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Letter from the Director



In this first issue of the 2008 University of Michigan Medical School Student Biomedical Research Program Newsletter, we highlight the outcome of the 2008 SBRP Summer Program Award competition. As indicated on pages 2-7, 97 students submitted proposals for potential funding by the SBRP Program and other summer research program initiatives. The Committee for Student Biomedical Research and I were very impressed with the diversity and quality of the proposals submitted. Most were granted support either initially or after revision. This was made possible by the renewal of the Program's T-35 Training Grant supported by the NIH/NHLBI along with extramural and intramural support from the MCRiT Program, the National Institute for Aging T-35, and institutional endowment funds for student research. Altogether 90 students will be participating in a summer research experience. We look forward to the annual Fall Research Forum to learn about the exciting results arising from this work.

In addition to the results of the 2008 SBRP Summer Research Program award competition, we want to highlight the success of our summer program graduates in competing for prestigious year-long fellowships. On pages 7-11 is a listing of SBRP graduates who were selected for year-long research programs supported by the Howard Hughes Medical Institutes, National Institute for Health, Sarnoff Foundation, AOA Foundation, MCRiT Program, etc.

Finally, we want to welcome a new addition to the SBRP leadership, Dr. Victor DiRita, who has recently been appointed as Assistant Dean for Graduate and Postdoctoral Studies (see section below). Dr. DiRita takes the place of Dr. David Engelke who has served as Associate Director for the past eighteen months, and has recently been appointed as Associate Dean for Academic Programs & Initiatives, in the Horace H Rackham School of Graduate Studies.

Welcome to Victor DiRita, Ph.D. as SBRP Associate Director



Effective June 1, 2008, Victor DiRita, Ph.D. will serve as SBRP Associate Director, assisting Dr. Robert Todd (Director) and Dr. Elizabeth Petty (Associate Director) in administration of the program, including selection of faculty mentors, student trainees, and stewardship of the many sources of extramural and intramural support for the program. Dr. DiRita, who has recently been appointed as Assistant Dean for Graduate and Postdoctoral Studies in the Office of Student Programs, is Professor in the Unit for Laboratory Animal Medicine and the Department of Microbiology and Immunology in the Medical School, and also serves as the Director of the Microbial Pathogenesis Training Program. Dr. DiRita is a senior scientist with a particular interest and expertise in bacterial pathogenesis.

He serves as Editor of *Infection and Immunity*, and is a frequent reviewer for many other prestigious journals including *Science*, *Cell*, *PLoS Pathogens*, and *PNAS*. He is a co-Editor of Shaechter's *Mechanisms of Microbial Disease* (4th Edition), a popular medical school microbiology text. He recently completed service on the NIH Bacterial Pathogenesis Study Section. He is Chair of the 2008 Gordon Research Conference on Microbial Toxins and Pathogenicity, and in June he will begin a two-year term of service as Divisional Group II representative of the American Society for Microbiology.

Goals of the Student Biomedical Research Program

The goals of the SBRP are to:

- Provide medical students with the opportunity to learn research concepts and methodology from experienced investigators, and to assess their desires to pursue careers in research.
- Expand the scholarly and research experiences of medical students as part of an overall career development strategy aimed at increasing the number of talented students choosing careers as physician-scientists.

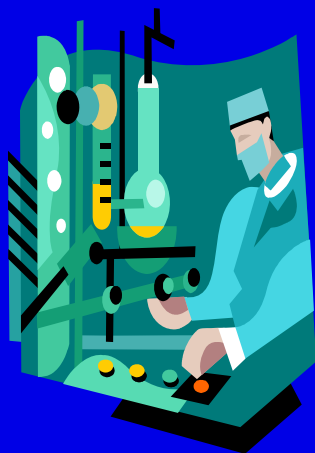
- Promote high quality and intensive research opportunities for those students who are already on a path towards academic medicine.

- Provide students who elect not to go into academic medicine with an understanding of the scientific method and critical analysis of literature through their research experience.

- Promote research experiences which can develop into longer-term student-faculty mentoring relationships.

