

Electronic Supplementary Information

Synthesis and evaluation of NHC derivatives and 4'- fluorouridine prodrugs

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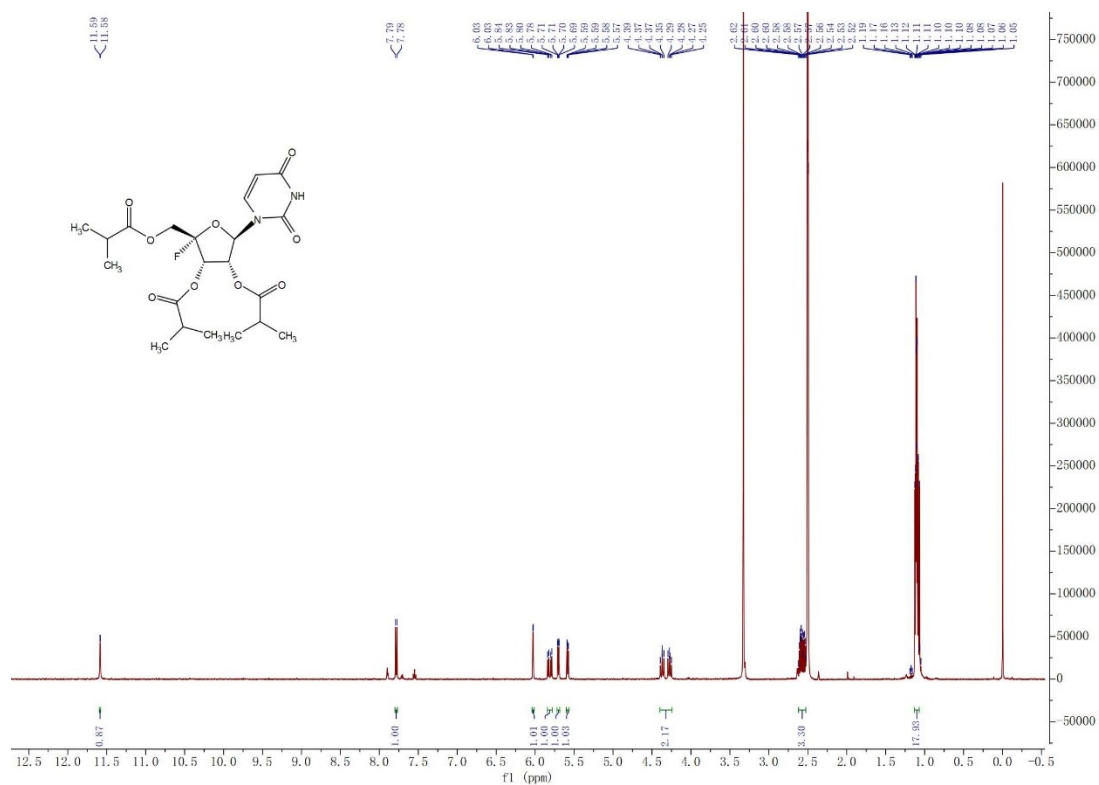
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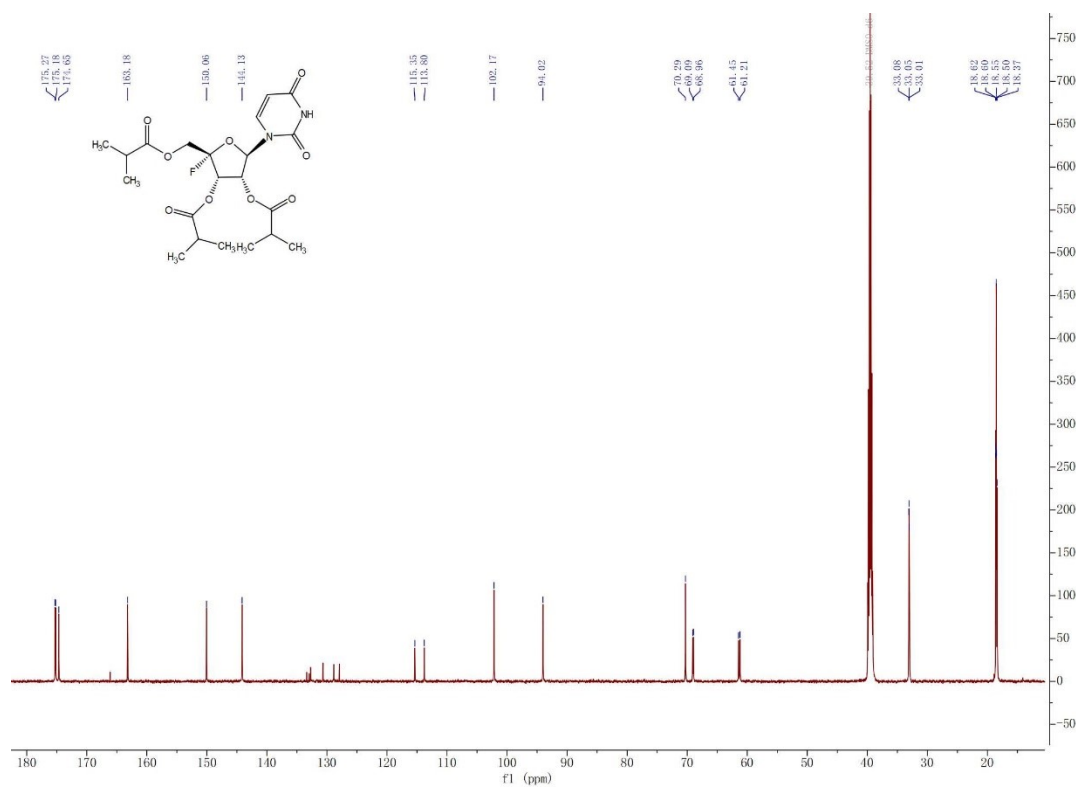
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2. ^1H NMR, ^{13}C NMR spectrum of compound 1a

^1H NMR (500 MHz, $\text{DMSO-}d_6$)

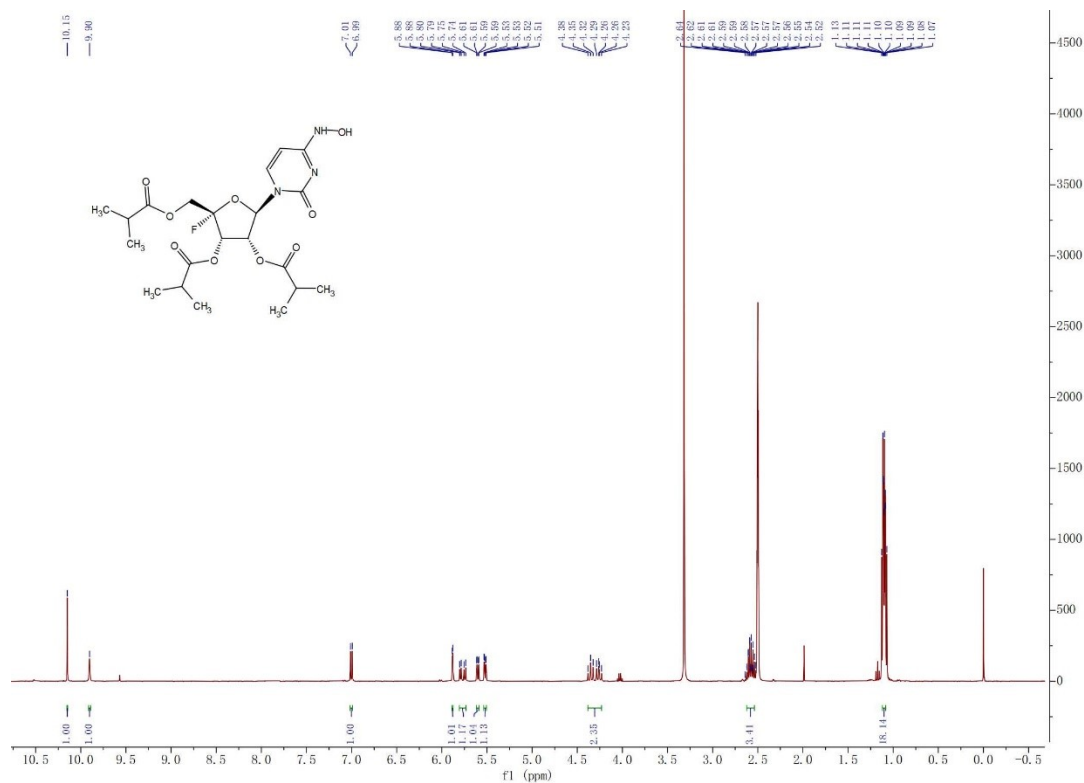


^{13}C NMR (151 MHz, $\text{DMSO-}d_6$)

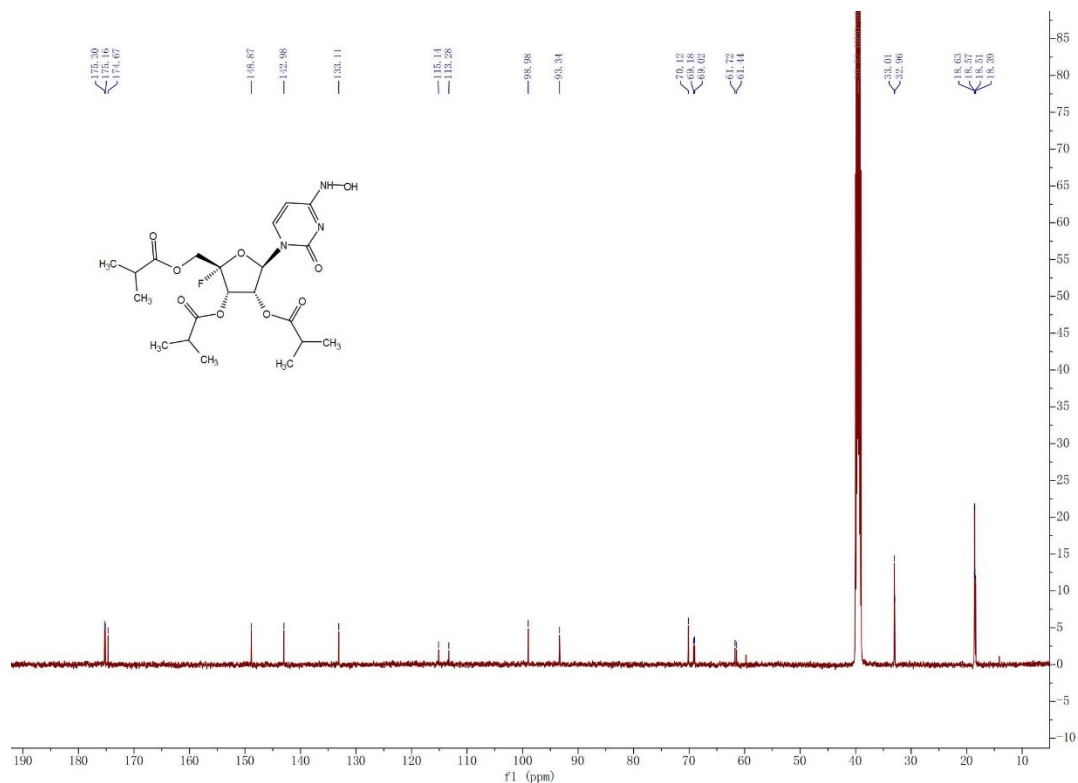


3. ¹H NMR, ¹³C NMR spectrum of compound 1b

¹H NMR (400 MHz, DMSO-d₆)

