



*Leadership Program* for Veterinary Students  
2006 Annual Report

2006



2006 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 387 of the most promising students, representing fifty-four veterinary colleges worldwide, have been selected to participate. Although the life experiences, culture, and academic backgrounds of program scholars are diverse, all have distinguished themselves in a variety of professional and personal pursuits. They are highly motivated individuals who possess the ability to excel as research scientists and public-health professionals.

Research is the foundation of the Leadership Program, and the activity around which all other activities are structured. Program scholars pursue individual projects under the guidance of Cornell faculty members, who are successful scientists and experienced mentors. Their investigations are conducted in state-of-the-art facilities within the unsurpassed intellectual environment of Cornell University, an Ivy League institution located in the scenic Finger Lakes region of New York State. Program scholars also participate in carefully designed modules and workshops, which are structured as student-directed learning experiences. Topics include emerging infectious diseases and biodefense, leadership and its attendant responsibilities, and exercises that illuminate characteristics of leadership and employment opportunities for veterinary graduates in academia, government, and industry. Vocational counseling and field trips to federal research facilities are additional features of the program.

The Leadership Program, now in its seventeenth 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. More than 100 of these individuals have earned the Ph.D. degree or are presently in training, while many others have been awarded other advanced degrees in science or public health. A legacy of the program has been the establishment of a network of alumni who have the motivation to contribute broadly to the biomedical sciences.

A handwritten signature in white ink, appearing to read "D. McGregor".

Douglas D. McGregor, M.D., D.Phil.  
Program Director

A handwritten signature in white ink, appearing to read "D. Fraser".

David R. Fraser, B.V.Sc., Ph.D.  
Co-Director

## Acknowledgements

The Leadership Program for Veterinary Students is made possible through awards from federal agencies, corporations, foundations, and other private-sector sponsors. For their generous support this year, the program organizers thank:

**The Albert C. Bostwick Foundation**

**The Merck Company Foundation**

**The National Institutes of Health**

**Pfizer Inc.**

**The Wellcome Trust**

The program organizers also thank the facilitators, counselors, and mentors who took part in the 2006 program. Thanks, too, to Ariana Blossom, the program coordinator, and to Susan Williams, Alexis Wenski-Roberts, and David Frank for their assistance. Finally, the organizers congratulate the scholars themselves. Their academic achievements, coupled with their dedication to discovery and service, mark these extraordinary individuals as future leaders of the veterinary profession.

## Contents

- 4 Agenda
- 5 Participants
- 6 Activities
- 14 Cornell's Partnership with the NIH
- 16 The USDA and Animal Agriculture
- 18 Presentations and Prizes
- 19 Program Scholars and Their Research
- 34 Counselors and Facilitators
- 36 Program Dinner
- 37 Housing, Program Coordinator
- 38 Time Out
- 39 Where Are They Now?
- 44 What Did They Say?

inside back cover      In The Limelight

## 2006 Leadership Program Agenda

- June 5** Opening Meeting
- June 6** Library Orientation  
Biological and Chemical Safety Training
- June 7** Laboratory Orientation
- June 10** Career Discussion  
Leadership Discussion Pre-meeting
- June 12** Leadership Discussion  
Program Dinner
- June 15** Visit to the National Institutes of Health
- June 16** Visit to the United States Department of Agriculture
- June 21** Radiation Safety Training Part One
- June 23** Radiation Safety Training Part Two
- June 29** Emerging Diseases Workshop
- June 30** Biodefense and Public Health Workshop
- July 10** Drug Design Workshop
- July 12** Reunion Dinner
- July 17** Careers in Industry Workshop
- July 19** Leadership in Action Discussion
- July 24** Residency Discussion
- July 25** Research Training Discussion
- July 26** Translational Science Discussion
- August 9** Research Presentations
- August 10** Research Presentations
- August 11** Exit Meeting



## 2006 Leadership Program Scholars

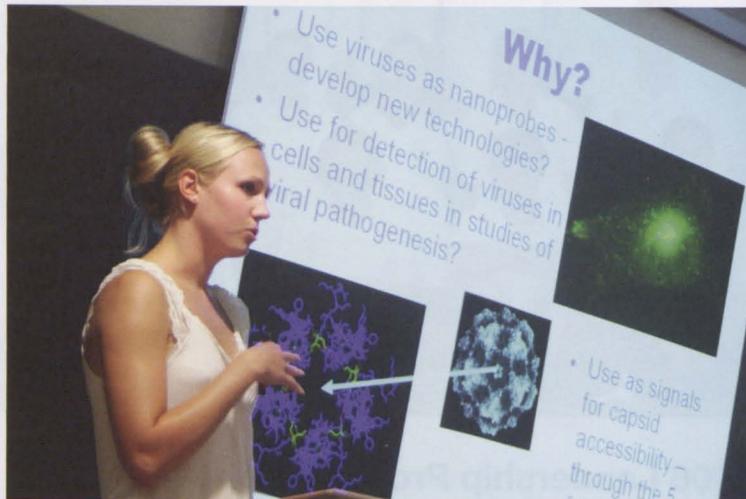
Name	College	Mentor	Department Affiliation	Sponsor
Stephanie Brien	University of Cambridge	Yrjo Grohn	Population Medicine	NIH
Onno Burfeind	Freie Universität Berlin	Tracy Stokol	Clinical Pathology	Pfizer, Inc.
Lisay Chizmar	Cornell University	Douglas Antczak	Baker Institute	NIH/Merck
Bronwyn Clayton	University of Sydney	Marci Scidmore	Microbiology/Immunology	Pfizer, Inc.
Alexander Corbishley	University of Cambridge	Klaus Beyenbach	Biomedical Sciences	Wellcome Trust
Janny de Grauw	Universiteit Utrecht	Richard Cerione and Marc Antonyak	Molecular Medicine	Pfizer, Inc.
Amanda DeMaster	North Carolina State University	Marjory Brooks and Jim Catalfamo	Population Medicine/Diagnostic Sciences	NIH
Louise Fitzgerald	University of Sydney	Alexander Nikitin	Biomedical Sciences	NIH
Anna-Linda Golob	Universität Leipzig	Katherine Houpt	Clinical Sciences	Merck
Anne Gordon	Cornell University	Eric Denkers	Microbiology/Immunology	NIH
Annika Haagsman	Universiteit Utrecht	Bud C. Tennant and Stephan Menne	Clinical Sciences	Pfizer, Inc.
Catherine Holmes	University of Cambridge	Alexander Travis	Baker Institute	Wellcome Trust
Eva-Maria Laabs	Leibniz Universität Hannover	Susana Mendez	Baker Institute	Bostwick
Jane Leadbeater	University of Queensland	Douglas Antczak	Baker Institute	Bostwick/Merck
Gelja Maiwald	Leibniz Universität Hannover	Klaus Osterrieder	Microbiology/Immunology	Bostwick
Richard Meeson	University of Cambridge	Lisa Fortier	Clinical Sciences	Wellcome Trust
Ashley Neary	University of Georgia	Ruth Collins	Molecular Medicine	Bostwick/NIH
Joseph Neary	University of Cambridge	Noa Noy	Nutritional Sciences	Wellcome Trust
John Parker	University of Bristol	Kenneth Simpson	Clinical Sciences	Wellcome Trust
Tiffany Reed	University of Georgia	Teresa Gunn	Biomedical Sciences	Bostwick/NIH
Swaantje Roth	Freie Universität Berlin	Colin Parrish	Baker Institute	Pfizer, Inc.
William Sander	University of Wisconsin	Teresa Gunn	Biomedical Sciences	NIH
Lauren Sawchyn	Cornell University	Paul Maza	Biomedical Sciences	NIH
Lynda Shaw	University of Sydney	Joel Baines	Microbiology/Immunology	Pfizer, Inc.
Justine Shotton	University of Bristol	John Parker	Baker Institute	Wellcome Trust
Laura Spoor	Royal Veterinary College	Martin Weidmann	Food Sciences	Wellcome Trust
Alexia Wilson	Royal Veterinary College	Ted Clark	Microbiology/Immunology	Wellcome Trust
Rosalind Wright	University of Liverpool	Edward Dubovi	Population Medicine/Diagnostic Sciences	Wellcome Trust

# Activities 2006

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.

## Research

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





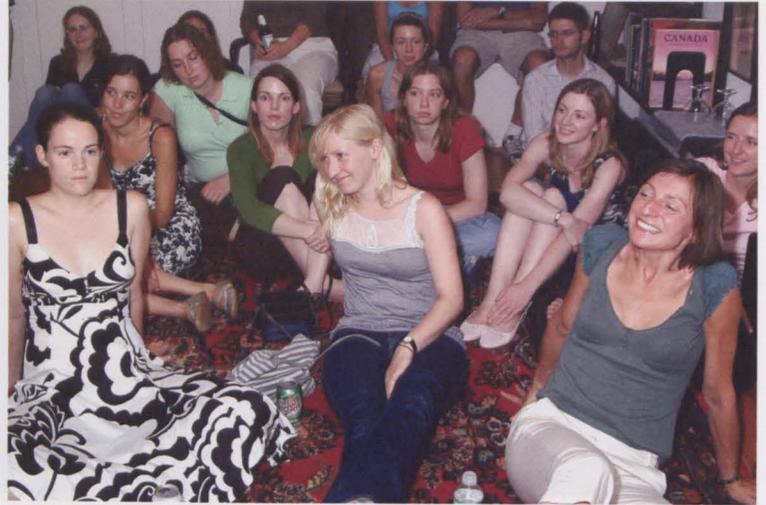
## Leadership

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 and economic, political, and social issues. Scholars and facilitators were assigned roles that 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. David Fraser moderated the discussion with assistance from Barbara Baird, Judith Kinnear, Dennis O'Connor, and Andrew Sage II.



## ***Leadership in Action***

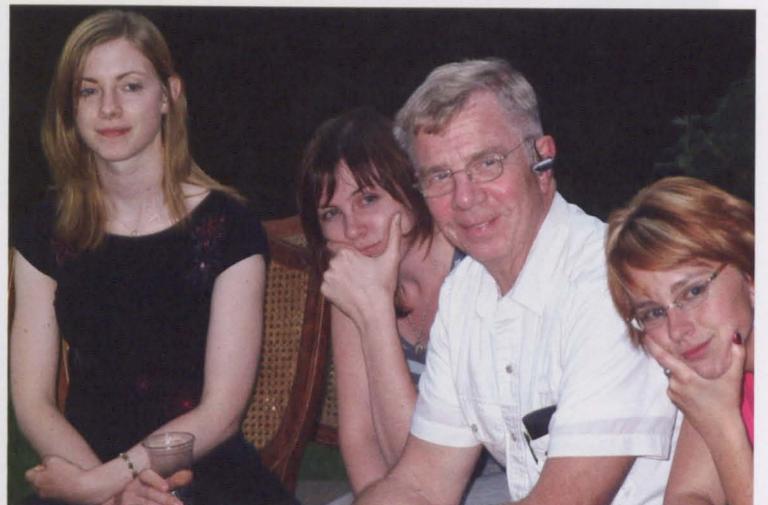
The film entitled *A Few Good Men* illustrated strengths and deficiencies of individuals cast in the role of leaders. The ensuing discussion was facilitated by Suzanne McGregor, David Fraser, and Douglas McGregor.



## ***Emerging Diseases***

A workshop moderated by Colin Parrish, John Parker, Philip Carter, and Peter Jahrling featured a discussion of diseases that are emerging or re-emerging in nature. From a prepared list the program scholars selected four diseases on which to focus. They conducted library research on the diseases, and then engaged their peers and the facilitators in a 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.





