The polyketide-II biosynthetic pathway produces an impressive array of polycyclic architectures with functional and stereochemical complexity, thus serving as a rich source of biologically active molecules. Charmed by the challenges posed by such attractive structures, we have been engaged in the synthetic studies, centering attention to strategies and tactics that would enable rapid assembly of polycyclic scaffolds and also allow installation of multiple functionalities and stereogenic centers in a regio- and stereo-controlled manner.[1]

This talk will illustrate our approach by focusing on the recent total syntheses of tetracenomycins C and X, that feature 1) preparation of hexasubstituted naphthonitrile oxide A by successive benzyne cycloadditions and an oxidative ring-opening reaction; 2) a novel ortho-quinone mono-acetal B as the A-ring unit; 3) construction of three contiguous stereogenic centers by an asymmetric benzoin cyclization, an isoxazole oxidation, and a stereoselective reduction.[2]