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The role of microbial Eukaryotes in Chronic Gastrointestinal Disorder and its therapy

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Background and aims: Gastrointestinal cancer (GI) is one of the most diagnosed malignancies and mortalities globally. Microbial composition is associated factor which might increases the possibility of developing gastrointestinal disorders and also, affects cancers' therapy efficacy. An investigation on stool samples microbial content collected during therapy establish link on gut microbiota composition, disease and subsequent therapeutic response. Therefore, two studies have been conducted investigating those links in our laboratory simultaneously. One; The associated risk of *blastocystis* infection in colorectal cancer: a case-control study. Two; the role of intestinal microbial content on gastrointestinal cancer and its therapy efficiency.

Aim and objective: the purpose of the studies is examining the association between exposure to microbial agents with gastrointestinal cancer development, progression and cancer therapy efficacy.

Methods: ongoing recruitment of patient from the Oncology Services Tawam Hospital. Depending on the study, participants are divided into groups, Cancer patients (Gastrointestinal cancer vs Cancer outside Gastrointestinal tract (COGI)) and Cancer Free (CF) participants. Participants gave written consent for biological sample collection. Microscopy was used to identify any present intestinal parasites/fungi in stool samples. Molecular analysis was conducted to identify gut microbes (*blastocystis* spp., fungus, and five bacterial groups), then sanger sequencing was conducted for the *Blastocystis-positive* samples for subtype identification and phylogenesis. Peripheral blood serum was analyzed using LEGENDplex™ Human Inflammation Panel 1 (13-plex) for simultaneous quantification of 13 human inflammatory cytokines and chemokines.

Results: There were more diverse non-pathogenic protozoa observed in COGT compared with GI patients. For example, the prevalence of *Blastocystis* was significantly higher among cancer patients (OR=2.98) compared to CF participants. Furthermore, this study revealed that the prevalence of *Blastocystis* spp. is significant in colorectal cancer (CRC) patients

(OR=5.66) compared to the CF group. Furthermore, Cytokine and chemokine analysis demonstrated a high average concentration of IP-10 at the baseline of the non-responder patient (361 pg/mL) to cancer immunotherapy compared to the responder (151 pg/mL).

Conclusions: The parasites hosted in patients' stool varied between GI and Non-GI patients, and the controversial *Blastocystis* was more prevalent in CRC patients undergoing chemotherapy. Also, we found that IP-10 concentration was increased in the non-responder to immunotherapy patients after treatment, and might work as a potential diagnostic biomarker.

Keywords: Gastrointestinal Cancer, Colorectal cancer, *Blastocystis*, Biomarkers, cancer therapy, United Arab Emirates

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DOI of publications

Title of the paper	**DOI**
Associated risk of *Blastocystis* infection in colorectal cancer: a case-control study	DOI: 10.3389/fonc.2023.1115835
The role of microbiota in immunotherapy outcomes in colorectal cancer patients: a protocol for a systematic review	DOI: 10.1371/journal.pone.0273314
Prevalence of, and Factors Associated with Intestinal Parasites in Multinational Expatriate Workers in Al Ain City, United Arab Emirates: An Occupational Cross-Sectional Study	DOI: 10.1007/s10903-019-00903-8