



CREATIS



SPECTRAL PHOTON-COUNTING COMPUTED TOMOGRAPHY (SPCCT): IN-VIVO MULTI-PHASE LIVER IMAGING WITH A DUAL CONTRAST AGENT PROTOCOL

Presenter: S. Si-Mohamed, MD, PhD student 3rd year, **LYON, FRANCE**

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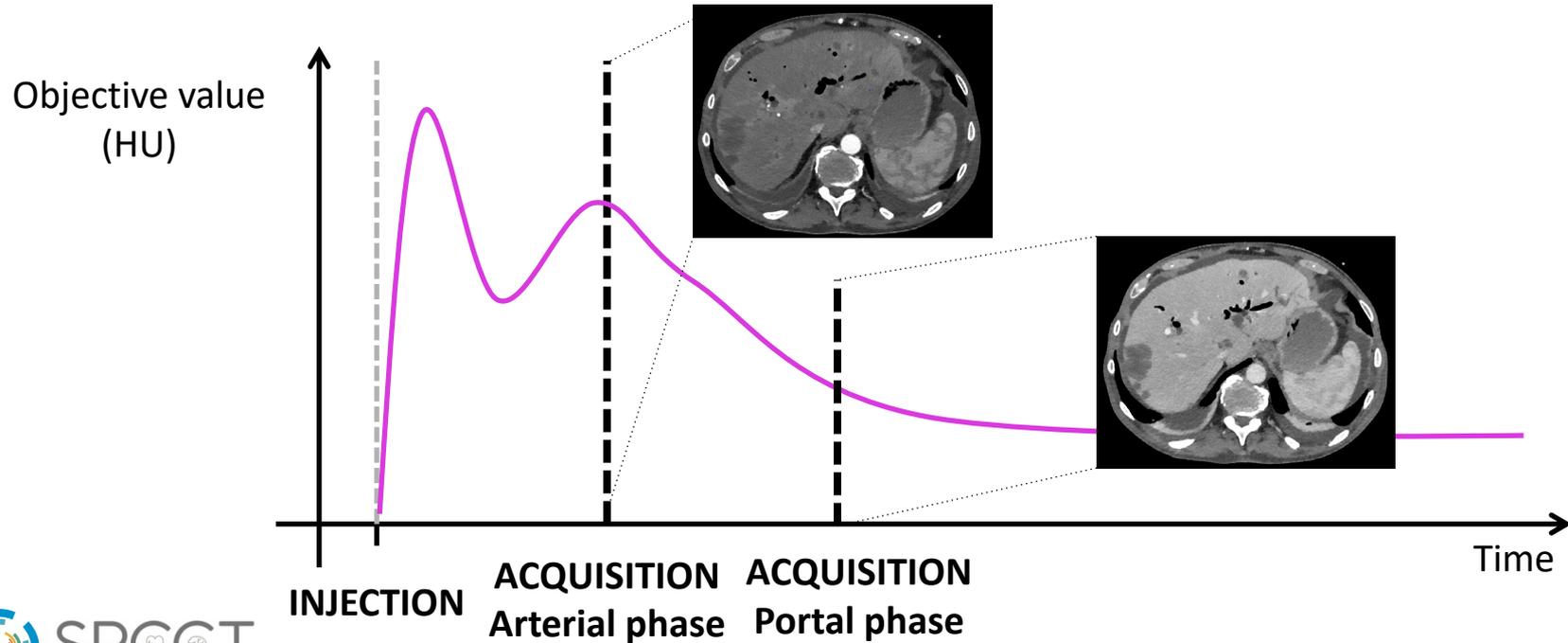


