CONVEGNO

HEALTH SCIENCE COMMUNITY

GARR E MINISTERO DELLA SALUTE
PER LA RETE DELLA RICERCA MEDICA

Ministero della Salute

Consortium GARR

neuGRID e outGRID: una infrastruttura elettronica globale per le neuroscienze computazionali

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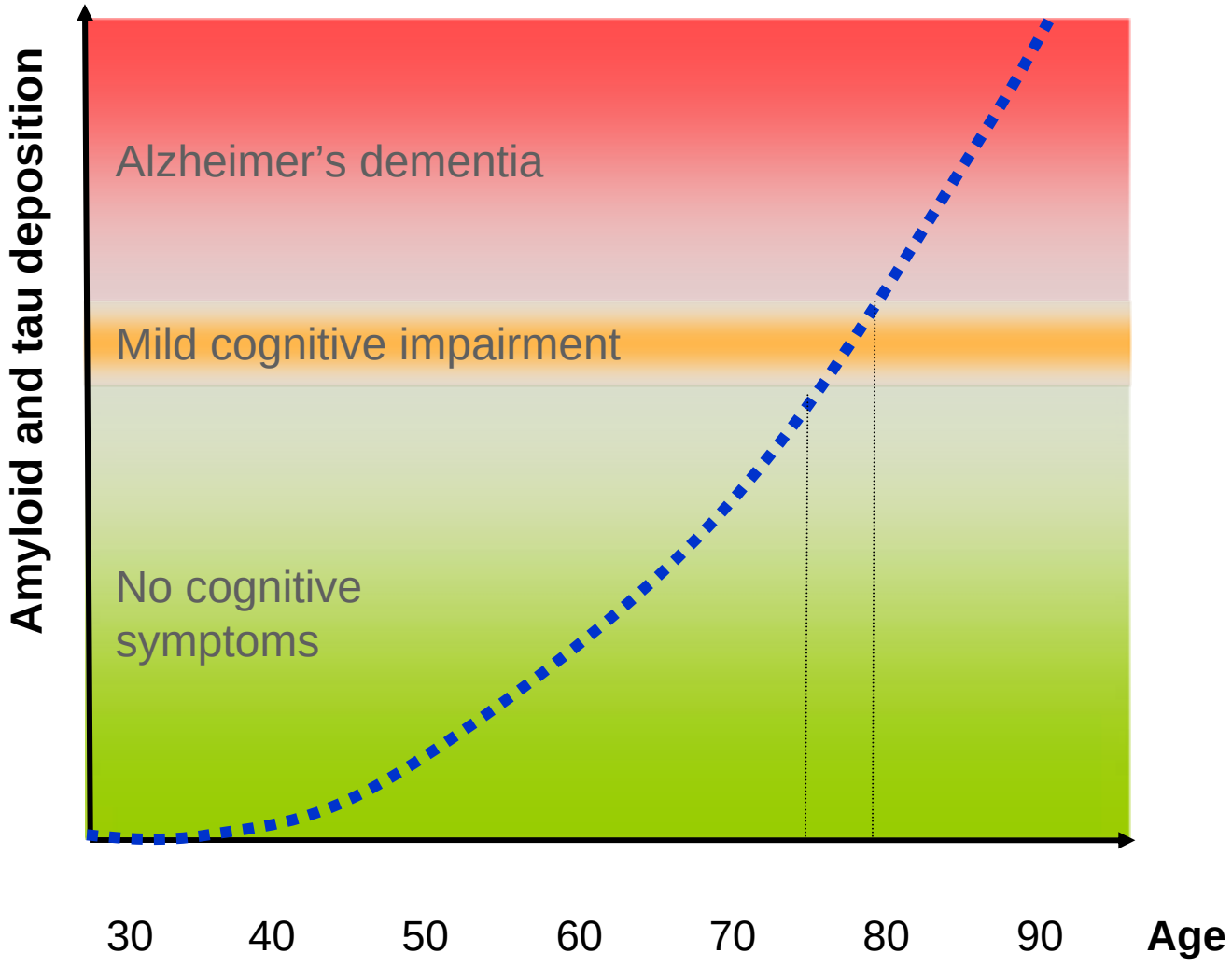
