

Synthesis of novel Phthalazine-based derivatives with potent cytotoxicity against HCT-116 cells through apoptosis and VEGFR2 inhibition.

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Electronic supporting information (ESI)

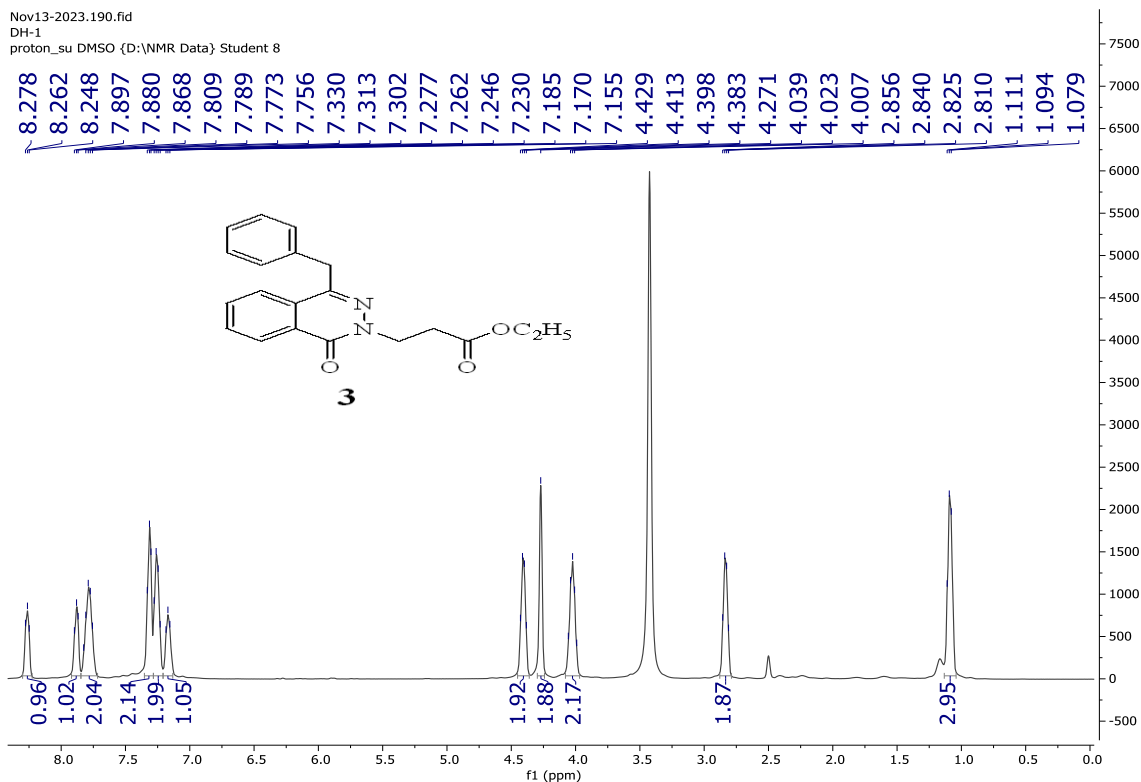


Figure S1 The ^1H -NMR spectrum of compound **3**.

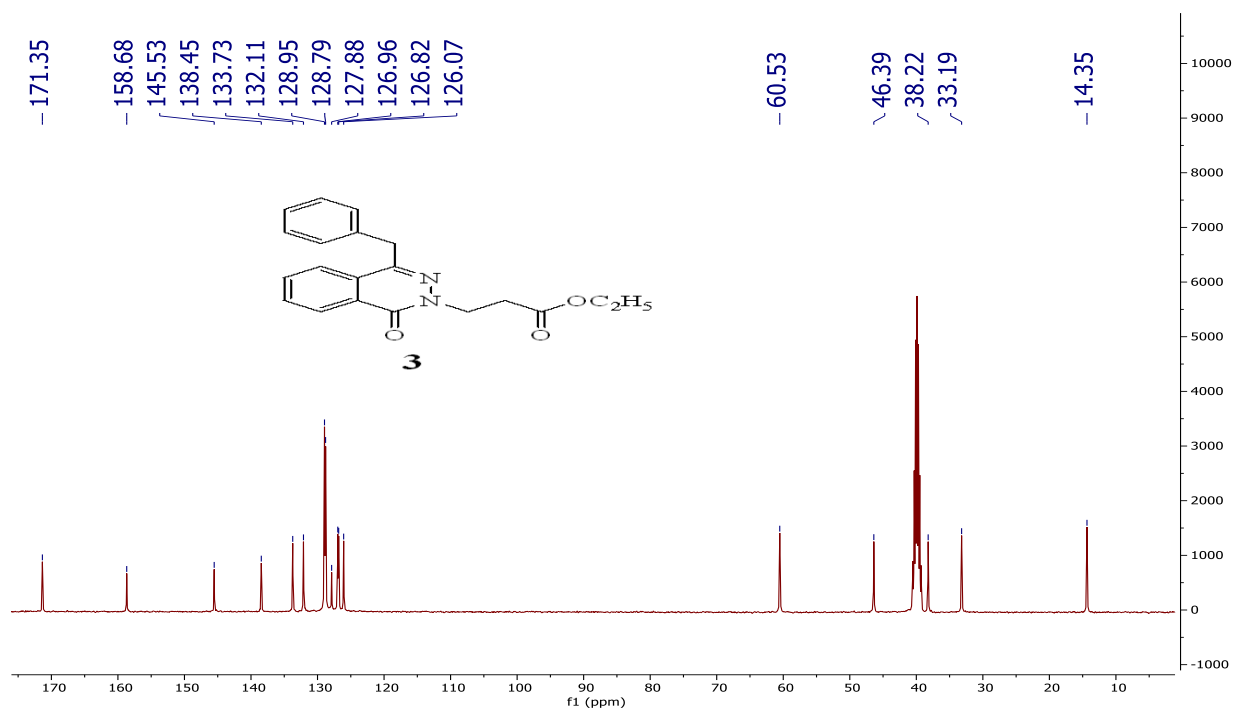


Figure S2 The ^{13}C -NMR spectrum of compound **3**.

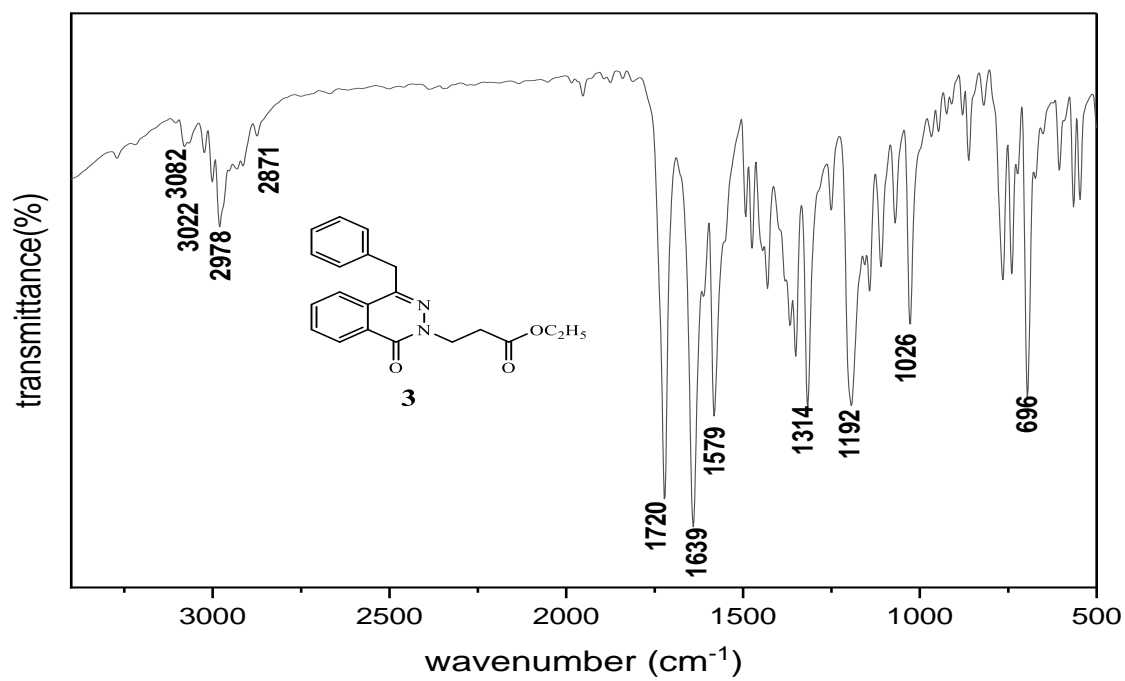


Figure S3 The IR spectrum of compound 3.

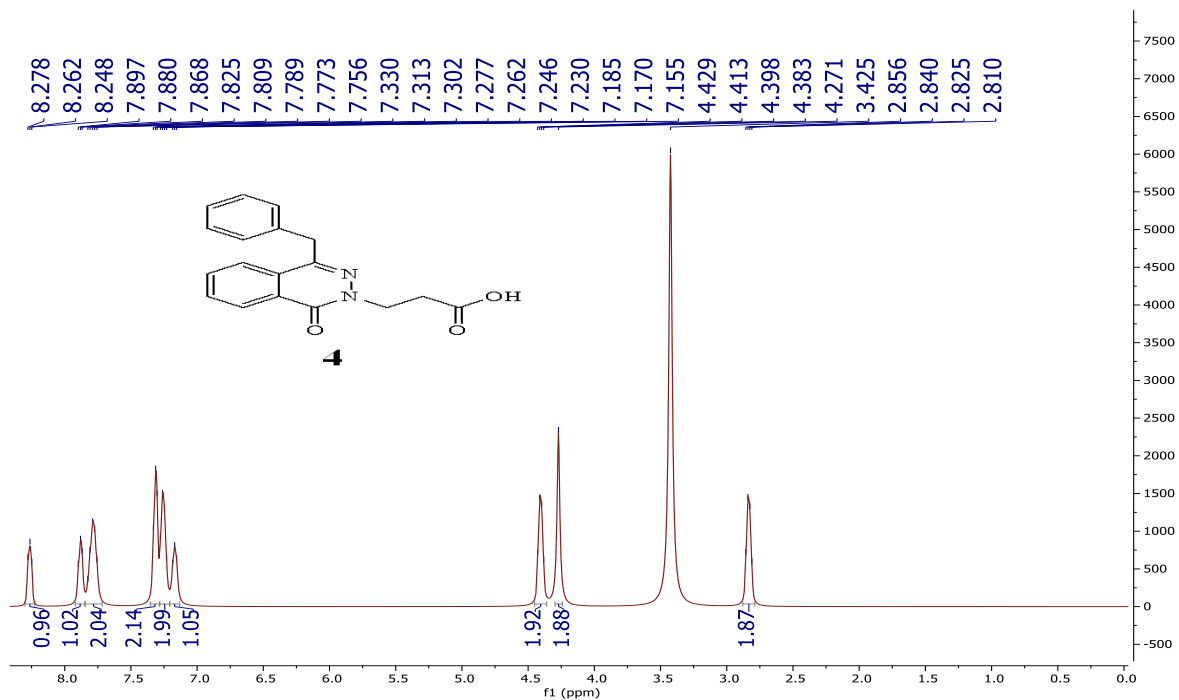


Figure S4 The ¹H-NMR spectrum of compound 4.

