

Supplementary Figure Captions

Supplementary Figure 1. Extracted positive ion MALDI images of DPPC (m/z 734.6) (A) and (B) SAPC (m/z 810.6) from an agarose inflated, FFPE mouse lung. (C) Modified Giemsa stain of the same agarose inflated, FFPE mouse lung. Extracted positive ion MALDI images of DPPC (m/z 734.6) (D) and (E) SAPC (m/z 810.6) from an agarose inflated, OCT embedded mouse lung. (F) Modified Giemsa stain of the same agarose inflated, OCT embedded mouse lung.

Supplementary Figure 2. Positive ion MALDI CID spectra of (A) DPPC (m/z 734.6), (B) POPC (m/z 760.6), (C) PAPC (m/z 782.6), (D) PDoPC (m/z 806.6), and (E) SM(d18:1/16:0)+Na (m/z 725.6) from a section of mOCT inflated and embedded mouse lung.

Supplementary Figure 3. Negative ion electrospray CID spectra of (A) DPPC (m/z 718.6), (B) POPC (m/z 744.6), (C) PAPC (m/z 766.6) and (D) PDoPC (m/z 790.6), which are the $[M-CH_3]^-$ of selected PC ions from the Bligh Dyer extract of a homogenized mouse left lung.

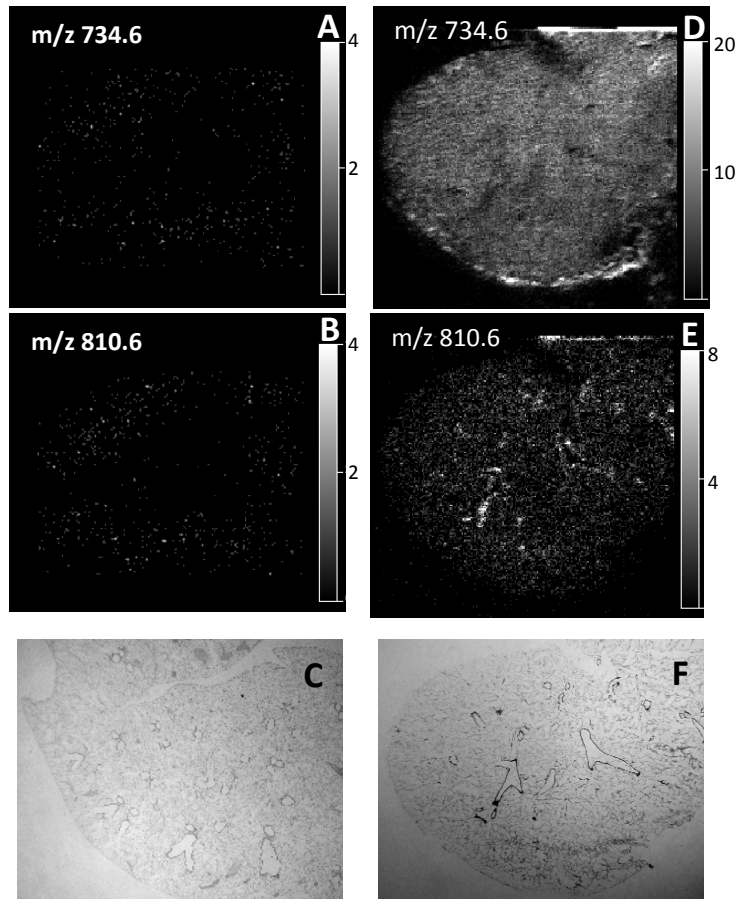
Supplementary Figure 4. Extracted positive ion MALDI images of (A) PMPC (m/z 706.6), (B) PPOPC (m/z 732.6), and (C) SAPC (m/z 810.6) from a mOCT inflated and

embedded mouse lung section. (D) Modified Giemsa stain of the same lung after MALDI imaging.

