300+

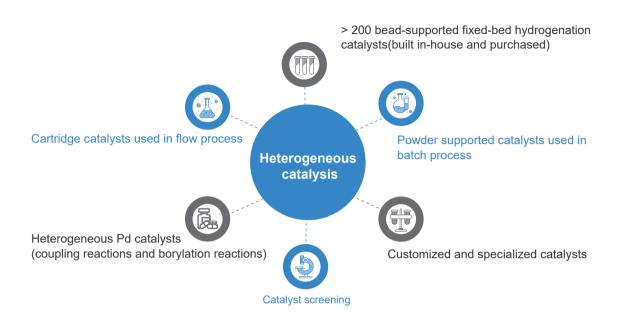
heterogeneous catalysts

200+

biocatalysis projects

kilo to hundred-kilo scale

Heterogeneous catalysis

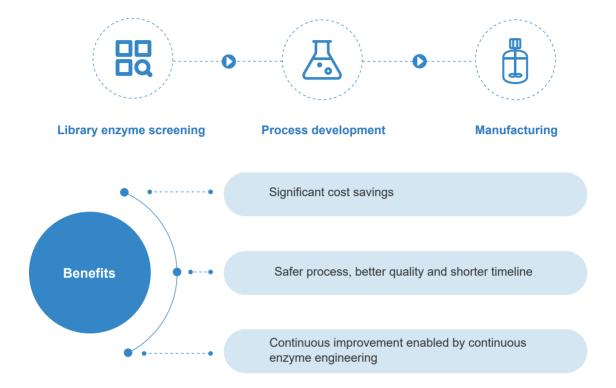


Miyaura borylation and Suzuki coupling case

Phosphine compound is polymerized into bulk material, thus the ligand is micronized and suitable for separation and recycling.

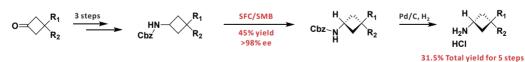
Catalysis

Biocatalysis



- > 500 enzymes in stock (commercial and in-house)
- Fermentation: up to 100 L
- · Screening and process development
- Directed evolution

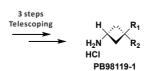
Case



Biocatalysis route 1:

$$0 = \bigvee_{\substack{R_1 \\ R_2}} \underbrace{\begin{array}{ccc} ATA \\ \hline 70-80\% \ Conversion \\ >99\% \ ee \end{array}} \underbrace{\begin{array}{cccc} H_2 N & \stackrel{i)}{\swarrow} (Boc)_2 O & \stackrel{ii)}{\longleftrightarrow} HCI & \stackrel{H_2 N}{\searrow} R_2 \\ & & & & & & & & & & & & \\ \hline \end{array}$$

Biocatalysis route 2:



70.6% Total yield for 4 steps >99% ee >10 kg scale

41.4% Total yield for 3 steps >99% ee