Advances in Veterinary Medicine Research Day 2011

Michael D. Lairmore DVM, PhD
Associate Dean
Office For Research and Graduate Studies

Research Week Speakers

MONDAY, APRIL 11TH
“Biomedical Imaging: Insight, Imagination and Innovation”
Dr. Michael Knopp, Professor of Radiology and Novartis Chair of Imaging Research

TUESDAY, APRIL 12TH
“Gut Reactions to Enteric Viruses and Vaccines”
Dr. Linda Saif, Distinguished University Professor, Departments of Veterinary Preventive Medicine and Food animal Health Research Program

WEDNESDAY, APRIL 13TH
“Scientific Discovery in Infectious Diseases at the Intersect of Animal and Human Health; Effective Partnerships that Breed Success”
Dr. Larry Schlesinger, Samuel Saslaw Professor of Medicine, Director, Division of Infectious Diseases and Center for Microbial Interface Biology
College of Veterinary Medicine

Industrial and Commercialization Advisory Panel

John E. Sagartz, DVM, PhD
President
Seventh Wave Laboratories LLC

Sharell Mikesell, PhD
Associate Vice President, Industry Liaison
Office of Research
The Ohio State University

Jean Schelhorn, PhD
Commercialization Director
The Ohio State University
College of Veterinary Medicine

Andrew Dahlem, PhD
Vice President, Chief Operating Officer,
Lilly Research Laboratories
Eli Lilly and Company

Michael Rohovsky, DVM, PhD
Vice President, Pittman-Moore
Johnson & Johnson
(Retired)

Susan Giovengo, DVM, PhD
Manager Professional Relations
Procter and Gamble Pet Care
Professional

William D. Kerns, DVM, MS
Chief Executive Officer
Accellient Partners LLC

College Research Mission

Promote translational research programs that improve the lives of animals and people for a healthier world
Public Health Preparedness for Infectious Diseases (PHPID)

• 100+ faculty - 6 colleges including Veterinary Medicine, Medicine, Public Health, Agriculture and Food Science, Biological Sciences, and Pharmacy

• Hires of 4 college faculty
• Graduate Education Fellowships
• Pilot Research Grants

Dr. Armando Hoet
VPM

Dr. Rebecca Garabed
VPM

Dr. Xin Li
VBS

Dr. Li Wu
VBS

Dr. Christopher Adin
Awarded Career Development Award

• Center for Clinical and Translational Science (CCTS) for a KL2 Scholar Career Development award

• Provides salary support and protected time for highly-qualified junior faculty
Drs. Gourapura and Lee (VPM-OARDC) Awarded First CCTS-CVM Pilot Grant

- Evaluation of influenza vaccine to generate broadly cross-protective candidate vaccine in a pig model
- CCTS Pilot Studies program creating translational integrated research teams
- Partnering to encourage new multidisciplinary research groups to address integrated solutions to complex problems

Ohio Third Frontier Application 2011 with Dr. Michael Knopp, Wrights Center for Innovation

- Beneficial clinically in repairing or weak bone

Gene Ther. 2010
Dr. da Costa Funded to Study Cervical Spondylomyelopathy in Great Danes

- Dr. Ronaldo da Costa, Neurology and Neurosurgery, Department of Veterinary Clinical Sciences funded by the Great Dane Club of America to study “Wobbler” syndrome, also known as cervical spondylomyelopathy (CSM).

- Most common spinal disease of giant and large breed dogs (http://vet.osu.edu/kinematic-gait-1).

Drs. Buffington and Lord Funded to Improve Welfare Education

- Kenneth A. Scott Trust funds to provide improved education in the welfare and society treatment of companion animals

- Didactic and web-based instruction teach students low stress handling of animals, behavioral wellness and problem prevention, and problem behavior intervention.

- Best practices shared with the Capital Area Humane Society and other institutions
Advanced cancer treatment in the Veterinary Medical Center diagnostic imaging, advanced surgical techniques, to innovative clinical trials using novel therapeutic approaches.

