Electronic Supplementary Material (ESI) for Analyst.
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-Supporting Information-

Study on biochemical mechanisms of micro-wave ablation on lung cancer by *ex vivo* confocal Raman microspectral imaging

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 # Equal Contribution

The H&E microscopic image of paracancerous tissue

Before single spectral measurement, our clinical partners helped us to identify the area of cancerous and paracancerous tissue in both frozen and H&E stained tissue section. For the cancerous tissue, it exhibited a high-degree tissue density in frozen tissue section with the aggregation of irregular cell nucleus in H&E stained tissue sections. But for paracancerous tissue, it exhibited an incompact tissue structure in frozen tissue section and non-evidential cancer presented in H&E stained tissue sections. As shown in Fig. S1, which is corresponding to the upper red box of Fig.1 A (a), the pathological features of paracancerous tissue in Pre-MWA group is presented. As shown in Fig.S2, which is corresponding to the left red box of Fig.1B(a), the pathological features of paracancerous tissue in Post-MWA group is presented. Guided by them, we acquired some featured spectra of paracancerous tissue to address the MWA induced biochemical changes in paracancerous tissue.

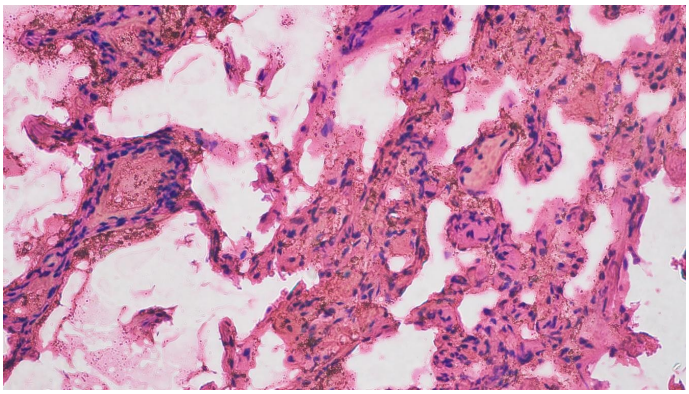

Fig.S1 Microscopic image of paracancerous tissue in Post-MWA group

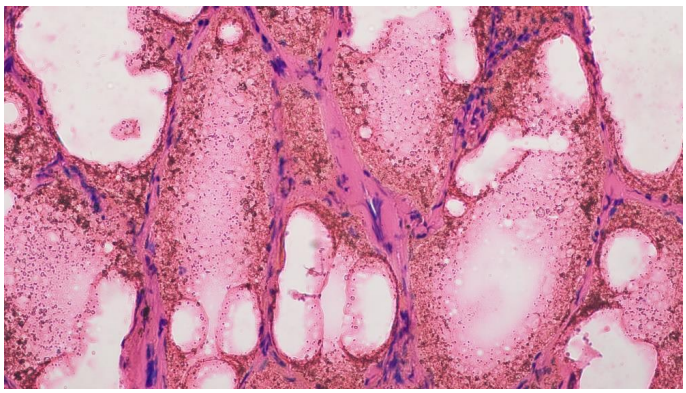

Fig.S2 Microscopic image of paracancerous tissue in Post-MWA group

The hierarchical cluster dendrogram of cluster analysis

By using WITec system in our study, the hierarchical cluster analysis cannot be adopted with the data processing software (WITec project 4). Therefore, we can't get any hierarchical cluster dendrogram for further description. However, with the reference of Maritin. H.,'s work[1], we adopted his analysis method and software (http://hyperspec.r-forge.r-project.org) to achieve the hierarchical cluster dendrogram for support the cluster analysis results, as shown in Fig.S3 and S4.

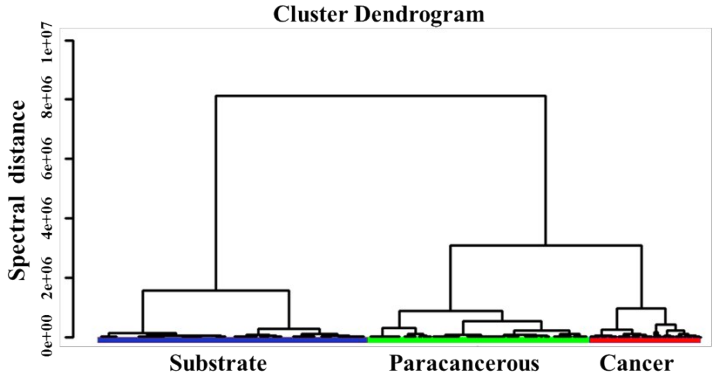

Fig. S3: The hierarchical cluster dendrogram of Pre-MWA group

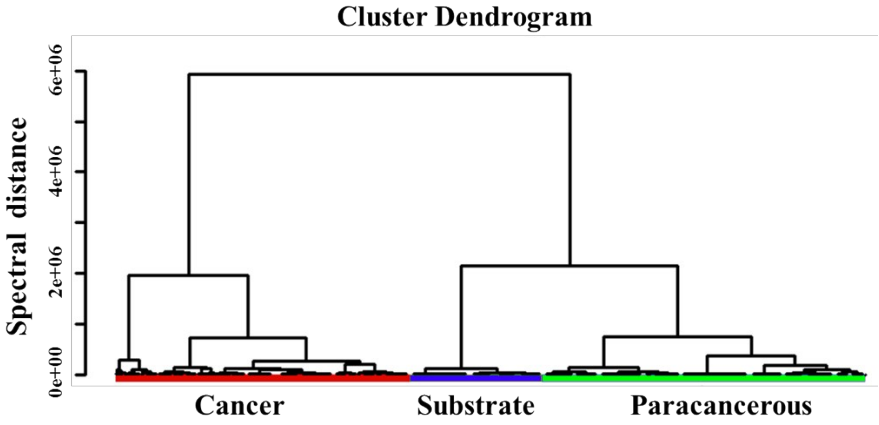

Fig. S4: The hierarchical cluster dendrogram of Pre-MWA group

Reference:

[1] Hedegaard, Martin A B, et al. "Spectral unmixing and clustering algorithms for assessment of single cells by Raman microscopic imaging." Theoretical Chemistry

Accounts (2011): 1249-1260.