

SPECIAL SECTION

Protein Dynamics

INTRODUCTION

- 197 Proteins in Motion

REVIEWS

- 198 Sending Signals Dynamically
R. G. Smock and L. M. Gierasch
- 203 Protein Dynamism and Evolvability
N. Tokuriki and D. S. Tawfik

- 208 Multiscale Modeling of Form and Function
A. J. Engler et al.

PERSPECTIVE

- 213 Trapping Moving Targets with Small Molecules
G. M. Lee and C. S. Craik

>> For a list of all related content, see p. 197 or go to www.sciencemag.org/sciext/proteindynamics/



page 166

EDITORIAL

- 147 Helping the President
Neal Lane

NEWS OF THE WEEK

- 157 Harvard's Financial Crunch Raises Tensions Among Biology Programs
- 158 Unlucky CLOVER: U.K. Halts Unfinished Telescope Project
- 159 Arne Duncan Hopes a Team Approach Will Improve U.S. Schools
- 161 Lunar and Planetary Science Conference A Primal Crust Found on the Moon, While Mercury's Proves Elusive
Water Everywhere on Mars, But Is Any of It Ever Liquid?
- 162 Darwin Applies to Medical School
Two Sides of the Same Coin?
- 163 From *Science's* Online Daily News Site
- 165 New Way to Target Hormone Receptor Thwarts Prostate Cancer
>> *Science Express Report* by C. Tran et al.
- 165 From the *Science* Policy Blog

NEWS FOCUS

- 166 Newborn Blood Collections: Science Gold Mine, Ethical Minefield
>> *Science Podcast*
- 169 The 'Tamba Dragon' Has Japanese Dinosaur Hunters All Fired Up
- 170 Détente in the Fisheries War
- 172 Renewables Test IQ of the Grid
Students Energized by Power Engineering

LETTERS

- 176 Advancing Human Rights Through Science
J. H. Toney
Tracing Fossil History
R. McDowell
Response
S. Bengtson and B. Rasmussen
Risks of Extreme Heat and Unpredictability
N. Hockley et al.
Response
D. S. Battisti and R. L. Naylor
- 177 Life in Science: Seeds of Doubt
P. H. Klopfer

BOOKS ET AL.

- 181 Freaks of Nature
M. S. Blumberg, reviewed by M. D. Laubichler
- 182 The Lives of Ants
L. Keller and É. Gordon, reviewed by N. R. Franks

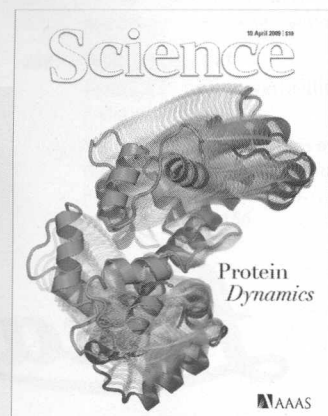
POLICY FORUM

- 183 Legal Bedrock for Rebuilding America's Ocean Ecosystems
M. Turnipseed et al.
>> *Science Podcast*

PERSPECTIVES

- 185 Electrode-Cellular Interface
G. G. Wallace et al.
- 186 Total Chemical Synthesis Peers into the Biosynthetic Black Box
S. J. Miller
>> *Report p. 238*
- 187 *Leshmania* Exploit Sex
M. A. Miles et al.
>> *Report p. 265*
- 190 Symmetry in Turns
B. W. Tobalske
>> *Report p. 252*
- 191 Green Evolution, Green Revolution
J. M. Archibald
>> *Report p. 268*
- 192 Puzzling Patterns of Predisposition
P. J. Pollard and P. J. Ratcliffe
>> *Report p. 261*
- 194 Laser Beams Take a Curve
J. Kasparian and J.-P. Wolf

CONTENTS continued >>



COVER

The dynamic nature of the master calcium signaling protein, calmodulin, schematically illustrated by snapshots from an interpolation between its calcium-bound state (blue) and its structure bound to both calcium and a peptide derived from one of its downstream cellular targets, myosin light chain kinase (red), generated using the Yale Morph Server and PyMol software. See the special section beginning on page 197.

Image: Robert Smock and Lila Gierasch

DEPARTMENTS

- 143 This Week in *Science*
- 149 Editors' Choice
- 152 *Science* Staff
- 155 Random Samples
- 280 New Products
- 281 *Science* Careers

BREVIA

- 217 **Exomic Sequencing Identifies *PALB2* as a Pancreatic Cancer Susceptibility Gene**
S. Jones et al.
Mutations in a gene previously implicated in breast cancer are a contributing factor in hereditary pancreatic cancer.

