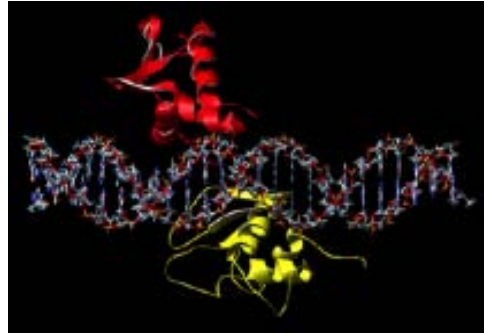


Spring 2016

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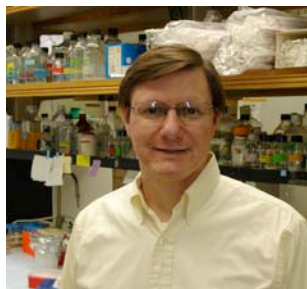
Dear VMD-PhD Alumni and Current Students,

This has been a great year for the VMD-PhD program at Penn. We had a fantastic applicant pool to the program, we interviewed nine students, and offered admission to four. All four accepted our offer. You will receive more information about this outstanding crop of incoming students in the Fall newsletter. In March we celebrated the Vet Student Research Day with a keynote by VMD-PhD alumnus Alex Travis, talks by VMD-PhD and VMD students, and numerous posters. Winners are listed inside this newsletter. In addition, in April another VMD-PhD alumnus, Stephanie Murphy, presented the Keynote at the Penn Zoobiquity Conference held at the Penn Perelman School of Medicine. We also have accomplishments by our alumni to report, and we present an update on current student publications and awards.

We are very proud of our alumni and current students, and hope that many of you will visit Penn during the coming year.

Wishing you the best in 2016,

Michael Atchison, Ph.D.
Director, VMD-PhD Program



We will be updating our alumni pages. Please let us know updates and changes.

<http://www.vet.upenn.edu/education/academics-and-training/vmd-phd-program/vmd-phd-alumni-profiles>

Find your profile and send us feedback!

<http://www.vet.upenn.edu/education/academics-and-training/vmd-phd-program>

VMD-PhD Admissions

We had a fantastic admissions season this year and choosing the best out of an impressive group of strong applicants was challenging. Ultimately we made four offers, and all four students accepted giving us a very strong incoming class.

The quality of our applicant pool is outstanding. Applicant averages for this year were GPA of 3.62 and GRE scores of 160 (V) and 158 (Q) with our matriculating students averaging GPA of 3.74 and GRE scores of 164 (93%; V), 163 (85%; Q), and 5.0 (91%; A). All had extensive research experience and outstanding letters of recommendation attesting to their abilities as scientists.

Incoming Students for Fall 2016

We are very pleased with our incoming crew of students. Their names, graduate groups, and undergraduate institutions are below.

Name	Graduate Group	Undergraduate Institution
Jaelyn Carlson	Bioengineering	Cornell
Phillip Hicks	Cell and Molecular Biology	U. Delaware
Nathaniel Sotuyo	Neurosciences	Johns Hopkins
Ashley Vanderbeck	Immunology	Haverford

More information on our incoming class will be in the Fall newsletter.



December Dinner Party at the program director's home.

CURRENT STUDENT AWARDS

The 2016 Phi Zeta Student Research Day, March 23, 2016



The Phi Zeta Student Research Day highlights veterinary student research at Penn. The day includes a keynote address by a prominent veterinarian-scientist, talks by VMD-PhD students, talks by VMD students, and student posters. Speakers were chosen from a large pool of abstracts and winners amongst our current VMD-PhD students are listed below.

Our keynote speaker this year was VMD-PhD alumnus Dr. Alexander Travis. Alex gave an outstanding talk entitled: “**Following Your Science – From Sperm to Stroke and From Basic to Bedside**”.



Alex also spent some time meeting with current students in the program.

VMD-PhD student presentation winners were:

First Place: Bailey Baumann

Advisor: Josh Dunaief MD/PhD, Department of Ophthalmology, Perelman School of Medicine, University of Pennsylvania

Title: *The Effect of Muller Cell Dysfunction on Iron Transport Across the Neurosensory Retina.*



Second Place: Feini Qu

Advisor: Robert Mauck, Ph.D., Department of Bioengineering, School of Engineering

Title: *A Low-cost, Wearable Magnet-based Detection System to Assess Joint Kinematics in Humans and Large Animals.*

Third Place: Elinor Willis

Advisor: Scott Hensley, Ph.D., Microbiology, Wistar Institute.

