



# A novel DDX5 gene in the freshwater crayfish *Cherax quadricarinatus* is highly expressed during ontogenesis and spermatogenesis

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**ABSTRACT.** The freshwater crayfish *Cherax quadricarinatus*, originally from Australia, is an invasive species that is also widely used in aquaculture. DEAD-box helicase family genes are found throughout evolution and encode RNA-binding proteins. The human DDX5 (p68) is important for normal cell growth, differentiation and proliferation. We identified a *C. quadricarinatus* homolog of DDX5 (Cq-DDX5); the temporal expression of Cq-DDX5 mRNA transcripts was measured during early ontogenesis, during spermatogenesis, during testes development, and during the annual cycle. The Cq-DDX5 cDNA comprises 2258 nucleotides, with an open reading frame of 1569 bp, encoding 522 amino acid residues. The deduced amino acid sequence of Cq-DDX5 has a 53 to 90% similarity to DDX5 of other eukaryotic species. mRNA transcripts of Cq-DDX5 were detected in all tissues, with high levels in the gonads. The DDX5 expression was highest in the nauplii stage, during early ontogenesis and during testes development. In adult testes, transcripts appeared at significantly higher levels in the pre-spawning and spawning phase than in the post-spawning or regressed phase. Eyestalk ablation resulted in upregulation of Cq-DDX5 in adult

male gonads in a time-dependent manner, with a peak at about 12 days. We conclude that the Cq-DDX5 gene plays an important role in early ontogenesis and spermatogenesis, with a crucial reproductive function in germ cell differentiation in these invertebrates.

**Key words:** DEAD-box helicase; *Cherax quadricarinatus*; Spermatogenesis; Gene expression; Eyestalk ablation