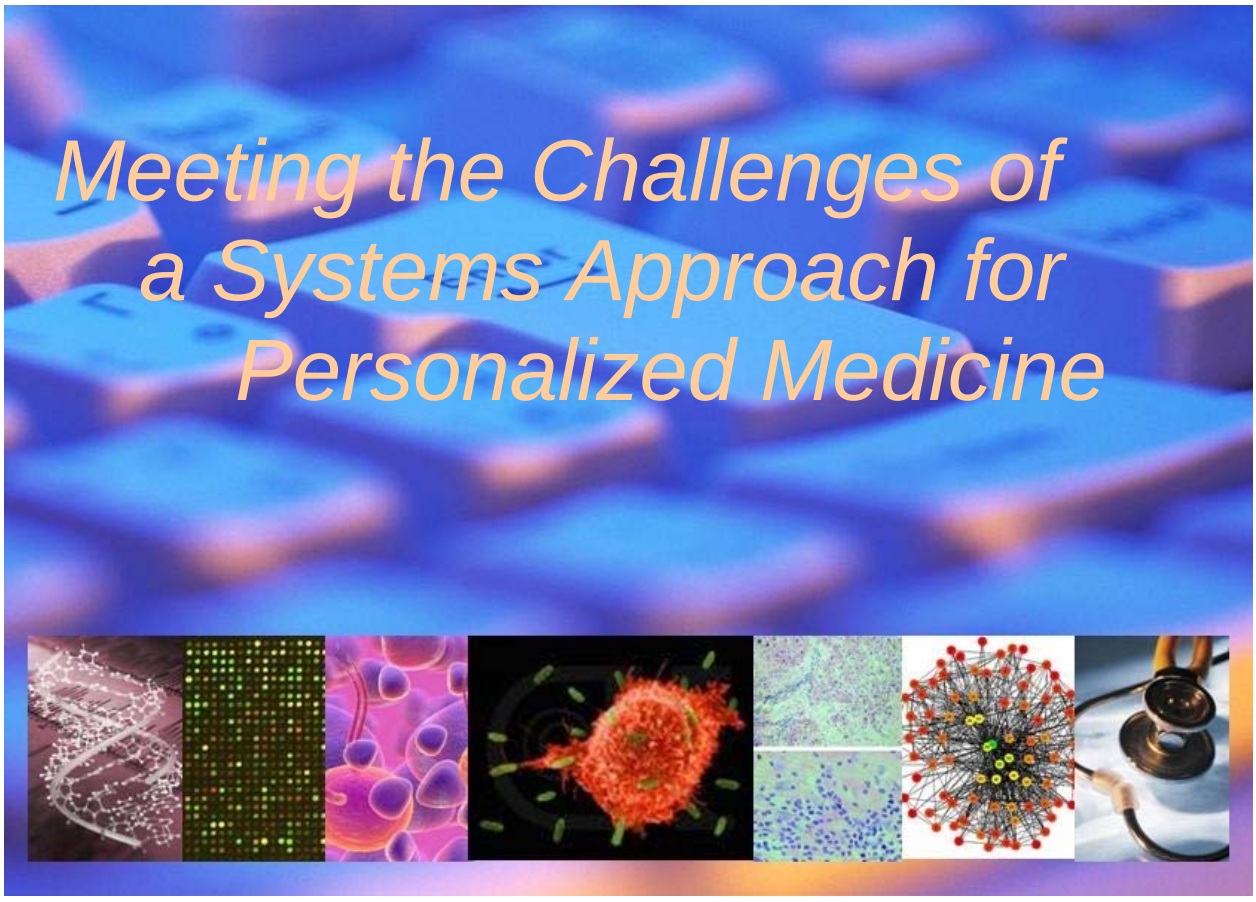
DAIT Bioinformatics Summit 2008

Oct. 20/21, 2008

Hilton Washington DC/Rockville
Executive Meeting Center



DAIT Bioinformatics Summit 2008

Oct. 20-21, 2008

Place: **Hilton Washington DC/Rockville**
Executive Meeting Center
1750 Rockville Pike, Rockville, Maryland 20852
Voice: 301-468-1100
Fax: 301-468-0163
http://www.rockvillehotel.com/location_directions/location_and_directions.cfm

