

**P030** Distribution of the  $\gamma$  H2AX protein in human and mouse spermatocytes

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Histone H2AX (14kDa) is a member of the H2A histone family that in eukaryotes contains an evolutionary conserved SQ motif at the C-terminus. The phosphorylated form of H2AX ( $\gamma$ H2AX) is unique in recognizing and repairing DNA double-strand breaks (DSBs).

We applied monoclonal antibodies raised against  $\gamma$ H2AX to study its distribution in human spermatocytes during meiosis 1. Positive labelling was detected along the length of SC chromatin at the leptotene stage of meiotic prophase 1. When synapsis is established during the zygotene stage,  $\gamma$ H2AX staining gradually decreases. On the other hand, in late pachytene,  $\gamma$ H2AX is restricted to the XY sex body, but, interestingly also occasionally accumulates at telomeric ends of SCs.

The distribution of  $\gamma$ H2AX in human spermatocyte SCs was thus found to be very similar to that observed in the previous studies on mouse spermatocytes. However, unexpectedly, we also found substantial accumulation of this protein at telomeres. This accumulation of  $\gamma$ H2AX may be related to near-telomere regions remaining unsynapsed at pachytene bearing in mind that synapsis in human spermatocytes is initiated near telomeres but not at telomeres *per se*. There is also an intriguing possibility that this relates to repair of DSBs as part of a meiotic ALT telomere lengthening mechanism.