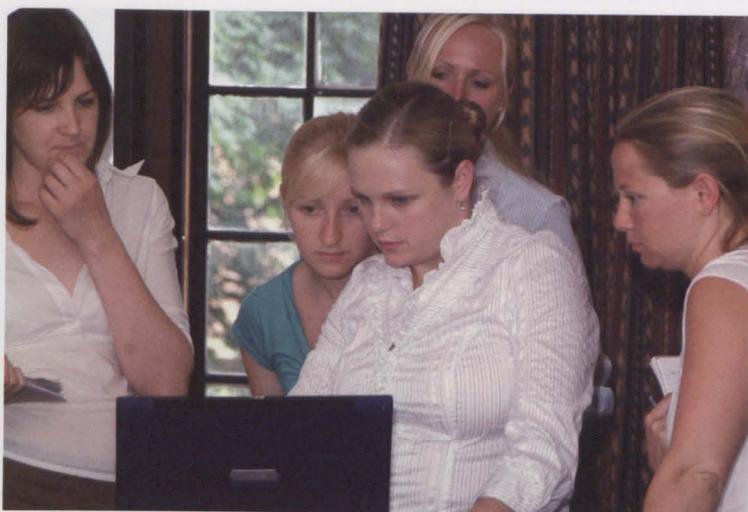
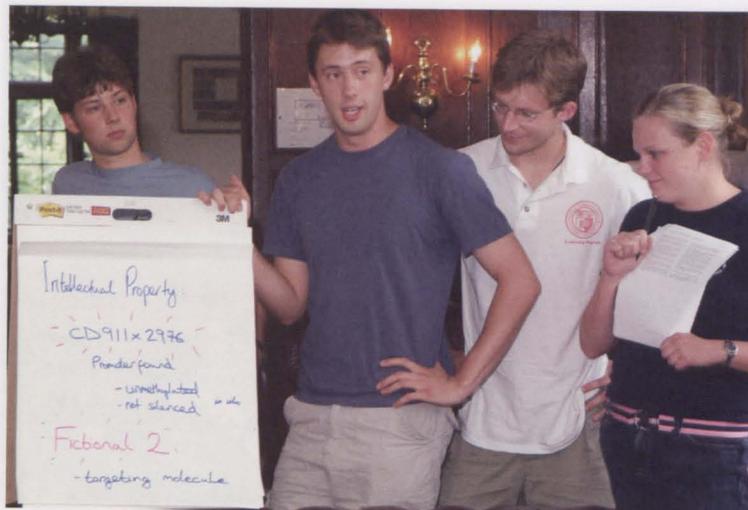
## **Biodefense and Public Health**

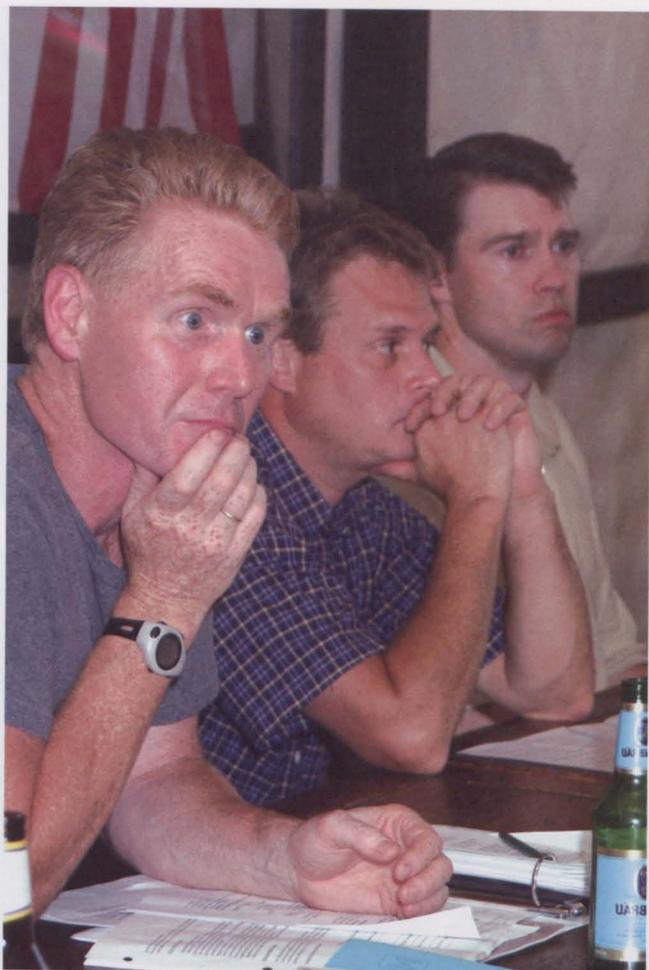
A similarly structured workshop addressed problems connected with the deliberate release of infectious agents that could have catastrophic consequences for animals and people. Here, as in the Emerging Diseases workshop, the scholars worked cooperatively in preparing and presenting their findings. Alfonso Torres joined the panel of facilitators who took part in the Emerging Diseases workshop. During the evening session, the facilitators commented on their own experiences and the preparation required for veterinarians to function as public-health professionals.



## Drug Design

Michelle Haven of Pfizer, Inc. moderated a mock competition in which the students exhibited creativity and teamwork in resolving problems connected with the discovery, development, and marketing of therapeutic drugs. She was assisted by two colleagues from Pfizer, Scott Brown and Steven Sutherland.





## ***Career Explorations***

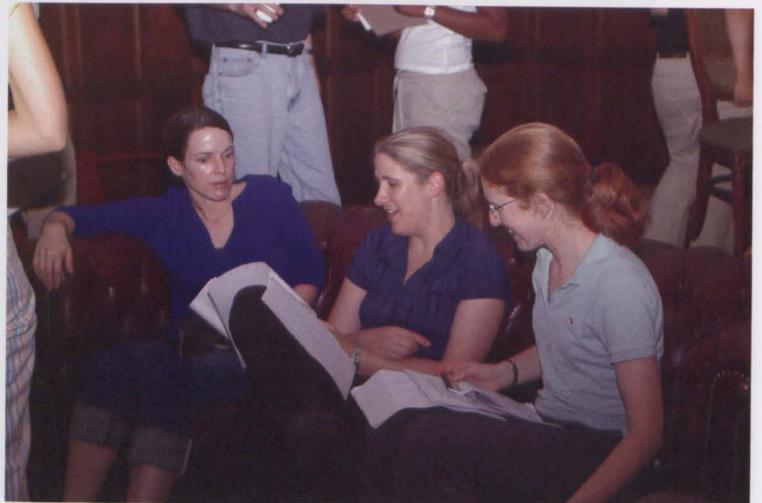
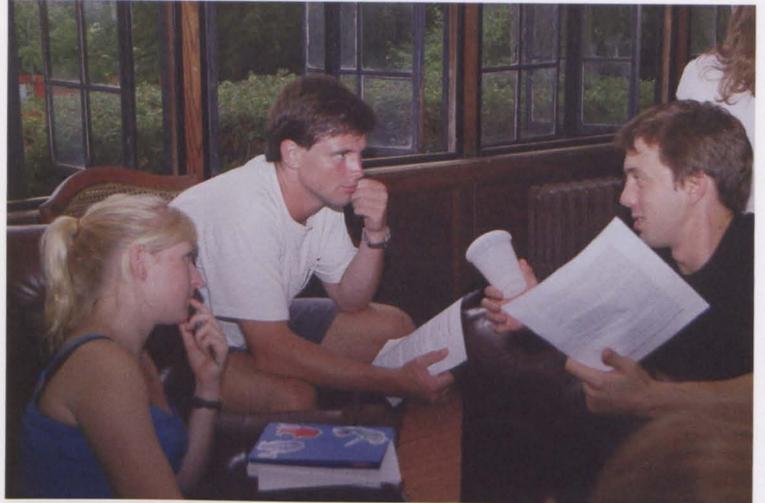
Career planning is featured prominently in the Leadership Program. Five meetings were convened this year to consider opportunities for veterinary graduates to broadly influence their profession.

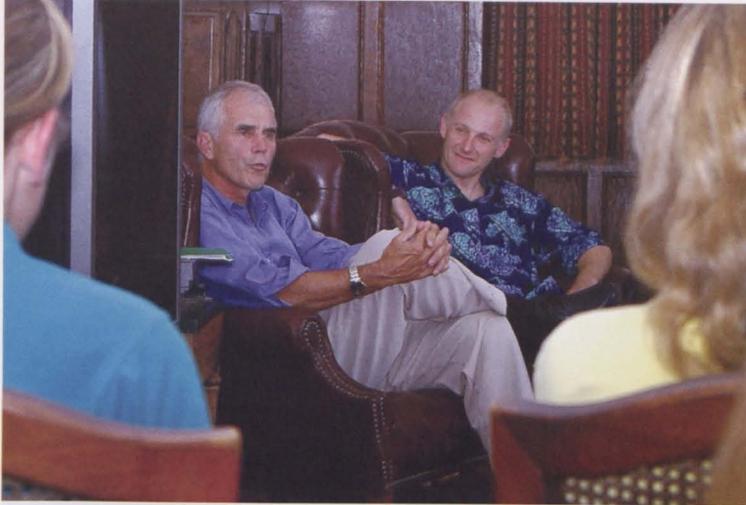
David Fraser, Mandi de Mestre, and Amy Warren commented on the importance of a veterinary degree for individuals who aspire to careers in science. The three counselors also emphasized the importance of selecting a superior environment for research training and a mentor who has a successful training record.



In a separate meeting, Gerard Hickey, Christopher DeMoula, and Christopher Johnson conducted mock interviews with program scholars. The students prepared for the interviews by reviewing three announcements of job positions and three hypothetical résumés of veterinarians who were candidates for those positions.

Lynn Wachtman and Amy Warren commented on residency programs in laboratory-animal medicine and pathology. The facilitators emphasized factors one should consider in seeking a residency; the expectations of program organizers, and the satisfaction of a public-service career.





A companion meeting addressed issues relevant to graduate research training. Ruth Collins, Richard Cerione, and Douglas McGregor identified aspects of training one should weigh in selecting an environment for graduate study; the subject of one's thesis research, and the individual to guide one's development as a research scientist.



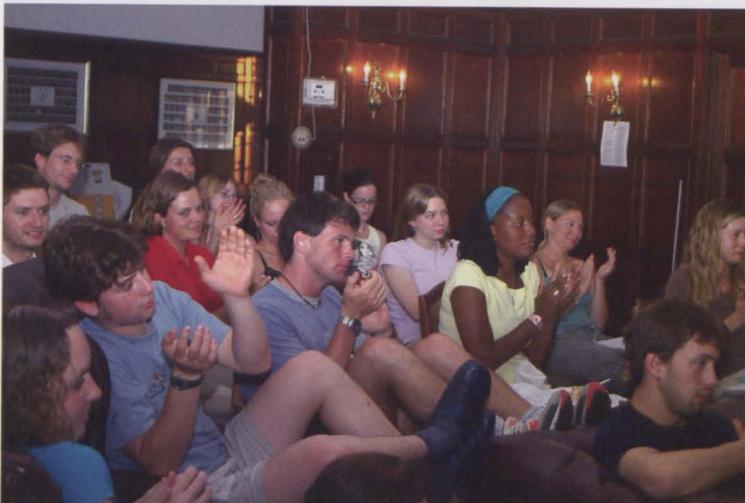
In a separate meeting, a case study illustrated "translational science." The ensuing discussion led by Edward Breitschwerdt and Kenneth Simpson revealed how individuals trained to a high level of proficiency as both clinical specialists and research scientists can extend the frontiers of knowledge through their unique capacity to define disease processes at the cellular or molecular level.

*How Gene X Environment Interactions Shape Biological and Behavioral Development in Rhesus Monkeys*

*Stephen J. Suomi, Ph.D.*

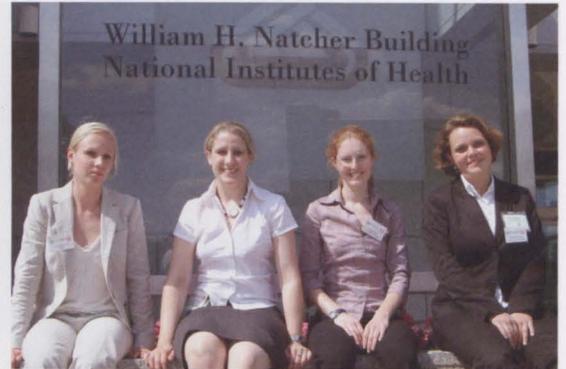
*Chief, Laboratory of Comparative Ethology,*

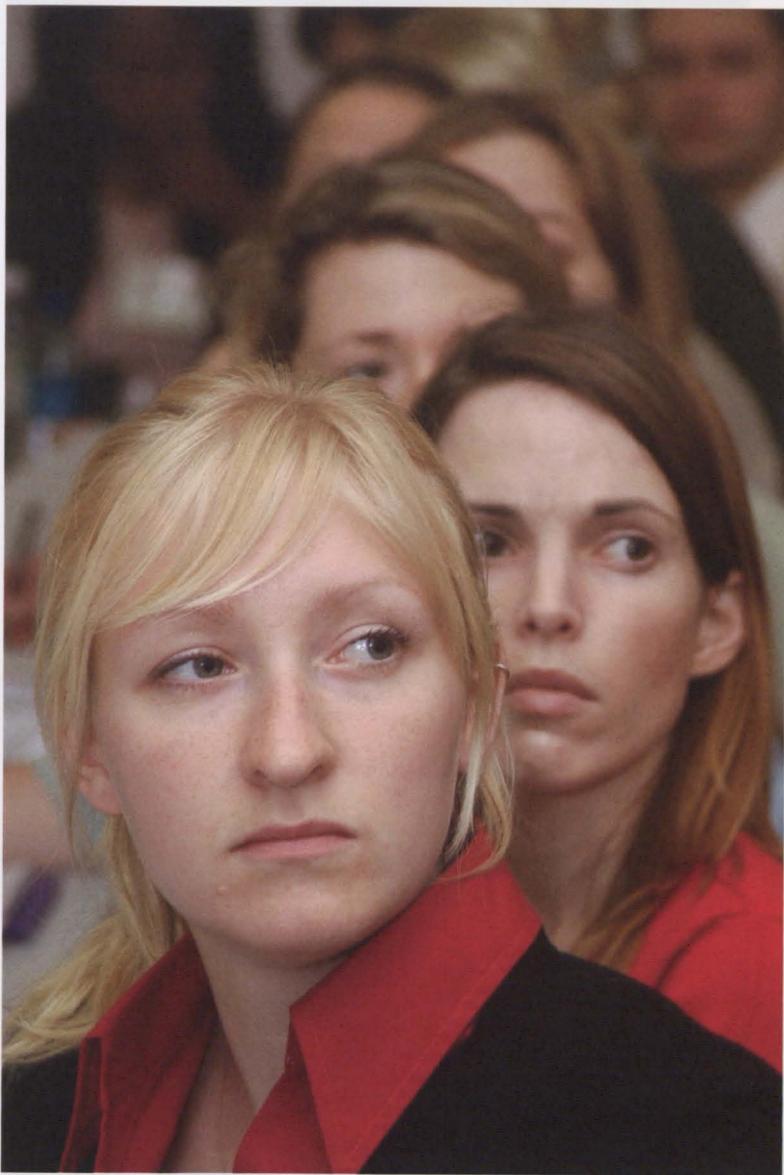
*University of Chicago*



## ***Cornell's Partnership with the National Institutes of Health 2006***

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





## **Topics and Speakers**

### **Welcome and Introduction**

*Joan P. Schwartz, Ph.D.*

Assistant Director, NIH Office of Intramural Research

### **The Cornell/NIH Partnership**

*Douglas D. McGregor, M.D., D.Phil.*

Director, Cornell Leadership Program for Veterinary Students

### **Role of Susceptibility Factors in Drug-Induced Liver Disease**

*Lance R. Pohl, Pharm.D., Ph.D.*

Chief, Molecular and Cellular Toxicology Section, Laboratory of Molecular Immunology, National Heart, Lung, and Blood Institute

