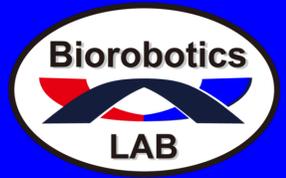


ハイブリッドマスクリソグラフィーによる ナノピラーパターン形成



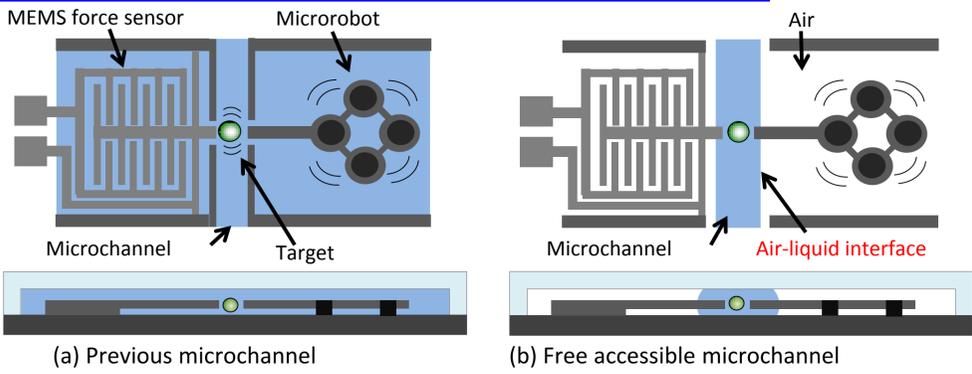
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¹ 名古屋大学大学院 工学研究科



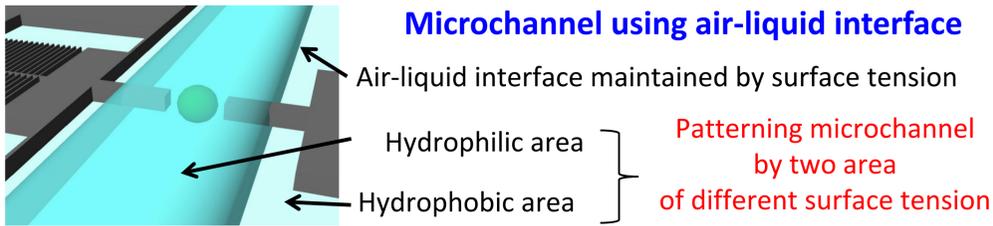
気液界面でマイクロチャネルを形成する!

1. Background

Cell manipulation by on-chip microrobot

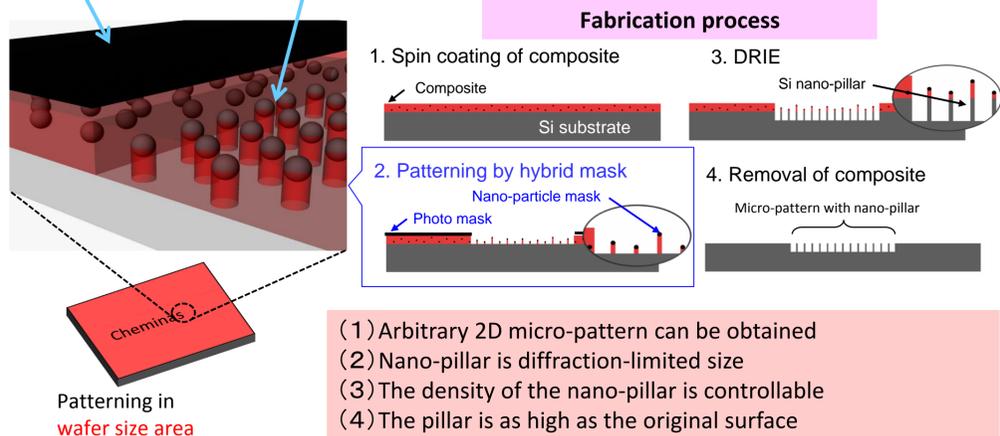


Microchannel using air-liquid interface

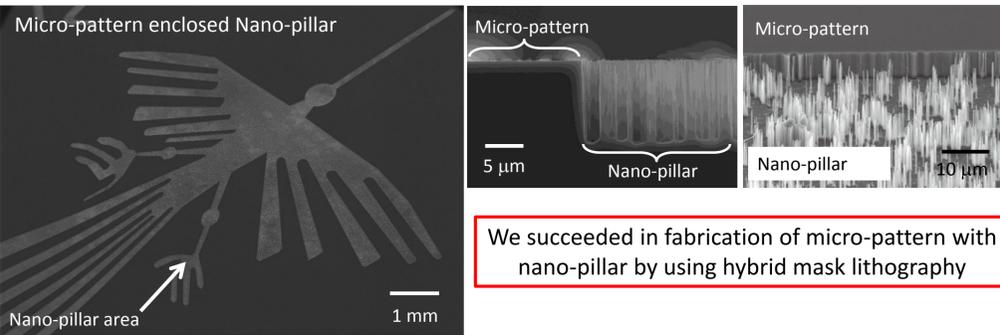


2. Fabrication concept

Photo mask for micro-pattern + Nano-particle mask for nano-dot pattern = Hybrid mask lithography

