

# Advances in the development of an early detection kit for bowel cancer

September 25 2012

---



DNA microarray slide before use. Photograph: UPM.

Rubén Armañanzas and Pedro Larrañaga, researchers of the Computational Intelligence Group at the Universidad Politécnica de Madrid's Facultad de Informática have used advanced statistical and data mining techniques to filter information about the activity of over 22,000 genes and have managed to separate tumoural from non-tumoural samples with a precision of 94.45%.

This is the UPM's contribution to a joint effort among several Spanish

institutions to assemble a genetic test for early [bowel cancer](#) detection. The goal of the study is to develop a low-cost device integrating biomarker measurement and mathematical models.

At present, [colon cancer](#) detection is primarily based on the result of biopsies of polyps identified during a colonoscopy. However, this is a highly invasive technique that often comes too late.

The study started with the analysis of the genetic activity of over 22,000 genes simultaneously using [DNA microarrays](#). All this information was filtered using advanced statistical and high-dimensional [data mining techniques](#).

This led to the identification of a small subset of genes that behaved differently in tumoural and non-tumoural samples. A classifier or diagnostic predictor can be built by combining the expression patterns using complex mathematical models.

## **94.45% precision**

Based on the gene panel, known in the technical jargon as biomarkers, the mathematical models are able to classify a new set of tumoural or non-tumoural samples with a precision of 94.45%.

As mentioned earlier, the final goal of the study is to be able to develop a low-cost device integrating the measurement of the biomarker panel and mathematical models. Its use in clinical practice could be helpful for early bowel [cancer diagnosis](#), while at the same time reducing costs and inconvenience to patients.

The project kicked off in 2005 and has been developed in several phases. It has involved patient recruitment and informed consent, DNA microarray-based laboratory testing, computational analysis using

machine learning techniques and validation.

The results have been published in BMC Cancer. Despite the promising results, population studies are now required to further validate the findings. These studies are now under way and are expected to return new results in the coming years.

**More information:** Garcia-Bilbao, A; Armananzas, R; Ispizua, Z; Calvo, B; Alonso-Varona, A; Inza, I; Larranaga, P; Lopez-Vivanco, G; Suarez-Merino, B; Betanzos, M. Identification of a biomarker panel for colorectal cancer diagnosis, BMC CANCER, 12 10.1186/1471-2407-12-43 JAN 26 2012

Provided by Universidad Politécnica de Madrid

Citation: Advances in the development of an early detection kit for bowel cancer (2012, September 25) retrieved 6 May 2024 from <https://medicalxpress.com/news/2012-09-advances-early-kit-bowel-cancer.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.