### **How Gene X Environment Interactions Shape Biological and Behavioral Development in Rhesus Monkeys**

*Stephen J. Suomi, Ph.D.*

Chief, Laboratory of Comparative Ethology, National Institute of Child Health and Human Development

### **Diagnostic Imaging Techniques Used in Biomedical Research—An Introduction**

*Brenda A. Klaunberg, V.M.D.*

Mouse Imaging Facility, National Institute of Neurological Disorders and Stroke

### **Neuronal Migration and Maturation of GnRH-1 Neurons**

*Susan Wray, Ph.D.*

Chief, Cellular and Developmental Neurobiology Section, National Institute of Neurological Disorders and Stroke

### **Stem Cell Transplantation, Gene Transfer, and Other Monkey Business**

*Robert Donahue, V.M.D., S.M.*

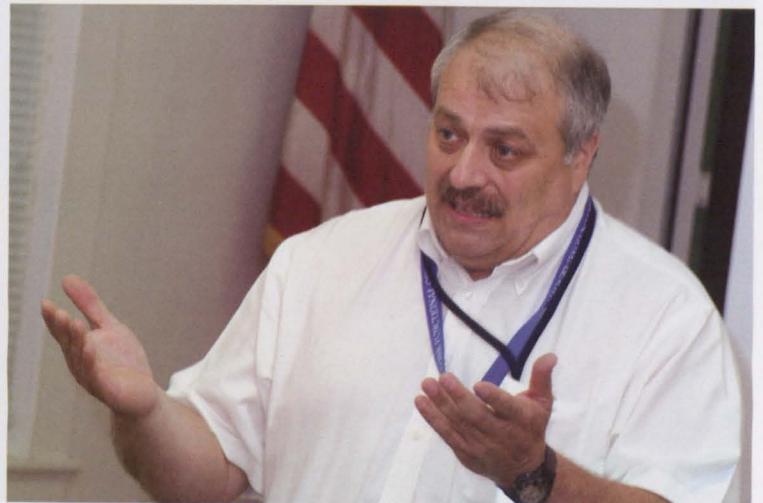
Director, Simian Gene Transfer Program, National Heart, Lung, and Blood Institute

### **Closing remarks**

*Joan Schwartz and Douglas McGregor*

## **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. Institute scientists commented on their research and opportunities for advanced training at this prestigious institution.



# SCIENTISTS

## and their Research

### **Topics and Speakers**

#### ***Introduction and Overview of the Beltsville Agriculture Research Center***

*David Granstrom*

Associate Director, Animal and Natural Resources  
Institute

#### ***Genetic Engineering in Livestock***

*Robert Wall*

Research Physiologist, Biotechnology and  
Germplasm Laboratory

#### ***Searching for Genes That Control Resistance to Internal Parasites of Cattle***

*Louis Gasbarre*

Research Leader, Bovine Functional Genomics  
Laboratory

#### ***Avian Coccidiosis: Past, Presentations and Future Control***

*Mark Jenkins*

Microbiologist, Animal Parasitic Diseases  
Laboratory

#### ***Ecology of Foodborne Pathogens on the Dairy Farm***

*JoAnn Van Kessel*

Research Animal Specialist, Environmental  
Microbial Safety Laboratory



# ***Presentations and Prizes***

The program scholars discussed their research in a series of presentations over two days at the conclusion of the program. A book prize was awarded to Stephanie Brien for best overall project as judged by her underlying hypothesis, project design, research results, and presentation. Additional prizes were awarded to Eva-Maria Laabs, Alexander Corbishley, and Laura Spoor for exceptional projects in integrative biology, cell biology, and molecular biology, respectively. The Selection Committee for the 2006 Leadership Program salutes these individuals and congratulates all of the scholars for their commitment to research and the excellence of their presentations.

## ***Program Prize***

*Stephanie Brien*  
Dynamics of *Salmonella* Infection  
in Dairy Cattle



## ***Integrative Biology Prize***

*Eva-Maria Laabs*  
Immune Regulation of the Host  
Response to a Live Vaccine  
Against Leishmaniasis



## ***Cell Biology Prize***

*Alexander Corbishley*  
Measuring Intracellular Chloride in  
Malpighian Tubule Cells



## ***Molecular Biology Prize***

*Laura Spoor*  
Multidrug Resistant ST6  
*Salmonella* in Cattle and Humans



# Program Scholars

## and their Research 2006

**Stephanie Brien** | University of Cambridge, *Epidemiology*

### ***The Dynamics of Salmonella Infection in Dairy Cattle***

On completion of my preclinical veterinary studies I intercalated in biological anthropology and found studying disease at the population level so enthralling that I opted to do an M.Sc. in epidemiology. After obtaining my veterinary degree I intend to do a Ph.D. in some aspect of disease dynamics. My long-term career goal is to work in international public health, specifically in the epidemiology and control of communicable disease.

I was assigned to a project perfectly aligned with my background and research interests. The aim was to develop a series of mathematical models to improve understanding of *Salmonella* transmission dynamics in dairy cattle. The models were based on data collected in a longitudinal study. Subclinical shedding by carriers is important in disease dynamics but has not been incorporated into previous models. I used the models to investigate the impact of heterogeneity in shedding and to quantify parameters that cannot be reliably calculated from existing data. In previous models they have been given assumed values. Our estimates can be used to improve the validity of existing and prospective *Salmonella* models. Significantly, we were able to determine the threshold below which transmission cannot be sustained. The information can be used to design control programs that eliminate disease and infection. This is critical as carriers pose a significant public-health risk through undetected bacterial shedding at slaughter. Disease elimination is of economic and animal-health importance but to improve human food safety it is essential that infection is also eliminated.

I have enjoyed working as part of a multidisciplinary team sharing skills, knowledge, and ideas. It has been a privilege to work with such a well-integrated, enthusiastic, and helpful group of people and I could not have hoped for a better mentor than Yrjo Grohn.





**Onno Burfeind** | Freie Universität Berlin, *Pathology*

### ***Cloning of the Canine and Equine Coagulation Factor III Domain***

My decision to study veterinary medicine was influenced by my interest in animals. I grew up on a farm and had a great affinity for farm animals as well as for wildlife, especially birds. My goal was to become a farm-animal veterinarian. During my studies I became fascinated by the various biological mechanisms that are responsible for life. I wanted to gain experience in what it means to work toward discovering the mechanisms that regulate organisms. I also was very interested in getting to know other young people from all over the world who were studying veterinary medicine.

During my time at Cornell I worked in Tracy Stokol's lab in the field of clinical pathology. I was involved in the process of developing an antibody-based test to determine Coagulation Factor III levels in animals. For this purpose I cloned the canine and equine Tissue Factor cDNA, purified it, and started to amplify the recombinant protein in bacteria. This protein will be used to produce species-specific antibodies that can be detected by immunological methods.

I want to thank all the people who were involved in this program for the great experiences I've had during my time here at Cornell. I gained a good insight into biomedical science and the processes of planning, conducting, and analyzing trials and experiments.

I would also like to thank Tracy Stokol, John Parker, and Janelle Daddona for all their help in the lab, and all the other people who were working with me. Last, but not least, I thank Ariana Blossom, David Fraser, and Douglas McGregor—for organizing this program, and all the other participants—for getting to know them and for the wonderful time we had at Zeta Psi (not only on the "Fußball" table).

### *Integrative Biology Prize*

**Lisay Chizmar** | Cornell University, *Reproductive Biology*

### ***Evaluation of Gene Expression in Equine Trophoblast Cells and Fetal Tissues***

I have always enjoyed learning about science and spending time with animals, but it wasn't until after I graduated from college that I realized I wanted to combine my interests in veterinary medicine. My career interests within the profession are broad (small animals, lab animals, pathology), which is why I applied to the Leadership Program. My goal this summer was to gain a better understanding of a career in research.

My project in Douglas Antczak's laboratory was focused on assessing gene expression in early equine conceptus tissues. The Horse Genome Project has facilitated the rapid design of primer sets from which gene expression in equine tissues can be evaluated. A better understanding of gene expression in trophoblast cells will help to characterize trophoblast subtypes in the equine embryo. In this study PCR probes for twelve genes identified in human and mouse trophoblast cells, plus two additional equine genes, eCGa and eCGb, were developed and tested in RT-PCR analysis to determine the expression patterns in early development equine conceptus tissues. Initially, the probes for each gene were screened against equine Day 34 (D34) chorionic girdle (CG) and allanto-chorion (AC) trophoblast tissues. Six genes that produced the expected band size were selected for further study. The knowledge derived from these experiments will enable a better understanding of gene regulation in equine trophoblast tissues, and may eventually facilitate the development of clinical tests to predict the outcome of pregnancy.

I would like to thank the members of the Antczak lab for all their help and encouragement this summer. I would also like to thank Douglas McGregor and David Fraser for coordinating the Leadership Program.



**Bronwyn Clayton** | University of Sydney, *Cell Biology*

### ***The Role of Host Protein Rab11 During Mitosis in Chlamydia trachomatis*-infected HeLa Cells**

*Chlamydia trachomatis*, an intracellular pathogen, is the most common sexually transmitted bacteria. Chlamydial inclusions avoid the endosomal/lysosomal pathway by mechanisms that are as yet unknown. The host trafficking factor Rab11 has been previously demonstrated to localize to the chlamydial inclusion in infected cells, but this interaction is not fully understood. Rab11 is primarily involved in membrane receptor recycling. Recently, Rab11 has been identified as an essential component of cytokinesis in mammalian cells, participating in delivery of membranes to the cleavage furrow during mitosis. Previous studies have demonstrated that inhibition of Rab11 results in defective cytokinesis and cell abscission. Cell populations infected with *C. trachomatis* have a high proportion of multinucleated cells, suggesting that completion of cytokinesis or cell abscission is interrupted during infection. We investigated whether the inhibition of cytokinesis observed in cells infected with Chlamydiae can be attributed to perturbation of Rab11 function at the cleavage furrow due to recruitment of Rab11 to the chlamydial inclusion. HeLa cells expressing wildtype, constitutively-active and dominant-negative EGFP-tagged Rab11 were infected with *C. trachomatis* serovar L2 and observed by laser-scanning confocal microscopy to determine if the number of multinucleated infected cells varied between treatment groups. The role of Rab11 during infection was also investigated by using siRNA to block the activity of Rab11 in cells and compare chlamydial infection rates to those in cells expressing Rab11. Mitosis in infected cell populations expressing EGFP-tagged Rab11 was synchronized at the G1-S phase by applying a double thymidine block, and the activity of Rab11 constructs during mitosis in infected cells was observed.

Many thanks to Marci Scidmore, Fae Tompkins, Susanne Mößmer, Asya Smirnov, Andrew Moorehead, and Ching Wen Tseng.

**Alexander Corbishley** | University of Cambridge, *Electrophysiology*

### ***Measuring Intracellular Chloride Concentration of Aedes aegypti Malpighian Tubule Cells***

My desire to be part of a professional network, and the promise of a challenging workload drew me to veterinary medicine. My intercalated degree in physiology at Cambridge demonstrated the intense satisfaction of being immersed in an active research environment and prompted me to apply to the program.

The project I undertook was to manufacture and characterize a chloride-selective micro-electrode. The goal of this exercise was to measure, in real time, the intracellular chloride concentration of Yellow Fever Mosquito Malpighian tubule (kidney) cells. This work will contribute towards the understanding of how the female mosquito rapidly excretes the fluid component of her blood meal to lose weight before leaving her victim. The proposed mechanism by which she does this involves the upregulation of paracellular epithelial transport (the movement of substances across epithelia by traveling between as opposed to across cells). This previously undiscovered and presently controversial phenomenon may be widespread in epithelia throughout the animal kingdom, opening a doorway to new research.

While the leadership program has no doubt enhanced my appreciation of research, its effects have been far more profound. The vibrant and interactive nature of the program highlighted the importance of robust communication. Not just articulating one's own opinion but also ensuring that the opinions of those around you are incorporated to form a constructive discussion. In a world where science and society are becoming increasingly polarized, these gifts will be cherished for the rest of my career.

