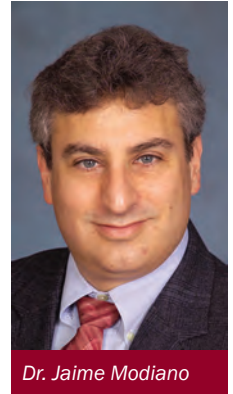


### From the director

It is always gratifying to share accomplishments of past and present Animal Cancer Care and Research (ACCR) students, who bring vitality, exuberance, and innovation to every aspect of our work. This summer we are especially proud to share the news that Jill Schappa received an individual training fellowship from the Howard Hughes Medical Research Institute (HHMI) and the Burroughs Wellcome Foundation (BWF). This is an unprecedented step for both HHMI and BWF, which have a long-standing commitment of support to medical education and research. Their recognition that veterinary and comparative research will impact the health of humans, animals, and the planet is exemplary, and we are as grateful for their support as we are proud of Jill for obtaining this inaugural award. We are certain she will set a high bar for future veterinary HHMI/BWF fellows to follow.



Dr. Jaime Modiano

We chose to stay in theme for this issue of Synergy, and highlight aspects of our education mission. We cannot dissociate education from research, as they go hand-in-hand in our mission to eliminate the negative health effects of cancer in companion animals and people alike. Dr. Mike Henson's description of "Education at Every Step" provides a window into our active efforts to teach and train students, residents, fellows, and scientists in the art and science of effective and compassionate cancer care and cutting-edge cancer research.

Dr. Cathy Carlson describes a successful training grant from the National Institutes of Health, currently in its second five-year renewal cycle, that is meant to attract veterinarians to research careers. The work students are carrying out with support from this grant again emphasizes our dual mission to improve human and animal health.

Finally, Drs. John Ohlfest and Elizabeth Pluhar detail their efforts to educate the community about brain cancer – and especially their partnership with dog owners and veterinary practitioners to recruit cases to participate in innovative clinical trials that will improve our ability to manage and treat these debilitating and deadly tumors.

As always, I hope you will enjoy these updates on our program. Our students represent the best and the brightest in our profession, and their enthusiasm provides yet another reason why we are excited about our future. We wish you will continue to travel with us in this journey of hope and success.

Sincerely,

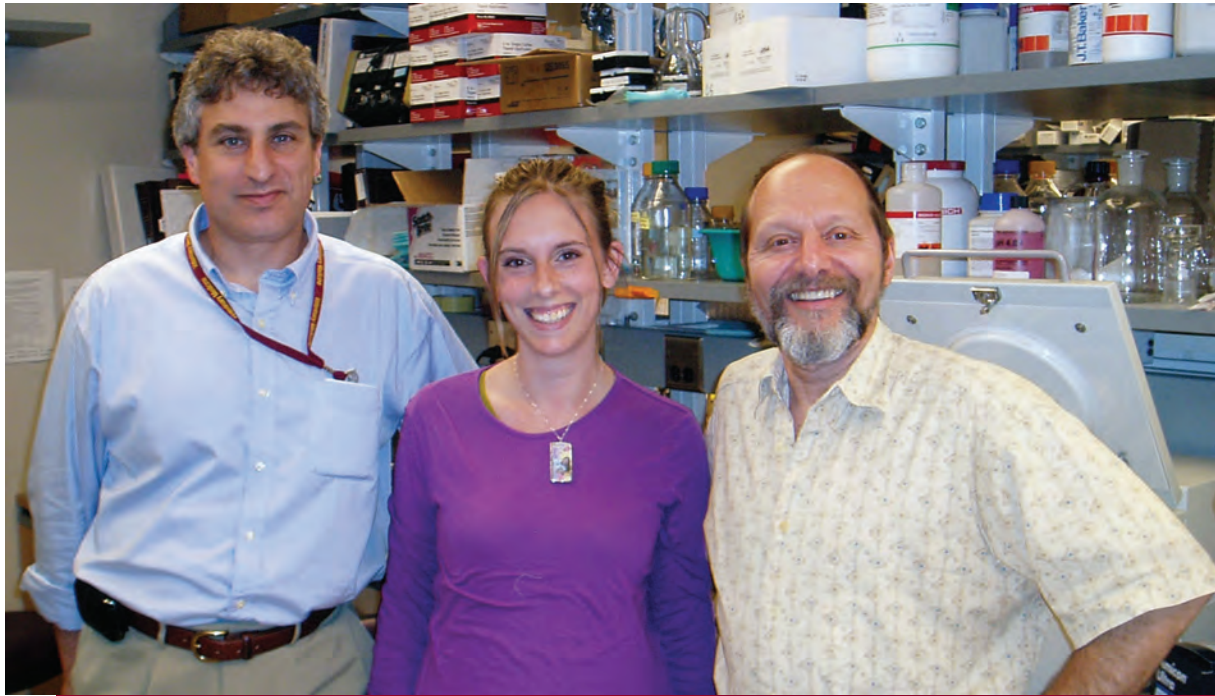
A handwritten signature in black ink that reads "Jaime".

