MINUTES FROM THE
SEVENTH ANNUAL MEETING
NHGRI RESEARCH TRAINING ADVISORY COMMITTEE MEETING WITH MAP GRANTEES

AUDITORIUM

HudsonAlpha Institute for Biotechnology
601 Genome Way
Huntsville, AL 35806
10:00 AM 13 OCTOBER 2009 to 1:00 PM 14 OCTOBER 2009

The Seventh Annual MAP meeting was hosted by the HudsonAlpha Institute which is a collaborating institution on Stanford University's Center of Excellence in Genome Sciences. A copy of the agenda and the participants' list can be found in Appendix I and II, respectively.

PURPOSE OF MEETING: (1) to discuss how the MAP community will interact with the Data Analysis and Coordinating Center (DACC); (2) to finalize the common data elements to be collected on MAP participants; (3) to share program development, implementation and evaluation information among grantees; (4) to identify areas of programmatic concern and to discuss possible solutions; and (5) to discuss topics, issues, concerns, etc suggested by the participants, the advisors or the staff.

INTRODUCTIONS

Dr. Rick Meyers, President of the HudsonAlpha Institute for Biotechnology, opened the meeting by welcoming the group to HudsonAlpha. Following introductions by the members, Dr. Alan Guttmacher, Acting Director, National Human Genome Research Institute, and Dr. Mark Guyer, Director, Division of Extramural Programs, both of whom were not able to attend the meeting in person, expressed NHGRI's continued commitment to making opportunities available to URM to pursue genomics research.

MEETING SUMMARY

Project Presentations

The meeting started off with presentations by five groups: Three T32 institutional training grantees (Washington University; University of Washington; Stanford University); and one each database (The Jackson Laboratory) and large scale sequencing (Baylor College of Medicine) grantees. The average percent of underrepresented minorities (URM) in the three programs over the period of the grants was about 14 percent. Some ways to recruit graduate students are to use summer outreach programs, reward faculty who participate in recruitment trips by giving them the opportunity to be mentors, partner URM graduate students with faculty on recruiting trips, encourage URMs to be more visible, such as mentoring undergraduate summer programs, or being teaching assistants, etc. Stanford has developed a "Center of Influence" whereby the university invites university staff from other institutions who works with URMs to Stanford and give them an orientation about what type of student Stanford is looking to attract and how to prepare the students for an academic life at Stanford. Some of the challenges facing training grant programs are: selecting URMs from a small pool of students; not being involvemed in the graduate student admission process (Stanford appeared to be the exception); convincing students to pursue research rather than medicine; finding postdoctoral trainees; identifying the formula for graduate student success; increasing the services for postdoctoral trainees; students lacking interest in cross-training; encouraging URMs to apply to graduate school, etc. It was noted that not every outstanding scientist can be a good recruiter; some of the qualities of a good recruiter are being able to engage the students, making the science exciting; introducing the students to the school's academic and social activities; interacting with the students beyond the one hour seminar; etc.

One issue that was discussed and resolved was how to take credit for URMs that were recruited by the training directors, but were not appointed to the training grant because they were supported from other funds, but were still participating in NHGRI-supported training grant activities. It was decided that these individuals would be counted as participating in the NHGRI program if the T32 program directors agreed to provide similar data on these trainees for data analysis. Their source of funding should be noted, however.

The number of applications for a summer experience at The Jackson Laboratory is approximately 400 for 30-35 positions. Of these, three are supported by NHGRI. The summer experience takes advantages of the students' academic strength, whether in informatics or biology. Students' experiences are 100% research including participation in research seminars and at the end of their summer experience, giving a talk about their research. Some of the challenges for recruiting students are that Maine is remote, is 98% Caucasian, there are cultural differences and stiff competition for the few URMs who apply. About 80% of alumni who have participated in this program remain in science and two of the alumni are holders of Nobel Prizes in the sciences.

Baylor College of Medicine has three active programs—Undergraduate Research Program, Post Baccalaureate Program and the Engineering Program. The latter has only one participant and when he receives his BS degree engineering in 2010, that program will be phased out. The undergraduate program has two slots reserved for engineering students. The purpose of this program is to give students academic enhancements, research experiences and encouragement to pursue a graduate degree. The postbac program is a two year program that prepares students for graduate school. Their program includes academic enhancement activities and research experiences. Students are taught to take the initiative in finding solutions; they are required to read two books during the summer months to improve their vocabulary. One challenge of the program is how to offer new and fresh opportunities for the second year.

A comparison experience, Integrative Graduate Education and Research Traineeship (IGERT) was described by the National Science Foundation staff. This is a program provides students with the tools to become leaders in the science and engineering of the future. Recruitment of URMs to this program was at nine percent for many years. This percentage was increased by the following: faculty interacting with faculty; students recruiting and mentoring other students; asked PIs to re-evaluate selection criteria resulting in the GRE dropped as a selection criteria; creating an atmosphere that made students feel comfortable and welcomed; providing a grant to a PI who was really good at recruiting and let him recruit from the 125 IGERT sites; taking URMs along on recruiting trips; providing a stipend of $30K and $10K for tuition. The NHGRI grantees reacted to the $30K stipend because NIH would not be able to match that level for graduate students, nor would most institutions have non-federal resources to make up the difference.

National Science Foundation (NSF) Presentation

The National Science Foundation presentation was conducted by Dr. Bernice Anderson and Mr. Paul "Wyn" Jennings who are in NSF's Directorate for Education and Human Resources. The purposes of NSF's evaluations are focused on: (1) program and organizational improvement; (2) resource utilization; (3) public accountability; (4) advancement of models and tools for evaluation; and (5) knowledge development within context. The Academic Competitiveness Council has developed a hierarchy or pyramid of study designs for evaluating effectiveness. At the top of the pyramid is the "experimental" approach of which randomized clinical trials is an example; next is "quasi experimental" in which well-matched comparison-group studies fall and at the bottom is "other designs, such as pre-post studies and comparison-group studies without careful matching. Most of NSF's evaluations fall within the "quasi-experimental" design. Each NSF evaluation study starts out with a logic model that includes inputs, outputs and outcomes/impacts. This model is used for most, if not all, NSF studies. Brochures were distributed that showed some of the results of these evaluations: (1) in the Louis Stokes Alliances for Minority Participation (LSAMP) Program, 80% of the students participating in this program took further coursework after earning

their Bachelor's degree; 66% pursued graduate degrees and 38% pursued graduate degrees in STEM fields. (2) in the Tribal Colleges and Universities Program (TCUP) findings from these studies demonstrated that a total of 271 STEM degrees and certificates were conferred at 16 Tribal Colleges and Universities in the 2003-2004 academic year. Target students earned 16 % of Bachelor's degrees, 89% of associate degrees, and 85% of certificates. The take home message from NSF is that data are required to demonstrate that a program is successful and a rigorous evaluation program is a critical part of any assessment. It was also stressed that in this climate of government accountability, evaluations are very important if one is to demonstrate that a program is working well.

Data Analysis and Coordinating Center to the Grantees—Strategy and Implementation

In September 2009, NHGRI made an award to Dr. D.C. Rao at Washington University in St. Louis, MO, to assist NHGRI with the data coordination and analysis of its research training activities and programs, specifically the T32 grants and the MAP activities. The rest of the team includes: Dr. Treva Rice, Co-Director; Dr. Donna Jeffe, Co-Investigator, Ms. Karen Clark Laseter, database administrator; and a to be named project manager. This award was made to specifically assist NHGRI in complying with one of the principles of the Plan for Increasing the Number of Underrepresented Minorities Trained in Genomics and ELSI Research ((http://www.genome.gov/10001707). By way of background, one of the principles of the plan was that "All components must have achievable goals, measurable outcomes and appropriate review and evaluation." It has always been a requirement that individual programs should have their own evaluation plans, but the difficulty has been in merging like data from similar programs so that NHGRI would have a clear overview of what is being accomplished overall. As a result, several years ago, the groups started to develop a set of common data elements (CDEs) which they agreed would be collected on individual participants while in the program and when they leave the program. Programs could also add additional elements, if needed for their individual program evaluations.

