

EVALUATION PLAN

NHGRI Summer Workshop in Genomics

Ripple Effect Communications, Inc.

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NHGRI Short Course Evaluation Plan

Background

The National Human Genome Research Institute (NHGRI), part of the National Institutes of Health (NIH), supports the development of resources and technology that will accelerate genome research and its application to human health. The NHGRI Education and Community Involvement Branch (ECIB) initiates, develops, implements, and evaluates education and community involvement programs designed to engage a broad range of the public in understanding genomics, its translation to health, and its importance to society.

Feasibility Study

In February 2014, Ripple Effect completed a Feasibility Study for NHGRI (see Appendix A) to design evaluation strategies to measure several NHGRI training programs and assess the value of those programs to the NHGRI and NIH Mission. As a result, Ripple Effect produced a feasibility report, which included several evaluation options and recommended approaches.

NHGRI staff reviewed the Feasibility Study and discussed the various options. As a result NHGRI decided to move forward with a structured evaluation of their Short Course program, which has involved the training of academic and nursing faculty, as well as students since the program began as described below:

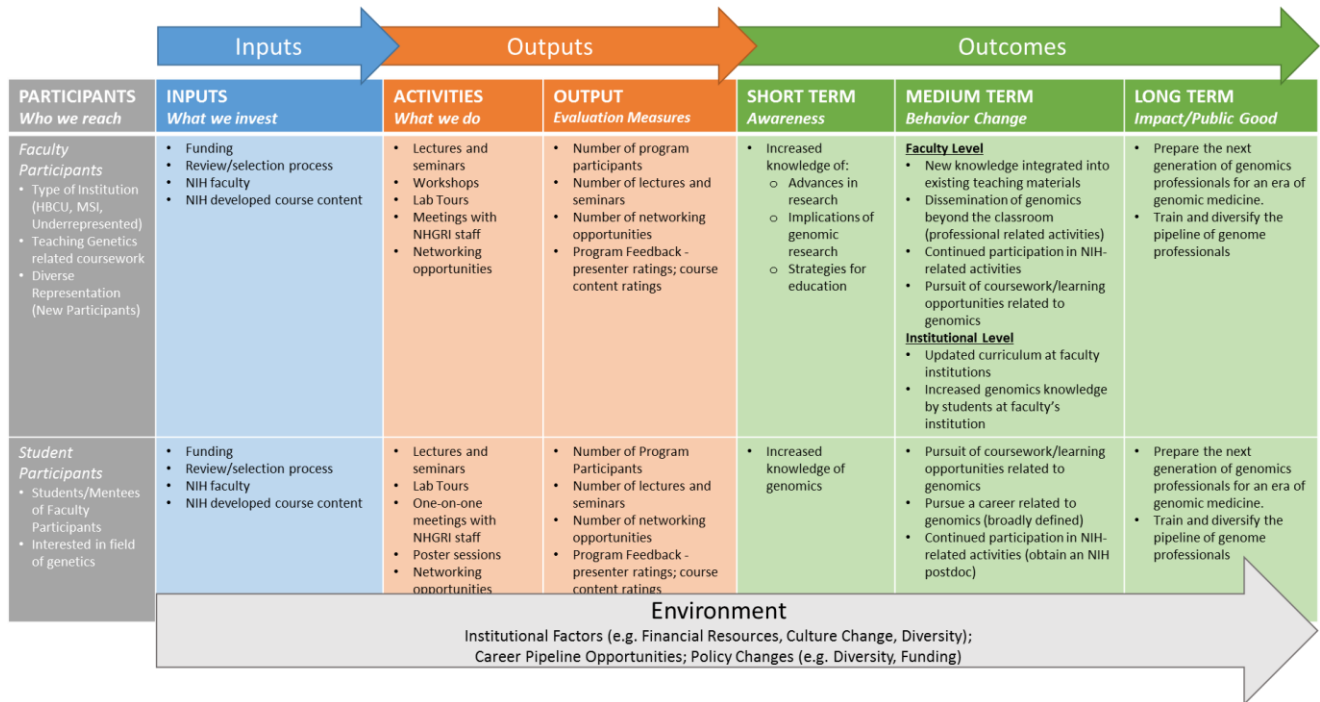
- Summer Workshop in Genomics (Faculty) – 2004-2012
- Genome Scholars Program (Students-Mentees of Faculty) – 2008-2012
- Advances in Genomics Research Summer Program (Nurse Educators) – 2012
- Advances in Genomics Research Summer Program (Students) – 2012

This document summarizes the evaluation plan, including the logic model, data collection plan, and planned analyses.

Evaluation Logic Model

Ripple Effect synthesized and organized the background information to describe the program and to articulate the overall goal of the program evaluation (Figure 1). The logic model elements are described below.

Figure 1. Evaluation Logic Model



Inputs

The Short Course is an intensive multi-day educational workshop designed to update biology instructors, as well as other instructors and researchers in related disciplines, on genomic science. The course focuses on the continuing effort to find the genetic basis of various diseases and disorders, and current topics on the ethical, legal, and social implications of genomics. The course targets college and university faculty seeking to update their curricula or develop new courses related to genetics and genomics. Preference is given to applicants from racial and ethnic groups that are underrepresented in the health-related sciences; from institutions that predominantly train students with disabilities; and from institutions that serve students from disadvantaged backgrounds including certain rural and inner-city environments. Students from those same circumstances have been included in the program since 2004, but student selection has evolved. Initially, faculty attendees selected students for attendance; then, in 2012, NHGRI began actively recruiting, screening, and accepting graduate students independent of faculty attendees, as a way of preparing and attracting future scientists and health-care professionals to a genomics workforce.

Applicants must complete an online application describing their research and teaching goals. In addition, applicants are asked to submit a current biography, a curriculum vitae, and a supporting letter from their department head (or equivalent). Women and minorities are encouraged to apply. Participants are then selected by an NHGRI committee based on their likelihood to update their courses and to include the broadest range of institutions supporting underrepresented students possible that meet program goals. NHGRI pays for room and board; participant's institutions are responsible for paying participant travel costs for faculty, both to and from the NIH in Bethesda, Maryland.

The Short Course is a highly visible program within NHGRI and is considered by NHGRI leadership as an important investment by the Institute. The annual budget of the Short Course is approximately \$80,000 and represents a total investment of almost one million dollars since its inception. Each year, more than 15 faculty are recruited from NHGRI and other ICs to serve as instructors and presenters for the Short

Course, and 1-2 NHGRI staff are responsible for coordinating the logistics and planning throughout the year.

Outputs

Short Course activities include lectures, lab tours, one-on-one meetings with NHGRI staff, and other networking opportunities. Both faculty and student Short Course participants follow a similar schedule, but at times the faculty and students are split into separate groups and receive targeted content. For faculty participants, the program provides content for the specific purpose of curriculum integration; when possible, materials are provided in electronic format to facilitate ease of integration. For student participants, the program functions to attract students to careers in genomic science, medicine, allied health, or any profession related to the application or use of genetic and genomic knowledge. Through activities such as lab tours, one-on-one meetings, and planned and spontaneous networking opportunities (e.g., post-lecture small group meetings, shared meals, tours of local attractions), the program creates and fosters a community of genomics professionals committed to contributing knowledge and expertise toward an era of genomic medicine.

Outcomes

There is an absence of information about whether and how the new knowledge and skills gained by participants has been disseminated over the years, and whether or not the course is meeting program goals. The evaluation will focus on two main outcomes: the degree of genetic and genomic curriculum integration at institutes represented by the faculty participants, and the current career paths of former student participants, including their perceptions about the influence of the summer workshops on their career choices. The overarching outcomes are categorized in to short-, medium-, and long-term goals at the faculty and/or institutional and student levels; these outcomes will help inform the evaluation research questions.

The short terms outcomes focus on increasing knowledge of research, implications, and educational strategies for genomics faculty. At the student level, the primary, anticipated short-term outcome is an overall increase in general knowledge of genomics. The medium term outcomes emphasize implementation and behavior change associated with the increased knowledge of the Short Course. At the faculty level, outcomes include integrating new material in to the classroom, as well as continued participation in professional activities and learning opportunities. These outcomes at the faculty level also imply that a broader change across the participating institutions will see updated curriculums and increased genomics knowledge by its students as a result of faculty participation. Student-level outcomes are similar and include a future pursuit of learning opportunities related to genomics and continued participation in NIH-related activities. The specified long-term outcomes reflect the program's goals of preparing the next generation of genomics professions and training and diversifying the pipeline of genome professionals.

Data Collection Process

Between 2004 and 2012, there were a total of 314 participants between 2004 and 2012, with 187 faculty and 127 students. Participants include faculty, students, and nursing participants. This evaluation utilizes a mixed-methods design to assess the process and outcome evaluation questions of interest. Drawing from web-based surveys and focus groups, the study team will retrospectively examine key areas of interest.

Focus Group

The purpose of the focus group is to seek detailed information from a sample of past Short Course participants that could be used to inform further data collection and to respond to concerns identified by the focus group. Responses from this data collection effort will help to inform a wide range of questions and indicators, including post-program integration and engagement with NIH and/or NHGRI, the educational and career paths of Short Course participants, and the influence of the program on the careers of faculty attendees.

The evaluation study team will develop focus group questions based on the program logic model and feedback from program stakeholders. Questions will be designed to provide supplemental information to the evaluation's web-based survey (planned for administration in late 2015). See Appendix B for a preliminary draft of the focus group questions. The focus group will be 90-minutes in length and cover four general areas of questions:

- Perceptions of the program
- Institutional involvement
- Diversity in the genome professional pipeline
- Recommendations for improvement

The evaluation's project director will facilitate the focus group and another team member will take detailed notes. Evaluation team members will then analyze the notes to summarize participants' experiences. Findings will be presented in relation to program goals, articulated by the Short Course evaluation logic model as short-, medium- and long-term outcomes.

Surveys

The evaluation team will administer a web-based survey to all past program participants (n=314)¹ to provide detailed information and insight about medium and long-term outcomes of the Short Course. The survey instrument focuses on collecting information on integration of Short Course knowledge into teaching materials; dissemination of genomics beyond the classroom; pursuit of careers related to genomics; and continued participation in NIH-related activities.

The web-based survey underwent several iterations of development to ensure questions are clear, concise, and aligned with key evaluation questions of interest. In addition, pilot tests were conducted to assess conceptual clarity, time burden, make needed changes to the web-based interface and skip logic, and to ensure survey data would be useful for planned analyses.

Sampling

Intended respondents of the web-based surveys are faculty and students of the Short Course between 2004 and 2012. The sampling method for the survey is a population-based sample of all program participants. There will be no cohort-specific (or year-specific) analyses. There are a maximum of 314 participants between 2004 and 2012, with 187 faculty and 127 students.

¹ This number is likely to be significantly smaller due to unavailable current contact information for all participants.

