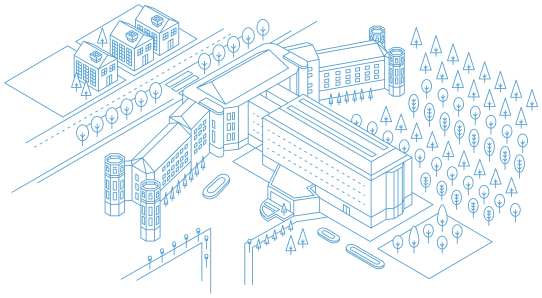
ISSUE 5 - OCTOBER 2015

CNIO FRIENDS *newsletter*

Latest news from the Spanish National Cancer Research Centre



COLUMN

New horizons in CNIO's research

Metastasis causes 90% of all cancer deaths and only now are we beginning to understand how this happens. To strengthen CNIO's commitment to the study of this process, we held a highly successful international conference from September 28 to 30, the CNIO Frontiers Meeting: Metastasis, mechanisms of initiation and treatment opportunities, co-organised by Hector Peinado, Head of the Micro-Environment and Metastasis Group at CNIO; David Lyden, from Weill Cornell Medical College; Yibin Kang, from Princeton University; and the prestigious journals *Nature Reviews Cancer*, *Nature Medicine* and *Cancer Cell*. For three days, the greatest experts in metastasis research shared their latest findings at our Centre with a view to developing early detection techniques and novel therapies, some of which are already being tested in patients. Among the speakers was Joan Massagué, whose profile has been included in this newsletter.

Finally, I would like to mention the World Breast Cancer Awareness Day held on October 19. Miguel Angel Quintela, Head of the Breast Cancer Clinical Research Unit at the CNIO, closed the march organised by Avon, who has also collaborated by supporting this Unit over the past 5 years. Quintela talked about how we are living in a time of great progress in research, while also spreading a message of hope to the patients.

—MARIA A. BLASCO
Director

CNIO SCIENCE NEWS

Researchers from the CNIO Genomic Instability Group, led by Oscar Fernandez-Capetillo, have generated safer stem cells that could be used in regenerative medicine; one of the great promises of biomedicine for the treatment of diseases **(1)**. The Cell Division and Cancer Group, headed by Marcos Malumbres, has discovered that blocking tumour energy could be effective in treating cancer when combined with specific chemotherapeutic agents such as taxol, one of the most powerful anti-cancer agents used in clinical practice **(2)**. The research teams of Maria A. Blasco (Telomeres and Telomerase) and Javier Benitez (Human Genetics) have found that a telomere gene, POT1, is mutated in families with Li-Fraumeni-like Syndrome, in which patients present multiple tumours, including cardiac angiosarcoma. The CNIO's Familial Cancer Consultancy and the Cardiology Unit at the *Puerta de Hierro* University Hospital have already created a Monitoring Unit to follow-up asymptomatic carriers, in order to assist in early diagnosis **(3)**. The Genomic Instability Group has revealed the protective role played by a little-known protein complex in cancer and ageing. The study emphasises, once more, the relationship between these two pathological processes **(4)**.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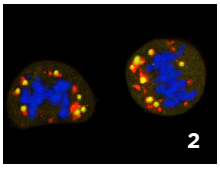
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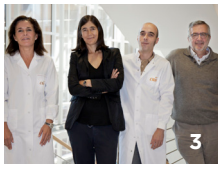
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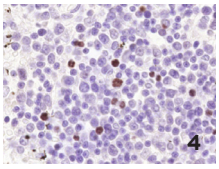
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OUR CENTRE

The CNIO participated in the European Researchers' Night held on September 25. This is an annual event in which 300 European cities unite to celebrate science and its researchers. More than 200 people of all ages visited the CNIO to perform experiments and talk to the more than 40 scientists who participated in the initiative.

Marisol Soengas, Head of the Melanoma Group, was awarded a 1.2 million euro AECC grant, received from the hands of Queen Letizia of Spain, to co-ordinate a consortium for multidisciplinary research in melanoma, in which Spanish and international centres as well as hospitals are cooperating to find new solutions against this type of cancer.

From October 7 to 9, we co-organised the *100xCiencia* Forum in La Palma. This event brought together 20 leading Spanish centres ('Severo Ochoa' Centres) to promote the dissemination of our key scientific activities as well as social awareness.

