

neurosurgery news

The Next Generation of Neurosurgeons

Educating future academic neurosurgeons is central to the mission of the Department of Neurological Surgery at UCSF. The University was one of the earliest training grounds in the United States for the field of neurosurgery. Beginning as early as 1913, Howard Naffziger MD – then an assistant in surgery at the School of Medicine and an early pioneer of neurosurgery – began training surgical residents by preceptorship to gain exposure to operations involving the brain and spinal cord, such as decompressive craniotomy for brain tumors.

In 1934, the American Medical Association Council on Medical Education and Hospitals gave approval to UCSF for a three-year training program in neurosurgery consisting of one clinical year at each of three hospitals: Franklin Hospital; the San Francisco Veterans Administration (SFVA) Hospital; and San Francisco General Hospital (SFGH). By 1969, the program was increased to five years and included one full year of research. The Department attracted 50 applicants in 1968 and 100 applicants in 1994.

In 2014, over 200 candidates applied to fill three positions in the Department's seven-year residency program. It is overseen

by the Program Director Michael McDermott MD and Associate Program Director Paul Larson MD, together with Department Chair Mitchel Berger MD and Residency Coordinator Kimberly Bissell.

"We receive extremely competitive applications," says Dr. McDermott. "Our goal is to train the next generation of academic neurosurgeons, who will continue to advance the field. The majority of our residents continue on to very prestigious faculty appointments in academic neurosurgery departments and many complete additional fellowship training prior to becoming faculty."

For Ethan Winkler MD, PhD, who began his first year of the residency program in June, the biggest draw to UCSF was the chance to learn from the best. "After interviewing at neurosurgery programs across the country, it became clear to me that training in an environment surrounded by some of the most prominent leaders in both neuroscience and neurosurgery was a very unique opportunity," said Dr. Winkler. "I was in search of a residency program that placed great emphasis on using scientific and clinical excellence to enhance each other, not retract from one another."

Residents in the Department of Neurological Surgery

Jonathan Breshears MD	Nathan Rowland MD, PhD
Tene Cage MD	Martin Rutkowski MD
Andrew Chan MD	Caleb Rutledge MD
Jason Davies MD, PhD	Michael Safaee MD
Dario Englot MD, PhD	Rajiv Saigal MD, PhD
Seunggu Han MD	Derek Southwell MD, PhD
Darryl Lau MD	Doris Wang MD, PhD
Stephen Magill MD, PhD	Ethan Winkler MD, PhD
Joseph Osorio MD, PhD	Corinna Zygourakis MD
John Rolston MD, PhD	

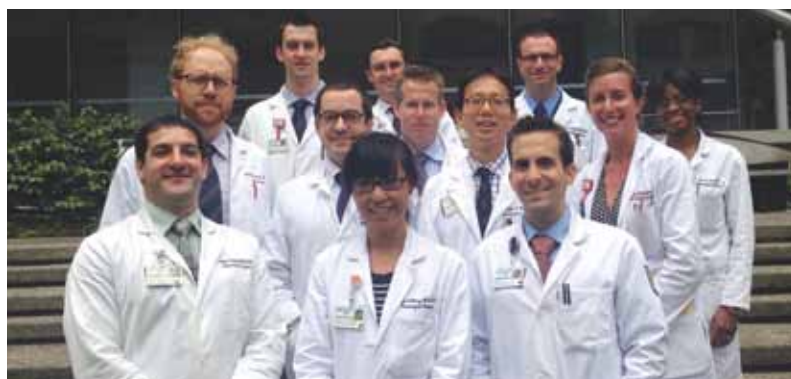
As the field of neurosurgery becomes increasingly subspecialized, residency training at UCSF has shifted to provide immersion into these various subspecialties. Residents rotate through services in neurocritical care, spinal disorders, movement disorders, epilepsy, pediatric neurosurgery, radiosurgery, neuroendovascular surgery, cerebrovascular surgery, peripheral nerve surgery, and brain tumor surgery.

"The best part and main advantage of being a resident at UCSF is exposure to so many true experts in each and every subfield of neurosurgery," says 2014 graduate Aaron Clark MD. "The breadth of UCSF neurosurgery is unparalleled."

Currently, neurosurgery residents rotate through services at Moffitt/Long Hospitals at the UCSF Medical Center; SFVA Medical Center; SFGH; and the UCSF Benioff Children's Hospitals in San Francisco and Oakland. In 2017, the program will expand to include a rotation in neuroendovascular surgery at Kaiser Permanente in Sacramento.

In 2015, all pediatric rotations will be centralized at the newly constructed Benioff Children's

cont. on page 3



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A major change in neurosurgery residency training at UCSF occurred in 2013 when our Department was chosen as one of seven neurosurgery programs in the country to participate in the pilot program of the new guidelines for residency training by the Society for Neurological Surgery — the Next Accreditation System (NAS) and implementation of milestones.

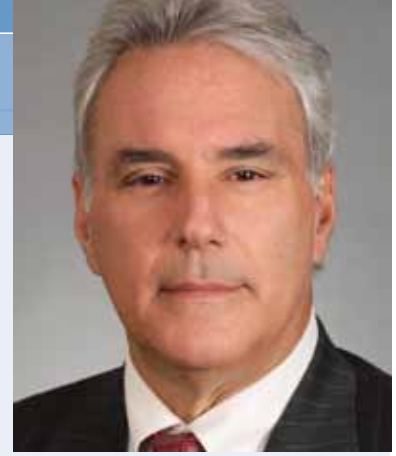
Our program reviews will be measured with new outcomes-based milestones for resident performance within six domains of clinical competence. The milestones are competency-based developmental outcome expectations that can be demonstrated progressively by residents and fellows from the beginning of their education through graduation to the unsupervised practice of their specialty. Program directors Michael McDermott MD and Paul Larson MD steered an overhaul of the curriculum to meet this new structure so that our residents will be prepared for every stage of assessment.

Another shift in the program has been to institute a formal quality improvement curriculum. We were the first Neurosurgery Department in the nation to make Patient Safety and Quality Improvement a formal part of our residency program, and we were recognized for that distinction at the 2013 annual meeting of the Society for Neurological Surgery. The residents participate in case review and ongoing departmental quality improvement projects, including an initiative that limited utilization of laboratory tests that have little

to no impact on patient care. The neurosurgery service, due to the high volume of patients and frequent usage of the ICU, has high lab usage. However, only few labs seem to truly change the course of care. Reducing unnecessary lab testing has, as a result, reduced waste and cost at the UCSF Medical Center.

In addition to in-depth exposure to a wide variety of clinical programs (see Page 1), the residents attend weekly neuroscience lectures by a rotating faculty member; multidisciplinary case conferences; grand rounds; and an active schedule of seminars, journal clubs, and lecture programs. During our annual Resident Research Day, each resident presents a scientific manuscript published that year and the faculty gives an award for the best basic science and best clinical science manuscript. The day is designed to recognize the extraordinary research achievements of the residents and expose them to other research taking place at UCSF.

All of these teaching activities are essential to exposing residents to the breadth of neurosurgical specialties, but the most important and satisfying component of education is one-on-one mentorship. Our faculty members are extremely committed to mentoring our residents at every stage of their training. It takes place in the operating room and at clinic visits, in laboratories and classrooms, and at meetings and retreats designed to foster collaboration. At UCSF, we aim to create an environment that not only provides superb technical training, but also one that supports research productivity, professionalism, and personal growth.



A handwritten signature in blue ink, appearing to read 'Mitchel S. Berger'.

Mitchel S. Berger MD

**Berthold and Belle N. Guggenheimer
Professor and Chair**

**Director,
Brain Tumor Research Center**

**Department of
Neurological Surgery, UCSF**

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Hospital at the Mission Bay campus. “This is a state-of-the-art hospital that will provide a unique training environment for residents,” says Dr. Larson. “By housing all the pediatric specialties in a dedicated hospital, our residents will be exposed to true multidisciplinary pediatric care, which cannot be found at many other training programs.”

The fifth year of the Neurological Surgery residency program is devoted to a research project in clinical or basic neuroscience, and allows residents to design a program that suits their interests, to function as independent investigators, and to take advantage of the rich research opportunities and technologies available at UCSF. They also gain experience with presenting data at national meetings and publishing scientific manuscripts.