The award was made to assist NHGRI in the following ways: (1) develop program specific objectives, such as targets and milestones for each career level; (2) develop common data sets to be collected on each participant (under development); (3) collect and analyze quality data from individuals and programs during and after program participation; (4) develop program-centric reports (short-and long-term) using quality data provided by grantees to demonstrate how the goals are/are not being met; and (5) document whether we are meeting individual programs and NHGRI goals and if not, recommend actions. NHGRI realized the challenges with trying to merge data from different programs, such as MAPs and T32 Programs have a small number of participants, such as: (1) MAPs train individuals at several career-levels from high school to faculty; (2) the training of MAP participants vary in length from a couple of months to a couple of years; (3) individuals are appointed to T32 Programs for two or more years; and (4) to obtain informed consent from participants to do data analyses; de-identified data would provide the most information. However, it is clear that consolidating information across programs with similar outcomes for short- and long-term analyses would provide more meaningful results. Thus overcoming these challenges would assist in generating informative reports (annually and long-term) to rigorously assess progress toward fulfilling the institute's goals for increasing the number of URMs pursuing genomics/ELSI research.

The need to obtain informed consent from participants has been discussed several times in previous annual meetings and meetings of the Training Coordinators. Since data from participants will be analyzed, this constitutes an education research project and as such may need Institutional Review Board approval, depending on the institution's policies for such studies. The need to pursue this approach becomes even more important when the data are to be shared with a third party for data analysis. Tracking participants once they leave the program or when NHGRI programs end, will also be facilitated by having de-identified data. These are the advantages of obtining informed consent and IRB approvals: (1) informed consent lets the participants know why the data are being collected and how it will be used; (2) in order to assess

the impact of the program, participants need to be tracked at least ten years because it will take that long to determine, depending on where they were in their career progression when they participated in the program; and (3) participants can be followed once they leave the program or when the NHGRI funded program is terminated. It was emphasized that program directors can always publish data on their own programs and that the DACC may publish trends and statistics (but not personal data) only in collaboration with the grantees who have provided data to the study.

There was concern expressed among the participants about the amount of time it would take to get informed consent and IRB approvals and that NHGRI should be open to providing additional resources/assistance in helping with this process. A concern was also expressed that some URMs might be reluctant to participate in a program that required informed consent. The DACC working with NHGRI staff will develop a model consent form that can be used as a starting point for individual use. This will be discussed further at the subcommittee meetings and the Training Coordinators' meeting in February.

In order to assist in determining which CDEs were appropriate, it was decided that we should first agree on what questions we want answered. It was also expressed that it is important to include free text fields with the realization with the analyses would require additional resources. The group came up with the following questions:

- Did the student make a successful transition? For example, did a Post Bac student get into a graduate school with an intense research program?
- Did the student remain in a STEM field (academia, industry or STEM teacher) or a field that required knowledge of a STEM discipline (science writer; patent lawyer, etc)?
- Did we train leaders?
- What is the baseline? Given that the numbers for all groups are small, statistical significance will not be possible; trends would be possible to demonstrate. Therefore, information of the programs before NHGRI funding would be essential.
- What are the predictors of success?
- What impact did the training have, such as publications, awards, honors, fellowships, etc?
- How did the duration of training impact success?
- Where did students come from before participating in the T32 or MAP program?
- Where were students recruited from?
- What/who influenced a student's career?

It was agreed that: (1) the subcommittees would review the list of questions and refine/modify/add, if necessary and (2) the DACC would take this list of questions and map them against the CDEs.

The DACC team described its plans that included first getting accurate information on the different types of training activities supported by the T32s and the MAPs; reviewing the CDEs to determine which are appropriate for each career level; developing a system to input the data and ensure quality control; and ensuring privacy of data submitted. In order for the DACC team to function, it needs IRB clearance from Washington University which will require that they submit IRB approvals from all participating grantees. Until these issues are resolved, the DACC may be able to use anonymized data to pilot test the scheme.