Title: Neonates Generate Long-lived Protective Immune Response in the Presence of Maternal Antibodies.



Thesis Defenses



Student: Feini Qu

Date: October 28, 2015

Title: Biomaterial-mediated Reprogramming of the Wound Interface to Enhance Meniscal Repair

Mentor: Robert Mauck
Bioengineering

Student: Rebecca Evans

Date: November 16, 2015

Title: T Cell Immunosurveillance of Pancreatic Ductal Adenocarcinoma

Mentor: Robert Vonderheide
CAMB CB





Student: Samra Elser
Date: February 29, 2016
Title: The Role of the gp41 Membrane-Proximal Tyrosine Motif in Simian Immunodeficiency Virus Pathogenesis
Mentor: James Hoxie
CAMB MVP

Graduating VMD-PHD Students



Erika Lin-Hendel
CAMB Developmental, Stem Cell, and Regenerative Medicine
Mentor: Dr. Stuart Anderson and Dr. Jeffrey Golden

Erika's thesis work demonstrated a link between mitochondrial metabolism with interneuron migration during development, which has implications in our understanding of neurological disorders such as epilepsy and autism. After graduation she will be working in agricultural research in global industry with the Austrian company Biomin.

Richard Jimenez
CAMB Genetics and Gene Regulation
Mentor: Richard Schultz

Richard's research explored the role of maternal SIN3A in the reprogramming of gene expression during mouse preimplantation development. After graduation Richard will be performing a Small Animal Rotating Internship with a VCA hospital in Maryland.



Student Publications, Honors, Awards

Oliver Wilson Calhoun was born at 1:08 pm on Dec 2, 2015: 8 lbs 8oz, 22 inches long!



Student Publications (2015-2016)

Madara JJ, Han Z, Ruthel G, Freedman BD, Harty RN. The multifunctional Ebola virus VP40 matrix protein is a promising therapeutic target. Review Article. *Future Virol.* 2015 May;10(5):537-546. PMID: PMC4480923

Han Z, **Madara JJ**, Liu Y, Liu W, Ruthel G, Freedman BD, Harty RN. ALIX Rescues Budding of a Double PTAP/PPEY L-Domain Deletion Mutant of Ebola VP40: A Role for ALIX in Ebola Virus Egress. *J Infect Dis. Suppl 2*:S138-45 (2015) PMID: PMC4564528.

Han Z, **Madara JJ**, Herbert A, Prugar LI, Ruthel G, Lu J, Liu Y, Liu W, Liu X, Wrobel JE, Reitz AB, Dye JM, Harty RN, Freedman BD. Calcium Regulation of Hemorrhagic Fever Virus Budding: Mechanistic Implications for Host-Oriented Therapeutic Intervention. *PLoS Pathog.* Oct 29;11(10):e1005220. (2015) PMID: PMC4634230

Winograd, R., Byrne, K.T*, **Evans, R.A***, Odorizzi, P.M., Meyer, A.R.L., Bajor, D.L., Clendenin, C., Stanger, B.Z., Furth, E.E., Wherry, E.J., and Vonderheide, R.H. Induction of T cell immunity overcomes complete resistance to PD-1 and CTLA-4 blockade and improves survival in pancreatic carcinoma. *Cancer Immunol Res.* 3:399-411 (2015). PMID: PMC439050 *Note: joint second authorship.

Beatty GL, Winograd R*, **Evans RA***, Long KB, Luque SL, Lee JW, Clendenin C, Gladney WL, Knoblock DM, Guirnalda PD, Vonderheide RH. Exclusion of T Cells From Pancreatic Carcinomas in Mice Is Regulated by Ly6C(low) F4/80(+) Extratumoral Macrophages. *Gastroenterology.* 149:201-210 (2015). PMID: PMC4478138 *Note: joint second authorship.

