

SPECIAL SECTION

Inflammation

INTRODUCTION

155 Inflammation's Yin-Yang

REVIEWS

156 Microglia: Scapegoat, Saboteur, or Something Else?
A. Aguzzi et al.

161 Leukocyte Behavior in Atherosclerosis, Myocardial Infarction, and Heart Failure
F. K. Swirski and M. Nahrendorf

166 Anti-Inflammatory Therapy in Chronic Disease: Challenges and Opportunities
I. Tabas and C. K. Glass
>> *Science Podcast*

172 Pleiotropic Actions of Insulin Resistance and Inflammation in Metabolic Homeostasis
J. I. Odegaard and A. Chawla

>> *Perspective p. 147; Report p. 218; and Science Signaling content at www.sciencemag.org/special/inflammation*

EDITORIAL

119 Funding Innovative Science
Anthony A. Hyman

NEWS OF THE WEEK

124 A roundup of the week's top stories

NEWS & ANALYSIS

127 Sequestration Takes Aim at Federal Science Spending

128 Climate Study Highlights Wedge Issue

130 Approval of Novel TB Drug Celebrated—With Restraint

131 Making a Selfish Generation by Fiat
>> *Science Express Report by L. Cameron et al.*

132 Author of Popular Blog That Charged Fraud Unmasked

NEWS FOCUS

133 The Children's Study: Unmet Promises

137 Expert Firms Play a Hidden Role in Connecting Science and Finance
An Expert's Words Can Move Markets
>> *Science Podcast*

LETTERS

140 Creating a Nobel Culture
J. S. Flier

Antarctic Treaty System Past Not Predictive
S. L. Chown

Sustaining China's Water Resources
H. Yang et al.

141 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

142 How Species Interact
R. Arditi and L. R. Ginzburg, reviewed by R. O. Peterson

143 The Nature–Nurture Debates
D. Goldhaber, reviewed by J. J. Bolhuis

POLICY FORUM

144 Regulation of Online Social Network Studies
R. B. Shapiro and P. N. Ossorio

PERSPECTIVES

146 How to Solve Protein Structures with an X-ray Laser
J. R. Hellmuth
>> *Report p. 227*

147 Improving Metabolism by Throwing Out All the JNK
A. W. Ferrante Jr.
>> *Inflammation section p. 155; Report p. 218*



page 133

148 When Metabolism and Epigenetics Converge
P. Sassone-Corsi
>> *Reports pp. 211 and 222*

150 Water-Responsive Polymer Composites on the Move
H. Kim and S. Kwon
>> *Report p. 186*

151 Specialized But Flexible
M. Knaden and B. S. Hansson
>> *Report p. 200*

152 Developmental Refining of Neuroglial Signaling?
A. Grosche and A. Reichenbach
>> *Report p. 197*

CONTENTS continued >>

Explore our rich online offerings, including multimedia, news, and our two research journals—*Science Signaling* and *Science Translational Medicine*—at www.sciencemag.org



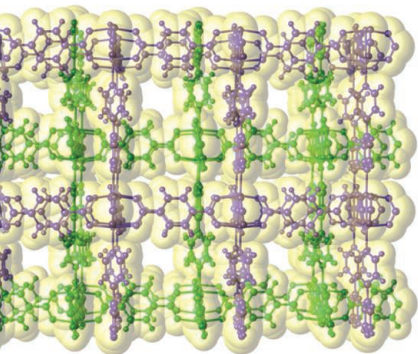
COVER

A yin-yang symbol superimposed on a scanning electron micrograph of a mouse tissue alveolar macrophage (diameter: ~18 micrometers). Macrophages are immune cells that mediate inflammation, but they often play protective roles as well. Several age-related chronic diseases—such as metabolic syndrome, cardiovascular disease, and neurodegenerative disease—have an inflammatory component. See the special section beginning on page 155.

Scanning electron microscope image: © Dennis Kunkel Microscopy, Inc.