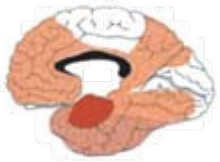
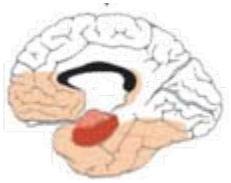
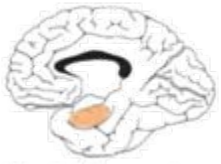
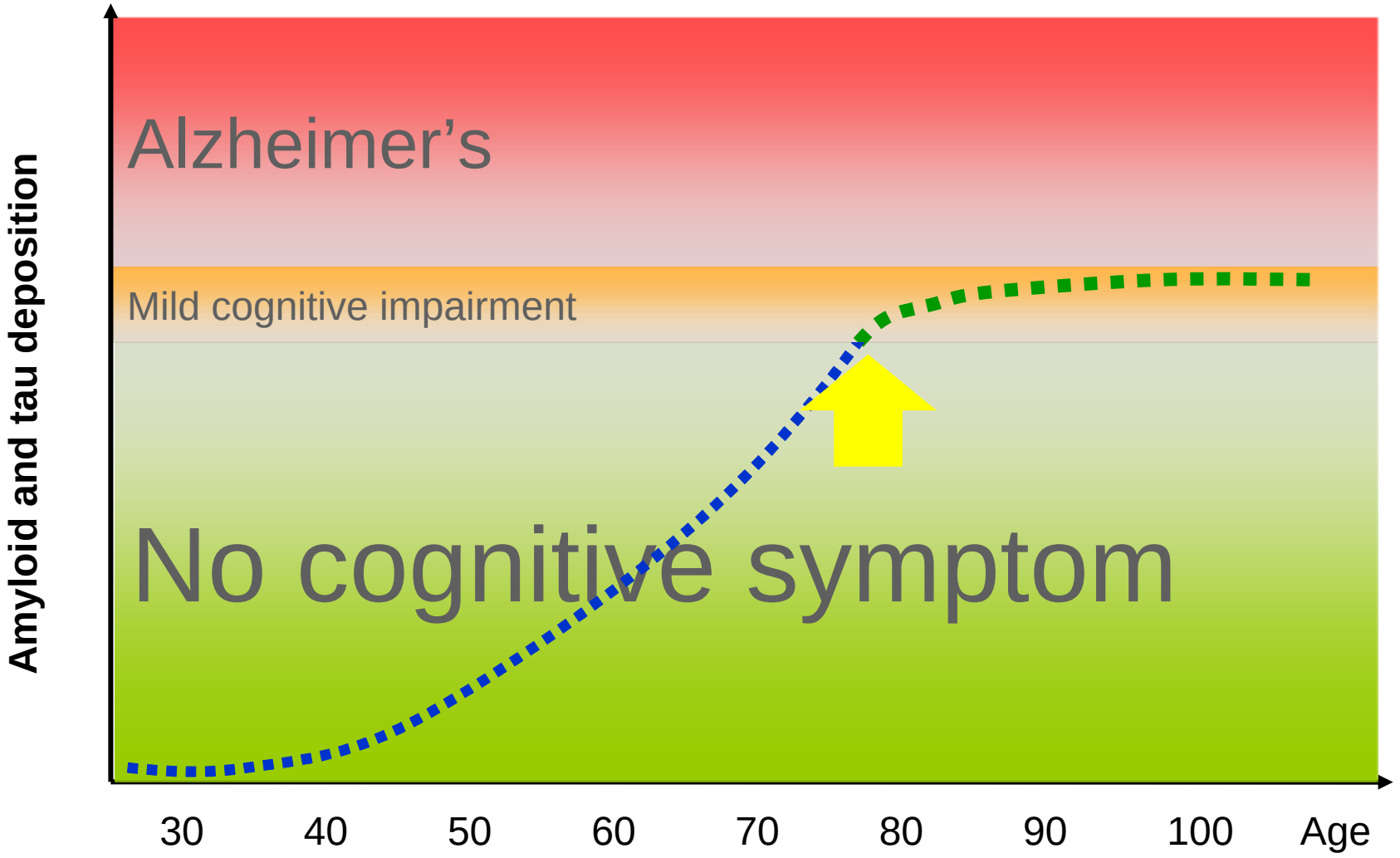
WHY DO NEUROSCIENTISTS NEED e-INFRASTRUCTURES TO STUDY AND TREAT ALZHEIMER'S DISEASE?

