# Convert genetic material to conducting nanowire devices

Chia-Ching Chang
Professor and Chairman
Department of Biological Science and Technology, Chiao Tung University, Hsinchu, Taiwan
Research Fellow, Institute of Physics, Academia Sinica, Taipei, Taiwan

DNA is a self-assembled dimeric molecule which storage the genetic information of cell. The metal ions can be chelated and aligned by the base-pairs of DNA. Therefore, a DNA template guided nickel ions chain (Ni-DNA) is fabricated. Redox state of each nickel ion in Ni-DNA can be programmed by applying different polarities and writing time of bias voltages. Therefore, multi-state information can be written, read, and erased on this Ni-DNA memristive and memcapacitive system. Thus, this Ni-DNA conducting nanowire can be used as memelemet for memory computing.

## Personal Statement:

Professor Chia-Ching Chang is a Biological Physicist. Professor Chang studied physics at National Tsing Hua University (NTHU), in Hsinchu, Taiwan. After finishing his study, he started his Ph.D. in molecular biophysics at Institute of Life Science, NTHU, Taiwan, 1992. In 1997, he was awarded visiting scholarship of MOE, Taiwan and visited Department of Biology, Johns Hopkins University, as pre-doctoral fellow. In 1998, he finished his Ph.D. and became postdoctoral fellow in Institute of Zoology, Academia Sinica. In 2000, Dr. Chang accepted the assistance professorship in Department of Physics, National Dong Hwa University, Taiwan. In 2004, Dr. Chang promoted to Associate Professor of Physics. In 2008, Dr. Chang promoted to full Professor in Department of Biological Science and Technology, National Chiao Tung University (NCTU). In 2009, Dr. Chang was co-appointed as Research Fellow by Institute of Physics, Academia Sinica. In 2010 Dr. Chang was invited to be the visiting professor in Department of Biochemistry, Microbiology and Immunology, University Ottawa. In 2014, Dr. Chang was appointed as Associate Vice President for international Affairs, NCTU from 2014 to 2016. In 2014, NCTU got the Excellent Performance Award of “The Internationalization Quality Inspection of the Universities” by Ministry of Education, Taiwan. Currently, Dr. Chang is the Chairman of Dept Biol. Sci & Tech., NCTU. The research topics of Dr. Chang include: Soft condense matter and Biological physics; biomaterials synthesis and characterization for protein folding and mechanism study, bio-nanotechnology application and new functional bio-nano-material development and biophotonics.