

Supplementary Material

ZRMQ-22, a Novel DYRK1A Inhibitor, Attenuates Neuroinflammation and Cognitive Impairments in LPS- Induced Mice: A Potential Strategy for Alzheimer's Disease

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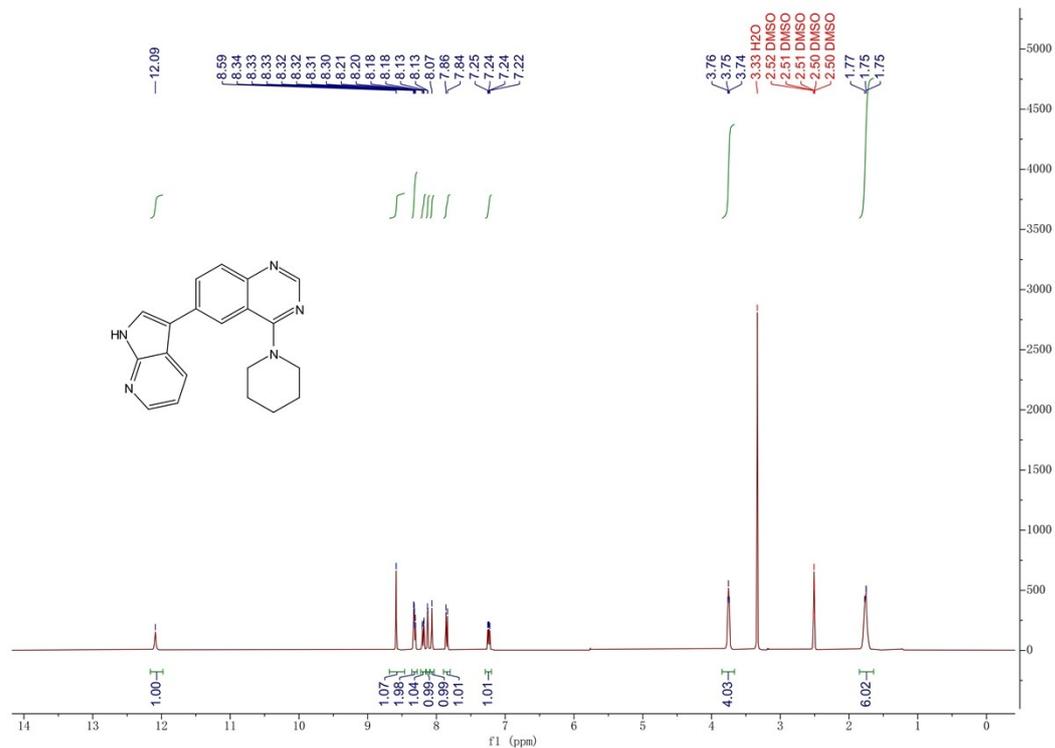
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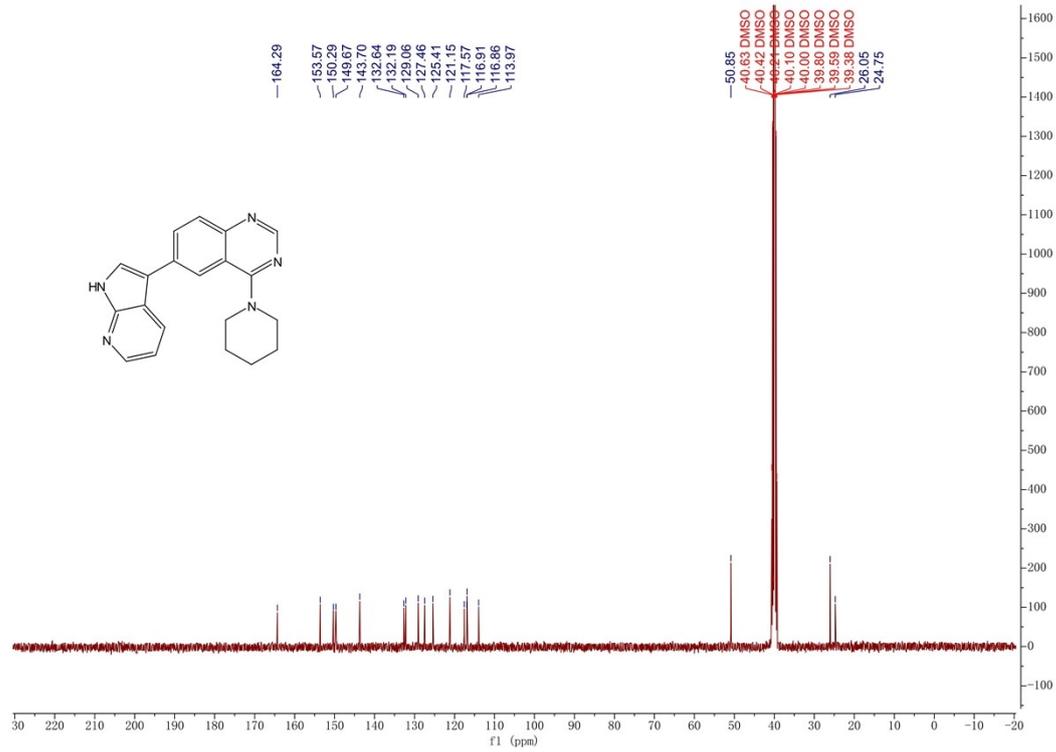
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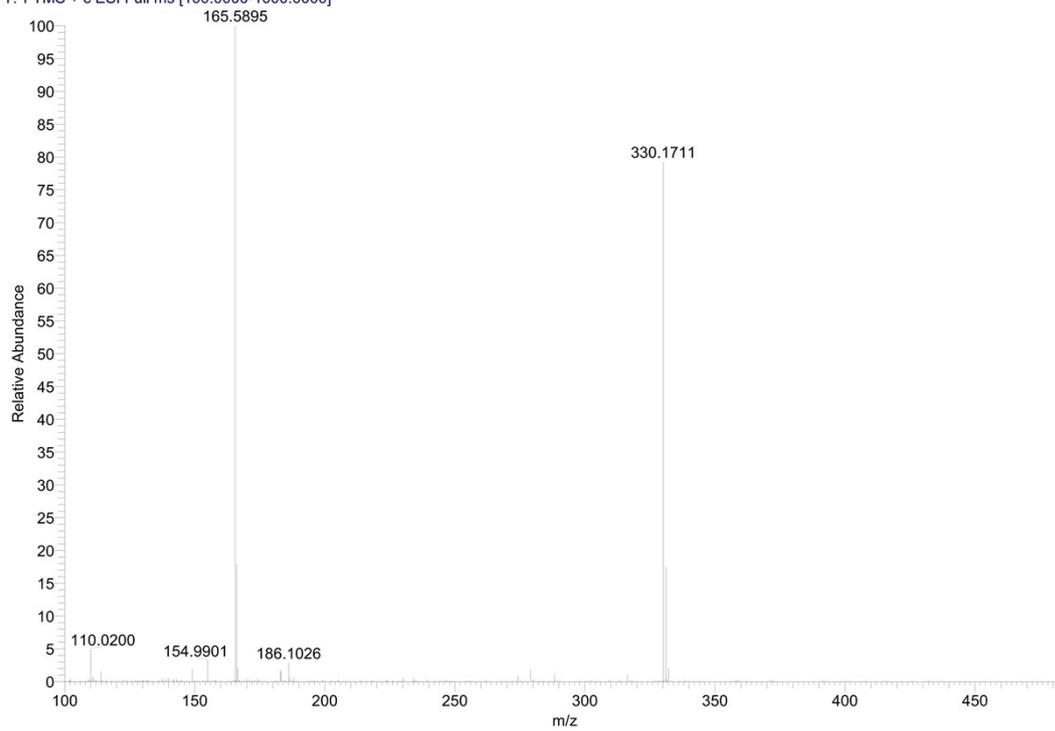
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NMR Spectra, HRMS Spectra and analytical HPLC trace for Target Compounds



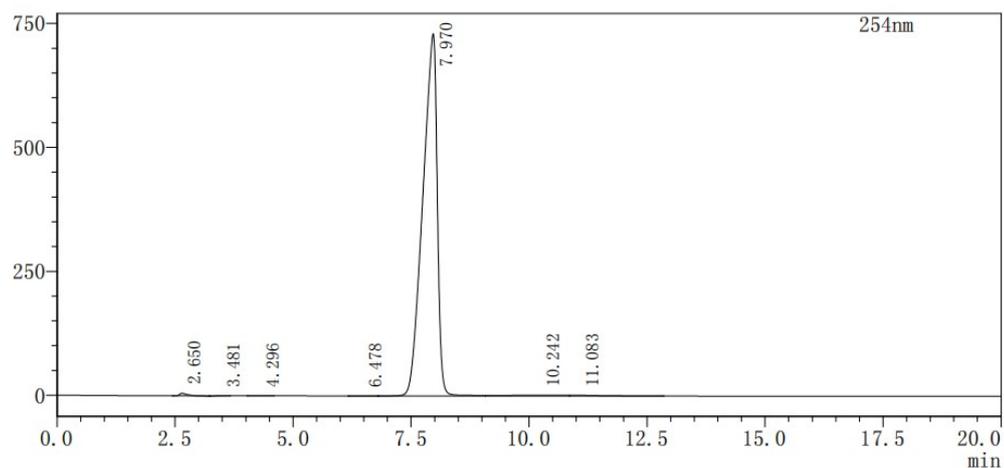


ZRMQ-1 #21-33 RT: 0.17-0.26 AV: 7 NL: 1.45E9
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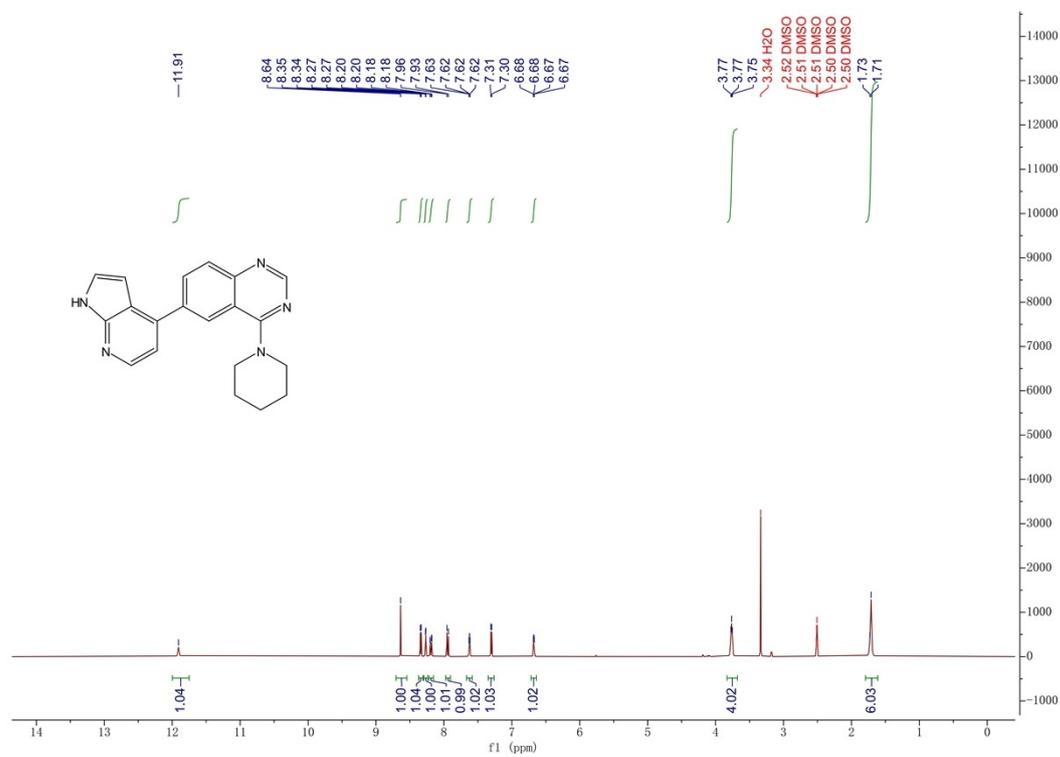


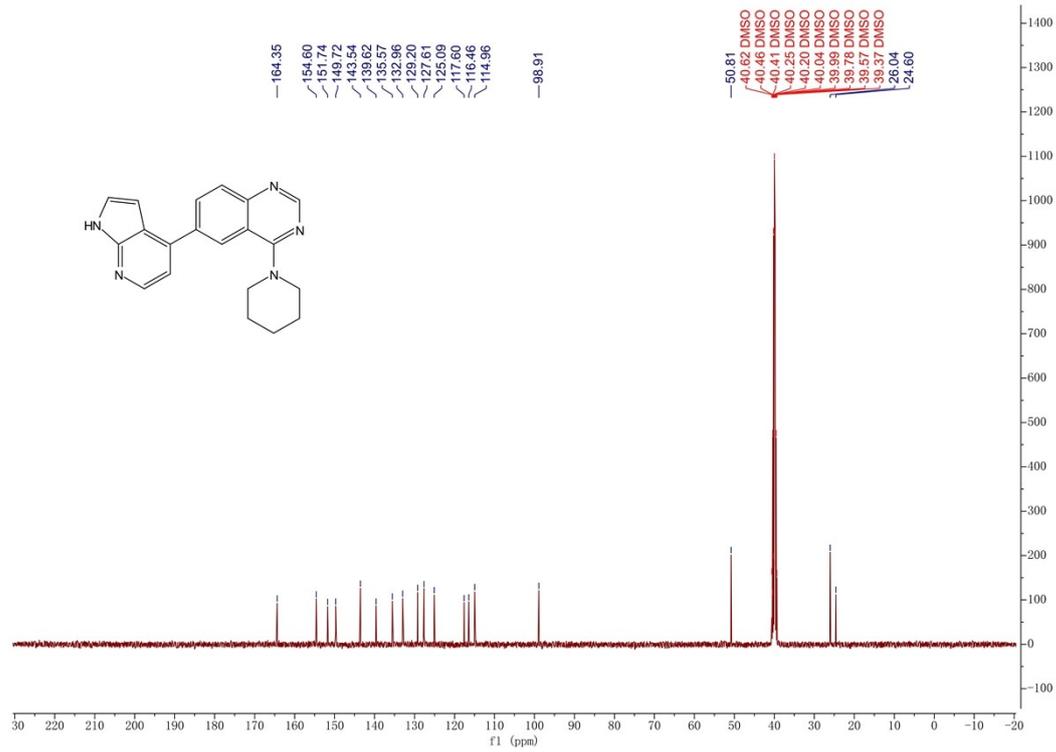
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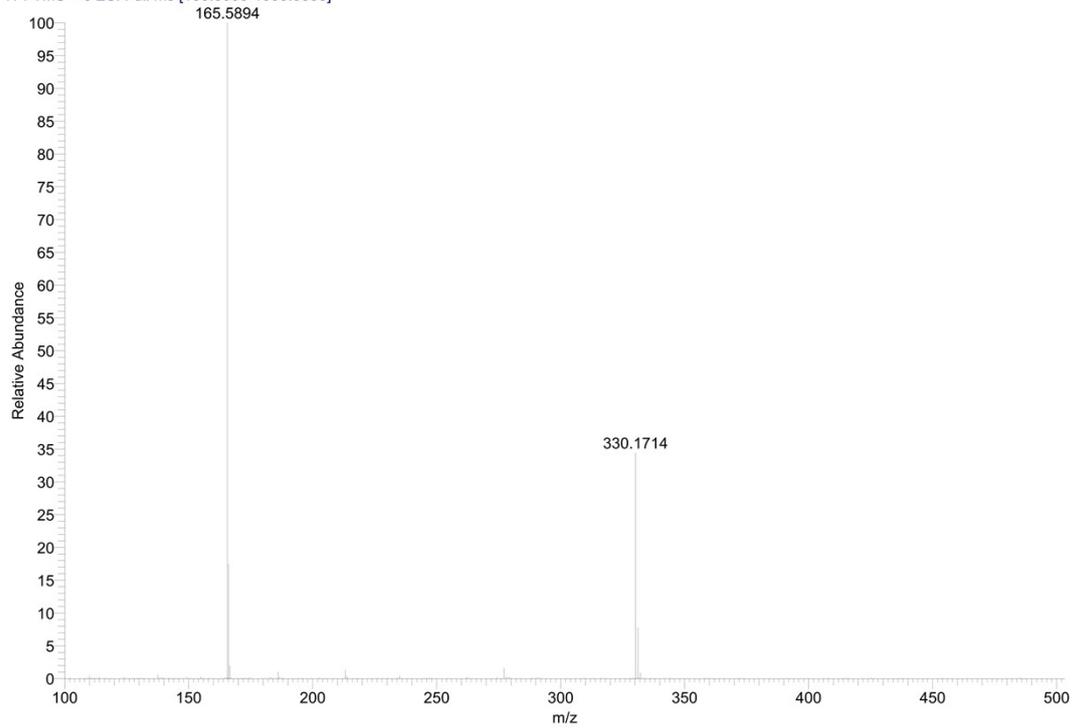
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2	3.481	0.037
3	4.296	0.027
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5	7.970	98.041
6	10.242	0.963
7	11.083	0.479
总计		100.000

Figure S1. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-1



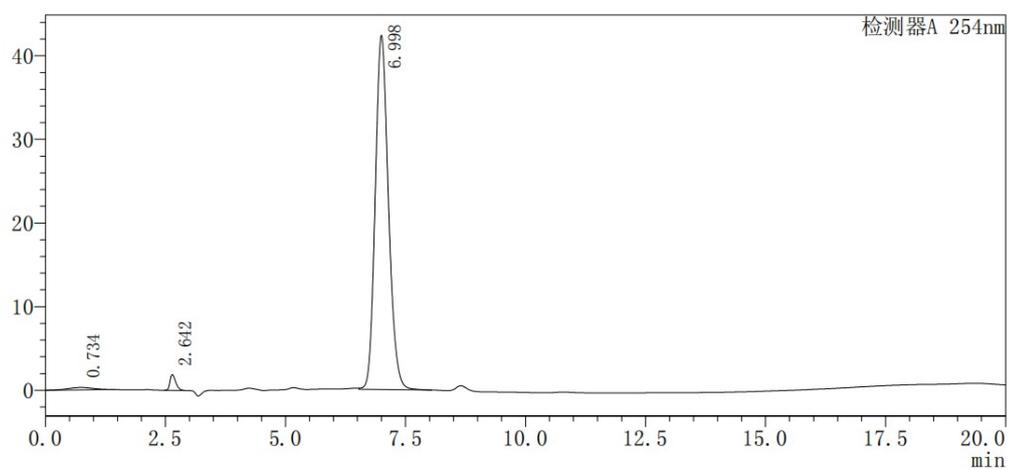


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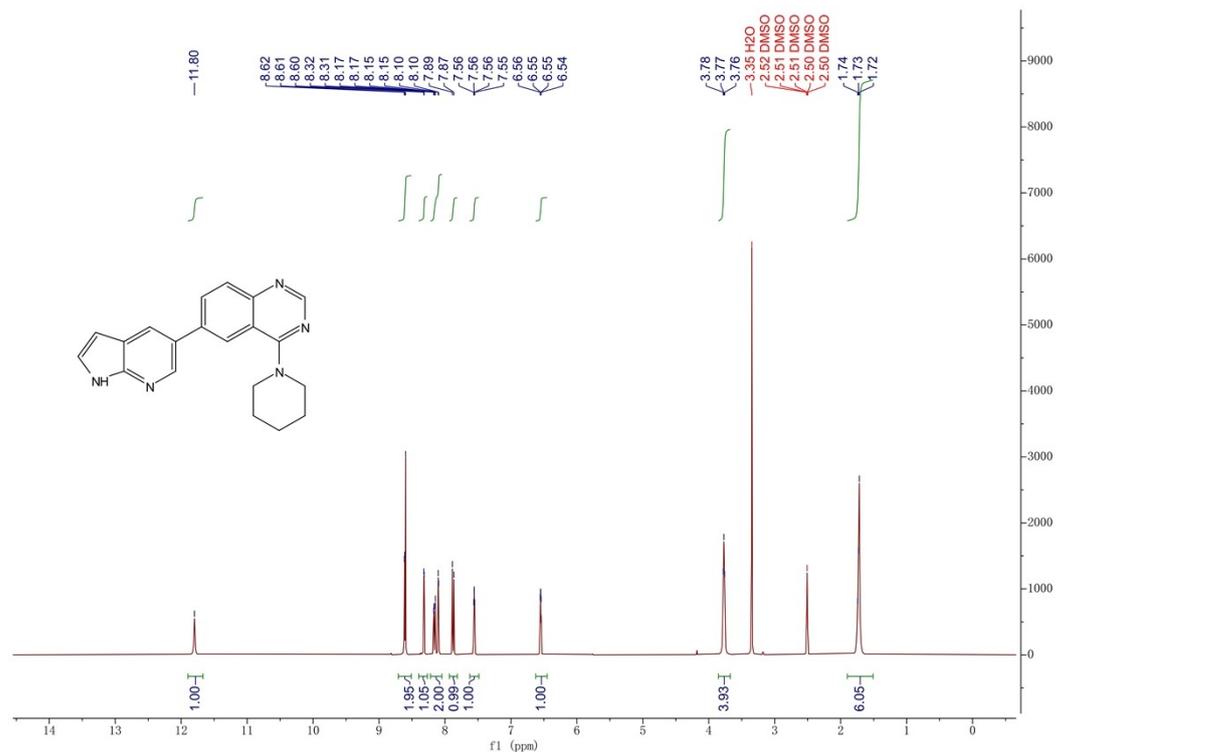


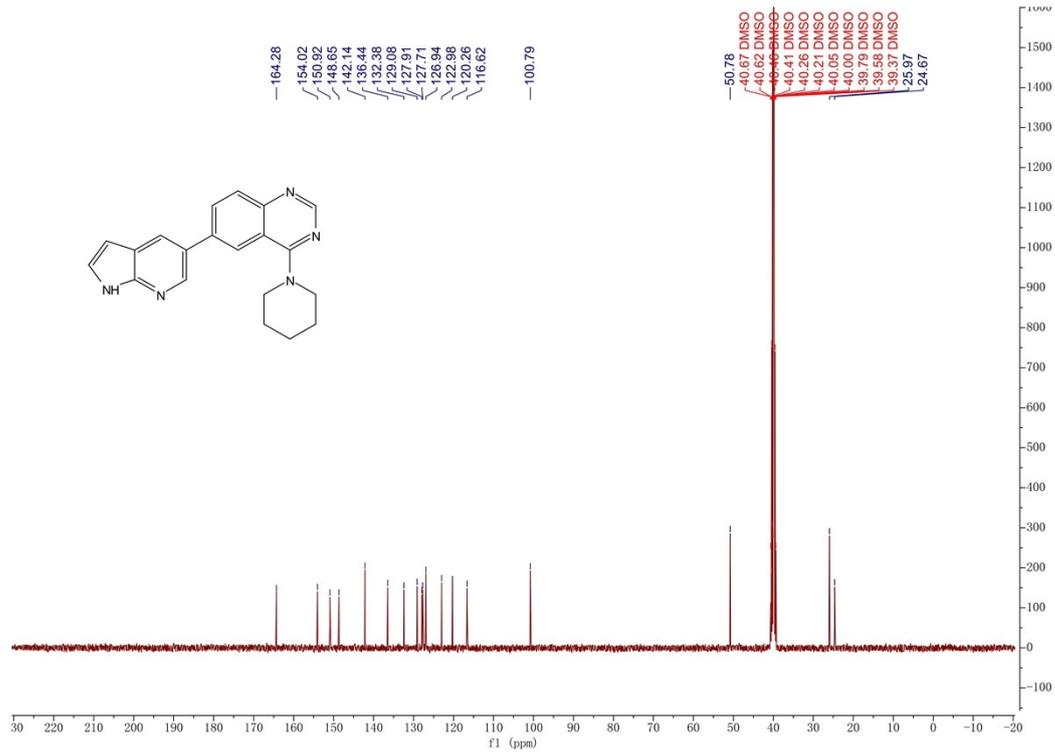
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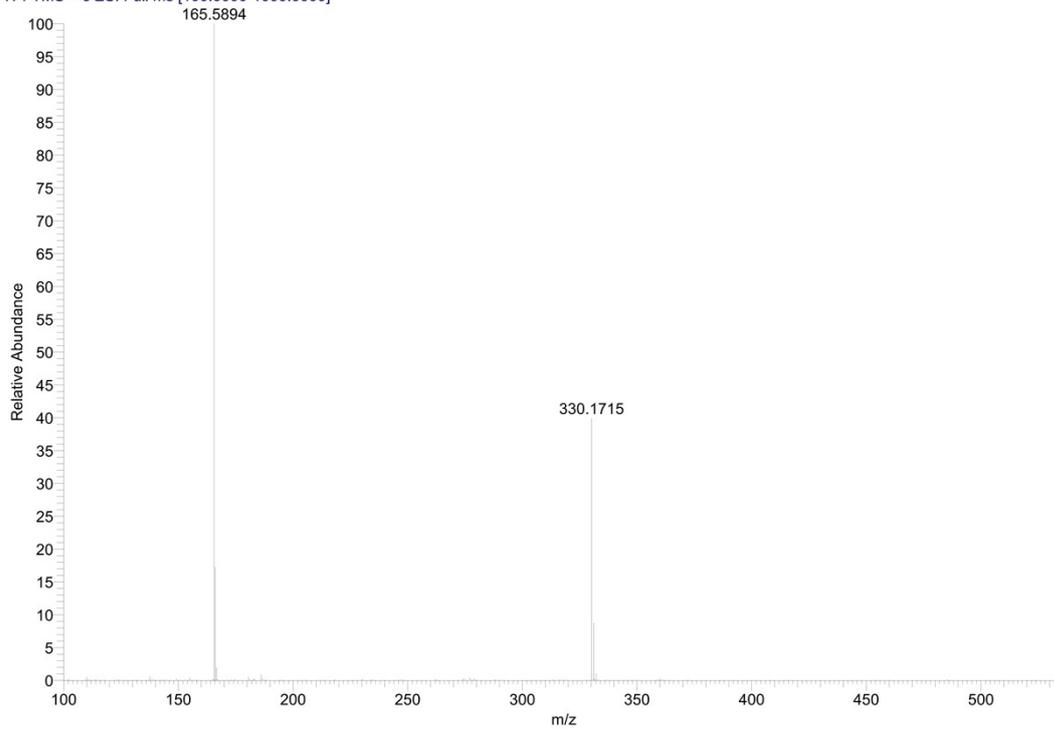
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Figure S2. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-2



