2002 Leadership Program for Veterinary Students

A Commitment to Excellence

The College of Veterinary Medicine at Cornell has hosted a summer leadership program since 1990. The program's tradition of excellence has drawn thousands of applicants, but only 280 of the most promising students, representing 53 veterinary colleges worldwide, have been selected to participate. Although the life experiences, culture, and academic backgrounds of program fellows are diverse, they all have distinguished themselves in a variety of professional and personal pursuits. The fellows are highly motivated individuals who possess the ability to become future leaders in academic veterinary medicine and the life sciences at large.

Research is the foundation of the Leadership Program for Veterinary Students and the activity around which all other activities are structured. Program fellows 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 and the unsurpassed intellectual environment of an Ivy League university. Program fellows also participate in carefully designed modules, workshops, and discussions. Topics range from biomedical ethics and good laboratory practice to career explorations and leadership and its associated responsibilities. Field trips to federal research facilities are an additional feature of the program.

The Leadership Program, now in its thirteenth year, has fulfilled its principal objective—to provide veterinary students with unique learning experiences that both clarify and strengthen their commitment to careers in science. A legacy of the program has been the creation of a network of animal-health professionals who have the motivation and ability to excel, to contribute to the discovery process, and to nurture the professional development of junior colleagues.

Douglas D. McGregor, MD, DPhil
Program Director
Acknowledgements

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The National Institutes of Health
The Merck Company Foundation
Pfizer Inc
Pharmacia Corporation
The Marilyn M. Simpson Charitable Trust
The Wellcome Trust
The Albert C. Bostwick Foundation
The R. K. Mellon Family Foundation

The program organizers also thank the facilitators, counselors, and mentors who took part in the 2002 program. Thanks, too, to Ms. Sarah Basil, Ms. Alexis Wenski-Roberts, and Mr. David Frank for their assistance. Special thanks to Dr. David Fraser and program coordinator, Ms. Christina Lofton. Finally, the organizers congratulate the Leadership Program fellows. Their academic achievements, coupled with their dedication to discovery and service, mark these extraordinary individuals as future leaders of the veterinary profession.
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2002 Leadership Program Agenda

June  3  Opening Meeting
June  5  Library Orientation
          Radiation Safety Training
June  6  Radiation Safety Training
          Biological and Chemical Safety Training
June  8  Career Options for Veterinarians
          Leadership Discussion
June 10  Leadership Module
          Program Dinner
June 13  National Institutes of Health
June 14  United States Department of Agriculture
June 21  Quality Assurance: Good Laboratory Practice
June 28  Emerging Diseases
July  2   Biomedical Ethics
July  7   Careers in Industry
July  8   Reunion Dinner
July 11  Drug Design and Development
July 16  Reconciling Professional and Personal Responsibilities
July 22  Residency Discussion
July 23  Graduate Research Discussion
August 7  Research Presentations
August 8  Research Presentations
August 9  Exit Meeting
# 2002 Leadership Program Participants

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The Leadership Program combines faculty-guided research with learning modules, workshops, group discussions, and field trips to federal research facilities. These activities are student driven. All encourage responsible leadership; the development of analytical, critical thinking, and teamwork skills; and an awareness of ethical issues related to the proper conduct of research.

Activities 2002

Research

Independent research is the foundation of the program. Each fellow is assigned a research project and a faculty mentor to guide his or her investigations. These projects enable students to gain practical experience in exploring problems of interest to them. Fellows also observe the way that a world-class research laboratory uses its professional and material resources. Fellows gain public-speaking experience by participating in group modules and presenting their research findings in a public forum.
Leadership

Leadership and its associated responsibilities are always a central consideration in the Leadership Program. This year, critical thinking and decision making were featured in a module that raised veterinary, public health, economic, political, and social issues. Students and facilitators were assigned roles that obliged them to state, defend, and sometimes alter their positions as details of the scenario were revealed. At the conclusion of the module, the facilitators commented on the exercise and discussed leadership principles that have guided their own careers. Dr. David Fraser, architect of the module, moderated, with assistance from Dr. Trevor Heath and Mr. Andrew Sage.
Biomedical Ethics

Ethical issues connected with the proper conduct of research are the subjects of formal discussion during the Leadership Program. Fellows this year studied videotapes and printed materials that focused on research integrity, and explored important issues in an interesting case-based learning format. The diverse backgrounds of participants drove lively discussion; Dr. David Lee, this year's moderator, made certain that all aspects of the cases were considered.

Good Laboratory Practice

In a separate discussion, the students addressed quality-assurance standards in research, focusing on the conduct of research under the rigorous conditions defined by the US Food and Drug Administration as "good laboratory practice." Dr. Lee, director of the quality assurance unit at Cornell's College of Veterinary Medicine, also moderated this session.
A workshop moderated by Drs. Colin Parrish, Frederick Murphy, and Robert Shope featured discussion about emerging diseases. From a prepared list that illustrated principles of disease emergence, program fellows selected the four diseases on which they would focus. They worked in groups to conduct library research on the selected topics and then engaged their peers and the three facilitators in animated discussion.

Later that evening the facilitators commented on related issues and career opportunities for veterinary graduates. Two invited guests, Dr. Leland (Skip) Carmichael and Dr. Philip Carter, also participated in this meeting.
Career Explorations

Six meetings scheduled during the ten-week program addressed various aspects of career planning. In these sessions, Drs. David Lee, David Fraser, and Trevor Heath commented on the range of careers open to veterinary graduates. On two other occasions, the students and guest facilitators explored research careers in industry. Dr. Donald Thompson described career opportunities for veterinarians in a major pharmaceutical company, using Merck & Co., Inc. as an example. In a separate meeting, Pfizer scientists, Drs. Michelle Haven, Donald Mann, and Christopher Balaski, engaged the fellows in a mock competition that encouraged creativity and teamwork in the discovery, development, and marketing of drugs.
Career-related issues also were discussed in meetings on topics including research and residency training, and the reconciliation of professional and personal responsibilities during a protracted period of graduate study.
Cornell’s Partnership with the National Institutes of Health

Topics and Speakers

Welcome and Introduction
Dr. Richard Wyatt, Executive Director
NIH Office of Intramural Research

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

Protective Role of Cytokines and Other Factors in Drug-Induced Hepatitis
Dr. Lance Pohl, Chief, Molecular and Cellular Toxicology Section
Laboratory of Molecular Immunology
National Heart, Lung, and Blood Institute

HIV Preferentially Infects HIV-Specific CD4+ T Cells
Dr. Daniel Douek, Chief, Human Immunology Section
Vaccine Research Center
National Institute of Allergy and Infectious Diseases

Functional Genetic Analysis of Neural Crest-Related Diseases
Dr. William Pavan, Senior Investigator, Genetic Disease Research Branch Head, Mouse Embryology Section
National Human Genome Research Institute

Gene Transfer in Non-Human Primates: Hematopoietic Cells
Dr. Robert Donahue, Director, Simian Gene Transfer Program
National Heart, Lung, and Blood Institute

Proteomics and the Application of Novel Technologies
Dr. Elise Kohn, Chief, Molecular Signaling Unit
Laboratory of Pathology
National Cancer Institute

The National Institutes of Health and the College of Veterinary Medicine at Cornell have forged a partnership that offers program fellows an opportunity to learn about government research at the highest level. This year’s fellows gathered at NIH facilities for a full day of scientific presentations and discussions. Speakers included distinguished scientists and administrators drawn from the agency’s intramural research program.
The USDA and Animal Agriculture

The United States Department of Agriculture has been both a sponsor and a participant in the Leadership Program. This year’s fellows visited the USDA’s Animal and Natural Resources Institute in Beltsville, Maryland, where they learned about research activities and opportunities for advanced training at the institute.
Topics and Speakers

Introduction to the Beltsville Agricultural Research Center
Dr. Thomas Sexton, Animal and Natural Resources Institute

Tracking Fecal Pathogens in the Chesapeake Bay Watershed
Dr. James Trout, Animal Waste Pathogen Laboratory

Using Hydrodynamic Pressure Processing to Enhance Food Safety in Meats
Dr. Anisha Campbell-Williams, Food Safety and Technology Laboratory

Transgenesis
Dr. Robert Wall, Gene Evaluation and Mapping Laboratory

Harnessing Molecular Biology for the Study and Control of Protozoan Parasites Afflicting Man and Animals
Dr. Mark Jenkins, Parasite Biology, Epidemiology Laboratory
Presentations and Prizes

The student fellows discussed their research in a series of presentations over two days at the conclusion of the program. A book prize was awarded to Karin Darpel for best overall project as judged by the underlying hypothesis, project design, research results, and presentation. Additional prizes were awarded to Scott Rizzo, Andrew Miller, and Simon Priestnall for exceptional projects in integrative biology, cell biology, and molecular biology, respectively. The Selection Committee for the 2002 Leadership Program salutes these individuals and congratulates all the fellows for their commitment to research and the excellence of their presentations.

