

T32 Programs by State

California:

1. Stanford University School of Medicine
2. University of California, San Diego
3. University of California, San Francisco
4. University Of California, Los Angeles

Colorado:

5. University of Colorado Denver Anschutz Medical Campus

Connecticut:

6. Yale University

Maryland:

7. Johns Hopkins University

Massachusetts:

8. Massachusetts General Hospital

Michigan:

9. University of Michigan Medical School

Missouri:

10. Washington University School of Medicine

New York:

11. Columbia University Health Sciences

North Carolina:

12. Duke University

Pennsylvania:

13. University of Pennsylvania
14. University of Pittsburgh

Tennessee:

15. Vanderbilt University Medical Center

Texas

16. University Of Texas Health Science Center, Houston

Washington:

17. University of Washington

Wisconsin:

18. University of Wisconsin

David J. Clark

djclark@stanford.edu

Stanford University School of Medicine

The objective of the Stanford Research in Anesthesia Training Program (ReAP) is to train leaders in academic anesthesia. We recognize that in order to accomplish this goal, substantial training beyond an MD or PhD is required. ReAP provides the guidance, training, and mentoring critical for the successful initiation of an independent research career and becoming a leader in the broad field of Anesthesiology. Trainees must 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, occasionally, PhD applicants interested in pursuing a career in anesthesia research and academic anesthesia. This recruitment is facilitated by our department's research training continuum featuring both a formal residency research track and, later, comprehensive support in transitioning to a junior faculty position. Once appointed, ReAP trainees select a primary research mentor and a secondary mentor to monitor and facilitate their progress. Close interaction with mentors and other accomplished faculty is essential to master critical skills that form the core of our training program. This is supplemented by didactic material, and, in the case of clinical research, may be augmented further by a master's degree in epidemiology or health science research. Administratively the program consists of a Program Director, Steering Committee, External Advisory Committee and a group of 28 highly skilled and successful training faculty from the anesthesia department and 9 other departments within the medical school. There are already established interactions among many of the faculty members.

The diverse faculty is divided into three overarching areas:

- 1) Neuroscience, Pain and Analgesia
- 2) Injury, Inflammation and Immunity
- 3) Outcomes Research, Economics and Bioinformatics.

These divisions encompass research areas at the forefront of our field. Our institutionally well-supported program and pipeline of highly qualified candidates will easily support a total of four trainees with two appointed per year anticipating two-year training experiences for most candidates.

Hemal H. Patel

Hepatel@ucsd.edu

University of California, San Diego

Anesthesiology is an interdisciplinary discipline that requires its practitioners to have a broad fund of knowledge that traverses pharmacology, physiology, and engineering with the ability to apply this knowledge in both controlled and emergency situations. In addition to providing trainees with exceptional clinical knowledge, the Anesthesiology Department as well as the larger academic community at the University of California, San Diego (UCSD), provides a world-class environment for the development of high quality training in research. Two particular basic science research strengths at UCSD include the Departments of Pharmacology and Engineering. Anesthesiologists including both basic scientists and clinicians have long standing interactions and collaborations with faculty in these two disciplines as the interests mirror the major clinical concerns of anesthesiology, the use of pharmacologic agents to best manage patients and to invent and create solutions that require engineering to enhance patient care. Our interactions and collaborations have spanned established faculty, junior physician scientist, fellows and residents. Thus, the primary goal of this T32 grant application is to formalize and take to the next level research training that has been occurring at UCSD and specifically in the Department of Anesthesiology with collaboration in Pharmacology and Engineering. This training grant will provide post-graduate trainees (MDs or MD/PhDs) with a 2-year research experience consisting of a broad focus on the basic molecular mechanisms of drug action and/or exploration of a variety of engineering disciplines. There is emphasis upon defining novel insights into mechanisms of drug action that can lead to development of therapeutic interventions and in applying engineering principles to create devices, model physiology and pathophysiology using mathematical and theoretical approaches, investigate biomaterials to facilitate non-invasive monitoring and generation of biometric data, etc.

From a practical perspective, to achieve this overall goal, the training experience has two specific aims:

- i) Expose the fellows to a culture of science and investigation present in the Department specifically and the campus broadly
- ii) Achieve competency in the allied elements of a research career, e.g. experimental design, data analyses, presentations, manuscript preparation and publication and how best to obtain research funding as well as lab management and job interview skills.

Importantly, we strongly emphasize issues of collegiality and ethics in the research environment. In achieving our strong commitment to the development of the clinician scientist, our overriding mission is the training of the next generation of clinician scientists who have the foundation of knowledge and fundamental tools coupled with the passion and commitment to affect translational research.

Judith Hellman

hellmanj@anesthesia.ucsf.edu

University of California, San Francisco

The broad goal of our T32 training grant program is to provide in-depth research training to talented individuals who are committed to pursuing basic, translational or clinical research focused on anesthesiology, critical care medicine and the surgical sciences. Our program structure ensures that our trainees learn state-of-the-art research techniques, the fundamentals of posing research questions, and the critical thinking involved with analyzing data and reporting their results. Through hands-on mentored research and formalized didactic training, seminars and conferences, our trainees learn to design and conduct experiments, to formulate and write grants, to perform appropriate statistical analyses, and to understand the regulations and ethical issues that are involved in research. We have designed our program to optimize functional interactions between trainees and the talented basic scientists and clinician scientists that serve as faculty mentors for the T32 program in order to produce high quality translational researchers that are capable of collaborating with clinical and basic science investigators.

Faculty are organized into 4 tracks that encompass the broad areas of research focus in the Department of Anesthesia:

- (1) Critical Care
- (2) Genomics, Outcomes Research and Bioinformatics
- (3) Neurosciences, Pain and Addiction
- (4) Vascular Biology and Bioengineering

Each track is overseen by an appropriate senior researcher from the Department of Anesthesia, and includes clinician-scientists and full-time scientists that are engaged in cutting edge basic, translational and clinical research. Faculty members come from the Department of Anesthesia as well as from multiple clinical and basic science departments across the UCSF campuses. We focus our recruitment efforts towards outstanding MD and MD/PhD candidates who have completed anesthesiology residencies. However, we will also occasionally consider outstanding physician trainees from other clinical disciplines or exceptional full-time PhD scientists, if their research and career goals directly support the mission of academic anesthesiology. We request 4 slots per year, which is an increase from our current allocation of 3 slots. This will allow us to accommodate the growing research trainee pool derived from our recently implemented Research Scholars Track of the Anesthesia Residency, which is a 4-year program (PGY2-PGY5/CA1-CA4) that includes 2 years of protected research time. We will require at minimum a 2-year commitment to post-doctoral research training for the majority of our T32 trainees, but will encourage some trainees do 3 years of training if an additional year is believed to be appropriate for their individualized research training program. Our T32 program is structured to prepare trainees to become independent investigators performing research on a wide range of topics that are relevant to the field of anesthesiology, and to help lay the groundwork for their development into leaders in academic anesthesiology and research.

Vesna Jevtovic-Todorovic

vesna.jevtovic-todorovic@cuanschutz.edu

University of Colorado Denver, Anschutz Medical Campus

The broad objective of this training program is to provide training to MD postdoctoral fellows in clinical and basic science related to anesthesiology and perioperative medicine. We propose the training of one fellow per year who will spend 2 years cumulative time in research in one of the participating training faculty's laboratories or clinical research setting. We propose to recruit 2 fellows the first year to create a cohort and the opportunity for peer mentoring. In year 3 we will again recruit 2 fellows and recruit our final fellow in year 4, for a total of 5 fellows over the 5 year duration of the grant. The training faculty are from several departments within the University of Colorado System, including Anesthesiology, Division of Cardiology, Cell & Molecular Biology, Emergency Medicine, Psychology and Neuroscience at CU Boulder. Research opportunities are offered by 21 NIH-funded faculty mentors, 9 of whom are in the department of Anesthesiology, with strong records of training postdoctoral fellows.

The research opportunities are organized into three major research areas relevant to anesthesiology

- 1) Neuroscience, cell injury & repair and pain
- 2) Clinical and Translational Drug abuse
- 3) Trauma, coagulation and cardiac physiology

We have developed a didactic program that will provide training in research methods, presentation skills (written and oral), grant writing and responsible conduct of research. In addition to our outstanding group of faculty mentors, we have an external scientific advisory committee and an executive committee that will assist the Program Directors in the selection of candidates and oversight of the training program.

The specific aims/goals of the training program are:

- 1) Recruit outstanding anesthesiology postdoctoral fellows from a diverse background pulling from a local and national applicant pool.
- 2) To develop an outstanding training program using didactic and experiential training to provide scientific training and the practical skills needed to successfully compete for National funding and develop and independent research career in anesthesiology.
- 3) Assemble a group of faculty mentors that are not only highly successful scientists, but excellent mentors that help create a supportive mentoring environment that keeps postdoctoral fellows engaged, enthusiastic about research and moving forward towards their career goals of becoming leading academic anesthesiologists.

Robert Schonberger
robert.schonberger@yale.edu
Yale University

Anesthesiology research has grown well beyond a search for drug mechanisms of action. The expertise of anesthesiologists now extends to all aspects of preoperative care. This competing renewal has been written with that in mind. It is our intention to provide talented and dedicated individuals with adequate time to delve into cutting edge research under the guidance of highly successful mentors. Dr. Niklason has served as the Program Director for this T32 Training Program for the past 9 years. Dr. Niklason will continue in this role for the upcoming competing renewal, and will be joined in the leadership effort by Dr. Helene Benveniste, Professor of Anesthesiology at Yale. Dr. Benveniste will serve as co-Director on this proposal.

Our post-doctoral training program continues to employ 5 tracks:

- 1) Neurobiology
- 2) Vascular Biology
- 3) Immunology/Inflammation
- 4) Bioengineering
- 5) Clinical Research

Of these tracks, trainees have most commonly sought Neurobiology, Clinical Research, and Bioengineering. In this renewal as in previous incarnations of the program, all trainees will be involved full-time, 40 hours per week, in research training, whether it be laboratory research, didactic training, preparing manuscripts and grants, or attending meetings and conferences. The five training tracks are designed to provide trainees with a breadth of basic science and clinical research opportunities, in areas that are directly relevant to anesthetic practice.

Preceptors have been strategically selected, and have the following qualities:

- i) History of outstanding training and mentorship – for younger Preceptors, a history of excellent interactions with junior house staff and an exciting and clinically relevant research program are deemed sufficient for inclusion
- ii) Research focus in one or more of the five selected training tracks
- iii) Clear desire to train productive clinician scientists in Anesthesia

Commonly, Preceptors having expertise across multiple scientific areas can provide a richer and more interdisciplinary training experience, which will be profoundly beneficial to trainees after they emerge from the T32 program to begin independent careers. Adding to the integration of the T32 program, we have instituted regular scientific and social meetings for all trainees, so that they may share scientific as well as career development experiences. To date, we have been extremely pleased with the progress of our current and former trainees, and hope that the NIGMS will continue to support this remarkably successful program.

Cyrus David Mintz
cmintz2@jhmi.edu

Johns Hopkins University

Although past advances in the field of Anesthesiology have made perioperative medicine remarkably safe for patients by comparison to historical standards, a myriad of important research questions that hold the keys to further progress in the allied fields of Anesthesia, Critical Care, and Pain Medicine remain unanswered.

These questions exist in, but are not limited to, the following domains:

- (1) The mechanisms of action of anesthetic and sedative medications
- (2) The systems biology of the perioperative state
- (3) The mechanism and prevention of postoperative delirium and cognitive dysfunction
- (4) Potential toxicity of anesthetic agents in the developing brain
- (5) Maximization of safety related to human factors and communication throughout the perioperative period
- (6) Development and testing of care pathways to improve long-term outcomes after surgery
- (7) Sepsis and other causes of organ failure in intensive care
- (8) Mechanisms and treatment of acute and chronic pain
- (9) Appropriate use of opioids and addiction prevention in the perioperative setting

