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DNA Makes Nano Barcode

Technology Research News June 27, 2003

To keep Moore's Law going—the tenet that computer speed will roughly double every 18 months—manufacturers must make faster circuits, and that usually means making them smaller. If an electronic signal has less distance to travel, it will make the trip more quickly.

But as the components that make up electronic devices grow smaller it is becoming increasingly difficult for manufacturers to assemble them using traditional lithography methods, which use light and chemicals to etch materials into shape.

Another tack is assembling materials from the bottom-up, molecule-by-molecule.

Duke University researchers have moved the bottom-up method a step forward by programming strands of synthetic DNA to self-assemble into a structure that makes the pattern encoded in a DNA strand readable by microscope.

Key to the method was coaxing columns of looped and non-looped strands of DNA stack into a barcode-like lattice. The researchers' prototype five-bit barcode was 75 nanometers long—about the span of 750 hydrogen atoms.

The method could eventually be used to make templates that will enable molecule-by-molecule construction of electronic circuits.

The method could be ready for practical use in 5 to 8 years, according to the researchers. The work appeared in the June 23, 2003 Proceedings of the National Academy of Sciences.

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