

# Supplementary Material

## Characterizing the Natural History of Acute Radiation Syndrome of the Gastrointestinal Tract: Combining high mass and spatial resolution using MALDI-FTICR-MSI

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**Figure 1.** Probabilistic latent semantic analysis (pLSA) score images showing 7 components from the control (A) and irradiated samples taken from each day post-IR, B-F for days 4-21 respectively.

**Figure 2.** MALDI-MS images of PE's and PI's localized to the crypt-villi axis in control and at days 4, 8, 11, 15 and 21 post-exposure.

**Figure 3.** MALDI-MS images of glycosphingolipids mapped to the villi epithelium in control and days 4, 8, 11, 15 and 21 post-irradiation.

**Figure 4.** MALDI-MS images of PL's localized to the lamina Propria and muscularis externa in the control and at days 4, 8, 11, 15, and 21 post-exposure.

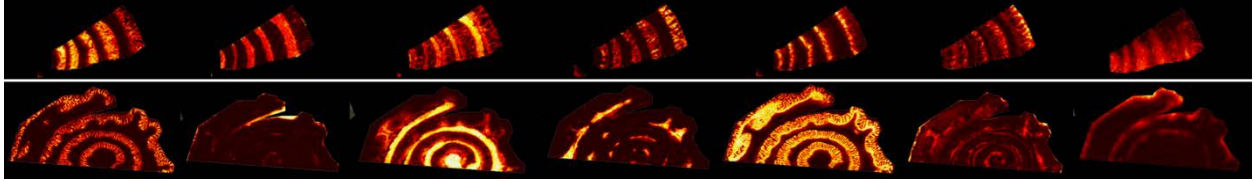
**Figure 5.** MALDI-MS images of cardiolipins detected in the jejunum of control and irradiated animals taken at days 4, 8, 11, 15 and 21 post-exposure.

**Figure 6.** MALDI-MS images of GSLs detected in the jejunum of control and irradiated animals taken at days 4, 8, 11, 15 and 21 post-exposure.

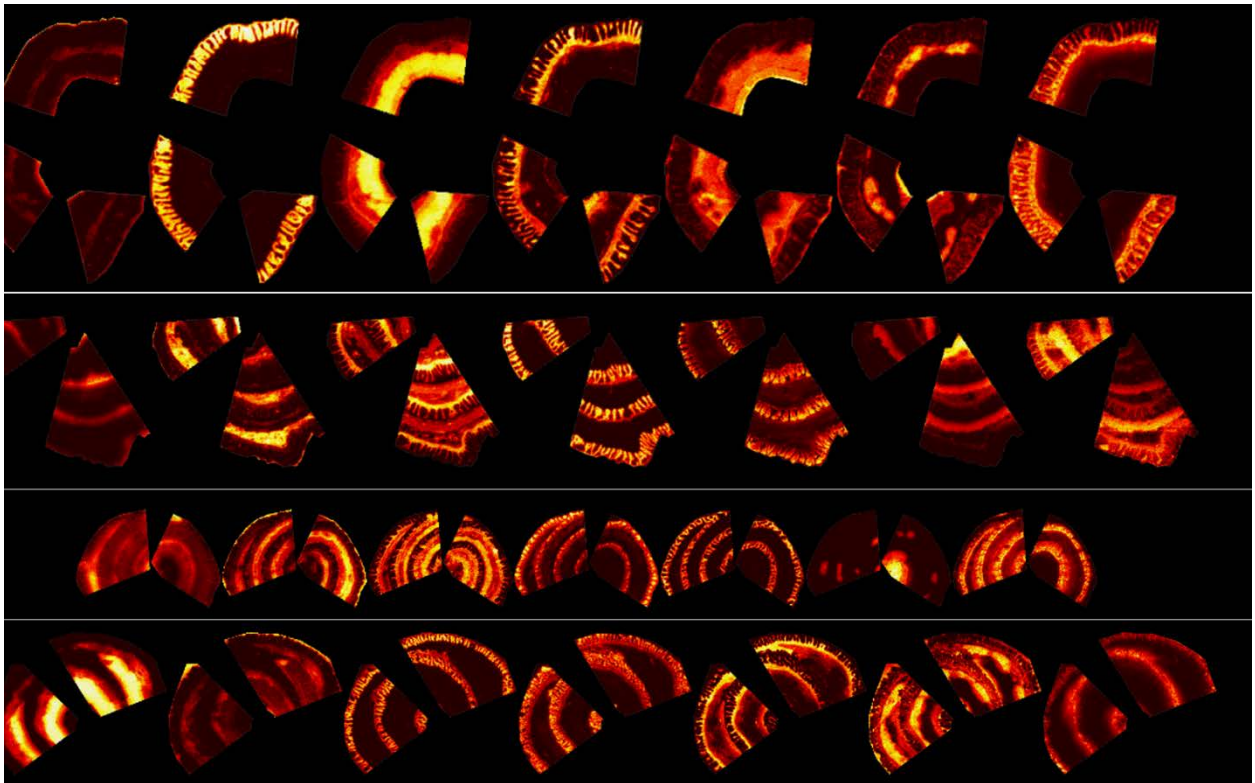
**Table 1.** Ki67 IHC staining protocol.

