ANNUAL REPORT 2019



LEADERSHIP PROGRAM FOR VETERINARY STUDENTS

Preparing tomorrow's scientists and public health professionals, today.







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CREDITS

Editing & Layout Ellen Leventry

Photography Alexis Wenski-Roberts

Produced by the Cornell University College of Veterinary Medicine.

Cornell University is an equalopportunity, affirmative-action education and employer.

On the cover:

Tabitha Spanjersberg works on developing new antibiotics to treat the rapidly growing problem of multidrug-resistant nontuberculous mycobacteria, including Mycobacterium abscessus subspecies, which are responsible for a wide spectrum of skin and soft tissue diseases.

To the left:

Natrine Cheuk explores the role of SIRT5 in breast cancer progression.



The annual Cornell Leadership Program for Veterinary Students provides students from around the world with learning experiences that clarify and reinforce their commitment to careers in science.

Since its beginning 30 years ago, more than 690 students have participated in this summer semester program. Hailing from veterinary colleges from all corners of the globe, many have become scientific leaders within the veterinary profession.

Veterinary students are aware of what a career in clinical medicine entails, but are much less informed about careers in biomedical research, public health, or in the pharmaceutical industry. This leads to a critical shortage of veterinary scientists and endangers the future success of the veterinary profession.

Our program introduces the most talented of veterinary students to the attractions of biomedical research as a career and to provide them with practical career guidance on how to succeed.

Research is the major focus of the program. Our summer scholars

undertake individual research projects under the guidance of Cornell faculty members who are all highly successful scientists and experienced mentors. The university's world-class research facilities and intellectual environment support the scholars' research investigations.

In addition to laboratory-based research, program scholars participate in modules and workshops that are designed to highlight employment and leadership opportunities for veterinary graduates in academia, government, and industry.

The 14 outstanding scholars who participated in 2019's program are featured throughout this annual report. And while it is too early to know exactly where they will take their careers; based on the achievements of our alumni, we can certainly expect great things from them!

> John S. L. Parker, BVMS, PhD Program Director

The first program of its kind in the world, the Cornell University Leadership Program is commited to science excellence, developing a legacy of leadership.



We Couldn't Do It Without You

The Cornell University Leadership Program for Veterinary Students is only made possible by the generosity and support of numerous groups and individuals.

The Leadership Program for Veterinary Students is made possible through awards from federal agencies, corporations, foundations, and other private sector sponsors.

For their generous support, the program organizers wish to thank the following:

- Albert C. Bostwick Foundation
- Boehringer Ingelheim Inc.
- Cornell Feline Health Center
- Dr. Geoffrey Letchworth
- Deutscher Akademischer Austauschdienst
- Ernst Reuter Society
- Müller-Peddinghaus Stiftung
- National Institutes of Health
- University of Cambridge
- The Royal Veterinary College

The program organizers would also like to thank the facilitators, counselors, and mentors who took part in the 2019 program, as well as those who dedicate themselves to creating the best program possible:

- Calista-Rae Campbell, Program Student Coordinator
- Bonnie Coffin
- Kimberly Hayes
- Dr. Douglas McGregor

- Dr. David Fraser
- Ellen Leventry
- Alexis Wenski-Roberts
- and David Frank.

From time-to-time, the program organizers have described elements of the program, strategies for their implementation, and outcomes of this initiative. Recent publications include:

- Promoting Science-Based Careers Through Student-Directed Learning. McGregor, D.D. and Fraser, D.R. J. Vet. Med. Educ. 33; 294, 2006.
- Counseling Veterinary Students Who Aspire to Careers in Science. McGregor, D.D. and Fraser, D.R. JAVMA 229:668, 2006.
- Acquainting Veterinary Students with Careers in the Pharmaceutical Industry. McGregor, D.D., Fraser, D.R., Haven, M.L. and Hickey, Gerard. J Vet. Med. Educ. 34:139, 2007.
- Career Paths of Alumni of the Cornell Leadership Program for Veterinary Students. Fraser, D.R., McGregor, D.D. and Gröhn,

"The program propelled me along the career path I am now pursuing."

- Steven Daly, 2000

Y.T. Vet. Record 163:750, 2008.

- Vocational Choices Made by Alumni of the Leadership Program for Veterinary Students at Cornell University.
 Fraser D.R., Parker J.S.L., McGregor D.D. J. Am. Vet. Med. Assoc. 249:759, 2016.
- Tracking veterinary students who aspire to careers in science. McGregor, D.D., Fraser, D.R., Parker, J.S.L. J. Vet. Med. Educ. 47:100, 2020.

Finally, the organizers congratulate the participating scholars. Their academic achievements, coupled with their dedication to discovery and service, mark these individuals as future leaders of the veterinary profession.



Exploring New Horizons in Veterinary Sciences

The Leadership Program for Veterinary Students at Cornell University is a unique summer research experience for veterinary students who seek to broadly influence the veterinary profession through a science-based career.

The Leadership Program combines facultyguided research with student-directed learning through participation in modules, workshops, and group discussions. These activities encourage responsible leadership, critical thinking, and the development of teamwork skills.

The program also highlights graduate training opportunities calculated to promote the professional development of program alumni as independent scientists and public health professionals.

Research

Each Leadership Program scholar is assigned a project and a faculty mentor to guide his or her research. The projects enable the students to gain practical experience by exploring problems of interest to them.

Simultaneously, students hone their communication skills through engagement in group discussions and by presenting their research findings in a public forum at the conclusion of the program.

Infectious Diseases

A workshop moderated by Professors Terence Dermody, Gerlinde Van de Walle, Brian VanderVen, and John Parker featured discussions of Zoonotic brucellosis, Crimean-Congo Hemorrhagic Fever, Rift Valley fever, and influenza. These infectious agents are responsible for emerging or re-emerging diseases in humans and animals.

Program scholars selected the diseases on which they wanted to focus. Then they conducted research on the topics and employed Socratic methods to engage their peers and facilitators in lively and informative discussions.

Later in the day, the facilitators commented on related issues and the need for veterinary scientists who contemplate careers in infectious disease research or veterinary public health.

Leadership

Leadership and its attendant responsibilities are central considerations in the Leadership Program.

Critical thinking and decision-making are featured in a scenario-based module that explores public health, economic, political, and social issues. Students and facilitators are assigned roles that oblige them to articulate, defend, or modify their views as the scenario unfolds.

At the conclusion of the module, the

facilitators comment on the exercise and discuss leadership principles they have adopted in their own careers.

This year, Professor David Fraser moderated the discussion with assistance from Dr. Simon Priestnall, Dr. Cynthia Leifer, and Professor Douglas McGregor.

Careers in Industry

Drs. Gerry Hickey, Emily Hickey and Peggy McCann discussed potential paths for veterinary students in industry. The facilitators helped the students practice answering questions for industrial interviews and engaged the students in debates about controversies within animal science and industry.

Career Explorations

Career planning is featured prominently in the Leadership Program.

Three meetings were convened to consider opportunities for veterinary graduates to broadly influence the veterinary profession through careers in the academy, government or industry.

Professor John Parker hosted a panel that explored career options available to veterinary graduates who aspire to careers in science. Professor Gerlinde Van de Walle and Dr. Elizabeth Moore emphasized the importance of selecting a superior environment for graduate research training and a mentor who has a successful training record.

A companion meeting addressed issues related to graduate research training. Professors John Parker and Robert Weiss identified aspects of training that one should weigh in selecting an institution for graduate study; the subject of one's thesis research and an individual to guide one's graduate studies. In a separate meeting, a case study illustrated "translational science." The ensuing discussion led by Professor Kenneth Simpson revealed how an individual trained to a high level of proficiency as both a clinical specialist and research scientist can extend the frontiers of knowledge through his or her capacity to define disease mechanisms at the cell or molecular level.

