

## **2017, a fundamental year for the CNIC**

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*The results of our research will allow an economic return of the investment in terms of reduction in the waiting lists, better use of the equipment or a decrease in the costs of hospitalization*

Since the Carlos III National Center for Cardiovascular Research (CNIC) was consolidated in 2006, thanks to the collaboration between the Spanish Government and the Pro CNIC Foundation,

excellence in research and translation of this knowledge in improving the treatment of patients have been the fundamental objectives of the CNIC. Excellence is demonstrated year after year with the publication of the research carried out in our center in the most important scientific journals. In 2017 alone, more than 250 studies were published in prestigious journals such as *Nature*, *Science*, *Embo Journal*, *Journal of the American College of Cardiology (JACC)* or *Cell Metabolism*, among others.

But 2017 has been, without a doubt, a fundamental year for the CNIC in the translation of this knowledge. In addition to the publications and the substantial amount of funding obtained in national and international projects by the groups at the center, this year it is a proven fact: the research we are doing is being transferred to the patient and benefiting society. Four examples illustrate this 'return' of the resources invested in research for the benefit of society:

### **PESA CNIC-Santander Study**

The PESA-CNIC-Santander study is already a worldwide reference in cardiovascular research. Since its beginning 7 years ago, this study, which includes more than 4,000 participants, assesses the presence and development of subclinical atherosclerosis through the use of innovative imaging techniques and its association with various molecular and environmental factors, including those related to lifestyle (eating habits, physical activity, psychosocial factors and sleeping habits). Their findings are helping to understand atherosclerosis in its early stages and provide essential information for the prevention of cardiovascular disease in apparently healthy people. In 2017 different sub-analysis from PESA have shown, for example, that it is possible that a more efficient reduction of 'bad' cholesterol or LDL is needed, even in those people considered to have an optimal risk; that an 'energetic' lacking breakfast (<5% of daily calories) doubles the risk of atherosclerotic lesions; that five indicators of health - Fuster-BEWAT index- (blood pressure, physical activity, body mass index, consumption of fruit and vegetables and tobacco) are enough to predict cardiovascular risk in healthy people, or that the vascular 3D ultrasound has been proven to be a key tool in identifying individuals at risk of cardiovascular disease. The study continues and I am sure that it will bring us new and interesting results that will improve the treatment and prevention of cardiovascular diseases.

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### **Fuster Polypill**

The first polypill approved in Europe for secondary cardiovascular prevention is the result of the public-private collaboration between the CNIC and the pharmaceutical company Ferrer. Sold in already 27 countries, its launch is planned for another 49 in the period of 2018-2019. The drug, available in Spain since January 2015, is indicated for patients who have survived a cardiovascular incident and require treatment to reduce the risk of a second incident. The drug, which is marketed under the name of Trinomia, includes three active ingredients: an antiplatelet drug to prevent the formation of thrombi, acetylsalicylic acid, a statin to control cholesterol levels and to stabilize atheromatous plaque, atorvastatin, and an ACE inhibitor, antihypertensive that prevents remodeling of the heart that occurs after a heart attack, Ramipril. The fact that the drug has been developed by the CNIC and Ferrer makes it an example of how Spanish innovation can be a leader worldwide.

### **Milestone in cardiac image**

The collaboration agreement between the CNIC and Philips allows us to have the most advanced cardiovascular imaging technology. Our goal is none other than to advance in the prevention, diagnosis and treatment of cardiovascular disease. Thanks to this cooperation agreement, a joint patent has been developed that marks a milestone in the field of cardiac imaging. Magnetic resonance imaging (MRI) is, today, the best technique to study the function and anatomy of the heart; however, it is a technically complicated test with examination times of over 30 minutes. But now, as a result of this collaboration, we have been able to reduce examination time to less than 1 minute, which undoubtedly represents a great benefit for the patient.

### **Myocarditis & infarction**

Myocarditis is a disease that is sometimes confused with a myocardial infarction, which makes its diagnosis difficult and can lead to inadequate treatments. Our work at the CNIC has allowed us to discover and validate a biomarker, already patented for the diagnosis of acute myocarditis. We are currently working on the joint development and licensing of the CNIC patent with a company to develop a biosensor capable of detecting the biomarker in blood samples of patients in 30 minutes, something that would be a fundamental tool in clinical practice for the differential diagnosis of acute myocarditis and myocardial infarction.

The first polypill approved in Europe for the secondary prevention of cardiovascular disease is the result of the public-private collaboration between the CNIC and the pharmaceutical company Ferrer

Finally, I would like to underline that some of these findings that we have made at the CNIC, and that are the result of continuous research over many years, have been crucial to include changes in the recommendations made annually by the European Society of Cardiology (ESC). The CNIC is mentioned 9 times in the new ESC guidelines.

### **Economic return**

The research we do at the CNIC not only affects the health care of the general population, but also produces an economic return that allows us to continue investing in projects and, in short, to mobilize the country's economy. For example, since its commercialization, the Fuster Polypill has generated royalties of more than 1 million euros. Likewise, we hope that the results of our research will allow, for example, a reduction in the waiting lists, a better use of the equipment or a reduction in the costs of hospitalization and treatment thanks to the new cardiac imaging techniques developed in collaboration with Philips, to secondary prevention with the Fuster Polypill or the differential diagnosis of myocarditis. All this means that, today, we can affirm that we are carrying out a translational research of excellence for the benefit of the patient and the Spanish society.

**Dr. Valentín Fuster**

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