



Gamma MRI



UNIVERSITÉ  
DE GENÈVE

# Production and purification of $^{129}\text{m}$ , $^{131}\text{m}$ , $^{133}\text{m}$ Xe for a new medical imagine technique - gamma MRI POSTER – ISOLDE WORKSHOP 2021

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# GAMMA-MRI APPROACH

- WHY?

**IMPROVED PET/SPECT  
RESOLUTION** + **INCREASED MRI  
SENSITIVITY**

- MAIN GOAL

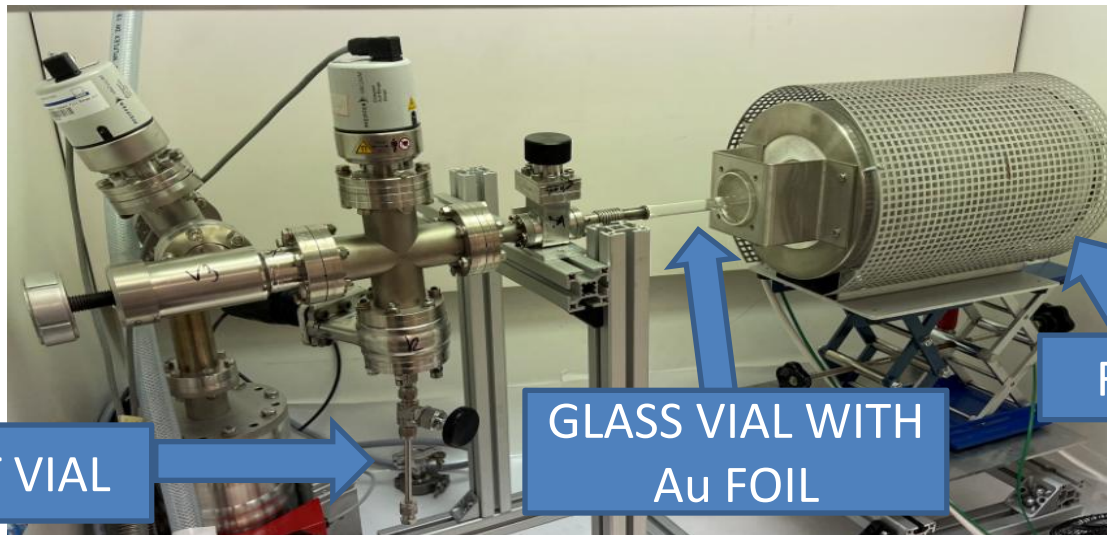
**PRODUCTION AND PURIFICATION OF THE  
RADIOACTIVE TRACERS:  
 $^{129\text{m}}\text{Xe}$ ,  $^{131\text{m}}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$  (mXe in short)**

# mXe ISOTOPES - PRODUCTION

- PROTON BEAM HITTING AN UC<sub>x</sub> TARGET



- COLLECTION IN ANNEALED Au FOIL AT GLM CHAMBER (11/2021)