Program Prize
Karin Darpel
The Interaction Between U_l31 and Nuclear Lamina in *Herpes simplex*-Infected Cells

Integrative Biology Prize
Scott Rizzo
FGF8's Role in Controlling Myogenesis in the Avian Head

Cell Biology Prize
Andrew Miller
Localization of GnRH-Mediated JNK Activation to Lipid Rafts in Mouse Gonadotropes

Molecular Biology Prize
Simon Priestnall
Studies on the Molecular Biology of *Heilocobacter heilmannii* Infection in Cats and Dogs
My decision to attend veterinary school came after long deliberation over whether to attend a veterinary college or graduate school. I had done a fair amount of population and ecology research, and I loved the idea of asking questions, designing experiments, and making discoveries. I ended up choosing a career in veterinary medicine because of the broad base of knowledge and the range of career options that the profession offers. Yet I am tempted by non-traditional careers within the profession, as I feel I might best be able to find stimulation and make a contribution by venturing away from private practice. The Leadership Program interested me because of the opportunity that it presented to explore research in a veterinary context.

This past summer I engaged in research on the pathogenesis of chicken anemia virus in Dr. Karel Schat’s laboratory. Specifically, my project dealt with the question of whether chicken anemia virus DNA can replicate episomally with host-cell division rather than by making virions. My goal was to answer this question by transfecting lymphoblast cell lines with mutated viral DNA, so that it cannot make virions but still allows the transfected cells to replicate. PCR was used to determine whether viral DNA also replicated.

The Leadership Program has given me insight into what molecular biology research is all about. This knowledge certainly will help me to focus my career goals. Dr. Schat and the members of his laboratory were great for tolerating my endless questions. I have learned much from them, as well as from Dr. McGregor and all the wonderful facilitators who helped with various aspects of the program. In addition, spending the summer with 24 of the most amazing veterinary students from around the world was exhilarating!
Nicolas Berryessa  
Cornell University, Bacteriological Pathogenesis

Exploring Models for Mycobacterial Granulomas

I have completed two years of study in the veterinary program at Cornell. A degree in veterinary medicine appeals to me because of the amount of general biology that it entails. I became interested in research during my undergraduate years at the University of California, Davis, where I did work on Lyme disease and leptospirosis. At Cornell, I have conducted research in canine theriogenology and schistosomiasis. The Leadership Program offered me the chance to work on an individual research project and create my own protocols.

My research this summer was conducted in Dr. David Russell’s laboratory where I developed an inhalation model for mycobacterial granulomas. The hallmark of mycobacterial infection is granulomatous inflammation at sites of infection. An integral part of granuloma formation is the immune reaction to the lipids on the surface of the bacteria. The Russell laboratory is studying the formation of granulomas in mice by using intra-peritoneal injections of hydrophobic beads coated in Mycobacterium bovis BCG (bacillus Camette-Guerin) lipids. The focus of my project was to compare the structure of these peritoneal granulomas with granulomas in the lung tissue of mice. My model used fluorescent beads coated in BCG lipids introduced intra-nasally. I harvested the lung tissue at different time intervals and froze sections cut on the cryomicrotome. Tissue was analyzed for lymphocyte markers with conventional histological stains as well as immunohistochemistry.

Although I have done research in the past, I learned many new laboratory techniques during the program and got a sense of what graduate school is like. I would recommend the Leadership Program to any veterinary student interested in pursuing a graduate degree. I would like to thank Dr. McGregor for this opportunity, as well as Dr. Russell, Dr. Rachel Geisel, Dr. Beth Rhoades, and Dr. Barbara Butcher for all their help and support with my project this summer.

Christopher Booth  
University of Bristol, Epidemiology

Effect of Lameness on Culling and Reproductive Performance in Dairy Cows

I will enter my fourth year at Bristol’s School of Veterinary Science this autumn, and I have just completed an intercalated degree in zoology. Although I have wanted to be a veterinarian for as long as I can remember, I now realize that there is more to veterinary work than vaccinations and neutering. Detailed study of veterinary problems is becoming much more appealing to me. Cornell’s Leadership Program has enabled me to broaden my knowledge and to make me think seriously about my future career direction.

Under the guidance of Dr. Yrjö Gröhn I investigated how lameness can affect certain reproductive parameters and the decision to cull. Lameness is a common problem in all dairy herds, but farmers often give it less attention than other common diseases such as mastitis and milk fever, as the long term effects of lameness are still largely unknown. I used a method of regression known as survival analysis (specifically, the semi-parametric proportional hazards regression method), which measures time to an event occurring as the dependent variable. As the occurrence of both lameness and culling can vary over the course of lactation, these variables are known as “time-dependent covariates.” They need to be programmed in a particular way to adequately control for their effects. The modeling of time-dependent covariates is relatively new, and Cornell has led the way with such modeling. Developing these models has taught me a great deal.

This program has been incredibly enjoyable and worthwhile. It has confirmed my desire for postgraduate study, which will almost certainly include epidemiology. I thank Dr. Gröhn for his never-ending patience and his willingness to spend time teaching me the fundamentals of epidemiology. He has been an inspiring mentor. I also thank all the program organizers for creating such a wonderful opportunity for me to conduct cutting-edge research in a superb veterinary school.
Mary Carson  
*Colorado State University, Bacteriology*

**DNA Sequence-Based Stereotyping of *Streptococcus uberis***

Having worked for the US Fish and Wildlife Service for several years, I decided to pursue my interest in wildlife pathology at Colorado State University's College of Veterinary Medicine and Biomedical Sciences. As I begin my third year of study there, I have deepened my knowledge of pathology and gained an interest in food-animal medicine and infectious diseases. I applied for admission to the program to gain experience in laboratory research and improve my ability to compete for pathology residency/PhD programs.

While at Cornell, I worked on a project involving the mastitis-causing bacteria, *Streptococcus uberis*. These bacteria not only affect individual cows but also have a negative economic impact on the dairy industry as a whole and result in inefficient use of resources. To prevent the spread of this pathogen, we need to know its sources and transmission routes. *S. uberis* has typically been classified as an environmental pathogen, but can also spread from cow to cow. To elucidate the origin of infections, researchers at Cornell are isolating *S. uberis* strains from the environment to compare to strains isolated from cows.

My part in this project involved determining if DNA sequence-based subtyping of *S. uberis*, using the plasminogen activator A (pauA) gene, is as discriminatory as other subtyping methods. Early results suggest that it is not. However, other gene sequences may prove better able to differentiate strains and to identify associations between bacterial clones and specified origins or pathologies.

I would like to thank Dr. Ynte Schukken, for providing me the opportunity to participate in Cornell's quality-milk course, where I learned a great deal about mastitis. I also want to thank Dr. Ruth Zadoks for being a patient teacher and providing me an invaluable learning experience. Thanks also to all the Leadership Program participants for introducing me to new ideas and cultures.

Karin Darpel  
*School of Veterinary Medicine, Hannover, Molecular Virology*

**The Interaction Between U,31 and Nuclear Lamina in *Herpes simplex*-Infected Cells***

This fall, I will enter my final year at the School of Veterinary Medicine in Hannover. I made the decision to study veterinary science because I wanted to develop my broad interest in natural science. While in veterinary school I discovered my principal interest—infectious diseases! I find it fascinating that every century, even the twenty-first century, has its own emerging diseases. Because of my work in a developing country aid organization called *Tierarzte ohne Grenzen e.V.*, I have become more sharply focused on tropical infectious diseases and zoonoses.

This summer I worked in Dr. Joel Baines’s lab, where I had the opportunity to study the egress of *Herpes simplex* virus (HSV) type 1 from infected cells. HSV acquires its first envelope as it buds through the inner nuclear membrane (INM). To get to the INM, nucleocapsids must first transit the nuclear lamina, a filamentous network located between the nucleus and the INM. Two proteins, U31 and U34, are key players in the budding process. My goal was to determine what happens to the cell lamina during virus capsid egress and to map the epitope where U31 and the nuclear lamina interact. To this end, I made use of a variety of molecular virologic techniques: transfection, cell infection, Western blotting, immunofluorescence staining, protein extraction, PCR, DNA preparation, and molecular cloning.

