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Department of Radioisotopes and Radiation Metrology

RADIOPHARMACEUTICALS R ESEARCH C ENTRE

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Sarajevo School of High Energy &
Medical Physics 2014



RADIOFARMACEUTICALS RESEARCH CENTER



hope through research

RRC - Location

European Union

GOVERNMENT OF ROMANIA

Structural Instruments
2007-2013

Sectoral Operational Programme “Increase of Economic Competitiveness”
“Investments for Your Future!”

IFIN-HH

Extreme Light Infrastructure - Nuclear Physics
(ELI-NP) - Phase I

eli
Nuclear Physics

Project co-financed by the European Regional Development Fund

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Project Simulation



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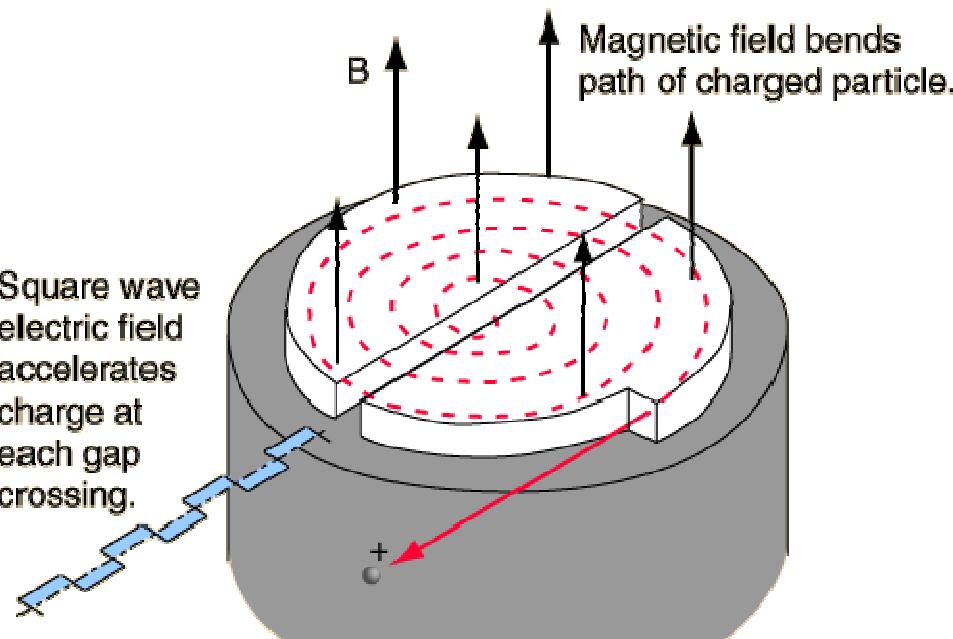
“Red” State

