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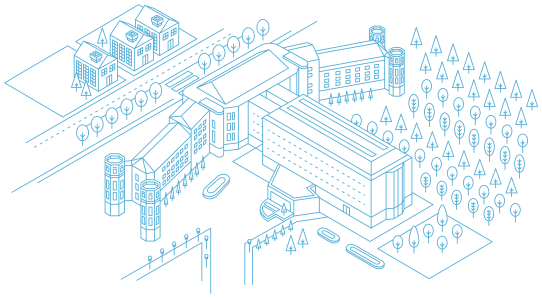
# CNIO FRIENDS *newsletter*

Latest news from the Spanish National Cancer Research Centre



COLUMN

## Advancing in Science

A few days ago, as every year, we published our 2016 scientific report, which includes the most relevant information about CNIO's scientific activities, innovation, and outreach. The results have been more than satisfactory. Starting with our presence in the major scientific journals, which have published 60 papers signed by our researchers, some of which have not only stirred the interest of the scientific community but also of the media and the general public.

This was a boost to the impact of our work, as are the partnerships we have entered into with industrial players to allow us to bring the findings of our laboratories to the hospitals. This is one of the centre's strategic lines that focuses on generating added value for society and cancer patients through the development of new diagnostic and therapeutic methods. Another of our priorities is to achieve a return on investment. Through our patent licenses, and thanks to our 44 inventors, we collected a total of 650,000 euros in revenue. Figures that increase every year and which represent a return on part of the investments made, of which we all partake given that we are a public centre.

And, I am not forgetting you, of course. At the close of the year we are now about 800 and this, my *friends*, has only just begun.

—MARIA A. BLASCO
Director

CNIO SCIENCE NEWS

Metastasis is the major cause of cancer-related deaths and its appearance remains a phenomenon that is difficult to predict and manage. We now know that, prior to the arrival of the cancer cells, tumours prepare the ground in the organ that they will later colonise. These areas with ideal conditions for the onset of metastasis are called pre-metastatic niches and targeting them will help to improve patient survival. These questions are the subject of a review paper published in *Nature Reviews* by an international group of experts in this field, including Héctor Peinado, head of the Microenvironment and Metastasis Group **(1)**. Hepatocellular carcinoma (HCC) is a deadly disease with no effective cure that develops in the context of liver diseases associated with chronic inflammation. A recent research article published in *The Journal of Experimental Medicine* describes how important a protein called c-Fos is for HCC development, because it affects cholesterol homeostasis in hepatocytes, the main cells of the liver. Using genetically modified mouse models (GEMMs), Erwin Wagner, director of the Cancer Cell Biology Programme, and his Genes, Development and Disease team experimentally document how c-Fos modulates premalignant hepatocyte transformation and how this is linked to cholesterol and inflammation. Maintaining healthy cholesterol levels in the organism is therefore important for preventing liver cancer **(2)**. The malignant transformation of hepatocytes is the origin of most hepatocellular carcinomas, an aggressive type of liver cancer with high mortality rates. But these cells do not act alone. Research conducted by Nabil Djouder, head of the Growth Factors, Nutrients and Cancer Group, reveals how hepatocytes "recruit" and "instruct" liver progenitor cells to contribute to the hepatic lesions. The paper appeared in the journal *Cell Reports* **(3)**.

OUR CENTRE

We started March with an event that we must describe as special given its purpose and significance. On the 7th of that month, our auditorium became a theatre for a few hours, staging the play *A Room of One's Own*. The performance, an adaptation by María Ruiz of the namesake book by Virginia Woolf, was received with great enthusiasm as part of the celebrations of International Women's Day. Clara Sanchís played the British author with great force and emotion before an audience that included a group of students from the Prince Felipe secondary school.

Emotion peaked that same week, during the IV Women's Solidarity March organised by the Municipality of Rojales (Alicante). The number of people exceeded all expectations and they ran out of numbers to honour Isabel Cañadas, who collaborated with CNIO

IV Women's Solidarity March of Rojales (Alicante)

Friends in the past so many times and whose loss we deeply regret.

