

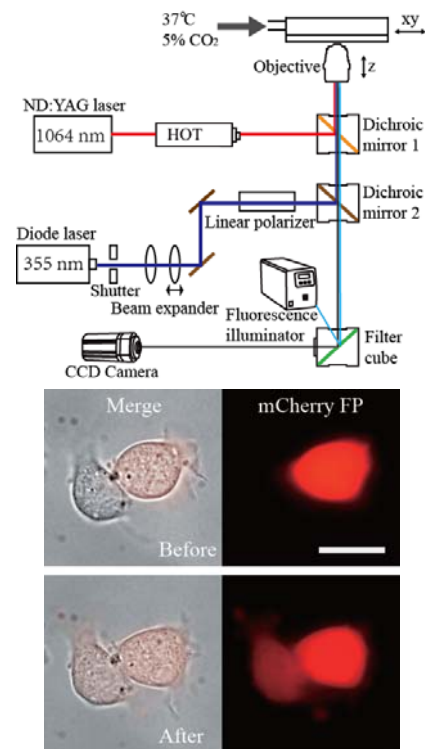
Laser-induced Cell fusion with Optical Tweezers Cell Manipulation System



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Abstract

Cell fusion is a process by which two or multiple cells combine to form a single entity. This process is important in numerous biological events and applications, such as tissue regeneration and cell reprogramming. Artificially induced cell fusion has been used as an effective tool in developmental biology and biomedical engineering. Conventional methods are mainly based on mass fusion technique, which causes heterogeneity and reduced spatiotemporal information at a single-cell level. In this talk, a robot-tweezers cell manipulation system is developed for achieving engineered laser-induced cell fusion. Laser-induced fusions have been achieved amongst suspended as well as adherent cells. The advantage of the proposed method is to achieve specific cell fusion at single-cell level with high selectivity and fusion efficiency. The method is particularly suitable for the fusion of loss-of-function mutant cells, which cannot migrate, recognize, adhere, or fuse to their targeted fusion partners. This method provides a new opportunity to study fusion during cell differentiation, maturation, reprogramming, and canceration.



Biography

Dong Sun is currently a Chair Professor in the Department of Mechanical and Biomedical Engineering, City University of Hong Kong. He has research interests in robotics and the related biomedical engineering, and has gained international reputation through his pioneering works in robot-aided cell manipulation. He has published 2 books and 300 technical articles in referred journals and conference proceedings, and held 6 patents. He has received numerous best paper awards from international journal and conferences, as well as industrial awards such as Hong Kong Awards for Industry in 2003 and 2012, respectively. For professional communities, he has organized several international conferences as the General Chair, and has served on editorial boards for several prestigious journals such as the *IEEE Trans. on Robotics*. He is currently serving as the member of Engineering Panel of Hong Kong Research Grant for General Research Grant (GRF) and Research Assessment Exercise (RAE).