2004 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 331 of the most promising students, representing 54 veterinary colleges worldwide, have been selected to participate. Although the life experiences, culture, and academic backgrounds of program fellows 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 scientists and teachers.

Research is the foundation of the Leadership Program, 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 within the unsurpassed intellectual environment of Cornell University, an Ivy League institution located in the scenic Finger Lakes region of New York State. Program fellows also participate in carefully designed modules and workshops. All are structured as student-directed learning experiences. Topics include emerging infectious diseases and biodefense, leadership and its associated responsibilities, and exercises which illustrate career opportunities for veterinary graduates in the pharmaceutical industry. Vocational counseling and field trips to federal research facilities are additional features of the program.

The Leadership Program, now in its fifteenth 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 establishment of a network of animal-health professionals who have the motivation to function at the forefront of discovery and the ability to contribute broadly to the biomedical sciences.

Douglas D. McGregor, MD, DPhil
Program Director
Acknowledgements

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**The Albert C. Bostwick Foundation**
**The Merck Company Foundation**
**The National Institutes of Health**
**Pfizer Inc**
**The R. K. Mellon Family Foundation**
**The Wellcome Trust**

The program organizers also thank the facilitators, counselors, and mentors who took part in the 2004 program. Thanks, too, to Mr. Kelvin Chao, the Program Coordinator, and to Ms. Susan Williams, Ms. Alexis Wenski-Roberts, and Mr. David Frank for their assistance. Special thanks to Dr. David Fraser, who has had a pivotal role in the Leadership Program in each of the past 12 years. 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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The Leadership Program combines faculty-guided research with student-directed learning through participation in modules, workshops, and group discussions. The activities encourage responsible leadership; the development of analytical, critical thinking, and teamwork skills, and an awareness of professional opportunities to broadly impact the veterinary profession.

Activities 2004
Independent research is the foundation of the program. Each fellow is assigned a project and a faculty mentor to guide his or her investigations. The projects enable scholars to gain practical experience by exploring problems of interest to them. Simultaneously, they hone their public-speaking skills by participating in group modules and presenting their research findings in a public forum at the conclusion of the program.
Leadership

Leadership and its associated responsibilities are central considerations in the Leadership Program. This year, critical thinking and decision-making were featured in a module that explored veterinary public health, economic, political, and social issues. Scholars and facilitators were assigned roles which obliged them to state, defend, and sometimes alter their positions as details of the scenario unfolded. 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 moderated the discussion with assistance from Dr. Prema Arasu, Admiral William Crowe, Dr. Achim Gruber, and Mr. Andrew Sage II.
A separate meeting combined an informal meal and a discussion of leadership based on Earnest Shackleton's 1914-1917 voyage to the Antarctic.
Emerging Diseases

A workshop moderated by Drs. Colin Parrish, John Parker, and Philip Carter featured a discussion of diseases which are emerging or re-emerging in nature. From a prepared list that illustrated principles of disease emergence, the program fellows selected four diseases on which to focus. They conducted library research on the diseases, then engaged their peers and the three facilitators in lively and informative discussion.

Later that evening, the facilitators commented on related issues and the need for veterinary scientists who contemplate careers in infectious disease research.
Biodefense and Public Health

A similarly structured workshop addressed problems connected with the deliberate release of infectious agents which could have catastrophic consequences for the health of animals and people. Here, as in the Emerging Diseases Workshop, the fellows worked cooperatively in preparing and presenting their findings. The proceedings were moderated by Dr. Alfonso Torres and Dr. Marguerite Pappaioanou.

During the evening session, the facilitators commented on their own experiences and the preparation required for veterinarians to function as public health professionals.
Dr. Michelle Haven of Pfizer, Inc. organized a mock competition which enabled the students to exhibit creativity and teamwork in resolving problems connected with the discovery, development and marketing of therapeutic drugs. Dr. Haven was assisted by two colleagues from Pfizer, Dr. Sallie Cosgrove and Dr. Steven Kamerling.
Careers in Industry

In a separate meeting, Dr. Gerard Hickey and Dr. William Feeney conducted mock interviews with students who prepared for the meeting by reviewing four announcements of job positions and four hypothetical resumes of veterinarians who were candidates for those positions.
Vocational Counseling

Career planning is featured prominently in the Leadership Program. Five meetings were convened this year to consider opportunities for veterinary graduates to broadly influence their profession.

Drs. David Fraser, Achim Gruber, Bruce Kornreich and Amy Warren commented on the importance of a veterinary degree for individuals who aspire to careers in science. They also emphasized the importance of selecting a superior environment for research training and a mentor who has a successful training record.

Drs. Dorothy Ainsworth, Rodney Page, and Kenneth Simpson commented on internships and residency programs. The facilitators described the matching process governing the appointment of interns and residents in U.S. veterinary colleges and participating hospitals. The facilitators also commented on factors one should consider in seeking such experiences.
A companion meeting addressed issues relevant to graduate research training. Drs. Franziska Grieder, Richard Cerione and Douglas McGregor emphasized factors one should weigh in selecting an institution and the individual to guide one's research training.

Drs. Stuart Bliss, Susan Bliss and Andrew Moorhead commented on the challenge of balancing professional and personal responsibilities throughout a protracted period of preparation for a career in science.

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National Institutes of Health
Cornell's Partnership with the National Institutes of Health

Topics and Speakers

Welcome and Introduction
Dr. Joan Schwartz, Assistant 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

Why HIV Causes Disease
Dr. Daniel Douek, Chief, Human Immunology Section
Vaccine Research Center
National Institute of Allergy and Infectious Diseases (NIAID)

GnRH-1: The Peripatetic Neuron
Dr. Susan Wray, Chief
Cellular and Developmental Neurobiology Section
National Institute of Neurological Disorders and Stroke (NINDS)

Role of Cytokines and Other Factors in Determining Susceptibility to Drug-induced Liver Disease
Dr. Lance Pohl, Chief
Molecular and Cellular Toxicology Section
Lab of Molecular Immunology
National, Heart, Lung, and Blood Institute (NHLBI)

Hematopoietic Stem Cell Transplantation and Gene Therapy in Non-Human Primates
Dr. Robert Donahue, Director, Simian Gene Transfer Program
National, Heart, Lung, and Blood Institute (NHLBI)

Evaluating Sub-Cellular Function in Vivo Using Multiphoton Microscopy
Dr. Robert Balaban, Scientific Director for Laboratory Research and Chief, Laboratory of Cardiac Energetics
National, Heart, Lung, and Blood Institute (NHLBI)

The National Institutes of Health and the Cornell University College of Veterinary Medicine have forged a partnership which offers program fellows an opportunity to learn about research conducted at the NIH, the nation's premier biomedical research institution. This year's fellows gathered on the agency's Bethesda, MD campus for a full day of scientific presentations and discussions. Speakers included distinguished scientists and administrators drawn from the NIH's intramural research program.
This year's fellows visited the United States Department of Agriculture's Animal and Natural Resources Institute in Beltsville, MD. Institute scientists commented on their research and opportunities for advanced training at this prestigious institution.
Topics and Speakers

Introduction and Overview of the Beltsville Agricultural Research Center
Dr. David Granstrom, Associate Director
Animal and Natural Resources Institute

Strategic Control of Nematodes in Dairy Cattle on Intensive Rotational Grazing
Dr. Louis Gasbarre, Research Leader
Bovine Functional Genomics Laboratory

Approaches to Controlling Cryptosporidiosis in Man and Animals
Dr. Mark Jenkins, Microbiologist
Animal Parasitic Diseases Laboratory

On Farm Detection of Dairy Pathogens
Dr. Michael Perdue, Research Leader
Environmental Microbial Safety Laboratory

Genetic Engineering in Livestock
Dr. Robert Wall, Research Physiologist
Biotechnology and Germplasm Laboratory
Presentations and Prizes

The student fellows discussed their research in a series of presentations at the conclusion of the program. A book prize was awarded to Baukje Schotanus for best overall project as judged by the underlying hypothesis, project design, research results, and presentation. Additional prizes were awarded to Robert Ossiboff, Sylvia Maliye, and Duncan Russell for exceptional projects in integrative biology, cell biology, and molecular biology, respectively. The Selection Committee for the 2004 Leadership Program salutes these individuals and congratulates each of the fellows for the progress made in their research and the excellence of their presentations.

