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Supplementary Materials

Live Cell Poration by Au Nanostars to Probe Intracellular Molecular Composition with SERS

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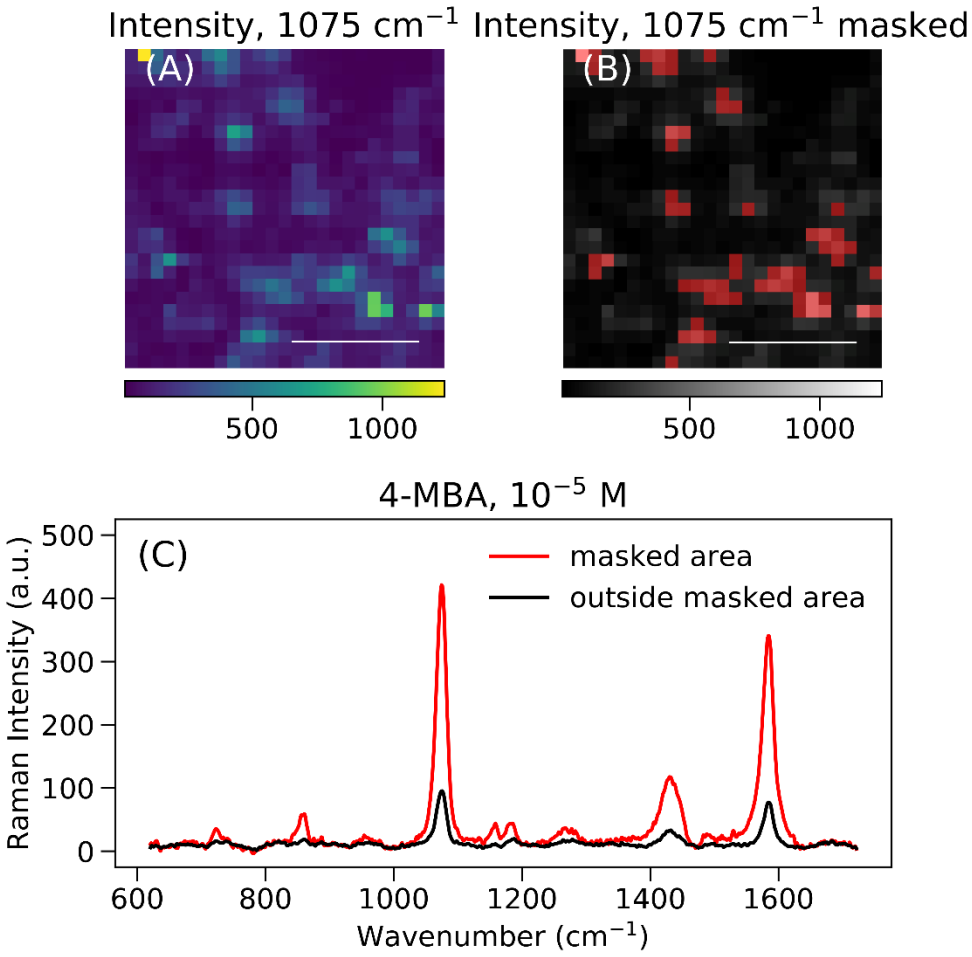

Figure S1. SERS map of 4-MBA (10^{-5} M solution in ethanol). (**A**) Intensity distribution at 1075 cm^{-1} peak. (**B**) The same map, values above threshold calculated using Otsu's method are marked with red. The scale bars at (**A**,**B**) correspond to 10 μm. (**C**) Mean spectra of area under (red line) and outside (black line) red mask (**B**).

Table S1. Raman peak assignment.

