



Brain Research & Tech

How can Horizon Europe
improve human brain
health and performance?

A contribution to a major European challenge

Under the high patronage of MEP Françoise GROSSETÊTE

Scientific coordination: Prof. Viktor JIRSA

WED. 6 MARCH 2019 - 9.00>16.00

European Committee of the Regions



**European Committee
of the Regions**



Human Brain Project

Dear Participant,

Thank you for joining us!

Understanding and healing the human brain is one of the most exciting challenges of the 21st century. For centuries we have been attracted by the mystery of thought and consciousness, but it is only now that we have the technical and scientific foundation to advance. Is consciousness fundamental for the emergence of thought? Will Artificial Intelligence need to be conscious? And can we repair our mind once it has been damaged? Addressing these questions requires boldness, is necessarily interdisciplinary and needs close coordination amongst scientists, clinicians, industry partners and policy makers. In Europe, we decided to accept this challenge and push the frontiers of our knowledge through efforts such as the European flagship Human Brain Project, the European Open Science Cloud, and our investments in High Performance Computing... But how will we succeed?

Aix-Marseille University - AMU, a European leader in brain health and technology, responds together with its scientific and industrial partners across the continent.

The conference will address concrete examples of progress and perspectives from within the Human Brain Project, Technology Transfer in Health and European data and computing infrastructures. It will highlight significant progress made in these fields due to interdisciplinary research, identify challenges, and address issues targeted by future European programmes, in particular Horizon Europe.

We wish you a nice day!

About the Human Brain Project

Understanding the organisation of the human brain at all relevant levels is a big challenge, but necessary to improve treatment of brain disorders, create new computing technologies and provide insight into our humanity. Modern ICT brings this within reach. The HBP's unique strategy uses it to gather, integrate and analyse brain data, understand the healthy and diseased brain, and emulate its computational capabilities. By sharing our tools with researchers worldwide, we aim to catalyse global collaboration.

Unlocking the brain's secrets promises major scientific, social and economic benefits. One is improved diagnosis and treatment of brain-related diseases; a growing health burden in our ageing population. A second is neuroscience's potential to contribute to approaches for future ICT, including extreme-scale and neuromorphic computing. The HBP will also contribute to a brain-inspired approach to Artificial Intelligence and robotics.

The HBP studies the brain at different levels, from genomics to higher-level brain functions. To help achieve this goal, the HBP is building an ICT-based research infrastructure to facilitate research collaboration, via the sharing of software tools, data and models. Incorporating inputs from the scientific community, the HBP's scientists and engineers ensure that our infrastructure meets real research needs. Another aim is to accelerate medical research, by facilitating researchers' secure access to broader data sets of patient data, as well as HBP tools and models. The HBP also educates young scientists to work across disciplinary boundaries and addresses the ethical implications of its work. Finally, it helps to integrate global brain research efforts and leads Europe's contribution in this field.

