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How nuclear phospholipase C beta 1 can regulate gene transcription?

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Since 80s the importance for nuclear phosphoinositides regulating enzymes has emerged, revealing that they are different and independent from the counterpart in the cytosol. While it is still not clear how phosphoinositides are presented in the nucleus nor how they are controlled, scientists have shown that their levels are changed in response to many different types of stimuli and that they are able to interact with and regulate proteins that are involved in nuclear functions such as transcription, mRNA processing and export and DNA conformation. Nuclear phospholipase C beta 1 (PLCβ1) has been shown to directly regulate cell cycle progression, differentiation and gene expression in a variety of different cell types [1-4].

We used human acute myeloid leukaemia THP-1 cells to investigate a possible role of PLCβ1 in epigenetic signalling. Epigenetic signalling is a mechanism by which environmental stimuli can impact on both short and long term gene transcriptional output and thereby control cell fate decisions. Here we shown that PLCβ1 directly regulates histone methyltransferase and demethylase, and as consequence, histone tails profiles that lead to transcription factors accessibility at the promoter of key genes involved in acute myeloid leukaemia.

References

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