Letter from the Department Chair

As we transition from summer to the fall of 2023, the department of Neurological Surgery has also gone through changes since our last newsletter. Despite navigating an ever-changing, post-pandemic environment, we have remained dedicated to our mission of training the next generation of neurosurgeon-scientists, educators, and leaders. As a result, both our clinical volume and research initiatives have continued to grow.

With growth comes new additions to the department to enhance and enrich the services we provide our community.

We have welcomed a new cerebrovascular and skull base neurosurgeon, Madhav Sukumaran, MD, PhD. Dr. Sukumaran will be working with Dr. Peter Amenta to grow our current Cerebrovascular Neurosurgery program. We have also welcomed a new spine neurosurgeon, Thomas Pieters, MD as Co-Director of Spine and Director of Spine Oncology. Dr. Pieters and Dr. Stephen Gutting are actively enhancing our spine services within the community as members of the department and Center for Spine Health.

Rachael Sirianni, PhD has continued to further develop translational research interests while continuing to support the growth of our research infrastructure and development of research-focused educational opportunities. Since joining the department, Dr. Sirianni and her lab has doubled our research footprint and held our first all-inclusive, research and clinical, department research retreat.

Our residents have also been busy and have been recognized for several awards and publications. We are pleased to welcome our new PGY1 resident, Hanya Qureshi, MD. Hanya's arrival marks the milestone of our fifth resident to join the department. While much has and will change, we as a department are continuing to progress toward our goal of providing world class care to every patient!

Mark Johnson, MD, PhD
Maroun Semaan Professor in Neurological Surgery
Chair, Department of Neurological Surgery
Welcome Hanya Qureshi, MD, Neurological Surgery Intern Resident

We are pleased to announce that Hanya Qureshi, MD, will be our next resident in the Department of Neurological Surgery at UMass Chan Medical School and UMass Memorial Health. As an undergraduate, Hanya attended both Cornell University (where she was a Pauline and Irving Harold Tanner Dean’s Scholar and a Cornell Meinig Family National Scholar) and Columbia University (from which she earned a B.A. degree in neuroscience and behavior). She then matriculated at the Yale School of Medicine where she was Co-Founder of Yale Global Health SURGE as well as Founder and Co-Developer of the United Nations STEM Connect Program (a part of the United Nations Girls Education Initiative, UNICEF) where she worked to increase STEM participation by high school girls from traditionally underrepresented regions around the world, including Tanzania, Rwanda, Senegal and Cameroon. She also served as a student leader in the Yale School of Medicine Office of Diversity, Inclusion, Community Engagement, and Equity, and she worked at the Yale Institute for Global Health and the Bill and Melinda Gates Foundation Burial Ground Study in Pakistan. Hanya was also a Solomon Center for Health Law and Policy Fellow at Yale Law School, where she developed and published research-informed policy to advocate for traumatic brain injury patients. She completed her medical school thesis on genomic profiles, frailty, and outcomes in meningioma patients. Throughout college and medical school, Hanya participated in numerous research activities covering such topics as ophthalmological disorders, the genetics and epidemiology of meningioma, subarachnoid hemorrhage, brain injury, epilepsy, and the genetics of arachnoid cysts. She has already co-authored 20 peer-reviewed publications, many in high impact journals such as Nature Medicine, Neurology, and the Journal of Neurosurgery. Hanya was an outstanding medical student at Yale, and was described as “bright and enthusiastic, with relentless energy and eagerness to learn”, an “extraordinarily hardworking team player,” with “outstanding clinical and surgical skills”, “caring for patients with a remarkable level of independence and ingenuity.” She is a published poet, pianist, photographer, avid hiker, and world traveler. Please join us in welcoming Hanya to our UMass Neurosurgery family.

An Intern Year of Residency at UMass Chan Medical School, Neurological Surgery
by William Lambert, MD, PGY-2

“Intern year is both a rewarding and humbling experience - you’ve earned the autonomy to apply the knowledge you’ve accumulated to care for patients, and you simultaneously appreciate how much more there is to learn. I am fortunate to find myself in a collaborative, multidisciplinary environment which allows me to care for my patients to the best of my abilities while also prioritizing teamwork and education. UMass Neurosurgery is my home for the next 6 years and I couldn’t imagine a better place to hone my surgical skills.”