To address these and other key questions that have the potential to improve public health, it is critically important to develop a core of well-trained and highly motivated physician-scientists within the Anesthesiology specialty who are dedicated to research and academics. The Department of Anesthesiology and Critical Care Medicine (ACCM) at the Johns Hopkins University (JHU) is submitting this renewal application for continued support of Postdoctoral Research Training in Anesthesiology (PRTA). In addition to providing an avenue for the support of Trainees, this program will continue to refine the approach whereby ACCM recruits talented and diverse young scientists engaged in Anesthesiology research and trains them via rigorous career development plans under the guidance of expert Faculty Mentors. Our principal aim is to develop the next generation of physician-scientists by endowing them with the tools and techniques best suited to their research while fostering innovation and the highest standards of scientific rigor. This aim is accomplished through a strong departmental research infrastructure that operates in conjunction with the incredible breadth and depth of the broader JHU scientific enterprise. Appointments are for two years, and key activities are mentored research and the potential for further education in the form of a relevant master's degree. As demonstrated in this application, ACCM has a long and productive history of clinical, translational, and basic research training in Anesthesiology, which the PRTA will continue to build upon and improve. Our previous success is highlighted by the career progression and scientific accomplishments of past Trainees, and our ongoing capacity to fulfill the mission of this Program is apparent in our outstanding pool of current and potential Trainees. We request continued funding for six Trainees per year for the so that we can continue to develop physician-scientists who will contribute to a secure scientific future in the field of Anesthesiology.

Stuart A. Forman

[saforman@partners.org](mailto:siforman@partners.org)

Massachusetts General Hospital

We seek to continue a postdoctoral research training program for anesthesiologists, now in its fortieth year, in order to develop skilled physician-scientists who will expand knowledge and ultimately improve clinical delivery of patient care in core practice areas of anesthesiology: perioperative medicine, critical care, perinatal care, and pain management. We propose to offer ten carefully selected anesthesiologists the opportunity to train with an outstanding investigator-mentor in one of the research programs at the Harvard Medical School or its affiliated institutes and hospitals, for a period of 2 or 3 years. A national pool of candidates is recruited, with highly capable and motivated residents and fellows at Harvard-affiliated academic anesthesiology programs providing an enriched source. Special efforts are made to establish and maintain diversity through recruitment and retention of individuals from underrepresented racial and ethnic groups, disabled individuals, and those from disadvantaged backgrounds. The training program is structured as a tutorial, individualized to meet the specific needs and research interests of each trainee. Research areas include, but are not limited to: biochemistry, bioengineering, biophysics, clinical outcomes, endocrinology, epidemiology, genetics, metabolism, molecular biology, neurobiology, pharmacology, physiology, and toxicology. To best match the needs of trainees, faculty mentors are selected or recruited, based on their expertise and experience, funding record, and demonstrated ability to help mentees succeed in achieving research independence, including independent extramural support. Trainees will also undertake course-work tailored to their individual experience, needs, and goals, which may include the completion of graduate certificates or degrees. Training in responsible conduct of research will be required. The program's long-term goal is to increase the number of anesthesiologists with the knowledge, skills, and determination to become independent researchers focused on questions of importance to anesthesiology and the basic sciences upon which it rests. The participating Harvard-affiliated academic anesthesiology departments, in which trainees will hold clinical appointments, are committed to their long-term career development beyond completion of this program. These trainees are expected to enrich the next generation of research leaders and mentors, as the needs of patients evolve and the medical discipline of anesthesiology optimally responds.

George A. Mashour

gmashour@umich.edu

University of Michigan Medical School

The University of Michigan (U-M) is one of the largest and most highly ranked public universities in the country as well as a major center for graduate and post-graduate research training. The Ann Arbor campus is home to 19 schools and colleges, and U-M faculty and students embrace multidisciplinary training and research. With almost \$1.5B in annual research expenditures, U-M is the top public university in research spending in the United States; more than half a billion of annual awards go to the Medical School. Within this broader environment of excellence, the U-M Department of Anesthesiology has reached an unprecedented level of research success, as evidenced by increased NIH awards (current #1 ranking for anesthesiology departments) and other sources of funding; increased quantity and quality of publications; high-level institutional research roles; and national research leadership in fields (such as precision medicine and translational science) that transcend traditional boundaries of the field. The department has created a supportive and nurturing environment for developing the research workforce and the anesthesiology T32 training program has become the centerpiece of our career development program. Our first T32 graduates are active academic anesthesiologists leading multidisciplinary research teams, with continued support and mentorship from senior faculty members. Their success in high-level publications and NIH grant applications suggests a positive impact of our T32 program. In the next phase, we hope to enhance professional growth through stronger partnership with our institutional CTSA program and its Career Development Academy, develop more effective mentors through formal training, leverage our institutional and national roles to connect T32 fellows to expert perspectives from different fields and different institutions, and enhance the diversity of our applicants and trainees. We are deeply committed to helping diverse clinician-scientists become ethical and outstanding researchers, leaders in their field, committed mentors, and change agents who contribute to the public good through a positive impact on medicine, science, and society.

Alex S. Evers
eversa@wustl.edu

Washington University School of Medicine

Our program is directed at resolving the unmet need for a robust pipeline of researchers equipped to address the fundamental problems in anesthesiology practice. The overarching goal of the Washington University Department of Anesthesiology T32 program is to train a diverse group of anesthesiology scientists with appropriate scientific skills to address the research priorities in anesthesiology-related science.

In order to accomplish this, we focus on:

- (i) Recruiting and training the most talented early stage anesthesiology scholars
- (ii) Identifying training opportunities in high priority and high yield scientific areas
- (iii) Providing expert, accountable and dedicated research mentorship to T32 trainees;
- (iv) Programmatically and systematically enhancing research training
- (v) Assessing trainee's personalized goals and progress
- (vi) Providing state-of-the art curricula and facilities as well as networking and educational opportunities

The Washington University Anesthesiology Department is among the most successful in academic anesthesiology, consistently ranking among the highest funded and most productive departments in the United States. T32 trainees in the Anesthesiology Department are typically selected from a cohort of research residents, which is one of the largest nationally, based on the vibrant and highly effective Academic Scholars Advancement Program and the Scholars track. Trainees judged to have the greatest commitment to a career in anesthesiology-related research and to have the greatest potential to advance the science or practice of anesthesiology are selected. Graduates from our T32 have been successful in publishing high impact research, obtaining competitive training grants, and continuing in academic faculty appointments at our university. Based on this track record, we propose to increase the number of T32 trainees from two to three per year. Two program directors (PDs) and an executive advisory committee (EAC) administer the training program. Mentors for the program have been carefully chosen based on the quality and relevance of their science, and demonstrated mentorship experience and success. Trainee-mentor pairing is facilitated and approved by the PDs and EAC. Trainees and mentors are formally evaluated twice annually for progress and satisfaction. Emphasis during these evaluations is placed on attaining milestones such as manuscript and grant submissions, and on progress towards development of an independent research program. The PDs, the EAC and the trainees evaluate the training program twice annually, and make ongoing recommendations for improvements. Our program also plays a leadership role in the Early Stage Anesthesiology Scholars (eSAS) initiative and in collaborative ventures with other national T32 programs. Therefore, our T32 trainees, in addition to obtaining foundational research skills, also develop key networking and leadership abilities.

Charles W. Emala

cwe5@columbia.edu

Columbia University Health Sciences

The proposed program will provide support for postgraduate research training within the Department of Anesthesiology within the Health Sciences Division of Columbia University. Qualified applicants will have committed to or be enrolled in postgraduate training in anesthesiology. The candidate pool is largely derived from an established research residency track (Apgar Scholars Society). The program will provide for four trainees, typically two in their fifth and two in their sixth postgraduate years. Research opportunities are offered by twenty one participating faculty members with proven records of success in the training of postdoctoral fellows, both within the Department of Anesthesiology as well as from nine collaborating departments, three in basic sciences: Pharmacology, Physiology and Cellular Biophysics, and the multidisciplinary Center for Neurobiology and Behavior; and six clinical departments/divisions: Preventive Medicine, Pulmonary Medicine, Cardiology, Endocrinology, Neurosurgery, and Psychiatry. Research areas include, but are not limited to, modulation of neurotransmission by excitatory amino acids; molecular mechanisms of neuronal plasticity in chronic pain; structure/function of ligand gated ion channels; anesthetic and alcohol modulation of gene expression; smooth muscle cell signaling; adenosine receptor physiology; mechanisms of organ injury and protection from ischemia-reperfusion injury; molecular mechanisms of airway remodeling in chronic lung disease; clinical and basic studies in anesthetic-mediated developmental neurotoxicity, biomarkers of clinical organ injury, and epidemiology studies of clinical outcomes. With the continued support of the Department of Anesthesiology following training, this program will lead to the establishment of independent physician-scientist modern methods and techniques to help meet the research needs of the specialty of anesthesiology in the twenty first century.

