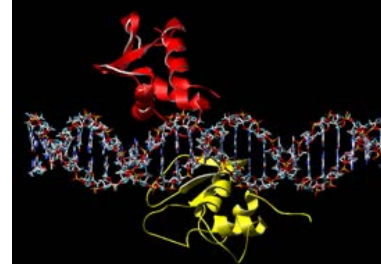


Fall 2020

In This Issue

1. Letter from the Program Director
2. Incoming students
3. Recent PhD defenses and Graduations
4. Current student publications and awards
5. Alumni awards, accomplishments, and honors



Dear VMD-PhD Alumni and Students,

Greetings from the Penn VMD-PhD program! OK, so I missed the Spring 2020 newsletter for obvious reasons. But at least the Fall 2020 newsletter is here. In mid-March Penn went into a dramatic lockdown due to the Covid-19 pandemic. That curtailed 90% of research activities making us all scramble for maintaining some research and adapting to a virtual teaching world. Restrictions were eased to 50% in early summer, and moved to essentially full research activity in the Fall as long as proper PPE and social distancing were maintained. This required shift work in some labs, and our teaching mission remained nearly all in a virtual format. The May 25 murder of George Floyd in Minneapolis, as well as other events sparked massive protests in Philadelphia, accompanied by some opportunistic rioting and looting. All the above was followed by a contentious election season that made 2020 either a year to remember, or to forget depending on your perspective. The closest thing I can compare 2020 to is 1968, for those of us old enough to remember. But this year is clearly unique, and due to my pathological optimism, I have hopes that this year will be remembered as one in which our nation made some progress in addressing systemic injustices. Through it all, I am proud of how Penn, the School of Veterinary Medicine, and our VMD-PhD program has carried on.

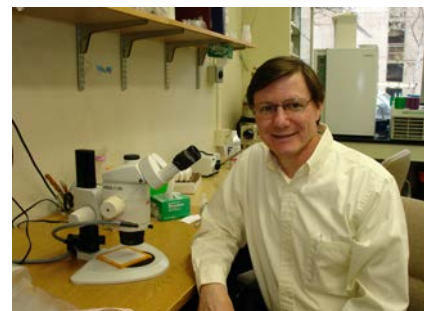
In this newsletter you will learn about:

- Incoming student information.
- Updates on PhD defenses, graduations, recent student publications, and recent student awards.
- Many updates from our alumni.

In other activities, the annual Combined Degree Retreat was a virtual event in August, and the annual Veterinary Combined Degree Symposium was virtual as well. Notably, the Penn Vet Student Research Day was cancelled last March, as was our Annual BBQ. Sadly, this will be the first year in 26 years that the annual Christmas Dinner Party will not be held at my home. We are now entering a new admissions cycle and admissions interviews will be held in January 2021 by a virtual mechanism. With the recent news of multiple vaccines becoming available in December this year, there is hope of an end to continuous isolation, and the power to escape from Zoom cubicles.

We wish you all the best as 2020 comes to a close, and we look forward to a fantastic 2021!

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



## Alumni are Online!

Check out:

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

Find your profile, and send us feedback!

## Incoming VMD-PHD Students

**Alexander Post (Year 1)**

**Queens University, Ontario**

**CAMB Development, Stem Cell, and Regenerative Biology**

Alex graduated from Queens University in May 2018, then completed an MS degree in Medical Science in August 2020 from the University of Toronto. He has performed research in multiple settings, first at the Hospital for Sick Children in Toronto with Dr. Peter Gilgan studying protein purification, and antimicrobial functions and properties of embryonic stem cell-derived macrophages. Subsequently he worked with Dr. Mingyao Liu at Toronto General Hospital on the effect of adaptor protein XB130 on skin inflammation and tumorigenesis. He also worked with Drs. Graeme Smith and Jonathan Ausman on the effects of carbon monoxide on mitochondrial dynamics in human placenta, and finally for his Masters research, he worked with Dr. Michael Fehlings at Toronto Western Hospital, on the effect of conditional GDNF expression in induced pluripotent stem cell neural progenitor cells using cell state-specific promoters following spinal cord injury.