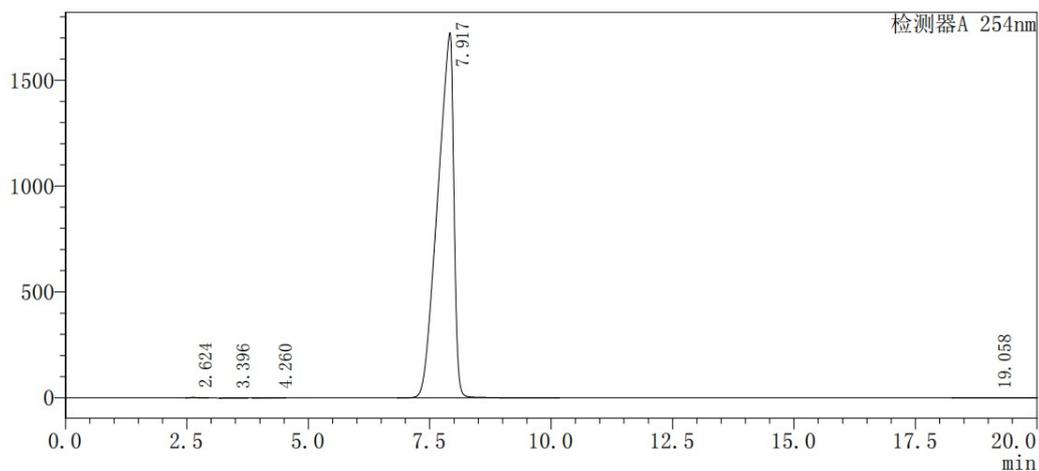


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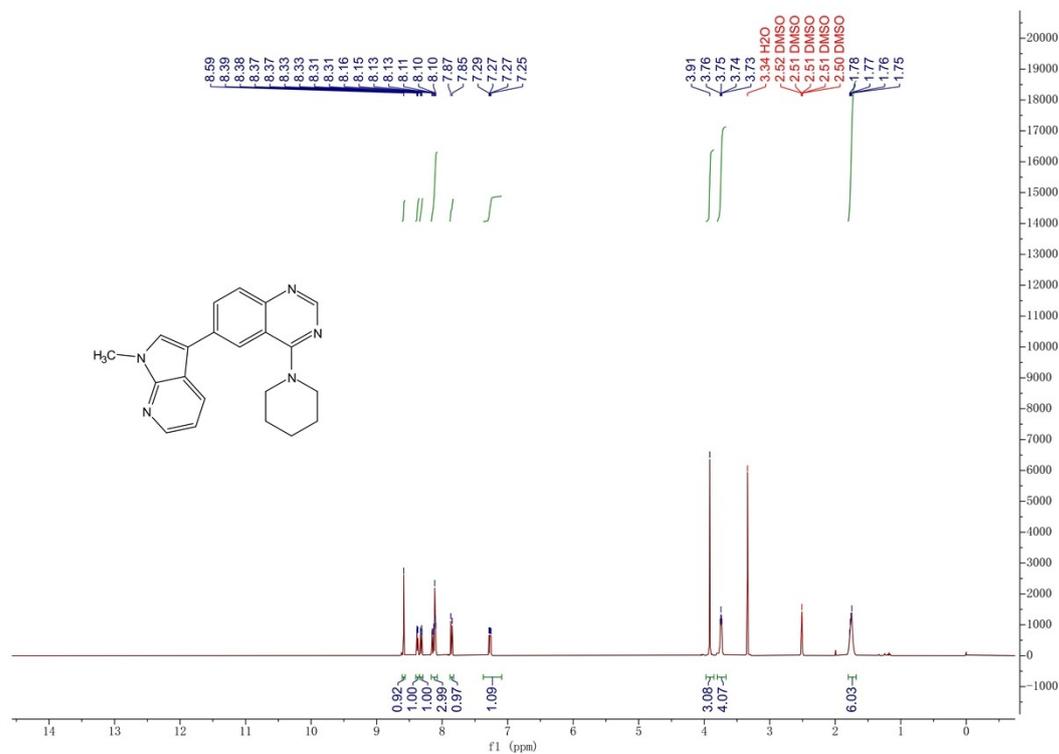


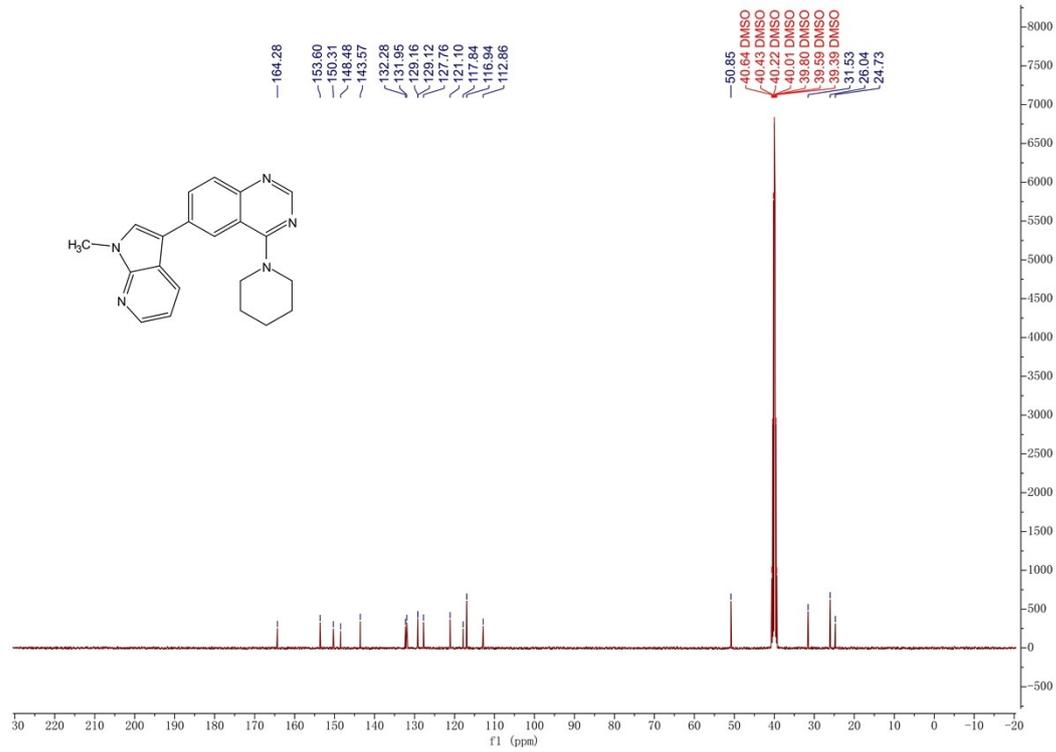
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检测器A 254nm

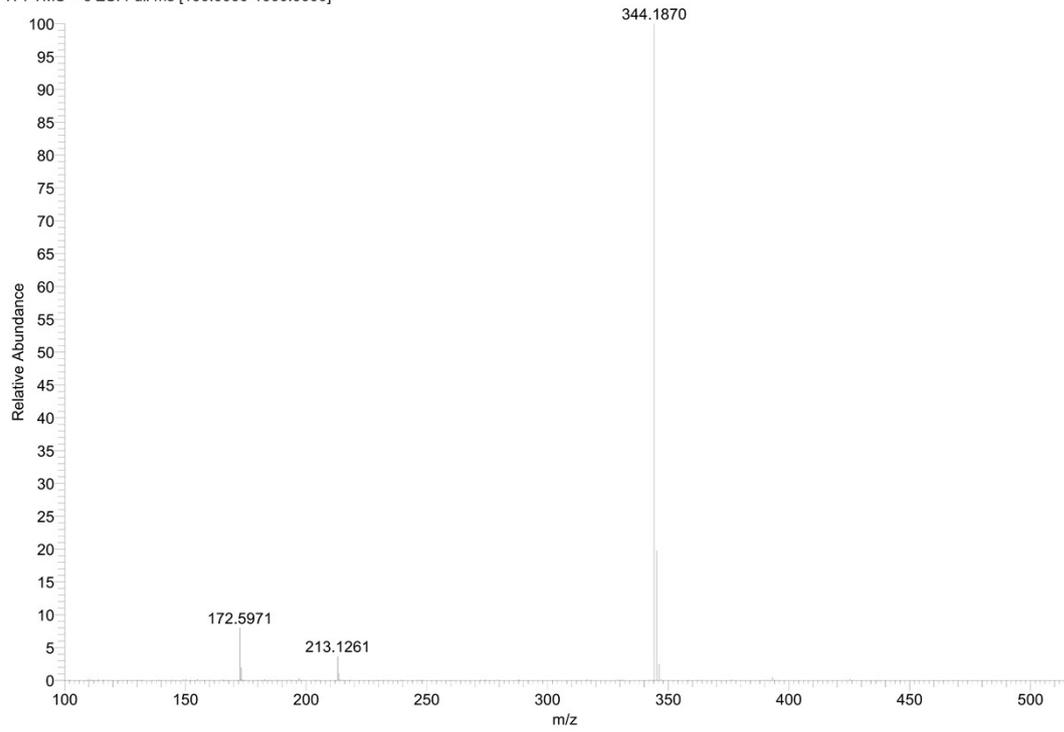
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2	3.396	0.040
3	4.260	0.039
4	7.917	99.824
5	19.058	0.047
总计		100.000

Figure S3. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-3



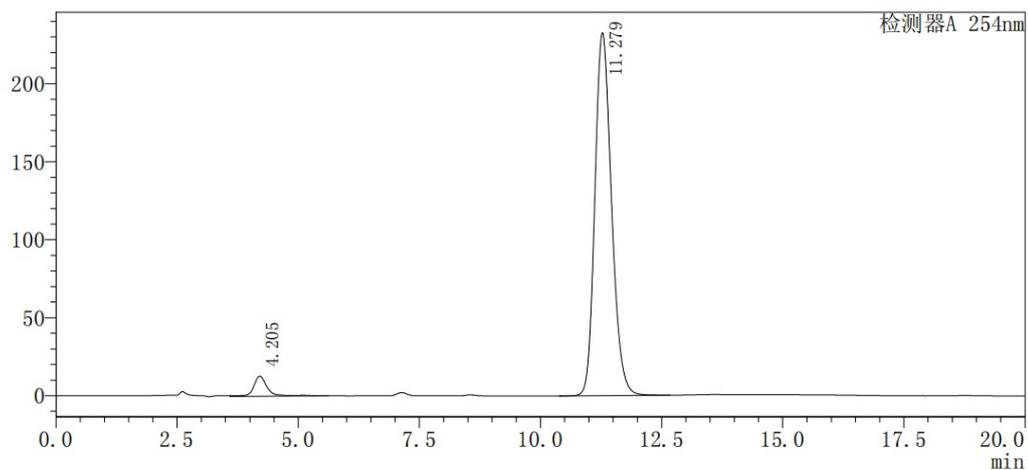


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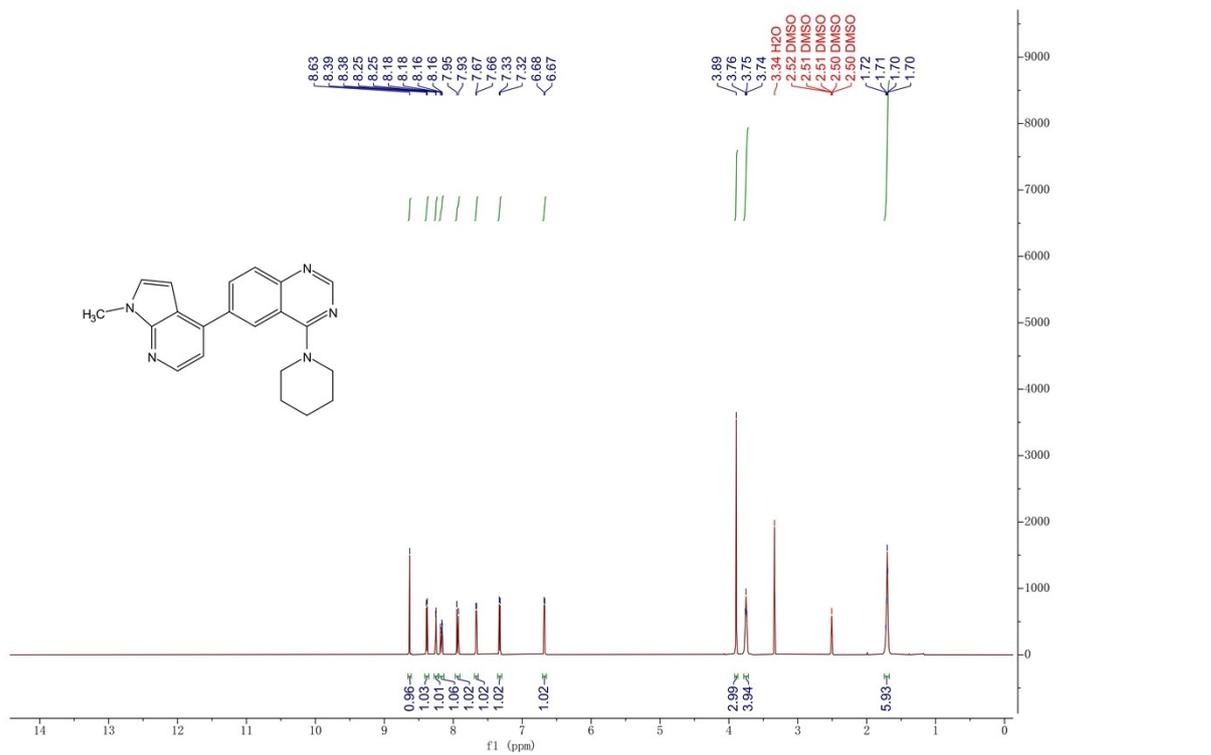


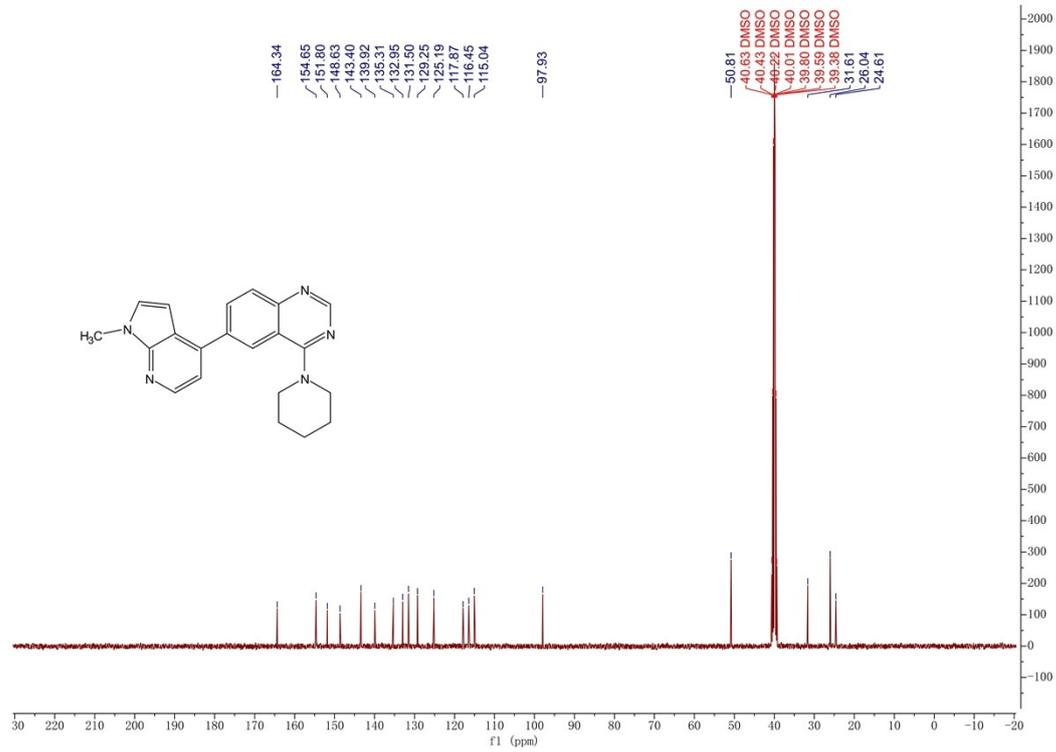
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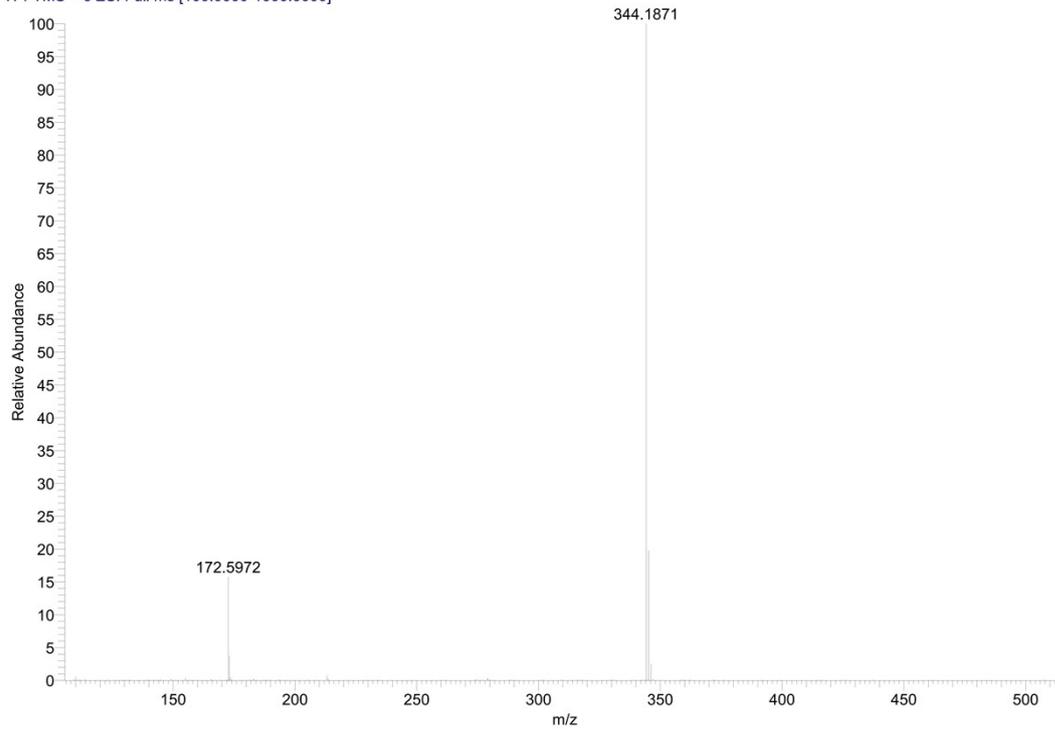
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总计		100.000

Figure S4. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-4



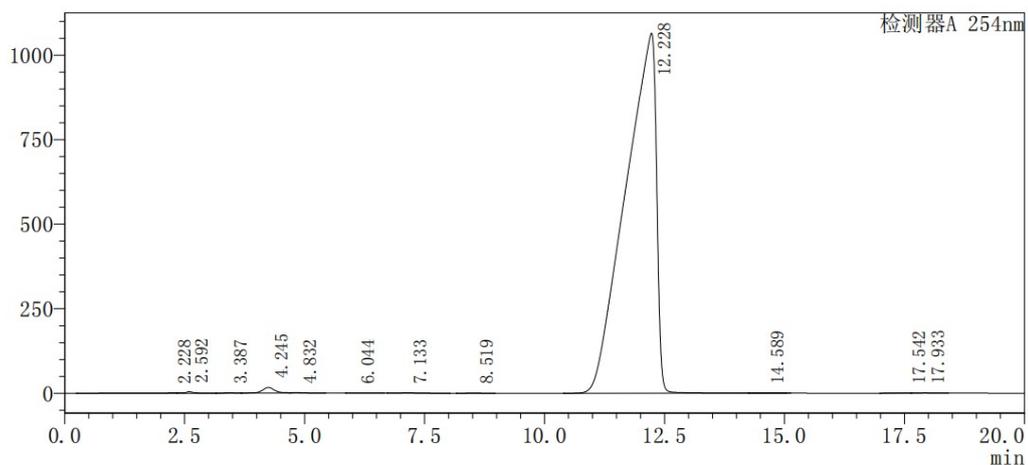


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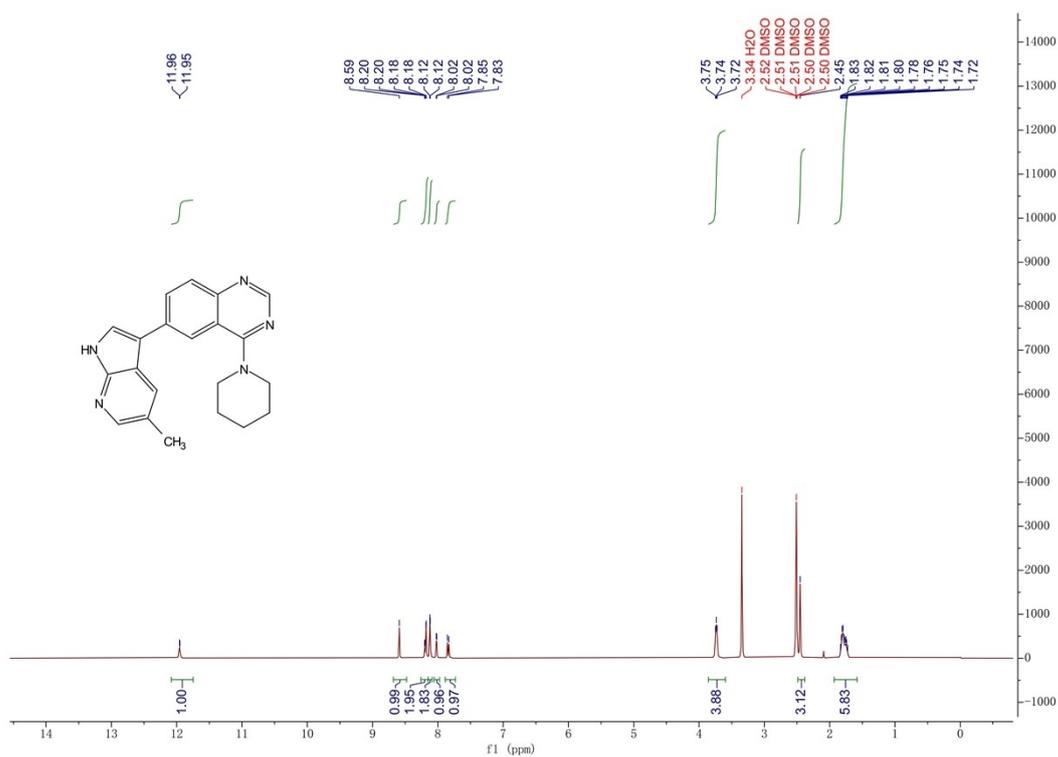


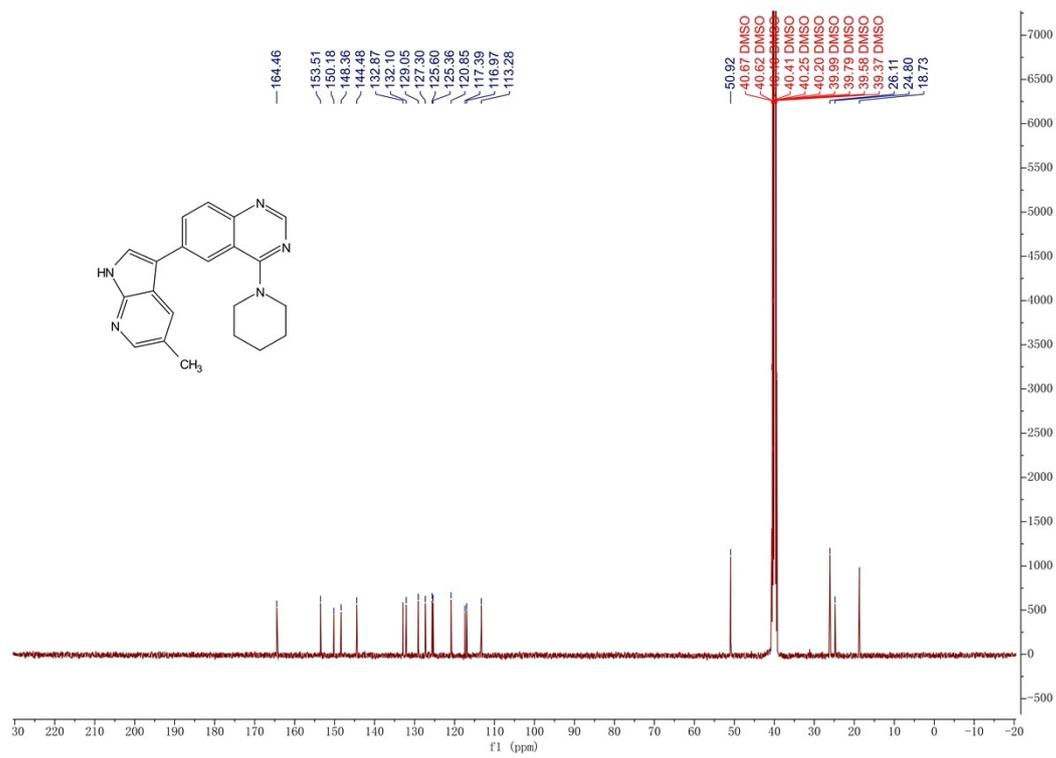
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检测器A 254nm