- Provide trainees with experience in scientific presentation and publication of research through the annual Student Biomedical Research Fall forum, and other scientific meetings at a regional or national level.

- Provide students with a high quality didactic program in research with an emphasis on the ethical and responsible conduct of research.



Results of the 2008 SBRP Summer Fellowship Award Competition

A total of 97 students (96 M1 students and 1 M4 student) submitted proposals for the summer biomedical research program by the February 1st deadline. Each of these proposals was reviewed by the Program Director as well as by four members of the Committee for Student Biomedical Research (as listed on page 3). As indicated in Table I (page 4), each proposal was judged on the basis of five criteria which were weighted equally with a maximum score of 10 points. As shown in Table II, the range of scores was 5.2 to 10.0 with the vast majority of proposals (over 80%) scoring 7 or above. Students whose proposals scored in the lower 18.5% were given the opportunity to re-submit revised proposals (and/or provide clarifying information). Among those students submitting revised applications, all were improved with scores above the seven range.

Among the 90 proposals to receive funding (as illustrated on page 5), 38 will be supported by the NIH T-35 Training Grant, 1 by the MCRiT Program, 16 by the National Institutes for Aging T-35 Training Program, and 42 students will be supported by internal funds resulting from endowment gifts from medical school donors (Ettl Memorial, Flint, Gelston, Grossman, Hazen Fellowship, Sewell, Shields, Sternberg, Stoddard, UpJohn Foundation).

Committee for Student Biomedical Research

CHAIR:

Robert F. Todd III, MD, PhD Professor, Internal Medicine

DEPARTMENTAL

REPRESENTATIVES:

Thomas H. Gest, PhD

Associate Professor,
Anatomy & Cell Biol.

Jill Mhyre, MD

Clinical Lecturer,
Anesthesiology

Roland Kwok, PhD Assistant

Professor, Biological
Chemistry

Cheryl Moyer, MPH Research

Investigator, Medical Education

Sewon Kang, MD Professor,

Dermatology

Robert Silbergleit, MD

Associate Professor,
Emergency Medicine

Michael Fetters, MD, MPH

Associate Professor, Family
Medicine

Lawrence Holzman, MD

Associate Professor,
Internal Medicine

Thomas H. Sisson, MD

Assistant Professor
Internal Medicine-Pul

Michele Swanson, PhD

Professor,
Microbiol. & Immunol.

Michael Wang, MD, PhD

Assistant Professor, Neurology

Gregory Christman, MD

Associate Professor, Ob/Gyn

Monte Delmonte, MD

Professor, Ophthalmology

Bryan Pfingst, PhD

Professor,
Otolaryngology

Cory Hogaboam, PhD

Professor,
Pathology

Barbara Felt, MD,

Associate Professor,
Pediatrics

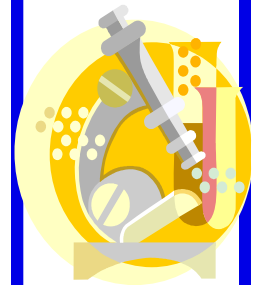
Anne Hartigan, MD

Clinical Instructor,
Phys. Med & Rehabil.

Melanie Urbanchek,

MS, PhD

Research Investigator,
Surgery



SENIOR ADVISORS:

Elizabeth Petty, MD Professor, Internal Medicine and Human Genetics

Victor DiRita, PhD Professor, Microbiology & Immunology

R. Alexander Blackwood, MD, PhD Associate Professor, Pediatrics

Louis D'Alecy, PhD Professor, Physiology

Benedict Lucchesi, PhD Professor Pharmacology

Dean Brenner, MD Professor, Internal Med/Pharm

Gilbert Upchurch, MD Professor, Surgery/Vascular

TABLE I
2008 SBRP Summer Program Proposal Review

The applications are scored in the following categories using the (3) point scale as follows:

- 0 = None - application does not demonstrate**
- 1 = Somewhat - application demonstrates to some extent**
- 2 = Satisfactory - application demonstrates**

	<u>Circle Only One</u>		
1. Clear statement of problem, research question and hypothesis.	0	1	2
2. Evidence of scholarly and critical literature review.	0	1	2
3. Research design and methodology are appropriate to answer the research question/hypothesis.	0	1	2
4. Proposed research training environment and student/mentor relationship is strong.	0	1	2
5. Student applicant has contributed significantly to the proposal application and has the ability and enthusiasm to complete the project.	0	1	2

TOTAL SCORE

For applications with a total score ≤ 5 , a brief comment on how the proposal could be improved is provided from the reviewer.

