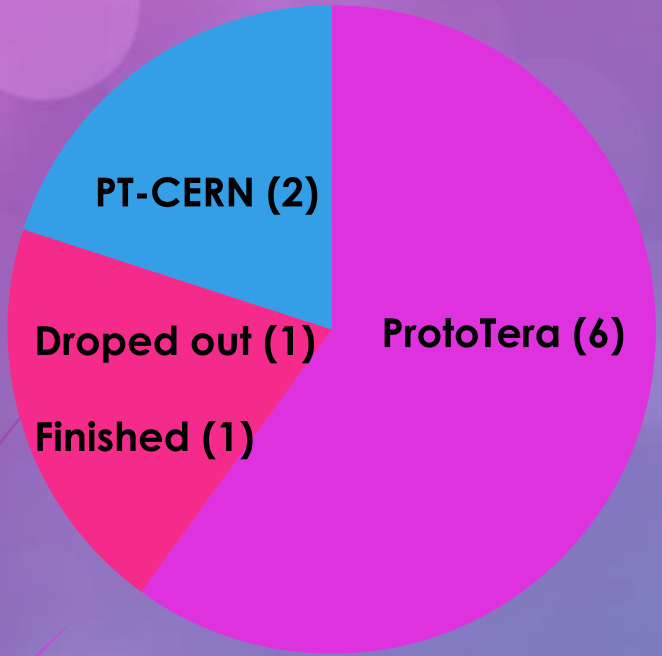
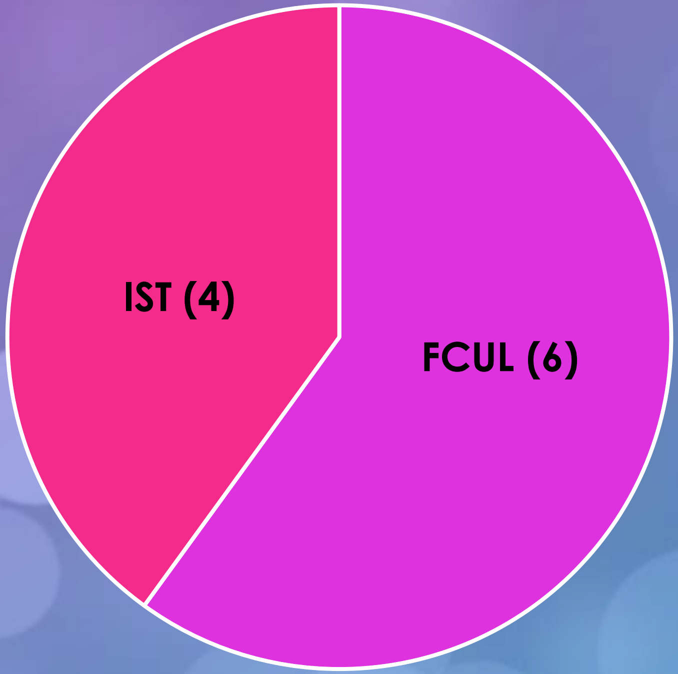
RADART

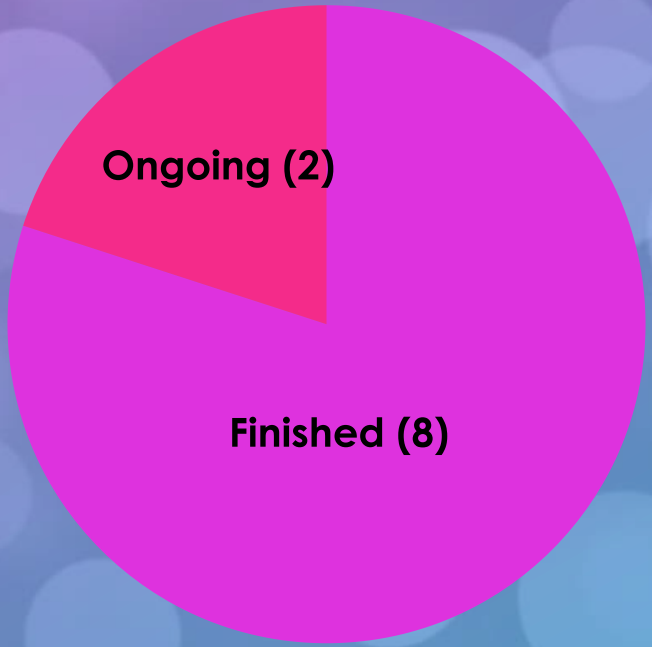
2023 – 2024

Researchers = 7
Trainees = 8
MSc. Students = 10
PhD. Students = 9

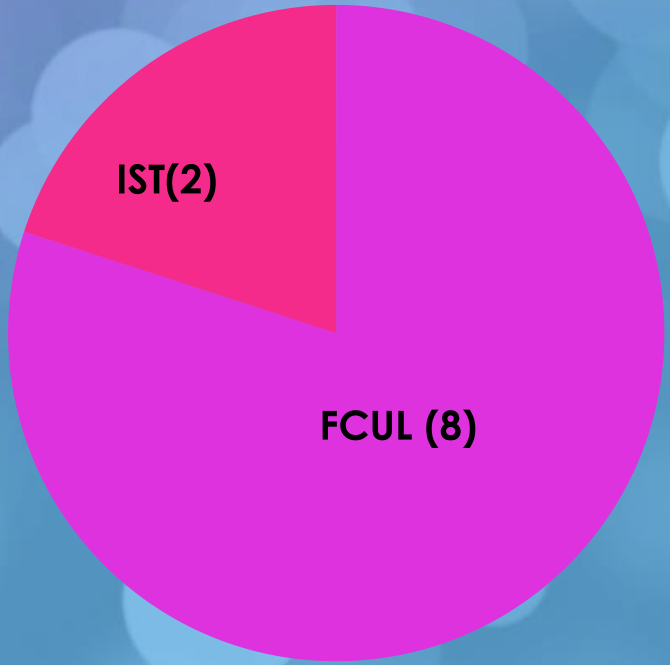


PhD. =9
(2023-2024)

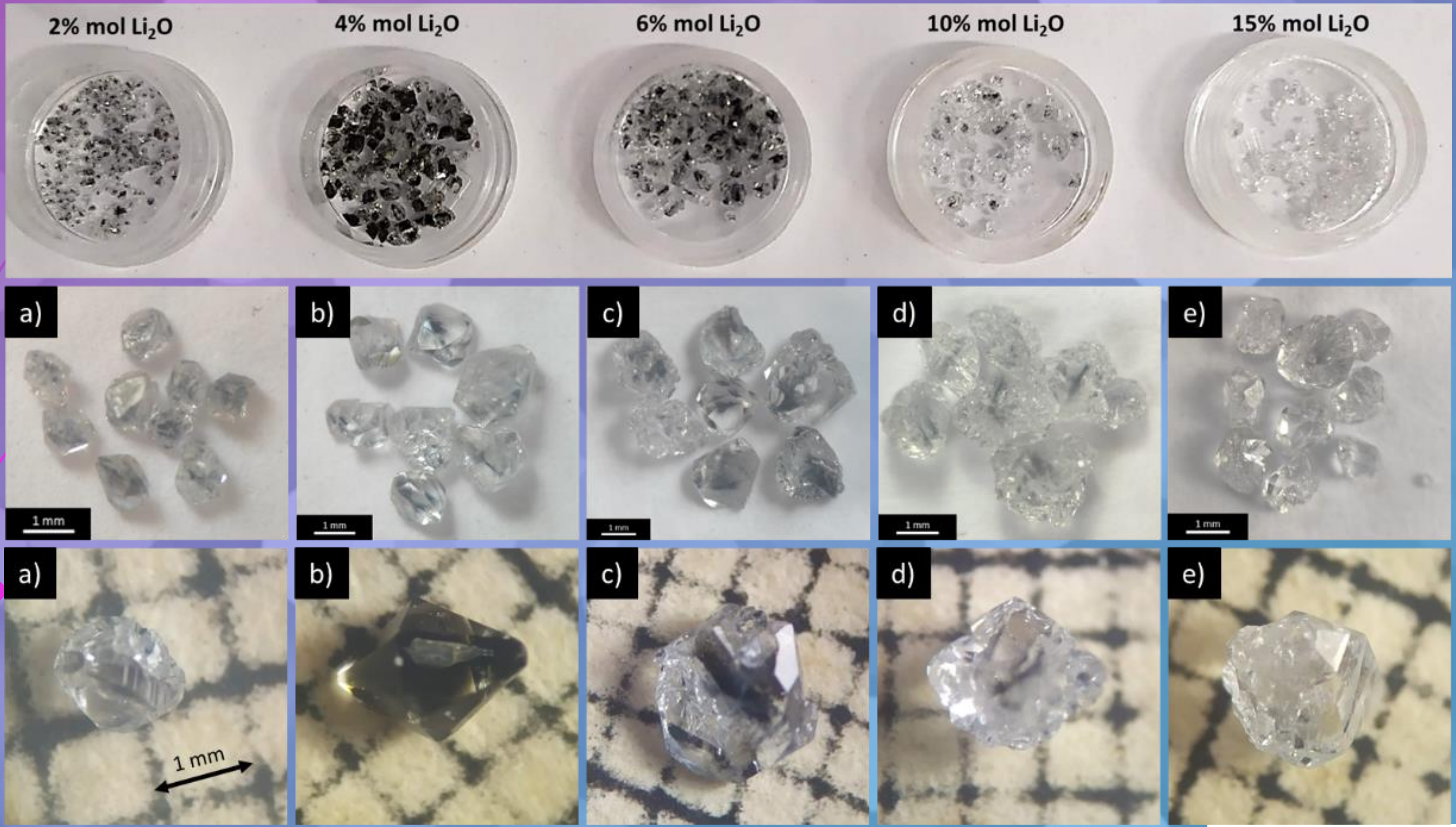




MSc.=10
(2023-2024)



