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Characterization of a novel eukaryotic initiation factor 5A (eIF5A) in Leishmania donovani

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Leishmania donovani is a protozoan parasite which leads to visceral leishmaniasis. Though Leishmaniasis is a dreadful disease the treatment options of it are limited and far from satisfactory. Eukaryotic initiation factor 5A (eIF5A) is a small, essential eukaryotic protein that contains a modified lysine residue, hypusine. The role of eIF5A in cell proliferation was documented in yeast. In HIV it was reported that it is involved in transport of viral mRNA from nucleus to cytoplasm in association with Rev HIV-1 protein. In humans, it induces apoptosis by acting as regulator of p53 and also is involved in translation elongation. In Leishmania, the function of eIF5A protein is not yet documented. This study was carried out to find out the function and localization of eIF5A in Leishmania donovani. To examine the subcellular localization of eIF5A protein, we cloned the gene in GFP vector and transfected in Leishmania donovani. Confirmation of the transfectants was done by fluorescent microscopy. Western-blot analysis using anti-GFP antibody showed expression of the fused eIF5A-GFP protein in total cell lysate and cytosolic fraction. However, this protein was absent in the nuclear fraction. This indicates that eIF5A has functions confined to the cytoplasm. To elucidate the function of eIF5A in parasite proliferation, the gene was cloned in an overexpression vector and transfected in promastigotes of Leishmania donovani. Interestingly, we found that there was decrease in growth of overexpressors when compared with the wild type and vector alone parasites. eIF5A overexpression may be leads to apoptosis as reported in other system.

Biography

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Bandages from microbial cellulose

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The ever advancing field of medical biotechnology has led us to a new path of exploiting the production of cellulose by a species of Acetobacter. These microbial cellulosic fibres produced by this bacterium may substitute cellulosic cotton fibres as it does not have lignin and hemi-cellulose unlike plant cellulose fibres. Cellulosic fibres synthesised by Acetobacter has shown a vast potential in wound healing. This wound healing capacity possessed by them is due to their unique nano morphology. These fibres prove to be further advantageous as they possess great elasticity, high wet strength and comfortability. These all attributes led it to prove it beneficial in formation of bandages. Also these microbial fibres have nonporous behaviour which will allow potential transfer of antibiotics to the wound as well as prevent any further infection by acting as a barrier. Moreover they can be moulded in any form or shape and hence can be applied at any place. This bandage will prove to be non-toxic, non-pyrogenic. Treatment with bases at high temperature will remove unwanted cells also and hence making it biocompatible also. Further treatment with citric acid will increase its antimicrobial properties. Microbial cellulose required for this process can be produced efficiently in fermenters giving less shear-stress to cell for eg: an air lift fermenter having hollow fibres. Hence production of bandage by microbial cellulose will surely prove advantageous over bandages synthesised from plant cellulosic fibres.

Keywords: Microbial cellulose, Bandage, Agar, Citric acid, Biocompatible.

Biography

Niharika Srivastava is pursuing B.Tech Biotechnology degree from VIT University, Vellore. She has done projects antimicrobial properties of major medicinal plants, preparation of cancer drugs using Silver Nanoparticles, comparative study of antimicrobial property of Cinnamomum zyelanicum and C. cassia on major food spoilage bacteria, protein profiling (at Indian Agricultural Research Institute, New Delhi).

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