Wavenumber/cm^{-1}	Assignment	Reference
583–589	PO_4^{3-} in DNA and RNA	[1]
640–650	C–C twisting mode in proteins	[1–3]
645	[Fe–S]	[4]
660–670	Guanine, Thymine	[5,6]
680	Guanine	[7]
702	Cholesterol, cholesterol ester	[7]
720	Adenine, phosphatidylcholine, sphingomyelin	[8,9]
745	Thymine H–C–O stretches in carbohydrates	[5,10]
750–755	Heme C (Fe^{3+})	[9]
760	Heme b (Fe^{3+})	[9]
780	Uracil and Cytosine ring breathing	[9]
789	Cytosine	[9]
802	Uracil	[6,9]
810–820	Proteins, DNA, RNA	[7]
832	RNA	[6]
900	Glycine	[3]
912	Carbohydrates	[5]
1000	Phenylalanine	[7]
1010	DPBS	[11]
1065–1067	Triacylglycerols, sphingomyelin; DPBS	[8,9,11]
1080	Alkyl C–C stretches	[10]
1112–1115	C–C trans stretches in saturated lipids, polysaccharides	[10,12]
1120	Carbohydrates	[10]
1125	Triacylglycerols	[9]
1131	Triacylglycerols, sphingomyelin, phosphatidylcholine	[8,9]
1140–1170	ν(C–C) in lipids, proteins	[2,12]
1180	C–H bend in tyrosine, phenylalanine	[5]
1200	Proteins, DNA	[7]
1206	Heme b; Adenine, Thymine	[5,9]
1220–300	Amide III	[7,10]
1246	Amide III	[11]
1264	Adenine, Thymine	[5]
1270	═C–H cis stretch in unsaturated lipids, Amide III	[10]
1270	Unsaturated fatty acid	[8]
1300–1330 (broad)	Fatty acids	[8,9]
1310	Adenine	[6,9]
1326	Guanine	[6,9]
1330	Carbohydrates	[10]
1350	Proteins, lipids	[9]
1360	Tryptophan	[1]
1370	Adenine, Thymine, Guanine	[6]

1380–1390	unassigned	
1413	C=C stretching	[7]
1432	Adenine, Guanine	[6]
1445–1450	Alkyl C–H_2 bend mostly in lipids	[8,9]
1480	Adenine, Guanine	[6]
1490–1495	C–N stretching vibration	[7]
1510	Mostly cytosine	[5,9]
1535–50	Adenine, Guanine	[6]
1545	Heme B	[9]
1548	Heme C	[9]
1560	Tryptophan	[3]
1570	DNA, RNA, proteins	[5]
1595	Adenine	[6]
1600	C–C stretch	[5,12]

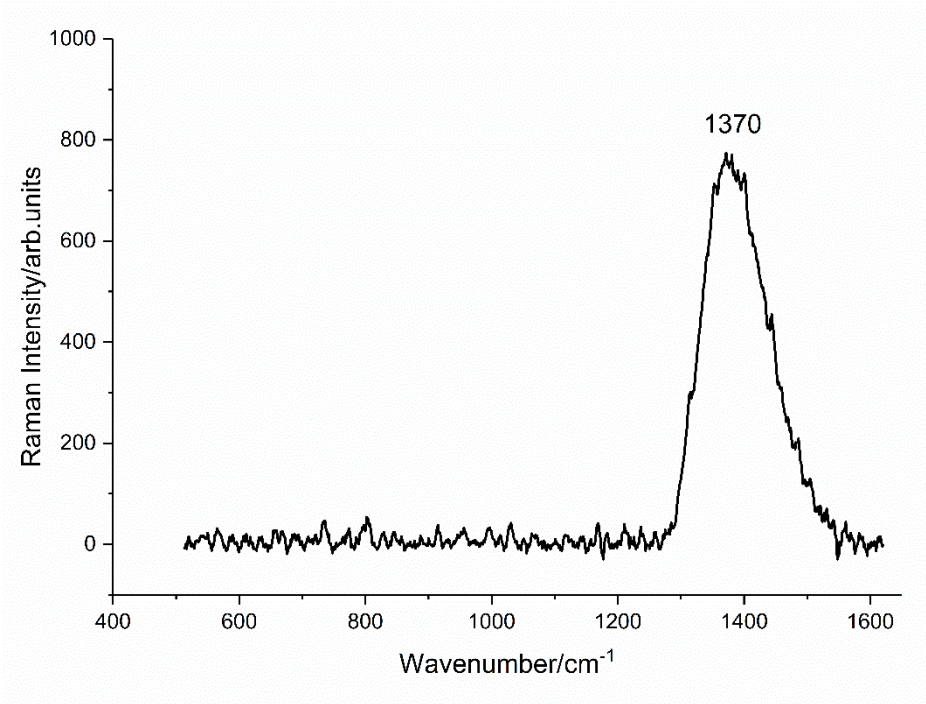

Figure S2. Spectrum of a cell outside gold substrates registered with 50×/0.5 n.a. objective lens, laser wavelength 785 nm, laser power 3 mW, acquisition time 1 s.