2019 Program Agenda

- June 3: Opening Meeting Ethics Discussion, Tour of Vet College & Baker Institute, Welcome BBQ
- June 4: Student/Mentor Breakfast, Laboratory Orientation, CARE Training
- June 9: Career Exploration Discussion, Leadership Pre-Meeting
- June 10: Role Playing Leadership Module, Reception & Dinner with Mentors
- July 1: Research Project Previews
- July 8: Infectious Diseases Workshop
- July 11: Reunion Dinner
- July 15: Careers in Industry Workshop
- July 17: Research Training Discussion
- July 19: Leadership in Action
- July 26–28: National Veterinary Scholars Symposium
- July 29: Translational Science Discussion
- July 31: Cheese & Wine Gathering
- August 5 : Career Planning Discussion
- August 8: Research Presentations, Farewell Dinner







Infectious Disease Workshop

A workshop moderated by Professors Terence Dermody, Gerlinde Van de Walle, Brian VanderVen, and John Parker featured discussions on infectious agents that are responsible for emerging or re-emerging diseases in humans and animals.

National Veterinary Scholarship Symposium

Many of this year's students attended the National Veterinary Scholars Symposium hosted by Tufts Cummings School of Veterinary Medicine in Worcester, MA, July 26th to 28th. They presented their work in a poster session and enjoyed the opportunity to meet and interact with nearly 500 other veterinary students undertaking summer research programs.

Leadership in Action Workshop

The 1992 film "A Few Good Men" illustrates both the strengths and deficiencies of individuals cast in leadership roles. The students used the film as a jumping-off point to discuss leadership characteristics with Professors David Fraser and Douglas McGregor.

Careers in Industry Workshop

Drs. Gerry Hickey, Emily Hickey and Peggy McCann discussed potential paths for veterinary students in industry. The facilitators helped the students practice answering questions for industrial interviews and engaged the students in debates about controversies within animal science and industry.



Program Dinner

The Leadership Program scholars hosted a dinner for their mentors, module facilitators, counselors, and other guests on the grounds of the Baker Institute.

FACILITATORS



Dr. Hector Aguilar-Carreno Associate Professor Microbiology & Immunology Cornell University



Dr. Terence Dermody Chair & Professor: Pediatrics University of Pittsburgh School of Medicine



Dr. Gerard Hickey President Synergy Regulatory Services



Dr. Cindy Leifer Associate Professor Microbiology and Immunology Cornell University



Dr. John Parker Associate Professor Microbiology & Immunology Cornell University



Dr. Simon Priestnall Professor Pathology Royal Veterinary College



Dr. Kenneth Simpson Professor Clinical Sciences Cornell University



Dr. Lisa Fortier Associate Chair & Professor Clinical Sciences Cornell University



Dr. David Fraser Professor & Dean Emeritus Animal Science University of Sydney



Dr. Emily Hickey CEO, Biomere (Biomedical Research Models, Inc.)



Dr. Peggy McCann Associate Vice President Regulatory Affairs Merck & Co.



Dr. Douglas McGregor Professor Emeritus Microbiology & Immunology Cornell University



Dr. Elizabeth Moore Postdoctoral Fellow Biomedical Engineering Cornell University



Dr. Brian VanderVen Assistant Professor Microbiology & Immunology Cornell University



Dr. Gerlinde Van de Walle Associate Professor Microbiology & Immunology Cornell University



Dr. Robert Weiss Associate Dean for Research & Graduate Education Molecular Genetics Cornell University

The Scholars of 2019

RANKS.

This summer's scholars represent a diverse group of 14 veterinary students of eight different nationalities. They join over 600 alumni scholars from 50 different colleges and universities.

Australia, France, Germany, Britain, the Netherlands, and the United States. Our 2019 scholars hailed from every corner of the earth and represent just as many disciplines. Outside of the lab, their pursuits are just as diverse as their research, including music, dance, art and graphic design, dressage, a variety of sports, writing, photography, and slacklining.

This well-rounded excellence is reflected in the fierce competition amongst participants for the Leadership Program prizes awarded at the end of the 10-week session. The scholars discussed their research in a series of presentations over two days at the conclusion of the program.

A book prize was awarded to Anneloes Andriessen for the best overall research achievement as judged by her underlying hypothesis, investigative protocol, results, and presentation. Additional prizes were awarded to Jessica Kohs, Annkatrin Flegel, Plotine Jardat, and Dylan Yaffy, for exceptional achievements in molecular biology, cell biology, and integrative biology, respectively.

Honoria Brown was awarded a prize for the highest-ranking presentation by a scholar from the United Kingdom or Australia.

The Selection Committee for the 2019 Leadership Program salutes these individuals and congratulates the entire group for their commitment to research and the excellence of their presentations.

Now, without further ado, get to know more about our 2019 scholars on the following pages.

Anneloes Andriessen

Extracellular vesicles and the maintenance of pluripotency in embryonic stem cells entire life



As a rising third-year veterinary master's student at Utrecht University, I applied to the Cornell Leadership Program with the objective of obtaining more research experience. This past summer, I worked in Dr. Richard Cerione's lab, on a project investigating the role of extracellular vesicles as a form of intercellular communication

among embryonic stem cells.

Extracellular vesicles (EVs) have emerged as important mediators of intercellular communication in various physiological and pathological processes. In this project, we have discovered a role for this unique form of intercellular communication in helping maintain pluripotency in embryonic stem cells (ESCs).

Interestingly, when ESCs cultured under differentiating-promoting conditions are treated with EVs isolated from naive pluripotent ESCs, they are able to maintain stem cell-like phenotypes, including expressing the core stemness proteins Oct3/4 and Nanog, and forming and being propagated as spheres.

Together, these findings suggest that EVmediated communication potentially serves as a novel mechanism that helps maintain pluripotency.

My research experience, in combination with the program's organized workshops and modules, have been my most career-shaping experience so far. The workshops and networking opportunities confirmed my interest in translational science and provided me with guidance on how to pursue such a career track. I hope to follow a career path in the field of cancer biology and/or regenerative medicine.

I am extremely thankful to Rick Cerione, Marc Antonyak and Yun Ha Hur for their supervision and mentorship. I would also like to thank Drs. Parker, Fraser and McGregor for all the effort they put into the organization of this wonderful program. Finally, I am grateful to the Bostwick Foundation and Dr. Geoff Letchworth for their support of my participation.

FIELD/SPECIALIZATION: Stem Biology

Marine Bazin

Detection of EHV-2 and EHV-5 in gastric ulcers of horses



The presence of equine herpesviruses 2 and 5 (EHV-2 and EHV-5) has been reported in healthy and, with a higher frequency, in ulcerated gastric mucosa of horses. In order to better define the correlation of these viruses with gastric, we need to analyze a much larger sample set, including glandular ulcers, which causes remain unclear.

For that purpose, samples from normal as well as from ulcerous squamous and glandular gastric tissues have been collected, either via necropsy or biopsy. DNA has been extracted from these tissues and will be used in a qPCR assay to detect and quantify EHV-2 and/or EHV-5 DNA. The standard curve for this qPCR is currently being developed by cloning viral DNA, spanning a consensus region of glycoprotein B that is conserved in most strains of EHV-2 and EHV-5.

I aim to combine a career in research with clinical work in equine internal medicine. Thanks to the Leadership Program, I have a much clearer idea of how to achieve that goal and would like to pursue a residency in equine medicine followed by a PhD after graduating from veterinary school.

