

RESEARCH CONFERENCES

ESF-COST High-Level Research Conference

**Systems Chemistry II:
Evolution and Systems**

Anna Grand Hotel • Balatonfüred, Lake Balaton • Hungary
18 - 23 October 2009

Chair: **Eörs Szathmáry**, Collegium Budapest, HU

Vice-Chair: **Dieter Schinzer**, University of Magdeburg, DE

www.esf.org/conferences/09332



Final Programme

Sunday 18 October

Late afternoon/
early evening Registration at the COST-ESF desk

19:00-19:30 **Eörs Szathmáry**
Collegium Budapest, HU
Welcome Note from Chair

19:30-21:00 Dinner

21:00 Welcome Drinks

Monday 19 October

Session 1

Chair: Mauro Santos, Autonomous University of Barcelona, ES

09:00-9:50 **William Martin**
Heinrich-Heine University Düsseldorf, DE
Hydrothermal Vents and the Origin of Life

09:50-10:40 **Günter von Kiedrowski**
Ruhr University Bochum, DE
TBD (Replicator and Systems Chemistry)

10:40-11:10 Coffee break

11:10-12:00 **Pier Luigi Luisi**
University of Rome, IT
Chemical Aspects of Synthetic Biology

Short Talks

12:00-12:15 **James Cleaves**
Carnegie Institution of Washington, US
What Were the Building Blocks Available for Proto-Life? The Prebiotic Small Molecule Inventory

12:15-12:30 **Goran Goranovic**
University of Southern Denmark, DK
Systems Chemistry: Coupled Electron Transfer from a Nucleobase to a Lipid via a Photocatalyst

12:30-14:30 Lunch

Session 2

Chair: **Chrisantha Fernando**, University of Sussex, UK

- 14:30-15:20 **Michael Yarus**
University of Colorado, US
Chemistry and the Code
- 15:20-16:10 **Sergei Rodin**
The Beckman Research Institute, US
Epigenetics and Evolution: Selection for CpGs in coding regions drives evolution of homeobox genes
- 16:10-16:30 Coffee break

Short Talks

- 16:30-16:45 **Josep Ribo**
University of Barcelona, ES
Frank Model and Spontaneous Emergence of Chirality in Closed Systems
- 16:45-17:00 **Addy Pross**
Ben Gurion University, IL
Seeking the Chemical Roots of Darwinism: Bridging between Chemistry and Biology
- 17:00-17:15 **Christoph Kuhn**
University Hospital Zürich, CH
On an Early Theory of Life's Emergence in the Light of Future Artificial Chemical Life
- 17:15-17:30 **Kepa Ruiz-Mirazo**
University of the Basque Country, ES
On the 'Lipid-peptide Minimal Cell' Scenario.
- 17:30-17:45 **Peter Strazewski**
Université Claude Bernard Lyon 1, FR
Of the Darwinian Advantage to be Neither too Soluble, nor too Insoluble, Neither too Solid, nor Completely Liquid

Evening Lecture

- 18:00-19:00 **Frigyes Károlyházy**
Eötvös University, HU
The Spell of the Quantum World
- 19:00 Dinner

Tuesday 20 October

Session 3

Chair: **Kepa Ruiz Mirazo**, University of San Sebastian, ES

- 09:00-9:50 **Mauro Santos**
Autonomous University of Barcelona, ES
Lack of Evolvability in Self-Sustaining Autocatalytic Networks: A Constraint on Metabolism-First Path to the Origin of Life
- 09:50-10:40 **Doron Lancet**
Weizmann Institute of Science, IL
Selection in Populations of Lipid-World Compositional Assemblies

10:40-11:10 Coffee break

11:10-12:00 **Niles Lehman**
Portland State University, US
A Self-constructing and Autocatalytic Set of RNAs

Short Talks

12:00-12:15 **Leroy Cronin**
University of Glasgow, UK
Dynamic Inorganic Complex Chemical Systems: From Dissipative Dynamics to Artificial Life

12:15-12:30 **TBC**
Organisation
Title

12:30-14:30 Lunch

Session 4

Pier Luisi Luigi, University of Rome, IT

14:30-15:20 **Peter Schuster**
University of Vienna, AT
The Role of Neutrality in Evolution. From Darwin to Present Day Molecular Biology and in Vitro Selection

15:20-16:10 **Dan Tawfik**
Weizmann Institute of Science, IL
The Evolution of New Protein Functions and Structures - a Reconstructive Approach

16:10-16:30 Coffee break

16:30-18:00 *Poster session*

Evening Lecture

18:00-19:00 **Stuart Kauffman**
University of Calgary, CA
Collectively Autocatalytic Sets Plus Agency

19:00 Dinner & Bowling Evening

Wednesday 21 October

Session 5

Chair: **Luc Steels**, SONY Lab, Paris

09:00-9:50 **Ferenc Darvas**
ThalesNano, HU
Systems Chemistry Aspects of an Emerging Field: Flow Chemistry

09:50-10:40 **Balázs Papp**
Biological Research Center Szeged, HU
Systems Biology of Genetic Interactions in Yeast Metabolism

10:40-11:10 Coffee break

11:10-12:00 **Dieter Schinzer**
University of Magdeburg
(+)-Sorangicin A: Synthetic Studies and Construction of the Key Fragments

Short Talks

12:00-12:15 **Gonen Ashkenasy**
Ben Gurion University of the Negev, IL
Kinetics and Mechanism of β -Sheet Peptide Replication

12:15-12:30 **Pierre-Alain Monnard**
University of Southern Denmark, DK
Biopolymerization in Self-Assembled, Structured Media

12:30 Lunch

Afternoon Half-day excursion

19:00 Dinner

Thursday 22 October

Session 6

Chair: John Odling-Smee, University of Oxford, UK

09:00-9:50 **Robert Aunger**
London School of Hygiene and Tropical Medicine, UK
Major Transitions in 'Big' History

09:50-10:40 **Chrisantha Fernando**
University of Sussex, UK
The Neuronal Replicator Hypothesis

10:40-11:10 Coffee break

11:10-12:00 *Poster Session*

Short Talks

12:00-12:15 **Bjørn Østman**
Keck Graduate Institute, US
Impact of Epistasis on Evolutionary Adaptation

12:15-12:30 **Sijbren Otto**
University of Cambridge, UK
Shaken, not Stirred: Spontaneous Emergence of Competing Synthetic Self-Replicators from Dynamic Molecular Networks determined by Mechanical Energy

12:30-14:30 Lunch

Session 7

Chair: Robert Aunger, London School of Hygiene and Tropical Medicine, UK

- 14:30-15:20 **John Odling-Smee**
University of Oxford, UK
Niche Construction and Ecological inheritance
- 15:20-16:10 **György Kampis**
Eötvös University, HU
Non-Aristotelian Entities: Putting Systems into Systems Chemistry and Systems Biology
- 16:10-16:40 Coffee break

Evening Lecture

- 16:40-17:40 **Herbert Gintis**
Central European University Budapest, HU
Five Principles for the Unification of the Behavioral Sciences

Forward Look Plenary Discussion

Chair: György Kampis, Eötvös University Budapest, HU

- 17:40-17:43 **Günter von Kiedrowski**
Ruhr University Bochum, DE
- 17:43-17:46 **Mauro Santos**
Autonomous University of Barcelona, ES
- 17:46-17:49 **Robert Aunger**
London School of Hygiene and Tropical Medicine, UK
- 17:49-17:52 **Michael Yarus**
University of Colorado, US
- 17:52-18:10 *Audience Discussion*
- 20:00 Get-together & Conference Dinner

Friday 23 October

Breakfast & Departure