With regard to scientific developments, we signed a collaboration agreement with PharmaMar a few weeks ago to identify new anti-tumour compounds. To this end, we have put in place screening tests to charaterise the anti-tumour potential of the marine compound library of the Spanish pharmaceutical company.

INTERVIEW

# «I consider myself very fortunate to have the opportunity of joining the CNIO»

Iván Plaza-Menacho is joining the CNIO as a junior group leader. More specifically, he will be heading the Kinases, Protein Phosphorylation and Cancer Group in the Structural Biology and Biocomputing Programme. Most of Plaza-Menacho's professional career has taken place outside Spain.

Iván Plaza-Menacho
Group Leader

### After so many years abroad, why did you decide to return to Spain?

The determining factor was the possibility of joining the CNIO as head of a group. After developing my scientific career in foreign countries, and spending so many years abroad, one is always eager to be able to return to Spain. At the same time, one is aware that the conditions and opportunities in Spain in scientific and professional fields are perhaps not the best. The fact that the CNIO has provided me with a guarantee to continue doing top-level science has been decisive. I consider myself very fortunate for the opportunity given to me.

### Your work focuses on deconstructing cancer at the molecular level. What tools do you use?

I apply multidisciplinary research processes to understand how the proteins that are directly involved in cancer function. In particular, I focus on the relationship of the three-dimensional information of these proteins with their functional status. To this end, I apply a series of techniques and methods from different disciplines, such as structural biology, biochemical and biophysical techniques, cell signalling tests, and I also use *Drosophila* (fruit fly) models. The ultimate goal of all this is to reveal the detailed mechanisms through which these proteins operate and thus be able to design drugs that are more efficient in fighting cancer.

### What are your medium-term goals?

To consolidate the lines of research that I have been developing independently throughout my postdoctoral career and to establish/direct a leading laboratory of scientific excellence that will become a reference point in basic cancer research. To do this, it is crucial to be in a position to compete for large European and international projects and I am convinced that, with the support of the CNIO, these objectives can be met.

PROFILE

## Tom Kirkwood

Newcastle Uni. Institute for Ageing

"Ageing is the key factor that is changing the rules of the game in the world", and Tom Kirkwood is one of the leading researchers in this field. On 10 March, he visited the CNIO during the Distinguished Seminars cycle sponsored by the Banc Sabadell Foundation to enlighten us on how and why we are living longer. Kirkwood's interest in ageing arose more than three decades ago and, in 1993, he became the first university professor on this subject matter in the United Kingdom. Later, he moved to the University of Newcastle where he has directed the Ageing Institute, one of the most prestigious in the world.

One of this researcher's most interesting aspects is that, in addition to having studied the genetic bases and the molecular mechanisms that underlie the ageing process and their evolutionary changes, he has also studied how the progressive increase in life expectancy affects societies and the entire planet. For this reason, he has become an advisor to the British Government and to the United Nations. "The increase in longevity" - he says- "has such a profound effect that it is altering each and every one of the aspects of society".

The first question to which we must find an answer to meet these challenges is why do we age. Kirkwood has a clear idea: "Given that we were not going to live for too long in nature, it never made sense for our genomes to invest in the maintenance of the repair systems that could give the body the potential to live indefinitely." If we affect them, we can extend life, as has been proven.

INVITED SEMINARS

### DISTINGUISHED SEMINARS

**13 MARCH**
**TOM KIRKWOOD**
Newcastle Univ. Institute for Ageing (UK)

**17 MARCH**
**REINHARD FAESSLER**
Max Planck Institute of Biochemistry (Germany)

**24 MARCH**
**IOANNIS AIFANTIS**
NYU School of Medicine (USA)

**31 MARCH**
**JOSÉ LUIS SANZ**
Autonomous University of Madrid (Spain)

**7 DE APRIL**
**JACOB (YAQUB) HANNA**
Weizmann Institute of Science (Israel)

**28 DE APRIL**
**KARI ALITALO**
Institute of Biomedicine (Finland)

### WOMEN IN SCIENCE OFFICE SEMINARS

**7 MARCH**
**'A ROOM OF ONE'S OWN'**
María Ruiz y Clara Sanchís (Spain)

**25 APRIL**
**ANA BOTELLA**
Former Mayor of Madrid (Spain)