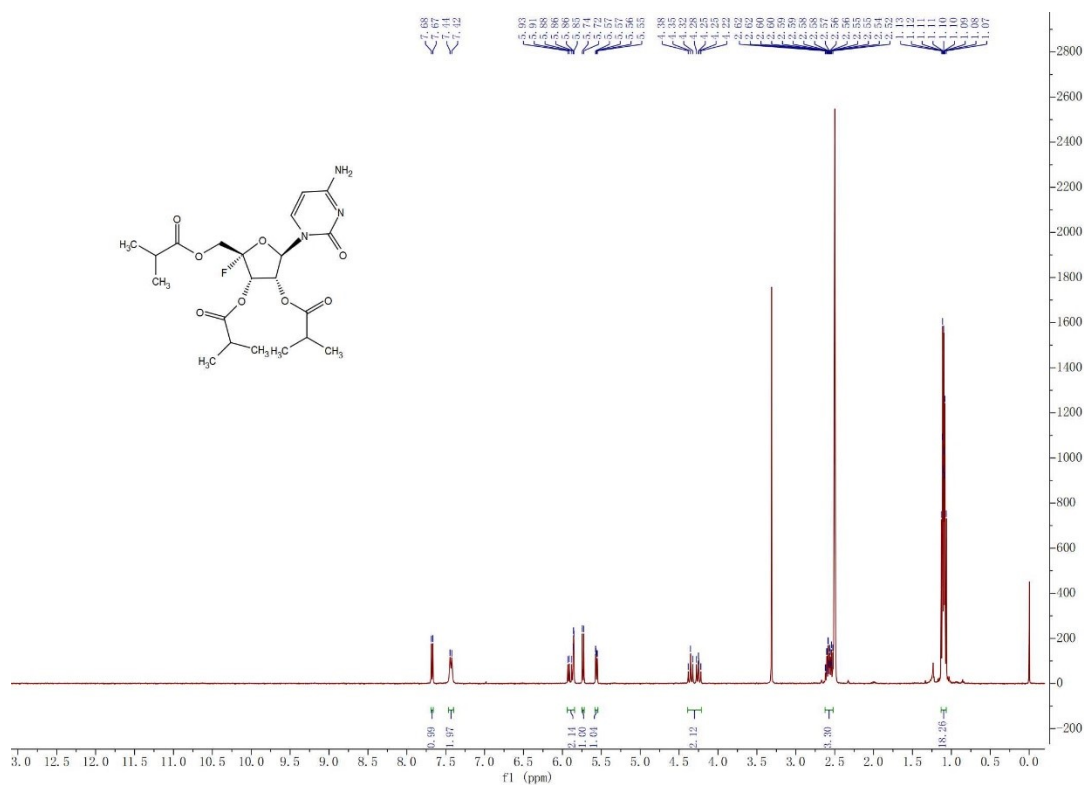


¹³C NMR (126 MHz, DMSO-d₆)

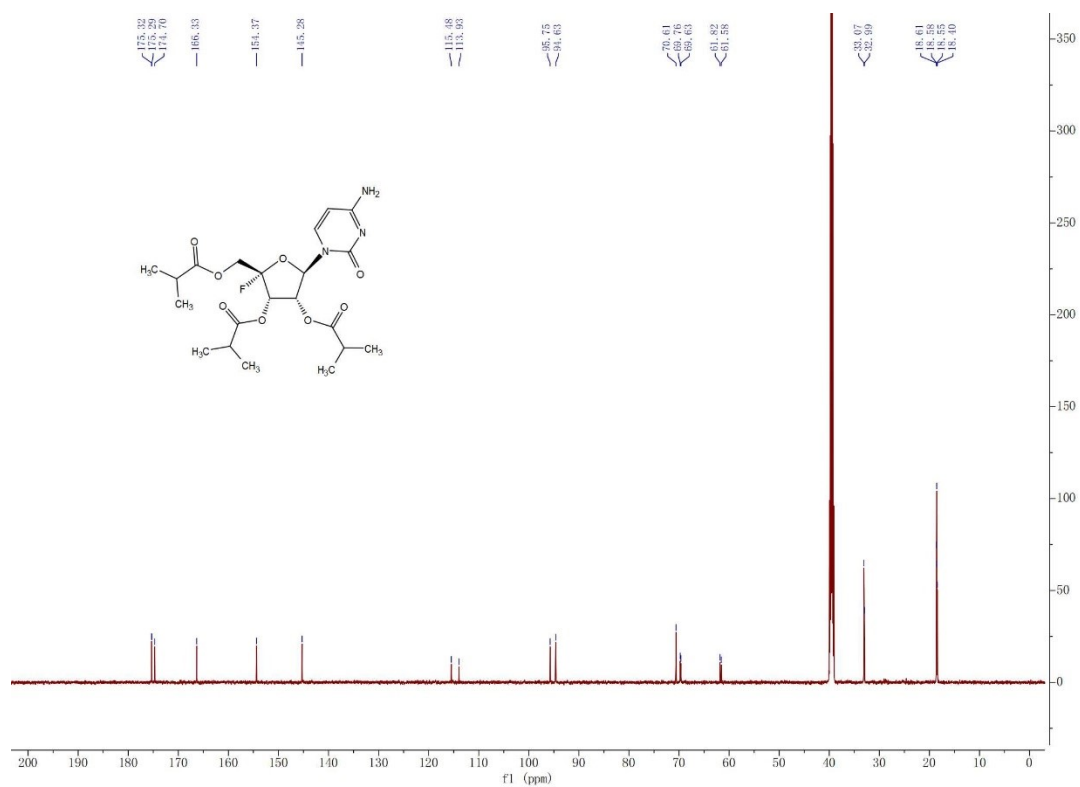


4. ¹H NMR, ¹³C NMR spectrum of compound 1c

¹H NMR (400 MHz, DMSO-*d*₆)

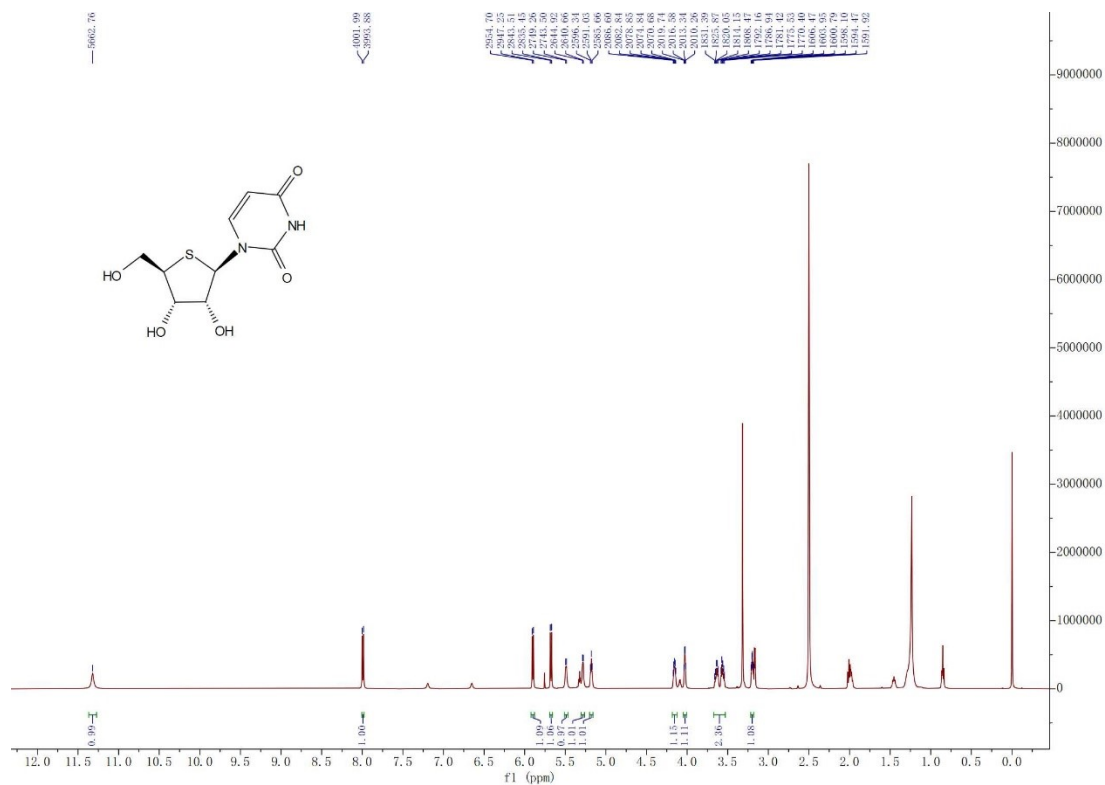


¹³C NMR (151 MHz, DMSO-*d*₆)

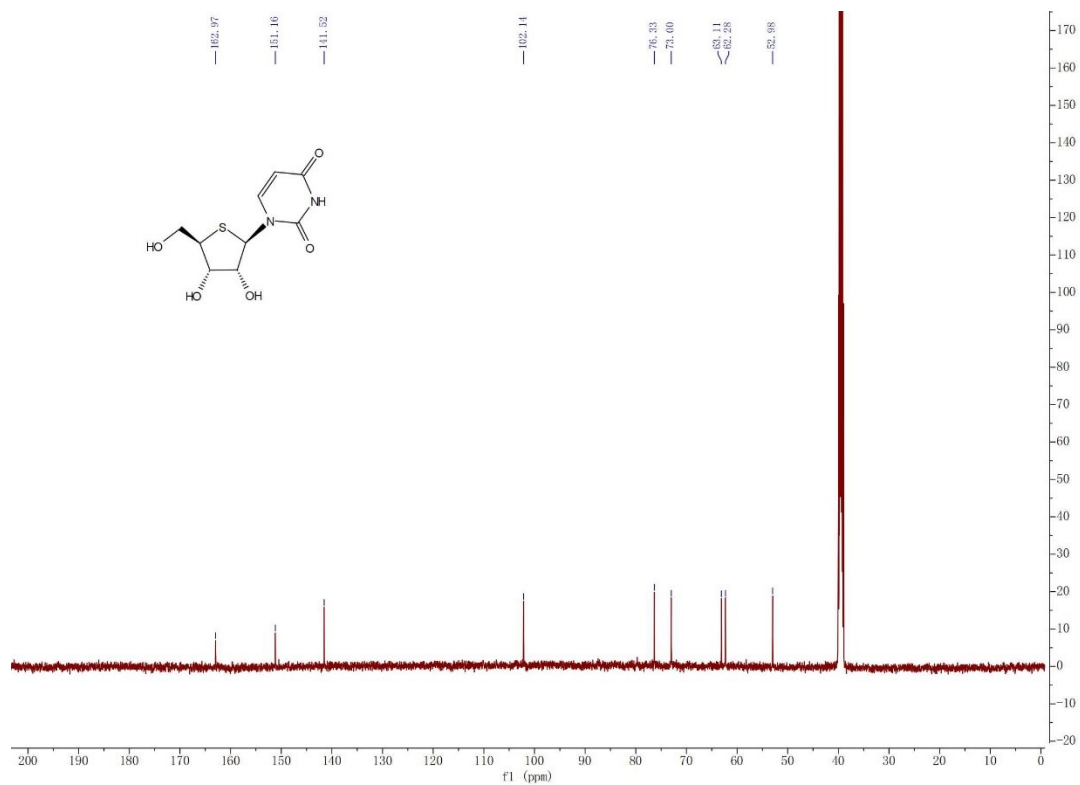


5. ^1H NMR, ^{13}C NMR spectrum of compound 2a

^1H NMR (500 MHz, $\text{DMSO}-d_6$)