I am grateful to everyone whose dedication made this year's leadership program a valuable experience, especially my mentor Klaus Beyenbach. His guidance, advice, and perspective have been deeply appreciated. Thank you.





**Janny de Grauw** | Universiteit Utrecht, *Cell Biology*

### ***Characterization of Novel Inhibitors of Tissue Transglutaminase***

At first it was my love for animals and the attraction of an outdoor, yet academic, profession that originally made me pursue a career in veterinary medicine. However, I now realize that the drive behind this was my fascination with the workings of the (human or animal) body in health and disease, and the ways in which we may influence these workings pharmacologically or otherwise. During my study at Utrecht University I took the opportunity to do a one-year research project in equine orthopedics. It was this awakening interest in veterinary research as well as a need for general vocational guidance that made me apply to the Leadership Program.

My project here has focused on an ubiquitous enzyme, tissue transglutaminase (TGase), which exhibits both GTP-binding and transamidation activities. As TGase has a role in such diverse diseases as Alzheimer's, celiac disease, and cancer, specific TGase inhibitors would be of great value both as research tools and as potential therapeutic agents. My goal was to characterize several novel TGase inhibitors both in vitro and in vivo. We established that the IC50 values for in vitro inhibition of TGase-crosslinking activity were in the micromolar range for all compounds tested, while none of the inhibitors interfered with TGase's ability to bind GTP. Specificity of the inhibitors for TGase was demonstrated by their lack of inhibition of the closely related enzyme glutaminase-C. Studies on breast cancer cell lines revealed that while none of the compounds had direct cytotoxic effects, one of them (T101) showed consistent and promising TGase inhibition in vivo.

I would like to thank both my lab (in particular, Marc Antonyak) and David Fraser and Douglas McGregor for a wonderful experience—and thanks to all of my fellow Leadership Program participants who made this summer truly unforgettable!



**Amanda DeMaster** | North Carolina State University, *Hematology*

### ***Detailed Study of the Canine Scott Syndrome Platelet Phenotype***

As I progress through my veterinary education, I have become increasingly aware of the important role that veterinarians play in scientific and clinical research. I hope to take what I've learned from my time in vet school and find a career that combines the challenges of research, working with animals, and modern medicine.

My research project with Marjory Brooks and James Catalfamo focused on further characterizing an inherited bleeding disorder in German Shepherd dogs, similar to Scott Syndrome in humans. The defining characteristics of Scott Syndrome are the absence of stimulated movement of phosphatidylserine (PS) to the outer leaflet of the platelet plasma membrane as well as reduced microvesiculation, or shedding of coagulant membrane vesicles from the platelet surface. In normal platelets, both provide a surface for the assembly of tenase and prothrombinase complexes of the coagulation cascade. Without these platelet membrane binding sites, coagulation factors cannot assemble to form an enzymatic complex necessary to generate thrombin. Studies in a human Scott Syndrome patient have focused on a putative mutation in the lipid transporter ABCA1 as a possible cause of abnormal membrane PS movement. Although human studies in a recombinant system showed reduced levels of ABCA1, our research demonstrated that affected dogs have normal platelet ABCA1 levels. Using flow cytometry, we investigated several parameters of platelet response unique to a subset of activated platelets (coated platelets). We found that Scott platelets, in addition to having impaired PS exposure and microvesiculation, fail to open a membrane surface pore and lack non-displaceable surface fibrinogen.

The leadership program has been an unforgettable experience that has helped me develop as a person and as a veterinary student and future scientist. I have enjoyed the opportunity to learn from outstanding leaders in the field, as well as from a diverse and motivated group of leadership students.

**Louise Fitzgerald** | University of Sydney, *Pathology*

### ***The Role of the Proto-oncogene Met in Epithelial Ovarian Cancer***

I am currently in my final year of my veterinary degree at the University of Sydney and will be graduating in December of this year. While I have always wanted to be a vet, it wasn't until I took a year out from my veterinary degree to complete a research project in veterinary pathology that I seriously considered the possibility of pursuing a research-based career. The Leadership Program offered a wonderful opportunity to further explore these career opportunities and to gain additional research experience in a high-quality institution.

This summer I have had the privilege of working in Alexander Nikitin's lab, where the main research focus is the comparative characterization of carcinogenic events associated with the inactivation of p53 and Rb tumor suppressor genes. My project was part of their work on ovarian cancer, which is one of the leading causes of cancer-related deaths among North American women. Utilizing a unique genetically defined mouse model of epithelial ovarian cancer recently developed by this laboratory, we have been working to characterize the roles of the tumor suppressor gene p53, the proto-oncogene Met, and the presence of hypoxia (all of which have been reported to be poor clinical prognostic indicators) in early carcinogenesis and tumor progression.

The Leadership Program has been a stimulating and rewarding experience for me. Not only have I had the opportunity to develop my problem-solving and research skills, but I will also leave with a much deeper understanding of the roles veterinarians play in the many aspects of scientific research. I'd like to thank everyone who helped make this experience possible, especially Alexander Nikitin and Andrea Flesken-Nikitin for their support and guidance. Special thanks must also go to my fellow participants for their friendship and to Douglas McGregor and David Fraser for making this program possible.

**Anna-Linda Golob** | Universität Leipzig, *Animal Behavior*

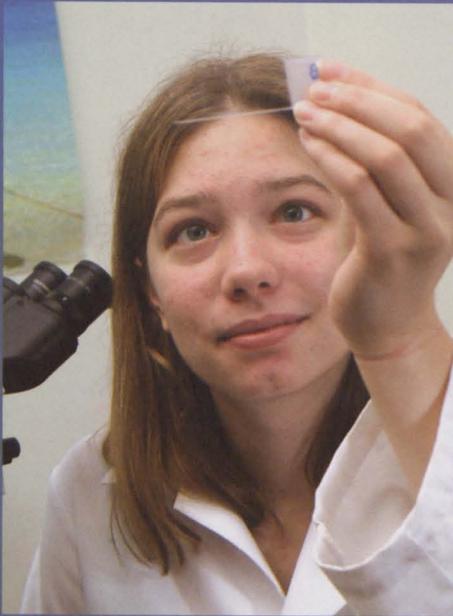
### ***Management of Cribbing and Wood-Chewing Behavior in Horses***

I am a third-year veterinary student at Leipzig University. My professional goal is to realize a career that combines clinical work and clinical research. By taking part in the Leadership Program, I hoped to learn more about my future opportunities in the veterinary profession, and to gain experiences in scientific research.

I had the immense pleasure of working with Katherine Houpt in a study of cribbing behavior in horses. The evaluation of questionnaires from an epidemiologic study provided description and management data on 267 horses in New York State. My task was to investigate the prevalence of cribbing and wood-chewing in the study population; to detect associations between cribbing and putative risk factors, and to compare these results with findings made in horses exhibiting wood-chewing behavior. Using statistical software I was able to determine that the prevalence of cribbing was 8.2 percent and the prevalence of wood-chewing was 13.1 percent in the study population. I showed that male horses, performance horses, American bred horses, quarter horses, thoroughbreds, and horses being fed sweet feed were more likely to crib, while management factors such as providing hay, feeding oats, using straw as a bedding, and spending an equal time stalled and turned out decreased the risk of cribbing.

During this summer at Cornell I was inspired in many ways and can take home many valuable and rewarding experiences. I would like to thank Douglas McGregor and David Fraser for organizing this exceptional Leadership Program; Katherine Houpt for being a supportive mentor and for giving me the opportunity to become involved in Animal Behavior; Hussni Mohammed for his patience in explaining statistics to me; Ariana Blossom for contributing to our mental and physical comfort; and all my fellow students for enriching this summer and life at Zeta Psi.





**Anne Gordon** | Cornell University, *Parasitology*

### **Activation of Stat Signaling by *Toxoplasma gondii***

I have completed my first year of the dual D.V.M./Ph.D. program at Cornell University. I have a fundamental interest in veterinary medicine, but exposure to research fueled my desire to understand the mechanisms by which infectious agents cause disease. Through the program I hope to gain a more complete view of animal health, both from the level of the whole animal and from the cellular and molecular levels.

My project this summer involved examining host dendritic-cell signaling responses during the innate immune response to infection with different strains of *Toxoplasma gondii*. *Toxoplasma* is a protozoan parasite with a wide host range, including humans, that has the ability to persist as a chronic infection by evading the host's immune system within brain and tissue cysts. I have focused my attention on *Toxoplasma* strain differences in the induction of Stat1, a transcription factor known to be involved in interferon-dependent signaling. I discovered that a type II strain of *Toxoplasma* is able to induce phosphorylation of Stat1 protein as early as ten minutes after infection, compared to other parasite strains where there is a delay of one to two hours. I am continuing with experiments to determine how this strain is able to activate Stat1 so rapidly, as well as what biological significance this may have for the host-parasite relationship.

I am already committed to a career involving biomedical research, but am still uncertain of the path I will eventually take. The Leadership Program was helpful in that it provided information about various careers in industry, academia, and translational science. I am thankful for the opportunity to have participated.



**Annika Haagsman** | Universiteit Utrecht, *Virology*

### **Antiviral Effects of RNA Interference on Woodchuck Hepatitis Virus Replication in Hepatocytes and Woodchucks**

I have one more year of clinical rotation in small-animal medicine to complete the program for my veterinary degree. I have always been interested in veterinary research on the development of new therapies, medications, and diagnostic methods. Before coming to Cornell, I spent one year of research at the National Institute for Public Health in the Netherlands.

This summer I worked in Bud Tennant's lab where I studied the antiviral effects of small interfering RNAs (siRNA) on woodchuck hepatitis virus (WHV). These siRNAs offer the prospect of a new treatment for hepatitis B virus (HBV) infections. The genomic organization, biological properties, and replicative strategy of WHV are similar to those of HBV. Infection of woodchucks with WHV is a well-characterized model for studies of HBV pathogenesis and for pre-clinical testing of drugs. My research included in vivo and in vitro studies of a WHV-specific siRNA construct. Following siRNA treatment of hepatocytes and of WHV carrier woodchucks, the levels of viral DNA, RNA, and surface antigen were analyzed. The antibody responses to WHV antigens in woodchucks were also determined. Drug-induced toxicity was measured by changes in cell viability and liver enzyme activity.

A career involving research, especially translational science, appeals to me. I would like to apply for an internship and subsequently a residency in small-animal surgery and possibly also a Ph.D.

The Leadership Program has been a rewarding experience to develop my interests and focus my career. It was great to work with veterinary students and facilitators of different nationalities and backgrounds during the workshops and modules. Thank you, Bud Tennant, Stephan Menne, Scott Butler, all the other people in the lab, and Douglas McGregor and David Fraser, for this wonderful experience.

**Catherine Holmes** | University of Cambridge, *Reproductive Biology*

**Role of Tubulin in the Organization Membrane Sub-Domains in Murine Sperm**

This summer I had the good fortune to work in Alex Travis's laboratory at the Baker Institute. Previous work within the lab had shown segregation of the ganglioside GM1 to the plasma membrane overlying the acrosome in live sperm. This led to questions regarding the mechanism of membrane segregation in sperm. In the nervous system, tubulin anchors glycosphingolipid-enriched membrane regions and I examined whether tubulin has a similar function in the sperm head. Previous work involving both EM and indirect immunofluorescence techniques demonstrated little evidence for any non-axonemal tubulin. However, my research using fluorescent-labeled taxol on both live and dead sperm cells showed intense labeling on the perforatorium and fainter labeling in the regions of the apical acrosome and the sub-acrosomal ring. Antibodies directed against alpha tubulin did not show specific staining in the sperm head yet staining in the apical acrosome was seen using antibodies against gamma tubulin. I confirmed that tubulin exists in the region of the acrosome by probing immunoblots of membrane vesicles released during acrosomal exocytosis with antibodies against alpha and gamma tubulin. Epitope masking could potentially explain why taxol is able to label areas that antibodies cannot. Future work will hopefully determine if membrane-associated tubulin has a role in anchoring raft sub-domains.

I would like to take the opportunity to thank everyone in the lab for all their help and guidance, with particular thanks to Douglas McGregor and David Fraser for organizing this program, and to the Wellcome Trust for the funding to make this possible.

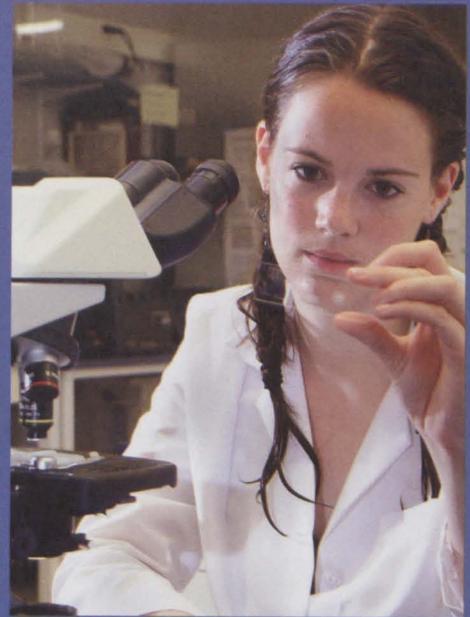
**Eva-Maria Laabs** | Leibniz Universität Hannover, *Parasitology*

**Role of IL-2 in the Immune Regulation Associated with a Live Vaccine, Containing CpG ODN, Against Cutaneous Leishmaniasis**

I grew up in a small village near Bremen, Germany, and at an early age decided to become a veterinarian. During my studies at the University of Veterinary Medicine Hannover I realized that veterinarians not only treat sick animals, but are also involved in other aspects of biology. I developed my interest in research through two internships in parasitology and this encouraged me to apply for a place in the Cornell Leadership Program.

