

The Chair's End of the Year Message and Holiday Greeting

In this end of year message, I thought it befitting to update you on the state of the department. It is cliched but true that time flies when you are busy! 2010 has been a very busy and productive year for the department. We welcomed three new faculty members (Dr Soraya Sayi - contract pathologist, Dr Mark Fast - Novartis Research Chair in Fish Health, Dr Byeong Hwa Jeon - bacteriologist), four staff members (Jennifer Roma, Curran Schoenmakers, Carolyn Thorne, Karen Smith) five post-doctoral fellows (Dr Dante Mateo, Dr Helena Fridholm, Dr Jennifer Covello, Dr Nakhyung Lee, Dr Sarah Stewart-Clark) eight graduate students (Emily Ball, Peter Gaudet, John Davidson, Dr Heather Fenton, Dr Anil Kalupahana, Dr Ravinder Sappal, Kelly-Clark Whitney, Megan Bauer), seven visiting professors (Dr Richard Fulton, Dr Mike Collins, Dr Jose Ramirez-Lezama, Larisa Chavez-Soriano, Dr Moustafa Atta, Dr Luis Rodriguez-Tovar, Dr Alicia Nevarez) and two visiting post-doctoral fellows (Dr Isabel Cornejo, Dr Ashkan Zargar) to the department. Dr Cora Gilroy and Dr Noel Clancey changed from FA2 to FA1 status. Dr Gary Conboy went on a 1-year sabbatical leave. We bid fond farewell to Dr Jim Bellamy who retired, Dr. Spencer Greenwood who moved to a tenure-track position in the Department of Biomedical Sciences, and Dr Jan Lovy, Dr Xin Yi and Dr Bertrand Sandjong who moved to research positions at other institutions.

The department excelled in delivering the academic missions of the college (teaching, research and service) as exemplified by the following accomplishments of our faculty, staff and students: Dr Alfonso Lopez received the 2010 Hessian Merit Award for Excellence in Teaching. Dr. Paul Hanna received the 2010 Vetoquinol Clinical Teaching Award. Dr Shelley Burton was appointed Chair of the Clinical Pathology section of the ACVP Examination Committee. Dr Noel Clancey became board certified in ACVP subspecialty Clinical Pathology. Several faculty members were successful in obtaining research funding this year. Most notable are: Dr Dave Speare as part of the NSERC Canadian Integrated Multi-Trophic Aquaculture Network (CIMTAN) received funding over 5 years (2009-2014). Dr Ahmed Siah and his team were funded two times by Innovation PEI. Dr Mark Fast and Dr Fred Markham received an NSERC Engage Grant, Dr Scott McBurney and Dr Maria Forzan received a Sir James Dunn Animal Welfare Centre grant, and Dr Anne Muckle, Dr Barb Horney and their team received an ACOA-AIF grant. Dr Byeong Hwa Jeon was funded by the Canadian Poultry Research Council. Several of our post-docs (Dr Sarah Stewart-Clark, Dr Dante Mateo, Dr Nakhyung Lee) and graduate students (Michael Ciaramella, Fraser Clark) were awarded Island Prosperity Fund Post-doctoral Fellowships and Graduate Student Scholarships, respectively. Dr Mebrahtu Araya, Dr Dante Mateo and Dr Sarah Stewart-Clark successfully defended their PhD theses. Dr Afaf Arara successfully defended her MSc thesis. Dr Elizabeth O'Neil successfully defended her MVSc project. Our clinical faculty members who are very passionate about professional service continued to provide high levels of diagnostic service to the veterinary community in clinical pathology, morphologic pathology, wildlife pathology, bacteriology and parasitology. Allan MacKenzie was recognized with the 2010 AVC Staff Merit Award. Dr Fred Kibenge was appointed to the editorial boards of BMC Molecular Biology journal and Journal of Biomedicine and Biotechnology. Dr Molly Kibenge was appointed to the editorial board of the Journal of Aquaculture and Research Development. Dr Sarah Stewart-Clark was appointed to the editorial board of the journal Aquatic Invasions. Numerous other accomplishments, awards, presentations at scientific conferences and research publications are detailed in the department's bi-monthly newsletter. I want to thank Rita Saunders and Diane MacLean who in various ways help to keep the department running smoothly. Together with many many other accomplishments that often go unrecorded, all deserve our acknowledgment and appreciation for supporting and representing the work of the department of Pathology and Microbiology. These accomplishments assure us of an even brighter future in these times of fiscal restraint and hard choices.

