

Supplementary Information

Table A1. Raman peaks of interest in the mean spectra from hiPSCs, ES cells and differentiated ES cells.^{16,36,42-44}

Raman band (cm ⁻¹)	Assignment
699-700	cholesterol or cholesterol esters
715	C-N symmetric stretching in phosphocholine
717	C-N symmetric stretching in lipid
718	Lipids (phospholipids → C-N stretch); DNA/RNA (adenine → ring breathing)
756	Proteins (symmetric ring breathing in tryptophan)
757	Proteins (symmetric ring breathing in tryptophan)
783	782 cm ⁻¹ : DNA/RNA (pyrimidines → ring breathing); 788 cm ⁻¹ : DNA (backbone → O-P-O stretching)
814	813 cm ⁻¹ : C-C stretching (collagen assignment), C'5-O-P-O-C'3 phosphodiester bands in RNA; 815 cm ⁻¹ : Proline, hydroxyproline, tyrosine, ν ₂ PO ₂ ⁻ stretch of nucleic acids
827	Proline, hydroxyproline, tyrosine, ν ₂ PO ₂ ⁻ stretch of nucleic acids
846	847 cm ⁻¹ α-glucose, (C-O-C) skeletal mode
852-853	Ring breathing mode of tyrosine, protein; C-C stretch of proline ring; Glycogen
861	Phosphate group

937-939	Proteins (collagen type I \rightarrow C-C stretching, α -helix \rightarrow C-C stretching); carbohydrates (glycogen)
999,1001,1002,1004	1000-1004 cm^{-1} : Phenylalanine, protein assignment
1030-1034	C-H in-plane bending mode of phenylalanine
1060-1095	PO_2^- stretching (DNA/RNA) Chain C-C stretching (lipids) C-O, C-C stretching (carbohydrates)

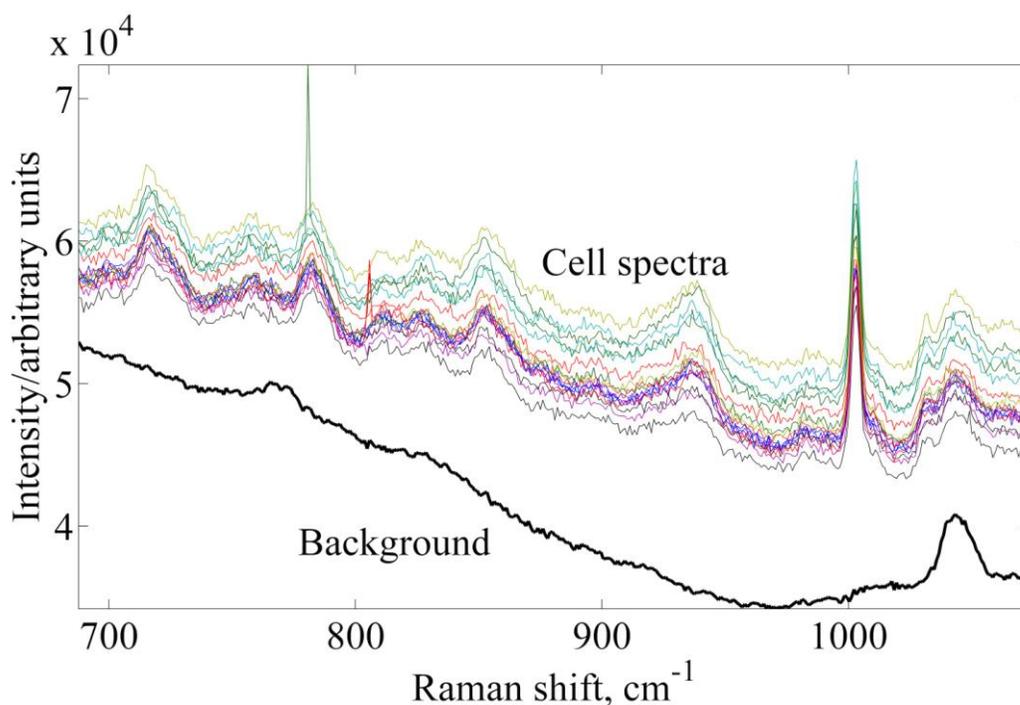


Figure A1. Sample raw spectra from hiPSCs (3 days after sub-culturing on the mirror, same set of data was used in the following comparisons). The colored spectra were collected from different spots in a growth area; the bottom bold one was the average of 4 spectra from the cell-free area (2 before the cell spectra collection and 2 after).

