



Nuclear technologies for a healthier world?

R&I DAYS, on-line event, Horizon Europe Hub, 23/9/2020 at 10.30

RATIONALE

The first discovery of radiation by Wilhelm Roentgen, Nobel prize in 1901, Marie and Pierre Curie in 1903 and Marie alone in 1911 was taken up for medical imaging or therapy. The number of licensed radiation devices used today in medical applications is immensely larger than licenses for any other application. Trained radiation professionals in the medical sector form the crowd of knowledge source in this field. Patients receiving radiation doses for medical purpose also represent the most valuable source of data on the root cause of the radiation risk. Knowing the cause is essential for informing energy policy and the role of nuclear in this policy.

Commission President von der Leyen committed in the ‘Political Guidelines’ to a European plan to fight cancer, to support Member States in improving cancer control and care, and for Europe to take the lead in the fight against cancer. The overall objective of the EU beating cancer plan is to improve the prevention, detection, treatment and management of cancer in the EU while reducing health inequalities between and within Member States.

The development of the EU Cancer Plan will be closely linked to the Mission on Cancer of Horizon Europe, which will maximise the impact of EU support to research and innovation, providing evidence-based knowledge to target specific action from cancer prevention, early diagnosis, treatment and care, to the quality of life of patients and social integration.

In this context, medical applications of ionizing radiation call for good integration of different policies, on public health, research and radiation protection. Fostering synergy of Euratom and Health research would place both programmes in the driving seat for research on promising ionizing radiation-based cancer therapy treatments and radiation health effects. This is in line with the 2019 Council conclusions and the Commission SAMIRA initiative (Strategic agenda for medical, industrial and research applications of nuclear and radiation technology), a Commission initiative launched in 2018 by DG ENER, RTD, JRC, SANTE and GROW and supported recently by the Council conclusions.

Patrick Child, Deputy Director-General of DG Research and Innovation will highlight these points in the introduction of the session.

Nuclear medicine fast innovation in the past decades delivered new diagnostic instruments, new molecular imaging applications and the possibility to treat patients with targeted therapies. Images using radiation techniques have become so precise that the tiniest piece of tumour can be localised and treated in the human body. Thus, the role of radiation imaging in cancer fight is essential. Moreover, radiation kills cancerous cells faster than normal cells making radiation a cure of choice to fight cancer. The technique continues to evolve combining imaging and therapy in a single procedure called theranostics giving hope to fight the most irreducible form of cancer. Theranostics is also suitable for personalised medicine, which takes into account the combined biodiversity of cancer type and patient predisposition to fight each of the type. Radiation in medicine calls for a multidisciplinary approach. The transposition to Man of knowledge acquired on other species requires validation in clinical trials. Data from clinical trials are the most reliable source of information to update the radiological protection standards. Euramed, the European association of radiation research in medicine is playing a key role in streamlining a dialogue between the various disciplines and making sure Europe is speaking one voice on the sensitive issue of radiation and health.

Christoph Hoeschen, Chair of Medical Systems Technology at Institut für Medizintechnik from German Otto Von Guericke Universität Magdeburg, will highlight the progresses in this field (by a 7 minutes speech).

The current radiation protection standard is based on the increased risk of death from cancer. Other diseases are not sufficiently documented to update the standard. Radiation protection research continues to look into detail of evidence to ensure the best protection. Cancer treatment using radiation induces secondary primary cancer in surrounding healthy tissues in the long term after the cure. The follow up of treated patients and the establishment of epidemiological studies combined with biological studies is therefore essential to advance knowledge on benefits and limitations of radiation in medicine. Better understanding of the health risks from exposure to low doses of ionizing radiation, including the individual sensitivity to radiation exposure can lead to optimized health protection.

Elisabeth Cardis, Research Professor in Radiation Epidemiology at Spanish ISGlobal, will highlight the progresses in this field (by a 7 minutes speech).

Research and training are the mandate of the Euratom Treaty. Indeed, theory is essential for acquiring knowledge and competence in radiation usage but skills and competence in this domain require to work with radiation in practice. Due their stringently controlled use, radiation infrastructures offering the entire spectrum of practical learning from unsealed sources of radiation to sealed sources and the variety of particle accelerators become less and less accessible. Europe has a key role to play in ensuring cross border access to skills and competences and research infrastructures going with them. Healthcare applications represent important opportunities for Europe not only in terms of improved health for European citizens, but also of highly skilled value-added jobs.

Hildegarde Vandenbove, Institute Director Environment Health and Safety of SCK CEN will highlight the progresses in this field (by a 7 minutes speech).

Questions and answers will follow each presentation.

The potential opportunities of synergies between Medicine and Nuclear in view of the next Horizon Europe framework programme will be highlighted by 3 minutes concluding remarks from each of the following Commission speakers:

Irene Norstedt, Acting Director for the Health Programme in DG RTD;

Said Abousahl, Head of Unit JRC A7;

Michael Huebel, Head of Unit, DG ENER D3;

Elena Righi-Steele, Head of Unit for Euratom research.