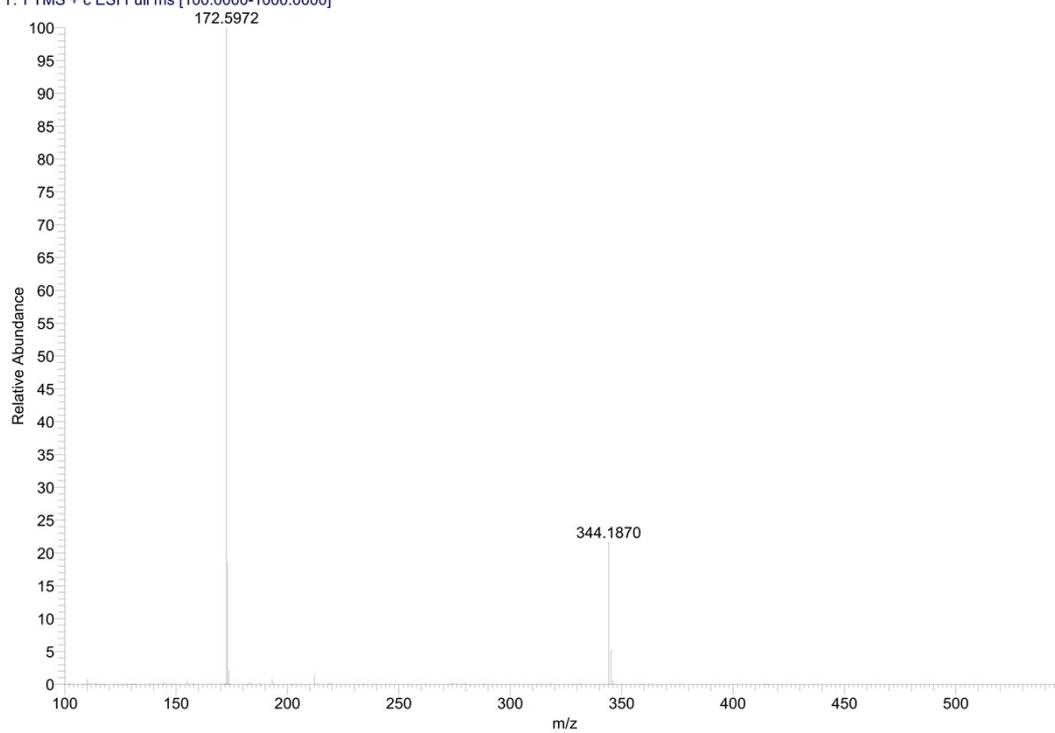
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2	2.592	0.129
3	3.387	0.043
4	4.245	0.662
5	4.832	0.066
6	6.044	0.004
7	7.133	0.053
8	8.519	0.013
9	12.228	98.898
10	14.589	0.005
11	17.542	0.022
12	17.933	0.029
总计		100.000

Figure S5. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-5



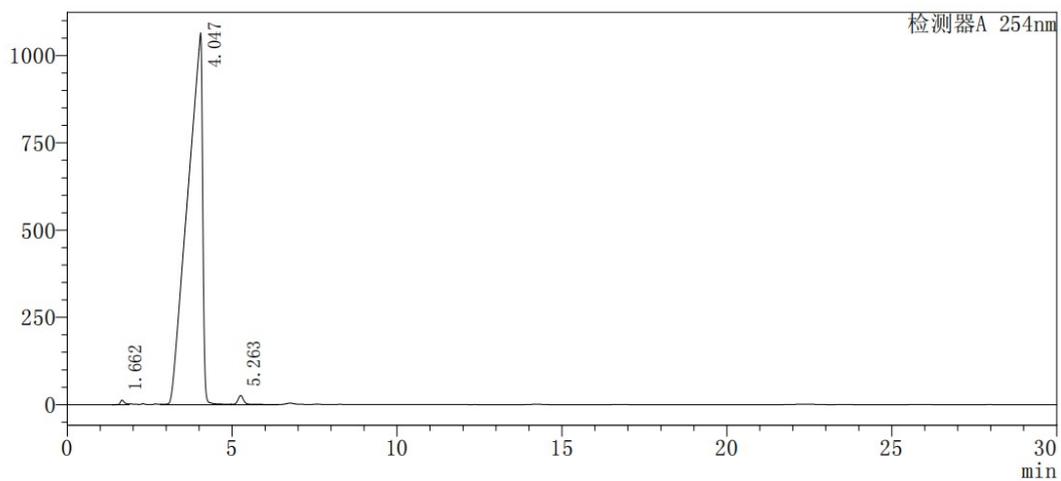


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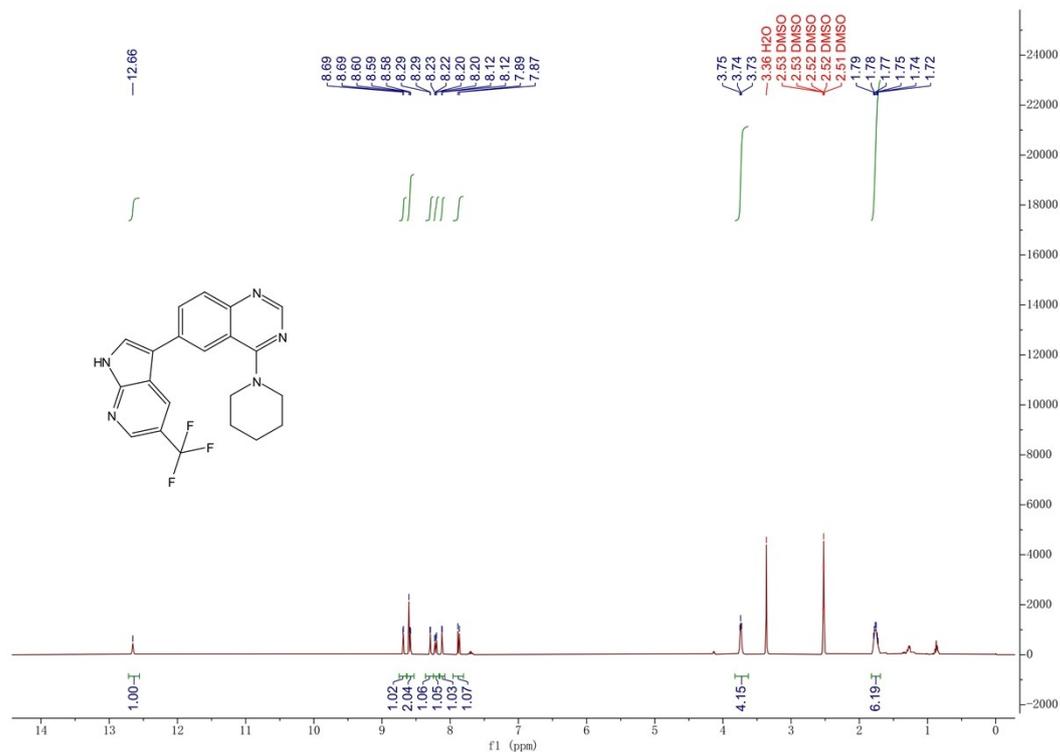


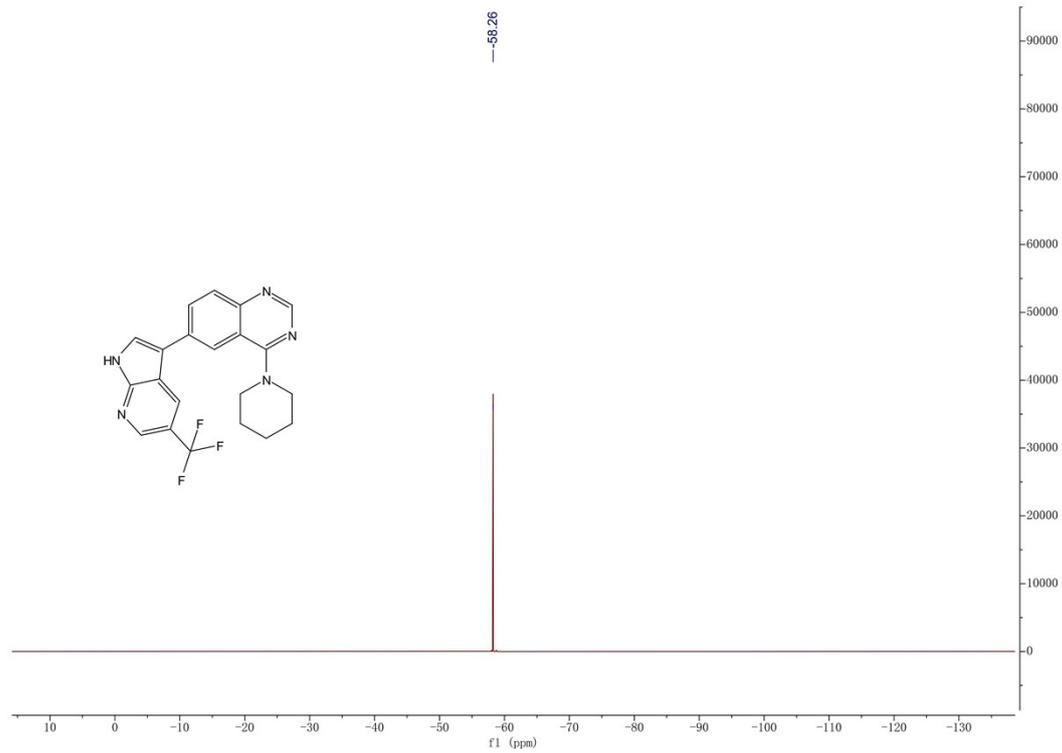
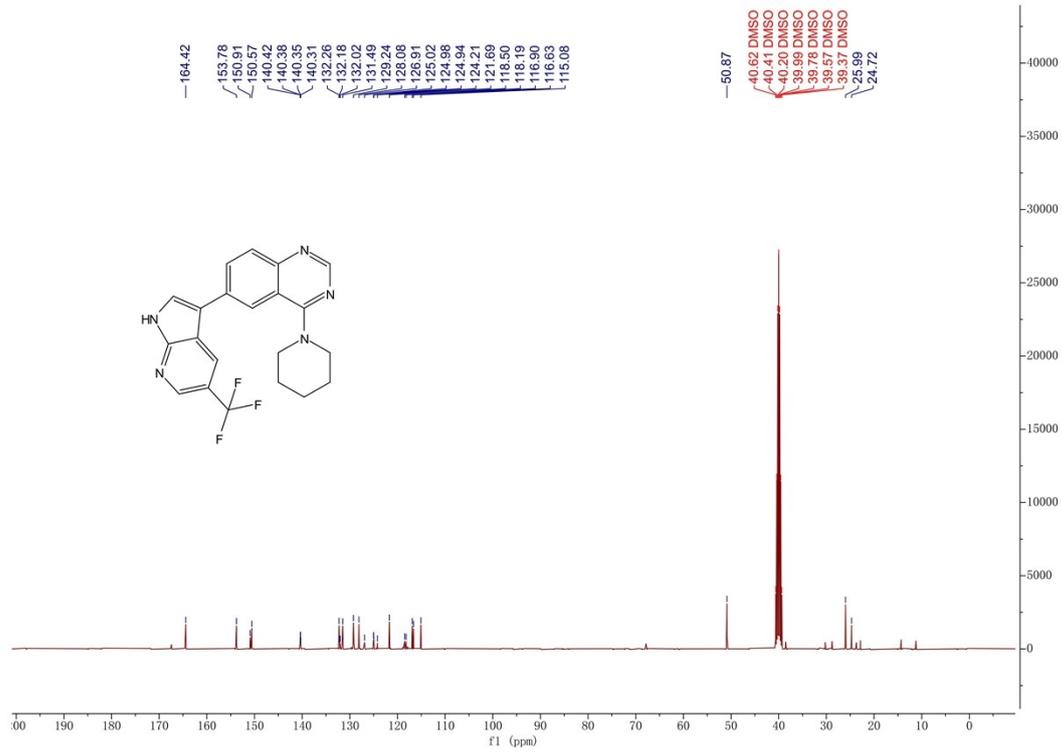
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检测器A 254nm

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总计		100.000

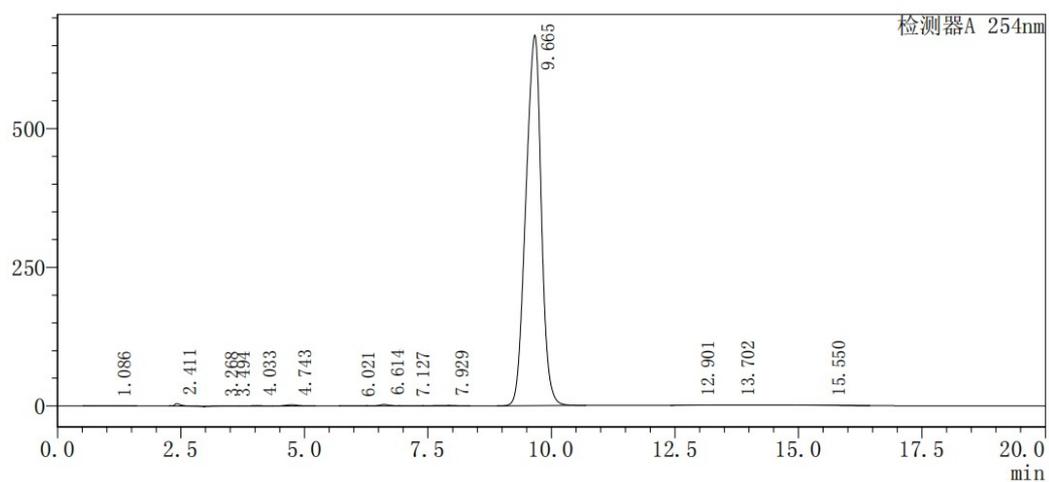
Figure S6. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-6





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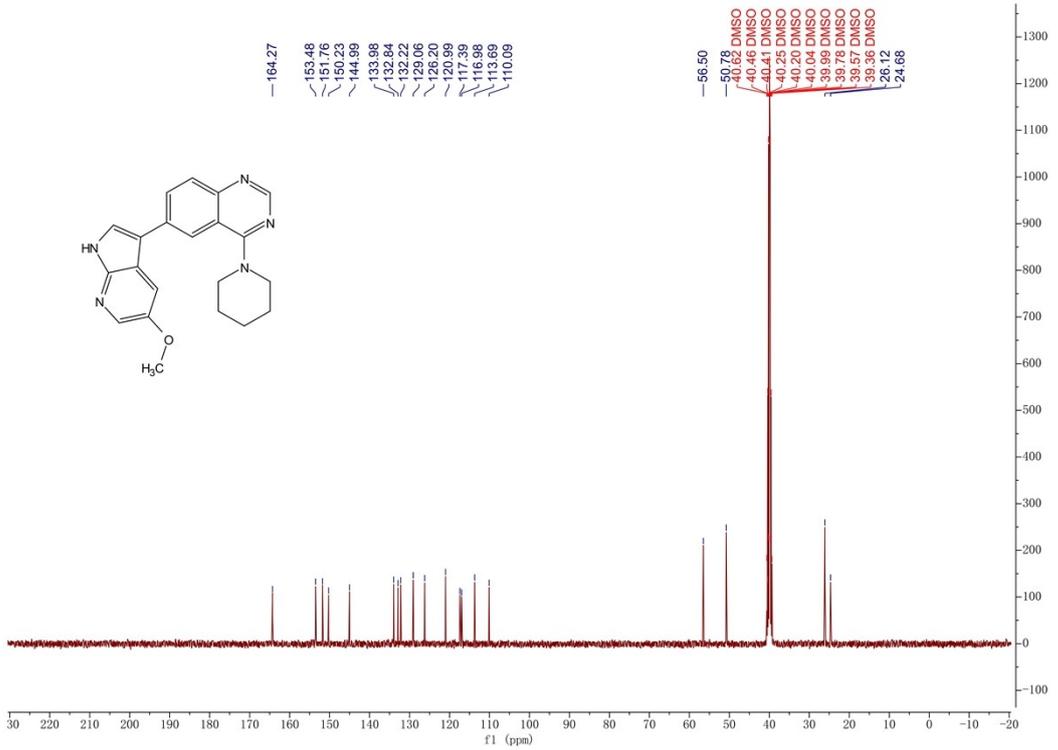
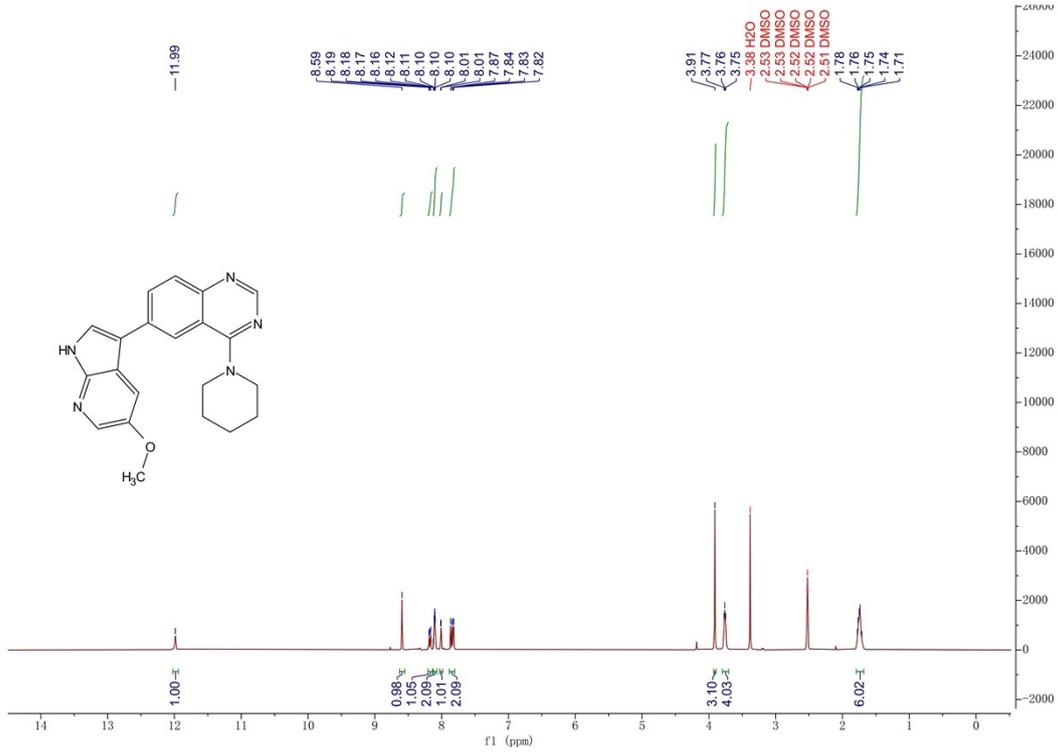


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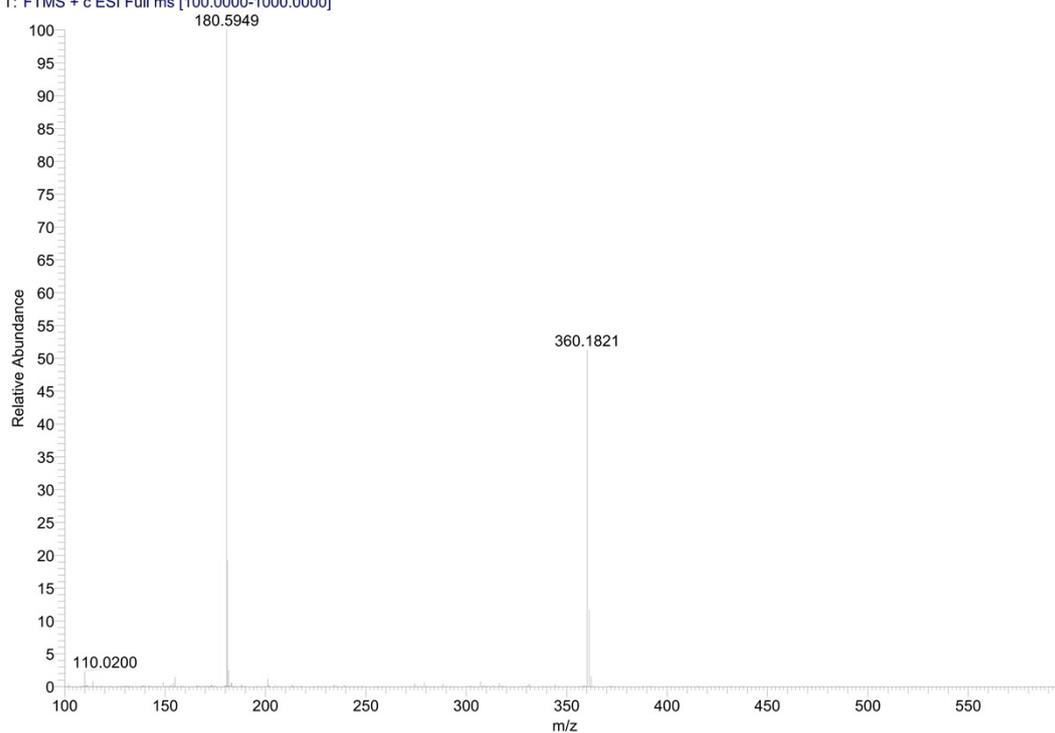
检测器A 254nm

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2	2.411	0.308
3	3.268	0.081
4	3.494	0.065
5	4.033	0.172
6	4.743	0.294
7	6.021	0.019
8	6.614	0.244
9	7.127	0.029
10	7.929	0.153
11	9.665	98.362
12	12.901	0.017
13	13.702	0.058
14	15.550	0.158
总计		100.000

Figure S7. ^1H NMR, ^{13}C NMR, ^{19}F NMR, HRMS and analytical HPLC trace for **ZRMQ-7**

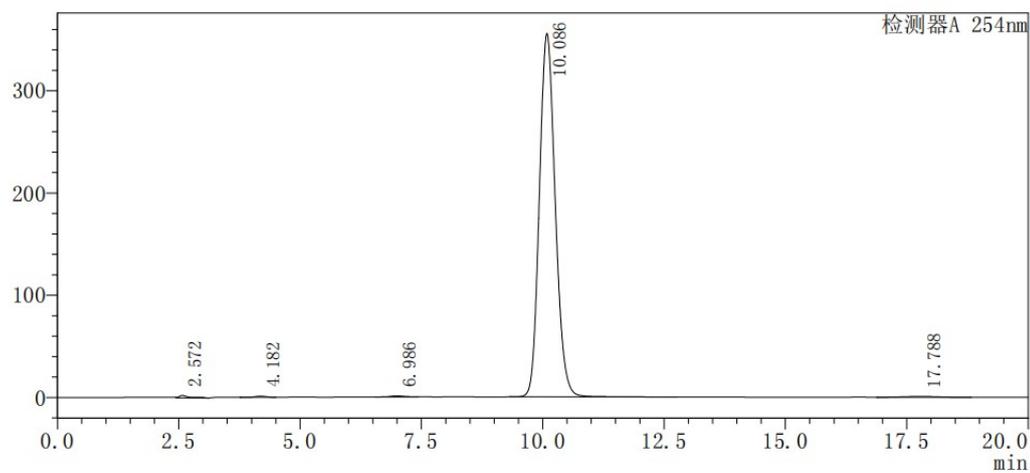


ZRMQ-8 #20-32 RT: 0.16-0.24 AV: 6 NL: 3.59E9
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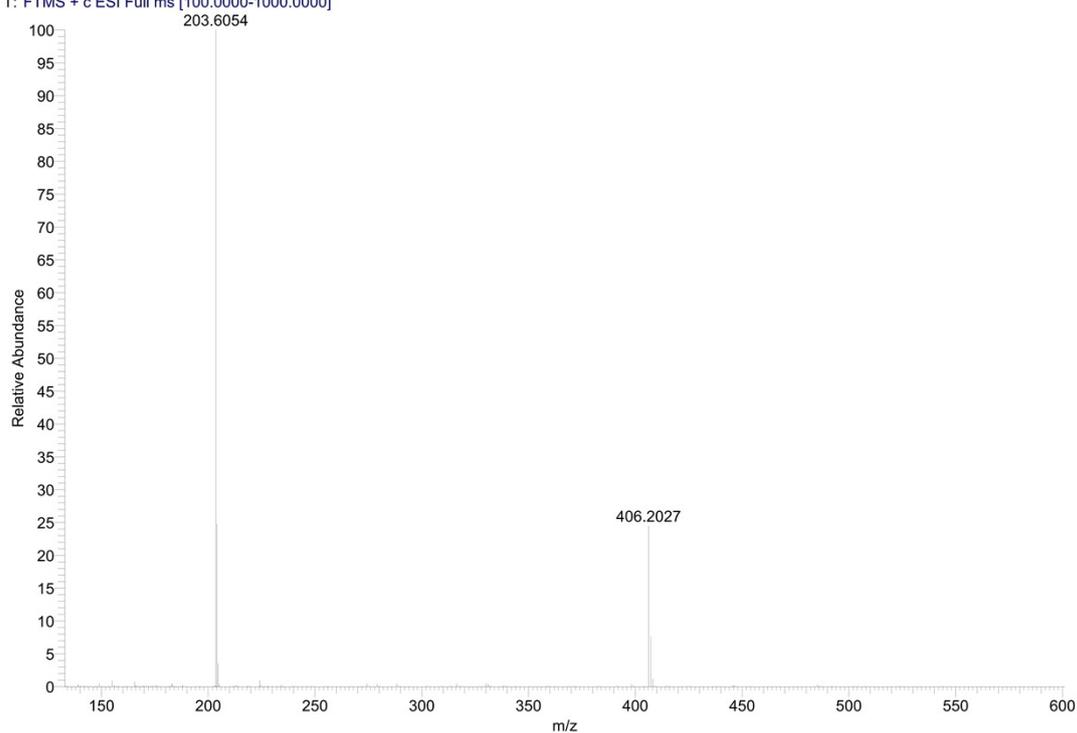
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检测器A 254nm

