

Building brains: Mammalian-like neurogenesis in fruit flies

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A new way of generating brain cells has been uncovered in *Drosophila*. The findings, published this week in the online open access journal *Neural Development*, reveal that this novel mode of neurogenesis is very similar to that seen in mammalian brains, suggesting that key aspects of neural development could be shared by insects and mammals.

In the widely accepted model of neurogenesis in *Drosophila*, neuroblasts divide asymmetrically both to self renew and to produce a smaller progenitor cell. This cell then divides into two daughter cells, which receive cell fate determinants, causing them to exit the cell cycle and differentiate.

In mammals, neural stem cells may also divide asymmetrically but can then amplify the number of cells they produce through intermediate progenitors, which divide symmetrically. A research team from the University of Basel, Switzerland set out to study whether specific *Drosophila* neural stem cells, neuroblasts, might increase the number of cells generated in the larval brain via a similar mechanism.

The team used cell lineage tracing and genetic marker analysis to show that surprisingly large neuroblast lineages are present in the dorsomedial larval brain – a result, they say, of amplified neuroblast proliferation mediated through intermediate progenitors.

In the novel mechanism postulated by the researchers, there are intermediate progenitors present that divide symmetrically in terms of

morphology, but asymmetrically in molecular terms. This latter feature means that cell fate determinants are segregated into only one daughter cell, leaving the other free to divide several more times, thus amplifying the number of cells generated.

The authors write: “The surprising similarities in the patterns of neural stem and intermediate progenitor cell division in *Drosophila* and mammals, suggest that amplification of brain neurogenesis in both groups of animals may rely on evolutionarily conserved cellular and molecular mechanisms.”

Source: BioMed Central

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