The C E I P Project

CEnter for Preclinical Imaging

University of Torino
Molecular Imaging Center
Molecular Biotechnology Center

"...to contribute to set up a cluster of Innovative Enterprises in the field of Biomedical Imaging and related areas in Piedmont"

Linea di intervento 2.4a) DOCUP ob.2
"Ricerca applicata di sistema"

Cluster of Innovative Enterprises/ Piedmontese Imaging Platform

-"Spin-Off": CAGE-Chemicals, Invento e Fluody.

-Projects under development at the "incubator of ideases" "Fresenius/CMB" and "Aspect/CBM".

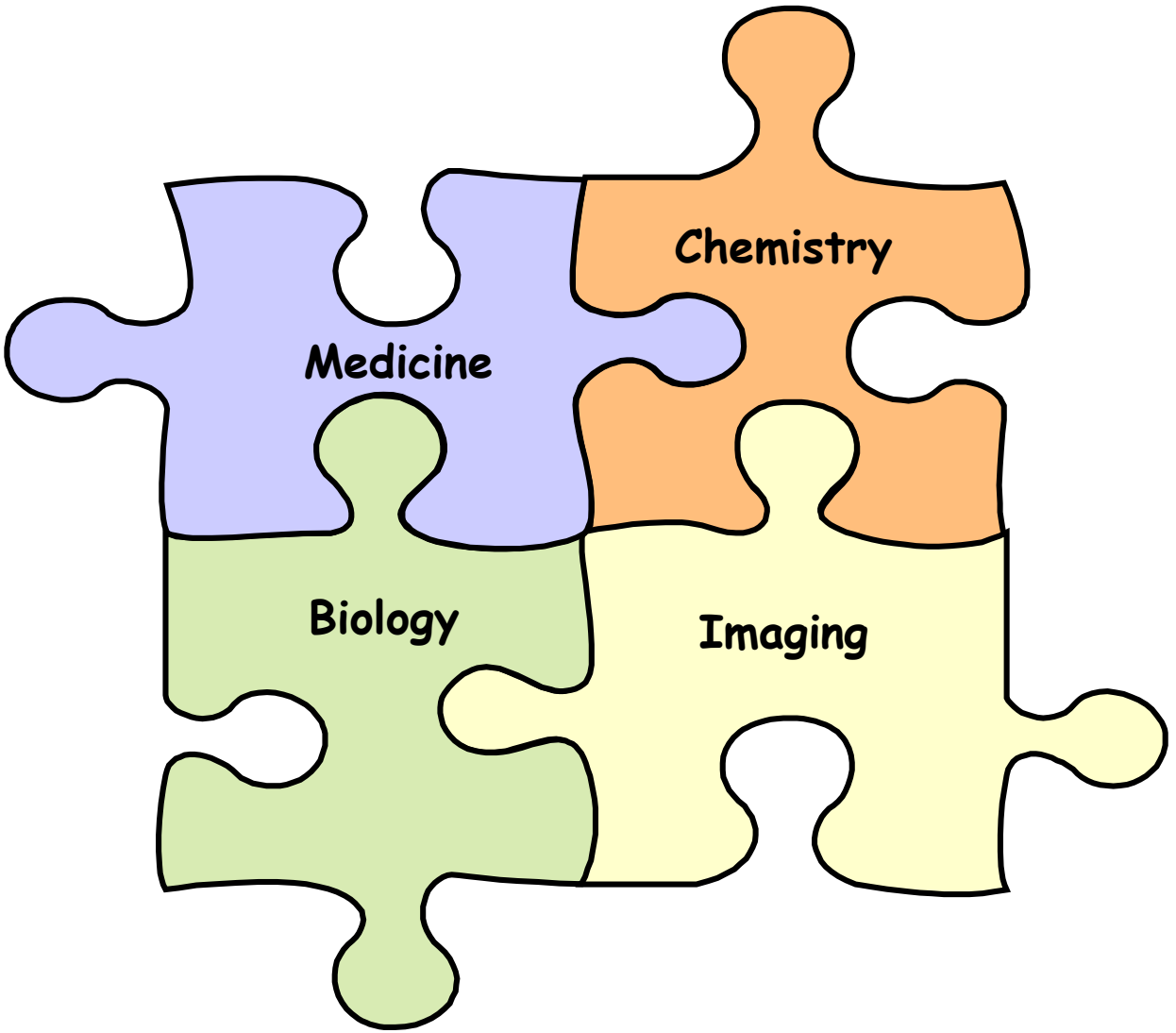
-Consolidated SMEs: AAA(now incl.GIPHARMA) and im-3D.

-Activities at the Nuclear Medicine Center at the Molinette Hospital.

-Activities at RBM/Merck-Serono in the development of new drugs.

-Activities at Bracco Imaging in the development of new in vivo diagnostic agents.

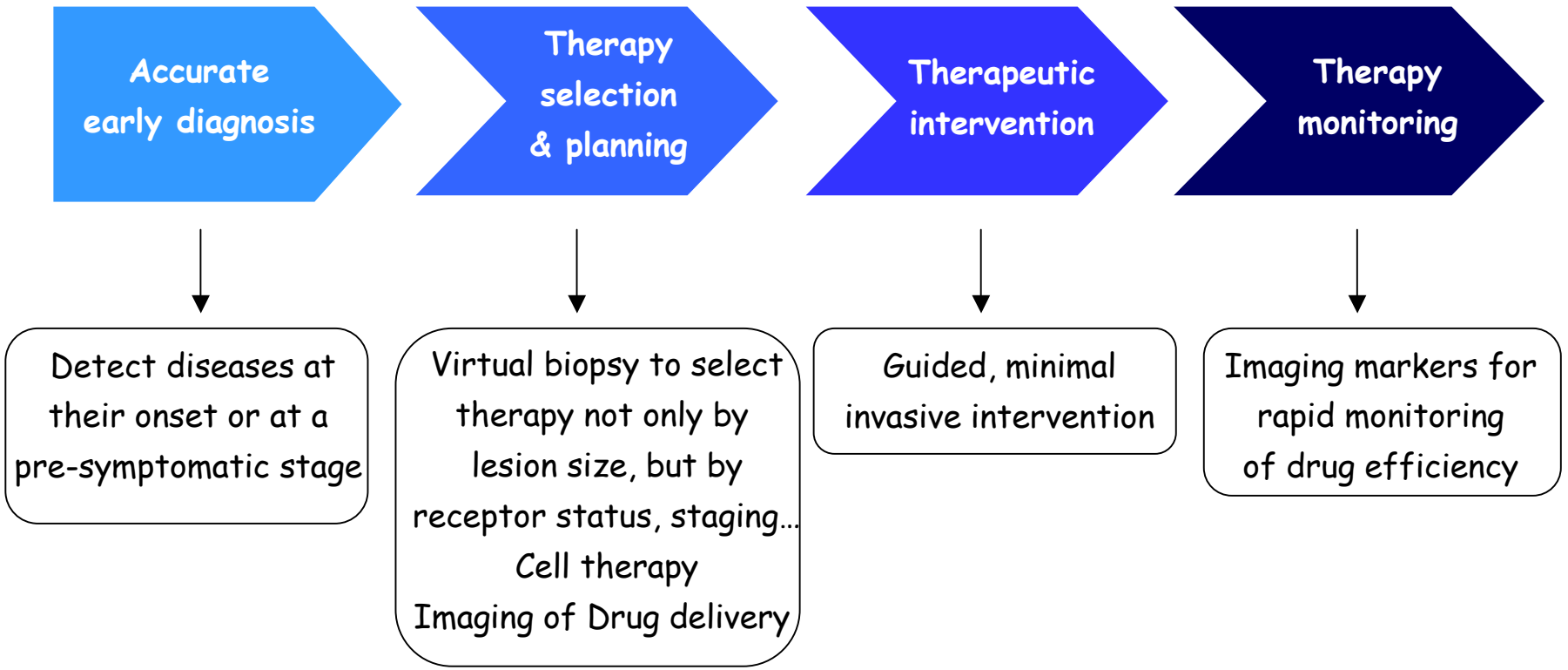
Molecular Imaging



The practice of Medical Imaging in the era of Molecular Medicine

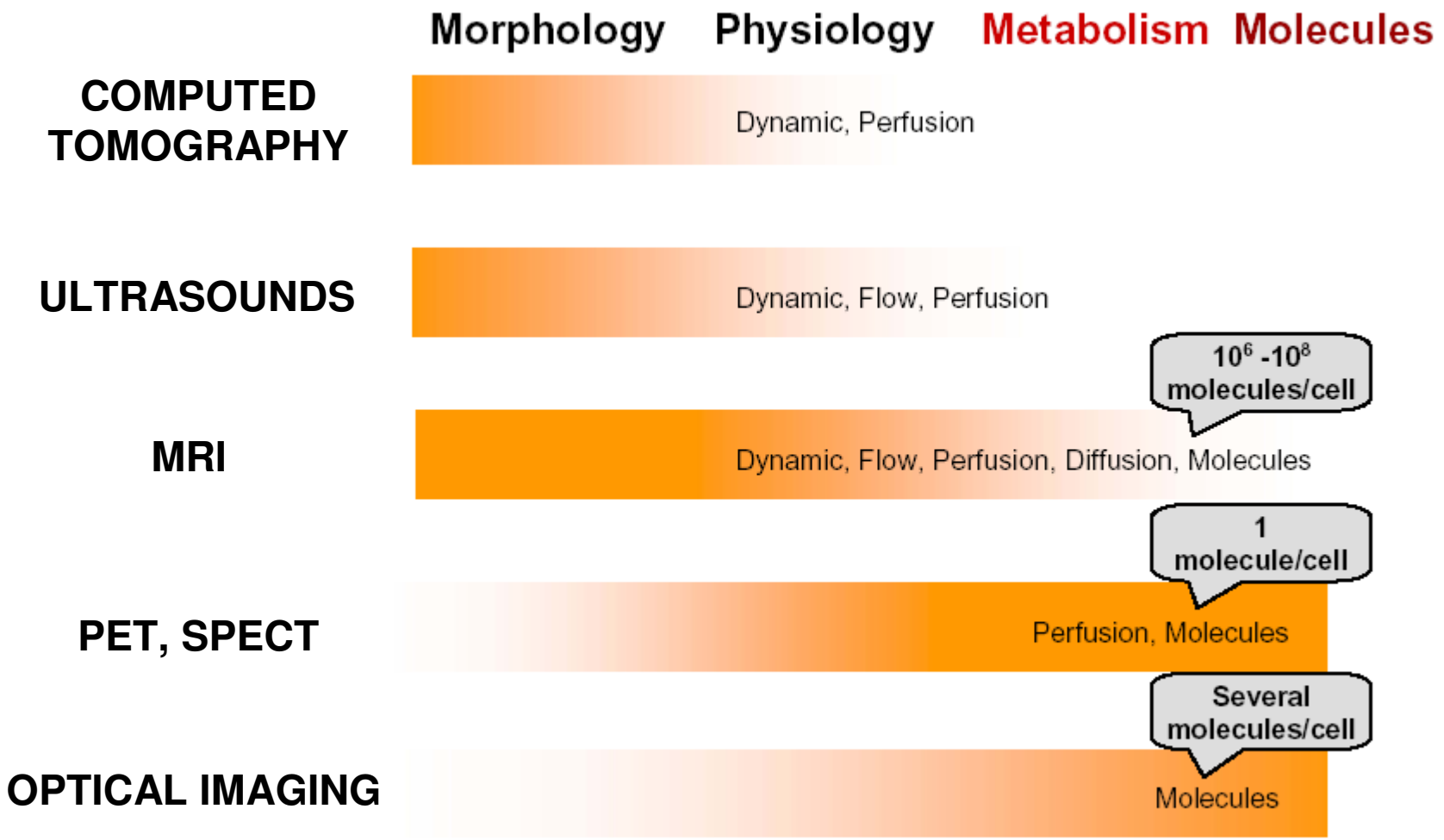
Molecular Imaging

"The practice of Medical Imaging in the era of Molecular Medicine"



