

Engineering of Phosphotriesterase to Detoxify Organophosphates in Extreme Environments

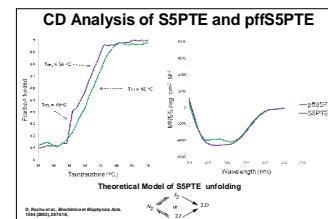
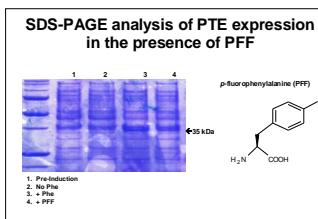
Peter James Baker¹ Yogesh T. Ganesan¹ and Jin Kim Montclare¹

Peter James Baker, Tegesu T. Suresan and Jim Kim Montauro
**¹Department of Chemical and Biological Sciences, Polytechnic Institute of New York University,
Brooklyn, New York 11201**

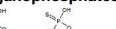
²Department of Biochemistry, SUNY-Downstate Medical Center
Brooklyn, New York, 11203

Abstract

Phosphotriesterase (PTE) is a well-studied naturally occurring enzyme capable of degrading and detoxifying organophosphates. Detailed kinetic analysis of the wild-type enzyme has shown a decreased activity in extreme environments such as high temperatures, low pH and in the presence of organic solvents. An enzyme which is functional in these environments has a great potential for biomedicine and anti-terrorism applications. Here we describe the residue specific incorporation of *p*-fluorophenylalanine into PTE and the effects on its thermostability and thermoactivity.

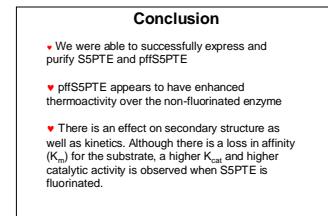
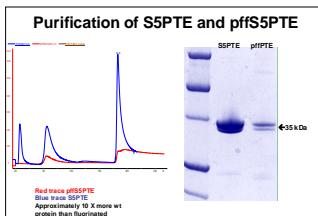
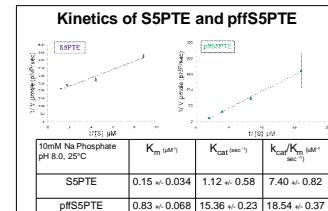
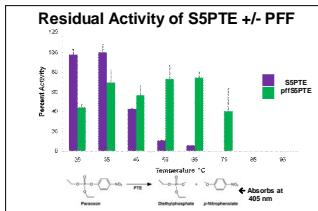


Organophosphates and S5PTE Structure



Paraxon Parathion

Sarin Soman



PJB is grateful to the National Science Foundation for supporting his research under a GK-12 Fellows grant 0741714. We also thank AFOSR and DURIP for their financial support.