

Landmark Program Title: *Veterinary Clinical Research at Texas A&M University*

Introduction: The Veterinary Medical Teaching Hospital (VMTH) and the Departments of Large Animal Clinical Sciences and Small Animal Clinical Sciences at Texas A&M University's College of Veterinary Medicine and Biomedical Sciences (CVMBS) provide expertise and facilities for veterinary patient care that are integral to service and teaching missions of the College. The CVMBS is the only veterinary college in the state of Texas, and is ranked fifth among U.S. colleges by the most recent rankings by U.S. News & World Report. During 2007, there were 14,464 patient visits to the VMTH's small animal hospital and 5,961 admissions to the VMTH's large animal hospital. This large number of cases of spontaneous disease managed by the clinical faculty affiliated with the VMTH represents an invaluable resource for clinical research. By clinical research, we refer to research that involves the study of spontaneous disease among client-owned animals, or research in experimental animals that can be directly applied to patients with spontaneous disease (e.g., methods for enhancing fertility in research mares can be directly applied to infertile mares examined at the VMTH). Patients seen by VMTH faculty create opportunities for veterinary and comparative medical research.

Rationale: Clinical research involving animals owned by clients of the VMTH is important for a number of reasons. First, patients seen by faculty at the VMTH can be studied using either clinical trial or observational study designs to evaluate diagnostic, therapeutic, and preventive interventions, or to establish prognosis. Such research directly impacts the health and welfare of companion animals and livestock. Companion animals are of societal importance through the salutary effects of the psychosocial bonds between animals and people and their assistance to those with physical or other handicaps, as well as for their roles in assisting police, rescue, and customs services. Livestock are of immense societal importance as sources of food and fiber. Second, spontaneous diseases in animals can be models of corresponding diseases in humans, such as various types of cancer, diabetes mellitus, and heart disease. Increasingly, there is evidence that experimental models of disease in mice and other laboratory animals do not adequately mimic disease in humans. Moreover, experimentally created disease in any species of animal is often a poor replication of spontaneous disease. Thus, animals with spontaneous disease seen at the VMTH are useful models for evaluating diagnostic, therapeutic, and preventive strategies for the benefit of improving human as well as animal health. Evidence exists that projects involving spontaneous disease in veterinary patients can attract substantial funding from private industry and federal resources. Third, there are public health research

opportunities represented by the client-owned animal populations studied. The large majority (viz., 75%) of emerging infectious diseases of human beings are zoonotic. Changes in methods of food production, trade policies, and a long international border with Mexico pose challenges for biosecurity among food animals and provide opportunities for transmission of food-animal-borne illnesses. Client-owned livestock populations provide a research resource for pre-harvest food safety and biosecurity. Fourth, there are important opportunities for translation of research findings by basic science faculty to patients. Although the VMTH is the public face of the College, a cadre of outstanding research faculty at the school conduct biomedical research that will ultimately have application to veterinary and human patients. Each of the College's landmark research programs (Cardiovascular Diseases; Genetics/Genomics, Infectious Diseases and Biodefense; Neurosciences; Oncology and Toxicology; and Reproduction) include clinical applications and faculty members with VMTH appointments. Thus, there is considerable justification to bolster the unique clinical research program made possible by the VMTH patients and the expertise of the clinical faculty.

Interdisciplinary Impact: The interdisciplinary impact of clinical research involving client-owned animals is strong. Within the CVMBS, each of the Signature Programs includes translation of basic science to clinical practice, including the study of spontaneous disease. The interdisciplinary impact of this program extends beyond the CVMBS. Animal Scientists in the College of Agriculture and Life Sciences collaborate with clinical researchers at the CVMBS to study problems of mutual interest, including cancer, animal reproduction, and nutrition. Investigators from the Texas A&M Health Science Center (including the College of Medicine) collaborate with investigators at the CVMBS in pre-clinical studies using spontaneous disease in animals that are mimics of human disease. Initiatives with the Baylor College of Medicine and the University of Texas's M.D. Anderson Cancer Center to study spontaneous disease in animals at the CVMBS for furthering our understanding of corresponding cardiovascular diseases and cancers have been established. Areas of special strength in clinical research within the CVMBS include bovine mycobacterial disease, cardiovascular disease, environmental disease, equine infectious disease, equine reproduction, gastroenterology, lipid nutrition, nephrology/urology, neurology, oncology, and small ruminant research. Each of these programs has comparative medical aspects and interdisciplinary collaborations, with considerable opportunity for expanded interactions with investigators within and external to Texas A&M University.

