

Molecular characterization of NEDD8, a developmentally down-regulated ubiquitin-like protein in *Schistosoma mansoni*

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NEDD8 (neural precursor cell-expressed and developmentally down-regulated gene), which consists of 81 amino acid residues, possesses the highest sequence similar to ubiquitin. Thus, NEDD8 is likely to be conjugated to other proteins in a manner analogous to ubiquitination. To study NEDD8 conjugation in more detail in *S. mansoni*, we used bioinformatic approaches to identify sequences that are similar to NEDD8 and the machinery of conjugation: E1 and E2 like and the cysteine protease DEN1/NEDP1 specific to NEDD8 precursor (SEN8). We used conserved amino acid domain against *S. mansoni* genome and transcriptome databases and identified SmNEDD8, SmE1-NEDD8, SmUBC-12 and SmSEN8. Alignment of the predicted ORFs with the homologous sequences revealed a high identity between sequences of *S. mansoni* and *S. japonicum*, *Drosophila melanogaster* and *Caenorhabditis elegans*. In addition, the transcript levels of these genes were analyzed by qRT-PCR using cercariae, adult worms, eggs and in vitro cultivated schistosomula with 0, 24, 48 and 72 hours and normalized for constitutive alpha-tubulin. Our results showed similar levels of expression for SmNEDD8, SmE1-NEDD8, SmUBC-12 and SmSEN8 in eggs and adult worms. In relation to cercariae and schistosomula development, our results showed down regulation of these genes, suggesting that genes from NEDD8 conjugation pathway were regulated at transcription levels during the life cycle of *S. mansoni*.

Keywords: NEDD8, ubiquitin, *Schistosoma mansoni*, qRT-PCR

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