NINDS CLINICAL FELLOWSHIP PROGRAMS

The NINDS intramural clinical program on the NIH campus in Bethesda, Maryland offers a unique training and research environment for clinicians interested in becoming physician-scientists. The campus has over 10,000 scientists who work in basic science laboratories and clinical branches of the numerous NIH institutes and centers. The campus houses the Clinical Center, a 240-bed hospital dedicated solely to research. A fellowship at the NINDS will provide the building blocks needed to become an academic leader in neurology or neurosurgery. NINDS offers extensive training in many subspecialty areas for both clinical and basic research.

Clinical subspecialty areas of research include: neuroimmunology; neurovirology; neurogenetics; movement disorders; stroke; neurorehabilitation; cognitive neuroscience; surgical neurology; neurocardiology; neuroradiology and autonomic disorders; epilepsy; clinical neurophysiology; and clinical trials methodology.

Basic science disciplines include: structural biology and biophysics; neurogenetics; cell and molecular biology of the nervous system; developmental neurobiology; synapses/circuit/systems neuroscience; cellular physiology; bioinformatics; stem cells and neural differentiation; and membrane and receptor pharmacology.

NINDS has several core facilities that include a Translational Neuroscience Center which has units for drug screening and medicinal chemistry, a neuropathology unit, a clinical proteomics unit, a clinical trials unit, biostatistics, and a neural differentiation unit. Other cores have a transgenic laboratory, animal imaging, electron microscopy and bioengineering facilities. NINDS has developed several novel in vitro and in vivo imaging instruments.
Physicians who have finished residency training in neurology and enter an NINDS clinical fellowship will obtain expertise in many different aspects of disease-oriented research from basic questions addressing the etiology of the disease to the design and conduct of clinical trials. The breadth and diversity of resources available allow the Fellows to design specific training experiences to suit their career goals. Access to many disciplines on campus builds cross-disciplinary collaborations and strengthens the development of translational research projects. Class work provides career/professional developmental programming throughout the training experience. NINDS has a variety of specialized seminar series, translational research working groups and Neurology Grand Rounds. Fellows can also participate in weekly neurology consult rounds. Collectively, they provide unique training opportunities not available at other academic centers. The Fellows are advised to establish a mentorship committee to help guide their training and career development.

Physicians who are pursuing or have finished residency training in neurosurgery are also welcome to apply for clinical fellowships.

Applications should be made to the Clinical Director at NINDSClinicalDirector@ninds.nih.gov or directly to specific faculty, as listed in the following paragraphs. To foster cross-disciplinary research additional positions will be funded through the Office of the Clinical Director.
This program trains Fellows in clinical and bench research as it relates to a variety of neuroimmune and virological disorders. Clinical research consists of natural history studies, development of novel biomarkers of disease activity, and therapeutic intervention using pharmacologic and biological approaches. Major emphasis is on clinical immunology and novel neuroradiological techniques. Bench research is largely focused on understanding disease pathophysiology but also includes novel pathogen discovery and drug development. The program has developed several disease models that include in vitro human brain models, iPS cells, rodent and simian models, and uses a variety of techniques such as intravital imaging, multicolor imaging flow cytometry, mass spectrometry and animal positron emission tomography (PET) and MRI scanning.

Areas of Current Research

- Multiple sclerosis
- Progressive multifocal leukoencephalopathy (PML)
- HTLV-I associated myelopathy/Tropical spastic paraparesis (HAM/TSP)
- Human herpesvirus-6 associated neurologic disease
- Lymphochoriomeningitis virus
- Neurological complications of HIV infection
- Undiagnosed neuroimmune disorders
- Viral/autoimmune encephalitis
- Neurological complications post-bone marrow transplant
The mission of the Neurogenetics Branch is to reduce the burden of disease in patients with hereditary neurological disease. Fellows have the opportunity to study basic disease mechanisms using different model systems. These include various techniques in genomics, generation of inducible pluripotent stem cells and animal models. The Fellows also have the opportunity to participate in conducting and designing therapeutic clinical trials using pharmacological and biological approaches. The Branch follows a number of cohorts of patients with genetic illnesses. A genetic outreach program is in place to identify and characterize patients, families, and children with both new and previously known hereditary neurological diseases.
Movement Disorders

