Recent Advances in Bromination Reactions

The ability to design elegant and economical synthesis routes is a major factor in the eventual viability and commercial success of a drug. Electrophilic bromine activates the olefins in various reactions, with the resulting products containing bromine atoms that can be readily modified to various functional groups. Many of these products are important building blocks for drugs and bio-active molecules but the selective delivery of a bromine atom to an olefin in a complex system is very challenging. For example, enantioselective bromination has proven difficult for chemists over the last 50 years.

Nevertheless, Asst Prof Yeung Ying-Yeung and his team envisioned that the successful development of novel the bromination reaction would allow us to obtain a powerful tool in the synthesis of various heterocyclic compounds. Recently, Yeung's team devised an amino-thiocarbamate catalysed enantioselective bromination protocol and a one-pot, four-component bromination system.
The new bromination protocols are green and efficient, and are applicable to both chemical and pharmaceutical research.

A unique amino-thiocarbamate catalyst is used in the enantioselective bromination to mediate the asymmetric delivery of a bromine atom. The reaction can be applied in the synthesis of a range of chiral bromolactones, bromopyrrolidines, and bromopiperidines (Figure 1).

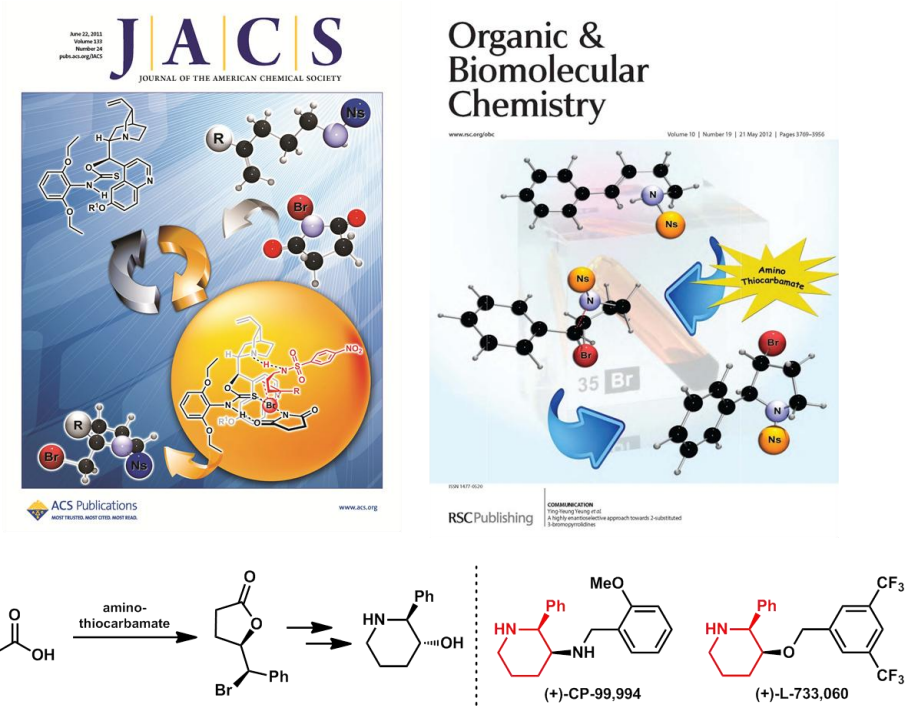

Figure 1. Catalytic Enantioselective Bromocyclization

Publications:

1. Enantioselective Bromoaminocyclization Using Amino-Thiocarbamate Catalysts
   Ling Zhou, Jie Chen, Chong Kiat Tan, and Ying-Yeung Yeung* *J. Am. Chem. Soc.* **2011**, *133*, 9164-9167.
   (Cover Page in *J. Am. Chem. Soc.* 2011, June issue)
   (Highlighted in Synfact July 2011)
2. A highly enantioselective approach towards 2-substituted 3-bromopyrrolidines
   Jie Chen, Ling Zhou, Ying-Yeung Yeung* *Org. Biomol. Chem,*. **2012**, *10*, 3808-3811.
   (Cover Page in *Org. Biomol. Chem.* 2012 April Issue)
   (Featured in "Organocatalysis" Web-themed issue)
   (Most-access article in March 2012)
3. Enantioselective Bromolactonization of *cis*-1,2-disubstituted olefinic acids using amino-thiocarbamate catalyst
   Chong Kiat Tan, Chencheng Le, Ying-Yeung Yeung* *Chem. Commun.* **2012**, in press.
   (Featured in "Organocatalysis" Web-themed issue)