

SOME EFFECTS OF THREE NEW CATIONIC ANTIMICROBIAL PEPTIDES OF *HIRUDO MEDICINALIS* ON HUMAN NEUTROPHILS

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Cationic antimicrobial peptides (AMPs) are recognized as a promising alternative to conventional antibiotics because they induce much less microbial drug resistance. We previously synthesized new AMPs (FRIMRILRVLK (P1), KFKKVIWKSFL (P2), RWRLVCFLCRRKKV (P3)) based on analysis of the *Hirudo medicinalis* leech genome [1]. Here we started evaluation of their influence on human neutrophils, with which, upon clinical application at infected sites, AMPs cannot avoid interaction. Neutrophil activation was evaluated by H₂O₂-dependent oxidation of scopoletin and by myeloperoxidase and lysozyme degranulation. The peptides differed in their effect on neutrophils. Addition of P3 to cells was followed by scopoletin oxidation. Treating cells with P3 also caused myeloperoxidase and lysozyme release. After 1-h incubation with P3 at MIC, the number of living cells decreased by 50%. No generation of H₂O₂ by neutrophils in response to P2 was observed. P2 at MIC had a greater effect on neutrophil viability than P3, as was seen by an 85% decrease in the number of living cells. P1 exerted lesser effects. The decrease in the number of living cells during incubation with P1 was comparable to that in control. Overall, the results suggest that P1 has potential in the development of AMP-based therapeutic agents.

References:

1. Grafaskaia E., Nadezhdin K., Talyzina I., Polina N., Podgorny O., Pavlova E., Bashkurov P., Kharlampieva D., Bobrovsky P., Latsis I., Manuvera V., Babenko V., Trukhan V., Arseniev A., Klinov D., V.N. Lazarev V. *Eur. J. Med. Chem.*, 2019, 180:143-153.