



Jeffrey N. Johnston

Stevenson Professor of Chemistry
Department of Chemistry
Vanderbilt University

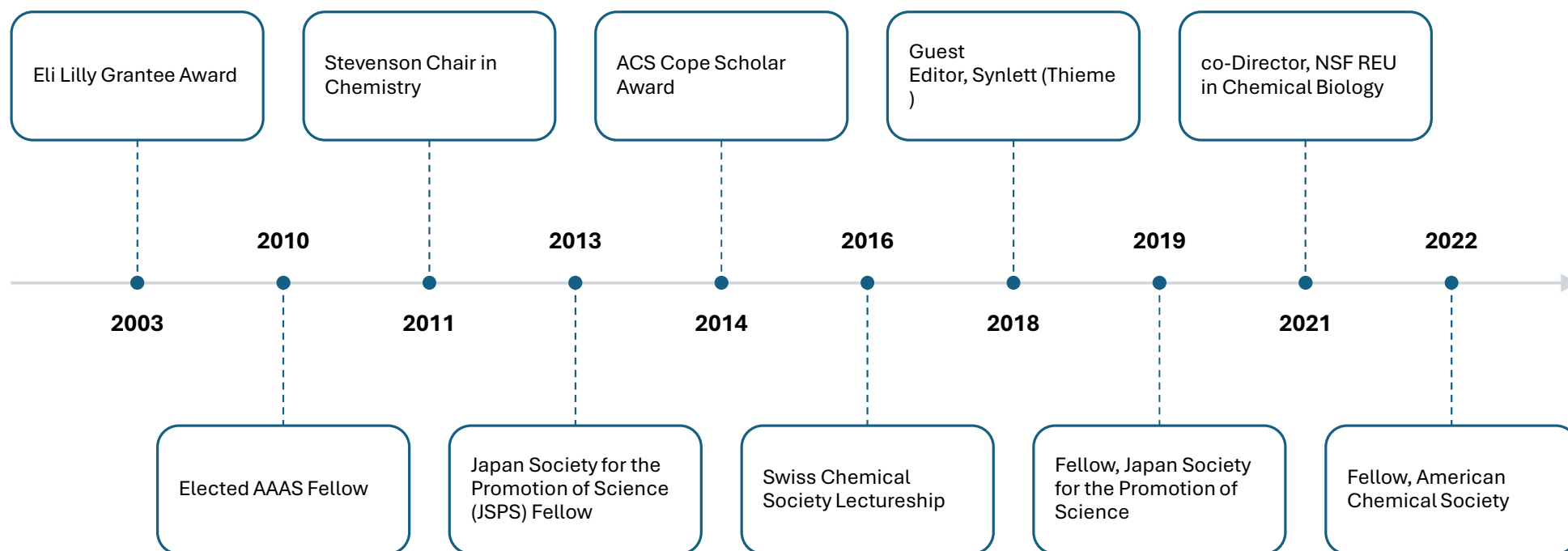
Education:

