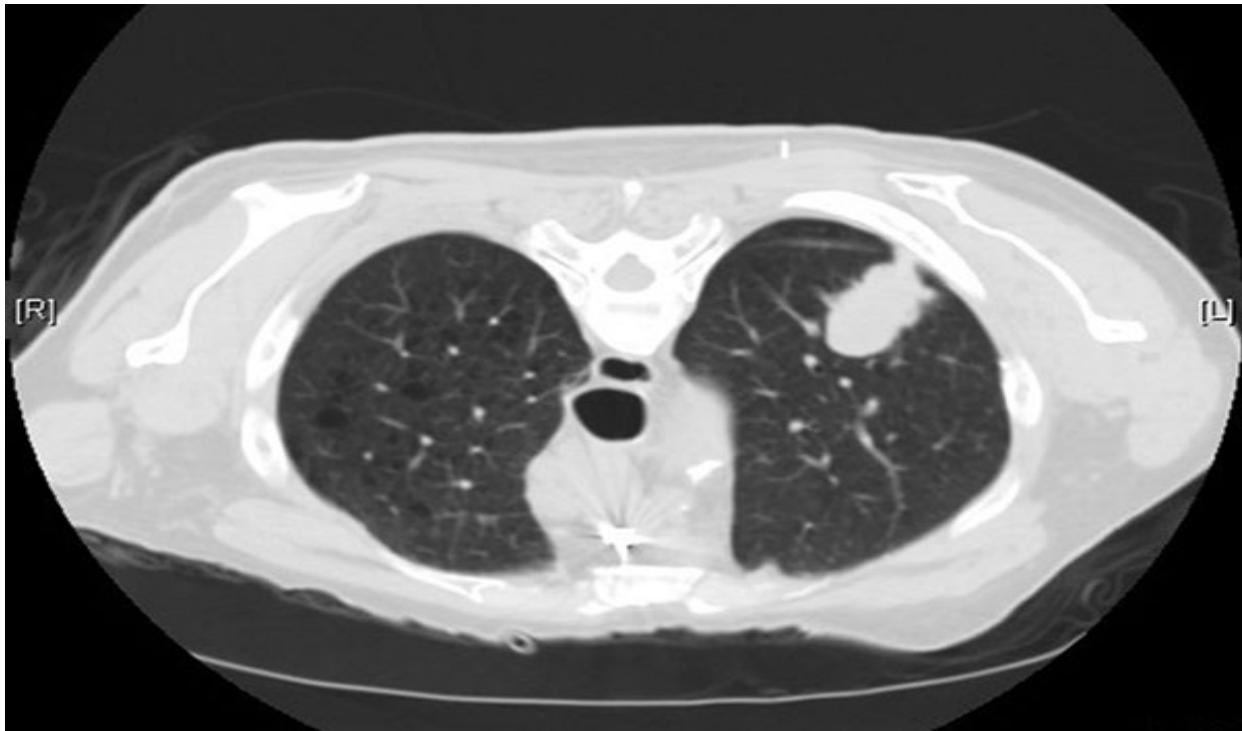


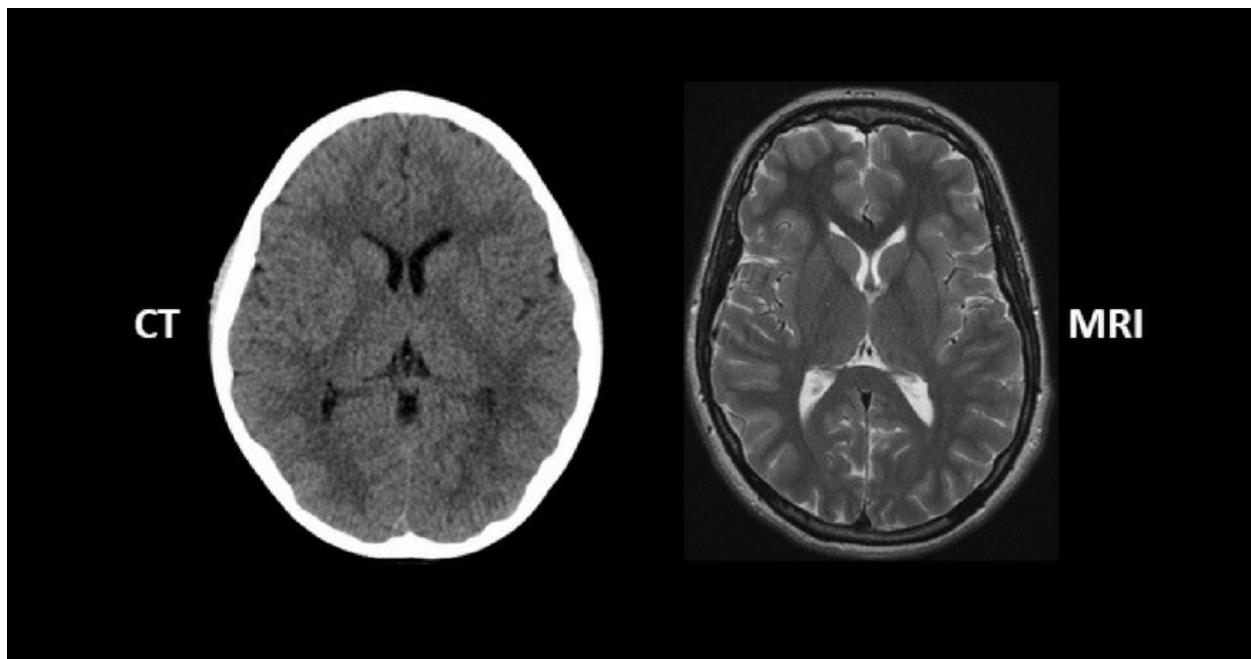
## X-Ray

- high energy waves
- useful to identify tumours
- **radiotherapy** : directs x-ray beams at tumour to damage DNA - affects all cells



