

Release date: March 16, 2016

Call for applications: Molecular Mechanisms of Disease Predoctoral Training Program

Scope and Purpose

- Stipend and fringe for one year
- Travel funds for one conference
- Training in leadership, teaching, and entrepreneurship

The goal of this NIH-funded program is to develop outstanding new scientists who work in collaborative multi-disciplinary teams to research disease mechanisms using quantitative approaches that ultimately yield tangible strategies for prevention and therapy. Successful applicants will be highly qualified, motivated students with a strong interest in studying underlying molecular causes of human disease. The program will provide a framework for students to assemble a broad knowledge base, actively seek research collaborations, produce an outstanding record of original published research, and develop presentation, proposal writing, and leadership skills. Successful completion of the program will position trainees for future excellence as independent researchers focused on mechanisms of disease progression.

Eligibility

- PhD student beginning the 2nd year of study in fall 2016 within a participating laboratory
- Citizen, non-citizen national, or permanent resident (in accordance with NIH guidelines)

Criteria for selection

- Excellent academic record
- Research record and evidence of first year progress
- Collaborative (co-mentored) proposal in an area of molecular disease research

Application materials (Submit as a single pdf document to MMoDprogram@unl.edu by midnight, May 15, 2016)

- Statement of career objectives and training goals, identification of conference presentation opportunity (under one page)
- Proposal (11 pt Arial, three pages single spaced, not including references. Include sections titled: Significance, Relevance to Molecular Mechanisms of Disease, Hypothesis and Approach, Impact)
- Applicant biosketch including undergraduate and graduate academic record, GRE scores, courses taken, abstracts and presentations, manuscripts published or accepted (NIH-style, 4 page limit, see example)
- Letter of support from each collaborating mentor describing role in the project and commitment to the student's career development. Primary advisors: please include a brief training plan that addresses the student's progress toward degree, timelines and opportunities for remaining courses, exams, teaching, writing/submitting manuscripts and external grant applications, presentation opportunities, other career development (one page limit)
- Biosketch for each mentor (NIH-style, 4 page limit)

FELLOWSHIP APPLICANT BIOGRAPHICAL SKETCH (SAMPLE)

USE ONLY FOR INDIVIDUAL PREDOCTORAL and POSTDOCTORAL FELLOWSHIPS. DO NOT EXCEED FOUR PAGES.

NAME OF FELLOWSHIP APPLICANT Leilani Robertson-Chang	POSITION TITLE Postdoctoral researcher		
eRA COMMONS USER NAME (credential, e.g., agency login) RobertsonL			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Swarthmore College	B.S.	05/1999	Engineering
UC San Diego	Ph.D.	09/2007	Molecular biology
Michigan State University (postdoc)	n/a	n/a	Bioinformatics

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

NOTE: The Biographical Sketch may not exceed four pages. Follow the formats and instructions on the attached sample.

A. Personal Statement

My long term research interests involve the development of a comprehensive understanding of key developmental pathways and how alterations in gene expression contribute to human disease. My academic training and research experience have provided me with an excellent background in multiple biological disciplines including molecular biology, microbiology, biochemistry, and genetics. As an undergraduate, I was able to conduct research with Dr. Xavier Factor on the mechanisms of action of a new class of antibiotics. As a predoctoral student with Dr. Tanti Auguri, my research focused on the regulation of transcription in yeast, and I gained expertise in the isolation and biochemical characterization of transcription complexes. I developed a novel protocol for the purification of components of large transcription complexes. I was first author of the initial description of the Most Novel Complex. A subsequent first author publication challenged a key paradigm of transcription elongation and was a featured article in a major journal. During my undergraduate and graduate careers, I received several academic and teaching awards. For my postdoctoral training, I will continue to build on my previous training in transcriptional controls by moving into a mammalian system that will allow me to address additional questions regarding the regulation of differentiation and development. My sponsor Dr. I.M. Creative is an internationally recognized leader in the transcription/chromatin field and has an extensive record for training postdoctoral fellows. The proposed research will provide me with new conceptual and technical training in developmental biology and whole genome analysis. In addition, the proposed training plan outlines a set of career development activities and workshops – e.g. grant writing, public speaking, lab management, and mentoring students – designed to enhance my ability to be an independent investigator. My choice of sponsor, research project, and training will give me a solid foundation to reach my goal of studying developmental diseases in man. During my second postdoctoral year in Dr. I.M.'s lab my father had a severe stroke that eventually ended his life. I was out of the lab for six months dealing with my father's incapacitating illness and end-of-life issues. This hiatus in training reduced my scientific productivity.

