



Pherecydes Pharma secures DGA funding for evaluating the use of bacteriophages against infected, antibiotic resistant burns

The French Government Defence procurement agency invests €900,000 towards Pherecydes Pharma managed €1.2-million project, involving several university laboratories

Paris, France – January 18, 2012 – Pherecydes Pharma, a biotechnology company specialized in the research and development of lytic bacteriophages for both therapeutic and diagnostic purposes, today announces that it has received funding of €900,000 from France's General Directorate for Armaments (*Direction Générale de l'Armement* - DGA) to part-finance PACOBURNS project. This project is set up to explore the possibility of using bacteriophages to combat bacterial infections that are resistant to antibiotics, especially skin infections.

The funds invested by the DGA fall within the framework of its RAPID program. The scheme supports dual innovation by small and medium-sized companies through providing financial assistance for projects that have great technological and commercial potential, are innovative in terms of industrial research, and have both military and civilian applications. The Institute of Genetics and Microbiology of the University of Paris XI and the Armed Forces Institute of Biomedical Research (*Institut de Recherche Biomédicale des Armées* - IRBA) are also involved in this project.

The PACOBURNS project aims to explore the role and potential of bacteriophages as a means of combating bacterial infections, especially against germs that are multi-resistant to antibiotics. It also involves promoting the use of phages as a credible alternative to antibiotics.

Using relevant animal models, PACOBURNS will make it possible to evaluate the therapeutic efficacy, safety and pharmacodynamics of two cocktails of bacteriophages. The first one is designed for infections caused by *Escherichia coli* type bacteria, and the second for infections caused by *Pseudomonas aeruginosa* species, and more specifically for treating open burn wounds infected by these resistant germs. Trials on humans are scheduled to begin early-mid 2013.

The project is targeting a market where antibiotics are becoming less effective. Resistance to antibiotics has become a major public health problem; at least 25,000 people die in Europe each year as a result of antibiotic-resistant infections.

This challenge is also of concern to the armed forces' health services, which are encountering increasing resistance to antibiotics in both military personnel and civilians, especially when it comes to the treatment of serious burns, as well as respiratory tract infections.

In the current state of pharmaceutical research, no new antibiotic is likely to reach the market over the next eight to ten years. It is against this background of therapeutic bottleneck that phagotherapy is emerging as a realistic alternative to current treatments that are losing their effectiveness.

"Despite optimizing the use of antibiotics, situations of therapeutic impasse are increasingly common in the case of multi-resistant bacteria," explained Dr. Patrick Jault, head of the Burns Treatment Center of Percy military hospital near Paris and the future coordinator of

the multicenter trial in man. "It is thus essential to explore new avenues, and bacteriophages are one of the most promising. It is now crucial to evaluate their merits and their therapeutic potential in humans."

Pherecydes Pharma is going to bring to the PACOBURNS project its expertise in the isolation and purification of lytic bacteriophages capable of destroying certain bacterial strains, including strains that have become resistant to antibiotics. Thanks to its large collections of bacteriophages (including the world's biggest collection of bacteriophages against *E. coli*), the company will concoct the two cocktails to be used in this project.

Pherecydes Pharma will also be responsible for the bioproduction of phages in GLP (Good Laboratory Practice) conditions, the finalization of the liquid formulas, and the initial *in vitro* tests. Preliminary tests conducted in rats demonstrated a complete absence of toxicity, perfect tolerability and 100% efficacy.

"Pherecydes Pharma's participation in this innovative project is a major recognition not only of its technology but also of the therapeutic potential of its products," said the chairman of Pherecydes Pharma, Jérôme Gabard. "Bacteriophages are a solution of the future for problems associated with bacterial resistance, and this project should help establish phagotherapy as both an alternative and a complement to antibiotic-based treatments."

PACOBURNS will enable Pherecydes Pharma to speed up the development of its leading therapeutic products, in particular through facilitating their future evaluation in man by the major burns units of military and civilian hospitals. The company then intends to extend the topical application of its cocktails to other skin pathologies (such as varicose ulcers), after that to test new products administered by aerosol and lastly by the internal route.

As for the other partners in the project, the Institute of Genetics and Microbiology of the University of Paris XI will be responsible for electronic microscopy and bacteriophage sequencing, while IRBA will provide a mouse model adapted to the initial preclinical evaluations.

ACE Management, the majority shareholder in Pherecydes Pharma, has close ties with defence companies along with defense-related projects and is supporting this promising innovative project. The second shareholder BioModeling Systems, has innovations that have helped Pherecydes Pharma participate in the PACOBURNS project.

About Pherecydes Pharma

Pherecydes Pharma SA specializes in the research and development of lytic bacteriophages (or phages) for both therapeutic and diagnostic applications. The company provides innovative and adaptable solutions to combat multi-resistant bacteria, through developing mixtures of natural phages and their accelerated *in vitro* evolution. Pherecydes Pharma is the only company currently that has been able to harness this evolution technology, allowing a head start on any given bacterium.

Due to the unique knowledge of the company in the characterization and rapid isolation of natural lytic phages, Pherecydes Pharma has developed a large bank of bacteriophage mixtures for combating infections that are resistant to antibiotics, which have steadily increased in number since the 1980s. In particular, it possesses the world's largest collection of phages against *Escherichia coli* and is also working on *Pseudomonas* and *Staphylococci*, three bacteria that alone represent over 50% of known infections in industrialized countries.

Pherecydes Pharma's proprietary technology is protected by three patents. The most important patent, TAPE®, targets the accelerated optimization of protein. The company is putting in place a standardized and certified industrial-scale phage development platform and plans to embark on clinical trials of its first products before the middle of 2013. Besides the human health sector, Pherecydes Pharma's technologies are also applicable in the areas of nanotechnology and biodefense.

Pherecydes Pharma is based at the Biocitech life sciences technology park near Paris and has been operational since the end of 2007. It currently employs six people and plans to double its workforce in 2012. It has raised over 2.3 million euros from private investors and OSEO, France's state innovation fund. The company collaborates with academic institutions such as the University of Paris-Sud, the French National Scientific Research Center (CNRS), and various university hospitals, as well as with military partners, such as IRBA, the military hospitals of Percy and Bégin in France and Queen Astrid in Belgium, and with the PHAGESPOIRS patients' association (which promotes the use of phage-based therapeutics).

For further information, go to: <http://www.pherecydes-pharma.com>

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