Raúl Méndez

From my Ph.D. I have been working on different aspects of gene expression regulation at the translational level.

During my second postdoc, In Richter's Laboratory, I started working on the meiotic translational regulation of maternal mRNAs by the CPEB family of RNA-binding proteins. This work was focused on the mechanisms of action and posttranslational regulation of CPEB1 (***Nature*** 2000, ***Molecular Cell*** 2000, ***EMBO J***, 2002). In 2002 I started my research group at the CRG-Barcelona following with the study of CPEBs. Since then, our group has made key contributions to the understanding of the mechanisms of gene expression regulation by CPEBs. Thus, our group has contributed to elucidating the mechanisms by which CPEBs establish temporal (***Cell*** 2008, ***Nature*** 2008, ***Nat. Struct. Mol. Biol.*** *2017* ***Genome Biology*** 2022) and spatial (***Nature Cell Biology*** 2008 ***RNA*** 2021) gene expression patterns, identifying the cis-acting elements code that defines when where and how much the CPE-regulated mRNAs will be transnationally activated. These works have expanded the number of CPEB-regulated mRNAs from a few maternal transcripts to 20-30% of the vertebrate genomes. We have also contributed to the understanding of how CPEBs are regulated and bind their targets ***(EMBO J.*** 2010, ***Genes and Development*** 2014**,** ***eLife*** 2016). In 2010 we did show that these mechanisms were not confined to the transcriptionally silent meiotic oocytes, but continued in somatic cells (***Nature Cell Biology***, 2010. ***Nature Cell Biology***, 2015) where, in addition to cytoplasmic polyadenylation, they control nuclear pre-mRNA processing (***Nature***, 2013). From these findings we expanded our mechanistic work to physiopathological scenarios, showing that deregulation of CPEB-mediated translational control drives tumor growth (***Nature Medicine***, 2012. ***Nature Communications*** 2016, ***Science Advances*** 2020) angiogenesis in chronic liver disease (***Gastroenterology***, 2016), immune responses (***EMBO J.*** 2023***, eLife*** *2022*, **iScience** 2022). or neurodegeneration (***Nature***, 2018, **Sci Transl Med** 2021). After our incorporation into the IRB in 2011, we focused our research on the implementation of the mechanistic aspects of this gene expression regulation to *in vivo* murine models, developing targeted models for all CPEBs and in combinations up to the quadruple KO. In these models, we are studying, from a mechanistic perspective, the contributions of the CPEBs to tissue homeostasis, stress response, and pathologies like cancer. As an example of this new approach, a hepatosteatosis phenotype in CPEB4 knockout led us to discover a new mechanism or circadian translational regulation in the ER-stress adaptive response (***Nature Cell Biology***, 2017). We are using these gene-targeted models to study cell division and differentiation regulation by CPEBs in tissue homeostasis, inflammation and their pathological manifestations, cancer, and metastasis (With a focus on antitumoral immune response). From these mechanistic studies, we have identified CPEBs as potential antitumoral targets and developed therapeutical tools (***Nature Communications*** 2017).

For these works, I have been elected **EMBO Member** (2012), **ICREA Professor** (2010), and received **Premio Carmen y Severo Ochoa** de investigación en Biología Molecular, 2010 and **Premio Ciudad de Barcelona**" for research (2008).

I serve in several community activities participating in many review panels (of which I would like to highlight: **ANEP** (National Agency of Evaluation and Prospective) **coordinator of BFS** (Basic and Systems Biology) evaluation panel. 2012-2015. I have been the **IRB Vice-Director** since 2018.