

NEWSLETTER

Penn Vet's Ralph Brinster receives the National Medal of Science



The photograph of Dr Brinster and President Obama is from the National Science & Technology Medals Foundation

On Friday, October 21, 2011, President Barack Obama presented the **National Medal of Science** to **Ralph Brinster**, V.M.D., Ph.D., the Richard King Mellon Professor of Reproductive Physiology in the Department of Animal Biology at Penn's School of Veterinary Medicine. The ceremony, held in the East Room of the White House in Washington DC, celebrated seven eminent winners of the nation's highest honor for inventions and innovation in science and engineering. Dr.

Brinster won the medal for his fundamental contributions to the development and use of transgenic mice. His research has provided experimental foundations and inspiration for broad progress in germ line genetic modification in a range of species, revolutionizing biology, medicine and agriculture. Dr. Brinster is the **first veterinarian and the eighth Penn faculty member** to be honored with this award since its inception almost 50 years ago.

Research at Penn Vet

The University of Pennsylvania School of Veterinary Medicine gained national attention once again for achievements in research. President Barack Obama awarded Penn Vet's **Ralph Brinster** with the National Medal of Science. A two-day symposium in honor of Dr. Brinster is planned for **August 24-25, 2012**. Faculty and veterinary students continue to make progress in a broad range of studies from veterinary therapies for companion animals to translational medicine advancing animal and human health. Penn Vet's chief of surgery, **David Holt** (page 6) collaborates with Sunil Singhal in the School of Medicine by testing an imaging system on dogs with soft tissue tumors, breast cancer and lung cancer. **Charles Vite** (page 6), Penn Vet neurologist, investigates a new drug in the treatment of Niemann-Pick type C in children. Research and discovery at Penn Vet continues to benefit not only the animals served, but also extends into the field of human medicine.



WELCOME WISTAR INVESTIGATORS.....

In early 2012 researchers from the **Wistar Institute** will move into laboratory space in Hill Pavilion and Rosenthal Building while renovations of their facilities are completed. Some Wistar core facilities, such as the flow cytometry, histo-technology, protein expression, and genomics cores, already moved into Rosenthal Building in the fall of 2011. Many of the Wistar faculty have collaborated with their counterparts at Penn Vet over the years.

Drs. Andrew Caton, José Conejo-Garcia, Jan Erikson, Gundi Ertl, Scott Hensley, and Hui Hu are preparing for their move in to Hill Pavilion. Wistar is renowned for their work in the development of vaccines for rabies, rubella, and rotavirus, the identification of genes associated with breast, lung, and prostate cancer, and the development of monoclonal antibodies and other significant research technologies and tools.



Andrew Caton

Andrew J. Caton, Ph.D., a Professor, Immunology Program, aims to illuminate the mechanisms that govern the ability of the immune system to react against various pathogens. In striving to define how these key mechanisms are regulated, the Caton laboratory also seeks to understand the failure of these underlying mechanisms in autoimmune diseases such as rheumatoid arthritis and lupus.

The goal of the Caton laboratory is to define how B cells and T cells, lymphocytes that recognize and eliminate infecting microorganisms while remaining neutral toward the host, are regulated, and to

understand the changes in immune response that can lead to autoimmune diseases such as rheumatoid arthritis and lupus, and can also play an important role in cancer.

José R. Conejo-Garcia, M.D., Ph.D., an Associate Professor in the Wistar Immunology Program, is primarily focused on understanding how certain white blood cells are co-opted by ovarian tumors to aid in their survival. These “vascular leukocytes,” defined by Conejo-Garcia and his colleagues in 2005, stimulate growth of blood vessels and also serve to regulate the immune system. Although vascular leukocytes can promote tumor progression by increasing nutrient flow and inducing tolerance to the tumor, under the right set of activating signals, the same cells can be transformed to drive anti-tumor immunity. Conejo-Garcia and his team are devising strategies to create new therapies that will utilize the patient’s own immune systems to elicit protective anti-tumor immunity against – and prevent recurrence of – ovarian cancer.