## Recent PhD Defenses



**Student: Bailey Bauman**

**Date:** July 17, 2019

**Title:** Pathways to pathologic retinal iron accumulation: blood, guts, and the immune system.

**Mentor:** Joshua Duniaef

**Graduate Group:** NGG

**Student: Robyn Allen**

**Date:** November 21, 2019

**Title:** FOP-ACVR1 Signals by Multiple Modalities in the Developing Zebrafish.

**Mentor:** Eileen Shore and Mary Mullins

**Graduate Group:** CAMB DSRB





**Student: Rebecca Rosenthal**

**Date:** June 3, 2020

**Title:** T-bet Expressing B Cells with Distinct Residency and Functional Characteristics Give Rise to Plasma Cells.

**Mentor:** Michael Cancro

**Graduate Group:** IGG

**Student: Sondra Calhoun (Lavigne)**

**Date:** July 19, 2020

**Title:** Antimicrobial use and resistance: intersections of companion animal and public health.

**Mentor:** Theoklis Zaoutis

**Graduate Group:** Epidemiology and Biostatistics



**Student: Gregory Sousa**

**Date:** November 23, 2020

**Title:** Dissecting the melanization immune response in the malaria vector *Anopheles gambiae*.

**Mentor:** Michael Povelones

**Graduate Group:** CAMB MVP

## Graduations

### **Elinor Willis**

**Date:** May, 2020

**Title:** The effect of maternal antibodies on anti-viral immunity in infant mice.

**Mentor:** Scott Hensley

**Graduate Group:** CAMB-MVP

Elinor is pursuing a Residency in Pathology at the University of Pennsylvania



### **Amanda Samuels**

**Date:** May, 2020

**Title:** Non-canonical Functions of the Bacterial SOS Response.

**Mentor:** Rahul Kohli

**Graduate Group:** CAMB-MVP

Mandie is pursuing an equine internship at the University of Georgia.

## **Student Honors, Awards, Publications**

### Current NIH F-grant awardees

#### **Monica Jimenez**

F31 DK122677

The microbiota regulates the progression of obesity through a highly conserved family of micro RNAs.



#### **Suna Li**

F31 DE029361

The role of the lateral habenula in central pain and itch processing.

#### **Nate Sotuyo**

F31 NS108622

Treatment of epilepsy and associated comorbidities using stem cell-derived interneurons to correct circuit dysfunction in an animal model of Dravet Syndrome.





**Elise Peauroi**

F30 AI149864

The novel innate immune-antagonistic effects of ectromelia virus C15 protein.

**Ashley Vanderbeck**

F30 AI161873

Role of Notch signaling during the early priming and activation of alloreactive T cells.



## Publications 2019-2020

### 2019

**Baumann, BH**, Shu W, Song Y, Sterling J, Kozmik Z, Littleton-Lakhal S, and Dunaief JL. (2019) Liver-Specific, but Not Retina-Specific, Hecpudin Knockout Causes Retinal Iron Accumulation and Degeneration. *Am. J. Pathol.* 189:1814-1830 PMID: PMC6723216

**Baumann, BH**, Shu W, Song Y, Simpson EM, Lakhal-Littleton S, and Dunaief JL. (2019) Ferroportin-mediated iron export from vascular endothelial cells in retina and brain. *Exp. Eye Res.* 187:107728 PMID: PMC6759385

Khan RS, **Baumann B**, Dine K, Song Y, Dunaief JL, Kim SF, and Shindler KS. (2019) Dexas1 deletion and iron chelation promote neuroprotection in experimental optic neuritis. *Sci. Reports* 9: 11664. PMID: PMC6690882

Schultz, H, Song Y, **Baumann BH**, Kappahn RJ, Montezuma SR, Ferrington DA, and Dunaief JL (2019) Increased serum proteins in non-exudative AMD retinas. *Exp. Eye Res.* **2019**, 186, 107686 PMID: PMC6703940

Shu W, **Baumann BH**, Song Y, Liu Y, Wu X, and Dunaief JL. (2019) Iron accumulates in retinal vascular endothelial cells but has minimal retinal penetration after IP iron dextran injection in mice. *Invest. Ophthalmol. Vis. Sci.* 60(13): 4378-4387 PMID: PMC6798310.

