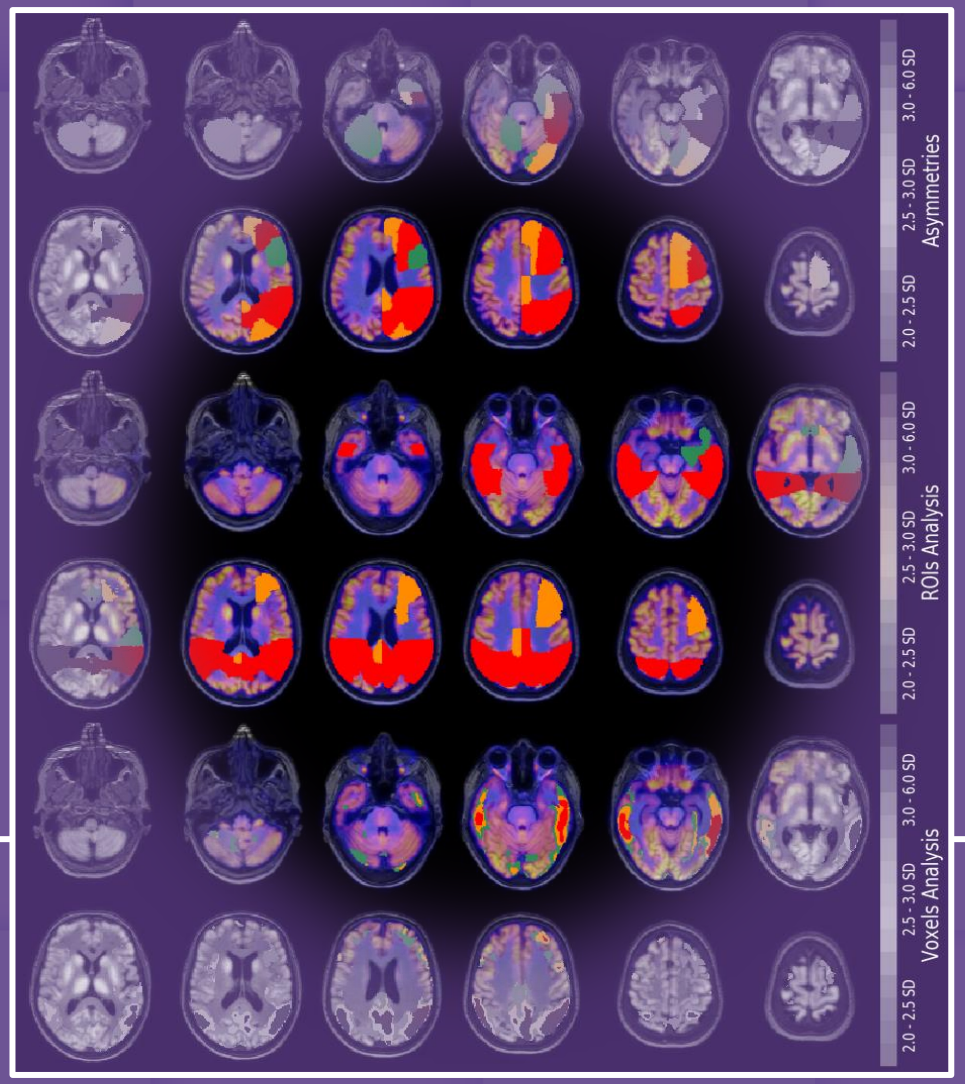

GALLAECIA

PET technologies

QUBIO tech

Advanced AI-assisted analysis of neuroimages

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Gallaecia-PET 1st Workshop

Coimbra, 15-16th June 2023

QUBIO tech : OUR JOURNEY

Complexo Hospitalario Universitario de Santiago de Compostela

NEUROCLOUD IS BORN 2017

+ 10 hospitals
+ 4k analysis
PET/SPECT/MRI

2021

2014
BORN FROM AND FOR HOSPITALS

Research group:
- ✓ Physicians
- ✓ Patients
