



Legnaro, 06/05/2015

Nuclei per la salute

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Università di Ferrara

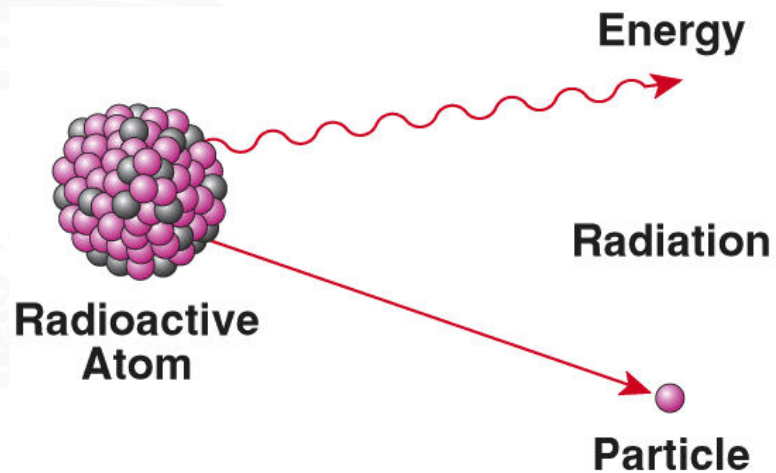
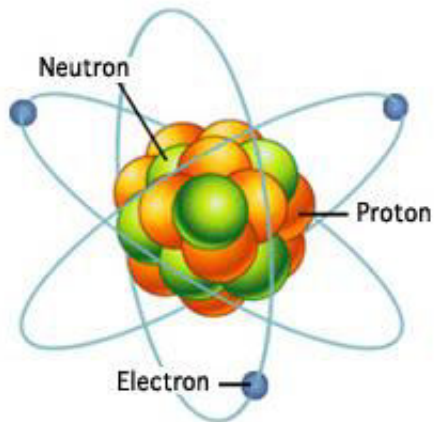
adriano.duatti@unife.it

Perché Laramed?

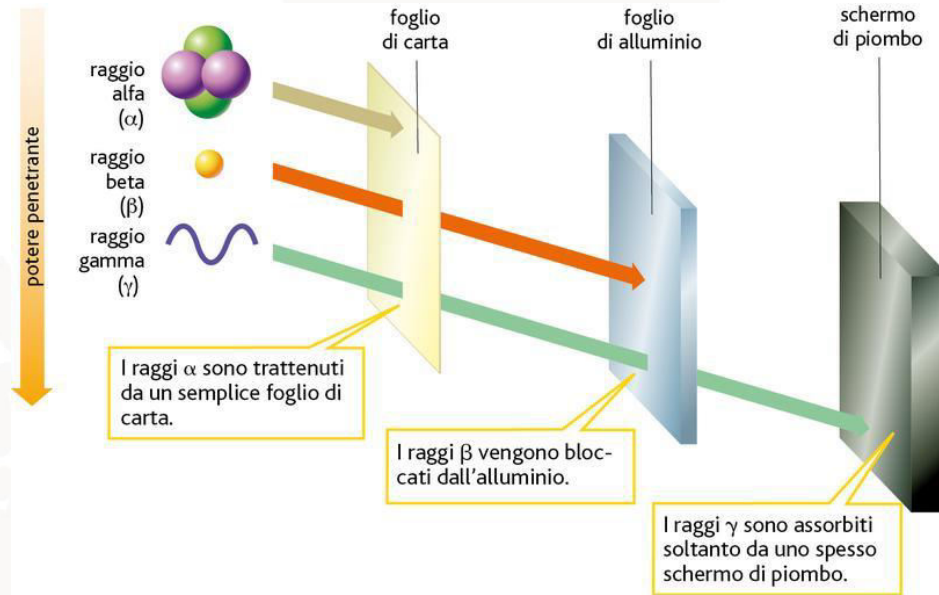
- Radionuclidi in medicina
- Medicina nucleare
- SPECT (Tomografia ad emissione di singolo fotone)
- PET (Tomografia ad emissione di positroni)
- Terapia con radionuclidi

Radioattività

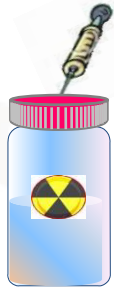
ATOM



Radiazioni α , β e γ



Scintigrafia



Preparazione del
radiofarmaco



Gamma
camera



Radiografia

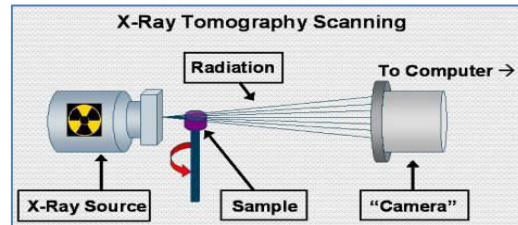
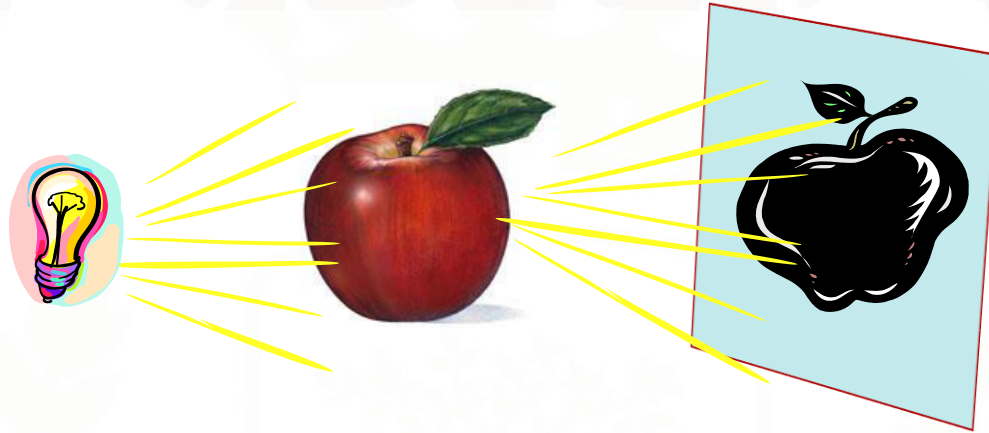


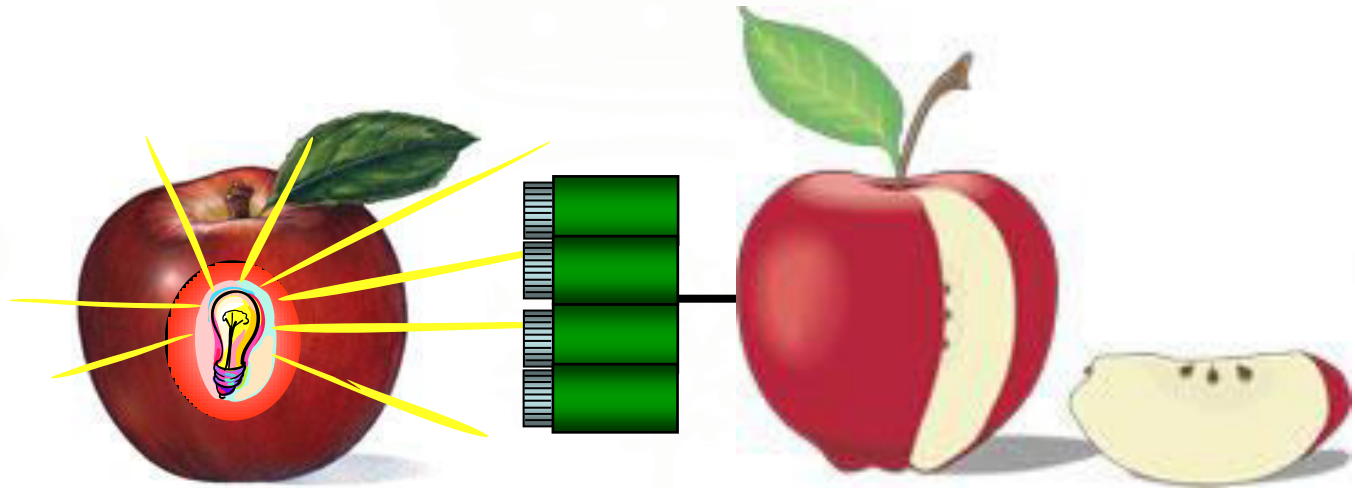
Immagine Radiografica (CT)



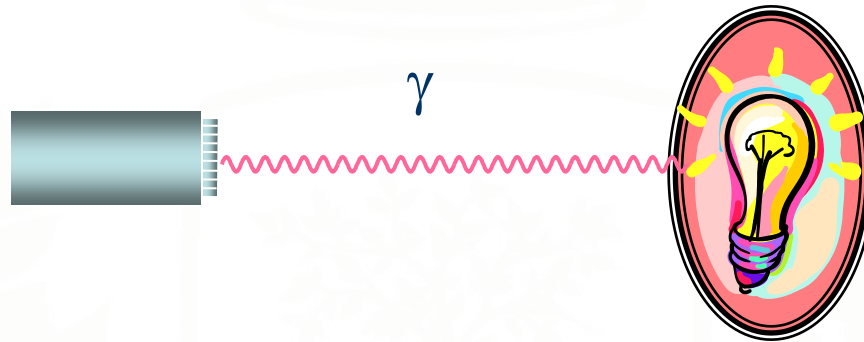
Anatomia



Scintigrafia

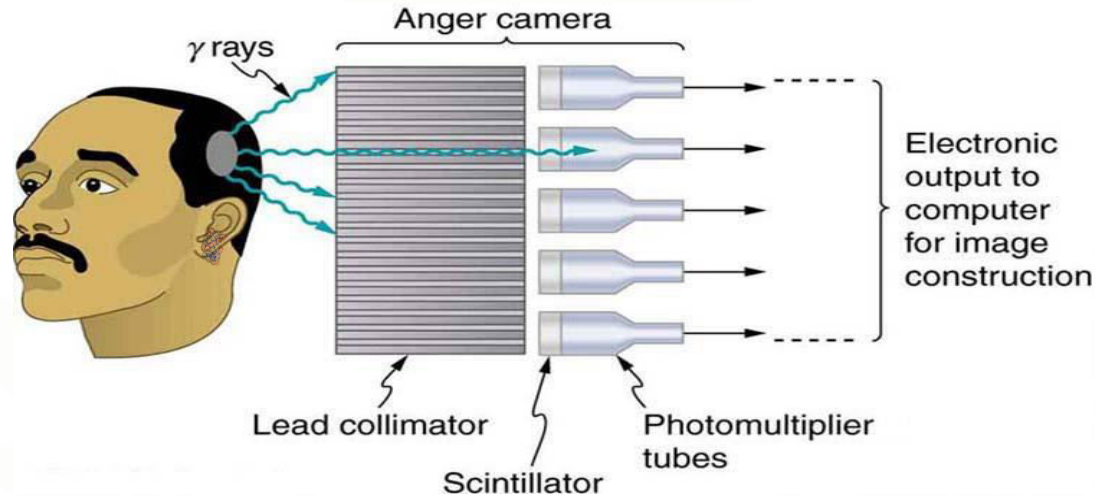


SPECT



La tomografia ad Emissione di Fotone Singolo

Single Photon Emission Computed Tomography (SPECT)



SPECT Gamma Camera

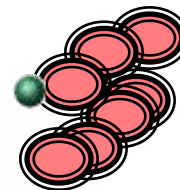




β^+



β^-



PET



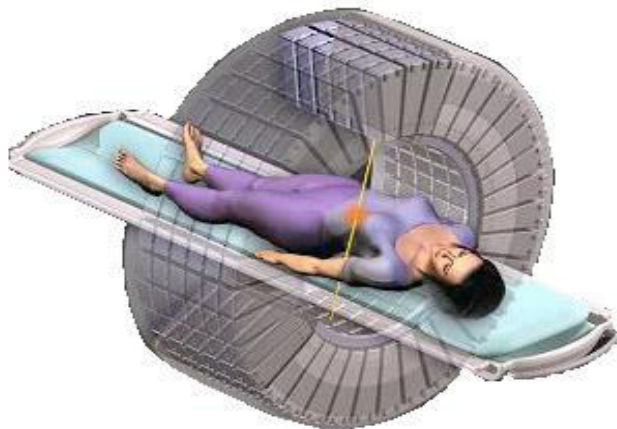
$\gamma, 511 \text{ keV}$



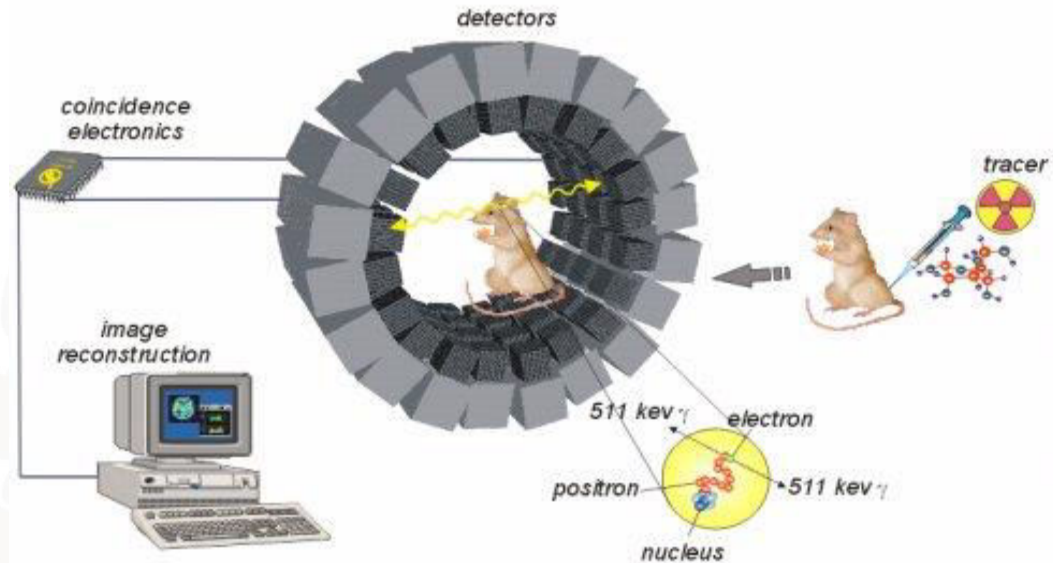
$\gamma, 511 \text{ keV}$



PET gamma camera



PET



Tomografi Ibridi



PET-CT

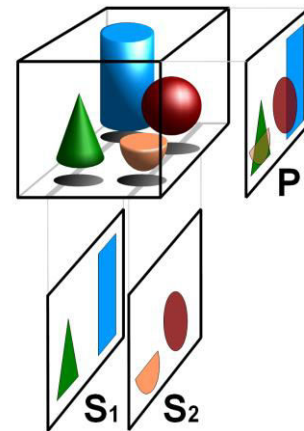
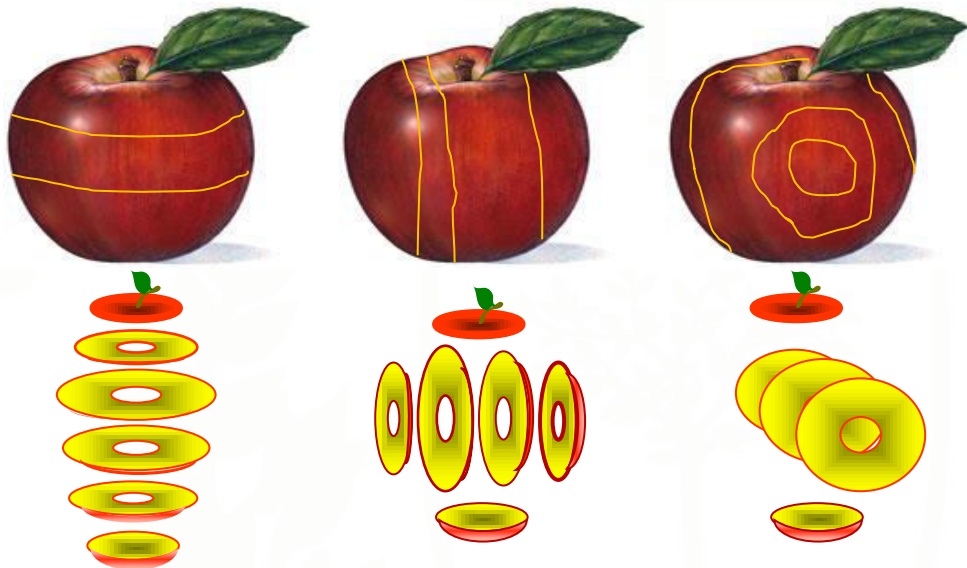


