Leadership Program for Veterinary Students
20th Anniversary Issue, 2009
A commitment to Excellence

The 2009 year marked the 20th anniversary of the Leadership Program for Veterinary Students at Cornell University. During this period, the program’s tradition of excellence drew thousands of applicants, but only 460 of the most promising students representing 58 veterinary colleges, were selected to participate. Although the life experiences, culture, and academic backgrounds of program scholars are diverse, all have distinguished themselves in a variety of professional and personal pursuits. They are highly motivated individuals who possess the ability to excel as research scientists and public health professionals.

Research is the centerpiece of the Leadership Program. Program scholars pursue individual projects under the guidance of Cornell faculty members, who are successful scientists and experienced mentors. Their investigations are conducted in state-of-the-art facilities within the unsurpassed intellectual environment of Cornell, an Ivy League university located in the scenic Finger Lakes region of New York State. Program scholars also participate in modules and workshops. Topics include emerging infectious diseases and biodefense, leadership and its attendant responsibilities, and modules which illustrate leadership and employment opportunities for veterinary graduates in the academy, government and industry. The aim is to empower students to make informed decisions about graduate education and their careers. A field trip to federal research facilities is an additional feature of the program.

The Leadership Program has fulfilled its principal objective—to provide veterinary students with unique learning experiences that both clarify and strengthen their commitment to careers in science. One hundred and thirty-eight of these individuals have earned the PhD degree or are presently in training, while many others have been awarded other advanced degrees in science or veterinary public health. A legacy of the program has been a growing network of alumni who have the motivation to assist one another and more junior colleagues. The desired outcomes are strengthening of the infrastructure of veterinary science, discoveries through research, and contributions that broadly influence the veterinary profession and the biomedical sciences at large.
Acknowledgements

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 this year, the program organizers thank:

- National Institutes of Health
- Albert C. Bostwick Foundation
- Pfizer Inc
- Boeringer-Ingelheim Co.
- The Wellcome Trust

The program organizers also thank the facilitators, counselors, and mentors who took part in the 2009 program. Thanks too to Ms. Cynthia Kwong, the Program Coordinator, and to Ms. Kathleen Williams, Ms. Alexis Wenski-Roberts, and Mr. David Frank for their assistance.

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.

Publications

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


Interested parties also are invited to visit the program website at www.vet.cornell.edu/OGE/Leadership
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2009 Leadership Program Agenda

Monday, June 1  Opening Meeting
Tuesday, June 2  Library Orientation
Biological and Chemical Safety Training
Laboratory Orientation
Saturday, June 6  Career Discussion
Student Representative Meeting
Leadership Pre-Meeting
Monday, June 8  Leadership Discussion I
Leadership Discussion II
Reception and Dinner
Wednesday, June 10  National Institutes of Health
United States Department of Agriculture
Wednesday, June 17  Radiation Safety Training
Monday, June 29  Emerging Diseases Workshop
Tuesday, June 30  Biodefense and Public Health Workshop
Monday, July 6  Drug Design, Development and Marketing Workshop
Wednesday, July 8  Reunion Dinner
Monday, July 13  Careers in Industry Workshop
Wednesday, July 15  Leadership in Action
Monday, July 20  Residency Training
Tuesday, July 21  Research Training
Wednesday, July 22  Translational Science
Monday, August 10  Research Presentations
Tuesday, August 11  Research Presentations
Wednesday, August 12  Exit Meeting
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To prepare tomorrow’s scientists and public health professionals
The Leadership Program combines faculty-guided research with student-directed learning through participation in modules, workshops, and group discussions. The activities encourage responsible leadership; development of analytical, critical thinking, and teamwork skills, and an awareness of graduate training opportunities that will enable program alumni to realize their full potential as independent scientists and public health professionals.

Research
Each Leadership Program scholar was assigned a project and a faculty mentor to guide his or her research. The projects enabled the students to gain practical experience by exploring problems of interest to them. Simultaneously, students honed their communication skills through engagement in group discussions and by presenting their research findings in a public forum at the conclusion of the program.
Leadership

Leadership and its attendant responsibilities are central considerations in the Leadership Program. Critical thinking and decision-making were featured in a scenario-based module that explored public health, economic, political, and social issues. Students and facilitators were assigned roles which obliged them to articulate, defend, or modify their views as the scenario unfolded. At the conclusion of the module, the facilitators commented on the exercise and discussed leadership principles which have guided their own careers. Professor David Fraser moderated the discussion with assistance from Professors Barbara Blacklaws, Gerhard Brevis, Sandy Trees and Mr. Andrew Sage II.
Leadership in Action
The film entitled, “A Few Good Men” illustrates strengths and deficiencies of individuals cast in the role of leaders. Characteristics illustrated by the film were discussed by the students and facilitated by Professors Drew Noden, Maurice (Pete) White, David Fraser and Douglas McGregor.

Emerging Diseases
A workshop moderated by Professors Colin Parrish and John Parker, and Drs. Philip Carter and Peter Jahrling featured discussions of antibiotic resistance and diseases which are emerging or re-emerging in nature. Program scholars selected four diseases on which to focus. They then conducted library research on the topics, and employed Socratic methods to engage their peers and the 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 and veterinary public health.
Biodefense
A related workshop addressed problems connected with the deliberate release of infectious agents that could have catastrophic consequences for animals and people. Participating scholars conducted library research based on questions prepared by the same panel of facilitators who took part in the Emerging Diseases Workshop. In an evening session, the facilitators commented on their own experiences and the preparation required for veterinarians to function as public health professionals.
**Drug Design**

Dr. Michelle Haven, a senior executive of Pfizer, Inc., designed and moderated a competition between mock companies formed by the students. The competition encouraged creativity and the development of teamwork skills through activities connected with the discovery, development and marketing of veterinary pharmaceuticals. Dr. Laurie Winka assisted Dr. Haven in this module. Later in the day, the two facilitators answered questions regarding the range of employment opportunities for veterinarians at Pfizer and the advanced training required to be competitive for such positions.
Working in Industry

Drs. Gerard Hickey, Christina Adreani and Charlie Hsu conducted mock interviews for three positions in the pharmaceutical industry and at Merck Co. in particular. The students prepared for the interviews by reviewing the resumes of prospective applicants and by submitting application letters of their own. On the day of the meeting, the facilitators commented on the letters and posed questions to the students which explored their personal interests and qualifications for employment.
Career Explorations

Career planning is featured prominently in the Leadership Program. Four meetings were convened to consider opportunities for veterinary graduates to broadly influence the veterinary profession through careers in the academy, government or industry.

Professor David Fraser, and Drs. Margaret Brosnahan and Karin Hoelzer commented on the importance of a veterinary degree for individuals who aspire to careers in science. The three counselors emphasized the importance of selecting a superior environment for research training and a mentor who has a successful training record.

Professors Lisa Fortier and Sean McDonough commented on residency programs in the clinical sciences and pathology, respectively. The two counselors emphasized factors veterinary graduates should consider in seeking a residency; the expectations of training organizers, and the satisfactions of pursuing a clinical or service-based career.
A companion meeting addressed issues related to graduate research training. Professors Robin Davisson, Richard Cerione, and Douglas McGregor identified aspects of training 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 William Horne 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.
Cornell’s Partnership with the National Institutes of Health

The National Institutes of Health and the Cornell University College of Veterinary Medicine have forged a partnership which offers program scholars an opportunity to learn about research conducted at the nation’s premier biomedical research institution. This year’s participants gathered on the main campus of the NIH for a full day of scientific presentations and discussions. Speakers included distinguished scientists and administrators drawn from the agency’s intramural research program.
Agenda

Welcome
Dr. Richard G. Wyatt
Executive Director, Office of Intramural Research

“The Cornell/NIH Partnership”
Dr. Douglas D. McGregor
Director of Leadership and Training Initiatives
College of Veterinary Medicine, Cornell University

“Building Animal Models for Cardiac Arrhythmia”
Dr. Karl Pfeifer
Senior Investigator, Section of Genome Imprinting
Eunice Kennedy Shriver National Institute of Child Health and Human Development

“Social Cognition–Developmental and Comparative Perspectives”
Dr. Annika Paukner
Postdoctoral Fellow, Section of Comparative Behavioral Genetics; Eunice Kennedy Shriver National Institute of Child Health and Human Development

“Using Mouse Genetics to Decipher Human Disease”
Dr. William Pavan
Senior Investigator, Mouse Embryology Section
National Human Genome Institute

“Cytokines and Other Risk Factors in Drug-induced Liver Disease”
Dr. Lance R. Pohl.
Chief, Molecular and Cellular Toxicology Section
Laboratory of Molecular Immunology

“The Non-Human Primate as a Preclinical Model for Hematopoietic Stem Cell Gene Transfer”
Dr. John F. Tisdale
Senior Investigator
National Heart, Lung and Blood Institute

