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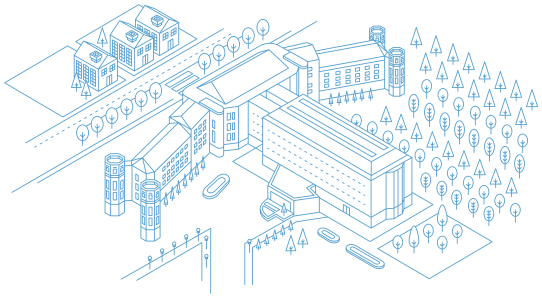
CNIO FRIENDS *newsletter*

Latest news from the Spanish National Cancer Research Centre



COLUMN

Scientific vacations at the CNIO

Summer is a time of intense and interesting activity at CNIO due to the fact that we welcome students and scientists from around the world to spend part of their holidays with us.

Every year, we host a Summer Training Programme in which several university students can learn and work at our laboratories for a period of eight weeks. For some of them, this is their first experience in an actual research environment. This year, we have had nine students around 21 years of age from Spain, India, USA and Peru. In addition, thanks to agreements with the Spanish Association Against Cancer and the Massachusetts Institute of Technology (USA), we have received another three students. They have all said that they found the experience highly satisfying.

Furthermore, four researchers from institutions in the USA and Poland are also spending some time at the CNIO. Through the *Visiting Researcher* Programme that we promote together with the *Jesús Sierra* Foundation, they will be staying for several months to collaborate on our projects. I invite you to meet them in the pages of this newsletter.

Finally, in recognition of your support, we have already begun to place the names of the Sponsors of the CNIO Friends initiative on the seats in our Auditorium. The Auditorium is a very important space for us. It is the place where we hold our most significant events and where we host the most prestigious scientific speakers from around the world. It is also the place where our researchers gather to share any developments in their investigations. From now on, you will be there with us, too.

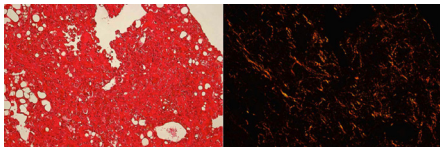
—MARIA A. BLASCO
Director

CNIO SCIENCE NEWS

Researchers from the CNIO Telomeres and Telomerase Group, in collaboration with researchers from the Centre's Molecular Imaging Unit and the Complutense University of Madrid, have discovered that damage to telomere (structures that protect the ends of chromosomes) is at the origin of idiopathic pulmonary fibrosis.

This condition, which has been associated with the risk of developing lung cancer, causes the gradual loss of respiratory capacity and can be lethal within a few years.

Our researchers have created an animal model



that reproduces the emergence and development of this disease in humans, which is triggered in response to environmental damage. Both factors together, the presence of shortened telomeres and environmental damage, triggered the disease in these mice.

Now, these mice are being used to test new treatments against the disease, including those that are aimed at repairing the damaged telomeres.

OUR CENTRE

On July 2, the CNIO hosted a guided tour of the Bioinformatics Unit and the Medicinal Chemistry Section, as part of the *Ojo al Data* project promoted by the Medialab-Prado cultural centre in Madrid. Visitors were able to learn about the profound implications of big data for science and in particular for oncology, regarding the study of the genetic basis of cancer and the early stages of drug discovery.

In early July, the expert in social skills for scientists, Rob Thompson, delivered two workshops on job hunting and negotiation/leadership. This is an initiative promoted by the CNIO Dean's Office, as part of its strategy to advance the professional careers of students preparing their doctorate and post-doctorate studies at the CNIO.

As part of the Leading Program Madrid 2015, 20 students from the Community of Madrid with the highest University Entrance exam grades in 2015 visited us on July 23. Organised by the company *bcnmoments*, and sponsored by *La Caixa*, this programme provided these students with the opportunity to enjoy a business experience in leading companies, including our Centre.

On July 24, the CNIO Director, Maria Blasco, and the President of the *Jesús Serra* Foundation, Federico Halpern, presented the new edition of the Foundation's *Visiting Researcher* Programme. The purpose of this programme is to enable reputed scientists from other international centres to come and work in Spain. Four foreign major researchers will be working at the CNIO for two to six months to collaborate on the Centre's projects. Their names, profiles and the groups they will be collaborating with can be found in the "Profile" section (page 2).