PET-MRI

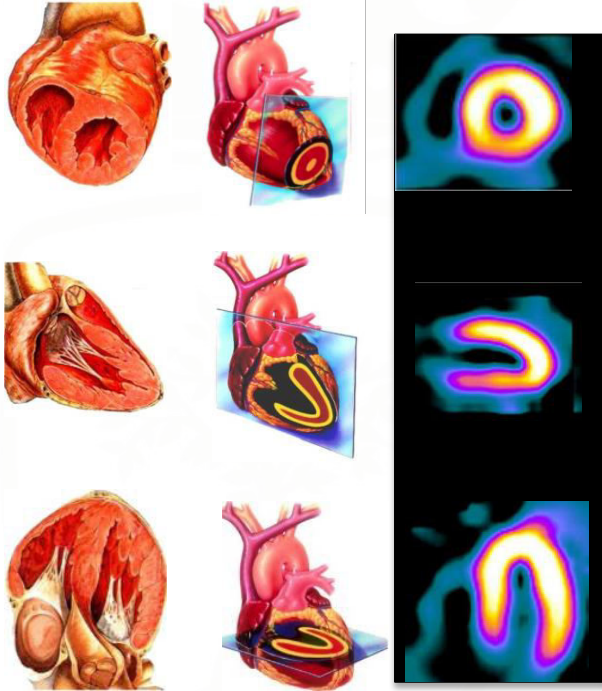


SPECT-CT

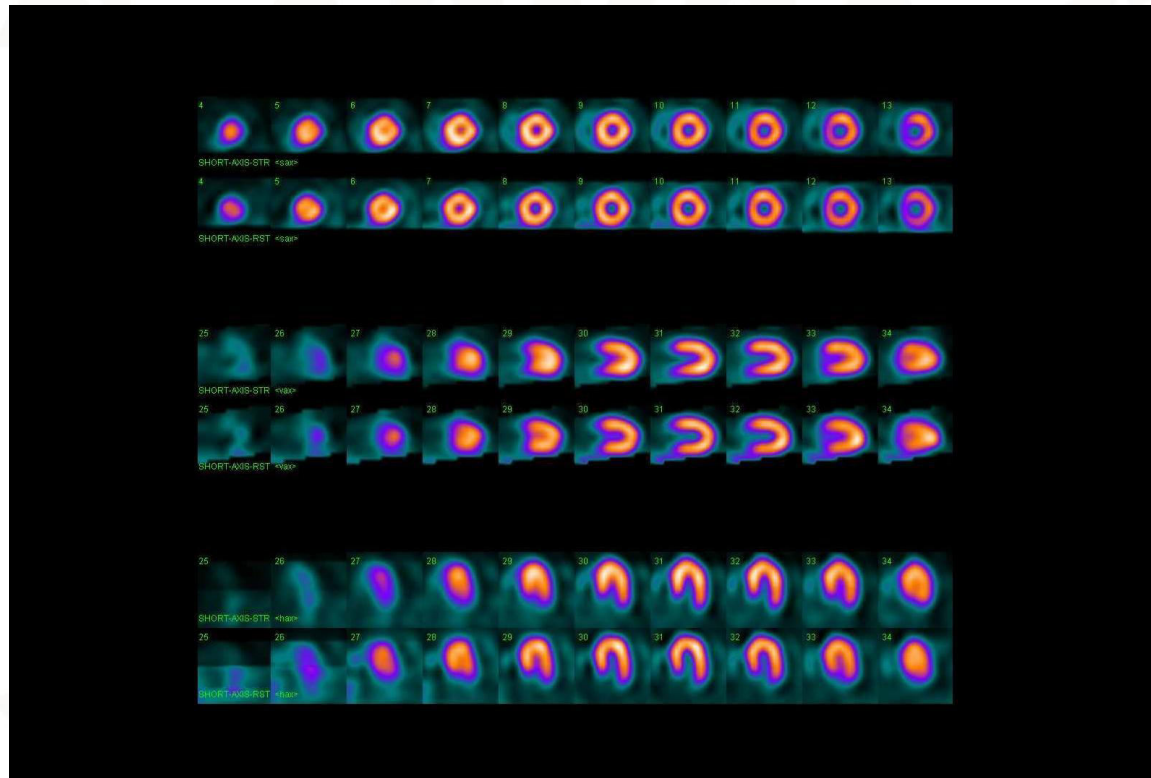
Tomografia



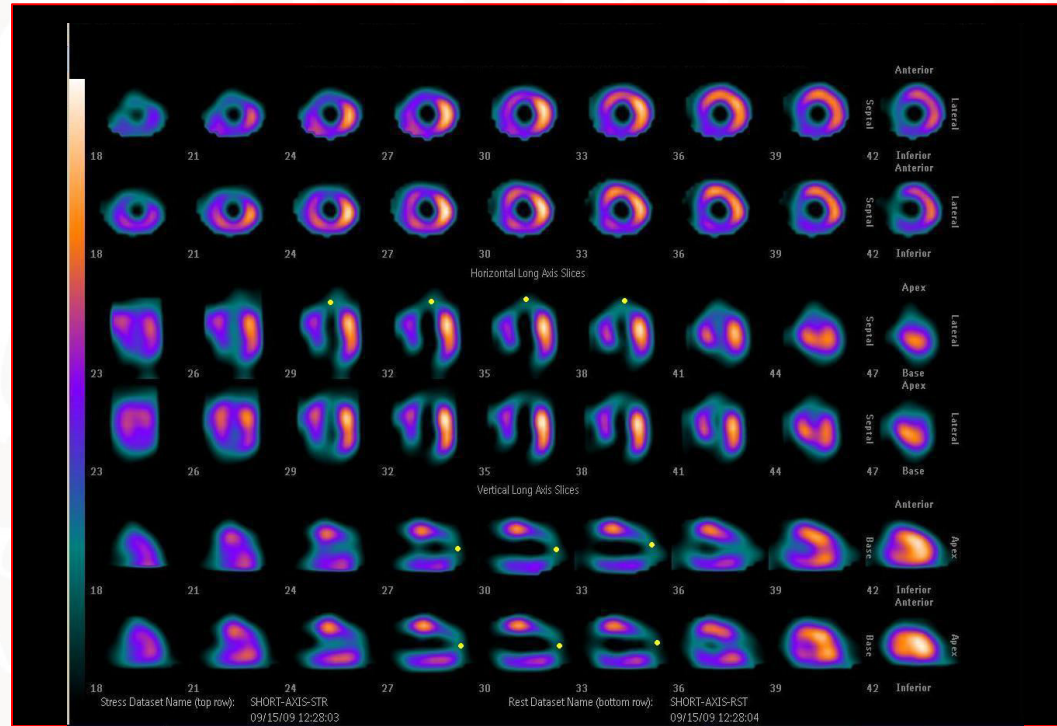
Scintigrafia

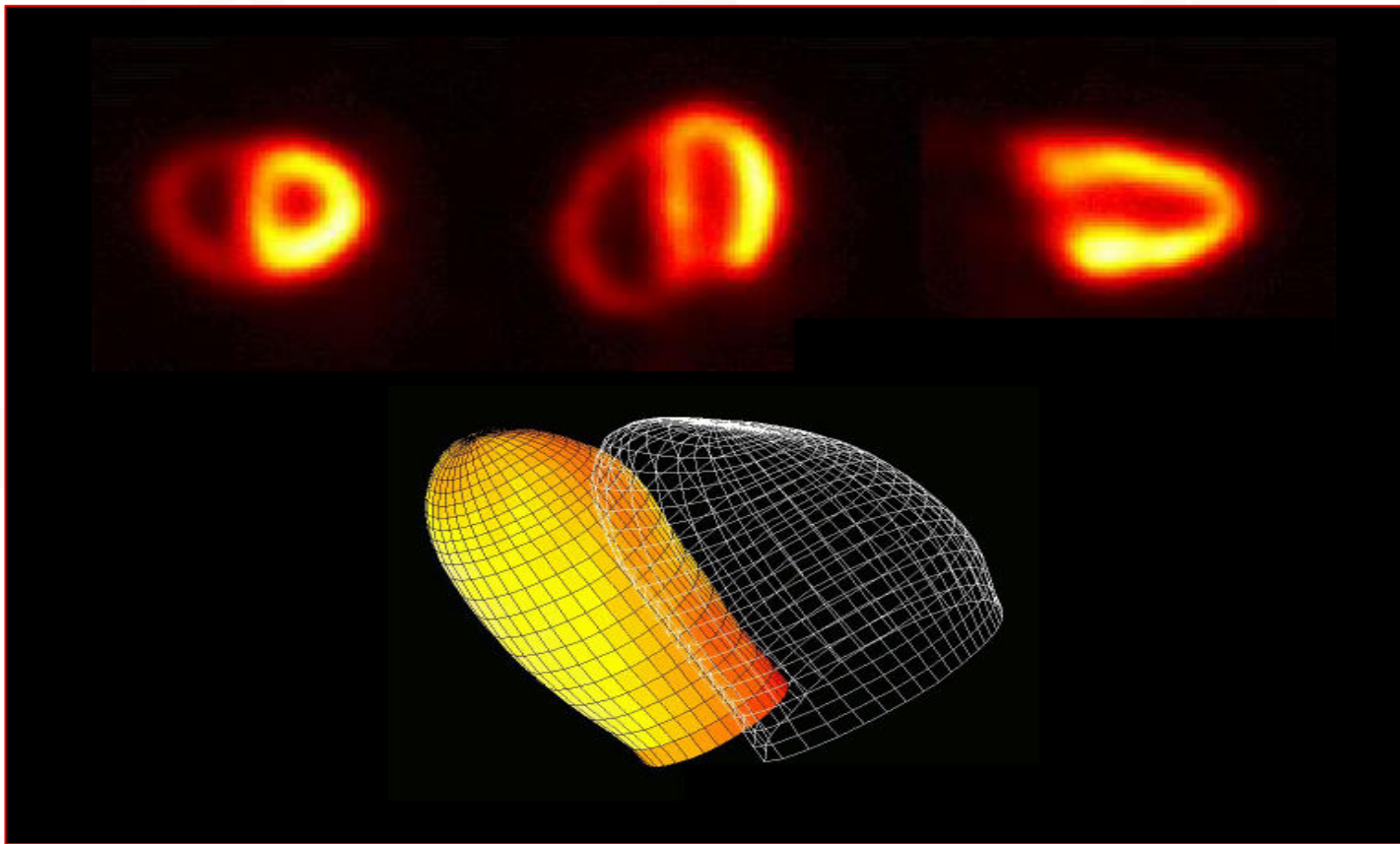


Tomografia



Tomografia

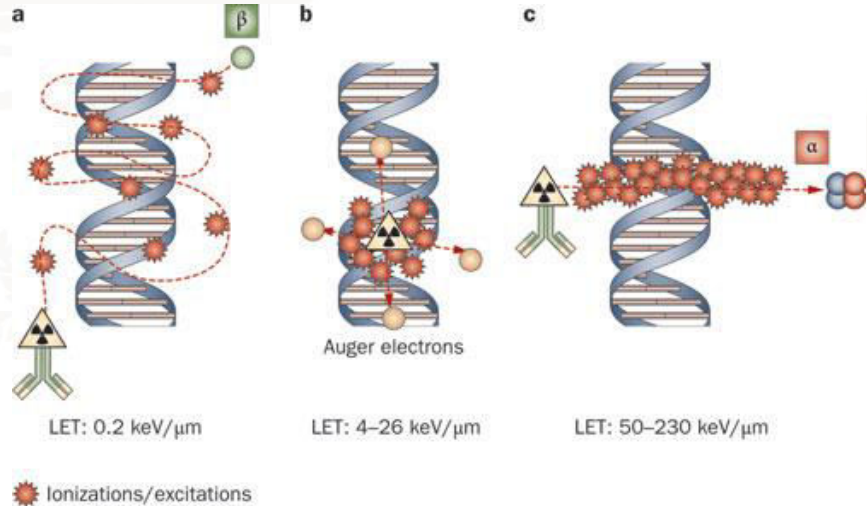
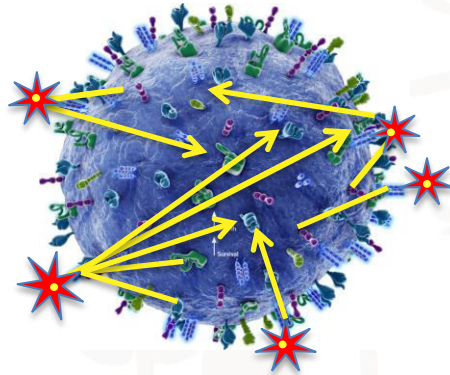




