



**“Commercialisation and return on investment in research remain priorities. CNIO’s royalty income in 2016 is double that of 2012. A total of 44 inventors, about 10% of the researchers at CNIO, have contributed and benefited from this achievement.”**

**MARIA A. BLASCO**  
Director

## FOREWORD

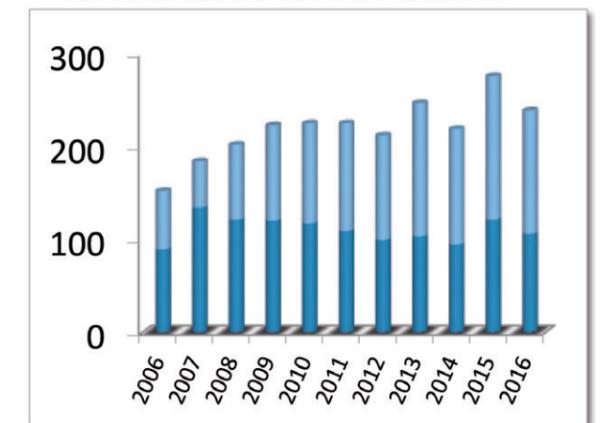
**Maria A. Blasco** Director

This year, once again, the data on CNIO's scientific performance illustrate that we are doing a superb job contributing towards scientific breakthroughs. During 2016, the CNIO authored a total of 239 papers, 28 of which were published in journals with impact factors (IF) ranging from 10 to 15, and 32 papers in journals with impact factors greater than 15. Comparison with previous years (2006-2016) indicates that CNIO has continued to increase the numbers of papers published in top journals with IF greater than 15.

With the aim of upholding the CNIO's strategy to remain an international Research Centre of Excellence and an influential institution in cancer research worldwide, 2016 saw the establishment of a CNIO Department of International Affairs. This new Department is headed by Carolina Pola who was the Editor of *Nature Medicine* for over seven years, as well as the former Director of Communications at Pharmamar, the most successful Spanish pharma company devoted to anti-tumour therapies. Since the creation of the Department of International Affairs, Carolina has redefined our international approach to embed the European concept of 'Responsible Research and Innovation' (RRI) in our institutional and research core. This new perspective, alongside several other efforts made by the Department, have resulted in several international collaborations that will bear fruit next year in the form of joint scientific symposiums to strengthen our research groups, as well as a plan to boost our recruitment of international talent. Our capacity to attract and retain scientific talent, providing new investigators with an interdisciplinary and multicultural environment, has become an integral part of our international agenda, which we will continue to nurture in the upcoming years.

I am also happy to mention that we continue to attract new and talented young group leaders to the CNIO. After the incorporation, in 2015, of two Junior Groups working in metastasis (led by Hector Peinado and Manuel Valiente) in the Molecular Oncology Programme, we welcomed another new Junior Group to the Programme in 2016: the Metabolism and Cell Signalling Group, led by Alejo Efeyan who joined the CNIO at the beginning of 2016

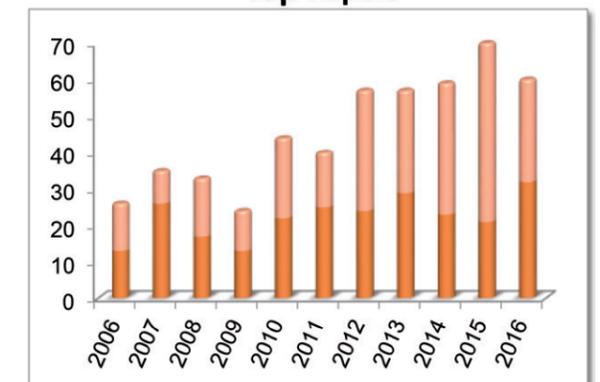
### Total Number of Publications



CNIO first/last author

CNIO as co-author

### Top Papers



IF > 15

IF 10-15

after a brilliant postdoc with David Sabatini at the Massachusetts Institute of Technology (MIT, Boston, USA).

During 2016, we also completed the selection process to incorporate two new Groups in the Structural Biology and Biocomputing Programme, with the aim of reinforcing lines of research in structural biology at the CNIO. The two new Junior Group Leaders who will start at CNIO in 2017 are: Ivan Plaza Menacho, currently Senior Research associate at the Structural Biology Laboratory at the Biozentrum, University of Basel, Switzerland; and Rafael Fernández Leiro, from the MRC Laboratory of Molecular Biology, Cambridge, UK.

