



6th Summer School on Intelligent  
signal processing for Frotlier  
Research and Industry

# Clinical Positron Emission Tomography/Magnetic Resonance Imaging: Acquisition and Quantification

Ángel Torrado-Carvajal

[angel.torrado@urjc.es](mailto:angel.torrado@urjc.es)

[atorradocarvajal@mgh.harvard.edu](mailto:atorradocarvajal@mgh.harvard.edu)

Medical Image Analysis and Biometry Lab – Universidad Rey Juan Carlos

Pain and Neuroinflammation Imaging Lab – Athinoula A. Martinos Center for Biomedical Imaging



Universidad  
Rey Juan Carlos



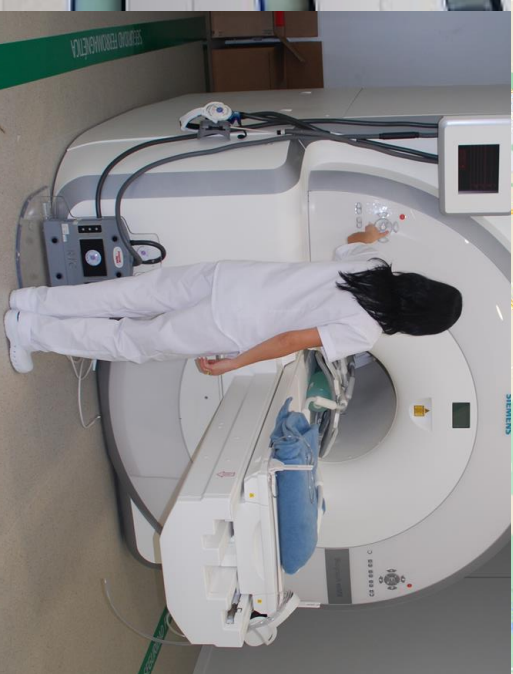
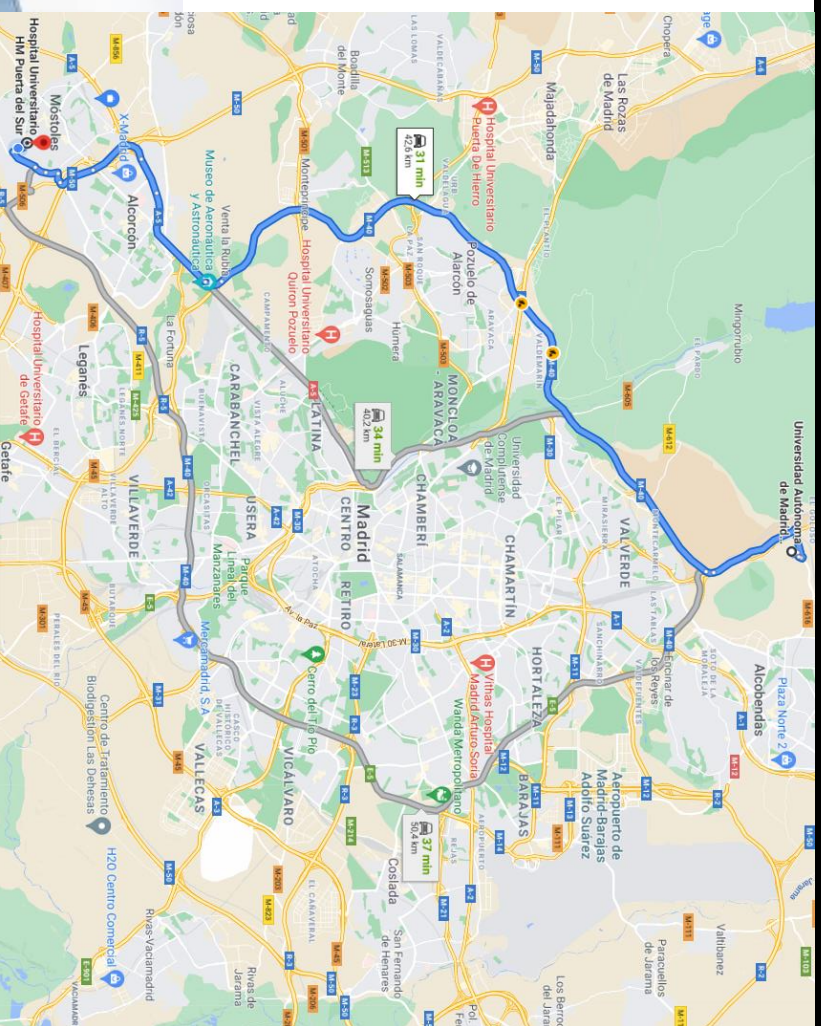
hm hospitales