Dosi assorbite

Metodo d'indagine	Dose (mSv)
PET (F-18)	15
SPECT	2-10
Rx	0.02-8
TC	1-20

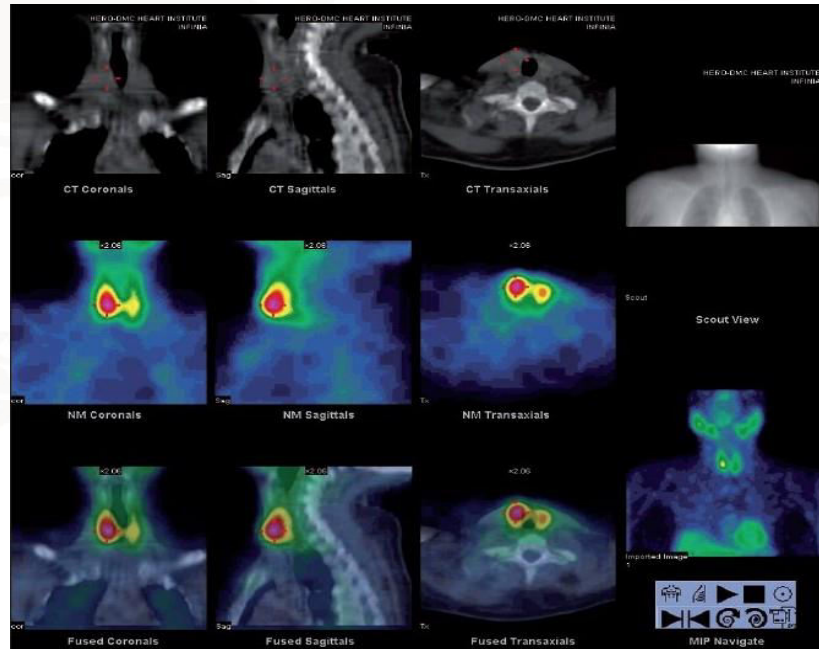
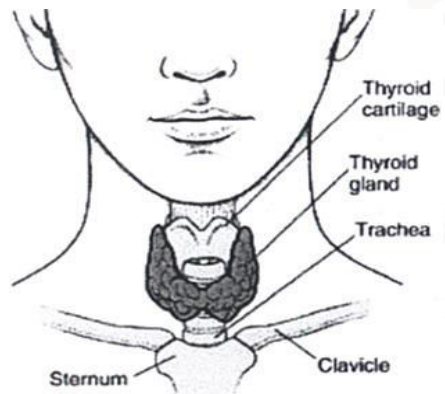
RADIONUCLIDI PER LA TERAPIA



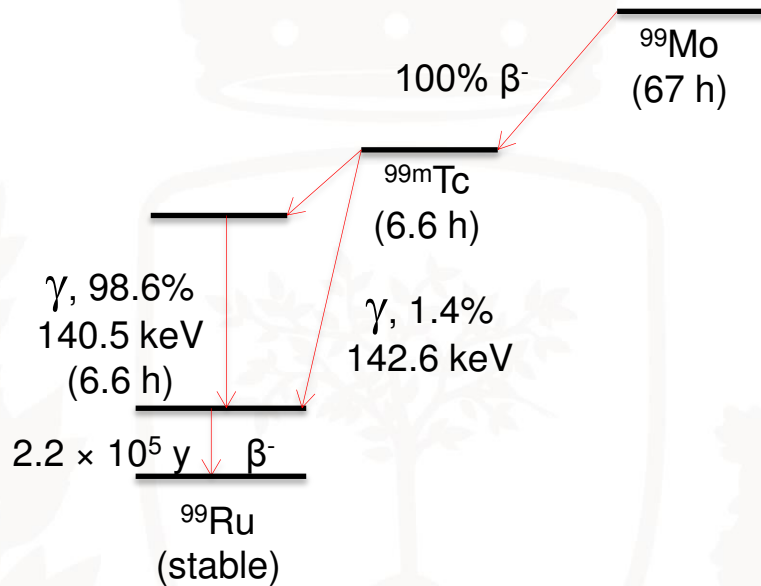
Iodio-131



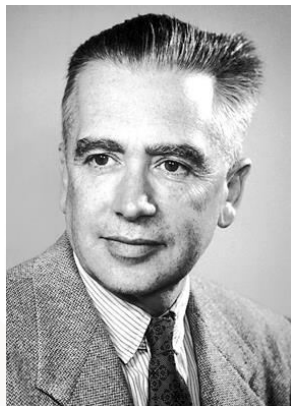
Iodio-131



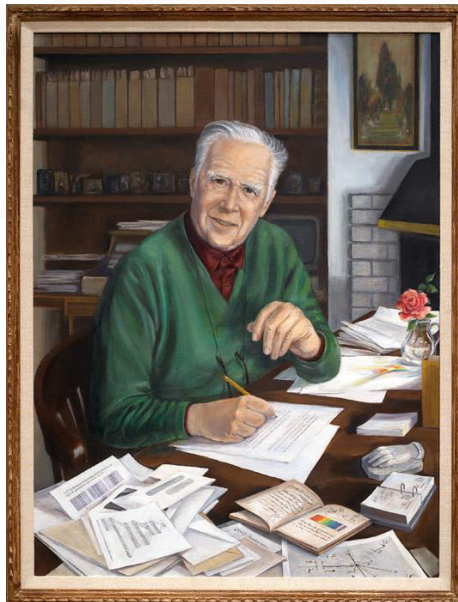
Tecnezio-99m



Scoperta del primo elemento chimico artificiale chiamato Tecnezio

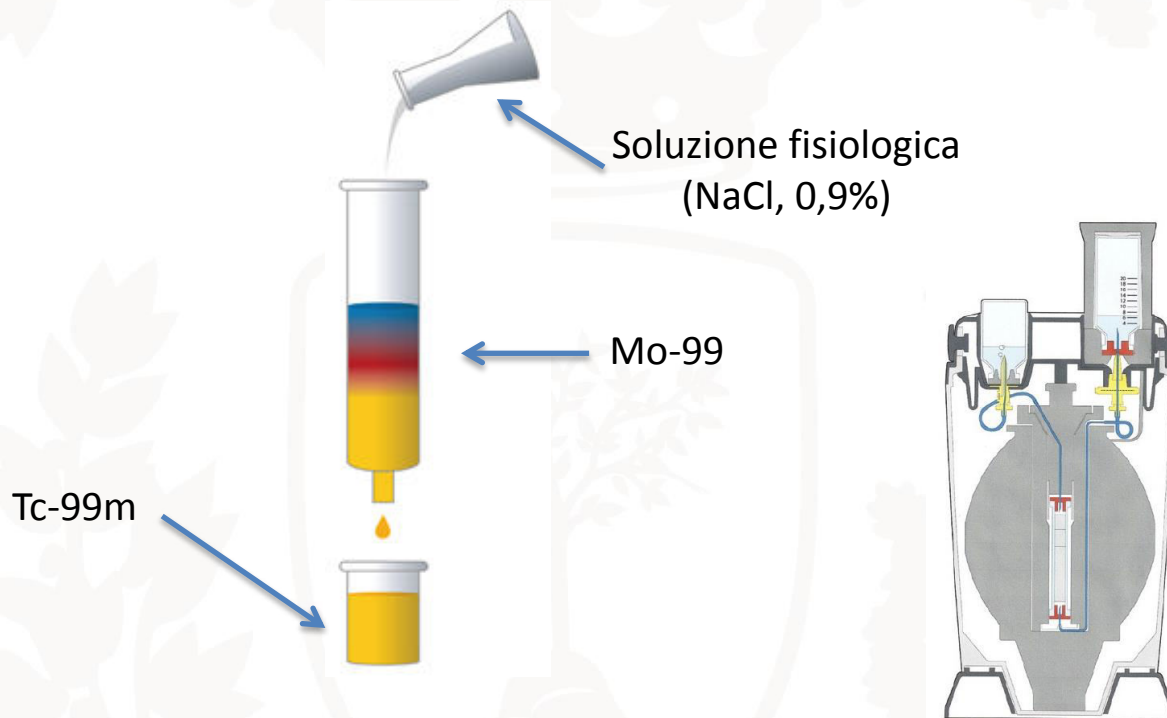


Emilio Segrè



Carlo Perrier

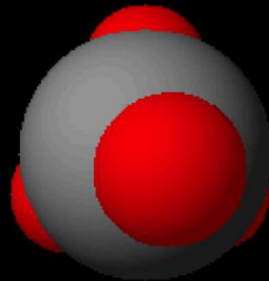
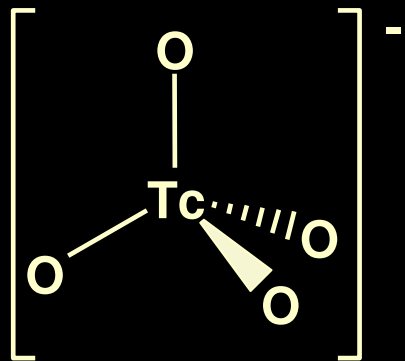
Generatore di Mo-99/Tc-99m