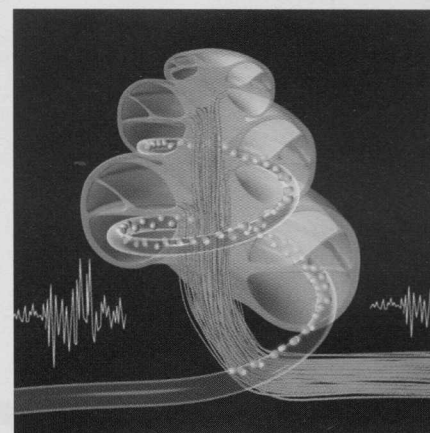
RESEARCH ARTICLE

- 218 **Genome-Wide Analysis in Vivo of Translation with Nucleotide Resolution Using Ribosome Profiling**
N. T. Ingolia et al.
Profiling the position of ribosomes on messenger RNA allows rapid, high-precision investigation of cellular protein translation.

REPORTS

- 224 **Elastic Shear Anisotropy of Ferroprecipitate in Earth's Lower Mantle**
H. Marquardt et al.
A minor phase of the deep mantle causes marked differences in seismic travel times in different directions.
- 226 **A Great Earthquake Rupture Across a Rapidly Evolving Three-Plate Boundary**
K. P. Furlong et al.
This event revealed plate dynamics in the Solomon Islands and showed that subduction of young crust can produce great quakes.
- 229 **Curved Plasma Channel Generation Using Ultraintense Airy Beams**
P. Polynkin et al.
Propagating intense structured laser beams through air creates self-focused "light bullets" that take a curved trajectory.
- 232 **Solar Power Wires Based on Organic Photovoltaic Materials**
M. R. Lee et al.
A transparent polymer coating allows optics to compensate for the shadowing effects of a metal wire electrode.
- 236 **Running Droplets of Gallium from Evaporation of Gallium Arsenide**
J. Tersoff et al.
Oscillation of gallium droplets is driven by a disequilibrium between the droplets and the gallium arsenide surface.
- 238 **Total Synthesis of (+)-11,11'-Dideoxyverticillin A**
J. Kim et al.
The key step in the synthesis of this complex fungal metabolite replaces four introduced hydroxyl groups with thiols.
>> *Perspective p. 186*

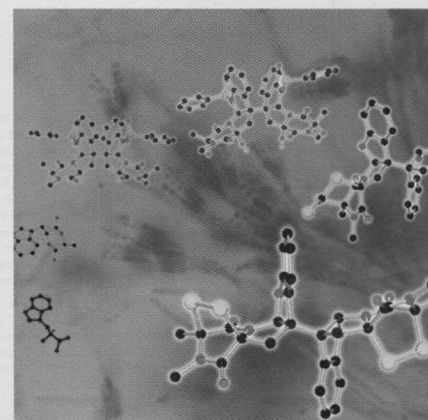
- 242 **Pulsatile Stimulation Determines Timing and Specificity of NF- κ B-Dependent Transcription**
L. Ashall et al.
The frequency of pulses of cytokine stimulation of a cell can determine the spectrum of genes whose transcription is regulated.
- 246 **Antibody Recognition of a Highly Conserved Influenza Virus Epitope**
D. C. Ekiert et al.
A broadly neutralizing antibody binds the hemagglutinin stalk of pathogenic influenza viruses to block membrane fusion.
- 252 **Wingbeat Time and the Scaling of Passive Rotational Damping in Flapping Flight**
T. L. Hedrick et al.
Morphology and flapping motion are combined in a model that predicts turn dynamics for flying animals ranging in size from fruit flies to cockatoos.
>> *Perspective p. 190; Science Podcast*
- 255 **Coding-Sequence Determinants of Gene Expression in *Escherichia coli***
G. Kudla et al.
RNA structure, rather than optimal codon usage, determines translation efficiency in *Escherichia coli*.
- 258 **Leucine-Rich Repeat Protein Complex Activates Mosquito Complement in Defense Against *Plasmodium* Parasites**
M. Povelones et al.
A family of molecules, apparently unique to mosquitoes, binds to invading parasites and initiates innate immune responses.
- 261 **Glioma-Derived Mutations in *IDH1* Dominantly Inhibit *IDH1* Catalytic Activity and Induce HIF-1 α**
S. Zhao et al.
Mutations in isocitrate dehydrogenase-1 compromise enzyme function and activate a signaling pathway that helps brain tumors grow when oxygen is limited.
>> *Perspective p. 192*
- 265 **Demonstration of Genetic Exchange During Cyclical Development of *Leishmania* in the Sand Fly Vector**
N. S. Akopyants et al.
Diversity among *Leishmania* parasites is not just a product of divergent mutation but also of genetic exchange.
>> *Perspective p. 187*
- 268 **Green Evolution and Dynamic Adaptations Revealed by Genomes of the Marine Picoeukaryotes *Micromonas***
A. Z. Worden et al.
An anciently derived clade of photosynthetic picoeukaryote, ubiquitous in the world's oceans, possesses surprising genetic diversity.
>> *Perspective p. 191*



page 185



page 232



page 238

CONTENTS continued >>