

Microfluidic Platform for Immobilizing Cells to Surfaces

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Atomic Force Microscope (AFM) is an advanced nanotechnology tool for image mapping and cell properties measuring. One of the major challenges presented to the scientists in the field is the procedure for sample preparation. In order for a cell or virus to be measured by the AFM, it has to be firmly attached to the surface. Existing methods including chemical functionalization of surface for cells binding are often very slow process which hinders the possibility of high throughput measurement. Therefore, we propose a new method that utilizes a fluid circulation system to immobilize cells of interest to designated area to significantly speed up the process. To achieve this goal, a hole which are comparable to the size of a cell are fabricated on the surface. Suctions are applied at these pores using an external pressure controller. Furthermore, two different designs are constructed as well as compared against each other in terms of price and effectiveness. One key difference between these two designs is that one will circulate the fluid back to the platform while the other one keeps transporting fluid across the microfluidics chip.