Closing Remarks
Dr. Douglas D. McGregor
USDA and Animal Agriculture
The United States Department of Agriculture has been another valued partner in the Leadership Program. This year’s fellows visited the USDA’s Animal and Natural Resources Institute in Beltsville, Maryland. Institute scientists commented on their research and opportunities for advanced training at this prestigious institution.
Agenda

Welcome
Morse B. Solomon, Acting Associate Director
Animal and Natural Resources Institute

Introduction and Overview of the Beltsville Agricultural Research Center (BARC)

“Animal Health and the Immune System”
Dr. Ted Elsasser
Research Scientist
USDA

“Antimicrobials for Mastitis Causing Pathogens that are Refractory to Resistance Development”
Dr. Stephen Becker
Research Molecular Biologist
USDA

“Swine as a Model for Human Allergic and Infectious Disease Interactions”
Dr. Joseph Urban
Supervisory Microbiologist
USDA
Leadership Program scholars discussed their research in a series of presentations over two days at the conclusion of the program. A book prize was awarded to Stuart Davenport for the best overall research achievement as judged by his underlying hypothesis, investigative protocol, results, and presentation. Additional prizes were awarded to Nancy Erickson, Laura Gey and Floryne Buishand for exceptional achievements in integrative biology, cell biology, and molecular biology, respectively. The Selection Committee for the 2009 Leadership Program salutes these individuals and congratulates members of the entire group for their commitment to research and excellent presentations.

Program Prize

Stuart Davenport
*The Role of Alpha2,6 Sialic Acid in the Cellular Entry of Feline Calicivirus*

Cell Biology Prize

Laura Gey
*Modular Effects of β–Subunit Domains on Ca²⁺ Channels*

Integrative Biology Prize

Nancy Erickson
*Structural Approaches to Understanding the Ability of Legionella to Manipulate the Host Cell*

Molecular Biology Prize

Floryne Buishand
*Extracellular Tissue Transglutaminase: a Novel Target for Glioblastoma Therapy*
Ailsa Guen Bradbury, Cambridge University, Biomedical Engineering

Do Cell-Cell Interactions in 3D Affect Pro-angiogenic Tumor Signaling?

I decided that I wanted to be a vet at a young age because I liked animals. I stayed loyal to this dream and am studying veterinary medicine at Cambridge. I applied to the Leadership Program to investigate alternatives for graduates outside the traditional practitioner route as I love the science of medicine. Far from focusing my career plans, the program has widened them. I am enjoying considering my options.

I worked with 3D polymeric scaffolds, looking at how the secretion of pro-angiogenic molecules altered the microenvironment of tumour cells. 3D culture is a growing field, throwing up some results that are not consistent with those obtained in 2D culture. There are a variety of different conditions in the microenvironment that can alter cell behaviour – I looked at the effects of cell-cell interactions, cell-matrix interactions, and oxygen concentration on the secretion of VEGF and IL-8. The data obtained support a growing body of evidence which suggests that 2D cancer cell culture may not provide an accurate representation of tumor conditions. My project was well chosen – giving both structure and intellectual freedom of investigation.

Thanks are due to my mentor, Claudia Fischbach-Teschl, to my supervisor, Scott Verbridge, who taught me so much about experimental technique, hypothesis testing and mushroom hunting and to my lab partner Brian Kwee, who rescued me when DNA assays and ELISAs were going awry. Thanks also to the Fischbach lab group, the Leadership students, and finally to Drs McGregor and Fraser who have created such a unique experience.
Floryne Buishand, Universiteit Utrecht, Molecular Biology

*Extracellular Tissue Transglutaminase: a Novel Target for Glioblastoma Therapy*

In addition to clinical aspects of veterinary medicine, I became interested in research during the honors program at Utrecht University, where I identified biomarkers in canine insulinomas. After attaining a PhD, I plan to enroll in a residency program and pursue a career in academia. I applied to the Leadership Program because I was confident that it would help develop the skills needed for my future career.

During my research this summer in the Cerione laboratory, I investigated the role of tissue transglutaminase (TGase), a protein that is capable of both binding/hydrolyzing GTP and an enzymatic transamidation activity that generates protein cross-links, in the human glioblastoma cell line U87. We have shown that TGase is highly expressed and constitutively active in U87 cells. Knockdown of TGase or treatment of the cells with the cell-permeable TGase inhibitor mono-dansylcadaverine (MDC), blocked the ability of the U87 cells to form colonies in soft agar, as well as sensitizing them to doxorubicin.

Interestingly, we also found that incubating U87 with the cell-impermeable inhibitor T101 mirrored the anti-tumor actions of MDC, suggesting that secreted TGase is essential for the oncogenic phenotypes exhibited by these cells. These findings highlight an unexpected role for secreted TGase in promoting the oncogenic activity of U87 cells, and raise the interesting possibility that extracellular TGase could be a potential target for glioblastoma therapy.

I would like to acknowledge the entire Cerione lab for their support throughout this summer, especially Dr. Marc Antonyak and Dr. Richard Cerione. Moreover, I would like to thank Dr. Douglas McGregor and Dr. David Fraser for creating such an inspiring program.

Stuart Davenport, University of Edinburgh, Virology

*The Role of Alpha2,6 Sialic Acid in the Cellular Entry of Feline Calicivirus*

The 2001 UK foot and Mouth Disease outbreak highlighted a pivotal role of the veterinarian at the interface between science, public policy and clinical medicine. Inspired by witnessing infectious disease in action and keen to join such a diverse field, I applied to veterinary school. The Leadership Program provided an ideal opportunity to further explore careers in science and to gain research experience in virology, an area that has sparked my interest.

Feline calicivirus (FCV) is a major cause of respiratory disease in cats. It is also one of the few cultivable members of the *Caliciviridae*. It has recently been reported that FCV binding is in part due to interaction with alpha2,6 sialic acid. My project identified incongruities in the experimental protocol previously followed and so this statement is questionable. Our investigation demonstrated that removal of sialic acid motifs from the surface of cells normally permissive to FCV does not decrease infectivity. Further to this, neither the use of specific lectins to bind and block alpha2,6 sialic acid nor pre-incubation of FCV with sialic acid reduced infectivity. In short, comprehensive evidence that alpha2,6 sialic acid does not function as a receptor for FCV has been obtained.

I would like to thank my mentor, Dr. John Parker, who has been incredibly generous with his time and possesses an infectious enthusiasm for his discipline. Acknowledgments also go to Brenda Werner and Jae-Won Kim. Finally I would like to thank Drs. McGregor and Fraser who have built this Program into a life-changing ten weeks, and Cynthia Kwong for her hard work.
Nancy Erickson, Freie Universität Berlin, Molecular Medicine

*Structural Approaches to Understanding the Ability of Legionella to Manipulate the Host Cell*

I applied to the Leadership Program, because it offered the opportunity to develop my interest in molecular medicine and cutting-edge research. The Program has made me aware of many non-traditional career opportunities for veterinarians, such as translational science, with which I have become increasingly intrigued. It also was an inspiring and motivating experience that I will draw on for the remainder of my professional life.

In the course of the summer, I had the privilege of working in Professor Ruth Collins’ laboratory, investigating an effector protein of *Legionella pneumophila*. This facultative intracellular pathogen, typically found in fresh water protozoa, is the causal agent of Legionnaire’s Disease. Upon inhalation of contaminated water aerosols, *Legionella* is phagocytized by alveolar macrophages. There it translocates effector proteins into the cytoplasm which promote the intracellular survival and replication of the organisms. My research focused on using solvent entropy reduction to improve the crystallization of one of those effector proteins, the acetyltransferase VipF (vacuole protein sorting inhibitor protein F), in order to determine its molecular structure. Surface exposed patches were altered by site-directed mutagenesis, decreasing local entropy and thereby enhancing crystal formation. The information gained by structure determination will provide insight into the acetyltransferase mechanism of VipF and possibly the role of this effector in the survival of *Legionella*.

I would like to thank Professor Ruth Collins and Duane Hoch for their exceptional mentorship and guidance, as well as the entire Collins lab for their support.

Jena Gettings, North Carolina State University, Bacteriology

*Kinetic and Mechanistic Studies of the Virulence Factor WspR from Pseudomonas aeruginosa*

During my first year of veterinary school, I applied to the Leadership Program with the intention of broadening my exposure to laboratory research and with the hope that I might increase my knowledge of the role of the veterinarian in public health. The program modules provided me with a broader understanding of problems veterinarians face in the research and public health fields and the mindset we must have in order to excel.

