Supporting information

Thermal Formation of Homochiral Serine Clusters

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Figure Captions

Figure s1 Apparatus used to generate amino acid clusters by (a) electrospray and (b) sonic spray

Figure s2 Absolute ion abundance of amino acid clusters generated by sublimation/APCI at heated capillary temperatures of 150 ^{o}C

Figure s3 Ion chronogram of serine octamer, $[Ser_8+H]^+$, generated from solid L-serine at various heating rates from 0.5 ^{o}C/s up to 3 ^{o}C/s

Figure s4 Ion chronogram of serine octamer, $[Ser_8+H]^+$, generated from (a) the homochiral mixture (L-Ser/L-Thr) and (b) the heterochiral mixture (D-Ser/L-Thr), and the corresponding mass spectra. The clusters are labeled by their component units (# of L/D-serines + # of L-threonines).

Figure s5 Ion chronogram of the serine/cysteine octamer, $[Ser_7Cys_1+H]^+$, generated from (a) the homochiral mixture (L-Ser/L-Cys) and (b) the heterochiral mixture (D-Ser/L-Cys), and the corresponding mass spectra. The clusters are labeled by their component units (# of L/D-serines + # of L-cysteines). (The starred peaks are serine octamers substituted by serine pyrolysis products.)

Figure s6 Ion chronogram of the serine/tryptophan octamer, $[Ser_7Trp_1+H]^+$, generated from (a) the homochiral mixture (L-Ser/L-Trp) and (b) the heterochiral mixture (D-Ser/L-Trp), and the corresponding mass spectra. The clusters are labeled by their component units (# of L/D-serines + # of L-tryptophans). (The starred peaks are serine octamers substituted by serine pyrolysis products.)

Figure s7 Gas chromatography and mass spectra of the derivatized pyrolysis products from the thermal sublimation of L-serine (EA represents ethanolamine.)

Figure s8 Gas chromatography and mass spectra of the derivatized standard mixture, D/L-alanine, glycine and D/L-serine

Figure s9 Sublimation/APCI mass spectrum of mixtures of L-alanine and L-serine at 220 ^{o}C with a varied mol ratio of (a) 1:1 (b) 1:5 and (c) 1:10. The clusters are labeled by their component units (# of L-alanines + # of L-serines).

Table Caption

Table s1 Clustering of amino acids via sublimation/APCI at heated capillary temperatures of 50 ^{o}C and 150 ^{o}C

Figures

Figure s1.

