

The Wrong Number of Cell Sticks Cause Bad Things In Cells

Josh Nicholson¹

¹Authorea Team

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Up-goer Five Entry

The body is made up of lots of cells and cells have sticks that make them what they are. Normal cells have a normal number of cell sticks. Bad cells, which can kill a body, have the wrong number of cell sticks. More cell sticks in a cell can cause cell problems that can lead to even more cells sticks in a cell. When this happens more cells take over a body and kill it. Some cell sticks when added cause new changes to happen in a cell as well that can lead to a problem when all cell sticks have to be given to new cells.

Peer-Reviewed Publication

Cancer cells display aneuploid karyotypes and typically mis-segregate chromosomes at high rates, a phenotype referred to as chromosomal instability (CIN). To test the effects of aneuploidy on chromosome segregation and other mitotic phenotypes we used the colorectal cancer cell line DLD1 ($2n = 46$) and two variants with trisomy 7 or 13 (DLD1+7 and DLD1+13), as well as euploid and trisomy 13 amniocytes (AF and AF+13). We found that trisomic cells displayed higher rates of chromosome mis-segregation compared to their euploid counterparts. Furthermore, cells with trisomy 13 displayed a distinctive cytokinesis failure phenotype. We showed that up-regulation of SPG20 expression, brought about by trisomy 13 in DLD1+13 and AF+13 cells, is sufficient for the cytokinesis failure phenotype. Overall, our study shows that aneuploidy can induce chromosome mis-segregation. Moreover, we identified a trisomy 13-specific mitotic phenotype that is driven by up-regulation of a gene encoded on the aneuploid chromosome.

From (Nicholson et al., 2015).

Figure 1: Representative video showing anaphase lagging chromosome during mitosis in an AF+13 (aneuploid) cell. Images were acquired by spinning-disk confocal microscopy at 1 min intervals and they are played back at 5 frames per second. DNA is shown green (H2B-GFP) and microtubules in red (RFP-tubulin). Image from (Nicholson et al., 2015).

References

Joshua M Nicholson, Joana C Macedo, Aaron J Mattingly, Darawalee Wangsa, Jordi Camps, Vera Lima, Ana M Gomes, Sofia Dória, Thomas Ried, Elsa Logarinho, and Daniela Cimini. Chromosome mis-segregation and cytokinesis failure in trisomic human cells. *eLife*, 4, may 2015. doi: 10.7554/elife.05068. URL <https://doi.org/10.7554%2Felife.05068>.