

Supplementary Data

Discovery of *N*,4-Di(1*H*-pyrazol-4-yl)pyrimidin-2-amine-Derived CDK2 Inhibitors as Potential Anticancer Agents: Design, Synthesis & Evaluation

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Content

Figures S1-S65. ¹H & ¹³C NMR spectra, HRMS & HPLC chromatograms of **14-21**, **23**, **25**, **31**, **32** and **35**.

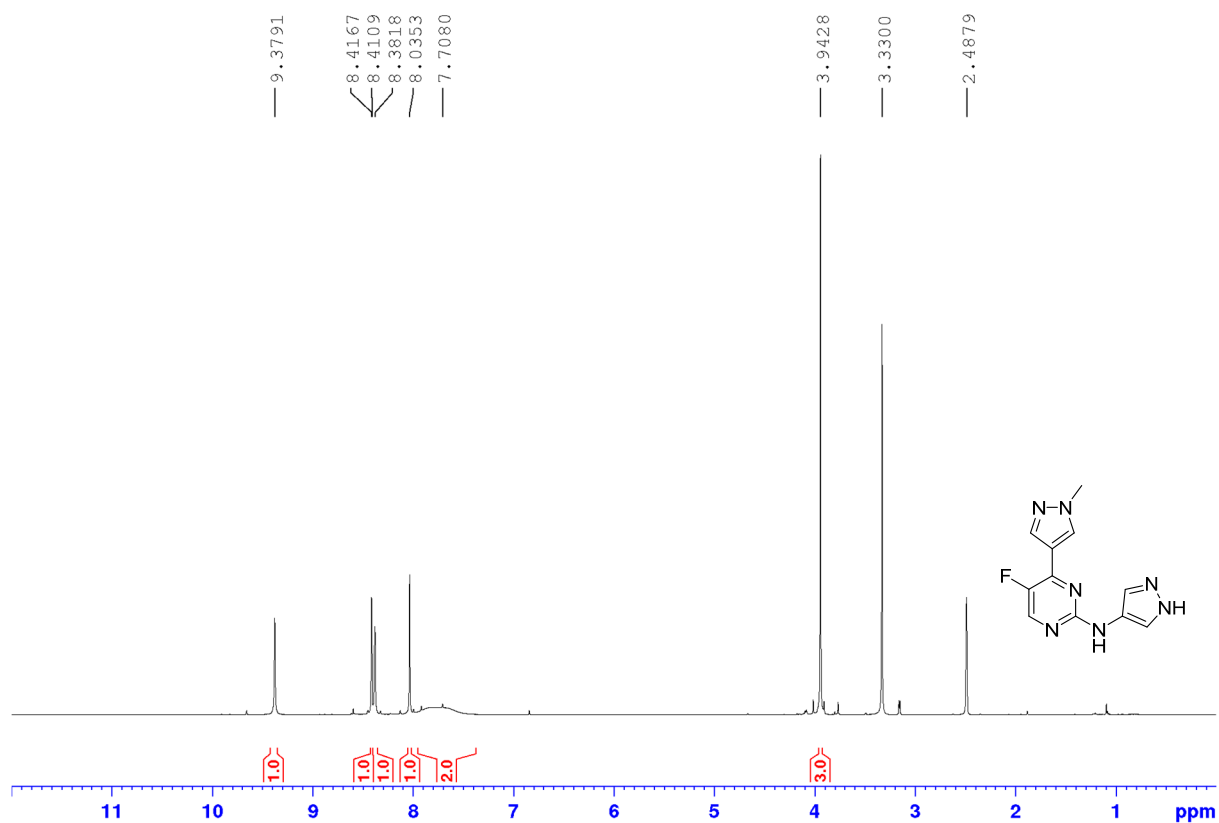


Figure S1. ¹H NMR spectrum of **14** in DMSO-*d*₆ (500 MHz).

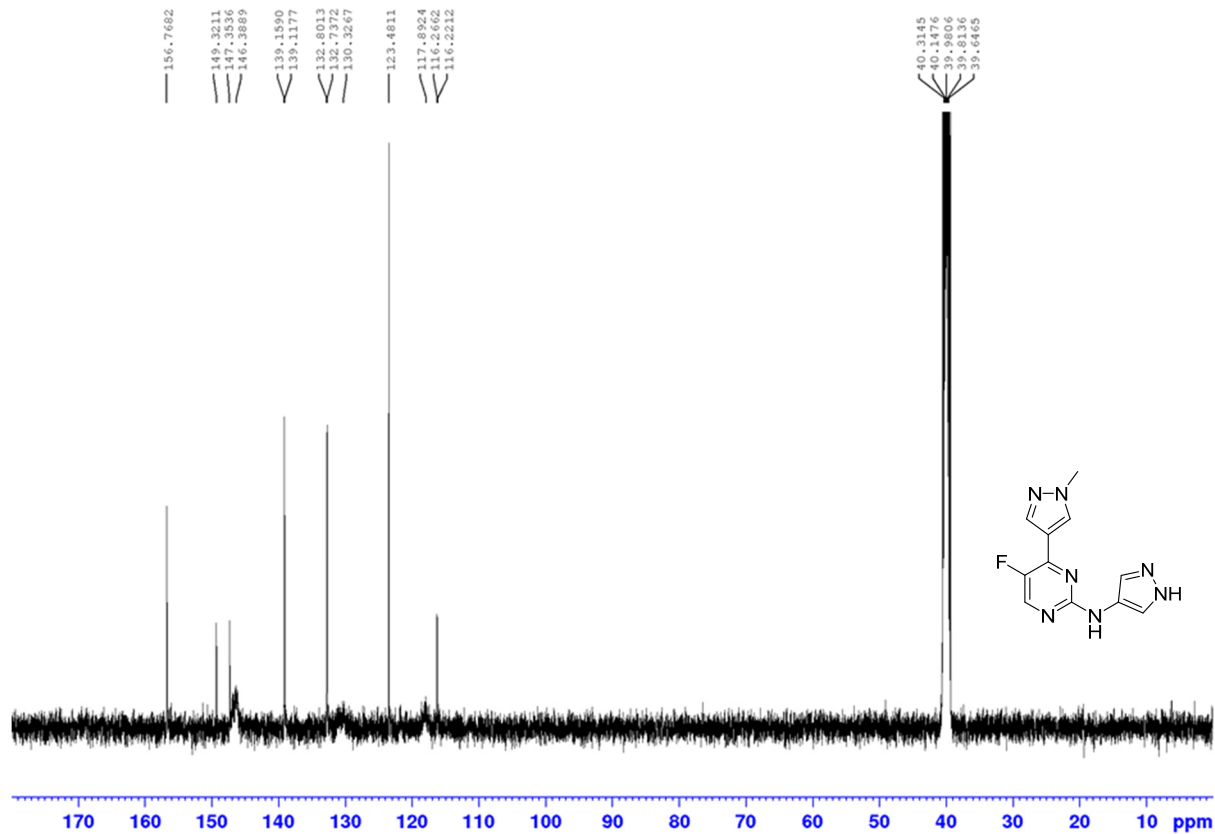


Figure S2. ¹³C NMR spectrum of **14** in DMSO-*d*₆ (125 MHz).

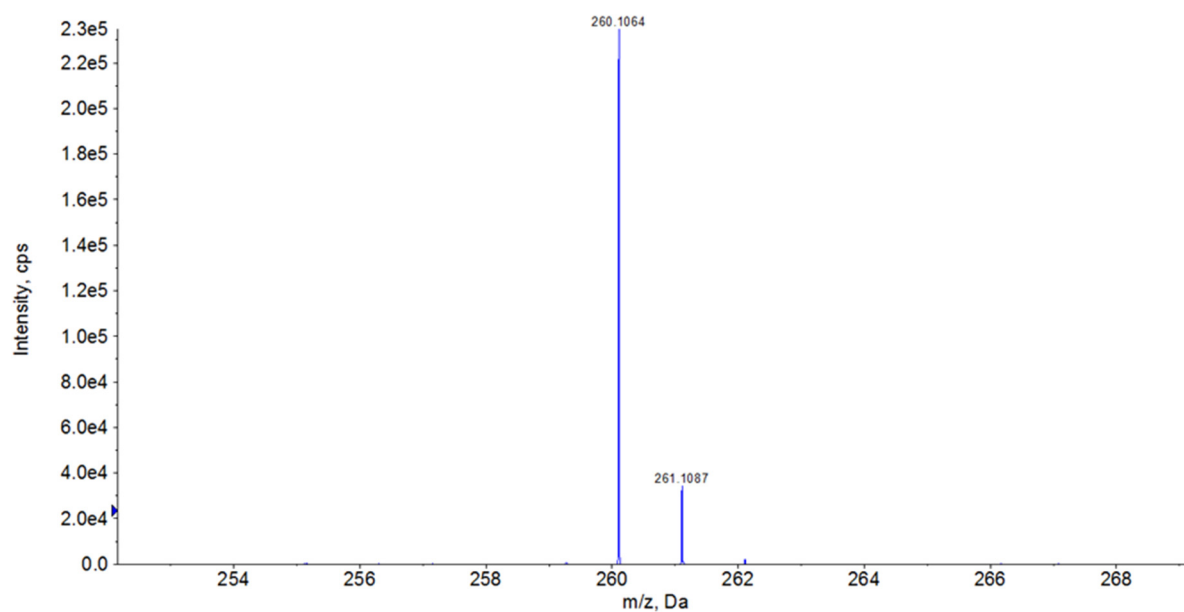


Figure S3. HRMS of 14.

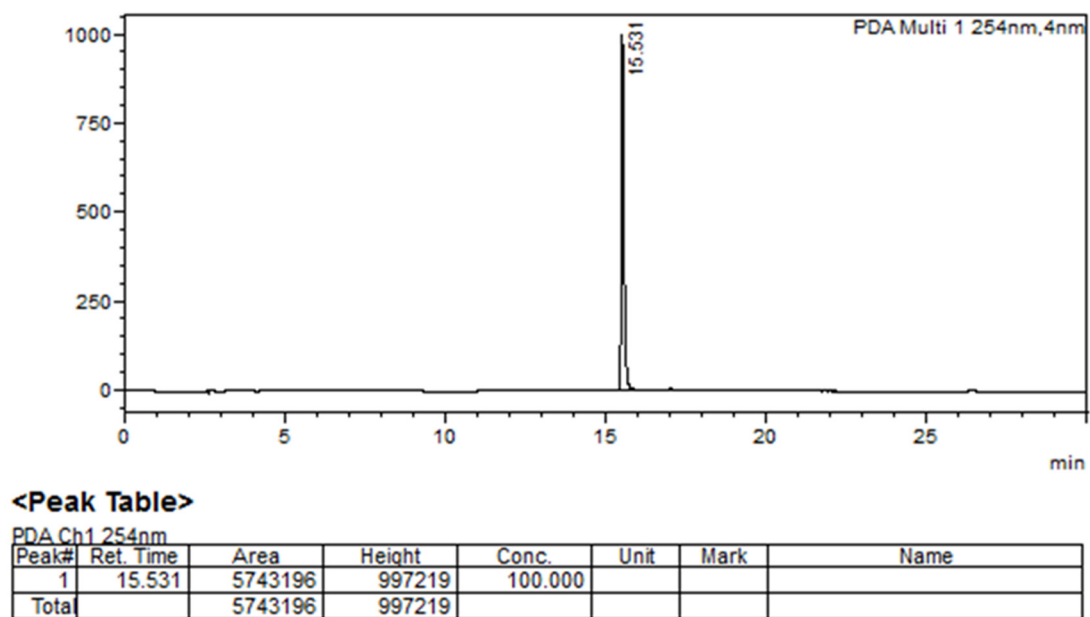


Figure S4. HPLC chromatogram of 14 determined by method A.

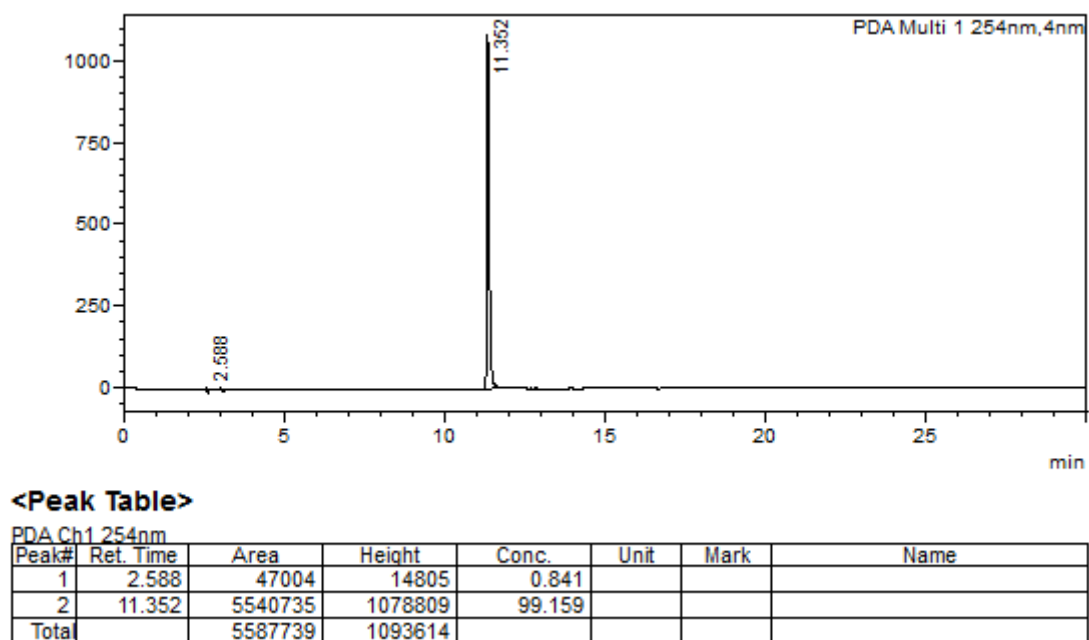


Figure S5. HPLC chromatogram of **14** determined by method B.

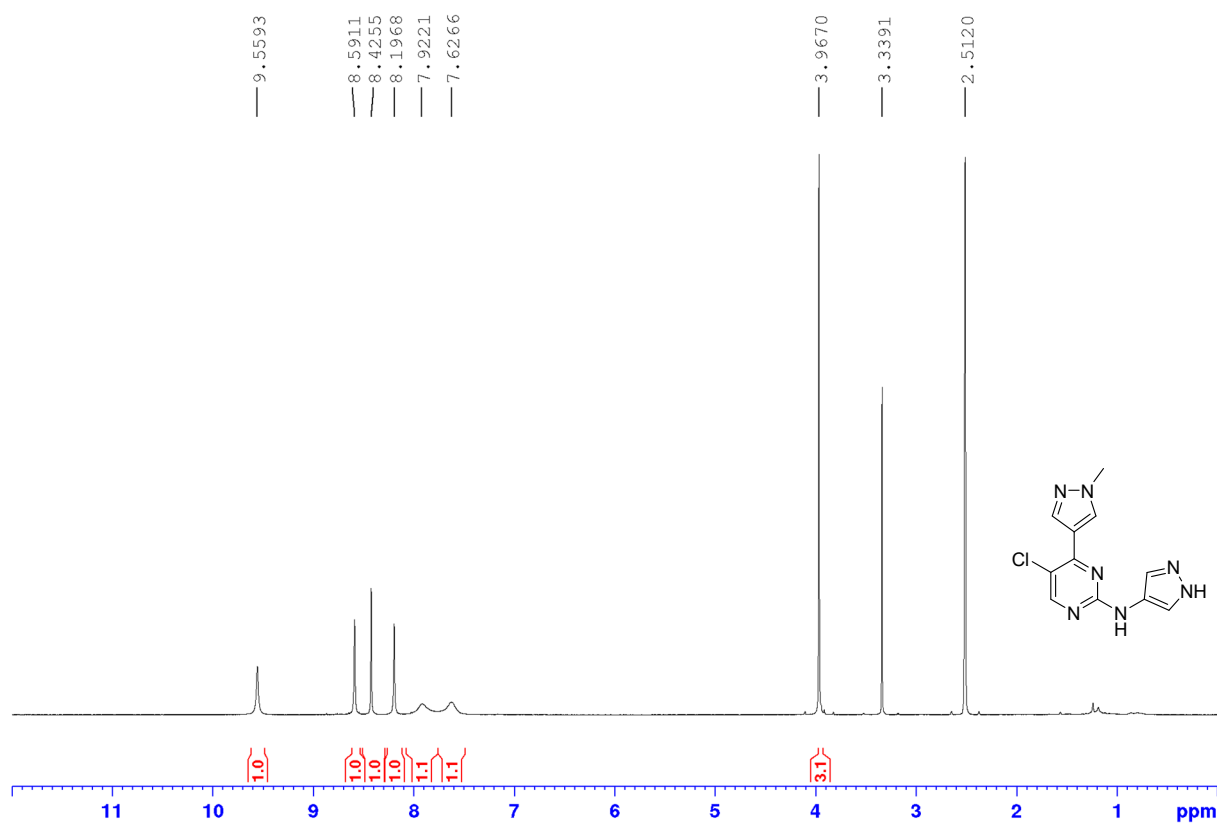


Figure S6. ^1H NMR spectrum of **15** in $\text{DMSO}-d_6$ (500 MHz).

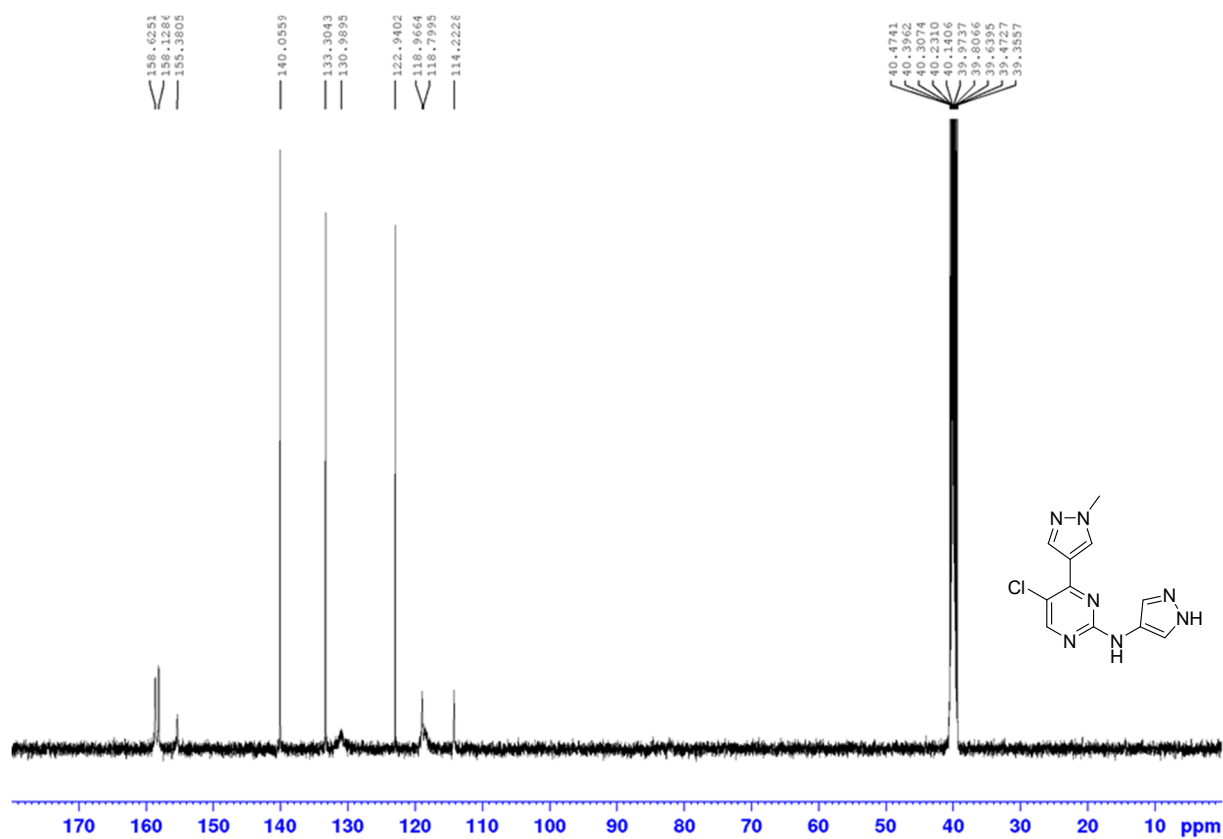


Figure S7. ¹³C NMR spectrum of 15 in DMSO-*d*₆ (125 MHz).