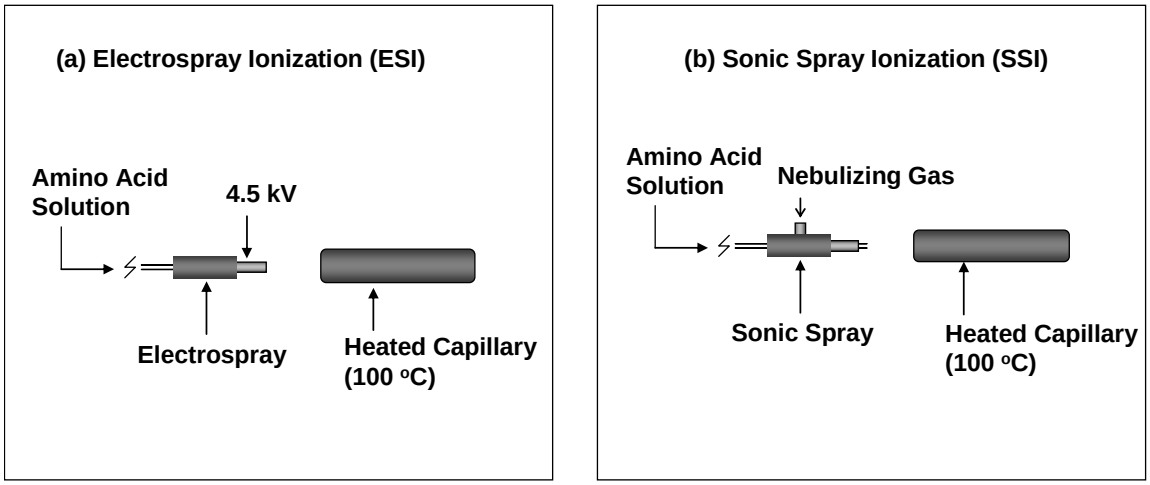

Figure s2

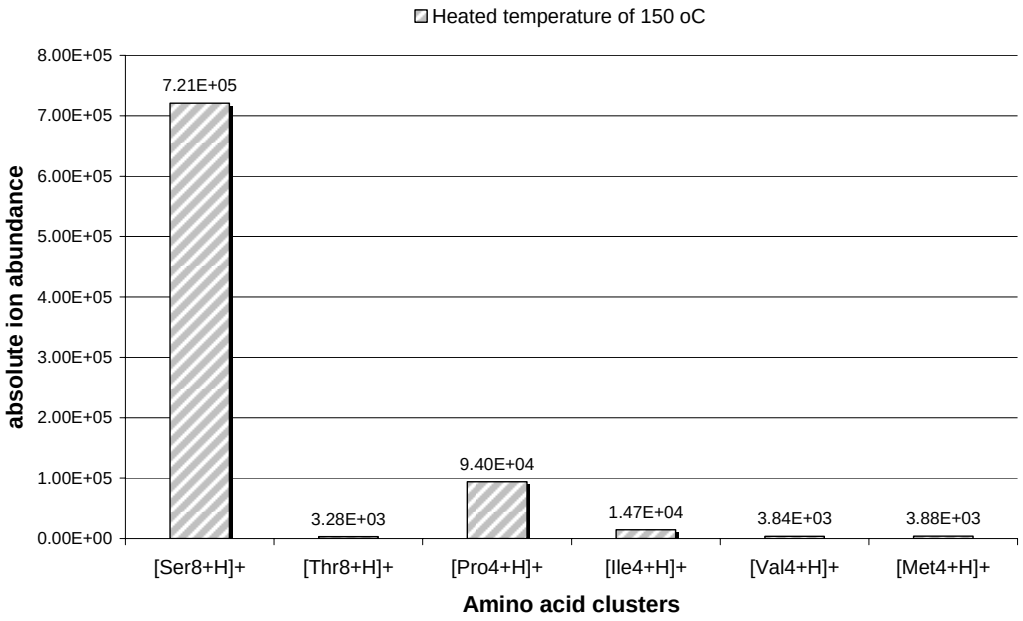

Figure s3

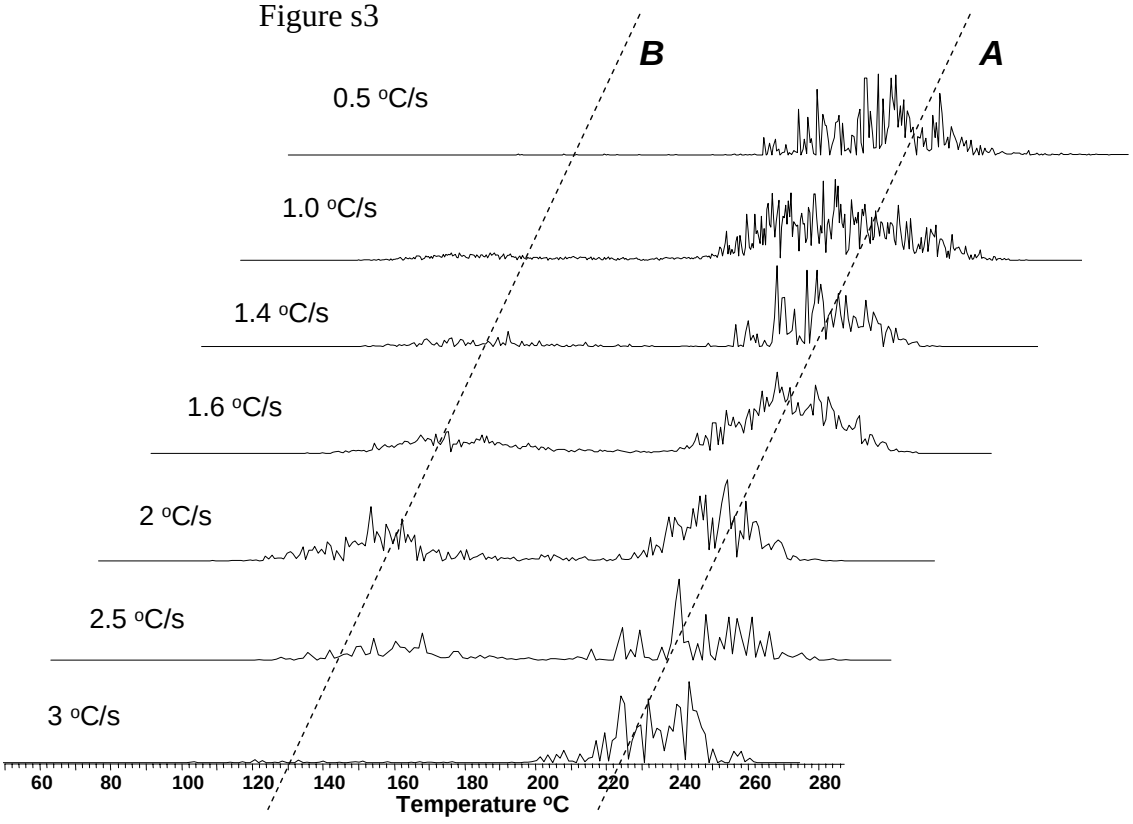

