

# Insect Biotech Conference – 2011

## Conference Schedule

### Wednesday Evening – June 8

- 6:00 pm                    **Registration:** Outside Newman Room
- 7:00 pm                    **Plenary Talk:** Newman Room  
Dr. Andrew Reynolds, Professor of Viticulture, Cool Climate Oenology & Viticulture Institute, Brock University  
**APPLIED GEOMATICS--CONNECTING THE DOTS BETWEEN GRAPEVINE PHYSIOLOGY, TERROIR, AND REMOTE** [Page vii]
- 7:45 – 9:30 pm           **Reception:** Outside Newman Room (Pizzeria, Beer and Wine)

### Thursday, June 9

- 7:45 – 9:00 am           **Breakfast:** Outside Newman Room (The All Canadian)
- 9:00 am                    **Opening Remarks:** Ian Orchard
- Session Chair:**           **Ian Orchard**
- 9:10 am                    **RATES OF EPITHELIAL TRANSPORT THROUGH ANALYSIS OF FLUOROCHROME CONCENTRATION GRADIENTS IN UNSTIRRED LAYERS.** [Page 1]  
Seabrooke, S and O'Donnell, M.J.  
Department of Biology, McMaster University, Hamilton, ON, Canada
- 9:30 am                    **SEPTATE JUNCTION GENES IN IONOREGULATORY ORGANS OF LARVAL *Aedes aegypti* AND THE EFFECT OF REARING SALINITY.** [Page 2]  
Jonusaite, S., Clelland, E., Kelly, S. and Donini, A.  
Department of Biology, York University, Toronto, ON, Canada
- 9:50 am                    **AMMONIUM SECRETION BY INSECT MALPIGHIAN TUBULES: APPLICATION OF A NOVEL AMMONIUM-SELECTIVE MICROELECTRODE.** [Page 3]  
Browne, A. A. and O'Donnell, M.J.  
Department of Biology, McMaster University, Hamilton, ON, Canada
- 10:10 am                   **ALLATOSTATIN INHIBITS LOCUST GUT CONTRACTION AND ILEAL ION TRANSPORT.** [Page 4]  
Robertson, L.<sup>1</sup>, Lange, A.B.<sup>1</sup>, Donini, A.<sup>2</sup>  
<sup>1</sup>Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada.  
<sup>2</sup>Department of Biology, York University, Toronto, ON, Canada.

10:30 – 10:50 am **Coffee Break:** Outside Newman Room

**Session Chair:** **Angela Lange**

10:50 am **UNDERSTANDING THE MESSY GENOMIC BACKYARD.** [Page 5]  
Yang, G., Janicki, M., Rooke, B., Wong, A., Hui, C.  
Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada.

11:10 am **APOPTOSIS IN HOST DEFENSE AND PRODUCTIVE INFECTION IN *AMSACTA MOOREI ENTOMOPOXVIRUS* INFECTED CELLS.** [Page 6]  
Srini Perera<sup>1,2</sup>, Peter Krell<sup>2</sup> and Basil Arif<sup>1</sup>  
<sup>1</sup>Laboratory for Molecular Virology, GLFC, Sault Ste Marie, ON, Canada,  
<sup>2</sup>University of Guelph, ON, Canada.

11:30 am **TISSUE AND STAGE- SPECIFIC PROTEIN KINASE C BETA HOMOLOGUE IN THE SPRUCE BUDWORM, *CHORISTONEURA FUMIFERANA*.** [Page 7]  
Guoxing Quan<sup>1</sup>, Haggag S Zein<sup>1,2</sup>, Shannon Escasa<sup>1,2</sup>, Tim Ladd<sup>1</sup>, Peter J. Krell<sup>2</sup> and Basil M. Arif<sup>1</sup>  
<sup>1</sup> Great Lakes Forestry Centre, Canadian Forest Service, Sault Ste. Marie, ON, Canada,  
<sup>2</sup>Department of Molecular and Cellular Biology, University of Guelph, ON, Canada

11:50 – 12:20 pm **Short Exposures** (5 minute talks plus questions)

**MOLECULAR CLONING AND CHARACTERIZATION OF NMDA-LIKE RECEPTORS IN THE COCKROACH, *DIPLOPTERA PUNCTATA*.** [Page 8]  
Huang, J. and Tobe, S.S  
Department of Cell and Systems Biology, University of Toronto, Toronto, ON, Canada

