Bioinformationist

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Bioinformatics:

“...science in which biology, information and computer science, coupled with information technology, combine to provide new biological and biomedical insights.”

Source: press release, January 12, 2012
Why a Bioinformationist?

Need: University of Michigan biomedical researchers have expanding and evolving research and informatics needs.

My Role: Collaborate and provide new and existing services and partnerships.

Focus: Collaborate primarily in bioinformatics and computational medicine, but also primary contact for all medical school basic science departments.
Outline

• Background
• Instruction and Instructional Resources
• Additional Services
• Questions
Timeline

U-M School of Information

Jean Song pilot Bioinformationist with NCIBI

Internships with THL and NCIBI

U-M Bioinformationist

National Cancer Institute-Frederick; Collaboration with NCIBI
2010

• National Center for Integrative Biomedical Informatics (NCIBI)
  – NIH-funded Center
  – Developed tools for molecular biomedical research
  – Funded 50% Bioinformationist position
January 2012

- Department of Computational Medicine & Bioinformatics (DCM&B)
  - Medical School Department

- Bioinformatics Core
  - Medical School Biomedical Research Core Facility

- Both fund 25% of Bioinformationist position
I work with bioinformatics tools that analyze data ranging from genes and proteins to small molecules.

INSTRUCTION AND INSTRUCTIONAL RESOURCES
Tools

• Cytoscape
  – Free network visualization software
  – http://www.cytoscape.org/

• MetScape
  – Cytoscape app
  – Metabolomics and gene expression data
  – http://metscape.ncibi.org/

• ConceptGen
  – Enrichment testing and concept mapping tool
  – http://conceptgen.ncibi.org
Tools

- **LRpath**
  - Gene set enrichment testing tool using logistic regression
  - [http://lrpath.ncibi.org/](http://lrpath.ncibi.org/)

- **MetDisease**
  - Cytoscape app
  - Annotates metabolic networks with MeSH disease terms and links to references
  - [http://apps.cytoscape.org/apps/metdisease](http://apps.cytoscape.org/apps/metdisease)

- **tranSMART**
  - Knowledge management platform for sharing translational research data
  - [http://www.transsmartfoundation.org/](http://www.transsmartfoundation.org/)
Open Training Sessions

• Mix of faculty, students, and staff
• Promotion: U-M hospital daily newsletter, DCM&B Facebook page, BRCF newsletter
• Example: Cytoscape network visualization software
  – Plugins/apps
  – Importing data; creating publishable image
  – Humanities and social sciences
Curriculum-Based Instruction

• Cytoscape and NCBI tools in Bioinformatics foundations class (about to do for 4th year)

• tranSMART in Bioinformatics foundations class (upcoming)

• ConceptGen in Public Health Epidemiology class
Workshops

• Bioinformatics Workshop, January 2012
  – MetScape

• International Society of Nephrologists Symposium, June 2012
  – Cytoscape and NCIBI tools

• MLA CE Course “Network Visualization Tools”, May 2013
  – Cytoscape and other network visualization tools
• MetScape
  – Update user manual as new versions are released
• MetDisease
  – Recently completed
Video Tutorials and Webinars

• **MetScape**
  • 22+ minutes, 6 chapters
  • [http://treehouse.ccmb.med.umich.edu/mst.html](http://treehouse.ccmb.med.umich.edu/mst.html)

• **LRpath**
  • 14+ minutes, 6 chapters
  • [http://treehouse.ccmb.med.umich.edu/LRPath.html](http://treehouse.ccmb.med.umich.edu/LRPath.html)

• **Cytoscape Webinars**
  • Attendees from US and Europe
Seminar Program Coordination

- Weekly DCM&B NCIBI Tools and Technology Seminar
- Attended by faculty, students, and staff
- Venue to discuss biomedical informatics tools, technologies, and/or methodologies that are recently developed, in development, or being used by researchers.
- Find/contact/schedule speakers/promote
- Attend seminars
- Occasional presenter
Journal Clubs

• Attend Bioinformatics/Proteomics Journal Club AND Virology Journal Club

• Bioinformatics: Periodically presented on Library Resources and PubMed/WoS

• Virology: Presented on Library and Virology Resources
ADDITIONAL SERVICES
Resource Management

• Genomatix - bioinformatics software package
• Manage online accounts
  – Limited number of accounts
  – Handle requests from new users
  – Determine inactive users
  – Create protocols
Website Content Management

- Launch of Department
- Design improvements (ex. seminar filters)
- Core’s Bioinformatics tools page
Grant Support

• Big Data 2 Knowledge (BD2K) - NIH Center Grant Proposal
• Written into grant
• Attended meetings to discuss grant proposal
• Drafted portions of training section
• Collected and formatted references
• Worked on biosketches, resources pages, budget justification
Administrative

• Bioinformatics Core
  – Outreach
    • Schedule staffing
    • Primary person staffing tables
  – Training
    • Facilitate training sessions offered by Bioinformatics Core analysts
      – Reserve room, promote, handle registration, handle evaluation form
Bringing it All Together: tranSMART

- Knowledge management platform
  - Data analysis and data sharing
- Public/private partnership

My role:
- Foundation website (part of team for design and content)
- Updated user manuals for release of v1.1
- Reorganized wiki
- Training
Mentor Students

• Work on projects related to bioinformatics, with faculty and staff from DCM&B

• Ex. Programming projects, assessment of NCIBI tools for integrating into tranSMART, video tutorial of ConceptGen, instruction materials for tranSMART
University Library

- Member of several library committees
- Attend library events and seminars
- Research Guides
- Meetings
- University Library initiatives
Questions?