The University of Chicago
Division of Biological Sciences

# 2007 – 2008

# Graduate Training Grants

# Administrative Handbook

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**TRAINING GRANTS FROM FEDERAL AGENCIES**

**Grant Director:** Albert Bendelac **Co-Director:** Hans Schreiber

**Admin. Contact:** Tracie DeMack Phone: 4-3899 Fax: 2-4634

**Project Title:** **Interdisciplinary Training Program in Immunology**

**Agency:** National Institute of Allergy and Infectious Diseases

**Expiration Date:** 06/30/09 **Grant Number:** AI07090

**Number of Slots:** 7 Pre-Doctoral
3 Post-Doctoral

**Purpose:** This interdisciplinary program trains individuals to become creative, independent research scientists in Immunology. A Ph.D. specializing in immunology is offered by the Committee on Immunology. A number of core courses offered in immmunobiology stress the development of critical thinking skills and an understanding of current experimental approaches. In addition to formal coursework, discussion and research, trainees present their research in bi-weekly seminars and the annual committee on immunology retreat. Ph.D. students in their first two years of training are also encouraged to take advanced courses in molecular genetics, cell biology, microbiology, and biochemistry. Participation in journal clubs and research seminars is required to develop skills important in communicating ideas and research to other scientists. Progress of the students in the first two years is monitored by the program director and by the chairman of the immunology curriculum committee, and in the later years by the graduate student adviser and the student's thesis committee. The overall goal of the program is to develop the knowledge, ability, and desire to solve the most critical questions in the field of immunobiology.

**Grant Director:** Eugene Chang

**Admin. Contact:** Lynn Kaczmarz Phone: 4-5811 Fax: 2-2182

**Project Title:** **Research Training in Digestive Diseases and Nutrition**

**Agency:** National Institute of Diabetes and Digestive and Kidney Diseases

**Expiration Date:** 06/30/10 **Grant Number:** DK07074

**Number of Slots:** 2 Pre-Doctoral
5 Post-Doctoral

**Purpose:** The major goal of this program is to train young physicians as well as pre- and postdoctoral students to become independent, productive investigators in the fields of adult and pediatric digestive diseases and/or nutrition. This program is truly multidisciplinary as well as multi-departmental in scope. The program offers a well-balanced and broad curriculum in a diverse area of fields pertaining to digestive diseases and nutrition. The program also offers its students the opportunity to attend national meetings, workshops and symposia. Minority students are particularly encouraged to apply.

**Grant Director:** Elliot Gershon

**Admin. Contact:** Christianne Montgomery Phone: 4-1324 Fax: 4-6761

**Project Title:** **Multidisciplinary Psychiatric Genetics Training Program**

**Agency:** National Institute of Health

**Expiration Date:** 06/30/08 **Grant Number:** MH20065

**Number of Slots:** 0 Pre-Doctoral
2 Post-Doctoral

**Purpose:** A central goal of the Departments in this application, Psychiatry, Human Genetics, Neurobiology, Statistics, and Psychology, is innovative biomedical research in behavior, the neurosciences, and genetics combined with the training of researchers who are able to make significant contributions to the field. This three-year postdoctoral training program is focused on interdisciplinary approaches to genetics of complex inheritance psychiatric disease, including basic research and technology development.

**Grant Director:** Godfrey Getz

**Admin. Contact:** Tracie DeMack Phone: 4-3899 Fax: 2-4634

**Project Title:** **Cardiovascular Pathophysiology and Biochemistry**

**Agency:** National Heart, Lung, and Blood Institute

**Expiration Date:** 06/30/2012 **Grant Number:** HL07237

**Number of Slots:** 8 Pre-Doctoral
3 Post-Doctoral

**Purpose:** The training grant in cardiovascular pathophysiology and biochemistry supports the training in cardiovascular pathophysiology broadly defined. Trainees are generally recruited from students who have already applied to the University of Chicago departments, committees and individual faculty. Trainees are selected by a faculty committee based on academic record, letters of recommendation, and statement of purpose from candidate and sponsor. A wide range of training opportunities exists with faculty in the disciplines of pathology, biochemistry and molecular biology, physiology, pharmacology, genetics, and nutrition. Trainees are exposed to various forms of microscopy (electron and confocal); various forms of spectroscopy and crystallography; genetic, molecular biologic; pharmacologic and electrophysiologic techniques; and experimental pathologic approaches.

A number of core courses offered in molecular pathogenesis of disease, and cardiovascular disease in particular, stress the development of critical thinking skills and an understanding of current experimental approaches. In addition to formal coursework, discussion and research, trainees will have an opportunity to present their research at the annual cluster retreat. Ph.D. students in their first two years of training are also encouraged to take advanced courses in molecular biology, cell biology, genetics, and biochemistry. Participation in journal clubs and research seminars is required to develop skills important in communicating ideas and

research to other scientists. Progress of the students in the first two years is monitored by the program director and by the curriculum committee, and in the later years by the graduate student adviser and the student's thesis committee. The overall goal of the program is to develop the knowledge, ability, and desire to solve the most critical questions in the field of cardiovascular pathophysiology and molecular pathogenesis and molecular medicine.

**Grant Director:** Maryellen Giger

**Admin. Contact:** Diep Truong Phone: 2-6272 Fax: 4-2233

**Project Title:** **Research Training in Medical Physics**

**Agency:** **National Institute of Biomedical Imaging and Bioengineering**

**Expiration Date:** 04/30/10 **Grant Number:** 5 T32 EB002103

**Number of Slots:** 4 Pre-Doctoral
2 Post-Doctoral

**Purpose:** The field of medical physics, which has emerged from the growing interaction between physics and biology, may be broadly defined as applied physics in medicine. The program faculty's primary areas of research interest include the physics of diagnostic radiology, magnetic resonance imaging, nuclear medicine, and radiation therapy. Students are required to take coursework, participate in seminars and journal club meetings, assist in research projects, and complete a research project under the supervision of a faculty member. Research projects may consist of: the development of computer-aided diagnostic schemes and the evaluation of observer performance; theoretical and experimental studies in digital radiography, picture archiving and communication systems; magnetic resonance imaging; MR spectroscopy; nuclear medicine imaging; positron emission tomography; computer applications in radiation therapy; multi-modality image correlation; or radiolabeled monoclonal antibody dosimetry. Unique features of this program are the faculty's focused efforts on research in medical imaging and on the training of high-level medical physicists.