- ✓ Healthcare system

2015-2017
+ **Team** build
+ **Funding**
+ **Positioning**
+ **Quality**

BAYER

ISO 13485 MEDICAL

2017
1st CUSTOMER

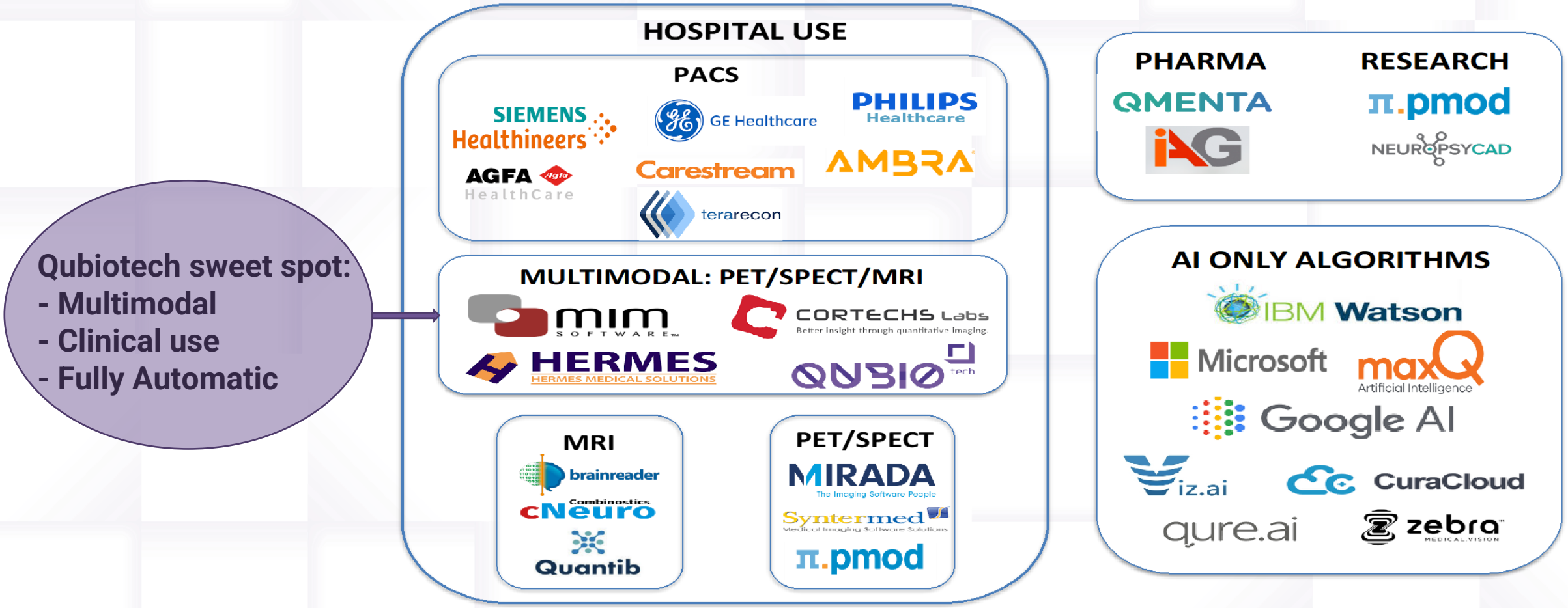
Epilepsia Russi Institut

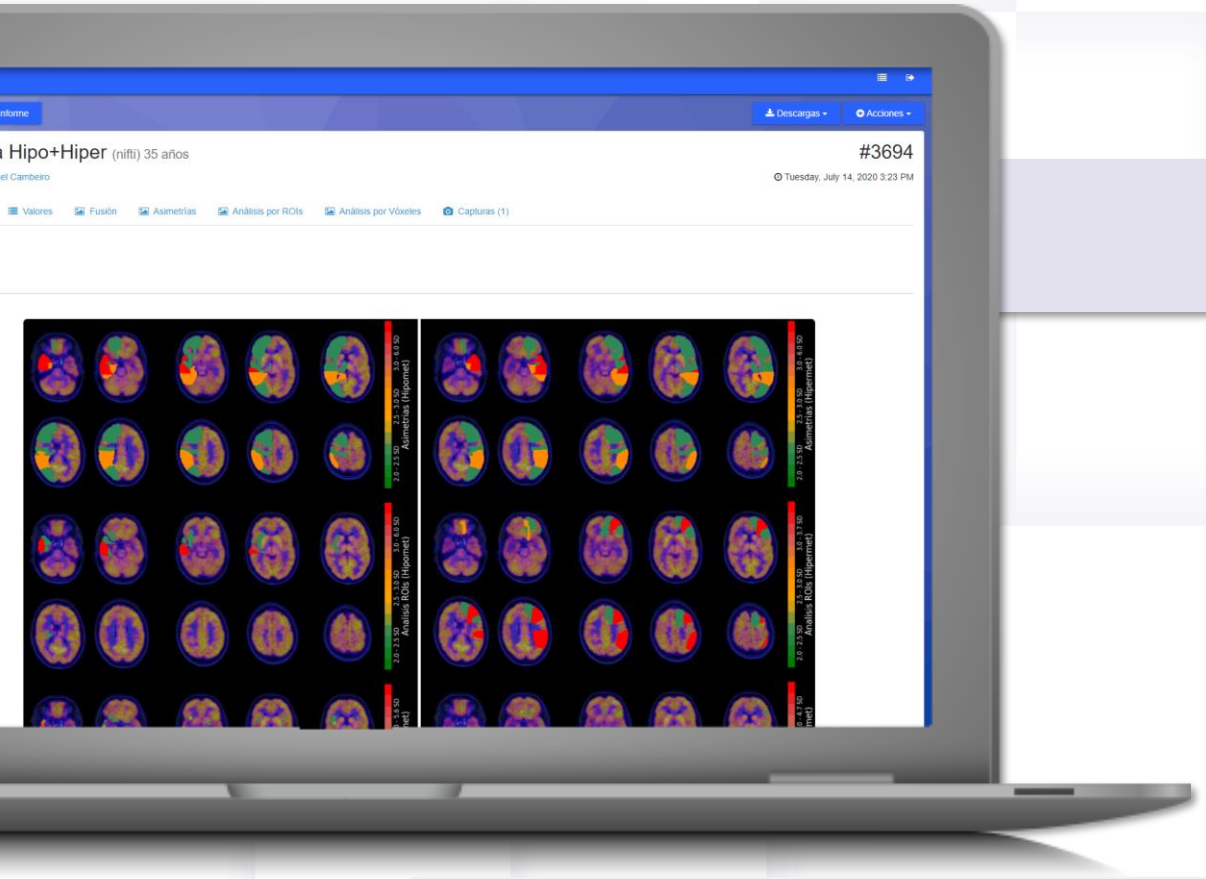
2017-2020
- **800k€ captured from R+D grants and private funding**
- **6 full time staff and 3 CE algorithms**
- **Most popular software for PET imaging in Spain**

2020
1st INTERNATIONAL CUSTOMER

SÃO JOÃO HOSPITAL

MEDICAL IMAGE LANDSCAPE





NEUROCLOUD

AUTOMATIC, FAST AND PRECISE AI-ASSISTED ANALYSIS OF NEUROIMAGES

- ✓ MULTIMODAL: PET, SPECT, RMI
- ✓ SAVES TIME & RESOURCES
- ✓ CLINICALY VALIDATED
- ✓ CLOUD or PACS CONNECTION AVAILABLE

IMAGE QUANTIFICATION ENABLES NEW AI BASED CAPABILITIES!!

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NEUROCLOUD CONCEPT: 2 CLICKS, 5 MIN RESULTS

1

- **Drag & Drop.**
- PET/SPECT/MR/CT
- **Automatic data anonimitation.**

2

- **Image quantification.**
- Identifying abnormal areas.

