

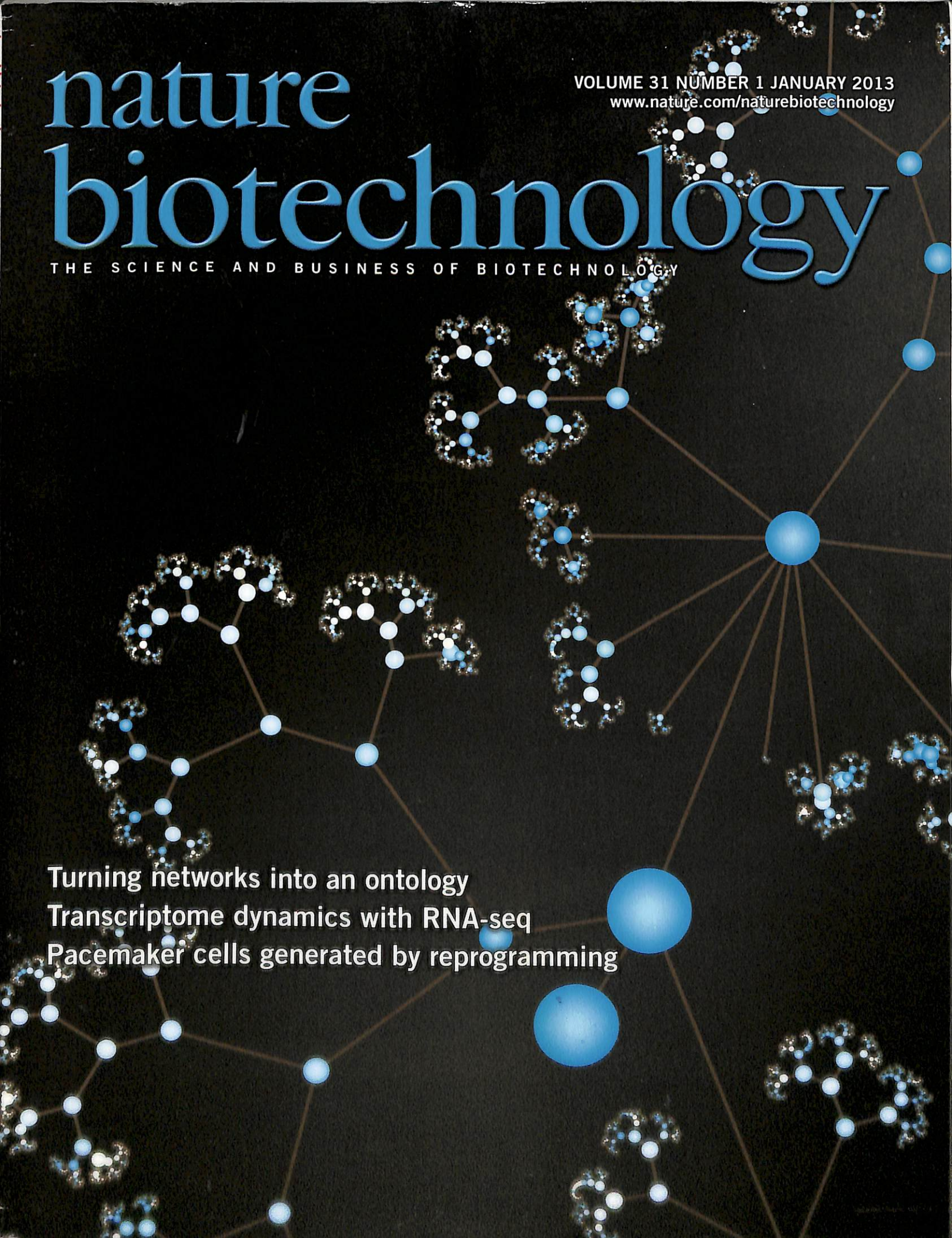
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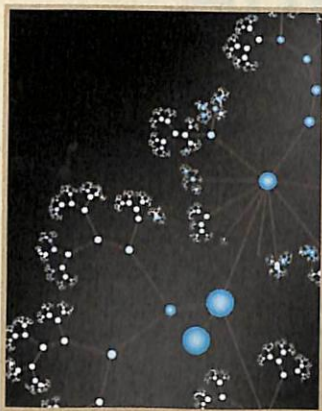
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THE SCIENCE AND BUSINESS OF BIOTECHNOLOGY