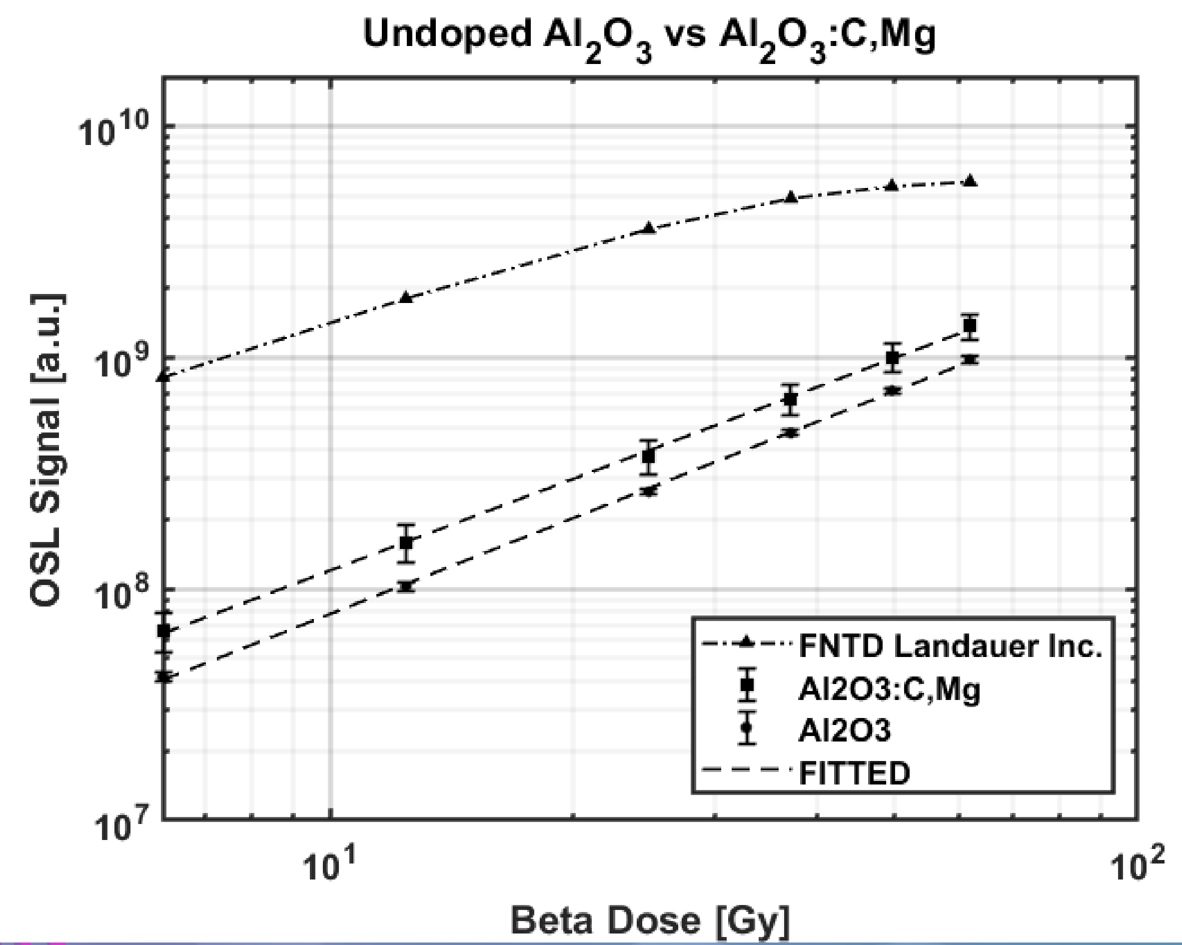
Sapphire detectors for radiotherapy
(Cristiana Rodrigues)



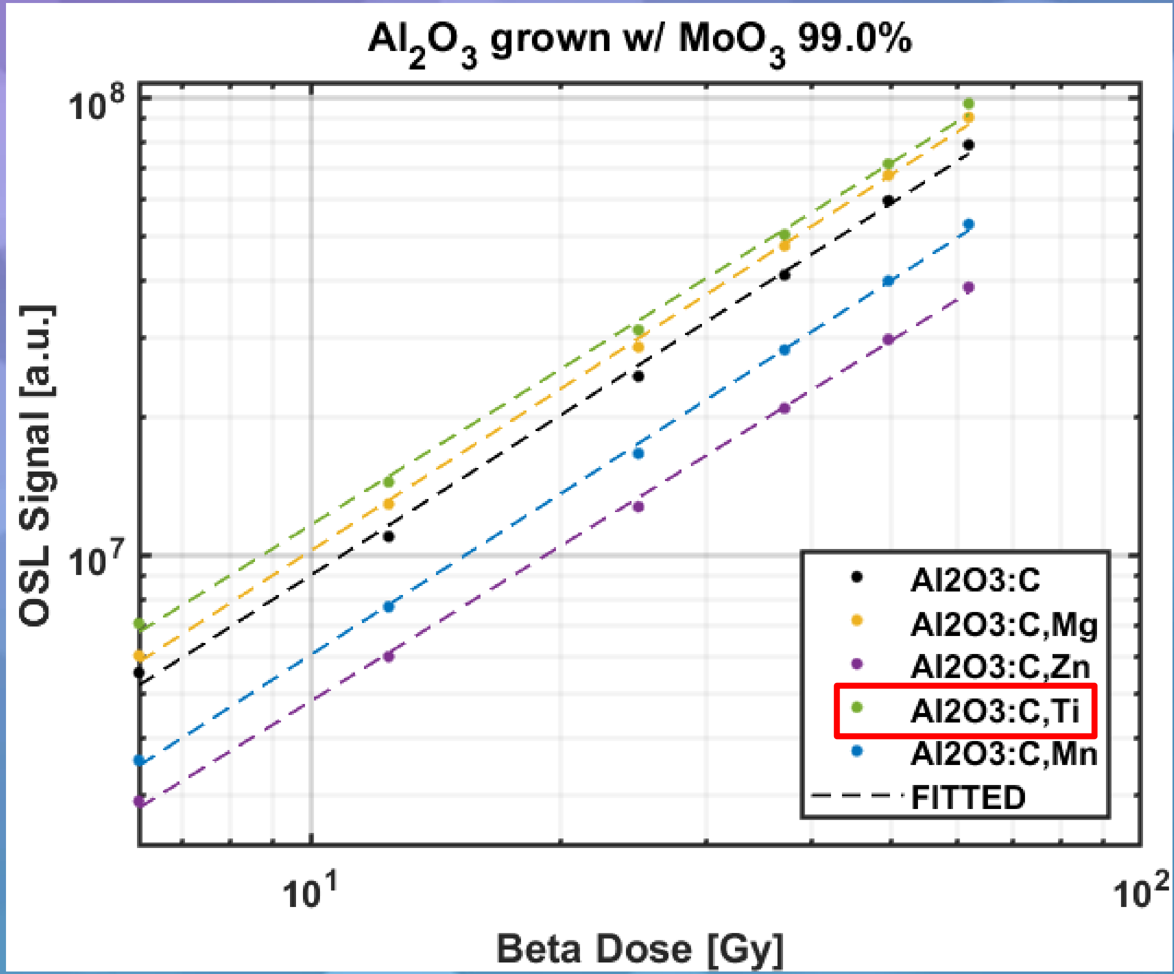
Biosystems and Integrative Sciences Institute

C²TN CENTRO DE CIÊNCIAS E TECNOLOGIAS NUCLEARES

Al_2O_3 vs Al_2O_3:C,Mg grown w/ MoO_3 p. 99.5%

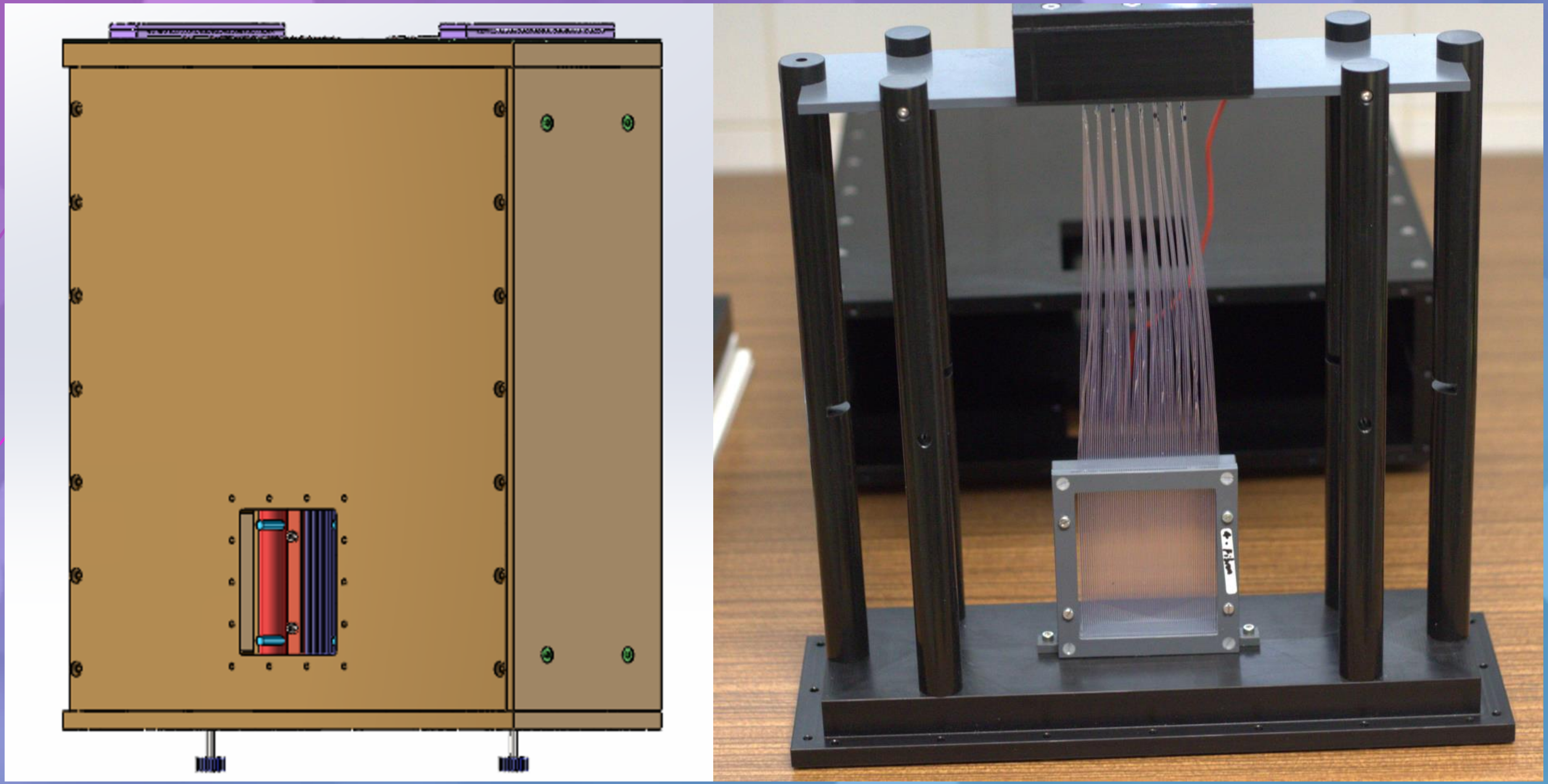


Novel Doped Al_2O_3 grown w/ MoO_3 p. 99.0%



LIBPhys-UNL
NOVA
NOVA SCHOOL OF SCIENCE & TECHNOLOGY
PAUL SCHERRER INSTITUT
PSI
dkfz.
GERMAN CANCER RESEARCH CENTER IN THE HELMHOLTZ ASSOCIATION