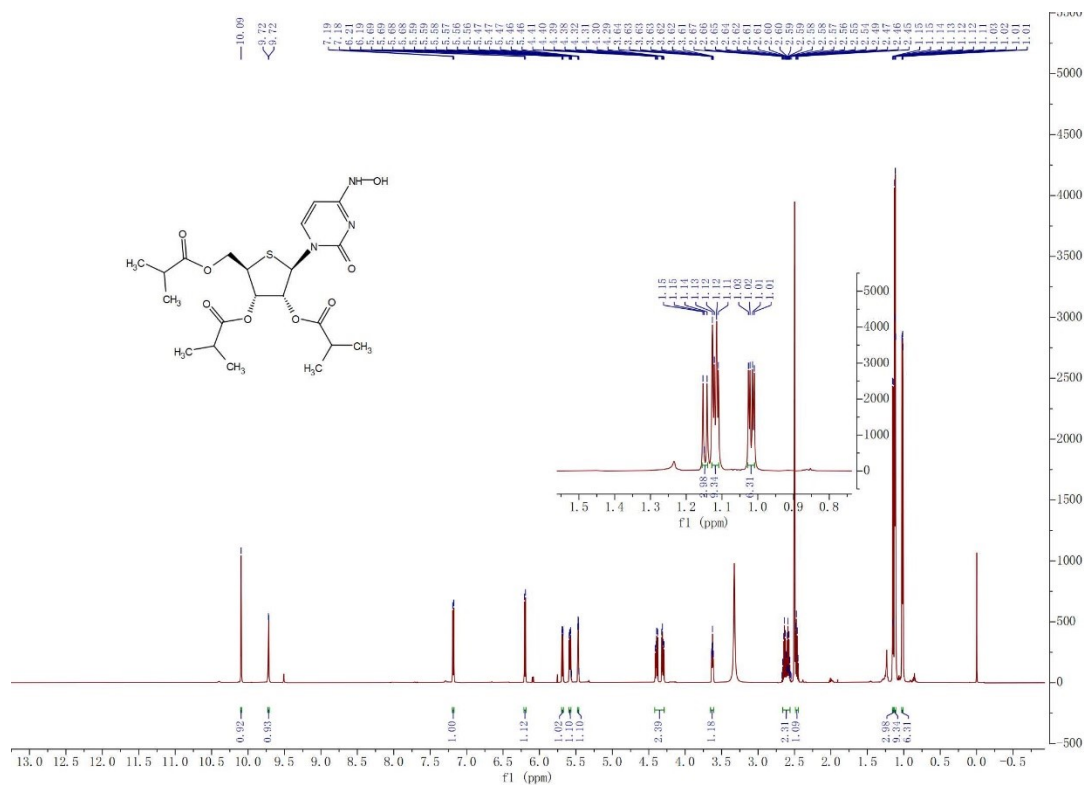


^{13}C NMR (126 MHz, $\text{DMSO}-d_6$)

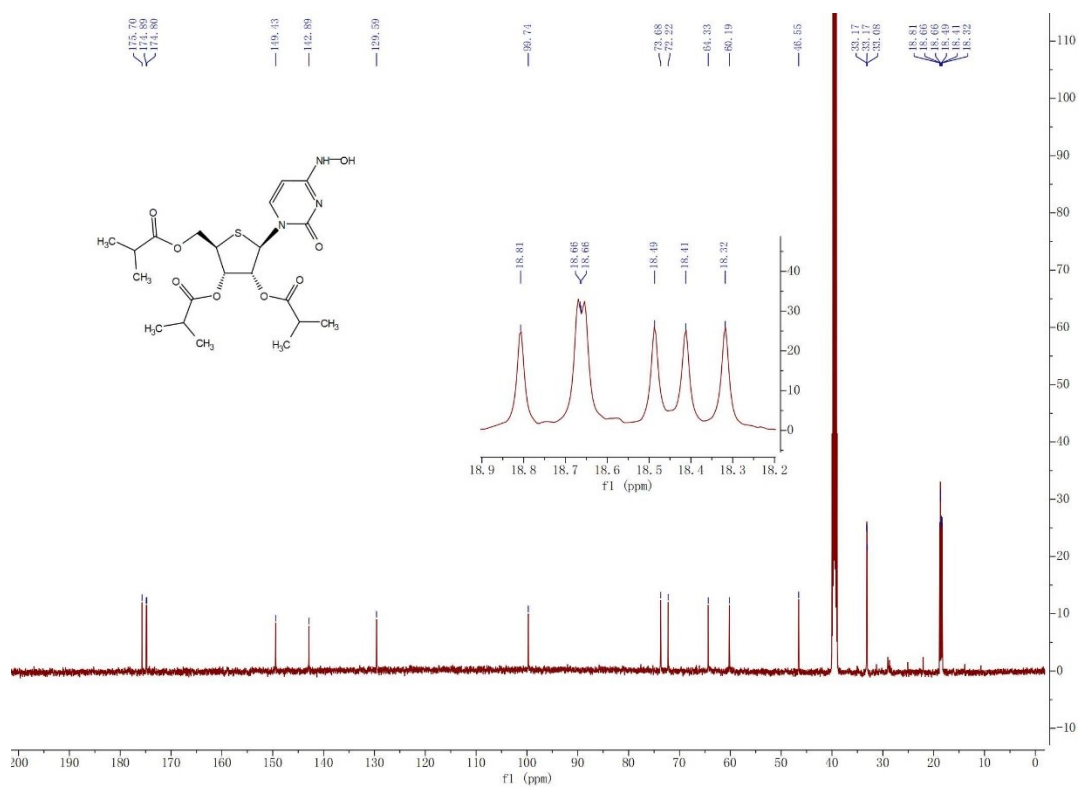


6. ^1H NMR, ^{13}C NMR spectrum of compound 2b

^1H NMR (600 MHz, DMSO- d_6)

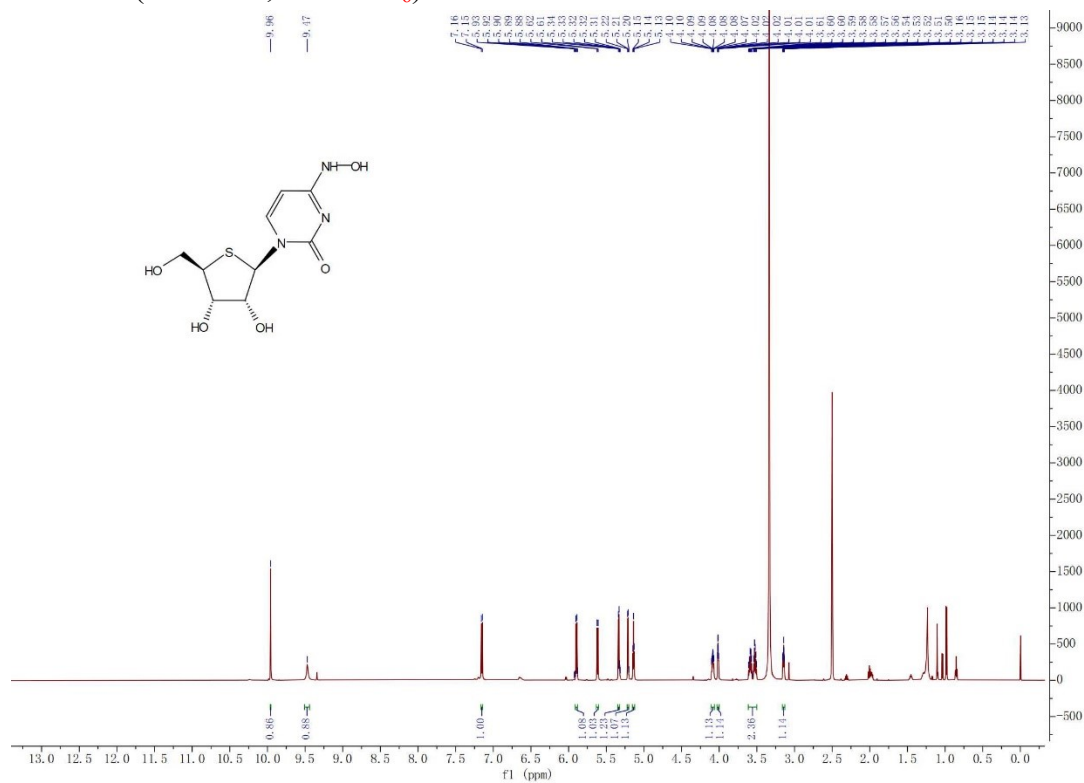


^{13}C NMR (126 MHz, DMSO- d_6)

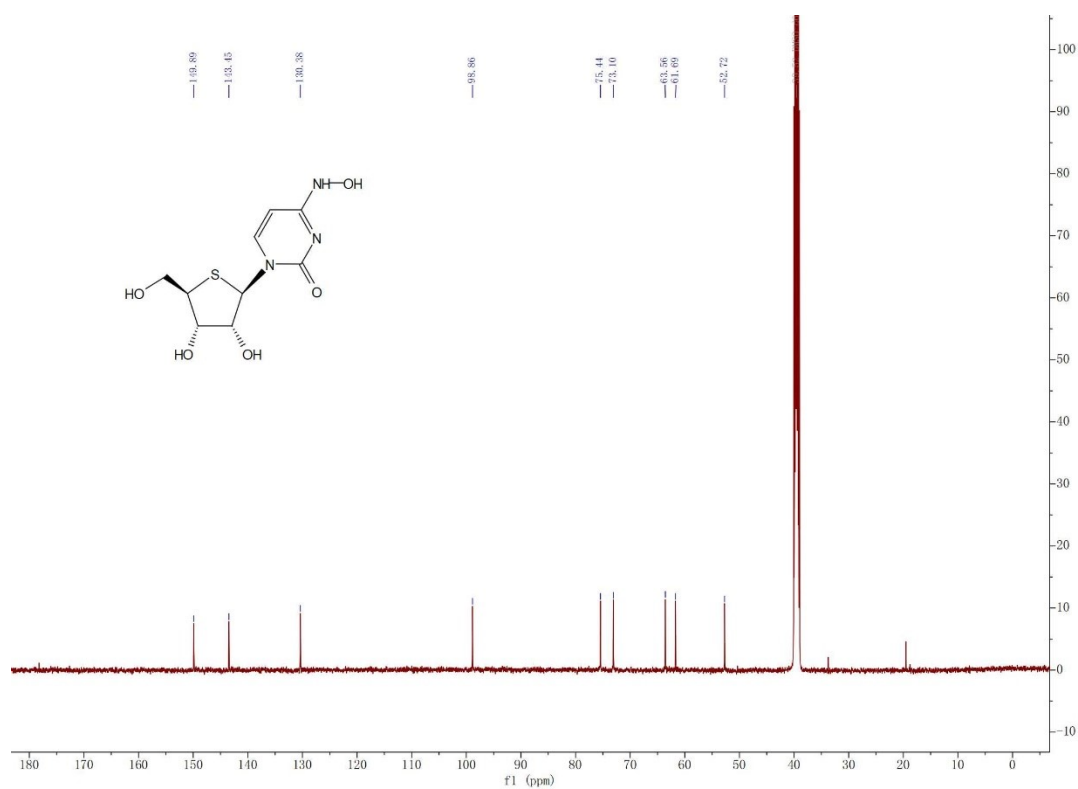


7. ^1H NMR, ^{13}C NMR spectrum of compound 2c

^1H NMR (600 MHz, $\text{DMSO}-d_6$)

