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SALAMANCA, 3-5 SEPTEMBER, 2025

European Journal of Anatomy

Volume 29 - Supplement 1 December 2025

PRESENTATION

Dear colleagues and friends,

The XXXI Congress of the Spanish Anatomical Society, held in Salamanca from 3 to 5 September 2025, has been a congress full of history for celebrating the 150th anniversary of the creation of the Spanish Society of Anatomy, the 75th anniversary of its refoundation as the Spanish Anatomical Society and, in addition, having been accepted as an academic activity within the celebrations of the V Centenary of the "School of Salamanca", an important milestone for our University, which is over eight hundred years old.

The first meeting of the Spanish Society of Anatomy was held in Madrid on October 7, 1872. On that occasion, Dr. González Velasco, the first president of the Society, said in his inaugural speech: ..."Here we meet with the plausible purpose and object of enlightening each other, studying and clarifying, as far as possible, the difficult and obscure points that embody the serious problems that still remain to be resolved in Science"... A paragraph that we could take up to define what has been intended with the organization of our biennial congress due to the teaching and research challenges that are opening up before us.

Participation in the congress has been very numerous, 141 registered, with 4 plenary conferences, 64 oral communications and 80 poster communications.

As can be seen in the abstracts included in this supplement, the conferences and communications presented (oral or poster) have been of high quality.

The local committee and the Spanish Society of Anatomy wish to thank all attendees and sponsors their participation and hope to see you again in the beautiful city of Cádiz in 2027, where the next Congress of the Spanish Anatomical Society will take place.

José Carretero González

President of the XXXI Congress of the SAE

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GENERAL PROGRAM OF THE XXXI CONGRESS OF THE "SOCIEDAD ANATÓMICA ESPAÑOLA"

Salamanca, September 3-5, 2025

Wednesday, 3rd September

15:30-16:15 h	Registration and documentation (*Faculty of Medicine lobby, University of Salamanca)*
	Poster setup (*2nd floor, Maternal-Infant Simulation Unit corridor)*
16:15-17:00 h	Official Opening Ceremony - Social Programme (*Aula Magna)*
17:00-17:20 h	Tribute to Body Donors for Science. (Reconocimiento y Agradecimiento a los Donantes de Cuerpos para la Ciencia) - Social Programme Faculty of Medicine lobby
17:30-18:15 h	Opening lecture. Human anatomy and 3D printing as a Clinical Tool
	Dr. Carmen Escobedo Lucea (Foundation for Research at the General Hospital of Valencia) (*Aula Magna*)
18:15-18:45 h	Elsevier Workshop: Designing an Anatomy Course Step-by-Step with Complete Anatomy
	Elisabete Álvarez (Educational Product Solutions Manager) (*Aula Magna*)
19:30 h	Guided city tour. Social Programme
21:30 h	Dinner at Claustro del Colegio Mayor Arzobispo Fonseca – Social Programme

Friday, 8th September

9:00-11:00 h	Oral presentations (S1):
	Teaching and learning: CO/D01 – CO/D08 (*Aula 11*)
	Chairs: Olivia García Suárez (University of Oviedo)
	Ana E. Rodríguez (University of Salamanca)
	Applied, clinical and translational research: CO/C01 – CO/C08 (*Aula 12*)
	Chairs: Josep Maria Potau (University of Barcelona)
	Roberto Cabo Pérez (University of Salamanca)
11:00 h	Coffee Break
11:30 h	Plenary lecture. Clinically relevant anatomical considerations within the osteochondral unit
	Prof. Henning Madry (University of Saarland, Homburg) (*Aula Magna)*
12:30-13:00 h	Anatomage Workshop (*Aula Magna*)
13:00-14:30 h	Poster presentations (*2nd floor, Simulation Unit corridor*)
14:30 h	Buffet Lunch (*Faculty of Medicine*)
16:00-18:00 h	Oral presentations. (S2):
	Teaching and learning: CO/D09 – CO/D16 (*Aula 7*)

	Chairs: Félix J de Paz (University of Valladolid)
	Leonardo A. Catalano (University of Salamanca)
	Basic Research: CO/B01 – CO/B08 (*Aula 6*)
	Chairs: Mónica Tomás Caballero (University of Valencia)
	Adrián Santos Ledo (University of Salamanca)
18:00 h	Coffee Break
18:30-19:30 h	Plenary lecture. The role of Human Anatomy in Forensic Medicine
	Dr. Sonsoles de Castro Herranz (Institute of Legal and Forensic Medicine of Palencia, Salamanca, and Valladolid) (*Aula Magna*)
21:15 h	Cocktail at hotel Alameda Palace (Social Programme)
21:45 h	Gala dinner at hotel Alameda Palace (Social Programme)

Friday, 5th September

9:30-11:30 h	Oral presentations (S3):
	Applied, clinical and translational research: CO/C09 – CO/C16 (*Aula 11*)
	Chairs: José Vicente Lafuente (Universidad del País Vasco)
	Laura Calderón Díez (University of Salamanca)
	Basic research: CO/B09 – CO/B16 (*Aula 12*)
	Chairs: Aroa Casado Rodríguez (University of Barcelona)
	Carmela Gómez Rodríguez (University of Salamanca)
11:30 h	Coffee Break
12:00-14:00 h	Oral presentations (S4):
	Applied, clinical and translational research: CO/C17 – CO/C23 (*Aula 11*)
	Chairs: Raquel Mayordomo Acevedo (University of Extremadura)
	Cristina Pérez Montes (University of Salamanca)
	Basic research. Teaching and learning: CO/B17 – CO/B20 and CO/D17 – CO/D20 (*Aula 12*)
	Chairs: Francisco Manuel Visiedo Gacía (University of Cádiz)
	Carmela Gómez Rodríguez ((University of Salamanca)
14:00-14:10 h	Primal Pictures presentation
	Humberto Marcolini (DotLib, Account Manager)(*Aula Magna*)
14:10-14:55 h	Plenary lecture. Revolutionizing anatomy education with emerging technologies **Prof. Juan Antonio Juanes Méndez** (University of Salamanca (*Aula Magna*)
15:00 h	Buffet lunch (*Faculty of Medicine*)
16:30 h	Closing ceremony (Social Programme) (*Aula Magna*)
17:30 h	General Assembly of the Spanish Anatomical Society (*Aula Magna*)

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Anatomage Table

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XXXI CONGRESS OF THE SPANISH ANATOMICAL SOCIETY

SCIENTIFIC SESSIONS

Wednesday September 3, 2025

17:30-18:15 Opening lecture. *'Human anatomy and 3D printing as a Clinical Tool'*

Dr. Carmen Escobedo Lucea.

Thursday September 4, 2025

9:00 – 11:00 Oral Presentations. Session 1. TEACHING AND LEARNING: CO/D01 – CO/D08 (Aula 11)

Chairs: Olivia García Suárez, Ana E. Rodríguez

CO/D01 INFLUENCE OF GAMIFICATION AND PERSONALIZED LEARNING PATHWAYS ON ACADEMIC PERFORMANCE IN URINARY AND REPRODUCTIVE SYSTEM. CONTENT IN HUMAN ANATOMY STUDENTS

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Chairs: Josep Maria Potau, Roberto Cabo Pérez

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Prof. Henning Madry. Center for Experimental Orthopedics, University of Saarland, Germany.

13:00-14:30 Poster Presentations

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PO-42 PURINERGIC TRANSMISSION IN THE HUMAN CAROTID BODY: THE SUPPORTING CELLS ARE THE SOURCE OF ATP.

García-Mesa Y, García- Suárez O, Cuendias P, Alba E, Martínez-Barbero G, Cobo T, Vega JA

PO-43 PYROPTOSIS AS A NOVEL MECHANISM IN MAMMARY GLAND INVOLUTION AFTER WEANING.

Ruíz-Alarcón P, Puebla S, Gimeno A, Alonso-Yuste E, Viña JR, Ortiz-Zapater E, García-Trevijano ER, Zaragozá R

PO-44 RELATIONSHIP BETWEEN PLANTAR FAT PAD THICKNESS AND HEEL PRESSURE IN YOUNG ADULTS.

Fontán Jiménez M, Cáceres-Madrid MV, López-Ripado O, Mayordomo-Acevedo R, Medina-Montero C, Nini-Moreno D

PO-45 RETINOIC ACID REGULATES THE PROLIFERATION, DIFFERENTIATION, AND CELL DEATH OF LIMB SKELETAL PROGENITORS, CONTRIBUTING TO ESTABLISH THE SIZE AND IDENTITY OF THE DIGITS.

Duarte-Olivenza C1, Moran G1, Montero JA1, Lorda-Diez CI

PO-46 SINGLE-NUCLEI TRANSCRIPTS CORROBORATES THE NEW RADIAL MODEL OF THE MOUSE PALLIAL AMYGDALA.

Fernández G, Pons-Fuster E, Puelles L, García-Calero E

PO-47 TARGETING METABOLIC ALTERATIONS IN PANCREATIC CANCER: THE THERAPEUTIC POTENTIAL OF ARGININE METABOLISM.

Perazzoli G, Quiñonero Muñoz FJ, Peña Contreras MM, Ortiz Quesada R, Melguizo Alonso C, Jiménez Luna C.

PO-48 THERAPEUTIC APPLICATIONS OF CAR-T CELL-DERIVED EXTRACELLULAR VESICLES IN ONCOLOGY: A SYSTEMATIC REVIEW.

Jiménez-Luna C, Hidalgo-Puñal J, García-Valdeavero OM, Melguizo C, Ortiz R, Perazzoli G, Prados JC

PO-49 VERTICAL GASTRECTOMY INDUCES ANATOMICAL REARRANGEMENTS IN THE DIGESTIVE TRACT BEYOND THE STOMACH.

García-Ortiz JC, Pérez-Harana GM, Gómez-Díaz AL, Visiedo-García FM, Ribelles-García A, Prada-Oliveira A, Gracia-Romero MA

PO-50 STUDY OF LINGUAL SURFACE IN NEWBORN AND ADULT SUMATRAN ORANGUTAN (Pongo abelii).

Cabo R, Potau JM, Casado A, Pastor JF

PO-51 ANTEROLATERAL LIGAMENT OF THE KNEE IN CERCOPITHECIDAE.

Pastor JF, Casado A, Potau JM, Cabo R

PO-52 THINKING WITH THE HEART: THE IMPORTANCE OF AUTOPHAGY IN THE CARDIAC NEXUS GLIA

Santos-Ledo A, Pérez-Montes C, Velasco A, García-Macia M, Lavado-Fernández E, Martínez-Rojo I, Robles-García M, Arévalo R.

PO-53 AUTOPHAGY ACTIVATION IN OLIGODENDROCYTES IS IMPORTANT TO MAINTAIN HOMEOSTASIS IN ZEBRAFISH OPTIC NERVE REGENERATION

Pérez-Montes C, Lavado-Fernández E, Martínez-Rojo I, Robles-García M, Velasco A, Arévalo R, García-Macia M, Santos-Ledo A.

PO-54 SHIFT FROM OSSIFICATION TO MARROW ADIPOSITY IN HRAS/NRAS DKO MICE: A SEX-DEPENDENT PRECLINICAL MODEL MIMICKING OSTEOPOROTIC PATHOPHYSIOLOGY

Del Castillo D, García-Navas R, Santos Jiménez M, Calzada N, Fernández-Medarde A, Santos E, Gómez C.

PO-55 PROLACTIN AND TAU POSITIVITY IN THE HIPPOCAMPUS OF IRS2 KNOCKOUT MICE WITH CEREBRAL INSULIN RESISTANCE.

Vicente T, Carretero-Hernández M, Catalano-Iniesta L, Blanco EJ, García-Barrado MJ, Acosta-Cano C, Hermosilla-Plaza N, Hernández-González D, Díez-Castro D, Rodríguez AE, Torres L, Carretero J

PO-56 AGE AND SEX: IMPACT ON SYNTHESIS OF PROLACTIN IN PYRAMIDAL NEURONS OF THE HIPPOCAMPUS IN THE RAT.

Carretero J, Vicente T, Díez-Castro D, Blanco EJ, García-Barrado MJ, Hernández-González D, Rodríguez AE, Catalano-Iniesta L, Carretero-Hernández M

PO-57 EVIDENCE FOR ESTROGENIC MODULATION OF PROLACTIN EXPRESSION IN THE HABENULA OF THE MOUSE BRAIN.

Blanco EJ, Carretero-Hernández M, Díaz-Rodríguez LG, Hernández-González D, Díez Castro D, Catalano-Iniesta L, Rodríguez AE, García-Barrado J, Carretero J

PO-58 EFFECTS OF AGING ON THE NEURONAL DIFFERENTIATION AND MATURATION IN THE HIPPOCAMPUS OF THE MALE RAT.

Hernández-González D, Carretero-Hernández M, Blanco EJ, Vicente T, García-Barrado MJ, Díez-Castro D, Rodríguez AE, Catalano-Iniesta L, Carretero J

PO-59 HYDROCEPHALUS ASSOCIATED TO THE LACK OF IRS2 IN MICE IS ASSOCIATED TO ACTIVE GLIOSIS IN THE BRAIN.

Catalano-Iniesta L, Carretero-Hernández M, García-Barrado J, Díez-Castro D, Hernández-González D, Blanco EJ, Vicente T, Blanco-Antona L, Herrero-Payo JJ, Carretero J

PO-60 DIFFERENCES INDUCED BY AGE AND SEX OF AKT AND p-AKT EXPRESSION IN THE RAT HIPPOCAMPUS.

Díez-Castro D, Blanco EJ, Hernández-González D, Vicente T, García-Barrado MJ, Rodríguez AE, Catalano-Iniesta L, Carretero J, Carretero-Hernández M

PO-61 ANATOMICAL VARIATIONS OF THE CEREBRAL ARTERIAL CIRCLE AND THEIR CLINICAL CORRELATIONS: A CADAVERIC STUDY.

Valadares da Silva CT, Valderrama Canales FJ

APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH

PO-62 PRELIMINARY ANATOMICAL STUDY OF THE VEIN AND LIGAMENT OF MARSHALL: IMPLICATIONS FOR ATRIAL FIBRILLATION ABLATION.

Hernández-Gil-de-Tejada T, Tomás-Caballero M, Rams-Almenar C, Alfosea-Cuadrado G, Arias-Mutis Ó, Borí-Tormo L, González-Soler EM, Blasco-Serra A, Blasco-Ausina MC, Fabregat-Andrés Ó, Valverde-Navarro AA

PO-63 2D AND 3D GEOMETRIC MORPHOMETRIC ANALYSIS OF FACIAL MORPHOLOGY IN WOMEN WITH TURNER SYNDROME.

Gallardo S, Ruffo C, Andreu-Montoriol M, González A, Heredia-Lidón A, Roure O, Herrera-Escartín D, Echeverry-Quiceno L, Rubert-Tayà M, Sevillano X, Casado Rodríguez A, Esteban E, Martínez-Abadías N

PO-64 3D GEOMETRIC MORPHOMETRIC ANALYSIS OF THE PALATAL VAULT IN WOMEN WITH TURNER SYNDROME.

Hu W, Martínez X, Sánchez-Molins M, Tallón-Walton V, Martínez-Abadías N, Manzanares-Céspedes MC, Casado A

PO-65 ANATOMICAL VARIANTS IN ONCOLOGY: CLINICAL IMPLICATIONS AND PATHOLOGICAL CORRELATION.

Mesas-Hernández C, Reyes-Clemente N, Quiñonero-Muñoz F, Peña-Contreras M, Prados-Salazar J, Doello-González K

PO-66 ANATOMICAL, ANALGESIC, AND FUNCTIONAL EVALUATION OF THE EFFICACY OF THE SIGMA-1 RECEPTOR ANTAGONIST S1RA FOR THE COMPREHENSIVE TREATMENT OF RHEUMATOID ARTHRITIS.

Diaz-Gil G, García MM, Rodríguez M, Viso A, Santamaría B, Nieto FR, Huerta MA

PO-67 CHARACTERISTIC FACIAL FEATURES OF 5p– SYNDROME: 2D AND 3D ANALYSIS TO IMPROVE DIAGNOSIS AND CLINICAL PROGNOSIS.

Ruffo C, Gallardo S, Andreu-Montoriol M, González A, Heredia-Lidón A, Roure O, Herrera-Escartín D, Echeverry-Quiceno L, Rubert-Tayà M, Sevillano X, Casado Rodríguez A, Esteban E, Martínez-Abadías N

PO-68 CHARACTERIZATION OF FACIAL DYSMORPHOLOGY IN MUCOPOLYSACCHARIDOSIS SYNDROMES IN A COLOMBIAN POPULATION.

Andreu-Montoriol M, Candelo E, Echeverry-Quiceno L, González A, Heredia-Lidón A, Roure O, Ruffo C, Gallardo S, Herrera-Escartín D, Rubert-Tayà M, Gómez E, Sevillano X, Casado A, Esteban E, Pachajoa H, Martínez-Abadías N

PO-69 DEFINING A STANDARDIZED ANATOMICAL PATTERN OF THE GREAT AURICULAR NERVE: A CADAVERIC AND MORPHOMETRIC MICRODISSECTION STUDY.

Martínez-Soriano F, Torres-Gaya J, Blasco-Serra A, González-Soler EM, Puche-Torres M, Valverde-Navarro AA

PO-70 DIFFERENTIAL FACIAL FEATURES IN CDKL5 AND CTNNB1 SYNDROMES: A 2D AND 3D MORPHOMETRIC APPROACH TO IMPROVE CLINICAL DIAGNOSIS.

Escobar-Ramírez B, Andreu-Montoriol M, González A, Heredia-Lidón A, Ruffo C, Gallardo S, Herrera-Escartín D, Echeverry-Quiceno L, Llambrich S, Rubert-Tayá M, Sevillano X, Casado Rodríguez A, Esteban E, Martínez-Abadías N

PO-71 ESTIMATING SEX AND HEIGHT FROM THE HUMERUS IN A MEDIEVAL POPULATION OF BAJO ARAGÓN, IN SPAIN.

Felder Chueca L, García Barrios A, Fieguth Batista A, Gracia Martinez M, Gil Costa A, Cisneros Gimeno AI

PO-72 FACTORS MODULATING FACIAL SHAPE VARIATION IN THE CONTINUOUS SPECTRUM OF HEALTH AND DISEASE.

Andreu-Montoriol M, Heredia-Lidón A, Gallardo S, Ruffo C, Echeverry-Quiceno L, Herrera-Escartín D, Rubert-Tayà M, Gómez E, Candelo E, Pachajoa H, Alves de Oliveira J, Michelatto D, Monlleó I, Sevillano X, Casado A, Esteban E, Martínez-Abadías N

PO-73 KNEE JOINT INNERVATION: ANATOMICAL REVIEW AND PRELIMINARY DISSECTION OBSERVATIONS.

Cateura A, Reina F, San-Millán M, Carrera A

PO-74 MORPHOMETRIC VARIATIONS IN THE AORTOMESENTERIC ANGLE.

Guerra-Juarez YA, Alvarez-Lozada LA, Quiroga-Garza A, Elizondo-Omaña RE, Llamas Linares G, Pinales-Razo R, Guzman-Lopez S

PO-75 MP-004, A SMALL MOLECULE DEVELOPED TO STABILIZE CALCIUM CHANNELS (RYR), AS A NEW THERAPY FOR DIABETIC RETINOPATHY.

Arroba AI, Martín-Loro F, Cordero Cochet de la Isla J, Geribaldi N

PO-76 MP-004, A SMALL MOLECULE DEVELOPED TO STABILIZE CALCIUM CHANNELS (RYR), AS A NEW THERAPY FOR DIABETIC RETINOPATHY.

Arroba AI, Martín-Loro F, Cordero Cochet de la Isla J, Geribaldi N

PO-77 UTERINE ANATOMY AND MÜLLERIAN MALFORMATIONS: IMPACT ON HUMAN REPRODUCTION.

Mokachir Mohsenin Z, Abril Pérez J, Gimeno-Arias L

PO-78 INCIDENCE OF THE MAJOR ENTHESOPATHIES OF THE LOWER EXTREMITY.

Pastor J, Potau JM, Casado A, Pastor JF

PO-79 THYROGLOSSAL DUCT CYST: ANATOMY, DEVELOPMENT, AND DIAGNOSIS IN MOTION.

Cantalapiedra-Barbosa M, Falcón-Moreno E, Barbosa-Cachorro M, García-Espiga S, Pastor-Vázquez JF

PO-80 ECOANATOMY IN THE DISSECTION ROOM: A MODEL OF EDUCATIONAL INNOVATION FOR RHEUMATOLOGY (2010–2016).

Martín-Holguera R, Rodriguez-Torres R, Carrascosa-Sánchez J, Slocker Arce A, Hernández-Fernández LM, Pérez-Gómez A, Turrión-Nieves AI

16:00-18:00 Oral Presentations. Session 2. TEACHING AND LEARNING: CO/D09 – CO/D16 (Aula 6)

Chairs: Félix J de Paz, Leonardo A. Catalano

CO/D09 CORRECT USE OF DONOR BODIES

Sanchez Ferrer F, Sánchez Ferrer ML, Sánchez Ferrer M, Martinez Soriano F, Sanchez del Campo F

CO/D10 INTEGRATING HUMAN ANATOMY AND SURGICAL PRACTICE: A TEACHING INNOVATION AT ALBACETE MEDICAL SCHOOL

Arroyo Jimenez MM, Montón Echevarría J, Rueda JL, Delgado JC, Villaseca González N, Marcos Rabal P, Insausti Serrano R

CO/D11 DEVELOPMENT AND PRELIMINARY VALIDATION OF A QUESTIONNAIRE ON ATTITUDES TOWARD BODY DONATION IN UNDERGRADUATE STUDENTS IN EXTREMADURA

Mingorance Álvarez E, Mayordomo R

CO/D12 PERCEIVED ANXIETY AND SATISFACTION FOLLOWING FIRST HUMAN PROSECTION CONTACT IN NURSING STUDENTS: IMPACT OF PRE-ACTIVITY NERVOUSNESS LEVEL

Moreno Gómez-Toledano R, Sebastián-Martín A, García de Juan MT, Ramírez-Carracedo R, Méndez-Mesón I, Aguado-Henche S, Slocker de Arce A, Hernández-Fernández M, Fernández-Baillo R, Grande-Alonso M

CO/D13 FEMALE URINARY TRACT CONGENITAL ANOMALIES

Agudo-Andrés N, Arqued-San Agustín J, Gómez Aristizabal AL, Urrea Serna C, Sacramento Herrero M, Herrero Polo M, García García J, Lorenzo Gómez MF

CO/D14 FROZEN CADAVERIC TRAINING PROGRAM FOR DERMATOLOGICAL SURGERY

López-Ruiz E, Toll A

CO/D15 INSTITUTIONAL COMMITMENT TO ANATOMICAL EDUCATION AND RESEARCH: THE ROLE OF THE UNIVERSITY OF VALENCIA’S BODY DONATION PROGRAM

Valverde-Navarro AA, Blasco-Serra A, González-Soler EM, Rams-Almenar C, Alfosea-Cuadrado G, Arias-Mutis Ó, Borí-Tormo L, Blasco-Ausina MC, Cabanes-Vila J, Martínez-Soriano F

CO/D16 BODY DONORS FOR SCIENTIFIC AND TEACHING PURPOSES AT THE UNIVERSIDAD

COMPLUTENSE DE MADRID: SOCIODEMOGRAPHIC AND ANTHROPOMETRIC PROFILE

Borbolla-Gándara A, López-Ejeda N, Marrodán-Serrano MD

16:00-18:00 Oral presentations. Session 2. BASIC RESEARCH: CO/B01 – CO/B08 (Aula 7)

Chairs: Mónica Tomás Caballero, Adrián Santos Ledo

CO/B01 CHANGES IN THE POPULATION OF PARVALBUMIN-EXPRESSING INTERNEURONS IN THE HUMAN HIPPOCAMPAL FORMATION IN ALZHEIMER'S DISEASE: A ROSTROCAUDAL STUDY

Buendía E, Palencia A, Villaseca N, Selva J, Insausti AM, Yushkevich PA, Insausti R, Arroyo-Jimenez MM, Marcos P

CO/B02 RETHINKING THE CIRCUITS RELATED TO COGNITION AND EMOTION

Olucha-Bordonau F, Navarro-Sánchez M, Gil-Miravet I, Zahran M, Hidalgo Cortés J, Castillo Gómez E

CO/B03 EFFECTS OF THE MICROGLIA-MEDIATED NEUROINFLAMATION INHIBITION ON THE CLINICAL OUTCOME AND MN DEAFFERENTATION IN SMA

Hernández-Estañol S, Casanovas-Llorens A, Martínez-España L, Gatius A, Guillamon P, Piedrafita L, Esquerda-Colell JE, Tarabal-Mostazo O, Calderó-Pardo J

CO/B04 PERIVASCULAR PATHWAY AS AN ANATOMICAL ROUTE FOR INTRACRANIAL DISSEMINATION OF MALIGNANT PERIPHERAL NERVE SHEATH TUMOR

Bulnes S, Bengoetxea H, Ortuzar N, Lafuente JV

CO/B05 LEFT-SIDED ABDOMINOPELVIC METASTASES: ANATOMICAL CONSIDERATIONS IN TWO RARE ONCOLOGIC CASES

Sacramento-Herrero M, Gómez-Aristizabal AL, Arqued-San Agustín JA, Alonso-Bragado J, Salvatierra-Salvatierra J, Domínguez-Fernández MH, Polo-López C, Lorenzo-Gómez MF

CO/B06 A SUBPOPULATION OF HUMAN DIGITAL MEISSNER´S CORPUSCLES IS POLY-INNERVATED

Cuendias P, García-Mesa Y, Alonso-Guervós M, Martín-Cruces J, García-Piqueras J, Cobo R, García-Suárez O, Vega JA

CO/B07 PROPRIOCEPTIVE INNERVATION OF THE RAT LARYNX: NEW INSIGHTS

Hernández-Morato I, Yu V, Brenner-Morton S, Maranillo Alcaide E, West C, Moayedi Y, Pitman M

CO/B08 THE ANTEROLATERAL LIGAMENT IS NOT SILENT: NEUROCHEMICAL INNERVATION REVEALED

Valderrama FJ, Arviza P, Aragonés P, Vázquez T

18:30-19:30 Plenary lecture. *'The role of Human Anatomy in Forensic Medicine'*

Dr. Sonsoles de Castro Herranz. Institute of Legal and Forensic Medicine of Palencia, Salamanca, and Valladolid

Friday September 5, 2025

9:30-11:30 h Oral Presentations. Session 3. APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH: CO/C09 – CO/C16 (Aula 11)

Chairs: José Vicente Lafuente, Laura Calderón Díez

CO/C09 LIFESTYLE FACTORS AND ACETABULAR ANATOMY: IMPLICATIONS FOR HUMAN IDENTIFICATION

San-Millán M, Warrier V, Carrera A, Reina F

CO/C10 EFFECTS OF ERECTOR SPINAE ISOMETRIC CONTRACTION ON LOCAL PAIN THRESHOLDS IN HEALTHY PEOPLE AND PATIENTS WITH CHRONIC LOW BACK PAIN. A RANDOMIZED PLACEBO CONTROLLED CLINICAL TRIAL

Escamilla-Ugarte R, Alberola-Zorrilla P, Sánchez-Zuriaga D

CO/C11 INFLUENCE OF THE ANATOMICAL REFERENCE AND SUPPORT SURFACE ON THE DECLINE OF THE MEDIAN FREQUENCY OF THE ERECTOR SPINAE DURING AN ISOMETRIC CONTRACTION TO FATIGUE

Martínez-Fernández MC, Alberola-Zorrilla P, Escamilla-Ugarte R, Sánchez-Zuriaga D

CO/C12 ASSESSMENT OF HYPERKYPHOSIS IN HIGHPERFORMANCE SWIMMERS USING FLEXI-CURVE©

Oliver García R, Martínez Molina S, Moreno Cascales M, Fdez-Villacañas Marín MA

CO/C13 PHYSIOTHERAPY APPROACH TO CERVICAL PROBLEMS CAUSING DIFFICULTIES IN BREASTFEEDING AFTER INSTRUMENTAL BIRTHS

Montori-Rodrigo I, Trandafir-Trandafir PC, Dominguez-Sanz N, Jimenez-Marcos MA, Bays-Moneo AB, Arroyo MM, Marcos P, Insausti-Serrano AM

CO/C14 ANTEROLATERAL KNEE LIGAMENT... WHAT'S NEW?

Aragonés P, Arviza-Lorenzo P, Simón De Blas C, Valderrama FJ, Vázquez MT

CO/C15 RELATIONSHIP BETWEEN EMBRYOLOGICAL AND ANATOMICAL THEORIES OF THE SMAS: A SYSTEMATIC REVIEW

Castro Vaz L, Casals-Agustí A, Carrera A, Reina F

CO/C16 TRUNK KINEMATICS ARE ALTERED IN WOMEN WITH VISCERAL REFERRED PAIN AT THE LUMBAR REGION

Alberola-Zorrilla P, Escamilla-Ugarte R, Sánchez-Zuriaga D

9:30-11:30 Oral Presentations. Session 3. BASIC RESEARCH: CO/B09 – CO/B16 (Aula 12)

Chairs: Aroa Casado Rodríguez, Carmela Gómez Rodríguez

CO/B09 MORPHOGENESIS OF THE LIGAMENTUM NUCHAE AND ITS RELATIONSHIP WITH THE SPINAL DURA MATER

Esteban-Marín R, Vázquez-Osorio T, Verdugo-López S, Rodríguez-Vázquez JF

CO/B10 TRANSCRIPTOME MAP OF THE RAT INTRINSIC LARYNGEAL MUSCLES FOLLOWING RLN INJURY

Hernandez-Morato I, Adrados Moran I, Kemfack A, Moayedi Y, Pitman M

CO/B11 MUSCULAR VARIATIONS OF THE UPPER LIMB EXPLAINED THROUGH COMPARATIVE ANATOMY

Potau JM, Casado A, Ciurana N, Rodríguez P, García M, San José I, Barbosa M, de Paz F, Cabo R, Pastor J

CO/B12 INFLUENCE OF THE MINUS INDEX ON THE EFFECTIVENESS OF PREFABRICATED ORTHOSES

Cáceres-Madrid MV, Calderón-García JF, Rico-Martin S, Fontán-Jiménez M, López-Ripado O, Mayordomo-Acevedo R

CO/B13 MACROSCOPIC AND MICROSCOPIC CONTRIBUTIONS REGARDING THE EMBRYOLOGY OF THE HUMAN PALPEBRAL APPARATUS

Petrescu IA, Băloiu AI, Filipoiu FM, Cîrstoiu MM, Publik M, Dumitru A, Munteanu O

CO/B14 ANATOMICAL ABNORMALITY DUE TO EMBRYONIC REMNANT: URACHAL DIVERTICULUM

Alonso-Bragado J, Sánchez-Sánchez P,Cubillo-Jiménez J, Sánchez-Moyano C, Polo-López C, Herrera-Puerto J, Palacios-Hernández A, Lorenzo-Gómez MF

CO/B15 CONGENITAL MALFORMATIONS OF THE LOWER URINARY TRACT IN MALES WITH CLINICAL MANIFESTATION IN ADULTHOOD

Sacramento-Herrero M, Arqued-San Agustín JA, Cubillo-Jiménez J, Urrea-Serna C, Salvatierra-Salvatierra J, Agudo-Andrés N, Tinajas-Saldaña, A, Lorenzo-Gómez MF

CO/B16 ANATOMICAL FACTORS INFLUENCING KIDNEY TRANSPLANT OUTCOMES

Herrero-Garrido M, Maya-Barrantes B, Urrea-Serna C, Martin-Parada A, Palacios-Hernández A, Heredero-Zorzo O, Eguiluz-Lumbreras P, Lorenzo-Gómez MF

12:00-14:00 Oral Presentations. Session 4. APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH: CO/C17 – CO/C23 (Aula 11)

Chairs: Raquel Mayordomo Acevedo, Cristina Pérez Montes

CO/C17 ANATOMICAL DIAGNOSIS OF A HAND

MALFORMATION IN A STILLBORN THROUGH DISSECTION

Carrera A, Tubbs RS, Iwanaga J, San Millán M, Cateura A, Reina F

CO/C18 ANATOMICAL STUDY OF THE LOCATION OF BRAIN METASTASES IN CANCER PATIENTS AND CORRELATION WITH FUNCTIONAL DEFICITS

Doello-González K, Mesas-Hernández C, Habib-Allah-Domínguez R, Cabeza-Montilla L, Prados-Salazar JC, Melguizo-Alonso C

CO/C19 ANATOMY OF THE PTERYGOID VENOUS PLEXUS AND ITS RELATIONSHIP WITH THE MANDIBULAR NECK AND CONDYLE: AN ANATOMICAL AND IMAGING STUDY

Pedreño Hernández N, Guerrero Sánchez Y, Moreno Cascales M

CO/C20 ANATOMIC-SURGICAL APPROACH TO THE DESIGN OF A PROTOCOL FOR TRANSORAL ROBOTIC SURGERY

Martínez Molina S, Oliver García R, Moreno Cascales M, Esteban Sánchez T, Fdez-Villacañas Marín MA

CO/C21 CHARACTERIZATION OF CRANIAL NERVE FORMATION IN NEWBORNS WITH BRAINSTEM DYSGENESIS

Andreu-Cervera A, Martínez-Sempere M, Quinones S, Company V, de la Calle E, Parmigiani V, Casado-Herranz E, De Uribe-Viloria M, Voinescu I, Esteban I, Morales-Delgado N, Puelles E

CO/C22 SELECTIVE NEURONAL VULNERABILITY IN THE DEVELOPING HUMAN BRAIN: AUTOPSY EVIDENCE FROM 20 YEARS OF STUDY

Puelles E, Quinones S, Simon de Blas C0, De Uribe-Viloria M, Macarrón V, Sánchez-López E, Barrios G, Company V, Martínez-Sempere M, Morales-Delgado N, Maranillo E, Adrados I, Regojo R, Andreu-Cervera A

CO/C23 ANATOMY OF THE PERONEAL ARTERY... IS IT REALLY SO IMPORTANT IN FOOT AND ANKLE SURGERY?

