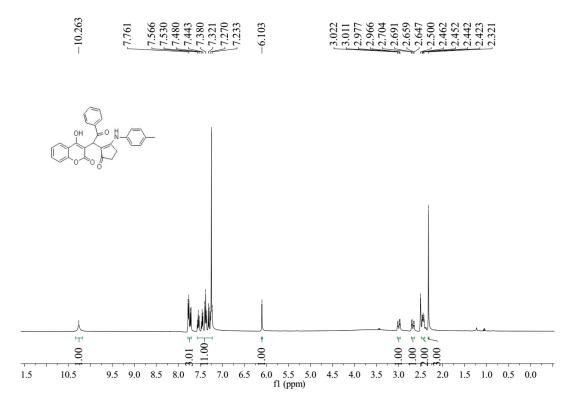
(Supplementary Materials)

One-Pot Syntesis of 3-Functionalized 4-Hydroxy- coumarin under Catalyst-Free Conditions

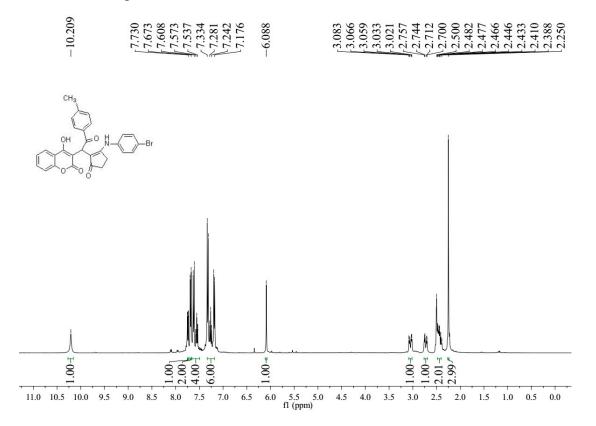
Yang Gao¹, Guoning Zhang², Juxian Wang², Xiaoguang Bai², Yiliang Li^{3,*} and Yucheng Wang^{2,*}

¹H NMR of compound **4a**

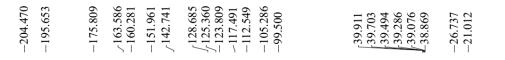


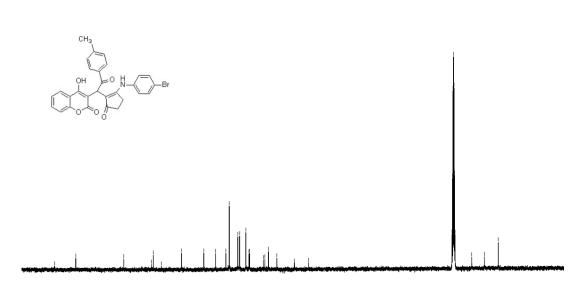
¹³C NMR of compound 4a -203.634-196.431-176.936164.828 163.606 -151.987 $_{f}135.580$ 128.036 123.994 123.715 115.938 -111.509 -105.090 -26.763 $\sqrt{20.467}$ $\sqrt{20.467}$ 40.044 739.838 739.629 739.420 739.211 739.003 -38.792 210 200 190 180 170 160 150 140 130 120 110 100 90 fl (ppm) 80 70 60 50 40 30 20 10 0

