33rd Summer Symposium in Molecular Biology

Wednesday, June 4, 2014

6:00 p.m. – 9:00 p.m.  Registration Check-in and Welcome Reception
Overlook Pavilion
The Arboretum at Penn State

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Thursday – June 5 – Morning Sessions 100 Berg Auditorium

8:30 – 10:40  Session 1 - Non-heme-iron enzymes
Chair: J. Martin Bollinger, Jr. (Pennsylvania State University)

8:30 – 9:10  Chuan He (University of Chicago)
Oxidative Demethylation of RNA and DNA in Biological Regulation

9:10 – 9:30  Nitai C. Giri (University of Texas, San Antonio)
Distinguishing Reactivities of the Individual Iron Centers in Flavo-Diiron Proteins (FDPs)

9:30 – 10:10  Lana Saleh (New England Biolabs)
Biochemical and structural insight into the modus operandi of NgTET1, a 5-methylpyrimidine oxygenase from Naegleria gruberi

10:10 – 10:40  Coffee break

10:10 – 12:20  Session 2 - X-ray techniques
Chair: Yisong (Alex) Guo (Carnegie Mellon University)

10:40 – 11:20  Serena DeBeer (Max Planck Institute for Chemical Energy Conversion)
X-ray Spectroscopic Studies of Biological Catalysis

11:20 – 11:40  Kelly N. Chacón (Oregon Health & Science University)
A “sensor-switch” has control: Using multi-edge x-ray absorption spectroscopy to solve the mechanism of the CusCFBA Cu+/Ag+ efflux pump in E. coli

11:40 – 12:20  Oliver Einsle (University of Freiburg)
A Really Close Look at Bioinorganic Metal Centers
12:20 – 2:30  
*Lunch break*

**Thursday – June 5 – Afternoon Session**  
100 Berg Auditorium

**2:30 – 4:10**  
**Session 3 - Maintenance and homeostasis of metallocofactors**
Chair: Kathryn L. Haas (*Saint Mary’s College*)

**2:30 – 3:10**  
**Celia W. Goulding (University of California, Irvine)**
Insights into how *Mycobacterium tuberculosis* acquires iron from heme

**3:10 – 3:30**  
**Grace E. Kenney (Northwestern University)**
Dismantling copper homeostasis in methanotrophs

**3:30 – 4:10**  
**Michael K. Johnson (University of Georgia)**
Iron-Sulfur Cluster Assembly and Repair

**4:10 – 7:30**  
*Free time / dinner*

**Thursday – June 5 – Evening Session**

**7:30 – 8:30**  
**Plenary lecture 1**
Chair: Amie K. Boal (*Pennsylvania State University*)

**Jacqueline K. Barton (California Institute of Technology)**
DNA-mediated Signaling

**8:30 – 10:30**  
**Poster session 1**
Willaman Bridge
Friday – June 6 – Morning Sessions

8:30 – 10:40  Session 4 – Detailed insight into biological long-range redox reactions
Chair: John H. Golbeck (Pennsylvania State University)

8:30 – 9:10  Aimin Liu (Georgia State University)
Bis-Fe(IV): Nature's Sniper for Long-range Oxidation

9:10 – 9:30  Lisa Olshansky (Massachusetts Institute of Technology)
Kinetics of Hydrogen Atom Abstraction from Substrate by an Active Site Thiyl Radical in the E. coli Class Ia Ribonucleotide Reductase

9:30 – 10:10  Brian M. Hoffman (Northwestern University)
Nitrogenase: Mechanism of New Substrates and Old

10:10 – 10:40  Coffee break

10:10 – 12:20  Session 5 - Controlling reactivity in transition metal complexes
Chair: Kyle Lancaster (Cornell University)

10:40 – 11:20  Wonwoo Nam (Ewha Womans University, Seoul)
Biomimetic Metal-Oxygen Intermediates in Dioxygen Activation Chemistry

11:20 – 11:40  Isaac Garcia-Bosch (Johns Hopkins University)
A Different Approach to the Synthesis of CcO Model Systems: A “Naked” Heme-Peroxo-Copper Complex Leads to the Stepwise Formation of Low-Spin Cores with Tunable Structure and Reactivity

11:40 – 12:20  David P. Goldberg (Johns Hopkins University)
Tuning the First and Second-Coordination Sphere in Biologically Relevant Mn and Fe Complexes

