

## Supplement Information

### Simultaneous analysis of acylcarnitines using MALDI-TOF mass spectrometry based on a parylene matrix chip

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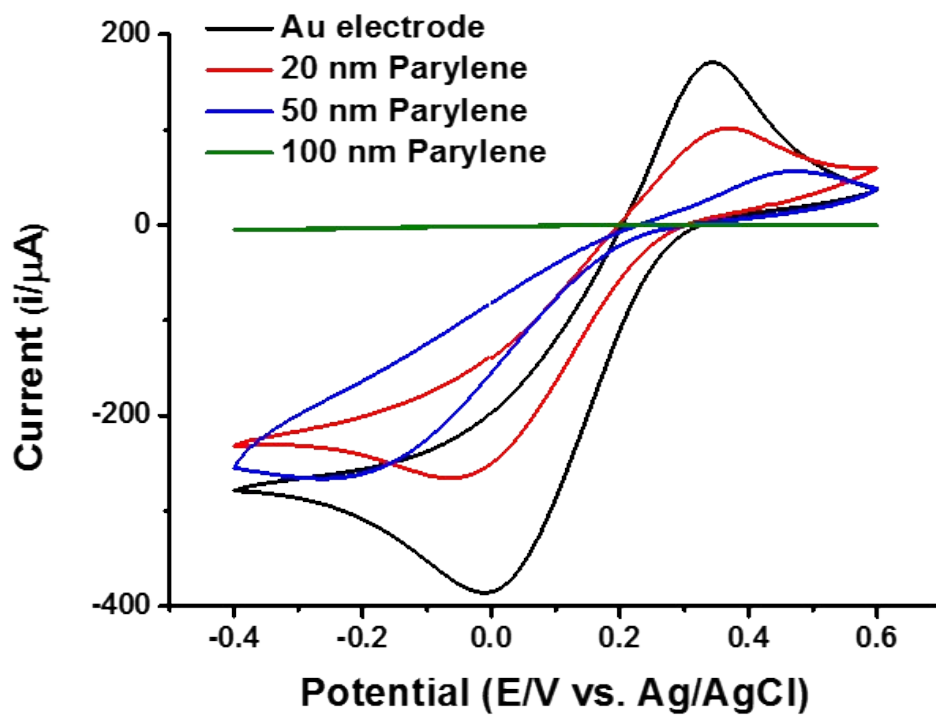
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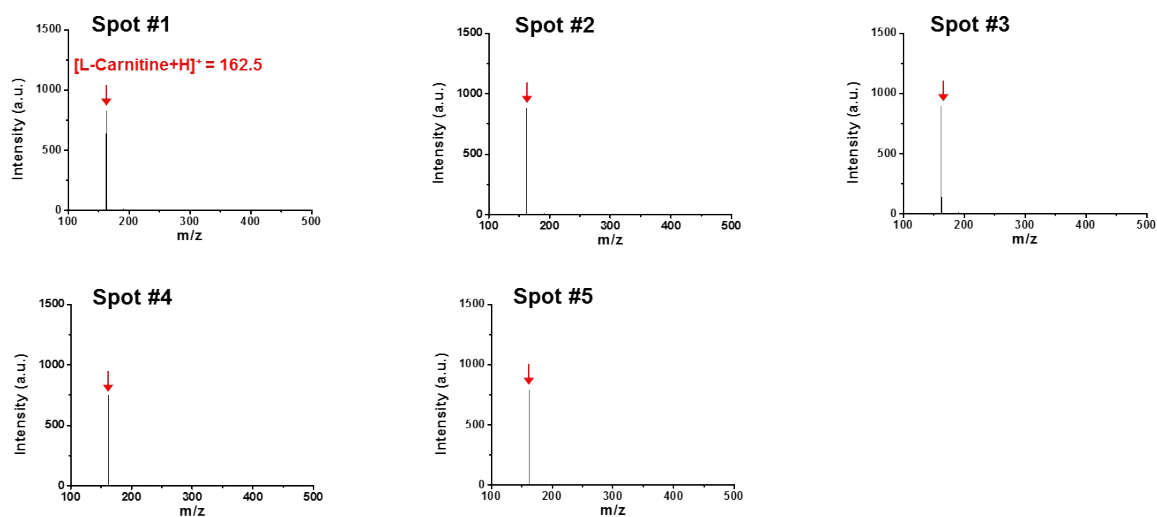
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Supplement Fig. S1. Analysis of the electrochemical property of parylene-N film by cyclic voltammetry with a redox couple of ferricyanide ( $\text{Fe}(\text{CN})_6^{3-/4-}$ ).

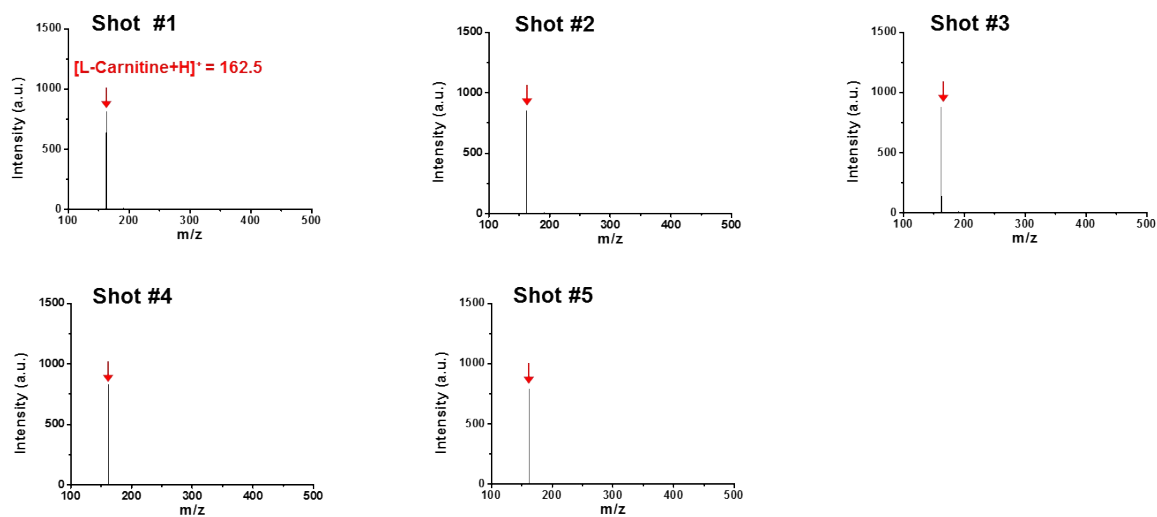


Supplement Fig. S2. Reproducibility of the parylene matrix chip for L-carnitine analysis. Mass spectra of (a) spot-to-spot reproducibility of L-carnitine, (b) shot-to-shot reproducibility of L-carnitine, (c) spot-to-spot reproducibility of L-carnitine in serum, (d) shot-to-shot reproducibility of L-carnitine in serum.

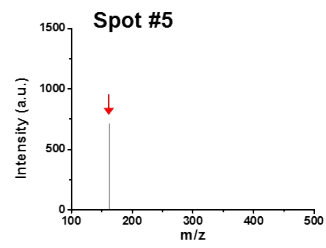
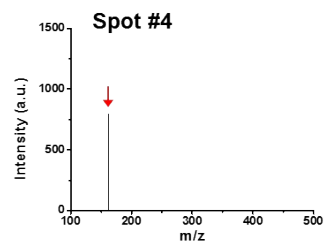
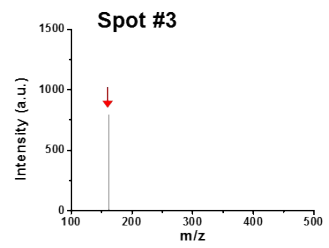
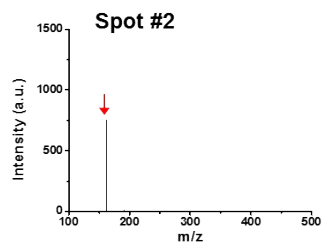
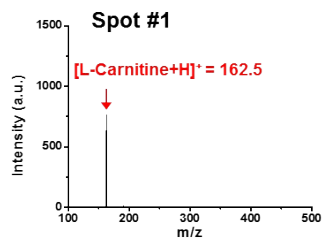
(a)



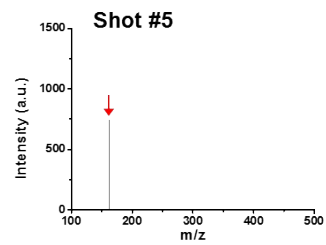
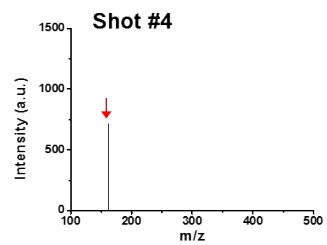
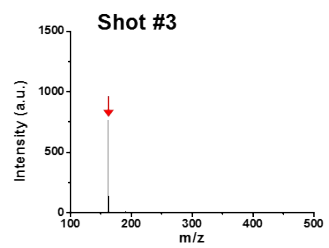
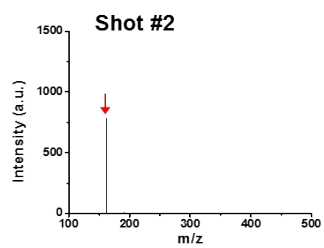
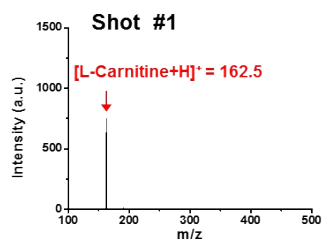
(b).



