

Irradiation of a biomaterial using a proton-beam

And characterization of the damage produced for
proton-therapy pre-clinical studies


S. Viñals, M. Crespillo, G. García

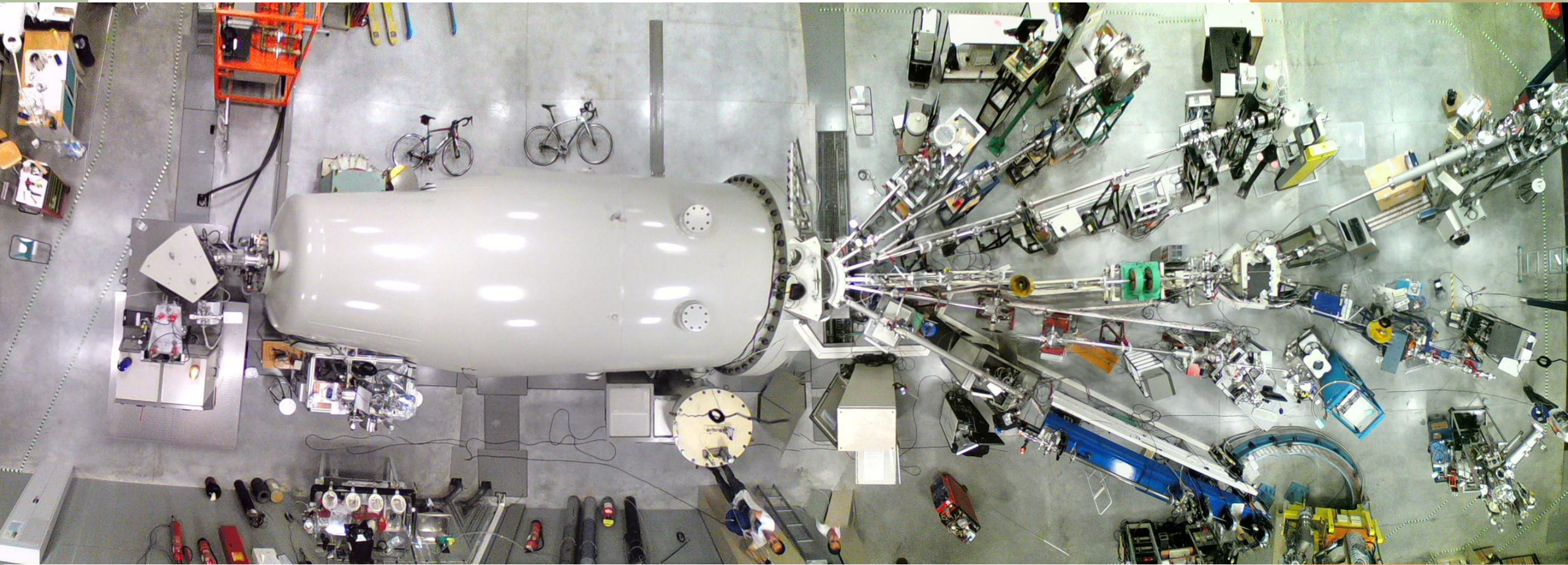


**6th Summer School on INtelligent
signal processing for FrotlEr
Research and Industry**

23/8 - 4/9, 2021

What we will do:

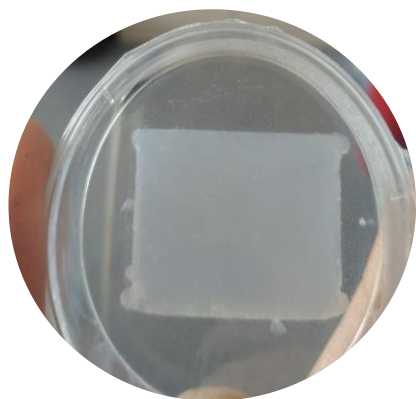
1. Manufacturing the biomaterial that will be irradiated
2. Irradiation experiment at the external micro-beam at  CMAM
3. Observe irradiated samples and discussion on characterization techniques (FTIR)
4. Planning of a proton-therapy treatment with SRIM software package



Materials and Methods at

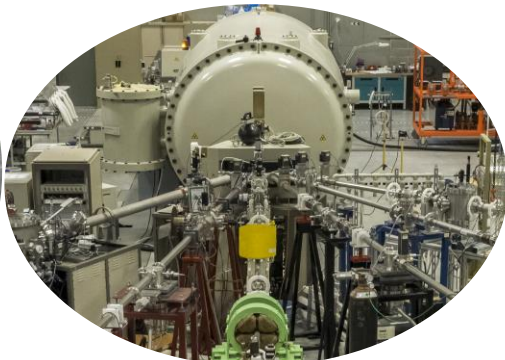
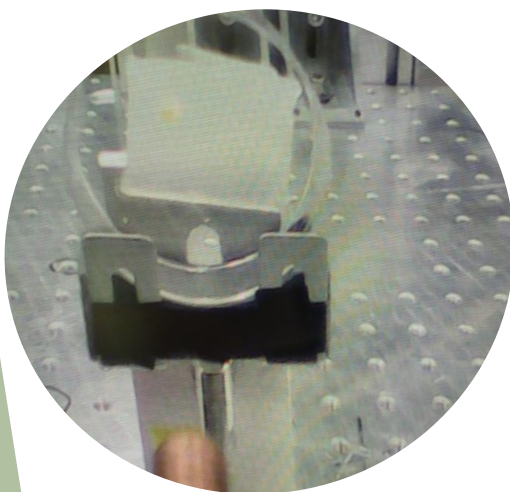
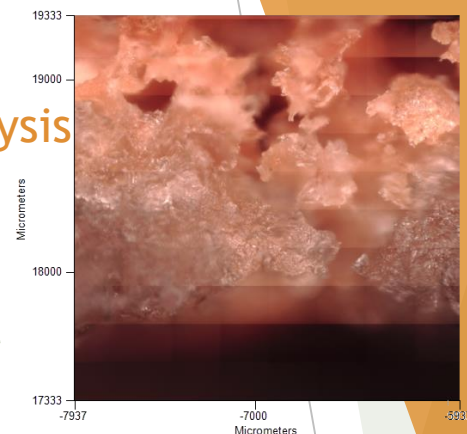
The biomaterial

An inorganic hydrogel that will simulate the soft tissues present at the body. This will be manufactured at the lab.



Sample observation and analysis

FTIR is a technique used to obtain an infrared spectrum of absorption, emission or reflectance. The analysis of the spectra may provide insight into the damage produced by the irradiation.

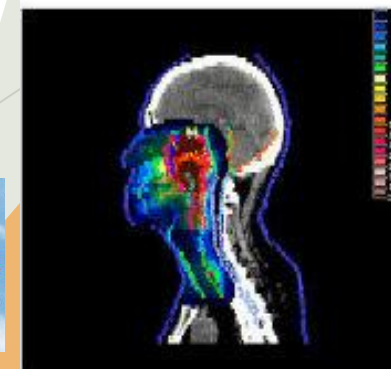
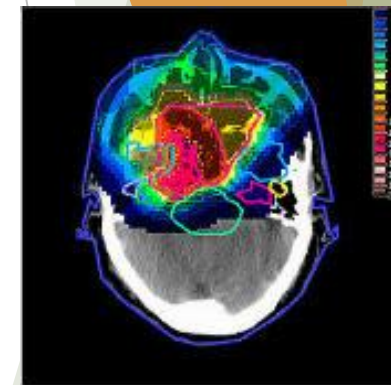


The irradiation@EuB

The external micro-beam line at CMAM allows to irradiate with protons up to 10 MeV samples that can not be in vacuum. Apart from the irradiation, the placement of the samples and the dose calculation will be carried out

The treatment planning

For proton-therapy, one of the main parts is the planning of the treatment. By knowing the location of a supposed brain tumor and using SRIM, the characteristics of the proton-beam will be obtained.



**Thanks for your
attention**