

**MADDIE'S COMPREHENSIVE SHELTER MEDICINE PROGRAM  
YEARS 4-6**

**PURDUE UNIVERSITY  
VETERINARY LEADERSHIP AND  
COMMUNITY PARTNERSHIP PROGRAM IN  
SHELTER MEDICINE, EPIDEMIOLOGY AND ANIMAL BEHAVIOR**

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**HUMANE SOCIETY  
OF INDIANAPOLIS**



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February 1 2011.

Dear Dr. Peek

I am proud to submit this proposal for continuing funding for the Purdue Maddie's Comprehensive Shelter Medicine Program grant (Years 4-6). The vision statement of the Purdue Maddie's Shelter Medicine Program is to become global leaders in addressing societal issues related to animal welfare through innovative discovery, education and communication. Our overarching goal is to end pet homelessness through education, research, and training, thus furthering the Maddie's Fund's mission to revolutionize the status and well-being of companion animals. At the heart of our program is our strong partnership with Maddie's Fund, PAWS Chicago and the Humane Society of Indianapolis, which has enabled us to advance adoption guarantee shelter practices, facilitate the conduct of applied research and disseminate information on preventive medicine and shelter issues.

The three principal objectives of our program are to:

1. Educate and train future leaders in the field of shelter medicine;
2. Conduct practically-relevant research in the areas of shelter medicine and pet homelessness; and to
3. Develop leadership in public education, dissemination of information and continuing education in shelter medicine.

Prior to the start of our program, Purdue Veterinary Medicine (PVM) had partnerships with the Humane Society of Indianapolis and the Almost Home Humane Society of Lafayette, but had no formal shelter medicine program. Now, PVM is home to one of the largest comprehensive Maddie's Fund programs in the country. A fundamental strength of our program is the network of close collaborative relationships we have developed over our first 3 formative years with leaders in the field of shelter medicine and research. These collaborative partnerships perform evidence-based studies to advance the health and welfare of shelter pets and raise awareness of shelter medicine issues. Our collaborators include:

- Shelters - PAWS Chicago, the Humane Society of Indianapolis, Stop Pet Overpopulation Today (SPOT) Clinic (Cloverdale, IN) and the Fitzhugh B. Crews FIV Cat Sanctuary;
- Other shelter medicine programs - University of Florida Maddie's Shelter Medicine Program and UC Davis Koret Shelter Medicine Program;
- International experts in infectious disease research - University of Glasgow Retroviral Research Laboratory and the University of Bristol School of Veterinary Sciences;
- Leaders from the Association of Shelter Veterinarians – Dr. Lila Miller, Dr. Gary Patronek, Dr. Julie Levy and Dr. Cynda Crawford;
- Industry - IDEXX Laboratories and Synbiotics.

Our program is training experts in the field of shelter medicine practice and pioneering novel research to prevent infections in shelter animals and increase adoption rates, while helping to create a model animal shelter environment that can be replicated across the United States. Communities and their animals are benefitting from the care and service provided by this

project as the expense and animal welfare implications of pet homelessness are reduced. The knowledge we are developing is being disseminated locally and globally through symposium and conference presentations and submissions to major veterinary journals.

The program outline, program budget and my curriculum vitae follow. Our shelter partners, PAWS Chicago and the Humane Society of Indianapolis, have supplied letters of support to accompany this application.

Please don't hesitate to contact me if you require any further information concerning our proposal. We look forward to your response.

Sincerely

A handwritten signature in black ink, appearing to read "A. Litster". The signature is fluid and cursive, with a small dot at the end.

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We respectfully request support to continue the following three program areas:

## **1. EDUCATION AND TRAINING OF FUTURE LEADERS IN THE FIELD OF SHELTER MEDICINE**

### **Maddie's Post-DVM Fellowships in Shelter Medicine**

We plan to offer 3 Maddie's Post-DVM Fellowships in Shelter Medicine over Years 4-6 of our program to fulfill our goal to complete 5 Fellowships. In recruiting potential candidates, preference will be given to veterinarians with at least 2 years post-doctoral experience who have a passion for shelter medicine and seek training to facilitate a career in this specific field. This is a 12-month position based at the state-of-the-art PAWS Chicago Lurie Family Spay/Neuter Clinic facilities. The program provides a DVM graduate with advanced clinical training in shelter medicine, specifically in areas of population medicine, infectious disease, animal welfare, preventative medicine and high volume spay/neuter. Participating individuals will gain a greater understanding and appreciation for adoption-guarantee practices and how to successfully implement them in the wider community. PAWS Chicago's Chief Shelter Medicine Veterinarian, Dr. Barbara Hanek, provides daily mentorship and support to the Fellow, working alongside the Fellow on population medicine and individual case management. The Maddie's Post-DVM Fellow also works with senior DVM students from PVM while they extern at PAWS Chicago. An independent shelter-based research project is also undertaken as part of the Fellowship under the guidance of Dr. Litster. The research project culminates in a manuscript submitted to a peer-reviewed journal at the conclusion of the fellowship and support is available for the Fellow to present the work at a national veterinary meeting. A 45-minute seminar at the Purdue School of Veterinary Medicine on the chosen topic of research is required for completion of the 12 month fellowship.

