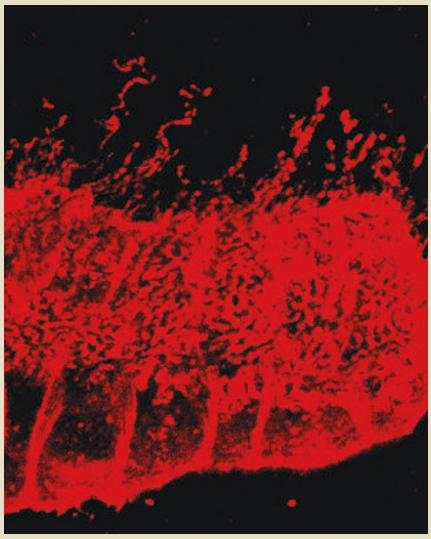
Cadherins reach out

Although usually relegated to the task of cell–cell adhesion, cadherins can crop up in unexpected places. A study from Dorothea Godt and colleagues, published in *J. Cell Biol.* (**171,** 549; 2005), finds that the cadherin Cad99C is required during *Drosophila* oogenesis to promote microvilli formation.

Microvilli are formed at the apical surface of epithelial cells, as well as sensory cells, and they perform a range of functions that include mechanotransduction and environment sampling. Their core structure consists of crosslinked parallel actin filaments, and actin polymerization is thought to be a driving force in their elongation. So far, little attention has been paid to the possible need for plasma membrane proteins in this process. Thus, the finding that a transmembrane cadherin is important for microvilli formation comes as a surprise.

Godt and colleagues began by determining which cadherins are present during *Drosophila* oogenesis. Cad99C, they found, was concentrated in the apical region of epithelial follicle cells. Unexpectedly, it was not present at sites of cell–cell contact but rather in microvilli extending from the apical surface. By isolating *Cad99C*-null mutations, they found that it is required for normal microvilli formation: in its absence, microvilli are shorter and have abnormal shapes. Conversely, overexpression of Cad99C increased the length of apical microvilli, suggesting that it regulates microvilli formation in a concentration-dependent manner.

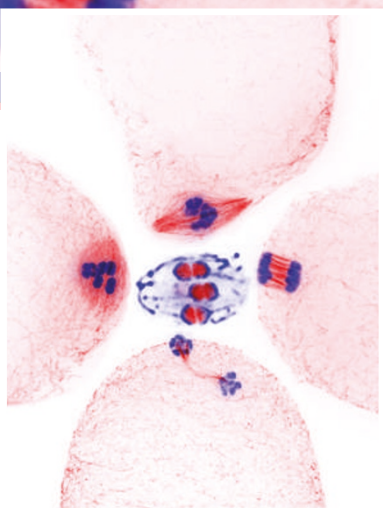
From the distance between microvilli, it is unlikely that Cad99C can be affecting adhesion between adjacent protrusions. So what is its function during oogenesis? Overexpression of a Cad99C construct lacking most of its cytoplasmic tail also promoted microvilli formation, from which the authors propose that the Cad99C extracellular domain is probably responsible for its effects. They favour two possibilities, in which Cad99C either stabilizes the membrane during microvilli protrusion or mediates signalling between the extracellular matrix and the actin cytoskeleton.



Overexpression of Cad99C in epithelial follicle cells results in longer microvilli forming on the apical cell surface. Image courtesy of Dorothea Godt.

This function of cadherins in microvilli formation may be conserved in humans. On the basis of similarities in their protein structure, Cad99C is proposed to be the orthologue of the vertebrate protocadherin 15 (PCDH15). Previous studies have implicated PCDH15 in the organization of hair-cell stereocilia, and mutations in this gene are responsible for Usher syndrome type I, the defects of which include deafness. Its role here was thought to involve adhesion of adjacent stereocilia, but this will now have to be revisited in light of the new insights from *Drosophila*.

ALISON SCHULDT



nature cell biology

ERRATUM

Owing to a technical error, the pages of this manuscript were originally mis-numbered by a 100 pages. This has now been corrected online. The corrected online manuscript is numbered 100 pages higher than the mis-numbered version.