

## Microplastic Detection Based on Nanorods Embedded Microneedle

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In this study, we fabricated a microplastic specific detecting platform microneedle for an enhancement of their detections through embedded with gold nanorods (Au NRs), which were conjugated by polystyrene binding peptide (PSBP) having a strong selectivity toward PS microplastics. For the enhanced signal of chemical identification of microplastics, Fourier transform infrared (FTIR) detection method was mainly adopted accomplishing surface enhanced infrared spectroscopy (SEIRA) phenomena by the Au NRs plasmonic antenna. Through the PSBP tethered Au NRs at the tip of the microneedle, specific binding of PS microplastics toward PSBP was confirmed by the amplification of FTIR peaks. In addition, SEM images could confirm existence of PS microplastics specifically bound with PSBP conjugated Au NRs. Therefore, a simple detection protocol of microplastics could be newly provided.