Significance: This work provides a method for achieving α-peptide ligation in water that tolerates all 20 proteinogenic amino acids. This is extremely important, especially in biochemistry and the life sciences.

Comment: The authors have developed a method for chemoselective α-aminonitrile ligation in water that uses prebiotically plausible molecules such as hydrogen sulfide, thioacetate, and ferricyanide. The α-peptides are obtained in good to high yields. The model suggests that short N-acyl peptides might have served as plausible substrates during the early evolution of life.