### **Maddie's Shelter Medicine Program Residencies in Animal Behavior**

Funding is also sought for the continuation of the Purdue Maddie's Shelter Medicine Program Residencies in Animal Behavior (2 consecutive 3-year residencies). As requested, the second 3-year residency is not included in the budget at this stage as Dr. Andrew Luescher (Head, Animal Behavior Clinic, Purdue University and Co-Investigator) will be retiring in June, 2011. Planning is currently underway at Purdue to appoint a replacement for Dr. Luescher so that continuity is achieved. As previously, the position will be fully funded by the university. After the position has been filled, we plan to seek funds from the Maddie's Fund to support the second Purdue Maddie's Shelter Medicine Program Residencies in Animal Behavior, as outlined in our original grant proposal.

Each resident will undertake a combined residency and master's degree program in animal behavior under the direction of the Director of the Animal Behavior Clinic at PVM. The focus of the research component of each residency will be the prevention and management of behavioral disorders of shelter animals. To this end, the current Maddie's Shelter Medicine Program Resident in Animal Behavior, Dr. Sara Bennett, has undertaken a study to evaluate the predictive value (sensitivity and specificity) of 2 widely used temperament testing instruments, including *SAFER*, to predict aggression in dogs. This study aims to develop a standardized and validated test that can be used by shelter workers and coordinates with Sheryl Walker's PhD research (please see below).

The Maddie's Shelter Medicine Program Resident will also be given opportunities to develop their skills in behavior modification while providing training to dogs awaiting adoption at our partner shelters in Chicago and Indianapolis. Additionally, veterinary students will work with the Maddie's Shelter Medicine Program Resident and the Director of the Purdue Animal Behavior Clinic and to gain valuable skills in practical behavior assessment and management while externing at our partner shelters. The goal will be to increase adoptability and retention of animals once adopted by correcting undesirable behaviors as well by teaching simple desirable commands such as sit, stay, and come while they are in the shelter.

In addition to the activities described above, the Maddie's Shelter Medicine Program Resident will receive formal classroom training and problem solving experiences in humane ethics and behavior of shelter animals. They will also participate in didactic student teaching and continuing education programs for veterinarians and technicians.

### **Shelter animal medicine student lecture course and other animal sheltering learning and awareness initiatives**

This one-credit elective 14-lecture course is offered to sophomore and junior DVM students and senior Veterinary Technology students. Our major goals for students who participate in the lecture course are to gain an appreciation of the role that animal sheltering, especially adoption-guarantee sheltering, plays in addressing pet homelessness; to understand practical population medicine and shelter pet care; and to be familiar with societal issues such as neglect, hoarding and abandonment. During the course, students become familiar with shelter animal medicine and welfare as it pertains to sheltering types and philosophies; population medicine; disease control; care of shelter pets including fostering and triage; abandonment and behavior assessment issues; animal abuse and cruelty; and the veterinarian's role in animal welfare. Dr. Litster is the major professor for the course and a number of leaders in shelter medicine are also regular guest lecturers, including Dr. Lila Miller and Dr. Gary Patronek. Whenever possible, guest lecturers also act as guest speakers at lunch meetings of the Purdue Student Chapter of the Association of Shelter Veterinarians. This course has been enthusiastically received by students and has fostered awareness of animal welfare issues by students, faculty and staff at PVM. While class size has been relatively small over the last 2 semesters that the course has been offered, the classes have been almost entirely composed of students who want to make their career in shelter medicine. All of these students have gone on to complete shelter externships/off-campus blocks, or have plans to do so. Plans are currently underway to increase enrolments by scheduling the lectures at more convenient times and making field trips to shelters a regular part of the course. Techniques that take advantage of small class size to enhance learning will also be employed. Posters featuring challenging shelter medicine and animal welfare topics have been prominently displayed in the PVM hallways and service learning projects have been completed. In spring 2009, students developed innovative learning experiences to be presented to school students at the Purdue School of Veterinary Medicine Boiler Vet Camp. The Boiler Vet Camp is held by the Purdue SVM each summer and is attended by high school students in Grades 7-12. The aim of the presentations were to provide information about an animal welfare or animal sheltering topic in an interactive way to educate, spark interest and foster further learning. Each student developed a novel and interesting board game that was used by Boiler Vet Camp participants over summer 2010. Titles included 'Shelter Game of Life', 'Animal Shelter Memory' and 'The Shelter Mythbusters Game'.

