13-15th
Nov. 2025

ICOCIMS

INTERNATIONAL STUDENT CONGRESS ON CLINICAL INNOVATION AND MEDICAL SCIENCES

Third edition

Abstract book

WELCOME LETTER

Dear ICOCIMS 2025 Participants,

On behalf of the Organizing Committee, we want to express our sincere gratitude to everyone who attended the third edition of ICOCIMS. Your active engagement and insights were central to the success of this year's conference, and we are incredibly grateful for your participation.

This third edition marked a pivotal milestone for ICOCIMS as the congress continues to grow in both scale and international impact. We were thrilled to welcome an exceptional number of global attendees representing a diverse array of biomedical science fields, and it is our hope that the conference continues to expand along this trajectory, fostering deep cross-disciplinary collaboration.

Your active participation was vital to this success. We recognize the substantial logistical challenges many of you navigated to be here, including securing funding, obtaining visas, and managing long-distance travel. Your dedication is deeply appreciated, and we sincerely hope that the knowledge acquired and the professional networks established during the conference will yield significant long-term value for your career.

In designing this year's schedule, our objective was to curate a comprehensive program rich in activities that would both inspire you and deliver distinct educational value. Through a combination of specialized workshops, keynote lectures from esteemed experts and highly interactive sessions, we aimed to maintain the highest possible scientific standard. Crucially, by providing a dedicated platform for early-career researchers to showcase their work via oral and poster presentations, we sought to foster the future of our field. We sincerely thank you for the high level of interest and engagement you demonstrated throughout the three days.

Beyond the scientific program, we trust that our social events, including the welcome aperitivo, the Friday night out, and the activities during session breaks, provided you with memorable moments and the opportunity to cultivate lasting connections within the international biomedical community.

This achievement relies entirely on collective effort. We extend our sincere thanks to our generous sponsors, our dedicated volunteers, and the organizing team working behind the scenes. Most of all, we thank you, the participants, for bringing your energy to the conference.

With heartfelt appreciation,

The ICOCIMS 2025 Organizing Committee

ACKOWLEDGMENT

Transforming a vision into reality requires a genuinely collaborative effort. We want to extend our sincere appreciation to the speakers, sponsors, volunteers and organizers who invested their time and knowledge into this event. Your active support and encouragement were the foundation of this year's congress. We are particularly grateful to:

- Prof. Luca Ampollini
- Prof. Giovanni Francesco Basini (and the Dipartimento di Giurisprudenza, Studi Politici e Internazionali)
- Dr. Alessandro Bernazzoli
- Prof. Stefano Bettati
- Dr. Angela de Bellis
- Dr. Dario Bottignole
- Prof. Ovidio Bussolati
- Prof. Sebastiano Buti
- Prof. Davide Carino
- Prof. Cosimo Costantino
- Prof. Antonio D'Aloia
- Prof. Michele Maria Dominici
- Dr. Fabrizio Fornaro
- Dr. Nicola Gaibazzi
- Dr. Giampietro Giudice
- Dr. Giovanni Guareschi
- Dr. Elia Indrigo
- Dr. Sonya Lanfranchi
- Prof. Paolo Martelli (Magnifico Rettore)
- Prof. Elena Masselli
- Dr. Riccardo Mazzoli
- Miriam Pallavicini
- Prof. Giorgio Pelosi
- Andrea Perrone
- Dr. Maddalena Pettenati
- Prof. Alessandro Pezzini
- Dr. Pietro Schianchi
- Prof. Ignazio Stanganelli
- U.O. Vigilanza e Logistica (Institutional unit)
- Prof. Giuseppe Vignali
- Dr. Maria Teresa Zanelli

(in alphabetical order)

We extend our sincere apologies if anyone who supported or endorsed our initiative is not specifically accredited here. Your contribution is truly valued and we appreciate your understanding.

Acknowledgment to Our Advisory Board

Behind every successful student-driven initiative stands a network of mentors who help elevate ambitious concepts into meaningful experiences. While this congress is entirely managed and led by students, its foundation is reinforced by the expertise and strategic vision of our Advisory Board. This group of distinguished academics is instrumental in shaping the scientific identity and long-term continuity of the event. We proudly ackowledge our supporters:

Prof. Elisa Araldi, Ph.D., Professor of Biochemistry at the University Parma, Human Technopole, and University Medical Center Mainz

Prof. Marco Falasca, Ph.D., Professor of Biochemistry at the University of Parma

Prof. Pier Giorgio Petronini, Ph.D., Professor of Pathology at the University of Parma

Our sincere thanks go to these mentors for investing in our potential and guiding our efforts. Their support has been instrumental in transforming a student-run initiative into a scientifically grounded platform for learning and collaboration.

Acknowledgment to our Judges, Moderators and Reviewers

Maintaining a rigorous scientific standard has always been a core priority for this conference. We extend our sincere thanks to our judges, who faced the difficult task of identifying the most outstanding presentations among an exceptionally competitive field of participant research. We are equally grateful to our moderators for guiding insightful discussions and driving meaningful dialogue during our sessions. Finally, we thank our reviewers, whose year-round commitment to evaluating abstracts ensured a high-caliber program. Your expertise is invaluable, and we are deeply grateful that you dedicated time from your demanding schedules to support this student-led initiative; the scientific integrity of this event would not be possible without your contributions.

Our Judges: Dr. Dario Bottignole, Dr. Antonio Crocamo, Prof. Lisa Elviri, Prof. Marco Falasca, Dr. Francesca Ferroni, Prof. Ruben Foresti, Prof. Federica Gaiani, Prof. Marzio Gerbella, Dr. Elia Indrigo, Dr. Giacomo Iovane, Prof. Stefano Kayali, Prof. Carlo Pellegrino, Prof. Pier Giorgio Petronini, Dr. Prisca Tamarozzi, Dr. Marina Valente.

Our Moderators: Dr. Massimiliano Baroni, Prof. Michele Miragoli, Dr. Matteo Panizzi, Prof. Paolo Perini.

Our Reviewers: Prof. Elena Giovanna Bignami, Dr. Dario Bottignole, Dr. Marta D'Angelo, Prof. Stefano Kayali, Prof. Giuliana Lo Cascio, Dr. Riccardo Mazzoli, Dr. Rebecca Navacchi, Prof. Antonio Nouvenne, Prof. Paolo Ossola, Prof. Pier Giorgio Petronini, Prof. Francesco Potì

Acknowledgment to Our Speakers

We are deeply grateful to the eminent speakers who contributed to the academic depth of this congress. Your willingness to share groundbreaking insights and specialized expertise across our keynotes and workshops created an exceptional learning environment. Thank you for investing your time in our community and for playing such a vital role in the success of this edition.

Acknowledgment to the University of Parma

Furthermore, the Organizing Committee wishes to extend its heartfelt thanks to the University of Parma for its generous financial, logistical, and academic commitment, which once again demonstrates its steadfast dedication to fostering student-driven initiatives. We owe a special tribute to the Department of Medicine and Surgery—including its faculty, technicians, and staff—for providing invaluable guidance and collaboration throughout this process. In particular, we want to recognize the Department Director, Prof. Stefano Bettati, for his exceptional dedication and trust in our efforts. We are also immensely grateful to Pietro Schianchi, whose instrumental support was vital to the success of this event. Above all, our deepest appreciation is reserved for the Rector Magnificus of the University of Parma, Prof. Paolo Martelli, whose vision, encouragement, and unwavering support have served as a pillar of strength for our project since its very first steps.
To everyone who has contributed, in ways both visible and behind the scenes, we offer our sincerest thanks.

PARTNERS

Annual International (Bio)Medical Students' Meeting

AIMS is a premier global event for medical and biomedical students, taking place in Lisbon, Portugal. This renowned congress brings together students, healthcare professionals, and researchers for an enriching experience that includes keynote lectures, interactive workshops, and dynamic discussions.

Leiden International (Bio)Medical Student Conference

Our partner LIMSC is a pinnacle in (bio)medical events taking place at Leiden University Medical Center, Netherlands. It will carry on its legacy of excellence established in 1999. Renowned for its global reach, their last in-person event hosted 720 participants from 70+ countries, showcasing a commitment to fostering international collaboration and cutting-edge biomedical discussions.

International Medical Students' Congress of Bucharest

IMSCB brings together medical students, professionals, and researchers from around the world for a dynamic program filled with keynote lectures, workshops, and roundtables. Participants will have the opportunity to deepen their medical knowledge, develop practical skills, and engage in meaningful discussions with experts in the field.

International Student Congress Of (bio)Medical Sciences

ISCOMS is one of the world's leading student congresses in the field of (bio)medical sciences. Students from around the globe have the unique opportunity to present their research. A wide variety of lectures will be

delivered by prominent scientists, including Nobel Prize winners. The conference takes place at the University Medical Center Groningen (UMCG).

Student Congress of Neuroscience, University of Rijeka

NeuRi, is a leading student conference that delves into the forefront of neuroscience. Set against the stunning backdrop of Rijeka, Croatia, NeuRi promises a unique blend of cutting-edge research, insightful discussions, and networking opportunities for participants passionate about the complexities of the human brain.

Oporto Biomedical Summit

Oporto Biomedical Summit takes place in the vibrant city of Oporto (Portugal), promising an immersive experience in the latest advancements in the biomedical field. Their dynamic event, aimed at student from different paths, combines insightful discussions, groundbreaking research, and unparalleled networking opportunities.

Medicalis Congress, University of Cluj-Napoca

Medicalis is an annual International Congress held in Cluj-Napoca, Romania, uniting both local and international students from various medical universities, along with young doctors eager to enhance their medical expertise. The event offers a range of opportunities, including workshops and organized conferences. It also features social events that foster connections among attendees from around the world.

MoReMED, University of Modena and Reggio Emilia

The MoReMED Congress has the objective of reshaping medical education and residency training. Organized by and for medical students and young doctors, it offers a dynamic space to explore modern challenges in healthcare, from digital innovation to interdisciplinary teamwork, through workshops, talks and networking.

International Conference for Healthcare and Medical Students, Royal College of Surgeons in Ireland

The International Conference for Healthcare and Medical Students (ICHAMS) is the first student-focused conference of its kind in Ireland. The congress has several goals: to provide healthcare students the opportunity to present their research findings in an international setting, to provide a platform for career development, to promote interactions among healthcare students from different countries and the exchange of research knowledge and to educate healthcare students on the importance of research and expose students to future research opportunities.

International Student Congress, Medical University of Graz

The International Student Congress (ISC), is a premier platform for students in medicine, pharmacy, nursing, life sciences, and allied health sciences. It offers a unique opportunity to exchange ideas, network, and develop essential hard and soft skills in a welcoming and dynamic environment. Renowned as one of Europe's top-rated medical student congresses, the ISC stands out not only as Austria's largest event of its kind but also for its impressive reach, with a growing online community of over 7,000 followers.

Riga Stradiņš University International Student Conference

The Riga Stradiņš University International Student Conference in "Health and Social Sciences" is a two-day conference that will be held in Riga, Latvia. It is a valid opportunity for student research exchange and to broaden social and scientific networks. The event has a very wide programme, including oral, poster and case report sessions, that students can present in the front of an international and professional audience, lectures and hands-on workshops addressed to local and international students.

International Medical Students' Conference, Jagiellonian University in Krakow

IMSC is one of Europe's oldest and most prestigious scientific events for young researchers.
A team of 60+ volunteers organizes the event, which also offers hands-onworkshops in echocardiography, ultrasound, laparoscopy, surgical suturing, and medical communication. Participants gain practical skills under expert guidance, bridging theory and practice.

SURGICON, Romanian Student Society of Surgery

The Romanian Student Society of Surgery is a non-governmental organisation, sustained by a group of medical students who share the same passion for surgery and are driven by a common goal: to ensure that their community has all the tools required to provide society with elite practitioners in the years to follow.

Young European Scientist Meeting, University of Porto

The YES (Young European Scientist) Meeting is an international conference organized by students from the Faculty of Medicine of the University of Porto, in Portugal. Its major goal is to provide a global platform of scientific and cultural exchange to biomedical students all over the world. Any student interested in learning about cutting-edge innovations may attend the conference and enjoy the Scientific and Workshops Programme, present their work in the Scientific Competition, participate in the Clinical Competition, as well as have the opportunity to visit the beautiful city of Porto.

AISFA Parma

The aim of the Italian Association of Pharmacy Students is to create a network of university students belonging to the Department of Pharmaceutical Sciences, training them and informing them about both the university pathway and the world of work through collaboration with the various local and other professional associations, taking advantage of the projects that the association carries out: the organization of scientific conferences/meetings as well as social events and visits to workplaces in the pharmaceutical sector.

Youth STEM Initiative

Youth STEM Initiative is a student-led scientific organization founded in Vancouver, Canada that is dedicated to showcasing the work of young science scholars and promoting STEM education through impactful content and initiatives that connect STEM-inspired youth from around the world.

INVITED SPEAKERS

Key Note Lectures

Prof. Michele Conti, University of Pavia

Prof. Michele Conti is currently a Professor of Bioengineering at the University of Pavia. He was the recipient of the European Society of Cardiology (ESC) Research Grant in 2016 and serves as the President of the Italian Chapter of the European Society of Biomechanics (ESB-ITA). He conducted advanced research on computational fluid dynamics of carotid arteries at the University of California, San Diego (USA) and has been actively involved in numerous international collaborations.

Prof. Conti is a reviewer for several leading peer-reviewed journals, including “Journal of Biomechanics”, “Medical Engineering & Physics”, and “Computer Methods in Biomechanics and Biomedical Engineering”. He has also served as a project reviewer for the Natural Sciences and Engineering Research Council of Canada (NSERC). He is the co-founder of P4P srl, a biomedical start-up company focused on innovation in personalized medicine and computational biomechanics.

Prof. Eride Quarta, University of Parma

Prof. Eride Quarta is an Assistant Professor of Pharmaceutical Technology at the University of Parma. She obtained her Ph.D. through a joint program with the University of Alberta (Canada), strengthening her international research profile.

Her work has been recognized with several awards, including Best Poster Award at the European Federation for Pharmaceutical Sciences Annual Meeting (2019, Frankfurt), and multiple Travel Grants for scientific events at Trinity College Dublin and the University of Groningen.

She was selected to participate in international innovation programs, such as the Business Match USMAC Silicon Valley Program (2019) and the Talent Open Innovation PhD Program (2020, Italy). Her research focuses on the design and development of innovative drug delivery systems, including micro- and nano-scale formulations using particle engineering technologies (e.g., spray drying, lyophilization, crystallization), with applications in repurposing orphan drugs and inhalable therapies.

Prof. Roberto Casale, Scientific director of OPUSmedica

Prof. Roberto Casale is a neurologist, anesthesiologist, and expert in pain medicine, with a Ph.D. in Advanced Rehabilitation Technologies from the University of Rome Tor Vergata. He currently serves as Scientific Director of OPUSmedica, an Italian organization dedicated to fighting and relieving chronic pain of any type and origin.

Prof. Casale as extensive experience in clinical neurophysiology and rehabilitation. He is a member of several international scientific societies, including the International Association for the Study of Pain (IASP) and the European Society of Physical and Rehabilitation Medicine (ESPRM).

His scientific interests focus on the neurological diagnosis of pain, rehabilitation of chronic disabling pain, and the neurophysiology of nociception, with special emphasis on neuropathic pain, fibromyalgia, and non-pharmacological pain management strategies. Prof. Casale has been actively involved in European research networks and international educational activities in the field of pain medicine.

Career Talks

Chiesi Farmaceutici S.p.A.

Chiesi Farmaceutici S.p.A. is a leading Italian multinational biopharmaceutical group, headquartered in Parma, Italy. The company operates in over 100 countries, with more than 30 affiliates, and it is globally recognized not just for its pharmaceuticals, but also for its commitment to sustainability.

Join experts from Chiesi Farmaceutici at this Career Talk to explore the diverse and dynamic career paths available within a major pharmaceutical or biotech group. This session is designed to broaden your perspective, exploring essential roles outside of pure research and offering concrete inspiration for careers beyond the classical professional paths. Hear firsthand accounts of career progression and practical advice on how to transition your skills into high-impact roles across the industry.

Matteo Angelini

In this session, Matteo Angelini will share his journey as an Italian medical student who pursued research and clinical training across leading international institutions, including Amsterdam UMC, Massachusetts General Hospital and the University of Pittsburgh. Drawing from his experiences in plastic and gender-affirming surgery, developmental biology and surgical outcomes research, he will discuss how going abroad transformed his academic and professional journey.

He will share practical insights on how to find research and clinical opportunities abroad, build an international network, and develop a global career perspective also at young stages of your education.

Francesca Romana Centini

Francesca Romana Centini is a medical student and a young researcher with a passion for neuroscience. Her interests focus on consciousness and the neural circuits that support creativity, with the goal of building concrete connections with neurotechnology. She has worked within the startup ecosystem and is currently a Founder's Associate, a role in which she integrates research, product, and communication. Alongside the scientific dimension, she has always maintained an artistic practice: she is a classical guitarist, a visual artist (her latest collaboration was for the Italian Tech Week), a photographer, and an author. She founded The Modern Renaissance, a mentoring and learning environment for people with multiple passions, where exchange and collaboration become the methodology. Everything she does stems from a great passion and an authentic love for life.