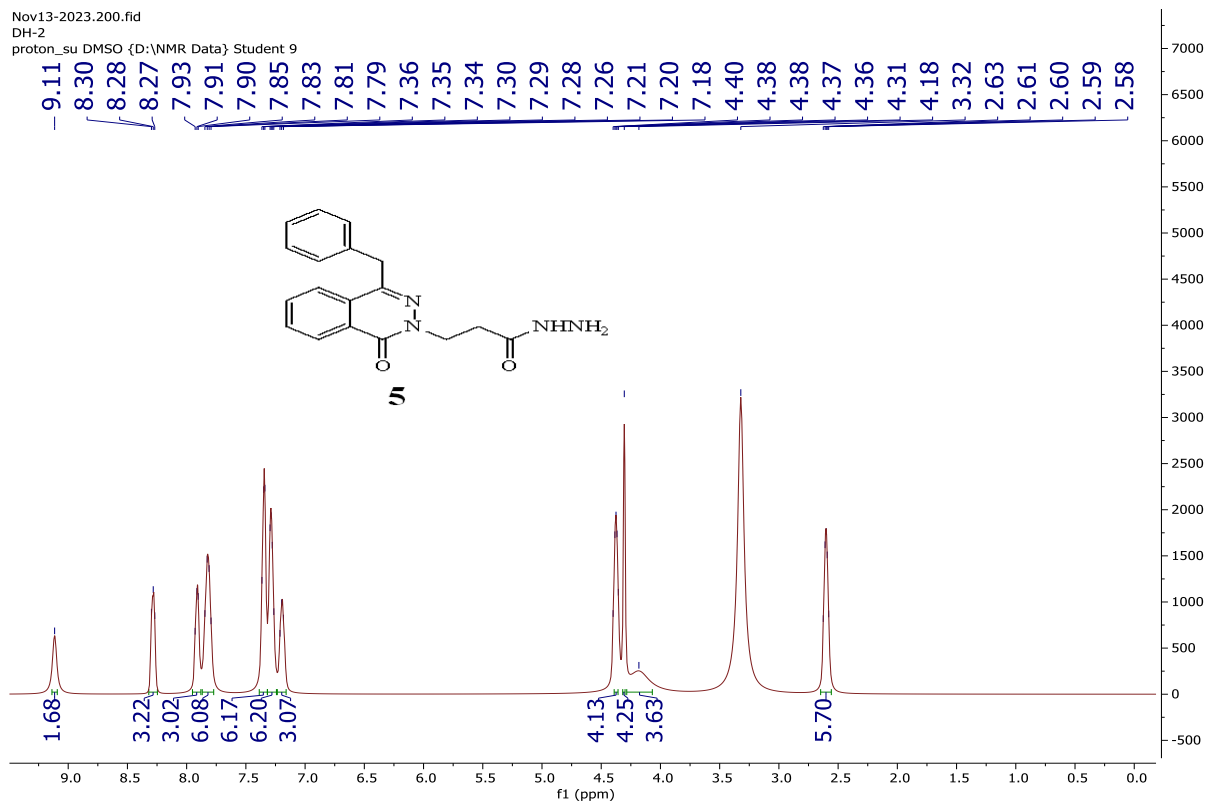


Figure S5 The ^1H -NMR spectrum of compound 5.

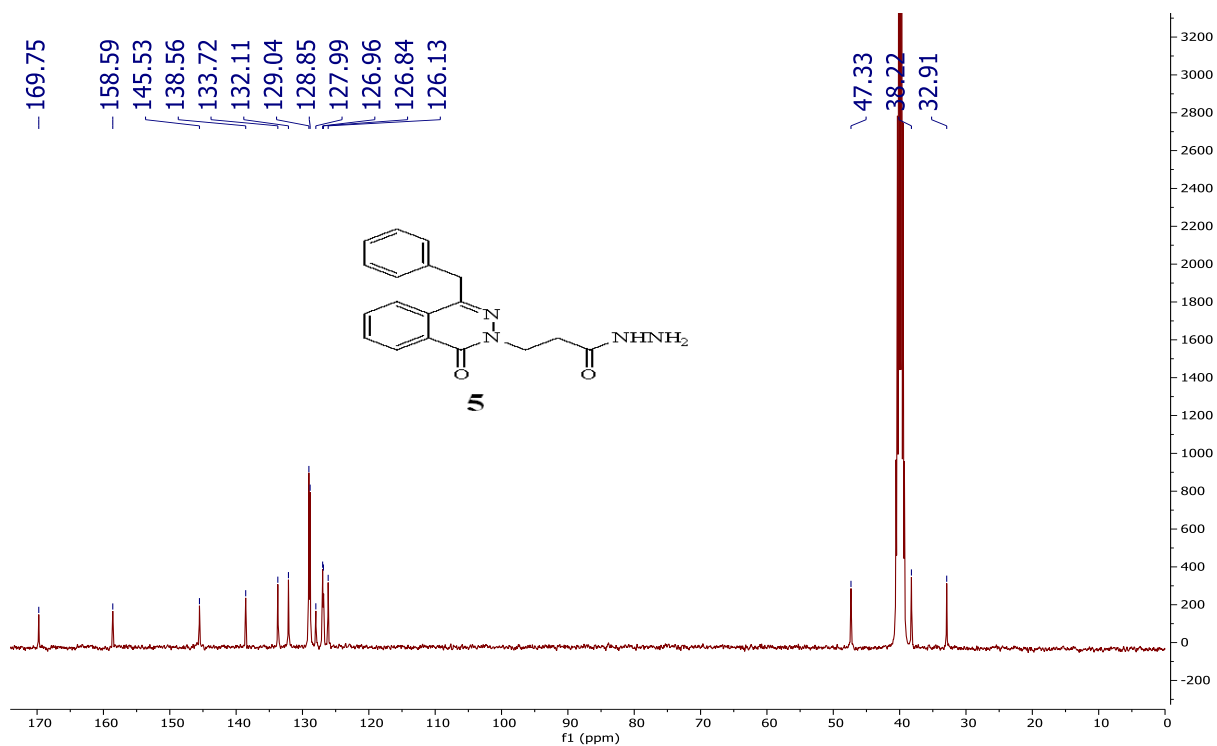


Figure S6 The ^{13}C -NMR spectrum of compound 5.

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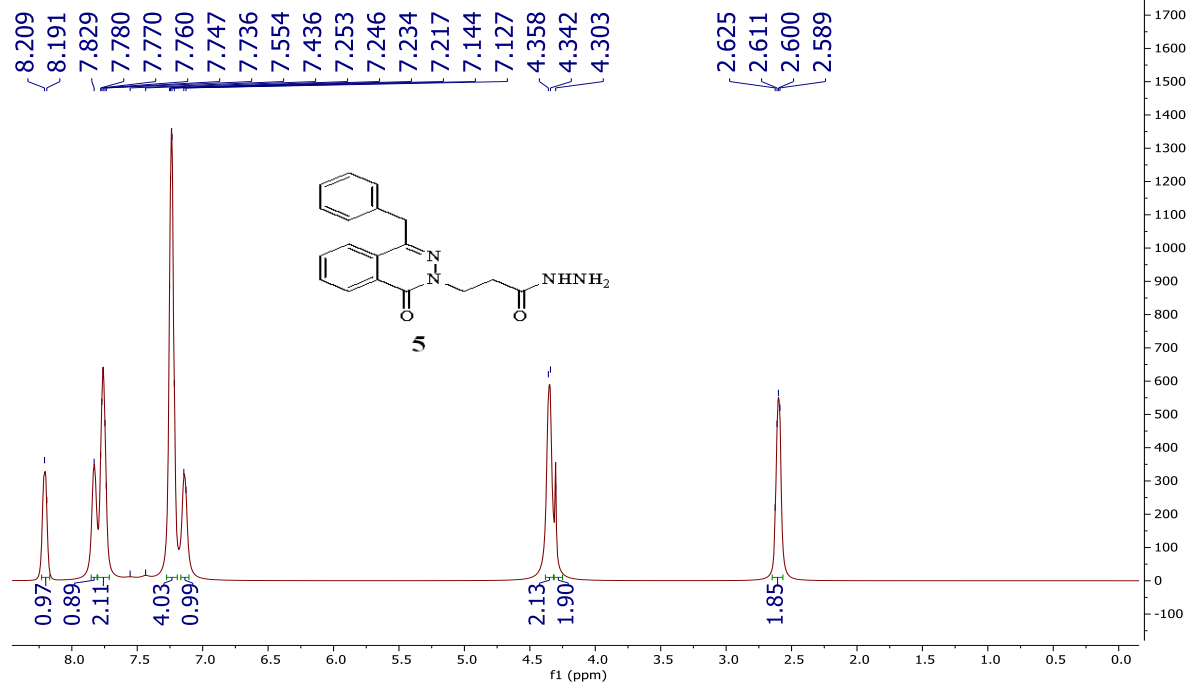


Figure S7 The D2O spectrum of compound 5.

