



XIX International Pharmacology School “Teófilo Hernando”

**ADVANCED THERAPIES FOR
HUMAN DISEASE**

Santander, June 20-24, 2022

Directors:

Antonio G. García

*Universidad Autónoma de Madrid,
Spain*

Michael Duchen

University College London, UK

Academic Secretary:

Luis Gandía Juan

*Universidad Autónoma de Madrid,
Spain*

Patrocina:



Monday, June 20

- 10:00 School inauguration by directors and UIMP academic authority
- 10:30 Senolytic therapies in cancer and other diseases
José Alberto López Domínguez
Institute for Research in Biomedicine, Barcelona, Spain
- 12.00 Telomers and telomerase in cancer and ageing
María A. Blasco
Centro Nacional de Investigaciones Oncológicas
- 15:00-17.00 *Young Researcher Presentations (YRP-1)*
Coordinator: **Luis Gandía**

Tuesday, June 21

- 10:00 Mitochondrial pathways as therapeutic targets for human disease
Michael Duchen
University College London, UK
- 12:00 Mitochondrial cell therapy
Natalie Yivgi-Ohama
MINOVIA, Israel
- 15:00- 17.00 *Young Researcher Presentations (YRP-2)*
Coordinator: **Luis Gandía**

Wednesday, June 22

- 10:00 Reprogramming human skeletal muscle regeneration: new strategies for neuromuscular modelling and therapy
Francesco Saverio Tedesco
University College London, UK
- 12:00 **Neurodegeneration, neuroprotection and drug repositioning**
Antonio G. García
Universidad Autónoma de Madrid, Spain
- 15:00-17.00 **Young Researcher Presentations (YRP-3)**
Coordinator: **Luis Gandía**

Thursday, June 23

- 10:00 Targeting mRNA polyadenylation as a novel therapeutic approach to treat drug refractory epilepsy
Tobias Engel
Royal College of Surgeons in Ireland, Dublin, Ireland
- 12:00 Epilepsy as a model for precision therapeutics
Katherine Benson
Royal College of Surgeons in Ireland, Dublin, Ireland
- 15:00- 17.00 Young Researcher Presentations (YRP-4)
Coordinator: **Luis Gandía**

Friday, June 24

- 10:00 Targeting purinergic check-points in inflammation and cancer
Francesco di Virgilio
University of Ferrara, Ferrara, Italy
- 11:30 Closing lecture.
The novel neurotechnologies: implication for science and medicine
Rafael Yuste
Columbia University, New York, USA
- 13:00 Closing ceremony by directors, professors and students

Central stage in the fascinating field of drug discovery and development is the identification of drugable targets implicated in the pathogenesis of a given human disease. Hence, in this School frontier knowledge in such endeavour will be analysed by worldwide renowned scientists in the field of neuroscience, mitochondria, the epilepsies, Alzheimer's disease, cell therapies and other advanced therapies. This XIX edition of the International Teófilo Hernando's Pharmacology School will enlighten young PhD and postdoctoral students, as well as graduate students in the area of biomedical sciences. Additionally, PhD and postdoctoral students will have the opportunity of presenting their work to the class and professors. It is a tradition in this School that professors and students read a poem to the class dealing with their own culture. In doing so, humanities and science walk hand in hand, as in renaissance times, 500 years ago. Hence, the School is a science and humanistic unique experience that reminds the foundation of UIMP by poets and scientists near 100 years ago.

The International Pharmacology School "Teófilo Hernando" was initiated in 1996, in the frame of the summer courses of UIMP. At that time, Rector José Luis García Delgado invited professor Antonio G. García (Universidad Autónoma de Madrid) to organise this School.

The School was named after Teófilo Hernando, a Spanish MD/PhD pharmacologist who was trained under Oswald Schmiedeberg at Strassbourg, the first formal Pharmacology School where many pharmacologists throughout the world were trained at the end of the XIX century and the beginning of the XX century and then developed the subject of basic and clinical pharmacology in their own countries. Teófilo Hernando introduced pharmacology as an independent teaching and science subject at the Universidad Complutense de Madrid, along the first three decades of the XX century this academic matter soon spread out to several Spanish universities by pharmacologists trained under professor Hernando. He trained numerous other disciples that extended the subject to many other Spanish universities along the XX century.

The format of a UIMP's School ("Escuela") is based in the critical analysis in the frontier of knowledge of a given scientific topic, along a week (Monday to Friday) by scientists and students of all over the world. Two sessions are delivered in the morning by invited scientists, lasting each one two hours, with vivid discussions. In the afternoon, PhD students and postdocs present their

ongoing scientific work as short oral communications. Emphasis is always made in the identification of new biological drug targets that illuminate the design, synthesis and development of new medicines to treat human diseases.