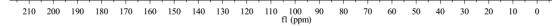
¹H NMR of compound **4b**



¹³C NMR of compound **4b**

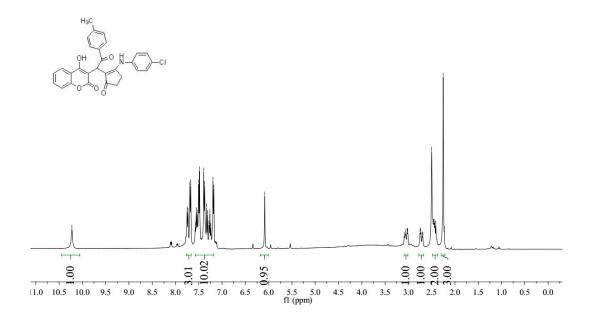




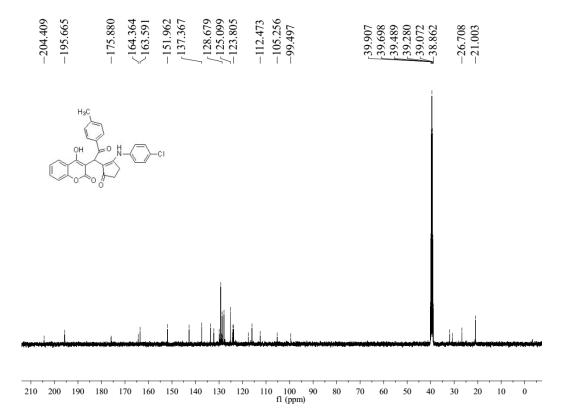


¹H NMR of compound **4**c



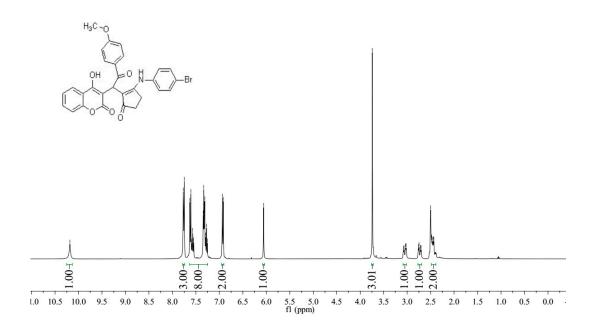


¹³C NMR of compound **4**c

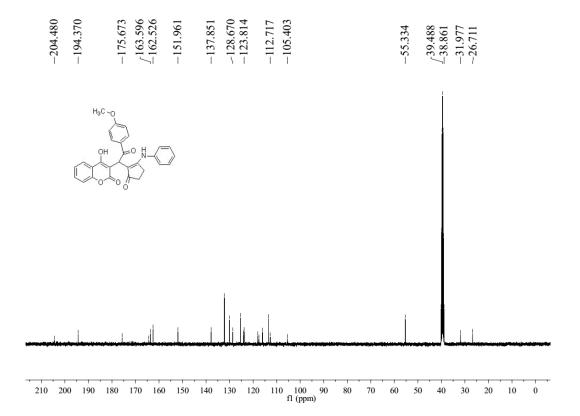