Turning networks into an ontology
Transcriptome dynamics with RNA-seq
Pacemaker cells generated by reprogramming



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A fractal-like hierarchy of network clusters extracted from the interaction networks of budding yeast. Dutkowski *et al.* use cellular components and processes embedded in molecular networks to derive a gene ontology (p 38).
Credit: Janusz Dutkowski



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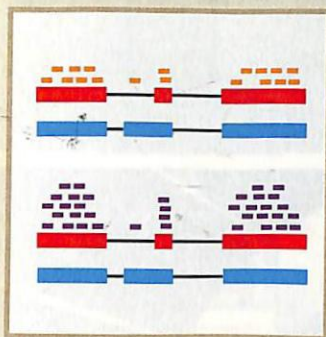
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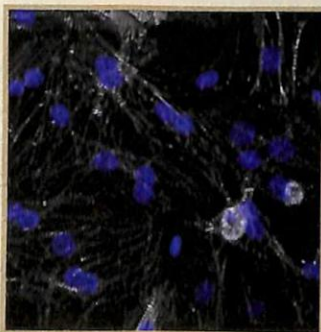
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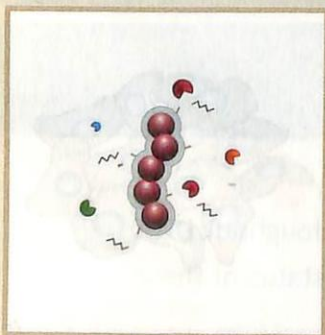
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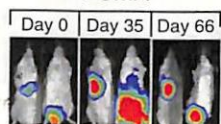
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Credit: Ryan McQuinn



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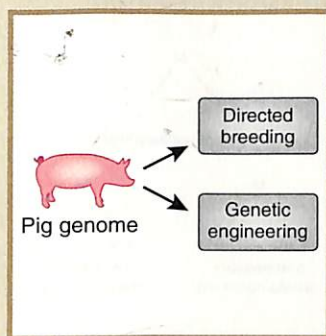
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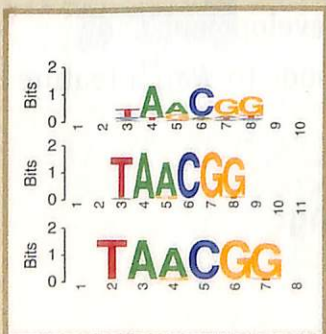
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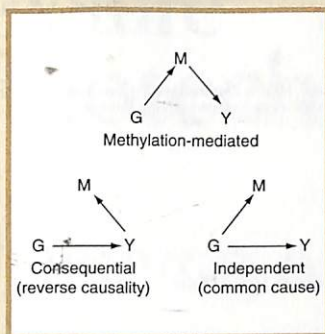
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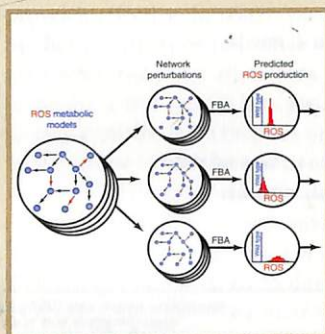
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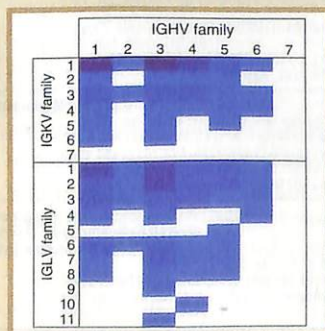
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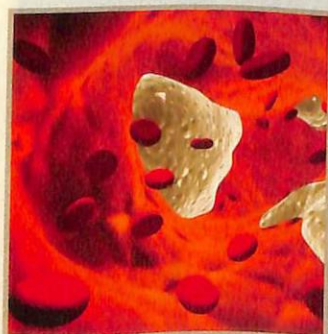
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Artistic rendition of DNA cleavage directed by the Cas9 endonuclease complexed with a synthetic single guide RNA. Three groups demonstrate site-specific genome modification in zebrafish embryos (p 227), human cells (p 230) and bacteria (p 233).
 Credit: Stephen Dixon