I am really thankful to my mentor, Dr. Gerlinde Van de Walle, for accepting me in her lab. I would also like to thank my supervisor, Dr. Joy Tomlinson, for her guidance, and Dr. Rebecca Harman for helping me carry out my experiments. I gained an invaluable research experience. I would also like to express my gratitude to Drs. Parker, Fraser and McGregor for leading such a remarkable program, and to the Müller-Peddinghaus fund for its financial support.

FIELD/SPECIALIZATION: Cancer Biology CORNELL MENTOR: Gerlinde Van de Walle, Baker Institute

 ${\tt FUNDING:}\ Mueller-Peddinghaus\ Fund$

HOME UNIVERSITY: Utrecht University

CORNELL MENTOR: Rick Cerione, Molecular Medicine

FUNDING: Bostwick Foundation; Letchworth Gift

AWARD: Program Prize

HOME UNIVERSITY: University of Veterinary Medicine Hannover (TiHO)

Honoria Brown

Investigating the role of miR-375 as a regulator of Wnt signaling in colorectal cancer



My project focused on the role of microRNAs (miRNAs) in colorectal cancer (CRC). Colorectal cancer is the second leading cause of cancerrelated mortality worldwide and there is a great need to identify novel therapeutics. miRNAs have been shown to promote cancer phenotypes and have been identified as potential

therapeutic targets. miR-375 is one of the most highly expressed miRNAs in normal colon tissue, and is the most significantly downregulated in CRC. My project aimed to identify novel gene targets of miR-375 which may be mediating its tumor suppressive effects in an attempt to better understand its mechanistic role in CRC.

The Veterinary Leadership Program really opened my eyes to the research-oriented career possibilities available through veterinary medicine. I now feel more confident in the career direction I want to pursue. My current goals are to undertake a PhD following the completion of my vet degree. I would then love to enter research either through academia or industry, potentially with a biotech aspect. I feel that the Leadership Program has given me leadership experience, shown me what to look for in a research mentor, and given me lifelong friends and a network of like-minded vets from across the globe.

Thank you to Jonathan Villanueva and Dr. Charles Danko for their mentorship and support this summer and for giving me so much valuable teaching. Thank you also to all of the Program organizers for allowing this once-in-a-lifetime experience! Finally, thank you to Cambridge University for providing the financial support to allow me to participate in this program.

HOME UNIVERSITY: Cambridge University FIELD/SPECIALIZATION: Cancer Biology CORNELL MENTOR: Charles Danko, Baker Institute FUNDING: Cambridge University AWARD: UK & Australia Prize

Natrine Cheuk

The role of SIRT5 in breast cancer progression



As a rising second year at Purdue University with an interest in pursuing specialty training in internal medicine/oncology, I applied to the Leadership Program wanting to explore ways to integrate research in my veterinary career, improve my research skills, and network with other like-minded individuals. In the Weiss Lab, I

investigated the role of SIRTS in breast cancer progression. SIRT5 is a NAD-dependent deacylase that catalyzes various physiological processes. While SIRT5 is dispensable in normal cells, it is amplified across cancers.

Previous studies in the Weiss lab have shown that Sirt5 loss decreases tumor progression in a transgenic breast cancer mouse model (MMTV-PyMT), where female mice are prone to developing mammary adenocarcinoma and spontaneous lung metastasis. We discovered pharmacological inhibition of SIRT5 in the MMTV-PyMT mouse model and human breast cancer xenograft model both impairs tumor growth.

To further investigate the role of SIRT5 in human breast cancer, we assessed the effect of SIRT5 loss in human triple-negative breast cancer cells (MDA-MB-231) and discovered that SIRT5 promotes anchorage-independent growth. Lastly, to establish SIRT5 as a therapeutic target, we developed a patientderived xenograft model using NOD scid mice to compare tumor progression following SIRT5-specific inhibitor treatment.

I would love to take this opportunity to thank Dr. Robert Weiss and Irma Fernandez for their guidance and support throughout the summer. I would also like to thank Drs. Parker, Fraser, and McGregor for organizing this momentous program and providing insightful advice for my career. The program has far exceeded my expectations and I am walking away feeling informed and inspired to become a translational scientist.

Finally, I would like to thank the Bostwick Foundation and Dr. Geoff Letchworth for the financial support for my participation in the program.

HOME UNIVERSITY: Purdue University FIELD/SPECIALIZATION: Cancer Biology CORNELL MENTOR: Robert Weiss, Biomedical Sciences FUNDING: Bostwick Foundation; Letchworth Gift

Annkatrin Flegel

Fusion-activation of Middle Eastern Respiratory Syndrome (MERS)-coronavirus (CoV) spike protein is influenced by calcium



There are currently no efficient drugs or vaccines to treat or prevent ongoing outbreaks of MERS-CoV. This summer I investigated the effect of calcium ions on the fusion activity of the MERS-CoV spike protein. I found that MERS-CoV fusion is dependent on high calcium concentrations. We hypothesize that the positively charged calcium

cation interacts with negatively charged amino acids in the fusion peptide of MERS-CoV and aids in viral fusion. This observation may provide insight into how viral fusion of MERS-CoV might be inhibited.

I would like to express my great gratitude to the Whittaker and Daniel lab for their guidance, support and exceptional mentoring throughout my project.

Although I have a broad range of interests, I was excited to work on this project, as I have always been curious about problems involving emerging infectious diseases. This project was also aligned with my future career objectives and has me considering different career opportunities in this field. I am interested in conducting research on viral pathogenesis and transmission in the future. I can also picture myself working for a (governmental) institution to monitor and prevent disease outbreaks.

I am a third-year veterinary student from Germany. Joining the Cornell Leadership Program was a truly rewarding experience and has helped me with my career plans. My special thanks go to Drs. Fraser, Parker and McGregor for organizing this program. Finally, I would like to thank the DAAD for providing scholarship support and the Bostwick Foundation for providing support that allows this program to continue.

HOME UNIVERSITY: Freie Universität Berlin

FIELD/SPECIALIZATION: Virology

CORNELL MENTOR: Susan Daniel and Gary Whittaker Microbiology & Immunology

FUNDING: DAAD

AWARD: Cell Biology Prize

Babette Fletemeyer

Variants of the low affinity IgE receptor CD23 in horses and their expression in different cell populations



CD23 is a low affinity receptor for IgE that is mainly expressed on B lymphocytes. It has an important role in immune regulation in the context of IgE responses and antigen presentation. Recently a population of peripheral blood mononuclear cells (PBMC) with high CD23 expression was found in horses allergic to Culicoides spp. The aim of my project

was to characterize CD23 high cells and identify different CD23 variants in the horse.

I want to thank the whole Wagner Lab for welcoming me and making this summer such a great experience.

Also, I want to thank Drs. Parker, Fraser and McGregor for putting so much effort into organizing this program. Due to my experiences I gained during the Leadership Program I am now certain about completing a PhD after graduation from vet school in 2023. I am interested in exploring a career in academia but also industry.

Finally, I am very grateful for the financial support from the DAAD and the Müller-Peddinghaus Stiftung that allowed me to participate in the program.

HOME UNIVERSITY: University of Veterinary Medicine Hannover (TiHO)

FIELD/SPECIALIZATION: Cancer Biology CORNELL MENTOR: Bettina Wagner Population Medicine & Diagnostic Science

FUNDING: DAAD; Müller-Peddinghaus Stiftung



Plotine Jardat

How do mice use their urine to communicate?



Mice, like most mammals, use urine for communication with individual conspecifics. However, because of the difficulty of tracking urine deposition over long periods of time, very little is known about how mice dynamically allocate their urine to scent marking. We have developed a novel and unobtrusive

technique to measure scent marking decisions over multiple days in multiple mice. Three different species of mice were studied to compare the scent marking behaviors of groups of mice from different ecological and genetic backgrounds.

