



# CICLE DE CONFER ÈNCIES 2017

**Víctor Borrell, PhD**

[CSIC- Scientific Researcher](#)

*Institute of Neuroscience, CSIC-UMH, San Juan de Alicante, Spain*

## **Cellular and molecular mechanisms of cerebral cortex growth and folding**

One of the most prominent features of the human brain is the fabulous size of the cerebral cortex and its intricate folding, both of which emerge during development. Cortical size is determined by the balance between progenitor cell self-renewal and neurogenesis. Cortical folding depends on the abundance of a particular type of basal progenitor, basal Radial Glia Cells (bRGCs), which abundantly populate a unique germinal layer, the Outer Subventricular Zone (OSVZ). In my lecture, I will discuss findings from my laboratory revealing cellular and genetic mechanisms that regulate cortical expansion and folding. In particular, we have identified an unprecedented mechanism of cortical development that underlies the embryonic emergence of the OSVZ. During a brief developmental period, apical progenitors in the ventricular zone generate a burst of bRGCs that become founders of the OSVZ. After closure of this period and for the remaining development, progenitors in the OSVZ follow a lineage completely independent from the other germinal layers. This brief time window is confined by the dynamic temporal regulation of genes key for bRGC formation, which hence determine the emergence of the OSVZ. Once the OSVZ is formed, the cortex folds in highly stereotyped patterns. We have identified unique transcriptional signatures along cortical germinal layers that map the prospective location of folds and fissures, including genes mutated in human cortical malformations. This map reflects mosaic expression patterns across the developing gyrencephalic cortex of ferret and human, but not the lissencephalic mouse, and may contribute to define cortical folds in gyrencephalic species.

**Date: Friday, 14 July 2017**

**Hour: 13:00**

**Place: Sala de Graus, Facultat de Biologia, Campus Diagonal**



Institut de Neurociències  
UNIVERSITAT DE BARCELONA



UNIVERSITAT DE  
BARCELONA

Campus d'Excel·lència Internacional

**B:KC** Barcelona  
Knowledge  
Campus

**HUB** Health Universitat  
de Barcelona  
Campus