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PREDICTIVE PROKARYOTIC FUNCTIONAL METAGENOMICS APPLIED ON AN ACID MINE DRAINAGE AFFECTED ENVIRONMENT

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In San Luis, Argentina, the acid mine drainage of an abandoned gold mine is released into La Carolina stream. In previous studies, we determined that physicochemical parameters and both eukaryotic and prokaryotic diversity are affected by the presence of this mine in the study area. Likewise, we established specific relations between physicochemical parameters and microbial taxonomic groups. The aim of the present study is to determine the prokaryotic functional differences among samples according to the location in the study area. Twelve sediment samples from the mine (7) and from the stream (5), before and after receiving the drainage, were selected to 16S rRNA gene amplicon sequencing (MR DNA, TX, USA) on MiSeq platform (Illumina). PICRUSt software (www.picrust.github.io) was used to predict metagenome functional content from 16S rRNA marker gene using KEGG Orthology (KO) database. Principal Component Analysis was performed to visualize the distribution of functions and samples. This analysis showed that functions such as environmental adaptation, biosynthesis of secondary metabolites, cellular processes and signaling, protein biosynthesis, energy metabolism, cell motility and genetic information processing were present to a greater extent in the samples taken from the south and lateral galleries of the mine, characterized by high heavy metal concentrations and low pH values. Cell communication function was associated to stream and main gallery samples, which were characterized by normal parameters. These results indicate that extreme conditions make to microorganisms to maintain an active metabolism, while cell communication is associated to normal conditions, where it is expected to find stable consortia.

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PARTICIPATION OF HUMAN ADIPOSE TISSUE IN THE REGULATION OF TUMOR PROGRESSION IN KIDNEY CANCER

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We have recently demonstrated that human adipose tissue of tumor kidney [hRAT], showed leptin and versican overexpressed compare to adipose tissue of normal kidney [hRAN]. Meanwhile, adiponectin and perilipin were significantly increased in hRAN. Conditioned media (CMs) of hRAN significantly increased proliferation of tumor [ACHN] and non-tumor [NK-2] renal epithelial cells. Now, we evaluated the expression of receptors (R): adiponectin -1, -2 (AdipoR1/R2) and leptin (ObR) in hRAN vs. hRAT and ACHN vs. HK-2. Additionally, CD44 expression (homing cell adhesion molecule) was assessed in cells. Human renal adipose tissues were obtained from patients with renal cell carcinoma [hRAT, n=6] and kidney donors [hRAN, n=8]. The CMs of hRAN and hRAT were collected 24h post incubation and cells were treated with CMs by 24 h. Protein expression was evaluated in tissue by IHQ, and WB in cells. Statistical differences among experimental conditions were evaluated by one-way ANOVA or t test, with Tukey's post hoc tests. We found AdipoR1 increased and ObR decreased in hRAN vs. hRAT ($p<0.05$). In addition, ACHN and NK-2 incubated with hRAT- showed CD44 and ObR increased vs. hRAN- and control-CMs ($p<0.05$). Further, AdipoR1 was significantly lower in ACHN incubated with hRAT-CMs compared to hRAN-CMs ($p<0.05$). And AdipoR1 decreased in hRAT- and hRAN-CMs vs. control-CMs ($p<0.001$). No significant changes were observed in AdipoR2 between the cell lines with different CMs. In conclusion, changes observed in the adipose microenvironment could be favoring tumor progression and therefore, the tumor stroma should be taken into consideration when dealing with a malignancy.

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THE FLAVONOID SALVIGENIN IS ACTIVE AGAINST *Trypanosoma cruzi* EPIMASTIGOTES

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Trypanosoma cruzi is the etiological agent of Chagas' disease. In cultures, these parasites cycle between the flagellate epimastigote form, and scarcely they differentiate into the infective trypomastigote. Natural compounds extracted from plants have shown to be effective against the parasite. Among them, flavonoids are an important family of natural compounds largely studied. In this study, a novel flavone,