An Algorithmic Platform to Optimize the Prescription of Antibiotics to Minimize Antibiotic Resistance Developing in Patients or Communities

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Each year, 2 million Americans acquire antibiotic-resistant infections and 23,000 die. Unfortunately, the scientific consensus is that no new classes of antibiotics are left to be discovered, leading the Centers for Disease Control to warn about an imminent post-antibiotic era when common bacterial diseases would be untreatable, and surgery would risk life-threatening infections. Optimizing best practices with antibiotics is currently the only option available to avoid antibiotic resistance. However, evaluating research databases is too complex for an individual physician with a given set of inputs such as pathogen species, patient antibiotic history, and local occurrence of antibiotic resistance. I have developed the algorithmic platform, Regimen Optimizer to Minimize Antibiotic Resistance (ROMAR),which evaluates the databases on antibiotic resistance occurrence, antibiotic modes of action, synergistic antibiotic adjuvants, and other factors considering a set of inputs provided by the physician. ROMAR delivers three possible antibiotic regimens optimized to prevent antibiotic resistance in the bacterial population: 1) the best narrow-spectrum antibiotic, 2) the most synergistic combination of two antibiotics with different modes of action, and 3) a combination of two antibiotics with an antibiotic adjuvant, which are recently discovered and expanding class of drugs which act against bacterial resistance modes of actions. The physician is provided with the top three choices for each category. Until entirely new technologies are available to replace antibiotics, ROMAR has utility to make best practices easily available to private physicians and hospital managers.

Awards Won:
Third Award of $1,000