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► **COVER:** 'Split personalities' by Vicky Askew, inspired by the Review on p517



ARIANNE HEINRICHS



EKAT KRITIKOU



FRANCESCA CESARI



ASHER MULLARD

The cloning of various organisms from different cell types has shown that the genome of a differentiated cell can be reprogrammed to allow the derivation of pluripotent stem cells and support the development of an entire organism. The reprogramming of a somatic cell to an embryonic state can be achieved by nuclear transfer, by fusing a somatic cell with an embryonic stem cell or by inducing the expression of a combination of embryonic stem-cell transcription factors. In the latest article of our Stem Cells series (<http://www.nature.com/nrm/series/stemcells>), Kevin Eggan and colleagues (page 505) enlighten us about the molecular mechanisms that underlie reprogramming. They discuss the importance of transcription factors in the establishment and maintenance of cellular phenotypes and the role of cell division in mediating the transition between different stages of gene expression.

The mechanisms of reprogramming, as well as the regulation of embryonic and adult stem-cell pluripotency and self-renewal, have been the subject of intense discussion by biologists from across the globe who recently met for the 73rd Cold Spring Harbor Laboratory Symposium. The meeting also highlighted the future promises for biomedical applications of stem cells with a focus on new strategies for generating patient-specific induced-pluripotent stem (iPS) cells and the challenges for their use in research and therapy. However, we will only be able to take advantage of these strategies once we fully understand the properties of stem cells and how their physiological environment influences their function. Furthermore, we need to find a way of carefully controlling the molecular circuitry of stem cells. We will keep you informed on the progress in this fast-moving field!

EDITORIAL OFFICES

LONDON NatureReviews@nature.com
The Macmillan Building, 4 Crinan Street,
London N1 9XW, UK
Tel: +44 (0)20 7843 3620;
Fax: +44 (0)20 7843 3629

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LONDON nature@nature.com
The Macmillan Building, 4 Crinan Street,
London N1 9XW, UK
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Fax: +44 (0)20 7843 4596/7
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NEW YORK nature@natureny.com
Nature Publishing Group,
75 Varick Street, 9th floor, New York,
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Tel: +1 212 726 9200;
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TOKYO nature@natureasia.com
Chiyoda Building 5F, 2-37-1 Ichigayatamachi,
Shinjuku-ku, Tokyo 162-0843, Japan
Tel: +81 3 3267 8751; Fax: +81 3 3267 8746
ASIA-PACIFIC PUBLISHER: Antoine E Bocquet
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