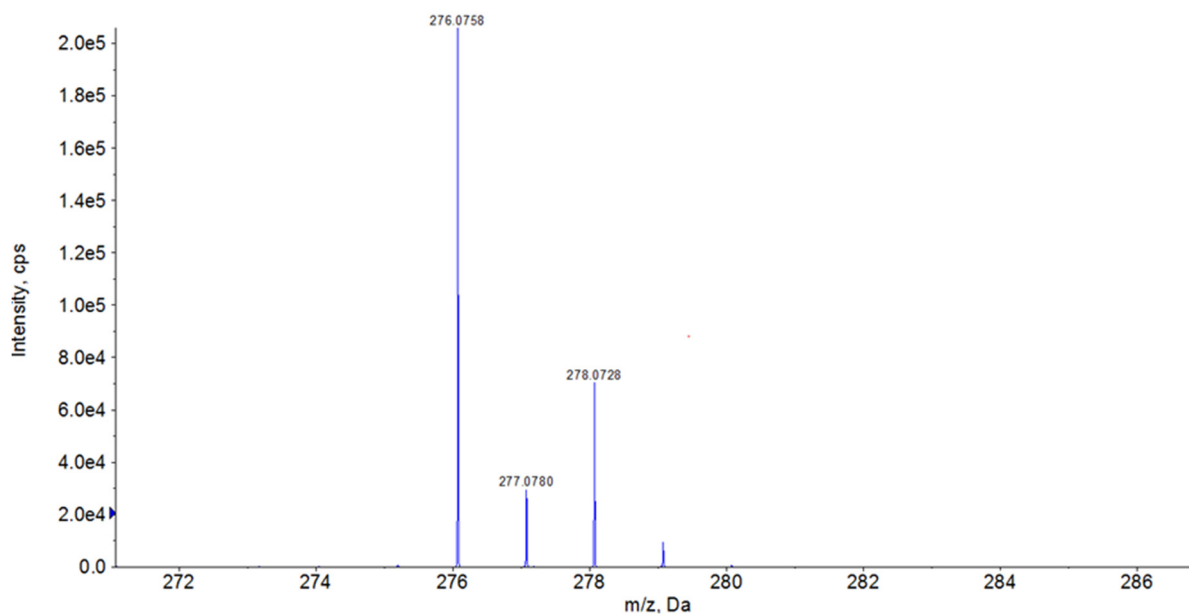
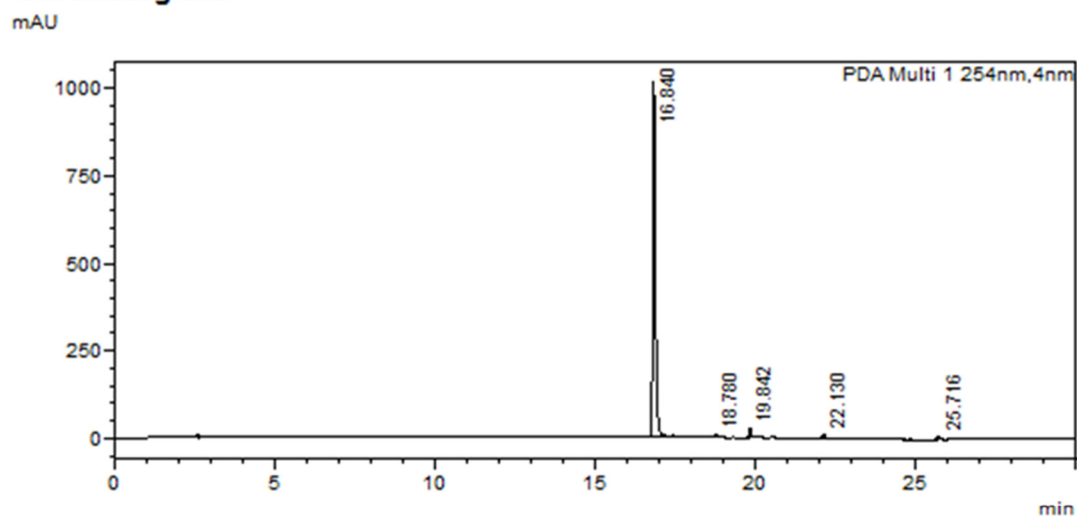


Figure S8. HRMS of 15.

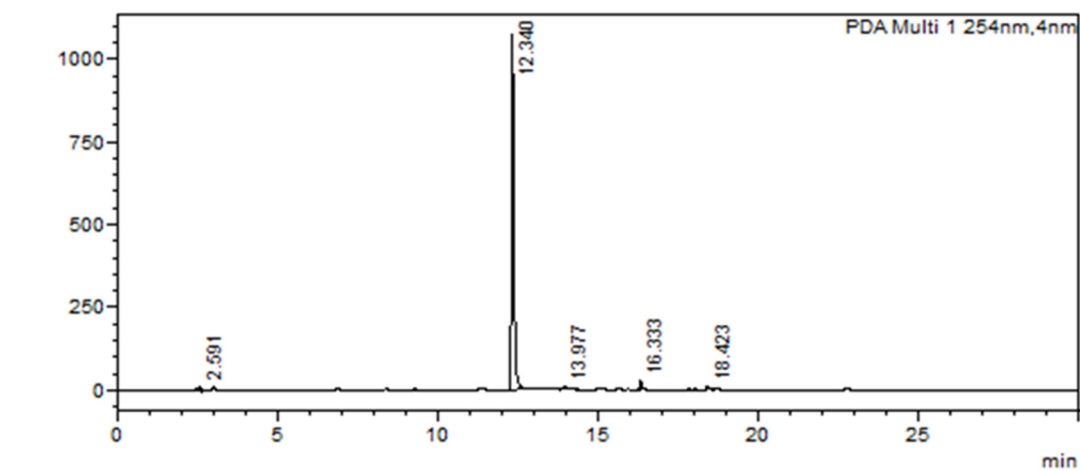
<Chromatogram>



<Peak Table>

PDA Ch1 254nm							
Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.840	5781709	1012524	95.582			
2	18.780	55656	10458	0.920			
3	19.842	123205	24487	2.037			
4	22.130	54164	11585	0.895			
5	25.716	34230	7150	0.566			
Total		6048964	1066205				

Figure S9. HPLC chromatogram of 15 determined by method A.



<Peak Table>

PDA Ch1 254nm							
Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	2.591	43150	15123	0.741			
2	12.340	5563012	1069367	95.547			
3	13.977	55892	10403	0.960			
4	16.333	114395	25665	1.965			
5	18.423	45799	8813	0.787			
Total		5822248	1129370				

Figure S10. HPLC chromatogram of 15 determined by method B.

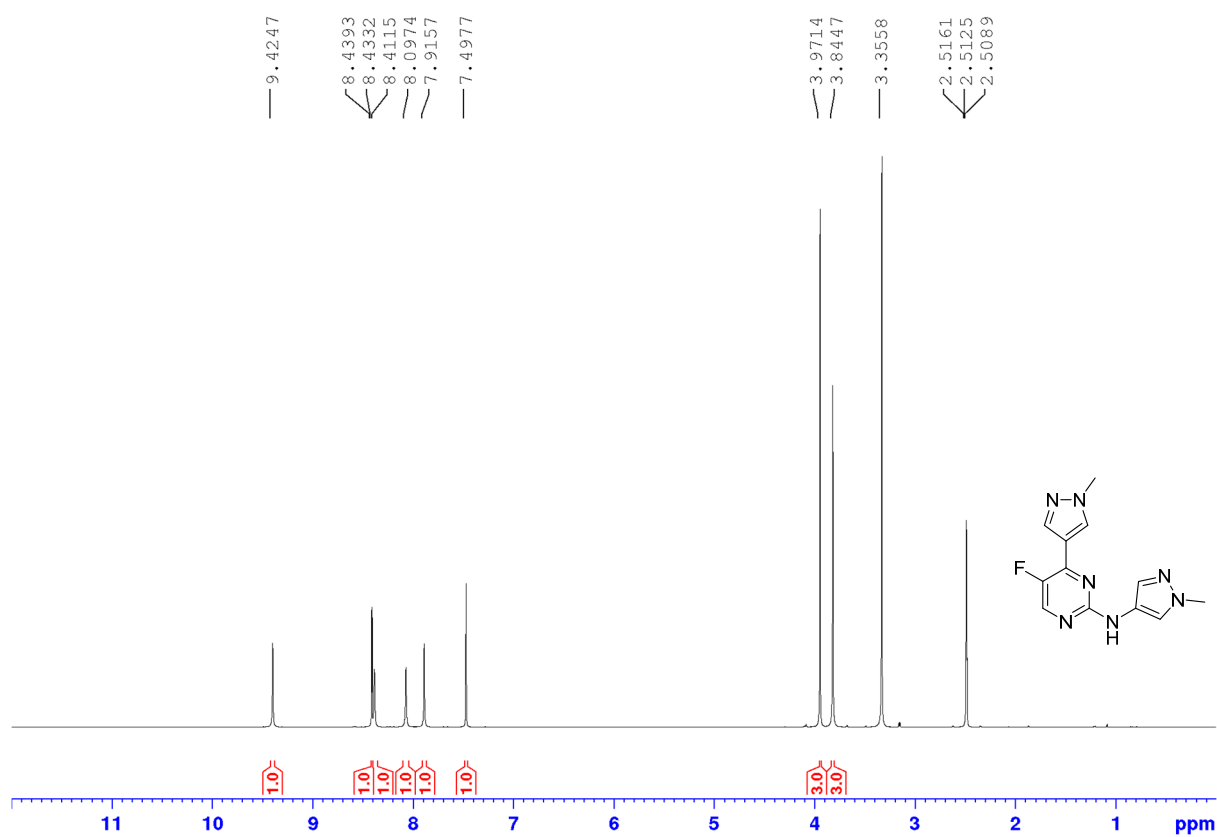


Figure S11. ¹H NMR spectrum of **16** in DMSO-*d*₆ (500 MHz).

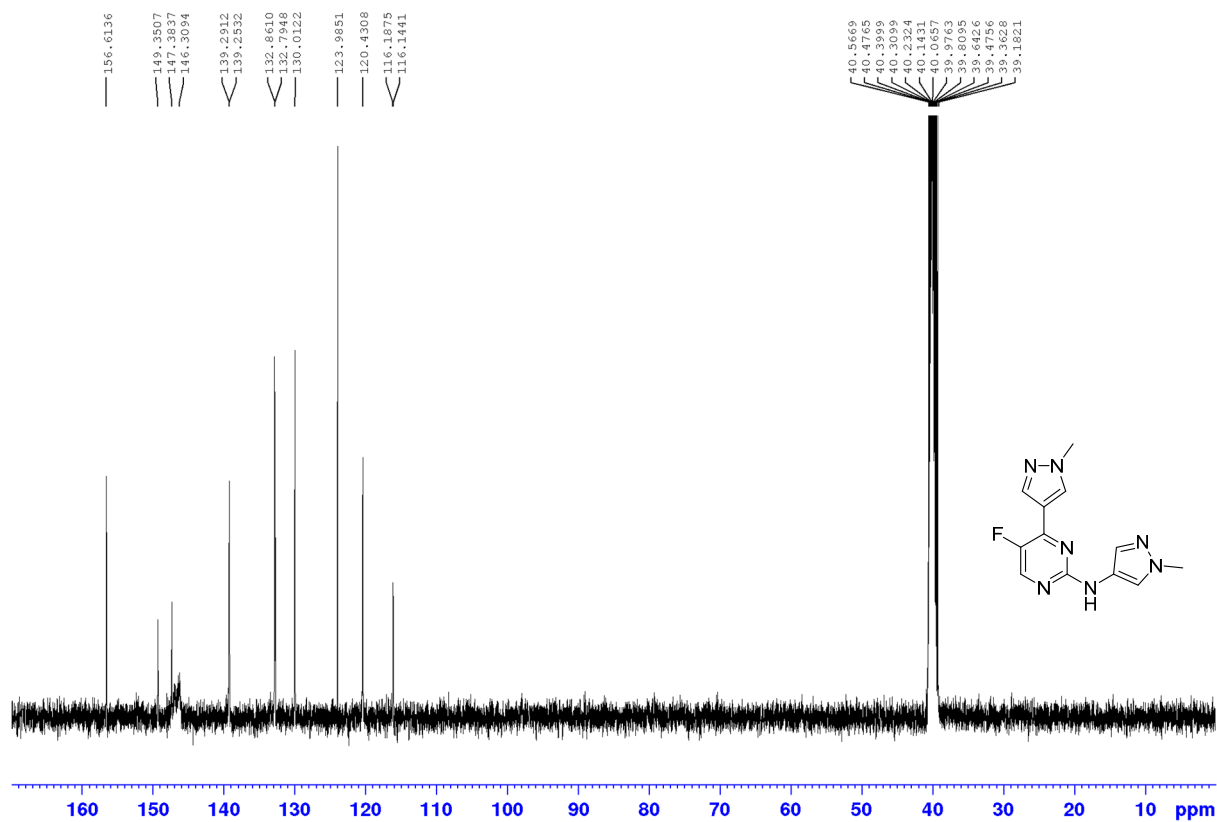


Figure S12. ¹³C NMR spectrum of **16** in DMSO-*d*₆ (125 MHz).

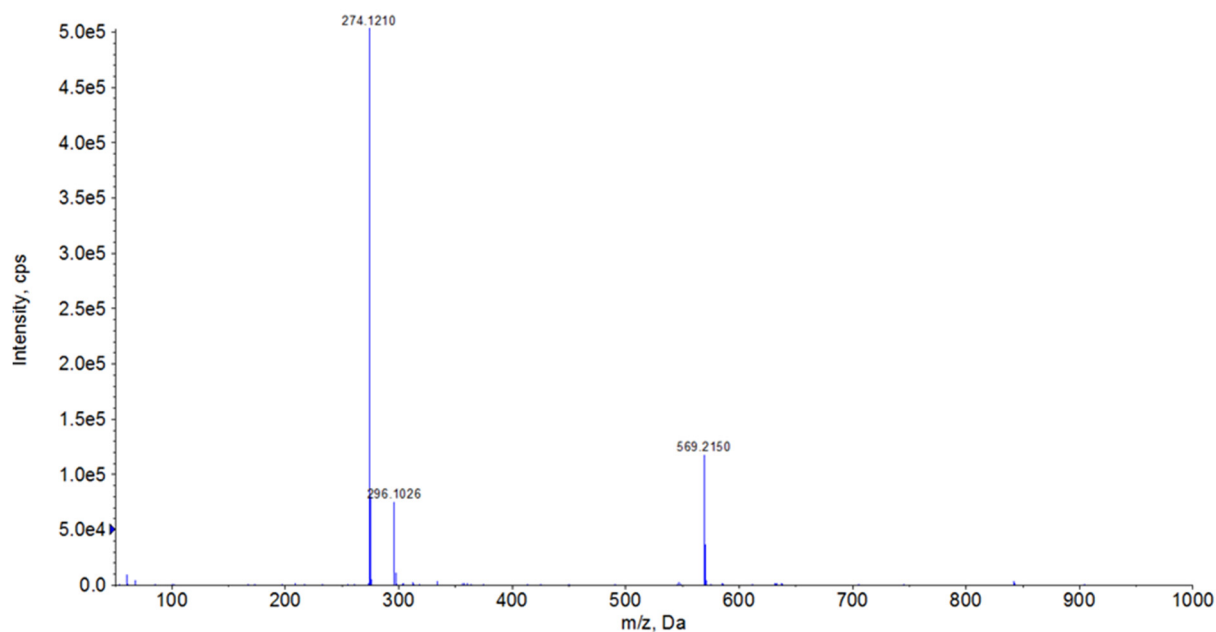


Figure S13. HRMS of 16.

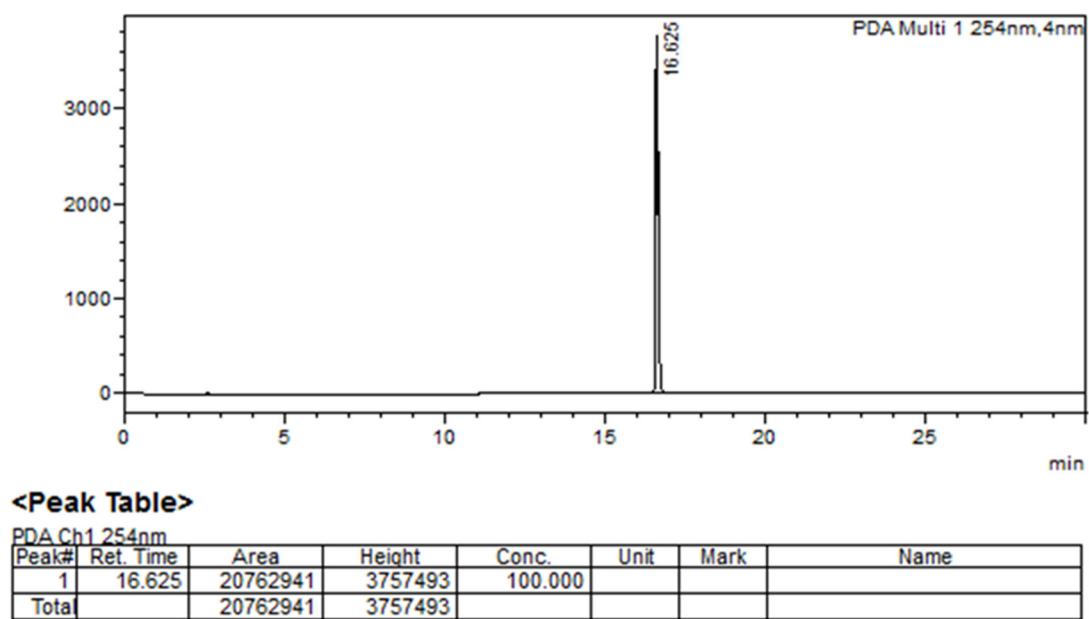


Figure S14. HPLC chromatogram of 16 determined by method A.

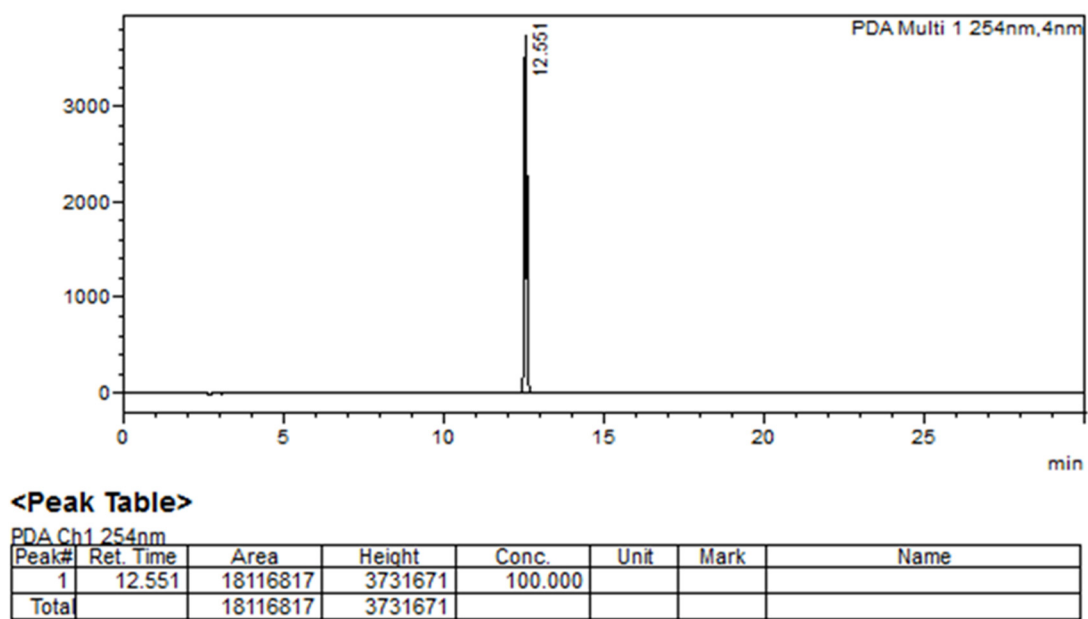


Figure S15. HPLC chromatogram of **16** determined by method B.

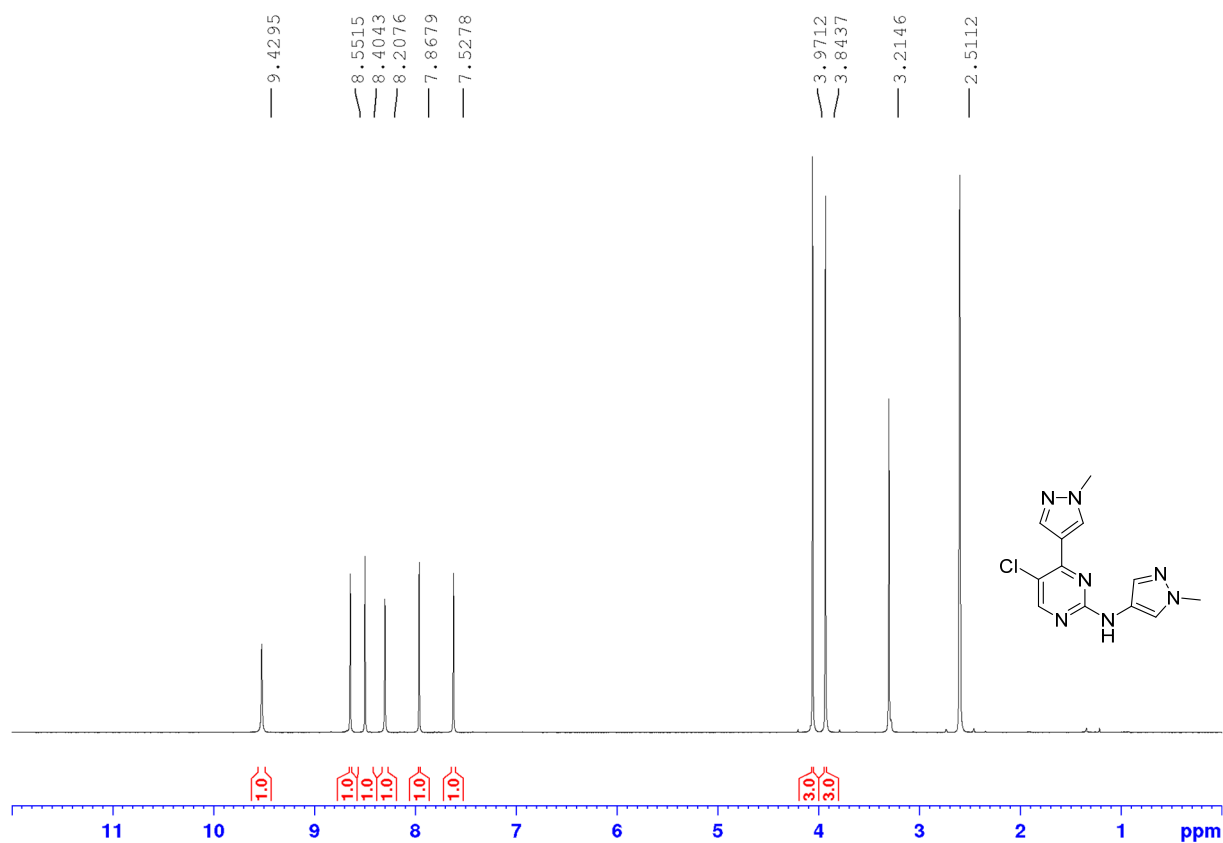


Figure S16. ^1H NMR spectrum of **17** in $\text{DMSO}-d_6$ (500 MHz).

