

1 **Supporting Information:**

2 **Synthesis of gibberellic acid derivatives and their**
3 **effects on plant growth**

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39 **Spectral Data of 2~6:**

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41 **3,13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone (2):** White
 42 solid, yield 98%, $^1\text{H-NMR}$ (300 MHz, CDCl_3): δ 6.39 (d, $J = 9.3$ Hz, 1 H), 5.90 (dd, $J = 9.3, 3.8$ Hz, 1 H), 5.36
 43 (d, $J = 3.8$ Hz, 1 H), 5.20 (d, $J = 1.7$ Hz, 1 H), 5.04 (s, 1 H), 3.31 (d, $J = 11.0$ Hz, 1 H), 2.84 (d, $J = 11.0$ Hz, 1
 44 H), 2.51 – 2.20 (m, 6 H), 2.15 (s, 3 H), 2.05 (s, 3 H), 2.01 - 1.81 (m, 3 H), 1.22 (s, 3 H). The analytical results
 45 of compound 2 was identical to the one described in the literature [1].

46 **3,13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl)
 47 ester-19,10-lactone (3):** White solid, yield 85%, m.p. 156–157 °C. $^1\text{H-NMR}$ (300 MHz, CDCl_3): δ 7.23 (d, $J =$
 48 8.5 Hz, 1 H), 6.47 - 6.43 (m, 2 H), 6.35 (dd, $J = 9.3, 0.6$ Hz, 1 H), 5.85 (dd, $J = 9.3, 3.8$ Hz, 1 H), 5.31 (d, $J =$
 49 3.8 Hz, 1 H), 5.19 - 5.18 (m, 1 H), 5.16 – 5.07 (m, 2 H), 4.94 (s, 1 H), 3.80 (s, 3 H), 3.77 (s, 3 H), 3.31 (d, $J =$
 50 11.0 Hz, 1 H), 2.77 (d, $J = 11.0$ Hz, 1 H), 2.44 - 2.11 (m, 5 H), 2.09 (s, 3 H), 2.01 (s, 3 H), 1.96 – 1.62 (m, 4 H),
 51 1.13 (s, 3 H). $^{13}\text{C-NMR}$ (75 MHz, CDCl_3): δ 176.68, 171.36, 169.63, 169.26, 161.26, 158.71, 153.46, 133.96,
 52 131.47, 128.72, 115.59, 107.77, 103.63, 98.11, 89.61, 83.78, 69.87, 62.53, 55.03, 54.97, 52.96, 51.77, 50.71,
 53 50.09, 41.86, 39.72, 35.63, 21.60, 20.39, 16.54, 13.88. HRMS for $\text{C}_{32}\text{H}_{40}\text{NO}_{10}$ ($\text{M}+\text{NH}_4$)⁺ 598.2647. Found:
 54 598.2648.

55 **13-acetoxy-ent-3 α ,10 β -dihydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-
 56 dimethoxybenzyl) ester-19,10-lactone (4):** White solid, yield 83%, m.p. 125–126 °C. $^1\text{H-NMR}$ (300 MHz,
 57 CDCl_3): δ 7.27 (d, $J = 8.2$ Hz, 1 H), 6.50 – 6.47 (m, 2 H), 6.33 (d, $J = 9.4$ Hz, 1 H), 5.93 (dd, $J = 9.3, 3.7$ Hz, 1
 58 H), 5.21 (s, 1 H), 5.19 – 5.10 (m, 2 H), 4.98 (s, 1 H), 3.84 (s, 3 H), 3.81 (s, 3 H), 3.23 (d, $J = 10.9$ Hz, 1 H), 2.82
 59 (d, $J = 10.9$ Hz, 1 H), 2.47 - 2.09 (m, 6 H), 2.04 (s, 3 H), 1.98 - 1.74 (m, 3 H), 1.25 (s, 3 H). $^{13}\text{C-NMR}$ (75
 60 MHz, CDCl_3): δ 178.24, 171.80, 169.42, 161.23, 158.71, 153.50, 132.30, 131.48, 115.61, 107.69, 103.63, 98.12,
 61 90.03, 83.92, 69.35, 62.61, 55.05, 54.98, 53.16, 52.35, 50.85, 50.77, 41.89, 39.80, 35.68, 21.63, 16.58, 14.00.
 62 HRMS for $\text{C}_{30}\text{H}_{38}\text{NO}_9$ ($\text{M}+\text{NH}_4$)⁺ 556.2541. Found: 556.2546.

63 **3 β -methylsulfonyl-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-
 64 dimethoxybenzyl) ester-19,10-lactone (5):** White solid, yield 95%, m.p. 80–82 °C. $^1\text{H-NMR}$ (300 MHz,
 65 CDCl_3): δ 7.26 (d, $J = 8.2$ Hz, 1 H), 6.50 (s, 1 H), 6.47 (s, 2 H), 6.02 (dd, $J = 9.3, 3.8$ Hz, 1 H), 5.22 (d, $J = 1.4$
 66 Hz, 1 H), 5.19 - 5.10 (m, 2 H), 5.07 (d, $J = 3.8$ Hz, 1 H), 4.98 (s, 1 H), 3.84 (s, 3 H), 3.81 (s, 3 H), 3.32 (d, $J =$
 67 11.0 Hz, 1 H), 3.08 (s, 3 H), 2.80 (d, $J = 11.0$ Hz, 1 H), 2.47 – 2.09 (m, 5 H), 2.04 (s, 3 H), 2.01 – 1.72 (m, 4 H),
 68 1.28 (s, 3 H). $^{13}\text{C-NMR}$ (75 MHz, CDCl_3): δ 175.66, 171.01, 169.32, 161.29, 158.75, 153.25, 135.40, 131.55,
 69 128.16, 115.52, 107.93, 103.65, 98.12, 89.47, 83.68, 62.62, 55.05, 55.00, 52.75, 52.28, 50.62, 50.54, 50.03, 41.76,
 70 39.76, 38.37, 35.52, 21.60, 16.51, 14.44. HRMS for $\text{C}_{31}\text{H}_{37}\text{O}_{11}\text{S}$ ($\text{M}+\text{H}$)⁺ 617.2051. Found: 617.2052.

71 **3 α -azido-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-
 72 dimethoxybenzyl) ester-19,10-lactone (6):** White solid, yield 89%, m.p. 126–128 °C. $^1\text{H-NMR}$ (300 MHz,
 73 CDCl_3): δ 7.24 (d, $J = 8.3$ Hz, 1 H), 6.50 - 6.46 (m, 2 H), 6.41 (dd, $J = 9.3, 2.0$ Hz, 1 H), 5.92 (dd, $J = 9.3, 2.6$
 74 Hz, 1 H), 5.20 (s, 1 H), 5.18 – 5.12 (m, 2 H), 4.97 (s, 1 H), 4.05 (t, $J = 2.3$ Hz, 1 H), 3.84 (s, 3 H), 3.80 (s, 3 H),
 75 2.99 (d, $J = 10.7$ Hz, 1 H), 2.77 (d, $J = 10.8$ Hz, 1 H), 2.03 (s, 3 H), 1.29 (s, 3 H). $^{13}\text{C-NMR}$ (75 MHz, CDCl_3)
 76 δ : 174.64, 171.22, 169.23, 161.30, 158.72, 153.20, 132.90, 131.56, 127.98, 115.42, 107.78, 103.67, 98.07,
 77 88.17, 83.69, 63.84, 62.68, 57.27, 55.02, 54.97, 52.75, 50.62, 50.47, 50.43, 41.79, 39.80, 35.58, 21.58, 16.56,
 78 14.51. HRMS for $\text{C}_{30}\text{H}_{37}\text{N}_4\text{O}_8$ ($\text{M}+\text{NH}_4$)⁺ 581.2606. Found: 581.2605.

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81 **Spectral Data of 8a~8o:**

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83 **N-Prop-2-ynylbenzamide (8a):** White solid, yield 98%, ¹H-NMR (CDCl₃): δ 7.79 (d, 2 H, J = 7.3 Hz), 7.56-
84 7.40 (m, 3 H), 6.35 (br, 1 H), 4.26 (dd, 2 H, J = 5.1, 2.5 Hz), 2.29 (t, 1 H, J = 2.4 Hz). The analytical results of
85 compound 8a were identical with the ones described in the literature [2].

86 **N-Prop-2-ynyl phenylacetamide (8b):** White solid, yield 90%, ¹H-NMR (CDCl₃): δ 7.28-7.43 (m, 5 H), 5.79
87 (br, 1 H), 4.04 (dd, 2 H, J = 5.1, 2.4 Hz), 3.62 (s, 2 H), 2.22 (t, 1 H, J = 2.6 Hz). The analytical results of
88 compound 8b were identical with the ones described in the literature [3].

89 **N-Prop-2-ynyl-p-methylphenylacetamide (8c):** White solid, yield 85%, m.p. 125-126 °C. ¹H-NMR (CDCl₃):
90 δ 7.16 – 7.23 (m, 4 H), 5.61 (br, 1 H), 4.04 (dd, 5.3, 2.6 Hz), 3.59 (s, 2 H), 2.39 (s, 3 H), 2.21 (t, 1 H, J = 2.6 Hz).
91 ¹³C NMR (75 MHz, CDCl₃): δ 170.62, 136.79, 129.39, 129.00, 79.15, 71.12, 42.68, 28.93, 20.72. HRMS for
92 C₁₂H₁₄NO (M+H)⁺ 188.1070. Found: 188.1070.

93 **N-Prop-2-ynyl-p-methoxyphenylacetamide (8d):** White solid, yield 95%, m.p. 99-100 °C. ¹H-NMR
94 (CDCl₃): δ 7.20 (d, 2 H, J = 8.7 Hz), 6.91 (d, 2 H, J = 8.7 Hz), 5.83 (br, 1 H), 4.02 (dd, 2 H, J = 5.4, 2.7 Hz), 3.83
95 (s, 3 H), 3.55 (s, 2 H), 2.21 (t, 1 H, J = 2.7 Hz). ¹³C NMR (75 MHz, CDCl₃): δ 170.93, 158.54, 130.16, 126.17,
96 114.06, 79.24, 71.11, 54.93, 42.08, 28.91. HRMS for C₁₂H₁₄NO₂ (M+H)⁺ 204.1019. Found: 204.1018.

97 **N-Prop-2-ynyl-p-chlorobenzamide (8e):** White solid, yield 92%, ¹H-NMR (CDCl₃): δ 7.64 (d, 2 H, J = 8.4
98 Hz), 7.33 (d, 2 H, J = 8.7 Hz), 6.41 (s, 1 H), 4.13 (dd, 2 H, J = 5.4 Hz, J = 2.4 Hz), 2.24 (t, 1 H, J = 2.4 Hz). The
99 analytical results of compound 8e were identical with the ones described in the literature [4].

100 **N-Prop-2-ynyl- α -naphthoacetyl amide (8f):** White solid, yield 93 %, m.p. 141-142 °C. ¹H-NMR (CDCl₃): δ
101 8.04 – 7.78 (m, 3 H), 7.62 – 7.36 (m, 4 H), 5.58 (s, 1 H), 4.04 (d, 2 H), 3.94 (dd, J = 5.4, 2.5 Hz, 2 H), 2.10 (t, J
102 = 2.5 Hz, 1 H). ¹³C-NMR (75 MHz, CDCl₃): δ 170.22, 133.66, 131.69, 130.27, 128.48, 128.31, 128.09, 126.56,
103 125.92, 125.30, 123.40, 78.93, 71.06, 41.16, 28.91. HRMS for C₁₅H₁₄NO (M+H)⁺ 224.1070. Found: 224.1069.

104 **N-Prop-2-ynyl-o-isopropyl-p-chlorobenzamide (8g):** White solid, yield 89 %, m.p. 132-133 °C. ¹H-NMR
105 (300 MHz, CDCl₃): δ 7.32 – 7.22 (m, 3 H), 6.20 (s, 1 H), 3.98 (dd, J = 58.5, 17.6, 5.3, 2.6 Hz, 2 H), 2.87 (d, J
106 = 10.3 Hz, 1 H), 2.18 (t, J = 2.6 Hz, 1 H), 1.04 (d, J = 6.5 Hz, 3 H), 0.69 (d, J = 6.7 Hz, 3 H). ¹³C-NMR (75 MHz,
107 CDCl₃): δ 172.60, 137.13, 132.70, 129.60, 129.31, 128.28, 79.02, 71.30, 60.53, 31.48, 28.94, 21.11, 19.96. HRMS
108 for C₁₃H₁₅ClNO (M+H)⁺ 236.0837. Found: 236.0838.

109 **N-Prop-2-ynyl-n-butylamide (8h):** White solid, yield 82 %, ¹H-NMR (CDCl₃): δ 5.72 (s, 1 H), 4.08 (dd, 2
110 H, J = 5.2, 2.6 Hz), 2.22 (m, 3 H), 1.72 (m, 2 H), 0.98 (t, 3 H, J = 7.4 Hz). The analytical results of compound
111 8h was identical with the ones described in the literature [5].

112 **N-Prop-2-ynyl-(2,2,3,3-tetramethylcyclopropane-1-formoxyl)-amide (8i):** White solid, yield 95%, m.p.
113 99-100 °C. ¹H-NMR (CDCl₃): δ 5.87 (s, 1 H), 3.99 (dd, J = 5.2, 2.6 Hz, 2 H), 2.18 (t, J = 2.5 Hz, 1 H), 1.23 (s, 6
114 H), 1.12 (s, 6 H), 0.85 (s, 1 H). ¹³C-NMR (75 MHz, CDCl₃): δ 171.08, 79.89, 70.78, 36.99, 28.57, 28.27, 23.29,
115 16.42. HRMS for C₁₁H₁₈NO (M+H)⁺ 180.1383. Found: 180.1382.

116 **N-Prop-2-ynyl-pivalamide (8j):** White solid, yield 89 %, ¹H-NMR (CDCl₃): δ 5.96 (br, 1 H), 4.05 (dd, 2 H,
117 J = 5.1, 2.4 Hz), 2.25 (t, 1 H, J = 2.4 Hz), 1.22 (s, 9 H). The analytical results of compound 8j were identical
118 with the ones described in the literature [6].

119 **N-Prop-2-ynyl-acetyl amide (8k):** White solid, yield 96%, ¹H-NMR (CDCl₃): δ 5.99 (br, 1 H), 4.07 (dd, 2 H,
120 J = 5.1, 2.4 Hz), 2.26 (t, 1 H, J = 2.4 Hz), 2.04 (s, 3 H). Compound 8k is identical with the compound
121 described in the literature [7].

122 **N-(Prop-2-ynyl)-2-chloro-acetyl amide (8l):** White solid, yield 99 %, ¹H-NMR (CDCl₃): δ 6.83 (br, 1 H),
123 4.14 (dd, 2 H, J = 5.4, 2.7 Hz), 4.11 (s, 2 H), 2.32 (t, 1 H, J = 2.4 Hz). The analytical results of compound 8l
124 were identical with the ones described in the literature [7].

125 **N-(Prop-2-ynyl)-2-chloro-nicotinamide (8m):** White solid, yield 91%, ¹H-NMR (CDCl₃): δ 8.46 (dd, 1 H, J
126 = 3.0, 2.2 Hz), 8.10 (dd, 1 H, J = 6.2, 3.0 Hz), 7.36 (d, 1 H, 3.0 Hz), 6.94 (br, 1 H), 4.25 (m, 2 H), 2.32 (t, 1 H,
127 2.2 Hz). The analytical results of compound 8m were identical with the ones described in the literature
128 [8].

129 **N-(Prop-2-ynyl)-3,6-dichloro-picolinamide (8n):** White solid, yield 96%, m.p. 113-114 °C. ¹H-NMR
130 (CDCl₃): δ 7.87 (br, 1 H), 7.82 (d, 1 H, J = 8.4 Hz), 7.44 (d, 1 H, J = 8.4 Hz), 4.27 (dd, 2 H, J = 5.6, 2.7 Hz), 2.32
131 (t, 1 H, J = 2.6 Hz). ¹³C NMR (75 MHz, CDCl₃): δ 161.33, 147.31, 145.09, 142.66, 130.63, 127.25, 78.72, 71.53,
132 28.93. HRMS for C₉H₇Cl₂N₂O (M+H)⁺ 228.9930. Found: 228.9926.

133 *N-Prop-2-ynyl-isonicotinamide (8o)*: White solid, yield 97%, ¹H-NMR (CDCl₃): δ 9.30 (t, 1 H, J = 5.3 Hz),
134 8.75 (m, 2 H), 7.79 (m, 2 H), 4.11 (dd, 2 H, J = 5.7, 2.6 Hz), 3.20 (t, 1 H, J = 2.5 Hz). The analytical results of
135 compound **8o** were identical with the ones described in the literature [9].

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137 **Spectral Data of 9a~9o:**

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139 *3α-(4-benzamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-*
140 *diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9a)*: White solid, yield 78%, m.p. 90-
141 91 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.79 - 7.83 (m, 2 H), 7.30 - 7.48 (m, 5 H), 7.23 (d, 1 H, J = 8.4 Hz), 6.50
142 (dd, 1 H, J = 9.3, 2.4 Hz), 6.44 - 6.47 (m, 2 H), 5.83 (dd, 1 H, J = 9.3, 2.7 Hz), 5.49 (t, 1 H, 2.4 Hz), 5.21 (s, 1
143 H), 5.12 (m, 2 H), 4.98 (s, 1 H), 4.69 (dq, 2 H, J = 15.3, 5.4 Hz), 3.81 (s, 3 H), 3.77 (s, 3 H), 3.21 (d, 1 H, J = 10.8
144 Hz), 2.78 (s, 1 H, J = 10.8 Hz), 2.20 - 2.44 (m, 6 H), 2.02 (s, 3 H), 1.81 - 1.91 (m, 3 H), 1.09 (s, 3 H). ¹³C-NMR
145 (75 MHz, CDCl₃): δ 174.58, 171.13, 169.39, 167.19, 161.44, 158.85, 153.18, 144.65, 133.78, 131.76, 131.26,
146 128.23, 127.55, 126.85, 121.52, 115.46, 108.04, 103.71, 98.22, 88.29, 83.74, 63.84, 62.93, 57.83, 55.12, 55.06, 53.79,
147 50.79, 50.66, 50.55, 41.94, 41.68, 39.91, 35.63, 35.18, 26.72, 24.70, 21.69, 16.66, 14.27. HRMS for C₄₀H₄₂N₄O₉
148 (M+H)⁺ 723.3025. Found: 723.3028.

149 *3α-(4-phenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-*
150 *1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9b)*: White solid, yield 76%, m.p.
151 118-119 °C. ¹H-NMR (CDCl₃): δ 7.31 - 7.36 (m, 4 H), 7.24 - 7.29 (m, 4 H), 6.53 (dd, 1 H, J = 9.3, 2.4 Hz), 6.46
152 - 6.50 (m, 2 H), 5.82 (dd, 1 H, J = 9.3, 2.4 Hz), 5.49 (t, 1 H, 2.6 Hz), 5.24 (s, 1 H), 5.09 - 5.20 (m, 2 H), 5.00 (s,
153 1 H), 4.48 (d, 2 H, J = 5.7 Hz), 3.84 (s, 3 H), 3.79 (s, 3 H), 3.60 (s, 2 H), 3.22 (d, 1 H, J = 10.5 Hz), 2.81 (d, 1 H,
154 J = 10.8 Hz), 2.15 - 2.51 (m, 6 H), 2.05 (s, 3 H), 1.73 - 1.86 (m, 3 H), 1.09 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃):
155 δ 174.43, 171.05, 170.74, 169.32, 161.36, 158.77, 153.09, 144.61, 134.39, 133.70, 131.68, 129.05, 128.59, 127.45,
156 126.89, 121.16, 115.38, 107.98, 103.61, 98.15, 88.17, 83.66, 63.72, 62.86, 57.75, 55.05, 54.98, 50.73, 50.57, 50.48,
157 43.17, 41.87, 39.85, 35.56, 34.77, 21.62, 16.60, 14.17. HRMS for C₄₁H₄₅N₄O₉ (M+H)⁺ 737.3181. Found:
158 737.3190.

159 *3α-(4-p-methylphenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-*
160 *norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9c)*: White solid,
161 yield 85%, m.p. 102-103 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.32 (s, 1 H), 7.26 (d, 1 H, J = 7.8 Hz), 7.16 (m, 4
162 H), 6.53 (dd, 1 H, J = 9.3, 2.7 Hz), 6.47 - 6.50 (m, 2 H), 6.09 (t, 1 H, J = 5.6 Hz), 5.83 (dd, 1 H, J = 9.3, 2.4 Hz),
163 5.49 (t, 1 H, J = 2.4 Hz), 5.24 (s, 1 H), 5.10 - 5.21 (m, 2 H), 5.01 (s, 1 H), 4.42 - 4.54 (m, 2 H), 3.84 (s, 3 H), 3.80
164 (s, 3 H), 3.57 (s, 2 H), 3.23 (d, 1 H, J = 10.8 Hz), 2.81 (d, 1 H, J = 10.8 Hz), 2.45 - 2.51 (m, 2 H), 2.36 (s, 3 H),
165 2.10 - 2.30 (m, 4 H), 2.06 (s, 3 H), 1.73 - 1.86 (m, 3 H), 1.09 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.41,
166 171.05, 170.98, 169.31, 161.37, 158.77, 153.10, 144.68, 136.53, 133.68, 131.68, 131.25, 127.48, 121.11, 115.39,
167 107.97, 103.62, 98.15, 88.15, 83.66, 63.72, 62.85, 57.76, 55.05, 54.98, 53.68, 50.73, 50.58, 50.48, 42.78, 41.88,
168 39.85, 35.57, 34.76, 21.61, 20.71, 16.61, 14.16. HRMS for C₄₂H₄₇N₄O₉ (M+H)⁺ 751.3338. Found: 751.3334.

169 *3α-(4-p-methoxyphenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-*
170 *norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9d)*: White solid,
171 yield 88%, m.p. 98-99 °C. ¹H-NMR (300 MHz, DMSO-d₆): δ 8.54 (t, J = 5.6 Hz, 1 H), 7.66 (s, 1 H), 7.29 (d, J =
172 8.3 Hz, 1 H), 7.19 (d, J = 8.6 Hz, 2 H), 6.87 (d, J = 8.6 Hz, 2 H), 6.64 (dd, J = 9.3, 2.1 Hz, 1 H) 6.59 - 6.50 (m, 2
173 H), 5.91 (dd, J = 9.3, 2.4 Hz, 1 H), 5.77 (m, 1 H), 5.19 (s, 1 H), 5.13 - 5.03 (m, 2 H), 4.98 (s, 1 H), 4.32 (d, J =
174 5.4 Hz, 2 H), 3.78 (s, 3 H), 3.76 (s, 3 H), 3.74 (s, 3 H), 3.38 (s, 2 H), 3.20 (d, J = 10.7 Hz, 1 H), 2.66 (d, J = 10.7
175 Hz, 1 H), 2.39 - 2.04 (m, 6 H), 2.01 (m, 3 H), 1.82 - 1.70 (m, 3 H), 0.99 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-
176 d₆): δ 174.91, 169.41, 166.31, 153.91, 149.38, 144.78, 136.99, 134.28, 132.73, 131.37, 128.51, 128.37, 127.40,
177 123.26, 107.35, 88.91, 83.84, 79.35, 63.11, 57.73, 53.76, 50.19, 49.91, 42.00, 41.44, 35.97, 34.91, 26.56, 24.41,
178 21.85, 16.57, 14.56. HRMS for C₄₂H₄₇N₄O₁₀ (M+H)⁺ 767.3287. Found: 767.3293.

179 *3α-(4-p-chlorobenzamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-*
180 *1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9e)*: White solid, yield 81%, m.p.
181 105-106 °C. ¹H-NMR (300 MHz, DMSO-d₆): δ 9.14 (t, J = 5.7 Hz, 1 H), 7.91 (d, J = 8.7 Hz, 2 H), 7.79 (s, 1 H),
182 7.56 (d, J = 8.6 Hz, 2 H), 7.28 (d, J = 8.3 Hz, 1 H), 6.63 (dd, J = 9.3, 2.4 Hz, 1 H), 6.58 - 6.49 (m, 2 H), 5.94 (dd,
183 J = 9.3, 2.5 Hz, 1 H), 5.77 - 5.76 (m, 1 H), 5.17 (s, 1 H), 5.07 (m, 2 H), 4.97 (s, 1 H), 4.60 - 4.47 (m, 2 H), 3.78
184 (s, 3 H), 3.76 (s, 3 H), 3.19 (d, J = 10.7 Hz, 1 H), 2.64 (d, J = 10.7 Hz, 1 H), 2.37 - 2.03 (m, 6 H), 2.01 (s, 3 H),
185 1.82 - 1.71 (m, 3 H), 0.99 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-d₆): δ 174.50, 170.98, 169.47, 165.27, 161.41,
186

186 158.92, 153.66, 144.59, 136.25, 133.04, 132.53, 132.00, 129.33, 128.48, 123.28, 115.49, 107.87, 104.54, 98.42,
 187 88.71, 83.67, 62.95, 62.59, 57.27, 55.55, 55.39, 53.62, 50.74, 50.32, 50.15, 41.43, 35.68, 34.94, 26.55, 21.79, 16.58,
 188 14.42. HRMS for C40H42CIN4O9 (M+H)⁺ 757.2635. Found: 757.2632.
 189 *3 α -(4- α -naphthoacetyllamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9f)*: White solid,
 190 yield 77%, m.p. 96-97 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.96 – 7.93 (m, 1 H), 7.87 – 7.84 (m, 1 H), 7.81 –
 191 7.78 (m, 1 H), 7.52 – 7.40 (m, 4 H), 7.25 – 7.21 (m, 2 H), 6.49 – 6.44 (m, 3 H), 6.37 (t, J = 5.8 Hz, 1 H), 5.70 (dd,
 192 J = 9.3, 2.5 Hz, 1 H), 5.41 (t, J = 2.5 Hz, 1 H), 5.23 (s, 1 H), 5.13 (m, 2 H), 4.99 (s, 1 H), 4.46 – 4.33 (m, 2 H),
 193 4.02 (s, 2 H), 3.81 (s, 3 H), 3.77 (s, 3 H), 3.19 (d, J = 10.7 Hz, 1 H), 2.79 (d, J = 10.7 Hz, 1 H), 2.50 – 2.43 (m, 2
 194 H), 2.27 – 2.13 (m, 4 H), 2.03 (s, 3 H), 1.92 – 1.74 (m, 3 H), 1.04 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.36,
 195 171.04, 170.68, 169.33, 161.36, 158.77, 153.10, 144.67, 133.57, 131.71, 131.68, 130.63, 128.41, 128.00, 127.42,
 196 126.33, 125.68, 125.33, 123.46, 121.09, 115.38, 107.97, 103.64, 98.15, 88.13, 83.67, 63.64, 62.85, 57.71, 55.05,
 197 54.99, 53.64, 50.70, 50.57, 50.47, 41.85, 41.04, 39.85, 35.57, 34.74, 21.62, 16.61, 14.15. HRMS for C45H47N4O9
 198 (M+H)⁺ 787.3338. Found: 787.3334.
 199 *3 α -[4-(2-isopropyl-4-chlorobenzamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9g)*: White solid,
 200 yield 80%, m.p. 102-103 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.31 (s, 2 H), 7.29 – 7.24 (m, 3 H), 6.56 – 6.46 (m,
 201 3 H), 5.74 (dd, J = 9.4, 2.4 Hz, 1 H), 5.46 (t, J = 2.4 Hz, 1 H), 5.24 (s, 1 H), 5.20 – 5.10 (m, 2 H), 5.00 (s, 1 H),
 202 4.48 (d, J = 5.5 Hz, 2 H), 3.84 (s, 3 H), 3.80 (s, 3 H), 3.22 (d, J = 10.6 Hz, 1 H), 2.87 (dd, J = 10.4, 3.8 Hz, 1 H),
 203 2.80 (d, J = 10.7 Hz, 1 H), 2.52 – 2.15 (m, 6 H), 2.06 (s, 3 H), 1.82 – 1.80 (m, 3 H), 1.08 (s, 3 H), 1.01 (dd, J =
 204 15.7, 6.4 Hz, 3 H), 0.71 (d, J = 6.6 Hz, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.36, 172.79, 171.05, 169.33,
 205 161.36, 158.77, 153.09, 137.58, 133.69, 132.40, 131.67, 129.33, 128.26, 128.15, 127.35, 115.38, 107.97, 103.62,
 206 98.16, 88.19, 88.13, 83.66, 63.70, 62.87, 60.55, 57.73, 55.05, 54.98, 53.68, 53.62, 50.75, 50.58, 50.48, 35.57, 31.26,
 207 31.01, 21.61, 21.14, 21.06, 19.95, 19.90, 14.18. HRMS for C43H48CIN4O9 (M+H)⁺ 799.3104. Found: 799.3118.
 208 *3 α -(4-n-butylamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9h)*: White solid, yield 75%, m.p. 92-93 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.36 (s, 1 H), 7.22 (d, J = 8.5 Hz, 1 H), 6.61 (t, J = 5.4 Hz, 1 H), 6.50 (dd,
 209 J = 9.3, 2.5 Hz, 1 H), 6.46 – 6.43 (m, 2 H), 5.82 (dd, J = 9.3, 2.5 Hz, 1 H), 5.48 (t, J = 2.5 Hz, 1 H), 5.20 (s, 1 H),
 210 5.11 (m, 2 H), 4.97 (s, 1 H), 4.48 (qd, J = 15.3, 5.7 Hz, 2 H), 3.80 (s, 3 H), 3.76 (s, 3 H), 3.20 (d, J = 10.7 Hz, 1
 211 H), 2.75 (d, J = 10.7 Hz, 1 H), 2.46 – 2.40 (m, 2 H), 2.26 – 2.11 (m, 6 H), 2.01 (s, 3 H), 1.96 – 1.70 (m, 3 H), 1.64
 212 (q, J = 7.4 Hz, 2 H), 1.07 (s, 3 H), 0.91 (t, J = 7.4 Hz, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.48, 172.80, 171.02,
 213 169.30, 161.34, 158.74, 153.05, 133.65, 131.65, 127.47, 121.20, 115.34, 107.95, 103.62, 98.11, 88.20, 83.63, 63.69,
 214 62.83, 57.71, 55.02, 54.96, 53.67, 50.72, 50.55, 50.45, 41.81, 39.82, 37.96, 35.52, 34.50, 21.58, 18.65, 16.56, 14.15,
 215 13.37. HRMS for C37H45N4O9 (M+H)⁺ 689.3181. Found: 689.3192.
 216 *3 α -[4-(2,2,3,3-tetramethylcyclopropane-1-formamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9i)*: White solid, yield 79%, m.p. 109-110 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.34 (s, 1 H), 7.22 (d, J = 8.4 Hz, 1 H), 6.50 (dd, J = 9.3, 2.5 Hz, 1 H), 6.46 – 6.43 (m, 2 H), 6.34 (t, J = 5.6 Hz, 1 H), 5.82 (dd, J = 9.3, 2.5 Hz, 1 H), 5.48 (t, J = 2.5 Hz, 1 H), 5.20 (s, 1 H), 5.16 – 5.10 (m, 2 H), 4.97 (s, 1 H), 4.53 – 4.39 (m, 2 H), 3.80 (s, 3 H), 3.76 (s, 3 H), 3.20 (d, J = 10.8 Hz, 1 H), 2.78 (d, J = 10.8 Hz, 1 H), 2.47 – 2.11 (m, 7 H), 2.02 (s, 3 H), 1.92 – 1.69 (m, 3 H), 1.25 (s, 3 H), 1.23 (s, 3 H), 1.14 (s, 3 H), 1.13 (s, 3 H), 1.08 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.43, 171.43, 171.02, 169.29, 161.34, 158.74, 153.07, 133.59, 131.65, 127.53, 121.10, 115.36, 107.95, 103.62, 98.12, 88.16, 83.63, 63.71, 62.83, 57.74, 55.02, 54.96, 53.66, 50.71, 50.55, 50.45, 41.84, 39.82, 37.02, 35.53, 34.48, 27.90, 27.85, 23.28, 21.59, 16.57, 16.46, 14.16. HRMS for C41H51N4O9 (M+H)⁺ 743.3651. Found: 743.3665.
 231 *3 α -(4-pivalamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxybenzyl) ester-19,10-lactone (9j)*: White solid, yield 81%, m.p. 89-90 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.35 (s, 1 H), 7.25 (d, J = 8.0 Hz, 1 H), 6.53 (dd, J = 9.3, 2.5 Hz, 1 H), 6.49 – 6.46 (m, 2 H), 6.36 (s, 1 H), 5.85 (dd, J = 9.3, 2.5 Hz, 1 H), 5.51 (t, J = 2.5 Hz, 1 H), 5.23 (s, 1 H), 5.14 (q, J = 11.6 Hz, 2 H), 5.00 (s, 1 H), 4.51 (d, J = 5.5 Hz, 2 H), 3.83 (s, 3 H), 3.79 (s, 3 H), 3.23 (d, J = 10.8 Hz, 1 H), 2.80 (d, J = 10.8 Hz, 1 H), 2.50 – 2.43 (m, 2 H), 2.29 – 2.14 (m, 4 H), 2.04 (s, 3 H), 1.85 – 1.74 (m, 3 H), 1.22 (s, 9 H), 1.10 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 178.20, 174.44, 171.04, 169.29, 161.35, 158.76, 153.09, 144.86, 133.75, 131.67, 127.44, 121.05, 115.38, 107.95, 103.60, 98.14, 88.14, 83.64, 63.75, 62.84, 57.77, 55.04, 54.97, 53.70,

239 50.73, 50.58, 50.46, 41.87, 39.82, 38.27, 35.55, 34.79, 27.12, 21.60, 16.58, 14.16. HRMS for C₃₈H₄₇N₄O₉
 240 (M+H)⁺ 703.3338. Found: 703.3357.
 241 *3α-(4-acetylamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-*
 242 *diene-7,19-dioic acid-7-(2,4-dimethoxy-benzyl) ester-19,10-lactone (9k)*: White solid, yield 83%, m.p. 100–
 243 102 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.37 (s, 1H), 7.22 (d, J = 8.5 Hz, 1H), 6.76 (t, J = 5.4 Hz, 1H), 6.51 (dd,
 244 J = 9.3, 2.5 Hz, 1H), 6.47 – 6.43 (m, 2 H), 5.83 (dd, J = 9.3, 2.5 Hz, 1H), 5.49 (t, J = 2.5 Hz, 1H), 5.21 (s, 1 H),
 245 5.11 (q, J = 11.6 Hz, 2 H), 4.97 (s, 1 H), 4.47 (qd, J = 15.4, 5.6 Hz, 2 H), 3.80 (s, 3 H), 3.76 (s, 3 H), 3.21 (d, J =
 246 10.7 Hz, 1 H), 2.77 (d, J = 10.8 Hz, 1 H), 2.47 – 2.40 (m, 2 H), 2.26 – 2.08 (m, 4 H), 2.02 (s, 3 H), 1.99 (s, 3 H),
 247 1.92 – 1.70 (m, 3 H), 1.08 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.55, 171.02, 169.93, 169.33, 161.34, 158.75,
 248 153.05, 133.69, 131.67, 127.46, 121.19, 115.34, 107.97, 103.61, 98.12, 88.25, 83.64, 63.71, 62.85, 57.72, 55.04,
 249 54.98, 53.69, 50.70, 50.56, 50.46, 41.83, 39.83, 35.53, 34.63, 22.66, 21.60, 16.58, 14.16. HRMS for C₃₅H₄₀N₄O₉
 250 (M+H)⁺ 661.2868. Found: 661.2885.
 251 *3α-(4-chloroacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-*
 252 *1,16-diene-7,19-dioic acid-7-(2,4-dimethoxy-benzyl) ester-19,10-lactone (9l)*: White solid, yield 84%, m.p.
 253 91–92 °C. ¹H-NMR (300 MHz, CDCl₃): δ 7.39 – 7.35 (m, 2 H), 7.23 (d, J = 8.4 Hz, 1 H), 6.52 (dd, J = 9.3, 2.5
 254 Hz, 1 H), 6.47 – 6.44 (m, 2 H), 5.83 (dd, J = 9.3, 2.5 Hz, 1 H), 5.52 (t, J = 2.5 Hz, 1 H), 5.21 (d, J = 1.3 Hz, 1 H),
 255 5.12 (q, J = 11.6 Hz, 2 H), 4.98 (s, 1 H), 4.55 (qd, J = 15.3, 5.7 Hz, 2 H), 4.05 (d, J = 0.9 Hz, 2 H), 3.81 (s, 3 H),
 256 3.77 (s, 3 H), 3.22 (d, J = 10.7 Hz, 1 H), 2.78 (d, J = 10.7 Hz, 1 H), 2.48 – 2.41 (m, 2 H), 2.31 – 2.07 (m, 4 H),
 257 2.02 (s, 3 H), 1.95 – 1.70 (m, 3 H), 1.08 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.52, 171.00, 169.31, 165.80,
 258 161.35, 158.76, 153.06, 143.74, 133.78, 131.67, 127.42, 121.26, 115.35, 107.96, 103.62, 98.13, 88.24, 83.63, 63.76,
 259 62.85, 57.73, 55.04, 54.98, 53.68, 50.69, 50.56, 50.45, 42.12, 41.83, 39.83, 35.53, 34.92, 21.60, 16.58, 14.13. HRMS
 260 for C₃₅H₄₀ClN₄O₉ (M+H)⁺ 695.2478. Found: 695.2499.
 261 *3α-[4-(2-chloro-nicotinamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10β-hydroxy-20-*
 262 *norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxy-benzyl) ester-19,10-lactone (9m)*: White solid,
 263 yield 72 %, m.p. 99–100 °C. ¹H-NMR (300 MHz, CDCl₃): δ 8.40 (dd, J = 4.8, 1.9 Hz, 1 H), 7.97 (dd, J = 7.6, 1.9
 264 Hz, 1 H), 7.57 (t, J = 5.4 Hz, 1 H), 7.48 (s, 1 H), 7.32 – 7.28 (m, 1 H), 7.22 (d, J = 8.4 Hz, 1 H), 6.52 (dd, J = 9.3,
 265 2.5 Hz, 1 H), 6.46 – 6.43 (m, 2 H), 5.83 (dd, J = 9.3, 2.5 Hz, 1 H), 5.49 (t, J = 2.5 Hz, 1 H), 5.20 (s, 1 H), 5.11
 266 (m, 2 H), 4.97 (s, 1 H), 4.69 (d, J = 5.5 Hz, 2 H), 3.80 (s, 3 H), 3.76 (s, 3 H), 3.21 (d, J = 10.8 Hz, 1 H), 2.76 (d,
 267 J = 10.7 Hz, 1 H), 2.46 – 2.40 (m, 2 H), 2.25 – 2.06 (m, 4 H), 2.01 (s, 3 H), 1.92 – 1.71 (m, 3 H), 1.06 (s, 3 H).
 268 ¹³C-NMR (75 MHz, CDCl₃): δ 174.47, 171.01, 169.33, 164.73, 161.34, 158.75, 153.04, 150.40, 147.04, 138.78,
 269 133.77, 131.66, 131.04, 127.39, 122.24, 115.34, 107.98, 103.64, 98.12, 88.23, 83.64, 63.73, 62.84, 57.69, 55.04,
 270 54.98, 53.68, 50.69, 50.56, 50.45, 41.80, 39.84, 35.50, 35.26, 21.60, 16.58, 14.15. HRMS for C₃₉H₄₁ClN₅O₉
 271 (M+H)⁺ 758.2587. Found: 758.2604.
 272 *3α-[4-(3,6-dichloro-picolinamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10β-hydroxy-20-*
 273 *norgibberella-1,16-diene-7,19-dioic acid-7-(2,4-dimethoxy-benzyl) ester-19,10-lactone (9n)*: White solid,
 274 yield 87%, m.p. 94–95 °C. ¹H-NMR (300 MHz, CDCl₃): δ 8.22 (t, J = 5.9 Hz, 1 H), 7.76 (d, J = 8.4 Hz, 1 H),
 275 7.44 (s, 1 H), 7.37 (d, J = 8.4 Hz, 1 H), 7.22 (d, J = 8.3 Hz, 1 H), 6.51 (dd, J = 9.3, 2.6 Hz, 1 H), 6.47 – 6.43 (m,
 276 2 H), 5.84 (dd, J = 9.3, 2.5 Hz, 1 H), 5.52 (t, J = 2.6 Hz, 1 H), 5.21 (s, 1 H), 5.12 (q, J = 11.6 Hz, 2 H), 4.97 (s, 1
 277 H), 4.70 (ddd, J = 32.3, 15.3, 6.0 Hz, 2 H), 3.81 (s, 3 H), 3.77 (s, 3 H), 3.21 (d, J = 10.8 Hz, 1 H), 2.78 (d, J = 10.8
 278 Hz, 1 H), 2.47 2.40 (t, J = 10.0 Hz, 2 H), 2.27 – 2.08 (m, 4 H), 2.02 (s, 3 H), 1.82 – 1.69 (m, 3 H), 1.09 (s, 3 H).
 279 ¹³C-NMR (75 MHz, CDCl₃): δ 174.48, 171.02, 169.31, 161.82, 161.34, 158.75, 153.08, 147.37, 145.63, 142.43,
 280 133.68, 131.66, 130.31, 127.52, 127.04, 121.36, 115.36, 107.94, 103.62, 98.12, 88.19, 83.64, 63.79, 62.84, 57.77,
 281 55.04, 54.98, 53.67, 50.70, 50.57, 50.45, 41.86, 39.82, 35.54, 34.70, 21.60, 16.57, 14.16. HRMS for C₃₉H₄₀Cl₂N₅O₉
 282 (M+H)⁺ 792.2198. Found: 792.2212.
 283 *3α-(4-isonicotinamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-*
 284 *1,16-diene-7,19-dioic acid-7-(2,4-dimethoxy-benzyl) ester-19,10-lactone (9o)*: White solid, yield 83%, m.p.
 285 94–97 °C. ¹H-NMR (300 MHz, CDCl₃): δ 8.73 (s, 2 H), 7.78 (t, J = 5.5 Hz, 1 H), 7.70 (d, J = 5.8 Hz, 2 H), 7.50
 286 (s, 1 H), 7.25 (d, J = 8.0 Hz, 1 H), 6.55 (dd, J = 9.3, 2.5 Hz, 1 H), 6.49 – 6.45 (m, 2 H), 5.86 (dd, J = 9.3, 2.5 Hz,
 287 1 H), 5.51 (t, J = 2.5 Hz, 1 H), 5.23 (s, 1 H), 5.14 (q, J = 11.6 Hz, 2 H), 4.99 (s, 1 H), 4.71 (ddd, J = 37.6, 15.3,
 288 5.6 Hz, 2 H), 3.83 (s, 3 H), 3.79 (s, 3 H), 3.24 (d, J = 10.7 Hz, 1 H), 2.80 (d, J = 10.8 Hz, 1 H), 2.49 – 2.43 (m, 2
 289 H), 2.29 – 2.08 (m, 4 H), 2.04 (s, 3 H), 1.97 – 1.74 (m, 3 H), 1.11 (s, 3 H). ¹³C-NMR (75 MHz, CDCl₃): δ 174.46,
 290 171.02, 169.32, 165.20, 161.35, 158.75, 153.04, 149.94, 144.06, 140.94, 133.86, 131.67, 127.30, 121.88, 120.88,

291 115.34, 107.98, 103.63, 98.14, 88.25, 83.63, 63.82, 62.88, 57.69, 55.04, 54.98, 53.70, 50.72, 50.54, 50.47, 41.83,
292 39.83, 35.53, 34.93, 21.60, 16.58, 14.20. HRMS for C₃₉H₄₂N₅O₉ (M+H)⁺ 724.2977. Found: 724.2989.

293 **Spectral Data of 10a~10o:**

294

295 **3 α -(4-benzamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-1,16-
296 diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10a):** White solid, yield 83%, m.p. 174-175 °C. ¹H-NMR
297 (300 MHz, DMSO-*d*₆): δ 13.15 (s, 1 H), 9.10 (t, J = 5.7 Hz, 1 H), 7.91 - 7.89 (m, 2 H), 7.79 (s, 1 H), 7.54 - 7.47
298 (m, 3 H), 6.63 (dd, J = 9.3, 2.2 Hz, 1 H), 5.91 (dd, J = 9.3, 2.3 Hz, 1 H), 5.74 (s, 1 H), 5.12 (s, 1 H), 4.98 (s, 1
299 H), 4.54 (d, J = 4.7 Hz, 2 H), 3.14 (d, J = 10.6 Hz, 1 H), 2.40 - 2.06 (m, 6 H), 1.99 (s, 3 H), 1.88 - 1.73 (m, 3
300 H), 1.06 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-*d*₆): δ 174.91, 169.41, 166.31, 153.91, 144.78, 134.28, 131.37,
301 128.37, 127.40, 123.26, 107.35, 88.91, 83.84, 79.35, 63.11, 57.73, 53.76, 50.19, 49.91, 42.00, 41.44, 35.97, 34.91,
302 26.56, 24.41, 21.85, 16.57, 14.56. HRMS for C₃₁H₃₃N₄O₇ (M+H)⁺ 573.2344. Found: 573.2344.

303 **3 α -(4-phenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-
304 1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10b):** White solid, yield 72%, m.p. 181-182 °C. ¹H-
305 NMR (300 MHz, DMSO-*d*₆): δ 12.84 (s, 1 H), 8.60 (t, J = 5.6 Hz, 1 H), 7.69 (s, 1 H), 7.31 - 7.22 (m, 5 H), 6.64
306 (dd, J = 9.3, 2.4 Hz, 1 H), 5.90 (dd, J = 9.3, 2.5 Hz, 1 H), 5.77 (t, J = 2.4 Hz, 1 H), 5.15 (s, 1 H), 5.01 (s, 1 H),
307 4.33 (d, J = 5.5 Hz, 2 H), 3.46 (s, 2 H), 3.16 (d, J = 10.7 Hz, 1 H), 2.59 (d, J = 10.7 Hz, 1 H), 2.37 - 2.05 (m, 6
308 H), 2.00 (s, 3 H), 1.90 - 1.70 (m, 3 H), 1.03 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-*d*₆): δ 174.67, 172.54, 170.24,
309 169.42, 153.52, 144.54, 136.41, 132.61, 129.06, 128.50, 128.30, 126.43, 123.04, 107.62, 88.80, 83.73, 79.28,
310 62.97, 57.42, 53.69, 51.03, 50.10, 49.96, 42.30, 41.85, 36.06, 34.38, 21.85, 16.52, 14.51. HRMS for
311 C₃₂H₃₅N₄O₇ (M+H)⁺ 587.2500. Found: 587.2509.

312 **3 α -(4-p-methylphenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-
313 norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10c):** White solid, yield 78%, m.p.
314 179-181 °C. ¹H-NMR (300 MHz, DMSO-*d*₆): δ 12.81 (s, 1 H), 8.55 (t, J = 5.6 Hz, 1 H), 7.65 (s, 1 H), 7.13 (q, J
315 = 8.0 Hz, 4 H), 6.63 (dd, J = 9.3, 2.4 Hz, 1 H), 5.90 (dd, J = 9.4, 2.4 Hz, 1 H), 5.76 (t, J = 2.4 Hz, 1 H), 5.15 (s,
316 1 H), 5.01 (s, 1 H), 4.32 (d, J = 5.5 Hz, 2 H), 3.41 (s, 2 H), 3.16 (d, J = 10.7 Hz, 1 H), 2.59 (d, J = 10.6 Hz, 1 H),
317 2.37 - 2.05 (m, 9 H), 2.00 (s, 3 H), 1.87 - 1.70 (m, 3 H), 1.02 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-*d*₆): δ
318 174.66, 172.54, 170.45, 169.41, 153.51, 144.62, 135.40, 133.32, 132.59, 128.93, 128.88, 128.50, 122.98, 88.79,
319 83.72, 79.27, 62.98, 57.42, 53.69, 51.03, 50.10, 49.95, 41.93, 36.05, 34.38, 21.84, 20.76, 16.54, 14.50. HRMS for
320 C₃₃H₃₇N₄O₇ (M+H)⁺ 601.2657. Found: 601.2658.

321 **3 α -(4-p-methoxyphenylacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-
322 norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10d):** White solid, yield 81%, m.p.
323 132-135 °C. ¹H-NMR (300 MHz, DMSO-*d*₆): δ 12.87 (s, 1 H), 8.53 (t, J = 5.5 Hz, 1 H), 7.66 (s, 1 H), 7.18 (d, J
324 = 8.6 Hz, 2 H), 6.86 (d, J = 8.6 Hz, 2 H), 6.64 (dd, J = 9.3, 2.2 Hz, 1 H), 5.90 (dd, J = 9.4, 2.3 Hz, 1 H), 5.76 (s,
325 1 H), 5.14 (s, 1 H), 5.01 (s, 1 H), 4.31 (d, J = 5.5 Hz, 2 H), 3.73 (s, 3 H), 3.15 (d, J = 10.6 Hz, 1 H), 2.58 (d, J =
326 10.7 Hz, 1 H), 2.32 - 2.05 (m, 6 H), 2.00 (s, 3 H), 1.84 - 1.73 (m, 3 H), 1.01 (s, 3 H). ¹³C-NMR (75 MHz,
327 DMSO-*d*₆): δ 174.68, 170.59, 169.42, 158.02, 153.54, 144.60, 132.58, 130.04, 128.51, 128.33, 123.01, 113.78,
328 88.81, 83.73, 79.28, 62.96, 57.43, 55.13, 53.68, 50.09, 49.95, 41.86, 41.42, 36.06, 35.90, 34.36, 21.85, 16.52,
329 14.51. HRMS for C₃₃H₃₇N₄O₈ (M+H)⁺ 617.2606. Found: 617.2608.

