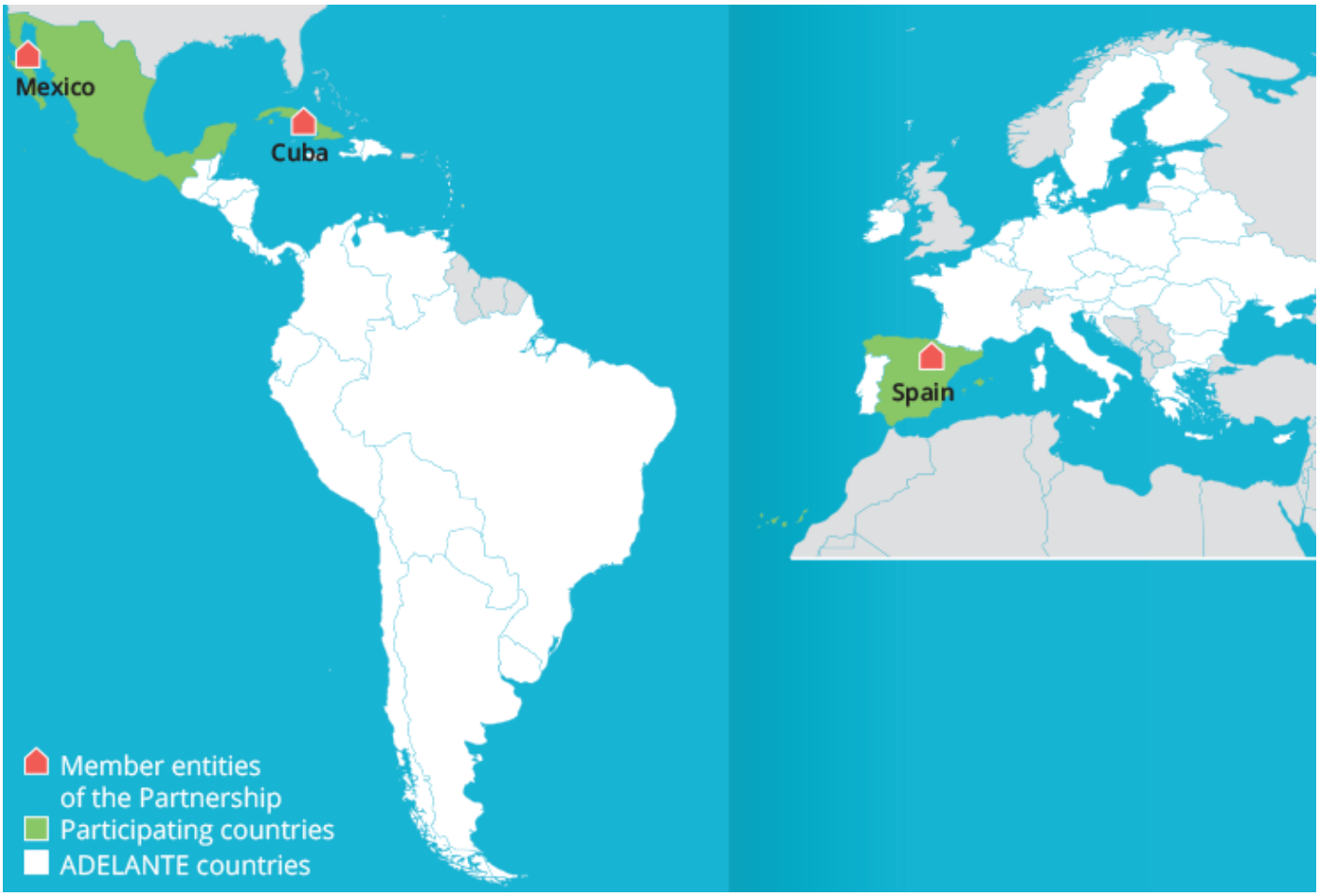
Developing Innovative Cancer Treatment Methodologies (INNOCANCER)

PARTNERSHIP



Background

The ***Centro de Ingeniería Genética y Biotecnología de Cuba*** (Center for Genetic Engineering and Biotechnology of Cuba - CIGB) is a leader in scientific research in the field of cancer immunotherapy. It has such promising levels of progress in clinical trials that the early production and application of certain innovative cancer treatments are on the horizon, leading the way in this sector.

In turn, the *Unidad de Angiogénesis del Área de Oncología del* ***Centro de Investigación Biomédica de La Rioja*** (Biomedical Research Center of La Rioja - CIBIR) in Spain is developing nanotechnology vaccines against

cancer with molecules aimed at inhibiting the growth of new blood vessels (angiogenesis). This is a fundamental process to prevent tumour growth and a particularly relevant component of the treatments developed by CIBIR.

