

EDITORIAL

- 1127 Growing Latin American Science
Celia R. S. Garcia et al.

NEWS OF THE WEEK

- 1132 A roundup of the week's top stories

NEWS & ANALYSIS

- 1135 Tough Financial Times Bring
ESA Down to Earth
- 1136 News Flash: X-ray Laser Produces
First Protein Structure
>> *Science Express Report* by *L. Redecke et al.*
- 1137 BP Criminal Case Generates
Record Payout for Science
and Restoration
- 1138 Experts Agree Global Warming
Is Melting the World Rapidly
>> *Research Article p. 1183*
- 1139 An Oil Gusher in the Offing,
but Will It Be Enough?

NEWS FOCUS

- 1140 Raising Up a Fallen Ivory Tower
>> *Science Podcast*
- 1143 Salt and the Sea Serpent
- 1144 Crusader Crisis: How Conquest
Transformed Northern Europe
- 1146 Amid Europe's Food Fights, EFSA
Keeps Its Eyes on the Evidence

LETTERS

- 1149 The K Computer: User-Friendly
K. Hirao
- The Final End of the Final Frontier?
C. M. Lisse and R. L. McNutt Jr.
- Animal Welfare Development in China
X. Meng et al.
- 1151 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 1152 Hawking Incorporated
H. Mialet, reviewed by J. Agar

POLICY FORUM

- 1153 From Acid Rain to Climate Change
S. Reis et al.

PERSPECTIVES

- 1155 iPSC Disease Modeling
F. Soldner and R. Jaenisch
- 1156 Building the Human Brain
C. K. Machens
>> *Report p. 1202*
- 1157 Integrating the Captive and the Wild
K. H. Redford et al.
- 1159 LEGO-like DNA Structures
K. V. Gothelf
>> *Research Article p. 1177*
- 1160 Embers of the Distant Past
V. Bromm
>> *Report p. 1190*
- 1161 Outsmarting Outbreaks
M. J. Walker and S. A. Beatson
- 1163 Retrospective: E. Donnall Thomas
(1920–2012)
F. R. Appelbaum

SCIENCE PRIZE ESSAY

- 1164 Solving Complex Problems
K. V. Hodges

CONTENTS continued >>



page 1144



pages 1156 & 1202



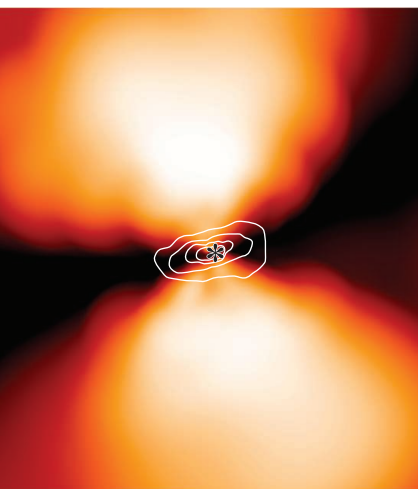
COVER

Computer-generated models of three-dimensional nanostructures that were self-assembled from synthetic DNA strands called DNA bricks. A master collection defines a 1000-voxel "molecular canvas" with a 25-nanometer edge. By selecting subsets of bricks, *Ke et al.* constructed a panel of 102 distinct shapes with sophisticated surface features and intricate interior cavities and tunnels. These nanostructures may find applications ranging from biomedicine to nanoelectronics. See page 1177.

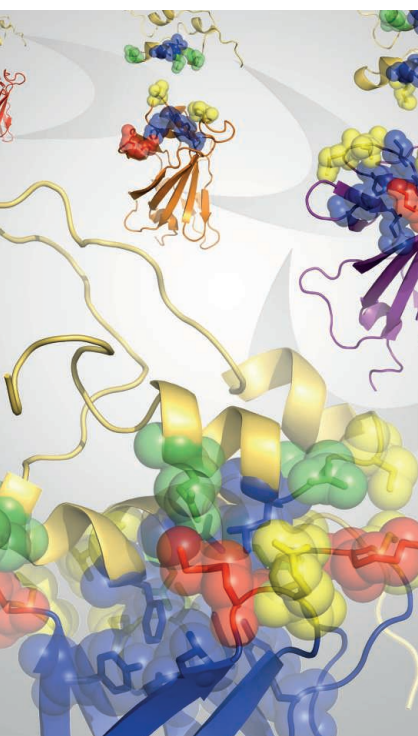
Image: Yonggang Ke

DEPARTMENTS

- 1124 This Week in *Science*
- 1128 Editors' Choice
- 1130 *Science* Staff
- 1166 AAAS News & Notes
- 1233 New Products
- 1234 *Science* Careers



pages 1160 & 1190



page 1209

REVIEW

- 1172 Ice-Sheet Response to Oceanic Forcing
I. Joughin et al.

RESEARCH ARTICLES

- 1177 Three-Dimensional Structures Self-Assembled from DNA Bricks
Y. Ke et al.
Stepwise assembly of 32-nucleotide DNA "bricks" can create a wide variety of nanoscale objects.
>> *Perspective p. 1159*
- 1183 A Reconciled Estimate of Ice-Sheet Mass Balance
A. Shepherd et al.
The mass balance of the polar ice sheets is estimated by combining the results of existing independent techniques.
>> *News story p. 1138*

REPORTS

- 1190 The Imprint of the Extragalactic Background Light in the Gamma-Ray Spectra of Blazars
M. Ackermann et al.
Gamma-ray spectra obtained with the Fermi Space Telescope constrain star formation and galaxy evolution over cosmic time.
>> *Perspective p. 1160*
- 1193 Superconducting Dome in a Gate-Tuned Band Insulator
J. T. Ye et al.
Liquid gating tunes the carrier density in molybdenum disulfide, revealing unconventional superconductivity.
- 1196 Formation of Regular Satellites from Ancient Massive Rings in the Solar System
A. Crida and S. Charnoz
An analytical model suggests that the terrestrial and giant planets in the solar system formed moons through a similar process.
- 1199 Chemically and Geographically Distinct Solid-Phase Iron Pools in the Southern Ocean
B. P. von der Heyden et al.
The distribution and composition of fine-grained marine iron particles vary strongly with location.

- 1202 A Large-Scale Model of the Functioning Brain
C. Eliasmith et al.
Two-and-a-half million model neurons recognize images, learn via reinforcement, and display fluid intelligence.
>> *Perspective p. 1156*
- 1206 Copy Number Variation of Multiple Genes at *Rhg1* Mediates Nematode Resistance in Soybean
D. E. Cook et al.
Resistance to a damaging disease of soybean is conferred by a cluster of linked genes present in multiple copies.
- 1209 An Exon Splice Enhancer Primes IGF2:IGF2R Binding Site Structure and Function Evolution
C. Williams et al.
Parental genetic conflict may have exploited changes in the coding of a protein loop in a growth factor receptor.
- 1214 Cytoplasmic ATP Hydrolysis Powers Transport of Lipopolysaccharide Across the Periplasm in *E. coli*
S. Okuda et al.
Transporting lipopolysaccharide from inside the bacterial cell to the surface requires multiple molecules of adenosine triphosphate.
- 1217 Direct Observation of Stalled Fork Restart via Fork Regression in the T4 Replication System
M. Manosas et al.
Bacterial DNA replication machinery is able to stall, regress, and then migrate past a DNA lesion in vitro.
- 1220 Progenitor and Terminal Subsets of CD8⁺ T Cells Cooperate to Contain Chronic Viral Infection
M. A. Paley et al.
Chronic viral infections like HIV are kept in check by two functionally distinct types of T lymphocyte.
- 1225 Body Cues, Not Facial Expressions, Discriminate Between Intense Positive and Negative Emotions
H. Aviezer et al.
The body reveals what the face conceals.
- 1229 A Mutation in EGF Repeat-8 of Notch Discriminates Between Serrate/Jagged and Delta Family Ligands
S. Yamamoto et al.
A genetic screen identifies an extracellular motif in a conserved signaling receptor that confers ligand specificity.

