

## K562 cell proliferation is modulated by PLC $\beta$ 1 through a PKC $\alpha$ -mediated pathway

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Phospholipase C  $\beta$ 1 (PLC $\beta$ 1) is known to play an important role in cell proliferation. Previous studies reported an involvement of PLC $\beta$ 1 in G0-G1/S transition and G2/M progression in Friend murine erythroleukemia cells (FELC). However, little has been found about its role in human models. Here, we used K562 cell line as human homologous of FELC in order to investigate the possible key regulatory role of PLC $\beta$ 1 during cell proliferation of this human cell line. Our studies on the effects of the overexpression of both these isoforms showed a specific and positive connection between cyclin D3 and PLC $\beta$ 1 in K562 cells, which led to a prolonged S phase of the cell cycle and a delay in cell proliferation. In order to shed light on this mechanism, we decided to study the possible involvement of protein kinases C (PKC), known to be direct targets of PLC signaling and important regulators of cell proliferation. Our data showed a peculiar decrease of PKC $\alpha$  levels in cells overexpressing PLC $\beta$ 1. Moreover, when we silenced PKC $\alpha$ , by RNAi technique, in order to mimic the effects of PLC $\beta$ 1, we caused the same upregulation of cyclin D3 levels and the same decrease of cell proliferation found in PLC $\beta$ 1-overexpressing cells. The key features emerging from our studies in K562 cells is that PLC $\beta$ 1 targets cyclin D3, likely through a PKC $\alpha$ -mediated pathway, and that, as a downstream effect of its activity, K562 cells undergo an accumulation in the S phase of the cell cycle.

### References

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### Key words

Nucleus, Phospholipase C $\beta$ 1, Protein Kinase C, Cyclin D3.