**Xie, Sherrie**, Alison L. Hill, Chris R. Rehmann, and Michael Z. Levy. (2019) Dynamics of bed bug infestations and control under disclosure policies. *Proceedings of the National Academy of Sciences USA* 116: 6473-6481 (2019) PMID: PMC6442569

- Xie S**, Hubbard RA, and Himes BE. (2019) Analysis of spatial trends in smoking status among patients with obstructive airway diseases highlight potential for targeted smoking cessation interventions. *AMIA Annu Symp Proc.* 2019: 1256–1265. PMID: PMC7153095
- Cho IK, **Hunter CE**, Ye S, Pongos AL, and Chan AWS. (2019) Combination of stem cell and gene therapy ameliorates symptoms in Huntington's disease mice. *Nature Regenerative Medicine* 4:7; <https://www.nature.com/articles/s41536-019-0066-7>
- Hlavaty SI**, Chang Y-M, Orth RP, Goulian M, Planet PJ, Thamm DH, Punt JA, and Garden OA. (2019) Bacterial killing activity of polymorphonuclear myeloid-derived suppressor cells isolated from tumor-bearing dogs. *Front. Immunol.* 10:1-8 PMID:PMC6400936
- Vanderbeck A** and Maillard I. (2019) Notch in the niche: new insights into the role of Notch signaling in the bone marrow. *Haematologica* 104(11):2117-2119. PMID: PMC6821628
- Virtue AT, McCright SJ, Wright JM, **Jimenez MT**, Mowel WK, Kotzin JJ, Joannas L, Basavappa MG, Spencer SP, **Clark ML**, Eisennagel SH, Williams A, Levy M, Manne S, Henrickson SE, Wherry EJ, Thaiss CA, Elinav E, Henao-Mejia, J. (2019) The gut microbiota regulates white adipose tissue inflammation and obesity via a family of microRNAs. *Science Transl. Med.* 11(496): eaav1892. PMID: PMC7050429
- Reyes Ruiz VM, **Sousa GL**, Sneed SD, Farrant KV, Christophides GK, Povelones, M (2019) Stimulation of a protease targeting the LRIM1/APL1C complex reveals specificity in complement-like pathway activation in *Anopheles gambiae*. *PLoS One.* 14(4):e0214753. PMID: PMC6453449
- Bishnoi R, **Sousa GL**, Contet A, Day CJ, Hou CD, Profitt LA, Singla D, Jennings MP, Valentine AM, Povelones M, Baxter RHG. (2019) Solution structure, glycan specificity and of phenol oxidase inhibitory activity of *Anopheles* C-type lectins CTL4 and CTLMA2. *Science Reports* 9(1):15191. PMID:PMC6811590
- Frank DB, **Penkala IJ**, Zepp JA, Sivakumar A, Linares-Saldana R, Zacharias WJ, Stolz KG, Pankin J, Lu M, Wang Q, Babu A, Li L, Zhou S, Morley MP, Jain R, Morrisey EE. (2019) Early lineage specification defines alveolar epithelial ontogeny in the murine lung. *Proc Natl Acad Sci U S A.* 116(10):4362-4371. PMID:PMC6410851
- Samuels AN**, Roggiani M, Zhu J, Goulian M, Kohli RM. (2019) The SOS response mediates sustained colonization of the mammalian gut. *Infect. Immun.* 87(2). pii: e00711-18. PMID: PMC6346138
- Carey JN**, Mettert EL, Fishman-Engel DR, Roggiani M, Kiley PJ, Goulian M. (2019) Phage integration alters the respiratory strategy of its host. *Elife* 8. pii: e49081. doi: 10.7554/eLife.49081. PMID: PMC6814406
- Louis L, **Clark M**, Wise MC, Glennie N, Wong A, Broderick K, Uzonna J, Weiner DB, and Scott P. (2019) Intradermal synthetic DNA vaccination generates *Leishmania*-specific T cells in the skin and protection against *Leishmania major*. *Infect Immun.* 87(8): e00227-19. PMID: PMC6652766

