

Internship
Programme



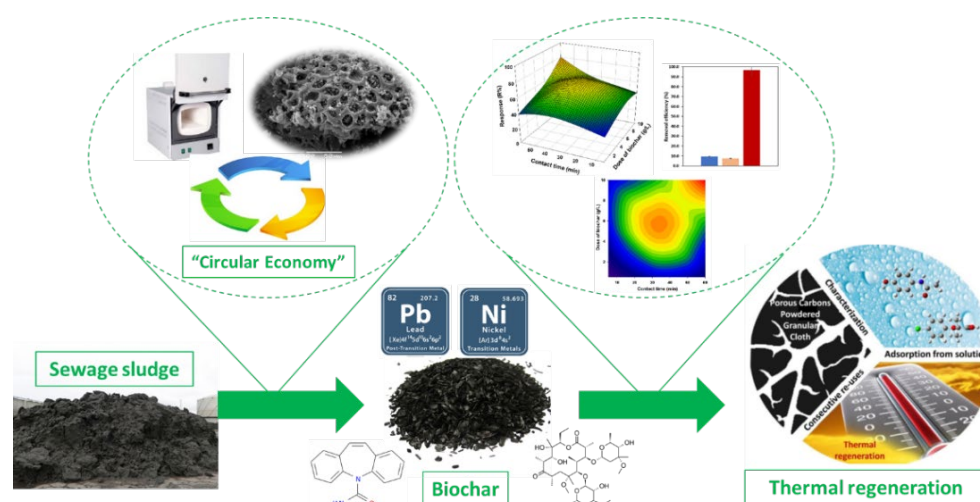
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Using Sewage-Sludge Biochar for Emerging Contaminant and Heavy Metal Removal from Wastewater

Supervised by Dr Lydia Niemi and Dr Szabolcs Pap

Current industrial practices and domestic use result in heavy metals and emerging organic contaminants entering wastewater in large quantities. Conventional wastewater treatment methods are unable to fully remove these from wastewater, resulting in entry into the environment where these pollutants are of ecotoxicological and regulatory concern. Simple and cost-effective methods are needed to remove these contaminants from wastewater, and adsorption using filtration material (e.g., biochar) is a possible circular approach.

This project will evaluate different sewage-sludge biochars for use in treating wastewater. The target contaminants will be inorganic (i.e., Ni, Pb) and organic (i.e., pharmaceuticals), and their detection will involve LC-DAD and ICP-OES. Batch and column studies will be carried out and factors such as solution pH, temperature and contact time will be investigated. Adsorption mechanisms and removal rates will be quantified to determine suitability.



LAB-SCALE FILTRATION SYSTEM



ICP-OES

Project duration/timing: ~4-6 months, start date flexible

Skills required: An interest in (and some experience of) analytical chemistry; also, an interest in wastewater treatment, sustainability and the circular economy.

IMPORTANT NOTE: This opportunity is NOT a funded internship - self-funding and/or external funding (i.e., Turing Scheme) would be required.



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Further reading:

Pap, S., Taggart, M. A., Shearer, L., Li, Y., Radovic, S., & Sekulic, M. T. (2021). Removal behaviour of NSAIDs from wastewater using a P-functionalised microporous carbon. *Chemosphere*, 264, 128439.



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