BtBs Seminars



Biotechnology and Biosciences Seminars

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Second messengers and nuclear condensates,

new paradigms in transcriptional regulation

The second messengers calcium (Ca2+) and cyclic AMP (cAMP) achieve functional pleiotropy through compartmentalisation. In fact, they can activate select effectors in distinct domains creating "molecular signatures" that the cell decodes into specific functions. One such domain is the nucleus, where both Ca2+ and cAMP can regulate transcription. Despite their functional importance, our understanding of how these messengers contribute to nuclear function remains poor. Recent studies suggest that Ca²⁺ and cAMP modulate the formation of nuclear condensates, thereby affecting local compartmentalization and revealing a previously unrecognized link between nuclear function and cellular signalling.

