COURSE DETAIL

SIGNALING AND SYSTEMS BIOLOGY OF MICROBIOMES
Country Italy
Host Institution University of Bologna
Program(s) University of Bologna
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Biological Sciences
UCEAP Course Number 183
UCEAP Course Suffix
UCEAP Official Title SIGNALING AND SYSTEMS BIOLOGY OF MICROBIOMES
UCEAP Transcript Title BIO OF MICROBIOMES
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description

This course is part of the LM degree program and is intended for advanced level students. Enrollment is by consent of the instructor. The course covers molecular, cellular, and “-omics” aspects of the following topics (considering both theoretical and methodological points of view): 1) Cell-cell communication in bacteria (quorum sensing): basic principles and components of quorum sensing (QS); role of the QS in microbial pathogenicity, genome plasticity (horizontal gene transfer), stress response, and microbial interaction with the host; and application of quorum sensing circuits in biotechnology and synthetic biology of single bacteria and microbial communities. 2) Microbial biofilms: distribution and diversity of biofilms; mechanisms of biofilm formation and persistence; microbial metabolism and physiology in biofilm; role of QS in biofilm formation; biofilm resistance and tolerance; in vitro systems to grow and study the microbial biofilm; and the role/importance of biofilms in medical and industrial fields. 3) Bacterial second messengers: molecular mechanisms of the nucleotide second messenger (NSM)-based intracellular signaling in bacteria; the different components involved in the NSM-based signaling; and essential and emerging roles of NSMs in bacterial sensing and cellular response, biofilm formation, and microbial interactions. 4) Signaling and interactions within microbial communities: “-omics” to study microbial communities and microbial interactions; and designing and construction of synthetic microbial communities for the application in medical, industrial, and environmental fields.

Language(s) of Instruction
English

Host Institution Course Number
96035

Host Institution Course Title
SIGNALING AND SYSTEMS BIOLOGY OF MICROBIOMES

Host Institution Campus
BOLOGNA

Host Institution Faculty

Host Institution Degree
LM in MOLECULAR AND CELL BIOLOGY

Host Institution Department
Pharmacy and Biotechnology

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