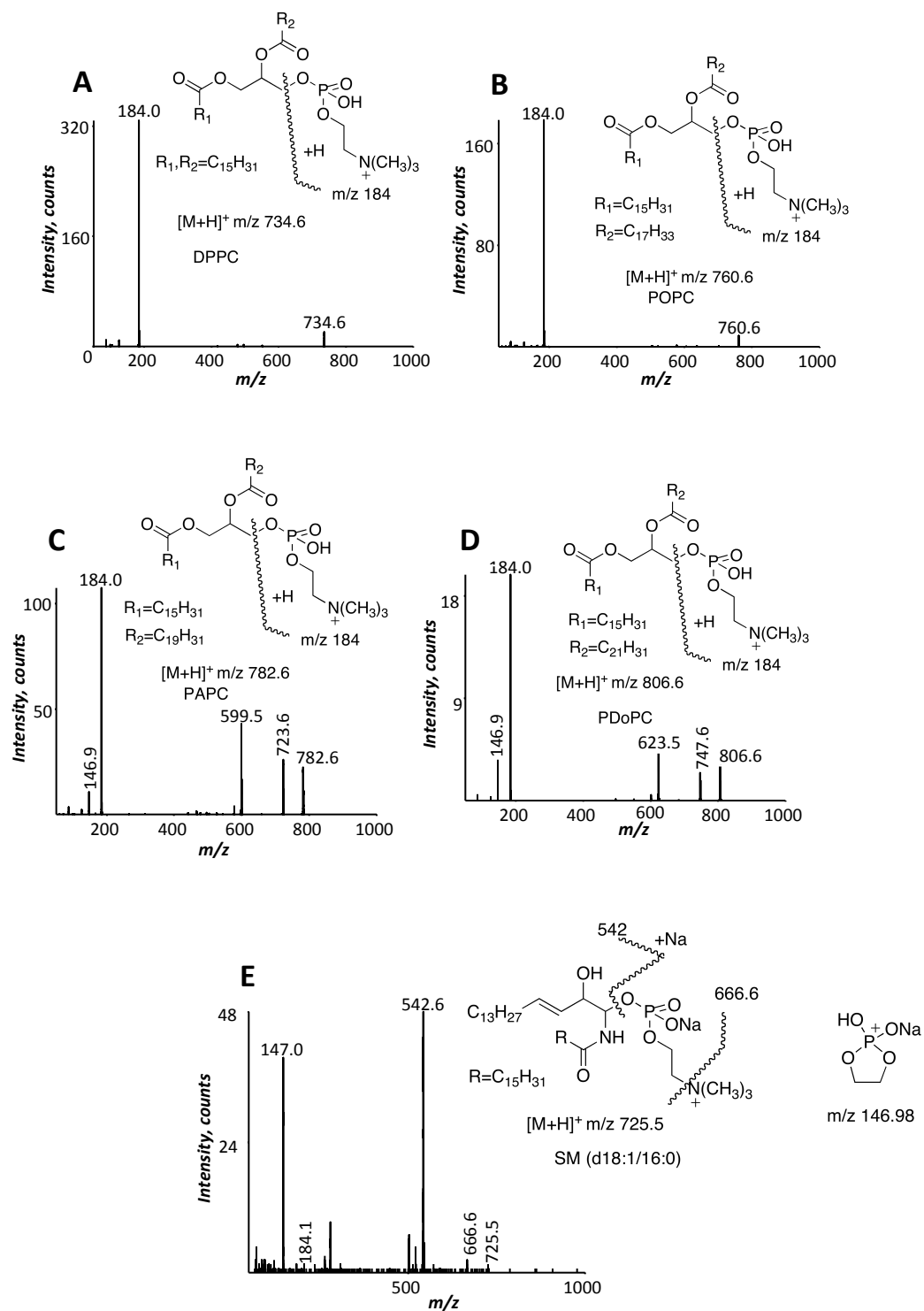
Supplementary Figure 5. (A) Modified Giemsa stain of a section of a mOCT inflated and embedded mouse lung. Positive ion MALDI image of PAPC (m/z 782.6) (B) and sodiated SM(d18:1/16:0) (m/z 725.6) (C). (D) Enlargement of the boxed part of the modified Giemsa stain in panel A. (E) Merged positive ion MALDI image of PAPC (green) and SM(d18:1/16:0)+Na (red) from the boxed in area in panel A. (F-J) Increasingly magnified images of an adjacent tissue section illustrating the localization of airways by acetylated tubulin (ACT, green), blood vessels by thrombomodulin (TM, red) and cell nuclei by DAPI (blue).

Supplementary Figure 6. Negative ion MALDI CID spectra of (A) POPG (m/z 747.6), (B) SOPS (m/z 788.6), (C) SAPE (m/z 766.6), and (D) SAPI (m/z 885.6) from a section of a mOCT inflated and embedded mouse lung.

