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Dr. Richard Ross and Mycoplasma Research

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This past summer the Dean of the College of Veterinary Medicine, Dr. Richard Ross, received the American Feed Manufacturers’ Association Award for his lifelong research and organizational work towards a vaccine for mycoplasma in swine.

While Dr. Ross grew up on a farm with both hogs and beef cattle, he was mostly involved with cattle in high school (entering cattle in 4-H competitions). Even some of his work as a veterinary student at Iowa State was with cattle. As he started to work along side faculty, he was introduced to the influential Dr. William Switzer, who led him to swine research.

“I was a veterinary student from 1955 to 1959 and my major professor, Dr. Switzer, started working with mycoplasma about 1956,” said Dr. Ross. “He was a preeminent researcher and was receptive to giving me an opportunity. He was working mostly with pigs and I had experience with pigs, too. So, because of the opportunity here at the university, I kind of fell into it; I could have gone either way [bovine or swine research].”

Immediately upon graduation in 1959, he started working with Dr. Switzer as a graduate student for a few years until he established his own laboratory. In 1965, after nearly fifteen years of pursuit, Dr. Switzer and Dr. John Mare, another graduate student of his, published their discovery of \textit{Mycoplasma hyopneumoniae}.

This species of mycoplasma colonizes in the airways of a pig’s respiratory tract. By attaching to the cilia, these microorganisms damage a major defense mechanism of the respiratory tract against infection. The mucociliary blanket, or escalator, no longer functions properly as an aid to move mucus out of the lung. This makes the pig more susceptible to mixed infections: bacterial and/or mycoplasmic.

Discovering the cause is one thing, developing a vaccine is another matter.

“After they published that paper, there was a long, dry period but eventually there came steady progress on diagnostic methods,” he said, “but not much progress on control.”

For nearly 25 years Dr. Ross and other investigators helped build an information base. By 1990, this information became commercialized as companies started to develop vaccines. Work by another former graduate student of Dr. Switzer’s, Dr. D.L. Harris, has led to a high health swine production strategy called segregated early weaning. (An article reviewing this strategy follows on the next page.)

Dr. Ross has also been instrumental in the management and organization of research groups both at Iowa State and around the world. During his tenure as the President of the International Organization for Mycoplasmology, he helped sponsor a meeting in 1992 which was held at ISU. As chair of the International Research Program of Comparative Mycoplasmology (IRPCM), he spearheaded “a series of committees that investigated different mycoplasma occurring in chickens to pigs to humans to plants to insects.”

Recent work in Dr. Ross’ lab on actinobacillus, another respiratory pathogen that causes pneumonia, has led to a vaccine of which Iowa State holds the patent. Another past accomplishment for the ISU Veterinary Medical Research Institute (VMRI) has been the demonstration of an effective vaccine against \textit{Mycoplasma hyosynoviae}, which causes arthritis in pigs.

“Iowa State is continuing to focus on the molecular aspects of the pathogenesis of mycoplasmal disease. Two key people doing the work are Barbara Erickson, a research technician, and Theresa Young, a research associate,” he said. “There are two other colleges of mine at VMRI who are absolutely internationally known in mycoplasmology: Dr. Chris Minion and Dr. Ricardo Rosenbush. In addition, many excellent graduate students have contributed immensely to progress along the way.”

“There’s a lot of interactivity and collaboration on projects. As we make strides, we make them together;” he said. “I give all of these people a lot of credit as well as Dr. Switzer.”

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