In 2016, we also created a new service unit at the CNIO: the Biological Text Mining Unit, which is focused on the application and development of biomedical text mining technologies that are becoming a key tool for the efficient exploitation of information contained in unstructured data repositories. This Unit is fully funded through the ‘*Plan de Impulso de las Tecnologías del Lenguaje de la Agenda Digital*’ (PITL), in the framework of an agreement (‘*encomienda*’) between the Secretary of State of Telecommunications of the Spanish Ministry of Energy, Tourism and Digital Agenda (MINETAD) and the CNIO. We also revised the organisation of the two Bioinformatics Units that were providing support and expertise to our investigators; namely, the Bioinformatics Unit of the Structural Biology and Biocomputing Programme, and the Translational Bioinformatics Unit of the Clinical Research Programme. Under a new single structure, the CNIO Bioinformatics Unit, headed by Fátima Al Shahrour, we have joined the efforts of both previous units in order to better serve the needs of the CNIO Research Groups and to better coordinate and manage bioinformatics projects.

The valorisation of the research results generated by CNIO’s scientists, with the aim of turning them into high-potential diagnostic or therapeutic products and services, is one of our ways of creating added value for society and boosting public benefit through improving cancer patient outcomes, in particular. Óscar Fernández Capetillo, Vice-Director of Translational Research and Director of Innovation since end 2015, has been leading these key strategic areas for the CNIO, enhancing translational research at CNIO in collaboration with the CNIO Experimental Therapeutics Programme. In 2016, we leveraged on public-private partnerships in order to bring our research results closer to the patient. A project based on Dr. Djouder’s findings that boosting levels with nicotinamide riboside (NR) prevented and abolished aggressive tumour formation, received nearly 1 Mio in funding from *MINECO’s Retos-Colaboración* Programme. The aim of the project is the development of a new NR-based therapy for use in hepatocellular carcinoma and other tumours.

We continue to track previously licensed programmes from our drug discovery projects led by the Experimental Therapeutics Programme; one focused on Pim kinase inhibitors and another

one on ATR inhibitors, both are very close to reaching the clinical testing stage.

Commercialisation and return on investment in research remain priorities. Royalty income and milestone payments collected in 2016 raised more than 650 thousand euros. This includes revenues from patent licences as well as from commercialisation of research tools such as monoclonal antibodies. Following CNIO’s policy of royalty revenue share, this income flows back to the CNIO’s research activities as well as to the inventors themselves. A total of 44 inventors, about 10% of the researchers at CNIO, have contributed and benefited from this achievement.

Industrial partnerships remain key to achieve valorisation of scientific knowledge. Valorisation is not just about ‘money’, but also about the impact that can be created through successful alliances with industry. In such collaborations, both the CNIO and its industrial counterpart are committed to working towards a common goal and to jointly undertaking all the steps needed to conduct the research, as well as to identifying the best possible protection and commercialisation of the results. In 2016, new contracts with industry secured future revenues for collaborative research that amount to nearly 4 million euros, which represents about 10 % of CNIO’s annual income.

The CNIO External Scientific Advisory Board (SAB), currently chaired by Mariann Bienz, is of utmost importance for guiding the strategic plans of the CNIO as well as for the review of our research groups. We would like to wholeheartedly thank our former SAB member Joan Massagué (Memorial Sloan Kettering Cancer Center, New York, USA) for his committed dedication to the CNIO SAB that lasted for over a decade (2003-2016). Joan Massagué, served as Chair of the CNIO SAB from 2011 to 2014, and as member for the remaining 9 years. During 2016, we welcomed two new members to our SAB, namely Stephen Frye, Director of the Centre for Integrative Chemical Biology and Drug Discovery at the University of North Carolina Eshelman School of Pharmacy in Chapel Hill (USA); and Ada E. Yonath, Nobel Prize winner in Chemistry (2009) and Director of the Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly at the Weizmann Institute of Science in Rehovot (Israel).

I would like to take this opportunity to thank all those who helped the CNIO by sponsoring our students, postdoctoral programmes and the stays of several researchers. I hereby extend my gratitude to the *Banco Santander* Foundation for funding postdoctoral stays at the CNIO and the *IE Business School* course, the *La Caixa* Foundation for fostering international PhD fellowships, the *Seve Ballesteros* Foundation that supports the Seve-Ballesteros Foundation-CNIO Brain Tumour Group, and the *Jesus Serra* Foundation for supporting the Visiting Scientists Programme and the Dean’s Office. During 2016, we hosted Patrick Sung, Professor of Molecular Biophysics and Biochemistry and of

Therapeutic Radiology, Yale University School of Medicine in New Haven (USA), who started his Sabbatical at CNIO in 2015 and split his stay at the Centre in two short periods.

