EUROMIWO VALÈNCIA 2024

IMPLEMENTATION OF ANTIMICROBIALS DISCOVERY BY STUDENT CROWDSOURCING THROUGH A SERVICE-LEARNING STRATEGY. EUROPEAN MICROBIAL WORLD

WHAT, WHEN AND WHERE

EUROMIWO is a Blended Intensive Program (BIP), a combination of short-term physical mobility (**9-13 September 2024**) with a virtual component **(2 and 23 September 2024)** using innovative teaching methods, organized by the Universitat de València.

Mobility funded by Erasmus Program

Recognition ECTS

The participation in a BIP grants 3 ECTS credits to the student.

Coordination: Prof. Sergi Maicas and Prof. Belén Fouz. Department of Microbiology and Ecology (Universitat de València)

Inscription:

Send an e-mail including a brief CV to micromon@uv.es **before** 30 June, 2024.

Contact:

micromon@uv.es

More info:

https://www.uv.es/superbugs/

https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2020.564030/full

Implementation of antimicrobials discovery by student crowdsourcing through a service-learning strategy. European Microbial World (EUROMIWO)

COORDINATION

Prof. Sergi Maicas (SMP) & Prof. Belén Fouz (BFR). Department of Microbiology and Ecology. Faculty of Biology. Universitat de València. Burjassot, València SPAIN

Contact: micromon@uv.es

MOBILITY GRANTS

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INTRODUCTION

Antimicrobial resistance (AMR) is a global health and development threat. It requires urgent multisectorial action in order to achieve the Sustainable Development Goals (SDGs). WHO has declared that AMR is one of the top 10 global public health threats facing humanity. Misuse and overuse of antimicrobials are the main drivers in the development of drug-resistant pathogens. Lack of clean water and sanitation and inadequate infection prevention and control promotes the spread of microbes, some of which can be resistant to antimicrobial treatment. The cost of AMR to the economy is significant. In addition to death and disability, prolonged illness results in longer hospital stays, the need for more expensive medicines and financial challenges for those impacted. Without effective antimicrobials, the success of modern medicine in treating infections, including during major surgery and cancer chemotherapy, would be at increased risk.

Within the emerging antibiotic pandemic context, four universities belonging to the FORTHEM Alliance, University of València (UV), University of Mainz (UMainz), University of Palermo (UniPa) and University of Opole (UniOp), are inviting international students to join a Blended Intensive Program (BIP) to learn more about the relation between microorganisms and their ability to produce antibiotic substances. Moreover, during this BIP, methodologies and best practices are shared and discussed between professors and students virtually as well as face to face in order to set the new horizon for pandemics.

What are antimicrobials?

Antimicrobials – including antibiotics, antivirals, antifungals and antiparasitics – are medicines used to prevent and treat infections in humans, animals and plants.

What is antimicrobial resistance?

Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or impossible to treat.

Why is antimicrobial resistance a global concern?

The emergence and spread of drug-resistant pathogens that have acquired new resistance mechanisms, leading to antimicrobial resistance, continues to threaten our ability to treat common infections. Especially alarming is the rapid global spread of multi- and pan-resistant bacteria (also known as “superbugs”) that cause infections that are not treatable with existing antimicrobial medicines such as antibiotics. The clinical pipeline of new antimicrobials is dry. In 2019 WHO identified 32 antibiotics in clinical development that address the WHO list of priority pathogens, of which only six were classified as innovative. Furthermore, a lack of access to quality antimicrobials remains a major issue. Antibiotic shortages are affecting countries of all levels of development and especially in health- care systems. Antibiotics are becoming increasingly ineffective as drug-resistance spreads globally leading to more difficult to treat infections and death. New antibacterials are urgently needed – for example, to treat carbapenem-resistant gram-negative bacterial infections as identified in the WHO priority pathogen list. However, if people do not change the way antibiotics are used now, these new antibiotics will suffer the same fate as the current ones and become ineffective.

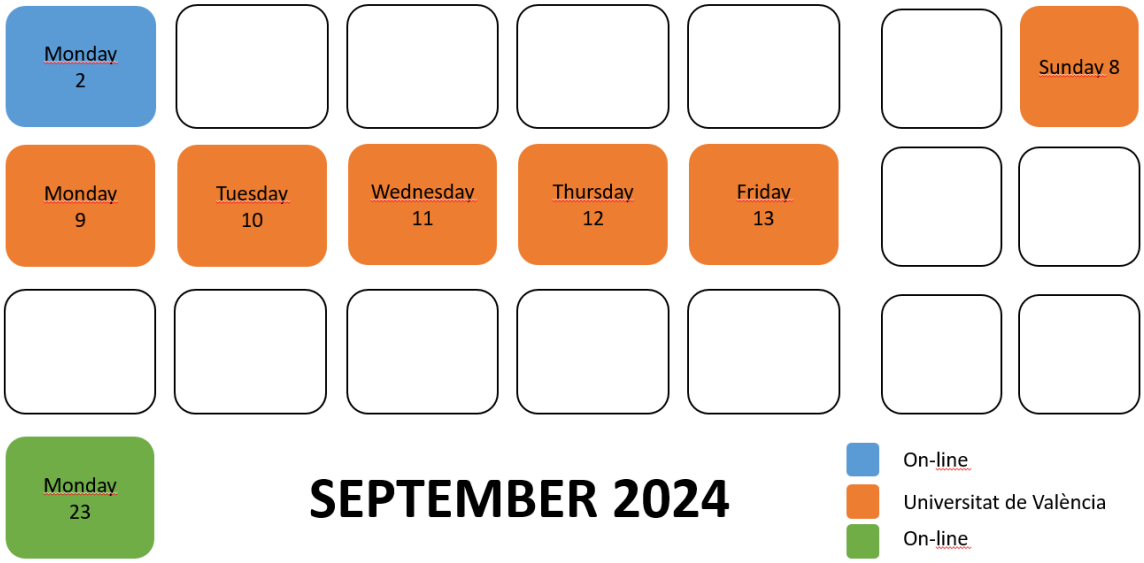
The cost of AMR to national economies and their health systems is significant as it affects productivity of patients or their caretakers through prolonged hospital stays and the need for more expensive and intensive care. Without effective tools for the prevention and adequate treatment of drug-resistant infections as well as improved access to existing and new quality-assured antimicrobials, the number of people for whom treatment is failing or who die of infections will increase. Medical procedures, such as surgery, including caesarean sections or hip replacements, cancer chemotherapy, and organ transplantation, will become riskier.

What accelerates the emergence and spread of antimicrobial resistance?

AMR occurs naturally over time, usually through genetic changes. Antimicrobial resistant organisms are found in people, animals, food, plants and the environment (in water, soil and air). They can spread from person to person or between people and animals, including from food of animal origin. The main drivers of antimicrobial resistance include the misuse and overuse of antimicrobials; lack of access to clean water, sanitation and hygiene (WASH) for both humans and animals; poor infection and disease prevention and control in health-care facilities and farms; poor access to quality, affordable medicines, vaccines and diagnostics; lack of

SCHEDULE

Part 1: Virtual component A
Part 2: In-person intensive week at Universitat de València, Spain
Part 3: Virtual component B and evaluation


Monday 2
Sunday 8
Monday 9
Tuesday 10
Wednesday 11
Thursday 12
Friday 13
Monday 23
SEPTEMBER 2024
On-line
Universitat de València
On-line

Part 1: Virtual component A (2h)
Start of this part is Monday 2 September 2024 (BFR and SMP).
Pre-test regarding the content of the project. Iwona Sobieraj and Karolina Kupis
Start-up of the project – in international teams:
Start project work & self-study; Creation of the groups and identification; sampling procedure; overview of the laboratory manual. Basic explanation BFR and SMP

Part 2: In-person intensive week at University of València, Spain
Start of this part is Sunday 8 September 2024.