For more about the HBP, please go to: <https://www.humanbrainproject.eu/en/>

Agenda

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- 8.30 – 9.00 Registration
- 9.00 – 9.10 **Introduction by Prof Yvon BERLAND**, President of Aix-Marseille University
- 9.10 – 9.20 **Françoise GROSSETÊTE**, Member of the European Parliament
- 9.20 – 10.15 **Brain Research & Tech: The Human Brain Project** by Prof. Katrin AMUNTS, Chair of Human Brain Project
- Reading and Writing in the brain: Novel technology for the blind** by Prof. Pieter ROELFSEMA, Director of the Netherlands Institute for Neuroscience
- Personalized brain models for epilepsy surgery** by Prof. Viktor JIRSA, Director of the System Neuroscience Institute, Aix-Marseille University
- 10.15 – 11.00 *Coffee break*
- 11.00 – 12.15 **Neurotechnology, where we are, where we go?**
Panel discussion including Q & A with the public
- Prof Viktor JIRSA, Director of the System Neuroscience Institute, Aix-Marseille University
 - Prof Pieter ROELFSEMA, Director of the Netherlands Institute for Neuroscience
 - Prof Kathinka EVERS, Center for Research Ethics & Bioethics, Uppsala University
 - Dr Thomas BRIONNE, Principal Clinical Scientist, Medtronic International
- 12.15 – 14.00 *Lunch at the European Committee of the Regions*
- 14.00 – 14.40 **HORIZON EUROPE roadmap**, by Dr Wolfgang BURTSCHER, Deputy Director-General, DG RTD, European Commission
- Latest developments in HORIZON EUROPE negotiations** by Lieve WIERINCK, Member of the European Parliament
- Dr. Pierre MEULIEN, Executive Director**, Innovative Medicine Initiative
- 14.40 – 15.50 **Designing and implementing Horizon Europe: the brain in Europe and its impact on society**
Panel discussion including Q & A with the public
- Dr. Thomas SKORDAS, Director "Digital Excellence and Science Infrastructure", DG CONNECT, European Commission
 - Dr. Pierre MEULIEN, Executive Director, Innovative Medicine Initiative
 - Prof. Katrin AMUNTS, Chair of Human Brain Project
 - Prof Anthony Randal MCINTOSH, Senior Scientist, Rotman Research Institute, Baycrest
- 15.50 – 16.00 Prof Viktor JIRSA, conclusion
- 16.00 – 16.30 *Networking coffee - end at 16.30*

Speakers



FRANCOISE GROSSETÊTE Member of the European Parliament since 1994, Françoise Grossetête is a law graduate from the University of Lyon. She started her career as a university teacher before being elected at local level, first as deputy Mayor of Saint-Etienne (1983-2008) and then as President of the Pilat Natural Park (1989-2008). In the European Parliament, she is Vice-President of the EPP Group since 2014, a position she held already before, between 1999 and 2007. Françoise Grossetête sits in the committees for the Environment, Public Health and Food Safety, and Research, Industry and Energy. With a strong focus on health policies, she has carried through Parliament a number of legislations related to pharmaceuticals and healthcare. A former Regional councillor for Rhône-Alpes, she is also member of the Political Bureau of Les Républicains.

WOLFGANG BURTSCHER is Deputy Director-General of the European Commission's Directorate-General for Research and Innovation. An Austrian national, Wolfgang Burtcher acted before joining DG Research and Innovation as a Director in DG Agriculture of the European Commission since 2000. Before his Commission career Mr Burtcher was representative of the Länder at the Austrian Permanent Representation to the EU. From 1992 to 1996 he was Director of European Affairs in the Vorarlberg administration. Previously, from 1990 to 1992, he was a legal advisor at the European Free Trade Association (EFTA) in Geneva, at the time of negotiations on the European Economic Area (EEA). He focused particularly on the free circulation of goods and capital and on competition issues. Between 1983-1990 he was a lecturer in International and European Law at the University of Innsbruck. Wolfgang Burtcher holds a doctorate in law and has a qualification from the Institut Européen des Hautes Etudes Internationales in Nice.



LIEVE WIERINCK is a Flemish politician for the liberal Open VLD party. Mrs. Wierinck holds a pharmaceutical degree from the VUB (Vrije Universiteit Brussel). In addition, she obtained a Post-graduate degree of Pharmaceutical management in 2006 at the University of Hasselt. In line with her academic background, she owned and managed a pharmacy for nearly 30 years. Before joining the European Parliament, Lieve was leader of the party fraction in Zaventem, followed by her twelve-year presidency of the OCMW (Public Centre for Social Welfare), where she managed a staff of 150 people. She combined this with her obligations as a fulltime member of the City Council of Zaventem. From December 2011 until June 2014, she was a member of the Belgian Federal Parliament, where she was a member of the Committee for Public Health, Environment and Social Renewal, and of the Advisory Committee on Societal Emancipation. In May 2016, Lieve replaced Mr. Philippe De Backer as a Member of the European Parliament, where she is a full member of the Industry, Technology, Research and Energy Committee (ITRE) and a substitute Member of the Committee on Economic and Monetary affairs (ECON). Lieve also works on topics surrounding healthcare, as she strives for a progressive and affordable healthcare in Europe.

