

ARCHIVES OF THE HUNGARIAN MEDICAL ASSOCIATION OF AMERICA



53rd Annual Scientific Meeting

The official publication of the Hungarian Medical Association of America, Inc.

Letter from the President

Dear Colleagues and Friends,

Welcome back my friends to one of our homes, Sarasota!

During the 53rd Annual Conference, ready yourselves to rekindle friendships, resume clinical discussions, learn a touch and most of all, recharge your batteries to improve the care you provide daily.

It is surreal to imagine that after 20 years as Treasurer and now having fulfilled your honorable request as your President, the mantle may be passed onto the able shoulders of Drs. Garami and Acs! My greeting to you wishes to share milestone accomplishments of the organization over the past few years.

The website has been expertly redesigned to maintain archives, register new members, allow for abstract submission, as well as be the repository of most of our societal information! Member connectivity is also a benefit for those who wish.

A third chapter of the HMAA has been founded in the Chesapeake Bay region of the mid Atlantic, thanks to the hard work of two individuals!

After a pivot the organization took just before the turn of the century, to provide for improved health care in Hungary, the HMAA solidified the student exchange program and as of today, the HMAA now has an actual home for students who study in Buffalo, NY. The home should allow us to even propagate the financial benefit/assets of the society, long into the future.

Over the past years we have been graced by the presence of Rectors and Deans of Hungarian and American universities, the President of Hungary, multiple Ambassadors to the United States, a Nobel prize winner, congratulatory letters from Senators and Governors, a multiple Olympic gold medal winner coach and so before I leave, a child born to Hungarian parents in the United States, I would appreciate sharing the rest of my heritage from a fellow Croatian/Hungarian/American during the social program and banquet this year!

We are grateful for our benefactors, thankful for those who led and taught us, and I bid All, congratulations on a job well done and implore you all to contribute time, ideas and continued support to your organization!

It is your Society!

Jó munkát!

Szeretettel!



Ivan Harangozo, MD
President of HMAA



Greetings From the President-Elect

Dear HMAA Members and Friends,

Welcome back to Sarasota! I hope all of you are looking forward to our 53rd Annual Scientific Meeting, which will, as always, provide us with fruitful discussions after superb presentations. We are so excited to learn from each other, not only within the scope of scientific discourse, but also about personal and professional milestones.

Each year, we are tested by new global challenges affecting each one of us in some shape or form. This time, we yearn for peace and prosperity as we witness Russia's unjust and brutal war on neighboring Ukraine. Resulting increases in energy prices and supply chain issues have also provoked new obstacles for hospital administrations across the globe. However, we are ready to face and discuss these present challenges, just like we were able to surmount those in the past - the recent COVID pandemic included. As a proud and supportive community, we come together stronger than ever.

This year, we continue our flagship student exchange program, and we re-opened the fellowship and observer programs. We restarted our academic exchange programs in both Buffalo and Houston, which we have more than 30 medical students currently enrolled in. You will be able to meet the students in person and listen to their lectures as well. We also have 3 research fellows from Hungary working an annual term at the Houston DeBakey Heart & Vascular Center. We continue to support our student conference in Balatonfüred, which was held August 26-27, 2022, and we will welcome the best English Lecture Award Winner and the North American Student Award Winner at our meeting.

I would also like to take this opportunity to thank all the individuals supporting our organization and our programs. Your contribution powers great opportunities and immense innovations. Let us all come together to make our annual meeting another great success.

This having been said, I would like to extend our warm welcome to everyone on the 53rd Annual Meeting of the Hungarian Medical Association of America!

Enjoy your time with us, take care, and stay safe!



Zsolt Garami, MD
President-Elect of HMAA



Summary and Evaluation of the 52nd Scientific Meeting

Istvan Stadler, PhD

The 52nd Annual Scientific Meeting of HMAA was held between October 25 and October 29, 2021, at the Sandcastle Resort at Lido Beach, Sarasota, FL.

Thank you for the opportunity to act one again as the Program Chair of the 52nd Annual Scientific Meeting of HMAA. I would also like to express my appreciation and thanks to the Program Committee Members, Drs. I. Harangozo, G. Acs, G. Baffy, Z. Garami, L. Mechtler and I. Somkuti, for their efforts and collaboration to put the program together.

The main title of the 52nd Scientific Meeting traditionally was "CURRENT DEVELOPMENTS IN BIOMEDICAL AND CLINICAL SCIENCE". The audience was able to gain information from the following scientific sessions:

1. LATEST DEVELOPMENTS IN BIOMEDICAL SCIENCES AND TRANSLATIONAL RESEARCH. YOUNG INVESTIGATORS' MULTIDISCIPLINARY SESSION I: STUDENT AWARD RECIPIENTS (Monday, October 25)
2. MULTIDISCIPLINARY SESSION I (Tuesday October 26)
3. MULTIDISCIPLINARY SESSION II (Wednesday, October 27)
4. MULTIDISCIPLINARY SESSION IV (Thursday, October 28)
5. MULTIDISCIPLINARY SESSION V (Friday, October 29)

There was a total of 37 presentations: 27 (73%) from USA and 10 (27%) from Hungary, including 29 on-site presentations and 8 virtual presentations.

On Monday (October 5) the young investigators presented their latest results of their research in medicine, and clinically relevant translational research. The session was multidisciplinary including cardiology, oncology, neurology and translational and basic science studies.

The sessions on Tuesday (October 26) were multidisciplinary and included medical education, vaccination issues for children, possible treatment for rheumatoid arthritis, and the latest developments in immunology.

The sessions on Wednesday (October 27) focused on status of epilepticus, smoking cessation, possible neurological symptoms in human Ebola patients, side effect of bleomycin treatment of young male with testicular embryonal carcinoma, humoral immune response for SARS Cov2 infection in immunocompromised and immunocompetent patients. The advantages and disadvantages of weight loss surgery for geriatric patients were also demonstrated in this section.

The session on Thursday (October 28) focused on public health, healthcare administration and general medicine. Topics included a non-aortic aneurysm case report, neuroimaging of brain tumors, discussion of NAFLD and the COVID pandemic situation, and pulmonary pathology in COVID Infection,

Friday's (October 29) lecture topics included the latest developments in oncologic pathology, neurology and their new approaches to more effective patient care.

In this year the audience had extended possibilities to ask questions and for discussions of the topics presented with the lecturers. The audience had opportunity to gain more information and news from lectures on their specialty.

At last, but not least, I would like to express our appreciation and many thanks to people who always ensure the success of our meetings:

Geza Acs, MD, PhD, Secretary; this year Dr. Acs did tremendous work on scheduling the lectures for the program and formatting the final version of our Archives and Program Book.

Istvan Somkuti, MD, PhD, Editor in Chief, for putting together and editing our Archives and providing gifts for meeting participants.

Kinga Huzella, MD, for organizing and managing our excellent and enjoyable social program.

Agnes Stadler, PhD, for helping in administrative and registration work, managing the printing of the Archives and program Books and for managing the onsite registration process during our meeting.



We are open to accept any suggestion and recommendations from our members regarding the topics of our future meetings.

Respectfully submitted by

A handwritten signature in black ink that reads "Istvan Stadler Ph.D." in a cursive script.

Istvan Stadler, PhD
Scientific Program Director

Public Relations Committee Report 2022

Alexander Matolcsy, MD and Agnes Virga, MD

The Covid 19 pandemic still caused a lot of cancellations and difficulties with travels and projects, programs since the last HMAA Board Meeting and the PR Committee report of October 25, 2021.

New Project with the University of Pecs

Dr. Matolcsy and UMASS Medical School Chair in Emergency Medicine, Dr. Gregory Volturo, were invited to the University of Pecs by Rector Dr. Attila Miseta and Dr. Gabor Horvath to discuss the student exchange program and cooperation. Setting the date of this visit is in progress and will happen in the next couple of months. Dr. Matolcsy will also meet with University of Pecs Department of Emergency Medicine Chair Dr. Peter Kanizsai.



Semmelweis University Department of Emergency Medicine Cooperation Project

With the facilitation by Semmelweis University Rector Dr. Bela Merkely and UMASS Medical School Chancellor Dr. Michael Collins, Dr. Matolcsy will meet with Semmelweis University Emergency Medicine Chair Dr. Csaba Varga on October 14, 2022 to discuss further cooperation.

HMAA at the Hungarian Summit

The Hungarian Summit was held on May 12-14, 2022 in Daytona Beach, FL. Dr. Virga represented the HMAA in the higher education, student exchange and the community programs sessions. She had a successful talk about *"Professional Organizations in Hungarian American Communities and Relationships"*. The HMAA was discussed and promoted in the presentation and afterwards. The event was a high-quality, meaningful event, one that has never happened before. We had a full house; 20-25 diaspora representatives, 16 enterprises, 14 higher education institutions, athletes, investors, experts, artists and other interested people were present. It was an honor to have Ambassador Szabolcs Takacs attending the meeting along with other domestic and local public law dignitaries, Florida's elected representatives, honorary consuls, diplomats, and economic professionals who



graced us at the event with their presence!

The education session offered individuals and institution leaders special workshops, lectures and networking opportunities so that they were able to gain knowledge of scholarships and student exchange programs. Hungarian and American leaders of higher education were present to build relationships to aim for a



collaboration in the near future. The goal for both sides is to learn about several grants, scholarships, exchange program opportunities and information. Further information is available at "Hungariansummit.com".



"KORHATARTALAN" and "SEGITSEG.MA "

The organizations continued their work and Dr. Virga has been serving as their Medical Ambassador in the USA and also trying to help develop a cooperation and introduce their programs to members of the HMAA. Dr Virga's experience was positive so far. Information can be found on "segitsege.ma" and "hungarianhub.com/korhatartalan" websites and social media sites. The Hungarian Hub/Korhatartalan community program for American and Hungarian audience presents monthly or bimonthly live discussions with experts on health/medical and other actual topics. Dr. Virga invited Dr. Gyorgy Baffy to be the expert guest and represent the HMAA for the November 18, 2021 event. He gave a very successful hour-long live presentation with Q/A and drew more than 1200 participants from both countries. More information about the event can be found at <https://www.facebook.com/events/916471572562708/>.



As the Covid restrictions have eased, the PR Committee is hoping to promote the HMAA in more events and relations in the next 6 months.

Respectfully submitted by

Alexander Matolcsy, MD
Chair of the Public Relations Committee

Agnes Virga, MD

HMAA Chesapeake Bay Chapter Report 2022

Kinga Michelle Huzella, MD and Klara Mark, DBH

We are very happy to report that after some working and planning, on October 28, 2021, the Board approved the establishment of the **Chesapeake Bay Chapter of the HMAA** (CBC-HMAA) with the by-laws being approved at the spring Board meeting of this year! Our chapter is a great way for the members of the HMAA, their family, guests of members, and those interested in learning more about the HMAA, who live in the Chesapeake Bay and surrounding area, to get together and remain engaged with each other more often than the annual meetings in Florida. We are a group of all ages who welcome students, active professionals, and retirees. We want to encourage and elevate each other while discussing scientific topics in a relaxed social setting.



Our first informal meeting, in the fall of 2021 was well attended, as we got together to gauge interest in the group and to establish the baseline goals. We wanted the group to be a great way for medical professionals in the area who are of Hungarian descent or those associated with or interested in Hungarian culture to get together in a fun, productive, and casual way. We all agreed that our purpose is to exchange medical knowledge in any specialty, allowing networking and friendships to foster. We had a great time, got to know each other better, and savored good food. Our regular members must belong to the HMAA and we will be

encouraging others to become acquainted with us and hopefully join us. We plan on meeting 3 times a year with a speaker and possibly additional times for events/boating/museum tours together, etc. We plan on rotating the meetings between members houses who volunteer their homes for an afternoon who are in the area. We have a Facebook group, our own logo, and yes...we will have shirts.



At our first formal meeting on March 12, 2022, Dr. János Pálóczi from the NIH spoke about his research passion. He gave an excellent informal presentation on the Cardiovascular Effects of Alcohol and Cannabinoid Abuse. It was very interesting, and we were honored to have him as a presenter. We had fun and even had Hungarian doctors from Philadelphia and New York City join the group that day!



At our last meeting, we decided to go pot-luck style and had some delicious food brought by our members! We had an amazing lecture given by Rachel Carreras-Tibold, CD coming all the way from Buffalo, NY. She is a passionate about women's health and works toward decreasing the incidence of mortality rates of infants and mothers during childbirth. She discussed the role of doulas in pre-natal care, childbirth, and post-partum care in a dynamic audio-visual presentation which, in addition to the Power-Point, included props and live presentation of techniques with our younger volunteers. It generated a lot of questions and discussion on a topic that touches all our lives. We were happy to see several student members attending this meeting!



If you would like to join us or just visit with us at one of our meetings, even if you are visiting from out of town, let us know. We would love to have you! Just contact one of us either Kinga or Klara. The CBC-HMAA email is chesapeakebaychapterhmaa@gmail.com.

We are looking forward to seeing you,

Kinga Michelle Huzella, MD
Co-President

Klara Mark, DBH
Co-President

HMAA Hungary Chapter Report 2022

Adam Domonkos Tarnoki, MD, PhD, David Laszlo Tarnoki, MD, PhD and Akos Koller, MD, PhD

ORGANISATION

During the year several communications, board and general assembly meetings were held to discuss the pertinent issues and prepare the yearly Balatonfured Congress. The yearly report for the Hungarian authority was filed. The board members of HMAA Hungary Chapter (HC) remained un-changed. The HC launched its own website: www.hmaa-hc.hu, in Hungarian language.



HMAA FURED2022 CONGRESS, BALATONFURED

The HMAA Hungary Chapter organized its 16th Hungarian (15th Balatonfured) multidisciplinary congress in the State Hospital of Cardiology in Balatonfured, between August, 26-27, 2022. We would like to thank Prof. Dr. Gabor Veress, Director General of the Hospital, for supporting the Congress by providing free venue.

The Congress was held in an in-person format, because the Coronavirus pandemic subsided in Hungary. Nevertheless, every safety measures were taken, such as availability of masks, disinfection sprays and rapid Covid tests.

For the HMAA Fured2022 Congress 135 participants including medical students, residents and PhD students from the four Hungarian medical universities (Semmelweis University, Universities of Debrecen, Pecs and Szeged) registered and 58 attendees gave oral and 26 attendees gave poster presentations. This year, 35 invited guests attended the Congress.

Similarly to previous years, the main aim of the Congress was to create a forum for the young scientists of various medical fields to present their own research work in English or in Hungarian. Over 75 abstracts were submitted, of which oral and e-poster presentations were selected based on the evaluation of the reviewers. The Program Committee of the Congress would like to thank the abstract reviewers for their time spent grading the abstracts, which secured the high quality of the Congress. Also, we would like to acknowledge the help of the student representatives and board members who contributed to the organization and helped to make the two days a memorable event.

This year the highlighted lectures and topics were organized in multidisciplinary sessions, such as COVID-19 pandemic, twin studies, emergency quiz, and so on.

It was an honor that HMAA President-Elect Dr. Zsolt Garami was also present at the meeting and gave a dynamic talk about exciting sonographic cases in the operation room.

In special Highlighted Sessions Prof. Dr. Nagy Zoltan Zsolt (Semmelweis University) talked about the role of femtosecond lasers in treating high intraocular pressure, Prof. Zsolt Bagi (Augusta University, USA) described the cerebral vascular dysfunction and MRI-defined white matter integrity in Alzheimer's disease, Dr. Peter Toth (University of Pecs) regarding endonasal endoscopic transsphenoidal surgery of hypophysis macroadenomas, the pulmonology-COVID session, chaired by Prof. Dr. Ildiko Horvath and Prof. Dr. Veronika Muller, and Hungarian Pulmonology Society session chaired by Prof. Dr. Gyula Ostoros, and finally, Prof. Dr. Laszlo L. Mechtler gave a Zoom lecture regarding "The potential medical use of cannabinoids is several neural diseases, such as migraines and tumors", which is in some states by now is legal.

In addition, several popular workshops were organized. Among others, Dr. Gyula Kincses, President of the Hungarian Medical Chamber, presented an interesting lecture and free discussion aiming to convince the young students to stay and work in Hungary. Prof. Dr. Kinga Karlinger had an interactive workshop for the students how to present a lecture. Dr. Richard Schwab discussed the new findings regarding Microbiome and Health (MIND Clinic)

and Johanna Takacs introduced the interpretations and proper use of standard deviation and standard error of means in statistics. All workshops were well attended.

As always, Awards were given to the best performances. The Irene and Ivan Krisztinicz MD Memorial Award (best English lecture award), offered by the HMAA was presented to Mr. Zalan Petnehazy (Department of Medical Imaging, University of Pecs) for his presentation entitled *"Do traumatic or non-traumatic microbleeds affect white matter integrity? Preliminary results of a tract level diffusion tensor imaging study"*. The winner of the HMAA North American Student Award (best lecture by a North American student studying in Hungary), offered by the HMAA, was Mr. Tom Werber (National Institute of Mental Health, Neurology and Neurosurgery, Semmelweis University) for his presentation entitled *"Alteration of visuo-spatial system as an early marker of cognitive decline: A double center neuroimaging study"*. The winner of the Istvan Mechtler Award (best Hungarian lecture award), offered by Drs. Laszlo L. and Stephen Mechtler, was Ms. Eszter Ven (Department of Pharmacology and Pharmacotherapy, Semmelweis University). The title of her presentation was *"Investigating the transcriptional changes underlying the hidden cardiotoxic effect of the selective COX-2 inhibitor rofecoxib"*. In addition, 15 session awards were given to the best student presenters.

The most important social programs were the dinner in the Anna Grand Hotel, the water polo game in the city swimming pool (the hospital pool was closed for renovation) and the waffle party.

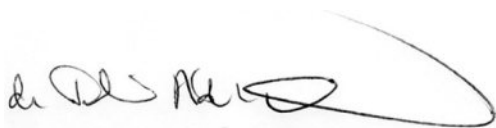
The full program, pictures of the congress, list of winners, publications and more information are available at www.hmaa-hc.hu website.