José R. Conejo-Garcia

Jan Erikson, Ph.D., a Professor in the Wistar Immunology Program is interested in the signals that guide the trajectory of immune cells along distinct developmental paths that result in either short-term or long-lasting immune response formation. Her research is critically important to a better understanding of autoimmune and infectious disease, and vaccine development.

continued on page 3

WISTAR investigators...

Dr. Erikson is investigating the interplay among different types of immune cells that result in immune system activation or suppression.

Most recently, Erikson’s laboratory has begun research on the immune response to influenza virus with the ultimate aim of developing a vaccine. Among her current studies is an investigation into how the B cell response to influenza virus is induced and regulated with the goal of identifying critical interactions responsible for effective immunity.

Hildegund C.J. Ertl, M.D., the Caspar Wistar Professor in Vaccine Research

Professor and Program Leader of the Immunology Program centers her work on developing vaccines for an array of diseases and conditions—including AIDS and some forms of cancer—not typically considered to be treated using this approach. These vaccines aim to protect against future infections and look to create new therapies for diseases already affecting people. Dr. Ertl’s projects fall into six broad categories: HIV vaccines, human papilloma virus vaccines, rabies vaccine models, universal influenza vaccine, vaccines to Epstein-Barr virus, and immune response associated with gene therapy using adeno-associated viral vectors.



Hildegund C.J. Ertl, M.D.

Scott E. Hensley, Ph.D., is an Assistant Professor in Wistar’s Immunology Program. Dr. Hensley’s goal is to combat seasonal influenza, which contributes to many annual deaths across



Scott Hensley, Ph.D.

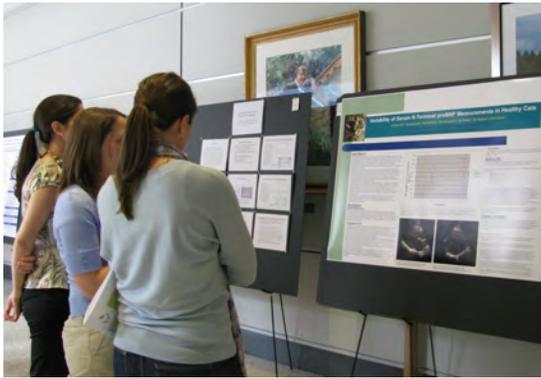
the world. His group uses basic virology and immunology techniques to understand how seasonal influenza eludes our immune system, making an annual influenza vaccine necessary. Hensley and his colleagues at The Wistar Institute Vaccine Center are also in pursuit of a “universal vaccine” for seasonal influenza, a single vaccine that will enable people to forgo an annual flu shot. In particular, the laboratory is interested in how seasonal influenza changes from year-to-year, as proteins on the surface of the virus accumulate mutations, a phenomena known as antigenic drift. Since antigenic drift is often unpredictable, a universal flu vaccine designed to target viral coat proteins in places that cannot be easily mutated.



Jan Erikson Lab

continued on page 5

SUMMER VETERINARY SCHOLAR PROGRAM FUNDED *at* PENN VET



Dr. **Michael Atchison**, director of the combined degree (VMD/PhD) program at Penn Vet announced that the MERIAL/ National Institutes of Health Summer Program has been funded for 2012. The **NIH/Merial Summer Research Program at Penn Vet** has been in existence since 1990. The program is designed to expose students in their first or second year of veterinary school to all phases of biomedical research. This includes the development of research ideas, the preparation of research proposals, the performance of biomedical research, and the presentation of research results in written and oral formats. Students in the program perform full time biomedical research during the months of June, July, and August, participate in weekly seminars, and present their work in oral, poster, and written presentations. Students also have the opportunity to attend the National Merial Scholars Conference.