Since 1996, 18 editions of the School have been held. Over 100 internationally recognised scientists and over 500 students have since then attended the School. The subjects of the subsequent Schools were as follows:

- 1.-Drugs and their receptors (1996)
- 2.-Drugs for the brain (1997)
- 3.-Clinical trials in Spain (2000)
- 4.-Biotechnological drugs (2001)
- 5.-Alzheimer's disease (2002)
- 6.-Drugs and cardiovascular risk (2003)
- 7.-Chronic inflammation and osteoarthritis (2008)
- 8.-Neurodegenerative diseases (2009)
- 9.-The language of neurons (2010)
- 10.-Neuroprotection and neuroreparation of the injured brain (2011)
- 11.-New concepts and strategies for neuroprotection (2012)
- 12.-Brain damage and repair (2013)
- 13.-Frontier drug discovery in brain disease (2014)
- 14.-New therapeutic targets in brain disease (2015)
- 15.-Alzheimer's and other neurodegenerative diseases: Pharmaco-therapeutic advances (2016)
- 16.-Understanding the human brain (2017)
- 17.-Frontier therapies in brain diseases: focus on purinergic signalling (2018)
- 18.-Frontier biomarkers and drug discovery for the early diagnosis and treatment of Alzheimer's disease (2019)

ACHIEVEMENTS

In these 25 years of the School, two are its main achievements: (i) the contribution to the multidisciplinary training of young PhD students and postdocs; (ii) the establishment of an international forum to analyse and discuss frontier basic knowledge with potential to serve as a platform for drug discovery and development to prevent, mitigate or cure human diseases. Of note is the fact the successive summer schools run in a friendly atmosphere with vivid discussions and good interaction among professors and students as well as among students themselves, from different countries. We believe that the School activities are contributing to reinforce the value of scientific collaboration, open exchange of ideas, friendship and respect for everyone throughout Europe.

SCIENTISTS THAT PARTICIPATED IN PAST SCHOOLS

The following scientists from different countries participated as professors in the School:

- Francisco **Abad** Santos, Hospital Universitario de La Princesa; Madrid, Spain
- Andrey **Abramov**, University College London, UK
- José Enrique **Alés**, Hospital Ruber Internacional, Madrid, Spain
- Guillermo **Alvarez** de Toledo, Universidad de Sevilla, Spain
- Celso **Arango**, Universidad Complutense de Madrid, Spain
- Alfonso **Araque**, University of Minnesota, USA
- Jesús **Avila**, CBM/UAM/CSIC, Madrid, Spain
- Mariano **Barbacid**; Centro Nacional de Investigaciones Oncológicas, Instituto de Salud Carlos III, Madrid, Spain
- Josep **Baselga**, Hospital Vall d'Hebron, Barcelona, Spain
- Carlos **Belmonte**, Instituto de Neurociencias, Universidad Miguel Hernández, Alicante, Spain
- Félix **Bermejo**, Hospital Universitario 12 de Octubre, Madrid, Spain
- Jan G. **Bjaalie**, Institute of Basic Medical Sciences, Oslo, Norway
- Francisco J. **Blanco** García, Hospital Juan Canalejo; La Coruña, Spain
- Rafael **Blesa**, Hospital de la Sta Creu i St. Pau, Barcelona, Spain
- Maria Laura **Bolognesi**, University of Bologna, Italy
- Ricardo **Borges** Jurado, Universidad de la Laguna; Tenerife, Spain
- Washington **Buño**, Instituto Cajal, CSIC, Madrid, Spain
- Fernando **Cañas**, Department of Psychiatry, Hospital Dr Rodríguez Lafora, Madrid, Spain
- Emilio **Carbone**, Universidad de Turin; Italy
- José **Castillo**, Hospital Clínico de Santiago de Compostela, Spain
- Marc **Ceusters**, Janssen Pharmaceutica, Beerse, Belgium
- Manuel **Criado**, Neuroscience Institute; Miguel Hernández University, Elche, Spain
- Antonio **Cuadrado**, Universidad Autónoma de Madrid /CSIC, Spain
- Valentín **Cuervas**-Mons, Clínica Puerta de Hierro; UAM, Madrid, Spain
- Jack **C. de la Torre**, Department of Neuropsychology, University of Texas at Austin, USA
- Francesco **di Virgilio**, University of Ferrara, Italy.
- Patrick **du Souich**, Universidad de Montreal; Canadá
- Javier **DeFelipe**, Instituto Cajal (CSIC) and Centro de Tecnología Biomédica (UPM), Madrid, Spain
- José M^a **Delgado** García, Universidad Pablo de Olavide; Sevilla, Spain
- Miguel **Díaz** Hernández, Universidad Complutense de Madrid, Spain.
- Michael **Duchen**, University College London, UK
- Jesús **Egido**, Fundación Jiménez Díaz; Universidad Autónoma de Madrid, Spain
- Tobias **Engel**, Royal College of Physicians of Ireland, Dublin, Ireland
- Juan V. **Esplugues**, Centro Nacional de Investigaciones Cardiovasculares; CNIC, Spain
- James W. **Fawcett**, Cambridge University Centre for Brain Repair; Cambridge, UK
- Javier **Fernández** Gadea, Janssen-Cilag, Toledo, Spain
- Alberto **Fernández** Soto, *Instituto de Física de Cantabria, Santander, Spain*
- Jesús Angel **Fernández-Tresguerres**, Universidad Complutense de Madrid, Spain
- Juan **Fortea**, Hospital Santa Creu e Sant Pau, Barcelona, Spain
- Bruno **Freguelli**, University of Warwick, Warwick, UK
- Enrique **Gálvez**, Universidad de Alcalá de Henares, Madrid, Spain
- Manuela **García** López, Instituto Fundación Teófilo Hernando, Universidad Autónoma de Madrid, Madrid, Spain

