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Synthesis of Substituted Quinazolinones with Applications Toward Chagas Disease

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Abstract

Chagas disease is a parasitic infection that impacts millions in South and Central America, predominantly those of lower socioeconomic status, as *Trypanosoma cruzi* (*T. cruzi*) proliferates in areas of poorer living conditions. Benznidazole and nifurtimox are currently the only two medications which serve as treatments for Chagas disease; despite the high bioavailability and effective treatment, limitations arise with usage such as toxic side effects and requirement of long regimes. Furthering quinazolinone research becomes necessary as immigration from endemic to non-endemic regions such as the US and Canada increases. The quinazolinone core is classified as a privileged scaffold as the substitution of many functional groups has been found, amide-substituted quinazolinones in particular have shown halts in the *T. cruzi* infection pathway. Our team aimed to devise robust pathways to synthesize amide-substituted quinazolinones. The synthetic steps included hydrolysis, alkylation, amination, and amidation in which our team found procedures that obtained acceptable yields. Time constraints interrupted furthering research for the amidation reaction in which our team aimed to create a more insoluble carboxylic intermediate by manipulating coupling reagents or using various extraction methods for the soluble intermediate. From initial synthesis through animation, our team used robust procedures for high yields of product. Although little research has been done on the declared neglected disease, our team was able to refine the reagents of the experiments conducted to provide a reasonable starting point for chemist and biologist when examining the bioactivity and working toward the broader goal of better therapeutic treatments for Chagas disease.