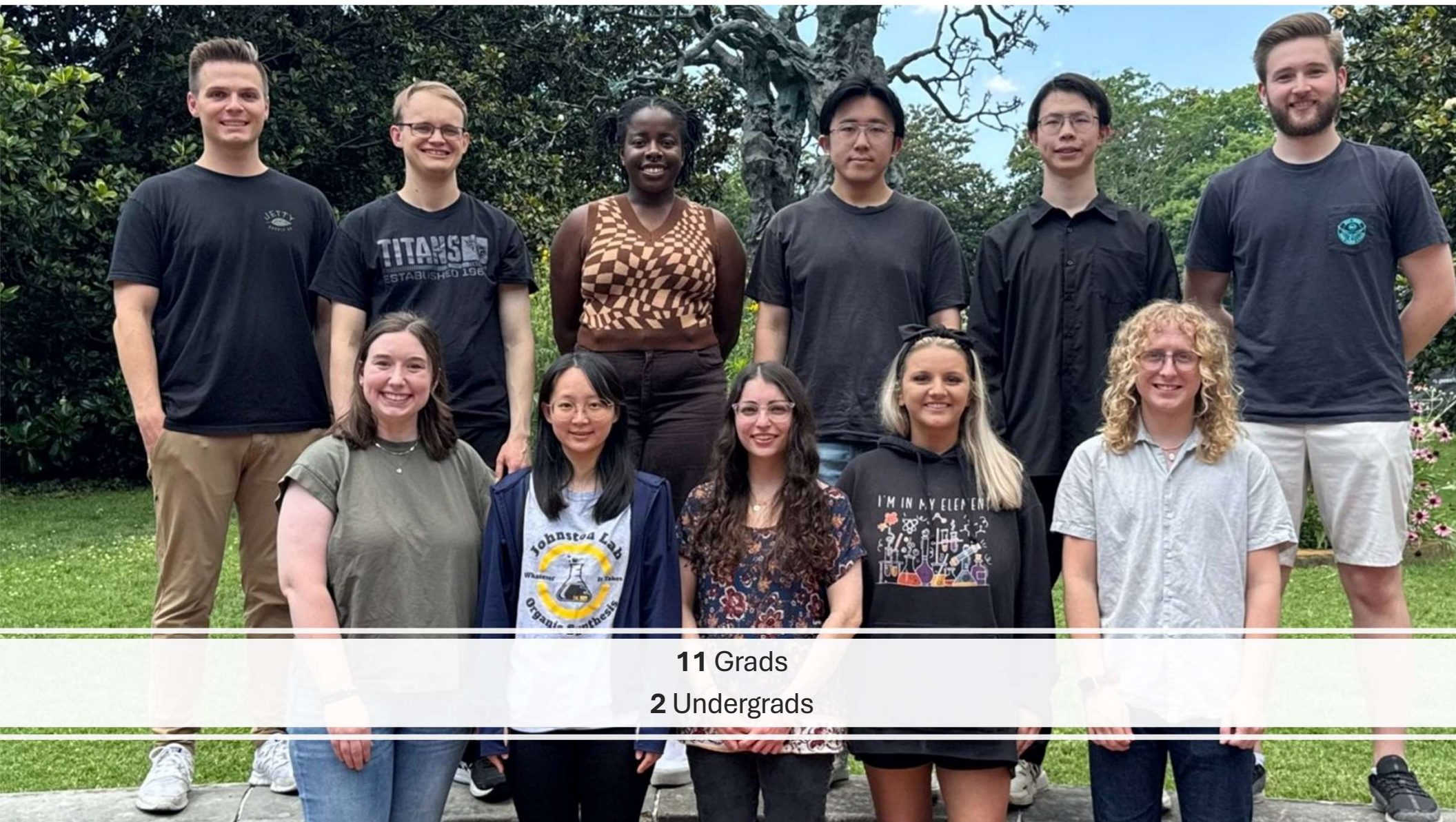
- B.S. Chemistry, 1992, Xavier University, OH
- Ph.D. Chemistry, 1997, L. A. Paquette, The Ohio State University, OH
- NIH Postdoctoral Fellow, 1999, D. A. Evans, Harvard University, MA

Career:

- Assistant Professor, 1999, Indiana University, IN
- Associate Professor, 2005, Indiana University, IN
- Professor, 2005, Indiana University, IN
- Professor, 2006, Vanderbilt University, TN
- Stevenson Professor of Chemistry, 2011, Vanderbilt University, TN
- 2021-pres co-Director, NSF REU in Chemical Biology
- 2021-pres Vice-Chair, Board of Directors, Arnold & Mabel Beckman Foundation

Honors:

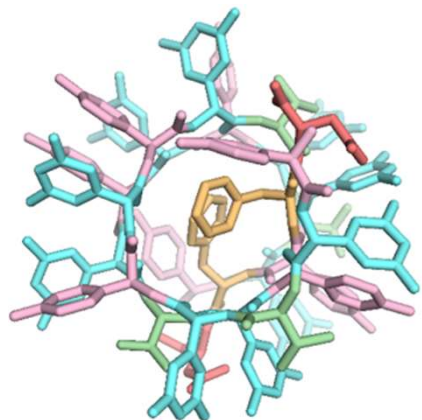




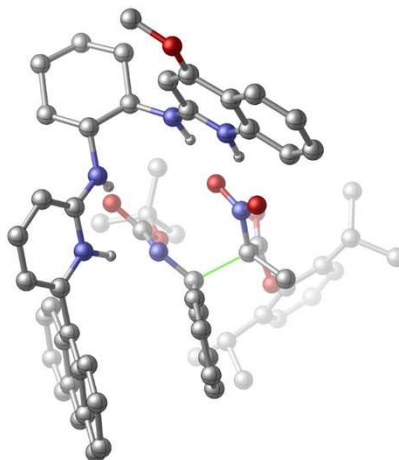
11 Grads
2 Undergrads

Research areas:

