World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:13, No:04, 2019

Inhibition of Variant Surface Glycoproteins Translation to Define the Essential Features of the Variant Surface Glycoprotein in Trypanosoma brucei

Authors : Isobel Hambleton, Mark Carrington

Abstract : Trypanosoma brucei, the causal agent of a range of diseases in humans and livestock, evades the mammalian immune system through a population survival strategy based on the expression of a series of antigenically distinct variant surface glycoproteins (VSGs). RNAi mediated knockdown of the active VSG gene triggers a precytokinesis cell cycle arrest. To determine whether this phenotype is the result of reduced VSG transcript or depleted VSG protein, we used morpholino antisense oligonucleotides to block translation of VSG mRNA. The same precytokinesis cell cycle arrest was observed, suggesting that VSG protein abundance is monitored closely throughout the cell cycle. An inducible expression system has been developed to test various GPI-anchored proteins for their ability to rescue this cell cycle arrest. This system has been used to demonstrate that wild-type VSG expressed from a T7 promoter rescues this phenotype. This indicates that VSG expression from one of the specialised bloodstream expression sites (BES) is not essential for cell division. The same approach has been used to define the minimum essential features of a VSG necessary for function.

Keywords : bloodstream expression site, morpholino, precytokinesis cell cycle arrest, variant surface glycoprotein
Conference Title : ICPCM 2019 : International Conference on Parasitology and Chemical Microbiology
Conference Location : Tokyo, Japan
Conference Dates : April 22-23, 2019