Synthesis of Palhinine A and D

Significance: Palhinine A and D are members of the Lycopodium alkaloid family isolated from the whole plant of Palhinhaea cernua L. Fan and co-workers describe the first total syntheses relying on a microwave-assisted regio- and stereoselective nitrone-alkene [3+2] cycloaddition as the key step to access the nine-membered azanone ring system.

Comment: Treatment of hydroxylamine E with formalin in CH₂Cl₂ resulted in the formation of nitrone F, which underwent an intramolecular 1,3-dipolar cycloaddition to give isoxazolidine G. N-Alkylation followed by reductive N–O cleavage gave access to the challenging azanone ring system, key structural motif of palhinine A and D.