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4	10.086	98.527
5	17.788	0.544
总计		100.000

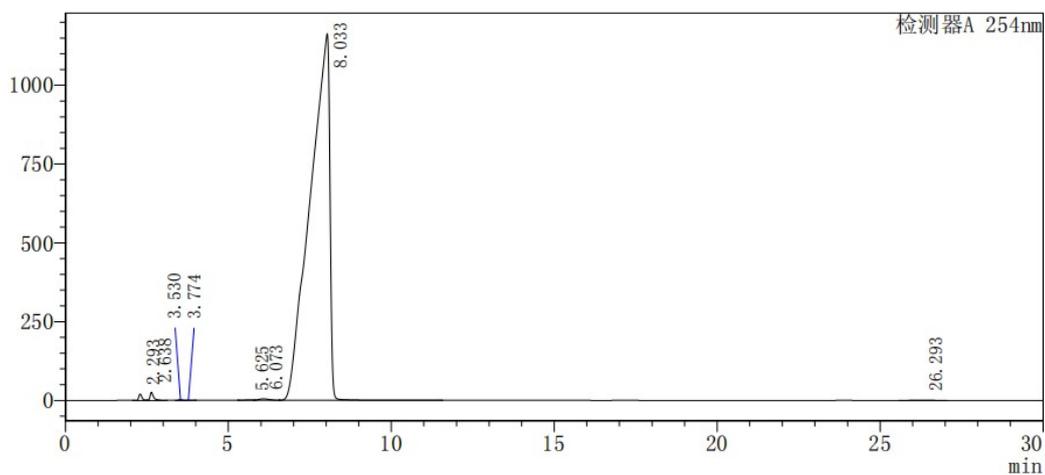
Figure S8. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-8**

ZRMQ-9 #22-30 RT: 0.18-0.23 AV: 4 NL: 4.44E9
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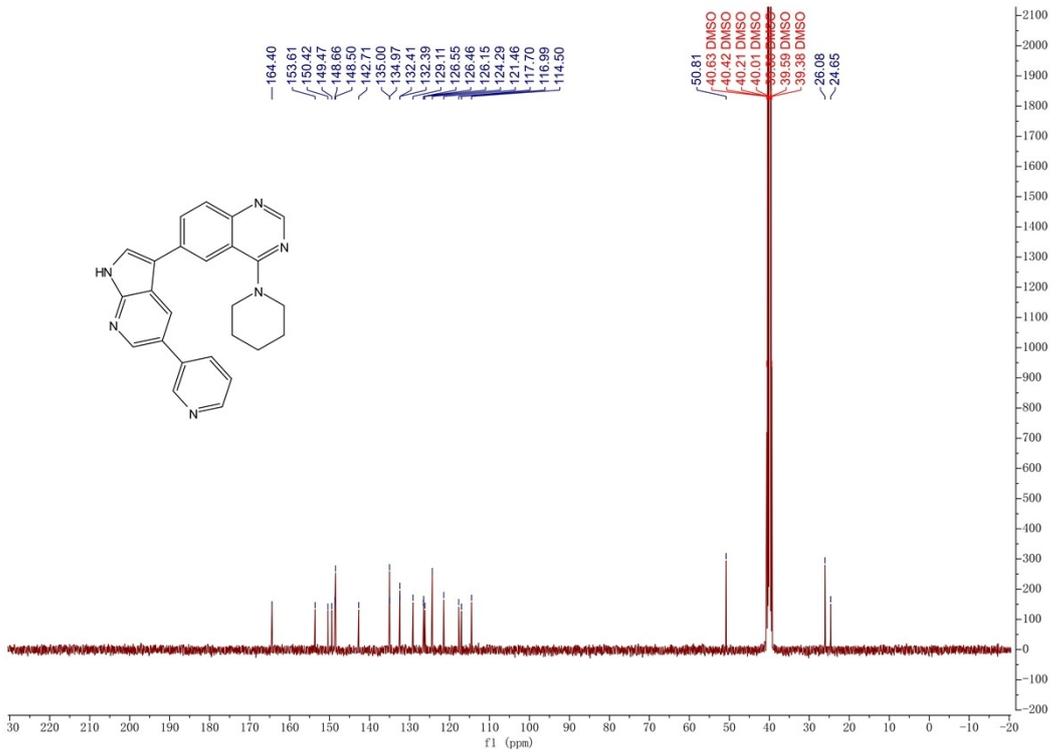
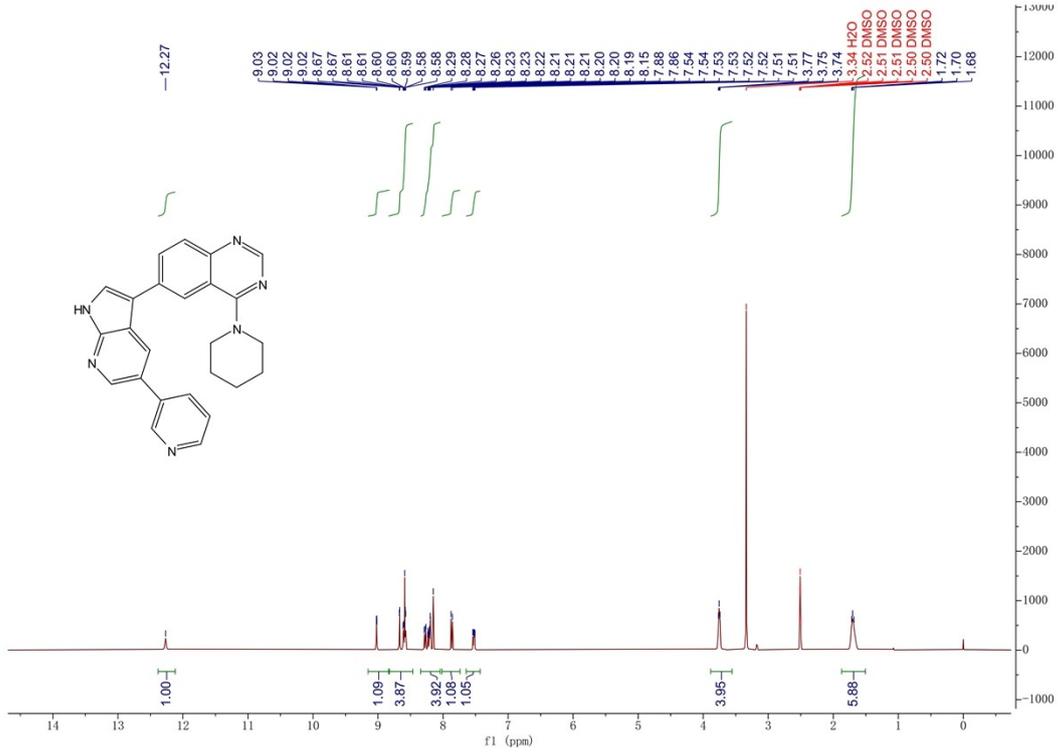


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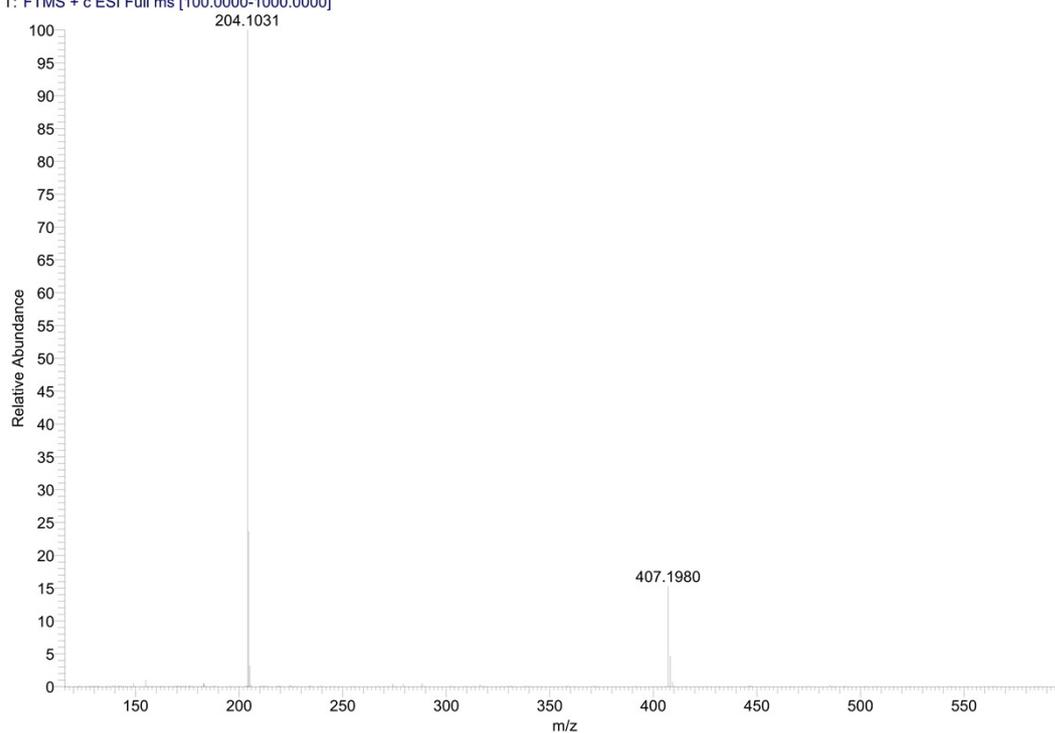
检测器A 254nm

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2	2.638	0.396
3	3.530	0.049
4	3.774	0.022
5	5.625	0.037
6	6.073	0.209
7	8.033	98.968
8	26.293	0.024
总计		100.000

Figure S9. ¹H NMR, ¹³C NMR, HRMS and analytical HPLC trace for ZRMQ-9

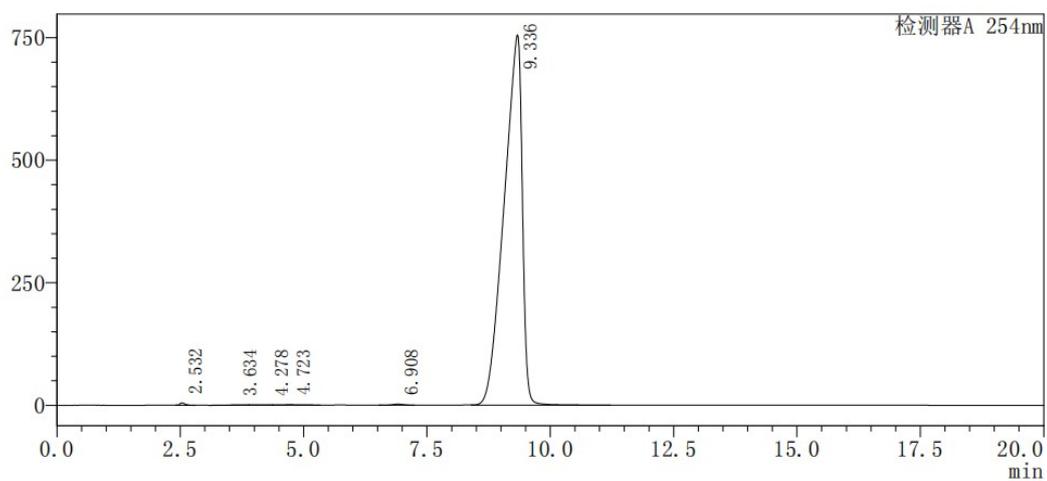


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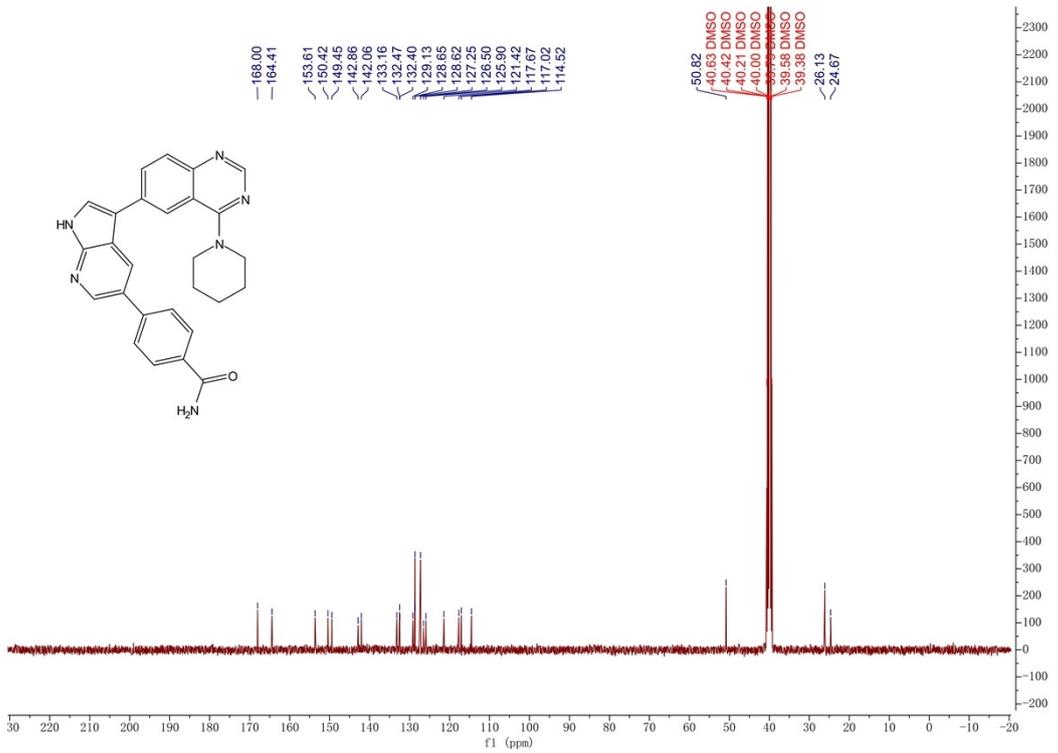
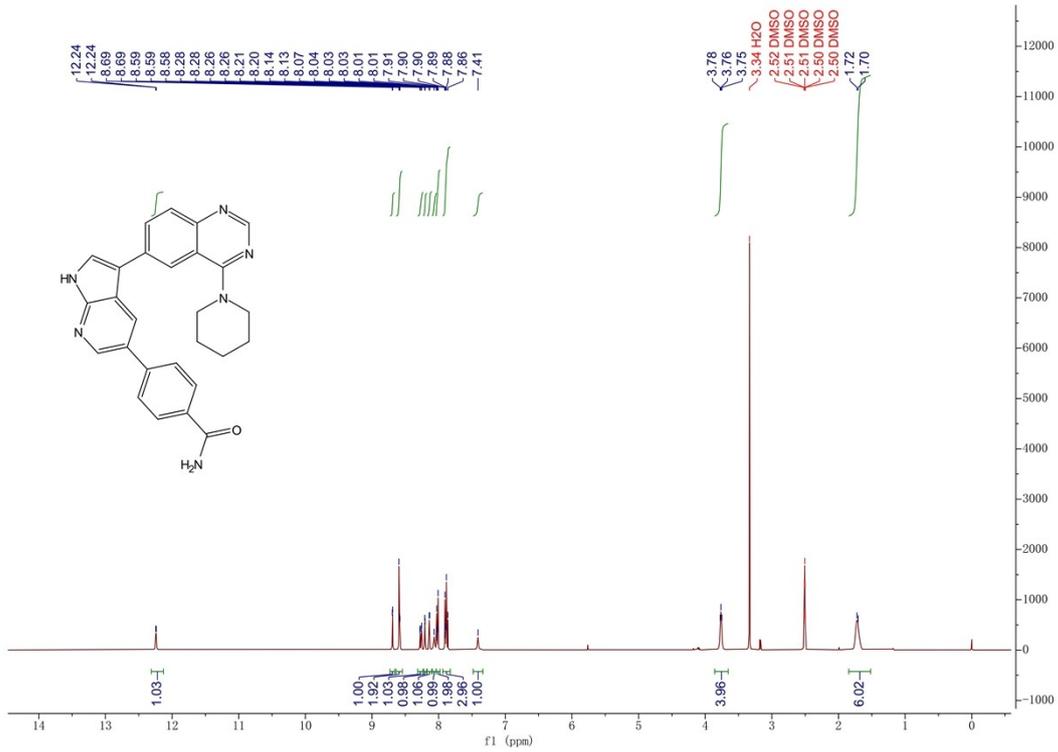


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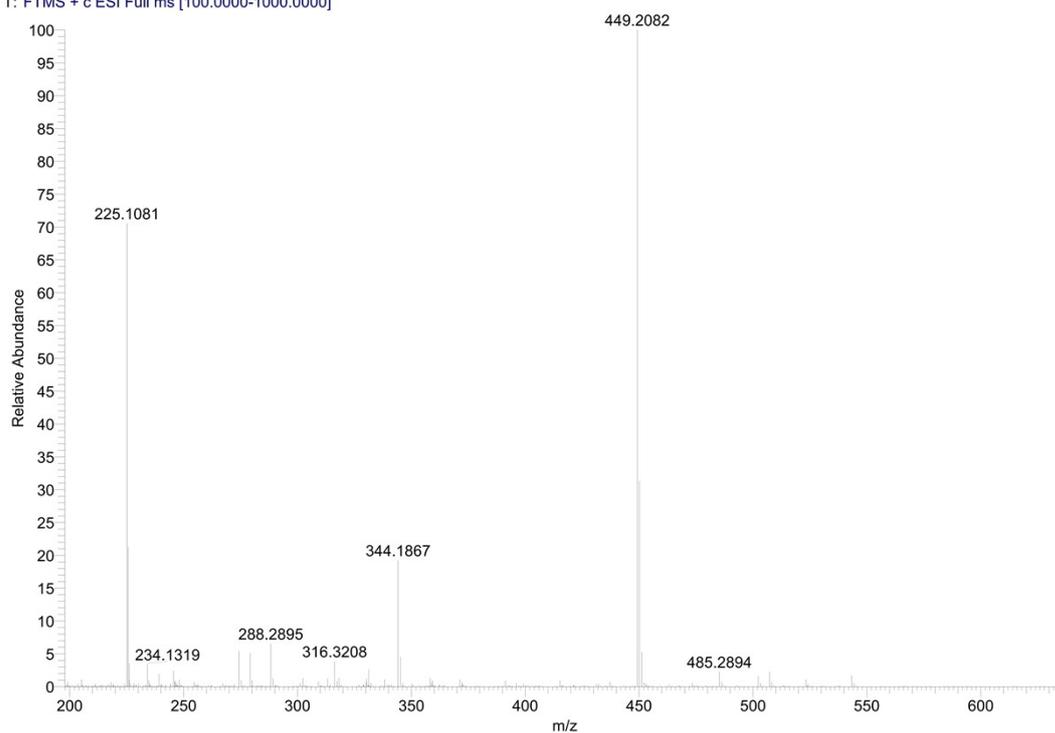
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2	3.634	0.098
3	4.278	0.076
4	4.723	0.144
5	6.908	0.147
6	9.336	99.347
总计		100.000

Figure S10. ^1H NMR, ^{13}C NMR, analytical HPLC trace and HRMS for ZRMQ-10

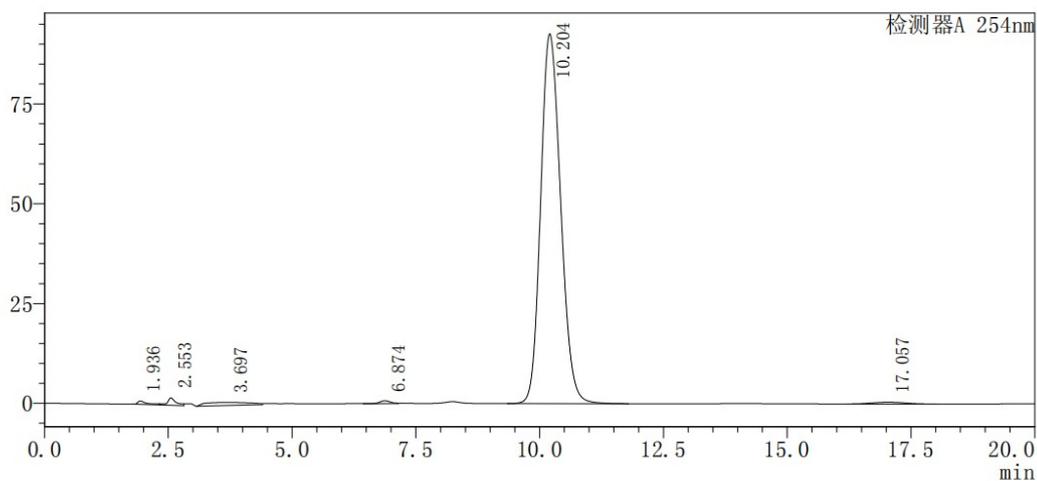


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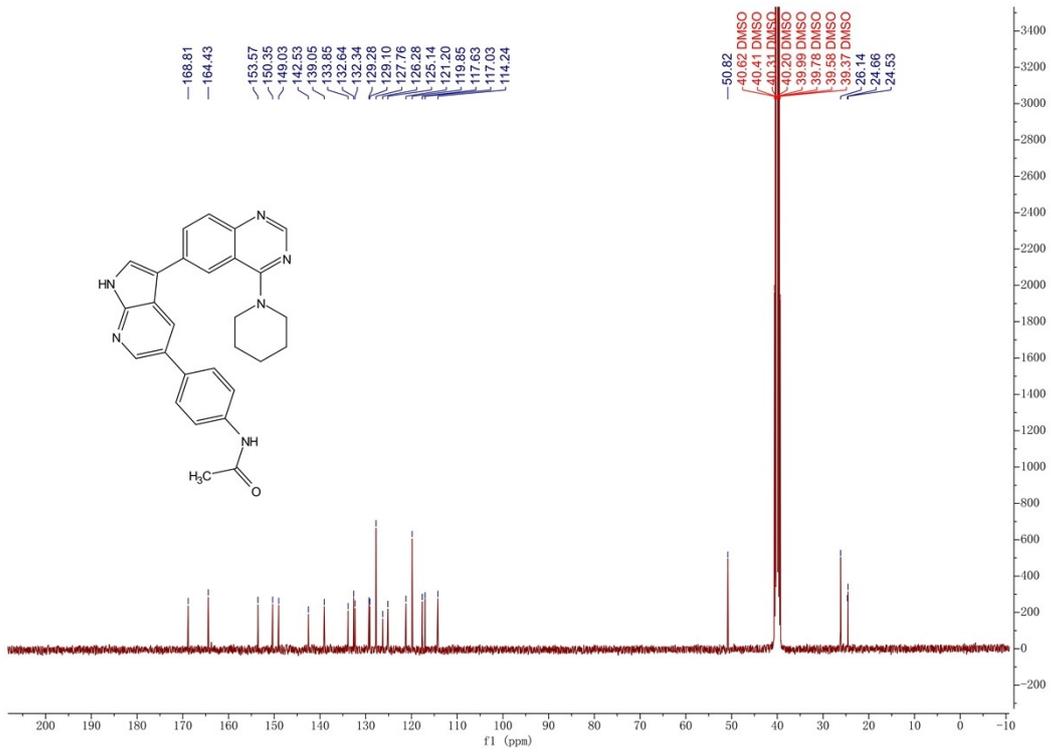
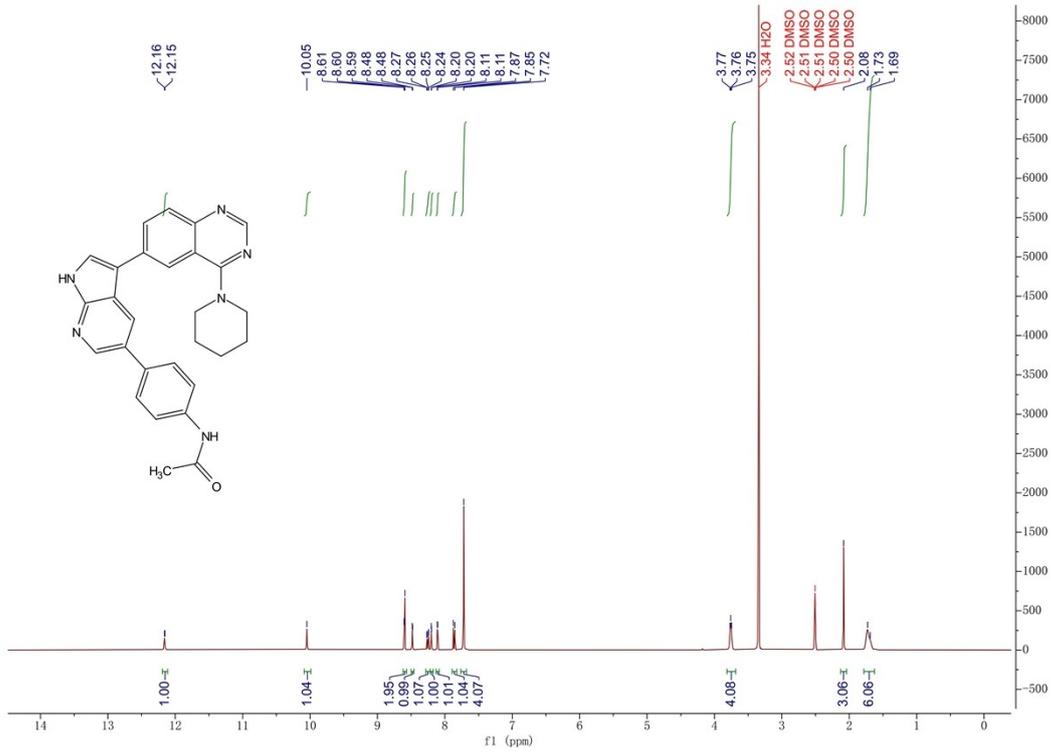


