ANTIBACTERIAL ALTERNATIVE TO ANTIBIOTICS, WITH HIGH SPECIFICITY AGAINST ESCHERICHIA COLI

PATENTED TECHNOLOGY

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ABSTRACT

The "**Molecular Microbiology**" research group at the **University of Alicante** has modified several phage **proteins (Poll-N and UK-C)** that have high specificity against Escherichia coli (E. coli), but not against other Gram-negative (G-) bacteria.

For these reasons, their use as a specific **antimicrobial against E. coli** is potentially interesting, especially in the case of contaminated food, cosmetics or water. It would also be useful in the treatment of diseases (infections) caused by E. coli.

The presence of a histidine tail attached to the phage proteins not only **facilitates their purification** but also improves **lysis efficiency** without the need of cell permeabilization treatments.

Companies interested in the **commercial exploitation** of the technology through license agreements and/or technical cooperation are sought.

TECHNOLOGY ADVANTAGES AND INNOVATIVE ASPECTS

The main advantages of the synthesized peptides, Poll-N and UK-C, are the following:

- The presence of a histidine tail at the N-terminal or C-terminal ends of synthesized peptides **facilitates their purification** and improves their **lysis efficiency**.
- They have a **high specificity** against E. coli as, among all bacteria tested, their lytic action is limited to those pertaining to this species without affecting any other belonging to other species, including closely related ones.
- Compared to antibiotics, a **lesser probability of resistance** occurrence is anticipated.
- Their use is expected to result, at most, **in negligible effects on resident microbiota** during the treatment of infections.
- **Simple formulation**, since no previous treatments of permeabilization of the external bacterial membrane are necessary, which in turn facilitates its application.

INNOVATIVE ASPECTS OF THE TECHNOLOGY

The main innovative aspect of the modified phage proteins is that they do not require prior treatments of OM permeabilization. Furthermore, the addition of nucleotides at the ends facilitates their manipulation and subsequent cloning in the appropriate expression vector. Finally, another innovative aspect is the generation of anti-E. coli endolysins whose sequence is significantly different from others.

MARKET APPLICATIONS

The present invention is framed in the general field of **genetic engineering** and, in particular, it refers to viral proteins that have been modified by means of the addition of a polycationic tail of amino acids at the N-terminal or C-terminal end, in such a way that they present antibacterial activity against E. coli without previous treatments of envelope permeabilization. Both proteins show a high specificity to E. coli.

Therefore, the developed polypeptides can be used both as antimicrobial agents against E. coli (particularly in food, cosmetics, water contaminated with E. coli, etc.), as well as in the treatment of diseases (infections) produced by E. coli.

This technology could be applied in **biosanitary, veterinary, biotechnological, or agri-food companies** interested in antimicrobial treatments alternative to antibiotics to control the growth of E. coli.

COLLABORATION SOUGHT

Companies interested in acquiring this technology for its **commercial exploitation** through technology transfer agreements (see below) are sought:

- Patent licensing agreements.
- Technical cooperation agreements (R&D projects) for the use of the technology or application in other sectors.
- Subcontracting agreements for technical assistance, training, etc.

Type of company sought:

- Companies in the **biotechnology sector.**
- Companies in the **pharmacological sector**.