

## Revealing Bacterial Blueprints for Natural Product Assembly

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Bacteria from the order Actinomycetales, commonly known as actinomycetes, are renowned producers of structurally fascinating small molecules. These natural products (secondary metabolites) serve as lead compounds for pharmaceuticals, function as chemical signals that govern interactions between organisms, and inspire organic syntheses. Actinomycete natural products are assembled via specialized biosynthetic pathways, through which enzymatic reactions transform ubiquitous small molecule precursors into unique products. These biosynthetic pathways are genetically encoded, with actinomycete gene clusters acting as the blueprints that dictate the assembly of complex natural products. My undergraduate research program elucidates and engineers these biosynthetic pathway blueprints to create natural products for future practical applications in medicine, agriculture, and other fields. To highlight this work, this presentation will showcase our elucidation and manipulation of biosynthetic pathways for anticancer diketopiperazine natural products.

