

Microfluidic single-cell analysis for signaling crosstalk between cell wall integrity and mating pathway in *S. cerevisiae*

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Micro-organisms live in continuously changing surroundings and they need to counterbalance with many stresses. In response to the challenges, cells have been developing adaptation mechanisms for maintaining homeostasis. Although the molecular mechanism of cell signaling of single stress becomes revealed, it has not been fully understood how the cells distinguish between multiple stresses. Here, we investigate the signaling crosstalk between cell wall integrity (CWI) and mating pathway of budding yeast via microfluidic device and quantitative single cell analysis. The microfluidic device enables to 1) monitor single yeast cells' response in media flow by fixing the cells underneath of PDMS micropad, and 2) modulate magnitude of a cell wall stress by dilution of hydrogen. Firstly, we monitor the expression of a mating-specific reporter, based on the Factor Induced Gene 1 promoter driving the expression of Quadruple-Venus fluorescent protein. As a result, we found the activation of CWI signaling inhibits mating signaling, which is shown as decrease of Fig1 expression upon increase of cell wall stress magnitude.