As we reflect on our successes in 2010, let us be thankful of those who played their part, and then look forward to a productive 2011. **Have a wonderful Christmas holiday!**

CCWHC Delivers OIE Workshop in Thailand

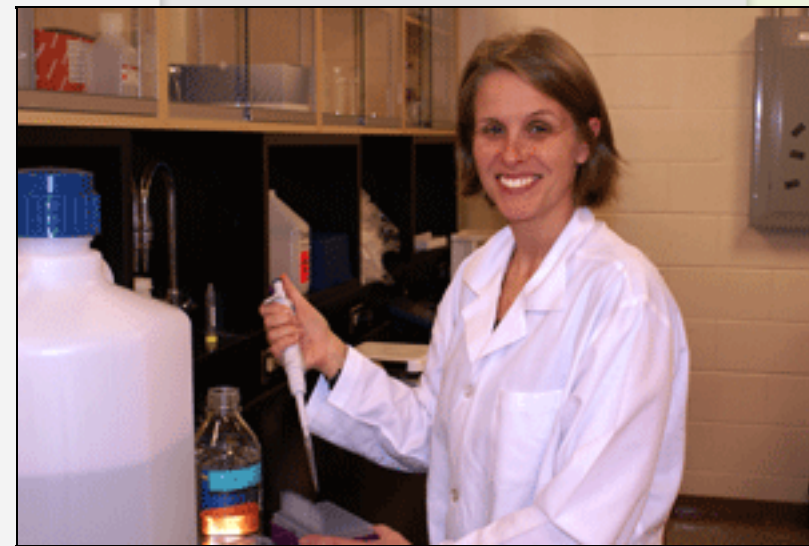


In October 2010, the last of the workshops organized by the OIE (World Organization for Animal Health) in conjunction with one

of its collaborating centres, the Canadian Cooperative Wildlife Health Centre (CCWHC), was held in Bangkok, Thailand. The workshops were intended for the training of Focal Points in Wildlife, those professionals whose job is to inform and advise the OIE Delegate in their own countries in matters of wildlife health. The last of this round of workshops was aimed at the Asian members of the OIE and was delivered by Dr Ted Leighton, General Director of the CCWHC, and **Dr Pierre-Yves Daoust**, Regional Director of CCWHC Atlantic Region and professor of our Dept. of Pathology and Microbiology. Dr Daoust is the third member of the CCWHC in our department to deliver one of these workshops, **Drs Forzan** and **McBurney** having preceded him in Panama and Tanzania, respectively. The workshops were well received and the OIE has already requested the CCWHC to start planning the second round, the first of which will take place in Slovenia and is tentatively scheduled for April 2011.

Sara Purcell Joining the Fish Health Group

Dr Mark Fast is excited to announce the start of **Dr Sara Purcell** on November 1, as the new technical staff within the Fish Lab In Host-Pathogen Interactions (FLIPI). Sara brings a wide breadth of knowledge and expertise within the molecular and genomics fields, and is a welcome addition to our group and the Department. Sara is no stranger to the Department of Pathology and Microbiology, and recently finished a post-doctoral position with Drs. Jeff Lewis and Fred Markham. Welcome aboard Sara, time to get your hands wet and please help us come up with a better name for our lab!



