**MicroRNA Screen for Colorectal Cancer Diagnosis**

“This groundbreaking discovery, which identifies microRNAs that contribute to colorectal tumor development and progression, will enable clinicians to employ a prognostic screen, tailor patient specific chemotherapy agents and provide the safest, most efficient mode of treatment for colon cancer.”

— Jingfang Ju, Ph. D., Associate Professor, Department of Pathology, Stony Brook University; and Co-director, Translational Research Laboratory, Stony Brook University Medical Center

**Background:**

MicroRNAs (miRNAs), small, non-coding single-stranded RNAs with the potential to regulate more than 30 percent of the human protein coding genes, are associated with a wide array of biological processes and human disease pathologies, including cancer. Medical research reveals that histone deacetylase 4 (HDAC4), a gene that modulates cellular growth and development, plays a role in cancer development and chemo sensitivity. It also is a direct target of miRNA140. Methotrexate (MTX) is one of the most common forms of cancer chemotherapy used by clinicians today, yet certain types of cancer are reported to be chemo resistant, specifically with slow proliferating cancer stem cells. Identification of novel therapeutic targets is crucial, and miRNA140 may offer a new path to overcome chemo resistance in cancer.

**Technology Description:**

Dr. Jingfang Ju, associate professor in the Department of Pathology at Stony Brook University; and co-director of the Translational Research Laboratory at Stony Brook University Medical Center, has identified novel therapeutic and diagnostic targets that can be used to diagnose and properly treat colon cancer otherwise found to be chemo resistant. Dr. Ju’s groundbreaking discovery identifies microRNAs that contribute to colorectal tumor development and progression. His discovery will enable clinicians to employ a prognostic screen, tailor patient specific chemotherapy agents and provide the safest, most efficient mode of care for colon cancer.

**Patents / Publications:**

- Patent Pending
- MicroRNA expression profiles classify the responsiveness of Human Osteosarcoma to Doxorubicin. Xi, Yuguang et al., Cisplatin, Ifosamide. J Clin Oncology. 2008.

**Advantages**

This technology:

- Presents a new method of diagnosing cancer by determining the level of microRNA expression.
- Describes a novel therapeutic target directed toward colon cancer stem cells.
- Identifies new cancer biomarkers that enable clinicians to determine the most appropriate patient care and effective treatment.

**Applications**

- Chemo resistance research
- Cancer therapeutics
- Diagnostic screening

**Adam M. DeRosa, Ph. D. Licensing Associate**

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N5002 Melville Library
Stony Brook University
Stony Brook, NY 11794-3369
631-632-6955 (voice)
631-632-1505 (fax)
Adam.DeRosa@stonybrook.edu
www.stonybrook.edu/research/otlir