

Can Chiral-Label-Free SERS and TERS Carry out Synchronous Chiral Discrimination and Identification of Aromatic Molecules?

Yukihiro Ozaki

*School of Biological and Environmental Sciences, Kwansai Gakuin University,
Sanda, Hyogo 669-1337 (Japan)*

It is very important to investigate techniques for discriminating enantiomers in various fields of science and technology, such as catalytic chemistry, biotechnology, and pharmaceutical science. However, most current methods lack either the sufficient sensitivity for recognizing the chirality of the target molecules or their molecular specificity information. We have succeeded in developing a versatile and chiral-label-free surface-enhanced Raman scattering (SERS)-based chiral discrimination sensing system for small aromatic molecules, where the molecular structural specificity and enantioselectivity can be given synchronously in a single SERS spectrum [1-3]. Vertically aligned Au nanorods (NRs) arrays modified with the achiral mixed-thiol self-assembled membranes were employed to differentiate and identify small aromatic molecules in solution by SERS. The key to success in chiral discrimination for this strategy is attributed to the synergy of the CT contribution and the EM enhancement of SERS. We have also developed synchronous chiral discrimination method using tip-enhanced Raman scattering (TERS) [4].

References

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