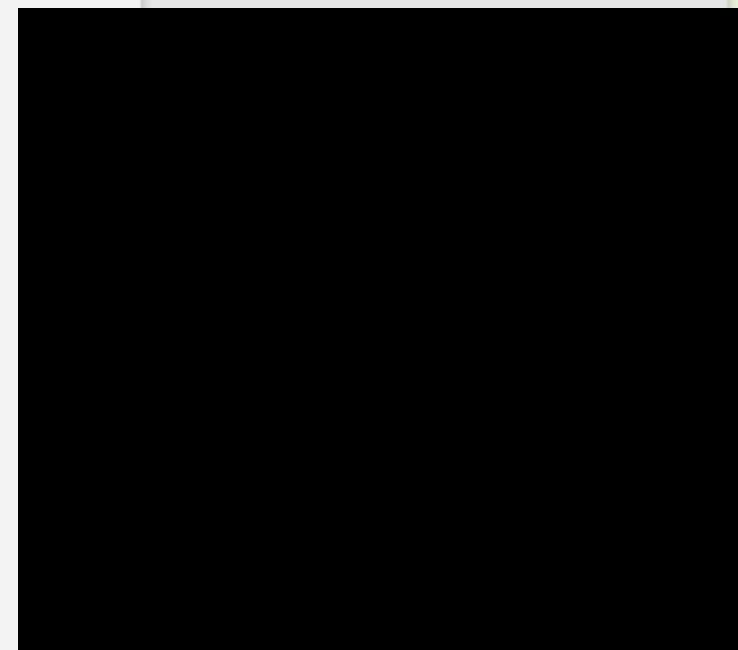
John Davidson New MSc Student



Born in Charlottetown, PEI, **John Davidson** studied business administration at UPEI finishing his degree in 2004. As a certified diver, John participated in and coordinated many projects associated with invasive tunicates while working as a Shellfish Technician with Department of Fisheries and Oceans. Propelled by his interests in invasive species, ecosystem health and aquaculture, he began an MSc project to determine the cost benefit of various treatment regimes for tunicates on cultured mussels. In addition to the data generated, John regularly films the effects of treatment while diving on the experimental plots. His MSc program in Path/Micro is under the co-supervision of **Dr Gerry Johnson** and Dr Pedro Quijon from UPEI Department of Biology with major funding coming from DFO Science.

Emily Ball New MSc Student

Emily Ball has recently joined the department as an MSc student working on a research project investigating factors affecting the viability of spores of the microsporidian *Loma salmonae*. The work is part of the NSERC-CIMTAN multiinstitutional network focused on developing novel integrated multitrophic polyculture approaches to reducing the impact of aquaculture on the environment. Supervised by Dave Speare, her committee members include Fred Kibenge, Mark Fast, Glenda Wright and Jeff Davidson. Emily comes from the 1,000 Islands in New York State along the St. Lawrence River and has an interest in fish, fish health, and disease treatment. From the picture, you can see that Emily has already found her way to the electron microscope!



Atlantic Canadian Association of Parasitologists meeting in Pictou, Nova Scotia



Jessica Willis

Peter Gaudet

Fraser Clark

Spencer Greenwood

Whitney Kelly-Clark

Graduate students present at Atlantic Canadian Association of Parasitologists meeting in Pictou, Nova Scotia on October 23. Jessica Willis (MSc, Biomedical Sciences), Peter Gaudet (MSc, Pathology & Microbiology), Fraser Clark (PhD, Pathology & Microbiology), Dr. Spencer Greenwood (Biomedical Sciences), Whitney Kelly-Clark (MSc, Pathology & Microbiology).

Presentation Titles:

- Fraser Clark and Spencer Greenwood "Genetic Profiling of the immune response of the American lobster during parasite infection"
- Peter Gaudet, Spencer Greenwood & Rick Cawthorn "*In vitro* studies on *Hematodium* sp.: A bitter mystery"
- Whitney Kelly-Clark, Spencer Greenwood, Maria Forzan & Scott McBurney "Trich or Tweet : Emergence of trichomonosis in Maritime wild finch populations"
- Jessica Willis, Spencer Greenwood, Carol McClure, Jeff Davidson, & J McClure " Keeping Shuckers Healthy and Shellfish Harvesters Happy: *Cryptosporidium* and *Giardia* Detection Studies of Atlantic Oysters of Prince Edward Island."