**Table 2.** CD 13 IHC staining protocol.

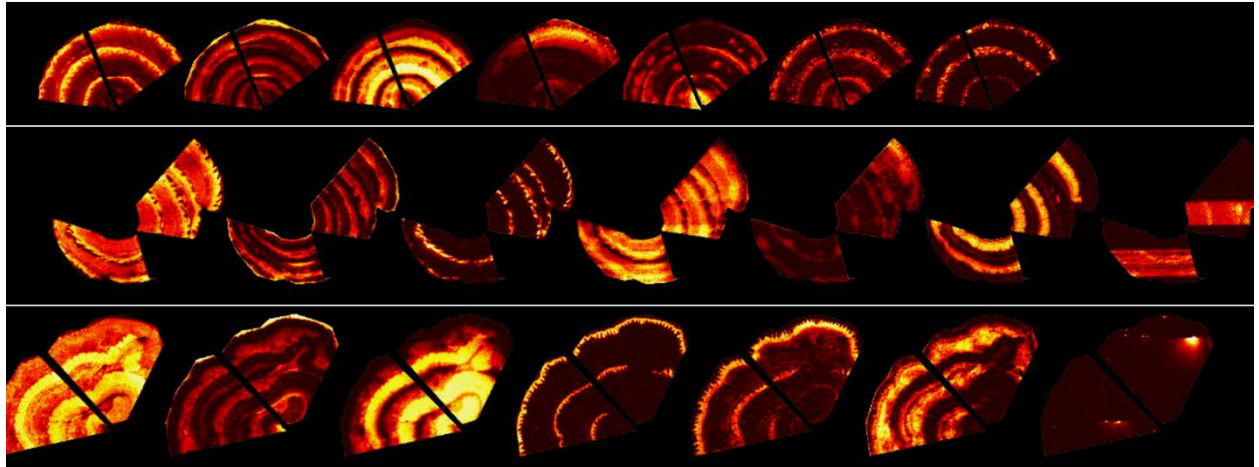
A) Control



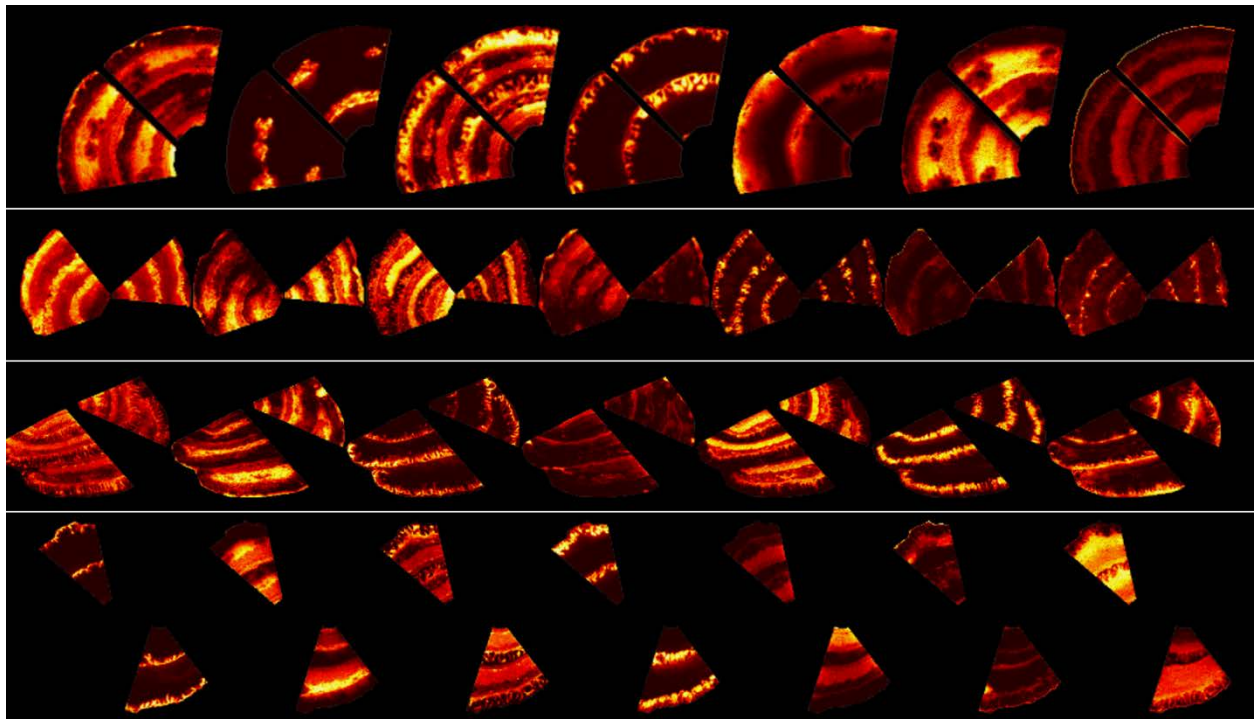
B) Day 4



