

# HAPTENS, ANTIBODIES, AND METHOD TO DETECT *PSEUDOMONAS* *AERUGINOSA* INFECTIONS

## ABSTRACT

The present invention is related to the design of haptens, structurally related to pyocyanin, a toxin secreted by the Gram negative bacterium *Pseudomonas aeruginosa*, and its derivatives. It is also related to the hapten conjugates used for the production of specific antibodies against such substances. Furthermore, the invention refers to a method and a kit for the detection and quantification of pyocyanin and its derivatives, using the mentioned antibodies, to detect infections due to *Pseudomonas aeruginosa*.

It was developed by researchers belonging to the Spanish National Research Council (CSIC); the Biomedical Research Networking Center in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN); and the Autonomous University of Barcelona (UAB).

## DESCRIPTION

The authors of the present invention have designed and synthesized pyocyanin-like haptens, and its derivatives, such as 1-hydroxyphenazin, for the production of specific antibodies against these compounds. Particularly, with these antibodies, a diagnostic tool has been developed, allowing the quantification of 1-hydroxyphenazin and/or pyocyanin in subject samples. Thus, detecting *Pseudomonas aeruginosa* infections.

A key aspect of this invention is the design and synthesis of the immunizing haptens and its conjugates. Their structures allowed the production of specific antibodies.

Other aspects of the invention are the use of these antibodies, the method, and the kit for the detection and quantification of 1-hydroxyphenazin and/or pyocyanin in order to detect *Pseudomonas aeruginosa* in sample from subjects.

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## APPLICATIONS

Detection of *Pseudomonas aeruginosa* infections

Quantification of 1-hydroxyphenazin and pyocyanin in subject samples.

Immunoassays  
(ELISA, lateral-flow immunoassay, Western or dot blotting, immunoturbidimetry, immunosensor, immunosorbents, immunoprecipitation, radioimmunoassay, immunofluorescence, immunohistochemistry, flow cytometry, etc.)

Immunoaffinity extraction systems  
(chromatography, biofunctionalized particles, etc.)

## DEVELOPMENT STATUS

Developed  
Laboratory tested

## AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement
- Further research or development

## TECHNOLOGICAL OFFER

## INNOVATIVE ASPECTS AND ADVANTAGES

Design of immunizing haptens, capable of generating specific antibodies

Highly specific and sensitive tests, decreasing detection threshold

Quick diagnostic tests, shortening time for pathogen identification

Automated, miniaturized, and non-invasive tests

Tests require a small volume of samples, easily obtainable.

Neither specialized personnel nor clinical laboratory needed

## INDUSTRIAL PROPERTY

Spanish patent granted **ES 2504715 B1**

European patent granted **EP 2966066 B1**

USA patent granted **US 10,422,791 B2**

## CONTACT DETAILS

[fsantos@ciber-bbn.es](mailto:fsantos@ciber-bbn.es)

[www.ciber-bbn.es](http://www.ciber-bbn.es)