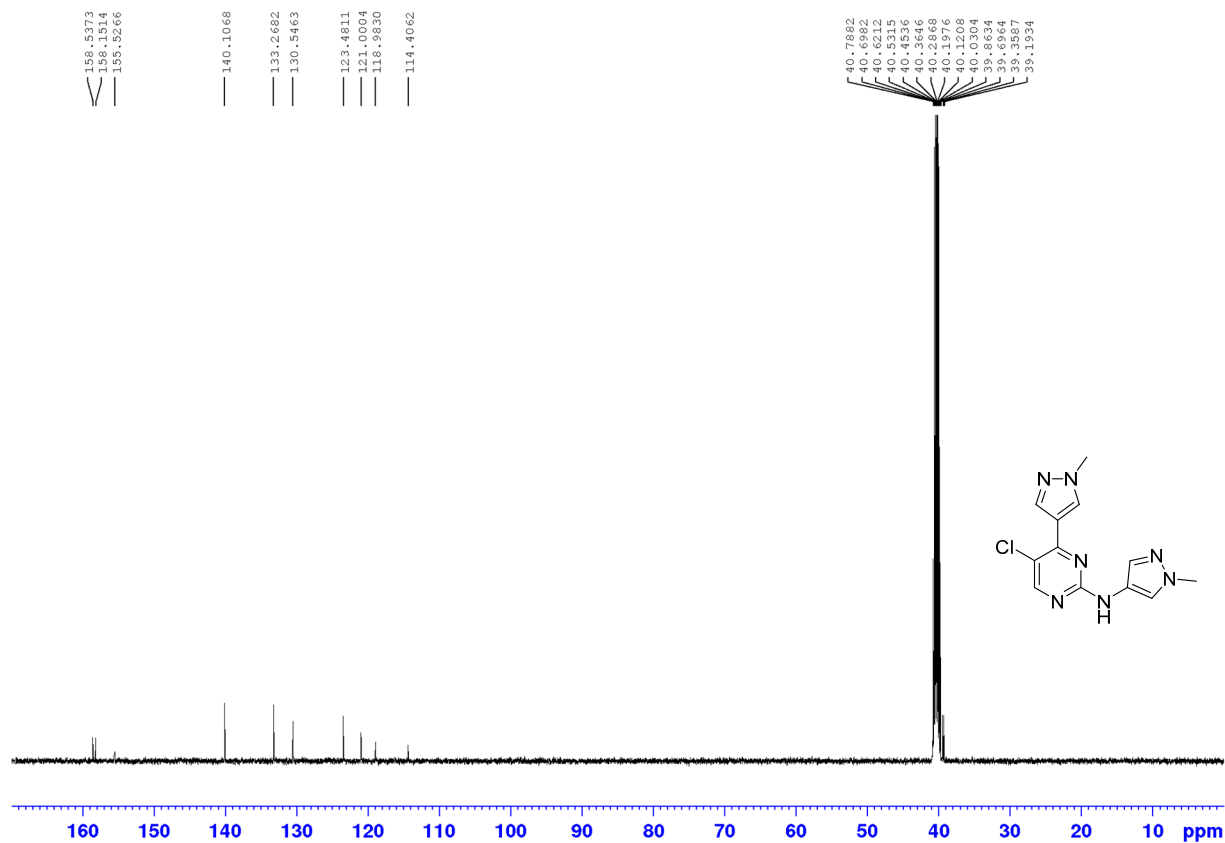


Figure S17. ¹³C NMR spectrum of 17 in DMSO-*d*₆ (125 MHz).

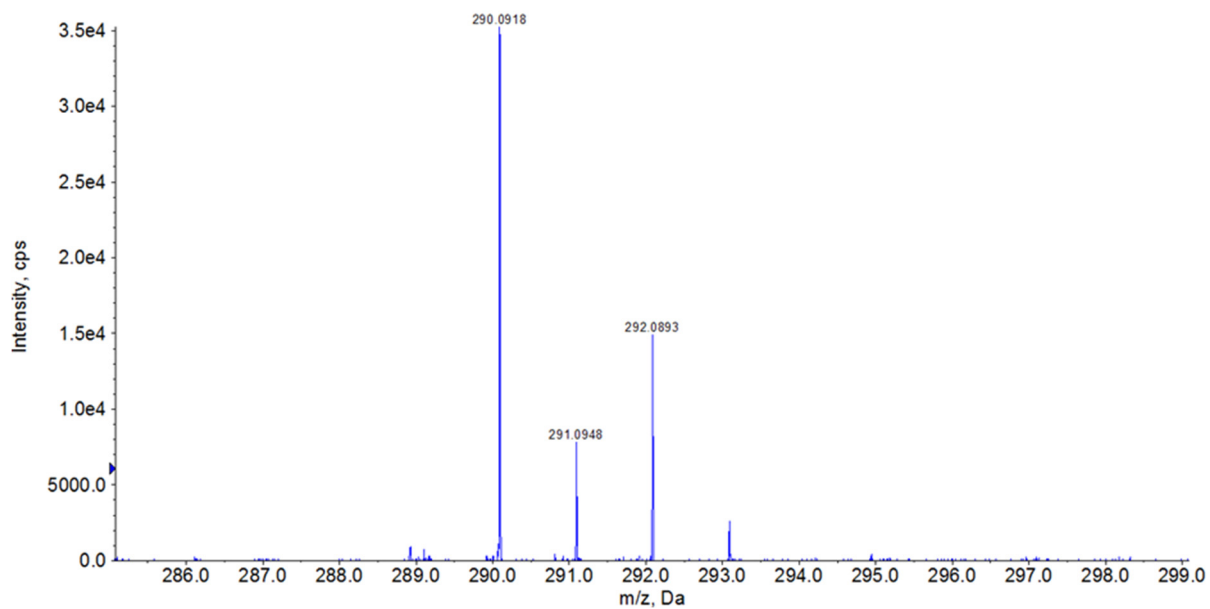


Figure S18. HRMS of 17.

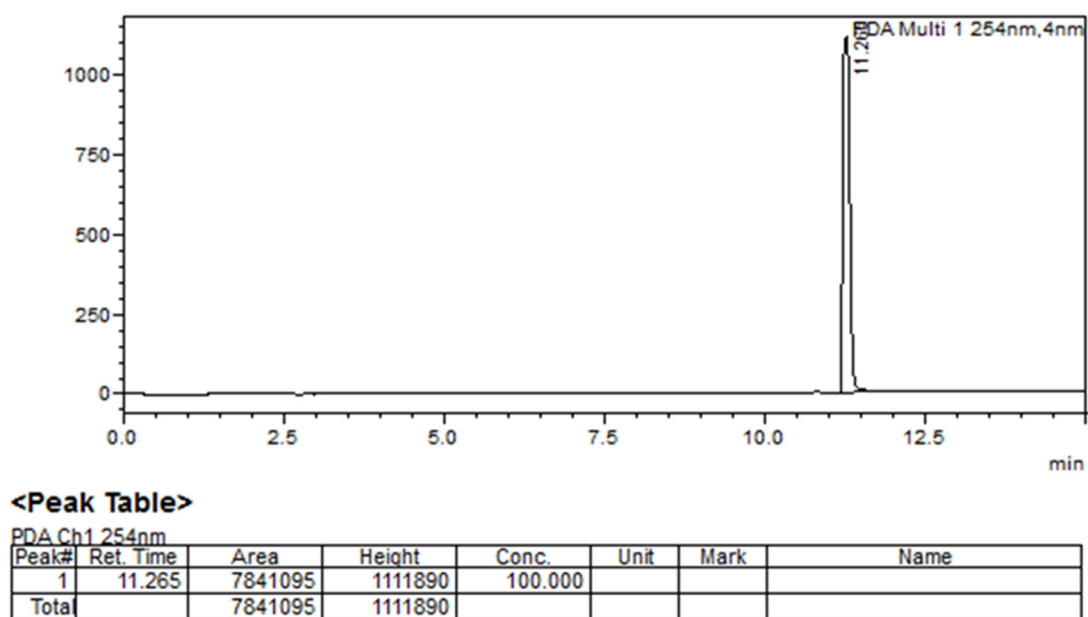


Figure S19. HPLC chromatogram of **17** determined by method A.

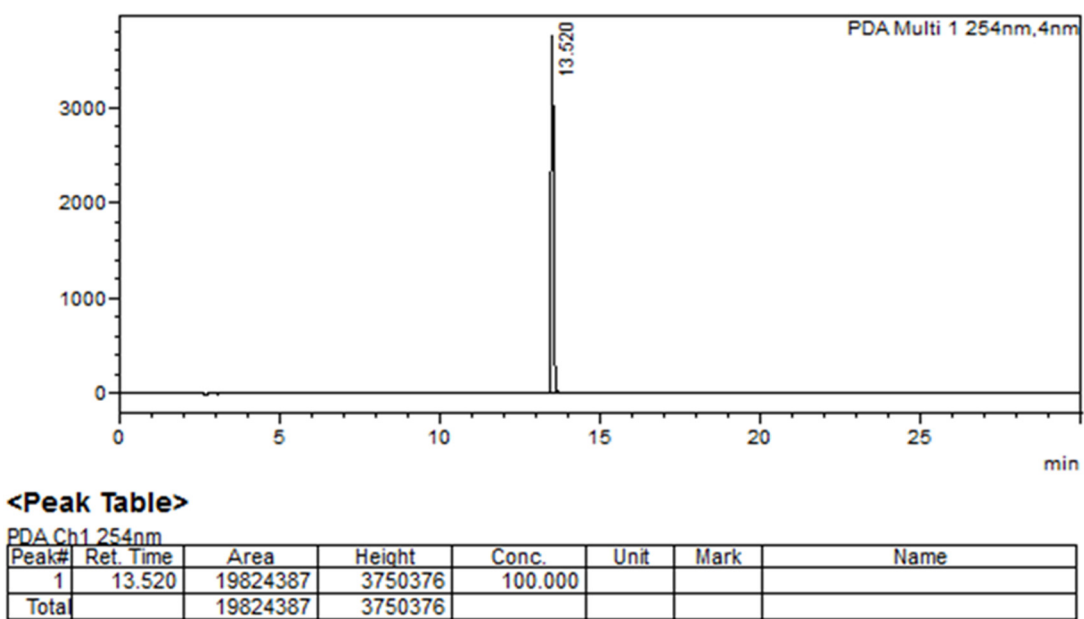


Figure S20. HPLC chromatogram of **17** determined by method B.

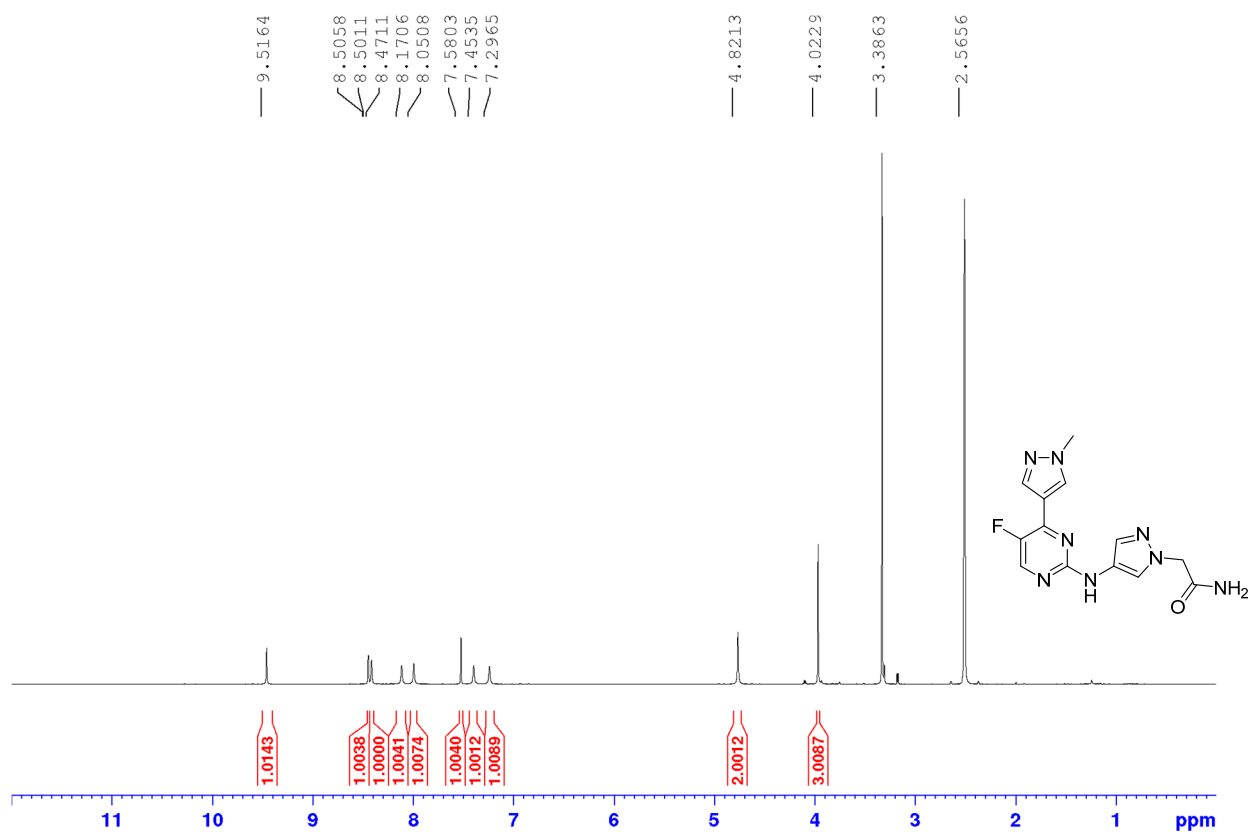


Figure S21. ¹H NMR spectrum of 18 in DMSO-*d*₆ (500 MHz).

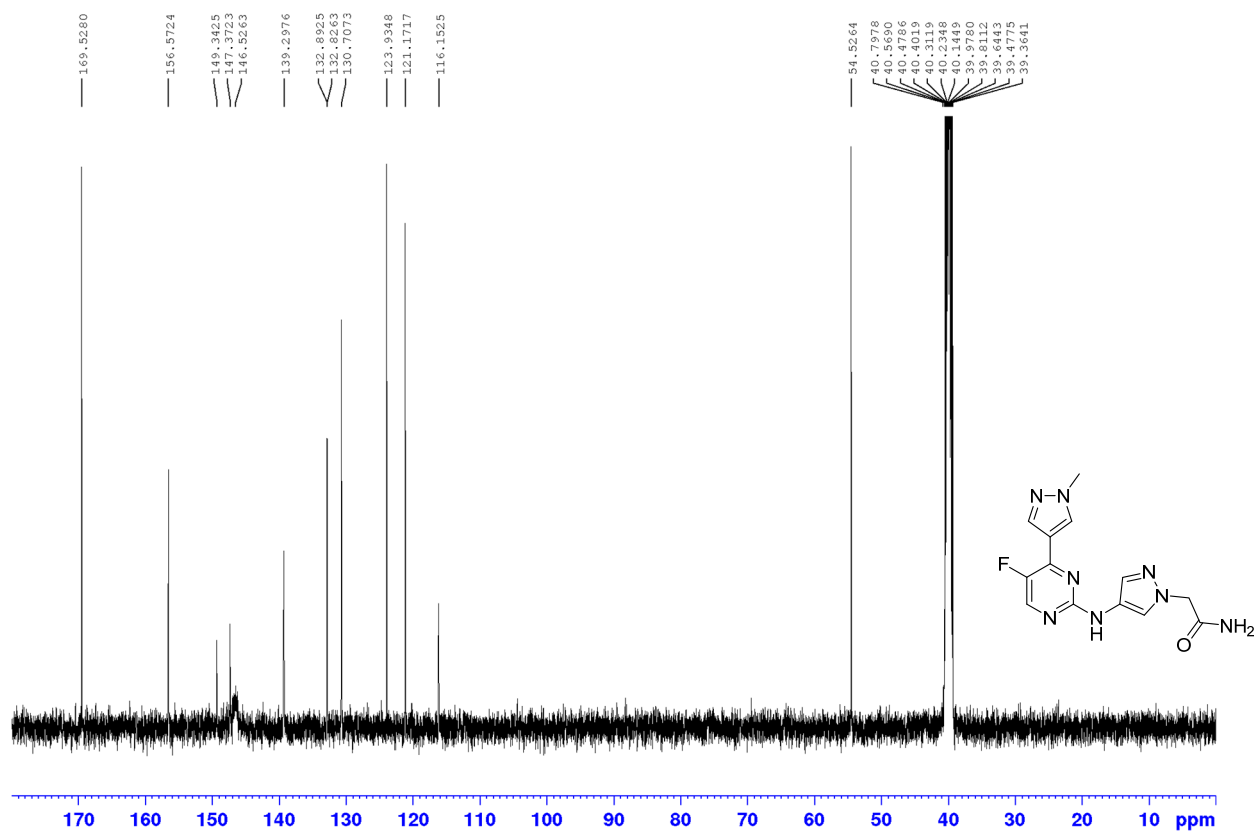


Figure S22. ¹³C NMR spectrum of 18 in DMSO-*d*₆ (125 MHz).

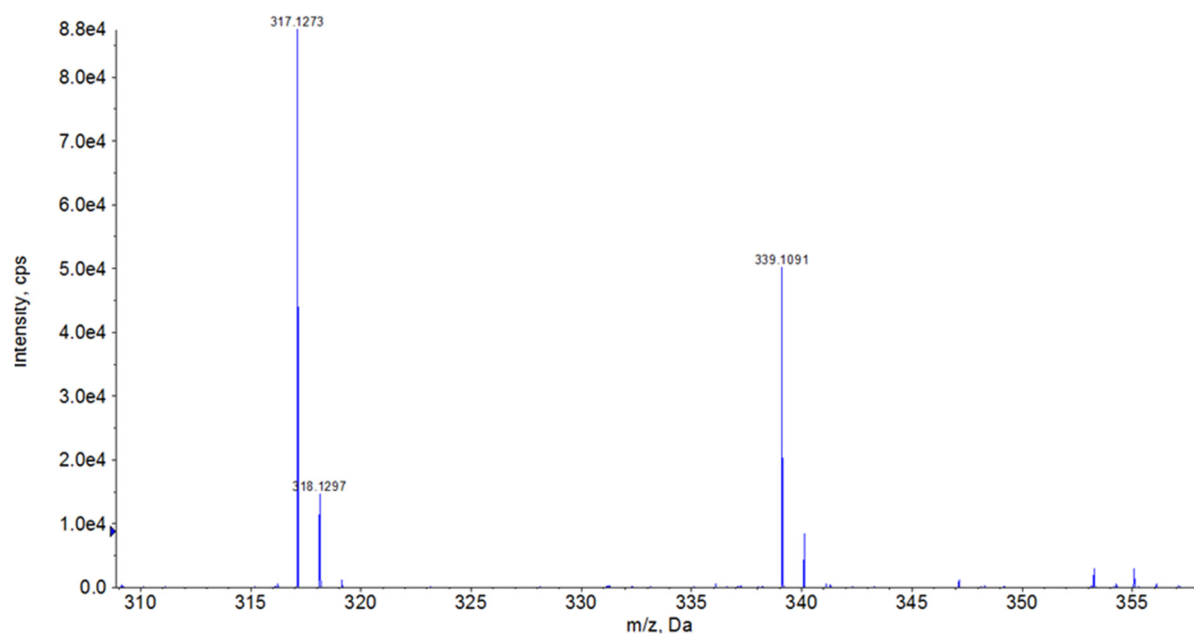


Figure S23. HRMS of 18.