“Both clinically and academically I have had access to outstanding mentors that have helped guide

me through career decisions and develop my research goals,” says 2014 graduate Michael Ivan MD. “They have allowed me to participate in their research and then given me the resources to expand on my own. I cannot imagine a better program to prepare for beginning a career in academic neurosurgery.” In 2012, Dr. Ivan received a fellowship from the Neurosurgery Research and Education Foundation of the American Association of Neurological Surgeons to support his research into the pathogenesis of glioma.

“Ultimately, I think the residents leave here with a very well-rounded experience and are prepared to thrive in academic neurosurgery careers,” says Dr. Larson. “By becoming immersed in so many specialties, they are really able to choose individualized career paths and compete for top academic fellowships and attending positions.”



Residents attend a 3-D lecture on neuroanatomy taught by Arnau Benet MD. From left: Rajiv Saigal MD, PhD; Doris Wang MD, PhD; Dario Englot MD, PhD; Seunggu Han MD

While preparation for future academic careers is the ultimate goal of the program, the residents leave with more than surgical and laboratory skills: they are members of a dedicated and accomplished team that works to improve the lives of patients. “The staff and faculty are a true team and give the residents tremendous support throughout their time here,” says Dr. Ivan. “I am extremely thankful for this opportunity to be a part of the UCSF family and have made many lifelong friends through my journey here.”

UCSF Neurosurgery Resident Awards in 2013-2014

Jonathan Breshears MD

Young Investigator Award, San Francisco Neurological Society

Tene Cage MD

First place for Ventriculostomy at the Top Gun Competition at the Annual Meeting of the American Association for Neurological Surgeons

Dario Englot MD, PhD

Best Resident Research Presentation, Annual Meeting of the California Association of Neurological Surgeons

Harold Rosegay Resident Teaching Award, UCSF Department of Neurological Surgery

Michael Ivan MD

UCSF School of Medicine Class of 2014 Teaching Award for Cherished Housestaff

Elected to the Young Neurosurgeon's Committee Board, American Association of Neurological Surgeons

Naffziger Outstanding Resident Award, UCSF Department of Neurological Surgery

Stephen Magill MD, PhD

John H. Moe Basic Science Award, Scoliosis Research Society

John Rolston MD, PhD

National Research Service Award, National Institutes of Health

Nathan Rowland MD, PhD

National Research Service Award, National Institutes of Health

Caleb Rutledge MD

Krevins Award for Clinical Excellence, San Francisco General Hospital

Rajiv Saigal MD, PhD

Best Basic Science Presentation Award, 2014 Resident Research Day, UCSF Department of Neurological Surgery

Doris Wang MD, PhD

Best Clinical Science Presentation Award, 2014 Resident Research Day, UCSF Department of Neurological Surgery

Corinna Zygourakis MD

UCSF Caring Wisely Grant for Reducing Operating Room Costs through Price Transparency

Tene Cage MD won the Top Gun ventriculostomy competition for her accuracy and speed at the Annual Meeting of the American Association of Neurological Surgeons.





selected publications

Cheng JS, Ivan ME, Stapleton CJ, Quinones-Hinojosa A, Gupta N, Auguste KJ. Intraoperative changes in transcranial motor evoked potentials and somatosensory evoked potentials predicting outcome in children with intramedullary spinal cord tumors. *J Neurosurg Pediatr* 2014;13(6):591-9.

Cheng JS, Lim DA, Chang EF, Barbaro NM. A review of percutaneous treatments for trigeminal neuralgia. *Neurosurgery* 2014;10 Suppl 1:25-33.

Cheng JS, Park P, Le H, Reisner L, Chou D, Mummaneni PV. Short-term and long-term outcomes of minimally invasive and open transforaminal lumbar interbody fusions: is there a difference? *Neurosurg Focus* 2013;35(2):E6.

Cheng JS, Dubal DB, Kim DH, Legleiter J, Cheng IH, Yu GQ, Tesseur I, Wyss-Coray T, Bonaldo P, Mucke L. Collagen VI protects neurons against Abeta toxicity. *Nat Neurosci* 2009;12(2):119-21.

Jason S. Cheng MD completed his undergraduate studies at Stanford University, majoring in Biological Sciences and minoring in Computer Science. He then entered the UCSF School of Medicine in 2002 to begin his medical training.