330 **3 α -(4-p-chlorobenzamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-
331 1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10e):** White solid, yield 80%, m.p. 198-201 °C. ¹H-
332 NMR (300 MHz, DMSO-*d*₆): δ 12.55 (s, 1 H), 9.12 (t, J = 5.7 Hz, 1 H), 7.90 (d, J = 8.6 Hz, 2 H), 7.80 (s, 1 H),
333 7.54 (d, J = 8.6 Hz, 2 H), 6.62 (dd, J = 9.3, 2.4 Hz, 1 H), 5.92 (dd, J = 9.3, 2.4 Hz, 1 H), 5.75 (t, J = 2.3 Hz, 1
334 H), 5.12 (s, 1 H), 4.99 (s, 1 H), 4.53 (d, J = 4.0 Hz, 2 H), 3.14 (d, J = 10.7 Hz, 1 H), 2.56 (d, J = 10.7 Hz, 1 H),
335 2.33 - 2.03 (m, 6 H), 1.98 (s, 3 H), 1.87 - 1.66 (m, 3 H), 1.02 (s, 3 H). ¹³C-NMR (75 MHz, DMSO-*d*₆): δ
336 174.70, 169.42, 165.30, 153.51, 148.59, 144.55, 136.27, 132.99, 132.57, 129.32, 128.48, 123.37, 107.60, 88.82,
337 83.71, 62.99, 57.43, 53.70, 51.07, 50.08, 49.92, 48.73, 41.83, 36.03, 34.94, 21.84, 21.15, 16.51, 14.51. HRMS for
338 C₃₁H₃₂ClN₄O₇ (M+H)⁺ 607.1954. Found: 607.1958.

339 **3 α -(4- α -naphthoacetylalamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-
340 norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10f):** White solid, yield 76%, m.p.
341 179-180 °C. ¹H-NMR (300 MHz, DMSO-*d*₆): δ 12.68 (s, 1 H), 8.73 (t, J = 5.6 Hz, 1 H), 8.10 - 8.07 (m, 1 H),
342 7.93 (dd, J = 6.4, 3.1 Hz, 1 H), 7.83 (dd, J = 6.6, 2.9 Hz, 1 H), 7.67 (s, 1 H), 7.59 - 7.41 (m, 4 H), 6.63 (dd, J =

343 9.3, 2.3 Hz, 1 H), 5.87 (dd, J = 9.3, 2.5 Hz, 1 H), 5.77 (t, J = 2.3 Hz, 1 H), 5.15 (s, 1 H), 5.02 (s, 1 H), 4.37 (d, J = 5.5 Hz, 2 H), 3.97 (s, 2 H), 3.17 (d, J = 10.6 Hz, 1 H), 2.61 (d, J = 10.6 Hz, 1 H), 2.21 (ddd, J = 52.8, 34.5, 10.1 Hz, 6 H), 2.01 (s, 3 H), 1.90 – 1.64 (m, 3 H), 1.03 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO- d_6): δ 174.70, 172.56, 170.23, 169.42, 153.53, 144.63, 133.46, 132.77, 132.66, 132.10, 128.47, 127.84, 127.18, 126.11, 125.71, 125.61, 124.31, 122.96, 107.64, 88.80, 83.73, 79.28, 62.97, 57.42, 53.70, 51.03, 50.10, 49.96, 41.86, 36.07, 34.49, 21.85, 21.15, 16.53, 14.53. HRMS for $\text{C}_{36}\text{H}_{37}\text{N}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 637.2657. Found: 637.2657.

349 *3α-[4-(2-isopropyl-4-chlorobenzamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10g)*: White solid, yield 89%, m.p. 201–202 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.82 (s, 1 H), 8.65 – 8.61 (m, 1 H), 7.51 (d, J = 3.3 Hz, 1 H), 7.34 (s, 3 H), 6.62 (dd, J = 9.3, 2.3 Hz, 1 H), 5.83 (d, J = 9.6 Hz, 1 H), 5.75 (dd, J = 4.4, 2.4 Hz, 1 H), 5.13 (s, 1 H), 5.00 (s, 1 H), 4.41 – 4.17 (m, 2 H), 3.13 (d, J = 10.7 Hz, 1 H), 3.08 (dd, J = 10.6, 2.4 Hz, 1 H), 2.56 (d, J = 10.7 Hz, 1 H), 2.33 – 2.13 (m, 6 H), 1.99 (s, 3 H), 1.83 – 1.67 (m, 3 H), 0.98 – 0.90 (m, 6 H), 0.61 (d, J = 6.7 Hz, 3 H). ^{13}C -NMR (75 MHz, DMSO- d_6): δ 174.57, 172.48, 169.42, 153.50, 144.61, 144.58, 139.10, 132.54, 131.40, 130.02, 128.42, 128.18, 107.62, 88.75, 83.71, 62.90, 58.90, 57.37, 53.63, 53.61, 51.00, 50.07, 49.93, 48.73, 41.83, 36.04, 34.23, 30.91, 21.84, 21.24, 21.17, 20.26, 16.52, 14.39. HRMS for $\text{C}_{34}\text{H}_{38}\text{ClN}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 649.2424. Found: 649.2455.

359 *3α-(4-n-butylamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10h)*: White solid, yield 71%, m.p. 199–200 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.85 (s, 1 H), 8.32 (t, J = 5.0 Hz, 1 H), 7.71 (s, 1 H), 6.64 (dd, J = 9.3, 2.4 Hz, 1 H), 5.92 (dd, J = 9.2, 2.5 Hz, 1 H), 5.77 (s, 1 H), 5.14 (s, 1 H), 5.01 (s, 1 H), 4.30 (d, J = 5.6 Hz, 2 H), 3.14 (d, J = 10.7 Hz, 1 H), 2.57 (d, J = 10.8 Hz, 1 H), 2.35 – 2.05 (m, 8 H), 2.00 (s, 3 H), 1.83 – 1.72 (m, 3 H), 1.53 (dd, J = 14.7, 7.3 Hz, 2 H), 1.01 (s, 3 H), 0.85 (t, J = 7.4 Hz, 3 H). ^{13}C -NMR (75 MHz, DMSO) δ 174.68, 172.16, 169.43, 153.56, 148.97, 144.78, 132.57, 128.53, 123.06, 107.59, 88.80, 83.72, 62.95, 57.45, 53.68, 51.09, 50.08, 49.92, 48.72, 41.84, 37.26, 36.04, 34.15, 21.84, 18.73, 16.51, 14.48, 13.70. HRMS for $\text{C}_{28}\text{H}_{35}\text{N}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 539.2500. Found: 539.2512.

368 *3α-[4-(2,2,3,3-tetramethylcyclopropane-1-formamido)-methyl-1H-1,2,3-trizol-1-yl]-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10i)*: White solid, yield 80%, m.p. 169–170 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.66 (s, 1 H), 8.25 (t, J = 5.6 Hz, 1 H), 7.70 (s, 1 H), 6.64 (dd, J = 9.3, 2.4 Hz, 1 H), 5.92 (dd, J = 9.3, 2.4 Hz, 1 H), 5.78 (t, J = 2.3 Hz, 1 H), 5.13 (s, 1 H), 5.00 (s, 1 H), 4.27 (d, J = 5.4 Hz, 2 H), 3.15 (d, J = 10.7 Hz, 1 H), 2.57 (d, J = 10.7 Hz, 1 H), 2.35 – 2.04 (m, 6 H), 1.99 (s, 3 H), 1.88 – 1.68 (m, 3 H), 1.19 (d, J = 3.0 Hz, 6 H), 1.11 (s, 7 H), 1.02 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO- d_6): δ 174.67, 170.96, 169.41, 153.56, 148.99, 144.97, 138.16, 132.53, 128.57, 124.85, 123.15, 107.59, 88.78, 83.72, 79.27, 62.92, 57.45, 53.68, 51.07, 50.09, 49.93, 41.85, 36.02, 34.22, 27.10, 23.64, 21.85, 16.72, 14.47. HRMS for $\text{C}_{32}\text{H}_{41}\text{N}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 593.2970. Found: 593.2984.

377 *3α-(4-pivalamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10j)*: White solid, yield 79%, m.p. 172–174 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.82 (s, 1 H), 8.05 (t, J = 5.8 Hz, 1 H), 7.61 (s, 1 H), 6.63 (dd, J = 9.3, 2.4 Hz, 1 H), 5.92 (dd, J = 9.3, 2.4 Hz, 1 H), 5.77 (d, J = 2.4 Hz, 1 H), 5.13 (s, 1 H), 5.00 (s, 1 H), 4.30 (d, J = 5.7 Hz, 2 H), 3.14 (d, J = 10.6 Hz, 1 H), 2.57 (d, J = 10.7 Hz, 1 H), 2.33 – 2.04 (m, 6 H), 1.99 (s, 3 H), 1.85 – 1.72 (m, 3 H), 1.10 (s, 9 H), 1.00 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO- d_6): δ 177.61, 174.63, 172.53, 169.40, 153.53, 145.46, 132.56, 128.55, 122.86, 107.60, 88.76, 83.71, 79.26, 62.92, 57.41, 53.68, 51.00, 50.09, 49.93, 41.84, 38.08, 36.05, 34.65, 27.43, 21.84, 16.52, 14.43. HRMS for $\text{C}_{29}\text{H}_{37}\text{N}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 553.2657. Found: 553.2673.

385 *3α-(4-acetylamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10k)*: White solid, yield 85%, m.p. 202–205 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.77 (s, 1 H), 8.36 (t, J = 5.6 Hz, 1 H), 7.73 (s, 1 H), 6.64 (dd, J = 9.3, 2.4 Hz, 1 H), 5.93 (dd, J = 9.3, 2.5 Hz, 1 H), 5.76 (t, J = 2.4 Hz, 1 H), 5.14 (s, 1 H), 5.01 (s, 1 H), 4.29 (d, J = 4.4 Hz, 2 H), 3.15 (d, J = 10.6 Hz, 1 H), 2.58 (d, J = 10.6 Hz, 1 H), 2.33 – 2.05 (m, 6 H), 2.00 (s, 3 H), 1.85 – 1.69 (m, 6 H), 1.03 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO) δ 174.69, 172.54, 169.42, 169.26, 153.54, 144.58, 132.57, 128.55, 123.09, 107.60, 88.81, 83.72, 79.28, 62.96, 57.42, 53.69, 51.05, 50.09, 49.94, 41.84, 36.05, 34.22, 22.56, 16.51, 14.52. HRMS for $\text{C}_{26}\text{H}_{31}\text{N}_4\text{O}_7$ ($\text{M}+\text{H}$) $^+$ 511.2187. Found: 511.2201.

393 *3α-(4-chloroacetamido-methyl-1H-1,2,3-trizol-1-yl)-13-acetoxy-ent-10β-hydroxy-20-norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10l)*: White solid, yield 73%, m.p. 179–180 °C. ^1H -NMR (300 MHz, DMSO- d_6): δ 12.67 (s, 1 H), 8.74 (t, J = 5.6 Hz, 1 H), 7.78 (s, 1 H), 6.64 (dd, J = 9.3, 2.4 Hz,

396 1 H), 5.93 (dd, $J = 9.3, 2.5$ Hz, 1 H), 5.78 (t, $J = 2.5$ Hz, 1 H), 5.13 (s, 1 H), 5.00 (s, 1 H), 4.37 (d, $J = 5.5$ Hz, 2
 397 H), 4.10 (s, 2 H), 3.16 (d, $J = 10.7$ Hz, 1 H), 2.58 (d, $J = 10.7$ Hz, 1 H), 2.35 – 2.02 (m, 6 H), 2.00 (s, 3 H), 1.85
 398 - 1.72 (m, 3 H), 1.03 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO-*d*₆): δ 174.68, 172.60, 169.45, 166.04, 153.55, 143.78,
 399 132.58, 128.50, 123.38, 107.66, 88.80, 83.68, 79.27, 62.91, 57.34, 53.67, 50.97, 50.06, 49.91, 42.62, 41.80, 36.05,
 400 34.62, 21.86, 16.51, 14.52. HRMS for C₂₆H₃₀ClN₄O₇ (M+H)⁺ 545.1818. Found: 545.1798.
 401 3 α -[4-(2-chloro-nicotinamido)-methyl-1*H*-1,2,3-trizol-1-yl]-13-acetoxy-ent-10 β -hydroxy-20-
 402 norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10m) : White solid, yield 89%, m.p.
 403 146-148 °C. ^1H -NMR (300 MHz, DMSO-*d*₆): δ 12.80 (s, 1 H), 9.17 (t, $J = 5.7$ Hz, 1 H), 8.49 (dd, $J = 4.8, 1.9$
 404 Hz, 1 H), 7.91 (dd, $J = 7.5, 1.9$ Hz, 1 H), 7.84 (s, 1 H), 7.51 (dd, $J = 7.5, 4.8$ Hz, 1 H), 6.66 (dd, $J = 9.3, 2.4$ Hz,
 405 1 H), 5.95 (dd, $J = 9.3, 2.5$ Hz, 1 H), 5.82 (t, $J = 2.4$ Hz, 1 H), 5.14 (s, 1 H), 5.01 (s, 1 H), 4.53 (d, $J = 5.6$ Hz, 2
 406 H), 3.17 (d, $J = 10.7$ Hz, 1 H), 2.60 (d, $J = 10.7$ Hz, 1 H), 2.36 - 2.06 (m, 6 H), 1.90 – 1.69 (m, 3 H), 1.05 (s, 3
 407 H). ^{13}C -NMR (75 MHz, DMSO-*d*₆): δ 174.67, 172.53, 169.42, 165.22, 153.53, 150.36, 146.70, 144.04, 138.10,
 408 133.00, 132.63, 128.52, 123.25, 123.09, 107.62, 88.81, 83.72, 79.27, 63.00, 57.42, 53.72, 51.01, 50.10, 49.95,
 409 41.86, 36.06, 34.88, 21.84, 16.52, 14.48. HRMS for C₃₀H₃₁ClN₅O₇ (M+H)⁺ 608.1907. Found: 608.1920.
 410 3 α -[4-(3,6-dichloro-picolinamido)-methyl-1*H*-1,2,3-trizol-1-yl]-13-acetoxy-ent-10 β -hydroxy-20-
 411 norgibberella-1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10n) : White solid, yield 90%, m.p.
 412 186-187 °C. ^1H -NMR (300 MHz, DMSO-*d*₆): δ 12.65 (s, 1 H), 9.25 (t, $J = 5.8$ Hz, 1 H), 8.11 (d, $J = 8.5$ Hz, 1
 413 H), 7.84 (s, 1 H), 7.68 (d, $J = 8.5$ Hz, 1 H), 6.64 (dd, $J = 9.3, 2.4$ Hz, 1 H), 5.95 (dd, $J = 9.3, 2.4$ Hz, 1 H), 5.82
 414 (t, $J = 2.3$ Hz, 1 H), 5.13 (s, 1 H), 5.00 (s, 1 H), 4.53 (d, $J = 5.7$ Hz, 2 H), 3.16 (d, $J = 10.7$ Hz, 1 H), 2.58 (d, $J =$
 415 10.6 Hz, 1 H), 2.35 - 2.02 (m, 6 H), 1.99 (s, 3 H), 1.88 – 1.68 (m, 3 H), 1.04 (s, 3 H). ^{13}C -NMR (75 MHz,
 416 DMSO-*d*₆): δ 174.65, 172.57, 169.42, 163.46, 153.51, 151.33, 147.65, 143.74, 141.90, 132.57, 128.55, 127.82,
 417 126.82, 123.48, 107.61, 88.80, 83.72, 79.25, 62.97, 57.43, 53.69, 51.04, 50.09, 49.94, 41.84, 36.04, 34.61, 21.85,
 418 16.51, 14.49. HRMS for C₃₀H₃₀Cl₂N₅O₇ (M+H)⁺ 642.1517. Found: 642.1527.
 419 3 α -(4-isonicotinamido-methyl-1*H*-1,2,3-trizol-1-yl)-13-acetoxy-ent-10 β -hydroxy-20-norgibberella-
 420 1,16-diene-7,19-dioic acid-19,10-lactone-7-carboxyl (10o) : White solid, yield 75%, m.p. 228-230 °C. ^1H -
 421 NMR (300 MHz, DMSO-*d*₆): δ 12.83 (s, 1 H), 9.38 (t, $J = 5.7$ Hz, 1 H), 8.75 (d, $J = 5.3$ Hz, 2 H), 7.84 - 7.82
 422 (m, 3 H), 6.63 (dd, $J = 9.3, 2.3$ Hz, 1 H), 5.93 (dd, $J = 9.3, 2.4$ Hz, 1 H), 5.77 (t, $J = 2.4$ Hz, 1 H), 5.13 (s, 1 H),
 423 5.00 (s, 1 H), 4.56 (d, $J = 3.7$ Hz, 2 H), 3.15 (d, $J = 10.7$ Hz, 1 H), 2.57 (d, $J = 10.7$ Hz, 1 H), 2.34 – 2.04 (m, 6
 424 H), 1.99 (s, 3 H), 1.88 – 1.71 (m, 3 H), 1.03 (s, 3 H). ^{13}C -NMR (75 MHz, DMSO-*d*₆): δ 174.69, 172.57, 169.42,
 425 164.65, 153.52, 150.14, 144.15, 141.69, 132.59, 128.52, 123.43, 121.69, 107.61, 88.82, 83.71, 79.26, 63.01, 57.42,
 426 53.70, 51.04, 50.08, 49.93, 41.83, 36.04, 34.97, 21.85, 16.51, 14.52. HRMS for C₃₀H₃₂N₅O₇ (M+H)⁺ 574.2296.
 427 Found: 574.2308.
 428
 429
 430

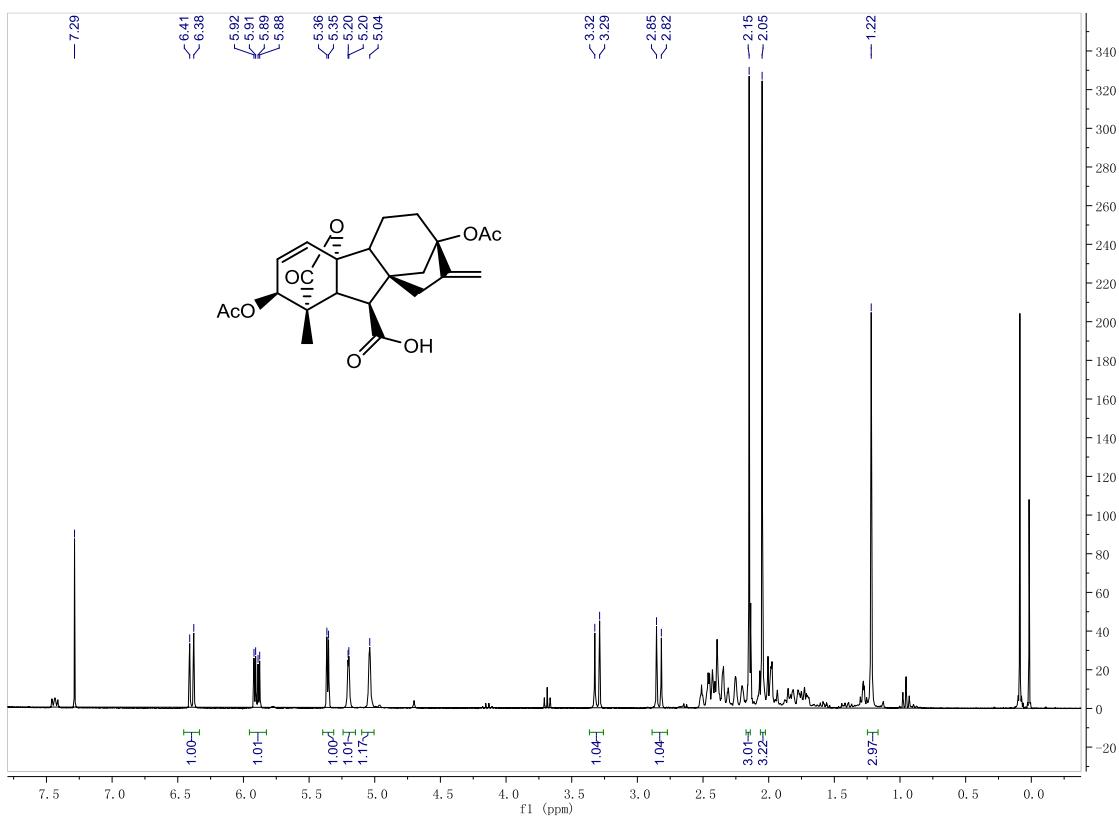
431

432 **Notes and References in Supporting Information**

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454 evaluation of n-((1-benzyl-1H-1,2,3-triazol-4-yl)methyl)nicotinamides as potential anticancer agents
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- 459

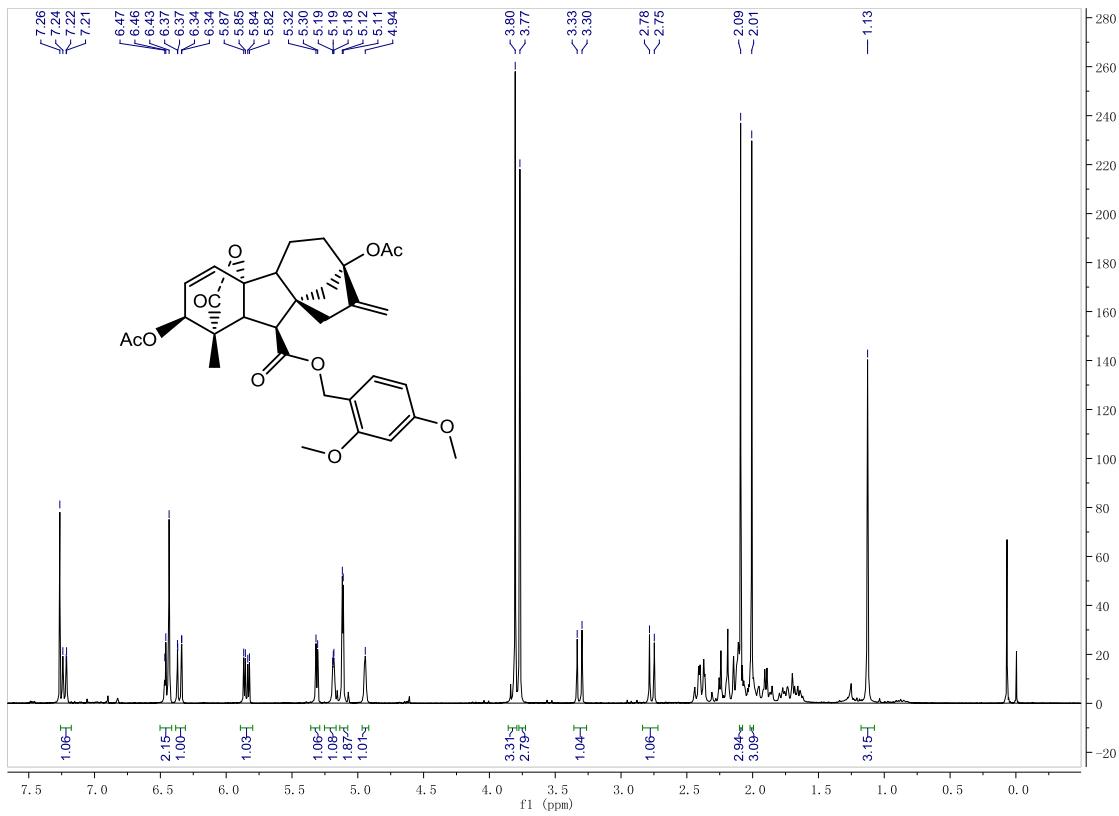
460

461 ^1H -NMR spectrum of compound 2.



462

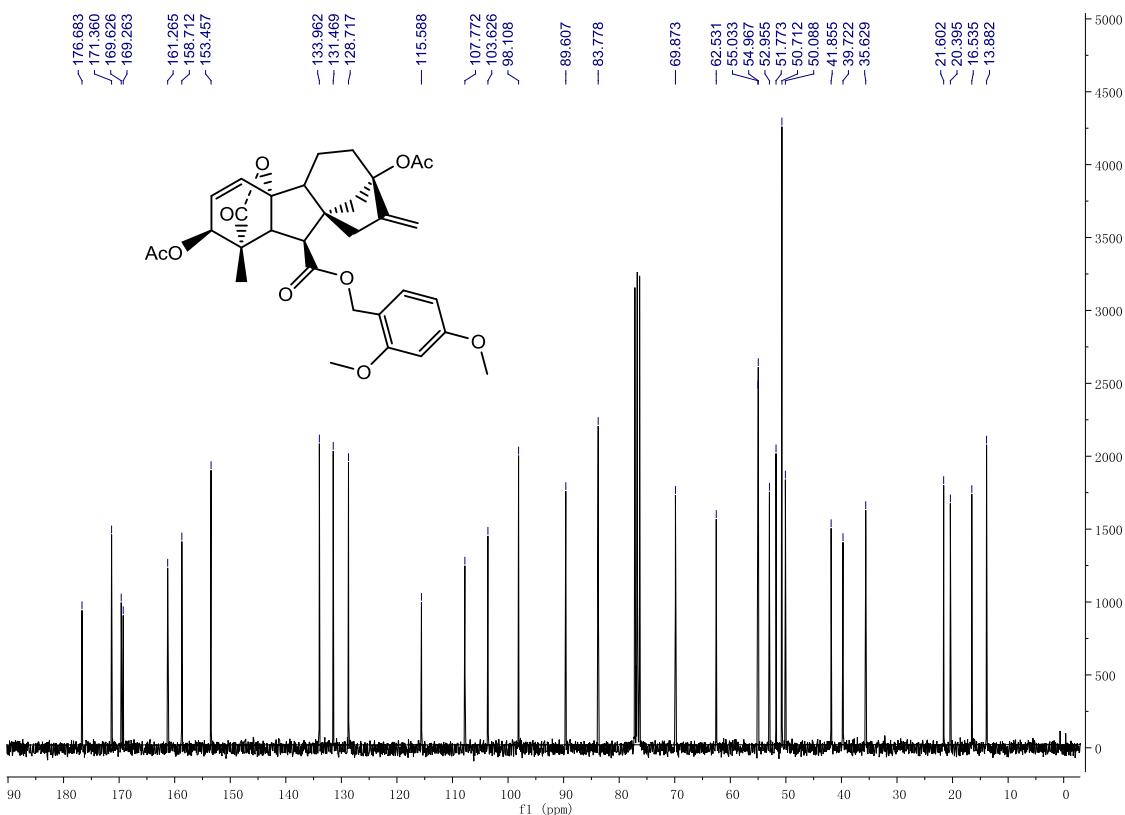
463 ^1H -NMR spectrum of compound 3.



464

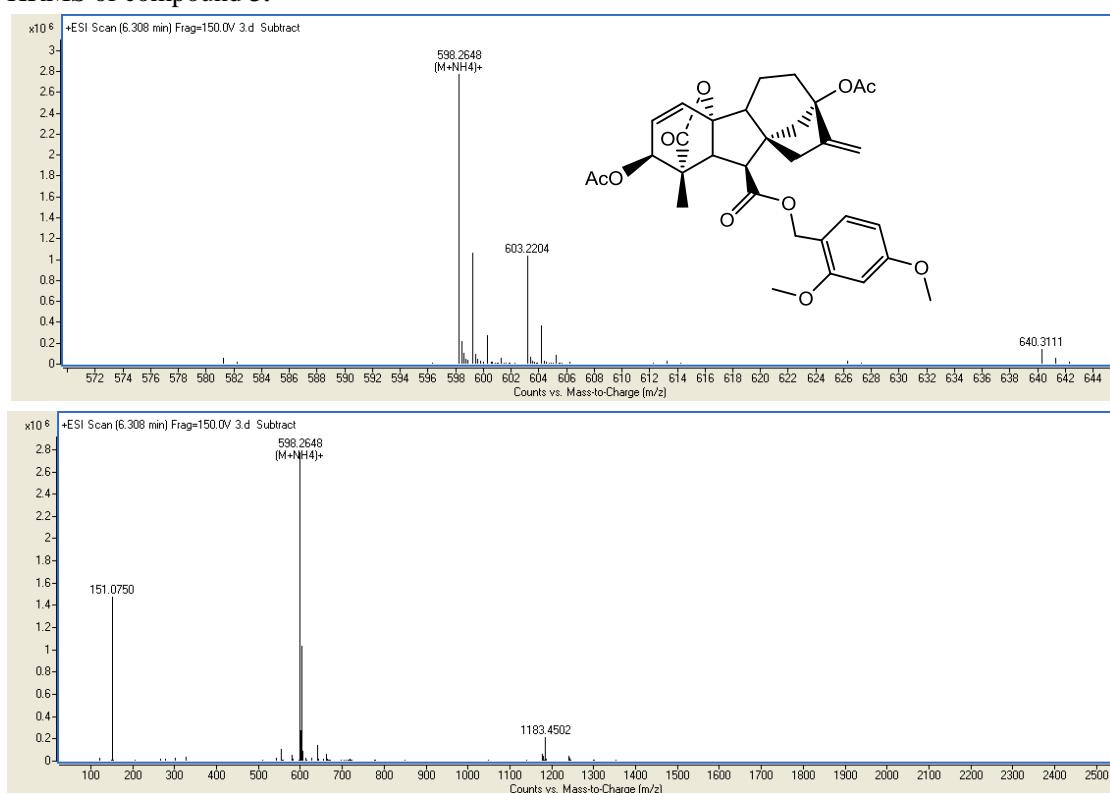
465

466

467 ^{13}C -NMR spectrum of compound 3.

468

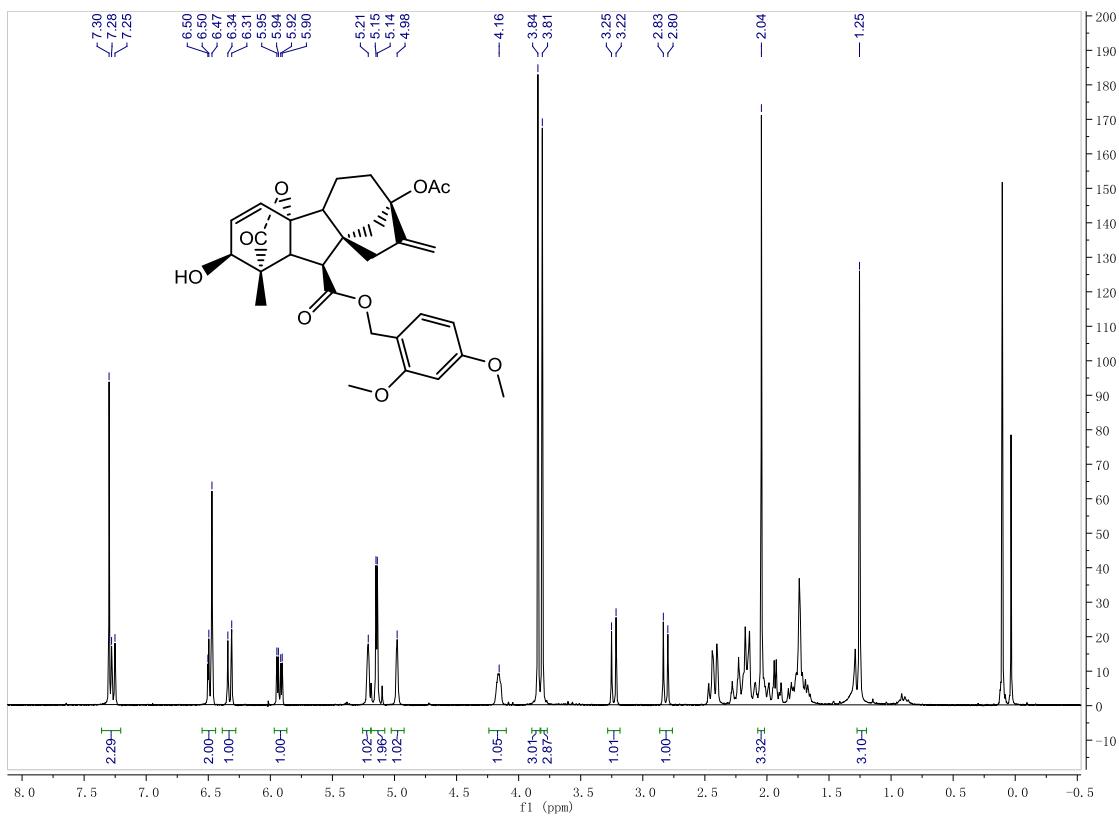
469 HRMS of compound 3.



470

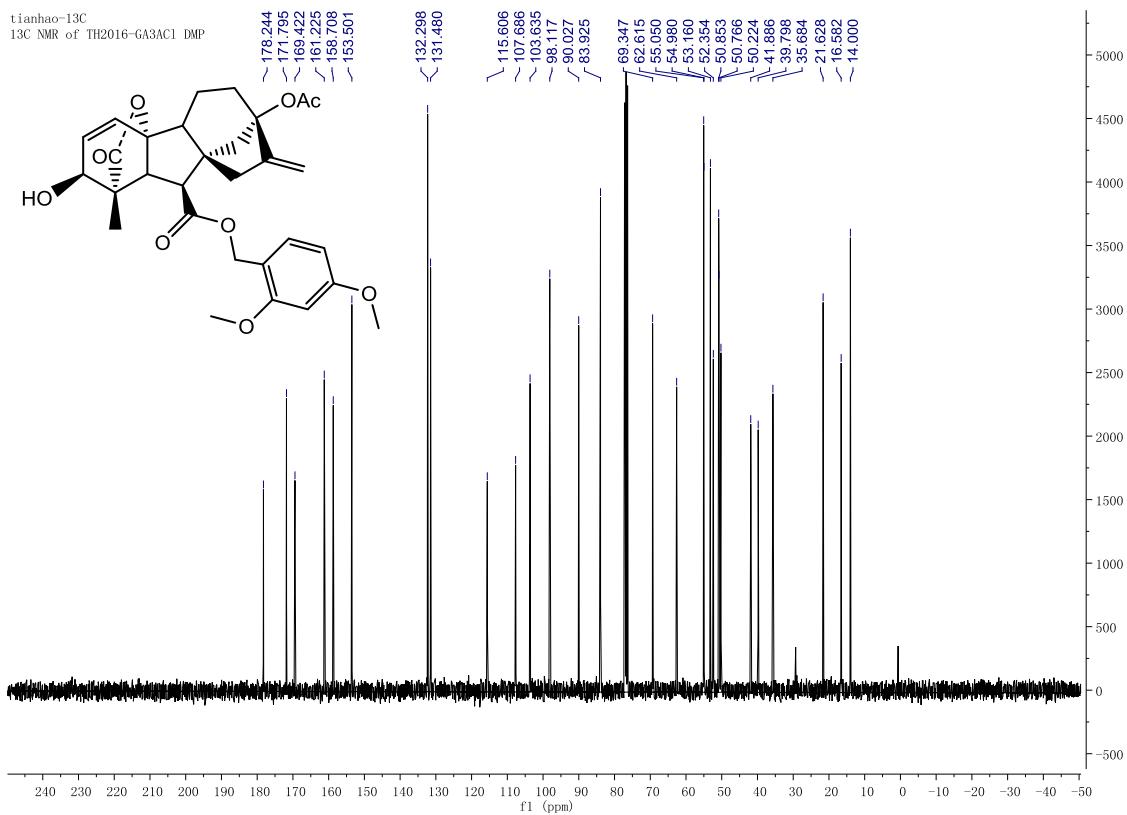
471

472 ^1H -NMR spectrum of compound 4.



473

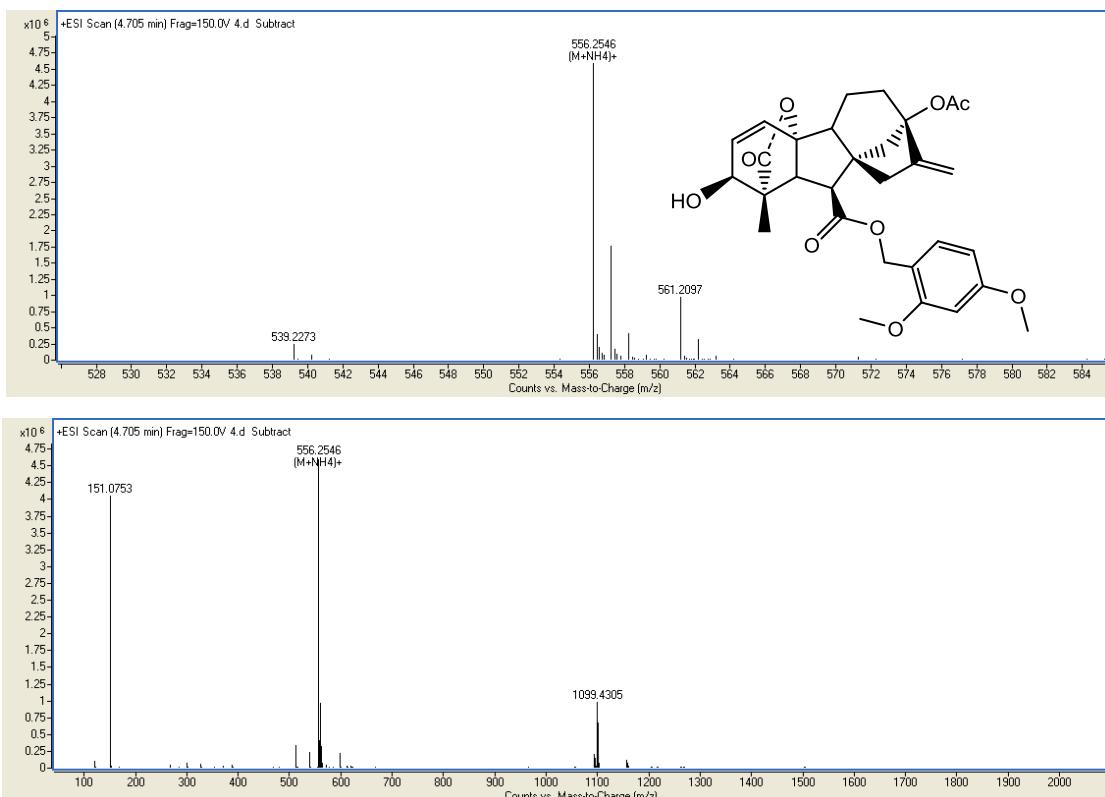
474 ^{13}C -NMR spectrum of compound 4.



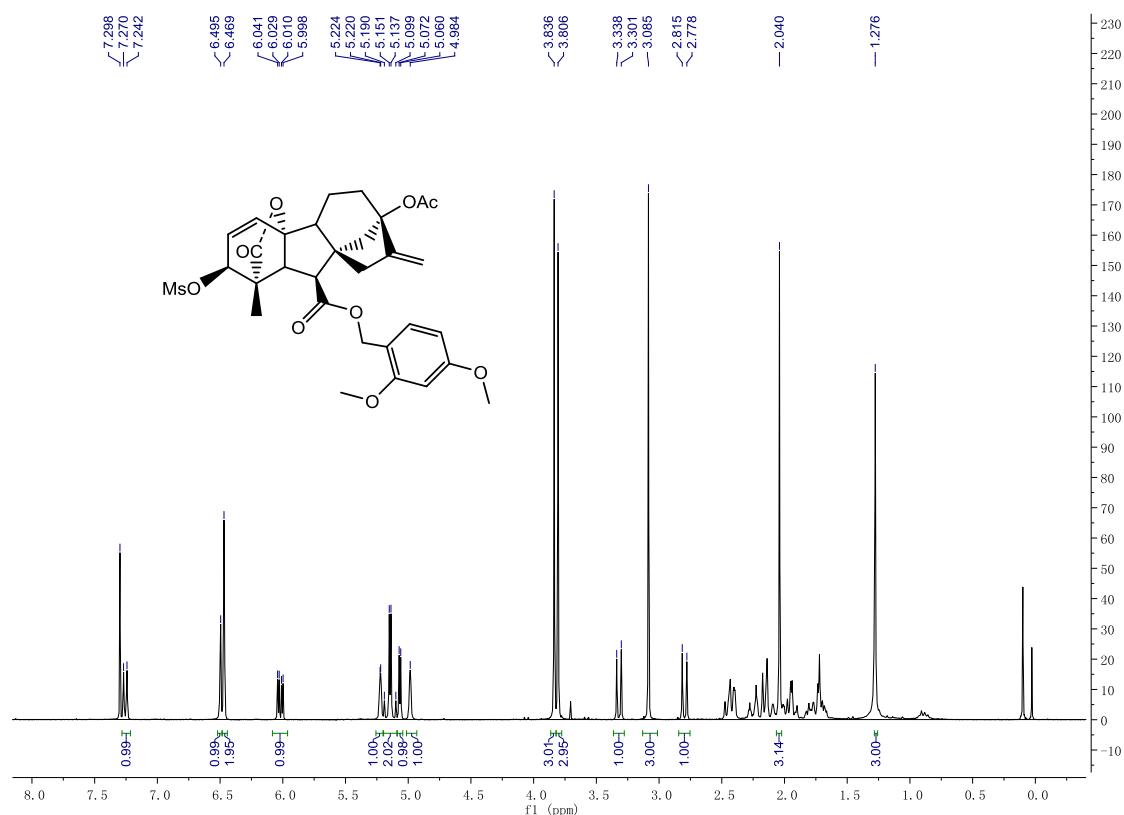
475

476

477 HRMS of compound 4.



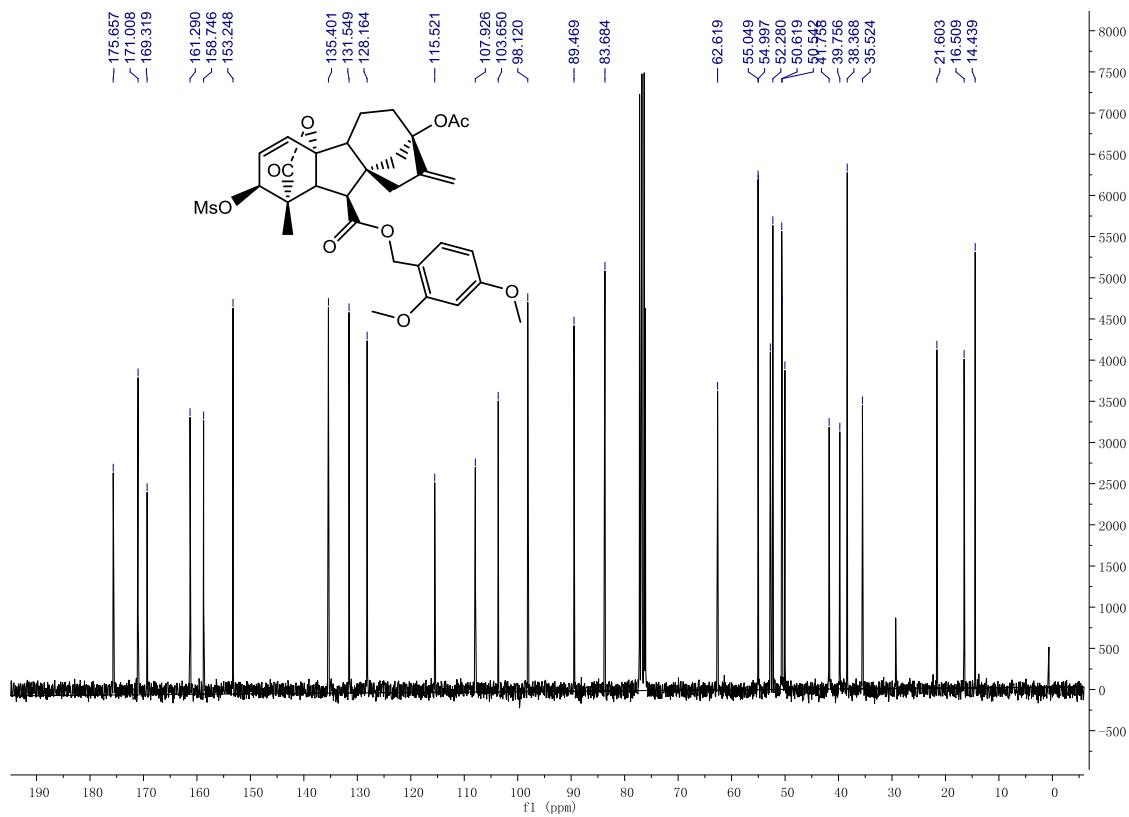
478

¹H-NMR spectrum of compound 5.

479

480

481 ^{13}C -NMR spectrum of compound 5.

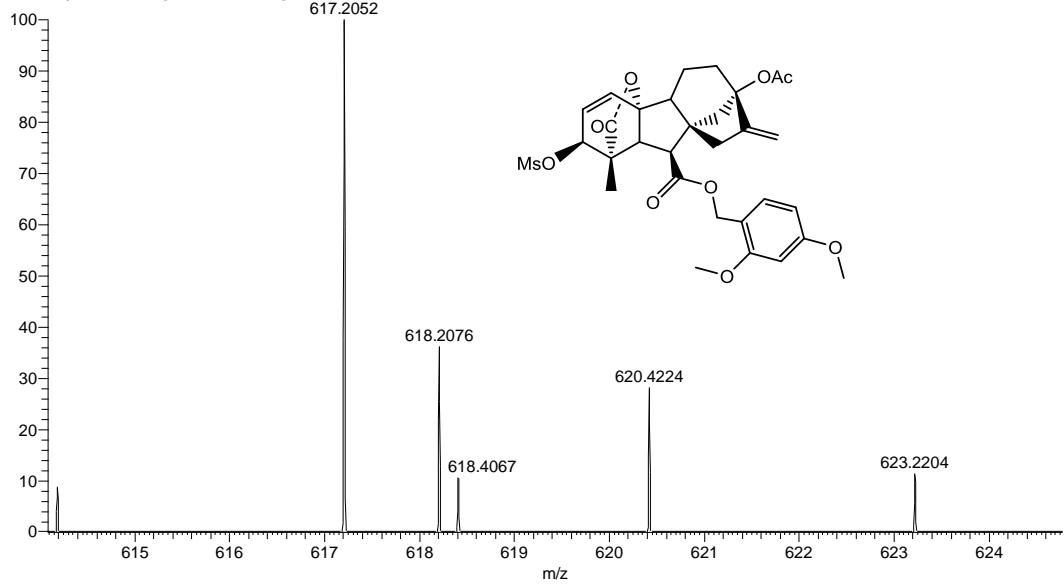


482

483

484 HRMS of compound 5.

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T: FTMS + p ESI Full ms [100.00-1500.00]



485

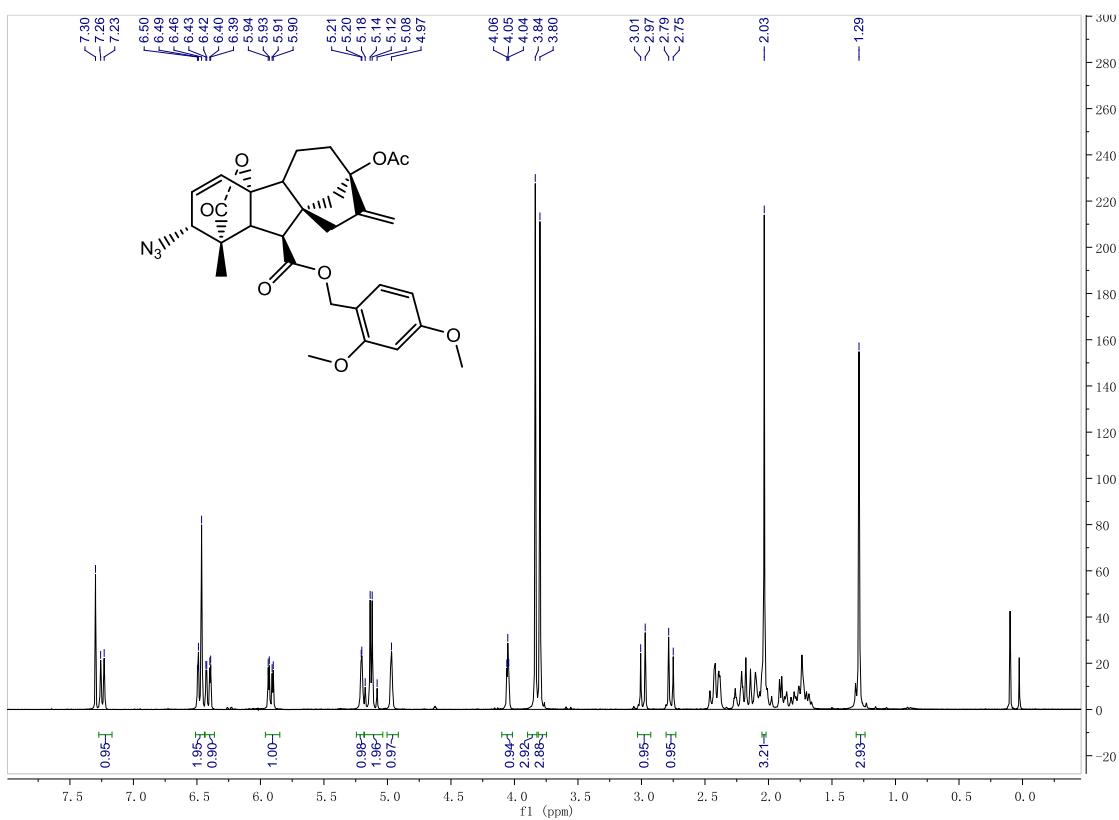
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487

488

489

¹H-NMR spectrum of compound **6**.