Program Prize
Baukje Schotanus
Inherited Aberrant Vessels in Beagles

Integrative Biology Prize
Robert Ossiboff
In Vitro Correlates of Virulence of Feline Calicivirus

Cell Biology Prize
Sylvia Maliye
Specificity Determining Regions in Rab GTPases

Molecular Biology Prize
Duncan Russell
Regulation of Tissue Transglutaminase in Breast Cancer Cells
Program Fellows and Their Research

Anton Asare
Cornell University, Infectious Disease

Characterization and Antimicrobial Susceptibility Patterns of Streptococcus Group G Strains Found in Dairy Cattle

Before I enrolled in veterinary school, I set my sights on a career in veterinary science that would allow me to broadly influence society and enhance the profession. Public health was an obvious choice, and it is the one I have decided to pursue. My goal is to conduct research in epidemiology and veterinary public health in the U.S. and abroad, and to combine those activities with short-term projects in rural development in poor countries.

I gained research experience this summer by working in the Quality Milk Production Services Unit and Food Science Lab. My associates were three great researchers, Dr. Ynte Schukken, Dr. Linda Tikofsky, and Dr. Ruth Zadoks. Our investigations focused on Group G streptococci isolated from dogs and cows. Group G streptococci are infrequent causes of mastitis in cattle; however, there are increasing reports of antibiotic resistance in members of this group. My project aimed to reveal antimicrobial susceptibility patterns of Group G streptococci strains isolated in herd outbreaks. In addition, I used polymerase chain reaction (PCR) to verify Streptococcus canis as a causal agent of mastitis. I also compared PCR to other, more traditional, diagnostic procedures. A related aspect of my research involved characterizing antibiotic resistance in genes of Streptococcus canis species. I found several genes which confer intermediate resistance to erythromycin.

The exposure I had to veterinary scientists engaged in biomedical research and the preservation of public health was a valuable aspect of the Leadership Program. I enjoyed this networking and the opportunity it afforded to meet people employed in academic institutions, industry, and government laboratories. The program enhanced my capacity to organize presentations as well as my public speaking, laboratory and teamwork skills.

Carolin Block
Ludwig-Maximilians, Universität München, Virology

In vitro inhibition of Marek Disease Virus by RNA interference

I am currently enrolled in my fifth year at university. From the beginning, my interest in pursuing a career in veterinary research has grown progressively. When I heard of the Leadership Program I recognized that it would be a fantastic opportunity to conduct research and further explore non-traditional careers as a veterinary scientist.

This summer I studied Marek’s Disease Virus (MDV) in Dr. K.A. Schat’s laboratory. MDV is a herpesvirus. It is the causal agent of a lymphoproliferative disease in chickens. My project entailed an effort to inhibit virus replication in chicken cell cultures using RNA interference. The principle is to transfec cells with specially designed RNA sequences which initiate a cascade of reactions that result in cleavage of the mRNA for a specific viral gene, thereby impeding synthesis of the gene product. We targeted the viral ICP4 gene. Because the product of this gene is necessary for viral replication, we expected to inhibit viral replication by silencing the gene. To test that proposition, DF-I cells, a fibrocytic chicken cell line, were stably transfected with three putative RNAi sequences. One of those sequences reduced virus replication 40-fold.

The Leadership Program has been a powerful experience. Not only did I gain insight into the meaning of research, but I also had the opportunity to meet and talk with veterinary professionals about their careers and the preparation required for such careers. I would like to thank all the people in my lab for helping me and answering all of my questions. Thanks too to all who made this extraordinary program possible.
Matthew Breed
University of Queensland, Endocrinology

The Membranous Environment of the GnRH-R

After completing a BSc at the University of Adelaide, I enrolled in the BVSc degree program at the University of Queensland. Upon graduating I intend to intern at a veterinary institution and then embark on a residency or PhD program. The Leadership Program has clarified my career aspirations and given me a platform from which to grow professionally.

Working in the Roberson Laboratory under Dr. Stuart Bliss, I studied the internalization and desensitization of mouse Gonadotropin Releasing Hormone Receptor (GnRH-R) in cell culture. GnRH-Rs belong to a large family of G-Protein Coupled Receptors (GPCR). Mammalian GnRH-R differs from the prototypical GPCR structure as it lacks the intracellular C-terminal tail. The latter is important for internalization and desensitization of most GPCRs. Its absence in GnRH-R suggests that internalization of this receptor may involve distinct domains of the plasma membrane called lipid rafts. My results show that the GnRH-R and other significant signaling proteins can be separated from the majority of other plasma membrane proteins using a discontinuous sucrose gradient. This finding supports the lipid raft theory.

Overall the research experience has been a wonderful opportunity to learn how to pursue science at the molecular level. The leadership and continuing education elements of the program were also insightful and encouraging. Interaction with distinguished facilitators allowed me to weigh career options in industry, academia and government. I would like to thank Dr. McGregor, Prof. Fraser, Dr. Bliss, Dr. Roberson, the great people in my lab, and my Zeta Psi brothers and sisters!

Andrew Broadbent
University of Cambridge, Cell Biology

Analysis of Rab14 recruitment to Chlamydial Inclusions

I embarked upon a veterinary degree with the desire to integrate science, medicine and working with animals. During my undergraduate years, I developed a strong interest in infectious disease, and obtained an intercalated BA in pathology at Cambridge.

Clinical aspects of the curriculum provided their own challenges; nevertheless, I retained my interest in basic science and now seek a career in which research will be a significant element of my professional responsibilities. The Leadership Program provided the perfect opportunity to explore various career paths, whilst participating in high-quality research.

I joined the Scidmore lab for an enjoyable 10 weeks working on the recruitment of Rab14 to the chlamydial inclusion. Chlamydia are obligate intracellular pathogens that reside within a vacuole known as an inclusion. The inclusion does not fuse with lysosomes; instead it is trafficked to the peri-Golgi region in a process requiring chlamydial protein synthesis. Chlamydia recruit host proteins, including Rab GTPases to the inclusion to regulate trafficking and promote intracellular survival. My project focused on Rab14. We found that GFP-Rab14-GTP, but not GFP-Rab14-GDP, is recruited to the inclusion. Since Rab proteins interact with effector proteins in their GTP bound state these data suggest that Rab14 may interact with a Rab-effector molecule. Unexpectedly, Rab14 is also recruited in the absence of guanine nucleotides. Therefore, Rab14 may be recruited to the inclusion via a direct interaction with an inclusion-membrane protein, or may simply 'hitch a ride' with other vesicles. Further research will help to clarify this matter.

The Leadership Program has renewed my enthusiasm for veterinary science, and has developed my confidence in taking leadership roles. For that I am grateful to Dr. McGregor, Dr. Fraser, and all who contributed to making this summer as memorable as it has been.
Jennifer Campbell  
Colorado State University, Epidemiology  

Strategies to Control Escherichia coli Infection on a Typical Dairy Farm  

Working with medical professionals in clinical and research settings and traveling in Africa fueled my ambition to use my degree in veterinary medicine to integrate medicine, research, animal patients and disease. Veterinary public health is especially interesting to me. I hope to investigate disease outbreaks, design disease prevention protocols, create and implement new strategies for disease control, develop public health policy and educate susceptible populations, especially in third world countries. I sought admission to the Leadership Program in the hope of adding to my knowledge in these areas and enhancing my research skills.