Background:

In the genomic era, both basic and clinical research relies heavily on database-supported computational-assisted bioinformatics. Integrating our knowledge about disease phenotypes and finding preventive and treatment interventions post great challenges for bioinformatics. During the 2006 Bioinformatics Summit meeting, we reviewed many bioinformatics programs funded by the National Institute of Allergy and Infectious Diseases (NIAID), Division of Allergy, Immunology and Transplantation (DAIT). We identified several areas of potential collaborations, synergy and reusable resources within the different DAIT funded bioinformatics and data management programs. In the 2007 Summit, we focused our discussion on the bioinformatics challenges on data reusability and secondary data analysis.

The main goals of the summit in 2008 are to:

- Identify challenges to knowledge integration
- Identify challenges to integrating variety of data types in gene regulatory networks, pathways, genetic variations, quantitative phenotypes, mathematical modeling
- Review data integration challenges in systems approaches to personalized medicine
- Review alternative data management architectures to integrate our knowledge of both basic and clinical research.

Registration: www.blsmeetings.net/3198

Contact:

Ashley Xia, M.D., Ph.D.
Program Officer
Office of Biomedical Informatics
Division of Allergy, Immunology and Transplantation
National Institute of Allergy and Infectious Diseases, NIH, DHHS
E Mail: axia@niaid.nih.gov

Agenda

Day 1, Oct. 20

8:00 am Continental Breakfast

8:15 -8:30 am **Cheryl Kraft M.S**., Office of Biomedical Informatics, DAIT, NIAID
Summit 2008 Overview

8:30 -9: 30 am **Keynote: Joseph Loscalzo M.D., Ph.D.**, Harvard Medical School, Dept. of Medicine, Brigham and Women's Hospital
Systems Pathobiology and Human Disease: An Approach to Personalized Medicine.

9:30-12:30

Session I Challenges in Data Analysis and Integration for Systems Approaches to Medicine

Aims: Discuss bioinformatics platforms to support:

- integration of different types of data: genomic, epigenetic, gene expression, proteomics and physiological and disease phenotypes
- analysis methodologies for systems approaches
- inference about pathways, networks, systems behaviors and disease outcomes at difference scales from cell to tissue, to organ and whole body
- challenges of personalized medicine

Chair: Dr. Joseph Loscalzo

9:30 – 10:00 am **Stephen Ramsey Ph.D.**, Institute for Systems Biology
An Integrative Approach to Studying Transcriptional Regulation in Innate Immune Cell Activation

10:00 – 10:30 am **John A Stamatoyannopoulos M.D., Ph.D.**, Dept. of Genome Sciences, University of Washington
Integrative Epigenomics

10:30 – 10:45 am Break

10:45 – 11: 15 am **Nathalie Pochet Ph.D.**, Bioinformatics and Evolutionary Genomics Group, VIB Department of Plant Systems Biology, Ghent University, Belgium
Distinct Physiological States of *Plasmodium falciparum* ***in Malaria-Infected Patients***

11:15 – 11:45 am **Bernd Genser Ph.D.**, Department of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, London, UK
A Statistical Framework For Data Analysis of Complex Immuno-epidemiological Studies - Applications to Studies Investigating Risk Factors of Atopic Diseases or Asthma

11:45 – 12:30 pm Discussion

12:30 – 1:30 pm Lunch on your own

1:30 – 5:15 pm

Session II Data Integration Challenges in Translational Research

Aims: Discuss bioinformatics challenges in supporting:

- multiscale data integration from genotype to disease phenotype and disease treatment
- translational research in immunology related diseases
- tools and analysis to facilitate translational research with the systems approach
- integration of quantitative clinical phenotypes

Chair: Dr. Atul Butte:

1:30 – 2:00 pm **Atul Butte M.D., Ph.D.**, Stanford School of Medicine
Exploring Genomic Medicine Using Translational Bioinformatics