On October 19, we held the *Innovation: Bridge between Science and Society* event at the CNIO together with the *Banco Santander* Foundation and the *Instituto de Empresa* Business School. The event consisted of a dialogue between the *UAM* professor and former Minister of Education, Ángel Gabilondo, and the Director of the CNIO, Maria Blasco, in which they stressed the CNIO's commitment to innovation and the translation of scientific knowledge for the benefit of society.

INTERVIEW

"We are now able to identify patients with the likelihood of developing metastatic disease"

Photo credit: C.Siegfried

David Lyden

Weill Cornell Medical College (USA)

In 2012, David Lyden and Hector Peinado, recently recruited by the CNIO as a Group leader, discovered at the Weill Cornell Medical College (USA) that tumour cells release nanovesicles called exosomes, which transfer biological information to the micro-environment that surrounds them to educate it and facilitate metastasis. In September they organised the *CNIO Frontiers Meeting: Metastasis Initiation, Mechanistic Insights and Therapeutic Opportunities*.

Your Group collaborates with Hector Peinado's Group at the CNIO. Could you tell us a bit more about this collaboration?

An important part of our CNIO collaboration is the translational value of the discovery of exosomes in metastatic progression. By a simple blood test, we are now able to identify patients with the likelihood of developing metastatic disease and from our most recent discovery, we are now able to determine the specific organ of metastasis. This will be instrumental in assisting the clinician to tailor therapies in patients with cancer. Importantly, our recent discoveries will lead to new treatments to block the production of tumor exosomes and prevent exosome fusion with cells in the lymph nodes and distant organs to inhibit metastasis formation.

Will we be able to control metastasis in the future?

Yes, I believe we can make a difference in the prevention and treatment of patients with metastatic disease. By knowing the biological steps responsible for metastatic formation, we can then develop new targeting therapies that can slow down the metastasis process and perhaps keep tumor cells in a dormant or sleepy stage. Similar to patients living with other disease, such as AIDS, I believe that patients with cancer can live longer lives preventing metastatic spread.

How do you evaluate the conference we have celebrated?

It was a great success. I admire the future vision of the CNIO faculty led by Maria Blasco [CNIO's Director] and Manuel Serrano [Director of the Molecular Oncology Programme], who wanted to support the organization of this meeting to advance our knowledge of cancer metastasis. We brought together the world's experts in the study of metastasis biology, who supported the most advanced knowledge to update our understanding of this process. The researchers who attended the meeting now can formulate essential collaborations. It was also a great opportunity to interact with Scientific Editors from *Nature*, *Nature Cell Biology*, *Nature Medicine*, *Nature Reviews Cancer* and *Cancer Cell*. Together, the meeting led to new directions for the prevention of metastatic disease as well as the design of novel therapies to treat it.

PROFILE

Joan Massagué

Director, Sloan Kettering Institute (USA)

The world's leading authorities on the study of metastasis came together at the recent congress on tumour metastasis organised by the CNIO. They included Joan Massagué, Director of the Sloan Kettering Institute in New York and one of the most prestigious cancer researchers in the world.

Massagué made his first major contribution to the understanding of the basis of cancer in 1993 when he established the mechanisms by which various cellular components prevent uncontrolled cell division. Several years later, he proved that, in certain cases, it is possible to identify genes that are predictive of metastatic outcome in primary tumours before these tumours extend to other organs. Throughout his career, he has identified genes and molecular mechanisms of metastasis to bones, lungs and the brain, thus opening up new avenues for treatment. For all the above, he has won major awards, such as the Prince of Asturias Prize for Scientific and Technical Research in 2004, and the BBVA Foundation Frontiers of Knowledge Prize in biomedicine in 2009.

Manuel Valiente, one of his most distinguished pupils, embarked on a line of study with him that he is now undertaking at the CNIO, where he heads the Brain Metastasis Group.

INVITED SEMINARS

DISTINGUISHED SEMINARS

4 SEPTEMBER
JAMES HURLEY
University of California (USA)

11 SEPTEMBER
ROGER WILLIAMS
MRC Laboratory of Molecular Biology (UK)

18 SEPTEMBER
SIAMON GORDON
University of Oxford (UK)

25 SEPTEMBER
MEGAN C. KING
Yale University (USA)

2 OCTOBER
WILLIAM C. HAHN
Dana-Farber Cancer Institute (USA)

9 OCTOBER
EDUARD BATLLE
IRB Barcelona (Spain)

30 OCTOBER
HUGUES DE THÉ
Univ. Institute for Haematology (France)