Diagnostics

Rapid detection system for extended spectrum resistance to beta-lactams in combination with beta-lactamase inhibitors

A research group of the Andalusian Public Health System in collaboration with the University of Seville, has discovered a system for improving microbiological diagnosis in relation to the rapid detection of antimicrobial resistance mechanisms.

>> Oficina de
TRANSFERENCIA DE TECNOLOGÍA
Sistema Sanitario Público de Andalucía
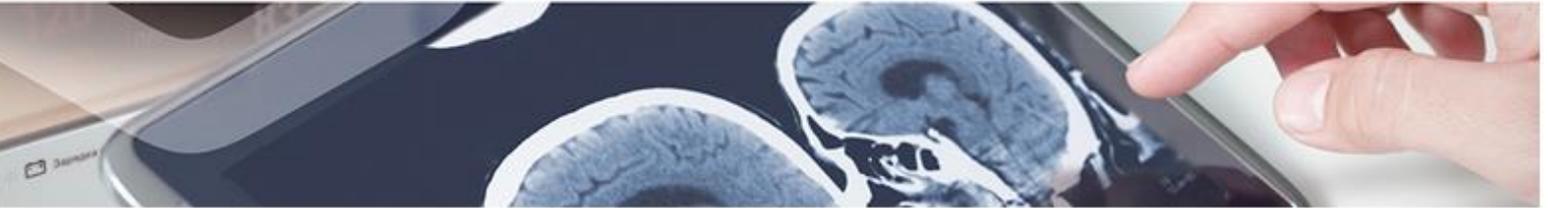
Description

Piperacillin / tazobactam is a broad-spectrum antibiotic recommended for the empirical treatment of serious infections, such as sepsis or intra-abdominal infection. However, the abusive use of this antimicrobial is leading to the appearance of strains resistant to it. In addition, there is evidence that there are clinical isolates of Escherichia coli sensitive to piperacillin / tazobactam, but capable of developing resistance to the antimicrobial if exposed to subinhibitory concentrations of the same. The early detection of this phenomenon, in isolates of E. coli resistant or potentially resistant to piperacillin / tazobactam is essential, in order to establish an adequate antibiotic treatment of serious infections, especially during the first 24 hours, at which time the use of Piperacillin / Tazobactam is of special relevance, thus avoiding possible therapeutic failure due to the presence of resistant bacteria.

This test is designed to solve these two problems since it allows to detect very quickly ($\leq$ 2 hours) both those clinical E. coli isolates that already have resistance to piperacillin / tazobactam and those isolates that can develop resistance to piperacillin / tazobactam. , although they are classified as sensitive by the commercial systems used in the Microbiology services. The test is based on a colorimetric method that allows the hydrolysis of the antibiotic to be detected by changing the color of the medium, as a result of the change in pH after the action of beta-lactamase. The time it takes for the medium to change color will indicate whether the clinical isolate presents resistance to piperacillin / tazobactam ($\leq$10 minutes) or possible acquisition of resistance to it (between 11 and 120 minutes).

Advantages

1. The time to obtain results is a maximum of 2 hours, compared to 18-24 hours of current standard methods.
2. It would allow a better optimization in the use of antibiotics, the decision making of the treatment and the management of the patient.
3. Ease of carrying out the method, not requiring any previous technical experience or equipment.
4. Its implementation in clinical practice would not produce a large increase in the total costs of the process (cost per determination of about € 0.20).

Intellectual property

This technology is covered by a International patent application (PCT).

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: Microbiological diagnosis
Pathology: Infectious diseases

Junta de Andalucía

FISEVI
Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla