A pregnant female tsetse fly (Glossina morsitans), roughly equivalent in size to a housefly. Tsetse flies are the sole carriers of human African trypanosomiasis (sleeping sickness). See pages 349 and 380 for a description of the sequencing and annotation of the tsetse fly genome.

Photo: Geoffrey M. Attardo, Yale School of Public Health
RESEARCH ARTICLES

376 Cryo-EM Study of the Chromatin Fiber Reveals a Double Helix Twisted by Tetranucleosomal Units
F. Song et al.
The structure of a segment of chromatin reveals the importance of the linker histone in determining its conformation.
>> Perspective p. 370

380 Genome Sequence of the Tsetse Fly (Glossina morsitans): Vector of African Trypanosomiasis
International Glossina Genome Initiative
Blood-sucking tsetses transmit protozoan parasites, harbor multiple symbionts, reproduce viviparously, and lactate.
>> News story p. 349

386 Discovery of Brainwide Neural-Behavioral Maps via Multiscale Unsupervised Structure Learning
J. T. Vogelstein et al.
An atlas is generated to reveal activation of which specific neurons in a Drosophila larva produce specific behaviors.
>> Perspective p. 372

REPORTS

392 A Dual-Catalysis Approach to Enantioselective [2 + 2] Photocycloadditions Using Visible Light
J. Du et al.
A two-catalyst combination offers long-sought selectivity in intermolecular coupling of olefins to form four-membered rings.
>> Perspective p. 368

396 Detection of the Gravitational Lens Magnifying a Type Ia Supernova
R. M. Quimby et al.
An unusually bright supernova faded away to reveal a foreground galaxy responsible for bending and amplifying its light.
>> Perspective p. 366

400 The Lunar Apatite Paradox
J. W. Boyce et al.
Hydrogen-rich apatite crystals in lunar volcanic rocks indicate self-inflicted loss of fluorine from basaltic melts.
>> Perspective p. 365

402 Preservation of a Preglacial Landscape Under the Center of the Greenland Ice Sheet
P. R. Bierman et al.
Soil has been frozen to the central part of the bed of the Greenland Ice Sheet for at least 2.7 million years.

406 Organic Matter Stoichiometry, Flux, and Oxygen Control Nitrogen Loss in the Ocean
A. R. Babbin et al.
The variable ratio of denitrification to ammonox in the ocean is due to variations in organic matter quality and quantity.

409 Conversion of Channelrhodopsin into a Light-Gated Chloride Channel
J. Wietek et al.
A class of directly light-gated anion channels can be used to block neuronal output in a fully reversible fashion.
>> Perspective p. 369; Report p. 420

413 High-Resolution Genomic Analysis of Human Mitochondrial RNA Sequence Variation
A. Hodgkinson et al.
Mitochondrial posttranscriptional variation is common among humans and can be attributed to a nuclear gene.

416 Structure-Guided Transformation of Channelrhodopsin into a Light-Activated Chloride Channel
A. Berndt et al.
A class of directly light-gated anion channels can be used to block neuronal output in a fully reversible fashion.
>> Perspective p. 369; Report p. 409

420 Neural Mechanisms of Object-Based Attention
D. Baldauf and R. Desimone
Brain imaging reveals how the brain can selectively attend to one of two overlapping objects.

424 Single-Cell Genomics Reveals Hundreds of Coexisting Subpopulations in Wild Prochlorococcus
N. Kashtan et al.
Covariation between the core alleles and flexible gene content of a marine cyanobacterium underpins vast diversity.

427 A Chloroplast Retrograde Signal Regulates Nuclear Alternative Splicing
E. Petrioli et al.
In plants, light-dependent regulation of nuclear alternative splicing involves a signal generated within the chloroplast.