- Luis **Gandía** Juan, Instituto Fundación Teófilo Hernando, Universidad Autónoma de Madrid, Madrid, Spain
- Antonio **G. García**, Instituto Fundación Teófilo Hernando, Universidad Autónoma de Madrid, Madrid, Spain
- Justo **García** de Yébenes, Hospital Ramón y Cajal, Madrid, Spain
- Javier **García-Sancho**, Facultad de Medicina, Universidad de Valladolid, Spain
- Hugo **Geerts**; In-Silico Biosciences, Lexington, MA, USA
- Hélène **Girouard**, University of Montreal, Canada
- Linda **Greensmith**; Institute of Neurology, University College London; UK
- Santiago **Grisolía**, Presidente del Consejo Valenciano de Cultura, Expresidente del Comité de Coordinación Científica de la UNESCO para el proyecto Genoma Humano, Valencia, Spain
- Pedro **Guillén** García, Clínica CEMTRO; Madrid, Spain
- José Antonio **Gutiérrez**, Fundación Lilly, Madrid, Spain
- John **Hardy**, Institute of Neurology, University College London, UK.
- Ricardo **Henriques**, University College London, UK
- Peter St. **George Hyslop**, University of Cambridge, UK
- Allen **Kaasik**, University of Tartu, Estonia
- John **Kemp**, Janssen-Cilag; Beerse, Belgium
- Arthur **Konnerth**, Technische Universität München, Germany
- Samir **Kumar-Singh**, University of Antwerp, Belgium
- Juan **Leirner**, Instituto de Neurociencias, UMH-CSIC, Elche, Spain
- David R. **Lester**, The University of Manchester, Manchester, UK.
- Filip **Lim**, Centro de Biología Molecular “Severo Ochoa”, CSIC-UAM, Spain.
- Juan **Linera**, Hospital Ruber Internacional, Madrid, Spain
- David **Lodge**, Lilly; UK
- José **López** Barneo, Hospital Virgen del Rocío; Universidad de Sevilla, Spain
- José Javier **Lucas**, Centro de Biología Molecular “Severo Ochoa”; CSIC-UAM, Madrid, Spain
- María Isabel **Lucena** González, Hospital Universitario “Virgen de la Victoria, Universidad de Málaga, Spain
- José Luis **Marco**, CSIC, Madrid, Spain
- Fionna **Martin** Eli Lilly and Company Limited, UK
- Carlos **Martínez-Alonso**, Centro Nacional de Biotecnología, UAM-CSIC, Madrid
- Fernando **Martínez** Brotons, Hospital de Bellvitge, Barcelona, Spain
- José Manuel **Martínez** Lage, Universidad de Navarra, Spain
- Jorge **Matias-Guiu**, Hospital Clínico San Carlos, Univ. Complutense de Madrid, Spain
- Carlos **Matute**, Universidad del País Vasco, Leioa, Spain
- Tristan **McKay**, St. George University of London, London, UK
- Miguel **Medina**, CIBERNED, Spain
- María Teresa **Miras** Portugal, Universidad Complutense de Madrid, Madrid, Spain
- Ingrid **Möller** Parera, Instituto Poal de Reumatología; Barcelona, Spain
- Salvador **Moncada** Wolfson Institute for Biomedical Research, University College London, UK
- Joan **Montaner** Villalonga, Hospital Vall de Herbron, Barcelona, Spain
- Ricardo **Moreno**, Hospital de La Princesa, UAM, Madrid, Spain
- Erwin **Neher**, Nobel prize of Physiology or Medicine 1991. Max-Planck Institute for Biophysikalische Membranen, Göttingen, Germany.
- Annette **Nicke**, Ludwig-Maximilians-Universität München, Germany
- Baldomero **Olivera**, University of Utah, USA
- Manuel **Ortiz de Landáuzuri**, Hospital de la Princesa, Madrid, Spain