Companion animals develop many of the same diseases seen in people:
- diabetes, heart disease
- immune mediated disease
- arthritis
- cancer

Canine genome completed
Comparative Studies and Models

Spontaneous Diseases in Companion Animals
Clinical Trials Office

- Provides investigators assistance in the design, execution, and evaluation of clinical trials in client owned animals to facilitate patient-derived data to inform human clinical trials
- Promote Good Clinical Practice/ Good Laboratory Practice (GCP/GLP) guidelines
- Facilitates clinical trial design, networking with regional veterinarians to insure timely enrollment, assistance in collection and coordination of data, and establishment of standard operating procedures

Team Awarded Grant from the U.S. Department of Defense

• Drs. Carlos Alvarez (Nationwide Childrens Hospital), Guillermo Couto (Veterinary Clinical Sciences) and Kun Huang (Department of Biomedical Informatics) will study “Integrative Life Course and Genetic Analysis of Military Working Dogs”.
• Team seeks to elucidate the molecular mechanisms that underlie complex environmental and genetic interactions and their contribution to cancer risk.
• Environmental and genetic interactions that contribute to cancer in military working dogs
CVM Pelotonia Team Raises Funds for Cancer Research

• $11.5 million raised in first 2 years from grassroots cycling tour to benefit cancer research

• Drs. James DeWille and Gustavo Leone were one of the first ten IDEA Pelotonia Grant awardees. -- receive a two-year, $100,000 Pelotonia Idea Grant to fund their “high-risk, high-reward” cancer research project.

• Amit Sharma, a PhD graduate student in the laboratory of Dr. Kathleen Boris-Lawrie, awarded a Pelotonia Graduate Fellowship

Dr. Rikihisa Semi-finalist TechColumbus Inventor of the Year

• *TechColumbus* Innovations Awards February 2011

• Pioneering studies in Ehrlichia, Anaplasma and Neorickettsia

• 9 US issued patents, one pending US patent application, four issued foreign patents and two pending foreign patent applications.

• Awarded over $16.4M in funds from the National Institutes of Health (NIH) to support her world-renowned research program.
Dr. Ian Davis Awarded New NIH R01 Grant to Study Influenza

• Understanding of mechanisms by which viruses impair healthy lung function

• Objectives increase understanding of the role of adenosine in the pathogenesis of influenza-associated lung injury, and determine its potential as a therapeutic target.

• Results from his work have already resulted in U.S. Patent

Dr. Boris-Lawrie's Research Cover of Nucleic Acid Research!

• RNA helicase promotes two aspects of RNA virus replication

Bolinger et al. (Nucleic Acids Res., 2010)
Center for Retrovirus Research
Signature Program Model

Drs. Patrick Green and Kathleen Boris-Lawrie – Co-Directors

- 10 of 20 PIs in College, CVM’s first NIH Program Project Grant–2003-13, $20M total costs
- Publications in top ranked journals e.g., Nature, Blood
- Tie to Viral Oncogenesis Program of OSUCCC
- Pilot project research grants link to NIH grants
- Partner in equipment purchases and repairs
- Annual Distinguished Research Career Award
- Seminar Series
- Postdoctoral Fellowship

International Partnerships and Educational Opportunities

- Africa
- Thailand
- France
- Spain
New International Training Program

- Dr. Wondwossen Gebreyes, Dr. John Gunn, and Dr. Samuel M. Kariuki (Kenyan Medical Research Institute)
- Awarded a five-year $735,600 award for their NIH-Fogarty Global Infectious Diseases Research and Training Program entitled “Molecular Epidemiology and Key Issues of Foodborne Pathogens in Eastern Africa”.

New Sponsored Training Programs in VPM

Drs. Fernando Silveira, Luke Heider, Wondwossen Gebreyes, and Bayleyegn Molla awarded a new training grant - USDA Cochran Fellowship Award

To raise the professional veterinary skills and knowledge of veterinary fellows from Armenia and Georgia and improve animal health systems

Dr. Gustavo Schuenemann, awarded a subcontract to provide specialized training in sustainable dairy practices for both conventional and organic systems
Drs. Croney and Lord Awarded USDA Education Bioethics Challenge Grant

Drs. Candace Croney and Linda Lord, (VPM) awarded a USDA Higher Education Challenge grant in the amount of $433,697.00 entitled “Development of an integrated curriculum for animal bioethics: teaching farm animal welfare, agricultural, environmental ethics, and rural societal issues”.