Dario Bottignole, European MD/PhD Association (EMPA)

Medical progress relies on ethical and innovative research, driven by dedicated physician-scientists who connect discoveries made in the laboratory with care delivered at the bedside.

In recent years, their numbers have been declining, prompting universities to create MD/PhD programs that integrate research training within medical education.

These programs aim to nurture a new generation of clinician-researchers capable of advancing science and improving patient outcomes.

Founded in 2012, the European MD/PhD Association (EMPA) brings together students and professionals from across Europe, promoting collaboration, exchange, and advocacy for the essential role of physician-scientists in shaping the future of medicine.

Workshops

From Research to Responsibility, Chiesi Farmaceutici S.p.A.

During the seminar, we will show how Chiesi Farmaceutici embeds sustainability as an integral part of its business strategy. As a Benefit corporation that measures its performance through the B Corp framework, Chiesi strives to integrate environmental, social, and governance

principles into every level of decision-making, creating shared value for patients, people, and the planet. Through tangible examples from Research & Development and Manufacturing, we will illustrate how a pharmaceutical company can, and must, combine scientific ambition with positive societal impact, making sustainability not just a goal, but a purposeful way of doing business.

The seminar will take its roots in the 2024 Chiesi Sustainability Report

(chiesi.com/img/annual_report/documenti/8_2025-chiesi-sustainability-report-2024.pdf).

ECG Interpretation, by Prof. Antonio Crocamo

This workshop will equip you with a step-by-step approach to ECG interpretation.

It will begin with a quick review of cardiac electrophysiology, followed by a clinical focus about how to recognize critical signs. The workshop concludes with an interactive practical session, in which you will analyze real ECG tracings to diagnose and act like a future doctor. Prepare to build your confidence for cardiac emergencies!

Ethics in Practice, by Prof. Annalena Venneri

This dynamic workshop will challenge you to engage directly with real-world ethical dilemmas, preparing you to navigate the moral complexities of your future clinical practice. You'll analyze clinical case studies and engage in discussions to determine the best course of action for each scenario. Prepare to think like an ethical leader and strengthen the moral compass required for your future professional practice!

Hands-on Thorax, by Dr. Luca Musini

This engaging workshop offers a dive into the management of key pleural conditions.

It begins with an anatomical overview, followed by a presentation on the mechanisms behind lung and pleural issues, such as fluid accumulation (pleural effusion) and lung collapse (pneumothorax).

The final part will be a hands-on practical session, to put theory into practice and learn like a future surgeon.

Surgical Suture Training, by Segretariato Italiano Studenti in Medicina

This workshop provides step-by-step guidance in essential suturing methods, knot-tying and wound closure. You'll be taught how to build precision and confidence, preparing for real-world applications.

Wheter you're a medical student, healthcare professional, or simply curious about surgical techniques, join it to gain a practical and empowering skill set!

Thinks Like a Clinician, by Prof. Marcello Maggio

During this workshop, you'll have the opportunity to analyze real clinical cases and to try determining the best therapy and management plan for the patient, as an expert clinician would do. This experience will strengthen your clinical reasoning skills and you'll learn how to think like a seasoned professional!

Designing Data-Driven Studies in Biomedical Research, Prof. Carlo Galli

This interactive workshop introduces participants to the essential principles of designing robust, data-driven studies in biomedical research. Through guided exercises, students will learn how to transform broad scientific ideas into testable questions, define measurable outcomes, and outline reproducible experimental designs—whether clinical, preclinical, or in vitro. Emphasis will be placed on critical reasoning, research transparency, and the intelligent use of data in modern biomedical inquiry.

Navigating Clinical Risk, by Prof. Valentina Bugelli, Marcello Seligardi and Francesco Calabroò

This workshop provides a look into real-life medical malpractice cases, giving you the opportunity to strengthen your understanding of risk, professional responsibility, and patient safety. You'll gain firsthand experience by actively analyzing clinical files and engaging in guided discussions to dissect complex situations.

Prepare to think critically and step confidently into the clinical world!

Mastering Academic and Grant Writing, Prof. Elisa Araldi, Prof. Orsola Di Martino, Dr. Riccardo Manca

This workshop will equip you with the essential strategic and technical skills needed to secure funding and publish successfully.

You'll focus on persuasive argumentation, structured narrative, and clarity of impact. Learn about grant calls and how to translate research into compelling prose. You will leave with a systematic approach to writing a clear, confident, and winning proposal!

Clinical Skills, by Margherita Masotti and AMBOSS

AMBOSS is your all-in-one hub for medical knowledge: a dynamic platform that connects classroom learning with real-world clinical application.

This workshop will showcase how to make the most of AMBOSS's integrated tools, including its comprehensive knowledge library and collection of case-based questions. You'll discover strategies to strengthen your clinical reasoning and critical thinking skills, learning how to connect theory and practice during your medical journey.

Roundtable Discussion

Moderator: Dr. Massimiliano Baroni, Ph.D.

Prof. Arianna Degliati, Ph.D.

Dr. Matteo Panizzi, M.D.

Dr. Michele Russo, M.D.

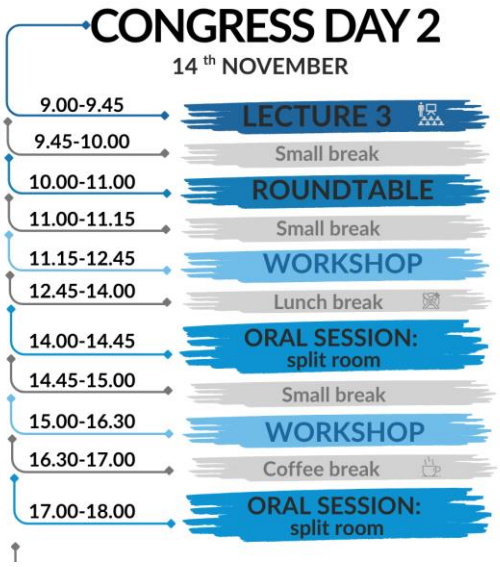
Prof. Andrea Prati, Ph.D.

Prof. Giancarlo Condello, Ph.D.

During the Roundtable discussion, experts from different fields discussed the topic of "Al in Biomedicine: Applications and Ethical Issues".Each professor brought their point of view based on their research, backgrounds and different areas of expertise, creating a dynamic and engaging conversation on this relevant topic

SCHEDULE


CONGRESS DAY 1
13 th NOVEMBER
10.00-13.00
REGISTRATION
13.00-14.30
Opening ceremony
14.30-14.45
Small break
14.45-15.30
LECTURE 1
15.30-16.00
Coffee break
16.00-16.45
LECTURE 2
16.45-17.00
Small break
17.00-18.00
PLENARY ORAL SESSION


CONGRESS DAY 2
14 th NOVEMBER
9.00-9.45
LECTURE 3
9.45-10.00
Small break
10.00-11.00
ROUNDTABLE
11.00-11.15
Small break
11.15-12.45
WORKSHOP
12.45-14.00
Lunch break
14.00-14.45
ORAL SESSION: split room
14.45-15.00
Small break
15.00-16.30
WORKSHOP
16.30-17.00
Coffee break
17.00-18.00
ORAL SESSION: split room


CONGRESS DAY 3
15 th NOVEMBER
9.00-10.30
POSTER SESSION
10.30-12.00
WORKSHOP
12.00-12.30
CARRER TALKS
13.00-14.30
Awards and Closing ceremony

ORAL SESSION ABSTRACTS

Oncology

Combined inhibition of glycolysis and permeabilisation of lysosomes in melanoma therapy: in vitro study

Lena Arandjelovic (1)*, Milos Mandic (1), Ljubica Vucicevic (2), Maja Misirkic Marjanovic (2), Ljubica Harhaji-Trajkovic (2), Vladimir Trajkovic (1) *lenaarandelovic@gmail.com

1) Institute of Microbiology and Immunology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia;

2) Institute for Biological Research “Sinisa Stankovic” — National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

Background Melanoma is an aggressive form of skin cancer, known for its high metastatic potential and resistance to conventional therapies [1]. Melanoma cells are characterised by distinct metabolic features, such as upregulated aerobic glycolysis and possession of enlarged lysosomes, which are particularly sensitive to membrane permeabilization [2,3]. Therefore, a therapeutic approach that targets both the glycolytic pathway and lysosomal integrity may provide a promising new strategy for melanoma treatment. The aim of this study was to investigate the combined effect of inhibiting glycolysis and inducing lysosomal destabilisation in the human melanoma cell line A375.

Materials and methods The human A375 melanoma cell line was cultured in high glucose DMEM medium. Shikonin was used to inhibit glycolysis, while chloroquine was applied to inhibit lysosomal acidification and induce lysosomal destabilisation [2]. The cytotoxicity of the inhibitors was assessed using crystal violet (CV) staining and the mitochondrial dehydrogenase reduction (MTT) assay, with the combined effect analysed using α index [3]. The morphology of A375 cells was subsequently examined with light microscopy. To determine the type of cell death (apoptosis or necrosis), cells were stained with annexin/propidium iodide and analysed using flow cytometry. Statistical analysis was performed using the Student's t-test.

Results The results of MTT and CV assays demonstrated that both shikonin and chloroquine significantly reduced the viability of A375 cells. The combined treatment exhibited a stronger cytotoxic effect compared to the individual treatments across all tested doses. α index analysis confirmed the synergistic effect of shikonin and

chloroquine in the killing of A375 cells. Additionally, morphological and flow cytometry analysis revealed that this combination induces apoptotic cell death.

Conclusion The selective inhibition of glycolysis with shikonin and chloroquine-mediated lysosomal destabilisation synergistically induce apoptosis in A375 melanoma cells, underscoring the potential of this combined treatment in melanoma therapy.

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From mood stabilizers to chemotherapeutics: assessment of the antineoplastic and antioxidant effects of Lithium and Selenium treatment in central nervous system tumor models

Alicja Szklarska (1), Dorota Luchowska-Kocot, PhD (2)

1. Student Research Group ISOMERS at the Department of Medical Chemistry, Medical University of Lublin, Lublin, Poland

2. Department of Medical Chemistry, Medical University of Lublin, Lublin, Poland

Background Lithium is widely used in psychiatry, serving as a first-line mood stabilizer in therapy of bipolar disorder and treatment-resistant depression [1], demonstrating high treatment efficacy but causing oxidative stress-related side effects during prolonged administration [2]. Several studies confirm the effectiveness of Lithium therapy not only in psychiatric disorders, but also in treatment of neoplasms, including leukemia [3], however its impact on central nervous system (CNS) tumors remains underexplored. Selenium, an antioxidant, has been proposed to decrease Lithium-induced oxidative damage [4,5]. Furthermore, recent studies indicate that micronutrients such as Selenium may offer therapeutic benefits in the management of brain tumors, including glioblastoma, which remains the most aggressive primary brain tumor in adults [6]. This study evaluates Lithium and Selenium effects in various brain tumor cellular models: two glioblastoma models and one model of glioma, assessing the antineoplastic potential and measuring the oxidative stress parameters of the therapy used.

Materials and methods Glioblastoma cell lines LN-229 and LN-18, and GAMG glioma cells were cultured in Dulbecco's Modified Eagle's Medium (DMEM) with 100 U/ml penicillin and 100 U/ml streptomycin in an incubator with 5% CO2 at 37°C. Hippocampal HT-22 cells served as a control group and have been cultured under identical conditions. The cells were treated with Lithium Chloride (5-100mM) and Sodium Selenite (2μM-1mM). Cellular activity was measured using the MTT assay to determine the half-maximal inhibitory concentration (IC50) values for each substance. Subsequently, the co-treatment combining IC50 Lithium Chloride with Sodium Selenite (5, 10, 50, 100 μM) was performed. Antineoplastic effects of the treatment were evaluated measuring matrix metalloproteinases MMP-2 and MMP-9 activity. Oxidative stress was assessed through glutathione peroxidase (GPx) and malondialdehyde (MDA) concentrations. Total antioxidant status was measured using ferric reducing antioxidant power (FRAP) assay.

Results Lithium inhibited tumor cell growth across all tested doses, however the IC50 values were higher for the glioblastoma cells than for the physiological cells. It was established that Lithium has negative effects on the oxidative system, which was considered statistically significant especially in the glioblastoma cells. The addition of Selenium to Lithium treatment not only stopped the decreasing trend of FRAP, but also

resulted in its significant improvement in the control group whereas in the tumor cells a further decrease of its values was observed. Selenium, even in low concentrations (10 μM), improved the antioxidant parameters and reduced MMP-2 and MMP-9 activities. Combined Lithium and Selenium synergistically suppressed tumor proliferation and invasiveness while attenuating oxidative stress.

Conclusion Lithium demonstrates antitumor efficacy against CNS tumor cells, though elevated IC50 values relative to physiological cells suggest the need for adjunct neuroprotection. The positive effects of Selenium administration on the antioxidant system indicate that it could become such an agent, which might be taken into consideration in creating new tumor treatment strategies, however these assumptions require confirmation in further research.

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Targeted Diosgenin Delivery Using Chitosan-Folate Modified PLGA Nanoparticles: A Novel Strategy Against Breast Cancer

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Background Since diosgenin is a verified steroidal saponin with anticancer activity [8–10], it is restrained in clinic application by poor bioavailability as well as poor water solubility [7, 8]. We therefore designed folic acid-guided poly(lactic-co-glycolide) (PLGA) nanoparticles surface-modified with folic acid and chitosan (Da-PFC-NPs) to guide diosgenin for breast cancer [3, 5, 6, 11–13, 19].

Materials and methods Nanoparticles exhibited spherical morphology, 218 nm particle size, and 0.41 polydispersity index with homogeneity and stability [3, 5]. Mice were utilized for the in vivo study, separated into four groups of n = 5 each: healthy control, tumor-bearing control, and treated with Da-PFC-NPs at 50 and 100 mg/kg body weight. Induction of breast cancer was carried out by Tubo cells by subcutaneous injection [18] followed by intraperitoneal injection daily of nanoformulized particles for 28 days.

Results From the outcomes, it was clear that Da-PFC-NPs inhibited tumor growth at the treatment group compared to the control group. Biochemical examination revealed that treatment with nanoparticles changed the quantity of liver enzymes AST, ALT, ALP and regulated immune response with statistically significant variation in the quantity of IgA, IgG, and IgM [11, 12]. At the molecular extent, Da-PFC-NPs exhibited pro-apoptotic gene caspase-3 and down-regulated anti-apoptotic gene Bcl2, exhibiting apoptosis activation [10, 17, 21]. Additionally, oxidative stress genes such as GPx and SOD were expressed on increased scale in the liver, exhibiting increased antioxidant defense [14, 15].

Conclusion Findings of the current work establish the promise of utilizing chitosan-folate decorated PLGA nanoparticles and provide an encouraging approach of utilizing plant-derived compound with improved therapeutic effect in cancer therapy [1–4, 20].

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Biotechnology

New Biocompatible Cyanoacrylate and Polylactic Acid Hemostatic Patch: An In Vivo Proof of Concept Study

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Background Severe abdominal trauma is present in approximately 20% of polytrauma cases, with massive hemorrhage being the primary cause of mortality [1]. Achieving rapid and complete hemostasis is crucial, especially during resections of parenchymatous organs [3,4], where techniques such as direct compression [5], sutures [6], electrocauterization [7], and hemostatic dressings [8,9] are commonly employed. This experimental study aimed to develop a novel hemostatic dressing by combining the adhesive properties of cyanoacrylate (CA) with the biocompatibility of polylactic acid (PLA). The CA–PLA patch was assessed in terms of bleeding time, total blood loss, and inflammatory response, compared to electrocautery and the TachoSil® (Takeda GmbH, Linz, Austria) hemostatic patch.

Materials and Methods A hemostatic patch was developed by electrospinning PLA membranes and loading them with CA under sterile, inert conditions to ensure controlled polymerization and adhesive application. The experimental protocol involved a liver laceration model, using 36 male Wistar rats randomized into three groups (control C, study S, and TachoSil® T). A standardized liver resection was performed, followed by hemostasis achieved using one of three methods. The animal part of the experiment was approved by the Romanian ANSVSA—Sanitary Veterinary and Food Safety Department of Cluj through the project authorization No. 377/25.08.2023.

Results The CA–PLA patch achieved a median hemostasis time of 94 s, significantly shorter than electrocautery (256 s; $p < 0.001$) and TachoSil® (120 s; $p = 0.010$). Blood loss and postoperative hemoglobin decline were minimal in the study group compared with controls. Unlike TachoSil®, which showed a significant postoperative rise in IL-6 and TNF-α, the CA–PLA group demonstrated no significant cytokine surge, indicating a lower acute inflammatory response. At long-term follow-up, the CA–PLA group exhibited persistent moderate inflammation (median score 2) with FBGC formation in 64% of cases and extensive fibrosis in 79%, along with occasional abscess formation (29%). TachoSil®

showed progressive reduction in inflammation and lymphocyte infiltration over time and more mature neovascularization, suggesting superior remodeling compared to CA–PLA.

Conclusion The CA–PLA patch offers rapid, safe, and biocompatible hemostasis and reduces early systemic inflammation compared with standard techniques. However, long-term it may induce foreign-body reaction, fibrosis, and sporadic abscesses, raising concerns about biocompatibility. Further optimization and extended testing are essential before clinical application.

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In Vitro Preliminary Study on Macrophage Morphology and Protein Expression in Response to Polydioxanone Mesh for Soft and Hard Tissue Regenerative Applications

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Background Absorbable synthetic biomaterials, such as polydioxanone, have shown encouraging potential in guiding tissue regeneration. Materials that can be tailored in terms of physical and mechanical properties are particularly advantageous, as they influence cell behavior during and after coagulation, ultimately promoting regeneration. Macrophages are key regulators of tissue remodeling, and their polarization toward pro-inflammatory (M1) or anti-inflammatory (M2) phenotypes is strongly affected by both microenvironmental cues and biomaterial properties. Achieving a well-orchestrated balance of polarization is essential for functional remodeling. The aim of this study was to characterize macrophage morphology and protein expression when cultured on a 3D polydioxanone mesh in vitro.

Materials and methods Polydioxanone mesh samples (0.5 mm thick) were divided into three groups: M0, M1, and M2. Human THP-1 monocytes were seeded onto the meshes and differentiated into macrophages. M1 and M2 groups were further stimulated with cytokines to induce pro-inflammatory and anti-inflammatory phenotypes, respectively, and maintained for 72 and 96 hours, while M0 received no additional stimuli. Cell morphology and adhesion were assessed by scanning electron microscopy (SEM), and gene expression of pro-inflammatory markers (TNF-α, IL-8) and anti-inflammatory markers (IL-10, ARG-2) was evaluated by qRT-PCR.

Results SEM analysis showed macrophages adhering to the mesh surface, infiltrating through its filaments, and forming monolayers of juxtaposed cells. Cells displayed different degrees of elongation, possibly reflecting their polarization state. qRT-PCR revealed that TNF-α, IL-8, and IL-10 expression in M1 macrophages was lower compared to M0 and M2 at both time points. ARG-2 expression was increased in M1 at 72 hours but decreased at 96 hours.

Conclusion Polydioxanone mesh supports macrophage adhesion, infiltration, and differentiation, while enabling modulation of pro-inflammatory gene expression. These

findings suggest that polydioxanone mesh may represent a promising biomaterial for regulating inflammation and promoting tissue regeneration.

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Exploring the role of miR-205-5p in diabetic retinopathy

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Background Diabetic retinopathy (DR) is a leading cause of vision loss and one of the most prevalent microvascular complications of diabetes. Oxidative stress and aberrant angiogenesis, mainly mediated by vascular endothelial growth factor A (VEGFA) and hypoxia-inducible factor-1 alpha (HIF-1A), play crucial roles in its pathogenesis. MicroRNAs have emerged as essential post-transcriptional regulators involved in DR progression and may serve as therapeutic targets [1,2]. Among them, miR-205-5p has been implicated in oxidative and angiogenic pathways, influencing VEGFA regulation and neovascularization processes [3]. However, its specific function in DR remains poorly understood.

Materials and methods We investigated the expression and functional impact of miR-205-5p in human retinal pigment epithelial cells (ARPE-19) exposed to high-glucose conditions, in aqueous humour of diabetic patients, and in diabetic mouse models. miR-205-5p expression was quantified by RT-qPCR in aqueous humour and extracellular vesicles (EVs) obtained from diabetic and non-diabetic subjects were characterized using nanoparticle tracking analysis and transmission electron microscopy. For in vivo experiments, diabetic mice received intravitreal injections of a miR-205-5p mimic, and the expression of VEGFA and HIF-1A was determined by RT-qPCR and Western blot analysis. For in vitro studies, ARPE-19 cells were exposed to 35 mM glucose, followed by miR-205-5p mimic transfection, and functional assays for angiogenesis and migration were performed.

Results Diabetic mouse retinas treated with the miR-205-5p mimic showed a significant reduction in VEGFA and HIF-1A expression, confirming the regulatory role of this microRNA on pro-angiogenic and hypoxic signaling. Aqueous humour samples from diabetic patients showed a decrease in miR-205-5p levels compared with non-diabetic controls, while the overall concentration of extracellular vesicles was increased, suggesting an altered intercellular communication pattern under diabetic conditions. In ARPE-19 cells, preliminary data indicate that the effect of the miR-205-5p mimic persists for up to one

week, maintaining reduced VEGFA levels and decreased angiogenic potential under high-glucose conditions.

Conclusions Our findings suggest that miR-205-5p plays a protective role in diabetic retinopathy by modulating angiogenic and hypoxic responses. The consistent downregulation of VEGFA and HIF-1A following miR-205-5p mimic treatment in both in vitro and in vivo models highlights its potential as a therapeutic target. Taken together, these results suggest that miR-205-5p may also participate in cellular responses to hyperglycemia, possibly influencing extracellular communication. Ongoing work aims to further characterize the molecular mechanisms involved and to validate these effects across different experimental systems.

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Gastrointestinal Diseases

The Significance Of Determining HLA-DQAI Type In Children With Inflammatory Bowel Diseases

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Background Inflammatory bowel diseases (IBD), including Crohn's disease and ulcerative colitis, are multifactorial gastrointestinal disorders with increasing incidence in the pediatric population. Anti-TNF therapy has significantly improved treatment outcomes; however, its efficacy can be reduced due to the development of anti-drug antibodies, particularly in patients carrying the HLA-DQA1*05 allele. The PANTS study demonstrated that this genetic marker doubles the risk of therapy failure, highlighting the importance of early genetic testing in personalized treatment approaches. The aim: Investigation of association between the presence of HLA-DQA1*05 allele and the optimization of the therapy dose in children with inflammatory bowel diseases.

Material and methods The retrospective study included 40 children suffering from chronic inflammatory bowel diseases receiving biological therapy. The clinic-pathological parameters that were analyzed were: age, gender, disease phenotype, presence and type of HLA-DQA1 gene, used biological therapy and presence of drug dose adjustment.

Results In examined sample of 21 patients who received an optimized drug dose, 10 of them (47,62%) had HLA-DQA1*05 genotype. While in a sample of 19 patients whose drug dose was not optimized , presence of HLA-DQA1*05 was found in 7 (36,84%) patients. A higher frequency of HLA-DQA1*05 presence was observed in patients whose biological drug dose was optimized, but this difference was not statistically significant according to the results of the χ^2 test ($p = 0,4911$).

Conclusion Determining the presence of the HLA-DQA1*05 allele may be of the importance in planning the treatment plan for patients suffering from inflammatory bowel diseases, but it cannot be used with certainty as a parameter for predicting the need for drug dose optimization.

Keywords: chronic inflammatory bowel diseases, anti-TNF therapy, HLA-DQA1*05, pediatric population

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Single nucleotide polymorphisms as biomarkers of response to neoadjuvant chemoradiotherapy in patients with rectal cancer. a systematic review

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Background Neoadjuvant chemoradiotherapy (nCRT) is standard for locally advanced rectal cancer. However, only 15–30% of patients achieve pathological complete response (pCR). Reliable biomarkers predicting treatment response could optimize patient selection and reduce unnecessary surgical morbidity. Single nucleotide polymorphisms (SNPs) represent stable and accessible genetic markers with potential predictive value. This systematic review synthesizes current evidence on the association between SNPs and response to nCRT in rectal cancer.

Materials and methods This systematic review followed PRISMA guidelines and was registered with PROSPERO (CRD420251054562). PubMed and Web of Science were searched (May 17, 2025) using a combination of keywords and MeSH terms without filters. Eligible studies included adult patients with locally advanced rectal cancer undergoing nCRT, reporting SNPs in relation to pathological response. Data extraction included study design, patient characteristics, SNPs evaluated, genotyping methods, and treatment outcomes (pCR, tumor regression grade [TRG], downstaging).

Results Thirty-two studies with 4,116 patients were included. [1-32] A total of 304 SNPs in 126 genes were analyzed. Genes most frequently investigated were involved in DNA repair (XRCC1, XRCC3, ERCC1, ERCC2) and folate metabolism (MTHFR, TYMS). Only two SNPs were reported as predictive in more than one study: rs25487 (XRCC1) and rs1801133 (MTHFR). Associations were inconsistent across studies, with contradictory results for both variants. Most other SNPs showed isolated associations in single studies without replication. Overall, no SNP demonstrated robust predictive value across independent cohorts. Study heterogeneity, small sample sizes, varied treatment regimens, and inconsistent response definitions limited comparability.

Conclusions Current evidence does not support the clinical use of individual SNPs to predict nCRT response in rectal cancer. While XRCC1 and MTHFR polymorphisms are the most extensively studied, their predictive utility remains inconclusive. Future research should prioritize large, multicenter prospective studies with standardized treatment and

outcome definitions, and consider polygenic risk models or integrated multi-omic approaches.

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Neurosciences

Insulin Resistance's Surprising Role in Unraveling Neurodegeneration

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Background Insulin resistance, characterized by decreased cellular response to insulin, extends its impact beyond peripheral tissues, profoundly influencing central nervous system functions, shedding light on its negative implications for synaptic health, inflammation, energy metabolism and vascular function.

Materials and methods An extensive literature research was conducted across the public domains of Google Scholar and PubMed, reviewing 12 articles published between 2015-2023. Our inclusion criteria focused on studies investigating the impact of insulin resistance in the brain of both diabetic and non-diabetic adult patients, that presented symptoms ranging from short and long memory loss to Alzheimer's Disease. We analyzed data from over 130 non-diabetic patients, 9901 type 2 diabetic patients, and 244 patients with memory loss who underwent experimental intranasal insulin treatment. Exclusion criteria included patients under 50 years old and those with type 1 diabetes. Insulin resistance was confirmed in all patients using various methods such as: HOMA2, MRI, fluorodeoxyglucose PET-CT, genotyping, and immunohistochemistry.

Results The impact of insulin resistance on cognitive function has been proven as a key mechanism, having a significant influence by causing amyloid β protein accumulations, elevating tau protein concentration, and interfering in both inflammatory and vascular responses within the brain. These effects lead to synaptic deterioration, decreased brain plasticity and neuron degradation, causing irreversible brain tissue atrophy. It has been observed that diabetic patients have twice the risk of developing AD in contrast to normal elderly people.

Conclusion The results of our study emphasize how insulin resistance and related metabolic factors play a crucial role in neurodegeneration. Targeting these factors could be key to preventing brain degeneration and enhancing cognitive function. By investigating new treatment approaches and adopting lifestyle changes, we may be able to maintain healthy brain function and see positive outcomes in slowing cognitive decline.

Keywords: insulin resistance, neurodegeneration, Alzheimer's Disease, neuropathology

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Ultrasound Evidence of Vagus Nerve Involvement in SARS-CoV-2 Infection

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Background The vagus nerve plays a key role in the regulation of systemic inflammation through the inflammatory reflex arc. Sensory (afferent) vagus fibers detect cytokines in the periphery and send nerve impulses to the brainstem, activating parasympathetic (efferent) vagus fibers that suppress overactivation of the immune system by releasing acetylcholine in the spleen. This "vagal brake" maintains immune balance and prevents excessive cytokine production. Neuropathy or edema of the vagus nerve disrupts this mechanism, leading to a cytokine storm - specific to severe COVID-19. In addition to infection, the vagus nerve is affected in cardiovascular, metabolic and autoimmune diseases such as atherosclerosis, diabetes mellitus and Crohn's disease.

Materials and methods A prospective study was conducted between October 2021 and April 2022, including 68 patients (mean age 53.1 ± 14.3 years) with PCR-confirmed Delta variant of SARS-CoV-2 infection and 50 controls (mean age 22.7 ± 2.4 years). Exclusion criteria were chronic diseases or medication affecting autonomic function. High-resolution ultrasound (10–18 MHz linear probe) was performed bilaterally, with patients in lateral decubitus or supine position. The cross-sectional area (CSA) of the vagus nerve was measured at two levels: X1 – carotid bifurcation and X2 – cricoid cartilage. Each measurement was repeated by two independent operators. Data were analyzed using the Mann–Whitney U tests (IBM SPSS v26).

Results On the left side, there was no significant difference in X1 values ($p > 0.05$), while X2 showed a borderline increase in the COVID group ($p=0.05$). On the right side, both X1 and X2 were nearly doubled in COVID-19 patients compared to controls ($p<0.001$). Median CSA values were consistently higher in patients (Left X1: 0.77 vs 0.70 mm^2; Left X2: 0.87 vs 0.70 mm^2; Right X1: 1.20 vs 0.60 mm^2; Right X2: 1.30 vs 0.70 mm^2). This increase in CSA in patients, who were older compared to the control group, and where reduced CSA values are naturally expected, only further confirms the presence of vagal edema. Visual representatation of right-side measurements is available in Picture 1. (https://drive.google.com/file/d/1ryU9Afo83RyclkzyHMqaPWfGWjUDg6cC/view?usp=sharing)

Conclusion Ultrasound revealed enlargement of the vagus nerve in SARS-CoV-2 positive patients, most pronounced on the right side. While ultrasound cannot clearly separate the cause of vagal edema, the observed pattern strongly supports underlying vagal inflammation. These results confirm that vagal dysfunction contributes to the cytokine

storm and the severe clinical manifestations in SARS-CoV-2 infection. Given the role of the inflammatory reflex in many chronic diseases, these results may extend beyond COVID-19, offering opportunities for diagnostics, monitoring, and therapeutic interventions targeting vagal pathways.

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Combined microsurgical and endovascular treatment for intracranial aneurysms

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Background Cerebral aneurysms account for 70–80% of subarachnoid hemorrhage cases [1], representing a leading cause of premature mortality in neurovascular pathology. Microsurgical and endovascular techniques are often regarded as competing therapeutic modalities; however, a combined approach may be essential for optimal management of complex intracranial aneurysms. The purpose of this illustrative institutional case series is to highlight the individual performance and limitations of each treatment method.

Materials and Methods Three cases that underwent both surgical clipping and endovascular treatment between 2017-2019 were selected for this retrospective study, conducted at the "Prof. Dr. Nicolae Oblu" Emergency Clinical Hospital, Iaşi, Romania. The analysis focuses on patients with ruptured intracranial aneurysms who underwent an initial treatment that had failed. Two patients initially underwent endovascular treatment followed by microsurgical intervention, while the other one was first treated with surgical clipping and subsequently with endovascular embolization.

Results Upon admission, all patients had a Hunt & Hess score of 3. Cases 1 and 3 were classified as Fisher grade 2, and case 2 as grade 1. Based on the modified Rankin Scale (mRS), two out of the three patients had a score of 1, and one patient died (mRS 6).

Case No. 1: A 63-year-old man presented with a sudden headache following intense physical effort. Imaging revealed a ruptured aneurysm of the left anterior cerebral artery (A2 segment) and an unruptured aneurysm in the A3 segment. Initial endovascular coiling secured the ruptured aneurysm. Thirteen months later, the patient returned with a persistent headache. Imaging confirmed rupture of the A3 aneurysm, while the previously treated one remained occluded. Microsurgical clipping was performed with a favorable outcome and no neurological deficits at 13-month follow-up.

Case No. 2: A 58-year-old woman presented with moderate headache and aphasia. Computed tomography angiography depicted a partially thrombosed saccular aneurysm of the left middle cerebral artery (M1 segment), with a wide neck. Initial endovascular coiling resulted in a type IIIb Raymond–Roy occlusion. The patient recovered neurologically, although imaging showed a left putaminal ischemic area. At six-month follow-up, aneurysm repermeabilization and coil compaction with the development of an anteroinferiorly oriented aneurysmal dome were noted. Microsurgical clipping with an MCA–STA bypass was performed to preserve flow. Postoperatively, the patient experienced transient right hemiparesis, which resolved within 72 hours.

Case No. 3: A 50-year-old patient was admitted with severe headache and confusion. Imaging showed subarachnoid hemorrhage due to a multilobulated aneurysm of the left internal carotid artery (posterior communicating segment). Microsurgical clipping was performed, with an initial favorable evolution. On postoperative day 10, the patient developed experienced seizure and coma, caused by aneurysm repermeabilization and rebleeding. Endovascular coiling and external ventricular drainage were performed, but the patient's condition deteriorated, resulting in mortality.

Conclusion Despite the surgical tendency for minimally invasive procedures due to fewer complications and faster recovery, open surgery still represents an effective treatment, especially for complex aneurysms with calcified walls and thrombosis. To ensure durable occlusion and reduce morbidity and mortality, therapeutic strategies must be individualized based on patient profile and the team’s expertise.

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Does Neutrophil-to-Lymphocyte, Platelet-to-Lymphocyte, and Monocyte-to-Lymphocyte Ratios Influence Impulse Control Disorders in Parkinson's Disease? A Retrospective Study

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Background Impulse control disorders (ICDs) are among the significant complications of dopaminergic therapy in Parkinson's disease (PD), particularly with dopamine agonists (DAs). This study explores the relationship between hematological inflammatory markers—neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and monocyte-to-lymphocyte ratio (MLR)—and ICD development in PD patients treated with DAs.

Materials and methods Data from 156 PD patients, monitored at Eskisehir Osmangazi University's Movement Disorders Clinic between 2014-2024, were retrospectively analyzed. Patients were divided into two groups: those with ICDs (ICD+) and without ICDs (ICD-). Hematological parameters, demographic data, disease duration, levodopa-equivalent doses, and DA dosages were evaluated.

Results Results showed a significant association between ICD occurrence and higher DA doses, as well as longer disease duration ($p<0.05$). However, no significant differences were observed in NLR, PLR, or MLR values between ICD+ and ICD- groups ($p>0.05$). Additionally, hematological parameters did not correlate with DA dosages. While prior research highlights the potential role of peripheral inflammation in neuroinflammation, our findings suggest that peripheral blood markers may not reliably predict ICD risk in PD.

Conclusion The study underscores the need for further investigation into biomarkers for ICD prediction. Managing ICDs in PD patients may benefit more from dose adjustments and behavioral monitoring than from peripheral blood parameters.

https://drive.google.com/drive/folders/1jzGNNQl-IL2w_TrwdfhQ_9n_5dh6eeCR?usp=sharing

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Cognitive and behavioral profiles in Parkinson's Disease patients with comorbid constipation: a study of candidates for symbiotic therapy.

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Background Parkinson's disease (PD) is the second most common neurodegenerative disorder, with a significant prevalence in the elderly population. Although motor symptoms are mandatory for diagnosis, non-motor symptoms (NMS) progressively become more impactful on patients' quality of life. Among these, gastrointestinal (GI) disturbances, particularly constipation, hold clinical relevance as they can precede motor manifestations by up to twenty years, supporting the hypothesis of an intestinal-originating pathogenetic model for PD.

Materials and methods This study aims to evaluate the neurological and gastroenterological profiles of PD patients before (T0) and after (T1) the administration of the symbiotic Probinul, which includes probiotics (Lactobacilli and Bifidobacteria) and prebiotics (inulin, oligosaccharides, and vitamins). The symbiotic will be administered at a dose of four sachets per day for twelve weeks, with a final follow-up assessment conducted 12 weeks after its discontinuation (T2). Patients are selected among individuals aged 18 to 80 years, with stable motor symptoms and a diagnosis of Functional Constipation or Constipation-predominant Irritable Bowel Syndrome (IBS-C) according to the Rome IV Criteria. The clinical evaluation included specific neurological and gastroenterological tests. Plasma and fecal samples were collected and analyzed to study pro-inflammatory cytokines and the fecal microbiome. When feasible, colonoscopic biopsy samples were also obtained.

Results Preliminary results from the analyzed cohort (N=18) have highlighted a complex interplay between neurological and gastroenterological domains. Bivariate correlation analysis revealed significant associations between affective symptoms and GI disturbances, specifically higher levels of state anxiety (STAI-Y State) and depression (BDI-II) correlating with greater severity of gastrointestinal symptoms (SCOPA-AUT_Gastro, PAC-SYM). Furthermore, multivariate linear regression analysis provided a more specific framework, identifying global cognitive impairment (PD-CRS total score) and depressive symptomatology (BDI-II total score) as independent and significant predictors of a worsened gastrointestinal quality of life (PAC-QOL).

Conclusion These data suggest that both cognitive deficits and depressive disorders independently influence gastrointestinal well-being in PD patients.

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Influence of anemia on cognitive function in peritoneum dialysis patients.

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Introduction Cognitive disorders represent a significant health problem in patients on peritoneal dialysis, which can have a serious negative impact on the quality of life and the outcome of treatment. Therefore, early detection of risk factors for the development of cognitive disorders in these patients is extremely important.

Aims The study's aims were to examine the cognitive status of patients treated with peritoneal dialysis and to determine the correlation between that status and the sociodemographic characteristics of the patients and anemia.

Material and methods The study was designed as a cross-sectional study with a sample of 36 patients treated with peritoneal dialysis. The following research instruments that were used are the Montreal Cognitive Assessment (MoCA) and a general questionnaire for obtaining sociodemographic characteristics of patients on peritoneal dialysis. The presence of anemia was determined on the basis of the hemoglobin value.

Results The frequency of cognitive dysfunction in patients on peritoneal dialysis was 69.4%, while anemia according to hemoglobin values was present among 58.3% of patients. It was found that age, urban place of living, and low hemoglobin values are factors that are significantly associated with cognitive dysfunction in patients on peritoneal dialysis.

Conclusion Preserved cognitive abilities are an important precursor for adequate implementation of peritoneal dialysis and for preserving the patient's quality of life. Further research is necessary to identify appropriate strategies for the prevention and treatment of anemia as a factor that affects cognitive functions in these patients.

Keywords: Cognitive dysfunction; peritoneal dialysis; anemia; risk factors

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Surgery

Delayed management in patients with positive surgical margins (PSM) after robotic assisted radical prostatectomy (RARP), a retrospective study.

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Introduction Robot-assisted radical prostatectomy (RARP) represents the standard of care in otherwise healthy patients with localized prostate cancer. In the last decade the robotic approach has dramatically improved the outcome of surgery, leading to fewer complications, shorter hospital stay and quick recovery of functional status.

Patients with positive surgical margins in histopathology are candidates for adjuvant treatment such as radiotherapy (RT) or androgen deprivation therapy (ADT), which may affect quality of life more than radical surgery alone.

This study aimed to evaluate whether surveillance with delayed treatment in patients with positive surgical margins after RARP is a safe alternative to immediate adjuvant therapy, potentially reducing overtreatment and related side effects."

Materials and Methods After approval of the local ethic authority, a group of patients who underwent RARP in the University Hospital of Parma between the period of 2019 and 2023, after having PSM, were given the possibility of choice between immediate treatment (RT/ADT) or delayed treatment. Those who chose delayed treatment were strictly surveilled with PSA and DRE every 3 months in order to assess local/biochemical recurrence and were promptly treated in case of recurrence.

The patients in the delayed treatment group were prospectively observed in order to reveal the ability of surveillance and safely delay and possibly avoid adjuvant treatment in selected cases.

All cases were discussed within the local multi-disciplinary team (MDT) and all patients were counselled and consented before inclusion in the immediate or delayed treatment group.

Results Out of a group of 385 people that underwent RARP at our centre, 189 showed PSM at histopathology (49.1%). Out of them, 65 (34.4%) showed undetectable PSA levels during follow-ups. Among those who showed detectable PSA levels (>0.03 ng/mL), 39 (41.4% of the detectable group) decided to undergo immediate treatment with RT/ADT, while 56 (58.9%) chose to be included in the delayed treatment group. 13 patients (23.2%) in the delayed treatment group developed biochemical recurrence (PSA >0.2), which was followed by salvage radiotherapy. Follow up data of 29 patients are not available.

ISUP classification of recurrences is as follows: ISUP1: 3, ISUP2: 7, ISUP3: 3, ISUP4 and 5: 0.

The time of recurrence is as follows: 3 at 3 months, 4 at 6 months, 3 at 9 months, 2 at 12 months, 1 at 21 months. The median follow-up time was 24 months.

Statistical analysis, including survival curves and multivariable analysis, will be presented at the conference.

Conclusion Our data suggests that the finding of positive surgical margins (PSM) after RARP might not be considered as an absolute indication for RT and/or ADT. In our series positive margins did not seem to correlate with local or biochemical recurrence. We argue that in this subgroup of patients adjuvant treatment may be delayed. Waiting for the increase in PSA level before deciding for treatment did not affect the outcome of RT/ADT and showed to be safe and effective.

In selected and well counselled patients, delaying adjuvant treatment may help reduce the risk of treatment-related comorbidities after RARP.

References

EAU Guidelines, NCCN Guidelines

The Ripple Effects o f Parathyroidectomy: Kidney, Heart, and Mind in Primary Hyperparathyroidism

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Background Contemporary guidelines for managing asymptomatic primary hyperparathyroidism (PHPT) emphasize biochemical thresholds and structural complications as surgical triggers. Neuropsychological and cardiovascular symptoms, though acknowledged in literature, are considered too nonspecific or unpredictable to guide intervention. However, emerging evidence suggests that subclinical dysfunction, such as fatigue, memory disturbances, and diastolic abnormalities, may not only be common but also reversible after parathyroidectomy (PTX). This systematic review evaluates whether patients with biochemically mild or non-classical PHPT, currently overlooked by surgical criteria, derive systemic benefits from early surgery.

Materials and Methods This systematic review followed PRISMA guidelines. A comprehensive search was conducted in PubMed, Scopus, and Web of Science through April 2025, using the terms “primary hyperparathyroidism” and “parathyroidectomy” combined with “renal function,” “cardiovascular outcomes,” “neuropsychological,” “neuropsychiatric,” and their MeSH equivalents.

The search yielded 76 renal, 48 cardiovascular, and 72 neuropsychological/neuropsychiatric studies. After screening and removal of duplicates, 15 studies were included for renal outcomes, 17 for cardiovascular, and 25 for neuropsychological function.

Eligible studies were original human research (interventional or observational) reporting pre- and post-PTX outcomes in at least one of the three domains. To capture underrepresented populations, studies were included regardless of whether participants met classical surgical thresholds. Two independent reviewers screened titles and abstracts; full texts were assessed and extracted into a standardized template capturing design, patient characteristics, biochemical profiles, outcomes, follow-up duration, and key findings. Disagreements were resolved by consensus.

Results PTX did not consistently improve renal filtration (e.g., GFR), but benefited patients with hypercalcemia >2.87 mmol/L, chronic kidney disease, or nephrolithiasis by slowing decline and reducing stone recurrence. Cardiovascular outcomes were particularly favorable in patients with subclinical disease: regression of left ventricular hypertrophy, improved diastolic function, and enhanced arterial compliance were observed even without changes in blood pressure. Neurocognitive improvements were consistent across mood, sleep, and subjective vitality. Several studies reported gains in executive function and attention, particularly in patients with mild hypercalcemia and

vague cognitive complaints, precisely the phenotype current guidelines deem insufficient for surgery.

Conclusion Current consensus discourages parathyroidectomy (PTX) in patients with nonspecific neurobehavioral symptoms due to a perceived lack of predictive criteria. However, this review identifies specific subgroups such as patients with mild biochemical disease and subtle neurocognitive impairment, for whom surgery yields measurable and sustained benefit. Similarly, although guidelines state that hypertension is not improved by PTX, this review highlights that key cardiovascular parameters (LV mass, vascular stiffness, diastolic compliance) improve, especially when surgery is performed before overt remodeling. These findings suggest that structural silence does not imply physiological health and may in fact reflect a reversible preclinical phase.

The designation of “asymptomatic PHPT” often obscures meaningful, reversible systemic dysfunction. Subclinical renal, cardiovascular, and neuropsychological impairment, currently excluded from surgical criteria, respond favorably to PTX. This review challenges the assumption that only overt disease warrants intervention and supports a broader, more individualized surgical approach in PHPT.

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Left-Sided Thoracoscopic Approach to the Nuss Procedure for Pectus Excavatum: Outcomes in 100 Patients

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Background Dr. Donald Nuss introduced a minimally invasive procedure for pectus excavatum in 1997. Modifications, including right-sided thoracoscopy, have improved safety and efficacy. We present a further modification—left-sided thoracoscopy—to allow continuous visualization of the heart and pericardium.

Materials and methods We retrospectively reviewed 100 children treated with a modified Nuss procedure at the University Children's Hospital of Cracow between 2016 and 2024. Data collected included demographics, surgery duration, hospital stay, and outcomes. The technique used three incisions: two for the introducer (anterior to the heart and lungs, posterior to ribs and sternum) and one for the thoracoscope. In our modification, the thoracoscope was placed on the left side to optimize cardiac visualization. The bar was removed after 2–4 years.

Results Of the 100 patients, 92 were male. All underwent left-sided thoracoscopy. Mean hospital stay was 9 days (range 5–21). Recurrence appeared in two patients. Surgical complications were observed in 5 patients; early postoperative complications in 12. No significant correlation was found between age and complications, recurrence, or reoperation. Higher weight was significantly associated with fewer intraoperative complications (rho = –0.46). Weak but significant correlations were found between shorter surgery duration and longer hospitalization (rho = –0.33), and between longer surgery duration and increased reoperation risk (rho = 0.35).

Conclusion The Nuss procedure remains an effective, low-risk treatment for pectus excavatum. Left-sided thoracoscopy may improve safety by reducing cardiac injury risk. Higher patient weight may indicate a lower risk of intraoperative complications.

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Schöttle's point 18 years later: anatomic and radiological considerations of the femoral origin of the medial patellofemoral ligament - a systematic review with meta-analysis

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Background Localizing the femoral origin of the medial patellofemoral ligament (MPFL) and accurate femoral tunnel placement is critical for successful MPFL reconstruction, as even small deviations can lead to graft failure, stiffness, or persistent instability. Since its introduction in 2007, Schöttle's point has influenced surgical practice worldwide by establishing repeatable radiographic landmarks for the femoral origin of the MPFL. However, the original study was based on a limited number of cadaveric knees, raising concerns regarding generalizability. Additionally, recent anatomic and radiological studies have reported variability in the femoral attachment site and questioned whether a single radiographic point reliably represents the native footprint. This systematic review with meta-analysis revisits the femoral origin of the MPFL to determine whether Schöttle's point remains a reliable reference nearly two decades later.

Materials and methods Relevant studies describing the anatomy of the femoral origin of the MPFL have been identified by searching the three main online databases (PubMed, Web of Science, and Embase). Data extracted included study sample size, MPFL femoral insertion area, distances from femoral insertion to surrounding bony structures (adductor tendon tubercle (ATT), median femoral epicondyle (MFE), and gastrocnemius tubercle (GT)), and distances to radiographic landmarks defining Schöttle's point (posterior femur cortex line and Blumensaat's line) were collected. The quality of the studies was assessed by researchers using the Anatomical Quality Assessment (AQUA) tool. Statistical analysis was conducted with Comprehensive Meta-Analysis software using a random-effects model.

Results After the database screening process, 30 studies met the inclusion criteria, comprising a total of 1606 knees. Mean MPFL femoral insertion area was 36.60 mm^2 (95% CI: 26.67–46.54 mm^2). The mean distance to the adductor tubercle was 10.59 mm (95% CI: 8.54–12.65 mm), to the medial femoral epicondyle 11.21 mm (95% CI: 9.18–13.23 mm), and to the gastrocnemius tubercle 10.66 mm (95% CI: 8.75–12.56 mm). Relative to radiographic landmarks, the MPFL femoral insertion was located 4.33

mm (95% CI: 1.84–6.83 mm) anterior to the posterior femoral cortex line and 2.51 mm (95% CI: 1.20–3.82 mm) proximal to Blumensaat's line. Both distances differ from those originally proposed by Schöttle (1.3 mm anterior, 3.1 mm proximal).

Conclusions This meta-analysis demonstrates that the femoral origin of the MPFL is located at variable distances from adjacent anatomic and radiographic landmarks, differing from the values originally described by Schöttle. These findings suggest that Schöttle's point alone may not provide universally accurate guidance for femoral tunnel placement. Instead, a combined approach using fluoroscopy, recognition of anatomic landmarks, and intraoperative isometry testing is recommended to optimize graft positioning and reduce the risk of non-anatomic reconstruction.

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Cardiovascular Diseases

Coronary artery occlusion or spasm in patients with acute myocardial infarction - differences and treatment particularities

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Background Acute myocardial infarction (AMI) is most frequently caused by atherosclerotic plaque rupture with subsequent thrombus formation. However, a distinct subset of AMI is attributable to coronary artery spasm (variant or Prinzmetal angina), often in the absence of significant atherosclerosis [1]. While both conditions present with acute myocardial ischemia and may fulfill diagnostic ECG and biomarker criteria for AMI, their pathophysiological mechanisms, diagnostic workup, and optimal management strategies differ substantially. Misclassification may lead to inappropriate therapy, particularly regarding antithrombotic use and vasodilator therapy [2]. This systematic review aims to compare diagnostic features and treatment approaches for AMI due to atherosclerosis versus AMI due to coronary artery spasm in adults.

Materials and Methods A systematic research was conducted in PubMed and Nature using predefined keywords related to "acute myocardial infarction", "atherosclerosis," and "coronary artery spasm", particularly focusing on 12 revealing studies from 2003 to 2025. Inclusion criteria are observational studies, clinical trials, case series (≥5 patients), adult population, explicit etiologic classification of AMI, and reporting of diagnostic criteria, treatment strategies, and outcomes. Exclusion criteria consist of pediatric studies, single-case reports, studies without clear etiologic differentiation, and non-human research.

Results Atherosclerotic AMI was most frequently diagnosed via coronary angiography demonstrating obstructive lesions with thrombus, supplemented by intravascular imaging. Vasospastic AMI was characterized by angiographically physiological or near-physiological coronaries, with spasm provoked by acetylcholine or ergonovine testing, and often transient ST-segment elevation during episodes. Standard therapy for atherosclerotic AMI included dual antiplatelet therapy, statins, beta-blockers, ACE inhibitors, and early revascularization. In contrast, vasospastic AMI management

emphasized calcium channel blockers and nitrates, with avoidance of beta-blockers lacking alpha-blockade. Prognosis varied: recurrent ischemic events were more common in vasospastic AMI despite preserved left ventricular function, whereas atherosclerotic AMI carried higher risk of adverse remodeling and heart failure.

Conclusions While both etiologies share overlapping clinical and ECG presentations, careful integration of angiographic, provocation testing, and biomarker data allows accurate differentiation. Management should be etiology-specific: aggressive atherothrombotic therapy for atherosclerotic AMI, and vasodilator-focused regimens for vasospastic AMI. Recognition of these differences is critical to improve long-term outcomes and avoid mistreatment.

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Early and long-term outcomes of reinterventions for type II endoleak after endovascular abdominal aortic aneurysm repair (EVAR): a single-centre retrospective analysis

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Introduction Type II endoleak is one of the most frequent complications after endovascular abdominal aortic aneurysm repair (EVAR) and may require reintervention in selected patients to prevent aneurysm sac expansion, rupture, or aneurysm-related death. However, the optimal strategy for achieving durable resolution remains undefined. This study aimed to evaluate perioperative and long-term outcomes of reinterventions for type II endoleak in a single-centre cohort.

Materials and Methods A retrospective analysis was conducted on 38 patients who underwent reintervention for type II endoleak at the Vascular Surgery Unit, Parma University Hospital, between 2011 and 2024. Clinical, preoperative, intraoperative, and follow-up data were collected. The primary outcome was endoleak recurrence. Secondary endpoints included technical success, perioperative complications, need for additional reinterventions, aneurysm sac behaviour, and recurrence-free survival.

Results Most patients were male (89.5%) with a median age of 80 years. The main feeding vessels were lumbar arteries (44.7%) and the inferior mesenteric artery (21%), with combined inflow in approximately 21% of cases. The median interval between EVAR and reintervention was 3 years. In 92.1% of cases, reintervention was indicated for significant aneurysm sac enlargement. Selective transarterial embolization was performed in 94.7% of cases, while translumbar embolization and laparoscopic inferior mesenteric artery ligation were performed in one case each. Technical success was achieved in 97.4% of cases, with no perioperative mortality or major complications. The median follow-up duration was 36 months. Type II endoleak recurrence rates at 12, 36, and 60 months were 64.9%, 85.2%, and 81.8%, respectively; corresponding reintervention rates were 10.8%, 37%, and 27.3%.

Conclusions Reinterventions for type II endoleak after EVAR are safe and achieve high short-term technical success, with negligible perioperative morbidity and no procedure-related mortality. However, their efficacy decreases over time, with recurrence exceeding 80% at 60 months and, in some refractory cases, the need for surgical conversion. Although persistent type II endoleak was not associated with rupture or aneurysm-related death during follow-up, the high recurrence and reintervention rates highlight the importance of a tailored therapeutic strategy. Patients with large aneurysm sacs, multiple collateral vessels, or absent circumferential thrombus are particularly at risk, underscoring the role of structured long-term imaging surveillance and the need for more durable treatment options.

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Transcatheter and surgical aortic valve replacement, postprocedural conductive disorders

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Introduction Hemodynamically significant aortic stenosis is most often treated by surgical replacement or transcatheter implantation of the aortic valve. The most common postprocedural conduction disturbances are high-grade atrioventricular block and new-onset left bundle branch block.

Objective The aim of the research is to assess the frequency of conductive disturbances as well as pacemaker implantation after transcatheter, i.e. surgical replacement of the aortic valve in relation to clinical and operative characteristics in patients with aortic stenosis.

Material and methods This retrospective single-center study included 196 subjects ≥ 18 years of age with an indicated aortic valve intervention. The data were collected from the Hospital Information System of the Institute for Cardiovascular Diseases of Vojvodina. The clinical parameters, operational characteristics and ECG of the subjects were analyzed.

Results The average age of the subjects was 73.85±10.88 years, and the average BMI was 28.09±4.92kg/m2. 96.43% of respondents had comorbidities. A statistically significant influence on the development of post-procedural conductive disturbances was proven only for age and chronic renal insufficiency. The most commonly used type of valve for TAVI was Evolut R, and for SAVR St Jude Medical. The average valve diameter for TAVI was 28.41±3.14mm, and for SAVR 22.96±2.53mm. AVAi averaged 0.4±0.11cm2/m2 for TAVI and 0.45±0.25cm2/m2 for SAVR subjects. De novo post-procedural disorders were developed by 40% of subjects after TAVI and 59.37% of subjects after SAVR procedure. Subjects with a postprocedurally implanted pacemaker most often had complete atrioventricular block and/or atrial fibrillation. The frequency of postprocedurally implanted pacemakers was 14/100 after transcatheter, that is, 96/4000 after surgical aortic valve replacement.

Conclusion The frequency of postprocedural conductive disturbances was significantly influenced by age and chronic kidney damage.

Keywords: aortic stenosis; PAN; SAVR; conductive disturbances.

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Complexity and Procedural Characteristics o f Native and Graft PCI i n Patients with Previous Coronary Artery Bypass

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Background Patients with previous CABG (Coronary Artery Bypass Grafting) frequently require repeat revascularization due to recurrent angina or acute coronary syndromes. The choice of strategy is largely determined by anatomical considerations, with PCI (Percutaneous Coronary Intervention) often preferred for its lower periprocedural risk. [1-5] Despite the growing prevalence of this population, evidence on procedural characteristics and outcomes remains limited. Therefore, this study aimed to compare PCI outcomes in native coronary arteries and bypass grafts.

Material and Methods We analyzed data from 159 patients with previous CABG who underwent non-emergency coronarography between 2020 and 2025 in the University Hospital in Kraków. Following coronary angiography, the patients were assigned to one of three groups: those who underwent PCI in a native vessel (n=48), those with PCI in a graft vessel (n=17) and those with conservative management received medical treatment only (n=94). Patients presenting with acute ST-elevation myocardial infarction, hemodynamic instability, or incomplete procedural data were excluded. Procedural success was defined as achieving Thrombolysis in Myocardial Infarction (TIMI) grade 3 flow with <20% residual stenosis and no in-hospital major adverse cardiovascular events. Statistical comparisons were performed using the Fisher’s exact test.

Results Among the patients with a history of CABG who later underwent treatment during coronary angiography, 30,2% underwent PCI of native coronary arteries, and 10,7% underwent graft PCI, after the mean time for repeat revascularization of 12,41 and 16,47 years, respectively, so patients in the PCI graft group had significantly older SVG (Saphenous Vein Graft) conduits compared to the PCI native group.
Patients’ mean age was 70,7 and 72.4 years, respectively, and most had multiple cardiovascular risk factors, including hypertension (100% vs. 88.2%), diabetes (47.9% vs. 17.6%), dyslipidemia (81.3% vs. 76.5%), and history of previous myocardial infarction (66.7% vs. 64.7%). Prior myocardial infarction within one month before admission was reported in 7 patients undergoing native PCI and in 2 patients

undergoing graft PCI. In our cohort, the mean number of stents implanted per patient during angiography were 1,4 and 1,3 for native and graft PCI, while POBA (Plain Old Balloon Angioplasty) was performed in 5 and 4 patients, respectively. IVUS (Intravascular Ultrasound) (n=17), OCT (Optical Coherence Tomography) (n=4), and Impella (n=2) were used exclusively in native PCI, while rotational atherectomy was performed 6 times in native PCI and once unsuccessfully in graft PCI. Thrombectomy was performed only in graft PCI (n=2).

Conclusions Repeat myocardial revascularization in post-CABG patients is associated with higher procedural risk and greater technical complexity. These patients are generally older, with multiple comorbidities, complex coronary anatomy, and degenerated grafts, making management challenging. Procedural success was not achieved in 22,9% of native PCI and in 35,5% of graft PCI cases, reflecting the technical challenges in this population. Native PCI more often required advanced adjunctive techniques such as IVUS, OCT, Impella support, and rotational atherectomy, whereas graft PCI was characterized by higher thrombotic risk, reflecting older age and advanced graft degeneration.

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Mixed Session

Intermediates of cholesterol biosynthesis in tumors: Data mining and machine learning to identify their clinical relevance

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Background and goals The cholesterol's pathway involve 11 distal intermediates (CBIs), each regulated by enzymes coded by specific genes (CBI genes). The roles of CBIs are poorly understood in physiological contexts, and the situation becomes even more complex in cancer settings. Evidence shows that the inhibition of intermediates—whether due to the negative feedback regulation or pharmacological inhibition—can be protective in certain tumor contexts. This implies that CBIs may have signaling or regulatory roles, and this work aims to further explore the potential roles of CBIs

Methods To explore the roles of CBIs in tumor cases, we analyzed bulk RNA-seq data from 33 tumor types in The Cancer Genome Atlas (TCGA), conducting both survival analyses for each CBI gene by comparing high and low expressers and differential gene expressions between healthy and primary tumor tissue. We also used gene-dependency data in model's cell line form DepMap database, interpreting high scores in perturbation by the deletion of a CBIs gene as indicators of gene essentiality for a specific cell lines. Data from both sources were processed using data analysis and machine learning techniques.

Results DEPMAP data confirm that certain CBI genes are essential for the viability of specific model cell lines, while DHCR24, the enzyme catalyzing the final step of cholesterol synthesis, is not always required in that cases. TCGA analyses revealed that in clear cell renal cell carcinoma (ccRCC), higher expression of CYP51A1 (tending to physiological levels) is associated with significantly better patient survival, suggesting a possible protective role when expression remains at more physiological levels. Both results from DepMap e TCGA also find a possible therapeutic target in the CBI between CYP51A1 and TM7SF2, as it shows protective effects in ccRCC patients and is lethal for cellular tumor models.

Conclusions Although survival data do not establish a direct causal link, both expression and dependency analyses suggest that CBIs have important cellular roles beyond serving as cholesterol precursors. These findings warrant further investigation to clarify their functions in cancer and also physiological conditions.

References

Chang et al.,2023; Pecci et al.,2024: Perrone et al., 2023, 2024; Ricco adn Kron.,2023; Santoni et al., 2022

Optical coherence tomography angiography microvascular modifications after dark and light adaptations: a swept source OCTA feasibility

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Purpose OCTA enhances the diagnosis of macular diseases by visualizing retinal microvasculature, but its role in the evaluation of functional microvascular reactivity is underexplored. This study assesses the potential of swept-source OCTA in the detection and quantification of retinal microvascular changes during dark and light adaptation, evaluating whether physiological ocular blood flow variations are reliably measurable with this technique.

Methods Healthy subjects underwent OCTA imaging using a swept-source OCTA system (Topcon Triton) under three controlled conditions: baseline, complete dark adaptation (20 minutes) and full light adaptation (10 minutes at standardized luminance). All imaging sessions were performed within a standardized time window (4:00–6:00 pm) to minimize the effect of circadian variations in ocular blood flow. Enface OCTA images of the superficial vascular plexus, deep vascular plexus, and choriocapillaris were reconstructed. Quantitative analyses included vessel density and foveal avascular zone (FAZ) area. Choroidal thickness measurements from OCT images were also assessed. Paired statistical comparisons were performed between dark- and light-adapted states.

Results A total of 30 healthy eyes from 30 subjects (15 males, mean age 28 years old) were analysed. OCTA successfully visualized macular microvasculature under both conditions without remarkable artifacts. Quantitative analysis demonstrated detectable changes in microvascular parameters among baseline, dark and light adaptations, especially for vessel density and FAZ area ($p<0.05$). In addition, we detected significant changes in the perifoveal and extrafoveal sections of the OCTA reconstructions. No significant changes were found among OCT-based choroidal thickness measurements.

Conclusion OCTA is a feasible modality to evaluate microvascular modifications associated with dark and light adaptations. These preliminary findings support the use of OCTA for the dynamic assessment of ocular blood flow regulation, suggesting a potential diagnostic role in retinal diseases and for patients at risk of disease onset and progression.

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Best Presentation Certificate for the Gastrointestinal Diseases Oral Session

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Best Presentation Certificate for the Mixed Oral Session

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POSTER SESSION ABSTRACTS

Inflammatory Biomarkers and Telomere Shortening in Chronic Diseases: A Scoping Review of Potential Blood Markers and Preliminary Analysis of Telomere Length in Normal Cells

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Introduction Telomeres, repetitive nucleotide sequences at chromosome ends, preserve genomic stability and progressively shorten with each cell division. Telomere attrition is a well-established marker of biological aging and is implicated in the pathogenesis of numerous chronic, non-oncologic diseases, including cardiovascular, metabolic, and autoimmune conditions. Chronic low-grade systemic inflammation, termed inflammaging, is a key contributor to accelerated telomere shortening. However, the specific blood-based inflammatory or metabolic markers most strongly associated with this process remain unclear. This scoping review aims to synthesize current evidence on the associations between leukocyte telomere length (LTL) and individual blood biomarkers in adults with chronic, non-oncologic diseases.

Materials and Methods A scoping review was conducted following PRISMA-ScR guidelines. Eligible studies included observational or interventional designs that concurrently assessed LTL and at least one circulating inflammatory or metabolic biomarker in adults with chronic diseases. Studies involving oncologic populations or pediatric subjects were excluded. Data extraction focused on study design, population characteristics, telomere measurement methods, biomarkers assessed, and reported associations. In addition to mapping existing evidence, we conducted a small-scale pilot study using the qPCR method to assess telomere length in leukocyte DNA from healthy controls. This preliminary work aimed to evaluate the feasibility of qPCR as a standardized measurement technique and is presented as supplementary information, distinct from the formal scoping review synthesis.

Results The included studies encompassed a variety of chronic conditions, predominantly cardiovascular and metabolic disorders. A consistent inverse relationship was observed between systemic inflammation and telomere length. Interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α) were the most frequently and strongly associated biomarkers, showing robust inverse correlations with LTL. High-sensitivity C-reactive protein (hsCRP) was widely measured but demonstrated variable associations, often weakening after adjustment for age, BMI, and lifestyle factors. Metabolic markers, such as fasting insulin, HOMA-IR, and HbA1c, were also linked to shorter telomeres, suggesting a role for metabolic dysfunction in biological aging. Limited evidence was available for anti-inflammatory or oxidative stress markers, though some studies suggested potential relevance.

Discussion The evidence supports a strong association between chronic inflammation and telomere shortening in non-oncologic diseases. IL-6 and TNF-α appear to be the most reliable blood-based indicators of telomere attrition. Nonetheless, significant heterogeneity in study populations, biomarker selection, and LTL measurement techniques limits comparability. Whether inflammatory markers actively drive telomere erosion or reflect parallel aging processes remains uncertain. Our pilot study demonstrates that qPCR is a feasible and practical molecular method for evaluating telomere length. Future research should focus on standardized LTL measurement protocols, such as qPCR, and on longitudinal designs to assess causality. Additionally, composite biomarker panels may improve predictive power, and integration of multi-omics approaches could help elucidate the mechanisms linking inflammation, metabolism, and telomere dynamics.

Conclusion Chronic inflammation and metabolic dysfunction are closely associated with telomere shortening in chronic diseases. IL-6 and TNF-α emerge as promising cytokine biomarkers of biological aging. Further research is needed to validate their predictive value and to assess whether targeting these pathways can mitigate age-related disease progression.

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Advanced Bio-Inspired Scaffolds for Craniofacial Regeneration: Integrating SF, PCL and β-TCP

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Background Silk Fibroin (SF) is a promising biomaterial for bone regeneration due to its inherent biocompatibility and versatility1. However, its limited mechanical strength and osteoconductivity necessitate to be improved for demanding applications as craniofacial regeneration2. This study aimed to develop an innovative scaffold by combining SF with poly-ϵ-caprolactone (PCL) and β-tricalcium phosphate (β-TCP) to overcome such limitations.

Materials and Methods Three types of scaffolds were fabricated from a 10% wt aqueous SF solution: neat SF, SF with 30% β-TCP (SF/β-TCP), and SF/β-TCP with 10% PCL (SF/β-TCP/PCL). Composites were prepared via vigorous whipping, followed by flash-freezing in liquid nitrogen, overnight annealing at -20°C, and subsequent drying. All samples were then crystallized by a 1-hour methanol dip. Comprehensive characterization included the assessments of mechanical properties, morphological features, and biocompatibility.

Results The implemented fabrication method successfully yielded 3D matrices with a high surface-to-volume ratio. Scanning Electron Microscopy confirmed significant pore interconnectivity and high β-TCP loading efficiency, with structural integrity maintained even after one week in cell culture conditions. Dry SF/β-TCP samples exhibited slightly reduced mechanical properties compared to neat SF. However, the addition of 10% PCL in SF/β-TCP/PCL foams significantly improved mechanical performance in the dry state. In wet conditions, overall mechanical properties declined, but SF/β-TCP/PCL composites consistently maintained superior performance compared to SF and SF/β-TCP. Biocompatibility assessments, including MTT assays and immunofluorescence staining, demonstrated enhanced cell viability on SF/β-TCP/PCL scaffolds. This improved cellular proliferation is likely attributed to the more porous morphology, which is known to favor osteoblast growth.

Conclusions This green chemistry-oriented fabrication approach successfully produced SF/β-TCP/PCL scaffolds that possess a synergistic combination of high porosity, enhanced

mechanical strength in wet environments, high β-TCP concentration, and excellent biocompatibility. These findings highlight the potential of SF/β-TCP/PCL composites as a promising solution for craniofacial bone regeneration.

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Reframing Suicide Prevention: The Role of Inflammation

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Background Suicide is a major global health crisis, claiming nearly 800,000 lives each year and ranking among the leading causes of death in young adults [1]. While psychiatric disorders such as major depression, bipolar disorder, and schizophrenia are well-established risk factors, only a subset of patients go on to attempt or die by suicide—hinting at additional biological drivers beyond psychiatric symptom severity [2]. Emerging evidence strongly suggests that chronic low-grade inflammation may play a causal role in suicidality, not merely serving as a correlate [3]. This review examines the links between inflammation and suicide and proposes a precision-psychiatry framework that integrates inflammatory biomarkers into traditional risk assessment and prevention strategies [4].

Materials and Methods A structured search of PubMed and Google Scholar identified 10 human or translational studies published over the last ten years (2015–2025) exploring inflammatory biomarkers, chronic inflammatory conditions, and therapeutic approaches in the context of suicidality. Case reports and pediatric-only studies were excluded.

Results Elevated inflammatory activity, reflected in IL-6, TNF-α, CRP, and other cytokines, has been consistently observed in suicidal individuals across blood, cerebrospinal fluid, and postmortem brain samples [3,5,6]. Notably, this association also applies to non-psychiatric medical contexts: chronic inflammatory diseases, such as autoimmune disorders, infections, and cancer, are associated with higher depression and suicide rates, especially during cytokine-based treatments like interferon-α [7]. This suggests systemic inflammation may directly trigger suicidality even in patients without a significant psychiatric history. Clinically, this underscores the need to extend suicide prevention efforts to medical populations living with chronic inflammatory conditions.

Therapeutically, targeting inflammation offers new hope. Early evidence supports the use of adjunctive anti-inflammatory treatments—including NSAIDs, minocycline, and cytokine-targeting biologics—to reduce depressive symptoms and suicidal ideation [8,9]. Ketamine's rapid anti-suicidal effect may partly stem from its modulation of neuroinflammation and the kynurenine pathway [6]. Non-pharmacological interventions—such as anti-inflammatory diet, exercise, and stress-reduction techniques—are scalable and potentially impactful on a population level [10]. Integrating biomarker-guided stratification within a precision-medicine paradigm could help clinicians pinpoint high-risk individuals and tailor prevention strategies.

Conclusion Chronic inflammation is more than a co-factor; it may actively drive suicide risk across psychiatric and medical contexts. Framing suicidality as an inflammatory phenotype shifts prevention toward biological risk assessment and opens therapeutic opportunities. Early detection via inflammatory biomarkers, coupled with targeted immunomodulation and lifestyle interventions, may significantly reduce suicide rates. Future studies should prioritize longitudinal biomarker tracking and interventional trials in patients with chronic inflammatory diseases to build an integrative, precision-medicine model for suicide prevention.

Keywords: Suicide, inflammation, chronic disease, biomarkers, therapy, precision psychiatry

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Prediction of depressive symptoms by perceived stress and gut microbiota composition: A Sex-Stratified Bayesian Approach in a healthy community sample

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Background The gut microbiota and the brain engage in bidirectional communication via the vagus nerve as part of the Microbiota-Gut-Brain (MGB) axis(1). This connection has been implicated in the pathophysiology of depression, a condition also linked to elevated stress levels(2). The present study investigates the relationship between gut microbiota composition, perceived stress, and depressive symptoms, and explores whether these associations differ between sexes in a healthy population.

Materials and methods Gut microbiota data and psychometric scores—Perceived Stress Scale (PSS) and the Center for Epidemiologic Studies Depression Scale (CES-D)—were collected from approximately 400 healthy participants enrolled in the Parma Microbiota Project. Sex-based differences in microbiota composition and psychological measures were analyzed. A Bayesian model averaging (BMA) approach was employed to assess predictive relationships among gut microbiota profiles, stress perception, and depressive symptoms across sexes.

Results No significant sex differences were observed in overall gut microbiota composition or psychometric scores. However, BMA analysis revealed that in women, a lower abundance of Eubacterium genus was associated with higher perceived stress levels. This relationship appeared to predict increased depressive symptomatology. These associations were not observed in men.

Conclusions Our findings suggest a potential sex-specific link within the MGB axis, whereby reduced Eubacterium abundance may contribute to heightened stress perception and depressive symptoms in women.

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Lung function in preterm infants with versus without history of intrauterine growth restriction (IUGR): a prospective study

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Background The impact of IUGR on lung function tests (LFT) and neonatal outcomes among preterm infants is still debated. Studies with LFT involved children >6 years and showed higher prevalence of obstructive patterns in IUGR vs those with appropriate intrauterine growth (AGA). We aimed at assessing early lung function data in preterm infants with and without IUGR.

Materials and methods Infants born <32 weeks of gestation were included; LFT were performed at term equivalent age and/or during routine follow-up visits. Perinatal/follow-up data were recorded. Infants with evidence of IUGR according to current obstetric guidelines were compared to AGA controls matched for gestational age at birth. Lung function tests included tidal breathing flow volume test and multiple breath nitrogen washout performed with the Exhalyzer D according to published guidelines.

Results We studied 41 preterm infants (21M, 20F); 21 had IUGR, 20 were AGA. IUGR vs AGA infants had similar gestational age (296/7 vs 291/7, p=0.082), gender prevalence, surfactant administration (43 vs 60%, p=0.272), rates of BPD (14 vs 15%, p=1.000), pneumothorax (5 vs 5%, p=1.000), pulmonary hypertension (5 vs 0%, p=1.000), days on mechanical ventilation [0 (IQR 0-3) vs 0 (0-4), p=0.656)], days on non-invasive ventilation [25 (IQR 4-55) vs 19 (5-35), p=754)], chorionamnionitis, severe IVH, PVL, NEC, ROP, sepsis, mother milk at discharge, parenteral nutrition, age at full enteral feeding.

IUGR vs AGA infants had significant differences in antenatal steroids (95 vs 65%, p=0.020), vaginal delivery (0 vs 25%, p=0.021), birth weight (935 vs 1226 grams, p<0.001), SGA<3rd percentile (71 vs 0%, p<0.001), PDA (0 vs 25%, p=0.021).

https://drive.google.com/file/d/1wCHEuobnRasciPN7vDdEtfe76if9Xb9M/view?usp=sharing

Conclusion In this cohort of preterm infants, early LFT data were similar between IUGR and AGA infants. Differences in antenatal steroid administration, delivery mode and PDA might have influenced the results. Follow-up data are needed to confirm these findings.

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Effects of myrtleciclib, a cyclin-dependent kinase inhibitor, in models of malignant pleural mesothelioma

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Background Malignant pleural mesothelioma (MPM) is a rare but aggressive neoplasm associated with occupational asbestos exposure, resulting from the malignant transformation of mesothelial cells in the parietal pleura.1 For approximately 20 years, chemotherapy with platinum compounds and pemetrexed has been the only approved standard of care; however, the prognosis of patients is still poor2, primarily due to the lack of an approved second-line treatment option to overcome chemoresistance.3 Genomic analysis revealed a high frequency of mutations in the CDKN2A/ARF oncosuppressor gene, suggesting a promising therapeutic target4 and supporting the use of CDK4/6 inhibitors.5 Therefore, this study aimed to evaluate the efficacy of Myrtleciclib, a novel compound that, unlike traditional CDK4/6 inhibitors, also inhibits CDK9, a key player in cell death mechanisms.6

Materials and methods Experiments were performed on a panel of MPM cell lines with different histotypes. MPM clones resistant to cisplatin and pemetrexed were obtained by exposing the H2452 epithelioid cell line to increasing concentrations of the drug combination over a period of more than six months. In vivo studies were performed in an immune-competent orthotopic rat recurrence model of MPM.

Cell proliferation and cell-cycle progression were determined through cell counting, MTT assay and flow cytometry; 3D spheroids models were generated using low attachment 96-well plates; apoptosis and signalling transduction pathways were assessed using fluorescence microscopy and Western blot, respectively.

Results Compared to commercially available CDK4/6 inhibitors, Myrtleciclib demonstrated superior anti-proliferative activity, with IC50 values approximately 50-fold lower across all the MPM cell lines. This effect was due to a reduced activation of proliferative signalling pathways such as AKT/mTOR and MAPK, and to an impairment of cell cycle progression, as demonstrated by the hypo-phosphorylation of Rb and the reduced expression of c-myc. Furthermore, Myrtleciclib induced apoptosis, by downregulating Mcl-1, which is a target of CDK9 and an anti-apoptotic molecule. Moreover, Myrtleciclib demonstrated significant effects on 3D spheroids, resulting in

complete spheroid disruption after 6 days of treatment. Finally, in vivo treatment significantly prevented tumor relapses compared to control animals.

Notably, Myrtleciclib exhibited high anti-proliferative and pro-apoptotic effects also in chemoresistant clones, as demonstrated by the preservation of sensitivity to the drug and by the cleavage of caspase 3.

Conclusion Recent years have witnessed a growing interest in molecular targeted therapies, and the high frequency of CDNKN2A/ARF gene loss in MPM has been identified as a potential therapeutic target. Our findings demonstrate the substantial potential of Myrtleciclib as a more efficient and durable second-line therapy for the treatment of MPM, able to overcome chemoresistance and thus offering a promising new treatment option.

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Medical Students' Perceptions and Knowledge on Health Impacts of Climate Change and the One Health Approach: A Two-Center Survey in Italy

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Background Climate change is a major threat to global health, increasingly recognized as the defining health challenge of the 21st century [1], and the One Health approach (linking human, animal, and environmental health) offers a framework to face it [2]. In recent years, international scientific societies and public health institutions have advocated for the integration of these topics into medical education. However, evidence on medical students' awareness, preparedness, and educational needs in this and related domains is still limited in Italy [3]. This study is a preliminary step of a broader project evaluating perceptions, self-reported preparedness, knowledge, and educational expectations related to climate change and One Health among Italian medical students.

Materials A cross-sectional survey in October-November 2024 was conducted among medical students from the University of Catanzaro (UniCz) and UniCamillus, Rome. A questionnaire was administered via QR code during hygiene lectures, assessing demographics, perceptions, knowledge, and preferred educational interventions. Demographics included age, gender and year of study. Perceptions of climate change relevance for clinical practice, One Health integration into curricula, and self-reported preparedness were measured through a Likert scale with six response options ranging from strongly disagree to strongly agree. Knowledge was assessed through multiple-choice items with a single correct answer, covering greenhouse gas emissions, desertification, and infectious diseases. Descriptive statistics were reported.

Results Seventy-five students participated (36 UniCz; 39 UniCamillus. Response rate not calculable due to in-class administration). Mean age was 22.2 and 21.4 years, respectively; 65.3% were female. On Likert scales, 65.3% (≥4) agreed that climate change will affect their future patients' health (56.0% with ≥5). For curriculum inclusion, 64.0% supported climate change and health (44.0% with ≥5) and 61.3% supported One Health (37.3% with ≥5). Overall, 76.0% (≥4) agreed that One Health is connected to climate change. Table: https://docs.google.com/document/d/1M-vNd4ZOzu6MoL_qAmKV88krE35-rud28Jb7NO4wdmY/edit?usp=drive_link Preparedness was moderate for climate change (median = 4, IQR 3–5) and low for One Health (median = 3, IQR 1–3). Only 5.3% felt well prepared (≥5) on One Health, 32% felt well prepared on Health Impact of Climate Change, and knowledge about these topics revealed gaps. There are no differences between the two universities. About useful curricular actions, students suggested introducing conferences (64% Health and Climate Change, 52% One Health), followed by elective courses (14.7%, 21.3%), mandatory courses (9.3%, 13.3%) or education during specialization (8%, 9.3%). Figures 1: https://drive.google.com/file/d/1agK8byLadzcfpIYDbBOzhBfofiNWkurF/view?usp=drive_link 2: https://drive.google.com/file/d/1QP_FMCeEt7XdBprLLHJuVeFJpA8CXg1-/view?usp=drive_link

Conclusions Italian medical students acknowledge the importance of climate change and One Health and support their curricular integration. However, preparedness is only moderate for climate change and low for One Health, with clear knowledge gaps, similar to surveys outside Italy [4, 5]. Students request structured and compulsory teaching rather than optional activities, emphasizing mandatory courses, expert seminars and experiential learning opportunities, including international medical electives, which enhance awareness and foster socially responsible practice [6, 7]. This preliminary survey aligns with similar findings internationally, but conclusions must be interpreted with caution due to the small convenience sample, absence of response rate, and lack of validated instruments. Larger, multicenter studies are needed to inform robust curricular reforms.

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Clinical Severity in Children with Neurofibromatosis Type 1 Microdeletion Syndrome: A Systematic Review

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Background Neurofibromatosis type 1 (NF1) affects approximately 1 in 2,500–3,000 individuals, with 5–11% having a 17q11.2 microdeletion that leads to a more severe phenotype, characterized by earlier tumor onset and significant neurodevelopmental impairment. This review synthesizes pediatric evidence on 17q11.2 microdeletions, highlighting genotype–phenotype correlations and their greater severity compared with classical NF1.

Materials and methods PubMed, Scopus, and Embase were systematically searched using keywords such as “neurofibromatosis type 1”, “17q11.2 microdeletion,” and “pediatric.” Studies were included if they focused on pediatric populations, were published in English within the past 10 years, and specifically addressed the 17q11.2 microdeletion. Studies involving intragenic NF1 mutations, other chromosomal syndromes, or non-pediatric cohorts were excluded. Eleven studies meeting the criteria were included, revealing key clinical and genetic insights.

Results NF1 microdeletions are classified into four subtypes based on size and breakpoints: type-1, type-2, type-3, and atypical [1]. Type-1 deletions (70–80%) span 1.4 Mb with 14 genes and 4 microRNAs and are typically non-mosaic germline events [2,4,5]. They are most studied, with strong genotype–phenotype correlations and the highest risk of complications. Global developmental delay, intellectual disability, speech impairment, motor delays, ADHD, and autism are common [1,2,3,6]. In one cohort, 41.6% (20/48 patients) had intellectual disability, with mean IQ scores of 70–77.7, significantly lower than in NF1 non-deletion patients [1]. Outcomes vary, with some children requiring special programs and others progressing through mainstream education, even college, reflecting heterogeneity. Tumor burden is particularly high in NF1 microdeletion syndrome. Patients carry a lifetime risk of malignant peripheral nerve sheath tumors (MPNST) of 16–26% compared with 8–13% in classical NF1 [2,3]. Earlier onset of cutaneous and subcutaneous neurofibromas, plexiform neurofibromas, and optic gliomas was also common [1,2,5]. Neurofibromas have been documented as early as 3 months of age, atypical for classical NF1 [7]. Growth patterns further distinguish these patients: while measurements in early infancy resemble those of classical NF1, increased height and weight become evident after 2 years, providing an important

diagnostic clue [8]. Dysmorphic features, scoliosis, chest wall deformities (pectus excavatum), and macrocephaly were consistently described [1,2,3,8]. Psychiatric comorbidities, including anxiety, depression, and sleep disturbances, were also frequent [1,6]. The rarer subtypes show greater variability: Type-2 deletions (10–20%) are smaller, often mosaic, usually resulting in a milder phenotype, though severe skeletal anomalies have been described [3]. Type-3 deletions are extremely rare (1–4%) [3,4]. Atypical deletions (8–10%) are highly heterogeneous—sometimes mild, sometimes severe depending on the additional genes involved. One pediatric case with an RNF135–SUZ12 chimeric gene was linked to multiple neurofibromas, suggesting gene-specific modifiers of tumor risk [4,9]. Across all subtypes, however, café-au-lait macules (CALMs) remain a common characteristic [2,3].

Conclusions NF1 microdeletion syndrome shows earlier onset, greater severity, and high variability compared with classical NF1. Early diagnosis is critical, yet rarity limits clear genotype–phenotype correlations with flanking genes, highlighting the need for larger pediatric studies.

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Treating the patient, not the age: Personalized neoadjuvant therapy in elderly TNBC

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Background Breast cancer is a disease of aging; 20% of diagnoses occur in women over 75, and over half of annual deaths are women over 70 [1]. Triple negative breast cancer (TNBC) is a rare aggressive subtype that lacks estrogen (ER) & progesterone (PR) hormone receptors, and human epidermal growth factor receptor 2 (HER2). It constitutes 15% of all breast cancers, of which only 10% involve elderly patients [2,3]. Because of its distinct biology, the treatment options for TNBC are limited to chemotherapy and immunotherapy. Particularly in elderly patients with cardiovascular comorbidities, complex parameters must be considered in order to achieve an optimal therapeutic risk-to-benefit balance.

Case presentation We present the case of an 82-year-old woman with NYHA class II congestive heart failure and ECOG 1-2. Following suspicion of lump on palpation of the left breast, an incisional biopsy was taken in October 2024, showing triple negative (ER- / PR- / HER2-) metaplastic carcinoma. A subsequent PET/CT (FDG) scan confirmed metabolically active lesions of overlapping sites of the breast. A large tumor mass of 12x8 cm between lateral quadrants was identified, with cartilaginous consistency. Additionally, nodal involvement comprised several axillary and subpectoral lymph nodes. Final disease staging was cT4N2M0; stage IIIb.

Comorbidities included hypertension with borderline ejection fraction 46%, compensated with a four-drug regimen; ARB + CCB + thiazide diuretic + Moxonidine. The patient's BMI was 29.4kg/m^2, and history revealed first degree relative with colorectal cancer, in addition to a history of intermittent smoking (15 pack-years).

Treatment & Results Given the aggressive tumor biology and non-metastatic disease, a definitive therapeutic approach was chosen. Neoadjuvant treatment was opted for, despite the patient's borderline ECOG status. The regimen consisted of the chemotherapeutic CarboTax (Carboplatin + Paclitaxel) + Pembrolizumab (immunotherapy component) every 21 days for up to 6 cycles according to the NeoPACT trial [4]; The patient's individualized plan involved up to 20% reduction of the chemotherapeutic dose, while the Pembrolizumab was administered at full fixed dose.

By April 2025, 6 cycles of immunochemotherapy had been completed. Major therapeutic response was observed, with the primary lesion described as a lobulated tumor mass 4x3 cm in the lower lateral quadrant. One borderline size axillary lymph node was identified, which appeared benign, demonstrating complete radiological response (rCR) in regional lymph nodes. The patient was subjected to a QE+ALND in May 2025, with pathology confirming pCR.

The postoperative options for this patient include: 1. Continuation of Pembrolizumab for up to 1 year, as per the Keynote-522 standard of therapy [5]. 2. Adjuvant radiotherapy, to reduce the risk of local recurrence after BCS. 3. Observation only - due to cumulative treatment burden, to prioritize the patient's quality of life.

Conclusion This case highlights the therapeutic potential of carefully personalized, dose-adjusted neoadjuvant chemoimmunotherapy in selected geriatric patients with TNBC. Older age should not be a blanket contraindication; When guided by functional age and disease biology, we are able to effectively administer individualized treatment with high benefit/risk ratio. Such cases may inform future protocols for calibrated care in geriatric oncology, allowing for aggressive cancers to be safely met with accordingly aggressive therapy.

Images

- https://drive.google.com/file/d/1GzfXFjmgGn2E54CzBlWKkNdxLsF8ARCl/view?usp=sharing
- https://drive.google.com/file/d/1EtqH8Hg-Ro4wYoh3sk2lfQyNXLPK7g1E/view?usp=sharing
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Harnessing Machine Learning and Phytochemicals: Evaluating the Anticancer Potential of Curcuma longa Extract on Human Cancer Cell Lines

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Introduction Natural compounds offer promising alternatives in cancer therapeutics. Curcuma longa (turmeric) is known for its bioactive component curcumin, which exhibits anti-inflammatory and anticancer properties. However, the variability in cellular responses and complexity of signaling pathways limits its clinical translation. Integrating machine learning (ML) enables predictive modeling of cytotoxic responses, optimizing experimental designs and uncovering mechanistic insights.

Materials and methods Ethanolic extract of Curcuma longa was prepared and characterized using HPLC. Human cancer cell lines (MCF-7, A549, and HeLa) were treated with graded extract concentrations. Cell viability was assessed via MTT assay. Using Python (scikit-learn, pandas, matplotlib), we trained multiple ML models (Random Forest, SVM, and K-Nearest Neighbors) on features including dose, treatment duration, and baseline gene expression. Model performance was evaluated using accuracy, F1-score, and ROC-AUC.

Results The extract showed dose-dependent cytotoxicity, with the greatest sensitivity observed in MCF-7 cells (IC_{50} = 18.4 µg/mL). The Random Forest model demonstrated superior performance (F1-score: 0.91; ROC-AUC: 0.94), successfully predicting viability outcomes across different cell lines and extract concentrations. Feature importance analysis highlighted baseline p53 expression and treatment duration as key predictors of response.

Discussion This study confirms the anticancer activity of Curcuma longa extract and demonstrates the power of machine learning in modeling complex biological responses. ML-driven insights not only enhance experimental efficiency but also identify potential biomarkers for extract sensitivity. Our Python-based pipeline can be adapted for other phytochemicals, paving the way for AI-assisted drug discovery from natural sources.

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Non-Invasive Blood Pressure Estimation in Real-Time Using PPG, ANN and MIMIC-2 dataset

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This paper introduces a novel method for real-time blood pressure estimation using photoplethysmography (PPG) signals processed through Artificial Neural Net-works (ANN). The system leverages the MIMIC-2 dataset to train the ANN, ena-bling continuous and non-invasive monitoring of blood pressure. Data acquisition occurs in real-time, where the PPG signal undergoes essential preprocessing steps, including DC offset removal, bandpass filtering, and normalization to enhance sig-nal quality. Morphological features, such as cardiac period, systolic upstroke time, and diastolic time, are extracted from the processed PPG signal and used as input parameters for the ANN. The proposed model demonstrates significant accuracy in estimating both systolic and diastolic blood pressure, outperforming traditional methods. Results indicate that the ANN-based approach can effectively provide immediate and reliable blood pressure readings, making it suitable for personal health monitoring applications. Future work will aim to optimize the model further and investigate its integration into mobile health platforms for widespread use.

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Ileal tumor with bacteremia – Case Report

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Background Small bowel tumors are very rare, benign (polyps) or malignant (adenocarcinoma, neuroendocrine tumors, gastrointestinal stromal tumors - GIST, lymphomas). Their diagnosis is particularly difficult because their non-specific clinical presentation and the difficult endoscopic access. Gastrointestinal (GI) tract tumors, especially colorectal cancer, may represent a cause of bacteremia with the gut microbiota germs. In certain cases unexplained bacteremia triggers the diagnostic workup for a GI tract tumor.

Case presentation We present the case of a 84-year-old woman who was consulted for fever (up to 38.6 Celsius degrees), chills and pain in the right flank. Physical examination revealed moderate tenderness in the right flank, without guarding. The patient also had diabetes mellitus and sick sinus syndrome, wearing a cardiac pacemaker.

The symptoms started 3 days before the consultation by pain in the right flank. In the evening preceding the consultation an episode of chills was followed by fever. Intestinal transit remained normal.

Laboratory tests showed C reactive protein elevation, leukocytosis, positive blood cultures for Escherichia coli, and renal dysfunction. Abdominal ultrasonography found a 2 cm hypoechoic mass in the terminal ileum, surrounded by inflammatory lymph nodes. Abdominal CT scan without contrast visualized the lymph nodes, but failed to show the tumor. Contrast-enhanced ultrasonography (CEUS) confirmed the presence of the bowel mass. Colonoscopy found a 1.5-2 cm polyp in the terminal ileum, at about 25 cm from the ileocecal valve, which was not biopsied (the patient specifically refused biopsy).

Antibiotic treatment by Ceftriaxone was initiated immediately after the admission, then switched to Piperacillin-Tazobactam because of the inefficacy of the initial treatment. The patient denied surgery and she was discharged from the hospital after 10 days of antibiotic treatment.

Conclusions The tumors of the small bowel are rare and their diagnosis is difficult because of the limited endoscopic access. Contrast-enhanced CT scan may be useful, but the renal dysfunction prevented its use. The experience of the ultrasonographer and the use of CEUS were determinant for the diagnosis, which was confirmed by ileoscopy. We considered the presence of the peri-ileal inflammatory lymph nodes as an indirect confirmation of the intestinal source for bacteremia.

Keywords: small bowel tumor, contrast-enhanced ultrasonography (CEUS)

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Post-myocardial infarction ventricular septal defect: unusual way to tackle it for enhanced cardiac recovery

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Background Ventricular septal defect (VSD) is a rare and serious mechanical complication of acute myocardial infarction (AMI). Delayed surgical repair of VSD is associated with lower mortality, but it is not always feasible, especially in patients with cardiogenic shock and hemodynamic instability. In this case report, we present an unusual way to achieve hemodynamic stability to buy time for surgical treatment.

Case presentation A 75-year-old man on IABP support was transferred to our Cardiac Surgery Intensive Care Unit from a secondary hospital for cardiogenic shock after percutaneous coronary intervention. On arrival bedside echocardiography revealed a large VSD. After careful evaluation the patient was placed on femoral-femoral veno-arterial extracorporeal membrane oxygenation (VAECMO). Two days later an Impella 5.5 device was placed via right subclavian artery to unload left and right ventricles. Due to reduced urine output continuous ultrafiltration was started. On the 10th hospital day, we switched from VA-ECMELLA to VAV-ECMELLA and tried to reduce the VA-ECMO support by progressive clamping the arterial line while increasing the Impella f low. The following day the patient was completely switched to VV-ECMELLA and the arterial line was removed. On the 19th hospital day the patient underwent VSD closure, removal of Impella 5.5 and implantation of a paracorporeal temporary right ventricular assist device (RVAD). The patient underwent tracheostomy on 24th hospital day to improve ventilation. After RV recovery the patient was weaned off RVAD support with decannulation on the 33th hospital day.

Conclusion Combined use of VV-ECMO and Impella 5.5 can be a a promising therapy to improve hemodynamic support and end-organ perfusion, while waiting for optimal surgical timing.

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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Myopericarditis as the Initial Presentation of Primary Sjögren's Syndrome: A Case Report

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Background Primary Sjögren's syndrome (pSS) is a systemic autoimmune disease primarily affecting exocrine glands, but extraglandular involvement may occur. Cardiac manifestations are rare and often under-recognized, with pericarditis and myocarditis described only in isolated cases [1,2]. Identifying such presentations is essential to prevent misdiagnosis and inappropriate treatment.

Case Presentation We describe a 56-year-old postmenopausal woman, smoker, with a history of cataract surgery (2024) and cholecystectomy (2017), referred from cardiology for recent myopericarditis of unclear etiology. Initial presentation was dominated by chest pain and dyspnea, without typical sicca symptoms. Only after repeated evaluation did the patient acknowledge mild xerostomia and xerophthalmia.

Laboratory tests showed antinuclear antibodies (ANA) 1:2560, strong positivity for Sjögren's-syndrome-related antigen A (anti-SSA/Ro), Sjögren's-syndrome-related antigen B (anti-SSB/La), and Ro52 antibodies, and rheumatoid factor (RF) positivity. Complement fractions (C3, C4), muscle enzymes, and thyroid function tests were normal.

Salivary gland ultrasonography demonstrated inhomogeneous parotid glands with multiple rounded hypoechoic areas, highly suggestive for pSS, but also revealed numerous intraglandular lymph nodes. Given this finding, salivary gland magnetic resonance imaging (MRI) was performed to exclude lymphoma or other pathology. MRI confirmed structural changes compatible with pSS, without evidence of lymphoproliferative disease.

Results The association of unexplained myopericarditis with a strongly positive autoimmune profile and typical salivary gland imaging led to the diagnosis of pSS with extraglandular cardiac involvement. This case underlines the possibility of atypical onset, where cardiac inflammation precedes over sicca syndrome, and the value of advanced imaging in excluding lymphoma. Although our patient was postmenopausal, it is important to note that the same autoantibody profile (anti-SSA/Ro, anti-SSB/La, Ro52) in younger women carries pregnancy implications, being associated with congenital heart block in 1–2% of first pregnancies and recurrence up to 10–20% [3–5]. Experimental studies confirm that Ro/SSA autoantibodies can directly bind fetal cardiomyocytes and disrupt conduction [6].

Conclusion This case highlights myopericarditis as an unusual initial manifestation of pSS. Clinicians should consider autoimmune etiologies in unexplained inflammatory cardiac disease, even in the absence of sicca symptoms. Moreover, awareness of reproductive risks linked to this serologic profile is crucial in women of childbearing age, reinforcing the need for timely diagnosis, counseling, and appropriate monitoring strategies.

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Single-Cell Atlas of GLP1R Expression: predicting GLP1RA off-target effects at single cell resolution

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Background The glucagon-like peptide-1 receptor (GLP1R) is a class B G protein–coupled receptor (GPCR) mediating the actions of the incretin hormone GLP-1. Its activation promotes glucose-dependent insulin secretion, appetite suppression, delayed gastric emptying, and cardiovascular protection, making GLP1R one of the most relevant pharmacological targets for the treatment of type 2 diabetes and obesity.

Although GLP1R-based therapies have revolutionized metabolic medicine, the fundamental biology of this receptor remains incompletely characterized. Bulk transcriptomic and immunohistochemical studies have localized GLP1R mainly to pancreatic β-cells and selected neuronal populations, yet antibody limitations and low transcript abundance have produced inconsistent evidence for other tissues. Unresolved questions persist regarding its expression and functional roles in the cardiovascular system, adipose tissue, and peripheral nerves. Recent advances in single-cell RNA sequencing (scRNA-seq) provide an unprecedented opportunity to reassess GLP1R distribution at cellular resolution across human tissues.

Methods We conducted a meta-analysis and visualization of publicly available single-cell RNA-seq datasets obtained from the CellxGene portal (Chan Zuckerberg Initiative). Datasets from metabolic, neural, and cardiovascular tissues were examined using their standardized annotations. GLP1R expression levels and the proportion of GLP1R-positive cells were quantified across clusters using Python-based analysis tools (Scanpy, Seaborn, ecc).

Results GLP1R expression was confirmed in pancreatic and intestinal endocrine cells and detected in neuronal, vascular, and cardiac subsets. These findings extend the known receptor landscape, suggesting systemic involvement beyond canonical incretin pathways. Importantly, mapping GLP1R expression at single-cell resolution enables prediction of the potential off-target effects of GLP1 receptor agonists (GLP1RAs), defined as unintended pharmacological effects arising from receptor activation in non-target tissues.

Conclusion This study provides a refined atlas of GLP1R distribution across human tissues through comprehensive visualization of high-quality single-cell datasets. Such detailed receptor mapping opens translational avenues including development of tissue-selective or biased GLP1R agonists to improve metabolic efficacy while minimizing adverse effects. The integration of transcriptomic data with spatial transcriptomics, proteomics, and nuclear imaging modalities (e.g., PET or SPECT with radiolabeled GLP1R ligands) promises to enhance receptor-based therapeutic strategies by

experimentally validating receptor expression and occupancy in vivo. Furthermore, investigating receptor synergy in neural populations may uncover metabolic regulatory pathways and CNS-targeted opportunities. Together, these approaches will aid in anticipating and mitigating off-target pharmacological effects, ultimately guiding the design of next-generation GLP1R-targeting therapies.

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From Eosinophilia to Crisis: Unmasking Churg-Strauss Syndrome

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Introduction Our case involves a 20-year-old male patient that complained of persistent irritating cough, progressive dyspnea, orthopnea that began two months before. His general condition was altered, and he experienced a febrile syndrome as well.

Clinical Case He has a known history with asthma for 3 years, treated with Fluticozone/Salmeterol (inhaled corticosteroid and long-acting beta-agonist) and Montelukast (leukotriene receptor antagonist). He also associated Betametazone (corticosteroid), that was stopped 2 months before his symptoms started.

Investigations Laboratory testing shows high eosinophilia of 42.7%. Chest X-rays revealed extensive pulmonary infiltrations, which initially showed partial improvement but then worsened upon re-admission. Immunological and serological tests came back negative. Spirometry revealed obstructive pattern. He also associated inflammatory syndrome.

Treatment/Results Initially, the patient was started on antibiotics and corticosteroids. Unfortunately, his condition deteriorated rapidly, necessitating re-hospitalisation and mechanical ventilation for three days due to respiratory failure. Aggressive immunosuppressive treatment was initiated, including pulse therapy with Methylprednisolone (1g/day for 3 days) combined with oral Cyclophosphamide (100mg/day). Following this intensive regimen, the patient experienced marked clinical recovery. At 4 months post-discharge, he maintained good evaluation of oral Methylprednisolone and Cyclophosphamide, with eosinophil counts normalizing and chest X-rays showing near-complete resolution of infiltrates.

Discussions The diagnosis established was Churg-Strauss Syndrome, also known as Eosinophilic Granulomatosis with Polyangiitis (EGPA). This diagnosis was based on the presence of bronchial asthma, marked peripheral eosinophilia, pulmonary infiltrates, and the development of polyneuropathy (paresthesia in the lower limbs), fulfilling ARC diagnosis criteria for the syndrome. This case exemplifies a severe presentation of

Churg-Strauss Syndrome (EGPA). It underscores the critical importance of prompt diagnosis and aggressive, multi-modal immunosuppressive therapy to manage disease progression, prevention of irreversible organ damage and achieve a favourable long-term outcome in this complex vasculitic condition.

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Case Study: Rupture Risk and Surgical Management of an Ascending Aortic Aneurysm Over 85mm"

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Background Ascending Aortic Aneurysm (AAA) is a life-threatening cardiovascular condition with a high risk of dissection and rupture, requiring complex surgical intervention. Factors such as aneurysm growth rate and patient-specific risk factors like hypertension and atherosclerosis further increase rupture risk. This case highlights the impact of aneurysm size on rupture risk and the need for timely surgical management.

Case Description A 68-year-old female patient with a history of pulmonary embolism and AAA diagnosed four years earlier presented with anterior chest pain. Imaging examinations confirmed an 86/85mm AAA, without dissection but with moderate coronary atherosclerosis.

Surgical intervention was performed to replace the ascending aorta and aortic arch with two segments of tubular graft. The brachiocephalic arteries were reimplanted, and the graft's distal anastomosis was completed with a stable postoperative course.

On the 10th postoperative day, the patient developed complete thrombosis of the left subclavian and internal jugular veins. Heparin and vitamin K antagonists treatment was initiated, follow-up assessments showing partial recanalization of the veins.

Discussion/ Results This case highlights the high rupture risk associated with large AAAs, particularly those exceeding 80mm. The patient's 86mm aneurysm placed her in a high-risk category. Large thoracic aneurysms have an annual rupture risk above 30%, making elective surgery essential for survival [3]. Despite known risks, the patient postponed surgery for years, underscoring the variability in aneurysm progression and the need for timely intervention. Additional factors like coronary atherosclerosis, hypertension and pulmonary embolism history exacerbated the pressure on the aortic wall.

Surgical decisions require balancing perioperative risks with rupture likelihood. While emergency repair carries a 50% mortality rate, elective surgery has significantly lower mortality. Guidelines recommend intervention for asymptomatic AAAs≥5.5cm and symptomatic or rapidly growing aneurysms, while smaller aneurysms monitoring is essential, as most of them eventually require surgery. [1]

Conclusion Timely surgical repair is essential to prevent aneurysm rupture. While elective repair carries risks, they are far lower than the risks associated with rupture. Decisions should consider individual risk factors, aneurysm size, and growth rate to ensure repair before complications develop. Regular monitoring and patient education are critical for improved outcomes.

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The Aggressive Face of MSSA: Sepsis in a Young Immunocompetent Patient

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Background Influenza A virus is known to greatly reduce the immune system's ability to fight against common pathogens, leading to serious complications and infections – but what happens when even broad spectrum antibiotics can't kill MSSA? The case below emphasizes how aggressive Staphylococcus aureus can be and how challenging it is to interpret discordant microbiological results, particularly when cultures from respiratory samples and sterile sites differ.

Case presentation We report a case of a 25 year-old woman previously admitted for post-influenza A bronchopneumonia, who was transferred to the Thoracic Surgery Unit under ongoing antibiotic treatment. The patient complained of severe dyspnea, fever and left basal chest pain, with an oxygen saturation of 72%. Chest radiography showed left pleural effusion, as well as diffuse pulmonary consolidations on both lungs. An axillary pleurotomy was performed in order to drain the fluid, revealing 700ml of seropurulent exudate; the cultures were negative, possibly due to prior antibiotics. Postoperatively, the patient's condition continued to deteriorate, with persisting fever, dyspnea, coughing and hypoxemia (SpO_2 ~60%). Broad-spectrum therapy with meropenem, vancomycin, and metronidazole was initiated, but the fever persisted.

The sputum culture revealed MRSA, so the treatment was adjusted accordingly; still, the patient showed no clinical improvement. Thoracic CT revealed a fluid-filled cavity at the left lung base, for which another axillary pleurotomy was done, followed by the evacuation of 300ml of foul-smelling pus. The culture from the abscess revealed MSSA, indicating this as the causative pathogen. After the drainage, the patient's condition improved, though her recovery was complicated by severe reactive thrombocytosis managed with low dose aspirin.

Discussions This case illustrates several key challenges in managing post-influenza bacterial complications. First, negative pleural fluid cultures do not exclude infection, particularly in patients undergoing antibiotic treatment. Second, discordant microbiological results complicate interpretation: while sputum cultures grew MRSA, sterile site culture from the abscess identified MSSA as the true pathogen. Finally, persistent sepsis despite broad-spectrum antibiotics underlines the importance of adequate source control in addition to antimicrobial therapy. On top of these, recovery was further complicated by reactive thrombocytosis, reflecting the systemic inflammatory burden of such infections.

Conclusion(s) This case highlights a message that needs to be taken into account by every clinician: the importance of source control in an infection and culture interpretation. This is especially true when microbiological findings are discordant, such as in this case, when prioritizing cultures from sterile sites over respiratory samples and surgical drainage were much more beneficial than broad-spectrum antibiotic therapy alone.

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A Life of Resilience: The Unfolding Journey of a 70-Year-Old with Tetralogy of Fallot

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Introduction Partially corrected congenital cardiac malformations, serve as a pathology that poses great problems in adult life. When complications arise, especially heart failure, pacients demand distinct therapeutic approach.

Case report A 70-year-old patient with a history of congenital heart disease (tetralogy of Fallot, pulmonary valvulotomy at age 7) and pulmonary tuberculosis presents with severe cardiorespiratory failure. The patient, on chronic treatment for atrial fibrillation, had occasional cardiac check-ups. Physical exam reveals central and peripheral cyanosis, onychogryposis, tachycardia and arrhythmic heartbeats (125/min), mesocardiac systolic murmur grade 5 with irradiation throughout the cardiac area, mitral systolic murmur grade 5 with irradiation in the axilla, BP = 110/80 mmHg, spontaneous SaO2 = 46%, bilateral alveolar crackles, jugular vein distention, lower limb edema, and painful hepatomegaly. ECG shows atrial fibrillation and diffuse myocardial ischemia. Echocardiography reveals a ventricular septal defect of 1.5 cm with bidirectional stenosis, aorta overriding on the interventricular septum, aneurysmal dilatation of the pulmonary artery trunk, middle pulmonary stenosis, pulmonary subvalvular membrane, severe tricuspid and mitral regurgitation, severe pulmonary hypertension, diastolic dysfunction of the left ventricle, pleural and pericardic fluid, ascites in the perihepatic, perisplenic, and Douglas spaces. The patient also presents with chronic compensated hypoxia (polycythemia, Hb = 19.7 g/dL, Hct = 58%), hepatic dysfunction, and acute-on-chronic respiratory failure due to intracardiac shunting, pulmonary congestion, and fibrosis. Paraclinic findings include hyponatremia and hyperkalemia. The patient is undergoing treatment with low-flow oxygen therapy, diuretics, a beta-blocker, a cardiotonic agent, a SGLT2 inhibitor, an uricosuric agent, and fluid-electrolyte rebalancing. The clinical and hemodynamic course has been favorable, with resolution of fluid retention and significant improvement in respiratory insufficiency

Discussions The patient has a cyanotic congenital malformation partially corrected in childhood, with favorable evolution. Pulmonary stenosis recurred, offering partial protection, but severe pulmonary hypertension developed, along with a bidirectional intracardiac shunt and hepatic dysfunction. Managing respiratory insufficiency, diuretics, and anticoagulation has been challenging due to chronic hypoxia, fluid-electrolyte imbalances, and coagulation disorders linked to hepatocardiac syndrome.

Conclusions Patients with congenital heart defects should be closely monitored clinically and with periodic echocardiograms. Upon heart failure onset, they should receive appropriate therapies based on the stage of cardiac dysfunction.

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Determining Transposable Element Expression from Bulk RNA-Seq Data

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Background Transposable elements (TEs) make up approximately half of the human genome (Pray, 2008) and can affect gene expression, chromatin accessibility, activate cell signalling pathways, RNA interference responses as well as trigger ageing and antiviral activities. Their study is challenging due to the high diversity in terms of sequences, loci and copy number in the genome (Lanciano and Cristofari, 2020). Determining TE expression is getting easier with improved quality of reference genomes such as GRCh38 and more complete T2T-CHM13 (Bilgrav Saether, 2025).

Materials and methods Bulk RNA-seq data were extracted from blood samples of 26 children and adolescents under 18 years of age, collected at the University Children's Hospital, University Medical Centre Ljubljana. Individuals were suffering from COVID-19 related inflammatory diseases. Two samples were taken from each individual, one during flare, the other 6 months afterwards, in remission. RNA-seq data were aligned using STAR (Dobin et al., 2013). TE expression was quantified with TEtranscripts (Jin et al., 2015), which uses an expectation-maximisation (EM) algorithm to assign multimapping reads to TE loci. It also performs differential expression analysis using DESeq2 (Love et al., 2014). P-value was adjusted for multiple testing using the Benjamini-Hochberg method. TEs were aligned to the T2T-CHM13 (Nurk et al., 2022) and GRCh38 (Mudge et al., 2025) reference genomes.

Results 681 and 738 TEs were statistically significantly differentially expressed on the GRCh38 and T2T-CHM13 genomes, respectively. All logFC values, where $|logFC| \geq 1$ were positive. LogFC was at least 2 for 2 TEs common to both genomes and 1 TE only present in the GRCh38 genome. A table of significantly differentially expressed TEs ($logFC \geq 1.5$) and volcano plots for both genomes are available at: https://drive.google.com/drive/folders/11TNwHWjEQ6187NuehTwUOW1uLCHLdM-o?usp=sharing.

Conclusion(s) We confirmed the change in TE expression in children with COVID-19 related diseases is statistically significant, which is in line with the finding that TE expression changes under stressful conditions (Colonna Romano and Fanti, 2022). Since the majority of TEs and all with $|logFC| \geq 1$, were upregulated, we can assume TEs are silenced less in flare than in remission. This suggests TE upregulation is associated with inflammatory flare in COVID-19 affected children, highlighting potential roles in disease pathogenesis. The more complete T2T-CHM13 assembly enabled more detailed and reliable TE expression profiling, likely due to fewer missing sequences and

mosaicity of GRCh38 (Aganezov et al., 2022; Fernandez-Luna et al., 2025; Klein and O'Neill, 2018; Schneider et al., 2017). To confirm this, additional research is needed. The tool TEtranscripts, with its family specific analysis and EM-algorithm multimappers assessment, offered us a good insight into general trends in TE expression. Future work may include narrower focus by using a locus specific tool thereby connecting TE and gene expression, starting with single cell data or focusing on specific part of TE expression e.g. polymorphic transcripts. Results showcase the promising development of bioinformatics to deepen our understanding of TE expression and TEs in disease mechanisms.

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Assessing Orthorexia Nervosa Among University Students: An Observational Study Analyzing Prevalence and Psychological Characteristics

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Background/Objectives The prevalence of orthorexia nervosa (ON) is increasing over time. Additionally, specific social categories seem to be more affected. In the literature, the prevalence of university students suffering from ON is unclear, ranging from 7% to 83%. Nonetheless, ON shares pathological traits with both eating and obsessive–compulsive disorders, making its etiology and therapeutic perspectives complex. This study aimed to investigate the prevalence of ON and explore its psychological characteristics in a sample of university students.

Methods A total of 205 students from the University of Parma were consecutively recruited using a convenience sampling procedure. Participants completed the Orthorexia Nervosa Questionnaire-15 (ORTO-15) to assess ON, the Eating Disorder Inventory-3 (EDI-3) to investigate eating behavior, the Symptom Checklist-90-Revised (SCL-90-R) to detect psychological symptoms, and the P Stress Questionnaire (PSQ) to describe stress-related lifestyle. Based on the scores obtained on the ORTO-15, a group of orthorexic students (ORTO-15 score ≤ 35) was compared with a group of non-orthorexic students (ORTO-15 score > 35).

Results The prevalence of university students with ON was nearly 42% (specifically, 41.95%). Furthermore, orthorexic students reported significantly higher levels of emotional dysregulation, perfectionism, and asceticism on the EDI-3 as well as affective problems and overcontrol in general. Furthermore, although there were no differences between the groups regarding psychological symptoms, an increase in sense of responsibility, vigor, and hyperactivity, as well as decreased free time on the PSQ, characterized the orthorexic student group.

Conclusions The results support that orthorexia nervosa emerged as a concerning phenomenon among university students, with increasing evidence pointing to its psychological correlates. Nonetheless, the fact that ON shares psychological characteristics with eating disorders highlights the clinical importance of implementing multidimensional assessments and multidisciplinary therapeutic approaches for individuals presenting with orthorexic-type eating behavior disorders.

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How long can it take to find Infract related artery (IRA)?

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Introduction In ST-segment elevation myocardial infarction (STEMI), the standard of care involves rapid identification and mechanical reperfusion of the infarct-related artery (IRA) [1], which is successfully visualized by coronary angiography in the majority of cases. However, in rare instances—estimated at less than 2–3% of patients—IRA cannot be clearly identified despite a clinical and electrocardiographic presentation typical for STEMI [2].

Case presentation A 59-year-old male with a history of hypertension, hypercholesterolemia, and HFmrEF was admitted to the cardiology ward in August due to suspected acute myocardial infarction (AMI). The patient presented with classical anginal chest pain, fitting the demographic profile—middle-aged male. ECG demonstrated sinus rhythm at 75 bpm, accompanied by ST-segment elevations localized to leads indicative of lateral wall involvement. Laboratory evaluation revealed significantly elevated cardiac biomarkers, with troponin I Ultra reaching 35,881 pg/mL and alongside hyperglycemia. Transthoracic echocardiography revealed hypokinesia of the apical and mid segments of the lateral and anterior walls, with an ejection fraction of 47%, corroborating the diagnosis of ischemic myocardial injury typically associated with an occluded coronary artery. Emergency coronary angiography performed via radial access revealed non-obstructive coronary artery disease, with only mild stenoses of up to 30% in the left anterior descending artery (LAD) and the left marginal branch. Despite clear clinical, electrocardiographic, and biochemical evidence of myocardial infarction, no infarct-related artery (IRA) was identified on angiography, presenting a diagnostic challenge; following thorough evaluation, the search was concluded and optimal medical therapy was initiated. The patient was discharged in stable condition after four days with a plan for follow-up angiography. At follow-up in September, repeat coronary angiography demonstrated a previously undetected critical stenosis of approximately 90% in the proximal segment of the diagonal branch (DG), suggesting this lesion may have represented the initially missed IRA.The lesion was successfully treated with implantation of a drug-eluting stent (DES, 2.25 × 23 mm). The patient remained hemodynamically stable and asymptomatic after the procedure.

Conclusions Such cases represent a critical diagnostic dilemma, where missing the infarct-related artery (IRA) can have serious clinical consequences. In the presence of strong clinical suspicion, reliance on angiography alone may be insufficient, as subtle or concealed lesions can be easily overlooked. In these situations, repeat angiography combined with intravascular imaging techniques such as IVUS or OCT becomes

essential—not optional—to uncover the true culprit lesion. Timely identification is crucial, as any delay in diagnosis and treatment risks irreversible myocardial damage.

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Primary renal squamous cell carcinoma incidentally discovered in a non-functioning lithiasis kidney

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Introduction Primary squamous cell carcinoma (SCC) of the kidney is an extremely rare malignancy, representing only 0.5–0.8% of all renal cancers [2]. It is typically associated with chronic inflammation, nephrolithiasis, and hydronephrosis, and is often diagnosed at an advanced stage due to nonspecific clinical and radiological features.

Materials and Methods We report a rare case of renal SCC diagnosed in the Department of Pathological Anatomy at the Mohammed VI Hospital in Marrakech. A 62-year-old male presented with a 4-day history of left-sided lumbago, associated with lower urinary tract symptoms (pollakiuria, urgency, and pyuria), in a febrile context. Clinical examination revealed tenderness in the left lumbar region. Abdominal ultrasound demonstrated left ureterohydronephrosis and a 4 cm calculus in the lower calyceal group.

Results The patient underwent a left radical nephrectomy due to a non-functional, stone-destroyed kidney. Gross pathological analysis revealed a 304g kidney measuring 11.5 × 8.5 × 7 cm, with a solid, grey-white, hemorrhagic and cystic neoplastic mass of 7 × 6 × 4 cm infiltrating cortex, medulla, and renal capsule. A 4 cm calculus was also present in the renal pelvis. Microscopic examination showed infiltrating carcinoma composed of cohesive epithelioid cells with marked pleomorphism, prominent nucleoli, frequent mitoses, eosinophilic dyskeratotic cytoplasm, and keratin pearls (Figure 1). Foci of in situ squamous carcinoma and squamous metaplasia were identified in the renal pelvis (Figure 2). Immunohistochemistry revealed diffuse expression of p63 and cytokeratin 5/6 (Figure 3), confirming the diagnosis of moderately differentiated infiltrating SCC.

Discussion Renal SCC is an aggressive tumor often diagnosed late due to its insidious onset and radiological similarity to other renal masses, including xanthogranulomatous pyelonephritis and other renal neoplasms [3]. Chronic irritation from longstanding nephrolithiasis and infection may induce squamous metaplasia, which can progress to dysplasia and carcinoma [1,8]. In this patient, chronic lithiasis and associated hydronephrosis likely contributed to neoplastic transformation.

Conclusion Given the rarity and aggressive nature of renal SCC, clinicians should maintain a high index of suspicion in patients with chronic nephrolithiasis presenting with renal masses. Definitive diagnosis relies on histopathological and immunohistochemical analysis post-surgery. Early recognition and surgical intervention remain critical for patient outcomes.

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