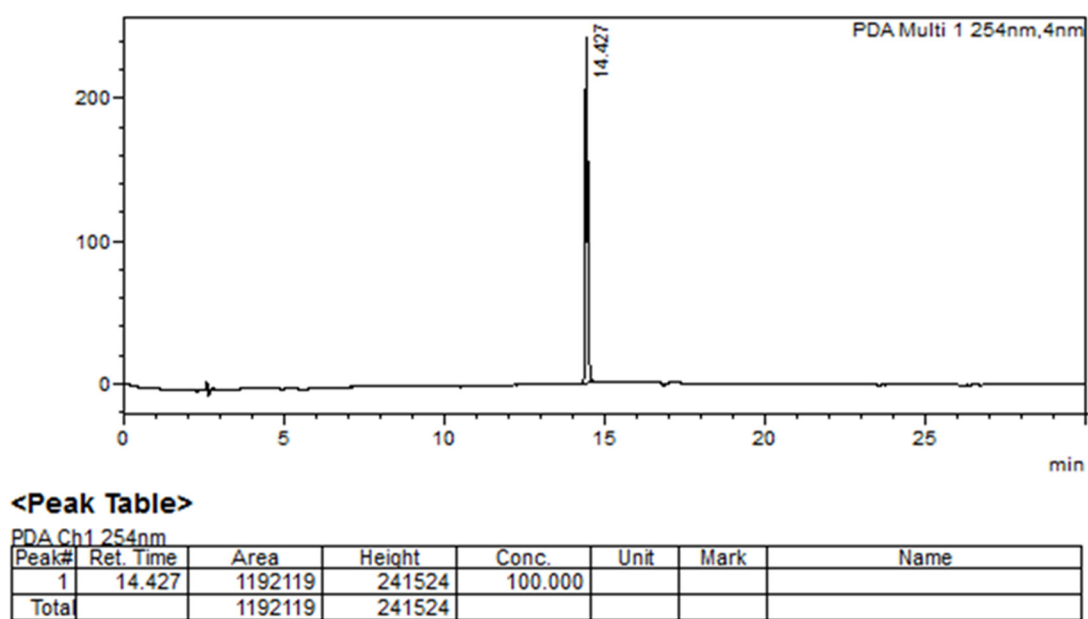


Figure S24. HPLC chromatogram of 18 determined by method A.

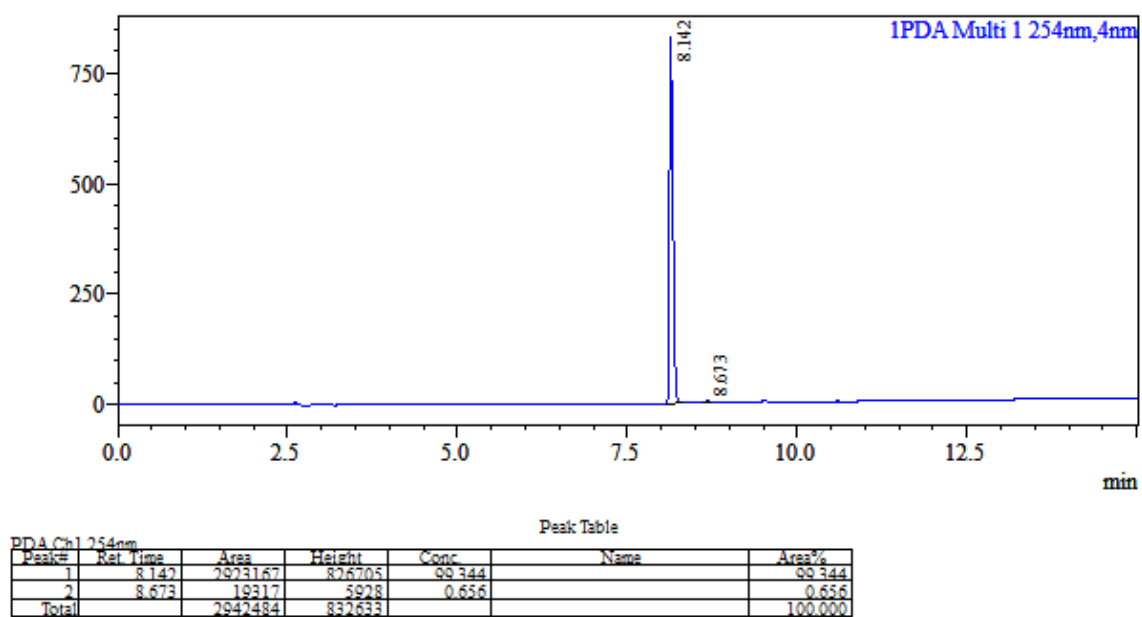


Figure S25. HPLC chromatogram of **18** determined by method B.

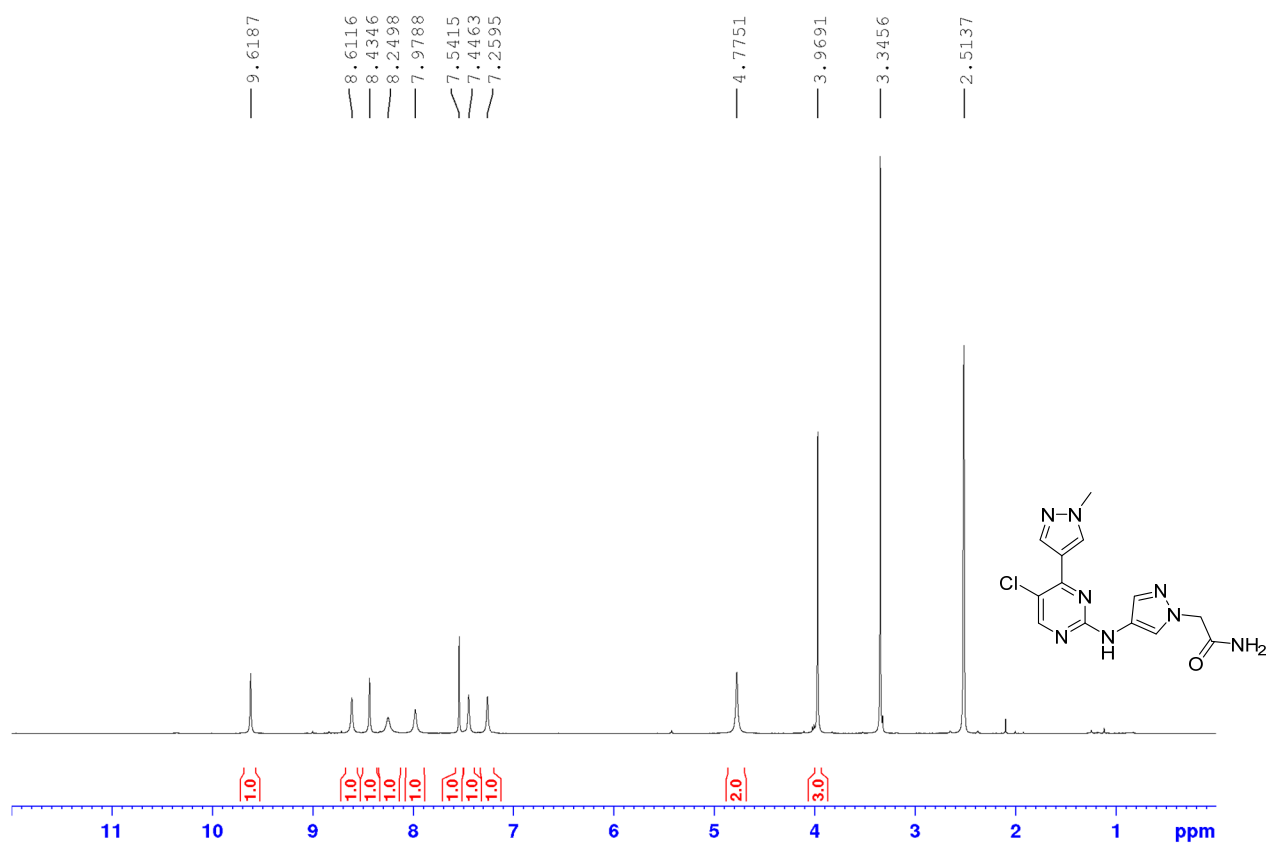


Figure S26. ^1H NMR spectrum of **19** in $\text{DMSO}-d_6$ (500 MHz).

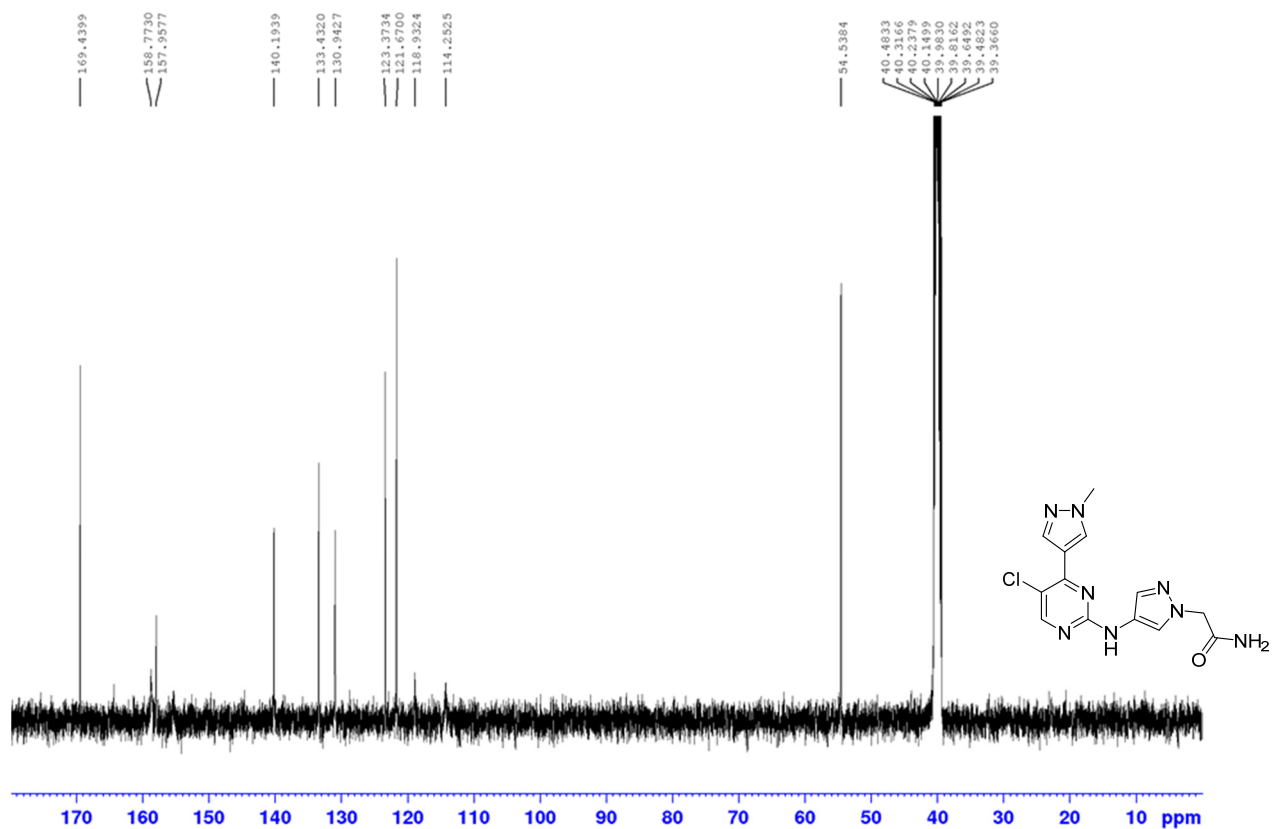


Figure S27. ^{13}C NMR spectrum of **19** in $\text{DMSO-}d_6$ (125 MHz).

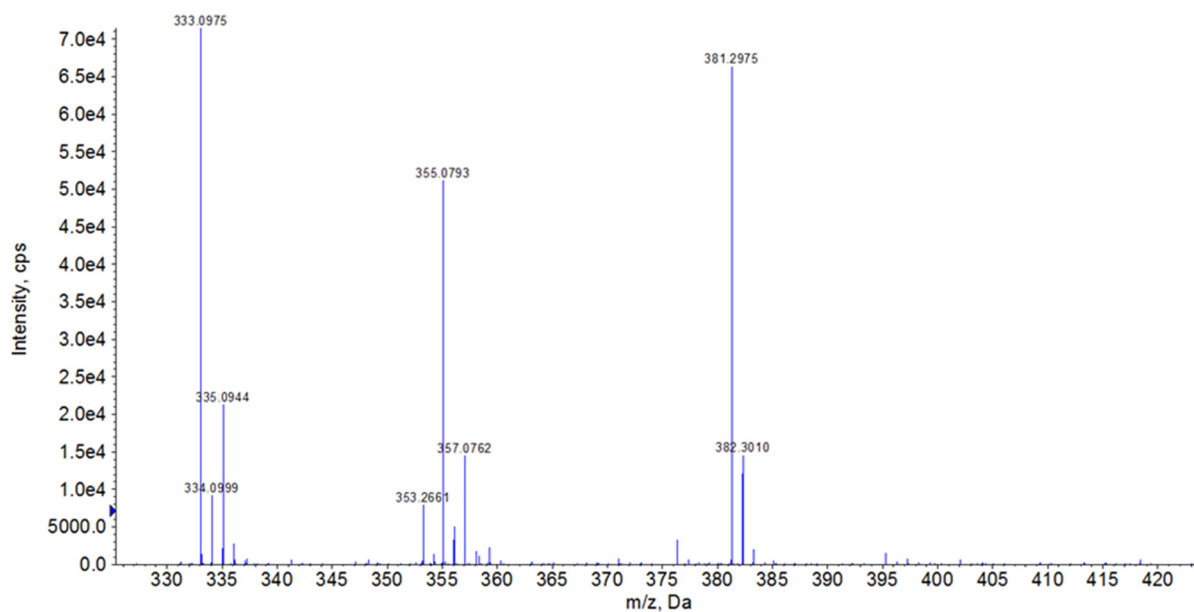


Figure S28. HRMS of **19**.

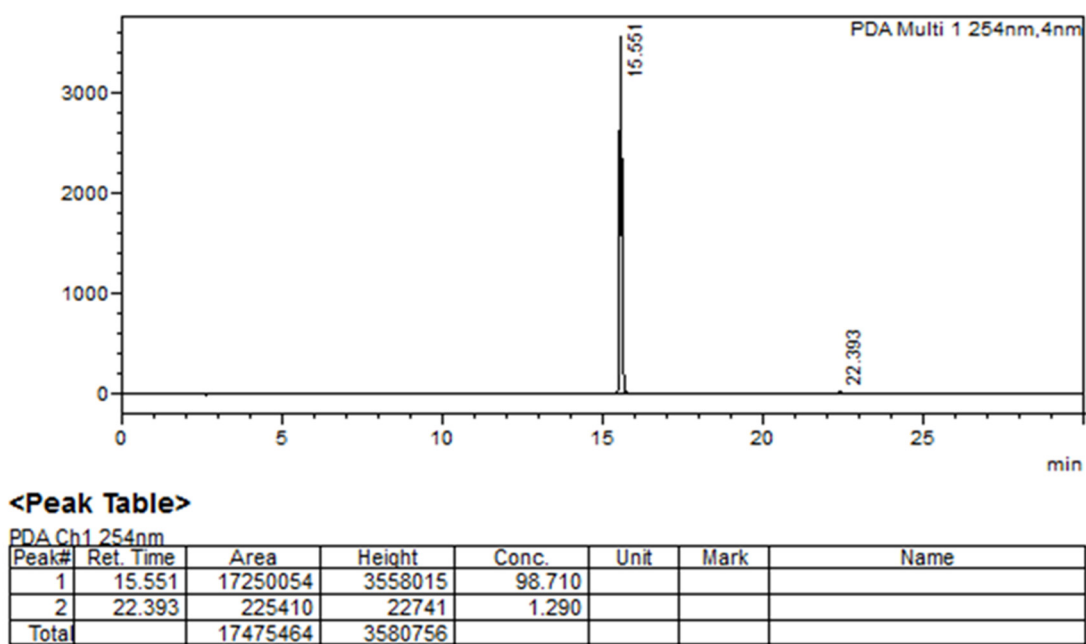


Figure S29. HPLC chromatogram of **19** determined by method A.

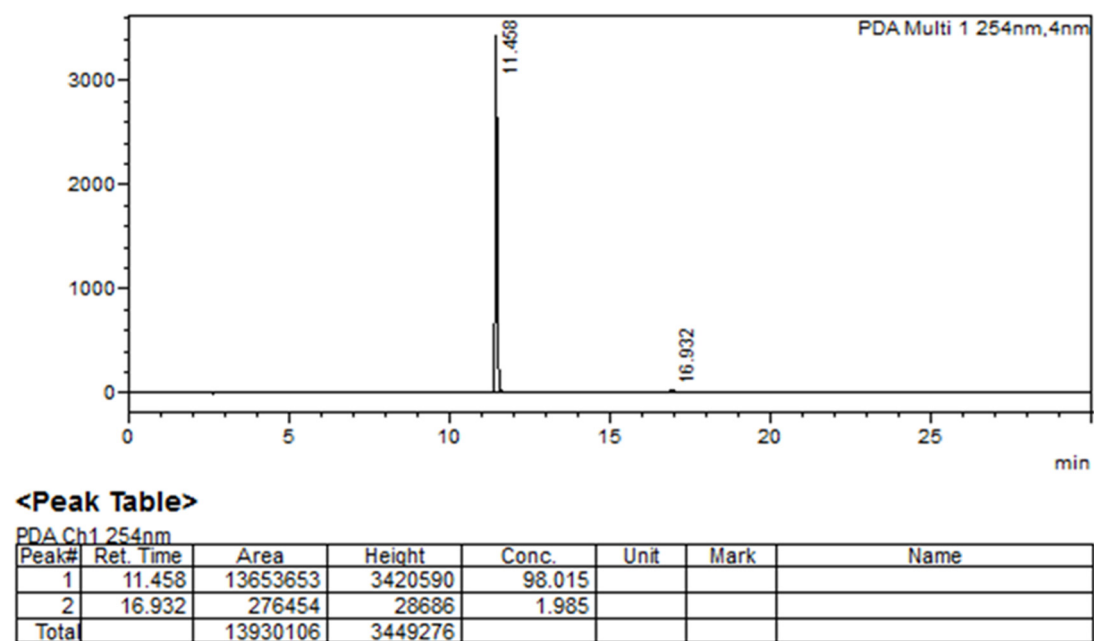


Figure S30. HPLC chromatogram of **19** determined by method B.

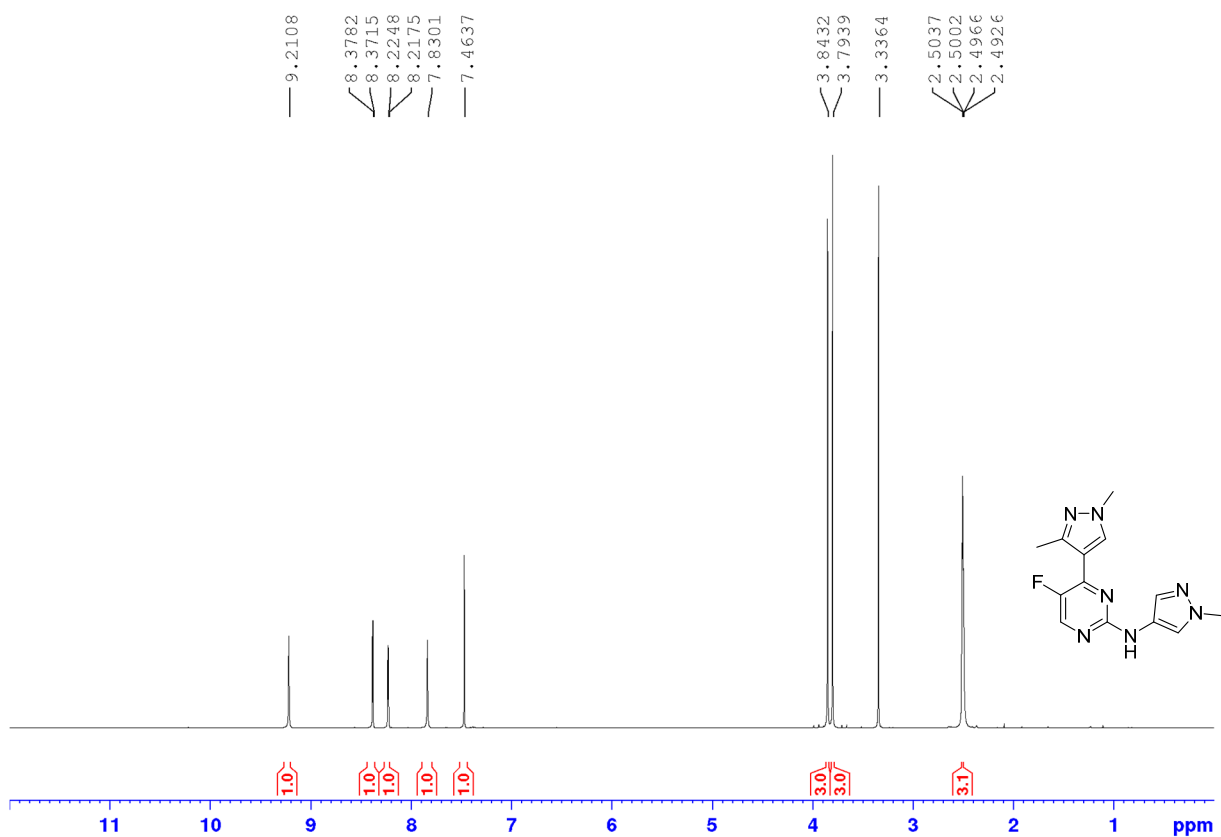


Figure S31. ¹H NMR spectrum of **20** in DMSO-*d*₆ (500 MHz).