Jaime F. Modiano, V.M.D., Ph.D.  
Perlman Professor of Animal Oncology  
Director, Animal Cancer Care and Research Program

### Driven to Discover

#### Jill Schappa receives inaugural Howard Hughes/Burroughs Wellcome Fellowship

**H**oward Hughes Medical Research Institute (HHMI) fellowships have long been recognized as the highest level of distinction that aspiring medical students can receive to obtain research training as an addition to their clinical education. Veterinary students who wished to extend their education with yearlong intensive research experiences were only an afterthought until this year, when HHMI partnered with the Burroughs Wellcome Foundation (BWF) to support a visionary effort to increase the number of young investigators in the field of veterinary research.



Jill Schappa with her mentors, Drs. Jaime Modiano and Dan Vallera

Enter Jill Schappa, a fourth-year veterinary student at the University of Minnesota. Jill is no stranger to research. She spent two summers working in laboratories at the Masonic Cancer Center supported by the CVM Summer Scholars program. She co-authored a published manuscript and presented her work at two CVM Research Days events. During the summer of 2009, Jill became aware of work on ligand-targeted toxins being done in Dr. Dan Vallera's lab at the Masonic Cancer Center. She proposed to extend this work to animal tumors, with the idea that validation of targeting in cell culture models would be a first step to further develop this therapeutic approach in and for companion animals. She generated exciting results, which she used as a basis to apply for an HHMI fellowship.

Her project, "Development of Targeted Toxins for Cancer Therapy Using Comparative Models," was selected for funding from a group of 274 outstanding

applications, and represents the first-ever award of this type to a veterinary student.

"Jill's academic excellence and her contributions as a citizen of the community are examples of how the demanding learning environment at the University of Minnesota fosters success," says Jaime Modiano, director of the Animal Cancer Care and Research Program, who holds the Perlman Chair in Animal Oncology.

Jill was provided the flexibility to tailor her veterinary training program to her needs. She will defer her final year of clinical training as a veterinary student while she pursues research full-time, and she will join the next veterinary school class next summer to complete the requirements for her D.V.M. degree. In the end, this experience may cement her decision to pursue an academic career in comparative oncology, and give her a

leg up as she moves to the next stage of training.

"No matter what Jill decides to do, we are certain she will do exceptionally well representing the University of Minnesota, Animal Cancer Care and Research program, HHMI, and BWF proudly," Modiano says. "This fellowship provides recognition of her achievements, as well as a stepping stone to the next level of training in her path to fulfill her potential as a scientist—where she in turn will help train the next generation of comparative oncologists."

Visit the Animal Cancer Care and Research program Web site at [www.cvm.umn.edu/accr](http://www.cvm.umn.edu/accr).

### Advancing our mission: Education at every step

By Mike Henson, D.V.M., Ph.D.

**T**he mission of the Animal Cancer Care and Research (ACCR) program is “To advance knowledge in cancer biology that can be translated and implemented into delivery of care that will reduce the incidence of cancer and improve the outcomes for animal and human cancer patients.”

