Proposed By: Adam M. Hott

Proposed Moderator(s): Adam M. Hott and Rivka Glaser

Session Topic Area: 12. Genetic Counseling, ELSI, Education, and Health Services Research

Session Content: Education

Session Title: Achieving Genomics Literacy for All: Providing Meaningful Education for Multiple Audiences

Session Description:
Twitter: "@ASHG How do we communicate in the classroom, café and clinic the importance of genomics? We must to battle funding decline and spot #fakenews #genomicliteracy". The utility of genomic research from food production to infection diagnostics and the integration of genomics in medical practice is quickly becoming a standard conversation from the lunch table to Twittersphere to the general practitioner's office visit. It is now more important than ever to ensure genomics literacy across the spectrum of age ranges and career specialties. Achieving that for groups as diverse as K-12 students, the general public, or healthcare providers is nuanced and can be difficult to navigate. This session explores ongoing efforts to increase genomics literacy for K-12, undergraduate, general public and pre-healthcare/healthcare provider audiences from NHGRI's Genomics Literacy, Education, and Engagement (GLEE) to the development of the CSER Consortium's Guide to Interpreting Genomic Reports: A Genomics Toolkit for non-genetics healthcare practitioners.

Session Rationale:
The vast majority of researchers, healthcare providers and faculty that attend the ASHG annual meetings are aware of the need for better understanding of genomics by everyone; however, few have knowledge about ongoing efforts to achieve genomics literacy or the best practices that are emerging for doing so. This session will fill that gap and provide attendees with the most recent perspectives on building genomics literacy across a variety of age and professional ranges.

Learning Objectives
1. Describe national efforts to decrease the genomics conceptual knowledge gap in at least four categories.
2. Compare genomic literacy needs in K-12, undergraduate, general public and healthcare provider groups
3. Employ strategies for increasing genomics literacy for target audiences across the country
4. Connect local needs to increase the genomics knowledge base to efforts underway across the nation

Attendee Benefits:
Attendees will not only gain a better appreciation for genomic literacy efforts across the nation, but will increase their awareness of the need for high quality, national efforts in genomics education to fill the literacy gap at all levels.

Target Audience:
Attendees need no specific background knowledge or area of expertise to attend the session. The target audience is all researchers, healthcare providers, collegiate faculty, and those that interact with the public on a regular basis.

The competencies and attributes the session will address:
Interpersonal and communication skills
System-based Practice

Speaker 1: Elizabeth Tuck
Presentation Title: Genomic Literacy for K-16 Audiences: Efforts to Develop a National Campaign to Enhance Genomic Literacy
Presentation Content: The profound advances in genomics over the past decade are revealing exciting opportunities to use genomic information as part of routine medical care and other areas of everyday life, making the 'language of genomics' increasingly relevant to all of society. There is a strong consensus from various stakeholder groups that the 'genomic literacy' of the general public is profoundly lagging behind the pace of genomic advances, creating a concerning gap that threatens the implementation of genomic medicine and other genomic applications. In March 2017, NHGRI hosted a Strategic Visioning Meeting for a proposed national genomic literacy initiative, focused on three major groups: K-16 students, general public, and healthcare professionals. Prior to the meeting, various strategies were employed to assess each major group. For K-16 audiences, we reached out to various groups to investigate their current teaching practices, resources utilized and anticipated needs. Informed by what we learned, we are pursuing genomic literacy needs for the K-16 education community through four major strategies: (1) establishing a framework for basic genomic literacy at the K-16 level, (2) facilitating better evaluation and dissemination of existing genomics education materials, (3) developing new resources to fill significant gaps and help keep pace with scientific advances, and (4) supporting authentic genomics training for students. We have begun to conduct foundational activities to advance the first two strategies, which will be the focus of this presentation.
Presentation Time Interval: 30 min

Speaker 2: Sarah C.R. Elgin
Presentation Title: The Genomics Education Partnership: Expanding Opportunities for Undergraduate Research in Genomics
Presentation Content: The Genomics Education Partnership (GEP; http://gep.wustl.edu) is a consortium of faculty members from over 100 colleges and universities who are involving undergraduates in Course-based Undergraduate Research Experiences (CUREs) in genomics/bioinformatics. GEP students participate in gene annotation of novel species, reconciling information from several ab initio gene predictors, protein sequence alignments against an informant genome (conservation), and RNAseq data to construct gene models that are supported by all of the available evidence. The submitted gene models are reconciled for quality control, and then used in the analysis of a region or pathway of interest. Our recent paper on the expansion of the Drosophila ananassae F element (fourth chromosome) has 31 faculty and 239 undergraduate co-authors. Recent curriculum development includes lessons to introduce eukaryotic gene structure to beginning students using a genome browser for dynamic visualization, and hands-on explorations of Hidden Markov Models and Dynamic

Programming for more experienced students. Both faculty and students find participation in GEP research to be rewarding. “Massively parallel undergraduates” can work with investigators to accomplish science that otherwise could not be done, simply because of the amount of detailed analysis required. We urge you to consider the possibilities! Supported by NSF IUSE #1431407 to SCRE.
Presentation Time Interval: 30 min

Speaker 3: Kelly M. East
Presentation Title: Supporting the Practice of Genomic Medicine on the Front Lines
Presentation Content: Next generation sequencing makes it possible for more people than ever to have access to their personal genomic data through genetics and non-genetics clinics as well as consumer driven methods. Innovative service models and development of practical resources are needed to support the growing demand for genomic medicine. Genetics professionals have a role to play as educators and trainers for current and future healthcare providers. In addition, tools and resources need to be developed and disseminated to support the understanding and use of genetic and genomic information across medical specialties for both providers and their patients. Kelly East, lead genetic counselor at HudsonAlpha, will describe work by the Practitioner Education Working Group of the Clinical Sequencing Exploratory Research (CSER) Consortium. As co-chair of this group, Kelly led the development of the Genomic Report Toolkit, a just-in-time resource for non-geneticist providers to navigate results from genomic tests, now available through the ASHG website. She will discuss development of this resource as well as feedback received from pilot testing and dissemination. Additionally, Kelly will highlight best practices for implementing educational programs for healthcare providers and trainees, including the use of dynamic case scenarios and emphasis on practical skills to help increase engagement and perceived relevance among participants. Lastly, Kelly will discuss her team’s experience providing scalable genetic counseling and education to patients and consumers within the context of the Information is Power initiative, which has provided free and reduced cost genetic testing for hereditary cancer risk to over 2500 individuals.
Presentation Time Interval: 30 min

Speaker 4: Chris Gunter
Presentation Title: Doing Science is Not Enough: The Importance of Communicating Your Research in Any Way You Can
Presentation Content: You might work with genomics every day, but what do your neighbors or your relatives need to know about the field? More importantly, how do we get them to care about the concepts of genetics that they need to make decisions on both trivial and important matters? Building a genomic-literate public depends on first making genomic information relevant to their everyday lives, and then conveying the information. This talk will recap some of the most successful public engagement efforts in genomics, along with teachable moments from others. We will explore the potential for multiple media to capture the imagination and illustrate complicated concepts in understandable ways. These resources may be created on the local to international level, but are usable by anyone.
Presentation Time Interval: 30 min