This Week in Science

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In this week's *Science*, a pair of Broad Institute scientists describes two new CRISPR-based methods for recording cellular events in bacteria and mammalian cells. Using base editors and Cas9 nucleases, the so-called CAMERA — short for CRISPR-mediated analog multi-event recording apparatus — systems record signal amplitude or duration as changes in the ratio of mutually exclusive DNA sequences or as single-base modifications, respectively. The researchers used the technology to record multiple stimuli in bacteria or mammalian cells — including exposure to antibiotics, nutrients, viruses, light, and Wnt signaling — show that they can make recordings with as few as 10 to 100 cells. "We envision CAMERA being used for applications such as recording the presence of low-abundance extracellular and intracellular signals, mapping the lineage of specific cell types, and constructing complex cell-state maps," the authors write.

Also in *Science*, two separate research groups publish reports demonstrating that different CRISPR enzymes can be used to detect pathogen-associated nucleic acids, pointing to their diagnostic potential. In the first study, a University of California, Berkeley-led team showed that the Cas-12a enzyme could selectively cleave single-stranded DNA, but only after target binding. Taking advantage of this attribute, they created a platform called DETECTR — or DNA endonuclease targeted CRISPR trans reporter — that could rapidly and selectively detect human papillomavirus in patient samples. In the second study, a team led by Broad Institute scientists used Cas-13, Cas-12a, and Csm6 enzymes to improve an earlier nucleic acid platform they developed called SHERLOCK — short for specific high sensitivity enzymatic reporter. With their new system, the researchers were able to detect dengue or Zika virus, as well as cancer mutations, in cell-free DNA obtained from liquid patient samples.

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