PIERRE MEULIEN is executive director of the Innovative Medicines Initiative (IMI), a €5 billion public-private partnership between the European Union and the European pharmaceutical industry. At IMI, he is responsible for the overall management of the program, which works to improve and accelerate the drug development process by facilitating collaboration between the key players involved in health research. Previously, Dr Meulien was president and CEO of Genome Canada, where he raised money and oversaw the launch of novel projects and networks in the field of genomics-based technologies. Prior to that, he was chief scientific officer for Genome British Columbia and was the founding CEO of the Dublin Molecular Medicine Center. Dr Meulien also worked with the French biotechnology company Transgene and with Aventis Pasteur (now Sanofi Pasteur). He has a Ph.D. in molecular biology from the University of Edinburgh and carried out a postdoctoral fellowship at the Institut Pasteur in Paris.



Speakers



YVON BERLAND is Professor and Hospital Practitioner of Exceptional class in Nephrology

He was Head of the Centre for Nephrology and kidney transplantation and Chief physician of the Urology and Nephrology Centre at Marseille University Hospital until July 2018. He has been President of the French National Observatory for demography of medical professions from 2003 to 2016, Chairman of the Board of EHESP (French Higher education institution for public health) from 2011 to 2016,

Yvon Berland was also elected Vice-president of the French Organisation of University Presidents (CPU) from 2010 to 2012. He was President of the Health Commission of CPU from 2007 to 2010 and from 2012 to 2018.

In 2004, he was elected President of the *Université de la Méditerranée* and re-elected in 2009.

He is President of Aix-Marseille University since its creation in 2012 by the merger of the three previously existing universities of the territory.

He is Chairman of the Board of the Regional Observatory for Health of Provence-Alpes-Côte-d'Azur Region since 2015.

THOMAS SKORDAS received his diploma in Electrical Engineering in 1984 and a PhD in Computer Science in 1988. From 1988 to 1995, he worked in France as a Research Fellow and project leader in EU-funded R&D projects in the areas of Information Technology and Robotics.

In 1995, Thomas joined the European Commission as a Research Programme Officer in the Directorate General Information Society & Media (DG INFSO). Ever since, Thomas worked in various units of DG INFSO (which, in 2012 became DG CONNECT) dealing with ICT research in the context of EU's Research and Innovation Framework Programmes. From 2006 to 2009, he was Deputy Head of Unit in ICT Security and Trust. In 2009, he was appointed Head of the Photonics Unit and in 2014, Head of the Flagships Unit.

Since March 2017, Thomas is the Director of DG Connect's "Digital Excellence and Science Infrastructure Directorate".



KATRIN AMUNTS did a postdoctoral fellowship at the C. & O. Vogt Institute of Brain Research at Duesseldorf University, Germany. In 1999, she set up a new research unit for Brain Mapping at the Research Center Juelich, Germany, and became professor for Structural-Functional Brain Mapping in 2004. She became full professor at the Department of Psychiatry, Psychotherapy and Psychosomatics at the RWTH Aachen University as well as director of the Institute of Neuroscience and Medicine (INM-1) at the Research Center Juelich in 2008. Since 2013, she is a full professor for Brain Research, director of the C. and O. Vogt Institute of Brain Research, Heinrich-Heine University Duesseldorf and director of the Institute of Neuroscience and Medicine (INM-1), Research Center Juelich.