OIE Laboratory Launches Twinning Project with a Chilean University to fight ISA virus



Juan Luis Ansoleaga, Deputy Minister of Sernapesca addressing invited guests at the launch ceremony. Seated in the front row first 3 seats from right to left are Dr Molly Kibenge (OIE Reference Lab @ AVC), Dr Sergio Marshall (Head of the PUCV Laboratory), and Dr Don Reynolds (Dean of AVC).

The OIE Reference Laboratory for ISA @ AVC and the Pontificia Universidad Catolica de Valparaiso (PUCV) in Chile recently launched a two-year twinning project to combat Infectious Salmon Anaemia (ISAV) virus (ISAV). The project, which is titled "Building capacity for improved diagnosis and control of ISA in Chile" is funded by the World Organization for Animal Health (OIE). The PUCV Laboratory of Molecular Genetics, Immunology and Bioinformatics (the Candidate Laboratory) was designated by Sernapesca (National Fisheries Service, Chile) as the National Reference Laboratory for ISA in Chile. This twinning with the OIE Reference Laboratory for ISA @ AVC (Parent Laboratory) will involve training of the technical personnel in the PUCV laboratory so that it can apply for designation as an OIE Reference Laboratory for ISAV. Attending the ceremony held in Chile on October 18, 2010 were Dr. Donald Reynolds, Dean of AVC, and Dr. Molly Kibenge of the UPEI Aquatic Virology Collaborating Centre, home of one of two OIE Reference Laboratories for ISA in the world. Representing Chile were Nelson Vasquez, Acting President of PUCV; Juan Luis Ansoleaga, Deputy Minister of Sernapesca; Rolando Chamy, Director of NBC; and Rosa Vera, Dean of PUCV's Faculty of Science. In the past 3 years, the OIE Reference Laboratory for ISA @ AVC has worked very closely with government officials and the Atlantic salmon industry in Chile to characterize the virus responsible for the 2007-2010 ISA epizootic in Chile. This laboratory demonstrated through sequence analysis that the ISA virus changed to a highly pathogenic form, not unlike what happens when avian influenza viruses infect commercial poultry and become highly pathogenic.

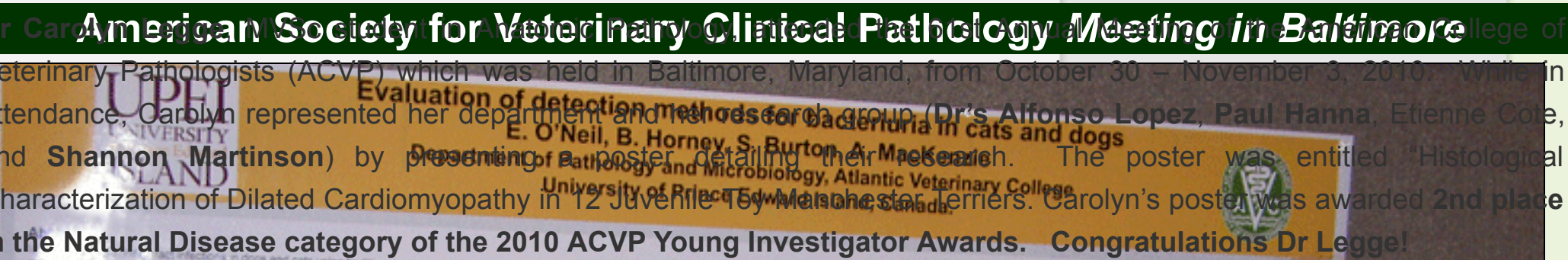
Keynote Speaker at the Association of Bovine Practitioners of La Laguna

Dr Alfonso Lopez was invited by the Veterinary Association of "La Laguna" to be a keynote speaker in the International Congress of Bovine Practitioners. This meeting took place on November 5-6 in Torreon, Coahuila, one of the two largest milk production regions of Mexico. Dr Lopez presented a paper on "Bovine Respiratory Disease Complex" (BRD). He also discussed the current diagnostic trends of bovine respiratory infections in Canadian farms, particularly the growing importance of *Mycoplasma bovis* in pulmonary and middle ear infections.

