Electronic Supplementary Material (ESI) for Analyst.

Supporting Materials

Dynamic characterization of drug resistance and heterogeneity of gastric cancer cell BGC823 with single-cell Raman spectroscopy

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Supplementary Figures

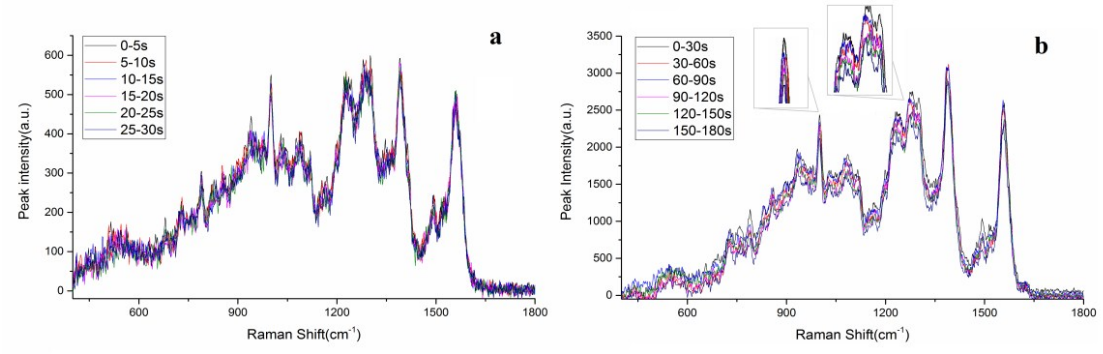

Figure S1. The effect of laser power on BGC823 cells.

a, The same cell was continuously illuminated by a 20 mW laser for 30 s, and the RS was taken with integration time of 5s. The 6 RS lines showed no remarkable differences. **b**, A cell was continuously illuminated by a 20 mW laser, and RS was collected every 30 s. The inset amplifies figures at 1001 cm^{-1} and 1446 cm^{-1}. The differences among RS lines were minimal, the intensity was slowly decreased with prolonged time and the maximum difference in the area under the curves between lines 0-30 s and 30-60 s was 3.3%. Therefore, 20 mW was used as an adaptive laser power for RS measurements.