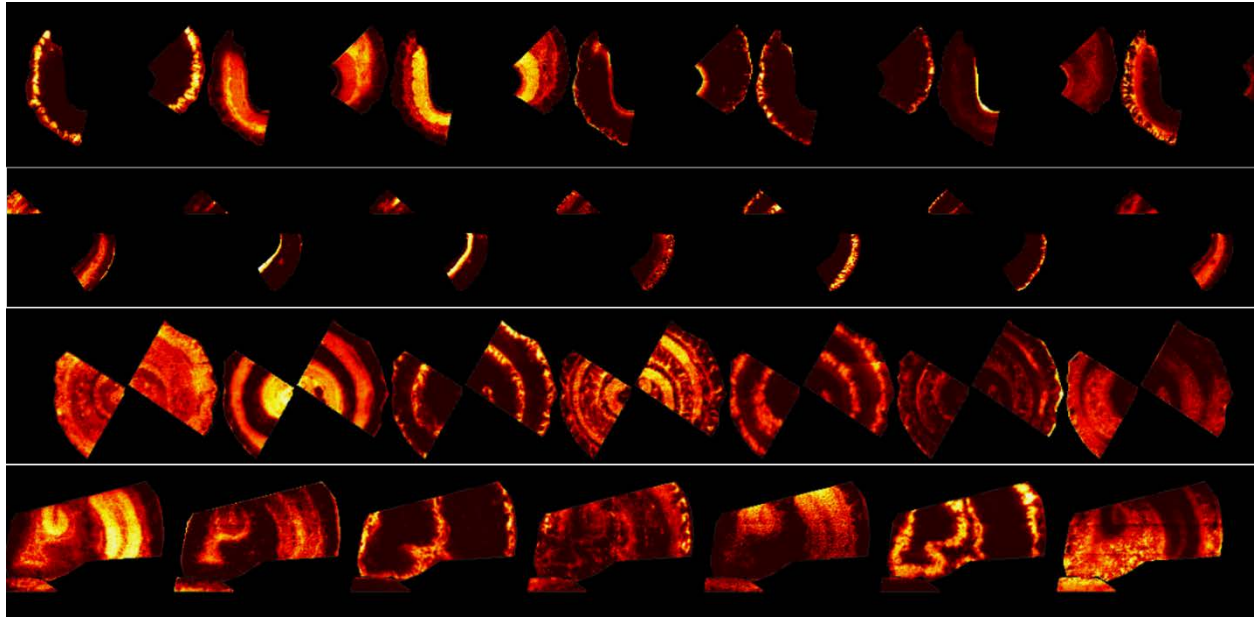
C) Day 8



D) Day 11



E) Day 15



F) Day 21

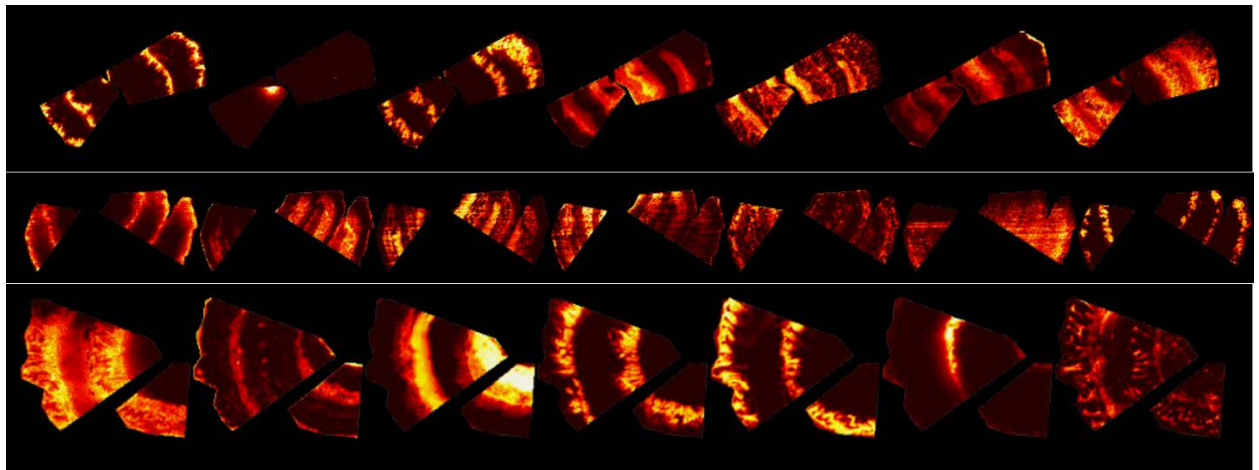


Figure S1.

