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Researchers believe discovery could lead to testing that displaces colonoscopies

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Nobody enjoys colonoscopies, including mice. University of Missouri researchers are excited about the potential of using genetic biomarkers to predict colon cancer caused by inflammation. A new method developed at the MU Research Animal Diagnostic Laboratory (RADIL) could eventually lead to a method that might eliminate colonoscopies altogether.

While working to develop novel therapeutics for colon cancer, Craig Franklin, associate professor of veterinary pathobiology in the MU College of Veterinary Medicine; Aaron Ericsson, post-doctoral researcher at MU; Mike Lewis, assistant professor of veterinary medicine and surgery; Matt Myles, assistant professor of veterinary pathobiology and Lillian Maggio-Price, professor of comparative medicine at the University of Washington, found biomarkers in mouse feces that predicted inflammation-associated colon cancer. This is the same type of cancer associated with some common inflammatory bowel diseases such as ulcerative colitis and Crohn's Disease.

The team found that the bacterium that leads to inflammation-associated colon cancer in mice first results in inflammation that can be detected by screening feces for messenger RNA of genes. Franklin believes this discovery could lead to tests for similar genes that are present in humans with early inflammation associated colon cancer.

The study was published recently in *Neoplasia*, which also featured the study on the journal's cover.

"The assumption was that the gene expression couldn't be detected in fecal matter because RNA breaks down very rapidly. Historically, this was something that a lot of scientists, including us, hadn't considered," Franklin said. "But technology has evolved, and we now have the means of preserving RNA much better than we did 15 years ago."

As a laboratory animal veterinarian, Franklin believes this discovery also could decrease the number of animals used in research.

"We're excited about the potential for application in humans, but this also will decrease animal numbers, which is one of our goals," Franklin said. "This test determines which mice will get cancer in advance, so we won't need to have as many animals in an experimental group to achieve statistical significance."

"There's also no stress on the animal for us to test their fecal matter," Ericsson said. "Many people put off colonoscopies longer than they should because of the invasiveness and unpleasant nature of the exam, and it's not pleasant for mice either. That unpleasantness is negated with this test."

For this study, the team also used a high-powered MRI machine located in the Department of Veterans Affairs facility located at the Harry S. Truman Memorial Veterans' Hospital. While effective, this technique was not as sensitive as the fecal biomarkers in predicting cancer, and it requires extensive expertise and very expensive equipment. Franklin credits the success of the project to a multidisciplinary team that included Wade Davis, assistant professor of biostatistics; Lixin Ma, assistant professor of radiology, and a multitude of veterinarians.

"It was a large collaboration, and veterinarians are ideal for collaborative medicine because we know the animal model," Franklin said. "There are several angles that converge here, and we're now interested in finding

collaborators in human medicine that would like to explore this further. Ultimately, I'd envision panels of tests that predict diseases, with this method in the mix."

Provided by University of Missouri-Columbia

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