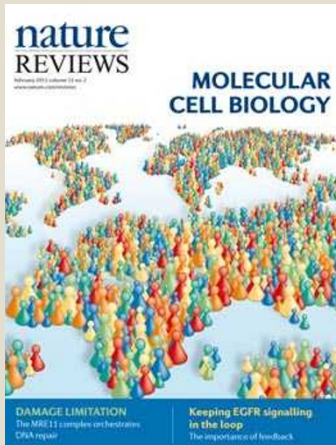




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► **COVER:** 'Mixed populations' by Vicky Summersby, inspired by the Review on p119.



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Variety is the spice of life, and unexpected examples of this continue to emerge in biology. Cells not only shift their behaviours in surprising ways depending on the context but, in some cases, they can also change their differentiation state.

The ability of cells to adapt to a changing environment is a crucial aspect of tissue homeostasis. On page 79, Izpisua Belmonte and colleagues compare and contrast the various ways in which cells can be induced to dedifferentiate, transdifferentiate or reprogramme, and the possibilities that this raises for tissue regeneration.

Multipotent stem cells retain the ability to differentiate into diverse cell types. The range of adult stem cell types present *in vivo* is still unclear and, on page 126, Silberstein and colleagues describe the elusive nature of mesenchymal stem cells. They highlight the need to better define these cells *in vivo* and the possible tissue-specific differences in their properties that may explain mixed reports on their characteristics.

Even within apparently homogenous populations, technical advances are allowing us to better appreciate the cell-to-cell variability that is built into biological systems. It is important to capture this range of behaviours to increase our understanding of how processes are regulated, and, as discussed by Snijder and Pelkmans on page 119, there is increasing evidence that much of this variation may arise from deterministic regulatory processes.

These articles, we hope, highlight our increasing appreciation of the chameleonic nature of cells and the importance of gaining a better grasp on this to better understand the ways that cells coordinate with each other and respond to local changes during development.

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