

Title: Exploiting α -Haloaldehydes in Complex Molecule Synthesis

Abstract: The diastereoselective addition of organometallic reagents to α -chloroaldehydes was first reported in 1959 and is historically significant as the prototypical reaction for Cornforth's model of stereinduction. Despite clear synthetic potential for these molecules, difficulties associated with producing enantiomerically enriched α -haloaldehydes limited their use in complex molecule synthesis through the latter half of the 20th century. Over the past 20 years, however, a variety of robust, organocatalytic processes have been reported that now provide direct access to optically enriched α -haloaldehydes and have motivated renewed interest in their use as building blocks for complex molecule synthesis. Here, our efforts to produce α -haloaldehydes and exploit these versatile building blocks in complex molecule synthesis will be discussed, including applications in the synthesis of nucleoside analogues, carbohydrate mimics and polyketides.