



# Department of Neurosurgery Residency Program





WashU provided me with the opportunity to grow my career, not only by teaching me how to become a strong, technical neurosurgeon, but by guiding me into developing strong research and leadership skills.

**CHAD WASHINGTON, MS, MD, MPH**

*Professor and Chair of Neurosurgery, Director of the Stroke Center,  
University of Mississippi Medical Center*



Every faculty member had a vested interest in my success and did their absolute best to give me all the right tools, in the operating room and out, to be a great neurosurgeon.

**AMY LEE, MD, FAANS**

*Professor of Neurosurgery, University of Washington in Seattle;  
Pediatric Division Chief, Seattle Children's Hospital*

# Neurosurgery



“WE HAVE A LONG HISTORY OF TRAINING THE NEXT GENERATION OF ACADEMIC NEUROSURGICAL LEADERS. The combination of our outstanding clinical and technical expertise with unmatched research training, is the foundation on which academic leaders are born. OUR RESIDENCY PROGRAM IS BUILT TO DEVELOP THOSE LEADERS.”

**CHAIR GREGORY J. ZIPFEL, MD**

*Ralph G. Dacey Distinguished Professor of Neurosurgery  
Neurosurgeon-in-Chief, Barnes-Jewish Hospital*



Training was rigorous, and we learned early on that responsibility for all aspects of patient care was necessary for the best outcomes. I learned the best of technical skills, the judgment to make wise recommendations and quickly and effectively assess the needs of a patient. These skills generalized to all aspects of leadership throughout my career.

**JEFFREY OJEMANN, MD**

*Vice Chair and Professor of Neurosurgery  
Richard G. Ellenbogen Endowed Chair in Pediatric Neurosurgery  
Chief Medical Officer and Senior Vice-President at Seattle  
Children's Hospital*



WashU residency was a fantastic experience. The training was both broad and deep. We were trained to be excellent operative neurosurgeons and clinicians.

Hard work, attention to detail and a holistic approach to the patient were always a part of our culture. Great people and a great place to train.

**WILLIAM W. ASHLEY, JR.,  
MD, PHD, MBA, FAANS**

*Director, Cerebrovascular, Endovascular  
and Skull Base Neurosurgery  
Chief, Neurointerventional Radiology  
Sinai Hospital of Baltimore and LifeBridge Health System  
Clinical Professor, Department of Neurosurgery at  
George Washington University*



“WashU is an incredible place to train for someone who is interested in becoming a surgeon scientist. Combining an incredibly busy

clinical service within the setting of an institution and department with a rich history of biomedical research provides a strong foundation to build my career.”

**CHARISE GARBER, MD, PHD**

*PGY4 Resident  
MD, Washington University School of Medicine*





# Outstanding Training

**SUPPORTED BY ONE OF THE TOP HOSPITALS IN THE U.S., SUBSTANTIAL RESEARCH FUNDING, SOME OF THE MOST CREATIVE MINDS IN ACADEMIC MEDICINE, AND THE LATEST TECHNOLOGIES, OUR RESIDENTS LEARN HOW TO STUDY AND SOLVE NEUROSURGICAL PROBLEMS AT THE VERY HIGHEST LEVEL.** All of this takes place at the top-ranked Washington University School of Medicine in St. Louis, Mo. Our culture of excellence is founded in our unique approach: a program intentionally designed to give residents one-on-one mentorship from exceptional faculty members. This personal level of training prepares residents for long, successful, and fulfilling careers in academic and clinical medicine.

**“AT WASHU WE INSTILL OUR RESIDENTS WITH THE GRIT, SKILL, AND COMPASSION TO BUILD CAREERS AS EXCELLENT CLINICIANS AND LEADERS. OUR GOAL IS TO ENRICH EACH RESIDENT ALONG THEIR PERSONAL PATH OF GROWTH, PROVIDING THE BEST MENTORSHIP, OPPORTUNITIES, AND CLINICAL EXPERIENCE ALONG THE WAY.”**

## **JOSHUA W. OSBUN, MD**

*Associate Professor of Neurosurgery,  
Radiology and Neurology*

*Vice-Chair of Education*

*Program Director, Neurosurgery Residency*

*Director, Cerebrovascular Surgery and  
Interventional Neuroradiology*

## **Dedicated to Developing World-Class Surgeons**

Our residents are exposed to high clinical volume and thorough immersion in every subspecialty including pediatrics. They learn directly from our faculty members who are all experts in their respective fields.

