

P026 The role of lipid biosynthesis in the regulation of cell growth by protein kinase B (PKB/Akt)
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Cell growth needs to be coordinated with the metabolic processes that are required for the synthesis of macromolecules such as DNA, proteins and lipids. The PI3-kinase/Akt signalling pathway induces cell growth via activation of complex 1 of the target of rapamycin (TORC1). While the significance of mTORC1 dependent induction of protein biosynthesis for cell growth is well established, the contribution of lipogenesis is less well understood. We show that Akt dependent lipogenesis as well as accumulation of fatty acids and phosphoglycerides requires mTORC1 activity. Akt induces rapid accumulation of mature SREBP1 in the nucleus and activation of SREBP by Akt was blocked by the mTORC1 inhibitor rapamycin. Furthermore, activation of AMPK in response to glucose starvation or by treatment with AICAR prevented Akt dependent activation of SREBP1 which places this transcription factor downstream of a pathway that integrates growth factor signalling and nutrient availability. We also show that silencing of SREBP attenuates Akt dependent lipogenesis and limits the increase in cell size in response to Akt activation in RPE cells *in vitro*. *In vivo* silencing of dSREBP in flies caused a reduction in cell and organ size and activation of dSREBP was required for the induction of cell growth by dPI3K. Our results suggest that the PI3K/Akt/TOR pathway regulates protein and lipid biosynthesis in an orchestrated manner and that both processes are required for cell growth.