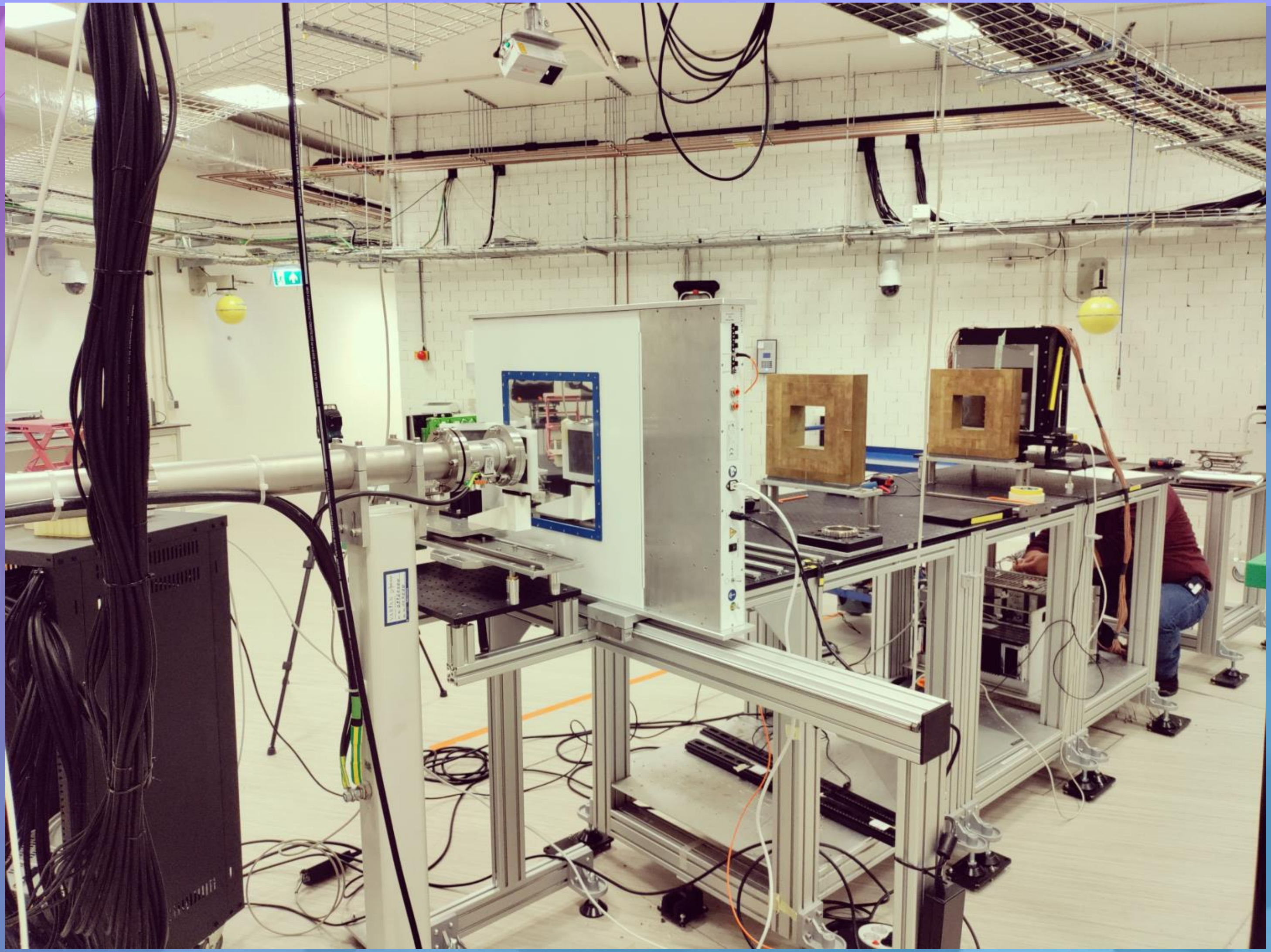
Proton Scintillating Fiber Array Detector
(Duarte Guerreiro)



64 scintillating fibers

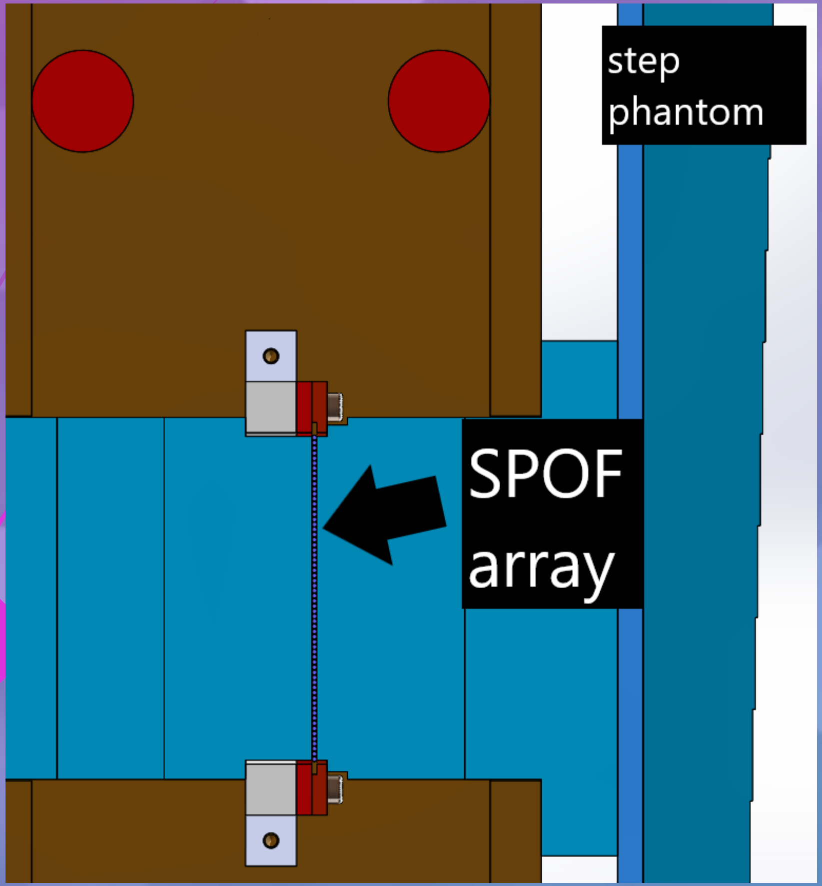
MultiAnode PMT

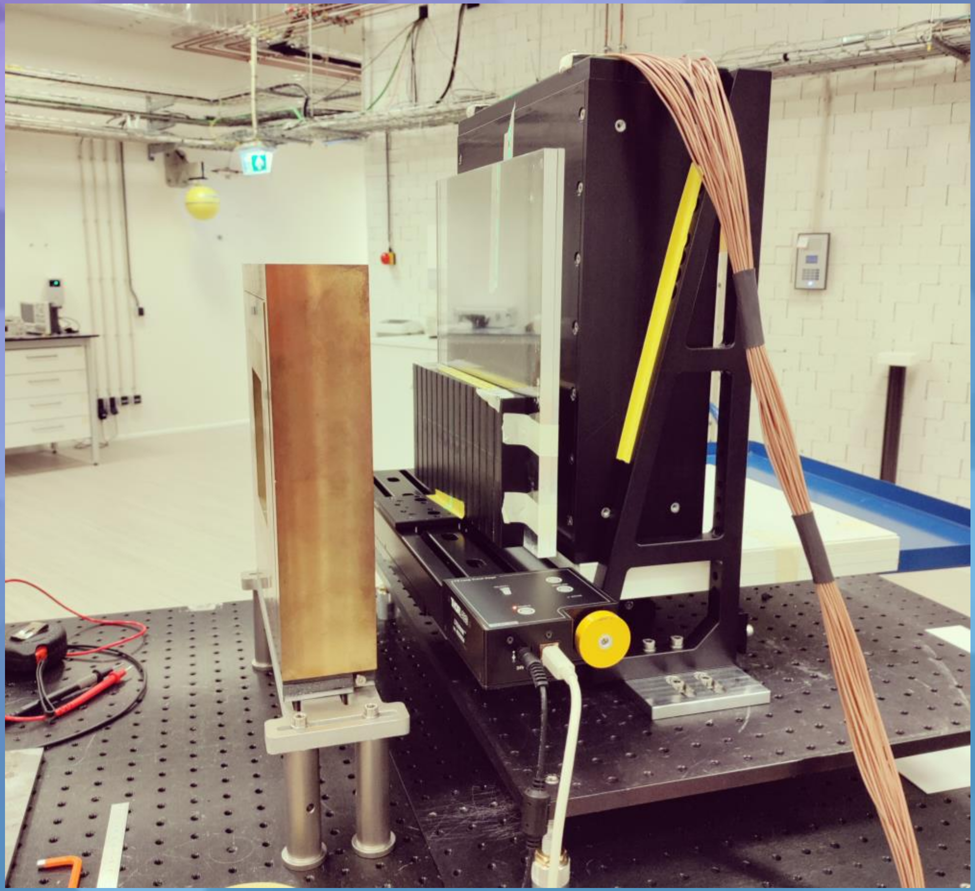
Proton beam tests at HollandPTC - 130 MeV