Aragonés P, Ordás A, Simón De Blas C, Vázquez MT

12:00-14:00 Oral Presentations. Session 4. BASIC RESEARCH. TEACHING AND LEARNING: CO/B17 – CO/B20 and CO/D17 – CO/D19 (Aula 12)

Chairs: Francisco Manuel Visiedo García, Carmela Gómez Rodríguez

CO/B17 FOWLER´S SYNDROME: ANATOMY OF THE FEMALE EXTERNAL URETHRAL SPHINCTER

Herrero-Garrido M, Gómez-Aristizabal AL, Sánchez-Sánchez P, Alonso-Bragado J, Sánchez-Moyano C, Domínguez-Fernández MH, Padilla-Fernández BY, Lorenzo-Gómez MF

CO/B18 ANATOMICAL FOUNDATIONS FOR THE SURGICAL MANAGEMENT OF CLITORAL HYPERTROPHY

Alonso Bragado J, Herrero-Garrido M, Urrea-Serna C, Heredero-Zorzo O, Palacios-López A, Silva-Abuin JM, Padilla-Fernández BY, Lorenzo-Gómez MF

CO/B19 MACROSCOPIC AND MICROSCOPIC PERSPECTIVES ON INTRAUTERINE NAIL DEVELOPMENT

Băloiu AI, Petrescu IA, Munteanu O, Publik M, Dumitru A, Cîrstoiu MM, Filipoiu FM

CO/B20 MYHC COMPOSITION IN THE RAT LARYNX BEFORE AND AFTER RLN INJURY

Hernandez-Morato I, Colasaco C, Joshi A, Kemfack A, Adrados Moran I, Maranillo E, Pitman M

CO/D17 BEYOND THE FACULTY: DEVELOPMENT OF A NEUROANATOMICAL GYMKHANA FOR MEDICAL STUDENTS WITH A SOCIAL PURPOSE IN GRANADA

Zafra MP, Jiménez G, Castilla JA

CO/D18 INNOVATION IN MORPHOLOGICAL EDUCATION: CREATION OF THE MASTER'S DEGREE IN MORPHOLOGICAL SCIENCES AT THE UCM-CHILE AND ITS RELEVANCE FOR SPAIN

Pérez-Rojas FJ, Cabo R, Vega Álvarez JA

CO/D19 A MODEL OF PROGRAMMED TEACHING OF HUMAN ANATOMY: THE ESCOLAR METHOD

Lafuente JV, Bengoetxea H, Bulnes S, Ortuzar N, Murueta-Goyena A

CO/D20 NOT EVERYTHING IS AI. THE FREINET METHOD APPLIED TO THE TEACHING OF HUMAN ANATOMY

Pinto-Bonilla R, Baeza-Noci J, Baeza-Pinto P

14:10-14:55 Plenary lecture. *'Revolutionizing anatomy education with emerging technologies'*

Prof. Juan Antonio Juanes Méndez. Department of Human Anatomy, School of Medicine, University of Salamanca

ABSTRACTS

XXXI CONGRESS OF THE
SPANISH ANATOMICAL SOCIETY

ABSTRACTS

PLENARY LECTURES

HUMAN ANATOMY AND 3D PRINTING AS A CLINICAL AND EDUCATIONAL TOOL

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Foundation for Research at the General Hospital of Valencia

The instruction of human anatomy has traditionally relied on cadaveric dissection, long regarded as the most comprehensive modality due to its structural fidelity, multisensory richness, and ability to reveal authentic anatomical variability. However, recent advances in additive manufacturing have enabled the generation of high-resolution three-dimensional (3D) anatomical models derived from clinical imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI). These technologies offer new opportunities in both anatomical education and preoperative surgical planning.

The application of 3D printing in this context encompasses various techniques, including Fused Deposition Modeling (FDM), Stereolithography (SLA), Selective Laser Sintering (SLS), and PolyJet printing. Each modality offers distinct advantages, which will be critically examined in this presentation.

FDM, characterized by its low cost and widespread accessibility, is commonly employed for the fabrication of osseous structures and for basic instructional purposes. SLA provides superior resolution, facilitating the reproduction of intricate anatomical details such as cavities and foramina. SLS enables the production of mechanically robust, complex geometries without the need for support structures, making it particularly suitable for advanced surgical models. PolyJet technology permits the simultaneous deposition of multiple materials with varying mechanical properties and color profiles, thereby enabling realistic simulations of soft tissues, cartilage, and vascular structures.

Emerging evidence highlights the pedagogical value of 3D-printed models in enhancing spatial understanding, improving the visualization of complex morphologies, and supporting repetitive, risk-free training scenarios. Their use is particularly advantageous in early-stage medical education or in contexts where access to cadaveric specimens is limited or ethically constrained.

Nevertheless, despite their considerable benefits, 3D-printed anatomical models are inherently limited in their capacity to replicate the viscoelastic and haptic properties of living or preserved human tissue. Most printable materials do not support realistic layer-by-layer dissection or tactile feedback, and the models cannot fully capture interindividual anatomical variation or the profound ethical and emotional dimensions associated with cadaver-based instruction—where the donor is often considered a student's "first patient."

In response to these limitations, our Biomedical and Tissue Engineering Laboratory has adopted a hybrid educational strategy that integrates cadaveric dissection with advanced 3D modeling. In collaboration with anatomical sciences departments and surgical teams, we employ patient-specific 3D-printed models as preparatory tools to enhance the efficacy of dissection labs and to optimize surgical planning in anatomically complex or variable regions. In our experience, the combination of tangible physical models with image-based virtual platforms reduces the learning curve, promotes clinical accuracy, and supports the design and placement of patient-tailored prosthetic devices.

Furthermore, in partnership with the Transfusion Center of the Valencian Community, we have established the first virtual human tissue bank. The development of this digital resource was predicated on prior work with cadaver-derived specimens, which was essential for calibrating and validating the technologies employed. This convergence of digital innovation with authentic biological reference points marks a significant step toward more efficient, ethically responsible, and clinically oriented anatomical education.

This presentation will highlight a selection of translational projects developed in our laboratory, underscoring the clinical and pedagogical potential of 3D printing technologies in anatomical sciences.

THE RELEVANCE OF HUMAN ANATOMY IN FORENSIC MEDICINE

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TA thorough understanding of the body's structures, their spatial relationships, and their function—that is, human anatomy—is essential in the practice of medicine, regardless of the modality, as long as it involves close contact with people, whether patients or those receiving medical care. The same is true for forensic medicine, where this knowledge is even more crucial.

To provide context, we will discuss legal and forensic medicine, its purpose, its organization, and the performance of its assigned functions.

Traditionally, legal medicine has been considered to belong to the academic sphere and forensic medicine to the practical sphere, but this is a fictitious and self-serving distinction that advocated for two separate, unconnected compartments. It is true that Legal Medicine, since the creation of the first chair by Dr. Pedro Mata, has been linked to universities and has focused on training future physicians in all the legal and regulatory aspects that transcend the work of what is traditionally called practical medicine, extending its function to the social sphere and the world of law.

Because of this, for a long time, there was a separation between teaching and the practice of Forensic Medicine in its role of assisting the courts and tribunals through the National Corps of Forensic Physicians, although its creation is also inextricably linked to Dr. Mata, the driving force behind the group.

This distinction persisted for many years until the European Council of Legal Medicine approved the term Legal and Forensic Medicine for the medical specialty that, within the medico-social disciplines, is responsible for resolving legal problems and encompasses a body of medico-biological knowledge that assists the justice system. It is a specialty recently incorporated into residency training, within the so-called MIR (Medical Intern Resident) pathway, as the first graduating class, without the school system, will complete their training in the current 2025-2026 academic year.

Returning to Forensic Medicine, forensic physicians, traditionally assigned to the Courts and working independently, have seen their affiliation and organization substantially modified with the creation of the Institutes of Legal Medicine and Forensic Sciences (IMLCF). They have gone from being generalists within the profession to physicians specializing in various aspects related to the different areas of their work, with a multidisciplinary working relationship.

The IMLCFs are organized into services, primarily two: Forensic Medical Clinic and Forensic Pathology. However, in the larger institutes, other services exist, such as the Forensic Laboratory; or the Clinic Service is divided into sections, including the Bodily Injury Assessment Section and the Forensic Psychiatry Section. or the Pathology Service in sections such as Prosectoral and Forensic Anatomy or Histopathology.

The forensic medical clinic deals with medicolegal issues related to living individuals. Examinations to assess injuries and organic or functional sequelae resulting from assaults or accidents, or the medical care and monitoring of detainees, for example, require in-depth knowledge of human anatomy and biomechanics.

Forensic pathology, for its part, is responsible for performing judicial autopsies and identifying corpses and human remains. Judicial autopsies share the methodology and techniques of clinical autopsies, focusing on obtaining anatomical information, but are performed in cases of violent death or death suspected of being a crime, according to the Criminal Procedure Law. The identification of corpses and human remains requires a deep understanding of anthropology and the human body.

Furthermore, all expert work involves the issuance of reports detailing the examinations performed and explaining the results and conclusions reached regarding the issues in dispute. For this, a thorough understanding of topographic anatomy and anatomical terminology is essential. Clear and understandable terminology must be used for the affected areas, regions, or body parts so that it is readily apparent to legal professionals. This allows for an understanding not only of the location of the injuries but also their orientation and dynamics in their development.

The importance of this knowledge is clearly evident in the judicial sphere, but not exclusively. It is also relevant in the teaching duties that forensic physicians are legally required to perform—primarily as associate professors in Faculties of Medicine, teaching subjects such as legal medicine and others, including embryology and human anatomy, as well as in the continuing education of their colleagues—in the investigation of mass casualty incidents, and in the field of human rights—age determinations in unaccompanied minors, investigations of crimes involving potentially unlawful deaths, deaths in custody, and collaboration on matters of democratic memory.

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ANATOMY 4.0: REVOLUTIONIZING HUMAN ANATOMY LEARNING WITH EMERGING TECHNOLOGIES

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Human Anatomy is a fundamental science in the training of health professionals, being a complex discipline that requires a deep understanding of the structures of the body, their spatial relationships and their functions. On the other hand, knowledge of human anatomy enables professionals to identify abnormalities, injuries and pathologies, facilitating the precise localization of structures for surgical interventions. A proper anatomical understanding decreases the risk of medical errors, such as damaging vital organs or structures during clinical or surgical procedures. Using correct anatomical terminology enables professionals to communicate accurately and efficiently with each other, which is vital in clinical settings.

The teaching of Human Anatomy has come a long way from its traditional methods to the most advanced digital technologies; that is, the study of anatomy has evolved significantly over time, adapting to the technological and methodological advances of society to improve the understanding of the human body.

The term Anatomy 4.0 is a neologism that describes the rapid technological advancement of the 21st century. It refers to a new way of transmitting knowledge, through the adoption of emerging technologies and digital tools for health sciences education, revolutionizing the teaching and study of human anatomy. It is based on the integration of advanced digital tools that enhance the understanding of the human body, facilitating a more interactive, immersive and accurate learning. In other words, it consists of creating interactive, personalized and immersive experiences that improve the retention and application of anatomical knowledge for clinical practice.

For a long time, the blackboard and coloured chalk have been a very useful resource to represent, in a simple way, structures of the human body. This method, although basic, encouraged the student's imagination and capacity for abstraction, requiring strong memorization and spatial visualization skills. In addition, this method, although simple, required great skill on the part of the teacher to correctly represent the shapes and proportions of the human body. Anatomical atlases served as a complement and as a fundamental tool for learning, allowing students to visualize anatomy more accurately, albeit in a two-dimensional manner. On the other hand, the use of real bones and anatomical models has also been crucial in anatomical learning. Students could manipulate these models to understand bone morphology and its relationship to other structures.

Undoubtedly, the use of cadavers has been one of the most important milestones in the teaching of human anatomy. Cadaver dissection has allowed students to directly explore anatomical structures in their real state. Despite its great educational value, this method presented challenges such as the availability of cadavers, preservation of bodies, and other logistical issues. However, despite these difficulties, dissection remains a fundamental pillar in the medical teaching of human anatomy.

With the advent of overhead projectors in the 1950s and 1960s, teachers began using overhead transparencies with anatomical illustrations. This method made it possible to show more precise images and facilitate the repetition of content without the need to redraw each time.

The teaching of anatomy advanced with the use of photographic slides projected on large screens. This method allowed students to observe actual images of dissections and more detailed representations of the human body.

However, a great leap forward has been the rise of personal computers, which allowed the appearance of interactive anatomy programs, such as Visible Body or Anatomy Atlas, offering three-dimensional representations of the human body. In addition, digital projection with PowerPoint presentations has replaced the blackboard, overhead transparencies, and slides, facilitating more dynamic and illustrative teaching.

Today, anatomy teaching has integrated advanced technologies such as virtual reality (VR), augmented reality (AR), and 3D printing. Tools such as the Anatomage Table, HoloLens and Complete Anatomy allow students to explore 3D anatomical models, interact with virtual organs and practice digital dissections without the need for real cadavers.

With VR headsets, students can immerse themselves in a three-dimensional environment where they can explore the human body in detail, manipulate organs and visualize blood flow or muscle movement in real time. With AR techniques, digital images can be superimposed onto the real world. This allows anatomical models to be projected onto a patient's body or a workbench.

These advances have improved the understanding of the human body, making learning more accessible in medical training. With rapid technological development, it is likely that anatomy teaching will continue to evolve towards even more immersive and interactive experiences.

Recently, artificial intelligence (AI) has been introduced, offering innovative solutions that complement and, in some cases, surpass traditional methods. One of the major contributions of AI is the creation of interactive three-dimensional anatomical models, obtained from radiological images of CT and MRI scans. This allows the study of the human body from real images obtained by these diagnostic techniques. Therefore, AI has allowed the development of virtual simulators that replicate medical and surgical procedures with a high degree of realism. These simulators not only help students become familiar with anatomy, but also allow them to practice clinical skills in a safe and controlled environment.

We can highlight four benefits that AI can bring to human anatomy learning:

Accessibility: These digital resources are available anytime and anywhere, democratizing access to medical training in the field of Anatomy.

Interactivity: These tools encourage active and participatory learning, increasing students' motivation and commitment to study.

Efficiency: Personalized learning allows students to progress at their own pace, optimizing the time dedicated to study.

Accuracy: AI-generated models provide accurate and up-to-date anatomical representations, reducing errors in interpretation.

AI is transforming the teaching and learning of human anatomy, offering innovative tools that improve understanding, retention, and practical application of knowledge. However, it is critical to address ethical and technical challenges to ensure that these technologies are used responsibly and equitably. As teachers and healthcare professionals, we have a responsibility to leverage these tools to train the next generation of doctors, nurses, physiotherapists, dentists and other healthcare professionals, preparing them for the challenges of the future.

The technological evolution in the teaching of anatomy has improved the accuracy, accessibility and interactivity of learning. Although technology has made it easier to explore the human body with great realism, cadaver dissection remains an irreplaceable resource for its value in actual medical practice. Each technological advancement has improved the way future healthcare professionals understand anatomy, making learning more dynamic, accessible and effective.

However, these resources do not replace the need for practice with real cadavers in medical training, but rather complement it, offering a deeper and more detailed understanding of the human body. The key to the future will lie in knowing how to integrate these technological tools with traditional teaching, in order to enhance medical education in a balanced way. In other words, good anatomy teaching should combine the best of each method: traditional dissection, advanced digitalization and technological immersion, thus ensuring a more complete and effective training for new generations of physicians and other healthcare professionals.

Integrating these technologies into medical training not only facilitates learning, but also prepares students to face real-world medical challenges with greater skill and confidence.

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Oral Presentations (S1): TEACHING AND LEARNING

INFLUENCE OF GAMIFICATION AND PERSONALIZED LEARNING PATHWAYS ON ACADEMIC PERFORMANCE IN URINARY AND REPRODUCTIVE SYSTEM CONTENT IN HUMAN ANATOMY STUDENTS

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The teaching of human anatomy, due to its conceptual complexity, requires methodologies that promote deep understanding and sustained student engagement. This study investigates the combined impact of learning pathway personalization and gamification on academic performance in the context of urinary and reproductive system content within a university anatomy course. A quantitative approach with a quasi-experimental design was employed to analyze a sample of 60 medical students, divided into two phases: an intervention based on personalized learning paths without gamification and another that integrated gamified elements (digital medals and rankings) using the Canvas educational platform. The learning paths were differentiated using the 20/80 instructional rule, which enabled the segmentation of students according to their initial performance, allowing for the assignment of adapted training paths. The study was structured around three dimensions: academic performance, performance variability, and differences according to the type of content (functional, descriptive, clinical, visual). The results indicated a significant improvement after personalization ($t(59) = -4.27$, $p < .001$; $d = 0.55$), with an additional moderate effect attributable to gamification ($t(59) = -2.03$, $p = .047$; $d = 0.26$), as well as relevant differences between types of content assessed ($F(3, 236) = 6.27$, $p < .001$). Overall, the findings indicate that integrating personalized pathways and gamified elements constitutes an effective pedagogical strategy to enhance academic performance and cater to the diverse needs in teaching complex anatomical content.

ENHANCING PERFORMANCE IN ANATOMY EXAMS: STUDENT SATISFACTION AND COMPARATIVE OUTCOMES OF GUIDED MULTIPLE-CHOICE TEST STRATEGIES

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Anatomy subjects in Health Sciences are taught usually in the first years of the degree, so students are not familiar with the examination methods used in their assessment. In the Universitat de València, General Anatomy is taught in the first semester of the first year of medical studies. The theoretical exam, a multiple-choice test, constitutes the 60% of the final grade. The aim of this project was to improve students' skills when facing multiple-choice exams, using methods of the preparatory schools of the Spanish medical board exam (MIR). Teaching material was prepared from an official General Anatomy exam, with detailed explanations of the correct answer to each question, and published as a book by the University publishing service. After teaching the content of each General Anatomy block of lessons, students took a voluntary practice session on the corresponding questions from the exam with immediate feedback through Virtual Classroom questionnaires. Satisfaction was assessed by anonymous surveys and the results of the final General Anatomy exam were compared with previous academic years. Most of the students (76.6%) practiced with the tests, during the course (30%) or while studying for the exam (70%). Most of them considered that this helped them to consolidate knowledge (91.4%), feeling more prepared (89.4%) and confident (65.9%). Although grades were similar to previous years, they were compared during a very difficult semester due to the catastrophic floods in Valencia. The preservation of learning results during such difficult times could be related to a positive effect of the intervention.

This research was financially supported by the Servei de Formació Permanent i Innovació Educativa (SFPIE) (project number UV-SFPIE_PIEC-3327037) of the Universitat de València

TRANSFORMING HUMAN ANATOMY EDUCATION: VIRTUAL REALITY IN THE TRAINING OF OCCUPATIONAL THERAPISTS

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Human anatomy is a complex discipline requiring a clear understanding of structures and their spatial relationships. The limitations of traditional teaching methods highlight the need for new tools that enable more accurate visualization. This project incorporated Virtual Reality (VR), through the use of immersive headsets, as an innovative resource for teaching human anatomy to Occupational Therapy students.

The objectives are: to facilitate the three-dimensional exploration of the human body; to promote active learning through gamified dynamics; to evaluate the impact of VR on anatomical understanding and student motivation.

Students were divided into two groups: an experimental group that used VR applications, and a control group that followed traditional methods. The digital tools allowed for 3D visualization and manipulation of anatomical structures, incorporating interactive challenges. Outcomes were measured through performance tests and satisfaction surveys.

The VR group showed a significant improvement in anatomical comprehension compared to the control group. Additionally, most students reported high satisfaction with the tool, highlighting its usefulness in increasing motivation and engagement.

In conclusion, virtual reality proves to be an effective teaching strategy in anatomy education, enhancing both conceptual understanding and student motivation. Its implementation adds value to health sciences training.

GAMIFICATION AND ATTENTION-CAPTURING STRATEGIES AS A COMPLEMENT TO TEACHING AND LEARNING IN HUMAN ANATOMY

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Motivation plays a key role in fostering active learning, particularly in Human Anatomy, a foundational yet demanding subject for health sciences students. This study explores the implementation of gamification, social media and other techniques to enhance student attention, engagement and interest in musculoskeletal anatomy courses. A range of digital tools was employed, including interactive quizzes via Kahoot! and Wooclap, gamified exercises designed in Educaplay and Genially, and educational content disseminated through the Instagram account @fisioanatomistas. These interventions were applied in Human Anatomy I and II, core subjects in the first year of the Physiotherapy degree at the Universitat de València (UV), and also reached students from other degrees such as Medicine and Podiatry, highlighting their cross-disciplinary applicability. The gamified activities achieved notable participation rates—88.7% during class sessions and 77.4% outside the classroom. More than 70% of the students reported an increased interest in the subject. According to student surveys, these initiatives not only reduced pre-exam anxiety but also enhanced academic performance. Overall, the integration of digital tools significantly contributed to student motivation and active participation, offering an effective complement to traditional anatomy education. Nevertheless, optimizing the dissemination of content via social media remains necessary to broaden outreach and reinforce the impact of these resources.

This methodology is part of the projects UV-SFPIE_PID-1640415, RENOVA_PID_UV-SFPIE_PID-2078182, UV-SFPIE_PIEE-2732290, and UV-SFPIE_PIEE-3323782, funded by the SFPIE of the Universitat de València.

"ANATOBODY-3D": VIRTUAL HUMAN ANATOMY LABORATORY WITH 3D MODELS OF DISSECTIONS AND BONE SPECIMENS FOR IMMERSIVE SELF-DIRECTED LEARNING

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Human anatomy education is a fundamental pillar in the training of healthcare professionals. However, its descriptive and visual nature, combined with the need to memorize numerous structures, presents a significant challenge for students. Although traditional teaching methods—based on dissections, physical models, and atlases—have been effective over the years, they also present limitations. Two-dimensional and plastic models hinder spatial understanding and lack realism. Moreover, dissection faces barriers such as limited availability of cadaveric resources, high preservation costs, and restricted accessibility outside the classroom, which reduces learning flexibility. In this context, there is a growing need to incorporate innovative educational strategies.

This project, Anatobody-3D, proposes the creation of a virtual laboratory based on 3D anatomical models generated through photogrammetry by the students themselves, using free mobile applications. The main objective is to foster immersive, active, and collaborative self-directed learning by integrating these resources into the virtual platforms of two Spanish Universities: The Universities of Seville and Jaén.

One of the key advantages of this proposal is that it will allow students to access 3D anatomical models of real dissections and bone specimens outside the laboratory, promoting autonomous and flexible study while also strengthening inter-university collaboration. The initiative includes several phases: selection of anatomical specimens, generation and validation of models, integration into virtual learning environments, and evaluation of the educational impact. The goal is to transform traditional anatomy teaching and lay the foundation for an innovative, accessible, and replicable methodology.

This work was supported by the University of Jaén, *project PID2025-66.*

USAGE OF THE DIGITAL PLATFORM SAPIENS AS A VISUAL LEARNING AND SELF-ASSESSMENT TOOL IN A COURSE OF ANATOMY FOR FIRST-YEAR UNDERGRADUATE MEDICINE STUDENTS

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The usage of the digital image-based platform SAPIENS was evaluated as a non-mandatory complementary tool to reinforce anatomy learning. The aim was to investigate whether students' engagement with the platform was associated with their final exam performance. Different types of exercises (multiple choice, specific point and region identifications, naming tasks) based on anatomical images and 3D models were incorporated thorough the SAPIENS platform to the first-year medical students at the University of Girona.

Data from 167 students across two academic years (2023-24 / 2024-25) were analyzed. A completion-weighted success rate (CWSR) quantified student platform engagement and it was correlated with theoretical and practical exam scores using Pearson's and Spearman's tests. Difficulty and satisfaction were assessed through a post-course survey.

Results revealed significant positive correlations between CWSR and exam marks ($p<0.022$), with stronger associations for the practical component of the exam. Exercise format influenced outcomes. Exercises requiring higher interactivity (item location, item drawing, naming tasks) were consistently perceived and measured as more difficult.

Survey revealed overall positive satisfaction. Students perceived multiple-choice questions as the easiest exercise type.

The instructor perspective was also considered. Although content preparation required notable effort, especially in structuring high-graphic interactive materials, the benefits in automated evaluation, progress tracking, and reusability were seen as worthwhile.

Results offer a preliminary view of SAPIENS platform's impact on anatomy education and highlight the value of integrating image-rich digital tools into medical curricula.

This research was financially supported by the Spanish Government (Ministerio de Ciencia e Innovación, grant number PID2022-137647OB-I00).

IMPLEMENTATION OF A VIRTUAL MICROSCOPE FOR NEUROANATOMY

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Neuroanatomy, in the second year of the Medicine degree, is taught by the Department of Human Anatomy of the Medical School, at the University of Murcia. This subject includes the histological (microscopic) study of the nervous system, considering the relevance of this procedure for the understanding of neural structure and function. Accordingly, since the 1980s this department has organized practical exercises for students of this course, consisting of the analysis with binocular microscopes of a collection of histological human brain preparations. This teaching was interrupted in 2020 due to the pandemic, and was temporarily replaced by the study of photographs from this collection or other sources, in virtual sessions. Consequently, the demand for a tool to support detailed analysis of this material became evident.

To this end, we implemented a virtual microscope, accessible online for both teachers and students, containing the aforementioned neurohistological collection. This tool allows to view the histological sections on the screen, with controllable panning and magnification, offering thus a hands-on, interactive approach. The images can be viewed as well as downloaded for its subsequent analysis. It has also the advantage of being available both during and outside the classroom, displaying the full collection, overcoming the limitation of individual microscopes and scarce sets of slides for each student. Therefore, in addition to its use in the classroom, it becomes a self-learning tool for students, and a highly relevant complement to the course of Neuroanatomy, as well as other subjects that include the study of the nervous system.

VID-FOOT PROJECT: INTEGRATING VIDEO-BASED DISSECTION TO FOSTER AUTONOMOUS LEARNING IN PODIATRY EDUCATION

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The integration of digital tools in higher education has prompted the development of more dynamic and student-centered teaching methodologies. Among these, the Flipped Classroom (FC) model has emerged as an effective strategy to enhance student engagement and autonomy. This study aimed to design and implement anatomically oriented multimedia resources to support self-directed learning in foot dissection practices among undergraduate Podiatry students. The study included 83 first-year students enrolled in the course "Anatomy of the Lower Limbs" at Miguel Hernández University of Elche (2023–24), divided into a control group (n = 34) and an experimental group (n = 49). The experimental group had exclusive access to four dissection videos (each lasting 4 to 8 minutes) via a private YouTube channel, allowing for asynchronous, remote preparation prior to face-to-face laboratory sessions. Both groups received identical in-person instruction and content evaluation. Our results revealed a statistically significant improvement in practical exam scores in the experimental group compared to the control group. Although theoretical exam scores showed a positive trend, the differences were not statistically significant. This pilot experience demonstrates that incorporating FC strategies into anatomical dissection teaching can enhance practical performance, promote greater learner autonomy, and optimize students' preparation for hands-on laboratory sessions. Furthermore, the high number of video views suggests strong student engagement, digital fluency, and a proactive attitude toward learning. These findings support the value of integrating concise, targeted multimedia resources into anatomy curricula, particularly in academic fields such as Podiatry, where spatial understanding and procedural familiarity are essential for professional development.

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Oral Presentations (S1): APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH

3D BIOPRINTING OF CARTILAGE WITH DECELLULARIZED MATRIX BIOINKS FOR THE REGENERATION OF OSTEOCHONDRAL LESIONS

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Articular cartilage regeneration remains a major challenge in regenerative medicine due to its limited self-healing capacity. Numerous studies have attempted to biofabricate cartilage substitutes using various biomolecules, biomaterials, and manufacturing techniques, yet fully mimicking native tissue remains elusive.

In this study, a novel hybrid scaffold was developed by combining a 3D-printed b-TPU scaffold with a bioink based on cell-derived decellularized extracellular matrix (dECM).

The b-TPU structure offers mechanical support and architecture suitable for tissue integration, while the dECM bioink, derived from chondrogenically differentiated mesenchymal stem cells (MSCs), provides a biochemical environment mimicking native cartilage-ECM. After obtaining the cell-derived extracellular matrices, their cell differentiation and correct decellularisation were confirmed. The cartilage-dECM bioink was formulated and characterized in terms of cell viability, biocompatibility, rheological behavior, and chondrogenic potential via immunofluorescence. In parallel, b-TPU scaffolds were designed using CAD software to generate a structure whose geometry and porosity allowed the biomechanical properties of the constructs to be similar to those of native articular cartilage. Finally, the scaffolds were combined with the bioink and the final constructs were evaluated. The results demonstrated improved biomechanical performance compared to other commonly used biomaterials. Furthermore, the constructs exhibited high biocompatibility, absence of cytotoxic effects, and promoted differentiation of MSCs into chondrocytes without requiring external growth factors or induction media. In conclusion, the combination of b-TPU scaffolds and cartilage-derived dECM bioinks resulted in functional constructs with strong potential for use in osteochondral repair.

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ADVANCED BIOFABRICATION STRATGIES FOR CLINICAL SKIN REGENERATION: DUAL-HEAD SPRAYING AND BIOMIMETIC THREE-LAERED CONSTRUCTS

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Recent advances in skin biofabrication aim to address the limitations of conventional skin grafting by developing innovative strategies that combine cell delivery, biomaterials, and clinically adaptable technologies. In this context, our research explores two complementary approaches to improve wound healing and skin regeneration outcomes. Firstly, we developed a novel bioink composed of fibrinogen enriched with a glycosaminoglycan (GAG)/collagen-based matrix containing hyaluronic acid, dermatan sulfate, chondroitin sulfate, and collagen. This bioink was applied using an innovative dual-head airbrush-based spraying system, enabling fast and homogeneous coverage of extensive wounds. The bioink, loaded with human mesenchymal stromal cells or dermal fibroblasts, demonstrated excellent physicochemical and mechanical properties, supported high cell viability and metabolic activity, and promoted effective wound healing in a murine excisional wound model with results comparable to autografts. Secondly, to better mimic native skin architecture, we developed a biofabricated three-layered (BT) skin substitute replicating the epidermal, dermal, and hypodermal layers. Specific biomimetic hydrogels were formulated with skin-relevant ECM components, keratin, and sphingolipids, and seeded with appropriate cell types: keratinocytes, fibroblasts, and mesenchymal stromal cells. The BT Skin displayed suitable rheological and mechanical properties, supported stable cell viability, facilitated intercellular signaling, and showed controlled inflammation in vivo. Together, these results highlight the clinical potential of combining advanced spraying techniques with multilayered biomimetic constructs. Our integrated strategies pave the way toward more effective, personalized skin regeneration therapies that can be translated into clinical practice for the treatment of extensive and complex skin injuries.

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A NOVEL LAPAROSCOPIC MODEL OF CHRONIC KIDNEY DISEASE IN MINIPIGS REVEALED A SPECIFIC LIPIDOMIC SIGNATURE AND AN ACCELERATED ATHEROSCLEROSIS PROGRESSION

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We have developed a novel model of chronic kidney disease (CKD) in pigs to characterize the temporal changes of CKD-driven atherosclerosis. Six female Yucatan minipigs with hepatic overexpression of a human gain-of-function mutant of PCSK9 were randomized to either CKD intervention (n=3) or control group (n=3). CKD animals underwent segmental branch clamping of the left renal artery, and total right nephrectomy by laparoscopic surgery.

