

1: [Cell](#). 2005 Jul 15;122(1):119-31. [Links](#)

## **G protein betagamma subunits and AGS3 control spindle orientation and asymmetric cell fate of cerebral cortical progenitors.**

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Neurons in the developing mammalian brain are generated from progenitor cells in the proliferative ventricular zone, and control of progenitor division is essential to produce the correct number of neurons during neurogenesis. Here we establish that Gbetagamma subunits of heterotrimeric G proteins are required for proper mitotic-spindle orientation of neural progenitors in the developing neocortex. Interfering with Gbetagamma function in progenitors causes a shift in spindle orientation from apical-basal divisions to planar divisions. This results in hyperdifferentiation of progenitors into neurons as a consequence of both daughter cells adopting a neural fate instead of the normal asymmetric cell fates. Silencing AGS3, a nonreceptor activator of Gbetagamma, results in defects similar to the impairment of Gbetagamma, providing evidence that AGS3-Gbetagamma signaling in progenitors regulates apical-basal division and asymmetric cell-fate decisions. Furthermore, our observations indicate that the cell-fate decision of daughter cells is coupled to mitotic-spindle orientation in progenitors.