

## Positron Emission Tomography (PET)

**SUPERVISOR :**

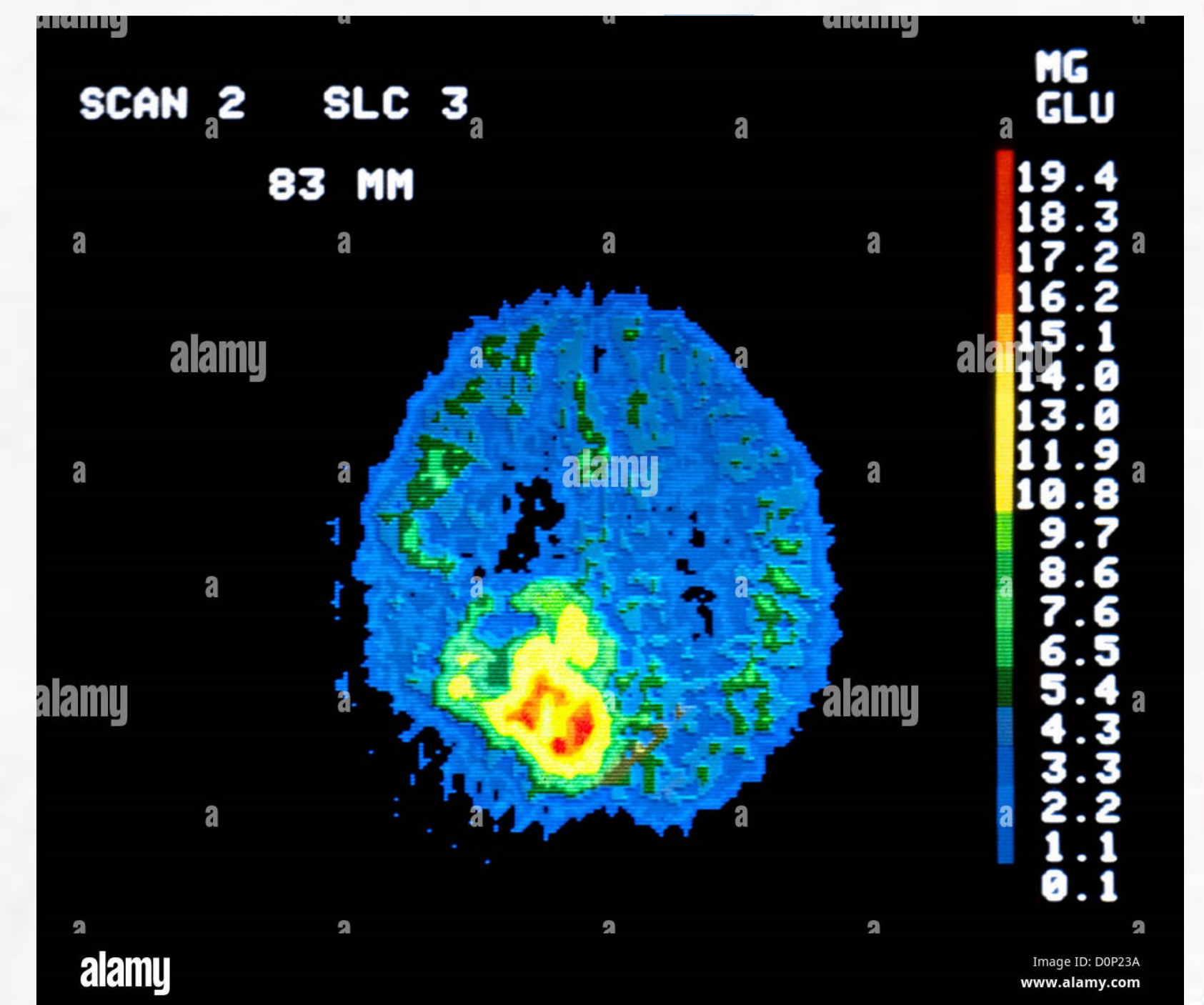