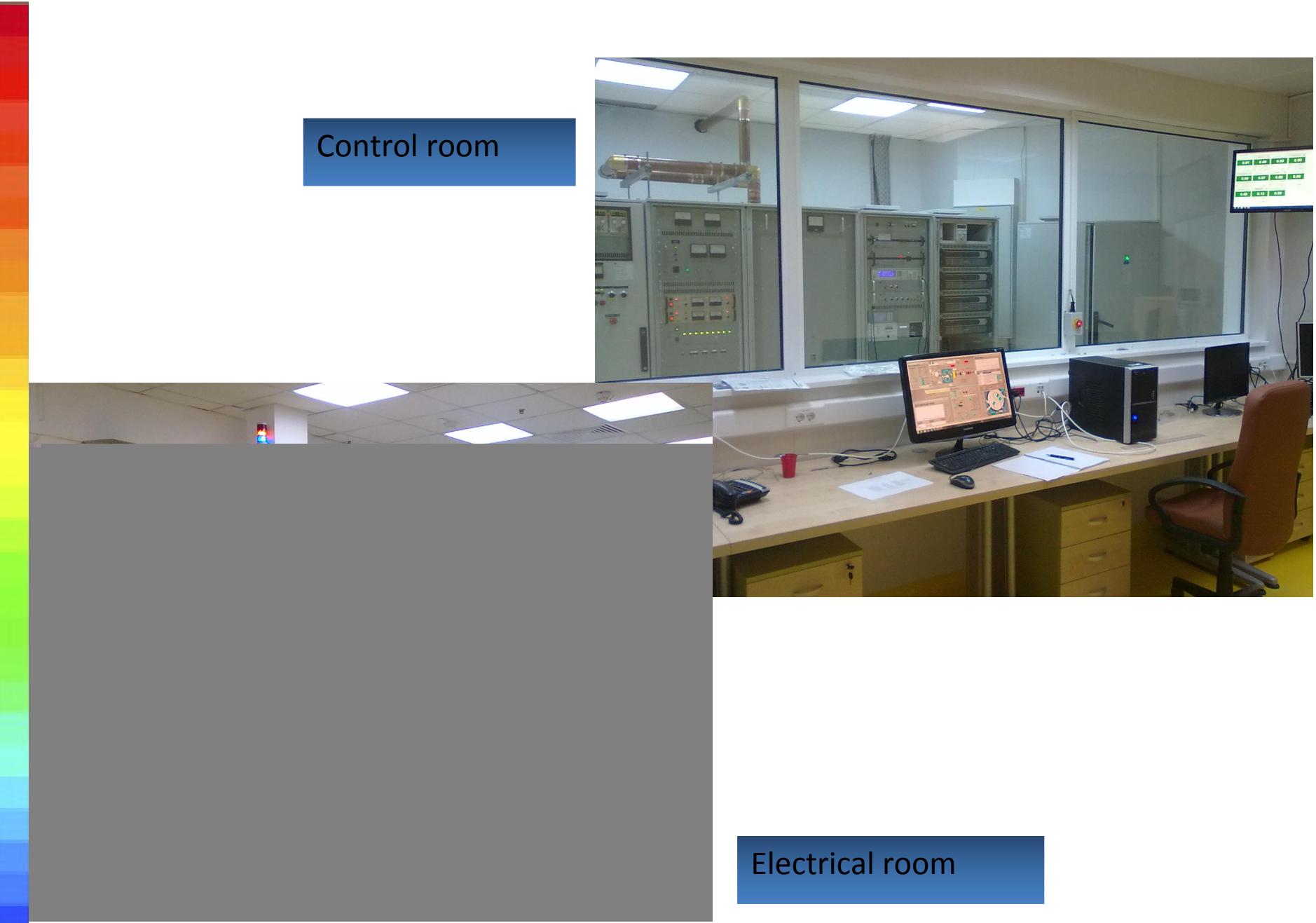


Cyclotron

➤ Principle of operation

- Particle acceleration is achieved using an RF field between “dees” with a constant magnetic field to guide the particles





TR-19 Cyclotron

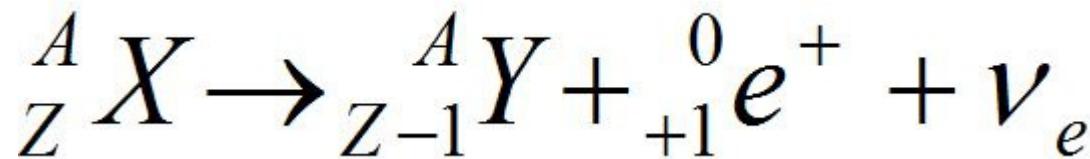
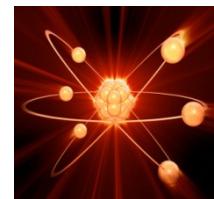


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TR-19 Cyclotron

- Fully automated and computer controlled machine.
- Variable Energy: extraction energy between 14 MeV and 19 MeV.
- External Ion Source (H^-) and Extraction System.
- Automated Target Changer with precise real-time target position alignment.
- Gaseous and liquid targets (solid targets processing system).
- Experimental hall with additional beam lines.