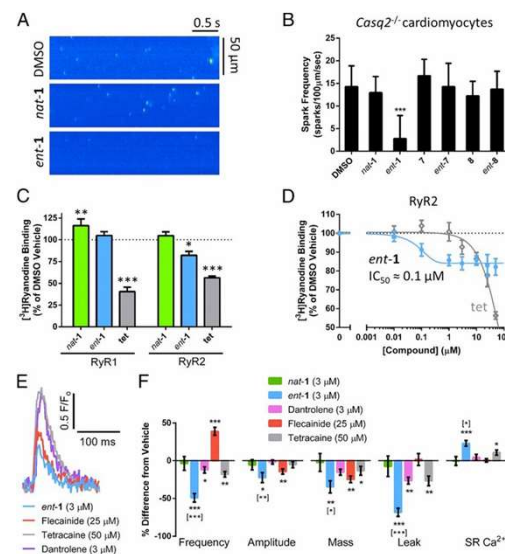
Natural Product Synthesis



Catalysis



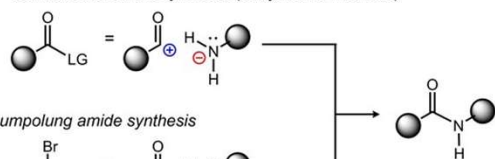
Therapeutic development



Umpolung amide synthesis (UmAS)

umpolung reactivity:

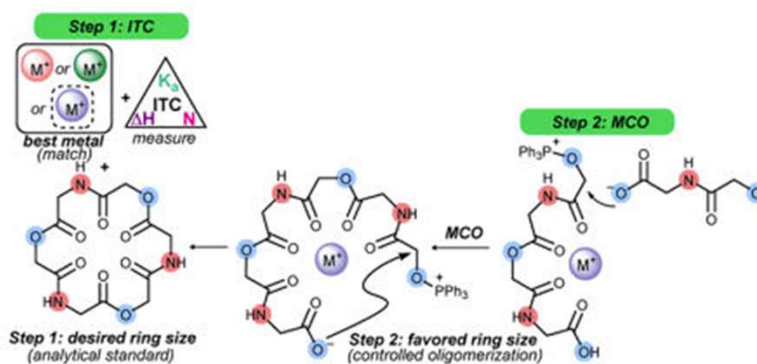
conventional amide synthesis (dehydrative methods)



⊕ electrophilic component
⊖ nucleophilic component

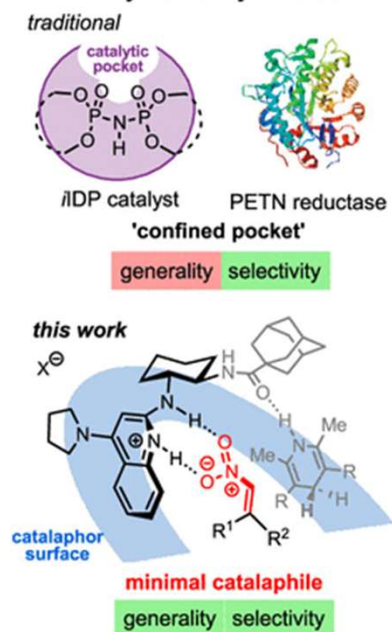
Shen, Makley, Johnston *Nature* 2010, 465, 1027

Macrocyclooligomerization (MCO)

