Abstract Submitted
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DNA guided nickel ion chain memristive system development and characterization[1] CHIA-CHING CHANG, HSUEH-LIANG CHU, Department of Biological Science and Technology, National Chiao Tung University, WEN-BIN JIAN, YU-CHANG CHEN, Department of Electrophysics, National Chiao Tung University — DNA is a nanowire in nature with multiple base-pairs. Ni ions were chelated and aligned in base-pairs of DNA and created a DNA guided Ni ion chain (Ni-DNA). Herein, we demonstrate that Ni-DNA exhibits a programmable multi-state memristive system with an added capacitive component. Each Ni ion in Ni-DNA has low and high oxidation state and can be programmed sequentially by applying different polarities and writing time of bias voltage. Therefore, multi-state information can be written, read, and erased on this DNA memristive system. Thus, this Ni-DNA conducting nanowire can be used in combination with other two-terminal devices for a variety of applications in memory as well as n-nary computing. This study also indicates the biomolecules-based self-organized nanostructure can be used as a template for nanodevices fabrication.

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