Artist’s conception of the complex network of relationships between disease and the human genome. Hundreds of diseases and traits (represented by colored dots) have been mapped to specific chromosomal positions in the genome. Most disease-associated genetic variants fall outside of protein-coding genes, instead affecting the genome’s regulatory circuitry by modifying the DNA “switches” (some of which are depicted here as gray triangles, many others not shown) that control gene activity. See page 1190.

Image: Rachael Ludwig and John Stamatoyannopoulos
REVIEW
1186 How Cells Know the Size of Their Organelles
Y.-H. M. Chan and W. F. Marshall

RESEARCH ARTICLE
1190 Systematic Localization of Common Disease-Associated Variation in Regulatory DNA
M. T. Maurano et al.
Genetic variants that have been associated with diseases are concentrated in regulatory regions of the genome.
>> News story p. 1159; Perspective p. 1179; Science Podcast

REPORTS
1196 Unconventional Sequence of Fractional Quantum Hall States in Suspended Graphene
B. E. Feldman et al.
A scanning single-electron transistor is used to measure the local compressibility of graphene's electronic states.
1200 Electron Small Polarons and Their Mobility in Iron (Oxyhydr)oxide Nanoparticles
J. E. Katz et al.
X-ray spectroscopy highlights the influence of local structure on electron transport in iron minerals.
1203 Photo-Tautomerization of Acetaldehyde to Vinyl Alcohol: A Potential Route to Tropospheric Acids
D. U. Andrews et al.
Enol tautomers may play a bigger role in atmospheric chemistry than previously suspected.
1207 Direct Mapping of Nuclear Shell Effects in the Heaviest Elements
E. Minaya Ramirez et al.
Highly precise mass measurements of nobelium and lawrencium isotopes provide insight into superheavy element stability.
>> Perspective p. 1183
1210 Evidence for NOx Control over Nighttime SOA Formation
A. W. Rollins et al.
The growth of particulate organic nitrates can account for much of the nighttime increase in organic aerosol mass.
1212 Predatory Fish Select for Coordinated Collective Motion in Virtual Prey
C. C. Ioannou et al.
Computer-generated prey evolve coordinated group behaviors when attacked by bluegill sunfish.
>> Perspective p. 1181
1215 Molecular Mechanics of Cardiac Myosin-Binding Protein C in Native Thick Filaments
M. J. Previs et al.
A myosin thick filament–associated sarcomeric protein modulates cardiac contractility in a phosphorylation-dependent manner.
>> Perspective p. 1182
1218 Conformational Control of the Ste5 Scaffold Protein Insulates Against MAP Kinase Misactivation
J. G. Zalatan et al.
A scaffold protein controls signal transmission by using an auto-inhibitory domain as a gate.
>> Perspective p. 1178
1222 Rad51 Is an Accessory Factor for Dmc1-Mediated Joint Molecule Formation During Meiosis
V. Cloud et al.
Duplication of a central protein in mitosis facilitated the evolution of a highly related protein required for meiosis.
1225 The Molecular Mechanism of Thermal Noise in Rod Photoreceptors
S. Gozem et al.
In rhodopsin, the transition state for thermal activation has the same electronic structure as that for photoexcitation.
1228 Ecological Populations of Bacteria Act as Socially Cohesive Units of Antibiotic Production and Resistance
O. X. Cordero et al.
Natural antibiotics enforce competition between, rather than within, bacterial populations.
>> Perspective p. 1184
1231 Transforming Fusions of FGFR and TACC Genes in Human Glioblastoma
D. Singh et al.
A fusion gene detected in a small subset of human brain tumors encodes a potentially druggable target.

CONTENTS continued >>
A new study finds that the shape of beer glasses can influence the perception of taste.