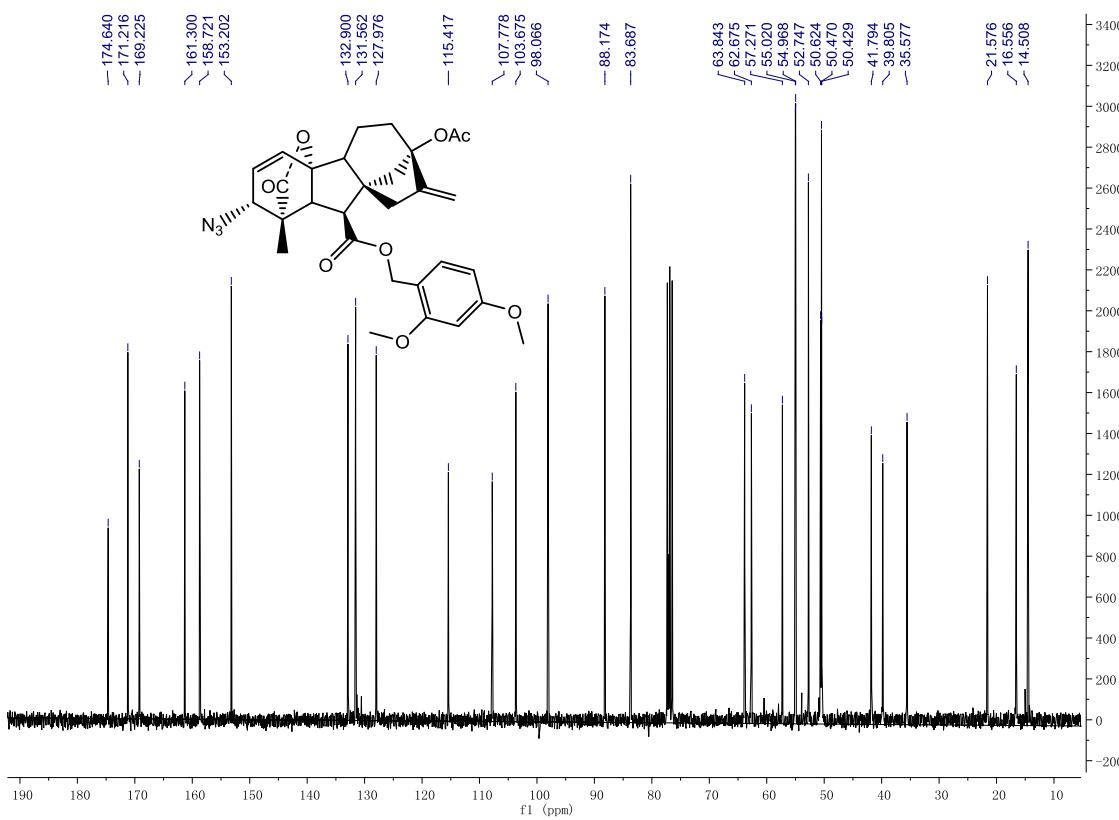


490

491

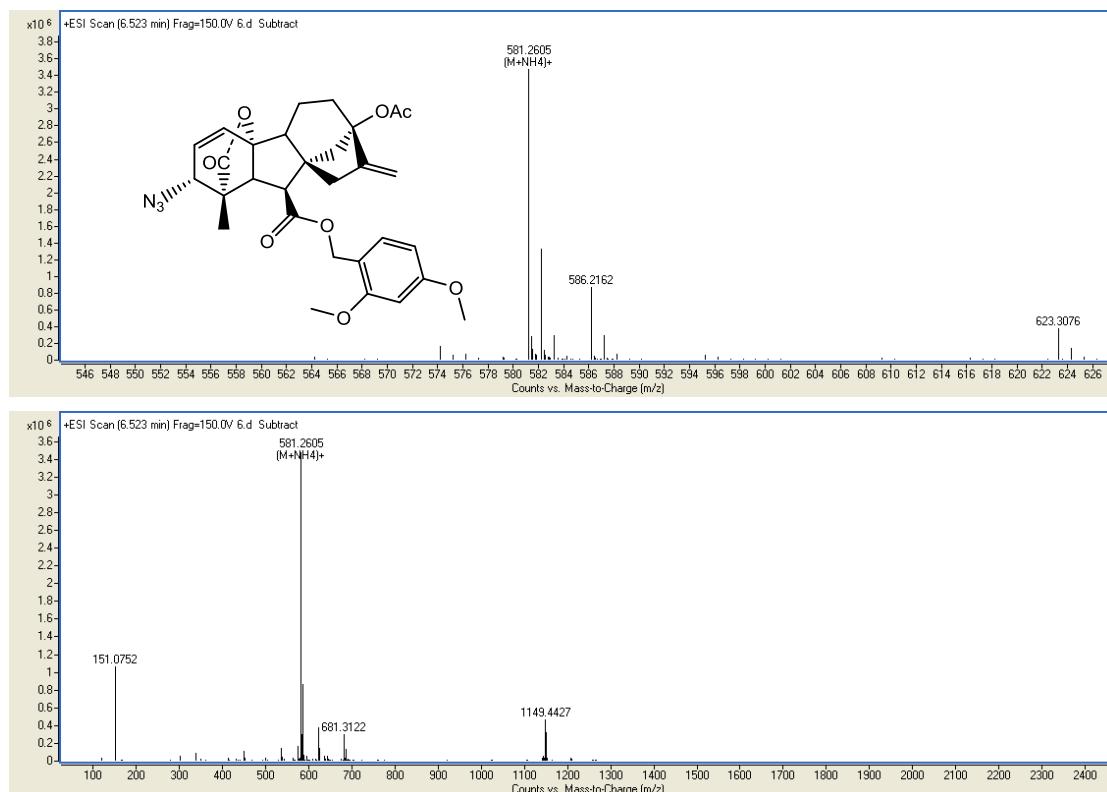
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¹³C-NMR spectrum of compound **6**.



493

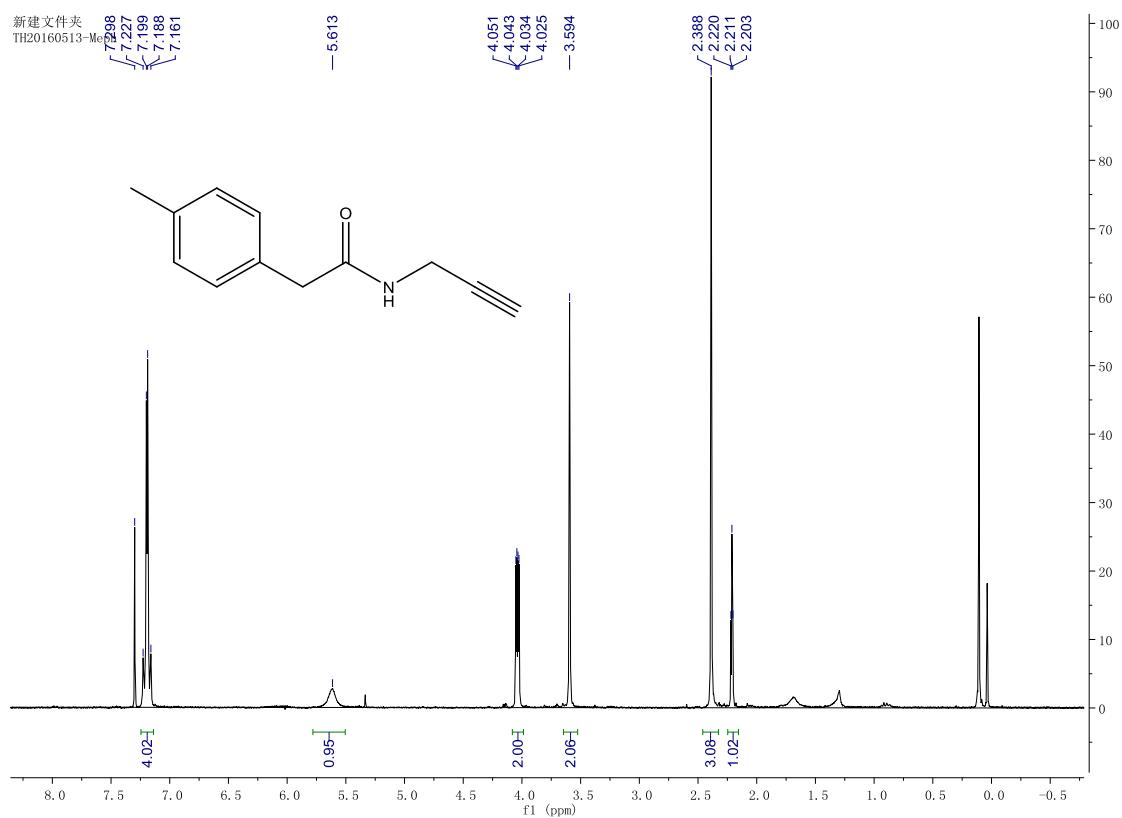
494 HRMS of compound 6.



495

496 ^1H -NMR spectrum of compound 8c.

497

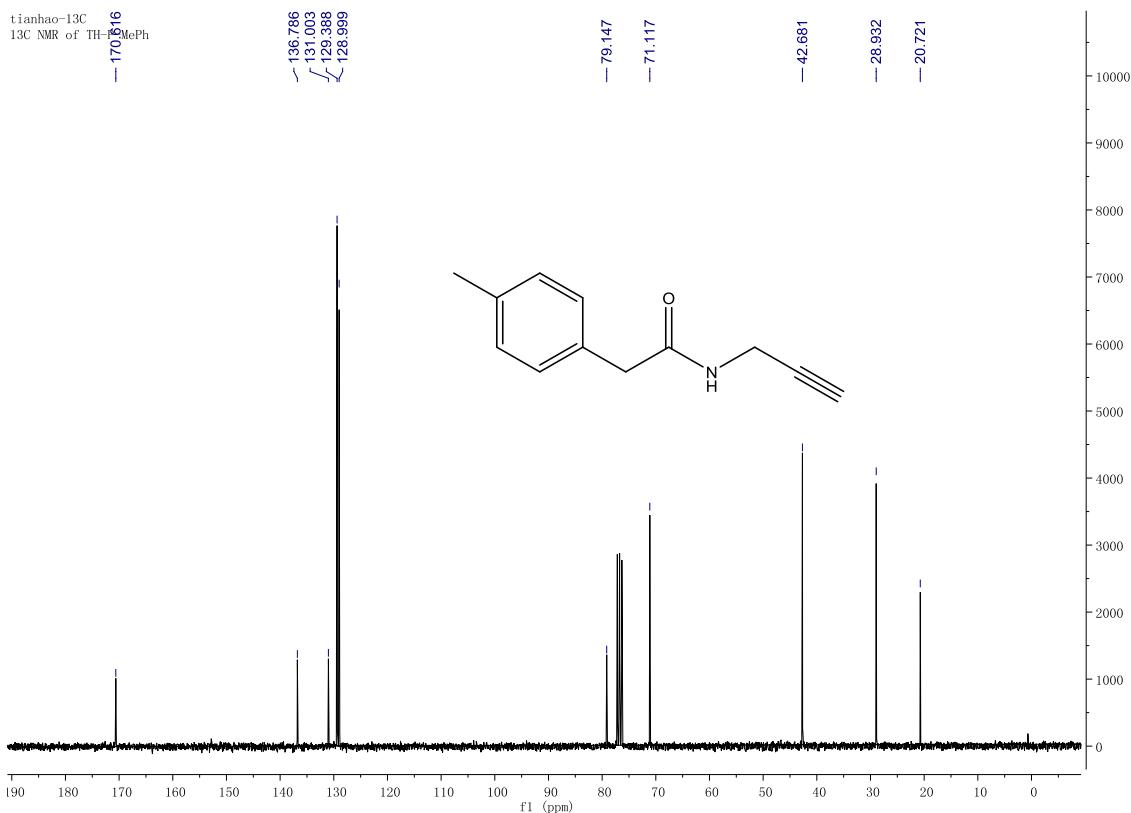


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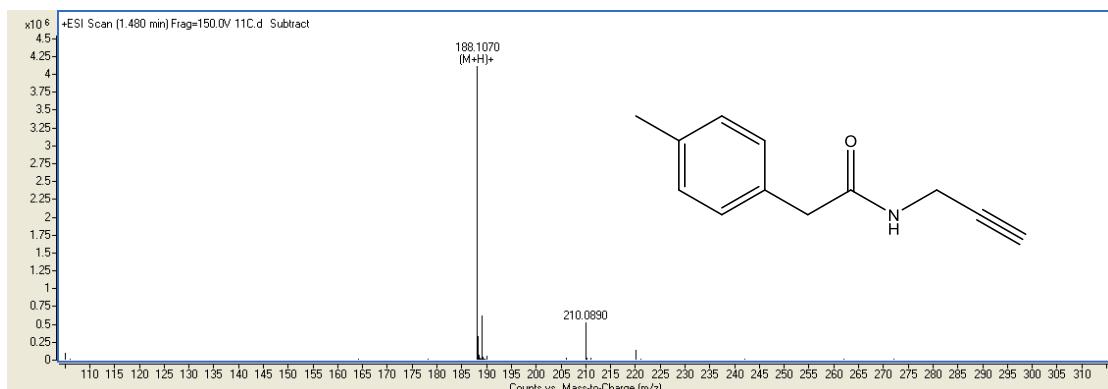
500 ^{13}C -NMR spectrum of compound **8c**.

501



502

503 HRMS of compound **8c**.

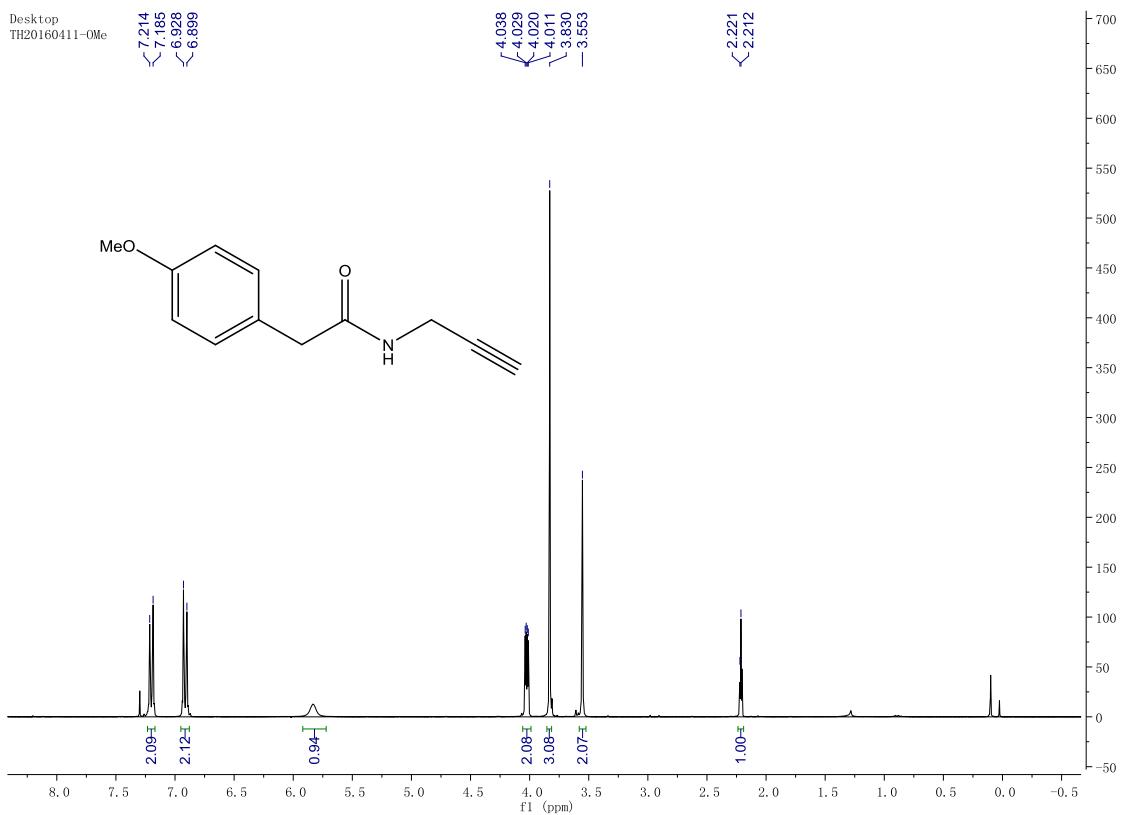


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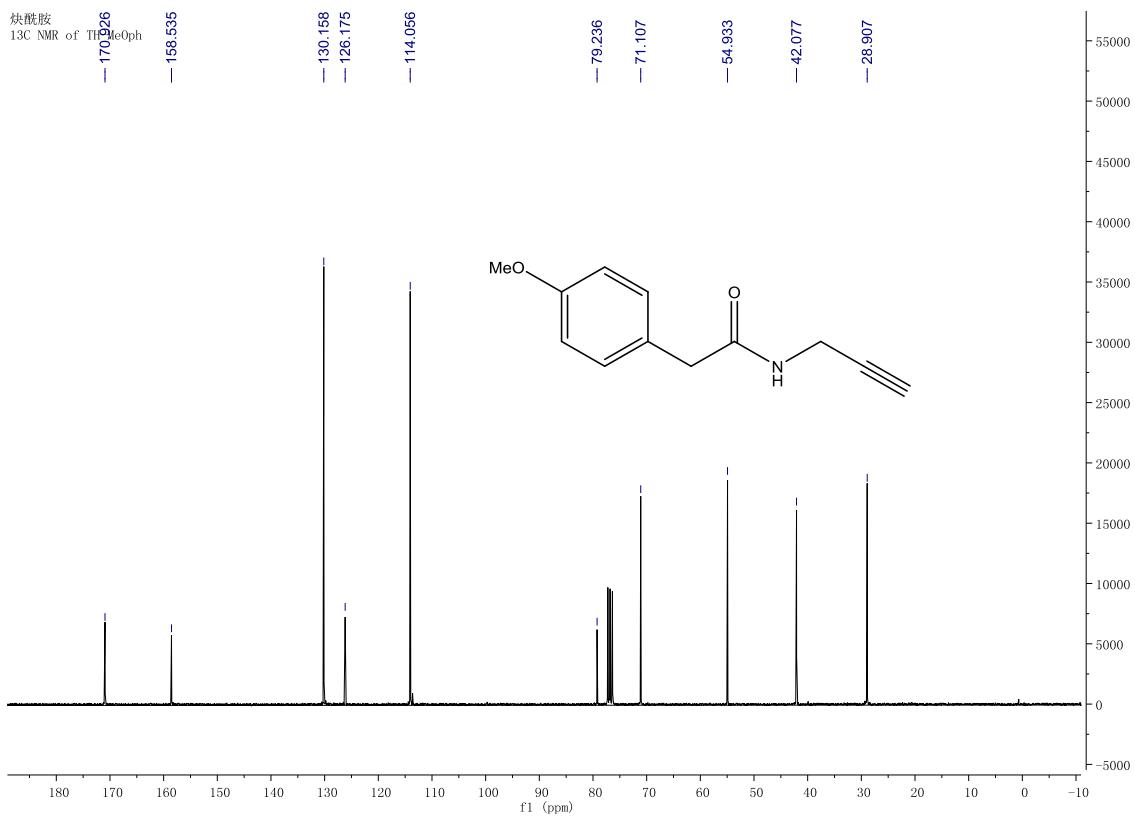
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506 ^1H -NMR spectrum of compound **8d**.

507

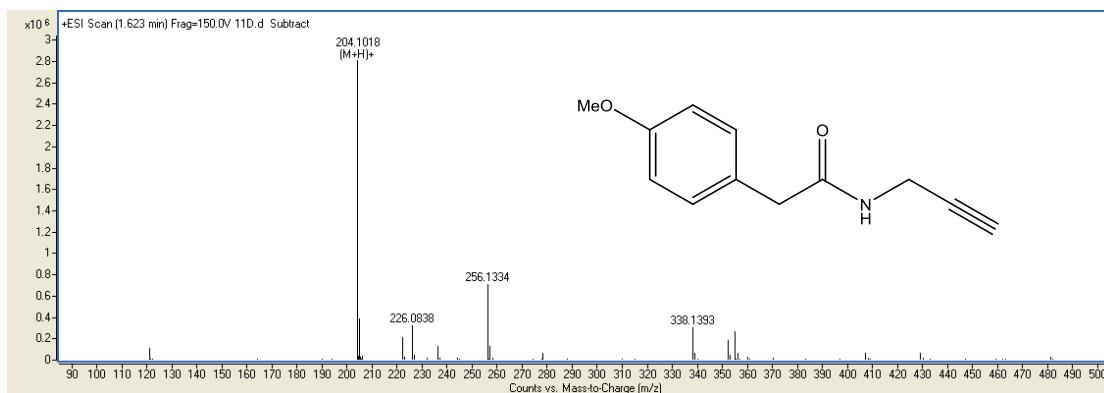
508 ^{13}C -NMR spectrum of compound **8d**.

509



510

511 HRMS of compound **8d**.

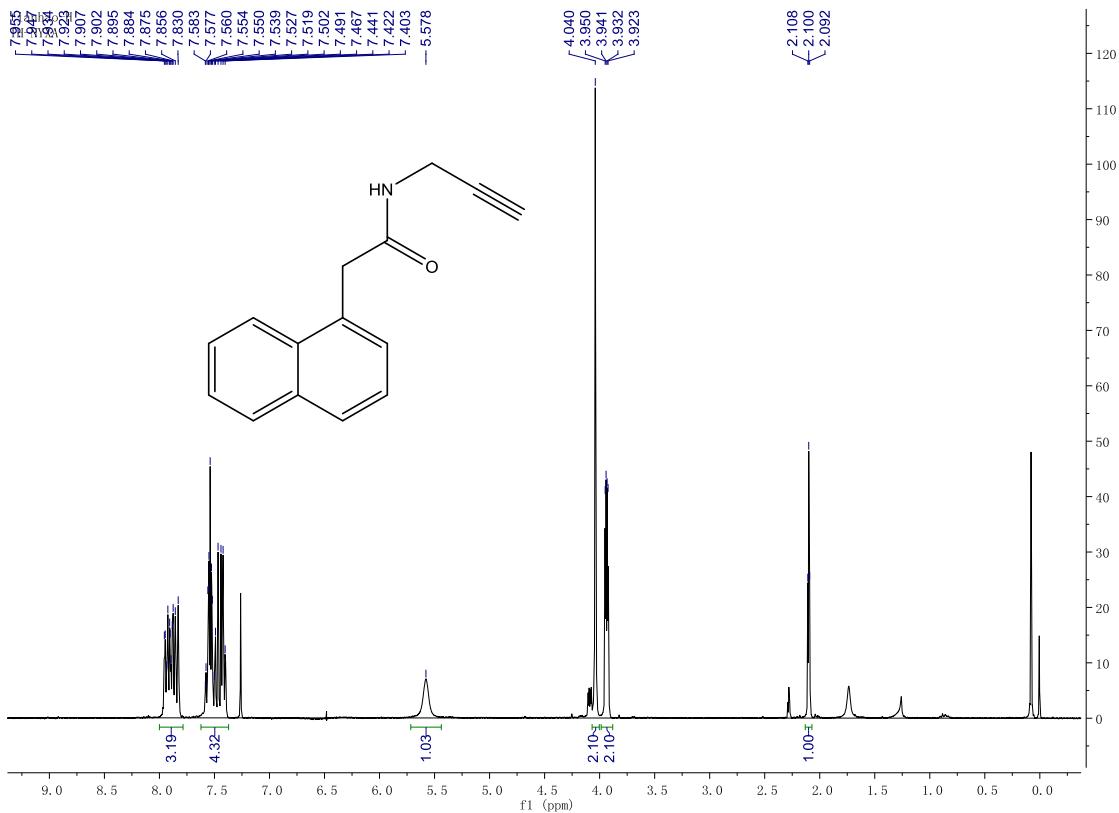


512

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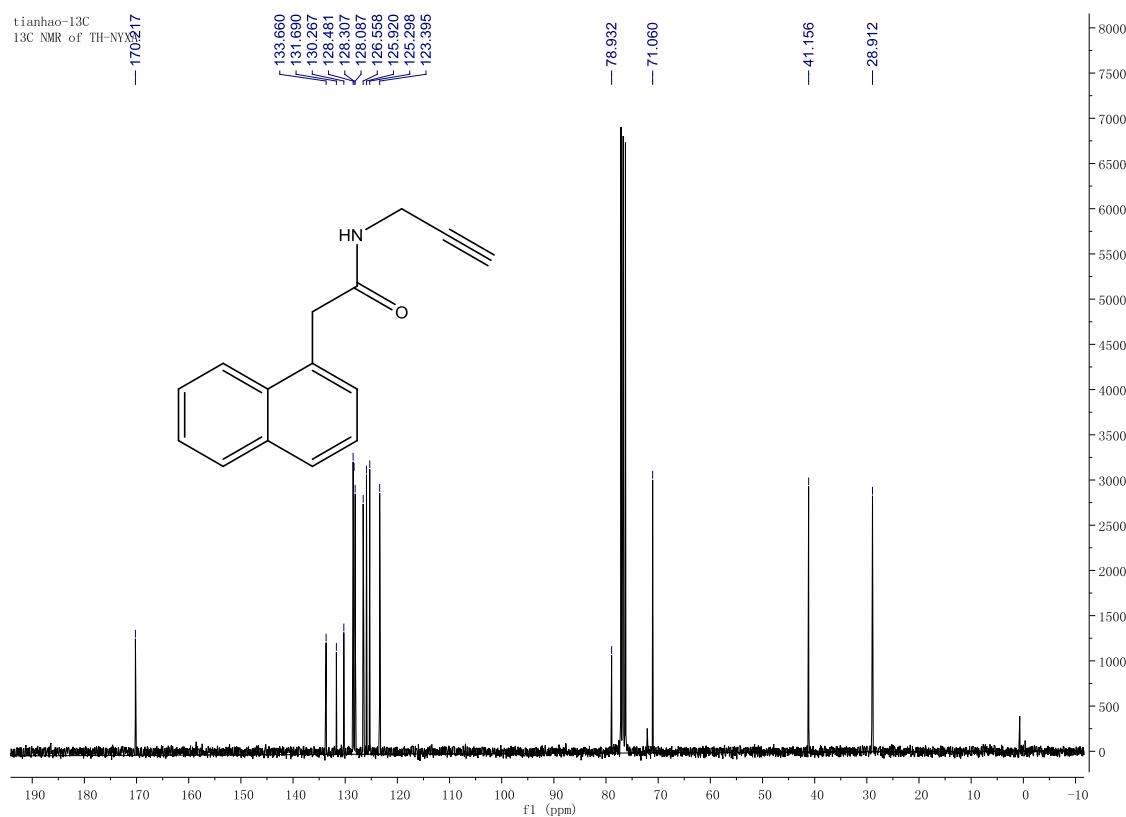
514 ¹H-NMR spectrum of compound **8f**.

515

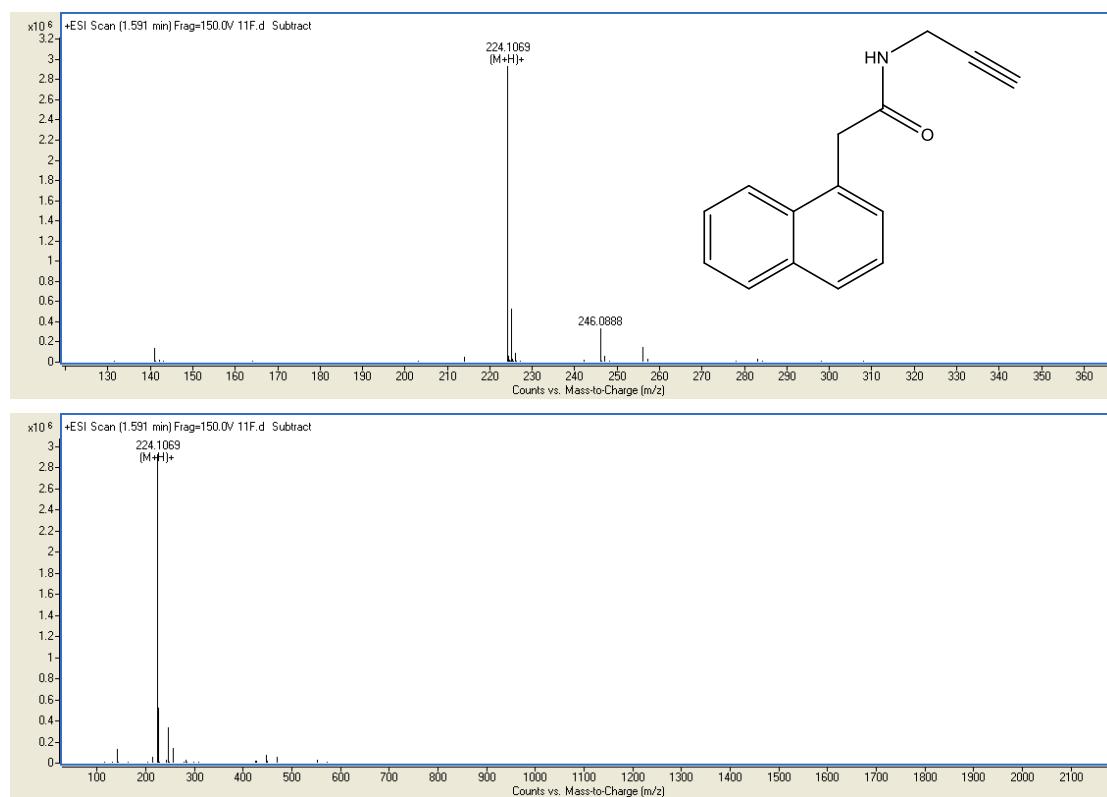


516

517

518 ^{13}C -NMR spectrum of compound **8f**.

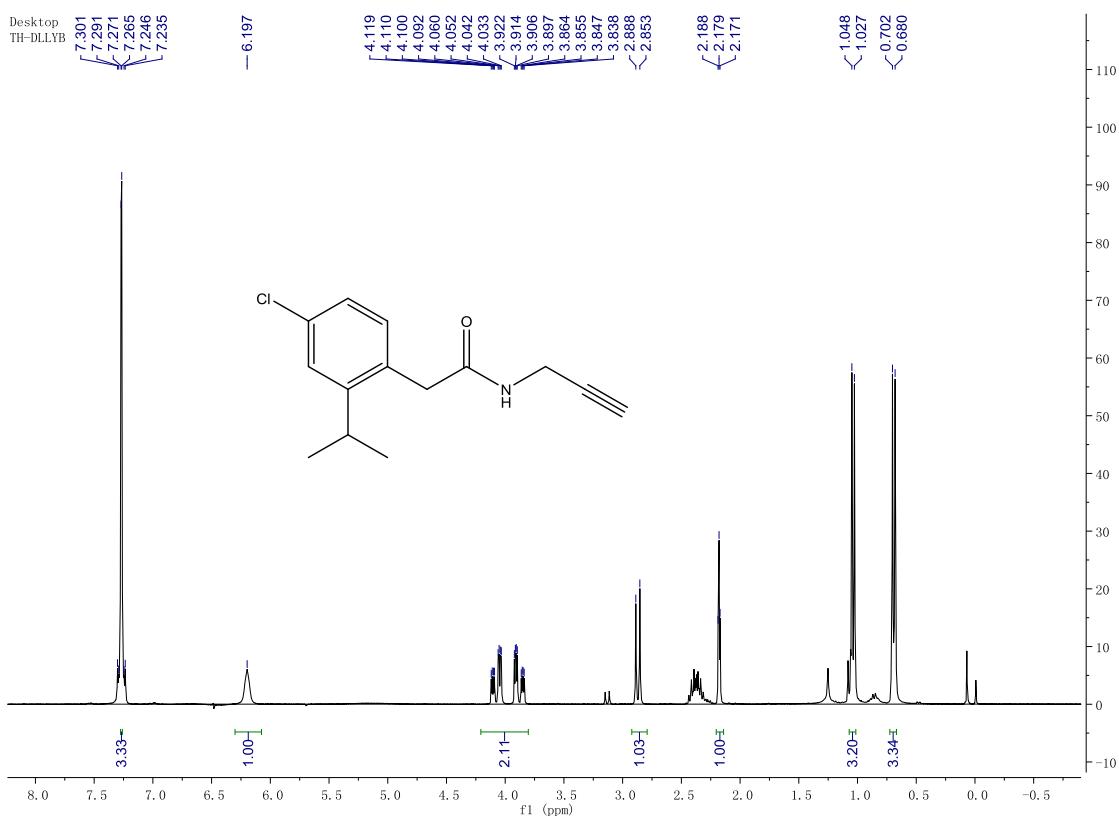
519

520 HRMS of compound **8f**.

521

522 ^1H -NMR spectrum of compound **8g**.

523

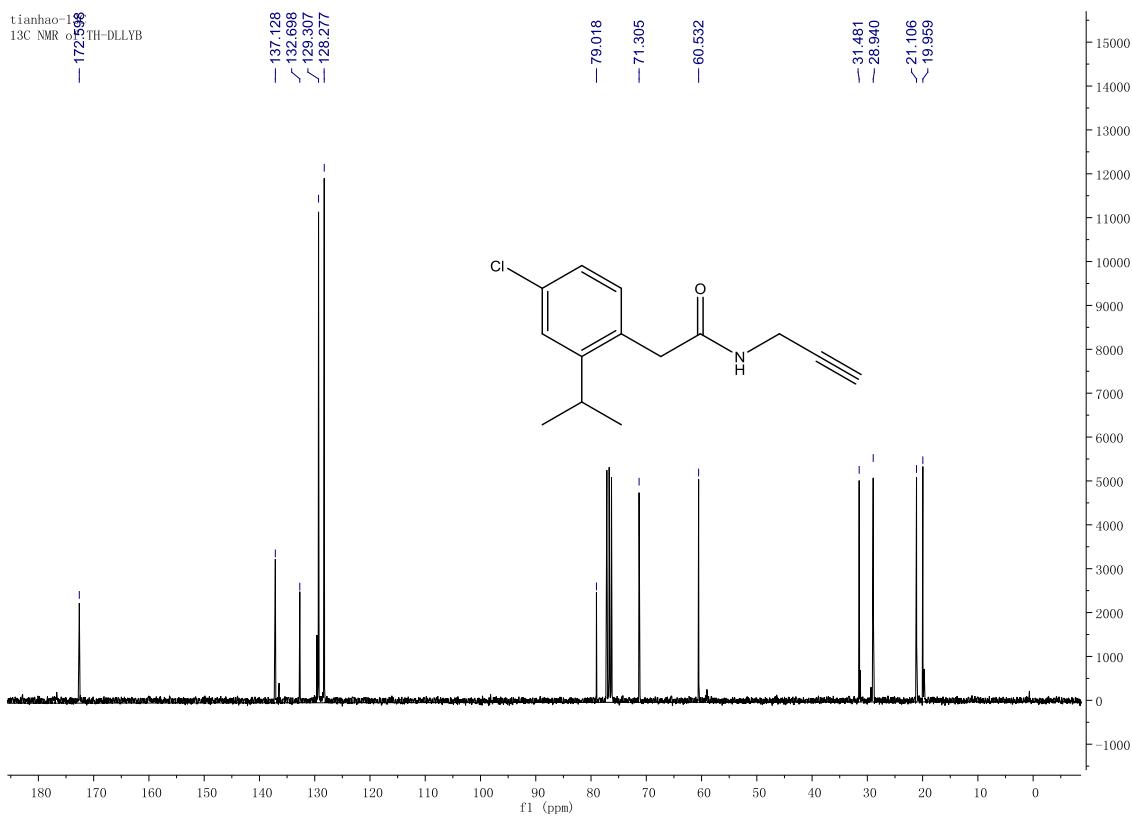


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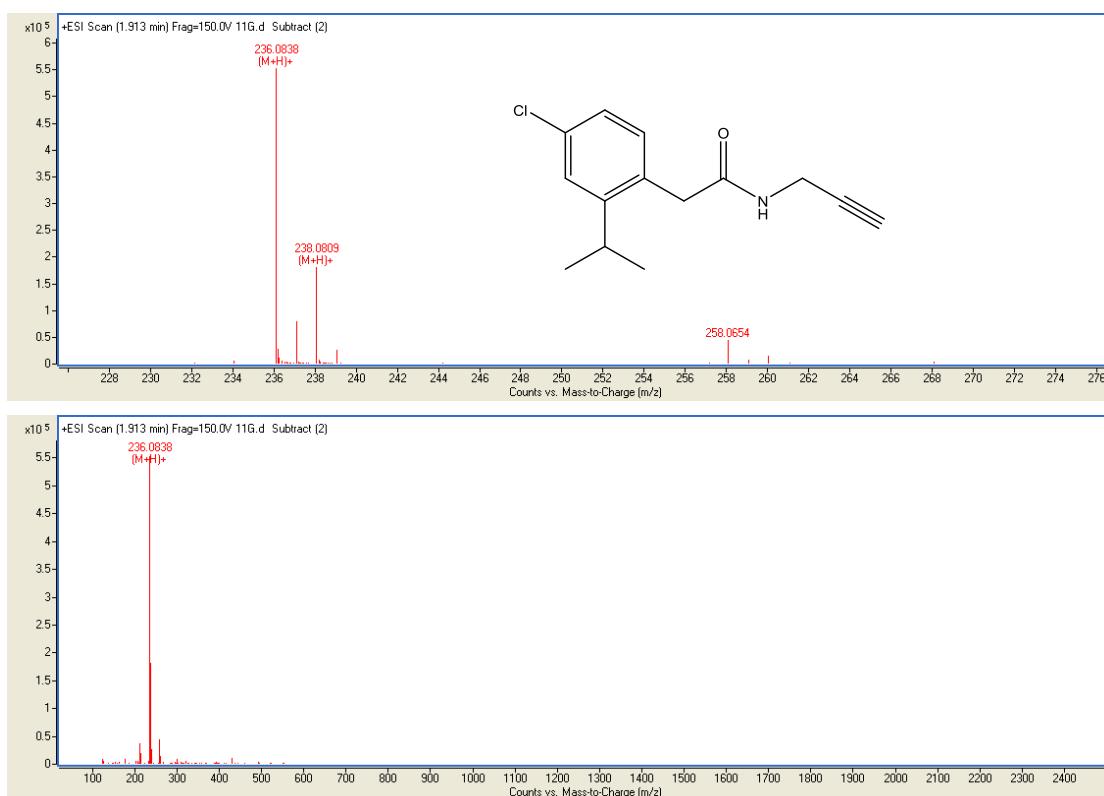
526 ^{13}C -NMR spectrum of compound **8g**.

527



528

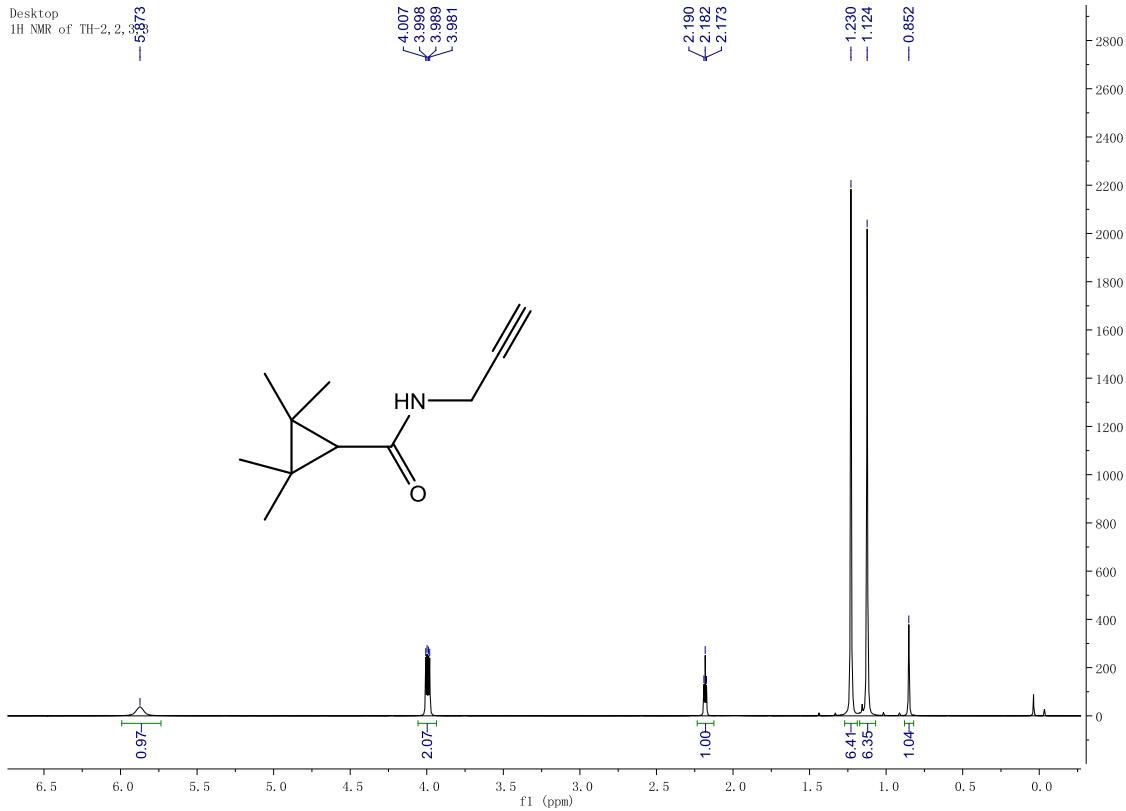
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530 HRMS of compound **8g**.

531

532 ¹H-NMR spectrum of compound **8i**.

533

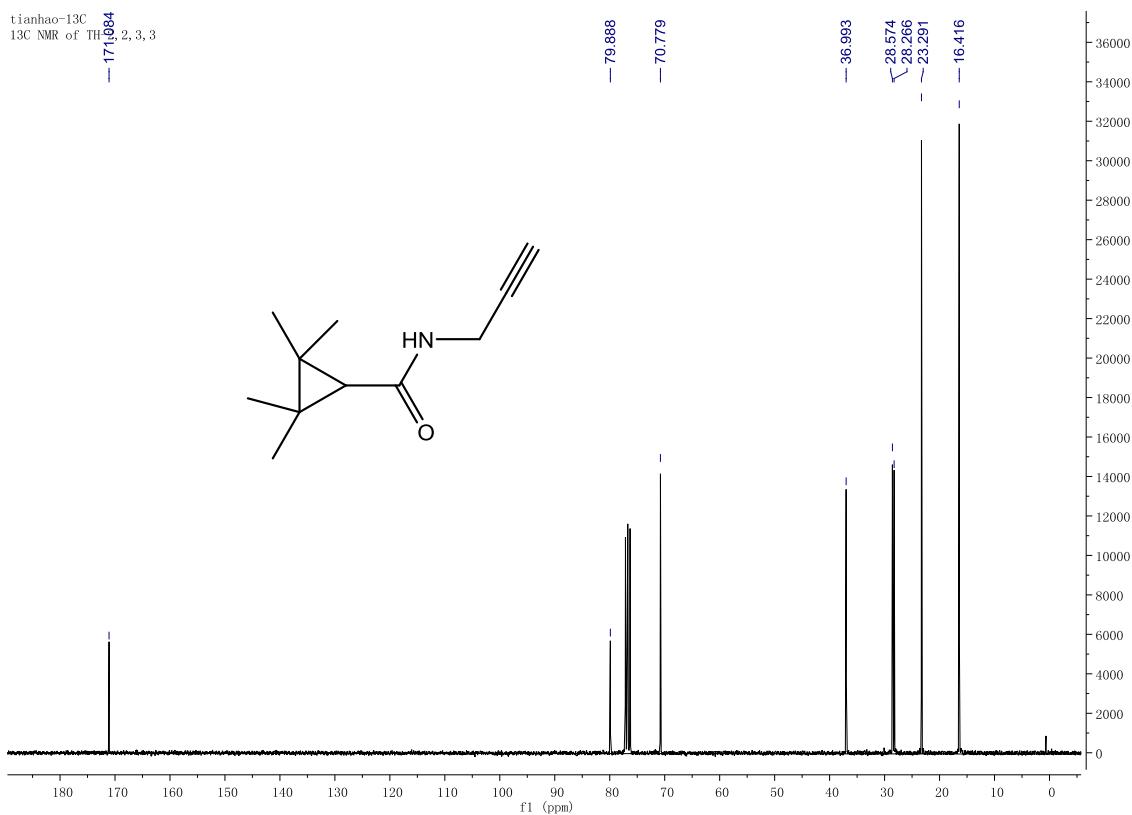


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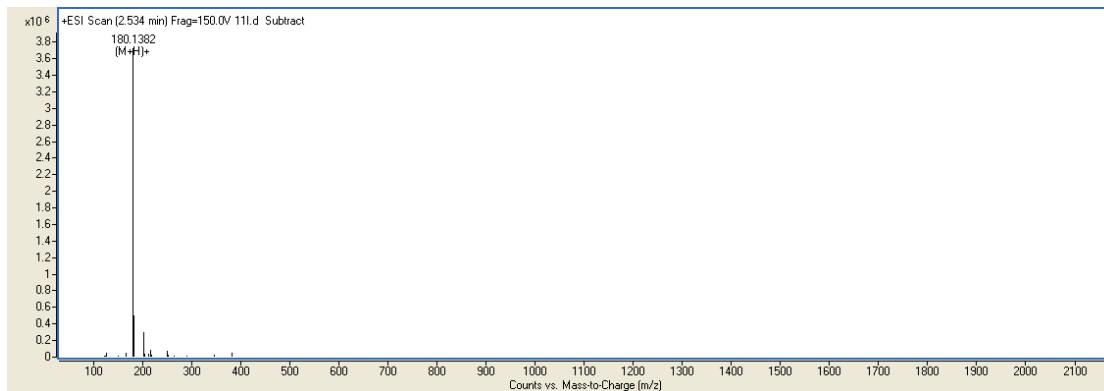
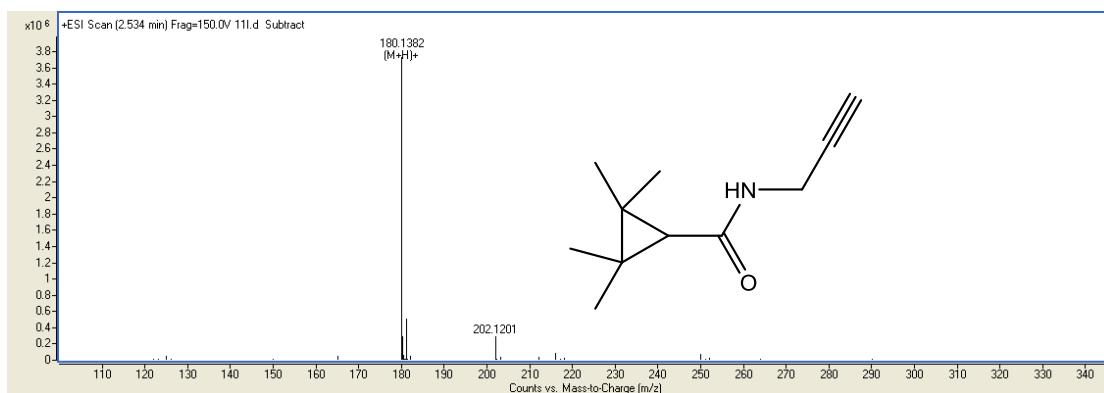
535

536 ^{13}C -NMR spectrum of compound **8i**.

537



538

HRMS of compound **8i**.

539

540

541 ^1H -NMR spectrum of compound **8n**.

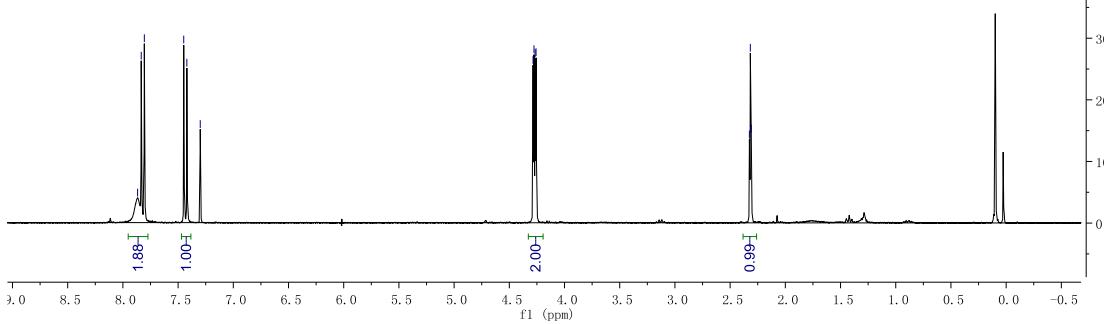
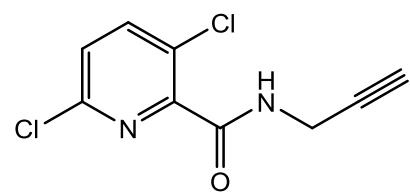
542

炔丙胺酰胺谱图
TH20160414-DICL

7.867
7.834
7.806
7.449
7.421
7.299

4.285
4.276
4.266
4.258

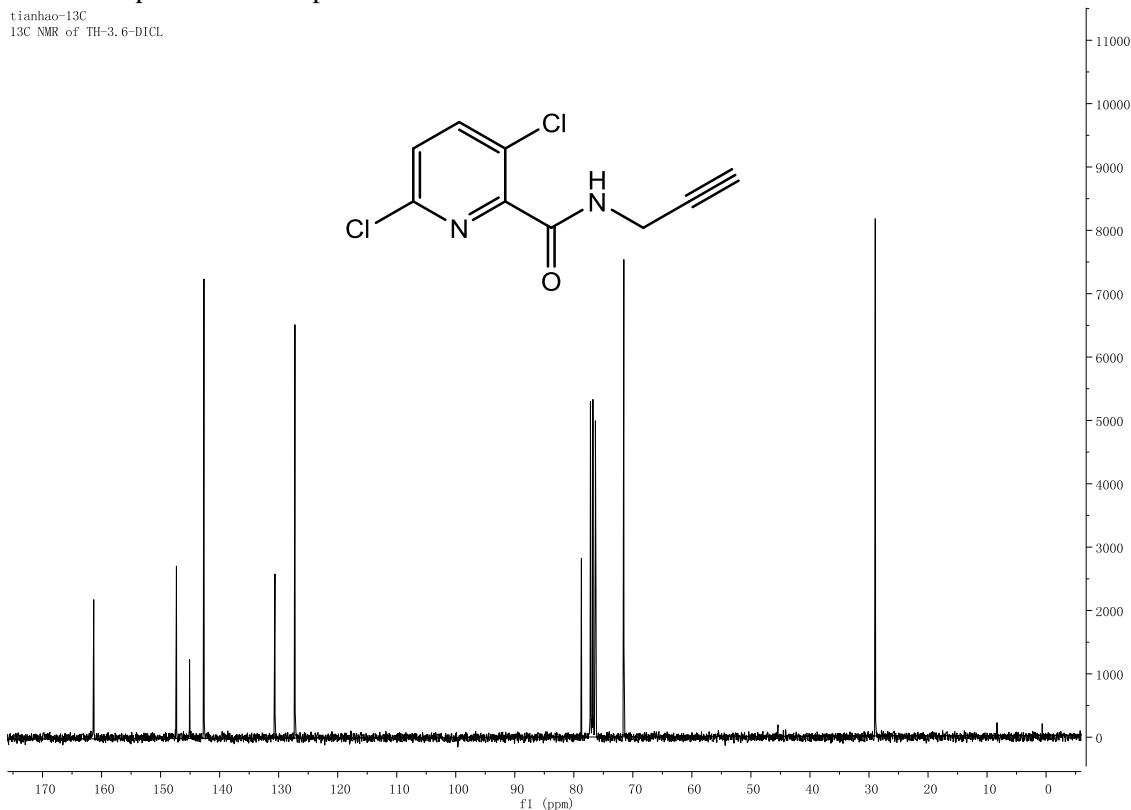
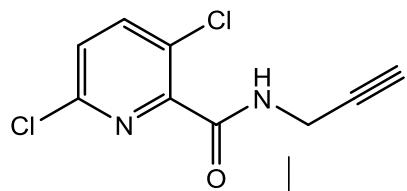
2.325
2.317
2.308



543

544 ^{13}C -NMR spectrum of compound **8n**.