¹H NMR of compound **4d**



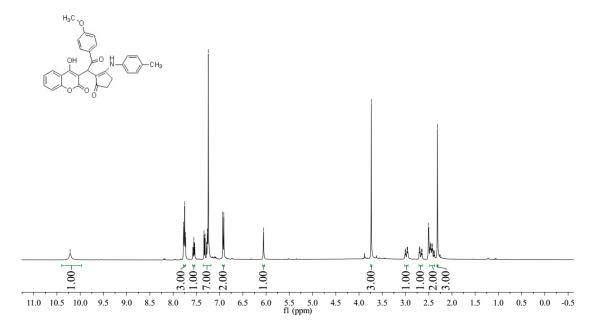


$^{13}\mathrm{C}$ NMR of compound 4d

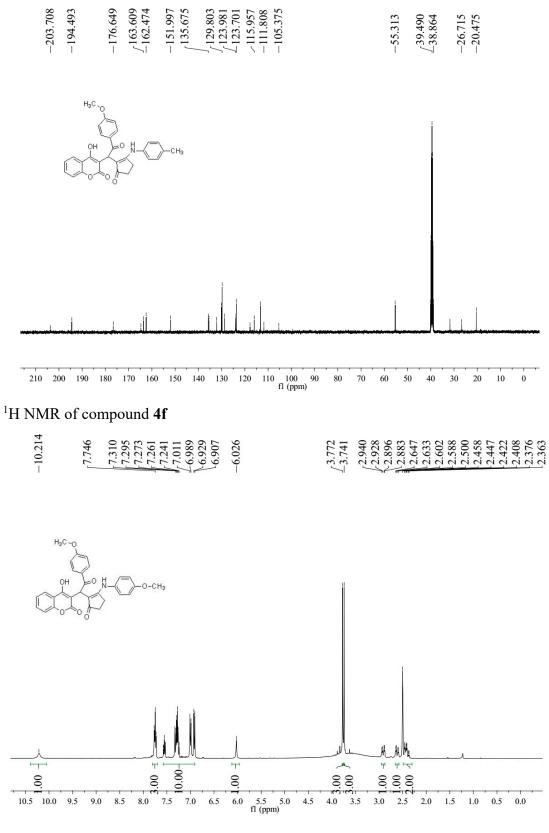


¹H NMR of compound **4e**

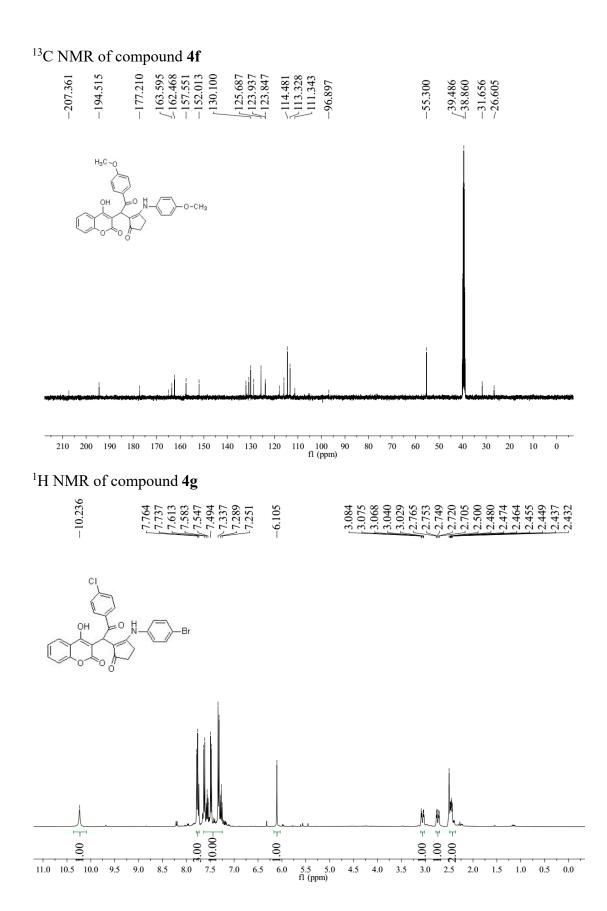




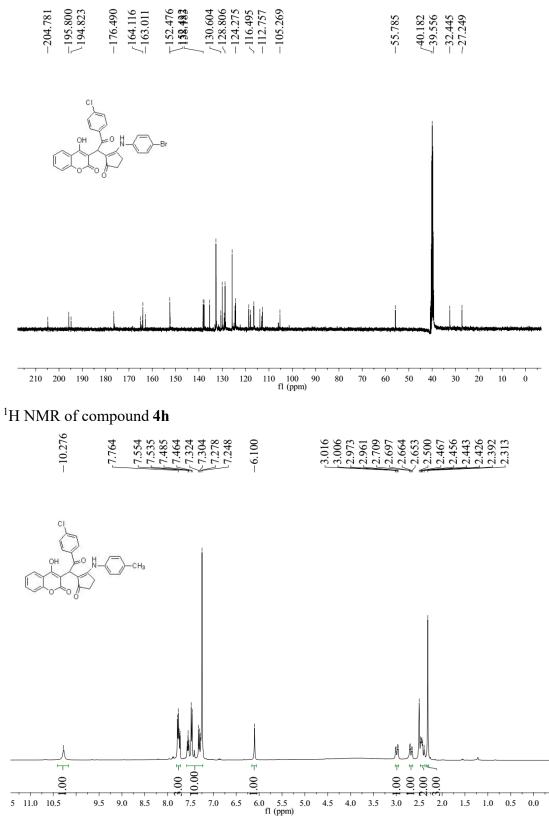
¹³C NMR of compound **4e**

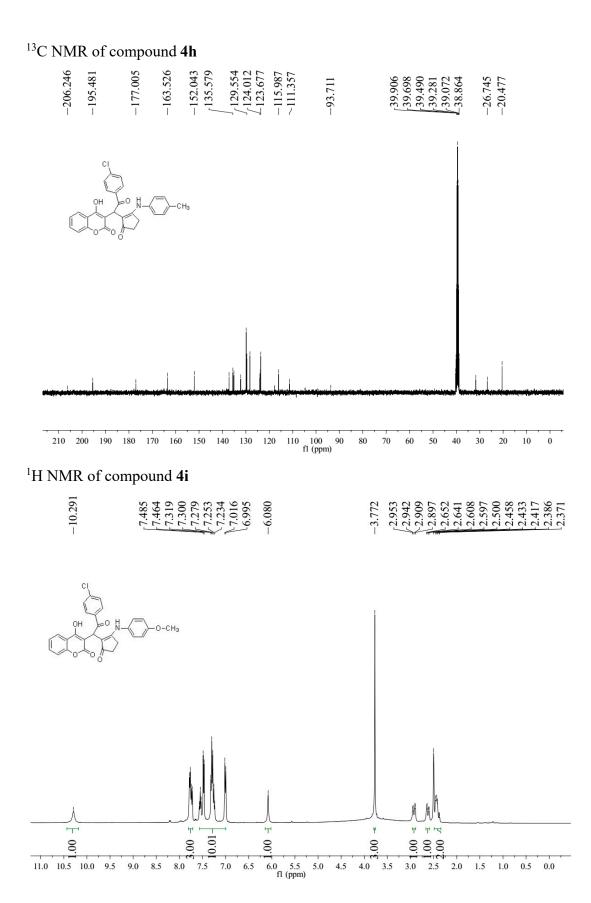