Many species of bacteria are capable of entering a sessile phase in which they establish a complex matrix that results in formation of a biofilm. Biofilms can develop on living or non-living surfaces, including those of animals and humans. The mucoid form of *Pseudomonas aeruginosa* in the lungs of patients with cystic fibrosis and the growth of bacteria on indwelling medical devices are examples of this phenomenon. The second messenger, c-di-GMP, has a role in the signaling pathway controlling biofilm formation. Proteins with a GGDEF domain have diguanylate cyclase activity and catalyze the formation of c-di-GMP from two GTP molecules. WspR is a response regulator of biofilm formation. My task this summer was to perform *in vitro* and *in vivo* assays to characterize a set of potential inhibitors of WspR.

The Leadership Program was a very positive experience and will be an asset in making future career decisions. My thanks to Professor Sondermann for hosting me in his laboratory this summer.
Laura Gey, Tieräztliche Hochschule, Hannover, Neuropharmacology

*Modular Effects of $\beta$–Subunit Domains on $Ca^{2+}$ Channels*

While working as a nurse in a psychiatric hospital, I observed serious side effects in patients taking antipsychotics. This issue sparked my interest in research, especially in pharmacology. I have decided to combine my research and clinical interests in a career devoted to research in developing new drugs with fewer side effects. Fortunately, I was placed in Professor William Horne’s lab where I studied the role of $Ca^{2+}$ channel $\beta$-subunits as potential targets for highly selective analgesic agents.

$\beta$-subunits regulate trafficking and gating of voltage-gated $Ca^{2+}$ channels, that are made up of five domains, A-E. There is controversy regarding their individual functions. One hypothesis maintains that the D domain is sufficient in itself in modifying gating, whereas an opposing notion is that more than one domain is involved. The latter hypothesis suggests that individual $\beta$-subunit domains cannot work as efficiently as full-length $\beta$. Compared with full-length $\beta$, I found that the expression rate was slower using BCD and D domains. Interestingly, $Ca^{2+}$ channel complexes expressed with BCD had gating properties similar to those containing full-length $\beta$, while those expressed with just the D domain activated and inactivated at depolarized membrane potentials. The results suggest that the A and E domains are critical for determining the expression rate and that B and C domains are important for gating.

I thank Professor Horne, Johanna Holm and the whole lab for giving me insight into research, for teaching, challenging and motivating me every day. I also thank Dr. McGregor and Dr. Fraser for giving me the opportunity to participate in this program.

Leanne Haines, University of Liverpool, Bacteriology

*The effects of intestinal butyric acid on Salmonella virulence*

This summer I found myself in Dr Altier’s lab working on *Salmonella typhimurium*. Fatty acids produced by the normal microbiota of the digestive system affect the expression of *Salmonella* invasion genes which are required for penetration of intestinal epithelium. Acetate and formate cause increased expression of invasion genes in *Salmonella*, whilst butyrate and propionate have a negative effect, reducing invasion. My project concentrated on the effect of butyrate. Little is known about the specific mechanisms involved. Using random Tn10 transposon insertions, I was able to knock-out single genes in the hope of identifying one that is important in controlling the effects of butyrate on the expression of the invasion gene *sipC*, and hence cell invasion. Fatty acids such as propionate and butyrate are used in farming to reduce the occurrence of salmonellosis. If we can understand how butyrate and propionate have their negative effects on *Salmonella* invasion, it might aid in the prevention of disease by altering gut flora and fatty acid production.

The Leadership Program has been an amazing experience. The workshops, discussions and lab work, along with the opportunity for extra-curricular activities, have made it an unforgettable summer. I have been provided with information about various careers for veterinarians and have discovered many opportunities available to me once I have completed my degree.

I would like to thank Dr. Altier, Chien-che Hung and Cherilyn Garner for their patience and guidance throughout my time at Cornell. I would also like to thank the participants and everyone involved with organizing the program for making it a huge success.

www.vet.cornell.edu/oge/leadership
Sonja Heinrich, Freie Universität Berlin, Vaccineology

Analysis of Expression of Six Different Constructs of Plasmodium Falciparum Protein Pfs48/45 in Transformed Tetrahymena Thermophila

Even before I started studying veterinary medicine I knew that I didn’t want a career in private practice. I applied to the Leadership Program because it emphasizes alternative career paths. The program also enabled me to pursue my own project. Meeting and talking to a lot of successful veterinarians and scientists fortified my inclination to follow a similar career path. After graduating in 2011 I intend to gain some practical experience and then return to the academy to pursue a PhD.

The Clark lab uses the ciliate Tetrahymena thermophila as a system for heterologous expression of proteins. I worked on Plasmodium falciparum gametocyte protein Pfs 48/45. Antibodies against this protein prevent fertilization of the parasite, making it a target for a transmission-blocking vaccine. We made six different fusion constructs of Pfs48/45, and successfully transformed T. thermophila with each. Using Western Blot analysis, I showed that two of the pfs48/45 constructs are expressed in Tetrahymena, one of which appears to be properly folded following translation. I have also used fluorescence microscopy to look at cellular localization of the expressed pfs48/45 protein in Tetrahymena.

I would like to thank the members of Professor Ted Clarks lab for their help, support and guidance, especially Donna Cassidy-Hanley, Yelena Bisharyan and Ted Clark of course. I also want to thank Prof. Fraser and Dr. McGregor for putting so much energy and effort into this program and for constantly reminding us of our special qualities and strengthening our confidence about our careers. The Leadership Program has been a wonderful experience I will never forget!

Alan Humphreys, University of Tennessee, Molecular Biology

Small GTPase RhoA Activity in Articular Chondrocytes after Osteogenic Protein-1 Treatment

It is a simple question: “What does one do after veterinary school?” But when I embarked on my first year at Tennessee’s College of Veterinary Medicine, I found that the answer was more complex. Most of my experience so far has been concerned with aspects of small animal medicine; yet there is “another world” full of opportunities that do not necessarily involve becoming a clinician.

So, before school began, I promised myself that I would keep an open mind about my goals and seek opportunities to explore other areas. What I found was the Cornell Leadership Program, and I have enjoyed it immensely.

I had the privilege of working in Professor Lisa Fortier’s laboratory this summer. Lisa is seeking to define cellular and molecular mechanisms involved in arthritis in order to ultimately identify molecular targets for the treatment or prevention of this disease. My project involved studying the effect of osteogenic protein-1 (OP-1) on the small GTPase RhoA in articular chondrocytes.

I would like to thank Lisa for her excellent guidance. She is highly effective at encouraging one to think as a researcher, and she provided me with a project that was both intellectually stimulating and technically feasible in a 10-week program. I also thank Kira Novakofski, who was there to help me in the lab every step of the way, even when she was off competing in an Iron Man race. Finally I thank Douglas McGregor, David Fraser, and Cynthia Kwong for hosting this program. It truly is a great way to help define one’s career pathway.
Shuhei Ito, Tokyo University, Genetics

*The Role of Histone Acetylation in Regulation of PAD4 Target Gene Transcription*

I am in the sixth year of my veterinary education. During my studies, I became interested in scientific research, especially in regard to human and animal diseases. The Cornell Leadership Program gave me a great opportunity and encouraged me to review my career plans. Working in the Pharmaceutical industry or the academy are interesting possibilities, and I plan to make further use of the skills that I acquired here.

I spent the summer with a fantastic group of researchers, under the supervision of Professor Scott Coonrod. Members of the Coonrod lab analyze Peptidylarginine Deiminase (PADI) genes. Histone H3 and H4 are known to be citrullinated by PADI4. Histone modification is one of the epigenetic modifications that regulate chromatin structure and gene expression. However, the relationship between gene expression, histone citrullination and other epigenetic modifications remains to be elucidated. We investigated the effect of the histone acetylation on the PADI4 target gene expression in MCF7 cells by trichostatin A treatment, using western blotting and a chromatin immunoprecipitation assay. Our results suggest that there may be some crosstalk between PADI4 catalyzed histone citrullination and histone acetylation at the level of target gene promoters.

The Leadership Program has given me unforgettably impressive experiences. I would like to thank the Coonrod laboratory members, especially Scott Coonrod and Xuesen Zhang for their skillful and patient guidance. I also would like to thank Drs. Douglas McGregor and David Fraser for making this program so successful.

Emily Jeanes, Liverpool University, Developmental Biology

*The Effects of Altered Nucleotide Metabolism on Mouse Embryonic Development*

I applied for admission to the Cornell Veterinary Leadership Program because my interest lay in learning more about careers other than clinical practice. Specifically, I wanted to gain practical experience in research. Participation in the program revealed a diversity of career options, and I am now considering a career in research or industry.

