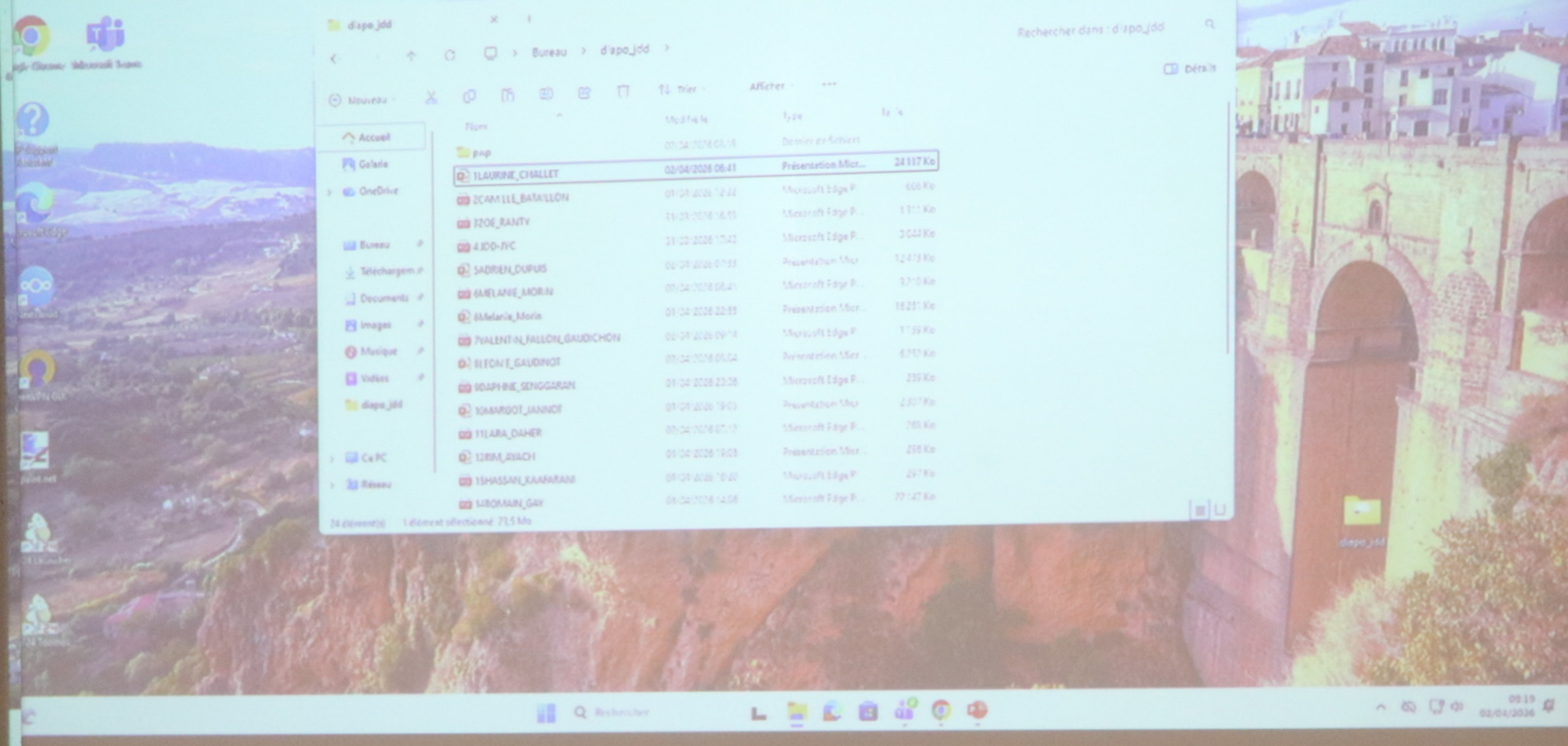




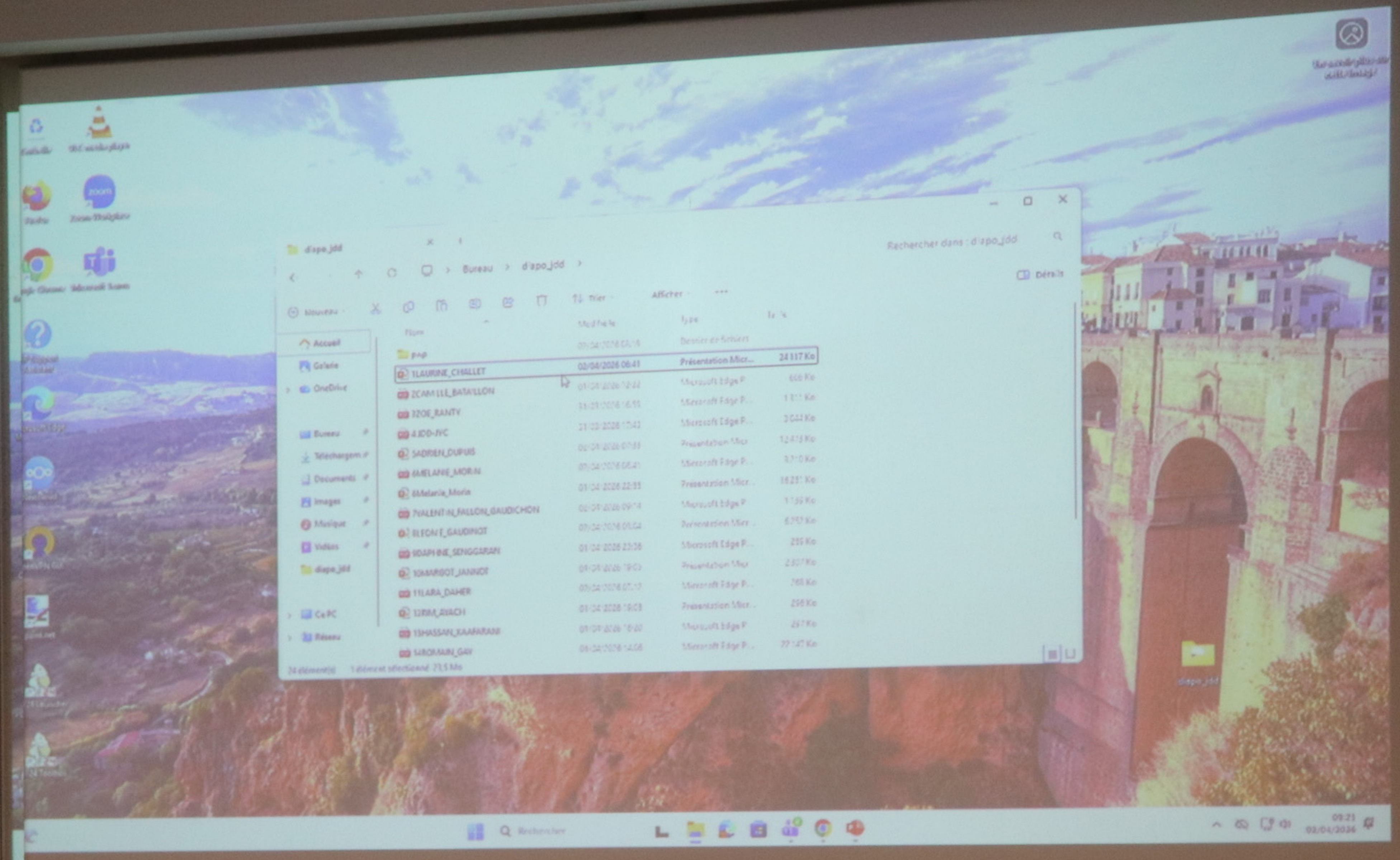
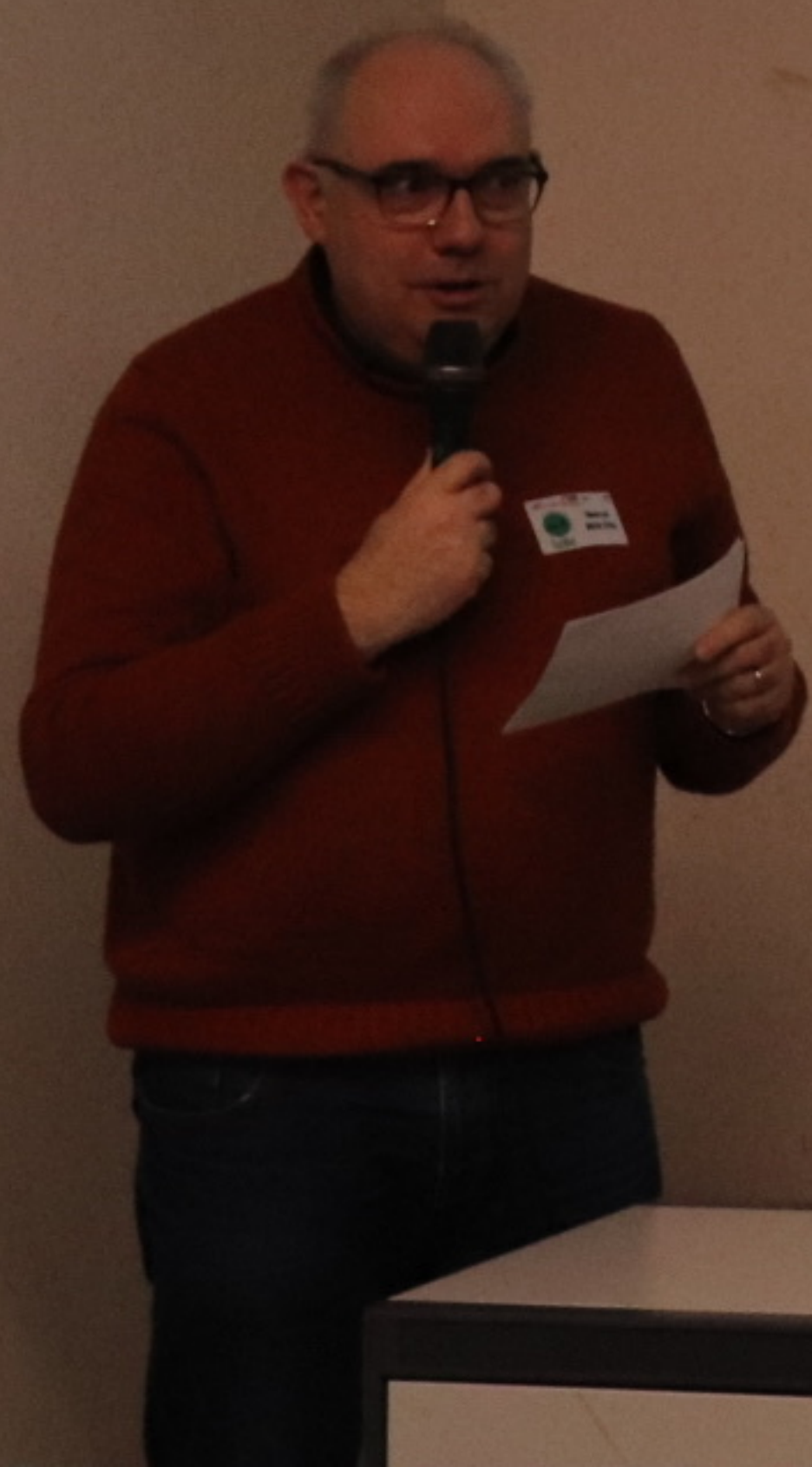




UT  
Nous vous rappelons  
qu'il est  
**FORMELLEMENT**  
**INTERDIT DE MANGER**  
**DANS LES SALLES.**  
Le secrétariat général