All in all, the Congress was a great success, after the difficult time of the COVID-19 pandemic, and the students and professors enjoyed the science and free personal interactions.

MORE INFORMATION

Please visit the renewed www.hmaa-hc.hu website for further information regarding the HMAA Hungary Chapter and Congresses.

Respectfully submitted,



Adam Domonkos Tarnoki, MD, PhD
Vice-President of HMAA HC



David Laszlo Tarnoki, MD, PhD
Secretary of HMAA HC



Akos Koller, MD, PhD
President of HMAA HC



Marosvásárhelyi Magyar Diákszövetség

Asociația Studenților Maghiari din Târgu Mureș
Hungarian Students' Association from Târgu Mureș

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29. Tudományos Diákköri Konferencia, Marosvásárhely - összesítő

A rendezvény dátuma 2022. május 11-14. volt, főhelyszínül a marosvásárhelyi Kultúrpalota szolgált, de adott szekcióknak, műhelymunkáknak és panellbeszélgetéseknek a Maros Megyei Tanács Gyűlésterme, a Studium Hub, a Marosvásárhelyi “George Emil Palade” Orvosi, Gyógyszerészeti, Tudomány- és Technológiai Egyetem termei és a Grand Hotel előadótermei is otthont adtak.

A 29. Erdélyi Tudományos Diákköri Konferencián 232 hallgató, ebből 175 hazai és 57 magyarországi diák mutathatta be tudományos dolgozatát orvosi, fogorvosi és gyógyszerészeti szakterületeken belül.

Az idei évben 14 meghívott előadóval büszkélkedhetünk, mely közül 2 hazai és 12 Magyarország területéről érkezett hozzánk. Emellett innovációként 3 panellbeszélgetésre is sor került, amelyeken összesen 8 meghívott előadó vett részt, ebből 6 hazai és 2 magyarországi szakember.

Az eddigi évekhez hasonlóan műhelymunkákkal is gazdagítottuk a rendezvénypalettánkat, amely keretén belül összesen 46 meghívott előadót számolunk, ebből 42 hazai, valamint 4 magyarországi.

CURRENT DEVELOPMENTS IN BIOMEDICAL AND CLINICAL SCIENCES

Abstracts of the 53rd Annual Scientific Meeting of the Hungarian Medical Association of America

Sarasota, FL, October 23 – October 28, 2022



NOCICEPTIN IS MORE THAN JUST NOCICEPTION

Tariq, S. and Adeghate, E.

Department of Anatomy, College of Medicine & Health Sciences, UAE University, Al Ain, United Arab Emirates



Ernest Adeghate, MD, PhD

Professor and Chair, Department of Anatomy, College of Medicine & Health Sciences, UAE University, Al Ain, United Arab Emirates

Dr. Adeghate obtained his MD from Semmelweis University Medical School, Budapest, Hungary in 1986 and his PhD from the Hungarian Academy of Sciences in 1992. He was awarded a DSc by the Hungarian Academy of Sciences in 2010. He also has a Master of Family Medicine degree from Monash University, Australia. Dr. Adeghate worked as a lecturer in Anatomy at Semmelweis University, Hungary before joining the College of Medicine & Health Sciences, United Arab Emirates University, Al Ain, UAE. Dr. Adeghate is a Professor & Chair of the Department of Anatomy and Chairperson of the Diabetes and Cardiovascular Research Priority Group, United Arab Emirates University. His research interest is in the field of experimental diabetes. He has published more than 150 full-length articles in peer-reviewed journals, 9 book chapters, 116 abstracts and attended over 72 scientific conferences. The cumulative impact factor of his publications is over 190 with a total citation of 1,689. Dr. Adeghate is the Editor-in-Chief of the International Journal of Diabetes & Metabolism, and a member of the Editorial Board of the World Journal of Diabetes, Neuroendocrinology Letters, Journal of Molecular and Genetic Medicine, The Open Medicinal Chemistry Journal and Islets.

Aim: Nociceptin/Orphanin FQ (N/OFFQ, NC) is a 17-amino acid (aa) peptide which was discovered in 1996. NC regulates physiological functions such as pain, neurotransmitter release, uterine contraction, gastric motility, pancreatic exocrine and endocrine release and many others. NC was first localized to the neurons of the central and peripheral nervous systems where it is believed to mediate nociception. We hypothesized that in addition to nerve tissue, other organs including the islet of Langerhans and the uterus contain NC and may possibly modulate the function of these organs. We also believe that the pattern of distribution of NC may change after the onset of diabetes mellitus (DM).

Methods: Diabetes was induced with streptozotocin (STZ, 60 mg/kg body weight). Pancreatic and uterine tissues were removed and further processed using several techniques including immunohistochemistry, immunofluorescence, Western blot and immunoelectron microscopy.

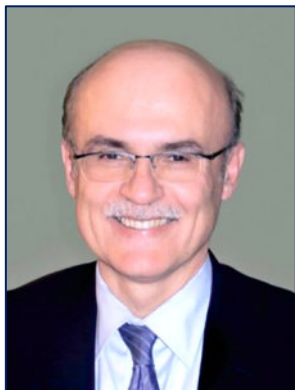
Results: Our results showed that NC is present in pancreatic islet cells where it co-localizes with insulin in β -cells. The number of NC-positive cells was significantly reduced after the onset of DM. NC-immunoreactive profiles were also seen in the endometrial and myometrial layers of the rat uterus. Transmission electron microscopy showed that NC is localized specifically to the secretory granules of the beta cells of both the normal and diabetic rat pancreas and the myofibrils of the smooth muscles of rat uteri.

Conclusions: These findings regarding the localization of NC in the endocrine pancreas as well as in the uterine wall suggest that NC may modulate the functions of these organs. The reduction of NC may contribute to the development of diabetes complications.

NEW INSIGHTS INTO THE MECHANOBIOLOGY OF NONALCOHOLIC FATTY LIVER DISEASE

Baffy, G.

VA Boston Healthcare System, Harvard Medical School, Boston MA



Gyorgy Baffy, MD, PhD

Associate Professor of Medicine, Harvard Medical School and Chief of Gastroenterology at the VA Boston Healthcare System, Boston, MA

Past-President and Member of the Advisory Council, HMAA

Dr. Gyorgy Baffy is Associate Professor of Medicine at Harvard Medical School and Chief of Gastroenterology at the VA Boston Healthcare System. He was an NIH Fogarty Fellow in the Department of Biochemistry and Biophysics at the University of Pennsylvania. He trained in gastroenterology at the University of Michigan and the Brigham and Women's Hospital. His research interests focus on nonalcoholic fatty liver disease (NAFLD) and related aspects including risk stratification, biomarkers, portal hypertension and hepatocellular carcinoma (HCC). He has published over 100 peer-reviewed papers and book chapters. In 2014, he lectured as a Fulbright

US Scholar on obesity and related disorders in Hungary. He is a Fellow of the American College of Physicians, American College of Gastroenterology, American Gastroenterological Association, and the American Association for the Study of Liver Diseases. He is the recipient of the Hetényi Medal and Pro Optimo Merito in Gastroenterologia Awards from the Hungarian Gastroenterological Association.

Aim: Mechanobiology is an interdisciplinary field that explores the impact of physical force on biological functions, such as development, growth, and differentiation. Mechanical cues are perceived by various mechanosensors of living cells (e.g., focal adhesions, adherens junctions, flow-sensitive ion channels), propagated by the contractile cytoskeleton (mechanotransmission) and intracellular biochemical cascades (mechanosignaling), and integrated into mechanoresponses by the nucleus. There is evidence that mechanical forces extensively inform the biological behavior of liver cells. Liver sinusoids represent a unique microenvironment in which a number of cell types are subjected to a variety of physical forces (e.g., compression, stretch, and shear stress) originating in the cytoskeleton and at interfaces with adjacent cells, the extracellular matrix, and vascular or interstitial fluids. However, the impact of mechanoresponses on the development and progression of liver disease remains relatively unexplored.

Methods: Recent studies suggest that early mechanical changes have a key role in the pathogenesis of nonalcoholic fatty liver disease (NAFLD), a globally prevalent disorder with heterogeneous outcomes. Steatosis and steatohepatitis profoundly alter liver tissue viscoelasticity associated with changing architecture and hemodynamic properties. Moreover, hepatocellular lipid accumulation and lipotoxic injury (ballooning), activation of inflammatory responses, dysfunction of liver sinusoidal endothelial cells, and transdifferentiation of hepatic stellate cells initiate mechanoresponses that may contribute to a pro-angiogenic, pro-fibrotic, and pro-oncogenic milieu and foster the development of portal hypertension, cirrhosis, and hepatocellular carcinoma. A number of studies indicate that the paralogous transcription co-activators YAP/TAZ have a prominent role in regulating mechanoresponses in health and disease. In the liver, YAP/TAZ have been associated with liver cell zonation, metabolic reprogramming, activation of hepatic stellate cells, and fibrogenesis.

Results: Several lines of evidence indicate that a better understanding of liver mechanobiology will help us gain new insights into the pathogenesis of NAFLD. One concept emerging from current research is that fibrosis is not a prerequisite to the initiation of portal hypertension in NAFLD. Indeed, multiple experimental and clinical findings suggest that steatosis, inflammation, and angiogenesis may increase sinusoidal pressure that may stimulate the development of subsequent fibrosis, establishing a bidirectional relationship, which is in part mediated through mechanosignaling. Another intriguing concept relates to the early development of hepatocellular carcinoma in noncirrhotic NAFLD, which represents a major public health challenge.

Conclusion: Identifying molecular targets to prevent or mitigate the impact of physical forces on liver cells may represent novel approaches to the treatment of NAFLD. Potential strategies include mechanical 'off-loading' by reducing the spatial impact of steatosis and inflammation, preventing the expansion of extracellular matrix and fibrosis, and decreasing fluid shear stress by normalizing sinusoidal pressure. Modulating mechanotransduction and reducing the responsiveness of liver cells to abnormal physical forces (e.g., stiffness-induced activation of hepatic stellate cells) may also prove beneficial. Further research is needed to validate early observations and evaluate the safety of inhibiting the pleiotropic YAP/TAZ pathway with the intent to re-regulate mechanotransduction in the diseased liver.

ADAM17 SHEDDASE IN AGING-RELATED MICROVASCULAR DISEASE

Bagi, Z.

Department of Physiology, Medical College of Georgia at Augusta University, Augusta, GA, USA



Zsolt Bagi, MD, PhD

Professor, Department of Physiology, Medical College of Georgia at Augusta University, Augusta, GA

Dr. Bagi is a Professor of Physiology at Medical College of Georgia at Augusta University. He received his MD degree in 2000 and PhD degree in 2004 from the Semmelweis University Medical School in Hungary. He joined Professor Gabor Kaley at the Department of Physiology, New York Medical College, Valhalla, NY in 2002, where he did his postdoc training and held an Assistant Professor position (2007-2010). He moved to Oxford in 2010 having been awarded an Intermediate Research Fellowship from the British Heart Foundation Center of Research Excellence and joined the Department of Pharmacology at University of Oxford (2010-2012). He was a Senior Research Fellow at the Somerville College, Oxford University (2011-2013). Currently, Dr. Bagi leads a

research laboratory in the Department of Physiology, where his current research is focusing on the molecular mechanisms of small blood vessel disease in diabetes mellitus, diastolic heart failure and aging.

Aim: Physiological and pathological vascular remodeling is uniquely driven by mechanical forces from blood flow in which wall shear stress (WSS) mechanosensing by the vascular endothelium plays a pivotal role. Previously we found that aging induces an excessive activation of the sheddase enzyme, disintegrin and metalloproteinase 17 (ADAM17). Here we aimed to determine the novel role of ADAM17 in impaired WSS mechanosensing, which was hypothesized to contribute to aging-related abnormal vascular remodeling.

Methods: Resistance arteries of aged mice (30-month old vs. 12-week old) exhibited impaired WSS mechanosensing and displayed inward hypertrophic arterial remodeling.

Results: These vascular changes were recapitulated by in vivo confined, AAV9-mediated overexpression of ADAM17 in the resistance arteries of young mice. An aging-related increase in ADAM17 expression reduced the endothelial junction level of its cleavage substrate, junctional adhesion molecule-A/F11 receptor (JAM-A/F11R). In cultured endothelial cells subjected to steady WSS ADAM17 activation or JAM-A/F11R knockdown inhibited WSS mechanosensing. Moreover, overexpression of ADAM17 cleavage resistant, mutated JAM-AV232Y normalized endothelial WSS mechanosensing in ADAM17-activated endothelial cells, in vitro, and augmented WSS-induced vasodilation in aged mice, in vivo.

Conclusion: These data demonstrate a novel role for ADAM17 in aging-related arterial remodeling via JAM-A/F11R cleavage-mediated, impaired WSS mechanosensing. ADAM17 could prove to be a key regulator of WSS mechanosensing, whereby it can also play a role in abnormal vascular remodeling in aging.

N,N-DIMETHYLTRYPTAMINE (DMT) EFFECT ON BLOOD-BRAIN BARRIER FOLLOWING TRANSIENT BRAIN ISCHEMIA IN RATS

Bago, M.P., Zatik, V., Nardai, S. and Laszlo, M.

Heart and Vascular Center, Semmelweis University, Budapest, Hungary



Mate Pal Bago, MS

Medical Student, Semmelweis University, Budapest, Hungary

Mate Pal Bago is a 6th-year medical at Semmelweis University in Budapest, Hungary. He is doing his research at the Heart and Vascular Center of Semmelweis University in the field of cerebrovascular disease focusing on new therapeutic approaches in brain ischemia.

Aim: NN,N-Dimethyltryptamine (DMT) is a hallucinogen produced by several plants and animals. DMT is consumed orally in brews like ayahuasca as part of religious rituals in South America. Although the endogenous synthesis of DMT in humans is acknowledged, its role and function are not understood yet. Previous in-vitro experiments proved the effect of DMT in increasing cell survival under hypoxic conditions. Our goal was to demonstrate the theoretically suggested tissue-protective effect of DMT focusing on Sig-1R dependent mechanisms in cerebral ischemia-reperfusion injury using the rat middle cerebral artery occlusion (MCAO) model.

Methods: In our experiment, the rat MCAO model was used. One hour of ischemic period was followed by 24 hours of reperfusion. The cerebral blood flow over the right middle cerebral artery territory was monitored with Laser-Doppler Flowmetry. The continuous infusion of DMT and Sigma receptor antagonist was carried out by intraperitoneal osmotic pumps. 24 hours later Serum and brain specimens were collected for immunohistology, ELISA, and QPCR.

Results: The DMT-treated group maintained blood-brain barrier function via smaller inflammatory response and apoptosis and increased regenerative response.

Conclusion: We identified reduced apoptosis, increased neurotrophic activity, and decreased inflammation as potential mechanisms behind the effect of DMT treatment in brain ischemia.

PANCREATITIS GONE WRONG. A FATAL CASE OF NECROTIZING HEMORRHAGIC PANCREATITIS

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Case Report: A 24-year-old male with no medical history presented to the ED with symptoms of alcohol withdrawal, abdominal pain, and diarrhea. He admitted to recent heavy drinking, and complained of abdominal pain, anorexia, anuria for 3 days, chills and fevers. His labs were notable for leukocytosis, hypocalcemia, transaminitis, and elevated lipase. CT Abdomen/Pelvis was notable for acute interstitial pancreatitis with large acute peripancreatic fluid collection tracking into pelvis, with reactive ileus, and hepatic steatosis. Given his acute pancreatitis, AKI, high anion gap metabolic acidosis, alcohol withdrawal, hyponatremia, hypocalcemia, tachycardia/tachypnea, he was placed in the ICU, but was downgraded after 24-hours. His treatment included benzodiazepines, IV Zosyn x2 days, IV fluids, thiamine, folic acid, Lovenox, and evaluation by surgery. He was discharged on hospital day 6, with above-mentioned lab values down-trending/correcting. At time of discharge his pain and nausea had improved, not fully resolved, though he was tolerating oral diet. 14-days after his initial admission, patient represented to ED with abdominal pain, fever, and weakness. He was noted to be tachypneic/tachycardic, now requiring 6L Oxygen. Labs were notable for hyponatremia, elevated Alkaline phosphatase, leukocytosis, anemia, and an elevated INR. CT Abdomen/Pelvis showed acute interstitial pancreatitis with increased inflammation/edema around pancreas with findings concerning for necrotic changes. Interventional Radiology and GI opted for noninvasive/conservative management. On day 15, with a worsening Ranson score, Infectious Disease recommended vancomycin/meropenem for concern of infected necrosis, and Interventional Radiology placed pigtail catheter to drain anterior abdominal wall collection. On day 17, his drains began producing dark-red serous fluid, the patient was confused, septic, with anasarca, requiring 8L O₂. Lovenox was started for splenic vein thrombosis. ICU was consulted given his overall deterioration. On day 18, his hemoglobin began to downtrend though no clear source of bleeding was identified. CT PE noted hemorrhagic abdominal fluid. Lovenox was stopped, and he was commenced on lactulose, rifaximin, and crystalloids. Surgery was reconsulted for necrotizing pancreatitis with hemorrhagic transformation. Patient transferred to ICU, given FFP, PRBC's, IV vitamin K, and started on pressors. On day 19, patient was transferred to a higher-level care hospital. CT GI-bleed showed a new 12cm hemorrhagic collection in the lesser sac with a small focus of active hemorrhage, retroperitoneal hemorrhage extending to the pelvis, and changes suspicious for necrotizing pancreatitis. Patient went to OR for ex-lap and debridement, however a few hours after operation became more unstable, with diffuse bleeding. He returned to OR where again, no definitive source was identified, and additional nonviable pancreatic tissue was removed. Patient required triple-pressors, and multiple transfusions. Despite these efforts, his condition worsened and he died 19 days after his initial presentation.

Conclusion: Acute pancreatitis results in nearly 250,000 annual admissions at a cost of approximately \$2.2 billion. Necrosis complicates as many as 20%-30% of all cases of acute pancreatitis, and these cases are associated with markedly increased morbidity and mortality. High clinical suspicion, earlier and stepwise intervention may serve to prevent adverse outcomes in these patients.

