

CIC biomaGUNE leads a research team to develop oxygen-carrying nanoparticles for cancer treatment through photodynamic therapy

PRESS RELEASE

Photodynamic therapy is based on the light-stimulated generation of free radicals that cause the death of cancer cells

Today the kick-off meeting was held for OXIGENATED, a research project funded by the European Commission

(Donostia-San Sebastián, 14 March 2019). A research team coordinated by CIC biomaGUNE began work today on the OXIGENATED project, which aims to develop oxygen nanocarriers and photosensitising agents for the treatment of cancer through photodynamic therapy. The project consists of developing haemoglobin-based protein carriers and investigating them in subsequent in vitro and in vivo studies in different cancer models to assess their therapeutic potential.

Experts from CIC biomaGUNE (Donostia-San Sebastián), the Medical Faculty of the Charité Berlin Hospital (Germany), the University of Tartu (Estonia), Surflay Nanotec GmbH (Berlin, Germany), the National University of General San Martín (Argentina), the University of Brasilia (Brazil), the University of Chulalongkorn (Thailand) and the National University of the South (Argentina) held their first team meeting today in Donostia-San Sebastián. The team will conduct its research activity over the next four years.

Sergio Moya, CIC biomaGUNE researcher and OXIGENATED project coordinator, explains: “Photodynamic therapy is based on the light-stimulated generation of free radicals that cause the death of cancer cells. This therapy is particularly useful in treating skin cancer and Bowen’s disease”. Dr. Moya, a specialist in the development of materials for biomedical applications, adds: “The idea is to treat malignant tissue with a photosensitising agent, which will be light-stimulated to form reactive oxygen species and free radicals. Free radicals are ultimately responsible for the death of cancer cells. The presence of tissue oxygen is fundamental in this therapy, but the low oxygen content in the malignant tissue (hypoxia) limits its application. The OXIGENATED project seeks

to increase the oxygen content in cancerous tissue for more efficient photodynamic therapy using nano-scale materials that act as oxygen carriers”.

Project results could potentially be applied toward development of alternative methods for treating cancer with photodynamic therapy, and may be used to improve the effectiveness of this therapy and the quality of life of treated patients.

OXIGENATED is a multidisciplinary research project involving aspects of materials science, physics, molecular biology, medicine and preclinical imaging.

The CIC biomaGUNE team taking part in the project is made up of chemists with experience in nanotechnology and materials science at the interface of biology and medicine. The research team includes Dr. Sergio Moya (coordinator); Dr. Patricia Andreozzi, an expert in nanomedicine in cancer therapy; Dr. Eduardo Guisasola, a specialist in the development of controlled release systems for cancer applications; and Dr. Elisa Bindini, an expert in the manufacture of nanomaterials and hybrid materials.

A project funded by the European Commission

OXIGENATED is a project funded by the European Commission under the Horizon2020 Research and Innovation Framework Programme and the Marie Skłodowska Curie Research and Innovation Staff Exchange (MSCA-RISE). The MSCA-RISE programme aims to foster international collaboration through exchanges of research personnel between European and non-European institutions and cross-sector exchanges between academia and industry within Europe.

About CIC biomaGUNE

The Center for Cooperative Research in Biomaterials (CIC biomaGUNE), located in the Gipuzkoa Science and Technology Park, conducts cutting-edge research at the interface between Chemistry, Biology and Physics, and particularly on the properties of molecular level biological nanostructures and their biomedical applications.

CIC biomaGUNE was accredited in 2018 as a “María de Maeztu” Unit of Excellence after assessment of its compliance with a series of excellence requirements characterised by a high impact and level of competitiveness in its particular field of activity and in the scientific arena worldwide. The center’s research activities are not only regularly subjected to scientific assessment processes conducted by an external and independent committee of scientists, but are frontier research actions developed in line with a strategic program. Furthermore, the centre also selects, trains and attracts talent on an international level, has active partnership and exchange agreements on an institutional level with other

top-level research centers and promotes activities for the transfer and dissemination of knowledge to society at large.