I had the opportunity to pursue these interests by learning mathematical modeling techniques under the guidance of Dr. Yrjö Gröhn. Food-borne pathogens, such as Escherichia coli are important because of the human illnesses they cause and the problem of antimicrobial resistance. The aim of my project was to describe the transmission dynamics of E. coli O157:H7 on a typical dairy farm. The model I created was used to determine the most influential factors in the prevalence of E. coli infection amongst cattle of different ages. The information was then used to determine an effective strategy for disease control. Our results revealed that inhibiting direct transmission (cow to cow), or indirect transmission (ingesting infectious bacteria from the environment) greatly reduced the prevalence of E. coli infections. On the other hand, biosafety measures alone are unlikely to be effective in reducing infection.

Participating in the Leadership Program has been a highly rewarding and challenging experience. I valued the opportunity to speak with so many veterinary professionals about their education and career paths. I would like to thank everyone involved for making this a successful summer.

Catherine Czaya  
Cornell University, Virology  

Characterization of Infectious Bronchitis Virus Infection in Polarized Epithelial Cells  

Since childhood, I have been fascinated by the amazing diversity amongst animals. During my second year of college, an advisor suggested I consider veterinary medicine because of the many career opportunities available to veterinarians. Now that I’m about to begin my third year in veterinary school, I have encountered many such prospects. My introduction to the concept of applying reproductive biology to the preservation of endangered species has particularly inspired me and led to serious consideration of a career in conservation research. My broad interests in this area prompted me to apply to the Leadership Program.

This summer, I worked in Dr. Gary Whittaker’s lab characterizing Infectious Bronchitis Virus (IBV) infection of polarized epithelial cells. A major interest of the lab lies in the molecular basis of virus entry into cells. Influenza virus and coronaviruses are used as models. My task was to characterize infection with two strains of IBV in different cell culture lines that have similar characteristics to naturally infected chicken epithelial cells. I performed assays for viral infection and spread, perfecting techniques necessary to visualize cellular compartments and viral particles with fluorescent antibodies and fluorescent microscopy. I also examined the localization of M surface protein in infected cells as a marker for viral assembly and budding, and concluded that localization in infected polarized epithelial cells does not seem to mirror that in non-polarized cells.

The Leadership Program has provided a wealth of information about alternative careers in veterinary medicine and a unique opportunity to exercise leadership qualities with veterinary students from all over the world. The experience has truly been both rewarding and enjoyable. I would like to thank Dr. McGregor and Prof. Fraser, everyone in the Whittaker lab, and my fellow participants for their friendship, support, and good humor.
Tonima Dan  
**Ontario Veterinary College, Virology**

**Characterization of US9 Function in Equine Herpesvirus Type 1**

Although I have always loved animals, my interest in veterinary medicine stems from my research experience during my undergraduate and masters program at the University of Guelph. Thus, I entered veterinary school with a research career in mind. During my first year, I applied to the Leadership Program at Cornell with the intention of exploring career opportunities in research, to meet people from other universities, and to learn new research techniques.

My project in Dr. Klaus Osterrieder’s laboratory was to characterize the function of US9, a putative non-essential protein in equine herpesvirus type 1. Equine herpesvirus type 1 causes disease in horses, characterized by abortions and neuronal disorders. A bacterial artificial chromosome (BAC) and bacteriophage recombination system in E. coli was used to delete the US9 sequence as well as to introduce a peptide sequence, called FLAG tag, at the end of the coding sequence of US9. The BAC DNA with the deleted US9 sequence was then transfected into eukaryotic cells to reconstitute US9-negative virus. Having this mutant virus, containing the FLAG tagged US9, allows us to visualize the distribution of US9 in virus infected cells.

It has been an invaluable experience contributing to Dr. Osterrieder’s research and I thank everyone in the laboratory for their kind help and support in making my stay in Ithaca an enjoyable experience.

Angelique DellaVolpe  
**University of Leipzig, Developmental Biology**

**Effect of FGF8 on Eye Muscle Development**

Animals have given so much to my life, that, at a young age, I decided I wanted to return the favor. Thus, I have long felt an intuitional draw towards veterinary medicine. I am originally from Washington State, but chose to pursue my veterinary degree in Leipzig, Germany, where I have completed my third year. I have always been interested in research and was attracted to the intensive experiences offered by the Leadership Program.

This summer I have had the opportunity to work on an animal development project with Dr. Drew Noden. I explored the effects of FGF8 (fibroblast growth factor 8) on the differentiation and migration of eye muscles. It was a major challenge to become a competent micro-surgeon within the ten week period of the program. Nevertheless, with the aid of a surgery microscope, I managed to implant beads soaked in FGF8 into the midbrain of two-day-old chick embryos. After surgery, the embryos were incubated for 2-6 days then fixed in formalin. Using probes for gene products and antibodies for muscle proteins, I was able to ascertain various affects of FGF8 on the surrounding tissues.

This Program has catapulted me to a higher level of understanding of veterinary medicine and the opportunities I will have upon graduation. I am still uncertain of the exact path I will take, but feel more prepared to make wise occupational decisions and have the confidence that whatever I choose will turn out to be rewarding, and challenging. I would like to thank to Dr. Noden and everyone in my lab for being so supportive and also to all my fellow participants for helping to make this summer such an enjoyable one. Lastly, thanks to Dr. McGregor and Dr. Fraser for organizing such an amazingly insightful program.
Karla Dreckmann  
School of Veterinary Medicine, Hannover, Virology

**Infectivity & Capsid Assembly of Mutations in the Structure of Parvovirus Capsid**

As long as I can remember I have wanted to become a veterinarian. My ambition stems from my love of animals, but it was later enhanced by the realization that much can be learned about natural sciences from the study of veterinary medicine. Soon after enrolling in veterinary school my interest was drawn to basic research, especially in infectious diseases. Taking part in the Leadership Program has provided an inside view of molecular and structural virology. It also offered me the opportunity to improve my conversational and problem solving skills while meeting many interesting people.

I pursued research on canine parvovirus in Professor Colin Parrish’s lab. There I investigated several plasmids containing the infectious virus genome. The viruses had induced changes in their capsids that were predicted to modify the structure and perhaps the function of the virus through amino acid sequence alterations in its fivefold axis. Some viruses were predicted to show differences in capsid assembly and infectivity compared to the wild type. The viral capsid forms a pore for externalization and possibly entry of molecules into or out of the capsid. These processes are presumed to be affected by changes in the pore’s 3D structure.

I transfected feline cells with plasmids generated in an earlier project. The cells were examined by fluorescent microscopy, after antibody staining, to detect either assembled proteins or non-assembled capsids. Secondary infections of new cells were also sought.

I would like to thank Dr. McGregor and Dr. Fraser for this inspiring summer. Special thanks go to Colin Parrish, and my lab colleagues for all their help and support. These ten weeks strengthened my intention to follow a career in veterinary research.

Jessica Frankel  
Cornell University, Genetics

**Characterization of the Second QTL on Chromosome 37 Associated with Canine Hip Dysplasia**

My decision to enter the field of veterinary science was stimulated by my strong interest in science as well as a desire to work with animals. During my first year of veterinary school I decided to apply to the Leadership Program to help me identify less traditional pathways available in veterinary medicine and hopefully attain guidance in further defining my chosen career.

This summer I worked in the lab of Drs. Nancy Burton-Wurster and George Lust. This lab has made notable advances in the fields of osteoarthritis and canine hip dysplasia. Current research aims to identify genes affecting the complex trait of canine hip dysplasia within the recently sequenced canine genome. Previous research had identified two potential quantitative trait loci on Chromosome 37. My project focused on characterizing the second QTL by fine mapping. To do this, I used several primers in the region flanking tetranucleotide microsatellite markers and then conducted PCR on DNA from an out-bred cross of Labradors and Greyhounds generated and maintained by the lab. The PCR product was genotyped to identify the alleles carried by each of the dogs in the lineage. My findings have increased the number of dogs and markers studied by the lab and will help to determine the specific location of the QTL on chromosome 37.

