Functional analysis of SdNP; A protein of unknown function in *Setaria digitata*

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Lymphatic filariasis, also known as elephantiasis, is a human disease caused by the parasitic nematode *Wuchereria bancrofti*. If left untreated, the infection can develop into elephantiasis which can only be managed with surgical excision. Studying the parasitology of *W. bancrofti* is extremely challenging because there are substantial complications in procuring adult parasites from the human lymphatic system. Therefore, cattle filarial parasite *Setaria digitata* was used as a model organism as it shares homologous counterparts with *W. bancrofti* and can be easily cultured in the laboratory. A novel protein called SdNP (S. digitata novel protein) was identified from *S. digitata* that may play a significant role in pathogenesis. Recent SiRNA inhibition studies showed that inhibiting SdNP expression impaired locomotion of the adult parasite leading to death. The research work presented here describes *in vitro* characterization of SdNP. Built on Bioinformatic analysis, an enzyme coupled ATPase assay was used to detect the ATPase activity of the putative kinase motifs. Our results confirmed that SdNP is a phosphor-protein that can bind and hydrolyze ATP to ADP and inorganic phosphate in a substrate-independent manner. In addition, native-PAGE and gel-filtration chromatography results showed that SdNP forms a stable tetramer *in vitro*. The fact that SdNP is unique to parasitic nematodes and is essential for the survival of adult worm suggests that functional analysis of SdNP may pave the way to design effective clade-specific drugs against filariasis.

**Keywords**: *Setaria digitata*, SdNP, ATPase activity, tetramer