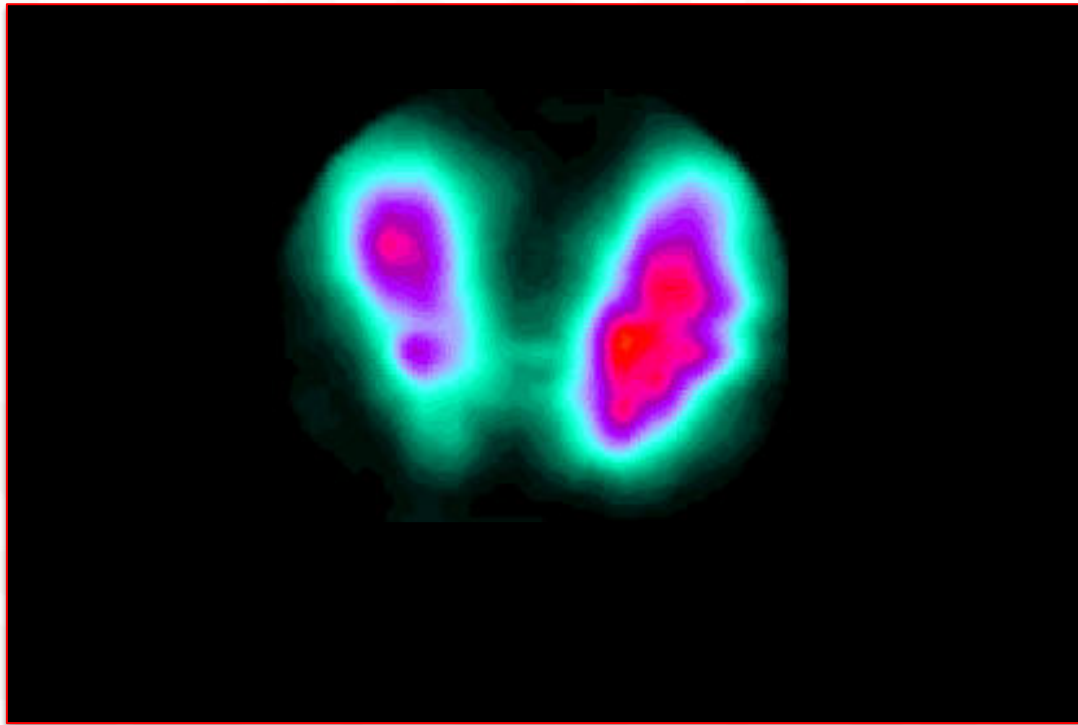
Tc-99m



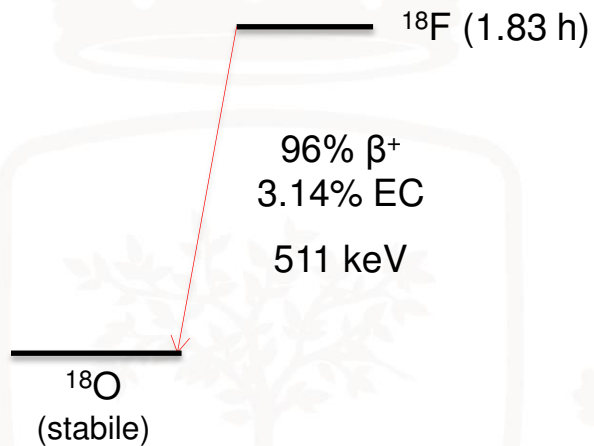
Tc-99m



Tc-99m



Fluoro-18

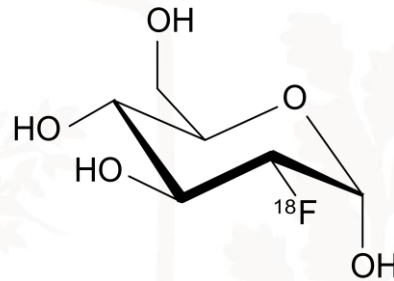
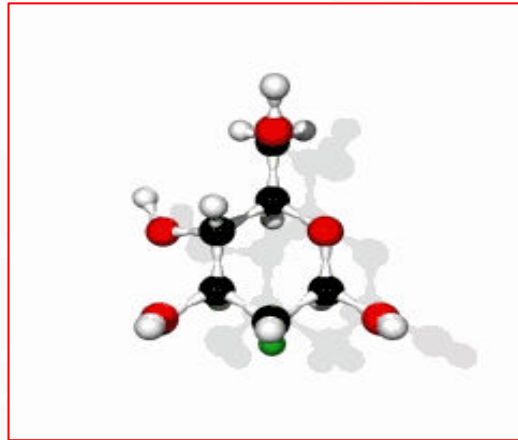


Scintigrafia Ossea con Fluoro-18

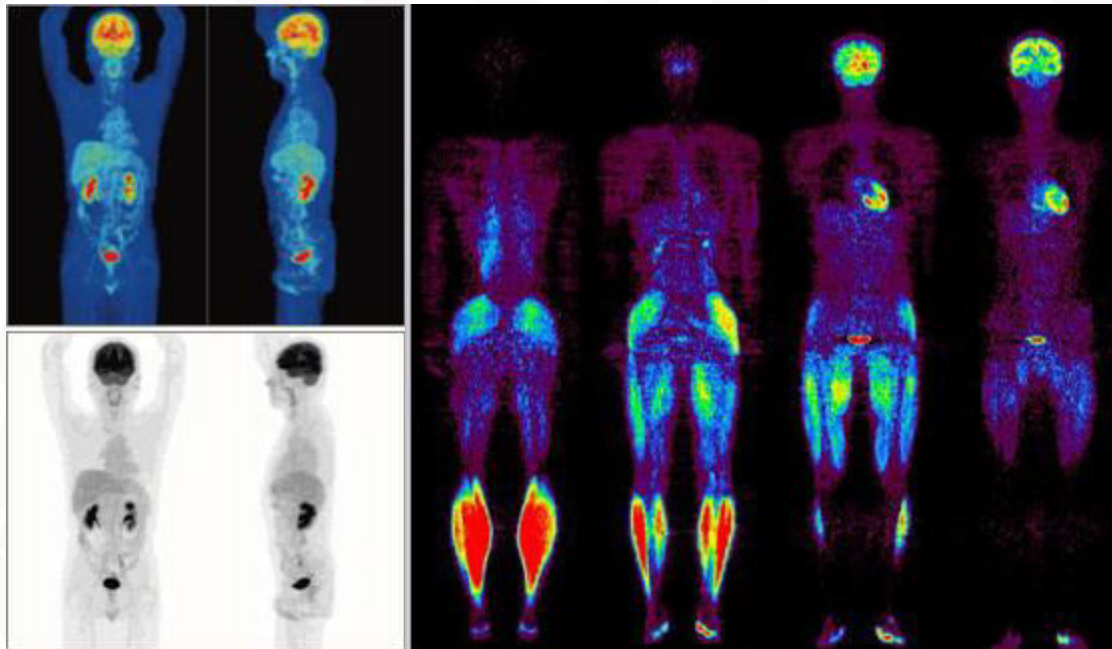


F-18-Fluorodesossiglucosio

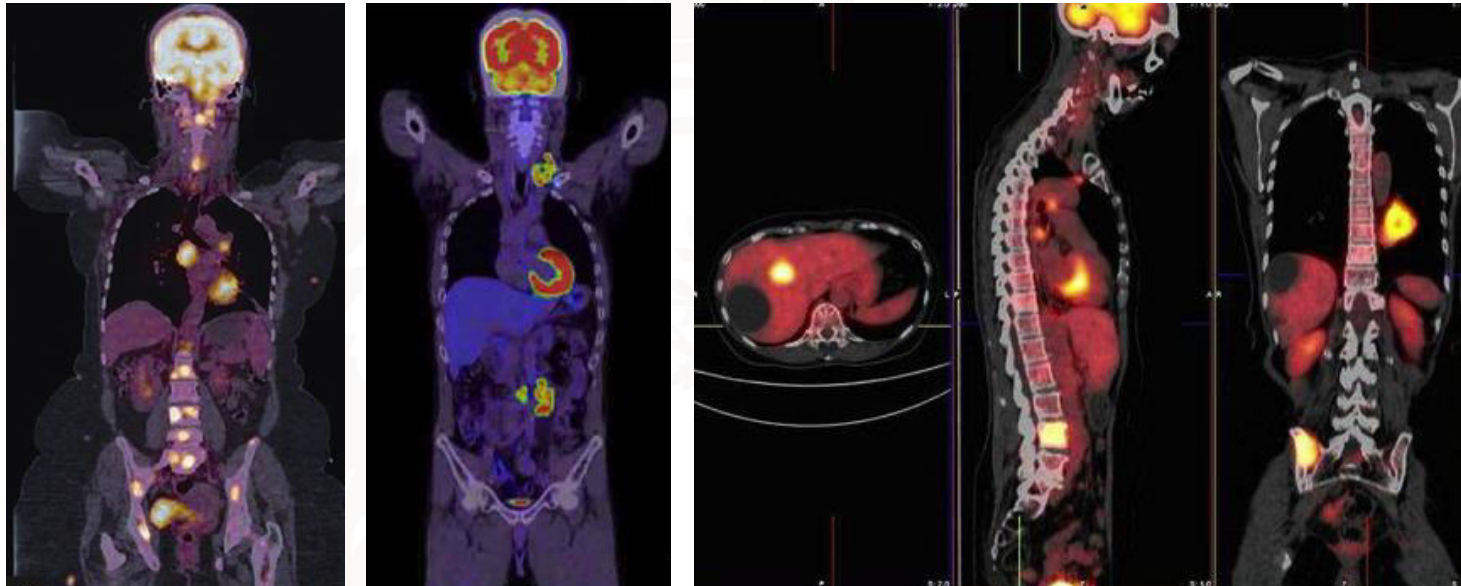
F-18-FDG



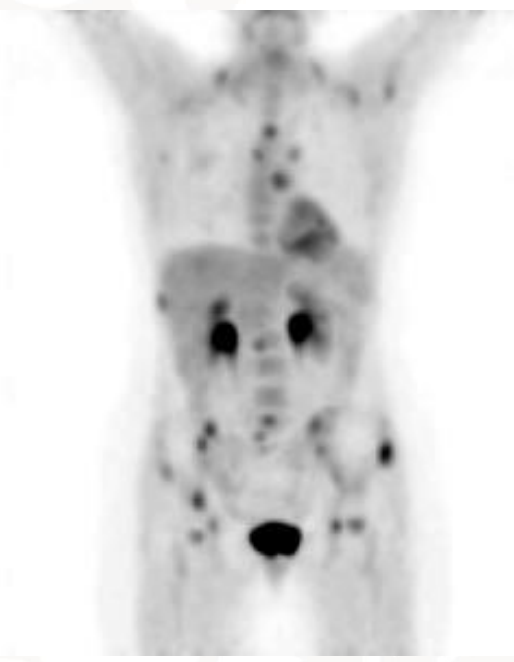
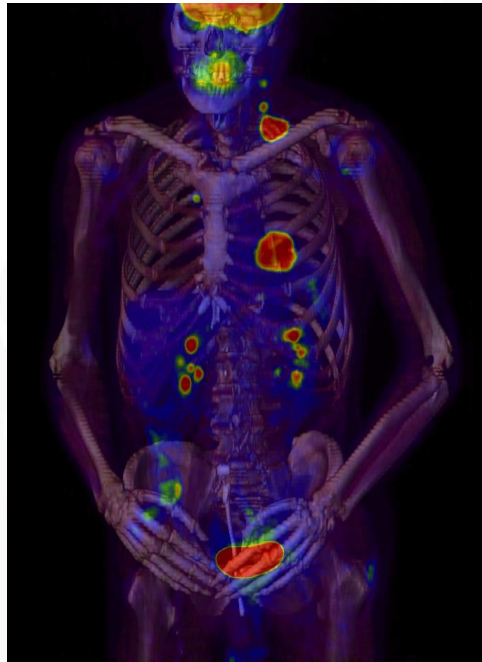
F-18-FDG



