

Electronic Supplementary Information

Elucidation of ultraviolet radiation-induced cell responses and intracellular biomolecular dynamics in mammalian cells using surface-enhanced Raman spectroscopy

Sajanlal R. Panikkanvalappil^a, Steven M. Hira^a, and Mostafa A. El-Sayed^{a,b}*

^aLaser Dynamics Laboratory, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, Georgia 30332-0400, United States.

^bKing Abdulaziz University, Department of Chemistry, Jeddah 22254, Saudi Arabia.

Electronic Supplementary Information 1

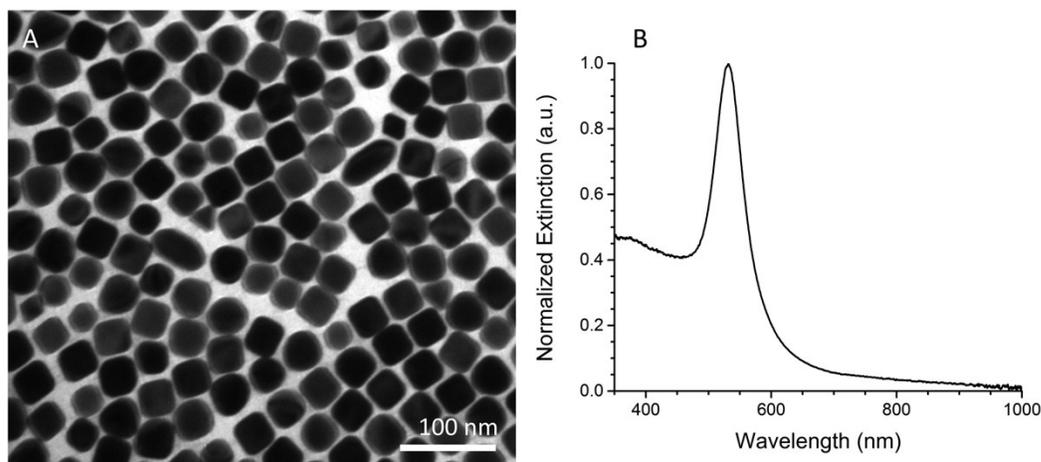


Figure S1. TEM image (A) and corresponding normalized extinction spectrum of AuNCs (B).

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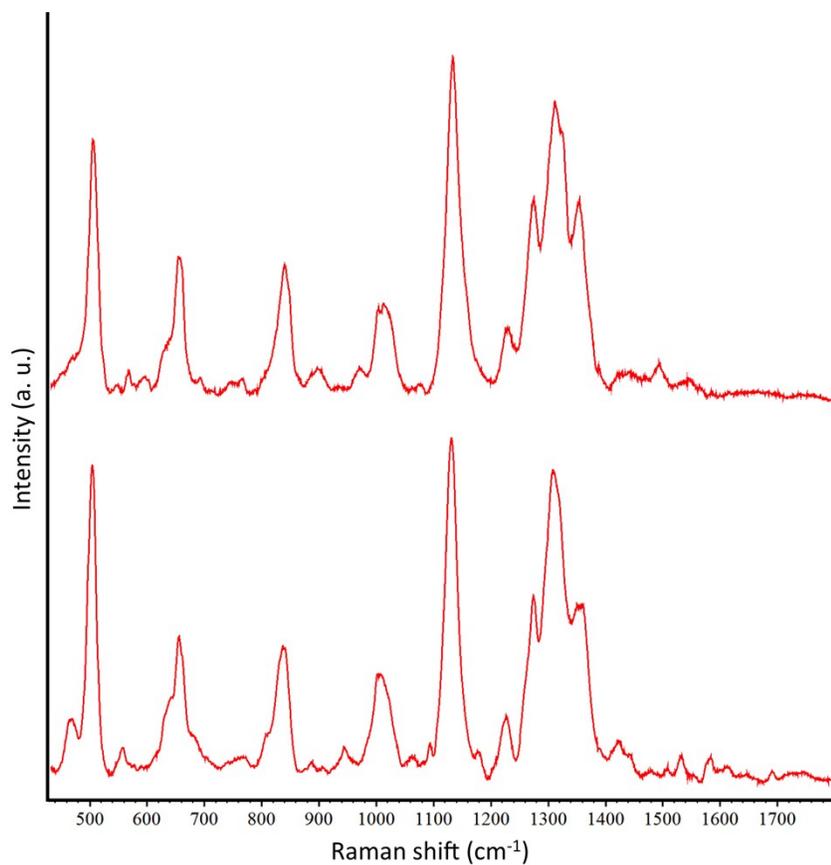


Figure S2. Initial SERS spectra collected from the same HSC-3 cell (G₁ phase) before UV light exposure (5 min interval).

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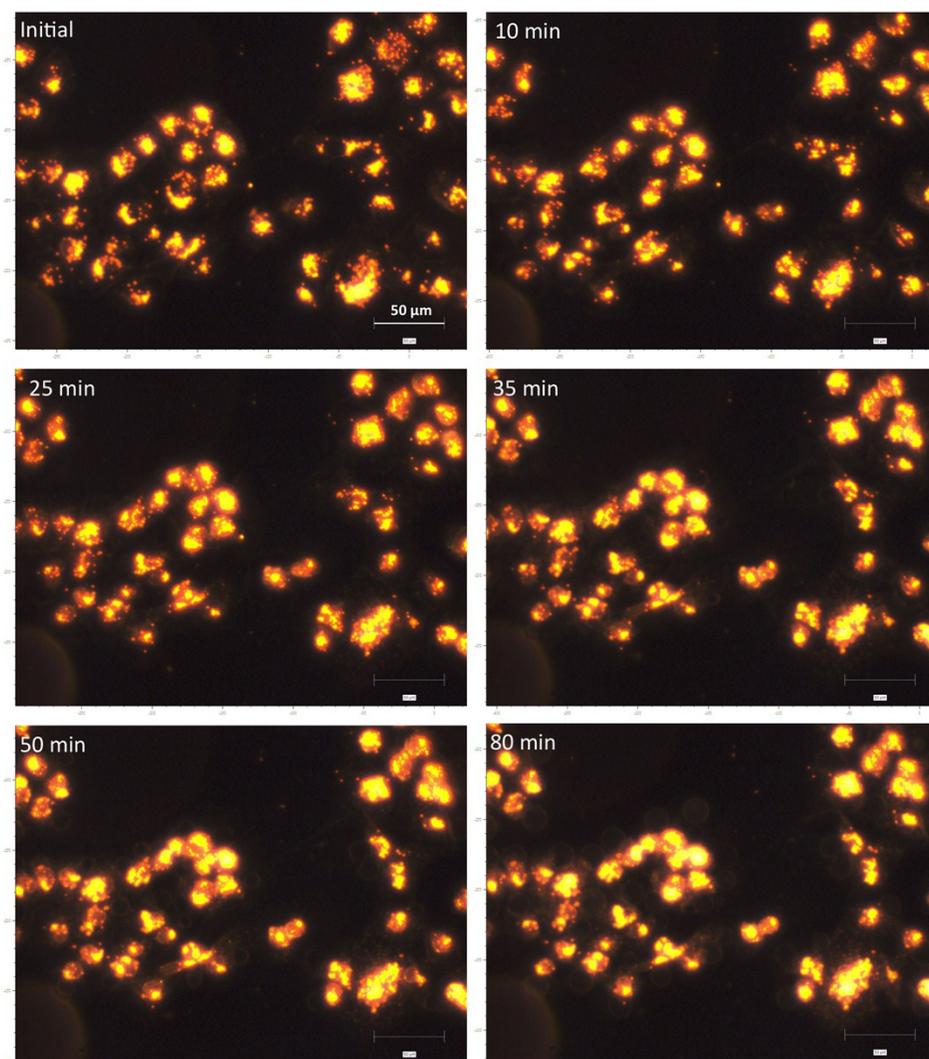


Figure S3. Time dependent DF images collected from a HSC-3 cell while being exposed to UV-C light (254 nm). Scale bar shown panel 1 (initial) applicable to all DF images.

