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Cystatin C peptidomimetic derivative with antimicrobial and immunoregulatory properties as a potential wound supportive compound

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Wound infections are one of the biggest challenges for pharmaceutical industry and modern medicine. They can hinder the healing process, cause chronic wounds formation and systematic inflammations. Due to the bacteria developing resistance to currently used antibiotics, there is an increasing demand for new chemotherapeutics against opportunistic pathogens. Cystapep 1 (A-20) is a human cystatin C derivative structurally based upon its N terminal fragment. This compound shows strong antibacterial properties against *S. aureus* and *S. pyogenes* which are associated with skin-related infections. A-20 effect on human primary keratinocytes proliferation, cytotoxicity and allergic potential has been analyzed. The XTT and LDH assays were used to determine the effect of A-20 on proliferation and cytotoxicity of normal human keratinocytes. Allergic potential of A-20 peptide was assessed using ELISPOT technique (IL-4, IL-5 and IL-13 releasing by human PBMCs) and basophil activation test (CD63, CD203c and CCR3 antigens expression by basophils). The studies show that A-20 is not cytotoxic to human keratinocytes and does not inhibit their proliferation in concentrations upto 50 µg/mL. At the same time, A-20 can stimulate proliferation of keratinocytes in lower concentrations. Moreover, it does not activate PBMCs or basophils *in vitro*. Additinally, A-20 inhibits IL-4 and IL-13 production by concavalin stimulated PBMCs *in vitro*. The obtained data led to a conclusion that A-20 can be helpful in treating wound infections caused by *S. aureus* and *S. pyogenes* and therefore enhance wound healing.

Biography

Milena Deptula is currently working at the Department of Embryology in Medical University of Gdansk and a Participant in STRATEGMED research project entitled "Novel technologies for pharmacological stimulation of regeneration". She has completed her Engineer and Master's degree in the field of Cancer Stem-like Cells Biology in the Department of Pharmaceutical Technology and Biochemistry at Gdansk University of Technology.

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