



**“The year 2022 has been a record year in terms of CNIO publications in top journals in our Centre’s history.”**

**MARIA A. BLASCO**  
Director

# FOREWORD

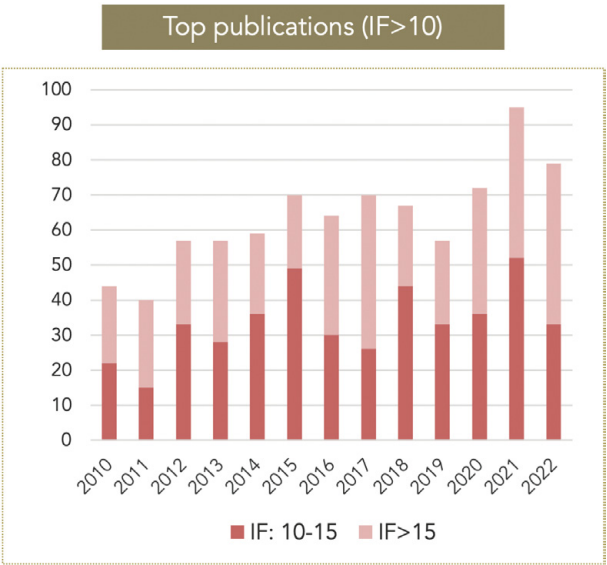
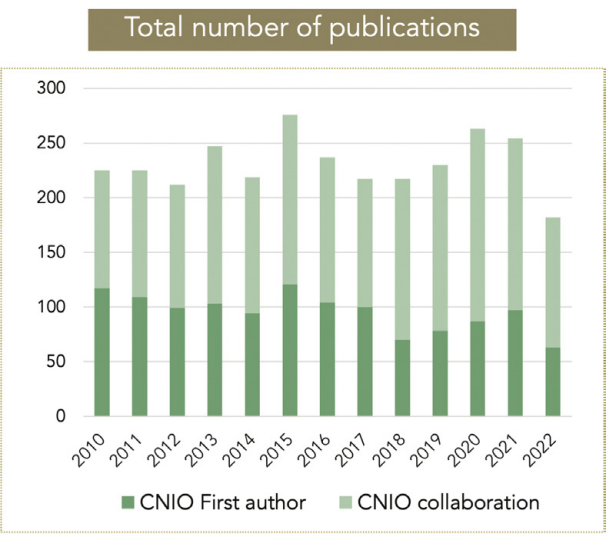
MARIA A. BLASCO Director

I am very glad to say that 2022 was an excellent year for our scientific productivity. We authored a total of 182 papers, 33 of which were published in journals with an impact factor between 10 and 15, and 46 publications in journals with an impact factor greater than 15, the latter representing the maximum of the historical series from the beginning of CNIO operations.

According to *Nature Index*, considering our scientific contributions in the life sciences and healthcare field, the CNIO is ranked second among cancer-focused institutions in Europe and holds the 9<sup>th</sup> position worldwide. Likewise, the SCImago ranking places CNIO in the 8<sup>th</sup> position among cancer centres worldwide. These indicators evidence the success of our scientific activity in cancer research and our leadership at the international level.

Additional evidence of CNIO’s excellence is the fact that 10 CNIO researchers are listed in the “World’s Top 2% Scientist List” generated at Stanford University, which ranks the 200,000 most influential researchers worldwide in all scientific fields, based on a score that takes into consideration scientific production across different periods, h-indexes, number of citations and author position.

Adapting the Centre to the constant evolution of science, by incorporating new research groups working in the new emerging fields in cancer research, is key to maintaining our competitive edge. Along these lines, a new operating model for the Clinical Research Programme has been adopted, focusing on the integration of top-notch oncologists from the National Health System by attracting senior clinical oncologists to set up a laboratory at CNIO. To implement this plan, a call was opened for candidates, which concluded in 2022 with the recruitment of 2 renowned oncologists with experience in translational research, working in areas complementary to those covered by the Clinical Research Units already in place. Thus, Luis Álvarez-Vallina, Head of the Cancer Immunotherapy Unit at the Hospital *12 de Octubre*, is now leading a new H12O-



