Neurological Surgery Faculty

John Raaf Professor and Chairman
Kim J. Burchiel, M.D., F.A.C.S.

Neurosurgery
Stanley L. Barnwell, M.D., Ph.D.
Kim J. Burchiel, M.D., F.A.C.S.
Justin Cetas, M.D., Ph.D.
Nicholas Coppa, M.D.
Johnny B. Delashaw, Jr., M.D.
Aclan Dogan, M.D.
Edmund H. Frank, M.D., F.A.C.S.
Daniel Guillaume, M.D., M.S.
Andrew N. Nemeczek, M.D.
Edward A. Neuwelt, M.D.
Brian T. Rapel, M.D.
Nathan R. Selden, M.D., Ph.D., F.A.C.S.

Neuroendocrinology
Maria Fleseriu, M.D.

Neurointensivist
Ansgar Brambrink, M.D.

Neuroradiology
Gary Nesbit, M.D.

Neuropsychology
David Gostnell, Ph.D.
Richard Kolbelle, Ph.D., A.B.P.P.

Otolaryngology
Sean O. McMenomey, M.D.

Pain Management
Kim J. Burchiel, M.D., F.A.C.S.

Physician Assistants
Jennifer Bedell, M.S., P.A.-C.
Christine Li, M.S., P.A.-C.
Katie Thompson, M.S., P.A.-C.
Janette Remling, M.S., P.A.-C.

Nurse Practitioners
Wendy O. Domreis, M.S., R.N., C.P.N.P.
Jane Olsen, R.N., C.R.N.P.
Laurie Yablons, M.S., C.P.N.P.
Chris G. Yedinak, M.N., C.F.N.P.

Research
Valerie C. Anderson, Ph.D., M.C.R.
Thomas K. Baumann, Ph.D.
Mary M. Heinricher, Ph.D.

Emeritus Faculty
Harold D. Paxton, M.D.

Administration
Sally Rodgers, M.A., F.C.M.P.E.
Shirley McCartney, Ph.D.
Andy Rekito, M.S.

Chairman’s Message

The generation of new knowledge is one of the core missions of an academic health center. Basic and clinical research endeavors are the means to that end, but you might wonder why neurosurgeons—generally very busy people—would devote time and effort to research. There are several reasons why neurosurgeons are in a particularly advantageous position to identify and explore areas of study that advance patient care, and our knowledge of the human nervous system.

First, neurosurgeons have unique access to the nervous system. Computer modeling and laboratory investigation can only go so far to answer questions in neurobiology. Eventually pathological conditions must be explored in patients, hypothesis need to be confirmed or rejected, and new therapies tested. Examples abound in our department.

- Dr. Nathan Selden, completed the first genetically engineered stem cell transplantation in a human here two years ago, for an inborn error of lipid metabolism, Batten disease. A series of pediatric patients have now undergone these implants in the brain, and the initial results are encouraging.
- Microelectrode recording of individual neurons is used to identify brain centers for implantation of deep brain stimulation (DBS) electrodes. The effects of DBS on neurons within these centers have been a mystery. A study conducted by Dr. Kim Burchiel showed that contrary to current wisdom, DBS does not inhibit these neurons, but rather it changes their firing patterns, i.e., changes their message. The results were recently published in the prestigious Journal of Neurophysiology.
- Dr. Johnny Delashaw and his skull base team have developed modifications of the orbito-zygomatic craniotomy.
- The New England Journal of Medicine recently published an article based on a multi-institutional study of DBS for Parkinson’s disease. Dr. Burchiel was involved in the original planning of this study, was a co-investigator at OHSU, and an author of the NEJM publication.

Second, neurosurgeons also have a unique perspective on diseases of the nervous system. Conditions, which are uncommon in the general population, such as brain tumors, trigeminal neuralgia, aneurismal subarachnoid hemorrhage, and pituitary tumors, are common in neurosurgical practice. It is only through neurosurgical focus on these disorders, which have a dramatic impact on individual patients that progress can be made. Otherwise, these disorders inspire little general research interest, since they have relatively little impact on overall public health. How has our department moved this research forward?

Some examples:
- Dr. Dan Guillaume and Dr. Ed Neuwell have recently published their experience with blood-brain barrier disruption-mediated chemotherapy for oligodendroglioma, a primary brain tumor.
- Dr. Kim Burchiel and his team have published extensively on the diagnosis, imaging and treatment of facial pain, particularly trigeminal neuralgia.
- Dr. Maria Fleseriu has developed new paradigms for testing patients with suspected tumors of the pituitary gland.