# PET/MR

## Check-in and Introduction

- Location

HM Puerta del Sur Hospital  
First PET/MR in Spain  
Shuttle service



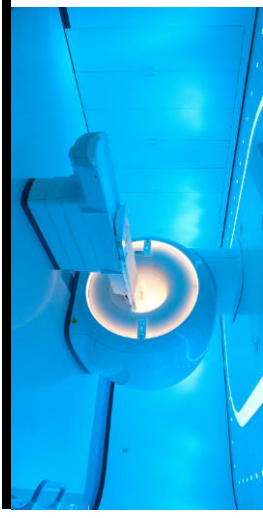
# PET/MR

## Imaging Theory and Applications

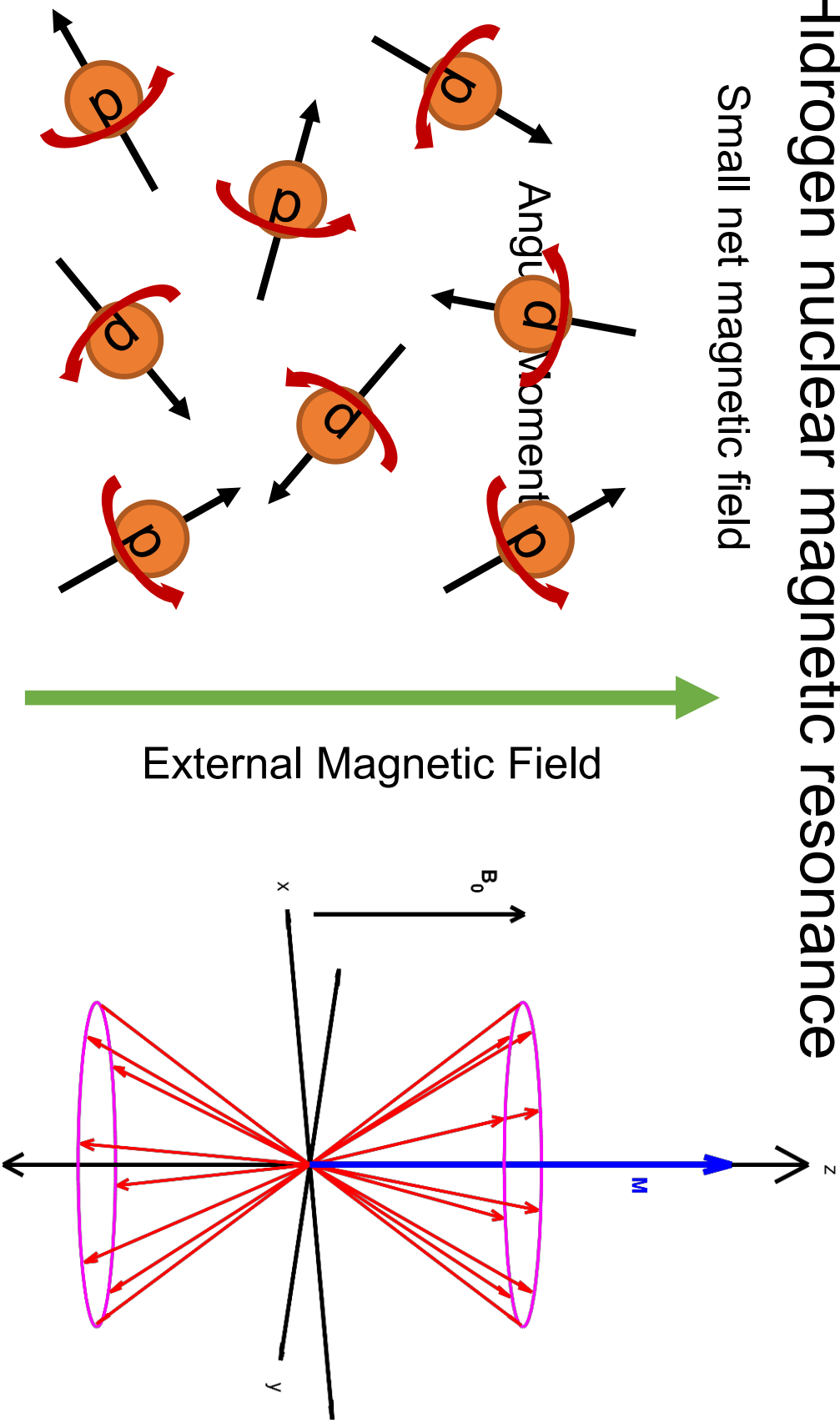


- Combination of different modalities on the same gantry to share the same patient table
- PET/MR Physical Principles
- Simultaneous or sequential acquisition of images
- Complementary information