Since its inception, the program has funded 331 awards to 300 different students to perform biomedical research in the laboratories of 131 different faculty members at the University of Pennsylvania. For more information about the NIH/ Merial Scholars Program at Penn go to <http://www.vet.upenn.edu/Research/ResearchTrainingOpportunities/MerialVeterinaryScholarsOtherPrograms/tabid/339/Default.aspx>

Research Spotlight

Dr. **Roselyn Eisenberg's** article "Antibody Induced Conformational Changes in Herpes Simplex Virus Glyco-protein gD Reveal New Targets for Virus Neutralization" has been selected by the editors of the Journal of Virology for inclusion in "Spotlight," a feature that highlights research articles of significant interest from the current issue. *Journal of Virology* (JVI) explores the nature of the viruses of animals, archaea, bacteria, fungi, plants, and protozoa. Dr. Eisenberg is a professor in the Department of Pathobiology in Penn's School of Veterinary Medicine.



Recent Papers



Monticelli, LA, Sonnenberg, GF, Abt, MC, Alenghat, T, Ziegler, CGK, Doering, TA, Angelosanto, JM, Laidlaw, BJ, Yang, CY, Sathaliyawala, T, Kubota, M, Turner, D, Diamond, JM, Goldrath, AW, Farber, DL, Collman, RG, Wherry, EJ, **Artis, D** (2011). Innate lymphoid cells promote lung-tissue homeostasis after infection with influenza virus. *Nature Immunology* Nov;12(11): 1045-54.



Carvalho, LP, Petritus, PM, Trochtenberg, AL, Zaph, C, Hill DA, Artis, D, and **Scott, P.** (2012) Lymph node hypertrophy following Leishmania major infection is dependent upon TLR9. *J. Immunol.* 188: *in press.*



Robinson, MA, Baumgardner, JE, and **Otto, CM.** (2011) Oxygen-dependent regulation of nitric oxide production by inducible nitric oxide synthase. *Free Radic Biol Med.* 51(11) 1952-1965. An invited review.



Miyadera, K, Acland, GM, and **Aguirre, GD.** (2012) Genetic and phenotypic variations of inherited retinal diseases in dogs: the power of within- and across -breed studies. *Mamm. Genome, in press.*



Jian Zhou, Fang Yang, N. Adrian Leu, **P. Jeremy Wang.** MNS1 Is essential for spermiogenesis and motile ciliary functions in mice. *PLoS Genetics.* 2012, *in press.*

continued from page 3... Wistar Investigators

Hui Hu, Ph.D. is an Assistant Professor in the Wistar Immunology Program. His research focuses on transcriptional regulation of cell development and function in the immune system. One goal of his laboratory is to identify novel regulatory genes/networks of T cell quiescence and determine their roles in T cell homeostasis, tolerance, and immune responses. Knowledge obtained from these studies will help design new therapeutic strategies that would manipulate T cell quiescence/activation for the treatment of autoimmune and infectious diseases and cancer. Another direction of the research in the Hu laboratory is to understand the hierarchical regulatory networks of key transcription factors that are engaged in hematopoiesis/lymphopoiesis.



Hui Hu, Ph.D.

Drs. Andrew Caton, José Conejo-Garcia, Jan Erikson, Gundi Ertl, Scott Hensley, and Hui Hu will move into the **fourth floor of Hill Pavilion** in January 2012.

SELECTED PUBLICATIONS BY WISTAR INVESTIGATORS

Cozzo Picca C, Simons DM, Oh S, Aitken M, Perng OA, Mergenthaler C, Kropf E, Erikson J, **Caton AJ**. CD4+CD25+Foxp3+ regulatory T cell formation requires more specific recognition of a self-peptide than thymocyte deletion. *Proc Natl Acad Sci U S A*. 2011 Sep 6;108(36):14890-5.