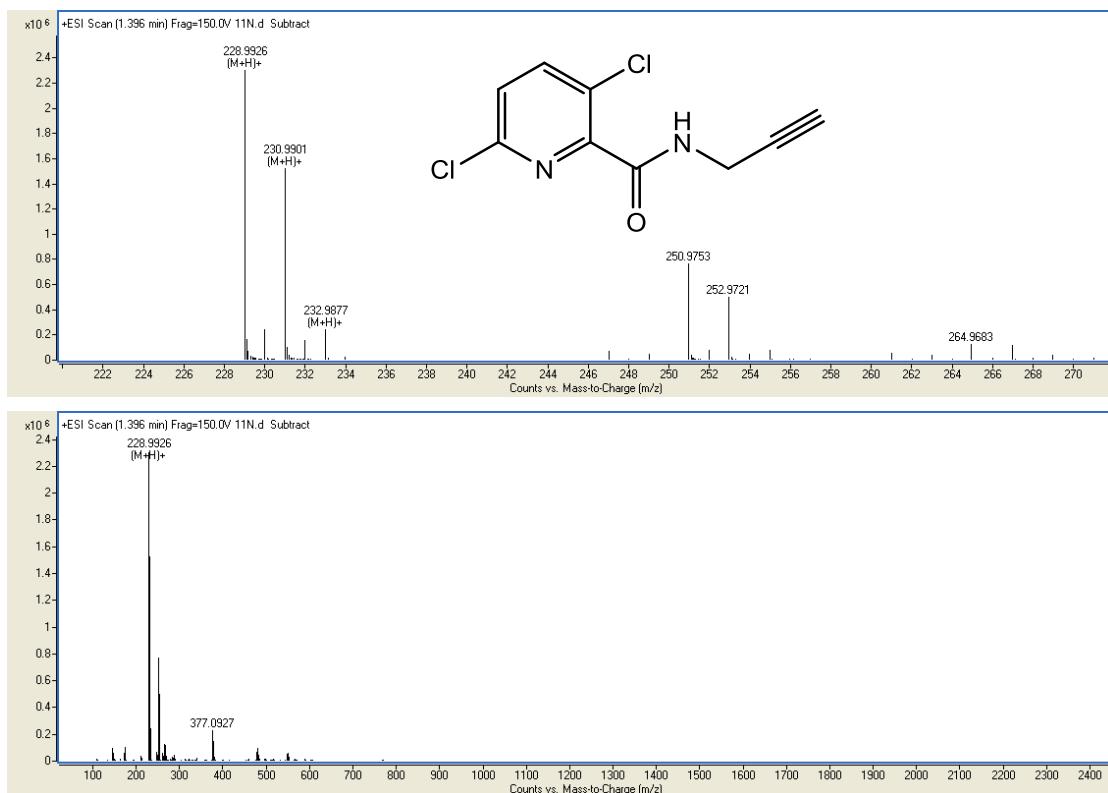
tianhao- ^{13}C
 ^{13}C NMR of TH-3, 6-DICL



545

546

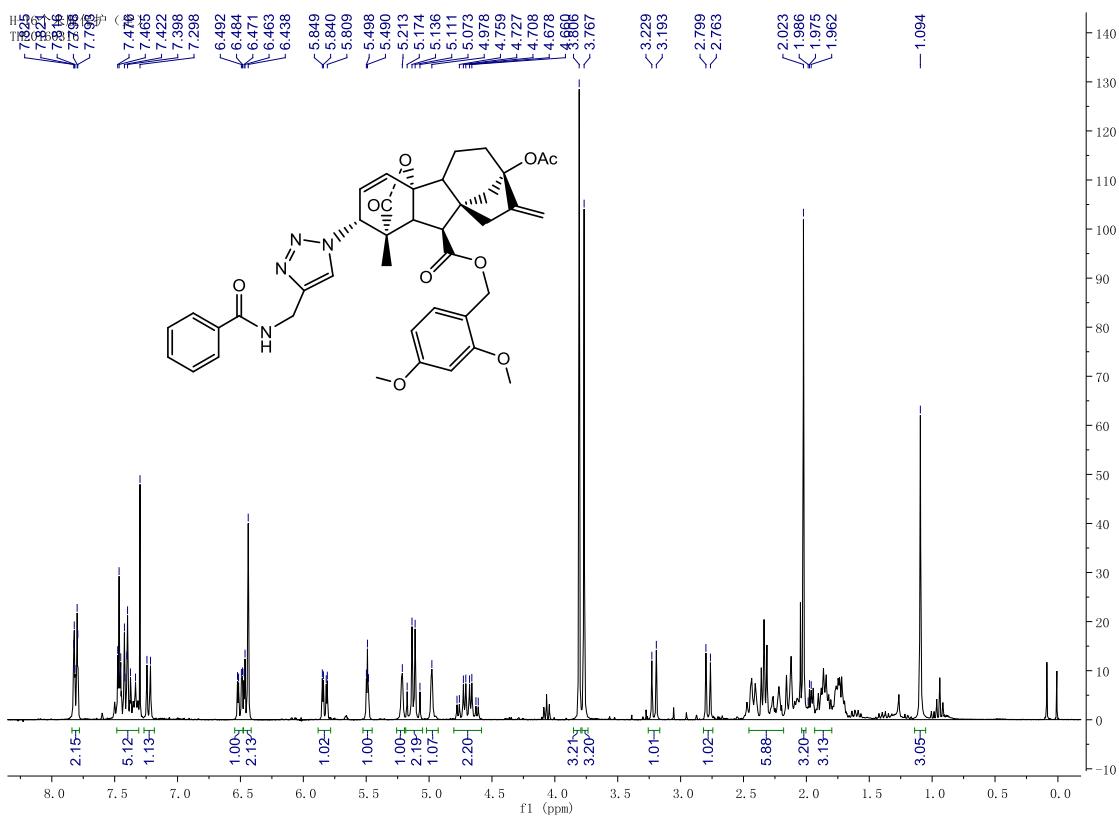
547 HRMS of compound **8n**.



548

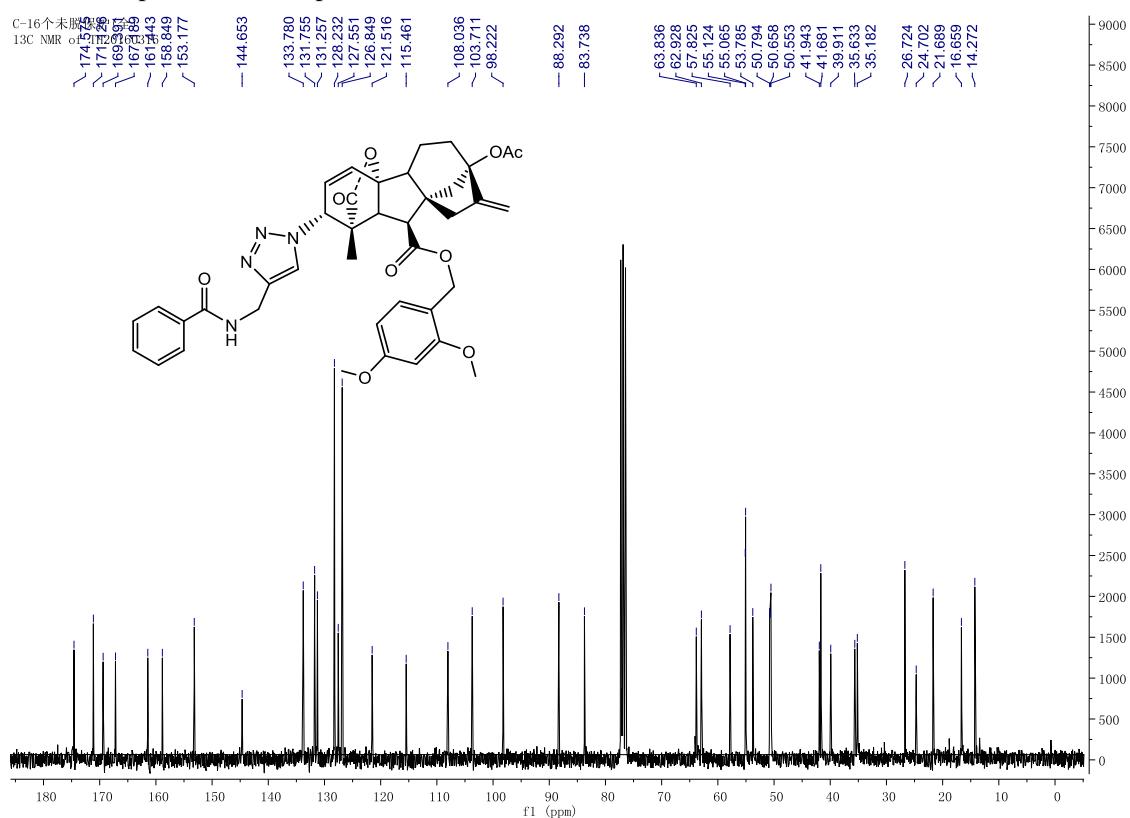
549 ^1H -NMR spectrum of compound **9a**.

550

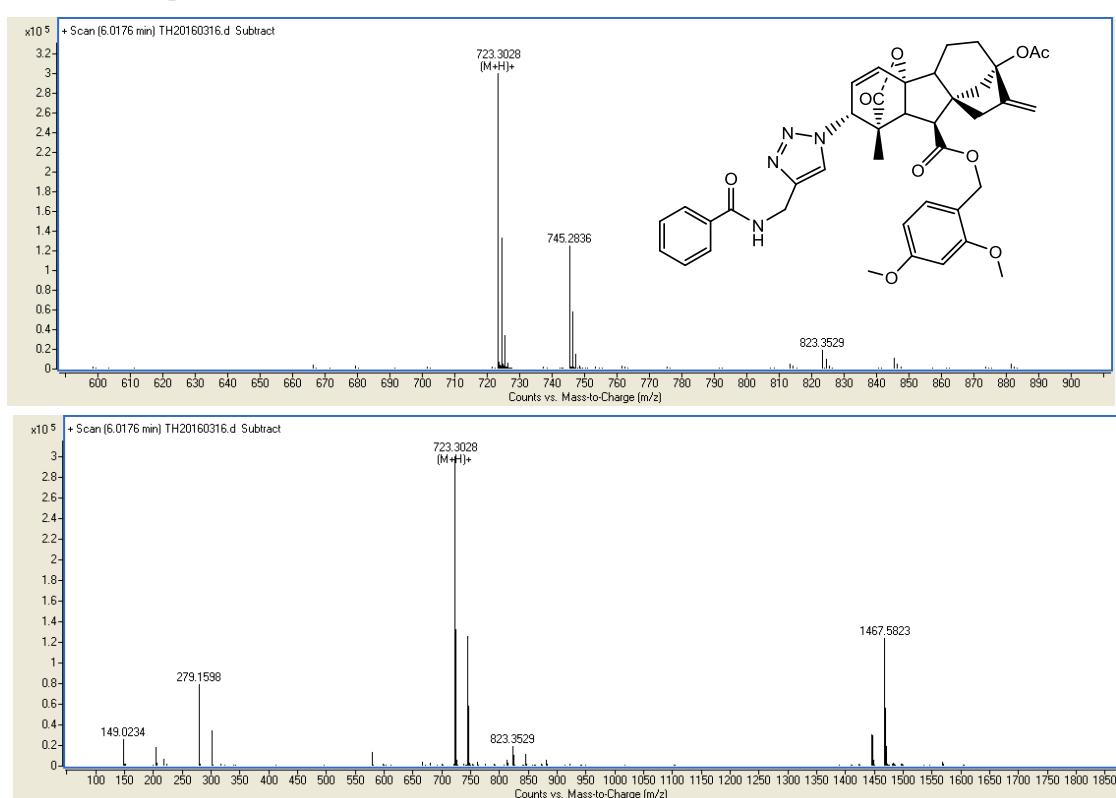


551

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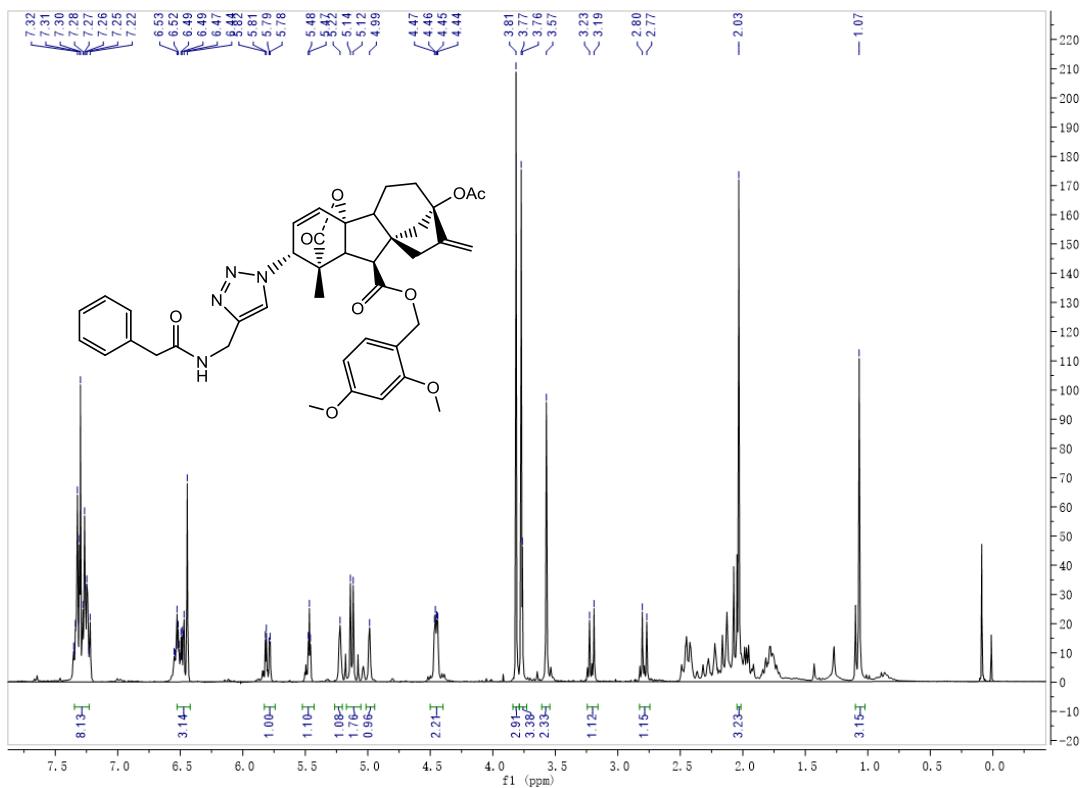
553 ^{13}C -NMR spectrum of compound **9a**.

554

555 HRMS of compound **9a**.

556

557 ^1H -NMR spectrum of compound **9b**.

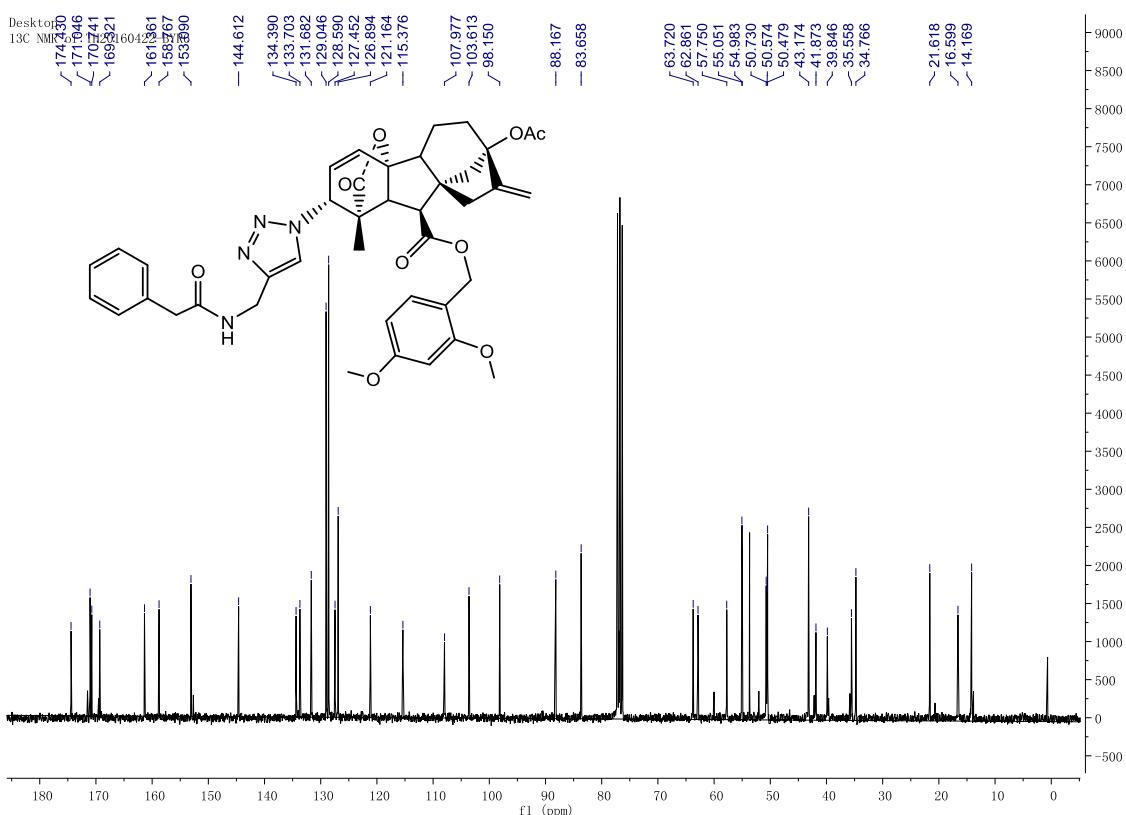


558

559

560 ^{13}C -NMR spectrum of compound **9b**.

561



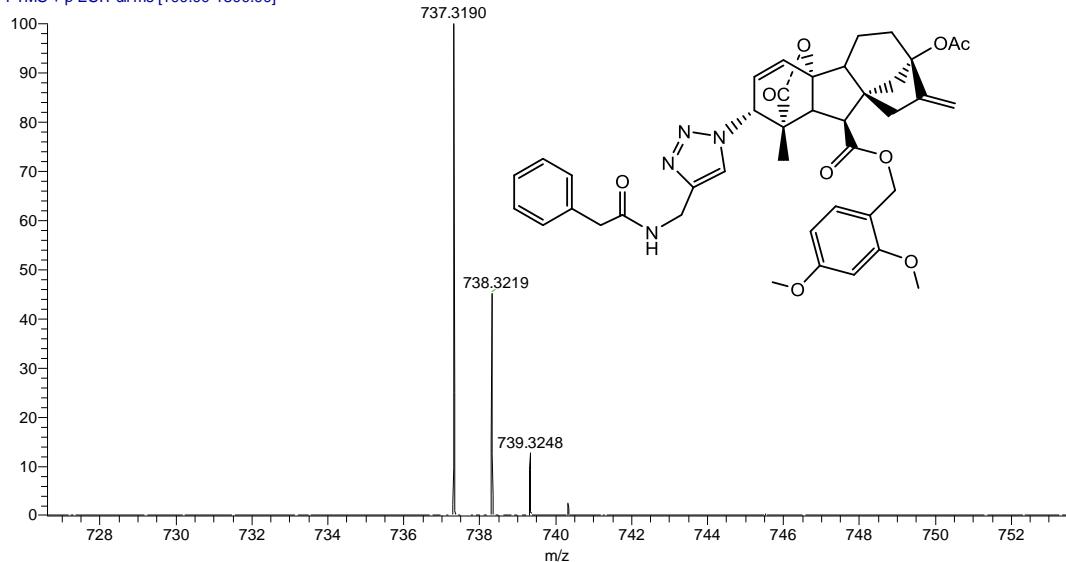
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563

564 HRMS of compound **9b**.

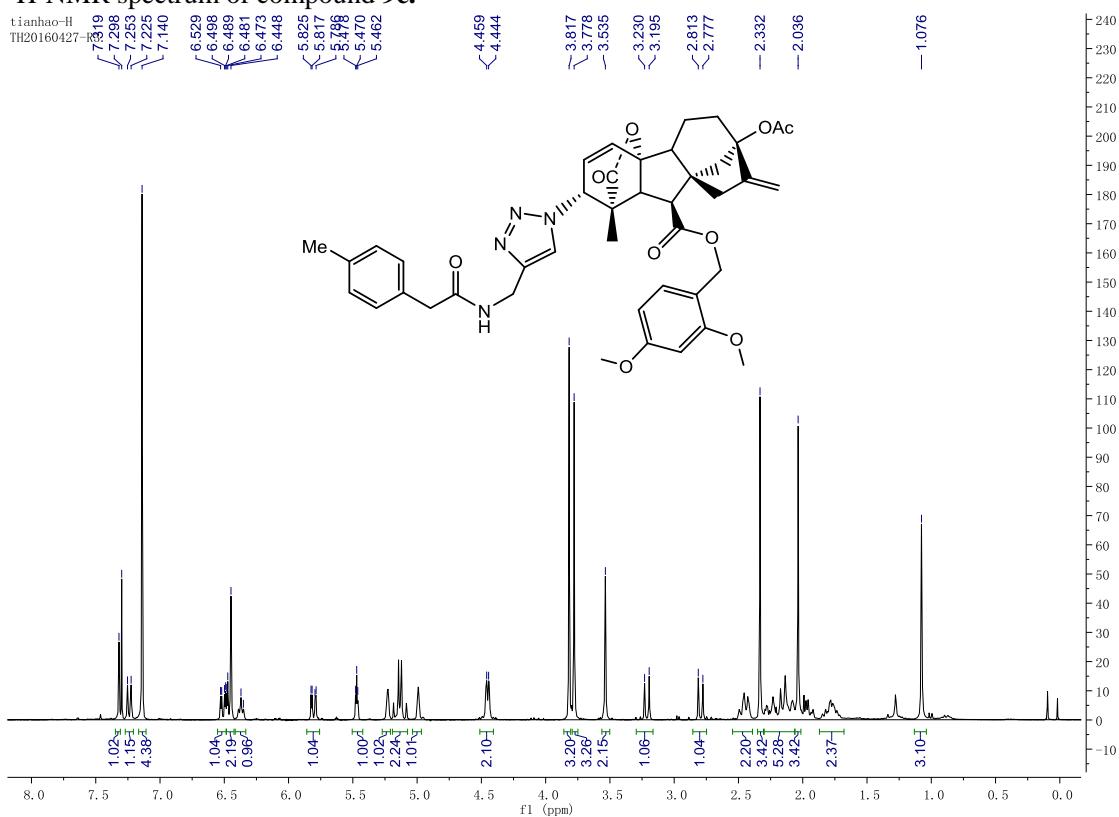
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25 #234 RT: 2.95 AV: 1 NL: 5.83E6
 T: FTMS + p ESI Full ms [100.00-1500.00]



566

567

568 ¹H-NMR spectrum of compound **9c**.

569

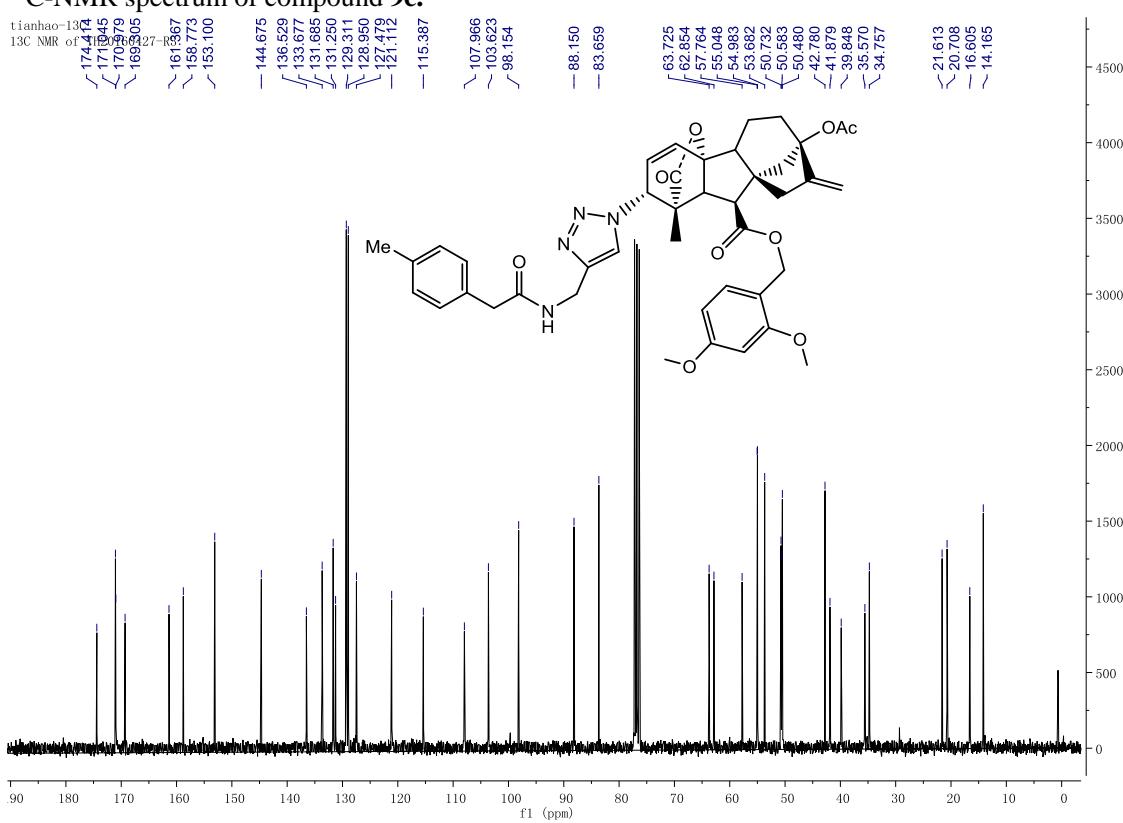
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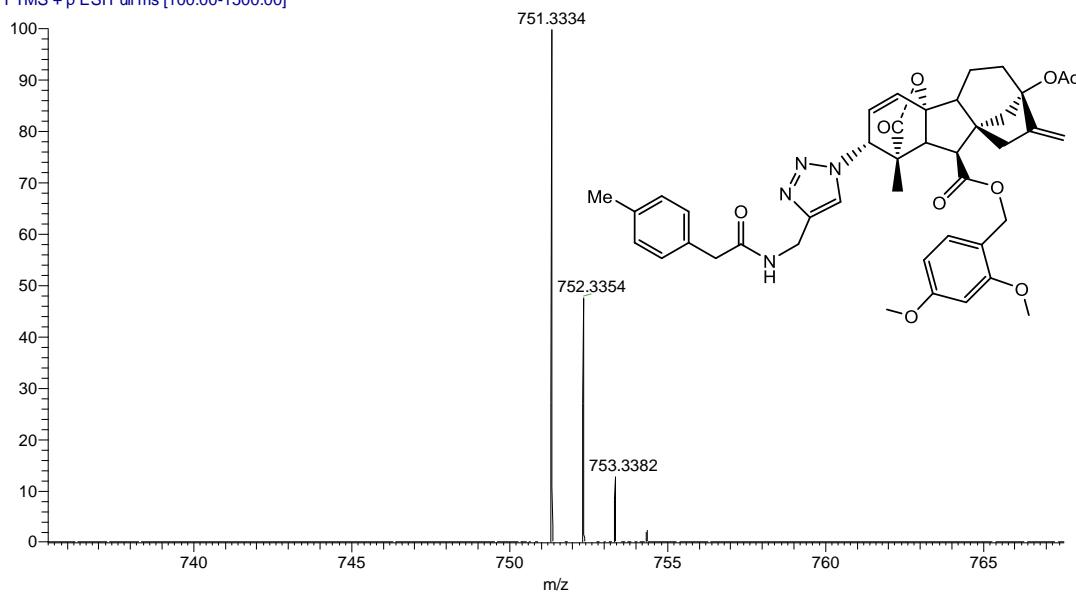
575 ¹³C-NMR spectrum of compound 9c.

576

577

578 HRMS of compound 9c.

31_160704203853 #78 RT: 0.81 AV: 1 NL: 8.12E8
T: FTMS + p ESI Full ms [100.00-1500.00]



579

580

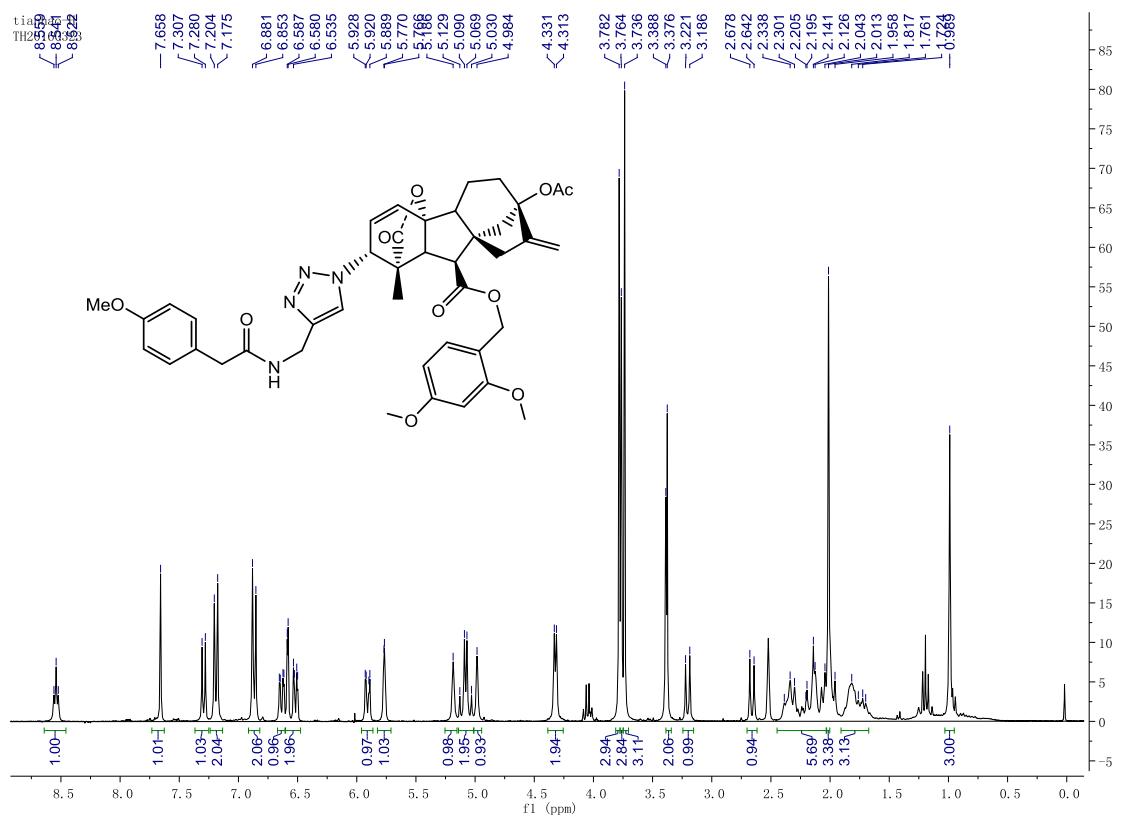
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582

583

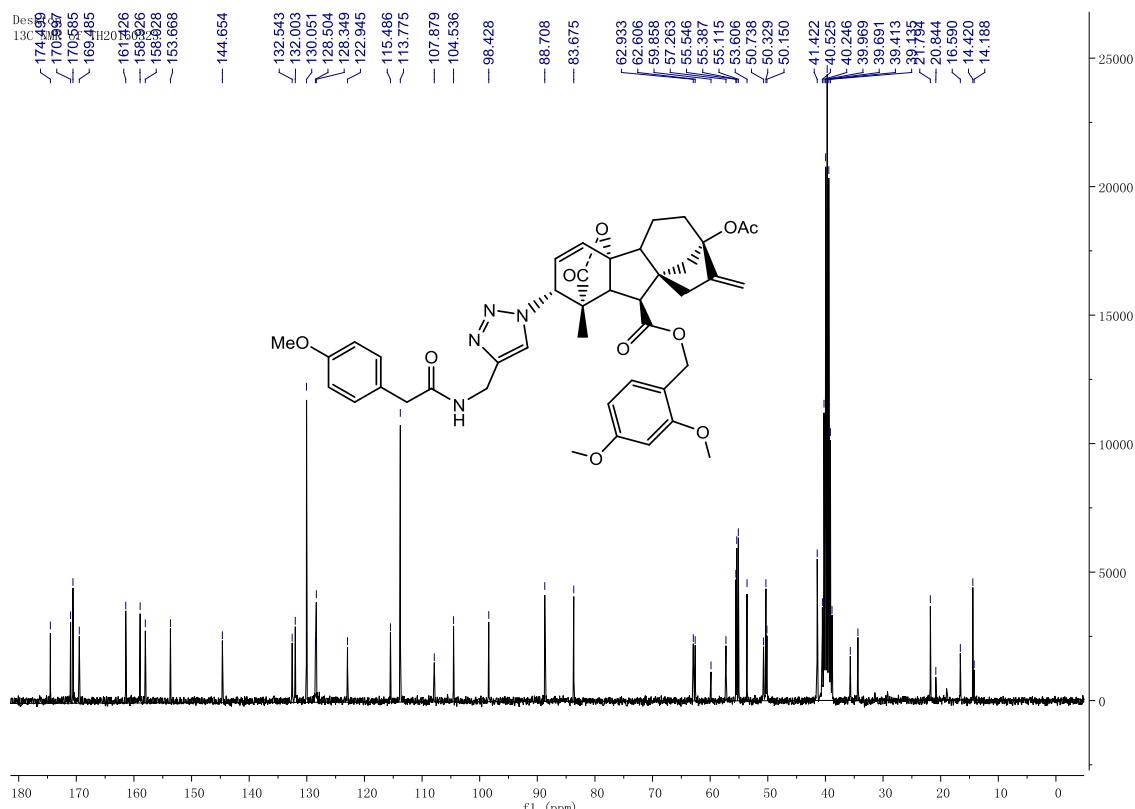
584 ^1H -NMR spectrum of compound **9d**.

585

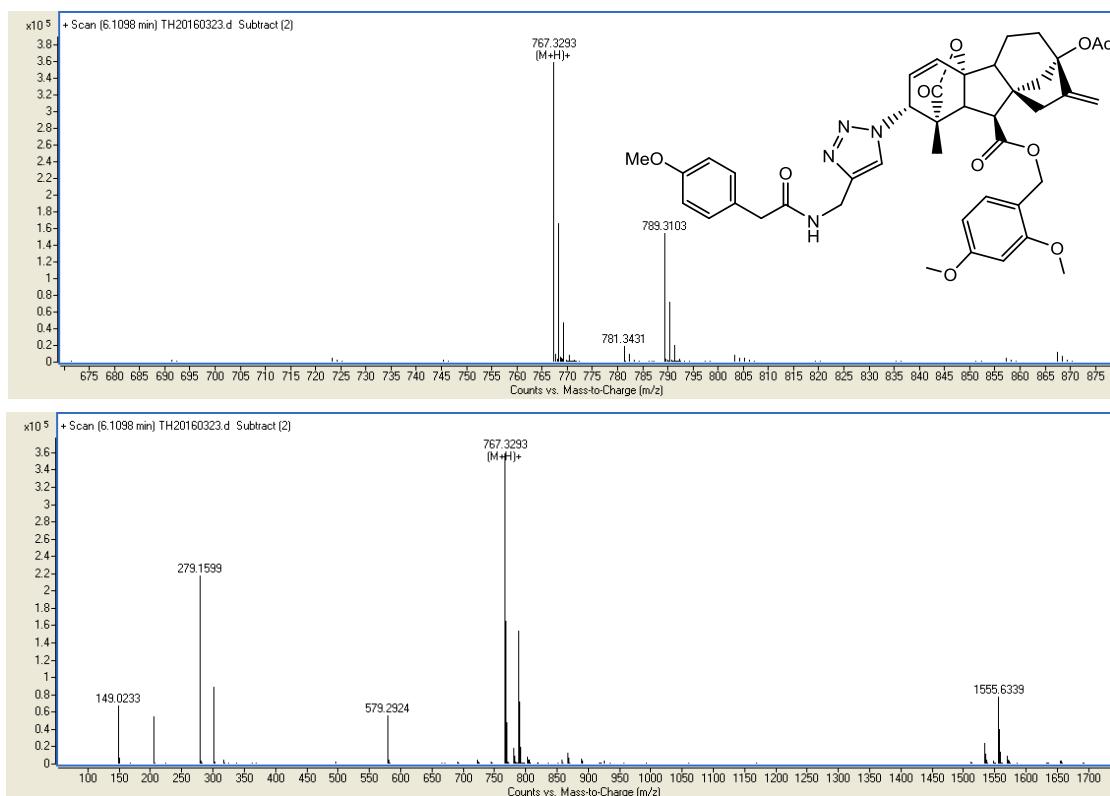


586

587 ^{13}C -NMR spectrum of compound **9d**.



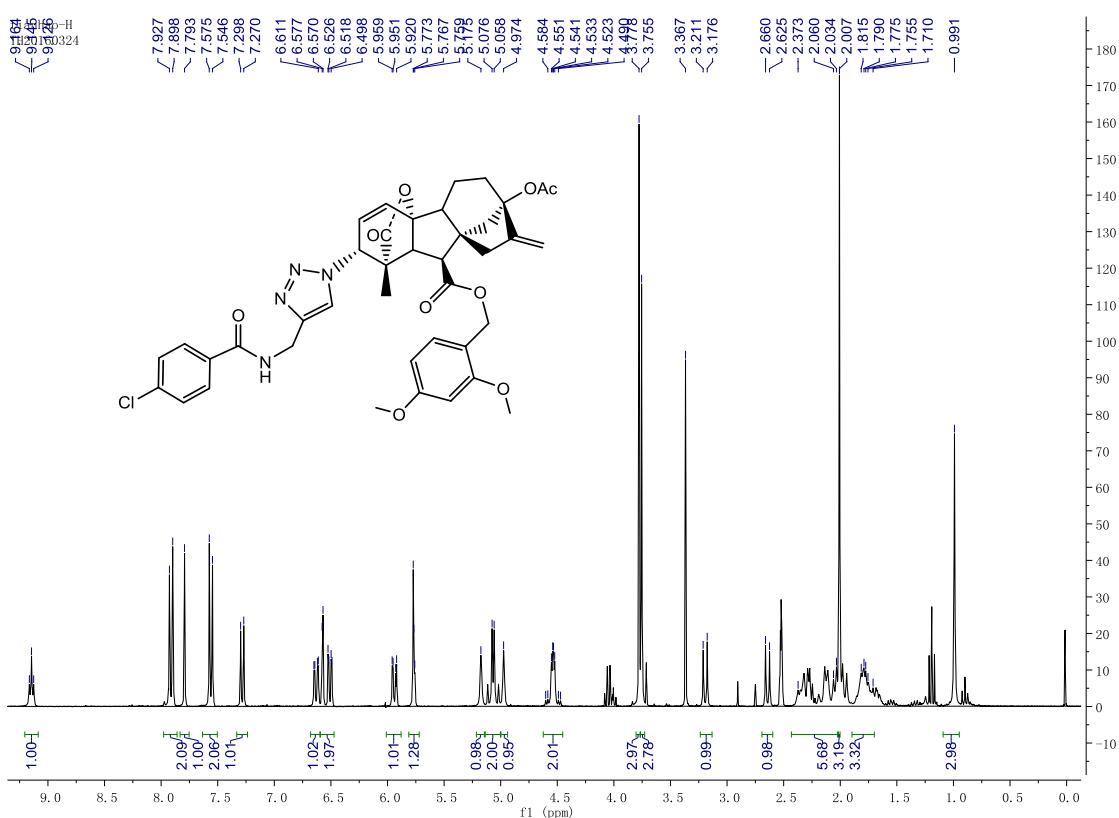
588

589 HRMS of compound **9d**.

590

591 ^1H -NMR spectrum of compound **9e**.

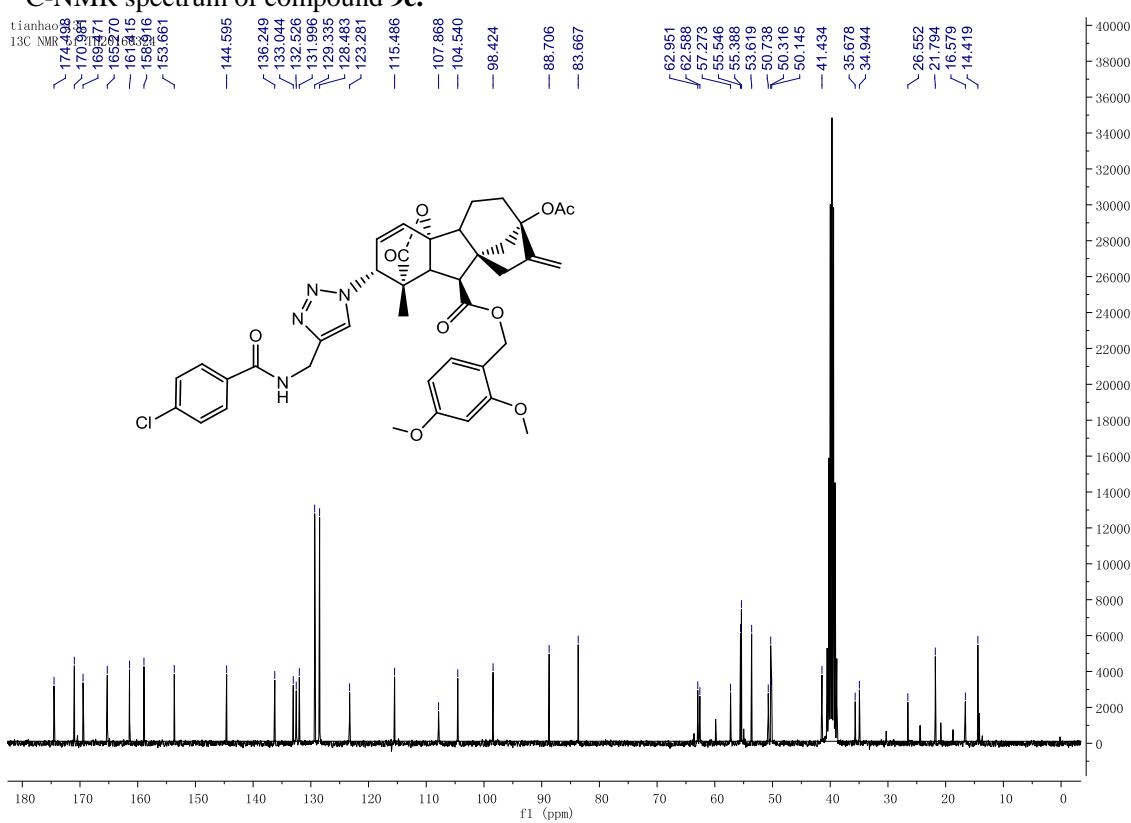
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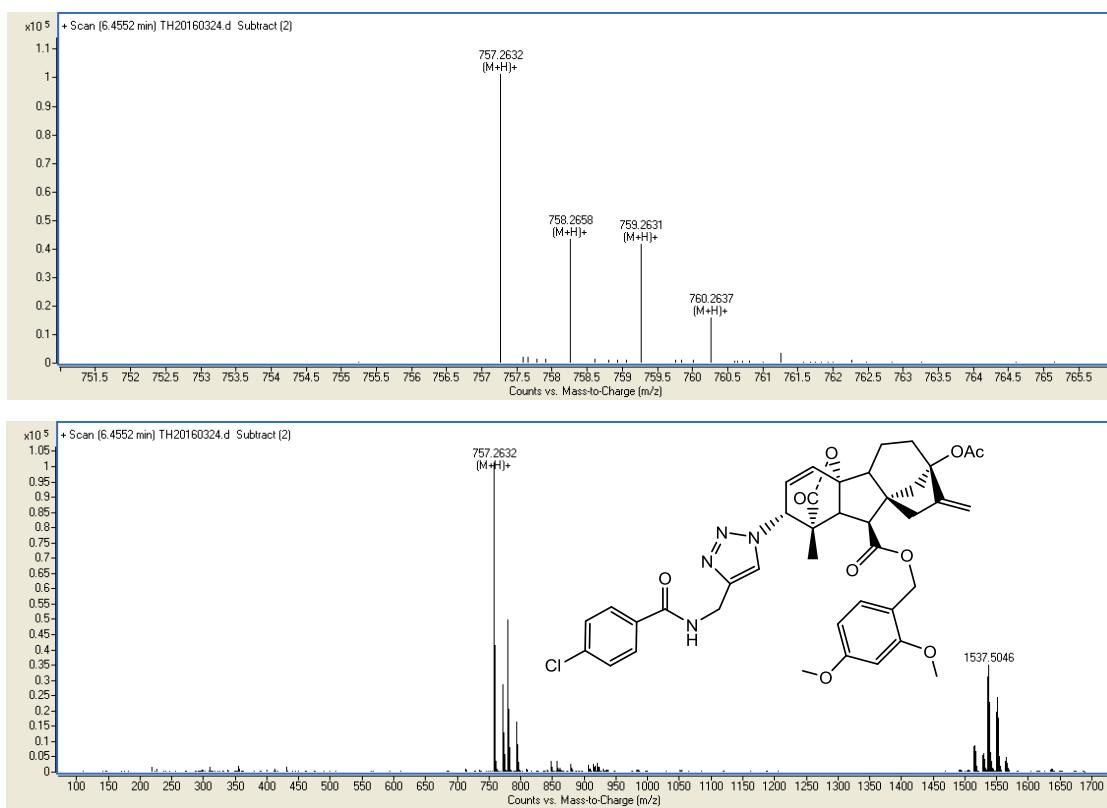
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594

595

596 **¹³C-NMR spectrum of compound 9e.**

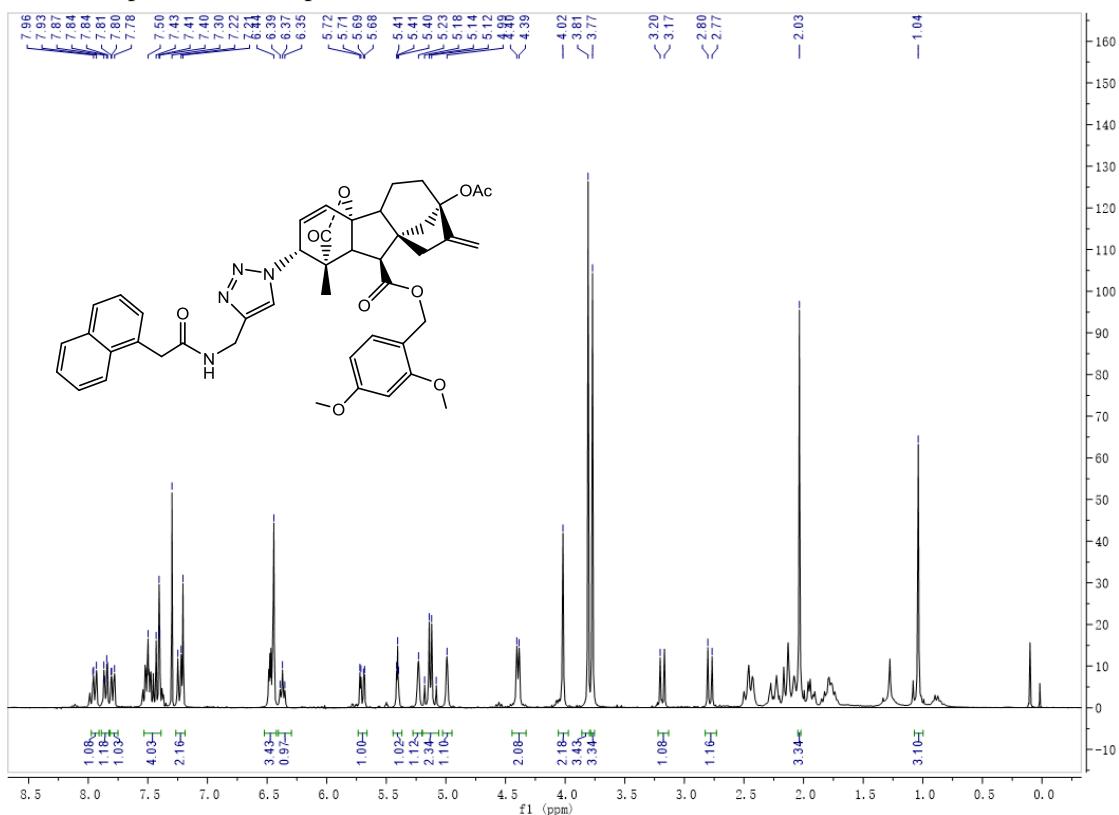
597

HRMS of compound 9e.