Main applications fields
- Oncology
- Cardiovascular diseases
- Neurological disorders

Available imaging modalities



CEIP: Strumentazione disponibile e future acquisizioni

MRI	**0.2 T Escan**	**Available (BiPCA)**
	7 T Microimaging	**Available (CIM)**
	7 T Bruker	**Available (BiPCa)**
	3 T Bruker	**September 07**

Ultrasound	**High Frequency micro imaging system**	**Available (CBM e BiPCa)**
	Echo 3D system for large animals	**To be purchased**

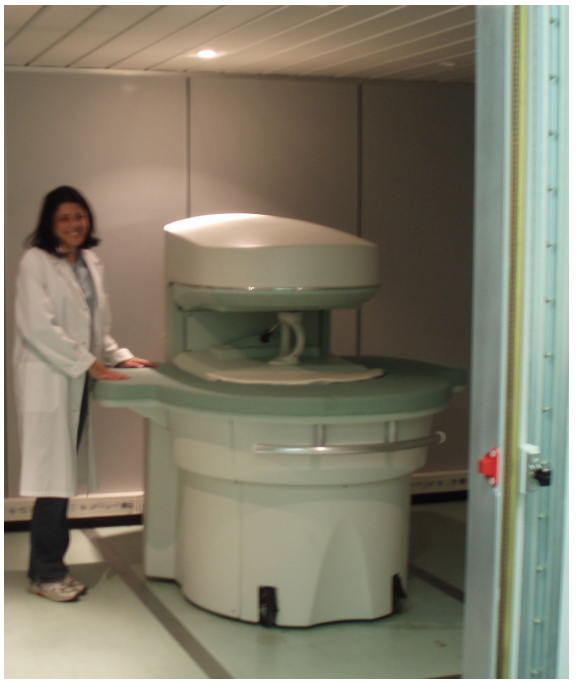
Optical Imaging	**Imager for Bioluminescence**	**Available (CBM)**
	Imager for Fluorescence (NIR) imaging	**To be purchased**

Nuclear Imaging	**Gamma camera**	**available**
	Cyclotron PET tracer production	**available**
	Micro PET/SPECT	**October 07**
	Micro-CT	**To be purchased**

Post-processing	**Software for post-processing analysis for all imaging modalities**	**To be developed**

MRI: Imager 0.2 T

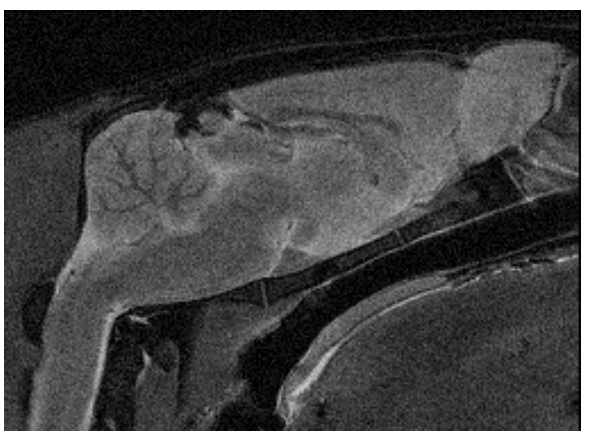
- Gradients 40 mT/m (Z,Y, X)
- Open system, max field of view 15 cm
- RF coils :
  - dedicated coil for rats
  - dedicated coil for mice
  - clinical coils (ankle, wrist, knee, shoulder)
- Standard sequences



MRI: Imager 7 T

- Gradients 300 mT/m (Z,Y, X)
- Bore internal diameter 15 cm
- RF coils :
  - whole body for rats
  - whole body for mice
- Standard sequences
- Fully open system to develop new sequences
- Cardiac and respiratory gating
- Isofluorane Anaesthesia system