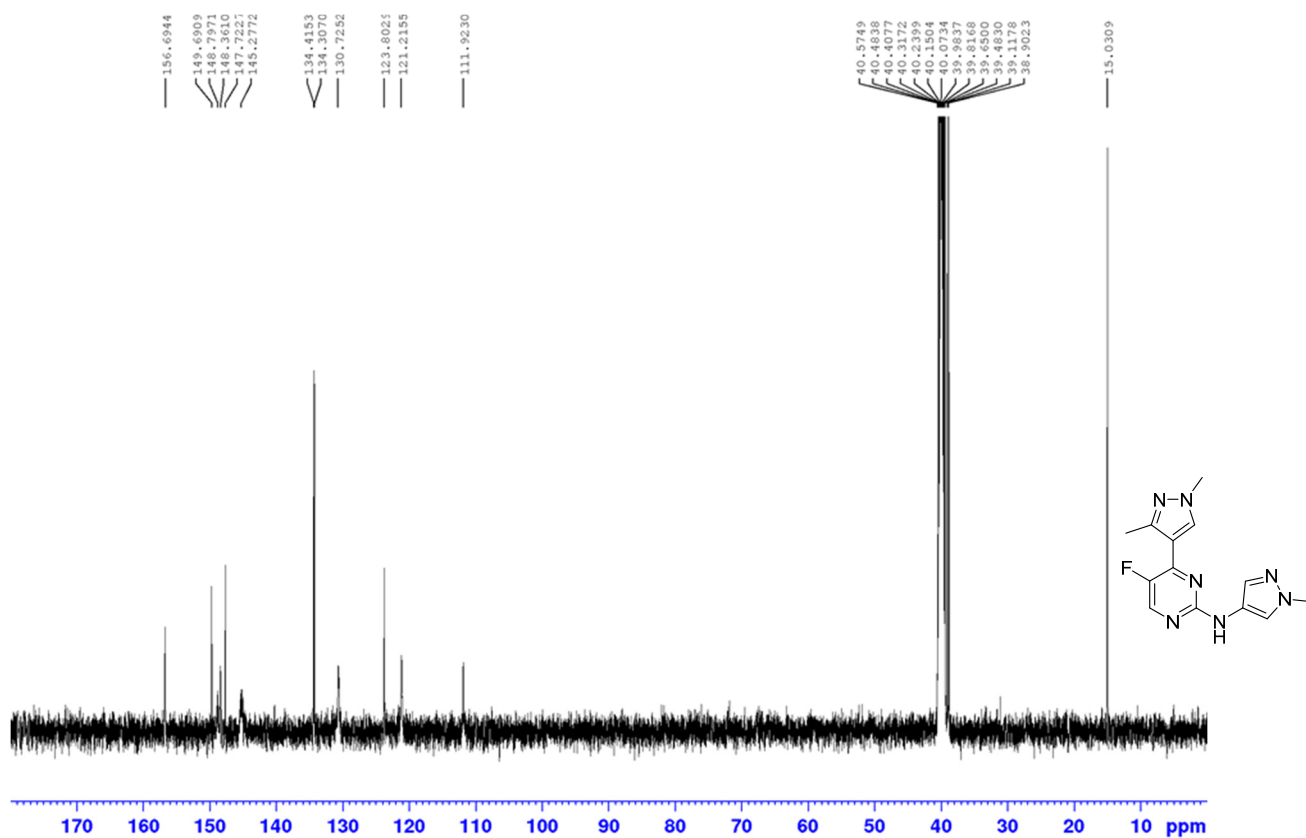


Figure S32. ¹³C NMR spectrum of **20** in DMSO-*d*₆ (125 MHz).

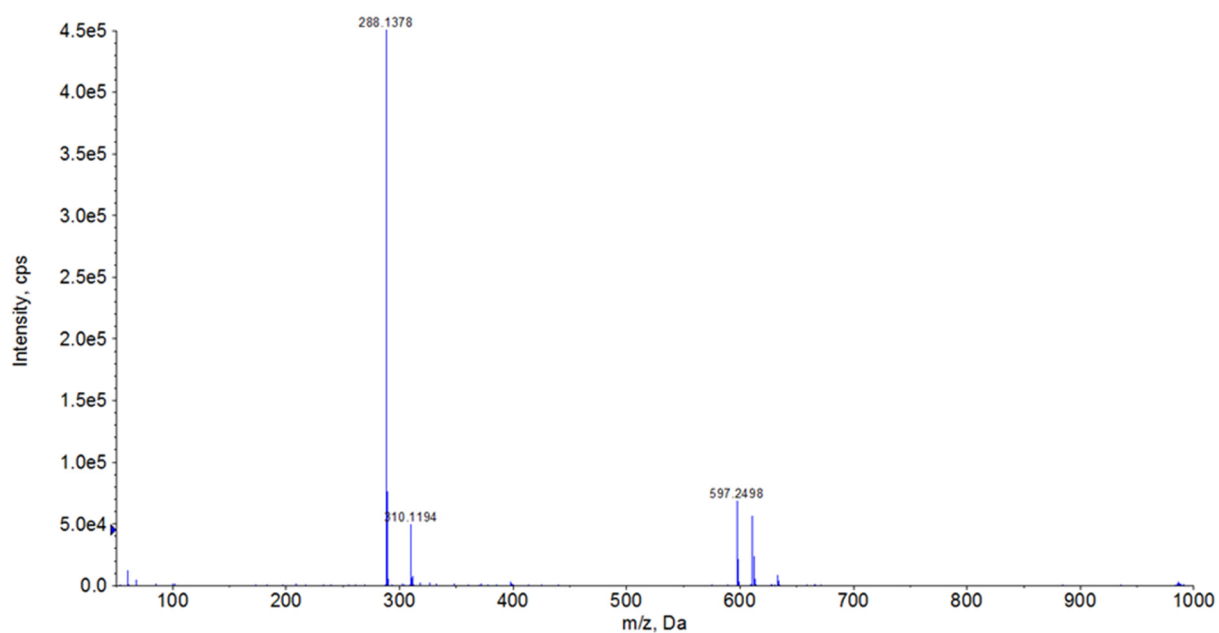
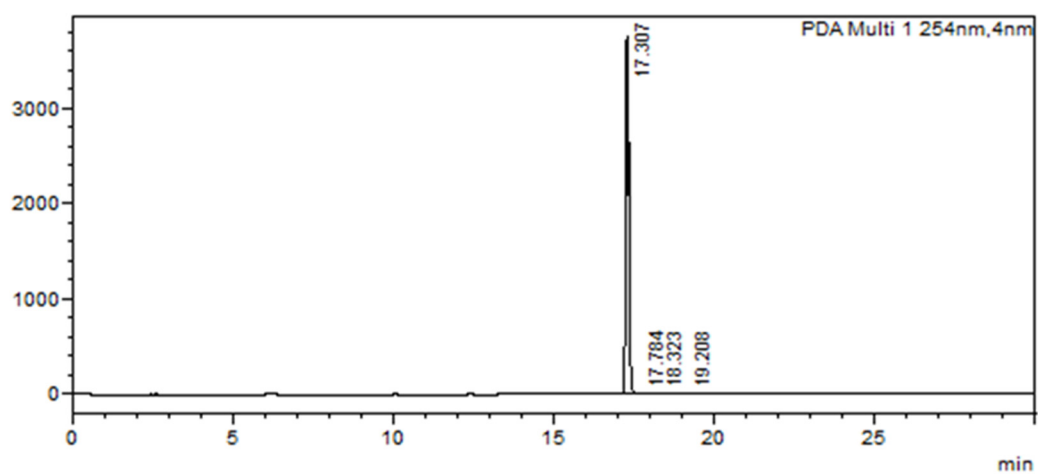


Figure S33. HRMS of 20.



<Peak Table>

PDA Ch1 254nm							
Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	17.307	26888821	3741374	99.509			
2	17.784	67519	11908	0.250		V	
3	18.323	38741	8003	0.143			
4	19.208	26320	5714	0.097			
Total		27021403	3766999				

Figure S34. HPLC chromatogram of 20 determined by method A.

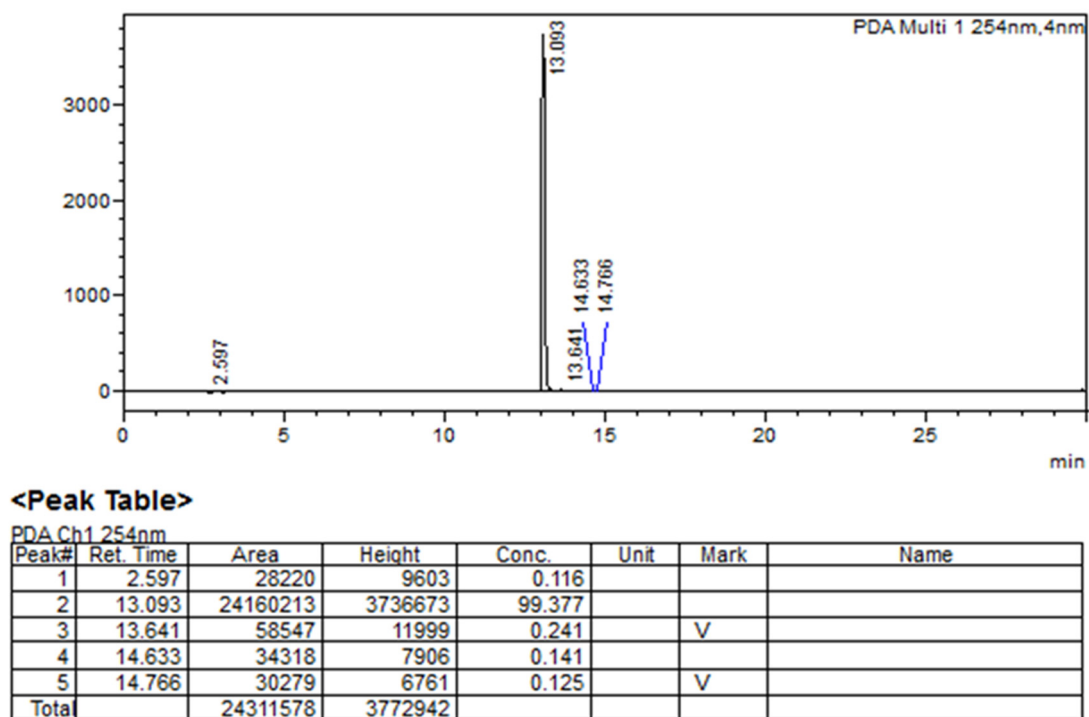


Figure S35. HPLC chromatogram of 20 determined by method B.

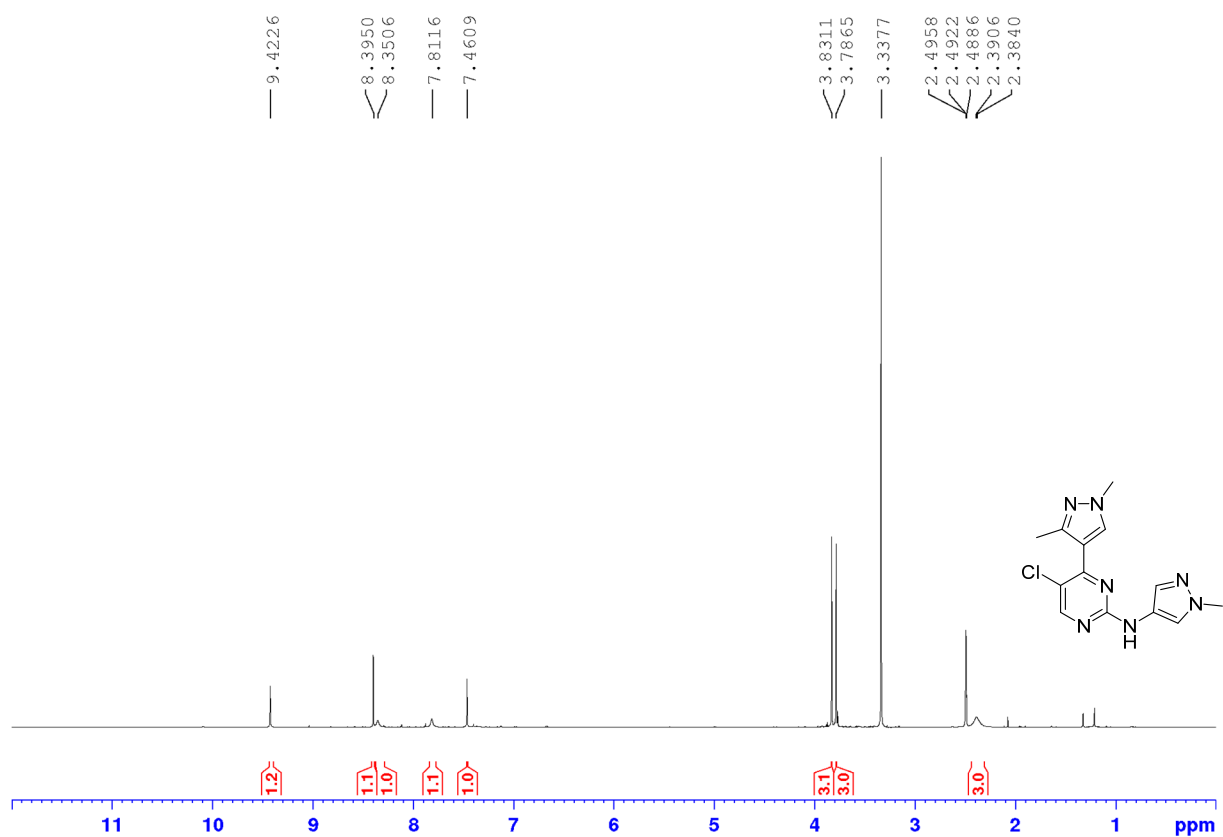


Figure S36. ¹H NMR spectrum of 21 in DMSO-*d*₆ (500 MHz).

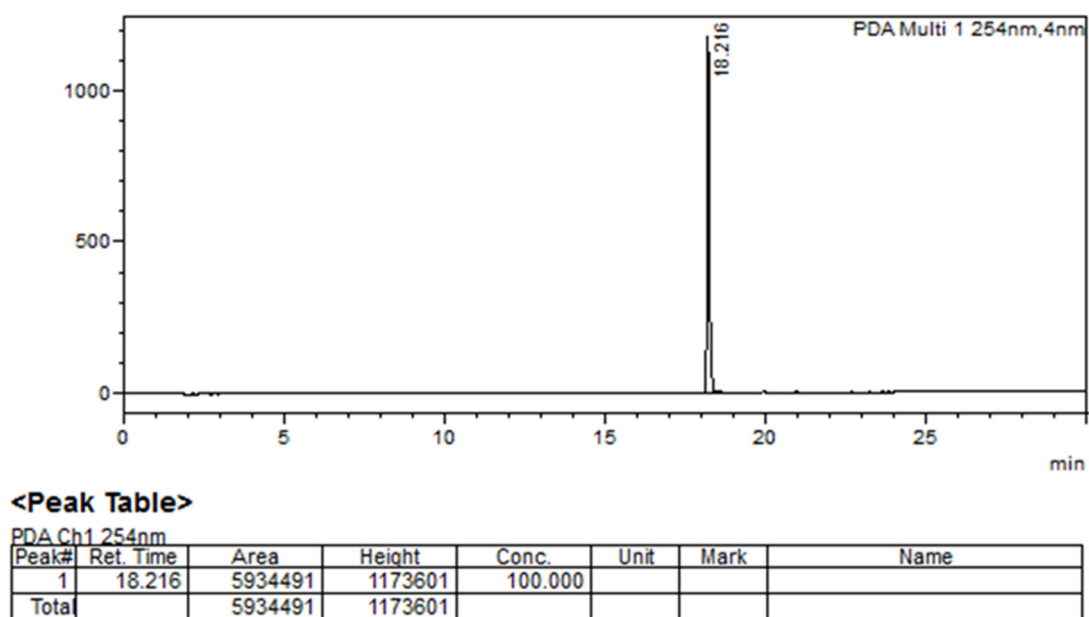


Figure S39. HPLC chromatogram of **21** determined by method A.

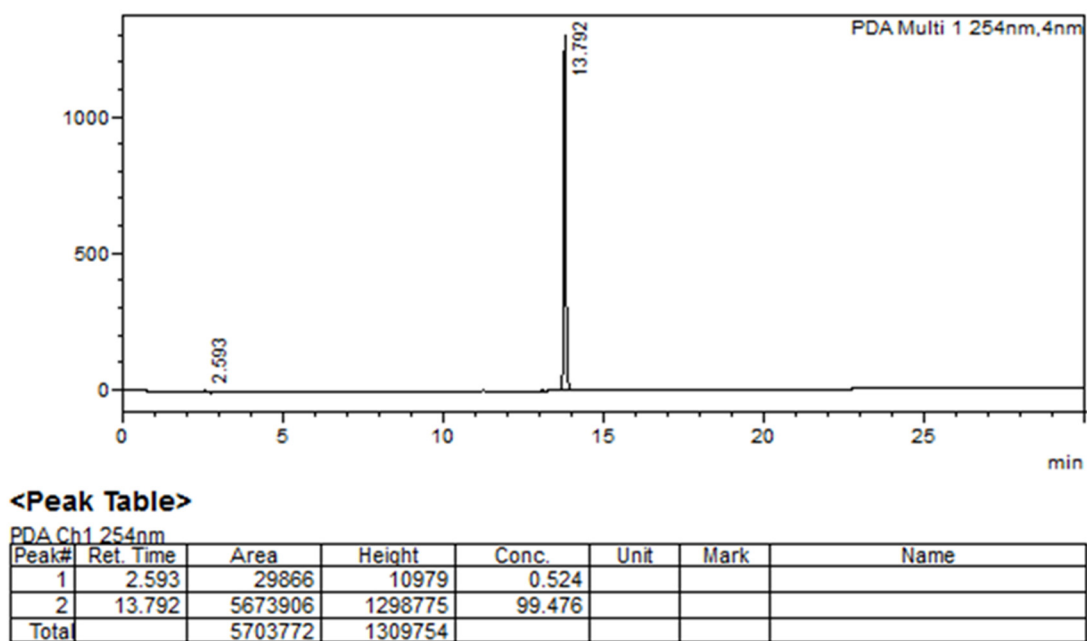


Figure S40. HPLC chromatogram of **21** determined by method B.

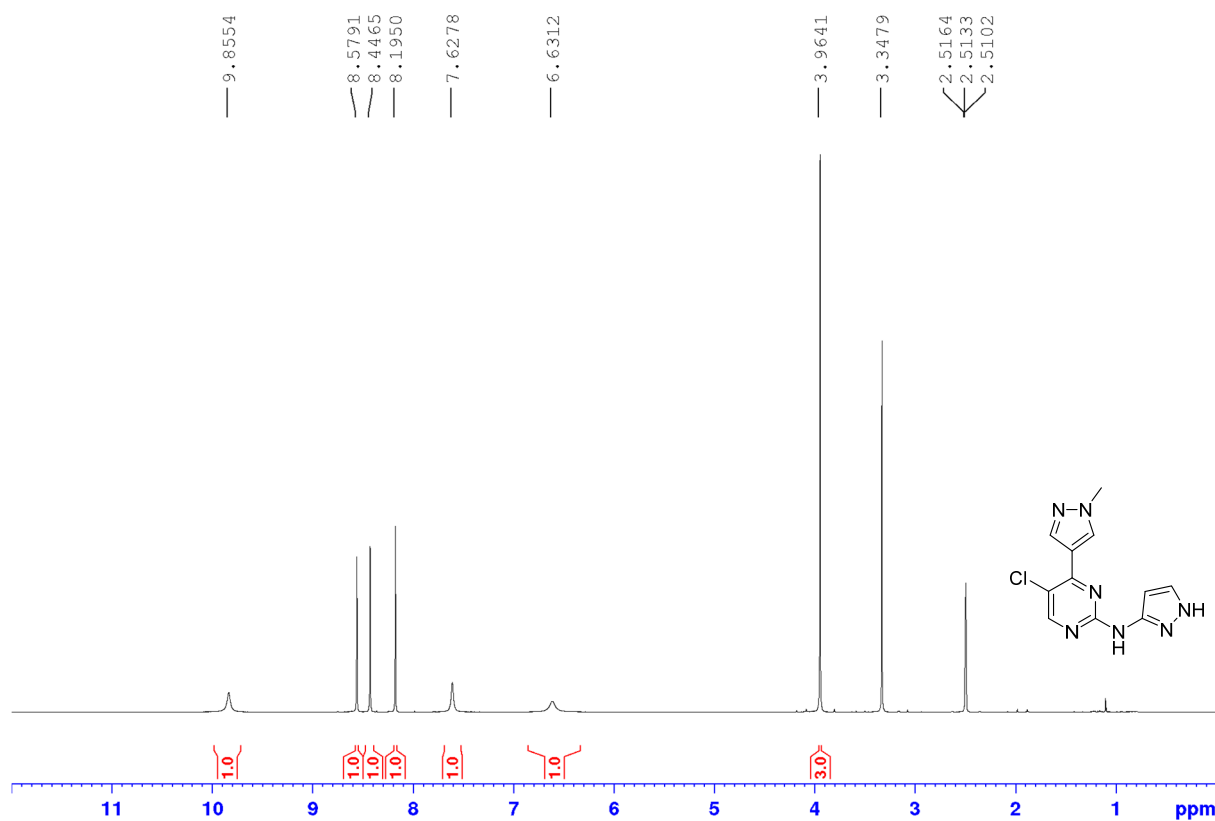


Figure S41. ¹H NMR spectrum of **23** in DMSO-*d*₆ (500 MHz).