My research project focused on the effects of altered nucleotide metabolism on mouse embryonic development. The rate limiting step in the biosynthesis of dNTPs, the basic building block of DNA, is catalysed by the enzyme Ribonucleotide Reductase (RNR). The activity of this enzyme is controlled in part by negative feedback via the binding of its product dATP to an allosteric inhibition site. A knock-in mouse model was created in which the feedback mechanism was disrupted via a single point mutation at the allosteric site. When heterozygous mice were inter-crossed, the homozygous mutant offspring died as embryos. Mice heterozygous for the point mutation survived, showing no abnormal gross morphology. We determined the time point of homozygote death as 10.5-11.5 days post conception by dissecting embryos from timed matings at various stages, and analysing the genotype and observed phenotype of the embryos. These findings highlight the importance of RNR feedback control for normal embryonic development and set the stage for future studies of the mechanism basis for the lethal consequences of RNR deregulation.

I would like to thank my mentor Dr. Robert Weiss, Jenn Page, and everyone else in my lab for all the help and support they have given me over this summer.
I entered my first year of veterinary school at Cornell knowing that I would prefer a career other than clinical practice. I applied to the Leadership Program hoping to gain research experience as well as exposure to non-traditional career opportunities available to veterinary graduates. The program exceeded my expectations.

My project, under the mentorship of Professor Robert Gilbert, investigated the effects of the hormone, ghrelin, on preimplantation bovine embryos. Ghrelin is primarily known to modulate feeding behavior and energy metabolism in the CNS; however, recent studies also have implicated actions of ghrelin in reproductive tissues. Ghrelin may inhibit the development of embryos, acting to avoid excess metabolic demands imposed by pregnancy during malnutritional states.

Bovine oocytes were fertilized in vitro and presumptive embryos were divided into treatment groups and incubated in media containing varying concentrations of ghrelin. Percent cleavage was evaluated for each treatment group. Differential and TUNEL staining were used to count the number of cells in the trophectoderm and inner cell mass, as well as apoptotic cells of blastocyst stage embryos. Fewer cells and a greater proportion of apoptotic cells at the blastocyst stage are expected for treatment groups exposed to ghrelin.

I would like to thank Professor Gilbert for his excellent mentorship over the course of the summer, Dr. Katie Beltaire for her assistance with the staining procedures, and many others who helped along the way. Finally, I would like to thank Drs. Fraser and McGregor for not only making the Leadership Program a reality, but a huge success. The unfathomable amount of time and energy they put into making this program possible is greatly appreciated.

Beth Licitra/ Cornell University, Virology

Differences in Cellular Entry Mechanisms Between FECV-1683 and FIPV-1146 May Account for Changes in Cell Tropism and Pathogenicity

The Leadership Program is full of bright and energetic students who share an interest in medicine and research. I was greatly impressed with the depth of knowledge and spontaneous creativity illustrated by my “classmates.” I found this summer’s activities and workshops empowering and motivating. As a dual degree student, I am grateful for the opportunity to participate in this program before matriculating into veterinary school. I will enter classes this fall with a much broader perspective on the places my training may take me. My career goals have evolved over the summer and I now hope to complete a residency before returning to research. The skills I gain in clinical practice will hopefully make me a better scientist. Ultimately, I hope to use my knowledge to influence public policy and improve veterinary and public health at a government agency such as the Centers for Disease Control and Prevention.

I spent this summer reflecting on what the most important qualities of leadership and have come up with the following list: ability to communicate one’s vision/passion, a certain “je ne sais quoi” that inspires others to follow, accountability, foresight, and knowledge. I hope to cultivate these abilities as I continue to grow as a scientist and veterinarian.

I would like to thank Dr. Gary Whittaker and my fellow lab members, especially Dr. Andrew Regan who assisted in the design and execution of my summer project. I would like to thank my fellow Leadership Program students and wish them the best of luck in their careers.

To prepare tomorrow’s scientists and public health professionals
PAD 2 Expression in Mouse Mammary Fat Pad and Uterus is Estrus Cycle Dependent

Because of my fascination with the biology of mammals, I decided to study veterinary medicine in Hannover. Although I had had some research experience during my veterinary studies, I wanted to broaden that experience and enhance my research skills. The Cornell Leadership Program provided the opportunity to do that and to develop my own project. The experience has confirmed my ambition for a career where I can use both my scientific and professional training to investigate important problems relevant to veterinary science.

Peptidylarginine deiminase 2 (PAD2) catalyzes the post-translational conversion of arginine residues to neutral citrulline residues on substrate proteins. The molecule is expressed in brain, muscle, uterus and the mammary fat pad, and is postulated to play a role in important diseases such as Alzheimer’s Disease, multiple sclerosis and breast cancer. In order to better understand the role of PAD 2 in breast cancer, I used immunohistochemical, immunofluorescent and western blot techniques a mouse model to measure PAD2 expression in the mouse mammary fat pad and the uterus during the estrus cycle.

The Leadership Program allowed me to pursue my interest in veterinary research but it also has been filled with new experiences. I want to thank Drs. McGregor and Fraser for their efforts in revealing to us a variety of opportunities for veterinarians in research. I also thank Professor Scott Coonrod for allowing me to work in his lab together with a team of brilliant and supporting people, particularly Brian Cherrington.

Risk Factors for Human Salmonellosis Compared Across Common Serotypes

The Cornell Leadership Program provided an invaluable opportunity to conduct research and to learn from a high-powered team of researchers and fellow veterinary students. The program allowed me to gain research experience and explore my interests in zoonotic diseases and public health. While pursuing my project, I gained proficiency with statistical programs, especially SAS. Enrichment activities in the form of program modules and counseling highlighted a diversity career opportunities for veterinary graduates.

My research project was concerned with human salmonellosis, a major cause of morbidity in the United States. Using data from the New York State Department of Health (NYSDOH) Emerging Infections Program, 628 human salmonellosis cases were analyzed. For each of the five most common Salmonella serotypes, cases infected with a given serotype were compared with cases from all other serotypes. Fifty-nine risk factors were examined using single variable analysis and by multivariate logistic regression. Using data from the NYSDOH and the census bureau, I also able to track changes in salmonellosis incidence rates by age group, to map incidence rates by county, and to investigate possible relationships with factors such as mean household income and population density.

I would like to thank my mentor, Professor Lorin Warnick, Dr. Kevin Cummings and other program facilitators for an outstanding summer. I also thank Cornell University for hosting the Leadership Program and the University of Tennessee for use of its analysis server in my research.
Meredith Sherrill, Iowa State University, Genetics

Genetic Mapping of White Spotting Associated with Neurological Defects in Silver Foxes

As a participant in the Leadership Program, I gained new insight at the interface of veterinary medicine and innovative scientific research. The intellectual challenges and collaborative nature of research are appealing. After completing my veterinary education, I see myself pursuing a PhD and an academic career.

This summer I worked in Professor Greg Acland’s lab studying the genetics of “star” white spotting in silver foxes (Vulpes vulpes). Compared to wild progenitors, many domestic species manifest increased diversity in coat color phenotype. Some pigmentation patterns are associated with hearing loss and neurological abnormalities. The star phenotype is frequently observed in a domesticated population of foxes selectively bred at the Institute of Cytology and Genetics of the Russian Academy of Science. Star exhibits autosomal semidominant inheritance; however, incomplete penetrance complicates genetic analysis. Previous research placed the star locus on chromosome 6 (VvU6). The objective of my project was to refine the position of the star locus. To this end, microsatellite markers were used to genotype a set of pedigrees segregating star. Linkage and haplotype analysis localized the star interval to a region on chromosome 6 downstream from the previously suggested position.

I want to thank Professor Acland and Dr. Anna Kukekova for their support and guidance, as well as Jennifer Johnson for her patience in addressing my questions, and Drs. Douglas McGregor and David Fraser for organizing a unique summer research program that integrates research with comprehensive career advice. The opportunity to share this experience with veterinary students from around the world was enlightening from both a cultural and professional perspective.

Elizabeth Slack, University of Edinburgh, Biomedical Engineering

Effects of Amyloid Beta (Aβ) Plaques on Local Vascular Dynamics in Alzheimer’s Disease

My decision to pursue a career in veterinary medicine was primarily motivated by my captivation with science. Having been inspired to undertake research projects during both the veterinary course and an intercalated year, I began to appreciate how exciting a career outside of clinical practice could be. I applied to the Leadership Program to explore these options. The Program has introduced me to stimulating new fields of research and broadened my perspective as an aspiring veterinarian. My enthusiasm to combine my interests in research and pathology and to work in industry as an investigative or toxicological pathologist has been encouraged.

In Professor Chris Schaffer’s lab, I investigated factors contributing to Alzheimer’s Disease, an incurable, progressive form of dementia characterized by the formation of amyloid-beta (Aβ) plaques. It is widely appreciated that gross alterations in cerebral blood flow are associated with that condition. My task was to determine whether microvascular dynamics are compromised in the toxic microenvironment of Aβ plaques. Using two-photon excited fluorescence microscopy, the cortical vessels of craniotomized mice were imaged. Blood flow velocity and vessel permeability were calculated and referenced to plaque location. Preliminary findings suggest that “stalled vessels” are more likely to occur in the vicinity of plaques. This is a potentially significant finding for the sequelae of blood flow disruption may be a contributing factor to plaque formation, thus creating a vicious cycle.

