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Microbial Fuel Cells as a Dual Solution for Energy and Clean Water

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Clean water and affordable energy are two essential needs that remain unmet for millions of people, particularly in developing countries. Traditional wastewater treatment systems require high investments and energy input, while untreated effluents continue to pollute rivers and groundwater. Microbial fuel cells offer an innovative solution by turning wastewater into both clean water and electricity. In this system, microbes feed on the organic matter present in sewage or industrial waste, releasing electrons that are captured to produce electricity. At the same time, harmful pollutants are broken down, making the water safer for reuse in agriculture or industry. This dual benefit creates a circular process where waste becomes a resource. The approach holds special promise for nations like India and Malaysia, where domestic sewage, agricultural runoff, and palm oil industry effluents cause significant environmental damage. By addressing water purification and renewable energy generation in a single process, microbial fuel cells represent a practical and sustainable tool for community-level solutions that improve health, environment, and energy access.

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