

# Stem cells stand up for themselves

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Adult stem cells are not pampered pushovers. O'Reilly et al. report that certain stem cells take charge of their surroundings, molding their environment to control their division and differentiation.

Citation: O'Reilly, A.M., et al. 2008. *J. Cell Biol.* doi:10.1083/jcb.200710141.

Source: Rockefeller University

Some stem cells are cosseted like newborns. Neighboring cells cradle them in a structure called the niche. The niche not only nurtures its charges, it also dictates their behavior, determining whether they reproduce and specialize. The standard view is that the niche shapes stem cells, not vice versa.

O'Reilly et al. found evidence for more active stem cells while studying how the cells anchor themselves in the *Drosophila* ovary.

Previous work indicated that ovary stem cells attach to the niche through the protein E-cadherin. O'Reilly et al. tested whether the stem cells also depend on integrins, cell surface proteins that link molecules in the extracellular matrix to the cytoskeleton.

They found that follicle stem cells (FSC)—one type of ovary stem cell—drifted away from their niche when they carried mutant integrins.

These breakaway cells were abnormally shaped, divided more slowly than normal, and displayed some cancer-like characteristics, such as refusing to stop crawling even after contacting another cell.

Integrins hook onto an extracellular matrix protein called laminin A. FSCs pump out laminin A, and the scientists found that mutant cells that were unable to make the protein broke their moorings and reproduced sluggishly. Two other kinds of stem cells in the ovary—germline stem cells, which spawn the egg, and escort stem cells, which travel along with it—didn't rely on integrins for anchoring, the researchers showed. The team concluded that the interaction between laminin A and integrins ensures that FSCs remain in place, primed to divide. By laying down laminin A, therefore, FSCs help build their own niche.

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