

三次元マイクロ流路を有する バイオリアクターを用いた血小板産生

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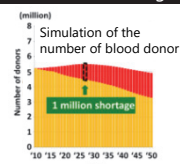
NAGOYA UNIVERSITY



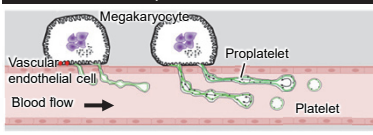
生体外で血小板を高効率に産生するには？

Background & Purpose

Donor shortage of platelet

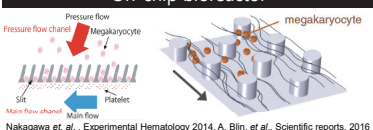


Platelets production in vivo



N. S. Poulter et al., Int. J. Biochem. Cell Biol 2015

On-chip bioreactor



Nakagawa et al., Experimental Hematology 2014, A. Blin, et al., Scientific reports, 2016

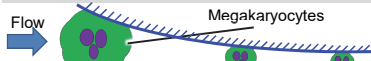
Production of PLTs from iPSC



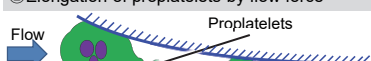
Ref.)わが国の将来人口と輸血可能人口の推移、厚生労働省

On-chip platelet production

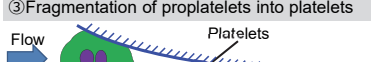
① Trapping of the megakaryocyte