I want to thank Joan Zhou, Professor Schaffer and Dr. Nozomi Nishimura for their guidance and support in the lab and the Wellcome Trust for funding my Fellowship.
Katrina Stewart, University of Sydney, Bacterial Pathogenesis

Environmental Triggers for Proliferation and Virulence of Adherent-Invasive Escherichia coli (AIEC)

The Leadership Program this summer offered an opportunity to explore careers other than general veterinary practice. With a degree in Biological Sciences and having worked in research, I am interested in combining my new clinical skills and knowledge with that of fundamental science.

My project in Dr. Kenny Simpson’s lab explored environmental conditions in the gastrointestinal tract that may affect the proliferation and virulence of Escherichia coli. The latter has been implicated in the pathogenesis of Crohn’s Disease, a chronic debilitating inflammatory bowel disease. A higher prevalence of adherent and invasive E. coli (AIEC) has been noted in patients with Crohn’s ileitis compared to colonic Crohn’s Disease. By controlling aspects of the gastrointestinal environment of Crohn’s sufferers, it may be possible to exert some control over disease expression. To examine this possibility we measured concentrations of short chain fatty acids along the gastrointestinal tract, particularly comparing ileum to colon, and the relationship of concentration difference to the growth of E. Coli strains isolated from Crohn’s patients. Assays were also performed to assess the ability of the E. coli grown under these varying environmental conditions to invade Caco-2 cells, derived from an epithelial colorectal adenocarcinoma.

This program provided a fantastic opportunity to explore career options, develop further research skills and stimulating independent thinking. I thank Dr Kenny Simpson, Belgin Dogan, Suzanne Klaessig and Yarra (sometime office companion) for their mentorship, support and technical assistance. Thank you also goes to Dr McGregor and Dr Fraser for their enthusiasm in supporting the development of young scientists.

Jakob Trimpert, Freie Universität, Berlin, Molecular Biology

The Effect of Recombinant Interleukin 8 on Tissue Factor (Coagulation Factor III) Activity in Canine Monocytes

I heard about the Cornell Leadership Program from reports by other students. All the participants seemed enthusiastic about it so I decided to apply. I have not regretted it.

Colder than promised, summer offered little distraction from work in the laboratory. Dr. Tracy Stokol provided wise supervision and congenial company as I worked on a protein called tissue factor or coagulation factor III. I was investigating the effect of interleukin-8 on the expression of this protein on the surface of monocytes. To this end, I isolated the monocytes from the blood of healthy dogs, cultured them overnight, then exposed them to the effect of IL-8 for four hours and finally measured the expression of tissue factor via a color reaction. In addition I was involved in a project concerned with the expression of tissue factor on tumor cells. I was principally occupied with isolating RNA and then with PCR and gel electrophoresis to demonstrate gene expression.

I enjoyed my summer in Ithaca. It was a great experience and a unique opportunity to learn about a broad spectrum of careers in veterinary medicine and to do so under ideal conditions - not to mention the very pleasant company of 24 highly gifted people. For offering me this splendid opportunity I would like to thank Dr. McGregor and Dr Fraser, the two organizers of this outstanding program. My thanks also go to our coordinator Cynthia Kwong for her exceptional administrative ability and great helpfulness. For the highly agreeable and instructive time in the laboratory I would like to thank Tracy Stokol, as well as Janelle Daddona and Seigo Ogasawara, who supported me at all times and very generously integrated me in their work.
Robert Turner, Massey University, Blood Coagulation

*Quantifying Microparticle Thrombin Generation in Canine Scott Syndrome*

The Leadership Program has been a fantastic experience. The facilitators gave me a unique glimpse into vocations other than veterinary practice. As more career paths open, I remain uncommitted but grateful for the amazing set of tools this program gave me to devise the career I want and how best to achieve it.

My research project was concerned with Canine Scott Syndrome, a hereditary disorder, characterized by a reduction in platelet procoagulant activity. Thrombin generation in Scott Syndrome and control dogs’ plasma-derived microparticles was investigated in a tissue factor and phospholipid sensitive assay system. I confirmed that thrombin generation is mostly initiated by microparticles in cell poor plasma. I also demonstrated that Scott Syndrome microparticles are deficient in their capacity to generate thrombin. Quantifying thrombin generation however proved more challenging because there was an increase in a number of microparticle events in the plasma of Scott Syndrome dogs compared with the controls.

I would like to extend my gratitude to Dr. Brooks, Dr. Catalfamo and the team at the Coagulation Lab. Under their guidance I learned a great deal about the processes involved in scientific research and clinical investigation of bleeding disorders. Finally, I made some incredible friends in the program. You’re a great bunch and I cannot wait to see where we all end up in the future!

Sarah van Rijn, Universiteit Utrecht, Cancer Biology

*Developing Oncolytic Adeno-associated Virus by Targeting Heat Shock Factor with RNAi and Aptamers*

I have always searched for challenges both in and outside my education. After completing the four pre-clinical years of the Veterinary Medicine course at Utrecht University, I participated in the Excellent Tracé program, an Honors Program which includes a twelve-month research project. The exercise made me realize that instead of limiting myself to private practice, I want to extend my career into other areas. I applied to the Leadership Program, to learn more about career opportunities for veterinary graduates. In September, I will begin Clinical Rotations, after which I hope to continue my education with an internship or PhD training.

My research project at the Jin lab focused on the development of oncolytic adeno-associated virus (AAV). In tumors, heat shock factor 1 (HSF1) is known to have an important role in the maintenance of the tumor environment. Since tumor development is inhibited in HSF1 knock-out mice, we decided to develop AAV expressing HSF1 siRNA and aptamer in order to inhibit the expression of RNA and protein, respectively. The AAV method was verified with effective knockdown of eGFP expression in 293T cells. Thereafter, we studied HSF1 knockdown in vitro with qPCR and Western Blot and analyzed cell death in AAV infected cancer cell lines. We also developed AAV expressing both siRNA and luciferase, enabling us to study AAV distribution in vivo.

I thank all the members of the Jin lab for a great 10 weeks, especially Moonsoo Jin and Xiaoling Gu for their inspiring mentoring and supervision. I also thank my fellow students and other program participants for making this an unforgettable experience.
Jolanda Verhoef, Universiteit Utrecht, Parasitology

**Thymosin Beta-4 as a Possible Therapy for Cutaneous Leishmania Major Infection.**

The Leadership Program has strengthened my resolve to pursue a career in Public Health. I decided to apply to the program in order to explore other, non-traditional veterinary career paths. The program has certainly met my expectations. I look forward in the near future to graduating from veterinary school after which I plan to gain experience in public health, production animal health, food safety and public policy through registration in an MPH program.

In my research project, I investigated cutaneous leishmaniasis caused by *Leishmania major*. Current therapies using antibiotics are not yet ideal because antibiotic resistance is developing and patient compliancy is low due to side effects. At present, there is no vaccine against this disease. Resistance or susceptibility to infection is thought to be driven by a polarized Th1 or Th2 immune response. Thymosin beta-4 (Tβ-4) has been shown to be a potent immune-modulator and to promote cutaneous wound healing. The hypothesis that Tβ-4 is an activator of the cellular immune response was tested using both *in vitro* and *in vivo* techniques. Preliminary results show an increase in the production of inflammatory interleukins (IL-6, 10 and 12) from dendritic cells. These encouraging results raise the possibility that Tβ-4 therapy could become an effective treatment of cutaneous leishmaniasis.

The Leadership Program has been incredibly influential in my future career choices. I would like to thank Dr. Mendez and her lab associates for the terrific project and for their support, guidance and patience. A special thanks to my room-mate Sonja, for her pioneering spirit and her friendship this summer.

Hans Winkler, University of Zurich, Virology

**Cellular Host Ranges and Tropisms of Canine and Equine Influenza Viruses**

Working in Professor Colin Parrish’s laboratory, I developed an in vitro system for studying host range and cell tropism differences between canine and equine influenza virus (CIV and EIV). CIV is an enveloped virus with a single-stranded, negative sense segmented RNA genome. It was discovered in 2004 in Florida and is clearly a host range variant of H3N8 EIV. Thus, CIV provides a model for viral emergence.

My project focused on comparing CIV and EIV infection and antibody binding. After designing a protocol for virus infection and detection by immunofluorescence microscopy, I assessed the growth of virus isolates in mammalian cell lines. I also performed antigenic typing of CIV and EIV isolates with a panel of anti-CIV and anti-EIV monoclonal antibodies.