I’m grateful for the opportunity to participate in the Leadership Program. It has encouraged me to pursue graduate research. To me, the most impressive aspect of the program is the remarkable people one meets. I especially want to thank my great mentor, Ashley Reynolds, Dr. Baines, and all the other people working in his lab!
Patrick Drury  
Murdoch University, Animal Behavior  

Cribbing Collars and Their Effects on Equine Behavior  

Under the guidance of Dr. Katherine Houpt, I was involved in a project examining crib-biting. This is a common stereotypy exhibited in horses, whereby they hold onto a fixed object with their incisor teeth and pull back, emitting a characteristic grunt as air is sucked into the esophagus. Many horse owners regard this behavior as unsightly, and special collars are frequently used on crib-biting horses with the aim of preventing it. There is recent evidence to suggest that many stereotypies, including crib-biting, may reduce stress in animals confined in sub-optimal environments. This being the case, the use of cribbing collars may, in fact, result in increased stress and a reduction in the welfare of crib-biting horses.

My project required me to analyze and compare the behaviors of three crib-biting horses, with each being tested with various types of collars over an eight-week period. We also took measurements of cortisol in the horses, using this as a parameter for a stress-response to the prevention of crib-biting.

The Leadership Program has provided me with many wonderful opportunities to learn about research areas in which veterinarians can become leaders. I have enjoyed my interaction with the many talented scientists and veterinarians who have played a part in the program, and I am extremely grateful to all of them. The ten weeks I spent at Cornell provided me with many experiences that will stay with me for the rest of my life. In the near future I plan to spend some time working in veterinary practice, although ultimately I wish to pursue a career as a researcher.

Karyn Havas  
Cornell University, Cell Biology  

The Effect of Planned Mutants of the Yip1 Protein on Survival of S. cerevisiae  

Committing to study veterinary medicine was a decision I made wholeheartedly in high school, although it had been a desire since my youth. After working with various animals—including farm animals and equines—and for several veterinarians in different animal environments, such as emergency medicine and general practice, I found that a veterinary career could be challenging and enjoyable. So, I pursued this path and landed at Cornell, where I learned about the Leadership Program. Having taken part in an enjoyable research project at my undergraduate institution, I thought it would be an incredible opportunity to expand on that initial experience and see if the research career path would be something I would enjoy. Thus I applied and, happily, was accepted.

This summer I conducted research in Dr. Ruth Collins' lab in the Department of Molecular Medicine on Yip1, a protein believed to be involved in controlling the Rab cell-signaling pathway. Rab is a protein that controls vesicular trafficking, or the movement of items in a cell. Yip1 is membrane bound, so I created a variety of mutants to its cytosolic or N-terminal domain. I then tested these planned mutants to see if they were essential or non-essential—i.e., the yeast died or lived—respectively. We identified some essential mutations.

The Leadership Program has innumerable benefits. I have made fine friends and have enjoyed learning about their experiences and schooling in different parts of the world. The career counseling integrated into the Leadership Program was a wonderful guide with sound advice from many experts that I will use to make decisions in my near future. The experience was incredible, and I would do it again if I could.
Patrick Kenny  
University of Sydney, Molecular Biology

Phosphorylation of the Nuclear Cap-Binding Complex

Nearing the completion of my veterinary degree from the University of Sydney, I decided to apply to the Leadership Program to gain experience in research in an environment otherwise not available to me as an undergraduate.

My summer was spent in Dr. Richard Cerione’s laboratory in the Department of Molecular Medicine. I was involved in studying the nuclear cap-binding complex (CBC), which is a protein heterodimer that binds to RNA via the 7-methylguanosine-cap structure. Binding facilitates several aspects of RNA processing and is subject to extra-cellular regulation. The larger subunit, designated CBP80, has been shown to be phosphorylated at two locations in a site that is important in the transport of the CBC and bound RNA across the nuclear membrane. This site shares a near identical amino-acid sequence to sites on three other proteins, hRPC62 (a subunit of RNA polymerase III) and the FXR1/FXR2 proteins (autosomal homologues of the Human Fragile X mental retardation protein). All are involved in gene expression, and it is conceivable they may all be phosphorylated at this site by a single, regulated kinase. Our efforts were directed at determining whether these other proteins are indeed phosphorylated at this site, and to look for the kinase responsible, using point-directed mutagenesis, phospho-transfer kinase assays, and western blotting, among other techniques.

The 2002 Leadership Program was a fantastic experience and one of the highlights of my career to date. I'd like to thank everyone in the Cerione lab, particularly Dr. Kristin Cerione, for making the summer as enjoyable and insightful as it was. In the future I intend to consolidate my clinical skills in veterinary medicine before moving into an area that would combine clinical work, research, and teaching.

Steven Laing  
University of Glasgow, Osteoarthritis

Cell Signaling and Cell Death in Impacted Cartilage

After experience in a mixed-animal veterinary surgery practice during high school, I decided that a career as a “vet” was the right path for me. I applied and gained entry to Glasgow’s Veterinary School, where I am about to enter my fourth year of studies. During my last three years at the university I have become aware that the science behind veterinary practice interests me a great deal and that working as a practitioner may not satisfy that interest. The Leadership Program provided a convenient way to explore alternative career options and also offered me the chance to spend ten weeks in the USA!

This summer I worked in the lab of Dr. Nancy Burton-Wurster. Her laboratory is involved in researching canine osteoarthritis. Previous work in the lab had used a mechanical loading machine to impact cartilage discs, simulating osteoarthritic changes in the cartilage. This work showed that following loading, a signaling compound spreads through the cartilage, triggering cell death. Specifically, my project has been to develop a protocol that could identify this substance.

A DNA microarray could show the up-regulation of a specific transcript, a possible candidate for the signaling, in loaded cartilage. The problem of using this technique is that RNA must be extracted from small quantities of cartilage, an extremely hypocellular tissue. My task was to develop a protocol that allows extraction of sufficient pure RNA under these conditions. Unfortunately, I did not have time to apply this finding to the loading experiment, but this work will be continued by Dr. Kristen Clements, who has been of great help to me during my time at Cornell.

I must extend my thanks to everyone in the Burton-Wurster lab and to all the other program participants for making my summer such an enjoyable experience.
Susannah Lillis  
*Murdoch University, Parasitology*

**Does Ichthyophthirius multifiliis Mate?**

Although I have wanted to be a veterinarian from a young age, in recent years my focus has shifted away from a career that is purely clinically based. I applied to the Leadership Program because it provided me the opportunity to explore careers for veterinarians in greater detail while allowing me to develop my research skills in an institution recognized for its research commitment and quality.

My project was conducted in Dr. Theodore Clark's laboratory. The goal was to determine whether a sexual phase exists in the lifecycle of the common fish parasite *Ichthyophthirius multifiliis*, the aetiological agent of white spot in freshwater fish. The disease causes significant economic loss to the aquaculture industry. I used randomly amplified polymorphic DNA PCR to assess the genetic fingerprints of *I. multifiliis* collected from channel catfish (*Icterus punctatus*) that were concurrently infected with two different serotypes of *I. multifiliis*. I compared these to fingerprints generated by the two serotypes individually. A fingerprint containing DNA fragments of the same size as those from both controls would suggest that mating had occurred.

The Leadership Program has been of great benefit to me as I have come to further appreciate the patience and persistence required to successfully pursue a career involving research. Although still undecided on my exact career pathway, I feel better equipped to make informed decisions.

I would like to thank Dr. Clark for his encouragement and unwavering patience, Ms. Yelena Bisharyan and Dr. Donna Cassidy-Hanley for their willingness to answer my many questions, and Dr. McGregor and Dr. David Fraser for their words of advice and wisdom. Finally, I would like to thank my Leadership Program peers for their often thought-provoking comments and their collective ability to create an unforgettable summer.

Anne Lo  
*University of Edinburgh, Molecular Virology*

**Molecular Basis of Vaccine Strains**

I will enter the penultimate year of vet school at the Royal (Dick) School of Veterinary Studies in Edinburgh this October. I was attracted to veterinary science because of the wide range of subjects it covers and the prospect of interacting with both people and animals. Cornell's Leadership Program provided me with a unique opportunity to combine top-level research and the chance to meet others with similar aspirations—all in an international setting.

While the program was in session, I worked in Dr. Colin Parrish's laboratory where the focus of research is on the biology of feline and canine parvoviruses. Canine parvovirus (CPV) can cause serious illness in dogs, but fortunately there is an effective attenuated vaccine available. Although the vaccine is widely used, the molecular basis of viral attenuation is unclear. My project examined why certain mutations have accumulated in vaccine strains of CPV.