Table 1. Short Course Participants by Year

Year	Number of Faculty	Number of Students	Total
2004	16	16	32
2005	18	18	36
2006	18	18	36
2007	20	13	33
2008	14	16	30
2009	18	17	35
2010	18	17	35
2011	36	0	36
2012	29	12	41
Total	187	127	314

Contact information (e.g., email address, phone number) is only available for 299 program participants based on a list provided to the evaluation team by NHGRI. The evaluation searched for updated contact information in the summer of 2015 and could not find current contact information for 77 potential respondents. While some of the previous contact information may be accurate, the likely pool of survey respondents is closer to 225. The anticipated response rate is approximately 50% given some respondents completed the program a decade ago.

To select participants for the focus group, the study team will narrow the list of potential participants to those who participated between 2008 and 2012 (a five-year period). The team will utilize a Doodle poll to assess availability for a 90-minute focus group on a range of dates and times. No more than 9 participants will be issued a final invite for the virtual focus group.

Plan for Data Security, Confidentiality, and Quality

Ripple Effect will program the survey instrument into an electronic format utilizing the appropriate software. For this evaluation, Ripple Effect will utilize a web based tool called Qualtrics that has met all the HHS requirements for security, privacy, accessibility and has an established terms of service agreement with HHS. The web-based version of the survey may include different versions or skip patterns for different audiences.

Ripple Effect will work with the appropriate forms and offices at NIH to obtain OMB and IRB clearances. IRB clearance, or a granted waiver, is required when human participants are involved in the study. OMB clearance is required when the number of participants is expected to be more than nine.

Ripple Effect will work with NHGRI to select an appropriate sample to pilot test the survey to ensure questions are clear and elicit the type of responses most useful for program evaluation. The survey will be adjusted as necessary to address feedback.

Data Analysis Plan

Conceptual Framework and Analysis Questions

Using the conceptual framework and logic model, Ripple Effect identified the primary evaluation questions. The questions focus on key medium- and long-term outcomes of the project, as seen in Table 2.

Table 2. Primary Evaluation Questions

Outcome Area	Evaluation Question
Engagement with NIH/NHGRI	Do faculty or students who participated in the program continue to engage in NIH- and/or NHGRI-specific activities or programs?
New Knowledge Applied	Do faculty apply knowledge by integrating genomic content into individual teaching materials, creating new educational resources, updating curricula at the institutional level, and/or developing new courses related to genomic science?
Continued Genomic Discovery	Does the program spur curiosity in genomic science and lead participants toward further discovery, learning, research, and/or a career in genomics research or a related discipline?
Institutional Barriers	Are there institutional limitations or barriers that prevent program attendees from taking the next step (e.g., curriculum integration, access to further information, pursuit of career)?

Table 3 presents each survey question and its linkage to elements of the logic model. This table is part of our SharePoint database and can be filtered and sorted as needed. This full list provides a mapping for our planned descriptive analyses.

Table 3. Linkages Between Survey Questions and Logic Model

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Historical	Select your role during your participation in the Short Course.	Faculty attendee (1) Student attendee (2) Nursing faculty attendee (3)	Both	Diverse representation	Participants
Historical	Did you hold a teaching appointment at the time of your attendance to the Short Course?	Yes (1) No (2)	Faculty	Teaching genetics related coursework	Participants
Historical	Out of 100 percent, what best represented your teaching/research ratio at the time?	Teaching (1) Research (2) Other, please specify: (3)	Faculty	Teaching genetics related coursework	Participants
Historical	What degree program were you enrolled in when you attended the Short Course?	Bachelor of Science (BS) (1) Bachelor of Arts (BA) (2) Master of Science (MS) (3) Master of Arts (MA) (4) Master of Public Health (MPH) (5) Doctor of Philosophy (PhD) (6) Doctor of Medicine (MD) (7) Dual degree (MD & PhD) (8) Registered Nurse (RN) (9) Other, please specify: (10)	Student	Students/ Mentees of faculty	Participants

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Historical	What was your primary Position or Occupation Title at the time of your attendance to the Short Course?	Researcher (1) Adjunct Instructor/Professor (2) Assistant Professor (3) Associate Professor (4) Professor (5) Distinguished and/or Endowed Professor and/or Emeritus (6) Other, please specify: (7)	Faculty	Teaching genetics related coursework	Participants
Historical	Was this a tenure or non-tenure track position?	Tenure track (1) Non-tenure track (2)	Faculty	Teaching genetics related coursework	Participants
Current	Are you still with [PIPED INSTITUTION NAMED]?	Yes (1) No (2)	Both	Type of Institution	Participants
Current	Please list your current institution or organizational affiliation.	Open text	Both	Type of Institution	Participants
Current	Has your Position or Occupation Title changed from [PIPE IN SELECTED CHOICE] since the time of your attendance in the Short Course?	Yes (1) No (2)	Faculty	Train and diversify the pipeline of genome professionals	6. Long-Term Outcomes
Current	What is your current primary Position or Occupation Title?	Researcher (1) Adjunct Instructor/Professor (2) Assistant Professor (3) Associate Professor (4) Professor (5) Distinguished and/or Endowed Professor and/or Emeritus (6) Administrator (7) Other, please specify: (8)	Faculty	Train and diversify the pipeline of genome professionals	6. Long-Term Outcomes
Current	Please specify whether this is a tenure or non-tenure track position.	Tenure track (1) Non-tenure track (2)	Faculty	Train and diversify the pipeline of genome professionals	6. Long-Term Outcomes
Current	What is your current primary Position or Occupation Title?	Student (1) Trainee (2) Clinician (3) Educator (K-12) (4) Researcher (5) Administrator (6) Instructor or Professor (7) Other, please specify: (8)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	What type of degree program are you enrolled in?	Master of Science (MS) (1) Master of Arts (MA) (2) Master of Public Health (MPH) (3) Doctor of Philosophy (PhD) (4) Doctor of Medicine (MD) (5) Dual degree (MD & PhD) (6) Registered Nurse (RN) (7) Other, please specify: (8)	Student	Pursuit of coursework/ learning opportunities related to genomics	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Current	Please specify trainee type.	Predoctoral (1) Postdoctoral (2) Clinical (3) Other, please specify: (4)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Please specify the type of instructor or professor position.	Researcher (1) Adjunct Instructor/Professor (2) Assistant Professor (3) Associate Professor (4) Professor (5) Distinguished and/or Endowed Professor and/or Emeritus (6) Administrator (7) Other, please specify: (8)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Please specify whether this is a tenure or non-tenure track position.	Tenure track (1) Non-tenure track (2)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Does your current position involve teaching genetic or genomic material?	Yes (1) No (2)	Both	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Select the content areas you teach: (Select all that apply)	Biology of genetics and genomics (1) Biology of human genetics (2) Molecular/cellular genetics (3) Genetics and genomics of common diseases (4) Genetic and genomic technology (5) Pharmacogenetics and genomics (6) Ethical, legal and social implications of genetics/genomics (7) Resources for genetic/genomic education (8) Career resources (e.g., grant writing) (9) Other, please specify: (10)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Out of 100 percent, what best represents your current teaching/research ratio?	Teaching (1) Research (2) Other, please specify: (3)	Student	Pursue a career related to genomics	5. Medium-Term Outcomes
Current	Which of the following best describes your primary field of work?	Academia (1) Government (2) Clinical (3) Clinical/Government (4) Industry (5) Non-profit (6) Other, please specify: (7)	Both	Pursue a career related to genomics	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Current	Please identify any credentials or degrees that you have received or pursued since attending the Short Course. (Select all that apply)	None received or pursued (1) Bachelor of Science (BS) (2) Bachelor of Arts (BA) (3) Master of Science (MS) (4) Master of Arts (MA) (5) Master of Public Health (MPH) (6) Doctor of Philosophy (PhD) (7) Doctor of Medicine (MD) (8) Dual degree (MD & PhD) (9) Registered Nurse (RN) (10) Other, please specify: (11)	Both	Pursuit of coursework/learning opportunities related to genomics	5. Medium-Term Outcomes
Current	Have you completed the credential or degree(s)?	Yes (1) No (2) Other, please specify: (3)	Both	Pursuit of coursework/learning opportunities related to genomics	5. Medium-Term Outcomes
Current	What discipline(s) is your credential or degree associated with?	Open text	Both	Pursuit of coursework/learning opportunities related to genomics	5. Medium-Term Outcomes
Short Course Program	Out of 100 percent, what best represents your current teaching/research ratio?	Teaching (1) Research (2) Other, please specify: (3)	Faculty	Pursuit of coursework/learning opportunities related to genomics	5. Medium-Term Outcomes
Short Course Program	To what degree did your experience at the Short Course influence your teaching to research ratio?	No influence (1) Some influence (2) Moderate influence (3) Great influence (4)	Faculty	Pursue a career related to genomics	5. Medium-Term Outcomes
Short Course Program	How many year(s) have you been engaged in teaching? (Numbers only)	Open text (numbers only)	Faculty	Diverse representation	Participants
Short Course Program	Please select one of the three options below in response to the following statement: I was able to update my curriculum as a result of my participation in the Short Course.	Yes, I made substantial changes (1) Yes, I made some changes (2) Yes, I made minor changes (3) No, I did not make any changes (4)	Faculty	Updated curriculum at faculty institutions	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Short Course Program	I was able to update my genetics or genomics curriculum and teaching materials in the following ways: (Select all that apply)	Informal/unplanned integration (e.g., anecdotal narratives, spontaneous examples) (1) Added content to my lecture materials (2) Added assignments to my courses (3) Removed other content to make way for new information (4) Developed new teaching objectives for my existing courses (5) Created new lab experiments (6) Developed a new course (7) Shared teaching material with other faculty (8) Other, please specify: (9)	Faculty	New knowledge integrated into existing teaching materials	5. Medium-Term Outcomes
Short Course Program	I was able to update my curriculum and teaching materials in the following content areas: (Select all that apply)	Biology of genetics and genomics (1) Biology of human genetics (2) Molecular/cellular genetics (3) Genetics and genomics of common diseases (4) Genetic and genomic technology (5) Pharmacogenetics and genomics (6) Ethical, legal and social implications of genetics/genomics (7) Resources for genetic/genomic education (8) Career resources (e.g., grant writing) (9) Other, please specify: (10)	Faculty	New knowledge integrated into existing teaching materials	5. Medium-Term Outcomes
Short Course Program	How much time was required to update your curriculum and teaching materials after participating in the Short Course?	Less than 3 months (1) Between 3 and 6 months (2) Between 6 months and 1 year (3) Between 1 and 2 years (4) Between 2 and 5 years (5) More than 5 years (6)	Faculty	Updated curriculum at faculty institutions	5. Medium-Term Outcomes
Short Course Program	Beyond curriculum integration, in what other ways did you disseminate information from the Short Course to students? If you did not disseminate information beyond curriculum integration, please write "None."	Open text	Faculty	Dissemination of genomics beyond the classroom (professional related activities)	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Short Course Program	Please rate how much you think the following institutional factors influenced your ability to transfer your knowledge to students following participation in the Short Course. Select "Not Applicable" if the factor was not relevant to your situation.	Time and space to accommodate or integrate new information into existing curriculum (1) Relevant course(s) not available (2) Process for changing curriculum (3) Support of colleagues (4) Support by supervisor or leadership (5) Institutional awareness about the importance of genetic and genomic content (6) Curriculum committee support (7) Incentive (financial or recognition/praise) (8) Institutional funding or resources (9) Ability to secure external funding or resources (10) Protected time to develop content (11)	Faculty	Institutional Factors (e.g. Financial Resources, Culture Change, Diversity)	Environment
Short Course Program	Please rate how much you think the following student-related factors influenced your efforts to transfer your knowledge to students. Select "Not Applicable" if the factor was not relevant to your situation.	Student preparedness (e.g., students' prerequisite knowledge) (1) Student perception around applicability of information to their career (2) Student awareness about the importance of genetic and genomic content (3) Students' interest (4) Students' self-confidence (5)	Faculty	Increased genomics knowledge by students at faculty's institution	5. Medium-Term Outcomes
Short Course Program	Did the Short Course influence your research?	Yes (1) No (2)	Both	Dissemination of genomics beyond the classroom (professional related activities)	5. Medium-Term Outcomes
Short Course Program	Please describe how your experience at the Short Course influenced your research.	Open text	Both	Dissemination of genomics beyond the classroom (professional related activities)	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Short Course Program	To what degree did your experience at the Short Course influence your decision to engage in the following activities? Select "Not Applicable" if you did not engage in the activity listed.	<ul style="list-style-type: none"> Presentations at scientific meeting (1) Attendance at scientific meeting (2) Involvement in professional organizations (3) Took additional classes on genetics/genomics (4) Attended seminars/events on genetics/genomics (5) Informal genetics/genomics chats (6) Engaged a mentor in the genetics/genomics field (7) Became involved in a research group related to genetics/genomics (8) Conducted research in genetics/genomics (9) Attended professional meetings related to genetics/genomics (10) Presented material at various events related to genetics/genomics (11) Published findings related to genetics/genomics (12) 	Both	Dissemination of genomics beyond the classroom (professional related activities)	5. Medium-Term Outcomes
Short Course Program	To what degree did your experience at the Short Course influence your decision to pursue new career or educational options?	<ul style="list-style-type: none"> No influence (1) Some influence (2) Moderate influence (3) Great influence (4) Not applicable – I did not pursue new career or educational options (5) 	Both	Pursue a career related to genomics (broadly defined)	5. Medium-Term Outcomes
Short Course Program	Please describe how the Short Course influenced your decision to pursue new career or educational options.	Open text	Both	Pursue a career related to genomics (broadly defined)	5. Medium-Term Outcomes
Short Course Program	Since the Short Course, have you been involved with Short Course attendees, NIH or NHGRI?	<ul style="list-style-type: none"> Yes (1) No (2) 	Both	Continued participation in NIH-related activities	5. Medium-Term Outcomes
Short Course Program	Please indicate the ways you have been involved with Short Course attendees, NIH or NHGRI since attending the program. (Select all that apply)	<ul style="list-style-type: none"> Communications with fellow attendees (1) Additional contact with presenter(s) (2) Additional contact with NIH or NHGRI staff (3) Pursued other training or educational opportunities at NIH (4) Pursued other training opportunities at NHGRI (5) Used NHGRI online resources (6) Involved in writing NIH grant-application (7) Awarded NIH grant (8) Joined NIH Listserv(s) or other forms 	Both	Continued participation in NIH-related activities	5. Medium-Term Outcomes