Program Duration: 2–5 years

Areas of Current Research

- Huntington’s disease
- Kennedy’s disease
- Spinocerebellar ataxia
- Spinal muscular atrophy
- Hereditary motor neuron disease
- Early onset muscle disorders
- Charcot-Marie-Tooth neuropathies
- Hereditary spastic paraplegias
- Friedreich’s ataxia
- Muscular dystrophies (Duchenne and LGMD)
- Congenital muscular dystrophies and myopathies

Faculty

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Ami Mankodi, M.D., Assistant Clinical Investigator, Neurogenetics Branch, ami.mankodi@nih.gov
Bryan Traynor, M.D., Ph.D., Neuromuscular Diseases Research Unit, Laboratory of Genetics, NIA, traynorb@mail.nih.gov

The fellowship program in movement disorders has the goal of training neurologists for an academic career with expertise in both clinical management and human-based research in movement disorders.
The general mission of the Human Motor Control Section (HMCS) is to understand the physiology of normal human voluntary movement and the pathophysiology of different movement disorders. The members of the Section work together on the different projects, each bringing special expertise to the tasks. The main techniques employed are transcranial magnetic stimulation (TMS), electroencephalography (EEG), neuroimaging with positron emission tomography (PET) and functional magnetic resonance imaging (fMRI), and other techniques of clinical neurophysiology. A special interest now is the process of movement initiation and volition. Part of the group’s work is to translate physiological insights into therapies, and Fellows will participate in ongoing clinical trials in Parkinson’s disease (PD), dystonia, and essential tremor.

The Parkinson’s disease Clinic follows a population of patients to provide research opportunities to investigators at NIH for various studies. Research is also originated in the Clinic itself. A special interest is in neuroimaging as a biomarker for PD and early phase clinical trials. There is a deep brain stimulation program in association with the Surgical Neurology Branch that includes various disorders as well as a focus on PD. One of the fellowship positions has a special focus on the PD research including deep brain stimulation.

The Botulinum Toxin Clinic includes a large variety of patients that can benefit from therapy with botulinum toxin; it also has an educational focus.

The Fellows gain from exposure to the breadth of research in movement disorders and a wide variety of clinical pathology and management modalities. Upon completion of the fellowship, it is expected that the graduates will demonstrate competitive expertise in selected research techniques, basic and clinical research, clinical management of movement disorders, deep brain stimulation management, and botulinum toxin injections.

**Areas of Current Research**

- Parkinson’s disease
- Dystonia
- Essential tremor
- Tourette’s syndrome
- Psychogenic movement disorders
- Principles of motor control and motor learning
- Other movement disorders

**Faculty**

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Katharine Alter, M.D., Affiliate Physiatrist, Botulinum Toxin Clinic, kalter@mail.nih.gov

Kareem Zaghloul, M.D., Affiliate Neurosurgeon, Deep Brain Stimulation Program, zaghloulka@mail.nih.gov
With a focus on clinical practice and research, the ACGME-accredited Vascular Neurology Fellowship at the NIH/NINDS Stroke Program is designed for neurologists who seek to become experts in the management of cerebrovascular disorders. The program is oriented toward emergency management of stroke with emphasis in neuroimaging, thrombolysis, and other novel therapeutic and diagnostic approaches. The program offers a one-year ACGME accredited fellowship with the opportunity to extend the fellowship for a research-focused second (and possibly third) non-ACGME accredited year for those interested in an academic or research track.

The clinical and research activities of the NIH Stroke Program take place at the NIH Clinical Center, Suburban Hospital (a 239-bed community hospital and a member of Johns Hopkins Medicine located directly across from the NIH Campus), and Washington Hospital Center (a 926-bed academic medical center located in Washington, DC). This unique program design orients the Fellow to the role of vascular neurology in both academic and community hospital settings while providing access to greater diversity in disease etiology.