I also wish to thank the *Banc Sabadell* Foundation for sponsoring a series of Distinguished Seminars at the CNIO given by ‘outside-the-box speakers’ who provided novel perspectives that contribute to the CNIO’s transdisciplinary environment. During 2016, we had the privilege to listen to: Romain Quidant, ICREA Research Professor at the Institute of Photonic Sciences (ICFO), Barcelona, Spain; Andrés Moya, Professor at the University of Valencia, Spain; Francisco Juan Martínez Mojica, Professor at the University of Alicante, Spain; and Francisco J. Ayala, an evolutionary biologist and philosopher at the University of California, Irvine, USA. The *Banc Sabadell* Foundation also sponsored one of the WISE seminars, given by Edurne Pasaban, Mountaineer, Tolosa, Spain.

Furthermore, I would like to highlight the work that is being carried out at the CNIO Women and Science (WISE) Office. During 2016, we had the pleasure of listening to María Concepción Ferreras, Head of You Tube Partnerships in Southern Europe and Russia; Margery Resnick, Professor at the Massachusetts Institute of Technology in Cambridge (USA), and President of the International Institute in Madrid; Pilar Garrido, Oncologist at the *Instituto Ramón y Cajal de Investigación Sanitaria* (IRYCIS), *Ramón y Cajal* University Hospital, Madrid; Edurne Pasaban, Mountaineer, Tolosa, Spain; María Teresa Fernández de la Vega, President of Women for Africa Foundation (*Fundación Mujeres por África*), and former First Deputy Prime Minister of Spain; Tánia Balló, documentalist and film director, Barcelona, Spain; Ángeles González-Sinde, scriptwriter, film director and former Spanish Minister of Culture; and Christina Rosenvinge, Spanish singer-songwriter, actress and producer. Together with Belén Yuste and Sonnia L. Rivas Caballero, from *Rocaviva Eventos*, Madrid, we also organised and hosted the CNIO Exhibition ‘Marie Skłodowska-Curie: a Polish girl in Paris’. Guadalupe Martín Martín, Medical Physicist at the *Hospital Universitario de Fuenlabrada*, gave us the opening talk about the role of Marie’s research breaking barriers for women in science at the time and starting the field of radiotherapy.

During 2016, we were also very excited to incorporate a journalist into our Communications Office; Cristina de Martos previously worked as a journalist for the health section of *El Mundo* (the second most read newspaper in Spain) for eight years. In 2016, the CNIO appeared in the printed and digital press more than 2,600 times, thus helping to bring the CNIO to the forefront of public awareness and interweaving it into our country’s culture. Throughout the year, the featured stories received nearly 83,000 hits (EurekAlert! news service) from around the world and were taken up by prestigious international media such as the BBC, The Guardian, The Scientist or Scientific American. One of the most widely commented articles in 2016 was the one authored

by the researchers Manuel Serrano and Lluç Mosteiro on cell reprogramming; it was published in November in the prestigious *Science* journal. Their discovery was covered by important media outlets such as radio and television, and even made it to the first page of the daily, *El Mundo*.

The ‘CNIO Friends’ initiative, devoted to raising funds for cancer research at the CNIO, celebrated its first two years of existence at the end of 2016. At that time, the initiative had about 800 Friends who showed their unwavering commitment at all times. Thanks to them, we put in place the first three cancer research grants in 2016. The first two grants sponsored the researchers Paulina Gómez, from the Genetic and Molecular Epidemiology Group, and Vera Pancaldi, from the Structural Computational Biology Group. The third grant came from an agreement with the *Juegaterapia* Foundation (<http://juegaterapia.org/>) that is devoted to helping children affected by cancer. Thanks to this collaboration, the CNIO will hire a researcher in 2017 to investigate neuroblastoma and central nervous system tumours, two of the most common tumours in children.

Businesses also joined our CNIO Friends community. In this context, the CNIO signed a collaboration agreement with *ASISA Vida* in relation to a new company product that includes specific coverage for gynaecological cancer. The CLH Group also participated in the sponsorship of the CNIO through an agreement aimed to support research and training of CNIO’s scientific personnel.

Last but not least, I would like to thank all the CNIO volunteers who make it possible for us to move our mission forward, and of course, to the entire CNIO Friends community. Combining society’s efforts with the endeavours of the research community can make a significant difference for the future of cancer.

Finally, I would like to thank all of those who have once again collaborated on the elaboration of this Annual Report, with especial thanks to Sonia Cerdá who is responsible for this CNIO publication, as well as to our collaborators: the visual artist Amparo Garrido and the underbau graphic design team.