The Leadership Program provided a great opportunity to practice research, think critically and broaden my knowledge of virology. It also provided new insights into a variety of careers suitable for veterinary graduates. When I start my fourth year at the University of Zürich, Switzerland this fall, I will major in “biomedical research”, thereby continuing to pursue a discovery-based career.

Thank you to my Parrish lab colleagues and especially Dr. Parrish for mentoring me and Karla Stucker for being a superb cell culture and virology teacher. I am also grateful to Dr. McGregor and Professor Fraser, who spared no effort in making this summer a great experience. Thanks to all my fellow Leadership Program participants – it was an awesome time!
Bing Yun Zhu, University of Sydney, Virology

The Effect of Dominant Negative Rab Proteins on Herpes Simplex Virus Egress

The Leadership Program has revealed many career choices beyond veterinary practice. It also taught me what graduate training is necessary for such careers and how to select a good graduate program. I found this all extremely practical and valuable.

I have gained practical laboratory experience with Professor Joel Baines and his team. My project was concerned with the effect of dominant negative Rab proteins on Herpes Simplex Virus (HSV) egress. On their path out of an infected cell, HSV virions are enveloped at the inner nuclear membrane, de-enveloped at the outer nuclear membrane and re-enveloped at the trans-Golgi network. Rab proteins are small GTPases, which coordinate intracellular vesicle transport. They are involved in vesicle formation, motility and attachment to target compartments. The hypothesis proposed for my project is that dominant negative Rab proteins (especially those associated with Golgi vesicle transport) interfere with and thus reduce HSV egress.

I would like to thank Joel Baines for conceiving such a project for me, which was interesting and fitted well into the short time I had here. Specifically it allowed me to see experiments through till the very end and repeat them without supervision. My thanks also to Liz, Kui, Luella and Rachel for their generous help and friendly company. I am also eternally grateful to Kari Roberts and Lucy Li for teaching me the various skills required to undertake my project! Finally, the most valuable element of the program I will take with me is the new friendships I’ve formed with fellow Leadership Program students and our ‘house mother’ Cynthia, without whom there would be many hungry nights.

Cynthia Kwong, Leadership Program Coordinator

Participating in the Leadership Program was an enriching experience. As Program Coordinator, I was in the enviable position of living in residence with the students. The arrangement allowed me to observe them gain in experience and confidence over the eleven-week period that the program was in session. The participants, now my friends, impressed me with their social, academic and professional prowess. I had the pleasure of seeing them come together as strangers to forge lifelong friendships and assume leadership roles with skill and conviction. They worked individually and collectively as professionals, eager to take charge and refusing to give any less than their best. I wish them all success in their future endeavors.
Facilitators & Counselors

Dr. Christine Adreani
Facilitator
Research Veterinarian
Laboratory of Animal Resources
Merck Co.

Dr. Barbara Blacklaws
Facilitator
University Lecturer in Molecular Virology
Cambridge University

Dr. Gerhard Breves
Facilitator
Professor of Physiology
Stiftung Tierärztliche Hochschule Hannover

Dr. Philip Carter
Facilitator
Professor Emeritus
North Carolina State University

Dr. Richard Cerione
Counselor
Goldwin Smith Professor Pharmacology and Chemical Biology; Department of Molecular Medicine
Cornell University

Dr. Robin Davisson
Counselor
Professor Biomedical Sciences
Cornell University

Dr. Lisa Fortier
Counselor
Associate Professor Clinical Sciences
Cornell University

Dr. David Fraser
Facilitator/Counselor
Professor Emeritus Animal Science
University of Sydney

Dr. Michelle Haven
Facilitator
Vice President, Business Development, Licensing and Strategic Planning Pfizer Animal Health

Dr. Gerard Hickey
Facilitator
Director, Worldwide Regulatory Affairs
Merck Co.

Dr. William Horne
Facilitator
Professor of Anesthesiology and Director of Cornell University Hospital for Animals
Cornell University

Dr. Charlie Hsu
Facilitator
Research Veterinarian, Laboratory Animal Resources
Merck Co.
To prepare tomorrow’s scientists and public health professionals
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 eleven-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.
Apart from their intensive schedule, program scholars found time for many personal pleasures. They capitalized on local Ithaca amenities and visited Montreal, Niagara Falls, New York City and Washington, DC.
The Leadership Program scholars hosted a dinner for their mentors, module facilitators, counselors, and other guests at Willard Straight Hall on the Cornell University campus.
Where Are They Now?

The program organizers remain in contact with Leadership Program graduates in order to strengthen the professional network forged at Cornell and to uphold the program’s tradition of excellence for the benefit of future fellows. 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, Associate Professor, Comparative Pathology, University of California at Davis, CA

William Carr, Instructor, MGH Partners for AIDS Research Center, Harvard University, Cambridge, MA

Laura Gumprecht, Associate Director, Safety Assessment, Merck Research Laboratory, West Point, PA

Elizabeth Lyon-Hannah, Research Faculty, Boise State University, Boise, ID

Richard Haworth, Senior Pathologist, GlaxoSmithKline, Middlesex, United Kingdom

Melissa Mazan, Associate Professor and Director, Sports Medicine, Tufts University, North Grafton, MA

Rebecca Papendick, Diagnostic Pathologist/Senior Scientist, Zoological Society of San Diego, San Diego, CA

Susan Schaefer, Clinical Associate Professor, Surgery, University of Wisconsin, Madison, WI

A. W. (Dan) Tucker, Senior Lecturer, Veterinary Public Health, University of Cambridge, United Kingdom

Thomas Vahlenkamp, Assistant to the President, Friedrich-Loeffler-Institute, Greifswald, Germany

**1991**

Prema Arasu, Associate Vice-Provost and Professor, International Academics, NCSU, Raleigh, NC

David Bainbridge, Clinical Veterinary Anatomist, University of Cambridge, United Kingdom

Linda Berent, Clinical Assistant Professor, University of Missouri, Columbia, MO

Ian Davis, Research Assistant Professor, Genomics and Pathobiology, Ohio State University, Columbus, OH

Dianne Hellwig, Associate Professor, Agriculture and Natural Resources, Berea College, KY

Judy Hickman-Davis, Director, Laboratory Animal Training Program/Assistant Professor, Department of Veterinary Preventive Medicine, The Ohio State University, Columbus, OH

Alan Radford, Senior Lecturer, Small Animal Studies, University of Liverpool, United Kingdom

Jean Reichle, Head, Animal Surgical and Emergency Center, West Los Angeles, CA

**1992**

Tomasz Betkowski, Medical Representative, Eli Lilly Co., Indianapolis, IN

Stephen Davies, Assistant Professor, Parasitology, Uniformed Services University, Bethesda, MD

Matthew Gerard, Clinical Associate Professor, Large Animal Surgery, N. Carolina State University, Raleigh, NC

Christine Hawke, Lecturer, Small Animal Clinical Practice, University of Sydney, Australia

Jacqueline Phillips, Professor, Molecular Neuroscience, Macquarie University, Sydney, Australia

Cristina Rodriguez-Sanchez, Senior Research Associate, Universidad Nacional Autónoma de México, Mexico

Louise Southwood, Assistant Professor, Large Animal Emergency and Critical Care, University of Pennsylvania, New Bolton Center, Philadelphia, PA

Reinhard Straubinger, Professor and Section Head, Bacteriology and Mycology, Ludwig Maximilian’s University, Munich, Germany

**1993**

Virginia Fajt, Associate Professor, Pharmacology, Texas A&M University, College Station, TX
Christopher Laing, Director, Science and Technology
University City Science Center, Philadelphia, PA

Emma O’Neill, Lecturer, Small Animal Medicine,
University College, Dublin, Ireland

Joanne Rainger, Registrar, Anesthesia, University of Sydney, Australia

Ashley Reynolds, Staff Scientist, National Cancer
Institute, NIH, Bethesda, MD

Susanna Ryan, Communications Specialist, MediTech
Media, London, United Kingdom

Veiko Saluste, Executive, Interchemi, Estonia

Melinda Stewart-Gabor, Pathologist, EMAI Diagnostic
Services, Menangle, Australia

Lynn Wachtman, Clinical Veterinarian and Instructor,
New England Primate Center, Harvard Medical School,
Southborough, MA

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1994

Melissa Beall, Research Scientist, Medical Affairs,
IDEXX Inc., Portland, ME

Larissa Bowman, Director, Mountain Veterinary
Pathology, Asheville, NC

Leslie Gabor, Laboratory Leader, EMAI Diagnostic
Services, Menangle, Australia

Maria Lara-Tejero, Research Associate, Department of
Microbiology, Yale University, New Haven, CT

Christopher Mariani, Associate Professor, Neurology,
North Carolina State University, Raleigh, NC

Sonia Mumford, Veterinary Medical Officer, Fish
Health Center, Olympia, WA

Jeffrey Phillips, Assistant Professor, Oncology,
University of Tennessee, Knoxville, TN