Cubillos-Ruiz JR, Martinez D, Scarlett UK, Rutkowski MR, Nesbeth YC, Camposeco-Jacobs AL, **Conejo-**

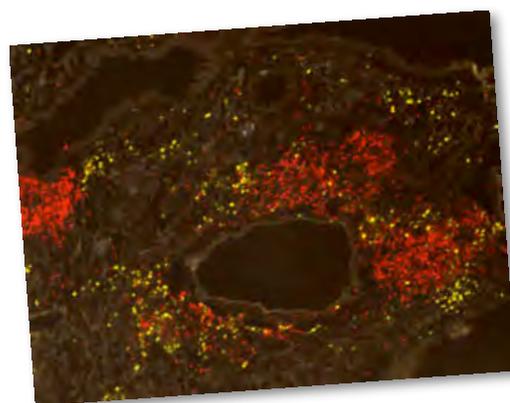
Garcia JR. CD277 is a negative co-stimulatory molecule universally expressed by ovarian cancer micro-environmental cells. *Oncotarget*. 2010 Sep;1(5):329-38.

Wolf AI, Mozdzanowska K, J Quinn W 3rd, Metzgar M, Williams KL, Caton AJ, Meffre E, Bram RJ, Erickson LD, Allman D, Cancro MP, **Erikson J**. Protective antiviral antibody responses in a mouse model of influenza virus infection require TACI. *J Clin Invest*. 2011 Oct 3;121(10):3954-64.

Lasaro MO, Sazanovich M, Giles-Davis W, Mrass P, Bunte RM, Sewell DA, Hussain SF, Fu YX, Weninger W, Paterson Y, **Ertl HC**. Active immunotherapy combined with blockade of a coinhibitory pathway achieves regression of large tumor masses in cancer-prone mice. *Mol Ther*. 2011 Sep;19(9):1727-36.

Hensley SE, Das SR, Gibbs JS, Bailey AL, Schmidt LM, Bennink JR, Yewdell JW. Influenza A virus hemagglutinin antibody escape promotes neuraminidase antigenic variation and drug resistance. *PLoS One*. 2011 Feb 22;6(2):e15190.

Feng X., Wang, H., Takada, H., Day, T., Willen, J. and **Hu, H.** (2011) Transcription factor Foxp1 exerts essential cell-intrinsic regulation of the quiescence of naive T cells. *Nature Immunology*. 12, 544-550



Immunohistology of lungs from an Influenza-infected BLIMP-1-YFP mouse (d38p.i.) depict the location of B220+ B cell clusters (red) and YFP+ plasma cells (yellow).] Erikson Lab

RECENT AWARDS

Thomas Parsons

PA Soybean Promotion Board
 Improving Swine Production and Profitability
 via Regional Control of the PRRS Virus
 7/1/2011-6/30/2012
 \$10,000

Thomas Parsons

PA Soybean Promotion Board
 Insuring Long-term Viability of Swine Farming
 with Husbandry Systems Designed to Meet the
 Changing Demands of Society
 7/1/2011-6/30/2012
 \$10,000

Chris Lengner

W.W. Smith Charitable Trust
 Control of stem cell-driven tumorigenesis by
 Musashi RNA binding proteins
 1/1/2012-12/31/2012 \$100,000

Brett Kaufman

W.W. Smith Charitable Trust
 Mitochondrial DNA Damage and the
 Progression Toward Heart Failure
 1/1/2012-12/31/2012 \$100,000

David Holt

AKC: Pre-and intra-operative detection and
 resection of cutaneous and subcutaneous
 sarcomas in dogs using an integrated
 spectroscopy and imaging system
 11/1/11-10/31/13, \$12,960

David Artis

Ro1 AI095466
 Regulation and function of innate lymphoid
 cells in the gut. 7/1/2011-6/30/2015 \$1,000,000

Shelley Rankin

FDA 1-U18 FD 004301
 Evaluation of Salmonella in Symptomatic and
 Asymptomatic Pets: Study for the Vet LRN
 Program
 9/16/2011-9/15/2012 \$37,500

Karina Guzewicz (Aguirre Lab)

Sponsor: Foundation Fighting Blindness
 Title: Therapeutic intervention for BEST1
 disorders
 7/1/11-6/30/2013 \$140,000

Gustavo Aguirre

Macula Vision Research FDN. Gene
 replacement therapy in bestrophin 1 model:
 implications for recessive and dominant human
 BEST1-Disorders
 5/1/12-4/30/15 \$300,000

IMAGING SYSTEM

Penn Vet's **David Holt**, chief of surgery, Department of Clinical Studies (PHL), has been collaborating with Dr. Sunil Singhal, thoracic surgeon, Penn's School of Medicine, on a new technology in fighting cancer. Dr. Holt has been testing an intraoperative cancer imaging system, developed by Dr. Singhal, on dogs with soft tissue tumors, breast and lung cancer. The system camera locates the cancer with a very good degree of accuracy in dogs and it is hoped that the technology will be an effective tool with humans.