I would like to thank Prof. Michael Sheehan for welcoming me in his lab this summer and including me in the team investigating scent marking behavior in mice. In this project I worked hands-on with animals and conducted data analysis that included programming - two things I really enjoy in science.

In the future I would like to pursue a PhD focused on animal behavior. My goal is to improve animal welfare and I would like to help the veterinary community to better understand companion animal behavioral issues in a scientific way.

In addition to giving me the opportunity to gain experience in research among great scientists, this program has helped me to understand the importance and the nature of leadership in science and has shown me how I could play a role in making the world a better place. It has also provided me with a large network of potential mentors and collaborators, along with friends all over the world that I will keep for life. Thank you to the Bostwick Foundation and Dr. Geoff Letchworth for supporting my participation in this program.

HOME UNIVERSITY: École Nationale Vétérinaire d'Alfort

FIELD/SPECIALIZATION: Behavior

CORNELL MENTOR: Michael Sheehan Neurobiology & Behavior

FUNDING: Bostwick Foundation, Letchworth Gift AWARD: Integrative Biology Prize

Karuna Katariwala

PAR2 Expression and JNK Signaling-Inhibition in Murine Bone Marrow-Derived Macrophages



Tumor cells are known to influence macrophage behavior and promote tumor growth and metastasis. However, the mechanisms are unknown.

We previously showed that tumor-derived microvesicles (MVs) contain tissue factor, have procoagulant activity, in a Protease-activated Receptor (PAR) 1-dependent manner. PARs are important G-protein coupled receptors for various

enzymes, including activated coagulation factors.

I tested the hypothesis that cancer MVs would stimulate cellular signaling and upregulate procoagulant activity in macrophages in a PAR-dependent manner. I found preliminary evidence that MVs from tumor cells did upregulate procoagulant activity in macrophages.

As a rising second year veterinary student at Cornell, participation in the Leadership Program allowed me to explore different career opportunities veterinary medicine offer as well as submerge myself into a world of research. The Program provided me with the opportunity to meet wonderful people from around the world and create long-lasting friendships.

This summer, I had the incredible opportunity to pursue research in a field I'm interested in. This allowed me to further explore what area of post-graduate training I would like to pursue.

I would like to thank Drs. Stokol and Leifer for hosting me and being great mentors this summer. Thank you to Jingyi Chen, Dr. Linda Huang, Karla Garcia-Martinez, Abigail DeJohn and Sophie Reynolds for sharing their laboratory with me and helping me throughout the summer.

Finally, thank you to the organizers and to the Bostwick Foundation and Dr. Geoff Letchworth for the financial support that allowed me to participate.

HOME UNIVERSITY: Cornell University

FIELD/SPECIALIZATION: Cancer Biology

CORNELL MENTOR: Tracy Stokol and Cindy Leifer Population Medicine & Diagnostic Science

FUNDING: Bostwick Foundation; Letchworth Gift

Jessica Kohs

Use of CRISPR-dCAS9 to investigate the role of PAD2 in estrogen receptor alpha activity at specific genomic loci



There are approximately 250,000 new cases of breast cancer in the United States each year. Approximately 75% of those cases are estrogen receptor alpha positive (ER α +). Peptidylarginine deiminase 2 (PAD2) catalyzes the deimination (or alternatively, citrullination) of positively charged arginine to a neutrally charged citrulline

on a range of target proteins, including histones.

Based on previous gene knockdown and inhibitor studies, we hypothesized that in ER α + breast cancer cells, estrogen induces PAD2-mediated histone citrullination that alters the chromatin structure at ER α binding sites and enhances the interaction of ER α -with DNA stimulating target gene transcription. The goal of my research project was to directly test this hypothesis using the endonuclease inactive, CRISPR dCas9 system.

For the project, I worked on developing a set of dCAS9-PAD2 fusion constructs (wild type, catalytic mutant, and calcium binding mutants). The overall goal of this project is to have a better understanding of the role and the importance of PAD2 in breast cancer.

I applied to the Cornell Leadership Program because it provided a unique opportunity to gain insight into various science-based graduate training and veterinary scientific careers. This program offered me new learning experiences in an inspiring environment of international participants. I truly enjoyed my stay at Cornell University.

I'd like to thank Dr. Coonrod for his mentorship. Special thanks to Brooke Marks, who was an amazing and patient teacher. I loved my time in the laboratory with such a friendly team! In addition, I'd like to thank Rae, Drs. Parker, McGregor and Fraser for such a fantastic program and Prof. Gruber for his support. Thank you to the Ernst-Reuter-Gesellschaft and the Bostwick Foundation for their funding which enabled me to participate in this wonderful program.

Lisa Kossak Isolation of Hap 2 in Tetrahymena thermophilia



Tetrahymena thermophilia is a binucleate ciliated protozoan frequently used as a model organism. During sexual reproduction, two cells fuse and exchange DNA due to a fusogen called Hap 2. The goal of my project was to develop a technique to isolate this fusogen.

During my summer project I was able to

isolate the HAP2 fusogen. Future experiments will determine how fusion works. This knowledge could be transferred to mammalian cells as we still do not know how the fusion of sperm with the egg occurs.

I am grateful to Dr. Theodore Clark whose mentoring and intellectual support were critical for my project. I also would like to thank Daniel Kolbin and Dr. Donna Cassidy-Hanley for their help and Ethan Seltzer, Zacharia Oliver and Mozammal Hossain for their technical support.

The Leadership Program was a special experience. I learned a lot scientifically but I also learned other things that will help me in my personal life and career choices.

During my project, I got an insight into a career in academic research. The leadership workshops were useful to learn how to behave in certain situations which can be transferred to any career.

Before the program I was interested in pursuing a career in research. Now I am sure that this plan is the right choice for me and that I do not want to become a clinician. After finishing my veterinary degree, I plan to do a PhD.

I would like to thank the organizers of the program and also the Ernst Reuter Society and the Bostwick Foundation for the financial support to participate in the program.

HOME UNIVERSITY: Freie Universität Berlin

FIELD/SPECIALIZATION: Cell Biology

CORNELL MENTOR: Ted Clark, Microbiology & Immunology FUNDING: Ernst Reuter Society, Bostwick Foundation

HOME UNIVERSITY: Freie Universität Berlin FIELD/SPECIALIZATION: Cancer Biology CORNELL MENTOR: Scott Coonrod, Baker Institute FUNDING: Ernst Reuter Society, Bostwick Foundation

AWARD: Molecular Biology Prize

Lawrence Noble

Investigating the expression and the gene that encodes sialyl-4-O-acetyltransferase in red pulp macrophages in mice



My project this summer was to isolate and culture red pulp macrophages (RPMs) from mouse spleens, and then to determine the gene responsible for the 4-O-acetylation of sialic acid. I isolated RPMs using magnetic cell separation (MCS) and further isolates cells expressing the 4-O-modification to analyze the specific

genes expressed. Determining the gene that encodes for 4-O-acetylation of sialic acid would enable us to manipulate its activity and determine the roles that modified sialic acid plays in host resistance and susceptibility to pathogens.

Over the summer, I worked in the 'Parrish lab' at the Baker Institute for Animal Health. The skills I acquired from working with a number of postdocs and PhD students was incredible and I would like to thank each of them for their time, patience and hospitality.

The program has opened my eyes to the opportunities available for research and other careers in veterinary medicine. My career plan at the moment is to be clinical veterinarian and undertake additional training in the US in the fields of equine medicine or neurology. After spending some time in practice, I hope to transition into an academic position, as I have a passion for teaching and I enjoy clinical research.