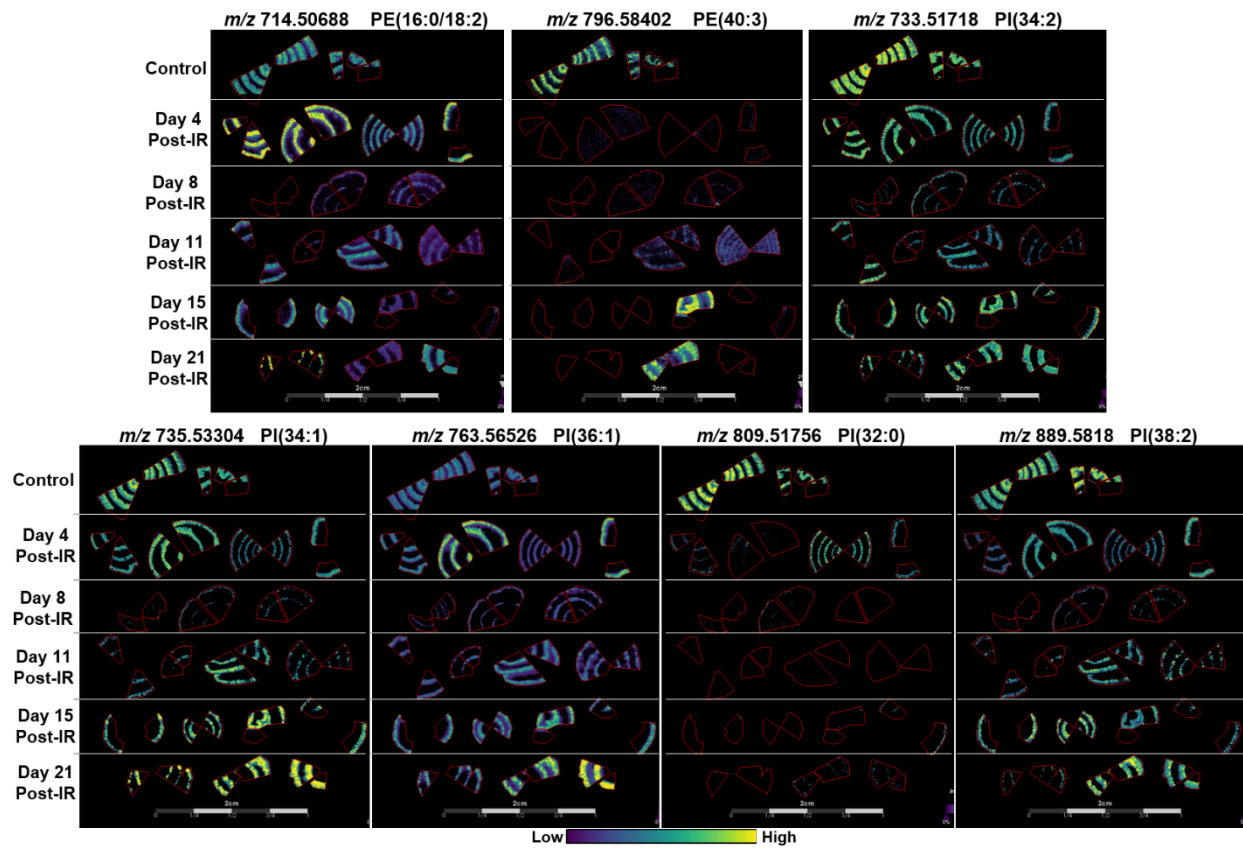


Figure S2.

