

# Press Release



## ***New EU-funded Project NuCapCure***

### **NuCapCure Project Launches to Develop Tailored Multimodal Treatments for GBM Brain Cancer**

*On the 29<sup>th</sup> of February 2024, the newly launched research project NuCapCure officially kicks off its activities in Oslo. The project consortium, led by coordinator Dr Theodossis Theodossiou from the University of Oslo, comprises seven European institutions.*

Each year, approximately 240,000 people worldwide are diagnosed with brain cancer. The most lethal type, Glioblastoma multiforme (GBM), also known as “the Terminator”, accounts for 14.6-16% of all primary brain and central nervous system tumours, tragically making it also the most common one.

The current standard of care for GBM involves surgery followed by a combination of radiotherapy and chemotherapy. These interventions impose a significant physical and financial burden on patients and healthcare systems, while their curative impact is unfortunately limited. In fact, they only marginally extend patient survival by approximately 15 months, with a survival rate for GBM patients within five years of diagnosis at nearly 6%. This highly unmet medical need presents one of the most substantial challenges for modern oncology and the overall well-being of global societies.

The new EU-funded NuCapCure project has been launched to address this challenge and undertake the ambitious mission of redefining the landscape of GBM treatment. The seven partners of the consortium aim to develop two radical, multimodal anticancer treatments highly specific to GBM. Over the next 54 months, NuCapCure will receive a total of €5.9 million in funding from the European Innovation Council's (EIC) Pathfinder programme, which targets visionary and disruptive innovations that can bring about decisive societal change by addressing global challenges.

#### **NuCapCure's Vision: Multimodal Anticancer Treatments**

NuCapCure's approach involves the creation of customised boron-containing photosensitisers (PSs) using intracellular biochemistry. This innovative strategy aspires to create new radical and cancer-specific treatments, combining proton radiotherapy, proton-induced PS activation, boron neutron capture therapy (BNCT), and neutron-induced PS activation.

One of the core objectives of the NuCapCure project focuses on the design, development, validation, and optimisation of boron-modified PS prodrugs. These compounds will facilitate the intracellular production of boron-modified PSs by hijacking vital biosynthetic pathways. Put differently, the cancer cells will become small individual chemical laboratories that generate the final drugs, leading to their destruction through neutron- or accelerated proton-based treatments. The specificity of the bespoke PSs to the cancer cells is crucial for sparing the normal tissue surrounding the lesions.

The project will include initial photophysical characterisation and photodynamic therapy (PDT) studies of various pre-drugs and PSs in cells. The proposed NuCapCure treatments will then be validated and optimised in 2D and 3D GBM cell cultures, with the most promising PS prodrugs being selected for in vivo studies. The final phase will aim to validate NuCapCure's efficacy in animal GBM tumour models.



# Press Release



## Scientific Breakthroughs and Transformative Impact Beyond Healthcare

Based on a combinatorial approach, NuCapCure anticipates several scientific breakthroughs, including externally controlled intracellular chemistry and multicomponent neutron and proton therapies. These advancements hold promise for effective GBM treatments, potentially offering curative solutions that could positively impact patients' lives and healthcare systems in terms of well-being and economy.

In addition, the project will stimulate economic growth by creating new business opportunities around the bespoke chemical agents, pharmaceuticals, and specialised medical services. Utilising existing European infrastructure, particularly i) exponentially expanding proton therapy centres and ii) neutron sources previously used for Boron Neutron Capture Therapy (BNCT), these cutting-edge therapies can set paradigm shifts in the fight against cancer, leading to disruptive innovations.

"The NuCapCure project can revolutionise cancer treatment, aiming to offer curative yet cost-effective alternatives for GBM, providing significant benefits for patients, healthcare systems, and the society as a whole," says Theodossis Theodossiou, the project coordinator from the University of Oslo. "With our hand-picked and committed partners, we can drive the project to revolutionise modern oncology and deliver a decisive blow to an until now incurable disease."

\*\*\*

## KEY FACTS

**Full name:** NuCapCure - Development of innovative proton and neutron therapies with high cancer specificity by 'hijacking' the intracellular chemistry of haem biosynthesis

**Start date:** 1 February 2024

**Duration:** 54 months

**Budget:** 5,972,875.75 EUR

**Coordinator:** UNIVERSITETET I OSLO, Norway

**Website:** <https://nucapcure.eu>

**X:** [@NuCapCure](#)

**LinkedIn:** [@NuCapCure](#)

### Project Partners:

- Universitetet i Oslo and Oslo Universitets Sykehus, Norway
- GalChimia, Spain
- Univerzita Karlova, Czechia
- Centrum výzkumu Řež s.r.o., Czechia
- EURICE – European Research and Project Office GmbH, Germany
- National Center for Scientific Research "DEMOKRITOS"
- Academisch Ziekenhuis Groningen, The Netherlands



# Press Release



## CONTACT

Project Coordinator  
Universitetet i Oslo, Norway  
Theodosis Theodossiou  
Email: [theodoss@fys.uio.no](mailto:theodoss@fys.uio.no)

Project Management  
EURICE – European Research and Project Office GmbH  
Laura Schweigert  
Email: [l.schweigert@eurice.eu](mailto:l.schweigert@eurice.eu)