**THE ROLE OF THE ECDYSONE RECEPTOR HETERODIMER IN THE ENDOCRINE CONTROL OF REPRODUCTION IN THE COCKROACH *DIPLOPTERA PUNCTATA*.** [Page 9]  
Ekaterina F. Hult<sup>1</sup>, Belinda S.W. Chang<sup>1,2</sup> and Stephen S. Tobe<sup>1</sup>  
<sup>1</sup>Department of Cell and Systems Biology, University of Toronto, Toronto, ON, Canada  
<sup>2</sup>Department of Ecology and Evolutionary Biology, University of Toronto, Toronto, ON, Canada

**NA<sup>+</sup>/K<sup>+</sup>-ATPASE TRAFFICKING IMPROVES RECOVERY FROM ANOXIC COMA IN PRECONDITIONED LOCUSTS.** [Page 10]  
Hou, N. Y., and Robertson, R.M  
Department of Biology, Queen's University, Kingston, ON, Canada

**ACCURATE AND QUANTIFIABLE MUSCLE CONTRACTION RECORDINGS FROM SINGLE FIBERS IN *DROSOPHILA LARVAE*** [Page 11]  
Kiel Ormerod<sup>1</sup>, A. Joffre Mercier<sup>1</sup> and Krans, J.L.<sup>2</sup>  
<sup>1</sup>Department of Biological Sciences, Brock University, St. Catharines, ON, Canada;  
<sup>2</sup>Department of Neuroscience, Western New England University, Springfield, MA, United States of America.

12:20 – 1:20 pm **Lunch Break:** Outside Newman Room (Deli Bar “Make Your Own”)

**Session Chair: Daniel Doucet**

1:20 pm **PROTEOMIC AND GENOMIC ANALYSES OF THE *NEODIPRION ABIETIS* NUCLEOPOLYHEDROVIRUS.** [Page 12]

Shannon Escasa<sup>1</sup>, Misha Demidovich<sup>1</sup>, Christopher Lucarotti<sup>2</sup>, Peter Krell<sup>3</sup> and Basil Arif<sup>1</sup>

<sup>1</sup>Laboratory for Molecular Virology, Great Lakes Forestry Centre, CFS. <sup>2</sup>Atlantic Forestry Centre, CFS. <sup>3</sup>Dept. of Cellular and Molecular Biology, University of Guelph.

1:40 pm **DETERMINATION OF THE ROLE ME53 PLAYS IN BOTH EARLY AND LATE PHASES IN THE BACULOVIRUS LIFE CYCLE.** [Page 13]

Liu, Y., de Jong, J., and Krell, P.J.

Department of Molecular and Cellular Biology, University of Guelph, Guelph, Ontario N1G 2W1, Canada

2:00 pm **PROTEIN KINASE C IN CF-203 CELLS IS INVOLVED IN *CHORISTONEURA FUMIFERANA* MULTINUCLEOCAPSID NUCLEOPOLYHEROVIRUS INFECTION.** [Page 14]

Shannon Escasa<sup>1,2</sup>, Tim Ladd<sup>1</sup>, Peter J. Krell<sup>2</sup>, Basil M. Arif<sup>1</sup> and Guoxing Quan<sup>1</sup>

<sup>1</sup> Great Lakes Forestry Centre, Canadian Forest Service, Sault Ste. Marie, ON, Canada

<sup>2</sup>Department of Molecular and Cellular Biology, University of Guelph, ON, Canada

2:20 – 2:50 pm **Short Exposures** (5 minutes plus questions)

**MAK 2.0: A GUI-BASED, CROSS-PLATFORM TE ANALYSIS SUITE.** [Page 15]

Janicki, M., and G. Yang

Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada.

**GENES OF THE JASMONIC ACID SIGNALING PATHWAY EXPRESSED BY GREEN ASH, *FRAXINUS PENNSYLVANICA*.** [Page 16]

Susan Bowman, Kyla Fadock and Daniel Doucet

Great Lakes Forestry Centre, Sault Ste Marie, ON P6Q 2E5

**PROTEOMIC ANALYSES OF INSECTICIDE-RESISTANT COLORADO POTATO BEETLE *LEPTINOTARSA DECEMLINEATA* (SAY)** [Page 17]

<sup>1</sup>Scott, I.M., <sup>2</sup>Jurvic, K., <sup>2</sup>Clarke, V., <sup>1</sup>MacArthur, D.C., <sup>1</sup>Tolman, J.H. and <sup>2</sup>Yeung, K.

