

ABSTRACT

Immunomodulation refers to the process of altering immune responses to a desired level. We attempted to modulate the immune system of mice and zebrafish for studying host pathogen interaction during viral infections. Studies in mice focused on elucidating the role of Myeloid Derived Suppressor cells (MDSCs) in HSV1 induced immunoinflammatory reaction in cornea. Initial experiments were aimed at understanding the kinetics of MDSCs in lymphoid and non-lymphoid organs. We found cell populations phenotypically similar to MDSCs in cornea and spleen during the course of infections. Experiments were also carried out to generate MDSCs in vitro and to check whether such cells can control the corneal inflammatory reactions caused by CD4 T cells. We were able to show that in vitro generated cells were able to control the proliferation of CD4 T cells in an antigen specific manner. Future experiments could be performed to establish the therapeutic value of in vitro generated MDSCs in controlling the immunoinflammatory reactions in cornea. My second project was aimed at generating a novel model for studying Dengue viral pathogenesis. We tried to generate a type I interferon receptor knockout zebrafish using CRISPR/Cas tool. We targeted CRFB5, which is a common receptor chain in two groups of type I interferon signaling in zebrafish. We generated gRNAs against CRFB5 and showed that indeed the gRNA is able to cause double strand breaks in the CRFB5 amplicon. Next we have to microinject gRNA and Cas9 mRNA into oocytes of zebrafish, to generate knock out fishes.