2011 International Congress on Invertebrate Pathology and Microbial Control
PROGRAM

SATURDAY – 6 August

SIP Board Meeting	**8:00 – 17:00** Sobey 153
Registration	**18:00 – 21:00** Sobey Building Lobby

SUNDAY – 7 August

Registration **(OECD-funded Symposium only)**	**7:00 – 12:00** Sobey Building Lobby
OECD Co-operative Research **Programme Funded Symposium:** **Disease in Aquatic Crustaceans:** **Problems and Solutions for Global Food Security** Organizer & Chair: Grant Stentiford	**9:00 – 18:00** Sobey 255
SIP 2011 Congress Registration	**16:00 – 21:00** McNally Theatre Auditorium
Mixer	**18:00 – 21:00** McNally Theatre Auditorium

MONDAY – 8 August

SIP 2011 Congress Registration	**7:00 – 17:00** McNally Theatre Auditorium
Opening Ceremonies and **SIP Founders' Memorial Lecture**	**Monday, 8:30 – 10:00** McNally Theatre Auditorium

Opening Ceremonies

Dr. Susan Bjornson, Chair, Local Organizing Committee
Dr. Leellen Solter, President, Society for Invertebrate Pathology
Dr David Gauthier, Vice President Academic & Research, Saint Mary's University
Student Awards Ceremony

Founder's Lecture

Introduction by Dr. Harry Kaya
Honoree: **Dr. John Briggs**
Lecturer: **Dr. Elizabeth W. Davidson**

10:00 – 10:25	**HEALTH BREAK**	Loyola Conference Hall

Plenary Symposium **Disease Perspectives from the** **Global Crustacean Fishery** Organizers: Grant Stentiford and Martin Erlandson	**Monday, 10:30 – 12:30** McNally Theatre Auditorium

10:30 **1 Crustacean diseases – A Canadian perspective** Rick Cawthorn. Department of Pathology and Microbiology, AVCLSC, Canada

11:00 **2 Crustacean diseases – A US perspective** Jeff Shields. Virginia Institute of Marine Sciences, USA

11:30 **3 Crustacean diseases – A European perspective** Grant Stentiford. European Union Reference Laboratory for Crustacean Diseases, Cefas, UK

12:00 **4 Crustacean Diseases – An Australian perspective** Brian Jones. Aquaculture Department of Fisheries of Western Australia, Perth, Australia

12:30 – 13:50	**LUNCH**	Dockside Dining Hall (Residence)

Student Workshop **Monday, 12:30 – 14:00**
How to Write Grant Proposals Sobey 255
Organizers: Sastia Putri and Kelly Bateman

12:40 **5 How to approach senior scientists for joint grant writing** Jørgen Eilenberg. Department of Agriculture and Ecology, University of Copenhagen, Thorvaldsensvej 40, Frederiksberg C DK 1871 Denmark

13:00 **6 Making sure your grant is funded** Ann E. Hajek. Department of Entomology, Comstock Hall, Cornell University, Ithaca, NY 14853-0901

13:20 **7 A winning proposal: effective grant writing for early career researchers** Helen Hesketh. Centre for Ecology and Hydrology, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxfordshire, OX10 8BB, UK

Afternoon Session 1 **Monday, 14:00 – 16:00**
Bacteria Contributed Papers 1 Sobey 260
Chairs: Hyun-Woo Park and Juan Ferre

14:00 **8 Identification of hemipteran-active *Bacillus thuringiensis* crystal proteins and evaluation of *in planta* efficacy for control of Lygus bugs in cotton** James A. Baum, Uma R. Sukuru, Stephen R. Penn, Steven E. Meyer, Shubha Subbarao, Xiaohong Shi, Stanislaw Flasinski, Gregory R. Heck, Robert S. Brown, Thomas L. Clark. Monsanto Company, 700 Chesterfield Parkway West, Chesterfield, Missouri 63017

14:15 **9 Novel approach for Bt toxin-based transgenic aphid resistance** Nanasaheb P. Chougule, Huarong Li[1], Sijun Liu, Bryony C. Bonning. Department of Entomology, Iowa State University, Ames, IA 50011, USA, [1]Current affiliation, Dow AgroSciences, Indianapolis, IN 46268, USA

14:30 **10 A novel transcriptional mechanism of *Bacillus thuringiensis* cry8Ea1 toxic to Scarab beetle** Lixin Du[1,2], Lili Qiu[1], Jie Zhang[1], Shuliang Feng[2], Fuping Song[1], Dafang Huang[3]. [1]State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, CAAS, China, [2]Institute of Plant Protection, Hebei Academy of Agricultural and Forestry and Sciences, China, [3]Biotechnology Research Institute, CAAS, China

14:45 **11 CytlA of *Bacillus thuringiensis* restores *Bacillus sphaericus* Bin toxicity via large microvillar lesions, not cation channels, in Bin-Resistant larvae of *Culex quinquefasciatus*** Brian A. Federici [1,2], Margaret C. Wirth[1], Jeffrey J. Johnson[1], Hyun-Woo Park[1], Dennis K. Bideshi[1], William E. Walton[1]. Department of Entomology[1] and Interdepartmental Graduate Program Microbiology[2], University of California - Riverside, Riverside, California 92521 USA

15:00 **12 The 60-kDa protein encoded by orf2 in the cry19A operon of *Bacillus thuringiensis* subsp. *jegathesan* functions like a C-terminus of the 135-kDa Class Cry proteins** J. Eleazar Barboza-Corona[1], Hyun-Woo Park[2,3,4], Dennis K. Bideshi[2,3], Brian A. Federici[2,5]. [1]Universidad de Guanajuato Campus Irapuato-Salamanca, División Ciencias de la Vida, Departamento de Ingeniería en Alimentos, Irapuato, Guanajuato, 36500, México, [2]Department of Entomology, University of California, Riverside, Riverside, CA 92521, USA, [3]Department of Natural and Mathematical Sciences, California Baptist University, Riverside, CA 92504, USA, [4]John A. Mulrennan, Sr., Public Health Entomology Research & Education Center, Florida A&M University, Panama City, FL 32405, USA, [5]Interdepartmental Graduate Programs in Genetics, Genomics & Bioinformatics, and Cell, Molecular & Developmental Biology, University of California, Riverside, Riverside, CA 92521, USA.

15:15 **13 STU Using multi-omics approaches to elucidate the bases of resistance to *Bti* in *Aedes aegypti*** Guillaume Tetreau Guillaume Tetreau[1], Margot Paris[1], Krishnareddy Bayyareddy[2], Christopher Johnson[3], Michael J. Adang[2,4], Jean-Philippe David[1], Laurence Després[1]. [1]Laboratoire d'Ecologie Alpine, CNRS-UMR 5553, Université de Grenoble, BP 53, 38041 Grenoble cedex 09, France; [2]Department of Entomology, University of Georgia, Athens, GA 30602-2603, USA; [3]Vector Group, Liverpool School of Tropical Medicine, Liverpool L3 5QA, UK; [4]Biochemistry and Molecular Biology, University of Georgia, Athens, GA 30602-2603, USA

15:30 **14 Fruit and shoot borer resistant transgenic *Bt* brinjal in India** P.M. Shekharappa, P.M.Salimathand R.R. Hanchinal. University of Agricultural Sciences, Dharwad-580 005, Karnataka, India.

15:45 **15 Field level resistance in bollworms to *Bt* cotton in India** Govind T. Gujar, Vinay Kalia. Division of Entomology, Indian Agricultural Research Institute, New Delhi 110012

Afternoon Session 2 **Monday, 14:00 – 16:00**
Viruses Contributed Papers 1 McNally Theatre Auditorium
Virus Genes I (Structural)
Chairs: Lorena Passareli and Deng Fei

14:00 **16 STU Mutations in 3 amino acids in VP4 affect the virulence of *Junonia coenia densovirus*** Cécilia Multeau[1,2] , Aurélie. Perrin[1,2], Marie E. Pastor[2], Rémy Froissart[3], Mylène Ogliastro[2]. [1]BIOTOP, Route de Biot - D4, 06560, Valbonne, France, [2]INRA, UMR 1333, Diversity, Genomes and insect-pathogen Interactions, Université Montpellier, [2]Place Eugène Bataillon, cc101, 34000, Montpellier, France, [3]CIRAD, UMR-BGPI TA A-54/K, Campus International de Baillarguet, 34398, Montpellier, France

14:15 **17 STU Molecular characterization of *Autographa californica* multiple nucleopolyhedrovirus ORF43 null mutant** Xue Ying Tao[1], Jae Young Choi[1], Yong Wang[1], Jae Su Kim[2], Yeon Ho Je[1]. [1]Department of Agricultural Biotechnology, Seoul National University, Seoul 151-742, Korea, [2]Research Institute for Agriculture and Life Sciences, Seoul National University, Seoul 151-742, Korea

14:30 **18 STU *Mamestra configurata* nucleopolyhedrovirus (MacoNPV): potential chitin-binding proteins and their role in oral infectivity** Amy L. Noakes[1,2]; Cedric Gillott[1]; Dwayne Hegedus[2,3]; David Theilmann[4]; Martin Erlandson[1,2]. [1]Department of Biology, University of Saskatchewan, 112 Science Place, Saskatoon, SK S7N 5E2, Canada; [2]Agriculture and Agri-Food Canada, Saskatoon Research Centre, 107 Science Place, Saskatoon, SK S7N 0X2 Canada; [3]Department of Food and Bioproduct Sciences, University of Saskatchewan, 51 Campus Drive, Saskatoon, SK, S7N 5A2, Canada; [4]Agriculture and Agri-Food Canada, Pacific Agriculture Research Centre, 4200 Highway 97, Summerland, BC V0H 1Z0 Canada.

14:45 **19 HA44 is an essential gene for *Helicoverpa armigera* nucleopolyhedrovirus replication and its coiled-coil domain is functionally important** Fei Deng, Sijiani Luo, Yuan Kang, Hualin Wang, Zhihong Hu. State Key Laboratory of Virology and CAS Key Laboratory of Agricultural and Environmental Microbiology, Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan 430071

15:00 **20 Baculovirus virion formation requires the interaction between VP80 and the F-actin cytoskeleton to connect the viral replication factory with the nuclear periphery** Martin Marek[2,3], Feana Francis-Devaraj[1], Lionel Galibert[2], Just M. Vlak[1], Otto-Wilhelm Merten[2], Monique M. van Oers[1]. [1]Laboratory of Virology, Wageningen University, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands, [2]Department of Bioprocess Development, Généthon, 1bis, rue de l'Internationale, 91002 Évry Cédex, France, [3]Integrated Structural Biology, IGBMC, 1, rue Laurent Fries, 67404 Illkirch Cedex, France

15:15 **21 *Autographa californica* nucleopolyhedrovirus *ac93* is a previously unidentified core gene which is required for intranuclear microvesicle formation and egress of nucleocapsids from the nucleus** Meijin Yuan, Zhenqiu Huang, Denghui Wei, Zhaoyang Hu, Kai Yang, Yi Pang. State Key Laboratory of Biocontrol, Sun Yat-sen University, Guangzhou 510275, China

15:30 **22 Mutagenesis and functional analysis of N-linked glycosylations of the major envelope fusion protein of *Helicoverpa armigera* single nucleocapsid nucleopolyhedrovirus** Shu Shen[1], Manli Wang[1], Shufen Li[1], Xin Li[1], Fei Deng[1], Just M. Valk[2], Zhihong Hu[1], Hualin Wang[1]. State Key Laboratory of Virology and Joint Laboratory of Invertebrate Virology, Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan 430071, People's Republic of China[1], Laboratory of Virology, Wageningen University, 6708 PB Wageningen, the Netherlands[2]

15:45 **23 STU *Autographa californica nucleopolyhedrovirus pe38* is required for nucleocapsid production.** Shiyun Huang, Kai Yang, Yi Pang. State Key Laboratory of Biocontrol, Sun Yat-sen University, Guangzhou 510275, China

Afternoon Session 3 — **Monday, 14:00 – 16:00**
Microbial Control Contributed Papers 1 — Sobey 255
Chair: Surendra Dara

14:00 **24 STU Modulation of immunity in cotton bollworm, *Helicoverpa armigera* (Lepidoptera: Noctuidae)** Bindiya Sachdev[1,2], Gatikrushna Singh[1], Neema Agrawal[1], Rakesh K. Seth[1], Raj K. Bhatnagar[1]. [1]International Center for Genetic Engineering & Biotechnology (ICGEB), Aruna Asaf Ali Marg, New Delhi-110067, India, [2]Department of Zoology, University of Delhi, Delhi-110007, India

14:15 **25 STU Interaction between a beetle and its pathogen: do Asian longhorned beetles behaviorally fever?** Joanna J. Fisher , Ann E. Hajek. Department of Entomology, Cornell University, Ithaca NY 14853-2601

14:30 **26 Behavioural evidence and horizontal transmission of entomopathogenic fungi by infected and non-infected adult emerald ssh borer** George Kyei-Poku, Debbie Gauthier, Carl Nystrom. Great Lakes Forestry Centre, Canadian Forest Service, 1219 Queen Street East, Sault Ste. Marie, Ontario, P6A 2E5, Canada

14:45 **27 STU Optimum external sterilization technique using sodium hypochlorite on *Plectris aliena* grubs (Coleoptera: Scarabaeidae) and effects on behaviour** Nancy L. Brill, Wes D. Watson, Mark R. Abney. North Carolina State University, Department of Entomology, Raleigh, NC 27695-7630, USA

15:00 **28 The effect of pathogen odor signals on behaviors of termites, *Coptotermes formosanus*** Aya Yanagawa[1], Nao Fujiwara-Tsujii[2], Toshiharu Akino[3], Tsuyoshi Yoshimura[1], Susumu Shimizu[4]. [1]Research Institute for Sustainable Humanosphere, Kyoto University, Gokashou, Uji, 611-0011, Japan, [2]National Institute of Agrobiological Science, Ohwashi, Tsukuba, 305-0851, Japan, [3]Department of Biology, Kyoto Institute of Technology, Matsugasaki, Kyoto, 606-8585, Japan, [4]Institute of Biological Control, Faculty of Agriculture, Kyushu University, Fukuoka, 812-8581, Japan

15:15 **29 A push-pull biocontrol strategy involving Chinese cabbage, red clover, *Entomophthora muscae* and the cabbage and turnip root fly** Ingeborg Klingen, Maria Björkman, Pierre Antoine Allard, Idun Bratberg, Richard Meadow. Norwegian Institute for Agricultural and Environmental Research (Bioforsk), Plant Health and Plant Protection Division, Høgskoleveien 7, N-1432 Ås, Norway

15:30 **30 Potential synergism between *Beauveria bassiana* and plant extract of *Ginkgo biloba* against the two-spotted spider mite, *Tetranychus urticae* (Acari: Tetranychidae)** Farzaneh Seyed-Talebi[1], Reza Talaei-Hassanloui[2], Katayoon Kheradmand[1].[1]Department of Plant Protection, College of Abureyhan, University of Tehran, Pakdasht, Iran; [2]Department of Plant Protection, College of Agriculture and Natural Resources, University of Tehran, Karaj, Iran.

15:45 **31 Fungus in an oily residue – the perfect solution for a healthy home.** Nina E. Jenkins[1], Simon Blanford[1,2], Maureen Coetzee[3], Brian Chan[2], Andrew Read[2], Matthew B. Thomas[1]. [1]Department of Entomology, Merkle Lab, The Pennsylvania State University, State College, PA 16802, USA, [2]Department of Biology, The Pennsylvania State University, State College, PA 16802, USA, [3]Malaria Entomology Research Unit, University of the Witwatersrand and the National, Institute for Communicable Diseases, Private Bag X4, 1 Modderfontein Road, Sandringham 2131, South Africa

16:00 – 16:25 **HEALTH BREAK** Loyola Conference Hall

Mid-Afternoon Session 1 **Monday, 16:30 – 18:15**
Viruses Contributed Papers 2 McNally Theatre Auditorium
Invertebrate Viruses: Evolution/Population Dynamics
Chairs: Karolin Eberle and Elisabeth Herniou

16:30 **32 Deciphering the genetic and biological plasticity of *Cydia pomonella* granulovirus (CPGV)** Karolin E. Eberle[1], Stefanie Schulze-Bopp[2], Eva Fritsch[1], Karin Undorf-Spahn[1], Jutta Kienzle[3,] Johannes A. Jehle[1,2]. [1]Julius Kühn-Institut, Bundesforschungsinstitut für Kulturpflanzen, Institut für Biologischen Pflanzenschutz, Heinrichstr. 243, 64287 Darmstadt, Germany, [2]1Laboratory of Biotechnical Crop Protection, Department of Phytopathology, Agricultural Service Center Palatinate (DLR Rheinpfalz), Breitenweg 71, 67435 Neustadt/Weinstrasse, Germany, [3]Fördergemeinschaft Ökologischer Obstbau e.V.

16:45 **33 STU The *Agrotis* baculovirus complex: multiple viruses for multiple pests** Jörg T. Wennmann[1], Wael El-Menofy[2], Waly Essam[2], Naglaa Abdallah[2], Johannes A. Jehle[1]. [1]Institute for Biological Control, Julius Kühn-Institute, Federal Research Centre for Cultivated Plants, Darmstadt, Germany, [2]Faculty of Agriculture, Cairo University, Giza, Egypt

17:00 **34 The ecology of *Spodoptera exempta* nucleopolyhedrovirus within field populations of a migratory pest** Robert I. Graham[1], David Grzywacz[2], Wilfred L. Mushobozi[3], Jennifer S. Cory[4], Alan D. Shirras[1], Yamini Tummala[1], Kenneth Wilson[1]. [1]Lancaster Environment Centre, Lancaster University, Lancaster, LA1 4YQ, UK; [2]Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Kent, ME4 4TB, UK; [3]EcoAgriConsultancy Services Ltd, Nairobi Road, Kwa Idd, PO Box 15040 Arusha, Tanzania; [4]Department of Biological Sciences, Simon Fraser University, Burnaby, BC, V5A 1S6, Canada

17:15 **35 SeMNPV reactivation through stress factors in covertly infected *Spodoptera exigua*** C. Virto [1], R. Murillo[1,2], T.Williams[3], P. Caballero[1,2]. [1]Instituto de Agrobiotecnología, CSIC-Gobierno de Navarra, Ctra. de Mutilva s/n 31192, Mutilva baja, Spain; [2]Departamento de Producción Agraria, Universidad Pública de Navarra, Pamplona 31006, Spain; [3]Instituto de Ecología AC, Xalapa 91070, Ver., Mexico

17:30 **36 Virus persistence and the dynamics of covert infection in cyclic populations of tent caterpillars** Jenny S. Cory[1], Jutta Buchhop[1], Judith H. Myers[2]. [1]Department of Biological Sciences, Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6 Canada, [2]Department of Zoology, University of British Columbia, BC, V6T 1Z4 Canada

17:45 **37 STU Horizontal gene transfers between baculoviruses and entomopoxviruses** Julien Thézé[1], Julie Gallais[1], Jun Takatsuka[2], Madoka Nakai[3], Elisabeth Herniou[1]. [1]Insect Biology Research Institute, UMR CNRS-6035, University François Rabelais, 37200 Tours, France, [2]Forestry and Forest Products Research Institute, Matsunosato 1, Tsukuba 305-8687, Japan, [3]Institute of Agriculture, Tokyo University of Agriculture and Technology, Saiwai, Fuchu, Tokyo, 183-8509, Japan

18:00 **38 Genome sequence of a nudivirus from the crane fly *Tipula oleracea*** Annie Bézier, Julien Thézé, Elisabeth Herniou. Insect Biology Research Institute, UMR CNRS-6035, University François Rabelais, 37200 Tours, France

Mid-Afternoon Session 2 **Monday, 16:30 – 18:00**
Fungi Contributed Papers 1 - Ecology Sobey 255
Chair: Ingeborg Klingen

16:30 **39 Genetic diversity of *Beauveria* isolates collected from infected pollen beetles (*Meligethes aeneus)*** Nicolai V. Meyling[1], Christina Pilz[2], Siegfried Keller[2], Franco Widmer[3], Jürg Enkerli[3]. [1]Department of Agriculture and Ecology, University of Copenhagen, Denmark, [2]Ecological Plant Protection, Agroscope Reckenholz-Tänikon, Reckenholzstrasse 191, Zurich, Switzerland, [3]Molecular Ecology, Agroscope Reckenholz-Tänikon, Reckenholzstrasse 191, Zurich, Switzerland

16:45 **40 STU House flies (*Musca domestica L.*) delay fungal pathogenesis by fevering – at a cost** Robert D. Anderson[1], Simon Blanford[1,2], Matthew B. Thomas[1,2]. [1]Department of Entomology, 501 Agriculture Sciences and Industries Building, Penn State University, University Park, PA 16802, [2]Center for Infectious Disease Dynamics, Penn State University, University Park, PA 16802

17:00 **41 STU Evidence for self-medication: host plant choice of an oligolectic bee and pathogenic *Ascosphaera* spp.** Anja Amtoft Wynns, Annette Bruun Jensen, Jørgen Eilenberg. Center for Social Evolution, Department of Agriculture and Ecology, University of Copenhagen, Thorvaldsensvej 40, 1871 Frederiksberg C, Denmark

17:15 **42 Secretome of Entomophthorales infected aphids documents high pathogen activity and weak host response** Annette B. Jensen[1], Morten N. Grell[2], Peter B. Olsen[3], Lene Lange[2], Jørgen Eilenberg[1]. [1]Department of Agriculture and Ecology, University of Copenhagen, Thorvaldsensvej 40, DK-1871 Frederiksberg C, Denmark; [2]Section for Sustainable Biotechnology, Aalborg University, Lautrupvang 15, DK-2750 Ballerup, Denmark, [3]Molecular Biotechnology, Novozymes A/S, Krogshøjvej 36, DK-2880 Bagsværd, Denmark

17:30 **43 Target-oriented dissemination of *Beauveria bassiana* conidia using predators** Hong Zhu[1], Jeong Jun Kim[1], Hong-Hyun Park[2] , Sang-Guei Lee[2]. [1]Agricultural Microbiology Team, NAAS, RDA, Korea, [2]Division of Crop Protection, NAAS, RDA, Korea

17:45 **44 A novel nuptially-transmitted DRIP symbiont of *Tenebrio molitor*** Jeffrey C. Lord. USDA, Agricultural Research Service, Center for Grain and Animal Health Research, 1515 College Avenue, Manhattan KS 66502, USA

Poster Session I **Monday, 16:30 – 18:30**
Bacteria Loyola Conference Hall

B1 STU Construction of cDNA library and cloning of V-ATPase subunit B in midgut from *Helicoverpa armigera* (Hübner). Langyun Zou, Yanhui Lu, Yan Zhang, Gemei Liang, Kongming Wu, Yuyuan Guo. State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, P.R. China

B2 Activation process of Coleopteracidal Cry8 on alder leaf beetle. Shin-ichiro Asano, Keika Yamada, Takuya Yamaguchi, Ken Sahara, Hisanori Bando. Division of Agrobiology, Graduate School of Agriculture, Hokkaido University, N9W9 Sapporo Hokkaido, 060-8589, Japan

B3 STU Characterization of field-evolved resistance to transgenic Bt corn in *Spodoptera frugiperda.* Siva R. K. Jakka[1], Cris Oppert[1], Carlos Blanco[2], Maribel Portilla[3], Juan L. Jurat-Fuentes[1]. [1]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, USA; [2]USDA-APHIS, Biotechnology Regulatory Services, Riverdale, MD 20787, USA; [3]USDA-ARS, Southern Insect Management Research Unit, Stoneville, MS 38776, USA

B4 Esterase activity associated with Cry1Ac-resistant *Helicoverpa zea.* Marianne P. Carey[1], Bret Nolan[1], Konasale Anilkumar[2], William J. Moar[3]. [1]Case Western Reserve University, Department of Biochemistry, 10900 Euclid Ave, Cleveland, Ohio 44106, [2]Department of Entomology and Plant Pathology, Auburn University, Auburn, AL 36849; [3]Monsanto, 800 North Lindbergh Blvd, St. Louis, MO 63167

B5 STU Enhanced midgut regeneration as a resistance mechanism to *Bt* toxins in *H. virescens* larvae. Anaïs S. Castagnola[1], Omaththage P. Perera[2], Fred Gould[3], Juan Luis Jurat-Fuentes[1]. [1]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, USA; [2]Southern Insect Management Research Unit, USDA-ARS, Stoneville, MS 38776, USA; [3]Department of Entomology, North Carolina State University, Raleigh, NC 27607, USA

B6 Differential gene expression in the gypsy moth (*Lymantria dispar)* larval midgut in response to *Bacillus thuringiensis* (Bt) infection. Michael E. Sparks, Michael Blackburn, Dawn E. Gundersen-Rindal. USDA-ARS Invasive Insect Biocontrol and Behavior Laboratory (IIBBL), Beltsville, MD 20705

B7 STU Molecular cloning of beta-1,3-galactosyltransferase from *Helicoverpa armigera* (Hübner) and its function in relation with *Bt* resistance. Lili Zhang, Yanhui Lu, Qiong Lu, Gemei Liang, Kongming Wu, Yuyuan Guo. State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, P.R. China

B8 Analysis on the role of *Bacillus thuringiensis* Cry toxin loop regions in binding affinity to the cadherin-like receptor using Cry toxin mutants. Yuki Fujii, Takuya Kotani, Chinatsu Morimoto, Yuko Harashima, Yasushi Hoshino. Ryoichi Sato Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan

B9 STU Binding affinity improvement of the Cry1Aa toxin to the cadherin-like protein, BtR175 from *Bombyx mori* using phage display of loop 3 mutant toxins and bio-panning. Yuki Fujii, Manami Otsuki, Yasushi Hoshino, Ryoichi Sato. Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan

B10 A proteomic approach to investigate the mechanism of cross-resistance in Cry1Ab-resistant *Ostriniafurnacalis*(Guenée). Lina Xu[1], Natalie Ferry[2], Zhenying Wang[1], Jie Zhang[1], Kanglai He[1], Angharad M. R. Gatehouse[2]. [1]The State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, No. 2 West Yuanmingyuan Rd, Beijing 100193, China, [2]Newcastle Institute for Research on Sustainability, School of Biology, University of Newcastle, Newcastle upon Tyne, NE1 7RU, UK

B11 STU A cadherin-like receptor mediates the in vivo toxicity of *Bacillus thuringiensis* Cry11A toxin to *Aedes aegypti*. Su-Bum Lee[1], Jianwu Chen[2], Karlygash G. Aimanova[2], Amy M. Evans[2], Sarjeet S. Gill[1,2]. [1]Environmental Toxicology Graduate Program, [2]Department of Cell Biology and Neuroscience, University of California, Riverside, Riverside, CA

B12 A search for *Wolbachia* endosymbiont in *Agrilus* species and their associate parasitic wasps in Canada. George Kyei-Poku, Debbie Gauthier. Great Lakes Forestry Centre, Canadian Forest Service, 1219 Queen Street East, Sault Ste. Marie, Ontario, P6A 2E5, CANADA

B13 STU Processing of the *Bacillus thuringiensis* Vip3Aa protein by *Spodoptera frugiperda* and *S. exigua* midgut proteases. Maissa Chakroun[1,2], Yolanda Bel[1], Silvia Caccia[1], Lobna Abdelkafi[2], Baltasar Escriche[1], Juan Ferré[1]. Department of Genetics, University of Valencia, 46100-Burjassot (Valencia), Spain[1], Laboratory of Biopesticides, Centre of Biotechnology of Sfax, Tunisia P.O. Box ''K'', 3038, Sfax, Tunisia[2]

B14 A 104 kDa *Aedes aegypti* aminopeptidase N is a putative receptor of Cry11Aa toxin from *Bacillus thuringiensis* subsp. *israelensis.* Supaporn Likitvivatanavong, Jianwu Chen, Karlygash G. Aimanova, Sarjeet S. Gill. Department of Cell Biology and Neuroscience, University of California Riverside, Riverside, CA 92521 USA

B15 STU Key residues of Cry5B structure and function: mutagenesis by alanine screening. Jillian Sesar, Yan Hu, Hui Fan, Partho Ghosh, Raffi V. Aroian. University of California, San Diego, La Jolla CA 92093-0322, USA

B16 Improving the chitinolytic activity of chitinase genes by combining them with crystal genes of *Bacillus thuringiensis.* Arzu Özgen, Kazım Sezen, Zihni Demirbağ, Remziye Nalçacıoğlu. Karadeniz Technical University, Faculty of Science, Department of Biology, 61080, Trabzon, Turkey

B17 STU The nematocidal toxin Cry5B from *Bacillus thuringiensis* is a pore-forming toxin. Valbona Karabrahimi[1], Cheng-Yuan Kao[2], Hui Fan[2], Marc Juteau[1], Vincent Vachon[1], Raffi Aroian[2], Jean-Louis Schwartz[1]. [1]Groupe d'étude des protéines membranaires (GÉPROM), Université de Montréal, CP 6128, Succ. Centre-Ville, Montreal, Quebec, H3C 3J7, Canada, [2]Section of Cell and Developmental Biology, University of California, San Diego La Jolla, California 92093, USA

B18 Discovery and characterization of a novel *Bacillus thuringiensis* Cry1B-type insecticidal protein. Justin Lira, Joel Sheets, Stephanie Burton, Kenneth Narva. Dow AgroSciences, LLC, 9330 Zionsville Road, Indianapolis, IN 46268

B19 STU Variation of host cell components required for toxic actions of different subclasses of Cry1 toxin. Shiho Tanaka[1], Kazuhisa Miyamoto[2], Hiroaki Noda[2], Ryoichi Sato[1]. [1]Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan, [2]Institute of Insect and Animal Sciences, National Institute of Agrobiological Sciences, Tsukuba Ibaraki 305-8634, Japan

B20 *Bombyx mori* midgut epithelial cells' reaction induced by Cry1Aa includes both or either of osmotic swelling and apoptosis depending on toxic condition. Shiho Tanaka, Yasutaka Yoshizawa, Ryoichi Sato. Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan

B21 Proteomic and genomic analysis of response to Cry intoxication in susceptible and resistant *Heliothis virescens* larvae. Cris Oppert[1], Omaththage P. Perera[2], Fred Gould[3], Juan L. Jurat-Fuentes[1]. [1]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, USA, [2]Southern Insect Management Research Unit, USDA-ARS, Stoneville, MS 38776, USA, [3]Department of Entomology, North Carolina State University, Raleigh, NC 27695, USA

B22 STU The cleavage of the loop between alpha-3 and alpha-4 helix is critical for insecticidal activity of Cry8Da. Takuya Yamaguchi, Ken Sahara, Hisanori Bando, Shin-ichiro Asano. Department of Applied Bioscience, Graduate School of Agriculture, Hokkaido University, N9 W9, Sapporo, 060-8589, Japan

B23 Antimicrobial activity of bacteriocins from *Bacillus thuringiensis* subsp. *cameroun.* Jong Bin Park[1], Qin Liu[1], Jae Young Choi[1], Jae Su Kim[2] , Yeon Ho Je[1].[1]Department of Agricultural Biotechnology, College of Agriculture & Life Sciences, Seoul National University, Seoul 151-742, Republic of Korea, [2]Research Institute for Agricultural and Life Sciences, Seoul National University, Seoul 151-742, Republic of Korea

B24 Effect of *Bacillus thuringiensis berliner* in combination with tanic acid and sodium bicarbonate on caterpillars of *Gallelia mellonella* (greater wax moth). Nouraddin Shayesteh[1], Arezo Davoudi[2], Jafar Hosseinzadeh[3]. [1]Department of Plant medicine, Mahabad Branch, Islamic Azad University, Mahabad, Iran; [2]Department of Crop Protection, Faculty of Agriculture, Islamic Azad University, Tabriz, IRAN; [3]Department of Plant medicine, Faculty of Agriculture, Urmia University, Urmia, Iran

B25 From non-target risk assessment to *Bt* resistance management: the example of *Bt* Brassica sp. and Pieridae. Barbara Manachini[1], Filippo Castiglia[2]. [1]Dep. Environmental biology and Biodiversity, University of Palermo, Via Archirafi 18, 90123 Palermo. Italy, [2]Dipartimento Regionale Azienda Regionale Foreste Demaniali Servizio 3° Servizio gestione delle aree protette (UOB n. 1) Via Libertà, 97 Palermo. Italy

B26 Development of a PCR assay and DNA probe for the detection of *Pseudomonas fluorescens* in naturally infected Nile tilapia (*Oreochromis niloticus,* L.) tissues. Medhat. H. Hashem[1], Omaima A. Khamiss[1], Elsayed A. Khallaf[2], Adell A. Guirgis[1], Khalil A. EL Halafawy[1]. [1]Genetic Engineering and Biotechnology Research Institute (GEBRI), Minufiya University, [2]Faculty of Science - Minufiya University

Poster Session I	**Monday, 16:30 – 18:30**
Microbial Control	Loyola Conference Hall

MC1 STU Mycosis at cool temperatures: the susceptibility of the temperate grape cutworm *Abagrotis orbis* to entomopathogenic fungi. Scott Johnson[1], Tom Lowery[2], Jenny Cory[1] , Joan Cossentine[2]. [1]Department of Biological Sciences, Simon Fraser University, 8888 University Drive. Burnaby, BC, V5A 1S6 Canada, [2]AAFC, Pacific Agriculture Research Centre, 4200 Highway 97, Summerland, BC V0H 1Z0 Canada

MC2 Adaptive melanism and immunity to fungal infection in the migratory grasshopper. Robert B. Srygley, Stefan T. Jaronski. SDA-Agricultural Research Service, Northern Plains Agricultural Research Laboratory, 1500 N. Central Ave., Sidney MT 59270 USA

MC3 Storage of *Metarhizium anisopliae* at low temperature on rice substrate aiming sugar cane pest control. João R. Alencar[1], Ricardo A. Polanczyk[1], Marina A. Viana[2], Sergio A. De Bortoli[2], Thiago T. Agostini[1], Alessandra M. Vacari[2], Jaqueline M. Maeda[2]. [1]Laboratory of Arthropod Pests Microbial Control, Universidade Estadual Paulista. Access route Paulo Donatto Castellane, Jaboticabal, SP 14884-900 Brazil, [2] Laboratory of Rearing and Biology of Insects, Universidade Estadual Paulista. Access route Paul Donata Castellane, Jaboticabal, SP 14884-900 Brazil

MC4 Association of entomopathogenic fungi with exotic red palm weevil in treated and untreated *Phoenix canariensis.* Barbara Manachini, Franco Palla. Department of Environmental Biology and Biodiversity, University of Palermo, Via Archirafi 38, 90123 Palermo, Italy

MC5 Molecular characterization and virulence of *Beauveria* isolates from emerald ash borer within old outbreak sites in Canada. Shajahan Johny, George Kyei-Poku, Kees van Frankenhuyzen. Canadian Forestry Service, Great Lakes Forestry Centre, 1219 Queen Street East, Sault Ste. Marie, Ontario, Canada P6A 2E5.

