

Bacterial micropatterning by composite microstamp

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We present the noble method for micropatterning of bacteria by micropatterned composite stamps to print patterns of bacteria on agar plates. In general, poly(dimethyl siloxane) was extensively used for micro patterning of biomolecules by microcontact printing. However, because its surface property is hydrophobic, it is not suitable for bacterial patterning. We explored to find an optimum oxygen plasma condition of PDMS for obtaining hydrophilic surface, however, hydrophobic property of PDMS was easily repaired after an assigned number of hours. Theoretically, hydrogel stamp is good alternative material to pattern bacteria. However, stamps made of only hydrogel were difficult to handle because it had critical problem of mechanical stability. Therefore, we developed the noble composite stamp to solve mechanical problem in micro-bacterial patterning in this study. We found that these stamps could easily generated patterns of bacteria with each other features. The noble method provides rapidness, reproducibility, and convenience and can be used to control the pattern, spacing and orientation between colonies of different bacteria. In addition, patterned composite stamps can be used to pattern several times simultaneously; the same stamp can be used repeatedly.