CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
J0216

Project Title
Micro Machines: Determining the Optimal Temperature Range for a Microbial Fuel Cell

Abstract

Objectives/Goals
To determine how to create a well-functioning microbial fuel cell, I decided to test what temperature range a microbial fuel cell best functions.

Methods/Materials
Tested what temperature range a two-chambered microbial fuel cell best functions by creating 3 two-chambered microbial fuel cells. Placed mud in the fuel cell to generate the energy. Connected a multimeter to the fuel cell and tested milliamps and millivolts every day for 10 days to determine the optimal temperature range. After, I converted the data into watts.

Results
The 3 two-chambered microbial fuel cells were placed at three different temperature ranges to determine what temperature a microbial fuel cell best functions. I found that when placing a fuel cell at the baseline temperature (room temperature), at a temperature cooler than the baseline temperature, and at a temperature warmer than the baseline temperature, the fuel cell generated the most energy at a temperature warmer than the baseline temperature.

Conclusions/Discussion
Creating two-chambered microbial fuel cells and testing the optimal temperature range proved that a microbial fuel cell best functions at a temperature warmer than the baseline temperature. It also proves that a microbial fuel cell can be an effective renewable energy resource.

Summary Statement
After building 3 two-chambered microbial fuel cells, placing them at 3 different temperature ranges to test the energy generated for 10 days, I found that a microbial fuel cell best functions at a temperature warmer than room temperature.

Help Received
I designed, built, and performed the experiments myself. However, my dad assisted in drilling holes on plastic containers in order to build the fuel cells.