

BroadcastMed | mac_5740 Mayo Clinic researcher discusses methylated DNA markers and whole body cancer screening

DNA methylation is a chemical change in the DNA composition that does not affect its sequence, and although that's involved in a number of biological processes, DNA methylation has become a very potent and useful tool in cancer diagnostics. It's one of the components of the new multi-target stool DNA test that was recently approved by the Food and Drug Administration.

One of the questions that we get a lot from patients and doctors in practice is, could a stool DNA test detect cancer elsewhere in the body? And we really don't know yet, but we have some very encouraging new information. To try to answer that question, we looked at cancers throughout the gastrointestinal tract. We looked in the esophagus, the stomach, the pancreas, bile duct, and colon, and we actually sequenced those cancer DNA genomes to be able to compare and contrast what the methylation signatures of that DNA were across the entire GI tract.

We tested that model, comparing all of the cancers in some independent tissue samples and had very, very high accuracy, and that led us to wonder if we could actually test that in something noninvasive, something like blood.

We got some blood plasma samples from a number of patients with pancreas cancer and colon cancer, as well as some healthy controls, and our results were very encouraging. Basically, more than 75% of the time, we were able to find out not only whether or not a patient had cancer based on that blood test, but more importantly, where in the body that cancer was.

Now, we screen one organ at a time. We screen a colon. We screen breast. We screen cervix. We're not screening the whole patient. And so if you had a test that could be made positive by multiple cancers, you then need to help the doctor and the patient figure out where that cancer is, rather than shotgunning them with a whole bunch of different tests throughout the body. It would be really important to know, for instance, should I send my patient for a colonoscopy or for an upper endoscopy? Should I send my patient for an upper endoscopy, or should I send them for a CT scan? So that's what's really exciting about this data, is that it's going to help us streamline the investigation for patients in the future.

There's a lot of validation and subsequent testing that we need to do. We need to optimize that test, but one could envision, in the future, that we could screen cancer in the entire person with a single test, maybe a stool test to screen the entire gastrointestinal tract or even lungs or even upper airway, or maybe a blood test to screen for cancers at other sites, too. Potentially, even breast or prostate or hematologic cancers. So we're really excited to be sharing these results. We think it is a critical first step in a long-term pathway of research that could change clinical practice.