3

- **Customized reports.**
- 5 minutes.
- **Attachable to EHR.**

SEAMLESS INTEGRATION WITH YOUR EXISITING WORKFLOW

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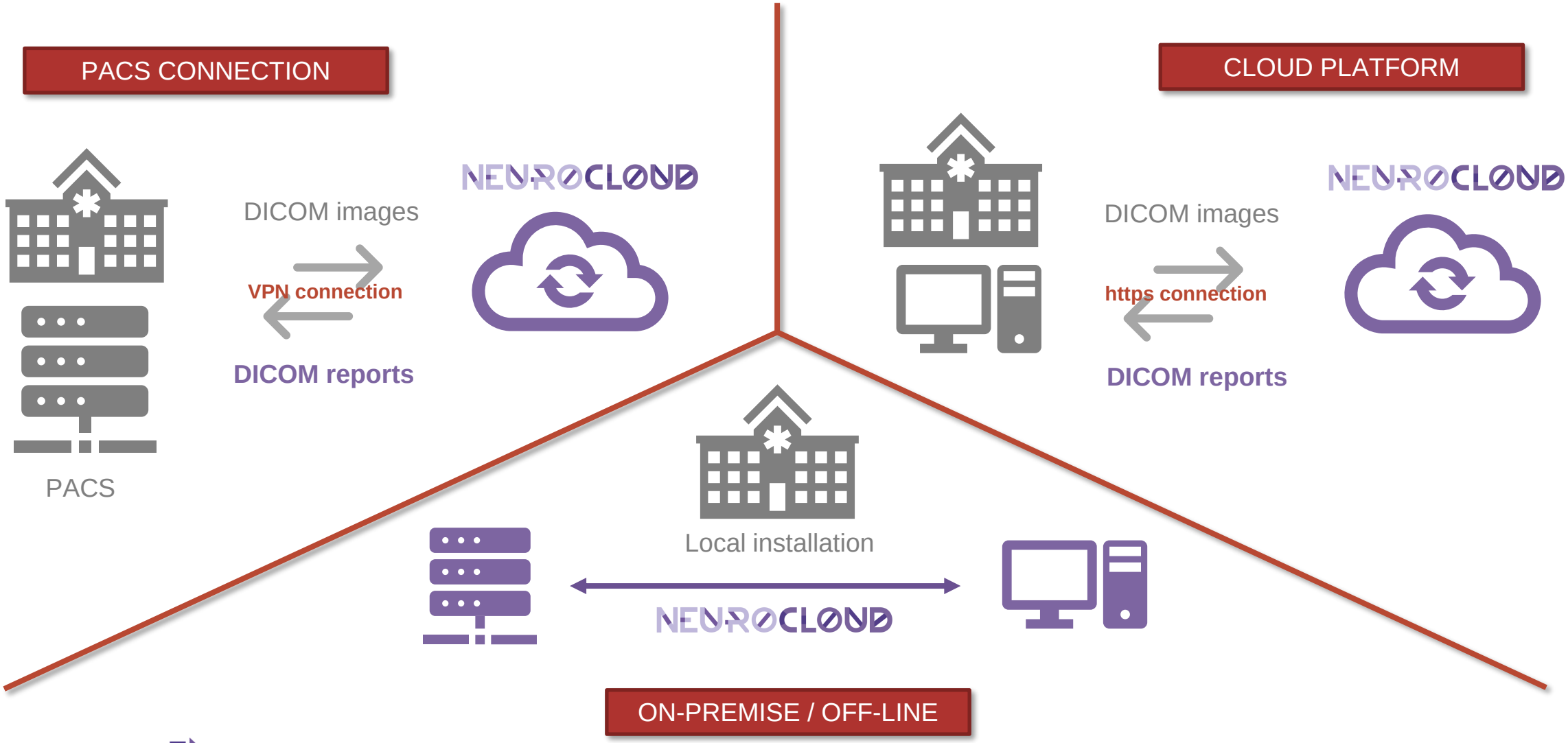
customized NEUROCLOUD INTEGRATION



CURRENT APLICATIONS: COLLABORATIVE ECOSYSTEM

NEUROCLOUD PET

Quantification of 18FDG metabolism and amyloid accumulation in PET imaging.

NEUROCLOUD VOL

Tissues segmentation and atrophy quantification in MRI-T1 and Lesion classification in FLAIR.

NEUROCLOUD SISCOM

Precise localization of epileptogenic focus by subtracting ictal and interictal SPECT image and MRI co-registration.

NEURODEGENERATIVE DISEASES: Dementias, Alzheimer, Parkinson, Multiple Scleroris, Epilepsy...

COLLABORATIVE ECOSYSTEM: Radiologists + Neurologists + Nuclear Physicians

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NEW INFORMATION: example nuclear medicine

Neurocloud meets all the imaging recommendations for dementia suggested by the European Society of Nuclear Medicine.