Assessment/Expectations: Clinical research is fundamental to the translational aspects of all of the College's landmark research programs, and strong multidisciplinary and intercollegiate clinical research collaborations exist. Moreover, there exist other successful clinical research programs such as gastroenterology, renal disease, and infectious diseases. Thus, the success of the clinical research program will be evaluated on the basis of the extent to which clinical faculty and the patients they treat are incorporated into landmark programs, as well as the extent to which programs outside of the landmark program attract and maintain extramural funding and a laudable record of peer-reviewed publication. Ideally, clinical programs will be incorporated into program project grants, center grants, and training grants. The program will also be assessed by the extent to which it contributes to generating training opportunities for students and veterinarians interested in clinical research careers.

Although there is a Clinical Research Review Committee to monitor the appropriate use of client-owned animals in research activities at the CVMBS, other infrastructure to support clinical research is lacking. Specifically, a centralized program (including faculty and staff) to facilitate efforts by clinical faculty members for planning and designing, conducting, and analyzing research projects involving client-owned animals is lacking. Such a program would provide guidance and resources to enhance the clinical research productivity and clinical research training experiences at the CVMBS. To accomplish this, an epidemiologist with experience in clinical trials research, a statistician, and a programmer should be recruited to the College to develop a Center for Clinical Research.

Indices of Excellence: The expertise of the clinical faculty is manifested by their proficiency in patient care, and their contributions to the scholarship of discovery and the scholarship of integration (such as presentations at continuing education seminars, book chapters, review articles, etc.). Indices of success for individual clinical research programs can also be described by the status of current external/extra-mural funding and the number of peer-reviewed publications during the last 3 years. These data are provided below for a number of existing clinical research programs.

In addition to these research programs, there are clinical services that interdigitate with all clinical research programs, such as anesthesia, clinical pharmacology, diagnostic imaging, and clinical pathology. Without these services, clinical research could not be conducted.

**Current Funding and Recent Publications from Clinical Research Programs in the
College of Veterinary Medicine & Biomedical Sciences (November, 2008)**

Program Name	Currently Funded Projects	Publications (last 3 years)
<i>Antimicrobial Resistance</i>	\$939,999	8 peer-reviewed reports
<i>Cardiology/Cardiovascular</i>	\$196,172	15 peer-reviewed reports
<i>Comparative Gastro- enterology</i>	GI Lab Service: \$2,698,657 Grants: \$118,076	35 peer-reviewed reports
<i>Environmental Disease Modeling</i>	\$295,000	18 peer-reviewed reports
<i>Equine Infectious Disease Epidemiology</i>	\$736,909	19 peer-reviewed reports
<i>Equine Musculoskeletal Disorders</i>	\$35,000	17 peer-reviewed reports
<i>Equine Reproduction</i>	\$356,884	20 peer-reviewed reports
<i>Johne's Disease</i>	\$300,000	9 peer-reviewed reports
<i>Lipid Nutrition of Companion Animals</i>	\$262,867	23 peer-reviewed reports
<i>Nephrology/Urology</i>	\$484,044	11 peer-reviewed reports
<i>Neurology</i>	\$168,912	34 peer-reviewed reports
<i>Oncology</i>	\$106,000	5 peer-reviewed reports
<i>Small Ruminant Research</i>	\$68,000	11 peer-reviewed reports
TOTAL	\$4,067,863 plus \$2,698,657 service	225 peer-reviewed reports

Participants from CVMBS (Appendix)

Cardiovascular Disease: Dr. Theresa Fossum (Professor), Dr. Sonya Gordon (Assistant Professor), Dr. Matthew Miller (Professor), Dr. Ashley Saunders (Assistant Professor).

