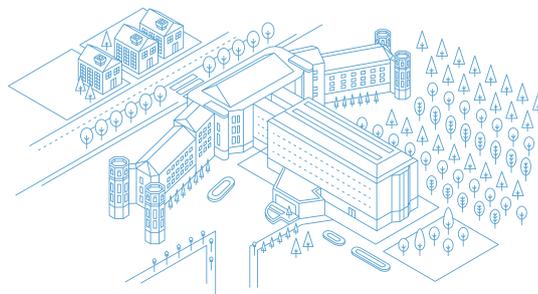


# CNIO FRIENDS

## newsletter

Latest news from the Spanish National Cancer Research Centre



 COLUMN

 CNIO SCIENCE NEWS

### Hopes and Challenges

The recent creation of a Ministry of Science by the new government is encouraging news, and we hope it will solve the underfunding of the science budget in our country as well as eliminate the bureaucratic obstacles that complicate scientists' work. Through its Minister, Pedro Duque, science will have the visibility that it deserves. At the CNIO, we are all very aware of the importance of being part of society's visible spectrum, thanks to initiatives like *CNIO Friends*. When researchers are able to bring what we are doing to the attention of the general public and to show how it can influence their lives, our relationship changes drastically. A few days ago, once again we had the chance to experience this first-hand at our annual meeting with our *Friends*; most of them are anonymous individuals who support cancer research at the centre. Similarly, focusing attention on research helps society to value investment in R&D&I as a source of wealth and development.

We wish Pedro Duque all the best in his new mission. Good luck!

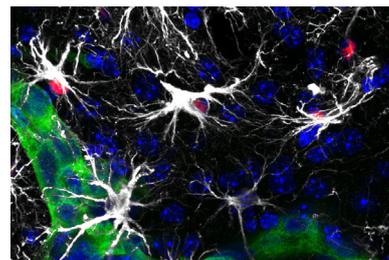
—MARIA A. BLASCO  
Director



Photo: Europa Press

To identify and prioritise treatment options based on a patient's profile of genetic alterations is a major challenge in personalised cancer medicine. Data-driven approaches such as PanDrugs can help to this end. This new computational resource has been developed by researchers from the Bioinformatics Unit and is described in a paper published in *Genome Medicine* (1). In recent years it has become evident that the spatial organisation of the genome is key for its function. This organisation depends on a number of factors, the cohesin protein complex being one of them. This essential complex is present in the cells in two versions that contain either the SA1 or SA2 subunit. Scientists from the Chromosome Dynamics Group have addressed the functional specificity of these two variant cohesin complexes. The study, published in *Nature Structural and Molecular Biology*, analyses in-depth the functions of both variants

in 3D genome architecture and shows how the alteration of SA2 influences gene expression and may favour the loss of differentiation in tumour cells (2). A study published in *Nature Medicine* by the Brain Metastasis Group shows that the administration of silibinin in patients with brain metastasis reduces lesions without causing any adverse effects. This preliminary trial provides proof of concept that this compound could be a new effective and safe alternative to treat brain metastasis (3).



 OUR CENTRE



CNIO Friends Day / CNIO

As we do each year, on 20 June we held *CNIO Friends Day*, in which we invited you to visit the Centre, meet some of our researchers and visit our labs and units to find out more about what we do. This year, the day began with a welcome speech by Maria Blasco, the Centre's Director, who gave an overview of the main features of the CNIO. Her speech was followed by presentations from Marcos Malumbres,

head of the Cell Division and Cancer Group, and Nabil Djouder, head of the Growth Factors, Nutrients and Cancer Group. Their teams each include one of the two most recent recipients of a postdoctoral *CNIO Friends* contract: Carolina Maestre and Sebastián Thompson, respectively. The two were present at the event and had the chance to speak with the attendees during lunch, which despite the heat was a nice opportunity for interaction.

That same week we were also visited by the Bandera Rosa association, which delivered a donation of 10,000 euros raised via its activities in Campo de Gibraltar, where it provides support to patients with breast cancer and their families.

We would also like to thank the organisers of the Zósimo Ibáñez Tournament for choosing this initiative as its fundraising cause this year.



