

## Nanobioelectronic Chip for Electronics and Diagnosis

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The basic principles in the development of new functional devices can be inspired from the biological systems such as molecular recognition, electron transfer chain, or photosynthetic reaction center. By mimicking the organization of the functional molecules in the biological system, biodevices can be fabricated artificially. The nanoscale fabrication technology of biomolecules can be applied to the development of nanoscale biochip for analyzing various kinds of proteins as a rapid tool for diagnosis and proteome research. The nanoscale molecular layers of proteins were fabricated by self-assembled technique. The nanoscale pattern formation technique of proteins has been developed to make nanoscale biochip. The electrical detection of immune reaction in nanoscale protein pattern has been investigated by using scanning tunnelling microscope (STM). Thus the biosurface fabrication using self-assembled protein molecules and nanoscale detection using STM could be successfully applied to the construction of nanoscale biochip for diagnosis. And the self-assembled film of functional protein molecules such as redox protein was applied to fabricate the biomemory. The results implicate that the biosurface fabrication using self-assembled protein molecules could be successfully applied to the construction of nanoscale biochip and biomemory.