(c)

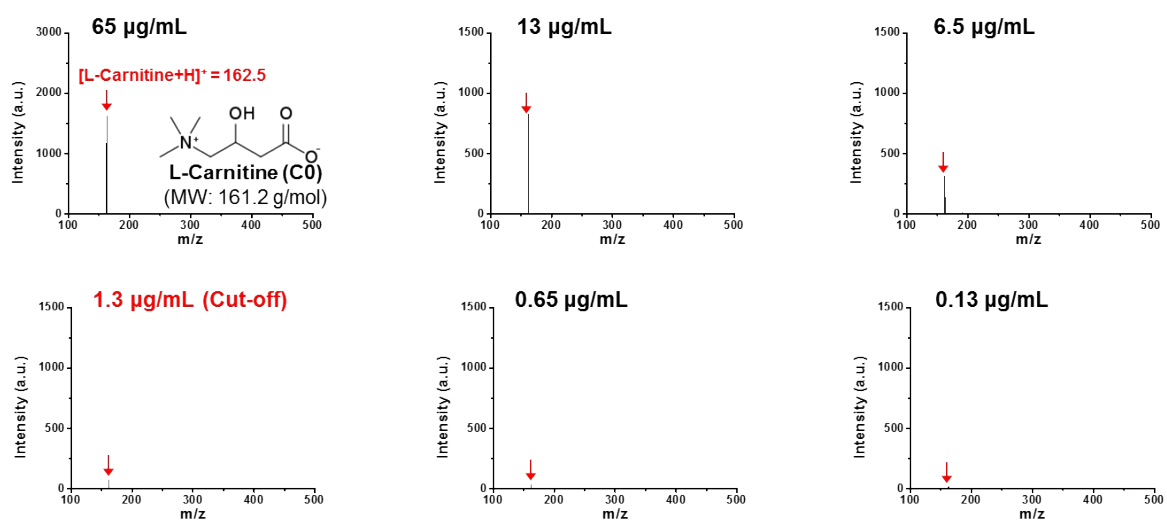


(d)

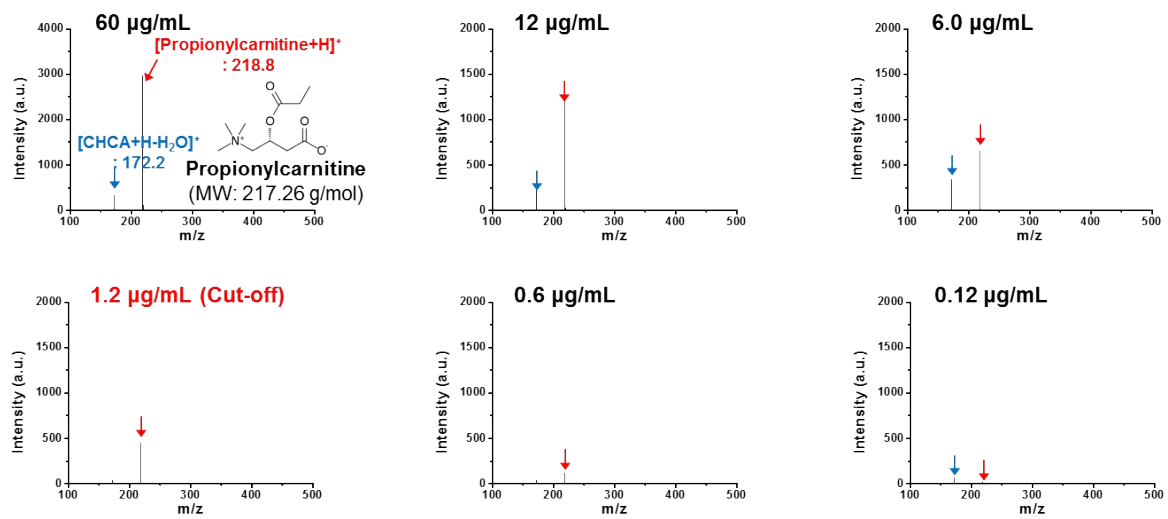


Supplement Fig. S3. Quantitative analysis of acyl carnitine in DW using MALDI-TOF based on parylene matrix chip. (a) Mass spectra of quantitative analysis of L-carnitine (C0) in DW, (b) Mass spectra of quantitative analysis of propionylcarnitine (AC3) in DW, (c) Standard curve of AC3, (d) Mass spectra of quantitative analysis of butyrylcarnitine (AC4) in DW, (e) Standard curve of AC4, (f) Mass spectra of quantitative analysis of isovalerylcarnitine (AC5) in DW, (g) Standard curve of AC5, (h) Mass spectra of quantitative analysis of octanoylcarnitine (AC8) in DW, (i) Standard curve of AC8, (j) Mass spectra of quantitative analysis of decanoylcarnitine (AC10) in DW, (k) Standard curve of AC10, (l) Mass spectra of quantitative analysis of palmitoyl-L-carnitine (AC16) in DW, (m) Standard curve of AC16.