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
		of communication (9) Other, please specify: (10)			
Background Information	What year were you born?	Drop down menu	Both	Diverse representation	Participants
Background Information	What is your sex?	Male (1)Female (2)Do not wish to provide (3)	Both	Diverse representation	Participants
Background Information	What is your ethnicity?	Hispanic or Latino (1)Not Hispanic or Latino (2)Do not wish to answer (3)	Both	Diverse representation	Participants
Background Information	What race do you consider yourself? (Select all that apply)	White or Caucasian (1) Black or African American (2) Asian (3) American Indian/Alaska Native (4) Native Hawaiian or other Pacific Islander (5) Do not wish to answer (6)	Both	Diverse representation	Participants
Background Information	Do/did you have a disadvantaged background, which can be defined either as coming from a family with an annual income below established low-income thresholds, or coming from an educational environment such as that found in certain rural or inner-city environments that have demonstrably and directly inhibited you from obtaining the knowledge, skills, and abilities necessary to develop and participate in a research career?	Yes (1) No (2) Do not wish to answer (3)	Both	Diverse representation	Participants

Section	Question	Response options	Respondent Type	Logic Model Link	Logic Model Area
Short Course Program	Please enter any other comments you would like to share with us about the Short Course and your experiences since attending the program. If you have no additional comments, please hit the next button.	Open text	Both	Varies based on response	Varies based on response

Challenges and Limitations

This evaluation presented certain challenges that affected both its design (and will affect the interpretation of findings). First, because the Short Course is a compressed multi-day workshop, it is difficult to attribute any outcomes to the course itself beyond short term knowledge gain. Second, the evaluation is collecting retrospective data, thus introducing the potential for recall bias or simply forgetting details that may be integral to some of the survey and/or focus group questions. Finally, the Short Course is very selective with its participants, thus limiting the size of the sample pool. Coupled with the retroactive nature of the evaluation (up to 10 years for the survey and 7 years for the focus group), it may be difficult to reach past program participants, potentially impacting the survey response rate.

Data Analysis Strategies

Data quality control and quality assurance procedures will be developed and implemented by senior evaluation professionals and applied to all collected data. For quantitative data, internal validity will be checked as necessary for analysis (e.g., consistency of responses within a case). Descriptive and summary statistics will be calculated from survey responses to inform the evaluation questions. If warranted and appropriate, data may be cross-tabulated to determine if medium- and long-term outcomes differ between the student and faculty participants.

Analysts will review and analyze the qualitative data by question (“Beyond curriculum integration, in what other ways did you disseminate information from the Short Course to students?”; “Please describe how your experience at the Short Course influenced your research.”; and “Please describe how the Short Course influenced your decision to pursue new career or educational options.”). The evaluation team will develop and apply a coding scheme to identify themes within the questions. These findings will be incorporated to provide additional contextual information for descriptive quantitative findings.

After the survey and focus group data are analyzed, Ripple Effect will draw conclusions and recommendations about the outcomes of the NHGRI Short Course. The results will be delivered in the form of a narrative report.

Summary of Recommendations

Ripple Effect Communications, Inc. was selected by the National Human Genome Research Institute (NHGRI) to conduct a feasibility study of the NHGRI Summer Workshop in Genomics Program and to design evaluation strategies that will assess its value to NIH and NHGRI. This report outlines our findings and includes the following recommendations:

- The techniques for evaluation described in this document can be used for all NHGRI sponsored “short courses” described in this document; however, the specific questions would need to be tailored based on the content and target audience of the short course.
- The evaluation is designed to retrospectively gather data from participants who attended the Short Course from 2003 to 2012 (approximately 300 faculty and 150 student participants). This includes nursing, faculty and student participants (Genome Scholars and the Advances in Genomics Summer Research Program participants).
- If the NHGRI goal is to evaluate the success of the Short Course program to-date, then we recommend NHGRI implement the first technique: [Electronic Survey of Short Course Participants](#). This approach will provide the most detailed information about the degree of curriculum integration at the institutions of participants, and about the supports or barriers they experienced at the institutional level.
- NHGRI may not know if the [Focus Group with Selected Participants](#) is useful or necessary until feedback from the survey is received.
- If funds are limited, then NHGRI may want to consider investing in the final two techniques ([Document Review of Related Archival Data](#), [Request for Information on Key Issues](#)) which provide useful information, but may not fulfill the desire to evaluate program success.
- NHGRI should consider building in a long-term expectation for program participants to provide follow-up information for future short courses.

Background

Project Scope

The National Human Genome Research Institute (NHGRI), which is part of the National Institutes of Health (NIH), supports the development of resources and technology that will accelerate genome research and its application to human health. The Education and Community Involvement Branch (ECIB) of the NHGRI initiates, develops, implements, and evaluates education and community involvement programs intended to engage a broad range of the public in understanding genomics and its translation to health and its importance to society.

NHGRI engaged Ripple Effect to conduct a feasibility study to design evaluation strategies that will measure several programs and assess the value of those programs to the NHGRI and NIH Mission. Specifically, Ripple Effect was engaged to answer the following specific questions:

- Does NHGRI have sufficient resources (e.g., human capital, funding, archival data) to pursue process or outcome evaluations?
- Is the estimated cost of a process or outcome evaluation reasonable given the cost of the program?
- What clearance requirements might be necessary to conduct the evaluation?
- What data collection efforts are needed to evaluate the program?
- What data are currently available that can be used to evaluate the program and determine baseline data?

Feasibility Activities

Ripple Effect completed the following activities:

- Review and gather background data;
- Assess program goals, inputs and outputs;
- Define evaluation questions and identify data sources; and
- Recommend feasible approaches to evaluation.

Review and gather background data. Background data was provided through interviews with NIH stakeholders (Appendix A and B), and background materials (Appendix C) were provided by NIH staff. This process was iterative and collaborative: interviews shed light on relevant background materials, and the background materials identified areas for clarification from additional interviews. In addition, Ripple Effect reviewed other related studies that may serve as models for this evaluation.

Assess program goals, inputs and outputs. Ripple Effect synthesized and organized the background information to describe the program and to articulate the overall goal of the program evaluation (Appendix H). The program description includes: program history; program goals; logic model including inputs, outputs and outcomes; program activities and the programs alignment with NHGRI and NIH mission. The high level description of the evaluation included defining the overall purpose of the evaluation, how the evaluation results would be used, and the evidence gaps that currently exist.

Define evaluation questions and identify data sources. Ripple Effect focused on proposing outcome evaluation strategies to assess the value of each program, and process evaluation strategies to improve

the efficiency and effectiveness of program implementation. For each program, Ripple Effect defined the following (Appendix E):

- **Program Goals:** Specific goals that align with program purpose and NIH/NHGRI mission.
- **Evaluation Objectives:** The objective describes the purpose of the evaluation and aligns with the program goals.
- **Evaluation Questions:** Key questions that will be answered by the evaluation that help determine evidence of the program's contribution to long-term outcomes. Questions are often dependent upon the uses of the evaluation.
- **Evaluation Indicators:** Criteria to be met in order for a program to achieve its intended results.
- **Data Collection Methods and Sources:** Identify appropriate data sources available for each indicator including feasibility, clearances and sampling for each method.