- Kotzin JJ, Iseka F, Wright J, Basavappa MG, **Clark ML**, Ali M-A, Abdel-Hakeem MS, Robertson TF, Mowel WK, Joannas L, Neal VD, Spencer SP, Syrett CM, Anguera MC, Williams A, Wherry EJ, and Henao-Mejia J. (2019) The long noncoding RNA *Morrbid* regulates CD8 T cells in response to viral infection. *Proc Natl Acad Sci U S A*. 116(24): 11916–11925. PMID: PMC6575676
- Carey JN**, Goulian M. (2019) A bacterial signaling system regulates noise to enable bet hedging. *Curr. Genet.* 65(1):65-70. PMID: PMC6291380
- Casal ML, Engiles, JB, Pipan MZ, Berkowitz A, Porat-Mosenco Y, Mai W, Wurzburg K, Xu M-Q, **Allen R**, O'Donnell PA, Henthorn PS, Thompson K, and Shore EM. (2019) Identification of the identical human mutation in ACVR1 in 2 cats with Fibrodysplasia Ossificans Progressiva. *Vet. Pathol*, 56(4): 614-618.
- Vanderbeck AN** and Maillard I. (2019) Notch in the niche: new insights into the role of Notch signaling in the bone marrow. *Haematologica*. 104(11): 2117–2119. PMID: PMC6821628
- 2020**
- Allen RS**, Tajer B, Shore EM, Mullins MC (2020) Fibrodysplasia ossificans progressive mutant ACVR1 signals by multiple modalities in the developing zebrafish. *eLife* 9:e53761. PMID: PMC7478894
- Sousa GL**, Bishnoi R, Baxter RHG, Povelones M. (2020) The CLIP-domain serine protease CLIPC9 regulates melanization downstream of SPCLIP1, CLIPA8, and CLIPA28 in the malaria vector *Anopheles gambiae*. *PLoS Pathogens* 16(10):e1008985. PMID: PMC7580898
- Wanting S, **Baumann BH**, Song Y, Liu Y, Wu X, and Dunaief JL (2020) Ferrous but not ferric iron sulfate kills photoreceptors and induces photoreceptor-dependent RPE autofluorescence. *Redox. Biol.* 2020 Jul; 34: 101469. doi: 10.1016/j.redox.2020.101469. PMID: PMC7327978
- Ryan SK, Gonzalez MV, Garifallou JP, Bennett FC, Williams KS, **Sotuyo NP**, Mironets E, Cook K, Hakonarson H, Anderson SA, and Jordan-Sciutto KL. (2020) Neuroinflammation and IEF2 signaling persist despite antiretroviral treatment in an hiPSC tri-culture model of HIV infection. *Stem Cell Reports* 14(5): 703-716 PMID: PMC7221088.
- Forsyth KS, Roy NH, **Peauroi E**, DeHaven BC, Wold ED, Hersperger AR, Burkhardt JK, and Eisenlohr LC. (2020) Ectromelia-encoded virulence factor C15 specifically inhibits antigen presentation to CD4+ T cells post peptide loading. *PLoS Pathog.* 16(8): e1008685. PMID: PMC7425992
- Shepley-McTaggart A**, Fan H, Sudol M, and Harty RN. (2020) Viruses go modular. *J. Biol. Chem.* 295(14): 4604–4616. PMID: PMC7135987

## ALUMNI UPDATES

### **Theresa Alenghat, VMD (2003) PhD (2007)**

**Member, Division of Immunobiology**

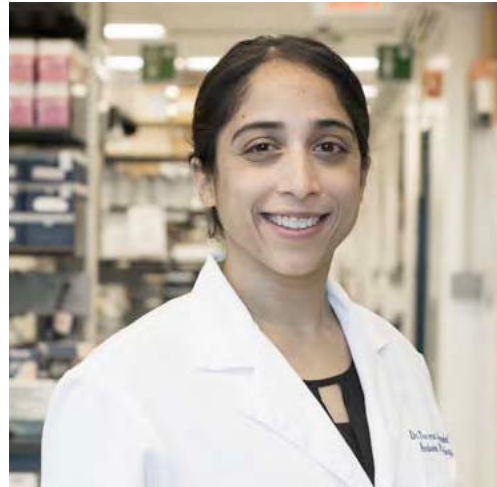
**Associate Professor**

**Department of Pediatrics**

**Cincinnati Children's Hospital**

Theresa has a new publication:

Wu S., Hashimoto-Hill S., Woo V., Eshleman E., Whitt J., Engleman L., Karns R., Denson L.A., Haslam D., and **Alenghat T.** (2020). Microbiota-derived metabolite promotes HDAC3 activity in the gut. **Nature**. 586(7827):108-112. doi: 10.1038/s41586-020-2604-2.



