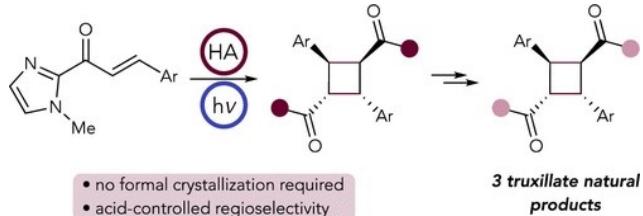


A General Synthetic Strategy toward the Truxillate Natural Products via Solid-State Photocycloadditions

Ellie F. Plachinski, Hyung Joo Kim, Matthew J. Genzink, Kyana M. Sanders, Riley M. Kelch, Ilia A. Guzei, and Tehshik P. Yoon\*

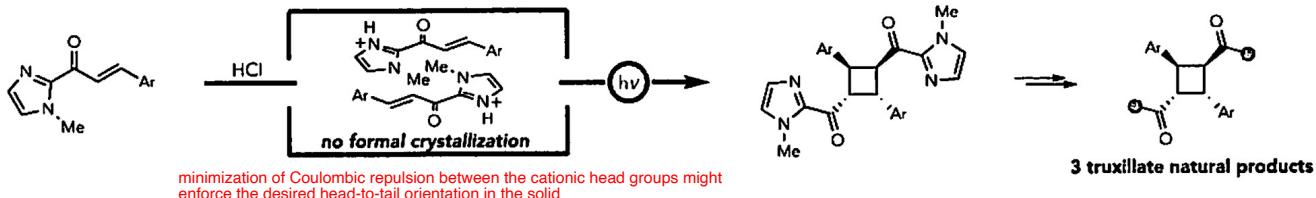
Cite this: J. Am. Chem. Soc. 2024, 146, 22, 14948–14953



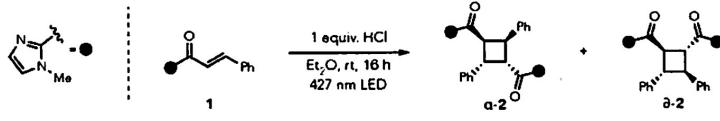
solid-state photoreactions are so sensitive to crystal form,

Alternate strategies to control the relative regioselectivity of solid-state photocycloadditions using hydrogen bonding, pi-pi stacking, or cation-pi interactions have been reported.

**C This Work: Truxillate Natural Products via Selective Solid-State Photocycloadditions**



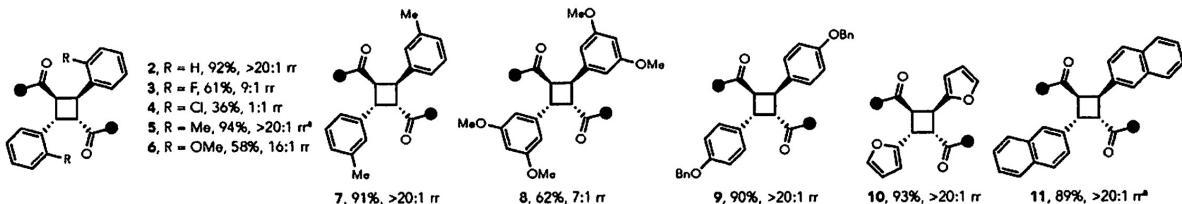
**A Optimization**



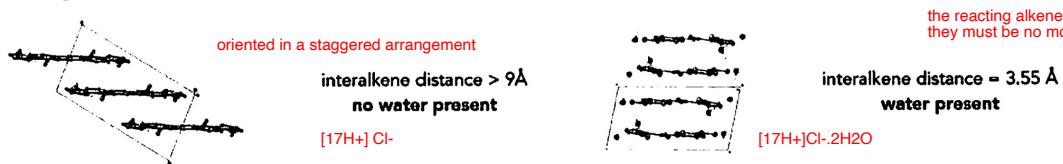
entry	deviations	alpha-2 (%)	beta-2 (%)
1	none	95	0
2	no acid	0	63
3	no solvent	56	0
4	TFA instead of HCl	6	42
5	MeCN instead of Et <sub>2</sub> O	0	52

homogeneous reaction mixture

**B Original Scope**

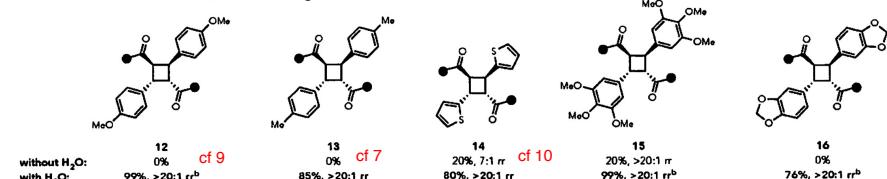


**C Effect of H<sub>2</sub>O on p-OMe Crystal Structure**



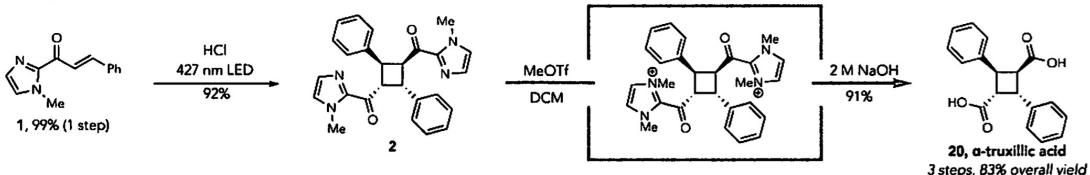
the reacting alkenes must be parallel to each other, and they must be no more than 4.2 Å apart. ...Schmidt rule

**D Additional Scope Enabled by Addition of H<sub>2</sub>O**

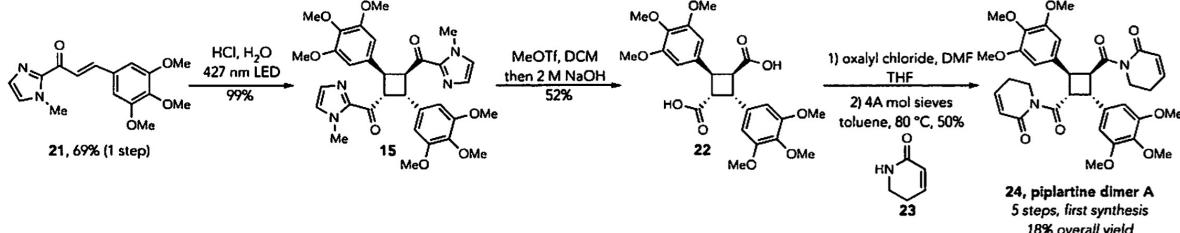


hypothesized that the sensitivity of this reaction to small structural perturbations arises from variations in the organization of the crystal lattice.

**A Total Synthesis of α-truxillic acid**



**B Total Synthesis of piplartine dimer A**



**C Total Synthesis of dipiperamide A**