7.5 5.5 5.0 fl (ppm) 10.5 10.0 9.5 9.0 7.0 6.5 4.5 2.0 1.5 1.0 0.5 0.0



¹³C NMR of compound **4g**

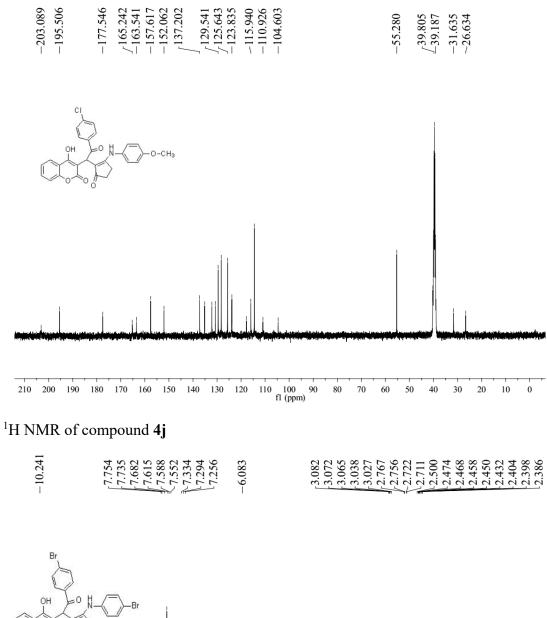


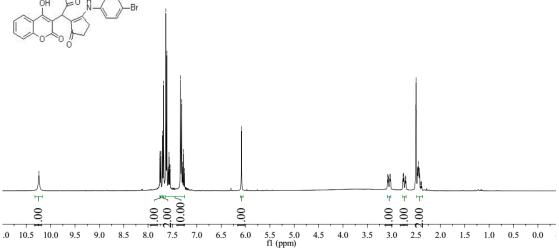


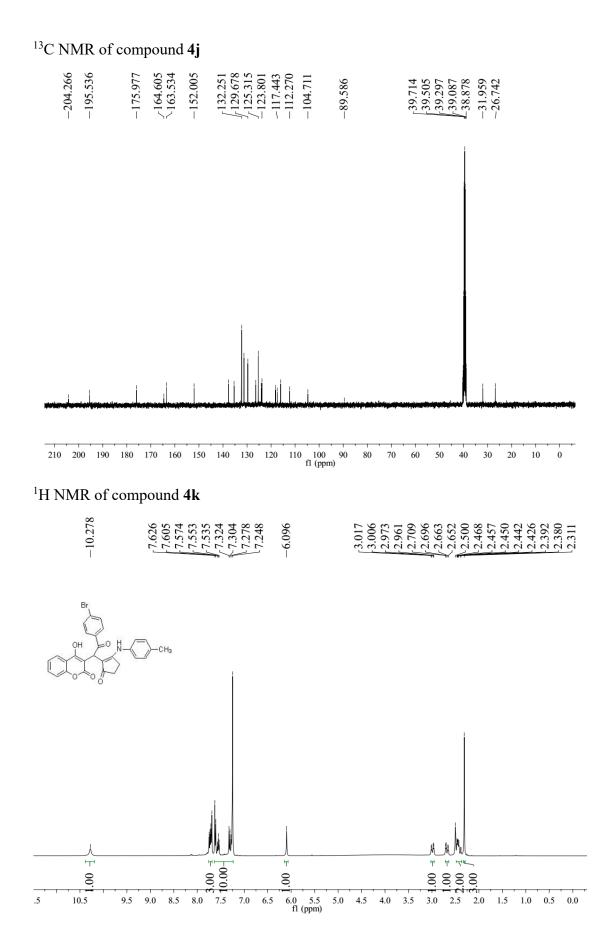
2.0 1.5 1.0 0.5 0.0

9.5 9.0 8.5

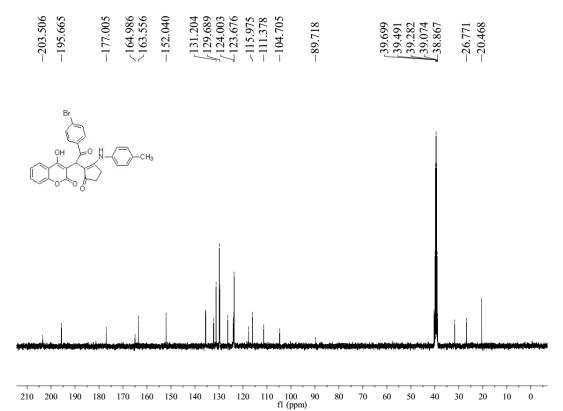
¹³C NMR of compound **4i**