Best Practices for Trainees and Mentors (Subcommittee Project)

The leaders of the undergraduate, graduate and postgraduate subcommittees (Debra Murray and Louise Pape) discussed this document (Appendix III). The purpose of this document is to provide guidance to URMs and their mentors to help them develop critical thinking skills, to provide an environment based on trust and that encourages open discussions, and to attend to non-

academic activities that allow students to focus on their academic and research pursuits. Several comments/observations: (1) the document should stress that the purpose of training/mentoring is to imbue students with critical thinking skills; (2) students should have many mentors and not be afraid of receiving "mixed messages" since the world is complex and they need to be able to figure what advice to take from whom; (3) the role of the graduate research committee should also be mentioned; (4) students should be aware that they do not belong to a PI or lab, but instead to a larger universe in the institution; (5) there are many resources available from sources such as AAAS, AAMC, etc regarding mentoring; this document should fill a hole that talks about how to make the training environment more attractive to URMs; and (6) some attention should be given to the target group of this document.

Program Announcement for MAP Applications

The National Human Genome Research Institute recently published a funding opportunity announcement (http://grants.nih.gov/guide/pa-files/PAR-09-245) that solicits applications for courses and MAP components that are integral components of Centers of Excellence in Genome Sciences, database grants and large-scale sequencing grants. The MAP component must be submitted as a companion application to the respective parent grant applications. The features of the application are: R25 must be submitted as a companion application to the parent application (new and renewal); PI of the parent application must be the PI of the R25; R25 is an electronic application; the parent grant for now is a paper application; R25 will be subjected to peer review; career levels targeted to undergraduates and above; one R25 per institution; requests limited to $300,000 direct cost; maximum of two years of support for post bacs, graduate students and postdocs; expectation that future support will be from individual NRSA or other peer review awards; program outcome is successful transition to the next phase; individual program evaluation still required; parent application will not be funded unless all components of the R25 have been rated "acceptable'" R25 cannot be a "stand alone" application; must be a component of a parent application; program focus still on URMs.

The types of research activity can would be appropriate for the R25 are: short-term research and academic experiences for UG and graduate students; Post Bac research and academic experiences (2 yr limit ->F31); graduate school support (2 yr limit ->F31); postdoctoral support (2 yr limit ->F32); faculty research to support preliminary data for peer review application; and HS support (grandfathered in; <10% of award).

The allowable cost for the R25 include: personnel as appropriate for managing the program; travel; participant costs (stipend/salary/per diem/housing, research costs, etc); tuition; and 8% Facilities and Administration costs

Action Items

- The subcommittees would review and refine/modify the list of questions that act as drivers for the CDEs.
- DACC will determine how well the questions map to the CDEs.
- DACC will review the information of trainees in Type 2 T32 applications from Princeton and U. Michigan to determine how much can be used in lieu of some of the CDEs.
- Boehnke will review the CDEs for graduate and postdoctoral trainees to see which ones can be deleted, modified, etc.
- DACC and Bettie will develop a model informed consent statement for discussion by MAP and T32 grantees via the subcommittees.
- The format of the annual meeting will be reorganized to allow separate discussion times for T32s only and MAP only grantees.
- T32 program directors will be apprised that if they have recruited URM trainees who are supported on other funds, but participate in NHGRI-funded activities, they can include

these students in the analyses so long as they are willing to provide the same information as is provided for NHGRI-funded students.

Next Meeting of the Training Coordinators

The next meeting of the Training Coordinators will be in February in the Bethesda/Rockville, MD area. The meeting will start at 6:00 p.m. on Thursday the 18th and run through 4:00 p.m. on Friday the 19th.

Appendix I

AGENDA

Four Points Sheraton BWI Airport SEVENTH ANNUAL MEETING
NHGRI RESEARCH TRAINING ADVISORY COMMITTEE MEETING WITH MAP GRANTEES

AUDITORIUM

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601 Genome Way
Huntsville, AL 35806
10:00 AM 13 OCTOBER 2009 to 1:00 PM 14 OCTOBER 2009

PURPOSE OF MEETING: (1) to discuss how the MAP community will interact with the Data Analysis and Coordinating Center; (2) to finalize the data elements to be collected on MAP participants; (3) to share program development, implementation and evaluation information among grantees; (4) to identify areas of programmatic concern and to discuss possible solutions; and (5) to discuss topics, issues, concerns, etc suggested by the participants, the advisors or the staff.7

Tuesday, 13 October 2008

10:00 a.m.	Welcome and Introductions
10:30	MAP Presentations[1]
	Training Grants Washington University U. Washington Stanford University (T32/CEGS) Database Grant The Jackson Laboratory Large-Scale Sequencing Grant Baylor College of Medicine.
1:00	Lunch
2:00	Evaluation of NSF Programs for URMs Bernice T. Anderson, Ph.D. Senior Advisor/Directorate for Education and Human Resources National Science Foundation
4:00	Break
4:30	Open Discussion on MAP Presentations
5:30	Research Training and Education Evaluation by Data Analysis and Coordinating Center

Strategy	B. J. Graham
Implementation	D.C. Rao and DACC Team

[1] 15 minutes of presentation; 15 minutes of discussion

7:00	Dinner and Networking

Wednesday, 14 October 2008

8:00	Coffee (Meet/Greet/Networking)
8:30-10:30	Research Training and Education Evaluation (Continued)
10:30	Break
11:00 to 11:30	Best Practices for Trainees and Mentors Louise Pape Debra Murray
11:30 to Noon	Program Announcement for MAP (PAR-09-245- http://grants.nih.gov/grants/guide/pa-files/PAR-09-245.html
12:00-1:00	Working Lunch
	Report of Subcommittees [2] Undergraduate (Debra Murray and Nancy Kerk) Graduate (Jeff Long and Seth Ruffin) Post Graduate (Louise Pape and Bruce Birren) K-12 (Carla Easter and Vicky Schneider)
	Feed-back
	Summary
	Schedule Next Training Coordinators' Meeting ***(Potential Date: 18-19 February 2010)***
1:00	Grantees Adjourn and Networking Advisors/DACC/NHGRI Staff-Executive Session

[2] 10 minutes of presentation; 5 minutes of discussion

Appendix II

National Human Genome Research Institute (NHGRI)
National Institutes of Health

Department of Health and Human Services

Seventh Annual NHGRI Training Advisory Committee Meeting

With the Minority Action Plan (MAP) Grantees

13-14 October 2009

HudsonAlpha Institute for Biotechnology
601 Genome Way
Huntsville, AL 35806
PARTICIPANT LIST

Expert Consultant

Bernice T. Anderson
Senior Advisor
Directorate for Education and Human Resources
National Science Foundation
(703) 292 – 5151
banderson@nsf.gov

RESEARCH TRAINING ADVISORY COMMITTEE

Walter E. "Skip" Bollenbacher*
Integrated Learning Innovations
55219 Broughton
Chapel Hill, NC 27517
(919) 370-9425
skipbollenbacher@mac.com

Vanessa Northington Gamble
The George Washington University
2130 H Street, NW
Washington, DC 20052
(202) 994-0978
vngamble@gwu.edu

Merna Villarejo*
University of California, Davis
2530 Whittier Drive

Kim J. Nickerson*
University of Maryland, College Park
Tydings Hall, Room 2141
College Park, MD 20742
(301) 405-7599
knickerson@bsos.umd.edu

Gayle R. Slaughter
Baylor College of Medicine
MS-N215
1 Baylor Plaza
Houston, TX 77041
(713) 798-6644
gayles@bcm.tmc.edu

Davis, CA 95618
(530) 756-2342
mrvillarejo@ucdavis.edu
*Unable to Attend

CENTERS OF EXCELLENCE IN GENOMIC SCIENCE

Yemi Adesokan
Harvard Medical School
77 Ave. Louis Pasteur
Boston, MA 02115
(949) 351-9954
yemi@genetics.med.harvard.edu

Steven Finkel
University of Southern California
1050 Childs Way, RRI 201
RRI 201, Los Angeles, California 90089-2910
(213) 821-1498
sfinkel@usc.edu

Kenneth Nelson
Yale University
MCDB, KBT 716, PO Box 208103
New Haven, CT
(203) 432 – 5013
kenneth.nelson@yale.edu

Seth Ruffins
California Institute of Technology
Pasadena, CA 91125
(626) 398-2026
sruffins@caltech.edu

Michael Snyder
Stanford University
Stanford, CA
(650) 736 8099
mpsnyder@yale.edu

Karen Burns White
Dana-Farber Cancer Institution
44 Binney Street BP322A
Boston, Massachusetts 02115
Karen_burnswhite@dfci.harvard.edu