(Left to right) Mark Johnson, MD, PhD, Chair of Neurological Surgery with William Lambert, MD, PGY-2.
The AANS UMass Student Chapter holds monthly journal clubs led by a faculty member to discuss articles with recent discoveries in the field. Rrita Daci, MD, PGY-5, Brittany Owusu-Adjei, MD, PGY-4, Constance Mietus, MD, PhD, PGY-3 and William Lambert, MD, PGY-2, Hanya Qureshi, MD, PGY-1, will serve as our resident advisors and be able to share their experiences as they advance during residency.

This Year’s Elected Officers
- Presidents: Chelsea Lim (MS4), Nathan Yingling (MS3) and Paramesh Karandikar (MS3)
- Vice-presidents: Danielle Li (MS3) and Christopher Zaro (MS3)
Research at the Department of Neurological Surgery

Neurosurgery researchers are keeping busy! Dr. Rachael Sirianni is a Professor and Vice Chair for Research in our department. Through the support of 3 NIH R01 grants, her laboratory sees to design better drug delivery strategies for the treatment of central nervous system (CNS) disease. They are developing nanoparticle strategies that improve tolerability and site-specific delivery of chemotherapy (to treat brain tumors) or neuroprotective agents (to treat brain injuries) in preclinical models, and bringing some of these therapies forward into clinical trials. In addition to her work on designing better therapies, she is also developing new, cell-culture based systems that can be used to study the biology of how tumors metastasize, which may be particularly important for designing new therapeutic strategies.

Dr. Sirianni’s oncology research is focused on medulloblastoma, which is a type of pediatric brain tumor that arises in the cerebellum at the back of the brain. In some instances, medulloblastoma tumors metastasize to the cerebrospinal fluid-filled subarachnoid space that surrounds the brain and spinal cord. This form of metastasis, known as leptomeningeal metastasis (LM), is very difficult to treat. In addition to cerebrospinal fluid, the subarachnoid space is also filled with small, collagen-rich fibers that are known as subarachnoid trabeculae (SAT, Figure 1). These SAT provide nutrient-rich microenvironments that promote the growth of metastatic cells and may allow them to escape conventional chemotherapy.

Relatively little is understood about the structure of SAT in different species and in different anatomical locations within the CNS. Members of Dr. Sirianni’s research group, including research technicians Colin Riley, MS, and Olivia Mihalek, as well as doctoral candidate Kha Dam, are working with Neurosurgical resident Rrita Daci, Assistant Professor of Neurology Heather Grey-Edwards, DVM, PhD, and members of the Anatomical Gift Donations program at UMass to collect trabeculae samples from different species and donated human cadavers. They are then using this information to develop biomaterial models of trabeculae structure, which are then applied in cell culture to study the mechanisms by which patient-derived cancer cells use these fiber structures to metastasize and develop treatment resistance.

This aspect of Dr. Sirianni’s research program is dedicated to understanding how the structure of these SAT influence the process of metastasis, driving movement of metastatic cells, as well as chemo- and radiation-resistance. Ultimately, these systems will be developed as a platform for drug screening, to identify new compounds that can prevent or treat LM. Identification of pharmacological strategies for treating LM could dramatically improve patient outcomes by reducing or eliminating the need for high dose craniospinal radiation, which otherwise can produce detrimental effects to the developing nervous system.

*This work was initially supported by funding from the Morgan Adams Foundation*
Meet Our Neurological Surgery Research Staff

Colin Riley, MS
Lab Manager

Chung-Fan (Joseph) Kuo, PhD
Postdoctoral Fellow

Oluwatobi Babayemi, BS
PhD Candidate

Not Shown:
Elena (Helen) Andreyko, PhD
Research Associate

Divya Sathya
Summer Intern

KhaUyen Dam, BS
PhD Candidate

Olivia Mihalek, BS
Research Associate

Congratulations, Rrita Daci, MD, PGY-5
Dr. Daci’s abstract, *Neuroimaging Analysis of Bilateral Thalamic Delivery for Gene Therapy* describing her work was recognized as the Pediatric Neurosurgery Best Basic Science Abstract by the joint AANS/CNS Section of Pediatric Neurological Surgery.

Dr. Daci was also awarded the Excellence in Research Award for Students and Fellows from the American Society of Gene-Cell Therapy in May 18, 2023.

Right photo. Oguz I. Cataltepe, MD, FACS with Best Basic Science Abstract winner Rrita Daci, MD, PGY-5.