THETA BURST BRAIN STIMULATION: THE FASTEST TREATMENT FOR LONG LASTING DEPRESSION

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Patrick Bodrog is an experienced technician and volunteer in the clinical aspect of healthcare, Undergraduate Researcher on Neurodegenerative Disorders, Honors Pre-Med Student, tutor and Teaching Assistant at the University of Massachusetts Amherst.

Aim: To analyze clinical significance of Theta Burst Stimulation treatment and Transcranial Magnetic Stimulation.

Methods: This presentation includes a review of the current impact untreated depression can have on health, as well as a review of the current standards for depression treatment. The STAR*D study is examined to determine the efficacy of current standards to treat depression. The mechanism of action for NeuroStar Transcranial Magnetic Stimulation (TMS) as well as Theta Burst Brain Stimulation (TBS) illustrated by a review of 6 FDA approved Neurostar TMS studies, including 2 multisite, randomized controlled trials.

Results: Current treatments for depression have 30% success for remission for first line treatment with decreasing remission rates for subsequent attempts. Compared to a sham treatment, the NeuroStar TMS treatment scored 2 points lower on the Hamilton depression 24-item Scale (HDRS). The HDRS difference between the sham and NeuroStar TMS was significantly different at both the 4 week and six week intervals. Patients receiving active NeuroStar TMS therapy were four times more likely to achieve remission compared to patients receiving sham treatment ($P = 0.0173$; odds ratio = 4.05). Compared to the next choice of treatment, the NeuroStar TMS treatment had significantly higher response ($P < 0.0001$) response and significantly higher ($p < 0.0001$) remission rates after six weeks of treatment.

Conclusion: In summary, Theta Burst stimulation (TBS) is a promising, quick and easier access alternative to the current standard repetitive Transcranial Magnetic Stimulation (rTMS) for treatment-resistant depression (MDD). TBS treatment is delivered over a much shorter time than any other alternatives (3 minutes), enabling more patients to be treated with the same resources. Faster treatment makes more patients being treated in high demand areas (i.e. Psych Clinics) – trials going on now for PTSD and Anxiety symptoms, too. TBS is an effective, FDA proven approach for patients with major depression when initial treatments have failed and for patients that would like to reduce their use of antidepressant medications and their side effects.

THE AGING EYE: ALTERATIONS IN THE RETINAL NEUROVASCULAR FUNCTION IN INDIVIDUALS WITH ALZHEIMER'S DISEASE

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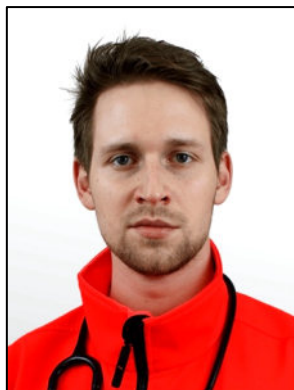
Dr. Cabrera DeBuc's laboratory research focuses on developing methods and algorithms to quantify pathological features and treatment-induced changes in patients with ocular and neurological diseases. The primary focus is to develop quantitative tools to improve ocular imaging and image processing analysis for clinical use as well as to identify novel imaging biomarkers of the onset and progression of ophthalmic and neurological diseases using advanced optical imaging (e.g., OCTA, LSFG, RFI, cSLO). The lab also has an interest in developing and translating low-cost multimodal approaches for eye screening integrated with telemedicine and artificial intelligence applications in primary care and community settings.

In the last 20 years, research focused on developing potential eye biomarkers for Alzheimer's and other neurodegenerative diseases has increased significantly. Neurodegenerative disorders are not limited to the brain but also affect the retina. Retinal alterations have been detected across the Alzheimer's continuum, noticeably ascertaining the significance of eye pathology in this disease. Therefore, a multimodal approach combining structural and functional retinal measures may be required to understand how this complex neurovascular system is affected by Alzheimer's. This talk outlines the status of research on retinal neurovascular alterations in Alzheimer's. It discusses the development of retinal biomarkers capable of identifying biological changes associated with Alzheimer's that could facilitate early detection and tracking of the progression of disease severity over time.

EFFECT OF MICRODOMAIN-FORMING LIPIDS ON THE MEMBRANE LOCALIZATION AND GATING OF VOLTAGE-GATE ION CHANNELS

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Dr. Bence Cs. Szabo graduated with summa cum laude as a medical doctor in 2021 at the Faculty of Medicine of the University of Debrecen, Hungary. Currently he is working as a PhD student in the Department of Biophysics and Cell Biology at the University of Debrecen under the supervision of Florina Zakany MD, PhD. Bence started his research work in the department as an undergraduate student in 2017. During his university years he attended many conferences including local and national Student's Research Society Conferences where he was awarded prizes for many times including a first prize at the national conference in 2021. He also received grants

of the New National Excellence Program of the Ministry of Human Capacities three times. As a member of the Ion Channel Structure-Function Research Group his main scientific interest is the investigation of the effects of membrane lipids on ion channels with pathological relevance applying electrophysiological and microscopical techniques. Besides his PhD studies he is also working as a paramedic doctor in the National Ambulance Service.

Aim: The gating of ion channels and their distribution between membrane microdomains such as lipid rafts and ceramide platforms strongly depend on lipid composition of the cell membrane. The level of the lipid raft constituent cholesterol (CHOL) influences these functionally relevant parameters of the KV1.3 voltage-gated potassium channel by modifying its pore domain (PD), which might carry pathophysiological relevance through controlling lymphocyte activation and neuronal functions. The HV1 voltage-gated proton channel has a unique structure by having only a voltage-sensor domain (VSD) without a PD. Although recent studies suggested a connection between HV1 and diseases with increased CHOL levels such as breast and colorectal cancers, CHOL actions on HV1 gating have not been investigated before. Furthermore, the effects of C16-ceramide (Cer) and C16-glycosylceramide (GCer), two other membrane microdomain-forming lipids, have not been previously examined on KV1.3 or HV1 despite the importance of these lipids and channels in neurodegenerative and lipid storage disorders.

Methods: We investigated the consequences of loading the cell membrane with CHOL, Cer or GCer on the localization and gating of KV1.3 or HV1 applying confocal microscopy and two-electrode voltage-clamp fluorometry (TEVCF). For microscopy, we transfected HEK cells with Kv1.3- and HV1-encoding plasmids, while GFP-GPI transfection and anti-ceramide antibodies were used for the visualization of lipid rafts and ceramide platforms, respectively. During quantitative image processing Pearson correlation coefficients were determined between KV1.3 or HV1, raft and ceramide platform markers in control and lipid-loaded samples to quantify their colocalization. TEVCF measurements performed on channels expressed in *Xenopus laevis* oocytes enabled simultaneous measurements of ionic currents and characterization of VSD and PD movements during the gating process after labeling a cysteine residue introduced into the VSD with TAMRA-MTS. By determining steady-state activation (G-V curves) and fluorescence-voltage relationship (F-V curves) we can identify the intramolecular target of lipids.

Results: Cer treatment significantly decreased the strongly positive Pearson coefficient between markers of KV1.3 or HV1 and lipid rafts, while increased that between channels and ceramide platforms, suggesting a relocation of these channels from lipid rafts to ceramide platforms. In contrast, GCer treatment significantly increased the colocalization of channels with lipid rafts without modifying that with ceramide platforms referring to enhanced lipid raft localization. Distinctive effects of Cer and GCer were further corroborated by TEVCF measurements for KV1.3. While both treatments shifted G-V curves towards more positive membrane potential values, only Cer induced similar changes in the F-V curve and GCer exerted no significant effects on VSD movements, suggesting that Cer modulates Kv1.3 function through affecting the VSD, whereas GCer targets directly the PD. TEVCF examination of Hv1 is in progress.

Conclusion: The intrinsic membrane components CHOL, Cer and GCer affect the gating of KV1.3 and HV1 channels possibly through modifying their preferential localization in various membrane microdomains, which could contribute to the pathomechanism of diseases with altered lipid levels.

Grant Support: UNKP-22-3-I-DE-243; UNKP-22-4-II-DE-69; UNKP-22-2-I-DE-134; OTKA FK143400, K138075, ANN133421, K132906, K143071, SNN139532; EFOP-3.6.2-16-2017-00006; GINOP-2.3.2-15-2016-00015

THE ROLE OF SALVAGE SURGERY IN ADVANCED HEAD AND NECK CANCER

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Ladislav Czako is Associate Professor and since 2019 Chair of the Department of Oral and Maxillofacial Surgery, Faculty Hospital Bratislava, Slovakia. He has been engaged in extensive reconstructions in the head and neck region with microvascular free flaps, especially in patients with oncological diseases. His scientific interests include 3D guided surgery in maxillofacial surgery. He trained at the Comenius University Bratislava, Slovakia.

Aim: To determine the oncologic outcomes of patients undergoing salvage surgery for recurrent oral cavity squamous cell carcinoma (OCSCC) and head and neck basal cell carcinoma (HNBCC) after initial treatment with surgery and adjuvant oncological therapy.

Methods: Patients included those with OCSCC and HNBCC who were initially treated with surgery or adjuvant therapy from 2016 and underwent salvage surgery for local and/or regional recurrence.

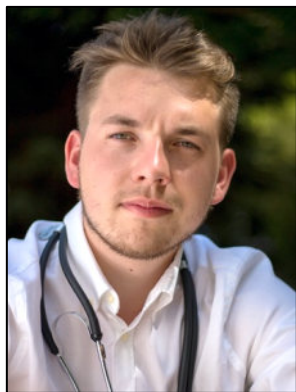
Results: A total of 26 patients were included (72% OCSCC, 28% HNBCC). Two-year overall survival was 39% and was significantly improved among patients with human papillomavirus-associated oropharyngeal tumors and significantly worse for those with postoperative positive margins. Adjuvant (chemo)reirradiation was not associated with disease control or survival regardless of margin status.

Conclusion: Patients presenting with resectable recurrence after failed initial therapy with surgery and adjuvant therapy have a significantly reasonable salvage rate when a negative margin resection can be attained. Patients with postoperative positive margins have poor survival outcomes that are not significantly improved with adjuvant chemotherapy or radiation. Those with combined locoregional recurrence are at particularly high risk for postoperative positive margins. The functional consequences of salvage surgery and its effect on quality of life are difficult in decision making, but this surgical technique give hope for survival and healing to oncology patients.

SYSTEMIC INVESTIGATION OF RESISTANCE PROCESSES AGAINST NEW ANTIBIOTICS TARGETING CRITICAL PRIORITY PATHOGENS

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Marton Czikkely works in the Csaba Pál Laboratory for more than 5 years as a 6th-year medical student of the University of Szeged and fellow of the National Academy of Science Education.

Aim: Multi-drug-resistant (MDR) pathogens are estimated to lead to a worldwide problem by 2050. The most critical bacteria according to the WHO list are resistant strains of *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Klebsiella pneumoniae*. Despite this, fewer and fewer new antibiotics are entering the market. The reason for this is the long and very expensive development, as well as the emerging resistance, which further increases the financial risk of drug research. As a result, we aimed to systematically investigating whether resistance is developing in the most critical pathogens of the WHO list against antibiotics that are under development and represent the therapy of the future. We were interested in whether there is a difference in the level of resistance between different antibiotics, functional groups and bacterial species.

Methods: By surveying the list of antibiotics under development I selected 13 from 6 different antibiotic families that has activity against Gram-negative bacteria, which the WHO has classified as the most critical ones. In addition to the antibiotics under development, based on their mechanism of action, I also chose 1-1 control antibiotics for the experiments, which are already routinely used in clinical practice, in order to validate my results. To test resistance processes I used one MDR and one sensitive strain of the four above mentioned species. I measured the minimum inhibitory concentration (MIC) of all strains for the new and control antibiotics. Antibiotic resistance evolution experiments were carried out with those strains, where the basic MIC did not exceed 4 µg/ml. After that, I investigated how random single genomic mutations affect resistance. For this purpose I used the standard mutational frequency assay with 3 biological parallel samples.

Results: For all antibiotics in clinical development, resistance has developed in one or more species, which is so high that it reaches the maximum plasma concentration or the clinical breakpoint. Analyzing the relative MIC values, it is clear that the degree of resistance to the new antibiotics does not differ significantly from the control agents that have been used for a long time. No resistance developed in the case of 25% of the tested antibiotic-bacterial strain pairs. Also, in general, membrane-targeting antibiotics are less prone to develop resistance than agents with conventional mechanisms.

Conclusion: Based on our results, resistance to newer drugs will develop in the future just as quickly as we are experiencing with current drugs. However, some of our observations can help prevent the coming crisis. Taking advantage of the mapped resistance-free bacteria-antibiotic pairs, we recommend in the future the development of a clinical practice in which the resistance-causing potential of the given species/strain is taken into account when administering antibiotics. With this method, we could slow down the rate of developing resistance in the clinic, gaining time for the development of new antibiotics or other antimicrobial agents. Furthermore, our results show that antibiotics targeting the bacterial membrane seem to be a promising development direction in the future to design new compounds with limited resistance.

Grant Support: Personal grants: UNKP-21-2 New National Excellence Program of the Ministry for Innovation and Technology, Szeged Scientists Academy under the sponsorship of the Hungarian Ministry of Innovation and Technology (FEIF/646-4/2021-ITM_SZERZ). Csaba Pál Laboratory: National Laboratory of Biotechnology Grant NKFIH-871-3/2020, The European Research Council H2020-ERC-2014-CoG 648364- Resistance Evolution, The National Research Development and Innovation Office 'Élvonal' Programme KKP 126506, The ELKH Lendület Programme LP-2017–10/2020.

IDENTIFICATION OF PROTEIN PHOSPHATASE EFFECTORS AMONG FDA APPROVED DRUGS: ARE THEY INVOLVED IN SOME UNIDENTIFIED SIDE EFFECTS?

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Ferenc Erdodi graduated from the University of Debrecen, Faculty of Natural Sciences as a chemist in 1979. Currently he is a full professor in the Department of Medical Chemistry at the University of Debrecen and does research on the roles of protein phosphorylation-dephosphorylation in the regulation of cellular processes. He worked in the USA as a postdoctoral fellow at the University of Illinois at Chicago and later as a visiting professor at the University of Arizona at Tucson. He participated in international research collaboration with scientists in the USA, Germany, Japan and Canada. He has published 86 peer-reviewed papers and 4 book chapters so far and his publications have been cited more than 3000 times. He has been the advisor for 9 successfully defended PhD thesis and the tutor for many students' research projects. He has been

the chairman of the Council of Students' Research Society at the Faculty of Medicine, University of Debrecen, since 2013.

Aim: Phosphoserine/threonine (P-Ser/Thr) specific protein phosphatases are important regulators of several cell functions via dephosphorylation of key phosphoproteins of cell signaling networks. These enzymes have been considered less "druggable" compared to their Ser/Thr kinase counterparts. Our recent studies have established that numerous molecules of natural origin or synthesized chemicals can influence differentially the activities of protein phosphatase-1 (PP1) and -2A (PP2A), the two major P-Ser/Thr specific protein phosphatase types, even in cellular systems. These findings prompted us to search for novel effectors of PP1 and PP2A via screening compound libraries.

Methods: We set up a high throughput screening (HTS) assay optimized for 384 well plate format and for phosphatase activity measurement to determine phosphate released from peptide substrates of PP1 or PP2A using malachite green reagent. Screening of 774 compounds from the Screen-Well® FDA Approved Drug Library V2 version 1.2 was carried out setting quite strict criteria for activatory or inhibitory effects on PP1 and PP2A.

Results: Three drugs, Foscarnet, Alendronate and Micafungin emerged as possible phosphatase inhibitors and their effects were confirmed and characterized in a more sensitive assay using radiolabeled substrate. Foscarnet proved to be more potent inhibitor of PP2A (IC₅₀= 1.24 μM) than Alendronate (IC₅₀= 11.12 μM). Foscarnet also showed more effective inhibition of PP1 (IC₅₀= 102.18 μM) compared to Alendronate (IC₅₀=~ 190.27 μM). Micafungin seemed to inhibit PP1 only (IC₅₀= 73 μM), while it activated PP2A (EC₅₀= 7 μM). Alendronate and Foscarnet exerted inhibition on phosphatases in HeLa cells suggesting that they permeate the cells and act on cellular PP1 and PP2A.

Conclusion: Our present data imply that drugs in general use in medicine may have influences on cellular PP1 and PP2A, enzymes which are involved in the regulation in numerous cellular processes. These findings may direct attention to the need of more detailed characterization of these phosphatase targeted effects of drugs possibly leading to the recognition of yet unidentified side effects.

Grant Support: This work was supported by NKFIH K129104 grant.

ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION FROM MATCHED RELATED DONORS FOR ACUTE MYELOID LEUKEMIA – SINGLE CENTER EXPERIENCE

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Balázs Gálffy is a fourth-year PhD student at the Comenius University in Bratislava, Slovakia. He received his medical degree in general medicine from the same university in 2016 and became a hematologist at the Slovak Medical University in 2022. His research interests focus on treatment of acute leukemias, hematopoietic stem cell transplantations and their complications. He currently works at the Department of Hematology and Transfusiology in Bratislava, which is the only center in Slovakia where autologous and allogeneic transplantations from related and unrelated donors are performed.

Aim: In patients with AML allogeneic hematopoietic stem cell transplantation (HSCT) remains the priority treatment modality as the most effective prevention of relapse. We aimed to summarize the characteristics of performed allogeneic sibling HSCT, to evaluate the effect of treatment response on the success of HSCT, to evaluate the impact of genetic risk on overall survival (OS) and to evaluate the causes of patient death. As part of the treatment response, we compared the group of patients according to whether they achieved a complete remission (CR) after the 1st or only after the 2nd induction chemotherapy and according to whether they were transplanted in the 1st or 2nd complete remission (CR) or with active disease. We compared the mortality of patients according to whether they received a graft from a brother or a sister.