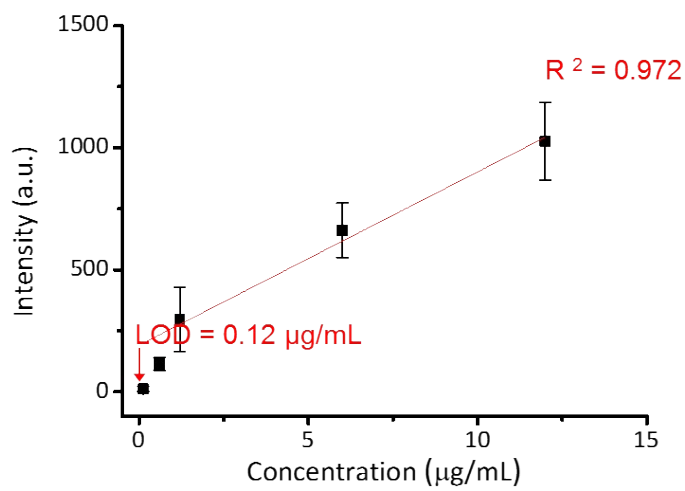
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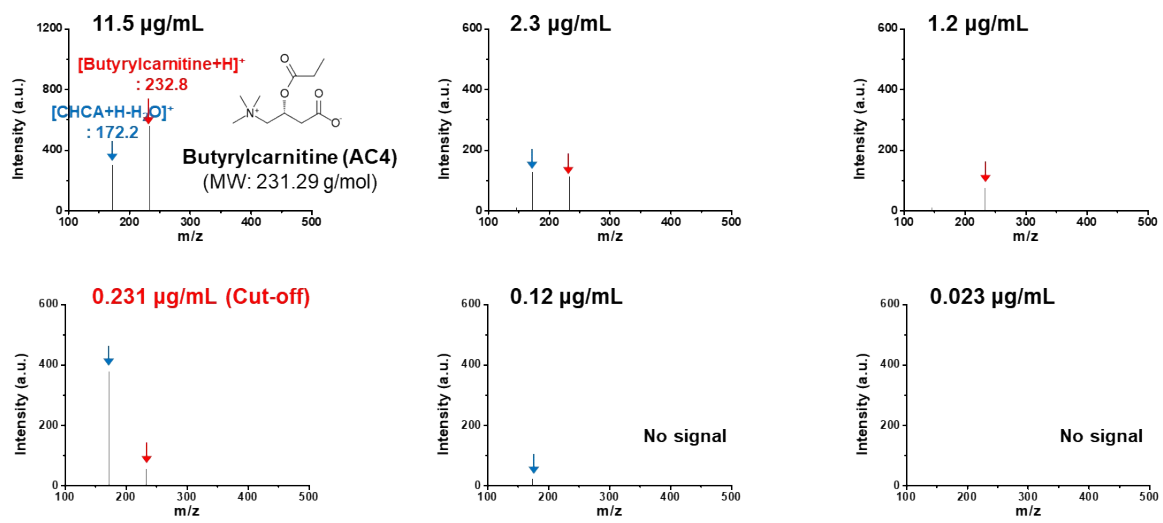
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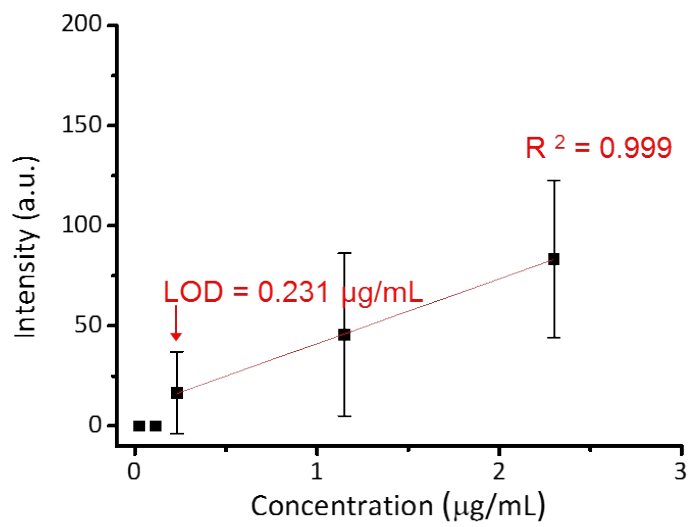
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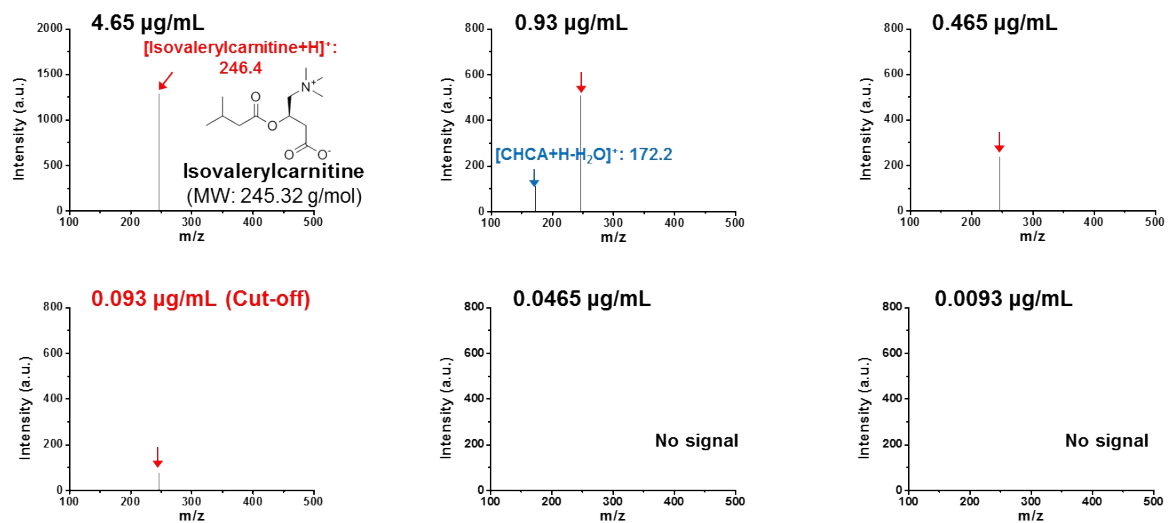
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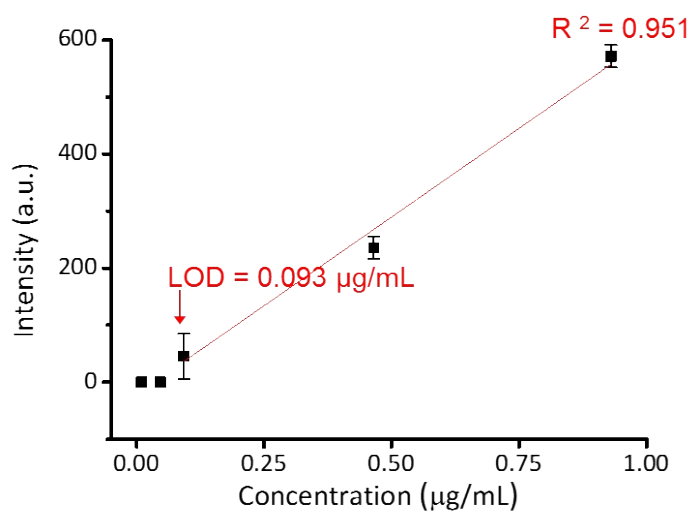
(e)



(f)

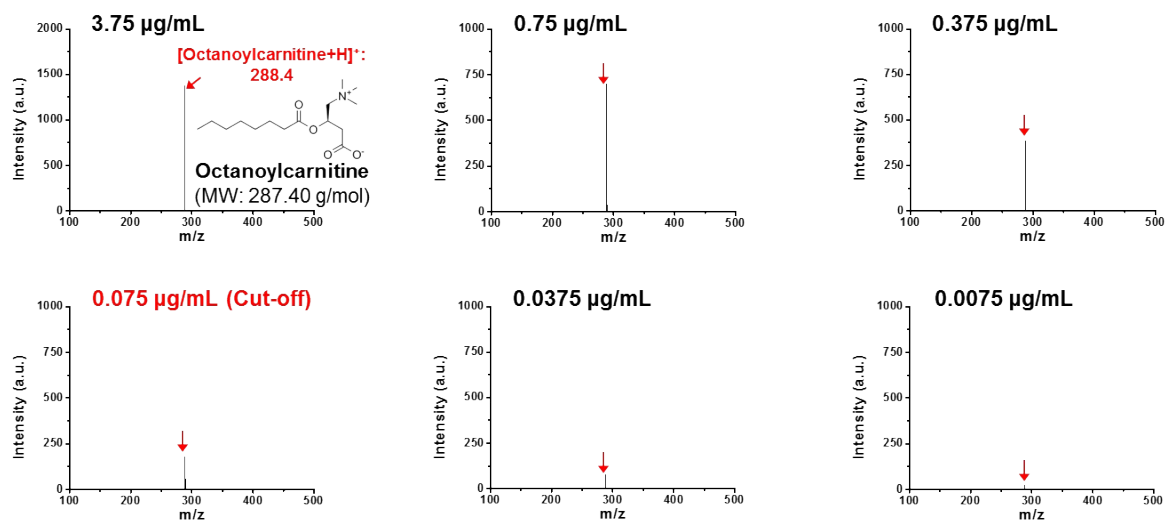


(g)

