DEPARTMENT OF CHEMISTRY  
COLLEGE OF ARTS & SCIENCES  

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN  

APPLICATION DEADLINE: 03/01/2017  

PROJECT TITLE: Structural analysis of poly(ADP-ribose) signaling proteins  

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Project Description  

Poly(ADP-ribosyl)ation (PARylation) is a transient post-translational modification that has widespread effects on DNA repair and replication, gene expression, and cell-fate. PARylation is cytotoxic when accumulated and dynamically regulated by PAR glycohydrolase (PARG). Small-molecule inhibitors targeting PAR metabolism has shown promise in precision cancer medicine, and inhibitors of PAR polymerases (PARPs) specifically kill BRCA1/2-deficient breast tumors.  

We are working on the structure, mechanism, and drug discovery of key proteins in PAR metabolism and signaling. We are highly interested in determining the crystal structures of and developing a high-throughput assay for our target proteins. These are the pre-requisite steps to discover new cancer therapeutics through a high-throughput screening.  

A WISE student will be primarily trained in expression, purification, and crystallization of PAR signaling proteins to determine the structures of protein, protein-ligand, and protein-protein complexes. She will obtain extensive experience and background in X-ray crystallography and various biochemical tools, including GST-pull down and time-resolved fluorescence resonance energy transfer (TR-FRET), etc.