Photo: Dr Alfonso Lopez with Dr Ramon Delgado.



American College of Veterinary Pathologists Meeting in Baltimore



Introduction

- Identification of bacteria from urine samples in cats and dogs has often been performed using traditional methods.
- The presence of bacteria in urine can indicate urinary tract infections (UTIs) and pyelitis, which are common conditions in both species.
- The standard method for identifying bacteria is based on microscopy findings and clinical suspicion.
- Traditional wet-mount examination has limitations in sensitivity and specificity for detecting bacteruria.
- False positives (other structures misidentified as bacteria) and false negatives (failure to detect bacteria) are considered common.
- Loop culture results of $\geq 1 \times 10^6$ colony forming units per ml of urine collected by cystocentesis have been the accepted standard for identifying significant bacteriuria in cats and dogs.
- The poor success of predicting which urine samples will be culture positive based on traditional methods is a constant source of frustration for veterinarians, in part because of the lack of standardization of methods.
- Examination of Gram-stained, surface Wright-Giemsa stained sediment slides preparations and air-dried sediment smears stained with Gram's and Wright-Giemsa stains, results were compared to quantitative aerobic bacterial culture.

Materials and Methods

- Submission criteria and sample handling are outlined in Figure 1.
- 120 urine specimens were obtained from 81 dogs and 100 urine specimens were obtained from 112 cats.
- Significance was noted at $p < 0.05$ using the McNemar test.

Results

- Examination of Wright-Giemsa and Gram stained urine sediment performed equally well in identifying bacteriuria.
- There was a significant difference in the specificity and positive predictive values of air-dried sediment evaluation with either Gram's or Wright-Giemsa staining for detection of bacteriuria compared to wet-mount examination using loop culture as the reference method (Table 1).
- 9% and 10% of feline and canine urine samples, respectively had positive growth on loop culture.
- 24% of both feline and canine urine samples had positive growth on urine sediment.
- In all samples but one with positive growth on loop culture there was agreement of species of bacteria grown with sediment culture results.

Discussion

- The addition of a useful and rapid positive result to the diagnostic process.
- This may uncover previously undetected cases of UTI.

Figure 1. Submission criteria and sample processing

Sample collected for urinalysis. No change to clinical decision based. Request tests as normal practice. If culture/sensitivity (C/S) is required, request as viral.

Table 1. Sensitivity, specificity, positive predictive values for detection of bacteriuria (combined feline and canine)

| Examination Method | Wet-Mount | Wright-Giemsa |
|-------------------------------|-----------|---------------|
| Sensitivity (%) | 91 | 83 |
| Specificity (%) | 99 | 87 |
| Positive Predictive Value (%) | 90 | 86 |
| Negative Predictive Value (%) | 99 | 98 |

Dr **Elizabeth O'Neil**, currently in her final year of her combined residency/MVSc program in clinical pathology, had the recent opportunity to attend the annual meeting of the American Society for Veterinary Clinical Pathology / American College of Veterinary Pathologists. This exciting conference was held in Baltimore, Maryland, where Dr O'Neil presented a poster of her research work entitled, "Evaluation of detection methods for bacteriuria in dogs and cats." At a special reception, she was also presented with the **CL Davis Foundation Student Scholarship Award** during the meeting, awarded to a trainee demonstrating competence in diagnostic pathology. **Congratulations Dr O'Neil!**

A photograph of two moose standing in a wooded area. The moose on the left is larger and has a prominent hump on its back. The moose on the right is smaller and is looking directly at the camera. They are surrounded by fallen logs and green foliage.

