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COVER
Bright-field light microscopy image of peritoneal cells, including a macrophage undergoing cell division (center cell, ~20 micrometers across), taken from mice treated with the cytokine interleukin-4. On page 1284, Jenkins et al. describe a mechanism of inflammation in response to parasitic nematode infection whereby macrophages expand in number through cell division rather than by recruitment from the blood.

Photo: Stephen Jenkins, University of Edinburgh, UK

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REVIEW

Terrestrial Ecosystem Responses to Species Gains and Losses
D. A. Wardle et al.

RESEARCH ARTICLES

Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation
D. Karlan and J. Zinman
A randomized controlled trial reveals both expected and surprising effects of microcredit.
>> Perspective p. 1271; Science Podcast

Local Macrophage Proliferation, Rather than Recruitment from the Blood, Is a Signature of \( T_2 \) Inflammation
S. J. Jenkins et al.
Proliferation in situ, rather than immune cell recruitment, drives macrophage expansion in response to parasitic infection.
>> Perspective p. 1268

REPORTS

Real-Time Dynamics of Quantized Vortices in a Unitary Fermi Superfluid
A. Bulgac et al.
A generalized theoretical approach is developed to describe the dynamics and phase transitions of Fermi superfluids.

Transformation Optics Using Graphene
A. Vakil and N. Engheta
Simulations show that control of the conductivity of a region within a graphene sheet could guide optical waves.

Wafer-Scale Graphene Integrated Circuit
Y.-M. Lin et al.
Components such as inductors were fabricated alongside graphene transistors to create integrated radio-frequency mixers.

Endotoxin-Induced Structural Transformations in Liquid Crystalline Droplets
I.-H. Lin et al.
Bacterial lipid A was detected by its interactions with defects in droplet-confined liquid crystals.

Methylhydroxycarbene: Tunneling Control of a Chemical Reaction
P. R. Schreiner et al.
Quantum tunneling induces the opposite outcome expected from traditional kinetic factors in a chemical rearrangement.
>> Perspective p. 1269

Origin and Evolution of Prebiotic Organic Matter As Inferred from the Tagish Lake Meteorite
C. D. K. Herd et al.
The study of organic matter in a well-preserved meteorite provides insight into processes that affected its parent asteroids.

Activation of Visual Pigments by Light and Heat
D.-G. Luo et al.
Thermal activation of visual pigments involves the same chromophore-isomerization reaction as does light activation.

A DNA Damage Response Screen Identifies RHINO, a 9-1-1 and TopBP1 Interacting Protein Required for ATR Signaling
C. Cotta-Ramusino et al.
A screen identifies proteins not previously known to function in protecting cells from DNA damage.

The mTOR-Regulated Phosphoproteome Reveals a Mechanism of mTORC1-Mediated Inhibition of Growth Factor Signaling
P. P. Hsu et al.
A search for substrates of a growth-promoting kinase revealed a regulatory feedback loop involved in tumor suppression.
>> Perspective p. 1270

Adaptation and Evolutionary Rescue in Metapopulations Experiencing Environmental Deterioration
G. Bell and A. Gonzalez
Dispersal and previous exposure to stress help yeast adapt to highly stressful environments.

Nicotine Decreases Food Intake Through Activation of POMC Neurons
Y. S. Mineur et al.
Nicotine decreases weight gain by targeting a brain pathway involved in the regulation of energy balance and food intake.
The breast cancer drug lapatinib increases the sensitivity of colon cancer cells to apoptosis through a HER2- and EGFR-independent mechanism.

**RESEARCH ARTICLE: Off-Target Lapatinib Activity Sensitizes Colon Cancer Cells Through TRAIL Death Receptor Up-Regulation**

N. G. Dolloff et al.  

The breast cancer drug lapatinib increases the sensitivity of colon cancer cells to apoptosis through a HER2- and EGFR-independent mechanism.

**PERSPECTIVE: Breaking Barriers—A New Take on Sepsis Pathogenesis**

N. M. Goldenberg et al.  

Loss of the endothelial barrier and subsequent leakiness in the microvasculature might be key determinants of the pathogenesis of sepsis.

**RESEARCH ARTICLE: Protein Interaction Reveals Converging Molecular Pathways Among Autism Disorders**

Y. Sakai et al.  

An autism protein interaction network provides a framework for studying autism pathogenesis.

**PERSPECTIVE: Beyond the Balance of Activator and Repressor**

T. Whittington et al.  

Transcription factor binding site affinity has a counterintuitive effect on the regulation of gene expression in response to Hedgehog.

**RESEARCH ARTICLE: The cis-Regulatory Logic of Hedgehog Gradient Responses—Key Roles for Gli Binding Affinity, Competition, and Cooperativity**

D. S. Parker et al.  

The spatial extent of the growing hedgehog zone, which are uninhabitable by many marine organisms, is very sensitive to oxygen content.

**Climate-Forced Variability of Ocean Hypoxia**

C. Deutsch et al.  

The spatial extent of ocean hypoxic zones, which are uninhabitable by many marine organisms, is very sensitive to oxygen content.

** Palladium-Catalyzed Aerobic Dehydrogenation of Substituted Cyclohexanones to Phenols**

Y. Izawa et al.  

Phenol derivatives are prepared from nonaromatic ring compounds that can bear a wide variety of substituents.

**A Growing Body of Research and Experience Suggests Presenting Your Work Effectively is an Important Part of a Scientific Career, but Dealing with the Anxiety It Provokes is Rarely Taught.**

I. S. Levine  

Presenting your work effectively is an important part of a scientific career, but dealing with the anxiety it provokes is rarely taught.