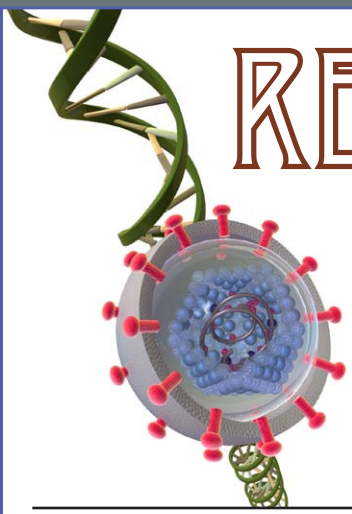

RETRO-ACTIVE NEWS

Newsletter of the Center for Retrovirus Research
at The Ohio State University College of Veterinary Medicine

2011 Highlights

The Center for Retrovirus Research 2011 Distinguished Research Career Award

Dr. Michael Emerman, PhD. Member, Division of Human Biology, Fred Hutchinson Cancer Research Center and Affiliate Professor in the Departments of Microbiology and Global Health at the University of Washington was the 12th recipient of the annual award for his seminal contributions to the understanding of the molecular and cellular biology of HIV.

Dr. Emerman received the engraved crystal award sculpture from Center for Retrovirus Research Director Dr. Patrick Green and presented the special lecture "Evolution of Immunodeficiency Virus-Host Interactions".

Dr. Emerman grew up in Columbus, Ohio and received his B.S. in Biochemistry at The Ohio State University. Dr. Emerman obtained his Ph.D. in Cellular and Molecular Biology at the University of Wisconsin-Madison in 1986 under the guidance of Dr. Howard Temin, a 1975 Nobel Laureate in Physiology or Medicine, where he used retroviruses to study how gene control elements could interfere with one another. During his graduate student years, HIV, the virus responsible for causing AIDS, was discovered, and Dr. Emerman continued postdoctoral training at the Pasteur Institute in Paris to work with its co-discoverer, Luc Montagnier (2008 Nobel Laureate in Physiology or Medicine). During that time, Dr. Emerman characterized HIV-2 and discovered the function of one of the key regulatory genes of HIV-1.

Dr. Emerman is an internationally renowned investigator making significant scientific contributions to the understanding of the molecular and cellular biology of HIV. Early investigations by his group showed that HIV is different from other viruses in its family by being able to infect non-dividing cells. This property has been exploited by others to develop HIV-like gene transfer vectors. Dr. Emerman also discovered that an HIV protein, Vpr, causes cell cycle arrest. Recently, Dr. Emerman has focused on the evolutionary battle between viruses and their hosts using HIV as a model for determining why innate immune defenses do not function well against HIV. Along with collaborators, Dr. Emerman has characterized the evolution and function of host antiviral genes and the antagonists against these defenses that are encoded by viruses. He invented a name for these studies, "Paleovirology," to capture the concept that ancient viruses have shaped the human repertoire of antiviral defenses in ways that impact our resistance or susceptibility to modern-day emerging viruses.

Dr. Emerman's visit was sponsored by the Center for Retrovirus Research, Departments of Veterinary Biosciences and Molecular Virology, Immunology and Medical Genetics, Public Health Preparedness for Infectious Diseases Program, and the Comprehensive Cancer Center Viral Oncology Program.

See a summary of previous award winners:
vet.osu.edu/retrovirus-research/award

Dr. Emerman presented a second lecture entitled "Function and evolution of the APOBEC3 family of primate antiviral genes" at the Center for Retrovirus Research weekly scientific meeting.

Kathleen Boris-Lawrie is Named Executive Director of The Ohio State University Life Sciences Graduate Network

Dr. Kathleen Boris-Lawrie, PhD, Center for Retrovirus Research Co-director and David White Professor in the Department of Veterinary Biosciences was appointed as Executive Director of the Life Sciences Graduate Network. Dr. Boris-Lawrie has been a faculty member at The Ohio State University since 1996 and has served the past two years as chair of the College Council for Graduate Studies in Comparative and Veterinary Medicine. This college-wide graduate program is designed to exploit the synergy that can be achieved when related educational opportunities are combined. Her new role as director of the Life Sciences Graduate Network provides the unique opportunity to pursue that same concept at the university level.

The Life Sciences Graduate Network (LSN) is the result of a continuing effort to revitalize graduate education and research in the life sciences at Ohio State. The plan stems from the doctoral program review conducted in 2008 and the findings of the task force on the life sciences completed in 2009. The plan is based upon the premise that excellence in graduate education and research is ultimately determined by the productivity of our graduate students as defined by lead-authorship in top-tier publications. To reach this goal requires an adaptable and flexible mechanism to foster team-building and interdisciplinary research for basic and translational outcomes – one that transcends college boundaries. The LSN is designed to link discipline-based and interdisciplinary graduate programs and the Office of Research in common purpose.

