

Biochemical characterisation of serine protease inhibitors from *Schistosoma japonicum*

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Schistosomiasis remains a major global public health problem, but despite significant progress in the control of this disease, clear limitations necessitate the development of an effective anti-schistosomal vaccine. Serine protease inhibitors (serpins) are a superfamily of proteins involved in many important biological processes such as blood coagulation, fibrinolysis and inflammation. These inhibitors have also been shown to play central roles in host immune modulation and/or evasion by pathogens. Furthermore it has been suggested that serpins may have evolved specifically in limiting the host immune activation by mediating the inhibition of host immunomodulatory signals. We hypothesise that serpins provide similar functions for schistosomes and their disruption by an effective host immune response by vaccination provides an opportunity to eliminate and control these parasites. Therefore, the aim of this study was to biochemically characterize novel serpins from *Schistosoma japonicum* and investigate the potential of these proteins as suitable anti-schistosomal vaccine candidates. Gene expression results from data mining of previously published microarray findings of our group and subsequent confirmation with quantitative PCR showed that two *S. japonicum* serpins termed *SjB6* and *SjB10* are differentially expressed in different life cycle stages of the parasite. The highest relative gene expression was observed in the egg and cercarial stages for *SjB6* and *SjB10* respectively indicating possible pathological and/or immunological relevance as well as a possible role for *SjB10* in cercarial penetration. Western blot analysis confirmed the expression of the native proteins in the adult worms. Recombinant proteins produced using the baculovirus expression system were tested for their inhibitory activity against a panel of serine proteases. *SjB10* was shown to be biochemically active against pancreatic elastase and chymotrypsin while *SjB6* showed no activity against any of the proteases tested. Work is now ongoing for the immunolocalisation of the native proteins using polyclonal antibodies raised in rabbit using the purified recombinant proteins as well as evaluating their possible anti-schistosomal vaccine efficacies.

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