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Press Release

CorWave's next-generation LVAD, Neptune, receives funding

The CALYPSO program will receive 14 million euros to develop CorWave Neptune, a new type of cardiac support to improve the management of patients with severe heart failure, as part of the *Program d'Investissements d'Avenir* (PIA) operated by Bpifrance.



The CALYPSO Research and Development (R&D) program, with a total budget of 25 million euros over 4 years, will be partially financed with 14 million euros support from the *Program d'Investissements d'Avenir* (Future Investments Program), managed by the Secrétariat Général pour l'Investissement (General Secretariat for Investment – SGPI) and operated by Bpifrance.

A breakthrough technology addressing an important public health issue: chronic heart failure.

The CALYPSO program aims to **optimise and then clinically evaluate the CorWave Neptune device**, an implantable cardiac support blood pump (Left Ventricular Assist Device or LVAD). Neptune features natural physiological response, designed to reduce the risk of complications associated to current LVADs and intended for patients suffering from severe heart failure. Heart failure is involved in one in ten deaths in France. This chronic disease can be fatal, with nearly half of patients dying within five years of diagnosis. The number of patients affected by heart failure increases as the population ages and becomes more sedentary.

Louis de Lillers, CEO of CorWave, leader of the CALYPSO project: " *We are very pleased to set up major partnerships with world-class university hospitals, thanks to the financial support of Bpifrance and the French Government. The CALYPSO program considerably increases the resources allocated to preclinical and clinical studies prior to the marketing of Neptune, a cardiac support pump that closely mimics the physiological flow of the native heart. This program will help CorWave convert its disruptive technology into a sustainable competitive advantage to establish itself, as a global leader in cardiac support, a market that already accounts for nearly \$1 billion in annual sales.*"

Professor Pascal Leprince, Head of Cardiac and Thoracic Surgery at the AP-HP Pitié-Salpêtrière Hospital and Professor at the Sorbonne University Faculty of Medicine: " *With its breakthrough technology, CorWave is in principle capable of generating pulsatile flow, similar to that of the body's normal physiology, reducing the serious complications associated with continuous flow pumps. Our teams, in collaboration with the IHU-ICAN research teams and the medical teams at CHU de Lille Hospital, look forward to conducting clinical trials with patients equipped with current and future LVAD technology.*"

Professor Sophie Susen, Head of Haemostasis and Transfusion at the CHU de Lille hospital and Professor in the Faculty of Medicine at University of Lille: *"We are thrilled to be participating in the development of the CorWave Neptune pump through our experimental models and our expertise in haemostasis. We hope to better understand and control the risk of bleeding involved in the operation of current rotary pumps. The collaboration with the AP-HP Pitié-Salpêtrière Hospital and LadHyX is an opportunity to create a cross-sectoral impetus in France that, in addition to supporting the development of CorWave, will advance the understanding of bleeding associated with circulatory assistance."*

The CALYPSO consortium is led by CorWave, the main project partner, and includes:

- **CorWave**, a French high-tech company that develops innovative implantable heart pumps using a disruptive technology, the wave membrane. This patented technology, inspired by nature, is capable of replicating a pulse and flow velocity similar to those of a healthy heart, thereby reducing the risk of complications associated with current pumps. Supported by renowned investors and the recipient of numerous awards for its pioneering technology, CorWave has been identified as a company with hyper-growth potential.
- **AP-HP Pitié-Salpêtrière Hospital** is one of the world's top three heart transplant centres and a world-renowned cardiac support centre, and the leading LVAD implant centre in France.
- **Lille University Hospital** is a centre of excellence in the treatment of Willebrand disease and is world-renowned for its expertise in haemostasis, in particular the assessment of haemorrhagic risk in patients with implantable cardiac devices. This team was the first to describe the links between flow abnormalities and blood biology in a 2003 publication in the *New England Journal of Medicine*.

The consortium will also work with the French Institute of Cardiometabolism and Nutrition (**IHU-ICAN**), as part of the clinical studies conducted with teams from the AP-HP Pitié-Salpêtrière Hospital, and the **INSERM** research institute in conjunction with Lille University Hospital. It will also benefit from the expertise of **eDevice**, a company specialising in the development of telemedical solutions, and **LadHyX**, the hydrodynamics laboratory at the Ecole Polytechnique, which will provide support in the field of fluid biomechanics in cooperation with Lille University Hospital.

