

# EBRAINS WORKSHOP: ANATOMY AND FUNCTION OF THE PREFRONTAL CORTEX ACROSS SPECIES

14 – 16 MARCH 2023  
PARIS, FRANCE

SCIENTIFIC PROGRAMME



EBRAINS



Human Brain Project



Co-funded by  
the European Union

## ABOUT THE EVENT

Understanding the human brain relies for a large part on work in animal models, which necessitates a careful cross-species comparison. The prefrontal cortex (PFC) is particularly relevant in this regard as its function is poorly understood and potential cross-species differences remain highly debated. This workshop brings together experimental and computational scientists whose work allows a comparison of the anatomy and function of the PFC between species (in particular between humans, monkeys and mice).

EBRAINS is uniquely suited to provide a platform to compare anatomy, physiology and behaviour between species, due to its atlases, numerous datasets, as well as the whole brain models from different species. The interactive format of the workshop will allow speakers as well as participants from largely separated fields to interact and discuss, which is expected to create novel insights as well as lead to more coherence and clarity in the relevant terminology, formats and important research directions in the field.

### Further information:

[humanbrainproject.eu/en/education-training-career/workshops/pfc/](https://humanbrainproject.eu/en/education-training-career/workshops/pfc/)

Use the hashtag #PFCworkshop to share your experiences at the workshop on social media!

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### Scientific Chairs & Local Hosts:

Timo van Kerkoerle | NeuroSpin, CEA Saclay, France  
Ruth Benavides-Piccione | Cajal Institute, CSIC & UPM, Spain  
Alain Destexhe | NeuroPsi, CNRS, EITN, France

### Contact:

[workshop.edu@humanbrainproject.eu](mailto:workshop.edu@humanbrainproject.eu)

### Co-organised by:



Human Brain Project  
Education Programme



### In cooperation with:



## TUESDAY 14 MARCH 2023

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Please note that all times are in CET (=GMT/UTC+1).

**08:00 – 09:00**    **Registration & Coffee**

**09:00 – 09:05**    **Welcome & Introduction**

**09:05 – 10:45**    **SESSION ANATOMY I: CROSS-SPECIES COMPARISON OF NEUROANATOMY**

Chair: Ruth Benavides-Piccione | Cajal Institute, CSIC & UPM, Spain

**09:05 – 09:30**    **Javier DeFelipe | Cajal Institute, Spain**

**Similarities and differences between cortical cell types in different species**

**09:30 – 09:55**    **Huib Mansvelder | Vrije Universiteit Amsterdam, Netherlands**

**Cognitive control by distinct prefrontal cortical output neurons**

**09:55 – 10:20**    **Nenad Sestan | Yale School of Medicine, USA**

**Regulation of Prefrontal Patterning and Connectivity by Retinoic Acid**

**10:20 – 10:45**    **Suzanaerculano-Houzel | Vanderbilt University, USA**

**The costs and benefits of gaining associative neurons in brain evolution**

**10:45 – 11:15**    **Coffee break**

**11:15 – 13:00**    **SESSION ANATOMY II: CROSS-SPECIES COMPARISON OF NEUROANATOMY**

Chair: Ruth Benavides-Piccione | Cajal Institute, CSIC & UPM, Spain

**11:15 – 11:40**    **Henry Kennedy | Stem Cell and Brain Research Institute, France**

**Visual cortex shapes communication in the inter-areal network**

**11:40 – 12:05**    **Mark Laubach | American University, USA**

**What, if anything, is rodent prefrontal cortex and why do we keep coming back to this question?**

**12:05 – 13:00**    **Plenary Discussion**

**13:00 – 14:00**    **Lunch Break**

## TUESDAY 14 MARCH 2023

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- 14:00 – 15:45**    **SESSION PHYSIOLOGY I: CROSS-SPECIES COMPARISON OF PHYSIOLOGY (AND BEHAVIOUR)**  
Chair: Timo van Kerkoerle | NeuroSpin, CEA Saclay, France
- 14:00 – 14:25**    Wim Vanduffel | KU Leuven, Belgium  
**The fine-grained functional organization of prefrontal cortex in monkeys**
- 14:25 – 14:50**    Marie Carlén | Karolinska Institute, Sweden  
**Functional maps of the mouse prefrontal cortex**
- 14:50 – 15:15**    Stefan Everling | Western University, Canada  
**Delay-related activity in marmoset prefrontal cortex**
- 15:15 – 15:40**    Hendrikje Nienborg | National Eye Institute, USA  
**Do spontaneous body movements drive brain-wide neural activity? A cross-species comparison**
- 15:45 – 16:15**    **Coffee Break**
- 16:15 – 18:00**    **SESSION PHYSIOLOGY II: CROSS-SPECIES COMPARISON OF PHYSIOLOGY (AND BEHAVIOUR)**  
Chair: Timo van Kerkoerle | NeuroSpin, CEA Saclay, France
- 16:15 – 16:40**    Pieter Roelfsema | Netherlands Institute for Neuroscience, Netherlands  
**Interactions between cortical neurons that give rise to conscious perception**
- 16:40 – 17:05**    Yang Dan | University of California, USA  
**Circuit mechanism for sleep/wake-dependent global ignition**
- 17:05 – 18:00**    **Plenary Discussion**
- 19:30**            **Social Get-Together: Cocktail Dinatoire**
- Les Amarres  
24, quai d'Austerlitz  
75013 Paris, France

## WEDNESDAY 15 MARCH 2023

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Please note that all times are in CET (=GMT/UTC+1).

### 09:00 – 09:05 Welcome & Introduction

### 09:05 – 10:45 **SESSION BEHAVIOUR I: CROSS-SPECIES COMPARISON OF BEHAVIOUR (& PHYSIOLOGY)**

Chair: Charles Wilson | Stem Cell & Brain Research Institute, France

09:05 – 09:30 Martha Havenith & Marieke Schölvinck | Ernst Strüngmann Institute for Neuroscience, Germany  
**A cross-species view of cingulate cortex and flexible behaviour**

09:30 – 09:55 Andreas Nieder | University of Tübingen, Germany  
**Dopamine and cellular mechanisms of cognitive control in primate prefrontal cortex**

09:55 – 10:20 Sandra Reinert | Max Planck Institute for Biological Intelligence, Germany  
**Neural representations of learned rules for categorization in mouse prefrontal cortex**

10:20 – 10:45 Ann Duan | University of California, USA  
**Cortico-subcortical contributions to flexible decision-making**

### 10:45 – 11:15 Coffee break

### 11:15 – 13:00 **SESSION BEHAVIOUR II: CROSS-SPECIES COMPARISON OF BEHAVIOUR (& PHYSIOLOGY)**

Chair: Charles Wilson | Stem Cell & Brain Research Institute, France

11:15 – 11:40 Stanislas Dehaene | NeuroSpin, France  
**Human prefrontal cortex, symbols and languages: a hypothesis**

11:40 – 12:05 Jessica Cantlon | Carnegie Mellon University, USA  
**Inner programs and information capacity in monkeys and human children**

### 12:05 – 13:00 Plenary Session Discussion

### 13:00 – 14:00 Lunch Break

## WEDNESDAY 15 MARCH 2023

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- 14:00 – 15:45**     **SESSION COMPUTATIONAL MODELLING I: CROSS-SPECIES COMPARISON WITH COMPUTATIONAL MODELS**  
Chair: **Alain Destexhe** | NeuroPsi, CNRS, EITN, France
- 14:00 – 14:25**     **Idan Segev** | Edmong & Lily Safra Center for Brain Sciences, Israel  
**Modelling of human and rodent neurons**
- 14:25 – 14:50**     **Rodrigo Cofre** | NeuroPsi, France  
**Dynamical aspects of the structure-function relationship modulation by anesthetics of the primate and human brains**
- 14:50 – 15:15**     **Rubén Moreno Bote** | University Pompeu Fabra, Spain  
**Recalling what was there: Looking back at the location of previously shown offers modulates the encoding of offer value in orbitofrontal cortex**
- 15:15 – 15:40**     **Jorge Mejias** | Universeiteit van Amsterdam, Netherlands  
**Dorsolateral prefrontal cortex and beyond: distributed working memory across neocortical networks**
- 15:45 – 16:15**     **Coffee break**
- 16:15 – 18:00**     **SESSION COMPUTATIONAL MODELLING II: CROSS-SPECIES COMPARISON WITH COMPUTATIONAL MODELS**  
Chair: **Alain Destexhe** | NeuroPsi, CNRS, EITN, France
- 16:15 – 16:40**     **Adrienne Fairhall** | University of Washington, USA  
**Flexible task-switching: behavioral modeling and PFC-hippocampal interactions**
- 16:40 – 17:05**     **Xiao-Jing Wang** | New York University, USA  
**Circuit mechanism and bifurcation in space underlying distributed working memory**
- 17:05 – 18:00**     **Plenary Session Discussion**

# THURSDAY 16 MARCH 2023

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*Please note that the programme of this day takes place in a different venue:*

NeuroPSI CNRS: Campus CEA Saclay | Bldg 151 | 151 route de la Rotonde | 91400 Saclay

All times are in CET (=GMT/UTC+1).