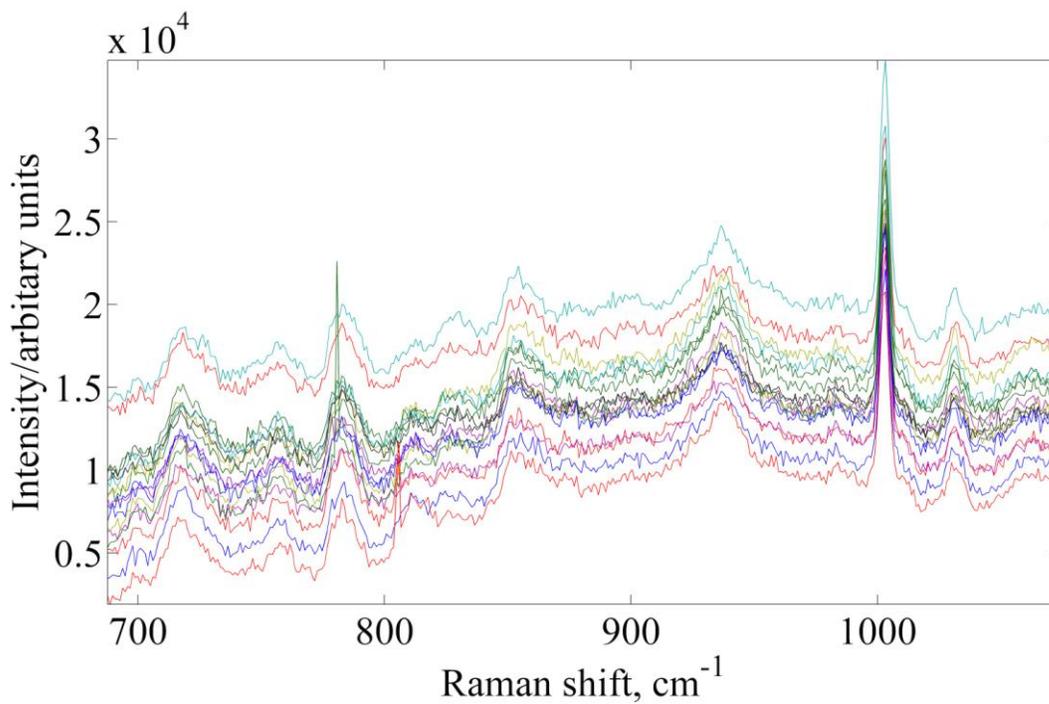


Figure A2. Background subtracted spectra using the raw spectra in Figure A1.

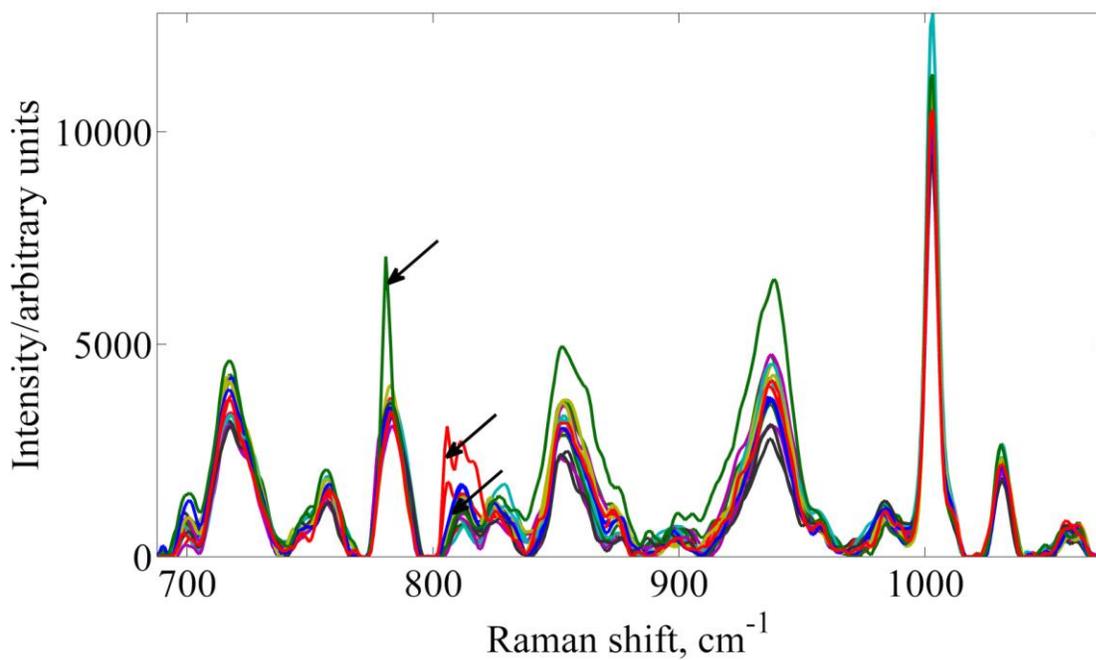


Figure A3. Baseline flattened and smoothed spectra using the background subtracted spectra in Figure A2. Three spectra with cosmic rays were rejected as indicated by the arrows.