598

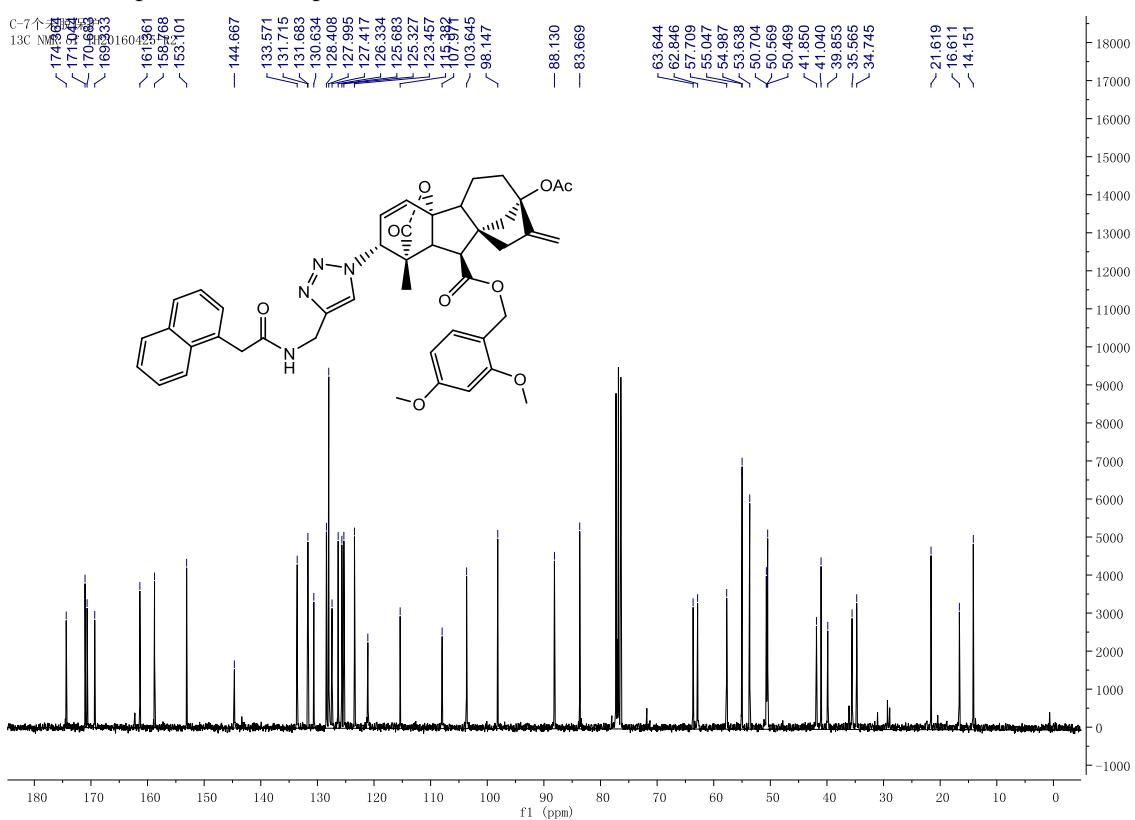
599

600 ¹H-NMR spectrum of compound **9f**.



601

602 ^{13}C -NMR spectrum of compound **9f**.

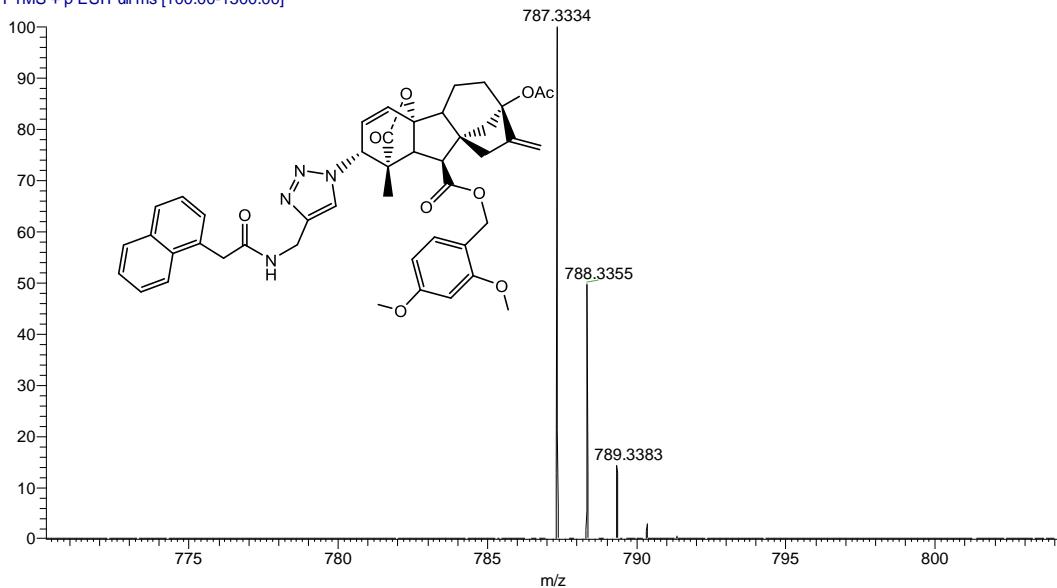


603

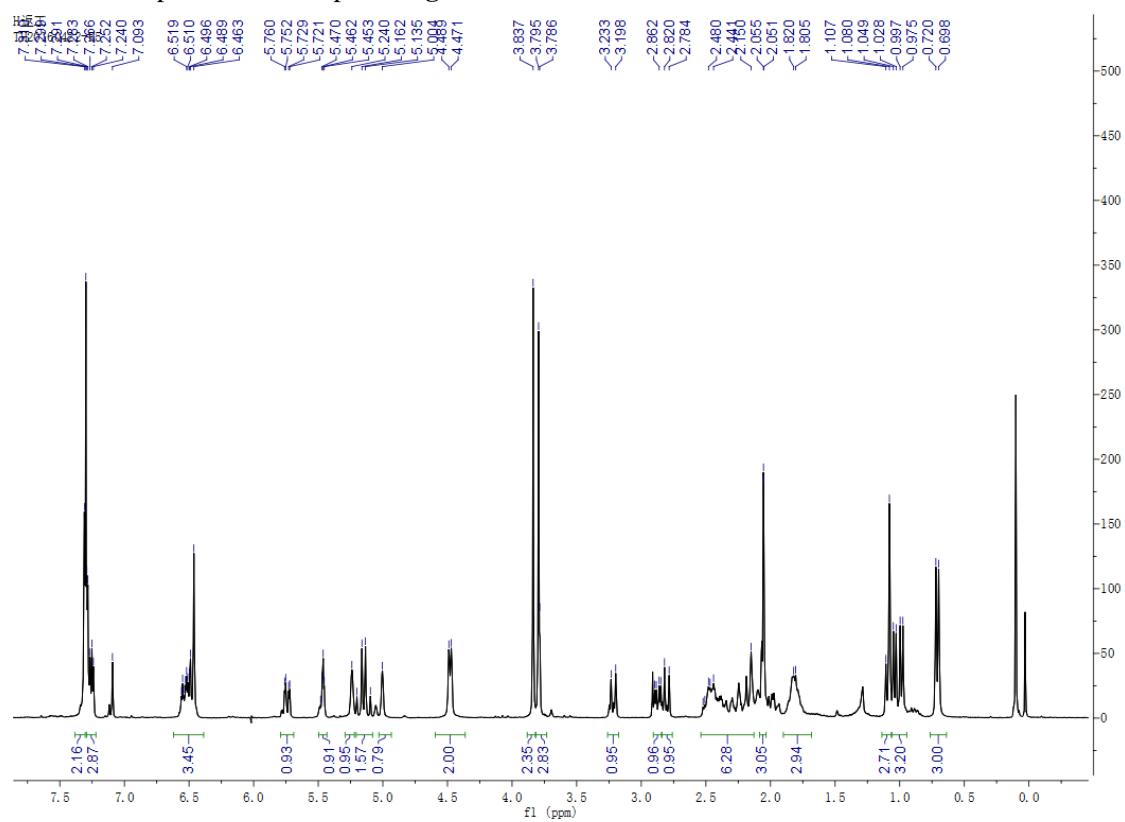
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605 HRMS of compound **9f**.

29_160704202508 #74 RT: 0.77 AV: 1 NL: 5.75E8
 T: FTMS + p ESI Full ms [100.00-1500.00]



606

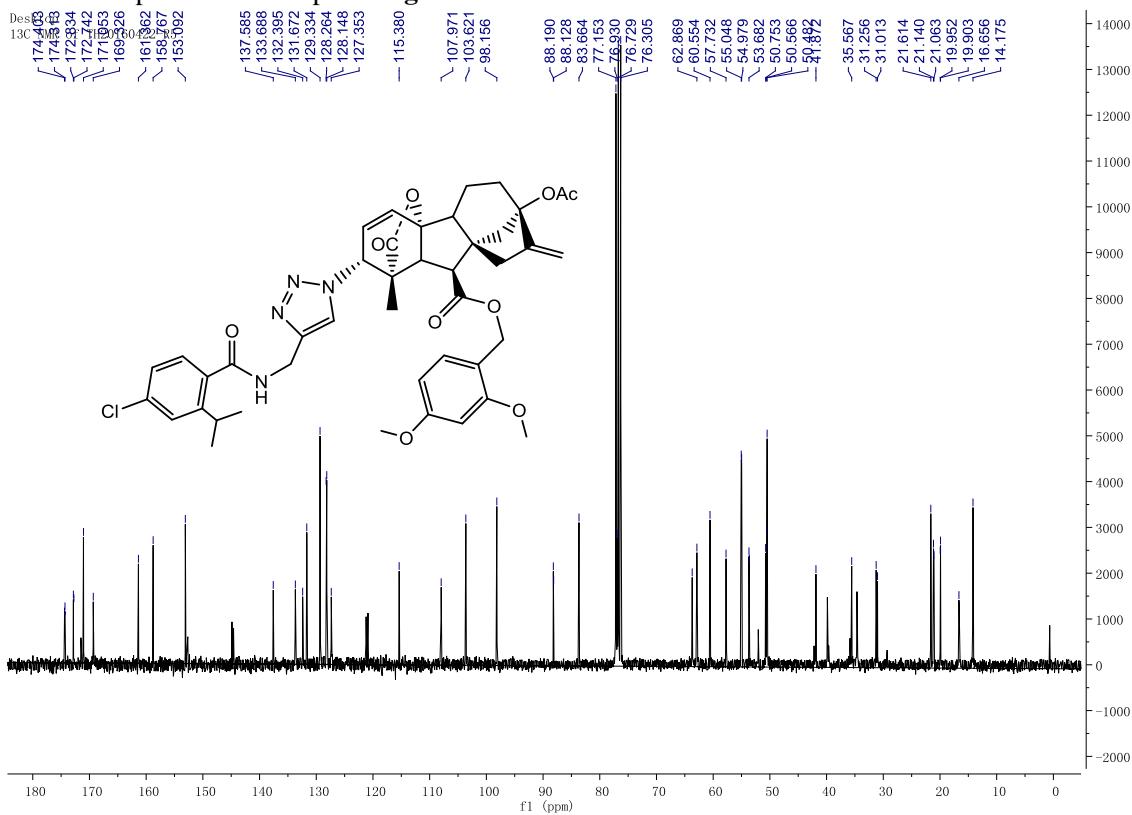
607 ^1H -NMR spectrum of compound **9g**.

608

609

610

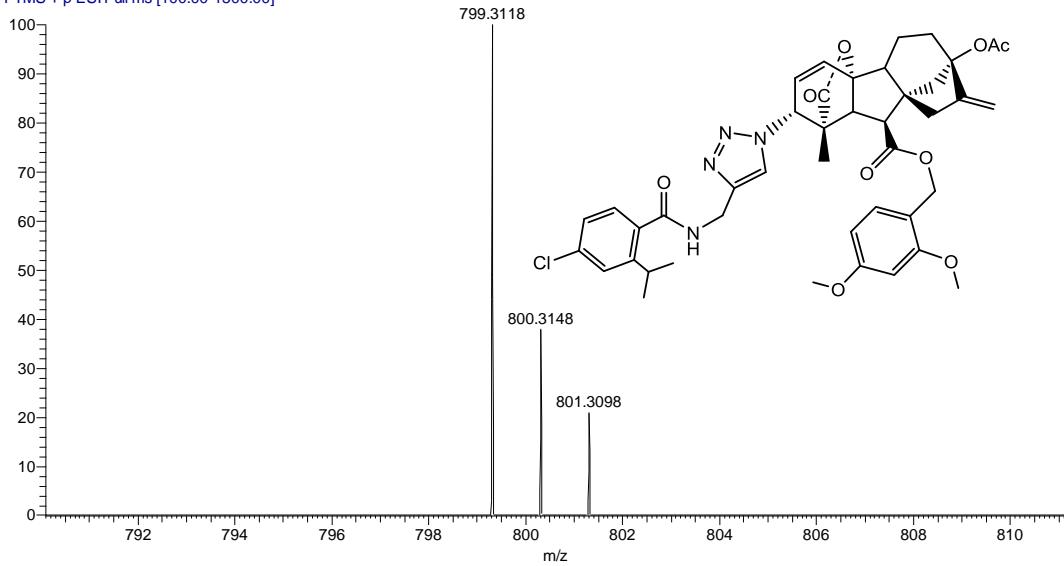
611 ^{13}C -NMR spectrum of compound **9g**.



612

613 HRMS of compound **9g**.

27 #266 RT: 3.33 AV: 1 NL: 3.55E4
T: FTMS + p ESI Full ms [100.00-1500.00]



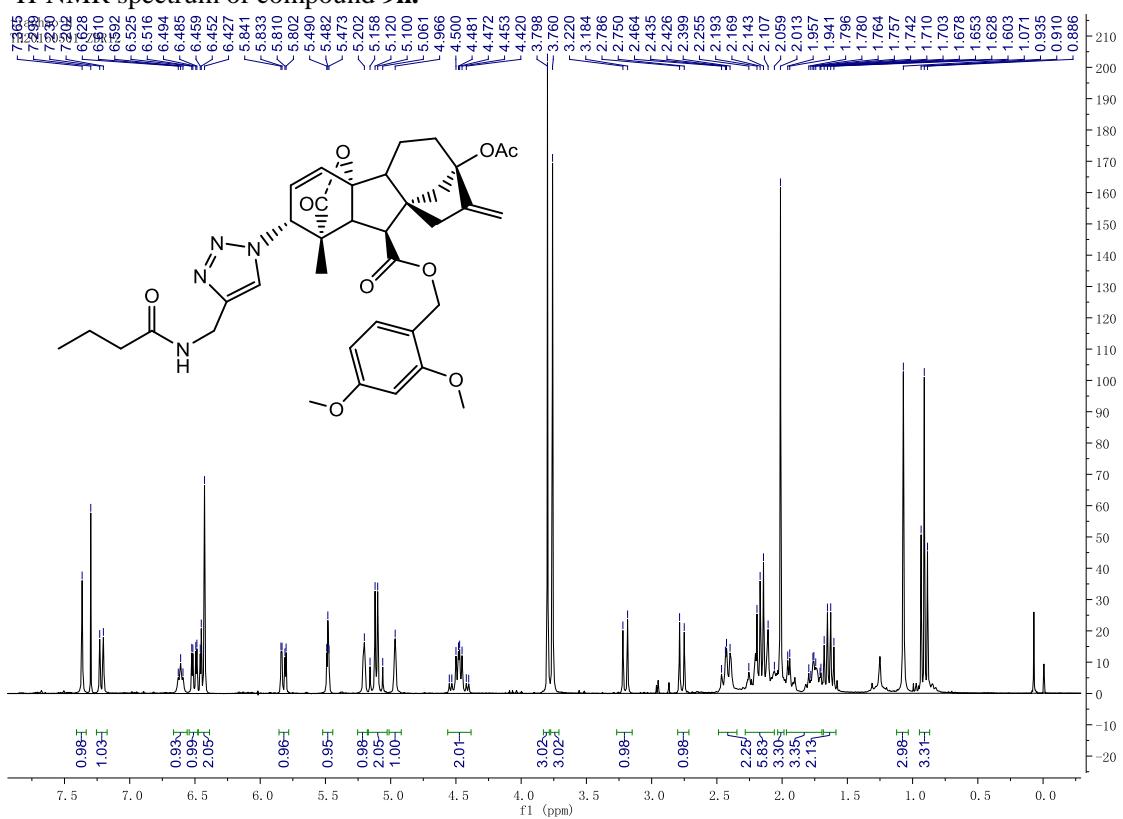
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618

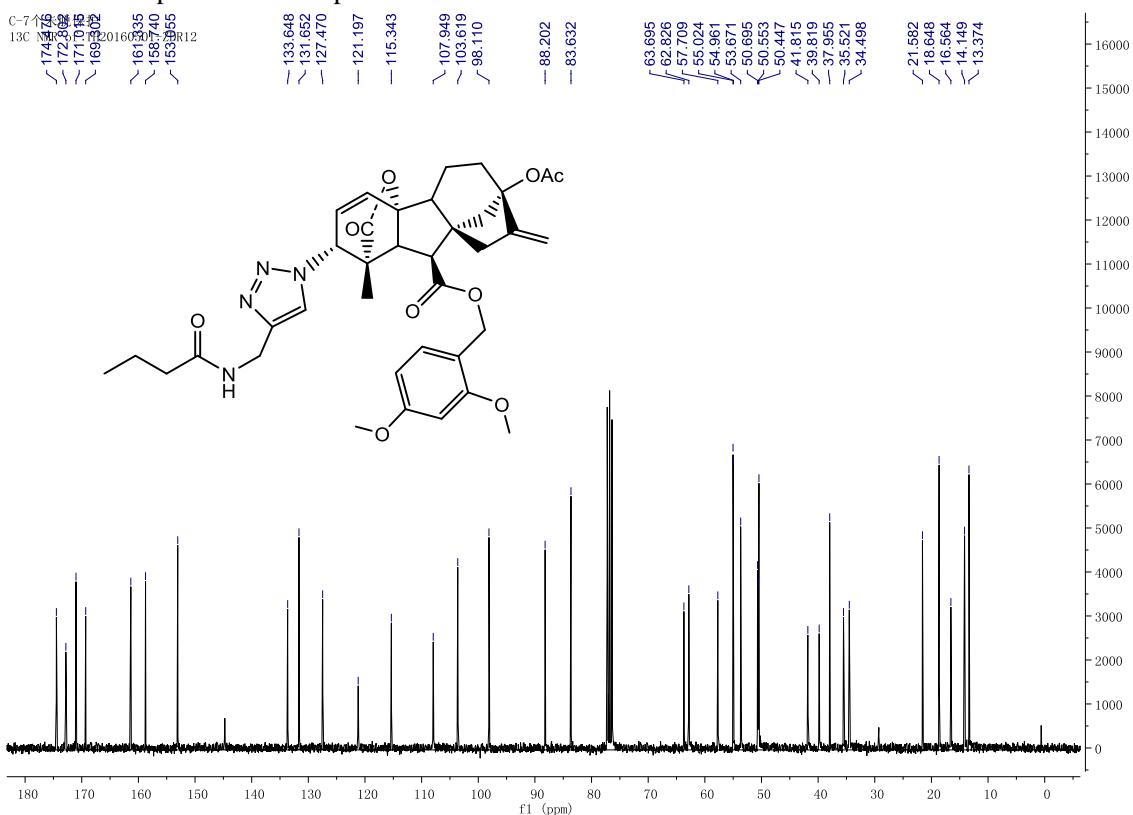
¹H-NMR spectrum of compound 9h.

619

620

621

622

623 ¹³C-NMR spectrum of compound 9h.

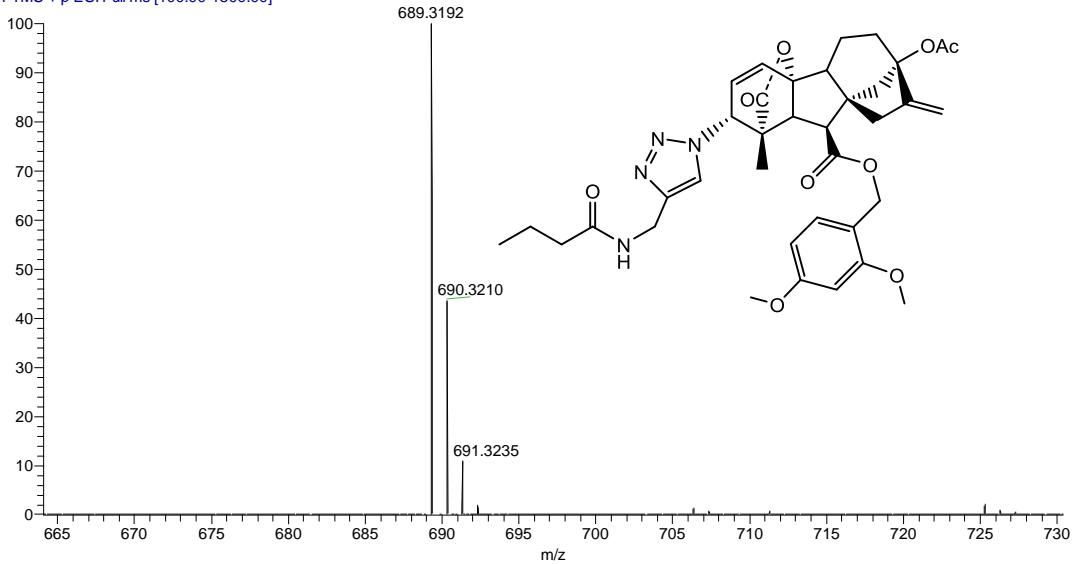
624

625

626

627 HRMS of compound **9h**.

9_160701105657 #58 RT: 0.67 AV: 1 NL: 1.81E8
 T: FTMS + p ESI Full ms [100.00-1500.00]

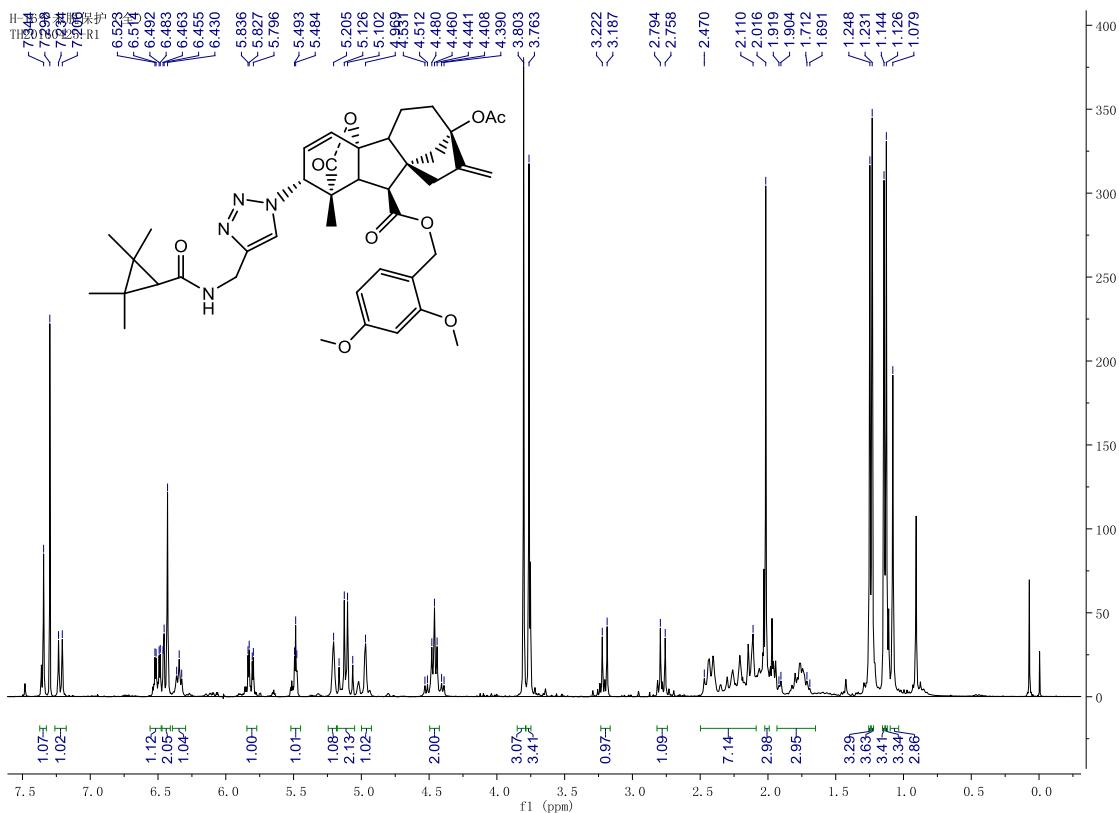


628

629

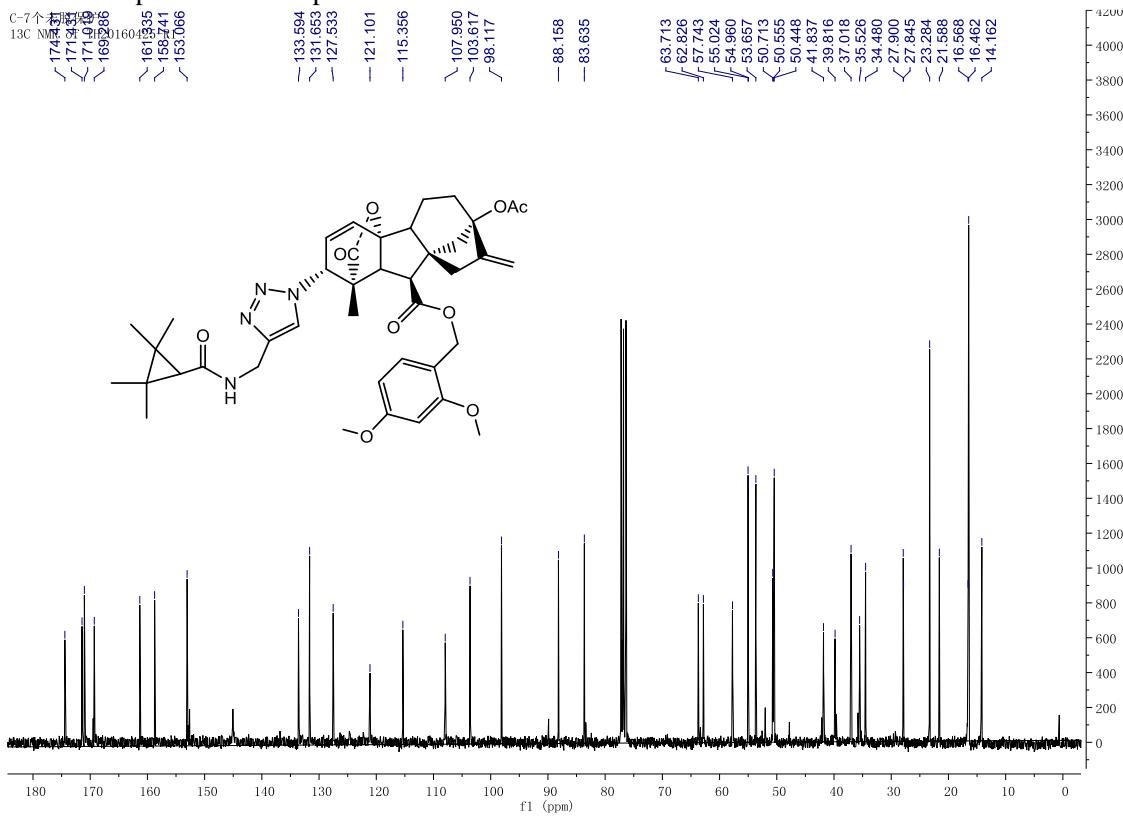
630 ¹H-NMR spectrum of compound **9i**.

631

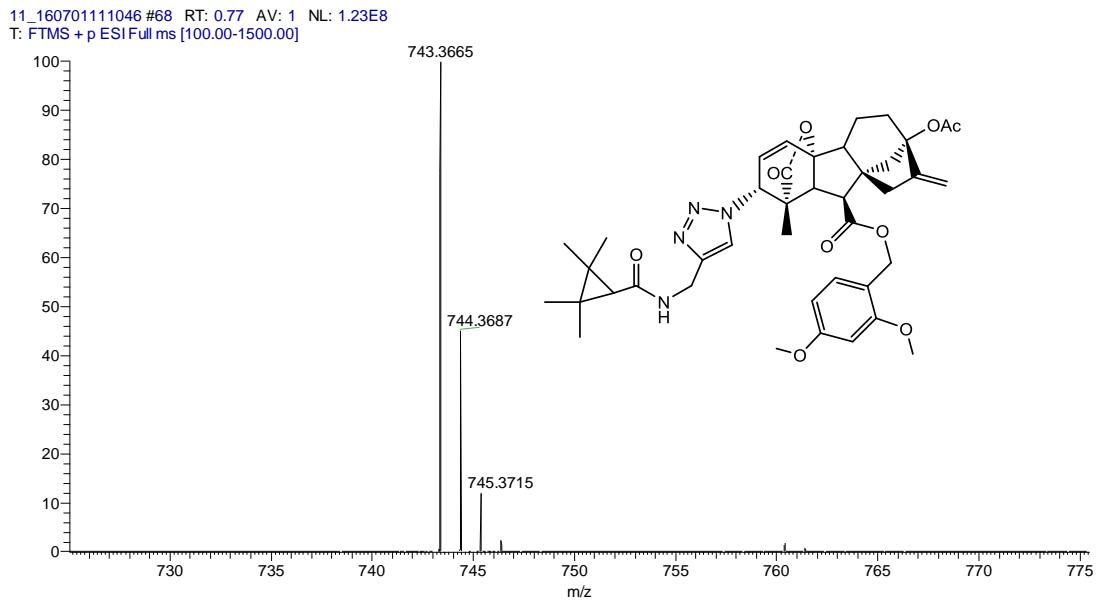


632

633 ^{13}C -NMR spectrum of compound **9i**.



635 HRMS of compound **9i**.



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640

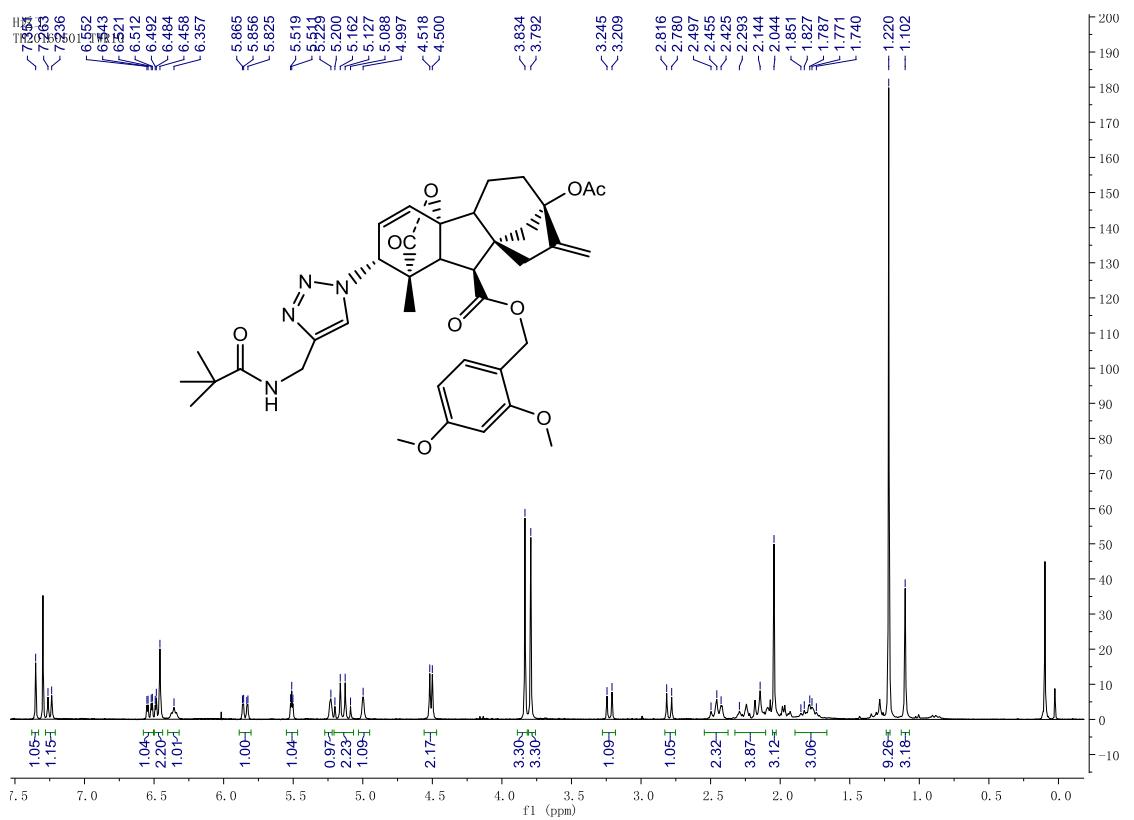
641

642

643

644 ^1H -NMR spectrum of compound **9j**.

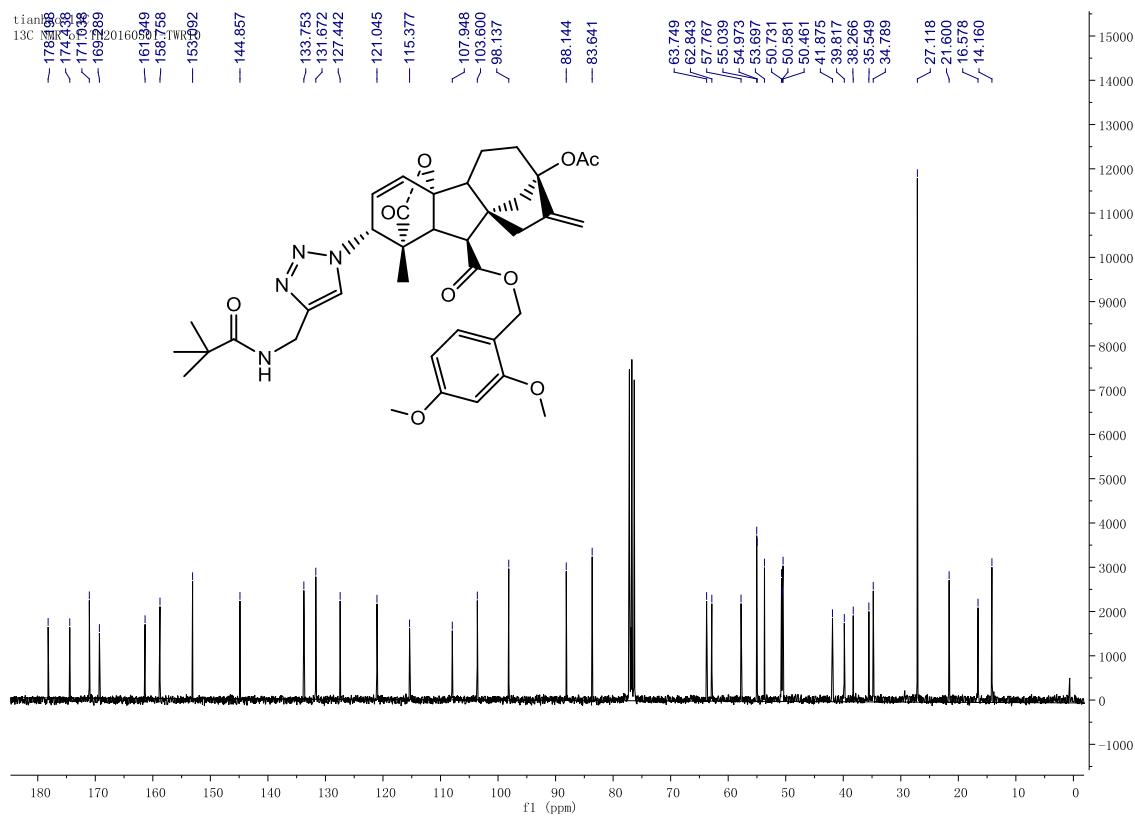
645



646

647 ^{13}C -NMR spectrum of compound **9j**.

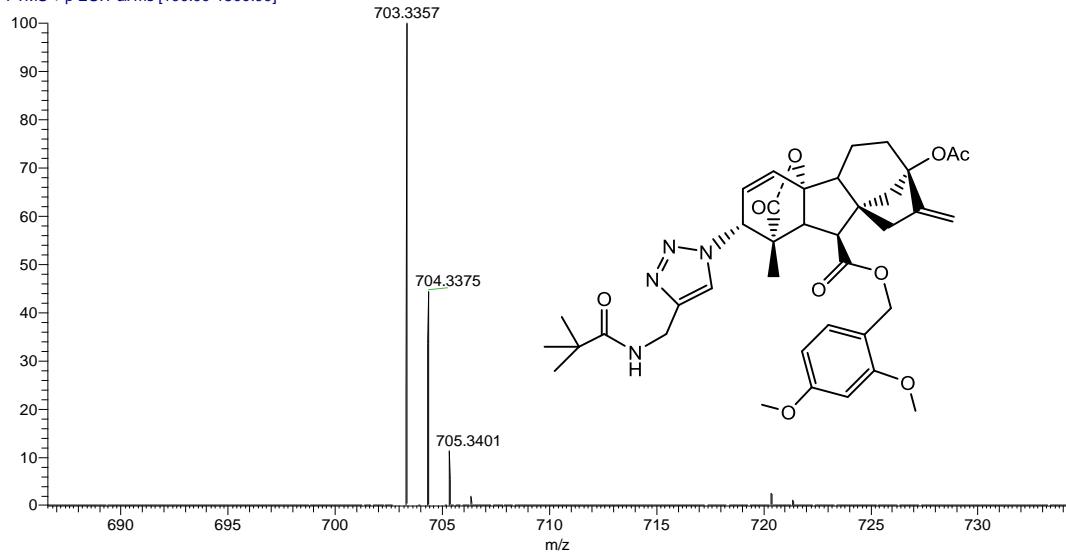
648



649

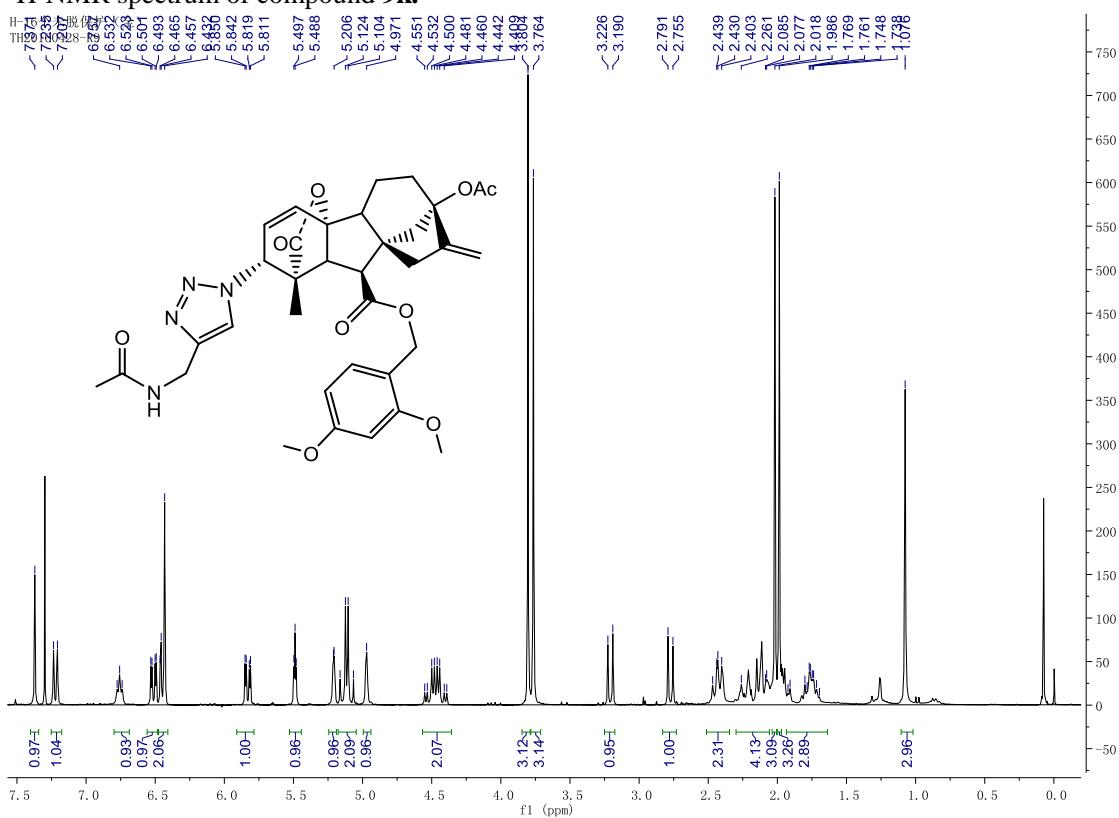
650 HRMS of compound **9j**.

15_160701113825 #72 RT: 0.81 AV: 1 NL: 8.16E7
 T: FTMS + p ESI Full ms [100.00-1500.00]



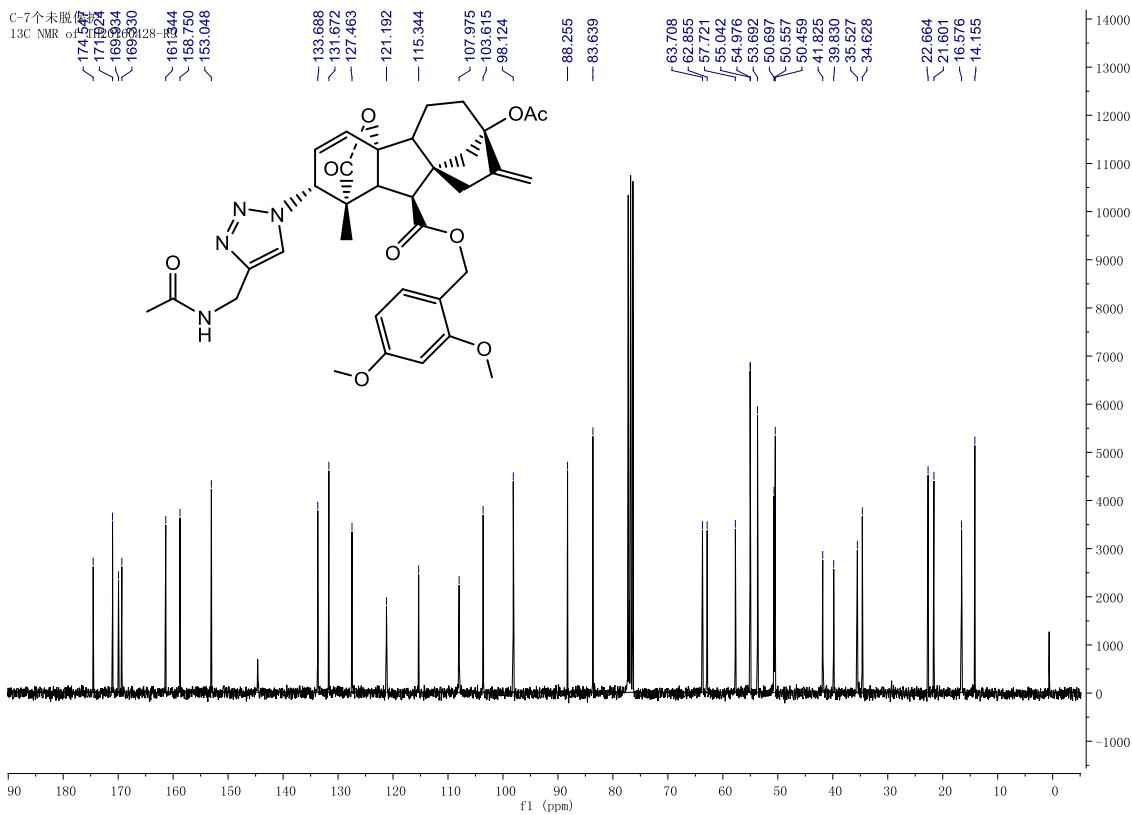
651

652

653 ^1H -NMR spectrum of compound **9k**.

654

655 ^{13}C -NMR spectrum of compound **9k**.



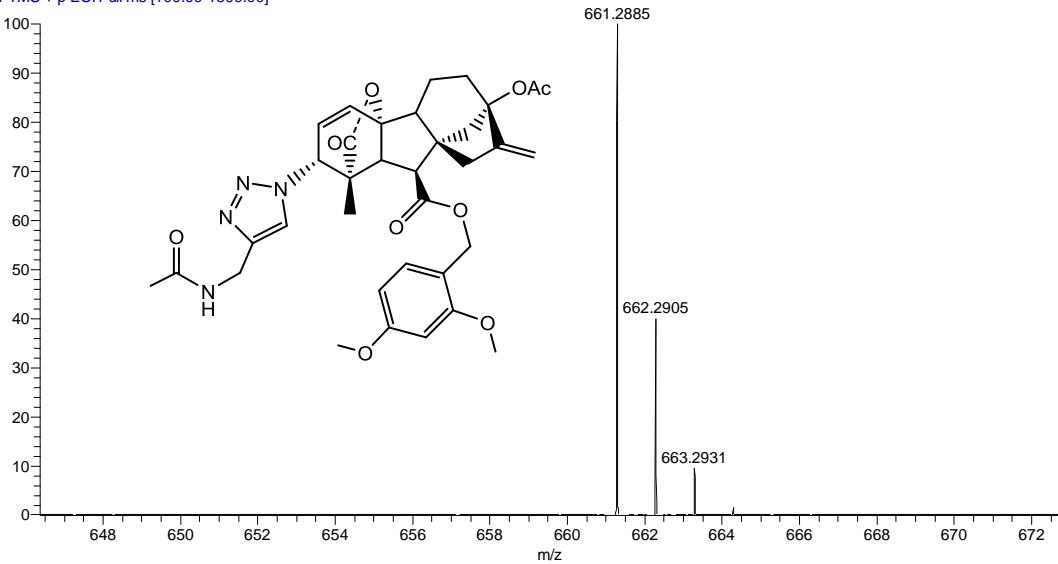
656

657

658

659 HRMS of compound **9k**.

17_160701115214 #64 RT: 0.79 AV: 1 NL: 1.71E7
T: FTMS + p ESI Full ms [100.00-1500.00]



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662

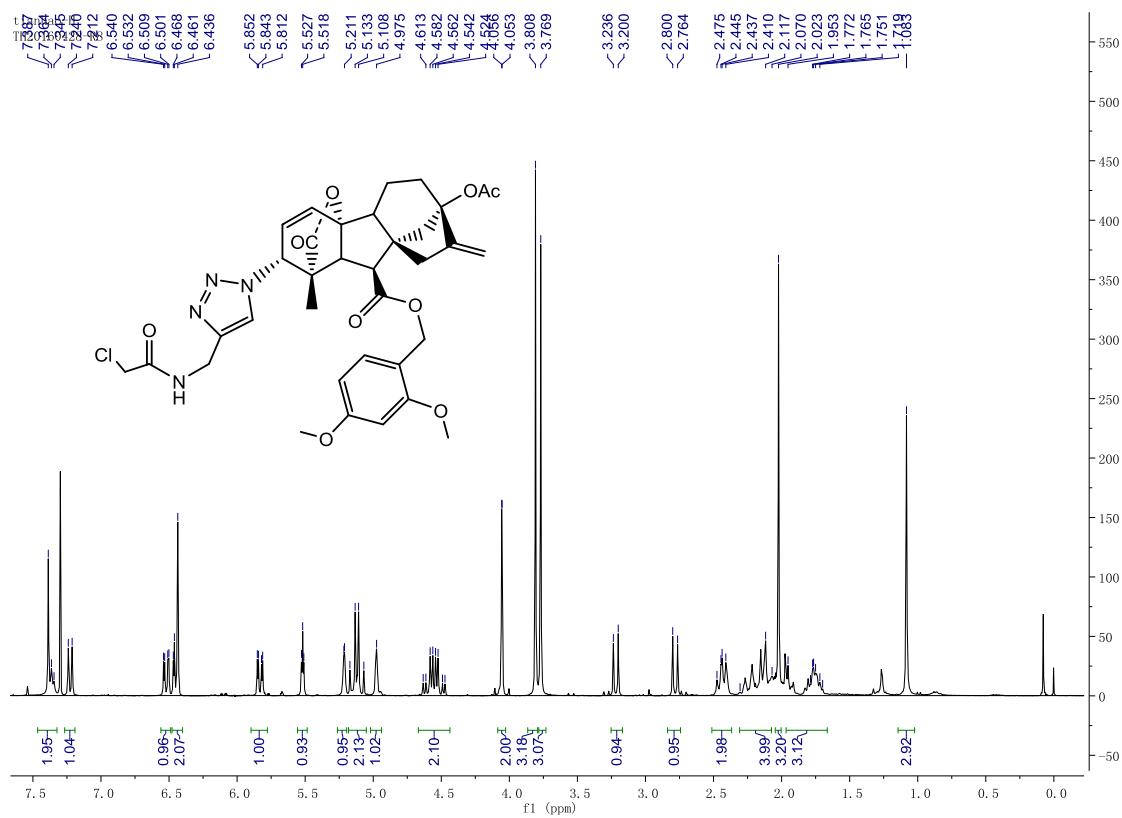
663

664

665

666 ^1H -NMR spectrum of compound 9l.