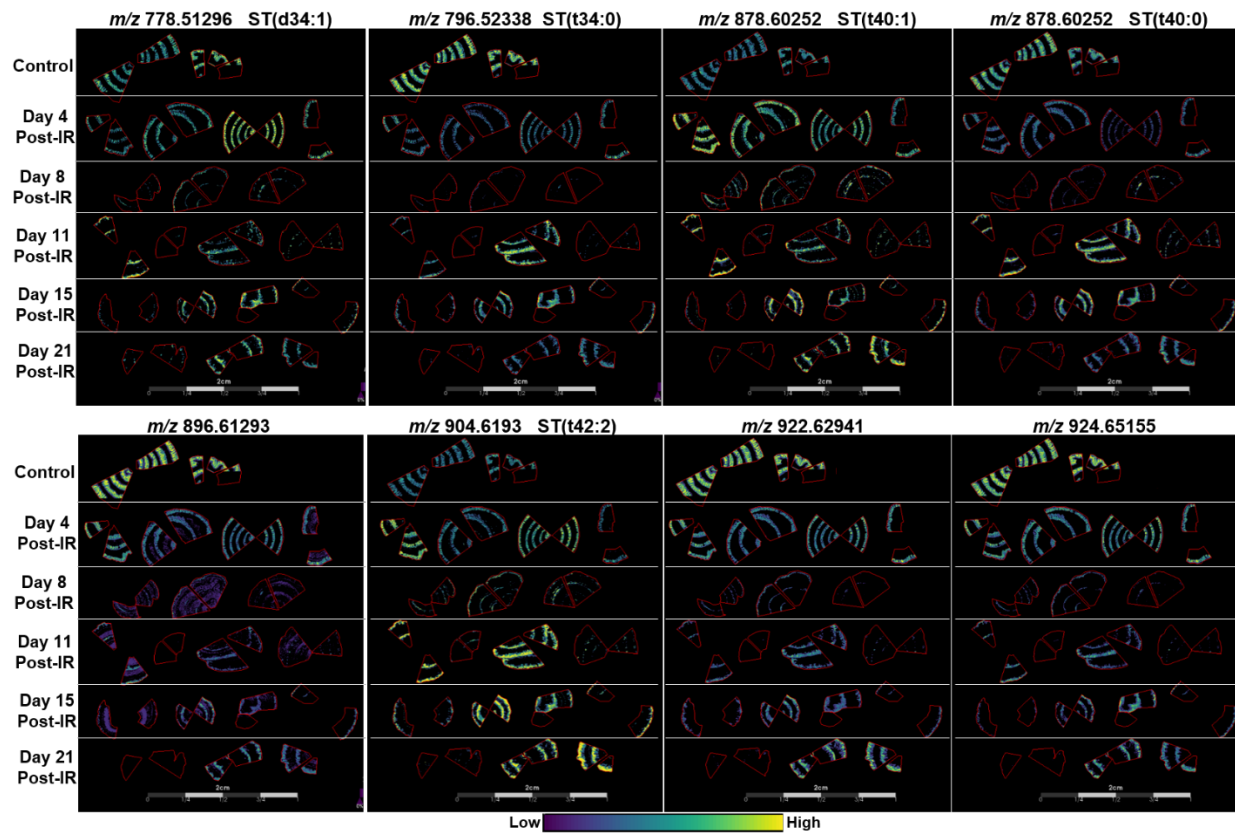


Figure S3.

