

ADDRESSING SOCIETAL CHALLENGES THROUGH ADVANCING THE MEDICAL, INDUSTRIAL AND RESEARCH APPLICATIONS OF NUCLEAR AND RADIATION TECHNOLOGY

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OVERVIEW OF CURIUM

Curium is the combination of Mallinckrodt's Nuclear Medicine Business and IBA Molecular/CISBIO



> 100 yrs History	<ul style="list-style-type: none">■ The union of two well-respected names in the industry■ 100% focus on Nuclear Medicine
> 40 Sites	<ul style="list-style-type: none">■ Producing more than 30% of Moly needs worldwide■ Producing more than 120,000 Tc-99m Generators p.a. (+ cold kits, hot products)■ Producing more than 320,000 doses of FDG per year
> 50 Products	<ul style="list-style-type: none">■ Broad product portfolio across SPECT (generators, cold kits, hot products) and PET
14 mil patients p.a.	<ul style="list-style-type: none">■ Serving 6,000 hospitals and Centers of Excellence around the world
> 60 Countries	<ul style="list-style-type: none">■ Main markets are USA, France, Germany, Spain, Italy and Benelux
> 1600 Employees	<ul style="list-style-type: none">■ Engineers, Radiopharmacists, Radiochemists, ...

OUR SPECT MANUFACTURING FOOTPRINT



Maryland Heights, MO
USA

- Expertise in manufacturing reactor and cyclotron based isotopes + cold kits
- State of the art and newest Tc generator line in the US
- 6 cyclotrons able to manufacture Tl-201, Ga-67, Ge-68 and In-111
- Aseptic suite for manufacturing cold kits



Petten
Netherlands

- Captive bulk-Moly processing capacity – one of the largest in the industry
- Capabilities to manufacture reactor and cyclotron based isotopes + cold kits
- 2 cyclotrons currently manufacturing In-111, I-123, Tl-201 and Ga-67
- New state of the art fill-line



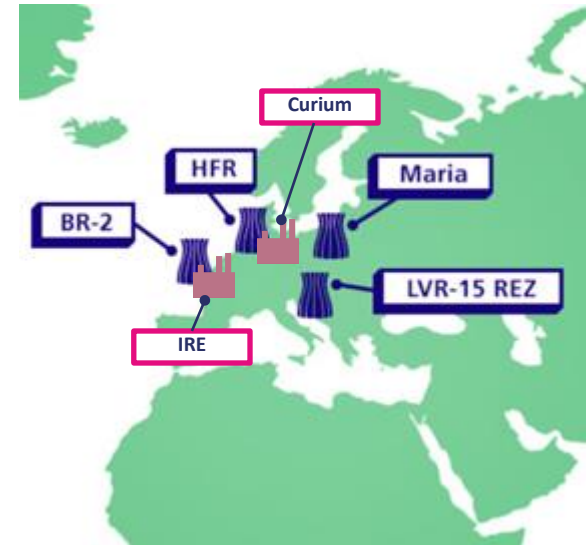
Saclay
France

- Capabilities to manufacture reactor and cyclotron based isotopes + cold kits
- 3 cyclotrons currently manufacturing Ga-67, I-123
- Sterile manufacturing capabilities for cold kits including terminal sterilisation

Complemented by a network of 20 SPECT Radiopharmacies dispensing mono-doses in Europe

HISTORICAL PERSPECTIVE ON MEDICAL RADIONUCLIDES

- The nuclear medicine industry experienced significant shortages of Mo-99 in 2009-2010.
- Since that time the industry has taken significant steps to improve the supply
 - MARIA and LVR-15 reactors were added
 - Significant Mo-99 production capacity has been added
- The industry has adopted the six operating principles of OECD, leading to a more stable supply.



Location of European Medical
Radioisotope Production Reactors
and Mo-99 Producers

THE EC COULD HAVE A MAJOR IMPACT SUPPORTING MEDICAL RADIONUCLIDES

- The Mo-99 producers have faced significant cost increases over the last few years from:
 - The cost of conversion from HEU to LEU, as well as the increased operating costs using LEU to produce Mo-99.
 - The extra cost associated with increasing Outage Reserve Capacity (ORC)
 - Paying for Full Cost Recovery (FCR) from reactor operators
- These changes have increased the cost of Mo-99 production and have forced manufacturers to start increasing Tc-99m generator pricing.
- Reimbursement for nuclear medicine procedures from EC member countries must keep pace with these price increases to protect patient access to one of the most cost efficient imaging modalities.

OTHER WAYS THE EC COULD HAVE A MAJOR IMPACT

- The European Strategy Forum on Research Infrastructure (ESFRI)
 - ESFRI establishes the “strategy-led approach to policy making on research infrastructures in Europe.”
 - ESFRI has previously supported the MYRRHA and Jules Horowitz reactors.
 - ESFRI support for PALLAS would help their efforts to continue Europe's strong role in medical radionuclide production.
- The world recognizes today most of the innovation in nuclear medicine is coming out of Europe. In order to sustain this the EC could:
 - Support research & development in nuclear medicine.
 - Include nuclear curricula in European universities.