

P004 ER-bounded calcium microdomains during mitosis

Michael Whitaker

*Institute of Cell and Molecular Biosciences University of
Newcastle upon Tyne*

Cell cycle calcium signals are generated by inositol trisphosphate-mediated release of calcium from internal stores (Ciapa et al. 1994. *Nature* 368:875-8; Groigno & Whitaker 1998. *Cell* 92:193-204). The major internal calcium store is the endoplasmic reticulum (ER): the spatial organization of the ER during mitosis may thus be important in shaping and defining calcium signals. In early *Drosophila* embryos, ER surrounds the nucleus and mitotic spindle during mitosis, offering an opportunity to determine whether perinuclear localization of ER conditions calcium signalling during mitosis. We have established (Parry et al. 2005. *J Cell Biol* 171:47-59) that the nuclear divisions in syncytial *Drosophila* embryos are accompanied by both cortical and nuclear localized calcium transients. Constructs that chelate inositol trisphosphate also prevents nuclear division. Analysis of nuclear calcium concentrations demonstrates that nuclear calcium concentrations are differentially regulated. These observations demonstrate that mitotic calcium signals in *Drosophila* embryos are confined to mitotic microdomains and offer an explanation for the apparent absence of detectable global calcium signals during mitosis in some cell types.