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## A microfluidic-based gradient medical waveform generator for pharmacology in single-cell

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Cellular pharmacology and its molecular mechanisms of resistance and drug interactions are critical for development of new drugs. Drugs with specific biochemical actions are also powerful research tools. Here, we proposed a novel microfluidic-based medical gradient waveform generator for investigating single cell pharmacology. Theory for the operation principle was established and validated by both numerical simulations and flow visualization experiments. A custom-built multi-channel pressure control system was constructed to automatically implement chemical gradient perturbation with various injection times, relaxation times and number of cycles. Investigations of intracellular and intercellular calcium signaling with different medicines were successfully demonstrated using the proposed strategy. These results revealed that microfluidic-based chemical gradient waveform generator provides a versatile means for probing cell signaling, which is potentially useful in chemical biology, cell biology and pharmacology studies.

### Biography

Yiran Guo has her expertise in evaluation and passion in understanding the complicated cell signaling pathways on microfluidic platform. She received Bachelor's degree in Bioinformation Technology, during September 2008 - July 2012 from Huazhong University of Science and Technology. She is pursuing PhD in the same University since September 2012.

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