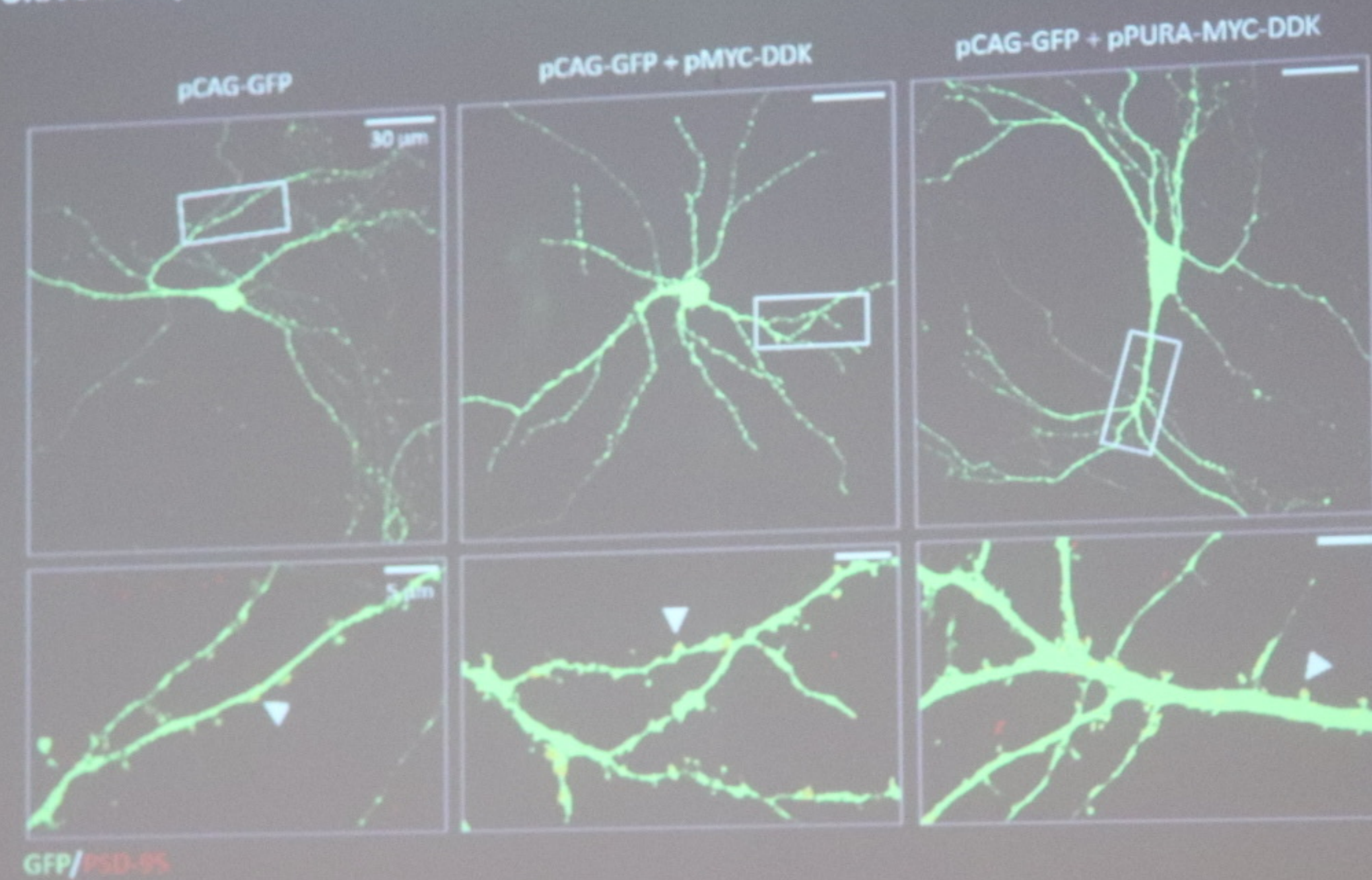




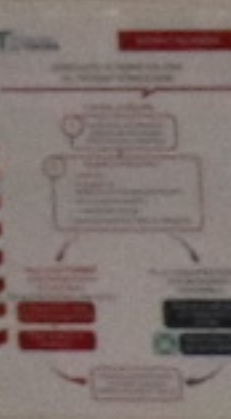




# Impact of PURA overexpression in developing mouse primary neuronal cultures



Nous vous  
qu'  
FORME  
INTERDIT  
DANS LE





# LANGUAGE IMPAIRMENT IN NEURODEVELOPMENTAL DISORDERS

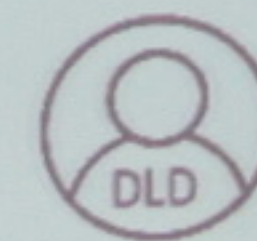
Language Impairment (LI) → most frequently reported developmental difficulties in childhood

Language difficulties → sensitivity to phonological & morphosyntactic complexity (reception & expression), consistent with the Computational Complexity Hypothesis (CCH) (Jakubowicz, 2003)

CCH: Syntactic complexity

Less complex structures → Fewer syntactic operations  
(e.g. in-situ wh-questions)

More complex structures → More operations, including movement (e.g. ex-situ wh-questions)



→ Persistent, heterogeneous language disorder affecting comprehension and/or production, with variable severity and significant impact on daily functioning (Bishop et al., 2017)

Children with DLD = difficulties with complex syntactic structures, especially complex constructions involving syntactic movement and subordination (Schaeffer et al., 2023; Riches, 2010)



# PERCEPTION – SENSORIAL PROCESSING

Repetition



Elementary property of central nervous system

Sensory adaptation

Regularity encoding

Repetition Suppression (RS) :



Repetition

Neural response with stimulus repetition

Classic oddball paradigm

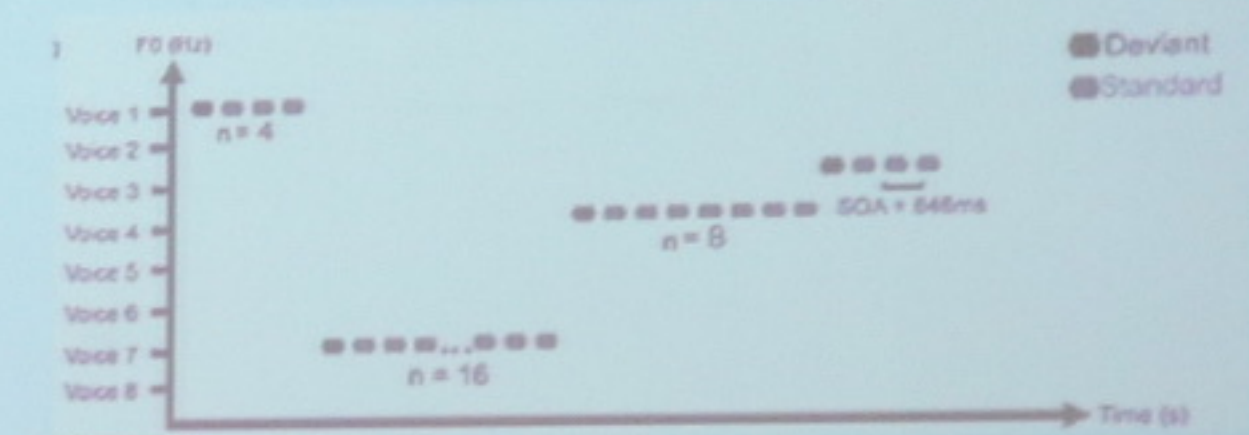


No update of memory trace

Unsuitable paradigm  
Not enough repetitions  
Not enough participants

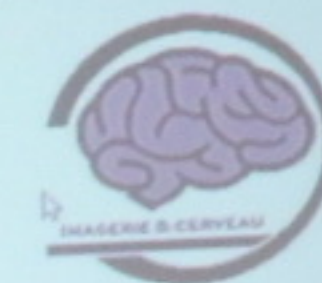
How to study neural adaptation ?

Roving paradigm



(Ruiz-Martinez et al., 2020; Martineau et al., 1992; Kolesnik et al., 2019)





## Deep learning algorithms for the diagnosis of neuropsychiatric disorders from neuroimaging data

Jacques-Yves Campion, MD-PhD Student

Pr Thomas Desmidt, Tours

Dr Karim Helmet, Pittsburgh



Nous vous rappelons  
qu'il est  
FORMELLEMENT  
**INTERDIT DE MANGER**  
DANS LES SALLES.







