



# **EFFECT OF SLUDGE RETENTION TIME ON ANTIBIOTICS REMOVAL IN HOSPITAL WASTEWATER BY SPONGE MEMBRANE BIOREACTOR**

## **Context**

Wastewater generated from hospitals and medical centers contains risk hazards including toxic substances such as pharmaceutically active compounds (PhACs), antibiotics, infected pathogens, virus, organics and nutrients. The improperly treated wastewater causes water born transmitting diseases and affects human health. The conventional biological treatment processes are not able to reduce the antibiotics significantly. Thus, membrane based technology is proposed to minimize the toxicity of antibiotics in this study. The proposed treatment technologies are able to simultaneously remove the organics/nitrogen and antibiotics. The high biomass concentration in MBRs with slow growing bacteria plays an important role in degrading the refractory and antibiotics as well. Moreover, the MBRs are compact compared to conventional biological processes, thus it is a potential technologies for hospital wastewater.

## **Objectives**

The research objectives are as follows:

- Investigate the performance of the Sponge MBR system based on removal of antibiotics, organics, nitrogen and pathogens corresponding with sludge retention time (SRT = 40, 20, 10, 5 days)
- Evaluate the characteristic of fouling behavior in Sponge MBR.
- Evaluate the antibiotic removal by adsorption of sponge and sludge
- Evaluate the antibiotic removal by decomposition of suspended and attached sludge.

## **Overall research content**

The lab-scale sponge membrane bioreactor (Sponge MBR) will be operated to treat hospital wastewater in Ho Chi Minh city. Meanwhile, the mechanism study of how MBR degrade the antibiotic compounds will be investigated. The treatment efficiencies of antibiotics, organic, nutrients and pathogens will be surveyed at different operating modes of the sponge MBR. Fouling behaviors of the MBRs will be observed during the operation periods.

## **Qualification requirement**

- Passion for research, honest and responsibility
- Teamwork skill

Length of the internship: 3-5 months

Coaching institution: Ho Chi Minh City University of Technology (HCMUT) & CARE-RESCIF

Location of the internship: HCMUT