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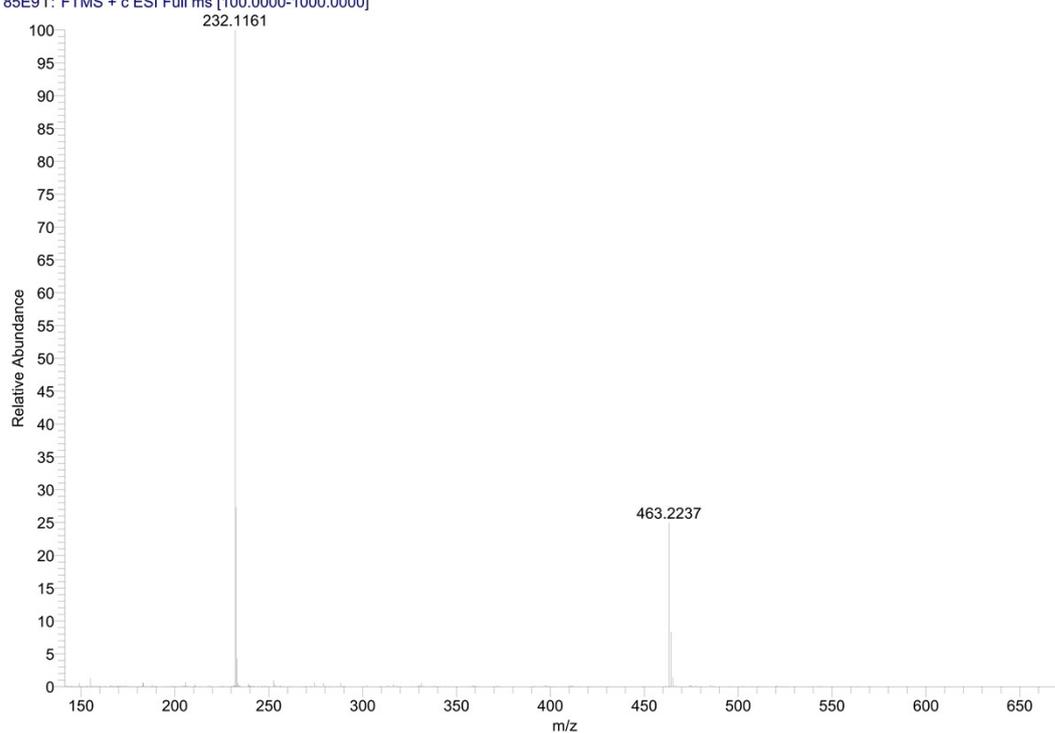
检测器A 254nm

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2	2.553	0.840
3	3.697	1.765
4	6.874	0.436
5	10.204	95.742
6	17.057	0.803
总计		100.000

Figure S11. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-11**

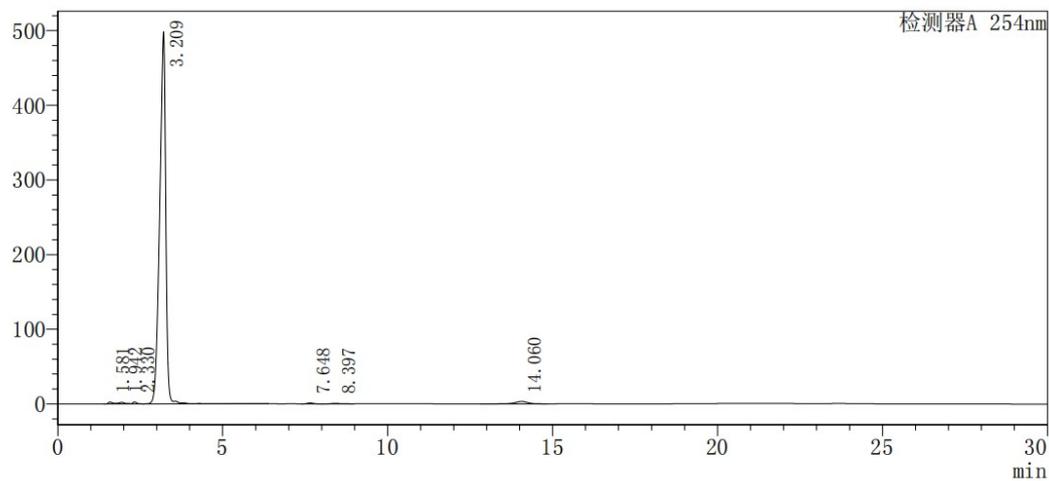


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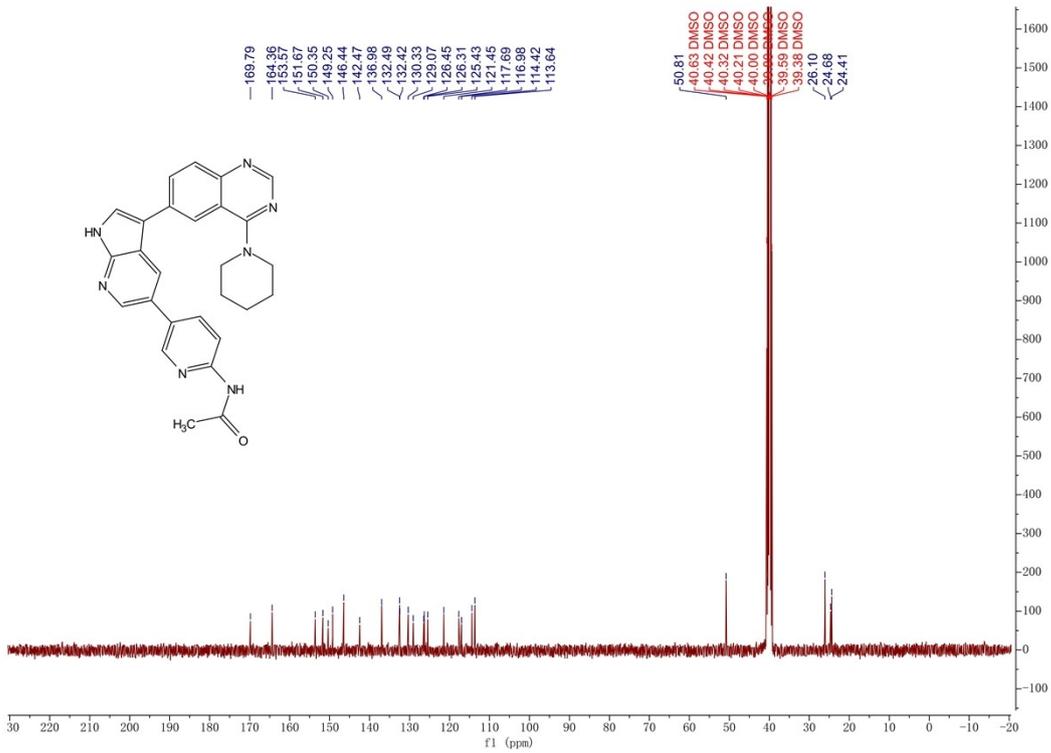
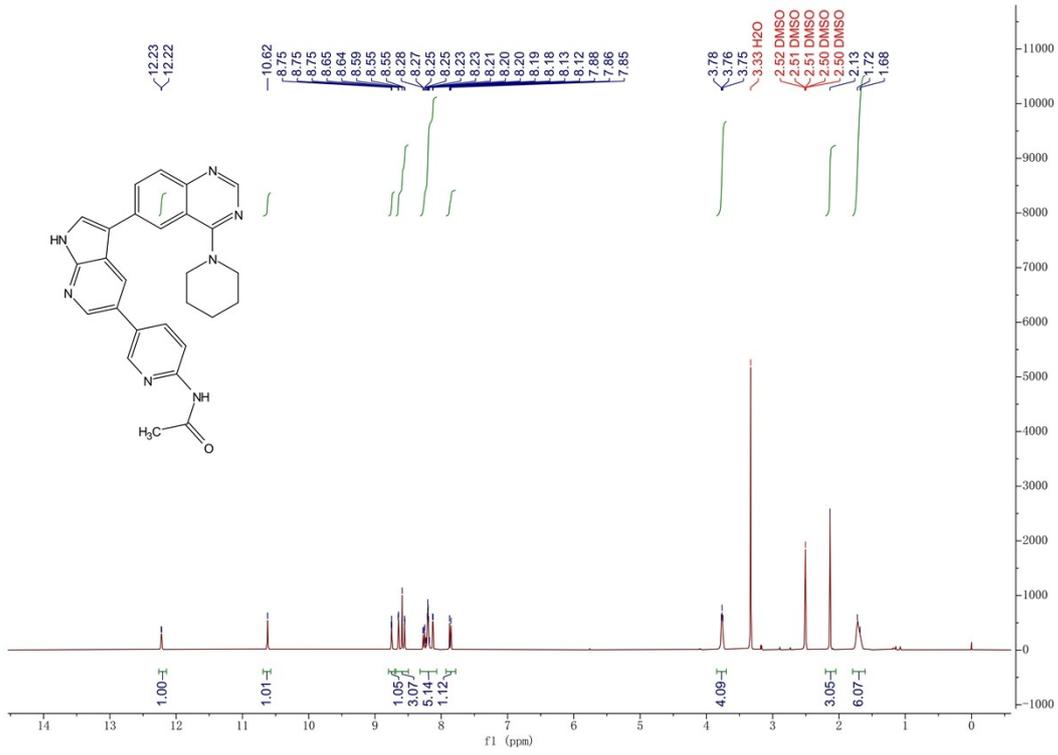


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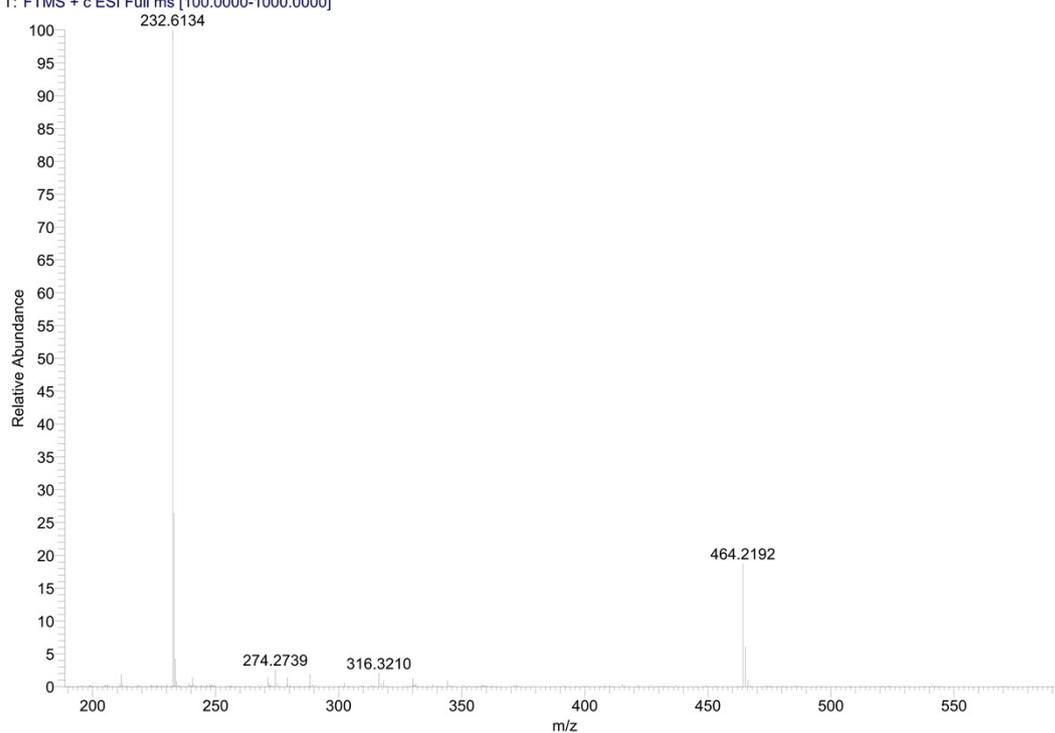
检测器A 254nm

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1	1.581	0.358
2	1.942	0.479
3	2.330	0.334
4	3.209	96.948
5	7.648	0.252
6	8.397	0.205
7	14.060	1.424
总计		100.000

Figure S12. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-12**

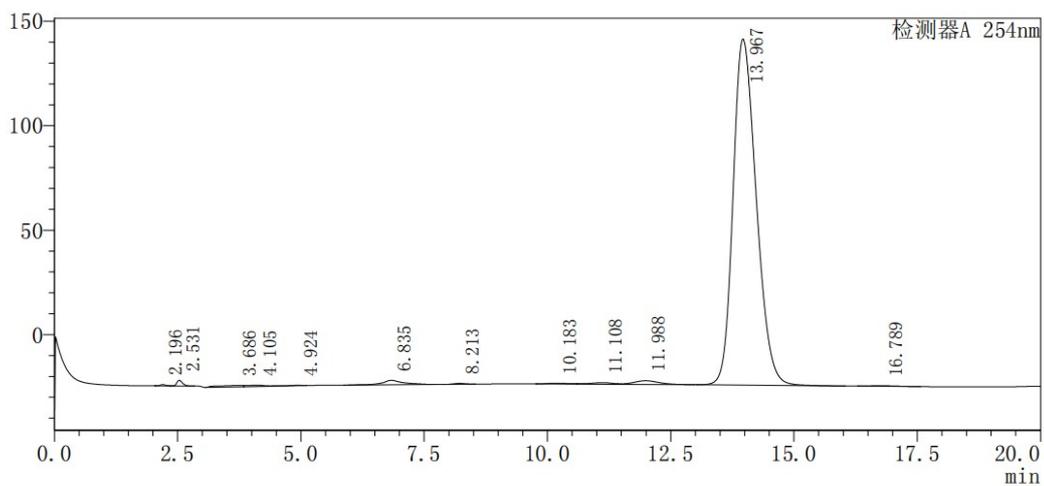


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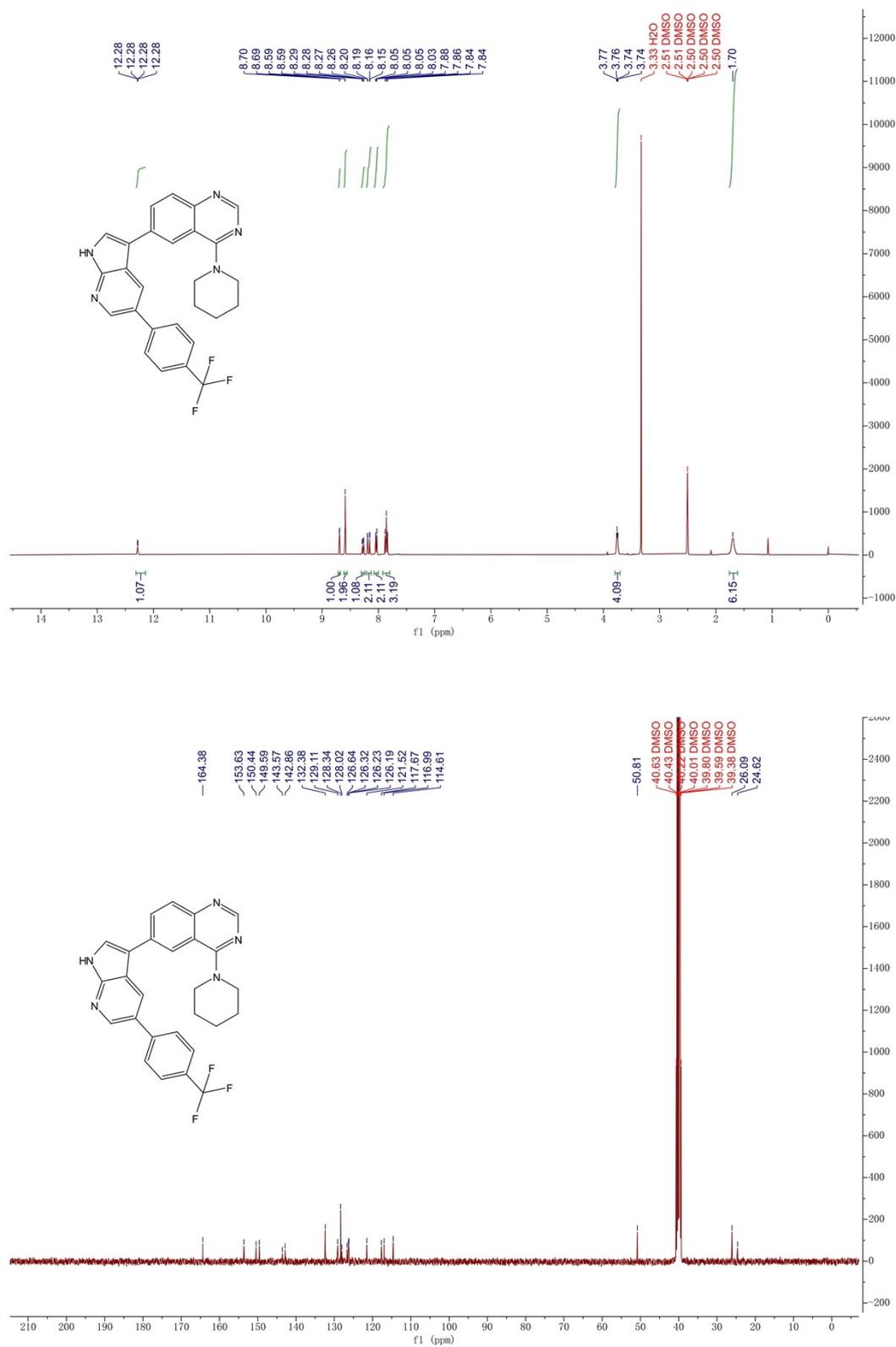


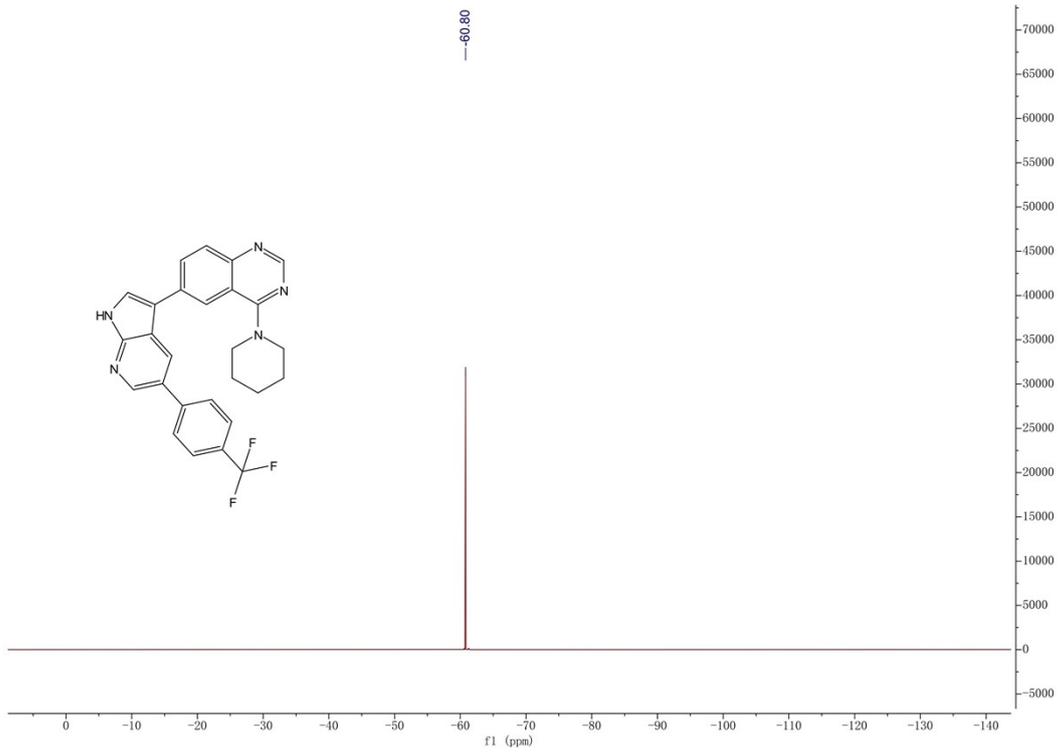
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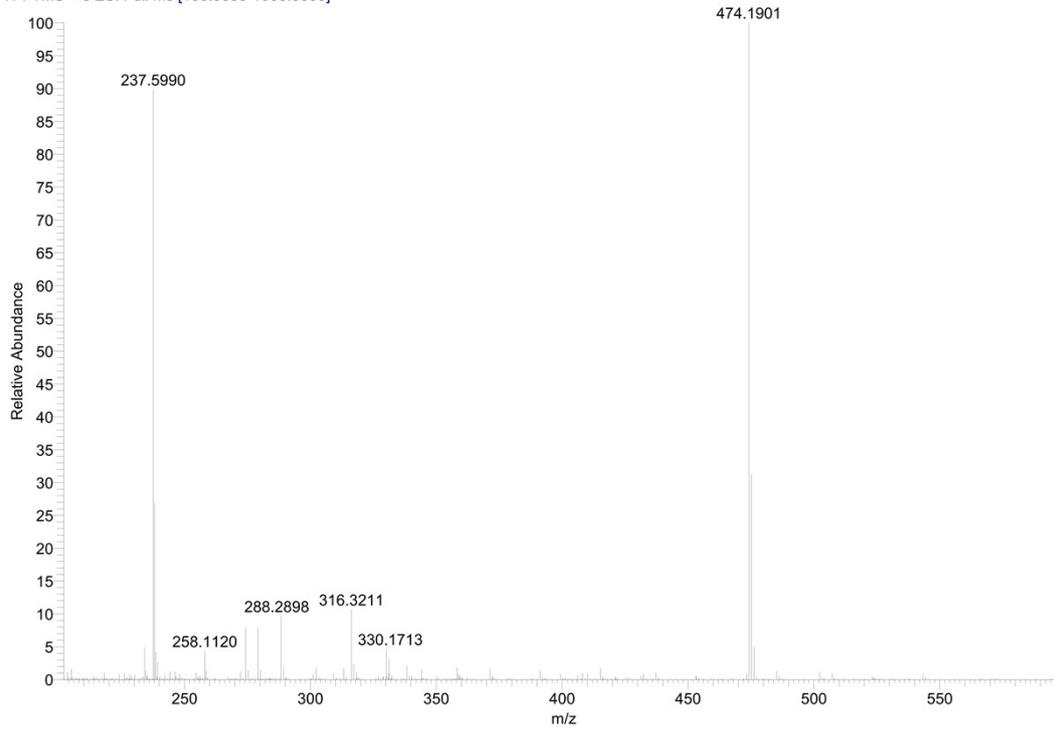
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2	2.531	0.405
3	3.686	0.451
4	4.105	0.270
5	4.924	0.085
6	6.835	1.178
7	8.213	0.111
8	10.183	0.218
9	11.108	0.440
10	11.988	1.117
11	13.967	95.456
12	16.789	0.170
总计		100.000

Figure S13. ¹H NMR, ¹³C NMR, HRMS and analytical HPLC trace for ZRMQ-13



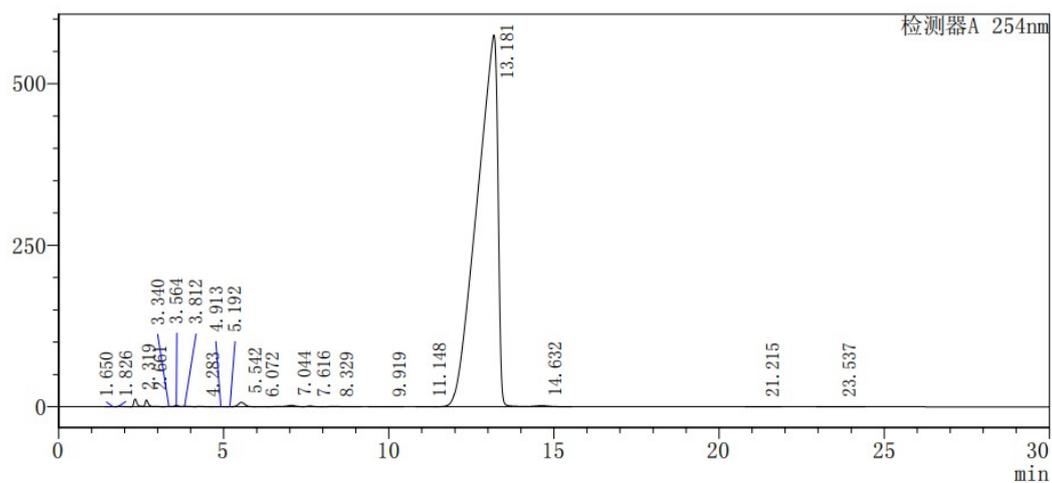


ZRMQ-14 #20-31 RT: 0.17-0.25 AV: 6 NL: 2.30E8
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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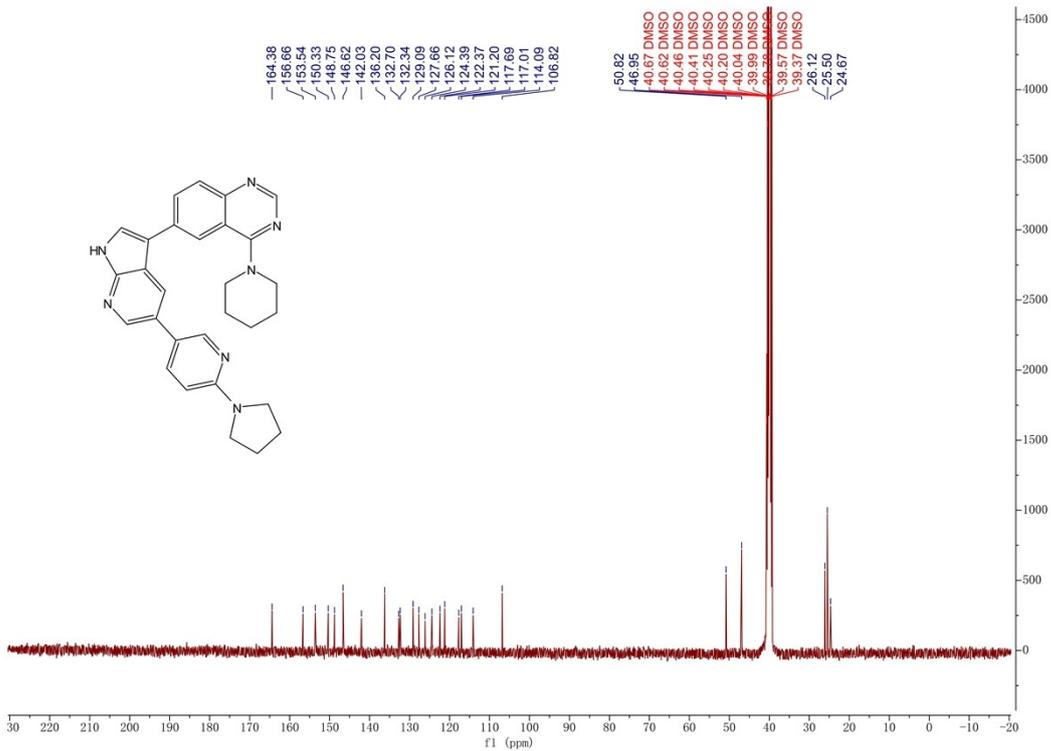
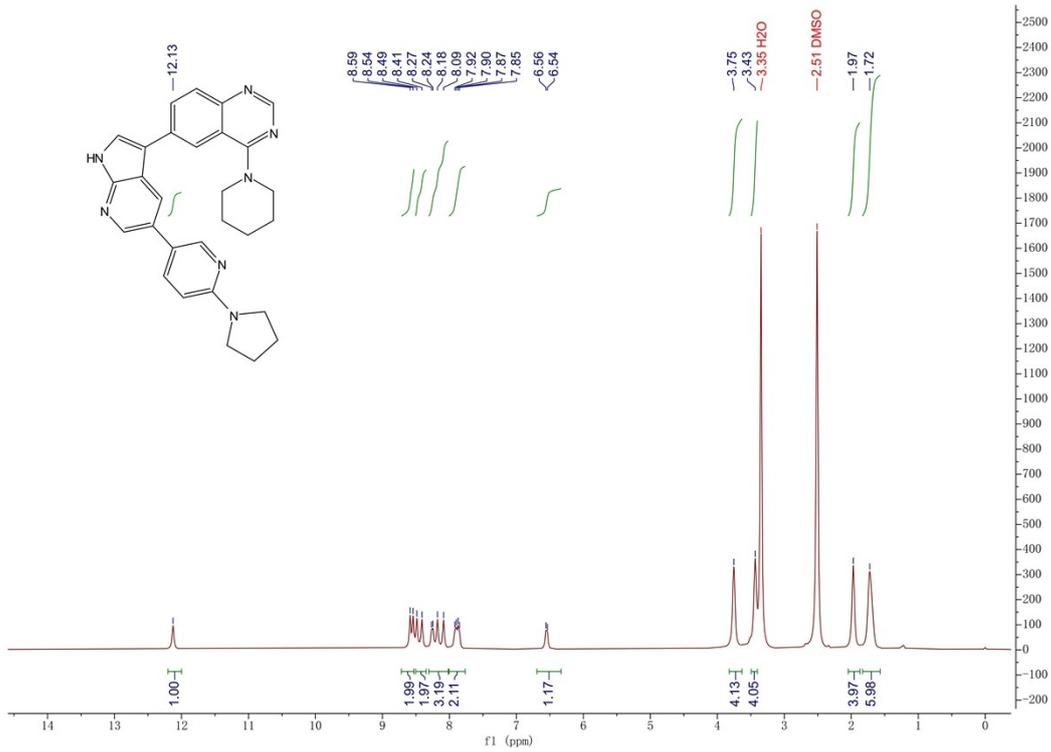


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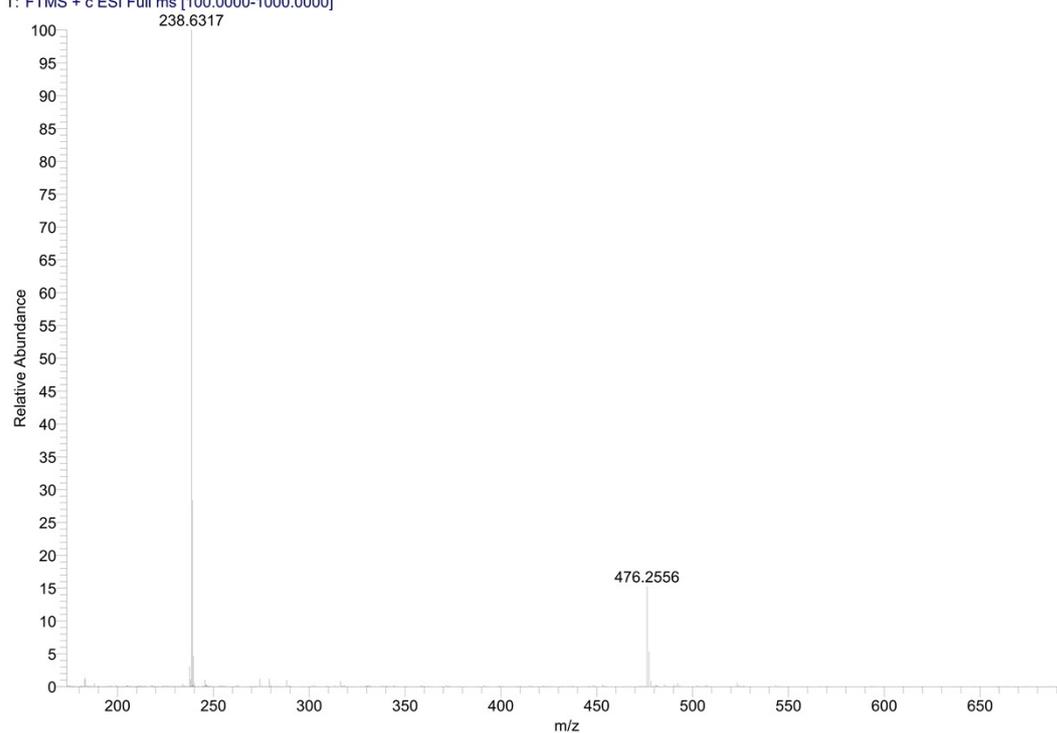
检测器A 254nm

峰号	保留时间	面积%
1	1.650	0.004
2	1.826	0.042
3	2.319	0.323
4	2.661	0.288
5	3.340	0.019
6	3.564	0.074
7	3.812	0.046
8	4.283	0.029
9	4.913	0.023
10	5.192	0.009
11	5.542	0.375
12	6.072	0.014
13	7.044	0.192
14	7.616	0.060
15	8.329	0.050
16	9.919	0.024
17	11.148	0.015
18	13.181	98.161
19	14.632	0.205
20	21.215	0.016
21	23.537	0.030
总计		100.000

Figure S14. ^1H NMR, ^{13}C NMR, ^{19}F NMR, HRMS and analytical HPLC trace for **ZRMQ-14**

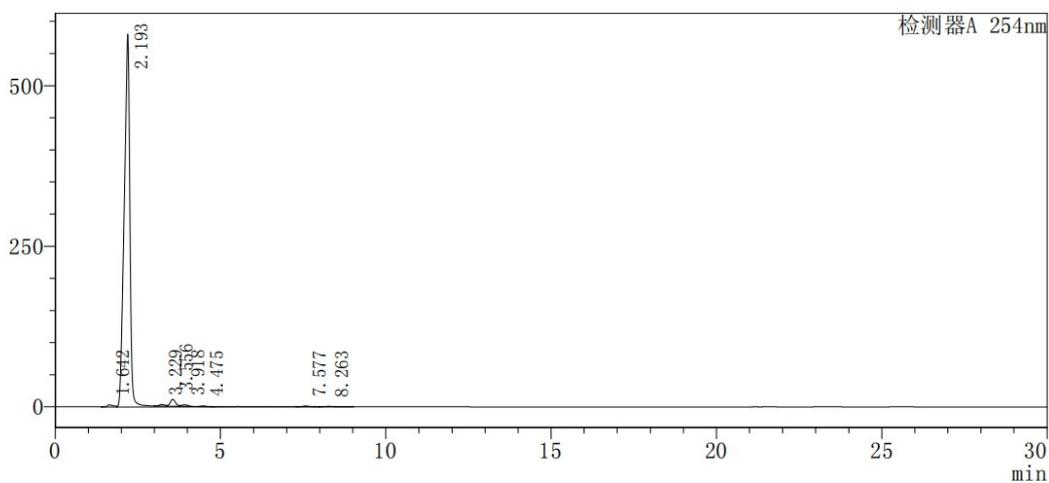


ZRMQ-15 #20-34 RT: 0.17-0.26 AV: 7 NL: 1.69E9
T: FTMS + c ESI Full ms [100.0000-1000.0000]



<色谱图>

mV

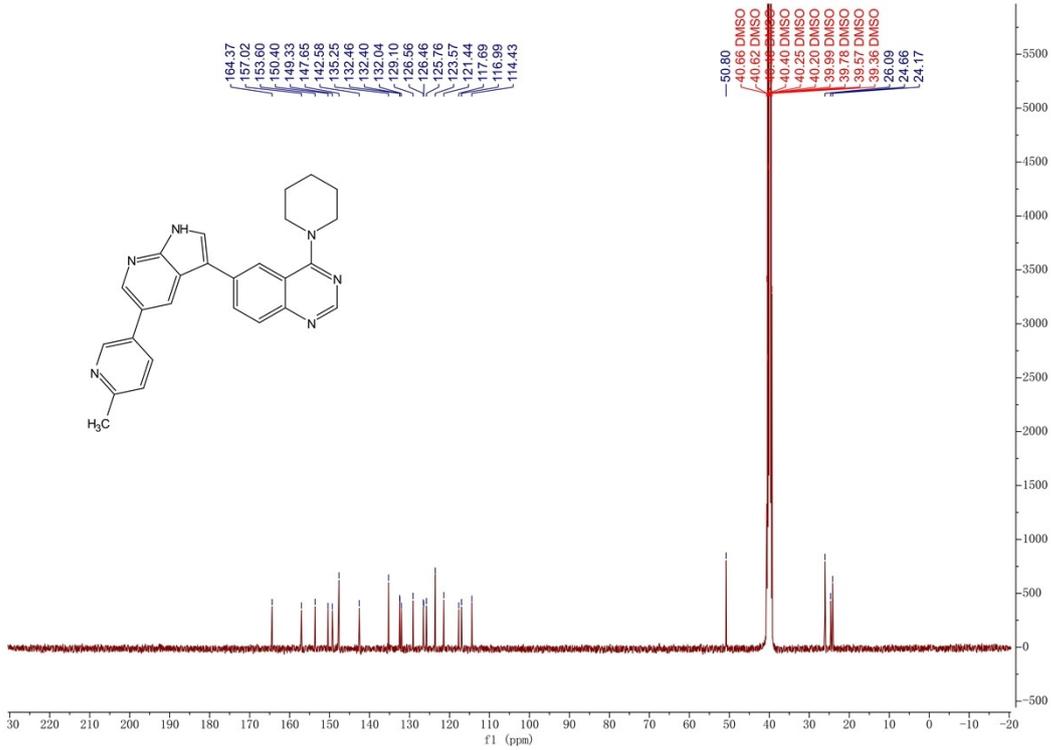
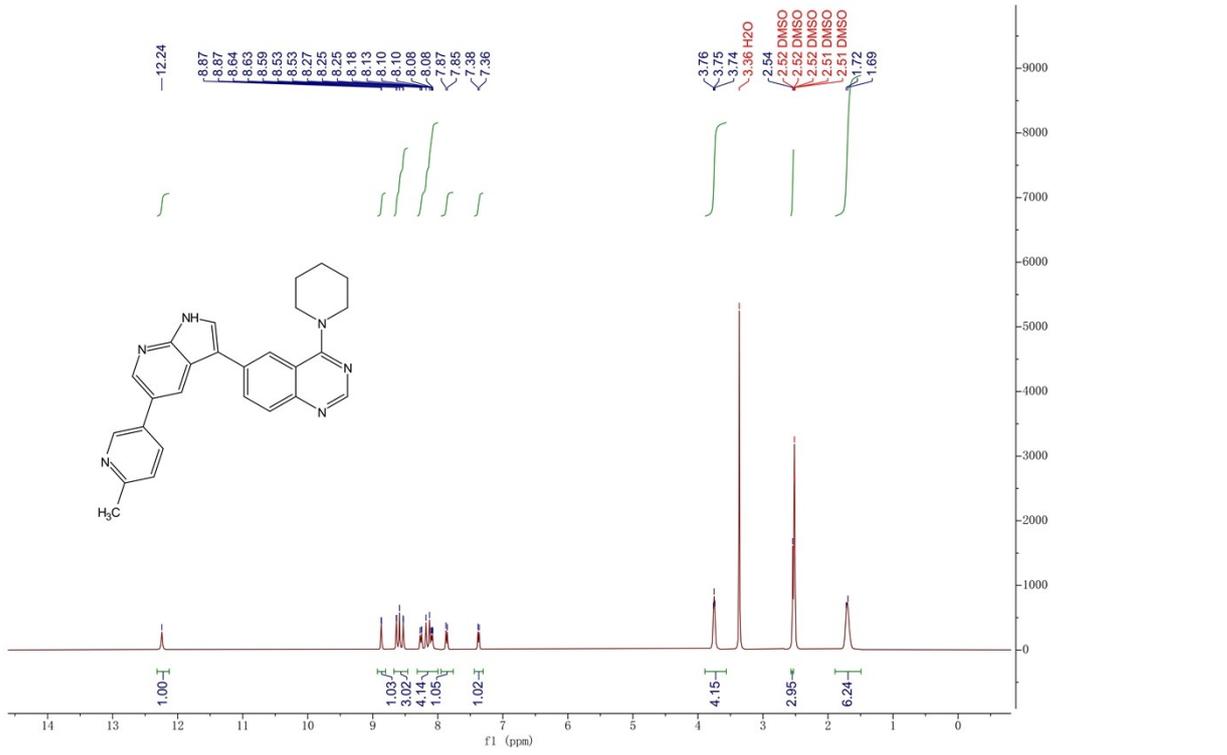


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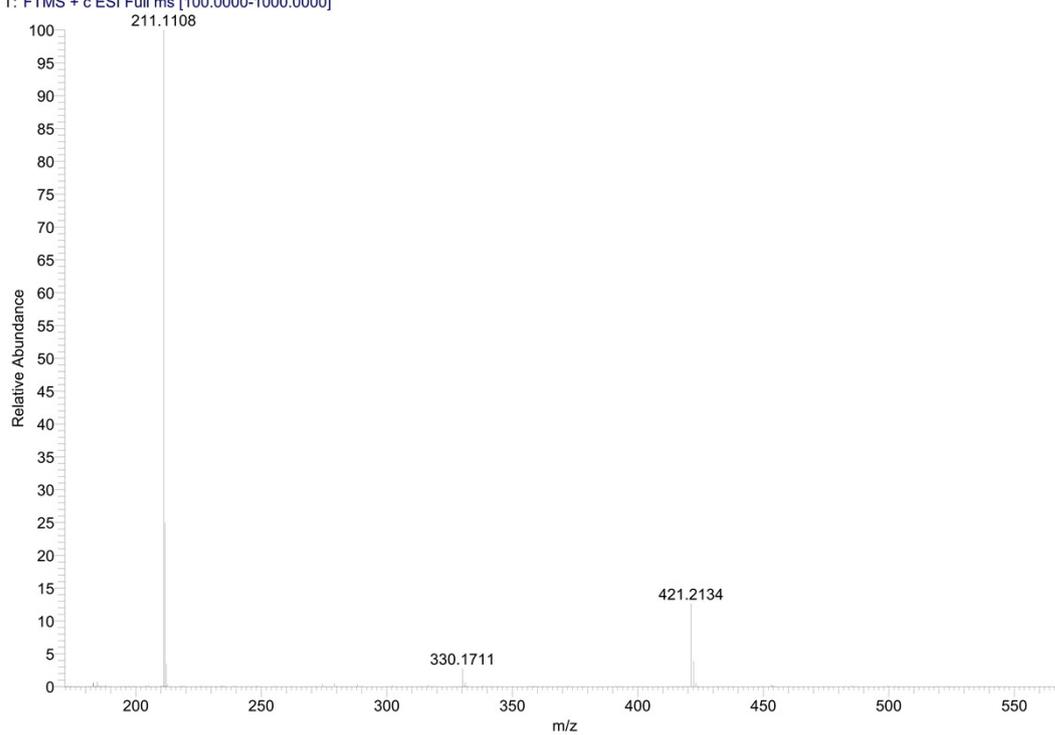
检测器A 254nm

峰号	保留时间	面积%
1	1.642	0.567
2	2.193	96.162
3	3.229	0.435
4	3.556	1.669
5	3.918	0.465
6	4.475	0.202
7	7.577	0.279
8	8.263	0.221
总计		100.000

Figure S15. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-15**

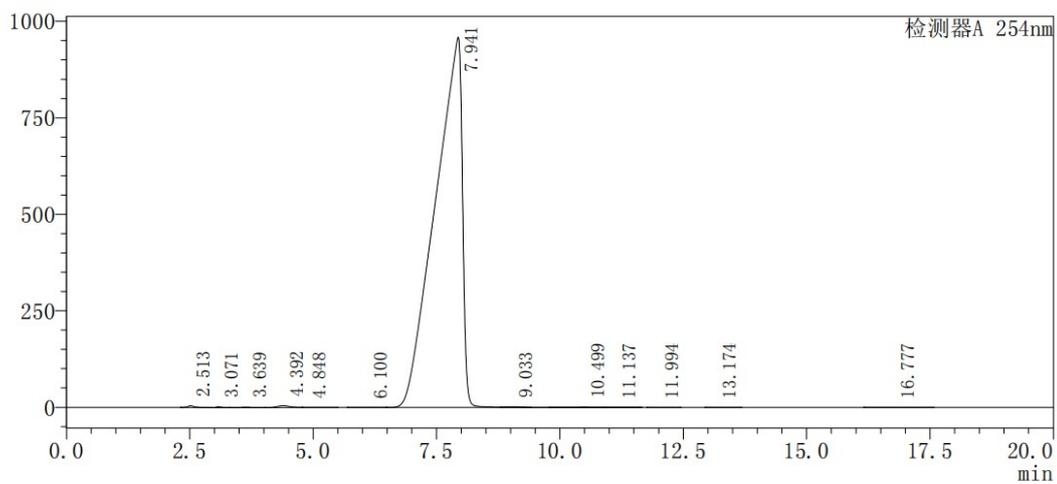


ZRMQ-16 #20-35 RT: 0.17-0.28 AV: 8 NL: 4.08E9
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV

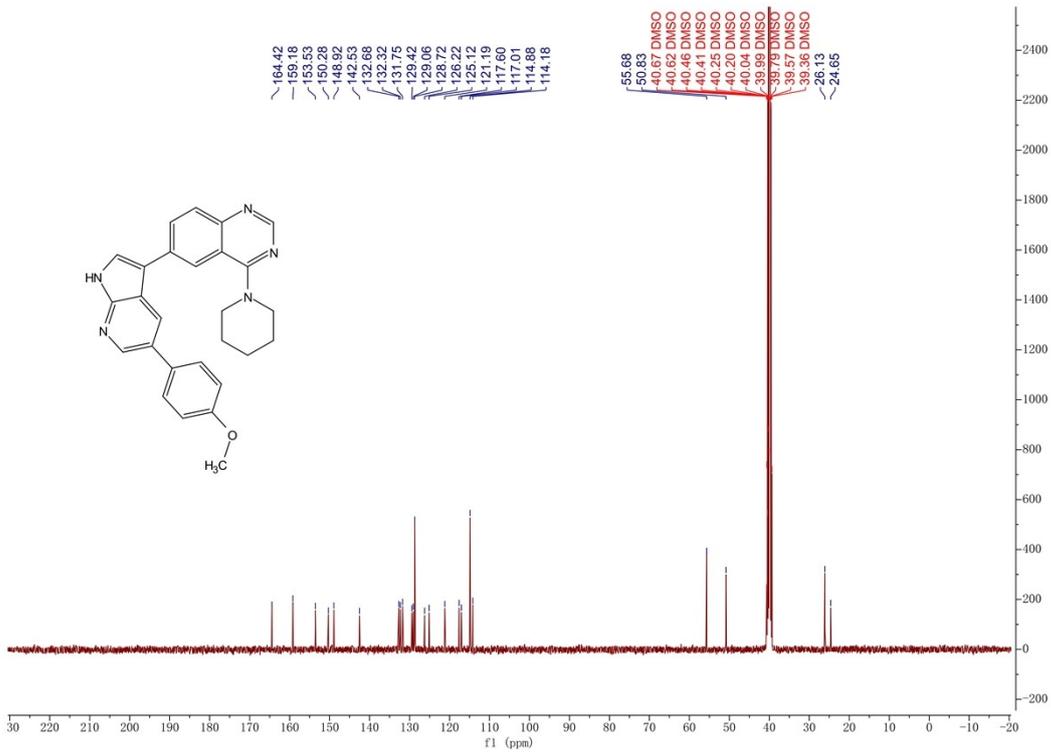
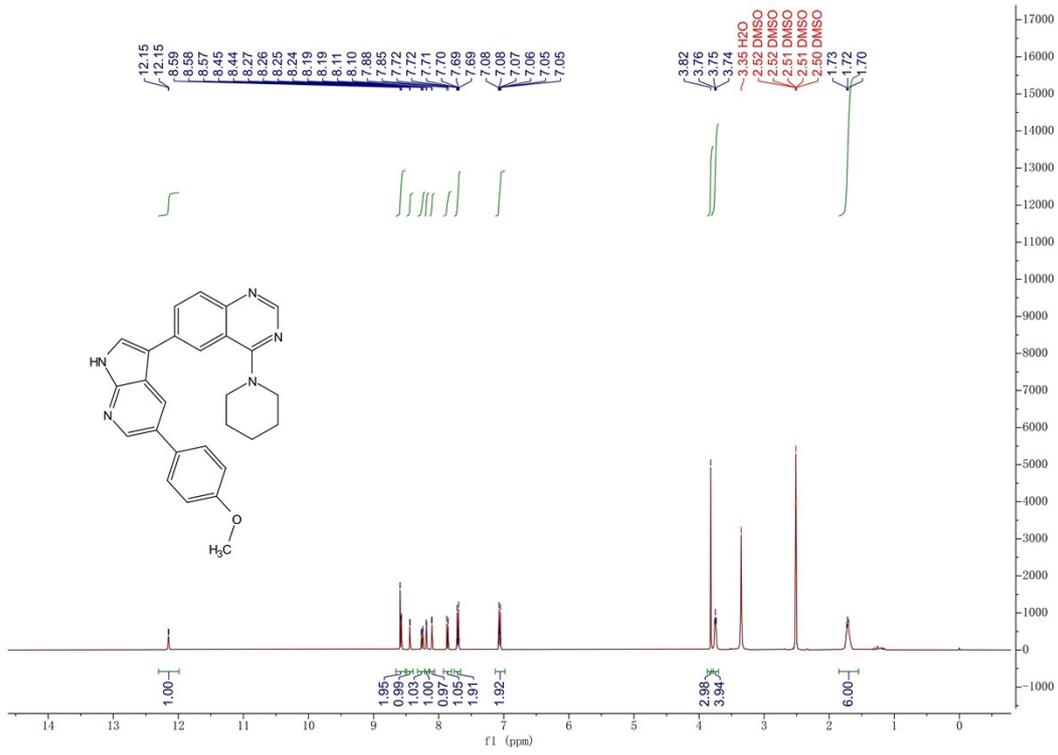


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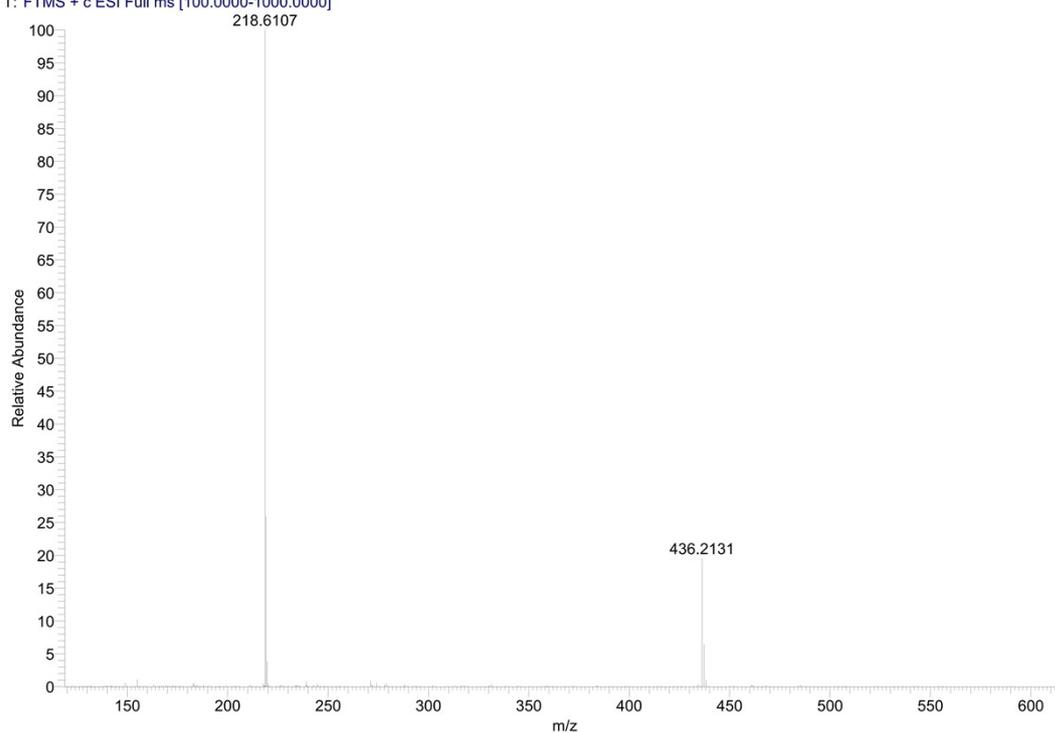
检测器A 254nm