Katrin Amunts is Scientific Research Director and Chair of the *Science and Infrastructure Board (SIB)* of the *The Human Brain Project (HBP)*, and leads Subproject 2 *Human Brain Organization*. She is member of the German Ethics Council since 2012, and has been elected as vice chair in 2016. Katrin Amunts is the programme speaker of the programme *Decoding the Human Brain* of the Helmholtz Association, Germany. Katrin Amunts is co-speaker of the graduate school *Max-Planck School of Cognition*. Since 2018, she is a member of the International Advisory Council *Healthy Brains for Healthy Lives*, Canada.

In order to better understand the organizational principles of the human brain, she and her team aim to develop a multi-level and multi-scale brain atlas, and use methods of high-performance computing to generate ultra-high resolution human brain models.



PIETER R. ROELFSEMA received his MD degree in 1991. He did his PhD project with Wolf Singer at the Max-Planck-Institute for Brain Research in Frankfurt and he received his PhD degree in 1995. In 2002, he started to work at the Netherlands Institute for Neuroscience in Amsterdam where he became director in 2007. He is professor at the Free University of Amsterdam and also Professor at the AMC in Amsterdam. He received a NWO-VICI award (2008) and an ERC-Advanced grant (2013). Pieter Roelfsema studies visual perception, plasticity and memory in the visual system of experimental animals, humans, and with neural networks. His main question is how neurons in different brain areas work together during thinking. Even the simplest task activates thousands of neurons across a large number of cortical and subcortical brain areas. Roelfsema studies how these networks of neurons work together to solve the task and how they configure themselves during learning. He develops neurotechnological solutions to create new high-bandwidth brain-computer interfaces. He combines these new technological possibilities with knowledge about the visual system to create a visual prosthesis for blind people that will restore a rudimentary form of sight.



Speakers



KATHINKA EVERS is Professor of philosophy at the Centre for Research Ethics & Bioethics (CRB) at Uppsala University and Professor ad honorem at the *Universidad Central de Chile*. She has been Invited Professor on the *Chair Condorcet* at *École Normale Supérieure*, Paris (2002); at *Collège de France*, Paris (2006 - 2007); and at *Centro de Investigaciones Filosóficas*, Buenos Aires (2012). Since 2013, she leads the Human Brain Project's Ethics and Society Subproject and the Philosophy and Neuroethics research group. Her research focuses on philosophy of mind, neurophilosophy, bioethics and neuroethics. She directs the teaching and research on neuroethics at Uppsala University, where she started the first courses in the subject.

She is also interested in the social responsibility of science, and was between 1997 and 2002 Executive Director for the Standing Committee for Ethics and Responsibility in Science of ICSU (International Council for Science); and 2008-2014, Expert in Scientific Review Panels for the ERC on 'The Human Mind and Its Complexity'. Since her first public lectures at the University of Oxford in 1990, she has lectured extensively at universities and research centres in Europe, the U.S., South America, Asia and Australia.

THOMAS BRIONNE, PhD, is a Principal Clinical Scientist in Deep Brain Stimulation (DBS) at Medtronic European Headquarters (Tolochenaz, Switzerland). Medtronic is a global leader in medical technology, dedicated to alleviating pain, restoring health and extending life. Medtronic DBS uses a small, pacemaker-like device to modulate electrical signals in the brain responsible for symptoms of Parkinson's Disease, Essential Tremor, Dystonia, Obsessive-Compulsive Disorder and Epilepsy. First trained in Cellular Biology & Animal Physiology at Sorbonne University (Paris, France), Thomas Brionne's academic research in neuroscience focused on neurodegeneration, first at the Gladstone Institute of Neurological Disease (associated with University of California San Francisco), then at Stanford University (California, USA). His PhD studied adult neurogenesis at the Brain Mind Institute of École Polytechnique Fédérale de Lausanne (Switzerland).

Thomas Brionne joined Medtronic in 2008, and currently contributes to defining the clinical research strategy, study designs and ensures results dissemination. He collaborates on submission dossiers to regulatory and reimbursement authorities, advises business partners on unmet medical needs and business development opportunities.



