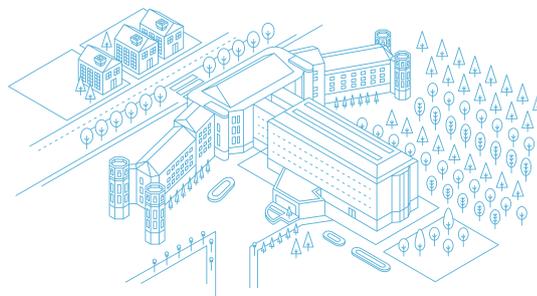


CNIO FRIENDS

newsletter

Latest news from the Spanish National Cancer Research Centre



 COLUMN

 CNIO SCIENCE NEWS

Excellence and Talent

Excellence is one of the basic pillars of the research conducted at the CNIO. Our vocation is to work at the forefront of knowledge and to keep up with the most prestigious international institutions, often endowed with more staff, resources and funding. Therefore, when our Centre appears in the top positions of rankings such as Nature Index, alongside world leading cancer research centres such as Dana Farber or Cancer Research UK, we feel to some extent that our efforts have been rewarded.

Part of this commitment to excellence lies in the capacity of the CNIO to attract and retain talent. A task that is not always easy and for which we have been counting on your collaboration for close to two years now. Thanks to “CNIO Friends”, we have launched a call to finance two postdoctoral contracts that now have names and faces. Vera Pancaldi, specialist in bio-computing, and Paulina Gómez, dedicated to Genetic and Molecular Epidemiology, will be continuing their research at the Centre. Their work will contribute to keep the CNIO at the top of the international rankings.

—MARIA A. BLASCO
Director

Two metres of DNA are packed into the nucleus of our cells, which is like trying to fit a football field into a grain of rice. Researchers from the Structural and Computational Biology Group have used social network characteristics to study the contacts between the different regions of DNA and its organization in the nucleus. This new perspective, published in the journal *Genome Biology*, will facilitate the study of the 3D layout of the genome in the nucleus and its impact on diseases such as cancer (1). An article published in *JCI Insight* by the Hereditary Endocrine Cancer Group shows how various miRNA molecules could predict the response to antiangiogenic agents in metastatic kidney cancer, drugs that are widely used to treat this type of cancer. The study, which is the most robust seen in this tumour type to date, could help to select the most appropriate therapy for these patients (2). The Melanoma Group has published a study in the journal *Autophagy* that could help to predict tumour prognosis in melanoma; a type of skin cancer that is often hard to diagnose and that is highly metastatic. A partial loss of the ATG5 gene serves as a marker of poor prognosis as well as drug resistance (3). Telomeres, the protective structures located at the ends of chromosomes, also need their own protective elements. According to an article

published in *Nature Communications* by the Telomere and Telomerase Group, the TERRA – RNA molecules produced by the telomeres – are essential for preserving these protective structures. The main region in the human genome where they are manufactured has also been located in the long arm of chromosome 20. This finding opens up new avenues for the study of patients with telomeric diseases (4). A few weeks ago, the Growth Factor, Nutrients and Cancer Group described in *Cancer Cell* magazine that the IL-17A pro-inflammatory molecule could be the origin of hepatocellular carcinoma, a highly aggressive liver tumour. Using mouse models, they showed that blocking this molecule prevents the appearance of non-alcoholic steatohepatitis, an inflammatory process in the liver that is a precursor of hepatocellular carcinoma (5). The same researchers have discovered a mechanism that allows cancer cells to survive in the centre of the tumour mass, where barely any blood vessels can reach and glucose levels are very low. This breakthrough, published in *Cancer Cell*, provides important clues that might help us to understand the resistance to antiangiogenic drugs that “starve” tumours by blocking the formation of new blood vessels (6).

 OUR CENTRE

While students of the Summer Training Programme took stock of what they had learned during their stay at the CNIO, for those who had been their fellow laboratory colleagues, preparations for another major event reached their climax. With good reason, since Researchers’ Night is one of the events we enjoy the most. During this open house day, which will be held on September 30, volunteers from the Centre will bring science closer to the

general public, through talks and experiments.