INVESTIGATIONAL DRUG

The collaborative group planning a cyclodextrin clinical trial at the National Institutes of Health (NIH) for the treatment of Niemann-Pick type C (NPC) disease met with the Food and Drug Administration (FDA) on November 15 and December 13, 2011. Representatives from the Therapeutics for Rare and Neglected Diseases (TRND) group at the NIH, as well as several NPC researchers, including two veterinarians, Drs. **Charles Vite**, Penn Vet Department of Clinical Studies (PHL), and Steven Walkley, Johnson & Johnson, and consultants from RRD International, LLC, participated in this meeting. Overall, the feedback from FDA was very positive and their comments and guidance will assist researchers in the generation of an IND application that is agreeable to FDA, thus allowing the initiative to move forward with the initial clinical trial in children as soon as possible. In addition, **Dr. Vite** spoke at a FDA Pharmacology/ Toxicology Seminar on November 17 on "Canine epilepsy as a model of human epilepsy".



UNIVERSITY RESEARCH FOUNDATION MARCH 30 DEADLINE

--The University Research Foundation (URF) is an intramural resource to support research for faculty for a variety of purposes, including: helping junior faculty with pilot projects that may lead to extramural funding; helping faculty at all levels to pioneer new ideas; or to fund the purchase of equipment & instrumentation. University faculty may find the guidelines at this website: [HTTP://WWW.UPENN.EDU/RESEARCH/](http://WWW.UPENN.EDU/RESEARCH/)



Save the date

Annual Phi Zeta Student Research Day

Thursday **March 22, 2012**
 Keynote Speaker: Paul McKellips of the Foundation for Biomedical Research will speak on: "Animal Rights Extremism and Public Opinion About Lab Animal Research"
 Student Abstracts due Feb 1
 For more information email: resnews@vet.upenn.edu

Other ways to find funding for your laboratory



By Roselyn Eisenberg, Ph.D., Professor, Department of Pathobiology

Most of us who do basic research rely on government funded grants or contracts. What else can you do? **Look in your freezers or mouse cages !!** Companies might be interested in licensing reagents you have developed and this is allowed by the National Institutes of Health (NIH). For instance, we have licensed polyclonal and monoclonal IgGs, purified proteins, and cell lines and companies may also be interested in plasmids and unique mouse strains. Penn’s Center for Technology Transfer (CTT) can license the research tools and distribute income to your laboratories in accordance with the Penn Patent Policy. And you can license the same thing to more than one company, increasing the benefit. Since it is unrestricted, the money can bridge a gap in funding, cover events for invited seminar speakers, or fund equipment purchases for the laboratory. We have even used such funds to pay for exploratory experiments unlikely to be initially

funded by NIH. CTT and the University have licensing guidelines and CTT will be happy to discuss revenue models with you. You may have to do some legwork to find companies interested in your product, but CTT will work with you to identify appropriate licensing partners. CTT has launched a new tool on their website showcasing reagents available for licensing, so please let them know of any reagents you would like to make available. Look in your freezers—you may find some buried treasure that can help keep your lab afloat!!

Center for Technology Transfer CTT serves as a bridge between Penn faculty and researchers and the business community. Through technology transfer, innovations may be incorporated into products and services that directly benefit society, as well as research and education at Penn.

