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TITLE: The Development of Performance Enhancing Asymmetric Catalysis to Address the Selectivity-Generality Paradox and Modern Expectations in Chemical Synthesis

ABSTRACT: The pace of new catalyst development is as rapid as ever, and diverse paradigms have matured over the last half-century. The result is a tremendous collection of solutions to asymmetric synthesis, particularly within enantioselective catalysis. Ironically, two obstacles are stubbornly positioned between catalysts and adoption by those who could benefit from their potential. The first is an accurate understanding of every catalyst's mechanistic underpinning from which confident translation can be made - to any substrate or to diverse reactions in search of 'privileged' catalyst stature. The second is the often intense chiral ligand/catalyst synthesis required to discover the most active and selective catalyst.

This lecture will detail our successful search for highly general catalysts, and the design of optimization paradigms that promise to more immediately enhance the performance of an individual chiral ligand. The translation of general catalysis to general synthesis will also be described, particularly to peptide and peptidomimetic synthesis.