

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 Course Details

<https://www.unibo.it/en/teaching/course-unit-catalogue/course-unit/2022/467669>

Host Institution Campus

BOLOGNA

Host Institution Faculty

Host Institution Degree

LM in MOLECULAR AND CELL BIOLOGY

Host Institution Department

Pharmacy and Biotechnology

Course Last Reviewed

2022-2023

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