PAUL SCHERRER INSTITUT

PSI

RADIONUCLIDE DEVELOPMENT

CRS

CENTER FOR RADIOPHARMACEUTICAL SCIENCES

ETH PSI USZ

WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN

h e d s

Haute école de santé
Genève

h e p i a

Haute école du paysage, d'ingénierie
et d'architecture de Genève

ISOLDE

Hes·so GENÈVE

Haute Ecole Spécialisée
de Suisse occidentale

UNIVERSITÉ DE GENÈVE

Nicholas P. van der Meulen:: Proposed CH Representative

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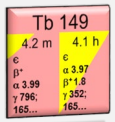
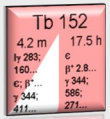
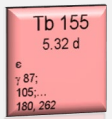
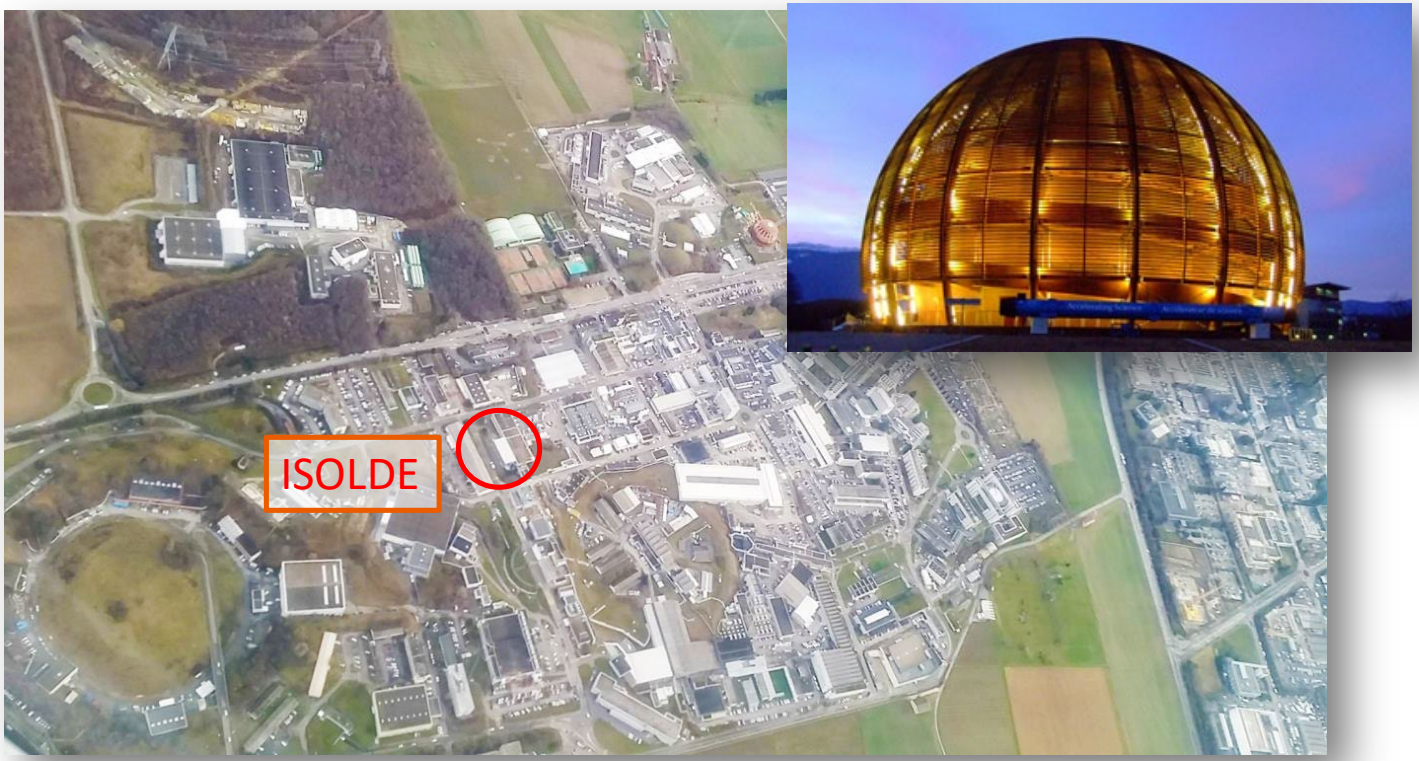
Matched Pairs Towards Theragnostics