TABLE II
2008 SBRP Summer Program
Range of Scores Based on Initial Review

<u>Score Range</u>	<u>Number of Proposals</u> (% of Total)
10	1 (1.0)
9.0 – 9.9	24 (24.7)
8.0 – 8.9	32 (33.0)
7.0 – 7.9	22 (22.7)
6.0 – 6.9	14 (14.4) *
5.0 – 5.9	4 (4.1) *

*Applicants given an opportunity to submit revised applications

Figure I shows the thematic focus of the 97 submitted proposals with 35% representing research to be conducted largely in the laboratory setting while 65% involve clinical/translational research (including data derived from IRB-approved human research proposals).

**2008 SBRP Summer Program
Final Funding Results**

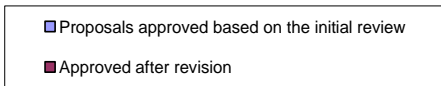
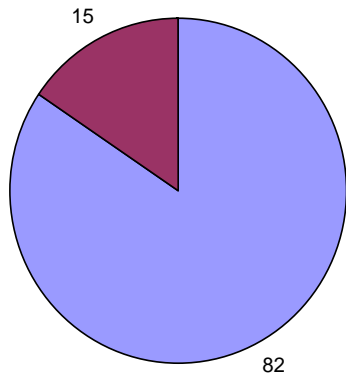
Proposals submitted and reviewed	97
Proposals approved based on the initial review	82
Proposals approved after revision	15
Proposals withdrawn	7
Applicants offered SBRP funding (T-35 & Endowed)	80
Applicants offered MCRiT funding	1
Applicants offered NIA-Aging T-35 funding	16

Proposal Research Focus

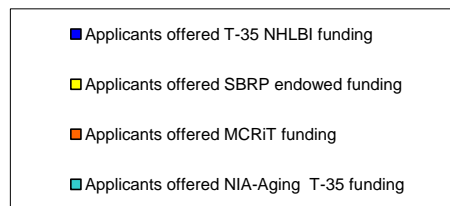
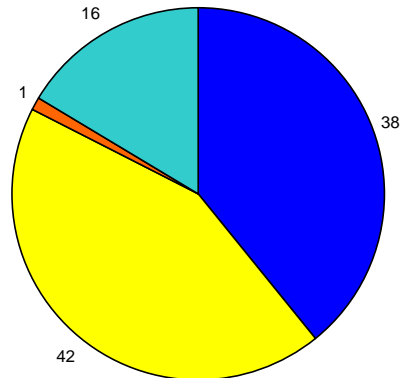
Laboratory-oriented research	63 (65%)
Clinical/Translational-oriented research	34 (35%)

FIGURE I

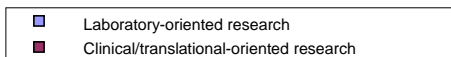
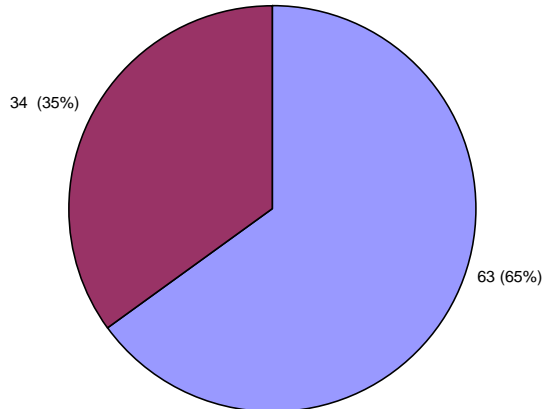
Review outcome of 97 submitted proposals for 2008