HollandPTC
Proton Therapy Centre

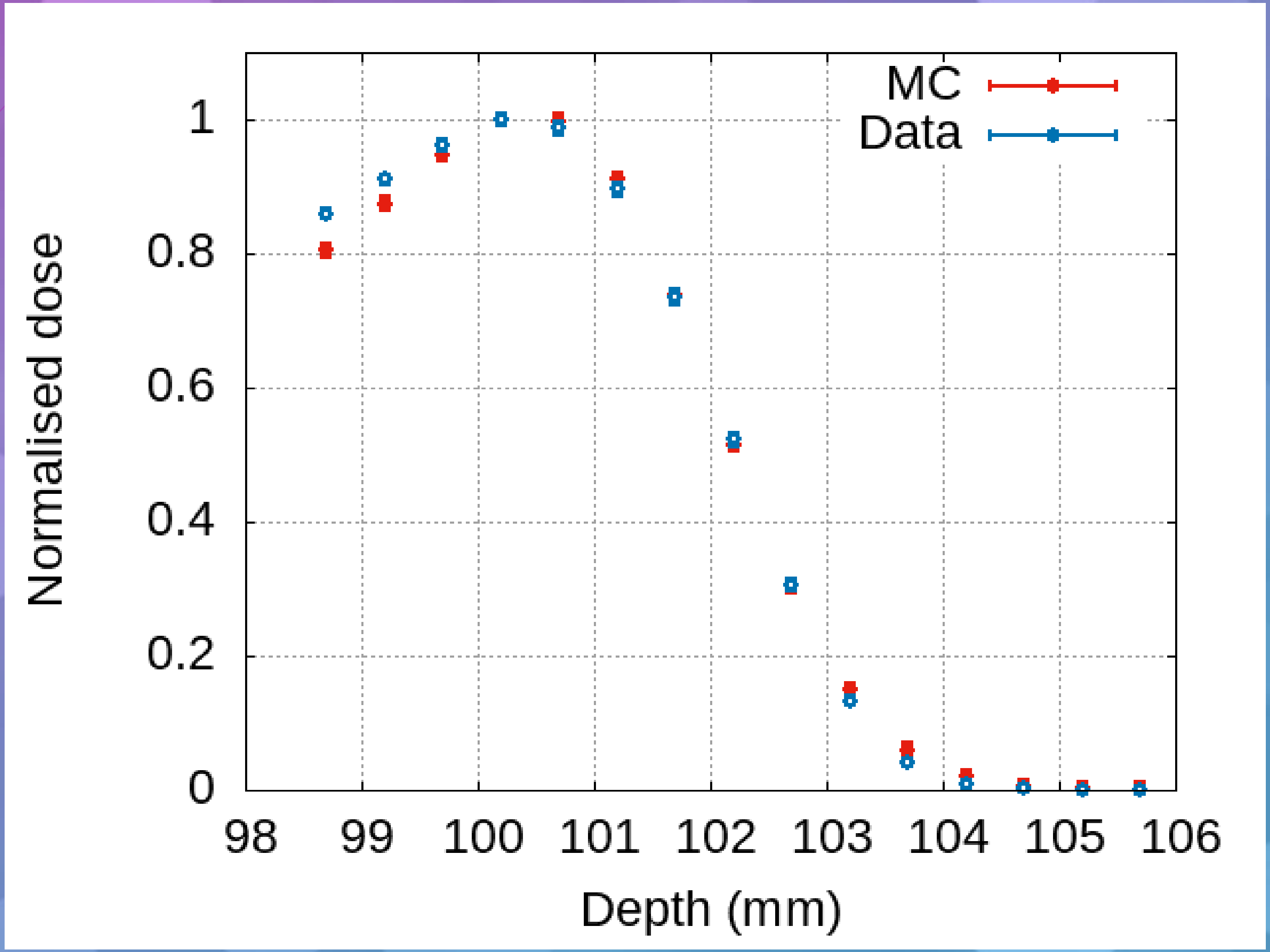
Proton beam tests at HollandPTC - 130 MeV



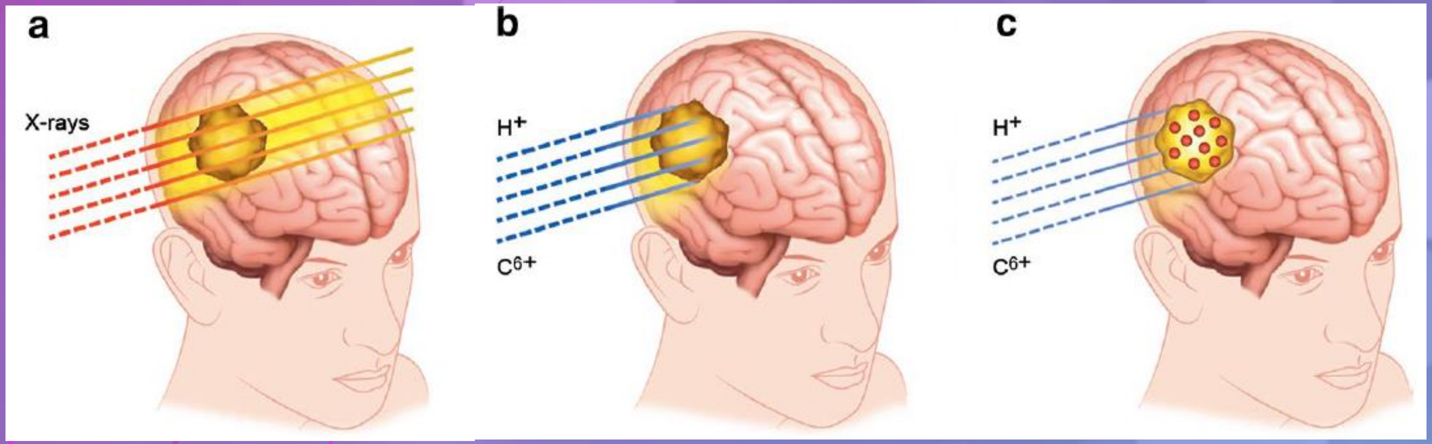


HollandPTC Proton Therapy Centre

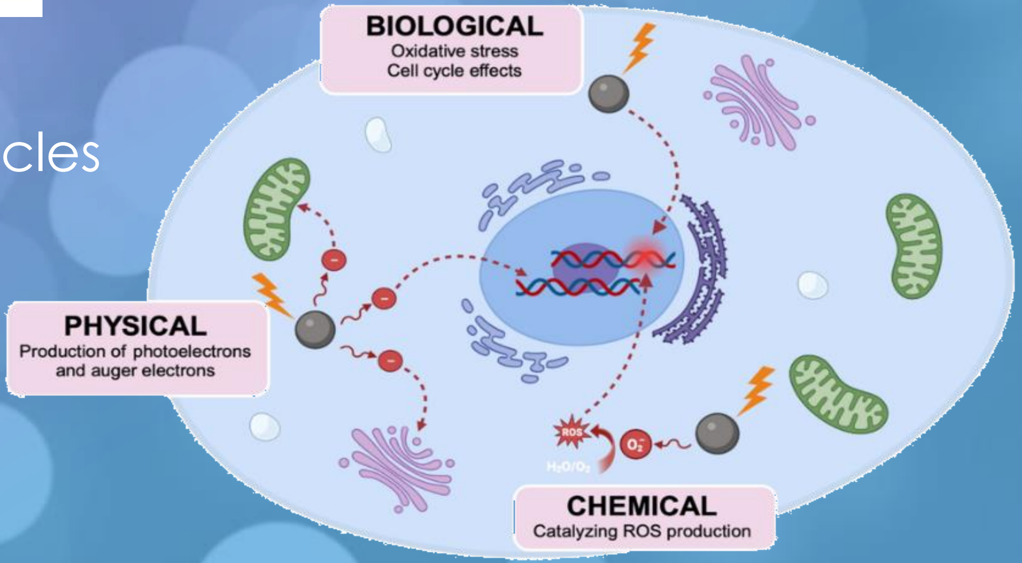
Bragg peak detection capability



Radiotherapy combined with Gold nanoparticles
(Joana Antunes)



- Increase production of secondary particles
- Increase production of Reactive Oxygen Species

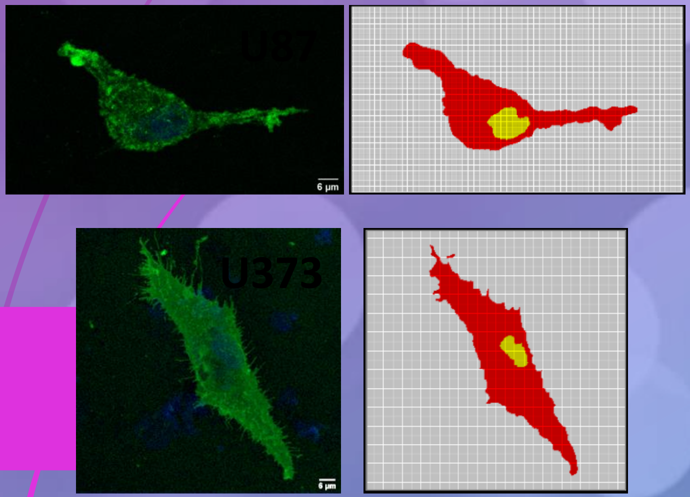


Mechanisms of high-Z NP radiosensitization.

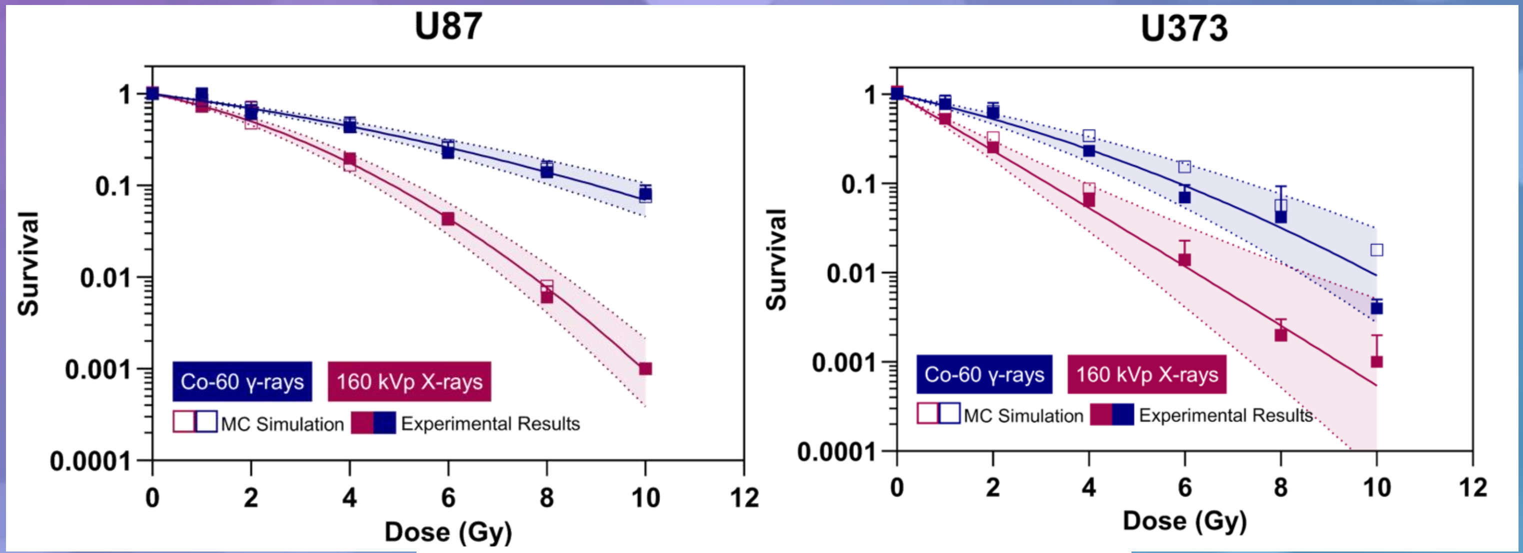
Jackson, N. et al., "Application of High-Z Nanoparticles to Enhance Current Radiotherapy Treatment", Molecules, 2024
Kempson, I., "Mechanisms of nanoparticle radiosensitization", Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology, 2021
S. Lacombe, E. Porcel, and E. Scifoni, "Particle therapy and nanomedicine: state of art and research perspectives", Cancer Nanotechnol,2017