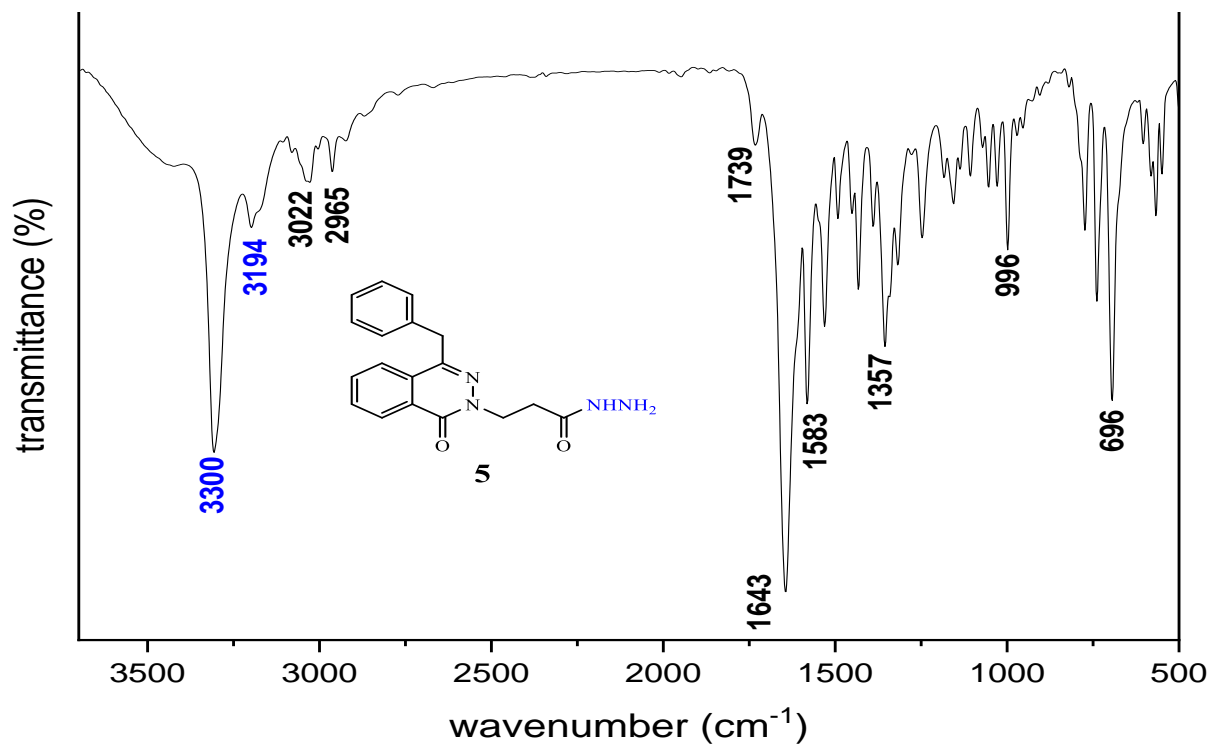


Figure S8 The IR spectrum of compound 5

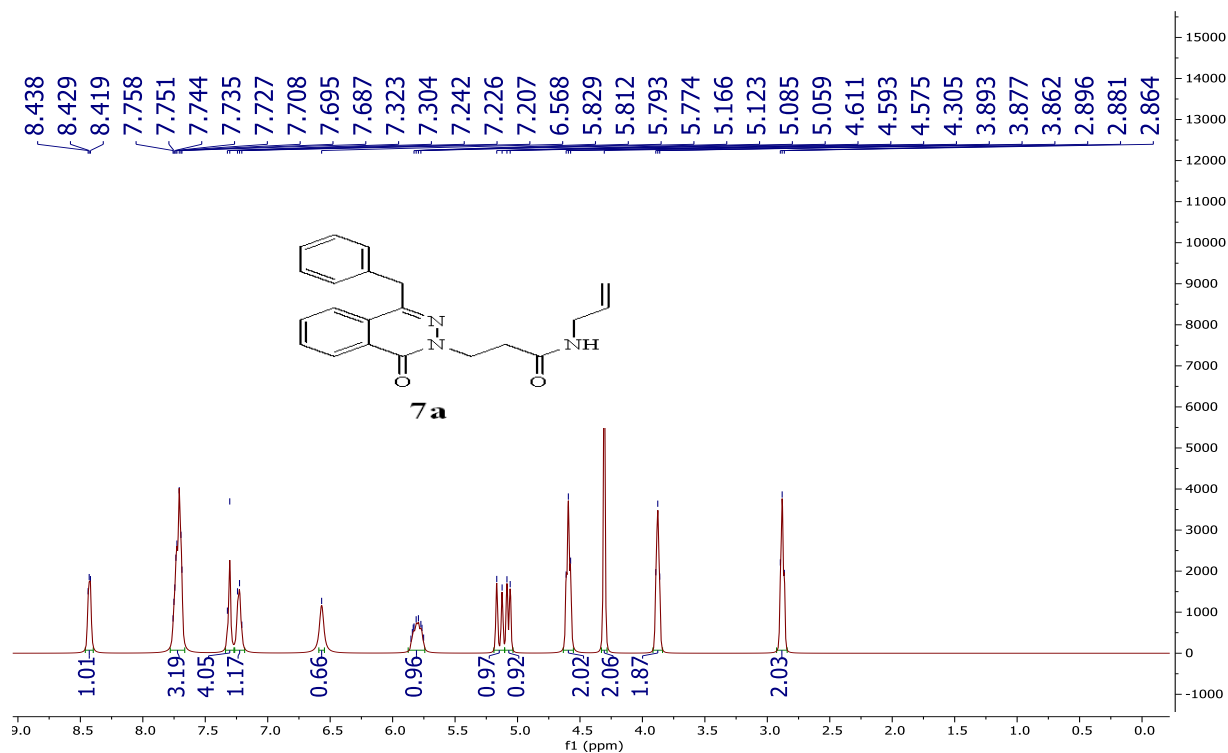


Figure S9 The $^1\text{H-NMR}$ spectrum of compound **7a**

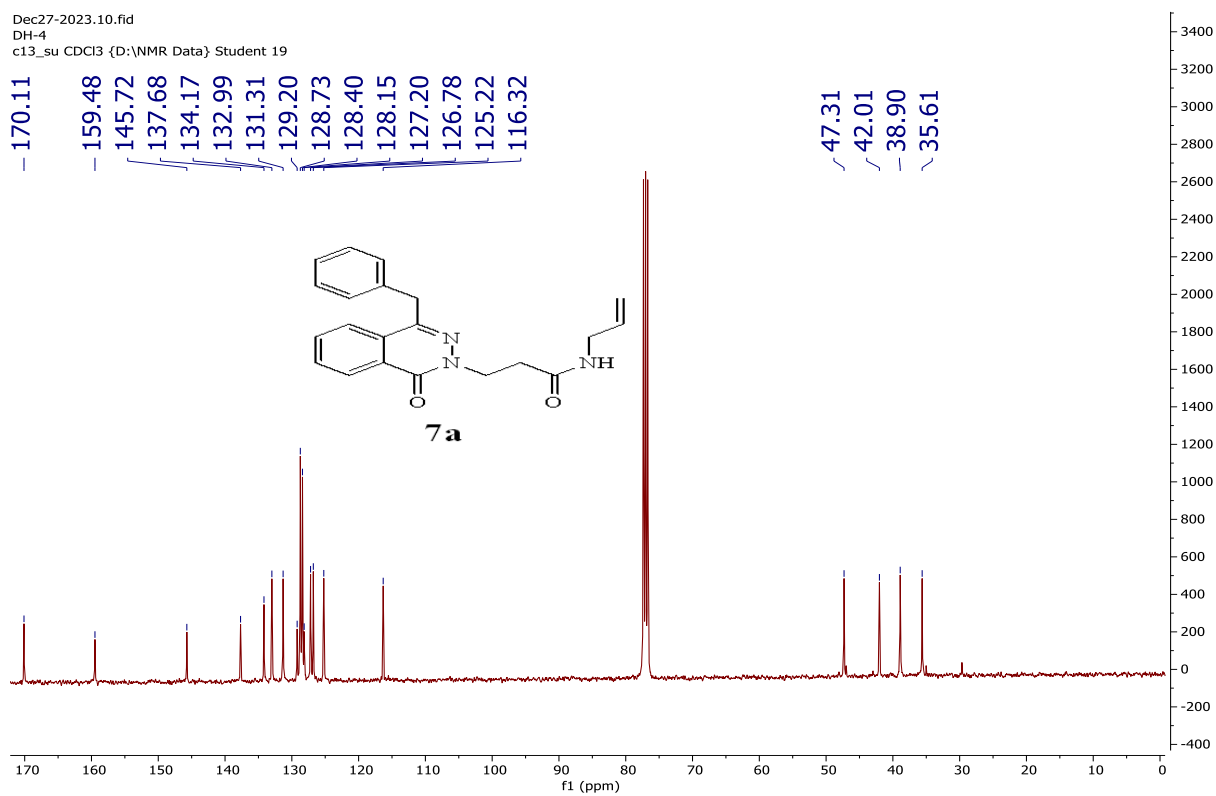


Figure S10 The $^{13}\text{C-NMR}$ spectrum of compound **7a**

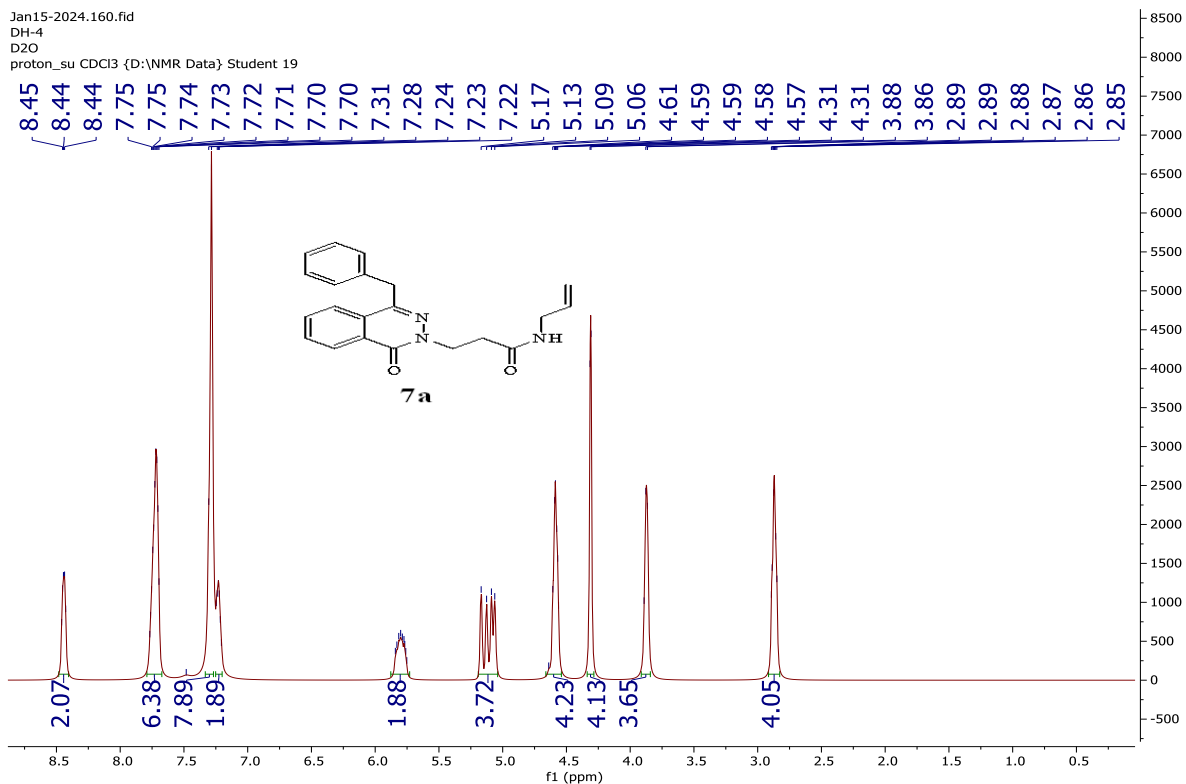