These weeks were also marked by the hosting of the first Network of Excellence in Research and Innovation in Exosomes (REDIEX) Workshop, aimed at the application of imaging techniques to study metastasis, which was organized by Héctor Peinado, Head of the Microenvironment and Metastasis Group at the CNIO.



Maridol Soengas (left), head of the Dean Office, with the students of the Summer Training Programme. / CNIO



«We work to detect circulating tumour cells before pancreatic cancer appears»

Diane Simeone, an internationally recognized expert in the field of pancreatic cancer, visited us to participate in the CNIO *Distinguished Seminars*.

What are pancreatic stem cells and why do you study them?

Pancreatic cancer stem cells are the cells in a tumor that spark tumor growth. Current cancer treatments sometimes fail because they are not attacking the cancer stem cells, ongoing research is geared towards identifying the cancer stem cells so that targeted drugs could be developed to kill them.

What are some of the latest discoveries in your lab?

Our team has already identified drugs that target the stem cells by blocking a critical signalling pathway that plays a role in how these stem cells function and clinical trials are ongoing to see just how well the drugs may work. It's very exciting, and we are eager to follow up with this work in clinical trials. We have also identified another key mechanism of treatment resistance: a gene we discovered called ATDC. Its expression (basically, how it is "turned on") is about 20 times higher in pancreatic cancer cells compared to healthy, normal cells. It's also highly expressed right at the point when pre-cancerous cells become malignant. The gene is what fuels the fast growth of cancer cells and generates cancer stem cells early in the process of tumorigenesis. It makes them aggressive and treatment resistant. Targeted drugs could potentially make the cells less resistant to treatments that are already available to patients.

Diane Simeone
University of Michigan
Health System
USA



What are the latest developments in pancreatic cancer research and the prospects for the future?

Of many approaches to detect pancreatic cancer early, the one I'm most excited about is work we're doing to detect circulating tumour cells in the blood in high risk individuals who don't have evidence of pancreatic cancer. These cells may serve as a beacon for what's going on in the pancreas, an organ that is hidden in the deep recesses of the abdomen and is hard to evaluate.

Do you think pancreatic cancer treatment will be improved in the near future?

Yes, Precision Promise, a large national initiative, will revolutionize the way patients battling pancreatic cancer are treated and rapidly improve treatments for the future patients. More than 53,000 people are diagnosed with pancreatic cancer each year, and 93 percent die within five years. None of us should be happy with where we are now. Precision Promise, a new consortium to execute more effective clinical trials based on the most compelling science, with personalized treatment for every patient, will likely move us much more quickly to having more effective therapies.

PROFILE

INVITED SEMINARS



Tània Balló
Documentalist and Film Director

Rather than doing justice to them, History has systematically ignored women. The same way that the Nobel Prize forgot about Rosalind Franklin, our country has been oblivious to a large part of its history written by women. A significant (and unfair) example of this relates to the women of the "Generation of '27" and recovering their memory is a task that filmmaker Tània Balló embarked on over seven years ago. *Las sinsombrero* (the hatless) is the name of this multidisciplinary, multi-platform project with no set limits, which sets out to retrieve,

disseminate and perpetuate a generation of women, the generation of '27. A group of women painters, poets, novelists, illustrators, sculptors and thinkers whose art, activism and critical reflection was crucial in the 20's and the 30's in Spain and which History, unlike its treatment of their male contemporaries, has relegated to a marginal place unknown to the vast majority of us. Ernestina de Champourcín, María Teresa León, Concha Méndez, Maruja Mayo, María Zambrano, Rosa Chacel... These are some of them. "Discovering these women has created the need in me to rewrite History", points out Balló during her talk at the CNIO, which was organized by the Women in Science Office (WISE).

In addition to compiling, studying and giving visibility to the work of this Generation, Balló's project aims to take all this new knowledge to the schools, in order to put an end to this historical bias and have more young people be aware that, contrary to what we have been told up to now, these are "not the woman of, but rather they are the women that".

DISTINGUISHED SEMINARS

10 JUNE
ADOLFO FERRANDO
Columbia University Medical Center
(USA)

27 JUNE
DIANE SIMEONE
University of Michigan Health System
(USA)

CNIO WOMEN IN SCIENCE OFFICE SEMINARS

28 JUNE
TÀNIA BALLÓ
Documentalist and Film Director
(Spain)