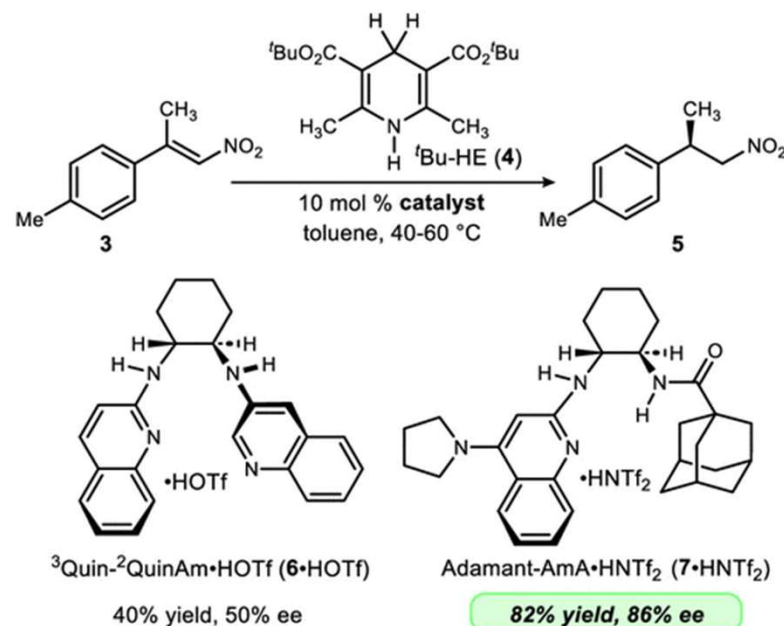
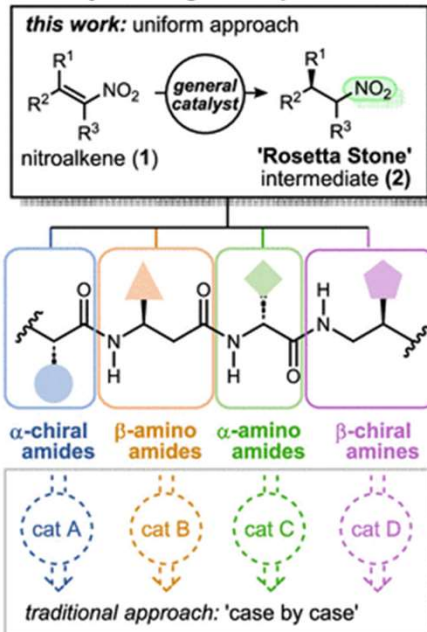


Generality-Driven Catalyst Development: A Universal Catalyst for Enantioselective Nitroalkene Reduction

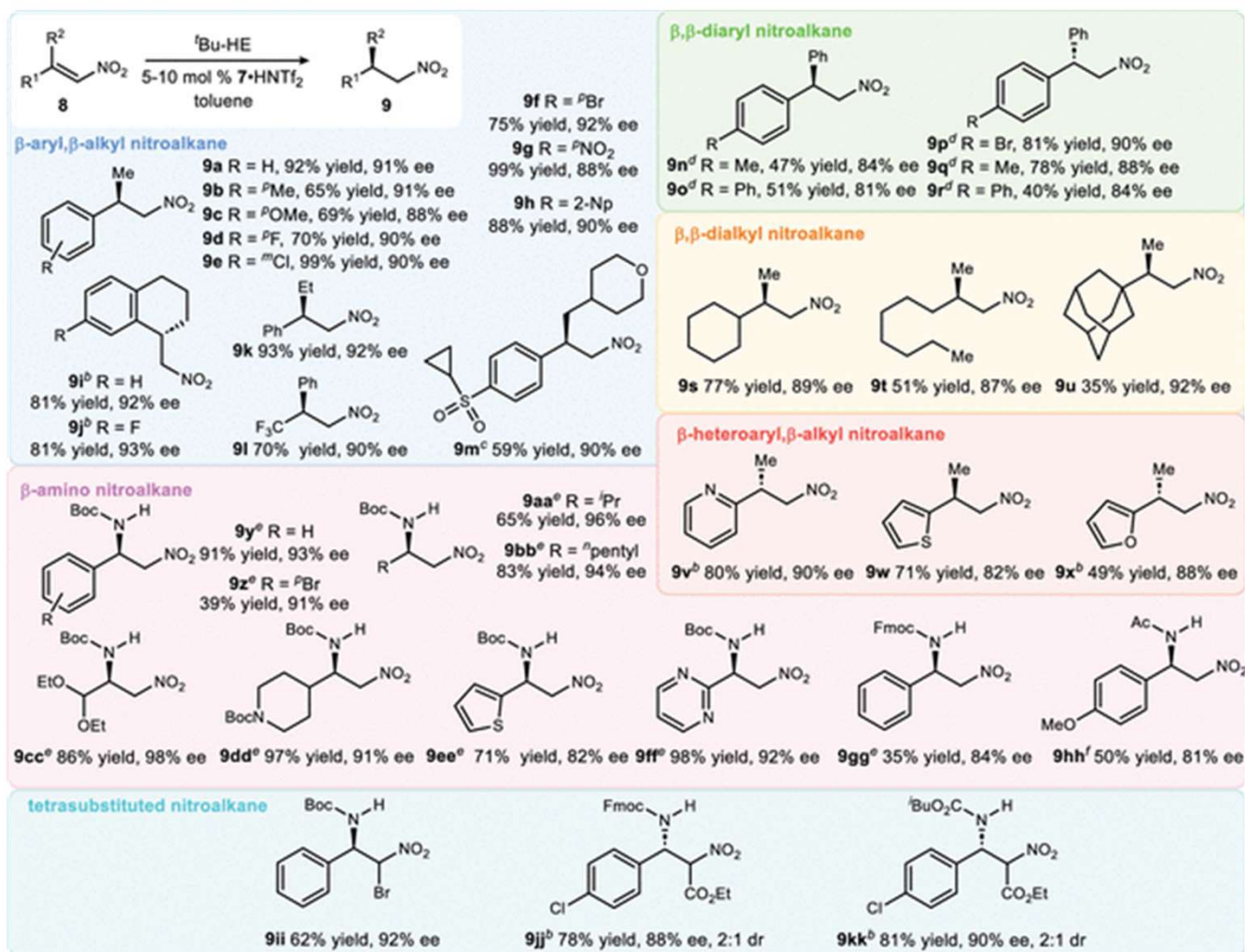
A. Mechanistic Underpinning of the Selectivity-Generality Paradox