RANDY MCINTOSH is a Senior Scientist at the Rotman Research Institute and a Professor of Psychology at the University of Toronto. He led an international consortium of 12 universities to study brain networks in health and disease (<http://brainnrg.org>), which resulted in the establishment of today's leading large-scale brain simulation platform The Virtual Brain (<http://thevirtualbrain.org>). He also served as Vice President of Research at Baycrest from 2009-2017, helping to establish key initiatives to facilitate translation of research into care for the aging brain (<http://cabhi.com>), and now is working with other neuroscientists across Canada to establish an open neuroscience platform to accelerate discovery for maximal societal impact (<http://conp.ca>).

The scientific coordinator

VIKTOR JIRSA is Director of the INSERM *Institut de Neurosciences des Systèmes* at Aix-Marseille-Université and Director of Research at the Centre National de la Recherche Scientifique (CNRS) in Marseille, France. Viktor Jirsa received his PhD in 1996 in Theoretical Physics and Applied Mathematics and has since then contributed to the field of Theoretical Neuroscience, in particular through the development of large-scale brain network models based on realistic connectivity, linking network dynamics to brain function and imaging. His work has been foundational for network science in medicine with translations to clinical applications in neurosurgery and has contributed to a better understanding of human motor behavior and epilepsy. Viktor Jirsa serves as curator and technical lead of the brain simulation platform The Virtual Brain (www.thevirtualbrain.org) and deputy-lead of the Theoretical Neurosciences subproject (SP4) in the European flagship Human Brain Project (<https://www.humanbrainproject.eu/>). Dr. Jirsa has been awarded several international and national awards for his research including the Grand Prix Départemental de Recherche en Provence (2018), Award of Scientific Excellence (CNRS, 2011), Early Career Distinguished Scholar Award (NASPSA, 2004) and Francois Erbsmann Prize (2001). Viktor Jirsa serves on various Editorial and Scientific Advisory Boards and has published more than 160 scientific articles and book chapters, as well as co-edited several books including the Handbook of Brain Connectivity.



The moderators



OLIVIER BLIN (MD, PhD, MBA), is Professor of Pharmacology at Aix-Marseille University, certified in Neurology, Psychiatry and Medical Biology. He is currently Head of the Clinical Pharmacology & Pharmacovigilance Department, Marseille University Hospital (AP-HM), member of the *Institut de Neurosciences des Systèmes*, and coordinator of the University Hospital Federation DHUNE, COEN center on neurodegenerative disorders and aging (www.dhune.org). At the national level, he is a Member of the scientific committee of CNS ITMO Aviesan. He also is Vice President of the scientific council of CSFRS (Ecole Militaire, Paris). At the international level, he has been elected as a member of Innovative Medicines Initiative Scientific Council by the 28 EU members. Olivier Blin is a Past member of the Board of the French Minister of Health (2004-05), Founding Vice-President of Eurobiomed Cluster, Past Head of Unit Physician, CNS, GSK, Shanghai (2011-13) and Past Visiting Professor at Imperial College London (2012-13). His research focuses on CNS clinical pharmacology, health products development and public-private partnerships.

CELINE DAMON Graduate of the Grenoble Institute of Political Studies and holder of a Master's Degree in European Studies from the Institute of European Studies in Brussels, Céline Damon has more than 15 years of expertise in European programs.

After an experience in Brussels, she created and led the AMU European Support Unit in charge of the framework programmes. Under her leadership, AMU has greatly improved its participation in the EU research program, ranking it 3rd in French universities in terms of participation in the 7th framework-programme and in Horizon 2020. Having led the European Support Unit to maturity, she now holds the position of European Strategy Policy Officer. French National Contact Point (NCP) for the Health Thematic for 10 years, she is also member of the Group 'Europe' of the French National Alliance for Life Sciences and Health AVIESAN.

