



# E-Newsletter SCHOOL OF CIVIL ENGINEERING



## WHAT DREAMS ARE MADE OF

ARCHITECTURE BEGINS WHERE  
ENGINEERING ENDS

*-Walter Gropius*

#EMPOWERCEUITM

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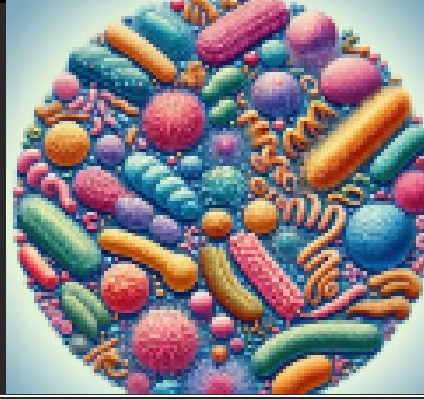
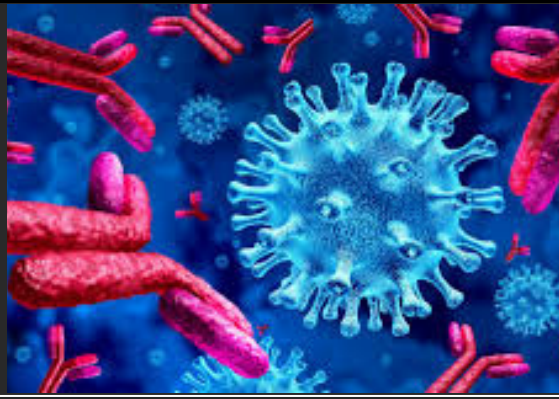
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# MICROPOLLUTANTS AND PATHOGENS IN WATER



## First and foremost...

Micropollutants and pathogens pose significant challenges to water quality and environmental health. These contaminants can enter soil and water from various sources, affecting ecosystems, human health, and water supply. In this article, we share our research efforts focused on detection and removing micropollutants and pathogens from water.

## What are they?

Micropollutants, also known as emerging pollutants (EPs), consist of natural and anthropogenic substances. They include pharmaceuticals, antibiotics, personal care products, pesticides, and industrial chemicals. These compounds have raised global concern due to their potential environmental impacts. As they are often present in surface water, groundwater, and even drinking water, effective removal strategies are crucial.

Pathogens are organisms that cause disease in their hosts. These harmful agents can infect humans and other organisms, leading to various illnesses. Several types of pathogens, bacteria, viruses, fungi, and parasitic worms.

## Importance and Challenges

- 1. Aquatic Ecosystem Health:** Micropollutants can disrupt aquatic ecosystems, affecting fish and other organisms. For instance, estrogen-related compounds have been associated with feminization of fish.
- 2. Drinking Water Production:** If contaminated water is used for drinking water production, eliminating micropollutants becomes even more critical. Antibiotic residues, for example, may contribute to antibiotic resistance in microorganisms.
- 3. Balancing Efficiency and Sustainability:** Researchers must strike a balance between efficient removal and sustainable practices. Developing technologies that are effective, cost-efficient, and environmentally friendly is essential.

## Sources

### 1. Household Wastewater:

Household wastewater contains a wide range of contaminants, including micropollutants and pathogens. Pharmaceuticals, hormone residues, personal care products, and pathogens can all enter water systems through domestic sewage.

### 2. Agricultural Activities:

Micropollutants such as pesticides and pathogens from manure application can directly discharge into surface water, impacting aquatic ecosystems.

### 3. Industrial Effluents:

Industrial processes release various micropollutants into water bodies, affecting water quality.

## Innovative Treatment Technologies

### 1. Advanced Oxidation Processes (AOPs):

AOPs generate highly reactive hydroxyl radicals (OH·) to break down micropollutants. Examples include UV-AOP and ozone-based processes.

### 2. Biological Treatment:

Biofilms, activated sludge, and constructed wetlands enhance biodegradation of micropollutants.

### 3. Hybrid Systems:

Combining multiple treatment technologies can improve overall removal efficiency.

In conclusion, ongoing research in micropollutant and pathogen removal by our research team aims to safeguard water quality, protect ecosystems, and ensure clean drinking water for communities worldwide. By understanding the sources, impacts, and innovative solutions, we can address these pressing environmental challenges.

**"WATER IS LIFE, AND CLEAN WATER  
MEANS HEALTH"  
- AUDREY HEPBURN**

# Stay Connected

Reach out to our dedicated team for any inquiries, assistance, or information you need.

[pkashahalam@uitm.edu.my](mailto:pkashahalam@uitm.edu.my)



School of Civil Engineering  
College of Engineering  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor, Malaysia



+603-55435248



[engineering.uitm.edu.my/civil](http://engineering.uitm.edu.my/civil)



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