

**Biotreatment of Pharmaceuticals and Personal Care Products during Water Treatment for Reuse:
Ensuring Human Safety at the Food-Water Nexus**

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Abstract:

This project is motivated by the need to develop new wastewater treatment technologies to remove pharmaceuticals and personal care products (PPCPs), which are now routinely detected in treated wastewater, surface water, and even treated drinking water. Further, PPCPs have been detected in foods irrigated with reclaimed water, and PPCPs are likely to be present in foods impacted by de facto water reuse. Existing advanced treatment technologies are energy intensive, produce potentially toxic byproducts and problematic waste streams, or are ineffective for some compounds. Thus, effective low-energy technologies are needed to protect human health, ecosystem health, and food safety. Biological treatment technologies are promising because they use microorganisms to degrade contaminants and can be designed to be low-energy technologies. The goal of this project is to develop microbial biotransformation hypotheses based on non-targeted metagenomic, metaproteomic and metabolomic analyses of archived samples.