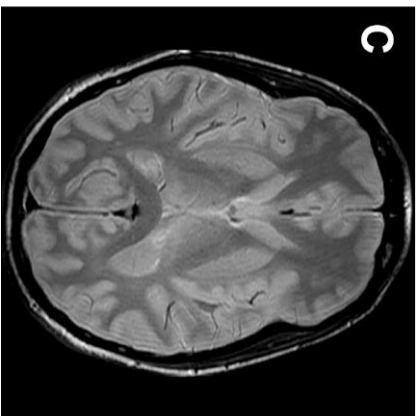
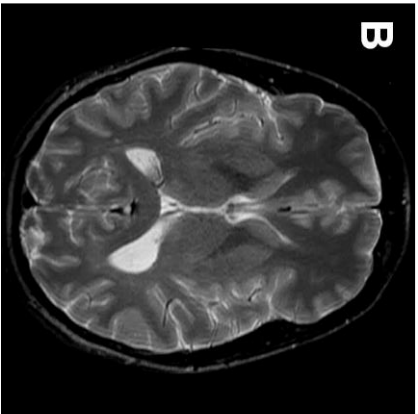
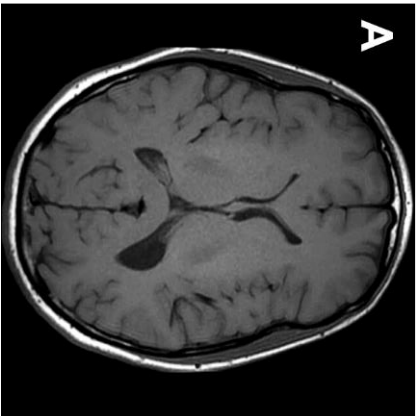
