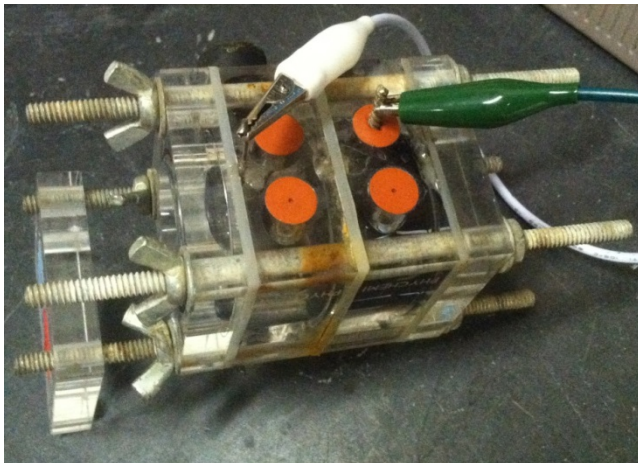


# Microbial Fuel Cells: Looking Inside the Black Box

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## Objectives

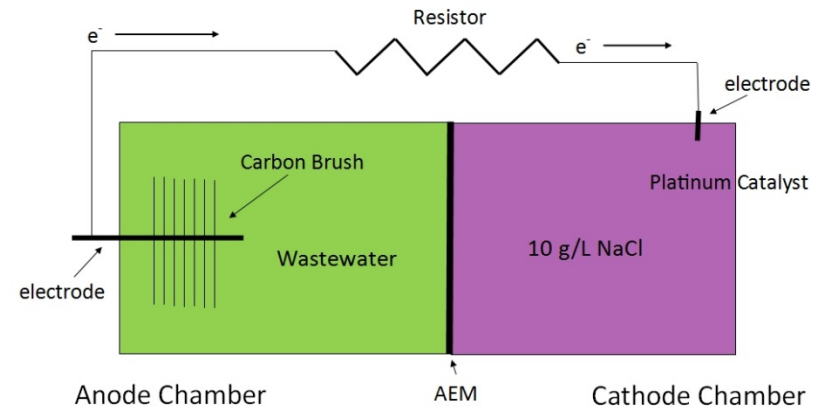
- Work with small-scale Microbial Fuel Cells (MFC) to determine feasibility of large-scale implementation of Microbial Fuel Cells into Wastewater Treatment Plants



Above: Image of Small-Scale Microbial Fuel Cell  
Right: Design layout for Small-Scale Microbial Fuel Cell

## Scope

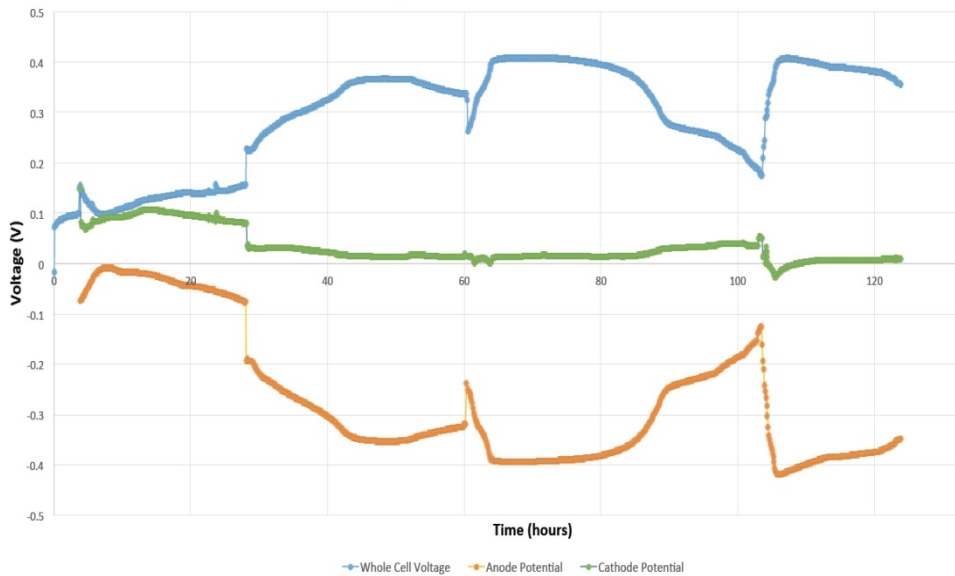
- Combine biochemistry and thermodynamics to better understanding why and how Microbial Fuel Cells work
- Be able to use this understanding to engineer a Microbial Fuel Cell that can compete with traditional wastewater treatment methods



# Microbial Fuel Cells: Looking Inside the Black Box

## Major Outcomes

Voltage Profile of Reactors vs Time



- The anode potential is easy to measure and directly linked to the microbial metabolism
- The microbial metabolism is difficult to measure and understand
- This relationship means we can make perturbations in the fuel cell and monitor changes in metabolism via the anode potential
- We can use this method to look inside the black box and better understand how to engineer a MFC that can compete with traditional treatment practices

- Start up with a power supply yielded high cell performance (blue)
- The cathode potential (green) is constant
- All changes in cell performance are driven by the anode potential (orange)