2:00 – 2:30 pm **Effie Petersdorf M.D.**, Fred Hutchinson Cancer Research Center
HLA and KIR Genes in Transplantation and Autoimmune Diseases

2:30 – 3:00 pm **Richard Scheuermann Ph.D.**, U. T. Southwestern Medical Center
HLA Sequence Features and Their Associations with Autoimmune Disease

3:00 – 3:15 pm Break

3:15 – 3:45 pm **Damien Chaussabel Ph.D**, Baylor NIAID Cooperative Center for Translational Research on Human Immunology and Biodefense
Translational Bioinformatics: Challenges and Solutions for Data Integration and Biomarker Discovery

3:45 – 4:15 pm **Deendayal Dinakarpandian Ph.D.** School of Computing and Engineering, Universtiy of Missouri-Kansas City, Missouri,
Chitra Dinakar M.D., *Children's Mercy Hospital, Kansas City, Missouri*
The Role of Informatics in Connecting Bench to Bedside in Allergy, Asthma & Immunology

4:15 – 4:45 pm **Ary L. Goldberger M.D.**, Harvard Medical School
The PhysioNet Project (www.physionet.org) and Complex Systems

4:45 – 5:15 pm Discussion

Day 2 (Oct. 21)

8:00 am Continental Breakfast

8:30 – 11:45 am

Session III Knowledge Integration and Ontologies

Aims: Review and discuss:

- advances in immunology-related ontologies
- semantic web technology in ontology-based knowledge integration

Chair: Dr. Mark A. Musen

8:30 – 9:00 am	**Mark A. Musen M.D., Ph.D.**, Stanford Medical School ***BioPortal: Community-based Support for Dissemination, Evolution, and Application of Biomedical Ontologies***
9:00 – 9:30 am	**Alan Ruttenberg**, Science Commons ***Advancing Translational Research with the Semantic Web***
9:30 – 10:00 am	**Alexander Diehl, Ph.D.**, Gene Ontology / The Jackson Laboratory ***Improvements in the Representation of Immune Cells in the Cell Ontology***
10:00 – 10:15 am	Break
10:15- 10:45 am	**Lindsay Grey Cowell, Ph.D.,** Duke University ***Biomedical Ontology as a Foundation for Data Integration and Computable Representations of Infectious Disease Pathogenesis***
10:45 – 11:15 am	**Isabelle Bichindaritz, Ph.D.** University of Washington ***Case-based Knowledge Representation within the Knowledge Spectrum and the Statistical Challenge in Biomedicine***
11:15 – 11:45 am	Discussion
11:45 am – 1: 00 pm	Lunch on your own

1:00 – 4:30 pm

Session IV Integration of Tools

Aims: Review and discuss:

- analysis tools for systems approach in immunological research
- best practices in tool integration
- the challenges of semantic data transformation in tool integration

Chair: Ms. Cheryl Kraft

1:00 – 1:30 pm	**Michael Reich Ph.D.,** Broad Institute ***GenePattern: A Platform for Integrative Genomics***
1:30- 2:00 pm	**Richard Scheuermann Ph.D.**, U. T. Southwestern Medical Center ***FLOCK: Computational Identification of Cell Populations in High Dimensional Flow Cytometry Data***
2:00 – 2:30 pm	**Bjoern Peters, Ph.D.,** La Jolla Institute for Allergy and Immunology ***Designing the Immune Epitope Database 2.0 - Lessons Learned from Ontology Development, Curation and User Feedback***
2:30 – 2:45 pm	Break
2:45 – 3:15 pm	**Cliburn Chan M.D. Ph.D.,** Duke University ***Statistical Modeling of Multi-parameter Flow Cytometry***
3:15 – 3:45 pm	**Jonas S. Almeida Ph.D.,** Univ. Texas MDAnderson Cancer Center ***A Semantic Web Management Model for Integrative Biomedical Informatics***
3:45 – 4:15 pm	Discussion
4:15 - 4:30 pm	**Cheryl Kraft M.S.**, DAIT, NIAID ***Meeting Summary***