The Graduate Programs in Medical Physics at the University of Chicago offers research training at three levels that lead to the Master of Science degree, to the Doctor of Philosophy degree, and postdoctoral training. Students working toward a graduate degree in medical physics are expected to have completed training equivalent to that required for the S.B. degree in the Department of Physics at this University. Postdoctoral trainees are selected from candidates with the Ph.D. degree in Physics or equivalent fields. Primary areas of research interests by the program faculty include four components: Physics of Diagnostic Radiology, Physics of Nuclear Medicine, Physics of Magnetic Resonance Imaging/Spectroscopy, and Physics of Radiation Therapy. Major research facilities are the Kurt Rossmann Laboratories for Radiologic Image Research, the Goldblatt MRI Center, the NMR lab, and the Frank Center in the Department of Radiology, and the Medical Physics Division in the Department of Radiation & Cellular Oncology. Unique features of this program are the faculty's focused effort on research in medical imaging and radiation oncology, and on the training of high-level medical physicists. Students and trainees are required to take course work, participate in seminars and journal club meetings, assist in research projects, and complete a research project under supervision of a faculty member. Research

projects may be theoretical or experimental studies in digital radiography, diagnostic performance, computer-aided diagnosis, magnetic resonance imaging and spectroscopy, nuclear medicine imaging, positron emission tomography, computer applications in radiation therapy, dose computation and verification, multi-modality image correlation, or dosimetry. All trainees take a cancer and radiation biology course, participate in programs related to responsible conduct of research, and serve as teaching assistants. The number of current program faculty is 24. The number of current predoctoral students is 32. There are two postdoctoral trainees in the program at the present. The number of trainees for which funding is requested is four per year at the predoctoral level (2 first-year and 2 second-year trainees per year), and 2 per year postdoctoral level. Prospective trainees are informed that support is for research in cancer detection and diagnosis, and cancer treatment and restorative care.

**Grant Director:** Geoffrey Greene

**Admin. Contact:** Tracie DeMack Phone: 4-3899 Fax: 2-4634

**Project Title:** **Graduate Training Program in Cancer Biology**

**Agency:** National Cancer Institute

**Expiration Date:** 12/31/08 **Grant Number:** CA09594

**Number of Slots:** 8 Pre-Doctoral
3 Post-Doctoral

**Purpose:** The program offers an interdisciplinary regimen of studies leading to the Ph.D. in preparation for research and teaching in this field. The program offers a broad curriculum and research training in a diverse area of fields pertaining to cancer. Areas of training include: cancer biology; cell biology; molecular genetics; biochemistry; pathogenesis of cancer; chromosomal rearrangements; oncogenic transformation; growth control; herpes and papilloma virus biology; immunology; and carcinogenesis. In addition to formal coursework, discussion and research, trainees present their research in bi-weekly cancer biology research seminars, the annual cluster retreat, and interact with invited speakers for the seminar series. The program also offers its students the opportunity to attend national meetings and cancer biology workshops.

**Grant Director:** Marvin Makinen

**Admin. Contact:** Lisa Marie Alvarez **Phone:** 2-9213 **Fax:** 2-0439

**Project Title:** **Predoctoral Training Program in Chemistry & Biology**

**Agency:** National Institute of Health

**Expiration Date:** 06/30/2011 **Grant Number:** T32 GM008720

**Number of Slots:** 4 Pre-Doctoral

**Purpose:** The Predoctoral Training Program in Chemistry & Biology, supported through a grant of the National Institutes of Health (T32 GM008720), is the only interdivisional, interdisciplinary predoctoral training program at The University of Chicago. Students are admitted to the program from both the Division of Physical Sciences and the Division of Biological Sciences. Students fulfill simultaneously the requirements of the program and the requirements of the program of graduate study leading to the Ph. D. degree in which they are enrolled. The main objective of the program is cross-training of students at the interface of the chemical and biological sciences with a mechanistic and synthetic focus. This goal is achieved through (1) satisfactory completion of two courses in the department of the other scientific discipline as electives; (2) an elective research rotation under the guidance of a participating faculty member in the other discipline upon initial appointment to the program in the Spring Quarter of the first year of graduate study; (3) coordinated mentoring of student-trainees by the primary research advisor together with a co-advisor of the other department up to the time of the final Ph. D. oral defense; and (4) participation in a series of monthly meetings throughout the academic year designated as "Discussions at the Interface of Chemistry & Biology" to gain acquaintance with theoretical concepts and methods. The broad scope of the interdisciplinary research interests of the faculty participating in the training program, strengthened through collaborative research projects and interactions, ensures a large variety of opportunities for meaningful cross-training experience.

**Grant Director:** Peggy Mason

**Admin. Contact:** Diane Hall Phone: 2-6371 Fax: 2-1216

**Project Title:** **Training in Neural Systems**

**Agency:** National Institute of General Medical Sciences

**Expiration Date:** 06/30/08 **Grant Number:** GM07839-28

**Number of Slots:** 7 Pre-Doctoral
0 Post-Doctoral

**Purpose:** The training program in neurobiology is a broad interdisciplinary program devoted to training individuals for careers as independent research scientists in universities and health related research laboratories. A Ph.D. degree specializing in neurobiology is offered by the Committee on Neurobiology. All predoctoral students are required to take a core sequence of courses in Neurobiology during

their first year and then may choose from a variety of electives in accordance with their background and research interests. The progress of students is monitored by the program director during the first year and then by an advisory committee which the student formulates with the aid of the program director. The uniform features of the program are common course work, departmental and student seminar programs, and journal clubs.