Both basic and clinical research experience is available. Bench research addresses both the cellular regulation of ischemic tolerance and the inflammatory and immune mechanisms that are acting in the initiation and progression of strokes. Promising agents or interventions for effective prevention or treatment of stroke that emerge from such studies enter a translational path. The clinical research seeks to make scientific advances toward new stroke therapies by developing, validating and testing imaging markers for use in clinical trials and practice. The overall approach is to: (1) investigate early pathobiological events in the evolving lesion in human stroke; (2) identify candidate imaging biomarkers of disease mechanisms or progression that are linked to clinical outcomes and therapeutic efficacy; and (3) use these markers as a basis for innovative clinical trial designs of novel therapeutic approaches in Phase II “proof of principle” trials. The NIH/NINDS Stroke Program is one of only eight Specialized Program of Translational Research in Acute Stroke (SPOTRIAS) sites, a national network of centers that perform early-phase clinical projects, share data, and promote new approaches to acute stroke therapy. As members of this network, the Program’s vascular neurology Fellows have access to experts and opportunities for research collaborations that are unparalleled.
Areas of Current Research

- MRI-guided enhancement of diagnosis and management of Acute Stroke
- Supplementary measures to augment the efficacy, safety, and appropriate use of tPA
- Translational stroke prevention research
- Translational stroke treatment research

Faculty

John Hallenbeck, M.D., Chief, Stroke Branch, john.hallenbeck@nih.gov
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John Lynch, D.O., M.P.H., Staff Clinician, Stroke Diagnostics and Therapeutics Section, lynchj@ninds.nih.gov
Jose Meino, M.D., Vascular Neurologist, John Hopkins Community Physicians, merinoj@ninds.nih.gov
Zurab Nadareishvili, M.D., Medical Director, Suburban Hospital Stroke Center

Neurorehabilitation and Behavioral Neurology

Program Duration: 2–5 years

This is an interactive program that trains Fellows in clinical and bench-to-bedside research focused on understanding mechanisms of behavioral, cognitive and motor disability associated with stroke, traumatic brain injury and neurodegenerative disorders. Fellows study the mechanisms underlying learning and other plastic changes in the human central nervous system in health and disease, the function of the human reward system, and novel therapeutic approaches for recovery of cognitive and motor functions.

FROM LEFT TO RIGHT: DTI in mouse; TMS
Instruction is given on the use of techniques in the context of investigations using transcranial magnetic stimulation (TMS) and direct current (tDCS) stimulation, structural MRI, TMS in combination with fMRI, MR spectroscopy, diffusion tensor imaging (DTI), PET scanning, and magnetoencephalography (MEG). These techniques are learned to understand mechanisms of neuroplasticity and behavioral control and to facilitate human brain function leading to more successful neurorehabilitation and cognitive improvements. Advances in this understanding in healthy volunteers are subsequently applied to patients with neurological conditions such as stroke, dementia, neurodegenerative disorders, and traumatic brain injury (TBI).

**Areas of Current Research**

- Neurorehabilitation of stroke, dementia and TBI
- Motor learning
- The role of the reward system in disorders of cognition, movement, and behavioral control
- Brain-computer interfaces
- Use of cortical stimulation to facilitate cognitive processes
- Natural history and biomarkers of motor neuron disorders

**Faculty**

- Leonardo G. Cohen, M.D., Chief, Human Cortical Physiology and Stroke Neurorehabilitation Section, cohenl@ninds.nih.gov
- Mary Kay Floeter, M.D., Ph.D., Chief, Human Spinal Physiology Unit, floeterm@ninds.nih.gov
- Eric M. Wassermann, M.D., Chief, Behavioral Neurology Unit, wassermanne@ninds.nih.gov

**Surgical Neurology**

**Program Duration: 1–2 years**

The Surgical Neurology Branch offers a basic, translational and clinical research training program for surgeons committed to a career in academic neurosurgery. The program is designed to foster the application of basic science research to the development of clinical neurosurgical treatments. Areas of ongoing research in the Branch include studies relating to...
primary brain tumors, pituitary tumors, syringomyelia, drug delivery to the central nervous system, development of surgical technology/techniques, cell death in neurologic disorders and functional neurosurgery (including Parkinson’s disease, dystonia, psychiatric disorders and epilepsy surgery).