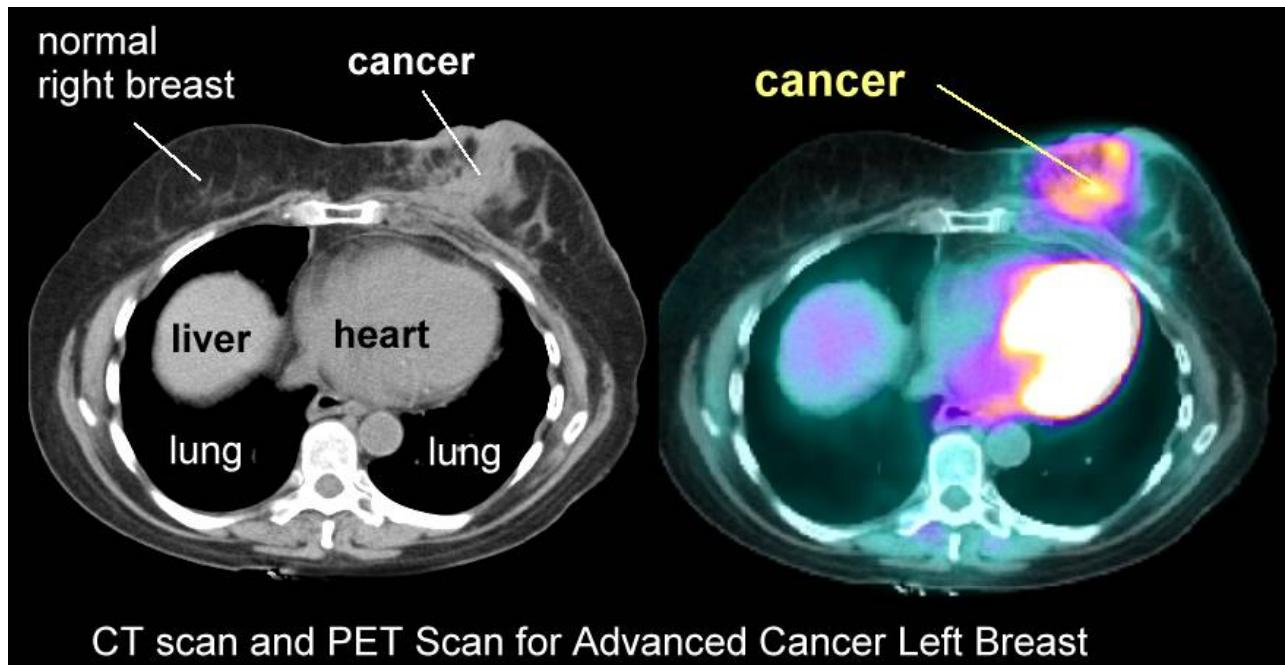
## Computed Tomography (CT) Scan

- use x-ray technology
- provide detailed images in a short amount of time



## Magnetic Resonance Imaging (MRI)

- use magnets and radio waves
- produce very detailed images
- takes a long time



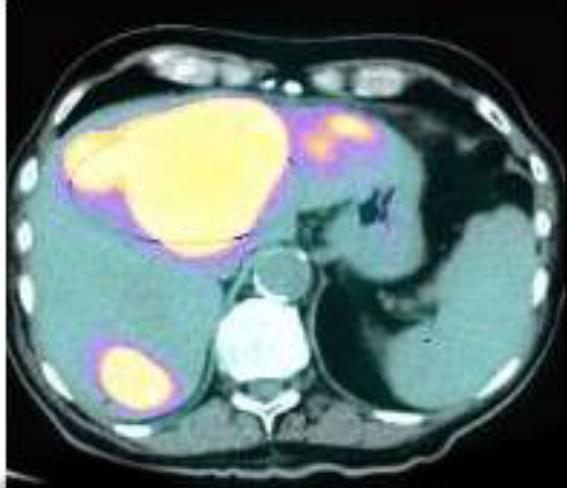
## Positron Emission Tomography (PET) Scan

- Radioisotopes in a solution
- taken up by cells needing energy
- solution Shows up as bright colours

Lung cancer metastatic to Liver



CT Scan



PET Scan

## Regeneration

- the process of a body part regrowing
- Use the mitosis process

stem cells?  
specialized cells?