Lo A, Wang LC, Scholler J, Monslow J, Avery D, Newick K, O'Brien S, **Evans RA**, Bajor DJ, Clendenin C, Durham AC, Buza EL, Vonderheide RH, June CH, Albelda SM, Puré E. Tumor-Promoting Desmoplasia Is Disrupted by Depleting FAP-Expressing Stromal Cells. *Cancer Res.* 75:2800-2810 (2015) PMID: PMC4506263

Breed MW, **Elsner SE**, Torben W, Jordan AP, Aye PP, Midkiff C, Schiro F, Sugimoto C, Alvarez-Hernandez X, Blair RV, Somasunderam A, Utay NS, Kuroda MJ, Pahar B, Wiseman RW, O'Connor DH, LaBranche CC, Montefiori DC, Marsh M, Li Y, Piatak M Jr, Lifson JD, Keele

BF, Fultz PN, Lackner AA, Hoxie JA. Elite control, gut CD4 T cell sparing, and enhanced mucosal T cell responses in *Macaca nemestrina* infected by an SIV lacking a gp41 trafficking motif. *J Virol.* 2015 89:10156-10175 (2015). PMID: PMC4580161

Patel NG, Rorres C, Joly DO, Brownstein JS, Boston R, Levy MZ, Smith G. Quantitative methods of identifying the key nodes in the illegal wildlife trade network. *Proc Natl Acad Sci U S A.* 2015112:7948-7953 (2015) PMID: PMC4491747.

Jimenez R, Melo EO, Davydenko O, Ma J, Mainigi M, Franke V, Schultz RM. Maternal SIN3A regulates reprogramming of gene expression during mouse preimplantation development. *Biol. Reprod.* 93(4):89, 1–12 (2015). PMID: PMC4711907

Koren S, DiPilato LM, Emmett MJ, **Shearin AL**, Chu Q, Monks B, Birnbaum MJ. The role of mouse Akt2 in insulin-dependent suppression of adipocyte lipolysis in vivo. *Diabetologia.* 58(5):1063-1070 (2015). PMID: PMC4393789

Qu F, Pintauro MP, Haughan JE, Henning EA, Esterhai JL, Schaer TP, Mauck RL, Fisher MB. Repair of dense connective tissues via biomaterial-mediated matrix reprogramming of the wound interface. *Biomaterials* 39:85-94 (2015)

Liu X, Berry CT, Ruthel G, **Madara JJ**, MacGillivray K, Gray CM, Madge LA, McCorkell KA, Beiting DP, Hershberg U, May MJ, Freedman BD. T cell receptor-induced NF- κ B signaling and transcriptional activation are regulated by STIM1- and Orai1-mediated calcium entry. *J Biol Chem.* 291:8440-8452 (2016). PMID:26826124 [PubMed - in process]

Lin-Hendel EG, McManus MJ, Wallace DC, Anderson SA, Golden JA. Differential Mitochondrial Requirements for Radially and Non-radially Migrating Cortical Neurons: Implications for Mitochondrial Disorders. *Cell Rep.*15(2):229-233 (2016) [PubMed - in process]

Penkala I, Wang J, Syrett CM, Goetzl L, López CB, Anguera MC. LNCRHOXF1: a long noncoding RNA from the X-chromosome that suppresses viral response genes during development of the early human placenta. *Mol Cell Biol.* 2016 Apr 11. pii: MCB.01098-15. [Epub ahead of print] PMID: 27066803 [PubMed - as supplied by publisher]

Nwe K, Huang CH, **Qu F**, Warden-Rothman R, Zhang CY, Mauck RL, Tsourkas A. Cationic gadolinium chelate for magnetic resonance imaging of cartilaginous defects. *Contrast Media Mol Imaging.* 2016 Feb 8. doi: 10.1002/cmml.1685. [Epub ahead of print] PMID: 26853708 [PubMed - as supplied by publisher]

Shearin AL, Monks BR, Seale P, Birnbaum MJ. Lack of AKT in adipocytes causes severe lipodystrophy. *Molecular Metabolism.* (2016, In press)

Alumni Awards, Accomplishments, and Honors

Congratulations go out to all of our alumni listed below

Stephanie J. Murphy, VMD, PhD, (1996) DACLAM, Director of the Division of Comparative Medicine, Office of Research Infrastructure Programs, Division of Program Coordination, Planning, and Strategic Initiatives, Office of the Director, National Institutes of Health.

As part of ORIP's strategic goals to promote MD/DVM collaborations, Dr. Stephanie Murphy, Director, Division of Comparative Medicine, ORIP, gave the keynote presentation, entitled "Comparative Medicine: Challenges and Opportunities," for the 2016 Zoobiquity Conference held at the University of Pennsylvania, Perelman School of Medicine in Philadelphia, PA on April 2, 2016. The annual Zoobiquity Conference is designed to bring together leading clinicians and scientists in both human and veterinary medicine to discuss the same diseases in a wide spectrum of animal species and human beings. The intention of this cross-disciplinary conference is to create conversations and relationships between human and veterinary colleagues confronted with similar clinical challenges. Dr. Murphy's presentation provided conference participants with a better understanding of what comparative medicine is and how it serves as a bridge between human and veterinary medicine as well as the challenges and opportunities facing comparative medicine.