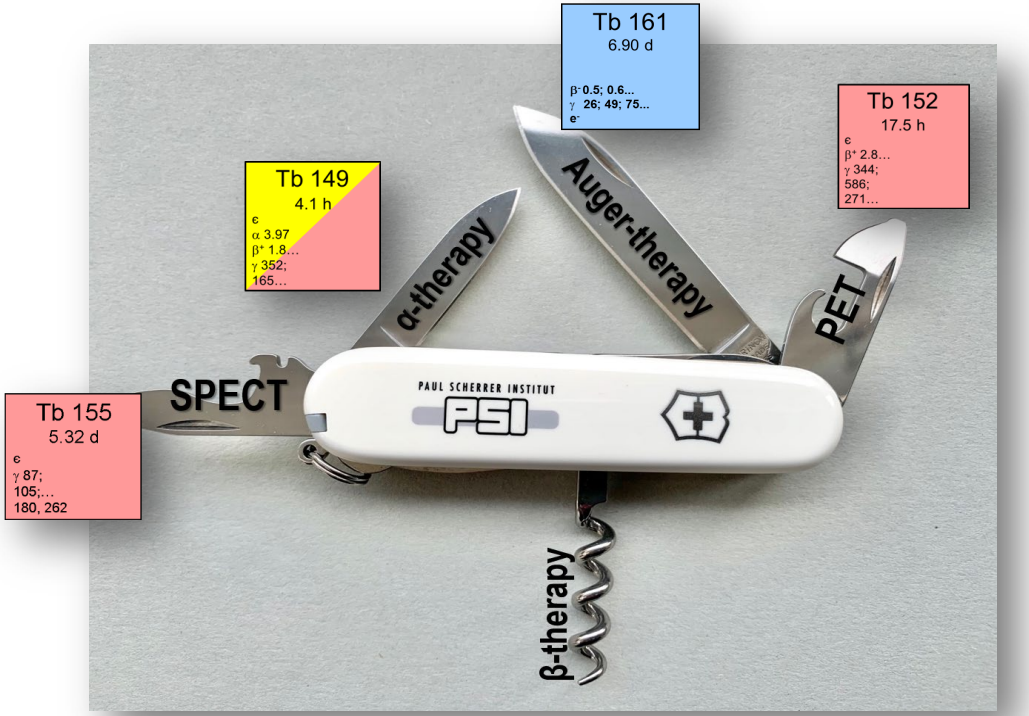
α-Therapy	Auger-e⁻ Therapy	β-Therapy	PET (β⁺)	SPECT (γ)
				