Julie Pomerantz, Associate Research Scientist, Wildlife
Trust, Palisades, NY

Stacy Pritt, Director and General Manager, Biological
Test Center, B. Braun Medical, Irvine, CA

Mary Thompson, PhD candidate, University of
Queensland, Australia

Oliver Turner, Pathologist, Novartis Inc., East Hanover, NJ

1995

Gertraut Altreuther, Project Manager, Parasitology,
Bayer Animal Health, Leverkusen, Germany

Philippa Beard, Lecturer, Virology, University of
Edinburgh, United Kingdom

Katee Creevy, Assistant Professor, Small Animal
Medicine, University of Georgia, Athens, GA

Rachael Gray, Lecturer, Veterinary Anatomy, University of
Sydney, Australia

Wendy Harrison, Research Scientist, GlaxoSmithKline,
Medicines Research Center, Stevenage, United Kingdom

Kelly Lorschy, Technical Service Specialist, Pfizer,
Australia

Andrew Moorhead, Assistant Research Scientist, Veterinary Parasitology, University of Georgia, Athens, GA

Tony Mutsaers, Adjunct Professor, Clinical Studies,
Ontario Veterinary College, Guelph, Ontario

1996

Mark Doherty, Technical Service Manager, Ancare,
Kirrawee, NSW, Australia

Michelle Dries-Kellaway, Strategic Project Manager,
University of Wollongong, NSW, Australia

Margaret Fleischli, Research Specialist, School of
Medicine and Public Health, University of Wisconsin,
Madison, WI

Patricia Gearhart, Adjunct Assistant Professor,
Ophthalmology, Michigan State University, East
Lansing, MI

Tamara Gull, Assistant Professor, Pathobiology,
Oklahoma State, Stillwater, OK

Antonia Jameson-Jordan, Lecturer, Department of
Biomedical Sciences, Cornell University, Ithaca, NY

Allison Stewart, Associate Professor, Equine Internal
Medicine Medicine, Auburn University, AL

Edwin van Duijnhoven, Research Scientist, NOTOX,
Netherlands

Constantin Von der Heyden, Director, Pegasys Strategy
and Development RSA, South Africa
To prepare tomorrow’s scientists and public health professionals
Holger Volk, Lecturer, Neurology and Neurosurgery, Royal Veterinary College, United Kingdom

Beatrice Bohme, Assistant Professor, Surgery, University of Leige, Belgium

Steven Daley, Postdoctoral Fellow, Immunology, Australian National University, Canberra, Australia

Katharine Evans, Deputy Veterinary Surgeon, Babraham Institute, University of Cambridge, United Kingdom

Toby Floyd, PhD candidate, Epidemiology, University of Cambridge, United Kingdom

Rachel Geisel-Allavena, Pathologist/Senior Principal Scientist, Pfizer Global Research and Development, Sandwich, United Kingdom

Samuel Hamilton, PhD candidate, Virology, Cambridge, United Kingdom

Birgit Hingerl-Viertlboeck, Postdoctoral Fellow, Immunology, University of Munich, Germany

Natali Krekeler, Ph.D. candidate, Pathology, University of Melbourne, Australia

Jamie Lovaglio, Clinical Veterinarian, Pacific Northwest National Laboratory, Richland, WA

Richard Luce, Epidemiologist, US Centers for Disease Control, Atlanta, Georgia

Fiona Norris-Sansom, Postdoctoral Fellow, Microbiology, University of Melbourne, Australia

Knut Stieger, Postdoctoral Fellow, Ophthalmology, University of Giessen, Germany

Joost Uilenreef, PhD candidate, Neurophysiology, University of Utrecht, Netherlands

Kevin Woolard, Postdoctoral Scientist, Cell Biology, National Cancer Institute, NIH, Bethesda, MD

Julie Chevrette, Head, Animal Environment, Montreal Heart Institute, Montreal, Canada

Karin Hoelzer, Postdoctoral Fellow, Infectious Diseases, Cornell University, Ithaca, NY

Katherine Hughes, PhD candidate, University of Cambridge, United Kingdom

Stephanie Janeczko, Medical Director, New York City Animal Care and Control, New York, NY

Charles Johnson, PhD candidate, Pathology, Iowa State University, Ames, IA

Robert Klopflieisch, Postdoctoral Fellow, Freie Universität, Berlin, Germany

David Loch, Post Doctoral Fellow, Comparative Medicine, Johns Hopkins University, Baltimore, MD

Maeva May, Resident, Large Animal Medicine, University of Pennsylvania, New Bolton Center, PA

Timothy Myshrrall, Assistant Director, Veterinary Services, Cleveland Clinic, Cleveland, OH

Kis Robertson, EIS Officer, Centers for Disease Control, Atlanta, GA

Jason Stayt, Resident, Clinical Pathology, Murdoch University, Perth, Australia

Amy Warren-Yates, Assistant Professor, University of Calgary, Calgary, Alberta, Canada

Robin Yates, Assistant Professor, Comparative Biology, University of Calgary, Calgary, Alberta, Canada

Rachel Windsor-Ballantyne, Technical Manager Merial Animal Health Ltd., Harlow, United Kingdom

Bevin Zimmerman, Senior Research Associate, Pathobiology, The Ohio State University, Columbus, OH
Christine Bayley Trezise, Veterinary Pathologist, Melbourne, Australia
Karin Darpel, Postdoctoral Scientist, Virology, Pirbright, United Kingdom
Karyn Havas, PhD candidate, Epidemiology, Colorado State University, Ft. Collins, CO
Patrick Kenny, Lecturer, Neurology and Neurosurgery, Royal Veterinary College, London, United Kingdom
Steven Laing, PhD Candidate, University of Glasgow, United Kingdom
Susannah Lillis, Clinical Assistant, Professor, Radiology, University of Tennessee, Knoxville, TN
Anne Lo, PhD candidate, Virology, University of Cambridge, United Kingdom
Michael Mienaltowski, Postdoctoral Fellow, Molecular Biology, University of South Florida, Tampa, FL
Andrew Miller, Head Diagnostic Services, New England Primate Research Center, Harvard Medical School, Southborough, MA
Simon Priestnall, Resident, Pathology, Royal Veterinary College, London, United Kingdom
Knut Steiger, Postdoctoral Fellow, Department of Ophthalmology, Justus-Liebig-University in Giessen, Germany
Kelly Still, U.S. Army Veterinarian, MPH candidate, Ames, IA
Ryan Taggart, Intern, Small Animal Medicine, Mississippi State University, Starkville, MI
Barbara Taennler, Post Doctoral Fellow, Inst. of Veterinary Biochemistry and Molecular Biology, Univ. of Zurich, Switzerland
Anke Werner, Postdoctoral Scientist, Ophthalmology, University of Hannover, Germany
Justin Wimpole, Resident, Ryde Veterinary Hospital, Sydney, Australia

Rosie Allister, Ph.D. candidate, Parasitology, University of Edinburgh, United Kingdom
Mieke Baan, Clinical Instructor, Medicine, University of Wisconsin, Madison, WI
John Baker, PhD candidate, Immunology, University of Oxford, Oxford, United Kingdom
Sandra Barnard, Resident, Oncology, Cornell University, Ithaca, NY
Belinda Black, Intern, Large Animal Medicine, Ontario Veterinary College, Guelph, Ontario
Patrick Carney, Resident Small Animal Med. & Surgery, Oregon State University, Corvallis, OR
Amy Cordner, Resident, Small Animal Med. & Surgery, University of Minnesota, MN
Carol Haak, Resident Critical Care, University of Missouri/Animal Emergency Center, Milwaukee, WI
Lindsay Hamilton, Postdoctoral Fellow, Renal Physiology, RVC, London, United Kingdom
Jutta Klewitz, Resident, Theriogenology, Tierarztliche Hochschule, Hannover, Germany
Michael Krahn, Postdoctoral Fellow, Stem Cell Biology, Georg-August-Universität Göttingen, Germany
Heather Martin, Resident, Laboratory Animal Medicine, Massachusetts Institute of Technology, Boston, MA
Siobhan Mor, Research Assistant Professor, Epidemiology, Tufts University, North Grafton, MA
Kate Paterson, Postdoctoral Fellow, Garvan Institute, University of New South Wales, Australia
Karla Stucker, PhD candidate, Virology, Cornell University, Ithaca, NY
Lyn Wancket, PhD candidate, Molecular Virology, The Ohio State University, Columbus, OH
Christiane Wrann, Postdoctoral Fellow, Endocrinology, BIDMC/Harvard Medical School, Cambridge, MA

Anton Asare, Public Health Veterinarian, USDA, Amarillo, TX
Carolin Block, Medical Trainee, Roche Pharma AG, Basel, Switzerland