Third, neurosurgeons also have a unique perspective, and approach, to more common conditions affecting large populations of patients, such as pain and dementia. In this way, neurosurgical research can contribute to the combined efforts of many types of investigators:
- Dr. Mary Heinricher and colleagues continue to define the nature of the descending pain control system located in the rostroventral medulla (RVM).
- Working with Dr. Heinricher, Dr. Nate Selden has described the host of neurotransmitters within the RVM, and their specific roles in the pain control system.
- Dr. Valerie Anderson has continued her work on imaging, with a description of changes in the thalamus in patients with Alzheimer’s disease.
- A full listing of basic and clinical research publications can be found at www.ohsu.edu/neurosurgery.

Thus, the unique perspectives of neurosurgeons are crucial for a vigorous research program in neuroscience. The department proudly participates in the efforts of the OHSU Brain Institute (OBI), one of the top neuroscience research consortia in the country, and will continue to support the growth of basic and clinical research at OHSU. We believe that research is a vital part of our academic mission. Moreover, in generating new knowledge, we hope also be able to apply this knowledge in our clinical practices. This commitment is consistent with our institutional vision that speaks to the ultimate application of our research products:

The knowledge of all, for the care of one.
Neurological Surgery’s Medical Illustrator

Five times in the last four years the editors of the American Association of Neurological Surgeons’ *Journal of Neurosurgery* have chosen to grace the cover of their publication with the artwork of prize-winning medical illustrator Andy Rekito, MS, Instructor, Department of Neurological Surgery. His peers in the national Association of Medical Illustrators (AMI) have honored him with ten awards since 2001. This summer he will be in the spotlight again when the AMI holds its 65th annual meeting in Portland (July 28-August 1) for which he is helping to arrange neuroanatomy-based lectures and presentations by surgeons from his department, including a day-long skull base surgery workshop, led by Johnny B. Delashaw, MD, Professor.

If a picture is worth a thousand words, Andy’s four-color illustrations are pure gold, which is why he’s kept busy on a steady stream of assignments, providing images for medical journal articles and book chapters that faculty members of his department are writing, as visual aids for lectures they are planning, or a variety of other uses. The projects run the gamut from novel case studies and descriptions of anatomic anomalies to new surgical approaches or an explanatory piece by a surgeon with expertise in a particular procedure. There’s a lot of back and forth with the surgeons he works with. Sometimes he’ll be invited to observe procedures in the OR, snap photographs and take detailed notes, or he’ll get after-the-fact descriptions. “They’ll say: ‘We removed this rib and that section of the vertebra to get to the tumor, which was in this part of the spine.’ And I’ll ask: ‘Do you want to show that you avoided that certain piece of vasculature, or that you had to go around that bone? What are the main teaching points? What amount of surrounding anatomy do we really need to view? Can we just have a vertebral column and spinal cord floating in space or do we need to see the skin incision, muscle retraction and the rest of the surgical exposure?’” Then he’ll produce thumbnail sketches to make sure he’s on track with their thinking before doing the final drawings.

Andy’s boyhood ambition was to be a painter or comic book illustrator, but the seed that ultimately bloomed into a career was planted by a high school science teacher who was taken by his drawings. The high school, as it happens, was in Augusta, Ga., site of the Medical College of Georgia (MCG) – one of the handful of institutions in the country with a graduate program in medical illustration – and Andy’s teacher urged him to look into it. He did, but at that point he wasn’t sure it would be “creatively satisfying.” It wasn’t until he crossed paths as an art major at the University of Georgia in Athens, GA, with a professor named Gene Wright that the idea really began to take hold. Wright, a practicing medical illustrator on the side, taught watercolors and ran a program called “scientific illustration,” which involved illustrating plant studies, animals, insects, and other non-medical scientific concepts. That became Andy’s major. After earning his fine arts degree, he went on to MCG’s two-and-a-half year graduate program in medical illustration where students learn advanced illustration techniques and the necessary medical science concepts by taking anatomy and physiology classes alongside first year medical students.

He worked as an illustrator in the department of neurosurgery at MCG after graduating and then as an assistant adjunct professor in the departments of neurosurgery, neurology, and medical illustration there. Drawn by the Pacific Northwest and a love for outdoor pursuits, he relocated to Portland and met with Department of Neurological Surgery Chair Kim Burchiel, MD, FACS, who was intrigued at the prospect of hiring Andy to bolster the educational and academic missions and to create a distinct visual identity for the department. “Recruiting Andy to our department was the proverbial ‘no-brainer,’ if you’ll excuse the expression. His work is so creative and elegantly presented, I felt that he would represent a tremendous asset to our group, our publication and teaching programs, and our public persona. I haven’t been disappointed.”