Clinical/NP evaluation

Structural imaging

NEUROCLOUD VOL

PATHWAY 1:
Most probable diagnosis = AD

Amyloid-PET or CSF

NEUROCLOUD PET

Only if negative or non conclusive

FDG-PET

NEUROCLOUD PET

PATHWAY 2:
Most probable diagnosis: non-AD + non move. disorders

FDG-PET

NEUROCLOUD PET

Only if non conclusive

Amyloid-PET or CSF

NEUROCLOUD PET

PATHWAY 3:
Presence of movement disorder symptoms

Dat-SPECT, FDOPA-PET

NEUROCLOUD SPECT

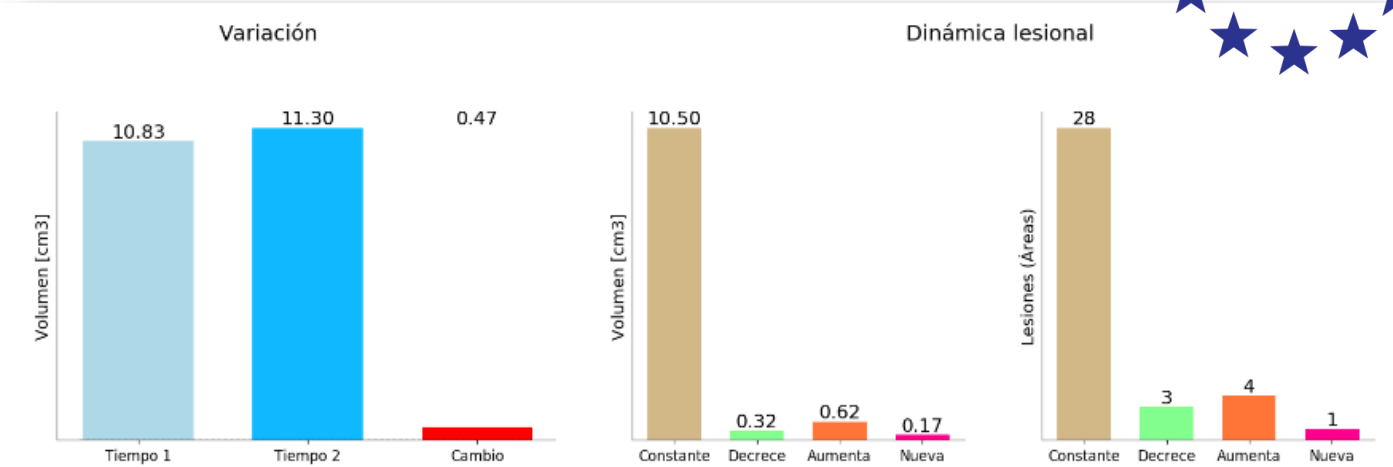
Only if equivocal findings

* Finding our way through the labyrinth of dementia biomarkers - European Journal of Nuclear Medicine and Molecular Imaging volume 48, pages2320-2324 (2021

NEW INFORMATION: radiology example

New **biomarker** information **quantified within minutes that facilitates customized reporting** that addresses the latest clinical criteria (*McDonald 2017, MAGNIMS 2021*):

- ✓ Global values of atrophy.
- ✓ Values by atrophy regions of interest.
- ✓ Accurate quantification of number, volume and type of lesions and their evolution.



Identification of lesion variation between the first and the second study

Dinámica lesional					
	Total	**Periventricular**	**Subcortical**	**Infratentorial**	**Yuxtacortical**
Constante	28 (10.5 cm3)	9 (7.54 cm3)	18 (2.93 cm3)	1 (0.03 cm3)	0 (0.0 cm3)
Decrece	3 (0.32 cm3)	0 (0.0 cm3)	3 (0.32 cm3)	0 (0.0 cm3)	0 (0.0 cm3)
Aumenta	4 (0.62 cm3)	3 (0.59 cm3)	1 (0.03 cm3)	0 (0.0 cm3)	0 (0.0 cm3)
Nueva	1 (0.17 cm3)	0 (0.0 cm3)	1 (0.17 cm3)	0 (0.0 cm3)	0 (0.0 cm3)

Clear indication of new lesions (type, number and volume).

