Summer School on " Microbial Specialised Metabolites: Origins and Applications", Dubrovnik, Croatia, September 13-21 2014

Timetable

	Sat 13	Sun 14	Mon 15	Tues 16	Wed 17	Thurs 18	Fri 19	Sat 20	Sun 21
8:00-9:00		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
9:00-10:30		L2 Flavia Marinelli	L4 Joern Piel	L6 Roberto Kolter		L8 Gerry Wright	L10 Flavia Marinelli	L12 Mervyn Bibb, Greg Challis	
10:30-11:00		Break	Break	Break	Trip	Break	Break	Break	Departure
11:00-12:30	Arrival	L3 Gerry Wright	L5 Mervyn Bibb, Govind Chandra, Greg Challis	L7 Mervyn Bibb, Maureen Bibb		L9 Duška Vujaklija	L11 Joern Piel	Wrap-up	
13:00-14:00		Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	
14:00-15:30		Small-group discussion	Computer workshop CW1*	Computer workshop CW1*		Computer workshop CW2*	Computer workshop CW2*	Free time	
15:30-18:00	Welcome and opening lecture L1 Roberto Kolter	Free time & City tour 16:00 – 17:30	Free time	Free time		Free time	Free time		
18:00-20:00	Reception at IUC	Guest seminar GS1 Mechas Zambrano	Poster session 1	Guest seminar GS2 Paco Barona Gomez	Dinner	Poster session 2	Guest seminar GS3 Alison Foster		
20:00---		Dinner	Dinner	Dinner		Dinner	Dinner and debate	Party at Mimoza Restaurant	

*Half the group does the computer workshop on one day and the second half on the next; meanwhile the other half has small-group discussions with the teaching staff. Thus each student will participate in two computer workshops and three small-group discussion sessions.

Faculty
Maureen Bibb, John Innes Centre, Norwich, UK
Mervyn Bibb, John Innes Centre, Norwich, UK
Greg Challis, University of Warwick, UK
Govind Chandra, John Innes Centre, Norwich, UK
David Hopwood, John Innes Centre, Norwich, UK
Roberto Kolter Harvard Medical School, Boston, USA
Flavia Marinelli, University of Insubria, Varese, Italy
Joern Piel, University of Bonn, Germany
Duška Vujaklija, Rudjer Bošković Institute, Croatia
Gerry Wright, McMaster University, Canada

Administration
Joyce Hopwood, Norwich, UK

Guest seminar speakers
Paco Barona-Gomez, Langebio Cinvestav, Guanajuato, México
Alison Foster, University Botanic Garden, Oxford, UK
María Mercedes Zambrano, Corporación Corpogen, Bogotá, Colombia

Lecture topics (L1 - L12)
L1 Roberto Kolter – A brief history of antibiotics
L2 Flavia Marinelli – Isolation, cultivation and screening of microbial producers of specialised metabolites
L3 Gerry Wright – Practical purification and characterisation of microbial natural products
L4 Joern Piel – Dissecting and manipulating biosynthetic pathways
L5 Mervyn Bibb/Govind Chandra/Greg Challis – Introduction to the computer workshops
L6 Roberto Kolter – Microbial chemical ecology
L7 Mervyn Bibb/Maureen Bibb – Regulation of specialised metabolism and morphological differentiation and its analysis
L8 Gerry Wright – Expansion of natural product chemical diversity: Lessons from antibiotic discovery
L9 Duška Vujaklija –Translational modification: focus on global studies of the protein phosphorylation in bacteria
L10 Flavia Marinelli – Industrial fermentation and strain improvement of producing microorganisms
L11 Joern Piel – Cultivation-independent techniques for drug discovery and production
L12 Mervyn Bibb/Greg Challis – Metabolic pathway discovery by genomics and activation of cryptic pathways for drug discovery

Guest seminars (GS1 – GS3)
GS1 María Mercedes Zambrano – Microbial communities in diverse ecosystems
GS2 Paco Barona-Gomez - An evolution-inspired natural products genome mining approach reveals novel biosynthetic pathways in *Streptomyces*
GS3 Alison Foster – Colour, smell and taste – the beautiful world of plants and chemistry

Hands-on computer workshops (CW1 and CW2)

Microbial genomes can now be sequenced and automatically annotated in a matter of hours. Transcriptomics is moving rapidly from microarray hybridization to RNA-seq and protein DNA interactions are being studied at the whole-genome level by ChIP-seq. The first workshop will describe the formats of data coming from such high-throughput technologies and demonstrate tools and methods for turning these data into conclusions and knowledge. The second workshop will introduce software and web sites for the identification and analysis of metabolic gene clusters, especially, but not exclusively, those for polyketides and non-ribosomal peptides. These websites are ideal for analysing cryptic biosynthetic gene clusters and making structural predictions about their metabolic products, providing examples of the increasing power of bioinformatics for deducing details of biosynthetic pathways from DNA sequences and hence aiding in the discovery of novel, useful compounds. The associated lecture (L12), after the workshop, will describe examples of the experimental discovery of novel metabolites using the principles developed in the workshop.