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## LETTER

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### Induction of tumor growth by altered stem-cell asymmetric division in *Drosophila melanogaster*

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**Loss of cell polarity and cancer are tightly correlated<sup>1</sup>, but proof for a causative relationship has remained elusive. In stem cells, loss of polarity and impairment of asymmetric cell division could alter cell fates and thereby render daughter cells unable to respond to the mechanisms that control proliferation<sup>2</sup>. To test this hypothesis, we generated *Drosophila melanogaster* larval neuroblasts containing mutations in various genes that control asymmetric cell division and then assayed their proliferative potential after transplantation into adult hosts. We found that larval brain tissue carrying neuroblasts with mutations in *raps* (also called *pins*), *mira*, *numb* or *pros* grew to more than 100 times their initial size, invading other tissues and killing the hosts in 2 weeks. These tumors became immortal and could be retransplanted into new hosts for years. Six weeks after the first implantation, genome instability and centrosome alterations, two traits of malignant carcinomas<sup>3,4</sup>, appeared in these tumors. Increasing evidence suggests that some tumors may be of stem cell origin<sup>5,6</sup>. Our results show that loss of function of any of several genes that control the fate of a stem cell's daughters may result in hyperproliferation, triggering a chain of events that subverts cell homeostasis in a general sense and leads to cancer.**

## ABSTRACT

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