The Leadership Program has revealed different aspects of veterinary medicine and identified pathways of entering such careers. I would like to thank the members of the Lust lab for their help throughout the summer.
Hilary Granson  
Cornell University, Genetics

Exploring Antigen Gene Variations in Different Strains of *Ichthyophthirius Multifiliis*

I entered veterinary school aged in my early 30s after working for more than a decade as a marketing copywriter. My decision to change career paths was rooted in a desire to find a career that was more meaningful to me. This coupled with a long-standing love of animals and a recent interest in the mechanisms of disease processes confirmed my decision.

The Leadership Program has enabled me to broaden my knowledge beyond clinical applications and to explore molecular processes of disease and the techniques needed to elucidate them. In the lab of Dr. Ted Clark, I learned about the fish parasite Ichthyophthirius multifiliis (Ich) and its devastating effects on freshwater fish. During the summer, I used degenerate primers and PCR to search for a gene variant in a newly discovered serotype. The gene I was seeking, codes for GPI-anchored proteins, which serve as antigenic determinants and are potential vaccine candidates. My efforts were rewarded with the discovery of one and possibly more novel genes coding for GPI-anchored proteins. I am currently working with others to sequence the gene(s) and measure the relative level of product expression through Northern blots.

In addition to hands-on research experience, discussions and workshops connected with the Leadership Program shed new light on research careers available to veterinarians. These opportunities ranged from positions in academia and government to the career paths in the pharmaceutical industry. I would like to thank Dr. McGregor and Dr. Fraser as well as all the program sponsors and participants for making this experience possible. It has reinforced my belief that research combined with clinical service offers a powerful tool for making significant advances in science and animal medicine.

Anthea Jones  
University of Queensland, Food Safety

Listeria Monocytogenes Transmission in Ruminants

My undergraduate degree in Biochemistry, Microbiology and Spanish sparked my interest in research. Before embarking on a definitive career, however, I wanted to learn more about physiology and pathology. A medical education seemed to satisfy that desire, but after meeting an extraordinary group of veterinary students, I changed tack and enrolled in the BVSc program at the University of Queensland.

This summer I joined Dr. Martin Wiedmann's Food Safety Lab. The Wiedmann group has a long standing interest in Listeria monocytogenes, a ubiquitous facultative intracellular bacterium that can cause severe disease in ruminants and invasive foodborne disease in immunocompromised people. I set about analyzing data from a study of fecal shedding in 25 cows and developing tools for use in a long-term study. A major thrust of my research was to develop an ELISA for detecting anti-listeriolysin O antibodies. Such antibodies are formed as a consequence of infection by Listeria monocytogenes. Once optimized, the ELISA will be used in a longitudinal study to measure the humoral response of cattle to the subject organism. I also performed tissue invasion assays to compare ribotypes isolated in an earlier investigation. Finally, I carried out sequencing and alignment of two virulence genes to compare the homology of different isolates.

I have thoroughly enjoyed my time with Dr. Wiedmann and want to thank him for teaching me to think about ‘the big picture’ and for encouraging me to be independent in my research. I am also indebted to everyone in the lab who has come to my rescue at some stage. A big thank you must also go to Dr. McGregor, Dr. Fraser and everyone involved in the Leadership Program. This has been an invaluable experience and a defining moment in my career.
Annika Krengel  
School of Veterinary Medicine, Hannover, Gene Expression

Control of Odorant Receptor Gene Expression in Mice

I have a passion for animals, so veterinary medicine seemed to be the only career choice for me. I began my studies in 2001, but soon felt that treating animals is not enough: I wanted to learn about other career options. The Leadership Program has been instructive in that regard. It provided insight into research while living with other program participants was an enriching experience that I will not forget.

I had the pleasure of working with Professor David Lin this summer. My project focused on the control of odorant receptor gene expression in mice. There are many ways by which gene expression can be regulated. Our hypothesis is that odorant receptor genes are subject to epigenetic regulation by a process involving gene methylation. We used a strain of mutant mice that do not express cSHMT, a protein that affects the availability of methyl-groups. My part in the study included genotyping mice and preparing tissue samples from the olfactory bulb and olfactory epithelium. I sectioned and stained the samples with a view to determining whether receptor protein expression is modified by methylation.

This summer was educational and rewarding, not only because of the program modules, but also because it afforded me the opportunity to work in an amazing lab. My thanks go to David and all the lab members who welcomed me and patiently answered my many questions. Thanks also to Merck both for sponsoring my participation in the Leadership Program and for hosting a great symposium in which I participated with students from other colleges.

Sylvia Maliye  
Royal (Dick) School of Veterinary Studies, Edinburgh, Cell Biology

Specificity Determining Regions in Rab GTPases

I am currently half way through my veterinary degree. I applied to the Leadership Program in the hope that it would allow me to explore alternative career paths, to obtain research experience in a university setting, and to acquire skills that will be useful in the future.

My summer was spent in Dr Ruth Collins’ laboratory, where Rab proteins are the subject of research. These evolutionarily conserved GTPases are critical regulators of intracellular trafficking, a process known to be altered in cancer cells. My project aimed to identify key regions controlling localization and function of two Rab proteins, Sec4p and Ypt1p. Previous research suggested that the Sec4p hypervariable domain controls localization. Ten DNA constructs were made encoding protein domains switched between the two genes, resulting in the production of chimeric proteins with switched domains. I investigated the functionality of the proteins derived from these constructs, expressed in two yeast cell lines. All constructs resulted in protein expression, though only three were compatible with cell survival. My work identified the effector domain region as being critical for Sec4p function. Fluorescence experiments showed that this domain is likely to be the one that controls Sec4p localization. Therefore, my studies have helped overturn the earlier conclusion that the hypervariable domain was responsible for the localization of Rab GTPases.

This summer has been a unique and extremely rewarding experience. It has further encouraged me to pursue a career which combines research and clinical responsibilities. The program also encouraged me to strive for excellence in selecting training options and armed me with new research skills. I wish to thank all members of the Collins Laboratory, Dr. McGregor, Dr. Fraser and my sponsor, the Wellcome Trust, for enabling me to have such a truly enjoyable summer.
Robert Ossiboff  
Cornell University, Virology

**In Vitro Correlates of Virulence of Feline Calicivirus**

Strong interests in both the basic sciences and animal health directed me towards a career in veterinary medicine. However, working several years as a veterinary technician in a small animal hospital made me realize that private practice wasn’t quite for me. I applied to the Leadership program to gain a better understanding of alternative careers.

This summer I conducted my research under the guidance of Dr. John Parker. Specifically, I explored the growth kinetics of Feline Calicivirus (FCV). FCV is a common feline pathogen for which multiple strains exist. Clinical manifestations are mild, and while morbidity is high, mortality is usually quite low. Yet, recently, highly virulent strains of the virus have resulted in systemic disease with mortality rates ranging between 33% and 60%. Growth characteristics of low virulence (FCV-3) and high virulence (FCV-5) strains of FCV were compared to determine if virulence correlates with growth kinetics of the virus. Measurements of viral titers with time revealed both greater titers and shorter time to logarithmic growth in the more virulent strain. This suggests that the kinetics of viral growth do have a role in virulence. Analysis of additional strains of FCV will be required to support this claim.

Immunofluorescence studies of the different strains of FCV also revealed different cell tropisms. Such tropism and kinetic differences point to what might be genetic changes between the two strains in regions of normally highly conserved sequences.

I would like to thank everyone in the Parker Lab for a great learning experience, and Dr. McGregor and the Leadership Program for providing me with this incredible opportunity.