**Grant Director:** Elizabeth McNally

**Admin. Contacts:** Amy Murphy Phone: 2-2680 Fax: 2-2681

**Project Title:** **Cardiovascular Sciences**

**Agency:** National Heart, Lung and Blood Institute

**Expiration Date:** 06/30/09 **Grant Number:** HL07381

**Number of Slots:** 3 Pre-Doctoral
6 Post-Doctoral

**Purpose:** The Cardiovascular Training Grant supports both postdoctoral (M.D. and Ph.D.) and predoctoral (Ph.D.) students for terms of 2-3 years to work in the laboratories of one of 18 trainers, whose research is in the cardiovascular sciences. The trainers include faculty from Cardiology, Pathology, Internal Medicine, Neurology, Pharmacology and Physiology, and Biochemistry and Molecular Biology. The program emphasizes training in cellular electrophysiology, muscle physiology, cardiac dynamics, gene regulation, and genetic disease.

**Grant Director:** David Meltzer **Co-Director:** William Dale, Godfrey Getz

**Admin. Contact:** Jackie Barrera Phone: 2-5035 Fax: 4-2238

**Project Title:** **MD/PhD Program in Medicine, Social Sciences and Aging**

**Agency:** NIH/NIA

**Expiration Date:** 04/30/09 **Grant Number:** T32AG23496

**Number of Slots:** 5 Pre-Doctoral

**Purpose:** This interdisciplinary program provides trainees with the skills they will need to pursue successful academic careers, produce high quality research, and provide leadership at the interface of medicine, the social sciences, and aging. This will be accomplished by providing training in medicine (leading to an MD), in the social sciences (a PhD in a social science or related discipline), and rich interdisciplinary training in both aging & health services research.

**Grant Directors:** Gregory Mueller

**Admin. Contact:** Carolyn Johnson Phone: 2-9474 Fax: 2-4699

**Project Title:** **Graduate Assistance in Areas of National Need (GAANN): Ecology**

**Agency:** U.S. Department of Education

**Expiration Date:** 08/14/09 **Grant Number:** P200A060043

**Number of Slots:** 5 Pre-Doctoral
0 Post-Doctoral

**Purpose:** Responses of natural and managed biotic systems to environmental change are among the most important issues facing the nation this century. Addressing these issues requires biologists and geologists trained to undertake research across a broad spectrum of spatial and temporal scales, to communicate their results to diverse audiences (including policy-makers), and to train future generations of scientists along this interface. Recent national reports show that few PH.D's are being prepared to answer this national need. Meeting this challenge requires a multidisciplinary educational program that includes ecology, genetics, conservation biology, systematics, paleobiology, anthropology, and climatology. Our GAANN program engages outstanding faculty in all these disciplines. The GAANN Fellows train in a coordinated program including: 1) cross-disciplinary courses focused on evolutionary environmental biology, 2) structured opportunities to learn from biologists, geologists, and policy-makers addressing applied ecological problems, 3) intensive teaching and innovative internship opportunities, and 4) group interactions at annual GAANN student-faculty retreats

**Grant Director:** Olufunmilayo Olopade

**Admin. Contact:** Emily Maple Phone: 2-2471 Fax: 2-0963

**Project Title:** **Basic Research Training in Medical Oncology**

**Agency:** National Cancer Institute

**Expiration Date:** 06/30/12 **Grant Number:** CA09566

**Number of Slots:** 0 Pre-Doctoral
7 Post-Doctoral

**Purpose:** Medical Oncology is a subspecialty of internal medicine that concerns itself with the diagnosis, staging, and treatment of malignant diseases. The emphasis is on the use of systemic therapies that include chemotherapy and biologics. Fundamental research includes cancer genetics, cancer cytogenetics, molecular oncology, and cancer pharmacology. The purpose of this program is to provide training to board-certified or board-eligible internists who desire to become the physician-scientists of the future and who want to maintain a full-time academic focus.

**Grant Directors:** Catherine Pfister

**Admin. Contact:** Carolyn Johnson Phone: 2-9474 Fax: 2-4699

**Project Title:** **Graduate Assistance in Areas of National Need (GAANN): Ecology**

**Agency:** U.S. Department of Education

**Expiration Date:** 08/14/10 **Grant Number:** P200A070323

**Number of Slots:** 3 Pre-Doctoral
0 Post-Doctoral

**Purpose:** Environmental problems are a growing concern in the United States and worldwide. Adequately addressing these problems requires a solid quantitative understanding of how ecological systems operate. To meet the anticipated national needs for highly trained scientists and teachers in
ecology, the Department of Ecology and Evolution has aggressively enlarged its faculty by 35% in experimental and quantitative ecology over the last 10 years. Trainees in this GAANN program learn both basic research and teaching skills. Our program seeks to support students in ecology, with particular attention aimed at students with financial needs, minorities and women. We offer support as participants in the program, as well as indirectly, by providing venues for training and mentoring students from the high school level to the Ph.D. Trainees will benefit from our highly interactive and interpersonal program focused on the rigorous interplay of quantitative and experimental techniques in ecology.

**Grant Director:** Richard Quigg

**Admin. Contact:** Kiara Moore Phone: 2-3596 Fax: 2-5818

**Project Title:** **Nephrology Research Training**
**Agency:** National Institute of Diabetes and Digestive and Kidney Diseases

**Expiration Date:** Under Scientific Review **Grant Number:** DK07510

**Number of Slots:** 0 Pre-Doctoral
3 Post-Doctoral

**Purpose:** The overall goal of the program is the training of physicians and scientists to investigate both renal diseases and the basic biology that underlies normal and abnormal kidney function. Although emphasis is placed on basic research techniques, they are applied to health related problems that include kidney regeneration after injury, glomerulonephritis, nephrolithiasis, uremic bone disease, vascular reactivity and hypertension, kidney disease and hypertension in pregnancy and cardiac function in uremia. Principal methods include molecular cloning, genomic DNA analysis using PCR, all forms of protein purification and characterization, cell culture, tubule microdissection and microanalysis, antibody methods, vascular contractility measurements, and whole organ and animal physiology, as well as direct human clinical protocols. Candidates have the M.D. or Ph.D. degree, and physicians will have completed clinical training in Internal Medicine and one year in Nephrology. Candidates are selected by the entire faculty based on interviews, letters of recommendation and past research performance where applicable. Progress of candidates is assessed by the program director and co-director, individual faculty sponsors, and seminars given by candidates.