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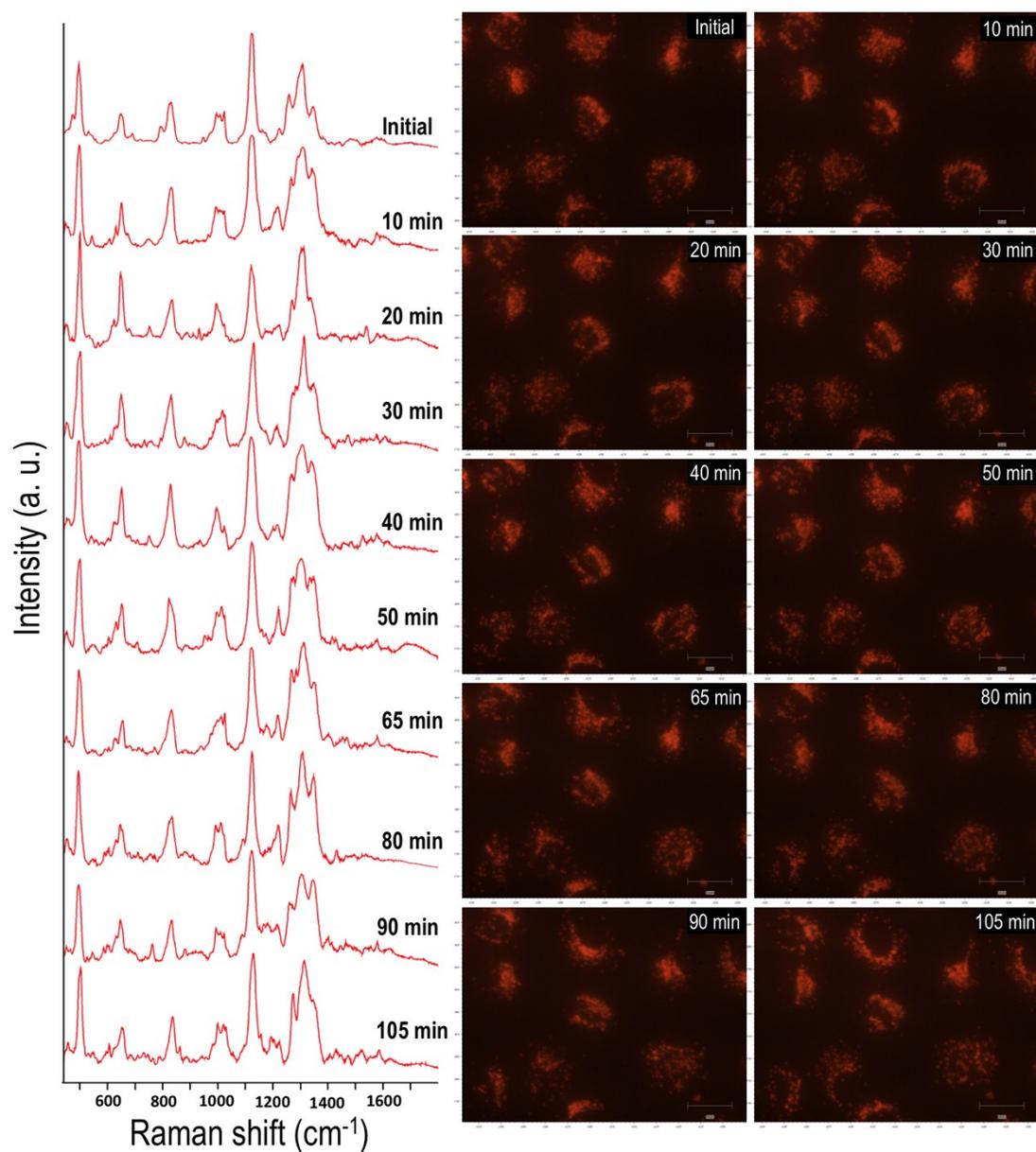


Figure S4. Time dependent SERS spectra collected from HSC-3 cells in absence of UV light. Corresponding DF microscopy images collected at respective time intervals are also given. The scale bars shown in the images are 20 μm .