<sup>1</sup>Agriculture and Agri-Food Canada, 1391 Sandford St., London ON N5V 4T3

<sup>2</sup>Department of Biochemistry, University of Western Ontario, London, ON N6A 5C1

**INFLUENZA VIRUS HEMAGGLUTININ (HA) EXPRESSION IN THREE DIFFERENT INSECT BACULOVIRUS EXPRESSION SYSTEMS** [Page 18]

Alexandra Elliott, Jeffrey Hodgson<sup>1</sup>, Éva Nagy,<sup>2</sup> and Peter J. Krell<sup>1</sup>.

<sup>1</sup>Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON, Canada.

<sup>2</sup>Department of Pathobiology, University of Guelph, Guelph, ON, Canada.

2:50 – 3:10 pm **Coffee Break**

**Session Chair: Bill Bendena**

3:10 pm **NEURAL MODULATION OF THE RATE OF THE HEART BEAT IN THE BLOOD-FEEDING INSECT, *RHODNIUS PROLIXUS*. [Page 19]**  
R. Gary Chiang, Biology Department, Redeemer University College, Ancaster, ON

3:30 pm **THE EFFECTS OF CRUSTACEAN CARDIOACTIVE PEPTIDE ON THE HEARTS OF TWO ORTHOPTERAN INSECTS, AND A FRANK-STARLING-LIKE MECHANISM. [Page 20]**  
Rosa da Silva<sup>1</sup>, Sara R. da Silva<sup>2</sup> and Angela B. Lange<sup>1</sup>  
<sup>1</sup>Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada  
<sup>2</sup>Department of Chemical and Physical Sciences, University of Toronto Mississauga, Mississauga, ON, Canada

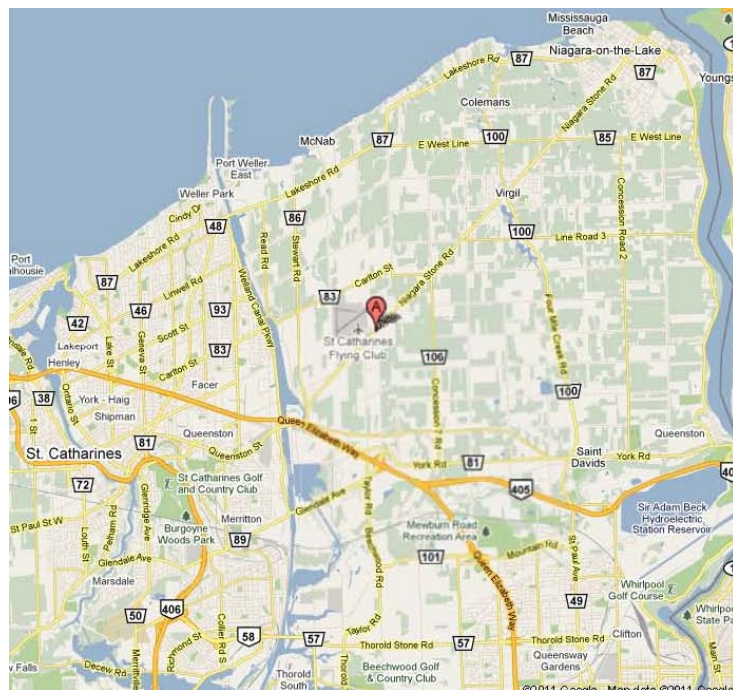
3:50 pm **CAPA PEPTIDES: ANTI-DIURETIC FACTORS IN LARVAL MOSQUITO? [Page 21]**  
Ionescu, A. and Donini, A.  
Department of Biology, York University, Toronto, ON., Canada

4:10 pm **THE ANTI-DIURETIC HORMONE, RHOPRCAPA-2, INHIBITS DIURETIC-HORMONE STIMULATED NATRIURESIS IN MALPIGHIAN TUBULES OF *RHODNIUS PROLIXUS*. [Page 22]**  
Paluzzi, J.P., Naikhwah, W. and O'Donnell, M.J.  
Department of Biology, McMaster University, Hamilton, ON, Canada.

