Novel Pyridoxamines for Enantioselective Biomimetic Transamination

Significance: Zhao and co-workers report a novel pyridoxamine catalyst bearing a lateral amine chain. Using this catalyst, they successfully mimicked the transamination activity of transaminases in converting \( \alpha \)-keto acids into the corresponding amino acids with commercially available diphenylglycine as the co-substrate; the reaction gave good yields and showed excellent enantioselectivity.

Comment: Transamination of \( \alpha \)-keto acids is a significant process for generating various amino acids in biological systems; consequently, great efforts have been made since the 1970s to achieve pyridoxamine-based biomimetic asymmetric transamination. In this work, enantioselectivities in excess of 90:10 were achieved under mild conditions for the first time.

Selected examples:
- 98% yield, er = 96.5:3.5
- 74% yield, er = 94:6
- 90% yield, er = 95.5:4.5
- 99% yield, er = 96:4

Proposed mechanism: