Quantitative Analysis of Single Cell Adhesion and Migration Using μ-PIV and TIRF

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μ-PIV와 전반사형광을 이용한 단일 세포 운동의 정량 분석

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Key Words: Cell Adhesion(세포부착), Cell Migration(세포이동), Focal Contact, μ-PIV, TIRF

Abstract : In order to quantify the single cell adhesion and migration, we propose a novel method using total internal reflection florescence (TIRF) microscopy and μ-PIV. A living cell has focal contacts on the substrate so that cell adhesion depends upon the formation of adhesive contacts between the cell and the substrate. Determination of the cell-substrate contact area is necessary in order to understand how biomaterial properties influence cell adhesion. By using TIRF microscopy, we can obtain the image of near-focal contact (sub-micrometer scale). From the obtained images, it is determined whether the cell adheres properly. The cell movement which is caused by changing the hydrodynamic condition is also observed. The moving focal contacts are measured quantitatively with μ-PIV. This combination of TIRF microscopy and μ-PIV proves to be very useful for analyzing cell viability in a new environment.

Power-Free Micro Blood Separator

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무동력 미세 혈액 분리기

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Key Words: Micro Blood Separator(미세 혈액 분리기), Power-Free(무동력)

Abstract : In this study, micro blood separators capable of separating blood cell and blood plasma using microstructure are fabricated and tested. Test results show the possibility of separating blood cell and blood plasma using microstructure. Since the micro blood separators do not require external energy for separation and the required whole blood for the separators is less than $1\mu\ell$, the separators proposed in the present work can be a good candidate for the blood separating component in miniaturized blood analysis systems.