JRC study on alpha therapy to treat digestive tumours wins international award

A picture is worth a thousand words. This is the reason why the image below has been awarded the title of "image of the year" by the Society of Nuclear Medicine (SNM). It comes from a study led by the Joint Research Centre’s (JRC) Institute for Transuranium Elements (ITU) and conducted in collaboration with University Hospital Heidelberg. It illustrates the effectiveness of the use of a tumour specific carrier molecule (DOTATOC, able to recognise gastroenteropancreatic neuroendocrine tumours - GEP-NETs - cells) coupled with an alpha emitting particle (Bi-213) to treat this kind of multi-resistant tumour, showing the remarkable results that can be achieved. According to the scientific committee awarding this prize at the 2012 SNM Annual Meeting (June 9-13): "it opens a new door for those patients whose cancer does not respond to traditional chemotherapy".

These images show that the carrier molecule coupled with alpha particle (Bi-213-DOTATOC) led to shrinkage of primary tumours as well as liver and bone metastases (right image).

In this specific case, the study performed at clinical level proves that the use of the carrier molecule coupled with an alpha emitting particle (Bi-213-DOTATOC) provided efficient treatment of gastroenteropancreatic neuroendocrine tumours (GEP-NETs). These are rare, slow growing tumours that develop in the digestive system and are distributed throughout the body and which frequently develop resistance to common beta therapy. Patients tolerated the increasing doses well, and there was no acute kidney, endocrine or hematologic toxicity.
This Joint Research Centre (JRC) study was conducted in the framework of the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities.

Targeted Alpha Therapy (also called Alpha-Immunotherapy) is considered a new approach to cancer treatment. It is based on the coupling of alpha particle emitting radioisotopes to tumour selective carrier molecules, such as monoclonal antibodies or peptides. These molecules have the ability to selectively target tumour cells even if they are spread throughout the body.

Radionuclides that emit alpha particles seem particularly promising for targeted therapy, since alpha particles are highly energetic and have a very short range in human tissue, corresponding to only a few cell diameters, much less than the commonly used beta radioisotopes. Consequently, targeted alpha therapy allows the specific targeting and killing of individual malignant cells, while minimising the toxicity to surrounding healthy tissue.

The JRC-Institute for Transuranium Elements, located in Karlsruhe (Germany), is specialised in synthesis and in vitro testing of novel radio conjugates, as well as preclinical research and clinical trials with partner hospitals.

**SNM's "image of the year" award**

International researchers selected this image among more than 2 000 studies presented at the Society of Nuclear Medicine's (SNM) 2012 Annual Meeting in Miami Beach, USA, held between 9-13 June.

Each year, SNM chooses an image that exemplifies the most cutting-edge nuclear medicine or molecular imaging research today and that demonstrates the ability of molecular imaging to detect and diagnose disease and help select the most appropriate therapy.

SNM is an international scientific and medical organisation dedicated to raising public awareness about what molecular imaging is and how it can help provide patients with the best health care possible. SNM members specialise in molecular imaging, a vital element of today's medical practice that adds an additional dimension to diagnosis, changing the way common and devastating diseases are understood and treated.

SNM’s more than 17 000 members set the standard for molecular imaging and nuclear medicine practice by creating guidelines, sharing information through journals and meetings while leading advocacy on key issues that affect molecular imaging and therapy research and practice. For more information, visit [www.snm.org](http://www.snm.org).

**JRC's Institute for Transuranium Elements (ITU)**

The Institute for Transuranium elements (ITU) is part of the European Commission's in-house science service, the Joint Research Centre. Its mission is to provide the scientific foundation for the protection of the European citizen against risks associated with the handling and storage of highly radioactive material. ITU’s prime objectives are to serve as a reference centre for basic actinide research, to contribute to an effective safety and safeguards system for the nuclear fuel cycle, and to study technological and medical applications of radionuclides/actinides. For more information, visit [http://itu.jrc.ec.europa.eu](http://itu.jrc.ec.europa.eu)
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