Céline Damon has a strong expertise in lobbying, awareness-raising and detection on European research and innovation programs; networking at national and European level; establishment and management of European research projects; monitoring of European policies and H2020 training.



Aix-Marseille University EU Office (Brussels)

Aix-Marseille University (AMU) has been the first French University to open a permanent EU Office in Brussels, since January 2016. AMU EU Office is located at the heart of the European quarter within the EU Office of Sud-Provence-Alpes-Côte d'Azur Region.

Attached to the Cabinet of AMU's President, the EU Office is internally responsible for

- Providing latest information on future EU programmes to AMU's Research Units and Faculties
- Providing research Units and Faculties networking opportunities to increase their participation in European collaborative projects
- Advising the Board and the Management of the University on EU programmes and European strategy

AMU Office in Brussels is externally in charge of

- Increasing the visibility of AMU's potential in Education, Research and Innovation
- Providing direct access to Research and Education expertise for EU institutions and stakeholders in Brussels
- Lobbying on future EU programmes and funding opportunities

AMU EU Office participates in several Brussels-based networks such as UnLiON (Universities Informal Liaison Offices Network).

Head of the EU Office, **KARL STOECKEL**

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Aix-Marseille University is a French comprehensive university founded on the 1 January 2012 by the merger of the three previously existing universities in Aix-en-Provence and Marseille. As a Research-intensive university, AMU conducts its research activities in the site of Aix-Marseille with the largest French research institutions (CNRS, CEA, IFSTTAR, INSERM, INRA and IRD). AMU is one of the three first French universities granted as *Excellence Initiative* in 2016 under the French "Investing for the future" programme (PIA).

Aix-Marseille University houses the second largest French neuroscience community and is to date the first French university in terms of participation to Health programmes within the current framework-programme for research and innovation Horizon 2020.

This event illustrates part of Aix-Marseille University's European strategy to allow a high-level dialogue involving European leaders and scientific communities across Europe.

- 78 000 students (of which 10 000 international students)
- 8 000 staff
- 119 research units
- 6 areas of education and research (*Arts, Literature, Languages and Humanities · Law and political · Sciences · Economics and Business management · Health · Science and Technology · Interdisciplinary areas: University Technology Institute, Teacher training Institute*)
- 70 projects financed under Horizon 2020 (30 ERC laureates under the current framework programme)
- 1st French university in terms of participation to health programmes under Horizon 2020



The *Institut de Neurosciences des Systèmes* (INS, UMR1106) is a multidisciplinary research institute of Inserm and Aix-Marseille University under the direction of Professor Viktor Jirsa. The Institute is located on La Timone Campus, right in the heart of Marseille and in one of the most vibrant medical research environments in France. INS members are comprised of more than a 120 researchers (Inserm, CNRS), academic faculty and clinicians of La Timone Hospital (APHM) institutions. The INS research program is focused on understanding the complex dynamics of the brain as it links to function and evolves in space and time. We capitalize on our symbiotic proficiencies by integrating experimental, theoretical and clinical approaches towards successful clinical translation.

INS houses a wide range of state-of-the-art facilities of brain research, which includes the MEG facility directly onsite of La Timone Hospital, TMS-EEG with Brain Navigation system, various

electrophysiology laboratories, an epileptic patient unit, high performance computing facilities and The Virtual Brain simulation platform. INS researchers perform research across species ranging from the rodent to the human brain to uncover the mechanisms underlying the functioning of the healthy brain and its disorders, notably epilepsy as the paradigmatic dynamic brain disease. At INS, we combine fundamental mathematical theories of brain function with latest brain imaging technologies (organic electrodes, simultaneous intracranial EEG and MEG, ...) and large-scale network computing in order to conduct high-risk research with potentially large societal impact. Such innovative projects can only be realized within a unique environment as offered by INS, in which many and distinct competencies are assembled in a single unit.

For more about INS, please go to <https://ins-amu.fr/>