CKD animals showed a significant decrease in glomerular filtration and accumulated blood creatinine. During 15-months follow-up, they developed a progressive increase of adventitial vasa vasorum density in both carotid and iliac arteries and a higher number of arterial calcification spots. Postmortem studies evidenced bigger atherosclerotic plaques and calcification areas in coronary arteries. CKD animals developed a proatherogenic lipoprotein profile They accumulated palmitic acid in blood and kidney. Atheromatous lesions also displayed compositional changes. Fatty streaks accumulated palmitic acid and 10,16-dihydroxy-palmitic acid, whereas carotid atheroma plaques accumulated polyunsaturated fatty acids.

In conclusion, CKD induces a distinct lipid signature and accelerates atherosclerosis progression in a novel minipig model.

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ANATOMICAL FACTORS OF RECTOVESICAL FISTULAS FOLLOWING LAPAROSCOPIC RADICAL PROSTATECTOMY

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Rectovesical fistula is an abnormal communication between the rectum and the bladder. Its etiology is diverse and can be either congenital or acquired (inflammatory or infectious intestinal and urinary processes, trauma, secondary to surgical procedures...).

We present two cases of rectovesical fistula following laparoscopic radical prostatectomy managed at our center.

Case 1: A 66-year-old male with an initially good postoperative course. A month later he began experiencing diffuse abdominal discomfort and fecaluria. An abdominopelvic CT scan revealed a rectovesical fistula. A diverting colostomy and cystostomy were performed. Despite robot-assisted laparoscopic surgery, the fistula persisted. Bilateral nephrostomies were placed.

Case 2: A 69-year-old male with a rectal perforation smaller than 1 cm identified and repaired intraoperatively. During the postoperative course he developed peritonitis due to urinary leakage from the left ureter, requiring a terminal colostomy and bilateral nephrostomies. Three months later, fluid discharge through the anal canal led to a CT-confirmed rectovesical fistula.

In both patients, the diagnostic evaluation was completed with retrograde urethrocystography, pelvic MRI and cystoscopy. Surgical repair of the fistula was subsequently undertaken, consisting of resection of the fistulous tract, separate closure of the bladder and rectum, and interposition of tissue within the rectovesical plane—perirectal fat in Case 1 and puborectal muscle in Case 2.

Surgical correction of rectovesical fistulas is challenging but feasible in experienced hands with a comprehensive knowledge of pelvic anatomy. One of the patients required a second surgery due to fistula recurrence. Currently, the fistula has been resolved in both cases.

CAN WE PREDICT THE PHYSIOLOGICAL BEHAVIOUR OF HPA AXIS IN A SOCIAL CONTEXT AND COMPUTE ANXIETY AND DEPRESSION VALUES FROM CORTISOL SAMPLES?

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Mental health is a topic that needs progress to be done, as health risks are rising, especially among adolescents. Considering HPA axis in stress and relaxation, in a real group interaction, can help describe its variable physiological flexibility, based on the adrenal glands' behaviour, in different pathologies, in situ, with the aim to construct biological markers, as exemplified here for anxiety and depression. The subjects are students, adolescents or young adults (N=39, age 15-26). Questionnaires for empathy, anxiety, depression, were administered, and cortisol samples were taken before and after a humanistic counselling group interaction, to assess its biological impact. The results were compared with similar research, done in pandemic period (N=12, age 14-17), for describing HPA axis reactivity in a high pressure versus a normal context. A neurobiological marker is proposed, allowing to compute the emotional values of interest from cortisol values. If mathematical functions can be constructed from HPA axis physiology, then they can help practitioners predict the level of anxiety or depression directly from cortisol values, prior to their intervention and therapy or medication treatment, based on biological parameters of HPA axis that make it flexible or rigid. As these equations work, when we increased the sample from 39 to 51 subjects, there are arguments to assess a marker-like value for the combined variables and the corresponding equations, making them possible medical instruments to help diagnose and adjust interventions and improve therapy.

EUROPE'S FIRST VIRTUAL HUMAN TISSUE BANK USING 3D SCANNING

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Three-dimensional digitization of bone tissues is transforming tissue banks by enabling the creation of virtual catalogs that let clinicians select grafts without any physical handling. This virtualization reduces the risks associated with cross-contamination and freeze–thaw cycles, while also supporting more precise and safer personalized medicine through integration with patient-specific 3D models. This study compares three non-contact 3D-scanning technologies—structured light, laser, and photogrammetry—to determine their suitability for tissue banks. Fifty-six long bones (femurs, humeri, tibiae, and radii) from the Department of Anatomy and Embryology at the University of Valencia were digitized with all three technologies. In parallel, a sterile scanning protocol was designed and applied to nineteen cranial caps provided by the Tissue and Cell Bank of the Valencian Community Transfusion Center. Dedicated software was developed to automate post-processing and extract digital measurements from the generated models. A total of 1,008 anthropometric measurements per technology were obtained. These data were compared with direct measurements on the original tissues to evaluate the morphometric accuracy of each technique. A colorimetric analysis (CIEDE2000) was also performed, and qualitative feedback from clinical professionals was gathered through various questionnaires. The results provide objective criteria for selecting the most accurate, efficient, and clinically viable scanning technology, thereby fostering the implementation of virtual tissue banks and intelligent solutions in digital health.

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LIMITATIONS AND CHALLENGES IN ULTRASOUND EXPLORATION OF THE NAIL BED

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Ultrasound has become a widely utilized diagnostic tool in clinical practice, particularly in dermatology and, more recently, in the evaluation of the nail apparatus. The advancement of high-frequency ultrasound probes has enabled high-resolution imaging at small scales, allowing for the identification of anatomically complex structures such as the nail bed. The nail bed is frequently referenced in research on the nail apparatus; however, despite being clearly defined in anatomical literature, its boundaries remain inconsistent across scientific studies.

This study aims to define the anatomical extension of the nail bed using ultrasound measurements, establishing clear limits relative to previously obtained laboratory data about nail bed + dermal nail bed extension (previously called central ph-plate: 2.67 ± 0.04 mm in our studies). A total of 43 patients (20 men and 23 women) were assessed, yielding an average nail bed thickness of 0.04 ± 0.00 mm. A statistically significant difference was observed between sexes (p-value < 0.022).

Our findings support the utility of ultrasound as a reliable technique for examining the nail apparatus. However, it is important to note that the nail bed does not extend to the distal phalanx periosteum but is confined to a depth of 0.04 mm beneath the nail plate, with potential sex-related variations.

This research was supported by the Junta de Extremadura and the European Social Fund through the grant for research groups, reference GR24135.

ULTRASOUND RELIABILITY OF THE TOENAIL UNIT

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Ultrasound assessment of the toenail unit has gained increasing clinical relevance due to its potential for early diagnosis of various pathologies. Given the anatomical complexity of this structure and the operator-dependent nature of sonographic imaging, it is crucial to establish reliable and reproducible ultrasound parameters. The aim of this study was to evaluate the intra- and inter-observer reliability of ultrasound measurements of the hallux toenail unit, in order to consolidate reproducible morphometric parameters applicable to clinical diagnostics.

Twelve healthy participants with a mean age of 22.42±1.379 years were examined using a high-frequency ultrasound device (18 MHz). Two podiatrists with differing levels of experience performed measurements in both longitudinal and transverse planes of the hallux. The variables assessed included distances from the distal phalanx to the nail plate, hyponychium, and matrix, as well as the curvature and thickness of the nail plate. Non-parametric tests (Friedman and Spearman) were used to analyse intra- and inter-observer reliability. High intra-observer consistency was observed ($p > 0.05$), indicating that the same examiner can achieve stable and reproducible measurements. In the inter-observer comparison, some variables showed significant correlations, while others did not—highlighting a degree of variability related to the examiner's experience.

Ultrasound is thus affirmed as a reliable tool for the morphometric study of the toenail unit, particularly when performed by the same operator. The observed inter-observer variability underscores the need for standardised protocols and further specialised training to enhance reproducibility in clinical settings.

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Oral Presentations (S2): TEACHING AND LEARNING

CORRECT USE OF DONOR BODIES

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Multimedia and virtual and augmented reality programs, which are undoubtedly becoming increasingly sophisticated, are an invaluable aid for learning Anatomy.

However, the attributes of anatomical knowledge, such as shape, size, mass, colour, texture, hardness, elasticity, and friability, are difficult to simulate without a real cadaver, treated in a way that minimizes modifications.

Due to the expansion of Medical and Health Sciences faculties, the demand for the use of cadavers in the various degrees is growing. At the same time, the demand from different medical and surgical specialty groups is also increasing exponentially.

It becomes necessary to establish a working group of different specialists to establish an operational order for the utilization of body segments that guarantees the highest efficiency in the use of donor bodies.

It would not be ethically acceptable for a group to use a complete cadaver for a single intervention, depriving other groups of the use of different segments, which goes against the wishes of the donor.

Furthermore, it is also not ethical to disregard the inherent gratuity of an act of altruistic donation. We believe that in any course where this material is used, the gratuitous nature of this material and gratitude towards the donors should be emphasized, along with its continuous acknowledgment.

INTEGRATING HUMAN ANATOMY AND SURGICAL PRACTICE: A TEACHING INNOVATION AT ALBACETE MEDICAL SCHOOL

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Traditionally, practical human anatomy education has relied on anatomical models and cadaveric dissection. Imaging-based simulation technologies have enhanced the visualization and spatial understanding of topographic anatomy. However, dissection remains an irreplaceable resource, offering a three-dimensional “in vivo” comprehension of anatomical structures that cannot be achieved through other technologies.

During the 2020/21 academic year, an innovative approach was introduced in the third-year elective course Anatomy Oriented to Diagnostic and Surgical Processes (6 ECTS credits). This approach focused on applying anatomical knowledge acquired through dissection to clinical procedures. Each year, 32 students work in small groups in the dissection room with cadavers, following a brief theoretical review of the region of interest. After completing the dissection, students propose clinical applications of the observed anatomical features by integrating them into real clinical cases. Assessment is based on a written report and an oral presentation, emphasizing anatomical knowledge and its relationship to the pathologies presented in the clinical cases.

Almost all students reported that this methodology enhanced their anatomical understanding compared to traditional methods, improved their grasp of clinical anatomy, and increased their confidence in performing invasive procedures. This teaching strategy promotes real-time practical learning and highlights the relevance of anatomical knowledge in diagnosis and treatment. Furthermore, it familiarizes students with advanced surgical and medical imaging techniques.

This educational initiative was originally designed by Dr. Ricardo Insausti, whose vision and dedication laid the foundation for this innovative approach. We honor his memory following his passing on December 26, 2025.

DEVELOPMENT AND PRELIMINARY VALIDATION OF A QUESTIONNAIRE ON ATTITUDES TOWARD BODY DONATION IN UNDERGRADUATE STUDENTS IN EXTREMADURA

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Cadaveric dissection is one of the oldest and most widely used methods for studying Human Anatomy. However, relatively few individuals donate their bodies for educational purposes, particularly when compared to donations for other causes. To explore this issue, a questionnaire was developed, and its preliminary psychometric properties were assessed to evaluate undergraduate students' attitudes towards body donation for teaching purposes at the University of Extremadura.

The sample included 364 students, of whom 260 were women (71.4%) and 104 were men (28.6%), with a mean age of 24.02 ± 4.28 years. Sample adequacy was confirmed using the Kaiser–Meyer–Olkin index, and the suitability for factor analysis was verified with Bartlett's test of sphericity. An exploratory factor analysis was conducted, and the internal consistency of each factor was examined using Cronbach's alpha.

After expert review, the initial 20-item questionnaire was reduced to 18 items. Item 12 was removed due to cross-loadings, and item 2 was excluded as it was the only item loading on a unique factor. The KMO index for the 18-item version was 0.814, and Bartlett's test was significant ($p<0.0001$). Five factors were extracted, explaining 59.425% of the total variance. Cronbach's alpha for the full scale was 0.813, with factor-specific values ranging from 0.796 to 0.571. Although Factor 5 comprised only two items, internal consistency was calculated for completeness.

These findings suggest that the instrument presents adequate preliminary validity and reliability for assessing attitudes towards body donation for educational purposes.

PERCEIVED ANXIETY AND SATISFACTION FOLLOWING FIRST HUMAN PROSECTION CONTACT IN NURSING STUDENTS: IMPACT OF PRE-ACTIVITY NERVOUSNESS LEVEL

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Human prosection sessions are a valuable educational tool for nursing students in anatomy learning. However, the first exposure to cadaveric material can generate anxiety, which may influence students' learning experiences and emotional adaptation. This observational study aimed to analyze anxiety levels (state and trait) and satisfaction before and after a prosection session in first-year nursing students, considering their perceived nervousness beforehand.

A total of 231 students participated voluntarily. Participants were grouped based on their self-reported nervousness (low vs. high). Anxiety was assessed using the State-Trait Anxiety Inventory (STAI) before and after the activity, along with satisfaction questionnaires post-activity.

Results showed a significant decrease in both state and trait anxiety after the session ($p<0.0001$), particularly pronounced in students with higher initial nervousness. Satisfaction with the activity was high in both groups, with no significant differences. Interestingly, greater prior nervousness was not associated with lower satisfaction. Correlation analyses revealed that higher anxiety was moderately related to lower satisfaction only in the low-nervousness group.

In conclusion, the results suggest that the stressful element of dissection is the uncertainty of not knowing what one will face. After the practice itself, anxiety levels are significantly reduced. Consequently, future studies should address interventions in this regard that allow students to familiarize themselves with the dissection process before practice.

FEMALE URINARY TRACT CONGENITAL ANOMALIES

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The detection of female congenital genitourinary malformations caused by alterations in embryonic development is important, as it enables the implementation of secondary prevention strategies, such as early diagnosis of chronic kidney disease, as well as other measures to prevent and reduce the risk of further complications.

We present a prospective descriptive study aimed at analysing the anatomical and clinical characteristics of congenital genitourinary malformations in women who attended the Urology consultation in Salamanca during the 2020-2021 period, and the different imaging tests to diagnose them. It includes both de novo malformations and those that presented in childhood and progressed into adulthood, applying a range of clinical variables.

A complete left ureteral duplication with megaureter and a malrotated kidney were anomalies detected via CT scan. Intravenous urography enabled the diagnosis of a right grade I hydronephrosis caused by crossing vessels, as well as the afore mentioned malrotated kidney. Renal ultrasound revealed a case of neurogenic bladder with bilateral pelvicalyceal ectasia, and cystography confirmed a case of ectopic ureteral orifices. These were the various congenital genitourinary malformations diagnosed during the 2020–2021 period.

These findings highlight the diversity of such malformations, which can affect any structure of the urinary tract. Therefore, early detection is essential, as it can have a significant impact on renal function and patients' quality of life.

FROZEN CADAVERIC TRAINING PROGRAM FOR DERMATOLOGICAL SURGERY

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Anatomical knowledge forms the foundation in surgical disciplines. A detailed anatomical knowledge provides more safety and improves the understanding of the procedures performed in the operating room. Given the practical nature of surgery, anatomy should be taught using hands-on methods. This approach is especially pertinent in dermatology, since many of the surgeries are performed near subcutaneous structures of great importance.

We report our experience in a cadaver dissection course for the study of anatomy applied to dermatological surgery (DS). After the course, participants were asked to complete a voluntary, anonymous survey evaluating the perceived usefulness of anatomy in DS, the educational value of the course, and potential areas for improvement. Of 23 participants, 16 (69.6%) responded to the survey. All participants considered that anatomy was useful for dermatology both before and after the course. All participants agreed or strongly agreed that the course had given them an anatomical foundation for DS and had made them feel more confident when operating. All but two (87.5%) agreed or strongly agreed that the course had helped them improve their surgical skills. The remaining two (12.5%) were indifferent to that statement. The main suggestions for improvement were to increase the theoretical part (18.8%) and to dedicate a section to plasties and flaps (18.8%).

The findings suggest that cadaveric dissection is an effective method for improving anatomical understanding, increasing surgical confidence, and enhancing technical skills in dermatological surgery.

INSTITUTIONAL COMMITMENT TO ANATOMICAL EDUCATION AND RESEARCH: THE ROLE OF THE UNIVERSITY OF VALENCIA'S BODY DONATION PROGRAM

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The availability of human cadavers is essential for the teaching of Human Anatomy and for the advancement of surgical research and training. In response to the declining availability of unclaimed bodies from public institutions, the University of Valencia (UV), a public university in Spain, established its own Body Donation Program. This institutional initiative ensures a reliable, ethical, and respectful supply of anatomical material for undergraduate education across more than 10 academic programs, including Medicine, Nursing, Dentistry, Physiotherapy, and Pharmacy, benefiting over 2,500 students annually. Moreover, the program supports postgraduate education through approximately 30 annual surgical anatomy training courses, developed in close collaboration with surgical departments from the major public university hospitals in Valencia. This synergy has fostered the creation of the Applied Surgical Anatomy Research Group, whose work has resulted in more than 45 scientific publications and over 10 PhD theses in recent years, all based on anatomico-clinical research conducted using donor bodies. The University of Valencia demonstrates strong institutional support through an annual direct investment of approximately €40,000, covering personnel, facilities, body retrieval and cremation services, and donor relations. Postgraduate courses also help subsidize program costs. This support underscores UV's long-term commitment to academic excellence and ethical standards in medical education and research. A recent testament to this commitment is the 2025 unveiling of Altruisme, a permanent public monument honoring body donors and their families, reaffirming the societal and academic value of anatomical donation as a gift to science.

BODY DONORS FOR SCIENTIFIC AND TEACHING PURPOSES AT THE UNIVERSIDAD COMPLUTENSE DE MADRID: SOCIODEMOGRAPHIC AND ANTHROPOMETRIC PROFILE

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The main objective of this study is to know the profile of the body donor of the Centro de Donación y Salas de Disección (CDCySD) of the Universidad Complutense de Madrid (UCM), from a sociodemographic and anthropometric perspective.

This is a descriptive observational study based on a sample formed by non-probabilistic convenience sampling of 75 deceased donors between 52 and 99 years of age. For this purpose, we reviewed the information collected in the Voluntary Body Donation database prepared by the CDCySD, comparing it with that published by the National Institute of Statistics (INE) on the distribution of household income and deaths by cause of death. For the analysis of the anthropometric data collected, the variables most commonly used in clinical and epidemiological studies were used, such as the muscle mass index, the waist-height index and the musculoskeletal mass index. The statistical study of all these variables was carried out using IBM SPSS v. 29.0.2.0. ®.

The typical profile for the UCM CDCySD body donor has thus been identified, characterized by being male or female, with the same probability, with an age close to 79 years, an average income level, who decided to donate his or her body at the “last minute”. Deceased due to tumor diseases and, consequently, with low weight or normal weight and a predominantly endo-ectomorphic somatotype, shows a significant sarcopenia affectation, in the case of being a woman.

Oral Presentations (S2): BASIC RESEARCH

CHANGES IN THE POPULATION OF PARVALBUMIN-EXPRESSING INTERNEURONS IN THE HUMAN HIPPOCAMPAL FORMATION IN ALZHEIMER'S DISEASE: A ROSTROCAUDAL STUDY

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Ageing involves a progressive decrease in brain volume and loss of cell density that can lead to neurodegenerative pathologies such as Alzheimer's disease (AD), associated with atrophy of the medial temporal lobe and a loss of cognitive functions. One of the most affected areas is the hippocampus, a key region for memory processing and learning. The hippocampus is a complex structure with different cell types, organized in different cellular and non-cellular layers. One of the main neuronal types are interneurons, that play a crucial role in regulating the activity of principal neurons. Some populations of interneurons can be detected by the expression of calcium-binding proteins such as parvalbumin (PV). It is known that the hippocampal population of PV-immunoreactive interneurons may be affected by ageing and neurodegenerative diseases. The aim of this work is to analyze in detail the changes in this interneuron population along the rostro-caudal length of the hippocampus in cases diagnosed with mild to moderate AD compared to age-matched controls. In addition, we aim to describe whether there is any segment where this population is particularly resistant or sensitive to AD. The results show rostro-caudal differences in the density of PV-positive interneurons in the different hippocampal fields and layers, and a significant decrease of this population in AD especially in CA1. Since the three rostro-caudal segments of the hippocampus (head, body and tail) are associated with different functions, the results may serve as a morphological basis to explain some of the alterations observed in patients with neurodegenerative pathologies.

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RETHINKING THE CIRCUITS RELATED TO COGNITION AND EMOTION

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The concept of the limbic system is based on the so-called Papez circuit. This loop was originally defined as a proposed circuit for emotions. This idea was extended by McLean, who incorporated elements such as the prefrontal cortex, the amygdala, and the brainstem. However, the clinical features of the Wernicke-Korsakoff syndrome indicate that the centers directly involved in the Papez circuit (cingulum, hippocampus, mammillary bodies, and anterior thalamus) are more related to cognitive processes implicated to memory than in emotional processes. Additionally, our group has shown that all centers that could be classified as limbic receive specific projections from the nucleus incertus of the pontine tegmentum. Based on this, a study of connections using anterograde and retrograde tracing in structures related to the nucleus incertus has been proposed, which has allowed us to define a set of six interrelated subcircuits: 1. A system of reciprocal connections between the cortical structures of the cingulum. 2. A bidirectional system of projections related to the activation of the amygdala and hippocampal systems and originating in the nucleus incertus. 3. The central core of memory-related structures, including the septohippocampal system. 4. The emotional control system, which includes the prefrontal cortex, amygdala, and ventral hippocampus. 5. The ancestral aversion-related circuit formed by the habenula, the interpeduncular nuclei, and the nucleus incertus. 6. Descending output pathways through visceral control from the periaqueductal gray matter and the lateral hypothalamic area.

EFFECTS OF THE MICROGLIA-MEDIATED NEUROINFLAMATION INHIBITION ON THE CLINICAL OUTCOME AND MN DEAFFERENTATION IN SMA

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Spinal muscular atrophy (SMA) is an autosomal recessive disease that represents the leading genetic cause of infant mortality. SMA is characterized by the degeneration of α-motoneurons (MNs), which results in progressive muscular atrophy, denervation and paralysis and is caused by homozygous deletion or inactivating mutations of the *survival motor neuron 1* (*SMN1*) gene. *SMN1* protein is ubiquitously expressed and plays a role in mRNA splicing. Neuroinflammation, involving reactive activation of both microglia and astroglia, is a common process in different neurodegenerative disorders, including MN diseases such as SMA. However, the full significance of neuroinflammation in the pathogenesis of these diseases remains unknown. In pathological conditions, microglia appear to play a major role in synapse elimination and deafferentation. Here, we analyzed the relationship between MN pathology and microglia inhibition in SMA. We treated either SMNΔ7 presymptomatic mice with the selective colony stimulating factor 1 receptor (CSF1R) inhibitor PLX5622 (Plexxikon Inc), and performed motor behavioral tests in treated and untreated animals. Moreover, we processed tissue sections of spinal cord and analyzed neuroinflammation, autophagy, and necroptosis phenomena, among others. Although PLX5622 treatment did not expand lifespan, it inhibited microgliosis, reduced microglial activation, and ameliorated the motor behavior in the SMNΔ7 mouse.

PERIVASCULAR PATHWAY AS AN ANATOMICAL ROUTE FOR INTRACRANIAL DISSEMINATION OF MALIGNANT PERIPHERAL NERVE SHEATH TUMOR

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Malignant peripheral nerve sheath tumors (MPNSTs) are highly aggressive neoplasms with poor clinical prognosis, primarily due to their marked invasiveness. Although parenchymal brain infiltration is uncommon, their potential for intracranial dissemination remains understudied. In this work, we analyzed the intracranial spread of MPNSTs through the perivascular space (PVS), with particular emphasis on the spatial distribution of Nestin-positive tumor cells and the associated glial response.

MPNSTs were induced in Sprague Dawley rats by transplacental exposure to N-ethyl-N-nitrosourea (ENU). Tumors were detected by T1-weighted imaging and analyzed histologically. Perivascular infiltration was analyzed using Nestin and BuChE immunolabeling. LEA histochemistry revealed microvasculature and reactive microglia, while TAMs and astrocytes were identified by Iba-1 and GFAP immunostaining, respectively.

MPNST originated from the trigeminal nerve sheath and extended anatomically into the interhemispheric fissure and along the Virchow-Robin spaces. Tumor progression triggered marked neuroinflammation, characterized by pronounced astrogliosis and recruitment of TAMs, which represented approximately 15% of the tumor mass. Within the PVS, clusters of Nestin+ cells were observed adjacent to the glia limitans; in several cases, these clusters breached the astrocytic barrier and infiltrated the brain parenchyma in close association with Iba-1+/LEA+ TAMs.

These findings suggest that cancer stem-like cells (Nestin+, BuChE+) use perivascular pathways as anatomical conduits for brain infiltration. Astrocytes and TAMs actively contribute to the formation of a permissive microenvironment. This experimental model provides novel anatomical and cellular insights into the mechanisms underlying the progression of peripheral nerve tumors into the central nervous system.

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LEFT-SIDED ABDOMINOPELVIC METASTASES: ANATOMICAL CONSIDERATIONS IN TWO RARE ONCOLOGIC CASES

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Unusual metastatic patterns can reveal critical anatomical factors in tumor dissemination. While renal and colorectal cancers typically metastasize to the lungs or liver, involvement of the kidney or testis is rare, particularly on the left side, where venous anatomy may favor retrograde spread. We present two uncommon cases of left-sided abdominopelvic metastases.

Case 1: A 58-year-old female with prior rectal mucinous adenocarcinoma underwent PET-CT that revealed a solitary left renal mass. Fine-needle aspiration cytology (FNAC) suggested clear cell adenocarcinoma. Radical nephrectomy and adrenalectomy confirmed metastasis from colorectal origin. Postoperative imaging later identified bilateral brain metastases. The route of dissemination may have been retroperitoneal or by the mesenteric vein.

Case 2: An 89-year-old male, 12 years after left nephrectomy for clear cell renal carcinoma, presented with left-sided scrotal swelling. Initially diagnosed as a hydrocele, surgical findings led to radical orchiectomy. Histopathology confirmed late testicular metastasis from the original renal carcinoma. Follow-up imaging showed no additional disease. Retrograde spread through the left gonadal vein, which drains into the left renal vein, is the most likely mechanism.

Anatomical understanding is essential when evaluating unusual metastatic sites. These cases highlight how regional venous and lymphatic anatomy can influence metastatic patterns and reinforce the need for thorough imaging and multidisciplinary evaluation. In both patients, the anatomic routes combined with the absence of physiological barriers may have facilitated left-sided spread.

A SUBPOPULATION OF HUMAN DIGITAL MEISSNER´S CORPUSCLES IS POLY-INNERVATED

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Meissner corpuscles (MC) are cutaneous end-organ complexes typical of the glabrous skin in humans and primates that function as adapting type I LTMRs (low-threshold mechanoreceptors). Structurally, MCs consist of the peripheral tip of an Aβ LTMRs (the so-called central axon), terminal glial cells, and a capsule of endoneurial origin. They are usually innervated by a single mechanosensory axon that occasionally branches giving a false image of poly-innervation. Nevertheless, true bi-innervation by mechanoreceptors (Aβ fibers) and nociceptors (C or Aδ fibers) was described in Macaca fascicularis or Macaca mulatta. Recently, it has been reported that the murine and avian MC-like are supplied by two axons with different molecular (TrkB+ and Ret+) and physiological profiles. However, this was never investigated in humans. Here we investigate the possible bi- or poly-innervation of human digital sensory corpuscles using silver impregnation and immunohistochemistry/immunofluorescence to several specific axonal markers. Results demonstrate that around 6-7% of human digital MC have double innervation. The axon of Meissner's corpuscles was TrkB+ while Ret was never detected. In 3D MC-reconstructions, there was no evidence of double innervation: the single axon had different calibers and very fine collateral protrusions. Multi-innervation has not been observed. The functional significance of the redundant innervation of this subpopulation of Meissner corpuscles in man is yet unknown.

PROPRIOCEPTIVE INNERVATION OF THE RAT LARYNX: NEW INSIGHTS

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The larynx is an organ of the respiratory system that serves as a protector of the lower airway, while also playing additional roles in voice production and swallowing. The profuse motor innervation of the intrinsic laryngeal muscles allows a fast response in vocal fold movement. Yet, the proprioceptive innervation of the larynx modulates the precision required for a normal function of the larynx throughout life. Despite its importance, a comprehensive characterization of the proprioceptive organs is lacking, and the physiology of laryngeal proprioception remains poorly understood.

In this study, larynges from 62 Sprague-Dawley rats distributed across five age groups (P3, P8, P11, P14, and P60) were immunostained with VGLUT1 and βIII-tubulin. For the characterization of neuron projections associated with mechanosensory and proprioceptive innervation, other neuromarkers were also used: S46, S100, CGRP, PLCβ2, and GNAT3. Muscle spindles were identified in the lateral thyroarytenoid muscles of just three rats at P8. No Golgi tendon organs were noted. VGLUT1-positive in some formations over muscle fibres, described at the beginning of the 20th century as flower spray-like endings. Also, intramuscular receptor-like entities were found within the rat intrinsic laryngeal muscles. More interestingly, mucosal formations were observed clustered at the medial surfaces of the arytenoid and aryepiglottic folds. The present study suggests that the larynx may possess a unique proprioceptive apparatus that governs the control of vocal fold movement associated with airway protection, swallowing, and voice production.

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THE ANTEROLATERAL LIGAMENT IS NOT SILENT: NEUROCHEMICAL INNERVATION RE-

VEALED

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The anterolateral ligament (ALL) of the knee is increasingly recognized as a key structure in rotational stability, yet its anatomical and functional properties remain incompletely understood. This study investigates the innervation of the ALL using immunohistochemistry and electron microscopy to characterize its neurochemical profile and structural organization.

Seventeen ALL samples from adult human fresh cadavers were analyzed. Thirteen were examined using immunohistochemical staining for PGP9.5 (general neuronal marker), VAChT (cholinergic fibres), tyrosine hydroxylase (TH, sympathetic fibres), calcitonin gene-related peptide (CGRP, sensory fibres), and nitric oxide synthase (NOS, nitrergic fibres). Four additional samples underwent transmission electron microscopy to assess ultrastructural features.

All ALL specimens displayed positive immunoreactivity for the markers evaluated, confirming the presence of neurochemically diverse peripheral nerve fibres. Both myelinated and unmyelinated fibres were identified, though no encapsulated mechanoreceptors were observed. The innervation pattern was comparable to that of the lateral collateral ligament (LCL), used as a control.

The ALL is a richly innervated structure with sensory, autonomic, and neuromodulatory potential, suggesting an active role in proprioception and homeostasis. These findings challenge previous views of the ALL as a passive capsular thickening and underscore its functional relevance in knee joint physiology.

Oral Presentations (S3): APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH

LIFESTYLE FACTORS AND ACETABULAR ANATOMY: IMPLICATIONS FOR HUMAN IDENTIFICATION

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Acetabular morphology is a reliable indicator for age-at-death estimation in forensic contexts. However, the influence of factors such as smoking and alcohol consumption—both known to affect bone health—on acetabular aging, remains unexplored. Tobacco use has been linked to reduced bone mineral density, cortical thinning, and delayed healing, while chronic alcohol consumption may impair bone remodelling and osteoblast activity—changes that can mimic age-related patterns and potentially lead to overestimation in age-at-death assessments. This study examines the impact of these factors on acetabular morphology and the accuracy of the acetabular aging method. 640 European Americans from the Bass Collection (US) were examined for age-at-death using acetabular changes. Mann-Whitney tests were used to compare mean values of acetabular variables, composite score, estimated age and absolute error between smokers and non-smokers, and individuals with or without a history of alcoholism. Results show no significant overall effect of tobacco or alcohol on acetabular morphology. However, tobacco use was associated with significantly younger acetabular stages in middle-aged males and more advanced stages in females. Alcohol abuse was linked to significantly younger morphology in middle-aged females. Crucially, these factors did not affect the accuracy of the acetabular method, except for tobacco consumption on females, confirming its robustness across lifestyle profiles. These findings suggest that while certain habits may influence skeletal appearance in specific demographic groups or markers, the acetabulum remains a reliable tool for age estimation. Further research is needed to clarify the biological mechanisms involved and to avoid overgeneralizing the effects of lifestyle on skeletal aging.

This study was partially funded by the Spanish Ministry of Education (AP2010-0595).