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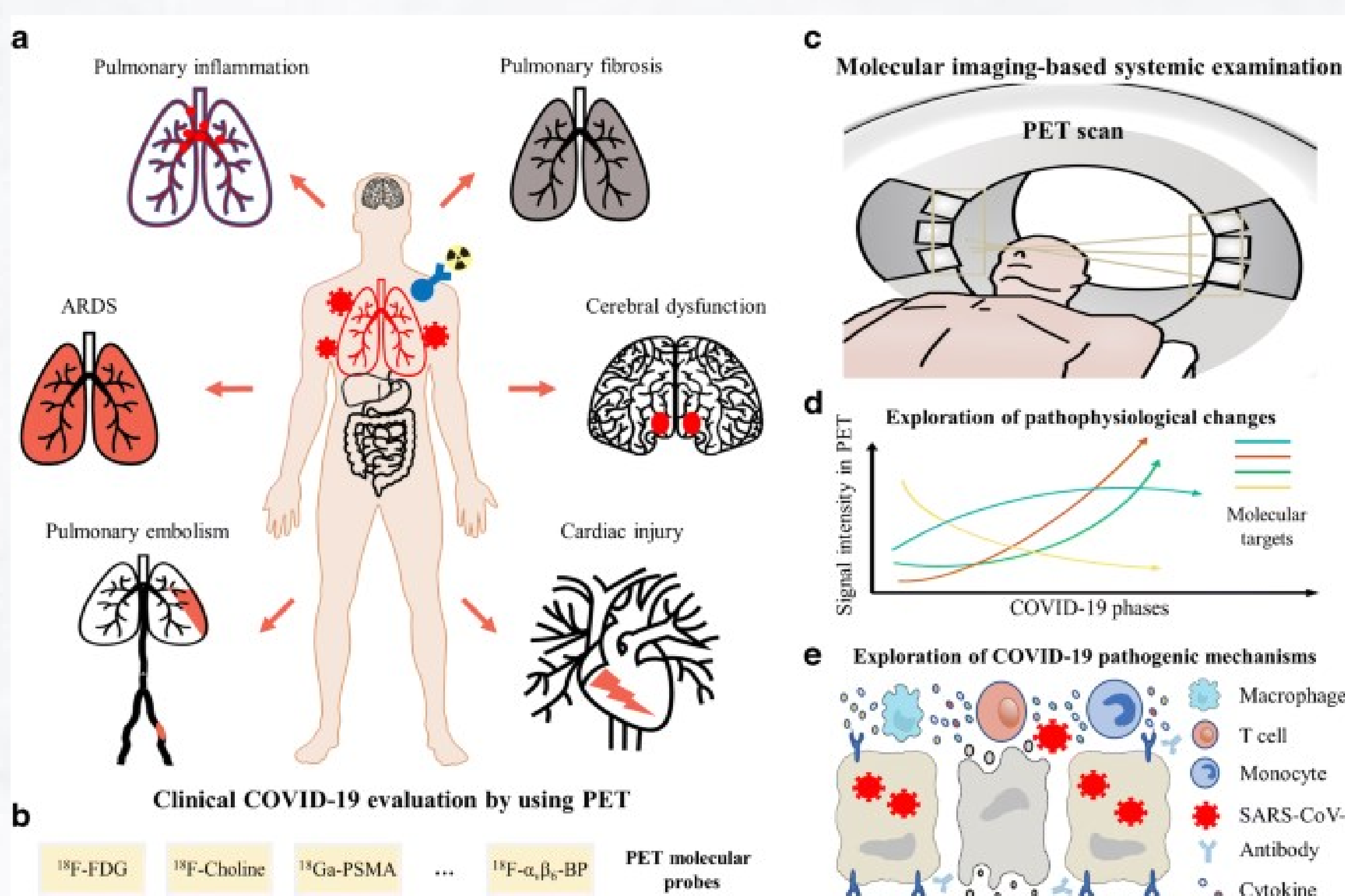
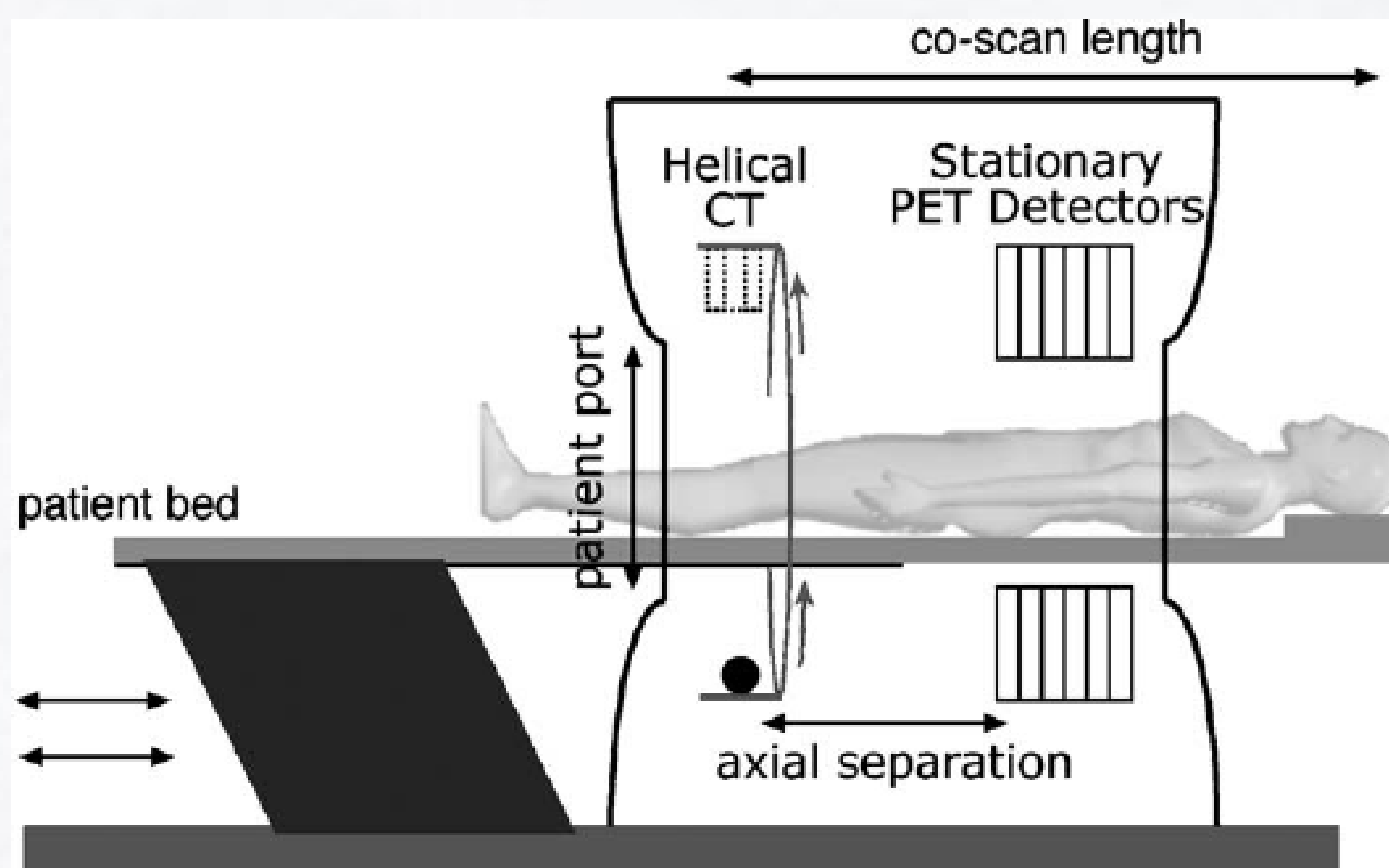
### INTRODUCTION :