New NIH Training Grant awarded in Cellular, Molecular, and Biochemical Sciences

Dr. Karin Musier-Forsyth, Ohio Eminent Scholar, Professor of Chemistry and Biochemistry, and Center for Retrovirus Research member with Co-PI Michael Ibba, Professor of Microbiology, successfully competed for a National Institutes of Health T32 training grant that will establish the new Cellular, Molecular, and Biochemical Sciences Program (CMBP) at the Ohio State University (2011-2016). This specialized training program is designed to attract top-tier graduate students; prepare them for life-sciences research careers in academia, government or industry; and advance research pursuits in areas related to human health, physiology and disease. Additional Center member trainers include Drs. Kathleen Boris-Lawrie, Mamuka Kvaratskhelia, and Patrick Green.

Patrick Green named Associate Dean for Research and Graduate Studies

Dr. Patrick Green, Center for Retrovirus Research Director and Professor in the Department of Veterinary Biosciences, accepted the position of Associate Dean for Research and Graduate Studies in the College of Veterinary Medicine. He leads the College of Veterinary Medicine's Office of Research and Graduate Studies, which oversees grant support for all faculty and graduate students in the college, coordinates the combined Veterinary and Comparative Medicine Graduate Program, hosts the Summer Research Program, works with a team to advance commercialization opportunities for faculty discoveries with the ultimate goal of creating new revenue streams for the college, and gives direction for the research agenda for the college.

Drs. Boris-Lawrie and Lairmore Elected Fellows of the American Academy of Microbiology

Center members Drs. Kathleen Boris-Lawrie and Michael Lairmore, both Professors in the Department of Veterinary Biosciences, were elected as Fellows of the American Academy of Microbiology, and were recognized at the 111th American Society of Microbiology Meeting in New Orleans on Tuesday, May 24th, 2011.

Dr. Boris-Lawrie was recognized for her distinguished contributions to the field of molecular virology, particularly for defining post-transcriptional control of proteins and RNA elements that modulate retrovirus replication and cell growth. Dr. Lairmore utilized his unique expertise in virology and pathology and contributed pioneering studies in animal models of human retroviruses, defined novel virus-host relationships, and created paradigm-shifting approaches to mechanisms of viral diseases.

The American Academy of Microbiology (academy.asm.org) is the honorific leadership group within the American Society for Microbiology (ASM), the world's oldest and largest life science organization. The mission of the Academy is to recognize scientists for outstanding contributions to microbiology and provide microbiological expertise in the service of science and the public. The Academy serves as a resource to governmental agencies, industry, ASM, and the larger scientific and lay communities by convening colloquia to address critical issues in microbiology.

Congratulations!

Dr. Michael Lairmore departed Ohio State in October, 2011 to become the Dean of UC Davis' School of Veterinary Medicine. Congratulations Mike and we wish you the best in this new endeavor.

Selected Publications

Anand AR, Tirumuru N, **Ganju RK**. A novel role for Slit2/Robo1 axis in modulating HIV-1 replication in T-cells. AIDS. 2011;31(16):3457-71.

Anupam R, Datta A, Kesic M, Green-Church K, Shkriabai N, **Kvaratskhelia M**, **Lairmore MD**. Human T-lymphotropic virus type 1 p30 interacts with REGgamma and modulates ATM (ataxia telangiectasia mutated) to promote cell survival. J Biol Chem. 2011 Mar 4;286(9):7661-8.

Coleman CM, Spearman P, **Wu L**. Tetherin does not significantly restrict dendritic cell-mediated HIV-1 transmission and its expression is upregulated by newly synthesized HIV-1 Nef. Retrovirology. 2011; 8:26.

de Silva S, **Wu L**. TRIM5 acts as more than a retroviral restriction factor.Viruses. 2011 Jul;3(7):1204-9.

Ditzler MA, Bose D, Shkriabai N, Marchand B, Sarafianos SG, **Kvaratskhelia M**, Burke DH. Broad-spectrum aptamer inhibitors of HIV reverse transcriptase closely mimic natural substrates. Nucleic Acids Res. 2011 Oct;39(18):8237-47.

Hayes AM, Qian S, Yu L, **Boris-Lawrie K**. Tat RNA silencing suppressor activity contributes to perturbation of lymphocyte miRNA by HIV-1. Retrovirology. 2011 May 13;8:36.

Kessl JJ, Li M, Ignatov M, Shkriabai N, Eidahl JO, Feng L, **Musier-Forsyth K**, Craigie R, **Kvaratskhelia M**. FRET analysis reveals distinct conformations of IN tetramers in the presence of viral DNA or LEDGF/p75. Nucleic Acids Res. 2011 Nov 1;39(20):9009-22.

