Fundación BBVA

2009 BBVA Foundation Frontiers of Knowledge Awards

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PRESS RELEASE

Lefkowitz wins the BBVA Foundation Frontiers of Knowledge Award in Biomedicine for discovering the receptors targeted by around half of current drugs

- Prof. Lefkowitz discovered the seven transmembrane receptors, the largest, most versatile and most therapeutically accessible receptor signaling system.
- The Frontiers of Knowledge Awards were established in 2008 to address the great global challenges of the 21st century.
- The breadth of disciplines addressed and their monetary amount – a total of 3.2 million euros – place them among the world's foremost award schemes. Each category carries a cash prize of 400,000 euros.

January 27, 2010.- The BBVA Foundation Frontiers of Knowledge Award in the Biomedicine category goes in this second edition to Prof. Robert J. Lefkowitz (1943, New York, United States), investigator in the Department of Medicine at Duke University (United States). The award was granted, in the words of the jury, "for his discoveries of the seven transmembrane receptors (G protein-coupled receptors), the largest, most versatile and most therapeutically accessible receptor signaling system, and of the general mechanism of their regulation".

Lefkowitz is author of more than 850 research papers that at the time of writing have been cited on over 95,000 occasions. His findings have led to the development of numerous drugs for a wide variety of conditions, above all in neurology (Parkinson's disease), cardiology (arterial hypertension) and diabetes.

The Frontiers of Knowledge Awards honor world-class research and artistic creation. The breadth of disciplines addressed and their monetary amount, an annual 3.2 million euros, place them among the foremost international award families. However their uniqueness lies in their close alignment with the scientific, technological, social and economic challenges of the present century. In this respect, they are the first to reserve dedicated categories for Climate Change; Development Cooperation; Information and Communication

Technologies, and Ecology and Conservation Biology, alongside the awards going to outstanding contributions in Economics, Finance and Management; Basic Sciences; Biomedicine, and Contemporary Music.

On being informed of the decision, Professor Lefkowitz declared himself "just thrilled. In its short history, this award has gone to the best of us, to Dr. Massagué. I have nothing but the biggest admiration and respect for his work and feel honored to be in his company". **Joan Massagué**, Spain's most internationally cited working scientist, was winner in this category in the first edition of the Frontiers Awards.

40 YEARS OF RESEARCH ON CELL RECEPTORS

In the 1970s, Lefkowitz was convinced that specific hormone and drug receptors in the cell membranes were a reality waiting to be discovered. A theory which he admits, "caused not a little skepticism among the scientists of the time. But I was young then and got it into my head that if we could just learn a way to isolate and study these receptors, that would open the door to new drug development and all kinds of new things".

Building on his training as a cardiologist, he began work on identifying and studying the adrenalin receptor and, through biochemical analysis and structural biology, was able to show the general principles of how they work. Nowadays, the more than 100 described components making up the superfamily of seven transmembrane receptors (7TM) have been isolated in all kinds of body cells.

From a clinical standpoint, the importance of his research is evidenced by the number of today's drugs, up to 50%, that act on the seven transmembrane receptors. According to Lefkowitz, "there is no field of medicine that has not been impacted by this new knowledge. The important thing to understand is that virtually all physiological processes in our bodies, and that includes diseases, are regulated by various members of this huge receptor family".

The jury takes up this point in its citation: "Lefkowitz's work has led to treatments for cardiovascular disease, such as beta-blockers. His studies have also led to an understanding of how drugs and hormones can lose their effect in patients who show changes in these receptors".

Lefkowitz's nomination was proposed by the Department of Molecular Biology at the Universidad Autónoma de Madrid and seconded by the University of Barcelona, California Institute of Technology (United States), the Albert Einstein College of Medicine (United States) and the Rudolf Wirchow Center at the University of Wuerzburg (Germany).

The jury in this second edition was chaired by **Angelika Schnieke**, Chair of Livestock Technology in the Department of Animal Science of the Technical University of Munich (Germany,) with **Robin Lovell-Badge**, Head of the Division of Stem Cell Biology and Developmental Genetics at the MRC National Institute for Medical Research (United Kingdom) acting as secretary. Remaining members were **Dario Alessi**, Deputy Director of the Protein Phosphorylation Unit, a Medical Research Council unit in the College of Life Sciences, Dundee University (United Kingdom); **Mariano Barbacid**, Director of the Spanish National Cancer Research Center (CNIO, Spain); **José Baselga**, Director of the Institute of

Oncology at the Vall d'Hebron University Hospital (Spain), and **Bruce Whitelaw**, Head of the Developmental Biology Division at the Roslin Institute in Edinburgh (United Kingdom).

WINNERS IN OTHER AWARD CATEGORIES

The Biomedicine category is the fourth to be decided in this edition of the BBVA Foundation Frontiers of Knowledge Awards. It follows on from the awards in Climate Change (granted to German physicist and mathematician **Klaus Hasselmann** for demonstrating that recent global warming trends are attributable to human activities), Information and Communication Technologies (engineer and mathematician **Thomas Kailath** for a mathematical development enabling the production of increasingly small size chips) and Basic Sciences (shared by physicists **Richard N. Zare** and **Michael E. Fisher** for rendering visible individual molecules and describing their collective behavior).

The next award to be decided is Ecology and Conservation Biology whose winner will be announced tomorrow, January 28. The calendar of remaining award announcements can be found at www.fbbva.es.

The BBVA Foundation supports knowledge generation, scientific research and the promotion of culture, relaying the results of its work to society at large. This effort materializes in research projects; human capital investment; and specialization courses, grants and awards. Among the BBVA Foundation's preferred areas of activity are basic sciences, biomedicine, ecology and conservation biology, the social sciences and literary and musical creation.

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