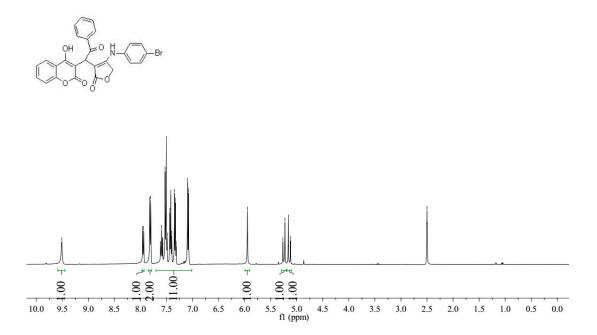


¹³C NMR of compound **4**k

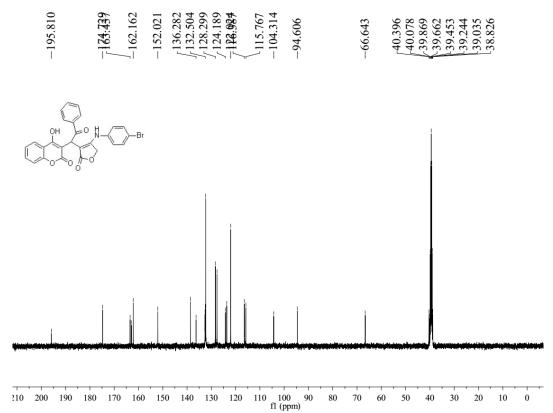


¹H NMR of compound **6a**

9.511	7.803 7.612 7.576 7.527 7.487 7.417 7.417 7.314 7.314 7.314	5.947 5.266 5.227 5.161 5.121	2.500
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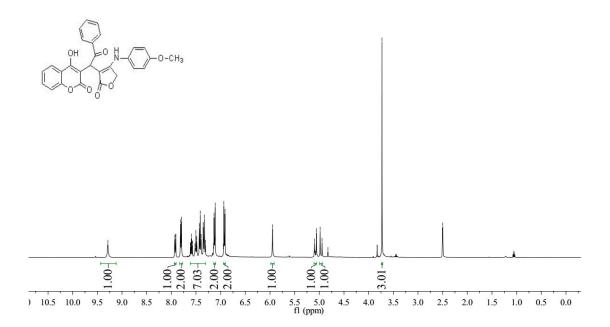