Positron Emitters from Generators



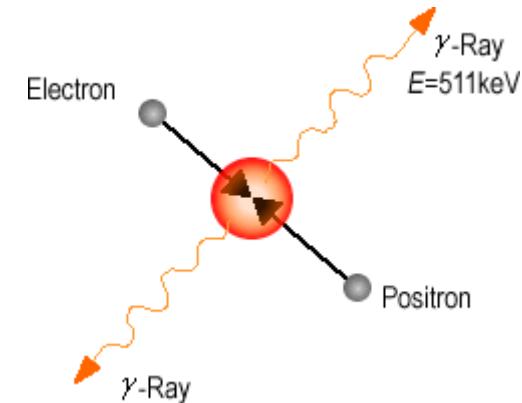
$^{68}\text{Ge}/^{68}\text{Ga}$ Generators



ITG
Organic matrix
0,05 N HCl

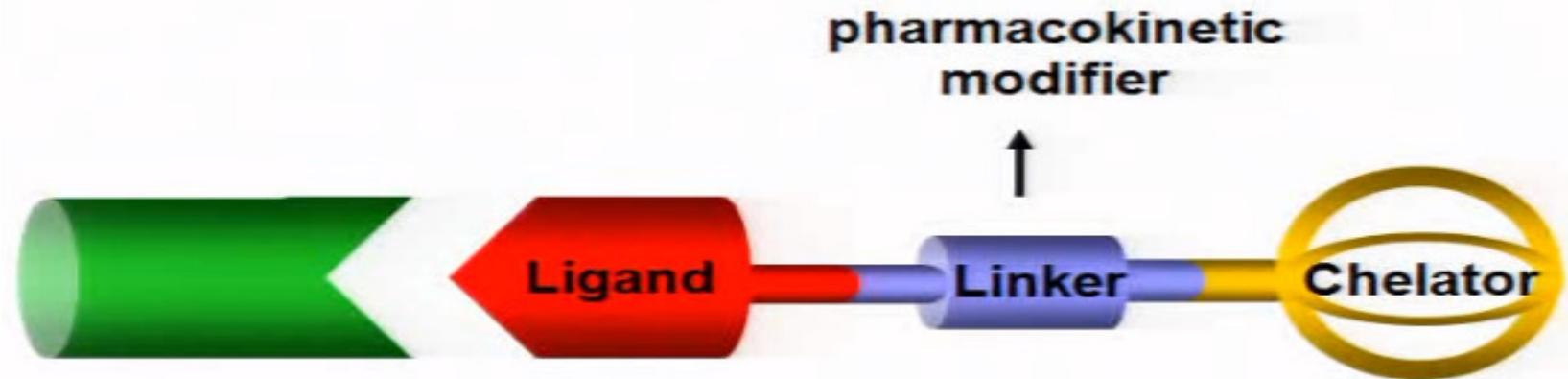
Cyclotron /
Eckert&Ziegler
Titanium dioxide
0,1 N HCl

Eckert&Ziegler
Tin dioxide
0,6 N HCl





Schematic of Drug Structure for PET Imaging



Target

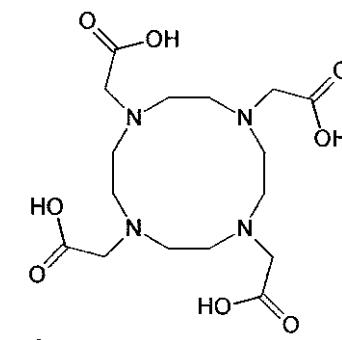
- Antigens
- **Protein receptors** and modifications
(somatostatin receptor)
- Transmembrane and their analogs
receptors (integrins)

