

2024

2.21 (wed.) 12:10  
12:50

12:10-12:15

◆ Introduction

12:15-12:40

◆ Seminar  
(Presentation)

12:40-12:50

◆ Q&amp;A

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(Zoom)Scan here for  
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# Energy Recovery Potential from Wastewater and Integrating Nanotechnology into the Recovery System

Chair: Assoc. Prof. Kim SCHUMACHER (Research Futures Coordinator of Q-AOS)



## Key Words

Nanotechnology

anaerobic digestion

Microbial Fuel Cells

Wastewater Treatment

energy recovery

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Osama Eljamal is an Associate Professor of Environmental Engineering in the Interdisciplinary Graduate School of Engineering Sciences (IGSES) at Kyushu University, Japan. He obtained his undergraduate degree in civil engineering from IUG, Palestine in 1997. He also received his Master and Ph.D. degrees in Environmental Engineering from the Graduate School of Engineering at Kyushu University in 2006 and 2009, respectively. He joined the department of earth resources engineering at Kyushu University as a JSPS postdoctoral fellow from April 2009 to October 2010. After that, he was appointed to the Graduate School of Bioresource and Bioenvironmental at Kyushu University in 2010 as an Assistant Professor. Afterward, he was promoted to Associate Professor in the Interdisciplinary Graduate School of Engineering Sciences (IGSES) at Kyushu University in 2014. He joined the Department of Chemical Engineering at University of Waterloo, Canada as a visiting Professor several times between June 2011 to September 2018. He also joined the Department of Engineering Science at University of Oxford, United Kingdom as a visiting Professor from January 2019 to October 2019.

Nanotechnology has a great potential to be used in energy recovery from wastewater, due its unique characteristic of having high surface area can be used efficiently for enhancing the chemical and biochemical reactions inside the energy recovery reactors. The urban areas generate a huge amount of wastewater must be treated carefully before discharge into the surrounding environment. The main purpose of conventional Wastewater Treatment Plants (WWTPs) is the removal of pollutants from wastewater which needs high amounts of energy taken from the public energy distribution grids. On the other hand, the wastewater contains a significant amount of organic matter that can be considered as a potential source for renewable energy. Various technologies to recover energy throughout WWTPs are being under consideration by several researchers worldwide. One of the available technologies is anaerobic digestion (AD) which is a biological process that converts organic matter into biogas energy. Microbial Fuel Cells MFC is another bioelectrical technology that use the natural metabolisms of microbes to produce electrical power directly from organic material