EFFECTS OF ERECTOR SPINAE ISOMETRIC CONTRACTION ON LOCAL PAIN THRESHOLDS IN HEALTHY PEOPLE AND PATIENTS WITH CHRONIC LOW BACK PAIN. A RANDOMIZED PLACEBO CONTROLLED CLINICAL TRIAL

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Exercise causes an immediate and lasting reduction in pain sensitivity, known in the literature as exercise-induced hypoalgesia (EIH). It is assumed that EIH is produced by the release of endogenous opioids due to the physiological stress caused by muscle contraction. However, although aerobic and isometric exercise have been widely compared in case-control interventions, the effect of an exercise-based placebo is unknown. The aim of this study was to investigate whether different interventions focused on the erector spinae (ES) generated EIH. This study was a randomized, placebo-controlled, cross-over, three-arm clinical trial according to the CONSORT guidelines. Seventy-six volunteers of both sexes were separated into low back pain and pain-free groups, and performed three interventions: aerobic exercise (cycloergometer); ES isometric exercise; and a third placebo intervention (without muscle activation of the ES). Pain sensitivity was measured through pressure pain thresholds on the ES at 3 time points: pre-intervention, post-intervention, and 30 minutes post-intervention. The activation of the ES through isometric and aerobic exercise produced EIH in both groups, but a hypoalgesic effect was also observed in people who did not show muscle activity but who believed they were performing an active exercise ($p<0.001$). These results may indicate that EIH in the lumbar region is not mediated by muscle contraction, the type or intensity of exercise, or the perception of effort. Factors such as patient expectations and the perception of receiving care could cause the phenomenon beyond physical activity and the contraction of the muscles themselves.

Clinical Trials registration number: NCT06330961

INFLUENCE OF THE ANATOMICAL REFERENCE AND SUPPORT SURFACE ON THE DECLINE OF THE MEDIAN FREQUENCY OF THE ERECTOR SPINAE DURING AN ISOMETRIC CONTRACTION TO FATIGUE

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The Biering-Sørensen manoeuvre (BSM) is the standard isometric exercise to fatigue the extensor muscles of the spine. A decline in the median frequency (MF) of the power spectrum of erector spinae (ES) activation, measured by surface electromyography (EMG), is a common indicator of muscle fatigue, which has been used as a prognostic variable in people with low back pain. However, BSM shows methodological variations between studies, which can influence the results and therefore preclude comparisons. The aim of this study was to investigate the influence of the anatomical reference and support surface on ES fatigue during BSM. Thirty participants (15 female and 15 male) performed on separate days six sessions of different variants of the BSM position, kept until exhaustion to measure EMG parameters of ES muscle fatigue. Subjects placed the trunk in the prone position on two different types of support surfaces, a Roman chair or strapped to a stretcher, with the trunk suspended over the border of the surface using the iliac crest, the anterosuperior iliac spine or the greater trochanter as a reference. The rate of decrease of ES MF was greater in males than females on both surfaces and all three anatomical references ($p<0.01$), greater on a stretcher than on the roman bench ($p<0.01$) and also greater using the anatomical reference of the greater trochanter ($p<0.05$). These results indicate that the anatomical reference and type of surface used during BSM alter the results of trunk extensor muscle fatigue measurements.

ASSESSMENT OF HYPERKYPHOSIS IN HIGH-PERFORMANCE SWIMMERS USING FLEXICURVE©

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Swimming is considered to be a safe and even therapeutic sport for back conditions; however, multiple studies relate competitive swimming to the development of sagittal abnormalities of the spine. It would be magnificent to have in our hands a simple, fast and non-invasive method for the swimming technicians to control and evaluate whether the training is in fact affecting the swimmers´ spinal column and, if necessary, to refer them to the correspondent specialist.

We wanted to evaluate the kyphosis degree via Inclinometer and Flexicurve, and to compare the obtained values. Afterwards, relate the amplitude of the thoracic kyphosis with the anthropometric parameters, the competitive swimming practice and the swimming stroke.

There were 62 participants recruited and split in two groups according to whether they practiced swimming or not. We measured the angle of the kyphosis with Inclinometer and Flexicurve. Furthermore, we obtained the participants anthropometric data (age, sex, height, weight, body mass index) and swimming related data (whether they were swimmers, the best and second best stroke).

We achieved a good correlation comparing angles of kyphosis obtained with Inclinometer and Flexicurve. The estimation of the ROC curve allowed us to obtain a new threshold for the evaluation of kyphosis with Flexicurve.

With Flexicurve or Inclinometer, we were not able to find correlation between hyperkyphosis and the anthropometric parameters, swimming practice and swimming stroke.

Inclinometer and Flexicurve are in fact useful for evaluation of thoracic kyphosis. However, Inclinometer has higher sensitivity than Flexicurve. The anthropometric values, swimming practice and stroke do not show correlation with the kyphosis degree in the studied population.

PHYSIOTHERAPY APPROACH TO CERVICAL PROBLEMS CAUSING DIFFICULTIES IN BREASTFEEDING AFTER INSTRUMENTAL BIRTHS

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Instrumental births may be necessary in certain situations to protect maternal or fetal health, but they carry a series of consequences for both the mother and the baby. One of the most frequent is the presence of problems with the initiation and maintenance of breastfeeding. This is a complex process that requires synchronization between mother and baby. A cervical evaluation of the newborn is necessary to address some of these difficulties when support from International Board Certified Lactation Consultants (IBCLC) alone is not sufficient.

It is important to determine whether evaluation and subsequent treatment of babies born after instrumental deliveries can improve difficulties in the initiation and maintenance of natural breastfeeding.

A randomized pre-post intervention study was conducted including 30 infants. The inclusion criteria were: prior decision for exclusive breastfeeding, instrumental delivery, breastfeeding difficulties, IBCLC counselling, and absence of ankyloglossia.

There was a significant improvement in the range of motion of the baby's cervical joint, including right and left lateral flexion and right and left rotation, after physiotherapy treatment. Other symptoms, such as uneven emptying of each breast, pain during feedings, mastitis, and cracked nipples, also showed substantial improvement.

Breastfeeding difficulties after an instrumental birth are related to asymmetric tone of the cervical muscles, which affects both biomechanics and breastfeeding function. Manual physiotherapeutic treatment of the cervical region promotes symmetry in muscle tone, thereby improving breastfeeding difficulties.

ANTEROLATERAL KNEE LIGAMENT…WHAT'S NEW?

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The anterolateral knee ligament (ALL) has gained recent interest following its "rediscovery" and its potential role in the treatment of residual rotational instability after anterior cruciate ligament (ACL) reconstruction

The lack of consensus on its biomechanical behavior limits the optimization of current surgical techniques. This study seeks to establish a correlation between anterolateral ligament isometry and a new classification based on its anatomy.

Sixty-nine knees from 44 individuals (27 male, 42 female, age 80.16 ± 11.84 years) were analyzed. Anatomical structures identified as anterolateral ligament were identified and measured using a digital caliper. Ligament isometry was assessed by measurements in different flexion positions (0º-30º-60º-90º) in neutral and internal rotation. The ligaments were classified according to their morphology, according to criteria of origin to insertion as well as according to their more vertical or horizontal trajectory. The data were analyzed statistically seeking to correlate the morphological variant with the point of greatest isometry exhibited, considering statistical significance at $p<0.05$.

LAL was identified in 87% of the knees, classifying them into 3 types and 8 subgroups, finding 85% of anchorages to the external meniscus. Significant differences were found between the isometry of more vertical variants, more isometric at 30° ($p=0.031$) and 60° ($p=0.005$) and horizontal variants, more isometric at 0° ($p<0.001$).

RELATIONSHIP BETWEEN EMBRYOLOGICAL AND ANATOMICAL THEORIES OF THE SMAS: A SYSTEMATIC REVIEW

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The superficial musculoaponeurotic system (SMAS) has been classically described as a continuous anatomical layer with a function of transmitting mimetic forces, but its existence as a uniform anatomical entity is being questioned by studies of macroscopic anatomical dissection, plastination, histological studies and embryological studies. However, the existence of this system as an anatomical entity apart from it being historically a surgical term, its true regional arrangement, its continuity with mimetic muscles and fasciae and the number of identifiable layers that compose it are controversial. This review aims to offer an updated perspective on the debate, which integrates embryological evidence as a differential feature to help in the adult anatomical interpretation and to try to clarify the discrepancies, following the development of the SMAS from the migration of the mesenchyme of the second branchial arch, how it is established only in certain regions and the extrapolable correlates in the adult. Integrating this knowledge allows for the individualisation of surgical techniques in the field of plastic surgery such as rhytidectomy, reducing complications and improving outcomes. The review justifies the need to abandon the classical notion of the SMAS and invites a reinterpretation of its role, highlighting its functional and regional role, rather than a universal layer.

UTRUNK KINEMATICS ARE ALTERED IN WOMEN WITH VISCERAL REFERRED PAIN AT THE LUMBAR REGION

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Altered kinematics of the lumbar region have been associated to non-specific low back pain (LBP), caused by a presumed mechanical injury to spinal tissues. Nevertheless, despite the high prevalence of women with LBP during menstruation, it is not known if this specific kind of referred visceral pain, with no local lumbar spine injury, is also associated to changes in lumbar biomechanics. Forty-eight women divided into two groups (referred LBP and non-LBP group) participated in this observational, case-control study. Lumbar spine kinematics were recorded both during the menstrual and the follicular phases of menstrual cycle. Angular displacement of the lumbar spine in the sagittal plane was recorded by an electromagnetic motion capture system, during standing and trunk flexion-extension. During the menstrual phase, both groups showed more lumbar and sacral inclination in standing, which means a more pronounced lumbar lordosis ($p<0.01$). During menstruation, both groups also reached higher lumbar flexion levels ($p<0.01$) than in the follicular phase. Nevertheless, during menstruation women with visceral referred pain showed lower degrees of lumbar flexion ($p<0.05$) and kept these values for a shorter time, spending less time with the spine flexed in maximum flexion ranges, when compared to LBP-free women ($p<0.05$). These results suggest that visceral referred pain at the lumbar region shows similar biomechanical changes to non-specific LBP. Thus, altered trunk kinematics in LBP patients could be mainly due to the presence of pain, regardless of the existence of a local nociceptive injury in the spine.

Oral Presentations (S3): BASIC RESEARCH

MORPHOGENESIS OF THE LIGAMENTUM NUCHAE AND ITS RELATIONSHIP WITH THE SPINAL DURA MATER

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The morphogenesis of the ligamentum nuchae (LN) and its relationship with the dura mater (DM) was studied in 25 human embryos and fetuses aged between 8 and 14 weeks of gestational age. At 8 weeks, the LN appeared as a mesenchymal band-like anlage located in the midline of the suboccipital region, continuous with the splenius capitis and trapezius muscles. By 9 weeks, the LN consisted of dense fibrillar connective tissue, separated from the atlanto-occipital and atlanto-axial membranes by loose connective tissue containing lymphatic vessels and veins. At 10 weeks, further differentiation of both the LN and the spinal dura mater was observed. From 11 to 12 weeks, the LN formed a sagittal fibrous lamina that connected to the spinal dura mater through the atlanto-occipital and atlanto-axial spaces. In transverse sections, it appeared as a small triangular septum with a posterior base, where the splenius capitis and trapezius muscles merged. At 13–14 weeks, the LN was connected to the dura mater via dense regular fibrillar connective tissue, becoming integrated with it. The LN-DM connection may constitute a pathway for venous drainage from the epidural venous plexus. Head movements could facilitate this venous return.

TRANSCRIPTOME MAP OF THE RAT INTRINSIC LARYNGEAL MUSCLES FOLLOWING RLN INJURY

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The larynx plays vital roles in protecting the lower airway and voice production by the coordinated action of the intrinsic laryngeal muscles (ILM). Those are innervated by the superior and the recurrent (RLN) laryngeal nerves. Despite a robust regeneration of the peripheral nerves, an acute injury to the RLN results in the vital roles of the larynx never being fully restored, which is a significant burden to patients. Recent advancements in RNA sequencing (RNA-Seq) offer promising avenues for identifying genes involved in RLN denervation and reinnervation processes.

Fifty-four Sprague-Dawley rats were used in this study, classified into six groups. In the five experimental groups, the right RLN was cut. Both stumps were put together to facilitate motor reinnervation of the larynx. At different time points (3, 7, 14, 21, 28 days post-injury), RNA was extracted from the lateral and medial thyroarytenoid and the posterior cricoarytenoid muscles.

25% of the genes showed at least a significant change in their expression across the experimental groups. A Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways analysis allowed to determine the most significant genes within the muscle fibers that may participate in reinnervation of the ILM from the proximal end of the injured RLN. The number of guidance-related genes showing significant changes in gene expression was lower than expected. In contrast, the presence of a large number of immune-related, differently expressed genes may reveal a critical role of these in cell-cell interactions required for neuromuscular synapse formation and maturation.

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MUSCULAR VARIATIONS OF THE UPPER LIMB EXPLAINED THROUGH COMPARATIVE ANATOMY

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The muscles of the upper limb can exhibit anatomical variations, more frequently in the forearm and hand. These variations often go unnoticed during an individual's lifetime, but in some cases, they may have clinical implications. The anatomical study of non-human primates, which include the animal species most closely related to Homo sapiens from a phylogenetic perspective, can help us understand the evolutionary origins of some of these variations. On one hand, there are anatomical variations that represent an atavism—that is, the reappearance of anatomical structures that are absent in a given taxon. An example would be the presence of a pectoralis abdominalis muscle or a dorsoepitrochlear muscle. It is also possible to identify the absence of muscles that are characteristic of modern humans but do not develop in other primate species, such as the extensor pollicis brevis. Another possibility is that a particular muscle in humans may exhibit an anatomical arrangement that is characteristic of other primate species, such as variations affecting the pectoralis minor, the extensor digiti minimi, or the extensor indicis. Understanding the musculoskeletal anatomy of primates and other animal species that are more distantly related to us from a phylogenetic standpoint can help interpret the emergence of anatomical variations in humans. This knowledge contributes to the accurate identification of such variations and to a better understanding of their clinical implications.

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INFLUENCE OF THE MINUS INDEX ON THE EFFECTIVENESS OF PREFABRICATED ORTHOSES

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The use of prefabricated orthoses is widely extended among foot care professionals as a conservative treatment for postural disorders. Pronation is a common postural alteration on the adult foot that can lead to complications in foot joints and alterations in the gait cycle, ultimately affecting an individual´s quality of life. It can be objectively diagnosed using the Foot Posture Index (FPI). The aim of this study was to determine whether the use of prefabricated foot orthoses leads or improvement in the posture of pronated feet in adults after 6 months of use. A randomized controlled clinical trial with 109 participants diagnosed with pronated feet, randomly assigned to a control group (no intervention) or an experimental group that used prefabricated orthoses for 6 months. Changes on both groups were assessed using FPI. A significant improvement in foot posture was observed in the experimental group, shifting from pronated to neutral, compared to the control group. Even participants with highly pronated feet showed improvement toward a less pronated posture. Interestingly, participants presenting a minus index did not exhibit such improvement in foot posture.

For an accurate diagnosis and effective treatment using foot orthoses in adults with pronated feet, it is advisable to conduct an anatomical assessment of the metatarsal structures, as the length of the first metatarsal plays a key role in both foot posture and biomechanics, as well as in the potential for postural correction.

This study was funded by the Regional Government of Extremadura and the European Social Fund Plus (FSE+) through the regional research grant program (reference GR24135).

MACROSCOPIC AND MICROSCOPIC CONTRIBUTIONS REGARDING THE EMBRYOLOGY OF THE HUMAN PALPEBRAL APPARATUS

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The palpebral apparatus performs vital protective, optical, and aesthetic functions, representing a key, yet understudied, aspect of human craniofacial development. The spatiotemporal sequence and morphological landmarks of eyelid morphogenesis in utero remain incompletely characterized. This study aims to elucidate critical stages of differentiation and clinical implications in the development of human eyelids.

We conducted a systematic morphological analysis of 54 human embryos and fetuses aging between 6–29 weeks in the Anatomy Department of Carol Davila University of Medicine and Pharmacy. Specimens underwent dissection and histological processing. Anatomical elements were evaluated as well as their evolution in stages of development, in comparison with histological findings of same age specimens.

Initial eyelid ridge formation and palpebral fusion were observed between 6–8 weeks GA, evidenced by groove formation and crease development. Histology at 10–14 weeks revealed periderm proliferation and emergence of tarsal plate primordia, orbicularis oculi and levator palpebrae muscles, as well as early eyelash follicle anlagen. By 18–20 weeks, tarsal plates became prominent and upper and lower lid separation began; caruncle and wet line structures evolved. From 24–29 weeks, the orbital septum, complete tarsal plates, and surrounding ocular adnexae elements demonstrate functional maturation of the eyelids.

This study delineates a refined timeline and morphology of eyelid development from early embryogenesis through late fetal stages. The detailed staging offers reference standards for normal palpebral morphology, and may aid in early detection of congenital pathologies. Improved understanding of eyelid ontogeny supports both developmental biology and obstetric/ophthalmologic clinical assessment.

ANATOMICAL ABNORMALITY DUE TO EMBRYONIC REMNANT: URACHAL DIVERTICULUM

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The urachus is a fibrous cord extending from the anterior wall of the fetal bladder to the umbilicus, derived from the allantois. Its incomplete obliteration can result in anomalies such as a urachal cyst—an uncommon condition in adults (1:5000), more frequent in males and often asymptomatic—making diagnosis particularly challenging. We present two clinical cases illustrating its varied presentations. The first case involves a 70-year-old man with long-standing erectile dysfunction and mild lower urinary tract symptoms (LUTS) treated with terazosin, with no significant medical history or abnormal physical examination. After symptom worsening and an ultrasound suggestive of a bladder diverticulum, transurethral resection of the prostate was performed without complications. Following initial improvement, new voiding symptoms emerged. A repeat ultrasound and voiding cystourethrography revealed an image compatible with a urachal cyst, prompting surgical excision.

The second case is a 23-year-old woman presenting to the emergency department with fever and general malaise. Ultrasound revealed a cystic image suggestive of a urachal cyst, and cystoscopy identified a protrusion on the bladder dome. Prior to surgery, a computed tomography scan excluded communication between the diverticulum and the bladder, allowing safe laparoscopic excision of the cyst. These atypical cases should be considered in the differential diagnosis of nonspecific urinary presentations, as they may be misinterpreted as bladder diverticula and may evolve into infection or, in rare cases, malignant transformation such as urachal adenocarcinoma. Including embryological remnants in clinical assessment is essential to avoid diagnostic delay and prevent serious complications.

CONGENITAL MALFORMATIONS OF THE LOWER URINARY TRACT IN MALES WITH CLINICAL MANIFESTATION IN ADULTHOOD

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Genitourinary malformations are among the most frequent congenital anomalies in humans. Their clinical manifestations range from asymptomatic findings to severe complications. Early identification is crucial to avoid misdiagnosis, inappropriate treatments, and adverse outcomes.

A prospective observational study was carried out at the University Hospital of Salamanca from January 1, 2019, to March 1, 2021. The study included male patients over 16 years of age with a primary diagnosis of congenital urinary tract malformation. The variables analyzed were age, reason for consultation, diagnostic tests performed, clinical diagnosis, and therapeutic approach.

Six clinical cases were recorded:

- A 68-year-old with hematuria and back pain was diagnosed with a ruptured horseshoe kidney and underwent heminephrectomy.
- A 51-year-old with left lumbar pain had a rotated kidney with ureteral lithiasis; treated with extracorporeal lithotripsy.
- A 77-year-old presenting with macroscopic hematuria was diagnosed with a double excretory system and vesicoprostatic mass; treated with radical cystoprostatectomy.
- A 21-year-old with recurrent omphalitis was found to have a complicated urachal cyst; surgical resection was performed.
- A 38-year-old with voiding dysfunction was diagnosed with megabladder, suggesting Hinman syndrome; managed with self-catheterization.
- A 39-year-old with dysuria and subfertility was diagnosed with a Müllerian prostatic cyst; psychiatric support was provided for a coexisting depressive episode.

Conclusions: Timely diagnosis of genitourinary malformations allows for appropriate therapeutic management, significantly improving patient quality of life and reducing the risk of long-term complications.

ANATOMICAL FACTORS INFLUENCING KIDNEY TRANSPLANT OUTCOMES

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Kidney transplantation is a solution for end-stage chronic kidney disease in patients who meet the selection criteria. A single-center, retrospective observational study was conducted with four groups: pre-robotic living donor group (GVPRER), pre-robotic deceased donor group (GCPRER), post-robotic living donor group (GVPOSTR), and post-robotic deceased donor group (GCPOSTR), with the aim of analyzing possible anatomical factors influencing the functional outcome of the transplant. The following results were obtained:

- Favorable prognostic factors included placement of the graft in the right iliac fossa and performing the anastomosis on the external iliac vein and artery in all groups.

- Unfavorable factors included placement of the graft in the left iliac fossa and performing the anastomosis in locations other than the external iliac vein.

- Regarding anastomoses in locations other than the external iliac vessels, the use of the common iliac artery was associated with better functional outcomes, whereas anastomosis to the common iliac vein was associated with poorer functional outcomes.

- In the GCPOSTR group, arterial graft plasty was identified as a poor prognostic factor. Due to the favorable outcomes, a clear trend was observed toward performing anastomoses on the external iliac vein and artery in the GCPOSTR group (97.5% of cases) and the GVPOSTR group (100% of cases).

Conclusion: Placement of the renal graft in the right iliac fossa and anastomosis to the external iliac artery and vein are associated with better functional prognosis.

Oral Presentations (S4):APPLIED, CLINICAL AND TRANSLATIONAL RESEARCH

ANATOMICAL DIAGNOSIS OF A HAND MALFORMATION IN A STILLBORN THROUGH DISSECTION

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A detailed dissection and a morphogenic analysis were performed in a forearm and hand of a stillborn female. The specimen, dated 1911, was 11.5 cm long. It showed a fusion of two fingers on its lateral aspect and two individual fingers, one on the medial aspect and the other on the middle axis of the hand. It was labelled as "duplication of the thumb with syndactyly of the two thumbs".

Microsurgical dissection was performed using 3X to 30X magnification. After location of subcutaneous nerves and veins, the dissection continued with the identification of muscles, vessels, and nerves through the deep planes.

In the forearm region, the anatomical structures and their topographical relationships were found following the common anatomical patterns, except for the presence of a consistent median artery that pierced the median nerve.

In the hand, where the malformation was apparent, the identification and the observation of distal insertions of the extensor pollicis longus, extensor indicis, extensor digiti minimi and flexor pollicis longus muscles, as well as the observation of the neurovascular distribution pattern, allowed us to determine the identity of each finger. Findings highlighted, contrary to what it was clinically diagnosed, the malformation corresponded to a distal fusion of the thumb and index finger and an agenesis of the fourth finger.

Evaluation of the dissection findings enabled us to make a correct diagnosis of this hand malformation, after more than a siècle. Results provide data on the morphogenic events that usually take place during the embryological development of limbs.

ANATOMICAL STUDY OF THE LOCATION OF BRAIN METASTASES IN CANCER PATIENTS AND CORRELATION WITH FUNCTIONAL DEFICITS

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Traditionally, brain function has been assessed through stimulation studies rather than localized lesions due to ethical concerns. However, brain metastases—common in advanced cancer and associated with high mortality—present an opportunity to study functional brain loss based on lesion location. The objective by a retrospective study is to analyze the relationship between the location of brain metastases and specific neurological symptoms to infer functional disruptions.

The study evaluated 111 anonymized patients diagnosed with brain metastases via MRI. Variables included age, sex, primary cancer type, metastasis location, and clinical symptoms. Statistical analysis was conducted using SPSS 28.0, employing descriptive statistics and inferential tests (Chi-square and Fisher's exact test).

Results showed that 67% of patients were male, with a median age between 60–69 years. Non-small cell lung cancer was the most frequent primary tumor (58%). The frontal lobe was the most common site for metastases, followed by the parietal lobe and cerebellum. Motor symptoms were most prevalent. Notably, significant associations were observed between specific brain regions and clinical symptoms: motor disturbances with parietal lesions ($P = 0.006$), memory issues with frontal lesions ($P = 0.03$), and thought process disturbances with temporal lesions ($P = 0.004$). Additionally, strong correlations were found between melanoma and small cell lung cancer with cerebellar metastases, and small cell lung cancer with occipital lesions.

In conclusion, the study highlights that analyzing symptom patterns in brain metastasis provides functional insights into brain organization that complement the traditional Brodmann area model, potentially informing both neuroscience and clinical practice.

ANATOMY OF THE PTERYGOID VENOUS PLEXUS AND ITS RELATIONSHIP WITH THE MANDIBULAR NECK AND CONDYLE: AN ANATOMICAL AND IMAGING STUDY

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Pterygoid venous plexus, located in the infratemporal fossa, is a complex and variable vascular structure, crucial in maxillofacial surgery and regional anesthesia. While classical anatomical literature predominantly describes it as a laminar network between the pterygoid muscles, its anatomy and arrangement are a subject of controversy. This study aims to explore and delve into the hypothesis that the plexus, or a portion thereof, could adopt an annular disposition around the neck and condyle of the mandible, and that this configuration might be closer to the predominant pattern than to an isolated variation, thus challenging the traditional laminar view. An anatomical and three-dimensional reconstruction study was designed. Methodology employed was macroscopic dissection of two human hemifaces (one with latex injection) using external and medial approaches, and the generation of 3D models from five plastinated temporomandibular joint blocks using specialized software (Amira). Dissections results revealed the presence of plexus vessels distributed around the condylar neck, with anastomotic patterns suggesting a partial annular arrangement. The medial approach corroborated the continuity of the interpterygoid plexus with this pericondylar network. Consistently, the three-dimensional reconstructions showed a tendency towards the formation of a vascular network that partially envelops the condylar neck, confirming an incomplete and variable annular configuration among the specimens. This study provides data supporting the existence of a pericondylar disposition of the pterygoid venous plexus, with a configuration tending to be annular, which complements existing descriptions. These findings contribute to a more detailed understanding of this complex anatomical region, with potential implications for clinical procedures.

ANATOMIC-SURGICAL APPROACH TO THE DESIGN OF A PROTOCOL FOR TRANSORAL ROBOTIC SURGERY

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Bioengineering has led to significant changes in medicine, both in diagnostic and therapeutic procedures, among which advances in the surgical field stand out. For this reason, today there is a need to develop new approaches to anatomical knowledge that allow us to evolve from minimally invasive procedures, which are currently widespread, to robotic surgical access, the most innovative technical advance in this field.

We have performed six dissections in 3 cadaver heads preserved in formalin and injected with latex, following an intraoral approach like that used in robotic surgery (DaVinci®) for the treatment of oropharyngeal tumors, with the aim of laying the foundations for a surgical protocol that can be used in this type of intervention.

Our protocol has included dissections of the area from epiglottis to soft palate, identifying the following muscle planes: palatopharyngeal muscle, superior pharyngeal constrictor, Riolano's bundle, hyoglossus and mylohyoid. These are used as anatomical references that allow the localization of risk elements or "red lines", especially the lingual artery, to avoid massive bleeding in this area of poor maneuverability. Although with notable variability, it has been possible to locate this artery in the most lateral region of the gloso-epiglottic recess.

We have been shown how anatomical structures, described centuries ago, now pose a new challenge. The technical advances in surgery, as dizzying as they are exciting, make anatomy the best tool for safely utilizing them. The control console of a state-of-the-art robot should not be conceived without a modest anatomy atlas.

CHARACTERIZATION OF CRANIAL NERVE FORMATION IN NEWBORNS WITH BRAINSTEM DYSGENESIS

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Brainstem dysgenesis is a congenital anomaly that disrupts the normal development of the midbrain, pons, and medulla oblongata, often resulting in significant neurological, motor, and sensory impairments. These deficits stem from malformations in cranial nerve nuclei and disrupted neural pathways. Understanding these changes is critical to interpret their clinical consequences.

Brainstem samples from human neonates who died prematurely were examined. Tissues were paraffin-embedded, sectioned using a microtome, and stained with cresyl violet, luxol fast blue, and hematoxylin-eosin to assess neuronal architecture and detect regions of hypoplasia or dysplasia. Immunofluorescence labelling for neuronal and glial markers was used to enhance visualization of structural abnormalities in the midbrain, pons, and medulla.

The study revealed frequent involvement of cranial nerves III (oculomotor), IV (trochlear), V (trigeminal), VI (abducens), VII (facial), IX (glossopharyngeal), and X (vagus). These abnormalities correlate with clinical signs such as ptosis, strabismus, diplopia, facial weakness, and swallowing difficulties. The observed malformations are consistent with congenital brainstem syndromes including midbrain hypoplasia, pontomesencephalic dysplasia, and bulbar dysplasia. This study underscores the value of combining traditional histological techniques with immunofluorescence to better characterize structural deficits and their potential impact on neurological function.

SELECTIVE NEURONAL VULNERABILITY IN THE DEVELOPING HUMAN BRAIN: AUTOPSY EVIDENCE FROM 20 YEARS OF STUDY

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The final two trimesters of gestation and the early neonatal stage are critical for proper central nervous system (CNS) development. Among the most significant neuropathological findings in perinatal autopsies is Selective Acute Neuronal Necrosis (SANN), a key feature of hypoxic-ischemic injury. This study investigates the topographic distribution of SANN and its associations with clinical parameters, placental pathology, and concurrent CNS anomalies.

A retrospective review was conducted on 1,090 autopsies of fetuses and infants (≥22 weeks gestation to 12 months of age) performed between 2000 and 2019. SANN was diagnosed in 205 cases (18.8%), defined by acute neuronal necrosis affecting multiple vascular territories. Placental lesions were classified using Amsterdam Consensus criteria. Statistical analyses included logistic regression and non-parametric tests.

The location of SANN varied by gestational age and sex. Lower gestational age correlated with damage to the basal ganglia and cerebellar cortex, whereas higher gestational age was linked to cerebral neocortex involvement. Live births were more likely to show hippocampal and midbrain damage. Sex-specific patterns were observed, with males more affected in the hippocampus and females in the cerebellum. Coexisting CNS abnormalities were present in 71.3%, notably gliosis, hemorrhage, and migration defects. Of the placentas examined (122/205), maternal vascular malperfusion (MVM) and fetal vascular malperfusion (FVM) were the most frequent findings, both associated with specific brainstem lesions.

In conclusions, SANN is strongly associated with placental vascular lesions, underscoring the importance of combined CNS and placental analysis in perinatal autopsies.

ANATOMY OF THE PERONEAL ARTERY... IS IT REALLY SO IMPORTANT IN FOOT AND ANKLE SURGERY?

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The fibular artery (FA), according to the classic description, terminally divides into the posterior fibular artery (PFA) and the anterior perforating branch (APB). The objective of this study is to detail the terminal distribution of the peroneal artery.

Anatomic dissection of 54 specimens was performed. The following variables were measured, taking the fibular malleolus as reference: distance to the most distal APB (terminal division), distance to other APB, presence of anastomotic branches (AB) between the FA and PTA, horizontal distances from the FA to the fibula at 5, 10 and 15 cm.

Six types on the terminal distribution of the fibular artery were identified: type 1 or classical bifurcation (40.7%); type 2 (14.8%), accessory anterior perforating branch proximal to the terminal bifurcation; type 3A (18.5%), terminal trifurcation into anastomosis, anterior perforating branch and posterior peroneal artery; type 3B (5.6%), terminal trifurcation where the anastomotic branch bows to join both posterior peroneal and posterior tibial arteries; type 3C (13%), accessory anterior perforating branch proximal to the terminal trifurcation; type 3D (3.7%), accessory anterior perforating and anastomotic branches proximal to the terminal trifurcation. Two specimens (3.7%) were non-classifiable. Three dominant peroneal arteries were found (5.56%).

Horizontal distances from the fibula to the FA were, at 5 cm, 0.83 ±1.21 mm; at 10 cm 1.24 ±1.16 mm; at 15 cm 1.63 ±1.34 mm. No differences were found for side or gender.

Understanding the anatomy of the FA, its branches and anatomical variations, may help to avoid iatrogenic injury to the fibular vascular bundle during the varied and increasing foot and ankle surgical procedures performed, such as posterior open reduction internal fixation of ankle fractures, ankle arthrodesis or arthroscopy.

Oral Presentations (S4): BASIC RESEARCH. TEACHING AND LEARNING

FOWLER´S SYNDROME: ANATOMY OF THE FEMALE EXTERNAL URETHRAL SPHINCTER

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Fowler's Syndrome is a rare condition characterized by urinary retention and voiding difficulties in young women due to functional alterations of the external urethral sphincter. 50% of cases are associated with polycystic ovary syndrome. Urethral botulinum toxin (Botox) injections induce relaxation of the sphincter, resulting in an improvement of patient symptoms.