In 2005, Dr. Cheng was awarded a two-year Howard Hughes Medical Institute Research Fellowship to conduct research in the laboratory of Lennart Mucke MD, studying the role of collagen VI protein in a mouse model of Alzheimer's disease. This work led to a publication in *Nature Neuroscience*, for which Dr. Cheng was co-first author, the Kathryn

Grupe Award for Excellence in Alzheimer's Research, and the UCSF Dean's Research Prize.

Dr. Cheng began his neurosurgical training at UCSF in 2009, after completing an internship in general surgery at UCSF. During that time he developed a broad interest in several areas of neurosurgery including pituitary surgery, minimally invasive spine surgery, and traumatic brain injury. He continued his work with Dr. Mucke during his research year, studying the role of Tau protein in a mouse model of traumatic brain injury. After completing his residency, Dr. Cheng plans to establish his clinical practice in California.



selected publications

Clark AJ, Tang JA, Leasure JM, Ivan ME, Kondrashov D, Buckley JM, Deviren V, Ames CP. Gait-simulating fatigue loading analysis and sagittal alignment failure of spinal pelvic reconstruction after total sacrectomy: comparison of 3 techniques. *J Neurosurg Spine* 2014;20(4):364-70.

Clark AJ, Ziewacz JE, Safaee M, Lyon R, Chou D, Weinstein PR, Ames CP, Clark III JP, Mummaneni PV. Intraoperative neuromonitoring with MEPs and prediction of postoperative neurological deficits in patients undergoing surgery for cervical and cervicothoracic myelopathy. *Neurosurg Focus* 2013;35(1):E7.

Clark AJ, Butowski NA, Chang SM, Prados MD, Clarke JL, McDermott MW, Parsa AT, Berger MS, Aghi MK. Neurosurgical management and prognosis of patients with glioblastoma that progress during bevacizumab treatment. *Neurosurgery* 2012;70(2):361-70.

Clark AJ, Lu DC, Richardson RM, Tihan T, Parsa AT, Chou D, Barbaro NM, Kunwar S, Weinstein PR, Lawton, MT, Berger MS, McDermott MW. Temporary arterial occlusion in the operative management of spinal hemangioblastomas. *World Neurosurg* 2010;74(1):200-5.

Aaron J. Clark MD, PhD is native San Franciscan and left for the University of California, San Diego to complete his undergraduate studies, majoring in microbiology. He then entered the MD/PhD program at the Medical College of Virginia in Richmond, Virginia.

His graduate research focused on elucidating the expression and function of the Wilms' tumor 1 (WT1) gene in human malignant glioma. This interest in brain tumors led him to pursue neurosurgery residency training at UCSF, which he began in 2008.

At UCSF, Dr. Clark extended his research into brain tumor clinical outcomes research and brain tumor immunotherapy models. Dr. Clark was awarded an NIH National Research Service Award to support his laboratory research.

During the course of residency training, he developed a new interest in spinal neurosurgery. In this field, he has published research on spinal oncology, spine biomechanics, spinal deformity, and intraoperative neurophysiological monitoring during spine surgery.

After completing residency in June 2014, Dr. Clark began additional fellowship training in minimally invasive spine surgery at the Semmes-Murphey Neurologic and Spine Institute in Memphis, Tennessee under the mentorship of Kevin Foley MD.

Michael E. Ivan MD, MBS completed his undergraduate studies at Cornell University where he received a degree in Chemical and Biological Engineering. Dr. Ivan then went on to work at Merck Pharmaceuticals for four years as an engineer in the Vaccine Technology and Engineering Division, and received his Masters in Biomedical Sciences at UMDNJ. In 2004, he entered medical school at UMDNJ-New Jersey Medical School, where he worked closely with Michael Schulder MD on the use of intraoperative MRI for pituitary tumors and Paul Larson MD on the use of intraoperative MRI for investigating brain shift during minimally invasive burr hole procedures.

Dr. Ivan began residency in the Department of Neurological Surgery at UCSF in 2008, focusing on the treatment and management of both vascular and tumor skull base lesions. Dr. Ivan's basic science research has been focused on the invasive qualities of brain tumors. His work on the role of EMR proteins in glioma pathogenesis and invasion in the laboratory of Andrew Parsa MD,

PhD was awarded the Neurosurgical Research and Education Foundation (NREF) grant in 2012.