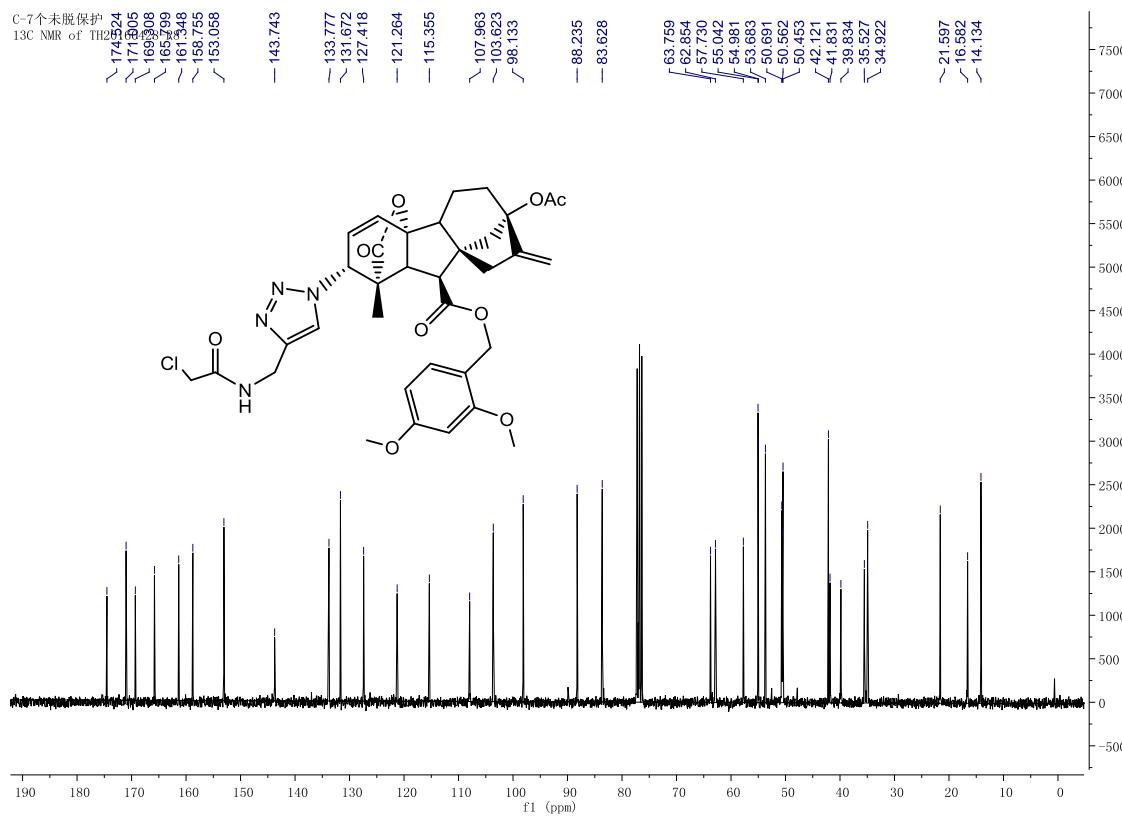
667



668

669 ^{13}C -NMR spectrum of compound 9l.

670

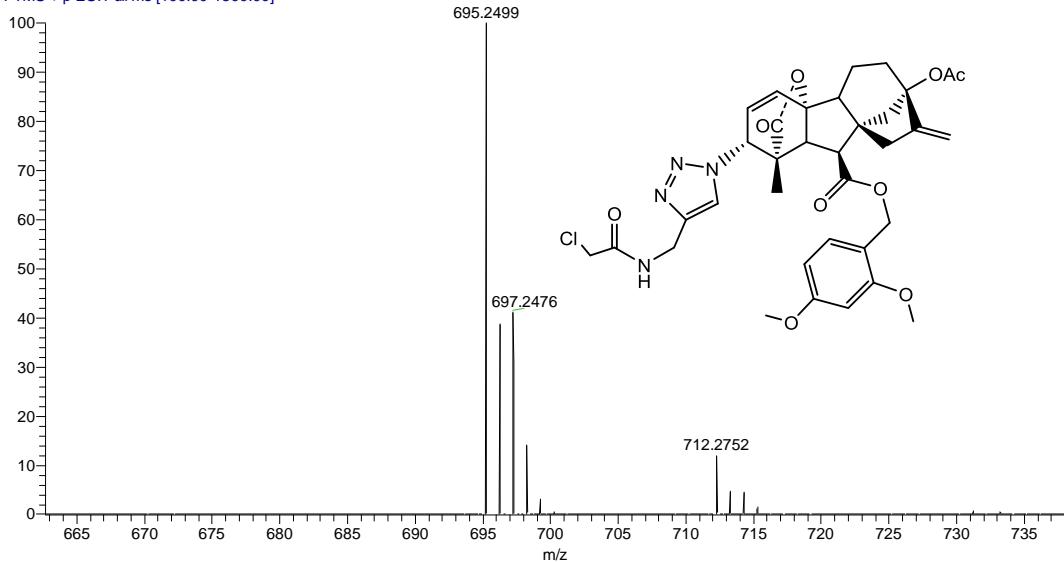


671

672

673 HRMS of compound **9l**.

13_160701112435 #64 RT: 0.72 AV: 1 NL: 7.19E7
 T: FTMS + p ESI Full ms [100.00-1500.00]



674

675

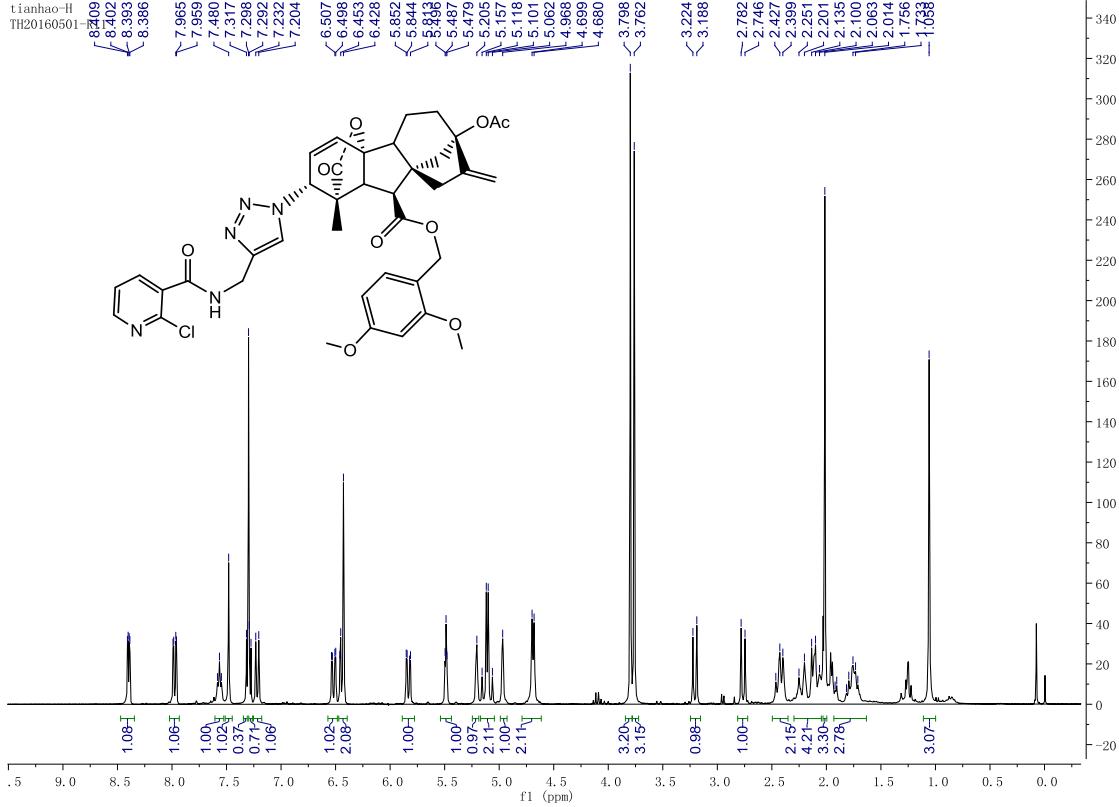
676

677

678 ¹H-NMR spectrum of compound **9m**.

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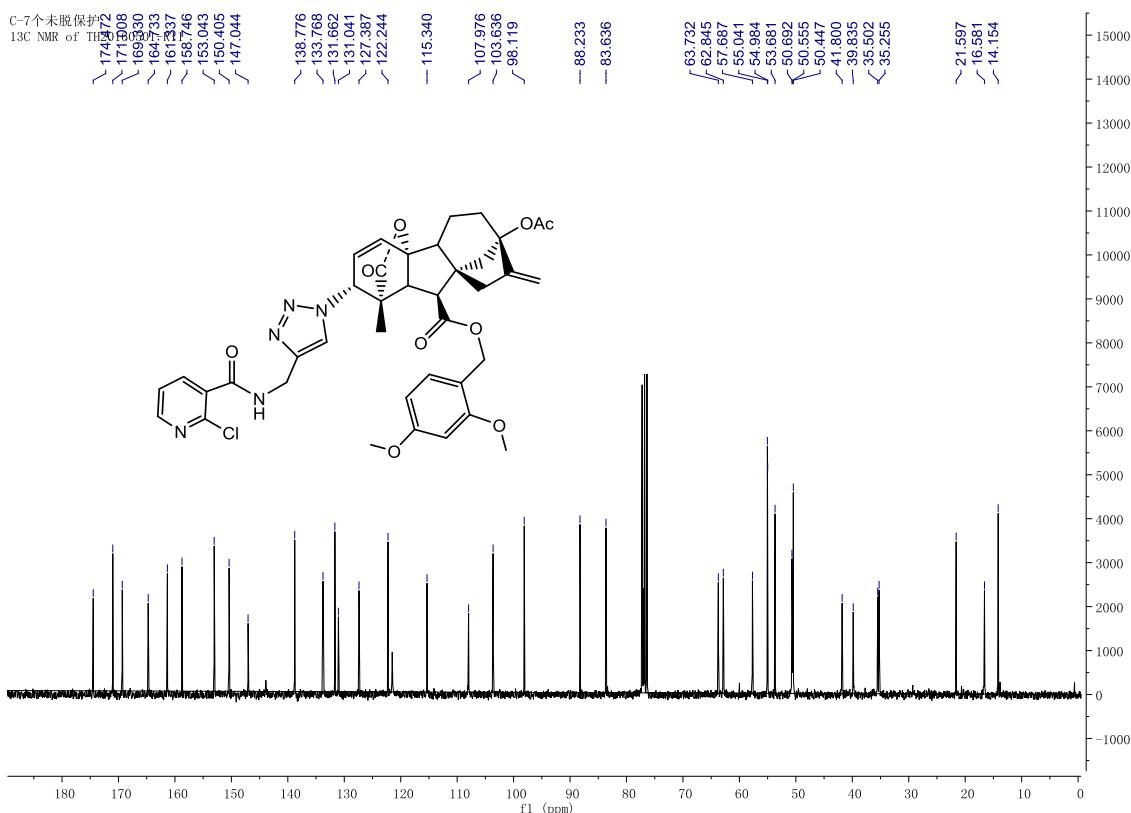
679

680

681

682 ^{13}C -NMR spectrum of compound **9m**.

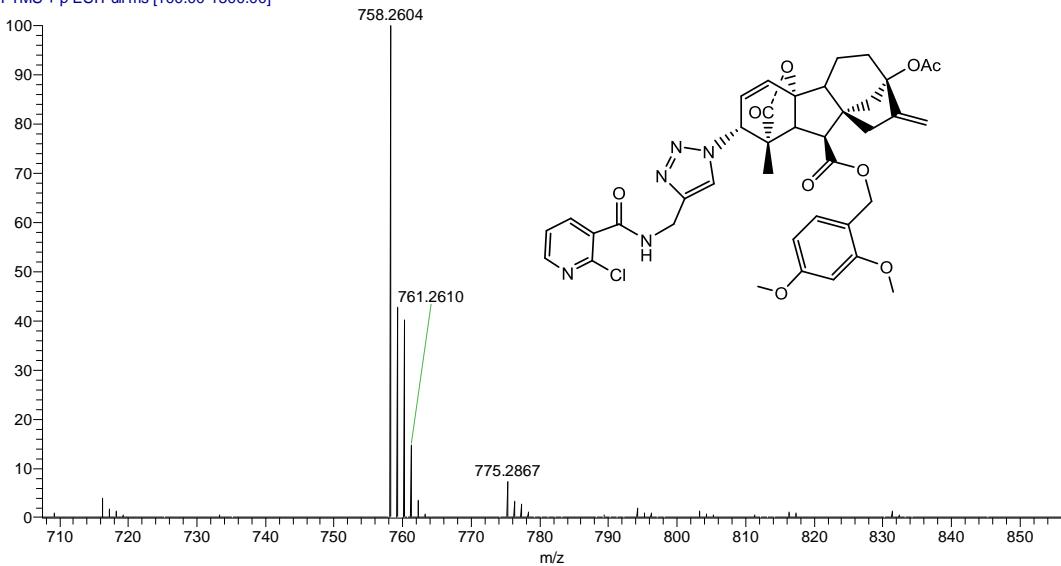
683



684

685 HRMS of compound **9m**.

19 #50 RT: 0.64 AV: 1 NL: 4.82E6
T: FTMS + p ESI Full ms [100.00-1500.00]



686

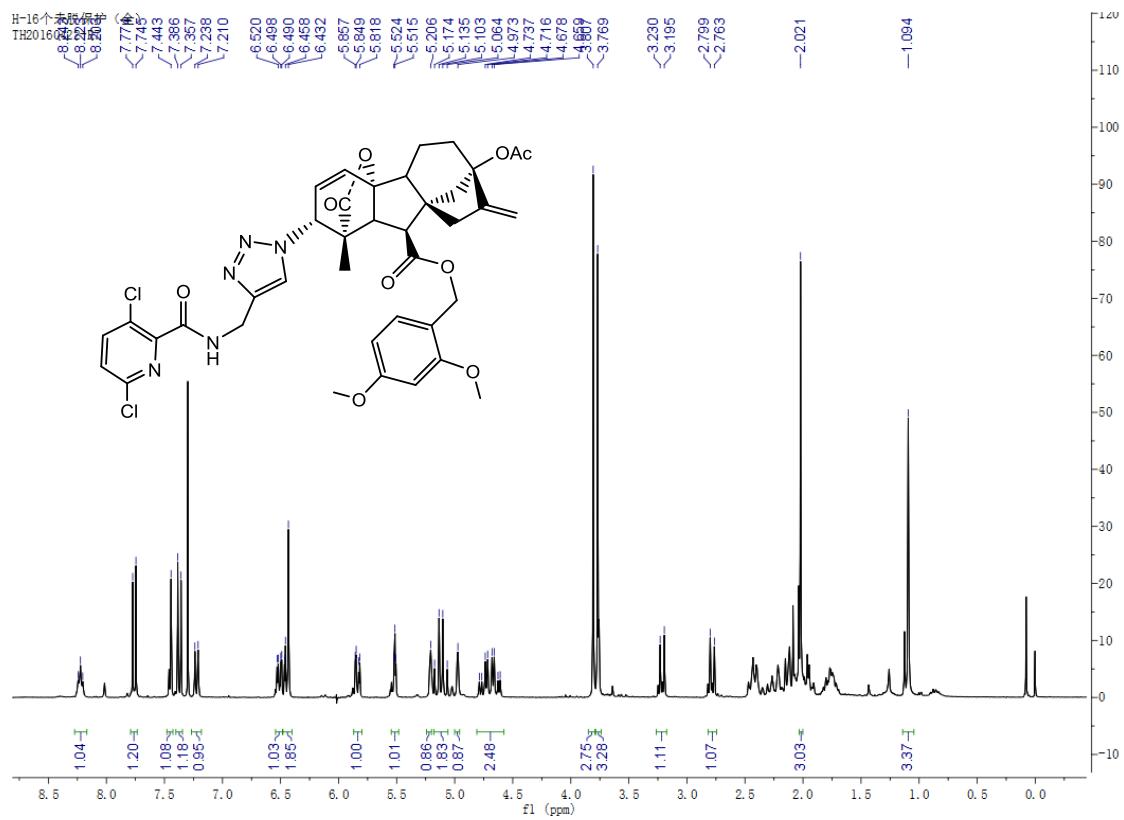
687

688

689

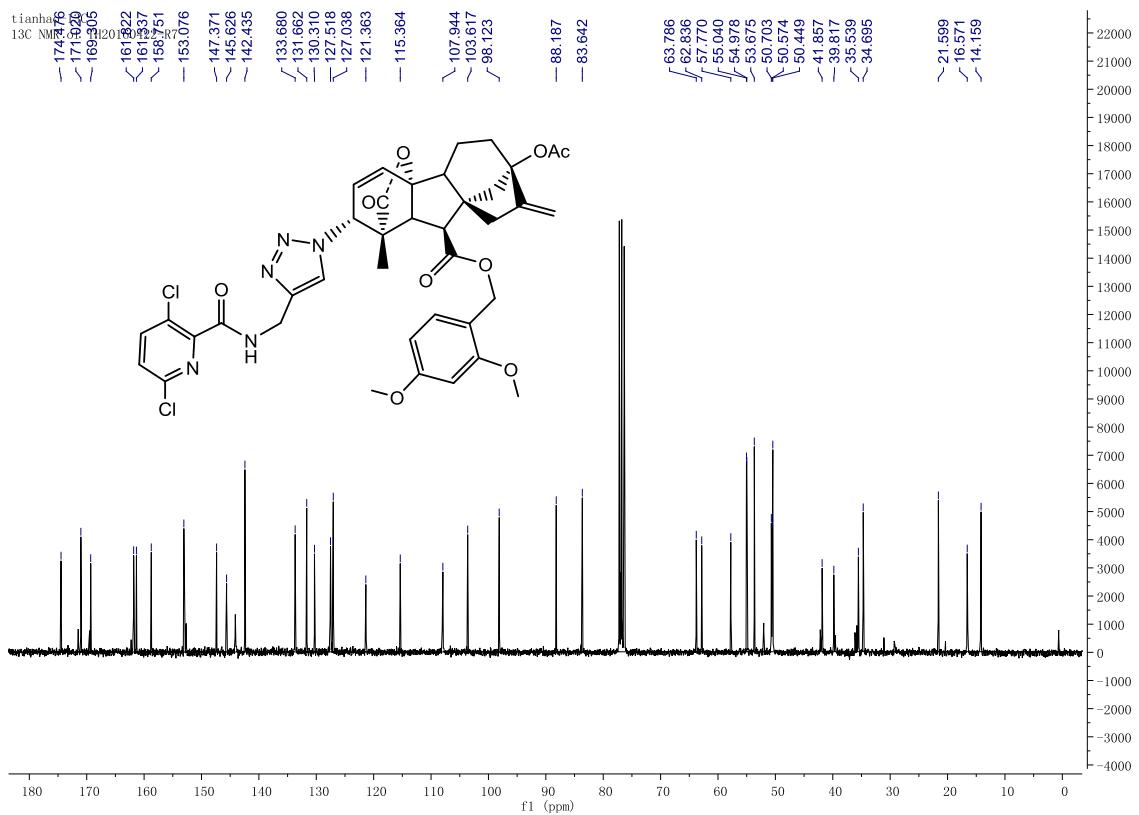
690

691

692 ^1H -NMR spectrum of compound **9n**.

693

694

695 ^{13}C -NMR spectrum of compound **9n**.

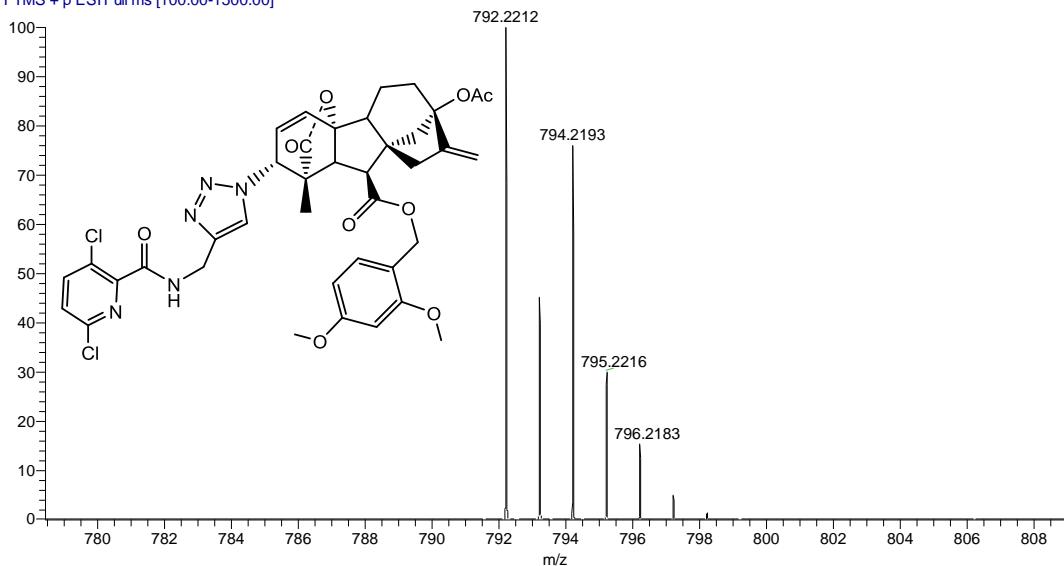
696

697

698

699 HRMS of compound **9n**.

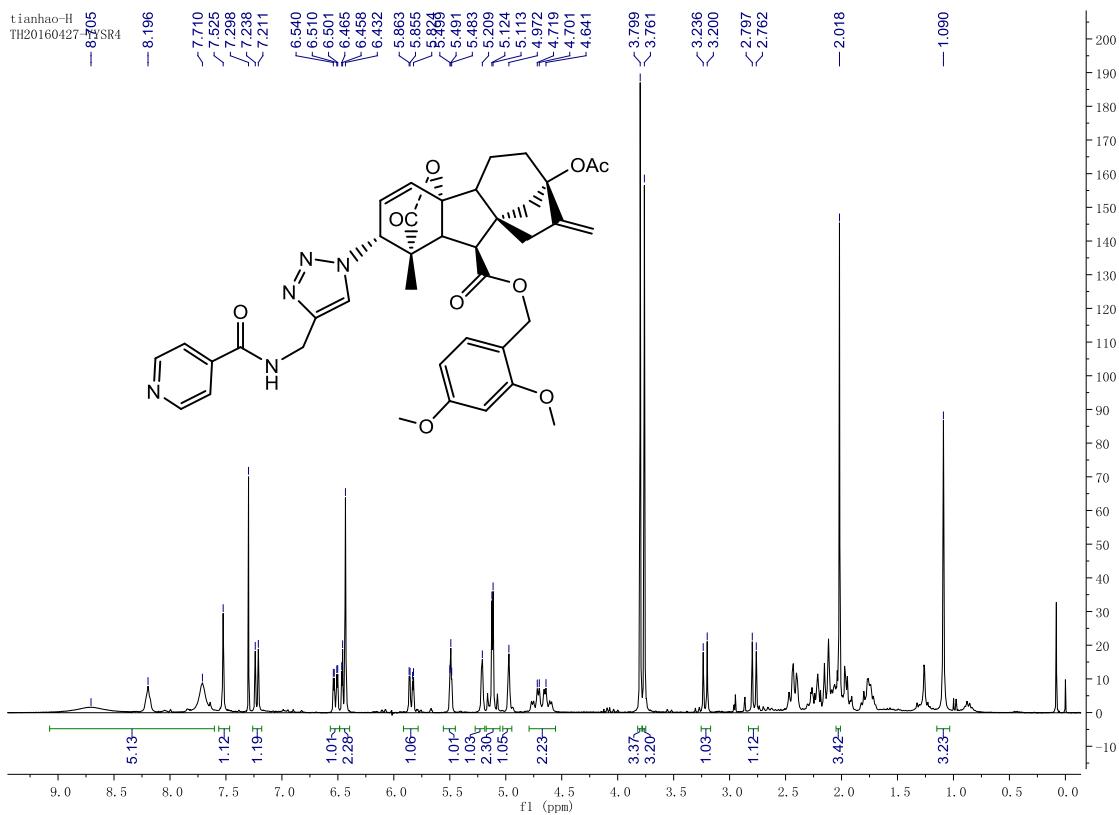
23_160701123341 #240 RT: 3.12 AV: 1 NL: 4.12E6
 T: FTMS + p ESI Full ms [100.00-1500.00]



700

701 ^1H -NMR spectrum of compound **9o**.

702



703

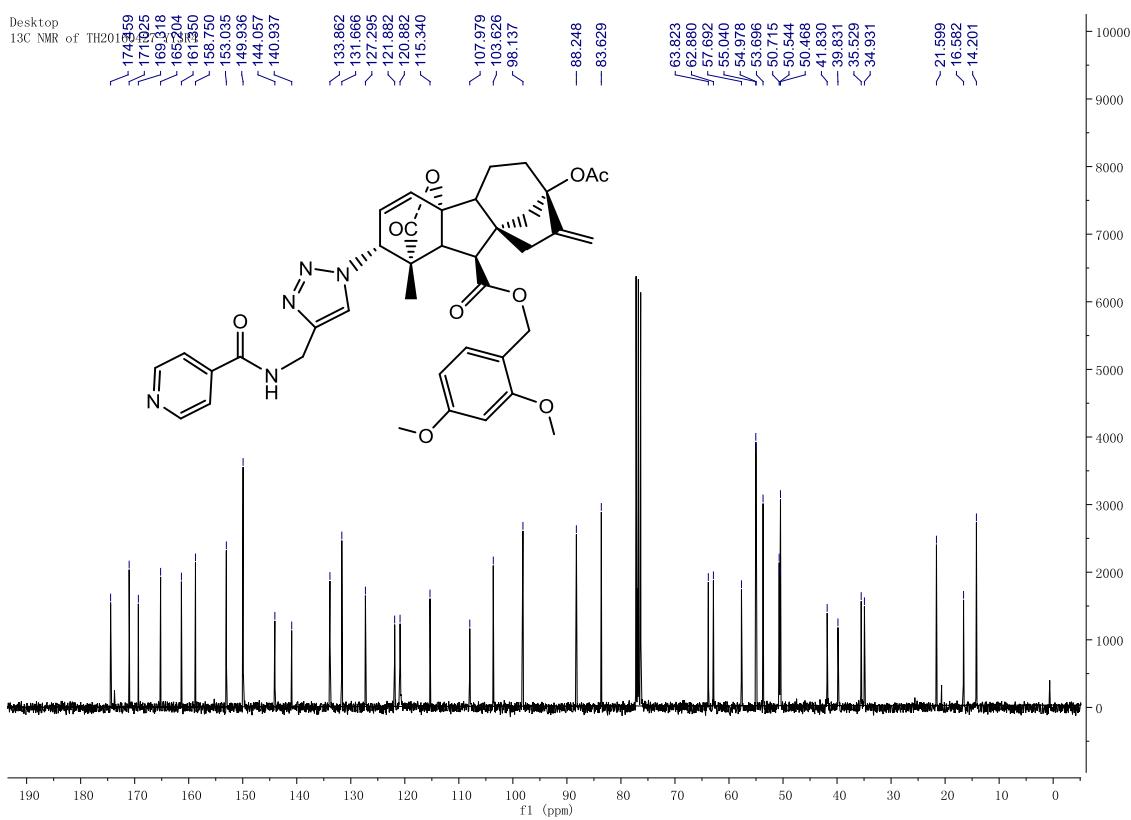
704

705

706

707 ¹³C-NMR spectrum of compound **9o**.

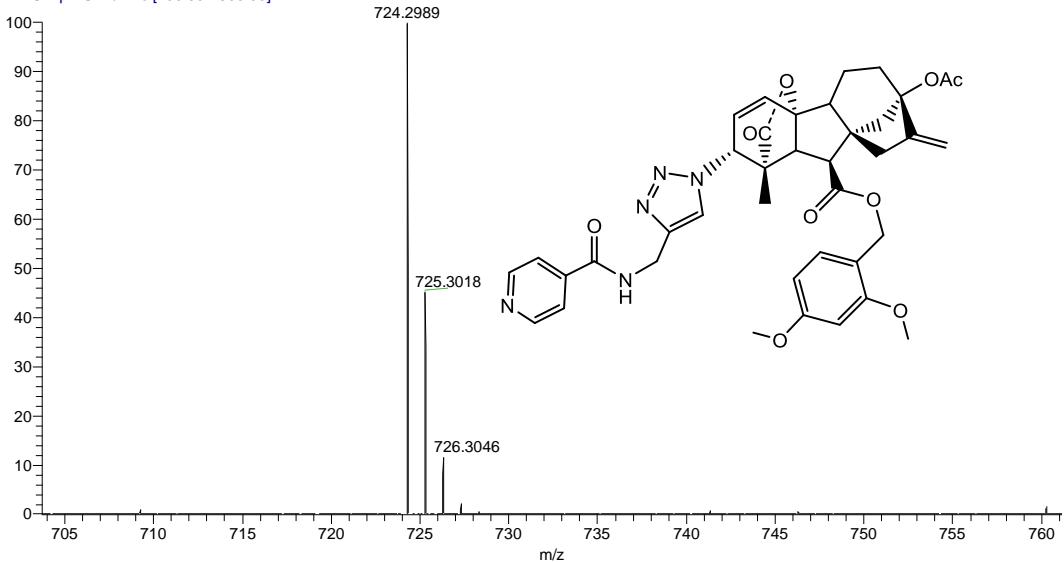
708



709

710 HRMS of compound **9o**.

21 #56 RT: 0.70 AV: 1 NL: 6.64E6
T: FTMS + p ESI Full ms [100.00-1500.00]

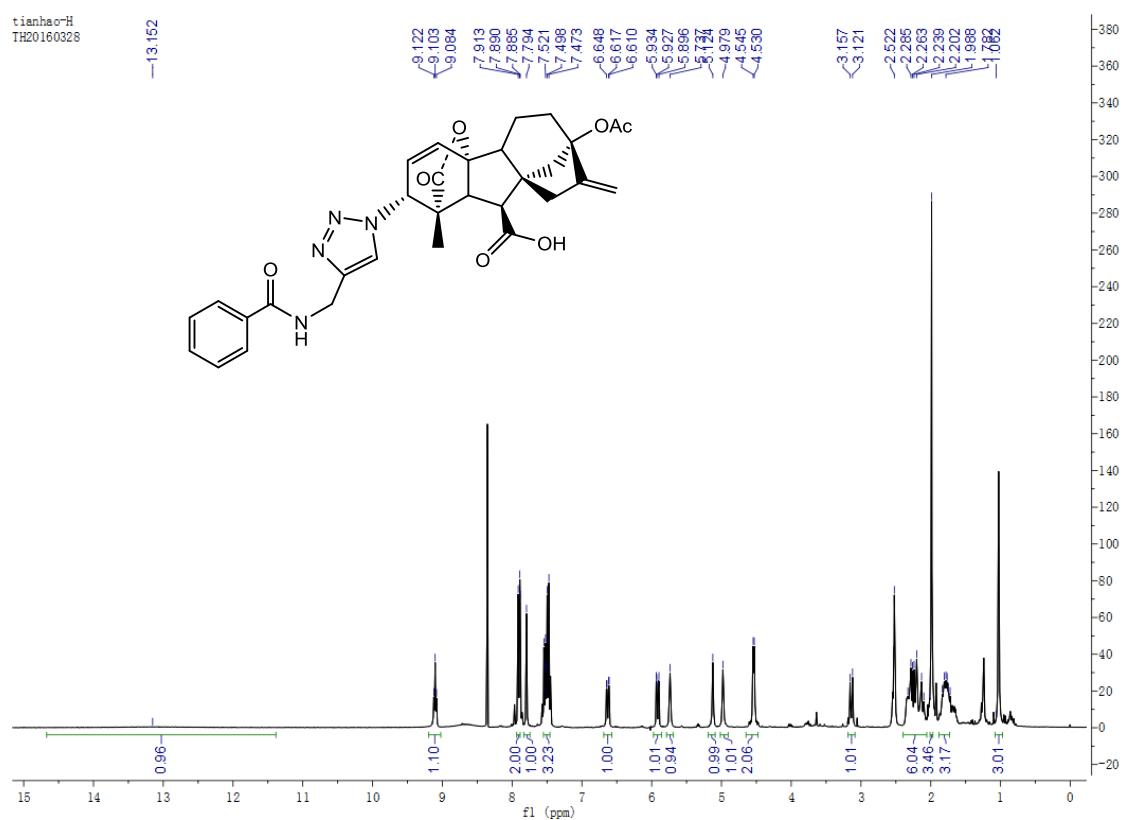


711

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713

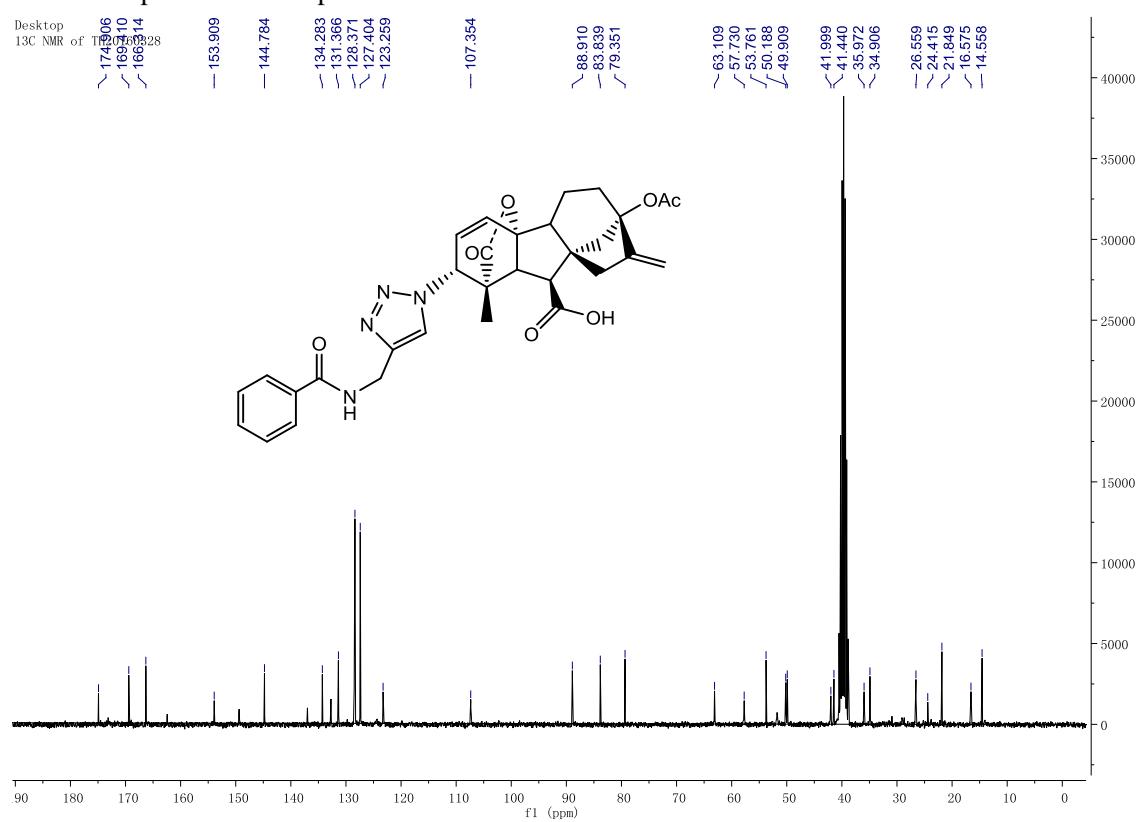
714 ^1H -NMR spectrum of compound **10a**.



715

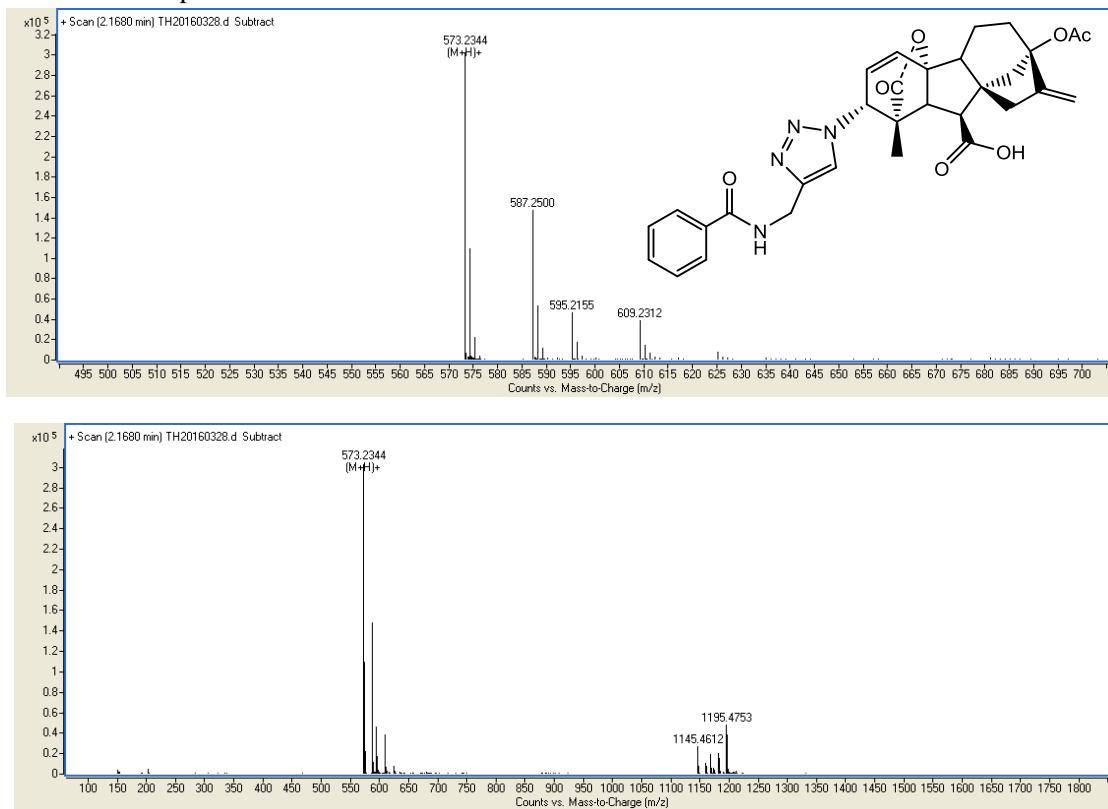
716

717 ^{13}C -NMR spectrum of compound **10a**.



718

719 HRMS of compound **10a**.



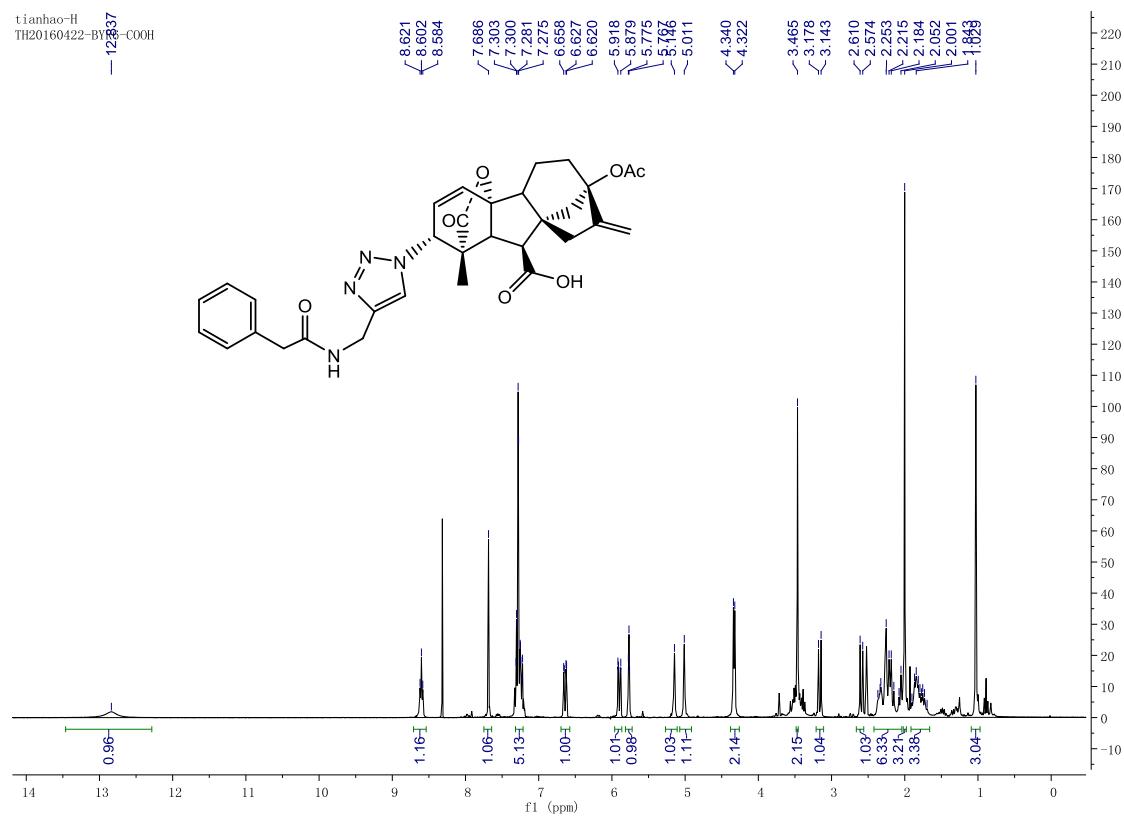
720

721

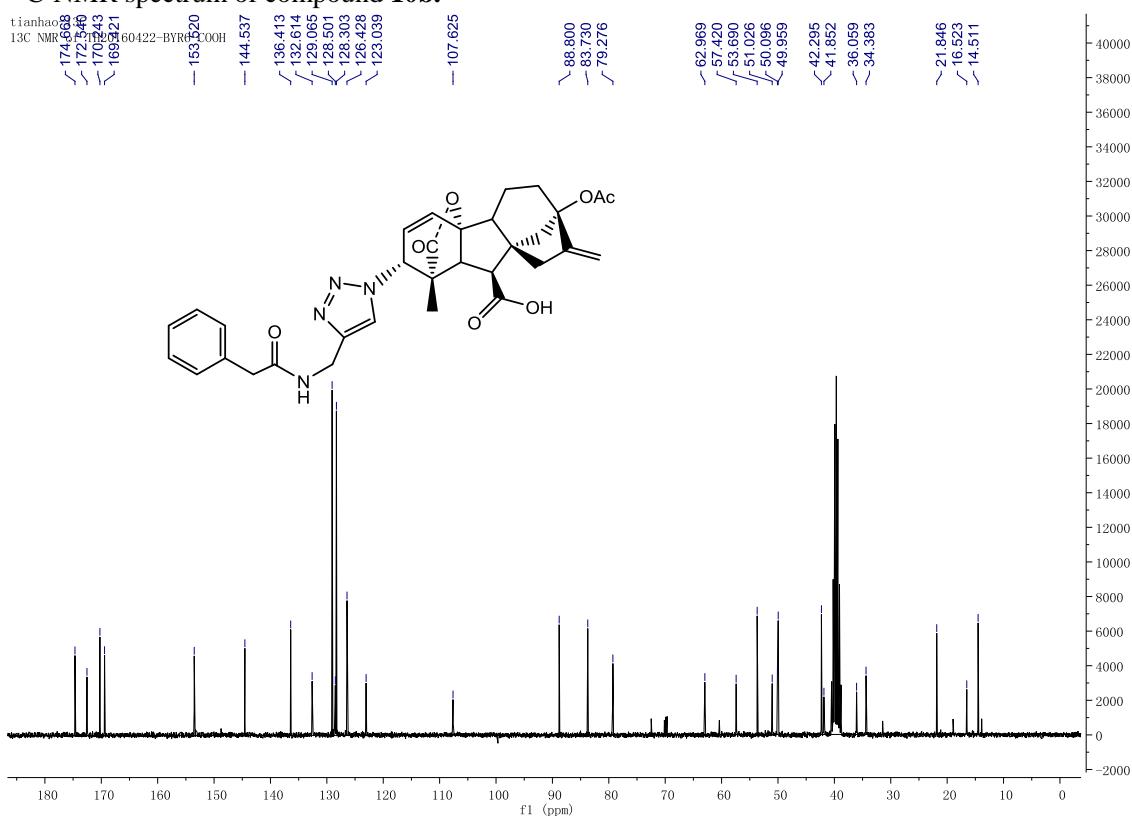
722

723 ¹H-NMR spectrum of compound **10b**.

724



725

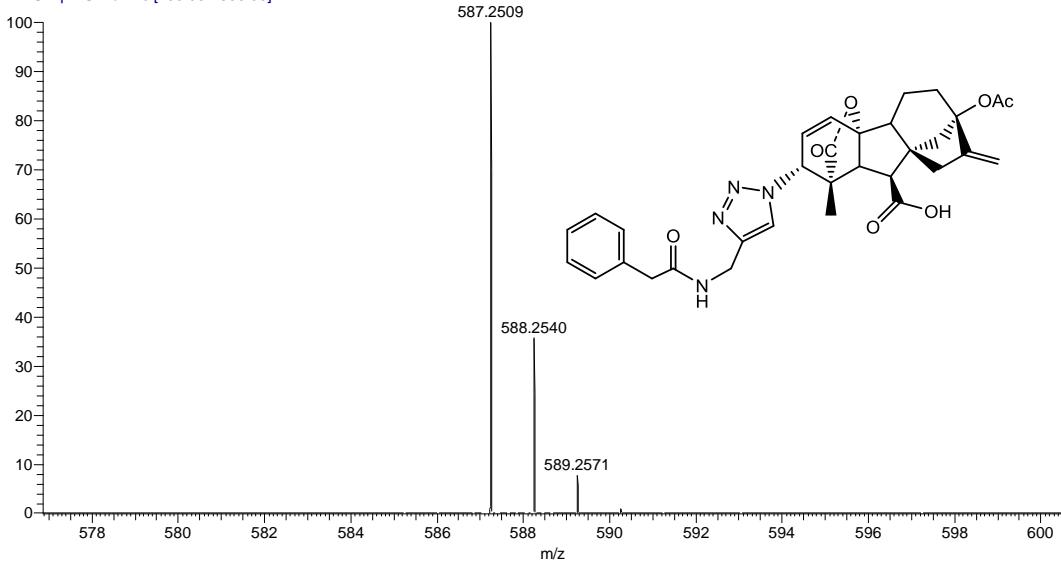
726 ¹³C-NMR spectrum of compound 10b.