The Surgical Neurology Branch offers a one- or two-year combined basic science and clinical fellowship. The principal goal of the fellowship is to develop expertise for identifying basic scientific questions that underlie clinical problems and for formulating and testing hypotheses that address these questions. The Branch’s resources are uniquely suited to advancing research from the laboratory to the clinic. Fellows are active participants in both the laboratory, translational, and clinical phases of research projects. The Surgical Neurology Branch laboratories and clinical facilities are located in the basic science facilities and Clinical Center on the NIH campus in Bethesda, Maryland.

Areas of Current Research

- Chiari malformation
- Cognitive neuroscience
- Deep brain stimulation
- Drug delivery
- Epilepsy
- Gene therapy for neurologic disorders
- Gliomas
- Mechanisms of cell death in neurologic disorders
- Neurofibromatosis type 2
- Neuroimaging
- Neurophysiology
- Pituitary adenomas
- Stem cells in disease
- Syringomyelia
- von Hippel-Lindau disease

Faculty

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Prashant Chittiboina, M.D., Staff Clinician, Surgical Neurology Branch, chittiboinap@ninds.nih.gov
John Park, M.D., Ph.D., Chief, Surgical and Molecular Neuro-Oncology Unit, parkjo@mail.nih.gov
Richard Youle, Ph.D., Chief, Biochemistry Section, youler@ninds.nih.gov
Kareem Zaghloul, M.D., Ph.D., Staff Clinician, Surgical Neurology Branch, zaghoulka@mail.nih.gov
Zhengping Zhuang, M.D., Ph.D., Staff Scientist, Surgical Neurology Branch, zhuangp@ninds.nih.gov
This program trains Fellows in patient-oriented and bench research related to disorders of the autonomic nervous system and of catecholamine systems in the brain and periphery and more generally to scientific integrative medicine (SIM). SIM is a way of thinking that applies systems concepts (e.g., stability by negative feedback regulation, multiple effectors, effector sharing, instability by positive feedback loops, allostasis, allostatic load) to acute and chronic disorders of regulation. The clinical research consists of developing and testing diagnostic and pathophysiologic biomarkers, natural history studies, and pathophysiologically relevant therapeutic interventions. Major emphasis is on disorders of catecholamine systems such as Parkinson’s disease (PD) and other synucleinopathies, evaluated by physiological, pharmacologic, neurochemical, and neuroimaging approaches. Bench research is largely focused on cellular and tissue indices of pathophysiology and novel therapeutics for catecholamine-related disorders. The program uses a variety of clinical assessment techniques such as physiological autonomic function testing, catecholamine neurochemistry, and visualization of catecholaminergic innervation by positron emission tomography (PET) scanning.

Areas of Current Research

- Diagnostic biomarkers and mechanisms of loss of catecholaminergic neurons in the brain and periphery in PD and related disorders
- Relationships of catecholamine systems to non-motor and pre-motor aspects of PD
- Clinical laboratory evaluation and natural history of chronic autonomic failure
- Experimental therapeutics of neurogenic orthostatic hypotension
- Clinical autonomic function testing
- Collaborative clinical and preclinical studies of catecholamine systems

Faculty

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Irwin J. Kopin, M.D., Scientist Emeritus, kopini@ninds.nih.gov
The Clinical Epilepsy Section (CES) offers an integrated two-year program in collaboration with the EEG Laboratory. In the year spent in the CES, Fellows have primary responsibility for the care of patients studied on the video-EEG monitoring unit. They evaluate new patients in the outpatient clinic and follow selected patients. They participate in research on surgical evaluation, antiepileptic drug trials, PET, fMRI, and magnetoencephalography (MEG). In the year spent in the EEG Laboratory, Fellows receive formal training in EEG, evoked potentials, and polysomnography. The second year is affiliated with the Walter Reed National Military Medical Center and Children’s National Medical Center, fulfills requirements for the American Board of Psychiatry and Neurology Added Qualification in Clinical Neurophysiology.