Andy Feinberg
Johns Hopkins University School of Medicine
855 N. Wolfe St., Rangos 570
Baltimore, MD 21205
(410) 614 3489
afeinberg@jhu.edu

Kimberly Lohrfink
Johns Hopkins University
5901 Smith Ave, McAuley Hall Ste 400
Baltimore, MD 21209
(410) 735 6236
klohrfil@jhu.edu

Lisa Peterson
University of Washington
Box 352180
Seattle, WA 98195-2180
(206) 685-2593
lisapete@u.washinton.edu

Vicky Schneider
Johns Hopkins University
5901 Smith Avenue, McAuley Hall Ste 400
Baltimore, MD 21209
(410) 735 6219
vschneider@jhu.edu

Simon Tavare'
University of Southern California
1050 Childs Way, RRI 201
Los Angeles, CA 90089-2910

(213) 740 – 1498
stavare@usc.edu

Dawayne Whittington
Strategic Evaluations, Inc
5501 Woodberry Road
Durham, NC 27707
(919) 403 9584
Dawayne@ncstrategic.com

LARGE SCALE SEQUENCING

Bruce Birren
Broad Institute
7 Cambridge Center
Cambridge, MA 02142
(617) 258-0913
bwb@borad.mit.edu

Cherilynn Shadding
Washington University in St. Louis
4444 Forest Park Blvd
(314) 286 – 1897
cshadding@wustl.edu

Debra Murray
Human Genome Sequencing Center – Baylor College of Medicine
One Baylor Plaza N1519
Houston, TX 77030
(713) 798 – 8083
ddm@bcm.edu

Eboney Smith
Broad Institute
7 Cambridge Center
Cambridge, MA 02142
(617) 324-1237
esmith@broad.mit.edu

TRAINING GRANTS

Michael Boehnke
University of Michigan
1420 Washington Heights
(734) 929 4882
Boehnke@umich.edu

David Botstein
Princeton University
140 Carl C. Icahn Laboratory
(609) 258 – 7005
Botstein@princeton.edu

Susanne Churchill
Harvard-MIT Division of Health Sciences &Technology (HST)
77 Avenue Louis Pasteur, c/o 250
Boston, MA 02115
(615) 525 - 4465
schurchill@partners.org

Jeanne Darling
Massachusetts Institute of Technology

32 Vassar Street G536
Cambridge, MA 02139
(617) 253-4294
darling@mit.edu

Louise Pape

Anita Blanco
Stanford University
300 Pasteur Dr, M350
Stanford, CA 94305-5120
(650) 736-7435
Anita.blanco@stanford.edu

Hannah Chervitz
University of Pennsylvania
4125 Blockley Hall
423 Guardian Drive
Philadelphia, PA 19104
(215) 746-2807
chervitz@exchange.upenn.edu

Barak Cohen
Washington University School of Medicine
Campus Box 8510,
4444 Forest Park Parkway
St. Louis, MO 63130
(314) 362 3674
cohen@genetics.wustl.edu

Alison Gammie
Princeton University
353 Lewis Thomas Laboratory
(609) 258 – 6380
agammie@princeton.edu

University of Wisconsin-Madison
3445 Biotechnology Center
425 Henry Mall
Madison WI 53706
(608) 265-7935
lpape@wisc.edu

Jeanette Papp
University of California, Los Angeles
695 Charles E. Young Drive South
Los Angeles, CA 90095-7088
(310) 825-6204
jcpapp@mednet.ucla.edu

Jasper Rine
University of California, Berkley
374A Stanley Hall #3320 Berkeley, CA 94720

(510) 642 – 7047
jrine@berkeley.edu

Arend Sidow
Stanford University
300 Pasteur Drive
Stanford, CA 94305
(650) 498 7024
arend@stanford.edu

Willie J. Swanson
University of Washington
1705 NE Pacific Street
Seattle, WA 98195
(202) 616 - 5065
wswanson@gs.washington.edu

DATABASES

William Gelbart
Harvard University
16 Divinity Avenue, Room 4059
Cambridge, MA 02138
(617) 495-2906
Gelbart@morgan.harvard.edu

Paul Szauter
The Jackson Laboratory
600 Main Street
Bar Harbor, ME 04684
(202) 288 – 6426
ps@informatics.jax.org