Education is one of the many tools we use to achieve the clinical care and research missions of the ACCR program. Teaching forms a web of connections both within the University and with those we serve, including pet owners, veterinarians, and the community.

Within the University, via several weekly seminars and journal clubs in both the Cancer Center and the College of Veterinary Medicine, we educate each

other about the latest research in our areas of expertise. This helps generate new ideas and foster the collaborations required to make great advances in the knowledge of cancer biology and translation to the clinic. These venues, along with graduate-level courses and individual mentoring, help us to train the next generation of cancer researchers. ACCR program faculty educate students at many levels, including undergraduates, graduate students,



The University of Minnesota Veterinary Medical Center's Oncology Services team includes (front row) Stephanie Magras, Michelle Miller, Dr. Brian Husbands, and Dr. Antonella Borgatti, and (back row) Susan Jensen, Erikka Hill, Dr. Claire Cannon, Kim Janisch, Dr. Mike Henson, and Julie McClure.

post-doctoral fellows, and residents. The research of some of these trainees have been highlighted in previous issues of Synergy, which can be found at [www.cvm.umn.edu/accr/newsletters/](http://www.cvm.umn.edu/accr/newsletters/).

Just as we provide research training at many levels, the same is true for clinical care delivery, from veterinary students and veterinary technicians to residents and practicing veterinarians. Since cancer is one of the most common causes of disease-related death in companion animals, it is critical that veterinary students are well prepared to manage the many types of cancer that they will see in their careers. Veterinary students learn some of the foundations for the study of cancer (oncology) in the first two years of the curriculum, including biochemistry, physiology, pathology, pharmacology, and professional skills. However, the majority of the oncology instruction occurs in the third and fourth years of veterinary college. In 2009, lectures pertaining to clinical oncology, previously part of a third-year general medicine course, were revised and enhanced in a new course dedicated to oncology. Contact hours were increased by a third and new teaching and assessment techniques were added.

In fourth-year clinical rotations, working one-on-one with oncologists, students apply their knowledge of science while learning the art of clinical practice. In a program similar to an apprenticeship, students learn to explain complex diagnostic and treatment options in a manner that helps pet owners make the best choices for their pets and families. There are always options available for cancer treatment, ranging from the latest advance from the ACCR program to comfort care and pain management, often with several options in between.

Knowledge is power, and it is the veterinarian's responsibility to educate owners about the specific type of cancer, prognosis, expected risks, benefits, costs, and most importantly, the expected quality of life with various treatment options. Since education of pet owners is one of our best tools to improve the life of animals, veterinary students must learn how to teach to be successful. They also learn how to work as part of a health-care team and when to refer to a specialist for care. Finally, working with our Social Work Services team, they learn tools to support the family while they find the best option for their pet.

In two-week rotations similar to those for veterinary students, the clinical oncology faculty also trains interns and internal medicine residents. Since there are relatively few board-certified veterinary oncologists, internal medicine specialists commonly provide cancer care, so training these individuals helps us meet our goal of improving outcomes for animals with cancer worldwide.

To meet the need for more veterinary oncologists, we recently rejuvenated our oncology residency program with the generous support of donors. To become board-certified in oncology, residents must complete several years of clinical training under the guidance of specialists, publish

in the field of veterinary oncology, and pass two sets of certification examinations. We recruited our current resident, Dr. Claire Cannon, from Australia for a three-year program in July 2009. She has been a wonderful addition to our team. In addition to her clinical training, she is being mentored in research in Dr. Jaime Modiano's lab and has successfully competed for grant funding for her research.

While they are learning, oncology residents are also called upon to teach. Through continuing education lectures, labs, and daily phone consultations, oncology faculty and residents share knowledge about clinical oncology with practicing veterinarians. This improves the outcomes for animals with cancer. It also helps to close the loop with our research mission by educating veterinarians about ongoing studies, sample collection, and opportunities for their patients to participate in clinical trials.

Finally, newsletters such as this help us connect with the community so they can help us reduce the incidence of cancer and improve the outcomes for animal and human cancer patients. Education is critical to our mission at every step of the way.

