



## **„NEW PEPTIDE DERIVATIVES, METHOD OF THEIR PREPARATION AND APPLICATION”**

---

### ***Product description***

---

The subject of the offer is the elaborated method of the production of new peptide derivatives modified with a deoxycholic acid residue that may be applied in the manufacture of a medicament or an antimicrobial disinfectant against gram-positive, gram-negative bacteria and an antifungal agent.

Almost 90% of human bile acids are secondary deoxycholic acid and primary chenodeoxycholic and cholic acids. Thanks to their structure, these acids are hydrophobic-hydrophilic in nature. They exhibit detergent characteristics and are capable of creating micelles in the aquatic environment within the range of concentrations (0.6-10 mM), which determines their physiological functions.

Derivatives of bile acids combined with various types of amine-group-containing compounds are widely described in the literature. Designing bile acid conjugates with peptides significantly reduces their susceptibility to enzymatic biodegradation and increases their ability to penetrate biological membranes.

### ***Key words***

---

Peptide derivatives, deoxycholic acid residue, disinfectants, antimicrobial action, antifungal action.

### ***Legal status of the product***

---

Polish Patent Office:

PL 226054 B1 „New peptide derivatives, method of their preparation, pharmaceutical composition, disinfectant composition and application and set” – Reported to Polish Patent Office on 4 December 2014 and labeled with No. P.410369, decision to grant a patent dated on 22 December 2016 – the sole authorized entity to patent is Medical University of Gdansk.

### ***Subject of offer***

---

The subject of the offer is the manufacturing process and the pharmaceutical composition of new N<sub>ε</sub>-trifluoroacetyl peptide derivatives modified by the steroid system (deoxygenic acid residue). Proposed peptide compounds can be used for the manufacture of a medicament and/or disinfectant with antibacterial activity against Gram-positive, Gram-negative bacteria and with antifungal action.

### ***Product research funding to date***

---

The project was financed from the resources N N405 025040 "Assessment of peptide use potential in



## „NEW PEPTIDE DERIVATIVES, METHOD OF THEIR PREPARATION AND APPLICATION”

---

### *Analysis of market competition*

---

New peptide derivatives can be widely used in a variety of medical industries, both for the manufacture of medicines and disinfectants. The use of the proposed compounds for the production of medicinal products with antimicrobial and antifungal properties is an innovative approach and may contribute to the development of production techniques for new, necessary pharmaceuticals. Every year, there is a significant increase in demand for pharmaceutical products, including antiseptics and medicines. High competition in the market of antimicrobial or antifungal products makes the proposed innovative solution highly attractive to the industry.

### *Advantages of the proposed product*

---

The formation of steroid bile duct connections with peptides allows for a wide range of structural changes as well as physicochemical and biological properties changes. Thanks to its extraordinary features such as high availability, chirality and biological activity, steroid systems can be used to design artificial enzymes, receptors, epitopes, antimicrobial compounds or to improve the pharmacological profile of known peptide drugs.

The steroid system contributes to reducing the conformational flexibility of the attached peptide chain. Physiological routes of bile-acid transport in the intestinal-hepatic circulation can be used to transfer drugs with peptide structure. The steroid system can be a useful tool in designing liver-specific prodrugs, targeting their transport, or increasing the bioavailability of poorly absorbed drugs.

The proposed pharmaceutical composition exhibits beneficial use for selected microorganisms: *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Bacillus subtilis*, *Escherichia coli*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Candida albicans*, *Aspergillus Niger*. The composition may be intended for use on microorganisms isolated from the surface of medical materials. The proposed new peptide derivatives can also be used to produce a medicament for the treatment of diseases caused by bacterial or fungal activity. These compounds may find potential use in the treatment of infections caused by drug resistant bacterial strains.