

Supplementary materials

Compound	Molecular formula	Mono-isotopic mass	[M+H] ⁺ m/z, theoretical	[M+H] ⁺ m/z, observed	Mass accuracy (ppm)
NC2311	C ₂₃ H ₂₆ NO ₄ P	411.1599	412.167223	412.1679	1.64
NC2313	C ₂₅ H ₃₀ NO ₆ P	471.1811	472.188353	472.1894	2.22
NC2314	C ₂₇ H ₃₄ NO ₈ P	531.2022	532.209482	532.2084	2.03
NC2315	C ₂₉ H ₃₈ NO ₁₀ P	591.2233	592.230612	592.234	5.72
NC2128	C ₁₉ H ₁₇ NO ₃	307.1208	308.12812	308.1278	1.04
EF-24	C ₁₉ H ₁₅ F ₂ NO	311.1122	312.119447	312.1203	2.73
NC2453	C ₂₁ H ₂₁ NO ₃	335.1521	336.15942	336.1581	3.93
NC2454	C ₂₃ H ₂₅ NO ₅	395.1733	396.18055	396.1798	1.89
NC2067	C ₃₀ H ₃₀ N ₂ O ₃	466.2256	467.23292	467.2336	1.46
NC2081	C ₃₂ H ₃₂ N ₂ O ₄	508.2362	509.243484	509.2441	1.21
NC2144	C ₂₇ H ₂₃ NO ₃	409.1678	410.17507	410.1756	1.29
NC2138	C ₂₇ H ₂₃ NO ₃	409.1678	410.17507	410.1752	0.32
NC2094	C ₃₁ H ₃₁ NO ₃	465.2304	466.237671	466.2383	1.35

Table 1. The mass accuracy of [M+H]⁺ ions of the tested curcumin analogues using ESI-Qq-TOF-MS.

MS³ analysis		
Precursor ion	First generation product ions (MS/MS)	Second generation product ions (MS³)
467.1	349.1	189.1, 147.1
	259.1	231.1, 229.1, 143.1
	247.1	219.1, 205.1, 143.1
	231.1	229.1
	192.1	147.1

Table 2. Summary of MS³ experiments for NC2067

MS³ analysis		
Precursor ion	Product ions (MS/MS)	MS³ product ions
308.0	291.0	273.0, 263.0, 245.1, 197.1, 169.1, 159.1, 147.1
	273.0	245.1
	280.0	263.0, 245.1, 237.0, 235.1
	263.0	245.1, 237.0, 235.1
	214.1	197.1
	197.1	169.1
Neutral loss scan		
Neutral loss	Precursor ion	
201 (forming product ion F5')	308.0	
94 (forming product ion F6')	308.0	

Table 3. Summary of MS³ and neutral loss experiments for NC2128.

The side chain fragmentation				
A) Amides and mixed amines/amides curcumin analogues				
NC 2067 F _I =192 Da	NC 2081 F _I =234 Da	NC 2094 F _I =191 Da	NC 2144 F _I =135 Da	NC 2138 F _I =135 Da
Compound	Precursor ion P = [M+H] ⁺	F _I [R ₅] ⁺ = (P - C ₁₉ H ₁₇ NO)	F _{II}	F _{III}
2067	467.2	192	(F _I - C ₂ H ₇ N) = 147	(F _I - C ₇ H ₄ O ₂) = 72
2081	509.2	234	(F _I - C ₄ H ₉ NO) = 147	(F _I - C ₇ H ₄ O ₂) = 114
2094	466.2	191	(F _I - C ₅ H ₁₀) = 121	-
2144	410.2	135	-	-
2138	410.2	135	-	-
B) Phosphoramidate curcumin analogues				
Compound	Precursor ion P = [M+H] ⁺	F _I (P - C ₂ H ₄)	F _{II} (F _I - C ₂ H ₄)	F _{III} (F _{II} - H ₂ O)
2311	412.2	384	356	338
2313	472.2	444	416	-
2314	532.2	504	-	-
2315	592.2	564	-	-

Table 4. The product ions of the curcumin analogues' side chains during their ESI-MS/MS (A) amides and mixed amines/amides categories, showing the structures of (F_I) product ion (B) phosphoramidate curcumin analogues, showing the fragmentation pathway of the phosphoramidate side chain.