

TECHNOLOGY TRANSFER AND VALORISATION OFFICE (TTVO)

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TTVO contributes to translating CNIO research and innovation for society's benefit by ensuring appropriate protection of intellectual property and by channelling the technologies that arise from our research to companies and entrepreneurs to develop them further and thereby impact society.

The activities of the TTVO during 2023 focused on monitoring the CNIO's scientific developments; identifying new inventions; protecting and managing industrial and intellectual property at the CNIO; managing contracts with other institutions and industry; and, finally, commercialising and exploiting CNIO's assets to promote impact on the biomedical industrial sector and society, both through exploitation licenses and through the creation of spin-off companies.

TTVO manages a portfolio of 44 active patent families, and provides advice and assistance during the drafting of patent documents, their filing, and the prosecution process.

“Our Office is fully aligned with the CNIO objective of translating new discoveries into cancer prevention, diagnosis and treatment for the benefit of society.”

In 2023, 7 priority patent applications were filed, one of them co-owned with Seoul National University, another co-owned with *Fundación de Investigación Biomédica Hospital 12 de Octubre (FIBH12O)*, and one more co-owned with *FIBH12O* and the company Tailor Bio Ltd. These 7 new patents protect quite varied inventions, including a combination therapy for PDAC; a signature for the prognosis of brain metastasis relapse; amplification and detection methods using Hyperbranched Rolling Circle Amplification; a method for analysing genomic sequencing data from targeted sequencing; a method of

characterising chromosomal instability in a DNA sample obtained from a tumour; a computer-implemented method of predicting whether a tumour is likely to acquire a gene amplification; and a method for detecting pathogenic germline variants in Mendelian disease-associated genes from samples of cancer patients. Moreover, 2 PCT (Patent Cooperation Treaty) applications for international extension were also filed in 2023.

Licensed patents make up 36% of the CNIO portfolio. In 2023, pharmaceutical industry interest in compounds identified and characterised by the Experimental Therapeutics Programme (ETP) resulted in 2 agreements. First, the German company Refoxy Pharmaceuticals GmbH and CNIO signed an exclusive license agreement for the intellectual property pertaining to several FOXO activators identified by ETP in collaboration with Refoxy. Second, the Irish company Inflection Biosciences Ltd entered into a license agreement with the Swiss-based biotech Mysthera Therapeutics AG for its PIM kinase inhibitor programme licensed from CNIO, with the aim to treat major unmet needs in autoimmune diseases. In addition, Tailor Bio signed an exclusive option to negotiate a commercial license for the patents EP23383179.1 “Detection of chromosomal instability” and EP23383180.9 “Prediction of gene amplification” from Geoff Macintyre's Group.

Over the course of the year, the TTVO managed 213 agreements (MTAs, CDAs, Research Collaborations, licenses, etc.). The majority of these agreements (63%) were established with international entities, which is an indicator of the internationalisation of CNIO's research activity. Through collaborations with industry, €4 million were secured for research activities.

Among the most outstanding agreements signed with the private sector is for the continuation of the collaboration with *CRIS S.L.* and *THOT BIOTECH A.I.E.* for the second phase of the “Kras Cancer” project directed by Mariano Barbacid (CNIO Experimental Oncology Group), with a budget of €1.5 million for 3 years.

Other relevant agreements with the private sector include the collaboration with *Loxo Oncology Inc.* The Signalling and Immunometabolism Section headed by Susana Velasco is working to identify and validate novel molecular targets involved in the induction of chromosomal instability (CIN). *Loxo Oncology* and CNIO renewed their agreement until the

completion of the research activities, with a budget of €1.8 million per year.

Finally, several other research agreements were signed, such as one with *L'Oreal España* for a project with the Telomeres and Telomerase Group directed by Maria A. Blasco; a collaboration agreement between *Janssen Pharmaceutica NV*, the Genetic & Molecular Epidemiology Group (Núria Malats) and the Epithelial Carcinogenesis Group (Francisco X. Real); and a sponsored research agreement between *Verastem Inc.* and the Experimental Oncology Group (Mariano Barbacid).

Patents and unpatented research tools (murine lines, cell lines and antibodies) are licensed to provide financial return to CNIO. In 2023, the net income generated in 2022 from CNIO asset licenses was posted, which amounted to €1.6 million (about €1.1 million from monoclonal antibodies alone).

The creation of spin-off companies is one of the technology transfer mechanisms through which knowledge is translated into commercial products and/or services. A new spin-off in the field of precision therapeutic nutrition “*TNC Nutrición Terapéutica*”, in which the CNIO and the *FIBH12O* participate, provides nutritional and dietary advice for patients with cancer and other diseases. CNIO and *FIBH12O* granted a license to *TNC* for the commercial exploitation of a proprietary algorithm for precision nutrition developed by Miguel Quintela (CNIO) and Luis Manso (*FIBH12O*).

All of the achievements mentioned here stand as a testament to the excellence and hard work of CNIO scientists, as well as to CNIO's unwavering encouragement of innovation and technology transfer activities. ■