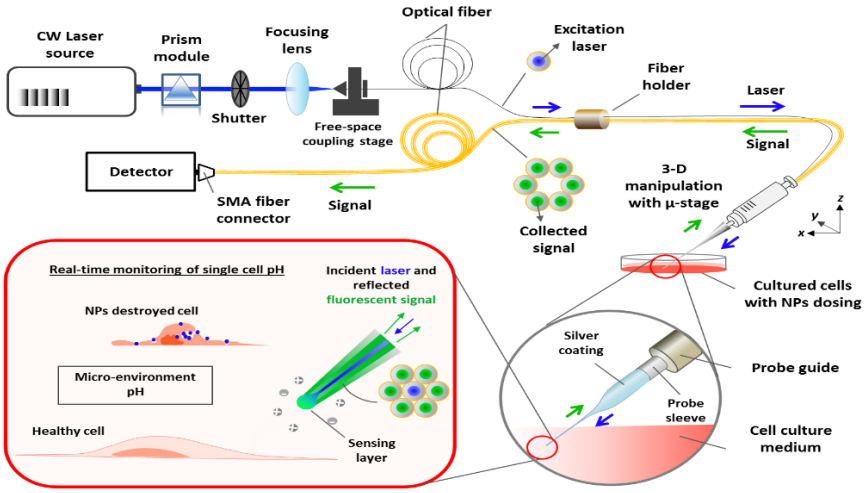
Novel Fiber-Optic Based Micro-Probe for Intracellular Single-Cell pH Measurement



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PROJECT DESCRIPTION: In this study, a fiber-optic reflection-based pH micro (μ)-probe (diameter of 500 nm – 2,000 nm) was designed and fabricated to enable pH measurement in a single cell with real-time data acquisition ability (response time of ~ 20 ± 5 seconds). The probe has a high pH detecting resolution (0.038 pH unit on average) within a biological meaningful range of pH 6.18 - 7.80. The miniaturized probes were successfully applied for intracellular-pH measurements in single human lung cancer A549 cells. The novel pH μ-probe, with high resolution, fast response, and linear correlation within the biological meaningful pH range, make it useful for chemical/biological sensing in a single cell.

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SELECTED PUBLICATIONS:

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2. Qingbo Yang, Hanzheng Wang, Sisi Chen, Xinwei Lan, Hai Xiao, Honglan Shi, Yinfa Ma, "A Novel Fiber-Optic Based Nano-Probe Using Hexagonal 6 -in-1 Fiber Configuration for Intracellular Single-Cell pH Measurement", *Analytical Chemistry*, 2015, 87: 7171−7179.
3. Yang, Qingbo, Hanzheng Wang, Xinwei Lan, Baokai Cheng, Sisi Chen, Honglan Shi, Hai Xiao, Yinfa Ma, "Reflection-mode micro-spherical fiber-optic probes for in vitro real-time and single-cell level pH sensing". *The Sensors and Actuators B: Chemical*. 2015, 207: 571-580.
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