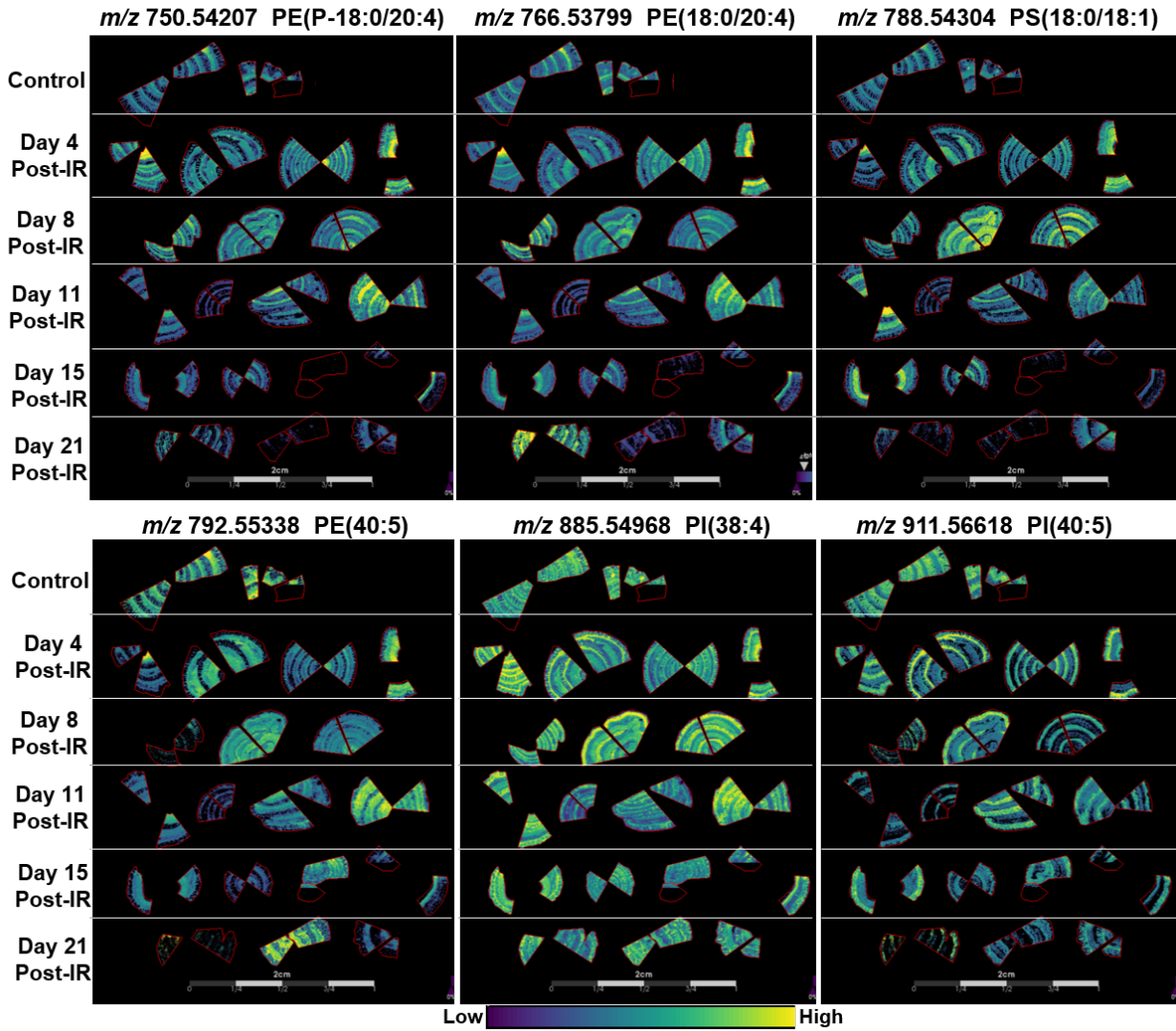


Figure S4.