## **Continuity of Training**

Our program gives residents continuity in each subspecialty in order to build their confidence, gain trust from the attending physicians, and gain autonomy. Our residents spend 4-month long rotations working with the same group of attendings within a subspecialty. This continuity instills a deep understanding of the disease processes encountered by neurosurgeons across subspecialties.

## **Resident Curriculum**

Resident education is one of the centerpieces of the department. Surgical case conferences, grand rounds, a longitudinally designed curriculum conference, journal club, and surgical dissection experiences comprise the weekly didactic structure of the program.



RECOGNIZED AS ONE OF THE BEST IN THE WORLD,  
the Washington University Neurosurgery  
Residency training program prepares  
residents for careers as neurosurgeons  
and neurosurgeon-scientists.

5,300+

NEUROSURGICAL CASES  
PER YEAR

16 R01 AWARDS

11 R01-FUNDED FACULTY

\$11 million

IN RESEARCH AWARDS  
IN FY23

R25 TRAINING GRANT TO SUPPORT  
NEUROSURGERY RESIDENT RESEARCH

14 FEDERALLY FUNDED LABORATORIES

#13 NEUROSURGERY RESEARCH  
DEPARTMENT IN THE COUNTRY  
BASED ON NIH FUNDING

NEUROSURGERY ALUMNI:

60%

IN ACADEMIC PRACTICE

40%

IN PRIVATE PRACTICE

85%

OF GRADUATES COMPLETE  
SUBSPECIALTY FELLOWSHIPS

“The infrastructure of our program allows residents to complement their clinical interests with their research interests. I received unparalleled support from the faculty and my co-residents, and the training more than prepared me to transition into the next phase of my academic career.”

DANIEL M. HAFEZ, MD, PHD

WashU Neurosurgery Residency Alumnus

Assistant Professor of Neurosurgery

Associate Program Director, Neurosurgery Residency

RESIDENCY PROGRAM 5







Washington  
University School  
of Medicine  
has one of  
the **MOST**  
**COMPREHENSIVE**  
**RESEARCH**  
**PROGRAMS IN**  
**THE COUNTRY.**

**DEDICATED RESEARCH PROGRAMS LED  
BY NEUROSURGERY FACULTY INCLUDE:**

ARTIFICIAL INTELLIGENCE  
BRAIN-COMPUTER INTERFACE  
BRAIN MAPPING  
BRAIN TUMOR IMMUNOTHERAPY  
BRAIN TUMOR METABOLISM  
BRAIN TUMOR MUTI-OMICS  
BRAIN TUMOR STEM CELLS  
CHIARI AND SYRINGOMYELIA  
DEVELOPMENTAL CSF DISORDERS  
DEVICE DEVELOPMENT  
ENTREPRENEURSHIP  
HUNTINGTON'S DISEASE  
LASER THERAPY FOR BRAIN TUMORS

NANOTECHNOLOGY  
NEURAL PLASTICITY  
NEURAL NETWORKS  
NEUROGENETICS  
NEUROMODULATION  
(WEARABLE AND IMPLANTABLE)  
NEONATAL INTRAVENTRICULAR  
HEMORRHAGE/HYDROCEPHALUS  
PERIPHERAL NERVE INJURY  
AND NEUROPROSTHETICS  
SUBARACHNOID HEMORRHAGE,  
VASCULAR DEMENTIA  
SPINAL CORD INJURY  
TRANSLATION ULTRASOUND

**OUR FACULTY AND RESIDENTS  
ARE INTEGRATED INTO MANY  
OF THE KEY RESEARCH AREAS  
AT THE MEDICAL SCHOOL,  
INCLUDING:**

BIOMEDICAL ENGINEERING  
CANCER BIOLOGY  
DEVELOPMENTAL BIOLOGY  
IMMUNOLOGY  
ENGINEERING  
GENETICS  
NEUROSCIENCE  
NEUROLOGY  
PEDIATRICS  
PSYCHIATRY  
RADIOLOGY



“The training at WashU is second to none and the attending surgeons are truly exceptional. Their operative expertise is complemented by their world class research, while always offering their patients the best, most compassionate care. The volume and breadth of cases that we take care of at Barnes-Jewish Hospital will undoubtedly prepare me for my future career as a neurosurgeon.”

