

1114

Arthur was transferred to a chimp sanctuary last year.

NEWS

IN BRIEF

1104 News at a glance

IN DEPTH

1107 DESIGNERS SQUABBLE OVER GIANT CHINESE SCOPE

Influential optics team clashes with astronomers over plans for 12-meter telescope *By D. Normile*

1108 NIH ABANDONS GRANT CAP, OFFERS NEW HELP TO YOUNGER SCIENTISTS

After controversy, agency aims to build \$1 billion “next-generation” fund *By J. Kaiser*

1109 MINI-LIVERS REVEAL FINE DETAILS OF ORGAN DEVELOPMENT

3D structure arises in a dish as cell types interact to promote differentiation *By E. Pennisi*

1110 SPOOKY ACTION ACHIEVED AT RECORD DISTANCE

Entangled photons from Chinese satellite foreshadow space-based quantum network *By G. Popkin*

► RESEARCH ARTICLE P. 1140

1111 IN A MAJOR SHIFT, CANCER DRUGS GO ‘TISSUE-AGNOSTIC’

Encouraged by an FDA approval, companies design cancer drugs to work in any solid tumor *By K. Garber*

1112 SUPPLY OF PROMISING T CELL THERAPY IS STRAINED

Surging demand for modified immune cells causes some cancer trials to run short *By J. Couzin-Frankel*

FEATURES

1114 CHIMPS IN WAITING

Two years after biomedical research on chimpanzees ended, why have so few been retired to sanctuaries? *By D. Grimm*

INSIGHTS

PERSPECTIVES

1118 A COMPOSITE WINDOW INTO HUMAN HISTORY

Better integration of ancient DNA studies with archaeology promises deeper insights *By N. N. Johannsen et al.*

1120 GROWING ANISOTROPIC CRYSTALS AT THE NANOSCALE

Single-nanoparticle imaging and theoretical modeling can guide synthesis strategies *By L. M. Liz-Marzán and M. Grzelczak*

1122 GLYCOPHORIN ALLELES LINK TO MALARIA PROTECTION

Genome-wide association studies identify variants in the human glycophorin *ABE* locus *By E. A. Winzeler*

► RESEARCH ARTICLE P. 1139

1123 DECIPHERING MICROGLIAL DIVERSITY IN ALZHEIMER’S DISEASE

A subset of microglia appear primed to protect against AD neurodegeneration *By G. C. Brown and P. H. St George-Hyslop*

1124 SCALING PAIN THRESHOLD WITH MICRORNAs

Tuning pain with a defined microRNA cluster *By L. Cassels and Y.-A. Barde*

► REPORT P. 1168

1126 TRACKING THE DYNAMICS OF ELECTRON EXPULSION

Electron holography is used to map out the wave function of a photo-emitted electron *By C. Vozzi*

► REPORT P. 1150

POLICY FORUM

1127 LINKING JOB LOSS, INEQUALITY, MENTAL HEALTH, AND EDUCATION

Job destruction knocks many youth off the path to college *By E. O. Ananat et al.*

BOOKS ET AL.

1129 THERE’S MORE TO A MEAL

A psychologist probes the invisible influences that shape the dining experience *By J. Ubbink*

1130 UNLIKELY ALLIES

An environmental toxicologist advocates embracing microbes as partners in human and agricultural health *By D. Schar*

LETTERS

1131 INVEST IN INSECTS

By S. Pina and A. Hochkirch

1131 CHILE UNPREPARED FOR PH.D. INFLUX

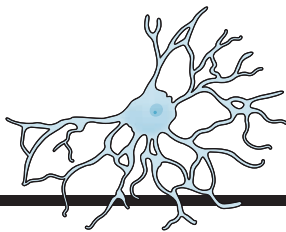
By N. S. Morales and I. C. Fernández

1132 NIH’S INEFFECTIVE FUNDING POLICIES

By W. P. Wahls

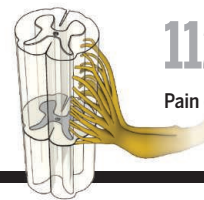
1133 TECHNICAL COMMENT ABSTRACTS

1133 ERRATA



1123

Are there good and bad microglia?



1124 & 1168

Pain control by microRNA

RESEARCH

IN BRIEF

1134 From *Science* and other journals

REVIEW

1137 MEMBRANES

Maximizing the right stuff: The trade-off between membrane permeability and selectivity *H. B. Park* et al.