CNIO Cancer Immunotherapy Clinical Research Unit. Dr Vallina is a recognised expert in the design and engineering of monoclonal antibodies for therapeutic use, and co-founder of Leadartis SL, a company working in this field. Likewise, Antonio Pérez, Head of the Service of Paediatric Haemato-oncology at the Hospital *La Paz*, will lead a joint Unit in the paediatric cancer field. Dr Pérez is a reference in the application of cell therapy in paediatric cancer, including NK cells, transplant of haematopoietic stem cells, and advanced therapies with CAR-T cells. The incorporation of Dr Pérez will come into effect in 2023, after closing the agreement with the Hospital *La Paz*.

During the previous year, the Heads of the Proteomics and the Confocal Microscopy Units left the CNIO to pursue other professional opportunities. The selection processes that were launched to identify candidates for those 2 positions culminated with the selection of 2 new Unit Heads. Marta Isasa joined the CNIO in October 2022 as new Head of the Proteomics Unit, after more than 10 years of international postdoctoral experience in proteomics, and formerly Associate Director of the Proteomics and Chemical Biology Group in Odyssey Therapeutics (MA, USA). Likewise, in December 2022, Isabel Peset joined the CNIO as new Head of the Confocal Microscopy Unit. Isabel also has international experience of more than 10 years after obtaining her PhD in the advanced microscopy field, having been Lead Scientist in Advanced Imaging at Medicines Discovery Catapult (Cambridge, UK).

In 2022, the Crystallography and Protein Engineering Unit was expanded to 2 independent Units, each focusing on the 2 distinct fields that were under the scope of the Unit. Thus, the current Protein Crystallography Unit, under the supervision of Inés Muñoz (former Head of the Unit), offers crystallography and SAXS for 3D protein structure determination; whereas a new Protein Production Unit, under the leadership of Jorge L. Martínez-Torrecuadrada, provides access to an array of technologies for heterologous expression and purification of recombinant proteins.

In 2022, the CNIO filed 4 priority patent applications, 12 PCT applications for international extension, and 1 registry of intellectual property to protect our IP assets. Our efforts in promoting collaborations with industry resulted in about €2.4M secured through research agreements with a number of partners from the pharmaceutical and biotech sectors. As much as 65% of CNIO agreements with the private sector were established with international entities. In addition, the income from royalties derived from the licensing of CNIO assets quantified in 2022 (corresponding to the sales in 2021) reached €1.3M, which represents an increase of 47% over the levels achieved in the previous year. This is a clear reflection of the leadership and influence of the CNIO and our researchers worldwide in the innovation field.

Furthermore, we continue supporting and promoting the participation of CNIO researchers in national and international calls from public agencies and private foundations that fund projects with a strong innovation component. Thus, in 2022 there has been very active participation in the new National AEI Innovation calls, co-funded by the EU Reconstruction Funds “NextGenerationEU”. Two public-private collaborative projects have been awarded: a project of the Telomeres and Telomerase Group in collaboration with the spin-off company Telomeres Therapeutics for the development of a novel gene therapy for the treatment of idiopathic fibrosis; and another project of the Histopathology Unit in partnership with MedLumics to develop an effective and safe system for the treatment of atrial fibrillation through irreversible electroporation. Another example is the ERC “Proof-of-Concept” grant awarded to the Transformation and Metastasis Group Leader, Eva González-Suárez, for the project “PLEIO-RANK” focused on targeting RANK receptors as a novel therapeutic strategy in triple negative breast cancer.

Our drug discovery programme (the Experimental Therapeutics Programme) continues working on the co-development of drug candidates from novel targets validated by CNIO investigators, contributing to the generation of new therapeutic agents to fight cancer and ageing-related diseases, which also represent assets for the CNIO. By the end of 2022, the CNIO reached a new milestone in obtaining the Rare Pediatric Disease Designation (RPDD) by the FDA to a drug candidate developed and licensed by the CNIO. This drug is a potential first-in-class oral kinase inhibitor that targets PI3K, as well as key resistance mechanisms such as PIM and mTOR, for the treatment of neuroblastoma. The product is now being further developed by AUM Biosciences.