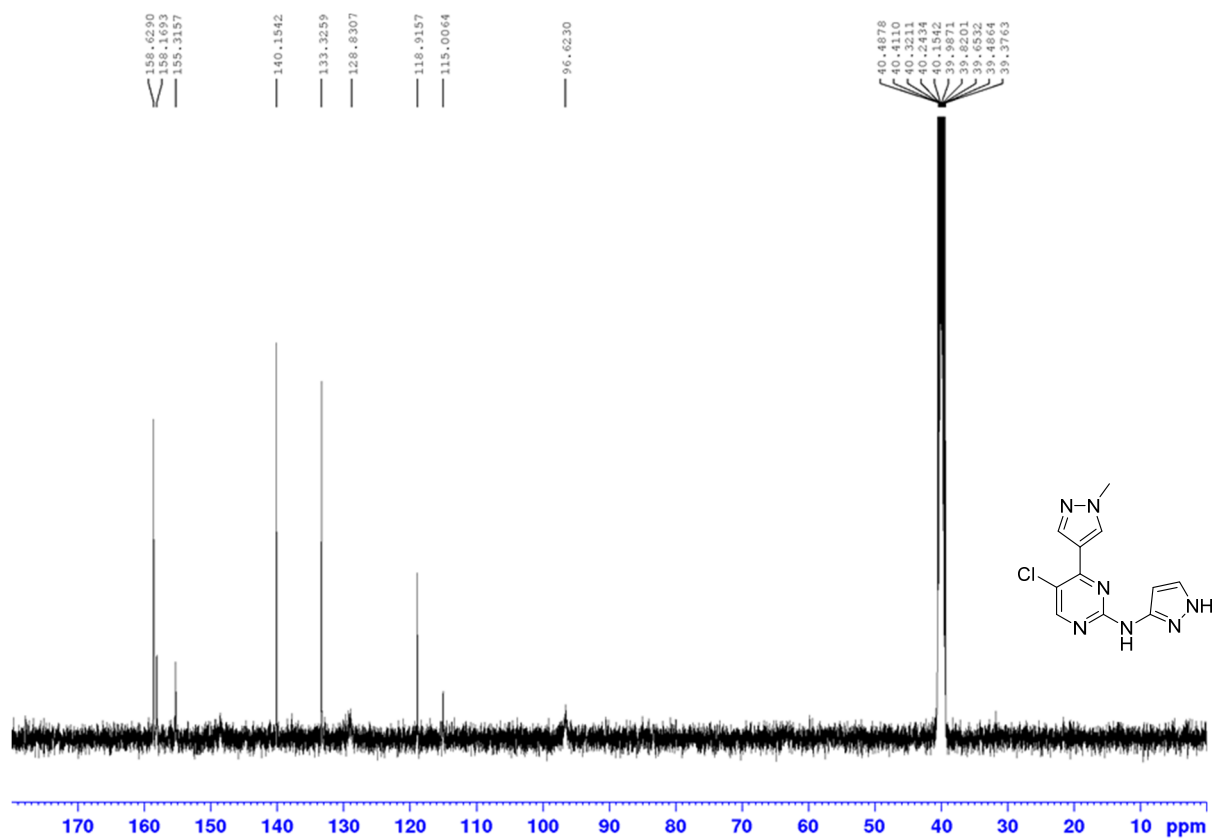


Figure S42. ¹³C NMR spectrum of **23** in DMSO-*d*₆ (125 MHz).

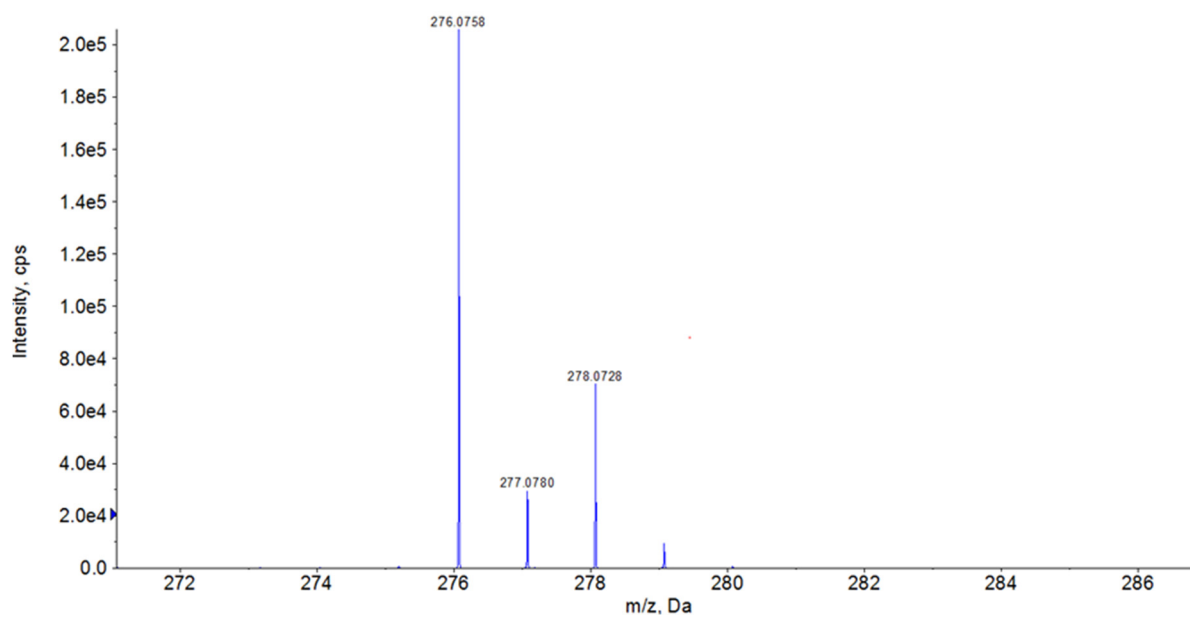
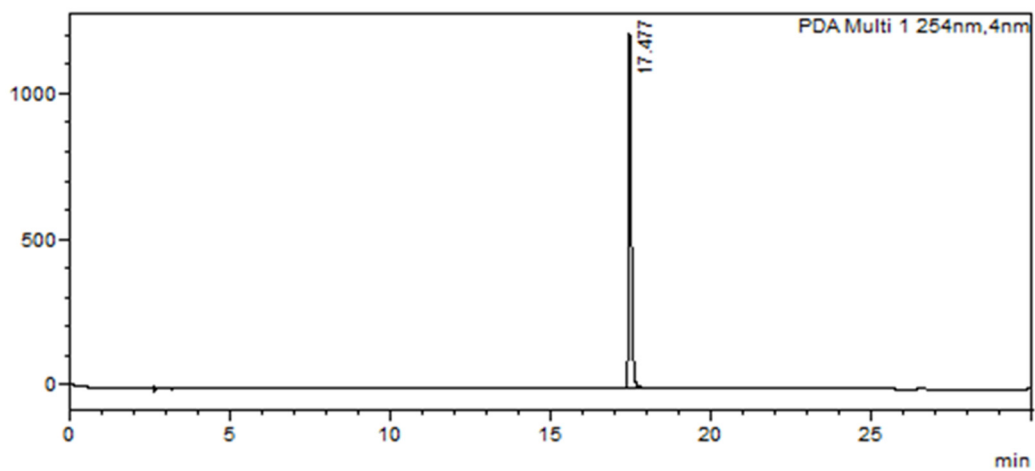


Figure S43. HRMS of 23.



<Peak Table>

PDA Ch1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	17.477	6660849	1213114	100.000			
Total		6660849	1213114				

Figure S44. HPLC chromatogram of 23 determined by method A.

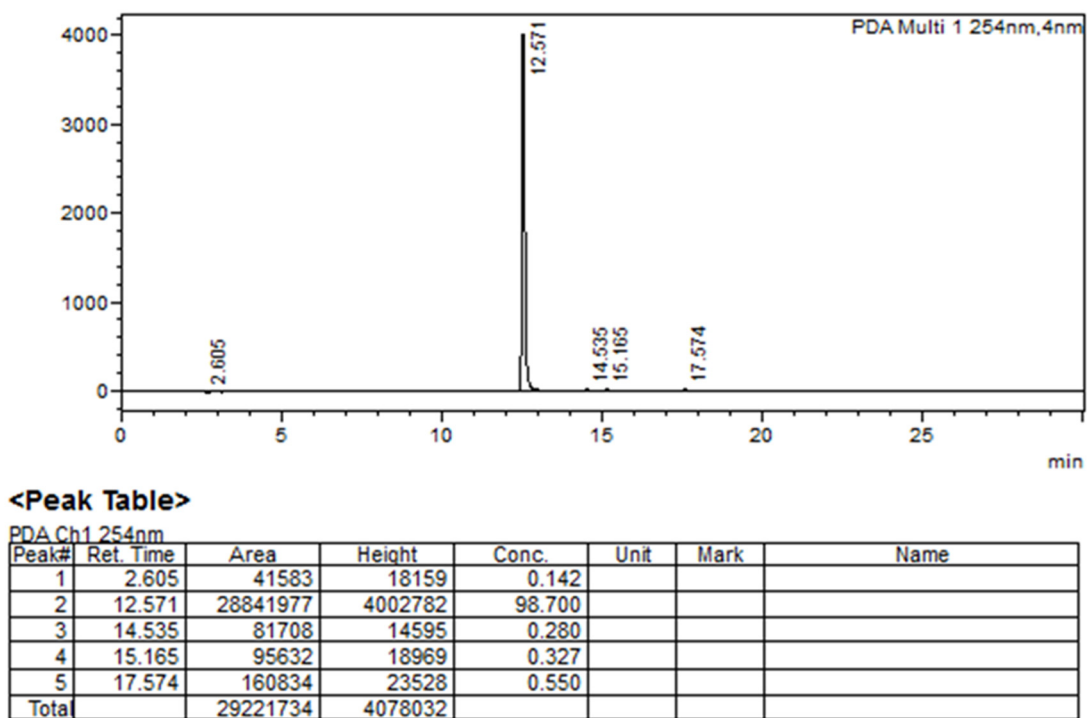


Figure S45. HPLC chromatogram of **23** determined by method B.

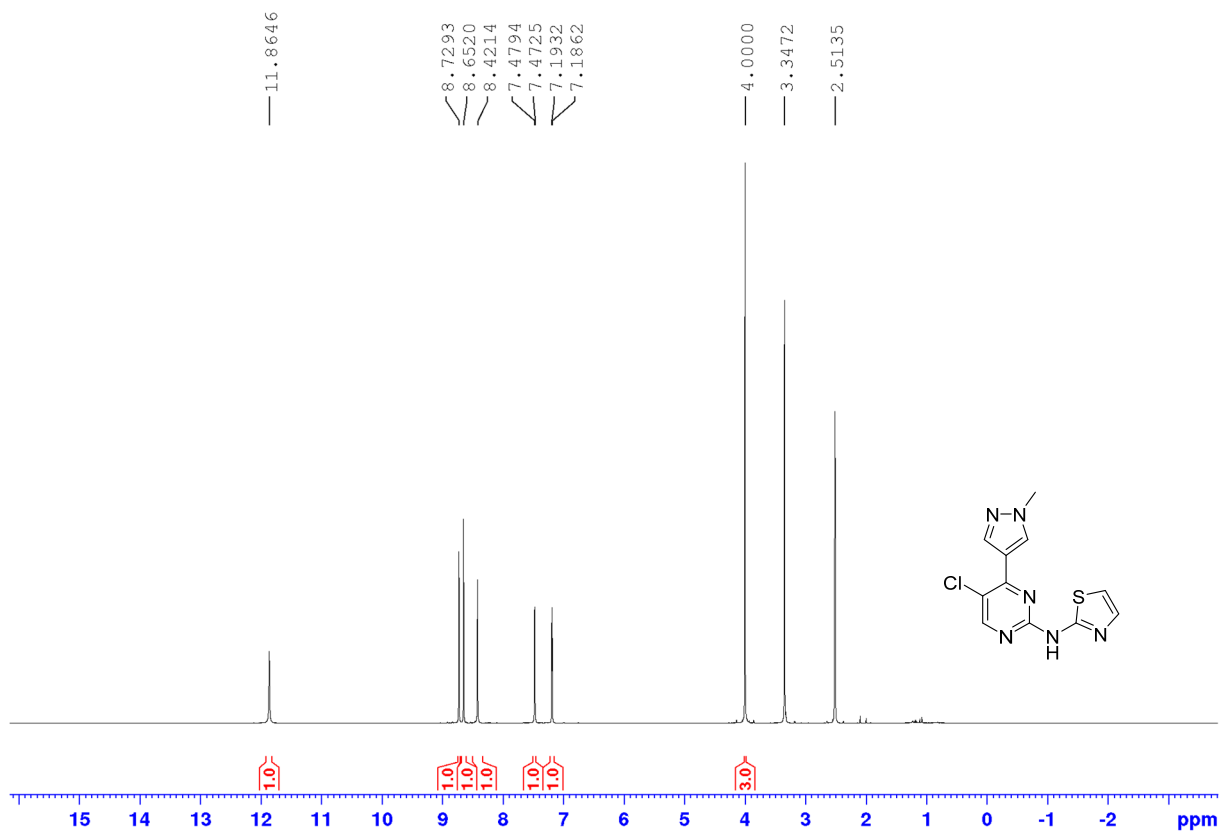


Figure S46. ^1H NMR spectrum of **25** in $\text{DMSO-}d_6$ (500 MHz).

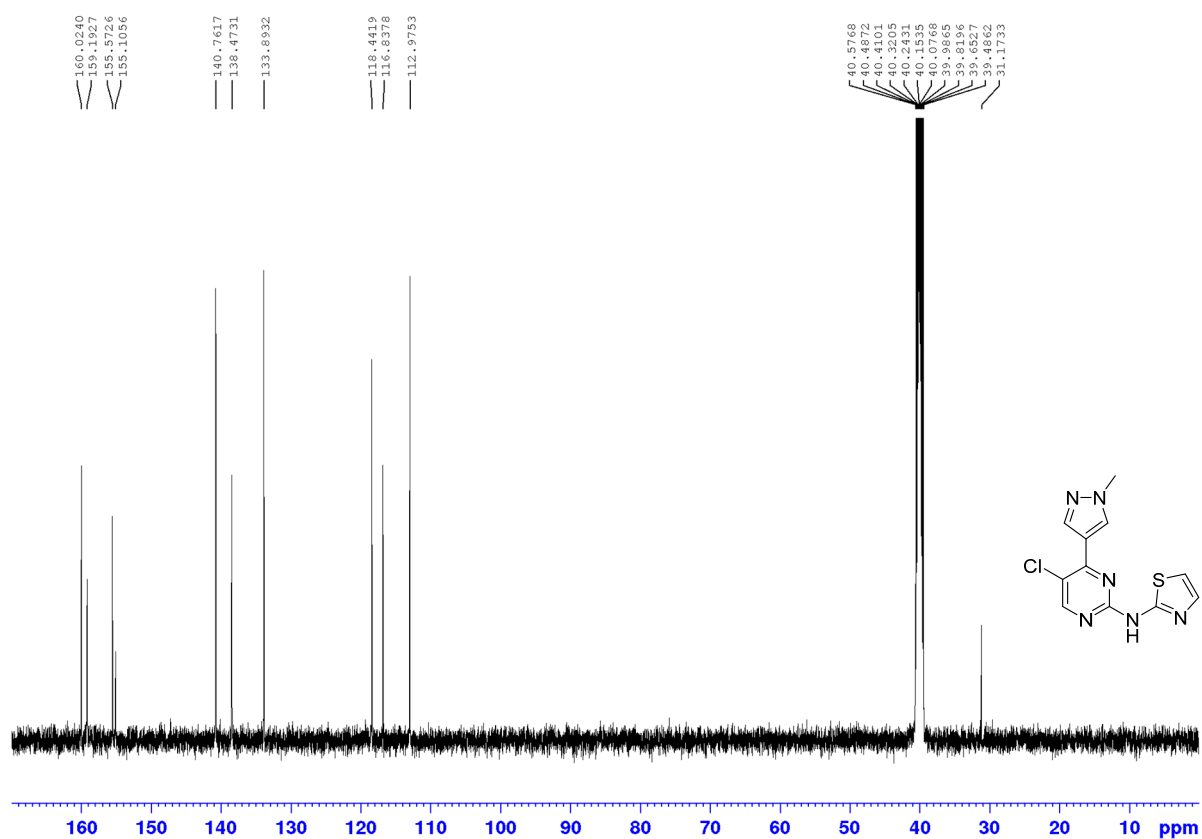


Figure S47. ¹³C NMR spectrum of 25 in DMSO-*d*₆ (125 MHz).

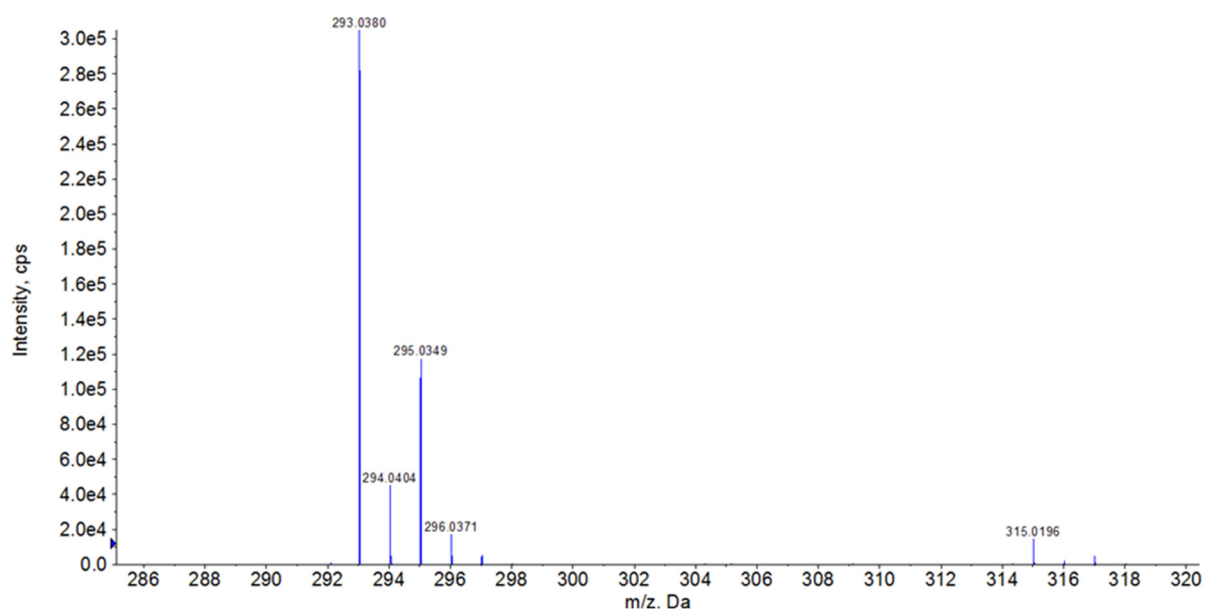


Figure S48. HRMS of 25.

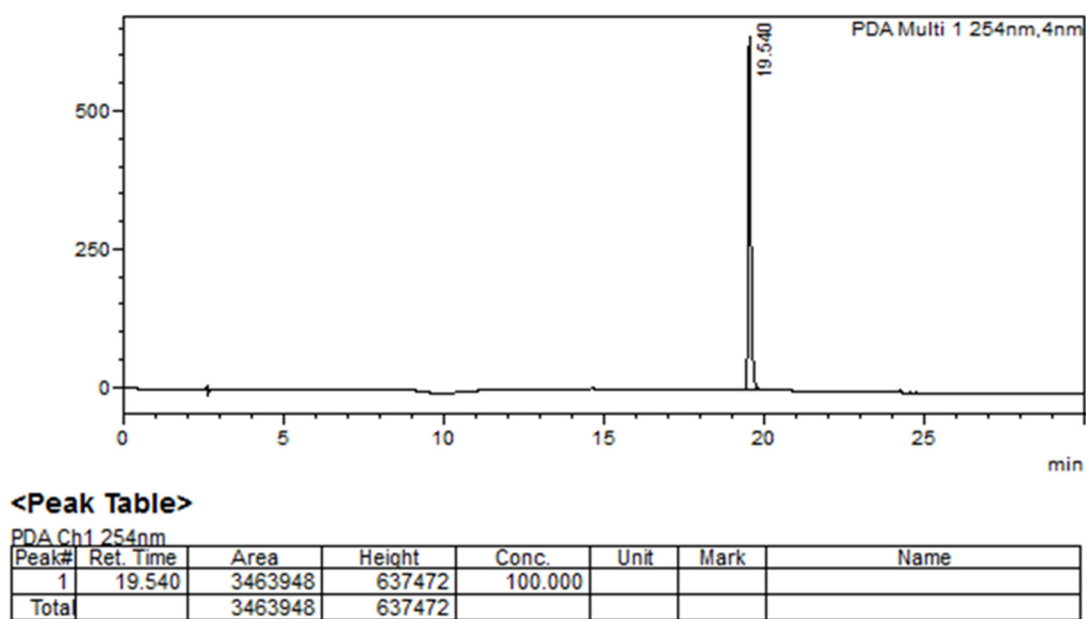


Figure S49. HPLC chromatogram of **25** determined by method A.

