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Arantza Muguruza
Departamento Fisiología
Facultad de Medicina y Enfermería.
Universidad del País Vasco

Is Calmodulin the Swiss-Army Knife of the Cell?

The **Google meet**: meet.google.com/tfu-yeea-oer

Abstract: Calmodulin (CaM) is often portrayed as a versatile calcium sensor, but recent findings elevate its status to that of a molecular multitool—crucial for a wide variety of cellular functions. In the context of the voltage-gated potassium channel Kv7.2, CaM displays remarkable functional diversity, orchestrating channel behavior not only through canonical calcium signaling pathways but also through unexpected roles. This seminar will explore how CaM modulates Kv7.2 gating via both conventional interactions at the calcium-responsive domain (CRD) and a novel, non-canonical binding to the redox-sensitive S2S3 linker. These interactions allow CaM to simultaneously affect the pore and voltage-sensing domains, fine-tuning channel activity in a context-dependent manner. Beyond gating, CaM also contributes to the trafficking and structural stability of Kv7.2, and even acts as a molecular chaperone during co-translational folding—highlighting a calcium-dependent role in the early biogenesis of the channel. Altogether, these findings underscore CaM's multifunctional nature and raise the question: could this small yet mighty protein be the ultimate multitasker of the cell?

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