David S. Warner

warne002@mc.duke.edu

Duke University

The goal of this program is to provide postdoctoral fellows with research training enabling them to develop independent investigative careers devoted to improving care of the anesthetized/critically ill/chronic pain patient by advancing scientific knowledge in the field. The Department of Anesthesiology at Duke University Medical Center has intensively invested its resources in the development of multidisciplinary laboratory and clinical research environments to offer state-of-the-art research training experiences. We have also innovated in anesthesiology residency training to provide a research continuum that provides a highly effective preparatory phase prior to T32 enrollment. This proposal outlines the credentials of a distinguished training faculty who are willing and prepared to meet our goal. The training program involves a 2-3 year continuum when the trainees work under the close and direct supervision of a program faculty member on research projects of mutual interest. Emphasis is placed on learning responsible research skills, achieving mastery of the literature, independent hypothesis generation, experimental design, data analysis, presentation and publication of research findings and competition for extramural funding. All trainees are encouraged to exploit relationships established with members of the program faculty for both enrichment of research skill repertoires and development of long-term collaborative relationships. The program is directed by the Program Director and an Oversight Committee consisting of 8 senior scientists and the departmental chair. Trainees formally report to the program leadership at quarterly intervals to allow assessment of trainee performance and progress in achieving program goals. Trainees are sought from a national pool of eligible candidates with emphasis placed on recruitment of under-represented minority trainees. The primary focus of this program is the research training of select post-doctoral fellows. However, the program also is the cornerstone of our departmental research training endeavor setting high standards for investigative training offered to medical students, residents, junior faculty, and visiting scholars who participate in the research training process.

Max Kelz

kelzma@uphs.upenn.edu

University of Pennsylvania

The goal of this program is to address the as yet unmet need to train more committed physician-scientist anesthesiologists. PPRTPM program direction, aims and objectives: Program leadership will be provided by Dr. Max Kelz, serving as contact PI, with further leadership provided by additional Executive Committee members Drs. Gordon Barr, Maurizio Cereda, Renyu Liu, and Roderic Eckenhoff. All are members of the University of Pennsylvania Department of Anesthesiology and Critical Care. Their responsibilities will be focused on directing four theme-based research training tracks, three of which are devoted to laboratory research trainees and one of which is devoted to clinical research trainees gaining research training in perioperative medicine.

The aims of the PPRTPM are to:

- Identify, recruit and foster research trainees, both anesthesiology residents and clinical subspecialty fellows willing to commit to training and career development in perioperative medicine research
- Match up trainees strengths and interests with mentoring teams
- Provide guidance for structured learning opportunities
- Maximize the opportunities for mentored research and career mentoring

The objectives of the PPRTPM are to:

- Train a cadre of committed physician-scientist anesthesiology researchers to advance the field of perioperative medicine research
- Provide these individuals with the skill sets and foundation for career advancement
- Encourage leadership and innovation

PPRTPM goals—to pursue the aims and objectives through a training program consisting of:

- Didactic opportunities, including core requirements and courses designed to provide research skills
- Seminars, workshops and a journal club focusing on research and progress in the field
- Mentoring with a team approach, mentor training and scholarship oversight
- Programmatic interactions with mainstream research through local/national professional interactions

Yan Xu

xuy@anes.upmc.edu

University of Pittsburgh

Modern anesthesiology and pain medicine have increasingly become an interdisciplinary specialty of medicine that requires integrated knowledge in anesthesiology, critical care medicine, neurobiology, pharmacology, structural and computational biology, pulmonary physiology, and molecular biology and genetics. This competitive renewal application seeks funding for years 11-15 of our successful T32 training program in postgraduate anesthesia research training at the University of Pittsburgh. Our primary goal is to continue training physician scientists to lead the future intellectual pursuits in anesthesiology beyond the confines of the traditional provision of anesthesia and to become independently funded investigators and leaders in the field. The trainees from our first funding cycle have demonstrated success in this path, producing numerous peer-reviewed publications, achieving seed, startup, and K-level grant funding, and presenting at scientific conferences. We propose to have 5 fellowship slots in years 11-15. A team of 36 principal training faculty, with excellent training records and successful research programs funded by the NIH and other agencies, have been carefully selected. Programmed training and research activities will target anesthesiology-related problems defined in the broadest sense. A minimum of two-years of training is planned using a combination of structured didactic and interactive teaching on both a group and individual basis as well as one-on-one mentoring in laboratory/clinical research. Multiple courses and online training sessions in research integrity are mandatory for all trainees. Departmental, institutional, and independent efforts are established to actively recruit underrepresented minority trainees and people with disabilities into the program. The administrative infrastructure consists of the Oversight Committee chaired by the Chairman of the Department of Anesthesiology and the Executive Committee chaired by the Program Director. The executive committee, working closely with the training faculty, will be in charge of the selection, appointment, and assignment of the trainees, and will regularly review and evaluate them. Continued NIH support of this postdoctoral training program, which focuses primarily on training of physician scientists, will provide both unique opportunities and critically needed resources for the next generation of academic anesthesiologists to integrate multidisciplinary knowledge from the bench-top to the bedside.

