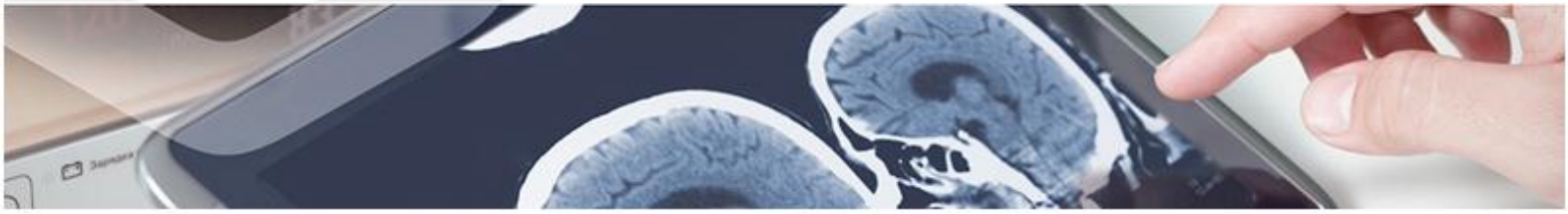
Therapy

Peptides for the treatment of infections caused by Gram-negative pathogens

A research group from the Andalusian Public Health System, in collaboration with the University of Seville, the Institut de Recerca Biomèdica (IRB), the University of Barcelona, the Hospital Clinic of Barcelona and IDIBAPS, has developed some outer membrane protein A (OmpA) inhibitors useful for the treatment of nosocomial infections caused by Gram-negative multiresistant and pandrug resistant pathogens.

Oficina de TRANSFERENCIA DE TECNOLOGÍA
Sistema Sanitario Público de Andalucía



Description

Severe nosocomial infections caused by *Acinetobacter baumannii* have increased recently, mainly at intensive care units. 18% of patients infected or colonized with *A. baumannii* developed bacteremia, associated with a mortality of a 34%. Moreover, it caused 9% of ventilator-associated pneumonia, with a mortality of 40% and is responsible of other serious conditions with a mortality rate of 25%. On the other hand, *Pseudomonas aeruginosa* is the second most common etiologic agent in hospital-acquired infections (10.2%) after *Escherichia coli* (17.6%). It has a mortality rate associated to ventilator-associated pneumonia of 34%-68% and the highest rate in bacteremia (18-61%). With regard to *E. coli*, its resistance to broad-spectrum beta-lactams has increased from 18% to 28% in recent years. In addition, 57% and 50% of bacteremia caused by extended-spectrum beta-lactamase-producing *Enterobacteriaceae* and those resistant to carbapenems have provoked the death of patients, respectively.

In this scenario, a substantial increase in resistance rates of *A. baumannii*, *P. aeruginosa* and *E. coli* to major antimicrobial treatment options has been observed in recent years. For this reason, the use of antibiotics such as imipenem, meropenem, ciprofloxacin, cefepime, tigecycline, colistin and amoxicillin/ clavulanate with multiresistant and pandrug resistant clinical strains is very limited. Hence, there is no alternative treatment approaches available for these three bacteria, aggravated by the lack of development of new antimicrobials against Gram-negative bacilli.

The present technology provides the use of peptides that inhibit the outer-membrane protein OmpA, known virulence factor in these pathogens, for treating infections caused by them. These peptides significantly reduce the adherence of microorganisms to three human lung epithelial cells, the interaction with fibronectin and biofilm formation as well as protect from cell death in *in vitro* assays. Some *in vivo* toxicity and efficacy studies have also been completed with very promising results.

Advantages

1. Innovative therapeutic approach.
2. The intervention is not based on the use of antibiotics, thus the appearance of new resistance phenotypes would not be a limitation, unlike current treatments.
3. No other OmpA inhibitors in development.

Intellectual Property

This technology is covered by a Spanish Patent Application with possibility of International extension.

Aims

We are looking for a partner interested in a license and/or a collaboration agreement to further develop and exploit this innovative technology.

Classification

Area: Biotech-Pharma (Therapy)
Technology: Biologics
Pathology: Infectious diseases

JUNTA DE ANDALUCIA
CONSEJERÍA DE IGUALDAD, SALUD Y POLÍTICAS SOCIALES
IBiS INSTITUTO DE BIOMEDICINA DE SEVILLA
FISEVI Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla
Hospital Universitario Virgen del Rocío. Edificio de Laboratorios, 6ª Planta. Avda. Manuel Siurot, s/n 41013 Sevilla. ESPAÑA ☎+34 955 013 647 MÓVIL: +34 671 597 574
☞pablo.hervas.exts@juntadeandalucia.es