Dr. Ivan has also taken a strong interest in teaching medical students and has taught multiple medical school courses. He was recently awarded the 2014 Teaching Award for Cherished Housestaff (TEACH) from the UCSF medical school Class of 2014. He is an active member of the Young Neurosurgeon's Committee. In his spare time, Dr. Ivan enjoys downhill skiing and has defended the title of the men's ski champion at the "Neurosurgery in the Rockies" conference for the last four years.

After finishing residency in June 2014, Dr. Ivan began a clinical and research fellowship in Neuro-Oncology at the University of Miami. He plans on continuing his research on targeted therapies toward the prevention of brain tumor invasion. He then anticipates a career in academic neurosurgery where he hopes to combine his interest in neuro-oncology and cerebrovascular disease with minimally invasive and open skull base approaches.



selected publications

Ivan ME, Yarlagaadda J, Saxena A, Martin AJ, Starr P, Sootsman K, Larson PS. Brain shift analysis during burr hole-based procedures using interventional MRI [published online ahead of print May 2, 2014]. *J Neurosurg*. doi: 10.3171/2014.3.JNS121312

Ivan ME, Jahangiri A, El-Sayed IH, Aghi MK. Minimally invasive approaches to the anterior skull base. *Neurosurg Clin N Am* 2013; 24(1):19-37.

Ivan ME, Cheng, JS, Sughrue ME, Kane AJ, Aranda D, McDermott M, Barani IJ, Parsa AT. Association of morbidity with extent of resection and cavernous sinus invasion in sphenoid wing meningiomas. *J Neuro Surg B Skull Base* 2012;73(1):76-83.

Ivan ME, Sughrue ME, Clark AJ, Kane AJ, Aranda D, Barani IJ, Parsa AT. A meta-analysis of tumor control rates and treatment-related morbidity for patients with glomus jugulare tumors. *J Neurosurg* 2011;114(5):1299-305.

focus on faculty



Paul Larson MD, associate professor and vice chair of neurological surgery, has clinical interests in stereotactic and functional neurosurgery, particularly with regard to movement, psychiatric, and auditory disorders. He has been involved in the development and evolution of novel surgical methods for deep brain stimulator

implantation, including frameless techniques and the use of high-field, real-time intraoperative magnetic resonance imaging (MRI). He has significant surgical experience in the use of intraoperative MRI for a number of neurosurgical applications.

During his residency, Dr. Larson was extensively involved in the development of the Norton Hospital intraoperative MRI program, and spent a year in the Speed School of Engineering's Computer Vision and Image Processing Lab studying the basic science of CT and MR image analysis and 3D modeling.

Dr. Larson's research interests include MRI-guided stereotaxis, gene therapy, and the role of the

basal ganglia in auditory perception, particularly phantom auditory disorders such as tinnitus. He is also involved in studies using high-field MR brain imaging for clinical and basic science research.

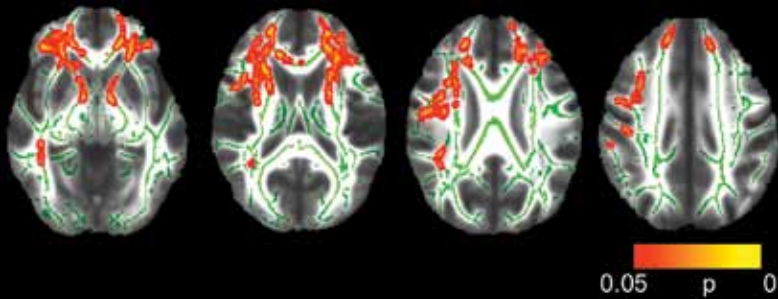
selected publications

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Vega RA, Holloway KL, Larson PS. Image-guided deep brain stimulation. *Neurosurg Clin N Am* 2014;25(1):159-72.

Ostrem JL, Galifianakis NB, Markun LC, Grace JK, Martin AJ, Starr PA, Larson PS. Clinical outcomes of PD patients having bilateral STN DBS using high-field interventional MR-imaging for lead placement. *Clin Neurol Neurosurg* 2013;115(6):708-12.

Larson PS, Cheung SW. A stroke of silence: tinnitus suppression following placement of a deep brain stimulation electrode with infarction in area LC. *J Neurosurg* 2013;118(1):192-4.



Red, orange and yellow regions represent typical areas of white matter injury seen on diffusion tensor imaging (DTI). These DTI patterns, combined with topological data analysis, will help investigators Adam Ferguson and Esther Yuh further define subgroups within the traditional 'mild' traumatic injury population.