**Grant Director:** José Quintáns

**Admin. Contact:** Jacqueline McKissack Phone: 2-9755 Fax: 4-5409

**Project Title:** **Medical Scientist National Research Service Award**
**Agency:** National Institute of General Medical Sciences

**Expiration Date:** 06/30/10 **Grant Number:** GM07281

**Number of Slots:** 34 Pre-Doctoral
0 Post-Doctoral

**Purpose:** The Medical Scientist Training Program is an integrated program of study leading to the M.D. degree and to a Ph.D. in a field related to medicine. Students admitted to the program begin in the summer with special anatomy and histology courses, to free up time during the school year for Ph.D. coursework. In the fall, students join the regular medical program, into which they integrate courses that will satisfy the specific requirements of their chosen Ph.D. program. During the second summer, trainees rotate through one or two laboratories to determine their specific area of research interest and their potential faculty adviser. While some students make this choice early and begin thesis research after the first year of medical studies, most trainees enter into full time research toward the Ph.D. after the second year of medical studies is completed, taking additional courses only as needed to meet degree requirements. After completion of the Ph.D., trainees return to finish the remainder of their medical program. Trainees may choose a wide range of areas for the Ph.D., including: biochemistry and molecular biology; cancer biology; immunology; molecular genetics and cell biology; neurobiology; pathology; pharmacological and physiological sciences; computational neuroscience; microbiology and human genetics.

**Grant Director:** Mark Ratain

**Admin. Contact:** Michelle Domecki Phone: 2-9699 Fax: 2-9698

**Project Title:** **Clinical Therapeutics**
**Agency:** National Institute of General Medical Sciences

**Expiration Date:** 06/30/10 **Grant Number:** GM07019
**Number of Slots:** 3 Post-Doctoral

**Purpose:** This training program has been designed to provide an education in a broad range of academic clinical pharmacology activities through exposure to both research and clinical activities and studies. The Committee on Clinical Pharmacology and Pharmacogenomics is comprised of faculty in the Departments of Anesthesia and Critical Care, Human Genetics, Medicine, Psychiatry, and Pediatrics. Each trainee follows an individually designed program based on his or her background, with minimal core requirements. It is anticipated that most fellows will have a M.D. degree, will have completed their residency training and will be eligible for board certification in their selected specialty. However, qualified applicants with a Ph.D. and Pharm.D. in a relevant discipline will be considered for acceptance into the program. It is also anticipated that some applicants with a M.D. degree will have completed a period of fellowship training in a selected sub-specialty. Applicants are expected to complete a 2-3 year period of training, at the end of which they should be qualified to address clinical pharmacologic issues and research questions within their specialty, as well as be prepared for board certification in Clinical Pharmacology.

**Grant Director:** Samuel S. Refetoff

**Admin. Contacts:** Ann M. Leu Phone: 2-6217 Fax: 4-0486

**Project Title:** **Integrated Clinical and Basic Endocrinology Research**

**Agency:** National Institute of Diabetes and Digestive and Kidney Diseases

**Expiration Date:** 06/30/2011 **Grant Number:** DK07011

**Number of Slots:** 3 Post-Doctoral

**Purpose:** The Endocrinology Fellowship Training Grant provides trainees with multidisciplinary training in endocrinology to prepare them for careers in academic endocrinology. The major focus of training is for M.D. and M.D./Ph.D. candidates, although a limited number of Ph.D. fellows are also eligible for training. Potential trainees interview preceptors who include faculty in the Section of Endocrinology and the Departments of Medicine and Pediatrics, as well as faculty in the basic science departments whose research is related to the study of hormonal regulation. Regularly scheduled conferences and research seminars are part of the training program, and the trainees have the opportunity to interact with invited speakers and also to attend national meetings and to present the results of their research in this forum.

**Grant Director:** Robert L Rosenfield **Co-Director:**

**Admin. Contact:** Mary Martin-Capouya Phone: 4-0281 Fax: 2-1196

**Project Title:** **Pediatric Endocrinology Research Training grant**

**Agency:** NIDDK

**Expiration Date:** 06/30/09 **Grant Number:** DK0654182

**Number of Slots:** 2 Post-Doctoral

**Purpose:** The Training Program in Pediatric Endocrinology at The University of Chicago will train pediatric physician-scientists in the investigation of endocrine diseases. This program is in response to the severe shortage of physician-scientists who have careers focused on pediatric endocrinology. Fortunately, this need comes at a time when the size of the Pediatric Endocrinology Section and available research opportunities have increased at The University of Chicago. While, The University of Chicago has an excellent record in training endocrinologists, the number of pediatric endocrinologists trained has been limited by available funding. Four highly qualified pediatricians, who have completed clinical training in pediatric endocrinology, will be accepted into a program that will feature basic and clinical science integration and collaboration among investigators from diverse disciplines. The Training Faculty carry out a broad range of endocrine-related research supported by a substantial base of NIH funding and are members of several University Departments: Pediatrics, Medicine, Biochemistry and Molecular Biology, Human Genetics and Health Studies. The program will emphasize all aspects of pediatric endocrinology including disorders of growth and development, puberty, obesity, the thyroid, and diabetes. There will be a required core curriculum

consisting of courses in research methodology, molecular biology, genetics and epidemiology and statistical analysis of research data. Training mentors have NIH-funded research programs that can support the trainees' investigational experience over a two year period. In addition, there will be seminars and conferences in endocrinological research as well as related disciplines. These features are critical for mastery of research in pediatric endocrinology. An executive committee will assist the directors in running and evaluating the program. In summary, the strengths of this research training program are collegial and successful mentors, an active general clinical research center, a committed executive committee, and a rich academic environment at The University of Chicago.