2008 SBRP summer program final funding results for 97 applicants



2008 Proposal research focus of submitted proposals



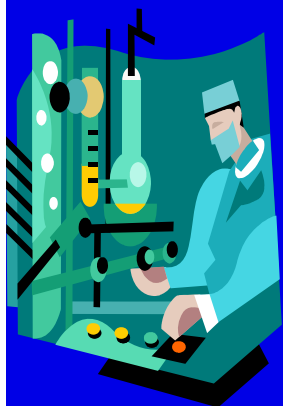


Table III outlines the agenda for the two half-day didactic sessions which will take place on Thursday, June 5 from 8:30 am – 12:30 pm in the North Lecture Hall of Med Sci II, and on Thursday, July 10 in North Lecture Hall and rooms 3913, 3917, 2913 and 2917.

The first presentation will feature a two hour session devoted to ethical issues related to the conduct of research and presented by Mr. Edward Goldman, (Associate Vice-President and Deputy General Council, Office of the General Council) and Dorene F. Markel (Director of Clinical and Translational Research, Managing Director, Michigan Institute for Clinical and Health Research [MICHHR]). In the second half of the morning's agenda, the Chairs of the Departments of Pediatrics, Surgery, and Pathology (Drs. Valerie Castle, Michael Mulholland and Jay Hess, respectively), will each present a personal "career retrospective", as three representative examples of how careers in biomedical science were developed.

The second didactic session on Thursday, July 10 (page 7), will feature Daniel Clauw, M.D. (Professor of Internal Medicine and Associate Dean, Clinical and Translational Research, Director, Michigan Institute for Clinical and Health Research Director, Chronic Pain and Fatigue Research Center) and a team of clinical scientists who will conduct an interactive workshop in designing a clinical research project. Students participate in small group sessions in which they will prepare an outline specific proposals to address clinical research hypothesis, taking into account all of the collaborate requirements to address meaningful clinical research questions.

TABLE III

Student Biomedical Research Seminar Thursday, June 5, 2008 North Lecture Hall, Med Sci II

Agenda

- 8:30 – 8:55 am Breakfast
- 8:55 – 9:00 am Introduction – Robert Todd, M.D., Ph.D.
Director, Student Biomedical Research Program, Frances and Victor Ginsberg Professor of Hematology/Oncology, Professor of Internal Medicine and Interim Chair, Department of Internal Medicine
- 9:00-10:45 am Ethical conduct of research –
Edward Goldman, J.D., Associate Vice-President and Deputy General Counsel, Office of the General Counsel

Dorene F. Markel, MS, MHSA, Director of Clinical and Translational Research, Medical School Administration Managing Director, Michigan Institute for Clinical and Health Research (MICHHR), Research Investigator, Department of Medical Education
- 10:45-11:00 am Break
- 11:00-11:30 am Valerie P. Castle, M.D., Ravitz Foundation Professor and Chair, Department of Pediatrics and Communicable Diseases
- 11:30-12:00 pm Michael W. Mulholland, M.D., Ph.D., Frederick A. Coller Distinguished Professor and Chair, Department of Surgery
- 12:00-12:30 pm Jay L Hess, M.D., Ph.D., Carl Vernon Weller Professor and Chair, Department of Pathology
- 12:30-12:45 pm QA with Drs. Todd, Castle, Mulholland, and Hess

TABLE III con't

Student Biomedical Research Seminar
Thursday July 10, 2008
North Lecture Hall Med Sci II

Agenda

8:00 – 8:30 am	Continental Breakfast
8:30 – 8:45 am	Introduction and Overview – Robert Todd, M.D., Ph.D. Director, Student Biomedical Research Program, Frances and Victor Ginsberg Professor of Hematology/Oncology, Professor of Internal Medicine and Interim Chair, Department of Internal Medicine
8:45 – 10:00 am	“The early steps in designing a clinical research project” - Daniel Clauw, M.D., Professor of Internal Medicine and Associate Dean, Clinical and Translational Research, Director, Michigan Institute for Clinical and Health Research, Director, Chronic Pain and Fatigue Research Center
10:00 – 10:15 am	Break
10:15 – 12:00 pm	Group sessions of designing your own clinical research project (3813, 3817 & 2913, 2917)
12:00 - 12:30 pm	Reconvene in North Lecture Hall for Wrap-Up

