

Department of Chemistry

Bridget Kelly Marcellino

Mentor: Christian Rojas

## A Novel Approach to the Synthesis of the Allosamidin Disaccharide

The Rojas group has undertaken the synthesis of the disaccharide portion of allosamidin, which is an important project due to this molecule's biochemical applications. Allosamidin is a glycosidase inhibitor that is composed of a disaccharide portion and an aminocyclopentitol headgroup. Allosamidin, by mimicking a reactive intermediate, inhibits the enzymatic hydrolysis of chitin, which is necessary for the survival of arthropods and fungi. This inhibiting ability coupled with the fact that allosamidin poses no health hazard to humans gives allosamidin great potential as a pesticide and fungicide.

Allosamidin has been previously synthesized, however our synthesis of the disaccharide portion involves a new approach that draws upon previous findings in the Rojas group regarding amidoglycosylation chemistry. This synthesis is intended to build upon the development of new nitrogen insertion methodology. Amidoglycosylation can provide glycosidic linkage of two disaccharide units, in this case a carbamate and an *n*-pentenyl glycoside. Amidoglycosylation of the allosamine unit has been shown to yield solely the  $\beta$ -anomer. This stereoselectivity is of great importance due to allosamidin containing a  $\beta$ -linkage.

The ability to glycosylate at the reducing end of the disaccharide portion would allow for the addition of an -OR group to the anomeric carbon. This would enable the complete synthesis of allosamidin and its analogs.