The ***Centro de Investigación Científica y de Educación Superior de Ensenada*** (Center for Scientific Research and Higher Education of La Ensenada - CICESE) in Mexico has been collaborating with CIBIR since 2000 on projects in the field of biotechnological products in different areas, including angiogenesis and cancer. Together with CIGB, CIBIR was identified as an ideal centre for joint research. Within the framework of these exchanges, the opportunity arose to create a Triangular Cooperation Partnership in order to promote the development of innovative products for the treatment of cancer, through the exchange of knowledge and the strengthening of scientific research capacities.

Entities and roles

BENEFICIARY ENTITIES

Centro de Investigación Científica y Educación Superior de Ensenada - CICESE

Mexico

FIRST PROVIDER ENTITIES

Centro de Ingeniería Genética y Biotecnología

Cuba

SECOND PROVIDER ENTITIES

Fundación Rioja Salud (Centro de Investigación Biomédica de La Rioja) - FRS (CIBIR)

Spain

Development challenges

According to the World Health Organisation, cancer is the leading cause of death in the world, accounting for approximately 10 million deaths in 2020 (WHO, 2022). In the face of this global challenge, all efforts are contributing to resolving a problem that extends beyond borders, cultures or economic status. To this end, this Triangular Cooperation Partnership will encourage knowledge sharing in order to generate innovative solutions that reduce mortality rates among cancer patients and improve their quality of life.

Under this Initiative, the knowledge and expertise of CIGB and CIBIR, as well as their more advanced stages on the Technology Readiness Level (TRL), will be leveraged to develop joint research with CICESE. In this regard, the aim is to enable the transition from basic proof-of-concept to the clinical setting, while working on a roadmap that will allow CICESE to advance on the TRL scale, thus enhancing its capacity to further develop its technologies. This methodology could be replicated by other entities in the biotech sector in the region, with a multiplier effect that could contribute to the development of new and improved cancer treatments.

INITIATIVE

This Triangular Cooperation Initiative aims to build capacity in the Partnership to develop an innovative methodology to treat cancer, based on research and the development of new techniques, and maximising the technological expertise of the Partnership countries.

Triangular approach

CIGB has reached a high Technology Readiness Level (TRL) in the research and development of biotech products for cancer therapy, even developing therapeutic candidates that are currently in human clinical trials. These include the HEBERSaVax vaccine targeting angiogenesis and the tumour micro-environment, with successfully completed research in advanced ovarian tumours and hepatocellular carcinoma. This experience helps provide knowledge on the regulatory and ethical pathways to increase the TRL of biotech products, which will contribute to developing the roadmap that will allow CICESE to reach a higher TRL.

The Angiogenesis Team at CIBIR has more than 30 years of expertise in angiogenesis and the tumour micro-environment, and has developed specific models to analyse these tumour characteristics in animal models, which have led to significant advances in the study of these phenomena. In addition, CIBIR has developed several clinical trials based on laboratory observations, reaching a very advanced technological readiness level. This knowledge will be shared with the Partnership entities, strengthening the evidence to support the mechanisms of these new molecules and contributing to the transition to higher TRLs.

CICESE has a research platform for the development of antibodies, which has succeeded in isolating an antibody that inhibits angiogenesis. This success can be replicated with other cells and neutralise the growth of solid tumours in cancer patients, which, together with its ability to perform in vitro and in vivo studies, holds great potential for taking these discoveries to clinical application. However, support from CIGB and CIBIR is necessary to be able to advance the TRLs and bring these treatments to patients in need.

The knowledge gained during the Initiative will lay the groundwork for the design of clinical studies in cancers that have not yet been studied for the molecules analysed. This methodology could be replicated by other entities in the biotech sector in the European Union, Latin America and the Caribbean, with the development of therapeutic options for the treatment of human diseases. The methodological guide to be developed within the Initiative will be useful for other laboratories in the region interested in advancing their technology.

Sectoral approach - Contribution to the 2030 Agenda

PRIMARY SDG

Goal 3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

Goal 3.B Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.