TRANSPORT VIAL

GLASS VIAL WITH  
Au FOIL

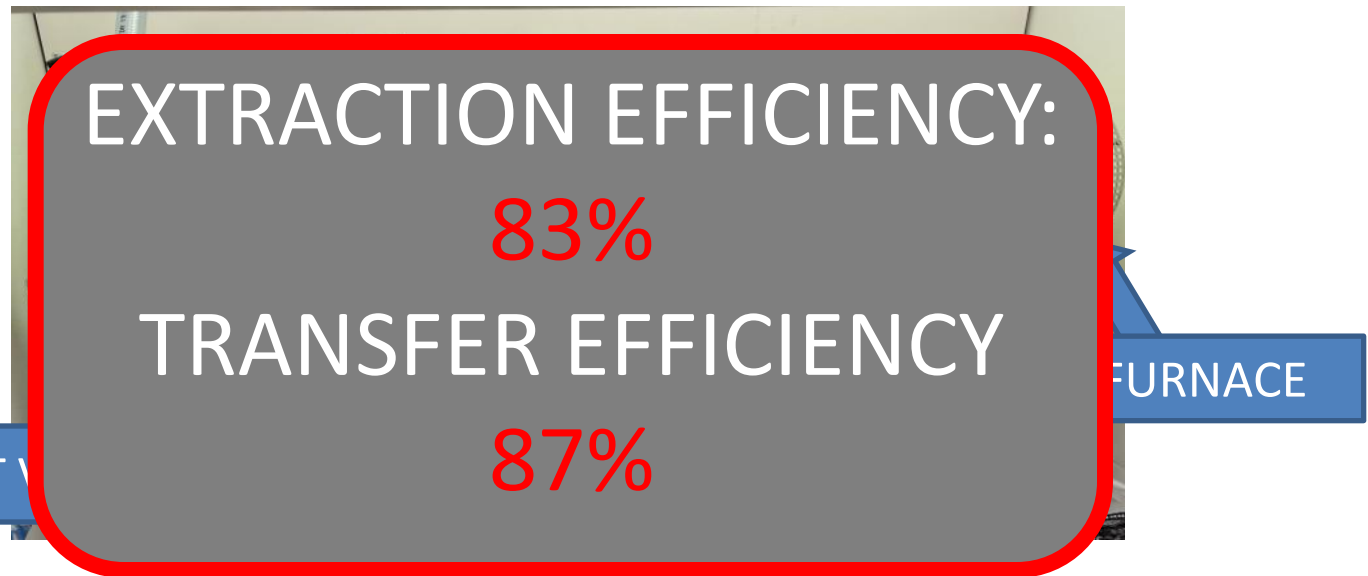
FURNACE

# mXe ISOTOPES - PRODUCTION

- PROTON BEAM HITTING AN UC<sub>x</sub> TARGET



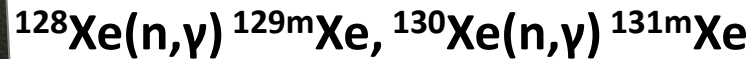
- COLLECTION IN ANNEALED Au FOIL AT GLM CHAMBER (11/2021)



# mXe ISOTOPES - PRODUCTION

- PRODUCTION BY NEUTRON IRRADIATIONS

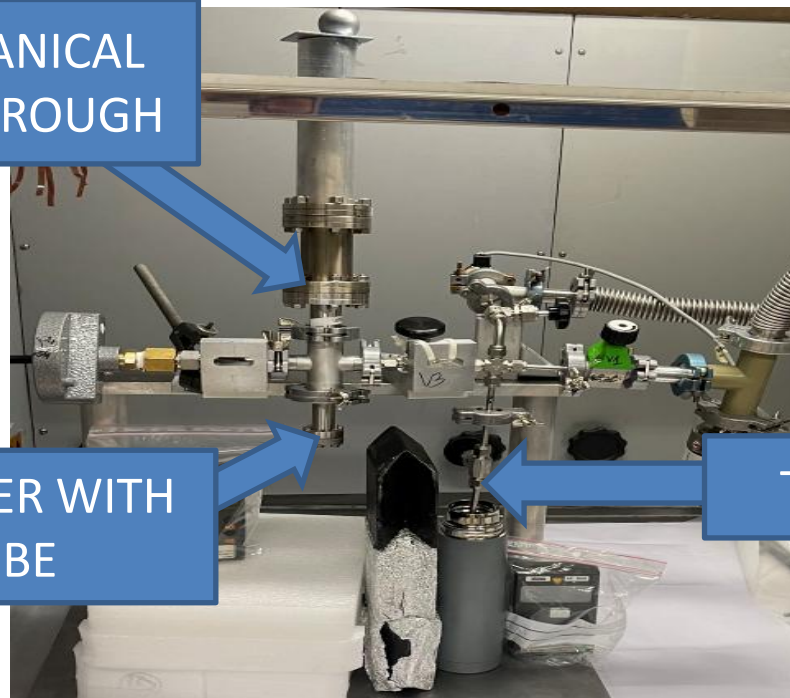
- STABLE XENON ISOTOPES ( $^{128}\text{Xe}$ ,  $^{130}\text{Xe}$ ) CLOSED IN QUARTZ:



MECHANICAL  
FEEDTHROUGH

METAL CONTAINER WITH  
QUARTZ TUBE

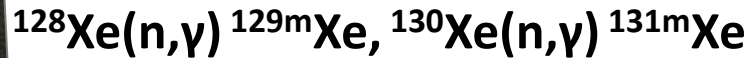
TRANSPORT VIAL



# mXe ISOTOPES - PRODUCTION

- PRODUCTION BY NEUTRON IRRADIATIONS

- STABLE XENON ISOTOPES ( $^{128}\text{Xe}$ ,  $^{130}\text{Xe}$ ) CLOSED IN QUARTZ:



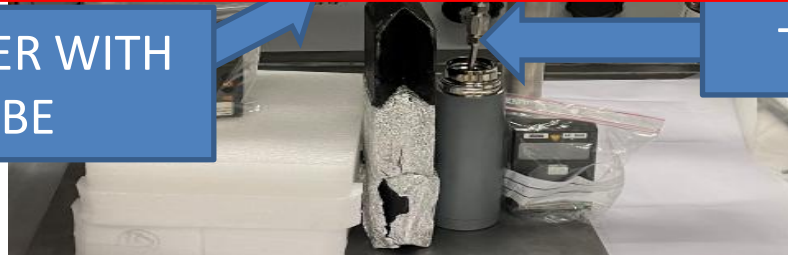
MECHANICAL  
FEEDTHROUGH

TRANSFER EFFICIENCY:

84%

METAL CONTAINER WITH  
QUARTZ TUBE

TRANSPORT VIAL



# mXe ISOTOPES - PURIFICATION

- PURIFICATION SETUP CONCEPT:

