



RESEARCH CONFERENCES

ESF-UB Conference in Biomedicine

ECSB II: DESIGN, PROGRAMMING AND OPTIMISATION OF BIOLOGICAL SYSTEMS

Hotel Eden Roc, Sant Feliu de Guixols (Costa Brava) • Spain
29 March – 03 April 2009

Chair: **David Gilbert**, Brunel University, UK

Co-Chairs: **Alfonso Jaramillo**, Ecole Polytechnique, FR

Natalio Krasnogor, University of Nottingham, UK

Víctor de Lorenzo, Centro Nacional de Biotecnología, ES

Organising Committee Chairs:

Sibylle Gaisser, Fraunhofer Institute for Systems and Innovation
Research ISI, DE

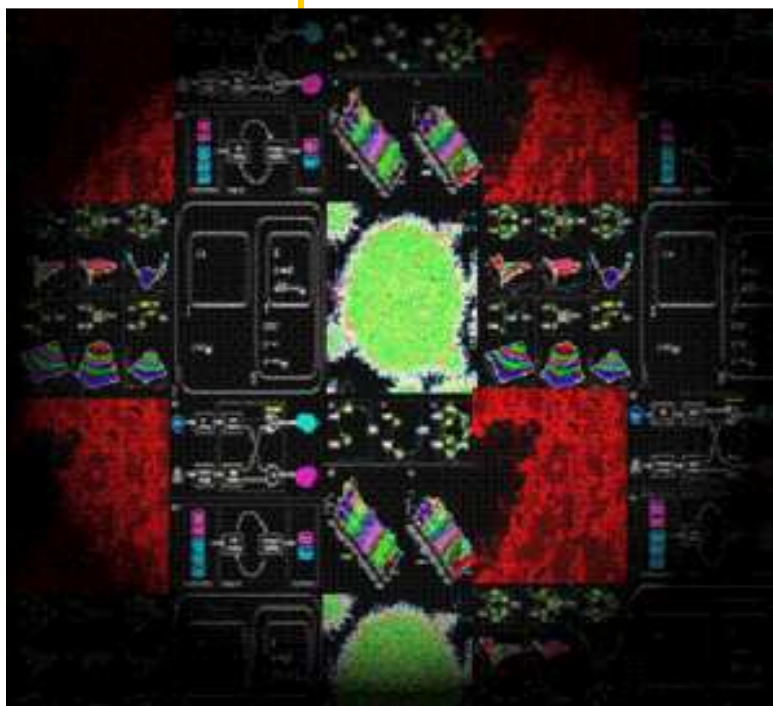
Markus R. Schmidt, Organisation for International Dialogue and
Conflict Management - IDC – idialog, AT

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With support from



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i Recerca**



Final Programme

Day 1 Sunday 29th March

Late afternoon / early evening

19.00

20.00

Registration at the ESF-RC desk

Welcome Drink

Supper

Day 2 Monday 30th March

08.45-09.00

David Gilbert (Brunel University)

Conference Opening on behalf of the Organizers

Pilar Pérez (CSIC) - *Presentation of ESF*

Session 1

Chair: Sven Panke (ETH Basel)

09.00-09.30

Martin Fussenegger (ETH Zürich)

Engineering of mammalian gene networks

09.30-10.00

Peter Walde (ETH Zurich)

Artificial vesicles as biomimetic compartments and templates

10.00-10.30

Maude David (E. Centrale de Lyon)

DNA shuffling: a dynamic model for novel gene synthesis

10.30-11.00

Coffee break

11.00-11.30

Jeff Hasty (UCSD)

Engineered Genetic Oscillations

11.30-12.00

Ulrich Gerland, U. Cologne

Heterogeneous timing in bacterial gene control

12.00-12.30

Herbert Sauro (U. Washington)

The role of software and standards in the design and construction of synthetic networks

12.30

Lunch

14.00-15.30

Tutorial 1: Víctor de Lorenzo (CNB, Madrid)

Genetic tools for Synthetic Biology I:

Functional elements, plasmids and transposons (40 min)

Break (10 mins)

Genetic tools for Synthetic Biology II:

Advanced molecular techniques (40 min)

