

Abstract Submitted
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Structure and electrical property of DNA molecules immobilized on the patterned self-assembled monolayers¹ YOICHI OTSUKA, Osaka University, KAORU OJIMA, TAKUYA MATSUMOTO, HITOSHI TABATA, TOMOJI KAWAI, Osaka University, CREST, JST — In spite of studies of the electrical property of DNA, results are controversial yet. This is because many factors are involved in sample preparation processes and/or measurement procedures that affect the electrical property. One of the important factors is the structure. As DNA molecules are flexible, they are bent easily on the solid surface. The bending results in losing of pi-stack and conductivity. We have prepared the substrate patterned with hydrophilic and hydrophobic surface by the radiation of deep UV to self-assembled monolayers (trimethoxypropylsilane) on the silicon oxide through the lithographic mask. After the immobilization of lambda DNA on the patterned substrate, we have found that DNA molecules are randomly immobilized on the hydrophilic area. On the other hand, DNA molecules are bundled, stretched and aligned in the direction of nitrogen gas flow on the hydrophobic area. Moreover, nanogap electrodes are fabricated on the samples by the angle-controlled thermal deposition method [*Nanotechnology* **15**, 1639 (2004).], in order to avoid the structural deformation at the edge of the electrodes, and electrical conductivity is measured.

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