Separating Raman Signal of Single Living Cells from the Autofluorescence Background

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Raman spectroscopy is very useful and powerful optical technique to detect molecular and biochemical signatures within cells. However, there are still some challenges for the application of Raman spectroscopy to biological systems. One of the difficulties to apply to biological systems is the removal of intrinsic autofluorescence background due to biological samples. Here, we use a method to solve the problem according to the work of Zhao *et al* [1]. In our research, however, we could not correct the baseline well by using the method of Zhao *et al.* It is probably because of actually obvious Raman signal of glass and water in our measured Raman data of cells. Therefore, our work aims to find the reason and solution.

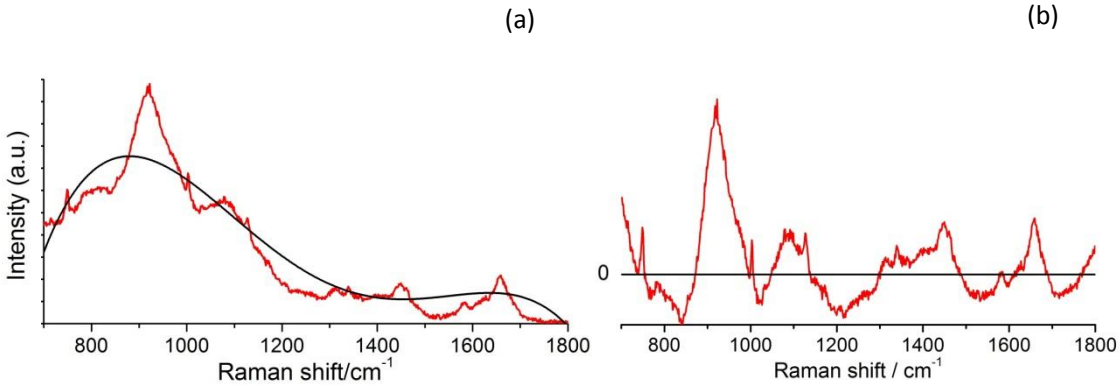

Figure.1 (a) A measured Raman spectrum of a living HeLa cell and the estimated baseline; (b) the Raman spectrum after the baseline correction.

In our research, to simulate Raman spectra, we created a series of spectra that consist of a big fluorescence background and small Raman peaks by using the Gauss function. We found some common properties of simulative spectra when baselines were not corrected successfully.

[1] J Zhao *et al.*, *Applied spectroscopy* **61**, 1225-1232 (2007).