SECONDARY SDG

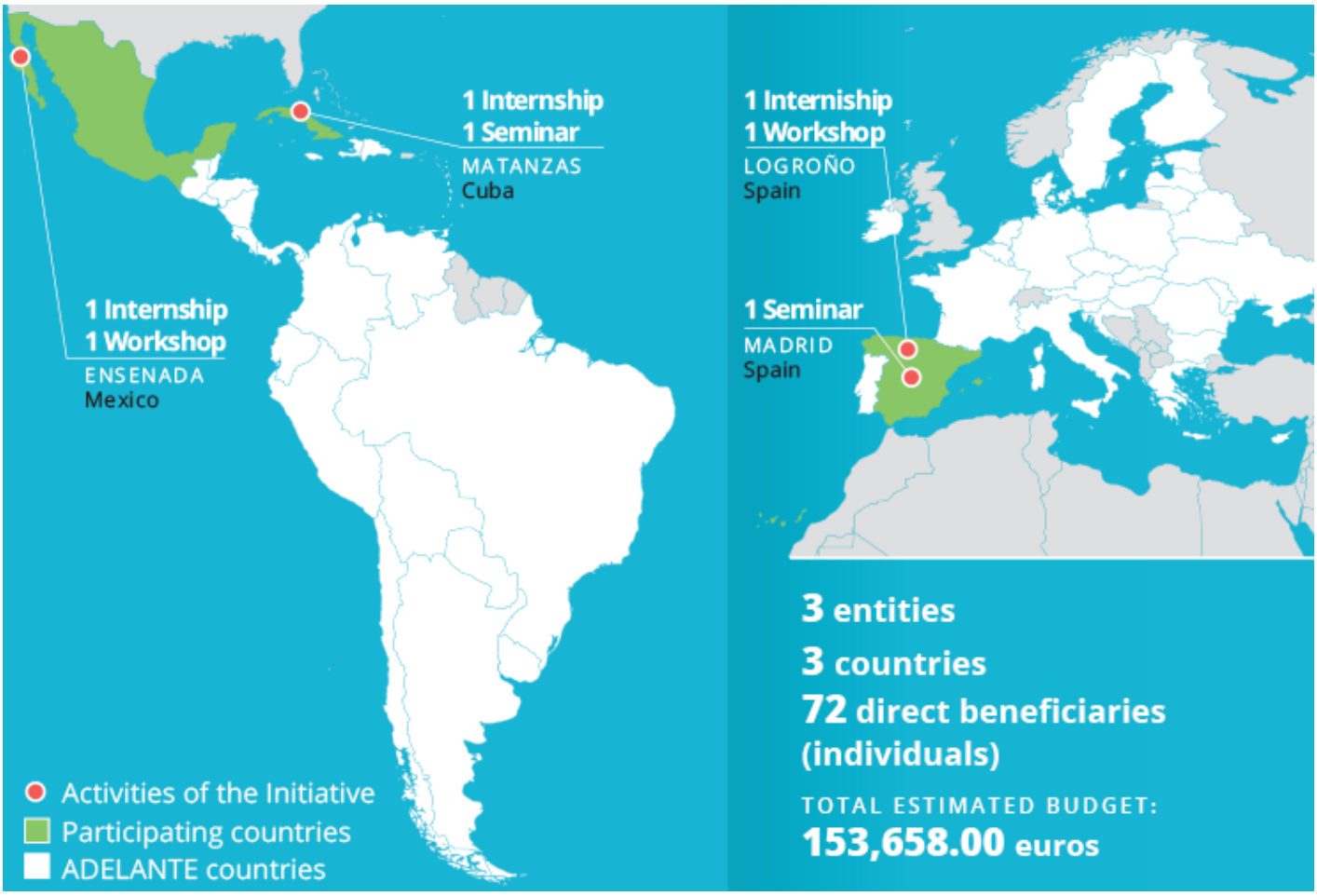
Goal 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

ADELANTE SDG

Goal 10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions

Goal 17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

Territorial approach



Intervention methodology

The work plan of this Initiative is based on **seven activities** that primarily seek to foster opportunities for joint research, as well as share the knowledge acquired with the scientific community.

Work will begin with **two seminars** that coincide with international cancer conferences. In addition to sharing knowledge with external actors and learning about current developments in cancer research, these events will serve as an opportunity for the three Partnership entities to meet face-to-face. These seminars will help prioritise the lines of research to be developed in the Initiative and update the knowledge transfer strategy.

Three internships will then be organised on-site at the different Partnership entities, where researchers will learn more about the available technologies first-hand and acquire specific knowledge so that they can take the necessary steps in advancing their technology, particularly in the case of CICESE.

Lastly, **two workshops** will be held to disseminate the technical capacity building model within the scope of cancer therapies. The final seminar will be held in Mexico and will also be the closing activity of the Initiative, where a collective reflection on the outcomes gathered throughout the period will take place, in addition to reflection on the future application of the knowledge generated.

Direct beneficiaries (individuals)

According to Rule 9 of the Guidelines for Applicants: all persons participating in the activities of the Initiative.

This Initiative features **72 direct beneficiaries** from the Partnership member entities. It should be noted that this Partnership is comprised of a significant number of female scientists (67%).

Moreover, some of the seminars will be open to undergraduate students from local universities, pre-doctoral students and those in the early stages of their post-doctoral careers. In addition, international experts on regulation, intellectual property and product commercialisation will be invited to attend. All of these individuals will benefit from the knowledge exchanged during the conferences and subsequent discussions, for which an estimated 300 direct beneficiaries could also participate in addition to the Partnership members.

Budget

EU contribution: 112,540.00 €
Co-financing - Triangular Cooperation Partnership: 41,118.00 €
Total budget: 153,658.00 €