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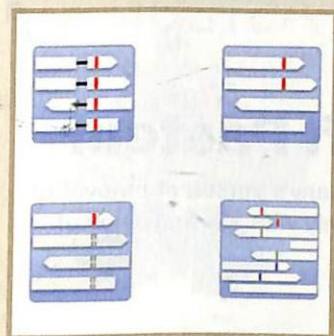
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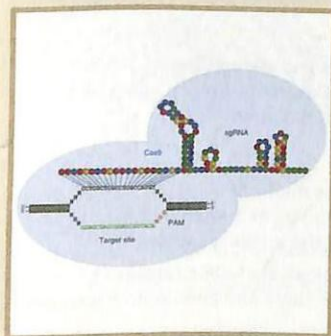
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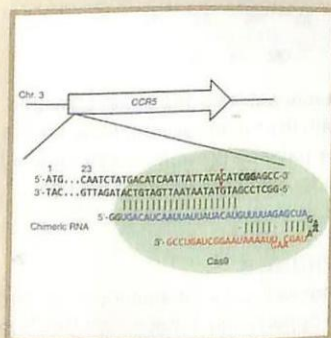
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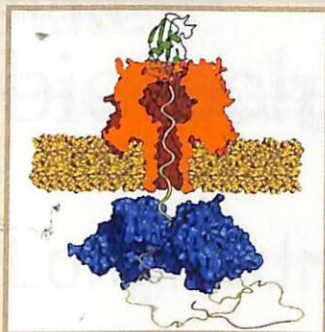
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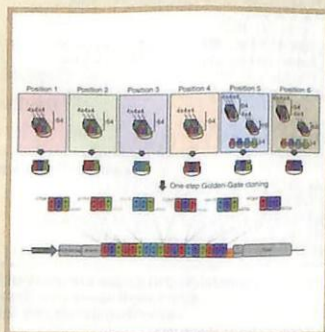
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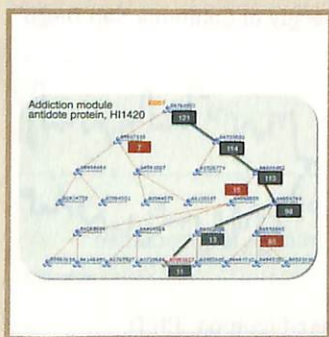
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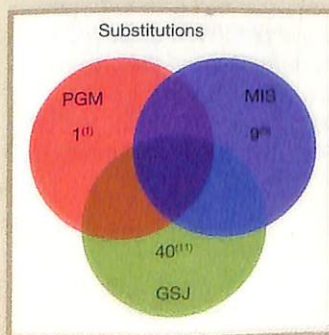
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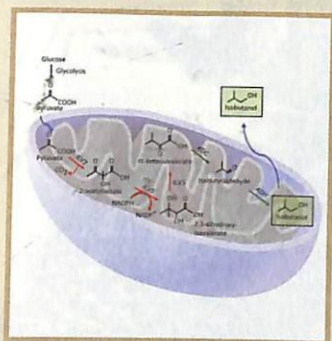
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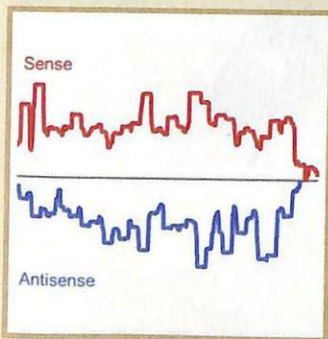
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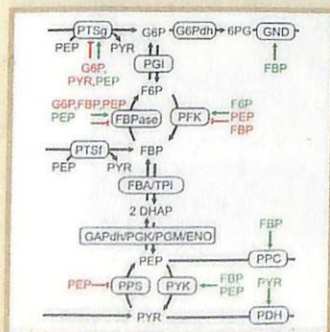
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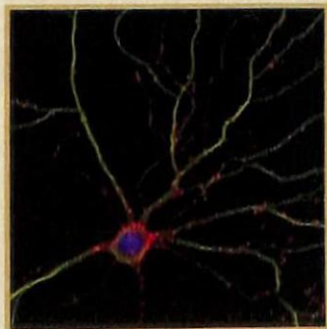


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A bacterial cell endowed with logic and memory. Siuti *et al.* open new doors for cellular engineering by synthesizing genetic circuits whose function depends on past and present inputs (p 448). Credit: Liang Zong and Yan Liang (I2xy2.com).



