

**APPLICANT BIOGRAPHICAL SKETCH**

Use only for individual predoctoral and postdoctoral fellowships, dissertation research grants (R36), and for Research Supplements to Promote Diversity in Health-Related Research (Admin Suppl). DO NOT EXCEED FIVE PAGES.

NAME OF APPLICANT Leilani Robertson-Chang	POSITION TITLE Postdoctoral researcher
eRA COMMONS USER NAME (credential, e.g., agency login) RobertsonL	

EDUCATION/TRAINING: (Most applicants will begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. High school students should list their current institution and associated information.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	START DATE MM/YYYY	END DATE (or expected end date) MM/YYYY	FIELD OF STUDY
Swarthmore College	B.S.	08/1995	05/1999	Engineering
UC San Diego	Ph.D.	08/2001	10/2007	Molecular biology
Michigan State University (postdoc)	n/a	09/2007	Present	Bioinformatics/ Immunology

**NOTE: The Biographical Sketch may not exceed five pages. Follow the formats and instructions below.**

**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. Creative'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

ACTIVITY/OCCUPATION	START DATE (MM/YYYY)	END DATE (MM/YYYY)	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/ Immunology	Michigan State University	I.M. Creative

### **Academic and Professional Honors**

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. Contributions to Science

I. My early career contributions were focused on applying my knowledge of structural engineering to improving the design and integrity of tensile structures. More specifically, I worked with a team of engineers at the IBeam Group to develop concrete with a higher tensile strength that could be utilized in large structures such as suspension bridges. My particular role in the project was to identify candidate polymers, determine the ultimate tensile strength of these polymers, and make recommendations as to which polymer would afford concrete the most structural integrity under various stresses.

### **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.

### **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.

II. My graduate research contributions focused on transcriptional gene regulation in *Saccharomyces cerevisiae*. Results from my research were highly relevant as they provided new details into the workings of complex biological systems, and allowed for further extrapolations into the development of certain diseases and their progression. I originally developed a novel protocol for the purification for components of large protein complexes. A subsequent publication, in which I isolated and characterized a long sought after transcription complex, challenged a key paradigm of transcription elongation and was a featured article in a major journal.

### **Research papers**

Robertson-Chang L and Auguri, T. 2004. A tandem affinity purification tag approach allows for isolation of interacting proteins in *Saccharomyces cerevisiae*. Proc Natl Acad Sci U S A. 98, 151-60.

Robertson-Chang L, Schneider K, Chen M, Auguri T. 2006. Rapid Isolation and Characterization of the Most Novel Transcription Complex in *Saccharomyces cerevisiae* and its role in transcription elongation. Cell. 128, 770-9.

### **Abstracts**

Robertson-Chang L and Auguri, T. A tandem affinity purification tag approach allows for isolation of interacting proteins in *Saccharomyces cerevisiae*. Abstract for poster presentation, 2004 Yeast Genetics and Molecular Biology Meeting, Seattle, Washington, September 2004.

Roberson-Chang L, Schneider K, Chen M, Auguri T. Rapid Isolation and Characterization of the Most Novel Transcription Complex in *Saccharomyces cerevisiae* and its role in transcription elongation. Oral presentation, 2006 CSHL Meeting on Mechanisms of Eukaryotic Transcription. Cold Spring Harbor, NY, August 2006.

III. As a postdoctoral fellow, my research has provided a compelling link between mutations arising in stress response proteins and the development of various autoimmune diseases in humans. Previous studies have shown dysregulation in the innate immune response lead to autoimmune diseases in humans. A few Rtc homologues have now been identified in humans and appear to play a role in the regulation of genes in the innate immune response. My research is focused on the transcriptional regulator Rtc from *Drosophila melanogaster*. I have shown that specific mutations affecting Rtc lead to disruptions in downstream gene regulation involved in the innate immune response.

### **Research papers**

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.

### **Reviews**

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

Complete List of Published Work in MyBibliography:

- <http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/public/1tay8xsxteXlw5R2StTcjhq5X/?sort=date&direction=ascending>.

## D. Scholastic Performance

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
UC SAN DIEGO			1997	Principles of Structural Design I	B
2001	Seminar in Genetics	P	1997	Statistics, Probability, and Reliability	A
2002	Statistics for the Life Sciences	P	1998	Principles of Structural Design II	A
2003	Ethics in Biological Research	CRE	1999	Senior Project	A
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.