

Origins of Life

Monday, 21 January 2013

8:00am *Breakfast (on site)*

8:55 am **Welcoming Remarks, Laura Landweber & Aaron Goldman**

Session Chair: **Adam Burrows**

9:00am “The limits of life on Earth”
John Baross, University of Washington

9:35am “Earth's early atmosphere and climate”
Jim Kasting, The Pennsylvania State University

10:10am *Coffee and Discussion*

10:40am Cosmochemistry and the origin of life
Sandra Pizzarello, Arizona State University

11:15am Chance and the origin of life
Dave Spiegel, Institute for Advanced Study

11:50am The algorithmic origins of life
Sara Walker, Arizona State University

12:25pm *Lunch (on site)*

Session Chair: **Aaron Goldman**

1:30pm Bringing rocks to life: Hydrothermal vents and microbial origins
Bill Martin, Heinrich-Heine-Universität

2:05pm Emergence of Bioenergetics in Hydrothermal Vents on the Early Earth
Laurie Barge, NASA Jet Propulsion Laboratory

2:40pm Reactivity of pyruvate under simulated hydrothermal vent conditions
Shelley Copley, University of Colorado Boulder

3:15pm *Coffee and Discussion*

3:45pm What do ancient proteins tell us about early life on Earth
Eric Gaucher, Georgia Institute of Technology

4:20pm Biology and the chemistry of the possible
Jim Cleaves, Carnegie Institution of Washington

Tuesday, 22 January 2013

8:00am *Breakfast (on site)*

Session Chair: **Laura Landweber**

9:00am Origins of life chemistry – reconciling the iron-sulfur and the RNA worlds
John Sutherland, MRC Laboratory of Molecular Biology

9:35am A semicontinuous process to form oligomeric RNA
Steven Benner, Foundation for Applied Molecular Evolution

10:10am *Coffee and Discussion*

10:40am The origin of the RNA world
Paul Higgs, McMaster University

11:15am A ribonucleotide origin – the sporadically fed pool
Michael Yarus, Colorado University

11:50am RNA fitness landscapes
Irene Chen, UC Santa Barbara

12:25pm *Lunch (on site)*

Session Chair: **Ed Turner**

1:30pm RNA synthesis inside protocell vesicles
Katarzyna Adamala, Harvard University

2:05pm Investigating the role of compartmentalization in the origin of life using microfluidics
Rebecca Turk MacLeod, École Supérieure de Physique et de Chimie Industrielles

2:40pm Active RNA droplets: Intracellular and protocellular assembly
Cliff Brangwyne, Princeton University

3:15pm *Coffee and Discussion*

3:45pm RNA evolution and my grandfather's axe
Nicholas Hud, Georgia Institute of Technology

4:20pm RNA-catalyzed RNA replication
Jamie Attwater, MRC Laboratory of Molecular Biology

Wednesday, 23 January 2013

8:00am *Breakfast (on site)*

Session Chair: **Cliff Brangwynne**

9:00am The relationship between early metabolism and prebiotic mineral catalysis

John Peters, Montana State University

9:35am Ironing out ancient biochemistry

Loren Williams, Georgia Institute of Technology

10:10am *Coffee and Discussion*

10:40am Spontaneous network formation among cooperative RNA replicators

Nilesh Vaidya, Princeton University

11:15am A Formal Framework for Autocatalytic Sets

Wim Hordkijk, SmartAnalytiX.com

11:50am Transport of DNA and RNA in temperature and solute gradients: A possible molecular sorter for early life

Yusuke Maeda, Kyoto University

12:25pm *Lunch (on site)*

Session Chair: **Christopher Chyba**

1:30pm Origins and evolution of the ribosome

George Fox, University of Houston

2:05pm The origin of protein structures and functions

Andrew Pohorille, NASA Ames Research Center

2:40pm Synthetic biology: Enabling life with molecular parts designed in the laboratory

Michael Hecht, Princeton University

3:15pm *Coffee and Discussion*

3:45pm Reconstructing the ancient proteome

Aaron Goldman, Princeton University

4:20pm Coalescence, gene transfer, and the study of pre-LUCA molecular evolution

Peter Gogarten, University of Connecticut

Thursday, 24 January 2013

8:00am *Breakfast (on site)*

Session Chair: **Tullis Onstott**

9:00am Comparative genomics and cell evolution: Not all RNA-related processes are ancient

Antonio Lazcano, Universidad Nacional Autónoma de México

9:35am Phylogeny of cell shape: A window into origins or adaptive dead end?

Janet Siefert, Rice University

10:10am *Coffee and Discussion*

10:40am Recombining horizontal gene transfers resolve conflicting narratives for the origin of eukaryotes

Greg Fournier, Massachusetts Institute of Technology

11:15am *Oxytricha* as a modern analog of ancient genome evolution

Laura Landweber, Princeton University

11:50am Hydrothermal polymerization: Nanopore analysis of RNA-like products

David Deamer, UC Santa Cruz

12:25pm **Concluding remarks**

12:35pm *Lunch (on site)*

