



Present and Previous positions

- 2016-present: Editor-in-Chief of *Neuroscience*,
- 2016-present: Secretary-General of the Federation of European Neuroscience Societies (FENS)
- 2014-present: Member of the Board, European Brain Council
- 2014-present: Member of the Executive Committee of the Confederation of Spanish Scientific Societies (COSCE)
- 2007-2016: Director, Instituto Neurociencias de Alicante (CSIC-UMH)
- 2013-16: Chairman of the PanEuropean Regional Committee of the International Brain Research organization (IBRO) (previously WERC+CEERC)
- 2005-07. Vicedirector, Instituto Neurociencias de Alicante (CSIC-UMH)
- 2000-03. Head of Department of Neural Plasticity. Instituto Cajal, CSIC
- 2000. Profesor de Investigación CSIC
- 1995: Acting Director. Instituto Cajal, CSIC
- 1993-96: Vicedirector. Instituto Cajal, CSIC

Fields of Scholarship

- Neuroscience
- Synaptic Transmission and Plasticity
- Glutamate receptors

Awards and Distinctions

- 2013- Distinction to the Scientific Merit. Government of Valencia Community.
- 2011-13 President of Spanish Neuroscience Society (SENC)
- 2010-13. Chairman of the Western European Regional Committee of IBRO
- 2010- Member of the Academia Europaea
- 2010. "Highest distinction to the investigative career". Universidad Nacional Mayor de San Marcos. Peru
- 2005- Member of European Dana Alliance for the Brain (EDAB)
- 2000- Member of European Molecular Biology Organization (EMBO)
- 2005. XI Award "Alberto Sols" to the Best Research Activity
- 2004. CEOE Foundation Award to the Sciences
- 2002. Award to the Scientific Excellence "Alonso Gabriel de Herrera"
- 2002. Santiago Grisolia Chair Award
- 1998. Distinction Award by the Health Science Foundation

Summary of Scientific Achievements

Juan Lerma (JL) initiated his career in 1979 at the "**RAMON Y CAJAL**" HOSPITAL in Madrid, studying the neural circuits and cellular activities that process sensory-motor integration during Paradoxical Sleep (REM sleep). After obtaining his Ph.D degree in 1983, he established an independent laboratory in the same department where he **CONTRIBUTED TO THE DEVELOPMENT OF BRAIN MICRODIALYSIS** until he **MOVED (1987) TO THE ALBERT EINSTEIN COLLEGE OF MEDICINE, IN NEW YORK**. In 1990, he returned to Madrid as Group Leader at the Cajal Institute (CSIC) where he continued to make key contributions in the field of glutamate receptors in neuronal physiopathology. In 2004, JL **MOVED WITH HIS GROUP TO THE INSTITUTO DE NEUROCIENCIAS** de Alicante, where he was appointed **VICEDIRECTOR IN 2005 AND DIRECTOR IN 2007**.

Since 1990, we have been working on the structure and function of glutamate receptors, the most important signaling system in the brain. We analyzed one important characteristic of neurotransmitter receptors: desensitization (Neuron 1992); defined its structural determinants (Neuron, 1998a) and the allosteric mechanism involved (Neuron, 2001), intrinsic to the NMDA type of glutamate receptors. We were first describing the existence in central neurons of functional kainate receptors (KARs), demonstrating that KAR proteins form functional receptor channels in hippocampal neurons (PNAS 1993) and providing the tool for further studies, the drug 2-3-benzodiazepine, GYKI 53655, which allowed their pharmacological isolation (Neuron 1995a). This finding paved the way for progress in the field. Our group was among the pioneers in applying single-cell RT-PCR (Neuron, 1995b) to study these receptors. We described their fundamental role in controlling neuronal tissue excitability and epileptogenesis (Neuron, 1997). Also demonstrated that KARs have a dual mechanism of signalling: as ion channels and triggering a second messenger cascade, involving a G-protein (Neuron, 1998b; PNAS, 2000). This and subsequent work (Neuron, 2003; EMBO J., 2007; J. Neurosci., 2013; Neuron, 2016) put forward the new concept that ion channel-forming receptors are also able to signal through a G-protein, opening new vistas on the functional mechanisms of ionotropic glutamate receptors and provided strong evidence supporting their role in the maturation of neural circuits during development (J Neurosci., 2013). We have also identified some members of the KAR interactome (Neuron, 2009; J. Neurosci, 2013, J. Neurosci, 2015a) and provided fundamentals on the structure of non-canonical signalling as we identified the Go alpha subunit and GluK1 subunit as natural partners for this activity.

Current line of research:

All these data led us to conclude that KARs influence neuronal excitability and information transfer in the brain (see our 2013 Neuron review). However, the role played by KARs in brain physiology and even clearer in pathology is still much more poorly understood than that of other glutamate receptors. Our recent discovery that overexpressing one of the KAR high affinity subunits, GluK4, reproduces autism traits (J. Neurosci., 2015b) represents one of the most compelling demonstrations of their involvement in mental disease; but also that slightly altering the gain of particular synapses may significantly impact the behavior.

These results prompted us to propose the general objective of our current project: to get insights into the role played by KARs in the pathophysiology of brain diseases, in particular those related with the alteration of the mood. We have hypothesized that an excess of function of KARs, in particular GluK4, drastically affects circuit formation determining the functional state of particular brain nuclei and/or neuronal circuits, which further result in altered brain performance and therefore altered behavior. Indeed, in the past few years, the findings from genetics and brain-imaging studies support the idea that the mental disorders overlap. In summary, in the next few years we will try to bridge the gap between cellular and molecular properties of brain processes and behaviour in the hope that understanding of brain diseases requires the definition of the molecular, synaptic and cellular alterations underpinning the behavioural features that define the disease.

Juan Lerma has organized and chaired symposia for the Society for Neuroscience (SfN) and the FENS meetings and gave several plenary lectures in national and international congresses. JL has written a number of reviews in journals such as **Neuron**, **Physiological Reviews**, **Current Opinion** and **Nature Reviews** as well as in a number of monographic books, including the **Encyclopedia of Neurosciences** (L. Squire, ed) and serves in the editorial board of several journals. Recently, he has been appointed **Editor-in-Chief** of Neuroscience, the flagship journal of IBRO.

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