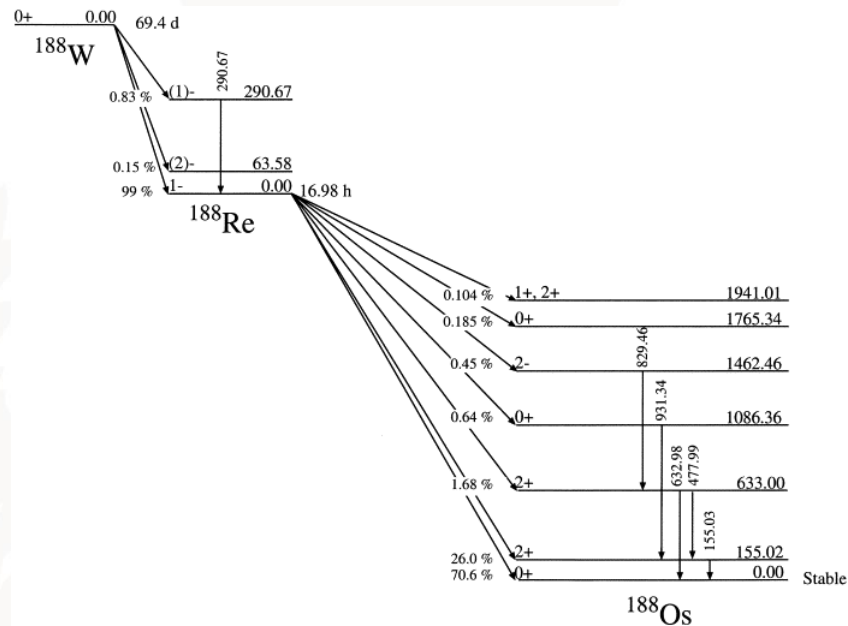
F-18-FDG



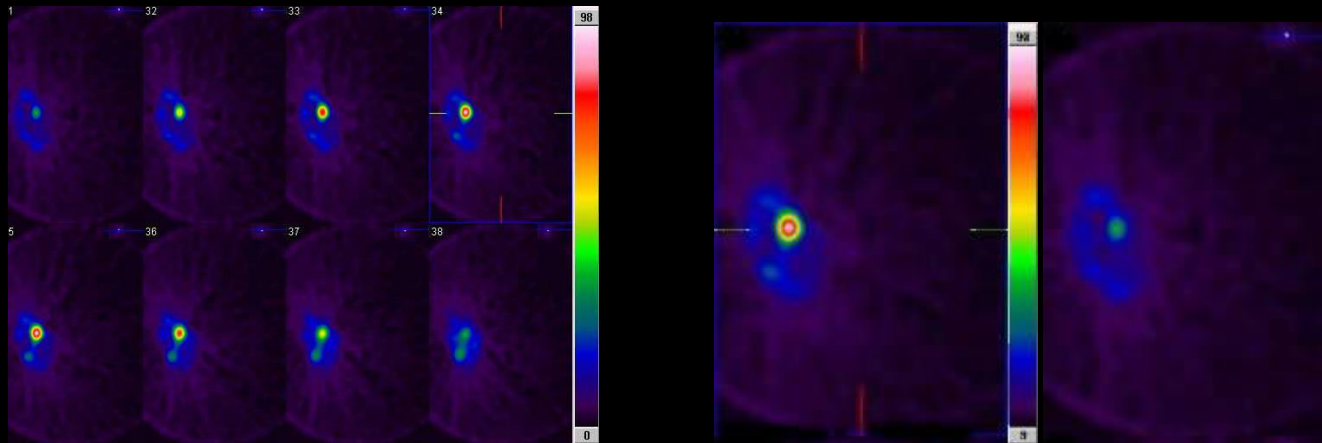
F-18-FDG



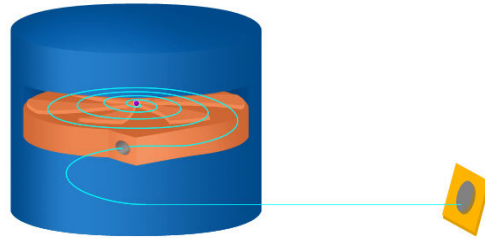
Renio-188



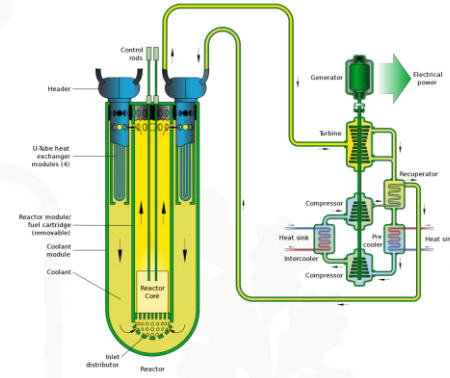
Renio-188



Produzione di Radioisotopi

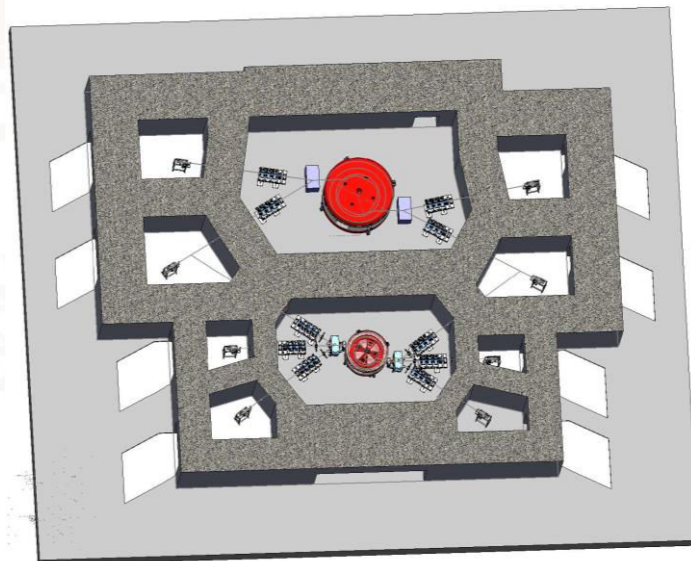
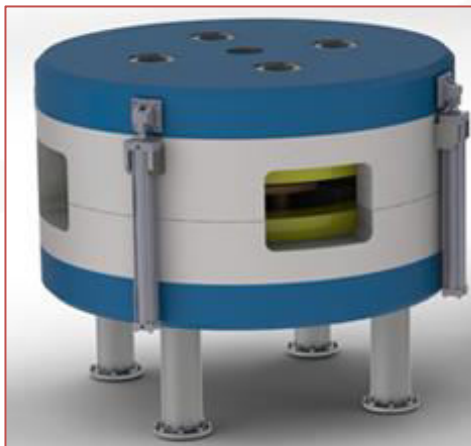


Ciclotroni

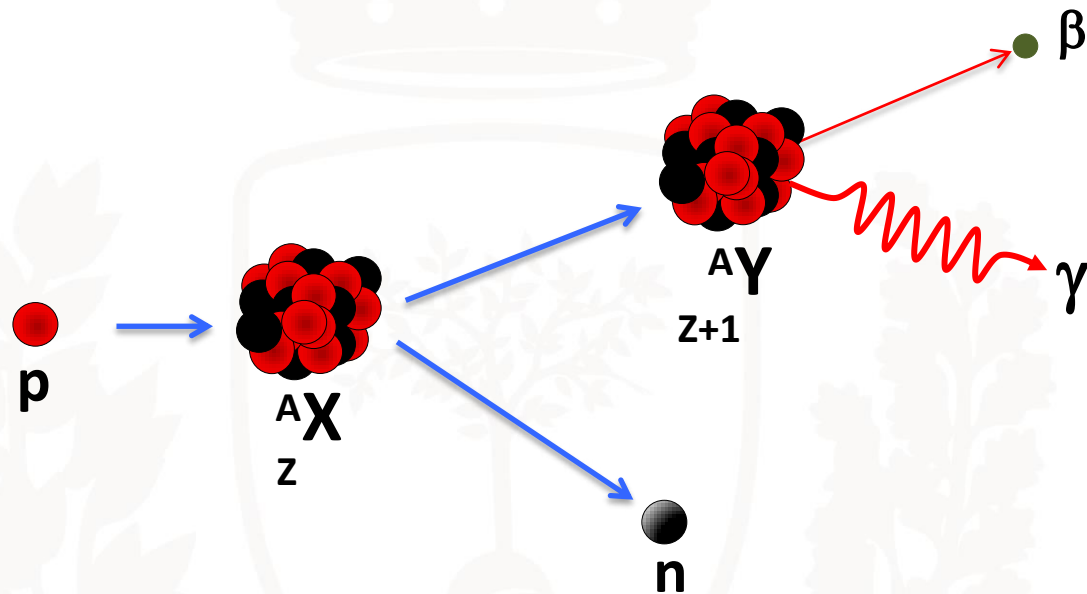


Reattori Nucleari

SPES Project



Produzione di radionuclidi per bombardamento con protoni



Stronzio-82/Rubidio-82

Generatore di Sr-82/Rb-82: $^{82}\text{Sr} + e^- \longrightarrow ^{82}\text{Rb} + \nu$
($T_{1/2} = 25.55 \text{ d}$)

Decadimento Rb-82 = β^+ (17%), β^- (39%),
($T_{1/2} = 75 \text{ sec}$)