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 643694



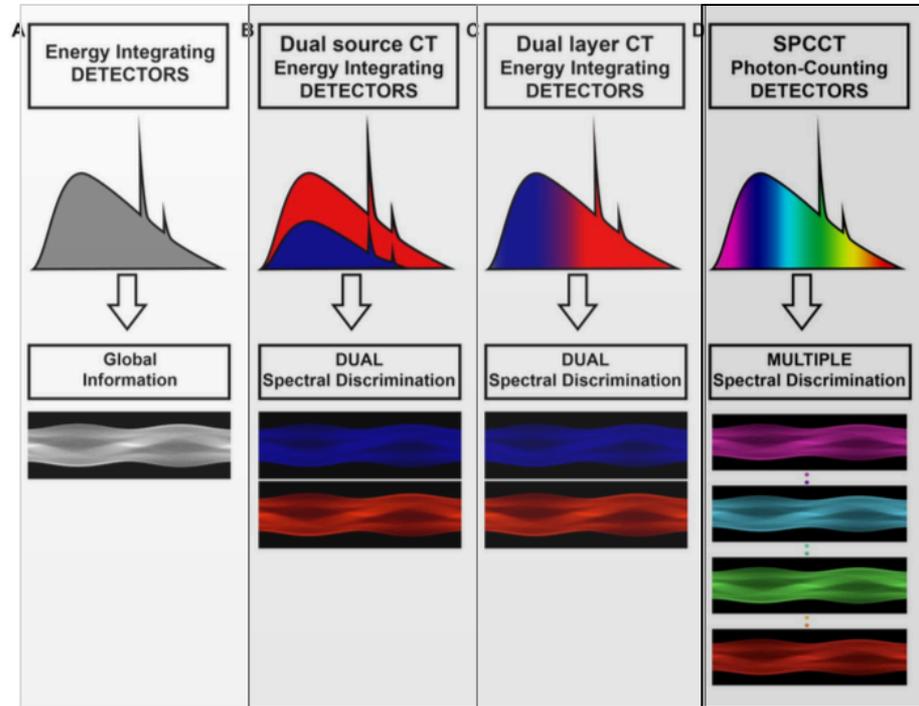
INTRODUCTION

- Dual phase liver imaging within **MULTIPLE** acquisitions



INTRODUCTION

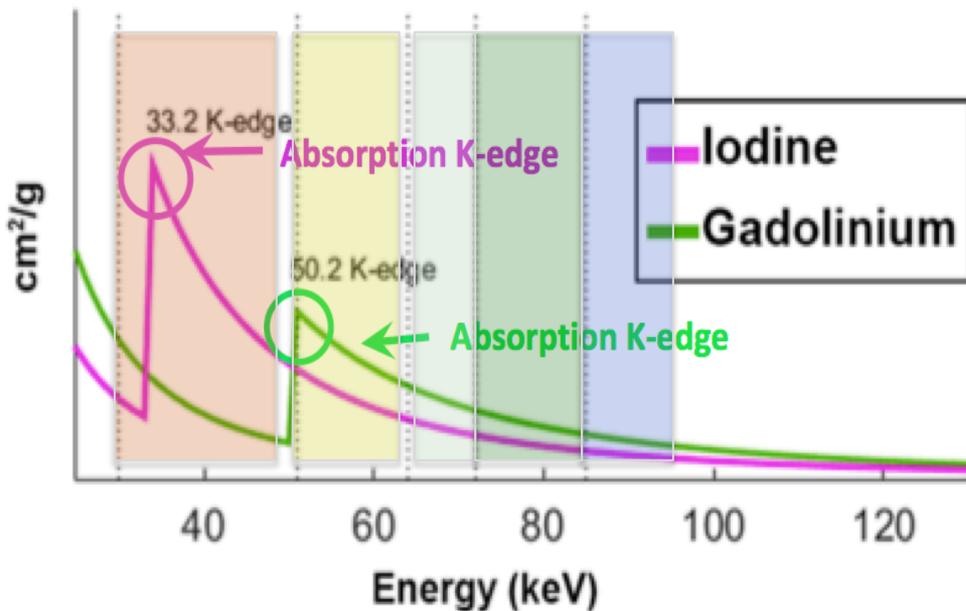
- Spectral photon-counting computed tomography (SPCCT) technology
 - New and promising imaging modality
 - Development of energy resolving detectors called photon-counting detectors ⁽¹⁾
 - **K-edge imaging**
 - **Dual contrast imaging**
 - Improved intrinsic spatial resolution ⁽¹⁾