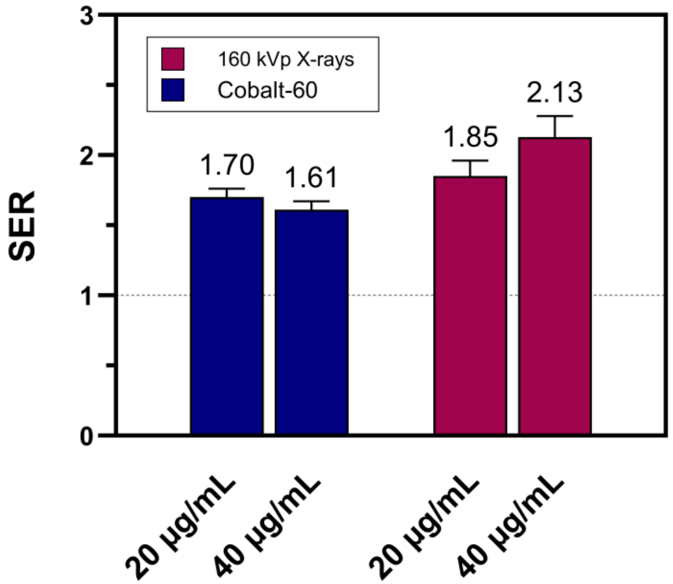
Radiobiological Effects of AuNPs in glioblastoma

Reconstructed computational GBM models



Radiobiological Models: LEM and MKM

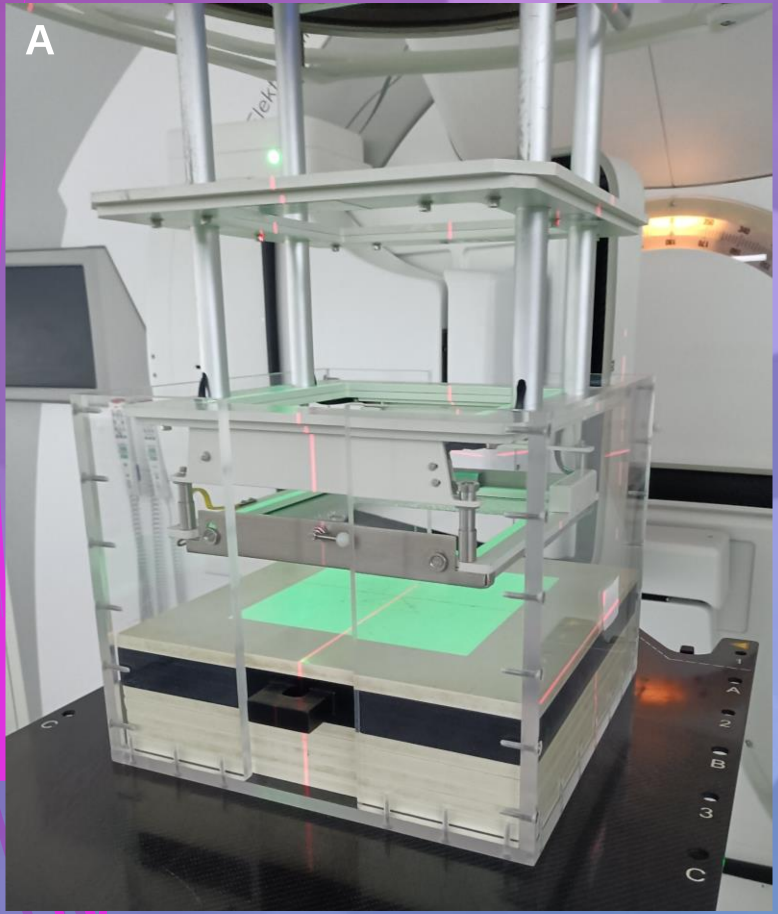




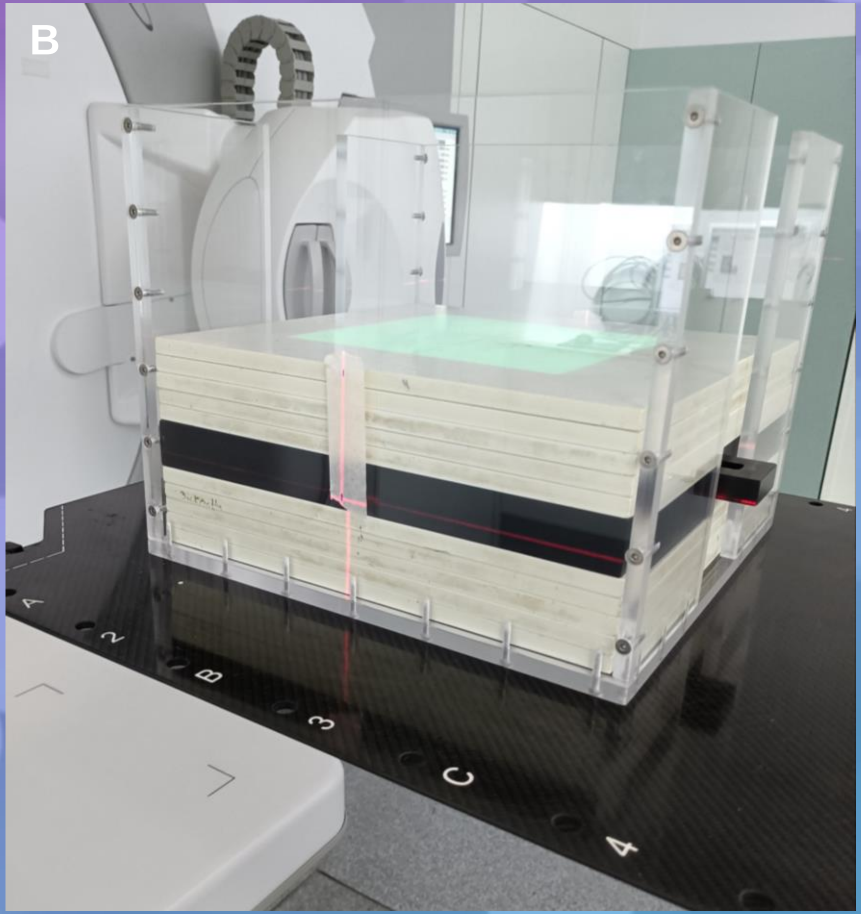
CENTRO DE CIÊNCIAS E TECNOLOGIAS NUCLEARES

INSTITUTO DE CIÊNCIAS NUCLEARES APLICADAS À SAÚDE
UNIVERSIDADE D COIMBRA

Proton Therapy in Neurodegenerative Disorders
(Carina Coelho)