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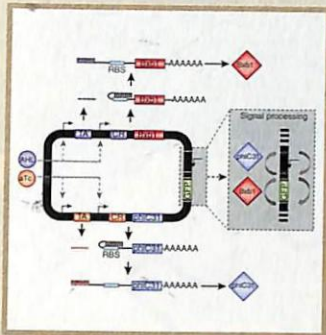
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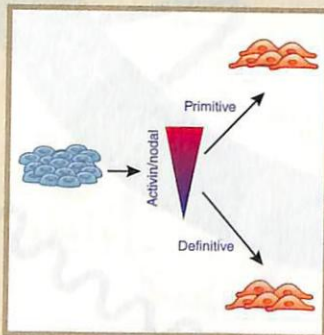


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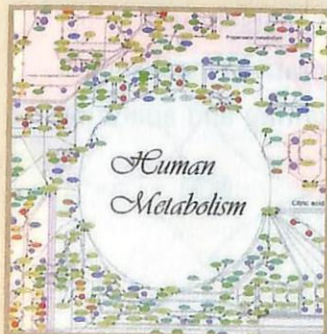
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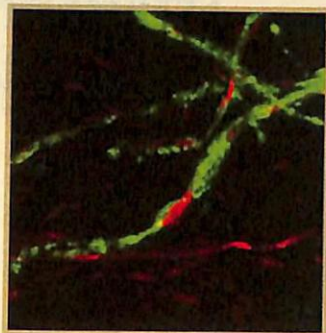
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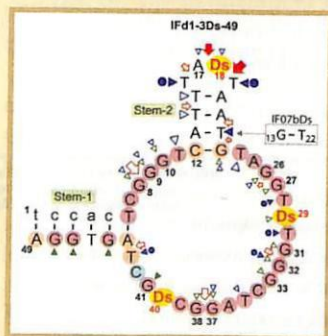
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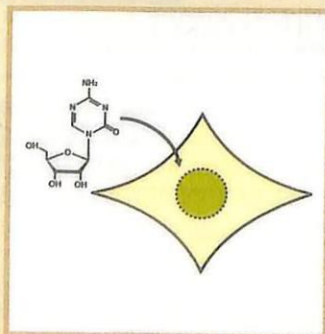
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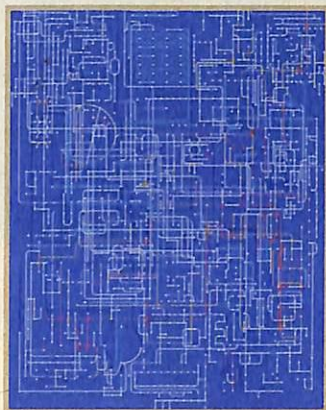


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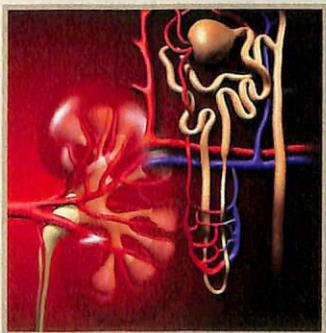


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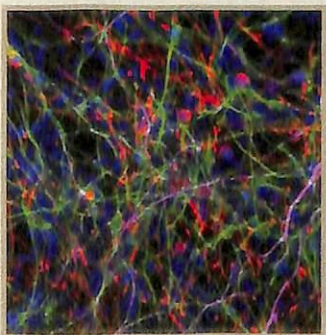
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Global mapping of cancer gene expression changes to the human metabolic network. Hu *et al.* find substantial heterogeneity in how cellular metabolism is reprogrammed across 22 cancers (p 522). Credit: Jie Hu and Dennis Vitkup using the iPath tool.