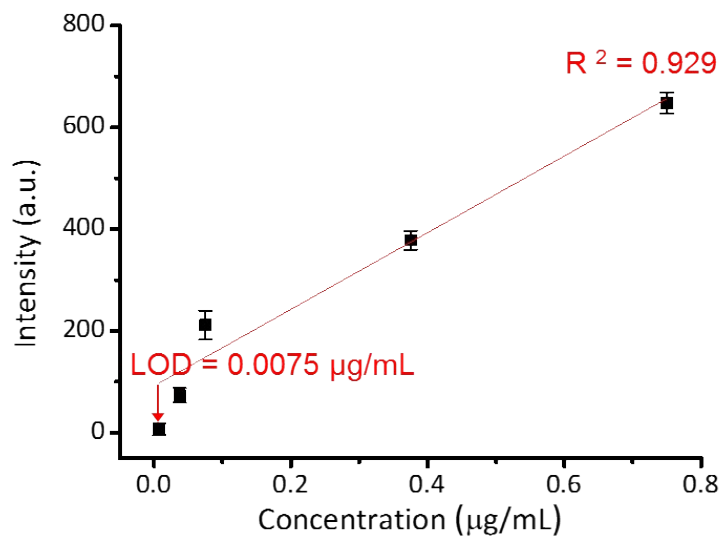




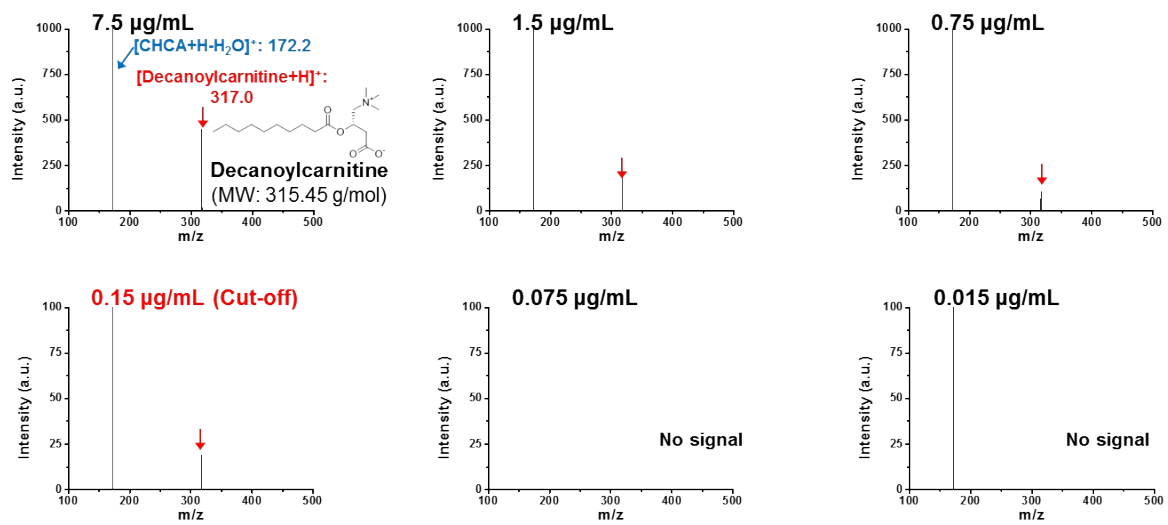
(h)



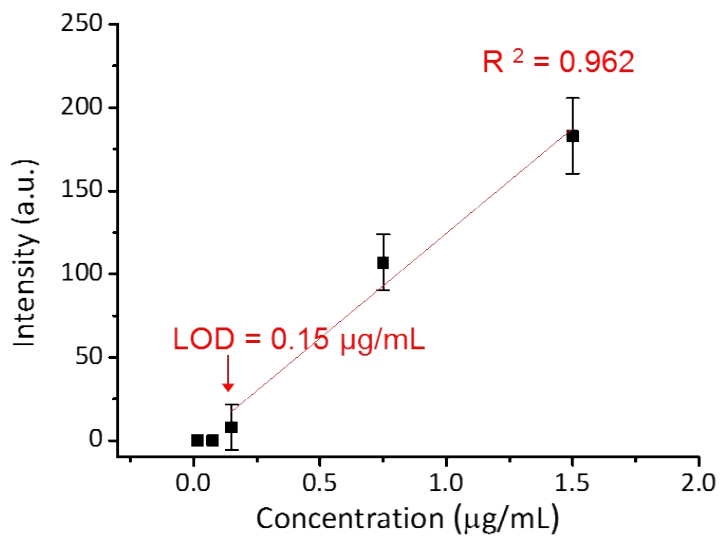
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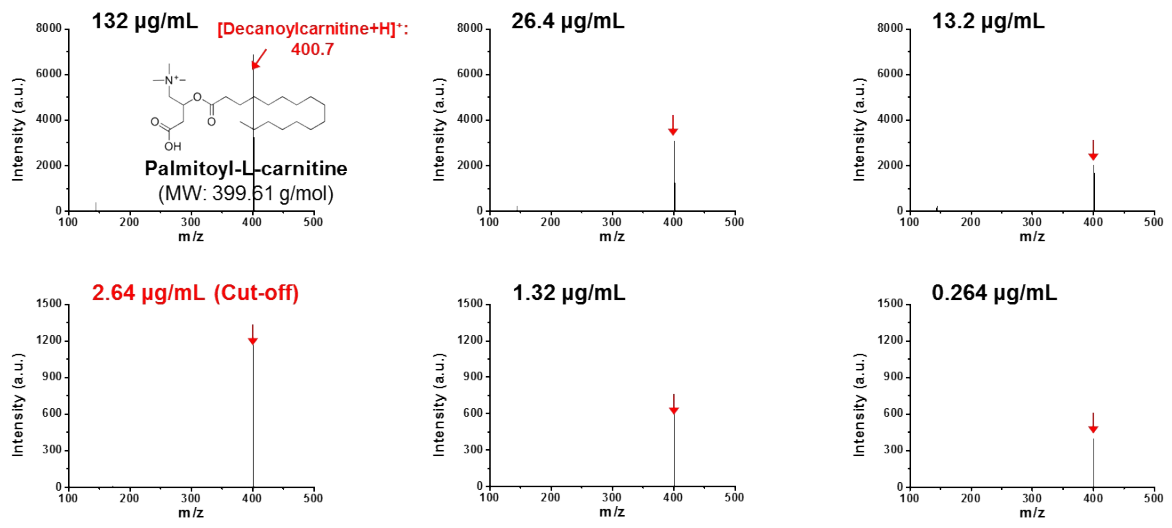
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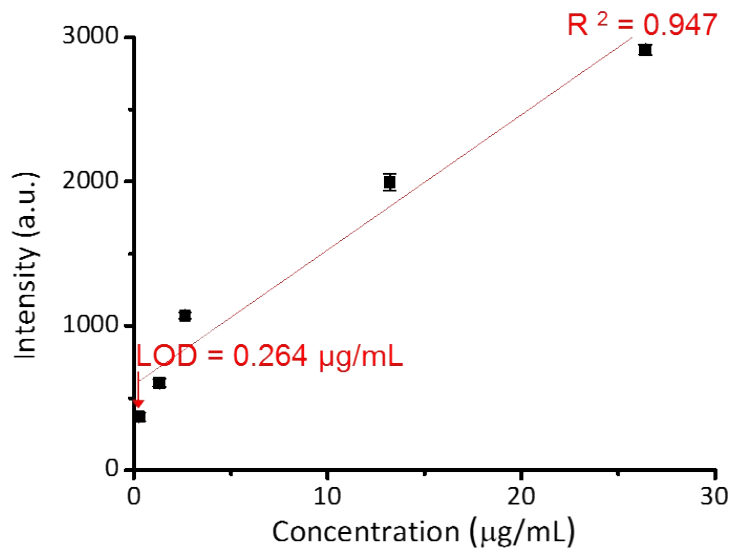
(k)



(l)

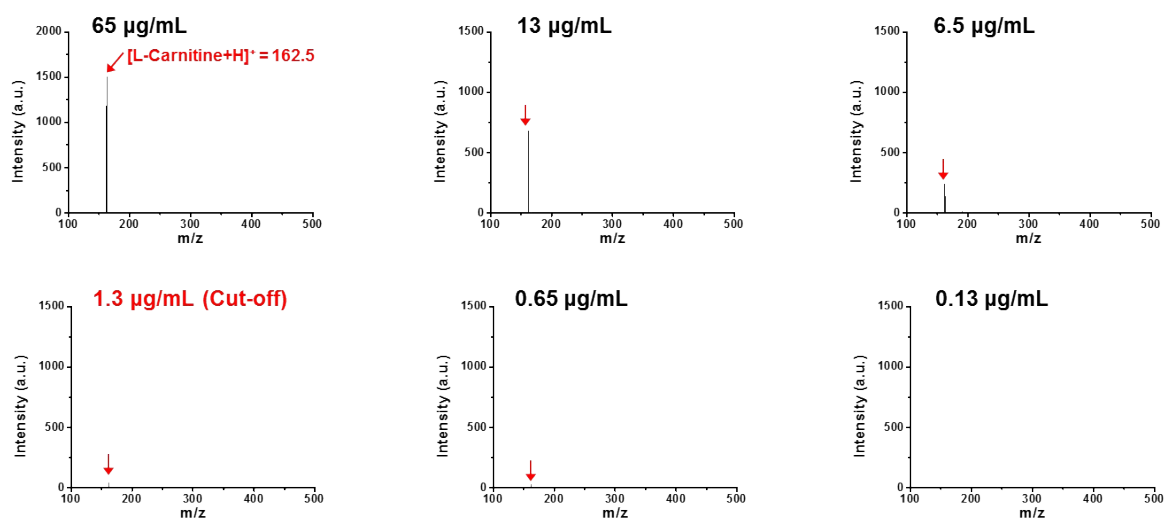


(m)

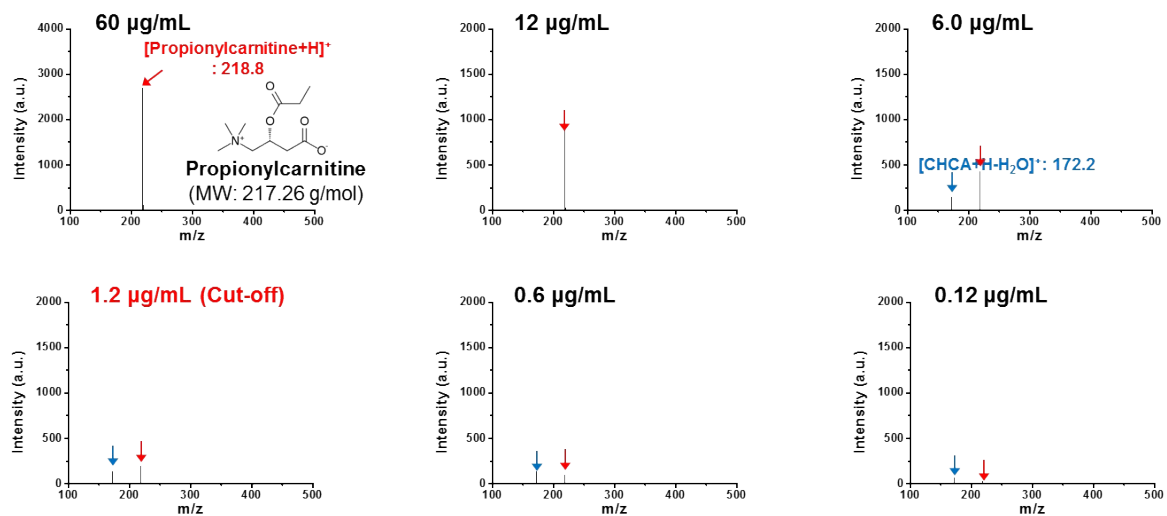


Supplement Fig. S4. Quantitative analysis of acyl carnitine in serum using MALDI-TOF based on parylene matrix chip. (a) Mass spectra of quantitative analysis of L-carnitine (C0) in serum, (b) Mass spectra of quantitative analysis of propionylcarnitine (AC3) in serum, (c) Standard curve of AC3, (d) Mass spectra of quantitative analysis of butyrylcarnitine (AC4) in serum, (e) Standard curve of AC4, (f) Mass spectra of quantitative analysis of isovalerylcarnitine (AC5) in serum, (g) Standard curve of AC5, (h) Mass spectra of quantitative analysis of octanoylcarnitine (AC8) in serum, (i) Standard curve of AC8, (j) Mass spectra of quantitative analysis of decanoylcarnitine (AC10) in serum, (k) Standard curve of AC10, (l) Mass spectra of quantitative analysis of palmitoyl-L-carnitine (AC16) in serum, (m) Standard curve of AC16.

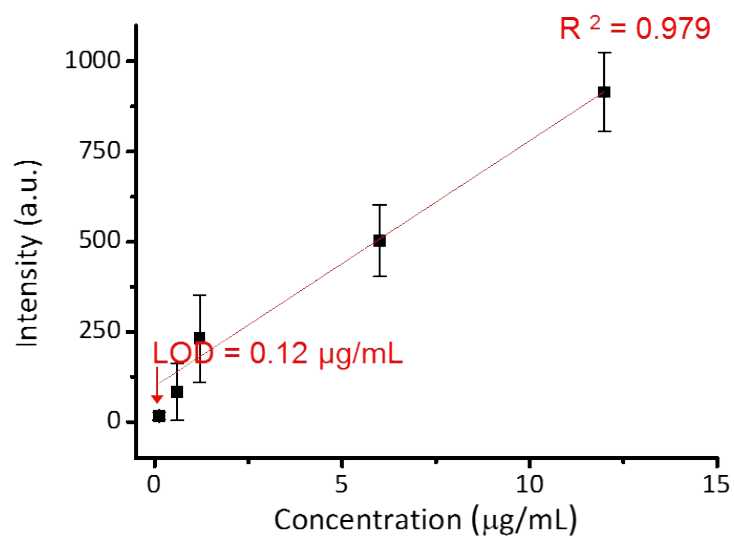
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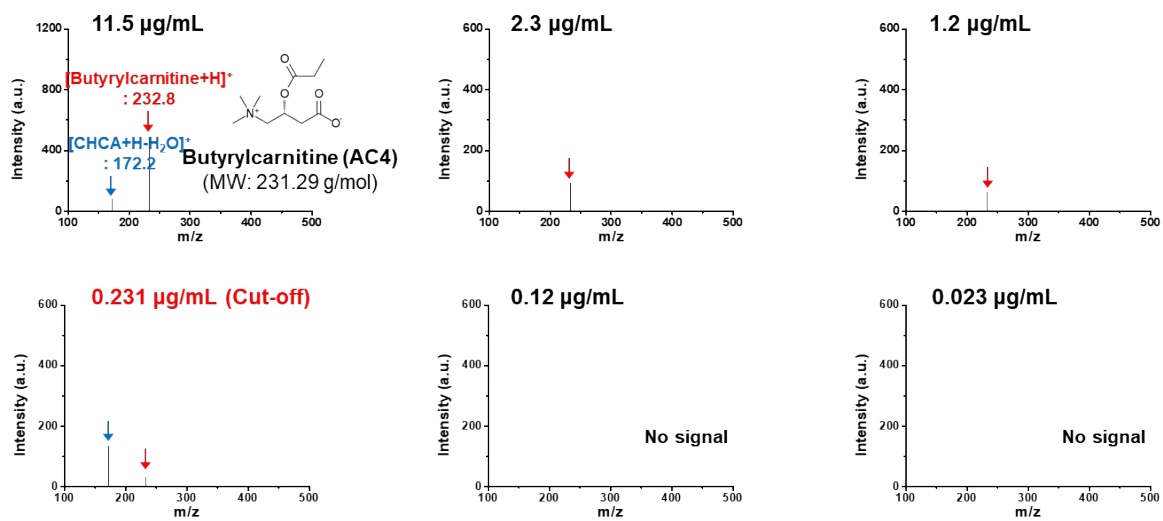
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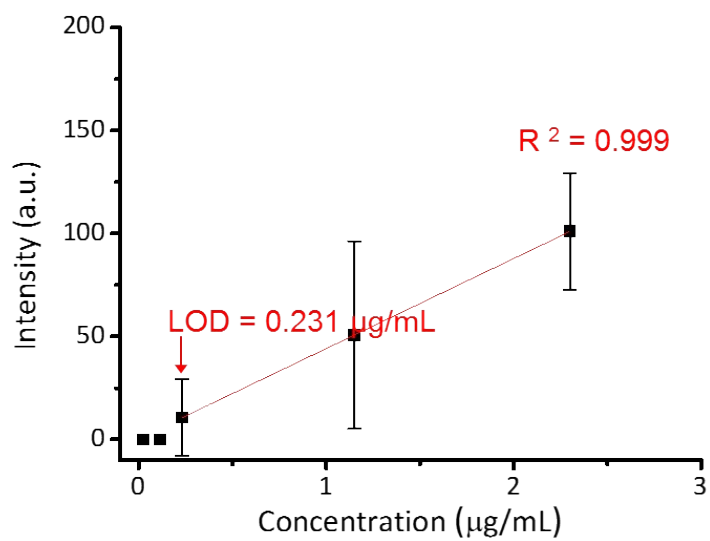
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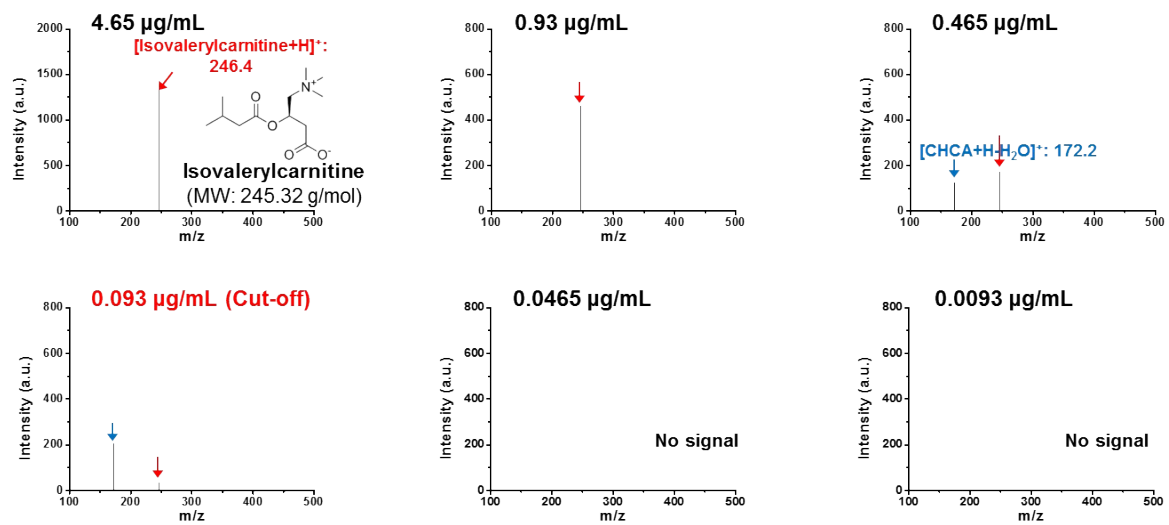
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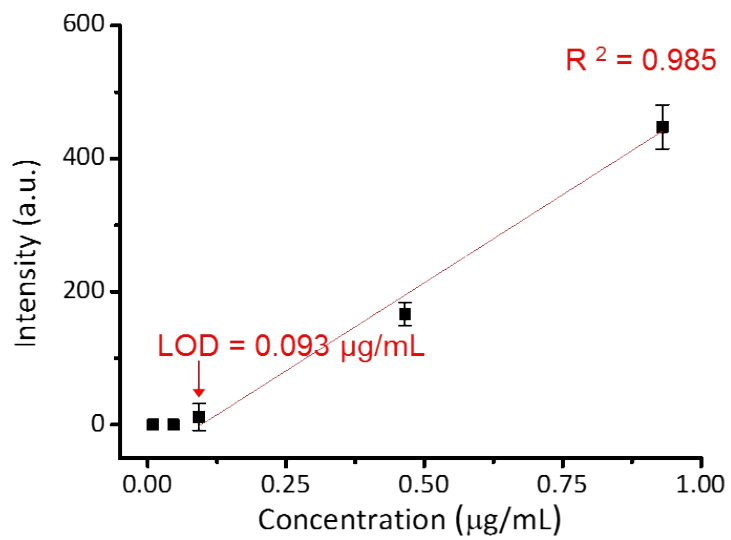
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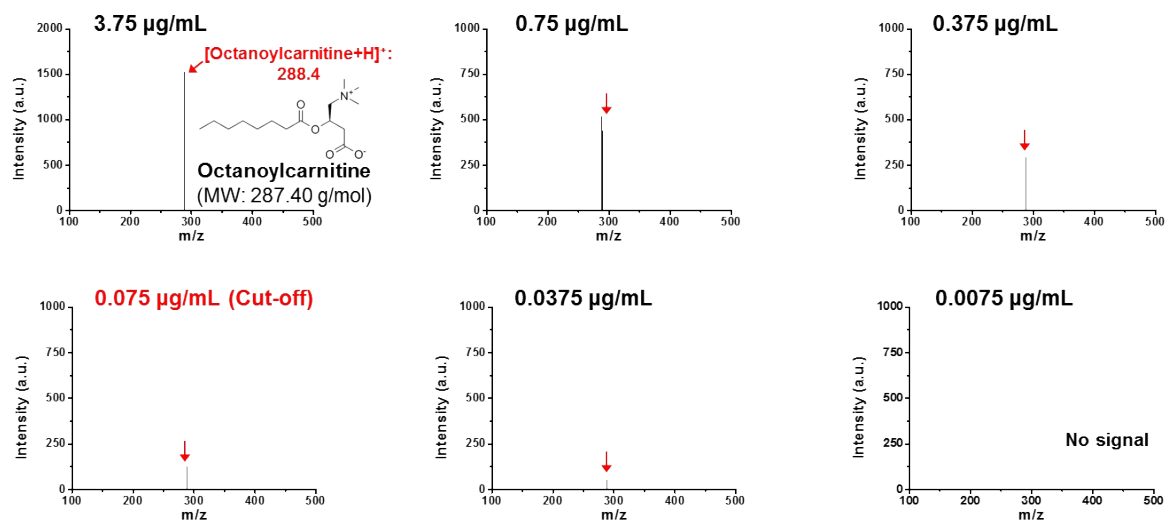
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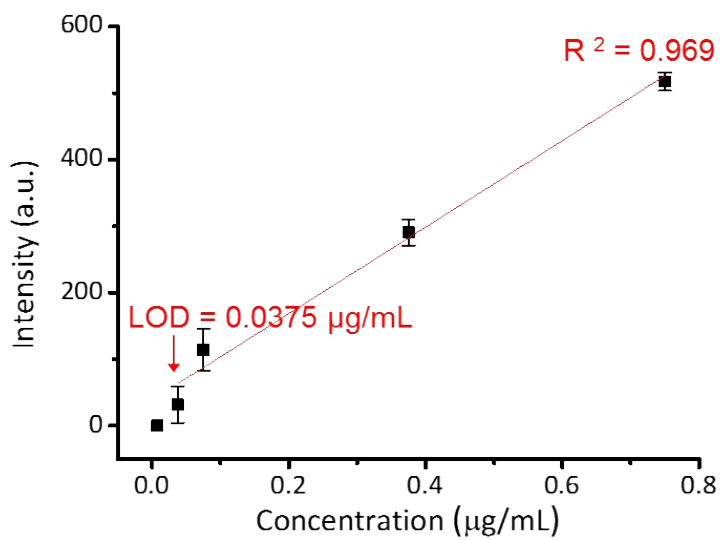
(g)