Current understanding of what constitutes Alzheimer's



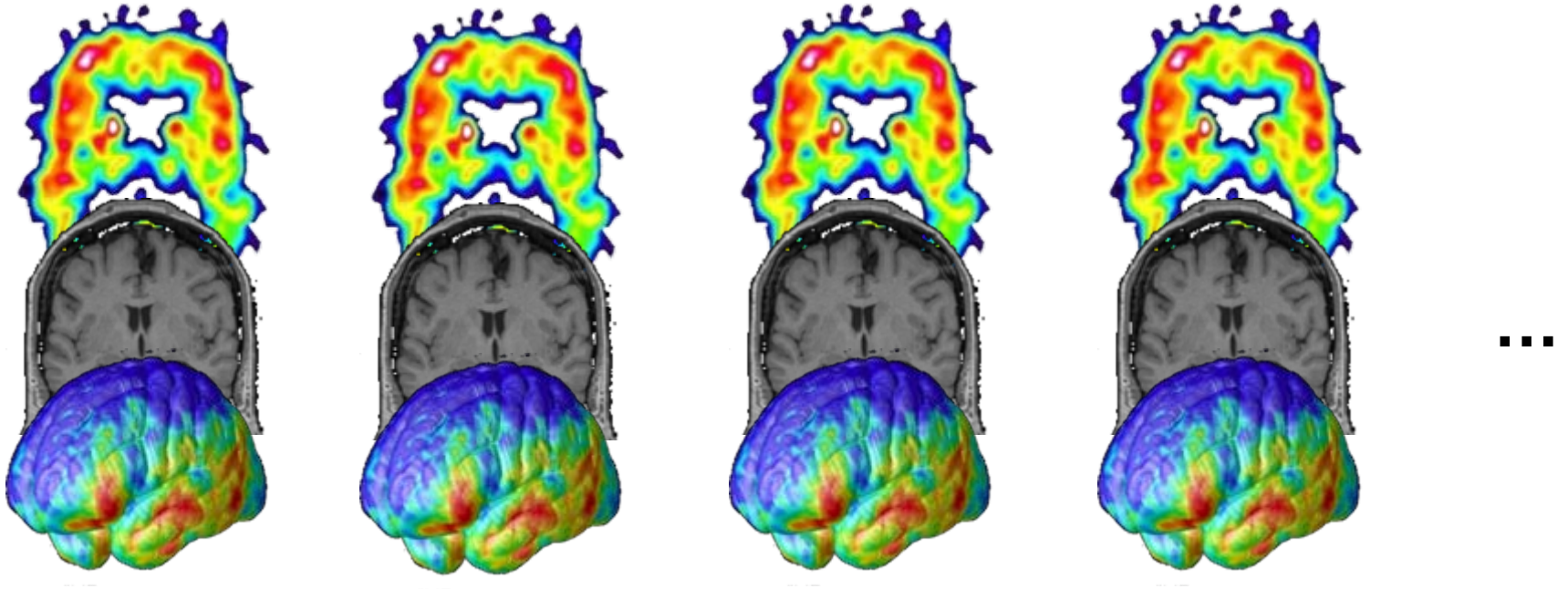
AD path.	Diagnosis
	Clinical
	With markers
	Impossible

Early diagnosis + anti-amyloid drugs



Recipe to develop markers for Alzheimer's disease:

1. Large databases ('0,000s) of very mildly affected patients

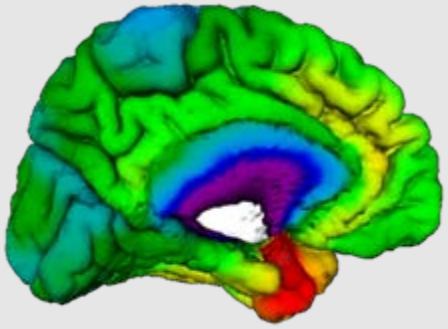
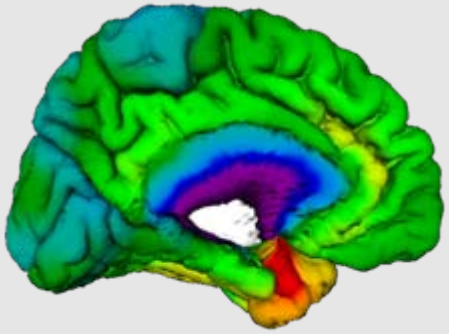
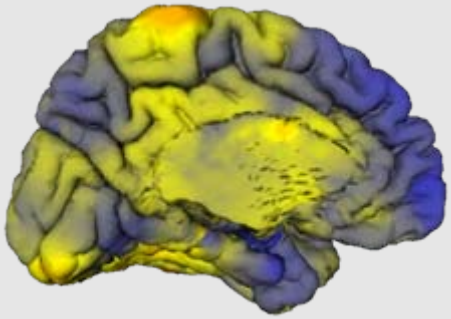
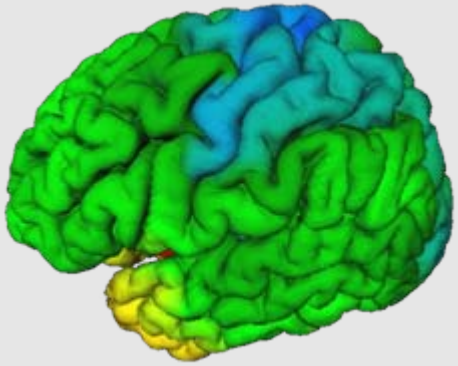
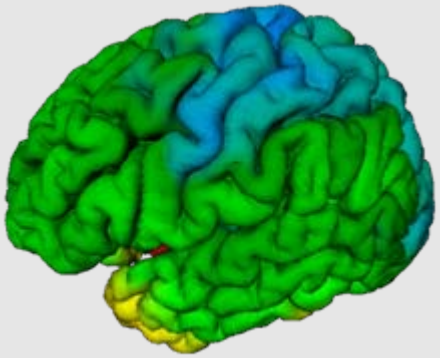
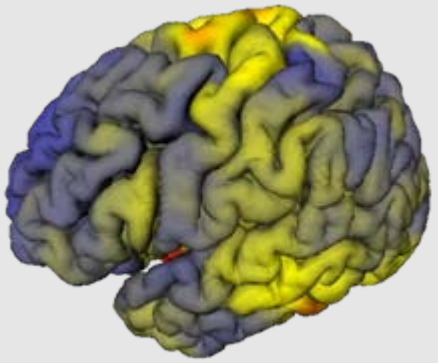