In an attempt to find the answer, recombinant viruses were created containing specific deletions and mutations that are present in the vaccine strains. The resultant clones were transfected into canine cells and the viruses were grown in tissue culture. Wild-type CPV and individual recombinants were inoculated into cultures and allowed to grow in direct competition with each other. Measurements of the relative viral loads allowed us to determine whether specific mutations afforded the mutants any growth advantages in vitro. Characterizations of these mutations have significance in the understanding of viral evolution and could ultimately lead to safer vaccines.

I had a wonderful summer! Special thanks must go to Dr. Parrish, who made my time here so challenging and rewarding, as well as to all members of the Parrish lab for their support. I also would like to thank Dr. McGregor and all the other participants for making this summer so special and memorable. Finally, I thank The Wellcome Trust for their generous sponsorship.
Michael J. Mienaltowski  
Michigan State University, Cell Biology

Antierythropoietin Antibody Response in Cats That Are Refractory to Recombinant Erythropoietin

It is amazing to think my childhood experiences of romping around with the family dog and counting pairs of eyes in newborn fish staring at me through the aquarium would inspire me to train for entry into one of the most honorable professions. Now, after years of attempting to figure out which aspect of veterinary medicine I best relate to, the Leadership Program has roused my interest in research.

Over the summer, I had the privilege of working with Dr. Jamie MacLeod of the Baker Institute for Animal Health. Previous studies in his laboratory demonstrated that recombinant feline erythropoietin (rEPO) successfully treated 85 percent of anemic cats. However, 15 percent of treated cats were refractory to rEPO. Recent human studies on the same topic demonstrated the occurrence of an immune response in patients refractory to human EPO. Recombinant proteins may become immunogenic if their conformations are changed by post-translational modification.

It was my job this summer to develop assays to detect an anti-EPO antibody response in the rEPO refractory cats. I worked to adapt a bioactivity assay in which mouse erythroid progenitor cells are treated with various rEPO concentrations and with heat-inactivated feline serum containing anti-EPO antibodies. Recombinant feline EPO competitively binds with the antibodies in the serum; unbound rEPO is then able to stimulate the erythroid progenitors. I also started developing an enzyme-linked-immunosorbent-assay (ELISA). I cloned rEPO into bacteria and tested the expression of the clones. Recombinant feline EPO will coat the wells of an ELISA that will detect anti-EPO antibodies.

I am grateful for the opportunity to work with a wise and talented mentor. I would like to thank Dr. MacLeod for allowing me to work on such a practical research topic, all the members of his laboratory for welcoming me into their lives for the summer, and Pfizer and NIH for funding my fellowship.

Andrew Miller  
Cornell University, Reproductive Biology

Localization of GnRH-Mediated JNK Activation to Lipid Rafts in Mouse Gonadotropes

I am a second-year veterinary student at Cornell. Although I have wanted to become a veterinarian since grade school, I have had a much harder time trying to decide between research and clinical practice. Two years of undergraduate research spurred me on to seek similar experiences, and the Leadership Program has provided me with such an opportunity.

My research was conducted in Dr. Mark Roberson’s laboratory. It involved a study of the molecular signals potentiated by gonadotropin-releasing hormone (GnRH) and its association with the lipid raft. The latter is a microdomain of the plasma membrane that acts as a hub for signaling molecules in several motifs. The specific signaling molecule that I investigated was a common kinase known as JNK, which is activated by GnRH. There are different isoforms, or sizes, of JNK. My objective was to determine whether the interaction between JNK and the raft is size specific. I found that JNK is indeed localized to the lipid raft and that the localization is dependent on the type of JNK with which it is associated.

I would like to thank Dr. Mark Roberson and Dr. Stuart Bliss for their tireless guidance and instruction. They provided me with a wealth of expertise and made working in the laboratory an easy transition. The Leadership Program has provided me with countless opportunities and opened my eyes to many aspects of veterinary medicine I had not previously considered.
Tomas Pansky  
Mississippi State University, Bacterial Pathogenesis

Development of a Screening Assay for Identification of *Listeria monocytogenes* Mutants Defective in PC-PLC Activity

Growing up in a rural mountain area and being surrounded by living creatures of all kinds crystallized my decision to become an "animal doctor." Now, as a veterinary medicine student, I take great satisfaction in discovering relationships between disease symptoms, their causes, and means of treatment. My hope was that the Leadership Program would provide me insight into options for a challenging career in the field of animal health.

This summer I conducted research in the Department of Microbiology and Immunology under the guidance of Dr. Hélène Marquis. In the course of my project, I developed a screening assay for detection of *Listeria monocytogenes* Tn-insertion mutants. These mutants are defective in their ability to activate PC-PLC, a bacterial factor involved in cell-to-cell spread. PC-PLC activation can be induced prematurely during intracellular growth, resulting in host-cell lysis. Hence, mutants that are defective in PC-PLC activation have a growth advantage. Preliminary results indicate that a single passage through tissue culture increased the population of mutants threefold. Such mutants will help define the mechanism regulating the temporal activation of PC-PLC during the infection cycle.

Participating in the Leadership Program gave me insight into many aspects of veterinary science. Through well-orchestrated seminars, modules, talks, and interactions with clinical and research professionals, I gained a better appreciation of my career options. And I cannot forget my fellow participants—twenty-four talented people, to whom I wish the best of luck. I would like to extend my gratitude to the people in the program most important to me—Dr. McGregor, the program’s founder, and Dr. Marquis, my genuinely patient mentor.

Simon Priestnall  
University of Bristol, Bacterial Molecular Biology

Studies on the Molecular Biology of *Helicobacter heilmannii* Infection in Cats and Dogs

My aspirations to follow a career in veterinary medicine stemmed from a passion for basic science, and my motivation to enter a research career has grown while I have been at university. (I have just completed an intercalated BSc in veterinary pathology.) I would like to maintain my active enthusiasm for cutting-edge science, and I plan to enter into a PhD and pathology residency program.

My project in the Leadership Program was conducted in Dr. Kenny Simpson’s laboratory, where I worked on a study involving *Helicobacter heilmannii* infection. *H. heilmannii* has been shown to have high prevalence (greater than 90 percent) in the stomachs of both clinically healthy and sick cats and dogs. The bacterium also has been implicated as a zoonosis with a strong association, following human infection, to gastric carcinoma and MALT lymphoma.

For our study, cat and dog gastric biopsy samples were obtained from both healthy and clinically infected animals. I performed PCR amplification of the *H. heilmannii* urease B gene and a hypervariable region of the *Helicobacter* 16S rRNA gene, followed by sequencing of the PCR products. Comparison of the sequence data with published sequence from human *H. heilmannii* isolates enabled me to study both genetic diversity among this species and also similarity with human isolates. Human *H. heilmannii* isolate-derived riboprobes were used for FISH, and the presence and localization of known *H. heilmannii* subtypes and closely related species was assessed.

The Leadership Program has been a fantastic experience—the research project, many seminars, and site visits have made for a very memorable summer. I would like to thank Dr. Simpson for an excellent project and his endless good humor, and Dr. McGregor and the other organizers and facilitators for a first-class program. Finally, I thank the other Leadership Program students for their good company on our exploration of a wonderful country.

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Scott Rizzo  
Colorado State University, Developmental Biology

**FGF8's Role in Controlling Myogenesis in the Avian Head**

I will begin my second year of veterinary training at Colorado State University this fall. Wanting to do more than private practice, I looked to Cornell's Leadership Program to provide research exposure and information about other opportunities available to veterinary students.

This summer I had the opportunity to work in Dr. Drew Noden's laboratory, where I studied the role of FGF8 (fibroblast growth-factor 8) protein and its effects on myogenesis and neurogenesis in the avian head. Within the avian embryonic head, mesoderm precursors of the dorsal oblique (DO) and lateral rectus (LR) muscles can be found beside and behind the midbrain. In addition, the oculomotor nucleus forms within the floor of the midbrain, at the same level as the DO muscle. My hypothesis was that FGF8-induced signals from the brain specify the sites at which mesoderm cells will differentiate into the DO and LR muscles and will help to induce formation and establish the location of the oculomotor nucleus. To test this proposition, I placed beads soaked in FGF8 protein into the forebrain/midbrain junction or the hindbrain of the embryo. Eighty-four to 96 hours after surgeries, whole-embryo immunoassays were performed using antibodies to label skeletal muscle and motor neurons.

