CONTENTS

6 OCTOBER 2017 • VOLUME 358 • ISSUE 6359

NEWS

IN BRIEF
14 News at a glance

IN DEPTH
17 TRIO SURFS GRAVITATIONAL WAVES TO NOBEL GLORY
Testy debate over who should win defused by potential laureate’s death
By A. Cho

18 REVELATIONS ABOUT RHYTHM OF LIFE REWARDED
In tight race, U.S. trio found genes controlling circadian clock in fruit flies
By E. Stokstad and G. Vogel

19 TREATY TESTED BY SPACE MINERS
Companies push the limits of 50-year-old Outer Space Treaty
By D. Clery

20 CHINA SPRINGS AHEAD IN CRISPR THERAPY RACE
Human trials are using the genome-editing technique to treat cancers and other conditions
By D. Normile

21 NEANDERTAL GENOME REVEALS GREATER LEGACY IN THE LIVING
DNA inherited from interbreeding may influence diseases
By A. Gibbons

22 SEISMIC ARRAY SHIFTS TO ALASKA
Mobile instruments offer improved earthquake monitoring
By J. Rosen

23 CATALAN SCIENTISTS PONDER FATE AFTER INDEPENDENCE VOTE
As a science hub, would the region do better on its own?
By T. Rabesandratana

FEATURES
24 AGAINST THE GRAIN
Known for helping protect old-growth trees from logging, forest scientist Jerry Franklin now wants to let the chainsaws loose in some forests
By W. Cornwall

28 ARCHAEOLOGY IN A DIVIDED LAND
Cyprus’s bitter political stalemate hampers studies of the world’s first farmers
By M. Gannon

INSIGHTS

LETTERS
34 NEXTGEN VOICES: PROMOTING HUMAN RIGHTS THROUGH SCIENCE

PERSPECTIVES
38 NERVE AGENTS IN HONEY
Analysis of local honey samples shows global landscape contamination by pesticides
By C. N. Connolly

39 THE PROTON RADIUS REVISITED
Hydrogen spectroscopy brings a surprise in the search for a solution to a long-standing puzzle
By W. Vassen

41 MICROBIAL CHANGE IN WARMING SOILS
Long-term reorganization of microbial communities leads to pulses in carbon release
By D. B. Metcalfe

42 NEUTROPHILS TAKE A ROUND-TRIP
Imaging sheds light on neutrophil dynamics in sterile inflammation
By H. Garner and K. E. de Visser

44 NOCEBO EFFECTS CAN MAKE YOU FEEL PAIN
Negative expectancies derived from features of commercial drugs elicit nocebo effects
By L. Colloca

ON THE COVER
Artist’s concept of examining a cell’s genetic “fingerprint.” Although we cannot actually see into individual cells via a magnifying glass, single-cell genomics offers the next best thing. In a quest to better understand ourselves, we aim to determine the distinct qualities of each cell, as well as intercellular relationships. This special issue focuses on the state of the field, highlighting technological progress and biological findings, especially those relevant to development, immunology, and neurobiology. See page 56. Illustration: Davide Bonazzi/@salzmanart

Special Section
Single-cell genomics

INTRODUCTION
56 A fantastic voyage in genomics
L. M. Zahn

REVIEWS
58 Single-cell transcriptomics to explore the immune system in health and disease
M. J. T. Stubbington et al.

64 The promise of spatial transcriptomics for neuroscience in the era of molecular cell typing
E. Lein et al.

69 Single-cell epigenomics: Recording the past and predicting the future
G. Kelsey et al.

SPECIAL SECTION
Single-cell genomics

sciencemag.org
6 OCTOBER 2107 • VOL 358 ISSUE 6359
Published by AAAS
45 THE MOLECULAR BASIS OF ALZHEIMER’S PLAQUES
An amyloid fibril structure provides insights into senile amyloid plaque architecture By S. Pospisch and S. Raunser

46 BROADLY NEUTRALIZING ANTIBODIES TO PREVENT HIV-1
Studies show the potential of synthetic and combinations of broadly neutralizing antibodies By M. S. Cohen and L. Corey

POLICY FORUM
49 DECRYPTING DUELING ANALYSES OF CLEAN WATER REGULATIONS
Hundreds of millions of dollars in benefits were discarded By K. J. Boyle et al.

BOOKS ET AL.
53 SURVIVAL OF THE SPINELESS
Fossils aren’t your forte? A charming tale of cephalopod evolution may change your mind By S. J. McAnulty

54 FUN AND GAMES
Blending fact and fiction, a mathematics professor aims to breathe new life into the history of game theory By C. J. Phillips

RESEARCH
IN BRIEF
76 From Science and other journals

RESEARCH ARTICLES
79 ATOMIC PHYSICS
The Rydberg constant and proton size from atomic hydrogen A. Beyer et al.

85 HIV THERAPY
Trispecific broadly neutralizing HIV antibodies mediate potent SHIV protection in macaques L. Xu et al.

REPORTS
90 OPTICAL CLOCKS
A Fermi-degenerate three-dimensional optical lattice clock S. L. Campbell et al.

94 LASER PHYSICS
Spatiotemporal mode-locking in multimode fiber lasers L. G. Wright et al.

97 METALLURGY
Segregation-induced ordered superstructures at general grain boundaries in a nickel-bismuth alloy Z. Yu et al.

101 GLOBAL CARBON CYCLE
Long-term pattern and magnitude of soil carbon feedback to the climate system in a warming world J. M. Melillo et al.

105 NEUROSCIENCE
Interactions between brain and spinal cord mediate value effects in nocebo hyperalgesia A. Tinnermann et al.

109 NEONICOTINOIDS
A worldwide survey of neonicotinoids in honey E. A. D. Mitchell et al.

111 IMMUNOLOGY
Visualizing the function and fate of neutrophils in sterile injury and repair J. Wang et al.

116 STRUCTURAL BIOLOGY
Fibril structure of amyloid-$\beta$(1–42) by cryo–electron microscopy L. Gremer et al.

119 TRANSCRIPTION
Mitotic transcription and waves of gene reactivation during mitotic exit K. C. Palozola et al.

DEPARTMENTS
11 EDITORIAL
U.S.-Iran science exchange By Glenn Schweitzer

142 WORKING LIFE
Hard data and human empathy By Darron Collins

Science Staff...............................8
New Products..............................123
Science Careers..........................124