**Grant Director:** Lucia Rothman-Denes

**Admin. Contact:** Sue Levison Phone: 2-2464 Fax: 2-3172

**Project Title:** **Genetics and Regulation Training Grant**

**Agency:** National Institute of General Medical Sciences

**Expiration Date:** 06/30/08 **Grant Number:** GM07197

**Number of Slots:** 18 Pre-Doctoral
0 Post-Doctoral

**Purpose:** This is a broad interdisciplinary program aimed at training Ph.D. scholars in advanced rationales and methods of genetic analysis for careers as independent scientists in basic and applied biomedical research and education. Trainees may matriculate in any degree-granting unit in the division. The training faculty is comprised of members from 9 academic departments in the Division of Biological Sciences. Opportunities are available to study diverse areas of genetics, including: developmental processes; gene structure and regulation; genetic recombination and mutation; chromosome mechanics; evolution; human disease; immunology; and other areas of modern genetics. Students receive broad training in these subdisciplines while specializing in one of them for their research career. Students take courses in molecular, transmission and population/evolution genetics. The program sponsors a regularly invited seminar series, a genetics journal club, student research presentations and an annual symposium focused on areas of current interest in genetics

**Grant Director:** Olaf Schneewind, MD, PhD

**Admin. Contact:** Julie Caldwell Phone: 49750 Fax: 4-8151

**Project Title:** **Biodefense Training in Host-Pathogen Interactions**

**Agency:** National Institute of Allergy and Infectious Diseases

**Expiration Date:** 9/30/10 **Grant Number:** AI065382

**Number of Slots:** 3 Pre-Doctoral
0 Post-Doctoral

**Purpose:** This training program is a new, interdisciplinary effort that draws on University of Chicago faculty expertise from the Pritzker School of Medicine and Biological Sciences Division (BSD), the Social Sciences Division (SSD) and Harris School of Public Policy (HSPP), the Physical Sciences Division (PSD), the Graham School, and Argonne National Laboratory. We propose to train graduate students and post-doctoral fellows from diverse disciplines to provide the necessary scientific knowledge and competencies that are connected to public health risk and crisis management. This program will address the leadership development needs, business acumen, public policy knowledge, public relations and communication skills, risk assessment and legal knowledge, and technological skills required of those managing and working to prevent disasters.

**Grant Director:** Nancy Schwartz

**Admin. Contacts:** Jeanne Corey Phone: 2-4722 Fax: 2-9234

**Project Title:** **Graduate Training in Growth and Development**

**Agency:** National Institute of Child Health and Human Development

**Expiration Date:** 04/30/08 **Grant Number:** HD007009

**Number of Slots:** 13 Pre-Doctoral
0 Post-Doctoral

**Purpose:** This is an integrated training program leading to both the M.D. and Ph.D. degrees. Students are considered for the program after they have completed one or in most cases two years of medical studies. Although not supported by the program during these pre-clinical years, students usually acquire relevant laboratory experience, fulfill some graduate course requirements and seek out a research sponsor and graduate degree unit in anticipation of their application to the program. If selected, the trainee may receive up to five years of support, which generally encompasses part of the Ph.D. phase and the remainder of the M.D. training (the two clinical years). A wide variety of Ph.D. degree-granting units are available to trainees, including: Biochemistry and Molecular Biology; Immunology; Molecular Genetics and Cell Biology; Neurobiology; Pathology; Pharmacological and Physiological Sciences; and Virology.

**Grant Director:** Harinder Singh **Co-Director:** Tobin Sosnick

**Admin. Contact:** Dawn David Phone: 4-8344 Fax: 2-3172

**Project Title:** **Molecular and Cellular Biology**

**Agency:** National Institute of General Medical Sciences

**Expiration Date:** 06/30/12 **Grant Number:** GM007183

**Number of Slots:** 29 Pre-Doctoral

**Purpose:** The Molecular and Cell Biology (MCB) training program is a long standing interdisciplinary program at the University of Chicago that is focused on the training of graduate students for independent academic and/or research careers in the Biomedical Sciences. The core mission of the program is to train students to analyze biological processes using the conceptual and experimental tools of structural, molecular, cell biology and biochemistry. This mission is necessarily interdisciplinary in nature and represents a distinctive feature of this training program. The program has strong research foci in the following areas of molecular and cellular biology: biochemistry including macromolecular structure (Protein and RNA), folding and function, synthetic biology, protein trafficking, organelle biogenesis, cell signaling, cell-cell interaction, control of gene expression and cell fate determination, chromosome structure, recombination and alterations during oncogenesis, viral and bacterial pathogenesis, immune cell development and recognition of antigens. An MCB trainee must take the Protein Fundamentals course and can choose between one of two courses in Cell Biology and one of three courses in Molecular Biology. All trainees, both current and past, participate in and attend the program lecture series, mini-symposium and "Research in Progress."

**Grant Director:** Julian Solway

**Admin. Contacts:** Elneda Boyd Phone: 2-0737 Fax: 2-6500
Juanita Tyler Phone: 2-6790 Fax: 2-4736

**Project Title:** **Research Training in Respiratory Biology**

**Agency:** National Heart, Lung and Blood Institute

**Expiration Date:** 06/30/10 **Grant Number:** HL07605

**Number of Slots:** 2 Pre-Doctoral
10 Post-Doctoral

**Purpose:** The objective of this research training program for Ph.D. or M.D. trainees is to produce scientists whose basic investigations in cell and molecular biology elucidate the pathophysiology of human respiratory disease and critical illness. The program focuses on Airway Biology and on Endothelial Cell Biology. Areas of training include: cell and molecular biology of airway and vascular tissue components; mechanisms of inflammation; tissue remodeling and growth; immunology; and organ physiology. Formal coursework, research presentations, and clinical exposure, coupled with laboratory investigation, provide broad experience designed to facilitate transition to the trainees' independent research careers.

