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Synthesizing Piperidine Quinazolinone Derivatives for The Treatment of Chagas Disease

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The protozoan parasite *Trypanosoma cruzi* (T. cruzi) is commonly found in areas of Latin America where poverty is especially prevalent. Transmittance of T. cruzi to humans and animals is caused by insect vectors, this causes the disease known as Chagas. Chagas currently infects over 10 million people, and an additional 100 million are currently living in high-risk areas for transmission. This disease can be largely asymptomatic, however, 30% of those who are chronically infected suffer severe heart and gut tissue damage that can lead to disability and death. Due to limited and inefficient treatment options, the organization "Drugs for Neglected Diseases Initiative" have identified a list of Quinazolinone derivatives, through high-throughput screening (HTS) that could serve as potential new medicinal treatments for Chagas if they can be synthesized in a cost-effective manner. Several of these derivatives were found to be synthesizable via N-alkylation, substitution, hydrolysis, and coupling reactions. Yields were produced between 16%-71% depending on the derivative. This research helps provide a solid foundation that now can go through the process of refinement and scaling up to test the clinical utility of these compounds against Chagas disease. Additionally, this work will help us continue to pursue viable synthesis methods to produce these quinazolinone derivatives as well as other derivatives in the future that will hopefully fulfill the medicinal treatment need for Chagas disease.