Drosophila Stem Cells and Their Niches

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Stem cells and their niches evolved early in the history of multicellular organisms and contain many features that are conserved between vertebrates and *Drosophila*. One of the best characterized niches resides at the tip of the *Drosophila* ovary, where it regulates germline stem cells (GSCs). A second type of stem cell, escort stem cells (ESCs), also reside in this niche and interact closely with GSCs. ESC division provides 1-2 squamous cells that cover each developing germ cell cyst, suggesting that the niche facilitates the coordinated activity of these two types of stem cells. We have also discovered that the adult posterior midgut is subject to continuous cell turnover and contains a single type of stem cell that replenishes both enterocytes and entero-endocrine cells. Gut stem cells are likely to be controlled by a niche that differs from the GSC/ESC niche in two respects. A niche cell that might serve to anchor the stem cell in position is not apparent. Moreover, the niche appears to repress most gut stem cells in a temporally and spatially regulated manner.