A biodegradable integrated circuit (length: ~2.54 centimeters) shown partially dissolved by a droplet of water. This demonstration system includes transistors; diodes; inductors and capacitors, with magnesium for the electrodes/interconnects; magnesium oxide for the gate/interlayer dielectrics; silicon nanomembranes for the semiconductor; and silk as a thin, flexible substrate. The dissolution characteristics can be tuned to address applications such as bioreabsorbable implants, biodegradable environmental monitors, and compostable consumer electronics. See page 1640.

Image: Beckman Institute, University of Illinois, and Tufts University
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1628 Next-Generation Digital Information Storage in DNA
G. M. Church et al.
Digital information can be stored in DNA at densities higher than digital media such as flash memory or quantum holography.

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Precipitation source regions for western North America changed substantially over the last deglaciation.

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Y. Zhen et al.
Parallel mutations in the alpha subunit of the sodium pump allow insects to specialize on host plants that produce ouabain.

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J. R. Kuhn et al.
Observations with NASA’s Solar Dynamics Observatory show that the shape of the Sun does not vary with the 11-year solar cycle.

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A gold catalyst can link together aromatic rings under very mild conditions.

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S. D. Pike et al.
Hydrogenation of a crystalline precursor enables structural characterization of a commonly evoked reaction intermediate.

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J. A. Lesku et al.
Male pectoral sandpipers go without sleep for days in order to mate as often as possible in the high Arctic.

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A few changes made the fly Drosophila pachea reliant on the steroid precursors produced by the senita cactus.

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S.-S. Chng et al.
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R. Venditti et al.
Sedlin, the product of the gene mutated in spondyloepiphyseal dysplasia tarda, acts to expand cargo containers to fit bulky procollagen.

1672 Radical SAM-Dependent Carbon Insertion into the Nitrogenase M-Cluster
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The carbon atom in the middle of a large metal cluster originates from the one-carbon donor S-adenosylmethionine.

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Diversity in human-specific regions of the genome has been reduced by functional constraints.

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L. Senovilla et al.
Polypliod cancer cells trigger an immune response owing to proteins aberrantly exposed on their outer surfaces.

1684 Mycobacterial Disease and Impaired IFN-γ Immunity in Humans with Inherited ISG15 Deficiency
D. Bogunovic et al.
A mutation that accounts for adverse reactions to the Bacille Calmette-Guérin vaccine against tuberculosis is identified.
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Comment and Response on "The Geometric Structure of the Brain Fiber Pathways"
Comment: M. Catani
http://dx.doi.org/10.1126.science.1223425
Response: V. J. Wedeen
http://dx.doi.org/10.1126.science.1223493

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Trafficking of activated receptors controls the transcriptional response to epidermal growth factor.

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L. Ottoboni et al.
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R. S. Smith et al.
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Pharmacogenomics research points to a personalized approach for prescribing and dosing medications.

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Infection-reducing biomaterials must balance host tissue integration and prevention of microbial attachment.

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