NEWS & COMMENT

An Industry-Friendly Science Policy 596
Government-Industry Collaboration: NIH Panel Rejects Pricing Clause 598
Molecular Medicine: One Less Hoop for Gene Therapy 599
Environmental Protection Agency: Browner to Beef Up Outside Research 599
DOE and Texas Settle SSC Claims 600

RESEARCH NEWS

Shoemaker-Levy Dazzles, Bewilders 601
The Comet Explodes by E-Mail 602
Neuroscience: To Sleep, Perchance to...Learn? New Studies Say Yes 603
From Bacteria: A New Weapon Against Fungal Infection 605
People of the Amazon Fight to Save the Flooded Forest 606
Cosmology: On the Track of Dark Matter in Mica 607

DEPARTMENTS

THIS WEEK IN SCIENCE 585
EDITORIAL 587
A Gift from the Heavens
LETTERS 589
Gene Ownership: T. Harris and K. J. Kinsella • Antibiotic Resistance: M. G. P. Page; H. L. Cooper; L. J. Gross • Statistical Medicine: L. Kish

RESEARCH ARTICLE

Spatial Organization and Time 625
Dependence of Jupiter’s Tropospheric Temperatures, 1980–1993

PERSPECTIVES

Totally Tubular 611
J. H. Weaver

Phage Assembly: A Paradigm for Bacterial Virulence Factor Export? 612
M. Russel

ARTICLES

Conserved Structures and Diversity of Functions of RNA-Binding Proteins 615
C. G. Burd and G. Dreyfuss

Arctic Ocean Gravity Field Derived From ERS-1 Satellite Altimetry 621
S. Laxon and D. McAdoo

DIFFERENTIATION OF BONE MARROW STEM CELLS


Mammalian hematopoiesis is regulated, at least in part, by negative and positive control actions of cytokines and growth factors. In bone marrow, stromal cells, such as osteoblastic cells, respond to a variety of hematopoietic growth factors by producing proteins that affect the proliferation and differentiation of hematopoietic cells. We describe the generation of osteoblastic cells, such as those of the bone cortex, with a high level of stromal cell-derived factor (SDF-1; also called stromal cell-derived factor-1 alpha, SDF-1alpha) and show that SDF-1alpha inhibits the differentiation of hematopoietic cells. The decrease of SDF-1alpha, which occurs during osteoblast differentiation, may be a crucial factor in the differentiation of hematopoietic cells. The ability of osteoblastic cells to down-regulate SDF-1alpha may provide the basis for the regulation of hematopoiesis by bone marrow stromal cells.
A hippocampal neuron (different colors represent different neurons) was active when a rat was located at the position of each cross on the dumbbell-shaped track. During the subsequent sleep period the firing pattern of these neurons was re-expressed, and correlations between pairs of these neurons are represented by the red lines. The re-expression of firing patterns may contribute to the storage of memories. See Reports on pages 676 and 679 and News story on page 603. [Image: M. Wilson and B. McNaughton]