omics approach

Supervised by Pr. Hélène Blasco and Dr. Charlotte Veyrat-Durebex

Adrien Dupuis

1st-year PhD student

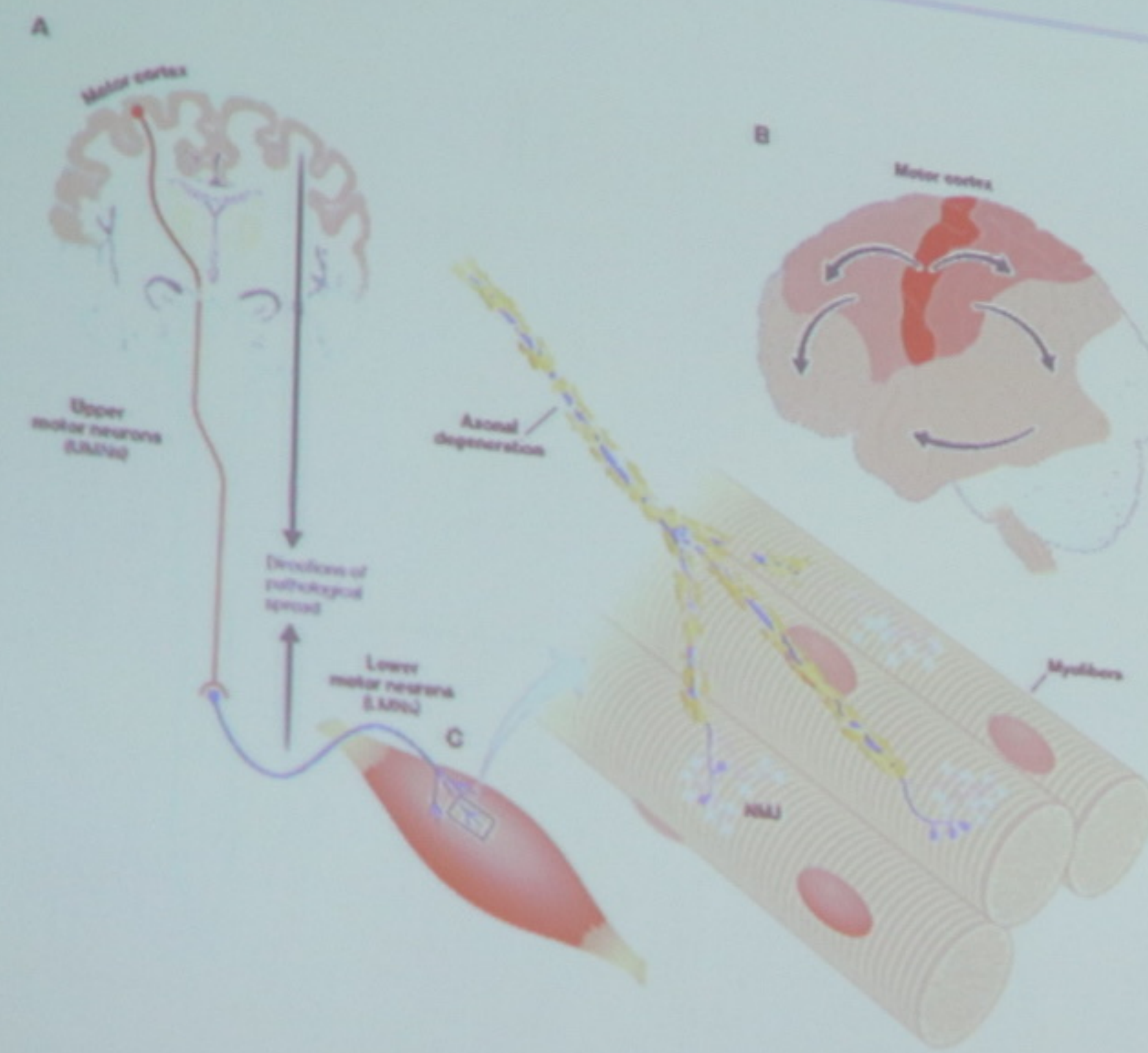




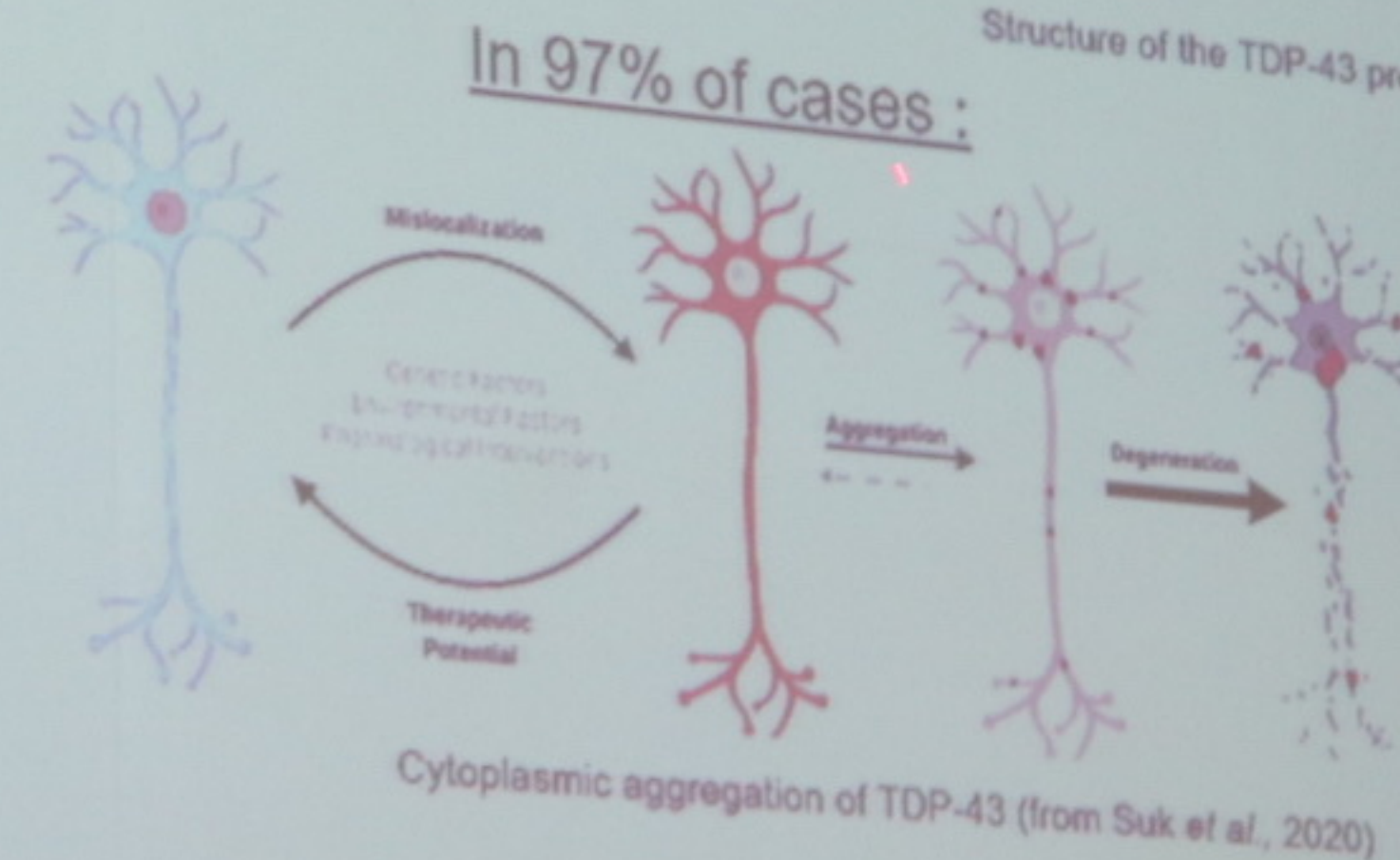
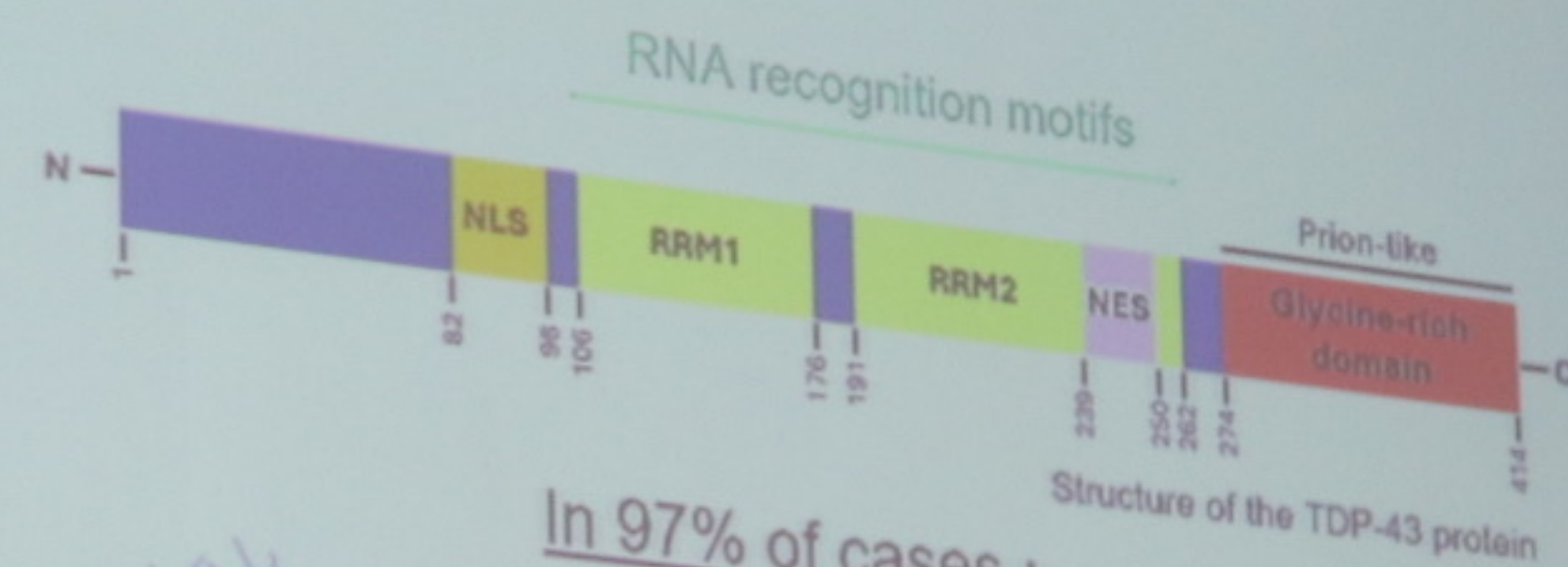




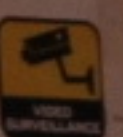
# Amyotrophic Lateral Sclerosis (ALS) and TDP-43



From Cicardi et al., 2021



→ No diagnostic or prognostic markers identified; no curative treatment



us vous rappelons  
qu'il est  
FORMELLEMENT  
INTERDIT DE MANGER  
DANS LES SALLES.

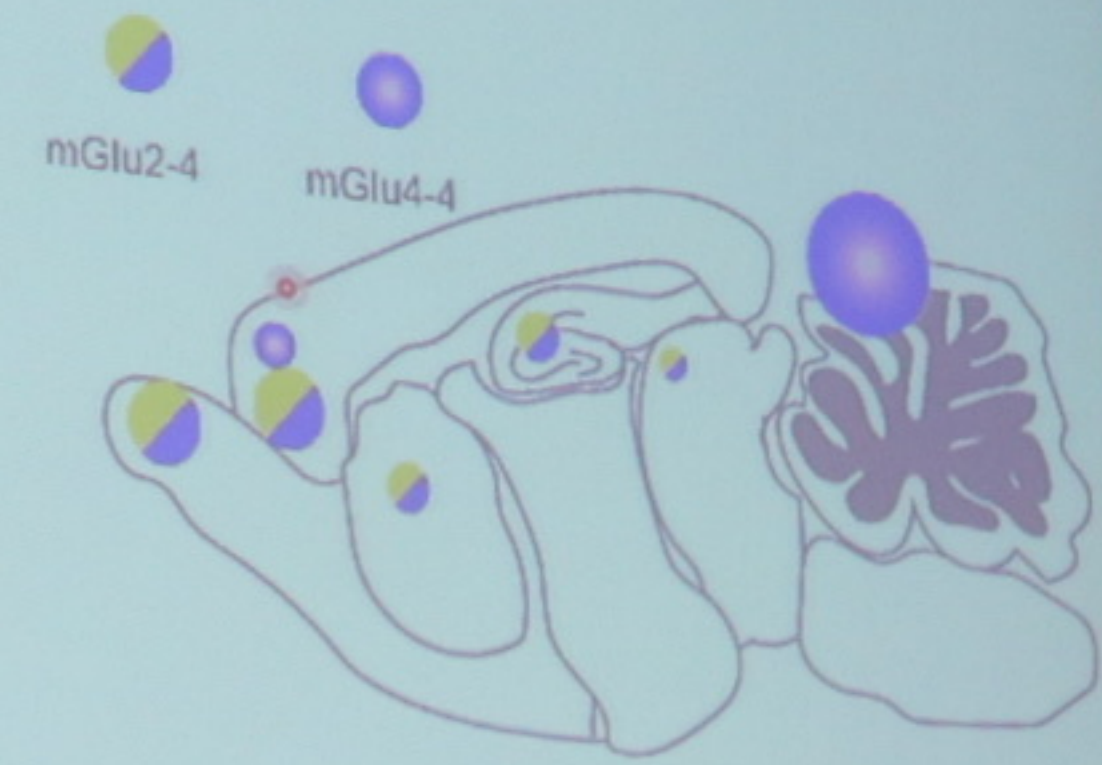




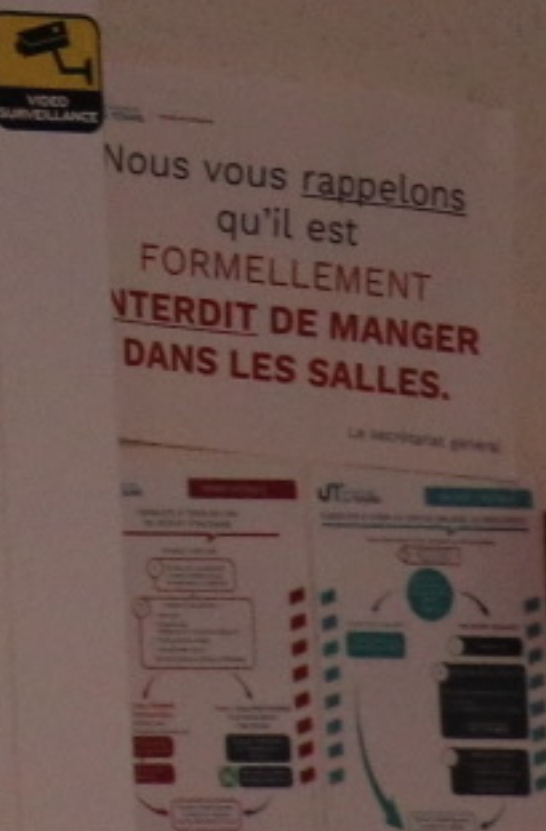
# Introduction

Metabotropic receptor family (G protein-coupled receptors)

- 3 different groups mGlu4: group III
- Coupled to a  $G_{i/o}$  inhibition of cAMP production
- Presence of mGlu4/mGlu2 heterodimeric forms in the striatum



