

Automated characterization of proteins by their subcellular localization on live cell array

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In vivo subcellular protein localization of GFP-tagged cDNAs is one essential step towards the understanding of functional protein networks [1]. Live cDNA-transfected cell arrays facilitate high-density morphological protein screening [2], while fast automated image acquisition and machine learning-based image classification would allow subsequent investigation of subcellular localization [3]. Here, we present the successful combination of live cDNA-transfected cell arrays, automatic image scanning cytometer and different high-level classification methods as a fully automated framework for high throughput subcellular protein analysis. Efficiency of the system is demonstrated by classification of subcellular localization of eleven GFP-tagged cDNAs in live cells. The developed framework is open for other morphological-based assays in live cell fluorescence microscopy, including functional assays using RNAi [4].

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