MC6 Characterization, pathogenicity and virulence of EAB-recovered *Isaria* and *Paecilomyces* isolates. Shajahan Johny, George Kyei-Poku, Kees van Frankenhuyzen. Canadian Forestry Service, Great Lakes Forestry Centre, 1219 Queen Street East, Sault Ste. Marie, Ontario, Canada P6A 2E5

MC7 Influence of fungicides on spore viability and pathogenicity of *B. bassiana* GHA. Jeong Jun Kim[1], Hong Zhu[1], Yujin Song[1], Yunheui Park[1],Manyoung Choi[2], Sang-Guei Lee[2], Jaehong Yoo, Sangyeob Lee. [1]Agricultural Microbiology Team, NAAS, RDA, Korea, [2]Division of Crop Protection, NAAS, RDA, Korea

MC8 Entomopathogenic fungi in sugar maple forest soils. B.L. Parker, M. Skinner, S.Y. Gouli, V.V. Gouli, J-S. Kim, D. Tobi, Ch. Frank. Entomology Research Laboratory, University of Vermont, 661 Spear Street, Burlington VT 05405-0105, USA

MC9 Are *Beauveria bassiana* treatments appropriate for orchard canopies? Joan Cossentine, Paul Randall. AAFC, Pacific Agri-Food Research Centre, 4200 Highway 97, Summerland, BC V0H 1Z0 Canada

MC10 STU Biopesticides for the control of greenhouse whitefly in Australia. Spinner, JE, Wilson, B, Stodart, BJ, Hauxwell, C, Ash, GJ. EH Graham Centre for Agricultural Innovation, Charles Sturt University and Industry & Investment NSW, Boorooma Street, Wagga Wagga, NSW 2678

MC11 Control of grain pests using *Beauveria bassiana* combined with an electrostatic powder (Entostat®). Clare Storm[1], Maureen E. Wakefield[2], Dave Moore[3], Belinda Luke[3], Bryony Taylor[3], Pierre Grammare[4], Oliver Poitin[4], Stephen Abolins[1]. [1]Exosect Ltd, Leylands Business Park, Colden Common, Winchester, SO21 1TH, UK, [2]The Food and Environment Research Agency, Sand Hutton, York, YO41 1LZ, UK, [3]CABI Europe-UK, Bakeham Lane, Egham, Surrey, TW20 9TY, UK, [4]Sylvan Bio – Europe, Zi Tivoli, Route de Mauvieres, 37600 Loches, France

MC12 Biological control of stem borer, *Chilo partellus* Swinhoe through *Trichogramma chilonis* Ishii and insect pathogens in sorghum. Shekharappa. AICSIP, University of Agricultural Sciences,
Dharwad-580 005: India

MC13 Effectiveness of a granulovirus and *Bacillus thuringiensis* strains on *Cydia pomonella* in laboratory and orchards. Xiangyang Liu, Chengfeng Lei and Xiulian Sun. Key Laboratory of Agricultural and Environmental Microbiology, Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan 430071, China

MC14 Gene transfer by densovirus derived vectors for biological control. Aurélie Perrin[1,2], Cecilia Multeau[1,2], François Cousserans[2], Max Bergoin[2], Philippe Fournier[2] , Mylène Ogliastro[2]. [1]Union Invivo-Biotop, 83 avenue de la Grande Armée - 75782 Paris Cedex 16, [2]Unité DGIMI, UMR 1333 INRA - Université Montpellier II, Place Eugène Bataillon, Bât. 24, cc101, 34095 Montpellier Cedex 5

MC15 A potential bacterial control agent against cotton leaf worm (*Spodoptera littoralis*, Lepidoptera: Noctuidae). Filiz Ozkan, Zihni Demirbag, Ismail Demir. Department of Biology, Faculty of Sciences, Karadeniz Technical University, 61080, Trabzon, Turkey

MC16 Preliminary results on antimicrobial activity of *Rhynchophorous ferrugineus* hemolymph. Domenico Schillaci[1], Francesca Tiziana Giaramita[2], Barbara Manachini[2], Vincenzo Arizza[2]. [1]Dep. Stembio, University of Palermo, Via Archirafi 32, 90123 Palermo Italy, [2]Dep. Environmental biology and Biodiversity, University of Palermo, Via Archirafi 18, 90123 Palermo Italy

MC17 Anti-fungal activity of *Bacillus thuringiensis* delta-endotoxin towards plant pathogenic fungi of *Phytophthora* and *Fusarium* genera. L. K. Kamenek[1], D. V. Kamenek[1], A. A. Tyulpinyova[1], M. A. Terpilowski[1], V.V. Gouli[2]. [1]Ulyanovsk State University, 42 Tolstoy Street, Ulyanovsk, 432700, Russia, [2]University of Vermont, Burlington, VT 05405-0105, USA

MC18 Role of the GntP protein in germination and outgrowth of *Bacillus thuringiensis.* Li-Fang Ruan, Guoqiang Liu, Yiming Wu, Jinshui Zhen, Dong-Hai Peng, Ming Sun. State Key Laboratory of Agricultural Microbiology, College of Life Science and Technology, Huazhong Agricultural University, Wuhan, 430070, China

MC19 A 100 generations population *Plutella xylostella* susceptibility to *Bacillus thuringiensis.* Sérgio Antonio De Bortoli, Ricardo Antonio Polanczyk, Alessandra Marieli Vacari, Caroline Placidi De Bortoli. Plant Protection Department, Universidade Estadual Paulista, Via de Acesso Prof. Paulo Donato Castellane, s/n. 14884-900 Jaboticabal, Sao Paulo, Brazil

MC20 Three new strains of *Bacillus thuringiensis* as potential biocontrol agents against pest weevils in the Republic of Moldova. Natalia V. Munteanu, Nadejda V. Malevanciuc, Anna I. Moldovan, Ion C. Toderas. Centre of General and Molecular Biology, Institute of Zoology, Moldova Academy of Science, 2028, Chisinau, Republic of Moldova.

MC21 A high-throughput strategy for identification of new toxin genes from *Bacillus thuringiensis* based on cosmically sequencing and computational pipeline. Donghai Peng, Weixing Ye, Lei Zhu, Yingying Liu, Ce Geng, Han Wu, Jinshui Zheng, Lifang Ruan, Ming Sun. State Key Laboratory of Agricultural Microbiology, College of Life Science and Technology, Huazhong Agricultural University, Wuhan, 430070, China

MC22 Effect of *Bacillus thuringiensis* on the reproductive capacity and survival of the predator *Orius insidiosus.* R.M. Goulart, A.M. Vacari, S.A. De Bortoli. FCAV/Unesp – Dep. Fitossanidade – Laboratório de Biologia e Criação de Insetos (LBCI), Via de Acesso Prof. Paulo Donato Castellane s/n 14884-900 Jaboticabal, SP, Brazil.

MC23 Effect of *Bacillus thuringiensis* on the parasitism capacity of *Trichogramma pretiosum.* Roberto M. Goulart, Alessandra M. Vacari, Sergio A. De Bortoli. FCAV/Unesp – Dep. Fitossanidade – Laboratório de Biologia e Criação de Insetos (LBCI), Via de acesso Prof. Paulo Donato Castellane s/n 14884-900 Jaboticabal, SP, Brazil

MC24 Interaction between *Bacillus thuringiensis* and *Telenomus remus.* João R. D. C. C. Alencar[1], Ricardo A. Polanczyk[1], Marina A. Viana[2], Sergio A. De Bortoli[2], Thiago T. Agostini[1], Alessandra M. Vacari[2], Jaqueline M. Maeda[2]. [1]Laboratory of Arthropod Pests Microbial Control, Universidade Estadual Paulista. Access route Paulo Donatto Castellane, Jaboticabal, SP 14884-900 Brazil, [2]Laboratory of Rearing and Biology of Insects, Universidade Estadual Paulista. Access route Paulo Donatto Castellane, Jaboticabal, SP 14884-900 Brazil

MC25 Interaction between Dipel® and *Orius insidiosus.* Jaqueline M. Maeda[1], Alessandra M. Vacari[1], Marina A. Viana[1], João R.D.C.C. Alencar[2], Caio Y.M. Yamauchi[1], Sergio A. De Bortoli[1]. [1]Laboratory of Rearing and Biology of Insects, Universidade Estadual Paulista, Access route Paulo Donatto Castellane, Jaboticabal, SP 14884-900 Brazil, [2]Laboratory of Arthropod Pests Microbial Control, Universidade Estadual Paulista. Access route Paulo Donatto Castellane, Jaboticabal, SP 14884-900 Brazil

MC26 Characterization of Iranian isolates of entomopathogenic nematodes for biocontrol of leopard moth, *Zeuzera pyrina* L. (Lep.: Cossidae). Javad Karimi[1], Mohammadreza Rezapanah[2], Mahbobeh Ashtari[3], Reyhaneh Darsouei[1], Raquel Campos-Herrera[4,5], Larry Duncan[4]. [1]Department of Plant Protection, Faculty of Agriculturey, Ferdowsi University of Mashhad, Mashhad, Iran, [2]Biological Control Dept., Iranian Research Institute of Palnt Protection, Tehran, Iran, [3]I.A. University of Arak, Iran, [4]University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL, 33850 USA, [5]Instituto de Ciencias Agrarias, CSIC, Madrid, 28006, Spain

MC27 Cloning, characterization and expression of an insecticidal crystal protein gene from *Bacillus thuringiensis* isolates of Andaman and Nicobar Islands. H.M.Mahadeva Swamy[1], R.Asokan[1], D.K.Arora[2]. [1]Division of Biotechnology, Indian Institute of Horticultural Research (IIHR), Hessarghatta lake post, Bangalore 560089, Karnataka, India, [2]National Bureau of Agriculturally Important Micro organisms (NBAIM), Mau Nath Bhajan, 275101, Uttar Pradesh, India

MC28 Effect of *Bacillus thuringiensis* on the reproductive characteristics of *Podisus nigrispinus* fed on *Plutella xylostella* Alessandra M. Vacari, Vanessa F. P. Carvalho, Gustavo O. Magalhães, Marina A. Viana, Sergio A. De Bortoli, Ricardo A. Polanczyk. FCAV/Unesp – Dep. Fitossanidade – Laboratório de Biologia e Criação de Insetos (LBCI), Via de acesso Prof. Paulo Donato Castellane s/n 14884-900 Jaboticabal, SP, Brazil

Poster Session I — **Monday, 16:30 – 18:30**
Diseases of Beneficial Invertebrates — Loyola Conference Hall

DBI-1 STU White Spot Disease mimics: hunt for the elusive B virus in European shore crabs (*Carcinus maenas*) and discovery of a novel herpes-like virus *en route.* Kelly S. Bateman, Grant D. Stentiford. European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Barrack Road, The Nothe, Weymouth, Dorset, DT4 8UB, UK

DBI-2 Histological survey of European shore crab *Carcinus maenas* from UK waters. Kelly S. Bateman, Ruth J. Hicks, Grant D. Stentiford. European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Barrack Road, The Nothe, Weymouth, Dorset, DT4 8UB, UK

DBI-3 PaV1 Detection by the Caribbean spiny lobster and its effect on population spatial structure. Josh Anderson, Donald C. Behringer. University of Florida, School of Forest Resources and Conservation & Emerging Pathogens Institute, Gainesville, FL 32653 USA

DBI-4 Prevalence of viral sequences in honey bees from the U-Mass apiary. Ajanta De[1], John P. Burand[1,2]. Departments of [1]Microbiology, and [2] Plant, Soil and Insect Sciences, University of Massachusetts – Amherst, Amherst, MA 01003 USA

DBI-5 Detection of honey bee virus sequences in native bee species from the Maine blueberry barrens. Crystal Cabral[1], Anna Morkeski[2], Anne Averill[2], John P. Burand[1,2,3]. [1]Graduate Program in Molecular and Cellular Biology and the Departments of [2]Plant, Soil and Insect Sciences, [3]Microbiology, University of Massachusetts – Amherst, Amherst, MA 01003 USA.

DBI-6 STU Identification of first toxins of *Paenibacillus larvae.* Anne Fünfhaus, Lena Poppinga, Elke Genersch. Institute for Bee Research, Friedrich-Engels-Str. 32, 16540 Hohen Neuendorf, Germany

DBI-7 Preliminary molecular evidence for transcriptionally variant innate immune receptors in a model marine brachyuran decapod. Chris Hauton[1], Meggie Hudspith[1], Richard Edwards[2], Tim Elliott[3]. [1]School of Ocean and Earth Sciences, University of Southampton, National Oceanography Centre, European Way, Southampton, Hants, SO14 3ZH, UK; [2]School of Biological Sciences, University of Southampton, Highfield, Southampton, SO17 1BJ, UK; [3]Faculty of Medicine, University of Southampton, Somers Cancer Research, Building (MP824), Southampton General Hospital, Tremona Road, Southampton, SO16 6YD, UK

DBI-8 STU Unravelling the function of secondary metabolites of *Paenibacillus larvae.* Garcia-Gonzalez, E[1], Borriss, R[2]; Genersch, E[1]. [1]Länderinstitut für Bienenkunde, Molekulare Mikrobiologie und Bienenkrankenheiten, 16540 Hohen Neuendorf, [2]Humboldt Universität, Bakteriengenetik, Chaussestr. 117, 10115 Berlin

DBI-9 Population genetics and pathogens of the edible crab *Cancer pagurus* in the Irish Sea. Joseph E. Ironside[1], Andrew Rowley[2], Hayley Watson[1], Emma Wootton[2], Joanne Porter[3], Shelagh Malham[4]. [1]Institute of Biological, Environmental and Rural Sciences (IBERS), Edward Llwyd Building, Aberystwyth University, Aberystwyth, Ceredigion SY23 3DA, UK., [2]Department of Biosciences, College of Science, Swansea University,

Singleton Park, Swansea, SA2 8PP, U.K., [3]School of Life Sciences, Heriot Watt University, John Muir Building, Gait 1, Riccarton Campus, Edinburgh, [4]School Ocean Sciences, Bangor University, Menai Bridge, Anglesey, LL59 5AB, UK

DBI-10 STU **Potential siderophore in *Paenibacillus larvae.*** Gillian L Hertlein, Eva Garcia-Gonzalez, Lena Poppinga, Anne Fünfhaus, Elke Genersch. Institute for Bee Research, Friedrich-Engels-Str. 32, 16540 Hohen Neuendorf, Germany

DBI-11 **A novel *Haplosporidium* sp. in shore crab (*Carcinus maenas*) and edible crab (*Cancer pagurus*): pathology, ultrastructure and phylogenetics.** Stentiford, G.D.[1], Bateman, K.S.[1], Feist, S.W.[1], Stokes, N.A.[2], Carnegie, R.B.[2]. [1]European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Weymouth Laboratory, Weymouth, Dorset DT4 8UB, United Kingdom, [2]Virginia Institute of Marine Science, College of William & Mary, PO Box 1346, Gloucester Point, VA 23062, USA

DBI-12 STU **Functional analysis of the S-layer protein of *Paenibacillus larvae.*** Lena Poppinga[1], Anne Fünfhaus[1], Eva Garcia-Gonzalez[1], Bettina Janesch[2], Christina Schäffer[2], Elke Genersch[1]. Institute for Bee Research, Molecular Microbiology and Bee Pathology, Hohen Neuendorf, Germany, [2]University of Natural Resources and Life Sciences, Vienna, Austria

DBI-13 **The effects of eugregarinid protozoan, *Cephaloidophora pacifica*, on the Antarctic krill, *Euphausia superba.*** Kunio T. Takahashi. National Institute of Polar Research, 10-3, Midori-cho, Tachikawa-shi, Tokyo 190-8518, Japan

DBI-14 **Electrical stunning: a suitable method for euthanising decapods crustaceans in research laboratories?** Ruth J. Hicks, Kelly S. Bateman, Grant D. Stentiford. European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Barrack Road, Weymouth, Dorset. DT4 8UB, UK

DBI-15 **Activation of eastern oyster (*Crassostea virginica*) hemocytes following administration of β-glucans** Robert S. Anderson[1], Gulnihal Ozbay[2], David H. Kingsley[3], Maureen A. Strauss[1]. [1]Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Box 38, Solomons, MD 20688, [2]Department of Agriculture and Natural Resources, Delaware State University, 1200 North DuPont Highway, Dover, DE 19901, [3]U S Department of Agriculture, Agricultural Research Service, Food Safety and Intervention Technologies, Delaware State University, W.W. Baker Building, 1200 North DuPont Highway, Dover, DE 19901

18:30 – 19:50	**DINNER**	Dockside Dining Hall (Residence)

Evening Session 1 — **Monday, 20:00 – 21:30**
Bacteria Division Meeting — Sobey 255
Organizer: Hyun-Woo Park

Evening Session 2 — **Monday, 20:00 – 21:30**
Microsporidia Division Meeting — Sobey 165
Organizer: Dörte Goertz
21:00 **45 Extreme dimorphism in a microsporidian infecting the musculature of marine crabs** Stentiford, G.D., Bateman, K.B., Feist, S.W., Chambers, E., Stone, D.M. European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Weymouth, Dorset DT4 8UB, UK.