Figure S11 The D2O spectrum of compound 7a

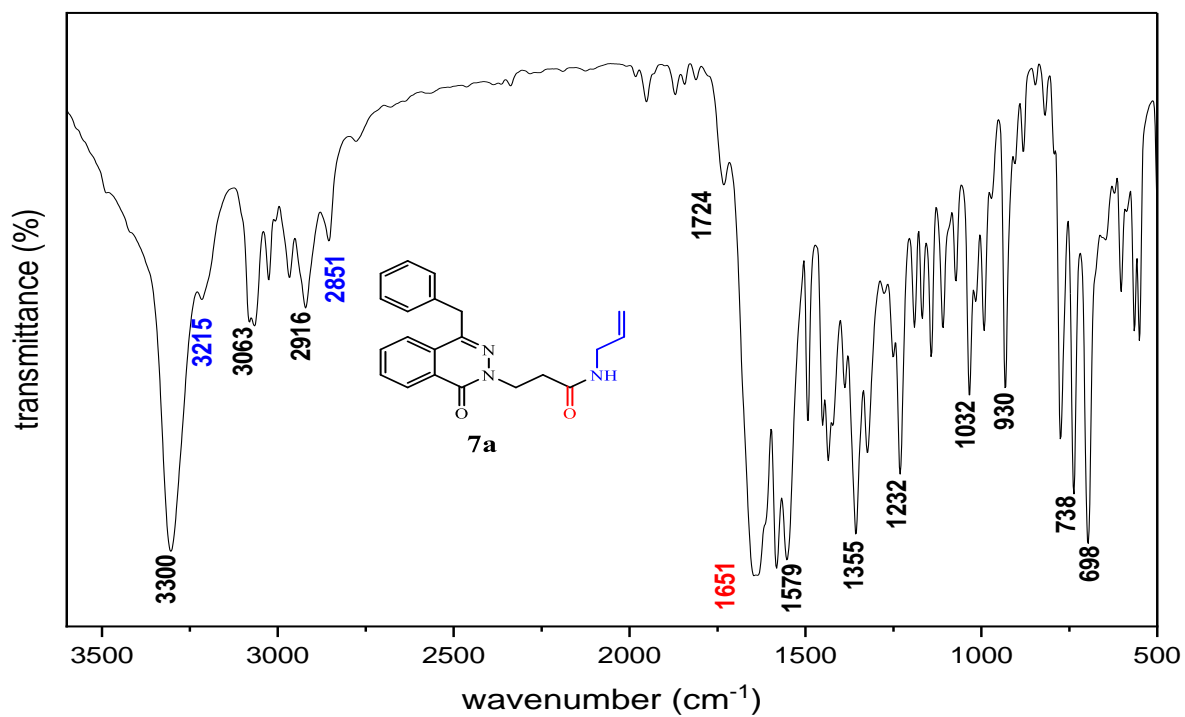


Figure S12 The IR spectrum of compound 7a

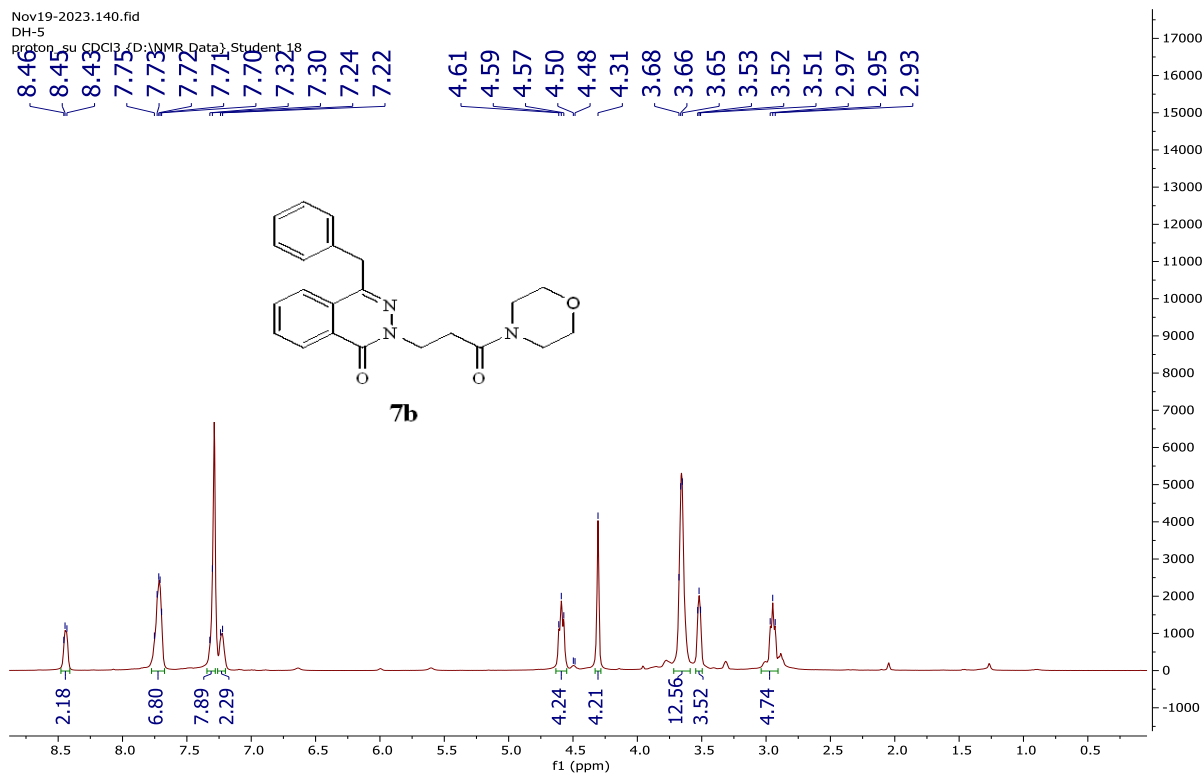


Figure S13 The ^1H -NMR spectrum of compound **7b**

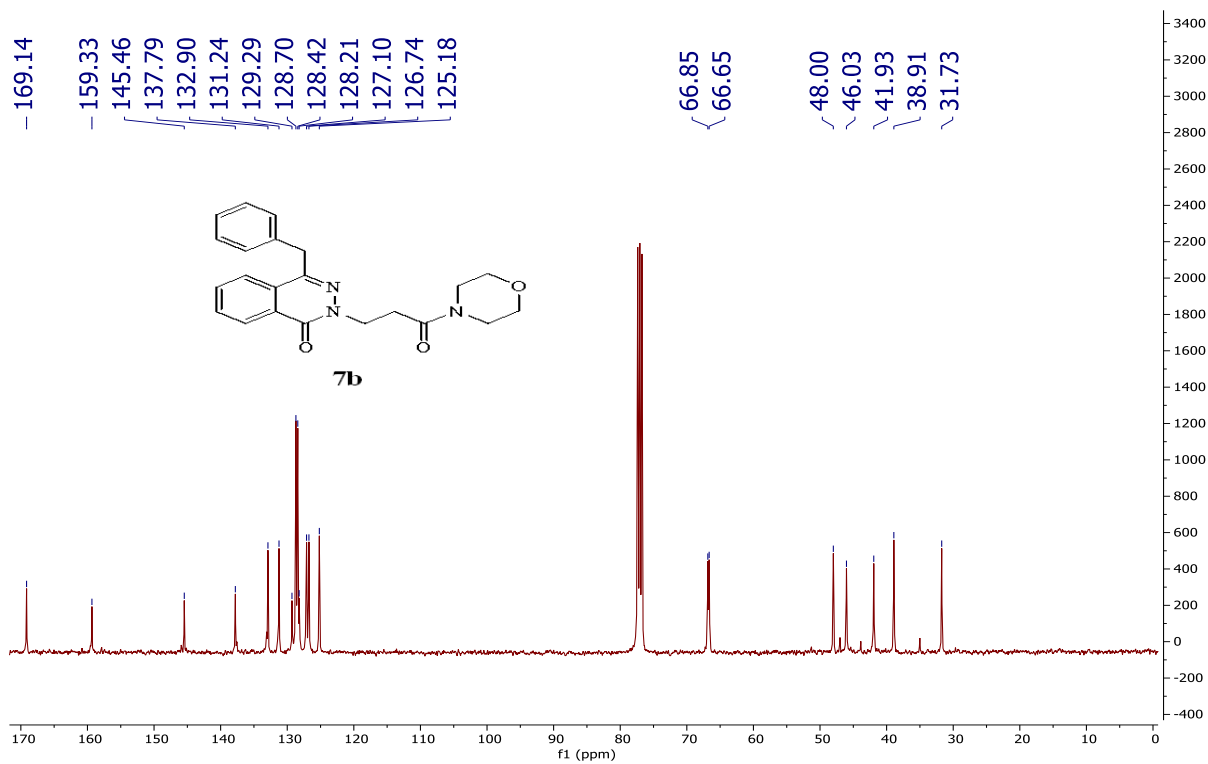


Figure S14 The ^{13}C -NMR spectrum of compound **7b**