- Angel **Pazos**, Facultad de Medicina, Universidad de Cantabria, Spain
- Pablo **Pelegrin**, Hospital Universitario Virgen de la Arrixaca, Murcia, Spain
- James **Putney**, National Institute of Environmental Health Sciences-NIH, North Carolina, USA
- Fernando **Rodríguez Artalejo**, Universidad Autónoma de Madrid, Madrid, Spain
- Francisco **Sala Merchán**, Instituto de Neurociencias, Universidad Miguel Hernandez-CSIC; Elche, Alicante, Spain
- Paul **Schumacker**, Northwestern University, Chicago, USA
- Kenneth **Smith**, Institute of Neurology, London, UK
- Bernat **Soria**, Centro Andaluz de Biología Molecular y Medicina Regenerativa, Sevilla, Spain
- Peter **Stadler**, Exelixis Inc/Artemis Pharmaceutical; Germany
- Bryan **Strange**, Centro de Tecnología Biomédica (UPM), Madrid, Spain
- James **Surmeier**, Northwestern University, Chicago, IL, USA
- Gyorgy **Szabadkay**, University College London, UK
- Juan **Tamargo** Menéndez, Universidad Complutense de Madrid, Spain
- Fernando **Valdivieso**, CBM/UAM/CSIC, Madrid, Spain
- Jesús **Vaquero**, Hospital Puerta de Hierro, Universidad Autónoma de Madrid, Spain
- Josep **Vergés** Milano, Bioibérica Farma; Barcelona, Spain
- José María **Villalón** Alonso, Servicios Médicos; Club Atlético de Madrid; Madrid, Spain
- Manfred **Windisch**, JSW Lifesciences GmbH, Austria

ABOUT THE INTERNATIONAL MENÉNDEZ PELAYO'S UNIVERSITY (UIMP)

UIMP (“Universidad Internacional Menéndez Pelayo”) was created on August 23, 1932 as a result of the approval of a foundational decree proposed by the Minister for Public Education and Arts, Fernando de los Rios. Courses started in 1933 under the leadership of Ramón Menéndez Pidal and Blas Cabrera from 1934 to 1936 and the poet Pedro Salinas as Secretary General. This could explain the strong emphasis in humanities and Spanish language courses as well as in political, economical and social sciences of UIMP. However, the summer programme has also traditionally hosted advanced courses in physics, chemistry, mathematics, medical and other sciences.

In the 1940s the University adopted its current name after Marcelino Menéndez Pelayo, a Spanish historian born in Santander, where the most traditional and famous campus of this University is located. The “Universidad Internacional Menéndez Pelayo” (UIMP) was created to foster a better relationship between professors and doctoral and postdoctoral students, during summer courses that lasted several weeks and at its earlier time, during the whole summer. The idea was to create an informal atmosphere for discussion and analysis of different topics in the frontier of knowledge. This strongly contributed to the intellectual maturation of young students as well as to the development of a critical and liberal attitude toward problems and people, in an atmosphere of open spirit and intellectual relevance.

During the last decades UIMP has diversified the type of courses and activities, of short (few days, one week) and longer duration (weeks to months) and has recently established PhD programmes in collaboration with the National Research Council (CSIC) and other private and public institutions. Near a century after its foundation, the UIMP is still a benchmark in the Spanish educational arena.

UIMP has different campuses throughout Spain and courses are held along the year. UIMP directly depends on the Spanish Ministry of Education that elects its Rector among renowned University Professors (For more information visit UIMP site at <http://www.uimp.es>).

SUMMER COURSES IN LA MAGDALENA PALACE

The most famous campus of UIMP is La Magdalena Palace, located in Santander, North of Spain.



This palace was built at the beginning of the XX century and was gifted by the city of Santander to the Royal Family (Alfonso the XIIIth), for summer vacations. This helped to develop Santander and its beaches and mountains surroundings, as one of the most beautiful tourist sites of Spain. In fact, Santander is actually considered as one of the most attractive cities of Spain due to the extraordinary combination of mountains, the Atlantic Ocean, the green and colourful gardens and the forests of Cantabria, the Autonomous Spanish Community having as capital Santander. Professors and students coming from abroad get unanimously astonished with the beauty of the Magdalena Palace, surrounded by forest, beaches (i.e. the famous “El Sardinero” beach) and beautiful and well kept colourful gardens where professors and students can gather together, in the lecture hall, at the restaurants or walking in the surroundings of the palace and the Caballerizas, the place where the horses were kept at the time of the Royal family vacations, and now a residency and some lecture halls.