Evening Session 3 — **Monday, 20:00 – 21:30**
Fungi Division Meeting — Sobey 260
Organizer: Helen Roy

Evening Session 4 — **Monday, 20:00 – 21:30**
Nematodes Division Meeting — Sobey 265
Organizer: Edwin Lewis

Evening Session 5 — **Monday, 20:00 – 21:30**
Viruses Division Meeting — McNally Theatre Auditorium
Organizer: Monique M. van Oers
Virus Workshop
21:00 **46 Virus Taxonomy** Peter Krell[1], Department of Molecular and Cellular Biology,University of Guelph, Guelph ON, N1G 2W1 Canada

TUESDAY – 9 August

5 K run/walk — **Tuesday, 6:30 AM** — Point Pleasant Park

SIP 2011 Congress Registration — **Tuesday, 7:00 – 13:00** — McNally Theatre Auditorium

Morning Session 1 — **Tuesday, 8:00 – 10:00**
Nematodes Division Symposium — Sobey 260
Entomopathogenic nematodes as model systems for biological studies
Organizers: Glen Stevens and Ed Lewis

8:00 **47 Parasites in the dirt: the case for entomopathogenic nematodes as models** Ed Lewis. Departments of Nematology and Entomology, University of California, Davis, CA 95616, USA

8:25 **48 EPNs as model systems for experiential learning in biology** Glen N. Stevens School of Natural Sciences and Mathematics, Ferrum College, Ferrum, VA, 24088, USA

8:50 **49 Entomopathogenic nematodes as model predators in soil food webs** Robin J. Stuart[1]; Raquel Campos-Herrera[1,2], Fahiem E. El–Borai[1,3], Ekta Pathak[1], Larry W. Duncan[1]. [1]Entomology and Nematology Department, University of Florida, IFAS, Citrus Research and Education Center,700 Experiment Station Road, Lake Alfred, FL 33850–2299, USA; [2]Instituto de Ciencias Agrarias, CSIC, Serrano 115 dpsp Madrid 28006, Spain; [3]Plant Protection Department, Faculty of Agriculture, Zagazig University, Zagazig, Egypt

Nematodes Contributed Papers 1 Sobey 260
Chair: Edwin Lewis

9:15 **50 Host-parasite interactions between mermithid nematodes and mosquitoes** Randy Gaugler[1], Manar Sanad[1,2], M.M. Shamseldean[2]; Yi Wang[1]. [1]Center for Vector Biology, Rutgers University, New Brunswick, NJ USA, [2]Department of Zoology, Cairo University, Cairo, Egypt

9:30 **51 Investigations into a nematode infecting an exotic invasive ant: new host relationship or hitchhiker across the Atlantic?** Eleanor Groden[1], S. Patricia Stock[2], Robert Lopez[2], Jennifer Lund[1]. [1] School of Biology and Ecology, University of Maine, Orono ME 04469, USA, [2] Department of Entomology, University of Arizona, Tucson AZ 85721, USA

9:45 **52 Scavenger Deterrent Factor (SDF) from symbiotic bacteria of entomopathogenic nematodes** Selcuk Hazir[1], Baris Gulcu[2], Harry K. Kaya[3]. [1]Adnan Menderes University, Faculty of Arts and Sciences, Department of Biology, Aydin, Turkey, [2]Duzce University, Faculty of Arts and Sciences, Department of Biology, Duzce, Turkey, [3]Department of Nematology, University of California, One Shields Avenue, Davis, CA 95616

Morning Session 2 **Tuesday, 8:00 – 10:00**
Viruses Contributed Papers 3 McNally Theatre Auditorium
Virus Genes II and Replication
Chairs: Yang Kai and Monique M. van Oers

8:00 **53 STU IE0 coupled with low levels of IE1 enables rapid DNA replication in *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV): rationale for the requirement of IE0 and IE1 to achieve wildtype infection** Nadia R. Sokal[1], Yingchao Nie[2], Leslie G. Willis[2], Mark Rheault[1], David A. Theilmann[1,2]. [1]Dept. of Biology, University of British Columbia, Okanagan, [2]Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Box 5000, Summerland , B.C., Canada V0H 1Z0

8:15 **54 Deletion analysis of the AcMNPV core gene *ac68* and *ac67* (*lef-3*) shows that the single stranded DNA binding protein LEF-3 is not essential for virus replication** Yingchao Nie[1], Minggang Fang[1], Martin A. Erlandson[2], David A. Theilmann[1]. [1]Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Box 5000, Summerland, B.C., Canada V0H1Z0, [2]Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon SK Canada

8:30 **55 STU ProV-CATH of *Autographa californica* multiple nucleopolyhedrovirus associates with both the chitin-binding and active site domains of the viral chitinase** Jeffrey J. Hodgson[1], Basil M. Arif[2], Peter J. Krell[1]. [1]Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON N1G 2W1, Canada, [2]Laboratory for Molecular Virology, Great Lakes Forestry Centre, Sault Ste Marie, ON P6A 2E5, Canada

8:45 **56 STU Characterization of the conserved *chiA* and *v-cath* bidirectional promoter of *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV)** Michael J. Norris[1], Basil M. Arif[2], Peter J. Krell[1]. [1]Department of Molecular and Cellular Biology, University of Guelph, Guelph, Ontario N1G 2W1 Canada, [2]Laboratory for Molecular Virology, Great Lakes Forestry Centre, Sault Ste Marie, Ontario P6A 2E5 Canada

9:00 **57 STU Analysis of baculovirus auxiliary protein P10 encoded by *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV)** Farheen Raza[1], Caroline Griffiths[1], Robert D. Possee[2], Linda King[1]. [1]Insect Virology Research Group, School of Life Sciences, Oxford Brookes University, Oxford, OX3 0BP, UK. [2]Centre for Ecology and Hydrology, Wallingford, OX10 8BB, UK

9:15 **58 Natural point mutations within conserved region II and III of *Autographa californica* multiple nucleopolyhedrovirus DNA polymerase increase drug resistance, affect DNA replication and alter structural morphology of occlusion bodies** Guozhong Feng[1], David Thumbi[2], Basil Arif[3], Daniel Doucet[3], Peter J. Krell[1]. [1]Department of Molecular and Cellular Biology, University of Guelph, Guelph, ON N1G 2W1, [2]Sylvar Technologies Fredericton, NB E3B 5A6; [3]Great Lakes Forestry Centre Sault Ste Marie, ON P6Q 2E5

9:30 **59 Construction and characterization of a recombinant AcMNPV with broader host range** Chunfeng Wu, Zihao Deng, Shimao Zhu, Meijin Yuan, Kai Yang, Yi Pang. State Key Laboratory of Biocontrol, Sun Yat-sen University, Guangzhou 510275, China

9:45 **60 Construction of a recombinant *Autographa californica* nucleopolyhedrovirus without using cell culture** Kaoru Teduka, Yasuhisa Kunimi, Ayako Hirao, Madoka Nakai. Tokyo University of Agriculture and Technology, Saiwai-cho, Fuchu-shi, Tokyo 183-8509, Japan

Morning Session 3 **Tuesday, 8:00 – 10:00**
Microbial Control Contributed Papers 2 Sobey 255
Chair: Nguya Kalemba Maniania

8:00 **61 Progress in the development of two novel microorganisms as bioinsecticides for control of sucking and chewing insect pests** Timothy B. Johnson, Lisa Chanbusarakum, Pamela Marrone. Marrone Bio Innovations, 2121 Second Street, Suite 107B, Davis, CA 95618

8:15 **62 Field effectiveness, environmental safety and characteristics of a new isolate of *Metarhizium anisopliae* derived from soil in Alberta, Canada** Dan L. Johnson. Water and Environmental Science Building, University of Lethbridge, 4401 University Drive, Lethbridge, Alberta, T1K 3M4, Canada

8:30 **63 Efficacy of spot-spray application of *Metarhizium anisopliae* formulated in oil extract of *Calpurnia aurea* in infecting and autodisseminating inoculum amongst adult *Rhipicephalus appendiculatus* ticks in semi-field experiments** N.K. Maniania[1], P. Nana[1], H.I. Boga[2], P. Kamtchouing[3]. [1]International Centre of Insect Physiology and Ecology (*icipe*), PO Box 30772-00100, Nairobi, Kenya; [2]Jomo Kenyatta University of Agriculture and Technology, PO Box 62000-00200, Nairobi, Kenya; [3]Department of Animal Biology and Physiology, University of Yaoundé 1, PO Box 812, Yaoundé, Cameroon

8:45 **64 Field suppression of the mango seed weevil, *Sternochetus mangiferae* with two formulations of *Metarhizium anisopliae* on mango orchard** Sunday Ekesi, Nguya K. Maniania. International Centre of Insect Physiology and Ecology (*icipe*), P Box 30772-00100, GPO, Nairobi, Kenya

9:00 **65 Evaluation of fungal entomopathogens for management of chilli thrips, *Scirtothrips dorsalis* Hood, on pepper** Steven Arthurs[1], Luis Aristizabal[1], Pasco Avery[2]. [1]Mid-Florida Research and Education Center, University of Florida, 2725 Binion Rd, Apopka, FL 32703, USA; [2]University of Florida, Indian River Research and Education Center, 2199 South Rock Road, Fort Pierce, FL 34945

9:15 **66 Optimizing and integrating microbial biocontrol strategies for western flower thrips on chrysanthemums** Michael Brownbridge, Taro Saito, L. Patrick Schenck, Rose Buitenhuis, Angela Brommit. Vineland Research and Innovation Centre, 4890 Victoria Avenue N., Box 4000, Vineland Station, Ontario, Canada L0R 2E0

9:30 **67 The use of mycoinsecticides to control pupal stages of western flower thrips** Taro Saito, Michael Brownbridge. Vineland Research and Innovation Centre, 4890 Victoria Avenue N., Box 4000, Vineland Station, Ontario, Canada L0R 2E0

9:45 **68 Developing functional biopesticides for the lawn care industry** Michael Brownbridge[1], Taro Saito[1], Pam Charbonneau[2], Paul Côté[1]. [1]Vineland Research and Innovation Centre, 4890 Victoria Avenue N., Box 4000, Vineland Station, Ontario, Canada, L0R 2E0; [2]OMAFRA, The Guelph Turfgrass Institute, 328 Victoria Rd. South, Guelph, Ontario, Canada N1L 0H2

10:00 – 10:25 **HEALTH BREAK** Loyola Conference Hall

Mid-Morning Session 1 **Tuesday, 10:30-12:30**
Cross Divisional Symposium Sobey 255
Viruses of Aquatic Invertebrates
Organizers: Karyn Johnson and Grant Stentiford

10:30 **69 Infectious myonecrosis: review of a new virus disease that emerged in the Americas, was introduced into SE Asia and quickly became OIE listed .** Donald Lightner, Bonnie T. Poulos, Carlos R. Pantoja, Rita M. Redman. Dept. of Veterinary Science & Microbiology, University of Arizona, Tucson, AZ 85721, USA

11:00 **70 Evolutionary epidemiology of viral pathogens in shrimp aquaculture** Jeff Lotz, Department of Coastal Sciences, Gulf Coast Research Laboratory, The University of Southern Mississippi, 703 East Beach Drive Ocean Springs, MS 39564 USA

11:30 **71 Wispovirus genetic variation and evolution in shrimp** Just M. Vlak[1], Dieu T.M Bui[2], Mark P. Zwart[1,3,4], Mart C.M. de Jong[4]. [1]Laboratory of Virology, Wageningen University, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands, [2]College of Aquaculture and Fisheries, CanTho University, 3/2 street nr. 1, 008471 Can Tho, Viet Nam, [3]Instituto de Biología Molecular y Celular de Plantas, CSIC-UPV, Ingeniero Fausto Elio s/n, 46022 Valencia, Spain, [4]Quantitative Veterinary Epidemiology, Marijkeweg 40, Wageningen University, 6709 PG Wageningen, The Netherlands

12:00 **72 Evidence for autonomous genetic modification in shrimp and its implications for viral disease diagnosis and control** Vanvimon Saksmerprome[1,2], Sarocha Jitrakorn[1], Kanokporn Chayaburakul[3], Timothy W. Flegel[1,2]. [1]Center of Excellence for Shrimp Molecular Biology and Biotechnology (Centex Shrimp), Faculty of Science, Mahidol University, Bangkok 10400, Thailand, [2]National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency (NSTDA), Thailand Science Park, Pathum Thani 12120, Thailand, [3]Department Anatomy, Faculty of Science, Rangsit University, Pathumthani 12000, Thailand

Mid-Morning Session 2 — **Tuesday, 10:30 – 12:30**
Microbial Control Division Symposium — McNally Theatre Auditorium
Microbial Pest Control Agents in IPM Systems
Organizer: Stefan Jaronski

10:30 **73 Introduction: What is IPM anyway?** S. Jaronski. USDA ARS, Sidney MT

10:45 **74 Microbial pest control agents in orchard IPM** Lawrence A. Lacey, IP Consulting International, P. O. Box 8338, Yakima, WA 98908, USA

11:10 **75 Managing tarnished plant bug in southern row crops** O. P. Perera, Gordon Snodgrass, Ryan Jackson. Southern Insect Management Research Unit, USDA-ARS, 141 Experiment Station Road, Stoneville, MS 38776

11:35 **76 Microbial control agents in greenhouse IPM** M. Brownbridge. Vineland Research and Innovation Centre, 4890 Victoria Avenue N., Box 4000, Vineland Station, Ontario, Canada L0R 2E0

12:00 **77 Entomopathogens in small fruit IPM** S. Dara. University of California Cooperative Extension, San Luis Obispo, CA 93401

Mid-Morning Session 3 — **Tuesday, 10:30 – 11:30**
Microsporidia Contributed Papers 1 — Sobey 260
Chairs: Regina Kleespies and Wei-Fone Huang

10:30 **78 A multi-gene analysis of the microsporidia as eukaryotes** Charles R. Vossbrinck[1], Heng Xiang[2]. [1]Connecticut Agricultural Experiment Station, 123 Huntington Street, New Haven, CT 06511, [2]Institute of Sericulture and Systems Biology, Southwest University, 2 Tiansheng Rd., Beibei District, Chongqing 400715, China

10:45 **79 PCR identification and phylogenetic analysis of the silkworm pathogenic microsporidians, and *Nosema bombycis*** Liu Ji-Ping[1], Li Jin[1], Hao Juan[1,2], Yan De-Hong[1], Zhang Ping[1], Liao Sen-Tai[2]. [1]College of Animal Science, South China Agricultural University, Guangzhou 510642, China, [2]Guangdong Provincial Agricultural Academy Institute, Guangzhou 510640, China

11:00 **80 STU *Nosema* spp. goes cellular: the first cell culture model for a honey bee pathogen** Sebastian Gisder[1], Nadine Möckel[1], Andreas Linde[2], Elke Genersch[1]. [1]Länderinstitut für Bienenkunde Hohen Neuendorf e.V., Friedrich-Engels-Str. 32, D-16540 Hohen Neuendorf, [2]FH Eberswalde, Applied Ecology and Zoology, Alfred-Möller-Str. 1, D-16225 Eberswalde, Germany.

