



SIMCARDIOTEST: WHERE ARE WE?

Simcardiotest is a collaborative project that brings together eight organizations in six European countries, funded by the European Commission (H2020). The challenge is to build an online platform for conducting in silico clinical and pre-clinical trials, based on the production of a digital model of the heart to evaluate three use cases. Initiated two years ago, the project will end in 2024. By then, the major challenge for the research teams is to succeed in generating a large panel of digital hearts to simulate as many situations as possible, and then to exploit the significant amount of data generated. It's on this very theme that the INNOVAHEART day was focused, which was organized on March 22, 2023. ■



EUROPEAN FUNDING TO PUSH BACK THE BOUNDARIES OF CARDIAC MRI SCANS

Interview with Prof. Aurélien Bustin, Researcher at Liryx and in the Cardiovascular Imaging Department of University Hospital of Bordeaux, Junior Professor at the University of Bordeaux and Visiting Researcher at the Lausanne Vaudois University Hospital Centre, Winner of a European Research Council Starting Grant 2022 (Horizon Europe) worth €1.5 million for his “SMHEART” cardiac imaging project.

What does your research consist of?

My research sits at the frontier of cardiology, medical imaging and data science to help improve patient care. The approach is inspired by my international academic and professional experience that gave me a multidisciplinary and translational view of cardiac imaging. My work has led me to look at both the advanced acquisition of cardiac images, but also at image reconstruction, so as to push back the boundaries of magnetic resonance imaging (MRI).

What scientific challenge does the “SMHEART” research project respond to?

To understand and treat cardiovascular disorders, MRI remains the only way of providing a complete assessment of the function and structure of the heart, without exposing the patient or the operator to potentially dangerous radiation. However,

radiographers are overwhelmed with hundreds of complex MRI sequences, while clinicians spend considerable time extracting the relevant diagnostic elements. From a scientific point of view, the lack of interaction between specialists hinders a detailed and complete study of cardiac pathology. At the same time, when considering the patient journey, I was struck by the difficulty of the examination. As such, there's an urgent need for discovery and innovation in this field.

What's the goal of the SMHEART project?

The goal is to unleash the full potential of MRI by introducing a fast, one-click, fully automated and comprehensive imaging pipeline, applicable to diagnosis, prognosis and therapy selection in cardiology. This approach will enable the rapid collection of a single 3D multiparameter volume of the whole heart during free breathing, therefore more comfortable for the patient, with automated extraction of the anatomy, function and characteristics of the heart tissues, thanks to artificial intelligence. This is not only the condition for a wider adoption of MRI in cardiology and the opportunity for better diagnosis, but it also offers the opportunity to improve knowledge of cardiovascular disorders, thanks to a multiparametric approach. ■

CADENCE PRIZE

On the occasion of the Prix Cadence ceremony and thanks to fundraising, Liryx rewarded the members of its teams invested in the CadeNCE program for their remarkable work.

Launched in March 2015 with the University Hospital of Bordeaux, this unique program on the heart made possible thanks to organ donations for research, makes it possible to explore the electrical properties of the heart in vitro and ex vivo, using state-of-the-art technologies in basic and clinical electrophysiology. Coupled with the expertise of CAdE NCE members, this multidisciplinary and translational approach offers advances in the understanding of the molecular mechanisms of atrial



fibrillation, of the Purkinje network in human ventricular arrhythmias, and in electrical remodelling in hereditary disorders, such as arrhythmogenic right ventricular cardiomyopathy. Ultimately, the programme aims to anticipate and to implement a protocol to meet biological and clinical needs that are adapted to the various cardiac arrhythmias.