(h)

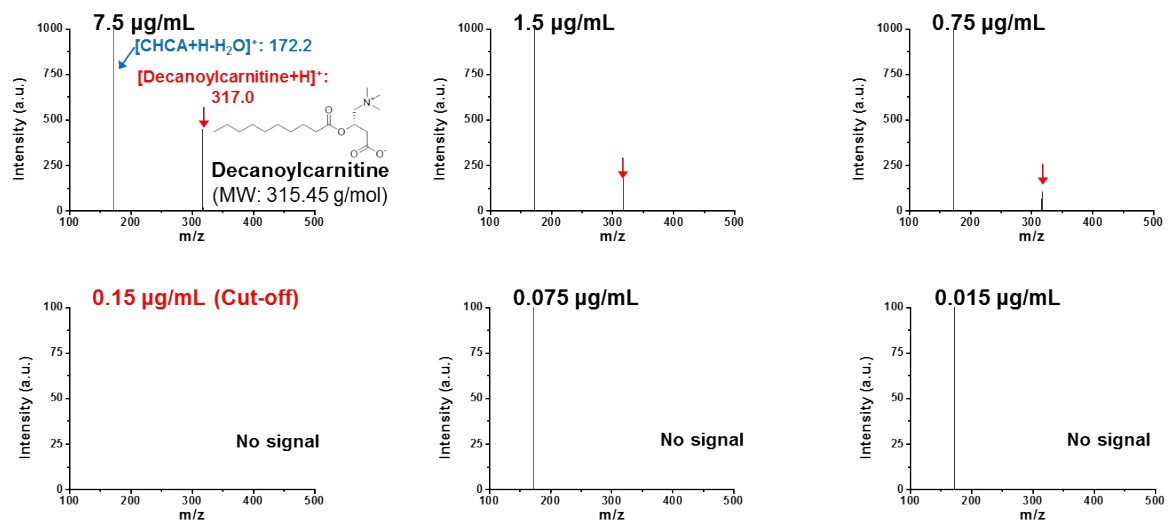


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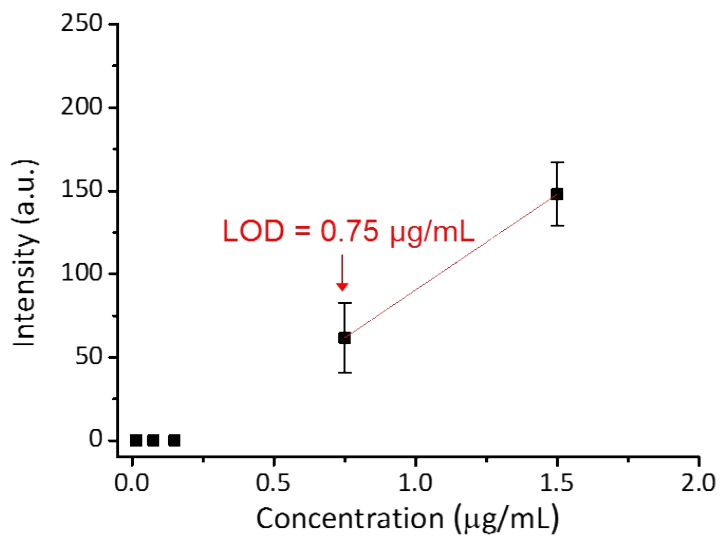




