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Eminence in Veterinary Medicine: Core Penn Vet Research Priorities

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In addition to comparative oncology, Penn Vet has identified three other core areas of research focus: infectious disease, neuroscience, and genes and development. We chose these areas because they will allow us to build on the strengths and expertise that we have developed in basic, clinical and translational research.

Infectious Disease

Zoonotic infectious diseases, those that can be transmitted between animals and people, are of growing concern. Penn Vet has the expertise and leadership in research in pathogen biology, immunology and epidemiology to advance important discoveries in this critical arena. The School is committed to addressing this issue through a recently implemented tripartite plan that brings together strategic recruitments of faculty with backgrounds in relevant areas, seed funding for infectious disease research projects, and new training initiatives to meet the urgent need for more veterinarians with expertise in infectious disease research.

By promoting the integration of clinical and basic research with front-line diagnostic surveillance for zoonotic diseases, Penn Vet will play a significant role not only in the control of current disease outbreaks, but will be able to develop new strategies for combating those emerging infectious diseases that have the potential to adversely impact both animal and public health.

Neuroscience

Advancing the understanding of the brain and the nervous system is arguably the most important area of study in human and animal medicine. Over the last three decades, veterinary and human medicine researchers have made dramatic steps in this field by bringing together scientists of diverse backgrounds, facilitating the integration of research directed at all levels of biological organization, and encouraging translational research and the application of new scientific knowledge to develop improved disease diagnoses, treatments and cures.

Both faculty expertise and a unique research environment exist at the Matthew J. Ryan Veterinary Hospital. With patient visits of more than 31,000 per year, there are many opportunities to study spontaneous illness and disease. What makes neuroscience unique at Penn Vet is the potential for clinicians and bench researchers to collaborate, thus making a real-world difference in the lives of critically ill animals and people. With areas of expertise that include sleep, obesity, stress and neurodegenerative disorders, collaborative studies focusing on both basic and translational research can make a groundbreaking impact on animal and human health.

Genes and Development (Stem Cells, Germ Cells and Medical Genetics)

Medical science is poised to make tremendous advances in the near future, thanks to recent discoveries in genetics and stem cell biology. While these therapies hold great promise for providing breakthroughs in human medicine, they require much more research before they reach the clinic. Novel stem cell-based therapies and gene therapy can be applied to animal patients long before they can be used in human patients, and in the case of stem cell therapy without the ethical debate surrounding the use of human stem cells. An advantage of Penn Vet is access to animal models of naturally occurring diseases that are targets for stem cell and gene therapies. If stem cell therapy can heal wounds and fractures, as well as naturally occurring diseases in animals, the same might eventually be true for humans.

Penn Vet's historical leadership in the field of stem cell and germ cell biology is spearheaded by the pioneering work of Dr. Ralph Brinster; recent work that pluripotent stem cells can differentiate into germ cells and that pluripotent stem cells can be derived from germ line stem cells highlights the synergy between the two research areas. Penn Vet maintains leadership in male germ line stem cell biology and in gene therapy both in basic science and its application to animal models.