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**MPS1 (monopolar spindlle-1-like)/ TTK (dual specificity protein)**

This protein is a core component of the spindle assembly checkpint (SAC) which is device to ensure the fidelity of chromosome segregation in mitosis. It is essential for chromosome alignment at the centromere during mitosis as well as centrosome duplication. MPS1 enhances Aurora B activity at centromeres In mammalian cells, **MPS1** silencing causes inaccurate metaphase plate alignment of chromosome and accelerates mitosis, ultimately causing massive aneuplodization not compatible with cellular survival.

**"High levels of the Mps1 checkpoint protein are protective of aneuploidy in breast cancer cells"**

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PNAS, 2011 Mar 29;108(13).

## Abstract

Most human cancers are aneuploid and have chromosomal instability, which contrasts to the inability of human cells to normally tolerate aneuploidy. Noting that aneuploidy in human breast cancer correlates with increased expression levels of the Mps1 checkpoint gene, we investigated whether these high levels of Mps1 contribute to the ability of breast cancer cells to tolerate this aneuploidy. Reducing Mps1 levels in cultured human breast cancer cells by RNAi resulted in aberrant mitoses, induction of apoptosis, and decreased ability of human breast cancer cells to grow as xenografts in nude mice. Remarkably, breast cancer cells that survive reductions in levels of Mps1 have relatively less aneuploidy, as measured by copies of specific chromosomes, compared with cells that have constitutively high levels of Mps1. Thus, high levels of Mps1 in breast cancer cells likely contribute to these cells tolerating aneuploidy.

**Review**

'Mps1 phosphorylates Borealin to control Aurora B activity and chromosome alignment'
Cell 132:233–246 (2008)