

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

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## 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 lysateuntreated 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.

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