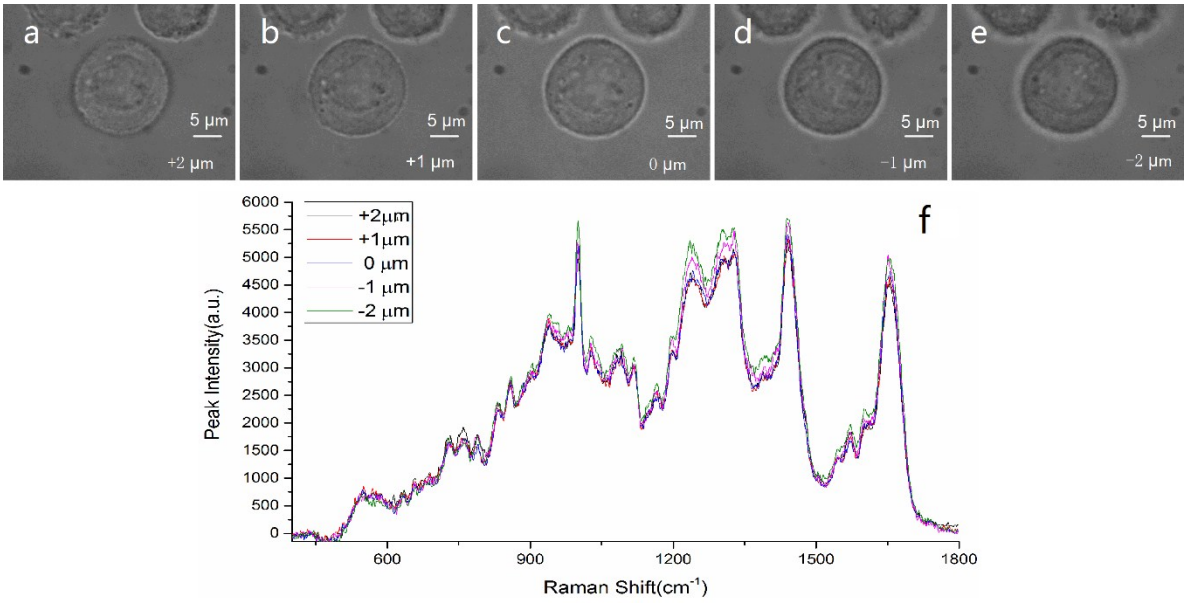

Figure S2. The focusing position controls under a bright light view of the cell. The axial position can be controlled with ~1μm precision by observing the edge of the cell under a bright light view. When focusing on the center of the cell accurately, a bright and fine ring is seen on the edge of the cell due to the bright light. The ring would become dark and wide when out of focus. (a)-(e), The axial focusing position from 2 μm above the cell center to 2 μm below the cell center. (f) The RS corresponding to (a)-(e). The differences in the area under the curves and between lines at 0 μm and ±1 μm were less than 2.8%. This is less than the change caused by the drug.

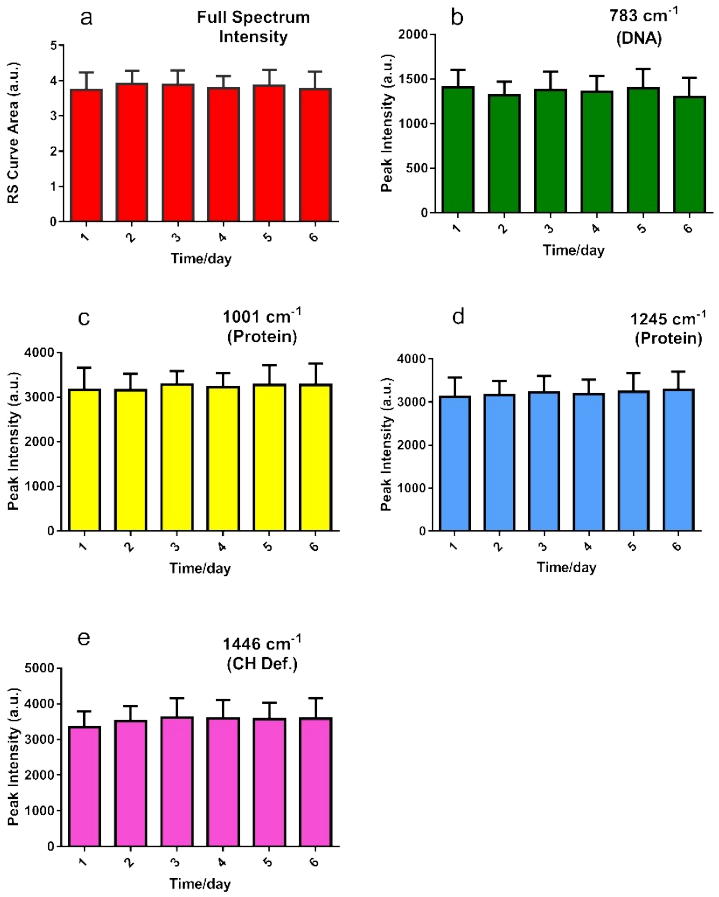

Figure S3. The RS of control group for BGC823 cells in different day. The data were collected every 24 h for 6 days. (a) Area under RS curve from 450 cm^{-1} to 1800 cm^{-1}(P=0.5127), (b)-(e) selected peaks corresponding to different components (P=0.1397, 0.6389, 0.5642, 0.2769, on the one-way ANOVA test, respectively). (Mean ±s.d., n≥30 cells per condition.) Bars represent the mean value of 30 cells, error bars represent the standard deviation. The results show that control groups are consistent.

