

(updated 05/06/08)



## ***Summer Institute Program to Increase Diversity (SIPID):***

### ***Genetic Epidemiology***

***with a focus on Cardiovascular and other  
Heart, Lung, Blood, and Sleep Disorders***

#### ***Flowchart of Activities***

### **COMPONENT-1**

The first component consists of a 3-week long (first) summer session. Training during this period begins with an Orientation Session, and will include one core course with a hands-on approach (“Fundamentals of Genetic Epidemiology”), several “Survey” lectures on special topics and Labs on measurement of important clinical phenotypes, and ends with a Concluding Session. The goals and expectations of the SIPID program will be briefly reviewed at the orientation session, including an expected time line for the entire process. The major goal of the required course is to provide a minimum background required for undertaking genetic epidemiology research on Cardiovascular and other Heart, Lung, Blood, and Sleep Disorders. Special survey lectures will be scheduled throughout, as discussed below. Finally, the Concluding Session will review what has been accomplished and what lies ahead, with particular emphasis on what is expected of the mentees and mentors prior to the mid-year meeting. The concluding session will be attended by all mentors involved with the particular cohort of mentees.

**Orientation Session:** After brief introductions by all participating faculty, mentors, and trainees/mentees, the goals and expectations of this SIPID program will be reviewed. Brief presentations will be made by all potential mentors present, providing an outline of the currently ongoing research in their labs. Each mentee will then have an opportunity to present his/her area of research interest. The mentors will have several opportunities to critique and offer suggestions to develop the research plan. Contact information for all the mentors and faculty will be provided to encourage communication among mentees and mentors. All mentees and mentors will have access to a secure area of the SIPID web site which includes course materials such as the schedule for the entire summer session, a contact list for guest speakers and mentors, lecture handouts, maps, evaluation forms and other miscellaneous information. The Program Directors will facilitate direct contacts between the mentees and mentors. Mentors will be identified for each mentee prior to the start of the Summer Institute, after which, mentees will meet with their mentors as often as possible (usually during lunch and/or dinner) to explore possible research ideas.

**Fundamentals of Genetic Epidemiology (M21-515; 3 credit hours):** The primary emphasis in this course is on learning various methods for investigating the genetic and environmental causes of phenotypic variation. The course includes extensive hands-on experience with real family data (lipids and obesity) using several genetics computer programs (e.g. SEGPATH, PAP, SOLAR, Merlin, QTDT, FBAT). Topics include brief overviews of the general principles of mathematics and statistics, biometrics, variance components and maximum likelihood methods, as well as an overview of the general principles of Mendelian and population genetics including Hardy-Weinberg Equilibrium and Mendelian segregation. There is in-depth coverage of the theories underlying familial resemblance (aggregation and heritability) and major gene models for a variety of study designs (family, twin, and adoption). The second week is devoted to linkage and association, including both theory and practical issues with regard to the quality and quantity of marker data in fine mapping and gene discovery studies. Additional topics as suggested by students may be covered if there is sufficient time and interest.

#### **Many Survey Lectures are presented during the Summer Institute. Examples include:**

- “Cardiovascular Epidemiology” by Victor Davila-Roman, MD (2 hours)
- “Conducting Phenotype-Genotype Family Studies” by DC Rao, PhD (2 hours)
- “Hands-on Phenotyping Laboratory: Echo & CIMT” lecture & lab by Alan Waggoner, MHS & Victor Davila-Roman MD (2.5 hours)

- “Cultural Competence and Health Care Disparities in Cardiovascular Diseases” by Angela Brown, MD (2 hours)
- “Obesity Etiology and Policy: Use of Multilevel Modeling” by Ross Brownson, PhD (1 hour)
- “Pharmacogenomics and Warfarin Dosing” by Brian Gage, MD (1 hour)
- “Phenotype-Genotype Association Study in Hypertensive Heart Disease” by Lisa de las Fuentes, MD (1.5 hours)
- “Grant Writing” by DC Rao, PhD (1 hour)
- “Characterization of Cardiovascular Phenotypes by Imaging” by Victor Davila-Roman, MD (1 hour)
- “Study Design Concepts in Epidemiology of Cardiovascular Disease” by Donna Arnett, PhD (1 hour)
- “Coronary Atherosclerosis and Model for the Study of Complex Traits” by Donna Arnett, PhD (1 hour)
- “Design of Family Studies and Practical Examples from the GOLDN Study” by Donna Arnett, PhD (1 hour)
- “Design of Association Studies and Practical Examples from the HyperGen Study” by Donna Arnett, PhD (1 hour)
- “Conducting a Research Study” by Phil Miller, AB (1 hour)
- “Establishing a Clinical Research Laboratory: The First Steps” by Michael DeBaun, MD (1.5 hours)
- “The Role of Signaling Proteins in Cardiovascular Disease” by Anthony Muslin, MD (1 hour)

### **Grants Writing Sessions**

A member of the NHLBI Staff also presents Grants Writing Sessions. Each Mentee is able to meet individually and ask questions relevant to their grant proposal. Mentees are encouraged to correspond directly with NHLBI Staff if further questions arise.

**Concluding Session:** A concluding session will be held on the last day of the summer session, attended by all mentees and mentors as well as all program directors. The session will review the progress to date and plans for the following year will be discussed in detail. Mentees complete evaluations (anonymously) of each lecture as well as a “Post Evaluation of the First Summer Program” prior to the concluding session. One of the evaluation items is the mentee’s judgment about the value of each course and survey lecture. For each of these, each mentee will also be invited to make ‘recommendations’. The concluding session will review the evaluations and recommendations. Goals and expectations for the following year including the mid-year meeting, will be presented at the concluding session. This will clarify the expectations for the mentees and their mentors, and provide some target dates in which to have things completed.

## **COMPONENT-2**

The second component spans from September (after the first summer session concludes) through the end of the following Spring semester. This component involves extensive networking activities between the mentees and the mentors, reviewing the current CVD literature to identify individual research interests, one mid-year meeting, and writing outlines for grant applications.

**Mid-Year Meeting:** A “mid-year” meeting of all mentees and mentors will be scheduled. This meeting will be held either during a weekend in January or February, or sometime during the mid-year break. This is scheduled to be a 1-3 day meeting in St. Louis that covers several topics. First, progress made by each mentee since the last summer session will be reviewed and documented. Any remedial action will be

suggested if progress seems inadequate. Second, Mock Study Sections will be held to review the Mentees' Grant Proposals. Third, mentor-mentee meetings will be arranged. Finally, a concluding session will review the expectations during the Spring semester and until the beginning of the second summer session discussed below under component-3.

### **COMPONENT-3**

The third component of the program consists of the second summer session which will also be 3 weeks long. The second summer session will include several major activities: (1) An introductory course on bioinformatics (including visits to some of the Microarray and Proteomics Labs), (2) A training workshop in the responsible conduct of research, (3) A review lecture on grant writing, (4) Series of grant writing and informal critique sessions, (5) Mock study section review sessions, and (6) A Concluding Session.

**Introduction to Bioinformatics** (M21-550; 3 credit hours): Provide a broad exposure to the basic concepts, methodology and application of bioinformatics to solve biomedical problem. The students are introduced to the basics of online genomic/protein databases and database mining tools, and will acquire the knowledge of underlying mathematical algorithms in advanced biotechnologies including genome sequence analysis (alignment analysis, gene finding/predicting), gene expression microarray analysis (gene chip), and the more recent proteomics analysis. Software labs and presentation of published reports and case studies are used to learn how to apply these bioinformatics tools to medical research and study of human diseases.

**Training in Responsible Conduct of Research:** We recognize the importance of mentee awareness of the issues surrounding academic and research integrity, and we will take several steps to facilitate their education in these matters. During the second summer, we will discuss some of the important issues involved in the conduct of research and share some standard documents available at Washington University as examples of policies. Every mentee will receive the Washington University Graduate School of Arts and Sciences Academic Integrity Policy for Graduate Students, which describes the offenses which constitute misconduct ( <http://artsci.wustl.edu/GSAS/Policies/ACINTEG03.pdf> ). Mentees will also receive copies of the Research Integrity Policy ( <http://www.wustl.edu/policies/research.html> ) for Washington University which deals specifically with the University's policies for reporting and investigating violations of the responsible conduct of research. Finally, each mentee will be provided with a copy of "On Being a Scientist" published by the National Academy of Sciences ( <http://www.nap.edu/readingroom/books/obas/> ). During their second summer, these policies will be discussed so as to increase their general awareness regarding their responsibilities in the conduct of research. Direct links to web pages containing University policies are on the home page of the DBBS website to which the mentees will have constant access.