Comparative Gastroenterology: Dr. Jörg Steiner (Associate Professor and Director), Dr. Jan Suchodolski (Research Assistant Professor and Associate Director);

Affiliated members: Dr. Michael Willard (Professor); Dr. Debra Zoran (Associate Professor); Dr. Audrey Cook (Clinical Associate Professor); Dr. Allen Roussel (Professor); Dr. Noah Cohen (Professor)

Environmental Disease Modeling: Dr. James Thompson (Professor and Director); Dr. Wesley Bissett (Assistant Professor)

Equine Infectious Diseases and Epidemiology: Dr. Noah Cohen (Professor and Director); Dr. M. Keith Chaffin (Professor);

Affiliated members: Dr. Bhanu Chowdhary (Professor); Dr. James Derr (Professor); Dr. Virginia Fajt (Clinical Assistant Professor); Dr. Thomas Ficht (Professor); Dr. Natalie Halbert (Research Assistant Professor); Dr. Sara Lawhon (Assistant Professor); Dr. Melissa Libal (Clinical Associate Professor)

Equine Musculoskeletal Disorders: Dr. Kent Carter (Professor), Dr. Keith Chaffin (Professor), Dr. Robin Dabareiner (Associate Professor), Dr. Clifford Honnas (Professor), Dr. Jeffrey Watkins (Professor)

Equine Reproduction: Dr. Dickson Varner (Professor and Director); Dr. Terry Blanchard (Professor); Dr. Steven Brinsko (Associate Professor); Dr. Y. Choi (Research Scientist); Dr. Katrin Hinrichs (Professor); Dr. Charles Love (Associate Professor)

Johne's Disease: Dr. Allen Roussel (Professor and Director)

Affiliated members: Dr. James Derr (Professor); Dr. Geoffrey Fosgate (Associate Professor); Dr. Sangeeta Khare (Research Assistant Professor); Dr. Bo Norby (Associate Professor); Dr. Noah Cohen (Professor)

Lipid Nutrition Program: Dr. John Bauer (Professor and Director)

Affiliated members: Dr. Jill Heatley (Clinical Associate Professor); Dr. Sharman Hoppes (Clinical Assistant Professor); Dr. Ian Tizard (Professor); Dr. Deb Zoran (Associate Professor)

Nephrology/Urology Program: Dr. George Lees (Professor and Director);

Affiliated members: Dr. Brian Berridge (Adjunct Associate Professor); Dr. Fred Clubb, Jr. (Professor); Dr. Mary Nabity (Clinical Assistant Professor)

Neurology Program: Dr. Jonathan Levine (Assistant Professor and Director); Dr. Daniel Hicks (Clinical Assistant Professor)

Affiliated members: Dr. Virginia Fajt (Clinical Assistant Professor); Dr. Sharon Kerwin (Professor); Dr. Karen Russell (Associate Professor); Dr. Ashley Saunders (Assistant Professor); Dr. Jörg Steiner (Associate Professor); Dr. Jan Suchodolski (Research Assistant Professor); Dr. George Stoica (Professor); Dr. Ben Young (Assistant Professor); Dr. Noah Cohen (Professor)

Oncology: Dr. Claudia Barton (Professor); Dr. Theresa Fossum (Professor); Dr. Kenita Rogers (Professor and Associate Dean); Dr. Heather Wilson (Assistant Professor and Director)

Small Ruminant Program: Dr. Kevin Washburn (Associate Professor and Director); Dr. Wesley Bissett (Assistant Professor); Dr. Virginia Fajt (Clinical Assistant Professor); Dr. Jeffrey Musser (Associate Professor);