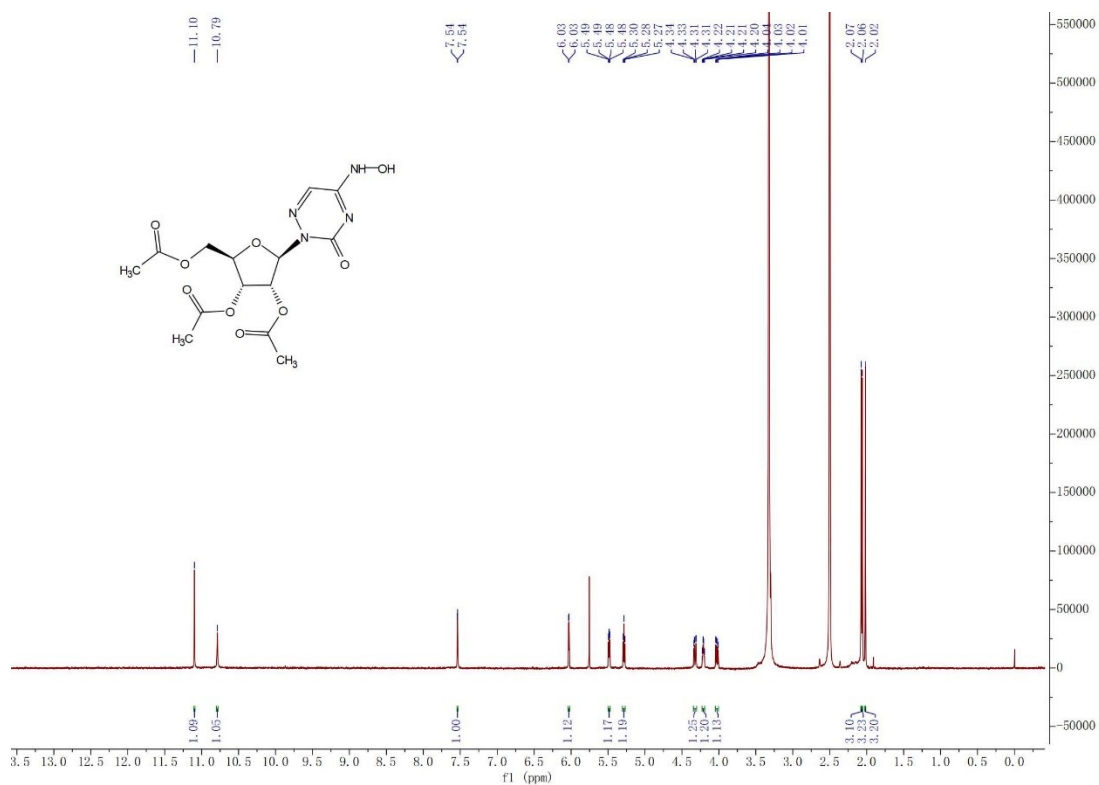


^{13}C NMR (126 MHz, $\text{DMSO}-d_6$)

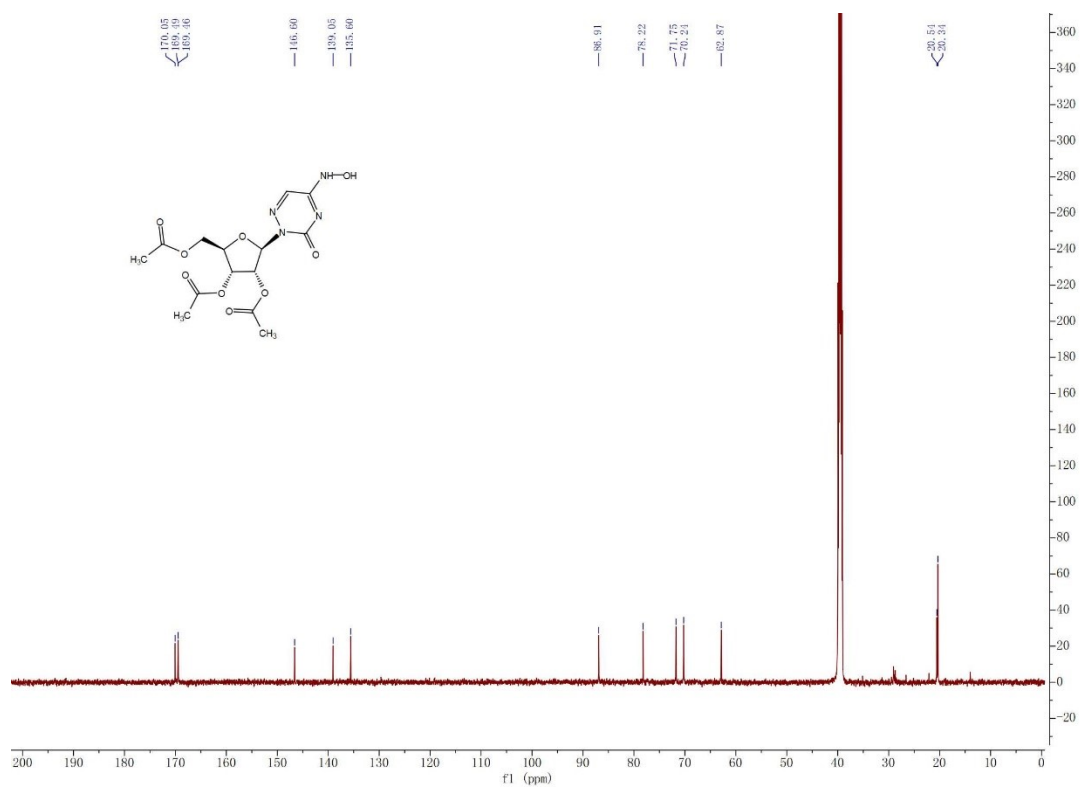


8. ^1H NMR, ^{13}C NMR spectrum of compound 3a

^1H NMR (500 MHz, $\text{DMSO-}d_6$)

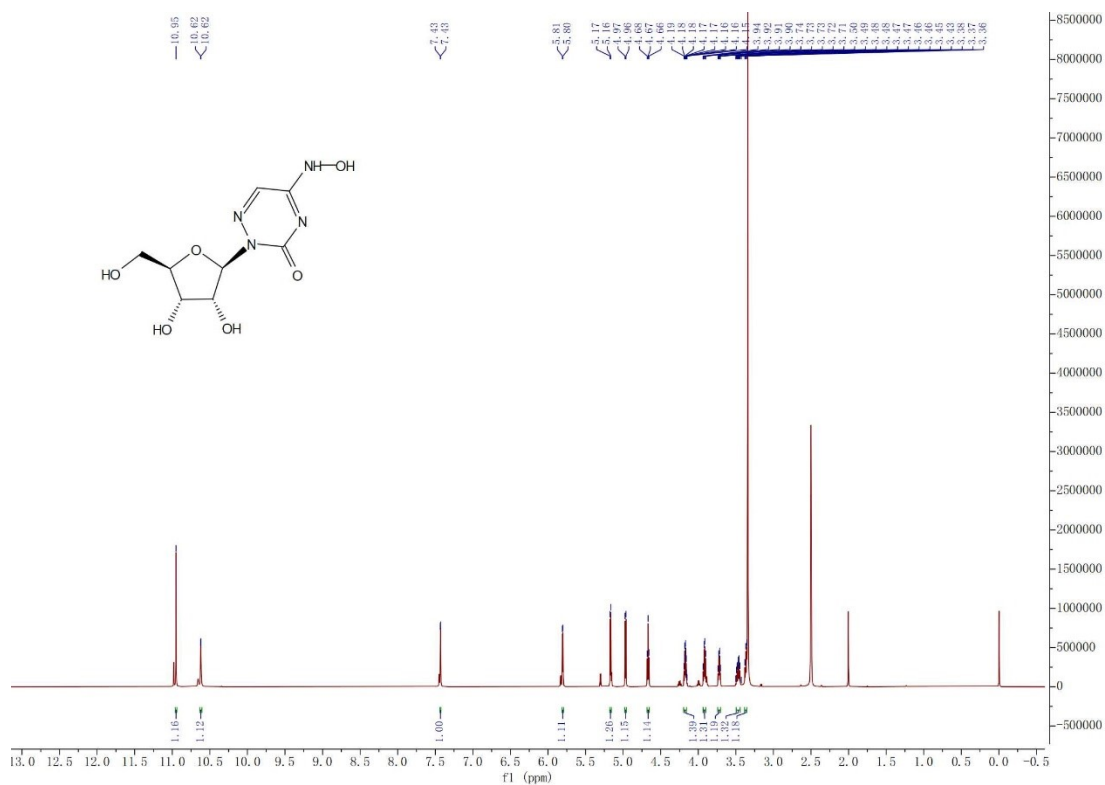


^{13}C NMR (151 MHz, $\text{DMSO-}d_6$)

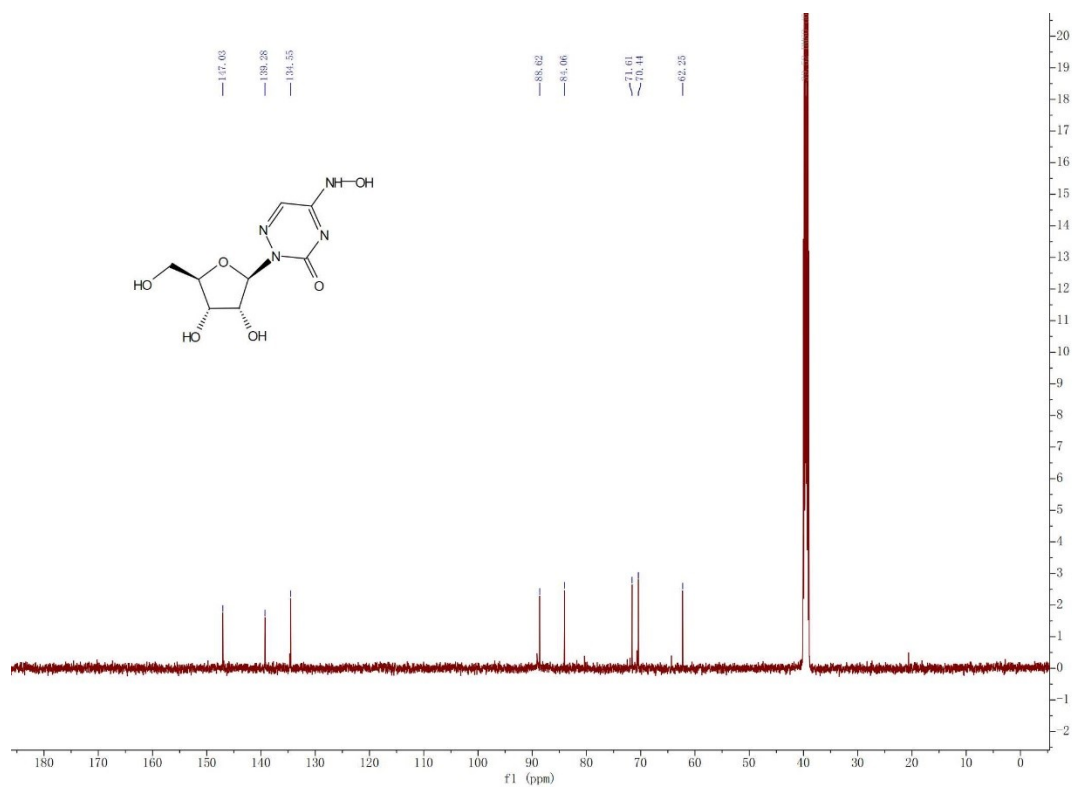


9. ^1H NMR, ^{13}C NMR spectrum of compound 3b

^1H NMR (500 MHz, $\text{DMSO-}d_6$)

