A chemical 'keypad lock' for biomolecular computers

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Researchers in New York are reporting an advance toward a new generation of ultra-powerful computers built from DNA and enzymes, rather than transistors, silicon chips, and plastic. Their report on development of a key component for these “biomolecular computers” is scheduled for the March 26 issue of ACS’ Journal of the *American Chemical Society*.

In the new study, Evgeny Katz and colleagues describe development of a chemical “keypad lock,” one of the first chemical-based security systems of its kind. The researchers note that years of effort have gone into developing biomolecular computers, which rely on chemical reactions rather than silicon chips to perform logic functions.

Among their uses would be encryption of financial, military, and other confidential information. Only individuals with access to a secret “key” — a chemical key — could unlock the file and access the data.

The research by Katz and colleagues solved one part of this technological challenge: The security code. They identified a series of naturally occurring chemical reactions that act as a “keypad lock.” In laboratory studies, they demonstrated that by adding the correct series of chemicals, the lock could be opened to access the computer. On the other hand, adding the incorrect chemicals to the system acts as a wrong password and prevents access to the computer, they say.

“In addition to the biomolecular security applications, the enzyme-based

implication logic networks will be extremely important for making autonomous decisions on the use of specific tools/drugs in various implantable medical systems."

Source: ACS