Figure S1. Body weight of Pex7\textsuperscript{hypo/null} and control mice before (a) and after (b) the treatment. No significant increase in body weight of Pex7\textsuperscript{hypo/null} mice after plasmalogen supplementation. Data were presented as mean ± SD.
Figure S2. Tissue plasmalogen levels in wild-type and Pex7\textsuperscript{hypo-null} mice treated with vehicle, PPI-1011 or PPI-1040. Neither PPI-1011 or PPI-1040 treatment increased plasmalogen levels in the lung (A), kidney (B), cortex (C), or cerebellum (D). Levels are presented as the mean percent of wild-type levels ± SD.
Table S1 – List of $^{13}$C-labeled glycerolipids measured by tandem mass spectrometry.

| Lipid Type | sn-1     | sn-2 | Glycerol  | Analysis mode | MRM Transition |
|------------|----------|------|-----------|---------------|----------------|
| 1050 closed ring | $^{13}$C$_3$ – 16:0 | 22:6   | $^{13}$C$_3$ | Positive      | 736.5/613.5    |
| 1050 open ring | $^{13}$C$_3$ – 16:0 | 22:6   | $^{13}$C$_3$ | Negative      | 752.5/327.2    |
| PlsEtn      | $^{13}$C$_3$ – 16:0 | 18:1   | $^{13}$C$_3$ | Negative      | 706.6/281.3    |
| PlsEtn      | $^{13}$C$_3$ – 16:0 | 18:2   | $^{13}$C$_3$ | Negative      | 704.5/279.2    |
| PlsEtn      | $^{13}$C$_3$ – 16:0 | 20:4   | $^{13}$C$_3$ | Negative      | 728.5/303.2    |
| PlsEtn      | $^{13}$C$_3$ – 16:0 | 20:5   | $^{13}$C$_3$ | Negative      | 726.5/301.2    |
| PlsEtn      | $^{13}$C$_3$ – 16:0 | 22:4   | $^{13}$C$_3$ | Negative      | 756.6/331.3    |
| PlsEtn      | 16:0     | 18:1   | $^{13}$C$_3$ | Negative      | 703.5/281.3    |
| PlsEtn      | 16:0     | 18:2   | $^{13}$C$_3$ | Negative      | 701.5/279.2    |
| PlsEtn      | 16:0     | 20:4   | $^{13}$C$_3$ | Negative      | 725.5/303.2    |
| PlsEtn      | 16:0     | 20:5   | $^{13}$C$_3$ | Negative      | 723.5/301.2    |
| PlsEtn      | 16:0     | 22:4   | $^{13}$C$_3$ | Negative      | 753.6/331.3    |
| PlsEtn      | 16:0     | 22:6   | $^{13}$C$_3$ | Negative      | 749.5/327.2    |
| PlsEtn      | 18:0     | 18:1   | $^{13}$C$_3$ | Negative      | 731.6/281.3    |
| PlsEtn      | 18:0     | 18:2   | $^{13}$C$_3$ | Negative      | 729.5/279.2    |
| PlsEtn      | 18:0     | 20:4   | $^{13}$C$_3$ | Negative      | 753.6/303.2    |
| PlsEtn      | 18:0     | 20:5   | $^{13}$C$_3$ | Negative      | 751.5/301.2    |
| PlsEtn      | 18:0     | 22:4   | $^{13}$C$_3$ | Negative      | 781.6/331.3    |
| PlsEtn      | 18:0     | 22:6   | $^{13}$C$_3$ | Negative      | 777.6/327.2    |
| VAG         | $^{13}$C$_3$ – 16:0 | 18:1   | $^{13}$C$_3$ | Positive      | 585.6/242.3    |
| VAG         | $^{13}$C$_3$ – 16:0 | 18:2   | $^{13}$C$_3$ | Positive      | 583.5/242.3    |
| VAG  | 13C3 – 16:0 | 20:4 | 13C3 | Positive | 607.5/242.3 |
|------|-------------|------|------|----------|-------------|
| VAG  | 13C3 – 16:0 | 20:5 | 13C3 | Positive | 605.5/242.3 |
| VAG  | 13C3 – 16:0 | 22:4 | 13C3 | Positive | 635.7/242.3 |
| VAG  | 13C3 – 16:0 | 22:6 | 13C3 | Positive | 631.5/242.3 |
| VAG  | 16:0        | 18:1 | 13C3 | Positive | 582.5/239.2 |
| VAG  | 16:0        | 18:2 | 13C3 | Positive | 580.5/239.2 |
| VAG  | 16:0        | 20:4 | 13C3 | Positive | 604.5/239.2 |
| VAG  | 16:0        | 20:5 | 13C3 | Positive | 602.5/239.2 |
| VAG  | 16:0        | 22:4 | 13C3 | Positive | 632.6/239.2 |
| VAG  | 16:0        | 22:6 | 13C3 | Positive | 628.5/239.2 |
Table S2. List of ethanolamine plasmalogen analytes measured by tandem mass spectrometry.

| Analyte                        | Molecular Formula | MRM transition |
|--------------------------------|-------------------|----------------|
| $^{13}$C$_6$-PlsEtn 16:0/22:6 (IS) | C$_{37}$H$_{74}$NO$_7$P | 752.5/327.2   |
| PlsEtn 16:0/18:1               | C$_{39}$H$_{76}$NO$_7$P | 700.5/281.2   |
| PlsEtn 16:0/18:2               | C$_{39}$H$_{74}$NO$_7$P | 698.5/279.2   |
| PlsEtn 16:0/20:4               | C$_{41}$H$_{74}$NO$_7$P | 722.5/303.2   |
| PlsEtn 16:0/20:5               | C$_{41}$H$_{72}$NO$_7$P | 720.5/301.2   |
| PlsEtn 16:0/22:4               | C$_{43}$H$_{78}$NO$_7$P | 750.5/331.2   |
| PlsEtn 16:0/22:6               | C$_{43}$H$_{74}$NO$_7$P | 746.5/327.2   |
| PlsEtn 18:0/18:1               | C$_{41}$H$_{80}$NO$_7$P | 728.5/281.2   |
| PlsEtn 18:0/18:2               | C$_{41}$H$_{78}$NO$_7$P | 726.5/279.2   |
| PlsEtn 18:0/20:4               | C$_{43}$H$_{78}$NO$_7$P | 750.6/303.2   |
| PlsEtn 18:0/20:5               | C$_{43}$H$_{76}$NO$_7$P | 748.5/301.3   |
| PlsEtn 18:0/22:4               | C$_{45}$H$_{82}$NO$_7$P | 778.5/331.2   |
| PlsEtn 18:0/22:6               | C$_{45}$H$_{78}$NO$_7$P | 774.5/327.2   |
| PlsEtn 18:1/18:1               | C$_{41}$H$_{78}$NO$_7$P | 726.5/281.2   |
| PlsEtn 18:1/18:2               | C$_{41}$H$_{76}$NO$_7$P | 724.5/279.2   |
| PlsEtn 18:1/20:4               | C$_{43}$H$_{76}$NO$_7$P | 748.5/303.2   |
| PlsEtn 18:1/22:4               | C$_{45}$H$_{80}$NO$_7$P | 776.5/331.2   |
| PlsEtn 18:1/22:6               | C$_{45}$H$_{78}$NO$_7$P | 772.5/327.2   |