Ahmed Somaida, Pharmacoeconomics 2018, Volume:3
DOI: 10.4172/2472-1042-C1-005

In vitro toxicity assessment of anthrax toxins for intracellular drug delivery

Ahmed Somaida
Greenwich University, UK

Many pharmaceutical agents need to be delivered intracellularly to exert their therapeutic action. Due to biological membranes preventing large hydrophilic molecules, such as siRNA agents or antisense oligonucleotides from spontaneously entering cells, new mechanisms to carry proteins across membranes into the cytosol of mammalian cells have been developed to overcome the pharmacokinetic and toxicity problems. One such drug delivery technology is based upon the anthrax toxins ability to delivery macromolecules to the cytosol. A detoxified version of anthrax toxin includes the proteins protective antigen (PA) and the N- terminal lethal factor (LFn) which has the potential to deliver a variety of pharmaceutical forms. In this study, the toxicity of PA and LFn fused in frame to markers such as green fluorescence protein (GFP) or the DNA binding protein GAL4 was assessed using the MTT cell viability assay over different concentrations of proteins (from 0.1 to 200 (Fig/mL)) in HeLa cells. The PA produced a marked effect over higher concentrations. LFn-GFP lacks any toxic effect when tested over three days and provides opportunity to use it as a protein carrier without any limitation in toxicity. This is confirmed by testing PA and LFn- GFP together and it shows results close to those of PA individually. Other suggested combination of LFn and GAL4 (LFn-gal4), that may applicable in gene delivery techniques, obtain an occurrence of developmental abnormalities to cells but still represent an applicable method as all readings above IC50. The combination of PA, LFn-GAL4 in addition to ASO, which may be a powerful tool in gene therapy applications, has shown a satisfactory out-put of safety with minimal toxicity effect as the IC50 was above the maximum concentration tested 200 (µg/ml). Further investigation *in vivo* trials is warranted into the safety and efficiency of this novo intracellular delivery technology.

ahmed.somaida@gmail.com

Notes: