PHERECYDES PHARMA is a biopharmaceutical company developing new products against emerging bacteria threats, combining, in an integrated approach, diagnostic and therapeutic products based on phage technology.
Diversified libraries of bacteriophages are created by stochastic recombination of their targeting system, and biotechnological applications are derived, such as miniaturized biosensors and pharmaceutical applications.

Our mission is to develop new tools to rapidly detect a large range of biothreat agents, including multi-resistant, emergent or previously uncharacterized bacteria and treat people and their environment against them.

The diversity of our phage libraries allied to the exceptional properties of bacteriophages allow us to address infectious problems in biodefense, environmental hygiene, food safety, veterinary and human therapeutics.

PRODUCTS AND SERVICES

Development of antibiotic resistance has emerged as a significant medical challenge.
Our products are designed to reinforce biodefense systems and to strengthen the fight against hospital infections: phage-based biosensors for real time detection of bacteria (biothreat agents, multi-resistant bacteria) and solutions for surface decontamination (hospital hygiene). Further developments concern the detection and neutralization of food poisoning bacteria and microorganisms presenting risks for the environment.

PARTNERING OBJECTIVES

We seek strategic partners for biosensor and pharmaceutical developments. Bacteriophage biotechnological applications include novel nanotechnologies like biosensors, and phage therapy, where bacteriophages emerge as a new approach in fighting against hospital infections or problems involving biofilms. We seek partners to transform the unlimited specificity of our phage libraries into the new tools for bacterial infections control. We are open to OEM strategies (phages, devices ,...) to give access to our technologies in specific markets.

TECHNOLOGY

BRIEF DESCRIPTION

Our technology targets bacteriophages, the natural viruses of bacteria. Despite very efficient properties for specific detection and rapid lysis of bacteria, phages have not yet been fully exploited as biotechnological tools due to the inefficient process of selecting them from nature. Our phage libraries are produced by targeted stochastic mutagenesis within key proteins of the targeting system of phages. The range of specificities is thus extended so as to potentially address any infectious problems due to new or emergent bacterial species. These flexible tools are incorporated into miniaturized detection devices and solutions for neutralization of bacteria.

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TECHNICAL DESCRIPTION

The phage host-targeting proteins are stochastically engineered to encode hypervariable regions interspersed between constant domains. Each engineering step generates millions of variants for a given protein, and when several proteins are being thus manipulated, the number of variants generated nears practical infinity. Thus, starting from a single phage, this results in the creation of a huge diversity of specificities. The phage libraries are then further characterized on collection bacterial strains.

INDUSTRIAL APPLICATION

Progress in the biotechnological exploitation of phages is ongoing: understanding of phage molecular biology has been exploited to generate novel nanotechnologies like biosensors for diagnostics, and new bacteriophage-based therapies are emerging for the management of hospital infections or problems involving bacterial biofilms. Pherecydes Pharma focuses on emergent infectious problems that are resistant to current strategies.

-ADDED VALUE

The high specificity of phages for their bacterial host is a key attribute, resulting in a high efficiency compared to classical antibiotic strategies or compared to molecular tools (DNA, antibodies) for diagnostics. The construction of large bacteriophage libraries by means of a stochastic recombination effectively foil the development of bacterial resistances.

INTELLECTUAL PROPERTY – KNOW HOW

PHERECYDES PHARMA holds two patents covering the production processes for extremely diverse phage libraries. The diversity is created at very specific regions of bacteriophage genome and can target any gene or combination of genes. The phage panels are designed and regularly updated for each application domain.

The two patents (TAPE and AB-ACCUS) were invented by Bio-Modeling Systems CADI™ discovery process. Pherecydes-Pharma, the owner is finalizing the development of these two disruptives technologies.

TAPE: A technology allowing to rapidly & simultaneously introduce defined densities of random mutations in any number of selected regions within a gene while conserving intact any number of defined coding domains in this same gene (applicable to all proteins, including antibodies, enzymes, etc..).
AB-ACCUS: A recombination technology allowing the rapid & efficient production of phage banks in which every individual differs from all others for any number of selected genes or other sequences.

CORPORATE

Pherecydes-Pharma is a spin-off of Bio-Modeling Systems that was incorporated on December 20, 2006 and financed by two defense/security specialized funds (FCPR Security fund and Financière de Brienne) managed by the V.C. ACE Management. The other shareholders are Bio-Modeling Systems and the two co-founders of Bio-Modeling Systems.

TEAM:

- Thierry Raynaud , C.E.O.
- Flavie Pouillot (PhD): Research program manager
- Scientific committee president: Dr. François Iris, founder & CSO Bio-Modeling Systems

Advisory board:

- Manuel Géa, President, Co-founder & C.E.O. Bio-Modeling Systems: www.bmsystems.net
- Michel Joli, Vice-President, former defense medical doctor
- Delphine Dinard, ACE Management

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