

## INSIGHT INTO CHIRAL RAMAN SIGNALS UNDER RESONANCE CONDITION.

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Resonance Raman optical activity (RROA) measures the small intensity difference between right circularly polarized light,  $I_R$ , versus left circularly polarized light,  $I_L$ , when a randomly polarized light is in resonance with a chiral molecule. Researchers have explored RROA as a mean to significantly enhance the weak ROA response for the past two decades, although the progress has been severely hampered by the lack of agreement between theoretical and experimental RROA spectra so far. After examining a series of light-matter events which can occur simultaneously under a typical RROA experimental condition, we discovered a new form of chiral Raman spectroscopy, eCP-Raman—a combination of electronic circular dichroism (ECD) and circularly polarized Raman (CP Raman).<sup>1</sup> Further analyses of the  $I_R-I_L$  spectra of three resonating chiral molecules revealed that all of the  $I_R-I_L$  spectra observed can be satisfactorily explained by the novel eCP Raman mechanism without any detectable contributions from natural RROA.<sup>2</sup> The discovery of eCP-Raman allows one to extract true RROA contribution from the  $I_R-I_L$  signal obtained under resonance to facilitate the current theoretical RROA development. Furthermore, eCP-Raman offers a new way for sensitive chirality detection of molecular systems in biology and chemistry.

1. G. Li, M. Alshalalfeh, J. Kapitán, P. Bouř, Y. Xu, *Chem. Eur. J.* 2022, doi.org/10.1002/chem. 202104302. 2. a) G. Li, M. Alshalalfeh, Y. Yang, J. R. Cheeseman, P. Bouř, Y. Xu, *Angew. Chem. Int. Ed.* 2021, 60, 22004-22009. b) T. Wu, G. Li, J. Kapitán, J. Kessler, Y. Xu, P. Bouř, *Angew. Chem. Int. Ed.* 2020, 59, 21895-21898.