Eric J. Delpire

eric.delpire@vanderbilt.edu

Vanderbilt University Medical Center

The training program open to MDs typically at the end of their residency training is designed to provide 2 years of research training in perioperative science.

The major goal of this training program is to provide the highest caliber research training to residents and postdoctoral fellows in four Specific Themes originating from existing strengths of our faculty within Anesthesiology and at Vanderbilt University Medical Center:

- 1) Mechanisms and Management of Pain
- 2) Perioperative Stress Biology and Outcomes
- 3) Perioperative Health Services and Translational Research
- 4) Personalized Medicine and Pharmacogenomics.

Each of these themes directly relates to the overarching aim of the program – to train the next generation of scientists to create new knowledge and translate it into best evidence for personalized perioperative care and pain management at a population level. The training faculty will consist of an exceptionally strong collection of physician-scientists and basic scientists who offer superb interdisciplinary research training opportunities in 7 different academic departments. The training program will accept two new trainees per year (staggered, maximum of 4 participants per year). Clinicians who show exceptional aptitude for successfully pursuing an academic research career and Ph.D. who demonstrate best aptitude to develop towards independence will be considered for participation. Each participant will commit to a 2 year basic science, clinical and/or translational research project with 75% effort and will receive over the 2 year period in addition to their research project training, coursework training in research related processes such as grant writing, publications, ethics, and responsible conduct of research. This training will prepare them to utilize the skills they acquire in the pursuit of future academic research careers.

Tonya M. Palermo

tonya.palermo@seattlechildrens.org

University of Washington

Our primary objective is to provide in-depth research training at the postdoctoral level in cutting edge (and emerging) areas of biomedical science related to anesthesiology and perioperative medicine. Trainees from our prior two funding cycles have demonstrated success in this program, producing numerous peer-reviewed publications, achieving research honors and awards, attaining seed and NIH career development grant funding, and presenting at scientific conferences. We propose training of four fellows per year who will spend 2-3 years cumulative time in research in one of a variety of laboratories in the Department of Anesthesiology and Pain Medicine or in collaborating basic science and clinical departments (e.g., Pharmacology, Genetics, Pediatrics, Psychiatry). Research opportunities are offered by 26 NIH-funded faculty mentors with proven records of success in the training of postdoctoral fellows, with diverse research programs ranging from laboratory-based science to translational, clinical, and health services research.

Core faculty research leaders will help match trainees to mentors within six major research areas relevant to anesthesiology and perioperative medicine including (alphabetically):

- 1) cardiovascular-pulmonary biology
- 2) clinical outcomes research & epidemiology
- 3) genome sciences & bioinformatics
- 4) neurosciences
- 5) pain
- 6) pharmacology

Aims of the program are to:

- Recruit outstanding diverse postdoctoral trainees from a national applicant pool
- Provide trainees with interdisciplinary theories and methods
- Provide trainees with the practical skills to design and conduct high quality research in anesthesiology and perioperative medicine
- Create a supportive environment through strong mentorship, a breadth of research opportunities, and collaboration across departments

We offer a robust didactic program to provide career development skills which includes monthly seminars in grantsmanship, scientific writing, journal club, and works in progress. All trainees completed individualized learning plans with their mentors to set goals for their training. Trainee progress is monitored regularly by an individualized fellow-specific review committee with summary findings reported to the departmental training grant advisory committee responsible for accepting/hiring fellows and following their progress. In addition, an external scientific oversight board meets yearly to offer advice to the program directors on all aspects of the training program. The overall intent of the program is to develop the next generation of clinician scientist leaders in anesthesiology and perioperative medicine research.