

Nuclear Medicine

Definition

Nuclear medicine is highly specialized on detection and diagnosis of functional disturbances, the morphology is mostly secondary.

Principle

Radioactive isotopes introduced into an organism are distinguishable by their radiation from the atoms already present. This permits the relatively simple acquisition of information about the dynamics of processes of uptake, incorporation, exchange, secretion, etc.

Main advantages of NM

The tracer method is extremely sensitive. In principle even the presence of only one atom can be detected. The high sensitivity allows the study of various processes with amounts of substances so small that they have no influence on the life processes.

“In vivo methods”

Labeled molecules and compounds, which behave virtually identically to the unlabelled ones in the various chemical, biochemical and biological processes radioactive isotopes form compounds in the same way like as the stable isotopes.

Isotopes disclose their presence by their radiation, and thus their movement and fate can be traced. For these purposes are used radionuclides that emit electromagnetic waves (γ rays) but don't emit any particle (α, β or neutron).

Radiopharmaceuticals

The most widely used radioisotope is Tc, with a half-life of six hours.

Activity in the organ can then be studied either as a two dimensional picture or, with a special technique called tomography, as a three dimensional picture (SPECT, PET)

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Related articles

- Positron Emission Tomography (PET)

Sources

References