UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

BIOTECHNOLOGICAL MICRORGANISMS MOD 2

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/02 (SYSTEMATIC BOTANICS)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOTECHNOLOGY
Curriculum	Chem- Pharma-Tech
Year of study	3°
Period	(01/10/2021 - 14/01/2022)
ECTS	3
Lesson hours	24 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	RODOLFI MARINELLA - 3 ECTS
Prerequisites	At the beginning of the course introductory knowledge concerning mycology will be provide. To make the course as profitable as possible, the student should have basic notions of microbiology.
Learning outcomes	To know how to frame the main environmental fungal taxa and their life cycle, acquire up-to-date knowledge of systematics; - be able to frame and describe the main metabolic potential of biotechnological interest, with particular reference to secondary metabolism; - be able to frame and describe the life dynamics of the main fungal groups producing extrolites; - know how to critically manage the main practical and application mycological aspects.
Course contents	Fungi as modular organisms: filamentous fungi, yeasts and yeast-like

	fungi, dimorphic and polymorphic. Fungal growth, morphogenesis, principles of nutrition, structural peculiarities, with particular regard to those of biotechnological interest; basic presentation of the fungal genome with focus on transposable elements and micovirus. The updated systematics and taxonomy of the V kingdom, way of life, exploitation and environmental adaptation. How fungi fit into biotechnology: historical, recent applications and new potentiality. Presentation of the fungal phyla and, within them, of the main fungal taxa of biotechnological interest, with particular reference to their reproductive cycles and their peculiar metabolic, fermentative and adaptive characteristics, origin of potential application. Focus on the main categories of molecules of biotechnological interest and on extracellular enzymes, with reference to processes, substrates, influence of environmental factors. How to manage the fungal species useful for biotechnology: laboratory best practices, instruments, methodologies for strain growth and iper-production.
Teaching methods	Frontal lesson. During each lesson, both basic theoretical concepts and application aspects supported by specific examples will be explained. The main fungal species will be presented and discussed by means of a descriptive sheet. Students will be involved and motivated to discuss the topics considered.
Reccomended or required readings	Lessons will be conducted with exhaustive presentations, adequate for the comprehension of the course. Further teaching and in-depth material (i.e. paper, review,...) will be made available during of the lessons and will be in English (since it is unavailable in Italian). Out of self-interest, students may refer to "Handbook of Fungal Biotechnology" 2nd Ed., Taylor & Francis, 2003.
Assessment methods	Oral examination carried out together with module 1. Questions will be aimed at verifying the acquisition, by the student, of the topics presented during the course.
Further information	During the carrying on of the lessons it will be possible to dwell on some species of biotechnological interest that are subject of new reports by the international scientific community.
Sustainable development goals - Agenda 2030	Aspects concernong the innovative use of microfungi in the food industry will be considered within the goals of counteracting problems related to a poorly balanced nutrition and food safety. $lbl_legenda_sviluppo_sostenibile