Early results indicate that central nervous system-derived signals, either FGF8 or another downstream signal, can induce mesodermal tissue to differentiate and develop to form muscle.

The Leadership Program has given me an excellent opportunity to explore a wide variety of career options and has provided me many of the skills and contacts I would need to continue a pursuit in research. I would like to thank Dr. McGregor and the program coordinators for putting together a truly remarkable summer experience. I would like to extend a special thank you to Dr. Noden for his patience and guidance this summer.

Lisa Rose  
Texas A&M, Molecular Genetics

**Isolation of Transgenes Containing Fluorescent Probes for in vivo Study of \( \text{Ca}^{2+} \) Regulation in Smooth Muscle and \( \beta \)-Islet Cells**

I entered veterinary medical school with background experience in research and with the notion that I would like to pursue a career in research. I soon realized I was the only person in my class who held such interests, and it was somewhat of a challenge to find support. As soon as I learned about the Leadership Program at Cornell, I was eager to apply in the hope of receiving career counseling and additional encouragement; I especially hoped to meet other veterinary students with similar interests. The summer surpassed my expectations.

I worked with Dr. Michael Kotlikoff in the Department of Biomedical Sciences. My initial project was to compare the contractility of papillary muscles and blood pressure in FKBP12.6 knockout and wild-type mice. The project was exciting and challenging, but I was unsuccessful in establishing a protocol that would generate results. After making the difficult decision to change projects, I began work on isolating transgenes generated by the laboratory, utilizing molecular biological techniques. I was quite thankful to gain that experience and feel my lab work gave me a good indication of what graduate school would entail.

I owe my most sincere thanks to Dr. Kotlikoff, Ms. Jane Lee, and all members of the Kotlikoff laboratory for their kind patience and assistance. To the program I owe inexpressible gratitude for encouraging me to pursue a non-conventional career, for pinpointing additional exciting career options, and for introducing me to wonderful colleagues from around the world.
Claudia Sandoval
Cornell University, Cell Biology

Chlamydia trachomatis Involvement in Preventing Apoptosis

This fall I will begin my second year at Cornell's College of Veterinary Medicine. Throughout my life I have been steered toward veterinary medicine; however, early in my education I realized that I would not be satisfied as a clinician. I wanted to participate in the Leadership Program to further pursue my interest in the discovery process.

I worked in Dr. Marci Scidmore's laboratory studying Chlamydia trachomatis, an obligate intracellular parasite that replicates within a vacuole (inclusion). The first eukaryotic protein found to associate with the inclusion was 14-3-3. Its target is the inclusion membrane protein, IncG. 14-3-3 is involved in several cell functions, one of which is the prevention of apoptosis. My tasks were to confirm that parasitism by C. trachomatis inhibits apoptosis and to determine whether the inhibition is related to binding of 14-3-3 to IncG.

Immunofluorescence and immunoblocking assays demonstrated that following their exposure to an apoptotic stimulus, Chlamydia-infected cells have a survival advantage when compared to normal, non-infected cells. To determine whether 14-3-3 has a role in the observed phenomenon, we expressed a novel inhibitor of 14-3-3 in infected cells. Research indicated that 14-3-3 was not required for preventing cell death.

My experience this summer benefited me greatly because it introduced me to microbiological research and exploration of science at the cellular level. I would like to thank Dr. McGregor for selecting me as a 2002 Leadership Program participant and providing me with valuable insight into future career choices. The program is unique because participants take part in cutting-edge research with excellent mentors. My thanks go to Dr. Scidmore for donating her valuable time to train me, answer many questions and ease my transition into her laboratory.

Kelly Still
Cornell University, Epidemiology

Effects of Antibiotic Additives in Milk Replacer on Dairy-Calf Performance and Antibiotic Resistance in Commercial Herds

After completing my first year at Cornell, my passion for dairy and production medicine is still strong. During this past year, I became increasingly interested in issues of food security and public health, which prompted my decision to apply for the Leadership Program. While I eventually hope to pursue a PhD in epidemiology, and possibly a residency in large-animal medicine, I first will enter the US Army Veterinary Corps following graduation.

This summer I worked with Dr. Lorin Warnick on a field study to determine if the addition of oxytetracycline and neomycin antibiotics to milk replacer will affect growth, morbidity, and mortality of calves prior to weaning. Additionally, we investigated the effects of feeding antibiotics in milk replacer on the isolation of tetracycline- or neomycin-resistant Escherichia coli and Salmonella sp. shed by the calves. As an ancillary project with Dr. Anthony Hay, I employed a recombinant bacterial strain in developing a highly sensitive and specific protocol for identifying oxytetracycline in milk replacer. While this procedure will be used for quality-control purposes in the current study, I'm intrigued by future applications of this test to evaluate environmental safety and clinical bioavailability of tetracycline compounds. Fortunately, I will be able to continue my work with Dr. Warnick through the academic year.

This has been a truly incredible summer. While the framework of my career intentions has not radically changed, my understanding of the path I will embark on was much improved by my participation in the program. I have found a real interest in epidemiology, an interest I always suspected but never had the chance to test. I extend my deepest thanks to all who made this program possible. I wish the best of luck to my fellow participants—I'm counting on working with you in the future!
Barbara Taennler  
*University of Zurich, Molecular Genetics*

**A Genetic Marker of Canine Hip Dysplasia**

Since high school I have been searching for a career that is both intellectually stimulating and combines practical work with social interactions. After working for a short period in a mixed veterinary practice, I was sure I wanted to become a veterinarian.

I attended veterinary school at the University of Zurich from 1997 to 2002; I graduated in May of this year. It was during this time that I became increasingly interested in research.

During this past summer at Cornell, I worked under the guidance of Dr. George Lust at the James A. Baker Institute. My project involved a search for a genetic marker of canine hip dysplasia. Labrador retriever-greyhound crosses were used in this study. Dysplastic and normal hips were defined by radiography. I tested decanucleotide primers on two pools of canine DNA obtained from blood samples. Each pool contained DNA from ten dogs; one pool represented the dysplastic dogs and the other the sound dogs. Primer-specific DNA fragments were obtained by randomly amplified polymorphic DNA polymerase chain reaction. The fragments were then separated using agarose gel. Primers, which detected a polymorphism, were used to screen individuals in a larger pedigree. Unfortunately, I failed to find a reproducible polymorphism; nevertheless I learned a lot about molecular genetics and associated techniques.

The Leadership Program was a great experience. It opened my mind to alternative career paths for veterinarians and gave me the opportunity to meet veterinary students from all over the world. Some have become close friends.

I hope I can take some of the Cornell spirit back home to Zurich into the veterinary biochemistry laboratory, where I will begin a PhD program in November.

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Ryan Taggart  
*Cornell University, Cell Biology*

**Assaying the PX Domain-Binding Specialty of SH3PX1 (Sorting Nexin 9)**

I will enter my second year at the College of Veterinary Medicine at Cornell this fall. I chose veterinary medicine as a career because I found it to be the most satisfying and rewarding way to practice medicine. Positive past experiences with research and a general desire to practice outside of the traditional mold of a veterinarian enticed me to apply to the Leadership Program.

I conducted my research on the lipid-binding specificity of SH3PX1 (sorting nexin 9) in Dr. Rick Cerione's lab, under the tutelage of Dr. Wannian Yang. This protein has recently been implicated along with ACK2 in the internalization and degradation of the epidermal growth-factor receptor (EGFr). In an attempt to better understand how the cell directs the fate of this receptor, we tested the lipid-binding specificity of this critical sorting nexin. Overlay assays with full-length SH3PX1 were successful and revealed a novel binding partner, phosphatidylinerine (PS). However, a fusion protein using only the PX domain was unable to be expressed. This prevented us from localizing the PS binding to this particular domain, already known to be a lipid-binding motif.

I'd like to thank Wannian Yang and Rick Cerione, my mentors for this program. Also, thanks to all the people in the lab who proved to be invaluable resources throughout the summer. I also would like to thank the Leadership Program for an enriching experience and for providing excellent career guidance.
Christine Trezise  
University of Queensland, Cell Biology

**Characterisation of GTPase Regulation in Equine Chondrocytes Treated with IGF-1**

Veterinary medicine is ideally suited to my long-term career goals. Few professions offer such a broad spectrum of careers of immense value to the community at large. These qualities of relevance and utility were instrumental in my decision to become a veterinarian. As a final-year student at the University of Queensland, the Leadership Program at Cornell offered me not only the opportunity to experience day-to-day laboratory-based research but also helped prepare me to make more informed career decisions. I experienced field research while completing a bachelor of biological sciences (marine biology) at James Cook University in North Queensland. I wanted to compare research at the ecological scale to intensive molecular biology bench-type work. I have found the differences to be many and varied, and this will certainly influence my decisions in the near future regarding career directions.