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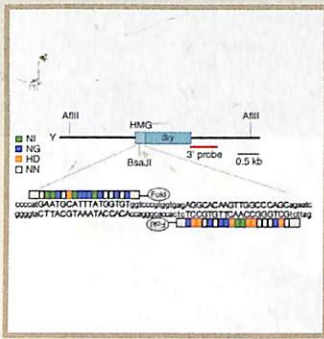
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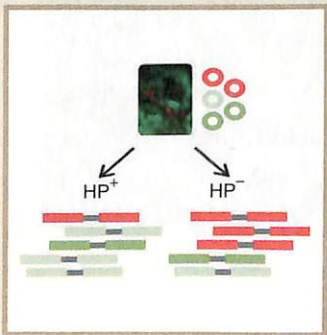
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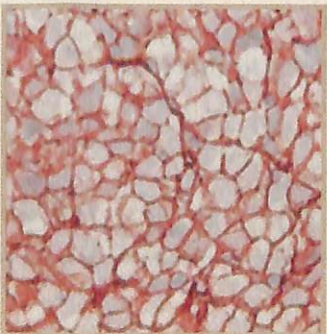
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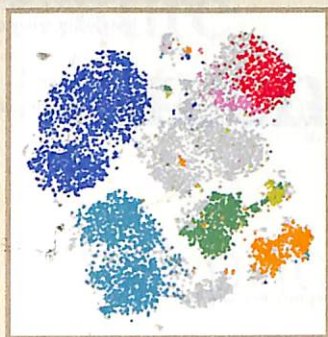
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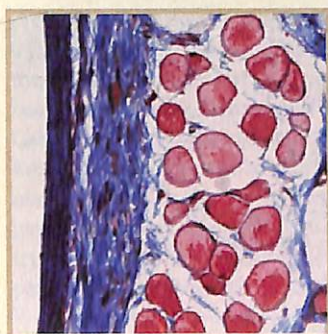
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x_{-1}	x_0	x_1
A	S	A
R	Y	R
...	T	...
W	pS	W
Y	pY	Y
V	pT	V

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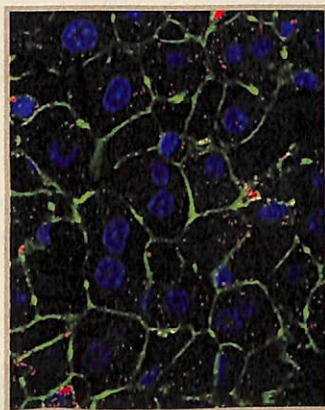
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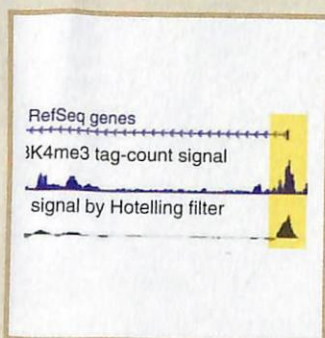
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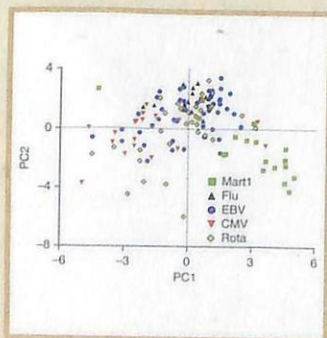
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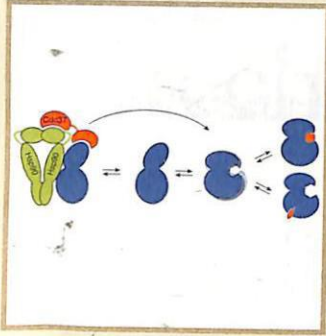


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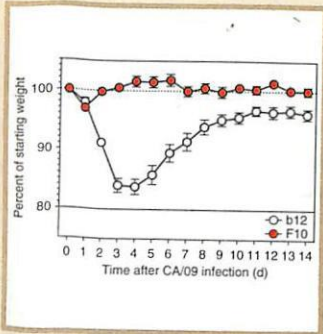
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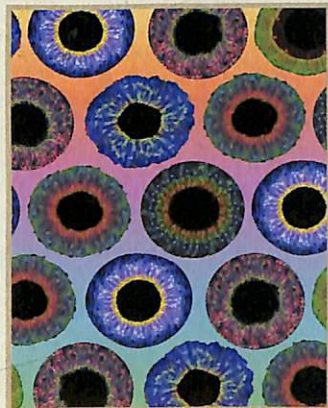
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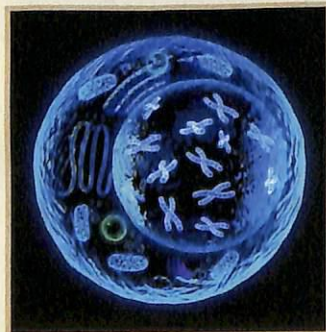
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Circular reconstructions with images of retinal tissue stained for various photoreceptor and retinal markers. Ali and colleagues generate mature photoreceptors by transplantation of mouse embryonic stem cells differentiated in three-dimensional culture (p 741).
 Credit: Anai Gonzales-Cordero