Congratulations, Brittany Owusu-Adjei, PGY-4 for reaching 800 cases!
Our residents are in the OR from day one here at UMass Neurosurgery. From simple to complex cases, they are in the operating room learning daily. We are grateful to our dedicated faculty for teaching the residents.
Welcome New Neurological Surgery Staff

Joey Daher, NP
Advanced Practitioner

Sophie Nichols, PA
Advanced Practitioner

Julia Mann, PA
Advanced Practitioner

Shelly Noll
Administrative Staff

Ida Newman, MHL, is the Residency Program Coordinator in the Neurosurgery Department. She graduated with her B.A degree in biology and minor in chemistry from the College of Charleston and later pursued Master’s in Healthcare Leadership from Wake Forest School of Medicine. Her previous experience in healthcare includes pharmacy where she worked in the roles of the operations manager and certified lead pharmacy technician. After taking a break from her professional career she is excited to join UMass Chan Medical School and is eager to contribute her knowledge, enthusiasm, and work ethic towards the continuous growth and development of the neurological surgery residency program.

Tania Montanez, LPN
ACC Clinic LPN

New ACC Clinic Staff
Shannon Ricker, Clinic Manager
Erica White, Clinic Supervisor
Chelsey Quinones, MOA
Dinah Sereboo, MOA
Nancy Bryson, ASR

Introducing, Residency Program Coordinator, Ida Newman, MHL

Ida Newman, MHL, is the Residency Program Coordinator in the Neurosurgery Department. She graduated with her B.A degree in biology and minor in chemistry from the College of Charleston and later pursued Master’s in Healthcare Leadership from Wake Forest School of Medicine. Her previous experience in healthcare includes pharmacy where she worked in the roles of the operations manager and certified lead pharmacy technician. After taking a break from her professional career she is excited to join UMass Chan Medical School and is eager to contribute her knowledge, enthusiasm, and work ethic towards the continuous growth and development of the neurological surgery residency program.
Oguz Cataltepe, MD Presenting: Bilateral Intrathalamic Infusion of rAAVrh8-HEXA/HEXB in a Phase 1/2 Clinical Trial for Gene Therapy in Infantile and Juvenile Tay-Sachs and Sandhoff Disease; Surgical Technique.

Dr. Cataltepe, Pediatric Neurosurgeon and Professor of Neurological Surgery, and Dr. Flotte, the study PI and the Celia and Isaac Haidak Professor, provost and executive deputy chancellor of UMass Chan Medical School and dean of the T.H. Chan School of Medicine, are paving the way for gene therapy for Tay-Sachs and Sandhoff Disease. These diseases are both monogenic and fatal neurodegenerative diseases due to Hexosaminidase A (HEXA) or B (HEXB) deficiency, that affect children. Dr. Cataltepe developed the technique that we currently use today in our Phase 1/2 Clinical Trial for Gene Therapy in Infantile and Juvenile Tay-Sachs and Sandhoff Disease. In this abstract presentation, Dr. Cataltepe described his surgical technique to the neurosurgical community in Washington D.C at the Congress of Neurological Surgery meeting this year.

Rrita Daci, MD, Research Year PGY-5 Presenting: Neuroimaging Analysis of Bilateral Thalamic Delivery for Gene Therapy

Rrita Daci, MD, a PGY5 neurosurgery resident at UMass Chan Medical School and Umass Memorial Health, has worked closely with Dr. Oguz Cataltepe, MD (Director of Pediatric Neurosurgery), Miguel Sena-Esteves, PhD D (translational scientist and a key developer of the viral therapy), and Terence Flotte, MD (Provost of UMass Chan Medical School and principal investigator of the Tay-Sachs gene therapy trial) on the bilateral thalamic gene delivery trial for Tay-Sachs/Sandhoff Disease since she was an intern. It was this clinical trial that spurred Dr. Daci’s interest in gene therapy, and she is currently one of the first Gene Therapy fellows at UMass Chan Medical School. Dr. Daci has been intimately involved throughout the entire trial, following and managing all of the patients closely on the neurosurgical service and in the pediatric clinic. The Chair of the Department of Neurological Surgery, Dr. Mark Johnson, states that “Rrita has done an excellent job caring for these patients on our service. Her surgical skills, compassion for patients and their families, and her clinical and laboratory research in this area have simply been outstanding.” Dr. Daci has analyzed the neuroimaging MRI data from patients who received intra-thalamic delivery of adeno-associated virus for the treatment of Tay-Sachs/Sandhoff Disease, and she will present her results at the Congress of Neurological Surgeons Meeting in Washington D.C. later this year. The abstract describing her work was recognized as the Pediatric Neurosurgery Best Basic Science Abstract by the joint AANS/CNS Section of Pediatric Neurological Surgery.