Participation of SBRP Graduates in Year-Long Research Fellowships

A major goal of the Student Biomedical Research Program is to stimulate and enhance the interest of student participants in the conduct of *more biomedical research* as a spring board to a career in academic medicine. Accordingly, one of the measures of the success of the summer program is the number of students who elect to pursue additional research training during medical school in the form of year-long (or additional summer) research fellowships sponsored by federal and non-federal funding agencies. This includes The National Institutes of Health, The Howard Hughes Medical Institute, The Sarnoff Foundation, The AOA Foundation, The American Federation for Aging Research, among several others. As shown in Table IV (page 8), a significant number of University of Michigan medical students have successfully competed for these national fellowship opportunities. In the pages that follow Table IV, we highlight the research experiences of five of our recent SBRP graduates who have completed or are enrolled in a year-long program in the current 2007-2008 academic year.



Table IV

**Success of U of M Medical School Students in Competing for Positions in
Year-Long or Summer Research Training Programs**

2007-2008

Last	First	Current Yr	Applied to and Approved for Research
Akhtar	Amana	M4	HHMI-NIH Cloister Program
Baxi	Sanjiv M	M4	MCRiT Program
Bryner	Ben	M4	MCRiT Program
Elliott	Amanda	M2	Sarnoff Foundation
Davis	Samantha	M3	American Association of Thoracic Surgeons
Esaki	Roy	M4	MCRiT Program
Godin	Jonathan	M3	Summer Fellowship in Orthopedic Research at Hospital for Special Surgery, New York, NY
Gracey	Lia	M3	HHMI-NIH Research Fellowship for Medical Students
Issaka	Rachel	M3	MHIRT Program
Krajewski	Megan	M4	NIH Clinical Research Training Program (CRTP)
Kurlander	Jacob	M4	MCRiT Program
Leonard	Ginger J.	M3	Medical Student Anesthesia Research Fellowship
McKellop	Jason	M4	NIH Clinical Research Training Program (CRTP)
Muncey	Aaron	M3	U of M Anesthesiology Lab
Narendra	Derek	M4	HHMI-NIH Cloister Program
Orandi	Babak J (BJ)	2008 Grad	HHMI – NIH Research Training Fellowship & AOA Year Long
Poznanski	Ann	M4	MCRiT Program
Thawani	Jayesh	M4	HHMI – NIH Research Training Fellowship
Viani	Kyle	M4	HHMI – NIH Research Training Fellowship

2008-2009

Last	First	Current Yr	Applied to and Approved for Research
Al-Holou	Wajd	M4	AOA Year Long Fellowship
Chaiyachati	Krisda	M4	Doris Duke Clinical Research Fellowship Program
Egbers	Robert	M4	MCRiT Year Long Clinical Research Fellowship St. Jude Children's Research Hospital - Pediatric Oncology Ed Program
Freire	Pamela E.	M1	
Gast	Katherine	M4	MCRiT Year Long Clinical Research Fellowship
Hiniker	Susan	M4	HHMI Research Training Fellowships for Medical Students.
Jang	Susie So	M4	Doris Duke Clinical Research Fellowship Program
Miracle	Aaron	M4	MCRiT Year Long Clinical Research Fellowship
Rahnama-Moghadam	Sahand	M4	MCRiT Year Long Clinical Research Fellowship
Russell	Joshua	M4	MCRiT Year Long Clinical Research Fellowship
Taylor	Justin	M4	MCRiT Year Long Clinical Research Fellowship
Thawani	Jayesh	M4	HHMI-NIH Cloister Program
Wendorf	Kristen	M4	MCRiT Year Long Clinical Research Fellowship

The following are representative of the U of M Medical Students who participated in the SBRP Program and pursued Year-Long Research Experience in 2007-2008