Additionally, in November 2009, all sophomore DVM students worked through a 4-session problem-based learning module on *Feline URI and panleukopenia in shelter cats*. This module was developed by Dr. Andrea Kerr and was followed by a closing lecture presented by Dr. Litster. A *Grand Rounds* lecture was also presented to the whole DVM student body by Rochelle Michalek (Executive Director, PAWS Chicago), who spoke on *Sheltering in the 21<sup>st</sup> Century*. A lecture on *A Career as a Shelter Veterinarian* is also presented to the Purdue Pre-Vet students as part of a core lecture course.

### **Purdue Student Chapter of Shelter Veterinarians (SCASV)**

After commencing in 2009, there are now 23 active members of the SCASV at PVM. Lunch meetings are held on an as-needs basis and guest speakers such as Dr. Lila Miller and Dr. Sandra Newbury have attracted large attendances. The SCASV is not only about exposing students to shelter medicine but it is also about being involved in the community. Student activities have included an adoption event and animal care events in conjunction with Lafayette's Almost Home Humane Society and volunteering at low-cost vaccine clinics for needy families in the Tippecanoe community.

### **Shelter experiences at PAWS Chicago and the Humane Society of Indianapolis for DVM and Veterinary Technology students**

Senior DVM students can enroll in a 3-week off-campus block or a 6-week externship in shelter medicine at either PAWS Chicago or at the Humane Society of Indianapolis. Similarly, Veterinary Technology student can undertake 12-week practicums or 6-week externships in shelter medicine at our partner shelters. Our major goals are for students to gain practical experience in the daily workings of a shelter and the roles that veterinarians and veterinary technicians play; and for them to appreciate the different challenges, strategies and solutions employed in an adoption-guarantee shelter compared to an open-admission shelter. We encourage participating students to seriously consider a future career in shelter medicine, either fulltime, part-time, or as volunteers. Dr. Andrew Luescher (Head, Animal Behavior Clinic, Purdue University) or Dr. Sara Bennett (Maddie's Shelter Medicine Program Resident in Animal Behavior) provide a full day of individual instruction in shelter behavior for each DVM student working at PAWS Chicago. Students who elect to go to PAWS also spend 2 days during their 3-week block at the SPOT (Stop Pet Overpopulation Today) Clinic at Cloverdale IN, where Dr. Nancy Ferguson, DVM teaches them canine and feline high volume spay/neuter techniques. Dr. Ferguson is Humane Alliance trained and was part of the team that wrote *The Association of Shelter Veterinarians veterinary medical care guidelines for spay-neuter programs*.

The Maddie's Shelter Medicine Program also provides an apartment in Chicago for the use of students and others associated with the program. This 2-bedroom apartment has 24-hour security and is centrally located, within walking distance of major public transport links and other facilities. The apartment has enabled students and visiting researchers to work at PAWS Chicago, experiencing adoption guarantee sheltering and conducting practical research to benefit shelter pets.

Scholarship funding is also sought to encourage Veterinary Technology students to participate in shelter experiences, since student feedback has indicated that these are particularly valuable in the development of hands-on practical techniques and an awareness of animal sheltering. We would also like to showcase the wide variety of skills that registered

veterinary technologists have to offer shelters and encourage them to take leadership roles in animal sheltering.

## **2. PRACTICALLY-RELEVANT RESEARCH IN THE AREAS OF SHELTER MEDICINE AND PET HOMELESSNESS**

### **Maddie's PhD Students in Shelter-based Population Medicine**

#### **Dr. Ruth Landau DVM**

Currently in her third semester of the PhD program in veterinary epidemiology, Dr. Landau has completed coursework in statistics, biostatistics, epidemiology, grant writing, and data analysis using STATA and SAS statistical software and achieved a 4.0 grade point average. She is a fluent Spanish speaker and has extensive experience in providing veterinary care and pet behavior/health information to Spanish-speaking clientele. Dr. Landau's research interests include analysis of socioeconomic factors of and attitudes toward pet- acquisition and veterinary care by potential adopters/owners with the goal of increasing spay/neuter and decreasing relinquishment of pets belonging to these owners. US population projections predict that the Latino population, already the nation's largest minority group, will triple in size and will account for most of the nation's population growth from 2005 through 2050. Understanding the attitudes and needs of the Latino population is vital if the issue of pet homelessness in the USA is to be permanently addressed. It is anticipated that during her PhD research, Dr. Landau will also undertake surveys to gather evidence regarding the attitudes of pet owners. The results of these surveys will be used to develop practical strategies aimed at reducing pet homelessness.

#### **Ms. Sheryl Walker MS**

Sheryl commenced her PhD studies in July this year and has enrolled in epidemiology coursework and canine behavior research. She is collaborating on Dr. Sara Bennett's resident research project investigating the ability of currently available temperament testing instruments to predict canine aggression. Sheryl's PhD research will examine the accuracy of the ASPCA's Canine-Ality™ Meet-Your-Match program in predicting long-term successful home placements for shelter dogs. It includes long-term follow-up of animals following adoption for problems such as separation anxiety, etc. and evaluates how owner expectations prior to adoption influence the long-term outcome of pet adoption. This project is an excellent fit for Maddie's Fund's focus on increasing shelter pet adoptions by successful placement in long-term homes. The evidence collected by the study is essential to develop practical strategies to increase shelter pet adoptions and optimize their success, helping to realize our shared goal of ending pet homelessness in the USA.