11:15 **81 Genetic diversity of *Dictyocoela*, a feminizing microsporidian parasite of crustaceans** Toby J. Wilkinson[1], Jenny Rock[2], Nia M. Whiteley[2], Mykola O. Ovcharenko[3, 4]; Joseph E. Ironside[1]. [1]Institute of Biological, Environmental and Rural Sciences (IBERS), Edward Llwyd Building, Aberystwyth University, Aberystwyth, Ceredigion SY23 3DA, UK., [2]School of Biological Sciences, College of Natural Sciences, Bangor University, Bangor, Gwynedd, LL57 2UW, UK., [3]Witold Stefański Institute of Parasitology of the Polish Academy of Sciences, Twarda Street 51/55, 00-818 Warsaw, Poland, [4]Pomeranian Academy, Arciszewski Street 22A, 76-200 Słupsk, Poland

13:00 – 22:00 **EXCURSION & BBQ**
Peggy's Cove/Acadian Maple Tour / Halifax Citadel National Historic Site

WEDNESDAY – 10 August

SIP 2011 Congress Registration — **Wednesday, 7:00 – 13:00** McNally Theatre Auditorium

Morning Session 1 — **Wednesday, 8:00-10:00**
Viruses Division Symposium — McNally Theatre Auditorium
Pathology of Insect-Virus Interactions
Organizers: Eric Hass-Stapleton and Bryony Bonning

8:00 **82 The actin cytoskeleton in intracellular transport and spread of baculovirus** Taro Ohkawa[1], Aniska Chikhalya[3], Loy E. Volkman[2], Eric J. Haas-Stapleton[3], Matthew D. Welch[1]. [1]Department of Molecular and Cell Biology and [2]Department of Plant and Microbial Biology, University of California, Berkeley, CA 94720, USA, [3]Department of Biological Sciences, California State University, Long Beach, CA 90840, USA

8:30 **83 Proteomic studies of BV/ODV and implications for baculoviral pathology** Zhihong Hu. State Key laboratory of Virology, Wuhan Institute of Virology, Chinese Academy of Sciences

9:00 **84 Roles of microRNAs in regulating host-virus interactions** Sassan Asgari. School of Biological Sciences, The University of Queensland, St Lucia QLD 4072, Australia

9:30 **85 A gut feeling: how baculoviruses establish systemic infections** Lorena Passarelli. Ackert Hall, Division of Biology, Kansas State University, Manhattan, Kansas 66506, USA

Morning Session 2 **Wednesday, 8:30 – 10:00**
Microsporidia Division Symposium Sobey 260
Microsporidian-Induced Effects on the Host
Organizer: Dörte Goertz

8:30 **86 Gene expression in ventriculi of bees infected by *Nosema apis* and *Nosema ceranae* microsporidia** Raquel Martín-Hernández[1], Aránzazu Meana[2], Neil Boonham[3], Mariano Higes[1]. [1]Bee Pathology Laboratory. Centro Apícola Regional.Camino de San Martín s/n, 19180 Marchamalo, Spain, [2]Animal Health Dep., Facultad de Veterinaria, UCM, Avda. Puerta de Hierro s/n, 28040 Madrid, Spain, [3]The Food and Environment Research Agency, Sand Hutton, York, YO41 1LZ, UK

9:00 **87 Individual and social pathology of the microsporidian *Nosema ceranae* in the honey bee *Apis mellifera*** Cédric Alaux[1], Claudia Dussaubat[1], Jean-Luc Brunet[1], Cynthia McDonnell[1], Raquel Martin-Hernandez[2], Mariano Higes[2], Luc Belzunces[1], Yves Le Conte[1]. [1]INRA, UMR 406 Abeilles et Environnement, Site Agroparc, 84914 Avignon, France, [2]Bee Pathology Laboratory, Centro Apícola Regional, JCCM, 19180 Marchamalo, Spain

9:30 **88 Effect of *Paranosema (Nosema) locustae* (Microsporidia) on behavior and morphological Phase Transformation of *Locusta migratoria manilensis* (Orthoptera: Acrididae)** Wangpang Shi. Key Laboratory for Biocontrol of Pests, Ministry of Agriculture, China Agricultural University, Beijing, 100193 China

Morning Session 3 **Wednesday, 8:00 – 10:00**
Bacteria Contributed Papers 2 Sobey 255
Chairs: Juan Luis Jurat-Fuentes and Baltasar Escriche

8:00 **89 Analysis of cahderin of *Helicoverpa armigera* as receptor to CrylAc** Saad Mousa[1], Patricia Barbosa Pelegrini[2], Swaminathan Sivakumar[2],Raman Rajagopal[2], Naresh Arora[2], Bindiya Sachdev[2], Raj K. Bhatnagar[2]. [1]Plant Protection Research Institute, ARC, Dokki, Giza, Egypt, [2]International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, 110 067, India

8:15 **90 STU Characterization of the CrylAc-induced midgut regenerative response to intoxication in *H. virescens* larvae** Anaïs S. Castagnola[1], Omaththage P. Perera[2], Juan Luis Jurat-Fuentes[1]. [1]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, USA, [2]Southern Insect Management Research Unit, USDA-ARS, Stoneville, MS 38776, USA

8:30 **91 STU Expression and characterization of five midgut aminopeptidases N from *Ostrinia nubilalis* in Sf21 cells** Cristina M. Crava, Yolanda Bel, Agata Jakubowska, Baltasar Escriche. Department of Genetics, University of Valencia, Dr. Moliner 50, 46100 Burjassot (Valencia), Spain

8:45 **92 Quantitative CrylFa toxin binding analyses using indirect radiolabeling** Siva R. K. Jakka[1], Joel Sheets[2], Ken Narva[2], Juan L. Jurat-Fuentes[1]. [1]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, [2]Dow AgroSciences LLC, 9330 Zionsville Road, Indianapolis, IN 46268

9:00 **93 STU Vip3C, a novel class of vegetative insecticidal protein from *Bacillus thuringiensis*** Leopoldo Palma[1,2], C. Sara Hernández-Rodríguez[3], Mireya Maeztu[2], Patricia Hernández-Martínez[3], Iñigo Ruiz de Escudero[1,2], Baltasar Escriche[3], Delia Muñoz[2], Juan Ferré[3], Primitivo Caballero[1,2]. [1]Instituto de Agrobiotecnología, CSIC-UPNA, Gobierno de Navarra, Campus Arrosadía, 31192 Mutilva Baja, Navarra, Spain, [2]Laboratorio de Entomología Agrícola y Patología de Insectos, Universidad Pública de Navarra, 31006 Pamplona, Spain, [3]Departamento de Genética, Facultad de CC. Biológicas, Universidad de Valencia, Valencia, Spain

9:15 **94 The improving of PCR-RFLP identification method of Cryl-type genes** Dongming Liu[1,3], Changlong Shu[1], Jie Zhang[1], Fuping Song[1], Dafang Huang[2], Jiguo Gao[3]. [1] State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, China, [2]Biotechnology Research Institute, Chinese Academy of Agricultural Sciences, Beijing 100081, China, [3] College of Life Sciences, Northeast Agricultural University, Harbin 150030, China

9:30 **95 Genetic diversity of 65 isolates from *Bacillus thuringiensis* using fAFLP** Fernando H. Valicente[1], Rosane B. da Silva[1]; Thaís B. Rodrigues[2]; André H. C. Mourão[3], Katia G. B. Boregas[1], Camila S. F. Souza[3]; Carine G. M. Silva[3], Emerson C. de Barros[1], Arthur A. G. Torres[3], Rodrigo S. Mendonça[3]. [1]Embrapa Maize and Sorghum Research Center, [2]Federal University of Lavras – UFLA, [3]Federal University of São João Del Rei

9:45 **96 A PCR-RFLP method to condense the *Bacillus thuringiensis* collections** Chunge Zhang[1,3],Changlong Shu[1], Jie Zhang[1], Fuping Song[1], Dafang Huang[2], Jiguo Gao[3]. [1]State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, China, [2]Biotechnology Research Institute, Chinese Academy of Agricultural Sciences, Beijing 100081, China, [3]College of Life Sciences, Northeast Agricultural University, Harbin 150030, China

10:00 – 10:25 **HEALTH BREAK** Loyola Conference Hall

Mid-Morning Session 1 **Wednesday, 10:30 – 12:30**
Viruses Contributed Papers 4 McNally Theatre Auditorium
Insect-Virus Interactions
Chairs: Adly Abd-Alla and Sassan Asgari

10:30 **97 STU The salivary secretome of salivary gland hypertrophy virus-infected tsetse fly *Glossina pallidipes* (Diptera: Glossinidae)** Henry M. Kariithi[1,3,5], Agah I. Ince[1,4], Sjef Boeren[2], Adly M. M. Abd-Alla[3], Monique M. van Oers[1], Aksoy S[6], Just M. Vlak[1]. [1]Laboratory of Virology, Wageningen University, The Netherlands, [2]Laboratory of Biochemistry, Wageningen University, The Netherlands, [3]Insect Pest Control Laboratory, Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, Vienna, Austria, [4]Department of Genetics and Bioengineering, Yeditepe University, Istanbul, Turkey. [6]Yale School of Public Health, New Haven, Connecticut, United States of America, [5]Biotechnology Centre, Kenya Agricultural Research Institute, Kaptagat Rd, Loresho, Nairobi, Kenya

10:45 **98 Potential management strategies to suppress Salivary Gland Hypertrophy Virus (SGHV) infection in *G. pallidipes* tsetse flies rearing** Adly M. M. Abd-Alla1[1], Henry Kariithi[1], Andrew G. Parker[1], Bryony C. Bonning[2], Just Vlak[3], Max Bergoin[4], and Marc J.B. Vreysen[1]. [1]Insect Pest Control Laboratory, Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, Vienna, Austria; [2]Department of Entomology, Iowa State University, Ames, IA 50011, USA; [3]Laboratory of Virology, Wageningen University, Binnenhaven 11, 6709 PD Wageningen, The Netherlands, [4]Laboratoire de Pathologie Comparée, Université Montpellier 2, Place Eugène Bataillon, 34095 Montpellier, France.

11:00 **99 *Plutella xylostella* larval transcriptome response to *Diadegma semiclausum* parasitism and identification of expressed polydnavirus genes genes** Kayvan Etebari[1], Robin Palfreyman[2], David Schlipalius[3], Lars Nielsen[2], Richard V. Glatz[4], Sassan Asgari[1]. [1]School of Biological Sciences, The University of Queensland, St Lucia QLD 4072 Australia, [2]Australian Institute for Bioengineering and Nanotechnology, The University of Queensland, St Lucia QLD 4072 Australia, [3]AgriScience Queensland, Department of Employment Economic Development and Innovation, Ecosciences Precinct, GPO Box 46, Brisbane 4001, Australia, [4]South Australian Research and Development Institute (SARDI), Entomology, Waite Road, Urrbrae, South Australia, 5064, Australia

11:15 **100 STU Toward understanding of bracovirus mechanism replication** Faustine Louis, Jean Michel Drezen, Annie Bézier, Georges Périquet, Catherine Dupuy. IRBI, Tours, France

11:30 **101 *Vankyrin* genes of the *Hyposoter didymator* ichnovirus: transcriptional expression patterns in different host species** Gabriel Clavijo[1,2], Tristan Dorémus[1,2], Marc Ravallec[1,2], Marie-Anne Mannucci[1,2], Véronique Jouan[1,2], Anne-Nathalie Volkoff[1,2], Isabelle Darboux[1,2]. [1]INRA, UMR 1333, Montpellier, France, [2]Université Montpellier 2, UMR 1333, Montpellier, France

11:45 **102 A host translation inhibitory factor of *Cotesia plutellae* bracovirus discriminates mRNAs depending on their dependency on eIF4A** Yonggyun Kim, Surakasi V. Prasad, Rahul P. Hepat. Department of Bioresource Sciences, Andong National University, Korea

12:00 **103 The evolution of the largest gene family of bracoviruses** Céline Serbielle[1], Stéphane Dupas[2], Elfie Perdereau[1], François Héricourt[1], Elisabeth Huguet[1], Jean-Michel Drezen[1]. [1]Research Institute on Insect Biology CNRS, University of Tours 37200 Tours, France, [2]Laboratory Evolution Genome and Speciation IRD/CNRS, 91190 Gif-sur-Yvette, France

12:15 **104 Integration of bracovirus genome into the host: a prospective gene delivery strategy strategy** Shu Zhang, Kavita Bitra, Markus H. Beck, Michael R. Strand. Department of Entomology, University of Georgia, 120 Cedar Street, Athens, GA 30602, USA

Mid-Morning Session 2 **Wednesday, 10:30 – 12:30**
Fungi Division Symposium Sobey 260
Fungal Associations with Mites and Ticks
Organizer: Ingeborg Klingen

10:30 **105 From basic pathology to microbial control: an overview of fungal acaropathogens** L.P.S. van der Geest. Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam, P.O. Box 94248, 1090 GE Amsterdam, The Netherlands

10:50 **106 Fungal control of ticks in Europe: Methods and first results** Gernot Walder[1], Hermann Strasser[2], Angelika Prader[3], Roland Zelger[3]. [1]Dept. of Hygiene, Med. Microbiology and Social Medicine, Innsbruck Medical University, Austria, [2]BIPESCO Team Innsbruck, Institut für Mikrobiologie, Leopold-Franzens Universität; Technikerstraße 25, A-6020 Innsbruck, Österreich, [3]Land- und Forstwirtschaftliches Versuchszentrum Laimburg, Laimburg 6, I-39051 Pfatten/Auer, Italien

11:10 **107 Fungal control of ticks in South America** Éverton K. K. Fernandes[1,2], Donald W. Roberts[2], Vânia R.E.P. Bittencourt[3]. [1]Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, GO, Brazil; [2]Department of Biology, Utah State University, Logan, UT, USA; [3]Departamento de Parasitologia Animal, Universidade Federal Rural do Rio de Janeiro, Seropédica, RJ, Brazil

11:30 **108 Research priorities for development of effective biological pesticides for control of cattle ticks** P. Polar. Faculty of Engineering, The University of the West Indies, Saint Augustine, Trinidad

11:50 **109 Overwintering of *Neozygites floridana* and its importance in conservational biological control of spider mites** I. Klingen[1], G. Wærsted[1,2], Westrum[1]. [1]Norwegian Institute for Agricultural and Environmental Research (Bioforsk), Plant Health and Plant Protection Division, Høgskoleveien 7, 1432 Aas, Norway, [2]Norwegian University of Life Sciences, Department of Plant and Environmental Sciences, PO Box 5003, 1432 Aas, Norway

12:10 **110 Factors important for survival and epizootick development of *Neozygites* in spider mite populations** Italo Delalibera Jr [1], Vitalis Wafula Wekesa[1,2], Karin Westrum[2], Vanessa da Silveira Duarte[1], Thiago Rodrigues de Castro[1], Silje Stenstad Nilsen[2], Ingeborg Klingen[2]. [1]ESALQ-Universidade de São Paulo, Brazil; [2]Norwegian Institute for Agricultural and Environmental Research (Bioforsk), Norway

Mid-Morning Session 3 — **Wednesday, 10:30 – 11:30**
Diseases of Beneficial Invertebrates — Sobey 255
Contributed Papers 1
Chairs: Chris Hauton and Grant Stentiford

10:30 **111STU Differential expression of immune related genes during bacterial infection in the American lobster (*Homarus americanus*)** K. Fraser Clark[1,2], Spencer J. Greenwood[1,3]. [1]Atlantic Veterinary College Lobster Science Centre, [2]Department of Pathology and Microbiology and [3]Department of Biomedical Sciences, University of Prince Edwards Island, Charlottetown P.E.I, C1A 4P3, Canada

10:45 **112 Expression of Cpn60 by *Aerococcus viridans* var. *homari* is associated with virulence during infection of the American lobster *Homarus americanus*** K. Fraser Clark[1,2], Adam R. Acorn[1], Spencer J. Greenwood[1,3]. [1]Atlantic Veterinary College Lobster Science Centre, [2]Department of Pathology and Microbiology and [3]Department of Biomedical Sciences, University of Prince Edwards Island, Charlottetown P.E.I, C1A 4P3, Canada

11:00 **113 STU Characterization of bacterial flora in the hemolympyh of juvenile American lobster, *Homarus americanus*** Daniel Hines[1,2], Adam R. Acorn[1], K. Fraser Clark[1,2], Rémy Rochette[4], M. John Tremblay[5], Michel Comeau[6], Spencer J. Greenwood[1,3]. [1]AVC Lobster Science Centre, [2]Department of Pathology and Microbiology, [3]Department of Biomedical Sciences, Atlantic Veterinary College, University of Prince Edward Island, 550 University Ave. Charlottetown, PEI C1A 4P3 Canada, [4]Biology Department, University of New Brunswick (Saint John), 100 Tucker Park Road, P.O. Box 5050, Saint John, NB, E2L 4L5 Canada, [5]Population Ecology Division, Fisheries and Oceans Canada, Bedford Institute of Oceanography, 1 Challenger Dr., P.O. Box 1006, Dartmouth, NS, B2Y 4A2, Canada, [6]Lobster Section, Fisheries and Oceans Canada, Gulf Fisheries Centre, 343 Université Avenue, PO Box 5030 Moncton, NB, E1C 9B6, Canada

11:15 **114 STU Identification of dysbiotic agents in epizootic shell disease of the American lobster (*Homarus americanus* H. Milne-Edwards, 1837)** Norman J. Meres[1], Cyril C. Ajuzie[2], Masi M. Sikaroodi[1], Jeffrey D. Shields[3], Patrick M. Gillevet[1]. [1]Environmental Science and Policy Department, George Mason University, 4400 University Drive, Fairfax, VA, 22030, [2]Aquaculture, Freshwater and Marine Ecology Research Lab, Applied Fisheries and Hydrobiology Unit, Department of Zoology, University of Jos, Nigeria, [3]Virginia Institute of Marine Science, PO Box 1346, Gloucester Point, VA, 23062

12:30 – 13:50 — **LUNCH** — Dockside Dining Hall (Residence)

Journal of Invertebrate Pathology — **Wednesday, 12:30 – 14:00**
Editorial Board Meeting — Sobey 153

Afternoon Session 1 — **Wednesday, 14:00 – 16:00**
Cross-Divisional Symposium — McNally Theatre Auditorium
Honouring Lerry Lacey and Harry Kaya
Organizers: Steven Arthurs and Ed Lewis

14:00 **115 Battling codling moth and tuber worms: Lerry Lacey as a postdoc mentor** Steven Arthurs. Mid-Florida Research and Education Center, University of Florida, 2725 Binion Rd, Apopka, FL 32703, USA

14:20 **116 The real dirt: Harry Kaya's influence on entomopathogenic nematode ecology** Mary E. Barbercheck. Department of Entomology, 501 ASI Building, Penn State University, University Park, PA 16802, USA

14:40 **117 Lawrence A. Lacey: colleague, friend and born-again insect pathologist** Brian A. Federici. Developmental Biology, University of California - Riverside, Riverside, California 92521 USA