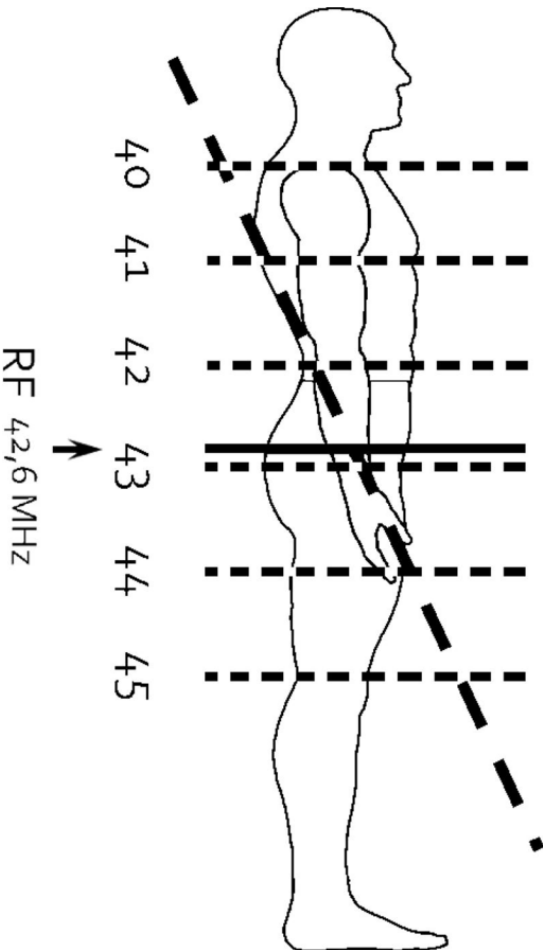
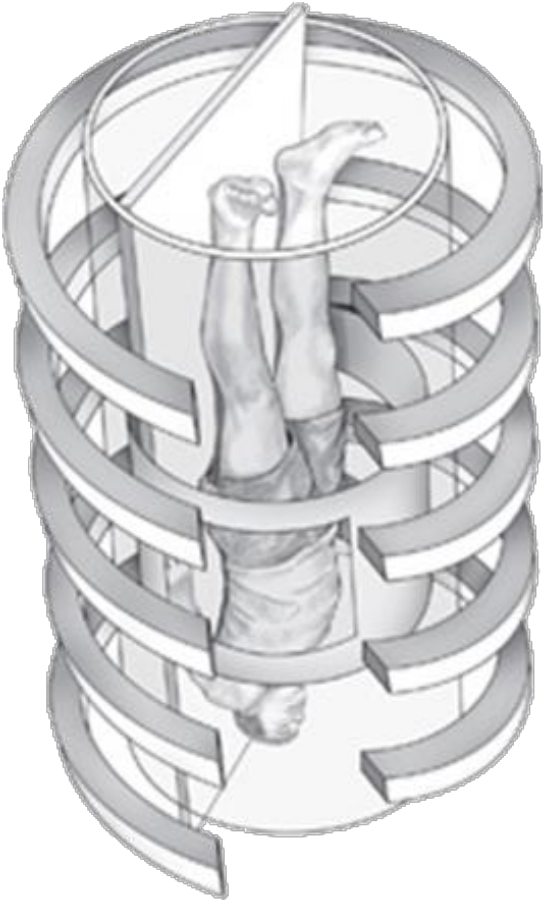
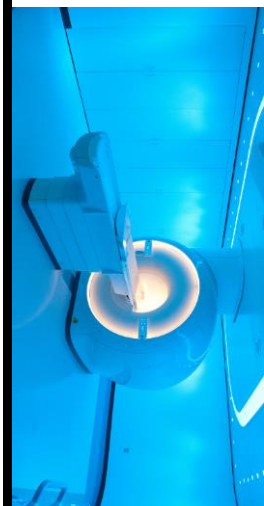
# PET/MR Magnetic Resonance