Two teams of students competed at Michigan State Animal Welfare Contest: a graduate student group, which included Judi Stella, Puja Buch, and Megan Pozza; and a veterinary student group that included Amanda Wagner, Maranda Sauerland, Brandi Lengacher, and Elizabeth Homerosky.

NSF Grant to Model Disease

- “Modeling Risks for Animals and Humans”

Dr. Rebecca Garabed, (VPM) and Drs. Mark Moritz (Anthropology), Song Liang (Public Health), Ningchuan Xiao (Geography) awarded a $1.4M grant from the National Science Foundation entitled “Livestock Movements and Disease Epidemiology in the Chad Basin: Modeling Risks for Animals and Humans”.

Office of Research and Graduate Studies in partnership with CVM Global Health Program (Dr. Gebreyes, VPM) global summer research opportunities for veterinary students.
Comparative and Veterinary Medicine Graduate Program

• Approved by Board of Trustees, and Ohio Regents’ May 2010

• Uniquely positioned to prepare professional and graduate students for careers in biomedical, epidemiology and applied veterinary research

• Train veterinary and non-veterinary scientists to gain in depth knowledge of all aspects of veterinary and comparative medicine to become leaders in government, industry, academia, etc.

Animal Models of Human Disease
NIH T-32 Training Grant

• Animal Models of Human Disease: Mouse or Rodent Models
• 6 post DVM trainee slots
• Postdoctoral (working on PhD typically)
• Based on high quality, established recruitment program, leverage of OSU resources, and trainee’s success
• T-32 Animal Models of Human Disease
• ~16 DVM-PhDs trained since 2002
CVM Graduate Student Association

• Graduate student leaders from The College of Veterinary Medicine’s Comparative and Veterinary Medical Graduate Program have organized Graduate Student Association (GSA)
  • Officially approved - provide representation to departmental committees and Council of Graduate Students
  • Plan, organize and develop academic and social programs, promote relations and interactions, and provide forums for policy and curriculum issues

CVM Graduate Students and NIH Fellowships: A Continued Success Story

• Dr. Tracy Carlson, an anatomic pathology resident and PhD candidate in the Department of Veterinary Biosciences awarded a 5 year K01 Special Emphasis Research Career Award (SERCA) to study pulmonary innate immunity

• Dr. Carlson was also a recipient of the OSU Presidential Fellowship, which recognizes outstanding scholarly accomplishments of graduate students entering the final phase of their dissertation research
- 2010, OSU Veterinary Public Health program - certification by the American College of Veterinary Preventive Medicine (ACVPM)

- The specialization is the first of its kind to receive this certification and is the second MPH degree with a veterinary public health focus to receive this recognition.

---

Critical Needs in Veterinary Sciences

- The National Academies report “estimates that 658 additional [post DVM] graduates need to matriculate each year in all disciplines to meet the needs of public practice.” (Critical Needs for Research in Veterinary Science, National Academies Press).

- “Colleges of veterinary medicine must lead an effort to recruit veterinary students into careers in public health, food systems, biomedical research, diagnostic laboratory investigation, pathology, epidemiology, ecosystem health, and food-animal practice” (Animal Health at the Crossroads: Preventing, Detecting, and Diagnosing Animal Diseases)
Summer Research Program for Veterinary Students

- NIH T-35 grant, Merial, Morris Animal Foundation, alumni donors, College, Departments, mentors, etc.
- Orientation/Research Training
- Field Trips e.g. BRT and U. Cinn Zoo
- Brown Bag Seminars
- Summer Scholars Meeting – NIH Campus (07), Michigan State University (08), North Carolina State University (09), U. Georgia (10)

OSU Veterinary Student Summer Research Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Student Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>5</td>
</tr>
<tr>
<td>2005</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>20</td>
</tr>
<tr>
<td>2007</td>
<td>25</td>
</tr>
<tr>
<td>2008</td>
<td>30</td>
</tr>
<tr>
<td>2009</td>
<td>35</td>
</tr>
<tr>
<td>2010</td>
<td>40</td>
</tr>
</tbody>
</table>
Summer Program Students Present at 2010 NATIONAL Merial- NIH Veterinary Scholar Symposium