SCIENCEEXPRESS

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Publication Ahead of Print

The Closing Door of Climate Targets

T. F. Stocker

10.1126/science.1232468

Bright and Dark Polar Deposits on Mercury: Evidence for Surface Volatiles

G. A. Neumann et al.

10.1126/science.1229764

Evidence for Water Ice Near Mercury's North Pole from MESSENGER Neutron Spectrometer Measurements

D. J. Lawrence et al.

10.1126/science.1229953

>> [Science Podcast](#)

Thermal Stability of Volatiles in the North Polar Region of Mercury

D. A. Paige et al.

10.1126/science.1231106

Apatite ⁴He/³He and (U-Th)/He Evidence for an Ancient Grand Canyon

R. M. Flowers and K. A. Farley

10.1126/science.1229390

Crocodile Head Scales Are Not Developmental Units But Emerge from Physical Cracking

M. C. Milinkovitch et al.

10.1126/science.1226265

>> [Science Podcast](#)

Natively Inhibited *Trypanosoma brucei* Cathepsin B Structure Determined by Using an X-ray Laser

L. Redecke et al.

10.1126/science.1229663

>> [News story p. 1136](#)

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Highlights From Our Daily News Coverage

Making a Flu Vaccine Without the Virus

A new influenza vaccine using only messenger RNA proves successful in animals.

http://scim.ag/New_Vaccine

Putting Themselves to Sleep

A Valium-like compound produced by the brain could make some people super sleepy.

<http://scim.ag/Sleepy-People>

Trees Living on the Edge

Forests are poorly equipped to deal with drought as the climate gets drier.

http://scim.ag/Forests_Drought

SCIENCE SIGNALING

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The Signal Transduction Knowledge Environment

27 November issue: <http://scim.ag/ss112712>

RESEARCH ARTICLE: Regulation of Phosphatidylinositol-5-Phosphate Signaling by Pin1 Determines Sensitivity to Oxidative Stress

W.-J. Keune et al.

Increasing the abundance of the phospholipid PtdIns5P protects cells from oxidative stress.

RESEARCH ARTICLE: Lack of the Phosphatase PTPN22 Increases Adhesion of Murine Regulatory T Cells to Improve Their Immunosuppressive Function

R. J. Brownlie et al.

PODCAST

R. Zamojska and A. M. VanHook

Loss of the phosphatase PTPN22 enhances the functions of both effector and regulatory T cells.

PERSPECTIVE: Remodeling a Tissue—Subtraction Adds Insight

J. D. Axelrod

Imaging, modeling, and genetics reveal the roles of an atypical myosin in morphogenesis.

FORUM: Highlights from Understanding Signaling Pathways in Cancer

L. K. Ferrarelli and N. R. Gough

Understanding the complexities of cell signaling is critical to developing therapies against cancer.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

28 November issue: <http://scim.ag/stm112812>

FOCUS: Time to Integrate Clinical and Research Informatics

I. L. Katzan and R. A. Rudick

Integration of electronic clinical and research data will ultimately improve patient care.

RESEARCH ARTICLE: Treating Diabetes and Obesity with an FGF21-Mimetic Antibody Activating the β Klotho/FGFR1c Receptor Complex

I. N. Foltz et al.

An antibody mimic of FGF21 exerts beneficial metabolic effects in obese monkeys.

RESEARCH ARTICLE: Detection of Chromosomal Alterations in the Circulation of Cancer Patients with Whole-Genome Sequencing

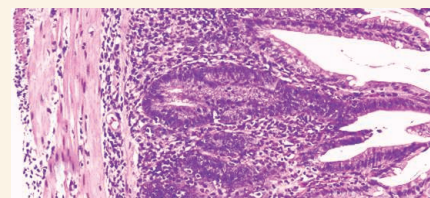
R. J. Leary et al.

Massively parallel sequencing directly detects tumor-derived chromosomal alterations in plasma DNA.

RESEARCH ARTICLE: Tadalafil Treatment for Muscular Dystrophy Patients

E. A. Martin et al.

Tadalafil abrogates muscle ischemia in patients with Becker muscular dystrophy.



SCIENCE SIGNALING
Intestinal colitis.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

<http://scim.ag/SciCareers30November2012>

Time Off for Dad

S. Gaidos

Paternity leave helps fathers *and* mothers advance their careers; too bad it is not more common.

Robots, Fish, and Undergrads

S. Webb

John Long and his Vassar undergraduates study fish biomechanics and behavior.

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