Develop and recommend feasible approaches to evaluation. In collaboration with NHGRI, we developed several data collection approaches, which were evaluated for feasibility, usefulness and alignment with program priorities. This prioritization process resulted in a short list of possible techniques for each program. For each technique, Ripple Effect outlined in more detail the design of the evaluation and level of effort. In addition, this report outlines the advantages and limitations of each technique. Finally, this report includes recommendations to NHGRI, based on our knowledge of NIH and our experience on advantageous evaluation approaches.

NHGRI will be able to use the information gleaned from this feasibility study to develop and implement the appropriate evaluation technique to meet NHGRI needs.

Program Overview

Program Summary

Program Description

The NHGRI Summer Workshop in Genomics (Short Course) is offered by the National Human Genome Research Institute (NHGRI), at the National Institutes of Health (NIH). This intensive, four-day course is designed to update biology instructors, as well as other instructors and researchers in related disciplines, on genomic science. The course focuses on the continuing effort to find the genetic basis of various diseases and disorders, and current topics on the ethical, legal and social implications of genomics. This course is especially intended for college and university faculty seeking to update their curriculum or to develop new courses related to genetics.

This course is designed to update instructors who train students from:

- Racial and ethnic groups underrepresented in health related sciences;
- Institutions that predominantly train students with disabilities; or
- Disadvantaged backgrounds including certain rural and inner-city environments.

Applicants must complete an online application describing their research and teaching goals. In addition, applicants are asked to submit a current biography, curriculum vitae, and supporting letter from their department head (or equivalent). Women and minorities are encouraged to apply.

Participants are then selected by an NHGRI committee based on their likelihood to update their courses and to include the broadest range of institutions supporting underrepresented students possible that meet program goals.

NHGRI pays for room and board; participant's institutions are responsible for paying participant travel costs for faculty, both to and from the NIH in Bethesda, Maryland.

Genome Scholars Program. In 2008, NHGRI expanded the program and invited successful faculty applicants to select one promising student from their institution to attend the Genome Scholars Program. The Genome Scholars Program parallels the Short Course, and offers a close-up view of careers in genetic research while providing an enhanced mentoring experience. Genome Scholar applicants must have a minimum 3.0 GPA, be currently enrolled at the sponsor's school in a science-related major, and successfully complete a formal application before being enrolled as a Genome Scholar. Each Short Course faculty participant is limited to one Genome Scholar.

Advances in Genomics Research Summer Program. In 2012, NHGRI developed a separate track targeted to nurse educators. This track was an intensive, five-day course for nursing faculty at colleges and universities with substantial under-represented minority, rural and/or disadvantaged student enrollment. Nursing faculty attended seminars presented by leading NHGRI research investigators and educators. Seminars provided updates on the latest advances in genomics research, focus on the most current understanding of the genetic/genomic basis of disease, examine the ethical, legal and social implications of genomics research, and provide potential strategies for nursing education.

Advances in Genomics Research Summer Program. In 2012, NHGRI hosted another short course titled, "Advances in Genomics Research Summer Program" that is an intensive, five-day course for students at colleges and universities with substantial under-represented minority, rural and/or disadvantaged

student enrollment. The NHGRI Advances in Genomics Research Summer Program was targeted to Ph.D. and M.D.-Ph.D. students enrolled in programs with areas of concentration in Molecular Biology, Computational Biology and/or Genetics. This intensive five-day course included seminars presented by leading NHGRI research investigators, focusing on the latest advances in basic genomics research, the genetic basis of disease, and the ethical, legal and social implications of genomics research. Students presented their research at a poster session and engaged with NIH investigators, postdoctoral trainees and career counselors. This was a unique opportunity for students interested in pursuing careers in genomics research to gain information, career advice and visibility in the research-rich context of the NIH.

Approximate Size

The Short Course is a highly visible program within NHGRI and is considered by NHGRI leadership as an important investment by the Institute. The Short Course annual budget is approximately \$80,000 and represents a total investment of almost one million dollars since its inception. Each year, more than 15 faculty are recruited from NHGRI and other ICs to serve as instructors and presenters for the Short Course, and 1-2 NHGRI staff are responsible for coordinating the logistics and planning throughout the year.

Organizational Location and Establishment

The NHGRI Education and Community Involvement Branch (ECIB) within the Division of Policy, Communications and Education at NHGRI offers the Summer Research Workshop in Genomics (Short Course) as a targeted education and outreach program. The course was initially sponsored by the NHGRI Division of Intramural Research and later moved to ECIB for leadership. The Short Course has been offered and supported by the Institute for more than ten years. Due to the lengthy process for gaining travel approvals that recently was instituted NIH-wide, this program was not offered in 2013; however, NHGRI plans to offer it in 2014 and future years.

Stakeholders

The NHGRI Summer Workshop in Genomics includes the following key stakeholders:

- **NIH Short Course Faculty:** Each year, more than 15 faculty are recruited from NHGRI and other NIH ICs to serve as instructors and presenters for the Short Course
- **Faculty Program Participants:** College and university faculty seeking to update their curriculum or to develop new courses related to genetics and train students from: racial and ethnic groups underrepresented in health related sciences; institutions that predominantly train students with disabilities; or disadvantaged backgrounds including certain rural and inner-city environments.
- **Student Program Participants:** Mentees or students at the same universities of selected faculty program participants interested in pursuing a genetics related career and selected by the successful faculty applicants. These students participated in the genome scholars program.
- **Nursing Program Participants:** College and university nursing faculty focusing on the specific needs of nurse education who are seeking to update their curriculum or to develop new courses related to genetics and train students from the underrepresented groups described of the faculty program participants.

Goals

This intensive, six-day course is designed to update post-secondary faculty and researchers in related disciplines on the latest research trends and topics in genomic science. The program aims to accomplish the following goals:

- Expand NIH and NHGRI’s professional network to reach out to diverse communities, and to create new partnership opportunities.
- Prepare the next generation of genomics professionals for an era of genomic medicine.
- Train and diversify the pipeline of genome professionals in alignment with the NIH and US Department of Health and Human Services diversity efforts.

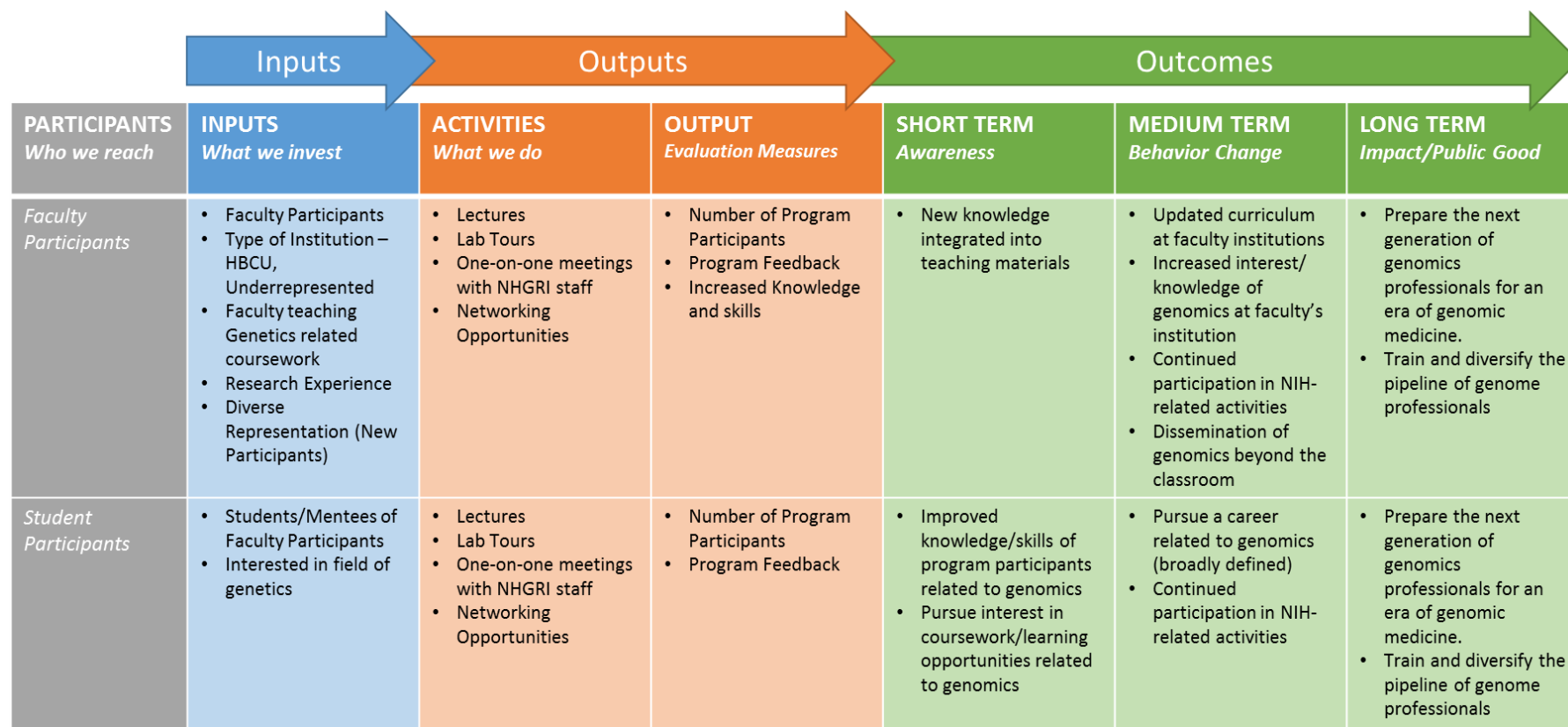
Support of NHGRI and NIH missions

The Short Course was created as a way to efficiently and effectively accelerate the dissemination of genetic and genomic information to science faculty, especially those faculty at minority serving institutions. As such, the Short Course meets aspects of both the NHGRI mission by “supporting the development of resources (faculty) that will accelerate genome research and its application to human health” and the NIH mission by “developing, maintaining, and renewing human resources that will ensure the Nation's capability to prevent disease.” This program fulfills the NHGRI Strategic Plan for education and training, which outlines the importance of preparing the next generation of genomics researchers in many disciplines and expanding the diversity of the genomics workforce.

Specifically, the program goals align with the following component of the NHGRI strategic plan:

- *Building healthcare providers’ genomic competencies.*
 - Prepare the next generation of genomics professionals for an era of genomic medicine.
- *Conducting public outreach.*
 - Expand NIH and NHGRI’s professional network to reach out to diverse communities, and to create new partnership opportunities
- *Preparing the next generation of genomics researchers.*
 - Train and diversify the pipeline of genome professionals in alignment with the NIH and US Department of Health and Human Services diversity and inclusion efforts.