**DEREK LI, MD**

*PGY5 Resident  
MD, Northwestern University*



# Innovative Research Opportunities

## Resident research, funding, and awards

As part of our commitment to extensive research, WashU Neurosurgery residents are granted up to 24 months of protected research time. They are often awarded independent funding and fellowships including awards from the NIH, NREF, and other foundations. Residents also have the opportunity to participate in the department's prestigious R25 Resident Research Education Program Grant funded by the NIH.

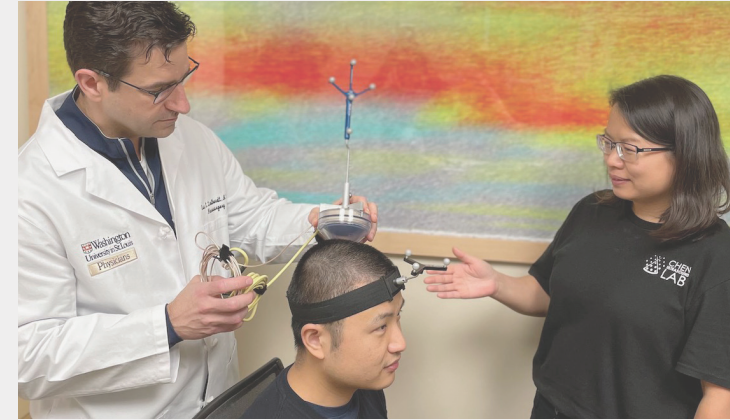
WashU Neurosurgery is consistently ranked as a top training program in average H-index ranking of our residents, making it one of the most productive in the country. Recent graduates have had high quality publications in some of the most elite scientific journals including *Science*, *Nature Medicine*, *New England Journal of Medicine*, *JAMA*, *Stroke*, and *Journal of Neuroscience* and the highest impact neurosurgical journals including *Journal of Neurosurgery* and *Neurosurgery*.

## Brain Tumor Center

Washington University's Brain Tumor Center (BTC), is a world-class multi-disciplinary team of neurosurgeons, clinicians, and scientists, meeting the challenge of finding cures for brain cancer by understanding fundamental aspects of brain tumor biology and creating unique and transformative treatments for patients. The BTC aims to accelerate the translation of laboratory-based discovery into the clinic to benefit patients and train the next generation of outstanding clinicians and scientists.

## Stereotactic, Functional and Epilepsy Neurosurgery

The evolution of functional neurosurgery has been life-changing for patients suffering from a variety of disorders, including essential tremor, epilepsy, chronic pain, depression, obsessive compulsive disorder, and Parkinson's disease. WashU Neurosurgery residents collaborate with faculty who are actively developing novel brain stimulation strategies. They also work as part of a multidisciplinary collaboration of physicians, engineers, and neurophysiologists.



## Neurotechnology

The Department of Neurosurgery's Division of Neurotechnology provides opportunities for residents to be part of the next generation of neurosurgeons deploying the most advanced neuro-technologies to care for present-day and future patients. Using technology to engage with the nervous system, residents are on the cutting edge of treating diseases such as brain tumors, chronic pain, post-traumatic stress disorder, spinal cord injury, and stroke. Additionally, the Division of Neurotechnology brings together an unparalleled diversity of expertise and leadership to meet the challenges of translating novel solutions into impactful therapies.







# State-of-the-Art Facilities

**IN ST. LOUIS, OUR RESIDENTS TRAIN AT ONE OF THE COUNTRY'S LARGEST MEDICAL CENTERS, WHICH INCLUDES BARNES-JEWISH HOSPITAL, ALVIN J. SITEMAN CANCER CENTER, AND ST. LOUIS CHILDREN'S HOSPITAL. THE HOSPITAL SERVES A DIVERSE REGION OF MORE THAN 3 MILLION PEOPLE AND DRAWS PATIENTS FROM ALL 50 STATES AND MORE THAN 80 COUNTRIES. A NEW INPATIENT BED TOWER AT BJH IS SCHEDULED TO OPEN IN 2024 AND WILL MARKEDLY EXPAND THE NEUROSURGERY AND NEUROLOGY BED PLATFORM.**

In 2023, a \$616 million, 11-story and 609,000 square-foot, state-of-the-art Neuroscience Research Building opened on the Washington University School of Medicine campus. It is one of the largest neuroscience research buildings in the country and will dramatically expand the neurosurgery research laboratory space of the Brain Tumor Center, a Department of Neurosurgery initiative. Additionally, the Division of Neurotechnology moved into a renovated space in the CORTEX Innovation Community. This research and technology hub includes a combination of wet and dry research labs and brings together investigators from multiple subspecialties.