#### **Dr. Jamieson Nichols DVM**

Dr. Nichols recently completed the Purdue Maddie's Shelter Medicine Program Post-DVM Fellowship in Shelter Medicine at PAWS Chicago. During the Fellowship, she developed a strong interest in the Purdue Feline Immunodeficiency Virus (FIV) study, a groundbreaking and multi-faceted investigation of the clinical effects and risk factors for disease progression of FIV infection in shelter cats. Funded in part by the Maddie's Fund, this study collects data from FIV positive cats and their age-, gender- and location-matched FIV-negative control cats over the course of 5 years (2010-2014) by serially monitoring routine

physical examination, serum biochemistry, hematology, CD4/CD8 counts and virological parameters. FIV was first recognized in almost 25 years ago, but very little is known about the effects of disease in naturally infected cats. Because of the current lack of evidence about what is the likely outcome for these cats, thousands of healthy FIV-positive cats arriving at US shelters each year are euthanized. The Purdue FIV Study will generate vital information so that veterinarians, cat owners and shelters can understand more about the disease and how best to care for FIV-infected cats. This comprehensive project investigates the disease from many angles and involves important collaborations with the University of Glasgow Retroviral Research Laboratory, the University of Bristol School of Veterinary Sciences, IDEXX, PAWS Chicago and the Fitzhugh B. Crews FIV Cat Sanctuary. We aim to enroll a total of 85 FIV-positive cats and 85 age-, sex- and location-matched control FIV-negative cats over the first 2 years of the study, and enrolments are ahead of schedule, with 112 of our 170-cat goal already reached in the first year of the study. Dr. Nichols plans to commence her PhD in January 2012, at the start of Year 3 of the FIV study, so that she can spend the final year of her 4-year PhD analyzing and writing the final study data.

In addition to the activities described above, the Maddie's PhD Students in Shelter-based Population Medicine will receive formal classroom training and problem solving experiences in humane ethics, shelter medicine, public policy issues, biostatistics, grant writing and scientific writing. Each PhD student will attend 2 intensive summer courses in clinical epidemiology, at either the University of Michigan or Johns Hopkins University. Dr. Litster will also attend the intensive summer course once. They will also participate in continuing education programs for veterinarians and technicians.

### **Maddie's Summer Research Experience**

Veterinary students who desire a more research-oriented shelter experience earlier in their education can participate in Maddie's Summer Research Experience - a 12-week summer research program. Maddie's Summer Research Experience students work with Dr. Litster on a research project and attend weekly seminars during which faculty talk about such topics as how to write a scientific paper, research ethics, research careers in veterinary medicine, and preventive medicine. This program stands alongside a Summer Research Fellowship program currently funded by Merck and Co. At the end of the summer, the Maddie's Summer Research Experience student is expected to prepare a poster describing their research. Students are selected by a competitive process. All summer studies are conducted at our partner shelters, PAWS Chicago and the Humane Society of Indianapolis, and studies focus on providing practical information to benefit the health and welfare of shelter pets and are minimally invasive. The Maddie's Summer Research Experience has been conducted over the last 2 years, resulting in one journal submission and 2 more manuscripts in the final stages of preparation.

### **Shelter Medicine Research Initiatives by the Purdue Maddie's Shelter Medicine Program**

In addition to research performed by graduate students and Fellows with the program, Dr. Litster also has a very active shelter medicine research program that aims to generate answers to practical problems that arise daily in the care of shelter animals. Most of this research is performed at PAWS Chicago and would not be possible without the assistance of Kristin Hall RVT, a research and shelter medicine technician employed by the Purdue

Maddie's Shelter Medicine Program fulltime at PAWS. Kristin assists with collecting, recording and maintaining research data and specimens and she is a vital link between Dr. Litster in West Lafayette and her primary shelter medicine research base in Chicago. Kristin's technical skills are also an invaluable asset to the PAWS Chicago environment, where she assists the Maddie's Post-DVM Fellow and the chief shelter medicine veterinarian in population management and the care of shelter animals.

