

TITLE: ANTICANCER ACTIVITY BY BACTERIA ISOLATED FROM A CAVE IN THE EASTERN AMAZON

AUTHORS: Santos, R.S.; Silva, S.C.; Paludo, K.S.; Favero, G.M.; Nunes, J.A.; Biscaia, F.A.B.; Rodrigues, D.S.; Albino, U.B.

INSTITUTION: UNIVERSIDADE FEDERAL DO SUL E SUDESTE DO PARÁ, MARABÁ, PA (FOLHA 17 QUADRA 04 CEP 68505-080 MARABA – PA)

ABSTRACT: The search for natural compounds with action against tumor cells has driven research to extreme or restrictive environments such as caves, where the nutrient dispute is constant. In these environments, microorganisms fight against each other producing selective compounds, which may have clinical applications. The Pedra da Cachoeira cave (03° 18' 43" S; 52° 20' 28" W), is an environment preserved in the Dense Ombrophylous Forest at Eastern Amazon, where occurs dry season every year. In 2014, a microbial ecology work resulted in 49 bacterial strains isolated from soil, walls and guano (bat feces) in the halls of this cave. For characterization, these cave bacteria were confronted with *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923, some of them proved to be powerful inhibitors of microbial growth. Among these strains, four, considered more effective were evaluated for the potential to inhibit tumor cells. An extract obtained by the liquid culture of these bacteria was applied in murine melanoma cells (B16F10) and two of the bacteria tested presented some antagonistic action to these tumor cells metabolism. A 16S rDNA sequence analysis could be identified these bacteria as different strains of *Bacillus subtilis*. A study aimed at identifying the substance responsible for the anticancer action of these bacteria was then initiated. After studying the growth curve of the two bacterial strains, culture medium samples were analyzed by High Performance Liquid Chromatography (HPLC) and revealed a variety of defined compounds, with possibility of purification. At first, liquid cultures of the two bacterial strains were subjected to filtration which separated soluble compounds from the bacterial cells. Two extracts were then produced from the liquid and solid phases, and these two extracts were subjected to chromatographic fractionation. Ten fractions have so far been separable. These fractions were then administered in increasing doses to the melanoma cell lines (B16F10) and to fibroblast (3T3) cells as a control. From the two lines positive results were obtained in isolated fractions of the solid phase of bacterial cultures revealing that the molecule capable of inhibiting the growth of B16F10 cells is part of the bacterial cell structure. It has not yet been possible to identify the active molecule nature, new fractions must be performed and a pure active compound identified, this will be studied in order to identify its chemical structure.

Keywords: Restrictive environment, Antitumor, chromatography.

Agency: Programa de Pós Graduação em Química – Unifesspa.