Example of information regarding the lesion dynamics of a Multiple Sclerosis patient (time 1 vs. time 2).

- ✓ Allows 2-minute comparisons between scans from different manufacturers and scanner models.
- ✓ Accurate results impossible to obtain through traditional clinical practice.

NEUROCLOUD basis for AI and new services

What you already have...

- ✓ **DICOM images**
- ✓ **Other clinical variables**
  - ✓ Genetic markers
  - ✓ Population metrics
  - ✓ Clinical indicators
  - ✓ ...

NEUROCLOUD

What Neurocloud delivers: Automatic extraction of quantified biomarkers

- ✓ **Multi-modal & Multi-fractional:** PET, MRI, SPECT.
- ✓ **Different pathologies:** MS, EZ, Epilepsy...
- ✓ **Multidisciplinary teams:** Neurologists, Radiologists, Nuclear Physicians.

1

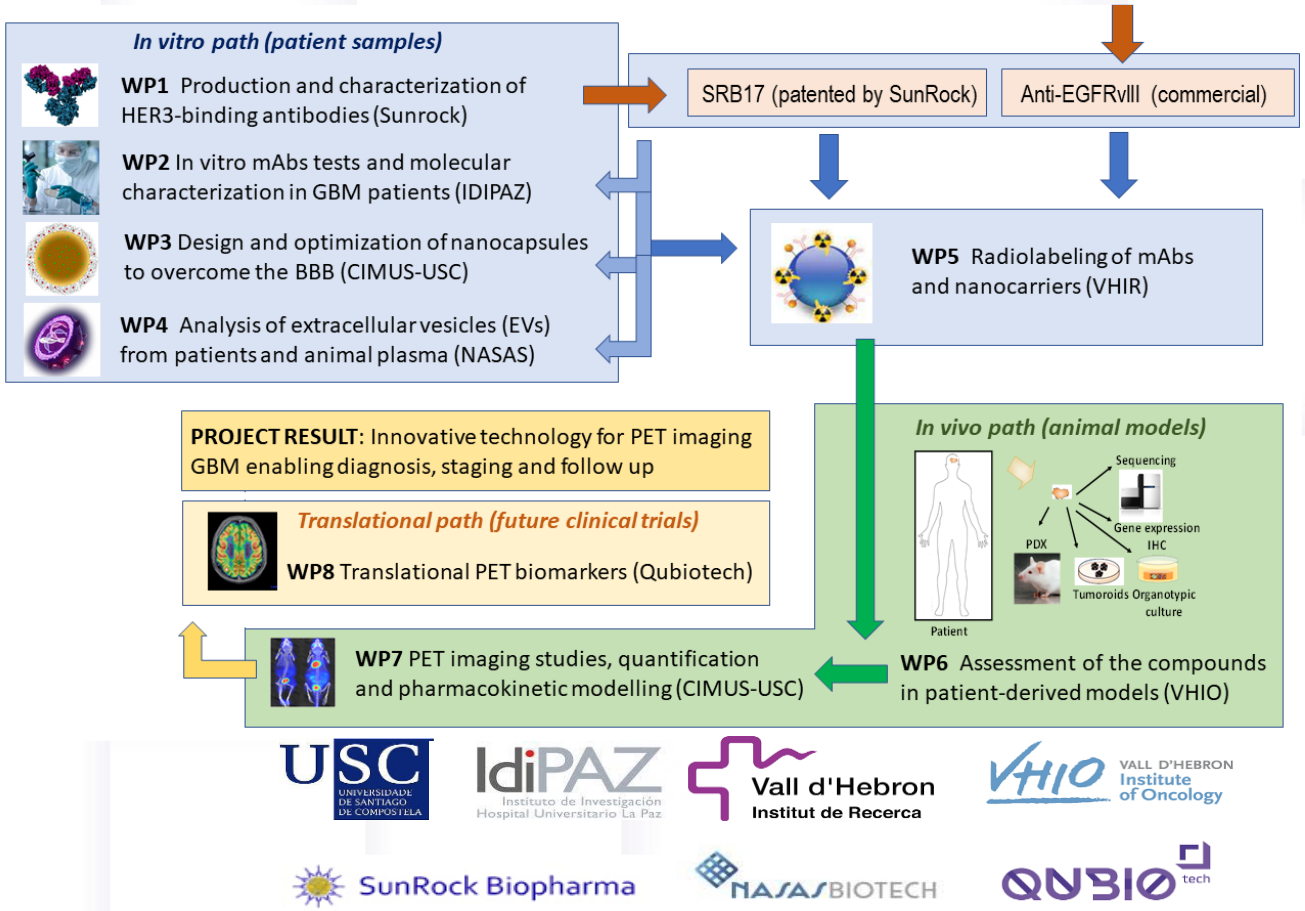
Integration of quantitative values in neuroimaging (NEUROCLOUD)

