Justin Powlowski

Associate Professor

BSc McGill University
PhD University of Minnesota
Postdoctorate: University of Michigan

powlow@alcor.concordia.ca

Biochemistry

Research Interests

Environmental applications of biochemistry; bacterial degradation of aromatic compounds; enzymology; biophysical characterization of proteins; fungal enzymes involved in biomass degradation; bioethanol production.

My research revolves around the biochemistry of microbial detoxification pathways for aromatic compounds, and fungal degradation of biomass. Enzymes and proteins involved in these processes feature prominently. A variety of approaches and techniques is used, including classical enzymology, protein engineering, gene discovery on a genome-wide basis, and proteomics to examine processes such as degradation of phenols and polychlorinated biphenyls by soil bacteria, and fungal degradation of phenols and components of wood. We collaborate with colleagues at Concordia's Centre for Structural and Functional Genomics as well as a number of industrial collaborators to discover new and novel enzymes for use in industrial processes. Another area of interest is characterization of proteins involved in bacterial resistance to mercuric ion. In addition to the potential practical applications of these bacterial and fungal activities, our studies often reveal interesting new biochemical information.

Selected Publications

Master, E., Zheng, Y, Storms, R., Tsang, A. & Powlowski, J. 2007. A xyloglucan specific, family 12 glycosyl hydrolase from Aspergillus riger: Recombinant expression, purification and characterization. Biochem. J. Immediate Publication, doi:10.1042/BJ20070819

Lahjouji K., Storms R., Xiao Z., Joung K.B., Zheng Y., Powlowski J., Tsang A, & Varin L. 2007. Biochemical and molecular characterization of a cellobiohydrolase from Trametes versicolor Appl. Microbiol. Biotechnol. 75, 337-46.

Dodard S.G., Powlowski J, & Sunahara G.I (2004) Biotransformation of 2,4,6-trinitrotoluene (TNT) by enchytraeids (Enchytraeus albidus) in vivo and in vitro. Environ. Pollut.131, 263-73.

Manjasetty BA, Powlowski J, & Vrielink A. (2003) Crystal structure of a bifunctional aldolase-dehydrogenase: sequestering a reactive and volatile intermediate. Proc Natl Acad Sci U S A. 2003 Jun 10;100(12):6992-6997.

Cadieux E, Vrajmasu V, Achim C, Powlowski J, & Münck E. (2002) Biochemical, Mössbauer, and EPR studies of the diiron cluster of phenol hydroxylase from Pseudomonas sp. strain CF 600. Biochemistry. 41, 10680-10691