Sanjiv Baxi M4
SBRP-NIH 2005
2007 – MCRiT Program

Starting in September of 2007, I will begin a year long clinical research program while pursuing a masters in clinical research. The program is partially funded by a NIH grant aimed to educate individuals seeking to be leaders in changing medicine for the better by implementing change based on sound scientific principles and data. The essential foundation to such endeavors is a strong background in the tools required to perform clinical research. Understanding how to ask the right questions is a very large part of this, but being able to utilize a seemingly endless plethora of resources available today will allow one to develop means of understanding better ways to practice medicine. Fundamentally this leads to better patient care - the essence of medical practice. My interest in medical research began during my undergraduate studies when I, in the lab of a terrific mentor, explored the mechanism by which lithium works. This was followed by my fortunate acceptance in the **SBRP** program at the University of Michigan after my first year of medical school. I was able to work in a high intensity lab that was committed to academic, professional and medical excellence. I decided to continue my interest in research, this time clinical in nature, and will embark on this voyage in the coming months.



Ben Bryner M4
SBRP 2005
2007 - MCRiT Program

The MCRiT (Multidisciplinary Clinical Researchers in Training) Program consists of three components. First: a Core Didactic and Practical Curriculum, which all trainees take. It includes subjects such as biostatistical methods and techniques, epidemiology, study design, and data quality, leadership training, ethics, regulation, and the responsible conduct of research. Second: personalized course electives, each of which focuses on a different type of clinical research and serves to complement trainees' research training and discuss research in areas in which they do not have firsthand experience. Third: the Core Practical Curriculum, consisting of clinical research conducted under the mentorship of University of Michigan faculty. I am planning on doing clinical research in the division of Pediatric Surgery. Trainees who complete all of three components receive a Master of Science in Clinical Research from the School of Public Health and Rackham Graduate School.

The **SBRP** program certainly increased my interest in taking a year off for research. It gave me valuable experience designing a research project and applying for funding, as well as for presenting and writing up my findings. I enjoyed research, and while this was not my first experience with research (I did a fair amount in college) this was a good experience in that it was independent and I learned more about developing a research project.



Amanda Elliott M2
SBRP 2006
2007 - Sarnoff Program

The Sarnoff Fellowship is a life-long program for students interested in cardiovascular research. As a junior fellow, the student is given funding to conduct a year of cardiovascular research at a laboratory outside their home institution. This includes a stipend as well as funds for traveling to interview with laboratories across the country, for moving expenses, for health insurance and computer equipment, and for financial support to attend meetings and conferences. The organization gives each junior fellow an established cardiovascular researcher to be their mentor. Mentors help students select and integrate into an appropriate lab; they will also monitor the student's research experience during the fellowship year. After completion of the research year, the student becomes a Senior Fellow and is funded to attend the Annual Scientific Meeting for the duration of their life. Career guidance and research mentorship continues to be available from the student's Sarnoff mentor, the Sarnoff scientific board and the greater Sarnoff Community. Additional research funding through the Scholars Program is available to Senior Fellows. Sarnoff Fellowships are awarded based upon the student's research interests and research proposal. Although many applicants have had a wide array of research experiences, the fellowship program is also interested in fostering students who have had none but who are interested in cardiovascular research.

The 2006 **SBRP** program was a large influence on my decision to pursue a year of research as a Sarnoff Fellow. My summer with **SBRP** allowed me to pursue cardiovascular research during M1/M2 years at the University of Michigan. I used many of the skills I had learned in **SBRP** to create the research proposal for my fellowship and my **SBRP** experience was a large factor in my selection of which research grant to pursue. **SBRP** enhanced my ability to independently construct a research project and proposal which was essential to my being able to design my own project from the literature and to write my proposal in a professional and informative manner. Seminars in the **SBRP** experience taught me to review literature more critically which was also essential to the construction of my project. As a part of **SBRP** I was free to select my own research area, and gained experience in a cardiovascular lab using traditional techniques in molecular biology. I was strongly encouraged to pursue less traditional techniques such as bioinformatics, computational biology, and genomics in the future. **SBRP** redirected my research focus to emerging areas of medical research while the Sarnoff Fellowship that I subsequently pursued gave me the funds to look across the country for established laboratories in emerging fields and the mentorship necessary to selecting the laboratory that matched my interests and goals. My **SBRP** research experience encouraged me to step outside the traditional mold of medical school to learn how to be an MD researcher in academic medicine and to pursue research in emerging fields.



