

P007 Subcellular Regulation Allows the *Drosophila* PI3-kinase/ Akt Signalling Cassette to Perform Different Functions
Goberdhan, D.C.I.¹, Vereshchagina, N.¹, Pinal, N.², Collinson, L.², Fujita, Y.², Cox, I.¹, Pichaud, F.² and Wilson, C.¹

1. Department of Physiology, Anatomy and Genetics, University of Oxford, South Parks Road, Oxford. OX1 3QX; 2. MRC LMCB, Department of Anatomy and Developmental Biology, UCL, Gower Street, WC1E 6BT, London.

The class I PI3-kinase/Akt signalling cassette has been shown to play a critical role in mediating many functions of insulin-like molecules in *Drosophila*. The activity of this cassette is antagonised by the fly homologue of lipid phosphatase PTEN. We recently identified and characterised two new cell type-specific roles for *Drosophila* PTEN. First we found PTEN is required to regulate apical membrane morphology in photoreceptor neurons. Second, we showed that although viable *PTEN* mutants contain globally reduced levels of neutral lipid, loss of *PTEN* in the nutrient-storing ovarian nurse cells produces a remarkable accumulation of highly enlarged lipid droplets. Both these defects are caused by Akt hyperactivation. However, in photoreceptors this activation is restricted to the apical membrane, while in nurse cells, lipid accumulation is regulated by cytoplasmic activated Akt. Our data indicate that cell type-specific effects of insulin signalling not only result from differences in target molecules, but also depend on differential subcellular regulation of the PI3-kinase/Akt cassette, a finding that has implications in understanding insulin functions and insulin resistance.