Manish Aghi MD, PhD was given the Journal of Neuro-Oncology Award at the 2014 Annual Meeting of the American Association of Neurological Surgeons. He was also given the Society for Neuro-Oncology Young Investigator Award at the Society's annual meeting in November 2013.

Scott Baraban PhD will serve as co-chair of the 2014 Gordon Research Conference on Mechanisms of Epilepsy and Neuronal Synchronization. The conference will take place August 17-22 in West Dover, VT and will provide a forum for presentations of unpublished findings related to basic mechanisms of epilepsy, current translational studies and synchronization of neuronal activity in cerebral networks.

Dr. Baraban was also the recipient of the 2013/14 Sackler Sabbatical Exchange Program from the Raymond and Beverly Sackler Center for Biomedical, Physical and Engineering Sciences. The prestigious program provides support for faculty from UCSF and UC Berkeley to take a sabbatical at the other institution for one year to foster collaboration with colleagues in other fields.

Mitchel Berger MD presented the largest awake craniotomy series ever reported at a plenary session of the American Association of Neurological Surgeons Annual Scientific Meeting on April 6, 2014. The presentation

detailed the optimal protocol for performing awake craniotomies with the lowest failure rate.

Adam Ferguson PhD was awarded a Wings for Life Foundation Grant for the project "Harnessing SCI Big Data to Accelerate Translation." The goal of this project is to drive innovation in biomedical informatics tools for animal-to-human translation. Dr. Ferguson was also awarded a GE NFL Head Health Challenge Grant for work that will use topological analysis of diffusion tensor imaging to diagnose and predict outcome following mild traumatic brain injury.

Praveen Mummaneni MD has been voted Chair Elect of the AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves. The Joint Section also presented Dr. Mummaneni with the Haid Deformity Award, together with Dr. Kai-ming Fu of Weill Cornell Medical College.

Arie Perry MD has been appointed as a Senior Advisor for the next World Health Organization brain tumor classification scheme, scheduled for publication in early 2016.

focus on faculty

selected publications

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Sughrue ME, Rutkowski MJ, Chen CJ, Shangari G, Kane AJ, Parsa AT, Berger MS, **McDermott MW**. Modern surgical outcomes following surgery for sphenoid wing meningiomas. *J Neurosurg* 2013;119(1):86-93.

Caballero JA, Sneed PK, Lamborn KR, Ma L, Denduluri S, Nakamura JL, Barani LJ, **McDermott MW**. Prognostic factors for survival in patients treated with stereotactic radiosurgery for recurrent brain metastases after prior whole brain radiotherapy. *Int J Radiat Oncol Biol Phys* 2012;83(1):303-9.

Sughrue ME, Rutkowski MJ, Shangari G, Fang S, Parsa AT, Berger MS, **McDermott MW**. Incidence, risk factors, and outcome of venous infarction after meningioma surgery in 705 patients. *J Clin Neurosci* 2011;18(5):628-32.

Michael McDermott MD has clinical specialty interests in meningiomas, skull base tumors, gliomas, radiosurgery, and hydrocephalus. He holds several positions in the Department as Professor and Vice-Chairman, the Robert and Ruth Halperin Chair in Meningioma Research, Neurosurgery Residency Program Director, and Co-Director of the UCSF Gamma Knife® Radiosurgery Program. He also practices in the Department's Skull Base Tumor Program, Clinical Neuro-Oncology Program, and Shunt Program for Hydrocephalus in Adults.

Dr. McDermott's research includes basic science studies related to meningiomas and novel agents for treatment. Dr. McDermott's clinical



research is focused on clinical outcomes studies and quality of life for meningiomas and skull base tumors, clinical outcomes for radiosurgery treatment of benign and malignant brain tumors, and he is a participating research clinician in adult glioma clinical trials at UCSF.