B. Synthetic Strategies to Approach Diversity Challenges of Peptidomimetics



- *J. Am. Chem. Soc.* **2024**, 146, 2, 1269–1275

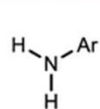
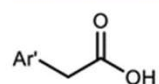


Preparation of N-Aryl Amides by Epimerization-Free Umpolung Amide Synthesis

conventional

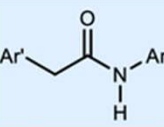
active ester precursor

nucleophilic N-source



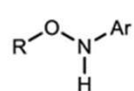
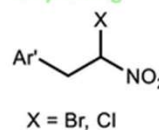
electrophilic coupling agent
nucleophilic promoter

N-aryl amide



- common structural subunit in medicinal chemistry
- aniline precursors are weak nucleophiles in conventional amide synthesis

umpolung



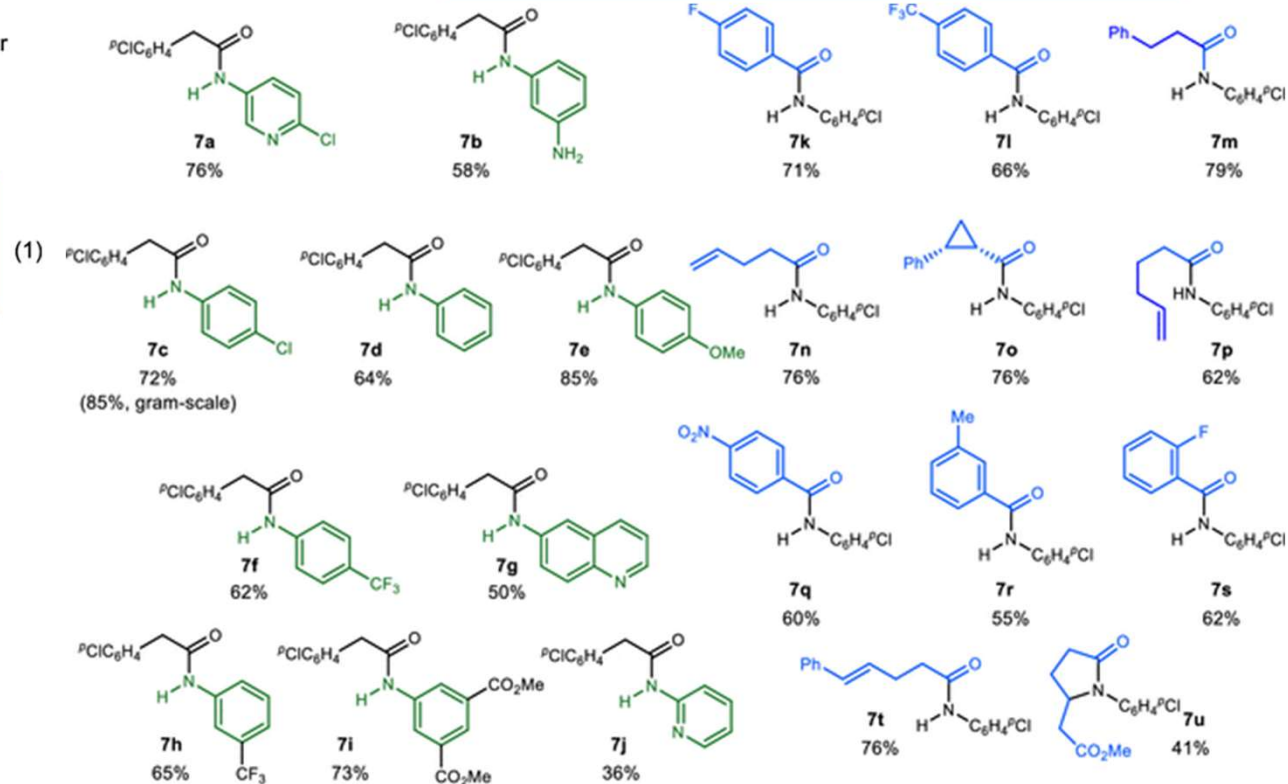
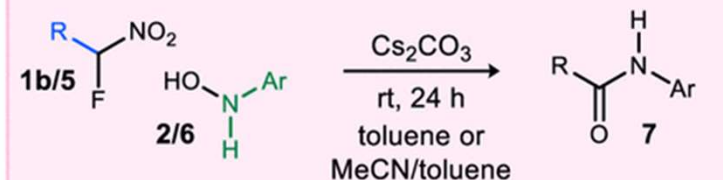
base
Ar, Ar' = *p*-ClC₆H₄