Areas of Current Research

- fMRI studies of language and memory in epilepsy
- PET imaging of inflammation, as well as serotonin and benzodiazepine receptors
- MEG for seizure focus localization
- Antiepileptic drug trials using novel agents
- Convection-enhanced delivery of muscimol to treat epilepsy
- Electrophysiological (ECoG and single unit activity) correlates of cognition and behavior
- Decoding electrophysiological seizure markers and predictors

Faculty

William H. Theodore, M.D., Chief, Clinical Epilepsy Section, theodorw@ninds.nih.gov

William D. Gaillard, M.D., Child Neurologist, Clinical Epilepsy Section, gaillardw@ninds.nih.gov

John Heiss, M.D., Staff Clinician, Surgical Neurology Branch, heissj@ninds.nih.gov

Sara Inati, M.D., Chief, Electroencephalography Section, inatisk@mail.nih.gov

Kareem Zaghloul, M.D., Staff Clinician, Surgical Neurology Branch zaghloulka@mail.nih.gov
Clinical Neurophysiology (EEG/EMG)

Program Duration: 1 year

This is an ACGME-accredited fellowship that provides eligibility for the American Board of Psychiatry and Neurology Certification Examination in the subspeciality of Clinical Neurophysiology. The program is approved to enroll two Fellows each year: one position in an EEG-predominant track (EEG Section) and one position in an EMG-predominant track (EMG Section). Fellows receive practical and didactic training in a wide variety of physiological techniques used in diagnosis and clinical research, and participate in the daily performance and interpretation of EEG and EMG studies on inpatients and outpatients. Fellows evaluate a broad spectrum of patients through rotations at three institutions: the NIH Clinical Center, Walter Reed National Military Medical Center, and Children’s National Medical Center. Fellows in the EEG-predominant track will gain experience in the presurgical evaluation of epilepsy patients, intraoperative monitoring, long-term noninvasive monitoring, and invasive monitoring as well as magnetoencephalography. Fellows in the EEG track are chosen in conjunction with the Epilepsy Fellowship. The EMG-predominant track offers Fellows opportunities to learn autonomic testing, transcranial magnetic stimulation, and the use of botulinum injections in movement disorders. The EEG-predominant track position is offered as part of an integrated two-year program in collaboration with the Clinical Epilepsy Section. Applicants for the EMG-predominant track can consider combining this 1-year fellowship with fellowships in other areas of clinical research. Completion of an ACGME-accredited neurology residency program and a valid, unrestricted U.S. license are required.

Areas of Current Research

• Functional and structural neuroimaging including Magnetoencephalography in epilepsy and epilepsy surgery
• Outcome measures in neuromuscular disorders

Faculty

Mary Kay Floeter, M.D., Ph.D., Chief, Electromyography Section, floeterm@ninds.nih.gov
Sara Inati, M.D., Associated Program Director, Chief, Electroencephalography Section, inatisk@ninds.nih.gov
Tanya Lehky, M.D., Program Director, Electromyography Section, lehkyt@ninds.nih.gov
The NINDS intramural program has a strong imaging program from basic molecular imaging to human studies. In addition to imaging for specific diseases there is an active MRI development program, as well as support for excellent facilities for both human and animal imaging. Active studies include technical developments in MRI to extend spatial resolution by developing very high-field MRI for humans and animal models as well as novel detectors. In addition there is interest in understanding important MRI contrast such as the significance of “resting state” fMRI fluctuations and the relation of functional MRI to neuronal architecture. Finally new contrast mechanisms such as phase contrast MRI, manganese enhanced MRI, and cell and molecular imaging techniques are being developed. These new MRI advances are rapidly translated to clinical studies of the structural anatomy, tissue metabolism, tissue perfusion, and blood oxygenation level-dependent (BOLD) contrast in both normal and diseased human brains. For clinicians interested in applications of imaging to research in neurological disorders, this fellowship offers an opportunity for combined training in advanced imaging techniques with a clinical focus. Clinical Fellows are encouraged to develop collaborative projects with a mentor from among the neuroimaging faculty and a relevant clinical investigator in a specific disease area. This offers the unique opportunity to translate new MRI techniques to a specific disease and to translate new information about neurological disorders to inspire new imaging techniques.

Areas of Current Research

- For information regarding current research areas visit: http://www.lfmi.ninds.nih.gov/.

Faculty

Daniel Reich, M.D., Ph.D., Program Director, Translational Neuroradiology Unit, reichs@ninds.nih.gov

Jeff Duyn, Ph.D., Chief, Advanced MRI Section, jhd@helix.nih.gov

Alan Koretsky, Ph.D., Chief, LFMI, koretsky@ninds.nih.gov

Larry Latour, Ph.D., Staff Scientist, Section on Stroke Diagnostics and Therapeutics, latourl@ninds.nih.gov

Afonso Silva, Ph.D., Chief, Cerebral Microcirculation Section, as378c@nih.gov
Clinical Trial Methodology

Program Duration: 1–2 years

The Division of Neurology Products (DNP), U.S. Food and Drug Administration (FDA), and the Office of Clinical Research (OCR) are offering a Clinical Trial Methodology and Regulatory Science Fellowship. Expanding the opportunities to large, multi-center trials, the fellows will participate in activities related to the planning and regulation of multi-center trials funded by the NINDS extramural program and regulated by the FDA. Working with the directors of the DNP and OCR, the Fellow will receive training in all aspects of clinical trials including concept evaluation, protocol development, statistical design, trial implementation, safety monitoring, ethical considerations, and regulatory sciences. During the first year, the emphasis will be on acquiring the basic skills necessary for the conduct of clinical research with most activities taking place at NIH along with early exposure to the FDA environment. During the second year, increasing independence in clinical research will be accompanied by more intensive participation in the full spectrum of activities in DNP, ranging from pre-investigational discussions with clinical investigators about first-in-human drug trials to analysis of complicated multi-center trials leading to possible approval of new medical products. In addition, Fellows will engage in implementing a clinical research project at the NIH Clinical Center and participate in a weekly subspecialty clinic of their choice. The program is customized but generally will include coursework on clinical research methodology and statistics. This fellowship is suitable for physicians or neuroscientists with a strong interest in clinical research and is particularly suited to those who already have some research experience.

Faculty

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NINDS BASIC CLINICAL TRANSLATIONAL RESEARCH FELLOWSHIPS

This combined fellowship is an individualized fellowship program aimed at M.D.s or M.D./Ph.D.s interested in basic research applicable to neurological diseases. The program is intended for clinicians with basic laboratory experience who wish to gain further training in laboratory-based research while improving clinical skills or for clinicians interested in emerging disciplines in neurological clinical research, such as neuroimaging. The successful candidate will spend the majority of time in basic research with a mentor, but will spend one day each week in clinical activities, such as working in a specialty clinic with a clinical supervisor and attending rounds and clinical conferences. Interested applicants should identify
potentially mentors from the NINDS faculty list and send an outline of their career goals, along
with a curriculum vita, addressed to the NINDS Clinical Director at NINDSClinicalDirector@ninds.nih.gov. Applications will be evaluated for programmatic and scientific appropriateness by the Scientific and Clinical Directors.