15.30-15.45

SHORT TALK - Stephanie Rialle (CNRS, Montpellier)

CompuBioTic, a methodology for de novo design of vesicles performing programmed tasks

15.45-16.00

SHORT TALK - Jiri Damborsky (Masaryk University)

Engineering of tunnels in proteins with buried active sites

16.00-16.30

Coffee break

Session 2

Chair: **Rafael Giraldo** (CIB, Madrid)

16.30-16.45	SHORT TALK - Tamas Feher (Hungarian Academy of Sciences) <i>Removal of the flexible gene pool of E. coli is accompanied by loss of adaptability</i>
16.45-17.15	Alfonso Jaramillo (Ecole Polytechnique, Paris) <i>Computational design of bacterial systems for new functionalities</i>
17.15-17.30	SHORT TALK - M. Eugenia Guazzaroni (Instituto de Catálisis, CSIC) <i>Experimental reconstruction of single cell metabolism and its implication in synthetic biology</i>
17.30-18.00	Edward Bayer (Weizmann Institute) <i>Designer cellulosomes: creating novel types of multi-enzyme complexes</i>
19.00	Dinner
20.30-22.00	Poster session

Day 3 Tuesday 31st March

Session 3

Chair: **Gyorgy Posfai** (Hungarian Academy of Sciences)

09.00-09.30	Sven Panke (ETH, Basel) <i>Towards orthogonal biochemical networks</i>
09.30-10.00	Sheref Mansey (Denver University) <i>Compartmentalized genetic replication</i>
10.00-10.30	Didier Mazel (Institute Pasteur Paris) Showing restraint: bacterial mobile genetic elements are designed not to perturb their host genome
10.30-11.00	Coffee break
11.00-11.30	Miguel Camara (University of Nottingham) <i>Emerging themes in bacterial cell-cell communication networks</i>
11.30-11.45	SHORT TALK - Javier Carrera (IBMCP CSIC-UPV) <i>Re-engineering E. coli chassis under dynamic environments</i>
11.45-12.15	Alfonso Valencia (CNIO Madrid) <i>Bioinformatics Infrastructure for Synthetic Biology</i>
12.30	Lunch
14.00-15.30	Tutorial 2.1. Natalio Krasnogor (U. of Nottingham) <i>Computational tools for Synthetic Biology</i>
15.30-16.00	Tutorial 2.2. David Gilbert (Brunel University) <i>Model validation and verification (temporal logic)</i>
16.00-16.30	Coffee break
16.30-17.00	François Képès (Genopole Evry) <i>Global transcriptional optimization</i>

Session 4

Chair: **Didier Mazel** (Institut Pasteur)

17.00-17.30

Jean-Loup Faulon (Genopole Evry)

A systems chemical biology approach to infer and design metabolic networks

17.30-18.00

Pasquale Stano (RomaTre)

Lipid vesicles as cellular models: from self-reproduction to semi-synthetic minimal cells

18.00-18.30

Philippe Marliere (Heurisko SAS)

Synthetic alternatives to canonical metabolism

19.00

Dinner

20.00-20.30

Phillip Wright (Sheffield University)

Proteomic level characterisation of an E. coli synthetic biology chassis

20.30-21.30

Poster Session

Day 4 Wednesday 1st April

Session 5

Chair: **Irene Chen** (Harvard University)

09.00-09.30

Antoine Danchin (Institute Pasteur Paris),

Maxwell's demon's genes

09.30-10.00

Rafael Giraldo (CIB, Madrid)

Engineering amyloid assemblies through ligand-modulated protein conformational switches

10.00-10.15

SHORT TALK - Austin Che (MIT, Boston)

Engineering synthetic splicing ribozyme systems

10.15-10.30

SHORT TALK - Jose-Ignacio Jimenez (CNB, Madrid)

Rewiring metabolic networks in bacteria through intracellular expression of camel VHH domains

10.30-11.00

Coffee break

11.00-11.30

Fernando de la Cruz (U. Cantabria)

Plasmids and plasmid modules as orthogonal devices in Synthetic Biology

11.30-11.45

SHORT TALK - Gregory Linshiz (Weizmann Institute)