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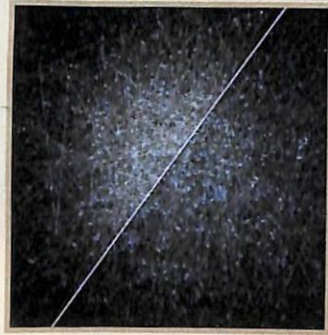
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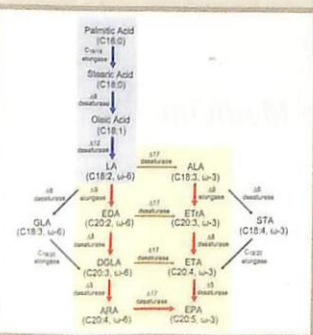




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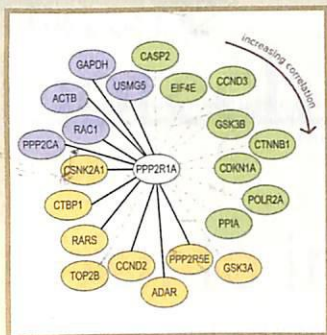
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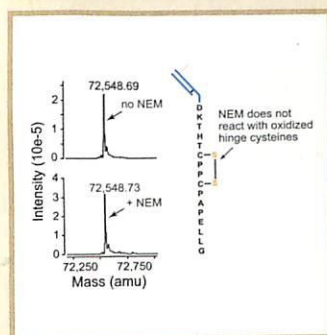
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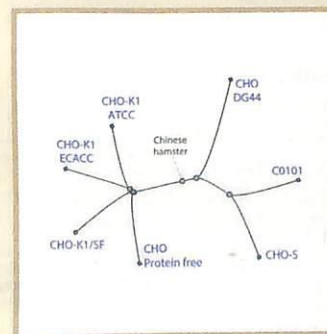
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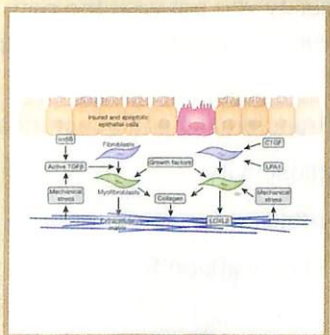
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Heat maps of the specificity of DNA cleavage by RNA-guided Cas9 endonuclease. Four groups use a variety of methods *in vitro* and in cells to assess the specificity of genome editing with CRISPR-Cas systems (pp 822, 827, 833, 839). Credit: Marina Spence, based on images provided by David Liu, Prashant Mali and Feng Zhang.



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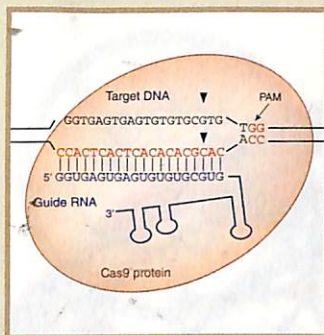


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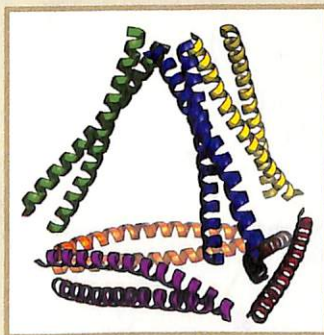