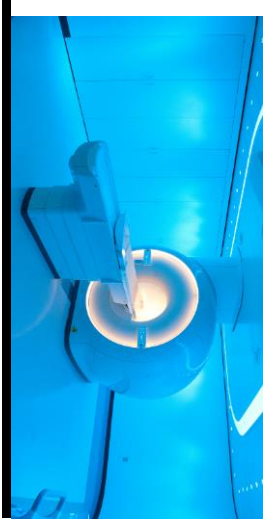
- Hydrogen nuclear magnetic resonance



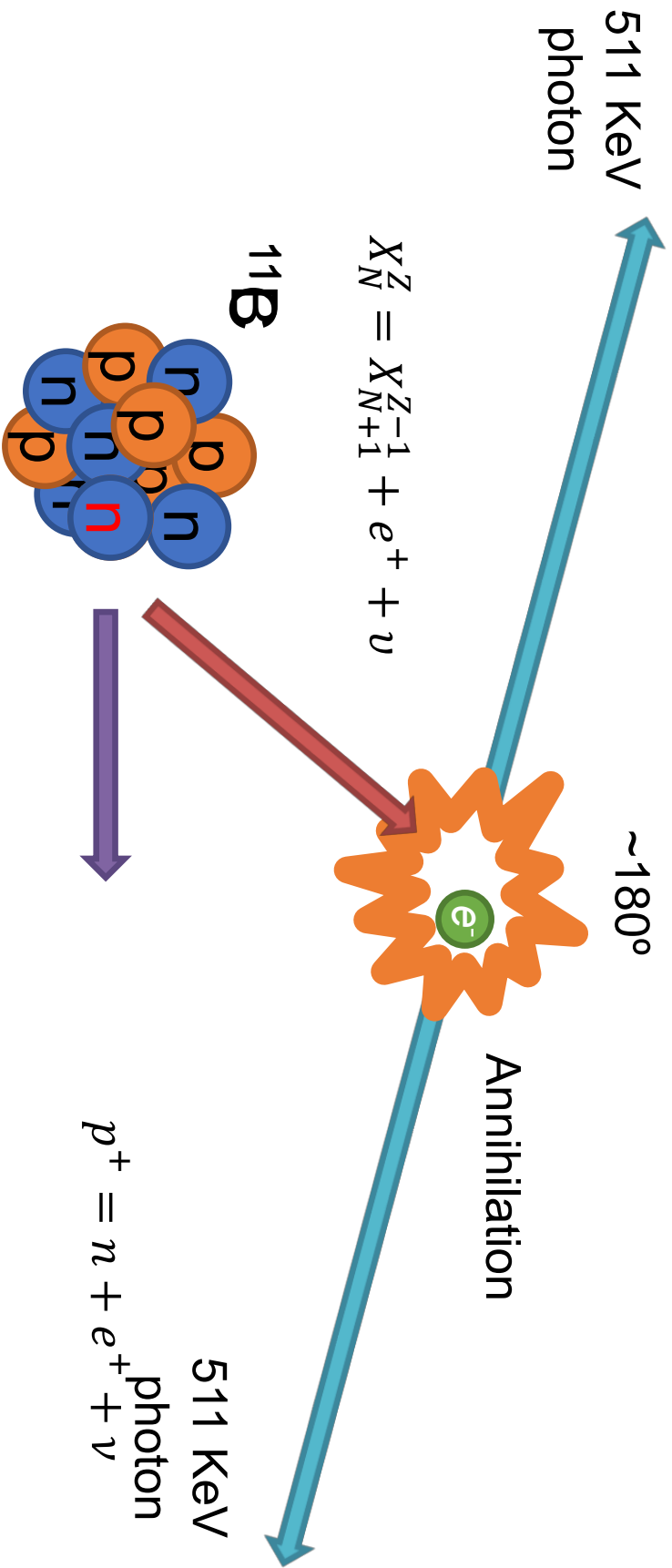