electron beam

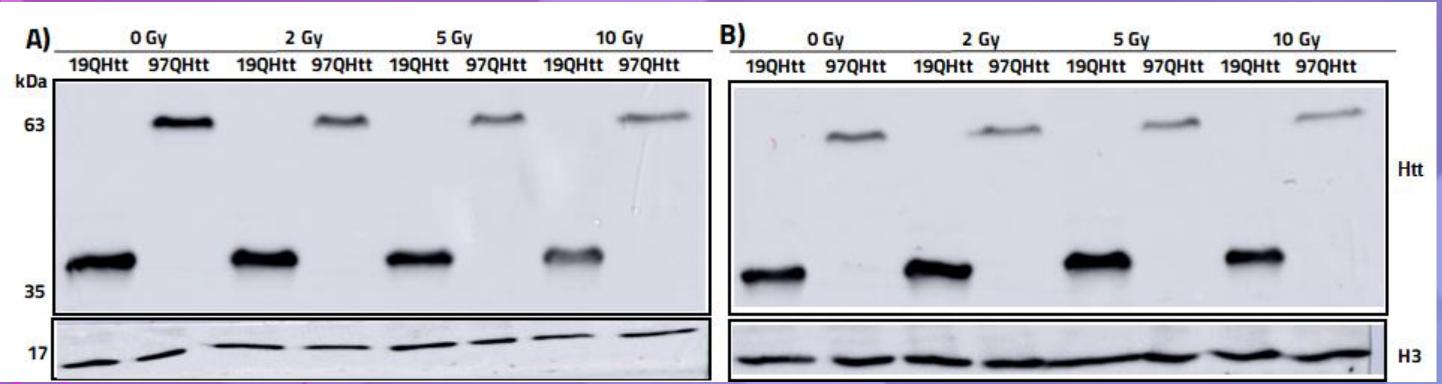


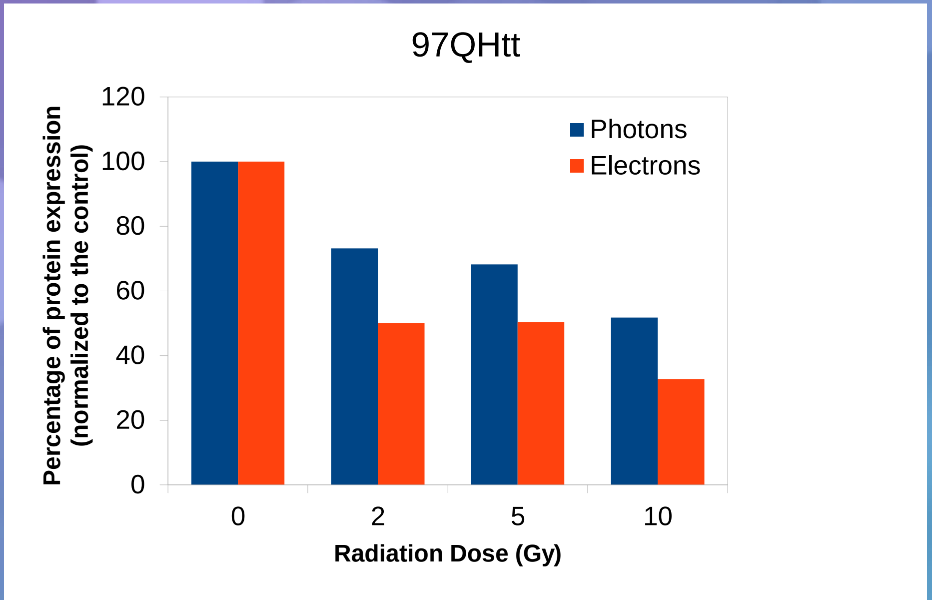
photon beam

positioning of the cell samples

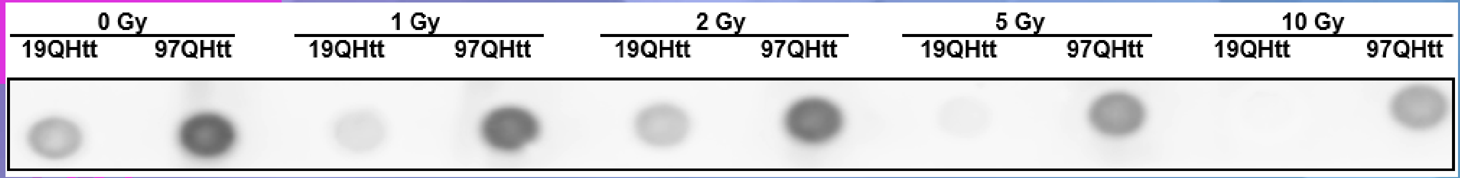
HOSPITAL DE SANTA MARIA

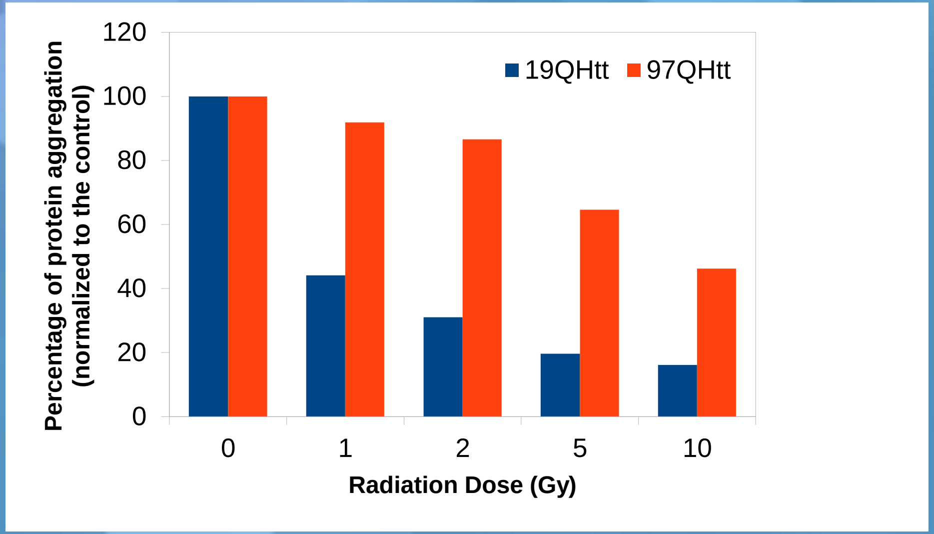
Proton Therapy in Neurodegenerative Disorders





Expression of the mutated protein 97Htt associated with Huntington disease

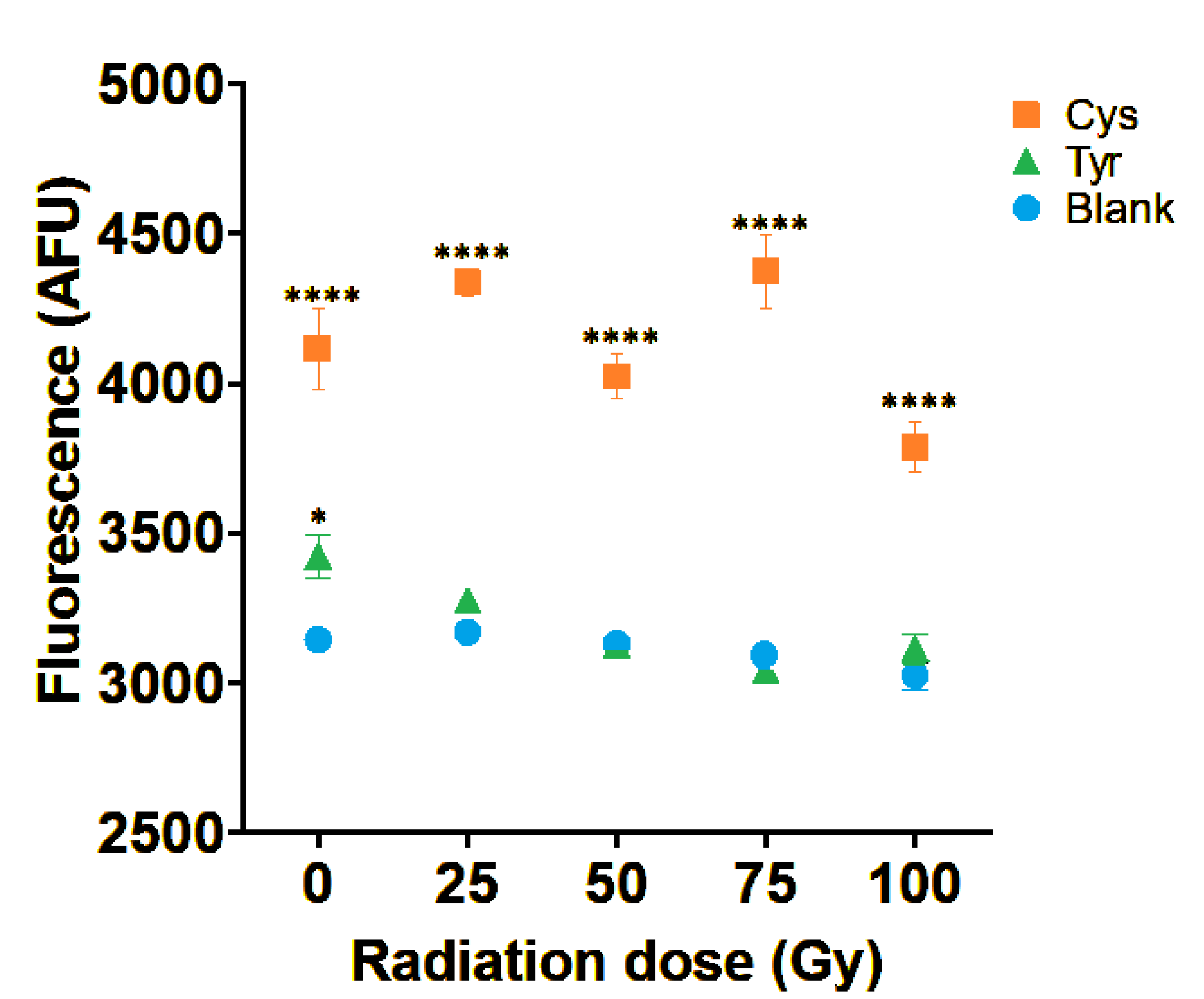




HOSPITAL DE SANTAMARIA

C2TN

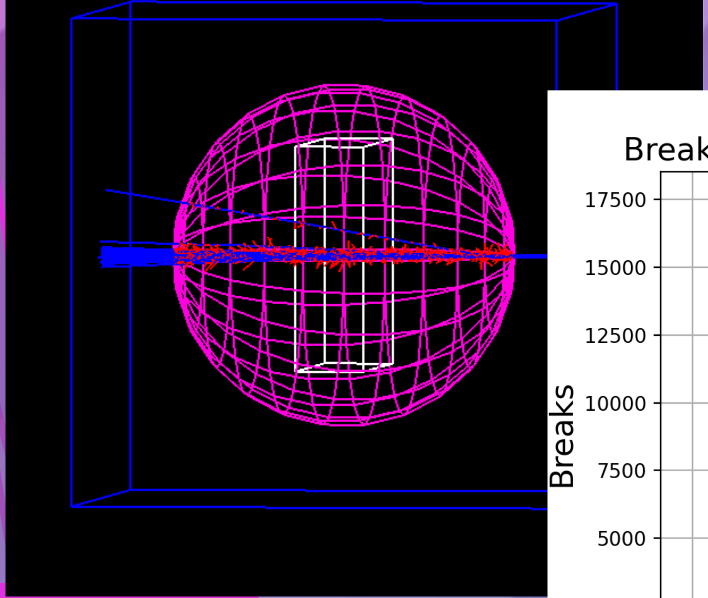
Proton Therapy in Neurodegenerative Disorders