Kumar SB, Handelman SK, Voronkin I, Mwapasa V, Janies D, Rogerson SJ, Meshnick, SR, **Kwiek JJ**. Different Regions of HIV-1 Subtype C env are Associated with Placental Localization and In Utero Mother-to-Child Transmission. J Virol. 2011 Jul;85(14):7142-52.

Lairmore MD, Anupam R, Bowden N, Haines R, Haynes II, RHA, Ratner L, **Green PL**. Molecular determinants of human T-lymphotropic virus type 1 transmission and spread. Viruses, 2011 3, 1131-1165; doi:10.3390/v3071131

Li M, Kannian P, Yin H, Kesic M, **Green PL**. Human T lymphotropic virus type 1 (HTLV-1) regulatory and accessory gene transcript expression and export are not Rex-dependent. AIDS Res Hum Retroviruses 2011, Aug 5. [Epub ahead of print]

Qin Y, Li Y, Liu W, Tian R, Guo Q, Li S, Li H, Zhang D, Zheng Y, **Wu L**, Lan K, Wang J. Penicillium marneffei-stimulated dendritic cells enhance HIV-1 trans-infection and promote viral infection by activating primary CD4+ T cells. PLoS One. 2011; 6(11): e27609.

Ranji A, Shkriabai N, **Kvaratskhelia M**, **Musier-Forsyth K**, **Boris-Lawrie K**. Features of double-stranded RNA-binding domains of RNA helicase A are necessary for selective recognition and translation of complex mRNAs. J Biol Chem. 2011 Feb 18;286(7):5328-37.

Russell ES, **Kwiek JJ**, Keys J, Barton K, Montefiori D, Mwapasa V, Meshnick S, Swanstrom R. The Genetic Bottleneck in Vertical Transmission of Subtype C HIV-1 Is Not Driven by Selection of Especially Neutralization Resistant Virus from the Maternal Viral Population. J Virol. 2011 Aug;85(16):8253-62.

Satou Y, Yasunaga J-I, Yoshida M, Miyazato P, Zhao T, Takai K, Shimizu K, Oshima K, **Green PL**, Yamaguchi T, Ono M, Sakaguchi S, Matsuoka M: HTLV-1 bZIP Factor Induces T-Cell Lymphoma and Systemic Inflammation In Vivo. PLoS Pathogens 2011 Feb 10;7(2):e1001274.

Tirumuru N, Anand AR, Zhao H, **Ganju RK**. SLP-76 regulates HIV-1 infection in T-cells through a Nef-dependent mechanism. J Immunol. 2011 In Press.

Yoder KE, Roddick W, Hoellerbauer P, Fishel R. XPB mediated retroviral cDNA degradation coincides with entry to the nucleus. Virology. 2011; 410:291-298.

Yoder KE, Espeseth A, Wang X, Fang Q, Russo MT, Lloyd RS, Hazuda D, Sobol RW, Fishel R. The host base excision repair pathway is required for efficient lentivirus integration. PLoS ONE. 2011 In Press.

Zhao T, Satou Y, Sugata K, **Green PL**, Imamura T, Matsuoka M: Human T-cell leukemia virus type 1 bZIP factor enhances TGF-βsignaling through p300 coactivator. Blood 2011 Aug 18;118(7):1865-76.

Selected Awards

Jacques Kessl, NIH R21AI09044, "Inhibitors targeting HIV integrase multimers" (2011-2013)

Ramesh Ganju NIH R21AI091420 "Novel approaches to attenuate lipopolysaccharide-induced inflammation" (2011-2013)

Patrick Green and Robert Baiocchi, Pelotonia Idea Grant "Role of PRMT5 enzyme over expression in HTLV-1-driven cellular transformation and leukemia" (2011-2013)

Karin Musier-Forsyth, NIH R01 "HIV nucleocapsid protein nucleic acid chaperone activity" (2011-2015)

Sarah Fritz (Boris-Lawrie mentor) was awarded a College of Medicine Systems and Integrated Biology Training Program Fellowship.

Jonathan Picking (Boris-Lawrie mentor) was awarded an OSU Howard Hughes Medical Institute Med Into Grad and an OSU Center for RNA Biology Fellowship.

Amit Sharma Travel Award, American Society of Virology 30th Annual Meeting, University of Minnesota, Minneapolis.

Rami Doueiri (Green mentor) was awarded First Place for his College of Veterinary Medicine Research Week poster presentation.

Doctoral Graduates

Arnaz Ranji, MS PhD. "Mechanistic insights into translational modulation of selected RNAs by RNA helicase A". Molecular Genetics Graduate Program

Nadine Bowden, DVM, PhD. "Structure and Function Studies of Human T-Lymphotrophic Virus Type 1 p30". Veterinary Biosciences Graduate Program

Han Yin, MS PhD. "Molecular analysis of HTLV-2 APH-2 in viral transformation, persistence and host immune response". Molecular Cellular and Developmental Biology Graduate Program