

Outstanding Questions Box

- What is the scope of carbenes and aziridines that readily form aziridinium ylides as productive reaction intermediates?
- What other transition metals, in addition to rhodium and copper, can facilitate the formation of aziridinium ylides?
- Can we develop new reagents and catalysts to accomplish photochemical transformations of aziridines and carbene precursors to densely functionalized, stereochemically complex amines?
- What strategies can be utilized to control pyramidal inversion in aziridines, with the aim of broadening the scope of this chemistry?
- What features of the substrate, catalyst, carbene precursor, and reaction conditions determine the ultimate reactivity of an aziridinium ylide intermediate?
- How can both catalyst and reagent control be effectively harnessed to manipulate the reactivity of aziridinium ylides?
- Can aziridinium ylides be intercepted as useful intermediates for productive multi-component reactions?
- Can methods to convert racemic precursors into valuable enantioenriched heterocycles be developed?
- Can we achieve tandem nitrene/carbene or carbene/carbene transfer sequences from alkenes and imines to furnish complex *N*-heterocycles in one pot?
- Can this type of reactivity be extended to onium ylides generated from other small, strained heterocycles, including azirines, diaziridines, azetidines, and diazaspriopentanes?
- Can predictable and stereocontrolled ring expansions of aziridinium ylides be employed to construct key skeletons of pharmaceuticals or natural products?