Collaboration with ISOLDE



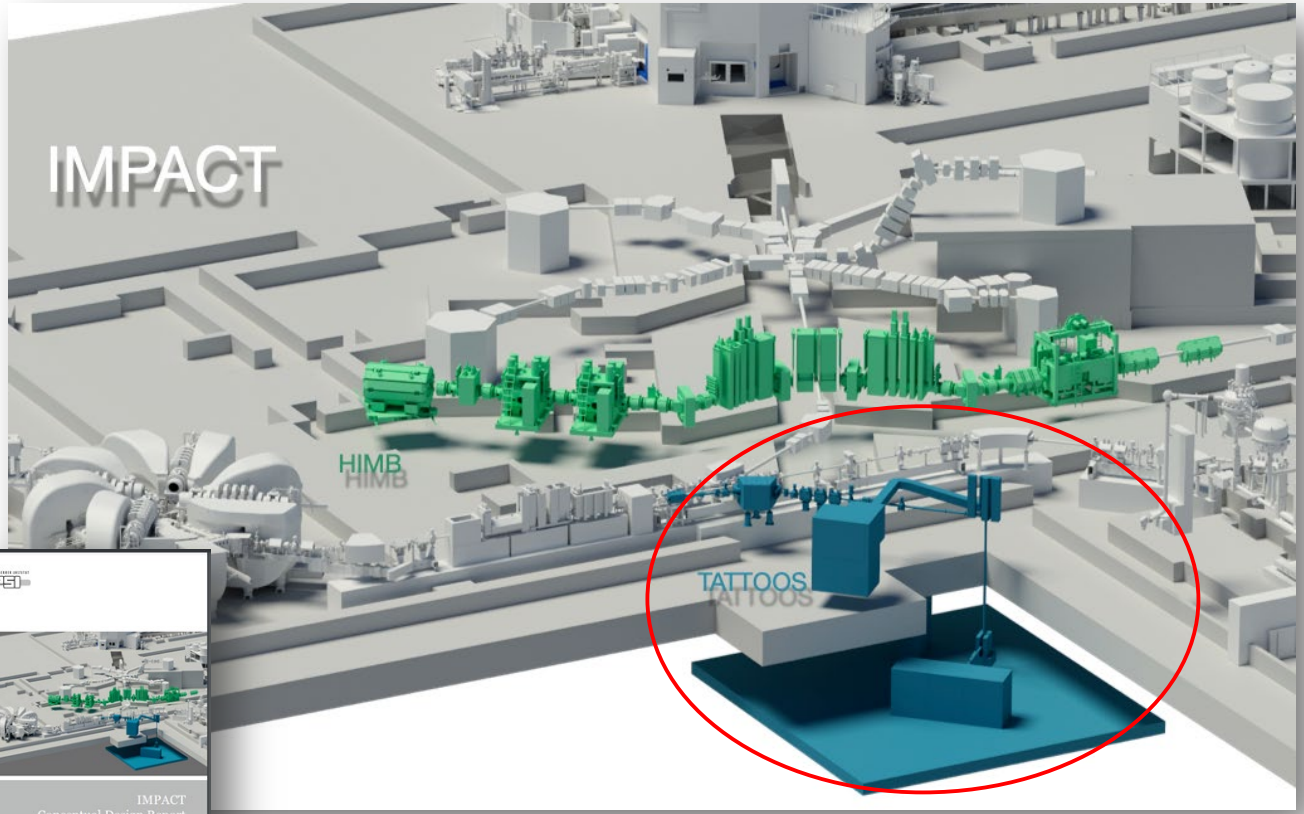
RADIONUCLIDE DEVELOPMENT

The Terbium “Sisters”



Not possible without ISOLDE collaboration!

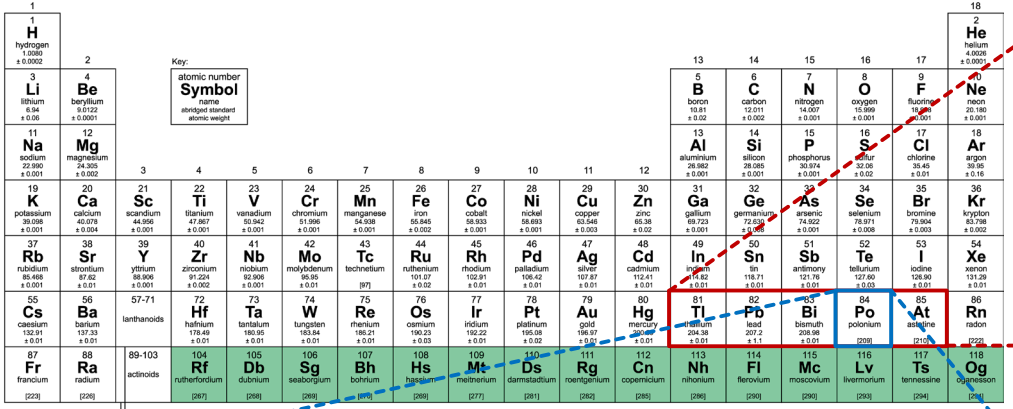
Isotope and Muon Production using Advanced Cyclotron and target Technologies



