

Validating Modeling & Experimental Methods to Enable Drug Discovery

April 19th-21st 2006

National Institute of Standards and Technology (NIST)
100 Bureau Drive
Gaithersburg, MD 20899

To register please see:

http://www.nist.gov/public_affairs/confpage/060419.htm

Workshop Agenda

April 19th Evaluation of Computational & Experimental Methods

Morning-Experimental Session

- Workshop aims and objectives
- Experimental difficulties of measuring small molecule/protein binding
- The need for accurate protein/ligand binding data
- State-of-the art experimental measurement of binding interactions

Afternoon-Computational Session

- Critical analysis of Docking and Scoring
- Breakout sessions & discussion - (Parallel)
 - Selection of data sets (protein target classes and ligands for highly accurate binding affinity data measurement)
 - Experimental techniques, limitations & uncertainty in measurements
 - Docking Methodologies, is docking the right technology?
 - Scoring Functions & Force Fields, why do they fail and how are they improved

April 20th New Methods & Technologies for Exploration of Molecular Recognition Events

Morning Session

- Overview of free energy calculation methods
- Free energy perturbations & thermodynamic integration methods
- MMPBSA method
- Force Field methods
- QM methods

Afternoon Session

- Solvation issues
- Protein pKa's
- Small molecule pKa's
- Sensitivity analysis
- Grid based free energy calculations

Breakout Session & Discussion

Sampling criteria: Protein, Solvent. Standards for convergence, ionization states. What errors are acceptable, trends in hardware development

Conference Dinner Speaker Dr. Chris Austin, (NIH,NHGRI)

April 21st Physical Property Measurements

Morning Session

- Session Overview: Property Measurements: The value & intricacies:
 - Tautomer Ratios
 - ADME Properties
 - Free Energies of Transfer
- Experimental Property Measurements at NIST
- Discussion Panel I:(Computational Perspective)
 - Small molecule experimental data:
 - What we use, how we use it, and why we think we need more?
- Discussion Panel II: (Experimental Perspective)
 - Where computational chemists might find new data, caveats in interpreting existing experimental data, what methods could help get new measurements"
- Round Table: Physical Property Measurement: what to measure and how

Afternoon session:

- Chemical collections Session:
 - What data sets should be selected &which physical properties measured-Straw man
- Breakout & Discussion
- **Proposals, Outcomes and road maps**
- **Workshop Close**

Current Speakers

Christopher Austin (National Institutes of Health)

Anne Chaka, (National Institute of Standards and Technology)

Christopher Bayly, (Merck-Frosst)

Michael Doyle, (Bristol-Myers Squibb)

Michael Gilson, (Center for Advance Research in Biotechnology-UMBI)

Peter Guthrie, (University of Western Ontario)

Martha Head, (GlaxoSmithKline)
Jan Jensen, (University of Iowa)
Rachel Kroe, (Boehringer Ingelheim Pharmaceuticals)
David Leahy, (Cyprotex)
Ray Luo, (University of California, Irvine)
Alex Mackerell, (University of Maryland)
John Marino, (Center for Advance Research in Biotechnology-UMBI)
Mark McLinden, (National Institute of Standards and Technology)
Kenneth Merz, (University of Florida)
Anthony Nicholls, (OpenEye Scientific Software)
Benoit Roux, (University of Chicago)
Kim Sharp, (University of Pennsylvania)
George Shields, (Hamilton College)
Michael Shirts, (Columbia University)
Carlos Simmerling, (Stony Brook)
Peter Taylor, (Astra-Zeneca-(retired))
Mark Whitmer, (Bristol-Myers Squibb)

Sponsorship provided by:

Abbott Laboratories
GlaxoSmithKline
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National Institute of Standards and Technology
OpenEye Scientific Software

Organizing Committee

Thomas Allison, (National Institute of Standards and Technology)
Scott Brown, (Abbott Labs)
Christopher Bayly, (Merck-Frosst)
Anne Chaka, (National Institute of Standards and Technology)
Jack Collins, (National Cancer Institute)
Michael Gilson, (Center for Advanced Research in Biotechnology-UMBI)
Martha Head, (GlaxoSmithKline)
Jayne Kapur, (National Institute of Standards and Technology)
Kenneth Merz, (University of Florida)
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Frederick Schwarz, (Center for Advanced Research in Biotechnology-UMBI)
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