Promoting Change and Opportunity at UMass Chan

The 2023 UMass Chan Medical School Educational Recognition Awards ceremony on Wednesday, May 3, honored achievements by faculty of the Tan Chingfen Graduate School of Nursing, Morningside Graduate School of Biomedical Sciences and T.H. Chan School of Medicine.

Mark Johnson, MD, PhD, the Maroun Semaan Chair in Neurosurgery, chair and professor of neurological surgery and senior vice provost for mentorship, leadership and transformation at UMass Chan, was named recipient of the Chancellor’s Award for Excellence in Mentoring.

(Right) Mark Johnson, MD, PhD, received the 2023 Chancellor’s Award for Excellence in Mentoring, presented by Chancellor Michael F. Collins, MD.
The UMass Chan Medical School, Department of Neurological Surgery, Annual Research Symposium
May 12, 2023

Keynote Address by Bradley Bernstein, MD, PhD
Chair, Cancer Biology, the Dana-Farber Cancer Institute
Director, Gene Regulation Observatory, the Broad Institute Professor, Cell Biology and Pathology, Harvard Medical School

Bradley Bernstein, MD, PhD
The Bernard Stone Lectureship: Modeling Epigenetic Lesions That Cause Tumors

Dr. Bernstein is one of the world’s foremost experts in understanding chromatin state epigenetic modifications and cancer. His research program focuses on how gene activity is controlled by noncoding regulatory elements such as ‘enhancers’, and how genes are packaged into chromatin. His discovery of ‘bivalent domains’, a signature chromatin state consisting of opposing histone modifications that poise master genes for alternate fates, was a key early demonstration of the impact of chromatin on mammalian development. Bernstein’s subsequent work revealed that the vast ‘noncoding’ portions of the human genome are in fact packed with sequence elements that control gene activity. Bernstein also showed that DNA methylation can activate oncogenes by disrupting genomic insulators, thereby sustaining potent oncogenic signaling in the absence of canonical mutations. His group has also uncovered numerous epigenetic mechanisms that underlie tumor cell self-renewal, drug tolerance and immune evasion.

Featured below left to right: Dr. Sirianni, Dr. Bernstein, Dr. Johnson

Dr. Sirianni, Dr. McGillicuddy, Dr. Johnson

Dr. Sirianni, Dr. Meitus, Dr. Johnson

Dr. Johnson, Tobi Oluwatobi, Dr. Sirianni

Bethany Berry
RESIDENT RETREAT 2023
Every year Mark Johnson, MD, PhD, Chair and Program Director of Neurological Surgery, takes the Neurosurgery Residents and the Research Lab on a very fun and active trip. Pictures below are from Cape Cod and Martha’s Vineyard, August 2023.

Fishing trip – Cape Cod, August 2023

Neurosurgery Residents (left to right) William Lambert PGY-2, Rrita Daci PGY-5, Brittany Owusu – Adjei PGY-4, Constance Mietus, PGY-3, and Hanya Qureshi PGY-1

Martha’s Vineyard, August 2023
Mark D. Johnson, MD, PhD

-Awards
Sontag Foundation Distinguished Scientist Alumni Award (PI) - Genomics of Meningioma (2023-2024)
Chancellor’s Award for Mentoring, UMass Chan Medical School (2023)
Outstanding Clinical Educator Award (2021, 2023)
Chair of the Members Committee for The Society of Neurological Surgeons (2022-2023)

-Publications

Peter S. Amenta, MD, FAANS, FACS

-Publications

Farid Hamzei-Sichani, MD, PhD

-New Grant Award
Project Number: 1P50DC019900-02  09/2022 – 08/2026
Name of PD/PI: Kristina Simonyan, MD, PhD (Role of Hamzei-Sichani, MD: UMMS Site PI)
Next-generation clinical phenotyping and pathophysiology of laryngeal dystonia and voice tremor; Deep Brain Stimulation in Laryngeal Dystonia and Voice Tremor.

Thomas Pieters, MD

-Publications
Rrita Daci, MD


Brittany Owusu-Adjei, MD


Constance Mietus, MD


William Lambert, MD


Accepted for Publication:
