

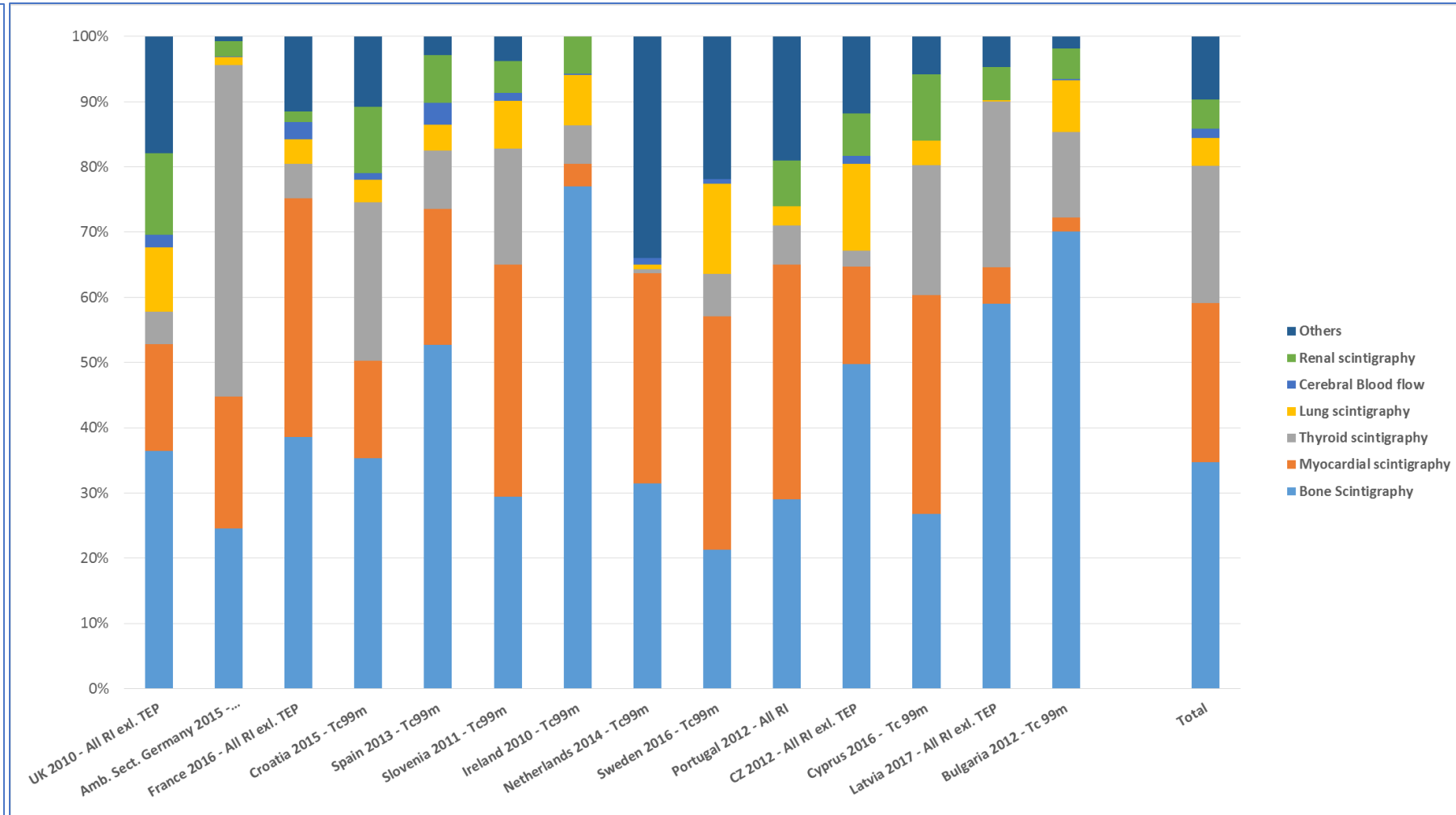
Session 1 – Health :
Ensuring security of supply
of medical radioisotopes in the EU

Introductory remarks

March, 20th, 2018
Brussels

Medical Radioisotopes today

- **IMAGING** : About 7 million Nuclear Medicine procedures performed in EU-28
- Clinical indications are MS-dependent
- $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$: imaging radioisotopes workhorse
- SPECT use seems rather stable over the 5 past years : no evidence of decrease in the next future, besides PET increase
- **THERAPY** : ^{131}I , ^{125}I , ^{90}Y , ^{223}Ra , ... largely used; ^{177}Lu and other isotopes promising (investments ongoing)



Medical Radioisotopes perspectives : a sustained growth?

- Radiotherapeutics open large perspectives (Personalized Medicine, NM theranostics,...)
- If key conditions for development fulfilled...
 - enlarged clinical indications with more imaging compounds (in-house labelling, research centers...)

	Compound	Preclinical	Phase I	Phase II	Phase III	Filing	Approved	Marketed
Neuroendocrine tumors	imaging							
	therapy							
Apoptosis and necrosis	imaging							
	therapy							
Prostate cancer	imaging							
	therapy							
Breast cancer	imaging							
	therapy							
For each indication...	imaging							
	therapy							

- availability of a global (worldwide), mass-producing & reliable, affordable, GMP supply chain for all necessary radiopharmaceuticals
- ... Radioisotopes demand (industry, market, jobs) should grow significantly

What is Molecularly-Targeted Radiation?

Targeting agent

Can be a small molecule or a biologic (antibody)

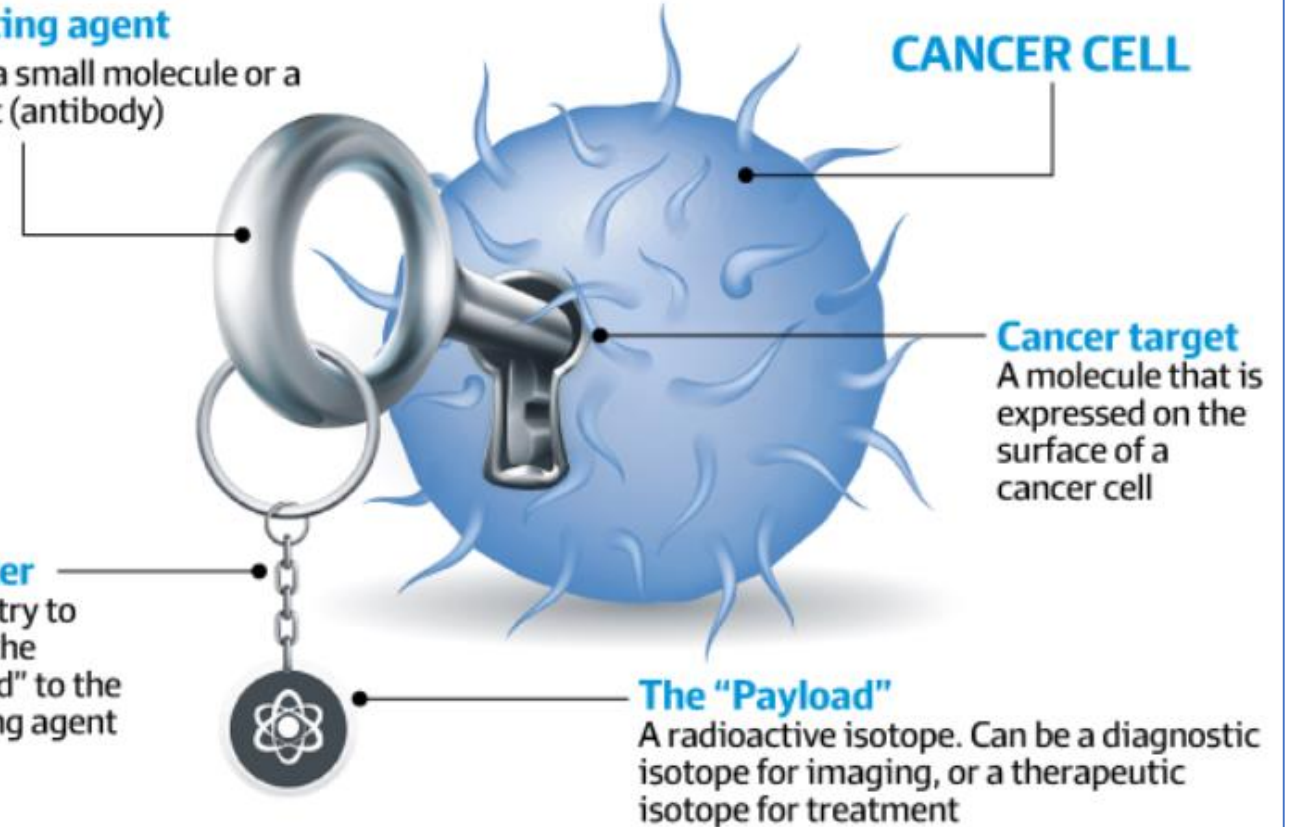
CANCER CELL

A Linker

Chemistry to attach the "payload" to the targeting agent

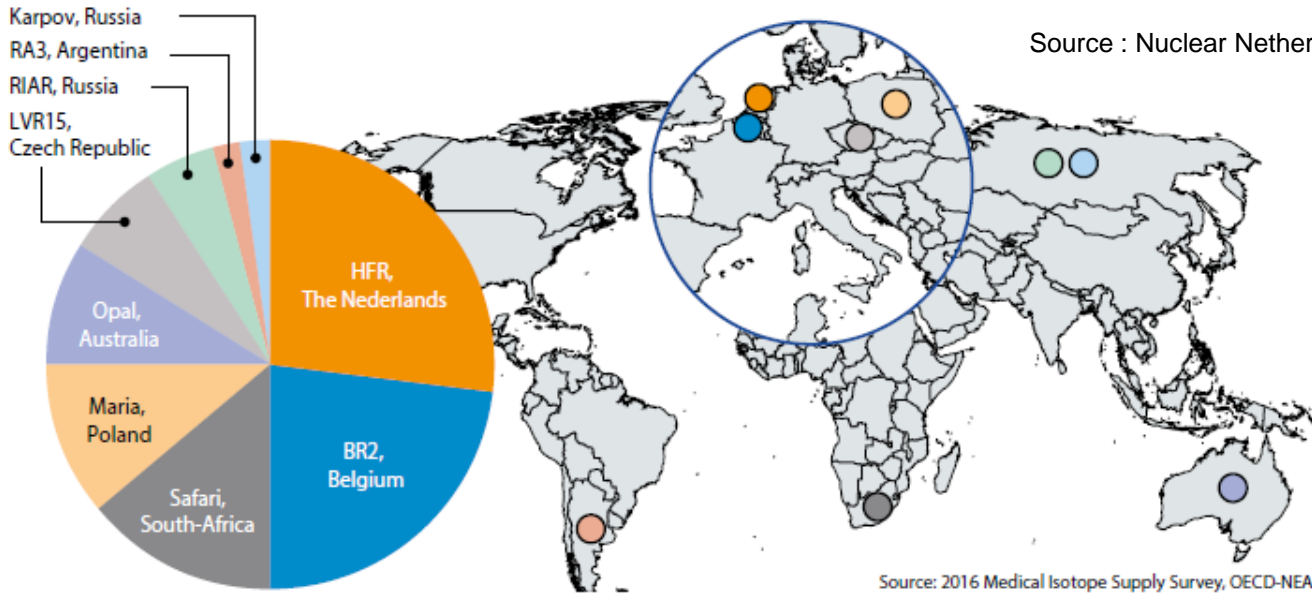
The "Payload"

A radioactive isotope. Can be a diagnostic isotope for imaging, or a therapeutic isotope for treatment