REVIEW SUMMARY; FOR FULL TEXT: dx.doi.org/10.1126/science.aab0530

RESEARCH ARTICLES

1138 CELL ADHESION

Tubular clathrin/AP-2 lattices pinch collagen fibers to support 3D cell migration *N. Elkhatab* et al.

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT: dx.doi.org/10.1126/science.aal4713

1139 MALARIAL GENOMICS

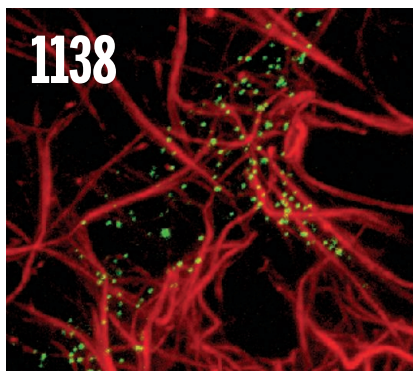
Resistance to malaria through structural variation of red blood cell invasion receptors *E. M. Leffler* et al.

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT: dx.doi.org/10.1126/science.aam6393
▶ PERSPECTIVE P. 1122

1140 QUANTUM OPTICS

Satellite-based entanglement distribution over 1200 kilometers *J. Yin* et al.

▶ NEWS P. 1110 ▶ VIDEO



1144 CHEMICAL ENGINEERING

Kilogram-scale prexasertib monolactate monohydrate synthesis under continuous-flow CGMP conditions

K. P. Cole et al.

REPORTS

1150 CHEMICAL PHYSICS

Coherent imaging of an attosecond electron wave packet *D. M. Villeneuve* et al.

▶ PERSPECTIVE P. 1126

1154 VOLCANOLOGY

Rapid cooling and cold storage in a silicic magma reservoir recorded in individual crystals *A. E. Rubin* et al.

▶ PODCAST

1157 GEOPHYSICS

Recurring and triggered slow-slip events near the trench at the Nankai Trough subduction megathrust *E. Araki* et al.

1161 GEOPHYSICS

Seasonal water storage, stress modulation, and California seismicity *C. W. Johnson* et al.

1164 LASER PHYSICS

Dual-comb spectroscopy of water vapor with a free-running semiconductor disk laser *S. M. Link* et al.

1168 PAIN REGULATION

miR-183 cluster scales mechanical pain sensitivity by regulating basal and neuropathic pain genes *C. Peng* et al.

▶ PERSPECTIVE P. 1124

PLANT SCIENCE

1172 Plants transfer lipids to sustain colonization by mutualistic mycorrhizal and parasitic fungi *Y. Jiang* et al.

1175 Fatty acids in arbuscular mycorrhizal fungi are synthesized by the host plant *L. H. Luginbuehl* et al.

1178 EVOLUTION

Increase in predator-prey size ratios throughout the Phanerozoic history of marine ecosystems

A. A. Klompmaker et al.

1180 CLIMATE CHANGE

Satellites reveal contrasting responses of regional climate to the widespread greening of Earth *G. Forzieri* et al.

1185 NEURODEVELOPMENT

Early life stress confers lifelong stress susceptibility in mice via ventral tegmental area OTX2 *C. J. Peña* et al.

1188 NUTRIENT SENSING

Transcriptional activation of RagD GTPase controls mTORC1 and promotes cancer growth *C. Di Malta* et al.

1193 MOLECULAR SEPARATION

Controlling guest conformation for efficient purification of butadiene *P.-Q. Liao* et al.

ON THE COVER



Artist's rendering of the quantum science satellite Micius, distributing two entangled photons to two locations separated by ~1200 kilometers on Earth. This approach is much more efficient

than direct transmission through optical fibers, thus opening up a new avenue for global-scale quantum networks and foundational quantum optics experiments in space. See pages 1110 and 1140. Illustration: C. Bickel/*Science*; Satellite model credit: Jian-Wei Pan

DEPARTMENTS

1103 EDITORIAL

Pittsburgh myth, Paris reality
By Patrick Gallagher

1202 WORKING LIFE

Drawing connections
By Jason McDermott

Science Staff	1102
New Products	1197
Science Careers	1198

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 © 2017 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): \$165 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$1659. Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$89. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #R1254 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: \$23.00 current issue, \$28.00 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 \$35.00 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

356 (6343)

Science **356** (6343), 1103-1202.

ARTICLE TOOLS

<http://science.sciencemag.org/content/356/6343>

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. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.