Allison Rogala  
North Carolina State University, Infectious Disease

**Intracellular Pathogenesis of Listeria Monocytogenes**

After completing my first year of veterinary school at North Carolina State University CVM, I applied to the Leadership Program because I am interested in pursuing a veterinary career other than clinical practice. I spent an enriching summer under the mentorship of Dr. Hélène Marquis investigating pathogenic mechanisms of Listeria monocytogenes, the causal agent of Listeriosis. L. monocytogenes is a gram positive, facultative intracellular bacterial pathogen capable of cell-to-cell movement throughout the host without release into the extracellular matrix. This curious property enables the organism to evade the host immune system. Upon entering the host cell, the bacteria are contained in vacuoles from which they must escape prior to dividing. I investigated the role of a newly-discovered L. monocytogenes protein, lmo2219, which shows homology to a molecular chaperone that facilitates folding of secreted proteins in Bacillus subtilis. My task was to determine whether this protein facilitates the secretion of proteins used by L. monocytogenes to escape from cellular vacuoles. The strategy I used involved the manipulation of a bacterial strain in which the lmo2219 gene was placed under inducible expression. Phenotypic evidence of increased protein secretion or increased efficiency of cell-to-cell spread was not observed upon induction. The findings suggest that if lmo2219 facilitates the folding of proteins involved in vacuolar escape, it is unlikely to be a limiting factor in protein secretion.

The Leadership Program assisted my investigation of alternative paths by allowing me to interact with successful veterinarians in a variety of fields. I hope to continue in research upon graduation, most likely in the area of infectious disease. I would like to thank Dr. Marquis and the program facilitators, not only for sharing their scientific knowledge, but also for serving as mentors as I continue my exploration of career alternatives.
Duncan Russell  
Glasgow University, Molecular Biology

Regulation of Tissue Transglutaminase in Breast Cancer Cells

With just one year of my BVMS degree remaining, the daunting prospect of making a career decision looms before me. For many years this decision had been obvious: I would become a veterinarian in mixed practice. During my first four years at veterinary school, however, I became more interested in fundamental questions that veterinary students encounter, especially those regarding disease mechanisms. This kindled my interest in research.

I applied to the Leadership Program with a view to exploring career options. During my summer at Cornell, I worked with Professor Rick Cerione and Dr. Marc Antonyak investigating regulation of tissue transglutaminase (tTGase) in SKBR3 cells. The work was an extension of an earlier investigation in which breast cancer cells were stimulated with epidermal growth factor (EGF). The stimulated cells expressed tTGase and were protected from doxorubicin-induced apoptosis. I investigated a number of signaling pathways in this system and identified both PI3 Kinase and Ras-Erk pathways as important regulators of tTGase. The complex nature of tTGase regulation was further revealed in our finding that the JNK pathway is a negative regulator of the enzyme. All of the pathways mentioned are potential targets for anti-cancer drugs.

The career decisions I now face are considerably less intimidating. My time in the Cerione lab, and indeed the whole Program, has been truly inspirational. Not only has it ignited a genuine desire to pursue a career in research, but I have managed to make some great friends. I send a huge thank you to Professor Cerione, Dr. Fraser, and Dr. McGregor for making this such an enjoyable experience. Special thanks also to Marc Antonyak for the harmonious working environment he created and his ever-insightful guidance.

Baukje Schotanus  
Utrecht University, Developmental Biology

Inherited Aberrant Vessels in Beagles

My interest in veterinary medicine began when I was very young. It was kindled by my love for animals, and the social aspects of being a veterinarian. During my studies, an interest in discovery was stimulated by hands-on research. The Leadership Program seemed to be an opportunity to build on that experience.

This summer Dr. Moise was my inspiring and enthusiastic mentor. I was involved in a study of dogs from a colony of Beagles which manifested a curious diastolic murmur. As cardiovascular disturbances may have profound effects on the interpretation of research results, it was important to understand the cause and mode of inheritance of this abnormality. My work entailed the performance and interpretation of electrocardiograms, transthoracic and transesophageal echocardiography, angiocardiography and the creation of vascular casts of the cardiopulmonary system in these dogs. The procedures revealed aberrant vessels shunting from the arterial system into the left pulmonary artery. To better understand the mode of inheritance we undertook a pedigree analysis. I also developed a hypothesis for the cause of the aberrant vessels. The project illustrated the importance of collaboration which in this case involved members of the cardiology laboratory and Dr. Braam Bezuidenhout, an anatomist, Dr. Drew Noden, an embryologist, and a geneticist, Dr. Orly Goldstein.

Research experience, the challenging workshops, informative discussions, and the inspiring and admirable facilitators who participated in the Leadership Program have helped to define my career options. I want to thank Dr. McGregor and Dr. Fraser and all other contributors for a fantastic experience.
Katherine Scollan  
Cornell University, Toxicology

**Tissue Distribution and Toxicity of Nanobiohybrids**

My interests in the field of veterinary medicine have changed dramatically during the past two years. I entered veterinary school with the goal of becoming a small animal clinician, but have developed a passion for veterinary pathology. The Leadership Program has revealed a range of careers available in that field and has given me information needed to pursue my goal.

This summer I worked in the lab of Dr. Alex Nikitin, where I studied the distribution and toxicity of nanobiohybrids in mice. Nanobiohybrids are novel vectors for delivering non-ionic, poorly water soluble drugs used in cancer therapy. The constructs are composed of the drug in a micelle of surfactant which in turn is incorporated within an aluminum-magnesium layered double hydroxide (LDH). While layered double hydroxides have been employed to deliver negatively charged drug molecules, nanobiohybrids allow non-ionic drugs to be similarly dispersed. But studies had not yet been performed to ascertain the tissue disposition and potential toxicity of nanobiohybrids. My project addressed that gap in knowledge by measuring animal survival, the distribution of nanobiohybrids in tissues, and the toxicity of the structures. The nanobiohybrids I used contained a fluorescent dye. They were administered to mice via three different routes and at three different doses. The injected mice were then euthanized at predetermined intervals post injection. Their tissues were collected and studied from the standpoint of the distribution of fluorescence and any pathologic changes which the nanobiohybrids may have caused. Fluorescence was seen in skin up to 7 days after subcutaneous injection and mild pathologic changes were observed in the liver, lung, and kidney.

After completing my DVM degree I plan to pursue an internship to solidify my clinical knowledge and then a residency in pathology. I would eventually like a career in an academic setting involving diagnostic work, research, and teaching.

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Ivana Sekis  
Veterinary University Vienna, Toxicology

**Determination of the Genotoxicity of Metronidazole in Feline Peripheral Blood Lymphocytes**

My fascination with clinical and basic biological sciences attracted me to veterinary medicine. I began my studies with the goal of pursuing a research career. My interests lie in infectious diseases and pathophysiological processes underlying host-agent interactions. I will graduate next year.

The Leadership Program has been an ideal opportunity to explore and prepare myself for a research career. I have had a great experience working with Dr. Kenneth Simpson this summer. We determined the ability of metronidazole to cause DNA breakage in feline peripheral blood lymphocytes (PBL) using alkaline single cell electrophoresis (Comet Assay). Long-term treatment with low doses of metronidazole, that are potentially "immunomodulatory", has been commonly employed in cats with inflammatory bowel disease. Previous studies revealed an association of metronidazole treatment with lymphoid neoplasia in mice and DNA alteration in human PBL. The objective of our work was to determine any genotoxic effect of exposure to different concentrations of metronidazole in cells from healthy cats as well as cells of a feline T-lymphoma cell line. Similar studies were also done with cells from cats, before and after oral treatment with metronidazole, to determine whether there was a dose-response relationship between metronidazole and the extent of DNA damage.

I am grateful for the opportunity to take part in the Leadership Program. I learned much and met many admirable and inspiring people. I would like to thank all who made that experience possible. My interaction with other program fellows was unforgettable.
Katy Townsend
University of Sydney, Blood Coagulation

Characterization of activation response of Scott syndrome platelets and lymphocytes in a German Shepherd colony

My love for animals was the initial driving force for me to study veterinary medicine. As I approach the end of my degree program, my career interests have changed. I had previously gained field research experience, with hyenas in Zimbabwe, but I wanted to complement this with laboratory research. Applying to the Leadership Program was an excellent way to investigate this and other facets of veterinary science.