Our training programmes are one of the key elements of the Centre’s strategic plan forming an essential part of our mission. Providing high-quality training to the new generations of biomedical researchers is one of our priorities, and we warmly thank our sponsors contributing to support our training initiatives.

During 2022, Prof. Eva Nogales, from UC Berkeley (USA), and Prof. Gonçalo Bernardes, from University of Cambridge (UK), were beneficiaries of the *Jesús Serra* Foundation’s Visiting Researchers Programme and spent several months in sabbatical stays in our Centre. In addition, Marwa Muhammad Abu-Serie Ali, from GEBRI, SRTA-City, Egypt, was awarded a grant from the “Science by Women” programme of the *Mujeres por Africa* Foundation, as Visiting Scientist, to join the Telomeres and Telomerase Group at the CNIO for a 6-month stay.

In 2022 we were also able to resume the prestigious CNIO-CaixaResearch Frontiers Meetings, which had been put on



hold during the years of the COVID-19 pandemic. These conferences represent a privileged forum for the exchange of new and exciting ideas in oncological research, involving the participation of key leaders in a broad array of fields. Two conferences were held in 2022, focusing on Molecular, Cellular and Organismal Drivers of Aging (May 9-10), and Diet, Nutrition and Cancer Cell Metabolism (October 24-26).

The “Philosophy and Science” symposia series that began in 2019 held its 4<sup>th</sup> edition this year, with the support of *Banco Sabadell* Foundation. Under the title “The long-term view”, a panel of philosophers and scientists discussed the future of the planet Earth, the future of humanity, and our future in relation to AI, a debate driven by the worrying situation between a very alarming present and the future of the planet and humanity.

The Communications Office has been instrumental across the years in enhancing the CNIO’s impact on society. Nuria Noriega, the Office Head for more than 10 years, left the CNIO in 2022 to pursue her professional career at another research institution. She has been replaced by Mónica González-Salomone, a well-known journalist specialised in the communication of science, with experience in the media at both national and international levels, and a regular collaborator of scientific institutions such as the European Spatial Agency, the *Instituto de Astrofísica de Canarias* (CSIC), the BBVA Foundation, and the CNIO.

During 2022, CNIO news continued attracting the interest of the media, keeping the level of previous years, and marking over 4,600 appearances in press (printed and online). In addition to some of our most relevant research findings, the non-specialised media also covered other CNIO initiatives, as described below.

Thus, on the occasion of World Cancer Day on February 4, we launched a fundraising and awareness campaign under the slogan “The lottery that touches you the most”, together with our logo #CNIOStopCancer, focused on conveying the high frequency of cancer cases and how the only way to mitigate their impact is by investing in research. The success of the campaign brought a significant presence of our Centre in the media, which in turn generated a significant number of new donors for our ‘CNIO Friends’ platform.

The Institutional Image and Outreach Office is leading several projects aimed to generate society’s trust and attention. Thus, in 2022, the 5<sup>th</sup> edition of our CNIO Arte project, co-funded by the *Banco Santander* Foundation, which explores the common territories between scientific research and artistic creation, brought together the sculptor Susana Solano and the epidemiologist Pedro Alonso, Director of the WHO’s Global Malaria Programme. The piece ‘*El mundo de las cosas*’ was



CNIO Arte stand at ARCO, February 23 - 27, 2022. In this photo, from left to right: Borja Baselga, General Manager of the *Banco Santander* Foundation, Susana Solano, CNIO Arte 2022 featured artist, Amparo Garrido, visual artist and CNIO Arte curator, and Maria Blasco, CNIO Director.

exhibited at the CNIO from February 16 throughout the year. For a second year, we had our own space at the contemporary art fair ARCO (February 23-27), where Solano’s work was exhibited, attracting a lot of interest from the public and the media. On top of the social visibility and impact, CNIO Arte generated a donation of €100,000 that contributed directly to our ‘CNIO Friends’ philanthropic initiative.