T0 T6 T12 T18 ...

US	**ADNI**	**≈10,000 images**
Australian	**ADNI (AIBL)**	**≈ 4,000 images**
Japanese	ADNI	(≈ 3,000 images)
European	ADNI (IMI Pharma-cog)	(≈ 1,500 images)

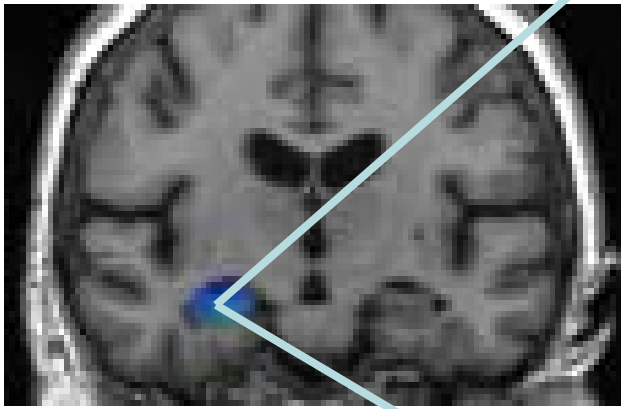
Recipe to develop markers for Alzheimer's disease:

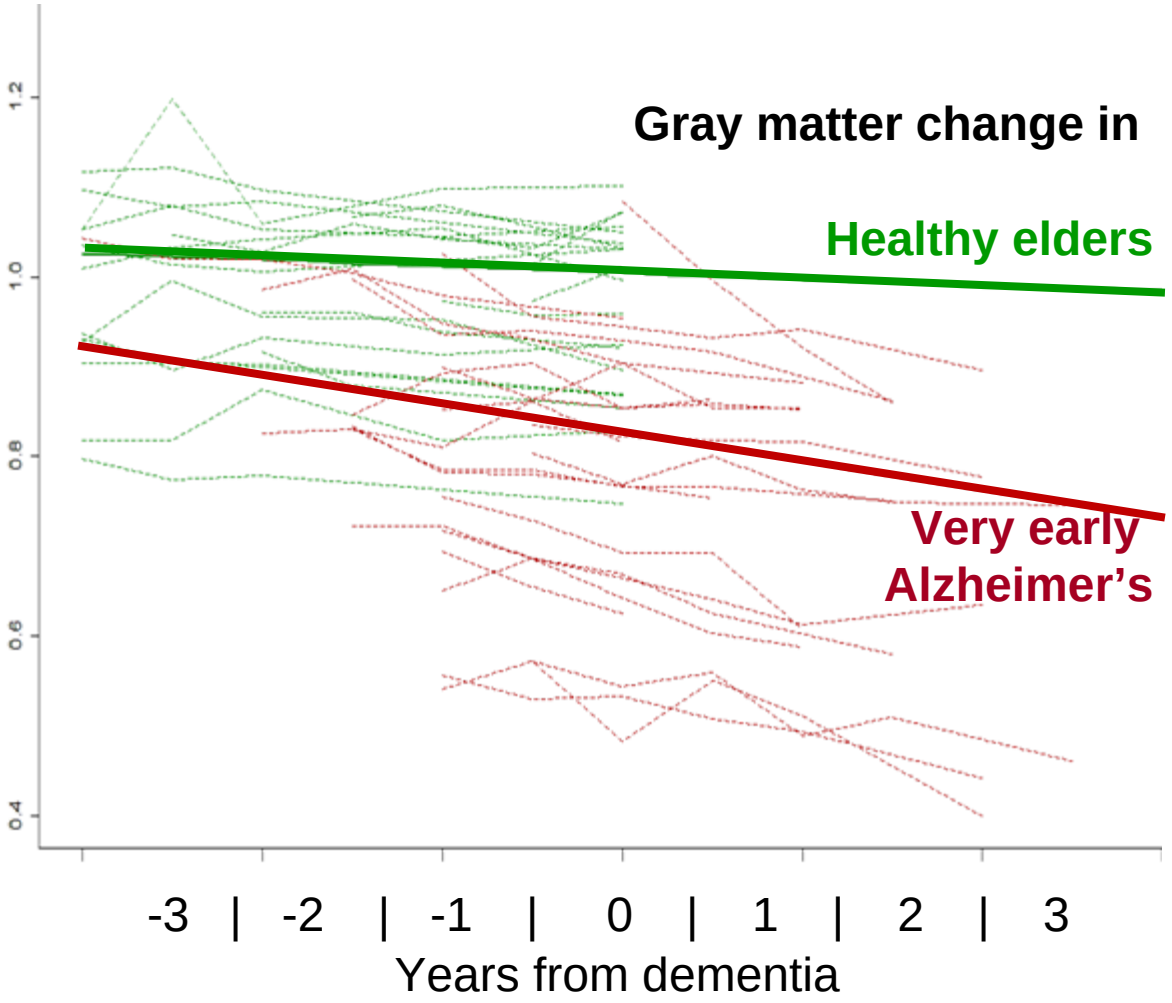
1. Large databases ('0,000s) of very mildly affected patients
2. Sophisticated algorithms for image analysis