To prepare tomorrow’s scientists and public health professionals
Mathew Breed, PhD candidate Immunology, Tulane University, Covington, LA
Andrew Broadbent, Ph.D. candidate, Microbiology and Immunology, Imperial College, London, United Kingdom
Angelique DellaVolpe, PhD candidate, Reproductive Medicine in Birds, Leipzig University, Leipzig, Germany
Karla Dreckmann, Postdoctoral Fellow, Immunology, Medical School, Hannover, Germany
Annika Krenkel, Dr. Med. Vet. candidate, Institute for Zoo and Wildlife Research, Berlin, Germany
Sylvia Maliye, Intern, Hagyard Equine Hospital, Lexington, KY
Robert Ossiboff, PhD candidate, Virology, Cornell University, Ithaca, NY
Duncan Russell, Resident, Pathology, Cornell University, Ithaca, NY
Katherine Scollan, Resident, Cardiology, Oregon State University, Oregon
Baukje Schouten-Schotanus, PhD candidate, Cell Biology, University of Utrecht, Netherlands
Ivana Sekis Calice, Scientist, Baxter Innovations GmbH, Vienna, Austria
Katy Townsend, Resident Surgery, The Ohio State University, Columbus, Ohio
Claire Underwood, Fellow in Cardiology, University of Pennsylvania, New Bolton Center, PA
Collin Wolff, Resident, Surgery, Dallas, TX

2005
Krystal Allen, PhD candidate, Cornell University, Ithaca, NY
Melanie Ammersbach, PhD candidate, Ontario Veterinary College, Guelph, Canada
Hannah Bender, Resident, Anatomical Pathology, Cornell University, Ithaca, NY
Derek Cavatorta, PhD candidate, Immunology, Cornell University, Ithaca, NY
Hille Fieten, Ph.D. candidate, Genetics, University of Utrecht, Netherlands
Kanika McAlpine-Singleton, U.S. Army Veterinarian

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Marieke Opsteegh, Ph.D. candidate, Parasitology, University of Utrecht, Netherlands
Tricia Oura, Resident, Diagnostic Imaging, North Carolina State University, Raleigh, NC
Bo Raphael, Senior Staff Scientist, Bureau of Rural Sciences, Australia
Johanna Rigas, Resident, Clinical Pathology, Oregon State University, Corvallis, OR
Klara Saville, Intern, Large Animal Medicine, Western College of Veterinary Medicine, Saskatoon, Canada
Ruth Schmitte, Dr. Vet. Med. Candidate, Neuroanatomy, Medical School, University of Hannover, Germany
Kai-Biu Shiu, Resident, Oncology, University of Wisconsin, Madison, WI
Catherine Trickett, PhD candidate, Animal Behavior, Bristol University, United Kingdom
Nina Weshaupt, PhD candidate, Neuroscience, University of Calgary, Canada

2006
Onno Burfeind, PhD candidate, Animal Reproduction, Freie Universität, Berlin, Germany
Bronwyn Clayton, PhD candidate, Virology, CSIRO, Geelong, Australia
Janny DeGrauw, PhD candidate, Cartilage and Synovium Biology, Utrecht University, the Netherlands
Amanda DeMaster, Intern, Small Animal Medicine, Texas A&M University, College Station, TX
Louise Fitzgerald, Veterinary Resident, Anatomic Pathology, Murdoch University, Australia
Anne Gordon-Schneider, PhD candidate, Cornell University, Ithaca, NY
Annika Haagsman, Surgical Intern, University of Utrecht, The Netherlands
Eva Marie Laabs, PhD candidate, Parasitology, Tierärztliche Hochschule, Hannover, Germany
Jane Leadbetter, Intern, Equine Surgery, Scone Veterinary Hospital, Queensland, Australia
Richard Meeson, Resident, Small Animal Surgery, Royal Veterinary College, United Kingdom
Gelja Maiwald, Ph.D. candidate, Biotechnology, University of Hannover, Germany
Ashley Neary, PhD candidate, University of Georgia, Athens, GA
Joseph Neary, MS candidate, Epidemiology, Colorado State University, Fort Collins, CO
John Parker, Senior Clinical Training Scholar, Neurology, Cambridge University, United Kingdom
Tiffany Reed, Resident, Pathology, Purdue University, West Lafayette, IN
Swaantje Roth, PhD candidate, Virology, Freie Universität, Berlin, Germany
William Sander, Intern, Small Animal Medicine, VCS Aurora/Berwyn, Plainfield, IL

2007
Patrick Ayscue, PhD candidate, Dual Degree Program, Epidemiology, Cornell University, Ithaca, NY
Rosemary Brungs, Medical Student, University of Sydney, Australia
Elva Cha, PhD candidate, Epidemiology, Cornell University, Ithaca, NY
Amy Fulton, Intern, Small Animal Medicine, Tufts University, N. Grafton, MA
Ludwig Groebl, PhD candidate, Biomedicine, University of Sydney, Australia
Annemarie Voorbij, Intern, Universiteit Utrecht, The Netherlands
Shen Yang, PhD candidate, Biomedicine, University of Maryland, Baltimore, MD

2008
Anna Byron, Intern, Internal Medicine, University of Sydney, Sydney, Australia
Lucie Chavallier, PhD candidate, Genetics, Pasteur Institute, Paris, France
Johanna Dups, PhD candidate, Virology, CSIRO, Geelong, Australia
Lisa Holz, PhD candidate, Tierärztliche Hochschule, Hannover, Germany
Prabhpreet Kaur, Government veterinarian, AVA Singapore
What Did They Say?

“I would recommend the program to anybody curious to investigate their vocational potential and keen to gain a wonderful life experience.”
Rebecca Wilcox, 1997

“I remember that wonderful summer of the Leadership Program.”
Mieke Baan, 2003

“I have such happy memories of the Leadership Program.”
Christine Broster, 1999

“The program was one of the best experiences of my life.”
Jutta Klewitz, 2003

“Little did I suspect that the Leadership Program would have such a profound impact on my career.”
Richard Luce, 2000

“The program was a great inspiration to me and I met great people.”
Anton Asare, 2004

“I am passionate about the Leadership Program as it gave me a valuable insight into research.”
Kate Hughes, 2001

“I have so many great memories of last summer and wish I could repeat it this year!”
Fiona McNeill, 2007

“The summer I spent in Ithaca is one I will never forget.”
Charles Johnson, 2001

“I often think of the great time I had in Ithaca, and I’m still in touch with many of my Cornell Fellows.”
Annemarie Voorbij, 2007
In the Limelight:

Pattie Pesavento

I needed to look up “limelight”, since I wasn’t altogether convinced that I should be in it. Limelight is “... a type of gas used to spot theaters in the early 20th century.” It sounds like quite good, bright light, but a bit dangerous, as periodically these type of lights will blow up. I’ll try to be careful.

Some people’s career maps have more obvious highways than others, and mine is more like a convoluted back-country road. Nonetheless, it has always been driven by a love of biology, and a great respect for good teaching. I was in graduate school at Harvard to study cell and developmental biology, and from this background began a love of infectious diseases. I completed my PhD, briefly worked on a project about malaria, but returned to school for veterinary studies so that I could ponder pathogens out of the tissue culture dishes and in their dynamic interchange with a host. It was a privilege to be in veterinary school at UC Davis. Joining the Cornell Leadership Program was a joyful time, and a welcome change from the enormous load of information presented in classes. That summer was a place where curiosity was rewarded rather than a distraction, and where we were considering, often in heated conversations, the medical problems, the diseases; how others had studied them, and how we might approach them ourselves. My project was undertaken in Dr. Judy Appleton’s laboratory where I learned a great deal about cellular invasion and the lifecycle of Trichinella Spiralis. My time in her lab seemed very brief. As ephemeral as I was, however, I was welcomed by the researchers in the laboratory; my unceasing questions were warmly tolerated, and I made some lovely friends. When I was leaving, Dr. Appleton gave me a stack of pre-stamped postcards of Ithaca, and asked me to send one back once in awhile to keep in touch. I am a pathetic correspondent (I believe I sent perhaps one card back), but I still have the now inadequately stamped cards in my desk. I often reflect on beautiful Ithaca and my experience in the Appleton lab. I returned to my veterinary studies with a deeper understanding of the place research held in the veterinary world, and finished my DVM back-to-back with a residency in Anatomic Pathology. My current position is a wonderful mixture of research, clinical duty, teaching, and even some psychology. By staying in academia, I’ve chosen a profession in which asking questions is ... well ... professional.

My co-faculty, Dr. Jim MacLachlan, whose office is right next door, walks in every morning and announces “The BEST job in the world, P, we have the best job in the world”. As much as I love to argue with him, and I do love to argue with him, I can’t imagine that I will ever disagree.
For more information about the Leadership Program, contact

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Photos by Alexis Wenski-Roberts unless otherwise noted.
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