Dr. Litster's current shelter medicine studies at PAWS Chicago include the following studies -

- *Use of a real-time PCR assay to identify infectious agents in cats with clinical signs of upper respiratory disease.* This study compares a commercially available test commonly used by shelters with gold standard methods to establish the diagnostic accuracy of the commercial test. Data has been collected from 18 cats and our goal is to enroll a total of 40-50 cats. Support has also been obtained by IDEXX for laboratory analysis.
- *Use of in-house ELISA test to assess canine parvovirus (CPV) and canine distemper virus (CDV) antibody protection status in shelter dogs.* This study compares a commercially available test with gold standard methods to establish the diagnostic accuracy of the commercial test. Data has been collected from 108 dogs and is currently being analyzed. Support was also obtained by Synbiotics for test kits.
- *Effects of dog appeasing pheromone and music on barking in shelter dogs.* This research was done in collaboration with the Herrick Laboratories at Purdue and results analysis is underway.
- *Use of Ponazuril as a first line treatment for coccidiosis in dogs and cats.* Coccidiosis is an important shelter management issue and Marquis Paste (ponazuril) is a very commonly used treatment in shelters, but information on the efficacy and safety of this product in dogs and cats has not previously been investigated. Many shelter veterinarians and private practitioners are currently using ponazuril off-label with very favorable results, but there is no uniform dose schedule and one of the primary goals of this research is to determine the correct dosages for efficacious treatment. Approximately 20 cats and 12 dogs have been enrolled in this prospective randomized clinical trial and our goal is to enroll 60 cats and 60 dogs by October 2011.
- *Use of doxycycline to treat Mycoplasma felis infection in shelter cats.* This prospective randomized study will investigate the course length required for efficacious treatment of upper respiratory tract infection by *Mycoplasma felis* and support has also been obtained by IDEXX for laboratory analysis. Dr. Barbara Kompare, the current Maddie's Post-DVM Fellow will perform this study, commencing January 2011.
- *Feline panleukopenia virus infection in shelter cats.* In this retrospective descriptive study, medical records from PAWS Chicago were used to investigate the epidemiology of feline panleukopenia infection in shelter cats. Dr. Chutamas Benjanirut, a visiting scholar to the Purdue Maddie's Shelter Medicine Program from Chulalongkorn University, Bangkok, analyzed data from 190 infected and in-contact kittens and cats and results analysis is currently underway.

To complement PAWS Chicago's aim to make Chicago a no-kill city, the Purdue Maddie's Shelter Medicine program intends to develop a Pet Evaluation Matrix in Cook County, IL. This will be achieved by surveying a variety of groups, including shelters, feral cat

caregivers, animal welfare groups, veterinary associations and pet owners regarding their attitudes on veterinary and behavioral care of owned pets. The results of the survey will be reviewed by an Advisory Committee of veterinarians, shelter workers and other key stakeholders to make final recommendations on the Asilomar Accords classifications of specific medical and behavioral conditions. These Cook County community standards will be circulated throughout the Cook County media and published to encourage transparency and encourage community support for shelter pets.

### **3. DEVELOPMENT OF LEADERSHIP IN PUBLIC EDUCATION, DISSEMINATION OF INFORMATION AND CONTINUING EDUCATION IN SHELTER MEDICINE.**

#### **Maddie's IVMA Animal Sheltering Symposium**

The first Maddie's IVMA Animal Sheltering Symposium was held in October, 2010 at the Humane Society of Indianapolis Wellness Conference Center and presentations covered a variety of shelter medicine and shelter management topics, with a focus on the adoption-guarantee philosophy. The Symposium was aimed at shelter workers and shelter veterinarians and participant feedback was excellent. The intention is to hold this symposium each year and to promote the symposium regionally and to a wider audience in the coming years.

Following the success of the Maddie's IVMA Animal Sheltering Symposium, we plan to hold an annual Shelter Medicine Symposium at PAWS Chicago annually to provide animal sheltering education and an awareness of animal sheltering issues in Cook County, the most highly populated regional center in the Mid-West. Fostering the adoption-guarantee philosophy will be a key focus of this Symposium, using practical information developed the Purdue Maddie's Shelter Medicine Program and by PAWS Chicago.

#### **A User-Friendly Decision-Support Tool for Shelter Financial Management**

Shelters must remain viable entities in order to continue to work towards fulfilling their missions. Business management skills, and enhancing the industry-specific decision making tools available, specifically financial decision-support tools, will help provide shelters the support they need to continue into the future. The successful management of an animal shelter depends on several factors, both biological and economic in nature.

This project proposes to develop an in-depth series of Excel based worksheets capable of walking shelter managers or workers through the process of determining the costs and benefits of various shelter management strategies. User-friendly computer-based worksheets, designed to aid managers in efficiently determining their costs, revenues, and levels of efficiency will be developed. Simply highlighting areas of the business which are financially sound versus those which are areas for potential improvement will enable more informed decision making by shelter managers. Once a shelter has determined their costs and revenues and highlighted areas for improvement, the proposed tool will enable managers to weigh the options or strategies to determine which is best for the shelter. Allowing managers to 'test out' various alternative strategies and determine the financial consequences, whether negative or positive, via a decision-support tool will enable managers to efficiently assess their options and improve their decision making capabilities. The final product for delivery to shelter managers is a user-friendly decision-support tool which can be used to efficiently determine potential outcomes of various shelter management decisions. By using the shelter's existing computer

and downloading this series of worksheets, the manager will be able to assess their current situation and efficiently explore options. This tool will be developed by Dr. Nicole Olynk of the Purdue Department of Agricultural Economics, in conjunction with a graduate student.