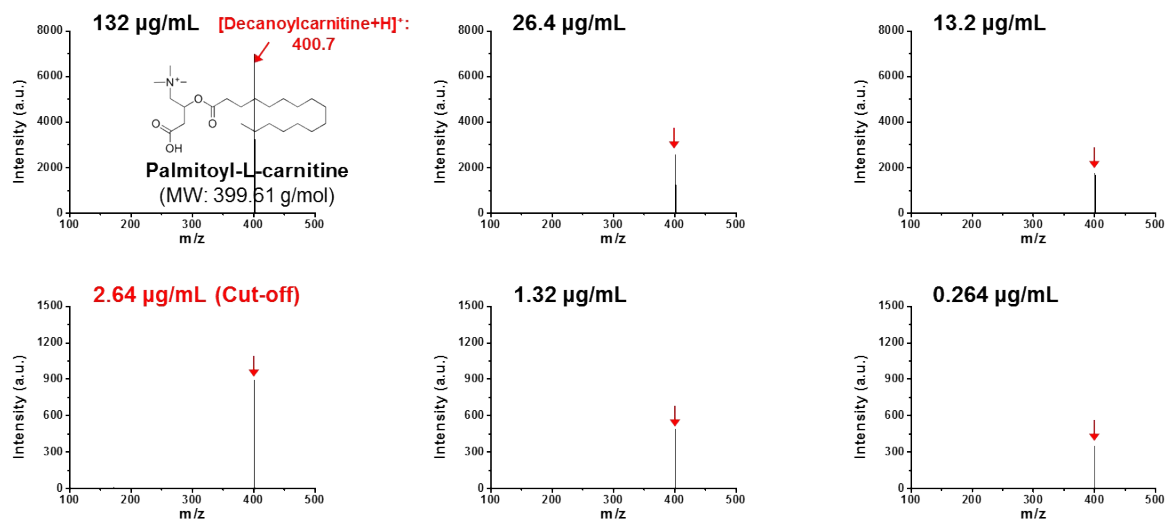
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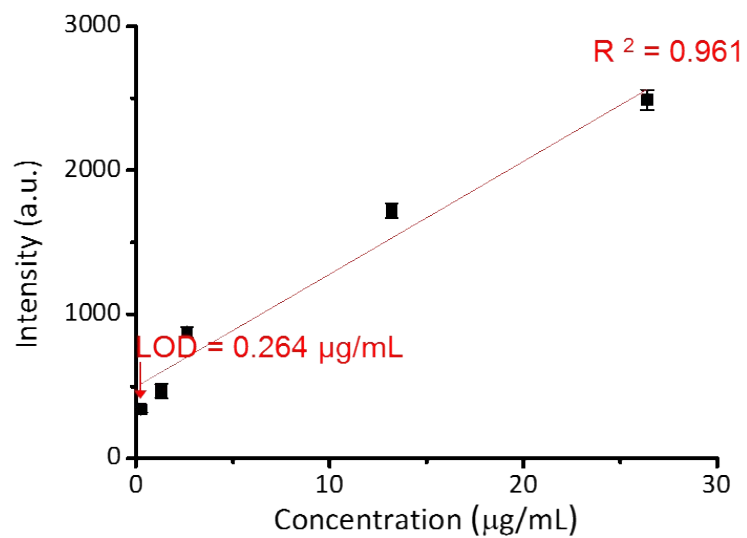
(k)



(l)

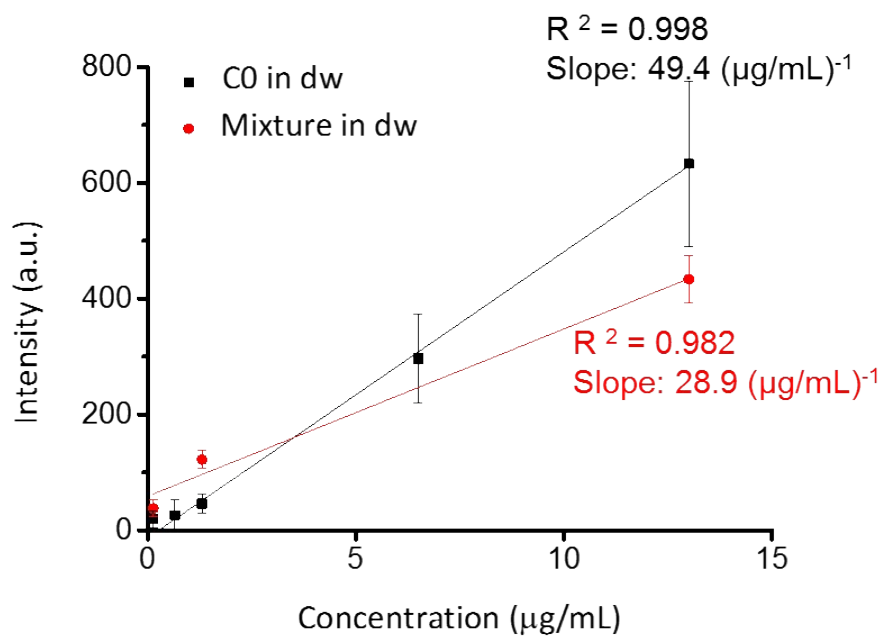


(m)

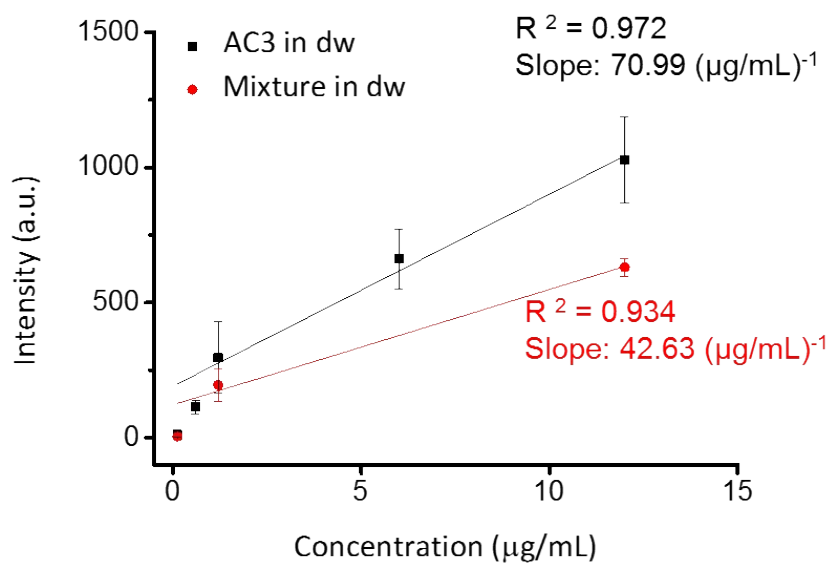


Supplement Fig. S5. Statistical analysis between singular standard analysis and mixture analysis. (a) Standard curve of singular standard analysis (C0) and mixture analysis, (b) Standard curve of singular standard analysis (AC3) and mixture analysis, (c) Standard curve of singular standard analysis (AC4) and mixture analysis, (d) Standard curve of singular standard analysis (AC5) and mixture analysis, (e) Standard curve of singular standard analysis (AC8) and mixture analysis, (f) Standard curve of singular standard analysis (AC10) and mixture analysis, (g) Standard curve of singular standard analysis (AC16) and mixture analysis.

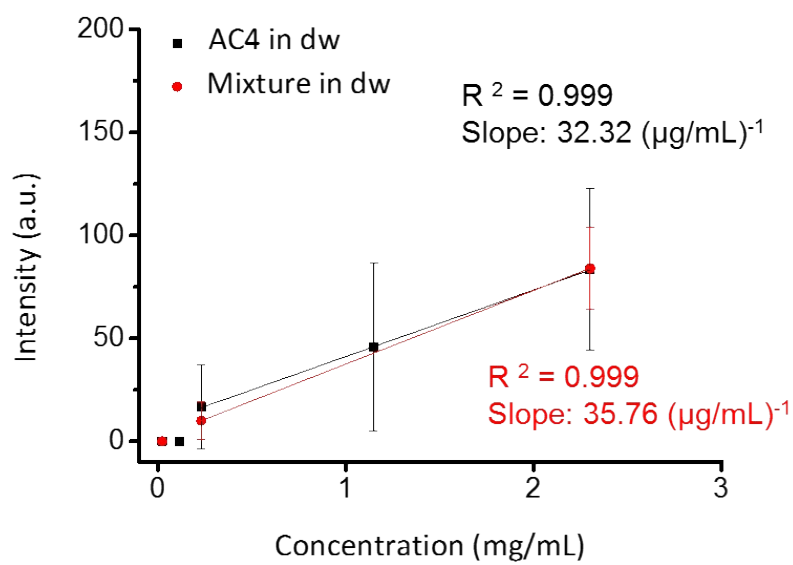
(a)



