



Current and Future Directions in Neuro-Oncology

A Young Investigators Forum

SEPTEMBER 21, 2021 – SEPTEMBER 23, 2021



VIRTUAL EVENT

YOUNG INVESTIGATORS BIOS

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Orwa Aboud, MD, PhD

Orwa Aboud, MD, PhD, is an assistant professor in the Department of Neurology and Neurological Surgery at the University of California at Davis, California, United States. His formal training includes an MD from the University of Damascus, Syria, a doctoral degree in neurobiology and developmental sciences, and residency in neurology at the University of Arkansas for Medical Sciences in Little Rock, Arkansas, United States. His doctoral research focused on the relationship between APOE genotype and the cellular and molecular responses in regions distinct from epileptogenic foci. The goal was to determine the potential role of neuronal and glial responses to the trauma of temporal lobe epilepsy, since its spread may be related to the later development of neurodegenerative changes. He carried out the molecular analyses on patients' temporalobectomy samples. This research was published in three papers in peer-reviewed journals. For his fellowship training in neuro-oncology, he received a Certificate of Completion of Research and Clinical Fellowship in Neuro-Oncology from the Johns Hopkin/NIH Joint Program. His research experience and training during his NIH/Hopkins Program focused on developing his expertise in translational research aimed toward the design and implementation of clinical trials for patients with primary brain tumors. Upon completion of his fellowship in 2020, he joined the University of California, Davis, as an assistant professor and neuro-oncology scientist in the department of Neurology and Neurological Surgery. Recently, he was awarded the "2021 Paul Calabresi Clinical Oncology K12 Award" with 75 percent protected time for translational research. His goal is to build a neuro-oncology program at the UC Davis Cancer Center, which, overtime, will broaden the spectrum of treatments for primary brain tumors based on evidence of metabolic changes that accompany tumor growth, since they may relate to the mutational incidence and burden. Toward this goal, he is enrolling patients in his two CRC-approved clinical trials with a focus on finding a broad-spectrum treatment options. Furthermore, his current research interest focuses on a comparative ultrastructural study of tumor cells in general, and mitochondrial features in particular, that encompasses *IDH* mutant and *IDH* wildtype high-grade glioma tumors. Dr Aboud feels very well-suited to perform the proposed research to improve our understanding of the ultrastructural pathology of high-grade gliomas. This will contribute to a better understanding of the mechanisms involved in response and resistance to treatment. As a neuro-oncologist and scientist at UC Davis, Dr Aboud is building a new brain tumor research program with a focus on launching clinical trials for patients with primary brain tumors. This effort will be based on his expertise in clinical and translational research, as well as identifying opportunities for national and international collaboration in the field of neuro-oncology.



Christopher Alvarez-Breckenridge, MD, PhD

Christopher Alvarez-Breckenridge, MD, PhD, is an assistant professor in the Department of Neurosurgery at MD Anderson Cancer Center in Houston, Texas, United States. He was a member of the Medical Scientist Training Program (MSTP) at The Ohio State University (Columbus, Ohio, United States) where he received his combined MD/PhD in 2013. He undertook his doctoral research in the laboratories of Dr Nino Chiocca and Dr Michael Caligiuri. His work focused on the role of the innate immune response to oncolytic herpes viral (oHSV) therapy for glioblastoma. In particular, his research identified a rapid influx of natural killer (NK) cells following oHSV infection that ultimately limited oncolytic viral efficacy through NK cell-mediated lysis of infected tumor cells. Additionally, his research identified the Nkp30 receptor on infiltrating NK cells as a key mediator of this response. In addition to exploring the mechanism of NK-cell targeting of gliomas infected with oHSV, he demonstrated that valproic acid was able to limit NK cell antiviral activity through STAT5 inhibition. He was ultimately awarded the Medical Scientist Training Program Award for the highest achievement amongst graduating MSTP students at The Ohio State University. Following the completion of his MD/PhD training, Dr Alvarez-Breckenridge pursued neurosurgery residency at Massachusetts General Hospital in Boston, Massachusetts, United States. During that time, he spent two years in the laboratory of Dr Priscilla Brastianos, where he studied tumor microenvironmental features of response to immune checkpoint blockade for leptomeningeal disease (LMD) and melanoma brain metastases. He utilized single cell RNA sequencing approaches to explore shifts within tumor cell states and inflammatory infiltrates in the cerebrospinal fluid (CSF) of patients with LMD who were treated with immune checkpoint inhibition. In particular, this work demonstrated that these dynamic changes were most pronounced within 30 days of administering immune checkpoint blockade and that clinical benefit was most closely linked to coordinated expression of antigen processing and IFN-gamma response pathways. Additionally, Dr Alvarez-Breckenridge performed single cell RNA sequencing and T-cell receptor sequencing amongst a cohort of 32 freshly resected immunotherapy-naïve and post-immunotherapy melanoma brain metastases to explore the tumor microenvironmental features of melanoma brain metastases in the context of immune checkpoint blockade. This research highlighted important findings on the role of myeloid phenotypic heterogeneity within the melanoma brain metastasis tumor microenvironment, which correlated with unfavorable response to immune checkpoint blockade. Additionally, his work explored the critical role of T-cell clonal expansion as a biomarker of response to immune checkpoint blockade and explored the relationship between T-cell clonal dynamics and phenotype within the blood and tumor microenvironment. His work was ultimately recognized with the Massachusetts General Hospital Neurosurgery Research Award and the American Association of Neurological Surgeons Journal of Neuro-Oncology Award. Following residency training in 2020, Dr Alvarez-Breckenridge completed a Neurosurgical Oncology Fellowship at MD Anderson Cancer Center in 2021 and was recently appointed assistant professor in the Department of Neurosurgery at MD Anderson Cancer Center. His surgical practice will primarily focus on tumors of the spine, and he is eager to build upon his prior research experiences to develop an immunology focused translational research program for metastatic disease along the craniospinal axis.

