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**Title: Anaerobic microbial desulfonation of sulfonated perfluoroalkyl substances**

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This two-year research project aims to identify and isolate microorganisms capable of anaerobically desulfonating specific per- and polyfluoroalkyl substances (PFASs), specifically 6:2 fluorotelomer sulfonic acid (6:2 FTSA) and/or 6:2 fluorotelomer sulfonamide alkylbetaine (6:2 FTAB). Characterized by the presence of carbon-fluorine (C-F) bonds that replace hydrogen atoms in hydrocarbon backbones, PFASs are known for their environmental persistence and potential health risks, and thus have prompted the exploration of microbial desulfonation as a potential remediation method. The methodology of this project involves establishing anaerobic microbial cultures from environmental samples and enriching them in sulfate-free media while exposing them to target PFASs for selection. Positive cultures will undergo further isolation, molecular characterization, and metagenomic analysis to identify the responsible microorganisms and potential genetic pathways.

The significance of this research lies in its contribution to environmental science and microbiology, addressing the pressing need for sustainable PFAS removal methods. The discovery of microorganisms capable of anaerobic desulfonation could offer an innovative solution to mitigate the environmental impact of persistent PFAS contaminants. Moreover, insights into microbial mechanisms can inform bioremediation strategies for PFAS-contaminated sites, presenting a valuable contribution to resolving a critical environmental issue.

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