Methods: It is a retrospective analysis of patients with AML who underwent a sibling HSCT at the Department of Hematology and Transfusiology in Bratislava within 10 years, in the period 1/1/2011 – 31/12/2020. The study included 104 transplants. We drew information from the database reported by European Society for Blood and Marrow Transplantation (EBMT) and the hospital information system. We evaluated OS using Kaplan-Meier curves. When stratifying patients according to genetic risk, we used the valid ELN2017 model. We used the Cox regression model in the multivariate analysis of OS when comparing patient age, risk and disease status before transplantation.

Results: The median age at the time of HSCT was 44 years (age range 19-71 years). From the entire group of 97 patients, 54 patients (55.7%) are alive as of January 1, 2022. 5-year survival is 53.3%. Non-relapse mortality was recorded in 24 patients, dominated by GvHD (10 patients) and infectious complications (5 patients). 5-year OS was 73.3% in favorable risk, 79.7% in intermediate risk, and 39% in adverse risk. 19 patients achieved CR only after 2 induction cycles, 11 patients were chemoresistant. Survival is worse in these 2 cohorts, as in patients who were transplanted in the 2nd CR.

Conclusion: According to our results, death occurs rarely after 2 years after transplantation. The median OS of our patients is similar to data from abroad. We attribute the better results in intermediate than in favorable risk to the error of small sample size, the difference is not statistically significant. When the patient's clinical condition allows, it is still worthwhile to transplant even in the 2nd CR. When looking at the causes of death, relapse of leukemia prevails. Wider use of donor lymphocyte infusion (DLI) could contribute to the reduction of relapses at our department. The treatment of corticosteroid-resistant GvHD is a worldwide problem, its frequency at our department is comparable to data from the world. Infectious causes of death in the cohort also included complications caused by CMV reactivation, which are expected to be significantly reduced by prophylactic administration of letermovir.

PREDICTING SUCCESS OF TAVR WITH A NEW OUTCOME MEASURE

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President-Elect, Chair of the Fellowship Committee and Co-Chair of the Irene and Ivan Krisztinicz Memorial Student Exchange Program Committee, HMAA

Dr. Garami obtained his medical degree from the University of Debrecen. He has a clinical background in Radiology and is EU board certified in that specialty. He has also received further specialization in intracranial ultrasound in Europe and the United States. In recent years, Dr. Garami has become a nationally and internationally recognized leader in transcranial Doppler (TCD). He is the Medical Director of the Vascular Ultrasound Lab, Houston DeBakey Heart & Vascular Center, Houston Methodist Hospital. Dr. Garami's research focuses on understanding and treating intracranial flow disturbances that cause stroke. He has numerous publications on the monitoring of the cerebral vasculature during vascular procedures such as coronary artery bypass grafting, and carotid artery surgery. His current studies aim to reveal critical patterns of distal intracranial embolization in LVAD patients, TAVR and CAS/CEA cases. Dr. Garami has served the HMAA as BOD member and Chair of the fellowship Committee. He is responsible for establishing the student exchange program in Houston, TX and has played an active role in organizing the student exchange program. He became President-Elect of the HMAA in 2020.

Aim: Transcatheter aortic valve replacement (TAVR) is a catheter-based procedure used as an alternative method to open aortic surgery. The Transcranial Doppler (TCD) can monitor perfusion and cerebral embolic exposure during these procedures. Aspects of the TCD waveform such as the initiation of systole, the shape and magnitude of flow acceleration to peak velocity, and peak velocity during systole all provide useful information for post-procedural risk assessment. More specifically, the baseline waveform confirms severity of aortic stenosis and waveform improvement measures success of operation. The purpose of this study is to investigate whether peak systolic acceleration (PSA) of the MCA waveform can be used as a new TCD parameter for TAVR intervention.

Methods: This case series utilizes TCD recordings from 6 patients (5 male; average age 76) and 10 MCA data points with less than 70% internal carotid stenosis who required and underwent TAVR with TCD (NovaSignal Los Angeles, CA; Spencer Seattle, Washington) monitoring. Waveform data was acquired with DigiView (Digisonics inc.) from patients with successful TAVR procedures. Success was defined as improved aortic valve gradient and stable hemodynamic parameters. Using DigiView's "Measure" function, we calculated the PSA of the MCA before and after valve insertion.

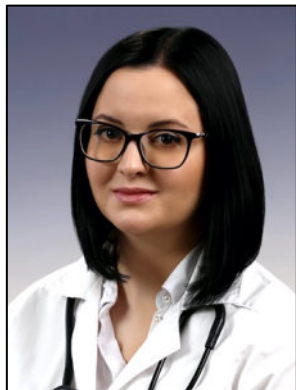
Results: PSA (dv/dt) increased after successful TAVR operation for every patient. The average increase in peak acceleration was 200.2 cm/s. Average PSA was 295.5±95 at baseline and 496±155, post procedure. A 2-tailed T-test demonstrated that the post aortic valve replacement peak acceleration was significantly higher than before aortic valve replacement.

Conclusion: We investigated PSA as a measure of blood flow improvement to the brain after successful TAVR procedure. We found that PSA significantly increased ($p < .05$) after valve implantation in patients with hemodynamic improvement. Further studies exploring the need for post-balloon dilation using diastolic waveform changes may be of interest in the future.

MENTAL HEALTH, TREATMENT COMPLIANCE AND THE RELATIONSHIP WITH THE THERAPIST IN THE COURSE OF SIMONTON-TRAINING FOR ONCOLOGIC PATIENTS

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Winner of the 2022 HMAA Student Scientific Travel Award

Petra Harasztosi was born in Debrecen in 1993. She is a medical student at the University of Debrecen and plans to finish medical school in September, 2022.

Aim: In Hungary, with the increasing numbers of oncologic patients, the duration of consulting time available per patient drops. According to our clinical experience, treatment compliance is influenced by the amount of time a patient has in the consulting hours and by the quality of the connection to the therapist. These factors affect the acceptance of treatments, the reporting of side effects, the attendance at the appointments. Lack of the above can indicate psychological problems, which can be managed at psychotherapeutic group meetings. The aim of this study is to make measurable the observation that group therapy has a beneficial effect on compliance with the oncologic treatment.

Methods: This study was conducted in pursuance of the 12 occasions long Simonton-training. Patients had to fill out the questionnaire three times, once before the training (t0), once right after the training (t1), and 3 months later (t2). The online questionnaire contained: The Hospital Anxiety and Depression Scale (HADS), WHO Quality of Life 5 (WHO QoL5), Morisky Medication Adherence Scale (MMAS-8) + five self-written questions about the patient's evaluation of their condition and their relationship with the oncologist. The distribution of continuous variables was examined with the Shapiro-Wilk test, and the Wilcoxon test was used for comparisons between the case and control groups due to the non-normal distribution of the majority of variables.

Results: A total of 27 patients in the psychotherapeutic group, and 62 patients in the control group were included in this study. There was no statistically significant difference between the control and the psychotherapeutic group regarding their gender ($p=0,876$) or their type of cancer ($p=0,362$). At t0, there was no significant difference between the control's and psychotherapy group's quality of life ($p=0,931$). From t0 to t1, the Simonton group's quality of life significantly increased ($p=0,0235$), meanwhile, the control group's QoL didn't change significantly ($p=0,204$). According to the HADS scale, the Simonton group's anxiety significantly decreased from t0 to t1 ($p=0,0154$), and the change for the control group wasn't significant ($p=0,1805$). Depression values also showed a significant decrease for the Simonton group from t0 to t1 ($p=0,0186$), whereas the control group's depression values didn't change significantly ($p=0,4064$). At t1, the Simonton group evaluated their conditions better than at t0, which showed borderline significance ($p=0,0535$). In this period, the control group's value didn't change significantly ($p=0,628$).

Conclusion: Our results show that the Simonton training had a positive impact on the patient's psychological state. The training's positive effect on adherence has not been proved, the reason can be the low number of patients in the groups.

WEIGHT REGAIN AFTER BARIATRIC SURGERY (OR “OMG I HAD WEIGHT LOSS SURGERY AND GAINED MY WEIGHT BACK”)

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Edward Hatchigian, MD

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Dr. Edward A. Hatchigian is Senior Advisor of the Weight Loss Surgery program at Beth Israel Deaconess Lahey Medical Center in Boston and Milton. He was instrumental in establishing the program with Dr. George Blackburn in 1999 and was Medical Director, from 1999 to 2021. He also helped establish a weight loss surgery program at the Veterans Affairs Medical Center in Boston where he is a consultant. Dr. Hatchigian received his MD from Boston University School of Medicine and Master of Science in Environmental/Public Health at Tufts University.

Aim: Weight loss surgery (WLS) has been shown to be a most effective and long-lasting intervention for severe obesity. Of greatest significance patients who underwent WLS experience improvements or even resolution of co-morbidities such as type 2 diabetes, obstructive sleep apnea, hypertension, fatty liver as well as overall improvement in quality of life. However, an estimated 25-33% of patients regain more than 15% of their body weight 2-5 years post-surgery. This has led to considerable frustration especially since those conditions that appeared resolved have returned. Over 95% of weight regain is behavioral in other words, it is the patient not the surgery. This paper looks at the causes of weight regain and what remedial options patients would need to undertake that many will say “I want to get back on track”.

Methods: Success after WLS has been defined as losing at least 50% of excess weight AND keeping it off for 5 years or more. Reasons of patients experiencing weight regain has many gaps that need to be explored. Review of contributing factors were looked at including hormonal/metabolic, physiological, psychological and behavioral including dietary indiscretion and physical inactivity. Examination of predictors for weight regain include older age, higher pre-op BMI, mental health issues were analyzed. Preventive and management of weight regain were assessed in terms of behavioral, dietary, and pharmacological as well as surgical management.

Results: Patients with BMI over 50 kg/m² were more likely to have significant weight regain. Type of weight loss surgery was a predictor - study showed that patients with sleeve gastrectomy gained weight 2 years after surgery. Patients over 60 were associated with weight regain but findings were inconsistent. Most common factor for weight regain remains behavioral - poor food choices, grazing/snacking especially night-time, drinking carbonated beverages, alcohol, sedentary lifestyle. Psychological factors included depression and binge eating disorder. Less than 5% of weight regain was due to anatomical, surgical failure leading to pouch distention, enlarged stoma outlet or gastro-gastric fistula.

Conclusion: Weight regain after weight loss surgery is a source of frustration that can lead to anger and even depression. Many patients struggling with regain are lost to follow-up therefore it is important to acknowledge weight gain can occur in the beginning of the evaluation for weight loss surgery. Interventional modalities would be important to address psychological and behavioral factors that contribute to weight regain. Identify those patients to highlight the importance of longer term, close follow-up to maximize weight and health results following WLS. Behavioral interventions such as cognitive behavioral therapy, dietary counseling, structured nutritional intervention, pharmacotherapy with FDA approved weight loss medications such as phentermine, Qsymia, Contrave and liraglutides such as Saxenda and Wegovy may be effective options as well as surgical intervention to correct anatomic defects, conversional surgery and newer endoscopic procedures.

PEDIATRIC ONCOLOGY IN HUNGARY NOW AND THEN

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Dr. Gabor Horvath graduated from the University of Pecs, Faculty of Medicine in 2011. He received the Pro Scientia Award of the Hungarian Academy of Sciences in 2009. He performed research in the Department of Anatomy at the University of Pecs and obtained his Ph.D. degree in 2016. He is currently working as a pediatrician at the Oncohematological Unit of the Pediatric Clinic at the University of Pecs Medical School. He specializes in pediatric oncology. He has been a member of the HMAA Hungary Chapter since 2007 and became a Hungary Chapter Board member in 2010. He worked as a local representative of the HMAA HC in Pecs for 5 years (2010-2014), and he was the HMAA HC Exchange program officer for 7 years (2012-2019). Dr. Horvath serves on the HMAA Board of Directors as one of the Liaisons for Hungary and also member of the Advisory

Board of the HMAA Hungary Chapter.

Aim: Pediatric patients with cancer in Hungary are treated in 6 centers. One of them is located at the University of Pecs Medical School, responsible for those Hungarian children who face these conditions and live in Somogy, Tolna, Baranya, or Zala counties. Thanks to the new and innovative treatments approximately 80% of children with cancer and leukemia are fully recovered. This result proves that childhood cancer and leukemia are curable if assisted by early diagnosis and adequate treatment!

Methods: National Childhood Cancer Registry has been operated since 1971 by the Hungarian Pediatric Oncology Network. This Registry collects data on epidemiology, treatment modalities, and effectiveness, as well as late follow-up of childhood cancers. An internet-based pediatric cancer registration and communication system for the Hungarian Pediatric Oncology Network has been introduced in April 2010. The National Childhood Cancer Registry contains data of all pediatric cancer patients (0-18 yrs) who have insurance covered by the Hungarian Social Security Card. The creation (1971) and operation of the National Childhood Cancer Registry have been very important steps in the field of childhood oncology to evaluate the efficiency of pediatric oncology treatments as well as maximize return on medical investment. We would like to compare the 20th and 21st-century Hungarian pediatric cancer survival data results and highlight some new and innovative treatments available nowadays. We would like to draw attention by case presentations on the difficulties of everyday life of the patients and their families at our oncohematological unit.

Results: Childhood cancer is rare representing less than 1% of all malignant diseases diagnosed. However, it plays a major role in childhood mortality (second cause for ages 1–14 years). Age-standardized yearly incidence rates show a slowly increasing trend (average annual percent change: 1.7%/year, CI 0.8–2.5%, standardized incidence: 161/million per yrs, 2001–2015. HCCR), in all major subgroups of diseases (leukemia, CNS tumors, non-CNS tumors). The outcome of childhood cancer has shown great improvement since the 1960s due to progress in multimodal therapy. Survival rates of different diseases exceeded 50% at different time periods during the last 50 years. As the outcome of diseases showed improvement, the average survival time of patients increased. Decreasing relapse risk and improving second-line therapy led to longer survival.

Conclusion: As the life expectancies of pediatric oncological patients increased significantly in the past decades, the long-term follow-up and quality of life are important points we need to focus on. The support of the patient and the family during and after the treatment is one of our major tasks besides the treatment itself. To reach this aim, and manage it at a high level, TEAMWORK is one of the most important.

COMPARATIVE ANALYSIS OF MONKEYPOX VIRUS INFECTION OF CYNOMOLGUS MACAQUES BY THE INTRAVENOUS OR INTRABRONCHIAL INOCULATION ROUTE

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Louis Huzella, DVM

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Dr. Huzella is a biocontainment research pathologist for the NIH/NIAID at the IRF at Ft. Detrick, MD. He provides pathology support in all levels of biocontainment, with subsequent gross, clinical, and histopathologic examinations of a wide range of species and organ systems. His specialty is veterinary pathology for high risk pathogens in biocontainment.

Aim: (i) Expand our understanding of the clinical, virological, immunological, and histopathological parameters and dose response of intravenous (i.v.) infection of Monkeypox Virus (MPXV) Zaire, (ii) determine the potential utility of intrabronchial (i.b.) infection as an improved model of simulated respiratory infection with a potentially slower progression of disease, and (iii) compare the disease sequelae of this novel respiratory exposure to that of i.v. exposure.

Methods: We compared the disease course following an i.v. or i.b. inoculation of NHPs with 10-fold serial doses of MPXV Zaire.

Results: Classical pox-like disease was observed in NHPs administered a high virus dose by either route. Several key events were delayed in the highest doses tested of the i.b. model compared to the timing of the i.v. model, including the onset of fever, lesion appearance, peak viremia, viral shedding in nasal and oral swabs, peak cytokine levels, and time to reach endpoint criteria. Virus distribution across 19 tissues was largely unaffected by the inoculation route at the highest doses tested. The NHPs inoculated by the i.b. route developed a viral pneumonia that likely exacerbated disease progression.

Conclusion: Based on the observations of the delayed onset of clinical and virological parameters and endpoint criteria that may more closely resemble those of human MPXV infection, the i.b. MPXV model should be considered for the further investigation of viral pathogenesis and countermeasures.

JUGULAR VENOUS REFLUX – A PITFALL OF TCD BUBBLE STUDY

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Dr. Lilla Juhasz is an anesthesiologist resident doctor from Szeged, Hungary and currently works in a postdoctoral fellow position at the Houston Methodist Hospital, Cardiovascular Surgery Department, Houston, Texas. At the Houston Methodist Hospital she participates in intraoperative TCD monitoring for different cardiac, carotid and thoracic aorta surgeries. She attended medical university in Szeged, and in the 6th year of the medical school, in 2016, she spent a 3-months-long rotation in Buffalo, NY. Back at that time, she was also given the possibility to participate, and present at the Annual Meeting of the Hungarian Medical Association of America, in Sarasota for which she is grateful.

Aim: Nearly one-fourth of the adult population have a patent foramen ovale, which accounts for 40-50% of cryptogenic strokes. Although transesophageal echocardiography with agitated saline has been a gold standard for diagnosing PFOs, transcranial doppler bubble test (TCD-BT) is an alternative sensitive and minimally invasive diagnostic test for right-to-left shunts.

Methods: Robotic TCD-BT was completed on a randomly selected group of six subjects (two female). Subjects were placed in a supine position and asked to perform an 8 second Valsalva maneuver, 3 seconds after injection of an agitated saline solution. The test was conducted according to our local protocol.

Results: On initial inspection, all six subjects showed varying grades of high intensity transient signals (HITS), confirming the presence of PFOs (Spencer Grade I-5 (3-0-0-1-2). Upon further review, one subject exhibited HITS-like signals on M-mode with a corresponding bilateral increased venous signal on spectral waveform. Additionally, there was one subject with positive HITS (Spencer Grade I) as well as an increased venous signal on the left side spectral waveform at a separate time point.

Conclusion: We found unambiguous signs of PFOs as well as dubious signals on M-mode with corresponding venous traces on spectral waveform. These irregular signals caused by internal jugular venous reflux (JVR), affecting cerebral blood flow, during the Valsalva maneuver. Based on our findings, we postulate that internal JVR might cause misleading interpretations of TCD-BT with false positive results, accounting for a pitfall of the bubble test. Therefore, TCD-BT should be performed after proper training and be evaluated with special care.

