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## **Radiometal-Theranostics: The first 20 years.**

*Sunday, 15 May 2022 18:45 (30 minutes)*

This HEVESY AWARD MEDAL lecture describes the dawn of radiometal-theranostics.

In the 1990ies, a team of researches at the Research Center Juelich, Germany, realized the need to quantify the radiation dosimetry of  $^{90}\text{Y}$ -labelled therapeutic compounds. They identified the positron emitter  $^{86}\text{Y}$  as an appropriate isotope to quantify uptake kinetics of the radio- $^{90}\text{Y}$ -labelled pharmaceuticals by means of PET. Those data were turned into radiation doses of individual compounds in healthy organs and in tumors.  $^{86}/^{90}\text{Y}$ -EDTMP and  $^{86}/^{90}\text{Y}$ -Citrate served as proof-of-principle theranostics. With the approach established, the  $^{86}/^{90}\text{Y}$ -DOTA-TOC was investigated first in baboons, later in healthy volunteers and finally in patient. This paved the way to the clinical application of  $^{90}\text{Y}$ -DOTA-TOC as a valuable treatment of neuroendocrine tumors. It already practiced the methodology of radiotheranostics in a period of time, when this wording did not yet exist.

The same time it demonstrated the importance and fruitful interdisciplinary research and development between radio and nuclear chemists, radiopharmacists, medicinal physicists and nuclear medicine doctors.

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