RARE (FSE)
TR/TE 3000/35ms
Resolution: 117µm
Slice thickness = 1mm



Imager 3T *(to be delivered sept. 07)*

- 3T horizontal magnet (31 cm bore)
- Two gradient bores (diameter >21cm and > 11cm); strength >200 mT/m and > 400 mT/m at 200A
- Two transmitter and receiver channels for proton and 13C, 19F imaging
- Two transmit and surface coils for brain and cardiac imaging of small and large animals
- Reconstruction tools for spectroscopy, fast imaging, 3D acquisition, and Tools for image-processing
- Cardiac and respiratory gating (mouse to monkey)
- 13C/1H double tuned birdcage coil

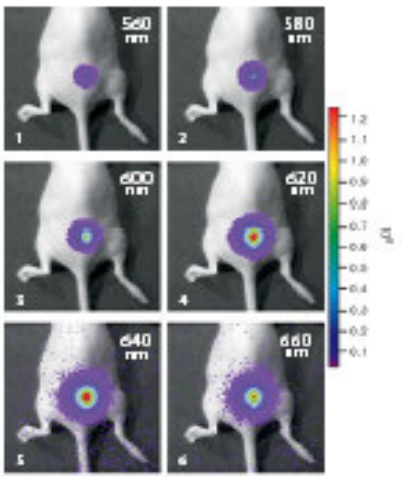
Ultrasound Imaging

VisualSonics-VeVo770

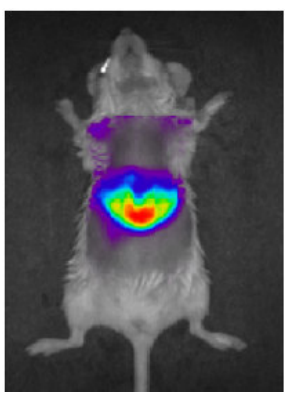
High resolution micro-ultrasound system (spatial resolution < 30 μm) for mouse and rat

Optical Imaging

- IVIS 200 Xenogen for Bioluminescence based Optical Imaging for mouse and rat



- Explore Optix (GE) for NIR fluorescence based Optical Imaging for mouse and rat



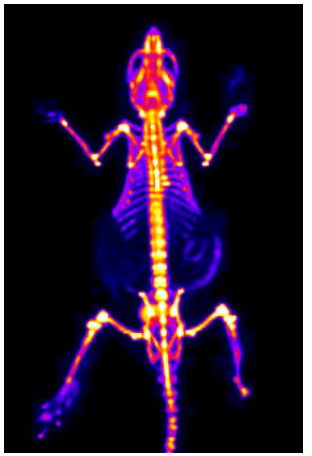
Nuclear imaging

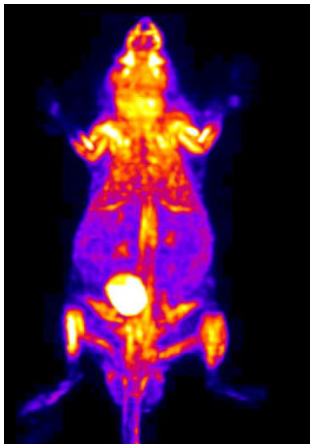
- Gamma Camera
- PET tracers production, cyclotron in situ (Advanced Acceleration Application)
- Micro-PET/SPECT System
- Micro-CT System (to be acquired)