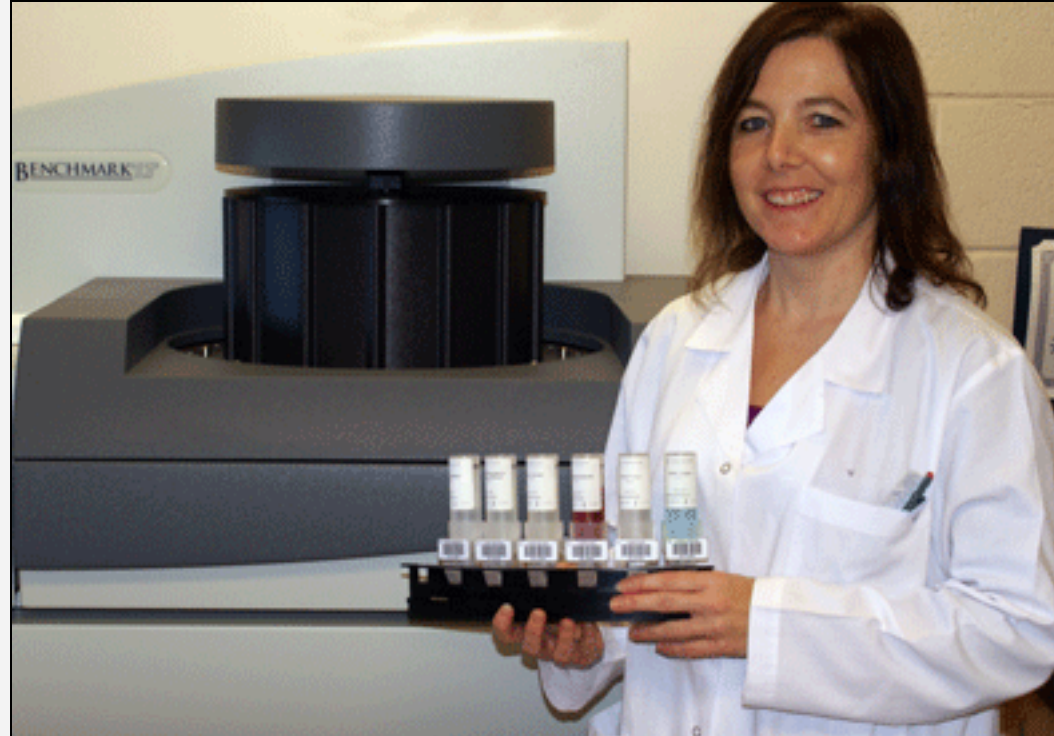
restoration and affecting forest ecosystems. If it were not
seemingly out to get *Alces alces*, there is also a mysterious
of moose in poor body condition, with neurologic signs and
life division to investigate. Suggestions include copper
(Newfoundland came from four individuals remember) or an
e. Thanks to collaboration among biologists, hunters and
egy will surface for Newfoundland moose. **Photo courtesy of**

Dwaine Oakley.

Kathleen Jones attended the 36th Annual National Society for Histotechnology Conference in Seattle, WA

Kathleen Jones attended the 36th Annual National Society for Histotechnology Conference in Seattle, WA

from September 24-29. This conference offered 100 in depth sessions given by industry leaders in histology and immunohistochemistry (IHC). Kathy completed 17 contact hours and received the NSH Certificate of Completion for the IHC Program. Some of the sessions included “Validation and Quality Control for IHC”, “Diagnostic IHC in Veterinary Applications”, and “Where Innovation Meets Research Histology”. At AVC, Kathleen has validated 15 antibodies so far which are now available for diagnostic testing in both mammalian and aquatic species. She is also helping researchers to develop protocols for automated IHC techniques.



UPEI Research Breakfast: Trying to stop lice from partying like its 1999



On Wednesday December 1, 2010, **Dr Mark Fast** gave a presentation for the 25th UPEI Research breakfast on the work his research group is conducting entitled “Trying to stop lice from partying like its 1999”. There was an excellent turn out from AVC and UPEI as well as the local community in the Georgia Room at the Rodd Charlottetown Hotel. Dr Fast discussed the current crisis facing the salmon farming industry in Canada, more specifically the Bay of Fundy, and strategies his team are employing to come up with new environmentally acceptable solutions. Dr Fast gave an update on the previous work he has done in prototype development of a sea lice vaccine, and current projects investigating immunostimulant efficacy against sea lice.

