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
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1186 How Cells Know the Size of Their Organelles
Y.-H. M. Chan and W. F. Marshall

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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

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1200 Electron Small Polarons and Their Mobility in Iron (Oxyhydr)oxide Nanoparticles
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1222 Rad51 Is an Accessory Factor for Dmc1-Mediated Joint Molecule Formation During Meiosis
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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.
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1231 Transforming Fusions of FGFR and TACC Genes in Human Glioblastoma
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A fusion gene detected in a small subset of human brain tumors encodes a potentially druggable target.
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Genetic variants that have been associated with diseases are concentrated in regulatory regions of the genome. 10.1126/science.1222794

A GPS for Navigating DNA E. Schadt and R. Chang
10.1126/science.1227739

Evidence of Abundant Purifying Selection in Humans for Recently Acquired Regulatory Functions L. D. Ward and M. Kellis
Diversity in human-specific regions of the genome has been reduced by functional constraints. 10.1126/science.1225057

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Repair of the intestinal epithelium requires both cell proliferation and replacement of crypt stem cells. 10.1126/science.1223821

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When the balance of branched-chain amino acids transported into the brain goes awry, neurological deficits can ensue. 10.1126/science.1224631

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Response to Comment on “Orthographic Processing in Baboons (Papio papio)’ J. Grainger et al.
Full text at www.sciencemag.org/cgi/content/full/337/6099/1173-c

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Unlike related proteins, FAM123A interacts with microtubule-associated proteins and alters microtubule dynamics.

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An ATP-binding allosteric site could be pharmacologically targeted to alter the activity of membrane guanylyl cyclases.

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An intravaginal ring loaded with the NNRTI MIV-150 prevents transmission of the HIV/SIV chimera SHIV-RT in macaques.

FOCUS: Regulatory Science Innovation—A Rate-Limiting Step in Translation N. S. Song and J. Barris
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