Since 2005, the combined efforts of department editor, Shirley McCartney, PhD, and Andy have helped the department continually increase its annual publication output and build a national reputation for the quality of its publications. “I get to be creative,” he says; “I love making images, I love telling a story as simply and cleanly and effectively as I can, and my story happens to be medical concepts, whether it is anatomical, surgical or physiological.”

Originally published in the OHSU School of Medicine Dean’s Newsletter April 2010

www.ohsu.edu/xd/education/schools/school-of-medicine/about/rekito-42710.cfm
Neurological Surgery Research Funding Updates

National Institutes on Aging Research Career Development Award (K-Award) awarded to Valerie Anderson, PhD, MCR

Quantitative Measurement of Cerebrovascular Permeability in Early Dementia
✓ Alzheimer’s disease (AD) is the most common form of dementia in the elderly.
✓ The experiments described in Dr. Anderson’s funded grant will attempt to map the microvasculature of healthy aged and early AD brain.
✓ The experiments should provide important understanding and insights into the transition from a healthy aging brain to dementia.

Cerebrovascular refers to blood flow in the brain
cerebro refers to the large part of the brain
vascular means arteries and veins

Alzheimer’s disease (AD) is the most common form of dementia in the elderly. Although usually thought of as a disease associated with “neurofibrillary tangles” and “amyloid plaques”, cerebrovascular structure and function is profoundly altered in AD, and this may contribute directly to the disease process. Since vascular dysfunction often precedes thought process impairment, understanding the role of vascular abnormalities in the development of AD is critical to rational treatment of the disease.

Dynamic contrast-enhanced MR imaging (DCE-MRI) provides quantitative measures of vessel integrity in the living human brain. Using ultra-high field (7 Tesla) MRI (magnetic resonance imaging), Dr. Anderson will utilize this highly precise and accurate imaging technique to look at the finer details of human brain blood vessels in healthy aging and early AD subjects. She will measure the time course and movement of water and other agents into, through, and out of the healthy aged and early AD brain. From these, she will be able to construct detailed maps of the brain derived from these measurements.

This knowledge should improve our understanding of the transition from a healthy aging brain to dementia and potentially reveal new imaging biomarkers for early AD.

The National Institutes on Aging (NIA)
NIA’s mission is to:
• Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
• Foster the development of research and clinician scientists in aging.
• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.
Project Start: 30-Sep-2009 Project End: 31-Aug-2013

The National Institutes of Health Award (R01) awarded to Mary Heinricher, PhD

Medullary Circuitry of Pain Facilitation
✓ The development of new approaches to manage persistent pain is critical.
✓ The experiments described in Dr. Heinricher’s funded grant will attempt to figure out exactly how activity-dependent changes in the properties and relationships of “ON-cells” and “OFF-cells” contribute to abnormal pain following nerve injury and during chronic inflammation.
✓ The experiments should provide new knowledge on how brainstem pain-modulating systems function.

nociception refers to perception of a painful stimulus
“ON-cells” exert a net facilitating influence on nociception
“OFF-cells” have a net inhibitory action on nociception

Scientific investigators interested in pain and analgesia are increasingly drawn to study not only acute pain mechanisms but to study those processes that give rise to persistent pain states.

There is now clear functional evidence that brainstem pain modulatory systems contribute to persistent pain associated with nerve injury and inflammation. The best characterized modulatory system has important links in the midbrain periaqueductal gray and rostral ventromedial medulla (RVM), and is recruited to enhance or inhibit nociception under different conditions. The present proposal focuses on the RVM.

Over the last ten years, Dr. Heinricher’s laboratory has demonstrated that pain-inhibiting and pain-facilitating influences from the RVM are mediated by two classes of neurons, “ON-cells,” which exert a net facilitating influence on nociception, and “OFF-cells,” which have a net inhibitory action. The overarching goal of this proposal is to understand how activity-dependent changes in the properties and relationships of these neurons contribute to abnormal pain following nerve injury and during chronic inflammation.

Using a combination of single-cell recording, behavioral pharmacology, and immunohistochemistry, the proposed experiments will test whether changes in the mechanical thresholds of ON- and OFF-cells in nerve-injured animals are important for behavioral hypersensitivity, attempt to relate sensitization of RVM neurons following nerve injury to activation of extracellular signal-related kinases in specific RVM cell classes, and contrast changes in RVM neurons during chronic inflammation with those seen following nerve injury.

