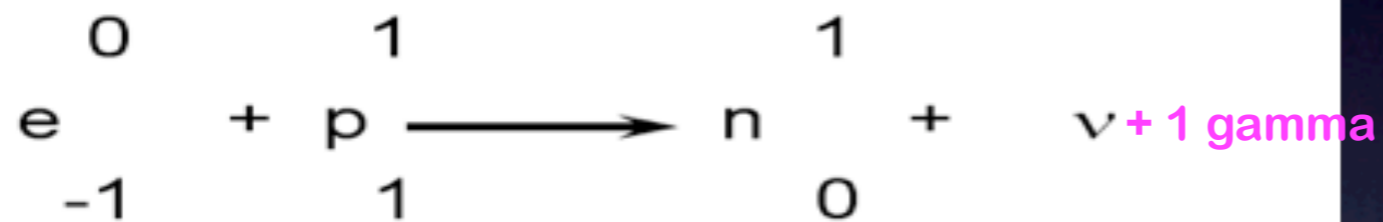


# Radiotracer : gamma radiation emission

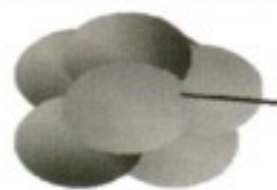


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## PARTICLE REACTION FOR ELECTRON CAPTURE



Nucleus



$e^+$  positron

$\gamma$  (511keV)

Annihilation + 2 gammas

$e^-$

$\gamma$  (511keV)

Positron Emission

- Principle: **Radiotracer** is a **radioactive isotope** meaning it has an **artificially created unbalanced Z to N ratio** which makes excess **PROTON** transforms into-**> NEUTRON**
- One way is **electron capture**: proton+ electron= neutron + **1 gamma**
- Second way is **positron emission**: proton-> neutron+positron +neutrino
- then, positron +electron->annihilation(disappear)+**2gamma opposite**

# Gamma rays: medical use in radiotracers



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- Radiotracer = gamma emitter is injected IV
- Next: flows w/ blood
- Next: cell uptake, normal/ increased in: repair (bone fracture), infection, tumor
- Dx tool for : blood flow obstruction: heart, lung, brain and increased cell uptake