Cortical thickness at month 0	Cortical thickness at month 30	Difference analysis
		
		
1.50 mm  4.50 mm		+.50  -.50

Recipe to develop markers for Alzheimer's disease:

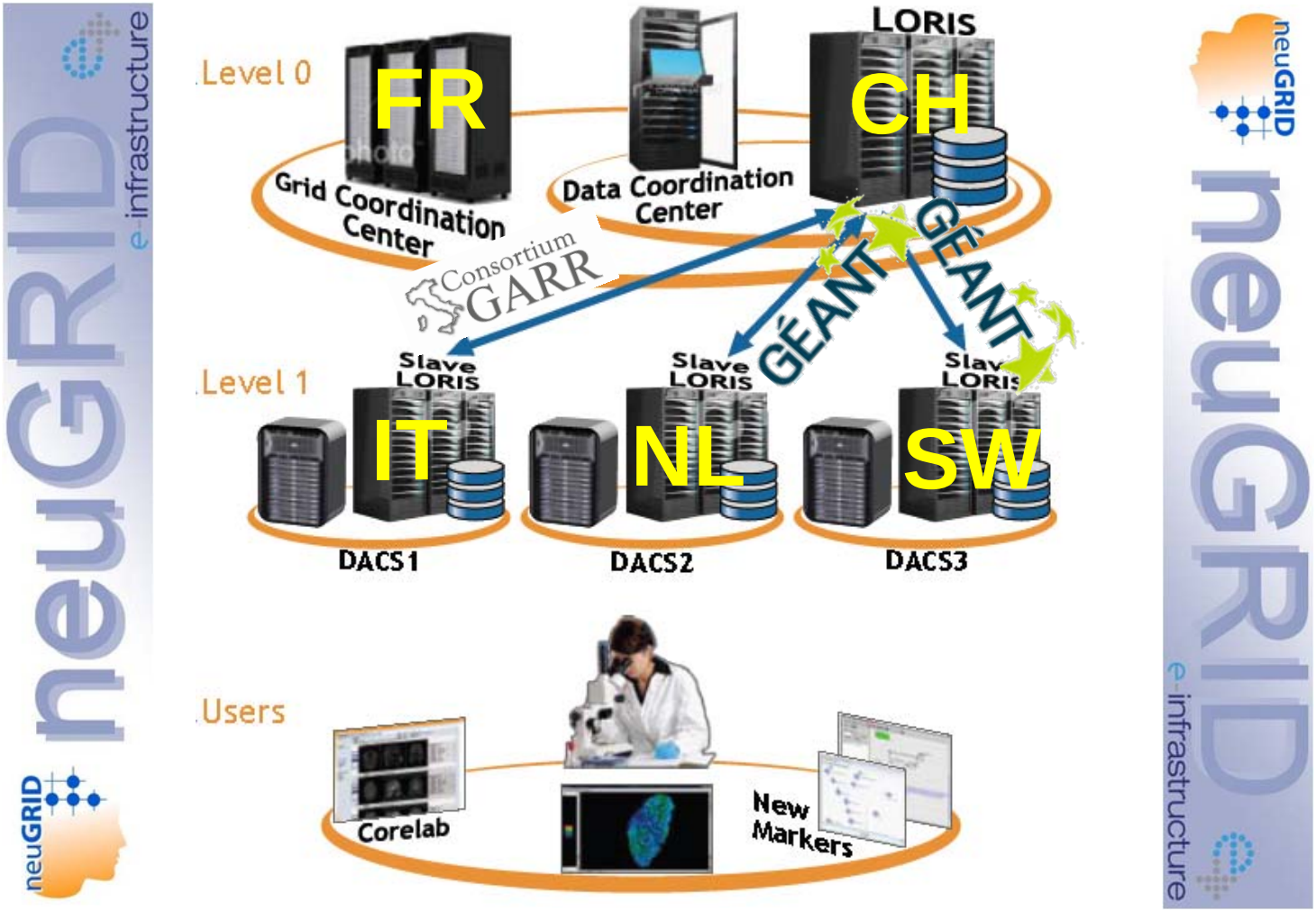
1. Large databases ('0,000s) of very mildly affected patients
2. Sophisticated algorithms for image analysis
3. Sophisticated statistical models