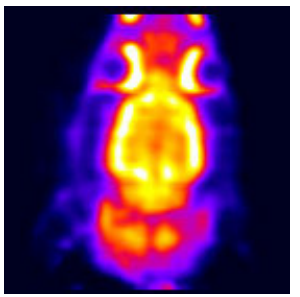
Micro-PET/SPECT System

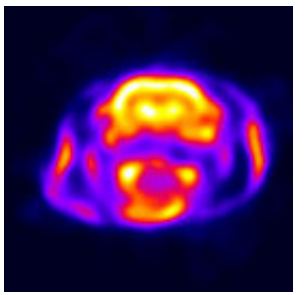
YAP-(S)PET

Scanner

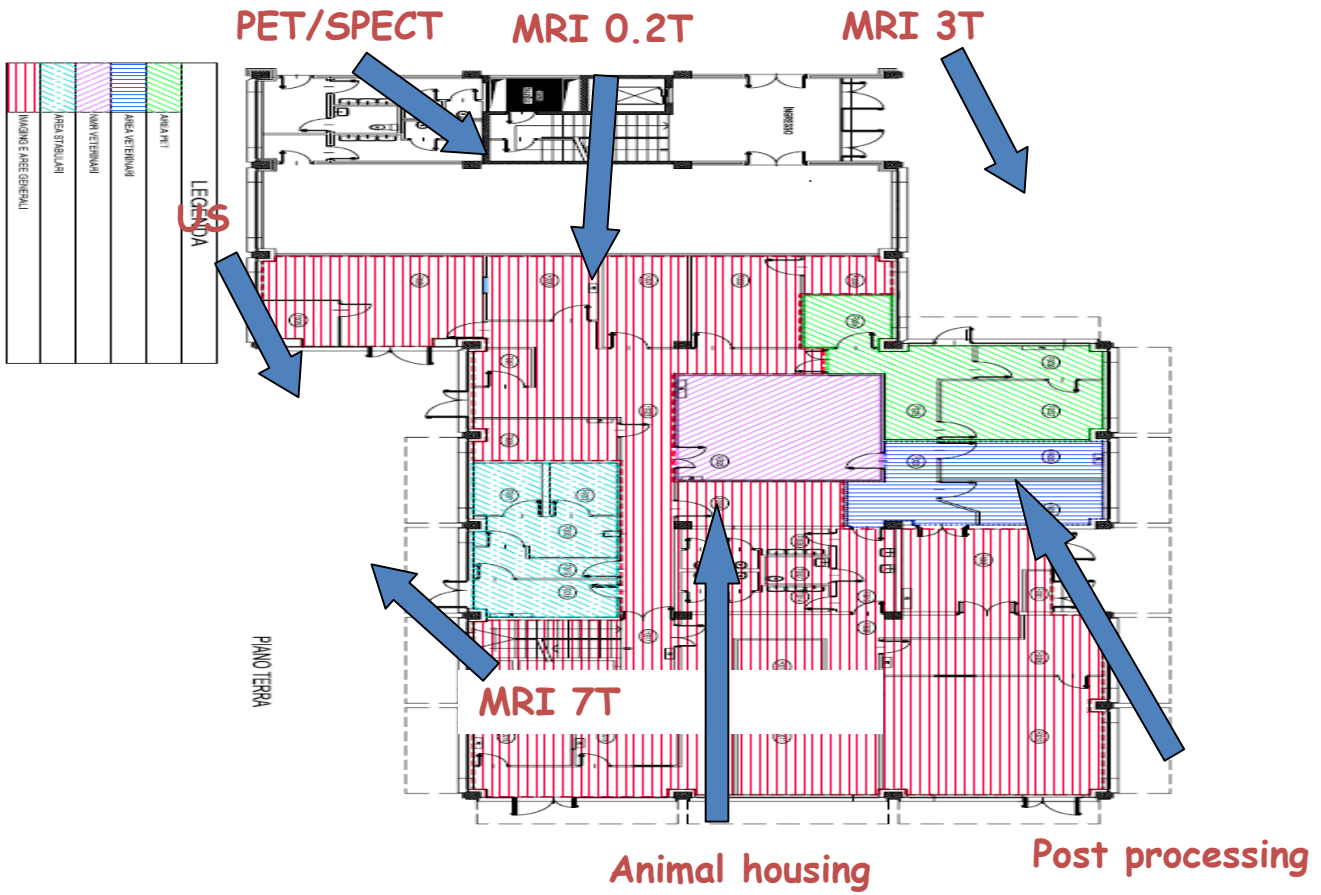








The CEIP Laboratory at BiPCa



Building F

CEIP: Animal Models

Different animal models have been developed:

ONCOLOGY	**Transgenic models - Xenografts**
CARDIOVASCULAR PATHOLOGIES	**Transgenic models – Induced pathologies**
CEREBRAL PATHOLOGIES	**Transgenic models – Induced pathologies**
INFLAMMATION	**Trangenic models-Induced pathologies**