### Synergy

*Synergy* is designed to provide you with information about the research and treatment efforts of the College of Veterinary Medicine's Animal Cancer Care and Research program and how these efforts may be of service to you and the animals you care about.

The Animal Cancer Care and Research program is part of the University of Minnesota College of Veterinary Medicine and Masonic Cancer Center. Its mission is to advance knowledge in cancer biology that can be translated and implemented into treatment that will reduce the incidence of cancer and improve the outcomes for animals and humans with cancer. For more information about the Animal Cancer Care and Research program, visit [www.cvm.umn.edu/accr](http://www.cvm.umn.edu/accr).

UNIVERSITY OF MINNESOTA

College of Veterinary Medicine  
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and Research program  
Web site at  
[www.cvm.umn.edu/accr](http://www.cvm.umn.edu/accr).

### Graduate education

## Comparative Medicine and Pathology training program

By Cathy Carlson, D.V.M., Ph.D.

**A** very important part of our mission at the University is graduate education, in which we focus on training the next generation of biomedical scientists who will dedicate their careers to improving the health and well-being of both humans and companion animals.

Achieving the highest quality of graduate education is only possible with sustained funding, and we have reached an important milestone in this regard. The Comparative Medicine and Pathology training program is supported by an institutional training grant, now in its sixth year (and its second five-year funding cycle) from the National Center for Research Resources at the National Institutes of Health (NIH).

The purpose of this program is to provide state-of-the-art research training to veterinarians who are interested in studying animal models of human disease. A unique aspect of the program is that it can take advantage of our patient base of companion animals with naturally occurring diseases, so in many cases students learn and promote human health while actively improving the outcomes of our patients. I serve as director of the training program, with Dr. David Brown as co-director. Thirty-two faculty mentors, all members of the College of Veterinary Medicine's Comparative and Molecular Biosciences graduate program, participate in the training program by mentoring a student and/or teaching relevant courses.

The Comparative Medicine and Pathology training program includes up to three years of stipend and additional support (travel, health insurance, tuition, etc.) to allow veterinarians to complete a Ph.D. degree in their areas of interest. The program is critically reviewed once every



Participants in the Comparative Medicine and Pathology training program gathered for a photo outside the Animal Science/Veterinary Medicine building on the St. Paul campus. In the front row are Mary Boyce, Sally Robinson, and Jaclyn Dykstra. In the back row are David Brown, co-director of the training program, Willie Greggs, Cathy Carlson, co-director of the training program, and Kari Ekenstedt. Not pictured: Jennifer Johnson. Photo by Sue Kirchoff

five years by an NIH-selected panel of scientists from all over the United States to determine whether or not it should be renewed. Initially, two positions were awarded; however, the program now includes five positions. Previous trainees have studied the genetics of muscle disease and epilepsy, animal models of osteoarthritis, the biology of treatments for diabetes, and the basic mechanisms underlying cystic fibrosis.

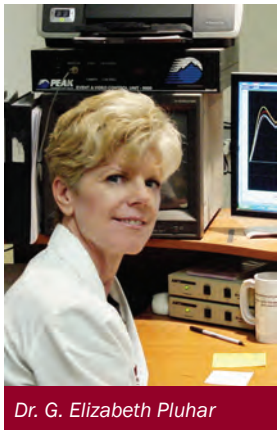
We are very pleased to have the ACCR represented in this program by a current trainee, Dr. Sally Robinson, who is focusing her research efforts on the study of hemangiosarcoma. We look forward to results from her work that may lead to the development of new treatment strategies for this deadly cancer in both dogs and humans.

### Brain cancer

## Reaching out to the community to improve treatment

By G. Elizabeth Pluhar, D.V.M., Ph.D., and John Ohlfest, Ph.D.

**B**rain cancer is a devastating disease in dogs and people. One of the most common types of primary brain tumors in both people and dogs is a glioma. This type of tumor is thought to occur most commonly in brachycephalic dog breeds, such as boxers, Boston terriers, and bulldogs. The median life expectancy in people with this destructive



Dr. G. Elizabeth Pluhar

disease is about 14 months, despite treatment with surgery, radiation therapy, and chemotherapy. The owners of most dogs with these brain tumors are not given many options for definitive treatment, and many people end their pet's life immediately after a solitary mass or tumor is found by computed tomography (CT) or magnetic resonance imaging (MRI). Therefore, the average life expectancy for dogs with a glioma, with or without treatment, is unknown.

