



**State-of-the-art *in vivo* imaging**

**MRI**

# PASREL IMAGERIE IN A NUTSHELL

## PRECLINICAL AND CLINICAL IMAGING

PET



Radiotracers



Ultrahigh field MRI



Multimodal Imaging



UltraFast UltraSound



Illustrations CEA ©

## FOUR CENTERS OF EXCELLENCE



Infectious diseases



Preclinical & clinical multimodal imaging



Brain neuroimaging



Neurodegenerative diseases

## A COMPLETE OFFER



One-Stop-Shop



A dedicated manager



One single contract



Services

Partnerships

Training

# PRECLINICAL MRI

## Our activity:

- ✓ High and ultrahigh MRI on rodents and non-human primates
- ✓ Multimodal imaging: PET/MRI – MRI/US
- ✓ Metabolic imaging ( $^1\text{H}$  or  $^{31}\text{P}$  MR Spectroscopy, Chemical Exchange Saturation Transfer for Glutamate, Glucose, Creatine)
- ✓ Diffusion weighted imaging, anatomical connectivity
- ✓ T1, T2, T2\* and susceptibility weighted imaging, parametric imaging
- ✓ Functional MRI (task and resting state)
- ✓ Optimized sequences for brain spectroscopy  $^1\text{H}$ ,  $^{13}\text{C}$  and  $^{31}\text{P}$
- ✓ ZTE imaging for  $^{17}\text{O}$
- ✓ BSL 1 to 3 environment
- ✓ Complementary assets: animal housing, histology, immunohistochemistry

## Therapeutical fields:

- ✓ Infectious diseases
- ✓ Neurodegenerative diseases
- ✓ Oncology
- ✓ Ophthalmology

## Expertise:

- ✓ Research of new contrast agents
- ✓ Animal model validation
- ✓ Evaluation of new therapies
- ✓ Anatomic and functional imaging
- ✓ Co-registration of reconstructed 3D-histological volumes of multimodal data acquired in vivo and/or ex vivo imaging

## Our strength:

- ✓ Long-standing experience in multimodal imaging processing on rodents and non-human primates
- ✓ Complementary experts: biologists, physicists, pharmacologists, radiochemists, radiopharmacists, nuclear doctors, physicians
- ✓ Well-established partnerships with public and industrial players

# PRECLINICAL MRI

**RODENTS, PRIMATES**

PASREEL  
imagerie

## APPLICATIONS

### ❖ Therapeutic fields

- ✓ Neurodegenerative diseases
- ✓ Oncology

### ❖ Expertise

- ✓ Animal model validation
- ✓ Evaluation of new therapies
- ✓ Study of drug-target interactions
- ✓ Pharmacokinetics study

## EQUIPMENT

MRI 1.5T  
MRI 7T

Achieva (whole-body)  
Primate

Philips  
Agilent

MRI 7T  
MRI 11.7 T  
MRI 17.2 T

Biospec, Avance III (small animal)  
Biospec, Avance III (small animal)  
Biospec, Avance III (small animal)

Bruker BioSpin  
Bruker BioSpin  
Bruker BioSpin

PET/MRI 3T (Primates)

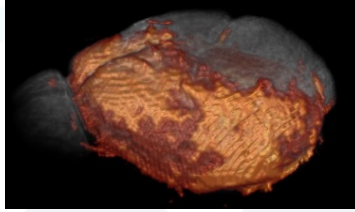
SIGNA

GE

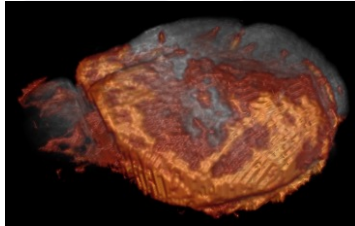
# PRECLINICAL CASE STUDIES

## Manganese Enhanced MRI

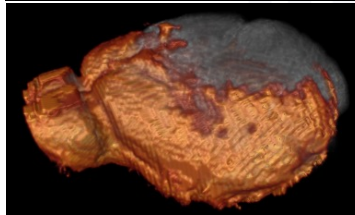
TR1



TR2

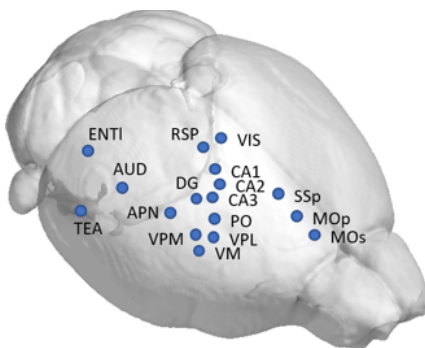


TR3

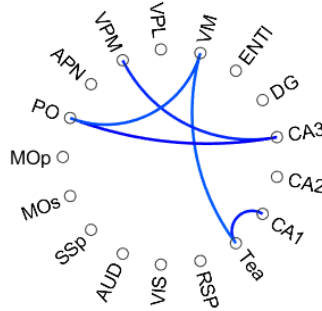


Drug effects on functional neuroimaging (Droguerre *et al.*, 2020)