峰号	保留时间	面积%
1	2.513	0.128
2	3.071	0.050
3	3.639	0.069
4	4.392	0.235
5	4.848	0.023
6	6.100	0.037
7	7.941	99.305
8	9.033	0.043
9	10.499	0.045
10	11.137	0.025
11	11.994	0.004
12	13.174	0.003
13	16.777	0.032
总计		100.000

Figure S16. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-16**

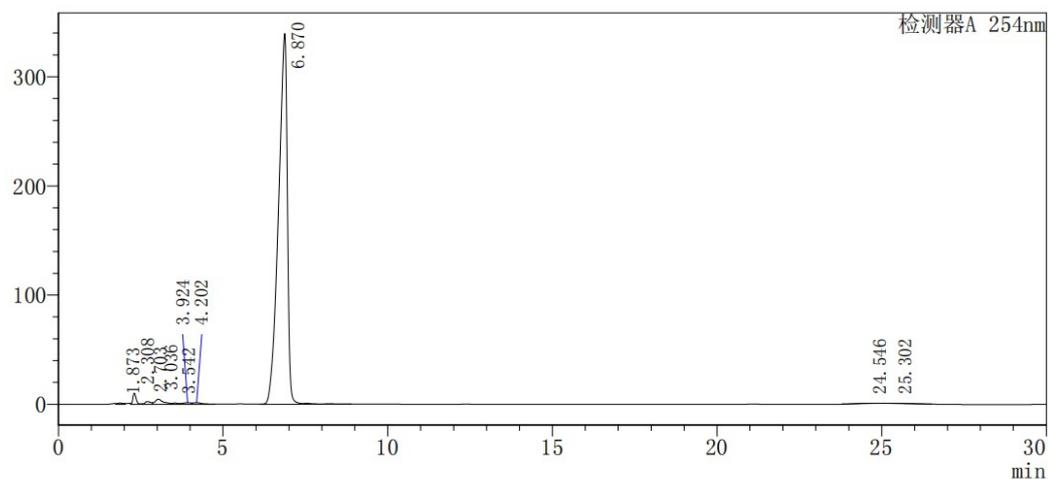


ZRMQ-17 #21-30 RT: 0.17-0.23 AV: 5 NL: 4.36E9
 T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV

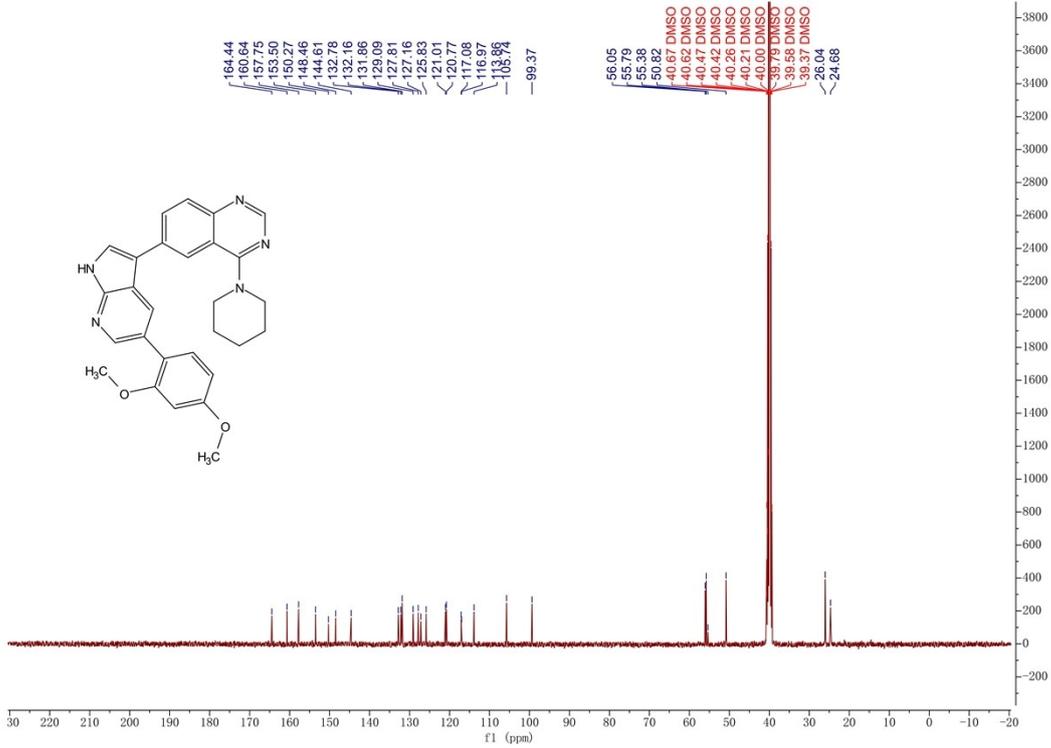
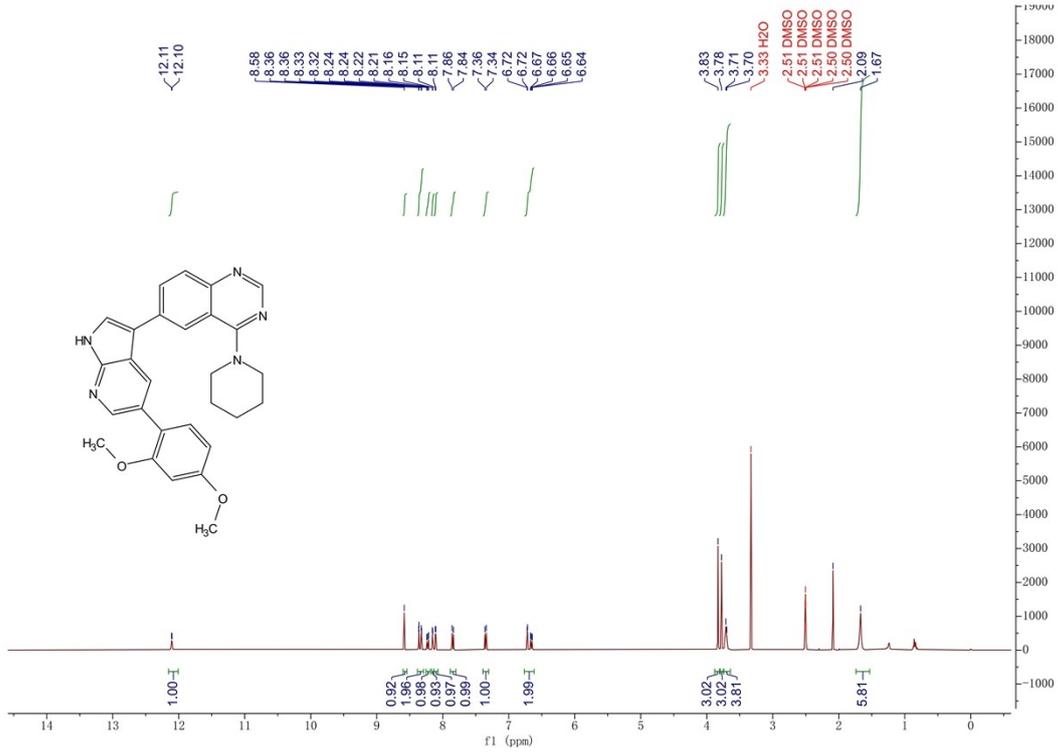


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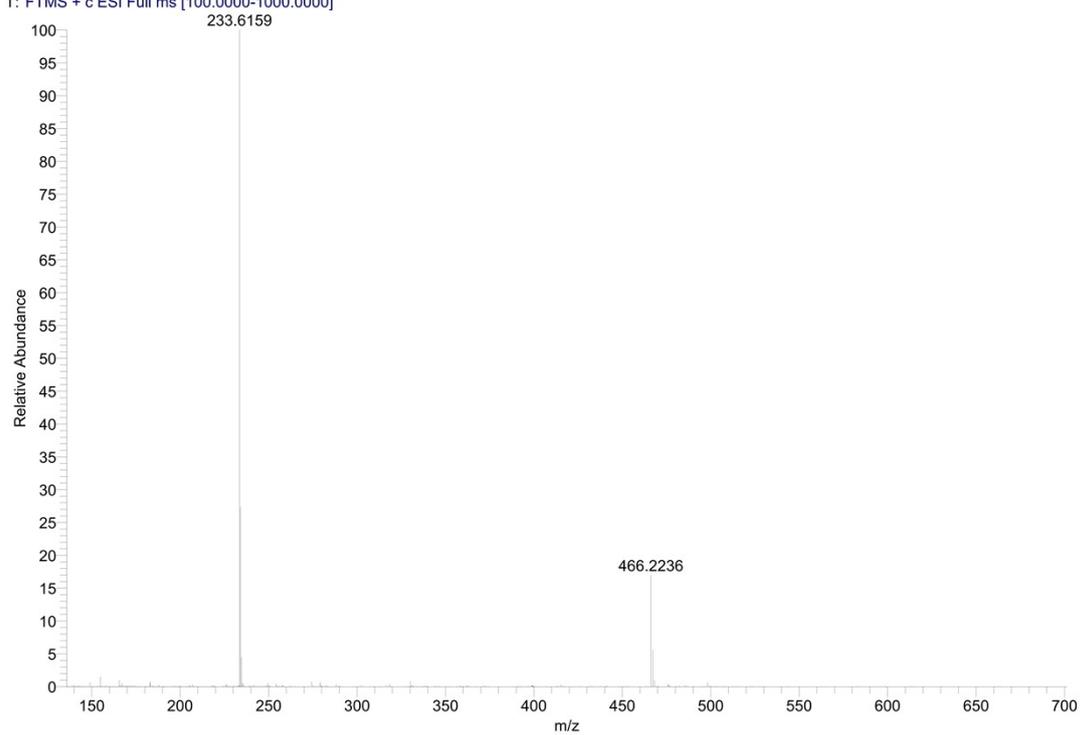
检测器A 254nm

峰号	保留时间	面积%
1	1.873	0.259
2	2.308	1.101
3	2.703	0.465
4	3.036	1.259
5	3.542	0.213
6	3.924	0.400
7	4.202	0.478
8	6.870	95.487
9	24.546	0.164
10	25.302	0.175
总计		100.000

Figure S17. ¹H NMR, ¹³C NMR, HRMS and analytical HPLC trace for ZRMQ-17

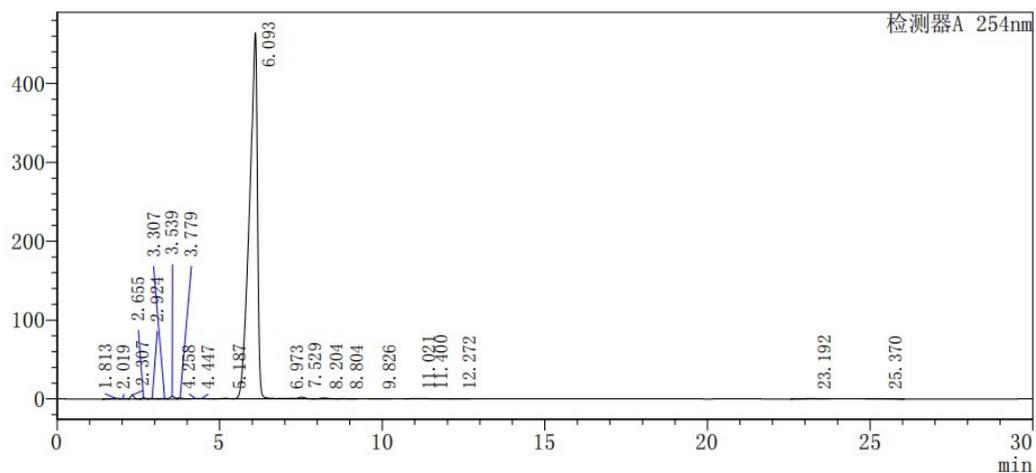


ZRMQ-18 #20-32 RT: 0.16-0.24 AV: 6 NL: 3.43E9
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV



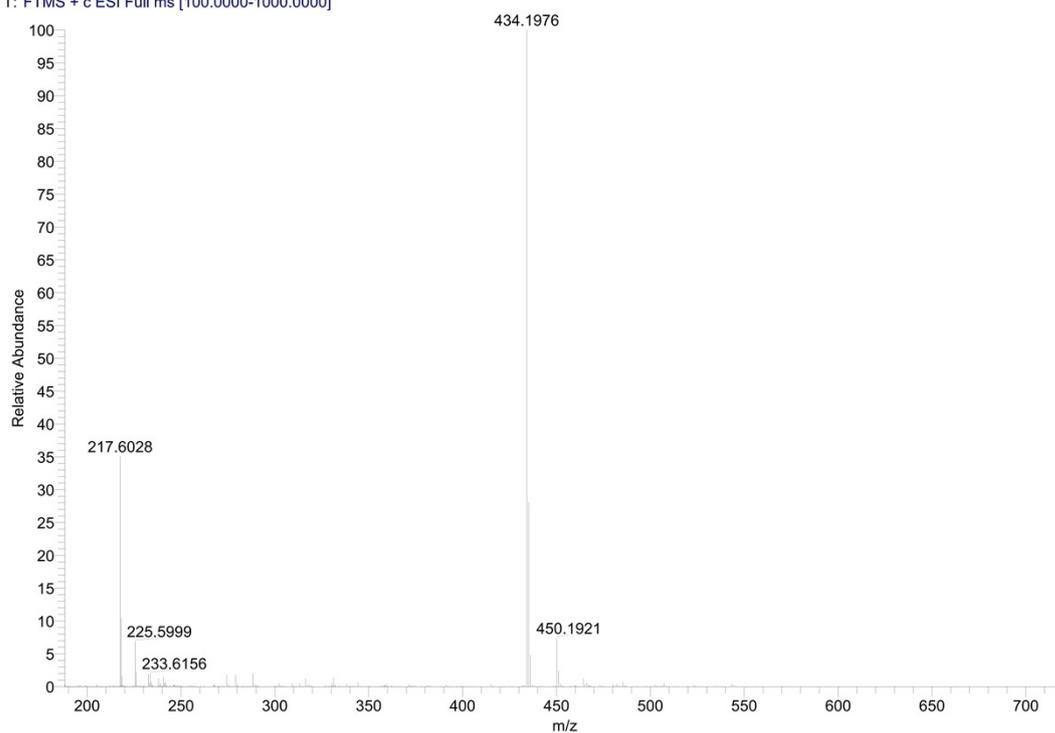
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检测器A 254nm

峰号	保留时间	面积%
1	1.813	0.181
2	2.019	0.115
3	2.307	0.456
4	2.655	0.175
5	2.924	0.134
6	3.307	0.121
7	3.539	0.396
8	3.779	0.166
9	4.258	0.088
10	4.447	0.121
11	5.187	0.196
12	6.093	96.594
13	6.973	0.028
14	7.529	0.344
15	8.204	0.255
16	8.804	0.068
17	9.826	0.038
18	11.021	0.167
19	11.400	0.101
20	12.272	0.033
21	23.192	0.164
22	25.370	0.059
总计		100.000

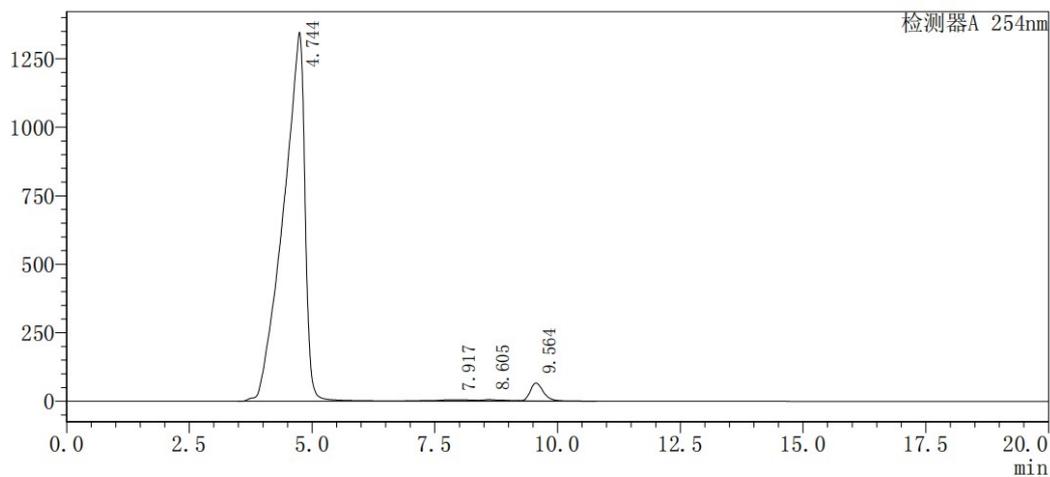
Figure S18. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-18**

ZRMQ-19 #20-32 RT: 0.16-0.24 AV: 6 NL: 1.18E9
 T: FTMS + c ESI Full ms [100.0000-1000.0000]



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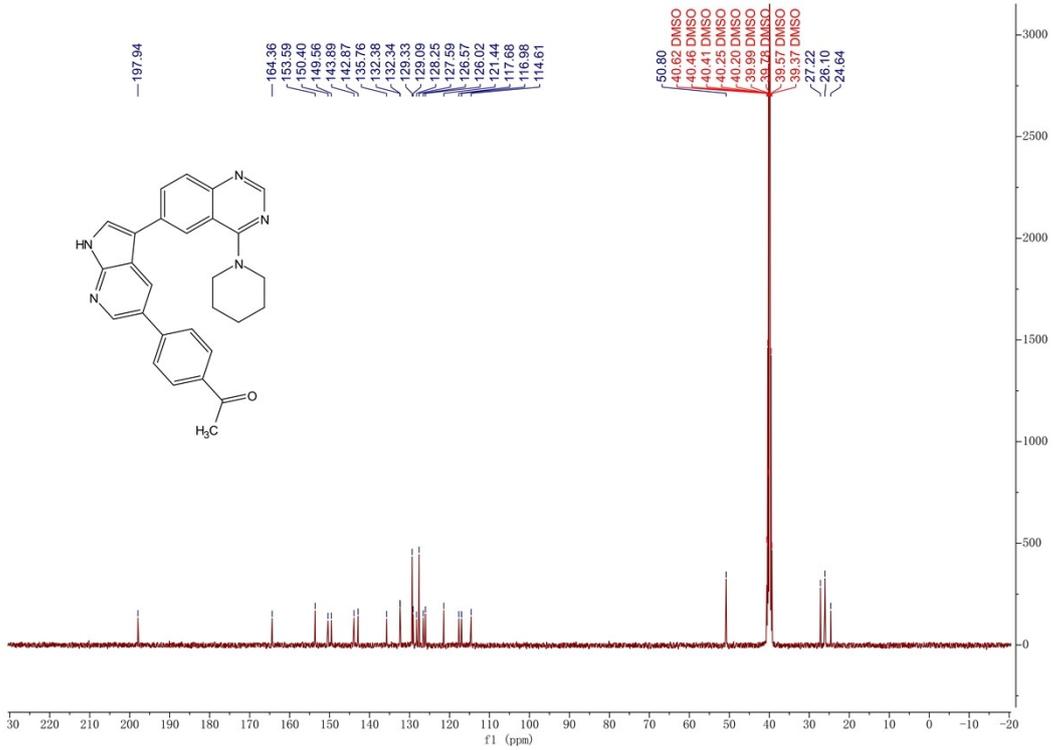
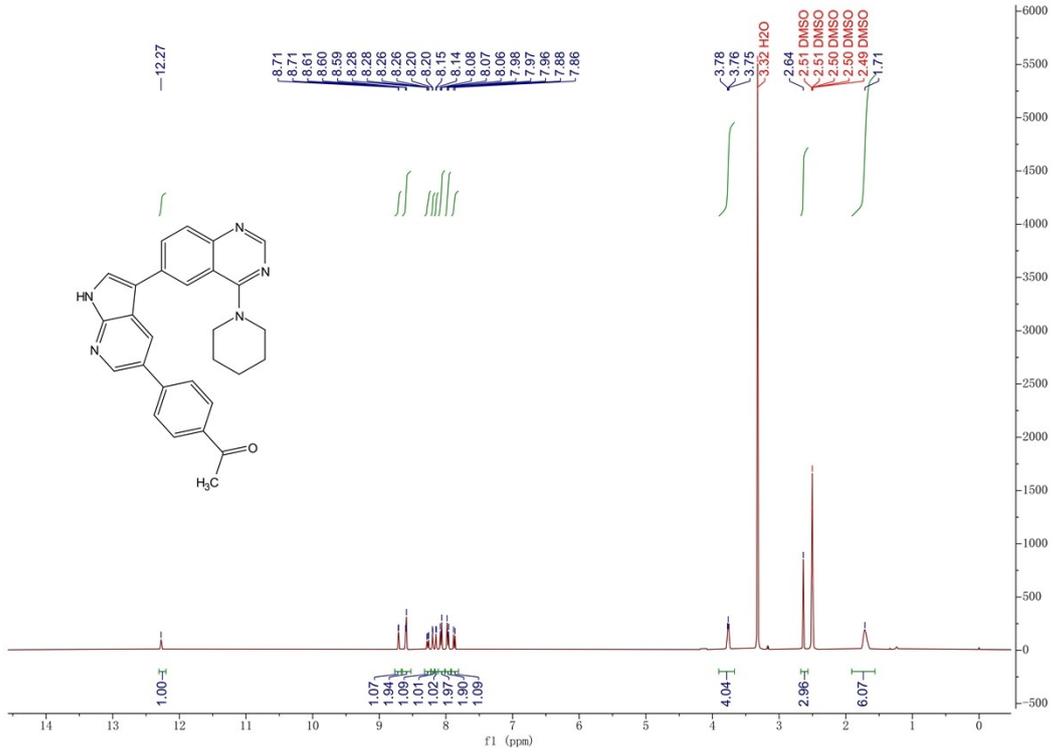


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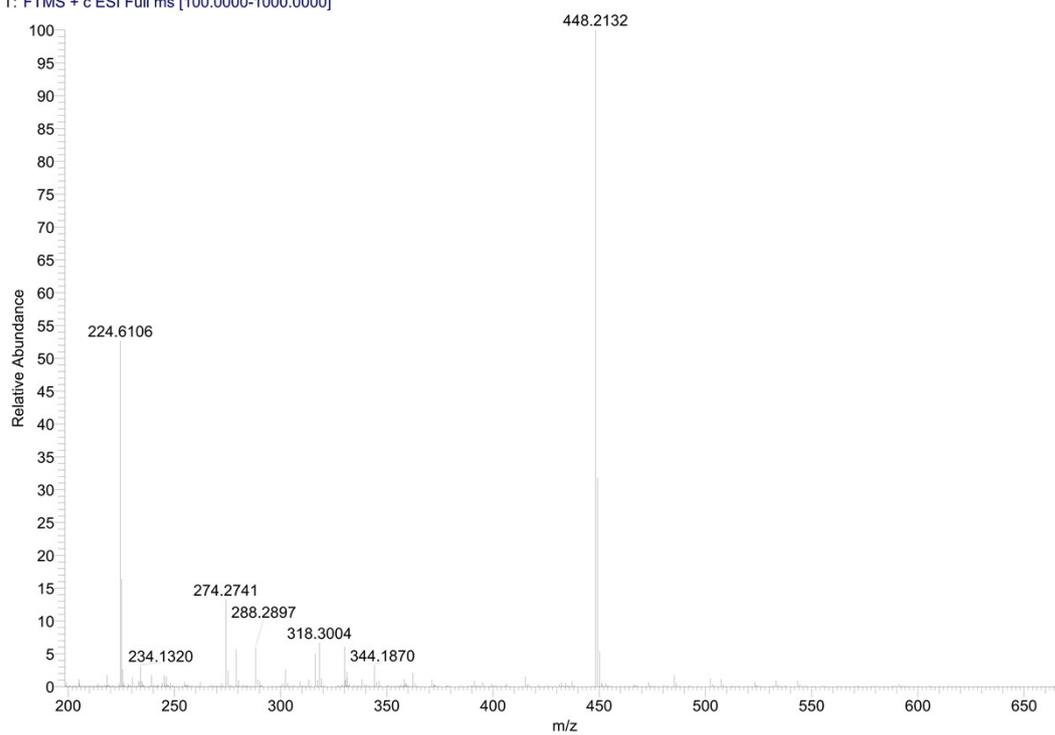
检测器A 254nm

