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## Optical manipulation: from single cell trapping to actuation

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Precise single cell trapping in cell crows is important for further precise single cell analysis, while controllable cell actuation allows us to further regulate the function and fate of a single cell. Although optical tweezers have been widely used for single cell trapping and manipulation, how to realize the controllable single cell actuation is still of great challenge. Here, I will show our recent advances on single cell trapping and actuation based on optical manipulation techniques. Using different multi-mode optical manipulation techniques, we realized the precise trapping of single cell, multiple cells, and subcellular structures. We further turned the optical manipulation techniques for controllable cell actuation, and formed different cell-based bio-micromotor/robots for precise biomedical tasks execution.



### **Short Bio:**

**Hongbao Xin** is currently a professor and vice director of the Institute of Nanophotonics, Jinan University, Guangzhou, China. He received his BS degree (2011) and Ph.D degree (2016) at Sun Yat-sen University. After graduation, he continued his research at the University of California, Berkeley and the National University of Singapore. He joined Jinan University in 2018. His research interests focus on biophotonics, such as optical tweezers for bio-manipulation and nanoplasmonics for molecular detection, etc. He has published more than 50 peer-reviewed journal articles, including Nature Photonics, Nature Reviews Materials, Nature Communications, Light: Science & Applications, Advanced Materials, Nano Letters, etc. He was elected as Young Changjiang Scholar from Ministry of Education, China, and the Distinguished Young Scholar by the Natural Science Foundation of Guangdong Province.