Jason Thomas
University of New Mexico
Albuquerque, NM 87131
(505) 270 – 7457
Jaseak@umd.edu

Data Analysis and Coordinating Center

DC Rao
rao@wubios.wustl.edu
Treva Rice
treva@wubios.wustl.edu
Karen Clark Laseter
Karen@wubios.wustl.edu
Washington University, School of Medicine
660 South Euclid
St. Louis, MO 63110

(314) 362 – 3608

NHGRI STAFF

Eva Campbell (Technical Assistance)

National Human Genome Research Institute
National Institutes of Health

5635 Fishers Lane, Suite 4076/MSC 9305

Rockville, MD 20852-9305

(301)435-5662

campbelled@mail.nih.gov

Gwendolyn Dudley (Technical Assistance)
National Human Genome Research Institute
National Institutes of Health

5635 Fishers Lane, Suite 4076/MSC

Rockville, MD 20852-9305

301.435.5565

dudleyg@mail.nih.gov

Bettie J. Graham

National human Genome Research Institute
National Institutes of Health

5635 Fishers Lane, Suite 4076

Bethesda, MD 20892-9305

(301) 496-7531

Bettie_graham@nih.gov

Mark Guyer
National Human Genome Research Institute
National Institutes of Health

Christine Cutillo (Analytical Assistance)
National Human Genome Research Institute
National Institutes of Health
5635 Fishers Lane, suite 4076/MSC 9305
Bethesda, MD 20892-9305
(301) 594-7116
cutilloc@mail.nih.gov

Carla L. Easter
National Human Genome Research Institute
National Institutes of Health
Bldg 31, Room B1B55, MSC 2070
31 Center Drive
Bethesda MD 20892-2070
esterc@mail.nih.gov

Alan E. Guttmacher

National Human Genome Research Institute
National Institutes of Health

31 Center Drive, Room 4B09

Bethesda, MD 20892-2152

(301) 594-7185

guttmach@mail.nih.gov

Jane Peterson
National Human Genome Research Institute
National Institutes of Health
5635 Fishers Lane, Suite 4076
Bethesda, MD 20892-9305
(301) 496 – 7531
Jane_Peterson@nih.gov

5635 Fishers Lane, Suite 4076
Bethesda, MD 20892-9305
(301) 496-7531
Mark_guyer@nih.gov

Jeffrey A. Schloss
National Human Genome Research Institute
National Institutes of Health
5635 Fishers Lane, Suite 4076
Bethesda, MD 20892-9305
(301) 496-7531
Jeff_schloss@nih.gov

Appendix III

BEST PRACTICES FOR MENTORS AND STUDENTS
Draft #2

I. Introduction

(NOTE: This document will provide general guidance to mentors and trainees. It is not meant to be exhaustive, but a document to disseminate best practices that have been identified by MAP grantees and MAP training coordinators and demonstrated to be successful.)

II. Guidance for Mentors

(NOTE: This section recognizes that a trainee may have several mentors (Directors/Co-directors of the MAP, MAP Training Coordinator, research advisor, etc). It is important that one mentor have primary responsibility for ensuring that the trainee does not receive conflicting messages and that the mentorship under several mentors is seamless and transparent.). It is important for the primary mentor to create an environment that allows free exchange of ideas and concerns between the mentor and the trainee.

A. Recruiting Students
    1. What are the qualities of a typical graduate students
    2. How to assess a student's potential
    3. What the department/lab offers to enrich the academic and research potential of students
    4. What the department/lab offers to enrich the social lives of students

B. Orienting Students
    1. Determining the objective (s) of the research and training experience
    2. Assessing trainee's academic and research skills
    3. Selecting appropriate research projects
    4. Recommending what fundamental academic courses (including general genetics/molecular biology/biochemistry/genomics/computational/statistical as appropriate) are needed for success
    5. Recommending what laboratory skills (including general genetics/molecular biology/biochemistry/genomics/computational/statistical as appropriate) are needed for success
    6. Recommending skills needed for success (how to study, time and stress management, reading the scientific literature, writing and presentation skills, etc.)
    7. Agreeing upon what is considered a successful outcome
    8. Agreeing upon timelines, goals and milestones