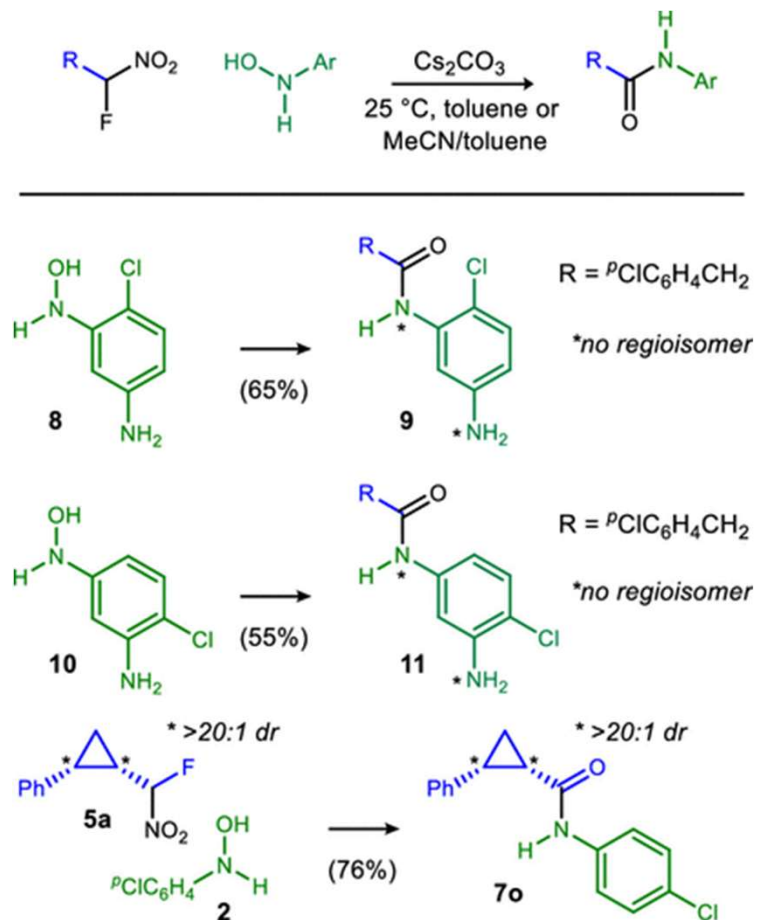
R = Ts
R = C(=NH)CCl₃

acyl anion equivalent

electrophilic N-source

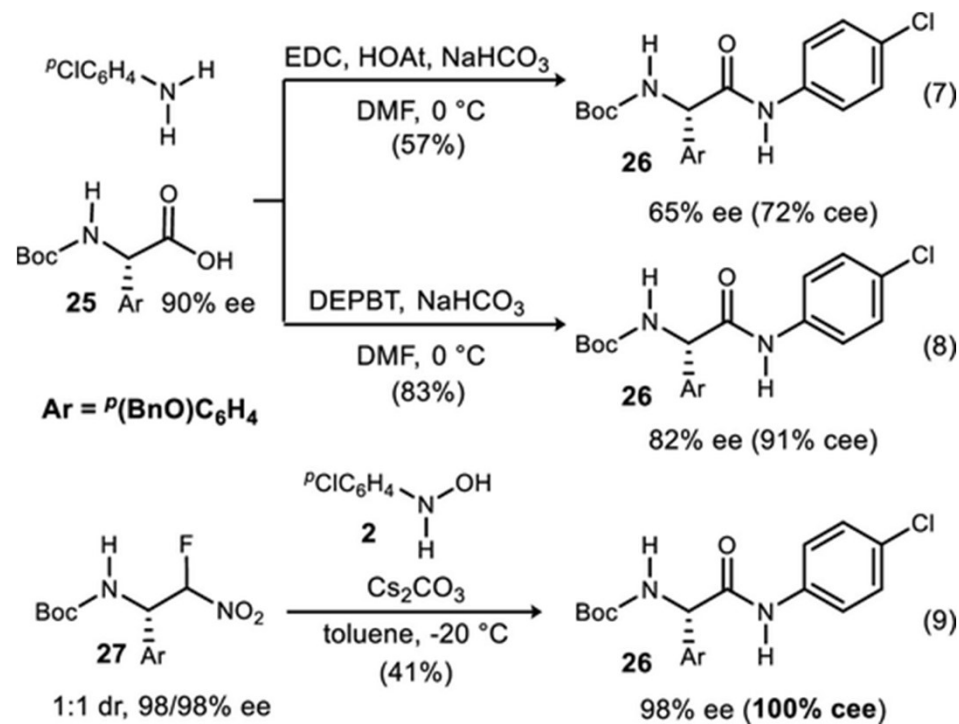