峰号	保留时间	面积%
1	4.744	96.264
2	7.917	0.480
3	8.605	0.358
4	9.564	2.898
总计		100.000

Figure S19. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-19**

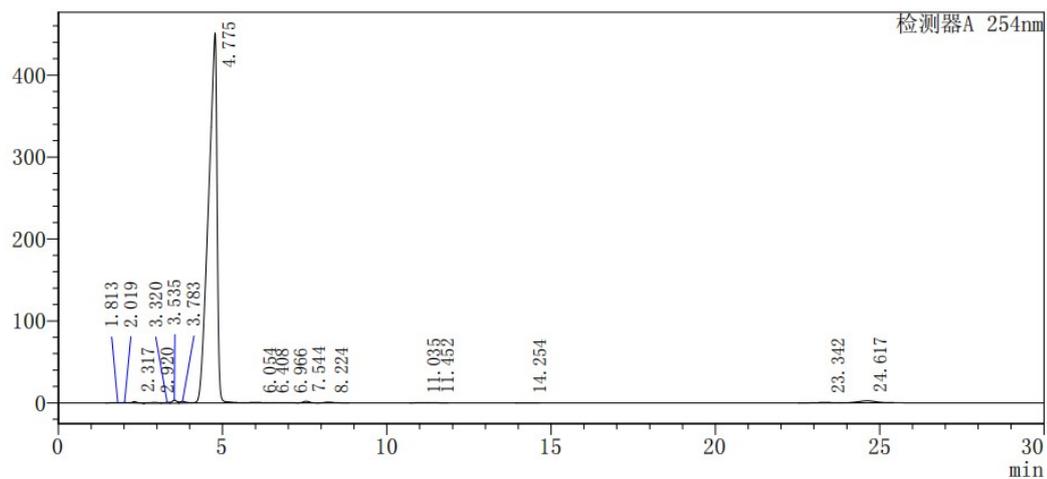


ZRMQ-20 #20-31 RT: 0.17-0.24 AV: 6 NL: 3.64E8
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV



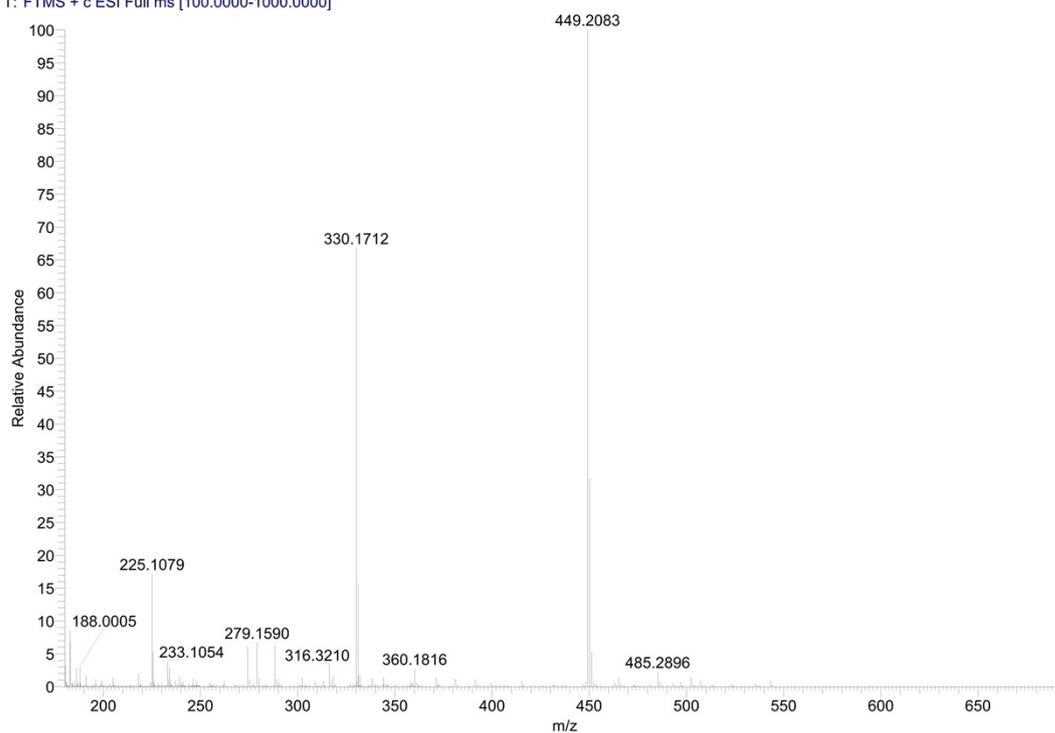
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检测器A 254nm

峰号	保留时间	面积%
1	1.813	0.063
2	2.019	0.088
3	2.317	0.233
4	2.920	0.211
5	3.320	0.124
6	3.535	0.424
7	3.783	0.328
8	4.775	95.933
9	6.054	0.280
10	6.408	0.053
11	6.966	0.169
12	7.544	0.345
13	8.224	0.246
14	11.035	0.098
15	11.452	0.060
16	14.254	0.023
17	23.342	0.227
18	24.617	1.096
总计		100.000

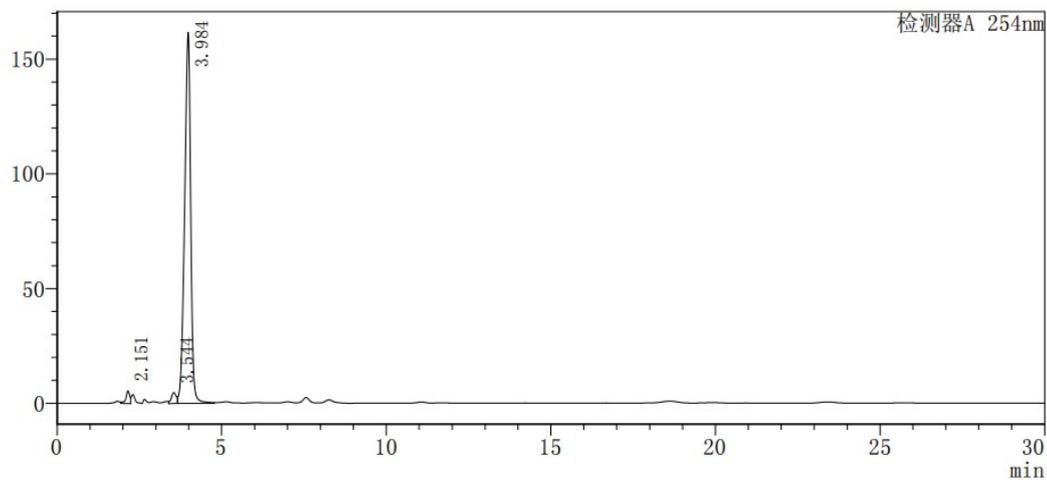
Figure S20. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-20**

ZRMQ-21 #19-33 RT: 0.15-0.26 AV: 8 NL: 2.94E8
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV

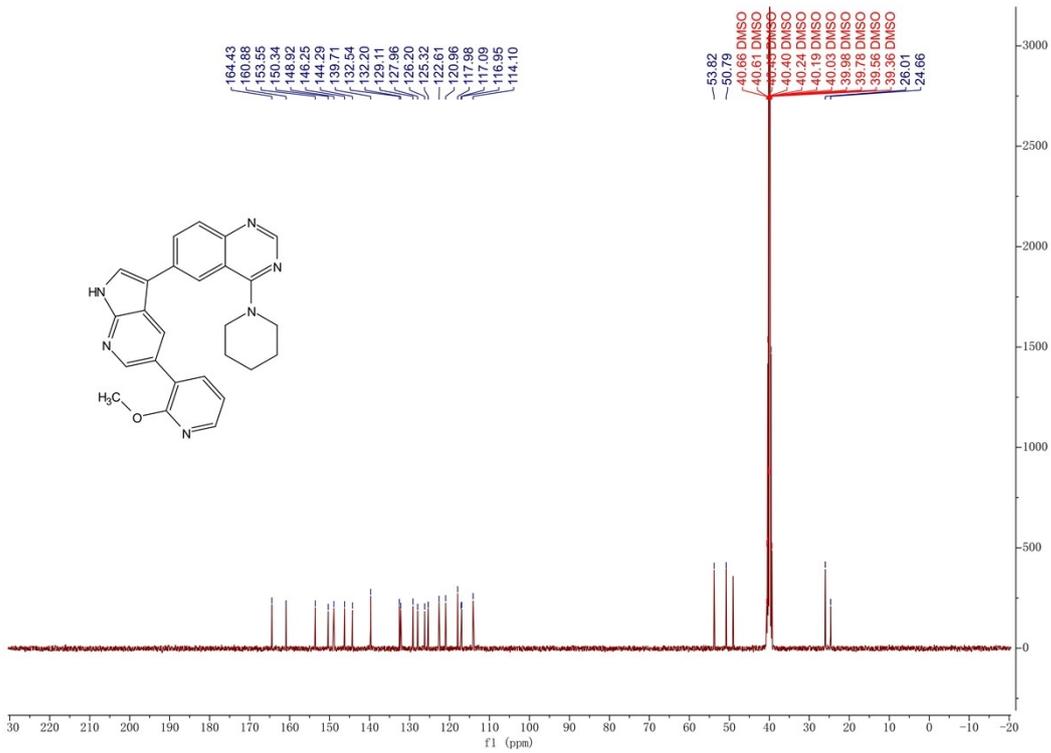
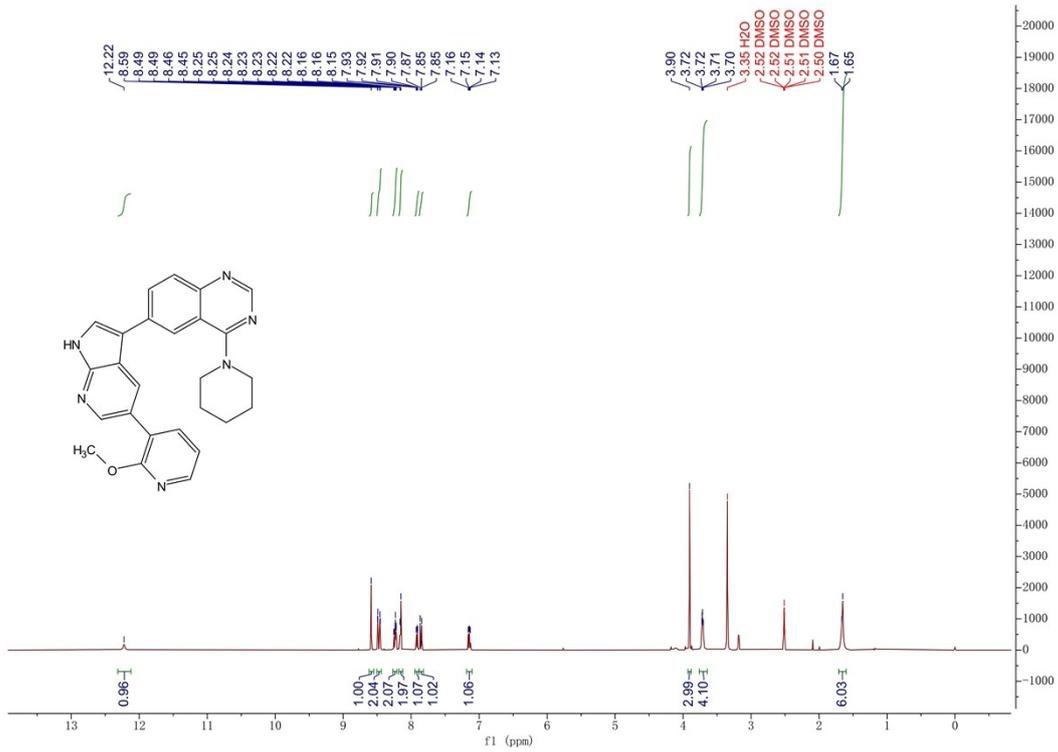


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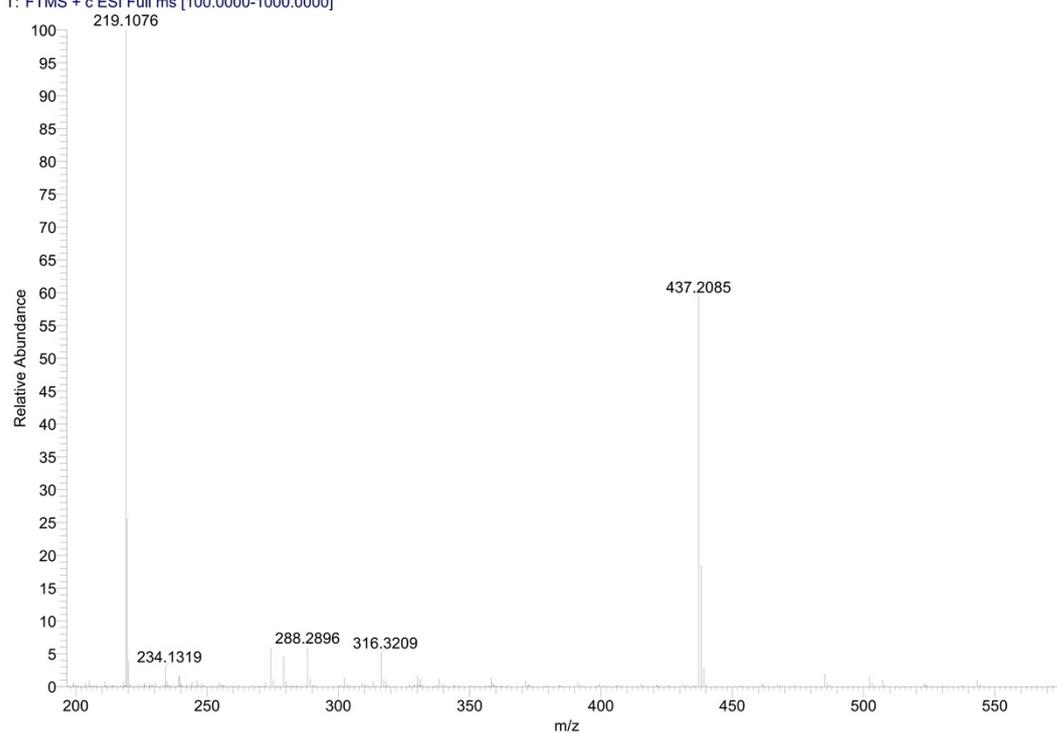
检测器A 254nm

峰号	保留时间	面积%
1	2.151	2.050
2	3.544	2.278
3	3.984	95.672
总计		100.000

Figure S21. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-21

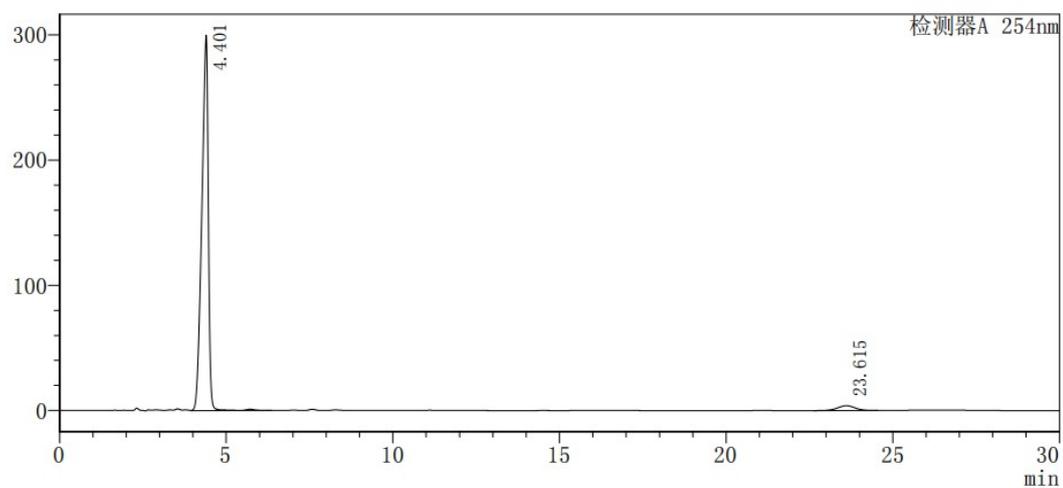


ZRMQ-22 #22-29 RT: 0.18-0.23 AV: 4 NL: 4.20E8
T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV

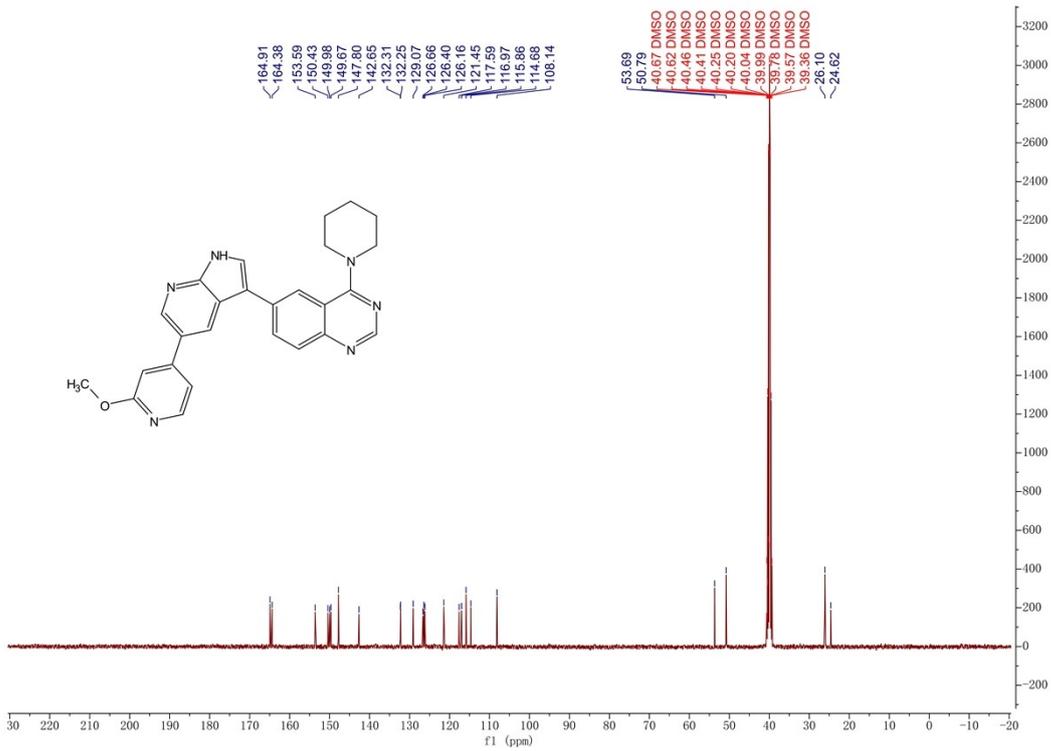
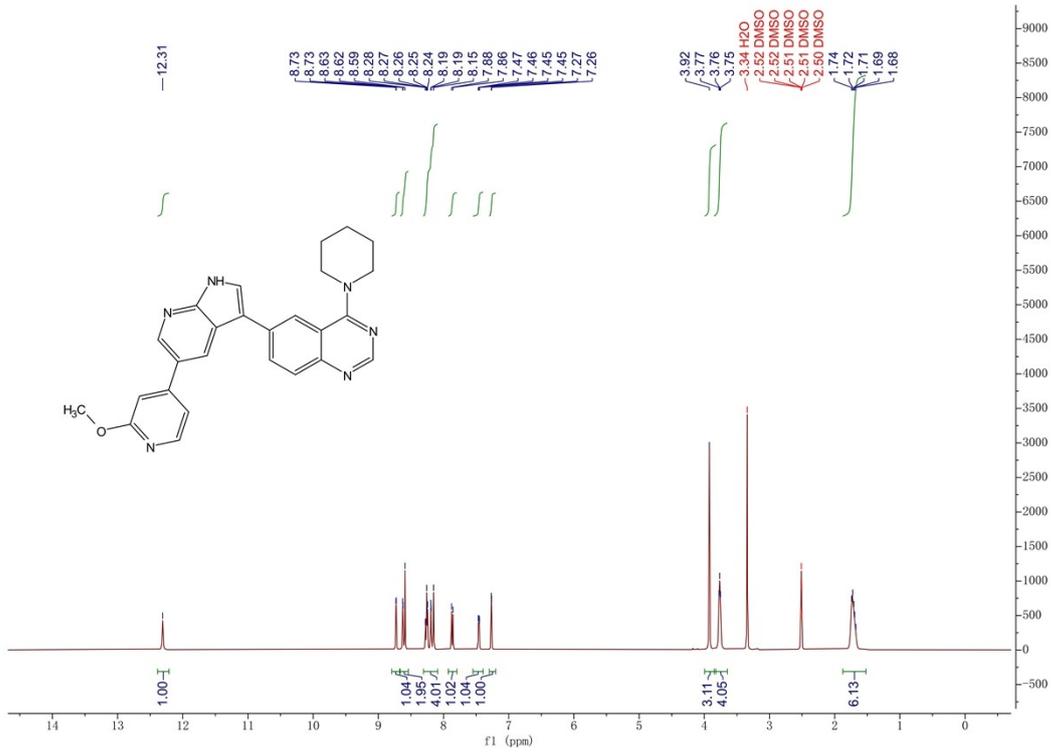


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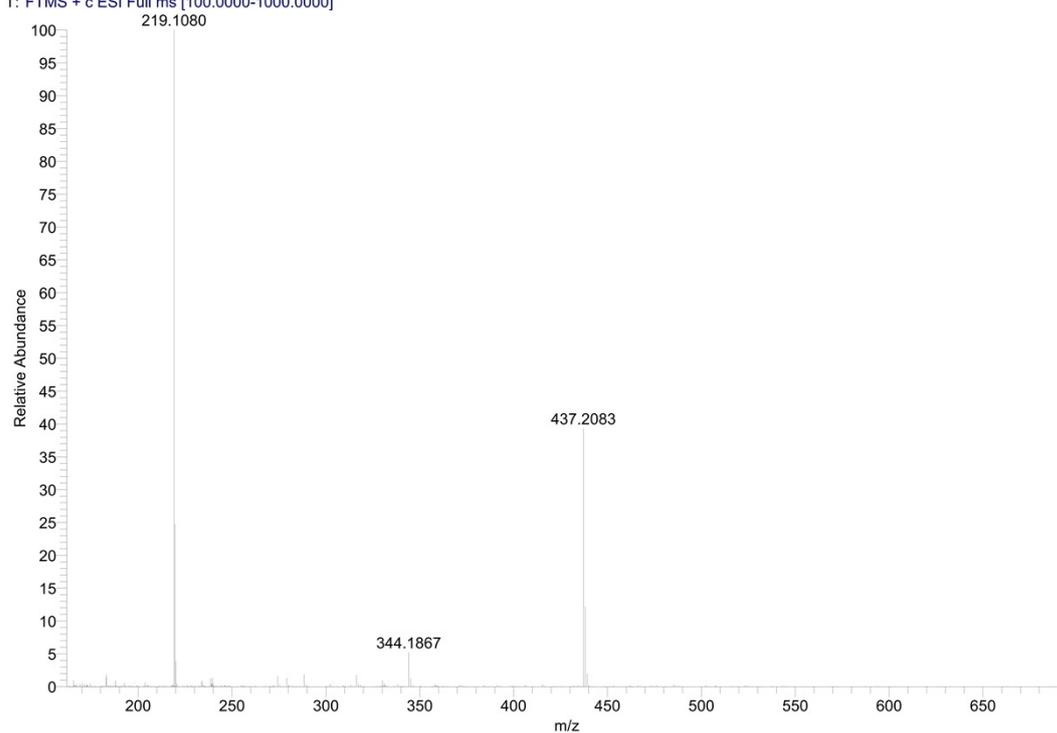
检测器A 254nm

峰号	保留时间	面积%
1	4.401	96.645
2	23.615	3.355
总计		100.000

Figure S22. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for ZRMQ-22

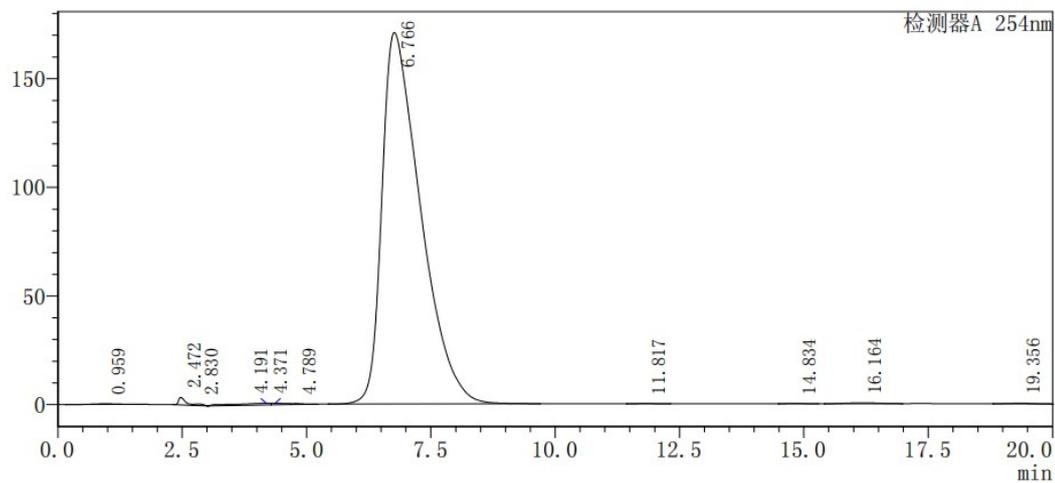


ZRMQ-23 #21-30 RT: 0.17-0.23 AV: 5 NL: 1.48E9
 T: FTMS + c ESI Full ms [100.0000-1000.0000]



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mV



<峰表>

检测器A 254nm

峰号	保留时间	面积%
1	0.959	0.149
2	2.472	0.327
3	2.830	0.091
4	4.191	0.482
5	4.371	0.158
6	4.789	0.076
7	6.766	98.380
8	11.817	0.022
9	14.834	0.023
10	16.164	0.190
11	19.356	0.101
总计		100.000

Figure S23. ^1H NMR, ^{13}C NMR, HRMS and analytical HPLC trace for **ZRMQ-23**