*Poster*


# Biodegradation of anti-inflammatory drugs and plastics. Identification of microbial activities by metagenomics

Garrido Montoro, José Manuel y Canosa Perez-Fragero, Inés*

Dpto. de Biología Molecular e Ingeniería Bioquímica. Centro Andaluz de Biología del Desarrollo. Universidad Pablo de Olavide, Ctra. Utrera, km 1,41013 Sevilla, España.

Tutor académico: Canosa Perez-Fragero, Inés.

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## ABSTRACT

**Motivation:** The rise of plastic and its subsequent accumulation in the environment has led us to face great challenges in our society today. One of these huge challenges is to avoid plastic debris, especially microplastics as well as other pollutants such as ibuprofen, naproxen and diclofenac, from reaching our seas or rivers. Currently wastewater treatment plants (WWTP) aren´t capable of preventing this contamination [1]. Therefore, we decided to identify bacteria or consortium of bacteria present in these WWTPs, prioritizing the consortium and thus increasing the possibility of finding biodegradation routes for more complex compounds such as plastic. On the other hand, we have also tried to determine the presence of genes or biodegradation pathways which allow these bacteria to use these pollutants as a carbon source.

**Methods:** For the isolation of these microorganism, we used two samples from the WWTPs of Ubeda and Seville. Samples were taken from the secondary treatment (sludge before decantation) from both WWTPs. Enrichment cultures were then prepared in a minimal medium with the pollutants used as carbon source [2]. When differences in growth were observed between the control Erlenmeyer flask and the different flasks with samples, different strategies were used such as drop seeding, a subsequent liquid passage, etc. Once a bacteria or microbial consortium capable of degrading a compound has been obtained, a preliminary morphological or biochemical characterisation is made to identify the microorganisms responsible for this degradation. Moreover, we confirm, where possible, whether they possess the genes necessary to degrade the compound.

**Results:** To date, a differential growth has been obtained for some samples with ibuprofen, naproxen and diclofenac which could contain microorganisms capable of growing using said pollutants as a carbon source. Moreover, a phylogenetic analysis of the 16S rRNA sequences has been peformed to determine the family affiliation. In the plastic sample, biomass accumulation has been observed around the plastic, although the turbidity of the culture is not yet significant.

**Conclusions:** A significant number of enrichments cultures have been obtained from WWTP samples, able to grow on ibuprofen, diclofenac, naproxen. Some of the culture members have been characterised biochemically and genetically. The results obtained so far are highly promising for defining new biodegradation routes for these compounds.

## REFERENCES

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