

Supplementary Figure Legends

Supplementary Figure 1: Representative collision induced dissociation (CID) spectra from each class of lipid observed in the MALDI imaging experiments including (A) $[M+Na]^+$ of TAG(52:2) (m/z 881.8), (B) $[M+Na]^+$ of PC(34:1) (m/z 782.6) (C) $[M+H-H_2O]^+$ of Cer(d18:1/18:0) (m/z 548.5), (D) $[M-H]^-$ of PI(18:0/20:4) (m/z 885.6), (E) $[M-H]^-$ of PE(P-18:1/18:1) (m/z 726.7), and (F) $[M-H]^-$ of PS(18:0/22:6) (m/z 834.6).

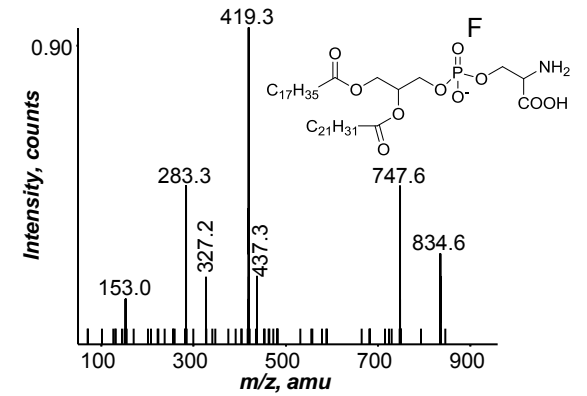
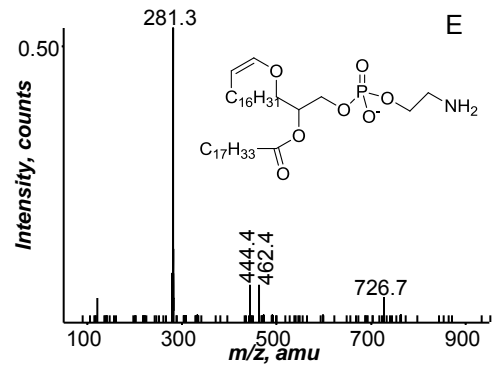
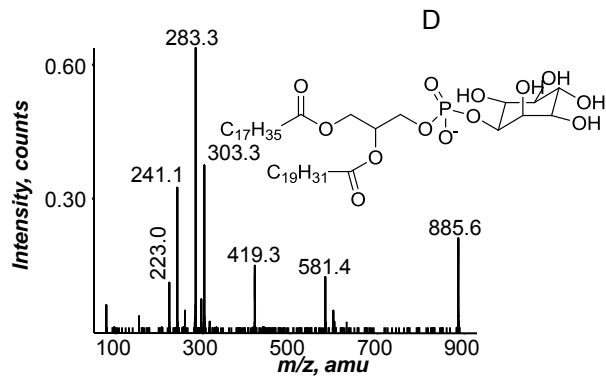
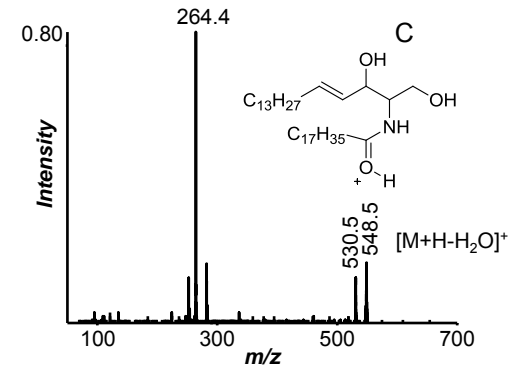
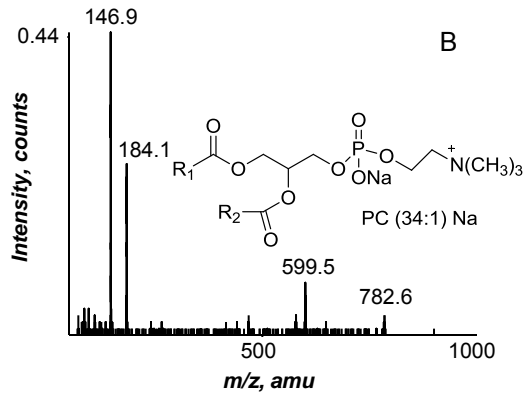
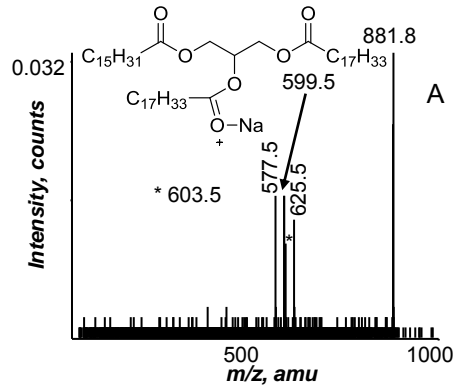
Supplementary Figure 2: Extracted positive ion MALDI images of the (A) $[M+Na]^+$ of PC(38:4) at m/z 832.6, (B) $[M+Na]^+$ of SM(d18:1/16:1) at m/z 723.6, (C) $[M+Na]^+$ of PC(32:0) at m/z 756.6, (D) $[M+H]^+$ of PC(34:1) at m/z 760.6, (E) $[M+H]^+$ of PC(36:1) at m/z 788.6, (F) $[M+H]^+$ of PC(40:6) at m/z 834.6, and (G) $[M+Na]^+$ of PC(38:6) at m/z 828.6.