I spent the summer in the lab of Susana Mendez, working on a vaccine against cutaneous leishmaniasis caused by *Leishmania major*. The aim was to avoid the side-effects of slowly healing lesions associated with the standard vaccine. The new vaccine consists of live *L. major* and CpG, which activates the host's immune system. Special T-cells (Tregs) are known to promote parasitic growth and the development of lesions, and as such are the main target in the development of a new vaccine. Tregs are inhibited by CpG, which therefore prevents lesions developing. In the chronic phase, Tregs support the persistence of parasites, which is necessary for maintenance of immunity. This also happens after vaccination with the new vaccine because Tregs recover from the effect of CpG probably because of IL-2 acting as a survival factor. My goal was to test this hypothesis. I compared the data from two groups of mice, one infected with the standard vaccine, the other with the new vaccine. I was able to detect that the new vaccine enhanced IL-2 production by different cell types at the vaccination site.

Finally, I want to thank my mentor and the whole lab. This experience encouraged my interest in research. Thank you also to Douglas McGregor, David Fraser, Ariana Blossom, and my fellow Leadership Students for a very enjoyable summer.





**Jane Leadbeater** | University of Queensland, *Reproductive Biology*

***Characterization of Survival, Function, and MHC Class I Expression in Transplanted Equine Trophoblast Cells***

A lifelong love of animals prompted me to pursue a Veterinary Science degree, but the limitations of a career purely in clinical practice became increasingly apparent, and I developed an interest in research as a challenging and constantly progressing field. This prompted my application to the Leadership Program with a view to investigating research as a complementary career path to clinical practice.

During the summer I worked with Doug Antczak and Mandi de Mestre investigating equine invasive trophoblast cells and their role in fetal evasion of maternal immune destruction during pregnancy. Equine invasive trophoblast cells are derived from the chorionic girdle region of the placenta. They form endometrial cups, which are required to maintain early pregnancy and regress by day 120 of gestation. The cells have a unique ability to differentiate and function within maternal tissues despite marked cellular and humoral immune responses against them. I used a method previously developed in the lab to study these cells independent of the physiological state of pregnancy. This involved harvesting cells from the chorionic girdle of day 34 equine conceptuses and their transplantation to ectopic sites in maiden mares. Biopsy samples of the transplanted tissues were taken at weekly intervals and stained with an indirect immunoperoxidase assay utilizing a panel of monoclonal antibodies. Over the summer I characterized the survival and function of the transplanted cells as well as their expression of Major Histocompatibility Complex Class I and the associated host cellular immune response.

I would like to express my sincere appreciation to everyone in the Antczak lab for their time and effort invested in guiding me through a truly wonderful summer. In addition, I would like to thank Douglas McGregor and David Fraser for coordinating a unique and enlightening program and all the 2006 participants for the multitude of good times.

**Gelja Maiwald** | Leibniz Universität Hannover, *Virology*

***Genomic Integration of Marek's Disease Virus***

During my first years at university they told us a lot and showed us little about the veterinary profession. Deciding that I wanted to be involved to further understand the various fields of veterinary work and to determine which direction I would like to go, I worked as a laboratory assistant as well as a clinical student assistant and did a four-month externship at the Institute of Virology at my university. From these experiences, I felt more and more attracted to the idea of a nonclinical career and applied for the Leadership Program to explore this option.

During my summer at Cornell, I worked in the lab of Klaus Osterrieder. I was involved in research on Marek's Disease Virus, an alphaherpesvirus that integrates into the chicken genome and causes lymphoid tumors as well as other serious pathology. This tumorigenesis, as well as the discovery that the MDV genome contained telomeric repeats at its termini, led to the hypothesis that the virus might integrate into the chicken chromosome telomeres. My project was designed to test this hypothesis. I used DNA from various transformed cell lines, as well as infected and uninfected chicken spleen cells in a Southern hybridization procedure.

I would like to thank my lab members, especially Keith Jarosinski, for immersing me in their research and having the patience to let me make my own decisions, mistakes, and discoveries. To me, that was more useful than getting good results. I also want to thank everybody involved in this thoughtfully organized program and also my fellow students. All of you made these weeks intense and memorable for me and strengthened my decision to pursue a nonclinical career.



*Tell me and I will forget; show me and I may remember; involve me and I will understand*

Confucius

**Richard Meeson** | University of Cambridge, *Pathology*

### ***Elucidating the Signaling Cascade from IGF-1 to Cdc42 in Chondrocytes***

The depth that the sciences underlying veterinary medicine are taught at Cambridge has fueled my desire to go beyond simply treating sick animals. After reading molecular pathology and immunology for my intercalated science degree, I wanted to understand what was happening in a clinical disease at the fundamental level. The Leadership Program has provided me with the knowledge and approach to my career that should hopefully allow me to achieve my goals.

Chondrocytes from old and osteoarthritic animals have been shown to have a decreased sensitivity to Insulin-like Growth Factor 1 (IGF-1). Previous studies demonstrated IGF-1 to have effects on the small GTPase, Cell division cycle 42 (Cdc42), specifically decreasing its activity, which affects the cell morphology and function. My lab project was a proteomic approach to identify which proteins, and specifically which GTPase Activating Proteins (GAPs), bind to Cdc42 post IGF-1 treatment. I harvested canine cartilage, and then subjected it to enzymatic digestion to liberate the chondrocytes. The chondrocytes were cultured and transfected with a constitutively active "bait," a Cdc42 construct, that had tags encoded to allow purification. The cells were then treated with IGF-1, lysed and purified using a Tandem Affinity Purification (TAP) pull-down approach, to produce clean proteins bound to the bait. The purified products were separated on a gel and subjected to mass-spectrometer analysis and bioinformatics database analysis to identify the purified interacting proteins.

I would like to thank Douglas McGregor and David Fraser for their invaluable career advice and guidance. I should also like to thank everyone in the Fortier lab, but especially Lisa Fortier and Brian Miller, for all their help and good humor. Finally, I wish to thank The Wellcome Trust for their generous summer fellowship.

**Ashley Neary** | University of Georgia, *Cell Biology*

### ***Sec2p and Sec4p: Defining the Interaction***

This past summer I worked in Ruth Collins's laboratory, which studies Rab GTPases: molecular switches that regulate distinct stages of membrane trafficking in eukaryotes. My project focused on Sec4p, a yeast Rab GTPase, which regulates post-Golgi trafficking to the plasma membrane. The mammalian homolog of Sec4p, Rab3 (~50 percent amino acid identity), regulates synaptic priming and plasticity in neurons. The activity of Sec4p is dependent on its nucleotide-bound state, tightly regulated by a series of factors, including guanine nucleotide exchange factors (GEFs) and GTPase activating proteins. These factors create the active (GTP-bound) or inactive (GDP-bound) state, respectively. Sec2p, a Sec4p specific GEF, stimulates the association of GTP with Sec4p, enabling downstream signaling. Previous work in the Collins lab developed an algorithm that predicted critical regions potentially important for Sec4p function. Through a series of biochemical assays using algorithm-predicted Sec4p mutants, I tested such predictions experimentally. Residues of Sec4p critical to its interaction with Sec2p were identified, thus giving insight into the mechanism by which Sec2p regulates Sec4p function.

From academia to industry and from research to clinical medicine, it has been inspiring to learn, through the Leadership Program, the many opportunities that are available to veterinary graduates. The program has been an engaging and enlightening experience that will assuredly shape my future endeavors. It has reinforced my interest in research, allowed me to interact with world-renowned scientists, and taught me the importance of having excellent mentors.

Thanks to Douglas McGregor and David Fraser for such a well-planned, organized, and challenging program that has expanded my veterinary focus, both academically and globally. Also, thanks to the facilitators, the entire Collins Lab, and the other fellows for such an enriching and enjoyable summer.





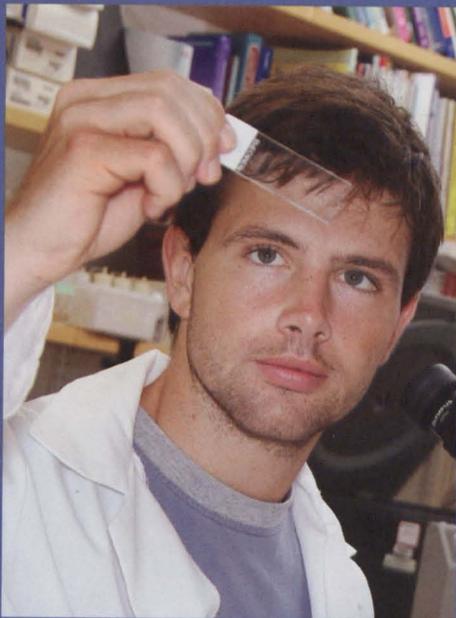
**Joseph Neary** | University of Cambridge, *Cancer Biology*

***Retinoic Acid Signaling Through Negative Feedback Regulation***

Since starting university I have come to acquire a great appreciation of the scientific research that must take place before advances in the clinical field of medicine can occur. Clinical management of cases is restricted by our basic scientific understanding, which can only be advanced through research. As I aspire to a career where I can work for the good of both animals and humans through research, I saw that the Leadership Program offered insights to students seriously considering such a career.

The vitamin A metabolite retinoic acid (RA) regulates multiple biological processes, including cell proliferation and differentiation, by virtue of its ability to modulate the rate of transcription of numerous target genes. The transcriptional activities of this hormone are mediated by two members of the nuclear hormone receptor superfamily: one of them being the retinoic acid receptor (RAR). The transcriptional activities of RA are also augmented by cellular RA-binding protein-II (CRABP-II), which binds to RA with sub-nanomolar affinity in the cytosol and channels it to RAR. Preliminary data suggested that RA could control its own signaling by negative feedback regulation on CRABP-II expression. I investigated this by culturing mammary carcinoma cells either with or without RA for variable time periods. By performing Western blots I found that RA does appear to lower CRABP-II expression and thus negative feedback may be a mechanism by which RA controls its own signaling.

In my brief time at Cornell, I have learned a lot about myself and of the tremendous diversity of career options available to veterinarians. I thank Douglas McGregor and David Fraser, the program facilitators and sponsors, especially the Wellcome Trust, and my new friends at the Noy lab, especially Noa Noy, for granting me this insight into the exciting and immensely worthwhile field of cancer research.



**John Parker** | University of Bristol, *Molecular Epidemiology*

***The Relationship of the Mucosa-Associated Microflora to Gastric Ulceration in Horses***

Kenny Simpson's laboratory investigates associations between bacterial infection and chronic disease states. My own work there contributed to a pilot study, the aim of which was to characterize the bacterial flora of the equine stomach through the use of molecular detection methods. Both healthy horses and those with evidence of gastric ulceration were sampled, with the intention of comparing the two groups. The results showed the presence of diverse bacterial flora, the majority of which are adherent to the mucosal surface. Ulcerated tissue was particularly enriched.

I am currently between my fifth and final year, having spent a year studying zoology as an intercalated degree. I applied to the Leadership Program because I saw it as an opportunity to broaden my perspective on the value of my veterinary education. Lacking a sense of direction, I found the linear structure and unforgiving expectations of the veterinary degree course increasingly oppressive. I sought the freedom to discover a cause of my own.

Before I came to America I found liberation in the arts: music, drawing, paintings, novels, theater, and film. I still indulge these passions, but they have become less an escape than a perspective complementary to my role in veterinary medicine. By applying my education in a novel context I found the freedom to consider the value of my knowledge and understanding to all aspects of society and its culture. To me, veterinary medicine is more a contribution than a discipline.

I am still unsure of the direction in which I wish my career to proceed. However, I am more aware of the ways in which my degree may be applied, and the opportunities available to me. Most importantly, I have gained an appreciation of the limitations of given doctrine and have greater confidence in the potential value of my own ideas.

**Tiffany Reed** | University of Georgia, *Genetics*

### ***Analysis of Egfl4 Gene Expression and Protein-Protein Interactions***

I was attracted to study veterinary medicine while completing my undergraduate degree at the University of Georgia and at the same time doing a research project on leptospirosis in dogs. Since then I have had the opportunity to see a number of examples of the special contribution that veterinarians can make to biomedical research. From these experiences I have decided to pursue a career in laboratory animal pathology.

This past summer, I have had the good fortune to pursue research in Teresa Gunn's laboratory. The Gunn laboratory is analyzing genetic mechanisms underlying neurodegeneration in mice. My project focused on Egfl4, a gene that has many similarities to one encoding for attractin, a protein involved in pigment-type switching and neurodegeneration. I analyzed protein-protein interactions of the cytoplasmic domain of the Egfl4 protein preparation using the yeast two-hybrid screening method. My goal was to identify interacting proteins derived from a mouse brain cDNA library. Using qRT-PCR and northern blot analysis, I also quantified the expression of RNA from Egfl4 in brain and testes of mice thought to be carrying a mutation of this gene.