I would like to thank the directors and my peers for an unforgettable summer and the opportunity to attend Cornell College of Veterinary Medicine. I also would like to thank the Feline Health Center for funding my participation in the program.

HOME UNIVERSITY: University of Queensland

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FIELD/SPECIALIZATION: Glycobiology
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CORNELL MENTOR: Colin Parrish

Baker Institute for Animal Health

 ${\tt FUNDING:} \ \ Cornell \ Feline \ Health \ Center$

Talitha Spanjersberg Drug discovery in multidrug-resistant

Drug discovery in multidrug-resistant nontuberculous Mycobacterium abscessus



Rapidly growing multidrugresistant nontuberculous mycobacteria including Mycobacterium abscessus subspecies are responsible for a wide spectrum of skin and soft tissue diseases. In response to the urgent need for an effective drug against this emerging pathogen, we screened several hundred repurposed compounds that inhibit M. tuberculosis

against M. abscessus to identify inhibitory compounds. The minimum inhibitory concentration values for hit compounds that possessed growth inhibiting properties were identified and ongoing work will include optimizing these compounds for potency and determining their mechanism of action.

The Leadership Program not only gave me insights in the different types of careers in research, but also taught me some valuable life lessons. I met many inspiring people and we were able to ask questions that I normally would not ask. My career goal is to connect the relevance of veterinary medicine to other fields such as one health or translational research. One of the things that I learned during the expert sessions is that most opportunities come unpredictably. Thanks to this program, I feel better prepared and equipped to choose (unexpected) career opportunities wisely.

I am thankful to the members of the VanderVen lab for a fantastic 10 weeks this summer. In particular, I would like to thank Dr. Brian VanderVen for his mentorship and Emma Roszkowski for all her help with the experiments. I am very grateful to Drs. Fraser, McGregor and Parker for all the time and effort they put in organizing this outstanding program. Finally, I am grateful for the financial support from the Bostwick Foundation.

HOME UNIVERSITY: Utrecht University

FIELD/SPECIALIZATION: Bacteriology, Drug Discovery CORNELL MENTOR: Brian VanderVen Microbiology & Immunology

FUNDING: Bostwick Foundation

Matthew Wun

The search for novel antimicrobial agents derived from secreted products of resident symbiotic gut bacteria



I'm a final-year vet student at the Sydney School of Veterinary Science. I spent this summer in Prof. Kenny Simpson's lab working on a project focused on discovering novel therapeutics directed against inflammatory bowel disease (IBD)-associated dysbiosis. This 'dysbiosis' is characterized by an increase in opportunistic

pathosymbionts (OPSs) and a decrease in resident symbionts (RSs), and may contribute to the pathogenesis of IBD. We found that the cell-free supernatants (CFSs) from two RSs suppressed the growth of various OPSs but not RSs. Through various purification and analytical techniques, we identified candidate molecules in the CFSs that may be responsible for this antimicrobial activity. We hope this will open novel therapeutic avenues for selective intervention against IBD-associated dysbiosis.

The program has inspired me to pursue a career as a translational scientist, studying disease mechanisms at a cellular and molecular level in order to develop novel diagnostic and treatment options that improve clinical outcomes. Thanks to the various program workshops and support network it has provided, I now feel much more confident as an individual and am excited to work towards my career goals.

Thank-you to my wonderful supervisor Shiying Zhang for her guidance, my mentor Kenny Simpson for his endless ideas, advice and knowledge, and Drs. Parker, Fraser and McGregor for organizing this fantastic program. I'd also like to thank my fellow students for the friendship that made the past 10 weeks so enjoyable – it's been a privilege to share this journey with you all. Finally, thank you to the Feline Health Center for supplying the funding that allowed me to participate in the program.

HOME UNIVERSITY: University of Sydney FIELD/SPECIALIZATION: Bacteriology CORNELL MENTOR: Kenneth Simpson Clinical Services, Feline Health Center FUNDING: Cornell Feline Health Center

Dylan Yaffy

Transmission dynamics of highly pathogenic avian influenza among multiple waterfowl species and poultry: The impact of migration timing



Outbreaks of highly pathogenic avian influenza (HPAI) among wild birds and poultry pose a risk to human health and increase concern about the likelihood of another epidemic comparable to that of 2016/17 when H5N8 swept across Europe. With a focus on species overlap during migration, we modeled the transmission of HPAI between wild birds

and domestic poultry at wetland regions in Croatia. We developed a deterministic SIR compartmental model that can account for both the direct and indirect modes of pathogen transmission among 4 bird species. The model includes compartments for backyard poultry and compartments for Mute Swans, a sentinel species for HPAI outbreaks. Additionally, we modeled Mallards, an asymptomatic carrier of HPAI, represented with two groups of compartments corresponding to the migratory and non-migratory (resident) birds.

I will graduate from the Royal Veterinary College next year. The Leadership Program gave me an opportunity to explore career options and network with professionals who are in positions I aspire to attain. My research experience further helped me decide to focus my career on conservation medicine. At Cornell, I used mathematical modelling to evaluate the effect of overlap between stopover periods of different migratory waterfowl species on the epidemiology of highly pathogenic avian influenza. This project introduced me to disease modeling and helped build a strong basis for future wildlife epidemiology projects I hope to undertake.

I would like to thank Dr. Renata Ivanek for her mentorship, Dr. Wendy Beauvais for her guidance throughout the project and the Ivanek lab for a great learning environment. I am grateful to the program directors, Drs. Parker, Fraser and McGregor, and Royal Veterinary College for the generous funding support.

HOME UNIVERSITY: Royal Veterinary College

FIELD/SPECIALIZATION: Epidemiology, Modeling

CORNELL MENTOR: Renata Ivanek Population Medicine & Diagnostic Science

FUNDING: Royal Veterinary College

AWARD: Integrative Biology Prize





















Life Outside of the Laboratory

From local Ithaca landmarks to cultural centers within striking distance of campus, the scholars enjoyed time away from the classroom.

> From paintball (right) to baseball (below): While in Boston for the National Veterinary Scholarship Symposium, the students stopped by Fenway Park to catch the Red Sox play the Yankees. They also took a day to engage in some team play of their own—battling it out at Ithaca Paintball.







Participants in the Leadership Program were housed in the Zeta Psi fraternity house on the Cornell campus. They had exclusive use of the building for the ten-week period that the program was in session. Several events were scheduled there, typically in the evening in conjunction with a catered meal. The living arrangements enabled the scholars to socialize and relax in a convenient and pleasant campus environment.







Exploring the Empire State: Students experienced both the nature of Upstate New York (left: Taughannock Falls) and the hustle-and-bustle of New York City.





Discovering New Directions

It's funny how little moments can change your life in big ways.

Written by Rachel Allavena, 2000

I was standing in a cow yard listening to my production animal lecturer during a practical when he mentioned the Cornell Veterinary Leadership Program and encouraged all of us to apply.

I had intercalated a oneyear research degree with my veterinary training at The University of Queensland, School of Veterinary Science. I worked on the anatomy of Pteropid bats, or flying foxes, which act as a vector for the Australian bat Lyssa virus and Hendra virus. Having already had a taste of research, I was keen for more.

My university was very accommodating in allowing me to move my final year clinical rotations to fit the schedule of the program, as the American summer falls smack bang into the middle of our Australian academic year.

It was very exciting to arrive in New York City and make my way up to Ithaca–which is like a paradise in summer.

During the program, I worked in the laboratory of Dr. Colin Parrish at the Baker Institute, helping clone the canine transferrin receptor that the team was researching for Parvovirus cell entry. As an undergraduate researcher, I was lucky enough to be included on their paper, which is still one of my highest cited research outputs! The program was just amazing. It opened my eyes to an international career in biomedical research, as well as how versatile a veterinary science degree is for helping both animals and people. I graduated that year, and could not wait to come back to Cornell for my PhD in Comparative Medicine, working on tuberculosis with Prof. David Russell.