Derived from the success of this initiative, a proposal was designed jointly with the *Instituto Cervantes* (IC), to exhibit the works of the artists participating in successive CNIO Arte editions in the different IC sites across the world. This initiative was developed through 2022 and materialised on February 3, 2023, when the exhibition “CNIO Arte, Dialogues between Art and Science” was opened at the IC in New York, in a social event that was attended by relevant personalities from the worlds of science and culture. The exhibition, which offers a selection of works from the CNIO Arte programme across the years, including photographs, videos, drawings and collages, will be on display at the IC until April 15 and moved later to other venues, including the Spanish Embassy in Washington and other IC sites.

Aiming to increase the impact of this initiative, we also organised the 3<sup>rd</sup> edition of the “Art and Science Symposia” series, which brings renowned professionals from both fields to participate in an open and enriching discussion on a selected topic. The symposium was held jointly with the presentation of the 5<sup>th</sup> edition of the CNIO Arte project, under the title “Art, Science and Pandemics”, chaired by Prof. Carlos Jiménez (Emeritus Professor of Aesthetics, historian and art critic).

Another related activity was established in 2022, namely the “CNIO Artistic Residences” initiative, which is financially supported by the Spanish Foundation for Science and

Technology (*FECYT*). After an open call, a young artist, Clara Montoya, was selected to spend several months at the CNIO with the goal of achieving an understanding of the Centre’s research activities and, based on that knowledge, to create one or more art works inspired by or reflecting the work developed at the CNIO. Those works will be exhibited at the CNIO as well as in those entities collaborating in the dissemination of the project, and will be available for sale, the benefits being designated to fund CNIO research activities.

The fundraising strategy of the CNIO is implemented through our Philanthropy and Development Office, aiming to generate an additional income stream for our research activities. Donations from members of the public, corporate organisations, associations and foundations go directly to the “CNIO Friends Contracts” initiative, to fully fund the salaries of new post-doctoral research fellows recruited through a highly competitive international call each year. We surpassed an exciting milestone this year, raising over €1 million for the first time. To date, philanthropic donations to the CNIO have made possible the incorporation of 34 new researchers since 2016 (9 during 2022). In an exciting new development, in 2022 we launched a new facet of the philanthropy programme: “CNIO Friends Projects”. In this initiative, major donations to the CNIO (e.g., €250,000+) can support specific research projects, and we were delighted to receive our first major donation through this programme this year to support research in renal fibrosis and telomeres. We are deeply grateful to all of our donors and CNIO Friends for their ongoing support of our research programme. After all, philanthropy is a tool that enables every member of society to have a direct and positive impact on helping us to stop cancer.

Our commitment to gender equality continued during 2022 through the activities spearheaded by our CNIO Women and Science Office (WISE), an effort by CNIO volunteers that is facilitating both cultural changes and institutional improvements. During this year, the WISE Office expanded its name to “Women and Diversity” Office. The Office continued bringing outstanding female leaders in a broad array of fields as speakers to the “WISE Seminars” series, which is open to the general public, aiming to inspire the audience to explore new perspectives and visions on the role of women in society (<https://www.cnio.es/mujeres-y-ciencia/actividades-y-eventos/>). Furthermore, on the occasion of International Working Women’s Day, the WISE Office organised a joint event together with the British Embassy, and with the participation of the Jane Goodall Institute, in which a tribute was paid to the career of Dr Jane Goodall. In our efforts to educate the future generations without gender bias, and for the occasion of International Day of Women and Girls in Science, CNIO released a video in which representatives from all CNIO professional categories of women involved in research tell us why they love research ([https://youtu.be/Qhq3se\\_YFb4](https://youtu.be/Qhq3se_YFb4)).

It is worth mentioning here the selection in November 2022 of CNIO researcher Sara García Alonso as an astronaut for the European Space Agency (ESA). The relevance of her success in the amazingly competitive selection process carried out by the ESA provides further evidence of the level of excellence attained by our scientists, and the impact in the media generated by her appointment has also helped to spread knowledge about the CNIO to society.

It is a pleasure for us to convey to society for another year the report of our activities and achievements during 2022. We emphasise again our commitment to continue dedicating our best efforts to fulfil our mission of conducting research of excellence in oncology, translating scientific knowledge into clinical practice, and transferring the technology developed at the CNIO to the productive sector for the years to come. ■