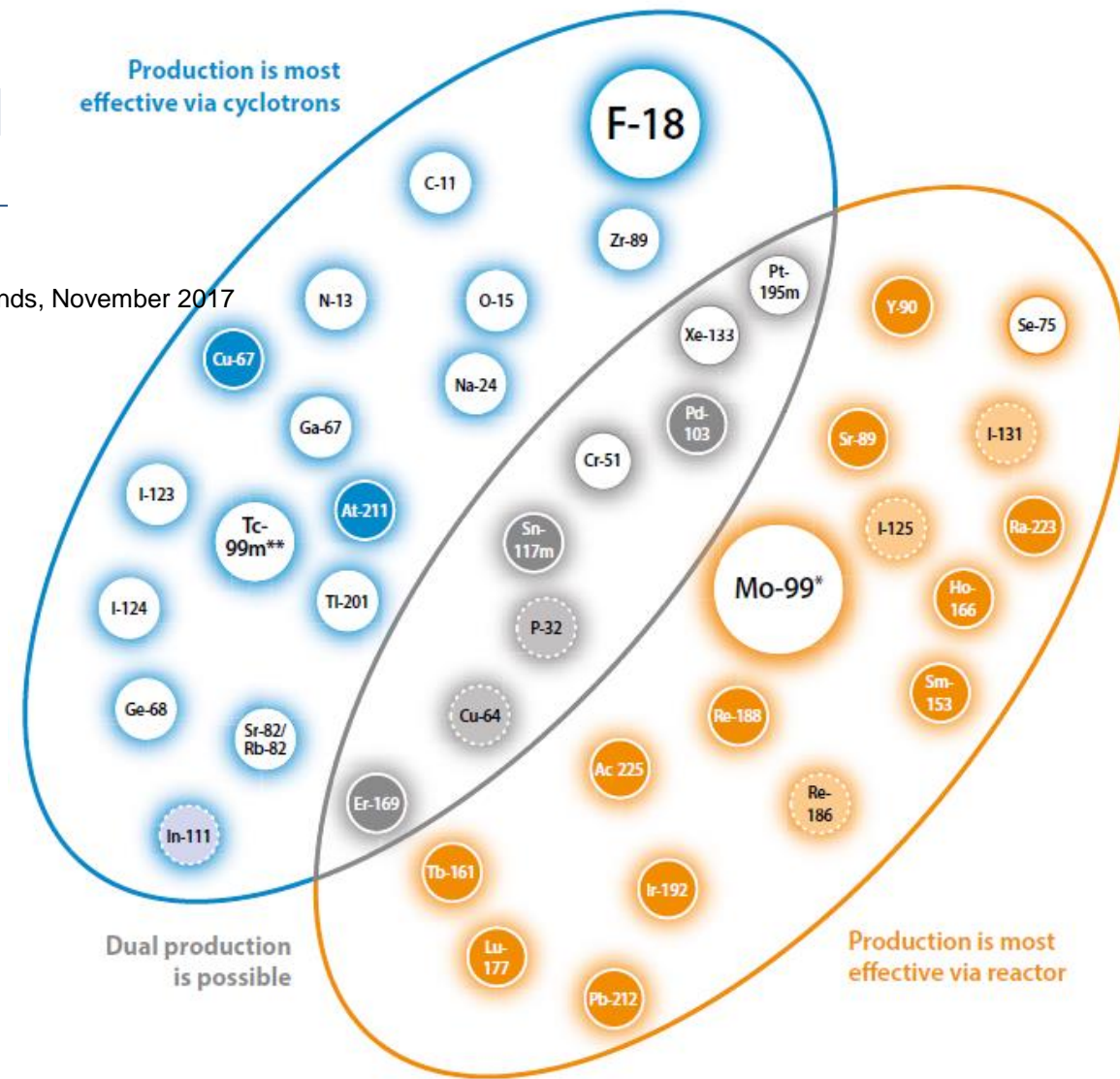
SOURCE: TELIX PHARMACEUTICALS

Supply chain : new capacity and FCR needed



- Notwithstanding PET imaging increase, a majority of radioisotopes used in imaging and therapy are best reactor-produced
- European reactors ensure today 60% of the world demand but are ageing
- If medical radioisotopes supplies deemed strategic for Europe, impediments to investment in new capacity must be addressed; « Project financing » can be envisaged; it would be eased if FCR principle is implemented

Production is most effective via cyclotrons



* Various production routes for Mo-99 are being examined.
 ** The direct production of Tc-99m via accelerators is being examined.