Contact:
Robert H. Schenkel, Ph.D.
 Director, Life Sciences Licensing
 215-898-9385
Robh@ctt.upenn.edu

Helene Hart
 Contracts Administrator
 215-573-4690
helenem@ctt.upenn.edu



TWO PENN VET FACULTY AWARDED WW SMITH GRANTS

The Trustees of the **WW Smith**



Charitable Trust have granted **Brett A. Kaufman, Ph.D.**, assistant professor in the Department of Animal Biology,

\$100,000 for his research project entitled "Mitochondrial DNA damage and the progression toward heart failure". Project period: 1/1/2012-12/31/2012

The Trustees of the **WW Smith**



Charitable Trust have granted Christopher Lengner, Ph.D., assistant professor in the Department of Animal Biology, \$100,000

for his research project entitled "Control of stem cell-driven tumorigenesis by Musashi RNA binding proteins". Project period: 1/1/2012-12/31/2012

The **W. W. Smith Charitable Trust** is a private foundation established by William Wikoff Smith. The Trust is specifically focused on areas involving basic needs for food, clothing and shelter; supplementing higher education scholarship programs; and basic medical research primarily in heart disease, cancer and AIDS.

NIH NEWS....Not funded on the first try? Now what?



Leslie King, Ph.D., Scientific Director of Grant Development, PennVet, has excerpted news from the NIAID/NIH website and added a few comments of her own.

Option 1: Revise and Resubmit—To the same study section— If reviewers were enthusiastic about your idea and you can readily answer their concerns, then revise and request the same study section. This option will allow you to keep most of your original application intact. While reviewers can determine how effectively you have addressed the concerns of previous reviewers, be aware that your application may still face some new reviewers who may raise new issues.

To a different study section. If the reviewers clearly did not appreciate your proposal, your study section may be a poor fit. While you presumably examined the study section roster and talked to colleagues and mentors PRIOR to your first submission, you may want to re-evaluate. Be aware however, that this option guarantees you will have new reviewers, and only one more shot at funding. If you DO decide to request a new study section, frame your request in positive terms by indicating how their expertise is necessary to review your application in your cover letter. But don't request reviewers by name or they will be

disqualified!

Although you will want to resubmit your grant as quickly as possible, rushing can be a bad idea. You have only one chance to resubmit, so wait until you can submit the **strongest** application possible. When resubmitting, you must write an introduction that addresses all the Reviewer's concerns. In addition, briefly describe new preliminary data and indicate where you have strengthened the application—even in areas your reviewers did not question.

Option 2: Create a "New" Application—If your original application had substantial problems—either because it was not deemed significant or you cannot address the reviewers' scientific concerns— it may behoove you to create a new application rather than resubmitting. Since an unscored proposal presumably will need extensive revisions, a new submission will negate the “first strike”, giving you two more shots at funding. Consequently, submitting a new proposal may provide funding more quickly— if successful, you can be funded in as little as 8 months. In contrast, if your resubmission is not funded and you then have to write a new grant, it will likely take 16 months or more to obtain funding.

Be aware that NIH is quite strict about the “newness” of the proposal— software scanning for assessing similar content, and Program and Scientific Review Officers checking for scientific “newness”. Grants that fail this scrutiny are subject to administrative triage. While you may keep preliminary data and some parts of the old application, you **must**

substantially change your direction and scope. Changing only the Significance or Innovation sections or modifying the Approach section while keeping the same Specific Aims are **NOT** sufficient. You do not need to address previous reviewers' comments in a new submission (or provide a Progress Report if it is based on a previously funded grant). In your cover letter or in the application itself, state that you have previously submitted some of the same ideas, and explain how the new application is different. Talk with your program officer for more advice.