Recipe to develop markers for Alzheimer's disease:

1. Large databases ('0,000s) of very mildly affected patients
2. Sophisticated algorithms for image analysis
3. Sophisticated statistical models
4. Powerful computational resources

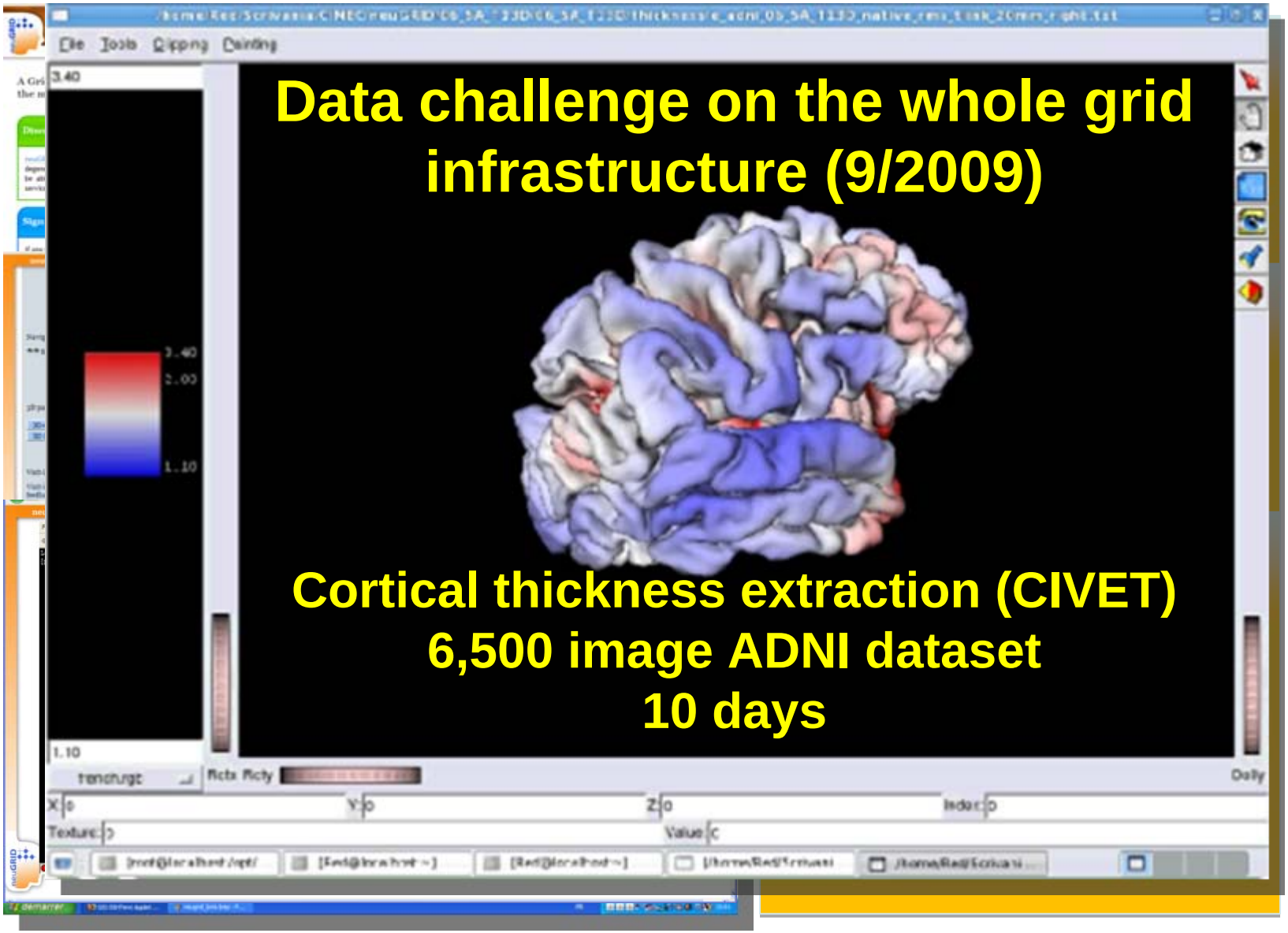


FP7 neuGRID

Computational grid- and Géant-based e-Infrastructure

- Includes world's largest image databases on Alzheimer's (US-ADNI, A-ADNI)
- Includes an advanced algorithm for cortical thickness extraction (McGill, Canada)
- Built general but to be expanded with more applications (i.e. stat models) when available