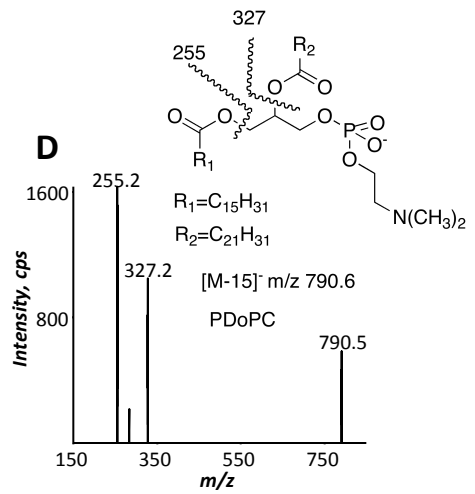
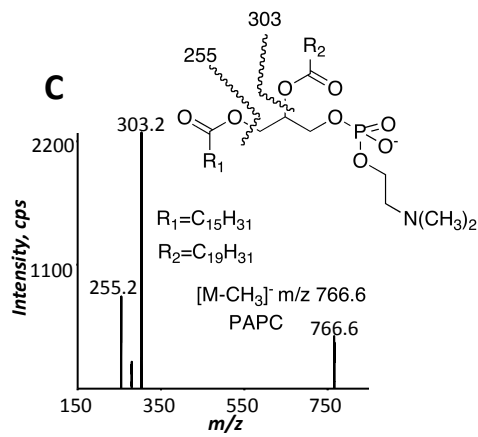
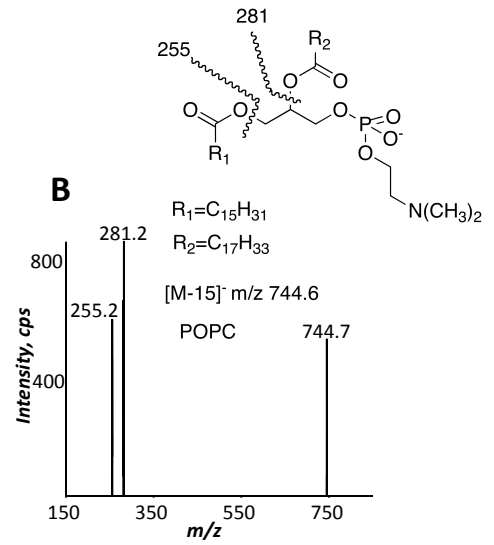
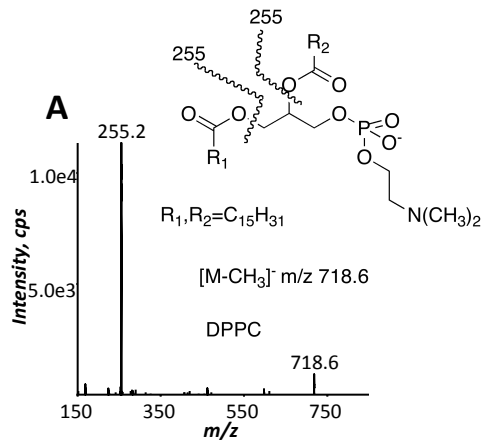
Supplementary Figure 7. Extracted negative ion MALDI images of (A) PLPC (m/z 745.6), (B) SAPS (m/z 810.6), (C) HAPE (m/z 722.6), and (D) PAPI (m/z 857.6) from a mOCT inflated and embedded mouse lung section. (E) Modified Giemsa stain of the same lung after MALDI imaging.

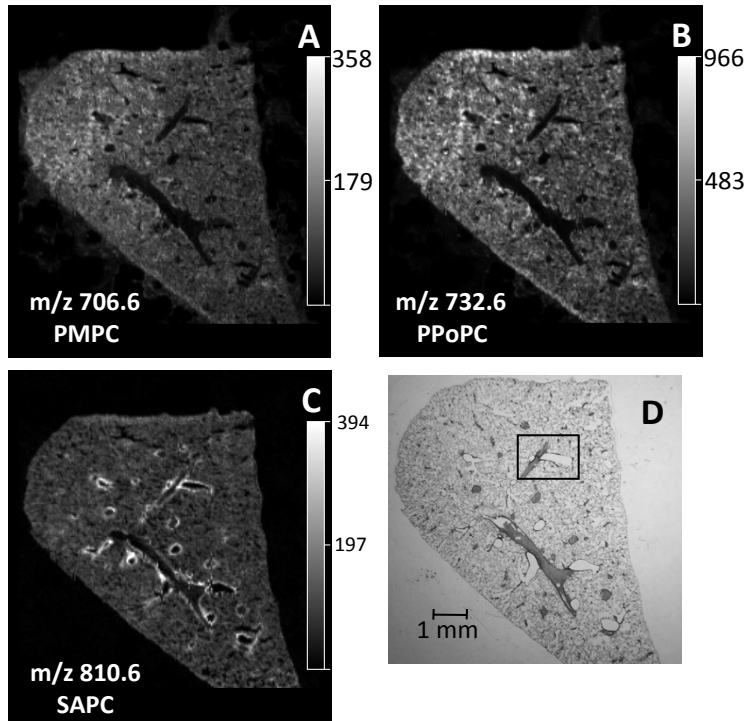


supplementary Figure 1

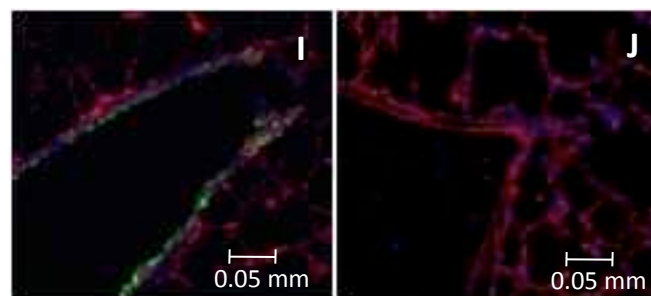
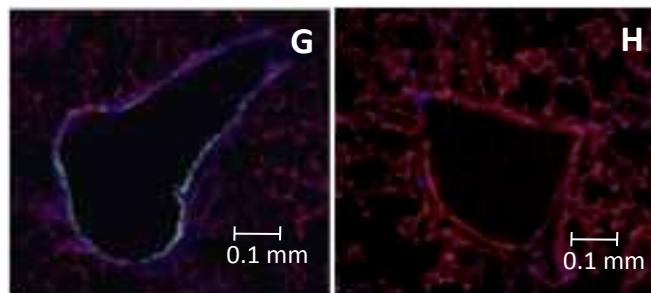
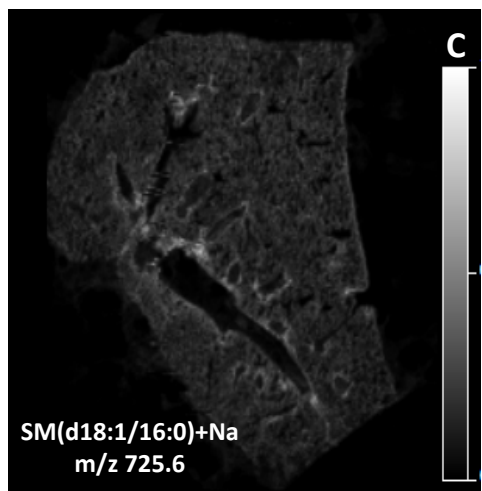
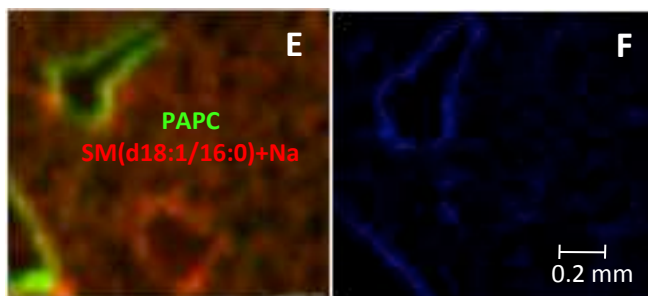
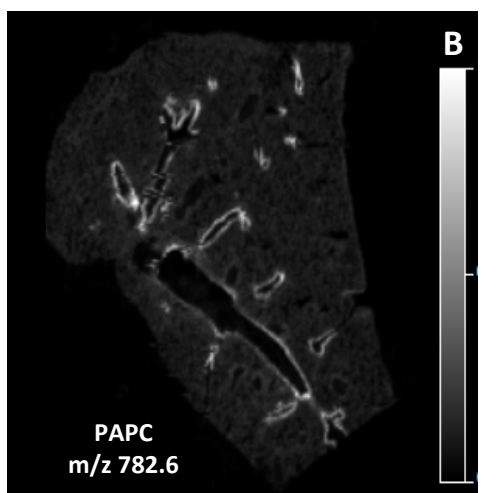
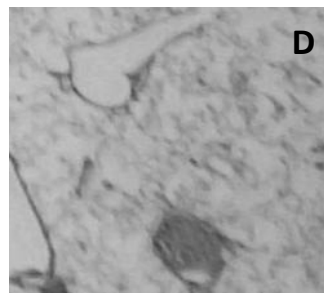
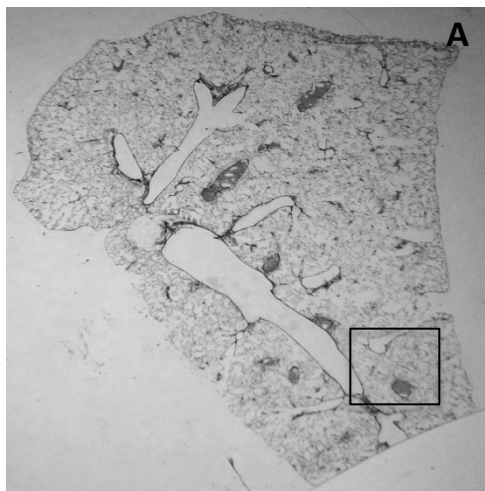


supplementary Figure 2





supplementary Figure 4



supplementary Figure 5