Option 3: Repurpose the Application—Normally you can apply to do the same research only once, but there are exceptions. You can submit an investigator-initiated application after responding unsuccessfully to an RFA and *vice versa*. You can also submit an unsuccessful application as a different activity code (e.g., RO1, RO3, R21) or include it in a multi-project grant. In such cases, submit as a **new** application and follow the requirements of the new funding agency. You can also simultaneously send an application to NIH and to some other organization, including the Department of Defense, the National Science Foundation, and other outside foundations. However, be aware that the application cannot be submitted to organizations within the U.S. Public Health Service (e.g., FDA, CDC, AHRQ), and you will be able to accept only one award. This information was condensed from the NIAID website <http://www.niaid.nih.gov/researchfunding/grant/strategy>

Modern Eye supports Penn Vet research

On November 15, 2011, **Modern Eye of University City** gave a designer eyewear trunk show to benefit Penn Vet's canine cancer research efforts. Dr. Christopher Anastasiou, a longtime supporter of Penn Vet, and his staff arranged an afternoon to early evening event featuring two eyewear designers, Bevel and Orgreen, for the trunk show. Elegant hors d'oeuvres were served along with fine wines from Moore Bros., who discounted the purchase of wine for the fundraiser. Modern Eye generously gave 20% of their sales as a donation to Penn Vet and offered special rates on the designer glasses. The excellent staff, including Dale Gaumer, Kate Goughary, Nikki



Sillá, Andrea McIntyre and artist Mitch Gillette, were indefatigable in helping people select frames and serving hors d'oeuvres. Guests were lined up for their eye examinations performed by Dr. Anastasiou. Modern Eye, at 34th and Walnut, was alive with activity!

People who attended the affair and placed orders were automatically entered into a drawing for a free frame, or free Zeiss digital lenses. Prior to the event, Modern Eye staff members also gathered door prizes for the raffle from: La Colombe Torrefaction; the 12th Street Gym; Fork Restaurant; Spread Bagelry; Capogiro; Chic Petique; Greens-grow Farms; Audrey Claire; Twenty Manning; Allegheny Art Company; Sampan Restaurant; Smith and Wollensky; Good Dog Bar & Restaurant; Spot's Spot; Lola Bean Café; Atlantis the Lost Bar; Rev'it; Plume Salon; Commonwealth Proper; and McFadden's Pub.

The genuine care and kindness of Modern Eye staff made for an atmosphere of conviviality and positive support for the School of Veterinary Medicine at the University of Pennsylvania. <http://www.modern-eye.com/>

Clinician Scientist Training Workshop--

A workshop was held on October 15-16, 2011 at the School of Veterinary Medicine, University of Wisconsin, Madison. Residents and interns from Penn Vet enrolled for the workshop video-conferenced to Penn. The goals of this workshop were to enhance interest and applicable skills in applied research among veterinary residents to promote collaborations among veterinary schools for bench-to-bedside research. Those enrolled from Penn Vet were: Heather Akridge, Joseph Amory, Anusha Balakrishnan, Julie Callahan Clark, Danna Clarke, Rachael Gaeta, Guidal Inal, Dorothy Jackson, Michael Jennings, Meredith Maczuzak, Keiko Miyadera, Matthew Paek, Kendra Pope, Chap Pratt, Alex Proulx, Natalia Samaj Kunze, Maria Soltero-Rivera, Jantra Suran, Vince Thawley, Melissa Tollett, Mandy Wallace, and Pam White. The faculty facilitator was **John Lewis, VMD**, Assistant Professor, Dentistry and Oral Surgery in the Department of Clinical Studies PHL. He also serves as Residency Director, Dentistry and Oral Surgery, and is the associate director of the Mari Lowe Center for Comparative Oncology.

The Penn Vet Research Newsletter is distributed quarterly.

Suggestions, requests, comments, and story ideas should be directed to:

resnews@vet.upenn.edu

Office of the
Associate Dean *for* Research
Phillip Scott, PhD
University of Pennsylvania
School of Veterinary Medicine

Editor: Gayle Joseph

University of Pennsylvania School of Veterinary Medicine
Office of the Associate Dean for Research
380 S University Avenue
3rd Floor Hill Pavilion
Philadelphia, PA 19104-4539

Wishes for a productive & successful 2012



University of Pennsylvania School of Veterinary Medicine
Office of the Associate Dean for Research
380 S University Avenue
3rd Floor Hill Pavilion
Philadelphia, PA 19104-4539

TO: