

## Publication

### Apical/basal spindle orientation is required for neuroblast homeostasis and neuronal differentiation in *Drosophila*

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Precise regulation of stem cell self-renewal/differentiation is essential for embryogenesis and tumor suppression. *Drosophila* neural progenitors (neuroblasts) align their spindle along an apical/basal polarity axis to generate a self-renewed apical neuroblast and a differentiating basal cell. Here, we genetically disrupt spindle orientation without altering cell polarity to test the role of spindle orientation in self-renewal/differentiation. We perform correlative live imaging of polarity markers and spindle orientation over multiple divisions within intact brains, followed by molecular marker analysis of cell fate. We find that spindle alignment orthogonal to apical/basal polarity always segregates apical determinants into both siblings, which invariably assume a neuroblast identity. Basal determinants can all be localized into one sibling without inducing neuronal differentiation, but overexpression of the basal determinant Prospero can deplete neuroblasts. We conclude that the ratio of apical/basal determinants specifies neuroblast/GMC identity, and that apical/basal spindle orientation is required for neuroblast homeostasis and neuronal differentiation.

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