After my PhD, I did a pathology residency at Ontario Veterinary College in Canada, and after board certification worked in Europe in pharmaceutical development and drug safety testing.

After 10 years overseas, I returned home to Australia and The University of Queensland as a faculty member. I am an active researcher in comparative medicine, developing novel immunotherapies to treat pet dogs with cancer, and provide data for human clinical trials. My current research is on immunotherapies, metallic alloys for biomedical devices, and koala conservation.

I enjoy working on projects where animal and human health is progressed in parallel with a true one-medicine approach.

Personal and Professional: A Life Changing Experience

I ended up leaving Cornell with more than a PhD. I met my husband, a French computer scientist doctoral candidate, and had the most amazing time living in Ithaca. Shoveling snow off the driveway in the winter, exploring the woods and waterfalls in the summer, and commencement in the football stadium are all beautiful memories. Maybe not the snow shoveling, but it is certainly a novelty if you come from Floridalike Queensland.

In the Cornell Leadership Program, I learned skills in communication, research, leadership, drug development, and work life balance. I now use these every day in my role as an anatomic pathologist, researcher, teacher and Deputy Head of School.

Academia is a crazy life, but I see something new or learn something every day. I worked out recently that my residents and I discover a new disease every couple of months.

I think I have one of the coolest jobs there is. I've cured pets of terminal cancer and I've

contributed to our understanding of what is driving Queensland koalas to extinction.

I am in awe of my brilliant students, and it is a privilege to help mentor them. Now it is their turn to attend the Cornell Leadership Program.

Here's what other alumni are saying about their experience:

- "Very happy memories." Christine Broster, 1999
- "An amazing experience." Maeva May, 2001
- "A great inspiration for me." Anton Asare, 2004
- "An awesome summer at Cornell." — Hannah Bender, 2005
- "I often think of the great time I had in Ithaca." — Annemarie Voorbij, 2007
- "I miss Ithaca, Cornell, and especially the Leadership Program." – Maria Volkmann, 2007
- "I enjoyed the program immensely."— Jenna Gettings, 2009
- "I look back at the program as some of the best weeks of my life." — Dimo Naujokat, 2014







Reunion Dinner

This year's dinner was held on Thursday, July 11. Four past participants returned to enjoy a catered meal and lively conversation (from left to right): James Mullman, 2018; Simon Frueh, 2015; Ari Boltax, 2016; and, Yun-ha Hur, 2015.

"The Leadership Program gave me the confidence and vision to pursue further training in science."

- Sarah Wood, 2011



Staying Connected

Contact with Leadership Program graduates is maintained in order to strengthen the professional network forged at Cornell and to uphold the program's tradition of excellence for the benefit of future scholars. Alumni are encouraged to make informed decisions about the advanced training needed to realize their professional goals. The accompanying table lists degrees awarded to program graduates and degrees they are expected to receive after completing the academic programs in which they are presently registered. Not included in the list are degrees' alumni received before they began their veterinary studies.

The following table indicates that a substantial number of program alumni obtained residency training in the course of their graduate studies. One hundred and twenty-four of these individuals were graduates of veterinary schools in North America while sixty-one were alumni of schools located elsewhere in the world. It is tempting to speculate that the difference between the two groups reflects greater opportunities for residency training in North America although other, less obvious reasons may contribute to the observed difference.

Academic	Qualifications (alumni	ofthe	Leadershin	Program	(1990-2018)	
Academic	Qualifications	alumin	orune	Leauership	riogram	(1990-2010)	

Degree	North American A	lumni (N = 323)	Other Countries	Total Alumni	
	No.	Percent.	No.	Percent.	Percent. (N = 665)
PhD	52	16.1	163	47.7	32.3
Dr. Med. Vet.	NA	NA	27*	32.5*	NA
MPH	15	4.6	8	2.3	3.5
MS	11	3.4	19	5.6	4.5

*Numbers and Percent of German, Austrian and Swiss alumni (N = 83)

Residency Training of DVM Alumni of the Leadership Program (1990-2017)

North American A	lumni (N = 323)	Other Countries Alun	Total Alumni Percent.	
No.	Percent.	No.	Percent.	(N = 665)
124	38.4	61	17.8	27.8

Listed below are the positions currently occupied by program alumni who have completed their veterinary education and are pursuing careers in science or public health.

1990 John Angelos: Professor, Medicine and Epidemiology, U. California, Davis, CA William Carr: Associate Professor, Biology, Medgar Evers College, University of New York, NY

Laura Gumprecht: Director, Safety Assessment, Merck Research Laboratory, Philadelphia, PA

Richard Haworth: Head, Pathology, GlaxoSmithKline, Middlesex, UK

Elizabeth Lyon-Hannah: Associate Professor, Epidemiology, Boise State U., Boise, ID

Melissa Mazan: Professor, Clinical Sciences, Tufts U., North Grafton, MA

Rebecca Papendick: Senior Scientist, Zoological Society of San Diego, CA

Susan Schaefer: Associate Professor, Surgery, U. Wisconsin, Madison, WI

A. W. (Dan) Tucker: Reader, Veterinary Public Health, U. Cambridge, UK

Thomas Vahlenkamp: Professor and Head, Institute of Virology, School of Veterinary Medicine, Leipzig, Germany

1991 Prema Arasu: University Policy Advisor, North Carolina State U., Raleigh, NC David Bainbridge: Veterinary Anatomist and Reproductive Biologist, U. Cambridge, UK

Linda Berent: Associate Dean, Academic Affairs, College of Veterinary Medicine, U. Missouri, Columbia, MO

Ian Davis: Associate Professor, Biosciences, The Ohio

State U., Columbus, OH

Judy Hickman-Davis: Professor, Veterinary Preventive Medicine, The Ohio State U., Columbus, OH

Alan Radford: Reader, Infection Biology, U. Liverpool, UK

1992 Tomasz Betkowski: Site and Resource Manager, Quintiles, Warsaw, Poland Stephen Davies: Associate Professor, Parasitology, Uniformed Services U., Bathesda, MD

Mathew Gerard: Teaching Professor, Anatomy and Surgery, North Carolina State U., Raleigh, NC

Jaqueline Phillips: Professor, Neuroscience. Macquarie U., Sydney, AU

Cristina Rodrigues-Sanchez: Technical Associate, Academic Diagnostic Biology, UNAM, Mexico

Louise Southwood: Associate Professor, Large Animal Emergency Medicine and Critical Care, U. Pennsylvania, New Bolton Center, Kennett Square, PA

Reinhart Straubinger: Dean, School of Veterinary Medicine, Ludwig Maximilian U., Munich, Germany

1993 Virginia Fajt: Professor, Pharmacology, Texas A & M, College Station, TX Melinda Stewart Gabor: Principal Veterinary Pathologist, Elizabeth Macarthur Agricultural Institute, Menangle, AU

Deborah Hoyle: Epidemiologist, Roslin Institute, U. Edinburgh, UK

Christopher Laing: Executive Director, Capital City Innovation, Inc., Austin, TX

Emma Massey O'Neill: Associate Professor, Small Animal Medicine, University College, Dublin, Ireland Joanne Rainger: Animal Anesthesiologist, U. of Queensland, Brisbane, AU

Susanna Ryan: Director, Ryter Ltd, London, UK Veiko Saluste: Chief Executive Officer, Interchemie Werken, Adelaar, Estonia

Lynn Wachtman: Epidemiology Officer, USDA, APHIS, Indianapolis, IN

Melissa Beall: Associate Director, Scientific Affairs, IDEXX Laboratories, Westbrook, MN Larisa Bowman: Director, Mountain Veterinary Pathology, Inc., Ashville, NC