B. Positions and Honors. List in chronological order all non-degree training, including postdoctoral research training, all employment after college, and any military service. Clinicians should include information on internship, residency and specialty board certification (actual and anticipated with dates) in addition to other information requested. State the Activity/Occupation and include beginning/end dates, field, name of institution/company, and the name of your supervisor/employer.

B. Positions and Honors

ACTIVITY/OCCUPATION	BEGINNING DATE (mm/yy)	ENDING DATE (mm/yy)	FIELD	INSTITUTION/COMPANY	SUPERVISOR/EMPLOYER
Engineer	08/99	06/01	Structural engineering	The IBeam Group	Sandip Mehta
Postdoc	10/07	12/07	Molecular biology	UC San Diego	G. Chadwick Murray
Postdoc	01/08	present	Bioinformatics	Michigan State University	I.M. Creative

Academic and Professional Honors. List any academic and professional honors. Include all scholarships, traineeships, fellowships, and development awards other than Kirschstein-NRSA. Indicate sources of awards, dates, and grant or award numbers. List current memberships in professional societies, if applicable.

Daughters of Hawaii Scholarship, 1995-1997

National Merit Scholarship, 1995-1999

Paula F. Laufenberg award for best senior project in the Department of Engineering, Swarthmore College, 1999

B.S. awarded with high honors, Swarthmore College, 1999

STAR award for public service in engineering, The IBeam Group, 2001

Ford Foundation Predoctoral Fellowship for Minorities, 2002-2005

Memberships in professional societies:

Sigma Xi

Association for Women in Science

National Society for Bioinformatics and Biotechnology

C. Publications (in chronological order). List your entire bibliography, separating research papers, abstracts, book chapters and reviews. Within each subsection the list should be chronological. Manuscripts "submitted for publication" or "in preparation" should be included and identified. For publicly available citations, URLs or PMC submission identification numbers may accompany the full reference: copies of publicly available publications are not accepted as appendix material.

Research papers:

Lorentson, C., Robertson-Chang, L., Sauer, N., and Mehta, S. 2000. Use of high-tensile concrete in cantilevered structures. *J. Applied Engineering* 63, 413-424.

Robertson-Chang, L., Yager, L.N., and Murray, G.C. 2007. Rtc is an essential component of the *Drosophila* innate immune response. *Genetics* 145, 884-891.

Yao, M., Dionne, C.-F., Robertson-Chang, L., and Murray, G.C. 2007. Up-regulation of *Drosophila* innate immunity genes in response to stress. *Science* 304, 1754-1756.

Robertson-Chang, L., Cescaloo, Q., and Murray, G.C. 2008. Structural analysis of *Drosophila* Rtc. In preparation.

Abstracts:

Robertson-Chang, L. and Janessa, A.J. 1998. Redesigning the Golden Gate bridge. Abstract for poster presentation, National Undergraduate Symposium on Science and Engineering, Baltimore, MD.

Robertson-Chang, L., Dionne, C-F., Yager, L.N. and Murray, G.C. 2007. Characterization of Rtc, an essential component of the innate immune response. Abstract for poster presentation, 48th Annual Drosophila Research Conference, Bozeman, MT.

Robertson-Chang, L. Using the Pugh-Andersen algorithm to evaluate microarray data. Abstract (submitted) for platform presentation, National Society for Bioinformatics and Biotechnology Annual Conference, Charleston, SC, November 2008.

Reviews:

Robertson-Chang, L. and Murray, G.C. 2006. Stress, flies, and videotape: the Drosophila stress response. *Ann. Rev. Physiol.* 346, 223-245.

D. Scholastic Performance. *Predoctoral* applicants: Using the chart provided, list by institution and year all undergraduate and graduate courses with grades. *Postdoctoral* applicants: Using the chart provided, list by institution and year all undergraduate courses and graduate scientific and/or professional courses germane to the training sought under this award with grades. In the space following the chart, explain marking system if other than 1-100; A, B, C, D, F, or 0 – 4.0. Show level required for passing. Predoctoral applicants should provide Graduate Record Examination scores, if available. MD/PhD applicants should provide MCAT scores, if available.