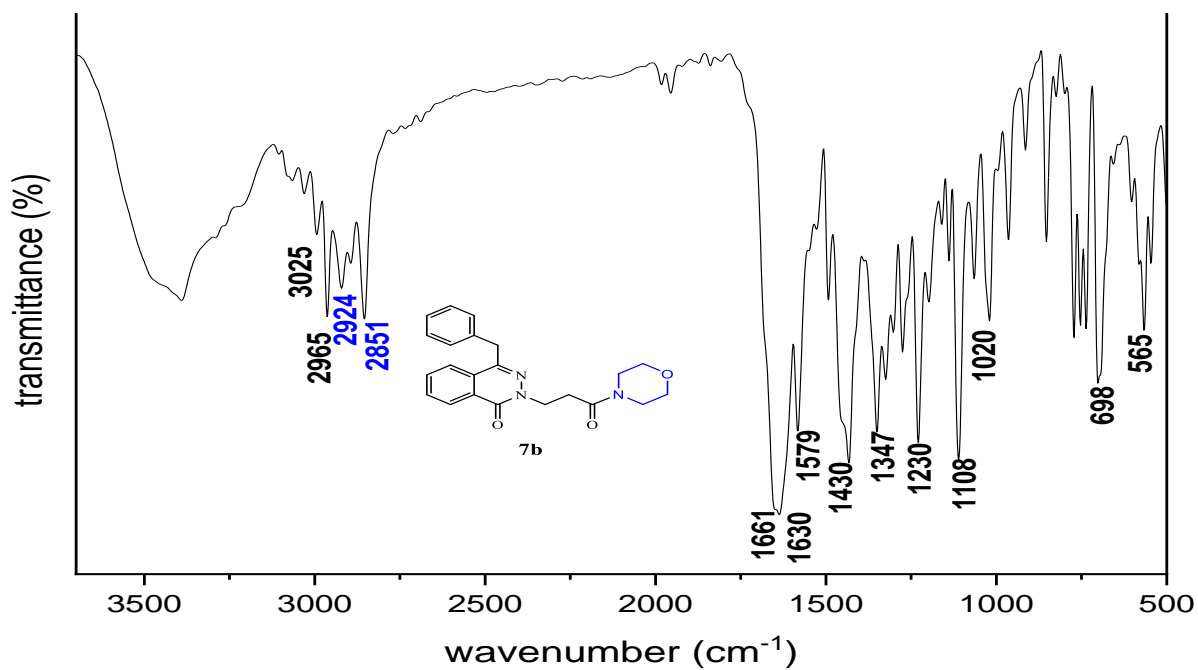


Figure S15 The IR spectrum of compound 7b

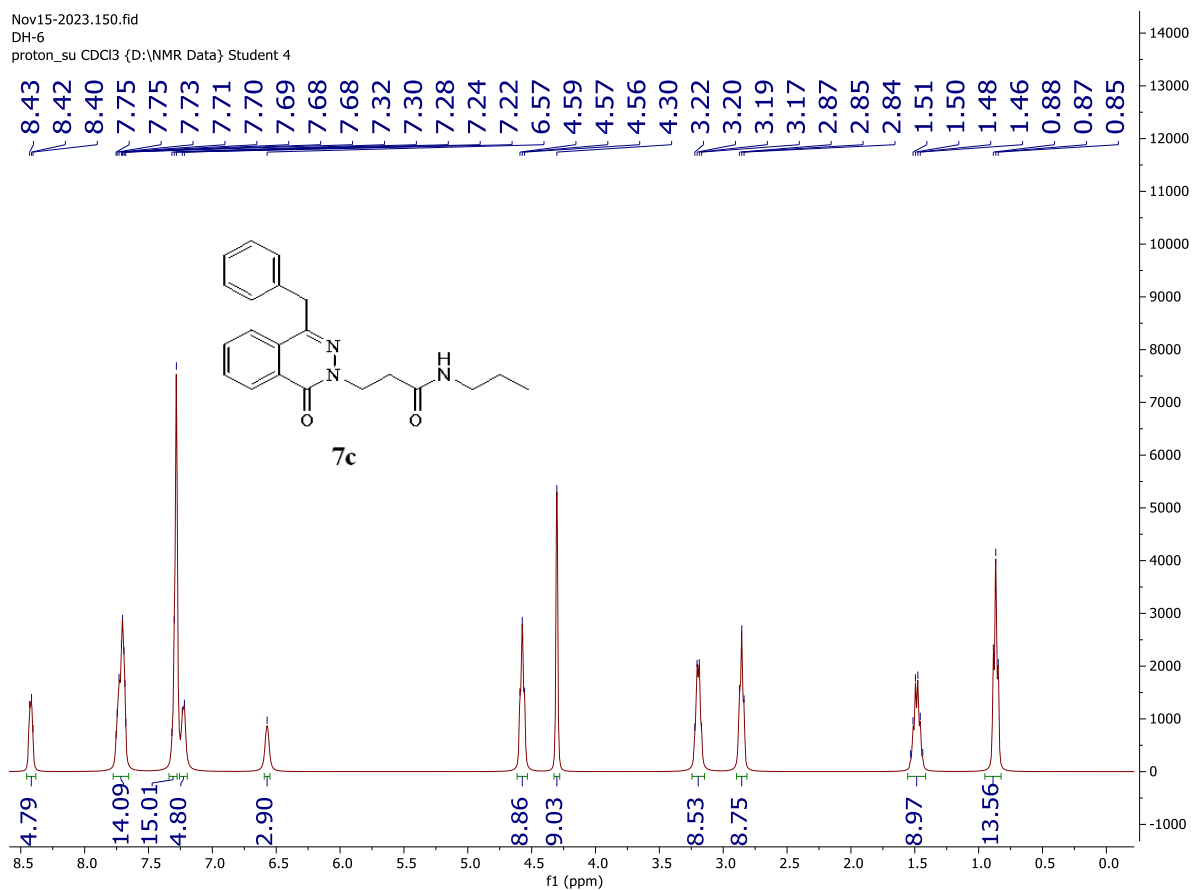


Figure S16 The ¹H-NMR spectrum of compound 7c

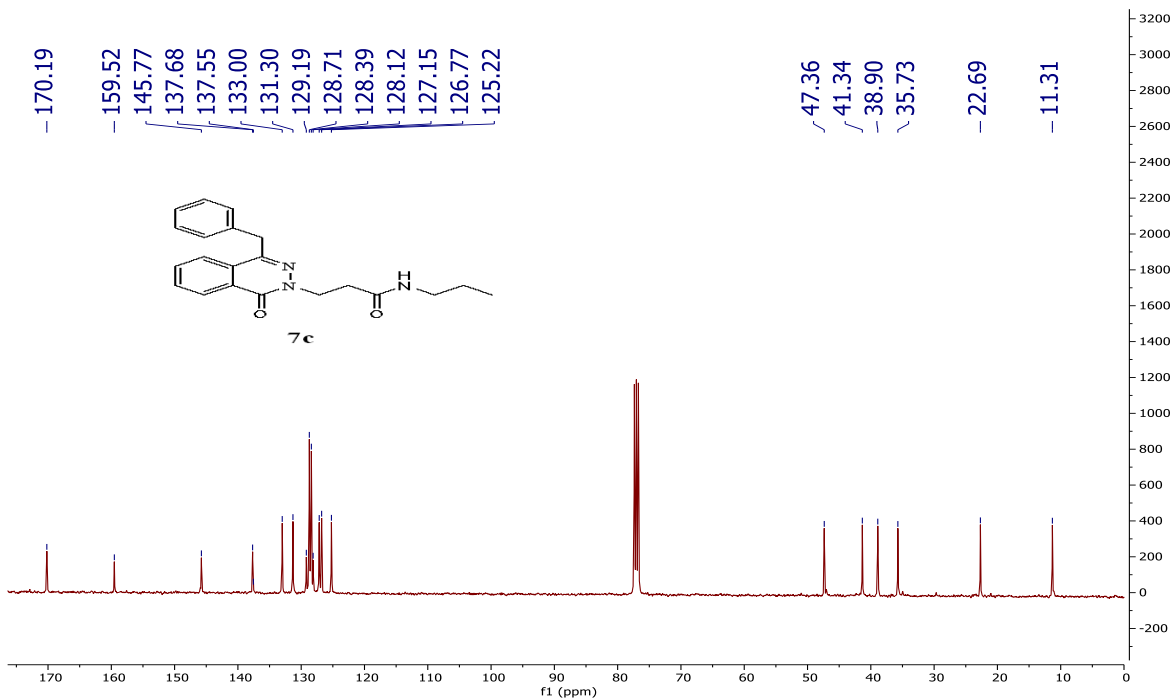


Figure S17 The ¹³C-NMR spectrum of compound 7c

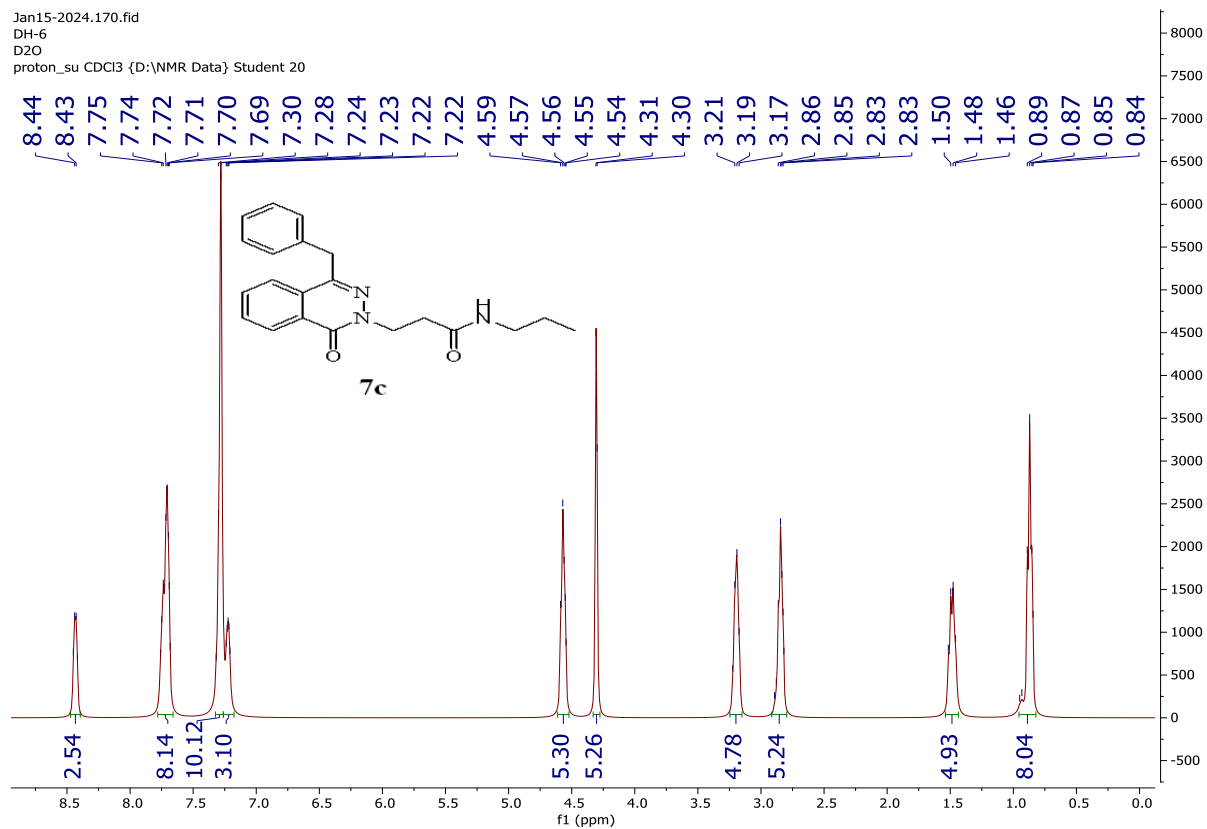