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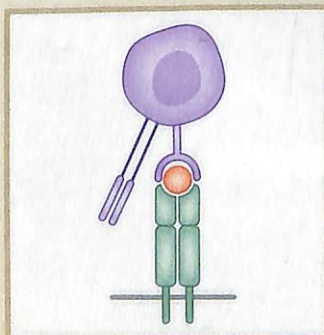
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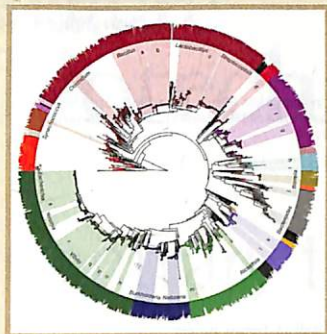
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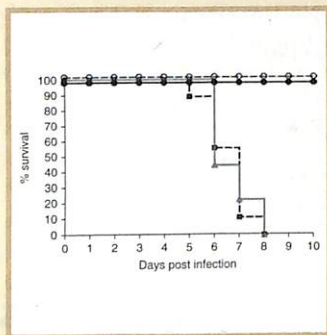
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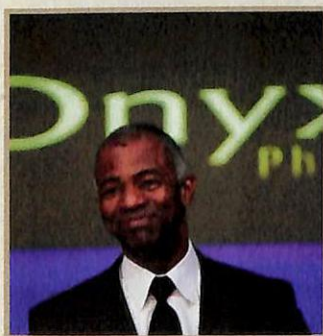
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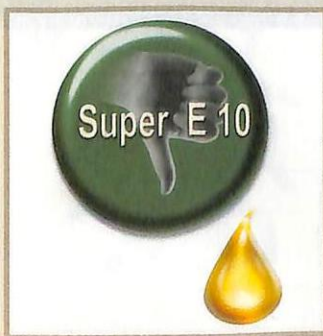
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Close-up of suckers and teeth rings on the tentacles of a Humboldt squid (*Dosidicus gigas*). Guerette *et al.* use RNA-seq to rapidly identify proteins that synthesize or constitute biomaterials, including promising silk-like proteins from squid sucker ring teeth (p 908). Credit: Louise Murray/Visuals Unlimited/Corbis



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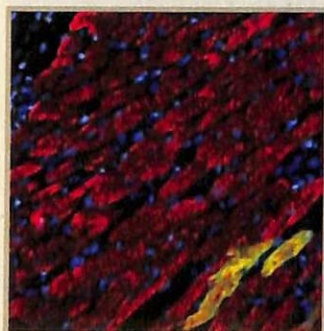
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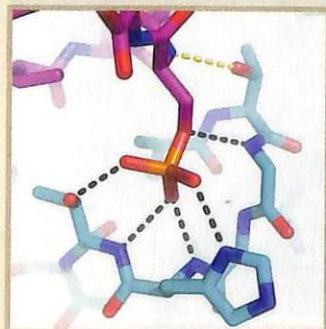
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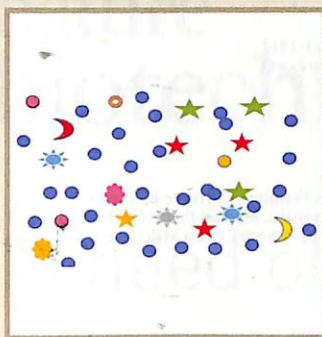
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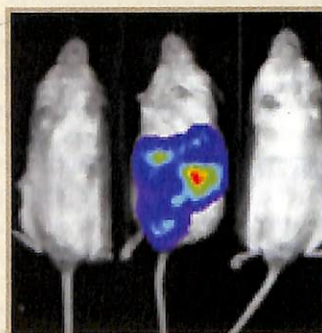
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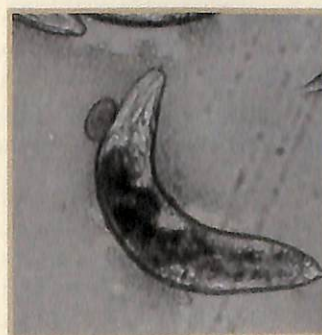
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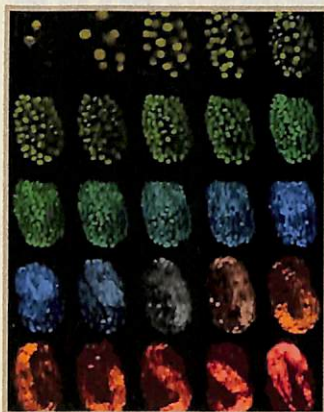
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Volumetric time series of false-colored GFP-histones in a live nematode embryo from the four-cell stage up to hatching. Wu *et al.* present diSPIM, a four-dimensional imaging method with isotropic resolution and minimal photobleaching (p 1032).
 Credit: Marina Spence, based on images from Yicong Wu and Hari Shroff.