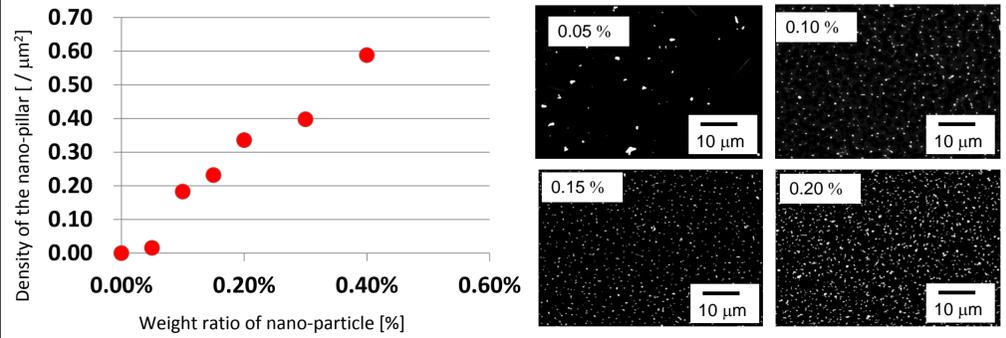


Demonstration : Hybrid mask lithography

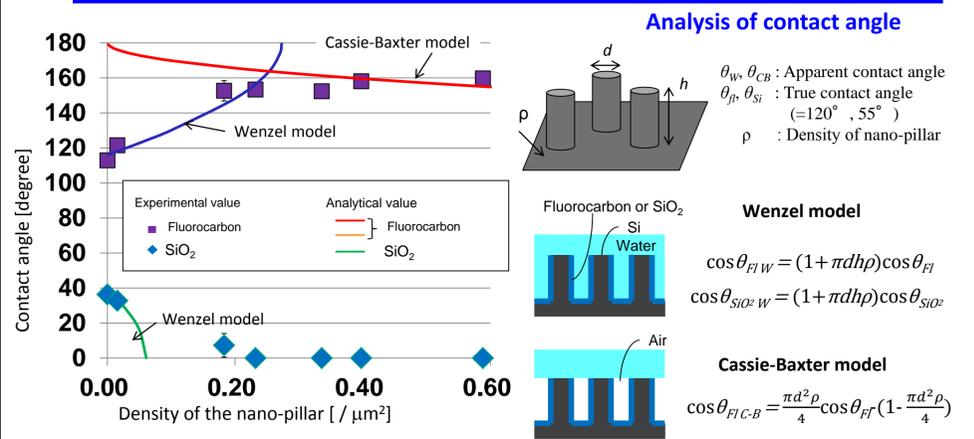


3. Geometry control of surface with pillar

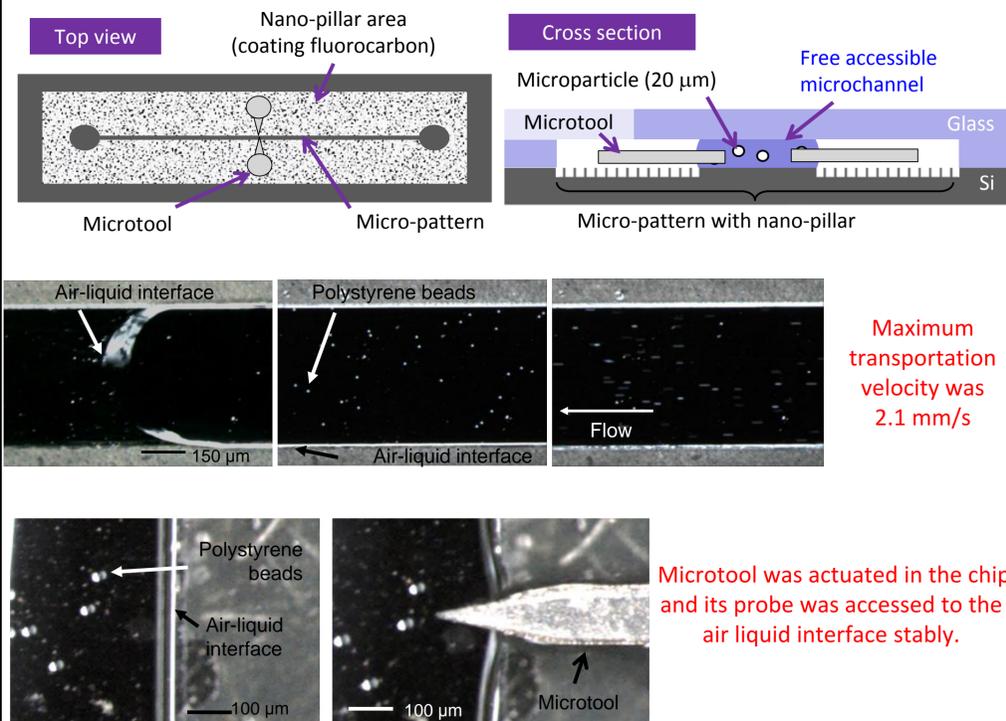
Control of the density of the nano-pillar



Control of the contact angle of the surface



4. Free accessible microchannel



5. Conclusion

- Hybrid mask lithography technique was proposed to obtain the nano-geometric surface with micropattern.
- Density of nano-pillar was controlled simply by changing the weight ratio of the nano-particle and thereby control contact angle between 0 and 160 degrees by nano-pillar coated SiO₂ or fluorocarbon.
- Analysis of the contact angle based on Wenzel and Cassie-Baxter model was achieved.
- We succeeded in fabrication of free accessible microchannel formed by the air-liquid interface.

Reference : S. Sakuma, M. Sugita, F. Arai, "Hybrid mask exposure for fabrication of micro-pattern with nano-pillars", IEEE International Conference on Nano/Micro Engineered and Molecular Systems (NEMS), pp.72-75, 2012.

Patent : 二次元パターンニング方法およびマイクロ流路の製造方法(出願番号: 2012-44180) 新井 史人, 佐久間 臣耶, 杉田 真邦

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