### **Publications and presentations of shelter medicine information and shelter medicine research data**

A key measure of the effectiveness of our program is its ability to generate publications and presentations; thus, the evidence generated by our research can be widely disseminated and shelter pets can gain the maximum resulting benefits. After the first 2 years of the Purdue Maddie's Shelter Medicine Program research, during which shelter medicine research initiatives have been planned, approved and undertaken, the following outcomes have already been achieved to disseminate new information to the profession and help promote the growing interest in shelter medicine locally, nationally and internationally:

- Submission of a manuscript to the *Journal of the American Veterinary Medical Association* - Comparison of the efficacy of amoxicillin/ clavulanic acid, cefovecin, and doxycycline in the treatment of upper respiratory tract disease in cats housed in an animal shelter.
- Submission of a manuscript to *Preventive Veterinary Medicine* - Risk factors for delays between intake and approval for adoption in shelter puppies and kittens.
- Submission of research abstract for presentation at the *ACVIM Forum 2011* - Prevalence of protective antibody titers against canine parvovirus (CPV) and canine distemper virus (CDV) and response to CPV and CDV vaccination in shelter dogs.

Dr. Litster has also made the following presentations since the Purdue Maddie's Shelter Medicine Program commenced:

- Shelter Medicine: The New Frontier for Veterinarians - Invited seminar at *School of Veterinary Medicine and Science, University of Nottingham*, November 29 2010
- Feline viral URI: A shelter perspective. *Michiana Veterinary Medical Association*, Mishawaka, IN. November 11, 2010.
- Trap Neuter Vaccinate Return (TNVR): The best management practice for dealing with the problem of community cats. *American Public Health Association 138th Annual Meeting*, Denver, CO, November 8, 2010.
- Feline URI – How to keep it under control in a shelter. *Maddie's IVMA Animal Sheltering Symposium*, Indianapolis, October 17, 2010.
- Shelter Medicine: The New Frontier for Veterinarians - Invited seminar at *Faculty of Veterinary Medicine, University of Glasgow*, April 12, 2010.
- Feline URI: A Shelter Perspective - Presentation to *American Pre-Veterinary Medicine Association Symposium*, West Lafayette, IN, March 13, 2010.
- Feline URI: A Shelter Perspective - Presentation to veterinarians at *Purdue Annual Fall Conference*, West Lafayette, IN, September 2009.
- Feline viral upper respiratory tract disease – Keeping the wolf from the door - Presentation to veterinary technicians at *Purdue Annual Fall Conference*, West Lafayette, IN, September 2008.

## **Research Ethics**

Population health is the focus of the research in this proposal. All animals will be treated in a humane manner and all research procedures will be either completely non-invasive or minimally invasive (e.g. blood sampling) and will be approved by both the shelters involved and the Purdue University Animal Care and Use Committee. All research publications stemming from the Maddie's Shelter Medicine Program will be submitted to Maddie's Fund at the time of publication. Any and all publications and presentations arising from the research will recognize Maddie's Fund.

## **Purdue Maddie's Shelter Medicine Program Advisory Board**

An Advisory Board, composed of members from PVM, Maddie's Fund, PAWS Chicago, the Humane Society of Indianapolis and key members of the US Shelter Medicine and Animal Welfare community, has been appointed to inspire and guide the Purdue Maddie's Shelter Medicine Program. Ably chaired by Dr. Hugh Lewis (former Dean, PVM and President, DataSavant), the Advisory Board meets annually at Purdue University, with more frequent communication to individual Board members on an as-needs basis. Minutes of the annual meetings are sent to Maddie's Fund, all board members and to the Dean of PVM. Dr. Litster will continue to provide quarterly verbal updates to Maddie's Fund and compose an annual written progress report. Additionally, PAWS Chicago and Humane Society of Indianapolis will submit annual shelter statistics, using the Asilomar Accords Animal Statistics Table and definitions. These statistics will be submitted annually to Maddie's Fund as part of the annual report.

The major role of the Advisory Board in Years 4-6 is to plan for the continuation of our program after funding by the Maddie's Fund is no longer available. The Advisory Board is strategically composed of people who would be ideal to lead succession planning of our program, not only because of their vision but also their knowledge of potential opportunities for further funding.