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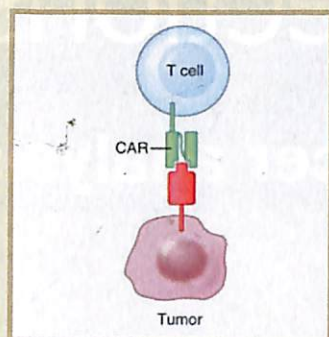


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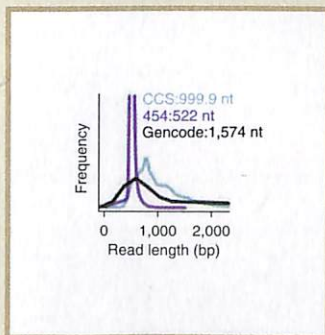


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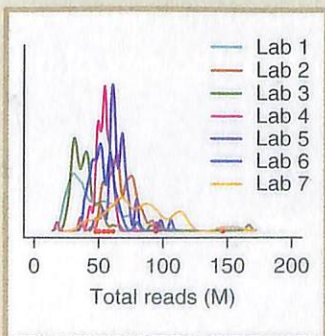
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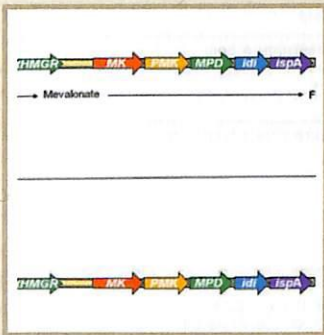
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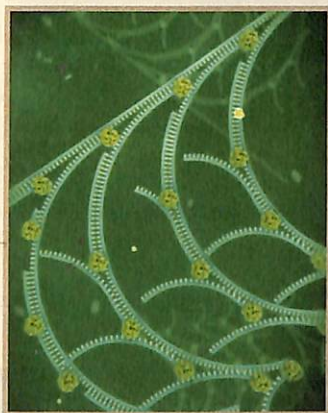
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Artistic rendition of hyperbranched amplicons created by multiple-displacement amplification. Gole *et al.* uniformly amplify the DNA of single cells in nanoliter wells, enabling copy-number variants to be detected in primary human neurons (p 1126).
Credit: Kun Zhang



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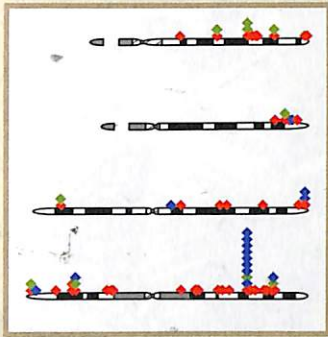
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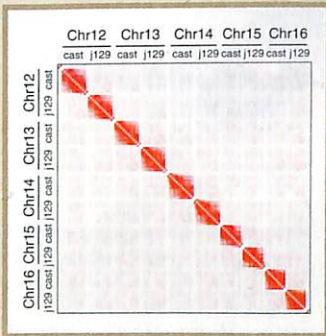


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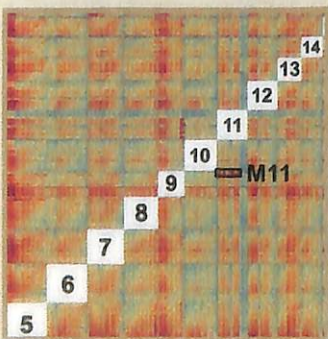
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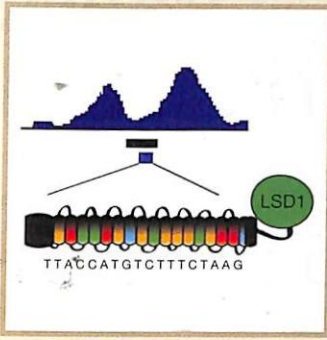
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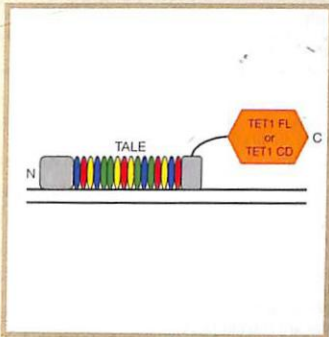
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Antibody-drug conjugates for cancer therapy

Dario Neri
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