**Grant Director:** Philip Ulinski

**Admin. Contact:** Diane Hall Phone: 2-6371 Fax: 2-1216

**Project Title:** **Training in Computational Neuroscience**
**Agency:** National Institute of Mental Health

**Expiration Date:** 06/30/09 **Grant Number:** MH20029-09

**Number of Slots:** 5 Pre-Doctoral
0 Post-Doctoral

**Purpose:** The program has two specific aims: (1) to train young scientists with a working knowledge of neuroscience at levels of organization ranging from molecular neurobiology to cognitive science, (2) to train young scientists who have basic expertise in both mathematical and experimental approaches to important problems in neuroscience. Students will gain degrees through existing, degree-granting units and participate in a training program that has six components: (1) background training in mathematics, biology or psychology, (2) three core courses in computational neuroscience, (3) elective courses, (4) a computational neuroscience seminar series, (5) laboratory rotations and (6) dissertation research. Thirteen training faculty are drawn from seven departments ranging from Mathematics to Neurology. They are involved in research ranging from structure/function relationships in voltage-gated sodium channels, to sensorimotor transformations in song birds, to connectionist models of language and semantics in humans. A key feature of the program is that most of the faculty are involved in combined mathematical and experimental approaches to neuroscience and behavior. The predoctoral training program is one component in a larger computational neuroscience program that includes expanding undergraduate and postdoctoral education components.

**Grant Director:** Paul Vezina

**Admin. Contact:** Victoria Strokova Phone: 2-2891 Fax: 2-0857

**Project Title:** **Neuropsychopharmacology Training for Drug Abuse Research**
**Agency:** National Institute on Drug Abuse

**Expiration Date:** 6/30/12 **Grant Number:** DA07255

**Number of Slots:** 5 Pre-Doctoral
5 Post-Doctoral

**Purpose:** The objective of this training program is to provide an educational and research environment in which both pre- and postdoctoral students receive basic and specialized training that will enable them to pursue research and teaching careers in drug abuse. The theme of research in the program is designed to enhance our knowledge of the behavioral, neurochemical, and neuropharmacological basis of drugs of abuse and by so doing, increase understanding of important behavioral and biological factors that play a role in drug abuse. This program relates to the neuropharmacology, psychopharmacology, and molecular biochemistry of drug abuse as well as the behavioral and subjective effects of drugs in humans. In addition to formal coursework, discussion, and research, this training program sponsors a seminar series in which trainees have the opportunity to present their work and to learn more about the work of training faculty and outside speakers working in the area of drug abuse.

**DIVISIONAL UNENDOWED FUNDS**

**Administration:** BSD Office of Graduate Affairs

**Number of Slots:** Varies

**Duration of Support**: Full fellowships for four quarters of the first year.

**Purpose:** Divisional Unendowed awards provide support during the first year (four quarters) to new graduate students. A significant portion of the first year students are supported by Divisional funds for the first year of graduate study.

**RESEARCH ASSISTANTS TYPE B**

**Administration:** BSD Office of Graduate Affairs

**Number of Slots:** Unlimited

**Duration of Support:** Indefinite

**Purpose:** Graduate Students may be supported by faculty research grants. This form of support is valuable for those students who have completed their period of support from an institutional training grant or who do not qualify for training support. Students are considered to be salaried research assistants to the advisor, employed to advance the research for which the grant was awarded.

**Stipend:** The current salary level for academic year 2007-08 is $25,500. Research Assistants Type B are paid at the same level as graduate students who are supported by training grants or other sources of funding. Health insurance and fees may be paid separately from a non-federal account. Alternatively, their salary may be increased to cover the cost of insurance and fees. The latter method must be used for foreign students who are paid as Research Assistants Type B.

**Tuition:** The research assistant tuition recovery from the research grant is $9,600 per research assistant per year, mandated by the Office of the Provost.

**OTHER SOURCES OF FUNDING**

Support for graduate students at the University of Chicago is a shared responsibility among the student's sponsor, the degree-granting department or committee, and the Division. Funding patterns may vary during a student's time at the University and may include support from training grants, Divisional funds, and individual awards and fellowships or research grants (RAships).

Students are also encouraged to seek independent, competitive outside awards. A significant number of current students have been awarded National Science Foundation and other prestigious national awards.

**APPENDIX A**
**SUPPLEMENTAL INFORMATION FOR TRAINING GRANTS**

Central Resources

While Training Grant Directors maintain current information on individual training grants and students, the following information may be obtained from the BSD Office of Graduate Affairs:

Student Admissions Statistics (Historical and current)
Current Minority Student Statistics (Historical and current )
Faculty Training Grant Affiliations
Electronic Versions of Standard Text (Minority Recruitment and Integrity of Science boilerplate)
List of division-wide Training Grants

**Minority Recruitment**

The following may be used as a boilerplate for training grant renewals. However, each program should modify and add to the text in a manner, which will reflect its own implementation and initiative.

The Division of Biological Sciences of the University of Chicago is represented at major minority conferences by members of the Office of Graduate Affairs, faculty, and current students. These conferences include the Annual Biomedical Research Conference for Minority Students (ABRCMS); the annual meeting of the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS); the Association of Minority Health Professions Schools; and the National Institute of General Medical Sciences (NIGMS) Minority Programs Symposium. The Office of Graduate Affairs follows up with information and application materials to all students who we meet at the conferences and express an interest in the graduate programs of the Division. In addition, the Office of Graduate Affairs sends out annual mailings to colleges with high minority populations.