We present two cases exemplifying the anatomical characteristics of this syndrome and the benefits of the urethral Botox injections.

Case 1: A 25-year-old woman presented with voiding dysfunction, recurrent UTIs and stress urinary incontinence. Ultrasound revealed normal kidneys and a distended, smooth-walled bladder with debris, suggestive of chronic retention. Retrograde urethrocystography showed a large bladder without reflux, urethral stenosis, and inability to void. Urodynamics indicated a hypocontractile bladder with elevated post-void residual. Cystoscopy revealed erythematous lesions; biopsy confirmed keratinizing squamous metaplasia. Management included clean intermittent catheterization, UTI autovaccine, and urethral Botox injections with significant clinical improvement.

Case 2: A 33-year-old woman was referred for dysuria, hesitancy and pain. Cystoscopy revealed a normal bladder, while urethrocystography showed urethral stenosis, a large bladder, and a mild cystocele. Cystomanometry demonstrated a failure of relaxation of the urethral sphincter. Surgical repair of the cystocele failed to improve symptoms. The patient underwent urethral dilations and received urethral Botox injections, with considerable clinical response.

Functional alterations of the external urethral sphincter are an uncommon condition. Imaging studies, such as retrograde urethrocystography, can aid in its diagnosis. Urethral Botox injections have proven to be a useful tool in alleviating symptoms and improving the quality of life.

ANATOMICAL FOUNDATIONS FOR THE SURGICAL MANAGEMENT OF CLITORAL HYPERTROPHY

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The presence of ambiguous genitalia at birth constitutes a medical emergency, primarily due to its psychological and social implications. One of the most frequent causes is congenital adrenal hyperplasia (CAH) due to 21-hydroxylase deficiency, with an estimated incidence of approximately 1 in 14,000 live births, following an autosomal recessive pattern. This condition is often associated with salt-wasting and metabolic disturbances in most cases. The female pseudohermaphroditism phenotype is characterized by a 46XX karyotype, normal ovaries, and virilized external genitalia. If surgical correction is not performed during childhood, it may become necessary and more complex in adulthood. The goals of this surgery are multiple: to achieve a functional and aesthetically female genital appearance, preserve clitoral sensitivity, and allow proper sexual function. Preservation of the neurovascular bundle is of great importance.

We present the case of a 23-year-old patient diagnosed at birth with virilizing CAH and associated salt-wasting syndrome. She underwent partial surgical and hormonal treatments throughout her life. In adulthood, she consulted for clitoral hypertrophy. Clitoroplasty was performed, preserving the neurovascular bundle and resecting the corpora cavernosa. Despite the complexity of the surgery, satisfactory functional and aesthetic results were achieved, with the patient reporting complete satisfaction 18 months postoperatively. This case highlights the importance of surgical planning and prioritizing both functionality and the psychological well-being of the patient.

MACROSCOPIC AND MICROSCOPIC PERSPECTIVES ON INTRAUTERINE NAIL DEVELOPMENT

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Nails have numerous other roles besides conferring protection to the distal end of the phalanges. Other purposes fall into the category of defense or attack mechanisms or serving cosmetic purposes, but, moreover, the nail plate provides a hard plane that counterbalances the pressure exerted on the palmar aspect of the distal phalanx, thus increasing the discriminatory capacity at this level.

Interest in nails has varied across history, with anatomical and comparative studies prevailing in the nineteenth century. From the mid-twentieth century onwards, a few researchers took interest in laying the foundations of human fetal nail development. However, there are few recent fundamental studies on anatomy, and even fewer on the embryology of the nail apparatus.

Within the Anatomy Department of the Faculty of Medicine and Pharmacy "Carol Davila", Bucharest, we analyzed a number of 54 embryos and fetuses with gestational ages ranging from 6 to 28 weeks. The study consists of a macroscopic part which analyzes the dynamic development of the various components of the nail apparatus, complemented by a second part of optical microscopy.

The first macroscopically detectable element appears at 7 GW in the fingers and is represented by the nail field. At 12 GW the nail plate starts to become visible in some of the fingers. In the hand, from the 25th week, the nails are similar in appearance to those of an adult, and the processes that follow are only processes of growth.

MYHC COMPOSITION IN THE RAT LARYNX BEFORE AND AFTER RLN INJURY

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The larynx is an organ that acts as a sphincter of the respiratory system. It plays vital roles in protecting the lower airway and voice production by the vocal fold movement facilitated by the coordinated action of intrinsic laryngeal muscles (ILM). Each muscle is composed of a mix of muscle fiber types expressing specific myosin-heavy chains. When compared to the other muscles of the body, ILM exhibits a heightened complexity. First, ILM contains a higher number of muscle types, including slow, fast 2A, and fast 2B, as well as two unique superfast fast 2X and extraocular muscle types. Second, the proportion of muscle types varies from one muscle to another.

For the determination of the muscle fiber types composition in the rat, larynges were cut and sections were immunostained to identify the different muscle types. Automated protocols for muscle type quantification in the ILM were evaluated. In a separate series of experiments, animals underwent a transection of the recurrent laryngeal nerve (RLN) and reconnection. Larynges were analyzed at 2, 4, and 8 weeks post-injury. Changes in muscle type composition were assessed bilaterally.

Several automated protocols were tested. Only MuscleJ2 showed results for rat ILM quantification. Manual quantification was also performed to compare results. Significant differences were observed among the ILM analyzed. RLN nerve injury affected the composition of the muscle types within the rat larynx. The composition at the ILM changed over time after the injury, but a similar arrangement before the nerve injury was not observed.

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BEYOND THE FACULTY: DEVELOPMENT OF A NEUROANATOMICAL GYMKHANA FOR MEDICAL STUDENTS WITH A SOCIAL PURPOSE IN GRANADA

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Teaching subjects like neuroanatomy to medical students often keeps them disconnected from the realities of the healthcare system in our community. It is therefore necessary to develop innovative extracurricular activities to increase students' motivation and social engagement.

Objectives: To plan, organize, and evaluate the level of satisfaction with the development of the first neuroanatomical scavenger hunt (solidarity free tour) through the city of Granada with medical students, and the participation of the Association for the Care of People with Cerebral Palsy (ASPACE).

A total of 15 students participated, selected through gamification activities carried out during the course's theory classes. The solidarity scavenger hunt was designed using local historical elements of Granada to create a neuroanatomical narrative. The participants visited the ASPACE facilities three weeks after the scavenger hunt. A questionnaire with several Likert-type questions was designed.

The participants highly valued the theoretical and practical content of the scavenger hunt and the visit to ASPACE, gaining a deeper understanding of the mobility and communication challenges faced by people with disabilities. The satisfaction rate among the ASPACE participants exceeded 80%.

Implementing gamified outdoor activities could be an effective strategy for enhancing the learning experience in neuroanatomy. However, the study's limitations, such as voluntary participation in these activities and the small number of students, should be considered in future research.

INNOVATION IN MORPHOLOGICAL EDUCATION: CREATION OF THE MASTER'S DEGREE IN MORPHOLOGICAL SCIENCES AT UCM CHILE AND ITS RELEVANCE FOR SPAIN

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Human morphology is essential in health sciences education. There is currently a lack of postgraduate programs specialized in this discipline, both in Latin America and Spain. The Master's in Morphological Sciences at Universidad Católica del Maule (UCM) emerges as an innovative response, offering a replicable model for international academic contexts.

This program, the only one of its kind in Chile and with no equivalent in Spain, aims to train specialists with strong scientific and pedagogical foundations, integrate artificial intelligence and deep learning into morphology, and contribute to the development and leadership in health sciences.

It is a four-semester, semi-presential program with research lines focused on Applied Morphology and Educational Sciences applied to Morphology. The curriculum includes a course on Artificial Intelligence and Deep Learning, maintains ties with CSIC, and collaborates with the PhD program in Health Sciences at the University of Oviedo. It also incorporates the Basic-Clinical Integration course, designed to connect basic and clinical sciences under a spiral curriculum, reinforcing educational continuity in the biomedical field.

The expected impact includes the training of highly specialized academics and researchers, strengthening health sciences education, promoting interdisciplinary research, and contributing to the quality of higher education in Latin America and Europe. The program represents an opportunity for Spain to establish advanced academic training in human morphology, supported by a validated Chilean model aligned with international standards, educational innovation, and global research collaboration.

A MODEL OF PROGRAMMED TEACHING OF HUMAN ANATOMY: THE ESCOLAR METHOD

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The Escolar Method is a pedagogical model for teaching human anatomy that emphasizes a holistic and narrative-based approach. Developed by a group of anatomy professors in Spain, it integrates theoretical knowledge with hands-on experiences, focusing on clinically relevant anatomical learning. Key features include the simplification of anatomical knowledge to highlight aspects with direct clinical applicability, presented within a logical and intuitive framework rather than as a series of isolated terms. Dissection is prioritized over prosection, preserving the anatomical integrity of the body to reinforce its interconnectedness. The method also employs unique visual tools like the “Belorcio”, a planimetric reconstruction that enhances students’ spatial understanding by allowing them to actively engage with anatomical layers. Additional features include group work, applied seminars to reinforce basic knowledge, and the use of drawing to visualize human structures. Despite its effectiveness in improving long-term retention and clinical competence, the Escolar Method remains underutilized outside of Spain. This review examines its core didactic principles, educational tools, and ancillary features, demonstrating how they align with current competencies required in medical education. By highlighting its potential to bridge the gap between basic anatomical knowledge and clinical practice, the article advocates for the method’s broader application in modern curricula.

POSTER PRESENTATIONS

Teaching

PO-01 - NOTES ON THE LONG HISTORY OF THE ANATOMICAL SOCIETY SINCE 1872 AND THE RELEVANCE OF 1950

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Dr. Pedro González Velasco promoted the creation of the Spanish Anthropological Society in 1865 (which disappeared in 1883 after his death in 1882) but left behind the National Museum of Anthropology.

Seven years later, in 1872, under his auspices, the Spanish Society of Anatomy was created with the aim (in his words) of mutually enlightening each other, studying and clarifying, as far as possible, the difficult and obscure points that embody the serious problems that still remain to be solved in science.

After a hiatus following his death, the political circumstances of the early 20th century and the civil war, the society ceased its activities, which were resumed when it was refounded as the Spanish Anatomical Society in 1950, on the initiative of Dr Miguel Guirao Gea.

Dr Miguel Guirao Gea was succeeded by his son, Dr Miguel Guirao Pérez, and the subsequent presidents of the Spanish Anatomical Society have been Drs Ricardo Vázquez Rodríguez, Javier Puerta Fenollá, José Luis Bueno López, José Carretero González and Teresa Vázquez Osorio.

PO-02 - ANATOMICAL SCAVENGER HUNT: IN SEARCH OF ACTIVE LEARNING

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Learning anatomy consistently poses a significant challenge for health sciences students due to the extensive and complex nature of the subject matter. This includes a large volume of technical terminology, three-dimensional structures, and functional relationships among organs and systems. Therefore, it is essential to implement pedagogical strategies that make the learning process more accessible and engaging. This approach aligns with 21st-century educational demands, which emphasize active learning and student engagement.

This project was implemented in the fourth-year course Topographic and Radiological Anatomy within the Physiotherapy degree. The primary methodology applied was gamification through an anatomical scavenger hunt. After acquiring theoretical knowledge—validated via the Kahoot platform—students participated in practical classroom and laboratory sessions. These sessions were structured into two-hour circuits involving four student groups and two instructors. Students demonstrated their knowledge using cadaveric specimens, methacrylate anatomical sections, conventional X-rays viewed on a lightbox, and digital imaging techniques (MRI, CT) through dedicated software.

The incorporation of game-based dynamics aimed to overcome passive learning and disinterest, particularly in complex or seemingly inaccessible areas of anatomy. Results showed sustained active participation across all sessions and an improvement in correct responses on the Kahoot quizzes after the scavenger hunts. Student knowledge progression was also favorable using this method, and the initiative received a very high overall satisfaction rating from participants.

PO-03 - ANATOMY FOR HEALTH: PROMOTING ANATOMICAL LITERANCY IN PRIMARY SCHOOL TO IMPROVE POPULATION HEALT

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The dissemination of fundamental anatomical knowledge from a young age has been demonstrated to foster healthy habits and reduce fear of healthcare environments. The cultivation of an understanding of the human body is conducive to the development of children's awareness of health, prevention, and self-care. For this reason, the Faculty of Medicine at the University of Cádiz has launched a programme to promote health education in primary schools. This initiative is in alignment with Sustainable Development Goal 3 (Good Health and Well-being) and promotes academic knowledge in the local community.

The objective of the project is to facilitate a more accessible and engaging relationship with medicine for young children through the facilitation of interactive activities that present essential anatomical and health concepts in an appealing manner. The programme's objectives also include fostering empathy towards healthcare professionals, promoting disease prevention, and cultivating positive attitudes towards healthcare from an early age.

Faculty members and students participated by delivering workshops and talks in schools. The activity programme introduces children to the fundamental principles of medical care through an interactive learning process, using anatomical explanations. Additionally, the medical students have actively contributed to the development of educational materials and videos, aiming to broaden the impact of the initiative and promote its dissemination throughout the community.

Our findings show strong student and teacher engagement, improving children's understanding of anatomy and health. The project strengthened university-community ties and boosted student involvement in health promotion, highlighting the value of early health education in building a more health-conscious society.

This project was approved and supported by the Teaching Innovation Unit of the University of Cádiz.

PO-04 - BREAKOUT IN HUMAN ANATOMY: LOCOMOTOR SYSTEM

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The methodological alternatives that exist for the teaching of Human Anatomy are numerous at present, being game-based learning one of the possibilities to be implemented.

The objective of the present communication is to show the students' opinion about the use of these methodological alternatives, and specifically the realization of a "Breakout" activity in the subject of Human Anatomy: Locomotor Apparatus.

In order to carry out this activity, which was carried out entirely on electronic devices, the teachers of the course designed a Break-out or "virtual escape activity" on the online platform Genially®, where the students had to escape from the "Temple of Angkor" where they had been locked up, but to do so they had to use their skills and their anatomical knowledge related to the contents of the Human Anatomy I: Locomotor Apparatus course.

The evaluation of the experience, by means of an evaluation survey answered by 90% of the participants, shows that 89% of them consider these activities useful to improve the motivation and participation of the students, 70% consider them useful for their learning and 75% and 85% consider these tools useful to integrate theoretical-practical contents and group cohesion respectively.

In conclusion, the use of breakout is a remarkable alternative for the study of human anatomy.

PO-05 - CADAVERIC EXPOSURE OF THE SUPERFICIAL UTERINE VEIN: AN ANATOMICAL POINT OF INTEREST IN THE DISSECTION OF THE ANTERIOR LEAF OF THE VESICOUTERINE LIGAMENT DURING RADICAL HYSTERECTOMY

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Radical hysterectomy has undergone significant anatomical refinement since its original description by Wertheim and Okabayashi, with current techniques aiming to optimize oncological outcomes while preserving neurovascular structures. A detailed understanding of uterine venous anatomy, particularly the superficial uterine vein (sUV), is crucial for safe and effective dissection of the anterior leaf of the vesicouterine ligament (VUL). This study presents a cadaveric dissection of a 90-year-old female donor, formalin-fixed, focusing on the identification and surgical relevance of the sUV.

A meticulous midline dissection exposed the pelvic retroperitoneum, allowing identification of key anatomical landmarks, including the uterine artery, sUV, hypogastric nerve, and ureter. Notably, the sUV was clearly delineated anterior to the ureter, entering the paracervix cranially—a variation found in up to 30% of cases that may facilitate the separation of the VUL with reduced bleeding and operative time. The dissection also exposed efferent branches of uterine vessels and highlighted the proximity of critical autonomic nerves.

These findings emphasize the importance of recognizing anatomical variations in the uterine venous plexus and their relationship with adjacent neural and urological structures. Accurate identification of the sUV during surgery may aid in preserving pelvic autonomic innervation and minimizing intraoperative complications, such as injury to blood vessels or the ureter. This anatomical insight supports safer and more individualized surgery strategies during nerve-sparing radical hysterectomy.

PO-06 - EMBRIOCOINS

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Today's generation of Higher Education students is characterized by being familiar with a virtual environment where they have access to a large amount of information. This poses a challenge when it comes to generating teaching materials to maintain the attention, motivation and participation of students.

We proposed the use of an activity in the General Anatomy and Embryology course, called "Embriocoins", in which students would earn coins through attendance and active participation in the theoretical and practical classes, which could later be exchanged for certain items that would serve as support in the development of the course.

For this, an exchange table was generated showing how to get "coins" and the associated cost of each of the items proposed (knowing a test question of the exam, option to eliminate false answers in a test question, increase by 0.1 the final grade of the course, etc). For attendance, a series of QR codes were hung daily in the classroom as a registry to store "coins". On the other hand, gamification and reinforcement activities were carried out during practical sessions that allowed them to continue accumulating coins.

The evaluation of these activities has been positively assessed by both teachers and students. At the level of the teaching staff, there has been a higher attendance at the theoretical sessions and for the students, it has served to encourage his participation and interaction in the practical classes.

PO-07 - ETHICAL AND LEGAL DETERMINANTS OF FAMILY CONSENT IN MEXICO'S BODY DONATION PROGRAM

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Body donation plays a critical role in anatomy education and biomedical research, yet its implementation depends on ethical and legal frameworks as well as cultural acceptance. This study explores the influence of human rights principles, national legislation, and sociocultural beliefs on family decisions regarding body donation in Mexico. A validated 35-item questionnaire was administered to first-degree relatives of deceased individuals at a university hospital. Results revealed that the donor's expressed will (90%) was the most influential factor in consent decisions, followed by institutional trust (85%) and clear communication (80%). Commemorative ceremonies were also valued (75%) as gestures of respect that humanize the donation process. While religious and cultural beliefs (65%) were relevant, they were not the primary determinants. These findings underscore the importance of aligning donation programs with ethical principles such as autonomy, transparency, and human dignity. Institutional practices that emphasize respectful use of remains, clear consent procedures, and public engagement are essential for improving family acceptance. The study supports the development of body donation policies rooted in legal compliance and bioethical integrity, aiming to foster a culture of voluntary donation that is both socially legitimate and educationally effective.

This study was conducted as part of an institutional research protocol approved by the Ethics Committee of the School of Medicine, Universidad Autónoma de Nuevo León.

PO-08 - FROM THE ULTRASOUND PROBE TO THE CLASSROOM: QUANTITATIVE ANALYSIS OF EDUCATIONAL IMPACT IN HUMAN ANATOMY

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Ultrasound-guided anatomical practice represents a valuable educational strategy for promoting early integration between theoretical knowledge and clinical application in health sciences curricula. This study aimed to evaluate the academic impact of five progressive, hands-on ultrasound sessions, each focused on a different anatomical region: general, vascular, neck, and thoracic. A pre-post design was employed, using identical questionnaires administered immediately before and after each session to assess students' knowledge acquisition.

The analysis included anonymized scores from a total of four sessions, as one was excluded due to a technical issue in data collection. Results demonstrated a consistent and statistically significant improvement in students post-session scores across all included practices. The average knowledge gain ranged from +12,25 to +14 points, highlighting a robust learning effect. These outcomes suggest that the incorporation of ultrasound into anatomy teaching not only reinforces anatomical comprehension but also enhances student engagement and motivation.

Additionally, the region-specific structure of the sessions allowed for an indirect comparison of the educational yield across different anatomical areas, revealing subtle differences in the magnitude of improvement. This observation may help refine and prioritize content in future curriculum planning.

In conclusion, ultrasound-based anatomy practice has a measurable and positive impact on student learning. This model supports active learning, encourages early clinical reasoning, and provides a scalable, adaptable framework for improving anatomy education through practical, image-guided approaches.

PO-09 - IMPLEMENTATION OF UNIVERSAL DESIGN FOR LEARNING IN HUMAN ANATOMY TEACHING

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The teaching of anatomy today is not based on a specific pedagogical model, but rather on a long-standing tradition. To address the challenges of modern medical education and improve student engagement, we designed and implemented a teaching innovation project based on Universal Design for Learning (UDL) principles in the practical sessions of the subject of Human Anatomy III (Splanchcnology) in the second year of medical degree at the University of the Basque Country. The aim was to enrich anatomy teaching by incorporating diverse resources and emphasizing clinical imaging to facilitate the understanding of anatomical structures through multiple representations.

Practical sessions were restructured into five rotating learning stations: cadaver dissection, isolated anatomical specimens, anatomical models and Human Planar Reconstructions, digital simulators, and clinical imaging workstations. A final 15-minute free-choice period allowed students to revisit any station for self-directed learning. A total of 155 students participated, and learning outcomes and satisfaction were assessed through exam results and Likert-scale surveys.

Results indicate enhanced student engagement and satisfaction. The variety of resources improved their anatomical understanding. The feedback emphasized the engaging nature, dynamic structure, and multimodal learning environment. Students particularly valued the integration of clinical images in deepening their understanding of anatomy from different perspectives and connecting, alongside cadaveric material, more closely with clinical reality. This pedagogical transformation represents a more inclusive and student-centered anatomy education model, promoting autonomy, motivation, and deeper learning.

This innovation project was supported by Educational Guidance Service (SAE-HELAZ) of the University of the Basque Country (UPV/EHU) (HBP-PIE-i3lab 2024/2025, modality EREIN code: i324-27 and Gaituz program).

PO-10 - INTERACTIVE ASSESSMENT IN ANATOMY EDUCATION FOR MEDICAL STUDENTS: 3D QUIZZES USING THE ANATOMAGE TABLE

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Anatomy teaching is progressively adopting active learning methodologies centered around technology. In this context, the Anatomage Table emerges as an innovative tool that enables interactive visualization of 3D anatomical models while integrating gamified strategies for educational purposes. This study analyzes the design, implementation, and evaluation of quiz-based games as a gamified activity during practical sessions in Human Anatomy within the Medicine degree program. Using the platform's quiz creation feature, questions were developed in alignment with the anatomical structures covered in each session. Students, working in teams of 2 to 4, were given three minutes to virtually dissect, identify, and mark eight anatomical structures on the 3D model, receiving immediate feedback. At the end of the activity, correct answers, errors, omissions, and response times were displayed. To assess the experience, a Likert-scale perception questionnaire was administered. Results showed that 72.1% of students found the interface intuitive, and 86% considered the time allocated appropriate. Additionally, 73.2% indicated that four team members was the optimal group size. From a learning perspective, 81.4% reported that the quizzes significantly enhanced their understanding and retention of anatomical knowledge, while 88.4% strongly recommended using the Anatomage Table for anatomy instruction. Overall, 83.7% rated the activity as "very good." In conclusion, the use of interactive quiz-based games with the Anatomage Table proves to be an effective strategy for integrating theoretical and practical content, fostering student engagement, and promoting meaningful learning in the university classroom.

This work was supported by the University of Jaén, project PID2025-66.

PO-11 - LONGITUDINAL EVALUATION OF ANATOMY LEARNING IN THE PODIATRY DEGREE

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Higher education promotes deep learning, which is challenging to achieve in anatomy courses, where learning is traditionally often rote due to the complexity of anatomical terminology, difficulties with spatial orientation, and the substantial content load. The main objective was to understand the different learning approaches (superficial or deep) among students enrolled in anatomy courses in the Podiatry degree: Human Anatomy (HA, 1C, first year) and Human Anatomy of the Lower Limb (IMA, 2C, first year). To this end, students were administered the R-SPQ-2 F Questionnaire and ad hoc questionnaires to collect sociodemographic, academic, satisfaction, and course organization variables.

Regarding learning, in HA (26 participants), 53.85% of students have a deep learning approach, although there are no significant differences based on gender.

Regarding the IMA course (58 participants), 76.59% of students have a deep learning approach. There are no gender differences. Regarding their assessment of the course, students believe that the practical content helps reinforce the theoretical content and enhances learning. Students are satisfied with both the course and the useful content.

Both courses have similar students, and an increase in deep learning can be observed, from 53.85% to 76.59%. This increase may be due to the passage of time as students have adapted to the university, although it should be noted that the IMA course includes more experiential practices than the HA course, such as dissection of human cadavers, palpatory sessions, and ultrasound practice, favoring deep learning.

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PO-12 - MICRO-CT IMAGES AND 3D MODELS ENHANCE STUDENT'S AWARENESS OF THE ROOT CANAL ANATOMY COMPLEXITY

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Understanding the internal anatomy of root canals is a fundamental challenge in Oral Health Education and clinical practice. 2D teaching tools such as photographic atlases and designs often fall short in conveying the spatial complexity of root canal systems. High-resolution 3D models obtained from Micro-CT of extracted teeth allow are proposed here to enhance anatomical visualization and clinical thinking.

The aim of this research was to evaluate the impact of 3D models and Micro-CT images of maxillary premolars on the student's perception of root canal anatomy complexity and the improvement of their awareness of its importance for clinical practice by applying the See/Think/Wonder Thinking Routine (Project Zero, Harvard Graduate School of Education, available at : https://pz.harvard.edu/resources/see-think-wonder).

Eighteen maxillary premolars from the Biobank Collection C.0008034 (Instituto de Salud Carlos III), were scanned using a Micro-CT system (SkyScan 1273, Bruker). The root canal systems of each tooth were digitally segmented (CTAn Software), and both photographs and three-dimensional models were generated. These visualizations were compiled into an atlas for educational use of the students. For this preliminary analysis, fifteen undergraduate dental students were first shown 5 periapical radiographs of maxillary premolars and then asked to engage in the See/Think/Wonder thinking routine ("What do you see?", "What do you think about that?", "What does it make you wonder?"). Participants were also asked to draw a premolar with its internal anatomy. Subsequently, access to the atlas of Micro CT images and 3D models of the premolar tooth root canals were proposed to the students, who were again asked to respond to the thinking routine and make the drawings. Data were collected, Complexity of the drawings was categorized and analyzed using RStudio. Thinking routine responses were analyzed with Atlas-ti.

Students were able to produce more complex drawings of the root canals after having access to the Micro-CT Atlas and the 3D Models of the maxillary premolars. Accessory canals were drawn by 6% of students before and by 60% after viewing the models. A fortiori, no student depicted an apical delta before seeing the 3D models, but 47% did afterward. Additionally, students' responses to the thinking routine became notably more complex, with more detailed descriptions of the internal anatomy of premolars and a greater number of clinically relevant questions proposed after observing the 3D models.

This pilot study made us conclude that high resolution images and 3D-models enhance the student's awareness of the complexity of root canal anatomy as well as their clinical thinking routine. New analysis will be made in different Institutions and student's groups and courses to ascertain the improvements in the student's understanding of the inner dental anatomy and its influence in their clinical thinking.

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The authors state that every effort was made to follow all local and international ethical guidelines and laws that pertain to the use of human cadaveric donors in anatomical research.

PO-13 - PHYSIOLOGICAL IMPACT OF THE FIRST ANATOMICAL DISSECTION EXPERIENCE

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Anatomical dissection of cadavers is crucial for medical students' learning, promoting skill integration and self-reflection on death. Despite its necessity, it can be emotionally intense and stressful. Previous studies, mainly through psychological questionnaires, have shown that dissection can cause stress and anxiety.

This study aims to determine the psychological and physiological effects of cadaver presence on medical students during their first dissection. The study involved 101 students (34 men and 83 women) entering a dissection room for the first time, conducted in two phases (T0 and T1):

- T0: Standard practice using resin or plastic models, without cadavers.
- T1: Dissection practice, corresponding to the first visit to the dissection room, just before exposure to the human cadaver.

Before entering the dissection room, physiological variables like blood pressure and heart rate were measured, and a saliva sample was taken to determine cortisol levels. Results showed a significant increase in systolic pressure (SP) during the dissection, though diastolic pressure remained unchanged. Heart rate (HR) was significantly higher on the dissection day. Cortisol levels also increased significantly (5.1068 ng/ml) compared to the standard session without a cadaver (4.1633 ng/ml).

These results demonstrate the physiological impact of cadaver presence, highlighting it as a potent stressor. Exposure to the cadaver activates the sympathetic nervous system, increasing SP and HR, and the hypothalamic-pituitary-adrenal axis, raising cortisol levels.

PO-14 - SIMUABDOMEN AND SIMUPELVIS: HUMAN ANATOMY APPLICATIONS TRASLATED INTO BASQUE AS A DIGITAL TEACHING TOOL FOR 2ND YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF THE BASQUE COUNTRY (UPV/EHU)

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Medical education is undergoing constant digital transformation. Simulators have become an interactive teaching and useful learning digital tools, particularly in the field of human anatomy. SimuAbdomen (SA) and SimuPelvis (SP) are applications oriented to the study of the abdominopelvic cavity with a diverse and dynamic didactic content: clinical imaging, drawings, dissections... designed to promote autonomous and in-depth learning of splanchnology. Following previous successful implementation of SimuTórax, an application oriented to the study of thoracic cavity—, we aimed to analyse the possible advantages that SA and SP, as part of an innovative teaching project, can bring to the learning process in 2nd year medical students at the UPV/EHU. For that goal, we implemented these applications in the practical sessions within Human Anatomy III subject. After the ordinary exam, a questionnaire was carried out in which students evaluated SA and SP platforms and its content. The results coincide in the easy access and logical order of the sequences content. SA and SP helped to understand better, more in detail the theoretical and practical concepts taught in the subject. Students highlighted the usefulness of the simulators in connecting anatomy with clinical relevance, and many recommended extending their use to other courses such as Human Anatomy II or IV in order to facilitate their learning process. Finally, based on the content offered by each application students prefer SA to SP.

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PO-15 - ASSESSMENT OF THE EFFECTIVENESS OF ANATOMICAL IMAGES AS A SUPPLEMENT TO VISCERAL ANATOMY PRACTICE

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Anatomical knowledge is essential in health sciences education. While traditional teaching methods remain fundamental, innovative approaches such as multimedia resources and interactive tools are increasingly being used. Although students generally view these alternatives favourably, their true effectiveness is not fully established. The present study was performed in the module of visceral anatomy taught to first-year medical students at the University of Valencia. It aimed to assess the impact of high-quality cadaveric images on knowledge acquisition and practical exam performance. Dissection-derived images of head, neck, and thoracic regions were provided for independent study and self-assessment, supporting exam preparation. The research employed a cross-sectional design with two experimental groups (n=180) granted access to the images, and two control groups (n=172) without. Additionally, a longitudinal component evaluated knowledge gains through pre- and post- online tests within the experimental groups. Student satisfaction with the learning materials was also surveyed. Results demonstrated a significant increase in post-test scores, indicating improved understanding after exposure to the images. Moreover, students with access to these digital resources achieved higher scores in practical exams compared to controls. These preliminary findings suggest that integrating high-quality visual materials into anatomy education fosters autonomous learning, enhances knowledge retention, and positively influences assessment outcomes. Overall, digital resources that support independent study appear to be a valuable additional tool to traditional teaching methods in health sciences.

PO-16 - USE OF SOCIAL MEDIA AS A TRAINING TOOL IN HEALTH SCIENCES: ENHANCING GOOD COMMUNICATION AND COMBATING MISINFORMATION

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In the course “Neurobiology of Functional Systems” of the Master’s Degree in Cognitive Neuroscience and Neuropsychology, a group activity was developed focused on scientific dissemination through social media. The main objective of the activity was to address the growing concern about misinformation and fake news, especially in the field of health, by promoting the dissemination of reliable information.

Students, in small groups (4–6 members), were required to create profiles on Instagram or X and produce at least five posts related to the course content, with special emphasis on aspects related to neuroanatomy, neurophysiology, or psychobiology. The posts had to include a minimum of 10 tweets for X or 10 images in an Instagram carousel, and to enhance interaction, elements such as links, polls, videos, images, animated GIFs, etc., were encouraged. All posts had to include the hashtag **#MásterNeuroFCSURJC**.

The published material had to be compiled in a report and submitted through the Virtual Classroom. The activity accounted for 30% of the final course grade, and the evaluation criteria were: expression and content (70%), creativity (20%), and impact (10%).

Eight work groups were created, and all chose Instagram as their social media platform. The activity grades ranged from 7.6 to 9.5, and satisfaction surveys showed good acceptance by the students. These results indicate that the use of social media can be an effective educational activity in the context of postgraduate training.

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PO-17 - BODY DONATION IN HEALTH SCIENCE STUDENTS

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Body donation is fundamental and essential for teaching and research, not only in health sciences, but also in industry, animal training, and facilitating the emotional impact on workers with human bodies. The use of bodies for teaching in biomedical fields has grown exponentially, with the addition of graduates in medical and surgical specialties (physicians, nurses, physical therapists, podiatrists, and stomatologists).

