

Genomic clues of cancer and aging

In recent years, the extraordinary momentum of Molecular Biology has allowed the rigorous and deep analysis of essential questions about the nature of life and human disease. Thus, the molecular scrutiny of complex processes such as cancer and aging have begun to figure a prominent place in the group of scientific problems subjected to new look. The human genome has 3,000 million nucleotides and about 25,000 genes that generate a harmonic universe of possible messages that make every moment of life in each of us. Why all this molecular harmony is lost and the cells are weakened, the tissues lose their functions, and body ages until finally surrenders? Will it be possible to control cancer and other diseases to which nowadays there is no appropriate answer? Will we be able to extend longevity in a near future? In his lecture, Professor Carlos López-Otín will present recent work from his laboratory aimed at trying to provide answers to these questions.

Carlos López-Otín is a Full-University Professor of Biochemistry and Molecular Biology in the Faculty of Medicine of the University of Oviedo. His professional work has also developed in the Ramón y Cajal Centre and “Severo Ochoa” Molecular Biology Centre in Madrid, and the University of Lund in Sweden, and New York and Harvard in the U.S. Currently, he combines teaching at the University of Oviedo with the development of lines of research on cancer, aging and functional analysis of genomes. The group's work has been directed to the identification of 60 novel human genes and analysis of their roles in tumour progression and other normal and pathological processes. He has also contributed to the annotation and characterization of the human genome and other organisms of biomedical and evolutionary interest as the chimpanzee. Since 2010, he co-directs the Spanish contribution to the International Cancer Genome Consortium, who has deciphered the genome and the epigenome of hundreds of patients with chronic lymphocytic leukaemia. Among the more recent work of his group include the discovery of anti-tumour proteases, the discovery of a new hereditary syndrome of accelerated aging, the development of a treatment for Hutchinson-Gilford Progeria, the identification of two genes that slow larynx cancer and the definition of the molecular key to human aging. These works have lead to more than 300 publications that have been cited more than 40.000 times, with an aggregate Hirsch index of 95. Professor López-Otín is a member of several academies and has won numerous awards, including the European Prize FEBS in Biochemistry, the Dupont Prize in Life Sciences, the Echevarne Prize in Oncology, the "Carmen and Severo Ochoa Prize" in Molecular Biology, The Cobos Prize in Biomedical Research, the Mexico Prize in Science and Technology, the Jaime I Prize in Research and the National Research Prize "Santiago Ramón y Cajal".