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## On-demand biologically-based electrical generation using microbial fuel cells for power generation in emergency situations

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**Introduction:** Bioelectrogenic microorganisms can create electricity in emergency situations (e.g. natural disasters) if traditional sources of power are unavailable. When coupled with a fuel cell, these microorganisms offer a promising source of alternative energy for use in adverse conditions. A microbial fuel cell was constructed and tested in both laboratory and field-based conditions. While this work is preliminary, it offers promising results that suggest a path towards proof-of-concept for the design of a commercial prototype.

**Method:** The MFC is constructed of a mud-filled container populated by microorganisms. The mud originates from a local pond containing wastewater. The MFC has two compartments, an anode and cathode, separated by a selectively-permeable membrane for positively-charged ions. Organic matter is oxidized by microorganisms to generate electrons. The electrons transmit via an electronical circuit to the cathode. Protons pass through the selectively-permeable membrane. The electrons and protons combine with oxygen to form water.

Anode: Anodic materials must be conductive, biocompatible, and chemically stable.

**Cathodes:** Water or Copper In addition to conventional instruments used for chemical measurements in microbial systems the MFC experiments required specialized electrochemical instrumentation for testing.

**Conclusion:** The MFC project is a new approach that represents new technology for generating bioelectricity from biomass and microorganisms. In the MFC the bacteria and organic matter produce electrons that travel and generated small amounts of electricity. Bacterial extracellular electron transfer can be a promising tool to utilize and convert chemical energy into electricity through electrochemical devices called microbial fuel cells, which combine hydrogen and oxygen to produce small amounts of clean electricity. Microbial fuel cells are a new promising technology for power generation for emergency situations across the globe.

## Biography

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