Figure S18 The D₂O spectrum of compound 7c

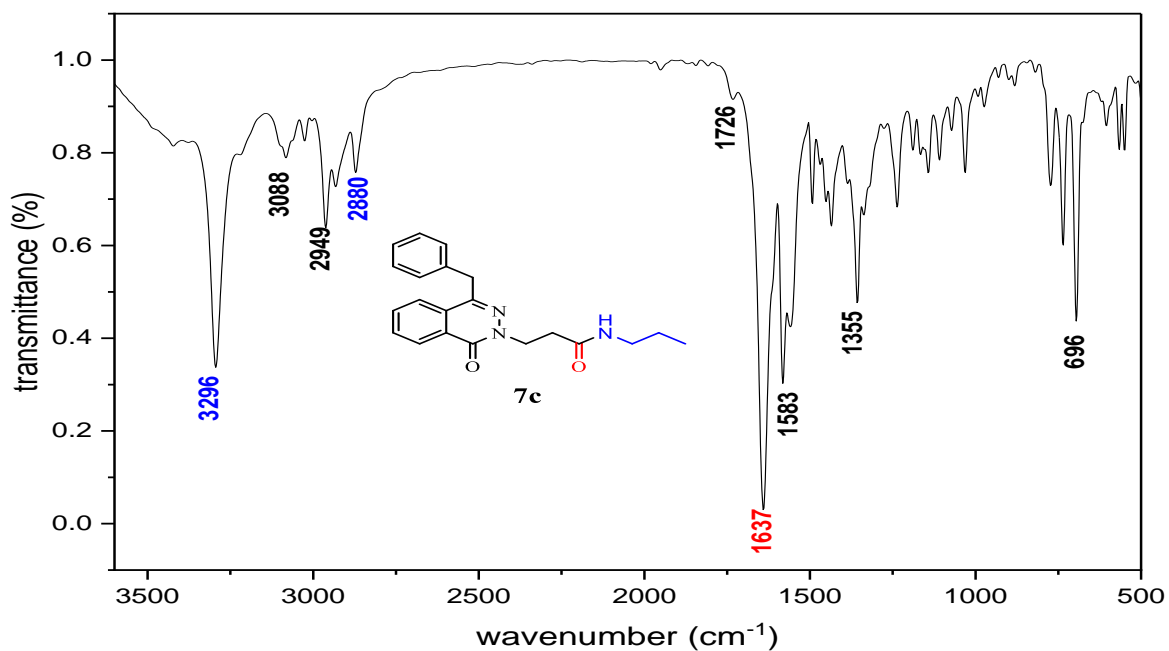


Figure S19 The IR spectrum of compound 7c

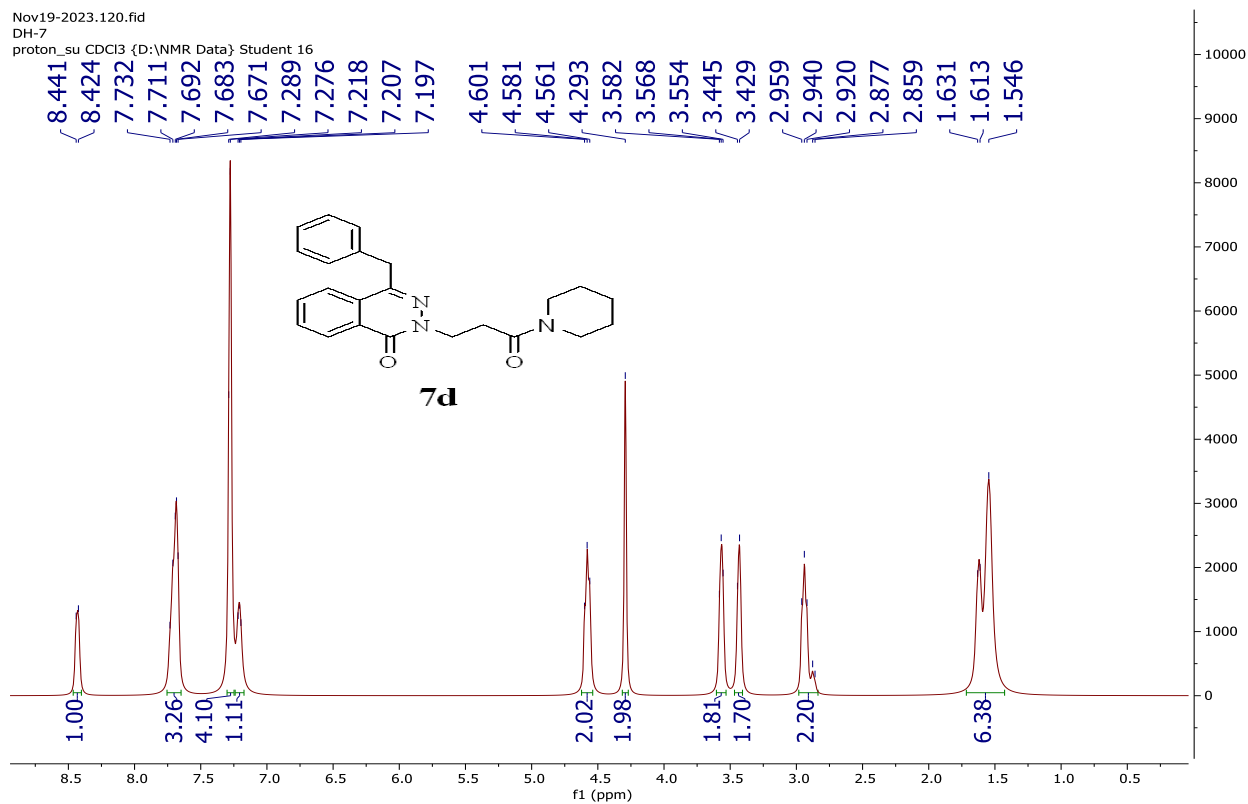


Figure S20 The ¹H-NMR spectrum of compound 7d

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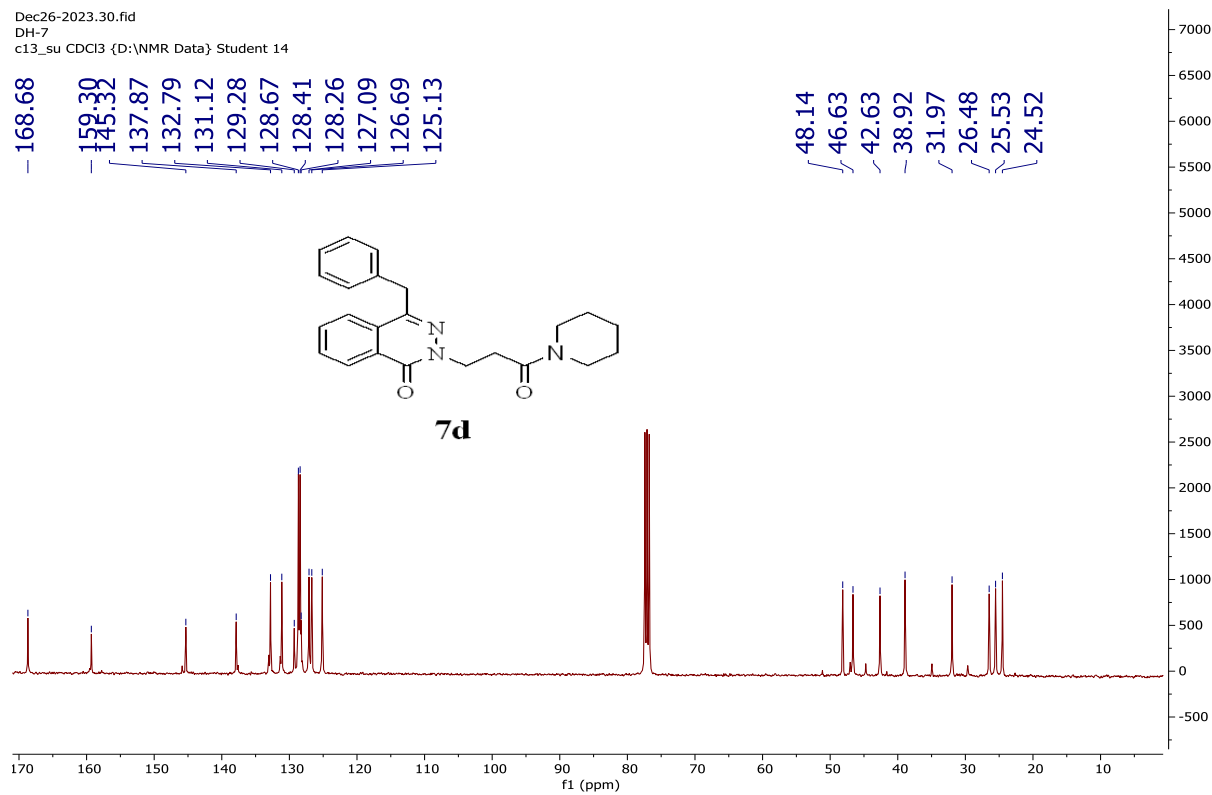


