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Bioelectrochemical Detector for Rapid Assessment of Bacterial Antibiotic Resistance

Antibiotic resistance directly impacts civilian populations. This impact can be mitigated in part by determining antibiotic susceptibility quickly and treating pathogens accordingly. Current bacteriological assays, however, are time consuming and have wide limitations, and there is significant need for new approaches to antibiotic susceptibility assessment. **We propose an alternative novel strategy for rapidly differentiating resistant bacteria. This approach is based on a bioelectrochemical response:** bacteria exposed to an antibiotic undergo a change in metabolic reaction rates that can be quickly determined using electrochemical methods. **If we are successful, bioelectrochemical measurements will provide a unique and alternative technology for determining antibiotic resistance quickly that will be significantly cheaper than existing technology.** Our approach have the advantages of 1) high sensitivity, 2) can be miniaturized / made portable as the technology 3) lower cost, and 4) experimental simplicity.