U.S. Defense Advanced Research Projects Agency (DARPA) Funds the Center for Neural Engineering and Prosthesis at UCSF-UC Berkeley to Develop Next-Generation Surgical Devices for Neuropsychiatric Disorders

A team of scientists and physicians led by neurosurgeons Edward Chang MD and Philip Starr MD, PhD is launching a \$26 million project, funded by DARPA, to map the human brain circuits that go awry in neuropsychiatric disorders and employ advanced technology to correct these patterns. The technology will improve on current deep brain stimulation (DBS) devices and be applied to the neural networks involved in disorders such as depression, anxiety, and posttraumatic stress disorder. For the first time, scientists and physicians will:

- Use multisite electrode recordings to create a high-resolution map of the human mesolimbic circuitry in both normal patients and those affected by neuropsychiatric disorders.
- Develop an implanted device that can record spatiotemporal patterns of neural activity and stimulate the brain when it detects a pattern of abnormality consistent with the patient's disorder.
- Develop a rehabilitation training environment for patients to use the implanted device to interact with external stimuli for cognitive training.

Program for Caregivers of Patients with Brain Tumors Takes Off

A ribbon cutting ceremony for the Neuro-Oncology Gordon Murray Caregiver Program took place on January 16, 2014. The Neuro-Oncology team celebrated with active supporters of the program, which provides additional support from a dedicated nurse and social worker to family members and caregivers of patients with brain tumors.

Staff members are trained to work with caregivers on specific topics at each stage of the illness. A series

of pre-determined checkpoints for interviews with the patient and caregiver ensures that all needs are being met in a timely manner. The goal of the program is to support caregivers so that they are prepared to help their loved ones through the illness and, in turn, optimize the quality of life for patients during this difficult time.

For more information on the Neuro-Oncology Gordon Murray Caregiver Program, visit: <http://bit.ly/1y4FgHn>.

New Faculty

Internationally renowned physician-scientist **Hideho Okada MD, PhD** has joined the Department of Neurological Surgery to lead the new Brain Tumor Immunotherapy Center. Dr. Okada specializes in CNS immunology and will be leading the development of new brain tumor immunotherapy clinical trials at UCSF.

Neuro-oncologist **Jennie Taylor MD** will join the UCSF Brain Tumor Center following completion of the joint Massachusetts General Hospital, Brigham and Women's Hospital, Dana-Farber Cancer Institute, and Harvard Medical School Neuro-Oncology Fellowship program.

Line Jacques MD will become the Department of Neurological Surgery's new chief of peripheral nerve surgery. In addition to fellowship training in peripheral nerve surgery, Dr. Jacques has research interests in chronic pain. She joins UCSF from the Montreal Neurological Institute and Hospital.

The Department of Neurological Surgery's Community Extension program has grown to include two new physicians. **Peter Zahos MD** has joined the UCSF Neurosurgery Clinic at Queen of the Valley Medical Center in Napa Valley. **Rishi Wadhwa MD** has joined the UCSF Neurosurgery team in Marin, specializing in minimally invasive and complex spine surgery. Both physicians are available for consultation and referrals.



Director of Neuro-Oncology Susan Chang MD, Randi Murray, Margareta Page RN, Program Coordinator Idonah Molina, and Neuro-Oncology Social Worker Judy Patt-Smoker in a new space dedicated for meeting with caregivers of patients with brain tumors.

selected recent publications from the department of neurological surgery

Benet A, Rincon-Torroella J, Lawton MT, González Sánchez JJ. Novel embalming solution for neurosurgical simulation in cadavers. *J Neurosurg* 2014;120(5):1229-37.

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Clarke JL, Molinaro AM, Phillips JJ, Butowski NA, Chang SM, Perry A, Costello JF, Desilva AA, Rabbitt JE, Prados MD. A single-institution phase II trial of radiation, temozolomide, erlotinib, and bevacizumab for initial treatment of glioblastoma. *Neuro Oncol* 2014;16(7):984-90.

Hervey-Jumper SL, Berger MS. Role of surgical resection in low- and high-grade gliomas. *Curr Treat Options Neurol* 2014;16(4):284.

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Lerner RG, Petrisch C. A microRNA-operated switch of asymmetric-to-symmetric cancer stem cell divisions. *Nat Cell Biol* 2014;16(3):212-4.

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Mesgarani N, Cheung C, Johnson K, Chang EF. Phonetic feature encoding in human superior temporal gyrus. *Science* 2014;343(6174):1006-10.

Morganti JM, Jopson TD, Liu S, Gupta N, Rosi S. Cranial irradiation alters the brain's microenvironment and permits CCR2+ macrophage infiltration. *PLoS One* 2014;9(4):e93650.

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