Design and Synthesis of Novel Antibacterial Agents Targeting Bacterial Topoisomerases

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This summer our research team worked on the development of a new antibiotic to target quinolone resistant gram negative bacteria. We conducted our research by synthesizing several different compounds with quinolone cores and structure alterations to increase activity against quinolone resistant bacteria. These fluoroquinolone derivative were then submitted for testing in order to determine their efficacy against quinolone resistant gram negative bacteria.

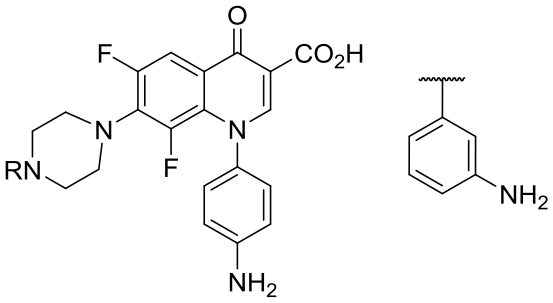

Figure 1: My targets for the summer

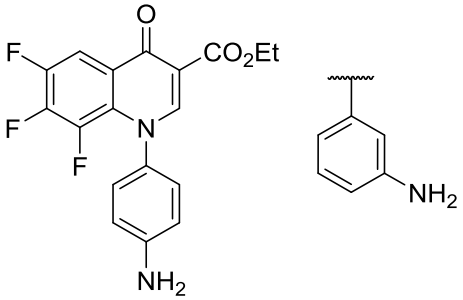

Figure 2: Current progress

As a group we managed to generate several of the derivatives that we were targeting. I, however, have not yet arrived at a complete synthesis of my target compound but hope to complete my synthesis this fall. The main issue that I faced was severe solubility problems which prevented me from conducting a successful hydrogenation of the nitro group on my starting material. I am currently two steps away from my final product.

This summer has been a great opportunity for me and working with Dr. Barbachyn has taught me a lot about the process of synthetic organic chemistry and helped me to understand what to expect from a career in synthetic organic chemistry.