Dr. Heinricher’s proposed experiments should advance knowledge of ways in which the function of the rostral ventromedial medulla can be altered in chronic pain states, which may be distinct in inflammation and nerve injury. This information is fundamental to understanding how brainstem pain-modulating systems are brought into play in response to internal and external homeostatic challenges, and critical to the development of new approaches to management of persistent pain.

The National Institute of Neurological Disorders and Stroke
The mission of NINDS is to reduce the burden of neurological disease - a burden borne by every age group, by every segment of society, by people all over the world.
I am proud to welcome the two newest members of the Residency Training Program in Neurological Surgery at OHSU. Both of our new surgeons were highly competitive candidates in the national neurosurgery match and both rotated as visiting sub-interns on our service, a testament to the collegial and educational nature of the service they experienced.

Priscilla Pang, MD, MS
Priscilla Pang is a senior medical student at Case Western University, Cleveland, OH, who also holds a Master of Science degree from Case in applied anatomy. Her research interests have included molecular mechanisms of neural protection and empiric antibiotic utilization in the clinical setting. While an undergraduate at Johns Hopkins University, she was a nationally competitive cyclist. She also enjoys rock climbing.

Abigail Rao, MD
Abigail Rao is a senior medical student at Brown University, Providence, RI. As a Howard Hughes Research Scholar, she had worked at the National Institute of Child Health and Human Development on hippocampal dendritic potassium channels. As an undergraduate at the University of Wisconsin, Madison, WI, she studied the expression of nestin in neural stem cells. She has served in the Big Sisters program and enjoys travelling with her family.

Please join me in welcoming these outstanding trainees to the OHSU Neurological Surgery Residency Program and Oregon for the next seven years!

New Physician Asistant
The OHSU Department of Neurological Surgery is pleased to welcome physician assistant, Jennifer Bedell to our team.

Physicians assistants (PAs) are often referred to as mid-level providers. They are highly trained members of our neurological surgery health care team who practice medicine with the supervision of licensed physicians, providing patients with a wide range of services that would otherwise be performed by physicians. Specific duties are defined by state regulation and practice setting, but include a variety of both diagnostic and therapeutic procedures.

Jennifer Bedell, PA-C, MS, graduated from Texas A&M University College Station, Texas with a bachelor of science in kinesiology in 2006. Subsequently, Jennifer graduated from the University of Texas Southwestern Medical Center, Dallas, Texas with a master of physician assistant practice in 2009.

Jennifer will work directly with Dr. Burchiel in his movement disorder and pain neurosurgical clinics.

Education Funding and Awards
Cameron Foundation Gives Back - Again!
The Cameron Family has generously supported the research in Dr. Selden’s laboratory with a second gift of $50,000 that funds the investigation of ways a child’s brain can decrease the impact of pain from trauma or surgery. Like many physician-researchers at Doernbecher Children’s Hospital, Dr. Selden brings new therapies and treatments to children to improve the quality of their lives.

N.L. Tartar Trust Awards to Neurological Surgery Student Interest Group students
$2,000 was awarded to Daniel Cleary, (MD/PhD student). Project: Descending Modulation in Chronic Inflammatory Pain. The Tartar fellowship will allow Daniel to travel to academic meetings on pain. Laboratory: Mary Heinricher, PhD, OHSU Neurological Surgery

$2,000 was awarded to Dominic Siler, (MD/PhD student). Project: Optical microangiography to study microvessels in subarachnoid hemorrhage. The Tartar fellowship will fund several courses offered by Mathworks to train Dominic on Matlab fundamentals and signal processing. Laboratory: Nabil Alkayed, MD, OHSU Anesthesiology

Mensa Scholarship
The Mensa Education & Research Foundation college scholarship program bases its awards on essays written by the applicants. Daniel Cleary, (MD/PhD student) was awarded the J.F. Shirmer Scholarship of $1000 to help fund his goal of becoming an academic neurosurgeon.

Alumni Update - 2010 Chiefs Move On
Zachary Litvack, MD, MS, will be the 2010-2011 Pituitary/Anterior Skull Base Fellow at the Brigham and Womens Hospital in Boston, MA. He will be studying endoscopic neurosurgery with Ed Laws, MD.

Jason Weinstein, MD, has accepted a position with Northwest Permanente in Portland. Dr. Weinstein’s clinical interests are general neurosurgery, epilepsy and advanced imaging.