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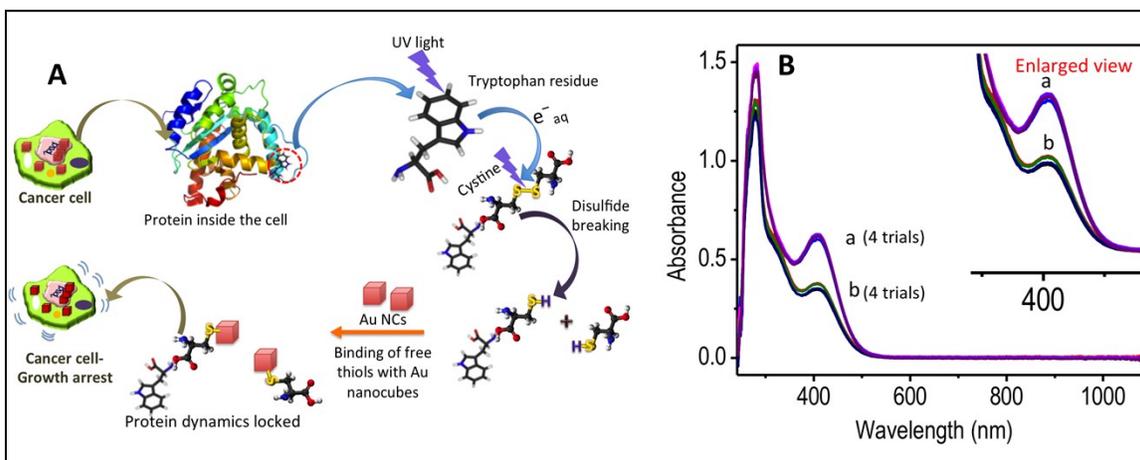


Figure S5. (A) Pictorial representation of the plausible mechanism of UV-light induced disulfide breaking inside cells and subsequent interactions of proteins with AuNCs. (B) UV-vis absorption spectra for (a) BSA + AuNCs solution centrifuged after 40 min. Subsequently, the supernatant was irradiated with UV light for 40 min and Ellman's reagent added to the supernatant. (b) BSA+AuNCs solution exposed to UV light for 40 min and Ellman's reagent added to the supernatant.

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Table S1. Assignment of bands in the SERS spectra		
Wavenumber (cm ⁻¹)	Component	Tentative assignments of SERS bands
495-510	Protein	-S-S-
620-660	Protein	-C-S-
800-850	Proteins and lipid	Tyrosine in proteins and C ₄ N ⁺ , O—C—C—N symmetric stretches in lipids
1000-1010	Protein	RB vibration of Phe
1012-1035	Protein	C-H in-plane bending mode of Phe and RB vibration of Trp
1100-1140	Lipid and protein	C-N vibration of proteins and Gauche and all-trans conformations of lipids
1200-1235	Protein	C ₆ H ₅ -C stretching vibrations of Phe and Try, amide III (β -pleated sheet)
1240-1255	Protein	Amide III (random coil)
1265-1300	Protein	Amide III (α -helix)
1300-1325	Lipid	-CH ₂ twist
1440-1460	Protein and lipid	CH ₂ bending mode of proteins and lipids along with methylene deformation
1584	Protein	Phe

RB=Ring breathing; Try=Tryptophan; Phe=Phenylalanine