Figure S21 The ¹³C-NMR spectrum of compound 7d

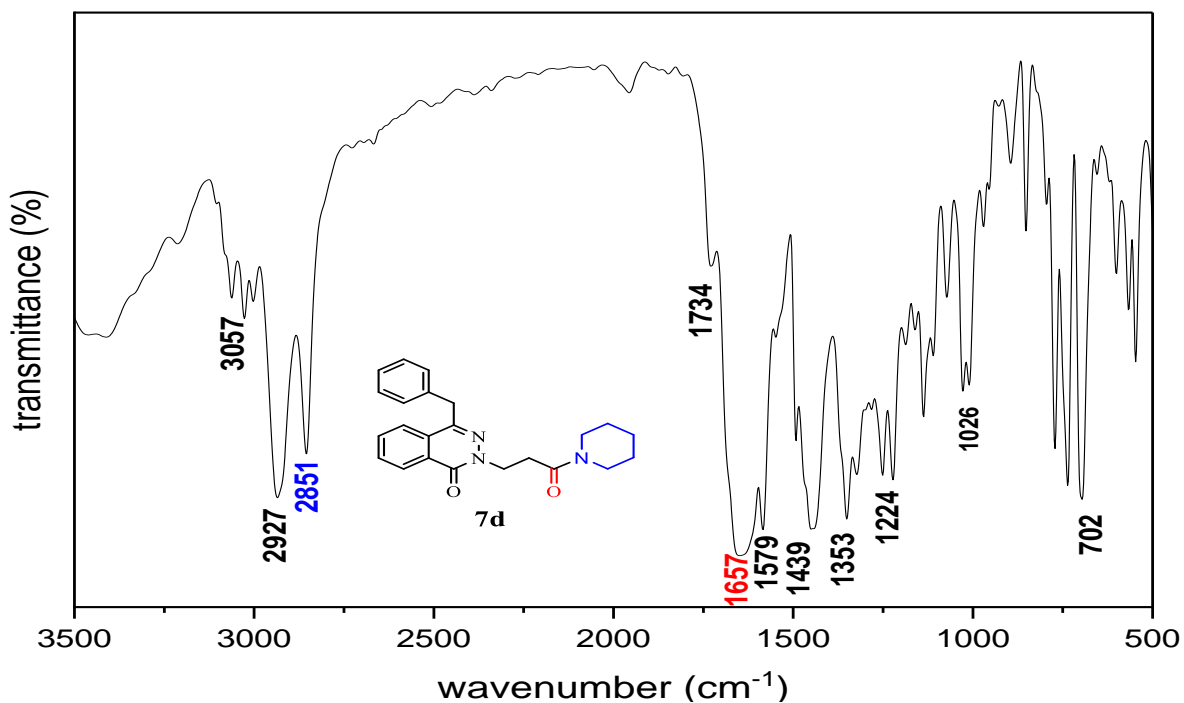


Figure S22 The IR spectrum of compound 7d

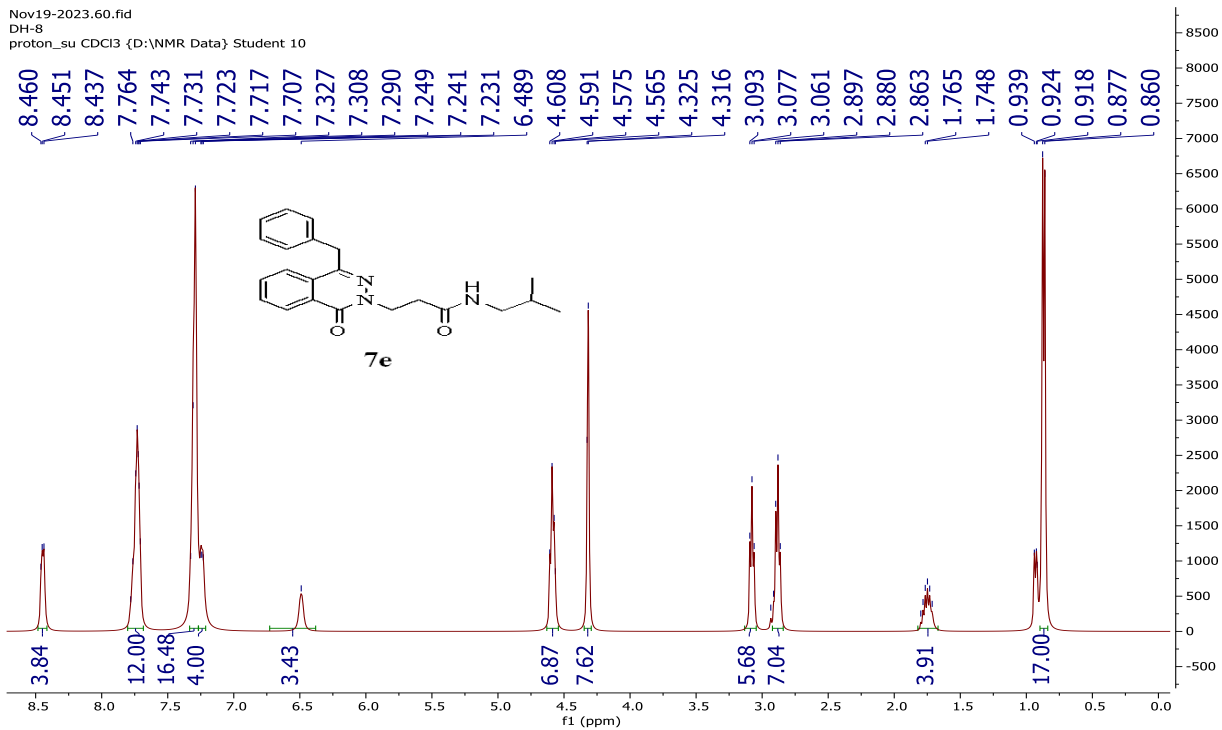


Figure S23 The ^1H -NMR spectrum of compound **7e**

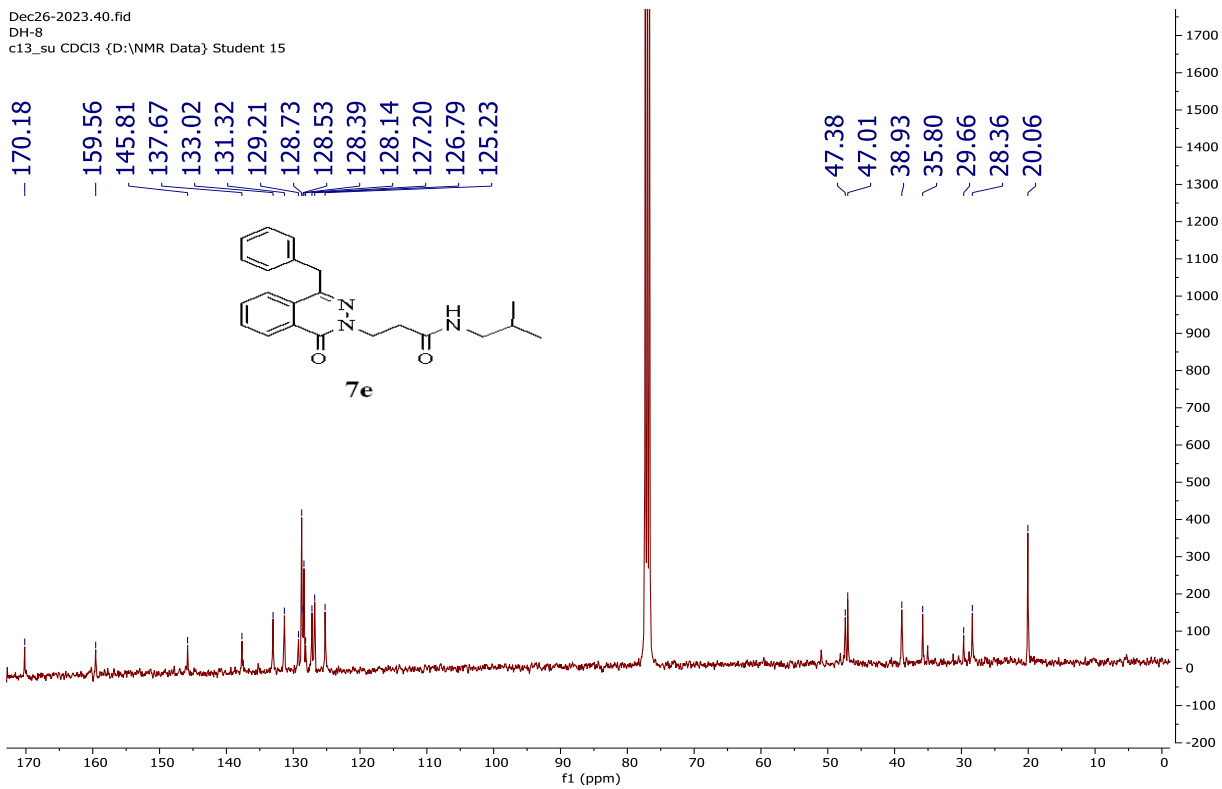


Figure S24 The ^{13}C -NMR spectrum of compound **7e**