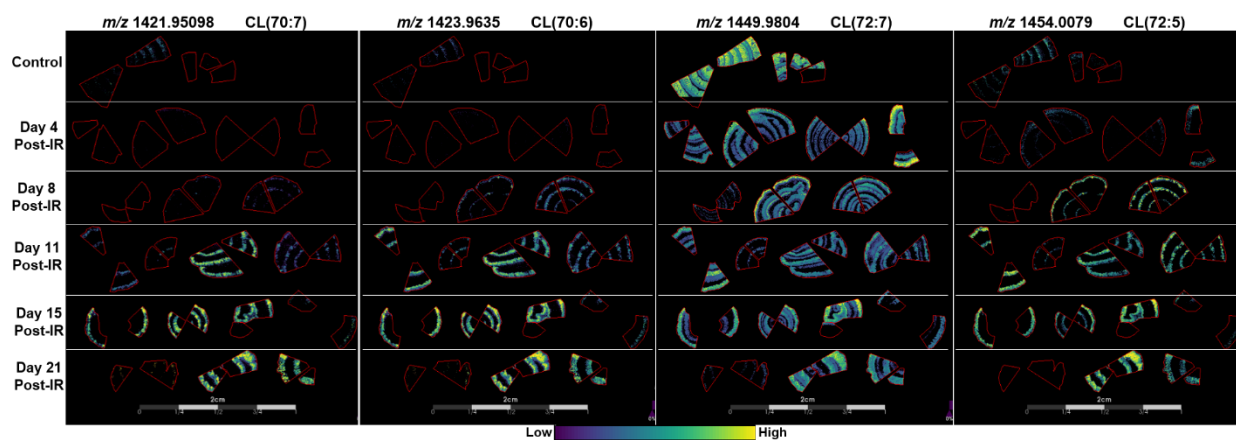


Figure S5

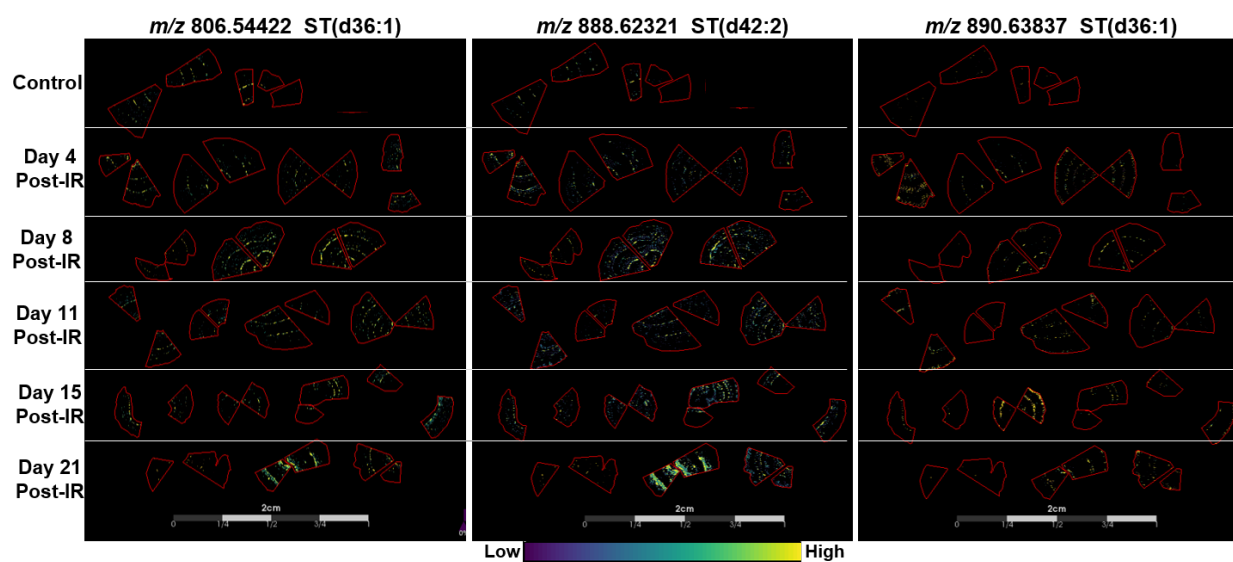


Figure S6.



