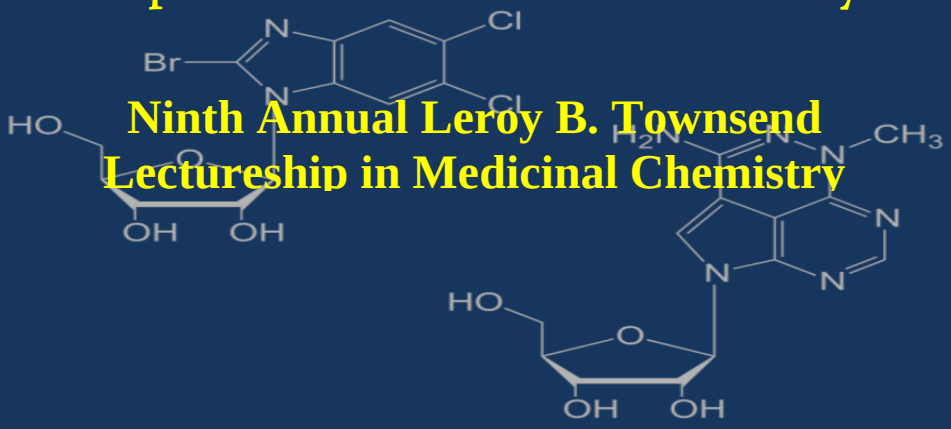
University of Michigan
Department of Medicinal Chemistry



Ninth Annual Leroy B. Townsend Lectureship in Medicinal Chemistry

"Probing the Enzymatic Activity of the Rv0045c Esterase from M. Tuberculosis: A Research Model for Undergraduate Biochemistry Education"

Abstract:

The Rv0045c protein from *M. tuberculosis* is an α/β fold hydrolase that displays esterase catalytic activity whose physiological role is currently unknown. We have employed this enzyme as a model for the fusion of undergraduate laboratory coursework and research. Students in our biochemistry laboratory course have explored the role of active site residues through the characterization of several amino acid variants, ultimately producing an enzyme (H187Y) with significantly higher catalytic activity than the wild type. Students in our organic synthesis laboratory course have produced a library of fluorogenic substrates that allowed structural-activity relationship studies, which revealed that Rv0045c displays a distinct preference for ester substrates with short and relatively non-hydrophobic acid moieties.