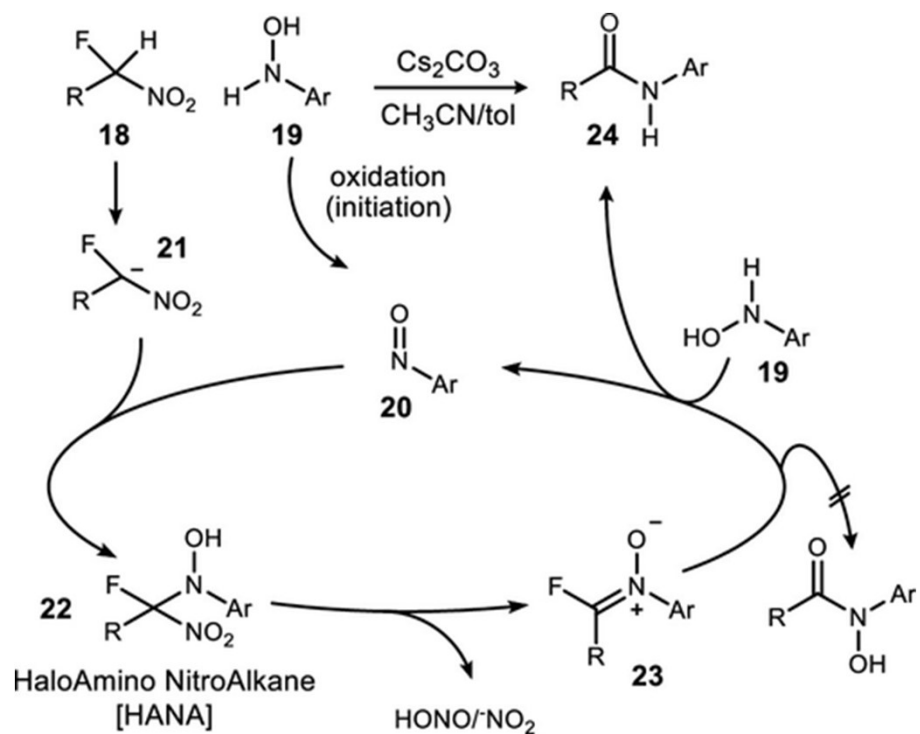
1b, R = *p*-ClC₆H₄CH₂-
5, R = various
2, R = *p*-ClC₆H₄-
6, R = various