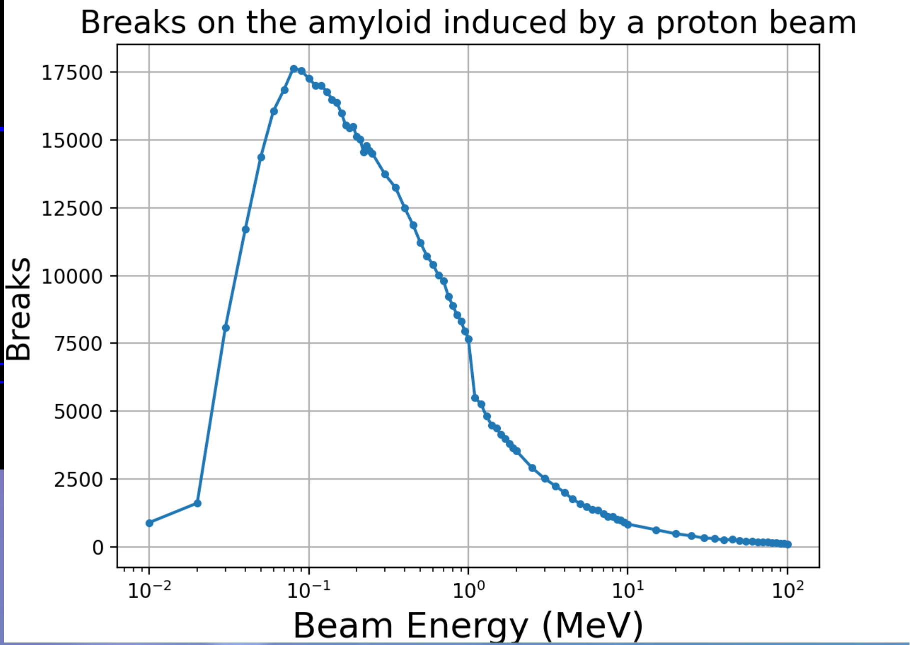


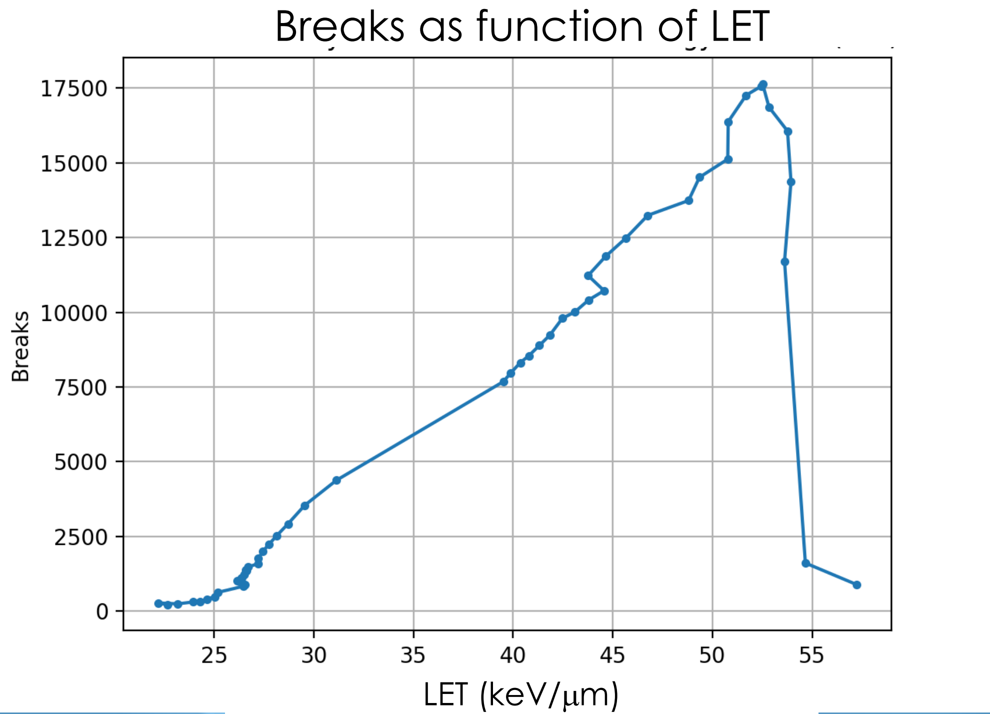
High doses of γ-radiation diminish the formation of amino acids *in-vitro* amyloid fibrils

Simulations of Bond Breakage in Amyloid-β Proteins by proton beam
(Francisca Afonso)

Geometry for simulation with TOPAS-nBio

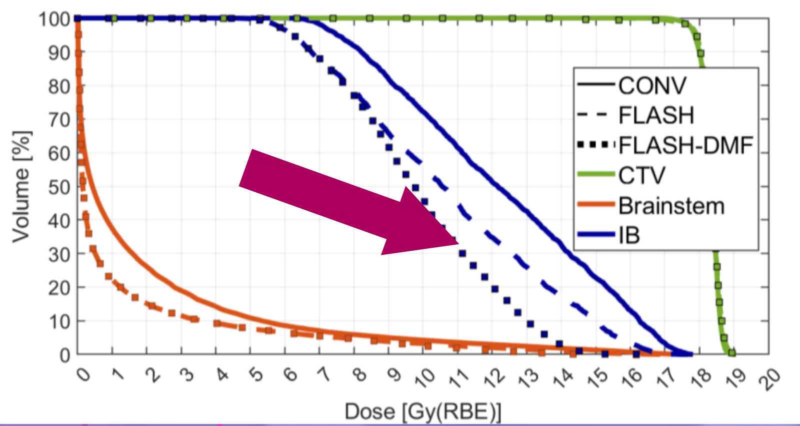


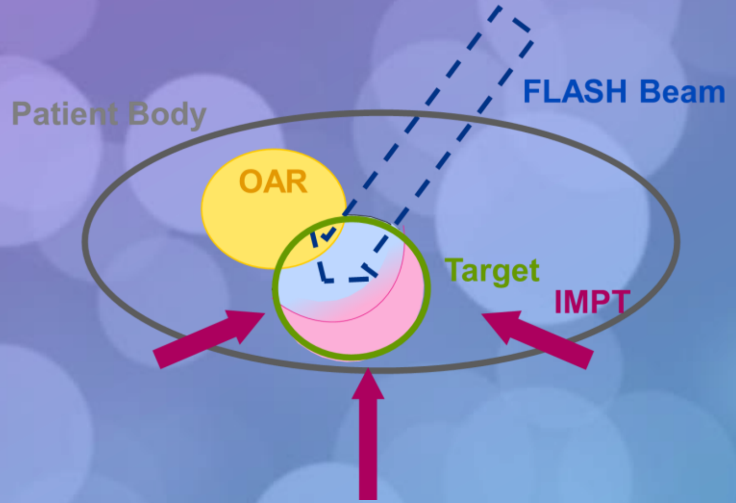




Partial-volume proton-FLASH – meningioma case
(Joana Leitão)

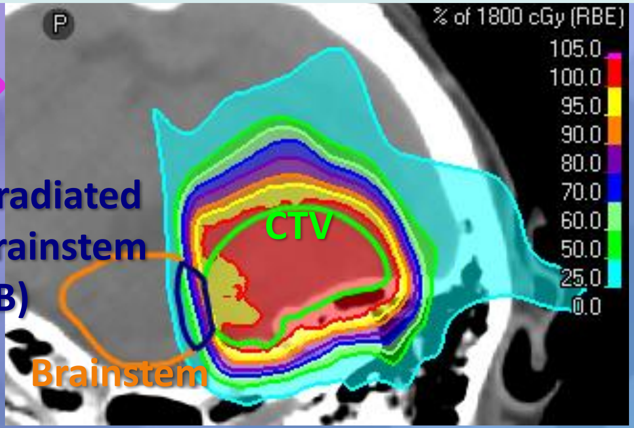
FLASH: Dose > 5 Gy, Dose-rate > 40 Gy/s



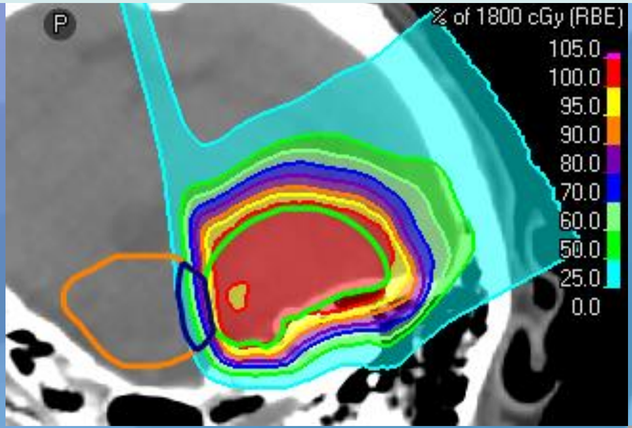


CONV (Clinical in 2 fx)

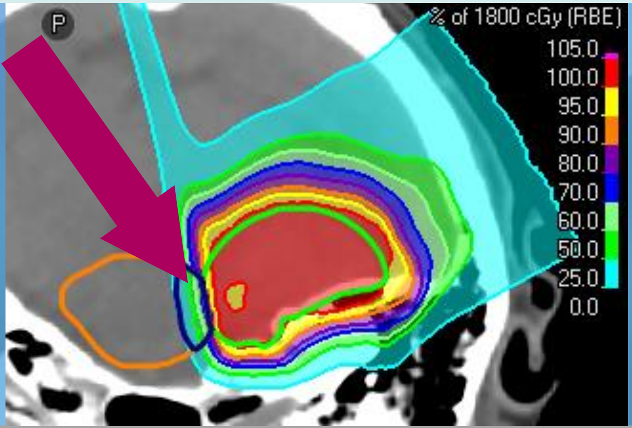
Irradiated Brainstem (IB)