Rame-64

Produzione = ${}^{64}\text{Ni}(p,n){}^{64}\text{Cu}$

Decadimento = β^+ (17%), β^- (39%),

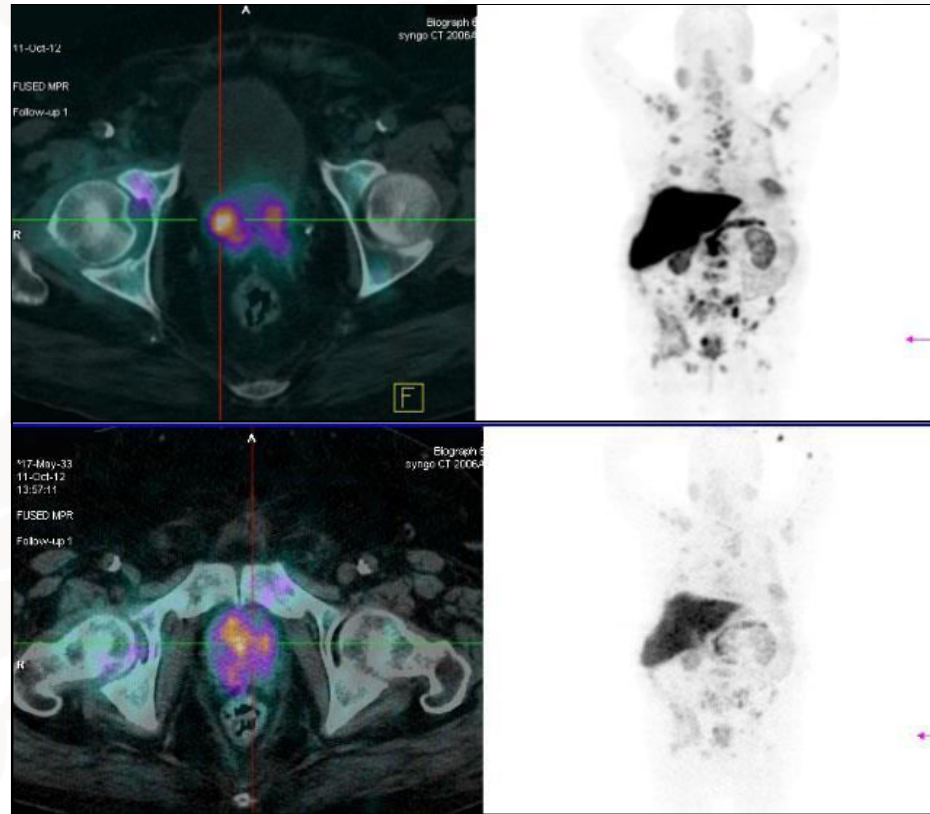
$t_{1/2}$ = 12.701 h

Rame-67

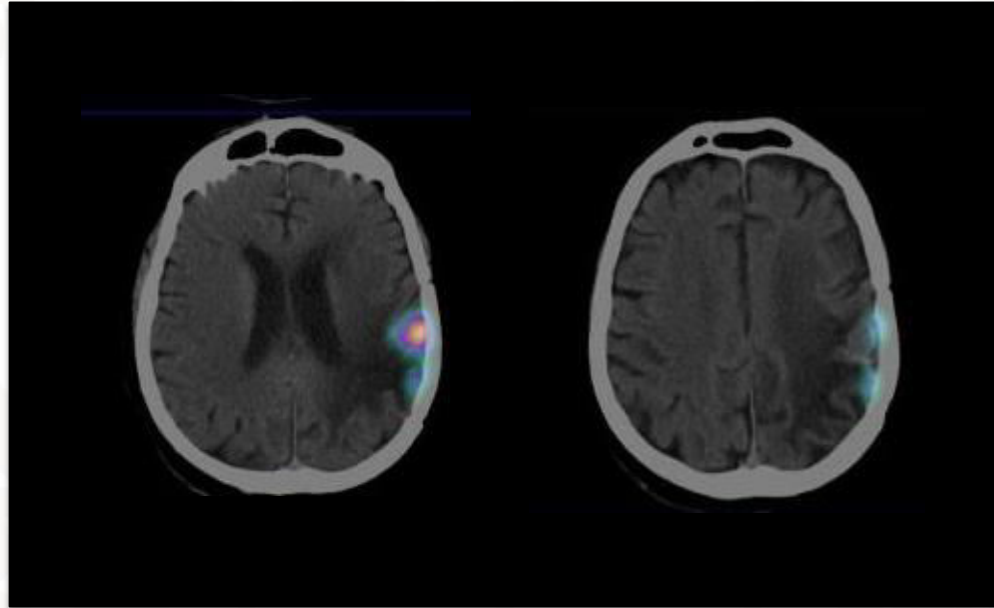
Produzione = ${}^{68}\text{Zn}(p,2p){}^{67}\text{Cu}$

Decadimento = β^- (17%), γ (39%),

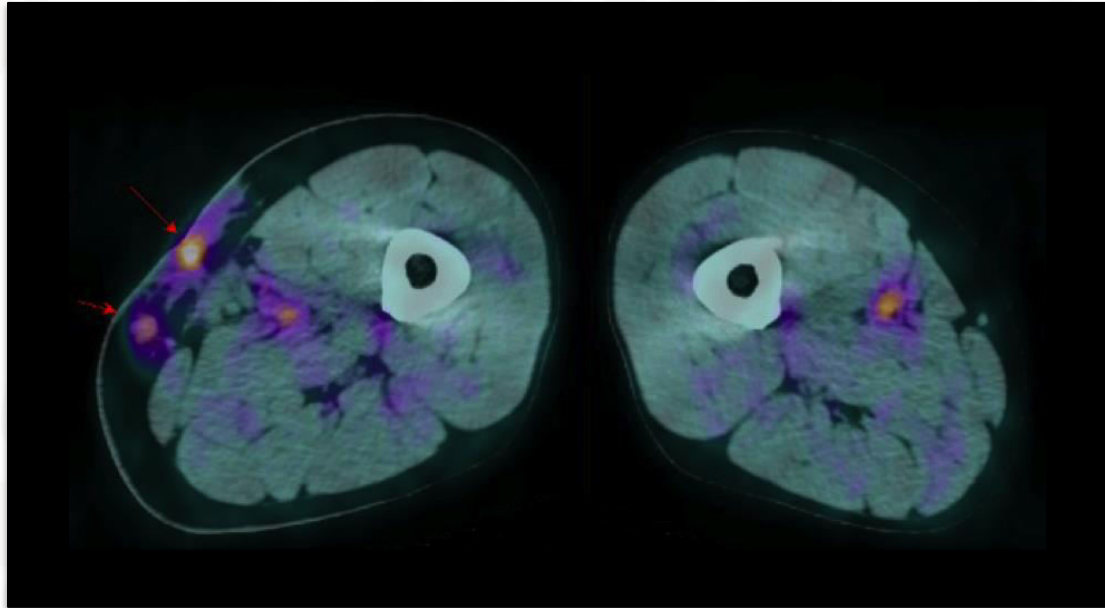
$t_{1/2}$ = 2.6 d



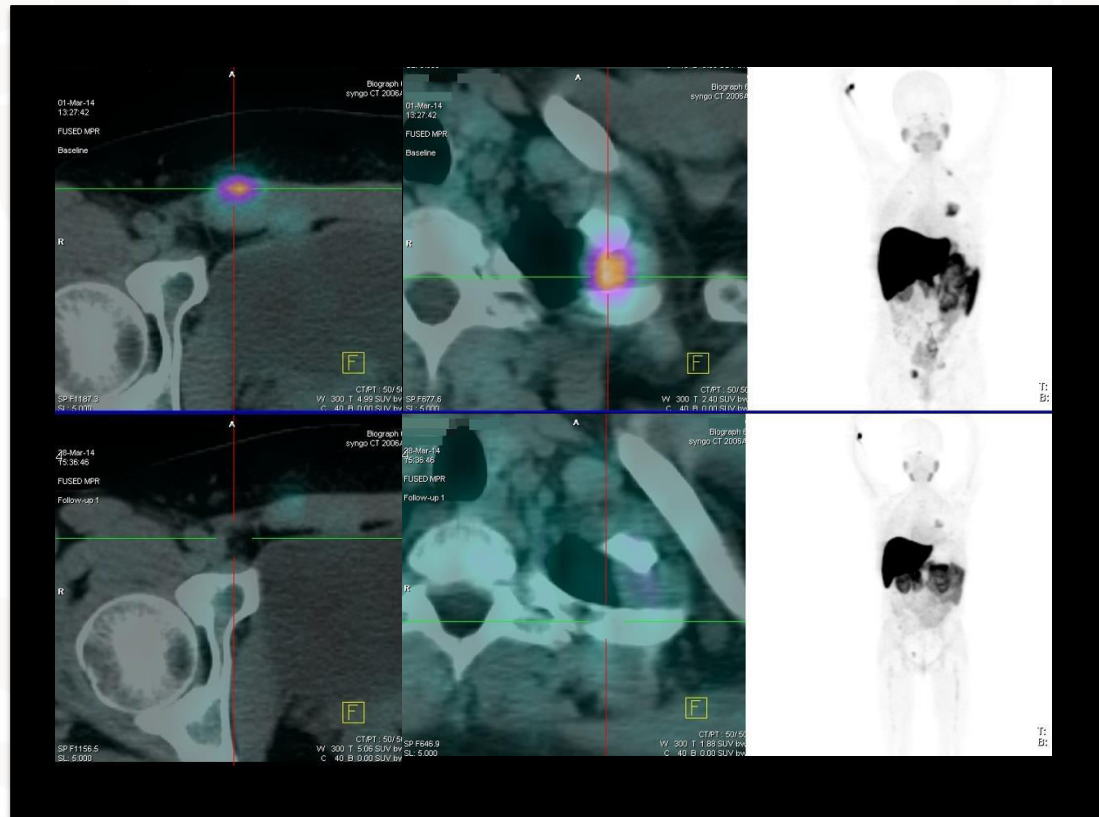
Cu-64 - Carcinoma prostatico



Cu-64 - Glioblastoma (prima e dopo la terapia)