J. Meng et al, 2022 (P. Rondard)







LABORATOIRE D'INFORMATIQUE FONDAMENTALE ET APPLIQUÉE DE TOURS



exact  
CENTRE D'EXCELLENCE AUTISME ET IND

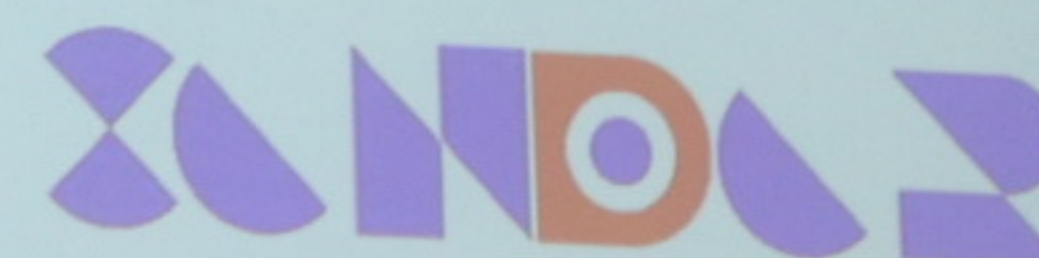
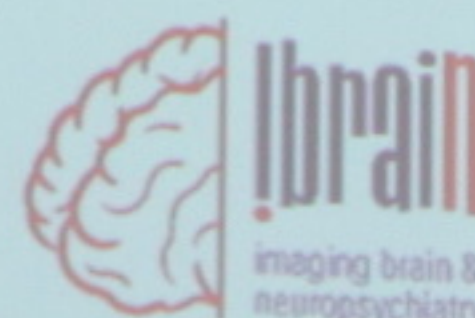


10

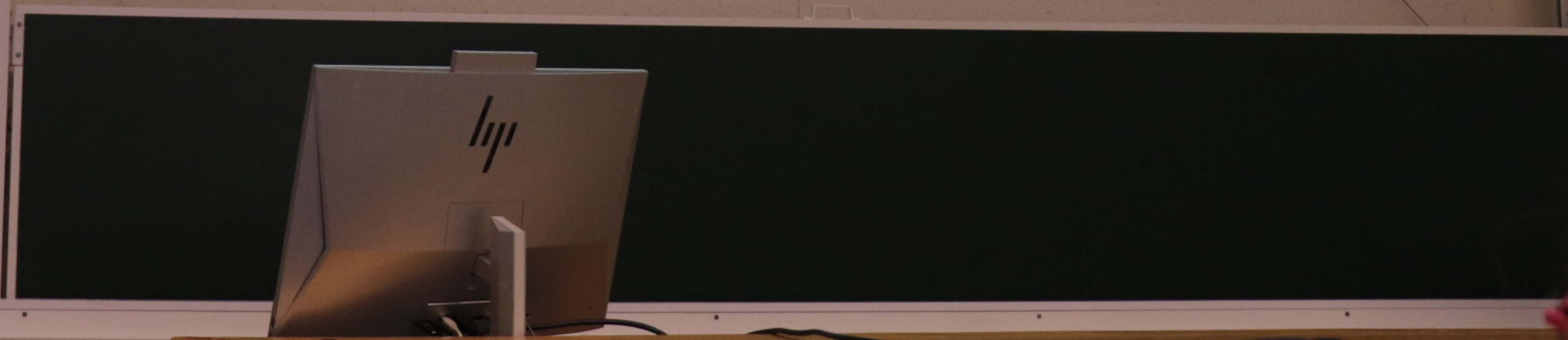
# Thank you for your attention

Inserm

La science pour la santé  
From science to health



Fallon Gaudichon Valentin - CHRU Tours



Nous vous  
qu'il  
FORMELL  
INTERDIT DE  
DANS LES



# FROM THE CLINICAL FIELD



## ACCEPTABILITY AND EFFICACY OF DEEP PRESSURE TOOL IN AUTISM SPECTRUM DISORDER

### 1. Focus groups and simulations



Thematic  
analyse : Sonal +  
Whisper



Participative  
research

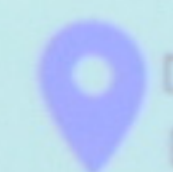


Groups



Children with ASD  
Parents  
Professionals

### 1. Mixt study observational retrospective and qualitative semi-structured interviews



Day hospital  
Bretonneau



SRQR  
checklist



- Perception of clinicians
- Effects on each child
- Usage characteristics



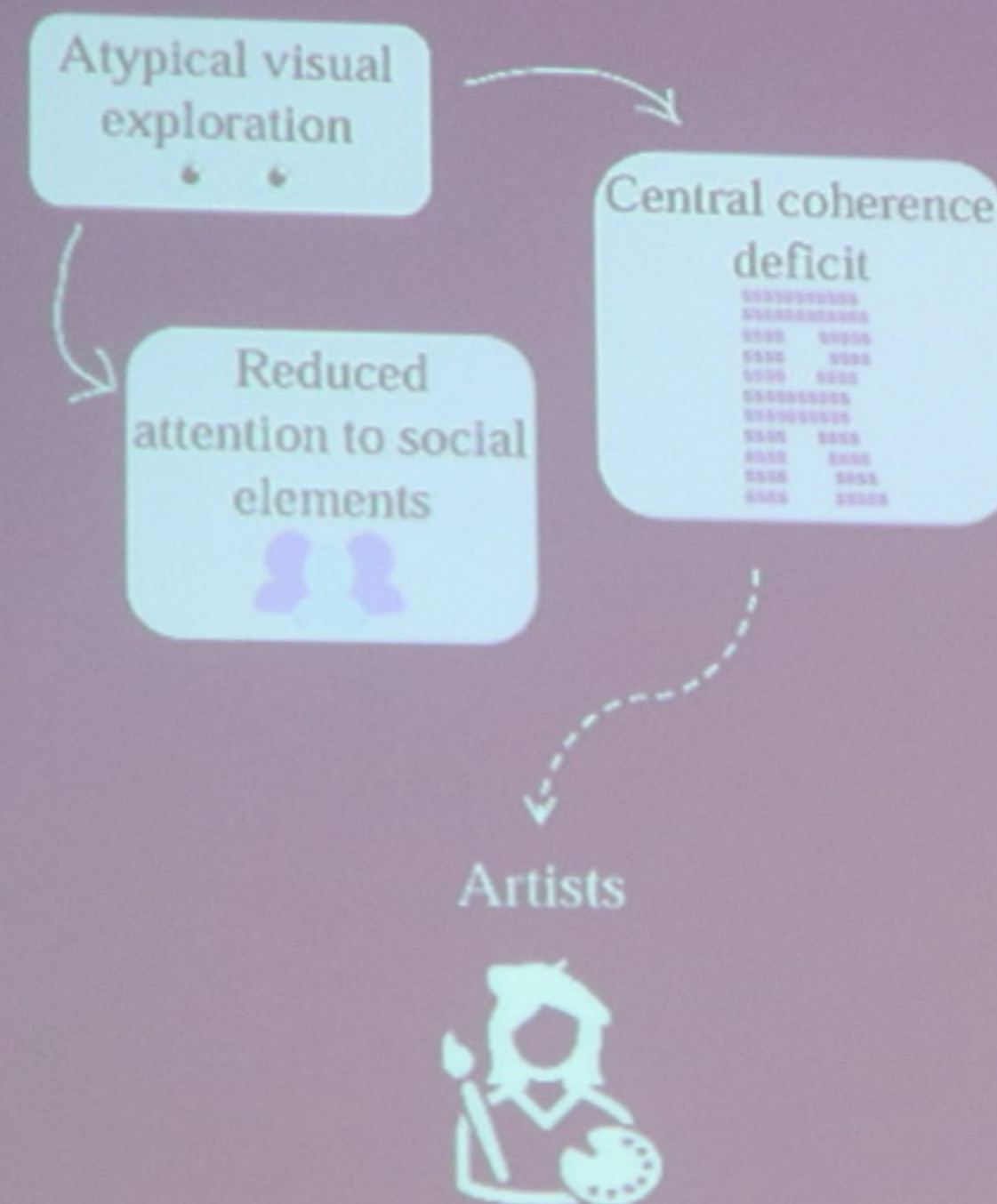


# An oculometric, pupillometric and heart rate analysis of painting perception in autistic, artist, and neurotypical individuals

D. Senggaran, R. Jusiak, O. Lehmann, C. Wardak, E. Houy-Durand, S. Morel-Kohlmeier, A. Kerkourima, A. Chetouani, N. Aguilhon-Hernandez



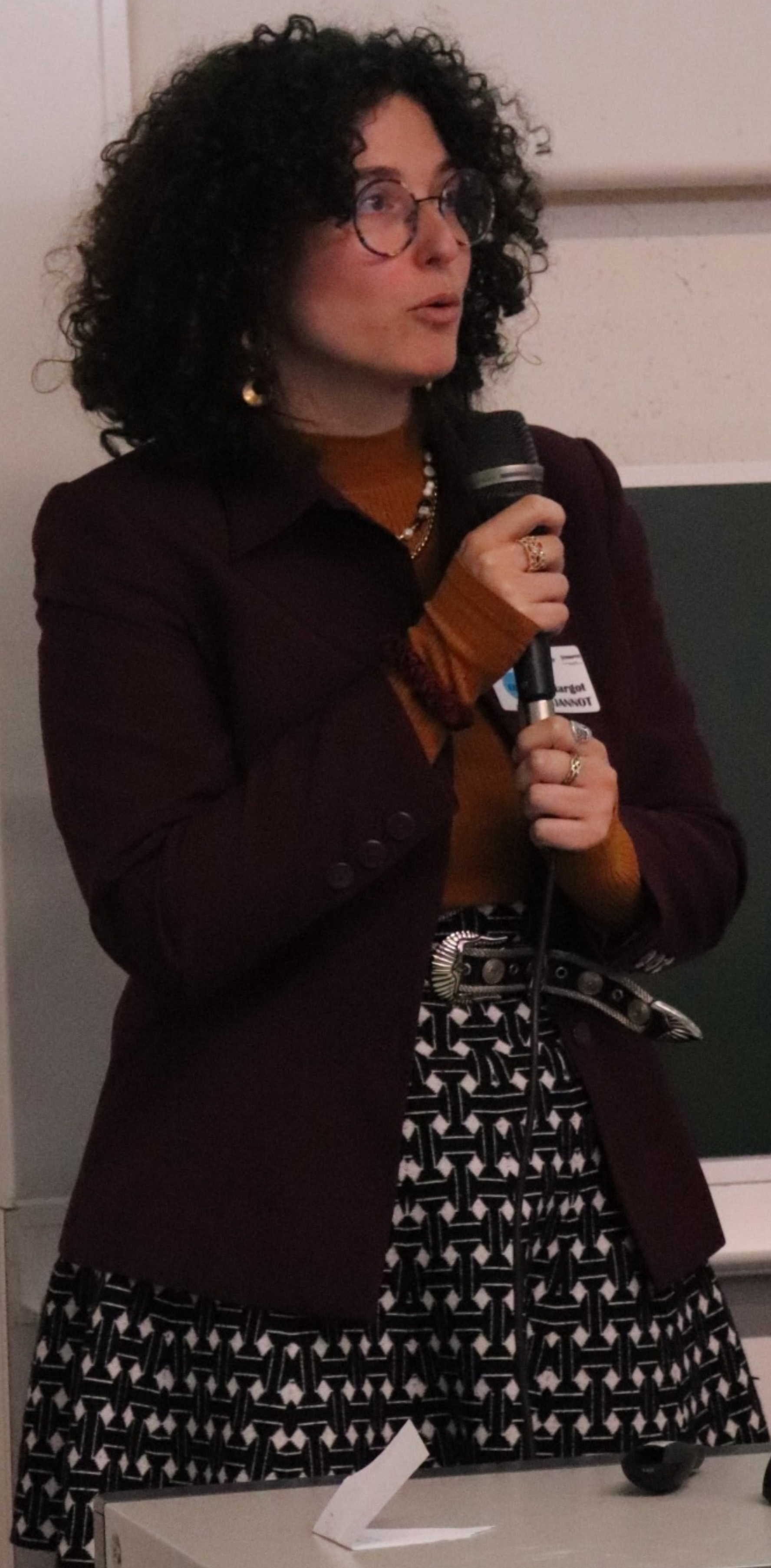
## Autism Spectrum Disorder



Artists









## Why this study?

- French written system = complex
- Opacity
  - Inconsistencies
  - Irregularities

### Dual-route model Two strategies

  
Phonological  
route

  
Lexical  
route

? What predicts spelling at the very beginning of literacy acquisition?