The faculty and staff congratulate them and wish them well.
Announcements

Professional Award
Maria Fleseriu, MD, assistant professor, Department of Medicine & Neurological Surgery, was recently promoted to Fellow of the American College of Endocrinology (FACE) in recognition of her high standards of excellence and achievement in endocrinology and quality of care given to her patients. According to the American College of Endocrinology (ACE), promotion is based on an expanding scientific reputation and contributions to the ACE.

OHSU Labor Management Committee
Sally Rodgers, MA, CMPE, was appointed to the OHSU Labor Management Committee. The 12 member LMC have attended a comprehensive two-day training, have developed the group’s charter and are beginning to assess needs and priorities in the OHSU workplace. The LMC is inviting feedback on their needs assessment; to contribute ideas on workplace improvements that affect employees across OHSU. Employees are encouraged to e-mail the LMC members who represent their mission area.

Visiting High School Students
Three high school students will participate in research projects this summer. One student from Catlin Gabel will work on a clinical retrospective pituitary project with Drs. Cetas and Delashaw and two students from Lake Oswego will study in the neurological surgery research laboratories with Dr. Heinricher.

4th Campagna Scholar in Neurological Surgery
The Campagna scholar selected for the summer of 2010 is Ms. Susan Wozniak, a 2nd year student at Texas Tech University Health Sciences Center (TTUHSC), School of Medicine, Lubbock, TX.

Ms. Wozniak holds a Bachelor of Arts in foreign languages (Spanish and German) and a Bachelor of Science (Biochemistry and Microbiology) from Texas Tech University Honors College, Lubbock, TX. As an undergraduate, she earned an honors endowed scholarship, a Howard Hughes Medical Research Scholarship, made the Dean’s list in each of her four years, and was a member of Phi Beta Kappa. She is enrolled in the joint MD/MBA (Health Organization Management) program at TTUHSC, School of Medicine. Her interest in medical administration has led to work in the TTUHSC Free Clinic and to an internship re-designing the physician re-accreditation system for Covenant Health Care, Saginaw, MI. At OHSU, Ms. Wozniak will pursue research in clinical neurosurgery and will participate in the activities of the neurological surgery clinical service, specifically epilepsy projects with Drs. Selden and Roberts (Neurology).

Neurological Surgery faculty participate in the national Association of Medical Illustrators (AMI) annual meeting, Portland OR, July 28- August 1, 2010.

Skullbase Dissection
Instructor: Johnny B. Delashaw, Jr., MD
At the end of this workshop, attendees will have:
✓ Gained in-depth knowledge of skull base anatomy and neuroanatomy
✓ Learned how and why complex skull base approaches are used based on the nature and location of pathology and the anatomy that must be bypassed to get to them
✓ Gained appreciation for the delicate nature of many neuroanatomical structures and the depth and small corridors of exposures that surgeons must work in to reach these structures
✓ Experienced how bone and brain tissue reacts to surgical instruments and manipulation

Minimally Invasive Neurological Surgery: Visualizing Endoscopic Approaches and Anatomy
Instructors: Daniel Guillaume, MD, MS and Nicholas Coppa, MD

Endoscopic anatomy and minimally invasive approaches to the ventricular system
Dr. Guillaume will discuss how, with technological advances and a trend toward minimal invasiveness in neurosurgery, the neuro-endoscope has emerged and now plays a powerful role in the management of many neurosurgical conditions. These include the management of ventricular lesions, treatment of hydrocephalus, and resection of anterior skull base tumors via an endonasal transphenoidal approach. The endoscope improves visualization of anatomical structures with high-resolution cameras and extreme magnification. It also offers an angled perspective that gives a view that is much different from conventional microscope or “naked eye” point of view. This presentation will review ventricular anatomy, comparing anatomic views as imaged by the microscope to images obtained from endoscopic cameras, as well presenting common and uncommon endoscopic procedures.

Anterior Skull Base Anatomy: An exocranial perspective during endoscopic surgery
Dr. Coppa will discuss the anatomy of the ventral midline skull base as seen from both an exocranial and endocranial perspective. The surgical strategy of approaching this region endoscopically for common disease processes such as pituitary tumors, cancer of the nasal cavity, and esthesioneuroblastoma will be reviewed. Techniques of endoscopic reconstruction of the skull base will also be discussed. An effort will be made to contrast endoscopic surgery with open skull base surgery while emphasizing the relevant anatomy.

