GASTROINTESTINAL IMMUNOPATHOLOGY

Project title
"The impact of the diet in modulating IBD and CRC development"

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Abstract
Although the eziopathogenesis of inflammatory bowel disease (IBD) is still unknown, the severity, extent of disease and the duration of inflammation represent the major risks associated with the development of colorectal carcinoma (CRC) in these patients. Unfortunately, the molecular mechanisms underlying the connection between intestinal inflammation and CAC are still unclear. Diet has a major impact on human healthy. The consumption of a westernized diet containing excessive amounts of refined and processed foods, red meats, and sugar beverages, accompained with a low consumption of fibers, fruits, and vegetables is associated with the increased development of metabolic and inflammatory diseases, and cancer.
Some studies have reported an increased risk for developing IBD with a diet high in polyunsaturated fatty acids, ω-6 fatty acids, saturated fats, and meat. However, there are no direct evidences that identify dietary components as drivers of intestinal chronic diseases and CRC. Therefore the aims of this project is to:
Aim1. To assess the role and the molecular mechanisms triggered by Western diet in promoting intestinal inflammation and CRC development.
Aim2. To explore the impact of diet on early stage of colorectal cancer. Aim3. To study the impact of diet on epigenetic changes in CRC patients.

Main technical approaches
Experimental models of IBD and CRC; patient-derived xenograft tumor model; immunocharacterization by FACS and immunohistochemistry of tumors. RNA-sequencing analysis of xenograft tumors. Analysis of cell metabolism assessed by Seahorse XF Technology. To address whether a specific diet drives epigenetic changes conferring advantages to tumor development, ChIP experiments will be carried out.

Scientific references
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