NEWS

IN BRIEF
12 Roundup of the week's news

IN DEPTH
14 EGGS’ POWER PLANTS ENERGIZE NEW IVF DEBATE
Firm adding energy-generating mitochondria to egg cells has already produced human pregnancies
By J. Couzin-Frankel

15 A CHILD-KILLING TOXIN EMERGES FROM SHADOWS
Scientists link mystery deaths in India to consumption of lychees
By P. Pulla

17 ‘THE BLOB’ INVADES PACIFIC, FLUMMOXING CLIMATE EXPERTS
Persistent mass of warm water is reshuffling ocean currents, marine ecosystems, and inland weather
By E. Kintisch

18 HOAX-DETECTING SOFTWARE SPOTS FAKE PAPERS
Springer jumps into sham submissions arms race
By J. Bohannon

FEATURES
22 DEEPWATER HORIZON: AFTER THE OIL
Five years on, the world’s largest accidental marine spill has left subtle scars on the Gulf of Mexico
By W. Cornwall

27 Critics question plans to spray dispersant in future deep spills
By W. Cornwall

EDITION P. 11; BOOKS ET AL. P. 49; PODCAST

INSIGHTS

LETTERS
32 NEXTGEN VOICES

PERSPECTIVES
36 A PRUDENT PATH FORWARD FOR GENOMIC ENGINEERING AND GERMLINE GENE MODIFICATION
A framework for open discourse on the use of CRISPR-Cas9 technology to manipulate the human genome is urgently needed
By D. Baltimore et al.

38 DEFINING THE EPOCH WE LIVE IN
Is a formally designated “Anthropocene” a good idea?
By W. F. Ruddiman et al.

40 TRACKING ANTIWEAR FILM FORMATION
Atomic force microscopy visualizes the formation of a lubricating film
By U. D. Schwarz

41 MicroRNAs SILENCE THE NOISY GENOME
Evolution may have selected for a dampening service for genes whose noise may have otherwise been too high
By Y. Hoffman and Y. Pilpel

REPORT P. 128

REPORT P. 114

REPORT P. 136; CANCER IMMUNOLOGY AND IMMUNOTHERAPY SECTION P. 54

42 INFANTS EXPLORE THE UNEXPECTED
Infants are more likely to explore objects that behave in unexpected ways, such as passing through walls
By K. Kupferschmidt

44 HOW YOUNG STARS GROW AND BECOME FOCUSED
Recent experiences in confronting the Ebola epidemic suggest principles for vaccine efficacy trials in challenging environments
By M. Lipsitch et al.

45 MULTIPLYING CANCER IMMUNITY
A soluble ligand of an innate immunoreceptor arms natural killers for tumor attack
By A. Steinele and A. Cerwenka

46 EBOLA AND BEYOND
Recent experiences in confronting the Ebola epidemic suggest principles for vaccine efficacy trials in challenging environments
By M. Lipsitch et al.

BOOKS ET AL.

49 p53
By S. Armstrong, reviewed by A. Mandinova and S. W. Lee
CANCER IMMUNOLOGY AND IMMUNOTHERAPY SECTION P. 54

49 A SEA IN FLAMES
By C. Safina
EDITORIAL P. 11; NEWS STORY P. 22

51 CORNELIA PARKER
M. Griffiths, curator, reviewed by D. Dixon
VIDEO

DEPARTMENTS

11 EDITORIAL
A community for disaster science
By Marcia McNutt
NEWS STORY P. 22; BOOKS ET AL. P. 49; PODCAST

150 WORKING LIFE
A career is like a love affair
By Madeleine Jacobs

Science Staff..................................................8
New Products..................................................141
Science Careers..........................................142
Cancer Immunology and Immunotherapy

OUTLINE

INTRODUCTION
54 Realizing the promise

REVIEWS
56 The future of immune checkpoint therapy P. Sharma and J. P. Allison
62 Adoptive cell transfer as personalized immunotherapy for human cancer S. A. Rosenberg and N. P. Restifo
69 Neoantigens in cancer immunotherapy T. N. Schumacher and R. D. Schreiber
74 T cell exclusion, immune privilege, and the tumor microenvironment J. A. Joyce and D. T. Fearon
80 Cancer and the microbiota W. S. Garrett

ON THE COVER
Cancer immunotherapy harnesses the power of the immune system to kill tumors. These therapies aim to activate and expand T cells, such as those shown in blue, to specifically kill tumors (black). Current approaches include antibodies targeting inhibitory proteins on T cells, adoptive T cell therapy, and tumor vaccines, among others. See page 54. Illustration: Valerie Altounian/Science

SEE ALSO
» PERSPECTIVE P. 45
» BOOKS ET AL. P. 49
» REPORTS PP. 124 & 136
» REPORT BY B. M. CARRENO ET AL. 10.1126/science.aaa3828
» SCIENCE CAREERS STORY BY R. BERNSTEIN

IN BRIEF
87 From Science and other journals

RESEARCH ARTICLES
90 EPigenetics
Epigenetic inheritance uncoupled from sequence-specific recruitment K. Ragunathan et al.
Research Article Summary; For Full Text: dx.doi.org/10.1126/science.1258699
» Report P. 132

91 COGNITIVE DEVELOPMENT
Observing the unexpected enhances infants’ learning and exploration A. E. Stahl and L. Feigenson
» Perspective P. 42

95 RIBOSOME
The structure of the human mitochondrial ribosome A. Amunts et al.
» Research Article by B. J. Greber et al. 10.1126/science.aaa3872

99 MOLECULAR PHYSICS
Production of trilobite Rydberg molecule dimers with kilo-Debye permanent electric dipole moments D. Booth et al.

102 TRIBOLOGY
Mechanisms of antiewear tribofilm growth revealed in situ by single-asperity sliding contacts N. N. Goswami et al.
» Perspective P. 40

106 FRUSTRATED MAGNETISM
Large thermal Hall conductivity of neutral spin excitations in a frustrated quantum magnet M. Hirschberger et al.

109 THERMOELECTRICS
Dense dislocation arrays embedded in grain boundaries for high-performance bulk thermoelectrics S. I. Kim et al.

114 STELLAR PHYSICS
Observing the onset of outflow collimation in a massive protostar C. Carrasco-González et al.
» Perspective P. 44

117 VIROLOGY
Mutation rate and genotype variation of Ebola virus from Mali case sequences T. Hoener et al.

120 PLANT BIOLOGY
Suppression of endogenous gene silencing by bidirectional cytoplasmic RNA decay in Arabidopsis X. Zhang et al.

124 CANCER IMMUNOLOGY
Mutational landscape determines sensitivity to PD-1 blockade in non–small cell lung cancer N. A. Rizvi et al.
» Cancer Immunology and Immunotherapy Section P. 54

128 GENE EXPRESSION
MicroRNA control of protein expression noise J. M. Schniedel et al.
» Perspective P. 41

132 EPigenetics
Restricted epigenetic inheritance of H3K9 methylation P. N. C. B. Audergon et al.
» Research Article P. 90

136 ANITtUMOR IMMUNITY
A shed NKG2D ligand that promotes natural killer cell activation and tumor rejection W. Deng et al.
» Perspective P. 45; Cancer Immunology and Immunotherapy Section P. 54