All second-year DBBS students at Washington University School of Medicine (<http://dbbs.wustl.edu/>) are required to complete the course, ***Ethics and Research Science*** which is a formal instruction in the responsible conduct of research. A synthesis of this course will be presented at the second summer session. The format for the full course has been developed over several years of practical experience. The basic principle is that active mentee/ trainee participation is essential. In practical terms, this has meant that (1) the bulk of the course is conducted in small groups with active participation by all mentees/ trainees, (2) mentees/ trainees prepare topics for discussion and lead the discussion, and (3) mentees/ trainees are required to prepare a brief written report of the discussion which they led. Each discussion section is led by two faculty members. In implementing this philosophical approach, we have recognized that mentees/ trainees require general background material. The general background is given in an introductory lecture and handout.

All mentees will be required to successfully complete a web-based training program and certification for conducting research dealing with human subjects. The course used by Washington University was developed by the University of Miami CITI and consists of nine core modules and one additional module which can be chosen from a list of relevant topics. All ten modules must be completed with a score of at least 80% in order to earn a certificate of completion. The SIPID program will keep records of all Mentee certificates.

**Series of grant writing and informal critique sessions:** A series of sessions will be scheduled where all mentees and mentors will be invited. Each mentee will informally present/discuss his/her current thoughts and progress made in writing sections of grant applications. This will be an opportunity where mentors and mentees will freely interact in an unstructured manner. These sessions will be in addition to separate one-on-one meetings of each mentee with his/her mentor(s). The group meetings will be organized so as to keep all mentee-mentor(s) pairings focused and to ensure that enough progress is being made by all mentees. These sessions will give an opportunity to consider re-aligning of mentees with other mentors as needed.

**Mock study section review sessions:** During the last 2-3 days, mock study sections will be organized for reviewing and critiquing the written grant materials. We expect that at least some of the mentees will have good drafts of their grant applications by the end of the second summer. These will be reviewed at these mock study sections in considerable detail, operating much in the spirit of regular NIH study sections. Fortunately, most of the mentors and many of the program faculty have extensive grant review experience through their service on regular and *ad hoc* study sections. "Summary Statements" will be prepared for each of the grants reviewed. For all other incomplete grant applications, an initial review will be performed with some written comments. In all cases, mentees will be offered an opportunity by their mentors to critique their final grant applications if submitted 2 weeks prior to the grant dead line.

**Concluding Session:** A concluding session will be held on the last day involving all mentees and all program faculty (including mentors). This will target several things. First, each mentee will be asked to prepare a page-long structured exit report summarizing their experience with the summer institute. They will be asked specifically to describe what they liked and what they did not like, as well as their feedback in terms of how things could be improved. We will make best efforts to implement their recommendations for changes. These reports will also document the exact progress made in terms of preparing grant applications, and seek their projected time lines for submitting final grants. We will also ask each mentee if they feel they need for additional and more prolonged training opportunities such as a post-doctoral fellowship. There are a number of training grants, including a pending NHLBI T-32 application by the Program Director, where such fellowship opportunities exist. Second, each mentee will have an opportunity to discuss/present their plans for handling the critiques resulting from the mock study sections. Third, protocols will be established for continued interactions between the mentees and their mentors, as well as for tracking progress for 2 years beyond the training period.

Tentative SIPID Summer Institute Schedules					
Cohorts	Year	Start Date	End Date	Cohort Overlap	Winter Retreat
1	1	07/30/07	08/17/07		01/11/08-01/13/08
1	2	08/11/08	08/29/08	08/11/08-08/14/08	N/A
2	1	07/24/08	08/14/08	08/11/08-08/14/08	Jan 2009
2	2	TBA	TBA	TBA	N/A
3	1	TBA	TBA	TBA	Jan 2010
3	2	TBA	TBA	TBA	N/A