



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Adam Yang	Project Number 36268
Project Title Pee for Power: An Exp. to Find the Opt. Concentration of Urine to be Introduced to a MFC to Produce the Highest Voltage	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this experiment is to find the best concentration of urine that will produce the most power when it is introduced to a microbial fuel cell (MFC). It is expected that the MFCs will produce the most power when the urine is added in a moderate concentration. This is expected because urine contains nutritional content and dangerous chemicals that can support or destroy microbial life. If the experiment is successful, then it is possible to introduce waste water into efficient microbial fuel cells to create power.</p> <p>Methods/Materials Three Mudwatt MFCs will be setup. The bacteria in the MFCs will be allowed to develop into healthy colonies for anywhere from two weeks to a month. After those two weeks, urine will be introduced to two of the MFCs: one with the urine half diluted, and another one that isn't diluted. The last MFC will act as the control and won't have any urine. Once the urine has been introduced, the power of the MFCs will be recorded for at least one to two weeks for two trials.</p> <p>Results The MFC with the moderate concentration of urine produced significantly more power than the other MFCs in both trials of experimentation. The moderate concentration of urine boosted the power of the MFCs much more than the other concentrations of urine.</p> <p>Conclusions/Discussion Urine can help a MFC produce more power, but the urine has to be introduced in a moderate concentration to a MFC to avoid killing any bacteria. With further developments and research, this method can be applied to sewage treatment plants to produce power.</p>	
Summary Statement It was discovered that a moderate concentration of urine causes a microbial fuel cell to produce the highest voltage compared to other concentrations.	
Help Received I assembled the microbial fuel cells by myself, along with the project board, but my science teacher helped me streamline my project and introduced me to the scientific method. I consulted many different online sources and databases for the research of this project.	