I had the opportunity to conduct research in Dr. Marjory Brooks and Dr. James Catalfamo's Comparative Coagulation Laboratory. There I attempted to further characterize a procoagulation disorder in German Shepherd Dogs. Platelet alpha granules were studied to see whether the uptake and release of their contents was defective and whether the platelets could be activated. Granule release was measured using a fibrinogen ELISA. Flow cytometry was used to evaluate activation through an immunofluorescence marker for the protein, P-Selectin, which is expressed on the surface of activated platelets. I found that platelets from Scott syndrome dogs could be activated but they have a decreased ability to release their alpha granules. Mononuclear cells were also studied. I isolated and activated lymphocytes and qualitatively showed that they too manifest this defect.

The Leadership Program has further enforced my decision to pursue a non-traditional career in veterinary science. It also has allowed me to meet inspirational facilitators and students. I thank my two mentors for their support, encouragement and guidance, Dr. Douglas McGregor and Dr. David Fraser for organizing this fantastic program, and my fellow students who made the summer an unforgettable experience.

Claire Underwood
Cambridge University, Genetics

Characterization of the First QTL Associated with Canine Hip Dysplasia on Chromosome 37

I entered veterinary school with the goal of becoming a specialist practitioner. However, over the past four years I have come to realize there are other aspects to veterinary medicine. I now wish to go beyond general practice, and am interested in tackling problems facing the profession. In my third year I completed the Cambridge Management Studies Tripos. This, combined with becoming president of the British Association of Veterinary Students, raised my awareness of political and economic aspects of veterinary medicine. Still, I had little research experience, and saw the Cornell Leadership Program as a wonderful opportunity to further explore this path.

This summer I worked with Drs. George Lust, Nancy Burton-Wurster, and Rory Todhunter. My project involved characterization of the first quantitative trait locus (QTL) for hip dysplasia on canine chromosome 37. Canine hip dysplasia is a polygenic trait, resulting in joint laxity and subluxation. I selected microsatellite markers flanking canine genes that were syntenic with genes associated with hip dysplasia upon human chromosome 2. Using the polymerase chain reaction, and QTL mapping, I attempted to identify polymorphisms that could be traced through a colony of Labrador-Greyhound crosses. This enabled me to produce a more detailed map of chromosome 37, and to narrow the QTL for canine hip dysplasia. A final objective would be to identify genes or narrow the QTL to such an extent so as to provide a reliable diagnostic test.

I have enjoyed this summer immensely, and thank Drs. McGregor and Fraser for organizing such a wonderful course, my sponsors The Wellcome Trust for sponsoring me, and everyone in the Lust/Burton-Wurster lab for their guidance and support.
James Weemhoff  
Kansas State University, Chondrocyte Biology  

IGF-1 and IL-1 Signaling in Equine Chondrocytes  

I applied to the Leadership Program because I wanted to conduct research that would be directly applicable to veterinary medicine. During the past summer, I had the privilege of working with Dr. Amber Boehm in Dr. Lisa Fortier's lab. My project entailed a study of equine articular chondrocytes. The focus of the project was on the role of the G-protein Rho in signaling pathways of insulin-like growth factor (IGF-1) and interleukin-1 (IL-1). These two cytokines had previously been shown to have counterbalancing effects on cartilage maintenance. The objective of my research was to ascertain whether Rho was “activated” by IGF-1 or IL-1. I found that Rho was not activated when chondrocytes were incubated for 10 minutes in the presence of either cytokine. Time did not permit me to test the effect of longer exposure times; but other experiments conducted using different techniques did implicate Rho in both the IGF-1 and IL-1 pathways.

My participation in the Leadership Program has been an eye-opening experience. In addition to pursuing a research project, the program’s in-depth discussions of careers in veterinary research has not only prepared me for what lies ahead, but has identified ways to structure my future training. At this stage, I still have doubts about my ultimate career: I’m leaning toward veterinary practice - perhaps working for a zoo or a wildlife agency - but I am also interested in discovery. Ideally, I would like to conduct research for NASA as an astronaut.

Collin A. Wolff  
Cornell University, Reproductive Biology  

Sperm from CatSper1-/- Mutant Mice Show Impaired Ability to Ascend the Oviduct  

My pursuit of a veterinary degree was initially charged by my desire to become a clinical veterinarian. In recent years, however, I have become aware of the existence of and need for veterinarians in many non-traditional vocations. Having just completed my first year, the Leadership Program seemed an excellent way to explore such careers.

I had the great pleasure of working with Dr. Susan Suarez, a well-recognized authority on mammalian sperm motility. Ongoing research in the Suarez lab seeks to determine the physiological significance of hyperactivation, a calcium-dependent change in sperm motility that renders the sperm fertilization-competent. A major advance came with the recent discovery of CatSper1, a putative voltage-gated Ca2+ channel localized to the sperm tail. CatSper1-knockout (CatSper1-/-) mice, which are genetically engineered to produce sperm that lack CatSper1, are infertile and their sperm do not exhibit hyperactivated motility. By analyzing the motility of CatSper1-/- mouse sperm within the female reproductive tract, I explored the question of why the inability to hyperactivate translates into infertility. Previous studies showed that hyperactivation is important in oocyte penetration; however, the results I obtained also suggest a role in passage of sperm through the utero-tubal junction and their separation from the oviductal mucosa.

I am infinitely grateful for the people I have met and the broad perspective of the veterinary profession I have attained as a result of my participation in the Leadership Program. The program’s lessons in career planning, professional training and personal responsibility will prove invaluable in my search for the most fitting professional career - once limited by a clinical vision, but now open to a colorful horizon in academia, or perhaps industry.
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.
Counselors and Facilitators for the 2004 Leadership Program

Dr. Dorothy Ainsworth, Counselor  
Professor  
Department of Clinical Sciences  
Cornell University

Dr. Prema Arasu, Facilitator  
Associate Professor  
Department of Microbiology  
North Carolina State University

Dr. Stuart Bliss, Counselor  
PhD Graduate Student  
Department of Biomedical Sciences  
Cornell University

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

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

Dr. Richard Cerione, Counselor  
Professor  
Department of Molecular Medicine  
Cornell University

Dr. Sallie Cosgrove, Facilitator  
Manager, Pharmacovigilance  
Animal Health Discovery  
Pfizer Inc.

Adm. William Crowe, Facilitator  
Chairman, U.S. Armed Forces  
Joint Chiefs of Staff, Retired

Dr. William Feeney, Counselor  
Director, Comparative Medicine  
Head of Laboratory Animal Resources-Rahway  
Merck Research Laboratories

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

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

Dr. Achim Gruber, Counselor, Facilitator  
Professor  
Department of Pathology  
University of Hannover

Dr. Michelle Haven, Facilitator  
Senior Director of Veterinary Medicine  
Pharmaceutical Discovery  
Animal Health Discovery  
Pfizer, Inc.

Dr. Gerard Hickey, Counselor  
Senior Director  
Animal Drug Evaluation  
Merck Research Laboratories

Dr. Steven Kamerling, Facilitator  
Senior Research Investigator  
Pharmaceuticals, Discovery  
Pfizer Inc.

Dr. Bruce Kornreich, Counselor  
PhD Graduate Student  
Department of Molecular Medicine  
Cornell University

Dr. Douglas McGregor, Counselor  
Director  
Leadership and Training Initiatives  
Cornell University

Dr. Andrew Moorhead, Counselor  
PhD Graduate Student  
Department of Microbiology and Immunology  
Cornell University

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

Dr. Marguerite Pappaioanou, Facilitator  
Associate Director  
Science and Policy  
Centers for Disease Control, Atlanta GA

Dr. John Parker, Facilitator  
Assistant Professor  
James A. Baker Institute for Animal Health  
Cornell University

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

Mr. Andrew Sage II, Facilitator  
President  
Sage Capital Corp.

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

Dr. Alfonso Torres, Facilitator  
Director  
Animal Health Diagnostic Laboratory  
Cornell University

Dr. Amy Warren, Counselor  
Resident, Pathology  
Department of Biomedical Sciences  
Cornell University

Dr. Robin Yates, Counselor  
PhD Graduate Student  
Department of Microbiology and Immunology  
Cornell University
Participants in the 2004 Leadership Program were housed in the Zeta Psi fraternity house on the Cornell campus. They had exclusive use of the building for the ten-week period that the program was in session. Several events were scheduled there, typically in the evening in conjunction with a catered meal. The living arrangements enabled the fellows to socialize and relax in a convenient and pleasant campus environment.

