NIBLSE: Network for Integrating Bioinformatics into Life Sciences Education

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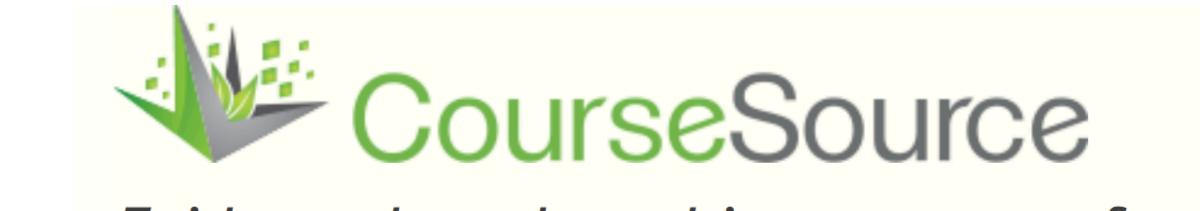
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Abstract

Bioinformatics is becoming increasingly important in all facets of biological research. Yet many undergraduate students in life sciences lack training in this crucial discipline, hampering both their future career options as well as overall research productivity. We recently initiated discussions to address this situation, culminating in the inaugural meeting of the Network for Integrating Bioinformatics into Life Sciences Education (NIBLSE), with 25 representatives from life science and computer science faculty, industry, education journals, and funding agencies in April 2014. The goals of our new network include identification of best practices for (1) preparation of students for bioinformatics instruction; (2) integration of bioinformatics into life science curriculum at all levels; (3) assessment of outcomes; and (4) preparation of faculty trained in life sciences to deliver curriculum in bioinformatics. We continue to grow the network and invite those interested to join with us. See http://niblse.unomaha.edu for more information.

The Learning Framework

CourseSource
Evidence-based teaching resources for undergraduate biology education

Several members of NIBLSE (Elgin, Pauley, Rosenwald, and Welch) developed a bioinformatics framework within the *CourseSource* model http://coursesource.org/courses/bioinformatics.

Framework topics include:
- Computation in the life sciences
- DNA – Information storage
- RNA – Information transfer
- Protein – Information in action
- Small molecules – Cellular homeostasis
- Ecology and evolution
- Computational skills

Goals and Objectives

The long-term goal of NIBLSE is to <u>establish bioinformatics as an essential component of undergraduate life science education</u> (1). We aim to create a network of experts in STEM education, bioinformatics, and industry to articulate a shared vision for achieving this goal. We are now developing working groups in 3 key areas:

1. Core Competencies in Bioinformatics
Charge: To draft a set of bioinformatics competencies for life science students beginning with the *CourseSource* Framework

- Mark Pauley – Univ of Nebraska-Omaha
- Charles Hauser – St. Edwards University
- Srebrenka Robic – Agnes Scott College
- Anne Rosenwald – Georgetown University
- Melissa Sayres – Arizona State University
- Todd Smith – Digital World Biology
- Eric Triplett – University of Florida
- Lonnie Welch – Ohio University
- Jason Williams – Cold Spring Harbor Labs

2. Validation of Assessment Tools
Charge: To identify existing assessment tools that align with core competencies, then to create new tools as needed

- Mark Pauley – University of Nebraska-Omaha
- Liz Dinsdale – San Diego State
- Jennifer Drew – University of Florida
- Sebastian Galindo – University of Florida
- Neal Grandgenett – University of Nebraska-Omaha
- Rafael Tosado-Acevedo – InterAmerican Univ of Puerto Rico
- William Tapprich – University of Nebraska-Omaha

3. Resources Review
Charge: To solicit and review curricuular materials and professional development resources

- Mark Pauley – University of Nebraska-Omaha
- Sam Donovan – University of Pittsburgh
- Neal Grandgenett – University of Nebraska-Omaha
- William Morgan – College of Wooster
- Michael Sierk – St. Vincent College
- Arlin Toro - InterAmerican Univ of Puerto Rico
- Robin Wright – University of Minnesota

Moving Forward

We plan to
- Establish NIBLSE as a permanent network to facilitate accomplishment of the long-term goal
- Use the collective experiences of the network members to develop and vet bioinformatics and assessment materials
- Organize the dissemination of curricular and assessment materials via *CourseSource* http://coursesource.org and *Quantitative Undergraduate Biology Education and Synthesis (QUBES)* http://qubeshub.org
- Upcoming Events
  - Meeting of the Core Competencies Working Group – May 2016
  - Meeting of all three working groups – August 2016

Join Us!

If you're interested in joining the network, contact Mark Pauley mpauley@unomaha.edu

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We thank the members of NIBLSE for their ongoing contributions to the network

(1) Dinsdale *et al.* (2015) NIBLSE: A Network for Integrating Bioinformatics into Life Sciences Education *CBE-Life Sciences Education* 14, 1-4
(2) Rosenwald *et al.* The CourseSource Bioinformatics Learning Framework *CBE-Life Sciences Education* (in press)