Our brain is the basis of our humanity, allowing us to perform extraordinary and highly complex tasks, such as writing a book, composing a symphony, or inventing ingenious machines like the computer. Alterations of the brain give rise to terrible and common diseases including Alzheimer's disease, Parkinson's disease, Schizophrenia, etc. Thus, understanding the human brain is the ultimate goal but this is extremely challenging – not only because of its complexity and the technical difficulties involved, but also because ethical limitations do not allow all of the necessary datasets to be acquired directly from human brains. Consequently, most of our present knowledge of brain structure and behavior has been obtained from experimental animals. The problem is that data from nonhuman brains cannot fully substitute information on humans since there are fundamental structural and behavioral aspects that are unique to humans as well as to any other species. Accordingly, the question remains as to how much of this nonhuman brain information can be reliably extrapolated to humans, and indeed it is important to establish what the best strategy currently is for obtaining the missing data.

It seems clear that only by combining studies at molecular, cellular, systems, and behavioural organization levels can allow us to fully understand the structural arrangement of the brain as a whole. However, despite the fact that neuroscience has advanced spectacularly in recent decades from genetic, molecular, morphological and physiological perspectives, the question remains as to why we are still so pessimistic about adopting this kind of combined approach. The simple reason for this is that there are enormous gaps between each of these disciplines – gaps which remain practically unexplored. This is not an easy task as it requires cooperation not only between groups of neuroanatomists with expertise in different techniques, but also close collaboration between those with expertise in quite different areas, like specialists in image analysis, data analysis, theory neuroscience, computation, molecular biology, physiology, among others. This is where large international projects come into play, the idea being to pool the efforts of multiple laboratories with different areas of expertise – coordinated through big worldwide projects like the Human Brain Project (HBP) based in the European Union and the Brain Activity Map based in the United States. Thanks to these and other initiatives that promote interdisciplinary collaboration and data sharing, such as the Allen Institute for Brain Research or neuroinformatic platform like NeuroMorpho.Org and BAMS2 Workspace, the tempo of the development of new technologies and new strategies to study the brain can be extraordinarily increased giving us cause for optimism.

In this series of lectures, several neuroscientists who are experts in different fields of research, including some of the leaders of the HBP, will discuss major issues regarding the study of the human brain from different angles. We will also deal with some major neurodegenerative brain diseases and with frontier drug discovery to treat Alzheimer's disease, other neurodegenerative diseases and stroke.

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→ Apertura de matrícula

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Escuela

XVI International School of Pharmacology «Teófilo Hernando». Understanding the Human Brain

Antonio G. García

Javier de Felipe

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Del 24 al 28 de julio de 2017

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XVI International School of Pharmacology «Teófilo Hernando». Understanding the Human Brain

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Universidad Politécnica de Madrid, Spain

Secretaría
Luis Gandía
Instituto / Fundación Teó.lo Hernando de I+D del Medicamento
Universidad Autónoma de Madrid, Spain

Del 24 al 28 de julio de 2017

Monday 24

10:00 h | Inauguration
Antonio G. García
Javier de Felipe

10:30 h | The origin of the universe
Alberto Fernández Soto
Instituto de Física de Cantabria, Santander, Spain

12:00 h | Similarities between the universe and microscopic world of the brain: two parallel worlds?
Javier de Felipe

15:00 h | YRC-1.-Frontier drug discovery in brain diseases
Moderación
Antonio G. García

Tuesday 25

10:00 h | Schizophrenia is a complex syndrome reflecting in many cases abnormal neurodevelopment
Celso Arango López
Universidad Complutense de Madrid, Spain

12:00 h | Cerebral basis of cognitive function
Bryan Strange
Centro de Tecnología Biomédica
Universidad Politécnica de Madrid, Spain

15:00 h | YRC-2.- Frontier drug discovery in brain diseases
Moderación
Luis Gandía

Wednesday 26

10:00 h | Computers like brains - How far we've come
David R. Lester
The University of Manchester, Manchester, UK

12:00 h | The Anatomical Problem Posed by Brain Complexity and Size: A Potential Solution
Javier de Felipe

15:00 h | YRC-3.- Frontier drug discovery in brain diseases
Moderación
Antonio G. García

Thursday 27

10:00 h | Localization in the brain: new solutions emerging
Jan G. Bjaalie
Institute of Basic Medical Sciences,Oslo, Norway

12:00 h | Understanding brain diseases: Alzheimer's disease
John Hardy
Institute of Neurology, University College London, UK

15:00 h | YRC-4.- Frontier drug discovery in brain diseases
Moderación
Luis Gandía

Friday 28

9:00 h | The increasing socio-health impact of Alzheimer's disease: perspectives
Rafael Blesa González
Hospital de la Sta. Creu i St. Pau, Barcelona, Spain

10:30 h | Closing Lecture: Frontier drug discovery in neurodegenerative diseases
Antonio G. García

12:00 h | Closing ceremony
Antonio G. García
Javier de Felipe