## **Purdue Maddie's Shelter Medicine Program Consultant - Dr. Larry Glickman**

Our Purdue team is greatly strengthened by the addition of Dr. Larry Glickman as a consultant. Dr. Glickman has over 25 years experience conducting pet population research and consulting for humane shelters. As a consultant to this proposal, he will help design studies that can be conducted at PAWS with the goal of improving the health of sheltered pets. Dr. Glickman will also help mentor the graduate and veterinary students to assure they optimize their experience at PAWS. Having published over 300 articles in veterinary journals, he will also work with Drs. Moore and Litster to publicize the results of research conducted at PAWS. Dr. Glickman has provided excellent mentorship to all levels of the Purdue Maddie's Shelter Medicine Program so far and is especially important to the success of our PhD research projects.

## **Expected outcomes of the Purdue University Veterinary Leadership and Community Partnership Program in Shelter Medicine, Epidemiology and Animal Behavior (Years 1-6)**

- Three Maddie's PhD graduates in shelter-based population medicine. These positions will result in three PhD theses with associated journal publications and potential contributions to national animal welfare policy development.

- Two trained animal behavior specialists who have developed and published uniform animal behavior guidelines to maximize shelter animal welfare and adoptability. Funding for the second residency is not included in the current budget, but will be sought from Maddie's Fund after Dr. Luescher's position has been filled.
- Five Maddie's Post-DVM Fellows in shelter medicine. These training positions will enable veterinarians to go out into the shelter community and advance the standards of medicine and animal welfare practiced in shelters throughout the USA.
- Senior DVM students and veterinary technology students from Purdue University SVM will be able to pursue 3-week or 6-week clinical experiences in shelter medicine at our collaborating shelters. Accommodation will be provided in Chicago for students working at PAWS Chicago. These opportunities for hands-on experience in state-of-the-art shelter environments have the potential to inspire and inform veterinary students and veterinary technology students at a critical stage in their professional education.
- Six students will be given the opportunity to participate in Maddie's Summer Research Experience (one 12-week summer research program per year). This experience is designed to stimulate and encourage future leaders in shelter medicine research.
- Shelter Medicine lecture course – This 14-lecture course on shelter medicine is offered to veterinary students, veterinary technology students and graduate students at Purdue University each year. This lecture course forms the foundation of our education and outreach program on campus at the Purdue SVM, together with the Purdue Student Chapter of the Association of Shelter Veterinarians.
- Annual presentations at the Maddie's IVMA Animal Sheltering Symposium and a similar meeting to be held in Chicago. Presentations will also be made at other meetings as opportunities arise, to heighten awareness of shelter pet care and welfare and shelter population management issues.
- Presentations of research findings each year by Maddie's PhD students, Maddie's animal behavior residents and PVM faculty at local veterinary meetings and at national scientific conferences.

**Budget:** Please see separate file. Version 1a of the budget was composed after consultation with Dr. Laurie Peek. The total cost of this budget will be offset by unspent funds totaling approximately \$320,000 on the budget for Years 1-3 of the project.

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## Current Curriculum Vitae – Dr. Annette Litster (Principal Investigator)

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NAME	CURRENT POSITION TITLE
Annette L. Litster	Assistant Professor (Tenure Track), Director, Maddie’s Shelter Medicine Program, Department of Veterinary Clinical Sciences, Purdue University, West Lafayette, IN

### EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR (s)	FIELD OF STUDY
University of Queensland, Australia	BVSc	1982	Veterinary Science
Australian College of Veterinary Scientists	MACVSc	1997	Feline Medicine
Australian College of Veterinary Scientists	FACVSc	2001	Feline Medicine
University of Queensland, Australia	PhD	2004	Veterinary Science
University of Newcastle, Australia	MMedSci	2006	Clinical Epidemiology

### Previous Professional Positions:

Jan ‘07 – June ‘07	Lecturer, School of Veterinary Science, The University of Queensland.
Dec ‘05 –Jan ‘07	Research Manager, Department of Pathology and Anatomy, School of Veterinary Science, The University of Queensland.
Jan ‘04 – Nov ‘05	Research Manager, Centre for Companion Animal Health, School of Veterinary Science, The University of Queensland.
Jan ‘99 – Dec ‘04	PhD student, School of Veterinary Science, The University of Queensland.
Jan ‘98 - July ‘98	Visiting Scholar, Department of Cardiology, Veterinary Hospital, University of Pennsylvania.
May ‘89 – Feb ‘00	Senior Clinician, Creek Road Cat Clinic, Brisbane, Australia.