LOGIC MODEL/CONCEPTUAL FRAMEWORK



Program Functions and Activities

Short Course activities include lectures, lab tours, one-on-one meetings with NHGRI staff, and other networking opportunities. Initially, the program was only open to faculty participants; however, in 2008, the program was expanded to include undergraduate and graduate students from the same institution as the faculty participants. In 2012, the program was further expanded to include nursing faculty, and address their unique nursing education needs as related to genomics. In addition, in 2012, another related 5-day Short Course, the Advances in Genomics Research Summer Program, was created to specifically target Ph.D. and M.D.-Ph.D. students enrolled in programs with concentrations in Molecular Biology, Computational Biology and/or Genetics. Both faculty and student Short Course participants follow a similar schedule, but at times the faculty and students are split into separate groups and receive targeted content. For faculty participants, the program functions to provide content for the specific purpose of curriculum integration; when possible, materials are provided in electronic format to facilitate the ease of integration. For student participants, the program functions to attract students to careers in genomic science, medicine, allied health, or any profession related to the application or use of genetic and genomic knowledge. Through activities such as lab tours, one-on-one meetings, planned and spontaneous networking opportunities (e.g., post-lecture small group meetings, shared meals, tours of local attractions), the program creates and fosters a community of genomics professionals committed to contributing knowledge and expertise toward an era of genomic medicine.

Evaluation Design

Evaluation Objectives

Purpose

Ideally, the evaluation will retrospectively gather data from participants who have attended the Short Course from 2003 to 2012 (approximately 300 faculty and 150 student participants). This will include the nursing participants, faculty and students, including the Advances in Genomics Summer Research Program. The evaluation will focus on two main outcomes: the degree of genetic and genomic curriculum integration at institutes represented by the faculty participants, and the current career paths of former student participants, including their perceptions about the influence of the summer workshops on their career choices.

Evidence Gaps

Each year, administrative staff have gathered feedback from participants directly following their participation in the Short Course. The evaluation forms typically offered a three-point rating scale and space for open-ended comments in response to questions, which focused on the quality of: course content; presenters; workshop activities; and supports. Feedback was used to evolve the program in successive years, but knowledge about the longer-term outcomes is unknown.

Use of Results

Findings. NHGRI will use the findings of this evaluation to make appropriate changes to the program design, which could include modifications to recruitment strategies, the application process, course programming, format, length and follow-up. For example, if it is found that the participation in the program was more useful for certain groups of participants, the application process could be adjusted to recruit the that group of participants. Alternatively, or in addition, the program agenda could be adjusted to better serve those participants who did not find the Short Course as useful.

This program is more than 10 years old and sufficient time has passed to evaluate the long term impact of the program. During his time as NHGRI Director, the current NIH Director, Dr. Francis Collins, had significant interest in the course with regard to its potential to enhance genomics education within the undergraduate curriculum and increase the diversity of trainees within NIH funded training programs; if the program is found to be successful, it could be suggested as a model to many ICs. If the program is not found to be successful, or only parts of the program are deemed successful, the current NHGRI Director, Dr. Eric Green, would likely change the program so that it would better meet the desired outcomes. Furthermore, since one of the program goals is to enhance diversity of the workforce, the results of this evaluation would provide input into current trans-NIH discussions on this subject. According to the ACD Working Group on Diversity of the Biomedical Workforce, "NIH needs to be more attentive to collecting the data on an ongoing basis to better inform next steps and future actions that are required to address" diversity. If this program is able to demonstrate success at increasing diversity, it would be a significant finding against the backdrop that "despite longstanding efforts from the NIH to increase the number of scientists from underrepresented groups, diversity in biomedicine still falls short of mirroring that of the U.S. population."²

Evaluation Questions

² <http://acd.od.nih.gov/dbr.htm>

Below is an outline of the evaluation questions that are relevant to the techniques included in this report. The full set of evaluation questions is available in Appendix F.

Goal: Expand NIH and NHGRI's professional network to reach out to diverse communities, and to create new partnership opportunities

Evaluation Type	Evaluation Question	Indicator(s)
Outcome	Engagement with NIH/NHGRI Do faculty or students who participated in the program continue to engage in NIH or NHGRI specific activities or programs?	(03) Degree to which former presenters have expanded their professional network due to participation (04) Degree to which former program participants continue(d) to interact with NIH/NHGRI (05) Post-program integration/engagement with NIH/NHGRI

Goal: Prepare the next generation of genomics professionals for an era of genomic medicine.

Type	Evaluation Question	Indicator(s)
Outcome	New knowledge/skills applied Do faculty apply knowledge and skills by integrating genomic content into individual teaching materials, creating new educational resources, updating curriculum at the institutional level, or developing new courses related to genomic science?	(08) Length of time after program that curriculum change was achieved (09) Type and quantity of genomic curriculum updates

Goal: Train and diversify the pipeline of genome professionals in alignment with the NIH and US Department of Health and Human Services diversity and inclusion efforts.

Type	Evaluation Question	Indicator(s)
Outcome	Continued genomic discovery Does the program spur curiosity in genomic science and lead participants toward further discovery, learning, research or a career in genomics research or a related discipline?	(06) Educational and career paths of participants (11) Faculty attendee perceptions of the program influence on their career (12) Student attendee perceptions of the program influence on their career (13) Degree to which participants pursued activities that demonstrate interest in genomics
Outcome	Institutional barriers Are there institutional limitations or barriers that prevent program attendees from taking the next step (e.g., curriculum integration, access to further information, pursuit of career)?	(14) Perception of institutional limitations or barriers that interfere with achieving program outcomes

Feasibility and Evaluation Techniques

Ripple Effect compiled and assessed a comprehensive matrix of all evaluation questions, the information required to answer each question, all potential data sources and methods for collecting data, and the scope of resources required (see Appendix D and E). The most feasible data sources and methods were

selected, and grouped into four overarching data collection techniques. Each technique addresses one or more of the evaluation questions and indicators shown in the table above.

The selected data collection techniques are presented below:

- [Electronic Survey of Short Course Participants](#)
- [Focus Group with Selected Participants](#)
- [Document Review of Related Archival Data](#)
- [Request for Information on Key Issues](#)

Electronic Survey of Short Course Participants

Overview:	Survey all program participants from 2004-2012 to assess genomic curriculum integration, institutional limitations for achieving program goals, program influence on continued participant engagement with NIH/NHGRI, and the career/educational paths of program participants.		
Data Source(s):	Data Source	Category	Qty.
	Short Course Faculty Participants	New Data	N=186
	Short Course Student Participants	New Data	N=111
Data Collection Method(s):	Survey: Electronic		
Sampling:	None		
Data Analysis Method(s):	Quantitative Analysis		
Frequency:	One-Time Survey		
Clearance Requirements:	Institutional Review Board Paperwork Reduction Act of 1995		
Estimated Budget	Medium		
Estimated Level of Effort	1000-2000 hours		
Estimated Timeline	8-12 months (depends on clearances)		

Indicator(s):

This technique has the capacity to inform the following indicators:

- (05) Post-program integration/engagement with NIH/NHGRI
- (06) Educational and career paths of participants
- (08) Length of time after program that curriculum change was achieved
- (09) Type and quantity of genomic curriculum updates
- (11) Faculty attendee perceptions of the program influence on their career
- (12) Student attendee perceptions of the program influence on their career
- (14) Perception of institutional limitations or barriers that interfere with achieving program outcomes

Data Sources and Collection Strategies:

Data Sources

Faculty Participants. Contact information, including first and last name, email address, phone number and name of home institution, is available for the 186 faculty participants who have attended the Short Course since 2004. Contact will be attempted with each individual.

Student Participants. Contact information, including first and last name, email address, phone number and name of home institution, is available for the 95 student participants who have attended the Short Course since 2005. In 2004, 16 student participants attended, but their email and phone numbers are unavailable. Contact will be attempted with all 111 student participants.

Sampling

Over the course of nine years (2004-2012), a total of 297 individuals participated in the program. Because this technique involves making contact with all 297 program participants, and no comparative sub-groups are necessary, there is no need to conduct sampling.

Data Collection Instrument(s)

Electronic Survey. Defining effective survey questions is among the most important elements of survey research. The survey should consider: the goals of the survey (indicators defined above); information desired from each respondent; and respondent burden. Questions will consider best practices in survey design to elicit proper feedback and encourage participation. For example, questions should consider the concepts they intend to measure, if all respondents would interpret the question in the same way, and if all respondents would be willing to answer.

The nature of each evaluation question and type of information required will inform the type of question created to collect responses. For example, if the goal is to understand the strength of a participant's point of view (e.g., how influential the Short Course was for integrating genomics into their curriculum), Likert scales could be developed that would shed light on the magnitude of program influence. However, if the goal is to capture an illustration of a student participant's career path then categorical choices may be developed. Where appropriate, opportunities for short open-ended narratives will be allowed; one method for optimizing response rate it to be sure the respondent can offer constructive criticism³.

The purpose of the survey is to collect as much information as possible from as many program participants as possible with minimal burden. The survey should take no longer 20 minutes to complete. A small group of NHGRI program staff will be selected to pilot the survey and collection process.

Data Collection Process

Step 1. Contact Participants. Electronic delivery of an introductory letter to all program participants will provide initial contact. The letter will explain the intent of the evaluation, the data collection instrument and process, and timeline for completing the data collection process (including a date for delivery of the electronic survey). To encourage responses, the letter will offer online links to new resources for teaching genomics (to illicit program loyalty), provide an option to receive a hard-copy of the survey with a postage-paid return envelope, and offer an honorarium or financial incentive to participate.

³ Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education*, 33(3), 301–314. DOI: 10.1080/02602930701293231

It should be expected that a number of email addresses will fail due to inaccurate contact information. All email failure notices will be captured, and the following steps will be taken to locate the individual:

- Attempt contact via telephone
- Search the World Wide Web, PubMed, or Lexis Nexus database using first and last name of the participant, in conjunction with the name of the institution reported at time of program attendance
 - Follow up using available information (e.g., new email address, phone number, LinkedIn profile, etc.)
- Review eRA Commons profiles for a matching name and history.
- Send a letter to the institution reported at time of program attendance to identify contact information.

Once contact is made, we will provide the former participant with the introductory letter and update their contact information in the database. If the individual cannot be located using any of the three steps above, s/he will be categorized as “Unable to Locate”.

Step 2. Send the Survey. A hard copy of the survey will be mailed to individuals upon request (names will be gathered and surveys sent once per week until complete); otherwise, the URL for the survey will be emailed to participants one week after the introductory letter was delivered. This communication will restate pertinent information and remind the participant of the resources available to them and the honorarium eligible to them when complete the survey. The email will assure former participants their feedback is anonymous and valued, and will be used to make program funding and design decisions. The letter will conclude by thanking them for time and candidness.

