



POLITICAL SCIENCE

Inducing potential voters to go the polls

A key challenge for any political campaign is to get its voters to actually vote. Field experiments have demonstrated that canvassing and phone calls are more effective than direct mail; all of these interventions increase voter participation by 0.5 to as much as 3 percentage points. With this in mind, Gerber *et al.* have reexamined an intervention based on the theory that nouns describe more stable attributes than verbs; for instance, "I am a Republican" versus "I vote for Republicans." They find, using 11,000 voters across three U.S. states, no difference between "noun" and "verb" phone calls and that neither message is as effective as referring to social norms in getting voters to the polls. — GJC

Proc. Natl. Acad. Sci. U.S.A. **113**, 10.1073/pnas.1513727113 (2016).

true-false reasoning task, either with advanced mathematical statements or with general knowledge statements. There were clear behavioral and brain-imaging differences between the two groups. Expert mathematical reasoning was underpinned by a brain network that is also used in basic quantity and number processing. This math-specific network was clearly distinct from the canonical language network. — PRS

Proc. Natl. Acad. Sci. U.S.A. **113**, 4909 (2016).

of highly inflammatory lipid mediators. Swollen nuclei of permeabilized or swollen cells attracted leukocytes in vivo. Cell swelling induced nuclear swelling, which caused an enzyme in the inner nuclear membrane to release proinflammatory lipids. Restriction of nuclear swelling

by actin filaments could limit this response. Thus, the nucleus plays an unexpected mechanosensory function to sense cell swelling and lysis and activate inflammatory signaling. — SMH

Cell **165**, 1160 (2016).

EDUCATION

On the origin of the achievement gap

Implicit bias is well documented in education, although specific examples and underlying causes are less understood. To learn more about teacher biases, Gershenson *et al.* used a student fixed-effects strategy to examine the formation of public school teachers' expectations of student educational attainment. Using representative U.S. survey data that contain two teachers' expectations for each student, the effect of student-teacher demographic mismatch was examined. Analysis showed that nonblack teachers have significantly lower educational expectations for black students than do black teachers. These results are the starting point for many additional, and necessary, research projects on this type of bias: How does it form, how can it be eliminated, and what are the long-term effects of its persistence? — MM

Econ. Edu. Rev. 10.1016/j.econedurev.2016.03.002 (2016).

BIOFUELS

Induction is the key to production

The enzymatic conversion of lignocellulose to glucose is a bottleneck in the biological production of ethanol. Inducing the synthesis of active cellulytic enzymes is critical for enhancing the conversion efficiency of a bioreactor. Li *et al.* developed a method to stimulate the production of high amounts of cellulase in the fungus *Trichoderma reesei*. The most effective inducer was a sugar mixture synthesized from glucose, which contains sophorose. Batch feeding of the mixture resulted in high cellulase production at levels three to five times higher than previously measured. Adding pretreated corn stover to the reactor resulted in high yields of glucose and of conversion to ethanol. — NW

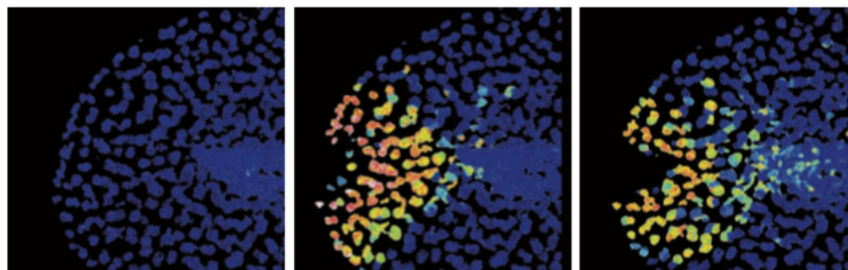
Bioresour. Technol. **216**, 503 (2016).

NEURODEVELOPMENT

Neural tube on a chip

The information that converts an unruly mob of stem cells into an organized, structured tissue, such as the neural tube, includes diffusible factors and three-dimensional constraints. Demers *et al.* have now constructed a microfluidics device

to deliver morphogens at the right time, right place, and in the right sequence for a simplified, experimentally accessible recapitulation of the normal developmental milieu. In this device, mouse stem cells



CELL BIOLOGY