CorWave, the CALYPSO program leader, will coordinate all the R&D and clinical investigation activities for the project and is responsible for ensuring its successful execution.

The CALYPSO program is designed to incorporate all the development stages of the Neptune cardiac assistance pump, as well as a scientific and clinical support, essential to ensure the device obtains CE marking. The improvement of the risk-benefit associated with LVADs via the optimisation of Neptune's operating parameters during the program should make it possible to reduce complications and to be able to offer this effective therapy to a wider patient population.

The CALYPSO program will enable CorWave to maintain its technological lead and strengthen its clinical impact by greatly improving therapy and care for patients fitted with LVADs.

About CorWave

CorWave is a French company that develops innovative cardiac support devices. The CorWave technology stands out from other LVADs currently on the market due to its physiological design enabled by a unique undulating membrane. Among other things, it is able to mimic a pulse and produce blood flow velocity similar to that of a healthy heart. Eventually, CorWave's membrane pump technology should reduce complications associated with current devices and improve the care of patients with heart failure, a market potentially worth several billion euros.

Founded in 2011 by the incubator MD Start and supported by well-known investors, including Bpifrance, Novo Seeds, Seventure, Sofinnova and Ysios, CorWave has received over €20 million of financing and employs more than fifty people.

Find out more: www.corwave.com

About Bpifrance

Bpifrance finances companies – at every stage of their development – through loans, guarantees and equity capital. Bpifrance supports them in their development projects and internationally. Bpifrance now offers a wide range of products to help them in their export business. The company also offers consulting, university, networking and acceleration programs for start-ups, SMEs and IT companies. Thanks to Bpifrance and its 48 regional offices, entrepreneurs benefit from a close, exclusive and efficient partner to help them face their challenges.

More information at: www.bpifrance.fr/presse.bpifrance.fr Follow us on Twitter: @Bpifrance - @BpifrancePresse

About AP-HP

The AP-HP is a university hospital centre and a major player in clinical research in France and Europe, as well as being renowned worldwide. Its 39 hospitals treat 10 million patients each year: on an emergency basis, during scheduled hospitalisations or at home. It provides a public health service open to all, 24 hours a day, which is both a duty and a source of pride. The AP-HP is the largest employer in the Greater Paris region: 95,000 people – doctors, researchers, paramedics, administrative staff and workers – work there.

Find out more: www.aphp.fr

About the Program d'Investissements d'Avenir (*Future Investments Program*)

With a budget of 57 billion euros, the Program d'Investissements d'Avenir (PIA), led by the General Secretariat for Investment (SGPI), was set up by the State to finance innovative and promising investments in France. Six national priorities have thus been identified to enable France to increase its growth and employment potential:

- higher education, research and training,
- the development of research and its spin-off to the world of business,
- sustainable development,
- industry and SMEs,
- the digital economy,
- health and biotechnology.

The third component of the PIA, the PIA3, is part of the General Investment Plan (GPI) laid out by the French prime minister on 25 September 2017.

To learn more about investments in the future: <http://www.gouvernement.fr/secretariat-general-pour-l-investissement-sgpi>

Twitter: @SGPI_avenir



About CHU de Lille Hospital

Lille University Hospital is one of the largest university hospitals in France, bringing together a community of more than 16,000 professionals whose multidisciplinary expertise in the fields of care, research and innovation is internationally recognised. Lille University Hospital is one of France's leading university hospitals in terms of the quality of its research and its research is organised around six different fields: Cancer – Neurosciences – Inflammation, infection and immunity – Metabolic and cardiovascular diseases – Longevity – Prevention.

Press contacts:

CorWave

Florence Portejoie

FP2COM

+ 33 (0) 6 07 76 82 83

fportejoie@fp2com.fr

Bpifrance

Annelot Huijgen

+33 (0)1 41 79 94 48

annelot.huijgen@bpifrance.fr

Secrétariat Général pour l'Investissement (SGPI)

Vincent Deshayes

+33 06 98 60 55 31

Vincent.deshayes@pm.gouv.fr