## Method

344  
Children

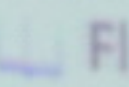
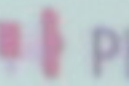
 Kindergarten (T1) - Potential predictors of spelling (12)  
Vocabulary · Expressive phonology · Phonol. awareness · Phonol. discrimination · Letter knowledge · RAN · Fluency · short term & working memory · NVR · Processing speed · Concept of print

1 year later

 Grade 1 (T2) - Spelling  
Dictation of pseudowords - Phonological scoring  
Dictation of regular words - Phonological & Orthographic scoring

## Conclusion

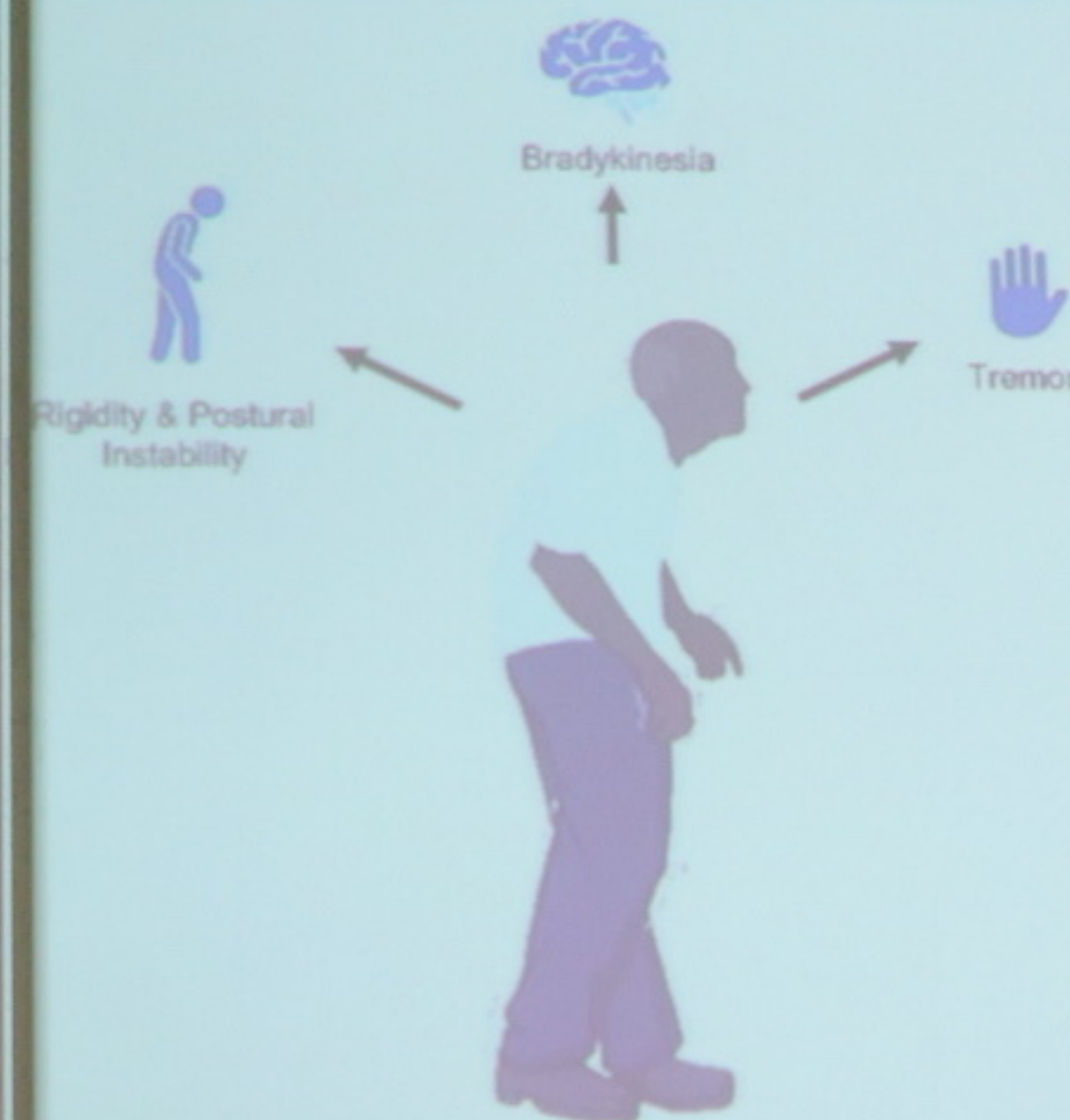
 Strongest predictors  
→ Letter knowledge  
→ Phonological awareness

 + Specific predictors  
 Fluency → Regular words  
 Phonol. discrimination → Pseudowords





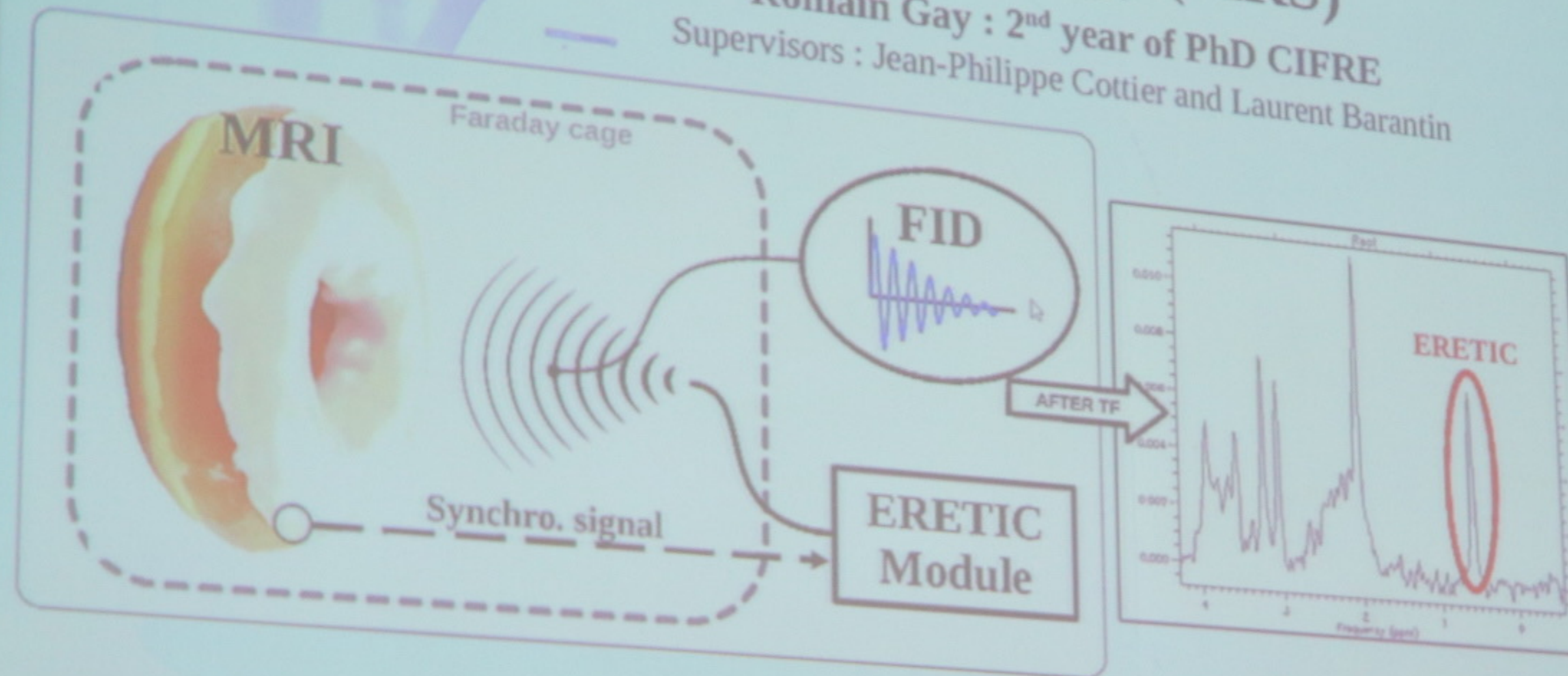
# Eliminate toxic $\alpha$ -synuclein in neurons? Let's make it **POSSIBLE**!





# Development of absolute quantification in 2D and 3D *in vivo* magnetic resonance spectroscopy (MRS)

Romain Gay : 2<sup>nd</sup> year of PhD CIFRE  
Supervisors : Jean-Philippe Cottier and Laurent Barantin



- Improve the reproducibility
- Extend to CSI 2D and 3D
- Build a reliable circuit
- Test on patients



us vous rappelons  
qu'il est  
FORMELLEMENT  
INTERDIT DE MANGER  
DANS LES SALLES.













## Visual perception

A. Chetouani<sup>1</sup>, N. Aguilon-Hernandez<sup>1</sup>  
<sup>1</sup> Inserm, Centre for Autism and  
Innovative Therapies, Paris, France.

### Aim of the study:

Analyze visual exploration strategies (fixation time), emotional reactivity, and autonomic regulation (pupil dilation and heart rate) in response to paintings with social and non-social content in adults with ASD, artists, and neurotypical individuals.

Eye-tracker system SMI RED500<sup>®</sup> (500 Hz)  
Biopac MP36<sup>®</sup> with electrodes

### Analysis:

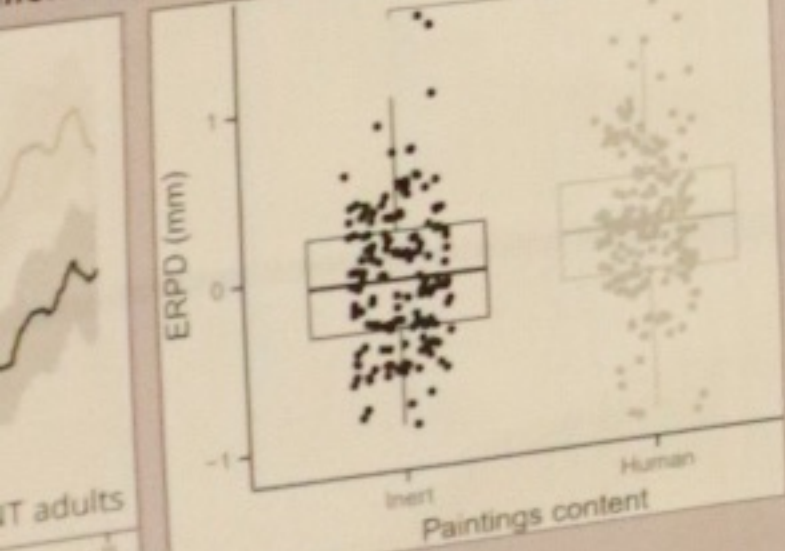
→ Kruskal-Wallis test +  
Dunn post hoc test /  
Wilcoxon test

→ Linear mixed model

→ Kruskal-Wallis test +  
Dunn post hoc test

Test the effect of  
paintings content  
between our 3  
groups / within a  
group

### Fluorimetry



Induce a higher pupil dilation than  
results for artists and ASD groups)

### Heart rate

→ Increased duration of RR intervals during  
paintings visualisation compared to baseline =  
Decrease of heart rate while watching the  
paintings

→ Higher increase of RR intervals duration for NT  
than for artists and ASD when presenting  
paintings with inert content  
Higher increase of RR intervals duration for NT  
than for ASD when presenting paintings with  
human content

### Contact



Scan here to contact us or  
download this poster:

neurotypicals  
the idea of  
groups, reflecting  
exhibit greater  
stabilization for

ly in the way  
the ASD group,  
trum.

nal processing

Service scolaire  
Grand amphithéâtre  
SID.com









étéria















Agrodice

PROLOGUE 2022-2023

Id-Pros and Rep-Pros: tasks involving linguistic and emotional prosody, from development to preliminary results in Autism Spectrum Disorder (ASD)

Margot Jarrot

Inserm

production

Prosody plays an important role in expression and in comprehension of language and emotions. It is a key factor in the development of language and communication skills. It is a key factor in the development of language and communication skills.

