

Exploring the Proteomic Profiles of Colorectal Tumor and its Histologically Free Margin of Patients from Amazon

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Introduction: Colorectal cancer (CRC) is the third type of cancer with the highest incidence in the world. The low survival rate of CRC is attributed to the late diagnosis and low therapeutic efficiency. One of the applications of shotgun proteomics is investigate the quantitative protein expression. This allows studies to differentiate between normal and diseased states, such as cancer. **Objective:** Investigate the proteomic profiles of tumor tissues and their adjacent normal mucosa of patients with colorectal cancer from Amazon (Brazil) using an isobaric tags for relative and absolute quantitation (iTRAQ-8 plex) proteomic approach. **Material and Methods:** Two biopsies (tumor tissue and respective adjacent margin – approx. 5 cm from tumor) of four patients diagnosed with histological type adenocarcinoma were collected from Oncology Control Foundation Center of the Amazonas State (FCECON), Manaus, Amazon. The eight samples were trypsin digested and labeled with iTRAQ 8-plex. The peptides were submitted to strong cation exchange chromatography followed by the reverse phase C18 chromatography / tandem mass spectrometry using mass spectrometer LTQ Orbitrap Velos (®Thermo Fisher Scientific). The shotgun data analysis were performed with Patternlab for Proteomics 4.0. **Results and Discussion:** We identified 1090 proteins (with redundancy). Detailed examination showed 59 proteins with alterations in their abundance between the two conditions studied (i.e. tumor and resection margin). We found to be upregulated in the resection margin, carbonic anhydrase 2, chromogranin-A, intelectin-1 and alpha-1-antitrypsin, which are correlated to neoplastic processes. Moreover, in the tumor tissues were found proteins involved in the development of tumorigenesis as transgelin, desmin, caldesmon, profilin-1, talin-1 and protein S100-A11. **Conclusions:** Proteins overexpressed in histologically free tissue margin are mainly related to biological processes, cellular components and molecular functions, indicating that this region can be an important microenvironment to understanding the biological processes that are occurring due to the presence of cancer.

Keywords: colorectal cancer, shotgun proteomics, Amazon.

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