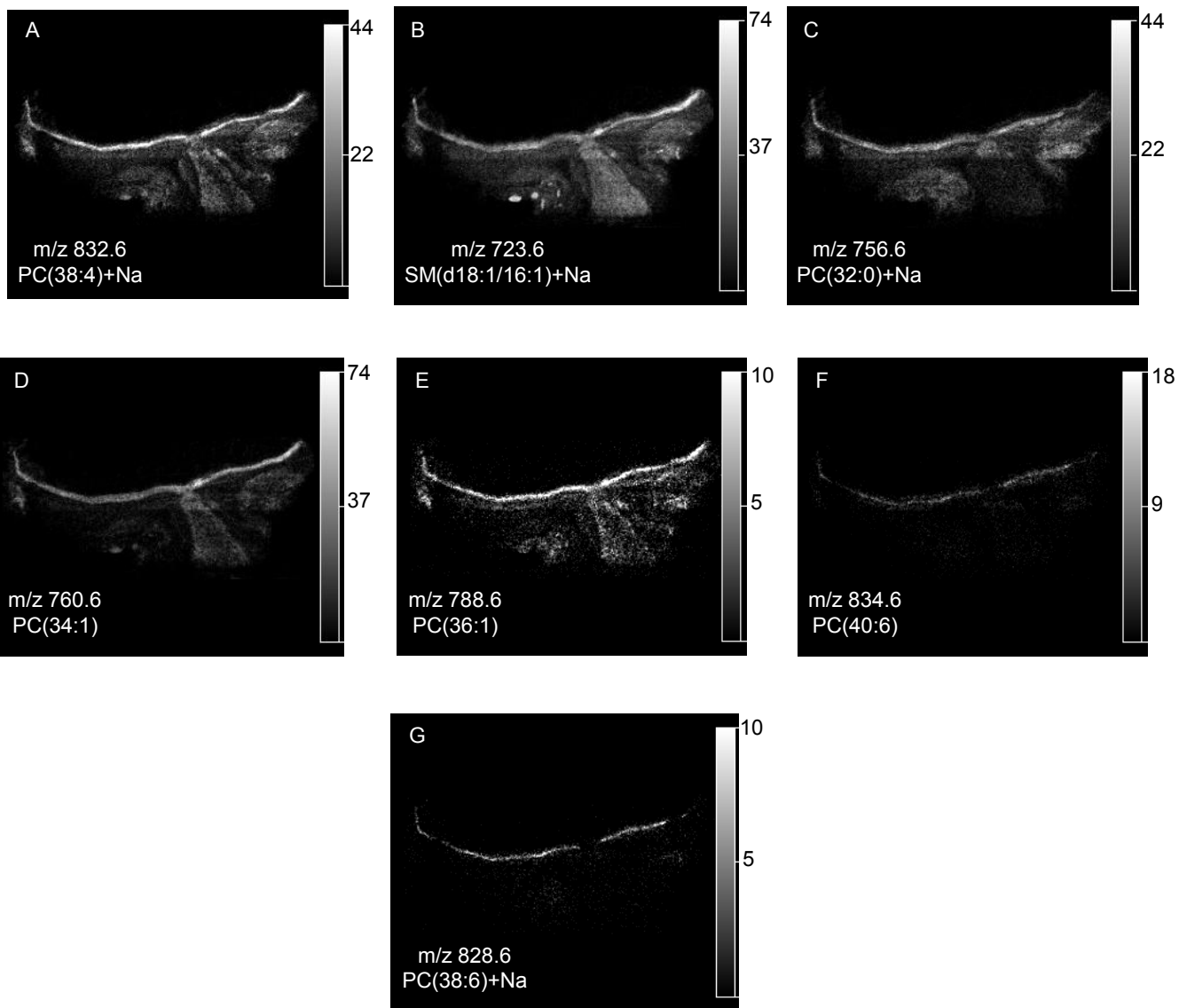
Supplementary Figure 3: (A) Negative ion MALDI mass spectrum of PC(16:0/18:1) standard with DHAP matrix. (B) Negative ion CID of m/z 910.7, which is $[M-H]^-$ of the DHAP adduct of PC(16:0/18:1).

Supplementary Figure 4: Extracted negative ion MALDI images of the (A) $[M+H]^-$ of PS(18:0/18:1) at m/z 788.5, (B) $[M+H]^-$ of PS(18:0/20:4) at m/z 810.5, (C) $[M+H]^-$ of PE(P-16:0/18:1) at m/z 700.5, (D) $[M+H]^-$ of PE(P-18:0/18:1) at m/z 728.5, (E) $[M+H]^-$ of ST(18:0/h24:1) at m/z 904.7, (F) $[M+H]^-$ of ST(18:0/24:1) at m/z 888.7, (G) $[M+H]^-$ of PE(P-18:0/20:4) at m/z 750.5, (H) $[M+H]^-$ of PE(18:0/20:4) at m/z 766.5, and (I) $[M+H]^-$ of PE(16:0/22:6) at m/z 762.5.

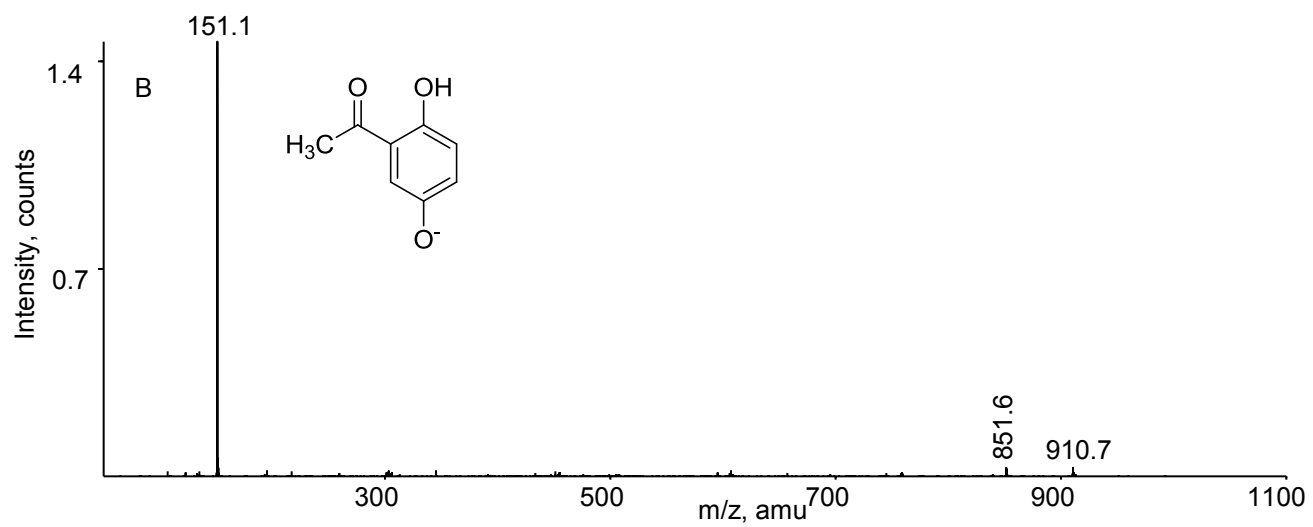
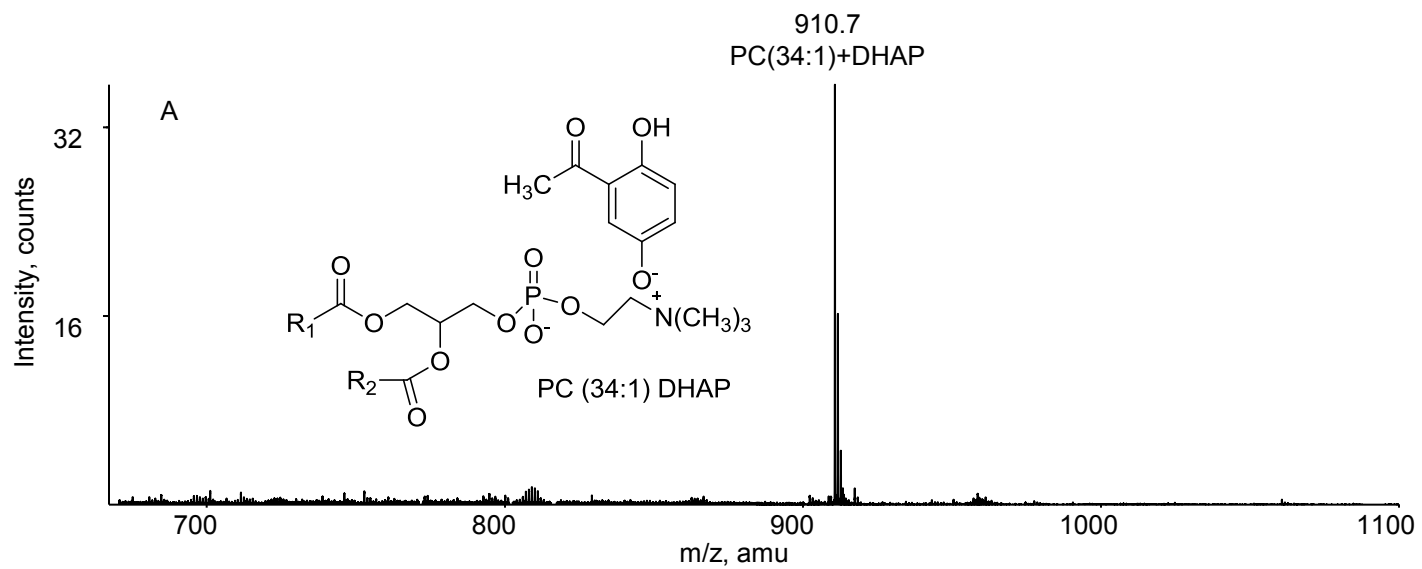
Supplementary Figure 5: Extracted positive ion MALDI images of ions originating from the embedding compound at (A) m/z 909.3, (B) m/z 951.3, (C) m/z 1009.3, and (D) m/z 1067.3 and

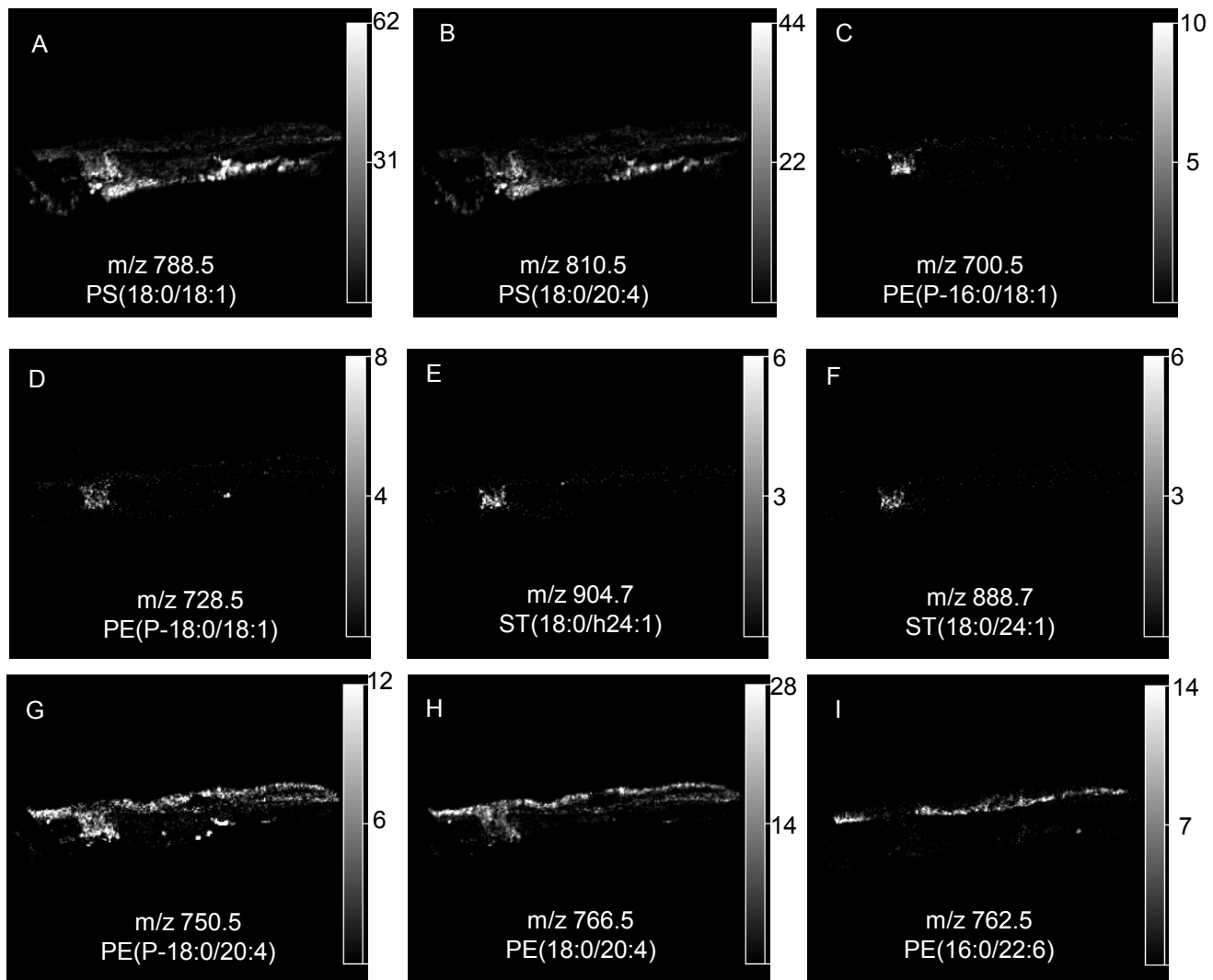
from the $[M+Na]^+$ of (E) PC(54:12) at m/z 1040.7, (F) PC(54:11) at m/z 1042.7, and (G) PC(54:10) at m/z 1044.7.





Supplementary
Figure 2





Supplementary
Figure 4

