RESEARCH

Basic Science Research

The association between chronic inflammation and the development of cancer is a well-established but incompletely understood phenomenon. One of the best-known examples is seen in patients with ulcerative colitis, who are at an increased risk of developing colorectal cancer. Though the fundamental mechanism is not known, there has been a growing awareness of the contribution of the underlying intestinal stroma on colitis-associated cancer (CAC). Colonic myofibroblasts are a subpopulation of cells located within the lamina propria of the GI tract that have been linked to both inflammation and tumorigenesis, and which produce many cytokines, growth factors, and inflammatory mediators also involved in these processes. Research in my laboratory evaluates the role of protein kinase D (PKD), an important cell signaling protein, on the regulation of key biological functions of myofibroblasts in the setting of inflammation that could promote CAC.

Key words: myofibroblast, colitis-associated cancer, PKD

Translational Research

While the overall incidence of colorectal cancer (CRC), the 3rd leading cause of cancer-related deaths in the USA, has been decreasing, the incidence among adults younger than 50 years has shown a striking increase, even when excluding patients with a known genetic predisposition (i.e., HNPCC, FAP). While the reasons for this trend are unknown, this increase in young-onset CRC may have an underlying molecular basis that has yet to be identified.

Genomic analysis of various cancers is becoming increasingly common as an effective means of identifying novel therapeutic targets and understanding the mutations that drive tumorigenesis. Our current study involves whole exome sequencing of young colorectal cancer patients who have tested negative for known hereditary syndromes (i.e., HNPCC, FAP). While the reasons for this trend are unknown, this increase in young-onset CRC may have an underlying molecular basis that has yet to be identified.

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Our long-term goal is to identify novel molecular mechanisms for colorectal cancer in young patients. The results of our study may lead to a personalized medicine approach for all patients with colorectal cancer that may affect treatment (chemotherapeutic agents) and screening for other family members and their offspring.