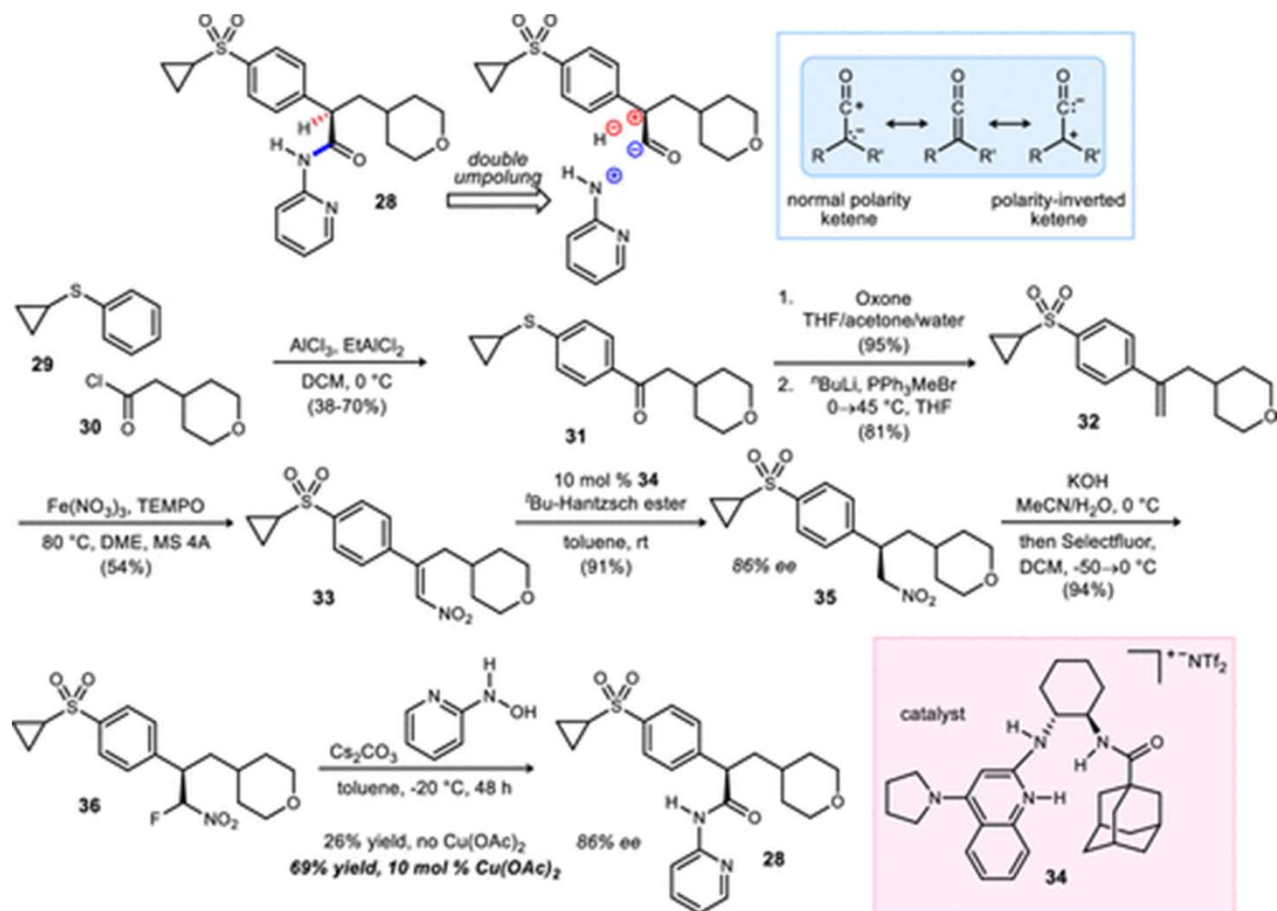
Umpolung *N*-Aryl Amide Synthesis: Regio- and Diastereospecific Reactions

- *J. Am. Chem. Soc.* **2022**, 144, 37, 16708–16714



Umpolung N-Aryl Amide Synthesis: Mechanistic Hypothesis

- *J. Am. Chem. Soc.* **2022**, 144, 37, 16708–16714



Development of a Double Umpolung Approach Using *N*-Aryl UmAS to a Glucokinase Activator

- *J. Am. Chem. Soc.* **2022**, 144, 37, 16708–16714