Method:

validation

4 conditions

50 words

→ Matched pairs

Ex: prosody

Identification

Results:

Validation

Performance

Prosody

Emotion

ASD

Conclusion

ASD

ASD

ASD

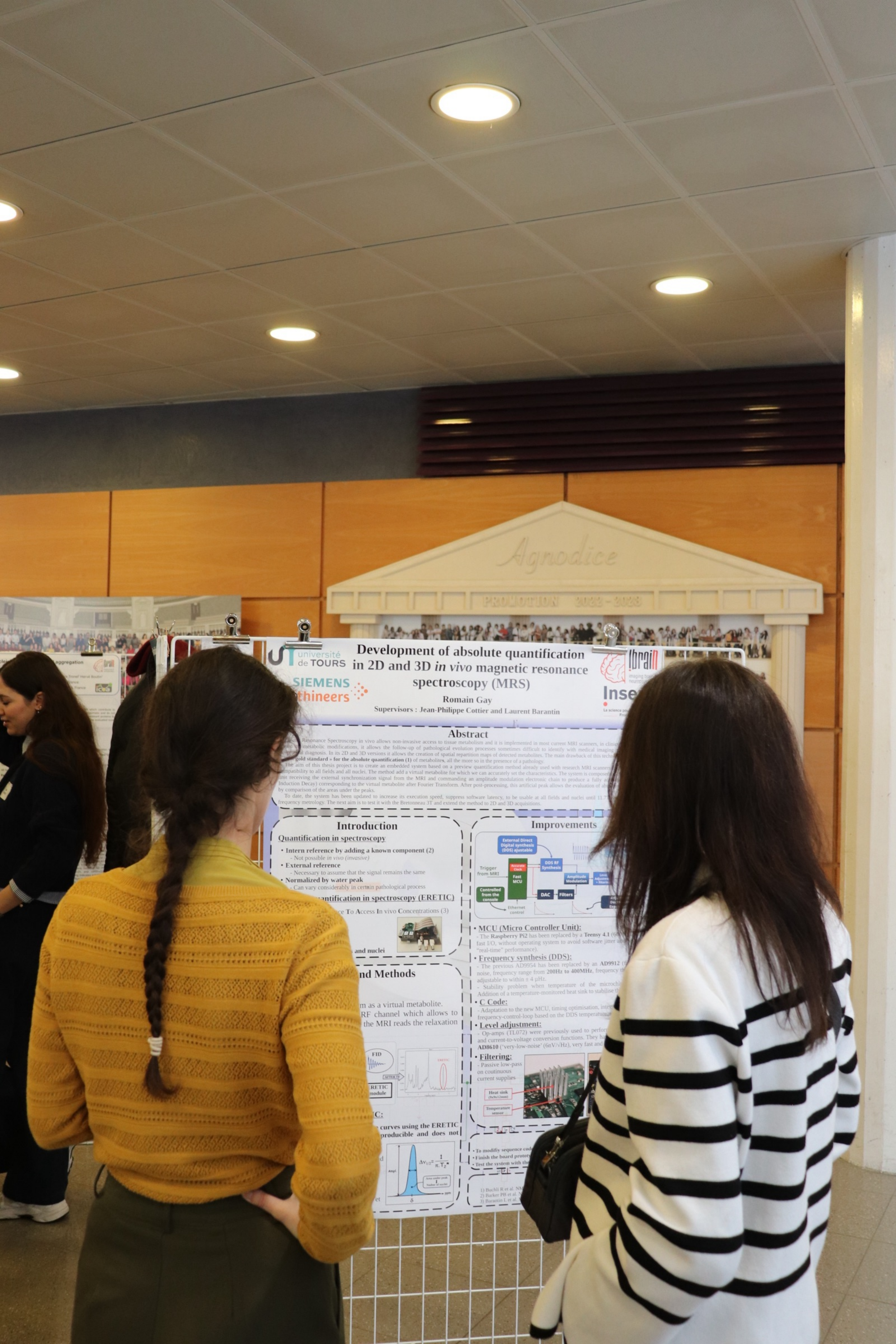
ASD

ASD









# Development of absolute quantification in 2D and 3D in vivo magnetic resonance spectroscopy (MRS)

Romain Gay  
Supervisors : Jean-Philippe Cottier and Laurent Barantin



## Abstract

Magnetic Resonance Spectroscopy in vivo allows non-invasive access to tissue metabolism and it is implemented in most current MRI scanners, in clinical practice. However, due to metabolic modifications, it allows the follow-up of pathological evolution processes sometimes difficult to identify with medical imaging. In its 2D and 3D versions it allows the creation of spatial repartition maps of detected metabolites. The main drawback of this technique is the lack of a gold standard for the absolute quantification (1) of metabolites, all the more so in the presence of a pathology. The aim of this thesis project is to create an embedded system based on a preview quantification method already used with research MRI scanners. This system is compatible to all fields and all nuclei. The method add a virtual metabolite for which we can accurately set the characteristics. The system is composed of a unit receiving the external synchronization signal from the MRI and commanding an amplitude modulation electronic chain to produce a fully adjustable (Induction Decay) corresponding to the virtual metabolite after Fourier Transform. After post-processing, this artificial peak allows the evaluation of absolute quantification by comparison of the areas under the peaks. To date, the system has been updated to increase its execution speed, suppress software latency, to be usable at all fields and nuclei until 11.7T. The next aim is to test it with the Bretonneau 3T and extend the method to 2D and 3D acquisitions.

## Introduction

### Quantification in spectroscopy

- Intern reference by adding a known component (2)
  - Not possible in vivo (invasive)
- External reference
  - Necessary to assume that the signal remains the same
- Normalized by water peak
  - Can vary considerably in certain pathological process

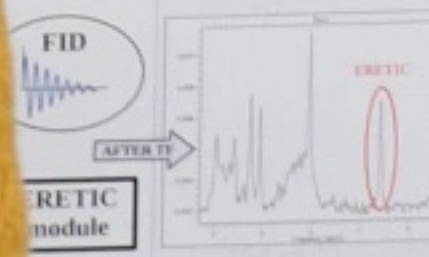
### Quantification in spectroscopy (ERETIC)

Access To Access In vivo Concentrations (3)

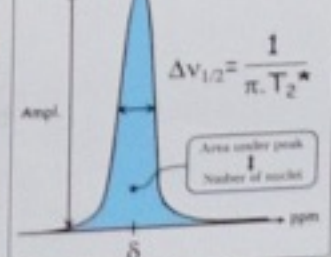


## and Methods

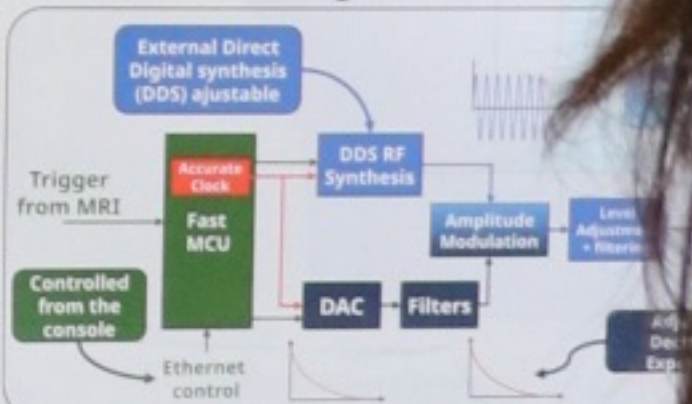
as a virtual metabolite. RF channel which allows to the MRI reads the relaxation



curves using the ERETIC reproducible and does not



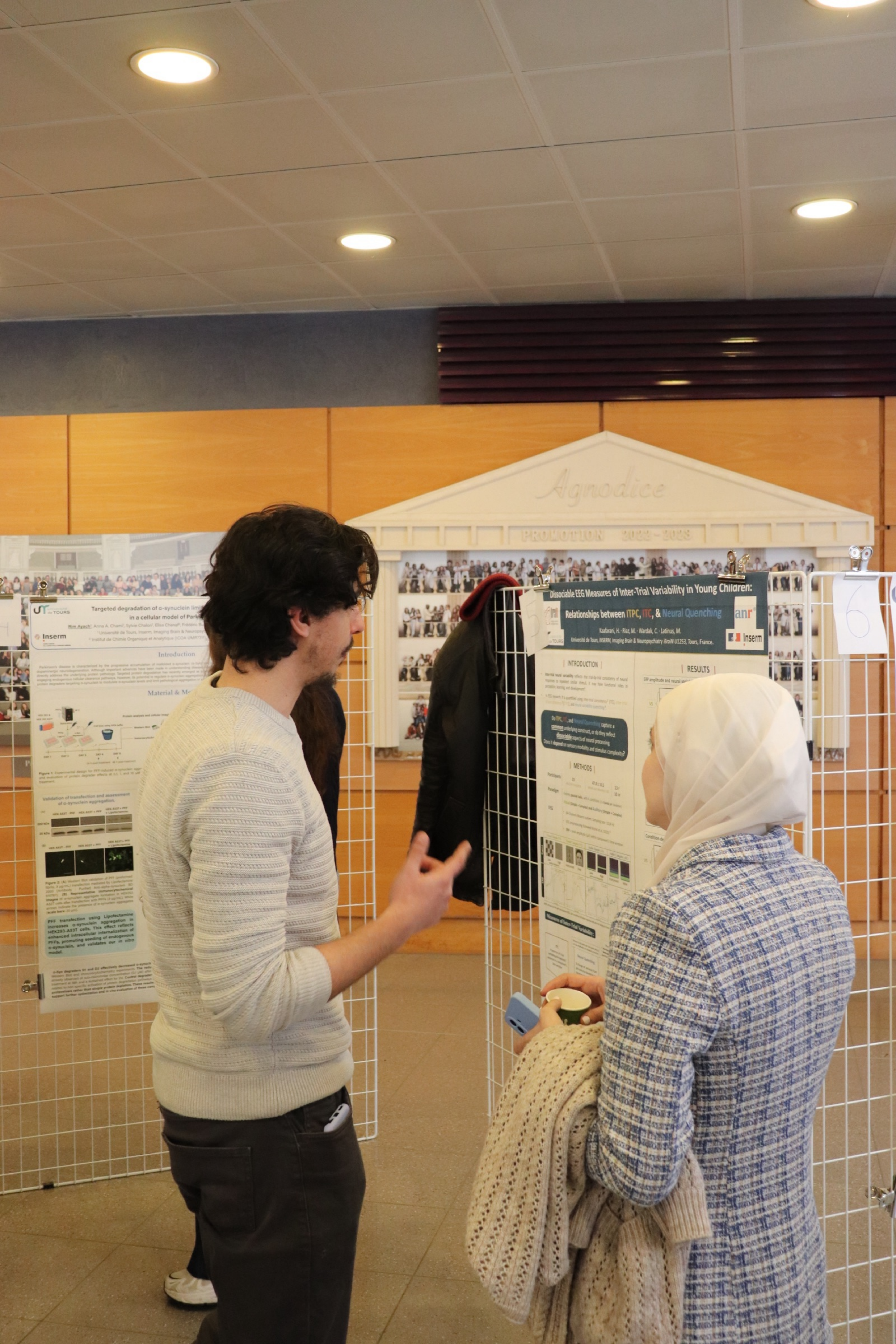
## Improvements



- **MCU (Micro Controller Unit):**
  - The Raspberry Pi2 has been replaced by a Teensy 4.1 (600MHz, 1MB RAM, fast I/O, without operating system to avoid software jitter and "real-time" performance).
- **Frequency synthesis (DDS):**
  - The previous AD9954 has been replaced by an AD9912 (100MHz, 128 channels, noise, frequency range from 200Hz to 400MHz, frequency adjustable to within  $\pm 4$  pHz).
  - Stability problem when temperature of the microchip increases. Addition of a temperature-monitored heat sink to stabilise the frequency.
- **C Code:**
  - Adaptation to the new MCU, timing optimisation, interrupt-driven frequency-control-loop based on the DDS temperature.
- **Level adjustment:**
  - Op-amps (TL072) were previously used to perform current-to-voltage conversion functions. They have been replaced by AD8610 ("very-low-noise" (6nV/√Hz), very fast and accurate).
- **Filtering:**
  - Passive low-pass on continuous current supplies.
- **Heat sink (70x70x20mm):**
  - Temperature sensor.
- To modify sequence code
- Finish the board prototype
- Test the system with the

