

Oferta de Trabajo de Fin de Máster del Máster de Física de la Materia Condensada y los Sistemas Biológicos de la UAM

Título en español: Explorando las fronteras en protonterapia.

Título en inglés: Exploring frontiers in proton therapy.

Resumen:

Proton therapy is a newer and more advanced radiation treatment for tumors that uses energy from positively charged particles (protons). Recent studies suggested that proton therapy is a promising radiation treatment because it focuses more energy on the tumor, causing fewer side effects than traditional radiation. We already performed proton therapy experiments in the Center for Micro-Analysis of Materials (CMAM, Figure 1a,b), but some improvements must be explored [1]. This project will aim to irradiate glioblastoma cells (brain cancer cells) with a proton beam. The first objective will be to design a new platform to perform these measurements in CMAM [2]. We will perform simulations to know the best conditions to irradiate the cells with the Bragg peak. We will also use software to design the platform and use 3D printing and fabrication methods to fabricate the platform. Proton therapy experiments will also be performed using the platform with glioblastoma cells (Figure 1c). Cell culture, imaging, and cell analysis will also be carried out to conclude the experimental section [3]. We are looking for a student who would like to be involved in a multidisciplinary project with experiments and simulations for proton therapy.

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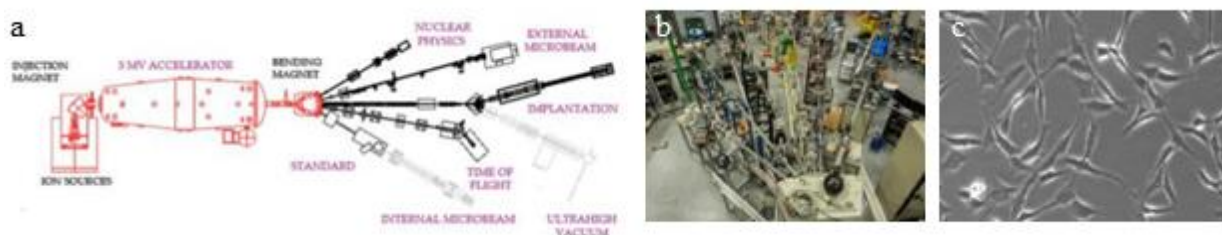


Figure 1: CMAM beamlines a) scheme and b) picture. c) Glioblastoma, brain cancer cells, cultured in a well-plate.

[1] S. Viñals et al 2023 JINST 18 C03025 DOI : 10.1088/1748-0221/18/03/C03025

[2] B. Cortés-Llanos et al 2023 Bioengineering & Translational Medicine, e10551, <https://doi.org/10.1002/btm2.10551>

[3] A. Granja et al 2023 Biomaterials Advances,151, 213443, <https://doi.org/10.1016/j.bioadv.2023.213443>.