

ESF-COST High-level Research Conference on Systems Chemistry III

PROGRAMME

Sunday 23 October

17:00-19:30	Registration at the ESF desk
19:30-21:00	Dinner
21:00	Welcome Drinks

Monday 24 October

8:30-9:20	Registration at ESF-COST Desk in front of lecture hall
9:20-9:50	Opening Remarks Introduction to ESF/COST

Session 1: Dynamic Self Assembly

Chaired by: **Gonen Ashkenasy**, Ben-Gurion University of the Negev, IL

9:50-10:25	Sijbren Otto - University of Groningen, NL; COST Action CM0703 & CM1005 <i>Mechanically activated self-replication</i>
10:25-11:00	Nicolas Giuseppone - University of Strasbourg, FR <i>Towards Self-fabricating Functional Materials</i>
11:00-11:30	Coffee break
11:30-12:05	Meital Reches - The Hebrew University of Jerusalem, IL <i>New strategies for peptides self-assembly</i>
12:05-12:25	Jan W. Sadownik - University of Strathclyde, UK <i>Enzymatically driven dynamic systems for peptide self-assembly</i>
12:30-14:30	Lunch

Session 2: Molecular Networks, Computation and Machines

Chaired by: **Goran Goranovic** - NTU Nanyang Technological University, SG

14:30-15:05	Stuart Kauffman - Tampere University of Technology, FI; University of Vermont, US <i>History and Current Status of Work on the Origin of Life</i>
15:05-15:40	Yaakov (Kobi) Benenson - ETH Zurich, CH <i>Biological computers identify specific cancer cells</i>
15:40-16:00	Nathaniel Wagner - Ben-Gurion University of the Negev, IL <i>Modeling and Simulation in Systems Chemistry</i>
16:00-16:30	Coffee break
16:30-16:50	Raphaël Plasson - Keio University, JP <i>A DNA toolbox for the design of in vitro complex reaction networks</i>

- 16:50-17:10 **Graham de Ruiter** - Weizmann Institute of Science, IL
Redox-Active Mono- and Multi-Layers with Sense and Memory: A Matter of Logic
- 17:10-17:30 **Christoph Flamm** - University of Vienna, AT; COST Action CM0703
Detecting chemical transformation motifs

Evening Lecture

Chaired by: **Peter Strazewski** - Université Claude Bernard Lyon 1, FR

- 18:00-19:00 **Günter von Kiedrowski** - Ruhr University Bochum, DE; COST Action CM0703
25 years of chemical self-replication – fun(damentals), facts, and fiction
- 19:00 Dinner

Tuesday 25 October

Session 3: Towards Artificial Cells

Chaired by: **Meital Reches** - The Hebrew University of Jerusalem, IL

- 9:00-9:35 **Pierre-Alain Monnard** - University of Southern Denmark, DK
Heterogeneous self-assembled media for biopolymerization
- 9:35-9:55 **Beatriu Escuder** - Universitat Jaume I, ES
Functional Fibrillar Networks: Emergence of New Properties Driven by Self-Assembly
- 9:55-10:15 **Zbigniew Lech Pianowski** - ETH Zurich
A Protein Container Evolved for Encapsulation of Charged Molecules
- 10:15-10:45 Coffee break
- 10:45-11:20 **Doron Lancet** - Weizmann Institute of Science, IL; COST Action CM0703
“and yet it metabolized first”
- 11:20-11:55 **Eors Szathmary** - Eötvös Loránd University Budapest, HU; COST Action CM0703
M,R systems, chemotons and reflexively autocatalytic networks: a critical assessment
- 11:55-12:15 **Sarah Maurer** - University of Southern Denmark, DK
Protocell Morphology During Growth and Division
- 12:30-14:30 Lunch

Session 3 (Cont.): Towards Artificial Cells

- 14:30-15:05 **Addy Pross** - Ben-Gurion University of the Negev, IL
Toward a general theory of evolution
- 15:05-15:25 **John S. McCaskill** - Ruhr-Universität Bochum, DE; COST Action CM0703
Electronic Systems Chemistry

Short oral presentations of poster

Chaired by: **Gonen Ashkenasy**, Ben-Gurion University of the Negev, IL; COST Action CM0703 & CM1005

- 15:25-15:35 **Celia Blanco** - Centro de Astrobiología (CSIC-INTA), ES
Mirror Symmetry Breaking at Interfaces: Glycine and alpha-amino acids
- 15:35-15:45 **Anna Fedor** - Eötvös Loránd University of Sciences, HU
Two different template replicators coexisting in the same protocell: Stochastic simulation of an extended chemoton Model
- 15:45-15:55 **Clare Mahon** - Newcastle University, UK
Templating a Polymer-Scaffolded Dynamic Combinatorial Library
- 15:55-16:05 **Leila Motiei** - Weizmann Institute of Science, IL
Self Propagating Molecular-based Assemblies
- 16:05-16:15 **Francesca Caprioli** - University of Groningen, NL
Self-propagating amino acids: further steps towards the origin of life

