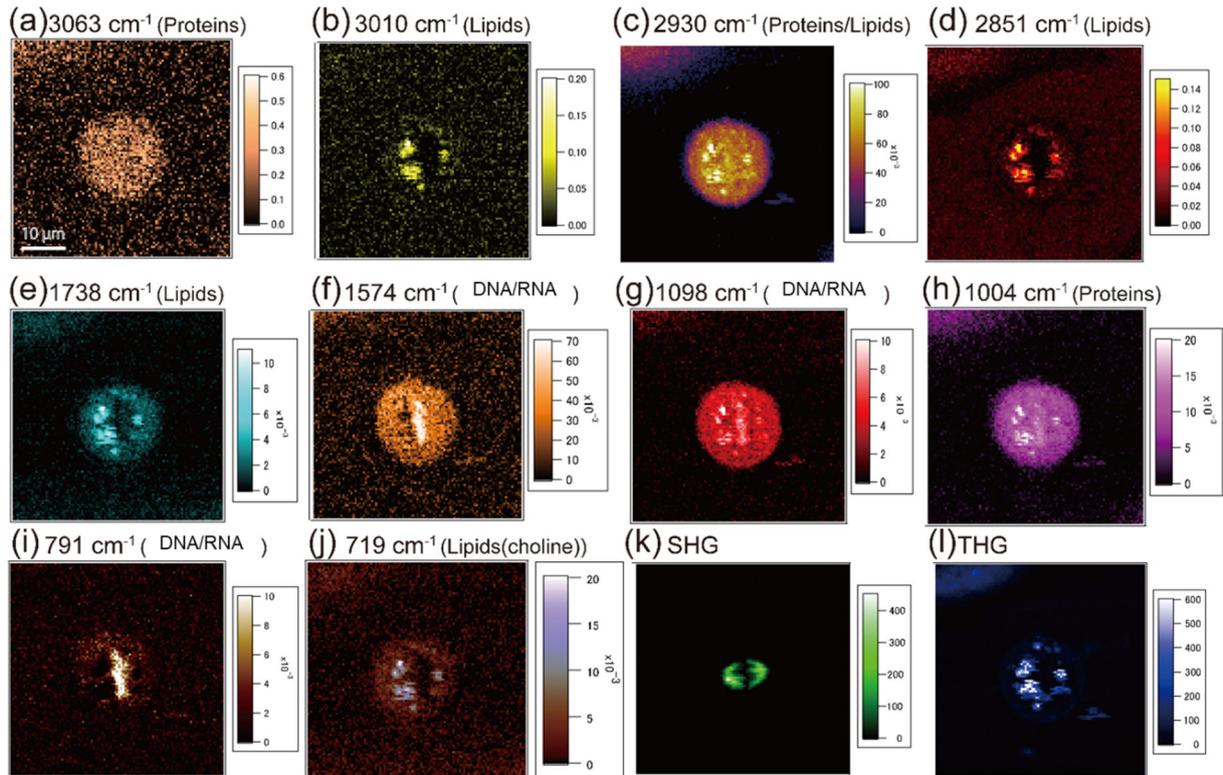
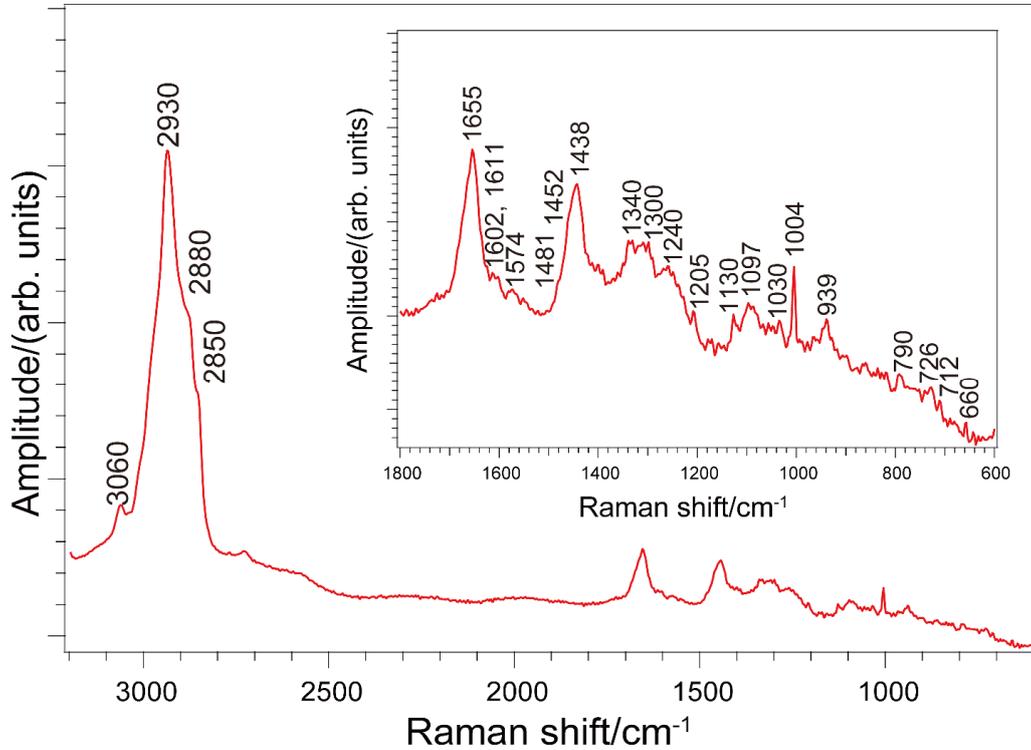




