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AUTOMATED MAPPING OF ANTIBIOTIC INTERACTIONS IN *ESCHERICHIA COLI*

The rapid evolution of bacterial drug resistance has motivated the use of drug combinations to combat resistance and maintain clinical efficiency. There is an increasing need to develop reliable systematic methods to map synergistic and antagonistic interactions between pairs of antibiotics (i.e. when two compounds enhances or diminishes each other's effect, respectively). Large-scale antibiotic interaction maps would be useful for i) exploring the mechanisms behind drug interactions, and ii) for the development of new combination therapies. We developed a high-throughput, automated screening and a robust statistical analysis methodology for identifying antibiotic interactions using a robotic liquid handling system. We systematically measured interactions between 24 antibiotics to experimentally construct a complete, high resolution antibiotic interaction map of *E. coli*. Using a data-mining approach, we searched for predictors of interactions based on chemical and biological features of antibiotics.