The Leadership Program has been an invaluable experience and has exceeded all of my expectations. Throughout my time here, I have not only learned of the availability of research opportunities for veterinarians, but also of the importance of veterinarians in science. I would like to thank Douglas McGregor and David Fraser for their dedication to this program and the support that they give each and every student. I would also like to thank Teresa Gunn, Will Walker, and all members of the Gunn lab, for the support provided throughout my project. Lastly, I would like to thank all the leadership program participants for contributing to a productive and enjoyable summer experience.



**Swaantje Roth** | Freie Universität Berlin, *Virology*

### ***Alteration of Parvovirus Capsids in Order to Produce Nanoparticles***

I started veterinary school in Berlin in 2002 as this seemed to offer me a broad ranging education in the natural sciences with the possibility of working directly with animals. I enjoyed gaining a general understanding of how life worked. Immunology, virology, and emerging diseases all fascinated me. As time passed, I became more and more curious about different career paths that veterinary medicine offers, besides that of a private practitioner.

During my summer in Cornell, I worked in Colin Parrish's laboratory. My project, altering parvovirus capsids to produce nanoparticles, differed from what you expect projects to be like in "the parvolab." I got the chance to learn and deepen my understanding of basic molecular biological techniques as well as fulfill my ambition to work in virology. But I have also come to know the new and exciting field of nanobiotechnology. I inserted the genomic sequence of two different templates for nanoparticles into the parvovirus protein 2 gene so as to potentially produce nanoparticles within the altered capsids.

The Leadership Program was a wonderful and challenging experience. In my project, I gained new knowledge and acquired new skills. I enjoyed participating in all the interesting modules and I appreciated learning so much about different career options our profession now offers us. I want to thank Douglas McGregor and David Fraser for making all this possible; my mentor Colin Parrish and my supervisor Christian Nelson for their help, patience, and encouragement; my fellow students for sharing this unforgettable experience; and last but not least, Ariana Blossom, a wonderful person and coordinator.





**William Sander** | University of Wisconsin, *Genetics*

### ***Gene Expression Analysis of German Shepherds with Ventricular Arrhythmias***

Fifteen years ago, Sydney Moïse observed sudden death without any prognostic indicators in young German Shepherd dogs. A colony of German Shepherds was established for further study. Dogs are harnessed with a Holter monitor for twenty-four hours to record the number of arrhythmias. To understand the molecular basis of the condition, gene expression profiling was performed using Affymetrix GeneChips. This study identified a number of genes that appear to be differentially expressed between the left ventricles of affected and unaffected dogs. I examined the expression level of fifteen of these genes related to mitochondrial/metabolic function in cardiac tissue under the guidance of Teresa Gunn. Using quantitative reverse transcription–polymerase chain reactions (qRT–PCR), I compared gene expression between twenty-five dogs ranging in phenotype from unaffected to severely affected to confirm that they are differentially expressed. qRT–PCR allows for the quantification of gene expression by synthesizing a DNA copy of the gene transcript from cellular RNA and amplifying it in the presence of a fluorescent dye that only binds to double-stranded nucleic acids. The level of fluorescence reflects the concentration of DNA, which directly correlates to the RNA expression level. This work will help build a gene-expression profile for ventricular arrhythmias in German Shepherds that may help us understand the pathogenesis of this disease.

This program, with research and learning modules, has broadened my horizons in the veterinary field. I feel strongly about wildlife health and conservation and now know different ways to get there: clinical residency, population health and epidemiology, or infectious disease research.



**Lauren D. Sawchyn** | Cornell University, *Anatomy*

### ***An Anatomical Guide to Carnivore Dissection***

I have always been caught between artistic and veterinary directions. I designed my education to link these interests, obtaining a master's degree in medical illustration. I will achieve CMI (board certification in medical illustration) status in a few years. I came to Cornell to direct my observational training towards a nontraditional career in veterinary medicine, which may include teaching, research, and/or clinical work.

My project involved creating accurate drawings for Cornell's carnivore dissection course. Paul Maza teaches this class to students who desire the detailed feline anatomical and clinical knowledge not offered in the canine course. I was surprised to learn that classes depended on *Miller's Guide to the Dissection of the Dog*, which does not highlight critical differences between cats and dogs. After referencing cadaveric prosections, photographs, and existing atlases, I consulted with Paul on the accuracy and aesthetic of each drawing. Although I focused on the musculoskeletal system, Paul and I will continue beyond the Leadership Program, also emphasizing internal structures and clinical procedures. The images will be integrated with photographs and text to create a comprehensive, user-friendly study guide that students can refer to throughout their academic and professional careers. In addition, I hope it renews interest in anatomy—a vital, but now often overlooked, part of a veterinary medical education.

As the first medical artist ever accepted to the Leadership Program, I am honored to have had this great experience. The program takes the initiative to open doors of opportunity and discovery to veterinary students worldwide, and though research is a primary focus, the program recognizes there is no limit to what students of veterinary medicine can accomplish. I am indebted to the program's founders for realizing my potential, and for giving back their time to help direct our futures.

**Lynda Shaw** | University of Sydney, *Virology*

### ***Intranuclear Capsid Movement Studies, and Development of an In-vitro Assay for the Confocal Microscopic Study of Herpes simplex Virus in Live Neurons***

I am currently in my fifth (and final) year of the Bachelor of Veterinary Science at Sydney University. This study has come following completion of a Bachelor of Science at the same university, giving me the opportunity to explore not only the biological sciences at large, but also an in-depth knowledge of a number of animal systems. It has been a fantastic culmination of my studies to come to Cornell in the Leadership Program and explore opportunities that are available to me after graduation.

My work in the Baines lab was in two parts. The first was to develop an assay for the study of *Herpes simplex* virus transport in live neurons by confocal microscopy. This assay will be used to study the effects of a number of tegument mutant viruses that are deficient in one of several proteins implicated in microtubular axonal transport. Alterations in capsid transport behavior in any of these mutants would implicate their expressed proteins in capsid transport within neurons for the first time. The second part was a study of intranuclear capsid movement in epithelial cells. Two phases of movement have been recognized: an early diffusion-dominant movement of capsids, and a later directed movement. Efforts are ongoing to determine the role of actin and cell stress that might influence the transition between these different phases of movement.

I would like to thank Joel Baines, Carol, Liz, Fan, Luella, Kui, and Jarek for welcoming me into their lab this summer, and for their endless assistance and patience. I would also like to thank Douglas McGregor and David Fraser for the hard work they put in to arranging this program, and to the other students for an entertaining and enjoyable summer.

**Justine Shotton** | University of Bristol, *Virology*

### ***Can We Predict the Virulence of Different Feline Calicivirus Isolates Based on Their Sequence?***

I have always wanted to become a veterinarian, and am greatly enjoying the path to realizing that dream. I believe veterinary scientists are vital to the profession since they have the potential to improve the health and welfare of millions of people and animals worldwide. I spent last year obtaining a B.Sc. in veterinary pathology and have furthered this research interest through the Leadership Program.

My summer project was conducted in the laboratory of John Parker, under the immediate supervision of Robert Ossiboff. The focus of the research was feline calicivirus (FCV). In recent years, a number of novel cases of highly virulent FCV have arisen, with severe systemic effects in vaccinated, adult cats, causing fatalities of up to 60 percent, compared to classical isolates, which rarely result in severe disease. My project involved sequencing the proteinase-polymerase (p76) region of both the classical isolates and the virulent systemic (VS) viruses. We failed to observe conserved differences between the two groups; however, differences may have been lost in the 'noise' of this highly variable region. The p76 region was chosen since it is more conserved; hence any differences present would be more obvious. Seven VS-FCV and three classical FCV isolates were sequenced, and aligned with all other published p76 sequences. No clustering of VS-FCV sequences was seen, confirming capsid data. Phylogenetic trees indicated that VS isolates were evolutionarily distinct, arising independently from each other. The mystery of what confers enhanced virulence to VS isolates remains unsolved.

My summer at Cornell has been a highlight of my education, opening my eyes to the plethora of career opportunities available. I would like to thank my mentors for their wisdom and intellectual stimulation, and the course organizers for creating such a vibrant and valuable program.





**Laura Spoor** | Royal Veterinary College, London, *Infectious Disease*

### **Genetic Characterization of an Emerging Salmonella Serotype Associated with Cattle and Humans**

My interest in understanding the cellular mechanisms for disease pathogenesis and public health has ignited an interest in research as a potential career.

Food born Salmonellosis causes 550 deaths annually in the U.S. An emerging serotype, S. 4,5,12:i:–, is of growing public health concern. Multiple-drug resistant (MDR) isolates have been obtained from both cattle and human clinical cases in the North-east U.S. We used multilocus sequence typing (MLST), a subtyping method that utilizes DNA sequencing of housekeeping genes to distinguish bacteria, to further characterize serotype 4,5,12:i:– and related isolates. Three-gene MLST had previously defined ST6 as one of the most common sequence types encountered in New York State. This ST contains MDR *S. typhimurium*, and also isolates of serotype S.4,5,12:i:–, which lacks the phase-2 flagellar antigen but is otherwise antigenically identical to *S. typhimurium*. The aim of my project was to use 7-gene MLST on these ST6 *Salmonella* to further characterize their genetic relationship. Seven-gene MLST showed that *S. typhimurium* ST6 and serotype 4,5,12:i:– carried essentially identical sequences for the 4329 bp sequenced, indicating recent emergence of serotype 4,5,12:i:– from a *S. typhimurium* ST6 ancestor. We conclude that, at least some *S. typhimurium* strains may have unique characteristics, that may make it more likely for them to serve as ancestors for new and emerging *Salmonella* strains.

The Leadership Program has provided me with a unique insight into the world outside clinical practice. I thank Douglas McGregor and David Fraser for organizing this inspiring program; Martin Wiedmann and Esther Fortes; and my sponsor, the Wellcome Trust.



**Alexia Wilson** | Royal Veterinary College, London, *Parasitology*

### **Proteases of *Ichthyophthirius multifiliis* as Potential Vaccine Candidates**

I began studying veterinary medicine because I loved biological science and medicine. After two years I undertook a largely research-based intercalated immunology degree at University College London, which I thoroughly enjoyed. It was this experience that initiated my interest in exploring career paths other than general practice. I applied to the Leadership Program in the hope it would help me make an informed decision about my future.

Ted Clark, whose research focuses on the fish parasite *Ichthyophthirius multifiliis*, agreed to be my research mentor at Cornell. A working premise of the Clark lab is that one of the proteases expressed in *Ichthyophthirius* could be used to produce a vaccine with which fish could be immunized. One of their aims is to identify likely candidates for this vaccine and produce the protease in *Tetrahymena thermophila*—a related ciliate protozoan. The protease could then be tested for its ability to immunize fish against *Ichthyophthirius*. Two likely candidates—a Leishmanolysin-like protease from the theront stage of the life cycle and an asparaginyl endopeptidase from the trophont stage—were studied. I replicated the genes for these proteins using PCR and cloned them by plasmid insertion into DH5 $\alpha$  *E. coli*. I will soon express the first in *Tetrahymena*.

The lab project gave me an opportunity to learn molecular techniques I had not previously used. It also gave me a chance to explore different bioinformatics programs while researching various *Ichthyophthirius* proteases.

The Leadership Program has not decided my future career path; however, it has given me options for the future and food for thought for when I make the decision for myself. In addition, the workshops have given me a new-found confidence in presenting my ideas to others. I have enjoyed every aspect of the program, and wish to thank all who made it possible.

**Rosalind Wright** | University of Liverpool, *Virology*

***Determining Molecular and Histological Procedures for the Detection of Equine Polyomavirus***

Although I had always planned to begin my veterinary career in small animal and exotic animal practice, I developed a strong interest in research during my intercalated B.Sc. degree in veterinary conservation medicine. Before entering the final year of my veterinary science degree at the University of Liverpool, I was keen to find out more about careers in scientific research and the Leadership Program seemed an ideal opportunity to do this.

During my summer at Cornell I was appointed an inspiring mentor, Edward Dubovi, and worked under the guidance of molecular virologist Randall Renshaw in the veterinary diagnostics laboratory. Following the association of Equine Polyomavirus (EPyV) with chronic equine uveitis, it was the aim of my project to develop diagnostic techniques to determine the prevalence of EPyV in cases of recurrent ocular disease in equids. My research focused on the replication, expression, and purification of the major capsid protein VP1 as a means to produce virus-like particles and induce an antigen–antibody response in a live animal. My mentors were keen for me to acquire a diverse spectrum of laboratory skills, which will prove invaluable should I pursue post-graduate studies. Techniques I undertook included cell culture, protein purification, plaque assays, gene sequencing, PCR, and IFAs, to name but a few.

The Leadership Program enabled me to experience the pleasures and frustrations associated with research in the rich and interactive scientific community at Cornell University. The workshops gave me a valuable insight into the exceptional careers of many renowned scientists and provided guidance on how to make the best career choices in the future. The entire experience gave me a unique opportunity to reflect on my personal and professional goals in life.



