**SCIENCE**

**ISO**

have fluorescently tagged a num-

ber of proteins from the kinetochore (the molecular machine that links the chromosomes to the spindle in dividing cells and thus ensures their proper segregation) and find that they segregate asymmetrically at the first meiotic division, forming the haploid spore, and also in subsequent divisions, so that they are preferentially retained in the mother cell lineage derived from the spore. These same proteins are symmetrically distributed between other dividing "cell types," and other proteins that are not part of the kinetochore do not show a similar asymmetry. The unequal segregation of the kinetochores may allow for the non-random segregation of sister chromatids, which would thereby maintain an "immortal" DNA strand, or of the centromeric DNA to which the kinetochores bind, which could drive the evolution of the centromeres. — GR


**PHYSICS**

**Colliding Light Beams**

Under normal conditions, photons don’t interact with each other very much. For instance, the light beams from two laser pointers pass through each other without trouble. Ramping up the power of the beams, however, changes that somewhat standoffish behavior. High-powered-laser beams can form self-focusing filaments in air that propagate without dispersion. These light bullets or light sabers are finding use in a diverse range of applications from triggering lightning to remote spectroscopic sampling. Finding ways of controlling propagation on the wing rather than tinkering with the laser on the ground would offer much more flexibility. Bernstein et al. take two high-powered laser beams and collide them. Rather than passing through each other unscathed, the beams couple and exchange energy, up to 7%, with one beam amplifying the other at its own expense. Being able to tune the output of the collision in terms of the energy and frequency distribution of the modified light pulses should provide a powerful and flexible method for remote sensing applications. — ISO

**A Store Manager**

Cells stockpile nutrients and metabolites in storage compartments that can be raided when environmental conditions change. Lipid droplets are dynamic cellular caches of neutral lipids, such as triacylglycerol, which can be used as high-energy reserves, signaling molecules, and membrane building blocks. On the other hand, lipid droplets have been implicated in devastating metabolic diseases, such as diabetes and atherosclerosis, and are found in almost all cells from yeast to mammals. Nevertheless, relatively little is known about how they are formed.

Eastman et al. have established that the protein SPG20 (also known as spartin) regulates lipid droplet formation. Using cultured human cells, they found that SPG20 localized to lipid droplets and interacted with the lipid droplet–associated protein TIP47. SPG20 localization was regulated by WWP1, a member of the HECT-ubiquitin ligase family that modulates diverse cellular functions by tagging proteins with ubiquitin. Further, mutations in SPG20 have been linked to the rare neurological disease Troyer syndrome, which is characterized by muscle spasticity and limb paralysis; a disease-associated SPG20 mutant did not localize to lipid droplets. — HP*

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Colliding Light Beams
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