▲  
**GET A GLIMPSE  
OF THE WASHU  
NEUROSCIENCE  
RESEARCH  
BUILDING**







# Living in St. Louis

**ST. LOUIS IS KNOWN AS ONE OF THE MOST LIVABLE CITIES IN THE U.S., A PLACE WHERE RESIDENTS CAN AFFORD TO BUY THEIR OWN HOME, COMMUTE TO WORK BY SHORT CAR RIDE, BIKE, OR ON FOOT, AND, AT THE SAME TIME, ENJOY ALL THE CULTURAL ACTIVITIES A GREAT CITY CAN OFFER.**

## Entertainment

Within five miles of Washington University School of Medicine, residents cheer on St. Louis City SC at CITYPARK, see Hamilton and other Broadway shows at the Fox Theatre, revel in Bach at the Saint Louis Symphony, deconstruct Van Gogh and Monet paintings at the Saint Louis Art Museum, and pet stingrays at the Saint Louis Zoo. Residents can also run, bike, play golf or tennis in Forest Park, directly across the street from the hospital.

## Camaraderie

Neurosurgery residents enjoy many of these St. Louis venues together, during the monthly department-funded social events, at gatherings with faculty, and in outings planned on their own. Because of the camaraderie within the program, and all of the fun activities they can do together in St. Louis, residents find that they make some of their best, lifelong friends here.

## Energy

With substantial resources for startups, St. Louis has become a top destination for entrepreneurs, attracting a growing millennial population, and with them an expansive network of craft breweries, music venues, and restaurants.



◀ **HEAR FROM  
WASHU RESIDENTS  
ABOUT LIVING IN  
ST. LOUIS.**

## Ireland Rotation

Our residents are given the opportunity to expand their surgical skills during a six-month international elective at Beaumont Hospital in Dublin, Ireland. This rotation represents a critical point in training, when residents are able to increase their surgical independence and experience. The rotation also provides residents with exposure to a nationalized health care system that consolidates specialty medical care into designated care centers like Beaumont, which cares for neurosurgical patients from more than 90% of the country. The experience is also personally enriching, as Ireland is a jumping off point to visit the many wonderful destinations throughout Europe.







## Clinical Faculty

Our faculty hold or have held national leadership roles in important academic and clinical societies and serve as members or chair on journal editorial boards. They are leaders in innovation and clinical care. Most importantly, they serve as mentors for our trainees.



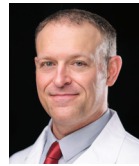
### GREGORY J. ZIPFEL, MD

*Chair, Department of Neurosurgery  
Ralph G. Dacey Distinguished Professor  
of Neurosurgery  
Neurosurgeon-in-Chief,  
Barnes-Jewish Hospital*



### RALPH G. DACEY, JR., MD

*Professor of Neurosurgery  
Former Chair of Neurosurgery  
Former Neurosurgeon-in-Chief,  
Barnes-Jewish Hospital*



### IAN G. DORWARD, MD

*Associate Professor,  
Neurosurgery and  
Orthopedic Surgery  
Neurosurgeon-in-Chief,  
Barnes-Jewish St. Peters  
Hospital*



### JOSHUA L. DOWLING, MD

*Professor of Neurosurgery  
Surgical Director of Gamma  
Knife Program*



### JACOB GREENBERG, MD, MSCI

*Assistant Professor of  
Neurosurgery  
Co-Director, Patient  
Safety & Quality Improvement*



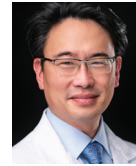
### DANIEL M. HAFEZ, MD, PHD

*Assistant Professor of  
Neurosurgery  
Associate Program Director,  
Neurosurgery Residency*



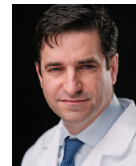
### M. BURHAN JANJUA, MD

*Assistant Professor of  
Neurosurgery*



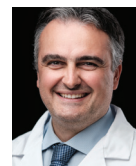
### ALBERT H. KIM, MD, PHD

*August A. Busch Jr. Professor  
of Neurological Surgery  
Senior Vice-Chair, Department  
of Neurosurgery  
Professor of Neurosurgery,  
Genetics, Neurology, and  
Developmental Biology  
Director, Brain Tumor Center  
Surgical Director,  
Pituitary Center  
Co-Leader, Neurorestorative  
Therapy Group, Hope Center*