**Laboratories in the Basic Neurosciences Program include:**

- Advanced MRI Section, Josef Duyn, Ph.D.
- Analytical Cell Biology Section, Brian Andrews, Ph.D.
- Axon Guidance and Neural Connectivity Unit, Edward Giniger, Ph.D.
- Cell Biology and Biophysics Unit, Antonina Roll-Mecak, Ph.D.
- Cellular and Developmental Neurobiology Section, Susan Wray, Ph.D.
- Cellular and Systems Neurobiology Section, Jeffrey Smith, Ph.D.
- Cellular Neurophysiology Unit, Zayd Khaliq, Ph.D.
- Cerebral Microcirculation Section, Afonso Silva, Ph.D.
- Channel Biophysics Unit, John Clay, Ph.D.
- Circuit Dynamics and Connectivity Unit, Kevin Briggman, Ph.D.
- Dendrite Morphogenesis and Plasticity Unit, Quan Yuan, Ph.D.
- Developmental Biology Section, Carolyn Smith, Ph.D.
- Developmental Neural Plasticity Section, Leonardo Belluscio, Ph.D.
- Developmental Neurobiology Section, Michael O’Donovan, M.D., Ph.D.
- Laboratory of Functional and Molecular Imaging, Alan Koretsky, Ph.D.
- Laboratory of Molecular Medicine and Neuroscience, Eugene Major, Ph.D.
- Membrane Protein Structure and Function Unit, Reinhard Grisshammer, Ph.D.
- Membrane Transport Biophysics Section, Joseph Mindell, M.D., Ph.D.
- Molecular Neuropharmacology Section, David Sibley, Ph.D.
- Molecular Neurophysiology Section, Miquel Holmgren, Ph.D.
- Molecular Physiology and Biophysics Section, Kenton Swartz, Ph.D.
- Neural Cell-Fate Determinants Section, Ward Odenwald, Ph.D.
- Neural Circuits Unit, Ralph Nelson, Ph.D.
- Neuronal Cytoskeletal Protein Regulation Section, Harish Pant, Ph.D.
- Neurophysiological Pharmacology Section, Judith Walters, Ph.D.
- Receptor Biology Section, Katherine Roche, Ph.D.
- Structural Cell Biology Section, Thomas Reese, M.D.
- Synapse and Neural Circuit Research Unit, Wei Lu, Ph.D.
- Synaptic Function Section, Zuhang Sheng, Ph.D.
- Synaptic Physiology Section, Jeffrey Diamond, Ph.D.
- Synaptic Transmission Section, Ling-Gang Wu, M.D., Ph.D.
- Viral Immunology and Intravital Imaging Section, Dorian McGavern, Ph.D.
BENEFITS AND ELIGIBILITY

There are numerous opportunities for formal instruction at the NIH. Clinical Fellows are encouraged to take formal coursework in the Principles and Practice of Clinical Research and Principles of Clinical Pharmacology, as well as workshops in grant writing, statistics, and career development skills. NINDS hosts weekly seminars in basic and clinical neuroscience. The nineteen institutes of the NIH present seminars every week on a wide variety of medical and scientific topics. Trans-institute interest groups provide a forum for interacting with top scientists and clinicians in areas outside neurology.

Clinical Fellows entering at the PGY5 level are paid a salary of about $68,000 and supplement for taking in-house call ($15-25,000, depending on number of Fellows participating). Salary increases are determined annually by Federal guidelines. Fellows receive Federal employee health insurance and benefits.

In addition to Branch-funded fellowship slots, there are competitive funding mechanisms available for intramural post-doctoral clinical fellowships. This includes K99, Lasker, and Transition awards. These awards provide funding for the fellowship training and for transition toward an independent academic faculty position. NINDS also has a loan repayment program available on a competitive basis for Clinical Fellows to repay educational debts: http://www.lrp.nih.gov/about/intramural.

To be eligible for clinical fellowships, physicians must have completed an accredited residency training program and hold an unrestricted U.S. License (or be in the process of applying for a license that will be issued within one year of the starting date). Residents in accredited neurosurgery residency programs may be eligible for fellowships on a case-by-case basis prior to completing residency training.
OTHER TRAINING OPPORTUNITIES

Resident Elective Rotations

Duration: 1-3 months

Eligibility
Residents must be enrolled in an accredited neurology or neurosurgery residency program and have a strong interest in pursuing academic medicine.