¹³C NMR of compound **6a**

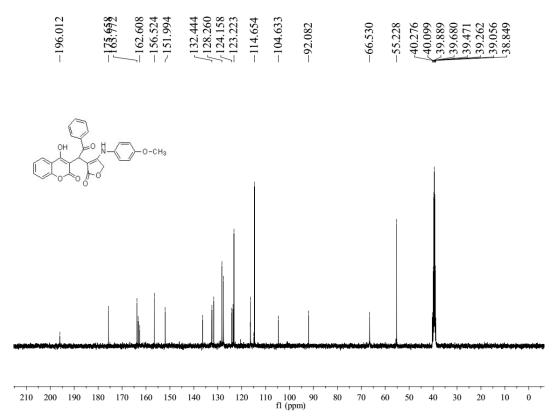


¹H NMR of compound **6b**

-	-	0 ~ ~ ~ 0 4 4 ~	6	$\infty \infty 4 4 0$	0	0
8	6	52 33 94 91 91 91 91	4	90 82 82 82 82 82 82 82 82 82 82 82 82 82	3	0
2	1	v44mm100	6	00668	5	S
6	r.	0011111	S.	NN 4 4 4	ć.	^c i
1			1		Ť	1

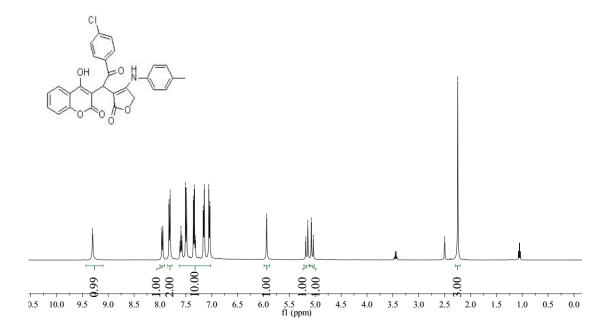


¹³C NMR of compound **6b**

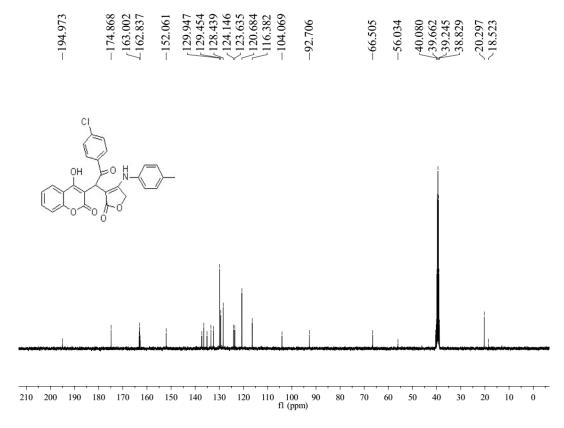


$^1\mathrm{H}\,\mathrm{NMR}$ of compound $\mathbf{6c}$

02	07 86 86 85 85 85 85 85 85 85 85 85 85 85 85 85	39	182 143 076 036	00 246
9.3	7.57.37.37.37.37.37.37.37.37.37.37.37.37.37	5.9	5.15	2.2
Ĩ		1		

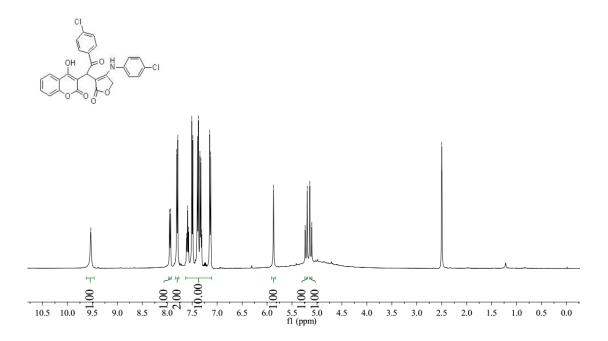


¹³C NMR of compound **6c**

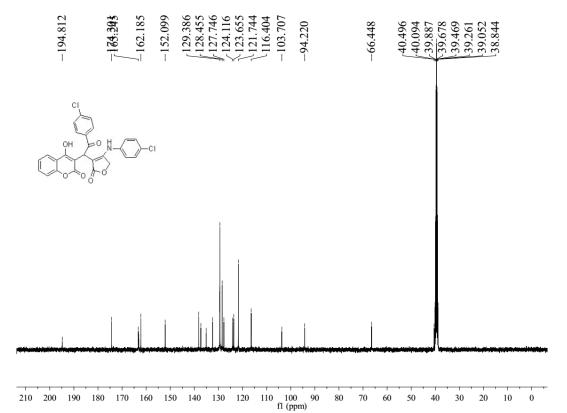


¹H NMR of compound **6d**

32	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $	70 96 44 04	00
ŝ	N 4 N N N N N	× 71111	5
6.	~~~~~	<i>5.5.5.</i>	5

