

RESEARCH PROJECT

Positions offered (2017-2018): 1 Master research project (6-9 month)

Sequential Batch Biofilm Reactor for the Decentralized Treatment of Greywater

Water scarcity is one of the main social problems of the twenty-first century, and therefore wastewater treatment and reuse have become extremely important. Grey water is a domestic wastewater with very limited pathogen contamination. It is considered to have considerable potential for reuse since it has a low macronutrient content. Examples could be the flow originating from showers, hand basins, kitchen sinks and washing machines, excluding black wastewater. During the past ten years, a number of emerging technologies have appeared with innovative solutions for recycling and reusing grey water.

A range of technologies has been used in the biological treatment of grey water to remove organic matter. These include rotating biological contactor, membrane bioreactors (MBR), sequencing batch reactors (SBRs), constructed wetlands and bioflocculation. A SBR (Figure 1) has the advantage that it is capable of dealing with organic matter, nitrogen and phosphorus in the same tank, and it adjusts quickly to dynamic influent characteristics (loads and flows). SBR therefore seems to be one of the preferred technologies for grey water treatment, especially for on-site removal of nutrients.

The candidate will work in the Ecotechnologies lab with different SBR. The objective of the project is to study the use of carriers to convert a conventional SBR process in a Sequencing Batch Biofilm Reactor (SBBR) (Figure 2) with the objective of improving the performance of the removal of organic matter and nitrogen during grey water treatment.

We are looking for a student of Chemical Engineering, Biotechnology or Environmental Engineering highly motivated for lab work and advanced water treatments. IQS is one of the Schools of Engineering of the University Ramon Llull, which is located in Barcelona, one of the most wonderful cities of Spain.

References:

- Aparna Dutta and Sudipta Sarkar, Sequencing Batch Reactor for Wastewater Treatment: Recent Advances, *Current Pollution Reports*, 2015, **1**, 177–190.
- Mariana Cardoso Chrispim and Marcelo Antunes Nolasco. Greywater treatment using a moving bed biofilm reactor at a university campus in Brazil. *Journal of Cleaner Production* 2017, **142**, 290–296.

Funding: Ecotechnologies Lab and Microbiology Lab own resources

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Figure 1. SBR for grey water treatment



Figure 2. SBBR for grey water treatment