15:00 **118 Good scientist, good mentor, good friend: Harry K. Kaya** Selcuk Hazir. Adnan Menderes University, Faculty of Arts and Sciences, Department of Biology, Aydin, Turkey

15:20 **119 From ecology to application: integrating entomopathogenic nematodes into turfgrass pest management** Albrecht M. Koppenhöfer. Department of Entomology, Rutgers University, New Brunswick, NJ 08901, USA

15:40 **Autodissemination of Japanese beetle pathogens: from the Azores to Oklahoma** Mike Klein

Afternoon Session 2 — **Wednesday, 14:00 – 15:45**
Diseases of Beneficial Invertebrates — Sobey 255
Contributed Papers 2
Chair: Elke Genersch

14:00 **120 Transcriptome analysis of the honey bee fungal pathogen, *Ascosphaera apis* and implementations to host pathogenesis** Katherine A. Aronstein[1], Scott Cornman[2], Anna Bennett[3]. [1]Honey Bee Research Unit, USDA-ARS, Weslaco, TX 78596, USA, [2]Honey Bee

Research Unit, USDA/ARS, Beltsville, MD Land Grant Program, Kentucky State University, Frankfort, KY 40601, SA, [3]Department of Biology, Georgetown University, Washington, DC 20057

14:15 **121 Honey bee colony collapse in stationary apiaries across the U.S.** Francis Drummond[1], Kate Aronstein[2], Brian Eitzner[3], James Ellis[4], Jay Evans[5], Nancy Ostiguy[6], Walter Sheppard[7], Marla Spivac[8], Kirk Visscher[9]. [1]School of Biology, University of Maine, Orono, ME 04469 USA; [2]Honey Bee Research Unit, USDA-ARS-SARC, 2413 E. Hwy 83, Weslaco, TX 78596 USA; [3]Department of Analytical Chemistry, The Connecticut Agricultural Experiment Station, PO Box 1106, New Haven, CT 06504 USA; [4]Department of Entomology & Nematology, Honey Bee Research and Extension Laboratory, P.O. Box 110620, Bldg. 970 Natural Area Drive, University of Florida, Gainesville, FL 32611 USA; [5]USDA Agricultural Research Service, Bee Research Lab, 10300 Baltimore Blvd., Bldg 476, Rm 100, BARC-east, Beltsville, MD 20705 USA; [6]Department of Entomology, Pennsylvania State University, 542 Ag Sciences & Industries Building, University Park, PA 16802 USA; [7]Department of Entomology, Washington State University, Pullman, WA 99164-6382 USA; [8]Department of Entomology, University of Minnesota, 219 Hodson Hall - 1980 Folwell Ave, Saint Paul MN, 55108 USA; [9]Department of Entomology, College of Natural and Agricultural Sciences, University of California, Riverside, CA 92521 USA

14:30 **122 Potential for neuro-immune communication in the cricket (*Gryllus texensis*): evidence for an octopamine receptor in hemocytes** Russell H. Easy, Shelley A. Adamo. Department of Psychology and Neuroscience, Dalhousie University, Canada

14:45 **123 STU Sickness behaviour in the Texas field cricket *Gryllus texensis*** Evan R. Fairn, Shelley A. Adamo. Department of Psychology, Dalhousie University, Halifax, NS, Canada B3H 4J1

15:00 **124 STU Chitin-binding proteins of *Paenibacillus larvae* and their role in pathogenesis** Garcia-Gonzalez, E, Poppinga, L, Genersch, E. Länderinstitut für Bienenkunde, Molekulare Mikrobiologie und Bienenkrankenheiten, 16540 Hohen Neuendorf

15:15 **125 Infection parameters for *Nosema ceranae* and *Nosema apis* in *Apis mellifera*** Wei-Fone Huang[1], Yanping Chen[2], Leellen F. Solter[1]. [1]Illinois Natural History Survey, University of Illinois, 1816 S. Oak St., Champaign, IL 61820; [2] USDA-ARS Bee Research Laboratory, Bldg. 476, BARC-East, Beltsville, MD 20705, USA

15:30 **126 STU The expression strategy of the *Acheta domesticus* densovirus (AdDNV) capsid protein (VP) gene cassette is so far unique among parvoviruses** Kaiyu Liu[1,2], Yi Li[1,2], Françoise-Xavière- Jousset[3], Qian Yu[1], Hanh Thi Pham[1], Jozsef Szelei[1], François Lépine[1], Max Bergoin[1,3], Peter Tijssen[1]. [1]INRS-Institut Armand-Frappier, Université du Québec, Laval, QC, Canada; [2] currently Central China Normal University, Wuhan 430079 People's Republic of China; [3]Université Montpellier2, Montpellier, 34095 France

16:00 – 16:25 **HEALTH BREAK** Loyola Conference Hall

Mid-Afternoon Session **Wednesday, 16:30 – 18:30**
Bacteria Contributed Papers 3 McNally Theatre Auditorium
Chairs: Mark Hurst and James Baum

16:30 **127 Utilization of host microRNAs by *Wolbachia* to regulate host gene expression and facilitate colonization of the dengue vector mosquito *Aedes aegypti*** Mazhar Hussain[1], Francesca D. Frentiu[1,3], Luciano A. Moreira[1,2], Scott L. O'Neill[1,3], Sassan Asgari[1]. [1]School of Biological Sciences, The University of Queensland, St Lucia QLD 4072, Australia, [2]René Rachou Research Institute – FIOCRUZ, Belo Horizonte MG 30190-002, Brazil, [3]School of Biological Sciences, Monash University, VIC 3800, Australia

16:45 **128 Discovery of a novel protein with activity against Western corn rootworm, *Diabrotica virgifera virgifera*** Deepa Balasubramanian, Dan Tomso, Brian McNulty, Jill Hinson, Kimberly Sampson, Rong Guo, Jessica Zeigler, Nalini Desai. Bayer CropScience, Research Triangle Park, NC27709

17:00 **129 The occurrence of *Photorhabdus*-like toxin complexes in *Bacillus thuringiensis*** Michael B. Blackburn, Phyllis A. W. Martin, Daniel Kuhar, Robert R. Farrar Jr., Dawn E. Gundersen-Rindal. Invasive Insect Biocontrol and Behavior Laboratory, Agricultural Research Service, United States Department of Agriculture, Henry A. Wallace Beltsville Agricultural Research Center,Beltsville, Maryland, USA

17:15 **130 3D structure of a novel bacterial toxin complex isolated from *Yersinia entomophaga* MH96 and implications for insecticidal activity** Michael J Landsberg[1], Sandra A Jones[2], Rosalba Rothnagel[1], Sean Marshall[2], Ben Hankamer[1], Mark Hurst[2]. [1]Institute for Molecular Bioscience, The University of Queensland, St Lucia, Queensland, 4072, Australia.[2]Biocontrol & Biosecurity, AgResearch, Lincoln Research Centre, Private Bag 4749 Christchurch, 8140, New Zealand

17:30 **131 Electron-microscopic and genetic characterization of a *Rickettsiella* sp. infecting the manuka beetle, *Pyronota setosa* (Coleoptera: Scarabaeidae)** Regina G. Kleespies[1], Sean D.G. Marshall[2], Christina Schuster[1], Richard J. Townsend[2], Trevor A. Jackson[2], Andreas Leclerque[1]. [1]Julius Kühn Institute (JKI) - Federal Research Centre for Cultivated Plants, Institute for Biological Control, Heinrichstraße 243, 64287 Darmstadt, Germany, [2]AgResearch Limited, Private Bag 4749, Christchurch 8140, New Zealand

17:45 **132 The grape phylloxera and *Pantoea agglomerans* – a perfect match?** Nora C. Lawo, Filomena V. Loiacono, Astrid Forneck. Division of Viticulture and Pomology, Department of Crop Sciences, University of Natural Resources and Life Sciences, Peter Jordan Str. 82, 1190 Vienna, Austria

18:00 **133 *Bacillus thuringiensis* delta-endotoxins activity against nematodes** Tatiana A. Malinina, Ludmila K. Kamenek, Valery M. Kamenek, Maxim A. Terpilovsky. Ulyanovsk State University, Ecological Department, 42 Lev Tolstoy Street, Ulyanovsk, 432970, Russia

18:15 **134 Monalysin, a novel β-pore-forming toxin produced by the entomopathogenic bacterium *Pseudomonas entomophila*** Onya Opota[1], Isabelle Vallet-Gély[2], Renaud Vincentelli[3], Christine Kellenberger[3], Ioan Iacovache[1], Manuel Rodrigo Gonzales[1], Alain Roussel[3], Françoise-Gisou van der Goot[1], Bruno Lemaitre[1]. [1]Ecole Polytechnique Fédérale de Lausanne, School of Life Sciences, Global Health Institute, Station 15, Lausanne, Switzerland, [2]Centre de Génétique Moléculaire, CNRS, 91198 Gif-sur-Yvette, France, [3]Structural Immunology, AFMB, CNRS-UMR 6098 Campus de Luminy, Marseille France

Poster Session II **Wednesday, 16:30 – 18:30**
Fungi Loyola Conference Hall

F1 STU How complex is the *Metarhizium* community in an agricultural field? Bernhardt M. Steinwender[1], Jürg Enkerli[2], Franco Widmer[2], Jørgen Eilenberg[1], Nicolai V. Meyling[1]. [1]Department of Agriculture and Ecology, Faculty of Life Sciences, University of Copenhagen, Thorvaldsensvej 40, DK 1871 Frederiksberg C., Denmark, [2]Agroscope Reckenholz-Tänikon Research Station ART, Reckenholzstrasse 191, 8046 Zürich, Switzerland

F2 Genetic diversity of multiple single-spore isolations of *Beauveria bassiana* from individual, naturally infected grasshoppers. Stefan T. Jaronski, John A. Gaskin. USDA-Agricultural Research Service, Northern Plains Agricultural Research Laboratory, 1500 N. Central Ave., Sidney MT 59270 USA

F3 STU Phylogenetic and pathogenic divergence within *Metarhizium majus* lineage. Oumi Nishi, Kazuhiro Iiyama, Chisa Yasunaga-Aoki, Susumu Shimizu. Laboratory of Insect Pathology and Microbial Control, Institute of Biological Control, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka, Japan

F4 Biological control of *Rhipicephalus microplus*: An intensive search for promising fungal biological control agents. Éverton K. K. Fernandes[1,2,a], Isabele C. Angelo[1], Drauzio E. N. Rangel[2], Thiago C. Bahiense[1], Áurea M. L. Moraes[3], Donald W. Roberts[2], Vânia R. E. P. Bittencourt[1]. [1]Curso de Pós Graduação em Ciências Veterinárias, Universidade Federal Rural do Rio de Janeiro, Seropédica, RJ, Brazil; [2]Department of Biology, Utah State University, Logan, UT, USA; [3]Laboratório de Taxonomia, Bioquímica e Bioprospecção de Fungos, Instituto Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro, RJ, Brazil; [a]Current address: Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, GO, Brazil

F5 STU Virulence and thermotolerance of acaropathogenic fungi for the control of the two-spotted spider mite, *Tetranychus urticae* Tae Young Shin, Won Woo Lee, Seung Hyun Ko, Sung Min Bae, Jae Bang Choi, Soo Dong Woo. Department of Agricultural Biology, Chungbuk National University, Cheongju, 363-763, Korea

F6 Effect of the alarm pheromone of the rice stink bug, *Oebalus pugnax,* on the *in vitro* germination and development of the entomopathogenic fungi *Beauveria bassiana and Metarhizium anisopliae.* Maynard L. Milks, James R. Fuxa, Jason C. Hamm, Arthur R. Richter, Michael J. Stout. Department of Entomology, Louisiana State University, Baton Rouge, LA, USA 70803

F7 STU The ability of *Aphidius colemani* to vector entomopathogenic fungi *Lecanicillium* spp. against insect *Aphis gossypii* (Bio-cooperated control for cotton aphids). Yuuna Saitou[1], Junya Tone[1], Masanori Koike[1], Daigo Aiuchi[2]. [1]Department of Agro-environmental Science, Obihrio University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan, [2]National Research Center for Protozoan Diseases, Obihrio University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan

F8 Biological evaluation of *Cordyceps militaris*. InPyo Hong[1], SoonOk Woo[1], SangMi Han[1], MiKyeong Lee[2], Richard A. Humber[3]. [1]National Academy of Agricultural Science (NAAS), Suwon, Rep. of Korea, [2]College of Pharmacy & CBITRIC, Chungbuk National University, Cheongju, Rep. of Korea, [3]USDA-ARS Biological IPM Research, Ithaca, NY, United States

F9 STU Evaluation of entomopathogenic fungus *Lecanicillium muscarium* hybrid strain 2aF43 formulation as biological control agent of greenhouse whitefly, *Trialeurodes vaporariorum.* Hiroto Shinomiya[1,4], Daigo Aiuchi[2], Willem J. Ravensberg[3], Masanori Koike[1]. [1]Depertment of Agro-enviromental Science, Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan, [2]National Research Center for Protozoan Diseases, Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan, [3]Koppert Biological Systems, Veilingweg 17, 2650 AD Berkel en Rodenrijs, the Netherlands, [4]Present address: Department of Bioregulation and Biointeraction, Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Fuchu, Tokyo 183-8509, Japan

F10 UV-B and heat induced post-stress growth delay. Chad A. Keyser[1], Everton K. K. Fernandes[1,2], Donald W. Roberts[1]. [1]Department of Biology, Utah State University, Logan, UT 84322-5305, USA, [2]Current address: Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, GO, Brasil 74605-050

F11 STU Cold activity and resistance of the entomopathogenic fungus *Tolypocladium spp* to UV-B radiation and heat. Maiara P. Santos, Luciana P. Dias, Michele S. Pinheiro, Paulo C. Ferreira, Drauzio E. N. Rangel. Instituto de Pesquisa e Desenvolvimento, Universidade do Vale do Paraíba, São José dos Campos, SP, 12244-000 Brazil

F12 The effect of aphid cuticular waxes and pigment on the infection process of *Metarhizium anisopliae*. Bree A Wilson[1], Ben J Stodart[1], Caroline I Hauxwell[1], Gavin J Ash[1]. EH Graham Centre for Agricultural Innovation (an alliance between Charles Sturt University and Industry & Investment NSW). Locked Bag 588, Wagga Wagga, NSW, 2678, Australia

F13 STU Evaluation of infectivity and pathogenicity of anamorphic entomopathogenic fungi isolated from wild mosquitoes in Japan and Burkina Faso against adult female *Anopheles stephensi.* Minehiro Ishii[1], Mitsugu Ishiyama[1], Masanori Koike[1], Shinya Fukumoto[2], Hirotaka

Kanuka[2], Junya Takeshita[1], Daigo Aiuchi[2]. [1]Department of Agro-environmental Science, Obihiro University of Agriculture &Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan, [2]National Research Center for Protozoan Diseases, Obihiro University of Agriculture and Veterinary Medicine; Obihiro, Hokkaido 080-8555, Japan

F14 STU Isolation of anamorphic entomopathogenic fungi from wild mosquitoes and evaluation of their latent infection. Junya Takeshita[1], Mitsugu Ishiyama[1], Minehiro Ishii[1], Masanori Koike[1], Shinya Fukumoto[2], Hirotaka Kanuka[2], Daigo Aiuchi[2]. [1]Department of Agro-environmental Science, Obihrio University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan, [2]National Research Center for Protozoan Diseases, Obihrio University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido 080-8555, Japan

Poster Session II — **Wednesday, 16:30 – 18:30**
Microsporidia — Loyola Conference Hall

MS1 STU The effects of two microsporidian pathogens on the two-spotted ladybeetle, *Adalia bipunctata* L. (Coleoptera:Coccinellidae). Thomas Steele, Susan Bjørnson. Department of Biology, Saint Mary's University, 923 Robie Street, Halifax, NS B3H 3C3 Canada

MS2 Prevalence of *Nosema* disease in honeybee in Korea. NamSuk Kim[1], YongSoo Choi[1], InPyo Hong[1], Richard A. Humber[2]. [1]National Academy of Agricultural Science (NAAS), Suwon, Rep. of Korea, [2]USDA-ARS Biological IPM Research, Ithaca, NY, USA

MS3 Agents effective against the germination of *Nosema ceranae* spores. Martin A. Matisoff. Thomas C. Webster, Land Grant Program, Kentucky State University, Frankfort KY, 40601 USA

MS4 *Nosema ceranae* in migratory beekeeping in the United States. Thomas C. Webster[1], James D. Elllis[2], Melissa L. Calhoun[1], Kirk Pomper[1], Kyle Schneider[1]. [1]Land Grant Program, Kentucky State University, Frankfort KY, 40601 USA, Department of Entomology and Nematology, University of Florida, Gainesville, FL, USA

MS5 Microsporidian pathogens in biological control agents of hemlock woolly adelgid. Leellen F. Solter[1], Wei-Fone Huang[1], Bradley Onken[2]. [1]Illinois Natural History Survey, University of Illinois, 1816 S. Oak St., Champaign, IL 61820, USA; [2]USDA Forest Service, 180 Canfield Street, Morgantown, WV 26505 USA

Poster Session II — **Wednesday, 16:30 – 18:30**
Nematodes — Loyola Conference Hall