CONNECTIVE TISSUE DISEASE-ASSOCIATED INTERSTITIAL LUNG DISEASE (CTD-ILD)

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Andras Khoor, MD, PhD, is currently Consultant in the Department of Laboratory Medicine and Pathology, Medical Director of the Biospecimen Accessioning and Processing/Pathology Research Core, and Professor of Laboratory Medicine and Pathology (Mayo Clinic College of Medicine and Science) at Mayo Clinic in Florida. Dr. Khoor received his medical degree from Semmelweis Medical University in Budapest, Hungary. After training in pathology and pediatrics in Hungary, he was invited to conduct research on lung development at Vanderbilt University in Nashville, Tennessee.

This was followed by residency in pathology at Vanderbilt University and a fellowship in pulmonary pathology at Mayo Clinic in Rochester, Minnesota. From 1997 to 2000, he was Active Staff in the Department of Pathology at the H. Lee Moffitt Cancer Center and Assistant Professor of Pathology at the University of South Florida in Tampa, Florida. He joined Mayo Clinic in Florida in 2000 and was Chair of the Department of Laboratory Medicine and Pathology from 2005 to 2018. Dr. Khoor's research interests include various areas of pulmonary pathology. He has authored more than 70 peer-reviewed publications and more than 20 book chapters. He is on the editorial board of the Archives of Pathology & Laboratory Medicine, Human Pathology, and Pathology & Oncology Research. He is also the Immediate Past President of the Hungarian Medical Association of America.

Aim: A significant proportion of CTDs have pleuropulmonary manifestations. At the same time, a significant proportion of ILDs have CTD underpinnings. Understanding this group of diseases is equally important for the practicing clinician and the practicing pathologist.

Methods: This is a traditional review based on evaluation of the medical literature and the presenter's own experience.

Results: Common forms of CTD include rheumatoid arthritis (RA), systemic sclerosis (scleroderma), polymyositis/dermatomyositis (PM/DM), Sjogren syndrome, systemic lupus erythematosus (SLE), and mixed connective tissue disorder (MCTD). Usual interstitial pneumonia is commonly seen in RA, but nonspecific interstitial pneumonia is more common in other forms of CTD. Organizing pneumonia is a pattern frequently seen in PM/DM. Diffuse alveolar damage may affect up to 10% of patients with SLE (acute lupus pneumonitis). Finally, lymphoid interstitial pneumonia is a common manifestation of Sjogren syndrome and SLE.

Conclusion: Patterns of CTD-ILDs are similar to those seen in various forms of idiopathic interstitial pneumonia. However, CTD-ILD typically has a better prognosis than its idiopathic counterpart.

LIQUID BIOPSY-BASED DETECTION AND MONITORING OF EZH2 GENE MUTATIONS IN FOLLICULAR LYMPHOMA

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Laura Kiss was born and raised in Kiskunfelegyháza, Hungary. Currently she is a final year medical student at Semmelweis University in Budapest. She is an active member of the scientific student research community of the university; her research project focuses on molecular oncohematology.

Aim: Follicular lymphoma (FL) has an overall survival rate of 15 years, however the disease is incurable with current standard of care. The majority of patients experience disease progression, raising the need for effective treatment response monitoring. Molecular analysis of tumor derived circulating DNA (ctDNA), referred as liquid biopsy, is a promising minimally invasive disease monitoring tool for patients suffering from broad spectrum of tumor types. Recent molecular profiling studies have identified gain of function mutations in 25% of FL cases in the EZH2 gene. The aim of our research was to develop a liquid biopsy-based EZH2 mutation test for non-invasive testing.

Methods: Pretreatment plasma samples were collected from 107 patients with active FL. To characterize the EZH2 mutation status, samples were tested by digital droplet PCR method (Bio-Rad, USA). In a multiplex PCR setup, we analyzed seven point mutations performing only two reactions.

Results: EZH2 mutations were detected in 29% (31/107) of the patients, while 71% of the cases proved to be wild-type. In EZH2 positive patients correlation between variant allele frequency (VAF) and therapy efficacy was demonstrated by analyzing samples collected during treatment. 78% (18/23) of evaluable patients responded to treatment, meanwhile 22% were refractory to therapy.

Conclusion: Our results suggest that liquid biopsy-based EZH2 mutation analysis is applicable for minimal invasive detection and monitoring of EZH2 mutations in FL. The frequency of EZH2 mutations was found to be 29%, somewhat higher than previously found in tissue samples. Our observation raises the possibility of a higher incidence of EZH2 mutations in FL, which may further expand the set of patients who may be eligible for EZH2 inhibitor therapy in the future.

REGULAR EXERCISE ATTENUATES THE AGE-RELATED DECLINE IN COGNITIVE AND MOTOR BEHAVIORS LIKELY BY RESCUING THE CHOLINERGIC SYSTEM IN THE HIPPOCAMPUS AND MOTOR CORTEX

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Akos Koller started his research work in Hungary after finishing the Semmelweis Medical School in 1975. Then, he started to work on coronary and brain microcirculation with Prof AGB Kovach. He moved from Hungary to the USA in 1982, where he was doing research at the Cerebrovascular Research Center at the University of Pennsylvania, with Martin Reivich and Britton Chance on pial microcirculation, regarding the role of adenosine, NADH level/metabolism, and spreading depression. Then in Tucson, Arizona, with Paul C Johnson worked on all topics of classical in vivo microcirculation and engaged in microcirculatory network studies to understand the important complexity of microcirculation. In 1987, he moved to New York Medical College, Valhalla, NY to work with Gabor Kaley. Meantime he worked at Semmelweis University, the University of Pécs, and the Hungarian University of Sports Science. With his international research network, he developed a network among microcirculatory communities in the United States, Europe, and Asia. Total IF: 922.4, Citations: 9969, Hirsch index: 62

work with Gabor Kaley. Meantime he worked at Semmelweis University, the University of Pécs, and the Hungarian University of Sports Science. With his international research network, he developed a network among microcirculatory communities in the United States, Europe, and Asia. Total IF: 922.4, Citations: 9969, Hirsch index: 62

Aim: Physical exercise is now generally considered a “medicine” to maintain locomotor and cognitive abilities in advancing age. The underlying mechanisms however are still not elucidated precisely. We hypothesized that regular exercise will improve both motoric and cognitive function primarily by maintaining the cholinergic system in the forebrain because learning and memory are closely associated.

Methods: Rats were subjected to moderate-intensity treadmill exercise for 6 months, prior to the experimental studies, which were conducted at 12-, 24- and 32-month of age. The chronic physical intervention was tested on motility in the Open field (OF). Cognitive functions were measured in the Morris water maze (MWM) for spatial learning and in the Novel object recognition (NOR) tests. In each age group, after exercise training cholinergic forebrain function (ChAT) fiber density was assessed in the hippocampus, and motor- and somatosensory cortical areas. In addition, quantification of ChAT-positive fiber aberrations as a neuropathological marker was also carried out.

Results: We have found that in OF chronic exercise maintained horizontal locomotor activity in all age groups. Importantly, rearing activity, MWM, and especially NOR performance were improved only in the 32-months old animals. We observed a general age-related decline in cholinergic neuronal innervation, yet, exercise increased ChAT fiber density in the hippocampus CA1 area and in the motor cortex notably in the 32-months group. Regular exercise clearly attenuated the massive ChAT fiber aberrations in all investigated areas which developed in senescence. (Neuroscience. 2019 Jul 15;411:65-75. PMID: 31146009).

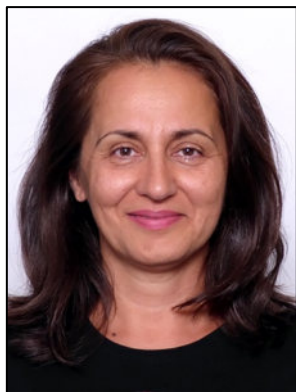
Conclusion: These results suggest that long-term moderate-intensity exercise (in the rats) is especially beneficial in advanced age, not only by attenuating the age-related decline in cognitive and motor behaviors, but also age-related cholinergic fiber reduction, and malformations of cholinergic forebrain innervation, a potential mechanistic relationship.

Grant Support: NRD Office Hungary Fund, OTKA K 132596, Hungarian Academy of Sciences/MTA Post-Covid 2021-34, MIT Hungary-NRDI-Fund TKP2021-EGA-37.

COVID-19-RELATED DYSPHAGIA IN CASE OF A STROKE PATIENT

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A confident and highly organized medical product manager with 10+ years of experience in therapeutic and medical brand supervision. High level of scientific, medical, and technical expertise acquired through current position and +3,5 years' private medical clinic experience, as well as through 11+ years' academic training. Comprehensive experience and understanding of project management and marketing activities in the medical field. Established and continuously developed knowledge in different therapeutic areas like oncology (head & neck cancer), ICU, neurology, and gastroenterology. Current academic pursuits - Ph.D .student at Semmelweis University – further strengthen and improve my ability to provide medical and scientific support.

Aim: My aim is to draw attention to the complications of COVID-19 and its association with dysphagia. In addition to this, effective dietary solutions following the screening of language disorder to help patients avoid malnutrition, and sarcopenia to support their quality of life, recovery, and effective rehabilitation. To develop a personalized and timely nutritional therapy strategy based on the screening and early detection of language disorder with the help of Institutional Dietitians.

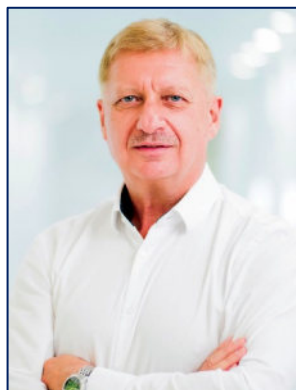
Methods: An online questionnaire was developed for dietitians working in health care institutions in Hungary, which also investigated dietitians' professional opinions on the complications of dysphagia.

Results: Dehydration, a common complication of dysphagia in COVID-19 patients, was reported by 78% of dietitians, aspiration pneumonia, a common complication of dysphagia in critically ill patients requiring ventilation, by 82% of dietitians, and malnutrition due to reduced food intake by 85.5% of dietitians.

Conclusion: For patients with COVID-19, screening for dysphagia, bedside assessment, and instrumentation, followed by swallowing rehabilitation, is of paramount importance, alongside the prominent role of nutritional therapy and texture-modified special diets, in which institutional dietitians can play an active role as members of the nutrition team.

MASSIVE ROTATOR CUFF REPAIR, TRANSOSSEOUS REPAIR – CHALLENGE, TECHNIQUE AND RESULTS

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Liaison for Germany, HMAA

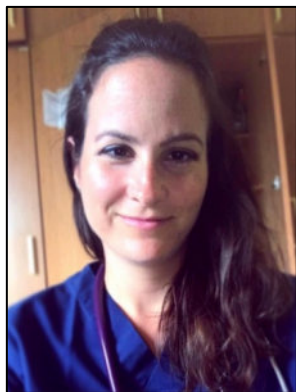
Dr. Kovacs is Director and Head of the Main Klinik Frankfurt, Germany. He serves on the HMAA Board of Directors as Liaison for Germany.

The number of shoulder surgeries has consistently increased over the last few years. Despite improvements in diagnostic processes and techniques, statistics reveal a wide range of outcomes and high levels of overall dissatisfaction. These tendencies remained unchanged, even as post-surgical rehabilitation services have improved. There are several causes for these poor outcomes, including postoperative irritation and re-rupturing of the rotator cuff. This re-rupturing can be the result of, among others, loosening of the anchor, dislocations, suture ruptures, insufficient tissue, fatty degeneration, insufficient knots, or transections of the rotator cuff. Regarding re-ruptures, we differentiate between short- and long-term postoperative phases. Moreover, the cause of re-rupture could be multifactorial, for example, pre-damaged tendons, above-mentioned fatty degeneration, or impaired blood supply of the tendon or bone structure. Academic studies and technical innovation have focused on primary fixation and the correct/stable anatomic reconstruction of the rotator cuff. Different knot techniques were developed. However, all these techniques require the implementation of a screw, which, in addition to the general complications, has the risk of loosening and dislocation.

TRANSCRANIAL DOPPLER ULTRASOUND MONITORING DURING TRANSCAROTID ARTERY REVASCULARIZATION

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Dr. Nora Fanna Kovacs is an anesthesiology and intensive care physician at Semmelweis University Heart and Vascular Center, Budapest, Hungary, currently working as a postdoctoral research fellow at Houston Methodist Hospital.

Aim: The aim of this report is to demonstrate the changes seen regarding cerebral blood flow with transcranial Doppler ultrasound (TCD) monitoring during the phases of Transcarotid Artery Revascularization (TCAR) procedure. We present the case of a 68-year-old male at high risk for adverse events from carotid endarterectomy due to a high grade (90%) asymptomatic left internal carotid artery stenosis. On the one hand TCAR procedure is a less invasive, hybrid alternative to open surgery which utilizes a neuroprotection system to temporarily reverse blood flow in the carotid artery while stenting, thus protecting the brain from embolization. On the other hand, flow reversal inevitably causes a temporary redirection of cerebral blood flow, deeming cerebral blood flow monitoring necessary.

Methods: A 68-year-old patient with a history of hypertension, hypercholesterolemia, hyperlipidemia, ADHD, coronary artery disease and recent coronary artery bypass graft surgery was diagnosed with severe, greater than 90% asymptomatic stenosis at the origin of the left internal carotid artery detected by CTA. Otherwise, no significant stenosis was identified. Anatomy was suitable for TCAR with additional TCD monitoring. TCD is known as a non-invasive, sensitive method providing realtime information on the presence, depth, direction, resistance, and velocity of blood flow and embolic exposure, and therefore a desirable choice for cerebral blood flow monitoring. We used color flow and pulsed wave TCD with emboli detection during the TCAR procedure to monitor the left middle cerebral artery (MCA) flow through the left temporal acoustic window. Mean flow velocity (MFV) and delta% (actual MFV compared to baseline MFV), pulsatility index (PI), peak systolic velocity (PSV), and end diastolic velocity (EDV) values of the MCA and any signs of embolization were continuously obtained and compared at key points of the procedure while making note of the actual vital parameters of the patient - mean arterial pressure (MAP) and heart rate (HR).

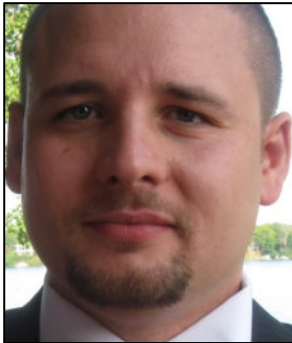
Results: Baseline values were recorded before the beginning of surgery (MFV 36cm/s, PI 0.6, PSV 44cm/s, EDV 23cm/s, MAP 73mmHg). Before clamping the CCA, MAP was increased to 100mmHg to maintain cerebral blood flow (MFV 52cm/s, PI 0.71). After clamping the artery, MFV dropped to 28cm/s which prompted to increase MAP to over 110mmHg and as a result MCA flow was restored (36cm/s, PI 0.58). Signs of emboli were seen during sheath and wire insertion and at the time of CCA unclamping. The waveform improved significantly at the end of surgery (MFV 38cm/s, PI 1.02, PSV 62cm/s, EDV 23cm/s, MAP 77mmHg).

Conclusion: While TCAR provides a safer alternative to a select group of patients at high risk for stroke, on account of the flow reversal technique monitoring with TCD is indispensable to identify potentially harmful alterations of cerebral blood flow.

LIFESTYLE MEDICINE – IS THIS THE WAY?

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Assistant Clinical Professor, Department of Family Medicine, McMaster University, Hamilton, ON, Canada

Dr. Lorand Kristof is an Assistant Clinical Professor of Family Medicine with McMaster University. He is also Board certified in Geriatric Medicine and Lifestyle Medicine.

Aim: To familiarize the participants with the existence, role and activity of the American College of Lifestyle Medicine.

Methods: This is not a presentation based on a particular research paper.

Results: This is not a presentation based on a particular research paper.

Conclusion: Lifestyle Medicine could bring a welcome paradigm shift in which we treat chronic disease in an evidence based way.

NEW DEVELOPMENTS IN MINIMALLY INVASIVE ADRENALECTOMY AND SPLENECTOMY AT THE UNIVERSITY OF SZEGED DEPARTMENT OF SURGERY

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Gyorgy Lazar, MD, PhD, DSc

Professor and Chair, Department of Surgery and Dean, University of Szeged Albert Szent-Gyorgyi Medical School, Szeged, Hungary

Professor Gyorgy Lazar, MD, PhD, DSc is Chair of the Department of Surgery, Professor of Surgery, and Dean of the Albert Szent-Gyorgyi Medical School, University of Szeged, Hungary, Past President of the Hungarian Surgical Society (HSS); President of the Surgical Oncology Section of the HSS; Representative of the HSS in UEMS (Union Européenne des Médecins Spécialistes); Member of the Education and Training Committee of the EAES; Member of the Membership Committee of the ESSO; Board Member: European Society of Surgery, European Foregut Society. Number of Awards: 13; Number of publications: 283; Cumulative impact factor (prereviewed full articles): 244; Citations: 1460 (without self-citation); Hirsch index: 23, g-index: 33.

Aim: In recent decades, minimally invasive surgery has revolutionized all areas of surgery, even the spleen and the adrenals. The technique was put into practice in the early 1990s at the University of Szeged Department of Surgery. Since then, our working group has become among the most experienced in this area in Hungary. In the present work we report our experience with minimally invasive surgery for the spleen and adrenals.

Methods: We have been using two methods to remove adrenals: the retroperitoneal (RP) and transperitoneal (TP) approaches. In our retrospective cohort study of 174 adrenalectomies (28 RP; 146 TP), both TP and RP represented minimally invasive techniques that are both safe and easy to reproduce. Patients who had undergone laparoscopic splenectomy (LS) between 1 January 2002 and 1 January 2015 were involved in our investigation.

Results: RP adrenalectomy seems to be reserved for the removal of smaller lesions. Our results confirm that the TP technique with an additional Pfannenstiel incision is safe and feasible, fulfilling oncological requirements even for large, malignant lesions. The LS can be considered a surgical procedure with low morbidity after gaining the necessary experience. We demonstrated that LS is a safe method in cases of extremely large spleens. The LS provides the longest-lasting results in the treatment for ITP. Our study showed that young age and a preoperative response to steroids were positive predictors for the success of splenectomy.