- Born with 450 cores, expandable "ad libitum"

Demonstration



Recipe to develop markers for Alzheimer's disease:

1. Large databases ('0,000s) of very mildly affected patients
2. Sophisticated algorithms for image analysis
3. Sophisticated statistical models
4. Powerful computational resources
5. Strong link with related international efforts

FP7 outGRID

A Worldwide e-Infrastructure for Computational Neuroscientists

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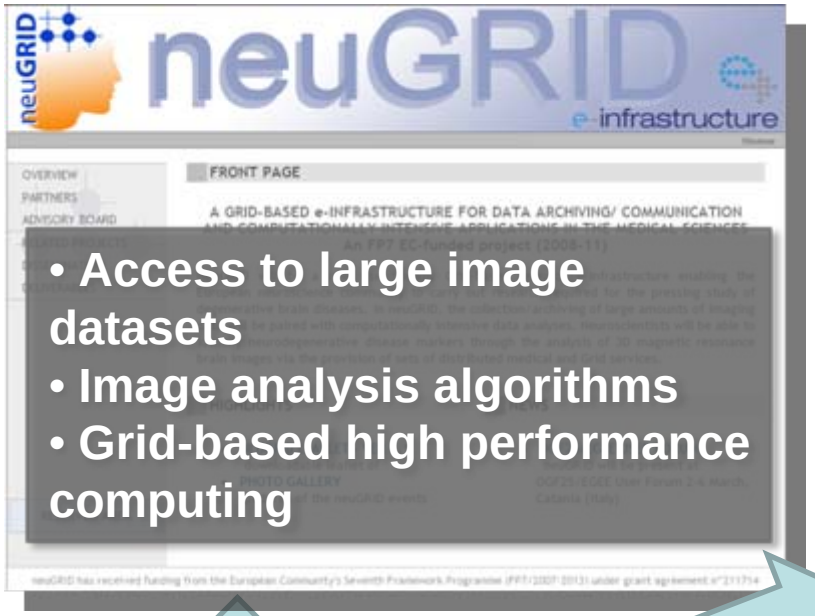
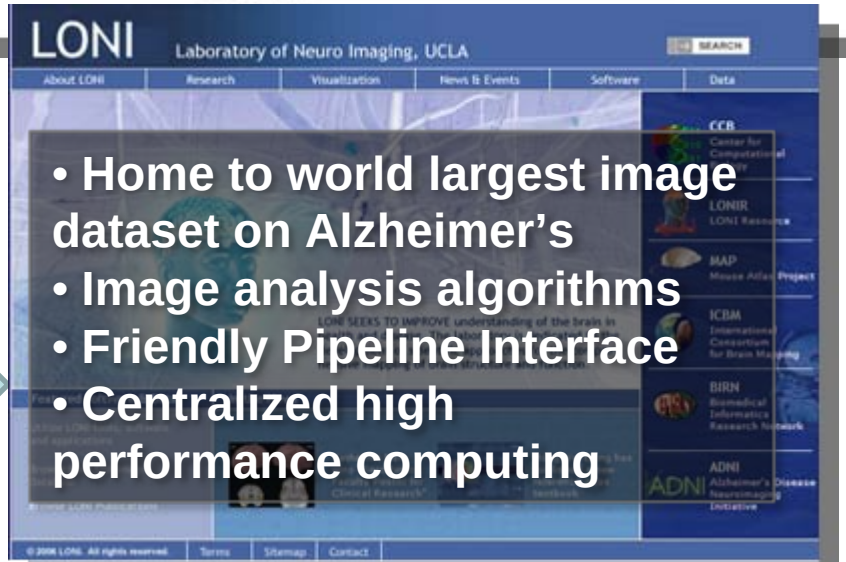




