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Diagnostic, Prognostic & Therapeutic Targets for CRC

Summary

Predictive biomarkers are important tools in drug development. Researchers at the Baylor Center for Gastrointestinal Cancer Research have discovered unique biomarkers that have diagnostic or prognostic potential for colorectal cancer (CRC) as well as targets for drug development. These biomarkers include DNA, non-coding RNAs, such as microRNAs or small non-coding RNAs and proteins.

Key Investigator

Ajay Goel, PhD

Field

Colorectal Cancer

Technology

Biomarkers
Drug Targets

Key Features

- Cancer screening
- Development of drug-able targets

Stage of Development

Preclinical proof of concept

Status

Available for licensing
Available for research collaboration

Patent Status

Patents pending

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For more information about the Baylor Center for GI Cancer Research visit: www.baylorhealth.edu/GiResearch

Market

CRC is the most prevalent of GI cancers, causing 600,000 deaths worldwide each year, and is the second biggest cause of cancer death in the US. Colorectal cancer is also a significant contributor to US health care costs, with over $12 billion spent on treatment each year. A better understanding of the mechanisms underlying CRC pathogenesis is required for developing clinically actionable diagnostic and prognostic biomarkers for CRC. Furthermore, more accurate diagnosis of the CRC stage will lead to novel and more effective therapeutic methods for treating CRC.

Technology

1. **miR-549a**: has been identified as a novel oncogenic miRNA in CRC. High miR-549a expression is associated with worse overall survival and disease free survival. miR-549a inhibition in CRC cell lines resulted in reduced proliferation, invasion, migration and anoikis.

2. **snoRNA (small non-coding RNA):** 6 novel snoRNAs were discovered to be potential prognostic biomarkers for CRC. Novel snoRNA prognostic biomarkers include: SNORD76, SNORD78, ACA11, SNORA42, SNORA2, SNORA34 and SNORD66. SNOR42 was also proved to be a novel oncogene and can be a therapeutic target for CRC.

3. **TMCO3 (Transmembrane and coiled-coil domain-containing protein 3):** a novel Na+/H+ transporter protein. TMCO3 is up-regulated in CRC patients, and higher TMCO3 expression correlated with worse stage and positive lymph node metastasis. Knocking down TMCO3 with siRNA reduces tumor growth in a xenograft model.

4. **XPO5 (exportin-5):** a novel oncogene with a prognostic value. XPO5 is a key protein responsible for transportation of precursor miRNAs from the nucleus to the cytoplasm. In CRC, both mRNA and protein levels of XP05 are upregulated. Inhibition of XPO5 expression attenuated tumor growth in a xenograft model.