• Merial Veterinary Scholars Program culminated in a national symposium where veterinary students from the U.S. and Canada presented their research findings and share experiences

• Presentations and networking opportunities with invited veterinary scientists, researchers and faculty members

NIH T-35 Short-term Research Training Grant

• To provide short term training experiences for professional veterinary students
• Acquire specific technical and conceptual skills to perform hypothesis-based research
• Encourage creative approaches to solving scientific problems, and fundamental issues important to public health.
10th Annual Merial NIH National Veterinary Scholars Symposium

- 11 Ohio State students from the college’s Summer Research Program and one CVM graduate student to the symposium
- Out of the almost 300 posters presented, two of our veterinary students were recipients of Best Poster Awards

Summer Research Program Alumni Excel in 2010-2011

Maureen O’Brien (VME Class of 2013) accepted into the prestigious Cornell University Leadership Program - Summer Research Program participant in 2010

Dr. Amanda Todd (OSU DVM 2010 and Summer Research Program Alumni) published a retrospective study with Dr. Karsten Schober (VCS) examining idiopathic hypertrophic cardiomyopathy in cats

Marlena McCarty, CVM Class of 2012, - Summer Research Program participant in 2009, - paper accepted as an oral presentation American Association of Swine Veterinarians (AASV) in March 2011.
"Building for the Future" NIH Grant to renovate Goss Lab

- $3.9 million construction grant from the National Centers for Research Resources awarded to the College.

- The renovated research facilities will permit the consolidation and complete integration of the research laboratories and address infrastructure deficits in Goss Laboratory.

Comparative Pathology and Mouse Phenotyping
Dr. Krista La Perle Director

Partnerships
Supported by the Department of Veterinary Biosciences, University Laboratory Animal Resources, and by the OSU Comprehensive Cancer Center

VMAB and Biomedical Research Tower

Services
- Comprehensive gross and histologic examination of genetically engineered mice
- Immunohistochemistry and special morphologic techniques.
- Referral service within College and the OSU research community
Biospecimen Repository

- Genetics and molecular biology of canine diseases as comparative models of human disorders
- Canine Comparative Oncology Genomics Consortium (CCOGC) as one of the first veterinary institutions in Pfizer-CCOGC Biospecimen Repository
- Tissues are collected and archived → serves as resource for developing new prevention and treatment strategies

Shared Resources Support Research and Discovery

- Applied Pathology, Biochemical & Molecular Core, Cytometry and Small Animal Imaging, Clinical Laboratories Core, Histology Core, Comparative Pathology and Mouse Phenotyping Shared Resource, Clinical Trials Office and Tissue Bank
- Key Staff Support that Evolves with Needs
  - e.g., Environmental Health and Safety Staff Member, Grant Support Office Services, etc.
Dr. Jean Schelhorn New Director of Commercialization

Accelerate licensing and commercialization efforts

• Commercialization strategies, and encourage a culture of entrepreneurship within the College

• In FY10 Ohio State University revenues from licensing were $1.907M; this is the third best revenue year in Ohio State’s history

• Top 4 revenue producing colleges in rank order were: Veterinary Medicine; Engineering; Pharmacy; and Food, Agricultural and Environmental Science

Sponsors – THANK YOU!

[Logos and names of sponsors]
Thank you

- Dr. Xin Li – Program Chair 2011
- 18 Faculty Judges
- 10 post docs and graduate students as poster judges
- Industrial/Commercial Panel Judges
- Mark Hardman – AV and Posters
- Melissa Weber – Marketing and Communications
- Michele Morscher – Organization, Planning,

Sandra Dawkins
Katie Kostyo
Danielle Ford
Karen Longbrake
Janelle Henderson
Curt Ashley
Michelle Harcha
Ken Matthias
Jerry Harvey
Jennifer Brandt
Elizabeth Hope
Ann Sanders
Nicole Cox
Lauren Ruddy
Kate Hayes-Ozello
Cindy Cheely
Students Assistants