Rotations
The NINDS welcomes neurology residents for clinical rotation at the NIH. The resident will be primarily based with the Neurology Consult Service, and from there will be able to tailor the experience to his or her interests by attending subspecialty clinics. Patients seen by the consult service frequently present with common neurological conditions in the context of rare conditions and novel therapeutics, and thus will build on the resident’s skills and knowledge base while expanding their understanding of complex disorders and treatments. The resident will be able to attend clinics of interest, including movement disorders, neuroimmunology, neuromuscular disorders, and epilepsy, as well as clinics in other institutes. Patients include children and adults, inpatients and outpatients, who are enrolled in clinical trials. Opportunities include rotations in highly specialized clinics such as neurogenetic disorders including spinocerebellar ataxias, hereditary spastic paraparesis, spinal muscular atrophy, primary lateral sclerosis and Kennedy’s disease; Parkinson’s disease, unusual movement disorders, neuroimmune disorders, autonomic disorders, neurofibromatosis, von-Hippel-Lindau disease, tropical spastic paraparesis, neurocysticercosis, traumatic brain injury and intractable epilepsy. Other opportunities include the Undiagnosed Disease Program that investigates some of the most challenging patients with neurological disorders. Programs in state-of-the-art neuroradiological techniques, deep brain stimulation and convection-enhanced delivery are available. Residents also participate in grand rounds, journal clubs, and research seminars.

The resident will be supervised by the Chief, Neurology Consult Service. Residents are expected to investigate issues related to those patients seen on rounds and in clinic, and present a 30-minute talk toward the end of their rotation.
Course Objectives

- Perform neurological evaluation of patients with complex diagnostic and management issues
- Gain experience in evaluating patients on research protocols, on novel therapeutic agents
- Discuss patients at the weekly Neurology Consult Service rounds

Faculty

Sarah M. Kranick, M.D., Chief, Neurology Consult Service, sarah.kranick@nih.gov
Avi Nath, M.D., Clinical Director, NINDSClinicalDirector@ninds.nih.gov

Medical Student Clinical Electives

Duration: 4-8 weeks

Eligibility

Students must be enrolled in an U.S. accredited medical school, have completed their school's required clerkship rotation in neurology, and have basic skills in history taking and the neurological examination. Eligibility requirements can be found at: http://www.cc.nih.gov/training/students/clinical_electives.html.

Rotations

Short-term rotations with one of the NINDS clinical research groups provides the student with an exposure to patient-oriented research and an opportunity to receive advanced clinical training in neurology. Students are encouraged to identify clinical research interests and faculty in their applications. Areas of faculty research can be viewed at the NINDS faculty webpage: http://intra.ninds.nih.gov.

Contact

Applications are submitted online to the NIH Clinical Center’s Office of Clinical Research Training and Medical Education (OCRTME) at http://www.cc.nih.gov/training/students/clinical_electives.html. Contact the OCRTME at (301) 496-9425 if you have any questions.
Medical Research Scholars Program

Duration: 1 year

Program

The Medical Research Scholars Program is a twelve-month program designed to attract the most creative, research-oriented medical students to the intramural campus of the NIH. Participants spend a year in a mentored basic, clinical or translational research project in an area that matches their personal goals. An additional year of support may be available to allow a continuation of ongoing studies where this is judged to be in the best interests of the student and the mentor. The program is designed for students who have completed their initial clinical rotations but does not exclude students with strong research interests from applying prior to having completed clinical rotations.

The program provides the opportunity for clinician-scientists to carry out research across the full spectrum of laboratory, translational and clinical opportunities. Participants will witness and collaborate in rigorous, hands-on research with offerings across the full continuum of biomedical research – the bench, the bedside, and between both – including computational biology, medical informatics, and other emerging areas of contemporary science.

Contact

For additional information please call the OCRTME at (301) 496-9425 or visit http://www.cc.nih.gov/training/mrsp/index.html. The application period typically runs from October to January.