# Supplementary Material

# Use of Raman spectroscopy to detect rat lung tissues to distinguish asphyxia from sudden cardiac death

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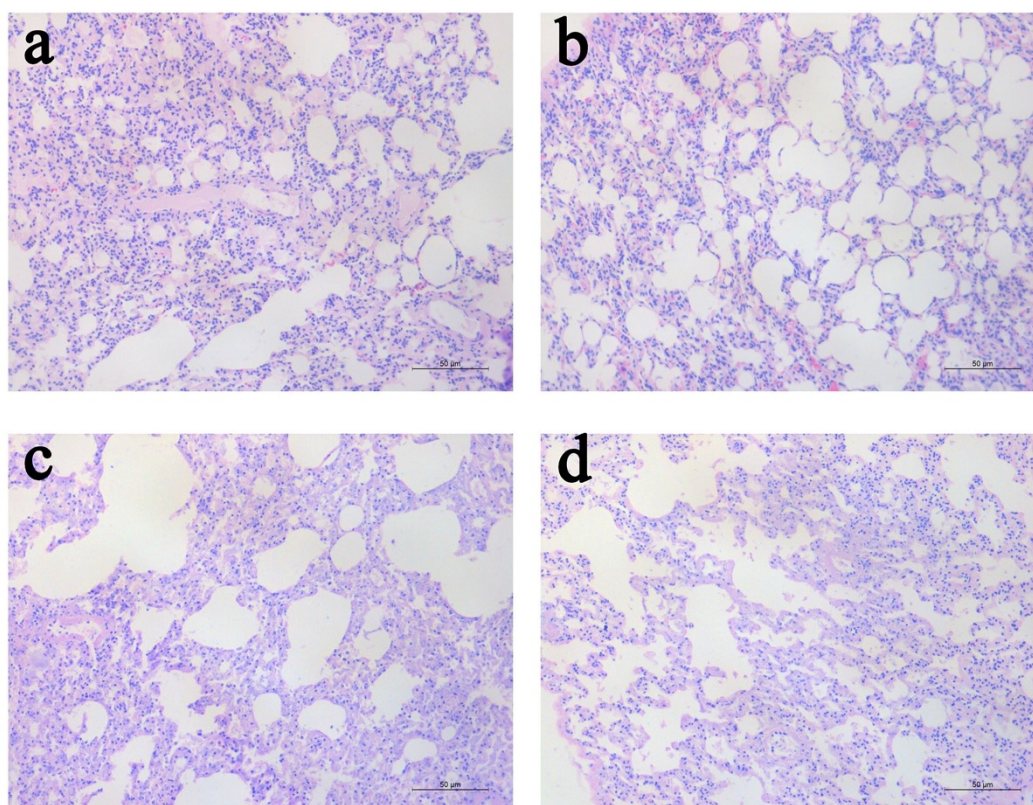
**Supplementary Figures**



