



Chemical & Physical Sciences  
UNIVERSITY OF TORONTO  
MISSISSAUGA

## COLLOQUIUM

TUESDAY, FEBRUARY 28<sup>TH</sup>, 2012  
12:00 P.M. (**SHARP**) – 1:00 P.M.  
**CCT 2150**

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# Laurie Parker

*Purdue University Center for Cancer Research  
Department of Medicinal Chemistry and Molecular Pharmacology*

## **“Biosensors for biomarkers: measuring kinase activity in live cells”**

We develop in vitro and intracellular sensors and assays for kinase activity, using peptides and nanoparticles to make specific substrates for various cancer-related kinases that are either targeted directly by inhibitor drugs (e.g. Bcr-Abl and imatinib) or related to off-target drug resistance and other cancer-specific signaling. We use highly sensitive mass spectrometry readouts that have the potential to be multiplexed to analyze many substrates at once. Our technologies could eventually be applied to high-content secondary screening of kinase inhibitor drugs, or more importantly, for monitoring therapeutic response during treatment. This could be extremely useful for drug discovery, where drug mechanisms and dosage are not well characterized in vivo during drug development and where traditional pharmacokinetics don't necessarily tell the whole story about mechanistic inhibition (since drug levels in serum don't always correlate to intracellular enzymatic inhibition). In particular for leukemias, our techniques should be sensitive enough to monitor mechanistic response in peripheral blood from animal models and human subjects. Other than drug response, our technologies also could be used to generate personalized kinase activation biomarker signatures that may inform diagnosis, prognosis or treatment decisions for individual patients.