### Awards and Other Professional Activities:

- Scientific Editor, *The Veterinary Journal*.
- Member: Association of Shelter Veterinarians; American Public Health Association – Veterinary Special Interest Group; European Society of Feline Medicine.
- Manuscript reviewer for *Journal of Veterinary Internal Medicine*, *Journal of the American Veterinary Medical Association*, *Epidemiology and Infection*, *Journal of Veterinary Diagnostic Investigation*.
- 2002: The Fred Z. Eager Research Prize in Veterinary Science 2002 – The award is made to the applicant whose postgraduate study is considered to make an outstanding contribution to the Veterinary Sciences discipline, based on consideration of the applicant’s report and discussions with the Head of School of Veterinary Science and the applicant’s supervisor.
- 2002: The University of Queensland Graduate School Travel Award, for collaboration with the Immunopharmacology Group, Southampton General Hospital, UK.
- 2001: Registration as a Veterinary Specialist with the Veterinary Surgeons Board of Queensland
- 2000: The University of Queensland Graduate School Award.
- 2000: Australian College of Veterinary Scientists Award for the Most Commendable Paper published in the *Australian Veterinary Practitioner* during 2000 – Litster, AL (2000): The Use of Clomipramine for the Treatment of Behavioural Disorders in 14 Cats – Efficacy and Side-Effects, *Australian Veterinary Practitioner*, **30** (1): 50.
- 1999: The Daniel Walker McLeod Bursary.

### **Selected peer-reviewed publications:**

- Litster AL**, Moss SM, Thompson M, \*Trott DJ. Feline bacterial urinary tract infections: an update on an evolving clinical problem. *The Veterinary Journal*. In press. Manuscript reference number: YTVJL-D-09-00486.
- Litster AL**, Moss SM, Platell J, Trott DJ (2009). Occult bacterial lower urinary tract infections in cats – urinalysis and culture findings. *Veterinary Microbiology*. **136**:130-134.
- Litster AL**, Atkins CA, Atwell RB (2008). Acute Death in Heartworm-Infected Cats: Unravelling the Puzzle. *Veterinary Parasitology*. **158**:156-203.
- Litster AL** and Atwell RB (2007): Feline heartworm disease: a clinical review. *Journal of Feline Medicine and Surgery*. **10**:137-144.
- Schull DN, **Litster AL** and Atwell RB (2007): Tick toxicity in cats caused by *Ixodes spp* in Australia: a review of published literature. *Journal of Feline Medicine and Surgery*. **9**:487-493.
- Litster AL**, Moss SM, Honnery M, Rees R, Edingloh M and Trott DJ (2007): Clinical efficacy and palatability of pradofloxacin 2.5% oral suspension for the treatment of bacterial lower urinary tract infections in cats. *Journal of Veterinary Internal Medicine*. **21**(5):990-995.
- Litster AL**, Moss SM, Honnery M, Rees R and Trott DJ (2007): Prevalence of bacterial species in cats with clinical signs of lower urinary tract disease: Recognition of *Staphylococcus felis* as a possible urinary tract pathogen. *Veterinary Microbiology*. **121**:182-188.
- Litster AL** and Sorenmo KU (2006): Characterization of the Signalment, Oncologic and Survival Characteristics of 41 Cats with Mast Cell Neoplasia. *Journal of Feline Medicine and Surgery*. **8**(3):177-183.
- Mills PC and **Litster AL** (2006): Using urea dilution to standardise components of pleural and bronchoalveolar lavage (BAL) fluids in the cat. *Journal of Feline Medicine and Surgery*. **8**(2):105-110.
- Litster AL** (2006): Acute systemic anaphylaxis in cats – What’s the take home. *Clinicians Brief*. **4**(6):27-29.
- Litster AL**, Atkins CA, Atwell RA, Buchanan JW (2005): Radiographic cardiac size in cats and dogs with heartworm disease compared with reference values using the vertebral heart scale method: 50 cases. *Journal of Veterinary Cardiology*. **7**:33-40.
- Atkins CA, Moresco A and **Litster AL**. (2005): Prevalence of naturally occurring *Dirofilaria immitis* infection among non-domestic cats housed in an area in which the organism is endemic *Journal of the American Veterinary Medical Association*. **227**:139-143.
- Beatty JA, Barrs VR, O’Brien CR, Foster SF, Foster DJ, **Litster AL** and Malik R (2005): Feline immunodeficiency virus vaccine issues. *Australian Veterinary Journal*. **83**:53.
- Snow TM, **Litster AL**, Gregory RJW, Hanger JJ (2004): Big cat scan: Magnetic resonance imaging of the tiger. *Australasian Radiology*. **48**:93-95.
- Litster AL** and Buchanan JW (2000): Radiographic and echocardiographic measurement of the heart in obese cats. *Veterinary Radiology and Ultrasound*. **41**:320-325.
- Litster AL** (2000): The Use of Clomipramine for the Treatment of Behavioural Disorders in 14 Cats – Efficacy and Side-Effects, *Australian Veterinary Practitioner*. **30**:50-54.
- Litster AL** and Buchanan JW (2000): Vertebral scale system to measure feline heart size in radiographs. *Journal of the American Veterinary Medical Association*. 2000; **216**:210-214.
- Evans EA, **Litster AL**, Menrath VH, Gunew M (2000): Forty five cases of feline heartworm disease in Australia (1990–1998). *Australian Veterinary Practitioner*. **30**:11-16.
- Litster AL** (1999): Pulmonary toxoplasmosis in a FIV positive cat. *Australian Veterinary Practitioner*. **29**(4): 154-158.