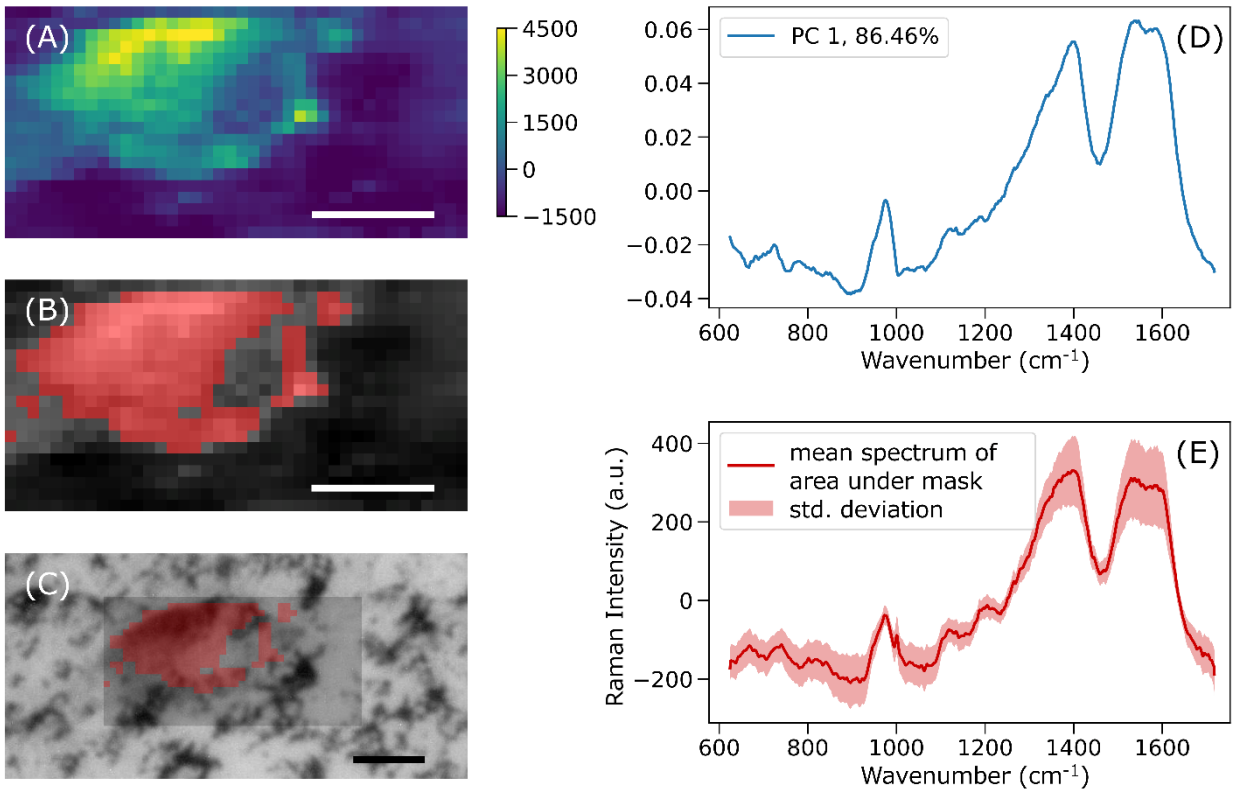

Figure S3. SERS mapping of B16-F10 cell. (**A**,**B**) 1st component in PCA decomposition (PC 1) score distribution. (**C**) White light image, scanning area is marked with light grey color. Red mask (**B**,**C**) corresponds to values (PC 1 score) above threshold calculated using Otsu's method. (**D**) PC 1 explaining 86.46% overall variance. (**E**) Mean spectrum of area under mask (**B**,**C**) with its standard deviation.

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