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Robert Lefkowitz to Receive Frontiers of Knowledge Award

The BBVA Foundation announced that Robert J. Lefkowitz, a Howard Hughes Medical Institute investigator at Duke University, has been selected to receive the Frontiers of Knowledge Award in Biomedicine.

According to the foundation, Lefkowitz was honored 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.”

The BBVA Foundation, which has its headquarters in Madrid, is the philanthropic arm of the Banco Bilbao Vizcaya Argentaria – Spain’s second largest bank. The Frontiers of Knowledge Awards consist of prizes in eight categories: Basic Sciences (Physics, Chemistry, Mathematics), Biomedicine, Ecology and Conservation Biology, Information and Communication Technologies, Economics, Finance and Management, Contemporary Music, Climate Change and Development Cooperation. The awards were established to recognize and promote research of excellence.

Lefkowitz will receive the 400,000 euros (approx. \$560,000) prize at a ceremony in Madrid in June. Last year, the Frontiers of Knowledge Award in Biomedicine went to HHMI investigator Joan Massagué of Memorial Sloan-Kettering Cancer Center.

An HHMI investigator since 1976, Lefkowitz is the author of more than 850 research papers. His research findings have led to the development of numerous drugs for conditions such as Parkinson’s disease, hypertension, and diabetes.

Lefkowitz’s work with G protein-coupled receptors, the largest and most pervasive family of cell receptors, began in 1982 with the identification of the gene for the β -adrenergic receptor, which helps regulate the body’s fight-or-flight response by reacting to epinephrine. Shortly thereafter, he discovered seven additional adrenergic receptors. These receptors—and all G-protein receptors—share a basic structure, in which the molecule weaves its way back and forth seven times across a cell’s membrane. When the portion of the molecule that lies outside the cell connects with the receptor’s

avored signaling molecule, the internal portions of the molecule can trigger the appropriate cellular response.

About a thousand G protein-coupled receptors are now known to contribute to physiological processes including pain tolerance, glucose metabolism, and the regulation of heart rate and blood pressure. Understanding the similarities that shape how these receptors function has helped pharmaceutical researchers target these molecules in the body. Lefkowitz has also discovered two new families of proteins that desensitize G protein-coupled receptors, a finding that has helped scientists understand how receptors become tolerant of certain drugs.