MCB PLANT BIOLOGY SEMINAR

Chris Hall
CRC in Recombinant Antibody Technology
School of Environmental Sciences
University of Guelph

"*In planta* production and *in vitro* assessment of the monoclonal antibody trastuzumab, the growth inhibitor of Her2 positive breast cancer"

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ABSTRACT:
Support from OMAFRA and the Canada Research Chairs Program has allowed my research group to perform cutting-edge research in recombinant antibody (rAb) technology to make bioproducts for applications in agriculture, medicine and the environment. Through rAb technology, antibody (Ab) genes from animals can be expressed in plants. For example, we transformed tobacco with an optimized, synthetic gene encoding an anti-botulinum neurotoxin antibody to examine the potential of using transgenic plants as bioreactors for the production of antidotes for this potential biological weapon. In vitro muscle-twitch assays demonstrated the functional utility of this Ab, after its extraction from tobacco, to neutralize paralysis caused by the toxin at neuromuscular junctions. Based on our purification data a few hectares of transgenic tobacco could supply 1 M people with an antidote to this toxin. Recently, we have increased this expression 100 fold using a new expression system. We have also developed an antibody purification platform using these plant bioreactors, and were first in the world to demonstrate that antibody expression in plants can protect them from toxic environmental contaminants and can potentially be used to remediate contaminated sites. An overview of this research and its significance will be discussed during my presentation.