727

728

729 HRMS of compound 10b.

26 #56 RT: 0.68 AV: 1 NL: 1.03E7
T: FTMS + p ESI Full ms [100.00-1500.00]



730

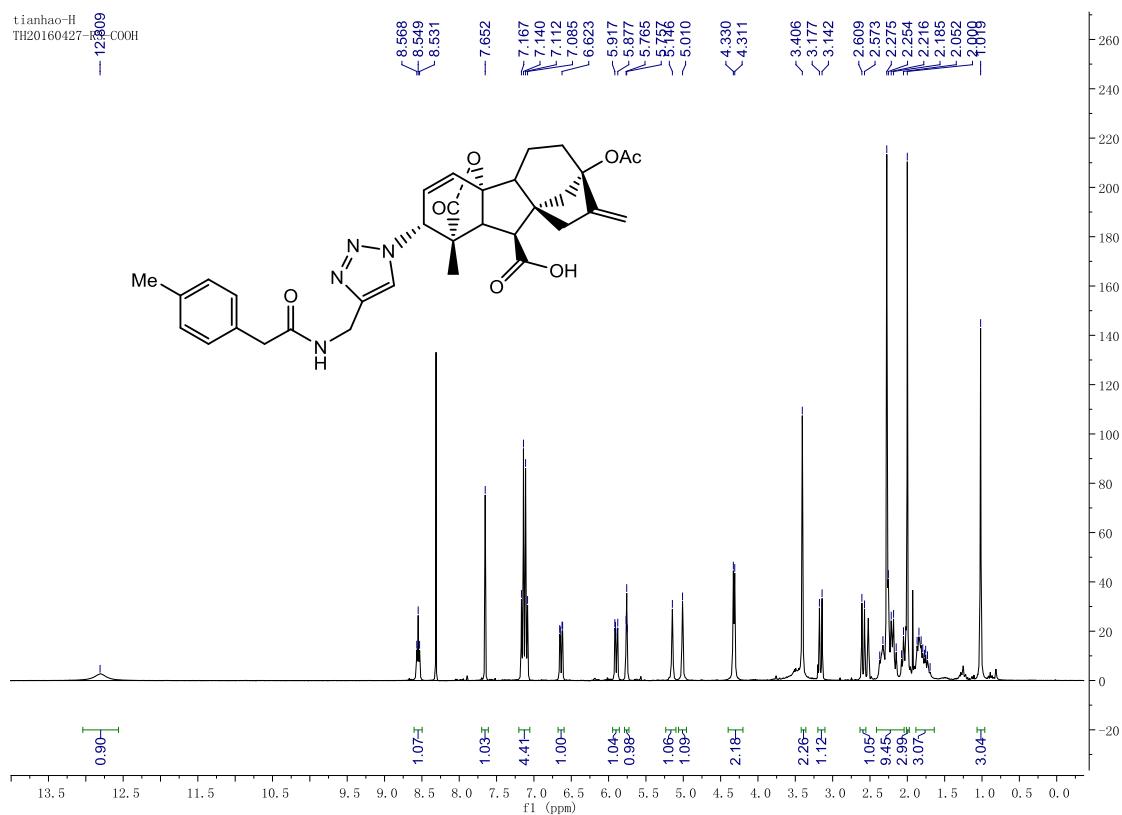
731

732

733

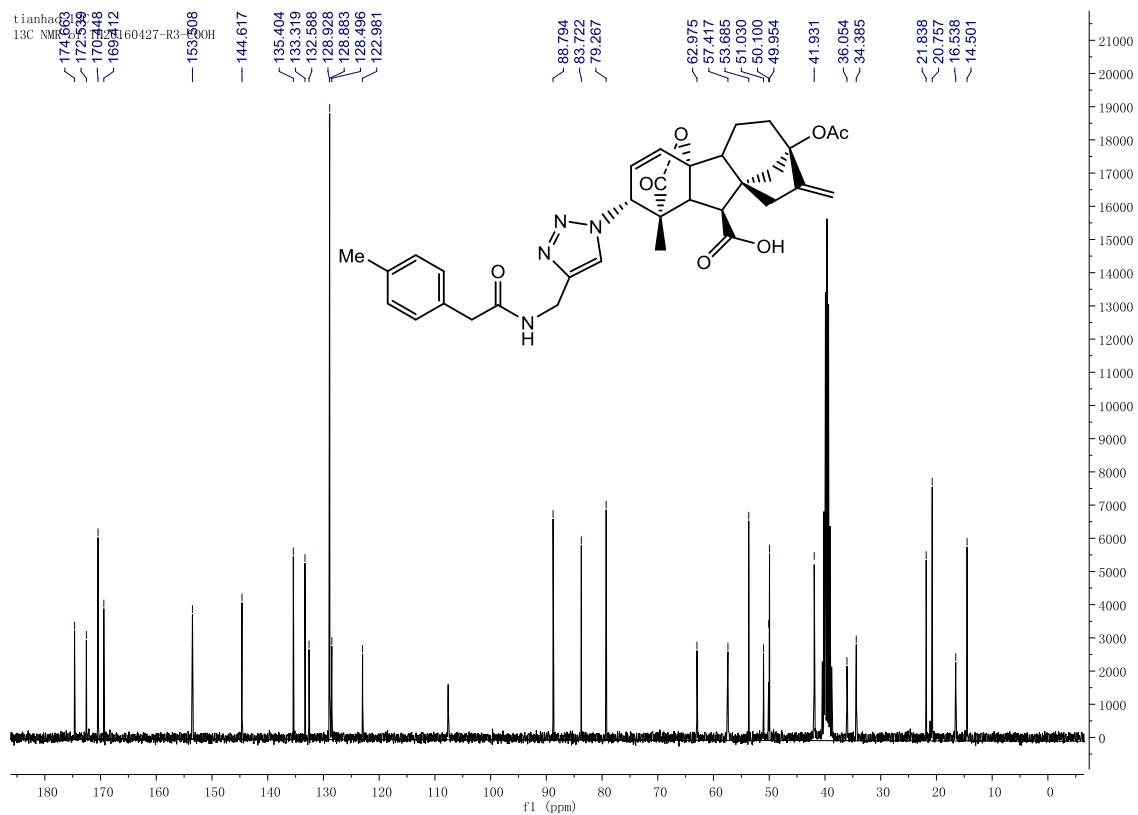
734

735 ^1H -NMR spectrum of compound **10c**.



737 ^{13}C -NMR spectrum of compound **10c**.

738

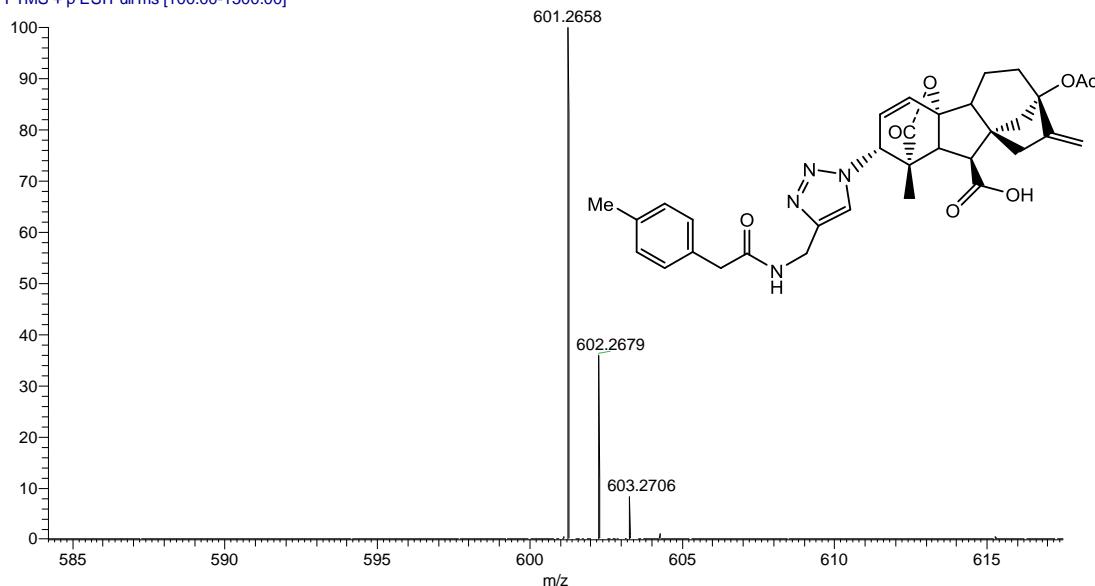


739

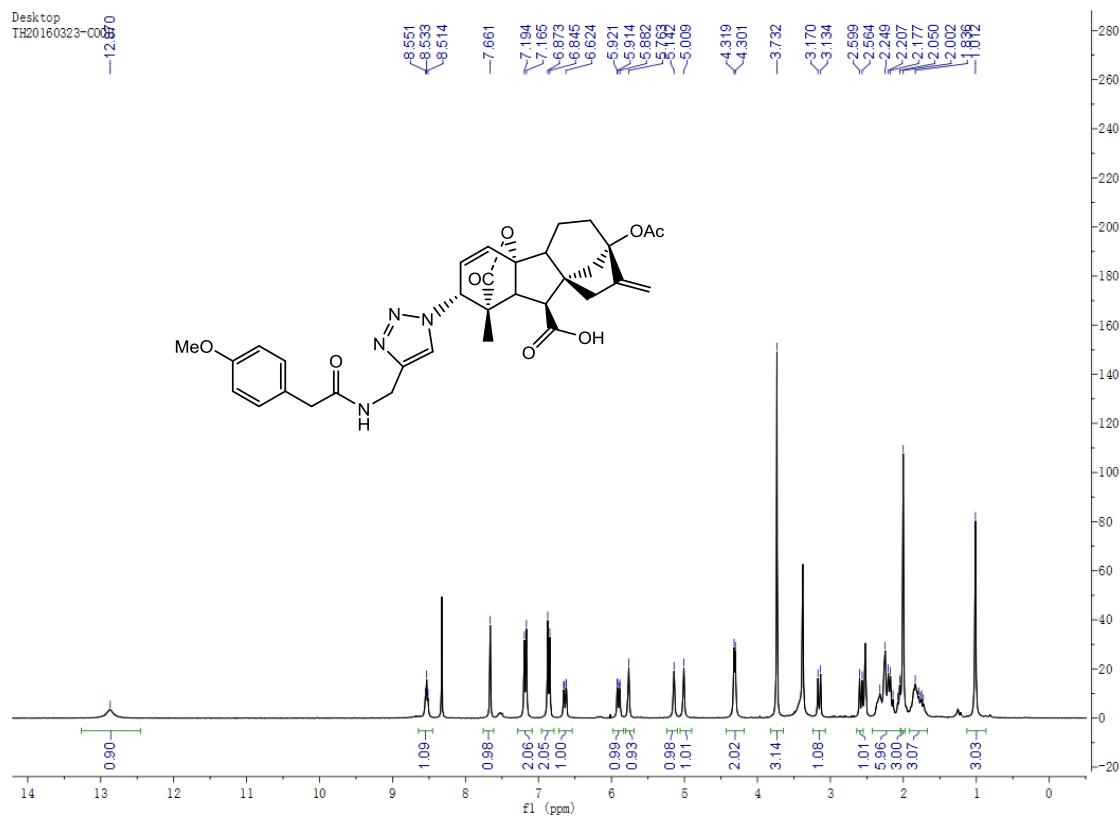
740

741 HRMS of compound **10c**.

32_160704204546 #58 RT: 0.61 AV: 1 NL: 1.38E9
 T: FTMS + p ESI Full ms [100.00-1500.00]



742

743 ^1H -NMR spectrum of compound **10d**.

744

745

746

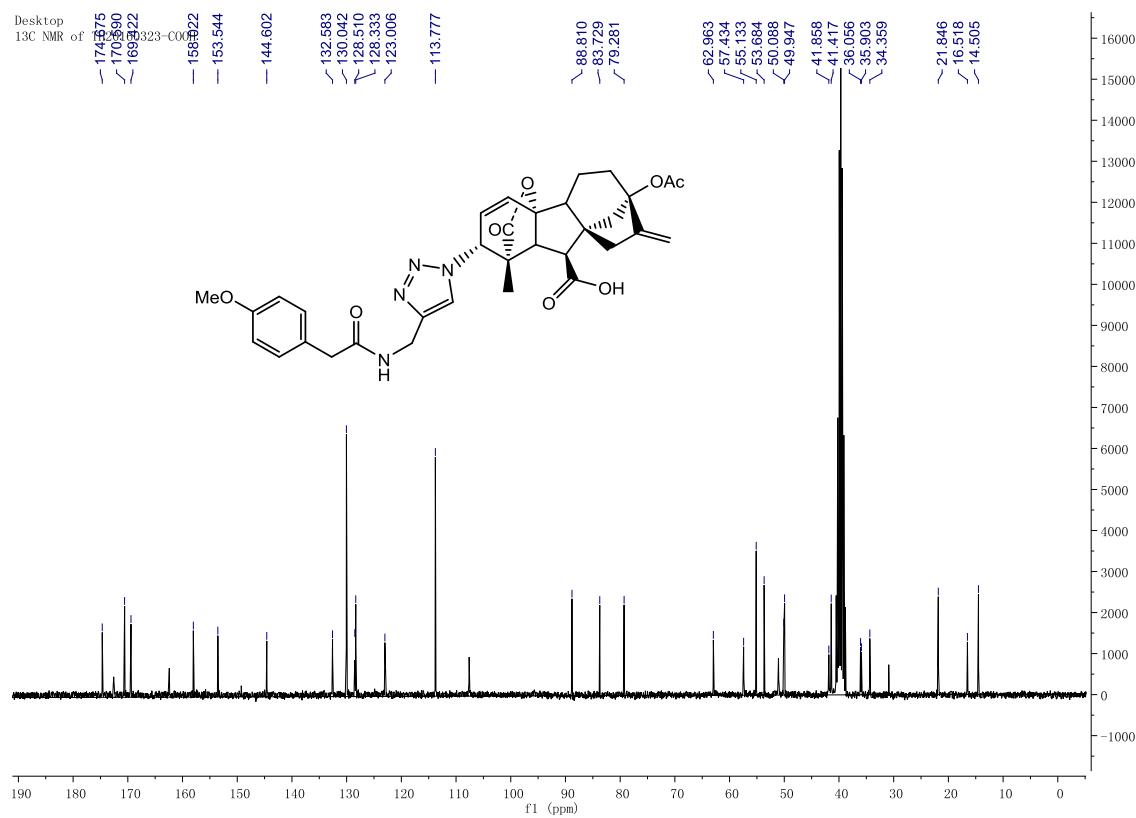
747

748

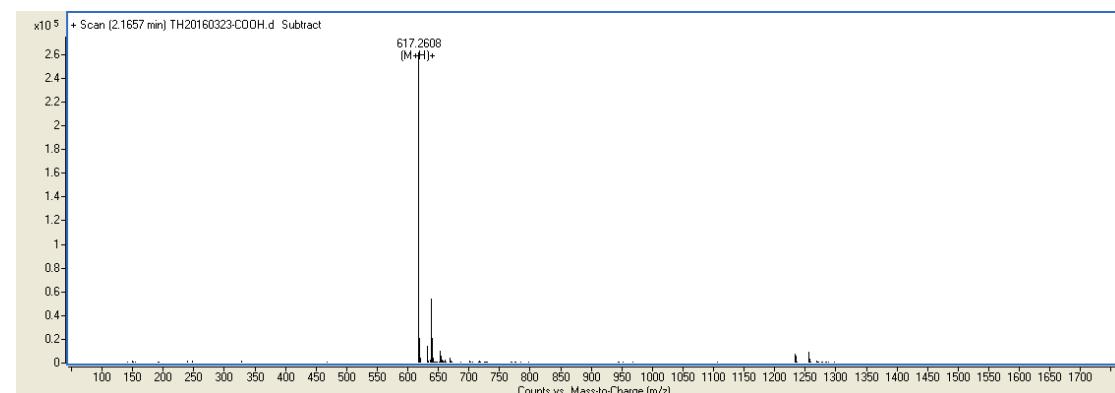
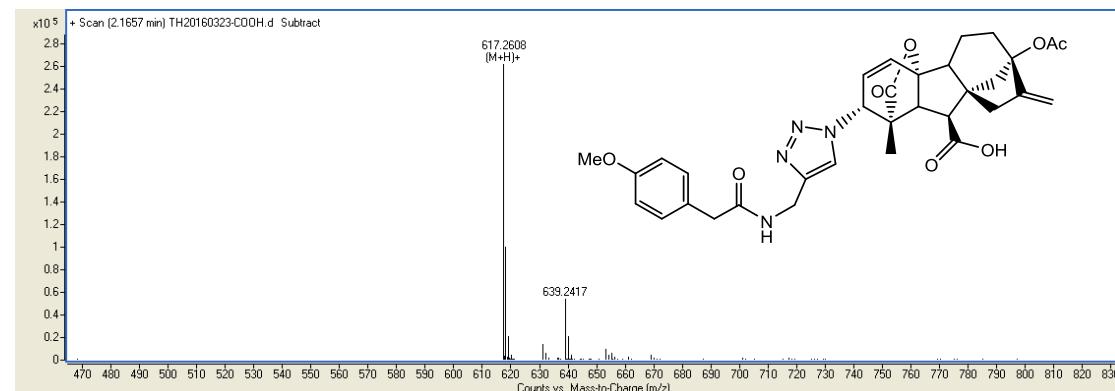
749

750 ^{13}C -NMR spectrum of compound **10d**.

751



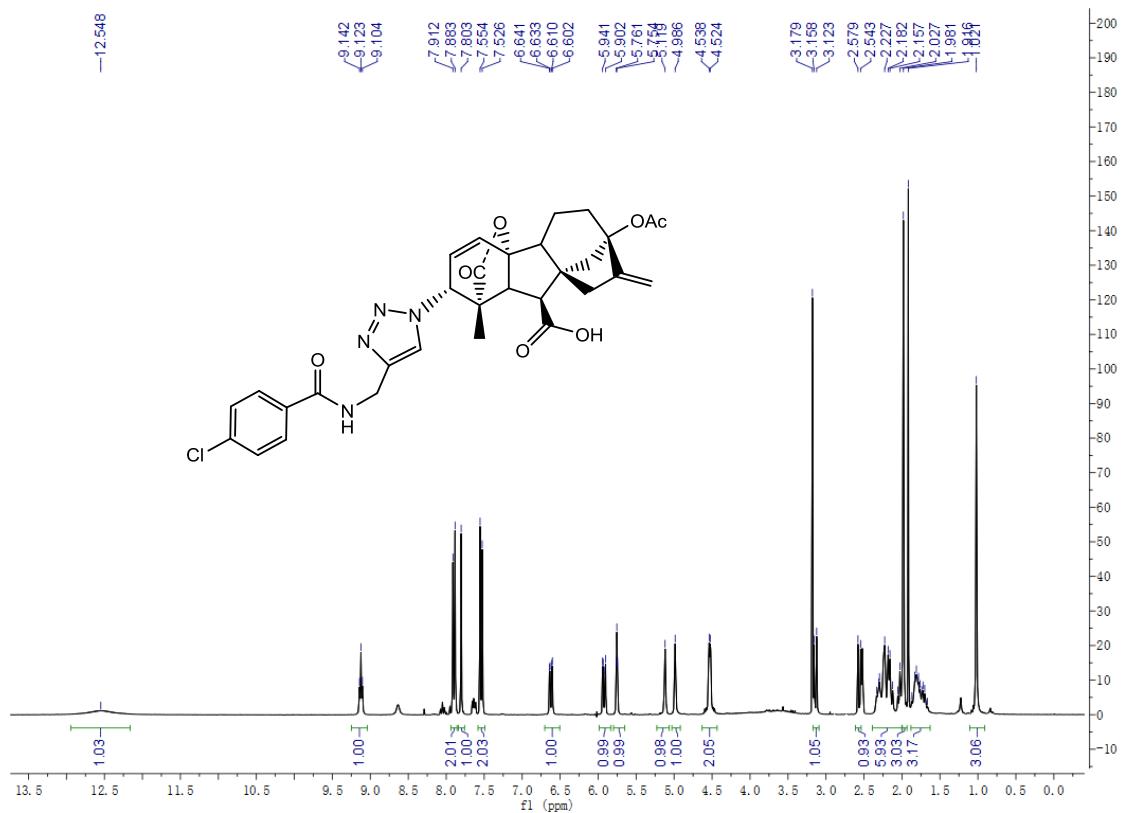
752

753 HRMS of compound **10d**.

754

755

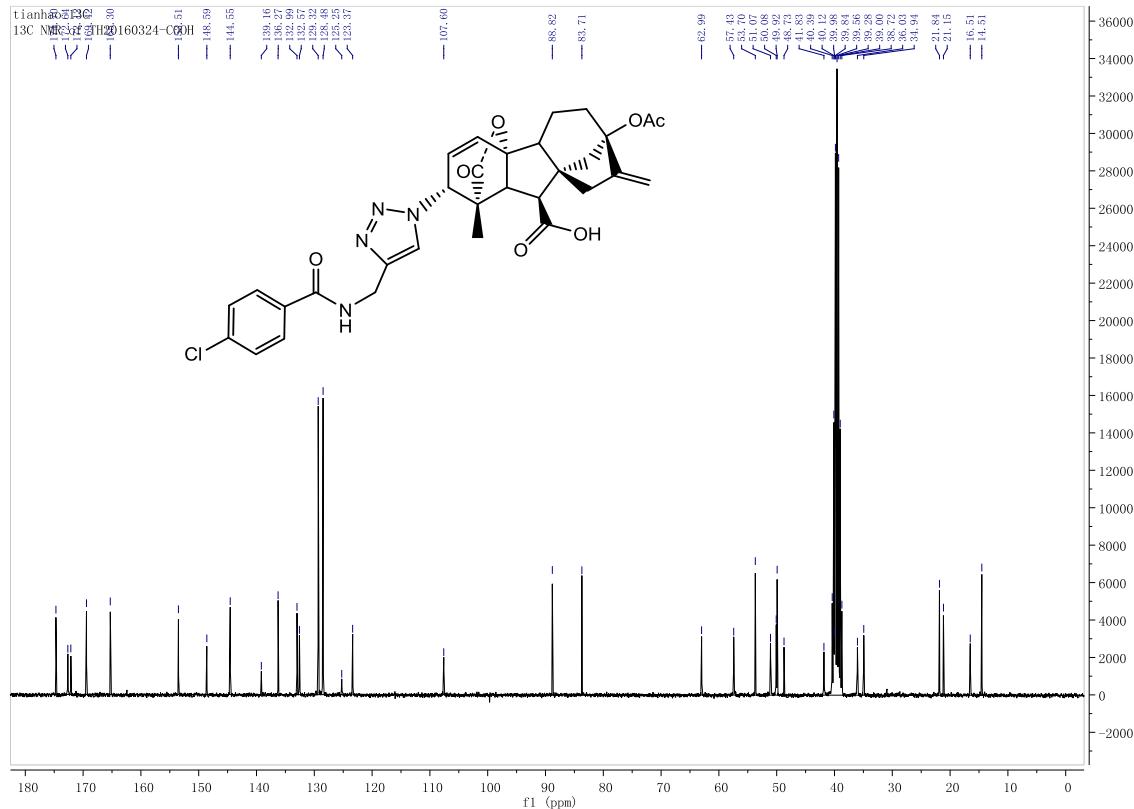
756 ^1H -NMR spectrum of compound **10e**.



757

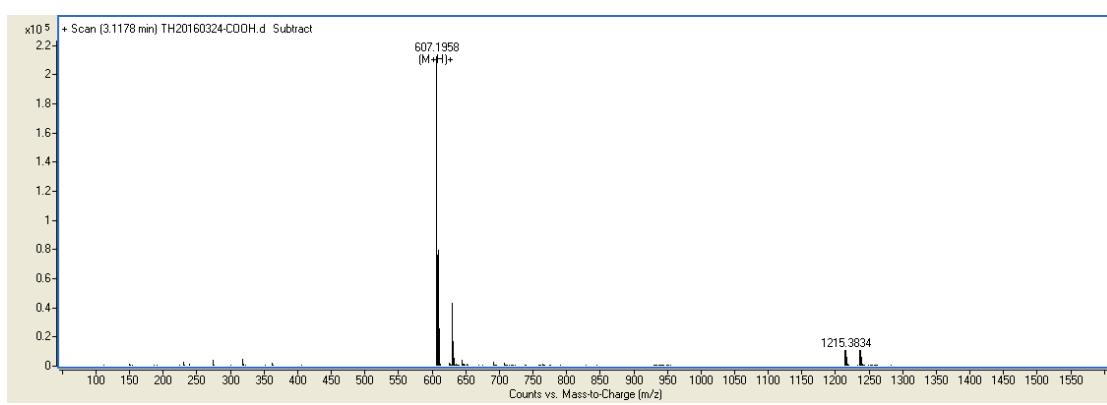
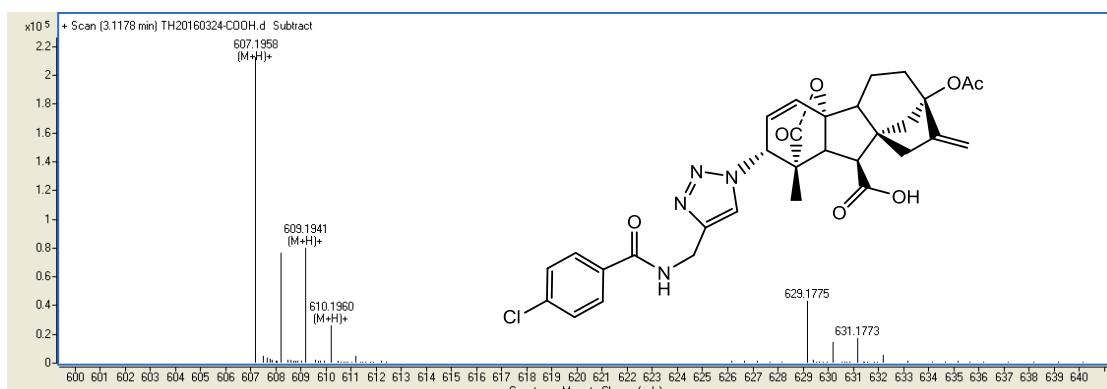
758 ^{13}C -NMR spectrum of compound **10e**.

759

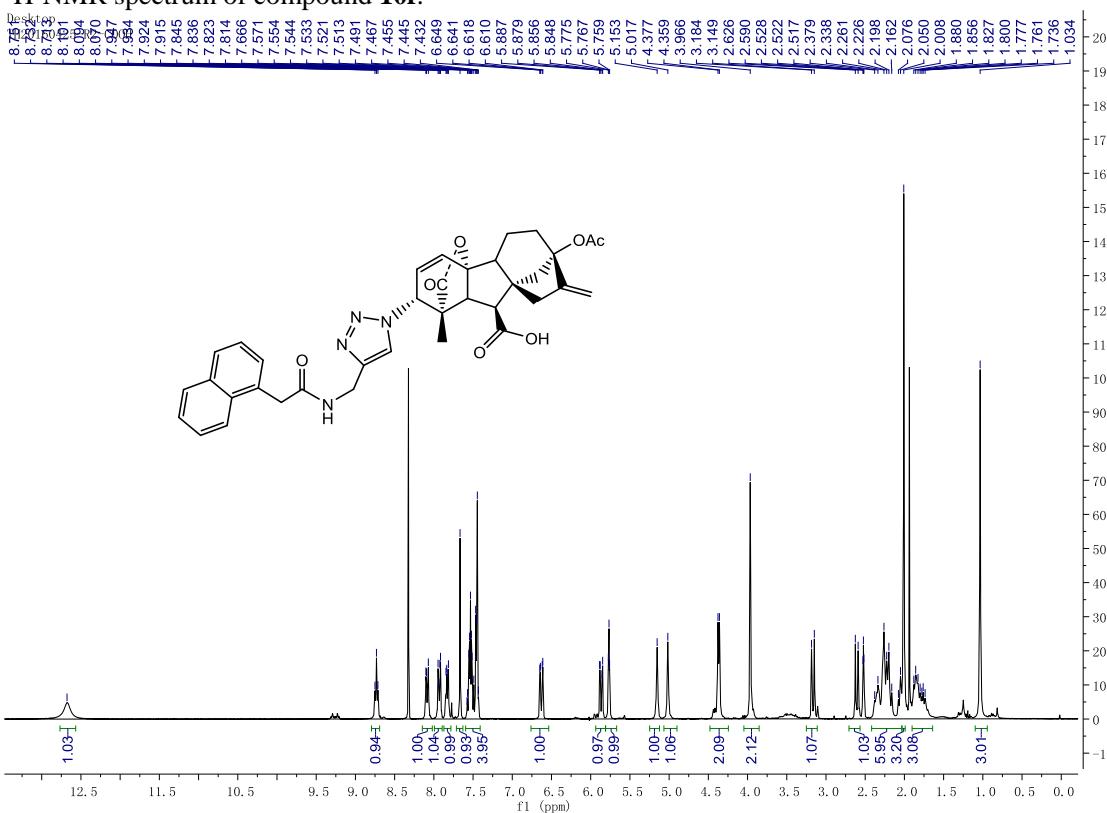


760

761

762 HRMS of compound **10e**.

763

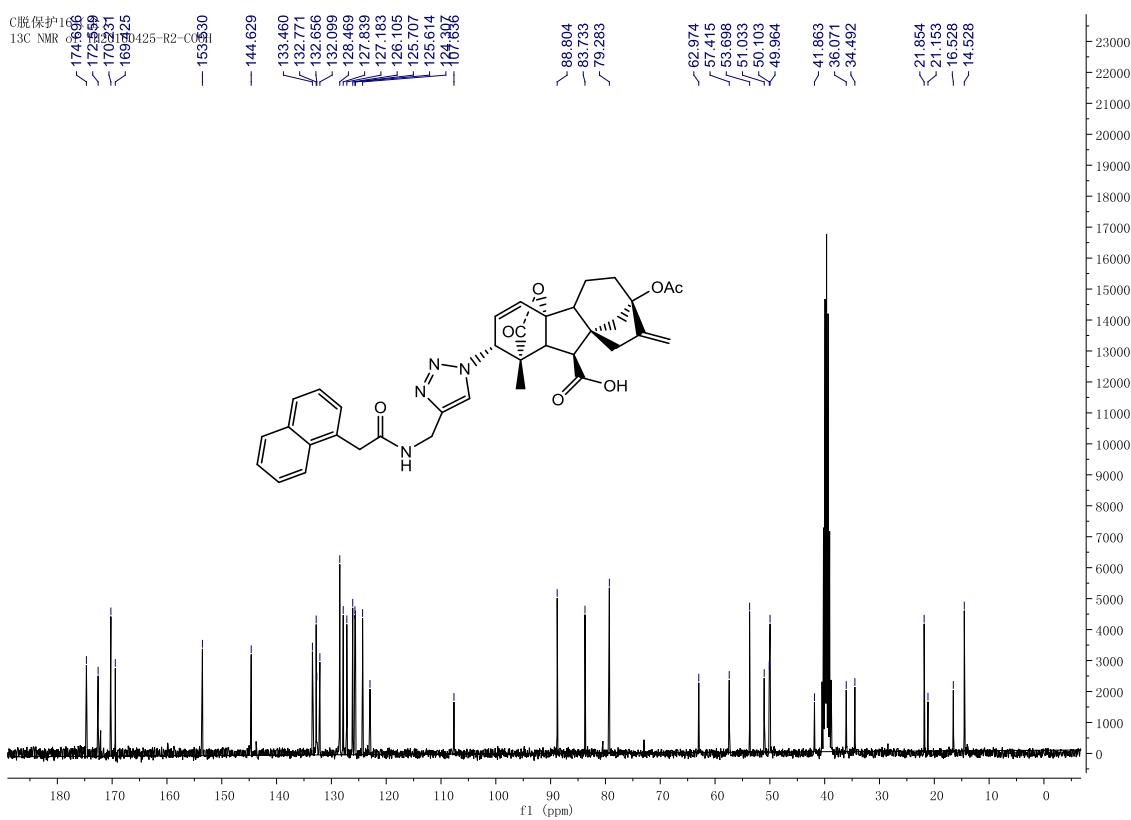
764 ¹H-NMR spectrum of compound **10f**.

765

766

767 ^{13}C -NMR spectrum of compound **10f**.

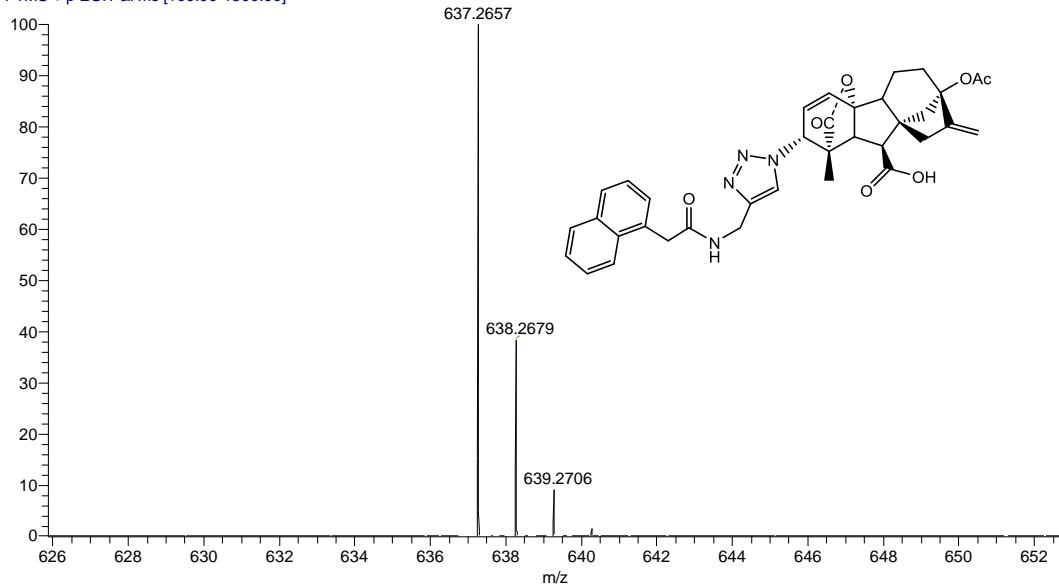
768



769

770 HRMS of compound **10f**.

30_160704203201 #60 RT: 0.62 AV: 1 NL: 1.38E9
 T: FTMS + p ESI Full ms [100.00-1500.00]



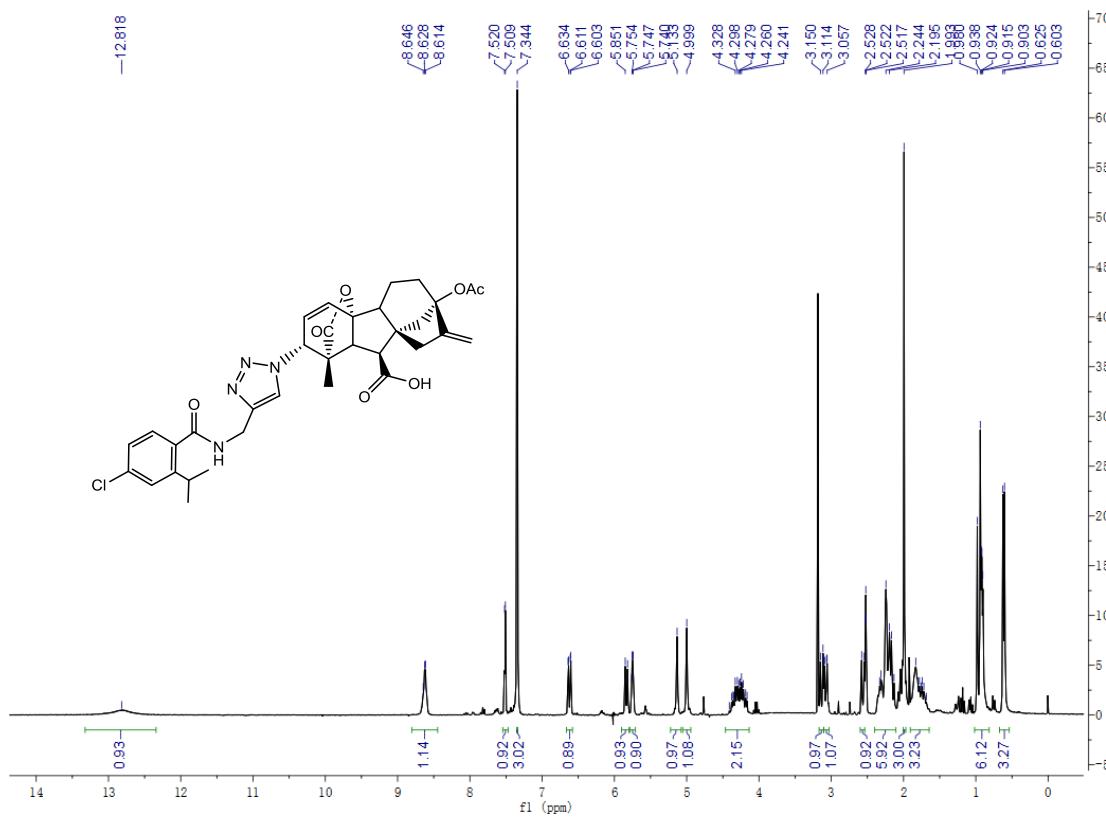
771

772

773

774

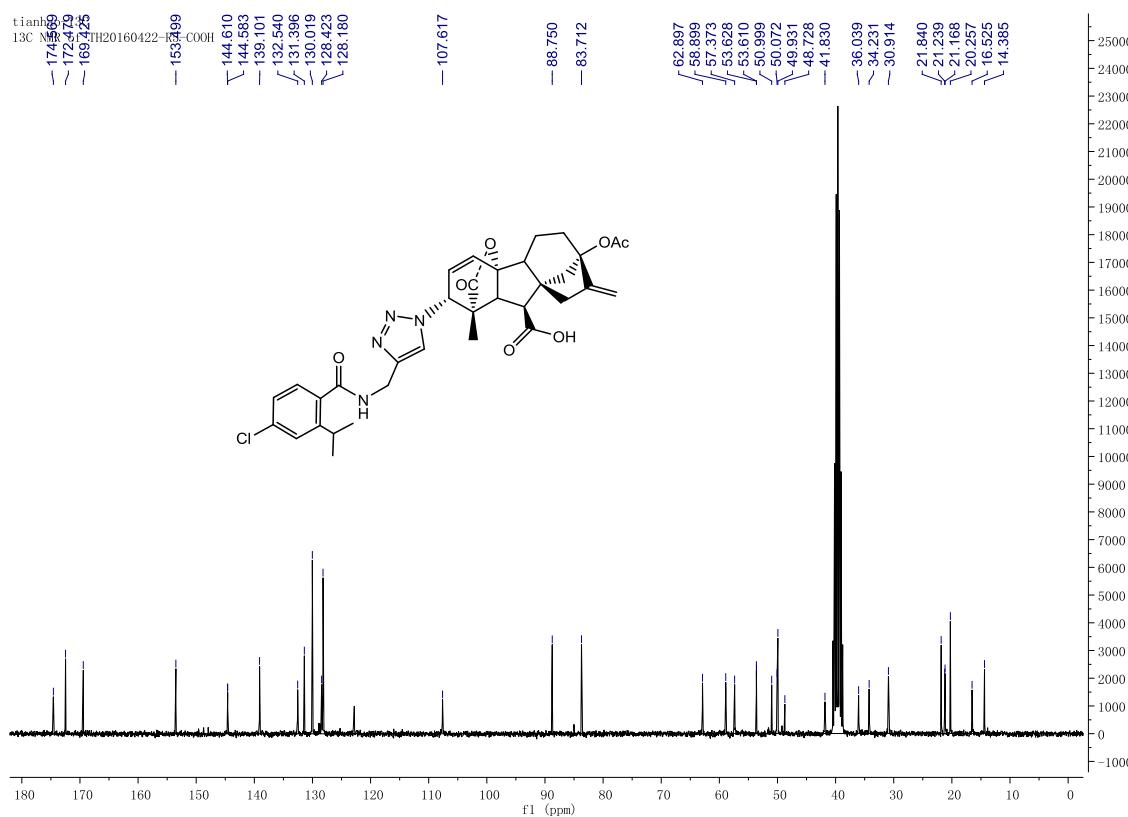
775 ^1H -NMR spectrum of compound **10g**.



776

777

778 ^{13}C -NMR spectrum of compound **10g**.



779

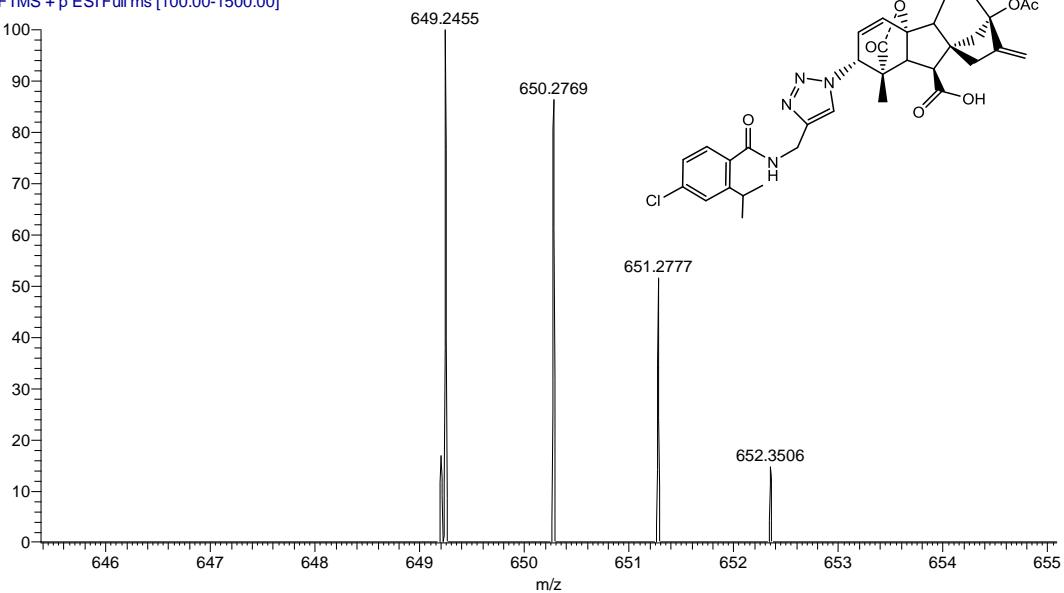
780

781

782 HRMS of compound **10g**.

783

28 #58 RT: 0.71 AV: 1 NL: 1.71E4
 T: FTMS + p ESI Full ms [100.00-1500.00]



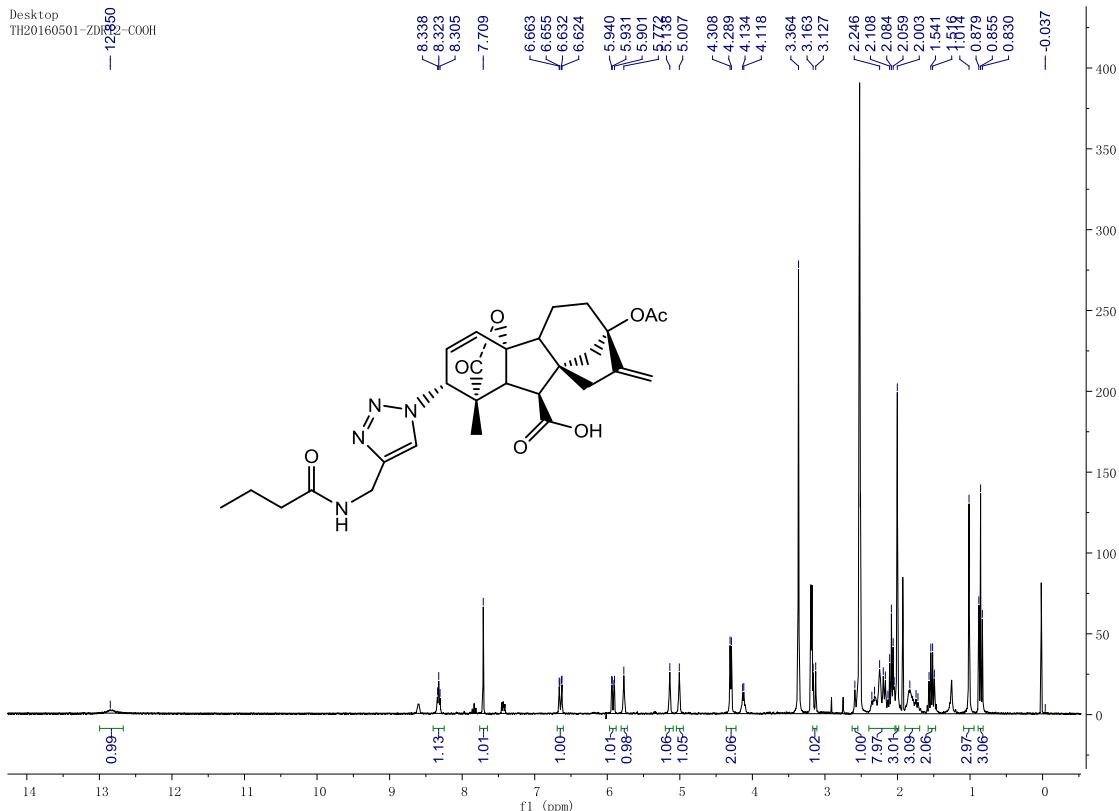
784

785

786

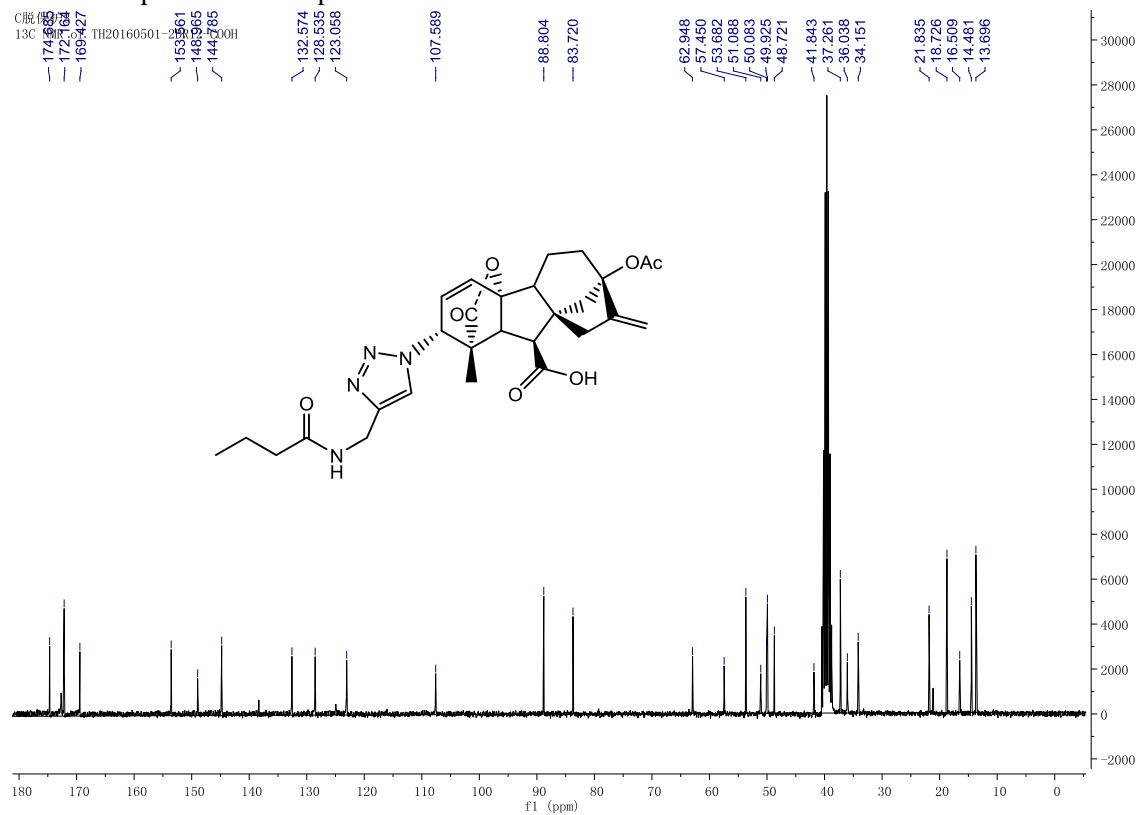
787 ^1H -NMR spectrum of compound **10h**.

788



789

790 ^{13}C -NMR spectrum of compound **10h**.