Step 3. Reminders and Deadline Extension. After one week, a reminder note will be sent to all former participants who have not completed the survey. After two weeks, another note will be sent to those who have not completed the survey, and at that point the deadline will be extended one week. Depending on the response rate (e.g., if lower than 20%), evaluation staff may decide to send hard copies of the survey, or continue with another reminder.

The data sources and collection strategies presented here include techniques documented by researchers who have achieved what is considered a high response rate to online surveys⁴. Response rates have been declining in recent years (since the 1950s), and although there is no official gold standard for response rates in evaluation research, anywhere between 50-60% is deemed adequate/average⁵. This group of individuals is assumed to be highly motivated and committed to the scientific endeavor; provided a high rate of successful contact with former program participants, a response rate of at least 50% is reasonable.

Design Advantages, Limitations and Challenges:

Advantages

⁴ Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education*, 33(3), 301–314. DOI: 10.1080/02602930701293231

⁵ Baruch, Y. (1999). Response rate in academic studies-A comparative analysis. *Human Relations*, 52(4), 421-438. DOI: 10.1177/001872679905200401

- Faculty participants can provide the most detailed information about the degree of curriculum integration at their institution, and about the supports or barriers they experienced at the institutional level.
- Only Faculty participants can provide *insider* information about their experiences with the program and the lasting effects it may be having on them professionally (e.g., knowledge gains, capacity for teaching genomics, professional activities).
- Only Faculty participants can provide information about the overall value of the program.
- Program leaders can opt to prioritize and select the number of questions deemed appropriate for available resources.
- Study results are suited for publication.

Limitations and Challenges

- This technique is limited to participant perspectives (subject to response bias). Including other perspectives, such as other faculty at the participants' institution, or gathering data from more objective sources (e.g., NIH Listservs or the eRA Commons Profile), could provide a more comprehensive understanding of program outcomes.
- The information age facilitates ease for locating and contacting an individual (especially professionals), but the level of effort required to update contact information is unknown.
- It can be challenging to get a sufficiently high response rate, especially from individuals who participated over 5 years ago.
- It may be difficult to attribute successful outcomes specifically to this program.

Focus Groups with Selected Participants

Overview:	Conduct focus groups with a sample of past participants who responded to the survey to investigate in more detail their survey feedback.		
Data Source(s):	Data Source	Category	Qty.
	External stakeholders: Former Program Participants	New Data	N=9 or Less
Data Collection Method(s):	Focus group: Virtual		
Sampling:	Maximum Variation Sampling		
Data Analysis Method(s):	Qualitative Analysis		
Frequency:	One-Time Focus Groups		
Clearance Requirements:	Institutional Review Board		
Estimated Budget	Low to Medium ⁶		
Estimated Level of Effort	500-1000 hours		
Estimated Timeline	3 months		

Indicator(s):

This technique has the capacity to inform the following indicators:

- (05) Post-program integration/engagement with NIH/NHGRI
- (06) Educational and career paths of participants
- (08) Length of time after program that curriculum change was achieved
- (09) Type and quantity of genomic curriculum updates
- (11) Faculty attendee perceptions of the program influence on their career
- (12) Student attendee perceptions of the program influence on their career
- (14) Perception of institutional limitations or barriers that interfere with achieving program outcomes

Data Sources and Collection Strategies:

Data Sources

Former Program Participants. This approach collects new data in focus groups from previous program participants based on their feedback to the survey.

Sampling

Number of Focus Groups. Focus groups will allow NHGRI to derive meaning from the abbreviated responses received from the survey and ask additional probing questions of survey respondents. Based on results from the survey (technique one), NHGRI will identify which areas they'd like to understand in greater depth, and then plan to conduct more than one focus group, based on those areas.

Conceptually, some areas of questioning may be appropriate to stand alone in a singular focus group (e.g., institutional barriers), while others areas may be complementary and should be grouped (e.g.,

⁶ Cost is impacted by number of focus groups and travel costs if focus groups are in person (vs. virtual).

career path and influence of the program on career path). To address OMB clearance requirements, each focus group must be significantly different.

Method. Depending on the areas of interest that arise from the survey results, either **criterion** or **maximum variation** sampling should be used to create samples. Both are purposeful sampling methods, but they differ by the number of selection criteria⁷. Criterion sampling is used when one important and overarching criteria is identified, and maximum variation sampling is used when a number of criteria are identified from within one group (e.g. traditionally underrepresented institutions). For example, if NHGRI wants to develop a deeper understanding of institutional barriers, then criterion sampling would be used first, and all survey respondents who identified institutional barriers as a problem would become a part of that sample. The maximum variation sampling may be more appropriate to include individuals on both sides of a particular survey response (e.g. including vs. not including Genome Scholars in the program) would become part of the sample. In some cases, a mixture of both methods makes sense; still with the institutional barriers example, once criterion sampling results in a group of those who identified barriers, then the maximum variation sampling method could be used to ensure representation on other criteria (e.g., faculty or student rank, size of the institution, geographic location, and racial composition). In the end, the questions will dictate the required sampling method, and those are undetermined at this time.

Number of Participants. Regardless of sampling method, when creating samples for each focus group, the total size for each focus group should include 12 individuals. However, to avoid the need for OMB clearance, no more than nine participants will be invited to each focus group. Selecting 12 individuals allows space for up to four participants to decline participation; however, because the focus groups are virtual, acceptance to participate is expected to be high.

Data Collection Instrument(s)

A **discussion guide** will be developed as a tool to walk participants through the focus group session and keep the facilitator on track. The guide will include explanation and request for consent, information about the process and purpose of the focus group, study questions and probes, a potential exercise, and space to collect individual narrative responses.

A **sign-in sheet** will be used to collect demographic information including name, position, name of institution, and contact information (e.g., phone, email address and mailing address). If appropriate, we may also collect race and ethnicity for student participants (Genome Scholars).

Data Collection Process

Step 1. Contact Participants. Once identified, 9 participants will be contacted via email inviting them to participate. The e-mail letter will outline the intent of the overall project and data collection effort, explain the data collection instruments and process, and request participation in the Focus Group. This invitation will include a date and time so that participants can save the date.

Step 2. Determine Participation. Follow-up contact with potential participants will be made one week after sending an email to determine commitment to participate. Return to step one to contact the back-up participants for those who decline to participate.

⁷ Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Thousand Oaks, CA: Sage.

Step 3. Send Materials and Reminder. An email will be sent to participants at least three days prior to the focus group to confirm their attendance. The email will include virtual focus group login instructions, the consent form, sign-up sheet and discussion guide. Request will be made for the signed consent to be returned prior to the meeting (via email).

Step 4. Conduct the Focus Group. The length of time required for the focus group will depend on the number of questions selected by NHGRI. The Focus Group should last no longer than two hours. The focus group will be recorded electronically for further analysis and participants will be made aware of this prior to initiating the focus group.

Step 5. Thank you. Each participant will receive a thank you e-mail and receive financial honorarium if deemed appropriate.

Following the data collection effort, the feedback will be analyzed and summarized in a focus group report that identifies key themes and makes strategic recommendations for next steps.

Design Advantages, Limitations and Challenges:

Advantages

- This technique as a follow-up to the first survey technique limits the number of narrative questions needed in the original survey, which keeps the survey burden lower.
- This technique provides important perspectives and new or more detailed insights on selected topic areas.
- When little is known about a phenomenon, a focus group is an effective method for gaining some detailed information that could potentially inform further data collection, or respond to current trends/concerns.
- Focus groups are ideal for encouraging discussion, especially when participants can benefit from hearing perspectives of others and build on that discussion (e.g., action research⁸).

Limitations and Challenges

- Sampling may require more of an investment than NHGRI is willing to make at this time.
- The virtual focus group method is less personal and is not as likely to encourage participation.
- Two hours is a large investment for a virtual meeting; consider offering intellectual incentives.

⁸ Rossman, G. B. & Rallis, S. F. (2003). Learning in the field: An introduction to qualitative research. Thousand Oaks: Sage.

Document Review of Related Archival Data

Overview:	To determine post-program engagement with NIH/NHGRI, conduct targeted searches of NIH/NHGRI databases.		
Data Source(s):	Data Source	Category	Qty.
	Databases: Outreach databases and Listservs	Archival	unknown
	Databases: IMPACII	Archival	N=297
Data Collection Method(s):	Document Review		
Sampling:	None		
Data Analysis Method(s):	Descriptive Statistics		
Frequency:	One-time		
Clearance Requirements:	None; however, any analysis and publication of this data will require Institutional Review Board (IRB) clearance		
Estimated Budget	Low		
Estimated Level of Effort	500 hours		
Estimated Timeline	2 months		

Indicator(s):

This technique has the capacity to inform the following indicator:

(04) Degree to which former program participants continue(d) to interact with NIH/NHGRI

Data Sources and Collection Strategies:

Data Sources

Outreach databases and Listservs. All NIH outreach databases and the central NIH Listserv database should be scanned for subscription by former short course participants based on name and e-mail address.

IMPACII. NIH maintains records in IMPACII of all applicants and awardees for NIH grants. IMPACII could be searched to determine the frequency of all 297 participants in applying for and receiving NIH awards.

Sampling

This technique involves reviewing existing data for all past program participants; therefore, sampling is not relevant.

Data Collection Instrument(s)

We recommend that NHGRI create an internal database to compile and analyze information.

Data Collection Process

Step 1. Confirm data availability and access. Contact NIH CIT about the ability to query the entire Listserv database for participants. Utilize the QVR system to access the appropriate information on each participant. Gather NHGRI specific communication database lists.

Step 2. Determine the desired data to collect. It is assumed that NHGRI is searching to match names or e-mail addresses of past participants against the other databases to determine the degree to which these individuals are participating in NIH activities. The data collected from each database will help to not only identify the number of individuals still connected to NIH in some way, it will also characterize the type and amount of involvement.

Step 3. Develop data structure. Create database to collect and analyze data.

Step 4. Collect data. Review the data sources and populate the data structure with database information.

Design Advantages, Limitations and Challenges:

Advantages

- Assuming access to the data, this technique can be completed quickly.

Limitations and Challenges

- Results are informational and should not be considered indicators of program success or failure; there are several ways to stay engaged with NIH and NHGRI beyond electronic means.
- Former participants may have changed their names, e-mail addresses or institutional location, making it difficult to match.
- Engagement with NIH or NHGRI may have continued without funding success.
- Former short course participants may be working on an NIH grant without being named on the grant itself (especially if in a postdoc position). Although recent records in IMPACII include such information as part of the digitized "All Personnel" report, older records may only contain scanned copies (images); therefore, the text contained within the report is not searchable because it is an image.

