E BRAINS WORKSHOP:
ANATOMY AND FUNCTION OF THE PREFRONTAL CORTEX ACROSS SPECIES

14 – 16 MARCH 2023
PARIS, FRANCE

SCIENTIFIC PROGRAMME
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/

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

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

Co-organised by:

In cooperation with:
**TUESDAY 14 MARCH 2023**

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

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<thead>
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<th>Time</th>
<th>Event</th>
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<td>08:00 – 09:00</td>
<td>Registration &amp; Coffee</td>
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<tr>
<td>09:00 – 09:05</td>
<td>Welcome &amp; Introduction</td>
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<tr>
<td>09:05 – 10:45</td>
<td><strong>SESSION ANATOMY I: CROSS-SPECIES COMPARISON OF NEUROANATOMY</strong></td>
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<tr>
<td></td>
<td>Chair: Ruth Benavides-Piccione</td>
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<tr>
<td>09:05 – 09:30</td>
<td>Javier DeFelipe</td>
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<td></td>
<td>Similarities and differences between cortical cell types in different species</td>
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<tr>
<td>09:30 – 09:55</td>
<td>Huib Mansvelder</td>
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<td>Cognitive control by distinct prefrontal cortical output neurons</td>
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<td>09:55 – 10:20</td>
<td>Nenad Sestan</td>
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<td></td>
<td>Regulation of Prefrontal Patterning and Connectivity by Retinoic Acid</td>
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<tr>
<td>10:20 – 10:45</td>
<td>Suzana Herculano-Houzel</td>
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<td>The costs and benefits of gaining associative neurons in brain evolution</td>
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<tr>
<td>10:45 – 11:15</td>
<td>Coffee break</td>
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<tr>
<td>11:15 – 13:00</td>
<td><strong>SESSION ANATOMY II: CROSS-SPECIES COMPARISON OF NEUROANATOMY</strong></td>
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<td>Chair: Ruth Benavides-Piccione</td>
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<tr>
<td>11:15 – 11:40</td>
<td>Henry Kennedy</td>
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<td>Visual cortex shapes communication in the inter-areal network</td>
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<tr>
<td>11:40 – 12:05</td>
<td>Mark Laubach</td>
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<td>What, if anything, is rodent prefrontal cortex and why do we keep coming back to this question?</td>
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<tr>
<td>12:05 – 13:00</td>
<td>Plenary Discussion</td>
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<tr>
<td>13:00 – 14:00</td>
<td>Lunch Break</td>
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TUESDAY 14 MARCH 2023

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
## Welcome & Introduction

### SESSION BEHAVIOUR I: CROSS-SPECIES COMPARISON OF BEHAVIOUR (& PHYSIOLOGY)

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

<table>
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<th>Talk Title</th>
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<tr>
<td>09:05 – 09:30</td>
<td>Martha Havenith &amp; Marieke Schölvinck</td>
<td>Ernst Strüngmann Institute for Neuroscience, Germany</td>
<td>A cross-species view of cingulate cortex and flexible behaviour</td>
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<tr>
<td>09:30 – 09:55</td>
<td>Andreas Nieder</td>
<td>University of Tübingen, Germany</td>
<td>Dopamine and cellular mechanisms of cognitive control in primate prefrontal cortex</td>
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<tr>
<td>09:55 – 10:20</td>
<td>Sandra Reinert</td>
<td>Max Planck Institute for Biological Intelligence, Germany</td>
<td>Neural representations of learned rules for categorization in mouse prefrontal cortex</td>
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</tbody>
</table>

### Coffee break

### SESSION BEHAVIOUR II: CROSS-SPECIES COMPARISON OF BEHAVIOUR (& PHYSIOLOGY)

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

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<td>11:15 – 11:40</td>
<td>Stanislas Dehaene</td>
<td>NeuroSpin, France</td>
<td>Human prefrontal cortex, symbols and languages: a hypothesis</td>
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<tr>
<td>11:40 – 12:05</td>
<td>Jessica Cantlon</td>
<td>Carnegie Mellon University, USA</td>
<td>Inner programs and information capacity in monkeys and human children</td>
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</tbody>
</table>

### Plenary Session Discussion

### Lunch Break

### 13:00 – 14:00 Lunch Break
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 | University of Amsterdam, Netherlands
Dorsolateral prefrontal cortex and beyond: distributed working memory across neocortical networks

15:45 – 16:15  Coffee break

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

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
This project has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under the Specific Grant Agreement No. 945539 (Human Brain Project SGA3).