An opinion survey was conducted among 324 male and female medical and nursing students at the University of Valladolid, assessing and comparing their attitudes toward body donation, motivations for donation, reasons against it, preferences for use, and the final destination of their remains.

Accurate and detailed information is something donors demand. The most frequently asked questions are: Can I donate? Where should I donate? Will it cost anything? What will happen to my body afterward? The motivations for donation differ between young university students studying health sciences and the general population. Young people are equally inclined to donate when the purpose is teaching and research in biomedical sciences. At the same time, the general population would also donate their body more frequently for any other purpose. Raising awareness among future doctors and nurses is very important, as they will have the closest contact with people considering body donation, and their awareness can be crucial to increasing donations.

PO-18 - LEARNING BY COMPETING: ACADEMIC OLYMPICS AS A DRIVING FORCE FOR INNOVATION IN UNIVERSITY TEACHING OF ANATOMY

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This project aims to design and implement a selection and training programme for Health Sciences students to represent the University of Salamanca in the Ibero-American Anatomy Olympics. It promotes academic excellence and student motivation through a competitive and collaborative learning environment.

The project has been developed during this academic year and consists of three phases: Preliminary phase (Sep24-Oct24), training and selection phase (Nov24-May25) and evaluation and dissemination phase (June25).

Short-answer questions and image interpretation were used. The content and tests are integrated with subject area syllabuses, maximising applicability and reinforcement of learning. In addition, specific supplementary resources, study materials and question banks have been developed.

Participating students have improved their anatomical knowledge and strengthened their critical thinking. To evaluate this progress, pre- and post-competition questionnaires and satisfaction surveys were used. The active involvement of the student body and the collaboration with student associations ensure a realistic adaptation to their needs.

Furthermore, participation in the Ibero-American Olympics will contribute to the international projection of the University of Salamanca, consolidating its commitment to educational innovation and quality training in Health Sciences

This project represents an innovative strategy to dynamise the teaching of Anatomy, promoting academic excellence and student motivation. We would like the Anatomy Olympics to be consolidated as a national event, involving more Spanish universities. This would foster inter-university collaboration, share good teaching practices and raise the level of Anatomy training in Health Sciences at a national level.

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PO-19 - EDUCATIONAL INNOVATION IN INVASIVE PHYSIOTHERAPY: LEARNING ULTRASOUND-GUIDED TECHNIQUES THROUGH PRACTICAL CADAVERIC ANATOMY TRAINING

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Physiotherapy is a young profession that is progressively incorporating new therapeutic approaches, such as invasive physiotherapy techniques. This specialty involves the application of therapeutic procedures through the insertion of needles into the body, usually under ultrasound guidance.

The safe and effective application of these techniques requires in-depth knowledge of musculoskeletal anatomy and proficiency in ultrasound image interpretation. However, current undergraduate physiotherapy curricula offer limited training in these advanced skills. In response to this educational gap, a university microcredential was developed to integrate both anatomical and ultrasound competencies in a coordinated manner. The program was jointly delivered by the Department of Physiotherapy and the Departament of Human Anatomy of the University of Salamanca.

A total of 20 physiotherapists participated in a 40-hour training program held in the dissection rooms of the Faculty of Medicine. Different teaching methodologies were employed. The course began with anatomical study on embalmed cadavers to improve structural understanding and detailed three-dimensional visualization of anatomical elements. Subsequently, in vivo musculoskeletal ultrasound sessions were performed, with a strong emphasis on correlating anatomical structures with ultrasound images. Finally, ultrasound-guided invasive techniques were practiced on fresh cadaver specimens to optimize the learning curve and ensure both safety and clinical efficacy.

This integrative approach, combining anatomical study with cadaveric work, significantly improved the participants' anatomical comprehension and their acquisition of ultrasound-guided invasive physiotherapy skills. Most participants expressed, through a final evaluation survey, that this type of training is highly valuable and should be more widely implemented in undergraduate and postgraduate physiotherapy studies.

PO-20 - PHOTOGRAMMETRY AND INTERACTIVE WEB PLATFORMS FOR THE STUDY OF CLINICAL ANATOMY OF THE HAND

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This project aimed to develop an innovative digital tool for studying the clinical anatomy of the human hand, integrating 3D anatomical models obtained from cadaveric dissections into an interactive web platform. The tool was designed to support self-directed learning and to complement dissection-based practical teaching within Health Sciences programs, enhancing anatomical understanding through real, spatially accurate representations.

Cadaveric specimens were dissected by faculty and internal students, following ethically approved protocols based on voluntary body donation. High-resolution photographs were captured using mobile devices under standardized conditions. These images were processed using Reality Scan to generate photorealistic 3D models, later adapted for interactive visualization through Unreal Engine. The web platform was developed using HTML5 and JavaScript in Visual Studio Code, and enriched with clinical content including diagnostic imaging (X-ray, ultrasound, MRI), anatomical diagrams, glossaries, and examples of hand-related pathology. The final product offers a sustainable, accessible alternative to synthetic 3D applications, preserving the anatomical variability observed in real dissections and linking descriptive anatomy with clinical practice.

PO-21 - AN APPROACH TO THE ANATOMICAL LEXICON FROM THE ETYMOLOGICAL ORIGIN:

LEARNING BY UNDERSTANDING

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Learning anatomical lexicon is one of the most challenging tasks faced by Health Sciences students, due to its vast amount of vocabulary and its necessary precision. This terminology is mostly of Greek or Latin origin, whose knowledge is essential to consolidate reasoned learning. In this study, we present an innovative teaching project on the study of Anatomy, with a systemic approach, through Etymology, which aimed to teach Human Anatomy and develop deductive vocabulary skills. These one-hour sessions were held during the second semester of the 2024-2025 academic course, outside of official timetable. An initial survey was distributed among students to measure baseline interest in the project. In addition, before and after each session, a document was distributed asking the meaning of five words, composed of a root referring to an anatomical structure and another lexeme referring to clinical practice (e.g., odontalgia). The words in the pre- and post-session tests were different, they did not appear during the session, but were composed of roots discussed during these in-person lessons. Attendees also completed a final satisfaction survey. Preliminary results showed a significant increase in the ability to deduce the meaning of anatomical and clinical terms (+1.2 points over 5, $p<0.001$, $d=1.00$). Post-session satisfaction surveys showed that the sessions met the expectations of 100% of attendees, or even exceeded them (>15%). The majority would assist to the next session and would recommend it, with scores of >9/10.

This innovative teaching project entitled "Greco-Latin roots with a clinical approach: study of Human Anatomy through the Etymology of words" was financially supported by the University of Alcalá (UAHEV/1557).

Basic Research

PO-22 - 3D MODELS OF THE TEMPOROMANDIBULAR JOINT IN ARCHAEOLOGICAL REMAINS

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The temporomandibular joint (TMJ) plays a crucial role in craniofacial biomechanics by allowing mandibular movement and transmitting masticatory forces to the skull. Its morphology is influenced by dietary, functional, and cultural factors. This study compares TMJ morphology in three different populations—medieval, 19th-20th centuries, and modern—through the application of geometric morphometrics to 3D models. A total of 86 crania and mandibles were 3D scanned, and eight type II landmarks were identified on condyles and glenoid fossae. The coordinates were processed using Procrustes superimposition, Principal Component Analysis (PCA), multivariate regression, and Discriminant Function Analysis (DFA) with MorphoJ software. In addition to conducting a study of oral pathologies in the contemporary population (19th-20th centuries).

The results show a clear morphological transition: medieval individuals exhibit deeper glenoid fossae and more projecting condyles, indicating higher masticatory load; nineteenth–twentieth century individuals display intermediate features; while the modern population shows narrower and shallower fossae with more homogeneous condyles, consistent with reduced functional demand. Functional sexual dimorphism was also observed: modern males present wider and more robust condyles compared to the more gracile forms found in females. This study presents a novel approach to TMJ morphology based solely on skeletal structures, contributing new insights to comparative anatomy and potential clinical applications.

PO-23 - ANATOMICAL FOUNDATIONS OF VESICO-VAGINAL FISTULA REPAIR

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Urogenital fistulas are abnormal connections between the urinary and female genital tracts, most commonly presenting as continuous urinary incontinence. This condition significantly impairs patients' quality of life on personal, social, and occupational levels. In developed countries, the majority of cases are iatrogenic, usually following gynecological or pelvic surgery—most notably hysterectomy. The World Health Organization classifies fistulas into simple and complex types, based on size, recurrence, and involvement of adjacent tissues or structures. Diagnosis requires a high index of suspicion, supported by imaging studies, urodynamics, and endoscopy. While conservative management may be appropriate in selected cases, surgical intervention is often required. Minimally invasive robotic surgery has proven to be a safe and effective therapeutic option with reduced perioperative morbidity.

We report the case of a 49-year-old woman with a history of total hysterectomy complicated by intraoperative bleeding, who subsequently developed continuous urinary incontinence, recurrent urinary tract infections, and pelvic pain. Imaging and endoscopic evaluations revealed a left ureterovaginal fistula. Surgical treatment involved robotic-assisted left ureteral reimplantation, including Psoas Hitch technique and extravesical ureteroneocystostomy (Lich-Gregoire). Postoperative evolution was favorable, with no complications. This case highlights the importance of early recognition of urogenital fistulas, proper differential diagnosis in the context of persistent urinary symptoms after pelvic surgery, and the advantages of robotic surgery as an effective and safe approach in managing these complex anatomical lesions.

PO-24 - CHARACTERIZATION AND BIOLOGICAL SIGNIFICATION OF TISSUE-RESIDENT MACROPHAGES IN THE AREAS OF PROGRAMMED INTERDIGITAL CELL DEATH OF THE EMBRYONIC CHICK

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The development of embryonic organs is associated with massive apoptotic cell death that sculpt the shape and/or regulate their structural and functional organization. Tissue resident macrophages, of yolk sac origin, are responsible for the clearance of the resulting cell remnants, but other potential biological functions of these macrophages are largely unknown. In adult organisms, in addition to immune host defense, macrophages play a pivotal role in wound repair, postnatal tissue maturation, several regenerative processes, and cancer. The role of macrophages in embryonic systems is less characterized due to the redundancy of cells capable of replacing the phagocytic function performed by professional phagocytes.

The aim of this study was to characterize the traffic, phenotype, and functional implications of macrophages in embryonic remodeling processes using the interdigits of embryonic chicken legs as a model.

Our findings are consistent with the proposed model of "layered macrophage system" that support the existence of "Tissue-Resident" and "Passenger/Transitory" macrophage populations of different origin, and molecular profile. CSF1R/SA-β-Gal/, and Neutral Red vital staining positive macrophages were detected beneath the limb ectoderm before apoptosis initiation. An additional population of "transitory" macrophages expressing the hematopoietic transcription factor PU.1 become recruited coincidently with the onset of interdigital cell death. At functional level, interdigital macrophages express M1/pro-inflammatory and M2/anti-inflammatory gene markers and produce a senescence-like secretome that includes an intense expression of cytoplasmic P21. Functional gene silencing studies suggest that this cell cycle inhibitor rather than arrest proliferation, contributes to modulate M1/M2 macrophage phenotypes.

PO-25 - EMERGING REGULATORY MOLECULES IN TRIGEMINAL MOTOR NEURON DEVELOPMENT: NOVEL TRANSCRIPTION FACTORS AND GUIDANCE CUES IDENTIFIED

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The trigeminal motor nucleus (Vm) consists of branchiomotor neurons that control jaw movement, a vital function in vertebrates. These neurons originate from the paramedial basal domain of the ventricular zone and migrate tangentially to their final position in the alar plate. Given the functional importance of the Vm, its specification and migration during embryonic development are tightly regulated.

In this study, we analyzed the development of the Vm in chick embryos to identify novel molecules involved in its formation. Early Vm development was characterized using specific molecular markers, and expression patterns were compared with gene expression data from mouse brains obtained from the ISH database (https://developingmouse.brain-map.org). Known transcription factors and axon guidance molecules were identified, along with their potential regulatory interactions. Additionally, neuronal migration of the Vm was examined in knockout (KO) mouse embryos lacking a classical axon guidance molecule.

Our results show that neuronal migration in the chick Vm begins before embryonic day 3 and concludes by day 9, mirroring the developmental timeline observed in mice. Several previously uncharacterized transcription factors have been identified and are expressed in the Vm, however, their role in the development of this nucleus remains unknown. These findings expand our understanding of the molecular regulation of Vm development and highlight novel candidate molecules for future functional studies.

PO-26 - GLABROUS SKIN EPIDERMIS AS A SENSORY STRUCTURE: NOVEL ROLE OF KERATINOCYTE PIEZO1 IN DIABETIC PAINFUL CONDITIONS

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Recent evidence highlights a sensory role for epidermal keratinocytes in touch perception; however, their contribution to pain in diabetes remains unclear. This study investigates the presence of the mechanosensitive ion channel Piezo1 in human epidermal keratinocytes and its potential role in mechanical hypersensitivity associated with painful diabetic conditions.

Skin biopsies from healthy individuals and patients with painful diabetic neuropathy were analyzed by immunohistochemistry, confirming Piezo1 expression in epidermal keratinocytes. In patients with neuropathy, keratinocytes appeared to express slightly higher levels of Piezo1 compared to healthy controls. To explore its functional role, a murine model of diabetes was established via intraperitoneal injection of streptozotocin (65 mg/kg), with diabetic status confirmed by blood glucose measurements.

Diabetic mice received subcutaneous injections of Yoda-1, a Piezo1 agonist (1 mM in Dulbecco's phosphate-buffered saline), into the right hind paw, while the left paw served as a diabetic control treated with vehicle. Injections were administered one hour before behavioral testing. Mechanical allodynia was assessed using von Frey filaments, and skin samples were analyzed for Piezo1 expression. Consistent with human data, diabetic mice demonstrated a mild increase in Piezo1 expression in epidermal keratinocytes compared to non-diabetic controls.

Activation of Piezo1 by Yoda-1 significantly reduced mechanical hypersensitivity, supporting a modulatory role for epidermal Piezo1 in diabetic pain states. These findings suggest that keratinocytes, through Piezo1, contribute to mechanical pain in diabetes and highlight its potential as a therapeutic target for painful diabetic neuropathy.

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PO-27 - GOLGI COMPLEX FRAGMENTATION AND EXOSOME BIOGENESIS IN NIGRAL AND ENTERIC NEURONS: INSIGHTS INTO EARLY EVENTS AND PROPAGATION PATHWAYS IN PARKINSON'S DISEASE

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Parkinson's disease (PD) is the second most frequent neurodegenerative disorder and it is not restricted to the central nervous system but also significantly impacts the enteric nervous system. Lewy bodies, large aggregates primarily composed by α-synuclein, questionably considered pathological markers of PD, have been observed in enteric nervous plexuses. This discovery has arisen theories suggesting the origin of the pathology in the enteric nervous system with prion like propagation to the brain via the vagus nerve. However, vagal innervation is anatomically limited to the transverse colon, while the descending colon and rectum receive parasympathetic input from the pelvic splanchnic nerves.

The Golgi complex of nigral neurons appears fragmented in PD, a common feature in most neurodegenerative diseases. Our previous studies in a cellular model, demonstrated that Golgi fragmentation is an early event in PD, previous to α-synuclein aggregation.

In this study, using a hemiparkinsonian rat model induced by 6-hydroxydopamine microinjection, we observed fragmented Golgi complexes in dopaminergic neurons of the substantia nigra pars compacta and nervous plexuses of the proximal and distal colon. The similarities of the comparative analysis in both colonic regions suggest the existence of alternative propagation routes beyond the vagus nerve. Since exosomes have been proposed as transmission vectors of neurodegenerative pathologies, we also examined exosome biogenesis in these neurons. Notably, Golgi complex fragmentation could favor increased exosome release to eliminate intracellular misfolded proteins. Our results support that Golgi complex structure could be useful as early sentinel of the disease, and suggest an enhanced exosome production as a possible mechanism of pathological transmission.

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PO-28 - HEPATOCYTE GROWTH FACTOR (HGF) CONTRIBUTES TO THE DEVELOPMENT OF NITROSO-REDOX IMBALANCE IN THE HUMAN PLACENTA

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Hepatocyte growth factor (HGF), an adipokine linked to metabolic disorders, has been proposed as an “energy modulator” in the placenta, reducing fatty acid oxidation and promoting triglyceride accumulation. This lipotoxic context may contribute to nitroso-redox imbalance and placental dysfunction yet to be confirmed. In this study, placental explants from term cesarean deliveries (n=5) were cultured ex vivo with increasing HGF concentrations. Oxidative and nitrosative stress markers (protein carbonyls, NADPH oxidase activity, nitrosothiols) and antioxidant responses (SOD, catalase, total antioxidant capacity) were measured. HGF exposure led to increased oxidative/nitrosative damage and decreased antioxidant activity. These findings suggest that elevated HGF levels may induce placental nitroso-redox dysregulation which could be implicated in the early stages of placental dysfunction and altered fetal metabolic programming.

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PO-29 - IDENTIFICATION OF AN ACCESSORY PECTORALIS MINOR MUSCLE IN A COMMON CHIMPANZEE: EVOLUTIONARY IMPLICATIONS

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During the routine dissection of the left upper limb of an adult common chimpanzee (Pan troglodytes), we observed the presence of an accessory pectoralis minor muscle, located between the costocoracoid ligament and the pectoralis minor muscle. This accessory muscle originates from the first rib and the fascia of the first intercostal muscle and inserts into the coracoid process of the scapula. The insertion of the pectoralis minor into the coracoid process is a characteristic anatomical condition of humans and other hominoid primates such as gorillas and orangutans, but it is extraordinarily rare in chimpanzees and non-hominoid primates. Classical descriptions indicate that in chimpanzees, the pectoralis minor muscle inserts into the proximal epiphysis of the humerus, most frequently at the greater tubercle, or surrounding structures such as the glenohumeral joint capsule. However, our record of 13 dissected chimpanzees indicates that its most common insertion is at the tendon of the supraspinatus muscle. The fact that common chimpanzees, along with bonobos (Pan paniscus), are the primates most closely related to Homo sapiens from a phylogenetic standpoint suggests that these findings are of great interest for interpreting the presence of anatomical variations of the pectoralis minor muscle in humans. In some cases, these variations may have significant clinical implications, and they include the insertion of the pectoralis minor at the glenohumeral joint capsule, the greater tubercle of the humerus, or the

tendon of the supraspinatus muscle.

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PO-30 - IMPACT OF LACTATION DURATION ON CALPAINS AND miRNAs DURING MAMMARY INVOLUTION AND ITS IMPLICATIONS FOR BREAST CANCER RISK

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In most mammals, weaning is a physiological process that occurs gradually as the litter ceases suckling. This process of mammary gland involution takes place at the end of lactation and involves, epithelial cell death, tissue remodelling and adipocyte differentiation until the tissue returns to a pre-pregnant state. However, abrupt weaning at the peak of lactation induces some of the tissue remodelling programs that are activated during wound healing. Indeed, it has been shown that this reduced lactation model may create a tumor-promoting environment in the mammary gland activating key regulatory nodes such as calpains. In this research, we examined how lactation duration affects calpains and microRNAs during mammary involution using two murine models: short lactation via forced weaning and prolonged lactation through spontaneous weaning. Morphological and molecular analyses revealed that prolonged lactation results in milder inflammatory responses, increased tissue remodelling, and collagen deposition during involution. Notably, calpain-2 expression and activity are more sensitive to the inflammatory environment and lactation model than calpain-1. Even after complete regression at 28 days postpartum, lower calpain-2 levels and higher expression of tumor suppressor microRNAs (miR-10b and miR-143/145) were observed in the prolonged lactation model compared to the short lactation model. These findings suggest that the duration of lactation influences mammary gland involution, with prolonged spontaneous weaning being more beneficial. Conversely, short lactation via forced weaning may leave persistent alterations in regulatory nodes, potentially increasing postpartum breast cancer risk. The long-term effects of these lactation-related changes requires further investigation.

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PO-31 - INTERSPECIFIC LOCOMOTOR DIFFERENCES AMONG HOMINOID PRIMATES: 3D GEOMETRIC MORPHOMETRIC ANALYSIS OF LIGAMENT INSERTION SITES IN THE DISTAL RADIUS

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Locomotion in hominoid primates is shaped by specific anatomical adaptations, particularly in the wrist, where the insertion areas of the radiocarpal ligaments reflect biomechanical demands related to the environment. This study presents a comparative analysis of the morphology of the insertion areas of the radioscaphocapitate, long radiolunate, and short radiolunate ligaments on the distal radius of six hominoid primate species (*Gorilla gorilla, Gorilla beringei, Pan troglodytes troglodytes, Pan troglodytes schweinfurthii, Pan paniscus, Pongo pygmaeus, and Pongo abelii*), based on a sample of 121 specimens and using 3D geometric morphometric analysis.

The results indicate that more terrestrial species, such as gorillas (genus *Gorilla*), are characterized by a relatively smaller size of the wrist ligament insertion areas and a radiopalmar orientation of the short radiolunate ligament insertion. In contrast, more arboreal species, such as chimpanzees and orangutans (genera *Pan* and *Pongo*), exhibit relatively larger ligamentous insertion areas and a palmar orientation of the short radiolunate ligament insertion. Significant differences were also identified between western lowland gorillas (*Gorilla gorilla*) and mountain gorillas (*Gorilla beringei*), between common chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*), between Bornean orangutans (*Pongo pygmaeus*) and Sumatran orangutans (*Pongo abelii*), and between the two common chimpanzee subspecies analyzed (*Pan troglodytes troglodytes* and *Pan troglodytes schweinfurthii*). Some of these differences may be related to the variation in locomotor behaviors previously described for these species. These findings support the utility of ligamentous insertion analysis as an indicator of locomotor adaptation and highlight the value of geometric morphometrics in comparative studies of functional anatomy and evolution.

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PO-32 - LGR5 AS A THERAPEUTIC TARGET FOR THE TREATMENT OF COLON CANCER: A NANOMEDICINE APPROACH

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The use of specific biomarkers for active cancer targeting has been on the rise in recent years. Leucine-rich repeat-containing G-protein coupled receptor 5 (LGR5) is presented in stem cells of colon, but also in colorectal cancer (CCR) cells, specifically with cancer stem cell (CSC) phenotype, related to resistant to radiotherapy and chemotherapy, and cancer spreading. This study proposes the use of pegylated magnetoliposomes loaded with biomimetic magnetic nanoparticles of Fe3O4 and oxaliplatin (OXA) or 5-fluorouracil (5FU), functionalized with antibodies anti-LGR5 for the selective targeting of malignant CRC cells for chemotherapy and hyperthermia therapy. Nanoformulations were synthetized and characterized in terms of physico-chemical and magnetic properties. Human and murine CRCs cells were used to test in vitro antitumor activity and internalization studies by flow cytometry, fluorescence microscopy and Prussian Blue staining. Iron-related toxicity was tested in C57BL/6 (immunocompetent) mice. Functionalized nanoformulations showed higher cellular uptake and proliferation reduction in colon cancer cell lines compared to free drug (3.2-folds IC50 value). Additionally this results were minors in a murine cell line transduced for a lower expression of LGR5 biomarker (MC38-L(-)), demonstrating the specific cell uptake mediated by the anti-LGR5 antibody. Furthermore, the nanoformulations were great hyperthermia agents with a pronounced reduction in cell proliferation after the application of an alternating magnetic field and showed and excellent biocompatibility in vitro and in vivo (in mice) with no alteration of mice weight and histologic parameters.

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PO-33 - MACROSCOPIC AND MICROSTRUCTURAL ANATOMY OF THE OVINE MEDIAL MENISCUS ANTERIOR ROOT AND ITS RELATION TO ADJACENT STRUCTURES OF THE TIBIAL PLATEAU

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Meniscus root tears result in loads equivalent to a total meniscectomy and are a critical risk factor for osteoarthritis. Understanding the topographic anatomy of the medial meniscus anterior root (MAR) is essential when developing sheep models of root repair and meniscus replacement. We present a comprehensive analysis of the anatomy of the ovine MAR and its relation to adjacent structures as a basis for developing such preclinical models. Data was obtained from 24 fully skeletally developed merino sheep stifles. A variable anatomy of the MARA as in humans or common fibers with other ligaments were not observed. Micro-computed tomography showed that the cortical bone in the MARA was undulated and about three times larger than the adjacent cortical bone. Type-II collagen immunoreactivity and Safranin O staining revealed abundant fibrocartilage in the epicenter of the MAR in both the calcified and non-calcified zones. Intensity gradient images visualized a stronger immunoreactivity right above the tidemark. PCA revealed a significant distinction between the medial and lateral tibial plateau based on all measured structures. Significant correlations were identified between the length of the MAR and both the total width of the tibia plateau and the distance to the medial aspect of the tibial tuberosity. The ovine MARA is a classical enthesis. The differences between the medial and lateral compartments impede simply extrapolating MAR to lateral tears. Tibial tuberosity and medial tibial eminence are key landmarks to consider in translational surgery when aiming to avoid damage to surrounding structures of the MAR.

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PO-34 - MODULATING THE LIPOFIBROBLAST-TO-MYOFIBROBLAST TRANSDIFFERENTIATION: ROLE OF PERILIPIN-1 IN LUNG FIBROSIS

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Pulmonary fibrosis, marked by excessive extracellular matrix (ECM) deposition, arises from chronic airway damage driven by activated myofibroblasts, key players in tissue remodeling. While usually seen as derived from activated fibroblasts, recent evidence suggests lipofibroblasts—fibroblasts with lipid droplets—may serve as precursors. Perilipins (PLINs 1-5) are lipid droplet-associated proteins involved in lipid metabolism. Among them, Perilipin-1 (PLIN1) regulates lipofibroblast-to-myofibroblast differentiation, influencing fibrosis progression. We investigated PLIN1 using human primary fibroblasts from healthy donors and idiopathic pulmonary fibrosis (IPF) patients, and 3D lung organoids derived from bronchoalveolar lavage (BAL) samples. PLIN1-4 are expressed in fibroblasts from both groups, but PLIN1 and PLIN2 levels are significantly lower in fibrotic fibroblasts and further decrease with TGFβ exposure, a profibrotic stimulus. Notably, PLIN1 (but not PLIN2) translocates to the nucleus upon TGFβ treatment, suggesting a nuclear role in myofibroblast differentiation. Inhibiting PLIN1 increases myofibroblast-related gene expression and ECM components. Moreover, it affects the organisation of the ECM matrix, reinforcing its role as a negative regulator of this transition. While PLIN1 does not affect fibroblast proliferation, it influences migration and adhesion, emphasizing its regulatory function in fibrosis. We propose PLIN1 as a transcriptional regulator that represses lipofibroblast differentiation into myofibroblasts and modulates profibrotic gene expression. These findings highlight PLIN1 as a potential therapeutic target for controlling fibrosis and promoting lung regeneration. Further research on PLIN1 modulation could lead to new antifibrotic therapies.

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PO-35 - MOLECULAR CHARACTERIZATION OF THE LATERAL LEMNISCUS NUCLEUS DURING EMBRYONIC DEVELOPMENT IN CHICK AND MOUSE

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The lateral lemniscus (LL) complex is an auditory structure in the vertebrate hindbrain composed of three nuclei: dorsal (DLL), intermediate (ILL), and ventral (VLL). While dorsoventral tangential migration of the ILL has been described in mice, the developmental mechanisms underlying LL formation in birds remain unclear. In this study, we used mouse and chick embryonic models to characterize DLL development and to investigate the role of transcription factors (TFs) and axon guidance molecules in its migration and specification.

In chick embryos, we found that DLL neurons originate from the alar plate of rhombomere 1 (r1) around embryonic day 3 (HH20) and undergo dorsoventral migration to reach their final position in the superficial alar plate by day 12 (HH38). We identified six previously unreported TFs and eight axon guidance molecules with specific expression in the LL, several of which show spatial and temporal patterns suggestive of functional interaction during development. Moreover, we evaluated the potential role of two of these molecules in regulating DLL migration.

These findings offer new insights into the organization and development of the avian LL and suggest the presence of partially conserved genetic mechanisms across vertebrates. Further functional studies are needed to determine the precise roles of the identified TFs and guidance cues in the morphogenesis of this structure.

PO-36 - MORPHOLOGICAL ANALYSIS OF THE LATERAL LIGAMENT OF THE TEMPOROMANDIBULAR JOINT

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The temporomandibular joint (TMJ) is a complex anatomical structure that has been the subject of numerous scientific studies. However, controversy persists regarding various structures that comprise it, one of which is the lateral ligament (LL). The scientific literature describes that LL limits excessive mandibular movements and helps stabilize the joint.

Recent research has questioned its existence as an independent anatomical entity. It has been suggested that the LL could correspond to an extension of the muscle fasciae adjacent to the joint. Our objective was to analyze the presence and morphology of the LL of the TMJ through anatomical dissection in human cadaver specimens.

The study was performed using four human cadaver heads. A mesoscopic dissection of the parotid region was performed, proceeding from the skin surface to the articular tubercle of the zygomatic bone. The dissections were recorded using a reflex camera and a 100 mm macro lens. Fiji (ImageJ) software was used to measure and analyze the images.

The anatomical findings suggest that the structure described as LL could correspond to an extension of the muscle fasciae of the muscles adjacent to the TMJ. The evaluation of the position and orientation of the masseter muscle fibers suggests their potential involvement in TMJ stabilization.

The results obtained contribute to the knowledge of TMJ morphology and highlight the fundamental importance of direct morphological studies as an indispensable tool for resolving persistent anatomical controversies.

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The authors state that every effort was made to follow all local and international ethical guidelines and laws that pertain to the use of human cadaveric donors in anatomical research.

PO-37 - MORPHOLOGICAL STUDY OF THE BUCCAL FAT PAD AND ITS CLINICAL IMPLICATIONS

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The buccal fat pad is an anatomical structure of increasing clinical and surgical interest. This study, based on a sample of 89 human hemifaces obtained from the Body Donation Center and Dissection Rooms of the Complutense University of Madrid, revealed that its morphology is highly variable, with the pterygoid, buccal, and deep temporal extensions being the most prevalent. It was observed that women have a shorter distance between the facial artery and the buccal fat pad, increasing the risk of vascular injury during procedures such as bichectomy. In contrast, men showed greater volume and extension of the fat pad. Additionally, the infraorbital extension was significantly more prevalent in women, as were critical structures such as buccal nerve type II and parotid duct type B, both of which pass deeply through the fat pad, reinforcing the need for a gender-specific surgical approach. Furthermore, significant positive correlations were found between volume and both extension and width, indicating a consistent morphological relationship among these dimensions. Finally, age did not show a significant influence on any of the anatomical variables analyzed, supporting existing evidence that the morphology of the buccal fat pad is not affected by aging.

PO-38 - NEUROGENIC POTENTIAL OF SEMAGLUTIDE: MODULATION OF TANYCYTE PROLIFERATION AND ITS NEURONAL DIFFERENTIATION

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The hypothalamus is an anatomical location with an endocrine function that regulates energy balance, fluid homeostasis, sleep-wake cycles, stress responses, and growth, among other physiological processes. Recent evidence demonstrates the presence of neural stem cells, known as tanycytes, within the hypothalamus, which can generate mature neurons that integrate into pre-existing circuits to support hypothalamic function. Due to the relevance of the hypothalamus in various diseases, hypothalamic neurogenesis may represent an innovative therapeutic strategy.

In this experimental study, we employed in vitro methodologies to elucidate the effects of semaglutide, a glucagon-like peptide-1 receptor (GLP-1R) agonist, on regulation of cellular proliferation and differentiation processes. To investigate proliferation, we performed neurosphere assays. Proliferative effects were further confirmed by immunohistochemical analysis of proliferation markers as KI67 and the neural stem cell marker SOX2. Subsequently, we characterized the cellular phenotype using differentiation markers (GFAP, β3-tubulin, S100β, and NeuN). We observed that semaglutide significantly increased the neurosphere area after three days, supporting its proliferative effects. The proliferative effect was confirmed by a significant increase in the number of ki67^{+} cells, a substantial proportion of wich co-expressed Sox2, indicating their stem identity. After seven days of treatment, a significantly higher number of β3-tubulin$^+$ cells were observed, without affecting the number of GFAP$^+$ cells. Moreover, semaglutide treatment led to a significant increase in the number of NeuN$^+$ cells, accompanied a reduction in S100β$^+$ cells.

In conclusion, our results suggest that semaglutide promotes hypothalamic neurogenesis by enhancing tanycytes proliferation and favoring neuronal differentiation.

This research was financially supported by Fondo Europeo de Desarrollo Regional (FEDER) and Consejería de Universidad, Investigación e Innovación de la Junta de Andalucía.