FP7 outGRID

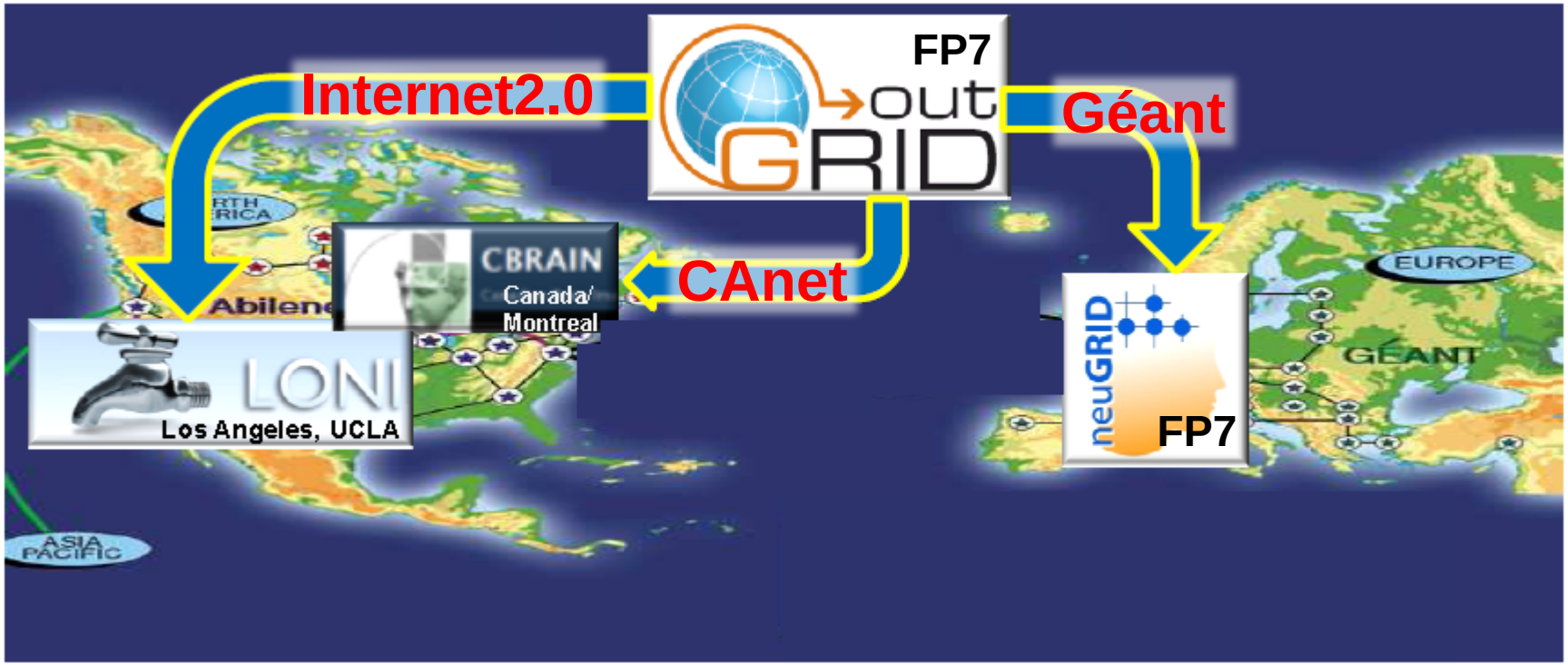
A Worldwide e-Infrastructure for Computational Neuroscientists

OBJECTIVES

- Define activities (including research and development) and outline technical specifications for interoperability
- Foster, within the project's lifetime, the maximum possible degree of interoperability allowed by this Support Action among the 3 infrastructures
- Lay the foundations for a larger research and development effort aimed to achieve full interoperability among the three infrastructures

THE GRAND VISION

A Worldwide e-Infrastructure for Computational Neuroscientists



Markers for diagnosis and of disease activity

	Diabetes	Alzheimer's
Diagnosis	Glicaemia	
Monitor treatment effect	Glycated hemoglobin	