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Antimicrobial effects of novel peptides cOT2 and sOT2 derived from *Crocodylus siamensis* and *Pelodiscus sinensis* ovotransferrins

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ABSTRACT

In light of the increasing threat of bacterial drug resistance to human health on a global scale, research and development of antimicrobial peptides as a novel class of potent antibiotics has gained considerable attention. The present study focuses on the structural evaluation and membrane interaction of two new cationic antimicrobial peptides, cOT2 and sOT2, derived from Siamese crocodile (*Crocodylus siamensis*) and Chinese softshell turtle (*Pelodiscus sinensis*) ovotransferrins. Here, cOT1 (+3) and sOT1 (+3) were derived from reptile ovotransferrins by chromatographic purification and characterized by mass spectrometry and N-terminal sequencing analysis. In order to increase the antimicrobial efficacy, two novel peptides, cOT2 (+6) and sOT2 (+5), were designed and synthesized as "naturally-engineered" by primary amino acid sequence extension of cOT1 and sOT1, respectively. These rational designs of modified peptides were assayed in term of antimicrobial activity. These peptides display strong antimicrobial activity against several bacterial strains, e.g. *Vibrio cholerae*, *Bacillus megaterium*, and *Bacillus pumilus* TISTR 905, with MICs of 7–16.1 μM. In term of structural conformation in mimic environments, CD spectroscopic analysis of the secondary peptides structure features revealed the fairly similarity on α-helical content with magainin II. Hence, the modes of actions have been speculated as toroidal and carpet model. Furthermore, the disruption of intact bacterial cells induced by cOT2 and sOT2 was investigated by SEM