At Cornell, I studied the control of a small GTPase protein in equine cartilage cells (chondrocytes). This protein, Cdc42, mediates undesirable changes in damaged cartilage, including changes in cell shape and matrix production. When exposed to insulin-like growth-factor-1 (IGF-1), the active form of Cdc42 decreases dramatically. My challenge was to explore how this effect was mediated. I measured activity of the two enzymes that control GTPase activation or inactivation—guanine nucleotide exchange factors (GEFs) and GTPase-activating proteins (GAPs), respectively. Preliminary results suggest that GEF activity does not vary with IGF-1 treatment; thus, a GAP may be responsible for this effect. Refining these biochemical assays to accurately measure GAP and GEF activity in whole-cell lysates presented a great challenge and is an ongoing project.

My sincere thanks are extended to Dr. McGregor, my mentor Dr. Lisa Fortier, and our technician Ms. Molly Deak. I strongly encourage veterinary science students, particularly Australian students, to consider the Leadership Program as a valuable aid to personal and professional development.

Anke Werner  
School of Veterinary Medicine, Hannover, Hematology

**Studies of the Platelet Function Defect in Scott Syndrome**

I have completed the third of a five-year program at the School of Veterinary Medicine in Hannover, Germany. The decision to enroll in veterinary school was not only driven by a childhood dream but also by the appealing variety of possible careers open to veterinary graduates. A desire to learn more about research and further career options outside of private practice led me to apply to Cornell’s Leadership Program.

I had the opportunity this summer to work with Dr. Marjory Brooks and Dr. Jim Catalamino in the Coagulation Laboratory. One of the ongoing interests of the laboratory is Scott Syndrome, a bleeding disorder in humans and dogs. The underlying cause is a platelet defect wherein the cell’s ability to move membrane phospholipid phosphatidyserine (PS) from the inner to the outer lipid layer of the cell membrane is compromised. This translocation is critical to the assembly and activation of factors Va, Xa, and Prothrombin in the coagulation cascade. The movement of PS to the outer membrane is dependent on a rise in intracellular \( \text{Ca}^{2+} \). To determine whether the disease involves a multi-lineage defect, my project involved spectrophotometric and cytometric flow analyses of red blood cells to determine PS outer-membrane expression in normal and affected dogs.

I was also involved in a study measuring intracellular ionized \( \text{Ca}^{2+} \) movements in platelets upon activation and the functional comparison of normal dogs and dogs with Scott Syndrome.

Thanks to my excellent mentors and the dedicated facilitators, this program has provided me with insight into the everyday life of researchers. The Leadership Program also opened up for my consideration a variety of possible career paths in a research-related field. Returning home, I feel better prepared to make crucial decisions concerning my contribution towards the veterinary field.
Justin Wimpole  
University of Sydney, Ion Transport  

Identification of Potassium Channels in the Basolateral Membrane of the Malpighian Tubules of *Aedes aegypti*

I chose veterinary medicine because my passions are science and animals and also because of its flexibility. During the summer I worked in Professor Beyenbach’s epithelial transport lab. The aim of my project was to identify potassium channels on the basolateral membrane of the principal cells of Malpighian tubules (kidneys) of *Aedes aegypti*. This is an exceptionally active epithelium. The mosquito depends on it to quickly unload excess water to enable flight after a blood meal. *Aedes aegypti* is an extremely important vector for many important diseases. It is conceivable that an understanding of their excretory system may lead to superior methods of vector control.

To study potassium channels, the basolateral membrane was impaled with a glass microelectrode. The tubule was then exposed to glybenclamide, a sulfonylurea used in the treatment of type II diabetes. Glybenclamide inhibits ATP-regulated K⁺ channels. Depolarization of the basolateral membrane voltage would indicate its presence. Glybenclamide also inhibits chloride channels important in cystic fibrosis. On exposure to 100μM glybenclamide, the basolateral membrane voltage was initially slightly hyperpolarized and then depolarized by 8.3mV. As the glybenclamide was washed out, there was initial hyperpolarization and then a return to resting potential. This unexpected finding indicates that, at the concentration employed, glybenclamide may interfere with chloride conductance. The hyperpolarization is probably due to inhibition of ATP-regulated K⁺ channels at lower concentrations during the transition between control and glybenclamide solutions.

The Leadership Program has given me insights into the worlds of science, research, and career opportunities. In Professor Beyenbach’s lab, I have learned a great deal about electrophysiology and research in general. Most importantly, I also met many remarkable people.

Vivian Yau  
Oregon State University, Molecular Virology  

Endocytic Pathways of Vesicular Stomatitis Virus

When I first entered veterinary college in the fall of 2000, I thought I would complete my life as a student by the spring of 2004. But it is now evident that this will not be the case. My desire to understand the “whys” and my joy to exceed my own limit of understanding now encourage me to continue my formal education. My professional goals are to be continually challenged and to contribute to the knowledge relevant to veterinary medicine. Both led me to apply for admission to Cornell’s Leadership Program.

This summer I had the honor of working with Dr. Gary Whittaker on the endocytic pathways of vesicular stomatitis virus (VSV). By over-expressing a dominant-negative form of Eps15 protein that inhibits clathrin-mediated endocytosis, I attempted to demonstrate that VSV utilizes clathrin-mediated endocytosis to infect cells, and to rule out the possibility of a non-clathrin-mediated endocytic pathway. A dominant-negative mutant was used to block the native protein from functioning properly. Using this approach, I obtained evidence that VSV infects cells via the traditional clathrin-mediated endocytic pathway.

The Leadership Program has given me a solid foundation in research and improved my communication skills. It also has been a great opportunity to make contacts with other people from around the world.
Counselors and Facilitators for the 2002 Leadership Program

Dr. Christopher Balaski, Facilitator
Associate Manager Market Research
New Product Development
Pfizer Inc

Dr. Philippa Beard, Counselor
Postdoctoral Fellow
Department of Microbiology and Immunology
Cornell University College of Veterinary Medicine

Dr. Stuart Bliss, Counselor
Graduate Research Assistant
Department of Biomedical Sciences
Cornell University College of Veterinary Medicine

Dr. Susan Bliss, Counselor
Postdoctoral Fellow
James A. Baker Institute for Animal Health
Cornell University College of Veterinary Medicine

Dr. Philip Carter, Facilitator
Professor
Department of Microbiology
North Carolina State University

Dr. Leland Carmichael, Facilitator
Professor Emeritus
James A. Baker Institute for Animal Health
Cornell University College of Veterinary Medicine

Dr. Lisa Fortier, Counselor
Assistant Professor
Department of Molecular Medicine
Cornell University College of Veterinary Medicine

Dr. David Fraser, Counselor, Facilitator
Professor
Faculty of Veterinary Science
University of Sydney

Dr. Susan Fubini, Counselor
Professor
Department of Clinical Sciences
Cornell University College of Veterinary Medicine

Dr. Franziska Grieder, Counselor
Director, Laboratory Animal Science Program
National Center for Research Resources
National Institutes of Health

Dr. Michelle Haven, Counselor, Facilitator
Assistant Director
Animal Health Discovery
Pfizer Inc

Dr. Trevor Heath, Counselor, Facilitator
Dean Emeritus
University of Queensland

Dr. David Lee, Counselor, Facilitator
Executive Director
External Relations and Marketing
Cornell University College of Veterinary Medicine

Dr. James Macleod, Counselor
Associate Professor
James A. Baker Institute for Animal Health
Cornell University College of Veterinary Medicine

Dr. Donald Mann, Facilitator
Senior Research Investigator
Animal Health Discovery
Pfizer Inc

Dr. Douglas McGregor, Counselor
Director
Leadership and Training Initiatives
Cornell University College of Veterinary Medicine

Dr. Frederick Murphy, Facilitator
Professor
Virology
University of California, Davis

Dr. Rodney Page, Counselor
Professor
Department of Clinical Sciences
Cornell University College of Veterinary Medicine

Dr. Colin Parrish, Facilitator
Associate Professor
James A. Baker Institute for Animal Health
Cornell University College of Veterinary Medicine

Mr. Andrew Sage II, Facilitator
Managing Partner, Retired
Lehman Brothers

Dr. Robert Shope, Facilitator
Professor
Pathology, Microbiology and Epidemiology
University of Texas Medical Branch at Galveston

Dr. Kenneth Simpson, Counselor
Associate Professor
Department of Clinical Sciences
Cornell University College of Veterinary Medicine

Dr. Donald Thompson, Facilitator
Director, Branchburg Farm
Merck Research Laboratories

Rory Todhunter, Counselor
Associate Professor
Department of Clinical Sciences
Cornell University College of Veterinary Medicine
Participants in the 2002 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 the program was in session. Several events connected with the program were scheduled there, typically in the evening in conjunction with a catered meal. The living arrangements enabled the fellows to socialize and relax in a convenient and pleasant campus environment.