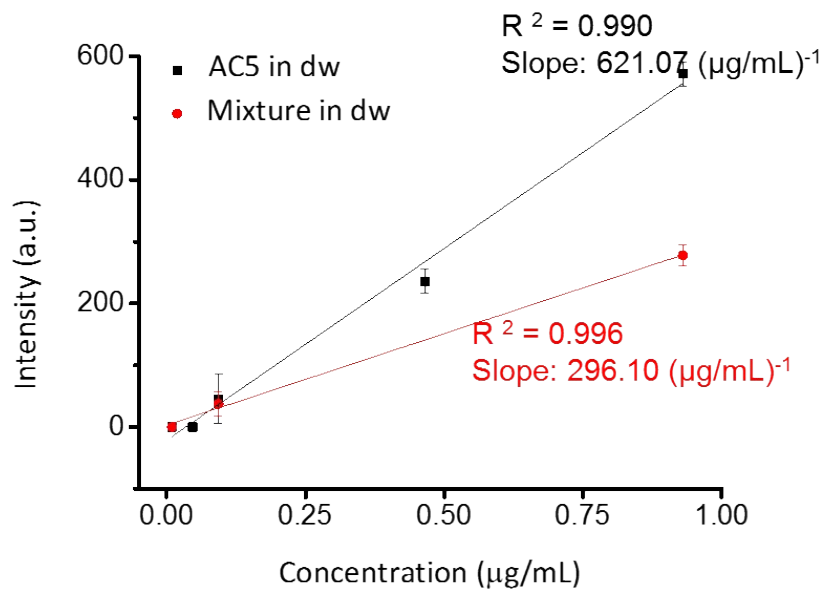
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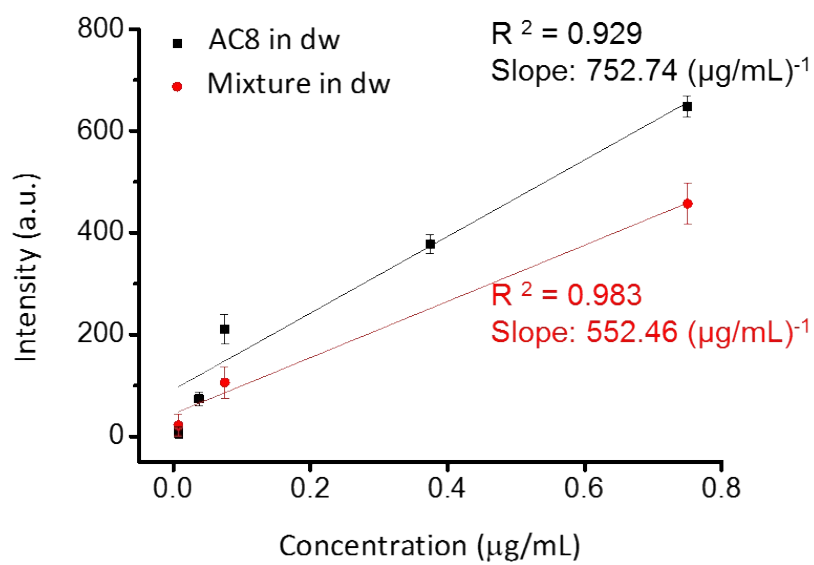
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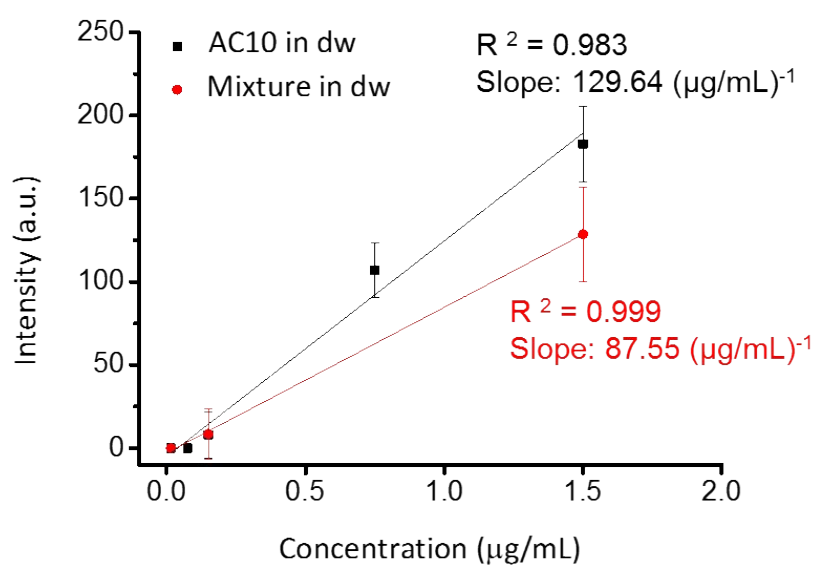
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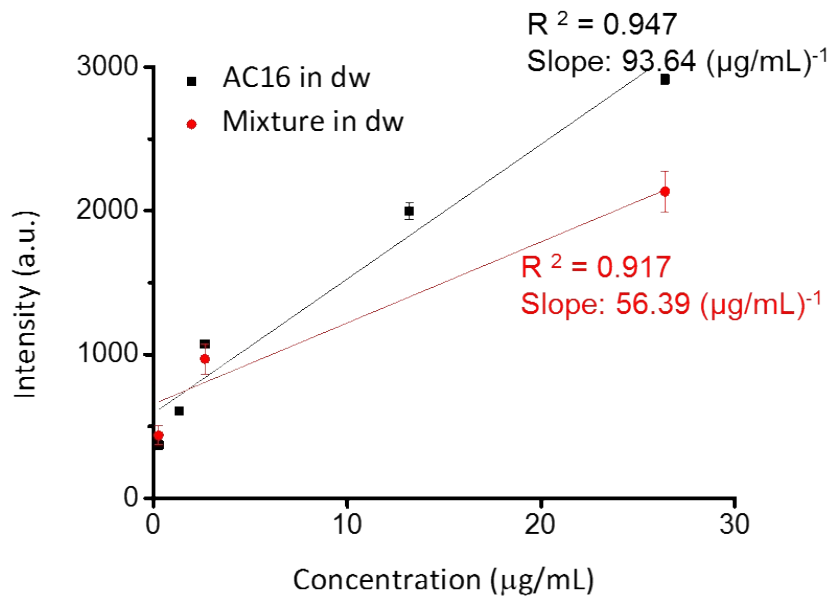
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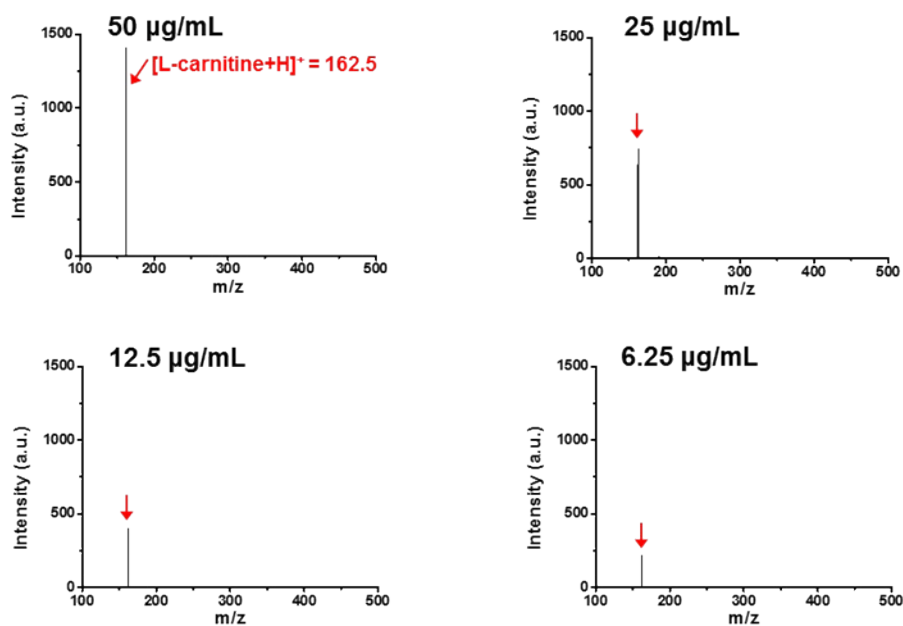


(g)



Supplement Fig. S6. Real sample analysis using MALDI-TOF mass spectrometry based on parylene matrix chip. (a) Mass spectra of serial dilution of L-carnitine tablet solution, (b) Comparison of the estimated concentrations using standard curve for L-carnitine.

(a)



(b)

