



LABORATÓRIO DE INSTRUMENTAÇÃO
E FÍSICA EXPERIMENTAL DE PARTÍCULAS
partículas e tecnologia

Dosimetry

group

Total FTE=13.1 (PhD=1.2)

7 Researchers

9 PhD students

9 MSc students

7 Undergraduate students/Trainees

10 External collaborators

- ✓ 1 Article in international journal (direct contribution)
- ✓ 2 LIP students notes
- ✓ 1 Oral presentation in national conference
- ✓ 2 Poster presentations
- ✓ 7 Student presentations
- ✓ 1 MSc+1 BSc thesis
- ✓ Jornadas doutorais (FCUL) + PT MasterClasses



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RADART

RAdiation Dosimetry to Advance RadioTherapy

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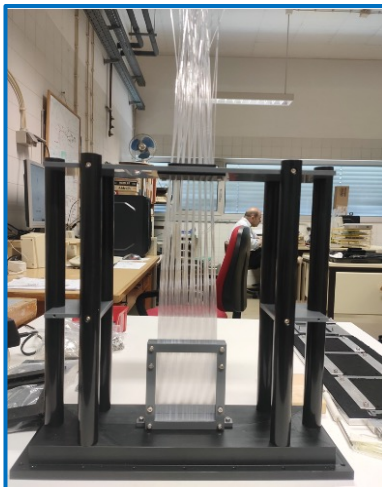
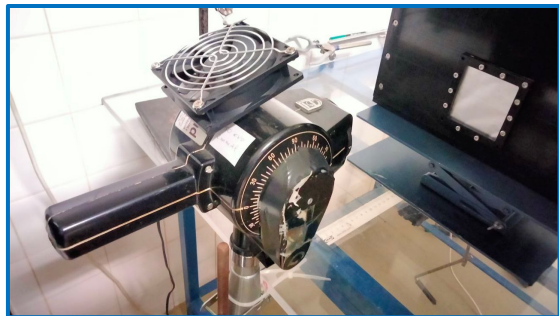
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Thematic lines

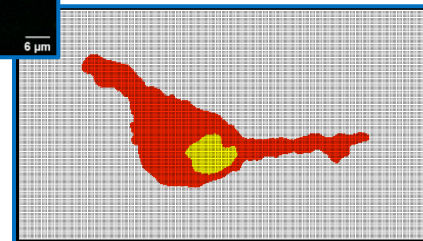
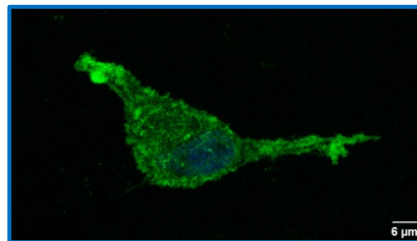
Detectors and materials for high-res dosimetry

- SPOF array for high-res dosimetry
- Development of materials for micro and nanodosimetry



New modalities and applications in RT

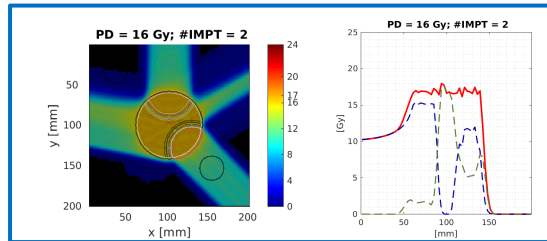
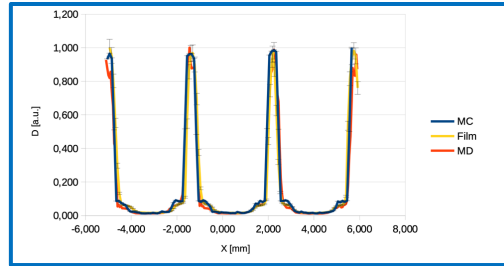
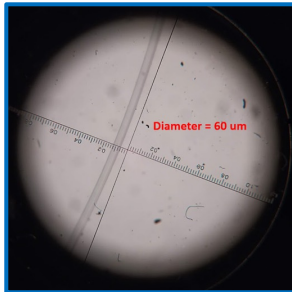
- Modeling radiobiological effects of NPs
- Advance charged-particle MBRT
- Advance FLASH-RT
- Effects of PT in NDDs



Milestones

Detectors and materials for high-res dosimetry

- Prototype assembly and first irradiation tests (XR 50 kV and ^{90}Sr e $^{-}$).
- First production μm fibers by electrospin (C2TN). MC simulations of microdosimetric quantities in FNTDs crystals.



New modalities and applications in RT

- Algorithm to reconstruct cell geometries from CM into TOPAS. Benchmark with a ^{60}Co source irradiation of GBM cells.
- Simulations of OF and PVDR for the C beam campaign at GSI in May 2022 and calibration factors for the μD and IBA RD detectors.
- FLASH-IMPT implementation in the matrad toolkit tests: robustness, prescribed dose and homogeneity
- First irradiation experiments of biological samples with a ^{60}Co to study several biological markers.



International Journal of
Molecular Sciences



Review

Radiation as a Tool against Neurodegeneration—A Potential Treatment for Amyloidosis in the Central Nervous System

Carina Marques Coelho ^{1,2,*}, Lia Pereira ^{1,2,*}, Pamela Teubig ¹, Pedro Santos ³, Filipa Mendes ^{3,4}, Sílvia Viñals ⁵, Daniel Galaviz ^{1,6} and Federico Herrera ^{2,7,*}

SWOT

Strengths

- Capability to attract students.
- Aggregates competences from several LIP infrastructures.
- Collaborations with external researchers from national and international institutions.

Weaknesses

- Consolidate collaborations linked to pre-clinical and clinical research.
- Number of FTE researchers small compared with the number of students. Most senior researchers have teaching duties

Opportunities

- > 10 new PT centres in Spain.
- Collaborations with CMAM (Madrid), IGFAE (Santiago de Compostela), DKFZ (Heidelberg), ICPO (Paris).
- New MSc in Medical Physics+International Network for Advanced Radiotherapy.

Threats

- Plan for a PT center in Portugal?
- Lack of medium-term funding.
- End of contract for one of the researchers the group.