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Elisa Aquilanti, MD

Elisa Aquilanti, MD, is an instructor in medicine at Harvard Medical School and a Neuro-Oncologist at Dana Farber Cancer Institute in Boston, Massachusetts, United States. She received her undergraduate degree in biochemistry and molecular biology from the University of California Berkeley (in Berkeley, California, United States) and her MD from Albert Einstein College of Medicine in Bronx, New York, United States. During medical school, she worked at Dana Farber Cancer Institute for one year as a Howard Hughes Medical Institute fellow, studying collateral vulnerabilities in glioblastomas with homozygous deletions at the 1p36 chromosomal locus. She then completed a residency in internal medicine at Brigham and Women's Hospital in Boston and a fellowship in medical oncology at Dana Farber Cancer Institute. She has a clinical and research interest in glioblastoma, and her current research is focused on validating telomerase as a cancer vulnerability in glioblastoma and developing novel telomerase-targeted therapeutics.



Ankush Bhatia, MD

Ankush Bhatia, MD, is an assistant professor in the Department of Neurology at the University of Wisconsin School of Medicine and Public Health in Madison, Wisconsin, United States. He specializes in neuro-oncology and helps lead the brain tumor program at the Carbone Cancer Center, in Madison.

His clinical practice focuses on the treatment of primary brain and spine tumors, and neurologic complications of cancer. He is board certified in neurology by the American Board of Psychiatry and Neurology, as well as in neuro-oncology, by the United Council for Neurologic Subspecialties.

His clinical research is focused on using advanced neuroimaging to explore the impact of neuro-oncologic disease on patient-centered outcomes and patient function. Through this research, his goal is to provide the best possible care for patients, while improving biomarkers of disease progression and advancing treatments through clinical trials.

Dr Bhatia is a member of the American Academy of Neurology, Society of Neuro-Oncology, and American Society of Clinical Oncology. He has published on neuro-oncology in multiple prestigious journals, including *Neuro-Oncology* and *Haematologica*. He has also authored a number of peer-reviewed articles and book chapters and has served as an investigator in multiple clinical trials.

Dr Bhatia earned his undergraduate degree in molecular biophysics and biochemistry at the Illinois Institute of Technology in Chicago, Illinois, United States. He then completed a combined master's in anatomy and cell biology and doctor of medicine at Rush Medical College at Rush University in Chicago. He remained at Rush University Medical Center to complete his neurology residency and then completed his fellowship in neuro-oncology at Memorial Sloan Kettering Cancer Center in New York City, New York, United States. Following his fellowship, he served as faculty at Memorial Sloan Kettering Cancer Center, as well as University of Texas Health Science Center at Houston, before settling in Madison, Wisconsin.

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Andrea Comba, PhD

Andrea Comba, PhD, graduated with a degree in biological sciences from the National University of Cordoba, Argentina. She obtained her PhD in cancer biology from the National University of Cordoba, Argentina, in 2013. Dr Comba's graduate project was focused on the characterization of the molecular mechanism underlying GLI1 oncogenic transcriptional activity in carcinogenesis. During this period, she was trained and awarded with the Graduate Research Fellowship from National Research Council of Argentina (CONICET) (2009-2014), the Scientific Exchange Visitor Research Fellowship from AMSUD-Pasteur, Uruguay (2010), and the Research Fellowship Visiting Graduate Student from Medical Graduate School, Mayo Clinic, Rochester, Minnesota, United States (2012). After her PhD thesis in 2014, she started a postdoctoral training at the Department of Biological Chemistry, National Research Council (CONICET) where she studied the molecular mechanisms of post-translational modifications in glioma cell death induction. In 2016, she joined Dr Castro-Lowenstein laboratory at the Department of Neurosurgery, University of Michigan Medical School in Ann Arbor, Michigan, United States, for a postdoctoral training in basic and translational neuro-oncology. Since starting her postdoctoral position, she has been working on identifying the functions and molecular mechanism underlying mesenchymal and self-organized growth patterns of malignant gliomas, and their interactions with the tumor microenvironment in preclinical mouse models and human glioma tissue. In 2018, she was awarded with the postdoctoral translational program (PTSP) career development grant from the Michigan Institute for Clinical and Health Research (MICHR) and the AACR Scholar-in-Training Award from the American Association for Cancer Research (AACR), for early-career scientists. Since 2021, she has been a research investigator in the research faculty track at Castro-Lowenstein Laboratory, Department of Neurosurgery, University of Michigan Medical School. The current aim of her research projects is to identify potential targets that regulate brain mesenchymal transformation in the spatiotemporal context of glioma heterogeneity, ultimately translating these experimental findings into novel therapies. During her research career, she has published original research articles as the first author and co-author (*Frontiers in Oncology* 2021, *Oncotmunology* 2021, *Neuro-Oncology* 2020, *PLoS Computational Biology* 2020, *Journal of Experimental Visualization* 2020, *Neuro-Oncology* 2018, *Molecular Neurobiology* 2018, *Journal of Biological Chemistry* 2016, *PLoS One* 2014, *Cancer Research* 2010). Dr Comba's long-term research goal is to contribute to advancing translational neuro-oncology research, developing novel therapies for treating malignant brain tumors.