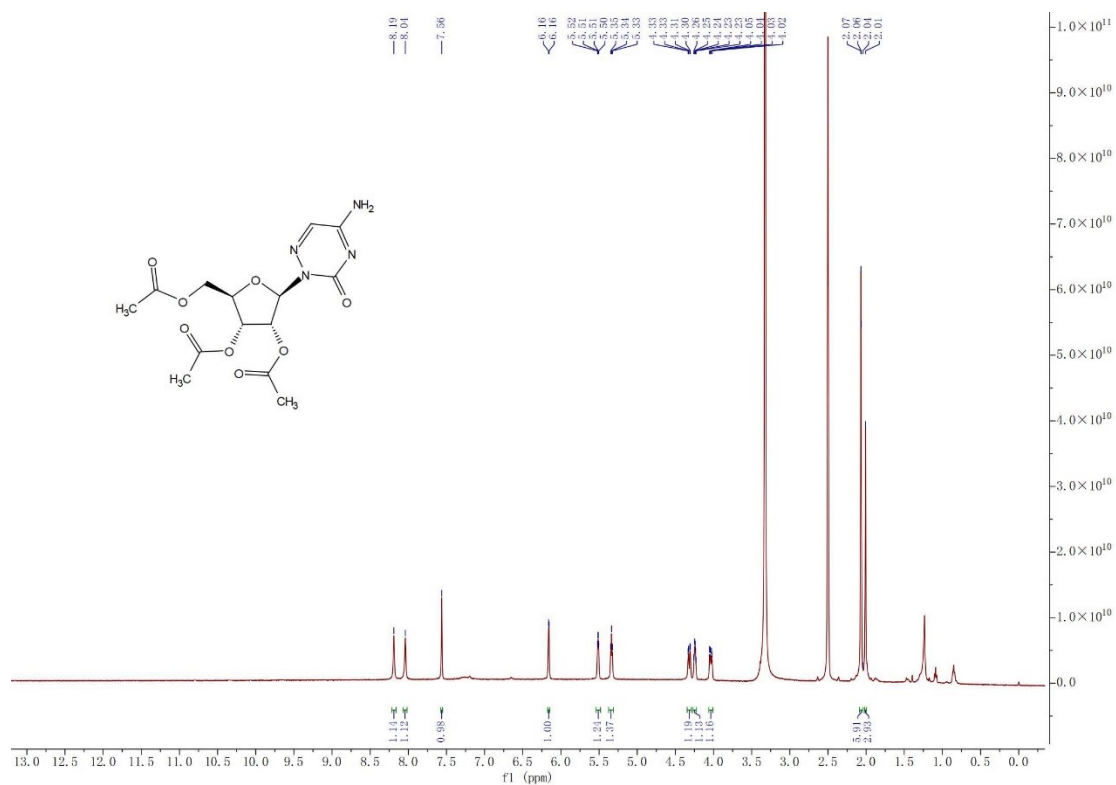


^{13}C NMR (126 MHz, $\text{DMSO-}d_6$)

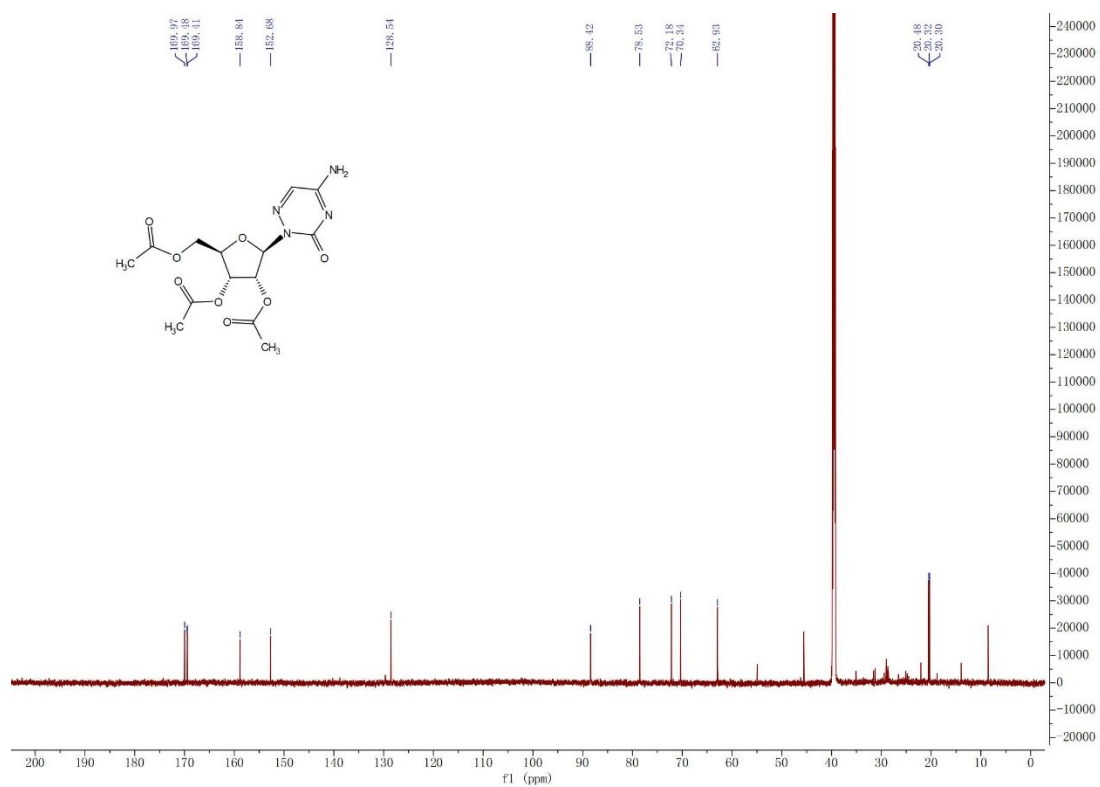


10. ^1H NMR, ^{13}C NMR spectrum of compound 3c

^1H NMR (500 MHz, $\text{DMSO-}d_6$)

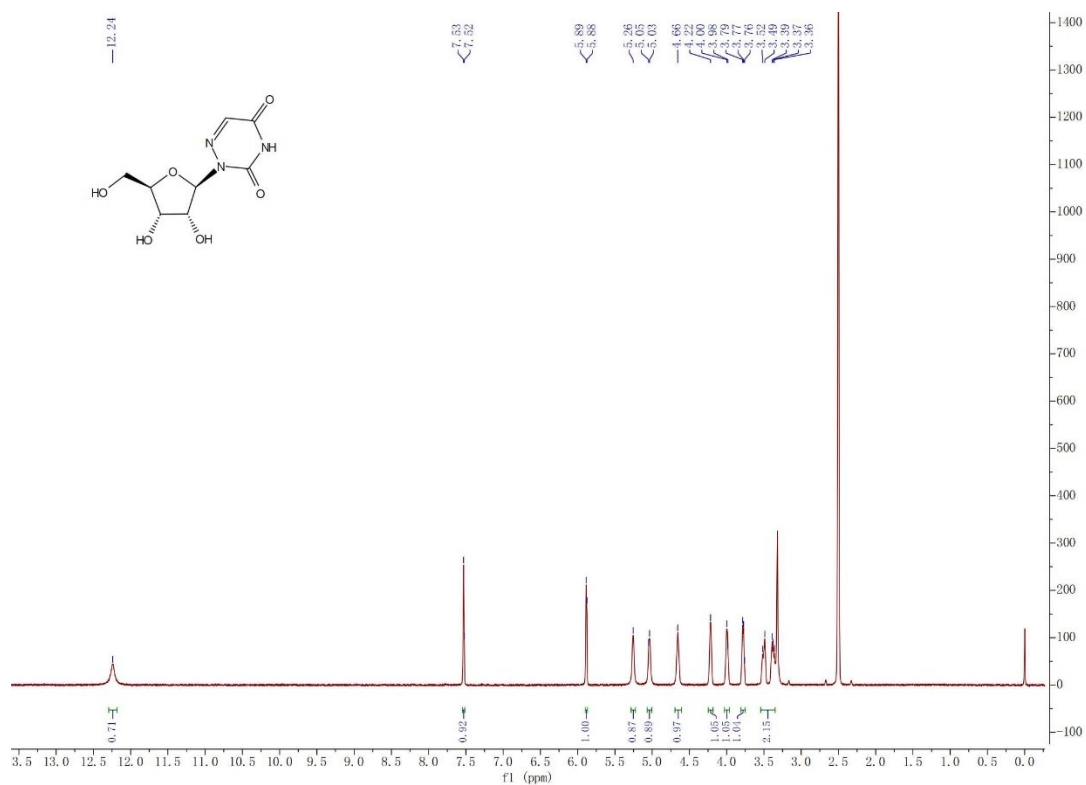


^{13}C NMR (201 MHz, $\text{DMSO-}d_6$)

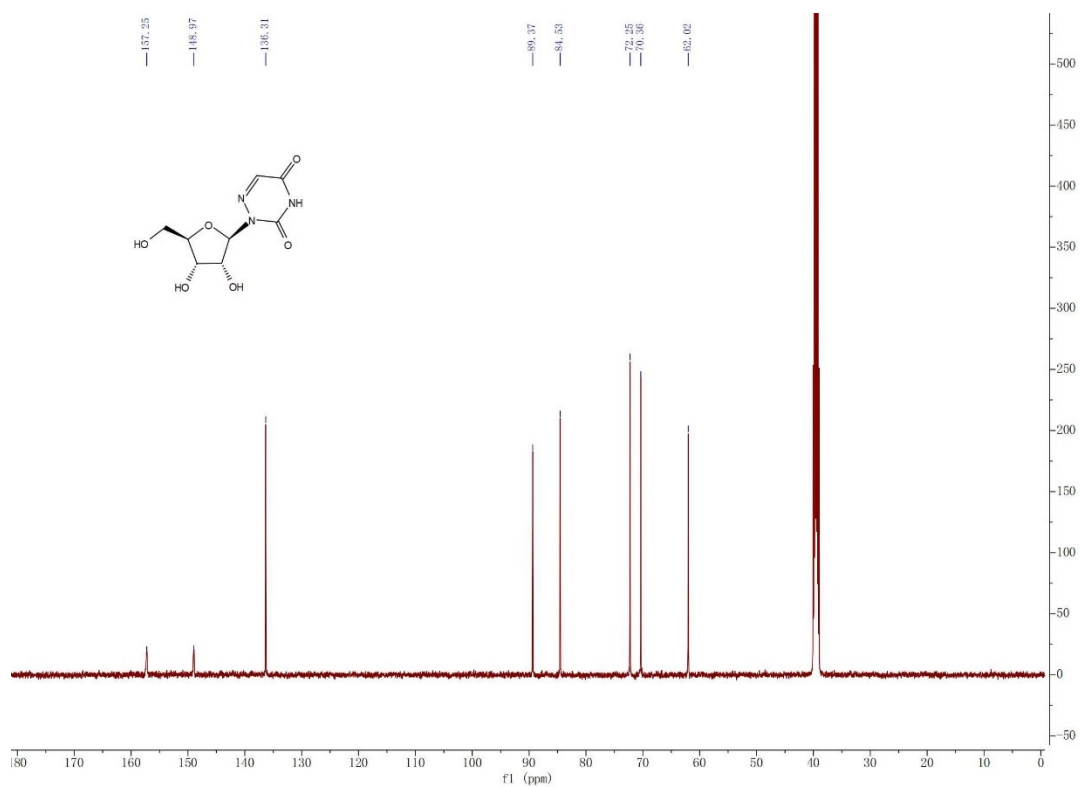


11. ^1H NMR, ^{13}C NMR spectrum of compound 3d

^1H NMR (400 MHz, $\text{DMSO-}d_6$)