1) Buchli R et al. NMR  
2) Barker PB et al. NMR  
3) Barantin L et al. NMR







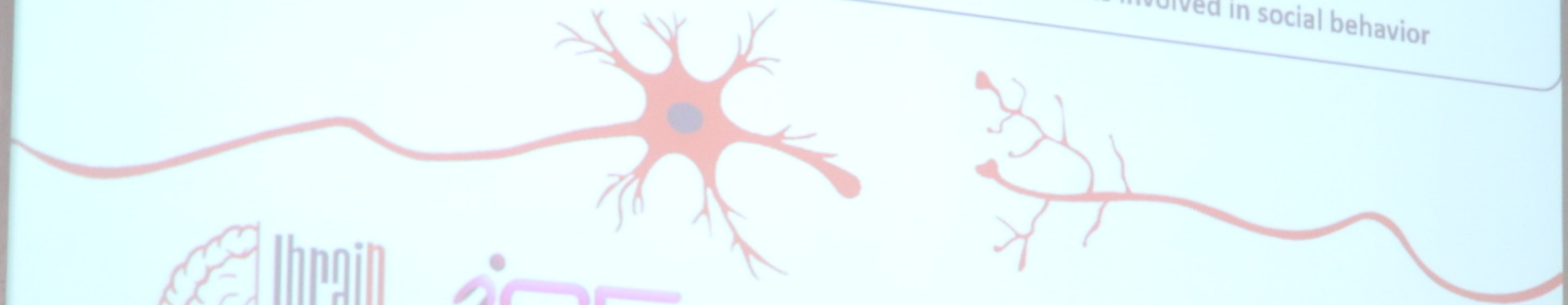
Service scolarité  
Grand amphithéâtre  
SID'com





# Photopharmacology in Autism Spectrum Disorder

Light - controlled modulation of mGlu4 receptors in striatal circuits involved in social behavior



us vous rappelons  
qu'il est  
FORMELLEMENT  
INTERDIT DE MANGER  
DANS LES SALLES.

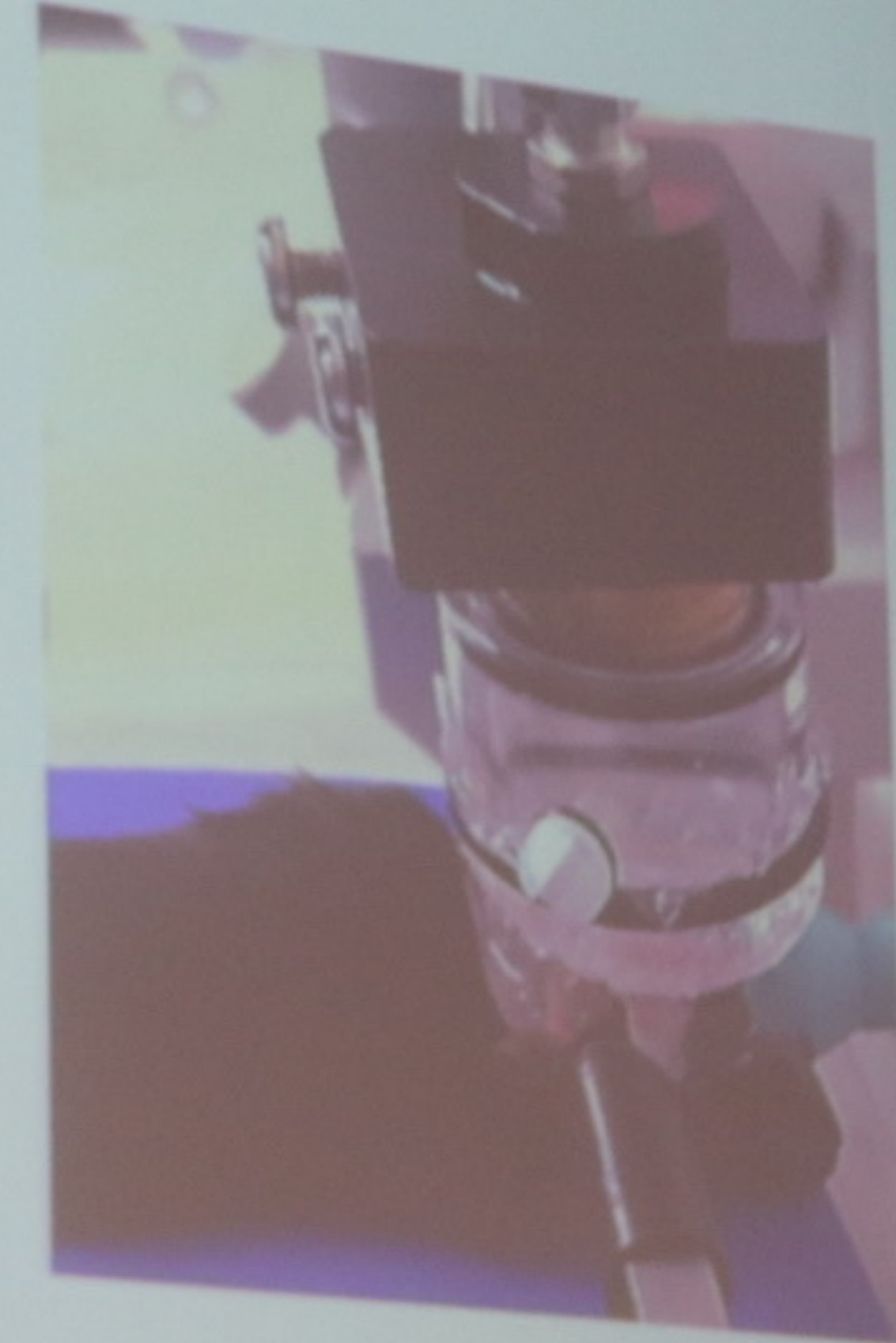
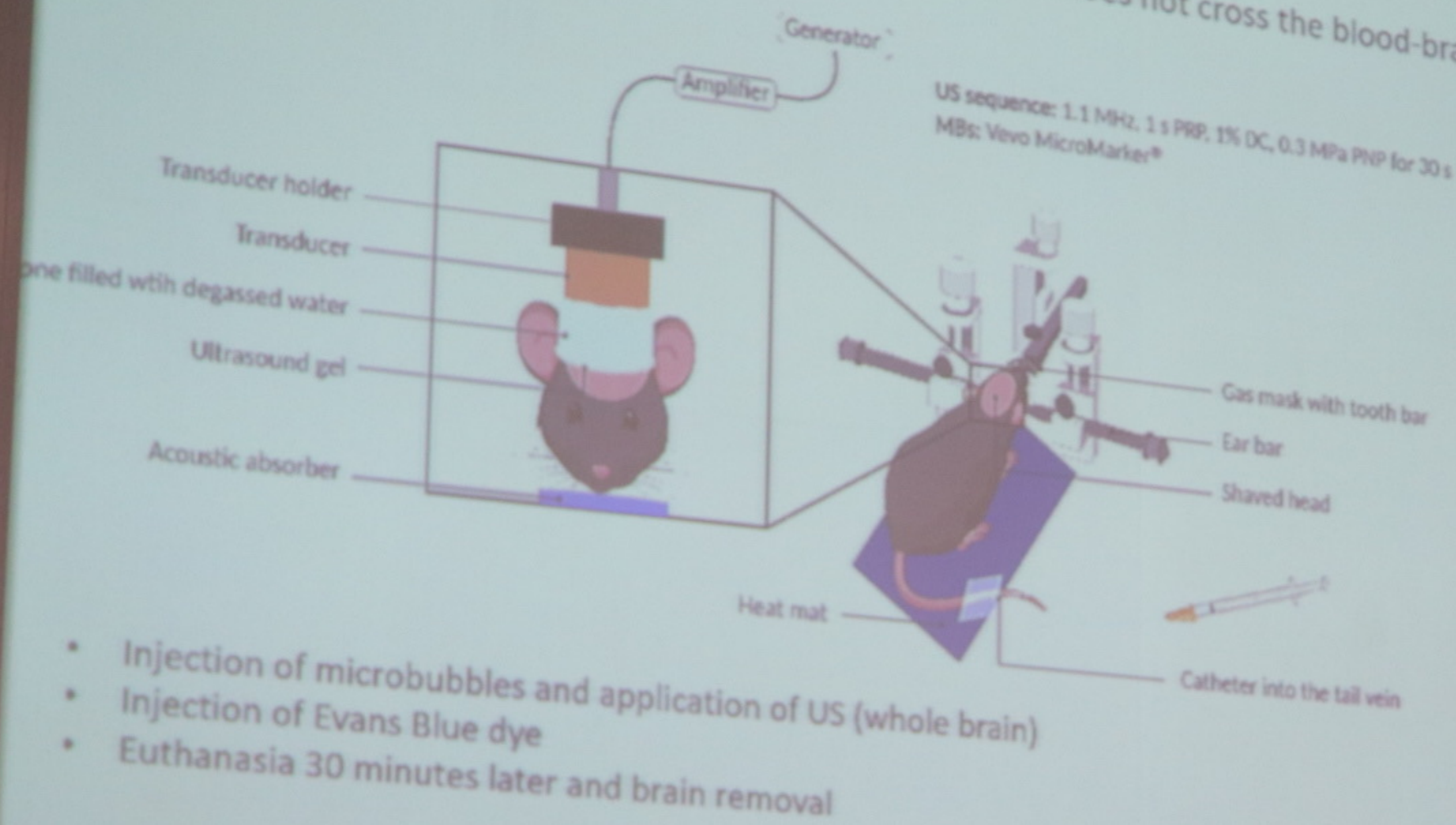




# BLOOD-BRAIN BARRIER OPENING THROUGH SONOPORATION IN WILD-TYPE MICE

Validation of blood-brain barrier opening: Evans Blue dye

Evans blue dye forms a 65-kDa complex with serum albumin—does not cross the blood-brain barrier