Figure s4

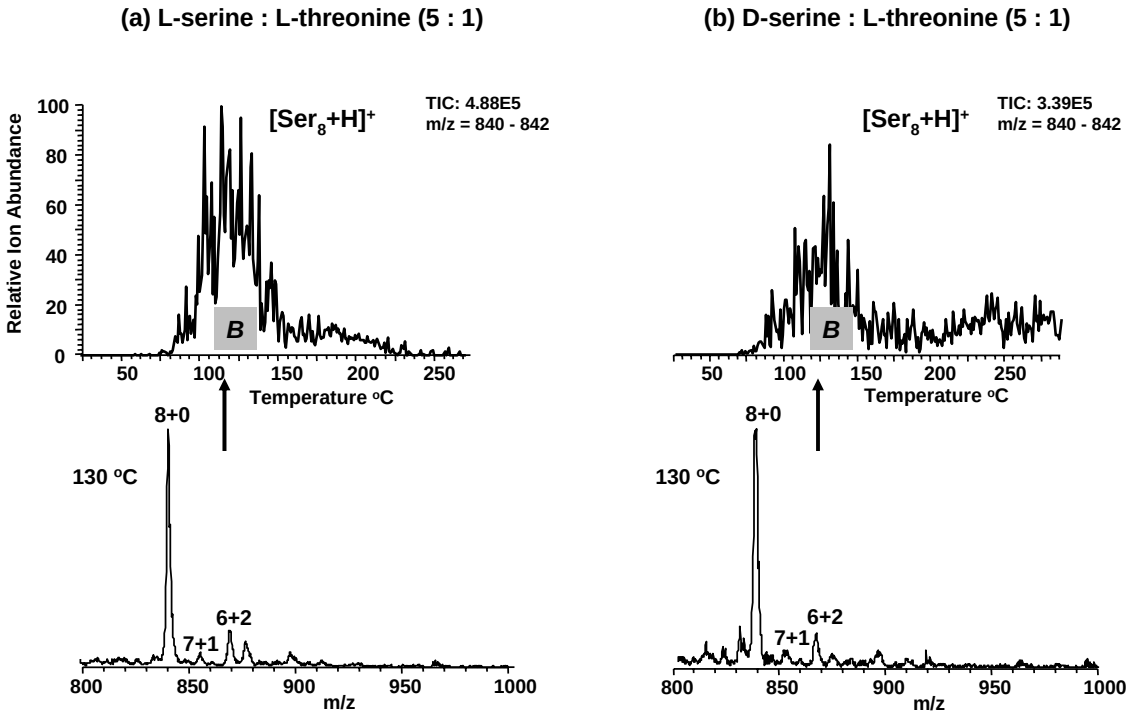

Figure s5

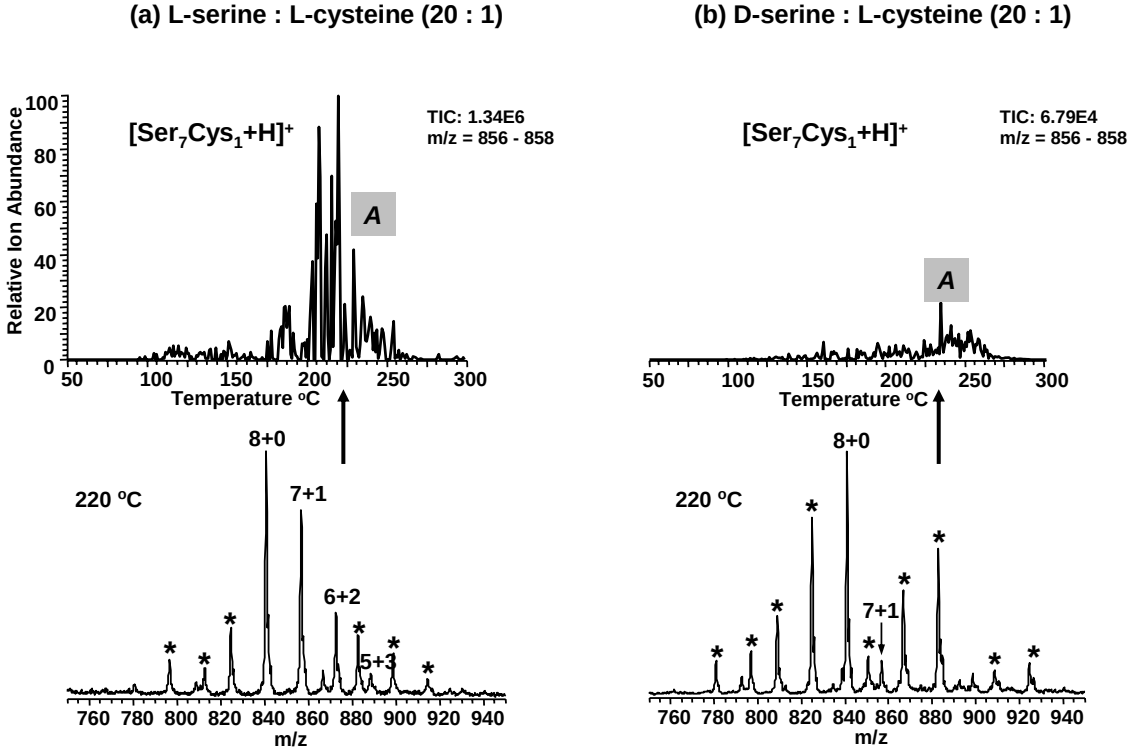

Figure s6

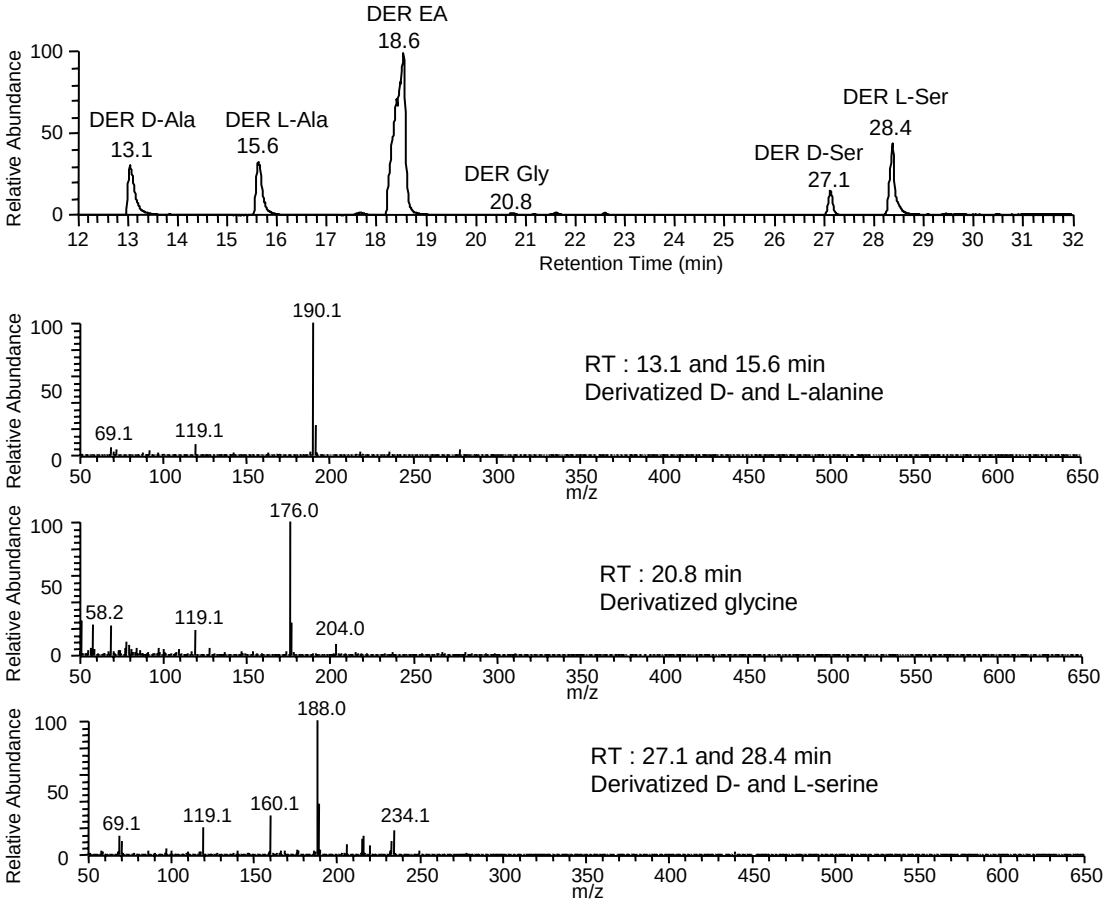