## «This finding reveals a new therapeutic target, not in cancer cells but rather in the microenvironment»

Manuel Valiente arrived at the CNIO in 2015 to direct the Brain Metastasis Group. A few weeks ago, he presented some study results in *Nature Medicine* magazine which open up a new avenue for the treatment of brain metastases.

**Manuel Valiente**  
Head of the Brain  
Metastasis Group



Photo: Lorenzo Charlez

### Why are brain metastases so difficult to attack?

Brain metastases have various particularities. First, the brain is protected by the blood-brain barrier, which means that many medications can't reach the cancer cells. Moreover, some data suggests that the evolution of metastasis-initiating cells in the brain differs from the evolution of the primary tumour, and even from metastases in other organs. This suggests that a brain metastasis won't necessarily respond to the same treatment as the primary tumour. One of the causes of the divergence seen in metastases in different parts of the organism may be rooted in the different composition of the microenvironment of each one, and the strategies that the metastatic cell thus requires in order to adapt.

What we discovered is that the brain is altered as the tumour grows in it. We detected that one of its cellular components, the astrocyte, activates a signalling pathway that is mediated by cancer cells, which causes it to behave in a manner that enables the metastasis to continue to grow and colonise the brain. The interesting thing about this finding is that since the metastasis depends on this change in the microenvironment in order to grow without difficulty, this creates a new therapeutic target, not in the cancer cells but rather in the microenvironment.

### What did you discover in this latest study?

We evaluated how the metastatic cell adapts to the environment that surrounds it in the brain. Thanks to earlier studies, we saw that the initial stages of metastatic colonisation were "hard" for cancer cells. In fact, many were actively eliminated by defence mechanisms in the brain. However, some were capable of continuing to the extent that something that had initially seemed to have anti-metastatic properties actually even seemed to help the tumour to continue to grow in advanced stages of disease.

### What are the next steps?

We conducted a practical proof of concept to validate the pharmacological and genetic inhibition of this alteration of the microenvironment associated with brain metastases. Following our success, we worked with oncologists from the ICO to carry out a small clinical study which also confirmed that STAT3 pathway inhibitors may be useful in treating brain metastases. Now we are trying to develop a clinical trial with more patients. In parallel, we are continuing to investigate the biology of these astrocytes.

## PROFILE

## INVITED SEMINARS



**Victoria Camps**  
Autonomous University of Barcelona

"Historically, the greatest inequality has been gender inequality. This means that we don't have clear examples of women in history who have done what we have wanted to do later on". Victoria Camps (Barcelona, 1941) gives an accurate assessment of the reality that women have experienced and continue to experience. Camps, an Emeritus Professor of Moral and Political Philosophy at the Autonomous University of Barcelona, is one of Spain's most renowned Ethics experts. Her visit to the CNIO, as an invited guest to the series of seminars organised by the Office of Women in

Science (WISE), was motivational and instructive, with a speech that was as low-key as it was laden with truth and depth. Her theory on why women are still being discriminated against and championing care as one of life's central and fundamental values deserve to be brought to everyone's attention: "Under patriarchal domination productive life came to be seen as the most important thing and reproductive life has been silenced. This makes women to have a hierarchy of values that is not exactly the same as the one that men have", explained Camps. These values include that of care, which was introduced by women in philosophy and "is something that everyone must take on, because up until now only women have been doing so". The idea isn't, then, for women to absorb the values of the patriarchy, but rather to change the system to include the female view. Her talk also touched on the Ethics crisis and the stark division between science and philosophy. The full presentation can be viewed at: <https://youtu.be/z3di4X64BVM>

### DISTINGUISHED SEMINARS

**25 MAY**  
**EDITH HEARD**  
Collège de France / Institut Curie (France)

**1 JUNE**  
**KUN-LIANG GUAN**  
University of California, San Diego (USA)

**15 JUNE**  
**ROGER LO**  
David Geffen School of Medicine at UCLA (USA)

### WOMEN IN SCIENCE OFFICE SEMINARS

**5 JUNE**  
**LAURA GONZÁLEZ MOLERO**  
Independent Board Member at Acerinox and Ezentis (Spain)