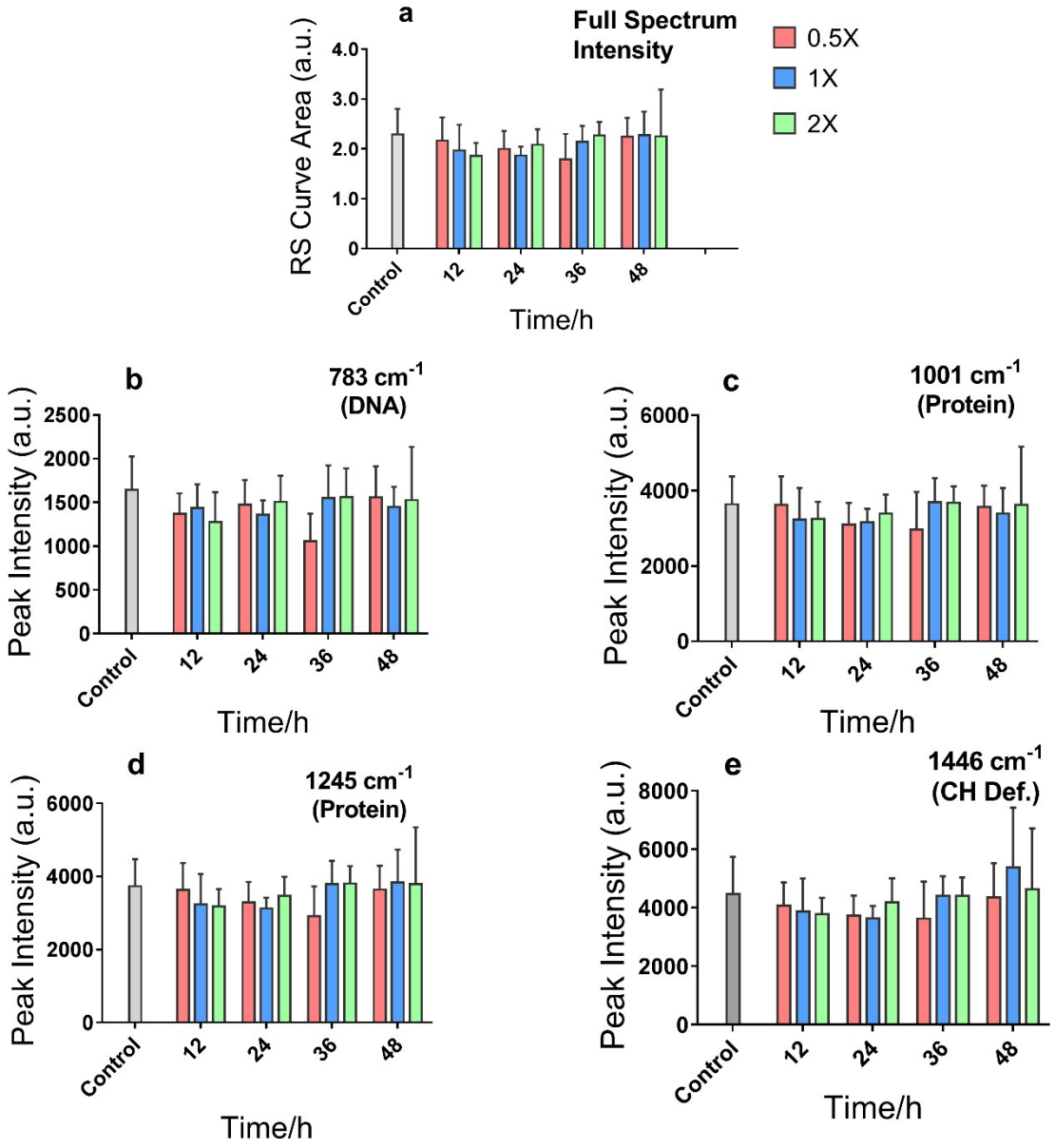

Figure S4. The RS intensity changes over different concentrations of PTX for normal BGC823 cells. The data were collected every 12 h for 48 h. The red bar is $0.5\times IC_{50}$ PTX, the blue bar is $1\times IC_{50}$ PTX, and the green bar is $2\times IC_{50}$ PTX. The trend in RS change as a function of different PTX concentrations were similar, but the minimum value times were different. (**a)** Area under RS curve from 450 cm^{-1} to 1800 cm^{-1}, (b)-(e) selected peaks corresponding to different components, respectively. Bars represent the mean±s.d., n≥25 cells.