<b>Ki-67 (ab15580)(Rb) Immunohistochemistry Staining Procedure</b>	
Step	Procedure on Ventana Discovery Ultra #11
1	Warm Slides to 69°C for 3 cycles of 8mins on Ultra.
2	Deparaffinize with EZ prep (Ventana, Reference No. 950-100).
3	Apply Liquid Coverslip (Ventana, reference No. 650-010).
4	Antigen retrieval with RiboCC incubation at 95°C for 32 minutes (Ventana, reference No. 760-107).
5	Rinse slide with Reaction Buffer (Ventana, reference No. 950-300).
6	Apply Liquid Coverslip.
7	Apply Background Sniper block option for 8 Minutes (Biocare medical, reference No. BS966M)
8	Rinse slide with Reaction Buffer.
9	Apply Inhibitor CM and incubate for 4 minutes (Ventana, reference No. 760-159)
10	Rinse slide with Reaction Buffer.
11	Apply primary antibody anti-Ki-67 for 32 minutes (abcam, reference No. Ab15580) Dilution: 1:500.
12	Rinse slide with Reaction Buffer.
13	Apply OmniMap anti-rabbit and incubate for 12 minutes (Ventana, reference No. 760-4311).
14	Rinse slide with Reaction Buffer.
15	Apply DAB CM and DAB H2O2 CM and incubate for 8 minutes (Ventana, reference No. 760-159).
16	Rinse slide with Reaction Buffer.
17	Apply Copper CM and incubate for 4 minutes (Ventana, reference No. 760-159).
18	Rinse slide with Reaction Buffer.
19	Apply Hematoxylin and incubate for 8 minutes (Ventana, reference No. 760-2021).
20	Rinse slide with Reaction buffer.
21	Apply Bluing Reagent and incubate for 4 minutes (Ventana, reference No. 760-2037).
22	Rinse slide with Reaction Buffer.
23	Remove slides, dehydrate, and coverslip.

**Table 1.**

<b>CD13 (NHP) Immunohistochemistry Staining Procedure</b>	
Step	Procedure on Ventana Discovery XT, Protocol #116
1	Warm slides to 75°C.
2	Deparaffinize with EZ prep (Ventana, reference no. 950-100).
3	Apply Liquid Coverslip (Ventana, reference no. 650-010).
4	Antigen retrieval with Protease 2 (Ventana, reference no. 760-2019) for 4 minutes at 37 degree Celsius.
5	Rinse slide with Reaction Buffer (Ventana, reference no. 950-300).
6	Apply Liquid Coverslip.
7	Apply Inhibitor CM and incubate for 4 minutes (Ventana, reference no. 760-159).
8	Rinse slide with Reaction Buffer.

9	Apply primary antibody anti-CD13 <sup>1</sup> for 32 minutes at 37 degree Celsius (abcam, reference no. ab108310).
10	Rinse slide with Reaction Buffer.
11	Apply OmniMap anti-rabbit HRP and incubate for 12 minutes (Ventana, reference no. 760-4311).
12	Rinse slide with Reaction Buffer.
13	Apply DAB CM and DAB H <sub>2</sub> O <sub>2</sub> CM and incubate for 8 minutes (Ventana, reference no. 760-159).
14	Rinse slide with Reaction Buffer.
15	Apply Copper CM and incubate for 4 minutes (Ventana, reference no. 760-159).
16	Rinse slide with Reaction Buffer.
17	Apply Hematoxylin and incubate for 8 minutes. (Ventana, reference no. 760-2021).
18	Rinse slide with Reaction Buffer.
19	Apply Bluing Reagent and incubate for 4 minutes (Ventana, reference no. 760-2037).
20	Rinse slide with Reaction Buffer.
21	Remove slides, rinse, dehydrate, and coverslip.

**Table 2.**

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