

課題番号 : F-18-KT-0174  
 利用形態 : 機器利用  
 利用課題名(日本語) : DNA オリガミのサイズ分離用 ANA(Anisotropic Nanofluidic Array)デバイス  
 Program Title(English) : ANA(Anisotropic Nanofluidic Array) device for DNA size separation  
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## 1. 概要(Summary)

In this work, a nanofluidic-sieving device is utilized for the separation of the shape-switching of DNA origami, which can be used a sensor platform for a variety of target biomolecules. A nanofluidic device called SNA (slanted nanofilter array, Fig. 1) was fabricated using a series of microfabrication techniques available in Nanohub, and the fabricated device was proven to be effective for the separation of DNA origami nanodevices which can capture target linkers shown in Fig. 2.

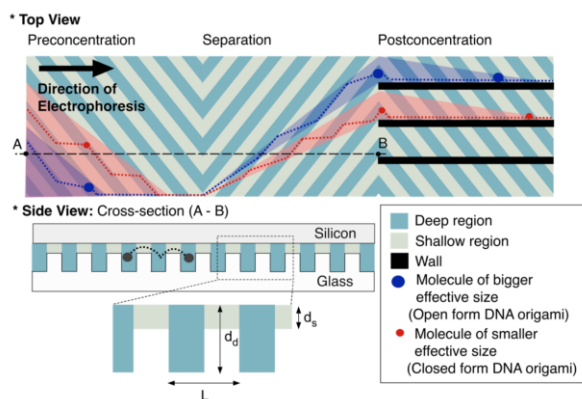


Fig. 1 The schematic figure of SNA device.

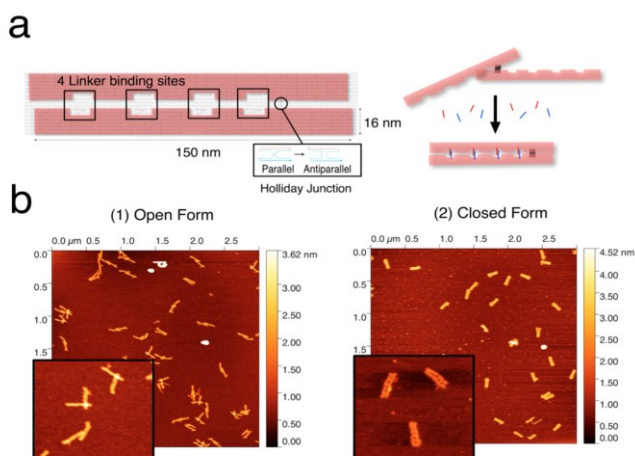


Fig. 2 the shape-switching DNA origami which can bind with specific linker DNA.

## 2. 実験(Experimental)

### 【利用した主な装置】

A04 高速マスクレス露光装置

B09 磁気中性線放電ドライエッチング装置

### 【実験方法】

With conventional photolithography using maskless lithography machine (A08, A04, A10) and plasma-assisted etching of glass (B09), shallow (120 nm) and deep (600 nm) channels were fabricated on 6-inch glass substrate. Subsequently, the etched glass wafer is anodically-bonded (B17) with thermally oxidized (B07) Si wafer and diced to be prepared for the experiment.

## 3. 結果と考察(Results and Discussion)

After the fabrication of SNA chip, fluorescently dyed DNA origami nanostructures are injected into the device, electrophoresed and observed with inverted fluorescent microscopy. As shown in Fig. 3, the separation between two conformations of shape-switching DNA origami was successfully achieved (open-form DNA origami showed bigger deflection angle).

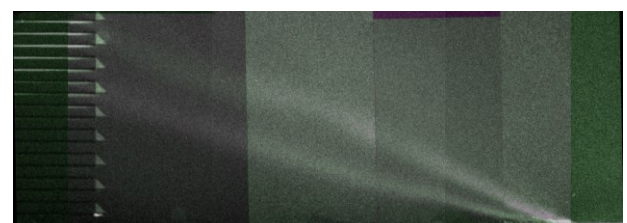


Fig. 3 The separation of shape-switching DNA origami.

3. その他・特記事項(Others) 特になし。

4. 論文・学会発表(Publication/Presentation) なし。

5. 関連特許(Patent) なし。