

## Characterization of TNF Alpha Receptor in *Schistosoma mansoni*

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### 1. Introduction

Schistosomiasis is a parasitic disease of world occurrence that affects about 200 million people. *Schistosoma mansoni*, the major causative agent, has a complex biological cycle involving six different life stages and two hosts, of which humans are the definitive host. There is evidence that the parasite uses signaling molecules from the host for its own development. Work in the literature showed that human Tumour Necrosis Factor alpha (TNF-alpha) induces changes in the egg-laying process and the metabolism of female parasites (Amiri et al, 1992. Nature 356: 604-7). Our research group identified a possible ortholog to TNF alpha factor receptor in *S. mansoni* (*SmTNFr*), but the information available from GenBank and the genome sequencing project (*SmGeneDB*) does not allow predicting the transcript ends. This work aimed at determining the 5' and 3' ends of the transcript in order to obtain the complete ORF (Open Reading Frame) and at determining the expression level of the receptor in males and females.

### 2. Results

The transcript 3' end was obtained through 3'-RACE (Rapid Amplification of cDNA Ends) experiments; the obtained fragment (900 bp length) was cloned and sequenced. Sequencing showed that this fragment has perfect identity with 500bp of a previously known gene fragment. The 900 bp fragment extended by 400 bp the 3' end sequence into the unknown 3' end region of *SmTNFr*. Knowledge of this transcript new region together with the previously known segment revealed an Open Reading Frame (ORF) of 415 amino acids, where 239 are predicted as the receptor extracellular domain, 22 as the transmembrane region and 152 amino acids as the intracellular domain (predicted by TMHMM-2.0 program). Real-time RT-PCR was performed in order to determine the expression levels of *SmTNFr* in male and female parasites. The results showed that the receptor has a 64-fold higher expression in males than in females.

### 3. Conclusion

Through 3'-RACE experiments we obtained the complete ORF of *SmTNFr*. Description of this gene and its future functional characterization will help understanding the signaling interactions between host and parasite. Quantitative RT-PCR revealed that receptor expression is higher in males than in females; it can be rationalized that males are more exposed to host signaling molecules than females (that are kept inside the Gynaecophoral Canal of males, a process known as pairing) and may be the primary target of human TNF-alpha.

Keywords: RACE, Real Time PCR, *Schistosoma mansoni*, TNF Alpha Receptor  
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