Figure s7

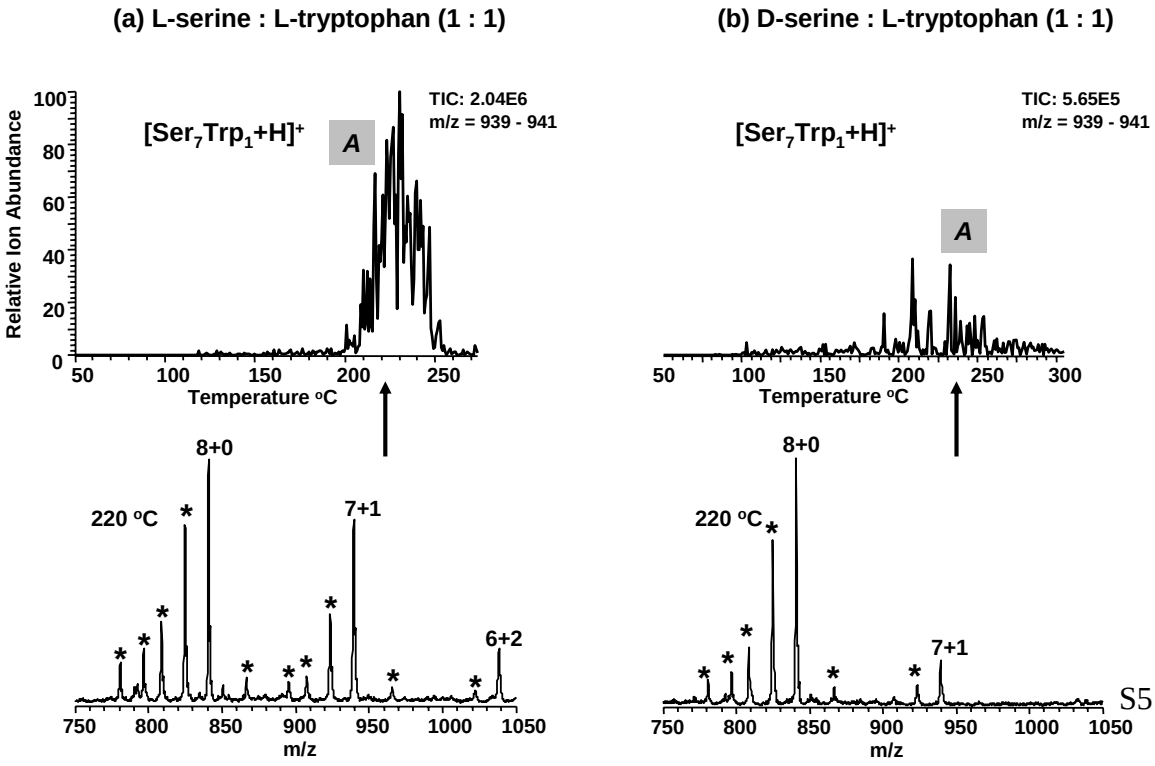

Figure s8

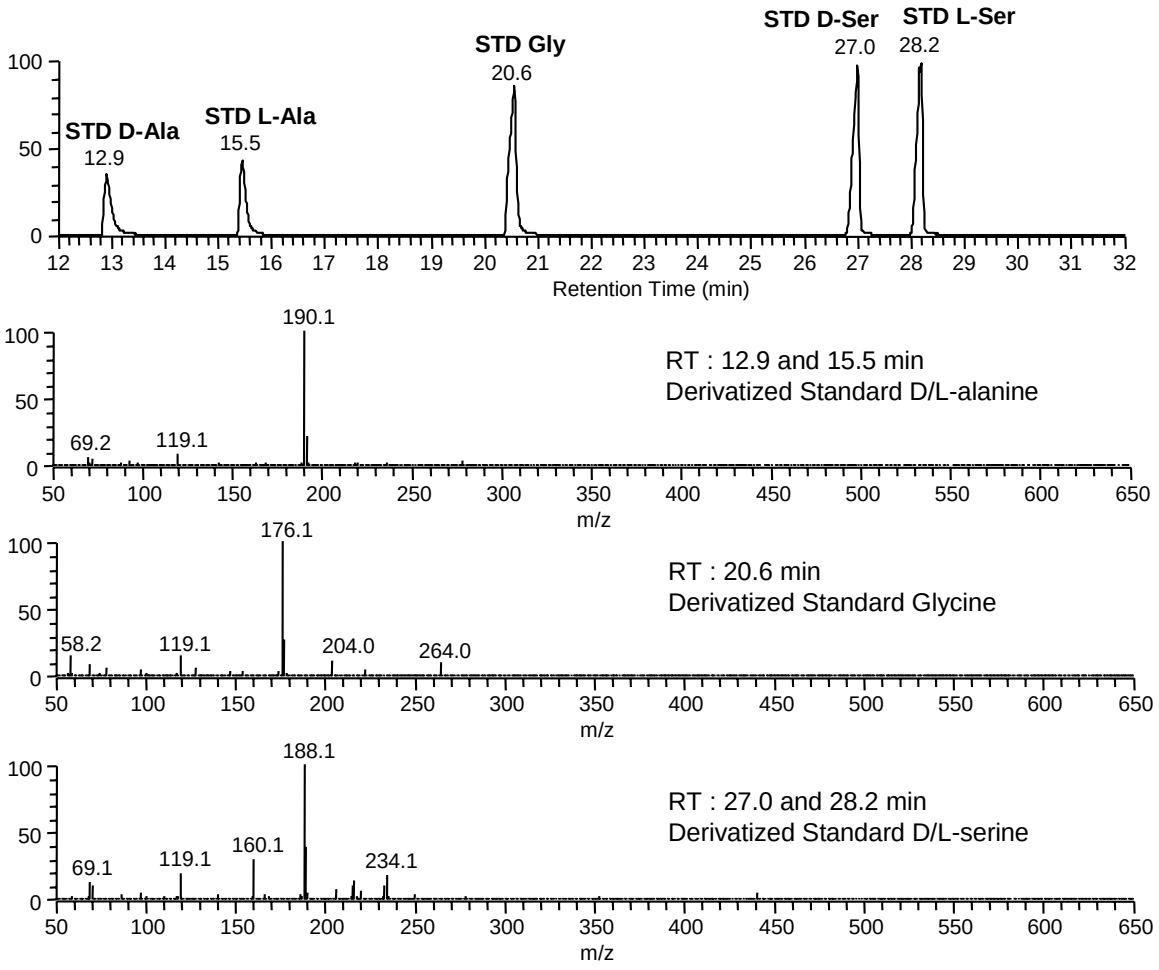
STD D-Ala
12.9
STD L-Ala
15.5
STD Gly
20.6
STD D-Ser
27.0
STD L-Ser
28.2
Retention Time (min)
190.1
69.2
119.1
RT : 12.9 and 15.5 min
Derivatized Standard D/L-alanine
176.1
58.2
119.1
204.0
264.0
RT : 20.6 min
Derivatized Standard Glycine
188.1
69.1
119.1
160.1
234.1
RT : 27.0 and 28.2 min
Derivatized Standard D/L-serine
m/z