Request for Information on Key Issues

Overview:	Create a Request for Information to gather feedback about the program goals and related evaluation issues/questions.		
Data Source(s):	Data Source	Category	Qty.
	Scientific Community At-Large	New Data	unknown
Data Collection Method(s):	Request for Information		
Sampling:	None		
Data Analysis Method(s):	Descriptive Statistics; Qualitative Analysis		
Frequency:	One-time RFI		
Clearance Requirements:	None		
Estimated Budget	Low-Medium ⁹		
Estimated Level of Effort	500-1500 hours		
Estimated Timeline	4 months		

Indicator(s):

This technique has the capacity to inform the following indicator:

- (14) Perception of institutional limitations or barriers that interfere with achieving program outcomes

Data Sources and Collection Strategies:

Data Sources

Scientific Community At-Large. This technique uses a public comment period to solicit feedback from the scientific community at-large. It is possible to not only get feedback from past and future participants, it is also likely to get feedback from other stakeholders in the process such as Institutional leaders.

Sampling

This approach utilizes an announcement that is broadly announced through the *NIH Guide for Grants and Contracts* and the *Federal Register*. Therefore, it is open to anyone who wishes to respond; sampling does not apply to this technique.

Data Collection Instrument(s)

“Public comment” describes the process of soliciting feedback from the public or membership on official reports, regulations, guidelines or programs such as this short course. In today’s electronic world, public comments can be received via Facebook, blogs, agency web sites and other social media outlets. The management and analysis process systematically consolidates and synthesizes all public comments to provide organizations with information to drive the decision making process. NHGRI must carefully design their approach to public consultation so they ask the right questions and maximize their effort. The public comment can be utilized by NHGRI for the following:

⁹ Dependent upon the breadth of the RFI and the number of responses

- **Obtain New Ideas.** Public comment periods can be used to get new ideas from stakeholders. For example, NHGRI could get focus feedback on the topic areas that future participants are interested in learning about.
- **Business Process Feedback.** Public comment periods may focus on business processes. These RFIs often focus on implementation of changes and the implications it may have for individuals and organizations affected by a change in process. For example, NHGRI could ask about barriers that exist to implement curriculum changes at institutions and how that relates to the size and type of institution.

Data Collection Process

Public Comment Management and Analysis is a five step process to facilitate the solicitation, receipt and analysis of public comments.

- **Step 1. Planning and Release.** This phase includes drafting the notice for publication in the *NIH Guide for Grants and Contracts* and/or the Federal Register. It also includes:
 - Determining the collection instrument (web based form or e-mail responses)
 - Considering the Paperwork Reduction Act
 - Preparing the analysis plan
 - Developing the questions
- **Step 2. Response Collection.** This phase includes:
 - Publishing the request in the *NIH Guide* and/or Federal Register
 - Creating a database to analyze responses
 - Hosting the database/web site for response collection
- **Step 3. Data Organization.** This phase includes:
 - Creating and hosting the analysis database
 - Cleaning the data for consistency
 - Counting the responses
 - Creating dashboard reports
- **Step 4. Data Analysis.** This phase includes:
 - Developing a coding schema for analyzing the narrative responses
 - Parsing the qualitative responses into comments
 - Assessing inter-coder reliability
 - Determining the themes from the data
 - Creating initial reports from the responses
- **Step 5. Report Summaries.** This phase includes:
 - Reporting the quantitative and qualitative results
 - Developing summaries and recommendations
 - Generating and formatting graphs
 - Creating reports (text and/or slides)

Design Advantages, Limitations and Challenges:

Advantages

- This approach is cost effective and can provide useful information to inform future program design
- This approach can gather feedback from a wider audience including institutional leadership, and students.
- This approach focuses on developing program approaches that reflect current needs.

Limitations and Challenges

- This approach will not provide information to evaluate the success of the current short course program.
- Without addressing topics that the scientific public consider interesting or controversial, response rates can sometimes be skewed (limited perspective) or limited in number.

Conclusions and Recommendations

Feasibility

As described in the Center for Disease Control (CDC) Program Evaluation Framework,¹⁰ the feasibility of an evaluation should consider the following:

- Purpose of the Evaluation
- Use of the Evaluation Results
- Stage of Program Development
- Intensity or Scope of the Program
- Resource Considerations

Purpose of the Evaluation. As outlined in the evaluation design section of this proposal, NHGRI would like to focus on two main outcomes: 1) the degree of genetic and genomic curriculum integration at institutes represented by the faculty participants, and 2) the current career paths of former student participants, including their perceptions about the influence of the summer workshops on their career choices.

Use of the Evaluation Results and Stage of Program Development. Enough time has passed since program implementation to properly evaluate the program's impact on intermediate-term outcomes. This information will be used to evaluate what aspects of program design should be changed for future implementations.

Intensity or Scope of the Program and Resource Considerations. The overall investment in the program is significant if all the years of implementation are considered. Each year, NHGRI serves a small number of participants; however the overall program as described is an important investment by NHGRI leadership.

Recommendations

Technique Selection

If it is NHGRI's goal to evaluate the success of the Short Course program to-date, then we recommend NHGRI implement the first technique: [Electronic Survey of Short Course Participants](#). This approach will provide the most detailed information about the degree of curriculum integration at the institutions of participants, and about the supports or barriers they experienced at the institutional level. Only participants can provide *insider* information about their experiences with the program and the lasting effects it may be having on them professionally (e.g., knowledge gains, capacity for teaching genomics, professional activities).

NHGRI may not know if the [Focus Group with Selected Participants](#) is useful or necessary until they receive the feedback from the survey. NHGRI can consider using the focus group technique in different ways as described in the alternatives below.

¹⁰ <http://www.cdc.gov/eval/framework/index.htm>

If funds are limited, then NHGRI may want to consider investing in the final two techniques ([Document Review of Related Archival Data](#), [Request for Information on Key Issues](#)) which provide useful information, but may not fulfill the desire to evaluate program success.

Alternatives and Considerations.

Although we recommend any combination of the three techniques detailed in this report, we would like to point to alternative considerations.

Alternative: Conduct Focus Groups Before the Survey

Technique: Focus groups with Selected Participants

Data Collection Instrument(s): *Focus Group*

Details. Oftentimes focus groups are used as a means to identify relevant survey questions. Once themes are identified by focus group, surveys can help provide information about prevalence. NHGRI could chose to conduct the focus groups before the survey, which would provide NHGRI with the capacity to ask more informed and targeted survey questions and develop potentially more meaningful categorical response options for the survey.

Alternative: Focus Group with institutional Leaders

Technique: Focus groups with Selected Participants

Data Collection Instrument(s): *Focus Group*

Details. The focus groups could comprise of institutional leaders from the selected institutions, specifically those individuals who recommended the faculty to participate in the program. This audience could offer unique insights about the barriers that exist for faculty who are trying to update curriculum at their institution.

Alternative: Focus Group Without the Survey

Technique: Focus groups with Selected Participants

Data Collection Instrument(s): *Focus Group*

Details. Though the focus group technique presented in this document is targeted to occur after the survey, this technique could be considered as a separate technique entirely and be used as a lower cost method, with less clearances, to gather data from past participants. However, sampling the appropriate 9 participants may be more challenging without the data from the survey.

Future Program Development

NHGRI should consider building evaluation into program design, which may translate into building participant follow-up into the program design. As part of acceptance into the program, NHGRI should seek program participant approval to provide follow-up information. This approach could reduce the clearances required and increase the participation rates in long term follow-up studies.

Appendix B: Focus Group Questions

Perceptions of the Program

- How would you say attendance at the Short Course influenced the way you felt or feel about your capacity to teach genetics and genomics?
- Would you say it had a long-term effect?
- Describe aspects of the training program you felt were the most useful?
- Which aspects of the program were not useful for you?
- After you completed the Short Course, and when you got back to your institution, what was it like to try to integrate what you learned at the Short Course into your teaching materials? What kinds of personal challenges did you experience?

Institutional Involvement

- In what ways did your institution help you incorporate new knowledge and skills into your teaching materials?
- What kinds of institutional challenges have you experienced while disseminating and integrating knowledge from the Short Course into your teaching materials?
- What challenges do you believe are unique to your institution and which ones are systemic (e.g., typical across all higher education institutions)?

Diversity in the Genome Professional Pipeline

- One of the goals of the program is to diversify the pipeline of genome professionals. In what ways do you think the Short Course is contributing to this effort?

Recommendations for Program Improvement

- Consider other genomic-related professional development activities you've attended over the years (e.g., other trainings either online or in person), how does the Short Course compare to those? What is unique about it? What are its strengths and weaknesses?
- Suppose you were going to put together a Short Course to prepare the next generation of genomic professionals for genomic medicine, how would your course look different than the short course you attended? Consider the structure and the curriculum and how the program is funded.

Appendix C: Survey Questions

Participant Information

Historical Information

This first set of questions focuses on verifying or gathering information as it stood at the time of your attendance to the Short Course; we will ask for updated information next.

Select your role during your participation in the Short Course (**All Attendees**)

1. Faculty Attendee
2. Student Attendee
3. Nursing Faculty Attendee

[Skip logic: If Student Attendee] What degree program were you enrolled in when you attended the Short Course?

1. Bachelor of Science (BS)
2. Bachelor of Arts (BA)
3. Master of Science (MS)
4. Master of Arts (MA)
5. Master of Public Health (MPH)
6. Doctor of Philosophy (PhD)
7. Doctor of Medicine (MD)
8. Dual degree (MD & PhD)
9. Registered Nurse (RN)
10. Other, please specify: _____

[Skip logic: If Faculty or Nurse Faculty Attendee] What was your primary Position or Occupation Title at the time of your attendance to the Short Course?

1. Researcher
2. Adjunct Instructor/Professor
3. Assistant Professor
4. Associate Professor
5. Professor
6. Distinguished and/or Endowed Professor and/or Emeritus
7. Other, please specify: _____

[Skip logic: If Faculty or Nurse Faculty Attendee] Was this a tenure or non-tenure track position?

1. Tenure track
2. Non-Tenure track

Did you hold a teaching appointment at the time of your attendance to the Short Course? (**Faculty/Nursing Faculty Only**)

1. Yes

2. No

[Skip logic: If Yes] Out of 100 percent, what best represented your teaching/research ratio at the time?

- Teaching _____
- Research _____
- Other, please specify _____

Current Information

This section will capture change or updates to your professional or academic profile since your attendance to the Short Course.

Are you still with _____ (prepopulate with Institutional name)? (All Attendees)

1. Yes
2. No

[Skip logic: If No] Please list your current institution or organizational affiliation.

Has your Position or Occupation Title changed from INSERT PIPED ANSWER since the time of your attendance in the Short Course? (Faculty/Nursing Faculty Only)

1. Yes
2. No

[Skip logic: If Yes] What is your current primary Position or Occupation Title?