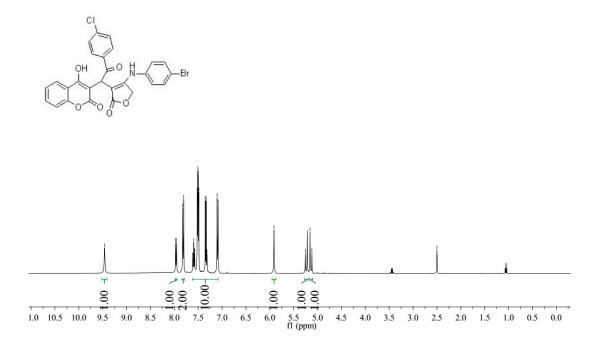


¹³C NMR of compound **6d**

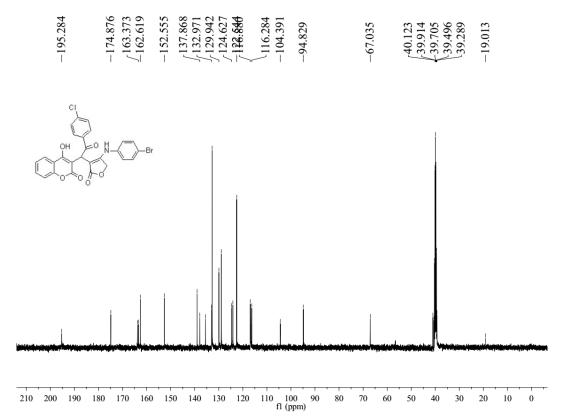


¹H NMR of compound **6e**

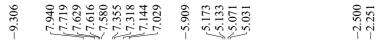


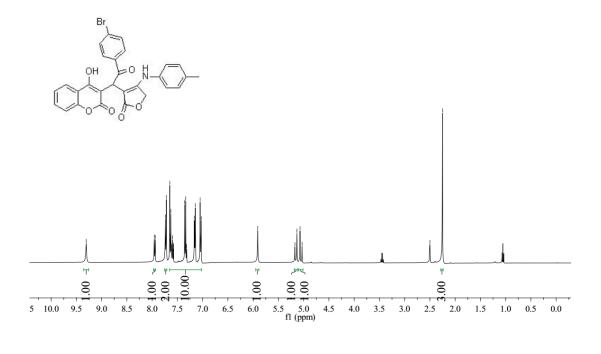


¹³C NMR of compound **6e**

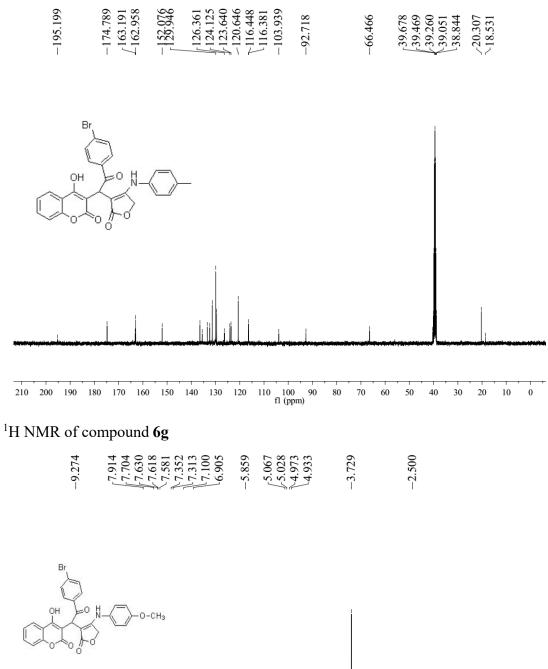


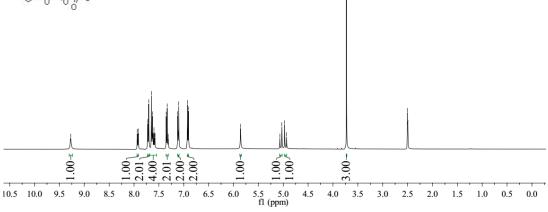
¹H NMR of compound **6f**



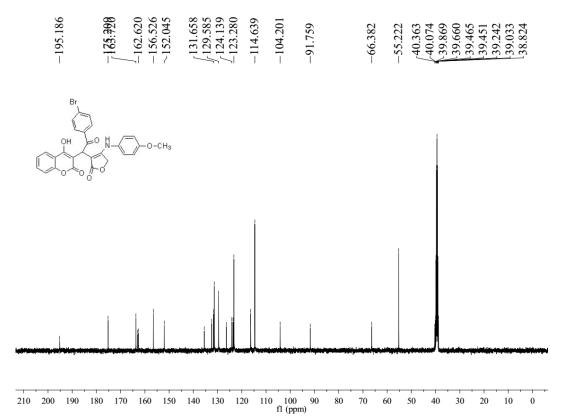


¹³C NMR of compound **6f**



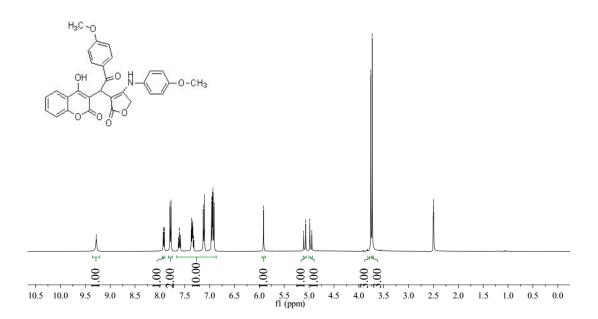