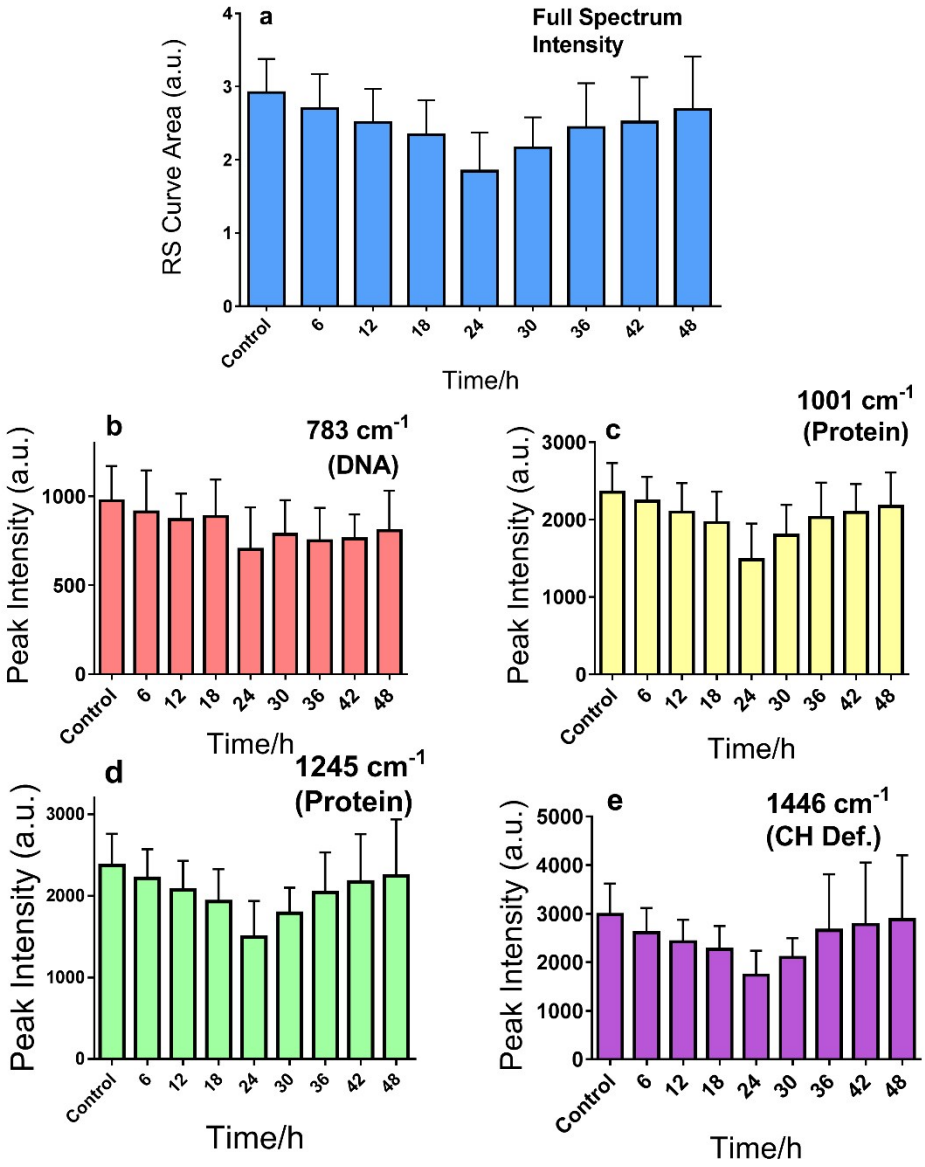

Figure S5. RS intensity change of normal BGC823 cell over drug exposure time. The concentration is 1X IC50 PTX, The data were collected every 6 h for 48 h. (a) Area under RS curve from 450 cm^{-1} to 1800 cm^{-1}($P<0.0001$),(b)-(e) selected peaks corresponding to different components, respectively ($P<0.0001$). Bars represent the mean±s.d., n=30 cells. P values: One-way ANOVA.