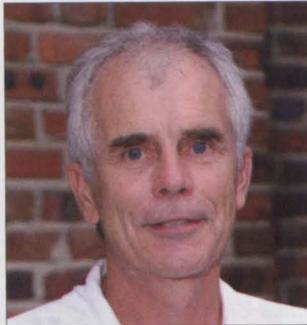
# Counselors and Facilitators

## for the 2006 Leadership Program



**Barbara Baird**  
**Facilitator**

Professor, Chemistry and  
Chemical Biology  
Cornell University



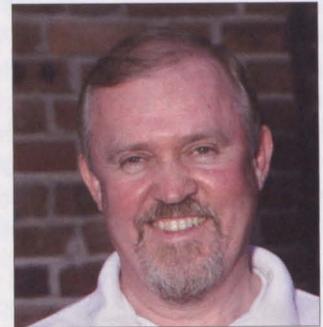
**Edward Breitschwerdt**  
**Counselor**

Professor, Internal Medicine  
North Carolina State University



**Scott Brown**  
**Facilitator**

Senior Director, Metabolism  
Safety  
Veterinary Medicine Research  
and Development, Pfizer  
Animal Health



**Philip Carter**  
**Facilitator**

Program Director  
Merck Childhood Asthma  
Network



**Richard Cerione**  
**Counselor**

Professor, Molecular Medicine  
Cornell University



**Ruth Collins**  
**Counselor**

Associate Professor, Molecular  
Medicine  
Cornell University



**Amanda de Mestre**  
**Counselor**

Postdoctoral Associate, James  
A. Baker Institute  
Cornell University



**Chris DeMoula**  
**Facilitator**

Research Fellow, Department of  
Pathology  
Merck & Co., Inc



**David Fraser**  
**Facilitator/Counselor**

Professor, Animal Science  
University of Sydney



**Michelle Haven**  
**Facilitator**

Executive Director, Veterinary  
Medicine Global Discovery  
Pfizer Animal Health



**Gerard Hickey**  
**Facilitator**

Senior Director, Pharmacology,  
Animal Health  
Merck & Co., Inc



**Peter Jahrling**  
**Facilitator**

Senior Scientist, NIAID  
National Institutes of Health



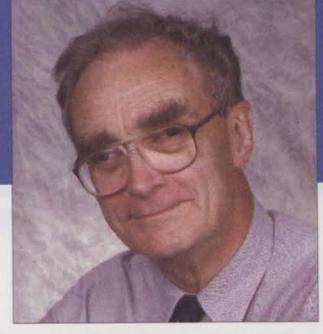
**Christopher Johnson**  
**Facilitator**  
 Research Veterinarian, Animal Resources  
 Merck & Co., Inc.



**Judith Kinnear**  
**Facilitator**  
 Vice Chancellor and President,  
 Massey University  
 New Zealand



**Dennis O'Connor**  
**Facilitator**  
 Professor, Biology  
 University of Maryland



**Douglas McGregor**  
**Counselor**  
 Director, Leadership and Training Initiatives  
 Cornell University



**Susan McGregor**  
**Facilitator**  
 Eastern Regional Counsel,  
 Immigration  
 U.S. Department of Homeland Security



**John Parker**  
**Facilitator**  
 Assistant Professor, Virology  
 Cornell University



**Colin Parrish**  
**Facilitator**  
 Professor, Virology  
 Cornell University



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



**Kenneth Simpson**  
**Counselor**  
 Associate Professor, Clinical Sciences  
 Cornell University



**Steve Sutherland**  
**Facilitator**  
 Senior Director, U.S. Regulatory Affairs  
 Pfizer Animal Health



**Alfonso Torres**  
**Facilitator**  
 Associate Dean, Veterinary Public Policy  
 Cornell University



**Lynn Wachtman**  
**Facilitator**  
 Clinical Veterinarian  
 New England Primate Center



**Amy Warren**  
**Counselor**  
 Resident, Clinical Pathology  
 Cornell University

# 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.



# Housing



Participants in the 2006 Leadership Program were housed in the Zeta Psi fraternity house on the Cornell campus. They had exclusive use of the building for the ten-week period that the program was in session. Several events were scheduled there, typically in the evening in conjunction with a catered meal. The living arrangements enabled the scholars to socialize and relax in a convenient and pleasant campus environment.

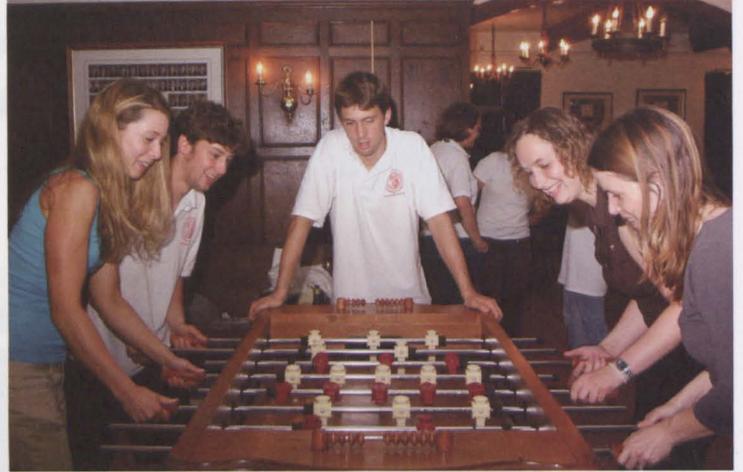
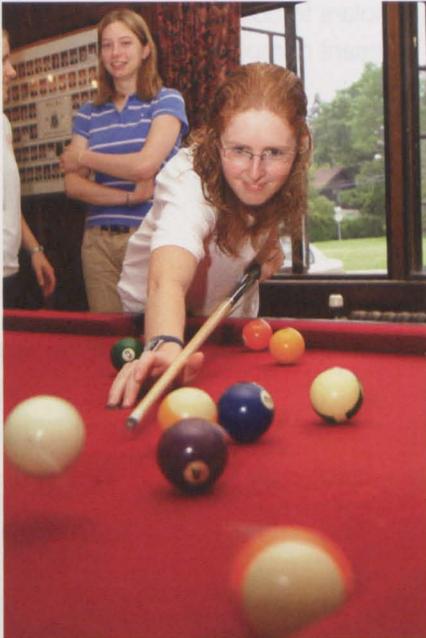


## **Ariana Blossom, Program Coordinator**

This has been a unique and eye-opening opportunity for me. I feel fortunate to have had the chance to work with such an outstanding, driven, delightful group of people from all over the world. The facilitators have all been genuinely interested in assisting the students on their career paths and it has been a pleasure to witness the interactions. I hold each student in my heart, knowing that they are all on the path to success.

# Time Out

Apart from their intensive schedule, program scholars found time for many personal pleasures. They capitalized on local Ithaca amenities and visited the Adirondack Mountains, Boston, Montreal, Niagara Falls, Toronto, New York City and Washington, D.C.



# Where Are They Now?

The program organizers maintain contact with Leadership Program graduates 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 careers in science or public health.

## 1990

- John Angelos** Assistant Professor, Food Animal Medicine, University of California, Davis  
**William Carr** Instructor, MGH Partners for AIDS Research Center, Harvard University  
**Laura Gumprecht** Assistant Director, Safety Assessment, Merck Research Laboratory, West Point, Pennsylvania  
**Elizabeth Lyon Hannah** Research Faculty Member, Boise State University, Boise, Idaho  
**Richard Haworth** Senior Pathologist, GlaxoSmithKline, Middlesex, United Kingdom  
**Melissa Mazan** Assistant Professor and Director, Sports Medicine, Tufts University, Somerville, Massachusetts  
**Rebecca Papendick** Associate Pathologist, Zoological Society of San Diego  
**Susan Schaefer** Clinical Assistant Professor, Surgery, University of Wisconsin, Madison, Wisconsin  
**A. W. (Dan) Tucker** Lecturer, Veterinary Public Health, University of Cambridge  
**Thomas Vahlenkamp** Assistant to the President, Friedrich-Loeffler-Institut, Greifswald, Germany

## 1991

- Prema Arasu** Associate Professor, Parasitology, North Carolina State University  
**David Bainbridge** Clinical Veterinary Anatomist, University of Cambridge  
**Linda Berent** Clinical Assistant Professor, University of Missouri  
**Ian Davis** Research Assistant Professor, Genomics and Pathobiology, University of Alabama  
**Judy Hickman-Davis** Assistant Professor, Anesthesiology, University of Alabama  
**Dianne Hellwig** Associate Professor, Agriculture and Natural Resources, Berea College  
**Alan Radford** Senior Lecturer, Small Animal Studies, University of Liverpool  
**Jean Reichle** Head, Animal Surgical and Emergency Center, West Los Angeles, California

## 1992

- Tomasz Betkowski** Medical Representative, Eli Lilly Co., Indianapolis, Indiana  
**Stephen Davies** Assistant Professor, Parasitology, Uniformed Services University, Bethesda, Maryland  
**Mathew Gerard** Assistant Professor, Surgery, North Carolina State University  
**Christine Hawke** Lecturer, Small Animal Clinical Practice, University of Sydney  
**Julio Montero-Oliver** Command Veterinarian, Headquarters U.S. Army South  
**Jacqueline Phillips** Senior Lecturer, Physiology, Murdoch University, Perth, Australia  
**Cristina Rodriguez-Sanchez** Senior Research Associate, Universidad Nacional Autónoma de México  
**Louise Southwood** Assistant Professor, Emergency and Critical Care, University of Pennsylvania  
**Reinhard Straubinger** Lecturer, Institute for Immunology, University of Leipzig

# 1993

- Virginia Fajt** Clinical Assistant Professor, Texas A&M University  
**Deborah Hoyle** Postdoctoral Research Associate, Epidemiology, University of Edinburgh  
**Christopher Laing** Science Writer, Integral Molecular Inc., Philadelphia, Pennsylvania  
**Emma O'Neill** Lecturer, Small Animal Medicine, University College, Dublin  
**Joanne Rainger** Registrar, Anesthesia, University of Sydney  
**Ashley Reynolds** Associate Research Scholar, Virology, Princeton University  
**Susanna Ryan** Communications Specialist, MediTech Media, London, U.K.  
**Veiko Saluste** Executive, Interchemi, Estonia  
**Lynn Wachtman** Clinical Veterinarian, New England Primate Center

# 1994

- Melissa Beall** Research Scientist, IDEXX Inc.  
**Larissa Bowman** Director, Mountain Veterinary Pathology, Asheville, North Carolina  
**Leslie Gabor** Assistant Professor, Pathology, Atlantic Veterinary College, Prince Edward Island  
**Paige Langdon** Clinical Instructor, Small Animal Medicine, University of Missouri  
**Maria Lara-Tejero** Postdoctoral Fellow, Department of Microbiology, Yale University  
**Christopher Mariani** Associate Professor, Neurology, University of Florida  
**Sonia Mumford** Veterinary Medical Officer, Fish Health Center, Olympia, Washington  
**Jeffrey Phillips** Assistant Professor, Oncology, University of Tennessee  
**Julie Pomerantz** Associate Research Scientist, Wildlife Trust, Palisades, New York  
**Stacy Pritt** Director Regulatory Operations, Covance Research Products, Inc.  
**Oliver Turner** Pathologist, Novartis Inc.