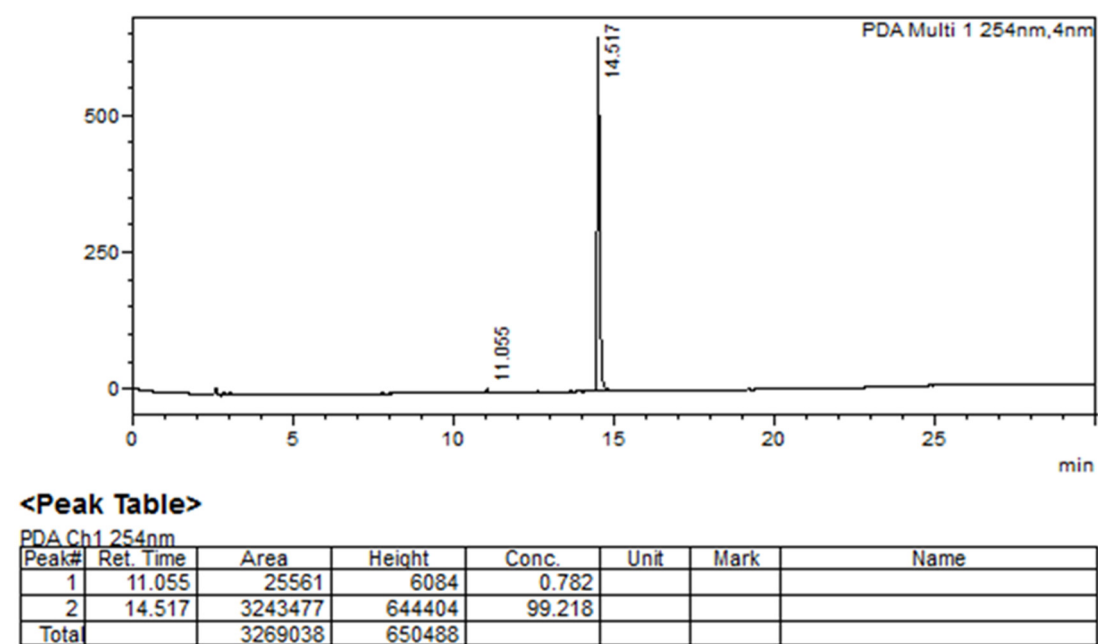
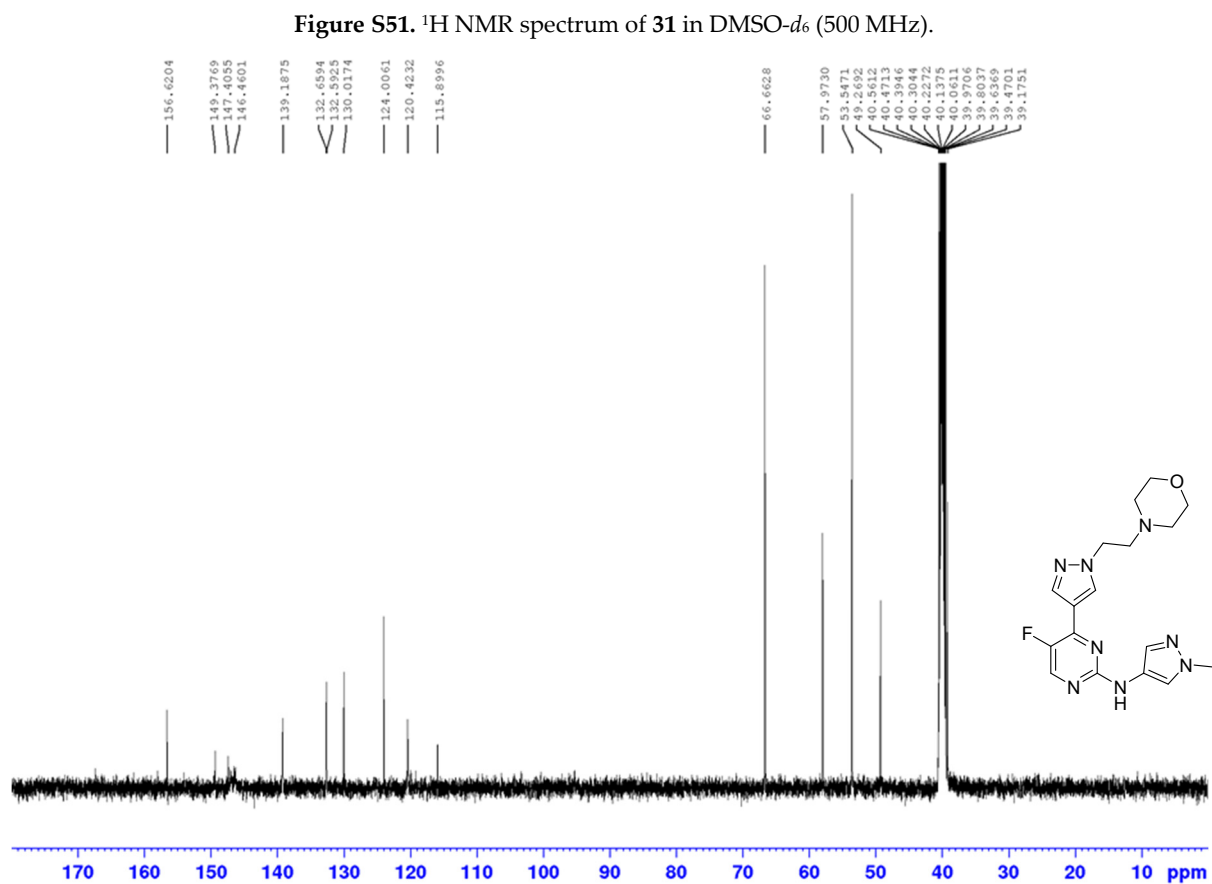
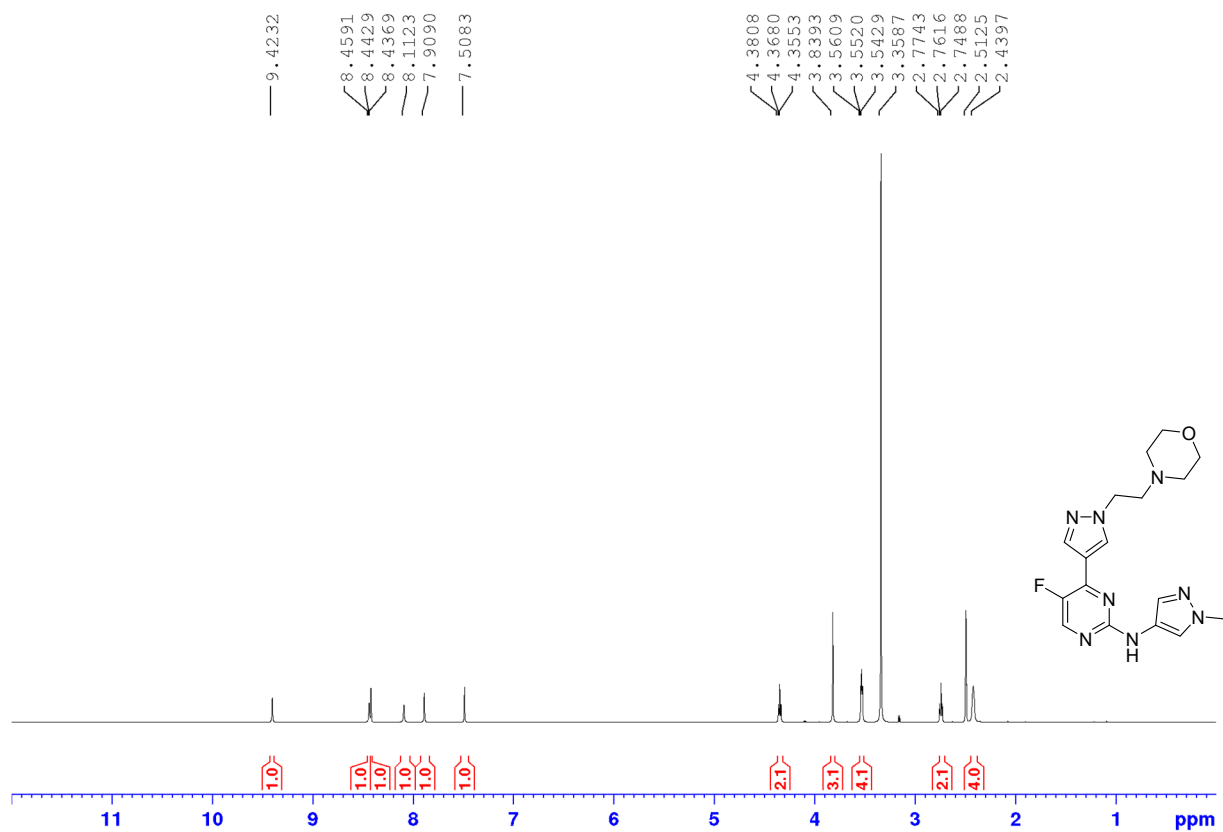


Figure S50. HPLC chromatogram of **25** determined by method B.



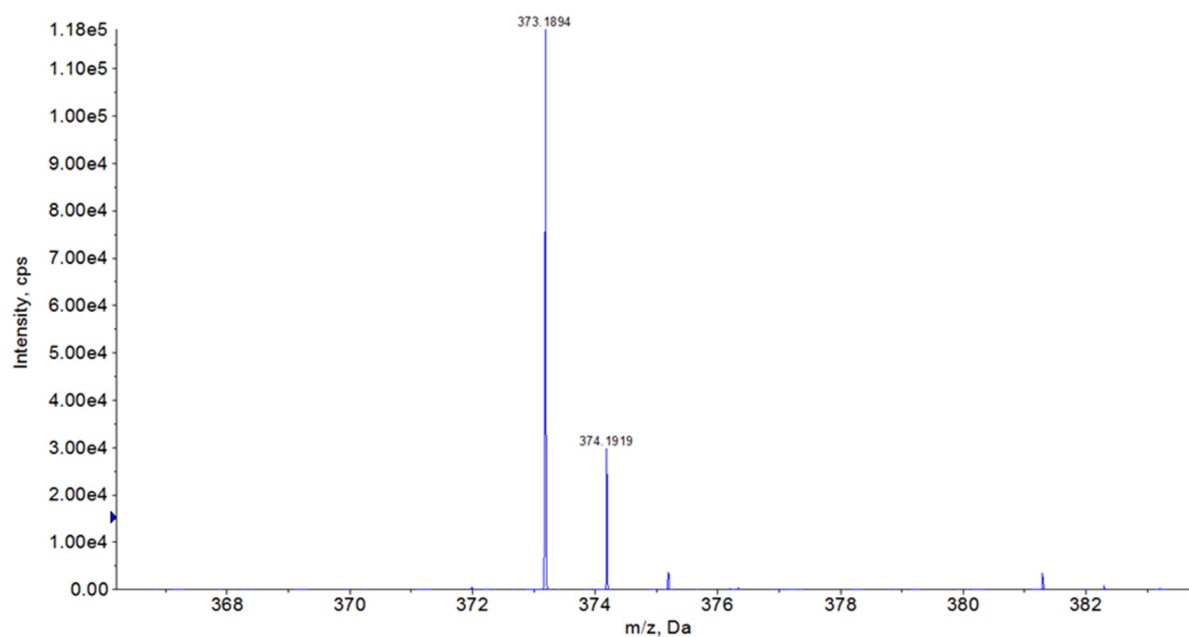
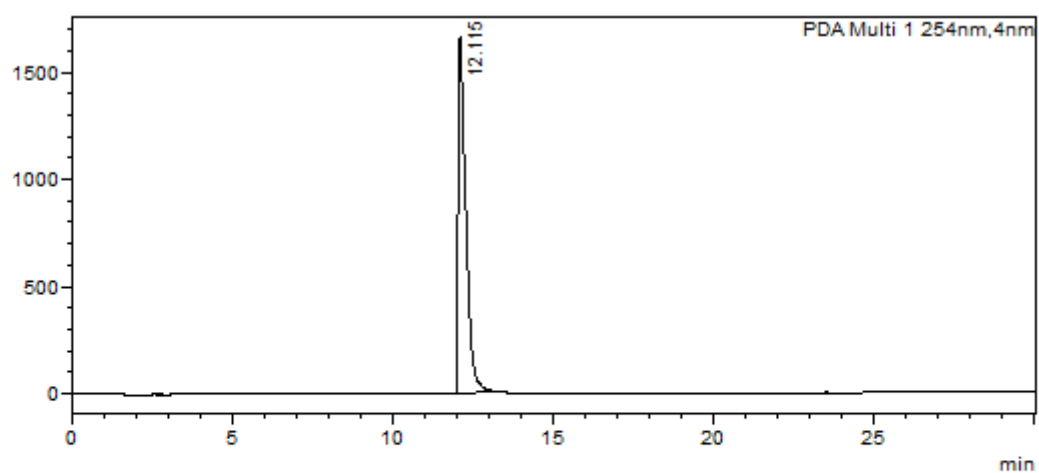


Figure S53. HRMS of 31.



<Peak Table>

PDA Ch1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.115	27865018	1665937	100.000			
Total		27865018	1665937				

Figure S54. HPLC chromatogram of 31 determined by method A.

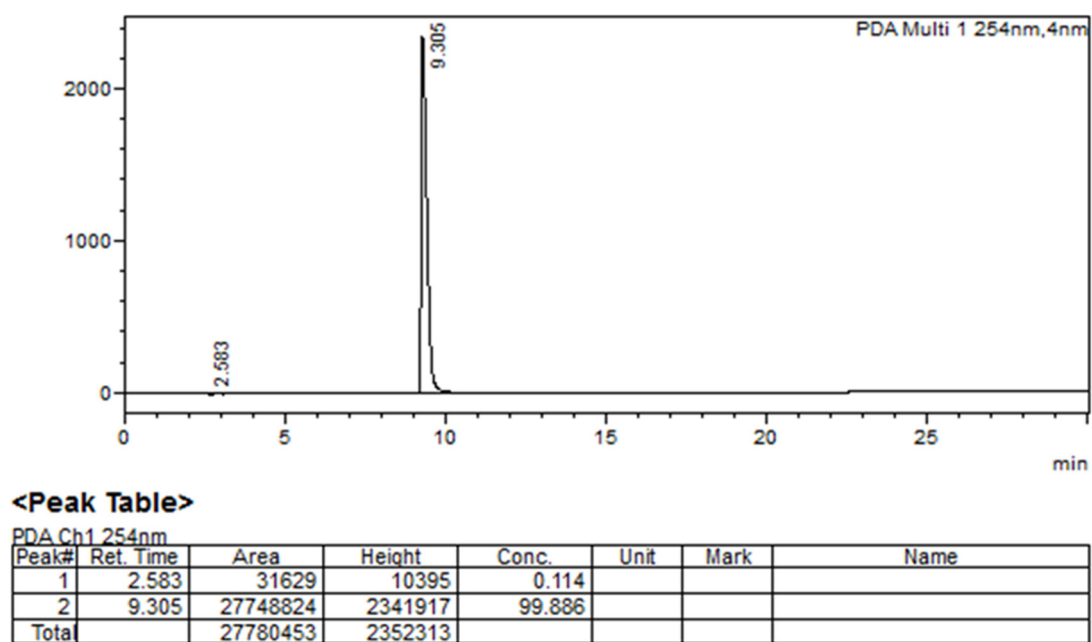


Figure S55. HPLC chromatogram of 31 determined by method B.

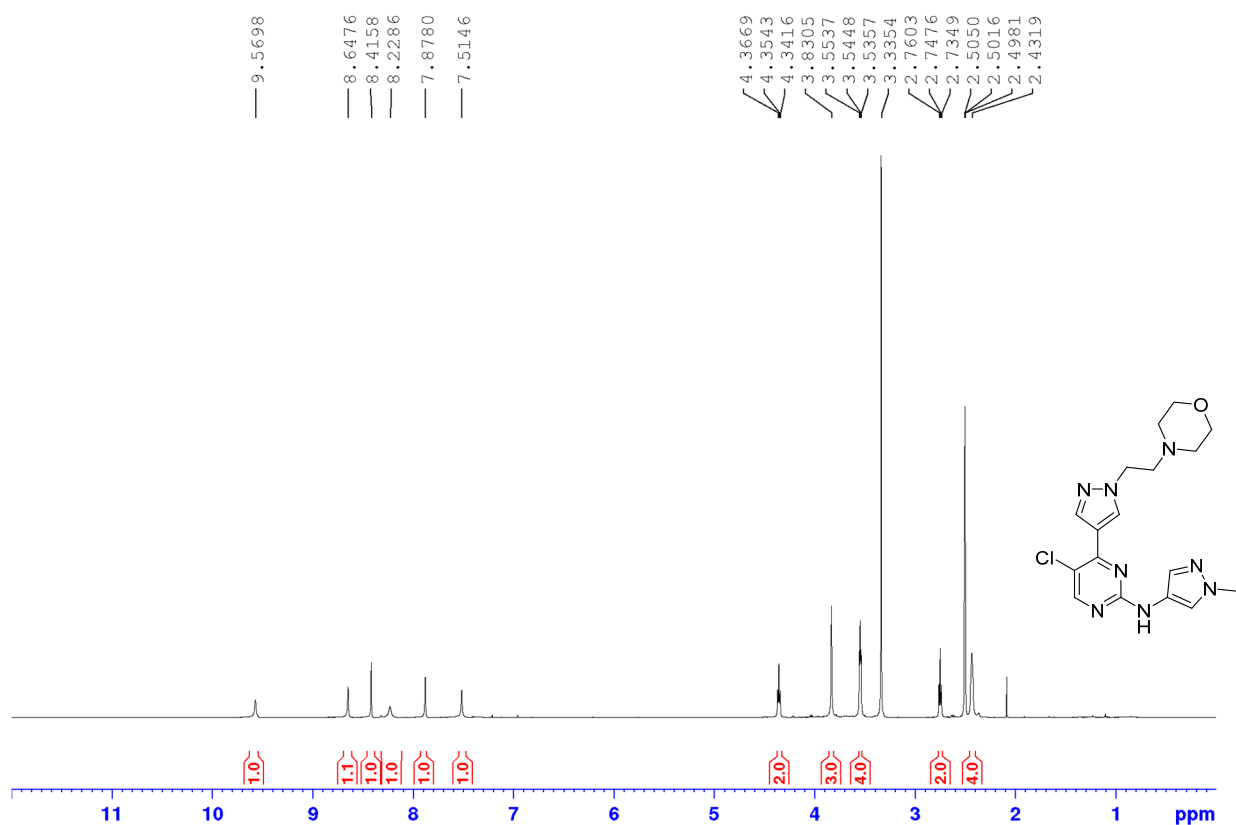


Figure S56. ^1H NMR spectrum of 32 in $\text{DMSO}-d_6$ (500 MHz).

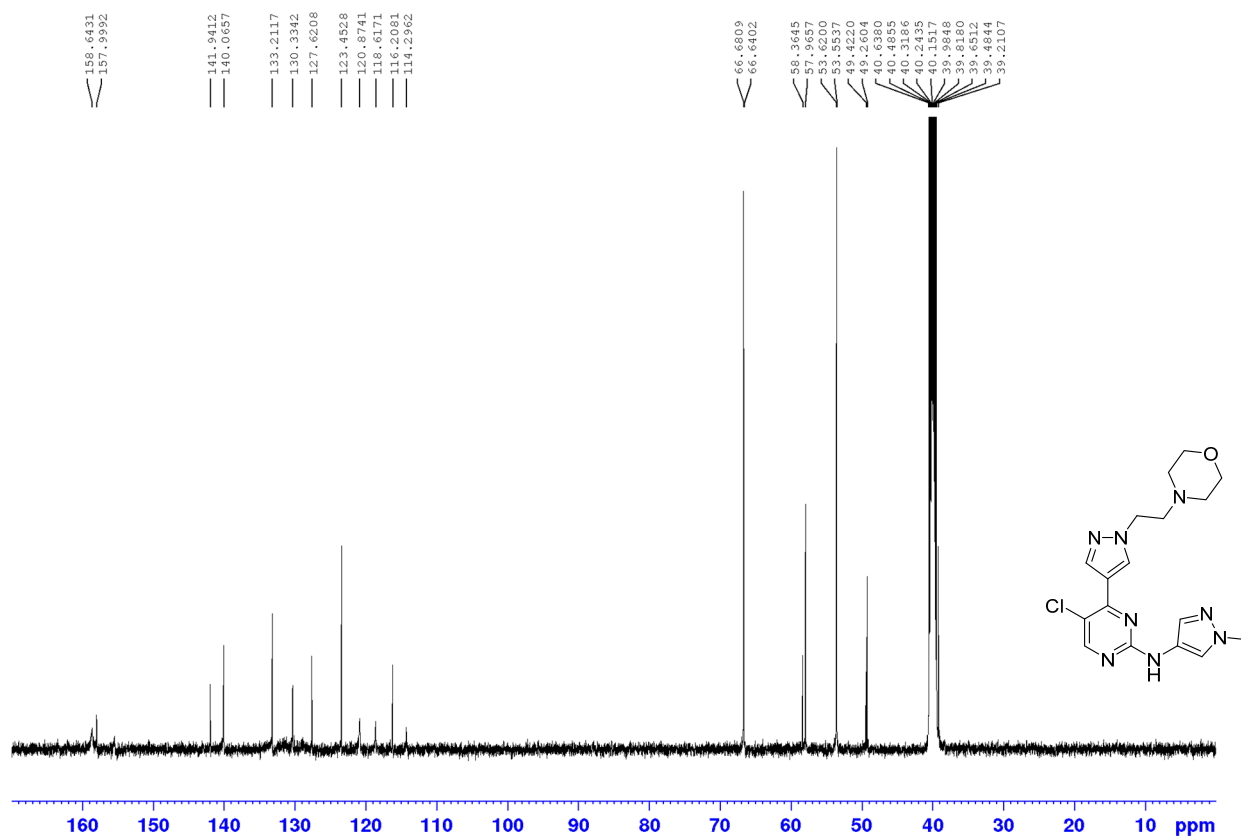


Figure S57. ¹³C NMR spectrum of 32 in DMSO-*d*₆ (125 MHz).

