Universal Dx Developing Sensitive, Large-Scale Screening Test for Early-Stage Colorectal Cancer

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NEW YORK (360Dx) – Seville, Spain-based Universal Diagnostics said last week that it is participating in a clinical study at a network of hospitals in London to validate its large-scale screening test for detection of early-stage colorectal cancer and adenomas.

The test uses mass spectrometry and a panel of 30 small-molecule metabolomics biomarkers, including lipids and amino acids, to measure metabolites in blood samples that are linked to the presence of colorectal cancer and precancerous cells, or adenomas.

Studies to date show that the test has a higher level of sensitivity than a fecal assay that is a standard test in European countries for detecting colorectal cancer. Importantly it is demonstrating an exceptionally high level of sensitivity in detecting colorectal adenomas, Juan Martínez-Barea, cofounder and CEO of Universal Diagnostics, said in an interview.

The Universal Dx test could also fare well in the US, he said. The standard test for colorectal cancer in the US, a colonoscopy, is recommended for people who are 50 years and older, among others. Although it is highly accurate, a large segment of people eligible to take the test avoid it because it is so expensive and invasive, Martínez-Barea said.

The cost of a colonoscopy in the US is between $2,000 and $8,000, depending on the diagnosis, he said, adding that around 30 million people in the US over 50 years old that are part of the risk population avoid undergoing a colonoscopy.

"Up to now, in the research phase, we have obtained 87 percent sensitivity for detection of colorectal cancer, 83 percent sensitivity for adenoma, and 83 percent specificity for both," he said of UDx's test, adding, "Now we will see in this large clinical evaluation if those numbers are validated. Our goal is to maintain a level of sensitivity and specificity above 80 percent."

In comparison, although specificity for fecal tests is "very good" and higher than 90 percent, the sensitivity level for colorectal cancer can be as low as 50 to 60 percent, he said, and the sensitivity for adenomas can be lower, at around 20 percent.

In practice, UDX expects that blood drawn from patients in an average risk population will be sent to a laboratory that utilizes a cost-effective mass spectrometer and the firm's colorectal cancer and adenoma test system. When the test result indicates the presence of advanced adenoma or colorectal cancer, the patient would be referred for a colonoscopy.

There is "a great need" for a simple, noninvasive, and accurate test "that can be used to screen great numbers of people to detect cancers earlier," James Kinross, a consultant colorectal surgeon at St. Mary's Hospital, Imperial College Healthcare NHS Trust in London, and a lead investigator in the study that is validating the UDX test, said in a statement.

“Research conducted at Imperial College London and the National Phenome Center has shown that metabolomics can play a vital role in early detection of cancer," he added.

Toni Castells, head of the colorectal cancer screening program at Clinic Hospital in Barcelona, Spain, said in a UDX company video that the method developed by the firm "may overcome" limitations presented by standard tests, including the challenge of detecting adenomas. "It is a blood-based analysis that could increase the participation rate, and at the same time, has a very high sensitivity for detecting advanced adenomas," said Castells, who is a member of the UDX scientific advisory board.

Martínez-Barea said that his company is patenting its work and that the biomarkers it has identified for colorectal cancer screening are, therefore, confidential. However, additional details will be made available, he said, when the company publishes peer-reviewed papers, expected in 2018, that describe the results of the multicenter clinical studies.

In the London-based Metabolic Biomarkers for Early Colon Cancer and Advanced Adenoma clinical study, the UDX blood-based screening test would rule out patients for colorectal cancer or rule them in for cancer or adenomas so that they can be referred for a colonoscopy, the firm said. A network of seven hospitals in London will collect approximately 660 blood samples from people aged 55 to 74, who have been referred by their general practitioners for colonoscopy due to a positive result from the fecal screening test. Following testing by UDX, the results will be used to confirm the current biomarker panel and potentially add additional biomarkers to further increase the sensitivity and specificity of the test.

The study is one among a series of prospective studies underway at more than 20 hospitals in Europe and the US, Martínez-Barea said.

He noted that the London-based study would probably continue for about six months, and that the rest of the studies would be completed during the next 18 months. The firm plans to seek regulatory clearances to market the test when the studies have been completed.

By then, the firm should have all of the data needed to obtain CE marking, and approval could come within six months of submitting an application, he said.

Martínez-Barea noted that in the test could be completed at clinical laboratories that use mass spectrometers or in a future clinical lab built by his firm.

In the US, the company expects to implement its approach in CLIA-certified labs as a laboratory-developed test prior to seeking premarket approval from the US Food and Drug Administration, he said.

Martínez-Barea said that to date, the firm has raised €9 million ($10.7 million) from small seed-capital funds, business angels, and European-based funds geared toward investing in high-tech startups.

Martínez-Barea said that the London-based clinical study is "a key milestone" for his firm because the study strengthens its international efforts to collect blood samples from different sources to develop the test.

He noted that the company had already presented results of its research.

In a poster presented in June 2016 at the World Gastrointestinal Cancer Congress, researchers from the UDX technology and innovation research center in the University of Seville and their colleagues showed results of a prospective study that used serum samples collected from 131 participants undergoing colonoscopy examination in a colon cancer screening program, from April 2016 to December 2016, at the Hospital Clinic of Barcelona.

The study had an objective to show that metabolomics technology could be successfully used to distinguish patients with advanced adenomatous polyps from those without adenomas.

The researchers, as a result of the study, described their proof-of-concept serum-based metabolomics test that identifies patients with advanced adenomatous polyps with an 87 percent sensitivity, and allowed clinicians to distinguish between advanced and non-advanced adenomas with 80 percent sensitivity.

Several companies and research organizations are looking into developing more effective tests to detect colorectal cancer.

Biocartis said today that it had received CE-IVD marking for two liquid biopsy tests to detect RAS mutations in circulating tumor DNA from patients with metastatic colorectal cancer. The tests are the Belgian molecular diagnostics firm's first liquid biopsy assays to receive CE-IVD marking.

The firm also noted that validation studies performed for the CE-marking of the Idylla tests showed 88 percent concordance between blood plasma-based and tumor tissue-based testing in patients with detectable levels of ctDNA.

Earlier in November, Natera announced that it will collaborate with Denmark's Aarhus University on a research study evaluating circulating tumor DNA as a biomarker to detect residual disease, treatment response, and disease recurrence in colorectal cancer patients.

Exact Sciences, which reported third quarter revenues rose 158 percent year over year, driven by a 136 percent increase in the number of completed Cologuard colon cancer tests, may be the most formidable competitor to diagnostic companies that are new entrants in the market for colon cancer screening.

In a research note earlier this month, Leerink Research analyst Puneet Souda said that Cologuard remains highly underpenetrated in an 80 million-patient market, and the company could deliver 40 percent penetration from just over 2 percent today.