Unraveling the mysteries of calcineurin

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Video Byte

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Abstract

Calcineurin is a serine/threonine phosphatase that serves as a critical bridge between calcium signaling and the phosphorylation states of numerous important substrates. But despite being studied for approximately 40 years, exactly how calcineurin is activated in humans and other organisms is not yet fully understood. Structurally, calcineurin is a heterodimer expressed as three different isoforms: α , β , and γ each featuring a catalytic domain, a B chain binding helix, the regulatory domain, an autoinhibitory domain, and an unstructured C-terminal domain of unknown function. Disorder is a key hallmark of calcineurin's structure. The intrinsically disordered regulatory domain could facilitate the rapid activation of calcineurin during calcium signaling. Increasing evidence suggests that calcineurin is a vital component of various signaling pathways. But even more work is needed to understand calcineurin's versatility including how certain substrates bind to calcineurin. So despite a decades-long history of research, calcineurin still remains largely mysterious.