¹³C NMR of compound **6g**

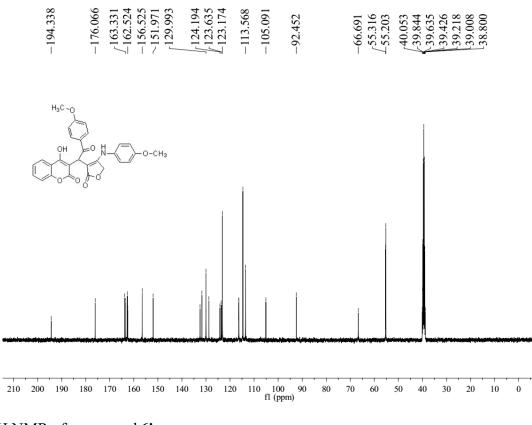


¹H NMR of compound **6h**

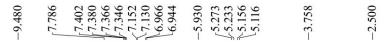
79	775 624 589 3368 3320 320 941 910	16	108 069 985 946	60	00
9.2	7.7 7.5 7.3 7.1 6.9 6.9	5.9	5.1 5.0 4.9	3.7	2.5
Ĩ		Ĩ,			

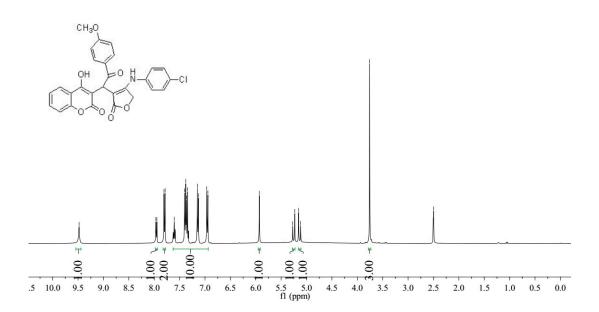


¹³C NMR of compound **6h**

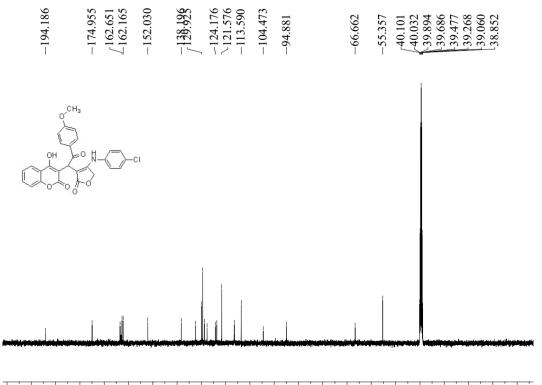


¹H NMR of compound **6i**





¹³C NMR of compound **6i**



210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 fl (ppm)