The Division of the Biological Sciences participates in several minority summer research programs for college students. The Office of Graduate Affairs provides funds for summer research internships for minority students who intend to pursue Ph.D. studies in basic science research as part of the Graduate Summer Program. The Office of Graduate Affairs also participates and coordinates activities with Summer Research Opportunities Program (SROP), which has science slots and is managed by the Dean of Students in College. The Pritzker Office of Multicultural Affairs administers a grant from the National Heart, Lung, and Blood Institute and has in place a minority summer internship program for undergraduates, graduate medical students, and first year medical students to do 11 weeks of research with Pritzker faculty. The Young Scientist Training Program (YSTP), a training program focuses on minority high school students and is funded by the National Institute of Digestive Diseases and Kidney Diseases of the NIH is also offered. The Pritzker Office of Multicultural Affairs also administers the Chicago Academic Medicine Program (CAMP) and the Prizker School of Medicine Experience in Research (PSOMER) in conjunction with the Office of Admissions to strengthen the competitiveness of minority students for medical school admission.

Although each training program initiates its own student visitation and outreach, the training grant directors have also established a committee on minority affairs, the Graduate Minority Committee (GMC), that coordinates with the Office of Graduate Affairs, recruitment visits to other schools, fosters other recruitment efforts, and enhances awareness among the faculty. The Committee keeps track of applications from minority students for graduate study, ensuring that applications from promising candidates are reviewed promptly. The Committee also keeps track of current students throughout their academic career, especially the early years of coursework. The Office of Graduate Affairs provides counseling and tutoring programs if necessary.

Currently enrolled minority graduate students often accompany Committee members on recruitment visits to minority institutions. The BSD graduate students have formed organizations, which conduct activities like a series of informal lunch workshops to meet with summer research students and minority undergraduates currently in the College or in the PREP to inform them about graduate study.

**Scientific Ethics**

The following may be used as a boilerplate for training grant renewals. However, each program should modify and add to the text in a manner, which will reflect its own implementation and initiative.

The University of Chicago has always taught the importance of conducting scientific research in an ethical and responsible manner. In 1990, in response to new regulations from the National Institutes of Health, this informal training was formalized into a teaching program on Scientific Integrity and the Responsible Conduct of Research. The program was initially sponsored by the University's Center for Clinical Medical Ethics. All pre- and postdoctoral students receiving funding from NIH/PHS T-32 grants were expected to attend. Other graduate students and faculty were encouraged to participate.

In 1990-91, a series of lecture-discussions was presented during the academic year, with accompanying readings. Speakers included members of the University community, as well as outside experts. Topics covered included: the feasibility of teaching scientific integrity; government concerns with integrity and misconduct in science; policies for protecting human research subjects; ethical and policy concerns of animal research; University of Chicago procedures for investigating academic fraud; ethical issues in scientific publication; and an examination of how researchers at the University handle issues of scientific responsibility.

In 1991-92, the format was changed to a series of four two-hour seminars, one in each academic quarter. For each seminar, students were divided into ten groups; each led by two faculty members, a biological scientist and an ethicist. Selected readings and a case study to initiate discussion accompanied each seminar, together with a list of potential topics and questions to cover, based on the reading material. Topics covered were scientific misconduct and fraud, laboratory supervision and control of data, publication and reviewing practices, and societal concerns about research material such as genes, animals, and human subjects.

In 1992-93, Robert Martin, a senior researcher from NIH discussed the famous case of the Piltdown Man and the current thinking on its status as a case of scientific fraud. A period of discussion followed. After the talk professional actors performed a reading of Mr. Martin's play, "A Stampede of Zebras," which deals with issues of scientific ethics. A panel of faculty and students then fielded questions and discussed issues raised in the play.

In 1993-94, a series of lectures was organized through out the year by invited speakers and covered topics such as: integrity and misconduct in science; conflicts of interest between academia and industry; responsible authorship and data management; and University of Chicago policies for handling questions of scientific ethics. In addition, training grant directors organized discussion sessions in which students presented specific ethics cases to small groups of students for more in-depth analysis.

In 1994-95, due to the popularity and success of the small discussion groups, training grant directors continued the program from the prior year. Selected readings, covering specific issues of scientific ethics, were also discussed at the sessions.

In 1995-96, the MacLean Center for Clinical Medical Ethics arranged a series of lectures, which focused on aspects of scientific integrity, including conflicts of interest, publishing, record keeping, the responsible conduct of research, and University policies for ensuring responsible science. Each lecture was followed by a lengthy question and answer session. The small discussion groups initiated by training grant directors were also continued.

In 1996-97, the Division of the Biological Sciences initiated a formal course in Spring Quarter entitled "Scientific Integrity and the Ethical Conduct of Research." Since then, all first-year graduate students are obliged to attend the course for academic credit, as one of the requirements for the Ph.D. degree. Many of the sessions are also open to the public and other students and postdocs are encouraged to attend. Different aspects of scientific ethics were covered each week; each led by two different faculty members. The format varied, including faculty presentations followed by group discussions; faculty presentations with question and answer periods within the presentation time; or case study discussion with no formal prior presentation. Topics covered included: mentoring; data presentation, ownership and sharing; responsibilities of scientific communication; fraud and misconduct; publication and authorship; human experimentation; the genome project; human cloning; institutional policies on scientific misconduct; conflicts of interest in research and industry; implications of genetic susceptibility to disease; animals in research; and science and society. The students were also required to complete two written assignments, based on case studies, and make small group presentations to the rest of the class.

In 2000-01, based on feedback from a student focus group, the structure of the course was altered from primarily a formal lecture format to incorporate smaller group discussions in a workshop format. The topics for the lectures follow the requirements from NIH, and include Teaching/Mentoring, Data Presentation & Management/Authorship & Publication, Fraud and Misconduct, Animals in Research, Human Research and its Challenges and Conflict of Interest. The rest of the course offers a variety of workshops that students may choose according to their area of research, such as, IACUC, Informed Consent, IP/Tech Transfer, Science and Society I – impact of sciences on society, Science and Society II – perception of sciences by society and how science is presented to the public, Genetic Counseling, Genome Project, Field Biology, and Genetically Engineered Food and Crops. The students also complete two written assignments. There were a total of 9 workshops throughout the course quarter.