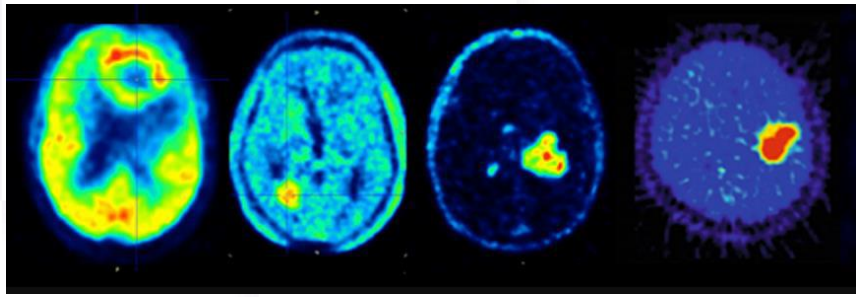
Association of other clinical data (genetic markers, tests...)

Development of data mining systems through learning routines.

R+D Projects: DIAGBI

Early molecular nanoDIAGnostics of Brain tumors using **ImmunePET** (DIAGBI)





From left to right, FDG-PET, FET-PET, FCHO-PET and FMISO-PET in patients with glioblastoma

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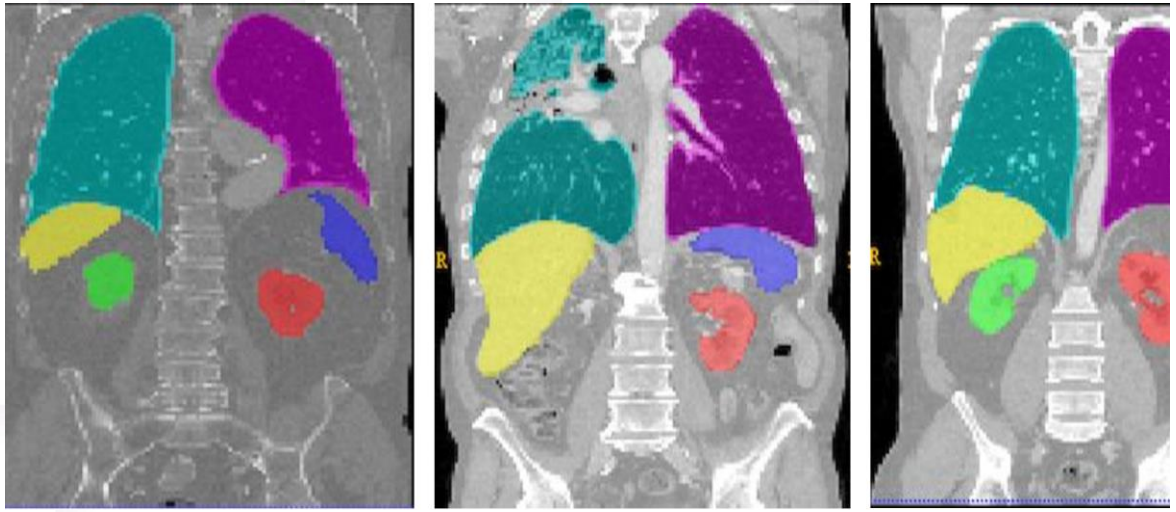
R+D Projects: DoseBrain

Advanced dosimetry for novel radiotherapy approaches in brain tumors

- Qubiotech task: develop DL methods for whole-body PET/MR and SPECT/MR quantification methods based on MR-based segmentation of the primary tumour and multiples tissues and organs



