B·DEBATE International Center for Scientific Debate BARCELONA

Sant Joan de Déu HOSPITAL MATERNOINFANTIL - UNIVERSITAT DE BARCELONA

Sant Joan de Déu Research Foundation

ÀLEX BAYÉS

CV

PARTICIPANT AT:

CONNECTING THE GROWING BRAIN

UNDERSTANDING NEUROPAEDIATRIC DISEASES THROUGH SYNAPTIC COMMUNICATION

November, 26th-27th, 2015, Barcelona

Àlex Bayés, Principal Investigator, Biomedical Research Institute Sant Pau, Barcelona, Spain

Àlex Bayés (AB) received his PhD on Biochemistry in 2005 (UAB, Barcelona). His doctoral research turned into several publications including a first author article in PNAS. Afterwards he performed a postdoctoral stay, between 2006 and 2012, at The Sanger Institute (Cambridge, UK) and, briefly, at Edinburgh University (UK) with Professor Seth GN Grant. Since May 2012 AB independently runs his own research laboratory at the Biomedical Research Institute Sant Pau (Barcelona). AB's research aims to understand the molecular mechanisms governing synaptic function. His work addresses the proteomic study of postsynaptic protein complexes found at glutamatergic synapses, particularly the postsynaptic density (PSD), as these supra-molecular structures are key to the reception and integration of excitatory neural signals. His methodology arises from the idea that protein complexes are highly coordinated molecular machines, which have to be understood as a whole system. For this reason AB's research does not aim at understanding the role of a particular synaptic protein or pathway but rather ambitions to understand the organisation and dynamics of the whole postsynaptic proteome and how this governs synaptic function. AB is also interested in investigating how the alteration of the normal molecular function of postsynaptic complexes contributes to brain disorders, particularly to intellectual disabilities (ID). AB recent work has importantly contributed to 2 interrelated and now well-accepted ideas. First, that the postsynaptic proteome has been highly conserved during animal evolution and, second, that mutations in genes predominantly expressed at the postsynapse are involved in many mental and behavioural disorders, specially in ID, autism spectrum disorders (ASD) and schizophrenia.

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ABSTRACT

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Mechanisms of Synaptic Dysfunction in Neuropaediatric Disorders

Human genetic studies have clearly established a very strong connection between genes expressed at the synapse and disorders affecting normal brain and cognitive development. This is particularly the case for proteins with a high expression level at synapses. Molecular and proteomic studies of cellular and animal models of neurodevelopmental disorders have further contributed to the notion that the perturbation of the subtle molecular mechanisms behind synaptic function could importantly contribute to these disorders. In this lecture we aim at reviewing our current knowledge of the major synaptic molecular mechanisms alerted in neuropaediatric disorders.

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