### **Jessica Bertout VMD (2010), PhD (2008)**

**Co-Founder**

**CASTR Alliance**



Jessica recently co-founded a veterinary clinical research organization called CASTR Alliance which provides clinical research services for sponsors and partners interested in running translational studies in companion animal patients. CASTR Alliance provides study design and protocol development, through full study execution. Excitingly, they initiated their first study in late August on the safety, efficacy, and pharmacokinetics of gefitinib in canine osteosarcoma. Due to significant overlap between canine and pediatric osteosarcoma, positive results would have the potential not only to benefit canine patients, but also to set a precedent for the evaluation of such combinations in clinical trials involving human patients.

She also recently adopted a Newfoundland puppy named Rookie. He has surpassed the weight and size of her other three children at this point, weighing in around 115 lbs at 10 months. Isabelle (12y), Sam (10y) and Charlie (7y) are loving the extra company at home as they continue their

remote school programs.

#### **Recent publication:**

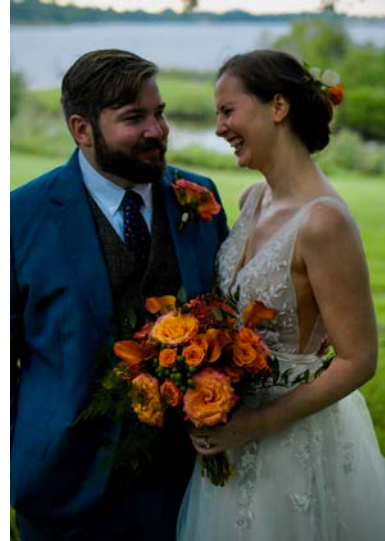
Gundle KR, Deutsch GB, Goodman HJ, Pollack SM, Thompson MJ, Davis JL, Lee MY, Ramirez DC, Kerwin W, **Bertout JA**, Grenley MO, Sottero KHW, Beirne E, Frazier J, Dey J, Ellison M, Klinghoffer RA, Maki RG. (2020) Multiplexed Evaluation of Microdosed Antineoplastic Agents In Situ in the Tumor Microenvironment of Patients with Soft Tissue Sarcoma. *Clinical Cancer Research* 26 (15) 3958-3968 DOI:10.1158/1078-0432.CCR-20-0614



**Abigail Shearin VMD (2017) PhD (2016)**  
**Veterinary Medical Officer**  
**Food and Drug Administration**

Personal update:

Abby married John Bradley on September 12, 2020!



**Mary Robinson**  
**VMD (2010) PhD (2009)**  
**Director, PennVet Equine Pharmacology Lab**  
**Assistant Professor**  
**Clinical Studies, New Bolton Center**  
**University of Pennsylvania**

Mary was recently appointed tenure-track Assistant Professor in Pharmacology at Penn Vet in the Department of Clinical Studies New Bolton Center, and she is a diplomat of the American College of Veterinary Clinical Pharmacology. Her contract with the Commonwealth of Pennsylvania for equine drug testing was renewed July 1, 2019 through April 19, 2022 for \$10.9 million.

**Catherine Brinkley**  
**VMD (2015) PhD (2013)**  
**Associate Professor**  
**College of Agriculture and Environmental Science**  
**University of California, Davis**

Katie earned tenure officially this summer! She also writes that it was delightful to see so many people at both PennDesign and PennVet when was a speaker in the opening session at the Farm of the Future event.

- Catherine Brinkley, UC Davis
  - *The One Health sustainability paradigm and planning for healthy communities and food systems*





**Rebecca Evans VMD (2017) PhD (2015)  
Scientist II  
Repertoire**

For the past couple of years, Rebecca has been establishing herself clinically, but she is now excited to return to a primarily research role. In January she will begin a new position as Scientist II in the Boston area company, Repertoire. She will continue to do part time ER moonlighting at Mass Vet Referral Hospital.

**Jeffrey Carey VMD (2019) PhD (2018)  
Postdoc  
University of Washington**

Jeffrey recently received the prestigious Helen Hay Whitney Foundation postdoctoral fellowship!



**Upcoming Events:**

**VMD-PhD Admissions Interviews  
January, 2021**

**Penn Vet Student Research Day  
March, 2021**

**We want to know....**

New position, promotion, patent, publication, etc.? Please share your news!  
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