

Antibiotic Resistant Bacteria: Occurrence and removal from Urban Wastewater

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Friday, Feb. 5, 2021

Recorded Seminar: [Link](#)

Abstract: The seminar 'Antibiotic Resistant Bacteria: Occurrence and Removal from Urban Wastewater' is related with the topic of urban wastewater (UWW) reclamation and reuse with especial focus on the occurrence and treatment of antibiotic resistant bacteria (ARB) and antibiotic resistant genes (ARG). The presence and spread of ARB is one of the major global health concern of this century's, and in this context, UWW treatment plants are today considered as hotspots for the spreading of antibiotic resistance (AR). This is due to the presence of antibiotics (at ng-mg/L range) that may act as selective pressure for the microbial adaptation and selection of ARB. Therefore, along the presentation, the following contents will be discoursed: i) a brief description of main antibiotic's mechanisms to inactivate microorganisms; ii) the different ways of bacteria to develop and acquire the resistance to antibiotics; iii) the occurrence of ARB/ARG on UWW and finally, iv) the efficiency of conventional and non-conventional (including solar technologies) tertiary treatments for the removal of ARB and ARG from secondary effluents.



Short Bio: Dr. María Inmaculada Polo-López is senior researcher in the group of Solar Treatment of Water in the Plataforma Solar de Almería-CIEMAT, Spain. She obtained her PhD in 2012 from University of Almeria. Her main expertise is solar photocatalytic disinfection of water and wastewater for drinking and reuse. She is author/co-author of 72 publications, 2 books and 12 book chapters (H-index: 30). She has been involved in 15 research projects (National and International) and supervised/co-supervised 2 PhD and another 2 PhD currently under development. She is also co-Leader of Advanced Technologies for Water Reclamation Research Unit in the Joint Research Center (Univ. Almería-CIEMAT) in Solar Energy (CIESOL).

About ODAK_{TR}: ODAK_{TR} is a national CST initiative led by METU-GÜNAM with objectives to

1. Support Turkey's energy transition through the development & commercialization of CST technologies;
2. Catalyze domestic CST economic activity by supporting growth in markets, industrial capacities, and industrial activities;
3. Strengthen Turkey's CST Research and Innovation (R&I) capacities, including by creating globally competitive CST research opportunities at Turkish universities.

One of ODAK_{TR}'s main strategies to achieve these objectives is through harmonization of national activities with EU CST initiatives by strengthening and exploiting synergies created by METU-GÜNAM's role as Turkey's National Node for the CST European Research Infrastructure Consortium (ERIC) EU-SOLARIS, and participation in 5 EU H2020 projects: 1. SolarTwins; 2. HORIZON-STE; 3. SFERA-III; 4. INSHIP; and 5. GeoSmart.

About the ODAK_{TR} Seminar Series: Through the ODAK_{TR} Seminar Series, leading CST experts from METU-GÜNAM's strategic CST partners CIEMAT-PSA (Spain) and DLR (Germany) and other CST experts will give seminars targeting the Turkish CST community and tailored to support realization of ODAK_{TR}'s objectives. The ODAK_{TR} Seminar Series is being executed within the framework of the H2020 Project SolarTwins. The current ODAK_{TR} Seminar Series schedule is as follows, with all seminars from 12:00-13:00 Turkish time:

Date	Speaker, Institution	Seminar Title
18 Dec. 2020	Prof. Dr. Eduardo Zarza, CIEMAT-PSA, Spain	An Introduction to Concentrating Solar Thermal (CST) Technologies and Applications
08 Jan. 2021	Dr. Yelda Erden-Topal, UPM & CIEMAT, Spain, and METU TEKPOL, Turkey	CST in Turkey: Current State and National Strategies to Exploit Opportunities
15 Jan. 2021	Dr. Florian Wiesinger, DLR - Institute of Solar Research, Germany	Quality Assessment and Accelerated Aging Experiments of Optical Components for CSP Plants
22 Jan. 2021	PhDc. Gkiokchan Moumin, DLR - Institute of Future Fuels, Germany	Calcination of Cement Raw Meal in a Solar Rotary Kiln and Heat Transfer Challenges
5 Feb. 2021	Dr. Inmaculada Polo, CIEMAT-PSA, Spain	Antibiotic Resistant Bacteria: occurrence and removal from urban wastewater
12 Feb. 2021	Dr. Reiner Buck, DLR - Institute of Solar Research, Germany	Solar Particle Technology for Dispatchable Power and Heat Generation
19 Feb. 2021	Marcel Bial, ESTELA- The European Solar Thermal Electricity Association	First learnings from a multifold stakeholders position review regarding the deployment of CSP in Europe
26 Feb. 2021	Dr. Isabel Oller, CIEMAT-PSA, Spain	Water-Energy-Food nexus in industrial and urban wastewater recovery

About the H2020 SolarTwins Project: The aim of the SolarTwins project is to step-up the scientific excellence of the promising CST Research Division ODAK of METU-GÜNAM (Coordinator) in collaboration with the internationally leading CST institutions CIEMAT-PSA (Spain) and DLR (Germany). SolarTwins includes 4-weeks of CST summer schools at METU taught by leading experts from CIEMAT-PSA and DLR and METU graduate students co-advised by experts from CIEMAT-PSA and DLR. An expected impact is the establishment of competitively-funded METU-CIEMAT and METU-DLR Joint Research Lines.

About the National (Spain R&D) Project NAVIA: The general objective of the NAVIA project is the development of novel photocatalysts and new technologies based on solar advanced oxidation processes operated in continuous flow mode for urban wastewater reclamation. In this collaborative project, CIEMAT-PSA, CIESOL-University of Almeria and Universitat politècnica de València are involved. The expected impact of NAVIA is to obtain treated effluents with solar-based technologies at pre-industrial scale, operating the system by a developed decision-making tool for proper operation control, ensuring its final safe reuse in crops' irrigation.



About the ENI CBC MED Project AQUACYCLE: Its main objective is set to bring an eco-innovative wastewater treatment technology that will consist of anaerobic digestion, constructed wetlands and solar treatment for the cost-effective treatment of urban wastewater with minimal costs of operation and maximum environmental benefits. Three local action and investment plans (demonstration plants) will be established in Tunisia, Lebanon and Spain targeting a combined reuse potential of 900,000 m³ of treated effluent, being this action the higher expected impact of this project. CIEMAT-PSA (Spain) is partner of this project jointly with another six institutions from five countries (Greece, Spain, Malta, Lebanon, and Tunisia).



About METU-GÜNAM's CST Research Division ODAK: ODAK includes a diverse set of academics and post-doctoral researchers who are actively contributing to METU-GÜNAM's National and European CST activities:

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EU Projects and Activities Showcased by ODAK_{TR}



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Funding Agencies Supporting Projects Showcased by ODAK_{TR}



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