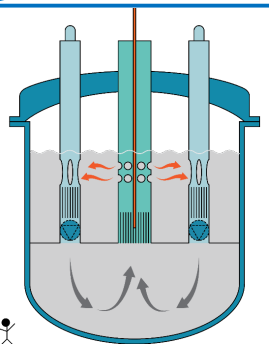
https://www.psi.ch/en/impact

CDR: https://www.dora.lib4ri.ch/psi/islandora/object/psi:41209

Fundamental radiochemical studies at ISOLDE



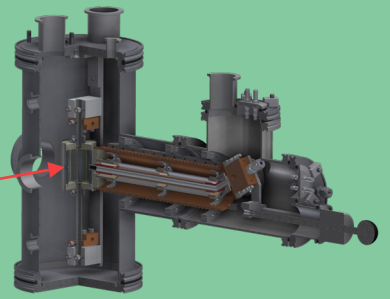
INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY



Volatility studies with Po for the **MYRRHA** project (Gen IV nuclear power plants) for the proposition of adequate **security measures**.

Fr 210 → Rn 210 → Po 206

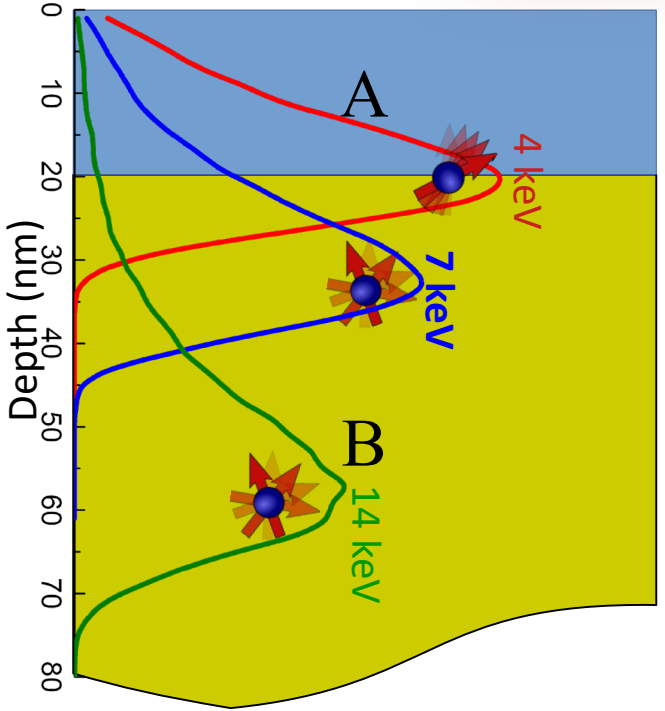
SCK•CEN
STUDIECENTRUM VOOR KERNENERGIE
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE



Isothermal **vacuum chromatography** will allow us to address the chemical properties of **superheavy elements** beyond flerovium (Fl, Z =114). ISOLDE offers optimum conditions for **homolog studies**.

Ions as Spin Probes in Thin-Film Heterostructures

- Use radioactive ions as implanted spin probes to study magnetic and electronic properties of materials.
- The ions may be spin polarized using optical pumping schemes, then used for beta-detected nuclear magnetic resonance.
- By implanting the ions at variable energies between 1-30 keV, depth-resolved measurements in the range of 1-200 nm can be performed.
- Most experiments probe either the surface or the bulk. Such implanted probe cover a range of depths that cannot be easily probed.



Xe Radioisotopes for Medical Imaging

- Collection of $^{129m;131m;133m}$Xe for the gamma-MRI project;
- using spin-polarized (hyperpolarized) mXe, MRI signals observed as changes in asymmetry of gamma-decay from externally-polarised long-lived Xe isomers;
- optimise and evaluate different ways of producing and extracting mXe, including collections at ISOLDE.

ISOLDE collections:

- In 2018: production/polarisation;
- In 2019: polarisation (chemical lab);
- From 2021 (EU project): production, Xe sample characterization and purification.

Motivation & Future Potential

PSI-TATTOOS and CERN-ISOLDE is seen as an asset in serving Switzerland as a whole:

- synergies for the implementation of TATTOOS;
- for further facility developments;
- for strengthening a common national and international user base;
- foster new research directions not yet pursued in Switzerland, connected to fundamental nuclear and particle physics studies
- it will provide a stable link for other interested Swiss parties.

Various groups have performed various physics- and medically-related projects, where Swiss parties have been involved in many ISOLDE-related publications.

CH will commit to its partnership by investing 60k CHF into the ISOLDE collaboration.