② Elongation of proplatelets by flow force



③ Fragmentation of proplatelets into platelets



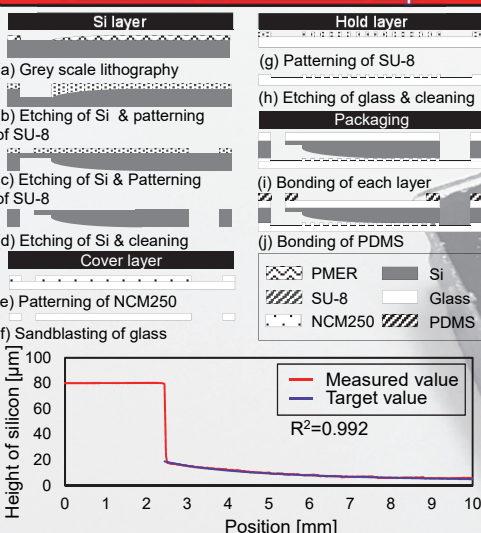
特願:2015-200805

Platelets production

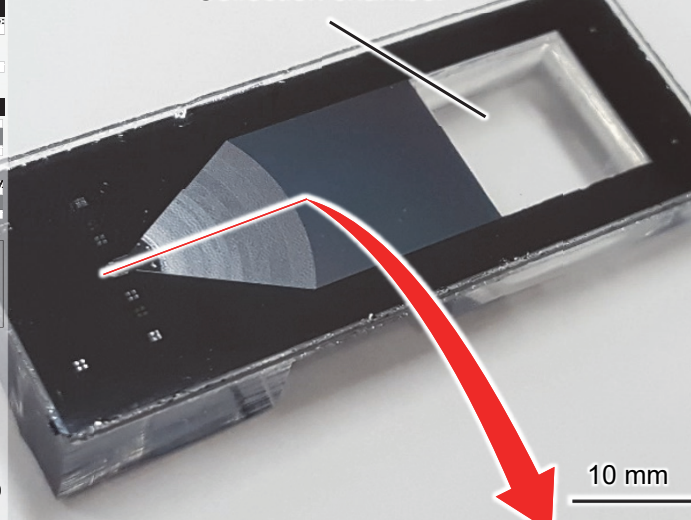


The 3D microchannel fabricated by using grey-scale lithography

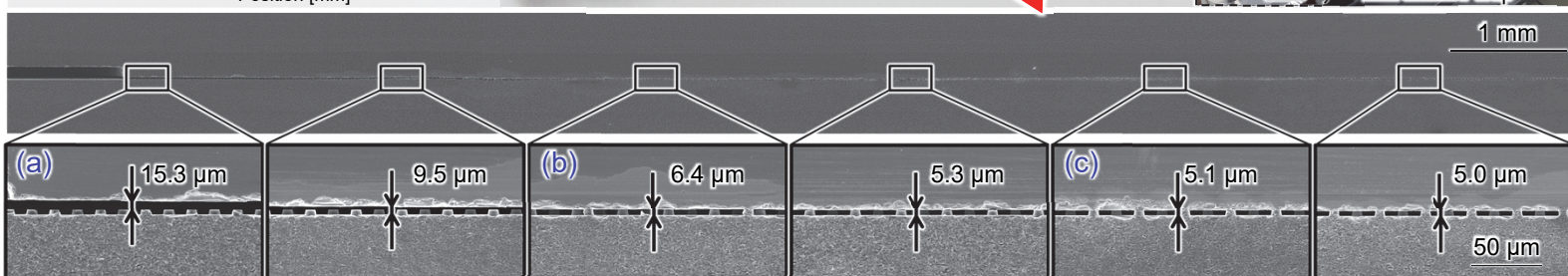
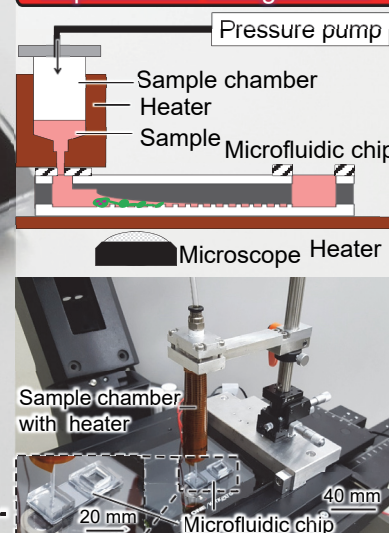
Fabrication of microfluidic chip



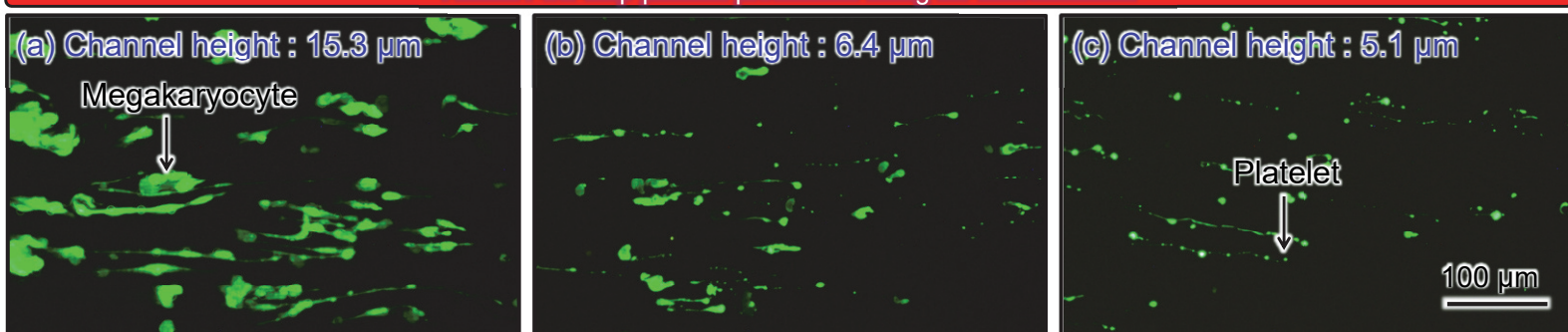
Collection chamber



Experimental configurations



Result : On-chip platelet production using 3D microchannel



- We succeeded on-chip platelet production using 3D microchannel.
- Number of produced platelet was **11.7 times** higher than previous report.

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