# Theranostic Strategy for Proton Boron Capture Therapy of Pancreatic Cancer (THER-PBCT)

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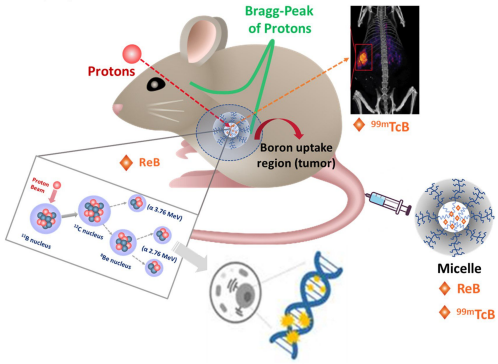
Medical Physics

## THER-PBCT Project: MAIN GOAL

- Prove that Proton Boron Capture Therapy (PBCT) can lead to an increased biological response of ductal pancreatic cells accumulating boronated micelles.

- Provide the devised PBCT strategy with a theranostic nature.

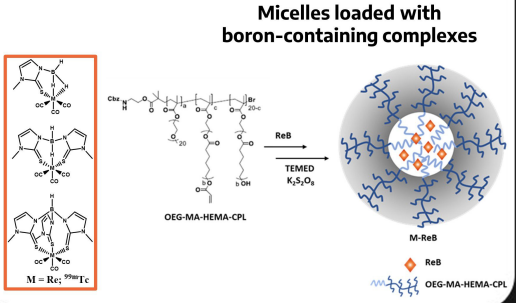



## THER-PBCT Project: Innovation

- Unprecedented experimental approach based on the delivery of boronated micelles to radioresistant pancreatic cancer cells and on the evaluation of the biological outcome upon their irradiation with a clinical proton beam. It is expected that this PBCT approach will lead to a significant dose enhancement factor (DEF), proportional with the amount of $^{11}$B atoms taken by the cells.

- By exploring polymeric micelles to deliver boronated Re(I) and $^{99m}$Tc(I) complexes to PDAC cells, we expect to evaluate an innovative theranostic strategy of PBCT in the treatment of pancreatic cancer that allows SPECT imaging of the tumoral accumulation of the carrier micelles.

## STRATEGY




## Research Plan

- Proton irradiation of pancreatic cells treated with the boronated micelles.
- Evaluation of cell viability and survival/ DNA damage.
- SPECT imaging and biodistribution studies in tumor bearing mice.

## TEAM

**C2TN/IST**
- António Paulo (***PI***)
- Célia Fernandes (**co-PI**)
- Elisa Palma (***chemistry/radiochemistry***)
- Fernanda Marques (***cellular studies***)
- Filipa Mendes (***cellular studies***)
- Lurdes Gano (***animal studies***)

**MDACC/UT**
- Chun Li (***PI***)
- Joe Y. Chang
- Qizhen Cao