Atlantic Society of Fish and Wildlife Biologists

The Atlantic Society of Fish and Wildlife Biologists (ASFWB) held its 47th Annual General Meeting in Corner Brook-Deer Lake, Newfoundland, this past October (5-7). The ASFWB membership consists of biologists and related professionals working in the Atlantic provinces. The main purposes of the ASFWB are to keep members informed about current problems in fisheries and wildlife biology in the region and provide for an exchange of expertise and information between professionals. The meeting was attended by approximately 40 biologists and technicians, primarily from Newfoundland and Labrador. Thanks to the 2010 Department of Pathology and Microbiology Professional Development Fund, **Whitney Kelly-Clark**, MSc candidate, was able to travel to the meeting and present her research on trichomonosis, an emerging parasitic disease of wild finches in Atlantic Canada. This opportunity was critical to Whitney’s project because it relies on a collaboration with field biologists and technicians to detect wild finch mortality and submit specimens for necropsy to determine if trichomonosis was the cause of death. For many of the meeting’s attendees, Whitney’s presentation was their first introduction to this regional wildlife health problem, and **her presentation won best student presentation. Congratulations Whitney!**



Invited Speaker at Seminario EWOS/Novartis 2.0 Industria

Dr Jen Covello was an invited speaker at UNA VISIÓN INTEGRAL PARA LA ALMONICULTURA 2.0, sponsored by EWOS Innovation, Novartis Animal Health, and InnovaChile CORFO. The seminar took place on October 18, 2010 in Puerto Varas, Chile. Jen gave a talk entitled “Attachment of sea lice: host-parasite effects”, outlining the current focus of sea lice (*Lepeophtheirus salmonis*) research in **Dr Mark Fast**’s lab and its possible application to the sea lice (*Caligus rogercresseyi*) situation in Chilean salmon farming. Jen also participated in meetings with EWOS Innovation and Novartis Animal Health throughout the week. A collaborative research agreement with EWOS Innovation has since resulted.



Launching the Network of the National Laboratories of the Veterinary Services of the Americas



Dr Molly Kibenge attended the meeting for Launching the Network of the National Laboratories of the Veterinary Services of the Americas which was held in Panama, Republic of Panama, 3 - 5 November 2010. The meeting was organized by the OIE Sub Regional Representation for Central America based in Panama. Full members of the network are the National

Master of Science Examination

Laboratories of Veterinary Services in the Americas, Central America and Caribbean regions. The Reference Laboratories and Collaborating Centres of the OIE are Observer members. Forty two people took part in this inaugural meeting that generated regulations and recommendations governing the Network. The next meeting will be held in Honduras in 2011.

On December 14, 2010, **Dr Afaf Arara** successfully defended her MSc thesis entitled “The Reid Index in Cats.” Afaf was born in Tripoli, the capital city of Libya. After graduation she worked at the Al-Fateh University. In 2005, Dr Arara received a scholarship to study in Canada and in 2006 she came to UPEI to pursue a MSc degree in Anatomic Pathology under the supervision of **Dr Alfonso Lopez**.



Congratulations Dr Arara!

Funding News

Dr Byeonghwa Jeon was recently awarded \$59,050 grant from the Canadian Poultry Research Council. The title of his project is “Development of Live-Attenuated Vaccines to Prevent *Campylobacter* Colonization in Poultry”. *Campylobacter* is a leading foodborne pathogen causing 400-500 million cases of human infection worldwide per year. Utilizing *Campylobacter*’s unique metabolism, he will construct live-attenuated vaccine strains to reduce*Campylobacter* contamination of poultry. The project starts in December 2010.

Research Integrity Update

Recently, the Council of Canadian Academies (CCA) released their report on research integrity, which was prepared on behalf of the Minister of Industry. This 132-page document included an analysis of data from Tri-Council (NSERC, CIHR, & SSHRC)-funded research; it identified gaps in Canada's policy framework and suggested ways of addressing them. This report is a must read for all those engaged in research in Canada.