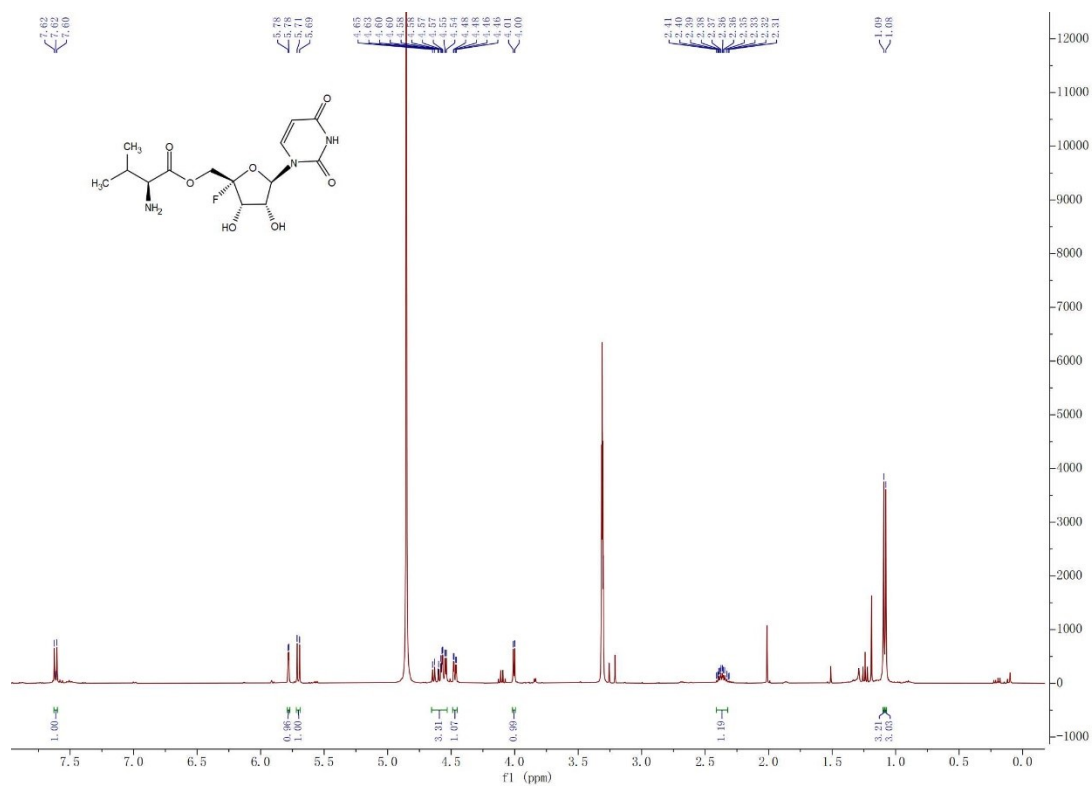


^{13}C NMR (126 MHz, $\text{DMSO-}d_6$)



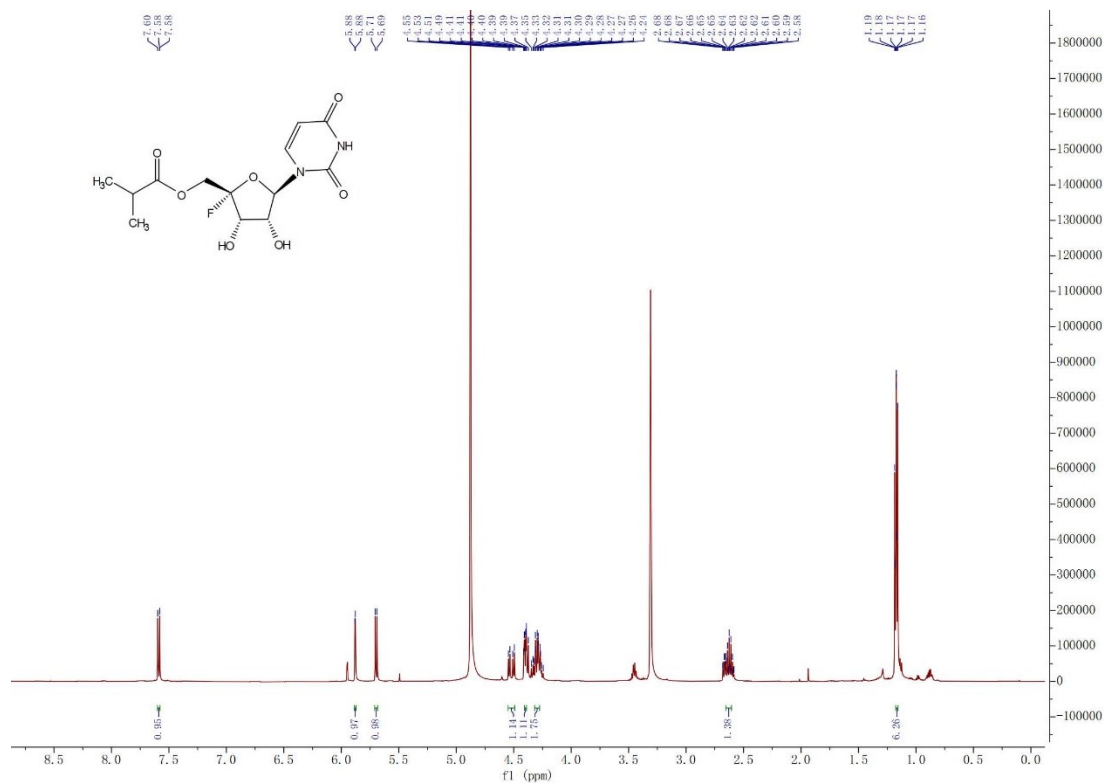
12. ¹H NMR spectrum of compound 4a

¹H NMR (400 MHz, Methanol-*d*₄)

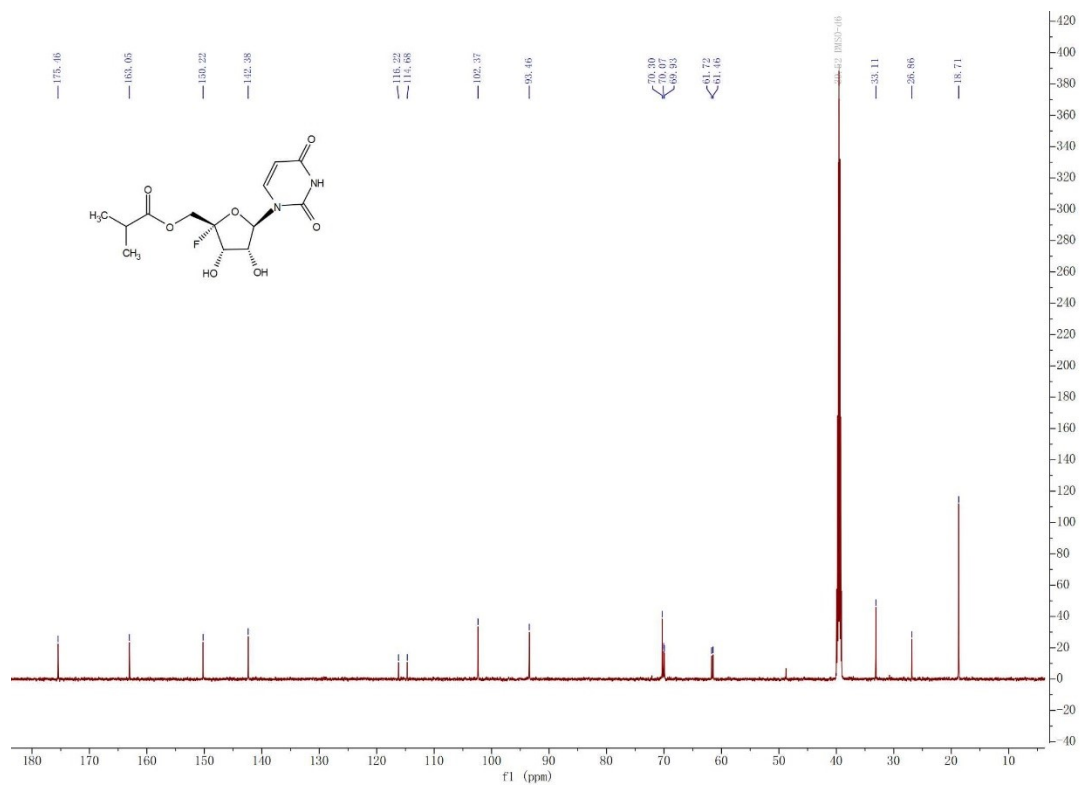


13. ¹H NMR, ¹³C NMR spectrum of compound 4b

¹H NMR (500 MHz, Methanol-*d*₄)

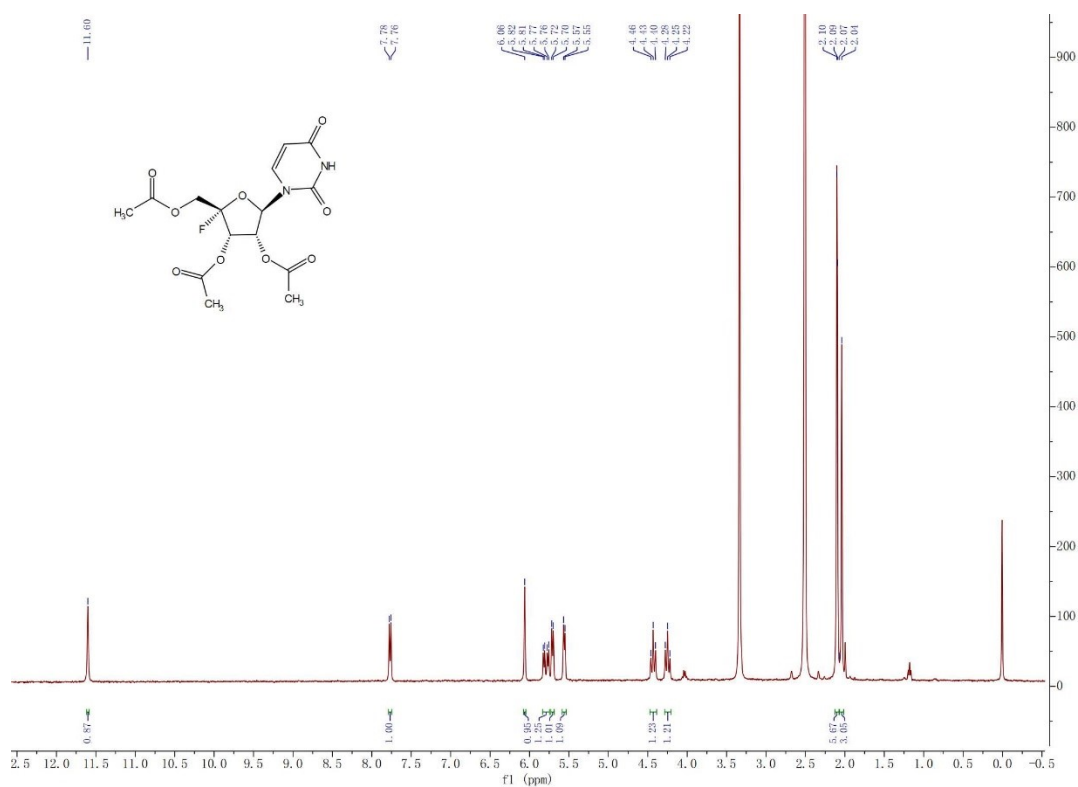


¹³C NMR (151 MHz, DMSO-*d*₆)

