Mouslim Assia, J Bacteriol Parasitol 2018, Volume 9
DOI: 10.4172/2155-9597-C1-046

Characterization of antiproliferative red-like pigments produced by actinomycete soil strains identified as *streptomyces coelicoflavus*

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Actinomycetes are filamentous bacteria, widely distributed in soil, water and plants rhisosphere. They are able to produce secondary metabolites with diverse chemical structures and biological activities. Among these bioactive metabolites, anthracycline antibiotics such as prodigiosin are known to exhibit antitumor, antioxidant, and immunosuppressive activities. In this study, five strains of actinomycetes isolated from soil were revealed to produce red-like pigments. Phenotypic and RNA gene coding sequence analysis allowed identification of the all strains as Streptomyces coelicoflavus, which reported here for the first time to produce an antiproliferative red-like pigment. The pigments are intracellular, hydrophobic and photosensitive. Their extraction could be performed with organic solvent from which, ethanol showed the most effective extracting ability. Like prodigiosin and undecylprodigiosin, UV-Vis absorbance of the pigments present sharp peak at nearby 534 nm at neutral or acid conditions, where the pigment color is red. In basic condition the pigment color turn yellow with a λmax of 458 nm. However, TLC analysis, antibacterial assay and production media suggest highly that these red-like pigments are undecylprodigiosin analogues or probably other similar anthracyclines. Cytotoxicity of crude extract and two fractions (FA, soluble in petroleum ether and FB, soluble in chloroform) of two strains were performed by MTT assay on mice P3 myeloid cancer cells and human osteosarcoma cancer cells (U-2 OS (ATCC HTB-96). Results on mice P3 cell line showed that the crude extract of one from two tested strains have the highest antiproliferative activity at low dose. At 100 µg/ml, both fractions A and B of the two strains showed high antiproliferative effect on mice P3 cell line. In human U2OS osteosarcoma cell line, 3 fractions showed more antiproliferative effect than on mice P3 cell line. FACs analysis suggests a cell phase cycle arrest at G1 and S according to the fractions.

Biography

Mouslim Assia is currently pursuing her PhD in Faculty of Sciences Ben M'Sik, University of Hassan II Casablanca, Morocco.

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