Program Coordinators

Ms. Sarah Basil
Office of the Dean

Ms. Christina Lofton
Class of 2004, Cornell University
School of Hotel Administration

This exciting opportunity to work in the Leadership Program opened my eyes to a whole new side of hospitality. I developed valuable skills in event planning, efficient multi-tasking, and managing individuals; however, quickly adapting to unexpected situations was the skill that I acquired and utilized the most. Working with a diverse group of national and international participants and facilitators was a highlight of my summer. I had a great time this year, and I thank the students for their patience and energy. Program coordination is an avenue that I have become highly interested in and for that I must thank Dr. McGregor and Ms. Sarah Basil for providing me the opportunity to explore and learn more about it.
Program Dinner

The Leadership Program fellows hosted a dinner for their mentors, module facilitators, and other guests at Willard Straight Hall on the Cornell University campus.
Time Out

In addition to the intensive summer learning experience, the fellows found time for personal pleasures. They visited Boston, Montreal, New York City, Niagara Falls, Philadelphia, Toronto, and Washington, D.C.
**Where Are They Now?**

The program organizers maintain 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 graduates who have completed their veterinary education and are pursuing science careers in academia, government, or industry.

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<tr>
<th>Year</th>
<th>Name</th>
<th>Position/Institution</th>
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<tbody>
<tr>
<td>1990</td>
<td>John Angelos</td>
<td>Lecturer, Veterinary Medicine/Epidemiology, University of California, Davis</td>
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<tr>
<td></td>
<td>William Carr</td>
<td>PhD Student, Immunology, Stanford University</td>
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<td></td>
<td>Laura Gumprecht</td>
<td>Veterinary Pathologist, Merck Research Laboratories, Rahway, New Jersey</td>
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<td></td>
<td>Elizabeth Lyon Hannah</td>
<td>Veterinary Epidemiologist, Qualis Health, Boise, Idaho</td>
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<td></td>
<td>Richard Haworth</td>
<td>Molecular Pathologist, GlaxoSmithKline, Middlesex, United Kingdom</td>
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<td></td>
<td>Stacy Hoffman</td>
<td>Resident, Small-Animal Medicine, University of Wisconsin</td>
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<td></td>
<td>Melissa Mazan</td>
<td>Director, Sports Medicine, Tufts University</td>
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<td></td>
<td>Rebecca Papendick</td>
<td>Associate Pathologist, Zoological Society of San Diego</td>
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<td></td>
<td>Dawn Shore</td>
<td>Veterinarian Specialist, Equine Theriogenology, Littleton, Colorado</td>
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<td></td>
<td>Thomas Vahlenkamp</td>
<td>Postdoctoral Fellow, Virology, North Carolina State University</td>
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<td></td>
<td>Brent Wilkens</td>
<td>Staff Surgeon, Dallas Veterinary Surgical Center, Dallas, Texas</td>
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<tr>
<td>1991</td>
<td>Prema Arasu</td>
<td>Associate Professor, Parasitology, North Carolina State University</td>
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<tr>
<td></td>
<td>David Bainbridge</td>
<td>Lecturer, Veterinary Science, Royal Veterinary College, London</td>
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<tr>
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<td>Linda Berent</td>
<td>Resident, Clinical Pathology, University of Illinois</td>
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<td>Allan Berger</td>
<td>Postdoctoral Fellow, Molecular Pharmacology, University of Iowa</td>
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<td></td>
<td>Ian Davis</td>
<td>Instructor, Genomics and Pathobiology, University of Alabama</td>
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<td>Judy Hickman-Davis</td>
<td>Assistant Professor, Anesthesiology, University of Georgia</td>
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<td>Dianne Hellwig</td>
<td>Associate Professor, Agriculture and Natural Resources, Berea College, Ohio</td>
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<td>Alan Radford</td>
<td>Lecturer, Small-Animal Studies, University of Liverpool</td>
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<td></td>
<td>Jean Reichle</td>
<td>Medical Director, Animal Imaging, West Los Angeles, California</td>
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<td>1992</td>
<td>Tomasz Betkowski</td>
<td>Medical Representative, Eli Lilly Co., Indianapolis, Indiana</td>
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<td></td>
<td>Stephen Davies</td>
<td>Postdoctoral Fellow, Tropical Diseases, University of California, San Francisco</td>
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<td>Mathew Gerard</td>
<td>Assistant Professor, Surgery, North Carolina State University</td>
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<td></td>
<td>Christine Hawke</td>
<td>PhD Student, Immunology, University of Sydney</td>
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<td>Joanne L'Anglais</td>
<td>Inspector, Canadian Food Inspection Agency</td>
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<td>Julio Montero-Oliver</td>
<td>Chief, Animal Medicine, US Army, Fayetteville, North Carolina</td>
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<td></td>
<td>Jacqueline Phillips</td>
<td>Lecturer, Physiology, Murdoch University, Perth, Australia</td>
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<td>Timothy Rocha</td>
<td>Staff Oncologist, Manhattan Veterinary Group</td>
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<td></td>
<td>Cristina Rodriguez-Sanchez</td>
<td>Senior Research Associate, University of Mexico</td>
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<td>Johanna Sherrill</td>
<td>Staff Veterinarian, Aquarium of the Pacific, Long Beach, California</td>
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<td>Louise Southwood</td>
<td>PhD Student, Clinical Sciences, Colorado State University</td>
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<td></td>
<td>Reinhard Straubinger</td>
<td>Research Associate, Institute for Immunology Vet, University of Leipzig</td>
</tr>
</tbody>
</table>
1993

John Benson  Clinical Fellow, Animal Medical Center, New York City
Virginia Fajt  Adjunct Assistant Professor, Veterinary Antimicrobial Decision Support System, Iowa State University
Deborah Hoyle  Postdoctoral Research Associate, Epidemiology, University of Edinburgh
Christopher Laing  Postdoctoral Fellow, Molecular Biology, University of Pennsylvania
Emma Massey  Lecturer, Internal Medicine, University College, Dublin
Joanne Rainger  Resident, Anesthesia, University of Sydney
Ashley Reynolds  PhD Student, Virology, Cornell University
Susanna Ryan  Postdoctoral Research Scientist, Immunology, Cambridge University
Veiko Saluste  Representative, Interchemi, Estonia

1994

Melissa Beall  Postdoctoral Fellow, Microbiology, Cornell University
Larissa Bowman  Diagnostic Pathologist, Mission St. Joseph Hospital, Asheville, North Carolina
Leslie Gabor  Assistant Professor, Pathology, Atlantic Veterinary College, University of Prince Edward Island
Amanda Gaskin  Resident, Small-Animal Medicine, North Carolina State University
Paige Langdon  Clinical Instructor, Small-Animal Medicine, University of Missouri
Maria Lara-Tejero  Postdoctoral Fellow, Sloan-Kettering Cancer Center, New York City
John MacGregor  Resident, Cardiology, Tufts University
Christopher Mariani  Resident, Neurology/Neurosurgery, University of Florida
Jeffrey Phillips  Resident, Oncology, North Carolina State University
Julie Pomerantz  Associate Research Scientist, Wildlife Trust, Palisades, New York
Stacy Pritt  Veterinarian/Study Director, Toxikon Corporation, Bedford, Massachusetts
Mary Thompson  Lecturer, Clinical Science, University of Sydney
Oliver Turner  PhD Student, Microbiology, Colorado State University

1995

Elizabeth Adkins  Resident, Ophthalmology, University of Tennessee
Gertraut Altreuther  Postdoctoral Fellow, Bayer Animal Health, Germany
Philippa Beard  Postdoctoral Fellow, Virology, Cornell University
Adrienne Bentley  Resident, Large-Animal Medicine, University of Georgia
Rachel Gray  PhD Student, Marine Mammal Pathology, University of Sydney
Krista-Britt Halling  Resident, Small-Animal Clinical Sciences, University of Florida
Wendy Harrison  PhD Student, Cardiovascular Pharmacology, St. Georges Hospital Medical School, London
Andrew Moorhead  PhD Student, Parasitology, Cornell University
Caroline Murray  Veterinarian, Department for Environment, Food, and Rural Affairs, United Kingdom
Tony Mutsaers  Resident, Oncology, Purdue University