**Fig. S1** Optical images (10× objective and a 10× eyepiece) of HE stained lung tissues of rats died from asphyxia and SCD. (a) asphyxia group, collected immediately after death. (b) SCD group, collected immediately after death. (c) asphyxia group, collected 24 h after death. (d) SCD group, collected 24 h after death. It can be found that it is impossible to distinguish asphyxia from SCD by morphological observation under the microscope, either for fresh or decomposed lung tissues, because there are no specific morphological changes.
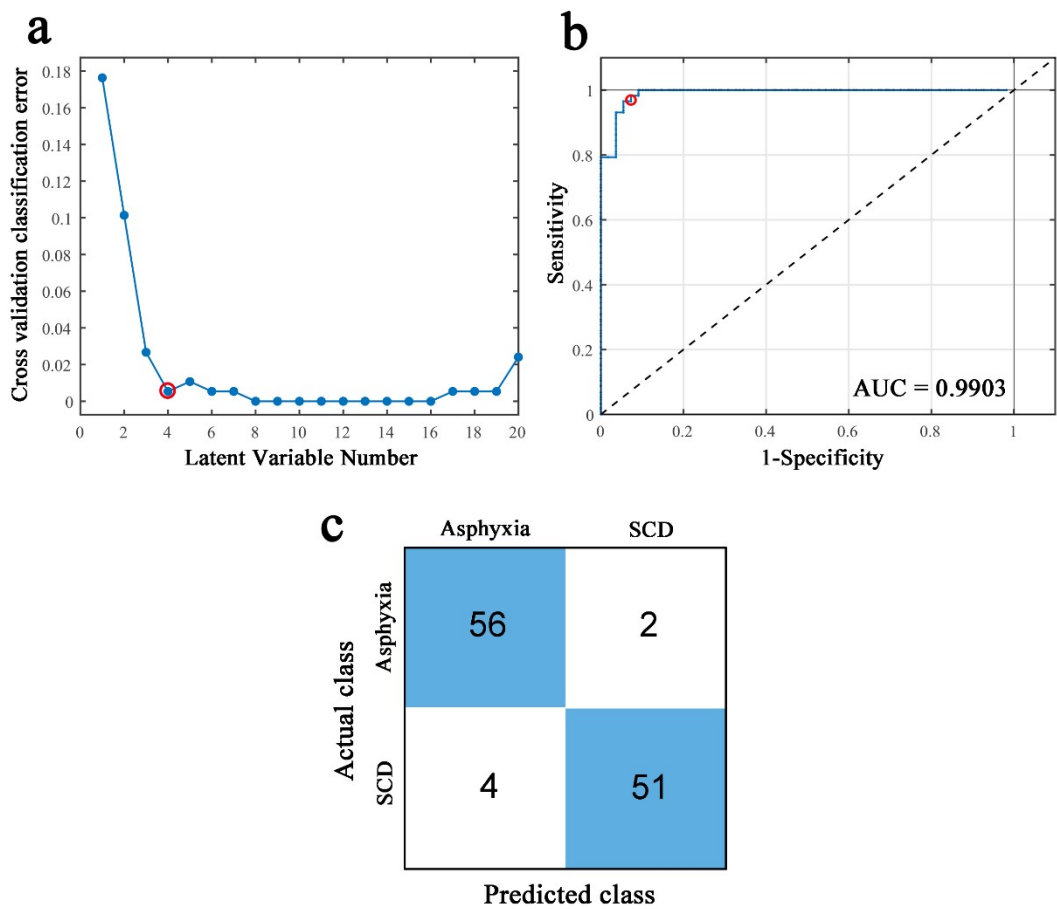
**Fig. S2** (a) The plot of the classification error rate versus the number of LVs for the PLS-DA model. (b) The result of ROC curve analysis, where the area under the curve (AUC) is 0.9903. (c) The confusion matrix of external validation in the PLS-DA model, where the accuracy is 0.9469. SCD: sudden cardiac death.
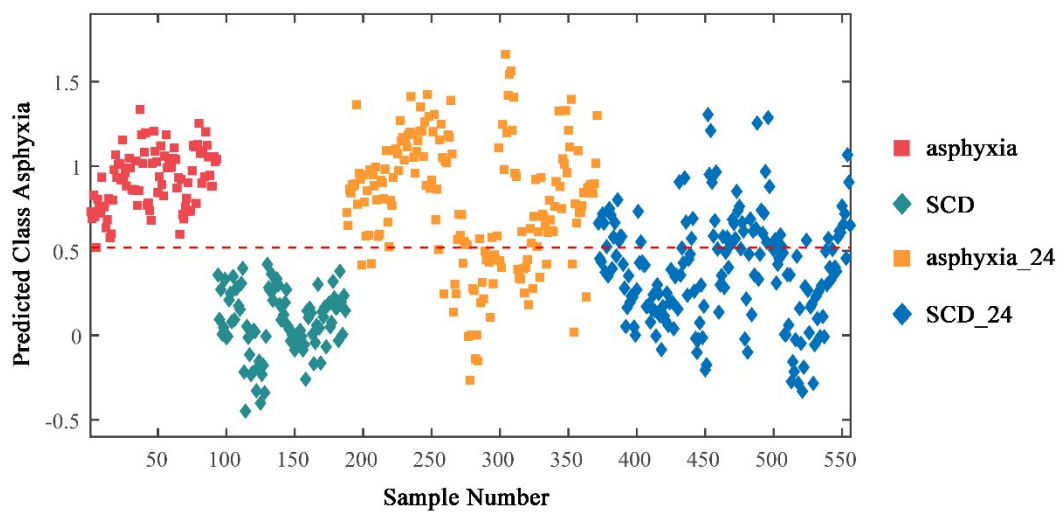


**Fig. S3** Classification results of decomposed lung tissues in the PLS-DA model built with fresh lung

tissues. The classification model built with fresh tissue samples was used to try to distinguish the spectra of decomposed tissue samples (collected at 24 h after death), but the performance is not satisfactory. SCD: sudden cardiac death.
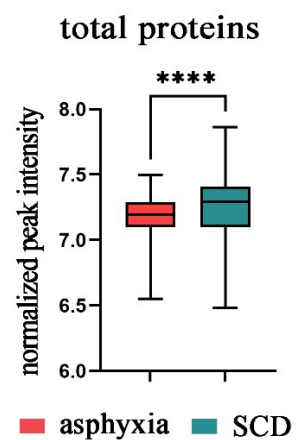
## total proteins



**Fig. S4** The comparison of total protein content in the lung tissues between the two causes of death, represented by the sum of the intensities of peaks at 1637 cm$^{-1}$, 1558 cm$^{-1}$, and 1230 cm$^{-1}$. SCD: sudden cardiac death.