Figure s9

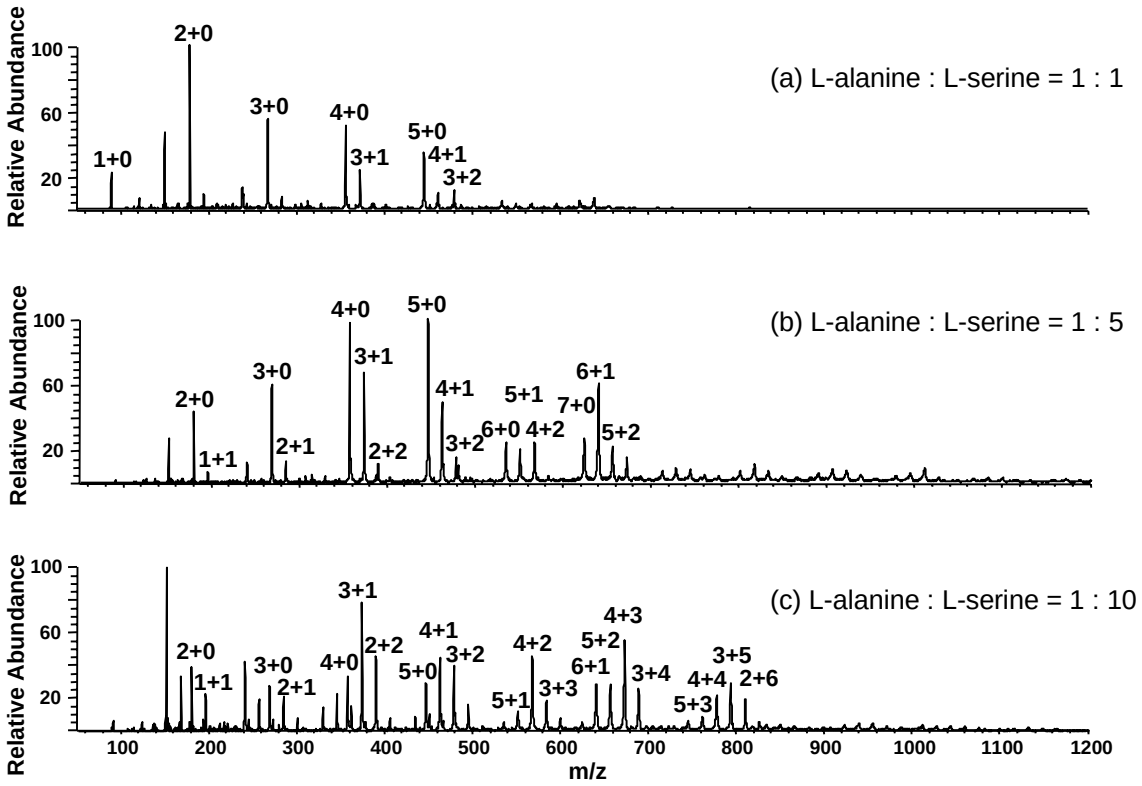
Relative Abundance
100
60
20
2+0
3+0
4+0
5+0
1+0
3+1
4+1
3+2
(a) L-alanine : L-serine = 1 : 1
Relative Abundance
100
60
20
4+0
5+0
3+1
3+0
2+0
4+1
5+1
6+1
7+0
1+1
2+1
2+2
3+2
6+0
4+2
5+2
(b) L-alanine : L-serine = 1 : 5
Relative Abundance
100
60
20
3+1
4+3
4+1
2+0
2+2
5+2
4+2
3+5
3+0
4+0
3+2
6+1
3+4
2+6
1+1
2+1
5+0
3+3
4+4
5+1
5+3
(c) L-alanine : L-serine = 1 : 10
100
200
300
400
500
600
700
800
900
1000
1100
1200
m/z

Table s1 Clustering of amino acids via sublimation/APCI at heated capillary temperatures of 50 ^{o}C and 150 ^{o}C

Temperature of Heated Capillary (ºC)	Amino Acids	Optimum Clustering Temperature (ºC)	Relative abundance of protonated clusters observed showing size n											
			1	2	3	4	5	6	7	8	9	10	11	12
50	**L-Ser**	220	38	50						100				
	L-Thr	230	42	18	8	26	10			100				
	L-Pro	200	100	53	22	89	23	22	5				13	28
	L-Ala	200	57	100	63	35	19							
	L-Val	205	100	81	29	77	11							
	L-Lue	210	100	63	14	19								
	L-Ile	210	100	38	27	99	22	8	10					
	L-Met	230	100	44	7	31								
	L-Cys	200	100	56	5									
	L-Lys	210	100	42	29	29								
150	**L-Ser**	220	29	68						100				
	L-Thr	230	45	100						33				
	L-Pro	200	41	100	7	64	12	6						
	L-Ala	200	21	100										
	L-Val	205	7	100	5	15								
	L-Lue	210	19	100		19								
	L-Ile	210	32	100		20								
	L-Met	230	100	23	6									
	L-Cys	200	100	96										
	L-Lys	210	100	28										