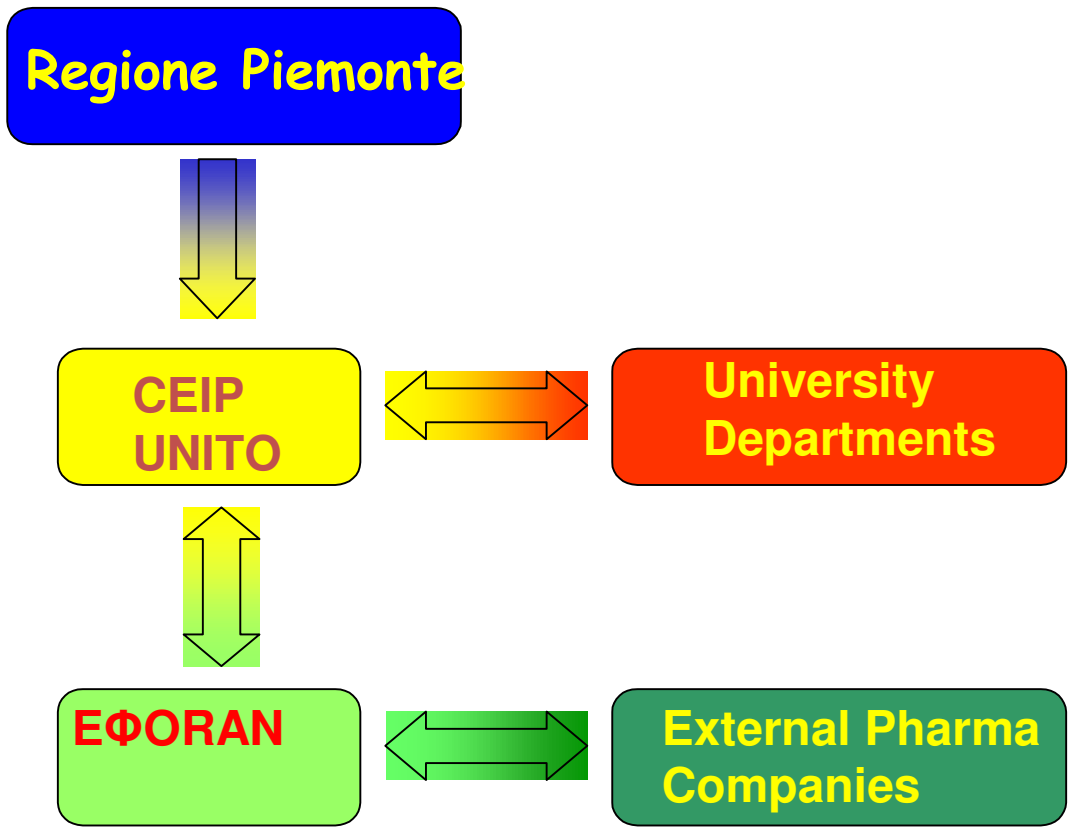
From CEIP to the Regional Imaging Platform:

- From the search of innovative diagnostic procedures to provide support to pharmaceutical companies for an accelerated validation process of new drugs

- From the validation of probes on animal models to the translactions to clinical applications.

- Integrating in vitro tests with Molecular Imaging assays to exploit the outstanding achievements of molecular medicine.

European Centre of Preclinical Imaging



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TELEDIAGNOSI

MEDICAL KNOW-HOW

La Rete Allergologica della Regione Piemonte consente il collegamento operativo delle strutture sanitarie interessate al trattamento delle Allergie.

Ad un livello superiore la rete è finalizzata alla raccolta di dati per l'Osservatorio Regionale per le Gravi Reazioni Allergiche preposto al monitoraggio e all'indagine a medio e lungo termine sulla situazione allergologica del Piemonte e sul relativo trattamento.

i.m 3D
MEDICAL IMAGING LAB

Università di Torino
M B C
Molecular Biotechnology Center

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THANK YOU!