Single-Step Enzymatic Synthesis of β-Methyltryptophans

Significance: Arnold and co-workers report an enzymatic single-step synthesis of β-methyltryptophan analogues from various nucleophiles and L-threonine by using a mutant β-subunit of the tryptophan synthase from *Pyrococcus furiosus* (*PfTrpB*). This subunit, derived from directed evolution, proved to be significantly more active than the wild-type subunit.

Comment: By employing directed evolution, the authors have previously achieved the restoration of activity of the sole β-subunit of the heteromeric tryptophan synthase from *Pyrococcus furiosus*, which facilitates applications outside the cell (*Proc. Natl. Acad. Sci. U.S.A.* 2015, 112, 14599). The current work is an intriguing extension that permits the efficient transformation of threonine instead of serine. The resulting β-methyltryptophans are valuable precursors to a variety of natural products and could previously be only accessed by several chemical or enzymatic steps.