We are working together to change the future for treatment of brain tumors in people and dogs. In 2009, we initiated the Canine Brain Tumor Clinical Trials Program at the University of Minnesota Veterinary Medical Center. We currently have funds from several sources, including the National Institutes of Health, the American Cancer Society, and the American Brain Tumor Association, to cover the owner's cost to treat their dog. These trials involve innovative forms of therapy including gene therapy, immune therapy with tumor cell-based vaccines,

and direct delivery of chemotherapy agents using a novel catheter system. We are actively recruiting dogs for these studies, and thus far dogs have come for treatment from the East Coast (Massachusetts, Georgia, and Florida) to the West Coast (California, Washington, and Oregon).

We have been trying to get the word out about dogs with brain tumors and the clinical trials to dog owners and veterinarians alike. Brain tumors can affect dogs of any age, but are most common in older dogs. The most common symptoms in dogs with a brain tumor are the sudden onset of seizure activity or changes in behavior or personality. Dog owners and veterinarians should suspect a brain tumor in older dogs exhibiting these symptoms, but an MRI is needed to confirm the presence of a tumor. The more people who recognize these symptoms, the greater the chance that affected dogs will be diagnosed and receive appropriate therapy. We believe in educating the public and referring veterinarians about the potential to offer pets and their owners hope in the form of innovative treatment at minimal cost.

Many people heard about the first dog we recruited for our study — a black German shepherd mix named Batman. Batman's journey has been documented by KARE 11, Minnesota Public Radio, the *Star Tribune* and *Pioneer Press*, as well as University of Minnesota publications (all archived at the CVM Web site at [www.cvm.umn.edu/newsarchives/2009/brain-tumortrials/archives/](http://www.cvm.umn.edu/newsarchives/2009/brain-tumortrials/archives/)). We now hope to



Dr. John Ohlfest

go “beyond Batman” to continue spreading the word of the clinical trials and recruiting at least 80 new canine patients. We have also reached out to inform the community about our clinical trials using written and visual media. You can listen to a podcast of our Mini Medical School presentation at [http://blog.lib.umn.edu/minimed/spring09/2009/03/john\\_ohlfest\\_and\\_elizabeth\\_plu.html](http://blog.lib.umn.edu/minimed/spring09/2009/03/john_ohlfest_and_elizabeth_plu.html). The Academic Health Center produced a “Corridors” video that highlights the brain tumor research that can be seen at [www.ahc.umn.edu/research/corridors/cancer/batman/](http://www.ahc.umn.edu/research/corridors/cancer/batman/). Our clinical trial program was also a topic of interest at the University of Minnesota booth at the 2009 Minnesota State Fair, the 2009 Small Animal Fall Symposium, and the 2009 College of Veterinary Medicine Open House.

Our research has far-reaching implications that go beyond veterinary medicine. Based in part on our dog studies, researchers in the Medical School are initiating two clinical trials in people with brain tumors this year. Both of these human studies build on lessons learned by treating dogs, making the maxim “dog is man's best friend” an inspiring reality.

We are continuing to disseminate information about our studies to aid in recruiting new cases. Visit the Ohlfest laboratory Web site at [www.braintumorlab.com](http://www.braintumorlab.com) and the CVM canine brain tumor research Web page at [www.cvm.umn.edu/vcs/braintumortrials/](http://www.cvm.umn.edu/vcs/braintumortrials/) for more information, applications to enroll dogs in the clinical trials, or to make a contribution to support this research.

Contact Dr. Pluhar at [pluha006@umn.edu](mailto:pluha006@umn.edu) or 612-625-1162, the Veterinary Medical Center at 612-626-8387, and Dr. Olfest at [ohlfe001@umn.edu](mailto:ohlfe001@umn.edu).