ANESTHESIA TRAINING PROGRAM IN BIOMEDICAL RESEARCH
STANFORD UNIVERSITY (T32 GM089626)

Program Description

The objective of the Anesthesia Training Program in Biomedical Science is to train leaders in academic anesthesia and its subspecialties. To accomplish this goal additional training beyond an MD or PhD is required. This two-year training program provides the essential guidance, training, and mentoring critical to increase the success of these trainees in launching their research careers[1].

[1] **Definition of Diversity Recruitment Groups**. The NIH is particularly interested in encouraging the recruitment and retention of the following classes of candidates:
a) Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a national basis (see data at http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=27 and the report Women, Minorities, and Persons with Disabilities in Science and Engineering, 2007, p. 262). The following racial and ethnic groups have been shown to be underrepresented in biomedical research: African Americans, Hispanic Americas, Native Americans, Alaskan Natives, Hawaiian Natives, and natives of the US Pacific Islands. In addition, it is recognized that under-representation can vary from setting to setting and individuals from racial or ethnic groups that can be convincingly demonstrated to be underrepresented by the grantee institution should be included in the recruitment and retention plan.
b) Individuals with disabilities, who are defined as those with a physical or mental impairment that substantially limits one or more major life activities.
c) Individuals from disadvantaged backgrounds who are defined as: 1. Individuals who come from a family with an annual income below established low-income thresholds. These thresholds are based on family size, published by

Trainees can work within one of three broad areas:

1) Omics: a systems approach to disease,
2) Inflammation, Signaling and Tissue Injury, and
3) Mechanisms of Anesthesia, Pain and Addiction.

Trainees will learn to pose important and well thought out questions, to think critically, and to use cutting edge interdisciplinary tools to answer these questions. Success also requires the development of skills in presentation of results in oral and written format, in preparation of competitive grant proposals, and in the ability to engage in collaboration when this will more effectively advance the research.

The training program starts by recruiting the most talented trainees from MD/PhD, MD, and PhD applicants interested in pursuing a career in anesthesia research and academic anesthesia. Trainees then have a primary research mentor and a secondary mentor to closely monitor their progress. Close interaction with accomplished faculty is essential to master these skills, and this is the core of the training program, which is then supplemented by didactic material, and in the case of clinical research may be supplemented by a master degree in epidemiology or health science research. Administratively, the program consists of a director, steering committee and a group of 18 highly skilled and successful training faculty from the anesthesia department and from 6 other departments within the medical school. There are already established interactions between many of the faculty members. The mission of the program is teaching trainees new technologies and approaches to anesthesia research.

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the U.S. Bureau of the Census; adjusted annually for changes in the Consumer Price Index; and adjusted by the Secretary for use in all health professions programs. The Secretary periodically publishes these income levels at http://aspe.hhs.gov/poverty/index.shtml. For individuals from low income backgrounds, the institution must be able to demonstrate that such candidates (a) have qualified for Federal disadvantaged assistance; or (b) have received any of the following student loans: Health Professional Student Loans (HPSL), Loans for Disadvantaged Student Program; or have received scholarships from the U.S. Department of Health and Human Services under the Scholarship for Individuals with Exceptional Financial Need. 2. Individuals who come from a social, cultural, or educational environment such as that found in certain rural or inner-city environments that have demonstrably and recently directly inhibited the individual from obtaining the knowledge, skills, and abilities necessary to develop and participate in a research career. Recruitment and retention plans related to a disadvantaged background are most applicable to high school and perhaps undergraduate candidates, but would be more difficult to justify for individuals beyond that level of achievement

Participating Faculty and Research Interests

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role In Program	Research Interest
Rona Giffard MD, PhD	Professor	Anesthesia, Neurosurgery	Director, Steering Committee, Faculty	Ischemic brain injury, role of astrocytes, gene therapy and computational modeling
Russ Altman MD, PhD	Professor	Bioengineering, Genetics, Medicine	Faculty	Bioinformatics, Pharmacogenetic
Martin Angst MD	Professor	Anesthesiology	Faculty	Genetics and inflammation in experimental human pain
David Clark MD, PhD	Professor	Anesthesia	Steering Committee, Faculty	Pain genomics, role of Heme oxygenase in pain, clinical pain
Mark Davis PhD	Professor	Microbiology and Immunology	Faculty	Molecular mechanisms of lymphocyte recognition and differentiation
Ronald Davis PhD	Professor	Biochemistry	Faculty	Whole genome analysis in Saccharomycecs cerevisiae and Human
Pamela Flood MD	Professor	Anesthesia	Faculty	Pain Medicine, Obstetric Anesthesiology
Gary Glover PhD	Professor	Radiology	Faculty	The advancement of imaging sciences for applications in investigative and diagnostic radiology
Eric Gross MD PhD	Assistant Professor	Anesthesia	Faculty	Links between pathways of nociception and cardioprotection
Greg Hammer, MD	Professor	Anesthesia	Faculty	PK/PD in pediatric cardiac anesthesia
Bruce MacIver PhD	Professor	Anesthesia	Faculty	Mechanisms of anesthetic action
Sean Mackey MD, PhD	Professor	Anesthesia	Steering Committee, Faculty	Functional neuroimaging of pain, pain and consciousness
Robert Malenka MD, PhD	Professor	Psychiatry and Behavioral Sciences	Faculty	Basic mechanisms of synaptic plasticity, drug addiction

Daria Mochly- Rosen PhD	Professor	Chemical and Systems Biology	Faculty	Protein kinase C isozymes in normal heart function, informatical cerebral ischemia protein- protein interaction in signal transduction
Ronald Pearl MD, PhD	Professor	Anesthesia	Steering Committee, Faculty	Pulmonary Hypertension
Gary Peltz MD, PhD	Professor	Anesthesia	Faculty	Genomics, metabolomics, pain addiction and genetics pharmacology
Greg Scherrer, PhD	Assistant Professor	Anesthesia, Neurosurgery	Faculty	Molecular mechanisms that control neural activity and behavior associated with pain perception and analgesia
Gary Steinberg MD, PhD	Professor	Neurosurgery	Faculty	Pathophysiology and treatment of acute cerebral ischemia
James Trudell PhD	Professor	Anesthesia	Faculty	Molecular theories of anesthesia
David Yeomans, PhD	Associate Professor	Anesthesia	Steering Committee, Faculty	Pain Physiology of sodium channels and inflammation