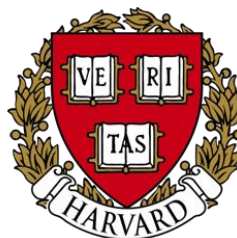


# RNA, Peptides, Vesicles and Exoplanets –

*The Chemical Origins of Life on Early Earth and Other Planetary Bodies*



## Earth-Life Science Institute – Harvard University Joint Workshop

The origins of life research community is a multidisciplinary one, bringing together scientists of diverse expertise, including chemistry, astronomy and astrophysics, geology, biology and computer science. The goal of this workshop is to bring together some of this expertise under the same roof in Cambridge to discuss the chemical origins of life from the perspective of chemists, molecular biologists, astronomers and theorists. Topics such as the prebiotic synthesis of RNA and its nonenzymatic replication, the interplay between RNA, peptides and vesicles, and the likelihood of the conditions perceived as favorable for the emergence of life on other planetary bodies, will be discussed.

The workshop and is supported by the Earth-Life Science Institute and Harvard Origins of Life Initiative. It will take place over the course of two days, **Thursday and Friday 26 and 27 February 2015** on the Harvard campus in the **Hilles Building, Room 105**, 59 Shepard Street.

Invited speakers are asked to give presentations about any topic of their choosing relevant to the focus of the workshop, with a planned length of ~30 minutes, making time for an additional 15–20 minutes of open discussion and questions.

## Schedule of Speakers

### Thursday 26 February

**9:00** INTRODUCTORY REMARKS – Albert Fahrenbach, Harvard / ELSI

**9:05-9:45** – Tony Jia, Harvard “*The Role of Peptides in the RNA World: Towards Multiple-Round Non-Enzymatic Replication*”

**9:45-10:25** – Yutetsu Kuruma, ELSI “*Reconstruction of Cell Membrane Function*”

COFFEE BREAK

**10:40-11:20** – Sukrit Ranjan, Harvard “*TBA*”

**11:20-12:00** – Matthew Powner, University College London “*Divergent Prebiotic Nucleotide Synthesis and High-Energy Phosphates*”

LUNCH

**1:30-2:10** – Daishi Fujita, University of Tokyo “*Arrayed Lipid Bilayer Chambers Allow Single Molecule Analysis of Membrane Transporter Activity*”

**2:10-2:50** – Dennis Cao, Northwestern “*Self-Assembling Peptide Amphiphiles*”

COFFEE BREAK

**3:10-3:50** – Jonathan Sczepanski, Scripps “*Talking to the Mirror: In Vitro Evolution of a Cross-Chiral Ribozyme*”

**3:50-4:30** – Wen Zhang, Harvard “*Structural Study on Nonenzymatic RNA Replication*”

RECEPTION

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### Friday 27 February

**10:00-10:40** – Jim Cleaves, IAS / ELSI “*227 Views of RNA and More: The Pre-RNA World?*”

**10:40-11:20** – Kate Adamala, MIT “*Toward the Origin of Darwinian Evolution: Competition and RNA Copying in Protocells*”

LUNCH

**1:00-1:40** – Chris Magnani, Harvard “*Probing the UV Sensitivity of Prebiotic Reactions*”

**1:40-2:20** – Kazuaki Amikura, ELSI “*The Number of Amino Acids in a Protein*”

COFFEE BREAK

**2:30-3:10** – Sebastian Danielache, ELSI “*Archean Atmospheric Disequilibrium Studied by a Dynamical Photochemical Model.*”

**3:10-3:50** – Alexis Gilbert, ELSI “*Abiotic Formation of Lipids in Hydrothermal Systems*”

COFFEE BREAK

**4:00-4:40** – Neha Kamat, Harvard “*Using Electrostatic Interactions to Localize RNA to Phospholipid Membranes*”

**4:40-5:20** – Aaron Engelhart, Harvard “*Copying RNA in Primitive Cells: Overcoming Challenges and Discovering Opportunities*”

## Directions from Hotel Tria to the Hilles Building

