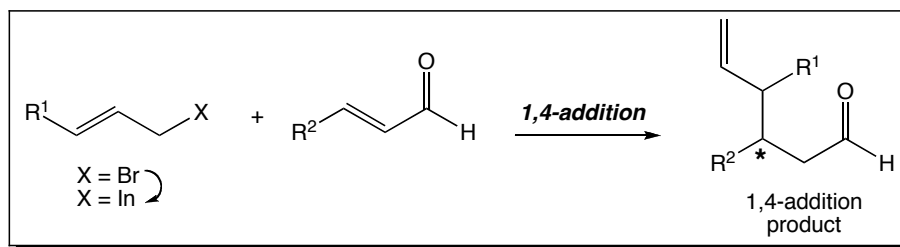


## Research

Research in my group focuses on the development of novel strategies that provide access to valuable building blocks used in the synthesis of biologically active compounds in an expeditious and stereocontrolled manner.

### *Enantioselective 1,4-Additions of Allyl Indium Reagents to $\alpha,\beta$ -Unsaturated Aldehydes*

The enantioselective conjugate allylation of  $\alpha,\beta$ -unsaturated aldehydes is being investigated. The addition of nucleophiles to  $\alpha,\beta$ -unsaturated aldehydes prefers to proceed in a 1,2- fashion rather than in a 1,4-fashion. Activation of the  $\alpha,\beta$ -unsaturated aldehydes with chiral imidazolidinones, however, has proven to be successful in directing the addition in a 1,4-fashion. The 1,4-addition of organometallic reagents to  $\alpha,\beta$ -unsaturated carbonyl compounds is one of the most useful and reliable methods for C-C bond formation. It is our goal to introduce the *first* enantioselective conjugate allylation of  $\alpha,\beta$ -unsaturated aldehydes using substituted allyl indium reagents. This asymmetric approach will allow access to a wide range of useful building blocks that can be further functionalized to a variety of biologically active natural products.



### *Total Syntheses of Tatarinoids A, B, & C*

Tatarinoids A, B, & C are 3 of 19 compounds isolated from the rhizome of the acorous tatarinowii plant; used for the treatment of central nervous system related diseases. Currently there are no reported syntheses of these molecules and it is our goal to accomplish the first syntheses in as few as 4 steps. The syntheses of the enantiomers of these natural products have been completed in our laboratory.