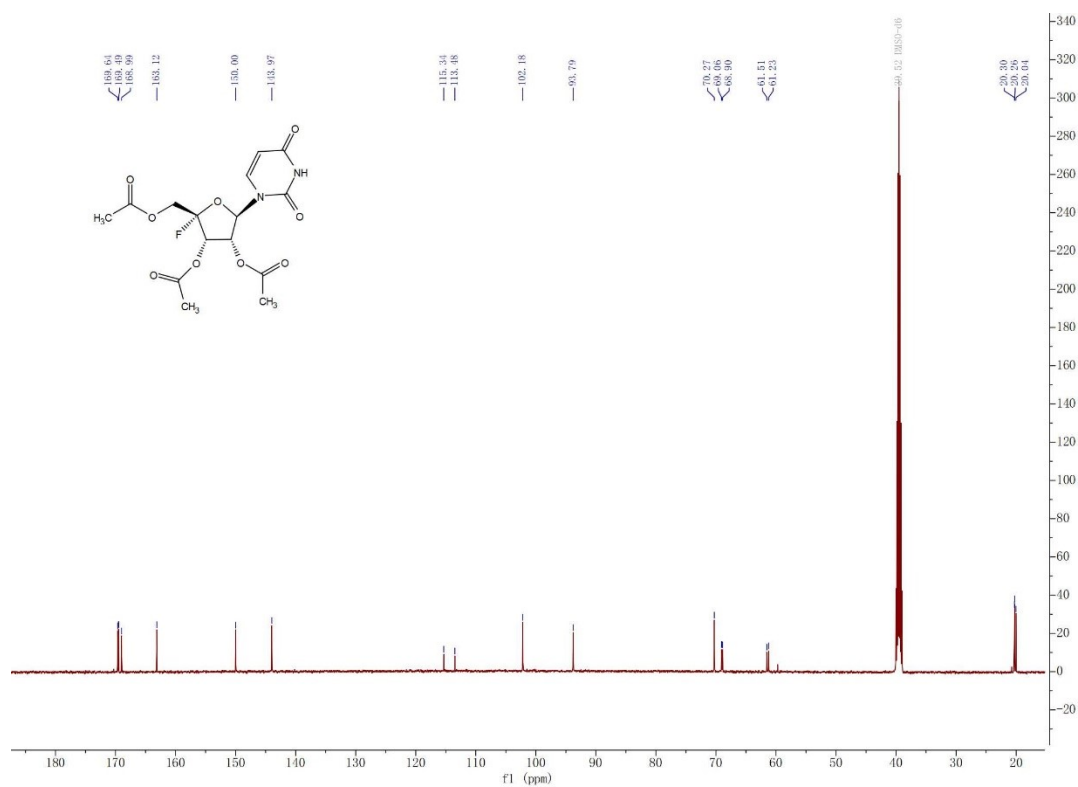


14. ^1H NMR, ^{13}C NMR spectrum of compound 4c

^1H NMR (400 MHz, $\text{DMSO-}d_6$)

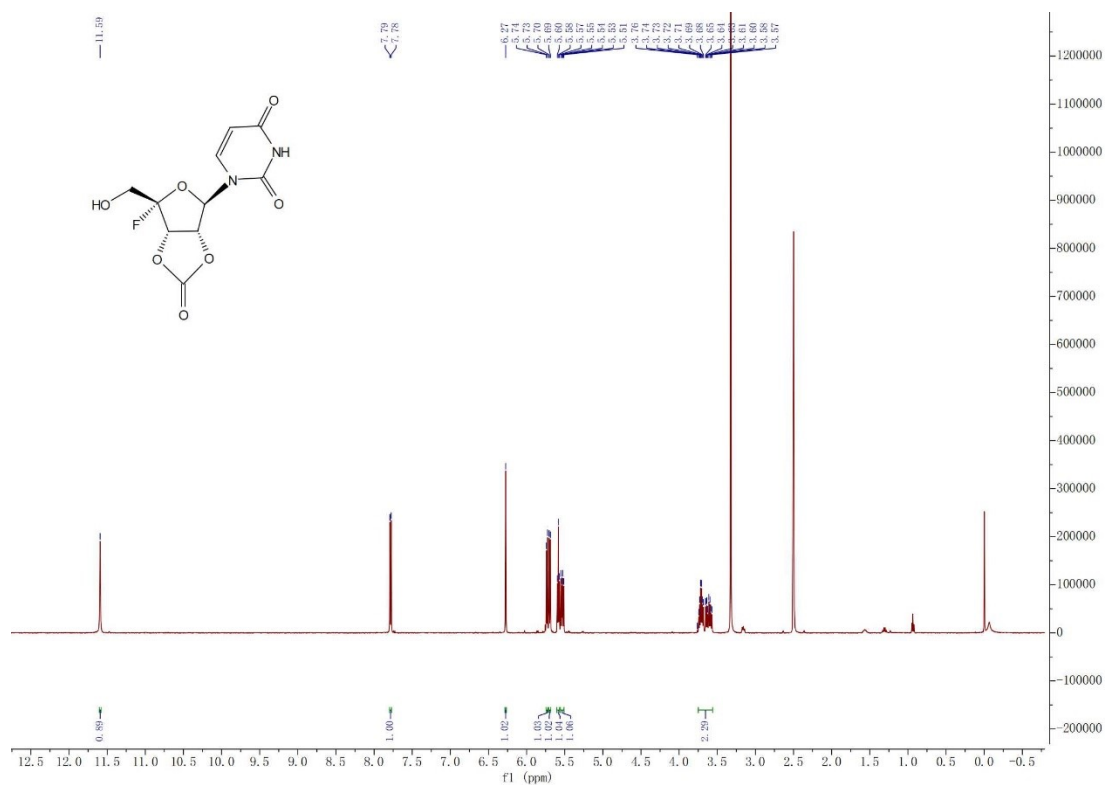


^{13}C NMR (126 MHz, $\text{DMSO-}d_6$)

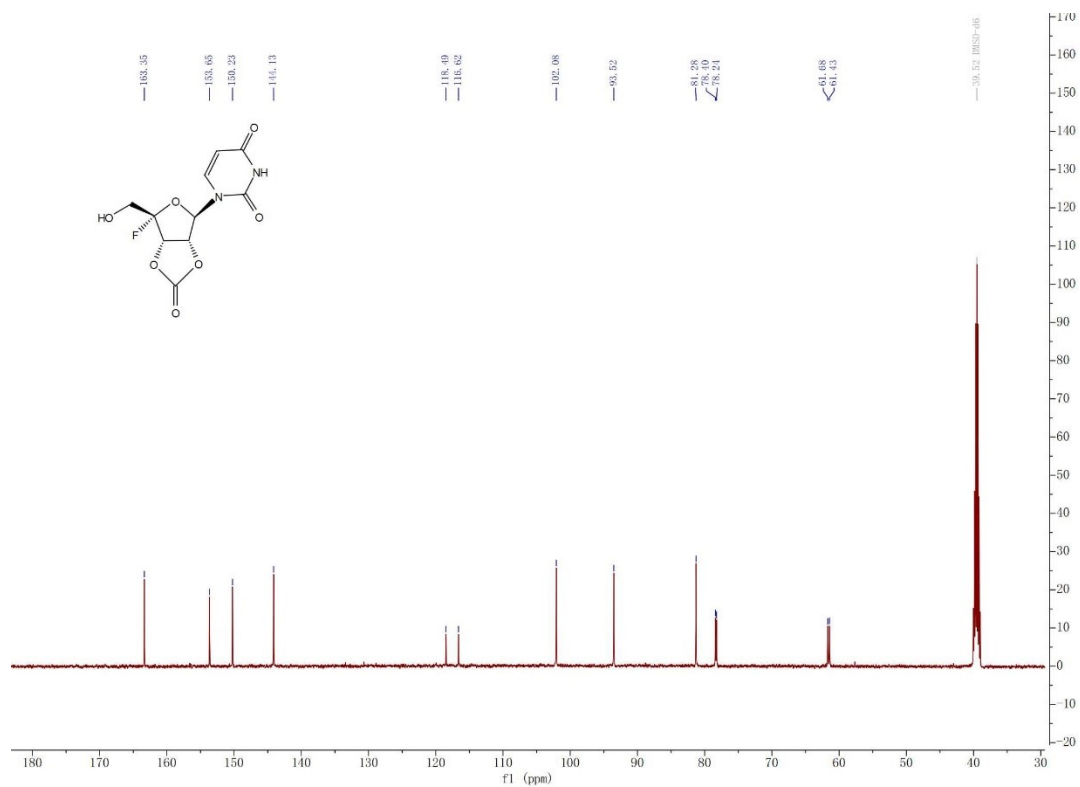


15. ^1H NMR, ^{13}C NMR spectrum of compound 4d

^1H NMR (500 MHz, $\text{DMSO-}d_6$)

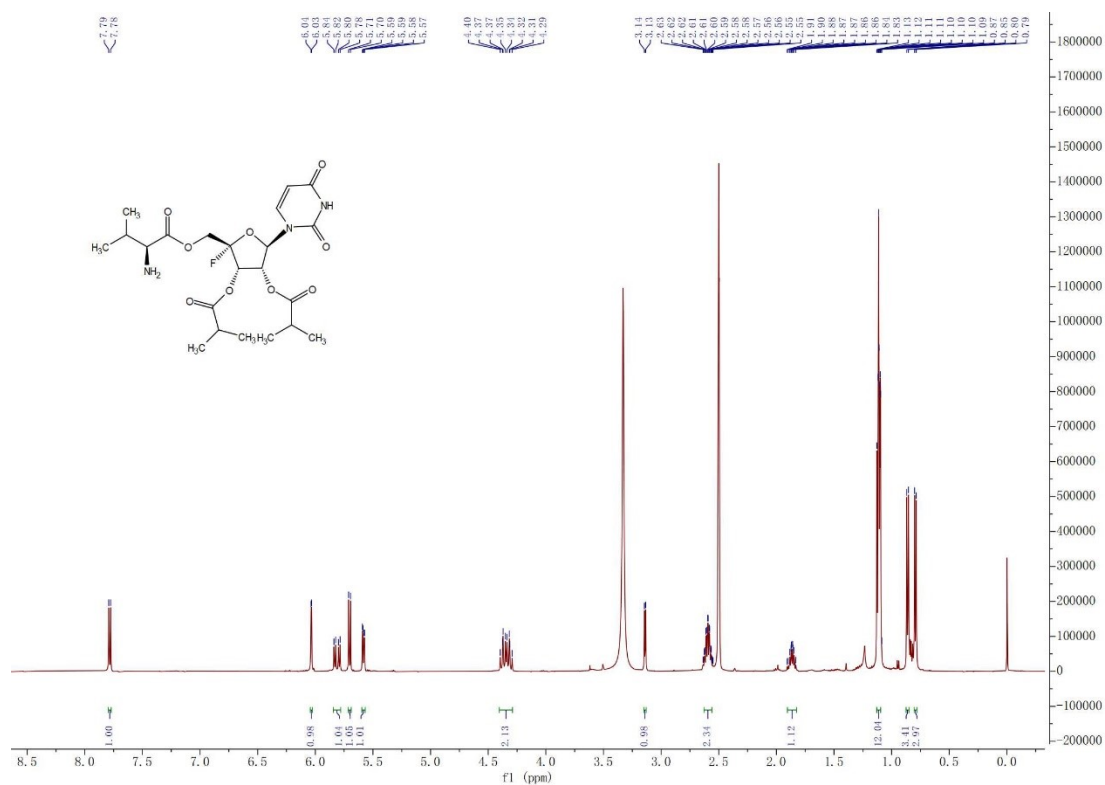


^{13}C NMR (126 MHz, $\text{DMSO-}d_6$)

