

# Radioisotope Production and Radiation Technology

## Objective

*To support Member States in strengthening their capability to produce radioisotopes and radiopharmaceuticals. To support Member States in applications of radiotracers and radiation technology for industrial use, environmental remediation, preservation of cultural heritage artefacts and production of novel high performance, environmentally friendly materials for diverse purposes.*

## New Coordinated Research Project on Production and Quality Control of Actinium-225 Radiopharmaceuticals to Support Local Production in Member States

The main limitation for the wide application of targeted alpha therapy is the availability of suitable radionuclides, as well as approved guidelines and protocols for the production and quality control of these radiopharmaceuticals. In light of advances in the preparation and clinical application of alpha-emitter radiopharmaceuticals, especially actinium-225, a new coordinated research project has been initiated to assist with building capacities for the development, production and quality control of this new generation of therapeutic radiopharmaceuticals focusing on actinium-225 radiopharmaceuticals (peptides, immunoconjugates, small molecules, etc.), addressing quality control, preclinical studies and health regulatory issues — all aspects prior to clinical applications (Fig. 12).

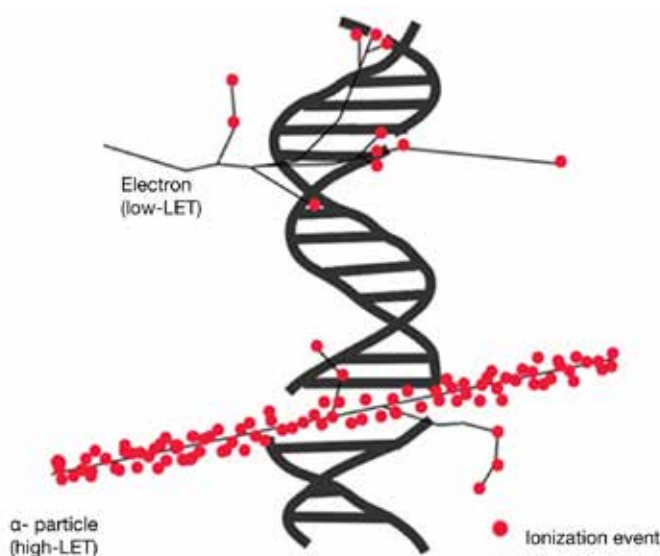


FIG. 12. Comparison of alpha and beta particle effect on target DNA. (Photograph courtesy of the United States Department of Energy.)

## Training and Capacity Building for Member States in Applications of Radiation Technologies

The Agency conducted three training programmes jointly with the Korea International Cooperation Agency, the Korea Atomic Energy Research Institute and the World Council on Isotopes in radioisotope production, radiopharmaceuticals and radiation technology. All three programmes were conducted virtually and benefited participating Member States by advancing technical knowledge and provided networking opportunities with professional peers. These programmes included an e-learning course on diagnostic and therapeutic radioisotopes and radiopharmaceuticals application with 27 Member States; a course on radiation technology and processing with electron accelerators given to senior managers, covering principles and applications of electron accelerators, polymer processing, wastewater or contaminated-air treatment, and sterilization; and a workshop on the establishment of long term management plans by strengthening capacity for diagnostic and therapeutic radioisotopes and radiopharmaceutical applications for ten countries with the aim of strengthening their capacities in establishing long term management plans and guidelines in the field of radioisotopes and radiopharmaceuticals.

The Agency held a School on Radiation Technologies with the World Nuclear University. The course covered various areas of radiation technologies, including medical, industrial and scientific uses of radioactive sources and radiation producing facilities. The School cohort comprised 33 fellows from 18 countries with a wide range of professional experiences, including individuals from regulators, research, academia and industry. The training consisted of lectures, virtual tours and breakout sessions on leadership challenges, public communication challenges and final project preparation.

A School on Non-power Nuclear Applications held jointly with the Rosatom Technical Academy was attended by 21 fellows from 11 countries with a wide range of professional experience and backgrounds. The training included lectures and discussions which covered various areas of radiation technologies, including medical, industrial and scientific uses of radioactive sources, and radiation producing facilities.