

Fondo Sociale Europeo Plus 2021/2027

FSE+

Sportello 2025 P.S. 20/24

Sostegno alla realizzazione di dottorati di ricerca

With Decree No. 9526/GRFVG of February 28, 2025, the Friuli Venezia Giulia Region published the Notice regarding the submission of operations for Specific Program No. 20/24, which aims to support higher education through the realization of PhD programs.

Specific Programme 20/24, through the funding of doctoral scholarships, contributes to the achievement of the objectives of the Sustainable Smart Specialisation Strategy (S4). It supports the development or strengthening of integration with the regional production system and/or research organisations, through coordination and collaboration mechanisms with regional enterprises or research bodies, or by leveraging the potential for technology transfer of processes, products, applications, or, more broadly, research outcomes.

- Sportello 2025
- Ciclo 41
- CUP J93C25000640008
- Progetto 2025/6525/24

Dottorato in **Molecular Biomedicine**

"Validation of the combined anti-osteolytic and anti-tumor therapeutic potential of the ICOS-Fc molecule "

In Italy, 35,000 new cases of bone metastases are recorded every year. The global metastatic bone cancer market, estimated at 19.7 billion dollars in 2022, is expected to reach 38.9 billion dollars by 2032. Current drugs primarily act against bone resorption, but not against the tumor. A drug that reduces bone loss and inhibits the growth of bone metastases would be a significant innovation. Our project will develop a therapeutic platform based on the ICOS-Fc molecule, a patented biological drug that simultaneously inhibits tumor growth and osteolysis by binding to receptors present in bone metastases. The project is born in collaboration with Novaicos immunotherapeutics – NIT – a spin-off of the University of Eastern Piedmont (UPO), which developed the biotechnological molecule named "ICOS-Fc" that currently has patent coverage in both Europe and the US. The idea will be developed through a series of steps that:

- A) will first confirm the effect of ICOS-Fc on in vivo models of bone metastases;
- B) will improve its efficacy and administration by incorporating it into nanoparticles.

The planned activities are:

1. Testing the efficacy of ICOS-Fc on murine models of bone metastases.
2. Incorporating ICOS-Fc into PLGA nanoparticles.
3. Functionalizing the nanoparticles with bisphosphonates to improve bone distribution.
4. Monitoring tumor burden and bone resorption through imaging and analysis.

The project will also explore the clinical applications of ICOS-Fc for the treatment of primary and metastatic tumors, severe osteoporosis, and the functionalization of bone cements for pathological fractures.