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Craig Erker, MD, MS, FRCPC

Craig Erker, MD, MS, FRCPC, is an assistant professor at the Department of Pediatrics at Dalhousie University in Halifax, Nova Scotia, Canada, beginning in July 2018. He is a pediatric oncologist, with a primary focus on neuro-oncology at the IWK Health Centre in Halifax. He was recently appointed as the Children's Oncology Group site principal investigator to help foster and oversee clinical research in his division.

His clinical practice involves working with a thriving multidisciplinary neuro-oncology team to care for children throughout 3 Canadian provinces, as the IWK Health Centre is the only referral center for children in these provinces. He has helped streamline the multidisciplinary clinic and aided in establishing a new clinic for oncology patients receiving targeted therapies (eg, MEK and BRAF inhibitors). He has also helped broaden neuro-oncology clinical trial options for the children of these 3 provinces.

He is active in clinical research having received and continuing to receive mentorship from multiple clinical neuro-oncology researchers at each career step. During his dedicated pediatric neuro-oncology subfellowship, he completed a study through the International DIPG (*diffuse intrinsic pontine glioma*) Registry looking at patients ≥ 10 years of age and assessing variables that influence their outcomes. This work was recently accepted for publication in *Neuro-Oncology*. He was recently selected as a member of the scientific council for the International DIPG Registry. He also served as a co-lead for the Response Assessment in Pediatric Neuro-Oncology (RAPNO) high-grade glioma working group to develop consensus response criteria, which was published in *The Lancet Oncology*. He has continued his efforts through RAPNO and is now involved in both the patient-reported outcome and the neurologic assessment in pediatric neuro-oncology working groups.

In Canada, the Canadian Pediatric Brain Tumor Consortium offers broad national collaboration and possibilities across the country. Because of this consortium, Dr Erker's most recent clinical study under the direct mentorship of Dr Lucie Lafay-Cousin looking at variables that influence outcomes for relapsed infant medulloblastoma was developed. Through this initial national effort, the study soon gained traction with further guidance from Dr Eric Bouffet to become a wide international collaboration. This study has the opportunity to shape the field for these young children and how we think about their therapy in the relapse setting. Dr Erker has also been provided the opportunity to be a junior leader through the pediatric track through the Society for Neuro-Oncology, serving as a co-lead in the development of a pediatric neuro-oncology tumor board. The tumor board had its first live webinar in August 2021, with a multidisciplinary panel of experts. He is also a member of the Children's Oncology Group (COG) high-grade glioma working group and serves as a member of an upcoming COG high-grade glioma study.

At a local level, he serves as a member of the hospital grant review team and is currently building his mentorship capability in clinical research. He currently mentors 3 trainees in various projects within neuro-oncology. The mentees have been successful in their pursuits for grant support, scholarships, and publications. He also collaborates on several projects with other pediatric neuro-oncology investigators.

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Yoshua Esquenazi, MD, FAANS

Yoshua Esquenazi, MD, FAANS, is an assistant professor in the Department of Neurosurgery at the University of Texas Health Science Center in Houston, Texas, United States. He is currently the director of Neurosurgical Oncology and his practice focuses on the multidisciplinary care of patients with complex brain tumors. Dr Esquenazi is currently investigating the relationship between brain tumors and the gut-brain axis, as well as the interactions with chemotherapy, radiation, and viral therapies. His preliminary work in murine models and in humans demonstrates a glioma induced dysbiosis and demonstrates changes in the gut microbiome following alkylating chemotherapy. Dr Esquenazi and his team are currently evaluating how the gut and tumor microbiome can modulate the response, as well as the efficacy of various therapies. Understanding such relationship via microbial, metabolomic, and immunologic pathways will allow for potential translational strategies. His ultimate goal is to develop novel strategies via microbiome modifications to enhance the effects of therapies that have currently not proven efficacy in glioma, and potentially translate these findings into clinical practice to improve the quality of life of patients with brain tumors.



Jana Ivanidze, MD, PhD

Jana Ivanidze, MD, PhD, is an assistant professor of radiology at Weill Cornell Medicine, divisions of Molecular Imaging and Therapy and Neuroradiology, and assistant attending radiologist at NewYork-Presbyterian Hospital/Weill Cornell in New York, New York, United States. After graduating from medical school at the University of Munich, and obtaining her PhD from the Technische Universitaet Munich, both in Germany, she moved to the United States, where she completed her residency in diagnostic radiology and fellowships in neuroradiology and nuclear medicine at NewYork-Presbyterian Hospital/Weill Cornell Medicine (NYP/WCM). She is a scientist at the Brain Health Imaging Institute and the Molecular Imaging Innovations Institute at Weill Cornell Radiology. She is the course director for the multidisciplinary CME conference on memory and movement disorders at Weill Cornell Medicine.

