The Synthesis and Reactions of Some 1,2-Diacyldiaziridines

An overall goal in my Laboratory is to investigate the bond-breaking selectivity of the three-membered diaziridine ring. One of the ways we plan to accomplish this is to utilize the Quantitative Structure/Activity Relationship (QSAR) method. This is a powerful “tool” that is used extensively in industrial R&D laboratories across the country; especially, in pharmaceutical companies. The QSAR method is a process by which a response (in this case, bond breaking) is monitored by systematically changing a particular variable (in this case, substituent electronic effects). To this end, we plan to exploit the use of carbene insertion chemistry with 4-phenyl-1,2,4-triazoline-3,5-dione (PTAD). The carbene precursors, specific $\alpha$-diazoesters, must first be synthesized from methyl (4-substituted)phenylacetates via a several step process. \textit{In situ} generation of the appropriate carbenes and subsequent reaction with PTAD should provide the various 1,2-diacyldiaziridines needed for this study. The chemistry of these systems will then be investigated in order to determine the effects of substituent electronics on the reactivity of the diaziridine ring system. Several new pharmaceutical drug candidates may also be realized from this project.

\textbf{Student Researcher:} Ivanny Jacome Ottati

\textbf{Faculty Advisor:} Dr. Steven M. Bonser