4:30 pm **End of Session**

6:00 pm **Southbrook Vineyards (Wine Seminar/Tasting)**

7:00 pm **Conference Dinner, Southbrook Vineyards (Catered by Kristin's Fine Food)  
581 Niagara Stone Rd., RR4 Niagara-on-the-lake, L0S 1J0**



## Friday, June 10

7:45 – 9:00 am      **Breakfast:** Outside Newman Room (The All Canadian)

**Session Chair:**      **Andrew Donini**

9:00 am      **EXPRESSION OF OCTOPAMINE RECEPTOR GENES IN THE CABBAGE LOOPER, *TRICHOPLUSIA NI*. [Page 23]**

Lam, F.<sup>a</sup>, McNeil, J.N.<sup>a</sup> and Donly, B. C.<sup>a, b</sup>

<sup>a</sup>Department of Biology, University of Western Ontario, London, ON, Canada

<sup>b</sup>Southern Crop Protection & Food Research Centre, Agriculture and Agri-Food Canada, London, ON, Canada

9:20 am      **CLONING AND CHARACTERIZATION OF THE CDNA ENCODING FGLAMIDE-RELATED ALLATOSTATIC PEPTIDES IN THE BLOOD-GORGING BUG, *RHODNIUS PROLIXUS*. [Page 24]**

Lytvyn, Y.; Zandawala, M.; Orchard, I.

Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada.

9:40 am      **MOLECULAR IDENTIFICATION AND CHARACTERIZATION OF A GENE ENCODING THE KININ PEPTIDES IN THE BLOOD-GORGING BUG, *RHODNIUS PROLIXUS*. [Page 25]**

Garima Bhatt and Ian Orchard

Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada

10:00 am      **PROCTOLIN IN THE BLOOD-GORGING BUG, *RHODNIUS PROLIXUS*. [Page 26]**

Do Hee Lee, Angela B. Lange and Ian Orchard

Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada

10:20 – 10:40 am      **Coffee Break:** Outside Newman Room

**Session Chair:**      **Cam Donly**

10:40 am      **FUNCTIONAL CHARACTERIZATION OF THE CONSERVED *CHIA* AND *V-CATH* BIDIRECTIONAL PROMOTER OF *AUTOGRAPHA CALIFORNICA* MULTIPLE NUCLEOPOLYHEDROVIRUS (ACMNPV). [Page 27]**

Michael J. Norris<sup>1</sup> and Peter J. Krell<sup>1</sup>

<sup>1</sup>Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON N1G 2W1 Canada

11:00 am      **NATURAL POINT MUTATION IN *AUTOGRAPHA CALIFORNICA* MULTIPLE NUCLEOPOLYHEDROVIRUS DNA POLYMERASE ALTERS VIRUS REPLICATION, DRUG RESISTANCE AND VIRION MORPHOGENESIS. [Page 28]**

Feng, G.Z.<sup>1</sup>, Thumbi, D.<sup>2</sup>, Arif, B. M.<sup>3</sup>, Doucet, D.<sup>3</sup> and Krell, P. J.<sup>1</sup>

<sup>1</sup>Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON N1G 2W1

<sup>2</sup>Sylvar Technologies Fredericton, NB E3B 5A6

<sup>3</sup>Great Lakes Forestry Centre Sault Ste Marie, ON P6Q 2E5

- 11:20 am            **BACULOVIRUS (*AUTOGRAPHA CALIFORNICA* MULTIPLE NUCLEOPOLYHEDROVIRUS) CHITINASE IS NOT REQUIRED AS A PROV-CATH FOLDING CHAPERONE.** [Page 29]  
Jeffrey J. Hodgson,<sup>1</sup> Basil M. Arif<sup>2</sup> and Peter J. Krell<sup>1</sup>  
<sup>1</sup>Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON N1G 2W1, Canada  
<sup>2</sup>Laboratory for Molecular Virology, Great Lakes Forestry Centre, Sault Ste Marie, ON P6A 2E5, Canada
- 11:40 - 12:00 noon        **Check out of hotel rooms**
- 11:45 – 1:00 pm            **Lunch Break:** Outside Newman Room (Sandwich Bar)
- Session Chair: Basil Arif**
- 1:00 pm            **CLONING OF THE PHOSPHOLIPASE A2 AND CYCLOOXYGENASE TRANSCRIPTS IN *RHODNIUS PROLIXUS* AND INFLUENCE OF A JACKBEAN UREASE DIET.** [Page 30]  
Defferrari, M.S.<sup>1</sup>, Zandawala, M.<sup>2</sup>, Carlini, C.R.<sup>1</sup>, Orchard, I.<sup>2</sup>  
<sup>1</sup>Graduate Program in Cellular and Molecular Biology, Universidade Federal do Rio Grande do Sul, Brazil  
<sup>2</sup>Department of Biology, University of Toronto at Mississauga, Mississauga, ON, Canada.
- 1:20 pm            **CHARACTERIZATION OF THE ODORANT BINDING PROTEINS AND ODORANT RECEPTOR OF EMERALD ASH BORER.** [Page 31]  
Sohail S. Qazi, Susan Bowman, Michel Cusson, Catherine Beliveau and Daniel Doucet  
Insect Biotechnology Group, Canadian Forest Service, Natural Resources Canada, Great Lakes Forestry Centre, Sault Ste Marie, Ontario
- 1:40 pm            **INTERACTION BETWEEN THE PHYSIOLOGICALLY RELEVANT ION K<sup>+</sup> AND THE TOXIC METAL Tl<sup>+</sup> IN *CHIRONOMUS RIPARIUS*.** [Page 32]  
Belowitz, R.F. and O'Donnell, Michael  
Department of Biology, McMaster University, Hamilton, ON, Canada
- 2:00 pm            **MOLECULAR GENETIC ANALYSIS OF ORGANIC ANION TRANSPORT BY MALPIGHIAN TUBULES OF *DROSOPHILA*: USE OF MUTANTS AND RNAi TRANSGENIC FLIES.** [Page 33]  
Chahine, S. and O'Donnell M.J.  
Department of Biology, McMaster University, Hamilton, ON, Canada.
- 2:20 – 2:30 pm            **Closing Remarks**
- 2:30 pm            **End of Conference**