OHSU NW Pituitary Center
Web site updated
www.ohsupituitary.com
Raaf Day and Alumni Reunion

2010 Raaf Professor: Robert Spetzler, MD, FACS

Dr. Robert Spetzler is a world-renowned neurosurgeon who specializes in cerebrovascular disease and skull base tumors. He has been involved in pioneering the technique of hypothermia and cardiac arrest for the treatment of difficult brain lesions. He has been honored many times by professional societies, including the American College of Surgeons and the Congress of Neurological Surgeons.

Saturday, September 25th, 2010
Vey Conference Center (Doernbecher Children’s Hospital –11th Floor)
9:00 am - Deep Cavernous Malformations: How we get there
10:45 am - Defining Excellence in Vascular Neurosurgery

Distinguished Alumni: Hirohisa Ono, MD

Dr. Ono will be honored at the alumni reunion, which will be held on Saturday, September 25th, 6:30 pm at the OHSU, Center for Health & Healing Atrium.

Further details are available at: www.oahsu.edu/neurosurgery. Please contact Joanie Mastrandrea at: mastrand@ohsu.edu or 503-494-6207, with any questions.

Clinical Neuroscience Research

The following clinical research topics have been accepted for presentation at the 2010 Congress of Neurological Surgeons Annual Meeting, October 16 – 21 in San Francisco, California.

2010 CNS Neurosurgical Forum Presentations
PRESENTER: Nathan R. Selden, MD, PhD

TITLE: Modified Orbitozygomatic Craniotomy for Resection of Cranioopharyngiomas in Pediatric Patients
PRESENTER: Nathan R. Selden, MD, PhD

TITLE: Skull-Fixated Fiducial Markers Improve Accuracy in Two-Stage Frameless Stereotactic Epilepsy Surgery
PRESENTER: Eric Thompson, MD

TITLE: Preliminary Safety and Efficacy of Ferumoxytol as an MRI Blood Pool Agent in Pediatric Brain Tumor Imaging
PRESENTER: Eric Thompson, MD

PRESENTER: Hai Sun, MD

2010 CNS Digital Poster
TITLE: Effects of DBS on Precision Grip Abnormalities in Essential Tremor
PRESENTER: Valerie C. Anderson, PhD

Research Funding continued from Page 4...

To support this mission, NINDS:
- Conducts, fosters, coordinates, and guides research on the causes, prevention, diagnosis, and treatment of neurological disorders and stroke, and supports basic research in related scientific areas.
- Provides grants-in-aid to public and private institutions and individuals in fields related to its areas of interest, including research project, program project, and research center grants.
- Operates a program of contracts for the funding of research and research support efforts in selected areas of national need.
- Provides individual and institutional fellowships to increase scientific expertise in neurological fields.
- Conducts a diversified program of intramural and collaborative research in its own laboratories, branches, and clinics.
- Collects and disseminates research information related to neurological disorders.

Research Project Grant (R01)
The Research Project Grant (R01) is the original and historically oldest grant mechanism used by NIH. The R01 provides support for health-related research and development based on the mission of the NIH.

Project Start: 1-May-2010  Project End: 30-Apr-2014

National Research Service Award (NRSA) awarded to Daniel Cleary

Descending Modulation in Chronic Inflammatory Pain

Tissue damage leads to pain. The detection of painful stimuli (nociception) is complex and involves the brainstem, projections to the spinal cord and inhibitory or excitatory effects on spinal cord dorsal horn neurons. The best-studied region involved in modulation of pain response is the rostral ventromedial medulla (RVM). The RVM forms part of a descending pathway that modulates nociceptive neurotransmission at the level of the spinal cord dorsal horn.

The overarching goal of this proposal is to understand the role of changes in RVM neurons during chronic, inflammatory pain. Using a combination of single-cell recording, behavioral pharmacology, and immunohistochemistry, the proposed experiments will test whether changes in the RVM changes neurotransmitters in specific cell types.

These experiments will advance understanding of the role of changes in the RVM in chronic pain and tie those neuronal changes to specific physiological cell classes.

OHSU Neurosciences

OHSU Neurosciences is one of the nation’s leading neurologic research and training programs and provides the most comprehensive care of neurologic illnesses in the Pacific Northwest. Our nationally recognized neurological programs and centers offer comprehensive clinical and surgical services that are available nowhere else in Oregon. Our leading-edge research and clinical trial opportunities ultimately provide new treatment options, earlier detection and improved quality of life for patients.
Publications, 2010


(22 additional articles are in press)