**09:30 - 09:35**    **Welcome & Introduction**

**09:35 – 11:15**    **HANDS-ON SESSION ANATOMY:**

**The Multilevel Human Brain Atlas in EBRAINS and its software interfaces**

**Timo Dickscheid & Sebastian Bludau** | Forschungszentrum Jülich, Germany

**11:15 - 11:45**    **Coffee Break**

**11:45 – 13:30**    **HANDS-ON SESSION PHYSIOLOGY:**

**Using Nilearn for machine learning analysis of functional connectivity**

**Yasmin Mzayek & Alexis Thual** | INSERM, France

**13:30 - 14:30**    **Lunch Break**

**14:30 – 16:15**    **HANDS-ON SESSION MODELLING:**

**Simulating (a)synchronous brain dynamics in EBRAINS using The Virtual Brain (TVB)**

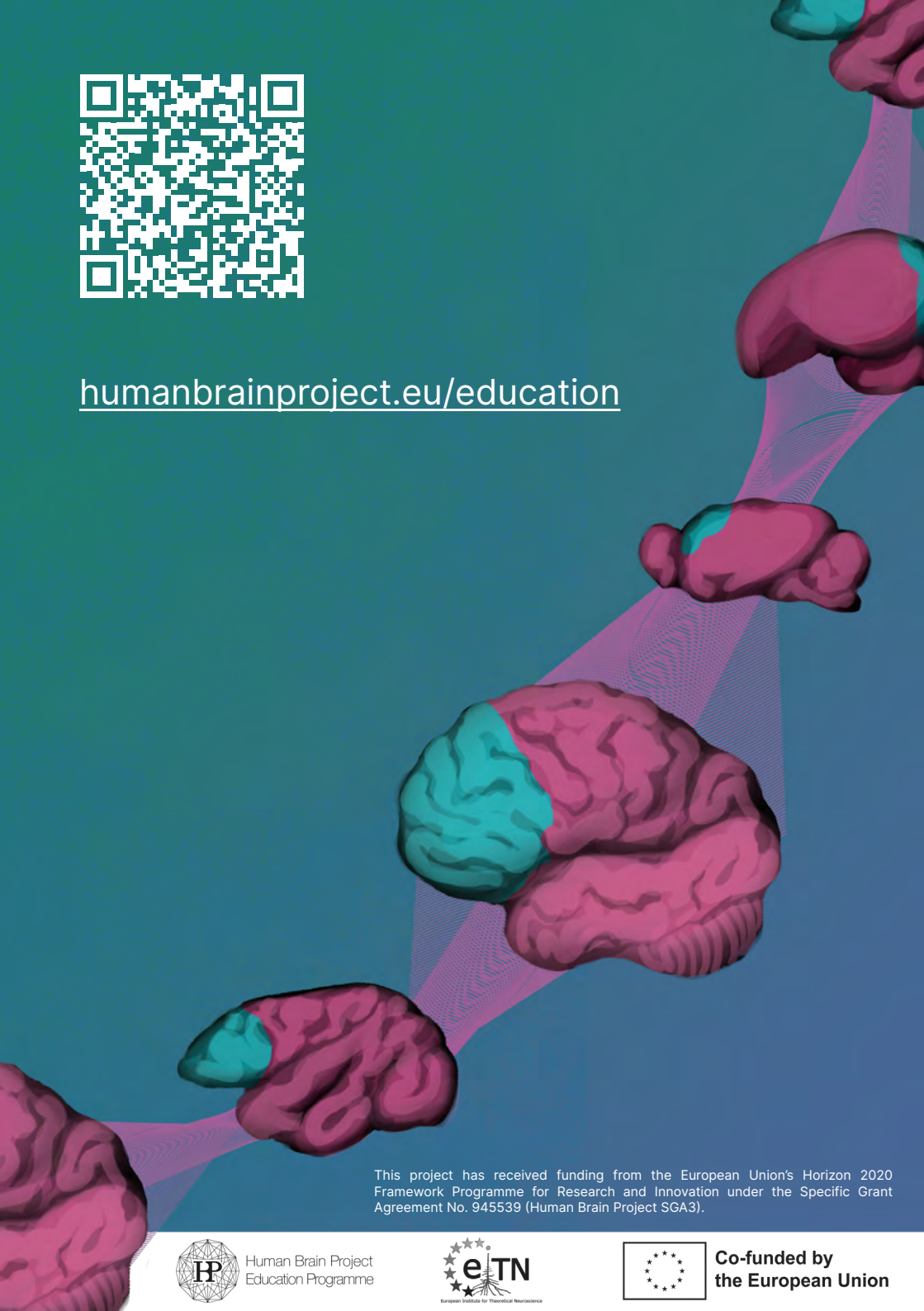
**Arnau Manasanch** | IDIBAPS, Spain

**Maria Sacha & Federico Tesler** | EITN, CNRS, France

**16:15 - 16:30**    **Closing & Remarks**



[humanbrainproject.eu/education](https://humanbrainproject.eu/education)



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