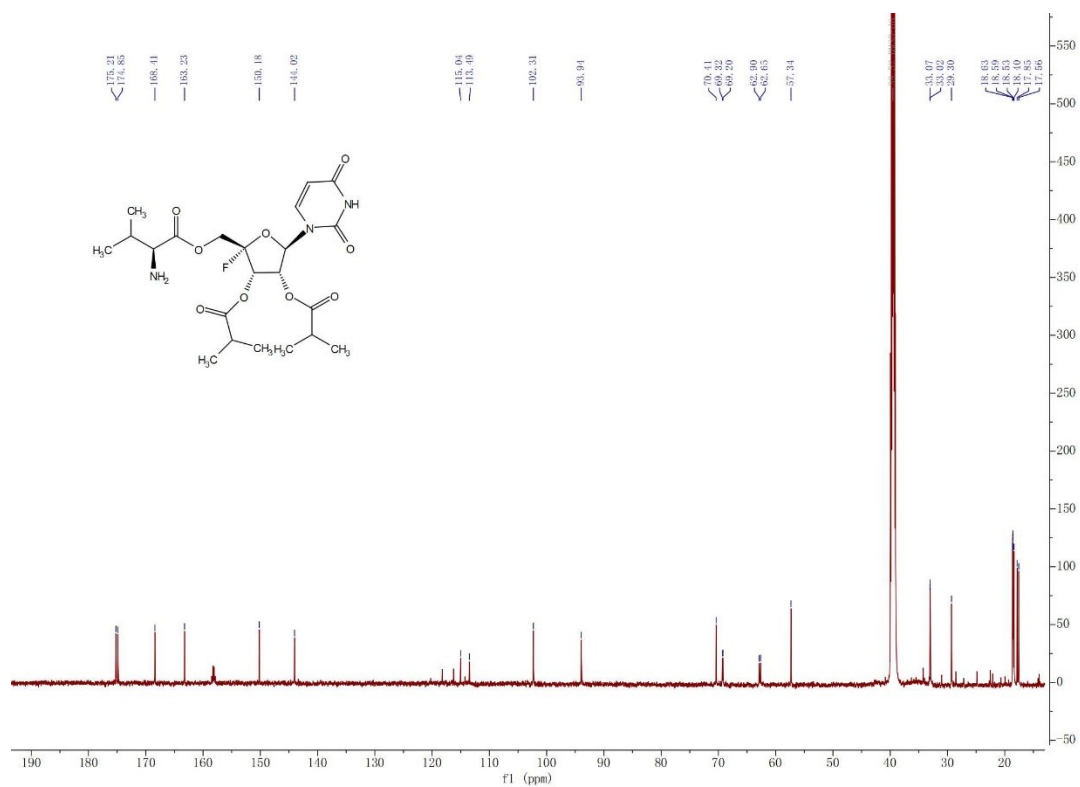


16. ^1H NMR, ^{13}C NMR spectrum of compound 4e

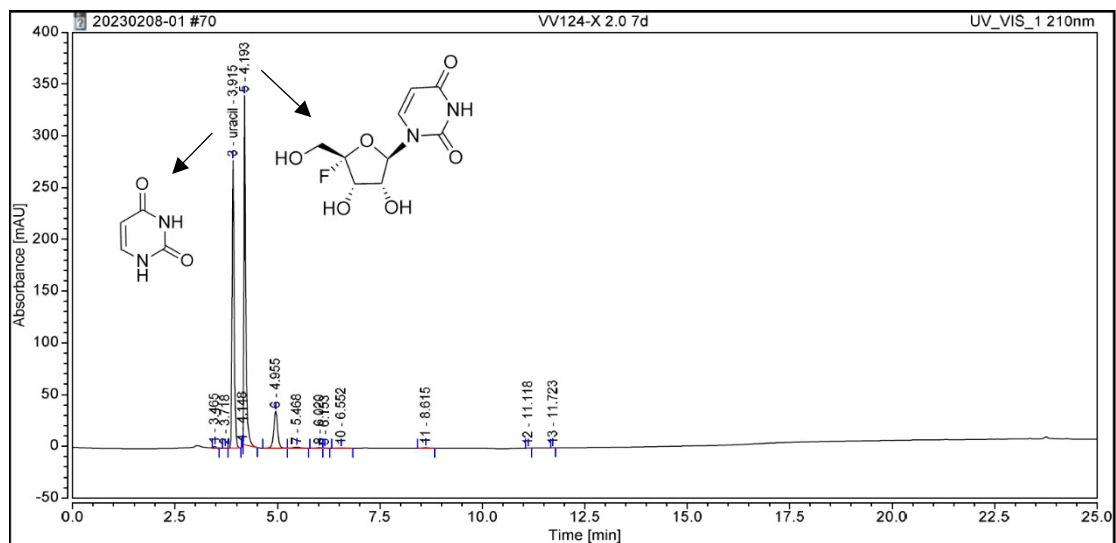
^1H NMR (500 MHz, $\text{DMSO}-d_6$)



^{13}C NMR (151 MHz, $\text{DMSO}-d_6$)

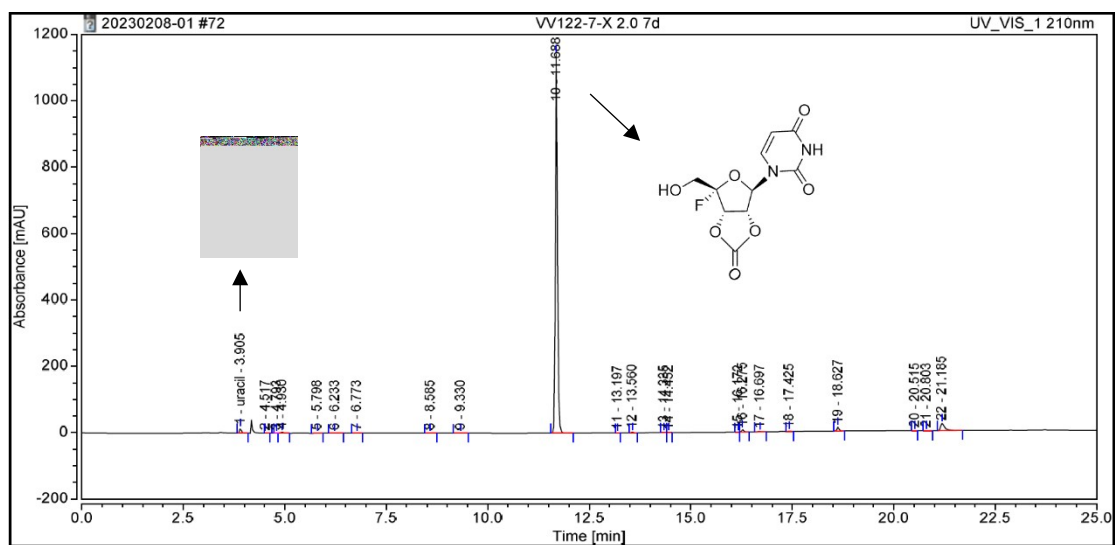


17. The HPLC chromatogram of compound 22 in pH 2.0 buffers at day 7



Integration Results								
No.	Peak Name	Retention Time min	Area mAU*s	Height mAU	Rel.Area %	Asymmetry (EP)	Resolution (EP)	Plates (EP)
1	uracil	3.465	5.68154	1.822	0.2615	1.4	3.1	32127
2		3.718	0.71887	0.225	0.0331	1.1	2.3	29737
3		3.915	944.09607	278.034	43.4549	1.2	4.0	32996
4		4.148	0.98240	0.927	0.0452	0.8	0.9	304265
5		4.193	956.94350	337.615	44.0463	2.4	6.9	66683
6		4.955	227.78370	35.753	10.4844	1.0	2.0	16187
7		5.468	14.52673	1.069	0.6686	n.a.	n.a.	3880
8		6.020	6.77656	0.706	0.3119	n.a.	n.a.	n.a.
9		6.153	1.73867	0.309	0.0800	n.a.	n.a.	n.a.
10		6.552	5.30881	0.398	0.2444	1.1	6.8	5494
11		8.615	6.93416	0.722	0.3192	1.0	14.8	18062
12		11.118	0.55572	0.169	0.0256	1.1	7.0	284677
13		11.723	0.54054	0.163	0.0249	1.1	n.a.	275015
Total:			2172.587	657.913	100.000	12.33		

18. The HPLC chromatogram of compound 4d in pH 2.0 buffers at day 7



Integration Results								
No.	Peak Name	Retention Time min	Area mAU*s	Height mAU	Rel.Area %	Asymmetry (EP)	Resolution (EP)	Plates (EP)
1	uracil	3.905	49.66608	14.648	1.0902	1.2	5.0	32939
2		4.517	0.55310	0.072	0.0121	4.3	2.7	12842
3		4.793	0.27453	0.090	0.0060	n.a.	n.a.	n.a.
4		4.930	20.77654	3.242	0.4561	0.8	5.1	17570
5		5.798	2.40001	0.336	0.0527	1.0	2.0	14057
6		6.233	1.70644	0.180	0.0375	1.3	2.5	11129
7		6.773	1.00432	0.139	0.0220	1.0	8.3	19584
8		8.585	1.92150	0.220	0.0422	1.0	2.9	20130
9		9.330	2.77476	0.273	0.0609	1.0	12.6	17883
10		11.688	4231.44599	1141.479	92.8827	1.2	17.8	242951
11		13.197	0.45357	0.158	0.0100	1.0	4.5	489761
12		13.560	8.31415	2.429	0.1825	1.2	8.7	379650
13		14.335	2.68010	0.771	0.0588	n.a.	1.3	401611
14		14.452	1.01826	0.302	0.0224	n.a.	20.1	451315
15		16.172	1.13736	0.365	0.0250	n.a.	1.2	569799
16		16.275	24.50250	7.055	0.5378	1.2	4.7	552673
17		16.697	4.18665	0.977	0.0919	1.0	7.6	514694
18		17.425	3.14066	0.810	0.0689	1.2	12.7	483599
19		18.627	41.86576	11.927	0.9190	1.2	18.1	699714
20		20.515	0.77629	0.175	0.0170	1.0	1.9	470530
21		20.803	0.69329	0.100	0.0152	1.3	2.1	193957
22		21.185	154.39543	21.447	3.3891	2.3	n.a.	244735
Total:			4555.687	1207.195	100.000	24.20		