

DNA engineered as 'hard drives' for information storage

A new DNA-based recorder allows bioengineers to create cell cultures that detect information in their environment and store it for later use. Such 'designer' cells might in the future be used to monitor water quality in a village, or measure the amount of sugar a person eats. The technique is described this week in *Science*.

In [synthetic biology](#), genes are engineered to regulate each other's expression in such a way that they can perform logic operations similar to those in computer circuits. Memory storage has long been considered one of the key components needed to fulfill the promise of this technology.

"Building gene circuits requires not only computation and logic, but a way to store that information," says bioengineer Timothy Lu of the Massachusetts Institute of Technology in Cambridge. "DNA provides a very stable form of memory and will allow us to do more complex computing tasks."

In previous synthetic-biology attempts, data storage has been laborious to create. It also recorded only the presence or absence of one particular sensory input, and could be used only for limited applications. In the latest paper, Lu and his colleague Fahim Farzadfard describe how they can record many types of data simultaneously, and can register the accumulation of the input over time, like a car's odometer counts kilometres. The stored information can then be read out by sequencing the DNA. They dub their method SCRIBE, for Synthetic Cellular Recorders Integrating Biological Events.

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