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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With support from:

DSM – the Life Sciences and Materials Sciences Company
Final Programme

Sunday 2 October

Late afternoon / early evening

19.00
Registration at the ESF-RC desk

20.00
Welcome Drink

20.00
Supper

Monday 3 October

08.45-09.00
Conference Opening

Session 1: General Synthetic Biology 1
Chair: Name, Affiliation – to be confirmed

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
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
Alfonso Jaramillo
Institute of Systems and Synthetic Biology, FR
*Engineering and characterization of novel regulatory elements to control gene expression in E. coli*

12.30
Lunch
Session 2: General Synthetic Biology 2
Chair: Name, Affiliation – to be confirmed

15:00-15:30  Luis Serrano
CRG, ES
A quantitative systems biology study on a model bacterium

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  Eric Tippmann
Cardiff University, UK
New approaches for the optimization of translational and post-translational modification of proteins

17:10-17:40  1 min. Poster presentations (Poster 1-16)
17.40-21.00  Poster session
19.00  Dinner

Tuesday 4 October

Session 3: Filamentous Fungal Systems 1
Chair: Name, Affiliation – to be confirmed

09.00-09.30  Nancy Keller
University of Wisconsin-Madison, US
Unlocking the fungal treasure chest

09.30-09.40  Sabine Albermann
Westfälische Wilhelms-Universitäet, 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: Name, Affiliation – to be confirmed

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-Acetyl Polyketides: Mupirocin and Thiomarinol

16.40-16.50 Joseph Strauss
BOKU University and Austrian Institute of Technology, AT
Histone H3 de-methylases are involved in regulating primary and secondary metabolism

17.00-17.30 1 min. poster presentation (Posters 17-32)
18.00-21.00 Poster session
19.00 Dinner

Wednesday 5 October

Session 5: Actinomyces Systems 1
09.00-09.30

Mohamed Marahiel
University of Marburg, DE
*Structural insights into the NRPS assembly machinery*

09.30-09.40

Christopher Corr
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
*Title to be confirmed*

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 Menéndez
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: Actinomycetes Systems 2

Chair: Name, Affiliation – to be confirmed

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 33-48)

18:10-21.00
Poster session

19.00
Dinner

Thursday 6 October

Session 7: Tools and Host Structures 1
Chair: Name, Affiliation – to be confirmed

09.00-09.30
Arnold Driessen
University of Groningen, NL
Secondary metabolite formation by Penicillium chrysogenum

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
Beatrix Suess
Frankfurt University, DE
Engineered riboswitches - an alternative means to control gene expression

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

11.55-12.05
Ana Lorena Arabolaza
Instituto de Biología Molecular y Celular de Rosario-CONICET, AR
Cell host design for the production of malonyl-CoA based compounds
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| 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                                                                  |
| 15.00-15.30 | Kristala Jones Prather                   | MIT, US             | Parts, devices, and chassis in support of metabolic engineering   |
| 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 | NRPSpredictor2: 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 syntheses combined with synthetic biology as a strategy for producing biologically active lead compounds |
| 17.10-17.30 | Chris Voigt                                | UCSF, US            | Refactoring Prokaryotic Gene Clusters                                 |
| 17.30-18.30 |                                                |                     | Forward Look Plenary Discussion                                      |
| 19.00 |                                                |                     | Get-together & Conference Dinner                                      |

Friday 7 October

Breakfast & Departure