



Max-Planck-Innovation

## Technology Offer

### A novel biomarker for a reliable diagnosis of colorectal cancer based on differentially methylated genomic regions

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### Background

With approximately 600,000 deaths annually colorectal cancer (CRC) is one of the most common cancer types worldwide. Early cancer and pre-cancer (polyps) detection by colonoscopy over the age of 50 until now is the best strategy for disease control and the chance of the cancer to be curable. Epigenetic changes such as DNA methylation has been shown to occur already at early stages of tumor development making such differentially methylated regions (DMRs) highly attractive for biomarker development [1]. However, potential biomarkers for CRC diagnosis based on differential DNA methylation patterns show a variable performance probably due to variable regions in their genomic region, so-called copy number alterations (CNAs), hampering a robust diagnosis. Thus, biomarkers for a simple and reliable diagnosis of CRC and for monitoring the course of the disease are still missing. There is a great need for the identification of such biomarkers that allow a reliable diagnosis of CRC and further, to enable the development of individual treatment strategies.

### Technology

Scientists at the Max-Planck-Institute of Molecular Genetics found by DNA methylation high-throughput sequencing a number of specific genomic regions marked by differential DNA methylation. In particular one specific interesting region was identified that reliably allows the discrimination of normal and colorectal cancer tissue. This genomic region is free of copy-number alterations and has been verified in colorectal tissue samples. The technology described here also offers the possibility to detect such DMRs in colorectal associated fluids, e.g. blood, lymph and feces. This biomarker has been correlated to clinical parameters, such as CIMP (CpG island methylator phenotype), histology and lymph node status and enables an early and reliable diagnosis of CRC. Furthermore this biomarker could be used to follow-up whether a chemotherapeutic treatment is efficacious or not. Currently, we are looking for a licensing partner interested in the further development and application of this method in diagnosis and treatment of CRC patients.

### Patent Information:

European priority application has been filed on 14<sup>th</sup> August 2012.

### Literature:

[1] "Genomics and epigenomics of colorectal cancer." WIREs Syst Biol Med 2013, 5:205–219. doi: 10.1002/wsbm.1206