N1 STU An investigation on efficacy of entomopathogenic nematodes on leopard moth, *Zeuzera pyrina* L. (Lep.: Cossidae) in Iran. Mahbobeh Ashtari [1], Mohammadreza Rezapanah[2], Javad Karimi[3]. [1]University of Arak, Arak, Iran, [2]Biological Control Dept., Iranian Research Institute of Plant Protection, Tehran, Iran, [3]Department of Plant Protection, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran

N2 STU A new isolate of the entomopathogenic nematode, *Steinernema* sp. (Nematoda: Steinernematidae), from Taiwan. Ching-Tzu Tseng[1], Roger F. Hou[1], Li-Cheng Tang[1]. [1]Department of Entomology, National Chung Hsing University, 250 Kuo Kuang Rd., Taichung, Taiwan

N3 Factors affecting hatching pattern of the eggs of *Strelkovimermis spiculatus* (Nematoda: Mermithidae). María V. Micieli, Paula Risso, María F. Achinelly, M. de los Milagros Villar, Juliana Tarquini. Centro de Estudios Parasitológicos y de Vectores, CEPAVE (CONICET- CCT La Plata -UNLP), calle 2 Nº 584, (1900) La Plata, Buenos Aires, Argentina

N4 Pathogenicity, biology and production of a new isolate of *Heterorhabditis bacteriophora* (Poinar, 1976) (Nematoda: Heterorhabditidae) from Argentina. María F. Achinelly, Daiana Eliceche, Nora Camino. Centro de Estudios Parasitológicos y de Vectores, CEPAVE (CONICET-CCT La Plata -UNLP), calle 2 Nº 584, (1900) La Plata, Buenos Aires, Argentina

N5 Efficacy of entomopathogenic nematodes against Japanese pine sawyer, *Monochamus alternates* (Coleoptera: Cerambycidae). Hwang Bin Yu[1], Domg Woon Lee[2], Ho Yul Choo[1]. [1]Department of Applied Biology, College of Agriculture & Life Sciences, Gyeongsang National University, Jinju, Gyeongnam, 660-701, Korea, [2]Department of Applied Biology, Kyungpook National University, Sangju, 742-711, Korea

N6 Biological responses of *Rhynchophorous ferrugineus* to *Steirnenema carpocapase:* an example of a model system. Barbara Manachini, Vincenzo Arizza. Dep. Environmental Biology and Biodiversity, University of Palermo, Via Archirafi 18, 90123 Palermo. Italy

Poster Session II — **Wednesday, 16:30 – 18:30**
Viruses — Loyola Conference Hall

V1 STU Dissecting the response to White Spot Syndrome Virus in non-model host decapod taxa in non-model environmental scenarios. Lauren S. Hall[1], Dr. Chris Hauton[2], Dr. Grant Stentiford[3]. [1,2]National Oceanography Centre Southampton, University of Southampton, European Way, Southampton, SO14 3ZH, UK, [3]CEFAS, The Nothe, Barrack Road, Weymouth, Dorset, DT4 8UB, UK

V2 Possible origin of a nucleopolyhedrovirus in winter moth populations in Massachusetts. Woojin Kim[1], Joseph S. Elkinton[1], George H. Boettner[1], John P. Burand[1,2]. Departments of [1]Plant, Soil and Insect Sciences, [2]Microbiology, University of Massachusetts – Amherst, Amherst, MA 01003 USA

V3 STU Adaptation of an AcMNPV population to *Trichoplusia ni* and *Spodoptera exigua.* Aurélien Chateigner, Davy Jiolle, Carole Labrousse, Annie Bézier, Elisabeth Herniou. Institut de Recherche sur la Biologie de l'Insecte, UMR CNRS 6035, Université François Rabelais de Tours, Faculté des Sciences et Techniques, Avenue Monge - Parc Grandmont 37200 Tours France

V4 Genetic variation and biological activity of nucleopolyhedrovirus samples from larvae *Heliothis virescens, Helicoverpa zea,* and *Helicoverpa armigera.* Daniel L. Rowley[1], Holly J. R. Popham[2], Robert L. Harrison[1]. [1]Invasive Insect Biocontrol and Behavior Laboratory, Plant Sciences Institute, USDA Agricultural Research Service, 10300 Baltimore Avenue, Beltsville, Maryland 20705, USA, [2]Biological Control of Insects Research Laboratory, USDA Agricultural Research Service, 1503 S. Providence Road, Columbia, Missouri 65203, USA

V5 STU Influence of polyhedra morphology on the virulence of *Autographa californica* nucleopolyhedrovirus. Jae Bang Choi[1], Won Il Heo[1], Tae Young Shin[1], Sung Min Bae[1], Soo Dong Woo[1]. [1]Department of Agricultural Biology, Chungbuk National University, Cheongju, 363-763, Korea

V6 Characterization of six Many Polyhedra variants of *Anticarsia gemmatalis* MNPV. Souza, M. Lobo, Sihler, W., Brito, A. Fernandes. [1]Embrapa Recursos Genéticos e Biotecnologia - Parque Estação Biológica - PqEB - Av. W5 Norte (final) Caixa Postal 02372 - Brasília, DF - Brasil - 70770-917

V7 STU Novel interactions of a cypovirus in the *Heliothis virescens* and *Campoletis sonorensis* host-parasitoid system. Juliane Deacutis, Philip Houtz, Bruce Webb. Department of Entomology, S225 Ag Science North, University of Kentucky,Lexington, KY 40546-0091

V8 STU The characterization of a novel cypovirus in a parasitoid-host relationship. Philip, L. Houtz[1], Juliane, M. Deacutis[2], Bruce, A. Webb[3]. [1]140 Hunter's Rest Lane, Lexington, KY 40515; [2]3546 Creekwood Dr. #20, Lexington, KY 40502 US; [3]S225 Agriculture Science Center North, Lexington, KY 40546-0091

V9 STU Generation of an orally infective recombinant AgMNPV with improved bioinsecticidal activity. Haase, Santiago[1], M. Leticia Ferrelli[1], Ricardo Salvador[2], Marcelo F. Berretta[2], Alicia Sciocco-Cap[2], Víctor Romanowski[1]. [1]IBBM-UNLP-CONICET, Universidad Nacional de La Plata, La Plata; [2]IMyZA-INTA, Castelar; Argentina

V10 Comparative analysis of mononucleotide repeat (MNR) sequences in the genomes of baculoviruses. Xiao-Wen Cheng[1], Samuel T. Murakami[1], Emily E. Schmidt[2], David C. Ream[1], Chun Liang[2], Iddo Friedberg[1]. [1]Department of Microbiology, Miami University, Oxford, Ohio 45056 USA, [2]Department of Botany, Miami University, Oxford, Ohio 45056 USA

V11 STU Complete comparative genomic analysis of two strains of *Bombyx mori* nucleopolyhedrovirus isolated in Korea. Hee Jung Kim, Won Il Heo, Jae Bang Choi, Sung Min Bae, Bit na rae Yun, Jun beom Lee, Soo-Dong Woo. Department of Agricultural Biology, Chungbuk National University, Cheongju, 363-763, Korea

V12 Identification of soybean aphid viruses using Next Generation sequencing technology. Sijun Liu, Diveena Vijayendran, Bryony C. Bonning. Department of Entomology, Iowa State University, Ames, IA 50011 USA

V13 Genome structure of a nucleopolyhedrovirus infecting *Abagrotis reedi,* a cutworm pest of vineyards. Martin A. Erlandson[1], Ajaykumar Maghodia[1], Joan Cossentine[2], Tom Lowery[2], David A. Theilmann[2]. [1]Agriculture and Agri-Food Canada, Saskatoon Research Centre, 107 Science Place, Saskatoon, SK S7N 0X, [2]Agriculture and Agri-Food Canada, Pacific Agriculture Research Centre, 4200 Highway 97, Summerland, BC V0H 1Z0 Canada

V14 Proteomics analysis of the occlusion derived virus (ODV) of Neodiprion abietis nucleopolyhedrovirus (NeabNPV). Shannon Escasa[1], Misha Demidovich[1], Christopher Lucarotti[2], Peter Krell[3], Basil Arif[1]. [1]Laboratory for Molecular Virology, Great Lakes Forestry Centre, CFS. [2]Atlantic Forestry Centre, CFS. [3]Dept. of Cellular and Molecular Biology, University of Guelph

V15 A naturally occurring mutant of *Spodoptera frugiperda* multiple nucleopolyhedrovirus reveals the existence of a new alphabaculovirus *per os* infectivity factor (PIF-6). Oihane Simón[1], Leopoldo Palma[1,2], Trevor Williams[3], Miguel López-Ferber[4], Primitivo Caballero[1,2]. [1]Instituto de Agrobiotecnología, CSIC, Gobierno de Navarra, 31192 Mutilva Baja, Navarra, Spain, [2]Departamento de Producción Agraria, Universidad Pública de Navarra, 31006 Pamplona, Spain, [3]Instituto de Ecología AC, Apartado Postal 63, Xalapa, Veracruz 91070, México, [4] Laboratoire de Gènie de l'Environnement Industriel, Ecole des Mines d'Alès, 6 avenue de Clavières, 30319, Alès Cedex, France

V16 STU Analysis of a novel transactivator BmNPV p15. Yukimi Akatsuka, Takumi Abe, Yasuyuki Nishijima, Chikako Ono, Ken Sahara, Shin-ichiro Asano, Hisanori Bando. Division of Applied Bioscience, Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Hokkaido, Japan

V17 Characterization of new active transposons isolated from insects. Mariano N. Belaich, Matías J. Garavaglia, Solange A.B. Miele, Cecilia S. Turco, Diego L. Mengual Gomez, Vanina A. Rodriguez, Pablo D. Ghiringhelli. LIGBCM-AVI, Departamento de Ciencia y Tecnología, Universidad Nacional de Quilmes. Roque Saenz Peña 352, Bernal, Pcia. Buenos Aires, Argentina

V18 STU Construction of novel baculovirus expression vector system by fusion of partial polyhedrin. Sung Min Bae, Bit Na Rae Yun, Jun Beom Lee, Hee Jung Kim, Soo Dong Woo. Department of Agricultural Biology, Chungbuk National University, Cheongju, 363-763, Korea

V19 Construction of the full-length cDNA clone of *Ectropis oblique* picorna-like virus. Yuanyang Hu, Meijuan Lin, Congyi Zheng, Jiamin Zhang. State Key Laboratory of Virology, College of Life Sciences, Wuhan University, Wuhan, Hubei 430072 China

V20 Study of late expression factors of *Spodoptera frugiperda* nucleopolyhedrovirus in the permissive insect cell line Sf-9. Marcelo F. Berretta[1], M. Gabriela López[2], Alicia Sciocco-Cap[1], Víctor Romanowski[3]. [1]IMYZA-CICVyA, Instituto Nacional de Tecnología Agropecuaria (INTA), CC 25 (1712) Castelar, Buenos Aires, Argentina, [2]IB-CICVyA-INTA, [3]IBBM-CONICET-UNLP, Facultad de Ciencias Exactas, Universidad Nacional de La Plata, calle 49 y 115, (1900) La Plata, Buenos Aires, Argentina

V21 Stability analysis of Sf-caspase-1 in Sf9 cells Zhongfu Ying, Ao Li, Meijin Yuan, Kai Yang, Yi Pang. State Key Laboratory of Biocontrol, Sun Yat-sen University, Guangzhou 510275, China

V22 The impact of silencing AcMNPV ORF33 on expressing integral membrane proteins by baculoviruses. Tamer Z. Salem[1,3], Suzanne M. Thiem[1,2]. [1]Department of Entomology, [2]Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI 48824, U.S.A., [3]Department of Microbial Molecular Biology, AGERI, Agricultural Research Center, Giza 12619, Egypt

V23 STU Baculovirus as a gene delivery vector for ischaemia reperfusion injury. Elisabetta Locanto[1], Richard B. Hitchman[2], Linda A. King[1]. [1]Oxford Brookes University, Insect Virology Research Group, School of Life Sciences, Oxford, UK, [2]Oxford Expression Technologies Ltd, Oxford, UK

V24 STU Heterologous cell culture models for DWV. Nadine Möckel, Sebastian Gisder, Elke Genersch. Institute for Bee Research, Friedrich Engels-Straße 32, D-16540 Hohen Neuendorf, Germany

V25 NTPase-like proteins from the banchine ichnovirus GfIV: transcriptional analysis, molecular modeling and functional assays. Michel Cusson[1,2], Audrey Nisole[1,3], Benoit Aspirault[2], Mathieu Landry[2], Catherine Béliveau[1], Halim Maaroufi[3]. [1]Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, 1055 du P.E.P.S., Québec, QC, G1V 4C7, Canada; [2]Département de biochimie, de microbiologie et de bio-informatique, Université Laval, Québec, QC, G1V 0A6, Canada; [3]Institut de biologie intégrative et des systèmes, Université Laval, Québec, QC, G1V 0A6, Canada

V26 STU Enhanced expression of the glycoproteins of Aujeszky's Disease Virus using baculovirus expression system. Bit Na Rae Yun, Sung Min Bae, Jae Bang Choi, Jun Beom Lee, Hee Jung Kim, Soo Dong Woo. Department of Agricultural Biology, Chungbuk National University, Cheongju, 363-763, Korea

18:30 – 19:50	**DINNER**	On Your Own

Evening Session 1 — **Wednesday, 20:00 – 20:30**
Microbial Control Division Business Meeting — McNally Theatre Auditorium
Organizer: Surendra Dara

Microbial Control and Bacteria Cross-Divisional Workshop: Industry Innovation in Biocontrol — **Wednesday, 20:30 – 22:30**, McNally Theatre Auditorium
Organizers: Kenneth E. Narva

20:30 **135 Insect resistance management in the bag: pyramided traits and seed blend refuges** Nick Storer. Dow AgroSciences LLC, 9330 Zionsville Rd, Indianapolis, IN, 46268, USA

20:45 **136 Pyramided crops incorporating RNAi technology** William Moar, Tom Clark. Parthasarathy Ramaseshadri; Gerrit Segers; Graham Head, Monsanto Company, 800 North Lindbergh, Creve Coeur, MO 63167

21:00 **137 Successes and challenges in commercialization of micro- and macrobiologicals** Andrew P. Brown[1], Mark Howieson[2], Julie Graesch[2]. [1]Becker Underwood Ltd., Harwood Road Industrial Estate, Harwood Road, Littlehampton, West Sussex, BN17 7AU, UK, [2]Becker Underwood Inc., 801 Dayton Avenue, Ames IA 50010, USA

21:15 **138 Novel targeted delivery systems in biocontrol** Nick Jessop, Exosect

21:30 **139 RNAi product platform for invertebrate health and targeted pest control** Ben-Chanoch Eyal. Glick Eitan, Paldi Nitzan, Yarden Gal, Beeologics Inc. 11800 SW 77th Avenue, Miami, Florida 33156 Tel: +1 305-233-6564

21:45 **140 Integration of entomopathogenic fungi into insecticide resistance management programs for control of sucking insect pests** Jarrod Leland. Novozymes Biologicals, Inc., 5400 Corporate Circle, Salem VA 24153 USA

22:00 **141 Novel microbial controls from the Enterobacteriaceae** Mark Hurst[1],Trevor Jackson[1]. Biocontrol & Biosecurity, AgResearch, Lincoln Research Centre, Private Bag 4749 Christchurch, 8140, New Zealand

Evening Session 2 — **Wednesday, 20:00 – 23:30**
Diseases of Beneficial Invertebrates Division Business Meeting — Sobey 255
Organizer: Grant Stentiford

SIP 2011 Congress Registration — **Thursday, 7:00-13:00**, McNally Theatre Auditorium

Morning Session 1 — **Thursday, 8:30-9:45**, Sobey 260
Fungi Contributed Papers 2
Chair: Drauzio Eduardo Naretto Rangel

8:30 **142 Natural occurrence and artificial establishment in *Pinus radiata* seeds and roots with *Beauveria bassiana*** Travis R Glare[1], Stephen D. Reay[2], Michael Brownbridge[3], Aimee C. McKinnon[1], Tracey L. Nelson[4]. [1]Bio-protection Research Centre, PO Box 84, Lincoln University, Lincoln 7647, New Zealand, [2]Silver Bullet Forest Research, Auckland, New Zealand, [3]Vineland Research and Innovation Centre, 4890 Victoria Ave. N., Box 4000, Vineland Station, Ontario, Canada L0R 2E0, [4]AgResearch Ltd., Lincoln Research Centre, Private Bag 4749, Christchurch 8140, New Zealand

8:45 **143 Recent studies to increase the thermotolerance of entomopathogenic fungi** Jae Su Kim[1,2], Margaret Skinner[1], Svetlana Gouli[1], Jae Young Choi[3], Yeon Ho Je[3], Bruce L. Parker[1]. [1]Entomology Research Laboratory, University of Vermont, 661 Spear Street, Burlington, VT 05405-0105, USA, [2]Research Institute for Agriculture and Life Sciences, Seoul National University, Seoul 151-742, Republic of Korea, [3]Department of Agricultural Biotechnology, College of Agriculture & Life Sciences, Seoul National University, Seoul 151-742, Republic of Korea.

