

# **The Role of Radionuclides and Radiotracers in Modern Nuclear Medicine**

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The present work addresses the fundamental aspects of nuclear medicine — specifically the application of radionuclides and radiotracers in modern medical imaging systems. The paper reviews the historical evolution of radiology, from the discovery of X-rays and natural radioactivity to today's high-tech advancements. Medical imaging methods such as PET and SPECT are analyzed in detail, including their comparison with traditional approaches and the critical role of radiotracers in functional diagnostics.

A significant portion of the work is dedicated to the production methods of radionuclides, their physicochemical properties, and qualitative assessment criteria, such as specific activity, radiochemical purity, and biological compatibility.