

Seminars in Biotechnology BTEC 591 & BTEC 691

“Antimicrobial Drug Discovery”

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13:30

GTU Congress Center, Red Hall

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Fatma Gizem Avci received her B.Sc. (2010) and M.Sc. (2013) degrees from the Department of Bioengineering, Ege University. During her M.Sc. studies, she focused on the production of 1,3-propanediol (1,3-PDO) using a cell recycle bioreactor under the supervision of Prof. Dr. Nuri Azbar. She received a scholarship from Erasmus Exchange Programme and participated in a project on the production of 1,3-PDO using the metabolic engineering approach for 3 months in the Centre for Industrial Biotechnology and Biocatalysis, Ghent University, Belgium. She completed her Ph.D. at the Department of Bioengineering, Marmara University in 2018 under the supervision of Prof. Dr. Berna Sariyar Akbulut. Her research during her Ph.D. was mainly focused on antibiotic resistance, investigation of antimicrobial candidates specifically from plant-derived compounds to tackle this issue, and understanding their mechanism of action. With support from FEMS Research Fellowship, she also carried out studies on the characterization of bacterial membrane proteins at the National Scientific Research Center (CNRS-Centre National de la Recherche Scientifique) in Lyon, France.

Fatma Gizem Avci is currently an Assistant Professor at Uskudar University, Bioengineering Department, Turkey. Her research areas include antibiotic resistance, understanding antimicrobial mechanisms, omic technologies, and industrial/environmental biotechnology.

Abstract

Increased pressure imposed by improper and reckless use of antimicrobial agents has triggered the pace in the development and transmission of bacterial resistance, which is regarded as a serious health threat¹. The basic types of resistance mechanisms are known as enzymatic inactivation of the antimicrobials, modification of the target sites, and reducing intracellular accumulation of antimicrobials by arranging influx/efflux mechanisms². The loss in available drug efficacies due to these resistance mechanisms and the decrease in new antimicrobial discovery rates have increased the search for alternative strategies.

This talk will mainly focus on two different strategies to fight with increasing antimicrobial resistance. The first one is the use of plant-derived substances, which are of utmost importance in the discovery of new antimicrobial agents with their structural diversities and multi-target properties³⁻⁶. The second one

is understanding the allosteric inhibition of beta-lactamase enzymes, which are the most common resistance mechanisms developed by bacteria against beta-lactam antibiotics^{7,8}.

References

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