1.A radioactive tracer is a chemical compound in which one or more atoms have been replaced by a radioisotope. Monitoring its radioactive decay, a radiotracer can be used to explore the mechanism of chemical reactions . They are also used for flow visualisation through different technologies, such as Single Photon Emission Computed Tomography (SPECT), Positon Emission Tomography (PET) and Computed Radioactive Particle Tracking (CARPT)

2. Positron emission tomography (PET) and PET/ computed tomography (CT) are emerging as important imaging techniques and their popularity is growing within the medical fraternity. Though PET has been a useful research tool for many decades its real growth into clinical applications has occurred in the last one decade or so. Currently its major use is in oncologic imaging. However it has a multitude of clinical applications in cardiology, neurology and psychiatry as well. In oncologic imaging, a major advantage of PET is that a single whole-body examination can provide accurate assessment of disease activity and spread. PET/CT amalgamates the functional information of PET with the structural details of the CT scan, thus greatly aiding in accurate staging, therapy response assessment and early detection of recurrent disease.

The basis of PET imaging is the detection of altered metabolism in biological tissues. By using tracers that target physiological parameters such as glucose metabolism, PET enables imaging and quantification of cellular function. In cancerous cells metabolic changes occur much before the cells undergo changes like dysplasia, metaplasia or anaplasia. This is finally followed by structural changes at a later stage. PET scan detects the disease at the metabolic level while anatomical imaging techniques like CT or MRI detect the disease at the structural level.