**Program Coordinator**

**Mr. Kelvin Chao**

*Class of 2006, Cornell University*
*School of Industrial and Labor Relations*

The participants exhibited genuine enthusiasm for their research and other activities connected with the Leadership Program. Their unique personalities and dedication encouraged me to follow their example in my responsibilities for organizing events and dealing with the many problems that arise in a multifaceted initiative of this kind.

While veterinary medicine and event planning are not directly related to my career aspirations, the many challenges that the program posed have greatly improved my organizational and interpersonal skills. I enjoyed sharing this summer with the students, facilitators, Ms. Susan Williams and especially Dr. McGregor. I am grateful to them for making the program an enjoyable and instructive experience.
The program fellows found time for many personal pleasures. They capitalized on local Ithaca amenities and visited Boston, Niagara Falls, New York City, and Washington D.C.
Where Are They Now?

The program director and 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 the academy, government, or industry.

**1990**

John Angelos  Assistant Professor, Food Animal Medicine, University of California, Davis  
William Carr  Postdoctoral Fellow, Immunology, University of California, San Francisco  
Laura Gumprecht  Veterinary Pathologist, Merck Research Laboratories, Rahway, New Jersey  
Elizabeth Lyon Hannah  Veterinary Epidemiologist, Qualis Health, Boise, Idaho  
Richard Haworth  Molecular Pathologist, GlaxoSmithKline, Middlesex, United Kingdom  
Melissa Mazan  Assistant Professor and Director, Sports Medicine, Tufts University  
Rebecca Papendick  Associate Pathologist, Zoological Society of San Diego  
Susan Schaef er  Clinical Assistant Professor, Surgery, University of Wisconsin  
Dawn Shore  Veterinary Specialist, Equine Theriogenology, University of Missouri  
A. W. (Dan) Tucker  Lecturer, Veterinary Public Health, University of Cambridge  
Thomas Vahlenkamp  Personal Assistant to the President, Friedrich-Loeffler Institute, Riems

**1991**

Prema Arasu  Associate Professor, Parasitology, North Carolina State University  
David Bainbridge  Clinical, Veterinary Anatomist, Cambridge University  
Linda Berent  Clinical Assistant Professor, University of Missouri  
Allan Berger  Postdoctoral Fellow, Molecular Pharmacology, University of Iowa  
Ian Davis  Research Instructor, Genomics and Pathobiology, University of Alabama, Birmingham  
Judy Hickman-Davis  Assistant Professor, Anesthesiology, University of Alabama, Birmingham  
Dianne Hellwig  Associate Professor, Agriculture and Natural Resources, Berea College, Ohio  
Alan Radford  Lecturer, Small-Animal Studies, University of Liverpool  
Jean Reichle  Medical Director, Animal Imaging, West Los Angeles, California

**1992**

Tomasz Betkowski  Medical Representative, Eli Lilly Co., Indianapolis, Indiana  
Stephen Davies  Assistant Professor, Parasitology, Uniformed Services College, Washington, DC  
Mathew Gerard  Assistant Professor, Surgery, North Carolina State University  
Christine Hawke  Instructor, Immunology, University of Sydney  
Joanne L’Anglais  Inspector, Canadian Food Inspection Agency  
Julio Montero-Oliver  Chief, Animal Medicine, US Army, Fayetteville, North Carolina  
Jacqueline Phillips  Lecturer, Physiology, Murdoch University, Perth, Australia  
Cristina Rodriguez-Sanchez  Senior Research Associate, University of Mexico  
Johanna Sherrill  Staff Veterinarian, Aquarium of the Pacific, Long Beach, California  
Louise Southwood  Assistant Professor, Emergency and Critical Care, University of Pennsylvania  
Reinhard Straubinger  Lecturer, Institute for Immunology, University of Leipzig
1993  Virginia Fajt  Adjunct Assistant Professor, Veterinary Microbiology, Iowa State University  Deborah Hoyle  Postdoctoral Research Associate, Epidemiology, University of Edinburgh  Christopher Laing  Postdoctoral Fellow, Molecular Biology, University of Pennsylvania  Emma Massey O’Neill  Lecturer, Small Animal Medicine, University College, Dublin  Joanne Rainger  Registrar, Anesthesia, University of Sydney  Ashley Reynolds  Postdoctoral Fellow, Virology, Princeton University  Susanna Ryan  Postdoctoral Research Scientist, Immunology, Cambridge University  Veiko Saluste  Executive, Interchemi, Estonia  Lynn Wachtman  MPH Student, Johns Hopkins University

1994  Melissa Beall  Research Scientist, IDEXX  Larissa Bowman  Diagnostic Pathologist, Mission St. Joseph Hospital, Asheville, North Carolina  Leslie Gabor  Assistant Professor, Pathology, Atlantic Veterinary College, University of Prince Edward Island  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  PhD Student, Neuroscience, University of Florida  Sonia Mumford  Staff Member, US Fish and Wildlife Service, Olympia, Washington  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  Oliver Turner  Pathologist, Novartis Inc.

1995  Gertraut Altreuther  Project Manager, Bayer Animal Health, Germany  Adrienne Bentley  Resident, Surgery, University of Pennsylvania  Philippa Beard  Postdoctoral Fellow, Virology, Imperial College, London  Rachel Gray  PhD Student, Marine Mammal Pathology, University of Sydney  Krista-Britt Halling  Assistant Professor, Surgery, Ontario Veterinary College  Wendy Harrison  Research Scientist, GlaxoSmithKline, Middlesex, UK  Kelly Stephenson Lorschy  Technical Service Specialist, Pfizer, Australia  Andrew Moorhead  PhD Student, Microbiology, Cornell University  Tony Mutsaers  PhD Student, University of Toronto

1996  Michelle Dries-Kellaway  Research Project Manager, Meat and Livestock Assoc., Australia  Margaret Fleischli  Research Intern, US Geological Survey National Wildlife Health Center, Madison, Wisconsin  Patricia Gearhart  Adjunct Assistant Professor, 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
Ralph Senften-Rupp Project Planning Consultant, Berne, Switzerland
Allison Stewart Assistant Professor, Large Animal Medicine, Auburn University
Edwin van Duijnhooven Research Scientist, NOTOX, Netherlands
Ilse van Vonderen PhD Student, Physiology, University voor Gezelschapsdieren, Netherlands
Constantin Von der Heyden Coordinator, Oxford Centre for Water Research, UK

1997

Antony Clements Clinical Scholar, Equine Studies, University of Glasgow
Alexandra Dörnath Exotic Animal Specialist, Berlin Zoo
Jennifer Sprague Fryer Resident, Small Animal Medicine, Texas A&M University
Esther Kornalijnslijper Postdoctoral Associate, Department of Farm Animal Health, U. Utrecht
Tanya LeRoith PhD Student, Veterinary Microbiology, Washington State University
Lucy Neave Lecturer, Creative Writing, Australian National University
Patricia Pesavento Research Assistant Professor, Pathology, University of California, Davis
Paul Plummer PhD Student, Iowa State University
Deborah Prattley Research Officer, Epidemiology, Massey University
Melinda Story Assistant Professor, Equine Surgery, Kansas State University
Rachel Walker Professional Service Veterinarian, Novartis Animal Health, Sydney, Australia
Jonathan Werner PhD Student, University of California, Davis
Rebecca Wilcox PhD Student, Virology, Melbourne University
Esther Wissink Postdoctoral Fellow, Netherlands Cancer Institute
Nicolette Zarday MPH Student, University of California, Berkely