FLASH – RBE-1.1

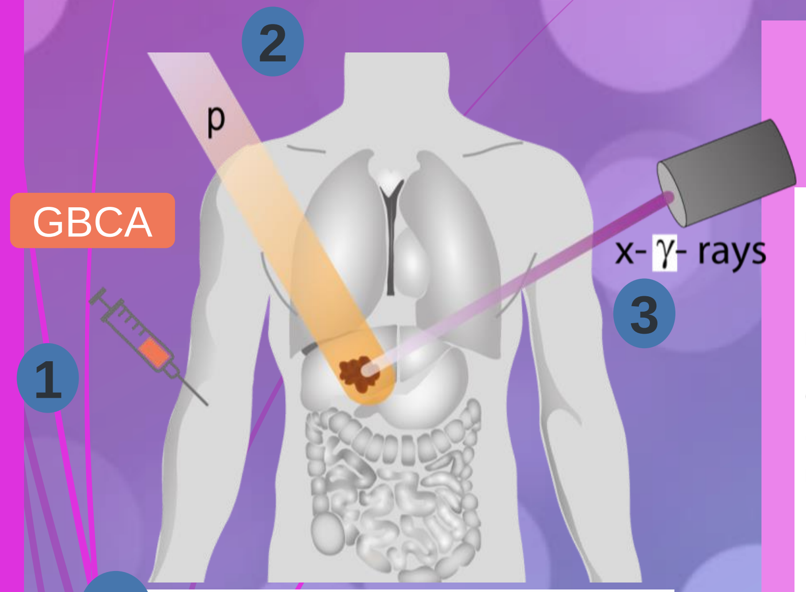


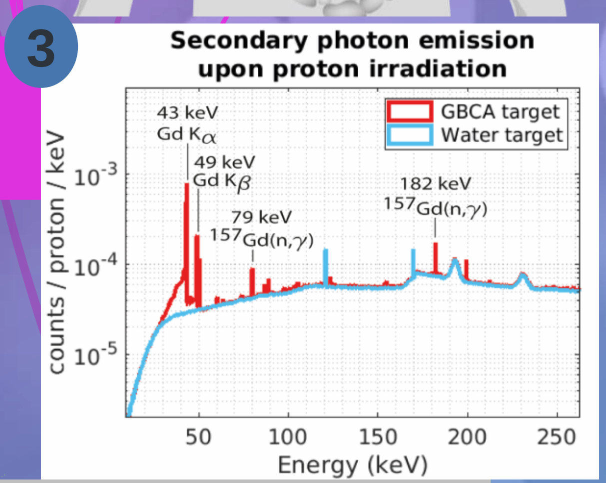
FLASH-DMF – RBE-1.1



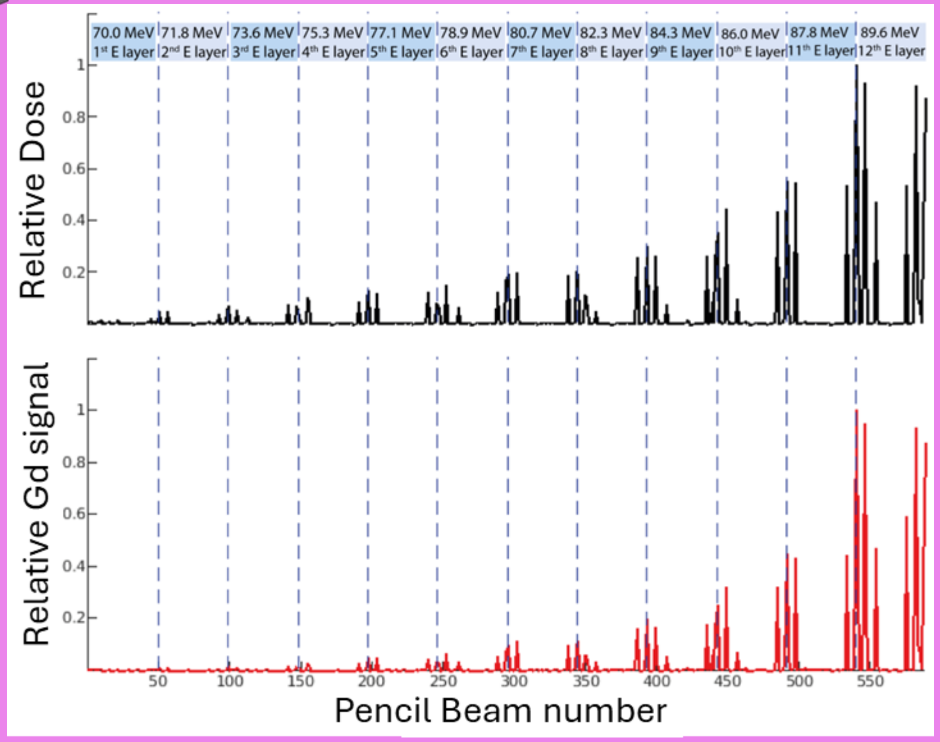
Centro de Protonterapia
Grupo quirónsalud
dkfz.

Gadolinium-based contrast agents as surrogates for **dose** and **proton range** measurements (Mariana Brás)

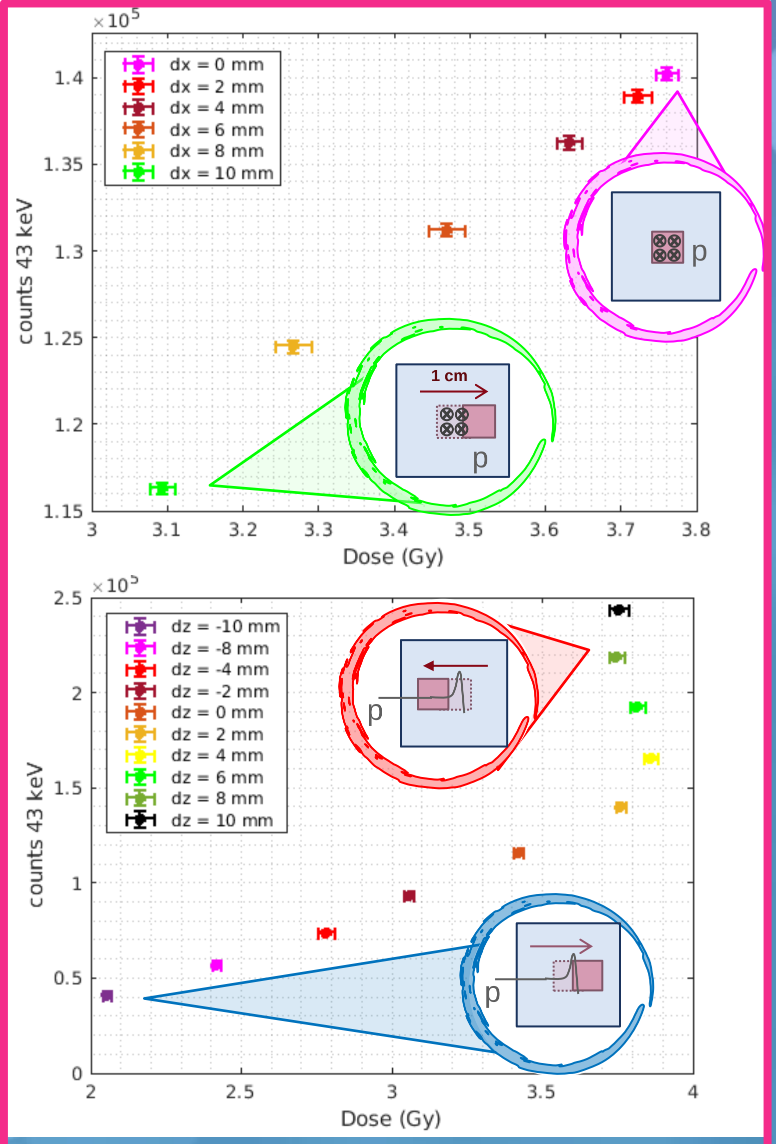




Correlation between dose delivered and Gd signal for each pencil beam of the TP



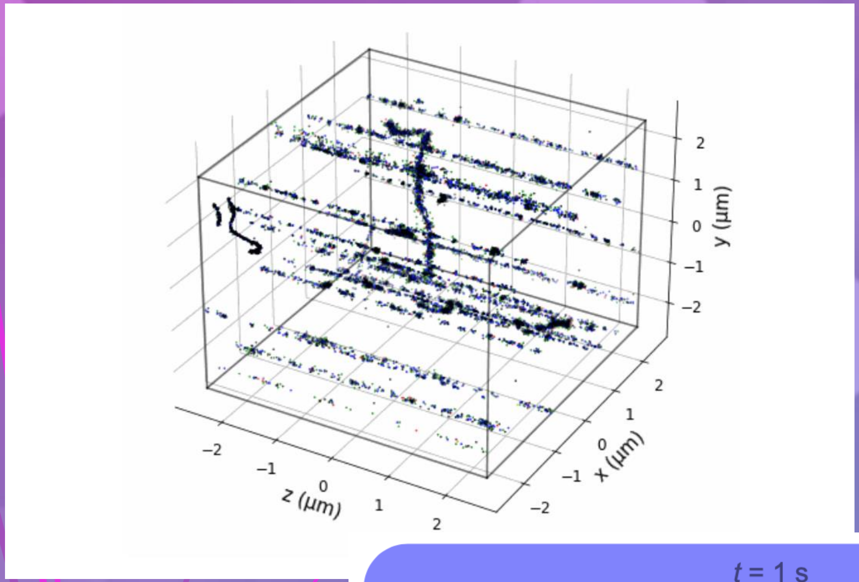
Response of Gd signal to anatomical uncertainties



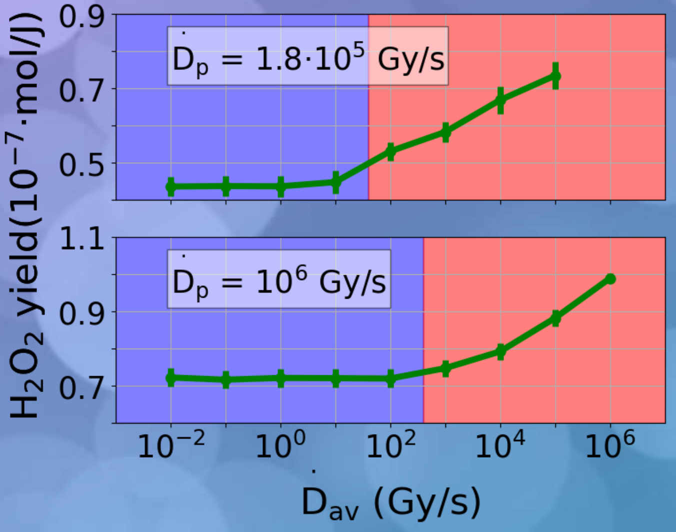
GEANT4 A SIMULATION TOOLKIT dkfz.

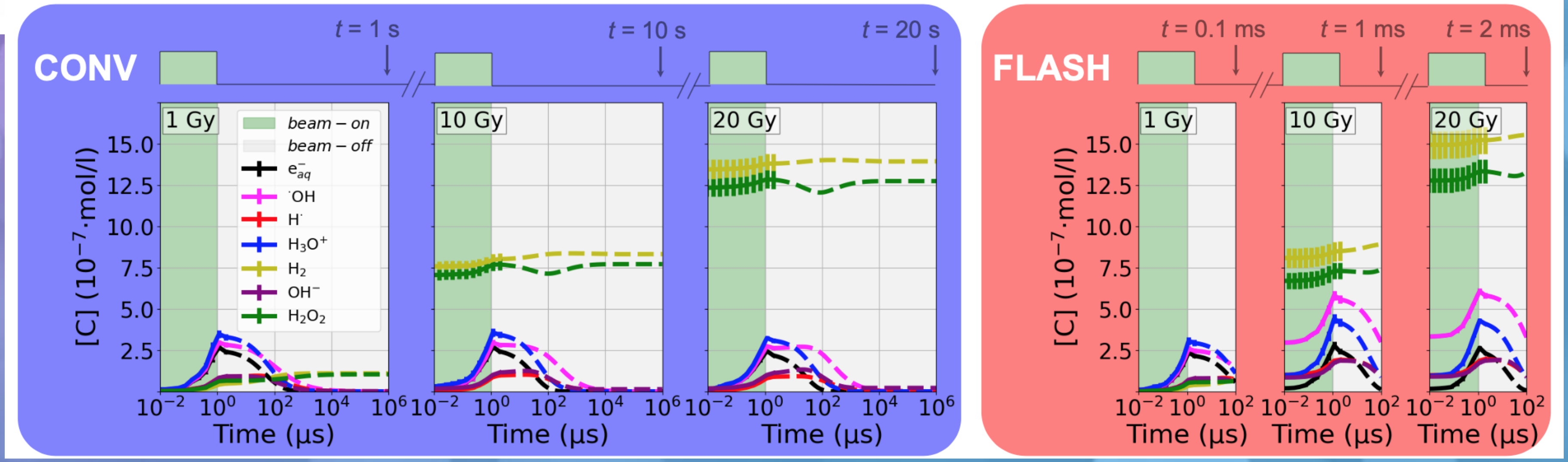
The key role of the background yield of chemical species during CONVENCIONAL vs. FLASH

(Miguel Molina-Hernández)



The BGD yield drives chemical dose rate thresholds





LIP dkfz.

RADART team

Hard working Staff (PhD students)

Cristiana Rodrigues

Duarte Guerreiro

Joana Antunes

Carina Coelho

Francisca Afonso

Joana Leitão

Mariana Brás

Miguel Molina-Hernández

Senior Staff

Jorge Sampaio

Daniel Galaviz

João Gentil

José Marques

Luis Peralta

Pamela Teubig

Patrícia Gonçalves