### ERIC C. LEUTHARDT, MD

*Shi H. Huang Professor of  
Neurological Surgery  
Vice-Chair of Innovation,  
Department of Neurosurgery  
Chief, Division of  
Neurotechnology  
Professor of Neurosurgery,  
Neuroscience, Biomedical  
Engineering and Mechanical  
Engineering & Materials  
Science  
Director, Center for Innovation  
in Neuroscience and  
Technology  
Director, Brain Laser Center*



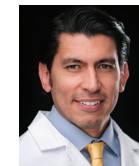
### DIMITRIOS MATHIOS, MD

*Assistant Professor of  
Neurosurgery  
Director, Molecular  
Neuro-oncology Lab*



### SEAN D. MCEVOY, MD

*Assistant Professor, Neurosurgery  
and Pediatrics*



### CAMILO MOLINA, MD

*Assistant Professor of Neurosurgery  
and Orthopedic Surgery  
Director, Spinal Deformity  
and Spinal Oncology  
Co-Director, Patient Safety  
and Quality Improvement  
Co-Director, Complex  
Spine Fellowship  
Deputy Director of Spine  
Innovation, Center for Innovation  
in Neuroscience and Technology*



### JOHN I. OGUNLADE, DO

*Assistant Professor of  
Neurosurgery*



### JOSHUA W. OSBUN, MD

*Associate Professor of  
Neurosurgery, Radiology and  
Neurology  
Vice-Chair of Education,  
Department of Neurosurgery  
Program Director,  
Neurosurgery Residency  
Director, Cerebrovascular Surgery  
and Interventional Neuroradiology*





**T.S. PARK, MD**  
Margery Campbell Fort  
Professor of Neurosurgery



**BRENTON PENNICOOKE,  
MD, MS**  
Assistant Professor of  
Neurosurgery and Orthopedic  
Surgery and Biomedical  
Engineering



**WILSON Z. (ZACK)  
RAY, MD, MBA**  
Henry G. & Edith R. Schwartz  
Professor  
Executive Vice-Chair,  
Department of Neurosurgery  
Professor of Neurosurgery,  
Orthopedic Surgery, and  
Biomedical Engineering  
Chief, Division of Spine Surgery  
Director, Peripheral Nerve  
Fellowship



**KEITH M. RICH, MD**  
Professor of  
Neurosurgery



**JAROD L. ROLAND, MD**  
Assistant Professor of  
Neurosurgery  
Director, Pediatric Epilepsy  
Surgery Program



**JENNIFER M.  
STRAHLE, MD**  
Associate Professor of  
Neurosurgery, Orthopedic  
Surgery and Pediatrics  
Interim Chief, Division of  
Pediatric Neurosurgery  
Director, Pediatric Neuro  
Spine Program  
Director, Pediatric  
Cerebrovascular Surgery



**KUMAR  
VASUDEVAN, MD**  
Assistant Professor of  
Neurosurgery



**ANANTH K.  
VELLIMANA, MD**  
Assistant Professor of  
Neurosurgery, Radiology  
and Neurology



**JON T.  
WILLIE, MD, PHD**  
Associate Professor of  
Neurosurgery, Biomedical  
Engineering, Psychiatry,  
Neuroscience and Neurology  
Director of Stereotactic,  
Functional, and Epilepsy  
Neurosurgery

## Research Faculty

Our nationally recognized neurosurgery researchers are dedicated full-time to identifying the underlying causes of neurological disease, with an eye toward translating that research into clinical trials to test the next generation of treatments.



**PETER  
BRUNNER, PHD**  
Associate Professor,  
Neurosurgery and  
Biomedical Engineering



**DAVID  
BUNDY, PHD**  
Assistant Professor,  
Neurosurgery



**HONG  
CHEN, PHD**  
Associate Professor,  
Biomedical Engineering  
and Neurosurgery



**GABRIEL  
HALLER, PHD**  
Assistant Professor,  
Neurosurgery, Neurology  
and Genetics



**CAROLINE H. KO, PHD**  
Associate Research  
Professor, Neurosurgery  
Associate Director, Research  
Strategy and Clinical  
Translation, Brain  
Tumor Center



**YANG (ERIC) LI, PHD**  
Assistant Professor,  
Neurosurgery and Genetics



**JAMES (PAT) P.  
MCALLISTER, PHD**  
Professor of  
Neurosurgery



**ISMAEL  
SE    EZ, PHD**  
Assistant Professor,  
Biomedical Engineering  
and Neurosurgery



**ALEXANDER H.  
STEGH, PHD**  
Professor of Neurosurgery  
Vice-Chair of Research,  
Department of Neurosurgery  
Research Director,  
Brain Tumor Center