PO-39 - NEUROINFLAMMATORY GLIAL SHIFTS IN PAIN/COGNITION-RELATED BRAIN REGIONS: FINDINGS IN A RESERPINE-INDUCED MYALGIA MODEL

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Fibromyalgia is a chronic pain syndrome characterized by widespread musculoskeletal pain and a wide range of comorbid symptomatology. Among the most disabling symptoms are cognitive impairments—commonly referred to as "fibro-fog"—which include deficits in attention, working memory, and executive function. These alterations have been associated with objective findings in neuropsychological tests and functional neuroimaging. In this study, we used a reserpine-induced myalgia (RIM) model in male Sprague-Dawley rats to investigate the anatomical and functional alterations in astrocytes and microglia in cognition- and pain-related brain areas such as medial prefrontal cortex (mPFC) and hippocampus (HPC). Markers analyzed included IBA1 and CD68 for microglia, and GFAP and C3 for astrocytes. Immunofluorescence was performed at 6 hours, 5 days, 15 days, and 28 days after model induction, alongside glacial acetic acid (AAG)-treated controls. Preliminary results revealed a triphasic microglial response in mPFC and CA1 of HPC, with initial activation (IBA1$^+$/CD68$^+$), followed by a silent or resolving phase, and finally a return to an active surveillance state. Similarly, astrocytic reactivity (GFAP) and complement activation (C3) progressed from early atrophy to reactive astrogliosis, with the emergence of the proinflammatory A1 phenotype (GFAP$^+$/C3$^+$) at later stages. These findings suggest a sustained neuroinflammatory environment involving microglia-astrocyte crosstalk, which could underlie long-term cognitive deficits. Our data highlight the relevance of glial cells in the pathophysiology of fibromyalgia-related cognitive dysfunction and open new avenues for therapeutic interventions targeting glial polarization and complement cascade modulation.

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PO-40 - NEW ANATOMICAL VARIANT OF THE OBTURATOR FORAMEN: A CASE REPORT

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The obturator foramen is an anatomical feature of the hip bone whose morphology varies between sexes. During a Forensic Anthropology course, an anatomical variant was detected in a hip bone from the Bone Archive of the Department of Human Anatomy at the Faculty of Medicine of the University of Murcia.

The dry bone presents a circular exostosis in the region where the obturator canal would be located.

Only one septate obturator foramen and one of the triple foramina variant have been described in the literature. One case of obturator osteophytosis has also been published.

The biomechanical consequences of this variant could impact the behavior of the obturator muscles, as well as the regional neurovascular bundle. Due to the rarity of this new variant, further study with new individuals is necessary.

PO-41 - MODELING CHOROID PLEXUS MATURATION: A COMPARATIVE STUDY OF HUMAN ORGANOIDS AND FETAL TISSUE

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Organoids represent a transformative platform for modeling human development and disease in vitro, offering three-dimensional, tractable systems that recapitulate key aspects of organ architecture and function. In 2022, the first commercially available choroid plexus organoid (ChPO) kit was introduced, enabling novel studies into cerebrospinal fluid (CSF) dynamics and the treatment of hydrocephalus. However, the developmental timeline and maturation characteristics of ChPOs remain poorly defined. This study aims to characterize the temporal progression of ChPO differentiation and compare these features with human fetal choroid plexus (ChP) development.

ChPOs were generated using StemCell Technologies' commercial ChPO kit, following the manufacturer's protocol. Organoids were harvested at days 22, 32, 42, 52, and 62 for immunofluorescence analysis. Comparative samples of human embryonic ChP were obtained from fetuses between 13 and 35 post-conceptional weeks (PCW). Key markers analyzed included transthyretin (TTR), aquaporin-1 (AQP1), claudin-1, forkhead box protein J1 (FOXJ1), paired box protein 6 (PAX6), T-box transcription factor 2 (TBX2), and glucose transporter 1 (GLUT1).

Early-stage ChPOs exhibited a pseudostratified epithelial architecture, characterized by the expression of bipolar AQP1 at the embryoid periphery. As cystic structures emerged, AQP1 became restricted to the basal membrane of cyst walls not in contact with the culture media. Conversely, AQP1 and GLUT1 expression diminished along the media-exposed surface. FOXJ1 expression emerged predominantly on the luminal surface of mature cysts. In human fetal ChP, initial bipolar AQP1 expression was observed, which transitioned over time to a polarized apical localization, consistent with its distribution in mature ChP. In contrast, GLUT1 was consistently localized to the basolateral membrane throughout development. Notably, FOXJ1 and other ependymal markers were limited to transitional zones between ependymal and choroid plexus epithelium.

Our findings suggest that ChPOs initially mimic early ChP features, including bipolar AQP1 expression, potentially reflecting early bidirectional CSF transport. Over time, the loss of AQP1 and GLUT1 from the media-facing surface, along with the upregulation of FOXJ1, indicates a maturation and a shift toward a simplified, ependymal-like epithelium. These developmental differences support the need for further functional and transcriptomic validation. Nevertheless, ChPOs hold promise as an emerging model to investigate ChP maturation.

PO-42 - PURINERGIC TRANSMISSION IN THE HUMAN CAROTID BODY: THE SUPPORTING CELLS ARE THE SOURCE OF ATP

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Extracellular ATP acts as an excitatory neurotransmitter between type I chemosensory glomus cells and afferent nerves in the carotid body (CB). The release of ATP occurs throughout pannexin-1 (Panx1) channels from type II supporting glomus cells, but the distribution of Panx1 in the human CB is unknown. This study aimed to characterize the cells expressing Panx1 in the human

CB.

Eight human carotid bifurcations (ages 38–68) from multiorgan donors were analyzed using immunohistochemistry and triple immunofluorescence/confocal microscopy with antibodies against Panx1, synaptophysin (to label type I cells), S100 (to identify type II cells), and neurofilaments (to label axons). Quantitative analysis assessed Panx1-positive areas in the CB.

Panx1 was mainly localized in type II glomus cells (≈ 61% of CB parenchyma), and nerve profiles while it was absent from type I cells. Immunoreactivity was also found in connective tissue septa and vascular walls.

These findings indirectly suggest that type II cells and some afferents and efferents are sources of extracellular ATP in the human CB. Thus, ATP released from type II glomus cells might act on type I glomus cells, nerves and type II cell themselves which express prurinergic receptors. The results lend support to the so-called tripartite synapse model, where Panx1-mediated ATP release from type II cells enhances the chemosensory signal.

PO-43 - PYROPTOSIS AS A NOVEL MECHANISM IN MAMMARY GLAND INVOLUTION AFTER WEANING

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At the end of lactation, the mammary gland undergoes a significant remodelling process termed involution, which involves the removal of secretory glandular epithelium and a return to a virgin-like state. This process is known to involve various forms of programmed cell death, such as apoptosis and necroptosis. However, the role of pyroptosis, an inflammatory form of cell death, has not yet been investigated in this context. To explore this, we used a forced weaning mouse model to determine whether the pyroptotic pathway is activated during mammary gland involution. We analyzed markers associated with pyroptosis, including NF-κB activation, pro-inflammatory cytokine expression, and the activation of key components like the NLRP3 inflammasome, caspase-1, and gasdermin D (GSDMD). First of all, there was a time-dependent degradation of IκBδ protein levels in response to weaning, suggesting NF-κB activation. Besides, there is an inflammatory response during the second phase of involution as demonstrated by increased cytokines expression. Finally, our results demonstrated inflammasome activation and GSDMD cleavage, indicating that pyroptosis occurs during mammary gland involution. These findings suggest that pyroptosis serves as an additional cell death mechanism, contributing to epithelial clearance and tissue remodelling after lactation. Overall, this study highlights the potential role of inflammatory cell death pathways in mammary gland involution, expanding our understanding of the molecular processes involved in postpartum tissue remodelling.

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PO-44 - RELATIONSHIP BETWEEN PLANTAR FAT PAD THICKNESS AND HEEL PRESSURE IN YOUNG ADULTS

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Heel pain is a common reason for clinical consultation, making the exploration of the region's anatomy essential. The plantar fat pad in the human foot is an adipose tissue whose functions include reducing the impact produced with the ground, redistributing plantar pressures, and protecting internal structures. On the other hand, the study of human gait is fundamental for assessing plantar pressures in clinical practice, but it remains unclear the precise effect of the plantar fat pad thickness, measured by ultrasound, and plantar pressures during gait. Therefore, we aimed to study the potential relationship between plantar pressures and the thickness of the heel fat pad.

To this end, we examined 45 healthy young adults, who underwent a study of anthropometric variables, gait analysis using the RSscan Footscan 9 pressure platform, and ultrasound evaluation with a Vinno E35 device. Although the thickness of the plantar fat and the pressure on the heel were studied, no significant relationship was found between these variables. No significant differences were observed in relation to sex either. This may be due to the fact that we are working with a young population or that our sample size is small. A study with a bigger sample size and different age groups, even taking into account other biomechanical variables, such as body weight or each individual´s gait pattern, could yield more conclusive results and could serve as a basis for understanding the development of certain degenerative and painful foot pathologies.

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PO-45 - RETINOIC ACID REGULATES THE PROLIFERATION, DIFFERENTIATION, AND CELL DEATH OF LIMB SKELETAL PROGENITORS, CONTRIBUTING TO ESTABLISH THE SIZE AND IDENTITY OF THE DIGITS

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The development of digits (both hands and feet) provides an excellent model for analyzing the molecular regulation of skeletal morphogenesis in vertebrates. Digits develop in the autopod as radial chondrogenic condensations separated by interdigital spaces containing undifferentiated skeletal progenitors destined to die by apoptosis. In avian species, the digits are characterized by differential size: the first digit is short and the fourth digit is larger.

In vitro experiments with micromass cultures of digit progenitors demonstrated that RA controls the balance between cell death, cell proliferation, and cell differentiation in a dose-dependent manner. In vivo, qPCR analysis revealed that the RA-synthesizing enzyme, Raldh2, and the RA-degrading enzyme, Cyp26a1, are expressed in the interdigits in an inverse gradient that correlates with the size of the digit adjacent to each interdigit. A low concentration of RA applied to the first interdigits, during the formation of the first phalanges, promoted mesodermal cell proliferation and led to the elongation of digit 1, while blocking RA synthesis in the third interdigit inhibited cell proliferation, followed by a reduction in the size of digits 3 and 4.

Our study reveals a possible role for retinoic acid (RA) expressed in the interdigits in regulating differential digit size. The morphological similarity of the digit patterns obtained in our experimental assays with those of other tetrapods suggests an evolutionary role for RA in determining digit morphology.

PO-46 - SINGLE-NUCLEI TRANSCRIPTS CORROBORATES THE NEW RADIAL MODEL OF THE MOUSE PALLIAL AMYGDALA

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The amygdala disruption is related to diverse psychiatric disorders such as autism, phobic disorders or anxiety. To understand these issues is essential to know how the amygdala is built and organized. The amygdalar pallial complex is a structure located in the temporal pole of mammals. We used snRNAseq and RNAScope techniques to build a cell-type atlas of glutamatergic (pallial) amygdalar neurons in adult mice. We analyzed these data in the context of the pallial amygdala radial model proposed recently by our group (Garcia-Calero et al. 2020, doi: 10.1007/s00429-020-02097-4). In this model, the pallial amygdala is subdivided into four main radial domains (*lateral, anterior, posterior and basal*), and three strata (*superficial, intermediate and periventricular*). With this information we were able to classify, characterized and clusterized the cells in several radial domains bioinformatically. To validate bioinformatic data, we carried out multiplex in situ hybridization techniques. The results obtained in this study support our radial model of the pallial amygdala in mice.

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PO-47 - TARGETING METABOLIC ALTERATIONS IN PANCREATIC CANCER: THE THERAPEUTIC POTENTIAL OF ARGININE METABOLISM

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Pancreatic cancer (PC) is among the malignancies with the worst prognosis, with a five-year survival rate of less than 12%. This aggressive tumor is characterized by profound metabolic reprogramming that enables cancer cells to meet their elevated energy and biosynthetic demands, thereby influencing both tumor progression and resistance to therapy. Understanding these altered metabolic pathways is essential to uncover the underlying pathogenic mechanisms and identify novel therapeutic targets that could improve patient outcomes. This study conducted a systematic review of recent literature focused on altered metabolic pathways in patients with CP, emphasizing metabolites with potential as diagnostic biomarkers or therapeutic targets. The search was performed in three different databases: PubMed, Scopus, and Web of Science, selecting studies that included samples from patients with PC as well as premalignant or benign pancreatic lesions, to minimize selection bias. After applying inclusion and exclusion criteria, a total of 14 original research articles were analyzed in detail. Among the most consistent metabolic alterations identified was arginine metabolism, highlighting its possible relevance as a therapeutic target in this disease. Arginine plays a central role in PC tumor progression, and in other cancer types, its depletion has been evaluated in clinical trials combined with chemotherapy. Additionally, it is a key component in the metabolism of myeloid-derived immunosuppressive cells, so its regulation could improve immunotherapy strategies. Given the clinical complexity of PC, further research is needed in this area to expand the available therapeutic options.

PO-48 - THERAPEUTIC APPLICATIONS OF CAR-T CELL-DERIVED EXTRACELLULAR VESICLES IN ONCOLOGY: A SYSTEMATIC REVIEW

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Chimeric antigen receptors (CARs) are structures that enable T cells to recognize and target tumor antigens. CAR-T cell therapy has shown outstanding results in hematological malignancies, but its application in solid tumors remains limited due to challenges such as immune-related adverse events (e.g., cytokine release syndrome and neurotoxicity), low efficacy, and complex manufacturing processes. In recent years, extracellular vesicles (EVs) derived from CAR-T cells have emerged as a promising alternative because they retain key features of parental CAR-T cells, including cytotoxic molecules and CAR expression, while avoiding many of their limitations.

In this systematic review, we analyzed the literature from the past 15 years concerning CAR-T-derived EVs as a therapeutic tool in oncology. We searched three databases: Pubmed, Web of Science, and Scopus. From a total of 273 publications identified, 9 were finally included after removing duplicates and applying the inclusion and exclusion criteria. Most studies highlight their potential use as anti-tumor agents and as biomarkers to monitor therapeutic response or predict toxicity. Notably, CAR-T-derived EVs demonstrate reduced immunogenicity, increased safety in preclinical models, and enhanced capacity to penetrate solid tumors. Additionally, strategies such as loading CAR-T-derived EVs with drugs have further improved their therapeutic effects in experimental models.

Despite these encouraging preclinical results, no clinical trials involving CAR-T-derived EVs have been conducted to date. This review underscores the urgent need for protocol standardization, comparative preclinical studies, and clinical evaluation to fully assess the potential of this approach in cancer immunotherapy.

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PO-49 - VERTICAL GASTRECTOMY INDUCES ANATOMICAL REARRANGEMENTS IN THE DIGESTIVE TRACT BEYOND THE STOMACH

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Vertical gastrectomy (SG) is considered a restrictive surgical technique; however, its effects on the distal intestine have been little studied. SG has been associated with hypergastrinemia, and high gastrin levels have been reported to inhibit PYY secretion. This study aims to clarify the relationship between gastrin, PYY, and GLP-2, and their role in the morpho-functional changes observed in the jejunum and ileum after surgery.

Using a Wistar rat model, plasma levels of gastrin, PYY, and GLP-2 were measured in three groups: sham-operated (Sham), SG-operated (SG), and SG-operated rats treated with Netazepide (SG+Nz), a CCK2 receptor antagonist. Intestinal hypertrophy and absorptive capacity were assessed at 4 and 12 weeks post-surgery. Additionally, these parameters were evaluated in a group of SG-operated rats infused with exogenous PYY and their corresponding controls.

SG limited the development of the jejunal and ileal surface area and was associated with elevated plasma gastrin and reduced levels of PYY and GLP-2. Treatment with Netazepide mitigated the decrease in PYY and GLP-2 levels and preserved intestinal surface development comparable to the sham group. Exogenous PYY administration maintained intestinal surface development and absorption, as well as GLP-2 levels, in SG-operated animals not treated with Netazepide.

SG impairs the development and absorptive function of the distal intestine. This effect is triggered by elevated gastrin levels, which inhibit PYY secretion via CCK2 receptors on L-cells, subsequently reducing GLP-2 levels.

PO-50 - STUDY OF LINGUAL SURFACE IN NEWBORN AND ADULT SUMATRAN ORANGUTAN (Pongo abelii)

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The tongue collects information about food features and participates in social communication in vertebrates. It is generally assumed that the differences in the morphology of vertebrate tongues are related to the strategies of catching food, tidying or modulating the vocalizations. The tongue is a key organ in feeding owing to the fact of its location and the sensory structures that it bears. Among tongue sensory structures are the lingual papillae. In mammals, two types of functionally lingual papillae can be distinguished: gustatory and non-gustatory papillae, distributed in the tongue surface on a species-specific way. The gustatory papillae, based on its morphology, are called foliate, fungiform, and circumvallate; they contain specialized chemosensory structures called taste buds. The non-gustatory papillae are involved in trapping food and are important for hygiene, bearing mechanosensory structures.

Our work focuses on the morphology of the lingual surface in the Sumatran orangutan. There are three species of orangutans: Pongo pygmaeus, Pongo tapanuliensis and the Sumatran orangutan, Pongo abelii. They are distributed throughout the islands of Sumatra and Borneo. Humans have 96.4% genetic homology with orangutans. Although orangutans mainly have a herbivorous diet, they also eat bark and insects.

Here, we used macroscopic observation and analysis of optical binocular low-magnification images to describe the morphology and distribution of lingual papillae on the Sumatran orangutan lingual surface in newborn and adult specimens.

PO-51 - ANTEROLATERAL LIGAMENT OF THE KNEE IN CERCOPITHECIDAE

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The anterolateral ligament (ALL) of the knee was described in 1879 by the French surgeon Segond as a ligamentous band anterior to the external lateral ligament of the knee. Later, in 2013, Claves et al. conducted a study of the incidence of this ligament and its precise insertions, relating it to knee stability during rotation. Subsequent reviews of the ligament's presence in different populations have yielded conflicting data and authors question its presence. To examine the phylogenetic implications, both knees of four cercopithecid primates (Macaca sylvanus, Cercocebus atys, Colobus guereza, and Papio Anubis) from the "Francisco Pastor" osteological collection at the University of Valladolid were dissected fresh. The anterolateral ligament was not located in any of the four knees, neither as a well-structured ligament nor as a fibrous band. In animals, Inhgam et al. In 2015, he did not find it in any of the 58 species he studied (including four humans, two bonobos, and eight gorillas). All the species studied are pronograde, meaning they walk with their spine horizontal and support all four limbs. This form of locomotion perhaps better stabilizes the knee during rotation, making an additional stabilizing ligament unnecessary. The anterolateral ligament has also not been observed in the knee of the common chimpanzee (Pastor 2019).

PO-52 - THINKING WITH THE HEART: THE IMPORTANCE OF AUTOPHAGY IN THE CARDIAC NEXUS GLIA

Santos-Ledo A [1,2,3], Pérez-Montes C [1,2,3], Velasco A [2,6], García-Macia M [3,4,5], Lavado-Fernández E [3,4,5], Martínez-Rojo I [1,3], Robles-García M [1], Arévalo R [2,6]

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Alcohol consumption is a major lifestyle-related factor contributing to cardiovascular disease and the development of alcoholic dilated cardiomyopathy (ADC), a condition characterized by ventricular dilation, reduced contractility, and progressive heart failure. While the impact of alcohol on cardiomyocytes has been extensively studied, little is known about how it affects the intracardiac nervous system. Particularly we have no information about the possible damage in the recently discovered astroglial-like cells of the heart, the cardiac nexus glia (CNG).

In this study, we analyzed the structural and functional response of CNG to ethanol-induced cardiac injury using zebrafish (Danio rerio) as a model system. Zebrafish larvae (4 days postfertilization, Tg (GFAP:EGFP)) were exposed to 0.5% ethanol for 24 hours, mimicking a model of ADC. We have also analyzed the autophagic response in these cells. Autophagy, the recycle system of the cells, is key under stress conditions and it is involved in the dynamics of the glia in the central nervous system.

Our results revealed hallmark features of reactive gliosis, including an expanded distribution of CNG and increased axonal innervation. Moreover, CNG displayed a significant increase in LC3-positive autophagosomes and enhanced colocalization with mitochondrial markers (SDHB), indicating elevated mitophagy. Despite no change in lysosome abundance (LAMP1), we observed a decrease in lipid droplet markers (Plin2), suggesting impaired metabolic support.

Altogether, our findings suggest that ethanol exposure induces structural and functional alterations in cardiac glia, potentially disrupting glial support functions through impaired autophagic flux and altered lipid homeostasis. These data highlight CNG as a novel cellular target in congenital and acquired heart diseases.

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PO-53 - AUTOPHAGY ACTIVATION IN OLIGODENDROCYTES IS IMPORTANT TO MAINTAIN HOMEOSTASIS IN ZEBRAFISH OPTIC NERVE REGENERATION

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Autophagy is an evolutionarily conserved process essential for maintaining cellular health. While it can promote cell survival, excessive autophagy may also be detrimental. Zebrafish is an excellent model for studying regeneration due to its continuous growth and ability to regenerate various tissues, including the optic nerve (ON). Fish glia supports new neuronal connections, aiding central nervous system regeneration, though its role in neuronal survival remains unclear.

Oligodendrocytes are key players in regeneration, but their specific function remains to be elucidated. We hypothesize that autophagy is crucial for ON regeneration and that its regulation influences zebrafish regenerative capacity.

We used a zebrafish ON crush model to study autophagy following injury. Regeneration in the ON and optic tectum (OT) was analyzed via confocal microscopy and Western blot for autophagy markers, together with sox10 fluorescent transgenic lines to label mature oligodendrocytes. ROS production was measured by flow cytometry. We also evaluated the effects of melatonin, a hormone that induces autophagy, on regeneration.

Autophagy is activated shortly after injury. At 3 hours post-lesion (hpl), differentiated oligodendrocytes decrease in both ON and OT, alongside reduced mitochondrial content in OT oligodendrocytes. By 24 hpl, mitochondrial and lysosomal populations increase in ON oligodendrocytes, with greater colocalization, suggesting enhanced mitophagy, while OT oligodendrocytes show partial recovery. ROS are produced by oligodendrocytes at 3 hpl, and JNK activity is triggered. Additionally, melatonin treatment impairs ON regeneration, blocking JNK upregulation, and inducing aberrant neuronal differentiation in ON and OT. In summary, autophagy in oligodendrocytes is essential for effective ON regeneration in zebrafish.

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PO-54 - SHIFT FROM OSSIFICATION TO MARROW ADIPOSITY IN HRAS/NRAS DKO MICE: A SEX-DEPENDENT PRECLINICAL MODEL MIMICKING OSTEOPOROTIC PATHOPHYSIOLOGY

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Ras proteins play a key role in regulating cell proliferation and differentiation. While activating mutations in RAS isoforms are well known for driving cancer, the complete loss of HRAS and NRAS leads to severe developmental defects: most double-knockout (DKO) mice die shortly after birth due to respiratory failure. However, a small number reach adulthood with normal lifespans, although they display evident respiratory and craniofacial abnormalities.

In this study, we examined how the deletion of HRAS, NRAS, or both affects skeletal development, focusing on bone ossification in perinatal and adult mice. Male and female HRAS-KO, NRAS-KO, and HRAS/NRAS DKO mice were analyzed using biochemical, histological, molecular, and anatomical approaches. Additionally, mesenchymal stem cells (MSCs) from bone marrow were differentiated into adipocytes or osteoblasts and assessed in vitro.

Our results show that HRAS/NRAS DKO mice exhibit significantly reduced cranial ossification and increased adipose tissue accumulation in the bone marrow of long bones, compared to heterozygous controls (HRAS^{+}/$^{-}$/NRAS^{+}/$^{-}$). These skeletal defects in female DKO mice were accompanied by altered serum levels of total protein, albumin, alkaline phosphatase, and blood urea nitrogen, along with changes in the expression of key adipogenic regulators in bone marrow. Interestingly, impaired ossification appears more strongly linked to NRAS loss, as confirmed by MSC-based in vitro assays.

In conclusion, female NRAS-KO and HRAS/NRAS DKO mice provide a promising model for studying osteoporosis, reproducing key features of the disease in a sex-specific manner and offering a useful tool for investigating bone loss and testing new treatments.

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PO-55 - PROLACTIN AND TAU POSITIVITY IN THE HIPPOCAMPUS OF IRS2 KNOCKOUT MICE WITH CEREBRAL INSULIN RESISTANCE

Vicente T, Carretero-Hernández M*, Catalano-Iniesta L, Blanco EJ, García-Barrado MJ, Acosta-Cano C, Hermosilla-Plaza N, Hernández-González D, Díez-Castro D, Rodríguez AE, Torres L, Carretero J

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Peripheral insulin resistance has been associated with the development of neurodegenerative diseases such as Alzheimer's disease, Alzheimer Tau (closely related to Alzheimer's disease).

Among the many biological actions of prolactin are its neurogenic and neuroprotective effects, as well as its involvement in social and maternal behaviors and in learning and long-term memory consolidation. To check whether hippocampal prolactin is altered by the absence of IRS2 and whether or not it is involved in Tau hyperphosphorylation, an immunohistochemical, morphoplanimetric and densitometric study of prolactin and Tau was performed in the hippocampus of ko mice for normoglycemic IRS2. It was found that in the dentate gyrus of these animals, the number of neurons in the granular stratum decreased and, at the same time, the number of prolactin-positive neurons and their reaction intensity. All this was accompanied by an increase in the size of these neurons. Similar results appeared in neurons in the stratum piriformis of the CA1 region. Conversely, neurons in the stratum piriformis of the CA3 region showed greater intensity in prolactin positivity. The increase in Tau intensity occurred equally in the dentate gyrus and in the two regions of the horn of Amun analyzed. Tau positivity is dissociated from prolactin positivity, at least in the CA3 region.

PO-56 - AGE AND SEX: IMPACT ON SYNTHESIS OF PROLACTIN IN PYRAMIDAL NEURONS OF THE HIPPOCAMPUS IN THE RAT

Carretero J, Vicente T, Díez-Castro D, Blanco EJ, García-Barrado MJ, Hernández-González D, Rodríguez AE, Catalano-Iniesta L, Carretero-Hernández M*

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Prolactin is a hormone with demonstrated roles in the brain, including hippocampus, acting on specific prolactin receptors. To determine the prolactin expression in the rat hippocampus during aging and to resolve some controversies related to the presence of prolactin in the hippocampus, the aim of this study was to analyze whether changes occur in the expression of Prl mRNA in pyramidal neurons at different stages of life. To determine this, we designed an experimental study in which we analyzed the expression of prolactin in the rat hippocampus, Ammon's horn, at different stages of life (prepubertal, postpubertal, young adult, adult and old) and check if there are differences related to sex, by in situ hybridization and a posterior morphoplanimetric and densitometric analysis.

Overall, the qPCR results obtained confirm previous findings from our laboratory and show that prolactin is synthesized in the pyramidal neurons of the rat hippocampus as deduced from the findings obtained by in situ hybridization. The results obtained suggest that hippocampal Prl mRNA positive pyramidal neurons are significantly modified in percentage, cellular area, and hybridization signal, intensity of fluorescence, by sex and age, suggesting the existence of age-related sexual dimorphism, mainly in postpubertal, young adult and old animals. The results obtained suggest that hippocampal aging is related to a decrease of prolactin synthesis in hippocampal pyramidal neurons, which helps to better understand brain aging.

PO-57 - EVIDENCE FOR ESTROGENIC MODULATION OF PROLACTIN EXPRESSION IN THE HABENULA OF THE MOUSE BRAIN

Blanco EJ, Carretero-Hernández M*, Díaz-Rodríguez LG, Hernández-González D, Díez Castro D, Catalano-Iniesta L, Rodríguez AE, García-Barrado J, Carretero J

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The habenula, dorsal diencephalic structure of the brain, is a multisensory brain region that can process visual, olfactory, mechanosensory and aversive stimuli. Various studies have implicated it in behavioural responses in pregnancy and lactation, proving the presence of receptors for prolactin in these physiological states. Prolactin is a hormone that is distributed in different parts of the brain, highlighting the hypothalamus, hippocampus, cerebellum and other regions of the cerebral cortex. In them, it has neurogenic, neuroprotective, behavioural effects and enhances learning and long-term memory. There are no studies that analyse whether, as occurs in the hippocampus, the habenula is capable of synthesizing prolactin, if oestrogens influence it and if there are differences between the medial habenula and the lateral habenula of rodents, since it has different functions.

By in situ hybridization, a study of prolactin synthesis in both habenular nuclei has been carried out comparing Wilde type mice versus Arko mice (knock out for P450 aromatase, the enzyme responsible for oestrogen production). The results obtained show that habenula synthesizes prolactin. In medial habenula, prolactin synthesis is higher in females than in males, this dimorphism seems to be related to oestrogen synthesis, since in Arko mice the habenular synthesis of prolactin is higher in males than in females and when compared with Wilde type animals, significant increases in males and significant decreases in females are observed. Similar behaviour occurs in the lateral habenula, but the changes are clearly significant only in male mice.

PO-58 - EFFECTS OF AGING ON THE NEURONAL DIFFERENTIATION AND MATURATION IN THE HIPPOCAMPUS OF THE MALE RAT

Hernández-González D, Carretero-Hernández M*, Blanco EJ, Vicente T, García-Barrado MJ, Díez-Castro D, Rodríguez AE, Catalano-Iniesta L, Carretero J

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Neurogenesis is a complex process that includes the activation, proliferation, differentiation, and migration of stem and glial cells and the synaptic integration of new neurons into the already formed neural network or circuits. One of the areas in the brain that has been described the existence of neurogenesis in rat adult age is the subgranular layer in the dentate gyrus of the hippocampus. Newly formed neurons in the dentate gyrus migrate a short distance into the granular layer and become dentate neurons that are directly related to learning, memory formation, object recognition, and spatial orientation processes. However, there are no studies that analyse the possible changes in neuronal differentiation and the persistence of mature neurons in the dentate gyrus of the rat throughout life from prepubertal stages to aging. To analyse it, an immunohistochemical study of the hippocampus with Doublecortin and NeuN has been carried out in the hippocampus of male rats from prepubertal to old ages.

In this study we demonstrate that age affects Doublecortin positivity, morphology and arrangement of stem cells in the subgranular stratum of the dentate gyrus. Similarly, age affects immunopositivity to NeuN in the dentate gyrus and the horn of Ammon. The thickness of the pyramidal and granular layers was greater in young males than in old ones. Numerical density was also higher in young adults than in old adults, mainly in the dentate gyrus and in the CA3 region.

PO-59 - HYDROCEPHALUS ASSOCIATED TO THE LACK OF IRS2 IN MICE IS ASSOCIATED TO ACTIVE GLIOSIS IN THE BRAIN

Catalano-Iniesta L, Carretero-Hernández M, García-Barrado J, Díez-Castro D, Hernández-González D, Blanco EJ, Vicente T, Blanco-Antona L, Herrero-Payo JJ, Carretero J

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IRS2 is an intracytoplasmic protein that It phosphorylates upon activation of the insulin receptor. Irs2 ko mice are characterized by peripheral insulin resistance that significantly affects the brain and is not associated with hyperglycemia. These animals have a microcephalic brain compared to the wild type mice that affects the entire brain equally and is not related to body size.

In our study we have verified that microcephaly is accompanied by cortical atrophy and hydrocephalus with ventricular dilation in 26.74% of the mice confirmed by magnetic resonance imaging and subsequent necropsy. The morphometric study revealed significant changes (p<0.01) in the calculated ventricular transverse diameters, the most evident ventricular dilation occurred in the lateral ventricle. Ventricular dilation was associated with marked atrophy of cortical and subcortical structures. This atrophy was accompanied by the appearance of reactive gliosis, so that brain regions and structures close to the ventricular system such as the thalamus, the medullar stria, the habenula, the amygdala complex and the insular and entorhinal cortex, developed a reactive gliosis with an increase in GFAP-reactive astrocytes.

PO-60 - DIFFERENCES INDUCED BY AGE AND SEX OF AKT AND p-AKT EXPRESSION IN THE RAT HIPPOCAMPUS

Díez-Castro D, Blanco EJ, Hernández-González D, Vicente T, García-Barrado MJ, Rodríguez AE, Catalano-Iniesta L, Carretero J, Carretero-Hernández M*

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AKT kinases (AKT1, AKT2 y AKT3) belong to the AGC family of serine/threonine. They were involved in several intracellular signalling pathways, such as PI3K and mTOR. Although they were codified by different genes, they have highly similar structure, and they play a specific role in physiology and brain pathologies. Each isoform has difference expression patterns: AKT1 and AKT3 were mainly found in neurons whereas AKT2 were in astrocytes. These kinases have been associated with long-term synaptic plasticity (LTP) and mGluR-dependent long-term depression (mGLuR-LTD).