## Resting state functional MRI biomarkers in neurodegenerative diseases

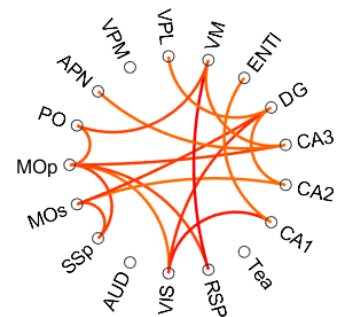


6M

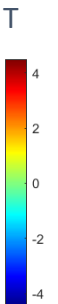


*hypoconnectivity*

12M



*hyperconnectivity*



Connectivity differences in AD vs WT

# CLINICAL MRI

## APPLICATIONS

### ❖ Therapeutic fields

- ✓ Infectious diseases
- ✓ Neurodegenerative diseases
- ✓ Oncology

### ❖ Expertise

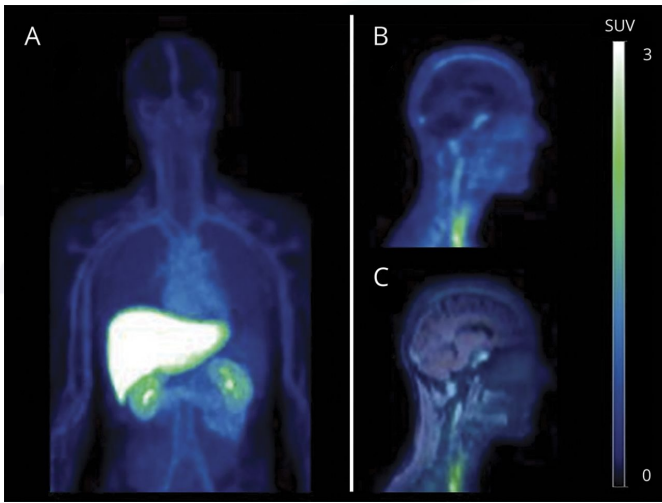
- ✓ Biomedical research protocol management
- ✓ Recruitment of healthy volunteers,
- ✓ Acquisition of in vivo brain imaging data from healthy or diseased humans
- ✓ In vitro acquisition of anatomical parts
- ✓ Development and implementation of MRI sequences (anatomy, diffusion, functional MRI, NMR spectroscopy)
- ✓ Imaging data analysis and processing

## EQUIPMENT

MRI 3T	Magneton Prisma fit	Siemens
MRI 7T	Magnetom 7T	Siemens
MRI 11.7T	Project ISEULT (France – Germany) dedicated to brain	

# CLINICAL CASE STUDIES

## PET/MRI



Biodistribution of marketed drug  
Microdose for clinical Ph 0. (Marie *et al.*,  
2019)

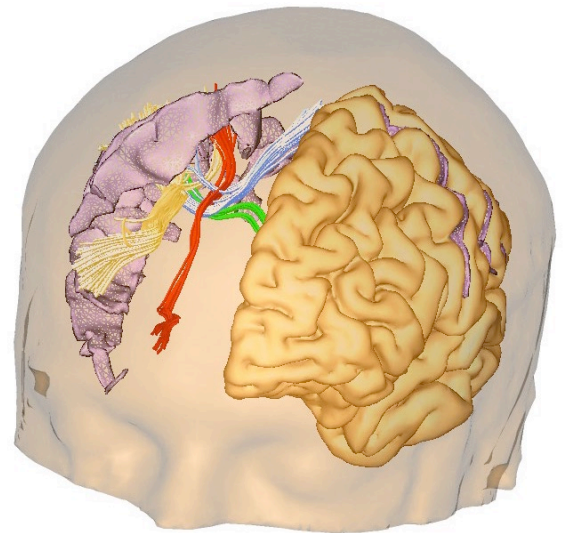
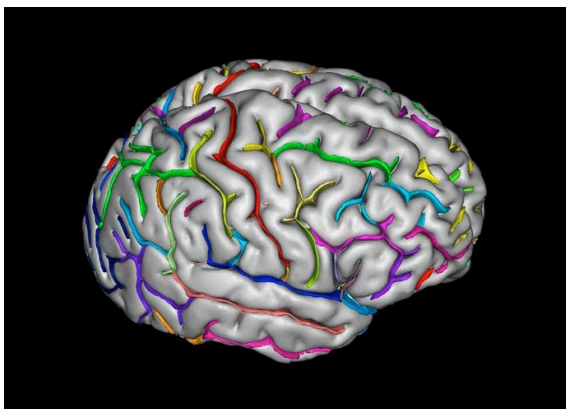


Image d'IRM de diffusion. © J-F. Mangin / V El  
Kouby / M. Perrin / Y. C.





# PASREL

## PASREL imagerie



+33 6 17 86 48 70



[ali.aitikhlef@cea.fr](mailto:ali.aitikhlef@cea.fr)



[Pasrel Imagerie](#)



[PASREL-PROJECT](#)



4 Pl. du Général Leclerc -  
91400 Orsay