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RADIOPHARMACEUTICALS IN DIAGNOSTIC AND THERAPEUTIC NUCLEAR MEDICINE

The aim of this lecture is presentation of the basic principles of production and application of radiopharmaceuticals. Radiopharmaceuticals are radioactive labelled substances containing one or more radionuclide(s) suitable for administration to humans and apply either for diagnostic or internal radiation for therapy in nuclear medicine. The radioactive drug will accumulate in target areas in the body. A Single Photon Emission Computed Tomography (SPECT) camera or Positron Emission Tomography (PET) camera are used for detection and image distribution of the radioactivity in the body of the patient.
The lecture will cover following topics: (1) production routes of the main radionuclides produced by cyclotron (fluor-18, carbon-11, iodine-12, iodine-124, copper-64, generators 68Ge/ 68Ga and 82Sr/ 82Rb) and nuclear reactor (iodine-131, 99Mo/ 99mTc); (2) principles of production and quality control of the radiopharmaceuticals and (3) the samples of currently applying radiopharmaceuticals for PET, SPECT and radiotherapy.

Primary author: TRTIC-PETROVIC, Tatjana (Laboratory of Physics, Institute of Nuclear Sciences „Vinča“, University of Belgrade, Belgrade, Serbia)

Presenter: TRTIC-PETROVIC, Tatjana