- Researcher
- Adjunct Instructor/Professor
- Assistant Professor
- Associate Professor
- Professor
- Distinguished and/or Endowed Professor and/or Emeritus
- Administrator
- Other, please specify _____

[Skip logic: If Yes] Please specify whether this is a tenure or non-tenure track position

- Tenure-track
- Non-Tenure-track

What is your current primary Position or Occupation Title? (Student Attendee Only)

1. Student
2. Trainee
3. Clinician

4. Educator (K-12)
5. Researcher
6. Administrator
7. Instructor or Professor
8. Other, please specify _____

- *[Skip Logic: If Student]* What type of degree program are you enrolled in?
 - MS
 - MPH
 - PhD
 - MD
 - MD/PhD
 - RN
 - Other, please specify _____
- *[Skip logic: If Trainee]* Please specify trainee type:
 - Predoctoral
 - Postdoctoral
 - Clinical
 - Other, please specify _____



- *[Skip Logic: If Instructor/Professor]* Please specify the type of instructor or professor position.
 - Researcher
 - Adjunct Instructor/Professor
 - Assistant Professor
 - Associate Professor
 - Professor
 - Distinguished and/or Endowed Professor and/or Emeritus
 - Administrator
 - Other, please specify _____
- *[Skip Logic: If Instructor/Professor]* Please specify whether this is a tenure or non-tenure track position.
 - Tenure-track
 - Non Tenure-track

Does your current position involve teaching genetics or genomics? (Student Attendee Only)

- Yes
- No

[Skip Logic: If Yes] Select the content areas you teach: (Select all that apply).

1. Biology of genetics and genomics
2. Biology of human genetics
3. Molecular/cellular genetics

4. Genetics and genomics of common diseases
5. Genetic and genomic technology
6. Pharmacogenetics and genomics
7. Ethical, legal and social implications of genetics/genomics
8. Resources for genetic/genomic education
9. Career resources (e.g., grant writing)
10. Other, please specify: _____

[Skip Logic: If Yes] Out of 100 percent, what best represents your current teaching/research ratio?
(Student Attendee Only)

- Teaching _____
- Research _____
- Other _____

Which of the following best describes your primary field of work? (All Attendees)

1. Academia
2. Government
3. Clinical
4. Clinical/Government
5. Industry
6. Non-profit
7. Other, please specify: _____

Please identify any additional credentials or degrees you have received or pursued since the Short Course. (Select all that apply). (All Attendees)

1. None received or pursued
2. BS/BA
3. MS/MA
4. MPH
5. PhD
6. MD/PhD
7. MD
8. RN
9. Other, please specify: _____

[Skip logic: If received or pursuing] Have you completed the credential or degree(s)?

- Yes
- No
- Other, please specify: _____

[Skip logic: If received or pursuing] What discipline(s) is your credential or degree associated with?

The Short Course Program

The next set of questions focuses on your professional activities since the Short Course.

Teaching Appointment

Out of 100 percent, what best represents your current teaching/research ratio? (Faculty/Nursing Faculty Only)

1. Teaching _____
2. Research _____
3. Other _____

[Skip logic: If Yes] To what degree did your experience at the Short Course influence your teaching to research ratio? (Faculty/Nursing Faculty Only)

1. No influence
2. Some influence
3. Moderate influence
4. Great influence

How many year(s) have you been engaged in teaching? (Faculty/Nursing Faculty Only)

Integration of Short Course Knowledge

Please select one of the three options below in response to the following statement: I was able to update my curriculum as a result of my participation in the Short Course. (Faculty/Nursing Faculty Only)

- Yes, I made some changes
- Yes, I made minor changes
- No, I did not make any changes

[Skip logic: If Yes or variant of Yes] I was able to update my genetics or genomics curriculum and teaching materials in the following ways: (Select all that apply)

1. Informal/unplanned integration (e.g., anecdotal narratives, spontaneous examples)
2. Added content to my lecture materials
3. Added assignments to my courses
4. Removed other content to make way for new information
5. Developed new teaching objectives for my existing courses
6. Created new lab experiments
7. Developed a new course
8. Shared teaching material with other faculty
9. Other, please specify: _____

[Skip logic: If Yes or variant of Yes] I was able to update my curriculum and teaching materials in the following content areas: (Select all that apply)

10. Biology of genetics and genomics
11. Biology of human genetics
12. Molecular/cellular genetics
13. Genetics and genomics of common diseases
14. Genetic and genomic technology
15. Pharmacogenetics and genomics
16. Ethical, legal and social implications of genetics/genomics
17. Resources for genetic/genomic education
18. Career resources (e.g., grant writing)
19. Other, please specify: _____

[Skip logic: If Yes or variant of Yes] How much time was required to update your curriculum and teaching materials

after participating in the Short Course?

1. Less than 3 months
2. Between 3 and 6 months
3. Between 6 months and 1 year
4. Between 1 and 2 years
5. Between 2 and 5 years
6. More than 5 years

Beyond curriculum integration, in what other ways did you disseminate information from the Short Course to students? If you did not disseminate information beyond curriculum integration, please write "None."

(Faculty/Nursing Faculty Only)

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Please rate how much you think the following **institutional factors** influenced your ability to transfer your knowledge to students following participation in the Short Course. Select "Not Applicable" if the factor was not relevant to your situation. (Faculty/Nursing Faculty Only)

	No Influence	Minor Influence	Moderate Influence	Great Influence	Not Applicable
Time and space to accommodate or integrate new information into existing curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relevant course(s) not available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process for changing curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support of colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support by supervisor or leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institutional awareness about the importance of genetic and genomic content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Curriculum committee support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incentive (financial or recognition/praise)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Institutional funding or resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to secure external funding or resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protected time to develop content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please rate how much you think the following **student-related factors** influenced your efforts to transfer your knowledge to students. (Faculty/Nursing Faculty Only)

	No Influence	Some influence	Moderate influence	Great influence	Not applicable
Student preparedness (e.g., students' prerequisite knowledge)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student perception around applicability of information to their career	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Student awareness about the importance of genetic and genomic content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students' interest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students' self-confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Did the Short Course influence your research? (All Attendees)

1. Yes
2. No

[Skip logic: If Yes] Please describe how your experience at the Short Course influenced your research.

To what degree did your experience at the Short Course influence your decision to engage in the following activities? Select "Not Applicable" if you did not engage in the activity listed. (All Attendees)

	No Influence	Some influence	Moderate influence	Great influence	Not applicable
Presentations at scientific meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attendance at scientific meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Involvement in professional organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Took additional classes on genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attended seminars/events on genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informal genetics/genomics chats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engaged a mentor in the genetics/genomics field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Became involved in a research group related to genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted research in genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attended professional meetings related to genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presented material at various events related to genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Published findings related to genetics/genomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what degree did your experience at the Short Course influence your decision to pursue new career or educational options? (All Attendees)

1. No influence
2. Some influence
3. Moderate influence
4. Great influence
5. Not applicable – I did not pursue new career or educational options

[Skip logic: If Yes or variant of Yes] Please describe how the Short Course influenced your decision to pursue new career or educational options.

Since the Short Course, have you been involved with Short Course attendees, NIH or NHGRI? (All Attendees)

- Yes
- No

[Skip logic: If Yes] Please indicate the ways you have been involved with Short Course attendees, NIH or NHGRI since attending the program. (Select all that apply)

1. Communications with fellow attendees
2. Additional contact with presenter(s)
3. Additional contact with NIH or NHGRI staff
4. Pursued other training or educational opportunities at NIH
5. Pursued other training opportunities at NHGRI
6. Used NHGRI online resources
7. Involved in writing NIH grant-application
8. Awarded NIH grant
9. Joined NIH Listserv(s) or other forms of communication
10. Other, please specify: _____

Background Information

This section is focused on demographic information.

What year were you born? (All Attendees)

- | | | |
|---------|----------|----------|
| 1. 1999 | 9. 1991 | 17. 1983 |
| 2. 1998 | 10. 1990 | 18. 1982 |
| 3. 1997 | 11. 1989 | 19. 1981 |
| 4. 1996 | 12. 1988 | 20. 1980 |
| 5. 1995 | 13. 1987 | 21. 1979 |
| 6. 1994 | 14. 1986 | 22. 1978 |
| 7. 1993 | 15. 1985 | 23. 1977 |
| 8. 1992 | 16. 1984 | 24. 1976 |

- | | | |
|----------|----------|-----------------------------|
| 25. 1975 | 58. 1942 | 91. 1909 |
| 26. 1974 | 59. 1941 | 92. 1908 |
| 27. 1973 | 60. 1940 | 93. 1907 |
| 28. 1972 | 61. 1939 | 94. 1906 |
| 29. 1971 | 62. 1938 | 95. 1905 |
| 30. 1970 | 63. 1937 | 96. 1904 |
| 31. 1969 | 64. 1936 | 97. 1903 |
| 32. 1968 | 65. 1935 | 98. 1902 |
| 33. 1967 | 66. 1934 | 99. 1901 |
| 34. 1966 | 67. 1933 | 100. Do not wish to provide |
| 35. 1965 | 68. 1932 | |
| 36. 1964 | 69. 1931 | |
| 37. 1963 | 70. 1930 | |
| 38. 1962 | 71. 1929 | |
| 39. 1961 | 72. 1928 | |
| 40. 1960 | 73. 1927 | |
| 41. 1959 | 74. 1926 | |
| 42. 1958 | 75. 1925 | |
| 43. 1957 | 76. 1924 | |
| 44. 1956 | 77. 1923 | |
| 45. 1955 | 78. 1922 | |
| 46. 1954 | 79. 1921 | |
| 47. 1953 | 80. 1920 | |
| 48. 1952 | 81. 1919 | |
| 49. 1951 | 82. 1918 | |
| 50. 1950 | 83. 1917 | |
| 51. 1949 | 84. 1916 | |
| 52. 1948 | 85. 1915 | |
| 53. 1947 | 86. 1914 | |
| 54. 1946 | 87. 1913 | |
| 55. 1945 | 88. 1912 | |
| 56. 1944 | 89. 1911 | |
| 57. 1943 | 90. 1910 | |

What is your sex? (All Attendees)

1. Male
2. Female
3. Do not wish to provide

What race do you consider yourself? (Select all that apply) (All Attendees)

1. White or Caucasian
2. Black or African American
3. Asian
4. American Indian/Alaska Native
5. Native Hawaiian or other Pacific Islander
6. Do not wish to answer

Do you consider yourself to be Hispanic/Latino? (All Attendees)

1. Yes
2. No
3. Do not wish to provide

Do/did you have a disadvantaged background, which can be defined either as coming from a family with an annual income below established low-income thresholds, or coming from an educational environment such as that found in certain rural or inner-city environments that have demonstrably and directly inhibited you from obtaining the knowledge, skills, and abilities necessary to develop and participate in a research career? (All Attendees)

1. Yes
2. No
3. Do not wish to answer

Please enter any other comments you would like to share with us about the Short Course and your experiences since attending the program. If you have no additional comments, please hit the next button. (All Attendees)

This is the end of the survey, thank you for your time, we appreciate your input.