Leslie Gabor: Head, Pre-clinical Safety, Elanco Ltd, Sydney, AU

Maria Lara Tejero: Research Scientist, Microbial Pathogenesis, Yale U., New Haven, CT

Christopher Mariani: Associate Professor, Neurology and Neurosurgery, North Carolina State U., Raleigh, NC

Sonia Mumford: Veterinary Medical Officer, Olympia Fish Health Center, US Fish and Wildlife Service, Olympia, Λ/Δ

Jeffrey Phillips: Associate Professor, Oncology, Lincoln Memorial U., Knoxville, TN

Stacy Pritt: Assistant Vice President, Institutional Policy Director, U. Texas, Dallas, TX

Mary Thompson: Associate Professor, Clinical Sciences, Murdoch U., Perth, AU

Oliver Turner: Senior Investigator, Novartis Institute for Biomedical Research, East Hanover, NJ

Gertraut Altreuther: Clinical Project **O** Manager, Parasitology, Beyer Animal

Health, Leverkusen, Germany Philipa Beard: Group Leader, Virology, Pirbright, UK

Kate Creevy: Associate Professor, Companion Animal Health, Texas A & M, College Station, TX

Rachael Gray: Senior Lecturer, Anatomy, Sydney U., AU

Wendy Harrison: Director, Schistosomiasis Research Center, Royal Veterinary College, London, UK

Andrew Moorhead: Director, Filariasis Research Center, U. Georgia, Athens, GA

Anthony Mutsaers: Associate Professor, Clinical Studies, Ontario Veterinary College, Guelph, CA

Kellie Lorschy Stephenson: Professional Services Veterinarian, IDEXX Sydney, AU

Mark Doherty: Portfolio Manager, Dehringer Ingelheim, Sydney, AU Michelle Dries Kellaway: Executive Manager, Strategy and Growth, Qantas Ltd, Sydney, AU

Tamara Gull: Associate Professor, Pathology, U. Missouri, Columbia, MO

Antonia Jameson Jordan: Lecturer, Biomedical Sciences, Cornell U., Ithaca, NY

Ralph Senften: Head, Information Technology, Provet AG, Berne, Switzerland

Alison Stewart: Lecturer, Internal Medicine, U. Queensland, Brisbane, AU

Edwin van Duijnhoven: Fetal Morphologist, Charles

River Laboratories, Nijmegen, NL

Constantin Von der Heyden: Managing Director, Pegasys International, Cape Town, SA

Peter Bracken: Head, Regulatory Affairs for Animal Health, Boehringer Ingelheim, St. Joseph, MO

Rachel Walker D'arcy: Research Scientist, Elanco Ltd, U. Sydney, AU

Jonathat Happold: Senior Consultant, Ausvet, Canberra, AU

Tanya LeRoith: Associate Professor, Pathology, Virginia Tech. U., Roanoke, VA

Lucy Neave: Lecturer, Creative, Writing, Australia National U., Canberra, AU

Patricia Pesavento: Professor, Microbiology and Immunology, U. California, Davis, CA

Paul Plummer: Associate Professor, Microbiology, Iowa State U., Ames, IA

Jonathan Werner: Director, Pathology, Amgen Inc., Thousand Oaks, CA

Rebecca Wilcox: Senior Animal Welfare Officer, RMIT U., Melbourne, AU

Esther Wissink: Data Analyst, Sint Antonius Ziekenhuis, Amsterdam, NL

Max Bastian: Principal Investigator, Friedrich-Loeffler Institute, Greifswald,

Germany

Amanda Murphy deMestre: Reader, Reproductive Immunology, Royal Veterinary College, London, UK

Steven Fleischer: Director, Therapeutic Drugs

Evaluation, Food and Drug Administration, Bethesda, MD Karsten Hueffer: Associate Dean, Graduate Education,

U. Alaska, Fairbanks, AK

Mary Klinck: Postdoctoral Fellow, Pharmacology, U. Montreal, CA

Zoe Lenard: Radiology Consultant: IDEXX Ltd, Perth, AU

Karen Liljebjelke: Assistant Professor, Bacteriology, Department of Ecosystem and Public Health, U. Calgary, CA

Larissa Minicucci: Associate Professor, Epidemiology, Department of Population Medicine, U. Minnesota, St. Paul, MN

Erin Crotty Phipps: Program Manager, Public Health, U. New Mexico, NM

Anne-Marije Sparnaaij: Project Manager, Netherlands Food Safety Authority, Amsterdam, NL

Erica Behling-Kelly: Associate Professor,

Clinical Pathology, Cornell U., Ithaca, NY Christine Broster Reix: PhD candidate, Microbiology,

U. Bordeaux, France

Robert Dickens: Veterinary Medical Officer, USDA, Raleigh, NC

Joshua Fine: Principal Senior Scientific Advisor, Tunnell Government Services, Washington, DC

Peter Florian: Director, Pharmacology, R & D, Sanofi,

ALUMNI Staying connected

Frankfurt, Germany

Francette Geraghty-Dusan: One Health Research for Development Portfolio, Indo-Pacific Center for Health Security, Canberra, AU

Sarah Gill: Principal, Wildlife Veterinarian and Director, Biosphere Environmental Consultants, Cairns, AU

Bronwen Harper: Science Educator, Box Hill Institute, Melbourne, AU

Carl Holmgren: Neuroscientist, Center for Advanced European Studies and Research, Bonn, Germany

Emily Meseck: Director, Project Pathology, Novartis Institute for Biomedical Research, Cambridge, MA

Mary Nabity: Assistant Professor, Pathobiology, College of Veterinary Medicine, Texas A & M, College Station, TX

Kimberly Costello Newkirk: Associate Professor, Pathology, U. Tennessee, Knoxville, TN=

Rachael Mo Peters: Associate Director, Agios Pharmaceuticals, Cambridge, MA

Christopher Premanandan: Associate Professor,

Veterinary Biosciences, The Ohio State U., Columbus, OH Nadine Bowden Ramos: Staff Research Fellow, Food

and Drug Administration, Washington, DC

Rachael Tarlinton: Associate Professor, Virology, U. Nottingham, UK

Holga Volk: Chair, Department of Small Animal Diseases, TIHO, Hannover, Germany

2000 Rachel Geisel Allavena: Associate Professor, Pathology, U. Queensland, Brisbane, AU Stephen Daley: Senior Research Fellow, Biochemistry

and Molecular Biology, Monash U., Melbourne, AU

Katharine Evans: Jane H. Booker, Chair, Canine Genetics, Seeing Eye, Morristown, NJ

Toby Floyd: Research Pathologist, Animal Health and Veterinary Laboratories, Weybridge, UK

Samuel Hamilton: Director, Epidemiology, One Health, Department of Agriculture, Canberra, AU

Natali Krekeler: Lecturer, Veterinary Reproduction, U. Melbourne, AU

Jamie Lovaglio: Clinical Veterinarian, NIH, Bethesda, MD

Richard Luce: EIS Officer, Centers for Disease Control and Prevention, Atlanta, GA

Knut Stieger: Professor, Ophthalmology, U. Giessen, Germany

Joost Uilenreef: Anesthesiologist, Primum Non Nocere, Amersfort, NL

Kevin Woolard: Associate Professor, Pathology, U. California, Davis, CA

2001 Rachel Windsor Ballantyne: MS candidate, Epidemiology, Royal Veterinary College, London, UK

Julie Chevrette: Associate Director, Animal Care, McGill U., Montreal, CA

Kis Robertson Hale: Deputy Assistant Administrator, Office of Public Health Science, USDA, Washington, DC Karin Hoelzer: Senior Manager, Food Safety, Pew Charitable Trust, Philadelphia, PA