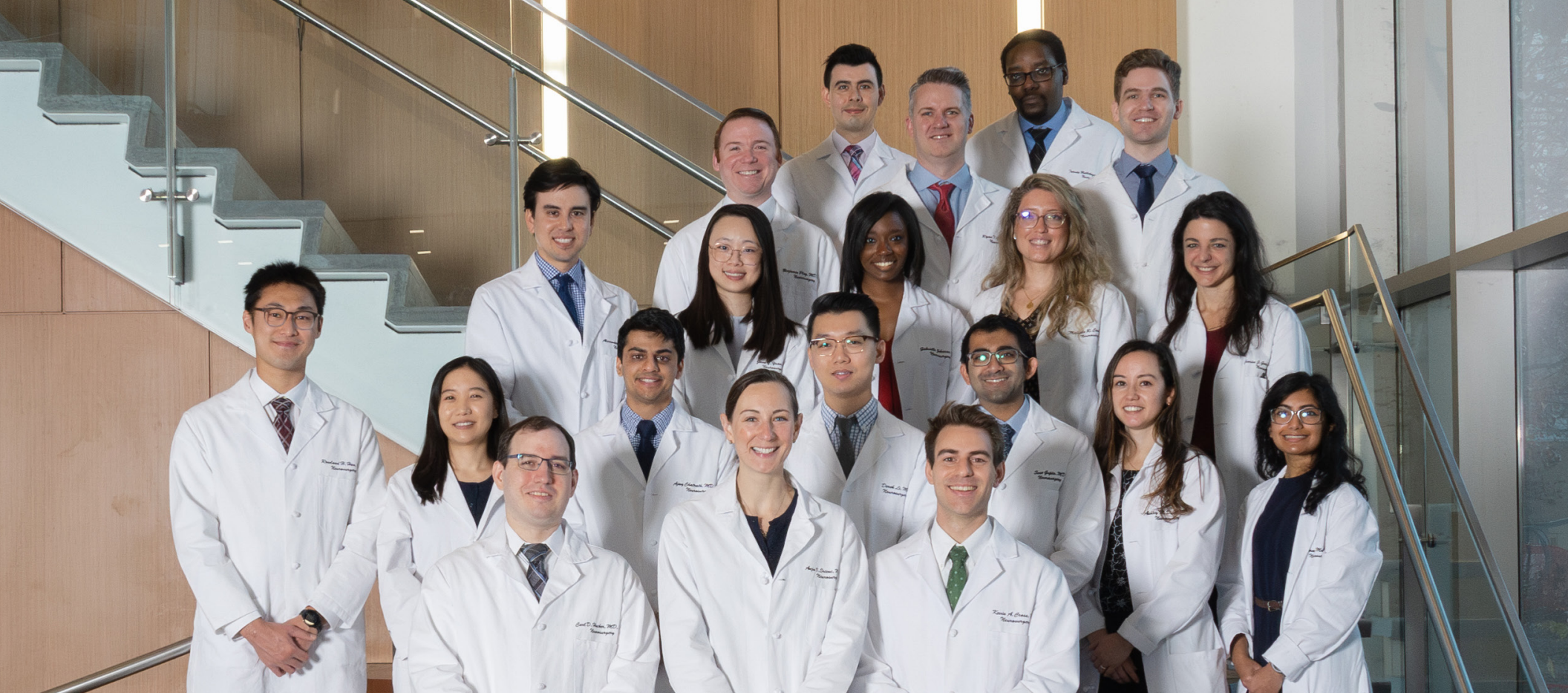
**RUI TANG, PHD**  
Assistant Professor of  
Neurosurgery



**HIROKO YANO, PHD**  
Associate Professor,  
Neurosurgery, Neurology,  
and Genetics







WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

# Neurosurgery Residency Program

## LEADERSHIP

GREGORY J. ZIPFEL, MD DEPARTMENT CHAIR

JOSHUA W. OSBUN, MD PROGRAM DIRECTOR

DANIEL M. HAFEZ, MD, PHD ASSOCIATE PROGRAM DIRECTOR

KAYLA ZOSCHG MANAGER OF EDUCATION SERVICES

## CONTACT INFORMATION

KAYLA ZOSCHG  
660 SOUTH EUCLID AVE.  
CB 8057  
ST. LOUIS, MO 63110  
314.362.3636  
ZOSCHGK@WUSTL.EDU