⁽¹⁾ Si-Mohamed et al. NIMAA. 2017

INTRODUCTION

□ “K-edge imaging”⁽¹⁾



- Advantages:
 - Material specific K-edge imaging
 - Absolute quantification of specific materials
 - **Dual contrast imaging**

(1) Si-Mohamed et al. Eur Rad. 2018

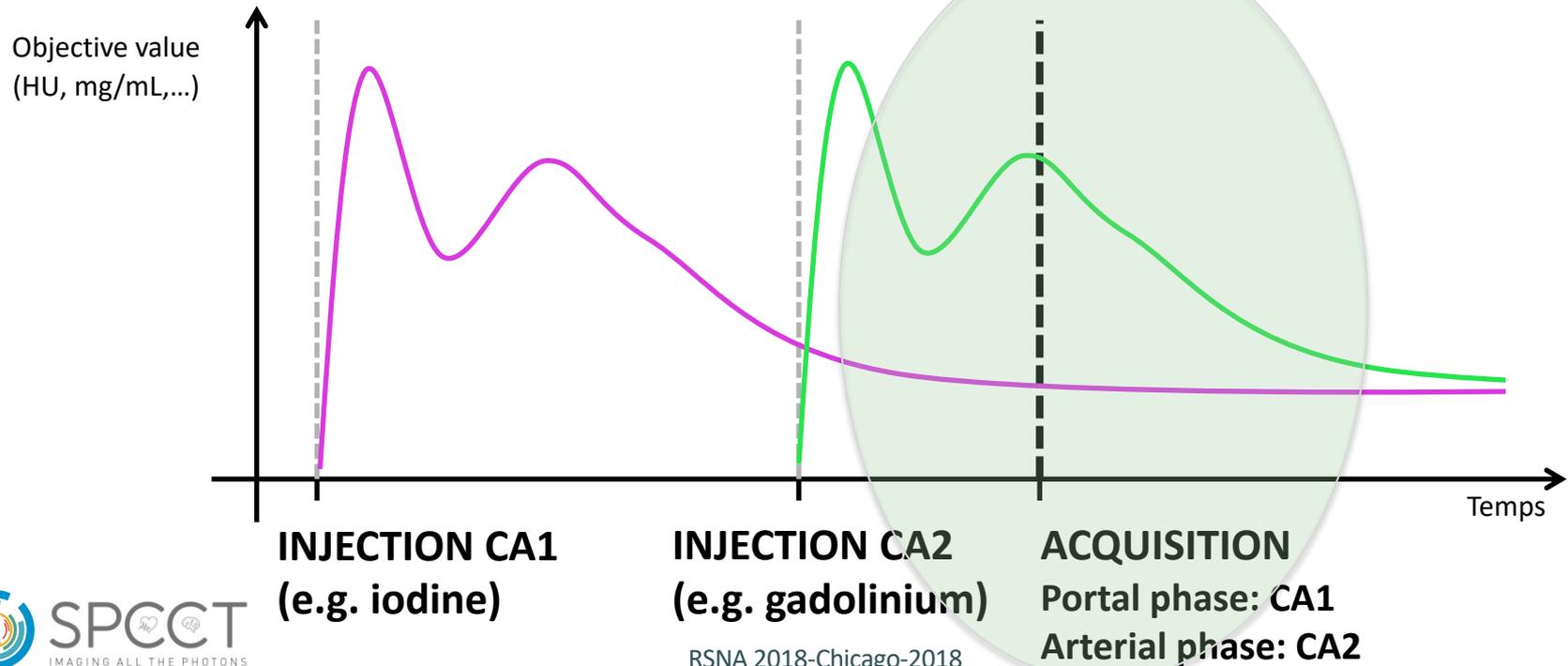
(2) Si-Mohamed et al. NIMAA. 2017

(3) Si-Mohamed et al. Sci Rep. 2017

(4) Si-Mohamed et al. Nanoscale. 2017

INTRODUCTION

- Dual phase liver imaging within ONE acquisition



MATERIALS/METHODS

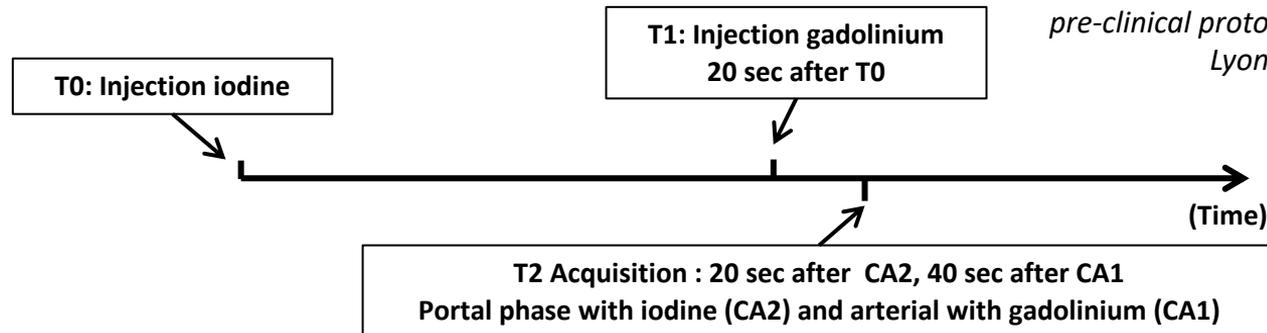
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- **Spectral photon-counting CT system (SPCCT)**
 - 5 bins photon-counting detectors system
 - Conventional X ray tube with a FOV of 160 mm
 - Spatial resolution: **250 μm**
 - Parameters used: 120 kVp, 100 mAs
- 4 NZW rabbits (3.3 ± 0.4 kg)

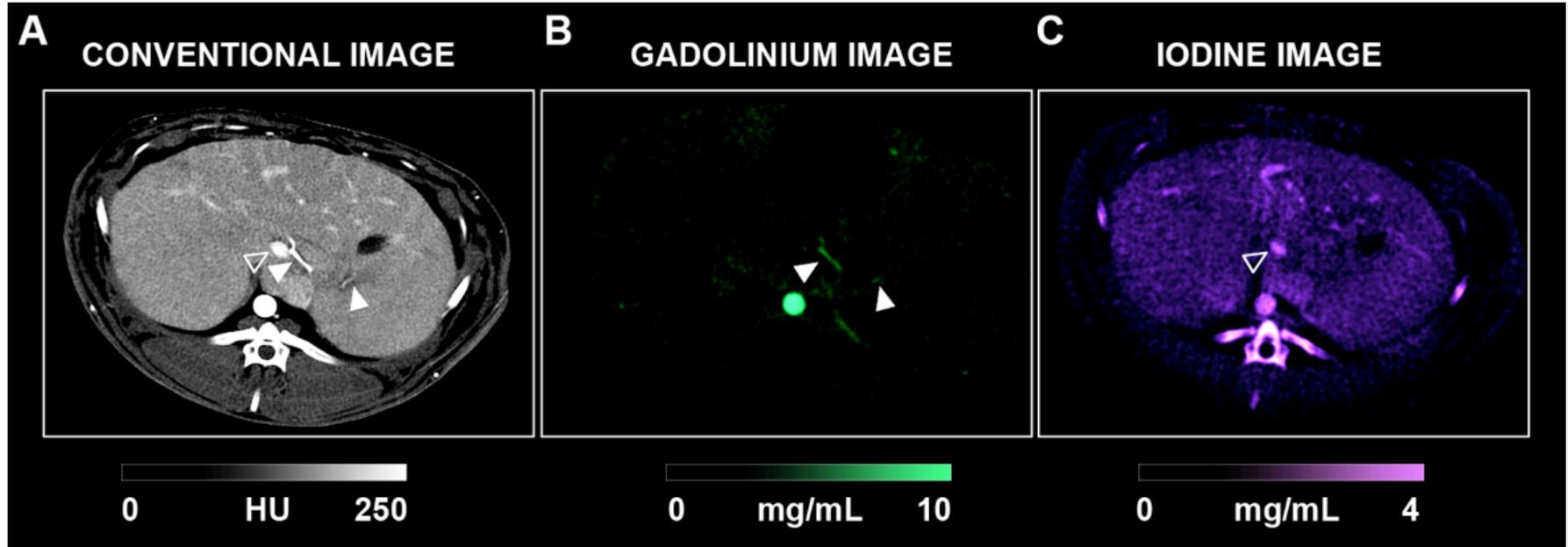


Philips Spectral Photon Counting CT pre-clinical prototype UCBL, CERMEP, Lyon, France



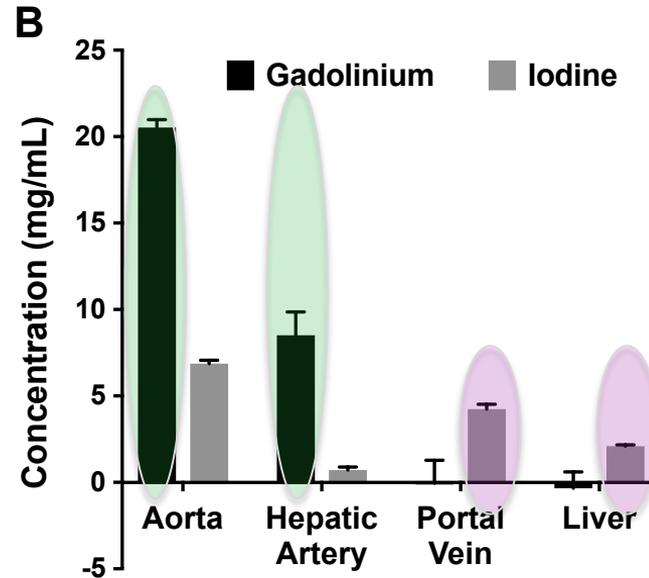
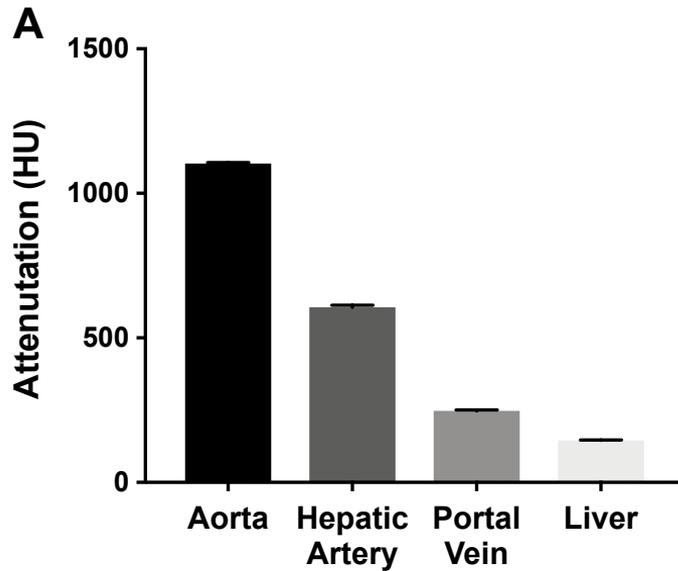
RESULTS *IN VIVO*

- Qualitative differentiation between the arterial and portal phases



RESULTS *IN VIVO*

- Quantitative differentiation between the arterial and portal phases



CONCLUSION

The Spectral Photon-Counting CT scanners allows a **multi-phase liver imaging with a dual contrast agent protocol within only one acquisition thus allowing**

- **Reduction of scans number**
- **Reduction of mis-registration artifacts**

Thank you for your attention