Molecular Adress

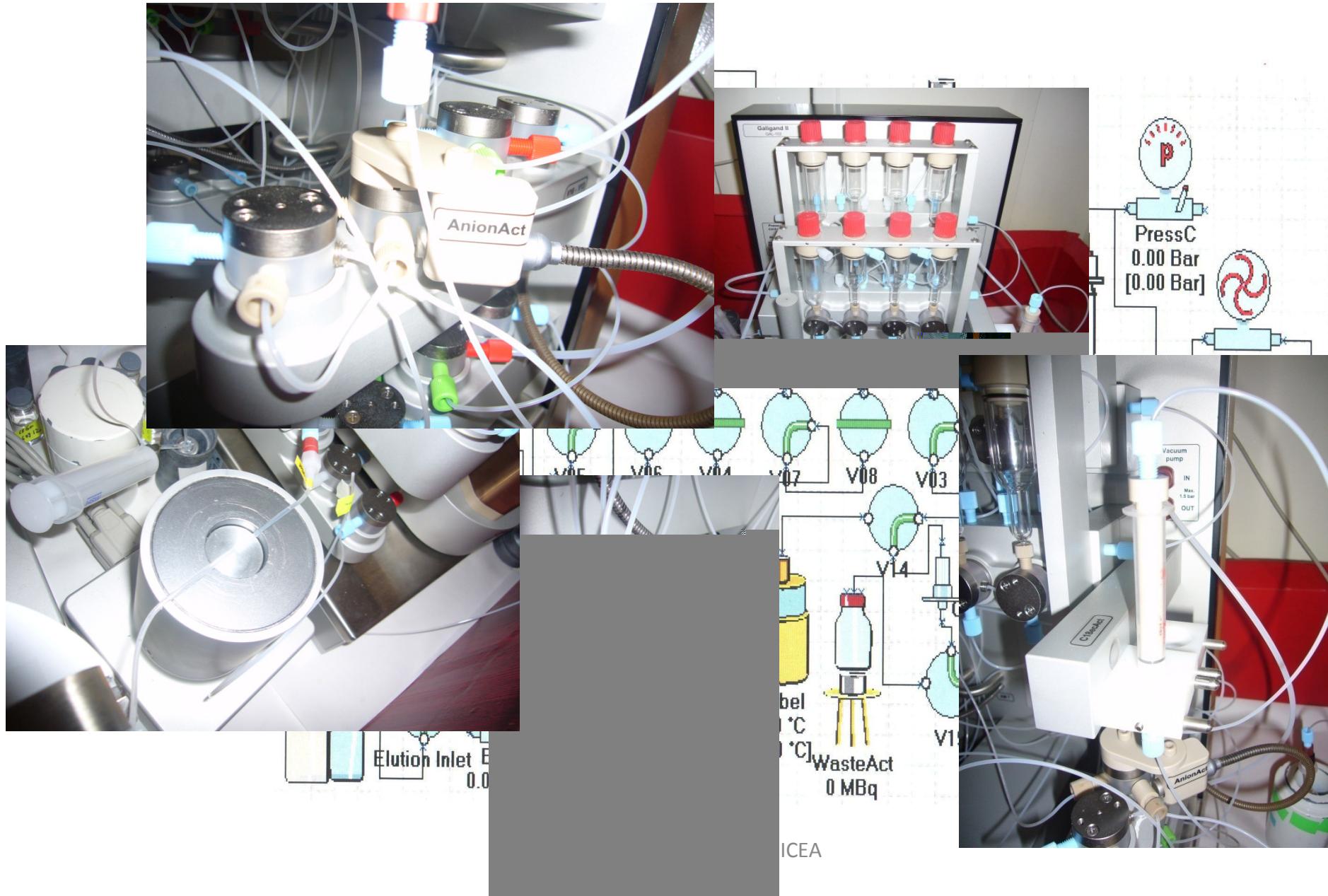
- antibodies, their fragments
- regulatory peptides
- (exp: TATE, RGD, NT)