Lia Gracey M3
SBRP 2006
2007 – HHMI-NIH
Research Fellowship for Medical Students

Gene therapy is a promising field of study for the treatment of many diseases, but problems with the current technology prevents its use in the clinic. One of the major problems with nonviral gene transfer is that foreign transgenes are silenced after initial expression in a mammalian system. Nucleosome positioning is a key area of study for silencing mechanisms because nucleosomes can both promote transcription of DNA or block access to DNA from transcription machinery. While studies have been done on the role of DNA sequence and the molecules involved in chromatin modulation, there is little knowledge for what exactly controls where nucleosomes sit on DNA. In this fellowship, I propose to test how nucleosome positioning affects gene expression. I will design Factor IX genes, containing artificial introns with nucleosome positioning signals, based on sequence suggestions in the literature and current knowledge in the lab of Dr. Andrew Fire. The synthesized Factor IX gene will be delivered to various cell culture lines and mice using a nonviral vector. Some of the constructs will also be transfected along with the Sleeping Beauty transposase to integrate Factor IX in to the host genome. I will monitor the duration of Factor IX expression as well as follow the course of chromatin modulations by collecting cells at multiple timepoints and isolating nucleosome core DNAs by digestion with micrococcal nuclease. I will also use antibodies against acetylated histones as well as bisulfite treatment to examine modifications to molecules associated with nucleosomes. In the future, this work could improve gene therapy applications by supplying guidelines for how to position nucleosomes to sustain expression of a delivered gene.



Derek Narendra M4
SBRP-NIH 2005
2007 - HHMI Cloister Program

I have not yet started my year long research experience (through HHMI-NIH Cloister Program) and so do not entirely know what it will entail. From what I have been told and have gathered from current fellows, the program, which accepts thirty-two fellows, provides subsidized housing on the NIH campus and a stipend, which is calculated to give a debt neutral year of research. Before I start the program this summer, I will be assigned a mentor who is an investigator at the NIH in my area of interest (for me, neuroscience). That mentor will give me some ideas about which labs at the NIH I should look into further and will help me contact those labs. During my first two weeks on campus, I will interview with the various labs identified and chose one that is a good fit. I will spend the rest of the year in that lab.

In addition to my research, once a week there will be a lecture and dinner for fellows with HHMI and/or NIH investigators. During the dinner we will have a chance to hear about their research and ask them any questions we have regarding their work and career. There will be a second dinner each week which will allow us to get together and discuss the status of our research projects. At the end of the year, there is a poster session. The program will also fund one class per semester through the NIH and will fund travel to and attendance at one conference during the year. We will also have an opportunity to attend one of the HHMI quarterly meetings.

There is an opportunity to take a second year to finish a project, if desired. A few fellows stay on to do a third year, as part of a Ph.D. program. After graduating from the program we will be eligible for one of twenty young investigator grants offered yearly through the Howard Hughes foundation aimed at giving junior faculty members seed money for pilot projects before they apply for NIH training grants.

The **SBRP** helped me in several ways. I enjoyed doing research that summer (on analgesia, using PET imaging techniques) and started thinking more seriously about spending a year on a research project and making research a part of my career in part as a result of that good experience. From a practical standpoint, it introduced me to a research mentor, Jon-Kar Zubieta, who recommended me for the HHMI-NIH fellowship and others. In addition, though none of the fellowships requires prior research experience, having worked on a project helped my application considerably and was the primary basis of discussion during my interviews for the HHMI-NIH and CRTP fellowships.

Calendar of Events

June 2008

6/02 — Summer
Research Experience
Begins

6/05
SBRP Research
Seminar

July 2008

7/10
SBRP Research
Seminar

August 2008

8/08 — SBRP
Research Experience
Ends

October 2008

All final paperwork
to be turned in from
SBRP participants

Summer Research
Seminar

Year-Long Research
Seminar

November 2008

11/05 — Fall
Research
Forum