# 1995

- Gertraut Altreuther** Project Manager, Parasitology, Bayer Animal Health, Leverkusen, Germany  
**Adrienne Bentley** Resident, Small Animal Surgery, University of Pennsylvania  
**Philippa Beard** Postdoctoral Fellow, Virology, Imperial College, London  
**Kate Creevy** Resident, Small Animal Medicine, University of Georgia  
**Rachael Gray** Lecturer, Veterinary Anatomy, University of Sydney  
**Krista-Britt Halling** Assistant Professor, Surgery, Ontario Veterinary College, University of Guelph, Guelph, Ontario  
**Wendy Harrison** Research Scientist, GlaxoSmithKline, Middlesex, U.K.  
**Kelly Lorsch** Technical Service Specialist, Pfizer, Australia  
**Andrew Moorhead** Ph.D. candidate, Microbiology, Cornell University  
**Tony Mutsaers** Ph.D. candidate, University of Toronto

# 1996

- Michelle Dries-Kellaway** Research Project Manager, Meat and Livestock, Australia  
**Patricia Gearhart** Adjunct Assistant Professor, Ophthalmology, Michigan State University  
**Tamara Gull** Ph.D. candidate, Texas A&M University  
**Antonia Jameson-Jordan** Ph.D. candidate, Molecular Medicine, Cornell University  
**Allison Stewart** Assistant Professor, Large Animal Medicine, Auburn University  
**Edwin van Duijnhoven** Research Scientist, NOTOX, Netherlands  
**Constantin Von der Heyden** Scientist, Pegasys Strategy and Development RSA, South Africa

# 1997

- Dennis Bailey** Lecturer, Oncology, Cornell University
- Alexandra Doernath** Exotic Animal Specialist, Berlin Zoo
- Jennifer Fryer** Resident, Small Animal Medicine, Texas A&M University
- Jonathan Happold** M.S. candidate, Epidemiology, University College, London
- Esther Kornalijnslijper** Postdoctoral Associate, Department of Farm Animal Health, Universiteit Utrecht
- Tanya LeRoith** Assistant Professor, Pathology, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, Virginia
- Lucy Neave** Lecturer, Creative Writing, Australian National University
- Patricia Pesavento** Assistant Professor, Pathology, University of California, Davis
- Paul Plummer** Ph.D. candidate, Iowa State University
- Deborah Prattley** Ph.D. candidate, Epidemiology, Massey University, New Zealand
- Melinda Story** Assistant Professor, Equine Surgery, Kansas State University
- Jonathan Werner** Principal Pathologist, Amgen Co., Thousand Oaks, California
- Rebecca Wilcox** Ph.D. candidate, Virology, Melbourne University
- Esther Wissink** Postdoctoral Fellow, Netherlands Cancer Institute
- Nicolette Zardy** M.P.H. candidate, University of California, Berkeley

# 1998

- Max Bastian** Postdoctoral Fellow, Institut für Klinische Mikrobiologie, Immunologie und Hygiene, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- Stephen Fleischer** Biologist, U.S. Food and Drug Administration
- Karsten Hüffer** Assistant Professor, Virology, University of Alaska
- Zoe Lenard** Resident, Radiology, Murdoch University, Perth, Australia
- Karen Liljebjelke** Postdoctoral Fellow, USDA, Athens, Georgia
- Larissa Minicucci** Director, D.V.M./M.P.H. Program, University of Minnesota
- Amanda Murphie [de Mestre]** Postdoctoral Fellow, Baker Institute, Cornell University
- Anne-Marije Sparnaay** Senior Policy Advisor, Ministry of Agriculture, Netherlands

# 1999

- Erica Behling-Kelly** Ph.D. candidate, University of Wisconsin
- Robert Dickens** Risk Management Veterinarian, North Carolina Department of Agriculture
- Peter Florian** Laboratory Head, Thrombosis, Sanofi-Aventis, Frankfurt, Germany
- Carl Holmgren** Staff Scientist, Neural Sciences, Karolinska Institutet, Stockholm, Sweden
- Emily Meseck** Pathologist, Charles River Laboratory
- Rachel Mo-Peters** Instructor, Pathology, Cornell University
- Mary Nabity** Resident, Clinical Pathology, Texas A&M University
- Kimberly Newkirk** Ph.D. candidate, Veterinary Biosciences, The Ohio State University
- Christopher Premanandan** Ph.D. candidate, Microbiology, The Ohio State University
- Rachel Tarlinton** Biotechnologist, Vaccine Delivery Group, Queensland
- Holger Volk** Resident, Neurology, Royal Veterinary College, London, U.K.

# 2000

- Tanya Babu** Veterinary Surgeon, Department of Environment, Food and Rural Affairs, U.K.  
**Beatrice Bohme** Resident, Small Animal Surgery, Liege, Belgium  
**Steven Daley** Postdoctoral Fellow, Immunology, Australian National University  
**David Detweiler** Resident, Radiology, University of California, Davis  
**Katharine Evans** Deputy Veterinary Surgeon, Babraham Institute, University of Cambridge  
**Rachel Geisel** Resident, Pathology, Ontario Veterinary College, University of Guelph, Guelph, Ontario  
**Samuel Hamilton** Ph.D. candidate, Epidemiology, University of Sydney  
**Birgit Hingerl [Viertlboeck]** Scientific Assistant, Immunology, University of Munich  
**Natali Krekeler** Postdoctoral Assistant, Biomedical Sciences, Cornell University  
**Richard Luce** State EIS Officer, Cheyenne, Wyoming  
**Fiona Norris** Ph.D. candidate, Microbiology, Monash University, Australia  
**Knut Stieger** Ph.D. candidate, Genetics, University of Nantes  
**Joost Uilenreef** Resident, Anesthesiology, Universiteit Utrecht  
**Kevin Woolard** Ph.D. candidate, National Cancer Institute, NIH

# 2001

- Julie Chevrette** Clinical Veterinarian, Charles River Laboratory  
**Robert Klopfleisch** Dr.Med.Vet. candidate, Friedrich-Loeffler-Institut, Greifswald, Germany  
**Katherine Hughes** Resident, Pathology, University of Cambridge  
**Karin Holzer** Ph.D. candidate, Virology, Cornell University  
**Stephanie Janeczko** Resident, Shelter Animal Medicine, Cornell University  
**Charles Johnson** Resident, Pathology, Iowa State University  
**Rebecca Lin** Resident, Small Animal Surgery, University of Pennsylvania  
**David Loch** Ph.D. candidate, Physiology, University of Queensland  
**Maeva Louis** Postdoctoral Fellow, Cornell University  
**Timothy Myshrrall** Ph.D. candidate, Toxicology, University of Washington  
**Kis Robertson** M.P.H. candidate, University of Minnesota  
**Simon Starkey** Resident, Avian and Exotic Medicine, Cornell University  
**Amy Warren-Yates** Resident, Clinical Pathology, Cornell University  
**Robin Yates** Fulbright Scholar, Ph.D. candidate, Microbiology, Cornell University  
**Bevin Zimmerman** Resident, Pathology, The Ohio State University

# 2002

- Janet Beagley** M.S. candidate, Epidemiology, Michigan State University  
**Karin Darpel** Ph.D. candidate, Parasitology, Pirbright, U.K.  
**Karyn Havas** U.S. Army Veterinarian, Grand Forks, North Carolina  
**Patrick Kenny** Resident, Neurology, University of California, Davis  
**Susannah Lillis** Resident, Diagnostic Imaging, University of Pennsylvania  
**Anna Lo** M. Phil. candidate, Virology, University of Cambridge  
**Michael Mienaltowski** Ph.D. candidate, Cell Biology, University of Kentucky  
**Andrew Miller** Resident, Pathology, Cornell University  
**Tomas Pansky** Intern, Texas A&M University  
**Simon Priestnall** Ph.D. candidate, Pathology, Royal Veterinary College, London  
**Scott Rizzo** Resident, Small Animal Medicine, University of Tennessee

**Kelly Still** U.S. Army Veterinarian, Enterprise, Alabama

**Ryan Taggart** U.S. Army Veterinarian, Havelock, North Carolina

**Barbara Taennler** Marketing Manager, Veterinaria, Zurich, Switzerland

**Christine Trezise** Intern, Pathology, Gribbles Co., Melbourne, Australia

**Justin Wimpole** Resident, Ryde Veterinary Hospital, Sydney, Australia

**Vivian Yau** Resident, Internal Medicine, Los Angeles, California

## 2003

**Rosie Allister** Ph.D. candidate, Parasitology, University of Edinburgh

**Mieke Baan** Resident, Small Animal Medicine, Ohio State University

**Belinda Black** Intern, Small Animal Medicine, Murdoch University, Australia

**Patrick Carney** Intern, Small Animal Medicine and Surgery, University of Pennsylvania

**Amy Cordner** Intern, Small Animal Medicine and Surgery, Ohio State University

**Jennifer Fernandez** Intern, Garden State Veterinary Specialists, Tinton Falls, New Jersey

**Erica Gruber** Intern, Small Animal Medicine and Surgery, Colorado State University

**Lindsay Hamilton** Ph.D. candidate, Neurophysiology, University of Cambridge

**Jutta Klewitz** Dr.Med.Vet. candidate, Leibniz Universität Hannover

**Michael Krahn** Postdoctoral Fellow, Stem Cell Biology, Georg-August-Universität Göttingen

**Heather Martin** Postdoctoral Associate, Lab Animal Medicine, MIT

**Siobhan Mor** Ph.D. candidate, Parasitology, Tufts University

**Kate Paterson** Ph.D. candidate, Garvan Institute, University of New South Wales

**Lyn Wancket** Resident, Pathology, The Ohio State University

**Christiane Wrann** Ph.D. candidate, Leibniz Universität Hannover

## 2004

**Anton Asare** Public Health Veterinarian, USDA, Amarillo, Texas

**Carolyn Block** Dr.Med.Vet. candidate, Ludwig-Maximilians-Universität München, Munich, Germany

**Mathew Breed** Resident, Ambulatory Medicine, Cornell University

**Andrew Broadbent** M.S. candidate, Epidemiology, University of Bristol

**Karla Dreckmann** Ph.D. candidate, Microbiology, Leibniz Universität Hannover

**Duncan Russell** Resident, Pathology, Cornell University

**Katherine Scollan** Intern, California Animal Hospital Specialty Group

**Baukje Schotanus** Intern, Small Animal Medicine, Universiteit Utrecht

**Ivana Sekis** Postdoctoral Fellow, Oncology, University of Vienna

**Katy Townsend** Research Fellow, Orthopedics, The Ohio State University

**Claire Underwood** Intern, Large Animal Medicine, University of Pennsylvania

## 2005

**Hille Fieten** Intern, Small Animal Medicine, Universiteit Utrecht

**Kai-Biu Shiu** Intern, Small Animal Medicine, Cornell University

**Marieke Opsteegh** Postdoctoral Scientist, Universiteit Utrecht

**Catherine Trickett** Ph.D. candidate, Animal Behavior, University of Bristol



# *What Did They Say?*

*"Participation in the Leadership Program was pivotal in launching me on a successful career in biomedical research."*  
Steven Davies, 1992

*"The Leadership Program was a major turning point in my career."*  
Jacqueline Phillips, 1992

*"The Leadership Program was THE defining experience in my decision to pursue a career in research."*  
Ashley Reynolds, 1993

*"I think it's because of the program that I'm doing research today."*  
Maria Lara-Tejero, 1994

*"The Leadership Program was a fantastic experience for a young, open-minded explorer."*  
Oliver Turner, 1994

*"I would probably not have pursued a Ph.D. without having participated in the Cornell program."*  
Andrew Moorhead, 1995

*"The 2000 Leadership Program propelled me along the career path I am now pursuing."*  
Steven Daley, 2000

*"I remember Ithaca and Cornell and how great it was."*  
Ivana Sekis, 2004

*"I am now realizing just how much I gained from the Leadership Program and how invaluable it was."*  
Louise LeFlufy, 2005



## *In the Limelight*

### **Stephen Davies**

Upon entering vet school at the University of Bristol in 1988, my interests lay more in the science of veterinary medicine rather than a career in practice. It was a decision that I have not regretted, as it later became clear I could productively combine these interests.

I had my first taste of bench science in 1991, when I spent the summer at the Biotechnology and Biological Sciences Research Council's Institute for Animal Health in Oxfordshire. I spent several months there studying bovine immunology with Ivan Morrison and Chris Howard. Then, in 1992, with the encouragement of Phillip Duffus and Michael Day at Bristol, I attended the Leadership Program at Cornell. The program was a pivotal experience for me because it allowed me to crystallize thoughts on my career. At Cornell, I indulged a growing interest in infectious diseases and parasitology, studying a murine model of schistosomiasis with Edward Pearce. Looking back, this was an important experience—I came to realize that, as veterinarians, we are trained in comparative medicine and are therefore uniquely qualified to study *in vivo* models of disease and make extrapolations from one species to another. As it transpires, mice are excellent hosts for one of the most important human pathogens, *Schistosoma mansoni*. The course of disease in mice closely resembles that seen in humans.

Returning to Bristol after my summer at Cornell, I completed my B.V.Sc. then promptly headed back to Cornell for graduate studies in parasitology. In 1998, I was awarded a Ph.D. and moved on to a postdoctoral fellowship at the Tropical Disease Research Unit, University of California San Francisco, under the direction of Jim McKerrow. It was an informative experience, being a veterinarian in the “M.D.-centric” environment of one of the world’s foremost medical schools. But my experiences at Bristol and Cornell left me in no doubt that I had a veterinary-relevant contribution to make. I continued my studies on schistosomiasis, largely because that’s where I saw the greatest need. Largely afflictions of the world’s poor, parasitic infections smolder below the radar screens of pharmaceutical companies, which cannot make profits or even recoup drug development costs from human populations that have no money. It therefore falls to academic institutions, benevolent government agencies, and philanthropic organizations to address the challenges posed by these diseases—and this is where I have found my niche.

In 2004, I joined the faculty at the Uniformed Services University of the Health Sciences near Washington, D.C. as an assistant professor of microbiology and immunology. I am now head of a research lab that studies parasitic diseases using animal models. My research is funded by the National Institute of Allergy and Infectious Diseases and the U.S. Department of Defense. In my current position, I draw on my background knowledge and clinical expertise in comparative medicine every day as we attempt to understand how parasites interact with the mammalian body. I also teach microbiology, immunology, parasitology, and medical zoology to medical students who, as members of the U.S. armed forces, are likely to be deployed to areas where they will encounter parasites firsthand. My teaching responsibilities, perhaps more than anything else, remind me that humans and animals are all flesh and blood and that, as veterinarians, we have a unique and special role to play in improving human and animal health.



Cornell University  
College of Veterinary Medicine

**For more information about the Leadership Program, contact:**

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Telephone: 607 253-3544  
Fax: 607 253-3701  
E-mail: ddm7@cornell.edu

Interested parties are also invited to visit the program web site at:

**[web.vet.cornell.edu/public/research/leadership](http://web.vet.cornell.edu/public/research/leadership)**

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