Recursive construction of perfect DNA molecules from imperfect building blocks

11.45-12.15

SHORT TALK - Giovanni Stracquadanio (U. Catania)

In-silico protein robustness: a design-for-yield approach for robust and effective proteins and drugs

12.30

Lunch

Afternoon

Half-day excursion

19.00

Dinner

20.00-21.00

Forward Looking Plenary Discussion

Animated by **Víctor de Lorenzo** (CNB, Madrid)

Day 5 Thursday 2nd April

Session 6

Chair: **Edward Bayer** (Weizmann Institute)

09.00-09.30

Irene Chen (Harvard University)
Mechanisms of emergence in the prebiotic world

09.30-10.30

Tutorial 3. Markus Schmidt (IDC Vienna)
Societal aspects of Synthetic Biology

10.30-11.00

Coffee break

Special Session and Roundtable Discussion on
SETTING THE LANDSCAPE OF SYNTHETIC BIOLOGY IN EUROPE.
Chair: **Sibylle Gaisser** (Fraunhofer ISI)

11.00-13.00

Sibylle Gaisser (Fraunhofer ISI)
Context conditions, actors and leading countries in SB

Benedicte Callan (OECD)
International governance Opportunities and Challenges

Berthold Rutz (European Patent Office)
IP regimes in the future and their impact on SB research and development

Ioannis Economidis (European Commission)
SB strategy in the European Commission and in FP7

Sophia Abbasi (BBSRC, UK)
UK strategy in Synthetic Biology

Roundtable Discussion
Making the most of the opportunities for Synthetic Biology

13.00

Lunch

Session 6 (Continuation)

Chair: **Edward Bayer** (Weizmann Institute)

14.00-14.30

Andres Moya (University of Valencia)
Learning from minimal natural cells

14.30-14.45

SHORT TALK - Kristian Müller (U. Freiburg)
Engineering membrane receptors, reporter enzymes, and DNA Nano-structures as parts for synthetic signaling

14.45-15.30

SHORT TALK - Gonzalo Durante (CIB, Madrid)
Designing artificial regulatory proteins for novel transcriptional control circuits

15.00-15.30

Ralf Wagner (Gene Art)
Gene Design, Gene Synthesis, Synthetic Gene Libraries and Beyond: Catalyst of Innovative Biotechnology

15.30-15.45	SHORT TALK - Alain Thierry (CNRS / BIO-RAD, Montpellier) <i>DNA compaction: auto-organisation, prebiotic chemistry and in vivo condensed forms of DNA</i>
15.45-16.15	Mark Bedau (Reed College, Oregon) <i>Beyond BioBricks: Synthetizing synergistic biochemical systems from the bottom-Up</i>
16.15-16.30	SHORT TALK - Inge Thijs (KU Leuven) <i>Modeling for Dr. Coli: a synthetic biology approach to intelligent bacterial drug delivery</i>
16.30-17.00	Coffee break

Session 7

Chair: Andres Moya (University of Valencia)

17.00-17.15	SHORT TALK - Anton Glieder (TU Graz) <i>Artificial promoters and minimal cells for whole cell biocatalysis</i>
17.15-17.30	TBC
17.30-18.00	Edward Trifonov (University of Haifa) <i>Reconstruction of (bio)chemical life by interpolation from modern sequences to zero time.</i>
18.00-18.30	Stephen Muggleton (Imperial College, London) <i>Inductive logic programming and machine learning for Synthetic Biology</i>
18.30-19.30	CONFERENCE DEBATE (Including nominations for the organisers of the next meeting) Animated by Natalio Krasnogor (University of Nottingham)
20.00	Before Dinner Drink (Bar Dali)
20.30	Conference Dinner

Day 6 Friday 3rd April

Breakfast & Departure

Abstracts, Posters & Short Oral Presentations

- Posters will be displayed throughout the meeting. Please, prepare them not wider than 1 m and not taller than 1.5 m. Please include a short summary and -if you wish- a handout for possibly interested people and further contact.
- Those having short oral presentations are encouraged to prepare one poster as well for further discussion during the corresponding poster session
- Short talks will take a maximum of 15 min each. It is suggested to employ most of the slot (~10 min) for the presentation and leave ~5 min for discussion.