## **APPLIED GEOMATICS--CONNECTING THE DOTS BETWEEN GRAPEVINE PHYSIOLOGY, TERROIR, AND REMOTE**

Andrew G. Reynolds

Professor of Viticulture, Cool Climate Oenology & Viticulture Institute, Inniskillin Hall, room 311, Brock University, 500 Glenridge Ave., St. Catharines, Ont. L2S 3A1.

Since 1998 we have been using geomatic tools (GPS, GIS) for investigating factors that might have the greatest influence on the terroir effect in the Niagara region. Our initial investigations focused upon soil texture and vine vigour, but since 2005 the major factor under investigation has been vine water status. Work with Riesling at ten sites throughout the Niagara Peninsula showed that substantial spatial variation occurred within vineyard blocks with respect to soil and vine water status, and moreover, this variation tended to be temporally stable. Positive spatial correlations were discovered between leaf water potential ( $\psi$ ) and both berry weight and titratable acidity, and negative correlations between leaf  $\psi$  and soluble solids, free volatile terpenes (FVT), and potentially-volatile terpenes (PVT). Sensory analysis and use of partial least squares (PLS) analysis associated astringency, vegetal, and wet stone attributes with high water status zones within vineyards and with high water status sites. A related trial with Cabernet franc similarly found spatial variability within blocks that was temporally stable. Positive spatial correlations were discovered between leaf  $\psi$  and both berry weight and titratable acidity, and negative correlations between leaf  $\psi$  and soluble solids, pH, berry colour intensity, total anthocyanins, and total phenols. Sensory analysis associated green bean, bell pepper, and other pejorative attributes with high water status zones within vineyards and with high water status sites. With both the Riesling and Cabernet franc trials, the sensory analysis permitted us to validate clusters of the ten sub-appellations in Niagara established by the VQA in 2005. A trial begun in 2006 at a 10-ha Riesling vineyard used the same geomatic tools as our previous work but added a remote sensing component. The vineyard was divided into six sub-blocks (sous-terroirs) based upon photography during a low-elevation flight that suggested there were clear vigour zones. Once again, each sous-terroir showed spatial variability with respect to leaf  $\psi$  and most variables were temporally stable. Positive spatial correlations were apparent between soil moisture and leaf  $\psi$  and both berry weight and titratable acidity, and negative correlations between leaf  $\psi$  and soluble solids, FVT, and PVT. Most interestingly, the various spectral reflectance variables (normalised difference vegetation index (NDVI), red edge inflection point, greenness ratio) were spatially correlated with each other, were temporally stable, and were correlated with variables such as vine vigour, yield, and water status. Positive sensory attributes tended to be linked via PLS to NDVI, FVT, PVT, and low vine water status. A related trial begun in 2008 with four blocks of Pinot noir led us to many of the same conclusions: most of the pejorative wine sensory descriptors were associated with high and medium water status zones. The temporal stability of the water status zones and their consistent relationships with relevant fruit composition and sensory variables suggest that creation of sub-blocks could be accomplished for purposes of economic gain. These relationships also could permit the implementation of precision viticulture if sub-sections of blocks present the ability to be differentially managed.