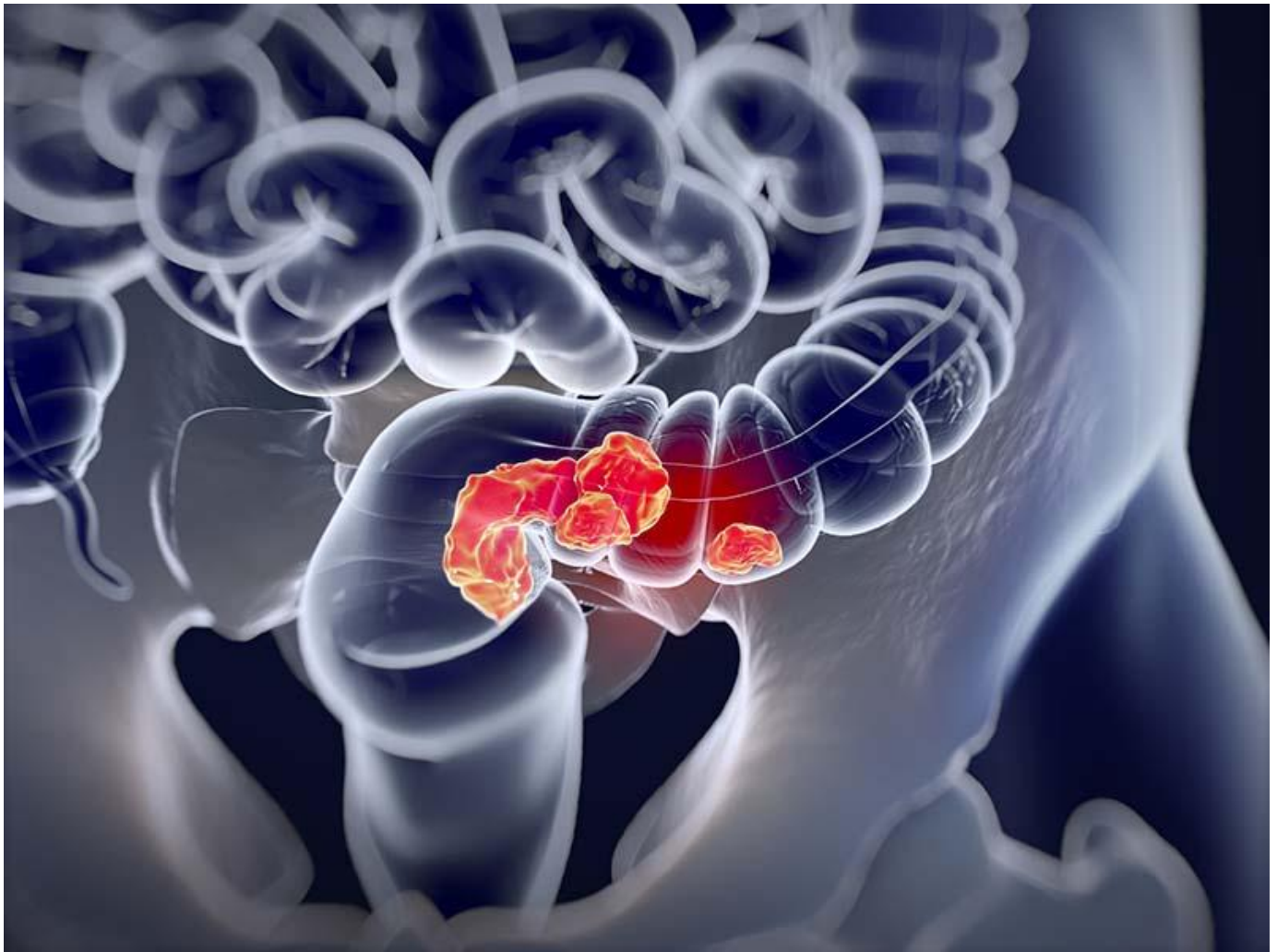# Tulane University study uses artificial intelligence to detect colorectal cancer

November 02, 2021 1:00 PM Lance Sumler
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A Tulane University researcher found that artificial intelligence can accurately detect and diagnose colorectal cancer from tissue scans as well or better than pathologists, according to a new study in the journal Nature Communications.

The study, which was conducted by researchers from Tulane, Central South University in China, the University of Oklahoma Health Sciences Center, Temple University, and Florida State University, was designed to test whether AI could be a

tool to help pathologists keep pace with the rising demand for their services.

Pathologists evaluate and label thousands of histopathology images on a regular basis to tell whether someone has cancer. But their average workload has increased significantly and can sometimes cause unintended misdiagnoses due to fatigue.

"Even though a lot of their work is repetitive, most pathologists are extremely busy because there's a huge demand for what they do but there's a global shortage of qualified pathologists, especially in many developing countries" said Dr. Hong-Wen Deng, professor and director of the Tulane Center of Biomedical Informatics and Genomics at Tulane University School of Medicine. "This study is revolutionary because we successfully leveraged artificial intelligence to identify and diagnose colorectal cancer in a cost-effective way, which could ultimately reduce the workload of pathologists."

To conduct the study, Deng and his team collected over 13,000 images of colorectal cancer from 8,803 subjects and 13 independent cancer centers in China, Germany and the United States. Using the images, which were randomly selected by technicians, they built a machine assisted pathological recognition program that allows a computer to recognize images that show colorectal cancer, one of the most common causes of cancer related deaths in Europe and America.

"The challenges of this study stemmed from complex large image sizes, complex shapes, textures, and histological changes in nuclear staining," Deng said. "But ultimately the study revealed that when we used AI to diagnose colorectal cancer, the performance is shown comparable to and even better in many cases than real pathologists."

The area under the receiver operating characteristic (ROC) curve or AUC is the performance measurement tool that Deng and his team used to determine the success of the study. After comparing the computer's results with the work of highly experienced pathologists who interpreted data manually, the study found that the average pathologist scored at .969 for accurately identifying colorectal cancer manually. The average score for the machine-assisted AI computer program was .98, which is comparable if not more accurate.

Using artificial intelligence to identify cancer is an emerging technology and hasn't yet been widely accepted. Deng's hope is that the study will lead to more pathologists using prescreening technology in the future to make quicker

diagnoses.

"It's still in the research phase and we haven't commercialized it yet because we need to make it more user friendly and test and implement in more clinical settings. But as we develop it further, hopefully it can also be used for different types of cancer in the future. Using AI to diagnose cancer can expedite the whole process and will save a lot of time for both patients and clinicians."