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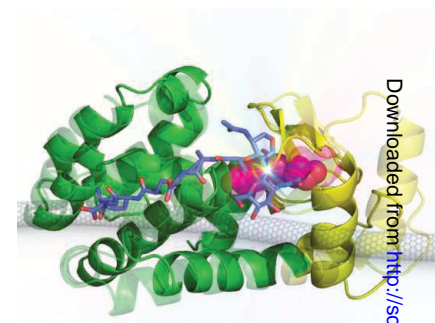
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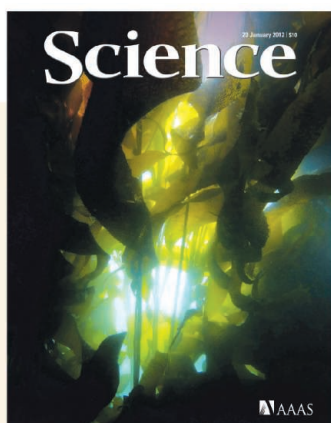


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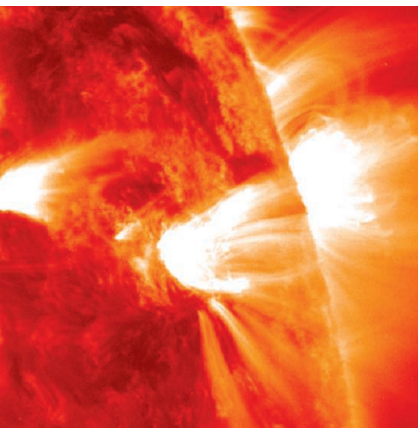
COVER

Brown seaweed (*Macrocystis pyrifera*), commonly known as giant kelp, off the coast of Chiloe Island, Chile (image width ~1 meter). Traditionally, seaweed has been ignored as a source of renewable fuel and chemical compounds for bioconversion, because its primary sugar component is not easily fermented. Wargacki *et al.* engineered a microbe to extract sugars from brown seaweed and convert them into low-carbon, renewable fuels and chemicals. See page 308.

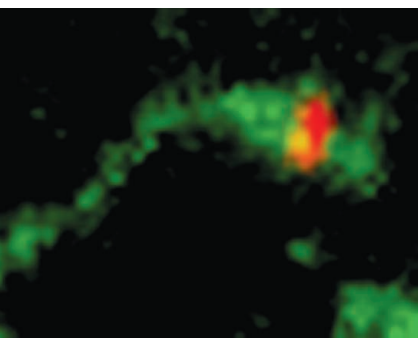
Photo: Julián Fernández

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S. Barz et al.
A protocol is implemented that can ensure secure client-server interactions on a quantum computer architecture.
>> *Perspective p. 294*
- 308** An Engineered Microbial Platform for Direct Biofuel Production from Brown Macroalgae
A. J. Wargacki et al.
Metabolic engineering showcases a preliminary route to generating ethanol from seaweed.
>> *News story p. 273*

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R. A. Williams et al.
A pair of lasers is used produce complex interactions between bosons in an ultracold gas.
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H. Yoshida et al.
Electron microscopy reveals how adsorbed carbon monoxide molecules restructure the surface of gold nanoparticles.
- 319** Single-Molecule Lysozyme Dynamics Monitored by an Electronic Circuit
Y. Choi et al.
Changes in protein conformation can be detected via changes in electrostatic potential with a carbon nanotube transistor.
>> *Perspective p. 300*
- 324** Destruction of Sun-Grazing Comet C/2011 N3 (SOHO) Within the Low Solar Corona
C. J. Schrijver et al.
The NASA Solar Dynamics Observatory detected and tracked a comet as it penetrated the solar atmosphere.
>> *Perspective p. 296; Science Podcast*
- 328** Polymerase Exchange During Okazaki Fragment Synthesis Observed in Living Cells
G. Lia et al.
Single-molecule microscopy suggests that a new core polymerase is used to synthesize each Okazaki fragment.

- 332** Manganese Blocks Intracellular Trafficking of Shiga Toxin and Protects Against Shiga Toxicosis
S. Mukhopadhyay and A. D. Linstedt
Manganese may represent a low-cost therapeutic agent for the treatment of a type of *Escherichia coli* food poisoning.
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- 335** Illusions Promote Mating Success in Great Bowerbirds
L. A. Kelley and J. A. Endler
Males that are more successful at tricking female senses mate more often.
>> *Perspective p. 292*
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K. R. Duffy et al.
Cell-fate decisions in activated B lymphocytes are determined by stochastic competition.
- 342** Asymmetric B Cell Division in the Germinal Center Reaction
B. E. Barnett et al.
Germinal center B cells undergo asymmetric cell division.
- 344** Tuning of Natural Killer Cell Reactivity by NKp46 and Helios Calibrates T Cell Responses
E. Narni-Mancinelli et al.
The activating receptor NKp46 is important for keeping the responses of natural killer cells in check.
- 348** A SUMOylation-Dependent Transcriptional Subprogram Is Required for Myc-Driven Tumorigenesis
J. D. Kessler et al.
An RNA interference screen identifies a "druggable" enzyme whose inhibition halts tumor cell growth.
>> *Perspective p. 293*
- 353** Locally Synchronized Synaptic Inputs
N. Takahashi et al.
The computational power of individual neurons is determined by a surprisingly precise wiring of neuronal networks.