[For the abridged version of the report please click here](#) [For the full version of the report please click here.](#)

Recent Publications

Wilkins W, Waldner C, Rajic A, McFall M, Muckle A, Mainar-Jaime RC. Comparison of bacterial culture and real-time PCR for the detection of Salmonella in grow-finish pigs in western Canada using a Bayesian approach. Zoonoses Public Health 2010; 57:115-120.

Siah A, McKenna P, Danger JM, Johnson G, Berthe FCJ. Induction of transposase and polyprotein RNA levels in disseminated neoplastic hemocytes of soft-shell clams: *Mya arenaria*. Developmental and Comparative Immunology 2011;35:151–154

Kulshreshtha V, Kibenge M, Salonijs K, Simard N, Riverol, A, Kibenge F. Identification of the 3' and 5' terminal sequences of the 8 RNA genome segments of European and North American genotypes of infectious salmon anemia virus (an Orthomyxovirus) and evidence for quasispecies based on the non-coding sequences of transcripts.Virology Journal 2010, 7:338.

Workenhe ST, Rise ML, Kibenge MJT, Kibenge, FSB. The fight between the teleost fish immune response and aquatic viruses. Molecular Immunology 2010;47:2525-2536.

Cornejo I, Sepulveda FV, Kibenge, FSB, Young JI. Isolation of the Atlantic salmon β-actin promoter and its use to drive expression in salmon cells in culture and in transgenic zebrafish. Aquaculture 2010; 309:75-81.

Departmental Seminars for January and February 2011

| | | |
|------------|---|---|
| January 11 | Analysis of the Diversity and Natural Products Potential of Microbes Associated the Gorgonian, <i>Eunicea fusca</i> | Rebecca Pike Biomedical Sciences |
| January 18 | Mechanisms of cadmium- and calcium-mediated mitochondrial dysfunction in rainbow trout | Reginald Adiele Biomedical Sciences |
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|-------------|---|---|
| January 25 | Not on porpoise: Estimating by catch as a result of entanglement in fishing equipment as a cause of mortality of harbor porpoises (<i>Phocoena phoceona</i>) in Canada Optimizing recovery and detection of <i>Cryptosporidium</i> sp. and <i>Giardia duodenalis</i> from contaminated Atlantic Oysters (<i>Crassostrea virginica</i>) | Heather Fenton Pathology and Microbiology Jessica Willis Biomedical Sciences |
| February 1 | Investigating Actinobacterial diversity from sediments as a source of bioactive secondary metabolites. | Katherine Duncan Biomedical Sciences |
| February 8 | Analysis of gene expression between and within Larval American lobster stages. <i>In vitro</i> cultivation of <i>Hematodinium</i> sp.: Optimization of culture conditions and characterization of developmental stages | Dan Hines Pathology and Microbiology Peter Gaudet Biomedical Sciences |
| February 15 | Catch-as-Catch-Can: Considerations Regarding Wildlife Capture and Handling Profiling gene expression in female <i>Homarus americanus</i> via oligonucleotide microarray analysis | Whitney Kelly-Clark Pathology and Microbiology Mitchell Moore Pathology and Microbiology |
| February 22 | Nutritional Status and Quality Assessment of the American Lobster, <i>Homarus americanus</i> Validation of co-oximetry for the measurement of methemoglobin in fish | Mike Ciaramella Pathology and Microbiology Janet Saunders Biomedical Sciences |

Message from the Editor

2010 is fading away and the **PathMicro Newsletter** continues to be a popular publication thanks to your contributions. This year we changed it from a monthly to a bimonthly publication and it is working well. I would like to encourage all PathMicro faculty, researchers and graduate students to submit in 2011 all newsworthy information, preferably with a good digital picture .

Finally, I would like to acknowledge the superb editorial work made by our two silent editors: **Dr Maria Forzan** and **Dr Shelley Burton**. **Our sincere thanks to both of you!**

Please don't print this newsletter unless you really need to!

For comments or suggestions for our newsletter, please contact
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