

A 'game-changer': By studying animal health, researchers find improved ways for developing, testing cancer therapies

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(Medical Xpress) -- A group of Kansas State University researchers has made valuable findings in the search for cancer's cure.

While researching ways to improve animal health, the scientists -- Raymond "Bob" Rowland, a [virologist](#) and professor of diagnostic medicine and [pathobiology](#), and Deryl Troyer, professor of anatomy and physiology -- have made two important discoveries that can also improve [human health](#). Not only have they found pigs with severe combined immunodeficiency, or SCID, but they are also the first to discover the connection with [human cancer](#), particularly melanomas and pancreatic cancers.

The researchers call it a scientific achievement with huge potential to improve surgeries and drug development involved with cancer.

"This could be a game-changer," Troyer said.

It began with Rowland's research with controlling and eliminating porcine reproductive and respiratory syndrome, or PRRS. The work led to a fortuitous discovery: a naturally occurring line of immunodeficient pigs.

"Pigs are closely related to humans anatomically and physiologically," Rowland said. "This can have huge potential for human [cancer research](#)

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After the discovery of SCID pigs, Rowland turned to Troyer, who performs cancer research. Their collaborative work not only enables researchers to better study SCID pigs, but they can also apply their research to the study of human cancer and anti-[cancer drugs](#).

"This is a great example of collaborative and interdisciplinary research," Troyer said. "With two perspectives, there is often a synergy that evolves because of different ways of thinking."

The researchers have already studied human melanomas and human pancreatic cancers, which are devastating [types of cancer](#) and a big target in cancer research, Troyer said. They want to apply the same methods to other types of solid cancers and blood [neoplasms](#) like leukemia.

While similar research has been performed with SCID mice, it has not adapted well to human cancer research. Rowland said there is about a 90 percent failure rate in translation of results from mice to humans. Research involving SCID pigs may be more beneficial to human cancer research because pigs are closer anatomically to humans.

The research opens a variety of doors for both animal and human health research. It may now be easier for scientists to improve strategies for bone marrow transplants. They also have a better way to detect cancer drug side effects and test surgical interventions, Troyer said.

"The potential is a little daunting because it is as if there is no horizon limiting possible ways to utilize this model, " Troyer said. "It is an opportunity for Kansas State University to be a leader in the field and to become a center for large animal biomedical research."

For Rowland, the discovery also opens new doors for infectious disease

research.

"There are a lot of pig diseases for which we still don't know how they function and how they cause disease," Rowland said. "Now we are able to ask the question, 'What role does the immune system play in clearing the virus or in causing disease?'"

The research also improves the study of zoonotic diseases, which are diseases -- like swine influenza -- that can be transmitted between animals and humans. By developing vaccines for diseases in SCID pigs, scientists can gain insight into human vaccine development. The university's Biosecurity Research Institute provides the ideal location for developing these vaccines, Rowland said.

The scientists have performed research on a small scale and now want to build it up to a larger scale. They see possibilities for new research with the Kansas State University Johnson Cancer Research Center as well as cancer research partnerships and collaborations with the University of Kansas Cancer Center, especially with its recent National Cancer Institute designation.

"Agriculture benefits the people of the state in so many ways," Rowland said. "While it includes jobs and exports, there is a human element that we sometimes forget. This is a good example of how we can take [animal health](#) research and all of a sudden it has the potential to help cure human cancer."

The research recently appeared in the journal *BioResearch Open Access*. Rowland and Troyer have another upcoming publication in the Journal of Veterinary Pathology.

Provided by Kansas State University

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