### 生細胞 (HeLa) の細胞内平均 CARS( $\text{Im}[\chi^{(3)}]$ ) スペクトル及びびイメージ





生細胞のラマンスペクトルに現れる典型的なラマンバンドとその帰属<sup>1-9</sup>

Typical Raman shift (cm <sup>-1</sup> )	Assignment	Main molecular components
3060	C-H stretch.(aromatic)	Proteins
3010	=C-H stretch.	Lipids
2930	CH <sub>3</sub> s-stretch.	Proteins/Lipids
2880	Overtone of CH <sub>3</sub> deform. in Fermi resonance with CH <sub>3</sub> s-stretch. / CH <sub>2</sub> a-stretch.	Proteins/Lipids
2850	CH <sub>2</sub> s-stretch.	Lipids
2580	S-H stretch.	Proteins
1741	C=O stretch. (ester)	Lipids
1655	cis C=C stretch./Amide I	Lipids/Proteins
1611	Tyr, Trp	Proteins
1602	Phe	Proteins
1574	Purine ring(A and G)	DNA & RNA
1481	Purine ring(A and G)	DNA & RNA
1452	CH <sub>3</sub> deg. deform.	Proteins
1438	CH <sub>2</sub> scis.	Lipids
1376	T, A, and C	DNAs
1340	CH deform.	Proteins
1335	Purine ring(A and G)	DNA & RNA
1300	CH <sub>2</sub> twist.	Lipids
1260	=C-H bend.	Lipids
1240	Amide III	Proteins
1205	C-C <sub>6</sub> H <sub>5</sub> (phenyl ring) stretch.	Proteins
1130	Skeletal C-C( <i>trans</i> ) stretch.	Lipids
1097	PO <sub>2</sub> <sup>-</sup> stretch.	DNA & RNA
1084	Skeletal C-C( <i>gauche</i> ) stretch.	Lipids
1063	Skeletal C-C( <i>trans</i> ) stretch.	Lipids
1030	In-plane phenyl ring deform.	Proteins
1004	Phenyl ring breath.	Proteins
939	C-C	Proteins
892	C <sub>2</sub> -C <sub>1</sub> ( <i>trans</i> ) stretch./CH <sub>3</sub> rock.	Lipids
876	C <sub>2</sub> -C <sub>1</sub> ( <i>gauche</i> ) stretch./CH <sub>3</sub> rock.	Lipids
790	Pyrimidine ring(C, T, and U)/ bk.(O-P-O)	DNA & RNA
726	CH <sub>2</sub> rock.	Lipids
719	Head group (choline (H <sub>3</sub> C)N <sup>+</sup> sym. stretch.) of phosphatidylcholine	Lipids
709	cholesterol	Lipids
660	C-S stretch.	Proteins

Abbreviations: stretch.: stretching; deform.: deformation; rock.: rocking; twist.: twisting; scis.: scissors; bend.: bending; sym. or s- symmetric; anti. or a- antisymmetric; deg.: degenerate; breath.: breathing; bk.: DNA backbone; A: adenine; C: cytosine; G: guanine; T: thymine; U: uracil; Phe: phenylalanine; Trp: tryptophan; Tyr: tyrosine.

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