CUSTOMERS & COLLABORATIONS

QUBIO tech

CLÍNIC BARCELONA Hospital Universitari

Complexo Hospitalario Universitario de Santiago de Compostela

HOSPITAL Casa de Salud

SÃO JOÃO HOSPITAL

hm hospitales

La Fe Hospital Universitari i Politècnic

Hospital del Mar

Parc de Salut MAR Barcelona

Epilepsia Russi Institut

Clínica Rotger desde 1944

Grupo quirónsalud

eit Health

BAYER

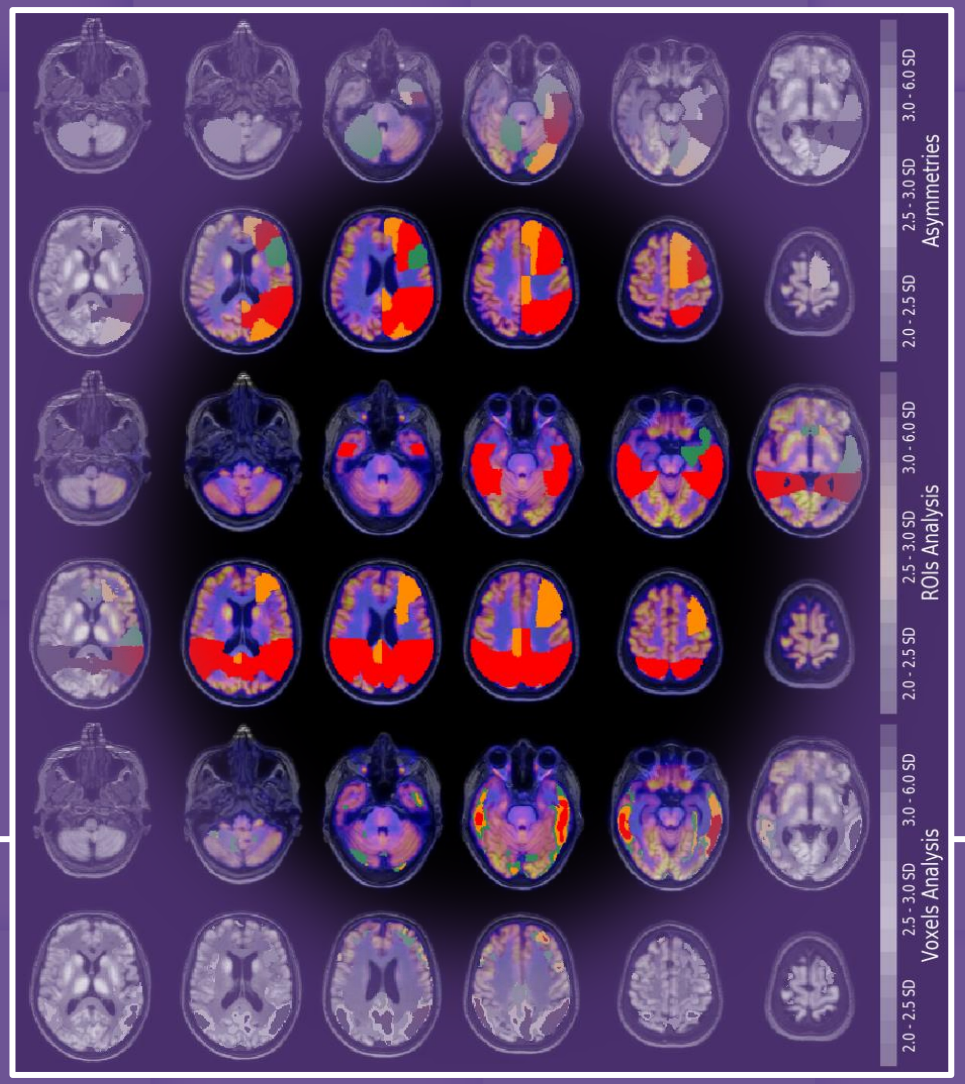
LABSAÚDE REDE DE LIVING LABS DE SAÚDE DE GALICIA

Member of European Network of Living Labs

acis

SERVIZO GALEGO de SAÚDE

XUNTA DE GALICIA CONSELLERÍA DE SANIDADE



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