## Stem Cells

- Unspecialized cells
- go through cell cycle



### Embryonic Stem Cells

- found in embryos
- can differentiate into all cell types

### Adult Stem Cells

- found in specific tissue
- replace old or damaged cells of their origin tissue

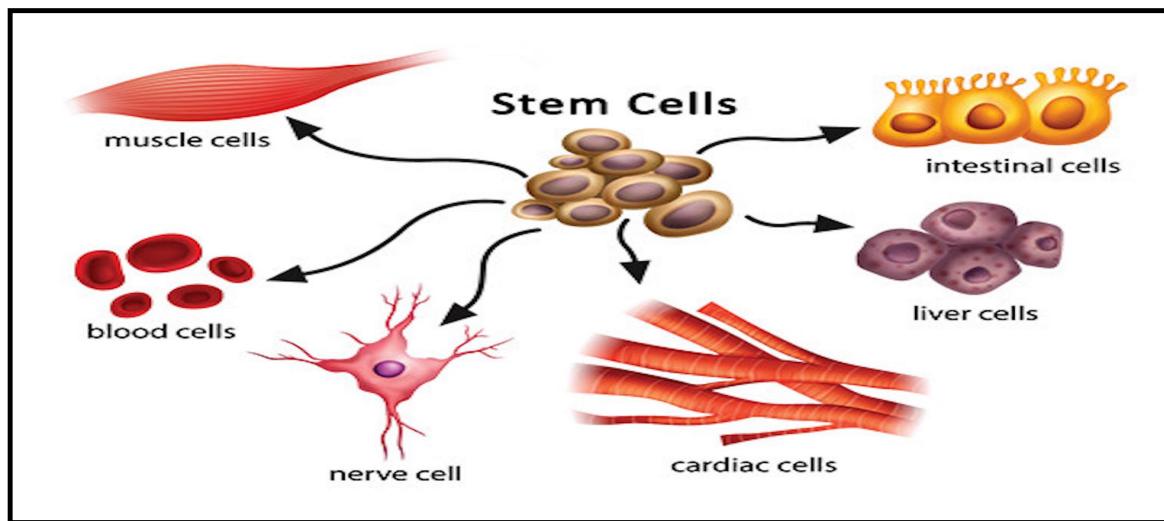
## Meristematic Cells

- Stem cells found in plants
- found in root tips

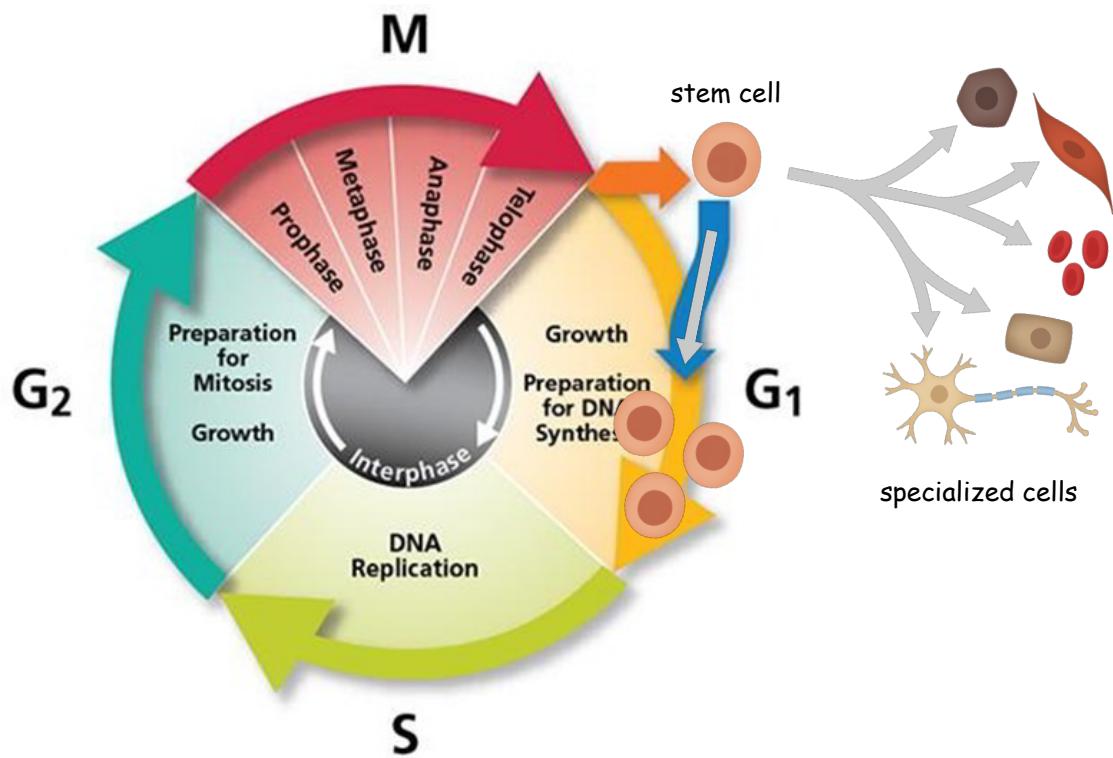


## Cell Specialization

- the process where cells develop to perform particular functions



# The Cell Cycle



G<sub>0</sub>: daughter cell 'decides' whether it wants to specialize or re-enter the cell cycle

## Research with Stem Cells

controversial (use of embryonic stem cells)



adult stem cells are already too specialized

believed to be able to treat injuries and diseases by regenerating organs



## Induced Pluripotent Stem Cells

