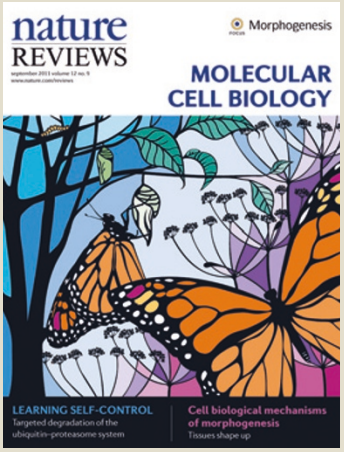

► **COVER:** 'Morphogenesis' by Vicky Summersby, inspired by the Focus topic of this issue.


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During development, in addition to acquiring a particular fate, cells in a tissue must complete the formidable task of acquiring the correct form. Through this process of morphogenesis, tissues and organs take their shape and position in the body. In this special Focus on Morphogenesis (www.nature.com/nrm/focus/morphogenesis), we highlight key examples of models in which our understanding of morphogenesis is gaining new ground. On page 551, Herbert and Stainier discuss how the vertebrate vasculature arises through the coordinated behaviours of endothelial cells. On page 581, Gjorevski and Nelson review how epithelial remodelling is orchestrated to develop the mammary gland during puberty. And Green and colleagues document, on page 565, the transformations that keratinocytes undergo as they journey through the multilayered epidermis to ensure tissue homeostasis. In each case, many of the core cell biological mechanisms that are emerging, including cell migration, dynamic cell adhesion and cytoskeletal crosstalk, and the integration of signalling networks and mechanical cues between different cell types, are likely to apply to other developmental contexts.

Morphogens, the secreted signalling molecules that establish tissue patterning, also regulate tissue growth through mechanisms that are less clear. On page 594, Gonzalez-Gaitan and colleagues present and evaluate the different models for how the morphogen Decapentaplegic mediates tissue growth in *Drosophila melanogaster*. This illustrates how studies of invertebrate morphogenesis continue to provide vital test beds for dissecting core mechanistic principles in development.

We hope that these articles highlight the exciting progress being made in this area and the challenges yet to be met for a better appreciation of how human diseases arise when morphogenesis goes awry.

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