

# Immune Regulatory Effect of Locally Isolated Nostoc Algae Lysate During HCV Infection

Noha Khalil ,MAHA EL-DEMELLAWY, MARWA MOHAMED , MOHAMED MAHROUS, ABEER ABDELWAHAB, SAHAR FIKRY, DOAA GHAREEB, OSAMA SALAMA AND MAE SELEEM

## Abstract

HCV represents a global health problem. In Egypt, 20% of the population are infected with HCV. During the infectious phase, HCV attenuates the immunity by producing specific HCV immune clearance. Blue green algae (BGA), especially Spirulina species, was studied pertaining to its effect on the human immune response in HCV.

The lysate of non-toxic BGA was isolated and identified as Nostoc sp EGY (NE). IL-4, IL-10, IL-12, INF-  $\gamma$  and TNF-  $\alpha$  mRNAs and their expressed protein were assessed using RT-PCR and ELISA, respectively. The prepared lysate induced immune stimulation of peripheral blood mononuclear cells (PBMC) at a concentration range of 10-500  $\mu$ g/ml. Moreover, concentrations of this crude lysate ranging from 100  $\mu$ g/ml stimulated normal human neutrophils to ingest and kill live Candida in an in-vitro test. IL-4, 10 and 12 proteins and their mRNA expression were significantly lower in HCV infected/NE lysate-treated PBMC, yet higher than HCV infected/NE lysate-untreated PBMC. This was in contrast to the levels of INF-  $\gamma$  and TNF-  $\alpha$  which showed significant decrease in HCV infected/NE lysate-treated PBMC relative to HCV infected/NE lysate-untreated PBMC. These findings give further insight regarding the effect of NE lysate on improving the immune response, thus presenting a promising safe and effective immune candidate for HCV treatment.

*International Journal of Pharmaceutical Research 2021, January*