# CURRENT RESEARCH TOPICS IN PHARMACY:

# *Microbiology Debates*

**December 14th, 2022 14.00 PM ISTANBUL**

***FOR REGISTRATION:***

## First Session- *Moderator: Büşra ERTAŞ 14.00-15.45 PM*

**Welcome- Assoc.Prof.Esra TATAR**

**Bacteriotheraphy – Dr. Zahraa AMER HASHIM**
*Mosul University, Mosul, Iraq*

**Antibiotic resistance – Assist.Prof. Pervin RAYAMAN**
*Marmara University, Istanbul, Turkey*

**The vaccination in Albania : An assessment of the level of knowledge and behaviour of the population regarding vaccines.- Assoc.Prof. *Mirela MIRAÇI***
*University of Medicine, Tirana, Albania*

**Chicken contamination with thermotolerant Campylobacter in Tunisia: Antibiotic resistance and virulence profiling –Dr.Awatef BEJAOUI**
*Institut Pasteur de Tunis, Tunis, Tunisia*

## Second Session- *Moderator: Esra TATAR 16.00-17.45 PM*

**Plant phenolics and their synthetic derivatives as inhibitors of *Helicobacter pylori* : Suggestion for a new mechanism of action - *Assoc.Prof.* Simone CARRADORI**
"G. d'Annunzio" University of Chieti-Pescara *University, Chieti Italy*

**Pomegranate rind extract with Zn (II) combination as a new therapeutic agent for oral care products- Dr.Vildan ÇELİKSOY**
*Cardiff University, Cardiff, UK*

**The antimicrobial effects of honey and other bee-derived products- Dr.Saira KHAN**
*Cardiff University, Cardiff, UK*

**Chair**
*Prof. Hatice Kübra ELÇİOĞLU*

***Vice Chairs***
*Prof. Levent KABASAKAL & Assoc. Prof. Esra TATAR*

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# ANTIBIOTIC RESISTANCE

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Antibiotics are medicines used to prevent and treat bacterial infections. Antibiotic resistance occurs when the response of bacteria to medicines. Unfortunately nowadays the emergence of resistance among bacterial pathogens is a major public worldwide health problem. Antibiotic resistance is a vital problem since it concerns human, animals, plants and environmental factors.

Additionally, multidrug-resistant organisms have emerged not only in the hospital but also in the community. The presence of antibiotic-resistant bacteria reservoirs outside the hospital is a worlwide issue which concerns many scientist. Moreover, according to the World Health Organization (WHO) antibiotic resistance is one of the 3 most important public health threats of the 21st century. Furthermore, according to Centers for Disease Control and Prevention (CDC) antibiotic resistance is estimated to cause around 300 million premature deaths by 2050, with a loss of up to $100 trillion (£64 trillion) to the global economy.

As it is known the mechanisms of antimicrobial resistance are modifications of the antimicrobial target, Enzymatic degradation of antibacterial drugs, changes in membrane permeability to antibiotics, changes in important metabolic pathways, activation of efflux mechanism.

During the modifications of the antimicrobial target in order to avoid the action of the antibiotic bacteria have evolved different tactics one of which is target protection (avoiding the antibiotic to reach its binding site) and the other one is modifications of the target site which results in decreased affinity for the antibiotic molecule. For example drugs affected by this mechanism include tetracycline (Tet[M] and Tet[O]), fluoroquinolones (Qnr) and fusidic acid (FusB and FusC) during target protections. The methicillin resistance seen in *Staphylococcus aureus* due to replacement of an exogenous PBP (PBP2a) and vancomycin resistance in enterococci is an example of replacement or bypass of the original target.

The β-Lactamases, macrolide esterases and aminoglycoside acetyltransferases are take place in enzymatic degradation of antibacterial drugs. Many of the antibiotics used in clinical practice have intracellular bacterial targets. Therefore, the compound must penetrate the outer and/or cytoplasmic membrane in order to exert its antimicrobial effect. β-lactams, tetracyclines and some fluoroquinolones are particularly affected by changes in permeability of the outer membrane. Also one of the most important mechanisms of antimicrobial resistance is the activation of efflux mechanisms. Many classes of efflux pumps have been characterized in both gram-negative and gram-positive pathogens. It is known that more than 20 different tet genes cause tetracycline resistance. Additionally, MDR efflux pumps like *AcrAB-TolC* in Enterobacteriaceae and MexAB-OprM in *P. aeruginosa* are able to extrude tetracyclines (including tigecycline) as part of their contribution to multidrug resistance.

In order to combat with antibiotic resistance one should protect him or herself and also his or her family. As it is known infections caused by multi-drug antibiotic-resistant germs are quiet difficult, and sometimes impossible to treat. However we can help stop the spread of these microorganisms. Normally, antibiotic resistance happens when microorganisms like bacteria and fungi develop the ability to defeat the drugs designed to kill them. People can not completely avoid getting an infection, but there are few precautions that you can take in order to reduce infection risk. These are, washing hands, getting vaccinated, using antibiotics appropriately, preparing food safely, being vigilant when traveling abroad and preventing sexually transmitted diseases.


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Consequently, antibiotic resistance is a worlwide problem which concerns many scientist since combating with it getting hard day by day. Merely, if the neccessary precaution metioned about are taken, antibiotic resistance could be minimalized.

**Keywords:** Antibiotic resistance, multidrug-resistant organisms, efflux mechanisms.

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