Reporting Unit

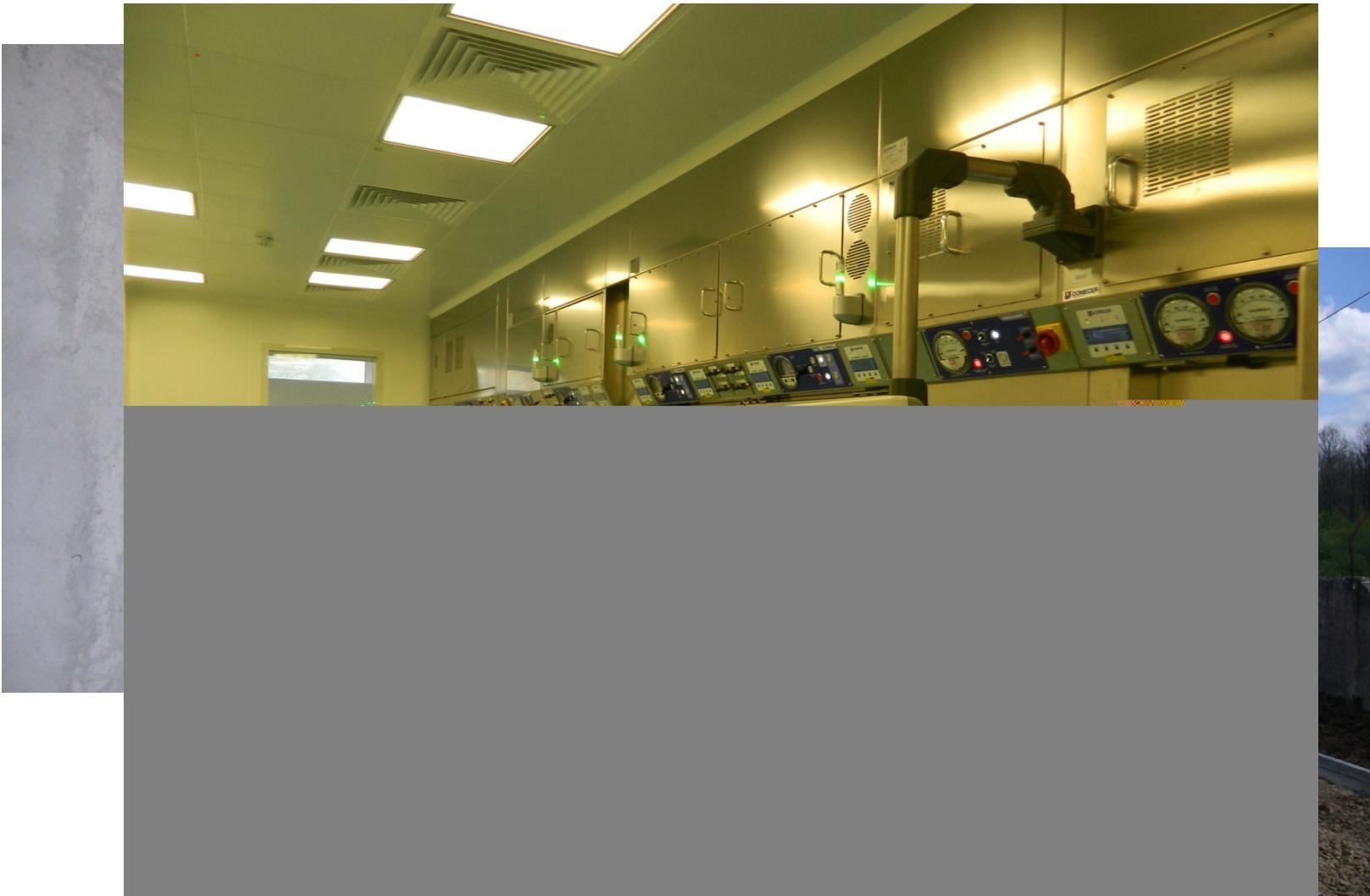
exp: DOTA



Automation of the synthesis



Clean Room



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Automated Synthesis Modules



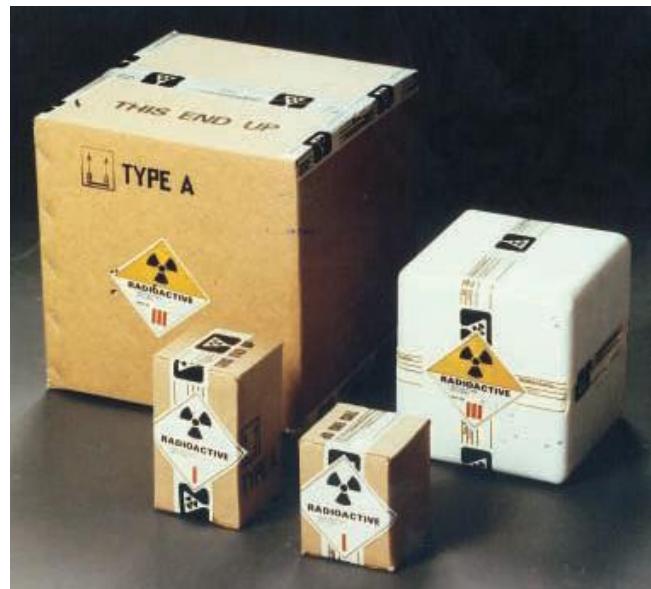


Automated Dispensing Unit





Delivering of Radiopharmaceuticals





Thank you for your attention!