YEAR	SCIENCE COURSE TITLE	GRADE	YEAR	OTHER COURSE TITLE	GRADE
SWARTHMORE COLLEGE			SWARTHMORE COLLEGE		
1996	Introduction to Molecular Biology	A	1995	Introduction to Engineering	A
1996	Introductory Chemistry I	B	1995	Calculus I	A
1996	Physics for Engineers	A	1996	Calculus II	B
1997	Introductory Chemistry II	C	1996	Structures and Design	A
1997	Organic Chemistry I	A	1996	Linear Algebra	B
1998	Organic Chemistry II	A	1997	Structural Materials	B
1998	Biochemistry	A	1997	Structural Materials Laboratory	A
1999	Cell Biology	A	1997	Numerical Computation & Graphics Tools	A
			1997	Engineering Graphics and Computer-Assisted Design	A
			1997	Principles of Structural Design I	B
			1997	Statistics, Probability, and Reliability	A
			1998	Principles of Structural Design II	A
			1999	Senior Project	A
UC SAN DIEGO					
2001	Seminar in Genetics	P			
2002	Statistics for the Life Sciences	P			
2003	Ethics in Biological Research	CRE			
2004	Seminar in Physiology & Behavior	P			

Except for the scientific ethics course, UC San Diego graduate courses are graded P (pass) or F (fail). Passing is C plus or better. The scientific ethics course is graded CRE (credit) or NC (no credit). Students must attend at least seven of the eight presentation/discussion sessions for credit.

MMoD mentor list 3/16/16

Metabolic Integrity

David Hage, Chemistry
Chromatographic automation of immunoassays (detection of glycosylated proteins in diabetic serum)

Paul Black, Biochemistry
Fatty acid transport in eukaryotes

Concetta DiRusso, Biochemistry
High throughput screens for fatty acid uptake inhibitors

Ed Harris, Biochemistry
Analysis of the functional groups of heparin required for systemic clearance

Wayne Reikhs, School of Biological Sciences
Lipid distribution and storage mechanisms

Robert Powers, Chemistry
NMR metabolomics

Jennifer Wood, Animal Sciences
Steroid hormone sensing and signaling

David Ro, Biochemistry
Nutrient sensing and metabolic signaling in obesity and cancer

Disease Microenvironment

Deb Brown, School of Biological Sciences
Vaccine strategies that target cytolytic CD4 T cells to the lung

Amanda Ramer-Tait, Food Science and Technology
Host-microbial interactions in inflammatory bowel disease

Sri Kidambi, Chemical and Biomolecular Engineering
Tissue engineering, stem cells, and liver reconstruction

Angela Pannier, Biological Systems Engineering
Non-viral gene delivery, synthetic extracellular matrices, protein-cell adhesion

Jiri Adamec, Biochemistry
Mitochondrial dysfunction biomarkers link to environmental stressors

Matthew Wiebe, Veterinary and Biomedical Science
Host pathogen interactions and viral mechanisms of immune evasion

Melanie Simpson, Biochemistry
Mechanisms of hyaluronan signaling and turnover in prostate cancer progression

Oxidative Stress

Don Becker, Biochemistry
Role of proline in redox homeostasis and apoptosis

Joseph Barycki, Biochemistry
Structural insights into redox homeostasis

Liangcheng Du, Chemistry

MMoD mentor list 3/16/16

Discovering new anti-infective agents from *Lysobacter*

Mark Wilson, Biochemistry
Redox regulation of DJ-1 function

Jaekwon Lee, Biochemistry
Mechanistic insights in homeostatic copper acquisition
Mechanistic insights into cellular metal detoxification

Oleh Khalimonchuk, Biochemistry
Oma1 in mitochondrial oxidative function

Nicole Buan, Biochemistry
Contribution of methanogenic bacteria to gut function

Limei Zhang, Biochemistry
metalloproteins involved in biotic and abiotic stress sensing or detoxification

Molecular Signaling

Andrea Cupp, Animal Science
Role of VEGF in testis morphogenesis

Bill Velander, Chemical and Biomolecular Engineering
cGMP recombinant factor IX for IV and oral hemophilia B therapy

Eric Dodds, Chemistry
Chemical glycobiology

David Berkowitz, Chemistry
Chemical biology and synthetic organic chemistry

Jiantao Guo, Chemistry
Protein tyrosine-O-sulfation, molecular interaction probes

Cliff Stains, Chemistry
Novel fluorescent protein design and protein activity switches

James Takacs, Chemistry
Catalytic asymmetric hydroboration: uncapping the potential with two-point binding