



RESEARCH CONFERENCES

ESF-EMBO Symposium

Synthetic Biology of Antibiotic Production

Hotel Eden Roc, Sant Feliu de Guixols (Costa Brava) • Spain
2-7 October 2011

Chair: Eriko Takano, *Microbial Physiology, University of Groningen, NL*

Co-Chairs: Roel Bovenberg, *DSM Biotechnology Center, Delft, NL and Centre for Synthetic Biology, University of Groningen, NL*; Rainer Breitling, *Groningen Bioinformatics Centre, University of Groningen, NL and Institute of Molecular, Cell & Systems Biology, University of Glasgow, UK*

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i Recerca**

**DSM – the Life Sciences and
Materials Sciences Company**



Final Programme

Sunday 2 October

Late afternoon /
early evening

19.00

20.00

Registration at the ESF-RC desk

Welcome Drink

Supper

Monday 3 October

08.45-09.00

Conference Opening

Session 1: General Synthetic Biology 1

Chair: Eriko Takano, University of Groningen, NL

09.00-09.30

Roy Kishony

Harvard University, US

The ecology of antibiotics

09.30-10.00

Christina Smolke

Stanford, US

Molecular controllers and their application in advancing metabolic pathway design in yeast

10.00-10.10

Tobias Bollenbach

IST, Austria

Resolution of gene regulatory conflicts caused by combinations of antibiotics

10.10-10.40

Coffee break

10.40-11.10

Markus Schmidt

Biofaction and IDC, AT

Biosafety and Public Dialogue in Synthetic Biology

11.10-11.20

Barry Canton

Ginkgo BioWorks, US

A pipeline for organism engineering at Ginkgo BioWorks

11.25-11.35

Rebecca Jane Miriam Goss

University of East Anglia, UK

Elucidating and Exploiting Biosynthesis: Synthetic Biology Approaches to Access Novel Uridyl Peptide Antibiotics

11.40-11.50

Karsten Temme

UC San Francisco, San Francisco, US

*Refactoring the Nitrogen Fixation Gene Cluster in *Klebsiella oxytoca**

12.30

Lunch

Session 2: General Synthetic Biology 2

Chair: Rainer Breitling, University of Groningen, NL and University of Glasgow, UK

15:00-15:30

Arnold Driessen

University of Groningen, NL

*Secondary metabolite formation by *Penicillium chrysogenum**

15.30-15.40

Nili Ostrov

Columbia University, US

Cell Engineering via Reiterative Recombination in Yeast

15.45-15.55

Todd Peterson

Life Technologies Corp, US

Design, synthesis, assembly technologies for synthetic biology engineering

15.55-16.25

Coffee break

16.25-16.55

Jörg Stelling

ETH, CH

Computational design of synthetic gene circuits

16.55-17.05

Ralf Wagner

GeneArt/Life Technologies, Regensburg, DE

Synthetic Lantibiotics – Design and Combinatorial Synthesis

17:10-17.30

1 min. Poster presentations (Poster 1-12)

18:00-21.00

Poster session

19.00

Dinner

Tuesday 4 October

Session 3: Filamentous Fungal Systems 1

Chair: Roel Bovenberg, DSM Biotechnology Center, Delft, NL and University of Groningen, NL

09.00-09.30

Nancy Keller

University of Wisconsin-Madison, US

Unlocking the fungal treasure chest

09.30-09.40

Sabine Albermann

Westfaelische Wilhelms-Universitaet, DE

*Approaches for directed strain improvement targeting enhanced biosynthesis of gibberellic acid in *Fusarium fujikuroi**

09.45-09.55

Russell Cox

University of Bristol, UK

Reprogramming Fungal Polyketide Synthases

09.55-10.25

Coffee break

10.25-10.55

Axel Brakhage

HKI, DE

Activation of fungal silent gene clusters

10.55-11.05

Jan A.K.W. Kiel

University of Groningen, NL

Secondary metabolism in filamentous fungi: there is more to it than just the cytosol

11.10-11.20

Vera Meyer

Berlin University of Technology, DE

Fungal survival strategies against antibiotics

11.25-11.35

Stefan Olsson

University of Copenhagen, DK

Exploring fungal-bacterial interactions for discovering new bioactive substances and their mechanisms of action

12.30

Lunch

Session 4: Filamentous Fungal Systems 2

Chair: Arnold Driessen, University of Groningen, NL

15.00-15.30

Jens Nielsen

Chalmers University of Technology, SE

Synthetic Biology Tools for Improving Fungal Production of Antibiotics

15.30-15.40

Arthur Ram

Leiden University, NL

*Secondary metabolite production in *Aspergillus niger* at near zero specific growth rates*

15.45-15.55

Daniel Scharf

Leibniz Institute for Natural Product Research and Infection Biology e.V., DE

Gliotoxin pathway reconstruction as a prerequisite for pathway engineering

15.55-16.25

Coffee break

16.25-16.35

Tom Simpson

University of Bristol, UK

Biosynthesis and Mutasynthesis of Trans-AT Polyketides: Mupirocin and Thiomarinol

16.40-17.00

1 min. poster presentation (Posters 13-25)