Positron emission tomography (PET) is a type of nuclear medicine procedure that measures metabolic activity of the cells of body tissues. PET is actually a combination of nuclear medicine and biochemical analysis. Used mostly in patients with brain or heart conditions and cancer, PET helps to visualize the biochemical changes taking place in the body, such as the metabolism (the process by which cells change food into energy after food is digested and absorbed into the blood) of the heart muscle.



### Operation:

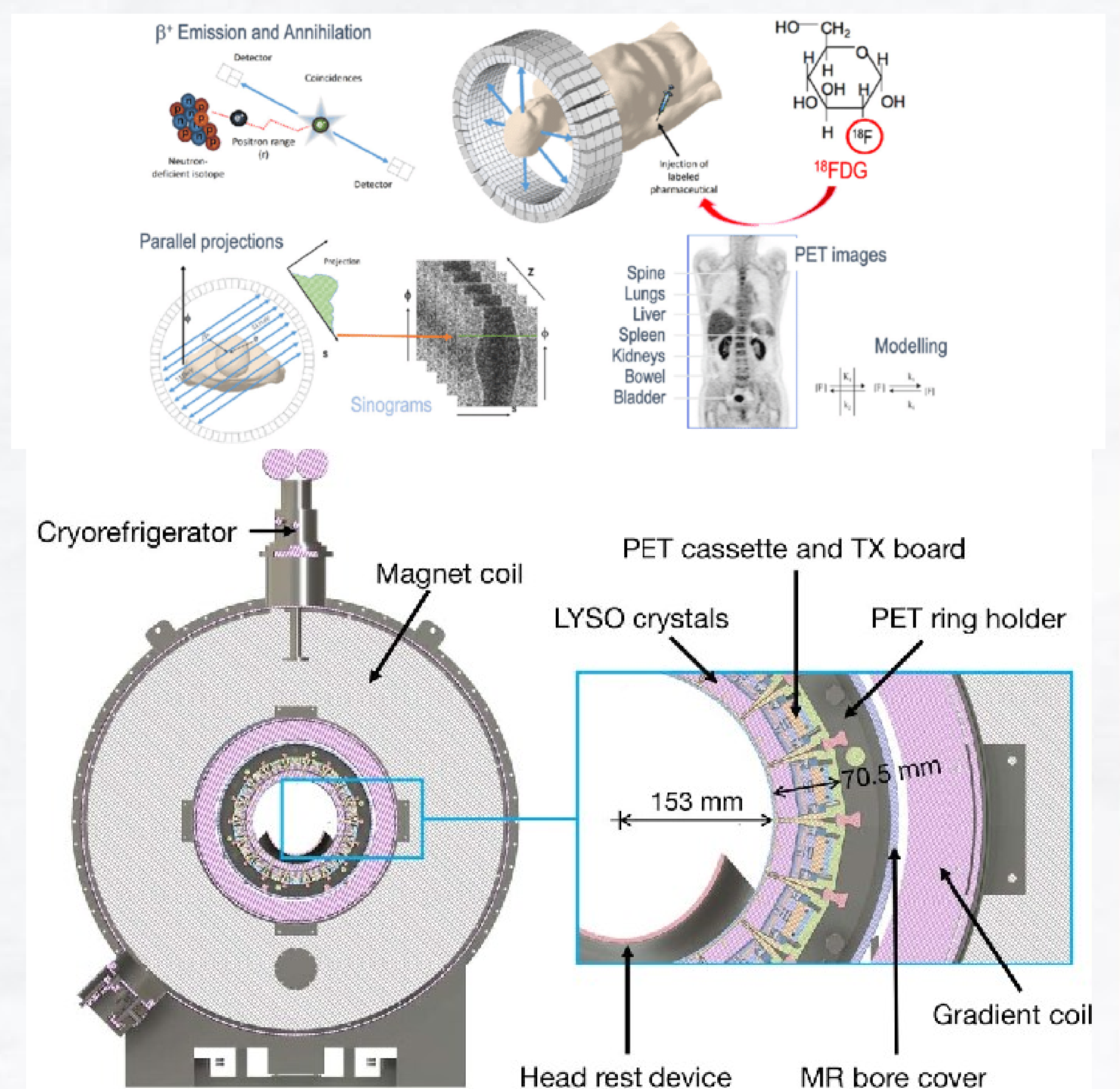
PET works by using a scanning device (a machine with a large hole at its center) to detect photons (subatomic particles) emitted by a radionuclide in the organ or tissue being examined.



### Uses :

In general, PET scans may be used to evaluate organs and/or tissues for the presence of disease or other conditions. PET may also be used to evaluate the function of organs, such as the heart or brain. The most common use of PET is in the detection of cancer and the evaluation of cancer treatment.

The radionuclides used in PET scans are made by attaching a radioactive atom to chemical substances that are used naturally by the particular organ or tissue during its metabolic process. For example, in PET scans of the brain, a radioactive atom is applied to glucose (blood sugar) to create a radionuclide called fluorodeoxyglucose (FDG), because the brain uses glucose for its metabolism. FDG is widely used in PET scanning.



### Components:

A PET system has three major components: - a particle accelerator with targets for production of the positron-emitting isotopes; - chemistry modules for synthesis and labelling of the desired tracers; - and a PET camera for in-vivo measurements of the distribution of the tracer in the body.