Conclusion: Due to the advantages of MIS, the laparoscopic technique became the standard of surgical care for spleen and adrenals.

THE ROLE OF THYMOSIN BETA-4 IN HEALING MIDDLE EAR LESIONS IN MAMMALS

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Balint Lippai, MD

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Winner of the 2020 Irene and Ivan Krisztinicz MD Memorial Award

Balint Lippai gained his medical degree at the University of Pecs, Medical School (UPMS) in 2021. During his studies he was actively enrolled in basic medical research in the field of hearing. Approaching towards translation, his focus is on future, regenerative treatment possibilities for both conductive and sensorineural hearing loss. With his research he participated at several local, national and international congresses, where he won 1st prize with his presentations. he also holds numerous excellence titles of the University of Pecs, such as Rector's Excellence award and Excellence award for PhD Fellows. In 2019 he spent 1 month of Surgery rotation at the Saitama

Medical University, Saitama, Japan. Aside of academic work, he is a board member of the Hungarian Medical Association of America (HMAA), Hungary Chapter from 2019. After graduation in 2021, he has been enrolled in his PhD studies at the Regenerative Sport, Science and Medicine (RSSM) research group at the University of Pecs, Medical School. He is a co/author of one scientific publication.

Aim: Acute tympanic membrane perforation primarily occurs due to an injury or middle ear infection. Spontaneous closure in acute cases is nearly 80%, largely influenced by numerous factors. Three months following an injury, the persisting status is considered chronic, in such cases the non-surgical treatment considerations are significantly limited, thus, the integrity of the tympanic membrane should be restored by myringoplasty. In practice, several materials and surgical methods are utilized for this very purpose. In addition to classical grafts such as fascia, cartilage and cartilage flap, promising results have recently been reported with other biological materials including silk or acellular collagen. However, despite the best efforts, healing is not always successful. Therefore, the need has arisen to employ substances that actively promote the migration and proliferation of the cells of the tympanic membrane. Our approach in expediting recovery, was to investigate the effect of thymosin-beta 4 (TB4), a 43 aa secreted peptide which has already demonstrated excellent regenerative properties in various organ systems to aid tympanic membrane regeneration in adult mice in vitro.

Methods: Following euthanasia, the parietal-squamous skull area containing the auditory bulla was isolated from C57BL/6 adult mice. Next, the tympanic membrane was dissected under a Carl Zeiss Stemi 508 stereomicroscope. The fibrous and bony appendages (excluding the malleus) were carefully purged, and the remaining tissue was placed on collagen gel extracellular matrixes. To enhance potential attachment, explants were incubated for three days, and then externally treated with Thymosin beta-4 or PBS. Cell migration was photo detected daily for a span of 12 days. The accumulated distance regarding cell migration was measured using ImageJ software. while immunocytochemical and mRNA expressional analyses were performed to determine cell type and the nature of the targeted molecules.

Results: Cell migration assays revealed significant increase in epithelial cell migration compared to the control group 3 days following TB4 administration. Based on our immunocytochemical analyses, we suggest that the local epidermal progenitor activity lies in the background of increased cell migration. Furtherly, mRNA analysis showed dynamic changes in expression of several hundred genes, including important participants known to be active in the course of wound healing.

Conclusion: We discovered the peptide affects the behavior of epidermal and epithelial cells of the tympanic membrane in vitro. Moreover, our initial results imply, it is not the differentiated, but most likely the local epidermal progenitor cells which are the primary targets of the molecule. Our presented results open a new, thus far undiscovered field regarding clinical utilization for Thymosin beta-4 in the future.

MINIMAL INVASIVE AORTIC VALVE SURGERY – ONE CENTER STUDY

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Akos Maklari, MS

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Akos Maklari is a final year medical student at Semmelweis University, Hungary. He does his research in the Gottsegen National Cardiovascular Center, Budapest, Hungary in the topic of adult cardiac surgery since 2020.

Aim: In the progressively aging populations one of the most common cardiac conditions are aortic valve diseases. Minimal invasive aortic valve surgery (mini-AVR) is a safe and effective treatment option for these patients. In our department the first mini AVR surgery happened in the end of 2018; since 2020, the number of minimal AVR procedures are increasing, beside aortic valve replacement via full sternotomy (AVR). Our aim was to compare our results (AVR vs. mini-AVR) and get information of learning process.

Methods: In our retrospective study we analyzed the pre-, intra and postoperative data of every isolated aortic valve operation during this 3 year period (n=662; 2019.0.10.1-2021.12.31).

Results: There were no significant differences between the groups basic characteristics in age (mini-AVR: 65,42 yrs [$\pm 10,65$]; AVR: 65,31 yrs [$\pm 11,35$]; $p=0,89$) and BMI (mini-AVR: 28,9 [$\pm 4,7$]; AVR: 29,18 [$\pm 5,8$], $p=0,58$). The time of the operation and CPB were significantly less in the mini-AVR operations (134,3 $\pm$ 30,33 min vs 151,2 $\pm$ 41,8 min ($p=0,006$) AND 74,1 min vs 81 min ($p=0,01$). Reoperation rates were significantly higher in the AVR group ($p=0,048$). Yearly follow up shows a clear decrease in the complication rates.

Conclusion: Aortic valve operations done in a minimal invasive way have the same or even better results than the AVR-s preformed with full sternotomy, if they are performed in a heart valve center with experience. As our results shows, this technique it can be mastered easily in a short period of time.

CURRENT PLASTIC SURGERY APPROACH TO TREATING GYNECOMASTIA AND THE MALE CHEST

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Dr. Marosan was born in Oradea, Romania and emigrated to the US with his parents and younger brother at the age of 15. On the way to the US, he spent 4 months in Tel Aviv, Israel and 5 months in a Greek refugee camp. Completed his higher education at SUNY at Buffalo with a BA degree in Cell and Molecular Biology, an MA from Roswell Cancer Institute. He matriculated into Rush Medical School in Chicago, Illinois. He did 5 years of general surgery residency in the USAF at David Grant Medical Center at Travis AFB. Served as a general surgeon at Myrtle Beach, South Carolina before entering a 2 year fellowship in plastic surgery at Walter Reed Army Medical Center in DC. He passed his board certification in both. He was assigned as a plastic surgeon at Madigan Army Medical Center, and in 1995 he resigned his commission in the Air Force as a Lieutenant Colonel. He opened his private practice in 1996 and has been in solo practice ever since. He specializes in cosmetic plastic surgery, body sculpting in men and women. He is a Total Definer surgeon, one of less than 100 in the US.

He opened his private practice in 1996 and has been in solo practice ever since. He specializes in cosmetic plastic surgery, body sculpting in men and women. He is a Total Definer surgeon, one of less than 100 in the US.

Aim: To show surgical technique of stealth incisions and scarless results in sculpting the male chest.

Methods: Review of the records of hi definition liposuction gynecomastia cases from January 1, 2020 to September 2022. Inclusion criteria included men with diagnosis of gynecomastia, BMI <32 kg/m², ASA I-II. I used the VASER solid probe ultrasound for fat emulsification, PAL (power assist liposuction) technique for fat removal and curved atraumatic cannulas for sculpting of the chest. Gland excision is done sharply via intra-areolar inverted omega incisions. Renuvion (He-RF) skin tightening is done in large gynecomastias and older men with loose skin to avoid skin excision in the appropriate candidates. Besides the gynecomastia, the chest wall is sculpted to reveal the lateral pectoral line, anterior border of the latissimus dorsi, anterior lips of the serratus muscle, deepening the space between the pectoralis major origins under the clavicle and deepening the sternal midline. Fat grafting is done in men who desire more pectoral muscle bulk and shape.

Results: Gynecomastia resection with hi definition liposuction technique was successful in all 88 cases during this time frame. All underwent gland excision (15gm-234gm/side) and liposuction (250cc-20000cc/side) and skin tightening with the Renuvion additionally in 10 patients. No nipple/areolar loss, minor complications of asymmetry, ecchymosis and swelling. Major complication of unilateral or bilateral hematomas in 5 patients (5%), requiring return to the operating room for evacuation of the hematoma. Two patients have residual gynecomastia requiring revision (2%). The satisfaction rate is very high due to an outcome which looks sculpted and not an operated look.

Conclusion: Gynecomastia is a very common condition from the early teens to adult hood and old age. Most men are self-conscious of this and feel embarrassed in removing their shirts in public places. In the last few years, we have seen an increased interest in seeking and undergoing treatment for gynecomastia. Gynecomastia treatment with gland excision and high definition liposuction of the chest wall via almost imperceptible stealth incision gives a very satisfaction rate with very low level of complications.

MEDICAL EDUCATION IN DEBRECEN DURING THE COVID-19 PANDEMIC

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Dr. Matyus graduated (with Wesszpremi prize) as a medical doctor at the University Medical School of Debrecen in 1980. Since then, he has been working in the Department of Biophysics and Cell Biology of the University of Debrecen, currently as Full Professor (since 2007). His research interest is the cell surface organization and dynamics of cell-surface receptors. Received a habilitation degree in 1998 and became the Doctor of the Hungarian Academy of Sciences in 2005. He served as the Secretary of EBSA (European Biophysical Societies Association) for 7 years. Between 2009 and 2015 he was Vice President, President, Past President, since 2015 a member of the Executive Committee. He is the President of the Hungarian Biophysical Society. He was elected

“Teacher of the year” based on the votes of students four times. He received Szechenyi Professorial Stipend, Istvan Szechenyi Stipend and Jedlik Anyos Award (2011 - Hungarian Patent Office). In 2012 the President of Hungary awarded him the Order of Merit of Hungary, Officer’s Cross. He served as Vice Dean for Scientific Affairs of the Faculty of Medicine for 5 years. He is the Dean of the Medical Faculty since 2013 and was also elected for the period of 2021-2026.

Aim: The worldwide pandemic has definitely changed our lives in Hungary as well. In March 2020 the Hungarian Government decided to introduce restrictions for students, i.e. prohibited attendance at all of the universities. Simultaneously, a so-called digital form of education was launched. Regardless of the situation, our goal has always been to deliver the educational material to our students as described in the predefined curriculum and to conduct the examinations according to the well-established standards. We carried on with teaching according to the previous practice, even under the changed circumstances. It is a special feature of medical training that it is focused on both gaining theoretical knowledge and acquiring practical skills, therefore some elements of the training could not be delivered through distance learning.

Methods: As part of the preparation to help with switching to digital training, the Rector of the University of Debrecen declared a week’s spring break starting on 16 March 2020. The break allowed time for the different departments to elaborate the methodology through which they could put digital training into practice. University of Debrecen prolonged the academic year of 2019/2020 until 31 August 2020. As the next step, new Academic and Examination Rules and Regulations (AERR) were introduced for the emergency period.

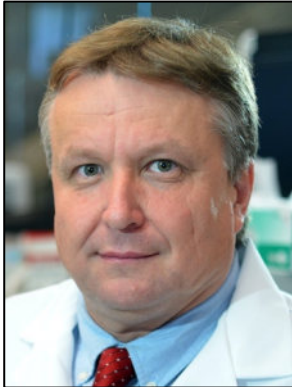
Results: In view of the emergency situation, the National Centre for Public Health has requested all County Government Offices to assign fifth and sixth-year medical to the National Ambulance Service (NAS) for emergency medical care tasks, in accordance with the provisions of the Government Decree on Emergency Health Care. Volunteer students were trained in advance by the EMS. All or part of the time spent as an ambulance volunteer was credited by our faculty towards the duration of the clinical placements, but volunteering did not exempt the students from other study obligations.

Conclusion: In my lecture I will summarize our experience with the newly introduced rules, and in general what have learned during these difficult times.

REGENERATIVE INFLAMMATION: WHEN IMMUNE CELLS HELP TO RE-BUILD TISSUES

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Dr. Nagy is a Professor of Medicine in the Division of Endocrinology, Diabetes and Metabolism in the Departments of Medicine and Biological Chemistry in the Johns Hopkins University School of Medicine. He is the associate director of the Johns Hopkins Center for Metabolic Origins of Disease, a program that spans Johns Hopkins Medicine campuses in St. Petersburg, Florida, and Baltimore, Maryland. He is also co-director of the Johns Hopkins All Children's Institute for Fundamental Biomedical Research. He has training as both a physician and as a molecular and cellular biologist. Dr. Nagy's research focuses on identifying and understanding how the identity of cells develops and how their differentiation contributes to human diseases. He seeks to understand how the

extra- and intracellular lipid environment contributes to cellular development and differentiation, and what impact that has on components of the immune system. In this context, Dr. Nagy also studies what causes cells to use certain pieces of genetic information and not others, and what causes that process to sometimes result in diseases such as chronic inflammation and tissue degeneration.

Inflammation is an essential immune response critical for responding to infection, injury, and maintenance of tissue homeostasis. After injury, regenerative inflammation promotes tissue repair by a timed and coordinated infiltration of diverse cell types and the secretion of growth factors, cytokines, and lipids mediators. Remarkably, throughout evolution as well as mammalian development, this type of physiological inflammation is highly associated with an induced immunosuppressive response. For instance, upon injury, regenerative inflammation is the consequence of an in situ macrophage polarization resulting in a transition from pro-inflammatory response to anti-inflammatory and pro-regenerative. Immune cells are the first responders upon injury, infiltrating the damaged tissue and initiating a pro-inflammatory response depleting cell debris and necrosis. After phagocytosis, macrophages go through multiple coordinated metabolic and transcriptional changes allowing the transition and dictating the initiation of the regenerative phase. Differences between a highly efficient, complete ad integrum tissue repair, such as, acute skeletal muscle injury and aberrant regenerative inflammation, as it is the case in Duchenne Muscular Dystrophy (DMD), highlights the importance of a coordinated response orchestrated by macrophages. During regenerative inflammation, these cells interact with others and alter the niche, affecting the character of inflammation itself and, therefore, the progression of tissue repair. Comparing acute muscle in injury and DMD regenerative inflammation we review how the same cells and molecules in different concentration and timing contribute differently to the inflammatory process. Thus, it is important to understand and identify the distinct functions and secreted molecules of macrophages during tissue repair and the contributors to the macrophage switch to allow leveraging this knowledge in treating diseases.

NEW DIAGNOSTIC AND THERAPEUTIC APPROACHES TO AGE-RELATED MACULAR DEGENERATION

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Dr. Nagy is clinic director, university professor, president of the Hungarian Ophthalmological Society, and board member of numerous domestic and international professional organizations. His professional experience is wide-ranging, he mainly specializes in microsurgical procedures. An eye surgeon with an innovative approach, he is credited with introducing the use of the most modern surgical techniques and equipment. Since 1992, he has been performing refractive ophthalmic surgeries, the number of which exceeds 25,000. The number of cataract surgeries he has performed is several thousand. In recognition of his professional work, he has received numerous awards and honors both domestically and internationally (International Society of Refractive Surgeons, All India Ophthalmological Society, American Academy of Ophthalmology).

Aim: Age-related macular degeneration (AMD) is a leading cause of irreversible severe visual loss in individuals over 60 years old. The two most important types of AMD are atrophic (non-exudative, dry) and exudative (wet).

Methods: For diagnosis, slit lamp examination with macular lens, fluorescein angiography (FLAG), optical coherence tomography (OCT), and genetic counseling are used. Treatments are based on the types of AMD. In the case of dry-AMD vitamins are recommended, in wet-AMD laser, photodynamic therapy, and anti-VEGF therapy are recommended.

Results: The results with dry-AMD are not too promising. Wet-AMD can be controlled best with anti-VEGF therapy presently. This is more useful compared to previous therapeutic possibilities such as retinal laser photocoagulation and photodynamic therapy.

Conclusion: AMD is still a great challenge in developed countries, especially due to increased average age and longer life expectancy. Timely applied intravitreal anti-VEGF therapy may restore full visual acuity. Genetics may reveal possibly affected persons well before the first symptoms before they may cause visual deterioration. Gene therapy might offer solutions in the future for some previously hopeless cases.

ELECTROCHEMOTHERAPY IN THE MANAGEMENT OF CUTANEOUS TUMORS - A 15-YEAR SINGLE CENTER EXPERIENCE

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Professor Judit Olah is Chair of the Department of Oncotherapy, University of Szeged (Hungary). She is President of the Dermato-Oncological Section of the Hungarian Dermatological Society, a board member of the European Association of Dermato-Oncology, Hungarian Clinical Oncological Society and Hungarian Dermatological Society, and a member of the European Academy of Dermatology and Venerology and Hungarian Oncological Society. She is the Honorary Member of the Serbian Association of Dermatovenereologists. She completed specialization training in dermatology (1990) and clinical oncology (1998). She has 283 publications, including abstracts and book chapters, and has given numerous invited presentations on topics related to her areas of

expertise.

Aim: Electrochemotherapy (ECT) carried out with reversible electroporation (EP) is a technique that increases cell membrane permeability through the induction of high intensity electric pulses, leading to increased penetration of hydrophilic molecules such as cytotoxic agents. Bleomycin-based ECT has been successfully used in the treatment of various superficial tumors. This new oncological approach was introduced in Hungary at the University of Szeged, Department of Dermatology and Allergology in 2007. Our aims were to summarize our results and present cases to demonstrate the effect of this local ablation technique, ECT.

Methods: During a 15-year period, more than thousand surgically inoperable cutaneous tumors were treated at our Department. Majority of the ECT patients suffered in metastatic melanoma and different types of non-melanoma skin cancers. The interventions were performed under general anesthesia with administration of intravenous bleomycin. Different types of standard electrodes were used to apply the high intensity electric pulses generated by Cliniporator (IGEA, Italy). In all cases a multidisciplinary tumor board indicated this oncological approach. Management of patients and bleomycin-based ECT treatment were performed according to updated European Standard Operative Procedures (ESOP). Tumor response was evaluated according to response evaluation criteria in solid tumors of WHO. Complete response was confirmed when the cutaneous lesion completely disappeared, PR in case of at least 30% decrease in diameters, PD in case of an absolute increase of existing lesions (min. 20%) and SD if neither sufficient shrinkage for PR, nor increase for PD was noted. EuroQol-5 Dimension (EQ-5D-3L) questionnaire was used to evaluate patient quality of life influenced by ECT treatment.