9:00 **144 Optimization of a media with antimicrobial effects on the germination of *Beauveria bassiana*** David Ruelas-Ayala, Cipriano Garcia-Gutierrez. CIIDIR-COFAA IPN Sinaloa. Department of Biotechnology. Blvd. Juan de Dios Batiz Paredes No. 250 AP. 280 Guasave, Sinaloa, Mexico

9:15 **145 Rhizosphere competens of insect pathogenic fungi in the control of *Othiorhynchus sulcatus* in strawberries under cold climatic conditions** Ingeborg Klingen, Karin Westrum. Norwegian Institute for Agricultural and Environmental Research (Bioforsk), Plant Health and Plant Protection Division, Høgskoleveien 7, N-1432 Ås, Norway

9:30 **146 Evaluation of *Fusarium coccophilum* as a biological control option for armoured scale insects** Nicola A. Mauchline, Garry Hill. The New Zealand Institute for Plant & Food Research Limited, (Plant & Food Research), 412 No. 1 Road, RD 2, Te Puke, New Zealand

Morning Session 2 — **Thursday, 8:00 – 9:45**, McNally Theatre Auditorium
Viruses Contributed Papers 5
Immunity and Intervention
Chairs: Rollie Clem and Hu Zhihong

8:00 **147 STU Immune-gene responses in *Penaeus monodon* shrimp following infection with *Gill-associated* virus** Darren J. Underwood[1], Melony J. Sellars[2], Jeff A. Cowley[3], Karyn N. Johnson[1]. [1]School of Biological Sciences, The University of Queensland, St. Lucia, Qld 4072, Australia, [2]CSIRO Food Futures National Research Flagship, CSIRO Livestock Industries, Queensland Biosciences Precinct, St. Lucia, Qld 4067, Australia, [3]CSIRO Food Futures National Research Flagship, CSIRO Marine and Atmospheric Research, Dutton Park, Qld 4102, Australia

8:15 **148 Subcellular localization and functional characterization of MdBV I_KB – like protein N5 in *Drosophila* mbn2 cells** Kavita Bitra, Richard Suderman, Michael R. Strand. Department of Entomology, University of Georgia, 120 Cedar street, Athens, Georgia - 30602, USA

8:30 **149 Studies of the subgenomic RNA3 and protein B2 of Wuhan Nodavirus** Xi Zhou, Yang Qiu, Jiamin Zhang, Congyi Zheng, Yuanyang Hu. State Key Laboratory of Virology, College of Life Sciences, Wuhan University, Wuhan, Hubei 430072 China

8:45 **150 Gloverin: an antiviral protein induced in *Trichoplusia ni* during baculovirus infection** Eric J. Haas-Stapleton, Daniela Moreno-Hable, Angelica Dulce. Department of Biological Sciences, California State University Long Beach, 1250 Bellflower Blvd., Long Beach, CA 90840 USA

9:00 **151 The impact of Dicer-2 and *Wolbachia* on antiviral protection in *Drosophila*** Lauren M. Hedges, Ryuichi Yamada, Scott L. O'Neill, Karyn N. Johnson. School of Biological Sciences, The University of Queensland, Brisbane, Australia

9:15 **152 Apoptosis in host defense and productive infection in *Amsacta moorei* entomopoxvirus infected cells** Srini Perera[1,2], Peter Krell[2], Basil Arif[1]. [1]Laboratory for Molecular Virology, GLFC, Sault Ste Marie, ON, Canada, [2]University of Guelph, ON, Canada

9:30 **153 Understanding the roles of p53 and the DNA damage response in baculovirus replication and baculovirus-induced apoptosis** Ning Huang[1], Wenbi Wu[1], A. Lorena Passarelli[1], George F. Rohrmann[2], Rollie J. Clem[1]. [1]Division of Biology, Kansas State University, Manhattan, KS, USA; [2]Department of Microbiology, Oregon State University, Corvallis, OR, USA

Morning Session 3 — **Thursday, 8:15-10:00**
Diseases of Beneficial Invertebrates — Sobey 255
Contributed Papers 3
Chair: Hamish Small and Grant Stentiford

8:15 **155 STU Susceptibility to viral infection and pathogenicity of White Spot Disease (WSD) in non-model crustacean host taxa from temperate regions** Kelly S. Bateman, Grant D. Stentiford. European Union Reference Laboratory for Crustacean Diseases, Centre for Environment, Fisheries and Aquaculture Science (Cefas), Barrack Road, The Nothe, Weymouth, Dorset, DT4 8UB, UK

8:30 **156 Behavior influences viral disease dynamics in the Caribbean spiny lobster** Donald C. Behringer[1], Mark J. Butler[2], Thomas W. Dolan[3], Jeffrey D. Shields[3], Jessica Moss[3]. [1]University of Florida, School of Forest Resources and Conservation & Emerging Pathogens Institute, Gainesville, FL 32653 USA, [2]Old Dominion University, Department of Biological Sciences, Norfolk, VA 23529 USA, [3]Virginia Institute of Marine Science, Gloucester Point, VA 23062 USA

8:45 **157 STU Pathogenesis of early *Hematodinium* sp. infection in Atlantic Canadian snow crabs (*Chionoecetes opilio*)** Melanie A. Buote[1,2], Richard J. Cawthorn[1,2], Andrea L. Battison[1] . [1]AVC Lobster Science Centre, [2]Department of Pathology and Microbiology, Atlantic Veterinary College, University of Prince Edward Island, 550 University Avenue, Charlottetown, PE C1A 4P3 Canada

9:00 **158 In vitro cultivation of *Hematodinium* sp. and characterization of developmental stages** Peter H. Gaudet[1,2], Richard Cawthorn[1,2], Spencer Greenwood[1,3], Dorota Wadowska[4], Glenda Wright[3]. [1]AVC Lobster Science Centre, [2]Department of Pathology and Microbiology,[3]Department of Biomedical Sciences,[4]Electron Microscopy, Atlantic Veterinary College, University of Prince Edward Island, 550 University Ave. Charlottetown, PEI C1A 4P3 Canada.

9:15 **159 STU Trichocyst development and their potential role in *Hematodinium* sp. survival** Peter H. Gaudet[1,2], Richard Cawthorn[1,2], Spencer Greenwood[1,3], Dorota Wadowska[4], Glenda Wright[3]. [1]AVC Lobster Science Centre, [2]Department of Pathology and Microbiology,[3]Department of Biomedical Sciences,[4]Electron Microscopy, Atlantic Veterinary College, University of Prince Edward Island, 550 University Ave. Charlottetown, PEI C1A 4P3 Canada

9:30 **160 Parasites and diseases in marine copepods: Challenges for future mass-production of live feed for fish larva production** Alf Skovgaard. University of Copenhagen, Faculty of Life Sciences, Department of Veterinary Disease Biology, Laboratory of Aquatic Pathobiology, Stigbøjlen 7, DK-1870 Frederiksberg C, Denmark

9:45 **161 STU Comparison of expression strategy of two brevidensoviruses, Penaeus stylirostris densovirus and Aedes albopictus densovirus** Hanh T. Pham[1], Françoise-Xavière Jousset[2], Hiroko Shike[3], Jozsef Szelei[1], Hanh T. Van[4], Jane C. Burns[3], Max Bergoin[2], Peter Tijssen[1].[1]INRS-Institut Armand-Frappier, Laval, Québec, H7V 1B7, Canada; [2]Laboratoire de Pathologie Comparée, Université Montpellier2, 34095 France; [3]Department of Pediatrics, University of California at San Diego School of Medicine, La Jolla 92093-0830; [4]Institute of Tropical Biology, Ho Chi Minh City, Vietnam

10:00 – 10:25 **HEALTH BREAK** Loyola Conference Hall

Mid-Morning Session — **Thursday, 10:30 – 10:45**
Special Presentation — McNally Theatre Auditorium
Chair: Dr. Elizabeth (Betty) Davidson

10:30 **162 Pioneer women in invertebrate pathology and their influence on the field** Dr. Elizabeth (Betty) Davidson

SIP Annual Business Meeting — **Thursday, 10:45 – 12:00** McNally Theatre Auditorium

12:00 – 13:25 **LUNCH** Dockside Dining Hall (Residence)

Afternoon Session 1 — **Thursday, 13:30–15:15**
Microbial Control Contributed Papers 3 — Sobey 255
Chair: Reza Talaei

13:30 **163 Effects of additives and UV protectants on *Plutella xylostella* granulovirus efficacy to control of diamondback moth (*Plutella xylostella* Linnaeus)** [1]A. Dezianian, [2]A.S. Sajap, [3]L.W. Hong, [3]D. Omar, [4]H.A. Kadir,[2]R. Mohamed and [4]M.R.M. Yusoh. [1]Department of Plant Protection, Shahrood (Semnan) Agricultural Research Center, Shahrood, Iran, [2]Department of Forest Management, Faculty of Forestry, University Putra Malaysia, 43400 UPM Serdang, Selangor, D, E., Malaysia, [3]Department of Plant Protection, Faculty of Agriculture, University Putra Malaysia, 43400 UPM Serdang, Selangor, D, E., Malaysia, [4]Malaysia Agricultural Research and Development Institute, Serdang, Selangor, D, E., Malaysia

13:45 **164 The inactivation of *H. armigera* nucleopolyhedrovirus (*Hear*NPV) by chickpea (*Cicer arietinum*) and other legume leaf surface compounds** David Grzywacz[1], Philip C. Stevenson[2], Reju F. D'Cunha[1], Aliyu Aminu[1]. [1]Natural Resources Institute, University of Greenwich, Chatham, Kent, ME4 4TB, UK, [2]Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey, TW9 3DS, UK

14:00 **165 Control of oriental fruit moth and codling moth with a new granulovirus isolate** Markus Züger[1], Iris Kraaz[1], Daniel Zingg[1], Martin Andermatt[1], Edith Ladurner[2], Massimo Benuzzi[2], Marketa Broklova[3], Gyula Laszlo[4]. [1]Andermatt Biocontrol AG, 6146 Grossdietwil, Switzerland; [2]Intrachem Bio Italia S.p.A., 47023 Cesena, Italy; [3]Biocont Laboratory Ltd., 627 00 Brno-Slatina, Czech Republic; [4]Biocont Magyarorszag Kft., 1139 Budapest, Hungary

14:15 **166 Purification of an active fragment of Cry1Ie toxin from *Bacillus thuringiensis*** Shuyuan Guo[1], Chunlu Zhang[1], Xiaoyin Lin[1], Yanrui Zhang[2], Kanglai He[2], Fuping Song[2], Jie Zhang[2]. [1]School of Life Science, Beijing Institute of Technology, Beijing 100081, China, [2]State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100094, China

14:30 **167 Spore-free antibacterial *Bacillus thuringiensis* delta-endotoxins formulations in integrated pest management** Lidia A. Ivanova, Ludmila K. Kamenek, Olga U. Shrol, Maxim A. Terpilovsky. Ulyanovsk State University, Ecological Department, 42 Lev Tolstoy Street, Ulyanovsk, 432970, Russia

14:45 **168 Spore-free insecticidal formulations based on cleaved *Bacillus thuringiensis* delta-endotoxins** Ludmila K. Kamenek[1], Dmitri V. Kamenek[1], Vladimir V. Gouli[2]. [1]Ulyanovsk State University, Ecological Department, 42 Lev Tolstoy Street, Ulyanovsk, 432970, Russia, [2]University of Vermont, Entomology Research Laboratory, Bioresearch Center, 661 Spear Street, South Burlington, VT 05405-0105 USA

15:00 **169 *Tenebrio molitor* cadherin fragment, a potential additive in *Bacillus thuringiensis* Cry3Aa against Vegetable Coleopteran larvae** Yulin Gao[1], Zhongren Lei[1], Juan Luis Jurat-Fuentes[2], Jeffrey A. Fabrick[3], Brenda Oppert[4]. [1]State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, P.R. China; [2]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996, USA; [3]USDA ARS U.S. Arid Land Agricultural Research Center, 21881 N. Cardon Lane, Maricopa, AZ 85138, USA, [4]USDA ARS Center for Grain and Animal Health Research, 1515 College Avenue, Manhattan, KS 66502, USA

Afternoon Session 2 — **Thursday, 13:30 – 15:30** — McNally Theatre Auditorium
Viruses Division Special Symposium in Honour of Basil Arif: Viruses of Forest Insect Pests
Organizers: Peter Krell and Kelli Hoover

13:30 **170 Viruses of forest insect pests** Peter Krell. Department of Molecular and Cellular Biology, University of Guelph, Guelph ON N1G 2W1 Canada

14:00 **171 Baculoviruses of forest pests – their application from an European perspective** Johannes A. Jehle. Institute for Biological Control, Julius Kühn-Institut, Federal Research Centre for Cultivated Plants, Heinrichtstr. 243, 64287 Darmstadt

14:30 **172 *Lymantria dispar* nucleopolyhedrovirus as a microbial control agent of the forest insect pest *L. dispar*** Kelli Hoover[1], James M. Slavicek[2]. [1]Department of Entomology, Penn State University, 501 ASI Building, University Park, PA 16802 USA, [2]USDA Forest Service, 359 Main Road, Delaware, OH 43015 USA

15:00 **173 Baculoviruses and the population cycles of two insect herbivores of balsam fir** Christopher J. Lucarotti. Natural Resources Canada, Canadian Forest Service - Atlantic Forestry Centre, 1350 Regent Street, Fredericton, New Brunswick, Canada, E3C 2G6

15:30 – 15:55 **HEALTH BREAK** Loyola Conference Hall

Mid-Afternoon Session 1 — **Thursday, 16:00 – 18:00** — McNally Theatre Auditorium
Bacteria Division Symposium
Resistance to Bt Crops
Organizers: Juan Ferre and Juan Luis Jurat-Fuentes

16:00 **174 Field-evolved resistance of *Helicoverpa zea* to *Bt* cotton** Bruce E. Tabashnik[1], Xianchun Li[1], Yidong Wu[2]. [1]Department of Entomology, University of Arizona, Tucson, Arizona 85750, USA, [2]College of Plant Protection, Nanjing Agricultural University, Nanjing 210095, China

16:30 **175 Adaptive management of resistance to *Bt*-cotton in Australian *Helicoverpa* spp.** Sharon J. Downes[1], Rod Mahon[2], Tracey Parker[1], Bill James[2]. [1]CSIRO Ecosystem Sciences, Australian Cotton Research Institute, Locked Bag 59, Narrabri, NSW 2390 Australia, [2]CSIRO Ecosystem Sciences, Black Mountain Laboratories, PO Box 1700, Canberra, ACT 2601 Australia

17:00 **176 Resistance to *Bt* maize in *Spodoptera frugiperda*: lessons from Puerto Rico** Nicholas P. Storer, Ed King, Gary D. Thompson. Dow AgroSciences LLC, 9330 Zionsville Road, Indianapolis, IN 46268, USA

17:30 **177 Field failure of first-generation *Bt* cotton documented with pink bollworm in Gujarat State, India** William Moar[1], Graham P. Head[1], John Greenplate[1], K.S. Mohan[2], K.C. Ravi[2]. [1]Monsanto Company, 800 North Lindbergh, Creve Coeur, MO 63167, [2]Monsanto Research Centre, 44/2A Vasanth's Business Park, Bellary Road, NH – 7, Hebbal, Bangalore 560092, India

Mid-Afternoon Session 2 **Thursday, 16:00 – 17:15**
Microsporidia Contributed Papers 2 Sobey 255
Chair: Andreas Linde

16:00 **178 Persistence, stability and co-occurrence of *Knellallenhazia solenopsae*, S. invicta virus 1 (SINV-1) and SINV-2 infections across years in Louisana** Maynard L. Milks, James R. Fuxa, Arthur R. Richter. Department of Entomology, Louisiana State University, Baton Rouge, LA, USA 70803

16:15 **179 Effects of a microsporidium from the convergent lady beetle, *Hippodamia convergens* Guerin-Meneville, on the endoparasitoid *Dinocampus coccinellae* (Schrank)** T. Saito[1], S. Bjornson[2]. [1]Vineland Research and Innovation Centre, 4890 Victoria Ave. N., Box 4000, Vineland Station, ON Canada L0R 2E0; [2]Department of Biology, Saint Mary's University, 923 Robie Street, Halifax, NS, Canada B3H 3C3

16:30 **180 Characterization of nosemosis in the sugarcane borer, *Diatraea saccharalis*, and its parasitoid *Cotesia flavipes*** Renata A. Simões, Júlia R. Feliciano, Letícia G. Reis, Italo Delalibera Jr. Universidade de São Paulo (ESALQ/USP), Av. Pádua Dias 11, C.P. 9, Piracicaba/SP, Brazil, CEP 13418-900

16:45 **181 Temperature affects development of the microsporidium *Nosema lymantriae* and disease progress in the host *Lymantria dispar*** Dörte Goertz, Sieglinde Pollan, Gernot Hoch. BOKU University of Natural Resources and Life Sciences, Vienna; Department of Forest- and Soil Sciences, Hasenauerstr. 38, 1190 Vienna, Austria

17:00 **182 Evaluating methods of disinfecting *Nosema ceranae*-contaminated comb** Abdullah Ibrahim, Andony P. Melathopoulos, Stephen F. Pernal. Beaverlodge Research Farm. Agriculture and Agri-Food Canada, AB. P.O. Box 29, Beaverlodge, Alberta T0H 0C0

18:00 – 01:00 **SIP BANQUET** Pier 21 National Historic Site