The regulation of AKTs depends on their phosphorylation, which could be modulated by age and sex. Our results analysing by immunohistochemistry and western blotting AKT and phosphorylated AKT (pAKT) in the hippocampus of four age groups of rats: prepubertal (4 weeks), postpubertal (6 weeks), adult (up to 10 months) and elder (up to 15 months), demonstrated that age-related decreases of both proteins were observed in both sexes.

PO-61 - ANATOMICAL VARIATIONS OF THE CEREBRAL ARTERIAL CIRCLE AND THEIR CLINICAL CORRELATIONS: A CADAVERIC STUDY

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The cerebral arterial circle plays a critical role in cerebral collateral circulation. However, anatomical variations are common and may influence the pathogenesis of cerebrovascular diseases. This study analyzed 17 human brains from adult cadavers (9 males, 8 females; ages 40–96) at the Universidad Complutense de Madrid, as part of a research project conducted at the Centro de Donación de Cuerpos y Salas de Disección between June and July 2024. After latex injection into the internal carotid arteries, the brains were dissected and analyzed. A total of 7 cases of arterial hypoplasia, 4 of hyperplasia, 4 arterial obstructions (mainly thrombotic), and 5 complete absences were identified. The most frequently affected vessels included the posterior communicating arteries (PComA), anterior inferior cerebellar arteries (AICA), and superior cerebellar arteries (ACS). Several cases demonstrated clear clinical correlation with stroke, hemorrhage, or suspected aneurysmal rupture. These results are consistent with recent findings in literature, which report a high prevalence of anatomical variations in the cerebral arterial circle, particularly involving the posterior communicating arteries. Bilateral hypoplasia or aplasia in this segment has been reported to impair anterior-to-posterior collateral circulation, thereby increasing susceptibility to ischemic events and presenting challenges for neurosurgical planning. Such anatomical insights are essential for clinical risk assessment and preoperative planning.

Applied, Clinical And Translational Research

PO-62 - PRELIMINARY ANATOMICAL STUDY OF THE VEIN AND LIGAMENT OF MARSHALL: IMPLICATIONS FOR ATRIAL FIBRILLATION ABLATION

Hernández-Gil-de-Tejada T, Tomás-Caballero M, Rams-Almenar C, Alfosea-Cuadrado G, Aas-Mutis Ó, Borí-Tormo L, González-Soler EM, Blasco-Serra A, Blasco-Ausina MC, Fabregat-Andrés Ó, Valverde-Navarro AA

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Atrial fibrillation (AF) is the most common cardiac arrhythmia and carries major clinical implications. While its precise etiology remains unclear, advances in understanding its triggers and sustaining mechanisms have improved treatment strategies. Ectopic electrical discharges, particularly those arising from the left atrial wall near the pulmonary veins, are key contributors. When drug therapy fails, ablation of these arrhythmogenic foci and their autonomic innervation is the treatment of choice. However, AF recurrence suggests other ectopic sources may be involved. The vein and ligament of Marshall (VOM and LOM), located between the left pulmonary veins and the left atrial appendage, have been proposed as such sources, though detailed anatomo-histological data are lacking. This study aimed to characterize the histological and morphometric features of the VOM and LOM, focusing on their lumens and surrounding tissues, especially elements involved in ectopic electrical activity, such as muscle bundles and nerve fibers. Transverse histological sections were obtained from six levels, from the coronary sinus to the base of the left pulmonary veins, using human hearts donated through the Body Donation Program at the University of Valencia. Muscle bundles were observed in the subepicardial fat surrounding the VOM, especially distally, with few nearby nerve fibers. In contrast, the LOM contained integrated muscle fibers and a greater density of adjacent nerve fibers. A continuous lumen was present in both structures. These findings suggest the LOM, given its anatomical features and accessibility, may represent a more effective and precise target for catheter-based AF ablation procedures.

PO-63 - 2D AND 3D GEOMETRIC MORPHOMETRIC ANALYSIS OF FACIAL MORPHOLOGY IN WOMEN WITH TURNER SYNDROME

Gallardo S[1], Ruffo C[1], Andreu-Montoriol M[1], González A2, Heredia-Lidón A2, Roure O[1], Herrera-Escartín D[1], Echeverry-Quiceno L[1], Rubert-Tayà M[1], Sevillano X[2], Casado Rodríguez A[3], Esteban E[1], Martínez-Abadías N[1]

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Turner syndrome (TS) is a rare genetic condition affecting females, caused by the partial or complete loss of the second X chromosome. Although a characteristic dysmorphic facial pattern has been described in the literature, it remains poorly quantified. This study analyzed differences in facial shape between women with TS and healthy controls using two-dimensional and three-dimensional geometric morphometrics, while also evaluating variations according to karyotype (45,X versus mosaicism). The sample included 90 participants (45 with TS and 45 controls), with facial models obtained through synchronized photogrammetry using 10 cameras. A total of 21 anatomical landmarks were placed to compare interlandmark distances (EDMA) and global landmark configurations (GPA). The results revealed a distinctive facial pattern in TS, with alterations in the orbital, nasal, and mandibular regions. The 45,X group showed greater morphological variability and females with more pronounced features compared to the mosaic group. Both 2D and 3D methodologies yielded comparable statistically significant results, although 3D models provided higher spatial resolution. These findings support the use of facial morphology as a non-invasive biomarker for early TS diagnosis

and suggest phenotypic differences according to karyotype, with clinical implications for personalized care.

This study is part of the "Juntas Menos Raras" project, with funding from the BeNeXT projects PID2023-147001OB-C21/C22 (funded by MICIU/AEI/10.13039/501100011033 and by FEDER/UE), as well as support from the Federación Española de Enfermedades Raras (AI-2023-057) and the Consolidated Research Group of the Generalitat de Catalunya 2021 SGR 00706.

PO-64 - 3D GEOMETRIC MORPHOMETRIC ANALYSIS OF THE PALATAL VAULT IN WOMEN WITH TURNER SYNDROME

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Turner syndrome (TS) is a sex chromosome monosomy associated with various somatic anomalies, including altered craniofacial morphology. At the viscerocranial level, the palatal vault is typically high, narrow, and ogival in shape. This study aimed to characterize the three-dimensional morphology of the palatal vault in women with TS using geometric morphometrics.

Digital models of 22 women (11 with TS and 11 controls) were obtained via 3Shape® intraoral scanning. Anatomical landmarks were placed on the palatal surface using Landmark Editor, based on Korkhaus index references. The 3D configurations were aligned in MorphoJ (v.1.08.02) using generalized Procrustes analysis.

Principal component analysis (PCA) was applied to explore shape variation, discriminant function analysis (DFA) to assess group classification, and Procrustes regression to examine allometry. Additionally, Procrustes distances between group means were calculated and tested for significance using a permutation test (n = 999) implemented in Python.

The first three components explained 90.97% of the shape variance (PC1 = 70.38%). TS patients showed significantly narrower, higher, and more anteriorly projected palatal vaults. DFA and the Procrustes distance ($d = 0.0381$; $p < 0.001$) confirmed significant morphological differences between groups.

This study was funded by the project "Juntes no tan Rares" (Ajuntament de Barcelona, 23S00731-001), the Josep Finestres Foundation, and a grant from the UFR of Dentistry, University of Barcelona. It was also supported by the RIMDA 2024 project "Tri-Dent" (DIG-UB/009). The research is part of GIDANAT and the research groups AEPPRI (2021 SGR 00244) and Complex_Fen_GXEXD (2021 SGR 00706).

PO-65 - ANATOMICAL VARIANTS IN ONCOLOGY: CLINICAL IMPLICATIONS AND PATHOLOGICAL CORRELATION

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There are several types of anatomical variants of normal, which are usually detected by cadaveric dissection or imaging tests. During the follow-up of oncological patients, where numerous imaging tests are performed, it has been seen that in a large number of cases these variants are detected secondarily.

The aim of this study was to statistically evaluate the possible relationships between anatomical variants and different types of tumors, as well as associated concomitant pathologies, in a cohort of cancer patients. A total of 112 oncological patients from Virgen de las Nieves University Hospital were included in this retrospective study. Anatomical variants were identified using their complementary imaging tests. The variables analyzed comprised sex, age, cancer type, presence of concomitant pathologies, and the specific anatomical variants observed.

Our analysis revealed a statistically significant correlation between the anatomical variant of the vena cava and the presence of germ cell tumors ($p = 0.0015$). Additionally, significant associations were found between tumors of the pancreas and bile duct and variants involving the hepatic artery, celiac trunk, and superior mesenteric artery ($p < 0.0001$). Furthermore, a notable correlation was observed between arterial hypertension and anatomical variants of the aortic trunk ($p = 0.01$).

These findings suggest certain anatomical variants may predispose or be associated with the development of specific tumors and systemic pathologies such as arterial hypertension. Given this is a novel investigation with limited prior literature, further large-scale and in-depth studies are necessary to confirm these associations and explore their clinical implications.

PO-66 - ANATOMICAL, ANALGESIC, AND FUNCTIONAL EVALUATION OF THE EFFICACY OF THE SIGMA-1 RECEPTOR ANTAGONIST S1RA FOR THE COMPREHENSIVE TREATMENT OF RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA) is a chronic inflammatory disease affecting synovial joints, causing pain, inflammation, and joint damage. Methotrexate (MTX) is the preferred disease-modifying antirheumatic drug (DMARD). However, some patients experience residual neuropathic pain and adverse effects. New DMARDs are needed for comprehensive RA treatment. Sigma-1 receptor inhibitors, like S1RA, have shown efficacy in treating neuropathic pain and are proposed as a new DMARD class. This study evaluates the anti-arthritic and analgesic efficacy of S1RA compared to MTX using a collagen-induced arthritis (CIA) model.

Female Wistar rats immunized with type II collagen and CFA (CIA) were used. The following tests evaluated treatment efficacy:

1. **Joint Inflammation and Damage:** Paw thickness was measured with an electronic caliper, and joint damage was assessed using toluidine blue and hematoxylin/eosin staining.

2. **Thermal Hyperalgesia:** The Hargreaves test measured pain sensitivity to thermal stimuli.

3. **Functionality:** The burrowing test evaluated the rats' digging ability, an innate behavior affected by pain and disability.

Both S1RA and MTX produced robust anti-arthritic effects, with MTX being more effective in reducing knee inflammation. S1RA had a stronger analgesic effect than MTX, which was not effective for pain relief. The burrowing test showed improved functionality in rats treated with S1RA and MTX compared to saline.

Sigma-1 receptor inhibition could represent a new class of DMARDs, offering additional analgesic benefits.

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PO-67 - CHARACTERISTIC FACIAL FEATURES OF 5p– SYNDROME: 2D AND 3D ANALYSIS TO IMPROVE DIAGNOSIS AND CLINICAL PROGNOSIS

Ruffo C[1], Gallardo S[1], Andreu-Montoriol M[1], González A[2], Heredia-Lidón A[2], Roure O[1], Herrera-Escartín D[1], Echeverry-Quiceno L[1], Rubert-Tayà M[1], Sevillano X[2], Casado Rodríguez A[3], Esteban E[1], Martínez-Abadías N[1]

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5p– syndrome (also known as Cri du Chat syndrome) is a rare genetic disease with a broad clinical and phenotypic spectrum. This study evaluates the diagnostic and prognostic potential of facial phenotype through 2D image analysis and 3D models obtained via photogrammetry. A total of 72 individuals were analyzed (36 patients and 36 age- and sex-matched controls), with 21 anatomical landmarks automatically recorded and geometric morphometric techniques applied.

The Face2Gene algorithm suggested the correct diagnosis as the first option in only 44.4% of cases, with higher accuracy in pediatric patients. However, statistical analyses revealed significant morphological differences between patients and controls, especially in the orbital, nasal, and perioral regions, in both 2D and 3D. Three-dimensional reconstructions allowed greater discrimination between groups, although both approaches proved useful in identifying characteristic craniofacial features such as hypertelorism, broad nasal bridge, microcephaly, and elongated face.

This work supports the use of facial morphometric analysis as a complementary and accessible tool for clinical diagnosis, with particular utility in resource-limited settings. The findings contribute to a more accurate biomedical characterization of 5p– syndrome, which could facilitate in the future early diagnosis and the development of more effective and personalized clinical strategies for managing this rare disease.

This study was carried out within the framework of the citizen science project Juntas menos raras (Ajuntament de Barcelona, 23S00731-001), with the collaboration of the ADAIS 5p– and ASIMAGA associations. The research was conducted under the Consolidated Research Group of the Generalitat de Catalunya 2021 SGR 00706 and funded by the *Muévete por los que no pueden Association.*

PO-68 - CHARACTERIZATION OF FACIAL DYSMORPHOLOGY IN MUCOPOLYSACCHARIDOSIS SYNDROMES IN A COLOMBIAN POPULATION

Andreu-Montoriol M[1], Candelo E[2,3], Echeverry-Quiceno L[1], González A[4], Heredia-Lidón A[4], Roure O[1], Ruffo C[1], Gallardo S[1], Herrera-Escartín D[1], Rubert-Tayà M[1], Gómez E[2], Sevillano X[4], Casado A[5], Esteban E[1], Pachajoa H[2,3], Martínez-Abadías N[1]

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Up to 30–40% of rare genetic conditions present with craniofacial dysmorphologies that are essential for clinical diagnosis and guiding genetic testing. Recently, tools like Face2Gene, which analyze 2D facial images, have been introduced to assist diagnosis. Emerging research explores the use of 3D facial analysis to improve diagnostic accuracy. However, most existing tools are mainly trained on individuals of European descent, limiting their effectiveness across diverse populations due to variations in facial morphology.

To bridge this gap, we analyzed facial dysmorphologies associated with mucopolysaccharidosis (MPS) types IV and VI in a Colombian population. We included 195 control individuals and 19 MPS patients (MPS IV: N=14; MPS VI: N=5). Using geometric morphometric (GM) techniques, 21 facial landmarks were automatically captured from both 2D images and 3D models obtained via stereophotogrammetry. EDMA and GPA analyses were employed to examine facial shape variation and to identify MPS-associated features. The diagnostic performance of Face2Gene was also assessed.

Results showed that age, sex, family relatedness, and self-perceived ancestry significantly influenced facial morphology. Individuals with affected relatives had distinct facial features compared to unrelated controls. While Face2Gene showed high sensitivity for identifying MPS generally, it struggled to distinguish between MPS subtypes. In contrast, both 2D and especially 3D GM analyses effectively differentiated MPS IV from MPS VI, underscoring the importance of population-specific and 3D approaches in enhancing diagnostic tools.

This study was carried out within the framework of the Juntas Menos Raras project and the Consolidated Research Group of the Generalitat de Catalunya 2021 SGR 00706.

PO-69 - DEFINING A STANDARDIZED ANATOMICAL PATTERN OF THE GREAT AURICULAR NERVE: A CADAVERIC AND MORPHOMETRIC MICRODISSECTION STUDY

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The primary objective of this study was to define, for the first time in the literature, a standard anatomical pattern of the great auricular nerve (GAN), integrating its morphometry, course, distribution, and anatomical relationships. Microdissections were performed on six human cadaveric hemifaces, with photographic documentation, stereoscopy, and three-dimensional reconstruction. Based on a detailed analysis of the nerve branches, a reference pattern was described and represented to scale, including the typical emergence of the GAN as a single trunk, its division into anterior, lobular, and posterior branches, and a novel classification based on the orientation, depth, and functional destination of each branch. The study revealed greater anatomical complexity than previously reported, with increased incidence and variability of lobular and deep branches, many of which form anastomoses with the facial nerve (FN) and other cervical plexus nerves. The proposed pattern provides precise anatomical landmarks useful in cervicofacial surgery, promoting nerve preservation and reducing sensory morbidity. Additionally, the findings support the potential role of the GAN in the pathophysiology of Frey's syndrome and suggest new directions for functional research. This standard anatomical pattern constitutes a high-resolution anatomical tool with clinical and educational applications, representing an original and necessary contribution in light of the oversimplification and inconsistency that still prevail in the current literature on the GAN.

This research is part of Jorge Torres-Gaya's doctoral thesis project entitled An Anatomical and Morphometric Study of the Cervicofacial Sensory Nerve Branches and Their Connections with the Facial Nerve: Anatomofunctional Implications

PO-70 - DIFFERENTIAL FACIAL FEATURES IN CDKL5 AND CTNNB1 SYNDROMES: A 2D AND 3D MORPHOMETRIC APPROACH TO IMPROVE CLINICAL DIAGNOSIS

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CDKL5 and CTNNB1-related syndromes are ultra-rare neurodevelopmental disorders that share overlapping clinical features and their genetic causing mutation was recently identified. Since the craniofacial phenotype remains poorly described, this study analyzed the facial phenotype of 14 individuals with CDKL5, 20 with CTNNB1, and 34 neurotypical sex and age-matched controls using geometric morphometrics. A total of 21 anatomical landmarks were automatically recorded on 2D frontal facial images and 3D models generated through photogrammetry. EDMA and GPA were used to assess local and global morphological differences.

Face2Gene failed to correctly identify any CDKL5 cases and only 10% of CTNNB1 cases, highlighting the limitations of current AI-diagnostic tools for underrepresented disorders. In contrast, morphometric analyses revealed statistically significant facial patterns: CDKL5 was associated with an elongated face, mild hypertelorism, chin retrusion, and frontal prominence; whereas CTNNB1 presented with midfacial hypoplasia, flat nose, long philtrum, and a convex profile with retrognathia. 3D reconstructions enabled more accurate visualization, particularly in CTNNB1.

This work supports the use of geometric morphometrics as a robust and complementary diagnostic tool, especially useful in settings with limited access to genetic testing, representing a significant step towards the broader implementation of precision medicine in the context of neurodevelopmental ultrarare disorders.

This study was carried out within the framework of the Juntas Menos Raras project and the Consolidated Research Group of the Generalitat de Catalunya 2021 SGR 00706.

PO-71 - ESTIMATING SEX AND HEIGHT FROM THE HUMERUS IN A MEDIEVAL POPULATION OF BAJO ARAGÓN, IN SPAIN

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Osteometric analysis of skeletal remains is a key method in Biological anthropology, enabling the estimation of various individual features such as height, sex, and age from skeletal remains found at archaeological sites. This study focuses on estimating height and sex through the analysis of humeri recovered from an aragonese archeological site known as “Ermita de la Consolación” in Chiprana (Zaragoza), which is believed to date back to the medieval period, approximately around the 12th century according to radiocarbon C-14 dating. A total of 108 humeri (52 right and 56 left) were examined and key measurements were taken. These included parameters such as the humeral head diameter, epicondylar width, or maximum length. The measurements were analyzed afterwards, using a series of discriminant functions tailored for specific historical and modern populations. The results showed a clear predominance of male remains, accounting approximately for 70% of the analyzed specimens. Height estimation was also obtained, revealing an average of 164 cm for males and 158 cm for females. This study provides a comprehensive overview of the osteometric methods used, offering a solid foundation for analyzing fragmented skeletal remains in other archaeological contexts.

PO-72 - FACTORS MODULATING FACIAL SHAPE VARIATION IN THE CONTINUOUS SPECTRUM OF HEALTH AND DISEASE

Roure O[1], Andreu-Montoriol M[1], Heredia-Lidón A[2], Gallardo S[1], Ruffo C[1], Echeverry-Quiceno L[1], Herrera-Escartín D[1], Rubert-Tayà M[1], Gómez E[3], Candelo E[3,4], Pachajoa H[3,4], Alves de Oliveira J[5,6], Michelatto D[5,6], Monlleó I[5,6], Sevillano X[2], Casado A[7], Esteban E[1], Martínez-Abadías N[1]

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Artificial intelligence (AI)-based diagnostic tools use facial features to assist in the identification of over 7,000 rare diseases (RDs). However, most of these tools have been trained with European cohorts, and it remains unclear how population or biological variables modulate facial morphology. We analyzed 919 individuals from Brazil, Colombia, and Spain, including 754 controls and 165 patients diagnosed with Down, Turner, Marfan, Noonan, Kabuki, or Morquio syndromes. Using 3D models reconstructed via photogrammetry, 21 anatomical landmarks were automatically recorded and geometric morphometric techniques applied. Genotyping data from 289 controls were obtained using the PangenomiX Axiom array, and genetic ancestry was estimated using ADMIXTURE. All studied factors—population, age, sex, family relatedness, genetic ancestry, and clinical condition—except for self-perceived ancestry, significantly influenced facial shape ($p < 0.05$). The facial phenotype of each RD varied across populations and was significantly affected by age; no sexual dimorphism was detected within syndromes. Controls related to patients exhibited significant differences as compared to unrelated controls. European ancestry was predominant in Spain (> 99%), while Brazilian participants presented an average of 67% European, 22% African, and 11% Amerindian ancestry. Genetic ancestry explained 7.3% of facial shape variation among controls. These results highlight the need to incorporate diverse population data and demographic variables into AI algorithms to achieve more equitable and personalized diagnostics in clinical genetics.

This study was conducted within the framework of the Juntas Menos Raras project (Ajuntament de Barcelona, 23S00731-001), with funding from the Wenner-Gren Foundation (Gr. 10657), the BeNEXT project PID2023-147001OB-C21/C22 (funded by MICIU/AEI/10.13039/501100011033 and by FEDER/UE), and the Consolidated Research Group of the Generalitat de Catalunya 2021 SGR 00706.

PO-73 - KNEE JOINT INNERVATION: ANATOMICAL REVIEW AND PRELIMINARY DISSECTION OBSERVATIONS

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Nerve ablation is a therapeutic treatment option for chronic knee pain. This technique requires precise identification of the nerve branches responsible for the sensitivity of the joint, commonly known as genicular nerves.

There is a certain level of agreement among experts regarding the nerves that give rise to these innervating branches of the knee. Most of the literature points to the femoral nerve, the obturator nerve, and specific branches of the sciatic nerve—specifically, the tibial and common peroneal nerves—as the main contributors. However, discrepancies remain concerning the exact identification of the branches involved and the specific regions of the joint they innervate.

In order to provide a detailed description of the anatomical organization of knee innervation, a preliminary study will be conducted through microanatomical dissections.

A literature review was also carried out in order to identify the nerves of origin, their topographic pathways, and the articular regions they supply, with the aim of precisely defining the anatomical innervation pattern of the knee.

PO-74 - MORPHOMETRIC VARIATIONS IN THE AORTOMESENTERIC ANGLE

Guerra-Juarez YA, Alvarez-Lozada LA, Quiroga-Garza A, Elizondo-Omaña RE, Llamas Linares G, Pinales-Razo R, Guzman-Lopez S

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The aortomesenteric angle is a crucial anatomical parameter associated with vascular and gastrointestinal syndromes such as superior mesenteric artery syndrome (SMAS) and nutcracker syndrome (NCS). This study aimed to classify and analyze the morphometric characteristics of the aortomesenteric angle and its related vascular structures to better understand their diagnostic relevance. A descriptive, observational, cross-sectional study was conducted using 240 contrast-enhanced abdominal CT scans. Morphometric parameters included the aortomesenteric angle, aortomesenteric distance at the duodenal level, diameters of the superior mesenteric artery (SMA) and the abdominal aorta (AA), and the anteroposterior length of the duodenum. Statistical analyses were used to determine correlations with demographic variables such as sex and age. Results showed that the mean aortomesenteric angle was significantly greater in males (66° ± 22.7) than in females (55.1° ± 17.6; $p < 0.0001$). Acute angles (<50°) were found in 38.3% of cases, more frequently in females (42.5%) compared to males (33%). High angles (>75°) were more common in males (39.6%). The aortomesenteric distance was also significantly greater in males (20.8 mm ± 9.1) than in females (15 mm ± 6.4; $p < 0.0001$). Differences in vascular diameters and duodenal dimensions between sexes were statistically significant ($p < 0.0001$). These findings suggest that females are more likely to present morphometric patterns associated with SMAS and NCS. An individualized morphometric evaluation of the aortomesenteric region may enhance diagnostic precision and clinical decision-making.

PO-75 - MP-004, A SMALL MOLECULE DEVELOPED TO STABILIZE CALCIUM CHANNELS (RYR), AS A NEW THERAPY FOR DIABETIC RETINOPATHY

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Retinal inflammation is a key factor in the early stages of several retinal degenerative diseases, including Inherited Retinal Diseases (such as Retinitis Pigmentosa and Leber congenital amaurosis), Age-related Macular Degeneration, glaucoma, and Diabetic Retinopathy (DR). This inflammation, primarily driven by activated microglia, contributes to neuronal apoptosis and vision loss. MP-004, a novel molecule targeting ryanodine receptor 2 (RyR2), has shown promise in modulating intracellular calcium levels, oxidative stress, and inflammation. This study aimed to assess the immunomodulatory effects of MP-004 administered as eye drops in BB rats, a widely used animal model for Type 1 diabetes and early DR.

BB rats received daily topical MP-004 or vehicle treatment for two weeks. Retinal mRNA levels of pro-inflammatory (M1: Nos2, Il1b, Tnfa, Il6) and anti-inflammatory (M2: Arg1, Homx1) markers were measured using RT-PCR. Retinal structure and inflammation were further evaluated through SD-OCT imaging, GFAP (glial fibrillary acidic protein) staining to assess gliosis, and Iba-1 staining to evaluate microglial activation.

Results showed that MP-004 treatment preserved retinal integrity and significantly reduced M1 pro-inflammatory gene expression while enhancing M2 marker Arg1. Additionally, MP-004 reduced GFAP expression and microglial activation, indicating a decrease in retinal inflammation.

In conclusion, MP-004 eye drops demonstrated a strong anti-inflammatory effect in early-stage DR, suggesting its potential as a therapeutic approach for DR and other retinal diseases involving neuroinflammatory mechanisms. These findings support the use of MP-004 for preserving retinal health and delaying disease progression.

This research was financially supported by the Spanish Ministry of Science, Innovation and Universities (CPP22-009867).

PO-76 - STOPA VERSUS ILIOINGUINAL APPROACH IN THE TREATMENT OF ACETABULAR FRACTURES: COMPARISON OF DAMAGE TO NEUROVASCULAR STRUCTURES

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Acetabular fractures are relatively rare and produced by a high-energy impact on the acetabulum. Nevertheless, they are increasingly prevalent, particularly due to falls in elderly individuals, and are also categorized as fragility fractures.

Although surgical reductions are achieved in only 55% to 75% of cases, it is essential to aim for reductions with a displacement of less than 1 mm. For anterior column and wall fractures, as well as some transverse fractures with significant anterior displacement, the ilioinguinal approach is commonly used. This approach is complex and requires a long learning curve. Alternatively, the Stoppa approach is simpler. However, it is performed close to neurovascular structures without direct visualization of these elements.

The aim of this study is to demonstrate that both approaches are equally safe. To this end, measurements will be taken of the path and position of the surgical plate in relation to nearby neurovascular structures. These approximations will be performed in the dissection room of the Ciudad Real Medical School, University of Castilla-La Mancha, using pelvic regions from human cadaveric donors.

The study will begin with a thorough anatomical dissection of the pelvic/inguinal region, followed by the Stoppa approach. Subsequently, the ilioinguinal approach will be completed, and measurements will be taken. Whenever possible, both laterality and sexual dimorphism will be considered.

All donors included in this study provided written informed consent through the body donation program of UCLM.

PO-77 - UTERINE ANATOMY AND MÜLLERIAN MALFORMATIONS: IMPACT ON HUMAN REPRODUCTION

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Müllerian duct malformations (Müllerian malformations, MM) occur mainly in the uterus, but can also affect the vagina and cervix, modifying female reproductive anatomy and function.

An anatomical study of a female pelvis was performed and correlated with the follow-up of a real clinical case of a patient diagnosed with a uterine malformation, followed for one year. The combination of anatomical dissection and clinical experience provided a practical illustration of the importance of early and accurate recognition of these anomalies and their impact on fertility and therapeutic approach.

A complete anatomical dissection of a human female pelvis was performed in the dissection room of the University of Murcia, with special attention to the uterus and its pelvic relations. This practice provided a detailed, three-dimensional understanding of the normal uterine anatomy, which was used as a fundamental reference for the subsequent interpretation of MMs.

The dissection provided a solid anatomical basis for comparisons with the different types of congenital anomalies described in the literature. Overall, this approach has facilitated anatomical learning as well as an applied clinical view of MMs, reinforcing their relevance in the reproductive context.

PO-78 - INCIDENCE OF THE MAJOR ENTHESOPATHIES OF THE LOWER EXTREMITY

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Entheses are the bone insertions of tendons and ligaments. When the insertion area generates a periosteal reaction in the bone, an enthesopathy begins to develop. Although any insertion is susceptible to enthesopathy, repeated and continuous muscular activity of certain muscles and tension at ligament insertions are the most likely to cause it. A total of 182 femurs, 86 patellas, 197 tibias, and 72 calcanei from the "Francisco Pastor" Osteology Collection at the University of Valladolid were examined. The enthesopathies studied and their incidence by sex were:

- Femur: Third trochanter (Men: 9.9%, Women: 2.4%). Gluteal line (Men: 7.9%, Women: 2.4%). Adductor magnus insertion (Men: 2.9%, Women: 0%)

- Patella: Quadriceps insertion (Men: 17.3%, Women: 5.8%)

- Tibia: Anterior tuberosity (Men: 15.1%, Women: 5.8%). Soleus line (Men: 7%, Women: 3.5%)

- Calcaneal: Spur (Men: 16%, Women: 8%). Triceps insertion (Men: 18%, Women: 4.5%).

In the femur, patella, and tibia, these are due to muscle insertions, and the calcaneal spur is due to the insertion of the plantar fascia. Pathologies of some of these entheses are relatively common, such as trochanteritis, Osgood-Schlatter disease, or calcaneal spur. Understanding these areas is essential for traumatologists and physical therapists, as well as the biomechanics of these musculoligamentous structures.

PO-79 - THYROGLOSSAL DUCT CYST: ANATOMY, DEVELOPMENT, AND DIAGNOSIS IN MOTION

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A thyroglossal duct cyst forms due to the persistence of the thyroglossal duct. Embryologically, the thyroid gland originates from an endodermal proliferation at the floor of the primitive pharynx, located between the first and second branchial arche where the foramen cecum will later be found. It typically descends anterior to the hyoid bone and thyroid cartilage to reach its final position at the level of the second tracheal ring, forming the thyroid gland. It has also been shown that the migration of these cells may occur posterior or through the hyoid body.

Thyroglossal duct cysts are the most common benign congenital neck lesions in the pediatric population, accounting for 70% of cases. Malignant transformation is rare, occurring in less than 1% of cases (typically into papillary thyroid carcinoma). Cyst location is distributed as follows: 50% are adjacent to the hyoid bone, 20–25% are suprahyoid, and 25% infrahyoid. In the presence of a cervical cystic lesion, it is essential to distinguish between congenital (typically benign, pediatric) and acquired lesions (usually inflammatory or neoplastic in adults). Accurate diagnosis relies on thorough physical examination and precise anatomical localization, supported by imaging studies such as ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI). The differential diagnosis should include: branchial cleft cysts, Delphian lymphadenopathy, epidermoid cysts, thyroid neoplasms, ranulas, and laryngoceles.

Treatment is curative and involves complete surgical excision of the cyst and tract using the Sistrunk procedure (USA, 1880–1933), which includes removal of the central portion of the hyoid bone and resection of the tract up to the base of the tongue.

PO-80 - ECOANATOMY IN THE DISSECTION ROOM: A MODEL OF EDUCATIONAL INNOVATION FOR RHEUMATOLOGY (2010–2016)

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Between 2010 and 2016, the Department of Anatomy at the University of Alcalá, and the Madrid Society of Rheumatology (SORCOM) developed a pioneering course in ecoanatomy. The objective was to integrate anatomical knowledge with ultrasound and injection techniques, bringing clinical training for rheumatology residents directly into the dissection room.

The weekend intensive course, held biennially, trained 40 rheumatology residents (3rd/4th year). Participants were divided into small groups rotating through stations covering:

- Upper limb (hand, elbow, shoulder)
- Lower limb (foot, knee, hip)

Under the guidance of anatomists and expert clinicians, residents performed ultrasound examinations and injections on cadaveric specimens, supported by a custom-designed pocket handbook developed for the course.

This model marked a qualitative leap in medical education by introducing ultrasound into the anatomy lab. The synergy between anatomists and rheumatologists fostered applied, in-depth understanding, proving to be a successful interdisciplinary collaboration for advanced specialist training and an innovative use of dissection facilities.

We express our deepest and most sincere gratitude to the Body Donors to Science. Their generosity and altruism are the essential pillar enabling advancements in medicine and the training of future generations of physicians.

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