# PET/MR Magnetic Resonance Imaging



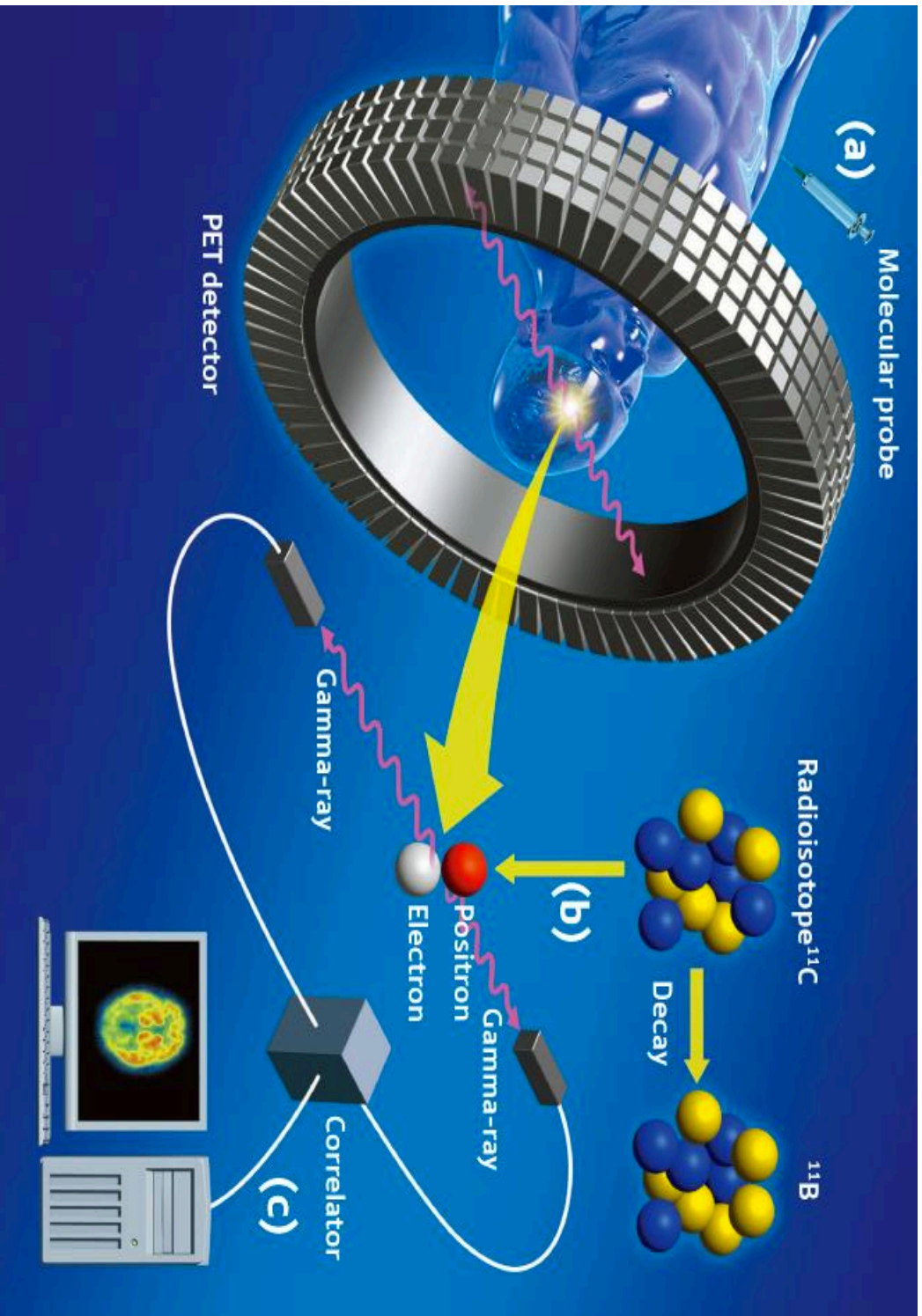
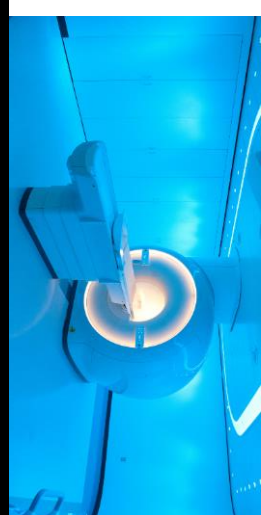
# PET/MR Positron Emission



