Library-based Support Translational Medicine

Bioinformatics Instruction & Consultation, Collaboration, Evaluation

AAAS/Science Translational Medicine Reception and Panel Discussion
Medical Library Association Annual Meeting
16 May, 2011

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Becker Medical Library
Washington University School of Medicine
St. Louis, MO
Clinical and translational science is a bit like the London Underground

Intersections of people and roles across the research continuum from clinical, research, community, administrative and support perspectives

http://www.tfl.gov.uk/
Outline

• Bioinformatics (Bioinformatics@Becker)
  – Education
  – Consultation
  – Software

• Institutional Support
  – Collaboration, discovery
    • VIVO
  – Tracking & Evaluation
    • Social network analysis
    • Assessing the Impact of Research
    • Strategies to Enhance Research Impact
Bioinformatics@Becker

- Education
- Consultations
- Software

Staff = 2
  Lili Wang, MD, MS; Kristi Holmes, PhD

Users
  Graduate and medical students, fellows, post docs, research staff, faculty, administration, and anyone else who needs help!

Support
  Bioinformatics advisory group
  Other key partners on campus

CTSA
  Provide bioinformatics education
**Workshops & Courses**
- Variety of topics, formats, levels, audiences
- Credit, NC courses

**Sponsored Training Opportunities**
- ½ day – multi-day training sessions
- Presented by vendors, organizations, scientists
- NCBI, Partek, GeneGo, Jackson Lab, R/Bioconductor, OpenHelix, JMP Genomics

**Lunchtime Lecture Series**
- 12 topics, hour-long sessions
- Databases, Software
- Follow-up with an open Q&A session

**“Road Show”**
- Bioinformatics 101 – tools and tricks
- Clinical Genomics
- NCBI resources
- Taught in the departments

**Basics of Bioinformatics**
- 2-8 hours long (tailored to the group)
- Groups like the Dept. of Biostatistics and Molecular Pathology residents
- Taught off-site at other universities

**Special Projects**
- Introduction to Genomic Medicine
- Future plans to reach out to clinicians and community

**Enhanced online resources**
- PowerPoint presentations
- Step-by-step tutorials
- Sample problems/examples
- Video tutorials

Education & Training
Introduction to Genomic Medicine

INTRODUCTION TO GENOMIC MEDICINE

Genomics play a role in 21st century research and clinical practice and Washington University School of Medicine is at the forefront of this evolving field. To continue to meet this challenge, a new cadre of investigators will need comprehensive training in topics related to genomic medicine.

A new seminar series is scheduled for this spring which offers a practical background in molecular biology, an introduction to genomic research and applications of genomic technologies in the research environment, and an understanding of the clinical application of gained knowledge. The content will be delivered by Washington University faculty and there will be ample opportunity for questions and discussion. Make sure to arrive early and get a good seat!

Tentative Schedule:

INTRODUCTION
January 31 Implications of Genomics in Clinical Medicine
February 7 Molecular Biology/Genetics Refresher - 1
February 14 Molecular Biology/Genetics Refresher - 2
February 21 The Genetic Basis of Disease
February 28 Introduction to Biostatistics & Introduction to Statistical Genomics
March 7 Tissue banking & Consent

GENOMIC TECHNIQUES & ANALYSIS
March 14 Whole Genome Sequencing and Analysis & Emerging Sequencing Technologies
March 21 Copy Number Variation
March 28 Genotyping Technology and Gene Expression Analysis
April 4 Common/Rare Variance
April 11 Genomes and Genome Browsers
April 18 Proteomics and Mass Spectrometry & Metabolomics
April 25 Epigenetics

CLINICAL APPLICATION
May 2 Clinical Trials - design, resources
May 9 Biomedical Informatics
May 16 Pharmacogenomics
May 23 Susceptibility Genetics
June 6 Cancer Genomics
June 13 Genomics of Microbes and Microbiomes
June 20 Panel discussion on 21st century medicine: Where do we go from here?

WHERE:
Wonk Auditorium

WHEN:
Monday afternoons, 4:45-6:00p.m.
January 31 - June 20, 2011

WHO CAN ATTEND?
This lecture series is designed for clinicians and other interested persons, including basic science researchers, fellows, post doctoral scholars, and anyone else who wishes to learn more about these topics.