INTERVIEW

"The CNIO has one of the few world-leading groups in the field of chromosome cohesion"

Patrick Sung
Researcher,
Yale University, USA

Patrick Sung, Professor and until recently Chair of the Department of Molecular Biophysics and Biochemistry at Yale University, USA, investigates the molecular bases of DNA repair processes, which are essential for maintaining the integrity of our chromosomes and for the suppression of tumours. He is doing his sabbatical from late July to December 2015 in the CNIO's Chromosome Dynamics Group, headed by Ana Losada.

How is your research related to cancer?

There are several very important tumour suppressor genes associated with breast, ovarian and pancreatic cancer, that are actually defective in a pathway called homologous DNA recombination [a process used by cells to repair harmful breaks that occur on both strands of DNA]. Very often, cancer patients undergoing treatment accumulate secondary mutations that reactivate this pathway, then it becomes 'hyperactive', so to speak. As a result, these patients develop resistance to treatments. We hope to be able to find ways to shut it down in cancer patients, so they can respond well to cancer therapies again. To achieve this goal, we first need to understand its molecular mechanism.

In what projects will you be involved at the CNIO?

Ana Losada has been working on a process called chromosome cohesion: basically, it is what holds pairs of chromosomes together. At a certain time during cell division, chromosomes need to get rid of that 'glue'. It has been known for quite some time that this process is very important for the DNA repair pathway that we have been studying, but nobody knows why. I have always been intrigued by its basic biology, in terms of understanding the mechanism. But there are only a few groups in the world that really know the chromosome cohesion process in depth, and Ana Losada's is one of them. I have followed Losada's work since she was a postdoctoral fellow at Cold Spring Harbor [New York, USA] and I've read almost every single paper that she has published for over ten years. So as soon as I had the chance, I contacted her to ask if I could spend a few months in her lab at the CNIO.

What are your goals during your stay at the Centre?

I don't expect to make any breakthroughs at the CNIO, but I do expect to develop ideas and projects that I can later pursue at Yale University in collaboration with Losada's group. The main approach will be to purify some of the proteins that are involved in the process, take them back, and study what they do in our own homologous DNA recombination systems. I am really excited about starting collaborations that we can continue over long distance in the future.

PROFILE

In addition to Patrick Sung, the CNIO is happy to welcome the following international researchers, through the *Visiting Researcher* Programme that our Centre has been promoting since 2009 in collaboration with the *Jesús Serra* Foundation:

Marcin Nowtony, group leader at the International Institute of Molecular and Cell Biology in Poland, is collaborating with the Structural Bases of Genome Integrity Group at the CNIO, directed by Santiago Ramon-Maiques. He is an expert in capturing microscopic images of major players in cell biology, which are key to developing new therapies.

Eva Nogales, a researcher at the Howard Hughes Medical Institute and senior researcher at the Lawrence Berkeley National Lab, USA, has joined the Computational Structural Biology Group, headed by Alfonso Valencia. Nogales has contributed to the understanding of how taxol works; this is an anti-cancer agent widely used in breast cancer and ovarian cancer treatments.

Chaitanya R. Divgi, Vice-Chair of the Radiology Department of the College of Physicians and Surgeons at Columbia University, USA, is working with the Seve-Ballesteros Foundation Brain Tumour Group, headed by Massimo Squatrito. Divgi is known for the development of new biomarkers for the early detection of cancer.

We wish them all a fruitful stay with us. Together we can continue to make breakthroughs in cancer research.

WOMEN SCIENTISTS AT THE CNIO

Diversity (cultural, gender, age...) facilitates the emergence of new ideas in all fields. This is especially important for scientific progress. However, in terms of gender diversity, women are not yet represented in equal numbers in top management positions in science.

To enable more women to reach these positions, we launched the CNIO WISE (Women In Science) Office in 2012. Since then, the Office has launched various initiatives to promote equal opportunities in the professional careers of women scientists at our centre. It also organises seminars in which women in managerial positions address labour-related gender issues. We have been visited by Carmen Vela, Margarita Salas and Flora de Pablo, among others.

With these and future initiatives, the CNIO WISE Office will help our Centre to reach ever higher levels of excellence.