

Molecular characterization of a cytosolic manganese superoxide dismutase from the Chinese mitten crab, *Eriocheir sinensis*

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ABSTRACT. A cytosolic manganese superoxide dismutase gene (*Es-cMnSOD*) was cloned from the Chinese mitten crab *Eriocheir sinensis*, using reverse transcription-polymerase chain reaction and the rapid amplification of cDNA ends. The open reading frame of *Es-cMnSOD* is 867 bp in length and encodes a 288-amino acid protein without a signal peptide. The calculated molecular mass of the translated protein of *Es-cMnSOD* is 31.43 kDa, with an estimated isoelectric point of 6.30. The deduced amino acid sequence of *Es-cMnSOD* has similarities of 90, 89, 84, 87, and 81% to those of white shrimp *Litopenaeus vannamei* MnSOD, black tiger shrimp *Penaeus monodon* MnSOD, giant freshwater prawn *Macrobrachium rosenbergii* MnSOD, blue crab *Callinectes sapidus* MnSOD, and red swamp crayfish *Procambarus clarkii* MnSOD, respectively. *Es-cMnSOD* contains a manganese superoxide dismutase domain (DVWEHAYY) and 4 conserved amino acids responsible for binding manganese. *Es-cMnSOD* was expressed

in the hemocytes, eyestalk, muscle, intestine, gill, and hepatopancreas. *Es-cMnSOD* transcripts in hemocytes of *E. sinensis* increased at 1.5 and 48 h after injection of *Aeromonas hydrophila*, indicating that the induction of the SOD system response occurred within a short period of time. This study suggests that MnSOD may play a critical role in crab immunity, allowing efficient activation of an early innate immune response in the crab.

Key words: Cytosolic manganese superoxide dismutase; Hemocyte; *Eriocheir sinensis*; *Aeromonas hydrophila*