SCIENCEONLINE

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www.sciencexpress.org

Propagation of Slow Slip Leading Up to the 2011 M_w 9.0 Tohoku-Oki Earthquake

A. Kato et al.

Two sequences of slow slip preceded and migrated toward the main rupture.

10.1126/science.1215141

>> [News story p. 272](#)

Determination of Noncovalent Docking by IR Spectroscopy of Cold Gas-Phase Complexes

E. Garand et al.

Conformationally freezing a weakly bound complex in the gas phase sheds light on its likely binding motifs in solution.

10.1126/science.1214948

Biased Signaling Pathways in β_2 -Adrenergic Receptor Characterized by ^{19}F -NMR

J. J. Liu et al.

Selective effects of different ligands provide insights into the structural plasticity of receptor signaling.

10.1126/science.1215802

Rescued Tolerant CD8 T Cells Are Preprogrammed to Reestablish the Tolerant State

A. Schietinger et al.

Maintenance of T cell tolerance is likely regulated by epigenetic mechanisms.

10.1126/science.1214277

Restricted Data on Influenza H5N1 Virus Transmission

R. Fouchier et al.

10.1126/science.1218376

H5N1 Debates: Hung Up on the Wrong Questions

D. R. Perez

10.1126/science.1219066

Life Sciences at a Crossroads: Respiratory Transmissible H5N1

M. Osterholm and D. A. Henderson

10.1126/science.1218612

The Limits of Government Regulation of Science

J. Kraemer and L. Gostin

10.1126/science.1219215

TECHNICALCOMMENTS

Comment on "Probing the Ultimate Limit of Fiber-Optic Strain Sensing"

G. A. Cranch and S. Foster

Full text at www.sciencemag.org/cgi/content/full/335/6066/286-a

Response to Comment on "Probing the Ultimate Limit of Fiber-Optic Strain Sensing"

G. Gagliardi et al.

Full text at www.sciencemag.org/cgi/content/full/335/6066/286-b

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Highlights From Our Daily News Coverage

Scientists Create World's Tiniest Ear

'Nano-ear' detects sound a million times fainter than our ears can hear.

http://scim.ag/Tiniest_Ear

New Animal Virus Takes Northern Europe by Surprise

Agent causes stillbirths and is 'a serious threat to animal health,' scientists say.

http://scim.ag/Animal_Virus

Global Warming May Trigger Winter Cooling

Arctic melting can lead to cooler temperatures and increased snowfall.

http://scim.ag/Winter_Cooling

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

17 January issue: <http://scim.ag/ss011712>

RESEARCH ARTICLE: Interleukin-11 Links Oxidative Stress and Compensatory Proliferation

T. Nishina et al.

Dying liver cells produce a cytokine that triggers healthy neighboring cells to proliferate.

RESEARCH ARTICLE: Plexins Are GTPase-Activating Proteins for Rap and Are Activated by Induced Dimerization

Y. Wang et al.

Semaphorin-mediated growth cone collapse may result from the Rap GTPase-activating protein activity of dimerized plexin receptors.

PERSPECTIVE: A Sweet Spot in the FGFR Signal Transduction Pathway

A. S. Ghabrial

Signaling through the fibroblast growth factor receptors Heartless and Breathless requires O-GlcNAcylation of an adaptor protein.

PERSPECTIVE: LRRK2 and Human Disease—A Complicated Question or a Question of Complexes?

P. A. Lewis and C. Manzoni

The kinase LRRK2 is genetically linked to diverse pathologies, including Parkinson's and Crohn's diseases.

GLOSSARY

Find out what HCN, CRISP, and SACO mean in the world of cell signaling.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

18 January issue: <http://scim.ag/stm011812>

RESEARCH ARTICLE: Skin Effector Memory T Cells Do Not Recirculate and Provide Immune Protection in Alemtuzumab-Treated CTCL Patients

R. A. Clark et al.

FOCUS: Immunology Taught By Humans

M. M. Davis

A therapeutic antibody depletes malignant T cells but spares skin resident effector memory T cells, treating L-CTCL without increased risk of infection.

RESEARCH ARTICLE: *Notch4* Normalization Reduces Blood Vessel Size in Arteriovenous Malformations

P. A. Murphy et al.

FOCUS: Arteriovenous Malformations in Five Dimensions

J. Kitajewski

Correction of Notch expression restores enlarged blood vessels to microvessels through EphB4-mediated reprogramming of arterial endothelial cells.

RESEARCH ARTICLE: Cigarette Smoke Induction of Osteopontin (SPP1) Mediates T_H17 Inflammation in Human and Experimental Emphysema

M. Shan et al.

The destruction of lung tissue in emphysema is orchestrated by antigen-presenting cells that have been activated by smoke.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Tooling Up: Forecasting the Fit

D. Jensen

Is your work style a match for your prospective boss?

http://scim.ag/TU_ForecastingFit

Genetic Engineering on Steroids

V. Venkatraman

Synthetic biologist Ron Weiss has moved from programming computers to programming cells.

<http://scim.ag/RonWeissProfile>

SCIENCEPODCAST

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On the 20 January *Science* Podcast: a Sun-grazing comet, protecting against the shiga toxin, the risks of experimental cancer therapies, and more.

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2012 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

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Science

335 (6066)

Science **335** (6066), 261-357.

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