Katherine Hughes: Lecturer, Pathology, U. Cambridge, UK

Stephanie Janeczko: Vice President, Shelter Medicine Services, ASPCA, New York, NY

Robert Klopfleisch: Veterinary Pathologist, Freie Universität, Berlin, Germany

David Loch: Senior Associate, Spruson & Ferguson, Brisbane, AU

Maeva Louis May: Policy Manager, British Heart Foundation, London, UK

Timothy Myshrall: Associate Director, Biological Resources, Cleveland Clinic, Cleveland, OH

Judith Phillips: Postdoctoral Scientist, Virology, U. Pennsylvania, Philadelphia, PA

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Robin Yates: Interim Dean and Vice Provost, Graduate Studies, U. Calgary, CA

Bevin Zimmerman: Associate Director, Pathology, Charles River Laboratories, Mansfield, OH

2002 Christine Trezise Bayley: Pathologist, Gribbles Pathology, Melbourne, AU

Kelly Still Brooks: Assistant Professor, Livestock Production Medicine, Colorado State U., Fort Collins, CO

Karin Darpel: Group Leader, Virology, Pirbright Institute, UK

Karyn Havas: Chief, Infectious Disease Epidemiology, Cornell U., Ithaca, NY

Steven Laing: Director, Pathology, Genentech, San Francisco, CA

Anne Lo: Director, Strategic Development, Trail Biosciences, Vancouver, CA

Michael Mienaltowski: Assistant Professor, Animal Science, U. California, Davis, CA

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Thomas Pansky: Graduate Student, Veterinary Technology Program, Binn College, TX

Simon Priestnall: Professor, Pathology, Royal Veterinary College, London, UK

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Rosie Allister: PhD candidate,

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Michael Krahn: Professor, Cell Biology, University Hospital of Münster, Germany

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2004 Anton Asare: Veterinary Medical Officer, USDA, APHIS, Columbia, SC

Carolin Block: Internal Clinical Trial Manager, Roche Pharma, Basel, Switzerland

Mathew Breed: Senior Animal Program Veterinarian, Frederick National Laboratory for Cancer, Frederich, MD

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Claire Underwood: Assistant Professor, Large Animal Imaging, U. Pennsylvania, New Bolton Center, Kennett Square, PA

Annika Krengel Weigdel: Veterinarian, Wilhelma Zoo Stuttgart, Germany

2005 Krystal Allen-Worthington: Veterinary Medical Officer, National Institute of Mental Health, Washington, DC

Melanie Ammersbach: Veterinary Clinical Pathologist, Antech Diagnostics, Elora, Ontario, CA

Hannah Bender: Veterinary Pathologist, Taronga Conservation Society, Sydney, AU

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Hille Fieten: Director, Center for Companion Animal

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Bronwyn Clayton: Senior Policy Analyst, State Department of Jobs Precinct and Regions, Melbourne, AU

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Joseph Neary: Senior Lecturer, Livestock Health, U. Liverpool, UK

William Sander: Assistant Professor, Preventive Medicine, U. Illinois, Urbana, IL

Anne Gordon Schneider: Postdoctoral Fellow, Population Medicine, Cornell U., Ithaca, NY

Gelja Maiwald Surma: Head, Business Development, Synlab.Vet, Berlin, Germany

Justine Shotton: Veterinary Services Manager, Maxwell Wildlife, Winchester, UK

2007 Patrick Ayscue: Director, Government Programs, Metabiota, San Francisco, CA Sonja Bröer: Neuroscientist, Neurona Therapeutics, San Francisco, CA

Rosemary Brungs: Registrar, Pediatric Endocrinology, Children's Hospital Sydney, AU

Stephen Burr: Postdoctoral Fellow, Mitochondrial Biology Unit, Cambridge, UK

Sarah Caddy: Clinical Research Fellow, MRC Laboratory of Molecular Biology, Cambridge, U., UK

Elva Cha: Associate Director, Deciphera Pharmaceuticals, Waltham, MS

Boran Choi: Postdoctoral Fellow: Neuroscience, Johns Hopkins U., Baltimore, MD

Ludwig Groebler: Professional Education Manager, Johnson & Johnson, Erkrath, Germany

Laura Grogan: Research Fellow, Wildlife Diseases, Griffith U., Brisbane, AU

Kate Johnson: Senior Research Fellow, U. Hertfordshire, St. Albans, UK

Kay Russo: Industrial Service Specialist, Land of Lakes Co., Fort Collins, CO

Mihaila Swift: PhD candidate, Natural History, King's College, London, UK

Ryan Traslavina: Pathologist, Antech Diagnostics, Hunt Valley, MD

Maria Volkmann: Scientific Associate, Epidemiology, Freie Universität Berlin, Germany

Annemarie Voorbij: Assistant Professor, Small Animal Medicine, U. Utrecht, NL

Kristin Lewis Wilson: Principal Pathologist, Amgen Inc., San Francisco, CA

Shen Yang: Senior Research Scientist, Cell Biology, Eidgenossische Technische Hochschule, Zurich, Switzerland

2008 Rachel Acciacca: Resident, Surgery, U.S. Army Jacksonville, NC

Hannes Bergmann: Livestock Compliance Inspector, Western Australia Department of Agriculture, Moora, AU

Jennifer Bernard: Pathologist, IDEXX Laboratory, Memphis, TN

Lucie Chevallier: Director, Molecular Genetics, U. Alford, Paris, France

Johanna Dups: Epidemiologist, State Department of Agriculture and Food, Perth, AU

Lisa Holz: Postdoctoral Fellow, Virology, Tubingen, Germany

Jennifer Irving: Resident, Pathology, Royal Veterinary College, London, UK

Sally Ann Iverson: Preventive Medicine Fellow, Centers for Disease Control and Prevention, Atlanta, GA

Joshua Leach: PhD. Candidate, Oncology, Beatson Institute for Cancer Research, Glasgow, UK

Katherine McKelvey: Academic Clinician, North Carolina State U., Raleigh, NC

Joanna Mleczko: Veterinary Research Scientist, Lovelace Biomedical Unit, Albuquerque, NM

Dallas New: Staff Scientist, Epidemiology, Public Health Agency of Canada, Saskatoon, CA

Annelies Nijdam: Postdoctoral Fellow, Epidemiology, Antoni van Leeuwenhoek, Amsterdam, NL

Jennell Bigrigg Ramero: Pathologist, Charles River Laboratories, Ashland, OH

Kimberley Schiller: Senior Manager, Accenture, London, UK

James Swann: PhD candidate, Pharmacology, Kennedy Institute, Oxford U., UK

Heidi Vesterinen: Research Project Specialist, Public Health, U. Minnesota, St. Paul, MN

ר	Λ	Λ	0	Alisa	Guen	Bradbury:	Innovation

2007 Consultant, Innovia Technology,

Cambridge, UK

Floryne Buishand: Lecturer, Small Animal Surgery, U. Edinburgh, UK

Elizabeth Slack Davenport: Patent Officer, J.A. Kemp, Oxford, UK

Nancy Erickson: Animal Welfare Officer, Freie Universität, Berlin, Germany

Jenna Gettings: Postdoctoral Fellow, Population Health, U. Georgia, Athens, GA

Laura Gey: Postdoctoral Fellow, Pharmacology, U. Bonn, Germany

Sonja Heinrich: Officer, Boston Consulting Group, Berlin, Germany

Shuhei Ito: Technical Specialist, Pfizer Inc. Tokyo, Japan

Greta Schmoyer: USDA, APHIS, Inspector, Knoxville, TN

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