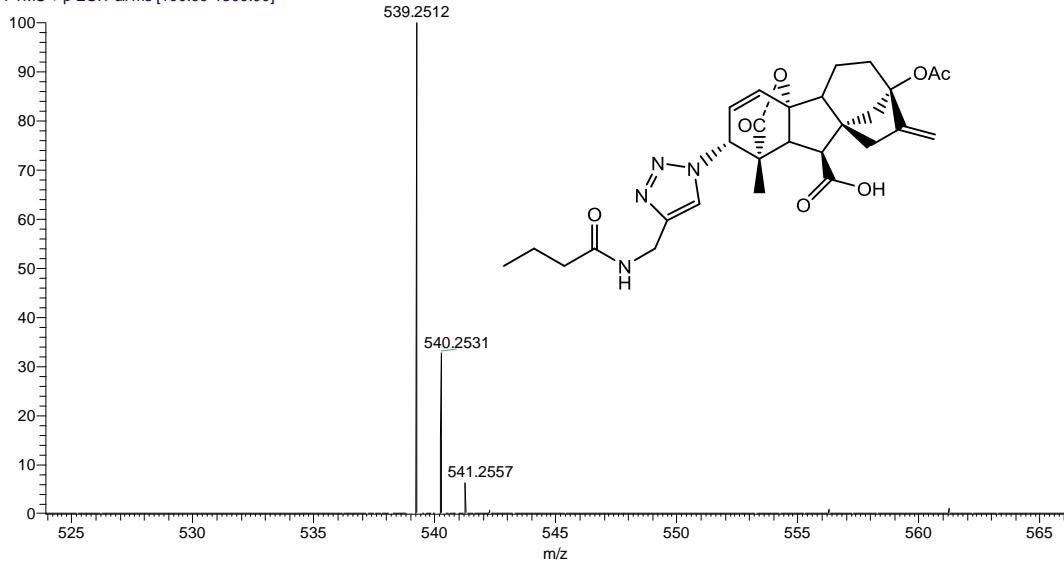
791

792

793

794 HRMS of compound **10h**.

10_160701110352 #54 RT: 0.62 AV: 1 NL: 3.25E8
 T: FTMS + p ESI Full ms [100.00-1500.00]



795

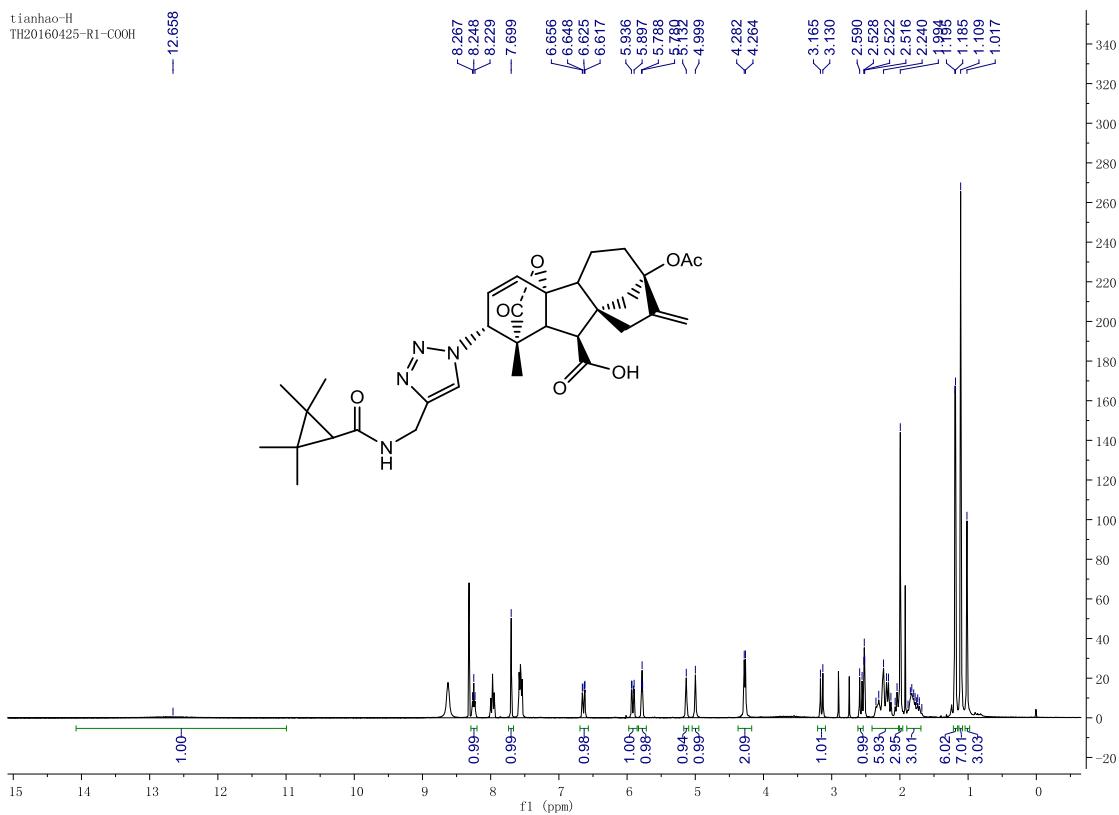
796

797

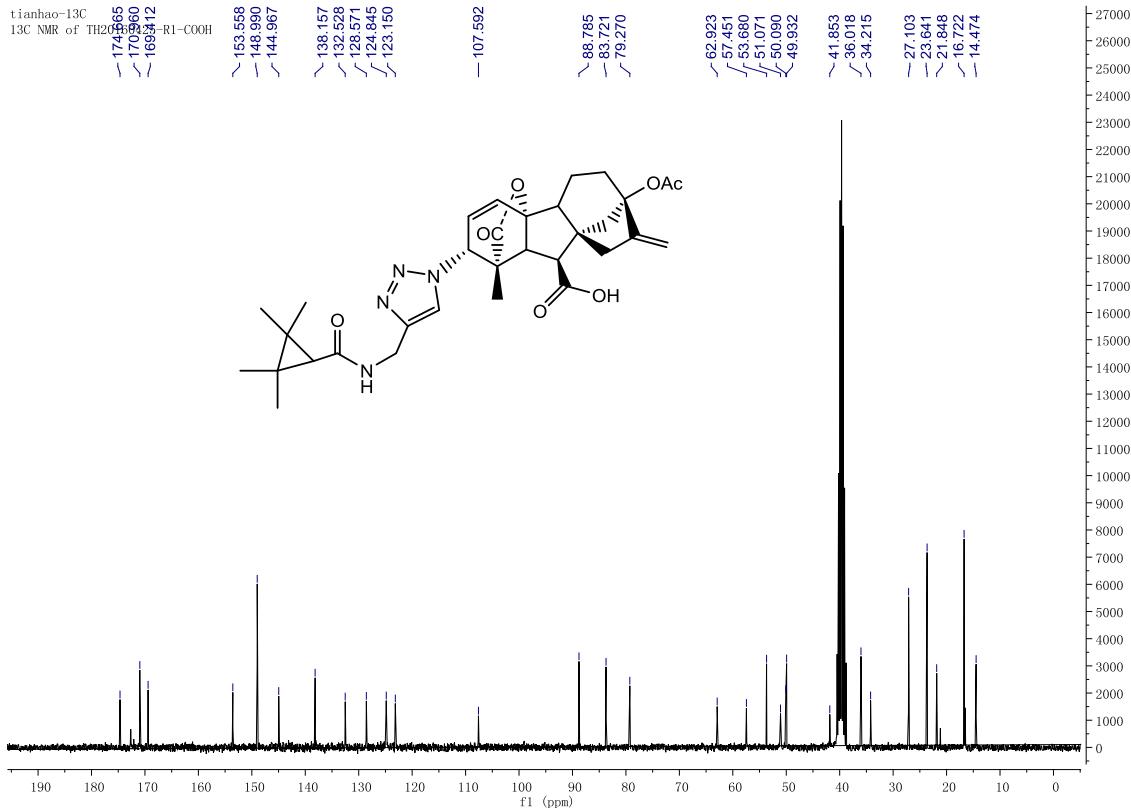
798

799

800

801 ^1H -NMR spectrum of compound **10i**.

802

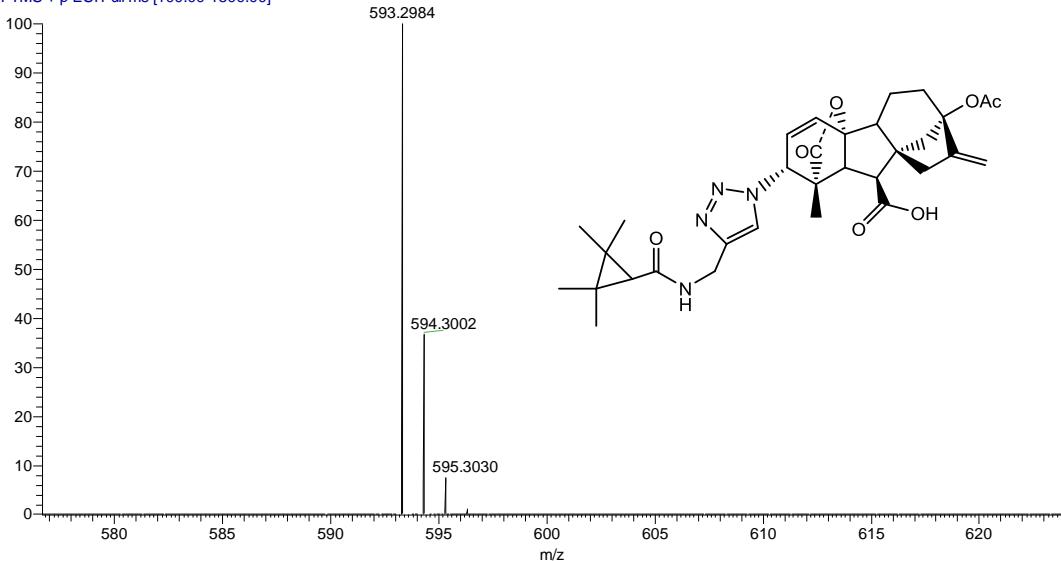
803 ^{13}C -NMR spectrum of compound **10i**.

804

805 HRMS of compound **10i**.

806

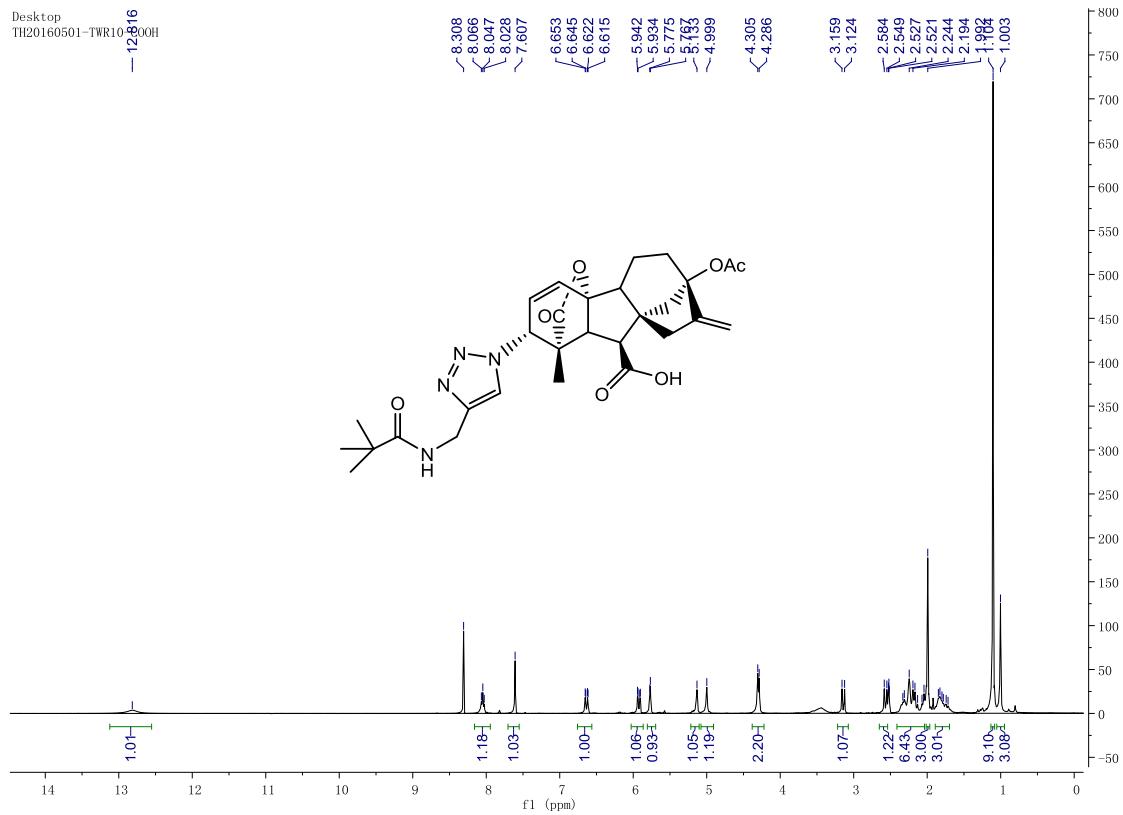
12_160701111741 #60 RT: 0.68 AV: 1 NL: 1.64E8
T: FTMS + p ESI Full ms [100.00-1500.00]



807

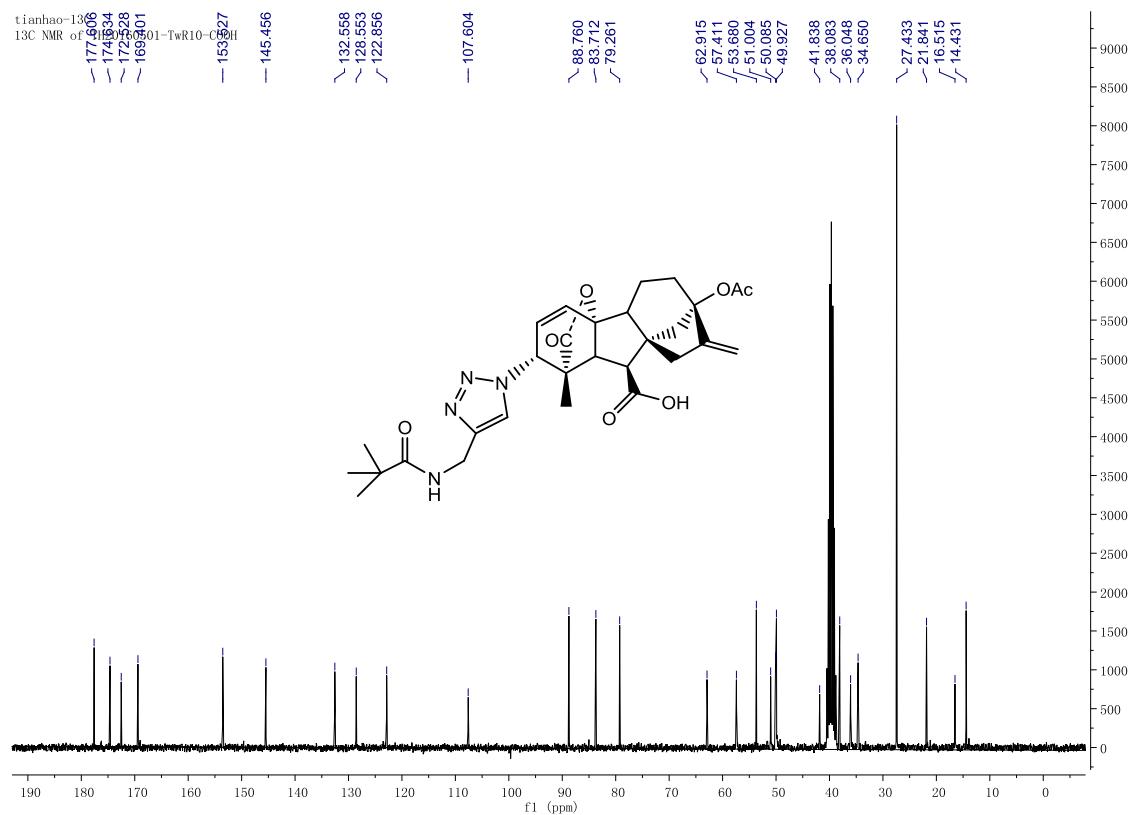
808

809 ^1H -NMR spectrum of compound **10j**.



810

811 ^{13}C -NMR spectrum of compound **10j**.

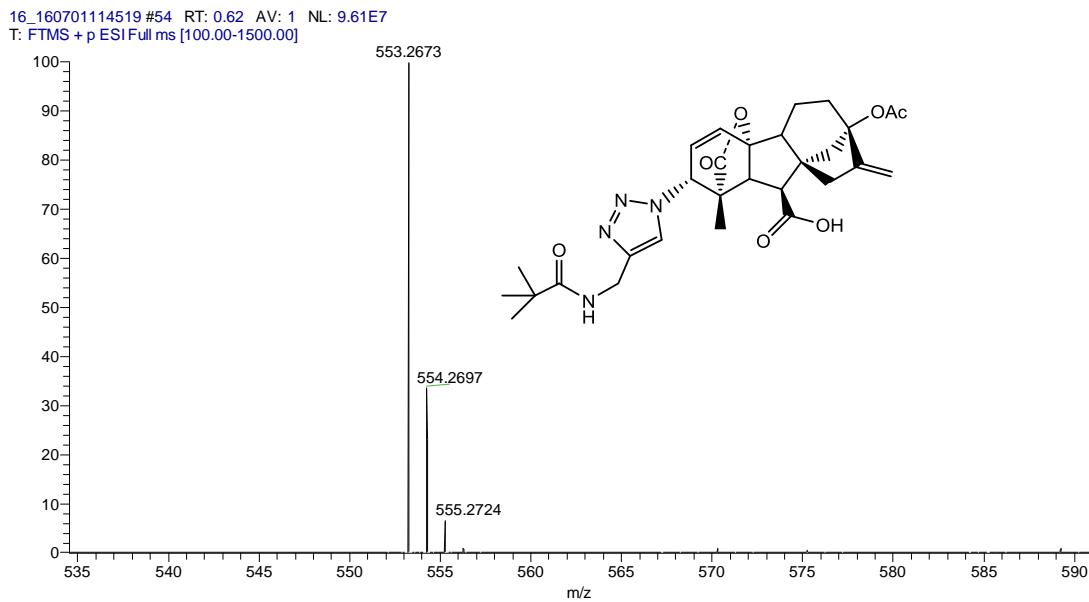


812

813

814

815 HRMS of compound **10j**.



816

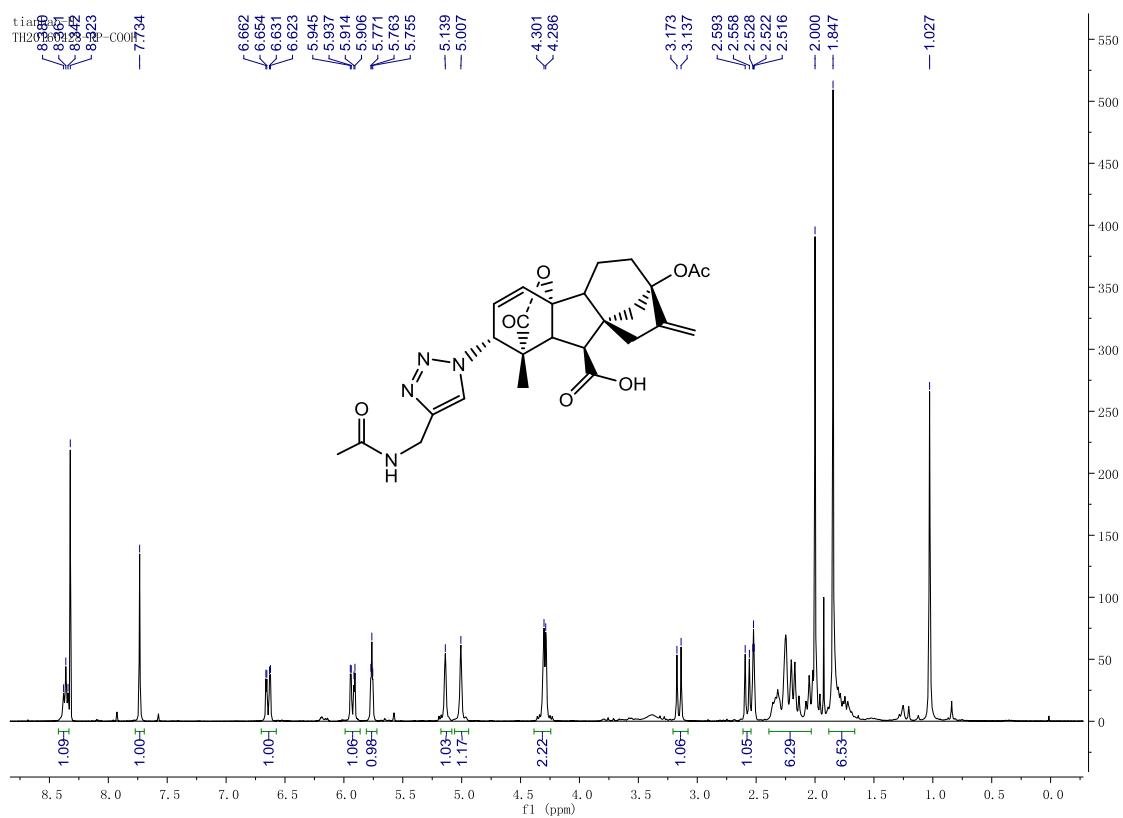
817

818

819

820 ^1H -NMR spectrum of compound **10k**.

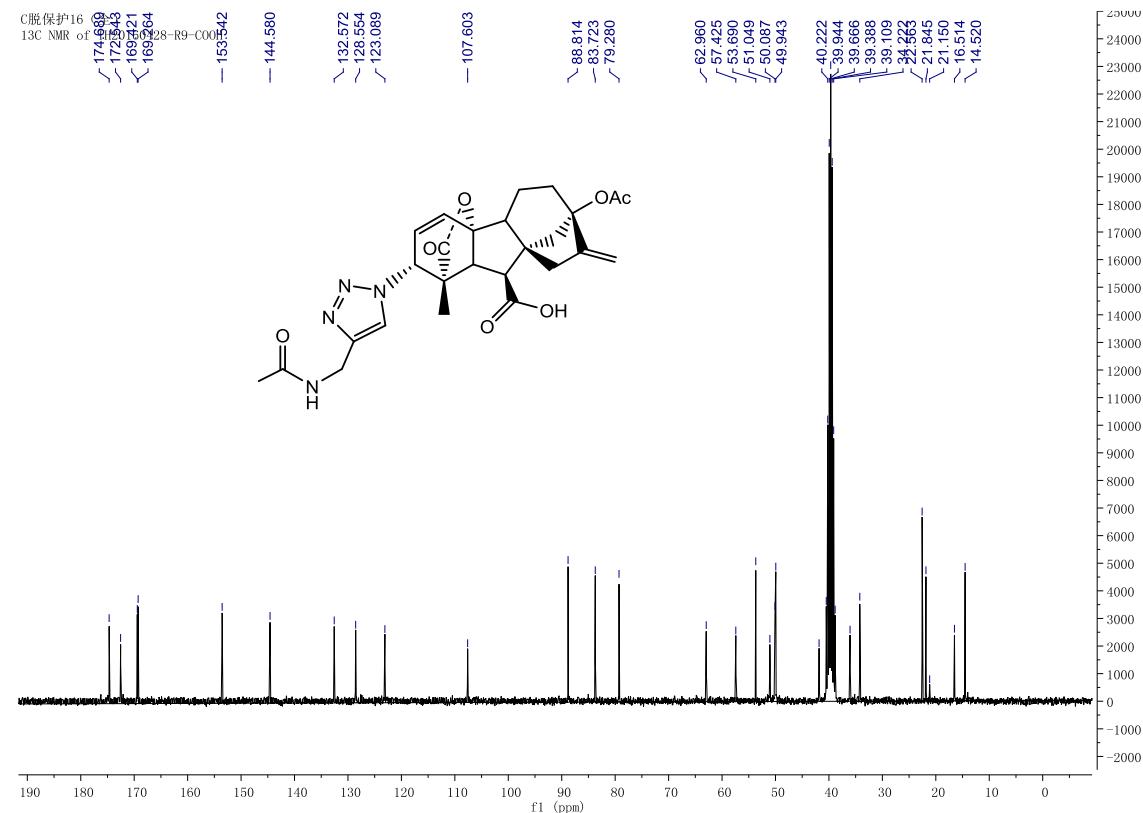
821



822

823

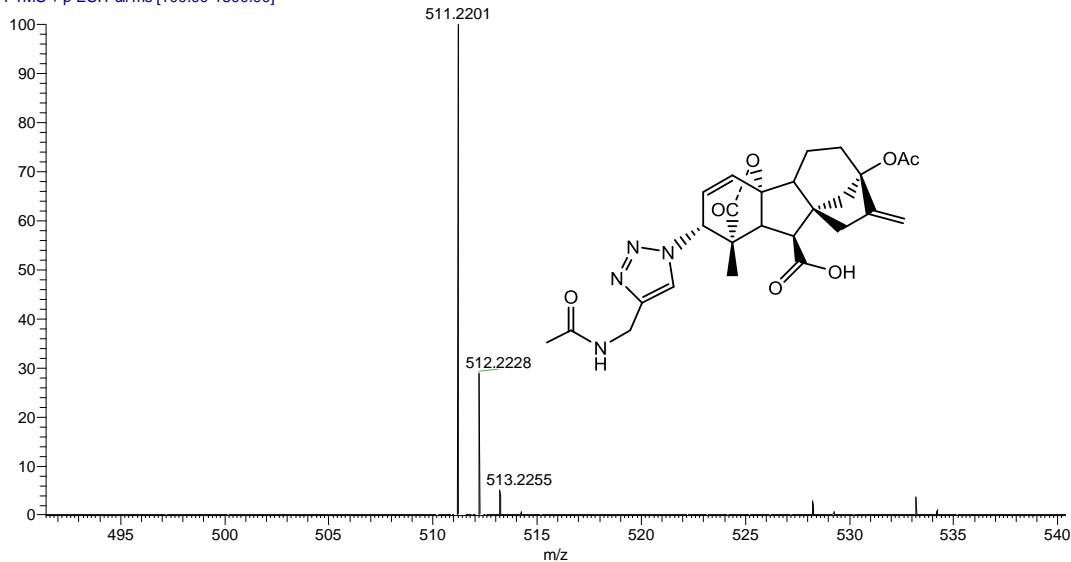
824 ^{13}C -NMR spectrum of compound **10k**.



825

826 HRMS of compound **10k**.

18 #48 RT: 0.60 AV: 1 NL: 4.22E6
 T: FTMS + p ESI Full ms [100.00-1500.00]

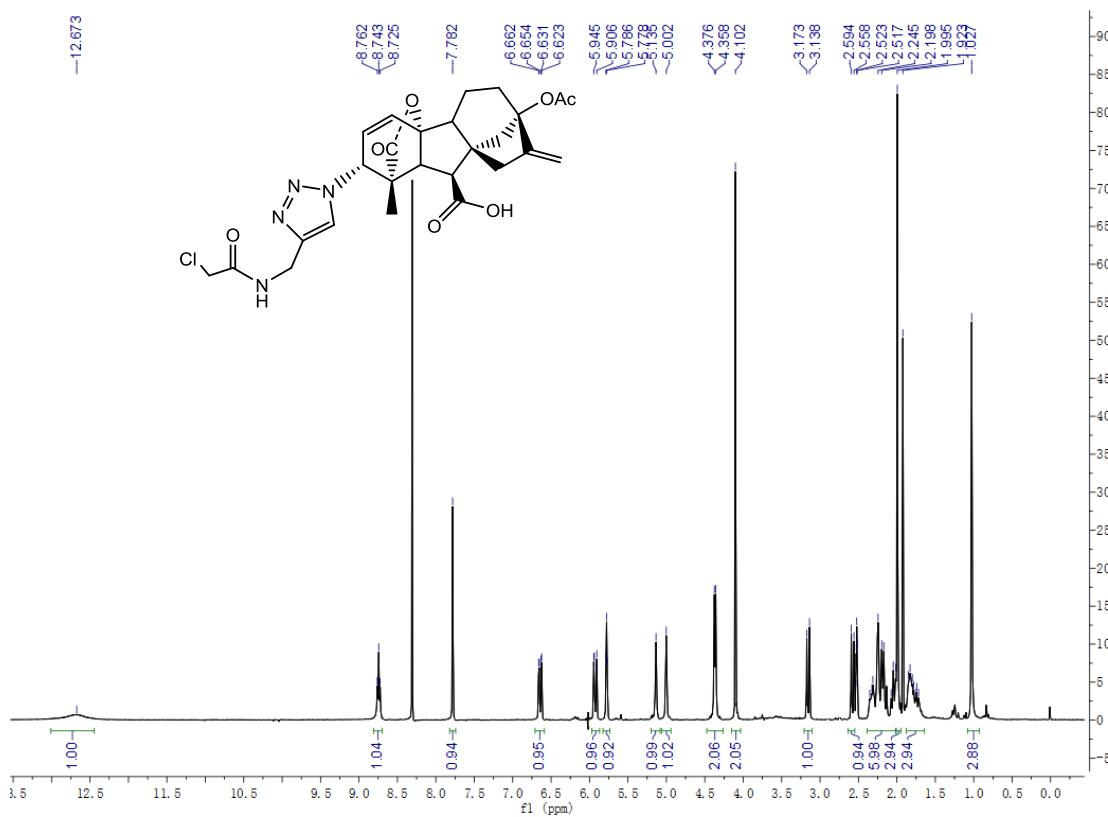


827

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830

831 ¹H-NMR spectrum of compound **10l**.

832

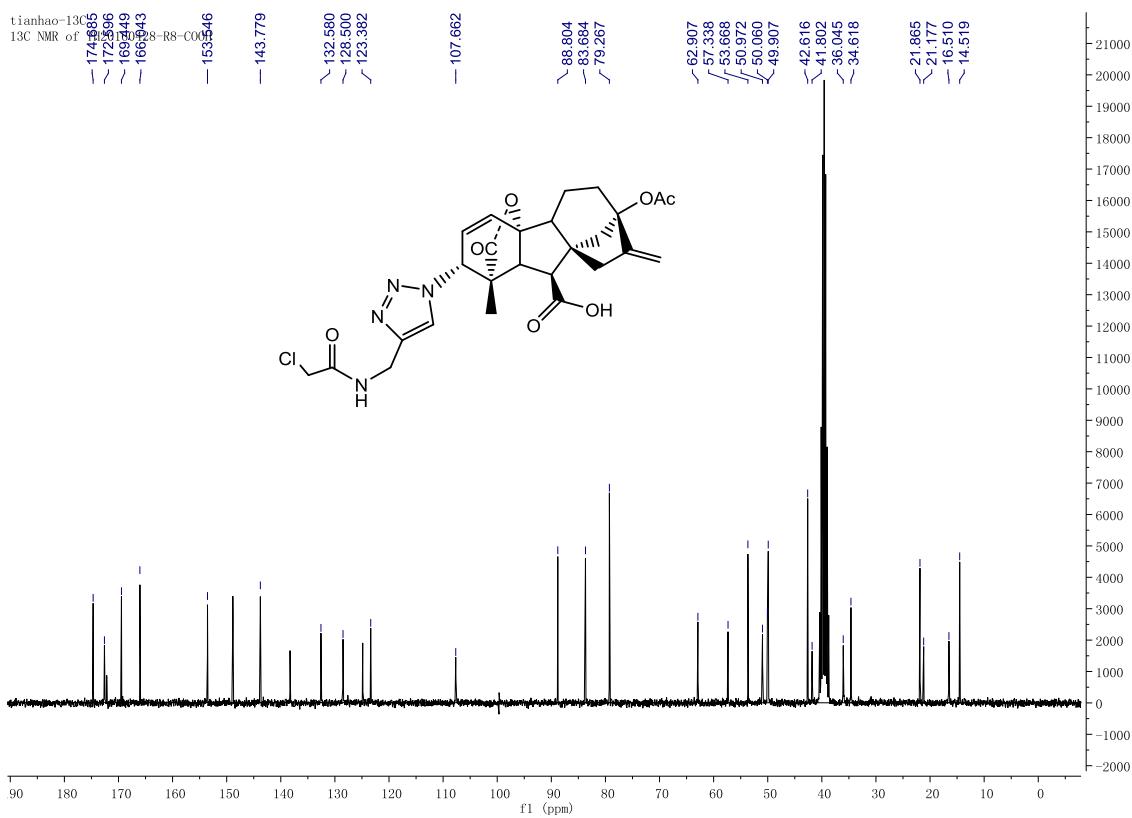
833

834

835

836 ^{13}C -NMR spectrum of compound **10l**.

837

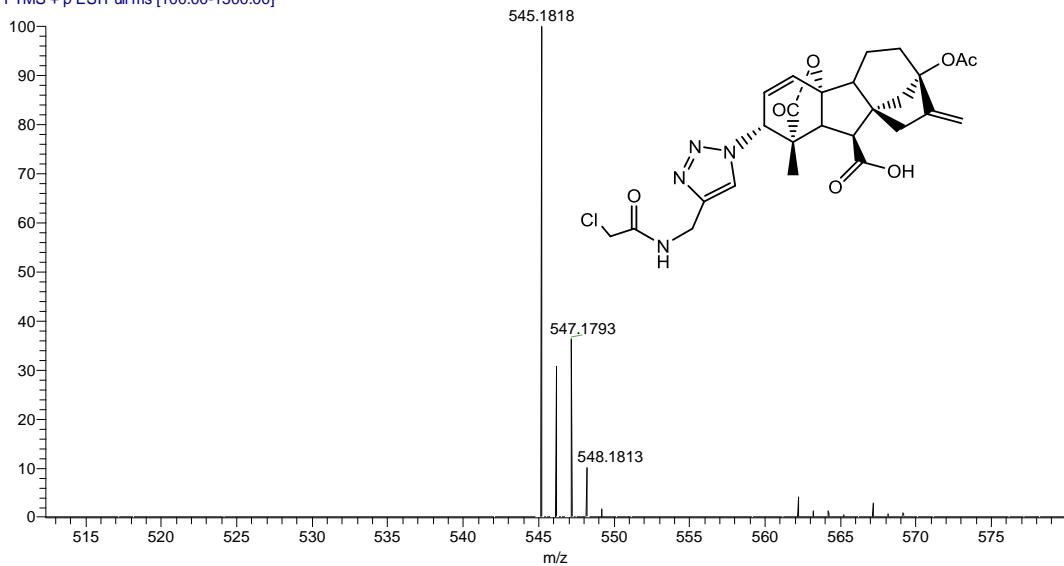


838

839 HRMS of compound **10l**.

840

14_160701113130 #56 RT: 0.63 AV: 1 NL: 7.25E7
T: FTMS + p ESI Full ms [100.00-1500.00]



841

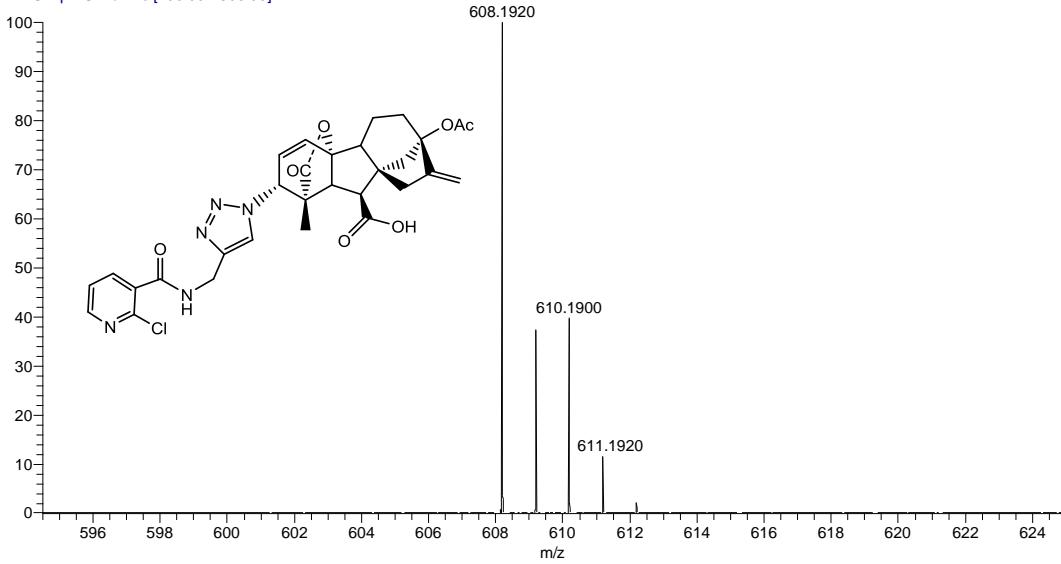
842

843

844

851 HRMS of compound **10m**.

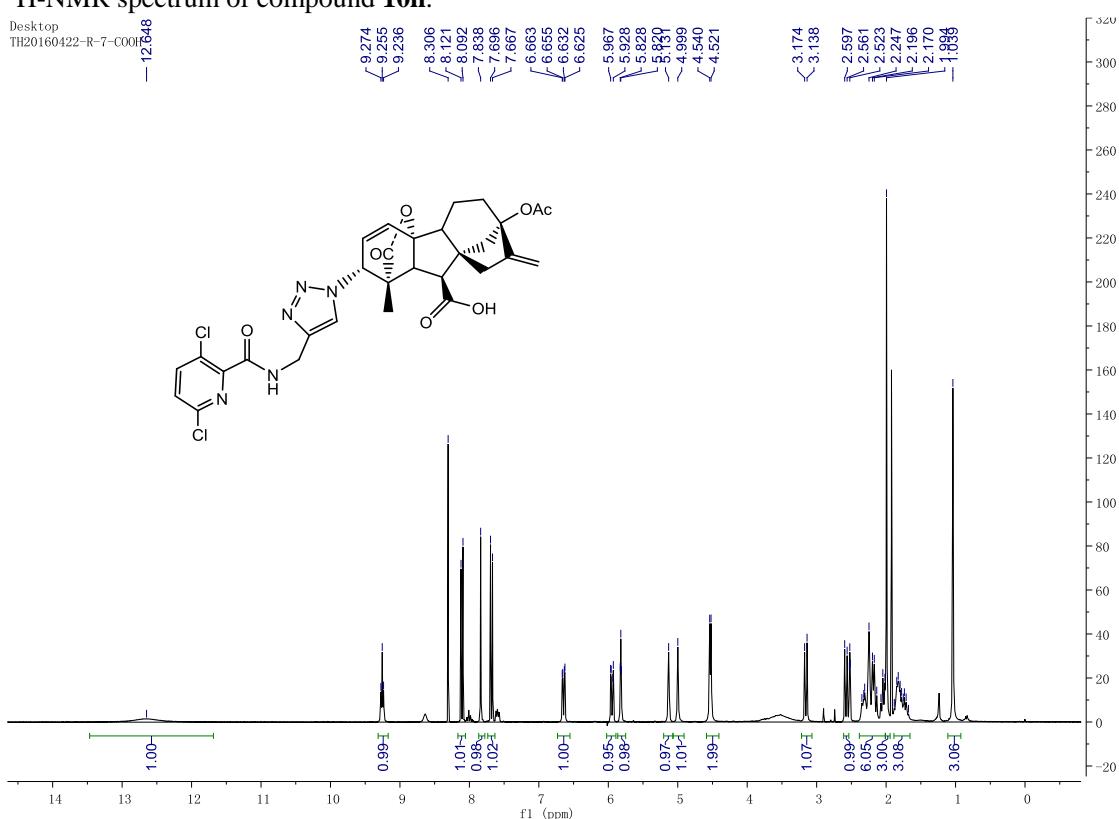
20_160701121257 #46 RT: 0.57 AV: 1 NL: 6.09E6
T: FTMS + p ESIFull ms [100.00-1500.00]



852

853 ^1H -NMR spectrum of compound **10n**.

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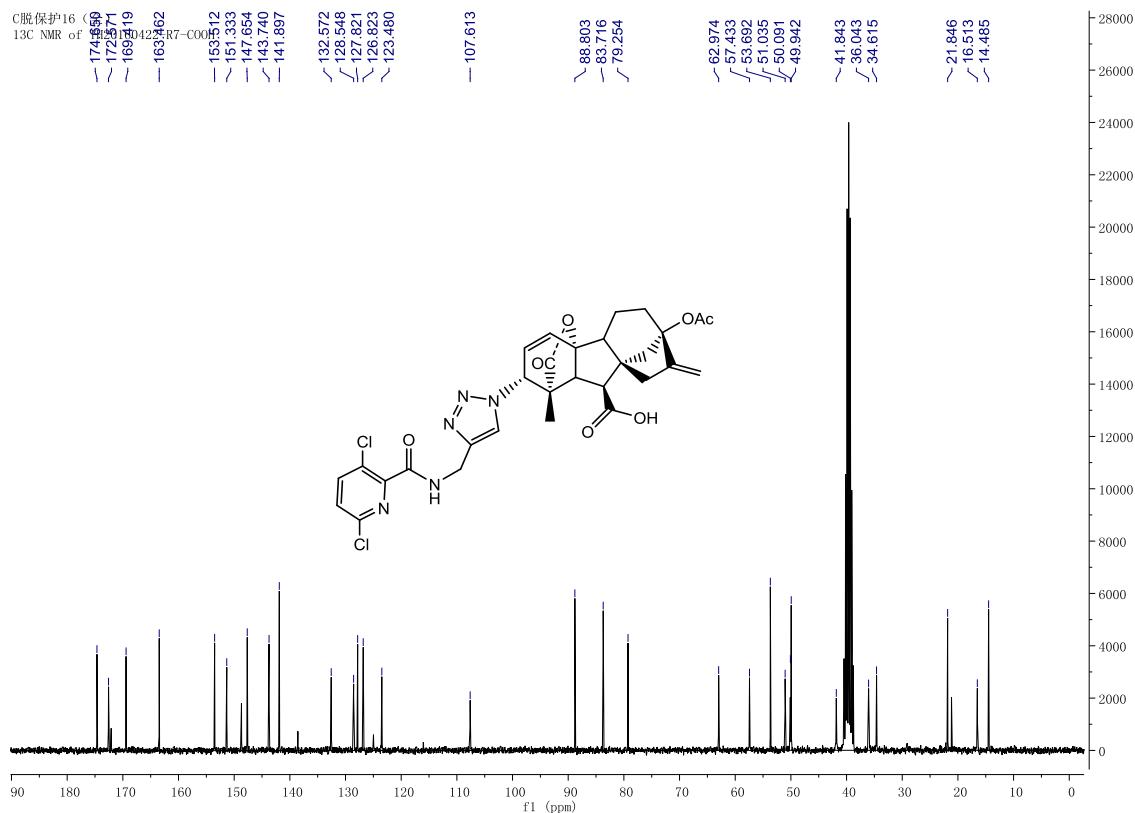
858

859

860

861 ^{13}C -NMR spectrum of compound **10n**.

862

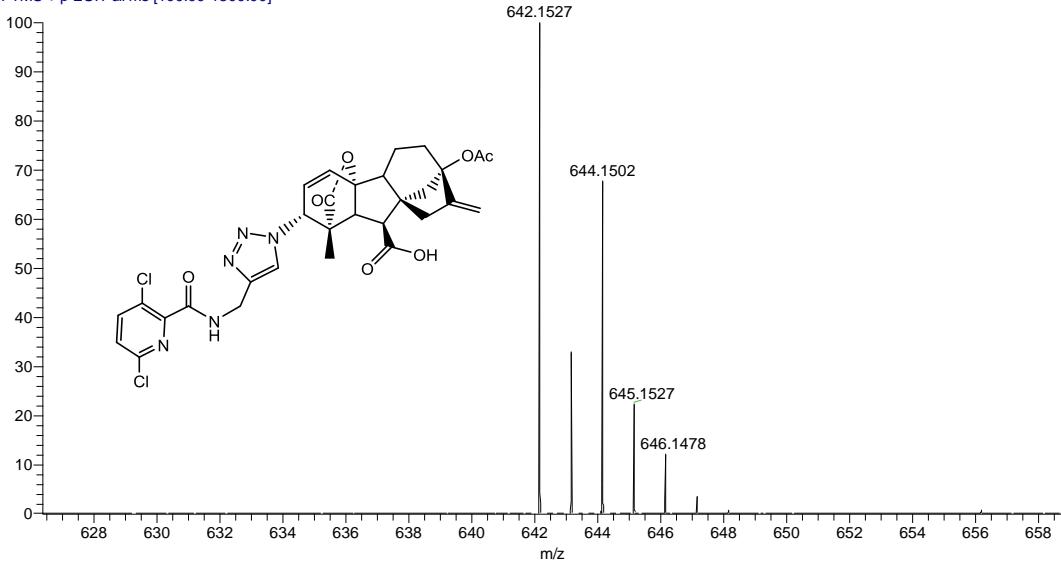


863

864

865 HRMS of compound **10n**.

24 #54 RT: 0.67 AV: 1 NL: 8.79E6
T: FTMS + p ESI Full ms [100.00-1500.00]



866

867

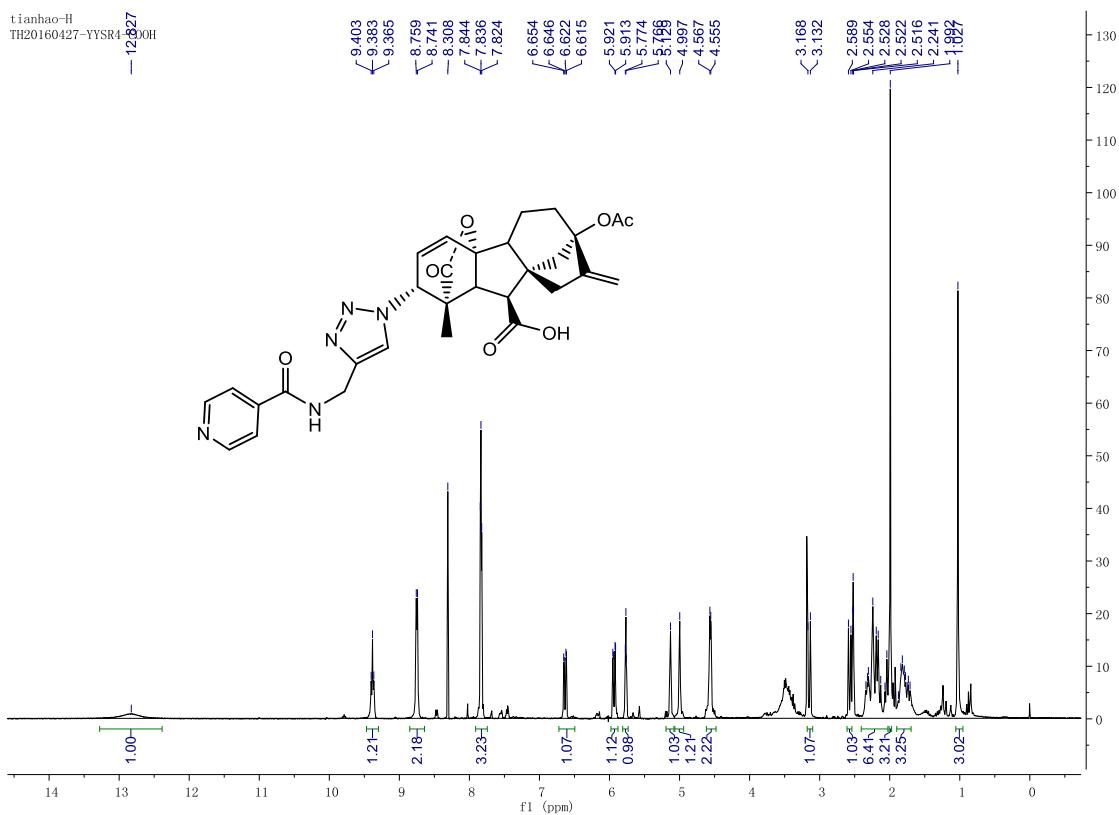
868

869

870

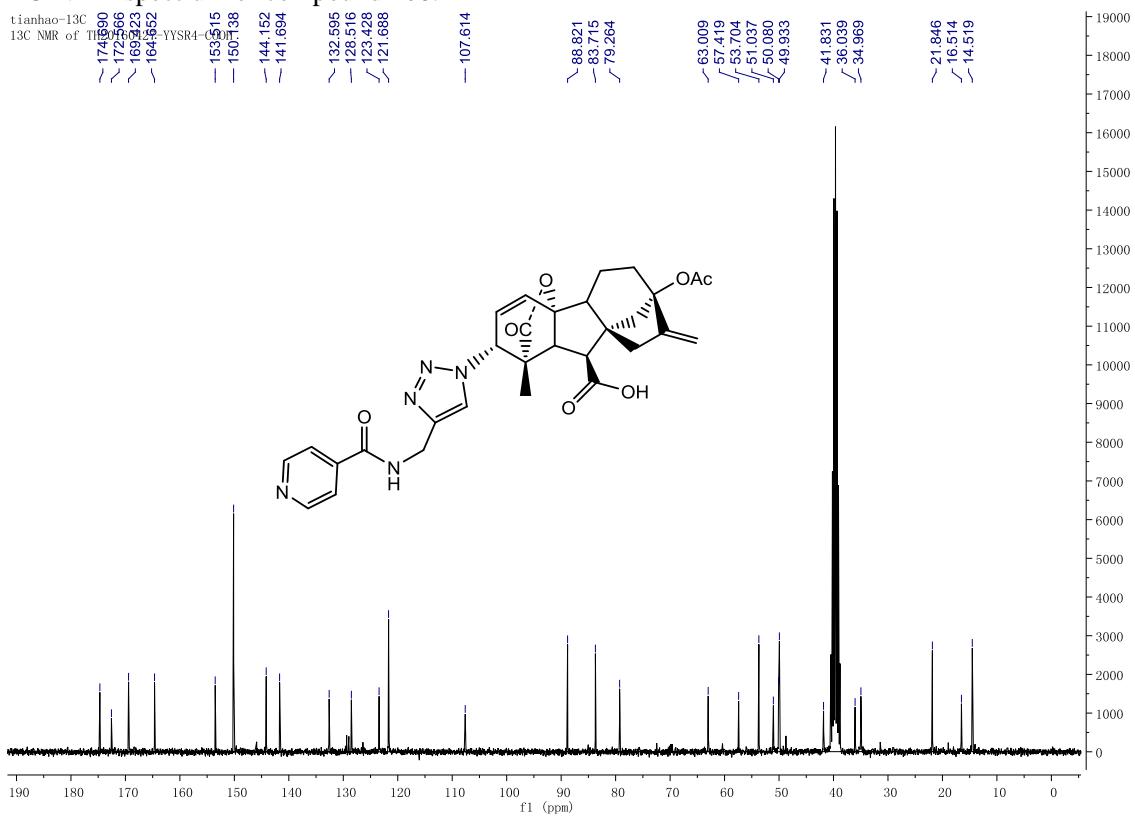
871 ^1H -NMR spectrum of compound **10o**.

872



873

874 ^{13}C -NMR spectrum of compound **10o**.

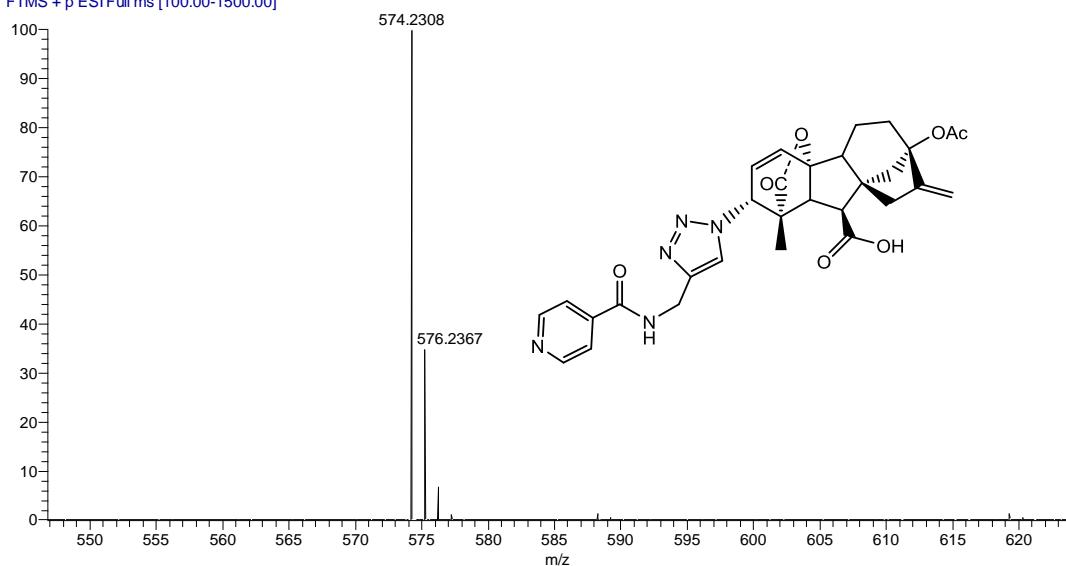


875

876

877 HRMS of compound **10o**.

22 #56 RT: 0.71 AV: 1 NL: 9.71E6
T: FTMS + p ESI Full ms [100.00-1500.00]



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880