

Promising blood biomarkers identified for colorectal cancer: Is a screening blood test within reach?

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UEG Week 2014. Credit: United European Gastroenterology

The search for blood-borne biomarkers that could be used to screen for colorectal cancer (CRC) has uncovered two promising candidates that may one day lead to the development of a simple blood test. Scientists have been piecing together the molecular events involved in the development of CRC and have identified abnormal DNA methylation

patterns and the presence of microRNAs as major players in the carcinogenic process.

Speaking to journalists today at the 22nd United European Gastroenterology Week (UEG Week 2014) in Vienna, Austria, Dr Antoni Castells from the Institute of Digestive Diseases Hospital Clinic in Barcelona, Spain, said these were exciting times to be working in CRC biomarker research. "Blood-borne biomarkers are opening up exciting avenues of investigation in colorectal and other cancers," he said. "We now have a better understanding of the molecular events participating in the development of CRC and these provide valuable targets for both the early detection of CRC and the development of novel treatments."

CRC screening: why do we need a blood test?

Colorectal [cancer](#) is the third most common cancer worldwide and the second leading cause of cancer-related death in the Western world. Several studies have confirmed that CRC screening is both effective and cost-effective in the average-risk population, with the two recommended strategies being stool tests that identify occult blood or exfoliated DNA associated with cancer, and structural examinations such as colonoscopy that detect both cancer and pre-malignant lesions.

"Participation in CRC screening programmes across Europe is worryingly low and there seems little doubt that people are put off by the nature of the current tests," said Dr Castells. "A simple [blood test](#) would encourage more people to come forward for screening, potentially saving thousands of lives every year."

The search for CRC screening biomarkers

Cancer biomarkers are biological changes that signal the presence of cancer in the body and are usually related to alterations in DNA, RNA or protein expression.¹ Several protein biomarkers of CRC have already been identified, however, none have been useful for CRC screening.¹ More recently, researchers investigating tumour-derived DNA in the blood have observed abnormal DNA methylation patterns – specifically, abnormally methylated SEPT9 DNA – in the patients with CRC, suggesting a potential new DNA-based biomarker for screening.¹

The second potential screening approach outlined by Dr Castells involves assessing the profile of small, non-coding RNAs, known as microRNAs, which have been shown to be increased in the plasma from patients with CRC.² A recent study conducted by Dr Castells and colleagues found that patients with CRC or advanced adenomas had a significantly different pattern of microRNA expression compared with healthy individuals, leading the group to conclude that plasma microRNA testing was a promising screening test for CRC that warrants further investigation.²

"Both of these potential new CRC screening approaches have shown promise in preliminary studies and should be explored further in larger cohorts of patients," he told journalists. "There is no doubt in my mind that having an accurate, blood-based screening method would increase adherence to CRC [screening](#) guidelines and reduce the number of patients reluctant to be screened."

More information: 1. Summers T, et al. J Cancer 2013; 4: 210–216.
2. Giráldez MD, et al. Clin Gastroenterol Hepatol 2013;11: 681–688.e3.

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