

Radiation Oncology

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DESCRIPTION

Our research is primarily clinical, focusing on changes in fractionation, incorporation of techniques for respiratory motion control, molecular imaging-based planning, and combination with new systemic treatments, both treatment of the primary tumor and oligometastases.

We collaborate with different groups to identify predictors of response and toxicity to radiotherapy in combination with systemic antineoplastic treatments, including immunotherapy.

During 2023 we started the development of a total body irradiation model with VMAT and SBRT (Stereotactic Body Radiation Therapy) in rats.

MAIN LINES OF RESEARCH

- We participate in a European project for the development of a predictive model for lung cancer patients, using omics-based variables that integrate established clinical factors with others derived from big data analysis and advanced imaging features, to create digital human avatars. Núria Farré, Núria Jornet (Medical Physics).
- Total Body Irradiation and SBRT in rats using modern Medical devices. Josep Balart, Saba Rabi-Mitre, Gemma Sancho, Núria Jornet (Medical Physics), Guillermo Gómez de Segura (TER), Sónia Bermejo (TER).
- Predictive factors of response to radiotherapy in head and neck tumors. Laura Montezuma, Xavier León (ENT department).
- Irradiation of large-volume sarcomas with lattice technique. Katarina Majercakova, Josep Isern.



5.1.6 Associated Groups

- SBRT (stereotactic body RT) in primary tumors (lung, pancreas, prostate) and ablative treatment of metastases in oligometastatic patients, with planning based on metabolic imaging, applying techniques for respiratory motion control such as image-guided RT (IGRT) or surface-guided RT (SGRT). Gemma Sancho, Núria Farré, Josep Balart, Josep Isern.
- Development and training of a self-segmentation programme for the definition of organs at risk and irradiation volumes. Joan Carles Julià, Pedro Gallego (Medical Physics).
- Clinical impact of the use of respiratory movement control techniques in radiotherapy for breast cancer: Eugènia Otero (MIR-3), Gemma Sancho, Núria Jornet (Medical Physics).
- Impact on clinical outcomes of peer-review sessions incorporated into clinical practice. Jady Rojas, Gemma Sancho, Núria Jornet (Medical Physics).
- Adaptation of radiotherapy schedules in geriatric oncology. Arantxa Mera, Gemma Sancho.
- Surface-guided radiotherapy with respiratory motion control techniques in SBRT. Josep Balart, Núria Farré, Sónia Bermejo, Cristina Ansón (Medical Physics).

SCIENTIFIC CHALLENGES

- Use of clinical devices to perform experimental irradiation in rats.
- Use of AI to identify predictors of response and toxicity to radiotherapy in lung and prostate cancer.
- Clinical impact of ablative radiotherapy of oligometastases.
- Surface-guided radiotherapy with respiratory motion control techniques in SBRT. Josep Balart, Núria Farré, Sónia Bermejo, Cristina Ansón (Medical Physics).
- Incorporate Deep-learning auto segmentation in clinical practice.

ACTIVE GRANTS

- Farre Bernado, Nuria. CANCER MULTI-OMICS AVATARS FOR INTEGRATED PRECISION MEDICINE. EraPerMed Farre. Unión Europea (GenCat

FUNDING - Acciones complementarias). Duration: 2023-2025. 198.202,00 €.

SCIENTIFIC CHALLENGES

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5.1.6 Associated Groups

Punglia RS, Wong JS, Spiegel DY, Jagsi R, Taghian A, Bellon JR, Ho AY. Looking Back: International Practice Patterns in Breast Radiation Oncology From a Case-Based Survey Across 54 Countries During the First Surge of the COVID-19 Pandemic. *Jco Global Oncology*. 2023; 9:e2300010. DOI:10.1200/GO.23.00010. PMID:37471670. Document type: Article.

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