In 2001-02, due to extreme popularity and value of the workshops, the number of workshops was increased to 12 with the introduction of Patents and the Academic Mission, Sexual Harassment in the Scientific Workplace, and Evolution and its Perception by Society. The lectures, student presentations and written assignments remained the same.

In 2002-03, the course format of formal lectures and smaller group workshops continued to be well received by the students. The lecture sessions remained the same as the previous year, while the workshops included Ethical Interpretation of the Genome Project, Evolution & it's Perception by Society, Genetically Engineered Crops & Food, Scientific Communication with the Public, Sexual Harassment in the Scientific Workplace, Patents & the Academic Mission, Environmental Ethics, Genetic Counseling and Mechanisms Underlying Ethical Behavior in Science. Student presentations and written assignments remained the same.

In 2003-04, a few changes were incorporated into the course format as well as the assignments and projects. For the first assignment, in addition to writing a paper on an ethical dilemma, the students were broken up into small groups for further discussion. The students very well received the small group discussions. The final project for the course was a group effort. The assignment consisted of a 20-minute presentation presented by 3-5 students and a brief paper prepared by the remaining members of the group. Again, the small group project was a great success and will be continued next year.

In 2004-05, the course format remained similar to the year before, as it had been well-received by students. An introductory lecture on "Scientific Ethics" was added, to give students a philosophical basis for Ethics. Other lecture topics included: Teaching: The Formal Context of Scientific Training; Ethical Treatment of Animals, Fraud & Misconduct; Intellectual Property, Technology Transfer, Conflicts of Interest; and Ethical Issues Related to Human Embryonic Stem Cell Research. All students attended two workshops. Workshop topics included: Sexual Harassment in the Scientific Workplace; Ethical Implications of the Genome Project; Genetically Engineered Crops and Food; Genetic Counseling; Patents and the Academic Mission; Scientific Communication with both the media and the public; Scientific Authority; and Environmental Ethics. Student groups had 20 minutes each to present on a variety of topics ranging from Data Integrity in Field Research to Personal Views of Appointed Scientists to Bioterrorism Research Spending to Genetics & Racism. Written assignments remained the same.

The format for the BSD Scientific Integrity and the Ethical Conduct of Research course was modified in 2005-06, and continued with the new format in 2006-2007. In order to foster critical thinking and peer discussion about scientific ethics, the BSD Ethics course changed from a lecture/workshop format to primarily student-led lessons on relevant and current topics of scientific research and education. After an introductory session, students broke into twelve groups, and were each assigned a distinct topic to present to the entire class. Each group met with a faculty mentor with expertise on the subject, followed by a meeting with the teaching assistants to polish the presentation. There were six formal sessions, with two groups each presenting a 45-minute lesson at each session. Each formal session was assigned a general topic, with each group presenting a different aspect of that topic. In 2007, topics included: Fraud and Misconduct (Resources and Consequences; Current Cases); Teaching (Ethics of Teaching; Ethical Issues Facing Students); Ethical Treatment of Animals (In the Lab; In the Field); Human Research Subjects (Stem Cells; Cultural Perspectives); Publishing and Authorship (Publishing, Authorship, and Data Presentation; Figure Production and Manipulation); Patents and Conflicts of Interest (Commercialization of Intellectual Property and Conflict of Interest; Patents and Tech Transfer). Students were asked to write a reflection paper at the end of the course.

In addition to this formal requirement for graduate students, there are a number of opportunities in the Division to explore the ethics related to the conduct of research; individual seminars offered by various departments which cover relevant topics and three academic units within the Division of Biological Sciences which routinely offer seminars on ethics and research. Although it has a more clinical focus, the MacLean Center for Clinical Medical Ethics' seminar series continues to cover a wide variety of ethics-related topics. In addition, the Department of Health Studies sponsors a weekly seminar series, which often includes topics of interest including research design and the ethics of research and clinical trials using human subjects. Finally, the Animal Resources Center provides monthly training sessions on the ethical care and use of animals on such recent topics as "Detecting and Evaluating Animal Pain and Distress," and "Determining the Number of Animals to Use in an Experiment."

**Teaching Requirement**

The following may be used as a boilerplate for training grant renewals. However, each program should modify and add to the text in a manner, which will reflect its own implementation and initiative.

As part of the commitment of the Division of the Biological Sciences to enhance the teaching abilities of all its students, especially those on training grant support, the Division has established a Teaching Assistant Program. All Ph.D. students are required to teach twice (two quarters) for credit in pre-approved teaching assistant (TA) positions in the Biological Sciences. The requirement must be fulfilled before the Ph.D. degree can be awarded.

Students who have no experience in teaching may register in a Teaching Assistant Training Course, given every Fall Quarter. This course may count as one of the two required teaching positions. It is led by two "Super TAs," who are students with extensive experience in teaching. Invited faculty speakers offer their insights on how to give a lecture and encourage class participation. Discussion sessions are led by students taking the course and cover a wide variety of teaching issues. Written assignments are also set. The course has also incorporated elements useful for all Teaching Assistants, such as computer-based learning tools like Chalkboard and PowerPoint.

At the beginning of the course, students prepare short lectures, which they deliver to the rest of the class, followed by a critique of their presentation by their fellow students. These mini-lectures are videotaped and the student is required to replay and critique his or her own performance at leisure. Later in the course, students prepare a second, ten-minute talk, which is also videotaped and critiqued. Participants thus have the opportunity to assess how well they have incorporated the teaching techniques taught during the course. Students also sit in on and evaluate College or graduate courses during the quarter, especially

those given by faculty who have won awards for excellence in teaching, to examine and learn from different teaching styles.

Students performing a TAship in partial fulfillment of the requirement are expected to gain real teaching experience from their work. To this end, course directors are asked to specify what aspect of teaching the TA will perform during the quarter. Qualifying elements are: giving one or more supervised lectures, running weekly discussion sessions which are a scheduled part of the course, or running weekly labs. Courses that do not contain any of these elements do not qualify for fulfilling the teaching requirement.

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