Lymphatic filariasis is a parasitic disease caused by nematodes (roundworms) and the species primarily involved are Brugia malayi, Wuchereria bancrofti and Brugia timori. The common conditions of lymphatic filariasis are elephantiasis, hydrocele and lymphedema. Adult worms that reside in lymphatic tissues of humans cause filariasis. The microfilarial larvae, which circulate through the bloodstream, are carried and passed on to other individuals by mosquitoes (Culex, Anopheles and Aedes). These microfilariae mature into adult worms thereby causing disease. Currently, several drugs are available for filarial treatment namely Diethylcarbamazine (DEC), Tetracycline, Ivermectin and Albendazole. These are effective only against microfilariae and prolonged treatment using these drug leads huge side effect especially in children and pregnant women. Hence there is an absolute need for new drug development against filariasis with minimal side effects and efficient treatment properties. Wolbachia seems to hold the key to the development of new drugs since it has an endosymbiotic relationship with nematodes that helps in nematode’s reproduction, pathogenicity and survival. As the word ‘endosymbiont’ infers, wolbachia resides in nematodes and is essential for the production of heme, flavin, adenine dinucleotide and riboflavin which can’t be synthesized by nematodes. Thus by eliminating wolbachia we can eradicate filarial disease. As Brugia malayi is one of the most endemic species in India and South East Asia causing filarial disease (according to WHO), we have chosen its wolbachia target proteins for further structural study and antibacterial drug development to find potential anti filarial drugs. Many Wolbachia proteins have been identified as antifilarial drug targets, wHsp60 (wolbachia Heat shock protein 60) is one among them. In this study, wHsp60 showed sequence identity of 46.8% with E. coli Hsp60 and 42.1% with Human mitochondrial Hsp60, this implies that wBm-Hsp60 shares higher structural similarity with E.coli than with human Hsp60. Since the structures of wolbachia proteins have not been explored to date, we have chosen to clone the wBm-Hsp60 gene and its expression was done in E.coli. The purified recombinant protein (58.8 kDa) was analyzed with SDS PAGE and crystal optimization condition is in progress to get X-ray structure.


Keywords: Heat shock protein 60 (Hsp60), filariasis, wolbachia