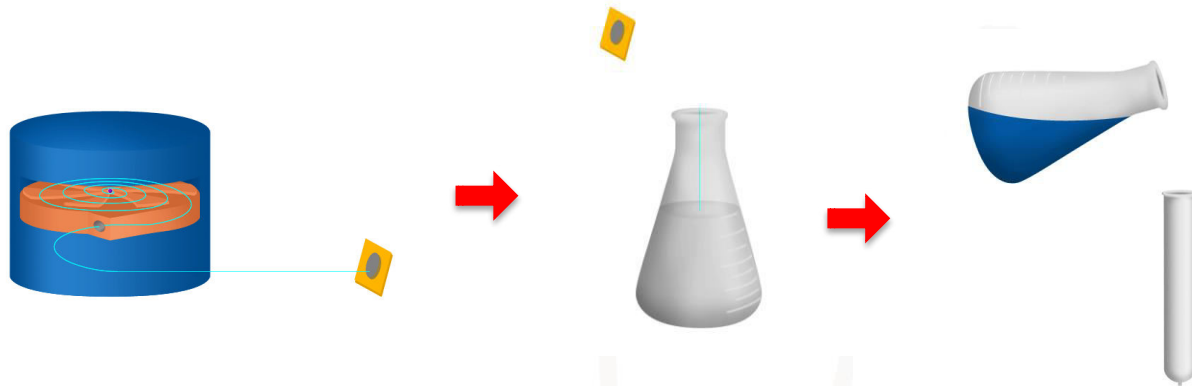


Cu-64 - Melanoma alla gamba sinistra (prima e dopo la terapia)

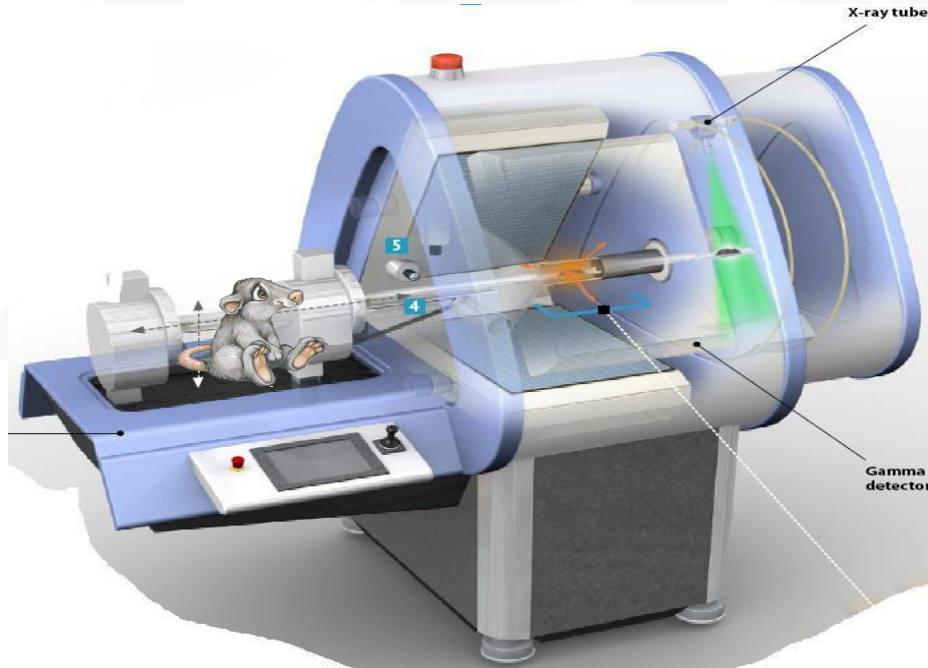


Cu-64 - Carcinoma mammario (prima e dopo la terapia)

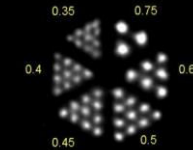
Techn-Osp Cyclotron Production of Tc-99m

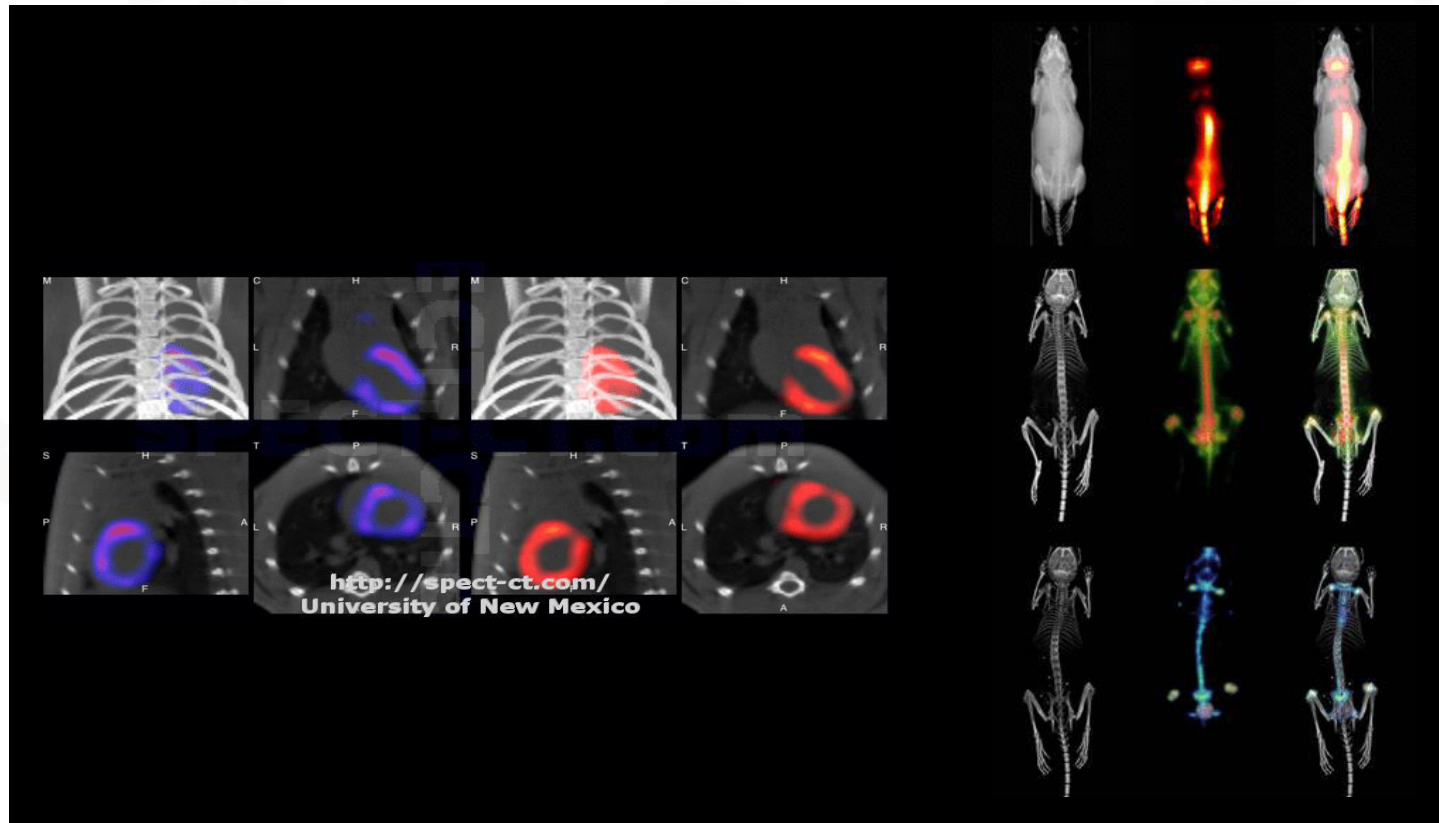


Small-Animal Scanners

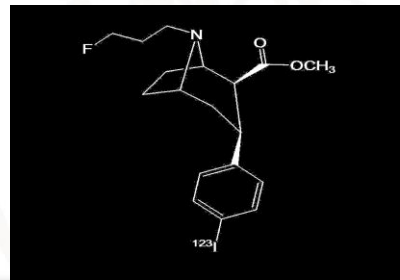
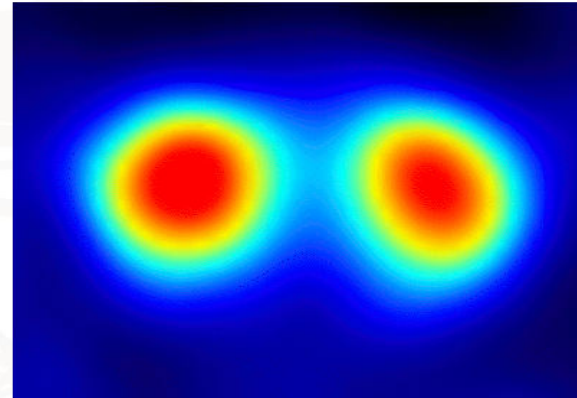
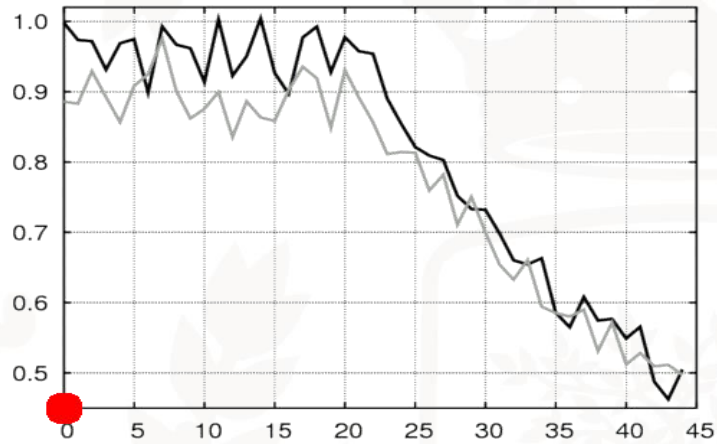


Resolution: 0.35 mm





Displacement of D2 receptor density measured by FP-CIT





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Grazie!

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