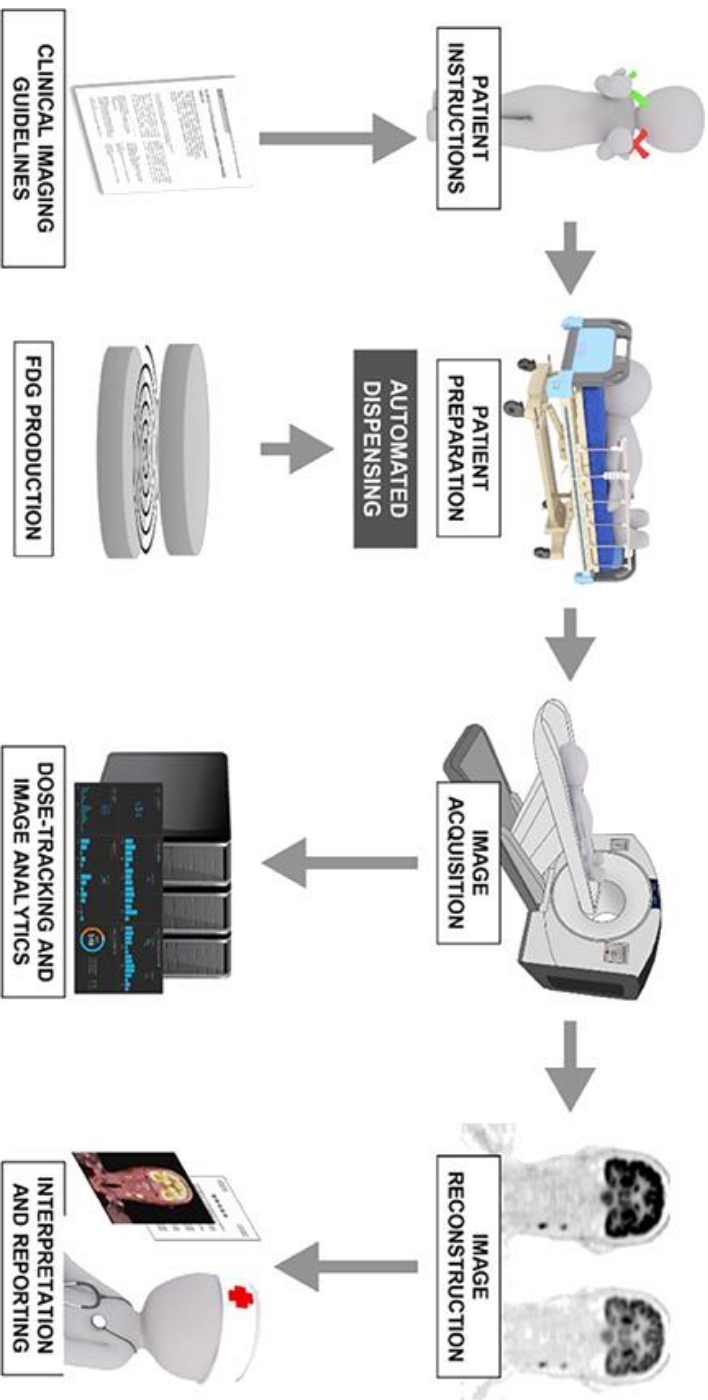
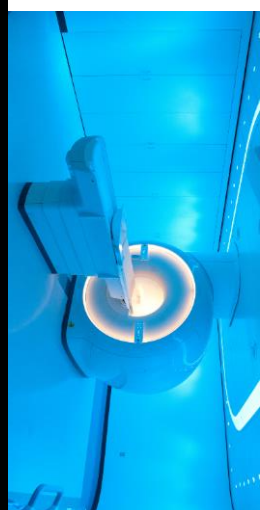
- Beta decay and positron annihilation