C. Implementing the trainee's academic and research training program
    1. Selecting mentor(s) and laboratory environment appropriate for the trainee's development
    2. Documenting the role of each mentor
    3. Setting up times to meet with trainee to discuss progress toward milestones
    4. Providing appropriate training in the responsible conduct of research
    5. Ensuring that the Institution provides appropriate training in skills needed for success (how to study, time and stress management, reading the scientific literature, writing and presentation skills, etc.)
    6. Determining when a change is needed in trainee's plan and plans for moving forward

7. Discussing alternate/remedial plans when the agreed upon goals and milestone are not met and plans for moving forward
8. Deciding when the goals and milestones have not been met and have little probability of being met and plans for moving forward
9. Preparing the trainee for transition to the next career level (when, evaluation, filling in the gaps, grant writing, interviewing and presentation skills)
10. Documenting program progression
11. Setting expectations and resolving conflict

D. Developing and participating in networks
    1. Professional networks
        a. Informal (lab and department)
        b. Encouraging trainee to mentoring younger students
        c. Encouraging formal (visiting other labs, national and international meetings; informal get togethers at national and international meetings)
    2. Social networks
        a. Face Book and LinkedIn
        b. Encouraging socializing outside academia

E. Tracking former trainees
    1. Establish consistent timeline and method of contact
    2. Encourage and provide opportunities for engagement with current trainees

III. Guidance for Trainees

(NOTE: Guidance in this section is provided for post baccalaureate trainees, graduate students, and postdoctoral fellows). It is important that the trainees select the right primary mentor and environment that will result in successful completion of the research training and education goals. The environment created by the mentor should be one of trust so that progress and concerns can be discussed freely, openly and constructively with the trainee.

A. Selecting a training environment
    1. Quality of program (why do students stay/leave)
    2. Quality of faculty (accessibility, research support)
    3. Quality of environment (openness,
    4. Quality of students (publications, where they transition to)

B. Understanding the academic and research expectations of graduate programs
    1. Determining the objective (s) of the research and training experience
    2. Obtaining training in the ethical conduct of research
    3. Assessing your academic, research and professional skills
    4. Selecting appropriate research project(s)
    5. Agreeing upon what academic courses (including general genetics/molecular biology/biochemistry/genomics/computational/statistical, etc as appropriate) are needed for success
    6. Obtaining appropriate training in skills needed for success (how to study, time and stress management, reading the scientific literature, writing and presentation skills, etc.)
    7. Agreeing upon what laboratory skills (including general genetics/molecular biology/biochemistry/genomics/computational/statistical as appropriate) are needed for success
    8. Agreeing upon what is considered a successful outcome
    9. Agreeing upon timelines, goals and milestones

C. Implementing the trainee's academic and research training program

1. Selecting mentor(s) and a laboratory environment appropriate for the trainee's development
2. Understanding the role of each mentor
3. Agreeing upon times to meet with mentors to discuss progress toward milestones
4. Agreeing when a change is needed in the trainee's plan and plans for moving forward
5. Agreeing upon alternate/remedial plans when the agreed upon goals and milestone are not met and plans for moving forward
6. Ensuring that the appropriate skills needed for success (how to study, time and stress management, reading the scientific literature, writing and presentation skills, etc.) are being pursued.
7. Agreeing when the goals and milestones are not being met and have little probability of being met and plans for moving forward
8. Discussing and agreeing on what happens when a change is needed and plans for moving forward
9. Preparing for transition to the next career level (when, self evaluation, filling in the gaps, grant writing)
10. Documenting program progression
11. Setting expectations and resolving conflicts

D. Developing and participating in networks
    1. Professional networks
        a. Informal (lab and department)
        b. Mentoring younger students
        c. Formal (visiting other labs, national and international meetings; informal get togethers at national and international meetings)
    2. Social networks
        a. Face Book and LinkedIn
        b. Social groups outside academia

E. Maintaining contact with mentor(s), fellow participants and institution

III. Resources

A. University's role in providing a welcoming environment for trainees
B. Utilization of resources from similar programs at the trainee's institution to enhance participation of URMs in research.
C. Appropriate fellowship, grant opportunities