Sunday, 8 September 2024

Time	What	Where
Evening (20)	Welcome reception: Natural History Museum. Burjassot	University of València (UVEG)

Monday, 9 September – Defining the problem of AMR

Time	What	Who	Where
8:30-9:30	Arrival and documentation	Valencian Student Team	UVEG
9:30-10:30	Welcome and introduction	SMP / BFR	UVEG
10:30-11	Coffee break		UVEG
11-13	Lab session 1: start-up of the project. International teams. Introduction. Soil sample processing: Dilution and spreading	Sergi Maicas Prieto	UVEG
13-14:30	Lunch		UVEG
14:30-16	Lab session 2: geolocalization	Jaume Segura García	UVEG
16-17	Keynote lecture 1: Antimicrobial resistance	Alfonso Navarro Marzal	UVEG
17-17:30	Coffee break		UVEG
17:30-18.30	Keynote lecture 2: Safety guides in lab	Elena González Biosca	UVEG
18.30	Social activity. Visit València	Guide & Support Team	UVEG

Tuesday, 10 September – AMR & Superbugs

Time	What	Who	Where
9-10:30	Keynote lecture 3: Physical-chemical approaches to investigate antimicrobial activity and resistance in microorganisms	Elena Piacenza (UNIPA)	On-line
10:30-11	Coffee break		
11.30-13.30	Visit CECT (Spanish Type Culture Collection)	Laboratory support team	CECT
13.30-14:30	Lunch		
14:30-16	Keynote lecture 4: Resistance in CTCL associated *Staphylococcus aureus*	Nazzareno Dominelli (UMainz)	On-line
16-16:30	Coffee break		
16:30-18	Lab session 3: microbial isolation	Jesús Zueco Cruz	UVEG

Wednesday, 11 September – Conservations of strains

Time	What	Who	Where
9-10.30	Lab session 4: master plates	Laboratory support team	UVEG
10.30-11	Coffee break		UVEG
11-13	Lab session 5: soil characterization	Esther Carbó Valverde	UVEG
13-14:30	Lunch		UVEG
15:30-18	Cultural activity: oceanogràfic València		OCEAN

Thursday, 12 September – Antibiosis tests

Time	What	Who	Where
9-10:30	Lab session 6: Antibiosis assay	Laboratory support team	
10:30-11	Coffee break		UVEG
11-12:30	Keynote lecture 7: Searching for antibiotics from historical and current perspectives	Ewa Moliszewska (UNIOPO)	UVEG
12:30-14	Keynote lecture 8: Antibiotic biosynthesis and resistance: the two-sides of the same coin	Rosa Alduina (UNIPA)	UVEG
14-16:00	Lunch		UVEG
16:00-18:00	Natural History Museum Visit	NHM personnel	UVEG
19	Evening cocktail		

Friday, 13 September – Results and conclusions

Time	What	Who	Where
8:30-9:30	Lab session 7: results	Laboratory support team	UVEG
9:30-10:30	Keynote lecture 9: microbiology in society (citizen science & service learning)	Belén Fouz Rodríguez	UVEG
10:30-11	Coffee break		UVEG
11-12	Keynote lecture 10: Socio-cultural determinants of the problem of antibiotics resistance	Karolina Kupis (UNIOPO)	UVEG
12-13	Keynote lecture 11: Methods of evaluating service-learning projects on the example of the Superbugs project	Iwona Sobieraj (UNIOPO)	UVEG
13-14:30	Lunch		UVEG
14:30-15	Quiz	Valencian Student Team	UVEG
15-15:30	Closing speeches and feedback	BFR / SMP	UVEG

Part 3: Virtual component and evaluation (2h).
Start of this part is Monday 23 September 2024.
Online Conclusions; Final test (evaluation)