12:20 – 2:30  Lunch break
Friday – June 6 – Afternoon Session

2:30 – 4:10  Session 6 - Radical SAM enzymes
Chair: Squire J. Booker (Pennsylvania State University)

2:30 – 3:10  Vahe Bandarian (University of Arizona)
Tales from the mines: Prospecting for novel transformations in secondary metabolism and tRNA modification

3:10 – 3:30  Martin I. McLaughlin (Massachusetts Institute of Technology)
Caught in the Act: Snapshots of Sulfur Insertion by Lipoyl Synthase

3:30 – 4:10  Catherine L. Drennan (Massachusetts Institute of Technology)
SPASMs and twitches in the AdoMet radical superfamily

4:10 – 7:30  Free time / dinner

Friday – June 6 – Evening Session

7:30 – 8:30  Plenary lecture 2
Chair: Partha Basu (Duquesne University)
Markus W. Ribbe (University of California, Irvine)
Hydrocarbon Formation by Nitrogenase

8:30 – 10:30 Poster session 2
Willaman Bridge
Saturday – June 7– Morning Sessions

8:30 – 10:40  Session 7 - Hydrogenases

Chair: Hannah Shafaat (Ohio State University)

8:30 – 9:10  R. David Britt (University of California, Davis)
Assembling the H-Cluster of [FeFe] Hydrogenase

9:10 – 9:30  Daniel L. M. Suess (University of California, Davis)
Mechanistic Investigations into [FeFe]-Hydrogenase H-Cluster Bioassembly

9:30 – 10:10  Rudolf K. Thauer (Max Planck Institute of Terrestrial Microbiology)
Electron-Bifurcating Hydrogenase Complexes

10:10 – 10:40  Coffee break

10:10 – 12:20  Session 8 - Controlling reactivity in transition metal complexes II

Chair: Matthew Kieber-Emmons (University of Utah)

10:40 – 11:20  Jonas C. Peters (California Institute of Technology)
Catalytic Reduction of Nitrogen to Ammonia by Mononuclear Iron Complexes

11:20 – 11:40  Ashley B. McQuarters (University of Michigan)
Modeling the Key Intermediate in Cytochrome P450 Nitric Oxide Reductase: Electronic Structure and Reactivity

11:40 – 12:20  Kenneth D. Karlin (Johns Hopkins University)
Copper Dioxygen Coordination Chemistry in Relationship to Copper Proteins

12:20 – 2:30  Lunch break
### Saturday – June 7 – Afternoon Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 9 – Design and control of reaction outcomes in metalloproteins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:30–4:10</td>
<td>Chair: Ben Allen (<em>Pennsylvania State University</em>)</td>
</tr>
<tr>
<td>2:30–3:10</td>
<td><strong>Amie K. Boal</strong> (<em>Pennsylvania State University</em>)</td>
</tr>
<tr>
<td></td>
<td>The essential stereoinversion in carbapenem antibiotic biosynthesis (1): Structure</td>
</tr>
<tr>
<td>3:10–3:30</td>
<td><strong>Wei-chen Chang</strong> (<em>Pennsylvania State University</em>)</td>
</tr>
<tr>
<td></td>
<td>The essential stereoinversion in carbapenem antibiotic biosynthesis (2): Mechanism</td>
</tr>
<tr>
<td>3:30–4:10</td>
<td><strong>F. Akif Tezcan</strong> (<em>University of California, San Diego</em>)</td>
</tr>
<tr>
<td></td>
<td>Evolution of Inorganic Reactivity in Biological Scaffolds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Free time / dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:10–7:30</td>
<td></td>
</tr>
</tbody>
</table>

### Saturday – June 7 – Evening Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Plenary lecture 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30–8:30</td>
<td>Chair: Michael T. Green (<em>Pennsylvania State University</em>)</td>
</tr>
<tr>
<td></td>
<td><strong>Andrew S. Borovik</strong> (<em>University of California, Irvine</em>)</td>
</tr>
<tr>
<td></td>
<td>Synthetic Chemistry as a Window into Metallobiochemistry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Final social get-together &amp; beer</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30–...</td>
<td>Champs, 1611 N Atherton St</td>
</tr>
</tbody>
</table>

*Shuttles to Champs will leave from the Chemistry Building starting at 8:30; last return shuttles from Champs to Eastview Terraces (on-campus housing) and the Atherton hotel will leave at midnight*