EDITORIAL
9  The New Patrons of Research
Marcia McNutt
>> News section p. 24; Policy Forum p. 41

NEWS OF THE WEEK
14  A roundup of the week’s top stories

NEWS & ANALYSIS
16  Even for Slide-Prone Region, Landslide Was Off the Chart
17  Cassini Plumbs the Depths of the Enceladus Sea
>> Report p. 78
18  Kurdistan Offers an Open Window on the Ancient Fertile Crescent
19  The Morning After, Inflation Result Causes Headaches
21  In New Report, IPCC Gets More Specific About Warming Risks
22  Court Slams Japan’s Scientific Whaling
23  RIKEN Panel Finds Misconduct in Controversial Paper

NEWS FOCUS
24  Chasing the Money
   The Vulnerable: Talene Yacoubian
   The Veteran: Russ Hille
   The Adapter: Rachel Brewster
   The Administrator: Jay Walsh
   The Well-Heeled: Donald Bowden
   The Crowd-Funder: Heidi Moretti
   Anatomy of a Grant: Michael Imperiale
>> Editorial p. 9; Policy Forum p. 41; Science Careers features by T. Gura and G. B. S. N. P. Varma at http://scim.ag/1dUhSB2; Science Podcast

LETTERS
34  NextGenVOICES

BOOKS ET AL.
39  Reading Darwin in Arabic, 1860–1950
M. Elshakry, reviewed by B. H. Küçük
40  Vikings
G. Williams et al., curators

POLICY FORUM
41  Science Funding and Short-Term Economic Activity
B. A. Weinberg et al.
>> Editorial p. 9; News section p. 24

PERSPECTIVES
44  Optogenetic Regeneration
S. M. Iyer and S. L. Delp
>> Report p. 94
45  A CO₂ Cloak for the Cyanide Dagger
I. Alabugin and R. K. Mohamed
>> Report p. 75
46  To Fence or Not to Fence
R. Woodroffe et al.
48  The Michael Jackson Fly
R. S. Mann
>> Report p. 97
49  Immune Activation with HIV Vaccines
A. S. Fauci et al.
51  Inside Earth Runs Hot and Cold
K. A. Kelley
>> Report p. 80
52  Not So Permanent El Niño
D. W. Lea
>> Report p. 84

REVIEW
54  Migratory Animals Couple Biodiversity and Ecosystem Functioning Worldwide
S. Bauer and B. J. Hoyer
Review Summary; for full text:
http://dx.doi.org/10.1126/science.1242552

CONTENTS continued >>

ON THE WEB THIS WEEK
>> Science Podcast
On this week’s show: life under rapid funding change and a news roundup with David Grimm.
>> Find More Online
Check out Science Express, the weekly podcast, videos, daily news, our research journals, and Science Careers at www.sciencemag.org.

COVER
A lone scientist considers the state of biomedical funding in the United States. As researchers adapt to new constraints, they are reconsidering their strategy and their science, and trying to find a road forward. See pages 9, 24, and 41.
Illustration: Mark Smith, MarkSmithIllustration.com

DEPARTMENTS
8  This Week in Science
10  Editors’ Choice
12  Science Staff
105  New Products
106  Science Careers
RESEARCH ARTICLES

55  Total Synthesis of a Functional Designer Eukaryotic Chromosome
    N. Annaluru et al.
    A synthetic version of yeast chromosome III
    with every gene tagged can substitute for the
    original.

58  Structure of a Class C GPCR Metabotropic
    Glutamate Receptor 1 Bound to an
    Allosteric Modulator
    H. Wu et al.
    Insight into the activation mechanism of a
    human neuronal G protein–coupled receptor.

65  Polyhedra Self-Assembled from DNA
    Tripods and Characterized with 3D
    DNA-PAINT
    R. Iinuma et al.
    Stiff DNA tripod units enabled the assembly
    of wireframe polyhedra with edges 100
    nanometers in length.

REPORTS

70  Soft Microfluidic Assemblies of Sensors,
    Circuits, and Radios for the Skin
    S. Xu et al.
    Flexible skin-integrated electronic sensors
    enable continuous, wireless health monitoring.

75  A Simple Complex on the Verge of
    Breakdown: Isolation of the Elusive
    Cyanofomate Ion
    L. J. Murphy et al.
    Characterization of a cyanide–carbon dioxide
    adduct bolsters its possible role in protecting
    a plant enzyme from cyanide inhibition.
    >> Perspective p. 45

78  The Gravity Field and Interior Structure
    of Enceladus
    L. Iess et al.
    The saturnian moon is differentiated and
    likely hosts a regional subsurface sea at its
    southern pole.
    >> News story p. 17

80  Geophysical and Geochemical Evidence
    for Deep Temperature Variations Beneath
    Mid-Ocean Ridges
    C. A. Dalton et al.
    Temperature variations in the upper mantle
    drive mantle convection.
    >> Perspective p. 51

84  A 12-Million-Year Temperature History
    of the Tropical Pacific Ocean
    Y. G. Zhang et al.
    A strong Pacific zonal surface ocean
    temperature gradient has existed for the
    past 12 million years.
    >> Perspective p. 52

87  Construction of a Vertebrate Embryo from
    Two Opposing Morphogen Gradients
    P.-F. Xu et al.
    Opposing gradients of bone morphogenetic
    protein and Nodal can induce the formation
    of a zebrafish embryo.

89  Polyiongol Ferulate Transferase
    Introduces Chemically Labile Linkages
    into the Lignin Backbone
    C. G. Wilkerson et al.
    Engineered poplar lignin with readily
    cleavable ester bonds in the polymer
    backbone improves wood degradability.

90  Optical Control of Muscle Function by
    Transplantation of Stem Cell–Derived
    Motor Neurons in Mice
    J. B. Bryson et al.
    Transplanted neurons controlled by light can
    drive muscle function in damaged mouse
    sciatic nerves.
    >> Perspective p. 44

94  Neuronal Control of Drosophila
    Walking Direction
    S. S. Bidaye et al.
    Activation of descending command neurons in
    Drosophila induces flies to walk backward.
    >> Perspective p. 48

97  SRP RNA Remodeling by SRP68 Explains
    Its Role in Protein Translocation
    J. T. Grotwinkel et al.
    Structures of part of the signal recognition
    complex help explain how newly synthesized
    proteins are inserted into membranes.
    >> Perspective p. 54

101 Two Opposing Morphogen Gradients
    of a zebrafish embryo.
    P.-F. Xu et al.
    Opposing gradients of bone morphogenetic
    protein and Nodal can induce the formation
    of a zebrafish embryo.
    >> Perspective p. 52

104 A 12-Million-Year Temperature History
    of the Tropical Pacific Ocean
    Y. G. Zhang et al.
    A strong Pacific zonal surface ocean
    temperature gradient has existed for the
    past 12 million years.
    >> Perspective p. 52

107 Construction of a Vertebrate Embryo from
    Two Opposing Morphogen Gradients
    P.-F. Xu et al.
    Opposing gradients of bone morphogenetic
    protein and Nodal can induce the formation
    of a zebrafish embryo.

110 Optical Control of Muscle Function by
    Transplantation of Stem Cell–Derived
    Motor Neurons in Mice
    J. B. Bryson et al.
    Transplanted neurons controlled by light can
    drive muscle function in damaged mouse
    sciatic nerves.
    >> Perspective p. 44

114 Neuronal Control of Drosophila
    Walking Direction
    S. S. Bidaye et al.
    Activation of descending command neurons in
    Drosophila induces flies to walk backward.
    >> Perspective p. 48

118 SRP RNA Remodeling by SRP68 Explains
    Its Role in Protein Translocation
    J. T. Grotwinkel et al.
    Structures of part of the signal recognition
    complex help explain how newly synthesized
    proteins are inserted into membranes.