Her research interests include the clinical translation of targeted molecular imaging approaches in the diagnosis, treatment planning, and response assessment in meningiomas, primary glial neoplasms, and central nervous system (CNS) metastases. She is passionate about the clinical translation of novel, targeted positron emission tomography (PET) tracers into clinical practice in neuro-oncology. Her active clinical trials in neuro-oncology focus on somatostatin receptor 2 (SSTR2) targeted PET/magnetic resonance (MR) in meningioma, and simultaneous hypoxia and proliferation targeted PET in high-grade glioma. Her research also involves advanced MR imaging approaches to blood-brain-barrier permeability assessment in normal aging and neurodegenerative diseases. Her research has been funded by peer-reviewed grants from Weill Cornell Medicine, Cornell University, Radiological Society of North America (RSNA), American Society of Neuroradiology (ASNR), the Society of Nuclear Medicine and Molecular Imaging, the Rhodes Glioblastoma Foundation, and Novartis Pharmaceuticals. She is chair of the American College of Nuclear Medicine research task force, member of the ASNR research committee, and the American College of Radiology appropriateness criteria committee. She is associate editor and podcast host for the RSNA journal *Radiology: Imaging Cancer*. Mentoring radiology residents and fellows, trainees from other specialties, and medical students is a central aspect of her work.

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Fred Lam, MD, PhD, FRCSC

Fred Lam, MD, PhD, FRCSC, is a Canadian board-certified and dual fellowship-trained neurosurgeon in neurosurgical oncology and complex spine surgery. Dr Lam obtained his PhD in neuroscience at the University of British Columbia, Vancouver, Canada, studying the mechanism of beta-amyloid peptide efflux through the multidrug resistance transporter p-glycoprotein. This discovery led to the award of a patent and the birth of a biotechnology company started by his PhD supervisor, Professor Peter Reiner. Following completion of his medical degree at the University of British Columbia, Dr Lam pursued neurosurgical residency training at the University of Alberta, Edmonton, Canada. This was followed by subspecialty fellowship training in complex spine surgery under the mentorship of Dr Michael Groff and a research fellowship in brain tumors and radiosurgery with Professor Ekkehard Kasper in the Division of Neurosurgery at the Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts, United States.

Following his clinical training, Dr Lam pursued a postdoctoral fellowship in the laboratory of Professor Michael Yaffe at the Koch Institute for Integrative Cancer Research at MIT, Cambridge, Massachusetts, United States, studying the DNA damage response in cancer cells and built a preclinical brain tumor program developing intracranial patient-derived xenograft mouse models of glioma and medulloblastoma. This platform allowed him to form cross-disciplinary collaborations with bioengineering labs at MIT to develop nanoscale theranostic delivery systems that have the potential to cross the blood-brain barrier to target brain tumors. Dr Lam had the privilege of mentoring technicians, undergraduate, and graduate students, which has enriched his experience as a clinician scientist. Similar to his graduate school biotechnology venture, Dr Lam was awarded patents at MIT and had the opportunity to serve on the medical advisory board of a spin-off start-up company.

After his postdoctoral fellowship, Dr Lam was recruited to McMaster University, Hamilton, Canada, by Professor Ekkehard Kasper as a clinical scholar in the Division of Neurosurgery, taking care of patients with brain tumors while pursuing brain metastases research in the laboratory of Professor Sheila Singh. He cosupervised a graduate student with Professor Singh, developing an *in vivo* functional genomics screen studying drivers of lung-to-brain metastasis using a novel patient-derived xenograft model of non-small cell lung cancer. On the clinical side, Dr Lam helped coordinate the first ever adult patient-initiated brain and spine organ donation to the Singh Lab for glioma research at McMaster. This selfless gesture of a dying patient's wish to further scientific advancements in brain tumor research has solidified his passion to pursue a career as a translational brain tumor surgeon-scientist.

Dr Lam is currently a neurosurgery fellow in the Department of Neurosurgery at Northwell Health, Long Island, New York, United States. As he looks toward entering independent practice, Dr Lam would like to continue mentoring learners, be involved in surgical education, and establish a translational neuro-oncology research laboratory to develop novel therapies to treat brain tumor patients. He would also like to learn more about drug development and clinical trials design. Outside of medicine and research, Dr Lam cherishes time with family and friends, and enjoys visual arts, music, theater and dance, yoga, as well as connecting with nature.

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Margot Lazow, MD, MS

Margot Lazow, MD, MS, is an assistant professor and pediatric neuro-oncologist in the brain tumor program at Nationwide Children's Hospital in Columbus, Ohio, United States. She originally hails from New Jersey, completed undergraduate studies at Columbia (New York, New York), and attended medical school at Vanderbilt in Nashville, Tennessee, United States. She recently finished pediatric hematology/oncology and neuro-oncology fellowships at Cincinnati Children's Hospital in Ohio, where she also earned a master's degree in clinical and translational research.

Throughout fellowship and now as junior faculty, Dr Lazow has developed focused clinical and research interests within pediatric neuro-oncology, inspired by the brave children she has the privilege of caring for and motivated by the lack of effective therapies for many of their brain tumor diagnoses. She is interested in clinical trial development and clinical research, with a focus on uncovering the molecular underpinnings of difficult-to-treat pediatric brain/spine tumors and translating findings into early phase trials using genomically-targeted agents. She has recently led clinical research studies specifically (1) evaluating temporal genomic heterogeneity in recurrent pediatric low-grade gliomas, (2) identifying associations between tumor molecular profiles and serial radiographic features (ie, response to radiation) in diffuse intrinsic pontine glioma (DIPG), and (3) assessing the accuracy of central neuro-imaging review compared with histopathology in DIPG. She is currently developing a phase 1/2 trial investigating treatment with lutetium Lu 177 dotatate, a targeted somatostatin peptide receptor radionuclide therapy, in children, adolescents, and young adults with refractory somatostatin type 2A receptor (SST2A)-expressing central nervous system (CNS) tumors; the submitted research evaluating membranous SST2A expression among high-risk pediatric CNS tumors was conducted to inform this trial and identify which patients are most likely to respond to this targeted radionuclide therapy.



David Meredith, MD, PhD

David Meredith, MD, PhD, is a neuropathologist at Brigham and Women's Hospital in Boston, Massachusetts, United States. He received his MD/PhD dual degree from the University of Texas Southwestern Medical Center at Dallas, Texas, United States, and completed anatomic pathology and neuropathology training at Brigham and Women's Hospital and Harvard Medical School in Boston. His clinical responsibilities include neuropathology, soft tissue pathology, and molecular diagnostics with specialization in the interpretation of next generation sequencing results in brain tumors. His research interests focus on uncovering genomic signatures and novel biomarkers for central nervous system (CNS) neoplasms and translating these into routine clinical care. Dr Meredith is also a founding member of the Dana Farber/Harvard Cancer Center for CNS Lymphoma, for which he has participated in the design of several active clinical trials and generated numerous tumor models to investigate tumor biology and novel targeted therapies for these rare cancers.

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Seyed Ali Nabavizadeh, MD

Seyed Ali Nabavizadeh, MD, is an assistant professor of radiology at the Hospital of the University of Pennsylvania with a research appointment at the Children's Hospital of Philadelphia in Pennsylvania, United States.

He is also the director of the translational imaging unit at the Center for Data Driven Discovery (D3b) at the Children's Hospital of Philadelphia and the imaging lead of two consortia, CBTN (The Children's Brain Tumor Network) and PNOC (The Pacific Pediatric Neuro-oncology Consortium) dedicated to biospecimen-driven data generation and precision medicine clinical trials respectively.

Dr Nabavizadeh is currently the principal investigator of multiple imaging clinical trials that are focused on using magnetic resonance imaging and amino-acid positron emission tomography imaging, and liquid biopsy in patients with glioblastoma (GBM) and brain metastasis to differentiate progressive neoplasm from post-treatment changes. In the past couple of years, he actively worked with neuro-oncology and the Circulating Tumor Material (CTM) Center at University of Pennsylvania in order to correlate and complement imaging findings with cell-free DNA (cfDNA) and circulating tumor DNA (ctDNA) in patients with glioma. In addition, he is actively performing research to characterize the immune microenvironment of pediatric and adult glioma with a focus on tumor associated macrophages.

His research efforts are supported by the National Institutes of Health (NIH), Radiological Society of North America (RSNA), Institute for Translational Medicine and Therapeutics (ITMAT), Abramson Cancer Center, and multiple pharmaceutical companies. He is the author of more than 90 peer-reviewed articles and book chapters, and his work has appeared in journals such as *Nature Communications*, *Clinical Cancer Research*, *JAMA Neurology*, *Neuro-Oncology*, *Radiology*, and *American Journal of Neuroradiology*.

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Elizabeth Ogando-Rivas, MD

Elizabeth Ogando-Rivas, MD, is a neurosurgeon who graduated from the Universidad Autónoma de México Hospital General de México in Mexico City, the largest hospital in Latin America. After completion of her neurosurgery training in 2016, she received additional training in neuro-oncology, pediatric neurosurgery and endoscopic skull base via a fellowship under the mentorship of Dr Alfredo Quiñones-Hinojosa, James Goodrich, and Theodore Schwartz, respectively. Her record of academic achievements includes the International Outreach Scholarship awarded by the 2016 Society for Neuro-Oncology, the Young Neurosurgeon Award from the 2018 World Federation of Neurosurgical Societies, and, more recently, the best translating research project using artificial intelligence VTOL fixed-wing UAV drones to transport blood products from The Transplantation Society from Latino America and the Caribbean. She has authored and co-authored about 20 manuscripts, two book chapters, and more than 30 posters presented at national and international meetings. Dr Ogando-Rivas is currently a postdoc under the mentorship of Dr Duane Mitchell at the University of Florida (Gainesville, Florida, United States) in the Brain Tumor Immunotherapy Program. Her research focuses on optimizing the use of checkpoint inhibitors in combination with adoptive cellular therapies to improve brain tumor patient outcomes.

Dr Ogando-Rivas' overall career goal is to become a neurosurgeon-scientist independently funded; with a research lab investigating novel immunotherapies and translating her findings into clinical trials to help patients with glioblastoma. She plans to achieve these goals through a combination of mentored research experience, didactic coursework, collaborations and meetings, and the publication and dissemination of research. Toward the end of her research period, her project findings will form the foundation of a K08 career development award application and later R01 grant submission. As her commitment in becoming a neurosurgeon-scientist, she has decided to be a full-time researcher for her career development activities, before getting into a US neurosurgery residency program where she will combine research and clinic. During this time, she will take full advantage of her world-class mentors and the fertile research and clinical environment of the University of Florida.

Dr Ogando-Rivas's long-term career goals include becoming an independently funded neurosurgeon-scientist, expert, and leader in glioblastoma immunobiology and immunotherapy; lead a translational research lab focused on bringing novel immune-based therapies from the bench-to-bedside to improve treatment for patients with glioblastoma; and becoming a US board certified neurosurgeon-scientist to combine the clinic and research as her professional pathway. Here short-term career goals include deepening her knowledge base in tumor immunology and immunotherapy; improving adoptive T-cell therapies for glioblastoma and gain expertise in clinical trial design and translational research; developing the foundation necessary to apply for a K08 grant in the latter years; and even though she is a certified neurosurgeon from Mexico, she is pursuing a US neurosurgery residency program this year to have more opportunities and resources to become a neurosurgeon-scientist.

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Katrina O'Halloran, MD

Katrina O'Halloran, MD, is a pediatric hematologist-oncologist currently pursuing an advanced fellowship in pediatric neuro-oncology. She completed a pediatric hematology-oncology fellowship at Children's Hospital Los Angeles in California, United States, with a focus on molecular cancer genomics and personalized medicine. She will be completing her advanced fellowship training with a focus on brain and spine tumors in children from July 2021 through June 2022.

Dr O'Halloran's research focuses on cerebrospinal fluid (CSF) liquid biopsy in central nervous system (CNS) tumors. She has developed a platform able to detect tumor DNA signal from a variety of pediatric CNS tumor patients and is working now to expand this technology. Her clinical focus is on precision oncology therapies which may be better informed by her work in liquid biopsy.

Dr O'Halloran received her degree in medicine from University College Dublin, National University of Ireland. She has also achieved a master's of science degree in clinical, biomedical, and translational investigations from the University of Southern California. She is board certified in the United States by the American Board of Pediatrics and by the Royal College of Physicians and Surgeons of Canada.



Haley Perlow, MD

Haley Perlow, MD, obtained his undergraduate degree at the University of Arkansas in Fayetteville, Arkansas, United States, double majoring in biology and political science. He graduated from medical school at the University of Miami, Florida, United States, in 2019. He is a current PGY-3 radiation oncology resident in the Department of Radiation Oncology at Ohio State University, Columbus, Ohio, United States. He plans to pursue an academic career in central nervous system (CNS) radiation oncology when he completes his residency. He originally pursued radiation oncology because of a balance between continuity of care, technologic innovation, and his interest in being a part of a research-oriented specialty. He has a special interest in CNS malignancy because many of these patients have poor disease outcomes and there is room for drastic improvement in the quality of care. Dr Perlow's research interests currently include optimizing the timing of stereotactic radiosurgery for patients with brain metastases, utilizing DOTATATE-PET imaging for patients diagnosed with a meningioma, improving neurocognitive outcomes for patients diagnosed with brain metastases, and improving the quality of care for patients diagnosed with a high-grade glioma. His short-term career goals include developing pilot studies under the mentorship of clinical trialists in his department. He is a current co-principal investigator of a single-arm trial examining early neuropsychologic intervention for patients diagnosed with brain metastases. He was awarded a grant for this study and is currently developing the protocol. His intermediate career goal is to obtain an academic position that allows for him to care for patients with CNS malignancies at an institution that is supportive of his research interests. Dr Perlow's long-term career goal is to obtain long-term funding (through the National Institutes of Health or other means) to fund prospective clinical trials while utilizing the skillset he developed in residency and in his early academic career.

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Prajwal Rajappa, MD, MS

After completing a unique multidisciplinary physician-scientist training program in clinical, basic, and translational sciences at Weill Cornell Medical Center/New York-Presbyterian Hospital in New York, United States, Prajwal Rajappa, MD, MS, was recruited by Dr Elaine R. Mardis to join the faculty at Nationwide Children's Hospital (NCH) in Columbus, Ohio, United States. At NCH, he currently serves as a principal investigator and physician-scientist at the Institute for Genomic Medicine (IGM). As director of the Translational Neuro-Oncology/Rajappa laboratory, Dr Rajappa is focused on leveraging next-generation sequencing (NGS) technologies to illuminate the immune cell biology of low-grade diffuse glioma malignant transformation using preclinical models and patient peripheral blood and tumor tissue from the operating room. His unique background includes neurosurgical management of pediatric and adult patients with a brain tumor, in combination with significant training in cancer immunology and transgenic brain tumor modeling. In addition, Dr Rajappa obtained a master's degree in clinical and translational investigation from Weill Cornell Medicine in New York, United States, that further enhanced his skillset in areas such as NGS, biostatistics, biomarker validation, targeted therapeutics, and clinical trial development. His master's degree defense focused on precision medicine sequencing as an addition to the standard of care for pediatric patients and young adults with central nervous system (CNS) tumors. While the overarching goal of his research is to develop novel immunotherapies that improve outcomes for patients with brain tumors, his research focuses on characterizing and modulating infiltrating bone marrow-derived myeloid cells and determining the functional role of this heterogeneous population in supporting diffuse glioma progression. Manuscripts published by Dr Rajappa and colleagues in the *Journal of Clinical Investigation* and *Clinical Cancer Research* identified a recruited myeloid cell population that is associated with low-grade to high-grade glioma transformation, and preliminary data suggest that modulating the recruitment of myeloid cells may impair glioma progression. ***His laboratory currently aims to dissect the contribution of myeloid cell heterogeneity in potentiating low-grade glioma (LGG) diffuse glioma malignant progression and modulate the immunosuppressive myeloid-cell rich tumor microenvironment (TME).*** To that end, he was recently awarded a National Cancer Institute (NCI) Supplement Grant Award to continue his research to define the myeloid compartment and define the utility of oncolytic virotherapy in low-grade diffuse glioma malignant progression. By virtue of the NCI Supplement Grant Award, he was invited to become a member of the NCI Cancer Moonshot Program and Pediatric Immunotherapy Discovery and Development Network (PI-DDN), a premier network of leading scientists in pediatric oncology. In addition, the high volume of brain tumors treated at Nationwide Children's Hospital and The James Comprehensive Cancer Center at Ohio State University serve as an academically enriched environment to pursue translational research in the Adolescent and Young Adult (AYA) oncology space. His laboratory is currently in the midst of finalizing a manuscript for submission titled "Single-Cell RNA Sequencing Reveals Immunosuppressive Myeloid Cell Diversity and Restricted Cytotoxic Effector Cell Trafficking and Activation During Malignant Progression in Glioma." Overall, Dr Rajappa's primary goal is to leverage his laboratory's findings into impactful clinical trials for pediatric and AYA patients with at risk low-grade and high-grade gliomas and develop next-generation immunotherapy strategies focused on ameliorating myeloid-derived immunosuppression within the glioma TME.

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Analiz Rodriguez, MD, PhD

Analiz Rodriguez, MD, PhD, is director of neurosurgical oncology at the University of Arkansas for Medical Sciences (UAMS) in Little Rock, Arkansas, United States. She obtained her bachelor's of arts in chemistry from New College of Florida, the honors college of the state university system of Florida in Sarasota, Florida, United States. She then matriculated in the National Institutes of Health (NIH)-sponsored Medical Scientist Training Program at Case Western Reserve University in Cleveland, Ohio, United States at 19 years of age. She completed the MD/PhD program in six years. Dr Rodriguez did her neurosurgery residency training at Wake Forest University Medical Center in Winston-Salem, North Carolina, United States, and was inducted into the Alpha Omega Alpha honor society. During her residency, she was awarded an American Association of Neurological Surgeons Neurosurgery Research Education Foundation (AANS/NREF) research fellowship for her work in glioblastoma. Dr Rodriguez completed her neurosurgical oncology fellowship at City of Hope National Medical Center in Duarte, California, United States, which specializes in immunotherapy trials. She is the director of neurosurgical oncology at UAMS and strives to bring novel therapies and trials to the state of Arkansas. She has an independent brain tumor research laboratory in the Winthrop P. Rockefeller Cancer Institute in Little Rock. Dr Rodriguez's research focuses on the development of novel diagnostics and treatment strategies for brain tumors. As a surgeon-scientist, she established a brain tumor biobank for precision medicine at UAMS. This allows her to study tumor samples directly from surgically resected specimens and identify drugs specific to a patient's tumor. She investigates glioblastoma and metastatic brain tumors. Her laboratory uses next-generation sequencing and proteomics to identify novel targets and understand tumor progression. Patient-derived organoid models are also used to validate candidate targets and understand brain tumor growth. Dr Rodriguez is also interested in healthcare disparities and how to improve access to surgical interventions for brain tumor patients. Her laboratory has been funded by the NIH and National Aeronautics and Space Administration (NASA).

Current and Future Directions in Neuro-Oncology

A Young Investigators Forum



Shubin Shahab, MD, PhD

Shubin Shahab, MD, PhD, is an instructor of pediatric hematology/oncology at Children's Healthcare of Atlanta/Emory University in Atlanta, Georgia, United States. His research is focused on trying to find cures for pediatric medulloblastoma. As a graduate student Dr Shahab studied the role of miRNAs in ovarian cancer. After completing his medical school education from the Medical College of Georgia, Dr Shahab completed his residency in pediatrics from Emory University. Subsequently, he received fellowship training in pediatric hematology/oncology from the combined Johns Hopkins University/National Cancer Institute fellowship program in Baltimore, Maryland, United States. There, Dr Shahab joined the laboratory of Drs Eric Raabe and Charles Eberhart and became interested in studying the LIN28 protein, which is involved in the development of pediatric embryonal tumors and regulates the let-7 family of miRNAs. As he finished his fellowship, Dr Shahab decided to return to Atlanta and obtain additional fellowship training in pediatric neuro-oncology at Children's Healthcare of Atlanta/Emory University where he continued to study the role of LIN28 in medulloblastoma under the mentorship of Drs Robert Schnepf, Tobey MacDonald, and Anna Kenney.

Dr Shahab has been the recipient of several awards throughout his education and training including a National Science Foundation Research Experiences for Undergraduates (NSFREU) scholarship, a President's Undergraduate Research Award, a Graduate Assistance in Areas of National Need (GAANN) fellowship, and a T32 grant. Currently Dr Shahab's research is funded by a CURE Childhood Cancer Research Foundation award and he is actively pursuing additional funding opportunities. Dr Shahab has been the author on many peer-reviewed publications, including publications in *Clinical Perinatology*, *Journal of Neuropathology & Experimental Neurology*, *BMC Medical Genomics*, *British Journal of Medicine and Medical Research*, and *PLoS One*.

Current and Future Directions in Neuro-Oncology

A Young Investigators Forum



Harish Vasudevan, MD, PhD

Harish Vasudevan, MD, PhD, is a Holman Pathway research fellow and resident physician in the Department of Radiation Oncology at the University of California, San Francisco (UCSF), United States. After completing his BS in biology at the California Institute of Technology in Pasadena, California, Dr Vasudevan pursued his joint MD-PhD training at the Icahn School of Medicine at Mount Sinai in New York, New York, United States, where his dissertation focused on receptor tyrosine kinase (RTK) signaling during neural crest development. He subsequently began residency and postdoctoral training in radiation oncology at UCSF where his initial work focused on understanding the molecular correlates of nervous system tumorigenesis through multiplatform molecular profiling including DNA methylation profiling, whole exome sequencing (WES), and RNA-sequencing (RNA-seq). To that end, Dr Vasudevan applied such an integrative approach to meningiomas, the most common primary central nervous system (CNS) tumor in the United States. He identified novel molecular signatures of cell proliferation leading to the discovery of the transcription factor FOXM1 as a key regulator of meningioma behavior. Dr Vasudevan similarly leveraged a genomic approach to investigate spatial heterogeneity in both ependymoma and meningioma to better understand how different subpopulations mediate aggressive tumor behavior. More recently, Dr Vasudevan has focused on the cancer predisposition syndrome neurofibromatosis type I (NF1). NF1 is caused by loss of the neurofibromin tumor suppressor gene that negatively regulates Ras signaling and serves as a key downstream effector of RTKs. Patients with NF1 are at increased risk for developing many nervous system tumors, including Schwann cell derived neurofibromas and malignant peripheral nerve sheath tumors (MPNSTs).

Through a multidisciplinary approach, Dr Vasudevan defined predictive and prognostic signatures in MPNSTs. His ongoing work focuses on how differentiation status underlies Ras pathway mediated malignant transformation and treatment resistance to MEK inhibitors, which will be to focus of his Society for Neuro-Oncology (SNO) Young Investigator Forum presentation. In addition to Schwann cell derived tumors, insights from his work hold the potential to elucidate novel druggable dependencies for nervous system tumors harboring mutations in the Ras signaling pathway including glioblastoma and brain metastases, ultimately leading to new treatments for patients.

Current and Future Directions in Neuro-Oncology

A Young Investigators Forum



Dionysios Watson, MD, PhD

Dionysios (Dennis) C. Watson, MD, PhD, is a physician-scientist committed to uncovering new mechanisms of interaction between glioma cells and their microenvironment, in order to develop next-generation therapies. He is currently a medical oncology fellow at University Hospitals/Case Western Reserve University in Cleveland, Ohio, United States, and a visiting research fellow at Cleveland Clinic. He is part of the Harrington Institute's physician-scientist combined clinical/research training program.

During his PhD research, he worked on the translational development of a novel immunostimulatory cytokine, heterodimeric IL-15 (hetIL-15). He developed technology for scalable manufacturing of extracellular vesicles carrying bioactive cytokine to tumors, tested an optimized dosing regimen for hetIL-15 in nonhuman primates, and led the correlative studies for the first-in-human clinical trial of the same cytokine. He currently is researching how glioma cells steal mitochondria from surrounding glial cells to become more tumorigenic, with the ultimate aim of blocking the protumorigenic effects of mitochondrial transfer therapeutically. He is also testing a variety of immunostimulatory extracellular vesicles for immune activation within preclinical glioblastoma models.

His clinical practice focuses on implementing the latest approved immunotherapy and targeted therapy of advanced solid tumors in the Veterans population in Cleveland. His practice also covers the management of diverse immune-related adverse effects in this population.

Dr Watson's research has been supported by an institutional TL1 (2020-2021) and T32 grant (ongoing), the Velosano Dream Experiment award (PI: Watson, 2021), and the Velosano Pilot Grant (PI: Justin Lathia, Co-I: Watson, ongoing). His research has been recognized both locally (most recently, Fellow Award, 2021 Department of Medicine/Case Western Reserve University Research Day) and nationally (most recently, First Prize, 2021 Society for Immunotherapy of Cancer Young Investigator Forum).