**Marnie FitzMaurice, VMD, PhD (1996, 2002)
Lecturer in Biomedical Sciences
Cornell College of Veterinary Medicine**



Last summer Marnie took on the position of Director of Veterinary Curriculum at Cornell College of Veterinary Medicine. In addition to this new role, she will continue as a Lecturer in Biomedical Sciences, teaching in the anatomy, neuroanatomy and physiology courses of the preclinical curriculum.

Bruce Smith VMD, PhD (1988, 1993)
Professor of Pathology
Scott-Ritchey Research Center
Auburn University

Bruce recently published a paper in his new, very part-time role as a professor of Brewing Science in Auburn University's Brewing Science and Operations Program. The paper is entitled "The Impact of Yeast Genomics on Brewing" and can be found online at: http://www.omicsonline.org/nutrition-food-sciences-abstract.php?abstract_id=66512



Todd Stochlic, VMD, PhD (2008)
Assistant Professor
Department of Biochemistry and Molecular Biology
College of Medicine, Drexel University



Todd received a one-year \$65,000 CURE (Commonwealth Universal Research Enhancement) grant from the PA Department of Health. The title of the project is: The role of MK2 kinase signaling in inflammatory breast cancer.

Sarah L. Ralston, VMD, PhD (1982)
Professor, Department of Animal Sciences
Rutgers University

In the past year Sarah has had several new refereed publications:

McCoy AM, Beeson SK, Lykkjen S, **Ralston SL**, Mickelson JR, McCue ME. Identification and Validation of Risk Loci for Osteochondrosis in Standardbreds. *BMC Genomics* 17:41-52, 2016.

Silva RFP, Rezende ASC, Saliba EOS, Maruch S, Ignacio DFS, Santiago JM, **Ralston SL**. The effect of deworming on apparent digestion, body weight and condition in heavily parasitized mares. *J. Equine Vet Science* 36:83-89, 2016. [http://www.j-evs.com/article/S0737-0806\(15\)00609-7/abstract](http://www.j-evs.com/article/S0737-0806(15)00609-7/abstract) (Result of her Fulbright Scholarship stint in Brazil February-May, 2014)

McCoy A, **Ralston S**, McCue, M. Short- and Long-Term Racing Performance of Standardbred Pacers and Trotters After Early Surgical Intervention for Tarsal Osteochondrosis. *Equine Vet J* 47:438-444. DOI: 10.1111/evj.12297. PMID: 4229490, 2015.

Invited Reviews:

Ralston, SL. Practical approach to the metabolic syndrome. Proc. AAEP 2015 Focus on Ambulatory Meeting, July, 2015. Minneapolis, MN. Pp 32-34.

Ralston, SL. Practical nutrition with focus on the skinny, old horse. Proc. AAEP 2015 Focus on Ambulatory Meeting, July, 2015. Minneapolis, MN. Pp 29-31.

Research Abstracts:

Mahbub M, *Ferlisi D*, Conover, K., Mohr M, Sirois PK, Massi VA, Pelczer I, **Ralston S**. Time-domain NMR analysis of composition of grass and hay. Proc. Practical Application of NMR in Industry Conference, Houston, TX, Feb. 2016.

Silva RFP, Rezende ASC, Saliba EOS, Maruch S, Ignacio DFS, Santiago JM, Pereira LFL, **Ralston SL**. Comparison of digestion in dewormed and not dewormed mares. Proc. 52nd Annual Meeting of Soc. Brasileira de Zootecnia, Belo Horizonte, Minas Gerais, Brazil, July, 2015.



Upcoming Events

NIH/Merial Program Trip to NIH: June 15-16
Merial-NIH Veterinary Scholars Symposium: July 28-31
Trip to Philadelphia Science Center: June 30
Panel discussion with alumni: July 6
Combined Degree Retreat: August 3
Welcome Night Out for Incoming Students: TBD

Contact Us

Michael Atchison, Ph.D.
Director, VMD/PhD Program
215-898-6428
atchison@vet.upenn.edu

Yong No
Coordinator, VMD/PhD Program
215-898-3800
yongno@vet.upenn.edu

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