Results: The average objective response (OR) was 80 % in the different histotypes of cutaneous tumors with mild side effects. On the basis of the EQ-5D-3L with elapsed time after ECT, most patients showed improvements in quality of life with decreasing post ECT pain levels.

Conclusion: Our long term experience demonstrates that bleomycin-based ECT is an efficient and feasible approach in the management of cutaneous tumors that are difficult to treat, independently their histotypes. The future perspectives are very promising to involve ECT in the complex oncological treatment of deep-seated solid tumors.

ENDOVASCULAR RETRIEVAL OF A FRACTURED INFERIOR VENA CAVA FILTER USING ENDOBRONCHIAL FORCEPS AND INTRA-OPERATIVE CONE-BEAM CT IMAGE GUIDANCE

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Peter Osztrogonacz obtained his medical degree from Semmelweis university in 2018. From 2018 he served as Vascular Surgery Resident at the Heart and Vascular Center of Semmelweis University. He is Postdoctoral Fellow in the Department of Cardiovascular Surgery, Houston Methodist Hospital, Houston, TX.

Aim: Our aim is to describe an advanced endovascular retrieval technique of a fractured inferior vena cava (IVC) filter in a 57-year-old female using endobronchial forceps and intra-operative cone-beam CT (CBCT) image-guidance.

Methods: A 57-year-old woman presented to our clinic with a chronic indwelling IVC filter placed several years prior for DVT complicated with PE. CT venography showed an anteriorly tilted retrievable Optease™ (Cordis, Miami Lakes, FL, USA) filter suspicious for posterior strut fracture. Our plan was to perform an endovascular retrieval of the IVC filter using the double guidewire and snare technique. The procedure was performed in a hybrid operating room, equipped with C-arm capable of CBCT imaging.

Results: Following ultrasound-guided access of right jugular and right common femoral veins the IVC filter was removed using the double guidewire and snare technique. Examination of the retrieved IVC filter showed a remaining fragment of fractured filter strut in the IVC. CBCT demonstrated a Y-shaped filter fragment in the posterior caval wall. A flexible endobronchial forceps was introduced from the right jugular access, and the filter fragment was successfully removed. Ex-vivo CBCT was performed to confirm complete retrieval of the filter. The patient did well post-operatively. At 1 year follow up, CTA demonstrated a patent IVC and no residual IVC thrombus.

Conclusion: Endovascular retrieval of fractured inferior vena cava filters beyond manufacturer recommended indwelling time may be challenging and require advanced retrieval techniques. Our report highlights the additional value of intra-operative cross-sectional imaging in conjunction with advanced endovascular techniques, for retrieval of challenging IVC filters.

DATA-DRIVEN TRANSCRIPTOMICS ANALYSIS IDENTIFIES PCSK9 AS A NOVEL TARGET IN AGING LIVER

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Pal Pacher received his M.D. and Ph.D. (summa cum laude) at Semmelweis University of Medicine, Hungary in 1993 and 1999. After spending 2 years at Thomas Jefferson Medical University in Philadelphia, and 2 additional ones in the drug development in Boston area he joined NIH at 2003, where he became Chief of Section on Oxidative Stress and Tissue Injury in 2005; was tenured in 2012, and became Head of Laboratory of Cardiovascular Physiology and Tissue Injury in 2015. Dr. Pacher co-authored over 350 peer-reviewed publications and with over 56,000 citations and 122 H factor listed among top 50-100 most cited researchers in the World in Pharmacology and Toxicology fields since 2010, and among the top 1% cited in Clinical Medicine, Biology and Biochemistry fields. He has also been listed in Highly Cited consistently since 2014 every year in multiple research fields. He is editorial board member of numerous scientific periodicals, recipient of numerous national/international research awards and grants, and elected Fellow of the American Heart Association, American College of Cardiology, and American Physiological Society. He is also a member of the Steering Committee of the Cancer Redox Biology Faculty at National Cancer Institute.

Aim: Liver is a key metabolic organ and its pathological alterations during aging may profoundly affect cardiovascular health. Utilizing data-driven approaches we aimed to systematically investigate the effect of aging on the liver and heart using an established rat aging model developed by National Institute of Aging. We also used additional rat and human aging data sets and co-expression network analysis to identify new target genes in the aging liver.

Methods: Systems biology approaches were used to analyze genome-wide transcriptomics data from liver and heart samples obtained from young and aging rats.

Results: Pathological alterations were observed in numerous key biological processes in aging tissues (e.g. in mitochondrial function, protein synthesis, inflammation and lipid metabolism). The results were also validated using independent human and rat aging datasets. Furthermore, we demonstrate the power of the co-expression network to identify novel driver genes for liver aging, confirm our findings in human aging subjects, and identify their cellular localization using single-cell RNA-sequencing data.

Conclusion: Using the above mentioned approaches and methods we identify and validate a liver-specific gene, PCSK9, as a potential therapeutic target for attenuating the pathological processes associated with aging.

EFFECT OF SLEEP DEPRIVATION ON THE NEUROVASCULAR CONNECTION

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As a 5th-year medical student Reka Palatka joined the research team at the Department of Neurology and wrote her thesis about the effects of sleep deprivation on the neurovascular connection. After graduation she joined a PhD program at the Doctoral School of Allergology and Immunology and her research topic is the clinical and immunological connection between Hidradenitis Suppurativa and Crohn's Disease. As of October 1, 2021, she is a resident in the Department of Dermatology at the University of Debrecen.

Aim: Sleep deprivation is known to have an impact on the cardiovascular system; the elevated risk of arrhythmia and coronary disease are linked to an increased sympathetic tone that occurs after sleep deprivation. In our study we examined the effect of 24-hour sleep deprivation on neuronal activation and cerebrovascular response, the two main components of the neurovascular connection.

Methods: Fourteen healthy volunteers (mean age: 29) were included in our study. Examinations were first conducted in a well-rested state after 8 hours of night sleep (control period) and were repeated the next day after 24-hour sleep deprivation. We detected the cortical activation of the occipital lobe with Visual Evoked Potential (VEP) and registered the amplitude and latency of the P100 wave. With Transcranial Doppler (TCD) we measured the changes in flow velocity in the posterior cerebral artery (PCA) triggered by visual stimulation (vibrating chess pattern). In the medial cerebral artery (MCA) we measured the increase in flow velocity (cerebrovascular reserve capacity, CRC) triggered by breath-holding (hypocapnia). Results from before and after sleep deprivation were compared with paired t-test. Changes in flow velocity triggered by visual stimulation in PCA were compared using repeated measures analysis of variance.

Results: No difference in VEP P100 amplitudes were found however, the latency of P100 wave was significantly higher after sleep deprivation ($111,3 \pm 5,4$ ms) than in the control period ($106,6 \text{ ms} \pm 3,3 \text{ ms}$; $p < 0,01$). In the PCA the increase in relative systolic flow velocity triggered by visual stimulation was significantly lower ($p < 0,05$) after sleep deprivation. The relative maximal systolic velocity change was also significantly lower after sleep deprivation compared to the control period ($118,9 \pm 5,4$ % vs. $122,1 \pm 4,6$ %, $p < 0,05$). No significant difference was found in the resting pulsatility index and in the CRC before and after sleep deprivation.

Conclusion: After sleep deprivation the velocity response in the PCA triggered by visual stimulation was decreased compared to the well-rested state which shows that the neurovascular connection was negatively impacted by sleep deprivation. Background of this phenomenon could be disturbance in the activation of neurons or regulation of vasodilatation. Since sleep deprivation did not affect neither resting pulsatility nor vasoreactivity, we could not prove that sleep deprivation has a direct negative impact on the cerebral vascular tone or on vasodilatation.

THE VOLTAGE GATED HV1 H⁺ CHANNEL IS EXPRESSED IN TUMOR-DERIVED MYELOID-DERIVED SUPPRESSOR CELLS

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Dr. Panyi graduated as a medical doctor in 1991 and started his basic research career right after finishing the medical school. He was trained to be an ion channel biophysicist and pharmacologist. He currently moves towards ion channels and cancer and the role of ion channels in differentiation and proliferation of various cells.

Aim: Myeloid-derived suppressor cells (MDSCs) are key determinants of the immunosuppressive microenvironment in tumors as they inhibit the availability (invasion), viability and activation of T cells targeting cancer cells. Compared to other immune cells little is known about the expression and the physiological/pathophysiological role of ion channels in MDSCs isolated from tumors. The aim of the study was to characterize the ion channel repertoire in tumor-derived polymorphonuclear (PMN-MDSC) and monocytic (Mo-MDSC) MDSCs.

Methods: Subcutaneous tumors in C57Bl/10 wild-type mice were induced by Lewis lung carcinoma cell line (LLC). The presence of PMN-MDSC and Mo-MDSCs in the tumor tissue was verified using immunofluorescence microscopy, the two MDSC populations were isolated using flow cytometry and sorting. The MDSC phenotype of the cells was confirmed by their ability to suppress anti-CD3 induced T cell activation in vitro. The electrophysiological properties of MDSCs were studied using whole-cell patch-clamp and appropriate ion substitutions and pharmacological agents.

Results: The histological examination of the tumor samples showed that PMN-MDSC cells (CD11b+/Ly6G+) represent an abundant group of cells and form extensive aggregates in the tumor as compared to Mo-MDSCs (CD11b+/Ly6G+). Flow cytometric sorting reported that the relative proportion of the PMN-MDSC (CD11b+/Ly6G-/F4/80-/MHCII-/Ly6C+) in the CD11b+ population was ~60% as compared to 10% of the Mo-MDSCs (CD11b+/Ly6G-/F4/80-/MHCII-/Ly6C+). Anti-CD3-induced proliferation of CD8+ and CD4+ T cells was significantly reduced to ~30% or ~50% of control, respectively, by co-culturing them with Mo-MDSCs at 1/1 Mo-MDSC/splenocyte ratio. However, PMN-MDSCs failed to suppress T cell activation at a similar MDSC/splenocyte ratio. Whole-cell patch-clamp did not identify voltage-gated or Ca²⁺-activated K⁺ currents in either cell population. Both PMN-MDSCs and Mo-MDSCs showed voltage-gated outward currents upon voltage-ramps, and slowly activating currents upon voltage steps when the pipette-filling and the bath solution contained H⁺ as the sole charge carrier. The activation threshold (V_{thr}) of the currents was -16.67 ± 3.1 mV with pH_i=6.2//pH_e=7.4 solutions, and become more positive at lower pH_e (e.g. 38 ± 9.16 mV at 6.2//6.2). The slope of the V_{thr}-ΔpH_e relationships were -39.36 mV/ΔpH_e for PMN-MDSCs and -40.07 mV/ΔpH_e for Mo-MDSCs. The current density measured at +145 mV was greater in PMN-MDSCs (~100 pA/pF) than in Mo-MDSCs (~30 pA/pF) using 6.2//7.4 pH combination. The current was quickly and reversibly inhibited by 200 μM ClGBI, and the reversal potential of the currents in PMN-MDSCs (E_{rev}= -1.34 ± 4.3 mV) in symmetrical pH (6.2//6.2) was consistent with a H⁺-selective current. The expression of Hv1 transcripts (PCR) and Hv1 protein (immunofluorescence) was also confirmed in both MDSCs types albeit, consistent with electrophysiology, more markedly in PMN-MDSCs.

Conclusion: The biophysical and pharmacological properties of the whole-cell currents recorded in PMN-MDSCs and Mo-MDSCs and the molecular biology data indicate the functional expression of Hv1 in myeloid derived suppressor cells.

EXAMINATION OF EXTRACELLULAR MATRIX MOLECULES IN GRADE II AND GRADE III OLIGODENDROGLIOMAS

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Melinda Rostas received her bachelor's degree in medical diagnostic analysis at the University of Debrecen. Her research interests include understanding extracellular matrix differences in malignant central nervous system tumors such as oligodendrogliomas. She is currently studying for a master's degree in Molecular Biology at the University of Debrecen and also works at the Medical Imaging Clinic as a teaching assistant.

Aim: Gliomas are the most common primary central nervous system tumors. Oligodendrogliomas belong to the group of low-grade gliomas nonetheless they pose a serious challenge to clinicians both in making an accurate diagnosis and in selecting appropriate treatment modalities. Due to their infiltrative nature, complete recovery is only possible in a small number of cases. It is almost impossible to completely remove the tumors which increases the chances of progression and significantly impairs the patient's quality of life. Previous studies have shown that the source of the infiltrative property of tumor cells is partly due to the extracellular matrix of the tumor. The levels of different ECM molecules in intracranial tumors have been studied in several cases but in oligodendrogliomas no panel-like expression analysis has been performed. The aim of our study is to determine the quantitative changes of ECM components in grade II and grade III oligodendroglioma samples.

Methods: In our study, we examined whether the expression pattern of molecules involved in invasion correlated with the grade of oligodendrogliomas, and whether there was a difference in patients within the same histological group and grade but with different prognoses. We created subgroups with poor and better prognoses within the same grade. Different aspects were considered in the prognostic grouping. The mRNA and protein levels of ECM components in tumor samples were measured. mRNA expression was measured by qRT-PCR, and protein level was measured by fluorescent immunohistochemical reactions.

Results: Significant differences were found between ECM components in the samples of both patients with different grades and patients with the same grade but different prognosis. The mRNA expression of BCAN, CSPG5, HAS2 and VCAN genes was determined to be significantly different between grade II and III tumors. Additionally, the levels of CSPG5 and NCAN molecules were determined to be significantly different in grade II samples, while BCAN and EGFR differed in grade III samples from patients with poor and better prognoses. These results were confirmed by immunofluorescence reactions.

Conclusion: In conclusion, it was determined that ECM components exhibit different expression levels in tumors with different grades and prognoses. Based on the expression pattern, it is possible to identify more aggressive tumors, thus the invasion spectrum can be used as a prognostic marker.

THE FEASIBILITY AND SAFETY OF VENTRAL HERNIA REPAIR IN MORBIDLY OBESE PATIENTS

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Dr. Andras Sandor is attending surgeon at Tufts Medical Center Community Care and works at MelroseWakefield Hospital in Melrose, MA and Tufts Medical Center in Boston, MA. He graduated from Semmelweis University in 1992. After 5 years of research at Yale University and the University of Massachusetts Medical School, he entered surgical residency at the University of Massachusetts in Worcester, MA. Following general surgery residency, he completed a fellowship in Minimally Invasive and Bariatric Surgery also at the University of Massachusetts. He entered practice in private practice in Stoneham, Massachusetts, just outside Boston in 2005 and in 2019 he joined Tufts Medicine. He teaches and trains surgical residents and medical students from Tufts University. His practice is focused on advanced laparoscopic and robotic surgery and weight loss surgery.

Aim: Conventional surgical guidelines strongly advise against elective repair of ventral hernias in morbidly obese (BMI > 40) patients due to the risk for wound complications, mesh problems and early recurrence. The concept of retromuscular dissection and mesh implantation with or without transversus abdominis release (TAR) revolutionized abdominal wall reconstruction (AWR). Minimally invasive execution of these procedures has become a reality using robotic techniques without the need for large incisions, often without entering the abdominal cavity. The aim of this study was to evaluate, whether robotic retromuscular AWR was a safe option to offer to morbidly obese patients with ventral hernias.

Methods: Between 01/2019 and 08/2022 74 robotic retromuscular ventral hernia repairs (BMI range: 20-66) were performed at our community teaching hospital, 18 with TAR. All surgeries were performed by the same surgeon using the DaVinci Xi robotic system. Postoperative follow ups were scheduled 2 weeks following the surgery, then every 6 months in person or via telemedicine. Depending on the size and location of the hernia defects, the patients' body habitus and the presence of previous surgical scars the surgeries were performed using one of the following approaches: 25 single-dock transabdominal repair (8 female, 17male), single or multiple hernia defects with hernia defect range: 2-5.4 cm. 25 patients with BMI<40 (mean: 31.75), mean OR time: 122 min, mean hospital stay: 0.13 day. The one patient with a BMI of 45 had a hospital stay of 0 days and OR time of 90 min. 11 dual-dock transabdominal TAR (9 bilateral, 2 unilateral), 7 female, 2 male, single or multiple hernia defects with hernia defect range: 6-12 cm. 5 patients with BMI40 (mean: 45.9), mean OR time: 382 min, mean hospital stay: 1.3 day. 38 extended totally extraperitoneal (eTEP) repair including 7 cases with bilateral TAR (19 female, 19 male) for single or multiple hernia defects with hernia defect range: 3-8 cm. 26 patients with BMI40 (mean: 49.8), mean OR time: 193.8 min, mean hospital stay: 0.83 day.

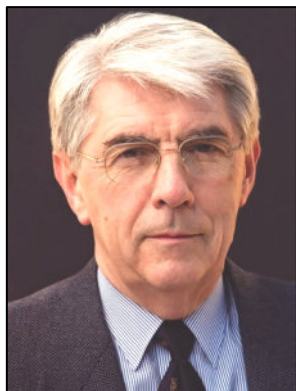
Results: In each group 1 surgical complication was encountered and they all presented with signs and symptoms of partial small bowel obstruction 1 – 6 weeks following the index operation. Open laparotomy and mesh removal was required for one patient, the other two were successfully managed with robotic repair. Most patients left the hospital on the day of the surgery with minimal or no narcotic pain medication. No recurrences were noted so far.

Conclusion: Robotic AWR procedures are time consuming but allow for complete closure of the hernia defects and placement of large, relatively inexpensive mesh products that will not be in contact with the intraperitoneal environment. Morbid obesity is no longer a contraindication to ventral hernia repair and most of these operations can be performed in the outpatient setting.