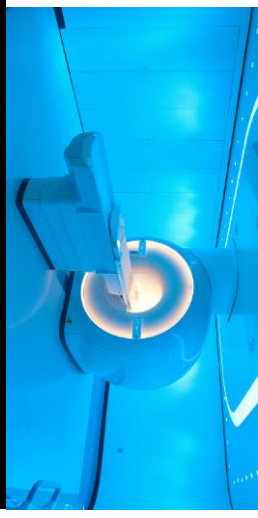
# PET/MR Positron Emission Tomography



# PET/MR Clinical Scanner Visit



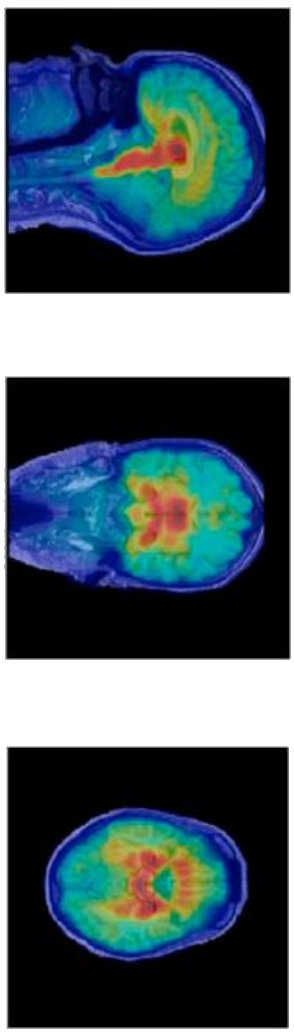




# PET/MR

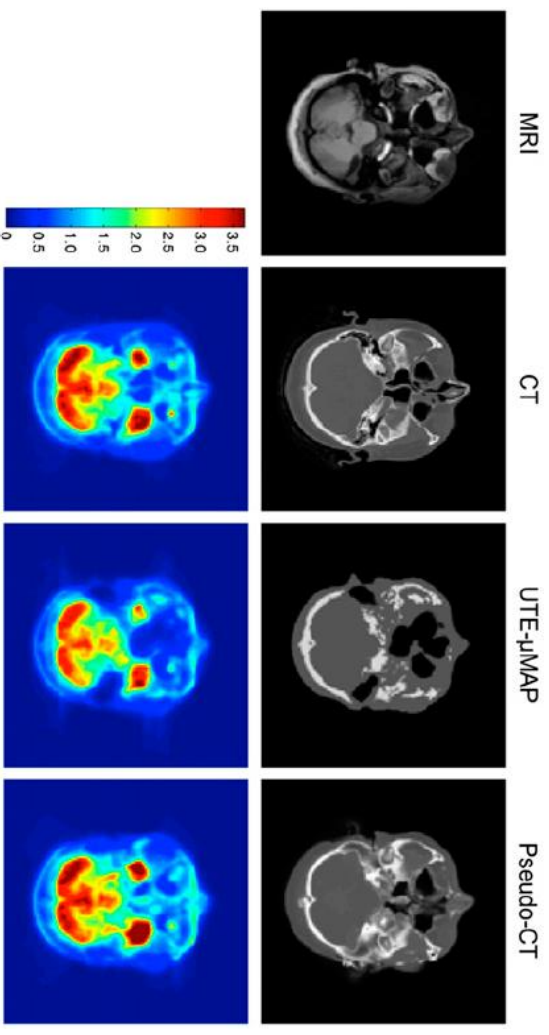
## Data Visualization and Processing

- Data Visualization
- LUT usage, window/level usage, modalities Fusion...



- Data Processing

- Registration, ROI delimitation, feature extraction...



# PET/MR

## Tentative Schedule



- 14:30 Check-in and Introduction
- 15:00 PET/MR Imaging Theory and Applications
- 15:45 PET/MR Clinical Scanner Visit
- 16:15 PET/MR Data Visualization and Processing  
**Bring your laptop with 3D Slicer<sup>1</sup> installed!**
- 17:00 Farewell

<sup>1</sup> <https://www.slicer.org/>



6th Summer School on Intelligent  
signal processing for Frotlier  
Research and Industry

# Clinical Positron Emission Tomography/Magnetic Resonance Imaging: Acquisition and Quantification

Ángel Torrado-Carvajal

[angel.torrado@urjc.es](mailto:angel.torrado@urjc.es)

[atorradocarvajal@mgh.harvard.edu](mailto:atorradocarvajal@mgh.harvard.edu)

Medical Image Analysis and Biometry Lab – Universidad Rey Juan Carlos

Pain and Neuroinflammation Imaging Lab – Athinoula A. Martinos Center for Biomedical Imaging



Universidad  
Rey Juan Carlos



hm hospitales