1998

Max Bastian Postdoctoral Fellow, Institute for Plinische Microbiologie, Erlangen
Stephen Fleischer Biologist, US Food and Drug Administration
Karsten Hüffer Postdoctoral Fellow, Microbiology, Yale University
Zoe Lenard Resident, Radiology, Murdoch University
Karen Liljebjelke Postdoctoral Fellow, Veterinary Diagnostic Laboratory, University of Georgia
Larissa Minicucci Epidemic Intelligence Officer, CDC, Colorado
Amanda Murphie de Mestre PhD Student, Genetics, Australian National University
Anne-Marije Sparnaay Registration Department, Intervet International B.V. in Boxmeer, Netherlands
Sophia Tzannes Resident, Small Animal Medicine, Liverpool University

1999

Elmer Ahrens PhD Student, University of Zurich
Erica Behling-Kelly PhD Student, University of Wisconsin
Nadine Bowden Postdoctoral Fellow, Centers for Disease Control, Atlanta, Georgia
Kimberly Costello Newkirk Resident, Pathology, The Ohio State University
Richard Dickens Risk Management Veterinarian, North Carolina Department of Agriculture
Joshua Fine PhD Student, University of Kentucky
1999

Peter Florian  Principal Scientist, Pfizer Inc., Sandwich, Kent, UK
Carl Holmgren  PhD Student, Neural Sciences, Karolinska Institute
Emily Meseck  Resident, Pathology, Cornell University
Rachel Mo-Peters  PhD Student, Microbiology, Cornell University
Mary Nabity  Resident, Clinical Pathology, Texas A&M University
Christopher Premanandan  Resident, Pathology, The Ohio State University
Rachel Tarlinton  PhD Student, Biology, University of Queensland
Holger Volk  Clinical Training Scholar, Neurology, Royal Veterinary College, London

2000

Tanya Babu  Veterinary Surgeon, Department of Environment, Food and Rural Affairs, UK
Beatrice Bohme  Veterinary Doctoral Candidate, Frankfurt University
Stephen Daley  Rhodes Scholar, DPhil. Student, Sir Wm. Dunn School of Pathology, Oxford
David Detweiler  Resident, Radiology, University of California, Davis
Katharine Evans  Resident, Anesthesiology, University of Bristol
Rachel Geisel  PhD Student, Microbiology, Cornell University
Birgit Hingerl  PhD Student, Immunology, University of Munich
Natalie Krekelel  Resident, Theriogenology, Cornell University
Richard Luce  MS Student, University of Cambridge
Silke Meermann  PhD Student, Genetics, Veterinary School, Hannover
Fiona Norris  PhD Student, Microbiology, Monash University
Knut Stieger  PhD Student, Genetics, University of Nantes
Joost Uilenreef  Resident, Anesthesiology, University of Utrecht
Kevin Woolard  Resident, Pathology, North Carolina State University

2001

Danielle Cain  Intern, VCA Emergency Animal Hospital
Julie Chevrette  Clinical Veterinarian, CTBR Inc.
Robert Klopfleisch  Veterinary Doctoral Student, Friedrich-Leffler Institute, Riems
Charles Johnson  Resident, Pathology, Iowa State University
Rebecca Lin  Intern, U. Pennsylvania
David Loch  PhD Student, Physiology, University of Queensland
Maeva Louis  Intern, Equine Studies, Lexington, Kentucky
Timothy Myshrair  PhD Student, Toxicology, University of Washington
Seung-Jin Park  Intern, Seoul, Korea
Kis Robertson  Enforcement and Investigation Officer, USDA, FSIS
Simon Starkey  PhD Student, Epidemiology, Cornell University
Amy Warren-Yates  Resident, Pathology, Cornell University
Rachel Windsor  Intern, Equine Medicine, Newmarket, United Kingdom
Robin Yates  Fulbright Scholar, PhD Student, Microbiology, Cornell University
Bevin Zimmerman  Resident, Pathology, The Ohio State University
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?

"The Leadership Program remains one of the best things I did in vet school. I miss Cornell."

—Lorrie Meyer '92

"The program was a key factor in my decision to enter research."

—Jacqueline Phillips '92

"My time at Cornell is one I will always cherish and has been a key factor in many of my career decisions."

—Oliver Turner '94

"Such fond memories."

—Wendy Harrison '95

"The best ten weeks I have ever had."

—Mark Doherty '96

"My experiences provided the impetus for (my) pursuit of a PhD."

—Tamara Gull '96

"I'm really glad that I had the Cornell experience; otherwise I would be wondering where to go from here."

—Fiona Norris '00

"The summer I spent in Ithaca is one I’ll never forget."

—Charles Johnson '01

"It was an amazing opportunity for a young vet student."

—Maeva Louis '01

"I still think of the wonderful time I had at Cornell and the great friends I met."

—Susannah Lillis '02
In the Limelight
Dan Tucker

It was with particular pleasure that I opened a letter from Dr McGregor earlier this summer and was transported 14 years back to my summer in the Cornell Leadership Program in 1990. In my current position as Lecturer in Veterinary Public Health at Cambridge University I had sent in a reference for one of our students to attend the same program and so the connection was re-formed. The program is clearly just as relevant, just as much in demand, just as worthy of funding by the sponsors, and, from reading the 2003 Annual Report, just as rewarding for the participating Fellows as it was in 1990. What an enormous credit to the program Director and his team.

Going to Cornell in 1990 was, I recall, a very ‘full’ experience. Balancing work in the lab with social activities seemed so much easier than it ever has since then! In fact, in Prof Neil Norcross’s Mastitis Research Lab, I recall that the line between work and play was very indistinct if it was there at all! That’s not to say that no work was done! Rather, the days were long and a great deal was done, all in a great team atmosphere with a welcoming and giving group of people. The entire program experience was an enthusing and formative introduction to the world of veterinary research.

The Leadership Program gave me a much clearer idea of my own possibilities for post-graduate development and training – a much less straightforward business for us vets compared to our medical colleagues. After graduation I took up an internship in production animal medicine at Cambridge, transferring to the medical school for a PhD studying pig-to-human xenotransplantation immunology.

One of the many useful things I learned in the Leadership Program is that, as well as being in the right place at the right time, career success is as much about who you know (i.e. networks) as it is about how much you know. On completing my PhD work the pig xenotransplantation research world was just waking up and I joined a small spin-out company, Imutran, as Head of Veterinary Services. Over the following years the company grew from a staff of 5 to 80 and I became heavily involved in developing a microbiological safety protocol for pig xenografts, as well as all the practicalities of setting up high health status transgenic pig breeding colonies all over the world - from Italy to North America and Scotland to Japan.

Eventually, the down-turn in the xenotransplantation development business came – there were problems with graft rejection and concerns over the potentially zoonotic pig endogenous retrovirus. At this point I transferred my skills over to clinical pig medicine and consultancy for a couple of years. This was a wonderful contrast to the high pressured regulatory affairs of biotechnology. Much of my time was spent exploring the back roads of rural England as I searched (sometimes in vain) for the next outdoor pig farm awaiting my services and worrying about how many more times my mobile phone would survive being dropped into my portable disinfectant boot wash!

The offer of the new Lectureship in Veterinary Public Health came 2 years ago, along with a Fellowship at Pembroke College, Cambridge. UK and most EU veterinary schools have been coming to terms with the fact that veterinarians have a critical role to play in both animal and human health. The scope has expanded beyond the traditional concepts of meat hygiene and State veterinary medicine to include epidemiology, population medicine, environmental protection, occupational health, disaster management and so on. Two years in and I finally am getting the opportunity to develop my research interests in the genetic basis of disease resistance, starting with the ubiquitous and devastating pig pathogen Haemophilus parasuis.

Pembroke College is a great contrast to the Department. The Colleges are rather like very old, financially well endowed fraternities where University members of all disciplines can mix. There are up-sides of College life such as great dinners and excellent company, but also down-sides such as being responsible for worming the College’s manic resident cat. Every few months I thank God for the invention of spot-on flea and anthelmintic preparations!!
For more information about the Leadership Program, contact:

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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.

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Leadership Program for Veterinary Students

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