17.00-21.00

Poster session

19.00

Dinner

Wednesday 5 October

Session 5: Actinomyces Systems 1

Chair: Wolfgang Wohlleben, Tübingen University, DE

09.00-09.30

Joern Piel

University of Bonn, DE

Biosynthetic pathways from animal-associated filamentous bacteria

09.30-09.40

Christopher Corre

University of Warwick, UK

New chemical keys to unlock the production of novel microbial antibiotics

09.45-09.55

Anna Eliasson Lantz

Technical University of Denmark, DK

*Application of Synthetic Promoter Library for modulation of actinorhodin production in *Streptomyces coelicolor**

09.55-10.25

Coffee break

10.25-10.55

Rolf Mueller

Saarland University, DE

Comparative Secondary Metabolomics and Insights from the Structure of Hexylmalonyl-CoA Reductase

10.55-11.05

Juan Pablo Gomez-Escribano

John Innes Centre, UK

Engineering Streptomyces coelicolor for the expression of heterologous gene clusters

11.10-11.20

Luciana Gonzaga De Oliveira

University of Campinas, BR

Molecular fingerprint in actinomycetes

11.25-11.35

Paula Yagüe Menendez

Universidad de Oviedo, ES

Mycelium differentiation and antibiotic production in liquid cultures of Streptomyces: Biotechnological applications

11.40-11.50

Justin Nodwell

McMaster University, CA

Remodeling secondary metabolism with synthetic chemical signals

12.30

Lunch

Session 6: Actinomyces Systems 2

Chair: Rolf Mueller, Saarland University, DE

15.00-15.30

Peter Leadlay

Cambridge University, UK

Defining modularity in polyketide synthase-containing pathways

15.30-16.00

Hiroyasu Onaka

Toyama Prefectural University, JP

Biosynthesis and genetic engineering of goadsporin, one of thiazole and oxazole containing peptides (TOPs) produced by Streptomyces sp. TP-A0584

16:00-16:30

Coffee break

16:30-17:00

Wolfgang Wohlleben

Tübingen University, DE

Supply of building blocks for antibiotic biosynthesis

17:00-17:10

Bohdan Ostash

Ivan Franko National University of Lviv, UA

Exploring and exploiting moenomycin biosynthesis to develop new class of antibiotics: contributions of genomics

17:15-17:25

Hrvoje Petkovic

Acies Bio, Ltd., SI

New insights into substrate supply and regulation of FK506 biosynthesis and their implications for bioprocess development and drug discovery

17.30-17.40

Sergey Zotchev

Norwegian University of Science and Technology, NO
Genome mining of marine actinobacteria for secondary metabolite biosynthesis gene clusters: tools and applications

17.40-18.10

1 min. poster presentations (Posters 26-35)

18:10-21.00

Poster session

19.00

Dinner

Thursday 6 October

Session 7: Tools and Host Structures 1

Chair: Chris Voigt, UCSF, US

09.00-09.30

Luis Serrano

CRG, ES
A quantitative systems biology study on a model bacterium

09.30-10.00

Haruo Ikeda

Kitasato University, JP
Engineered streptomyces host for heterologous expression of secondary metabolism

10.00-10.10

Julia Bandow

Ruhr-Universität Bochum, DE
Beyond Identification of Antimicrobial Compounds: Elucidating Antibiotic Mechanisms of Action

10.10-10.40

Coffee break

10.40-11.10

Kristala Jones Prather

MIT, US
Parts, devices, and chassis in support of metabolic engineering

11.10-11.40

Michael Fischbach

UCSF, US
A gene-to-molecule approach to the discovery and characterization of natural products

11.40-11.50

Martin Grninger

Max-Planck-Society, DE
Chemically coded two-step synthesis of lactones

11.55-12.05

Santiago Comba

National University of Rosario, AR
*Interplay between lipid metabolism and polyketide production in *Streptomyces coelicolor**

12.10-12.20

Marnix H Medema

University of Groningen, NL
Automated Mining and Synthetic Biology Implementation of Secondary Metabolite Biosynthesis Gene Clusters

12.25-12.35

Wayne Mitchell

Experimental Therapeutics Centre, SG
Engineering a Natural Product Chemicopia

13.00

Lunch

Session 8: Tools and Host Structures 2

Chair: Michael Fischbach, UCSF, US

15.00-15.30

Beatrix Suess

Frankfurt University, DE

Engineered riboswitches - an alternative means to control gene expression

15.30-15.40

Anne-Gaëlle Planson

University of Evry, FR

Therapeutic production in Escherichia coli using retrosynthetic design of metabolic pathways

15.40-16.10

Coffee break

16.10-16.20

Christian Rausch

Royal DSM N.V., NL

NRSPredictor2: an established method for the prediction of NRPS adenylation domain specificity – update and examples of applications

16.25-16.35

Adam Spargo

University of Exeter, UK

Rule-based simulation of synthetic integron construction

16.40-16.50

Colin Lazarus

University of Bristol, UK

Molecular systems development for studying and manipulating natural product biosynthesis

16.55-17.05

Antonio Starcevic

University of Zagreb, Zagreb, Croatia

Modelling of homologous recombination in modular polyketide synthases combined with synthetic biology as a strategy for producing biologically active lead compounds

17.10-17.30

Chris Voigt

Massachusetts Institute of Technology, US

Refactoring Prokaryotic Gene Clusters

17.30-18.30

Forward Look Plenary Discussion

19.00

Get-together & Conference Dinner

Friday 7 October

Breakfast & Departure