HOW CAN I LEARN MORE?
Email holmeskr@wustl.edu or visit www.becker.wustl.edu/GenomicMedicine to sign up for the mailing list.

Sponsored by the Washington University Institute of Clinical and Translational Sciences.

http://becker.wustl.edu/GenomicMedicine

Collaborators Drs. Govindan, Druley, and Dutcher
Bioinformatics@Becker

- **Education**
- **Consultation Services**
  - Answer questions, give advice on potential strategies, make referrals, serve as matchmaker...
  - Everything from simple requests to horrifying puzzles!
  - Requests via email, phone, web forms, and drop-ins
- **Software**
Bioinformatics@Becker

- **Software**
  - **Research Pod**
    - 2 Macs, 2 PCs loaded with many different types of software
    - Offers labs a place to try software or have access to packages that they might not be able to afford.
  - **Databases & Research Software**
    - DiscoveryGate/CSD
    - Mathematica
    - Partek Genomic Suite
    - GraphPad Prism
  - **Statistical Programs**
    - SAS
    - SPSS
    - Stata
    - Maple-Waterloo
  - **Presentation and Multimedia Tools**
    - Adobe Creative Suite
    - MSOffice & Visio

- **Site licenses**
  - We negotiate site-wide agreements for the institution based on what people need
  - Pass these savings onto the labs (usually results in savings of 50-75% or more for a lab)
  - Partek Genomic Suite, GeneGo MetaCore, Lasergene, Spotfire, JMP Genomics, and more
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    • Social network analysis
    • Assessing the Impact of Research
    • Strategies to Enhance Research Impact
    • Support of other initiatives
Collaboration

The effect of team research on phases of innovation

Disis M L, Slattery J T Sci Transl Med 2010;2:22cm9-22cm9
Open-source semantic web application that enables the discovery of research and scholarship across disciplines

- Populated with detailed profiles of faculty and researchers; displays items such as publications, grants, teaching, service, and professional affiliations
- VIVO offers a powerful search functionality for locating specific information across institutions and elegant visualizations of the enterprise at all levels.

http://vivoweb.org
Why A Library-based support model?

Libraries:
• Are a trusted, neutral space
• Have a tradition of service and support
• Strive to serve all missions of the institution
• Are technology centers and have IT and data expertise

Library Staff:
• Have skills—information organization, instruction, usability, subject expertise, ontologies and controlled vocabularies
• Have close relationships with their clients (buy in)
• Understand user needs
• Understand the importance of collaboration and know how to bring people together
• Have knowledge of institution, research, education, clinical landscape
Evaluation

• Social network analysis
• Assessing the Impact of Research
• Strategies to Enhance Research Impact

Member of the Tracking and Evaluation team at Washington University Institute of Clinical and Translational Sciences

Libraries are particularly well-poised to participate in evaluation activities
SNA: ICTS Program Directors and Co-Directors

Databases Searched
- Web of Science
  - Science Citation Index Expanded
  - Social Sciences Citation Index
  - Arts & Humanities Citation Index

Criteria
- Affiliation = Washington University
- Document Type = manuscripts, meeting abstracts, proceeding papers, editorial materials, letters, reviews
- Timespan = 2006-2010

Formatted list for Network Workbench

Caveats
- List has not been fully vetted
- Modeling, layout and graphing choices are many
  - Used co-authorship network model
  - Displayed only authors with 2+ works

Other opportunities for network analysis
- Training grants
- Highlight interdisciplinary research centers
- WU-ICTS

Visualizations on the individual, local, and global level

A model for assessing research impact

Traditional citation analysis is insufficient to assess the impact of research discoveries

Becker Model for Assessment of Research Impact

Included are:

- guidelines for quantifying and documenting research impact
- resources for locating evidence of research impact.
- strategies that investigators can utilize in order to enhance the diffusion of research output

- Impact can be evaluated for individual papers, individual investigators or departments, and even institutes and entire institutions.
- Assessing the impact of CTSA-funded research at WUSM
- Currently under revision to reflect new trends and metrics – feedback is welcome!

Acknowledgements

- Colleagues at Becker Library
- VIVO colleagues from across the country
- Library-based informationists at a number of institutions
- Tracking & Evaluation Group at WU-ICTS

Image credit: http://www.flickr.com/photos/julianaorihuela/384300758/

Thank you!