Summer School on Microbial Specialised Metabolites, 12-20 September 2026

	Sat 12	Sun 13 BIOSYNTHESIS	Mon 14 DISCOVERY	Tues 15 PROBLEM SOLVING	Wed 16	Thurs 17 METHODS	Fri 18 ECOLOGY	Sat 19 NP FRONTIERS	Sun 20
7:00-9:00		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
9:00-10:00		L02 Natural products overview + methods (Wilkinson)	L05 Natural products in industry (Marinelli)	L09 Regulation of biosynthesis (Elliot) **(09:00-10:30)***		L10 Techniques to analyse gene regulation (Hutchings)	L13 Plant-microbe interactions (Hutchings)	L17 Engineering biosynthesis/ synthetic biology (Wilkinson)	
10:00-11:00		Challenge project initial session	L06 Big data and tools for metabolite discovery (Duncan/Truman)	**Break from 10:30-11**		L11 Structural biology in biosynthesis (Alkhalaf)	L14 Evolution of pathways/phylogenetics (Jensen)	L18 Resistance guided discovery (Wright)	
11:00-11:30	Arrival	Break	Break			Break	Break	Break	
11:30-12:30		L03 Polyketide and terpene biosynthesis (Challis)	L07 Metabolite discovery from specialised niches (Pupo)	Polyketide Workshop (Alkhalaf/Challis) **(11-12:30)**		L12 Metabolomics (Duncan)	L15 Metabolism associated with insect-microbe interactions (Pupo)	L19 New frontiers in biosynthesis and ecology (Jensen)	
13:00-14:00		Lunch - IUC	Lunch - Mimoza	Lunch - IUC		Lunch - IUC	Lunch - Mimoza	Lunch - IUC	
14:00-15:30		Small group discussions	L08 Antibiotic discovery and purification (Wright)	Computer workshop and CW1** (or Small Group)		Computer workshop CW2** (or Small Group)	Computer Workshop Summary and then finalising challenge group plans/presentations	Challenge project presentations and assessment	
15:30-18:00	L01 Welcome and opening lecture Roberto Kolter	Free time & City tour 16:00 – 17:30	Challenge project preparation (30 min) then free time	Free time		Free time	Free time	Wrap-up session	
18:00-20:00	Reception at IUC	L04 Peptide biosynthesis (Truman) (18:00-19:30)	Flash talks & Poster session 1	Flash talks & Poster session 2		Flash talks & Poster session 3	L16 Zambrano talk (18:00-1930)	Free time	
20:00-		Dinner at Mimoza	Free evening	Small Group Dinner		Dinner at Mimoza	Small Group Dinner	Farewell dinner at Mimoza Restaurant	

Excursion to Cavtat & Lokrum

Students free to dine wherever

Departure

* Deviations from the usual timing slots are highlighted in **bold**

** Half the group does the computer workshop on Tuesday and the second half on Thursday; the other half participates in a Small Group discussion.

Hands-on computer workshops (CW1 - CW2):
Polyketide Biosynthesis and Computer Workshops: Mechanistic principles of polyketide assembly – led by Lona Alkhalaf and Greg Challis
The workshop will introduce software, websites and methods for the analysis of specialised metabolite biosynthetic gene clusters encoding modular polyketide synthases and non-ribosomal peptide synthetases. These websites and methods are useful 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 compounds.

Small Group Discussion options (topics chosen by the students):
Microbial interactions and chemical ecology - expression of BCGs in natural settings
Techniques for genetic manipulation and heterologous expression
Regulation of specialised metabolism
Elucidating enzyme function and mechanism; interrogating biosynthetic protein interactions
Natural product purification and structural determination
How do we find/develop new antibiotics?
Industry or academia (or both)?
Bioinformatics and genome mining for natural product discovery
Evolution of specialised metabolism

The groups usually consist of 1-2 faculty members with 5-10 students depending on topic popularity. The interactive discussions are led by the students.

Challenge Projects:
Groups of 5-6 students will work together throughout the course to develop a "plan of action" to solve a specific problem/unmet need in any area that involves microbial specialised metabolites. They will then present their plan on the final day of the course as a 5-minute pitch plus 10 minutes for questions, which will be judged by a judging panel of selected faculty members.