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Lipidomic Response to Neoadjuvant Chemoradiotherapy in Rectal Cancer

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Abstract : Lipidomics methods are widely used in the identification and validation of disease-specific biomarkers and therapy response evaluation. The present study aimed to identify a panel of potential lipid biomarkers to evaluate response to neoadjuvant chemoradiotherapy in rectal adenocarcinoma (RAC). Liquid chromatography–mass spectrometry (LC-MS)-based untargeted lipidomic was used to profile human serum samples from patients with clinical stage T2 or T3 resectable RAC, after and before chemoradiotherapy treatment. A total of 28 blood plasma samples were collected from 14 patients with RAC who recruited at the São Francisco University Hospital (HUSF/USF). The study was approved by the ethics committee (CAAE 14958819.8.0000.5514). Univariate and multivariate statistical analyses were applied to explore dysregulated metabolic pathways using untargeted lipidic profiling and data mining approaches. A total of 36 statistically significant altered lipids were identified and the subsequent partial least-squares discriminant analysis model was both cross validated (R2, Q2) and permutated. Lisophosphatidyl-choline (LPC) plasmalogens containing palmitoleic and oleic acids, with high variable importance in projection score, showed a tendency to be lower after completion of chemoradiotherapy. Chemoradiotherapy seems to change plasmanyl-phospholipids levels, indicating that these lipids play an important role in the RAC pathogenesis.

Keywords : lipidomics, neoadjuvant chemoradiotherapy, plasmalogens, rectal adenocarcinoma
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