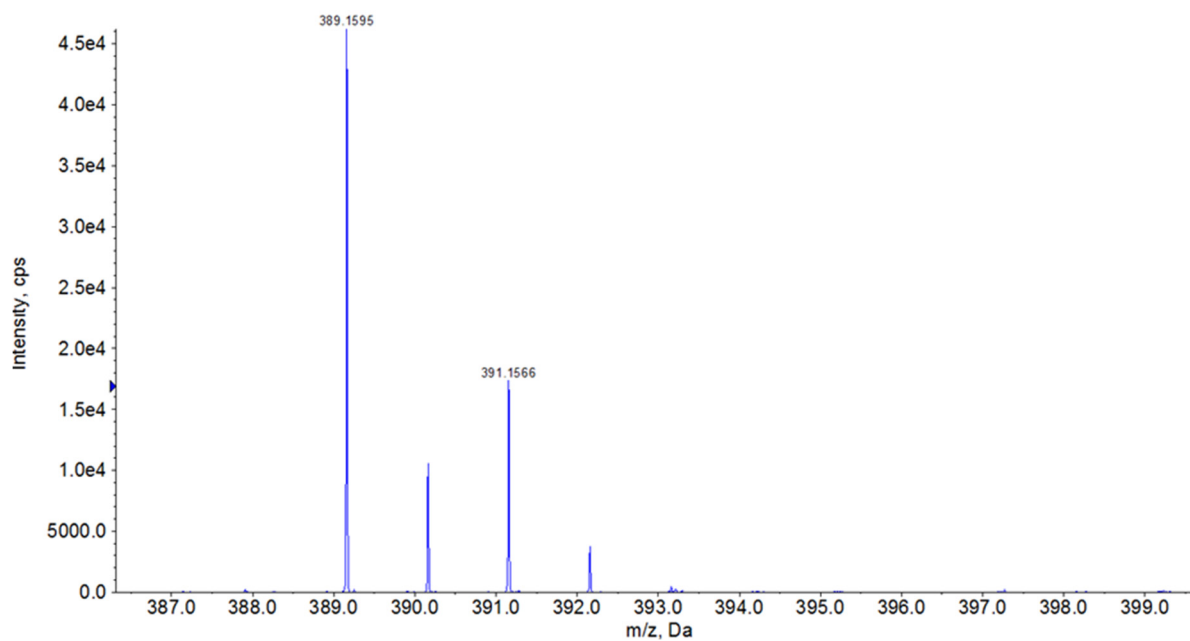


Figure S58. HRMS of 32.

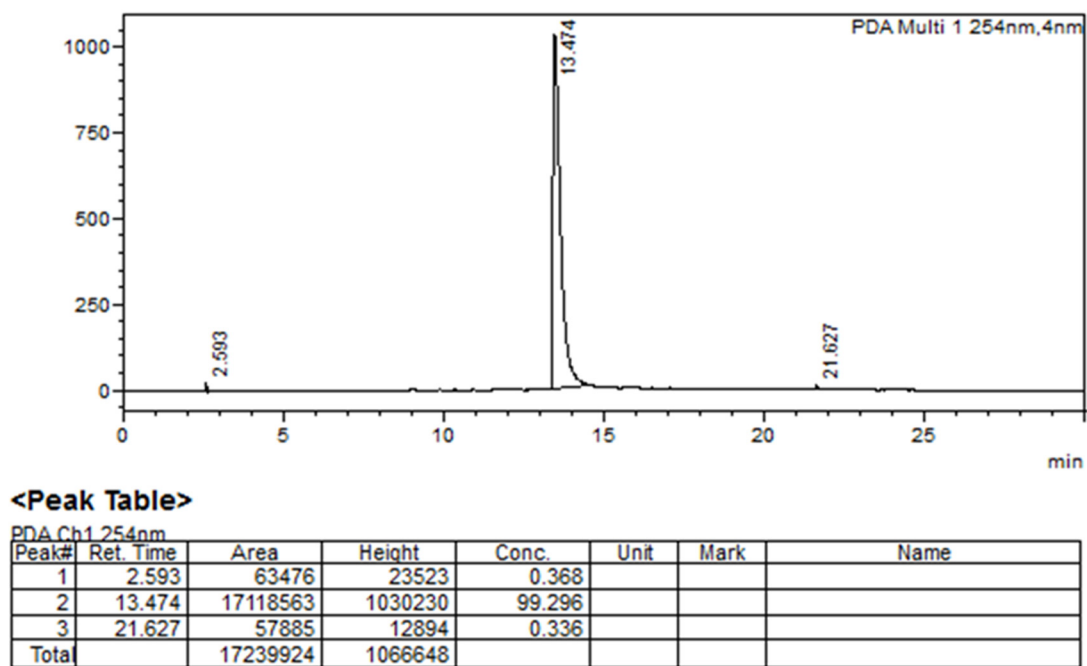


Figure S59. HPLC chromatogram of 32 determined by method A.

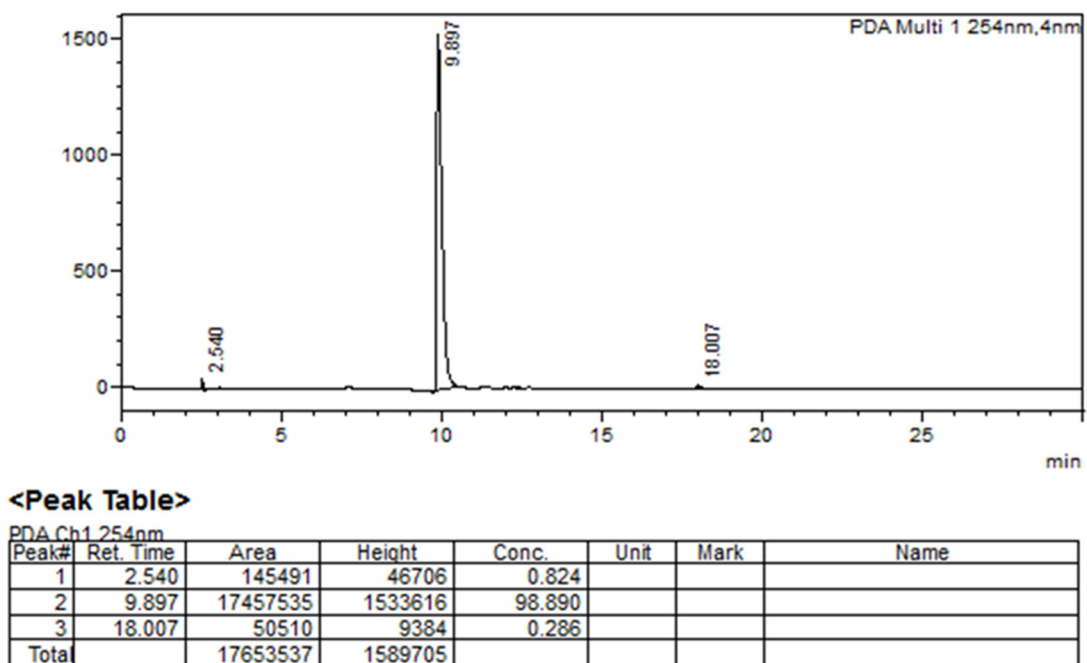


Figure S60. HPLC chromatogram of 32 determined by method B.

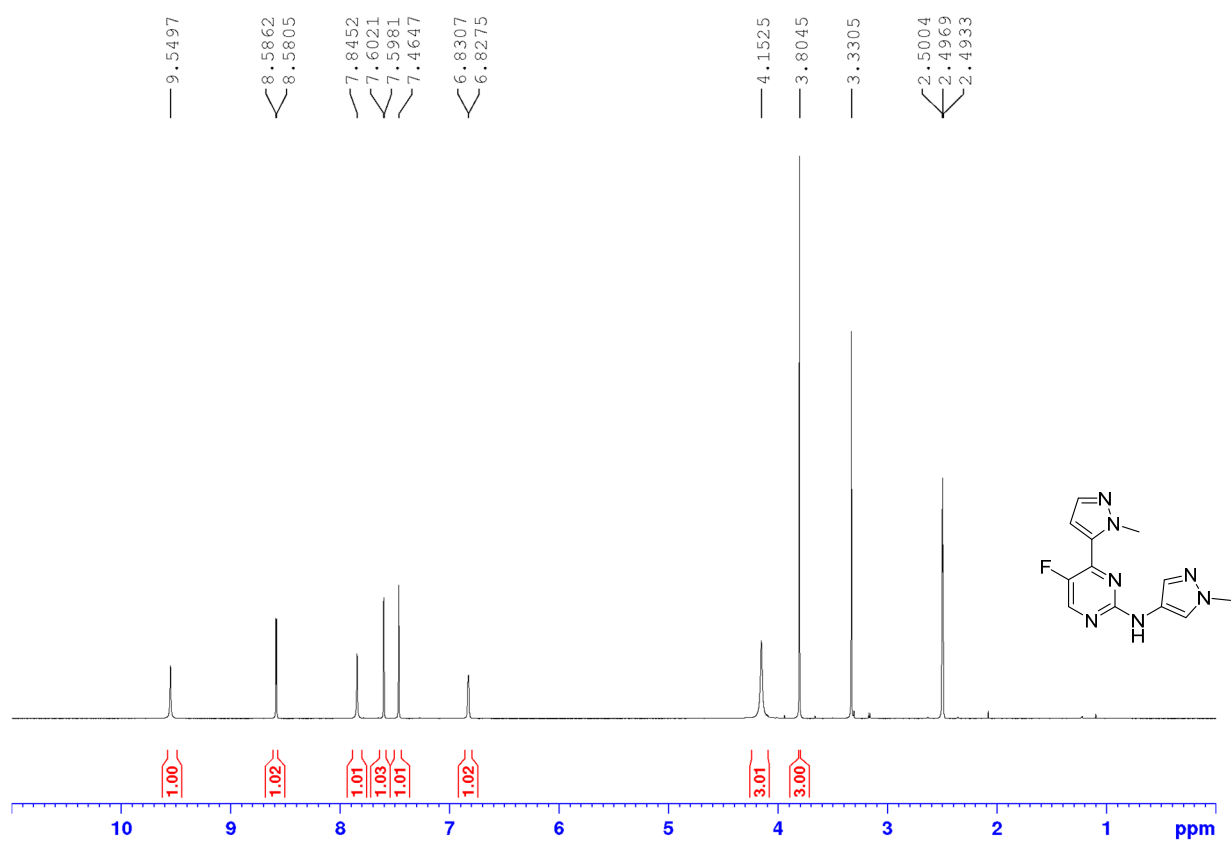


Figure S61. ¹H NMR spectrum of 35 in DMSO-*d*₆ (500 MHz).

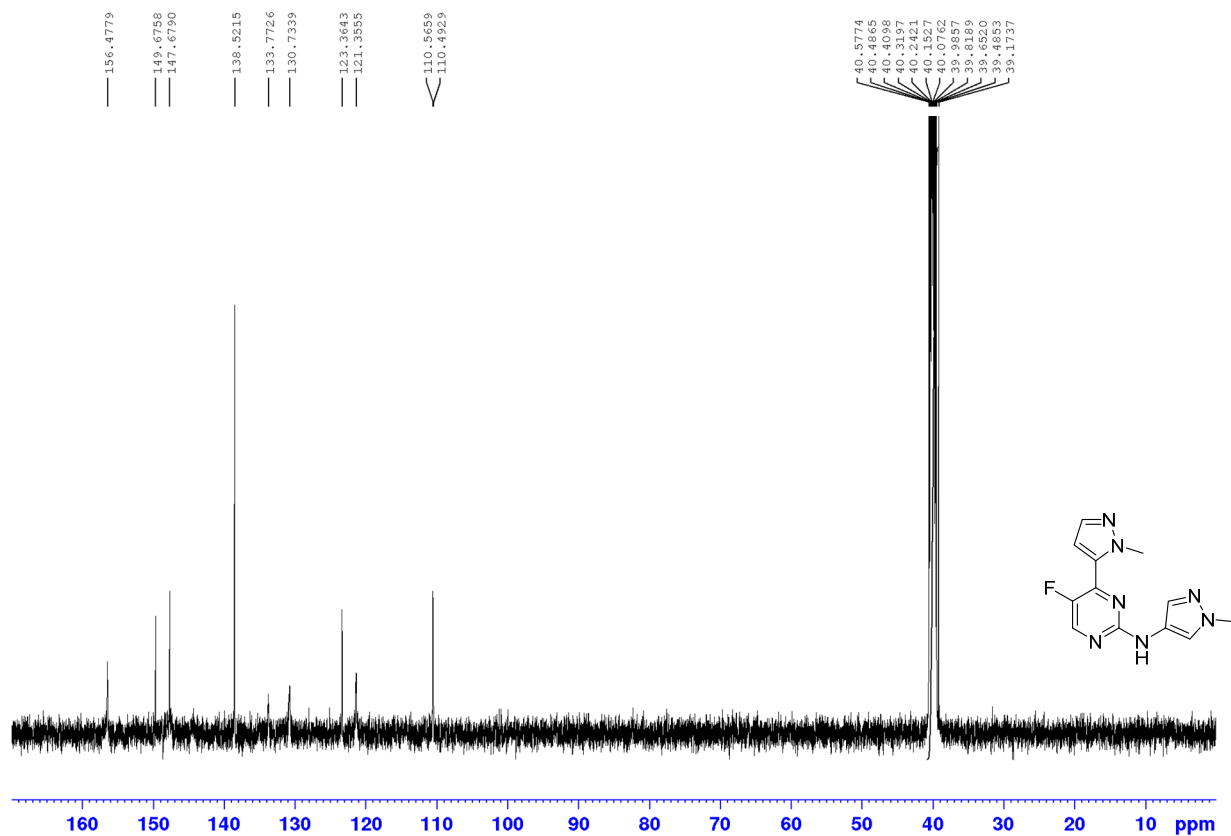


Figure S62. ¹³C NMR spectrum of 35 in DMSO-*d*₆ (125 MHz).

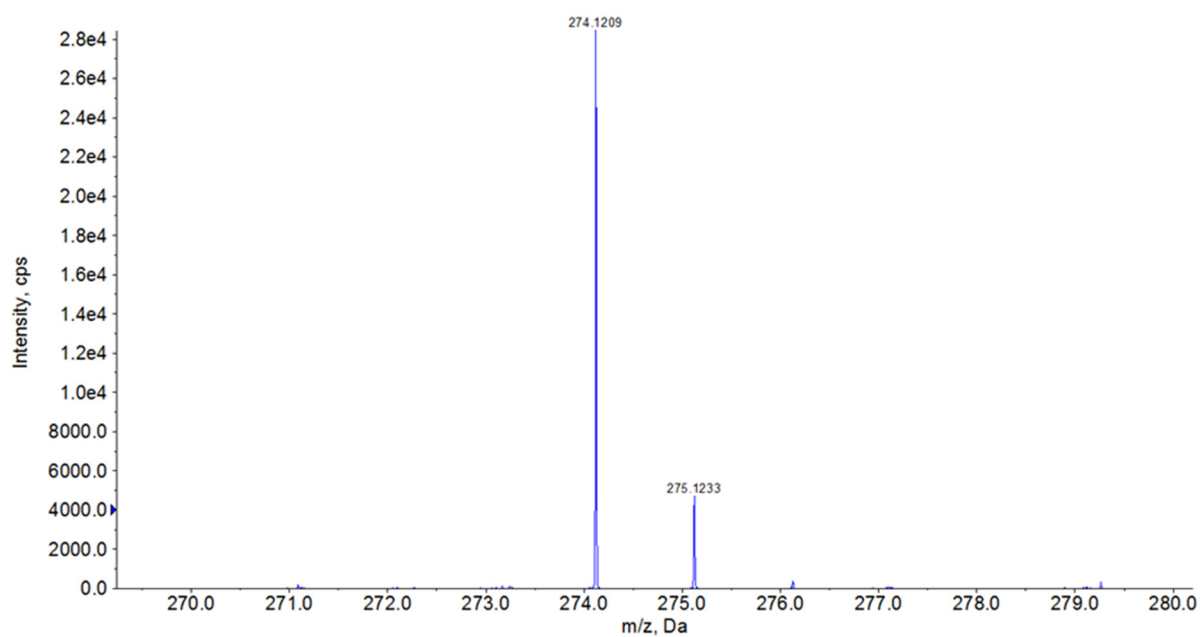
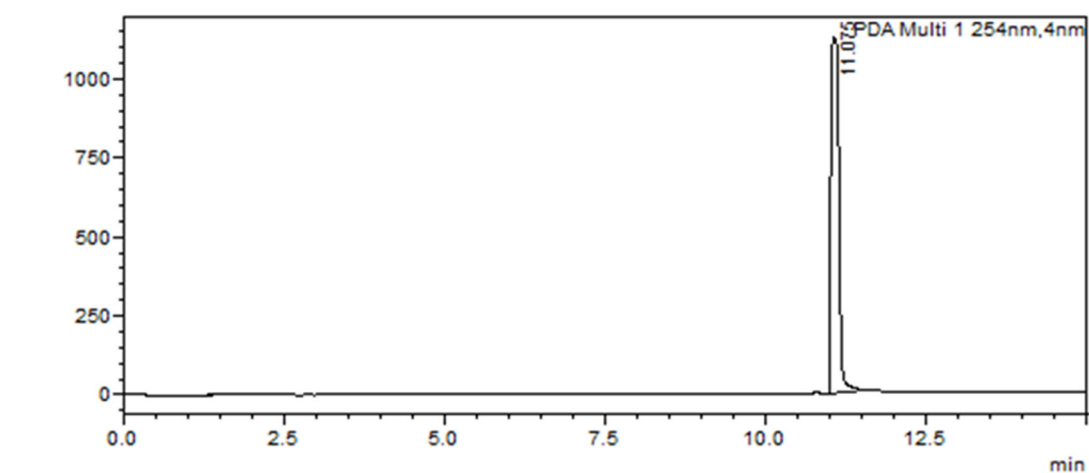


Figure S63. HRMS of 35.

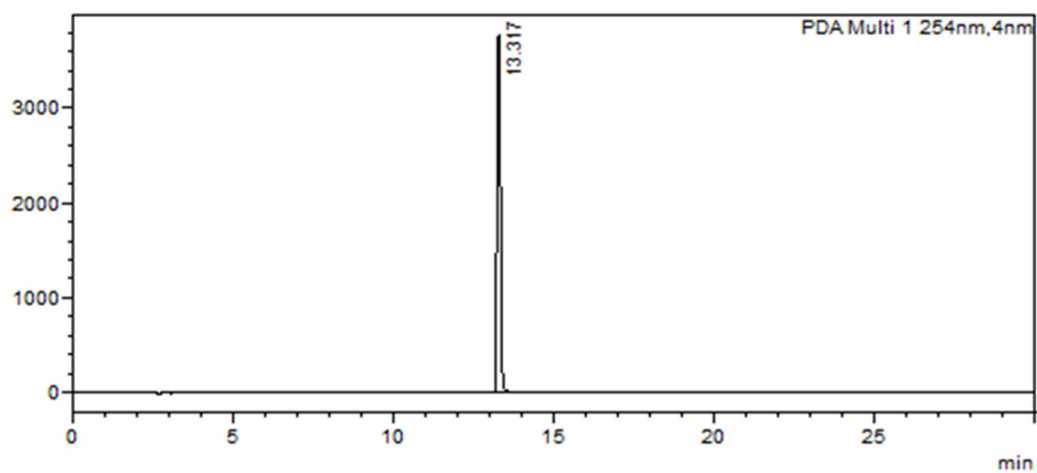


<Peak Table>

PDA Ch1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.075	10009115	1123706	100.000			
Total		10009115	1123706				

Figure S64. HPLC chromatogram of 35 determined by method A.



<Peak Table>

PDA Ch1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	13.317	28404258	3763998	100.000			
Total		28404258	3763998				

Figure S65. HPLC chromatogram of 35 determined by method B.