- 16:15-16:25 **Daniel Weingand** - Karlsruhe Institut of Technology, DE
The Soai Reaction as a tool for determination of small ee values
- 16:25-16:35 **Hong-Yu Zhang** - Huazhong Agricultural University, CN
Origin and evolution of proteins: a small molecule-based investigation
- 16:40-18:30 Coffee break & Poster session
- 18:30-20:00 Dinner

Evening Lecture

Chaired by: **Pierre-Alain Monnard** - University of Southern Denmark, DK

- 20:00-21:00 **John Sutherland** - MRC Laboratory of Molecular Biology, UK; COST Action CM0703
Prebiotic chemistry: a new modus operandi

Wednesday 26 October

Session 4: Origin of Homochirality

Chaired by: **Meir Lahav**, Weizmann Institute of Science, IL; COST Action CM0703

- 8:30-9:05 **Kenso Soai** - Tokyo University of Science, JP
Recent Study on the Origins of Chirality Using Asymmetric Autocatalysis
- 9:05-9:40 **Michael McBride** - Yale University, US
Non-Linearity in Crystal Growth Schemes
- 9:40-10:15 **Josep Ribo** - University of Barcelona, ES; COST Action CM0703
Effects of Flows in Auto-Organization, Self-Assembly and Emergence of Chirality
- 10:15-10:45 Coffee break
- 10:45-11:20 **Svetlana B. Tsogoeva** - University of Erlangen-Nürnberg, DE
Organocatalytic and Spontaneous Asymmetric Synthesis
- 11:20-11:40 **Roberto Purrello** - University of Catania, IT
Induction and memory of chirality
- 11:40-12:00 **Brigitte Bibal** - University of Bordeaux, FR; COST Action CM1005
Supramolecular Receptors for Organocatalysis & Recognition of Biological Species
- 12:00-13:30 Lunch
- 14:00-19:00 Half-day excursion:
Guide tour at the Palace of Knossos and walk in the old town of Heraklion
- 19:30 Dinner

Thursday 27 October

Session 5: Peptides, Proteins and Nucleic Acids in Systems Chemistry

Chaired by: **Beatriu Escuder Gil** - Universitat Jaume I, ES

- 9:00-9:35 **Rein Ulijn** - The University of Strathclyde, UK
Exploiting equilibrium and non-equilibrium self-assembly of peptide nanostructures
- 9:35-10:10 **Peter Strazewski** - Université Claude Bernard Lyon 1, FR; COST Action CM0703
Amphiphilic peptidyl-RNA spontaneously anchors to phospho- and glycolipidic giant vesicles
- 10:10-10:30 **Syuzanna Harutyunyan** - University of Groningen, NL
Stereochemical features are in control of directional movement on a single molecular level
- 10:30-11:00 Coffee break
- 11:00-11:35 **Alexander Kros** - University of Leiden, NL
Let's get together: Efficient membrane fusion using lipidated peptides

- 11:35-11:55 **Shai Rahimipour** - Bar-Ilan University, IL
Self-assembled Cyclic D,L-alpha-Peptides as Novel Anti-amyloidogenic Scaffolds
- 11:55-12:15 **Henderson James Cleaves** - Georgia Institute of Technology, US
Nucleoside Analogues Capable of Undergoing Reversible Ring-Opening Polymerization
- 12:20-12:30 Group picture
- 12:30-15:00 Lunch & Beach volleyball

Session 6: Minimal Living Systems

Chaired by: **Christoph Flamm** - University of Vienna, AT; COST Action CM0703

- 15:00-15:35 **Leroy (Lee) Cronin** - University of Glasgow, UK
Inorganic Biology
- 15:35-16:10 **Steen Rasmussen** - University of Southern Denmark, DK; COST Action CM0703
Challenges for assembling minimal living physicochemical systems
- 16:10-16:30 **Katie Marriott** - University of Leeds, UK
From Simplicity to Complexity: Reduced Oxidation State Phosphorus in Prebiotic Chemistry

Forward Look Plenary Discussion

Chair: **Gonen Ashkenasy**, Ben-Gurion University of the Negev, IL; COST Action CM0703 & CM1005

- 16:30-17:00 Discussion about future developments in the field
- 17:00-17:30 Coffee break

Evening Lecture

Chair: **Meir Lahav**, Weizmann Institute of Science, IL; COST Action CM0703

- 17:30-18:30 **Ada Yonath** - Weizmann Institute of Science, IL
An amazing natural bonding machine: the ribosome
- 20:00 Conference dinner

Friday 28 October

Departure after breakfast