A PIONEER LIFE TO SERVE SURGERY. GEORGE BERCI IS 102 YEARS OLD

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Professor Jozsef Sandor graduated from Semmelweis Medical School in Budapest and spent his professional clinical career at the 3rd Surgical Department of Semmelweis Medical School. His work was paramount in the rebuilding of the Department of Surgical Research and Techniques, where he currently serves as Scientific Advisory. He educated generations of medical, dental and pharmacy students and surgical trainees, presented his work in numerous peer reviewed publications, book chapters, national and international scientific meetings. He continues to teach students at the Semmelweis University Department of Surgery, Transplantation and Gastroenterology and serves as scientific advisor at the South-Pest Centrum Hospital (DPC)

Scientific Department.

Surgeons of five continents celebrated George Berci, the Hungarian-born professor of surgery on his 100th birthday last year. His carrier and whole life were determined by his experimental study published 70 years ago entitled „Conservation and Transplantation of Arteries”.

He managed to escape from the nazi concentration camp and also from the Russian „malenkij robot” labor camp. After the end of World War II he obtained his MD degree from Szeged University but due to political reasons he was expelled from the Surgical Clinic of the institution. Tragic situations of Hungarian Revolution in 1956 forced him to emigrate to Australia. He constructed there a miniature TV camera by which - for the first time in history – live projection was performed from the abdomen of a living person. This invention and application of a rod-lens optical system with Xenon-light made possible the birth of up-to-date laparoscopic surgery. He spent his further career in the USA, where his innovative work led to the development of many new surgical systems, several hundred scientific papers, 88 books and chapters, etc.

He was awarded the „Jacobson Innovation Award” – which is the highest appreciation of American College of Surgeons. His contributions to surgery are also acknowledged by the George Berci Lifetime Achievement Award in Endoscopic Surgery, created in his honor by the Society of Gastrointestinal and Endoscopic Surgeons. Prof. George Berci was an invited lecturer of the Scientific Meeting of HMAA in Sarasota in 1998, he is a honorary member of many national and international scientific societies and he is also Honorary Professor of Semmelweis University. On the 100th anniversary of his birth he received the Order of Merit of Hungarian Republic, Officer’s Cross from the President of the Hungarian Republic.

The life and career of Professor Berci motivated generations of surgeons all over the world. At the age of 102 he continues to work restlessly on novel ideas in surgical technology.

WEATHER PARAMETERS AND CARDIOVASCULAR MORBIDITY: A BAYESIAN APPROACH

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Aim: The increasing frequency of extreme weather events has become a concerning burden on healthcare systems. In Hungary, people with cardiovascular problems represent a significant proportion of the population, therefore it is paramount not only to analyze extreme situations but also to assess the full scale of weather effects on acute cardiovascular conditions. Synoptic air mass types have been used in meteorological and climatological research since the mid-20th century. Our study aimed to explore the relationships using Péczy's macrosynoptic classification and a large sample from Hungary. This classification depicts weather types in the Carpathian Basin: thirteen groups are distinguished, and each day can be classified into a single group.

Methods: We analyzed approximately 18000 Emergency Department visits with cardiovascular pathologies based on ICD codes from a single center between 2015 and 2019. Using several novel mathematical methods, we investigated the combined effect of each climate parameter. By analyzing different physical parameters of the weather, thresholds were established when a higher-than-average number of cases was recorded.

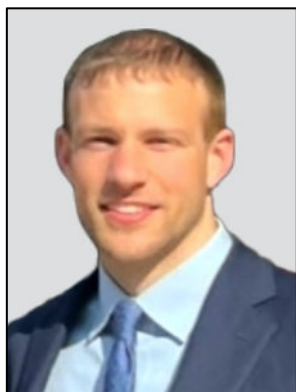
Results: The daily average case rate was 10.29, but some Péczy types or combinations of types resulted in 10-18% higher visit rates. On type 7 days the daily incidence increased by nearly 2 patients. This is a zonal cyclonic pattern. It is known that weather fronts may exacerbate certain diseases, our calculations confirmed this. Not every front-type day was associated with marked increases, however. On the other hand, certain day combinations decreased the number of cardiovascular visits by more than 20 percent. When two days with pattern type 9 followed each other, the daily incidence dropped by 21% on average.

Conclusion: Examining complex weather patterns can help predict daily cardiovascular events, providing a more accurate estimate of the risk factors associated with each weather situation. The method we use to determine thresholds has not been previously reported in the literature.

AN INCIDENTAL FINDING OF A SUSPICIOUS HYPERDENSE FOCUS IN THE ESOPHAGUS LEADING TO DIAGNOSTIC AND MANAGEMENT INSECURITY IN A PATIENT WITH AN UNKNOWN ORIGIN OF PNEUMOMEDIASTINUM

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Peter Szekely is a 6th year medical student at the University of Szeged Albert Szent-Gyorgyi Medical School and participates in medical and educational activities such as case studies in the ENT department and conducts research in the Radiology department where he analyzes CT scans of patients with a history ischemic stroke to collect data on the percentage of ischemic strokes that can be attributed to atrial fibrillation. He has a Bachelor's degree in the Biological Sciences with a Major in Biology and a Minor in Chemistry. After graduating he plans to apply for an internal medicine residency in the United States with an interest in sports medicine, general internal medicine care, and cardiology specialties. In his free time, he enjoys swimming and outdoor

activities.

Aim: To educate physicians about the connection between pneumomediastinum and hyperdense foreign body foci (e.g. bones and bubble gum) in the esophagus which can lead to difficulty executing a rapid treatment and management plan. Patients can be spared from additional unnecessary diagnostic testing and exposure.

Methods: Utilization of patient's history, imaging studies (CT, X-ray and a swallow test with a water soluble iodinated contrast agent (Gastrografin) from the electronic medical records were all used to collect data for our case. The patient's CT and X-ray studies were selected and density measurements of the foreign body (bubble gum) were taken using the (eRAD PACS imaging system/ records) pinpoint tool. Areas of interest on the foreign body were selected and compared and the Hounsfield units of density were recorded. This in combination with the patient history were the primary methods of data collection.

Results: Dimension measurements of the foreign body from CT imaging showed a size of 19x80x11 mm. Density measurements taken at the center of the hyperdense image were found to be 568 ± 23 Hounsfield units (HU) making it a hyperdense object comparable with the density to that of bone. Normal healthy bone has a density of 368 ± 1 .

Conclusion: Our case report demonstrates how the connection between pneumomediastinum and hyperdense foreign body foci (e.g. bones and bubble gum) in the esophagus may lead to difficulty in the physician's causative diagnostics, treatment and management. Our work can save patients from unnecessary lost time, money, testing, and imaging exposure. It demonstrates the importance of educating physicians about their connection and ultimately providing patients with the most efficient and effective treatment and management course.

PHASE 3, RANDOMIZED, SINGLE-DOSE, OPEN-LABEL STUDY TO INVESTIGATE THE SAFETY AND EFFICACY OF PAFOLACIANINE SODIUM INJECTION (OTL38) FOR INTRA-OPERATIVE IMAGING OF FOLATE RECEPTOR POSITIVE OVARIAN CANCER

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Dr. Janos L. Tanyi, Associate Professor in the Department of Obstetrics and Gynecology and Clinical Director of Immunotherapy in the Division of Gynecologic Oncology is an internationally known leader in clinical cancer immunotherapy who leads multiple immunotherapy trials targeting gynecologic malignancies. Dr. Tanyi earned his medical degree (summa cum laude) at the University of Debrecen in Hungary in 1993 and a doctorate at Semmelweis University, School of Clinical Sciences in Budapest, Hungary in 2008. He completed two residencies in obstetrics and gynecology; one five-year program at Semmelweis University (1993-98) and a second at Baylor

College of Medicine which he finished in 2008. He was a postdoctoral fellow and research scholar at the University of Texas, Houston in between the two residencies (1999-2004). Dr. Tanyi completed a fellowship in gynecologic oncology at the University of Pennsylvania. He was a recipient of the NICHD Reproductive Scientist Development Program Award (2010-2015). He received the Health Care Hero Award for outstanding patient care at the University of Pennsylvania Health System 4 times in the past 7 years (2012, 2014, 2016, and 2017). In 2014 he received the Angela Carino Excellence in Ovarian Cancer Research and Care Award by the Sandy Rollman Ovarian Cancer Foundation.

Aim: Pafolacianine sodium (PS) is under investigation as an adjunct to visual inspection and palpation by providing intra-operative imaging of folate receptor positive (FR+) ovarian cancer. Since complete resection (R0) is the strongest predictor of overall survival, methods to enhance detection of lesions are expected to benefit patient outcomes.

Methods: For this phase 3, randomized, multicenter, single dose, open-label pivotal trial (NCT03180307), patients with ovarian cancer who were scheduled to undergo cytoreductive surgery were recruited from 11 sites in the US and Netherlands from March 2018 through April 2020. The study objectives were to confirm efficacy and safety of pafolacianine sodium (0.025 mg/kg i.v., ≥ 1 h prior to imaging) in combination with intraoperative near-infrared fluorescence (NIRF) imaging to detect additional lesions not detected by palpation and normal white light alone. Pafolacianine sodium was administered to 150 total patients (safety analysis set); 109 patients comprised the full analysis set for efficacy analyses. Patients had primarily serous adenocarcinoma (n=72; 68.6%) and advanced stage disease (n=83; 76.1%).

Results: In 33% of patients (36 of 109), NIRF imaging with PS identified additional lesions that were not planned for resection and were not detected by normal white light and palpation ($P < 0.001$, 95% CI [0.243, 0.427]). This rate was higher, at 39.7% of patients with interval debulking (23 of 58; 95% CI [0.270, 0.534]). At the individual lesion level, the accuracy of PS with NIRF to detect ovarian cancer was by sensitivity of 83% (95% CI [73.9, 89.4]) and a false positive rate of 32.7% (95% CI [25.6, 40.7]). Drug-related adverse events (AEs) were reported by 30% of patients.

Conclusion: This phase 3 trial of pafolacianine sodium with NIRF imaging met its primary endpoint, intraoperatively identifying additional cancer not planned for resection in a statistically significant number of patients. Therefore, pafolacianine sodium may offer a novel real-time adjunct to current surgical imaging practice in ovarian cancer surgery.

ALTERATION OF VISUO-SPATIAL SYSTEM AS AN EARLY MARKER OF COGNITIVE DECLINE: A DOUBLE CENTER NEUROIMAGING STUDY

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Winner of the 2022 HMAA North American Student Award

Tom Werber is a 6th year medical student from Semmelweis University who is planning on moving to the US after graduation for a Neurology residency program.

Aim: The aim of our study was to analyze the functional connectivity and structural integrity of visuo-spatial (VS) network in amnesic mild cognitive impairment.

Methods: 32 MCI patients and 46 controls (HC) went through a detailed dementia screening protocol: medical history, neurological examinations, blood-tests, neuropsychological testing, brain fMRI and sMRI.

Results: Controls significantly outperformed a-MCI patients in all VS parameters, with no differences in other cognitive subdomains. Significant reduction was demonstrated in the thickness of left temporal pole and the right superior temporal gyrus in a-MCI patients. Changes in functional connectivity within VS network was also found, namely increased connectivity in left frontotemporal areas and reduced commissural connectivity.

Conclusion: In our multiple domain a-MCI patient cohort, VS impairment was the most dominant feature of cognitive decline. With a strict statistical correction, reduction of the thickness of the temporal pole and the superior temporal gyrus were the most characteristic structural hallmarks of a-MCI. The analysis of the VS network demonstrated increased functional connectivity between the left fronto-temporal areas, while connectivity was reduced between the right and left frontal structures. Using fMRI, data analysis and detection of VS system alterations might provide a non-invasive, fast, and sensitive biomarker for the early recognition of cognitive decline.

N,N-DIMETHYLTRYPTAMINE (DMT) EFFECTS ON INFARCT SIZE AND FUNCTIONAL RECOVERY FOLLOWING TRANSIENT FOCAL BRAIN ISCHEMIA IN RATS

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Aim: N,N-Dimethyltryptamine (DMT) is a natural hallucinogen, the active component of the ayahuasca brew used as a spiritual medicine by indigenous people in the Amazonian basin. DMT is synthesized in the human body under normal circumstances and pathological conditions, although its function and mechanism of action are poorly understood. It was proven in earlier studies that DMT has a highly beneficial effect on cell survival under ischemic conditions. This effect is at least partly mediated by the Sigma-1 receptor. The purpose of our experiment was to test the neuroprotective potential of the DMT under ischemia-reperfusion conditions in a rat middle cerebral artery stroke model.

Methods: We used a transient middle cerebral artery occlusion model. The ischemic period lasted for 1 hour, followed by 24 hours of reperfusion. The occlusion was proved by laser Doppler imaging. Osmotic pumps were implanted in the abdominal cavity of the animals at the beginning of the reperfusion period to provide 24 hours of balanced DMT and Sigma receptor antagonist absorption. 24 hours later magnetic resonance imaging was performed. The second part of the experiment investigated 30 days of reperfusion after 1 hour of ischemia, which allowed us to test the long-term effects of the DMT administered in the first 24 hours of the stroke. The animals were tested in a rodent staircase, standardly used to assess limb motor function and regeneration after stroke.

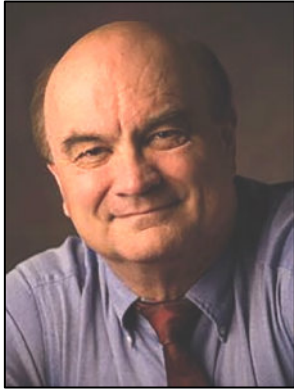
Results: The DMT-treated group showed smaller infarct lesion volumes and better functional outcomes at 30 days.

Conclusion: Given the clinically relevant timing of administration, the endogenous nature, and the high affinity of DMT to the human brain, DMT may have an important future implication for stroke therapy.

MIND

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Dr. Gabor Zoltay received his medical degree from Medical University of Pecs, Hungary. He is a board certified neurologist and neurosurgeon in his native country. As a neurosurgeon he rewrote with his coworker the head injury basic research with their new silver method, and they published the results in several prestigious journals. He was rewarded a scholarship in Charité University in Berlin, where he learned new surgical technics. Later he was rewarded a scholarship at Yale University and during these years he published several papers in well respected journals. He completed his neurology residency program in the biggest neuroscience center in Midwest, in University of Minnesota. He spent two year epilepsy fellowship in one of the biggest epilepsy center in the Country, in Henry Ford Hospital. He is a member of American Academy of Neurology and the American Epilepsy Society. Currently he works as a chief of Neurology Department in one of the hospitals in New York State.

Aim: "The mind is a powerful force. It can enslave us or empower us". The mind involves a special substance that is different in some fundamental way from material substances. What is the mind, where is the mind? The author would like to start a series about mind and he wants to inspire his colleges to tell their thoughts about the mind, their knowledge about the mind in following conference. This time the author will speak the general aspect of the mind, the different view of the mind, philosophic, religious and scientific view.

Methods: Read the literatures.

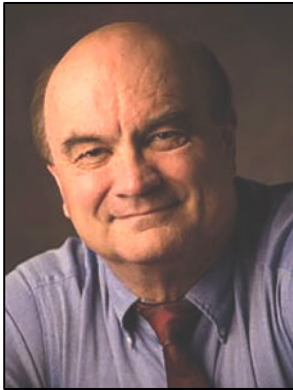
Results: The link between mind, body and soul is scientific fact.

Conclusion: We need further research to know more how the mind works.

DRUG-RESISTANT EPILEPSY – DO WE HAVE ANY CHANCE TO TREAT IT?

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Dr. Gabor Zoltay received his medical degree from Medical University of Pecs, Hungary. He is a board certified neurologist and neurosurgeon in his native country. As a neurosurgeon he rewrote with his coworker the head injury basic research with their new silver method, and they published the results in several prestigious journals. He was rewarded a scholarship in Charité University in Berlin, where he learned new surgical technics. Later he was rewarded a scholarship at Yale University and during these years he published several papers in well respected journals. He completed his neurology residency program in the biggest neuroscience center in Midwest, in University of Minnesota. He spent two year epilepsy fellowship in one of the biggest epilepsy center in the Country, in Henry Ford Hospital. He is a member of American Academy of Neurology and the American Epilepsy Society. Currently he works as a chief of Neurology Department in one of the hospitals in New York State.

Aim: About 50 million people worldwide suffer from epilepsy, and about 30 – 40% of these persons have seizures that are refractory to treatment with antiepileptic medication. ILAE defines drug-resistant epilepsy as “failure of adequate trials of two tolerated and appropriately chosen AED schedules (whether as monotherapies or in combination) to achieve seizure freedom”.

Methods: Vagus nerve stimulator (VNS) was the first neuromodulation device approved by the US FDA as an adjunctive treatment for medically refractory epilepsy for individuals aged 12 years, lately aged 4 and more with partial epilepsy. The VNS system is a battery powered device that resembles a cardiac pacemaker. The VNS consists of an implanted pulse generator inserted below the clavicle and lead that is wrapped around the left vagus nerve in the carotid sheath.

Results: The author retrospectively studied and analyzed 60 of his patients’ outcome with VNS. He analyzed age, gender, seizure types, seizure frequency reduction, quality of life. 50% of patients were responders to therapy and 5.0% of patients were seizure free at zero 4-12 months post-implantation. Subsequently, at 24 – 36 months, 63% of patients were responders with 8.0% achieving seizure freedom. After 2 years, about 50% of patients will experience at least 50% reduced seizure frequency. Adverse events with VNS treatment are rare and include surgical adverse events (infection, vocal cord paresis, etc.) and stimulation side effects (hoarseness, voice change, cough).

Conclusion: VNS is an effective and safe adjunctive therapy in patients with medically refractory epilepsy. It has a vital role for patients with epilepsy who are poor surgical candidates, such as those with generalized or non- localizable epilepsy, and individuals who have failed resection. VNS has consistently demonstrated efficacy in treatment of epilepsy. Multiple studies have shown efficacy in patients with generalized types of epilepsy or non-localizable posttraumatic epilepsy, and future approval for these patients may increase the number of people who benefit from VNS. Future developments in VNS including closed-loop and non-invasive stimulation may reduce side effects or increase efficacy of VNS.

Archives of the Hungarian Medical Association of America (ISSN 1070-0773)

Published by the Association

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