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This is a very interesting paper describing a subset of polyploid cells that unusually re-engage into the mitotic cycle during normal fruit fly development. These cells undergo mitosis with chromosome segregation errors, supporting the idea that polyploidy compromises mitotic fidelity.

It has been proposed that mitotic polyploid cells are more prone to genomic instability and aneuploidy, which has been observed during tumour development. Whether increased polyteny alone can lead to compromised mitosis has been a matter of debate. A major experimental limitation is that naturally occurring polyploid cells are usually terminally differentiated and have exited the mitotic program. Most studies have, therefore, relied on the analysis of tumour tissue or cell lines. It is fairly arguable that the mitotic defects observed could be caused by additional genetic alterations, rather than being a direct consequence of polyploidy.

This study now describes a naturally occurring polyploid cell lineage that re-engages the mitotic cycle during *Drosophila* hindgut development. The authors describe mitotic divisions of cells with 32 mitotic chromosomes (diploid cells have 8 chromosomes). Mitotic divisions of these polyploid cells are under the control of normal mitotic regulators but display a significant frequency of chromosome segregation abnormalities (extended anaphase timing, chromosome bridges, broken chromosomes, etc.). This study provides compelling evidence that the switch into the endocycle is not an irreversible transition and supports the view that mitosis in polyploid cells is less accurate than in their diploid counterparts, which might contribute to cancer development.

Disclosures

None declared