12/04/2026 - 3<sup>rd</sup> Edition PhD Day

Karen EA - 3<sup>rd</sup> Year



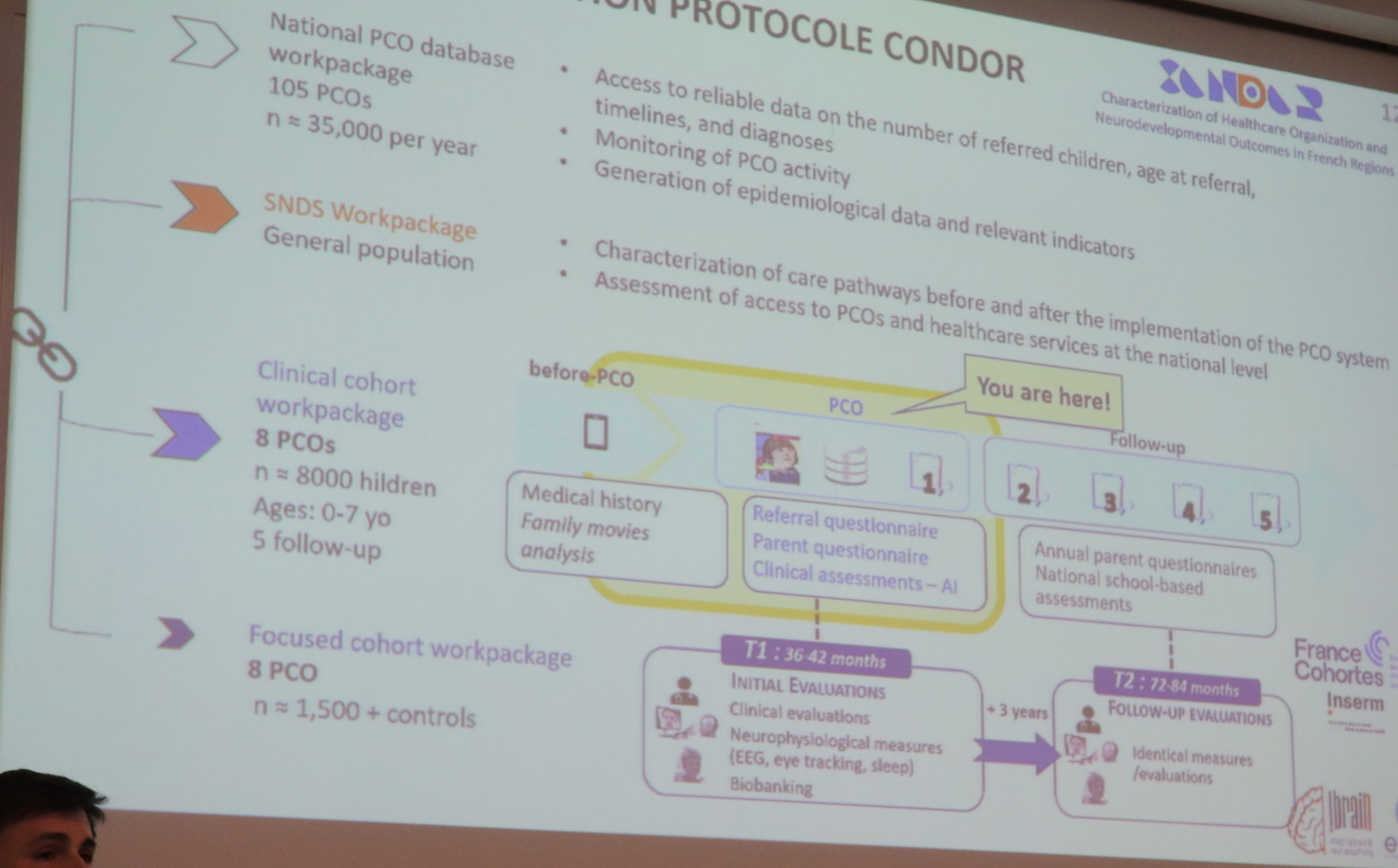
US vous rappelle  
qu'il est  
FORMELLEMENT  
INTERDIT DE MANGER  
DANS LES SALLES.



# 6 – OUVERTURE : PUBLICATION PROTOCOLE CONDOR

**CONDOR**  
Characterization of Healthcare Organization and  
Neurodevelopmental Outcomes in French Regions

12



us vous rappelons  
qu'il est  
FORMELLEMENT  
INTERDIT DE MANGER  
DANS LES SALLES.







eq. 1  
Daphné  
SENGARRAN

eq. 1  
Margot  
JANNOT

eq. 1  
Rim  
AYACH

eq. 2  
Melanie  
MORIN



# Functional characterization of candidate genetic variants involving the dihydropyrimidinase-like (DPYSL) protein family in neurodevelopmental disorders

UMR 1253, IBRAIN, UNIVERSITÉ DE TOURS, INSERM

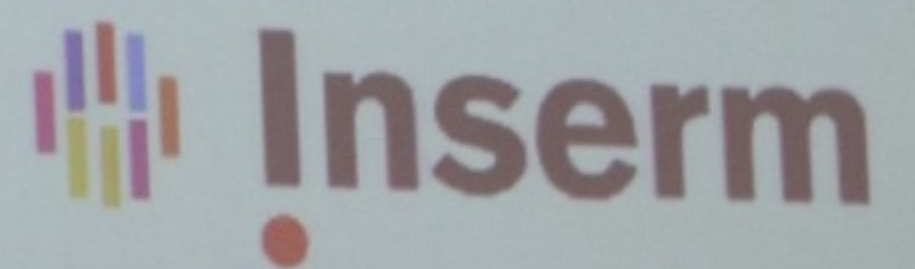
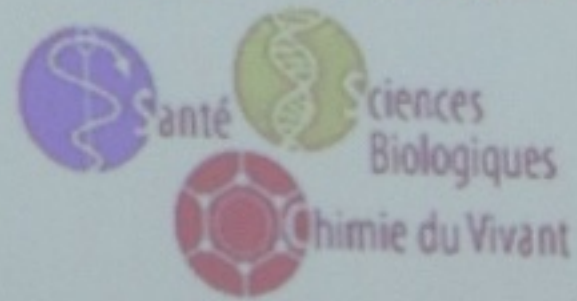
Team 3: IDeALS

Maily CROMBEZ

Supervisor : Frédéric LAUMONNIER



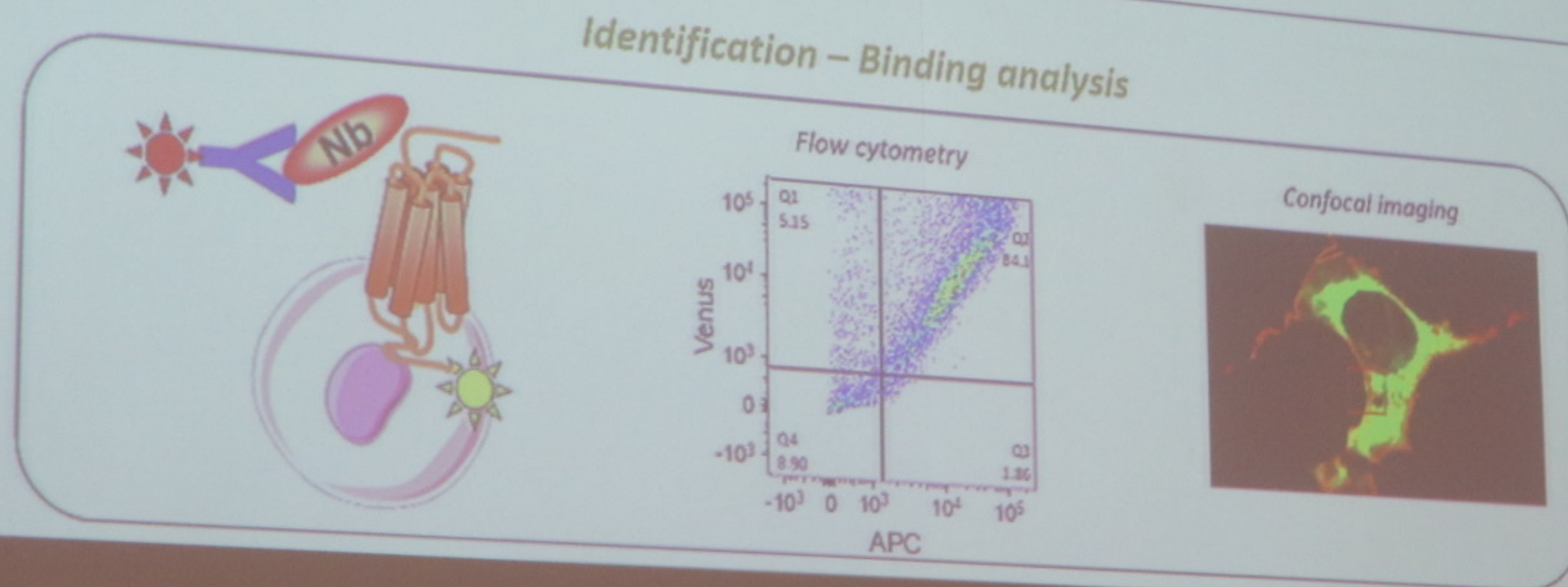
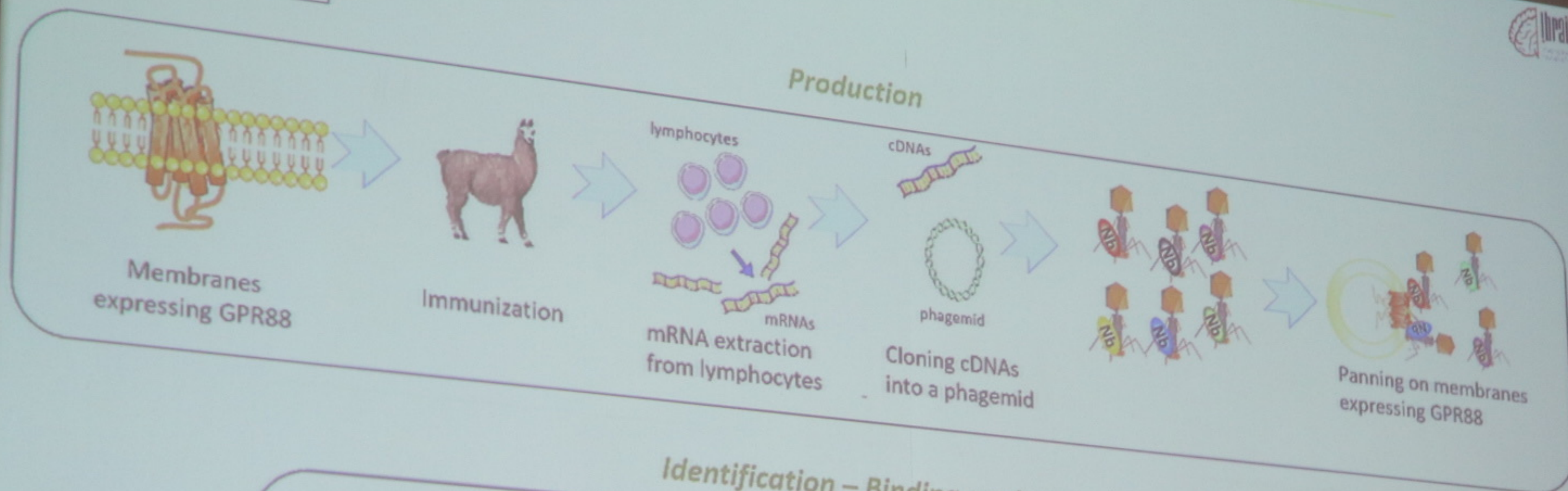
ECOLE DOCTORALE SSBCV





# Nanobodies

My Background – Context – PhD project



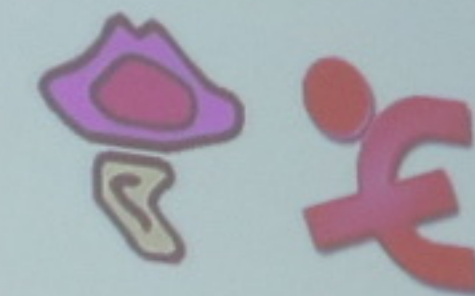


# Method



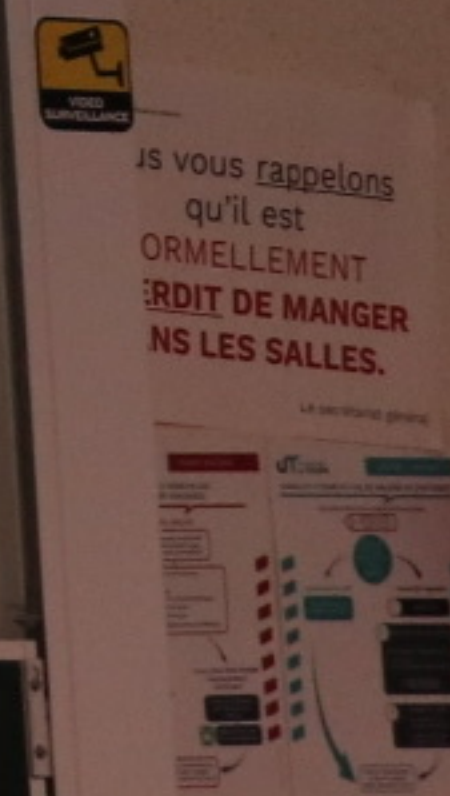
Video clips from EDT sessions (5 minutes):

- Vocal and verbal analyses: Praat (Boersma & Weenink, 2026)
- Gestural and verbal analyses: ELAN (ELAN, 2025)



Gestural prosody's contribution to vocal and emotional prosody in ASD

12







# Delivery of a therapeutic agent to the inner ear via sonoporation

Fabrice MICALETTI

Under the supervision of Prof. David BAKHOS and Dr. Jean-Michel  
ESCOFFRE

