Integrating Omics Content in PhD Programs

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Process to arrive at recommendations

- Council for the Advancement of Nursing Science convened the Idea Festival for Nursing Science Education and appointed the Idea Festival Advisory Committee (IFAC)
- The IFAC was charged with inspiring dialogue about emerging areas of science & education of the next generation of nursing scientists

Process to arrive at recommendations

- Omics was identified as a priority area of science important to PhD graduates to conduct competitive research

Table 2 – Emerging and Priority Areas of Nursing Science: Strengths, Weaknesses, Opportunities, and Threats for PhD Programs

Area	Characteristic	Highlights
Omics/ microbiome	Strengths	• Applicability to a wide range of areas in nursing science, with unique ability to "translate" findings from basic research to human health problems • Increasing awareness of the necessity of incorporating omics into nursing science leveraged by NINR support
	Weaknesses	• Faculty and PhD students lack prerequisite knowledge in biology, chemistry, and omics needed to compete successfully in omics sciences • Laboratory capacity and statistical analysis for genomics data are limited in schools of nursing
	Opportunities	• Reformulation of nursing science to fully incorporate biological approaches • Potential to advance nursing's visibility and contributions to health sciences at large
	Threats	• Rapid advancement of omics fields creates challenges in maintenance of scientific expertise • Without action now, other disciplines will incorporate symptom science, end of life, and self-management/health behaviors into their programs of research; nursing will lose the edge developed in this areas

Process to arrive at recommendations

- Work groups focusing on the areas identified by IFAC were formed – including one for omics
- Recommendations from the omics work group were developed through open ended survey data collection and group discussions

The omics work group has two main recommendations:

1) omics content should be incorporated into the core curricula of PhD programs in nursing
2) strategies need to be developed that enable students requiring immersion in omics to execute their research goals

Incorporating omics content into the curricula of PhD programs in nursing

Example Facilitators:

- Omics research can lead to knowledge discovery that will impact nursing practice
- Genomic nursing research is supported by the NINR and is consistent with their strategic plan
- Nurses are uniquely positioned to conduct biobehavioral research
- Pool of applicants to PhD in nursing programs are increasingly more omics savvy
- Could facilitate and promote interdisciplinary partnerships
- Adding omics to the toolbox used by nursing scientists increases their potential to contribute to science and increases exposure for their research findings
- Technology - omics content could be taught using web-based or distance education

Incorporating omics content into the curricula of PhD programs in nursing

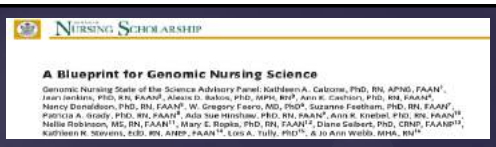
Example Obstructions:

- Many schools that offer PhD programs in nursing may not have the faculty expertise to educate or mentor students in omics content
- Resources and environment may not be optimal at all schools to support omics-based research

Developing strategies that enable students requiring immersion in omics to execute their research goals

Some PhD students will want more immersion into omics to accomplish their dissertation projects and prepare them for their chosen research trajectory…Some ideas…

- Multi-institutional approach to education and training
  - Students may chose a school for its strength in a particular content area important to their training that isn't also strong in omics – could those students complete of their education and training at a school that is strong in omics?
- Graduate Partner Program
  - In addition to their chosen school of nursing, students could obtain their omics training and education intramurally at the NIH



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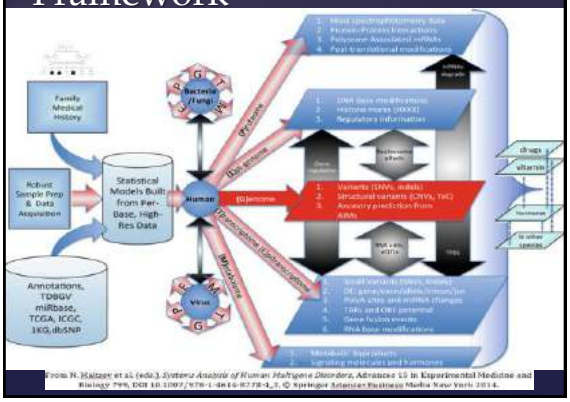
- The NINR and the NHGRI are supporting the activities of a group of researchers and educators to move genomic nursing science forward and realize this blueprint
- One important part of their work is focused on nursing education in omics
- Dr. Sandra Daack-Hirsch co-chairs the consortium on education and will give us some information about their work so far

Framework



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Integrating omics into Nursing Research

SUGGESTED KNOWLEDGE NEEDED TO INTEGRATED OMICS INTO NURSING RESEARCH

KNOWLEDGE LEVEL	Basic *Remembering & understanding/ Recall and reproduction*	Intermediate *Applying/Skills and concepts*	Proficient *Analyzing/ Strategic thinking*	Applied *Evaluating and Creating/ Extended thinking*
FROM BLOOMS TAXONOMY http://www.cmu.edu/teaching/designteach/design/bloomstaxonomy.html AND WEBB'S DEPTH OF KNOWLEDGE	At this level the individual has mastery of basic concepts and is able to outline the primary points and/or perform simple procedures if appropriate.	At this level the individual is well versed in the topic and able to explain the 'how' and/or 'why' and apply that information in to a different case scenario or context. At this level they are able to perform routine bench procedures or commonly used statistical analyses (ie regression, multifactorial analysis etc.	At this level the individual is highly conversant with the topic and able to develop, implement and execute a research protocol involving an omics approach	At this level the individual is completely immersed in the content area and is able to apply complex reasoning, development and application to research projects utilizing one or more omics approaches.
ROLE ON THE PROJECT	Member of the research team	Co-investigator or multi Principle Investigator – clinical lead on grants where the omics approach is conducted in another collaborators lab	Principle Investigator with co-investigators with strength in bench science – at this level the individual is conversant with the bench procedures	Principle Investigator – runs own lab and conducts all necessary bench processes and procedures

Discussion