

課題番号 : F-17-KT-0075  
 利用形態 : 技術代行  
 利用課題名(日本語) : バクテリア培養のためのマイクロ流路デバイスの作製  
 Program Title(English) : Microfluidics and microbiology  
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 キーワード/Keyword : Microfluidics, bacteria, biofilm, confinement, リソグラフィ・露光・描画装置

### 1. 概要(Summary)

I have requested the fabrication of chrome masks from Kyoto Univ. to be used to fabricate the molds for microfluidic devices. Using these masks, I am able to trap bacteria in chambers of  $\sim 0$  (1  $\mu\text{m}$ ). We are still gathering data to understand the phenomena that we are observing.

### 2. 実験(Experimental)

#### 【利用した主な装置】

Laser pattern generator (A3), Photoresist developer (A10)

#### 【実験方法】

Exposure/Development/Cr-wet etching/Resist removal (piranha treatment)

- Exposure : Laser pattern generator (A3)
- Development : Photoresist Developer (A10)
- Cr wet etching : Manual treatment
- Resist removal : 1<sup>st</sup> Acetone dipping,

2<sup>nd</sup> Piranha treatment : Wafer spin cleaner (A11)

### 3. 結果と考察(Results and Discussion)

Using the chrome masks from Kyoto Univ, I have been able to fabricate SU-8 molds using photolithography. We have successfully fabricated two-layer devices capable of trapping bacteria in a thin, quasi-2D chamber. Bacteria in this chamber grow normally and we are able to accurately monitor their growth and spatial distribution as they divide and spread.

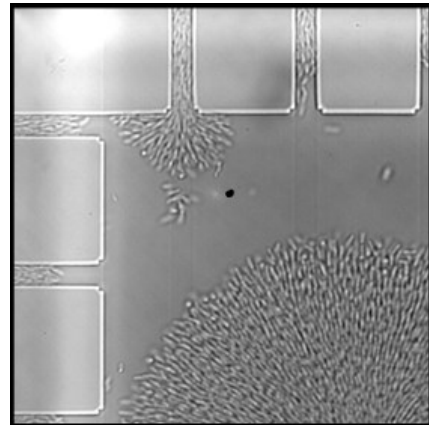


Fig 1. Bacteria growing in a PDMS device replicated from a mold fabricated at Univ. Tsukuba.

We show a bright field image of the 2D device and the corresponding isometric view taken using a stereomicroscope in Fig. 2.

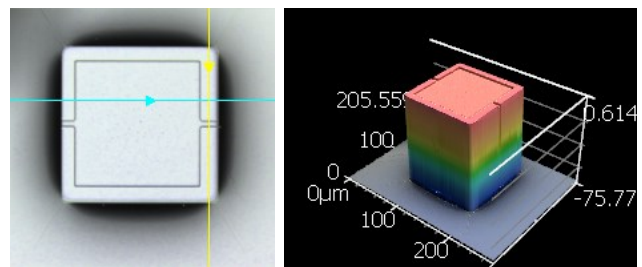


Fig 2. (a) image of 2D chamber (grayscale). (b) height-colored 3D image of PDMS chamber.

### 4. その他・特記事項(Others)

特になし。

### 5. 論文・学会発表(Publication/Presentation)

なし。

### 6. 関連特許(Patent)

なし。