1996

Felicity Cole  Lecturer, Clinical Science, University of Sydney
Michelle Dries  MBA Student, Australian Graduate School of Business
Margaret Fleischli  Research Intern, US Geological Survey National Wildlife Health Center, Madison, Wisconsin
Patricia Gearhart  Resident, Ophthalmology, Michigan State University
Jessica Geyer  Resident, Laboratory Animal Medicine, GlaxoSmithKline, King of Prussia, Pennsylvania
1996

Tamara Gull PhD Student, Texas A&M University
Antonia Jameson-Jordan PhD Student, Molecular Medicine, Cornell University
Polly Peterson Resident, Small-Animal Medicine, Texas A&M University
Ralph Senften-Rupp Project Planning Consultant, Berne, Switzerland
John Stein Resident, Small-Animal Medicine, Colorado State University
Allison Stewart Assistant Professor, Large-Animal Medicine, Auburn University
Edwin van Duijnhaven Research Scientist, NOTOX, Netherlands
Ilse van Vonderen PhD Student, Physiology, University voor Gezelschapsdieren, Netherlands
Constantin Von der Heyden DPhil Student, Environmental Studies, Oxford University

1997

Dennis Bailey Resident, Oncology, Cornell University
Roger Bralow Resident, Pathology, Washington State University
Antony Clements Junior Clinical Scholar, Equine Studies, Glasgow University
Alexandra Dorneth Veterinary Doctoral candidate, University of Leipzig
Esther Kornalijnslijper PhD Student, Farm Animal Health, University of Utrecht
Tanya LeRoith Resident, Pathology, Washington State University
Lucy Neave MA Student, Creative writing, New York State University, New York City
Patricia Pesavento Resident, Pathology, University of California, Davis
Paul Plummer Resident, Large-Animal Medicine, University of Tennessee
Deborah Prattley Veterinary Inspector, Department for Environment, Food & Rural Affairs, UK
Melinda Story Resident, Equine Surgery, Kansas State University
Rachel Walker Professional Service Veterinarian, Novartis Animal Health, Sydney, Australia
Tristan Weinkle Resident, Internal Medicine, Clinical Sciences, Cornell University
Jonathan Werner Resident, Pathology, University of California, Davis
Rebecca Wilcox PhD Student, Virology, Melbourne University
Esther Wissink PhD Student, Immunology, Erasmus University

1998

Max Bastian PhD Student, Swiss Tropical Institute, Basel
Erin Crotty Intern, Equine Medicine and Surgery, New Hampshire
Karsten Huffer PhD Student, Virology, Cornell University
Christopher Kunze Resident, Radiology, Texas A&M University
Karen Liljebjelke PhD Student, Microbiology, University of Georgia
Larissa Minicucci MS Student, Epidemiology, University of Minnesota
Amanda Murphie PhD Student, Genetics, Australian National University
Monica Murphy Intern, Small-Animal Surgery, University of Pennsylvania
Harish Narayanaswamy Intern, Small-Animal Medicine and Surgery, Los Angeles
Kitren Nickerson Intern, Littleton Large-Animal Clinic, Colorado
Amy Shumaker Intern, South Shore Animal Hospital, Florida
Anne-Marije Sparnaaij Registration Department, Intervet, International B.V. in Boxmeer, Netherlands
Participants in previous Leadership Programs gathered at Zeta Psi to renew friendships and meet this year’s participants. Many of the alumni are still in training and all are on career tracks envisioned by the program.
What Did They Say?

“I thought it was an excellent program and recommend it highly to my students.”
—Melissa Mazan ‘90

“If you are about to enter the Leadership Program, don’t go with any other expectation than to enjoy it. But be prepared for it to change your life!”
—Alan Radford ‘91

“Vet grad programs all over North America and the world are becoming filled with Leadership Program alums!”
—Tony Mutsaers ‘95

“The Leadership Program provided me with a unique experience to identify possible career pathways.”
—Michelle Dries ‘96

“My experiences during the summer provided the initial impetus for the pursuit of a PhD following my residency and have strongly influenced my career choices.”
—Tamara Gull ‘96

“I would recommend the program to anybody curious to investigate their vocational potential and keen to gain a wonderful life experience.”
—Rebecca Wilcox ‘97

“The Leadership Program introduced me to people with whom I will always keep in contact and decorated my life with an unforgettable experience.”
—David Detweiler ‘00
In the Limelight

Jacqueline Phillips

Looking back, I am amazed at how much the Cornell Leadership Program influenced my career. In 1992, I gave a personal report about the program, which proved to be an accurate prediction of my career path.

"The Leadership Program has shown me that a veterinary degree qualifies one for much more than a career in private practice. I still want to 'be a vet,' at least for a while. I then see myself entering an internship or residency or possibly a graduate research program leading to a PhD. My interests now lie in clinically orientated research."

However, before Cornell, my research experiences had been somewhat disappointing. Between my third and fourth years as an undergraduate, I worked in a research laboratory on a summer scholarship. It was a complete disaster! Nothing worked, and all I managed to do was culture some fungus. In my final year, I was offered the opportunity to attend the Cornell Leadership Program, where I undertook a project with then Associate Professor Bill Horne in molecular neurobiology—my interest in research took on a new light. My experiences in the Horne lab included exposure to the latest methodologies and participation in groundbreaking research. I also received sound and practical advice from established researchers on many subjects, ranging from how to choose your PhD ("pick a good supervisor") to how to combine having a family with working, among other issues. As a bonus, it was an incredibly rewarding experience with regard to the relationships I formed with the other participants, friendships of the type that have lasted even 10 years later.

After I graduated as a veterinarian in 1992, I fulfilled my dream to "be a vet" and worked in private clinical practice for two years. I then undertook a PhD at the Australian National University, studying neural vascular control mechanisms. My project was basic research, guided directly by my exposure to research at Cornell.

After the climax of submitting my PhD, turning 30, and having my first child (all within 3 days), I accepted a postdoctoral position at the University of Auckland, working with Professor Janusz Lipski. This step took my research from the topic of peripheral to central control of circulation. It was a calculated move on my part; I was aimed at increasing my chance of receiving competitive funding so that I could learn electrophysiological patch-clamp recording techniques. While I was in New Zealand, my work focused on two primary areas: determining the phenotype of neurons in the brain involved in the control of blood pressure, and studying both the functional and phenotypic characteristics of adrenal chromaffin cells. During this period I continued to work part time in small-animal veterinary practice to keep "my hand in," so to speak.

My veterinary side resurfaced as I found myself applying for lectureships at veterinary schools around the world. Murdoch University in Perth, Australia, offered me a position, which I accepted. In 2001, I began the somewhat-demanding task of establishing my own lab there (the Molecular Neurobiology Laboratory), while lecturing in veterinary and biomedical physiology. The focus of my research still revolves around central control of circulation, and I also have an interest in tumors of the nervous system. Techniques I utilize in the laboratory include molecular biology, immunohistochemistry, tissue culture, and electrophysiology.

As a postdoctoral researcher I have had the pleasure of advising two honor students and have just taken on my first PhD student. One of my goals when undertaking the lectureship at the Murdoch Veterinary School was to encourage and assist final-year students in applying to Cornell, so that others could enjoy the experience and gain the tremendous benefits that I obtained from the Leadership Program. That dream was realized when two of our students from Murdoch were selected for the 2002 program.

I still have many goals and ambitions, one of which is to establish a successful laboratory supporting a number of graduate students and post-doctoral fellows. I would like my research to be of value, adding not only to our knowledge of science but also to the health and well being of our communities.
For more information about the Leadership Program, contact:

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Leadership Program for Veterinary Students
S2-056 Schurman Hall
College of Veterinary Medicine
Cornell University
Ithaca, NY 14853-6401

Telephone: 1 607-253-3777
Fax: 1 607-253-3701
Email: ddm7@cornell.edu

Interested parties are also invited to visit the program website at:
web.vet.cornell.edu/public/research/leadership

The site also can be accessed directly by entering
"Cornell Leadership Program" into any web browser.

Graphics by the Image Lab,
College of Veterinary Medicine at Cornell University
Photography: Alexis Wenski-Roberts
Design: Barbara Tefft
Leadership Program for Veterinary Students

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