DEPARTMENTS

- 117 This Week in *Science*
- 120 Editors' Choice
- 122 Science Staff
- 231 New Products
- 232 Science Careers



page 193



page 208

REPORTS

- 178** **Quantum Back-Action of an Individual Variable-Strength Measurement**
M. Hatridge et al.
 The evolution of a quantum system can be tracked via a series of partial measurements that leave the system in a pure state.
- 182** **Strong, Light, Multifunctional Fibers of Carbon Nanotubes with Ultrahigh Conductivity**
N. Behabtu et al.
 Exceptional carbon nanotube fibers are produced by a wet spinning process using longer nanotubes as feedstock.
- 186** **Bio-Inspired Polymer Composite Actuator and Generator Driven by Water Gradients**
M. Ma et al.
 Polymer actuators are manipulated by changing hydration conditions and show strong contractile forces.
 >> *Perspective p. 150*
- 189** **Sequence-Specific Peptide Synthesis by an Artificial Small-Molecule Machine**
B. Lewandowski et al.
 A macrocycle threaded on a rod can catalytically insert several amino acids placed along its path into a peptide chain.
- 193** **Shape-Memory Nanopores Induced in Coordination Frameworks by Crystal Downsizing**
Y. Sakata et al.
 A porous material retains its framework shape after guest molecules desorb if its crystallites are sufficiently small.
- 197** **Glutamate-Dependent Neuroglial Calcium Signaling Differs Between Young and Adult Brain**
W. Sun et al.
 The expression of metabotropic glutamate receptors in brain astrocytes is down-regulated in early postnatal development.
 >> *Perspective p. 152*
- 200** **Neural Basis of a Pollinator's Buffet: Olfactory Specialization and Learning in *Manduca sexta***
J. A. Riffell et al.
 Hawkmoths supplement their innate repertoire of attractive flower odors by learning new ones via an octopamine pathway.
 >> *Perspective p. 151*
- 204** ***Ezh2* Orchestrates Topographic Migration and Connectivity of Mouse Precerebellar Neurons**
T. Di Meglio et al.
 During brain development, epigenetic mechanisms allow tangentially migrating neurons to retain topographical organization.
- 208** **Multiple Fitness Peaks on the Adaptive Landscape Drive Adaptive Radiation in the Wild**
C. H. Martin and P. C. Wainwright
 Increased competition drives phenotypic adaptive specialization within *Cyprinodon* pupfishes in lakes in the Bahamas.
- 211** **Suppression of Oxidative Stress by β -Hydroxybutyrate, an Endogenous Histone Deacetylase Inhibitor**
T. Shimazu et al.
 Ketone bodies, metabolites that accumulate during fasting, change gene expression by inhibiting histone deacetylases.
 >> *Perspective p. 148*
- 215** **The COMPASS Subunit Spp1 Links Histone Methylation to Initiation of Meiotic Recombination**
L. Acquaviva et al.
 A protein involved in histone methylation targets the meiotic recombination machinery to chromatin.
- 218** **JNK Expression by Macrophages Promotes Obesity-Induced Insulin Resistance and Inflammation**
M. S. Han et al.
 A kinase in macrophages is required for high-fat diet-induced metabolic changes and inflammation.
 >> *Perspective p. 147; Inflammation section p. 155*
- 222** **Influence of Threonine Metabolism on S-Adenosylmethionine and Histone Methylation**
N. Shyh-Chang et al.
 Unusual threonine metabolism in mouse stem cells influences genetic reprogramming via altered histone methylation.
 >> *Perspective p. 148*
- 227** **Natively Inhibited *Trypanosoma brucei* Cathepsin B Structure Determined by Using an X-ray Laser**
L. Redecke et al.
 In vivo crystallization and serial femtosecond crystallography reveal the structure of a sleeping sickness parasite protease.
 >> *Perspective p. 146*

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 © 2013 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.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$30.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

Science

339 (6116)

Science **339** (6116), 117-231.

ARTICLE TOOLS

<http://science.sciencemag.org/content/339/6116>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2013 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.