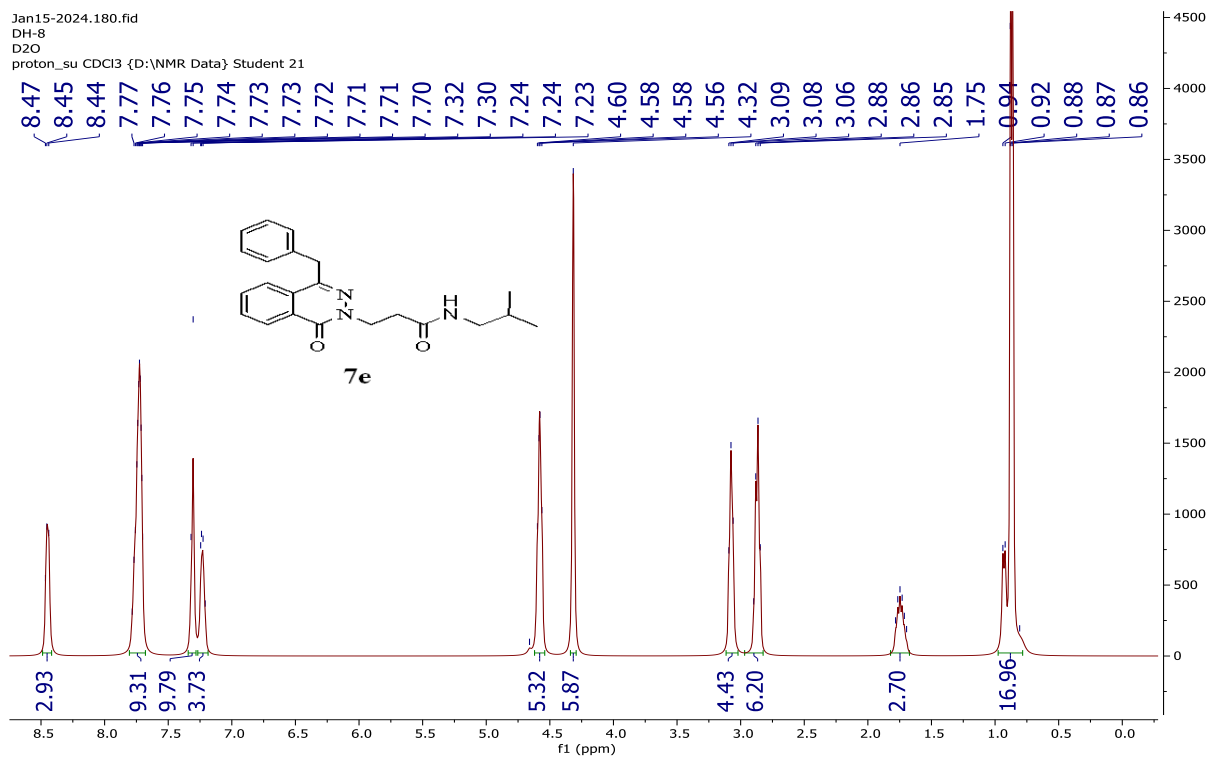


Figure S25 The D2O spectrum of compound 7e

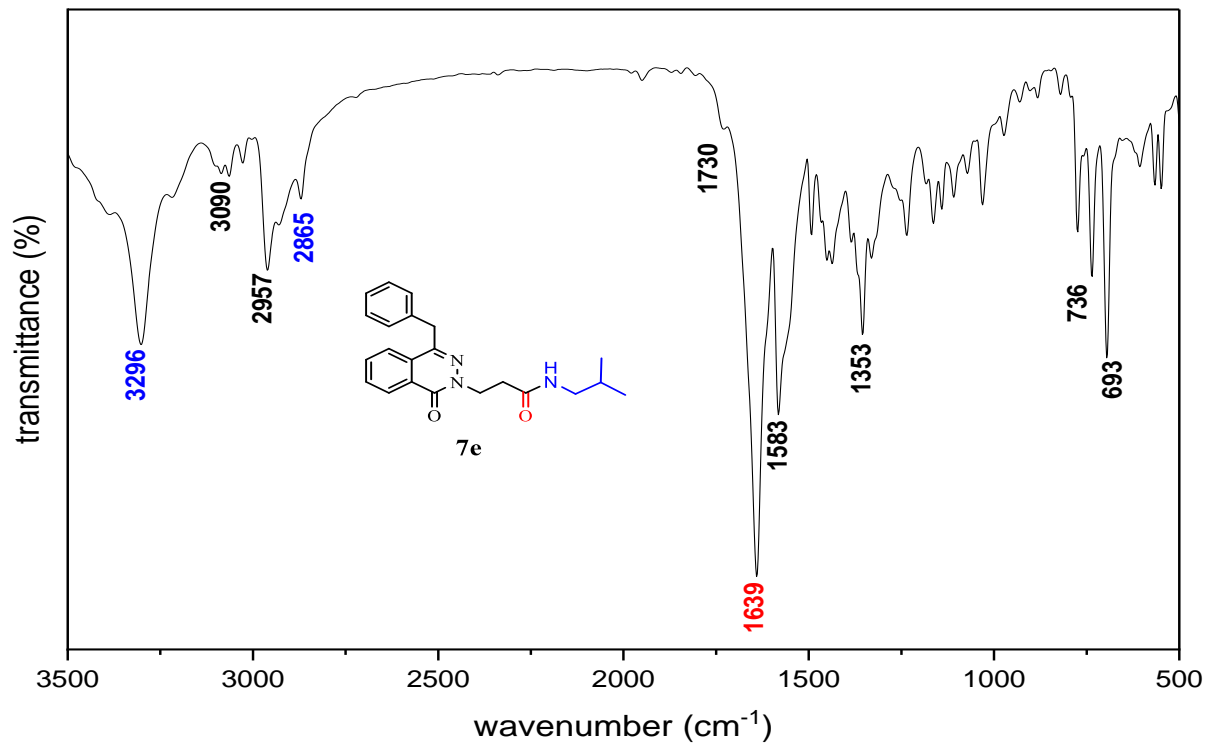


Figure S26 The IR spectrum of compound 7e

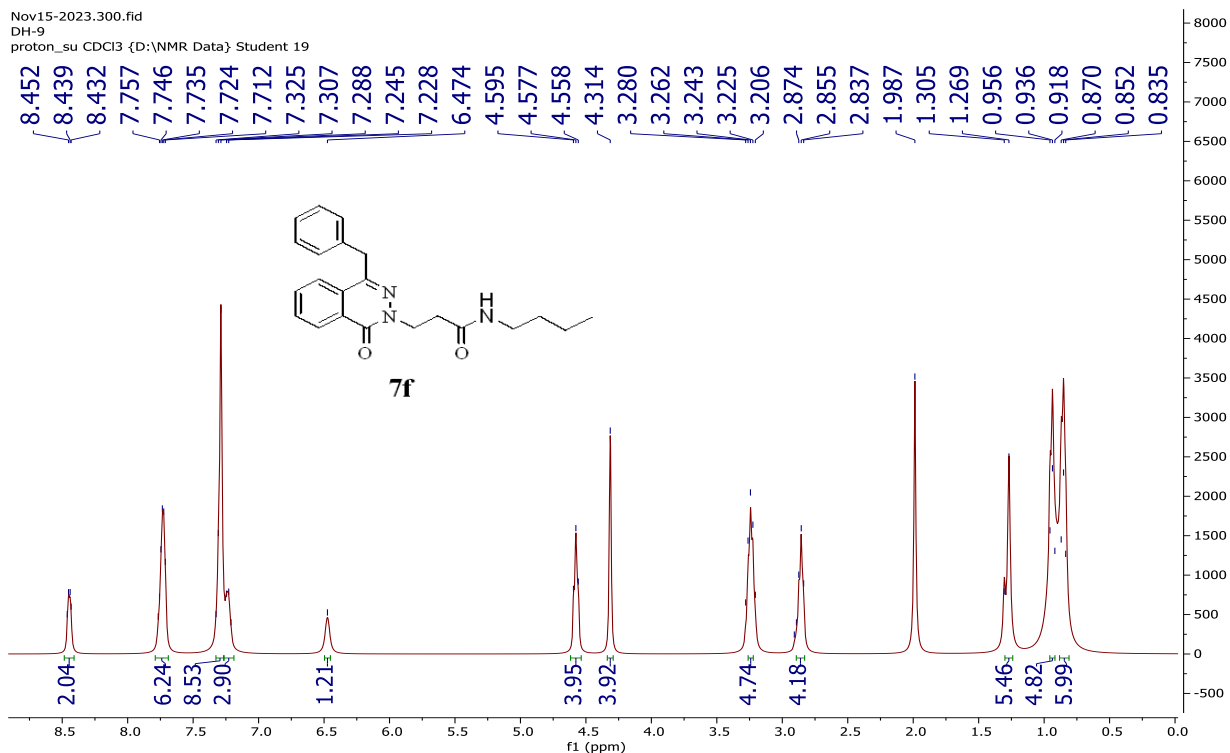


Figure S27 The ^1H -NMR spectrum of compound **7f**

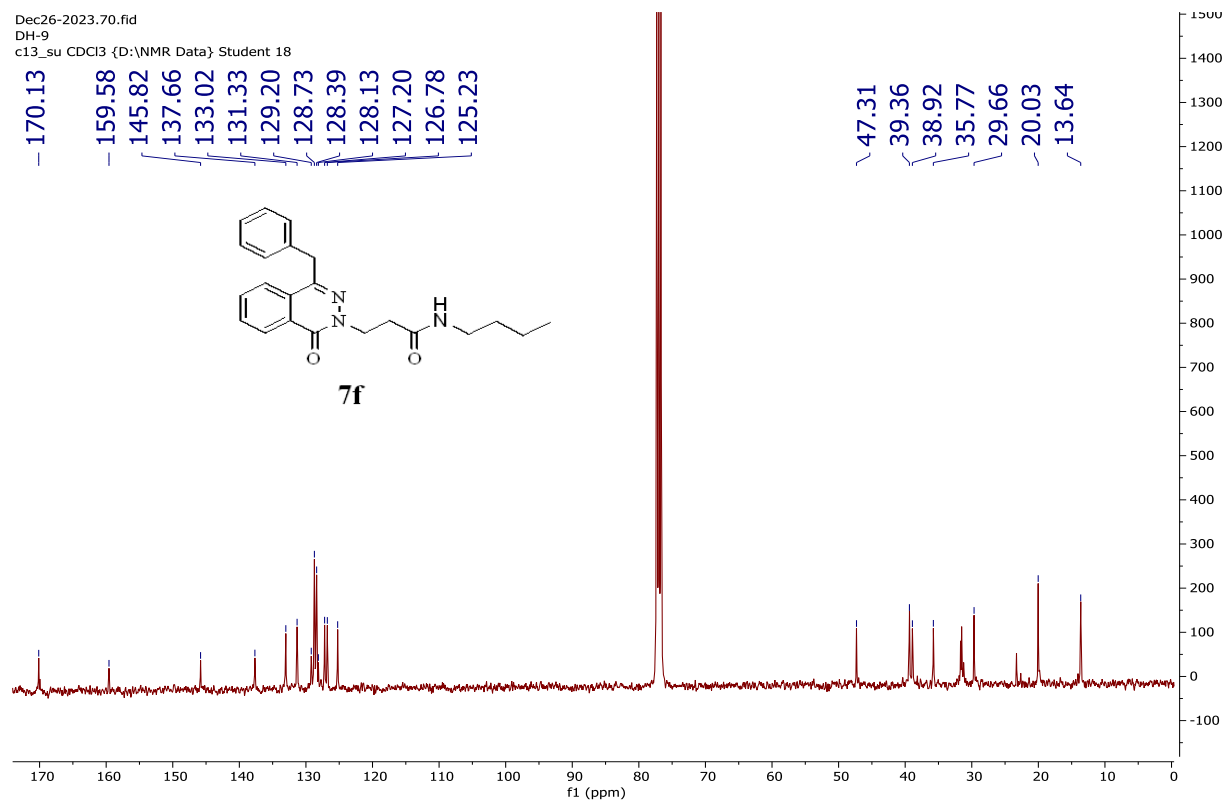


Figure S28 The ^{13}C -NMR spectrum of compound **7f**

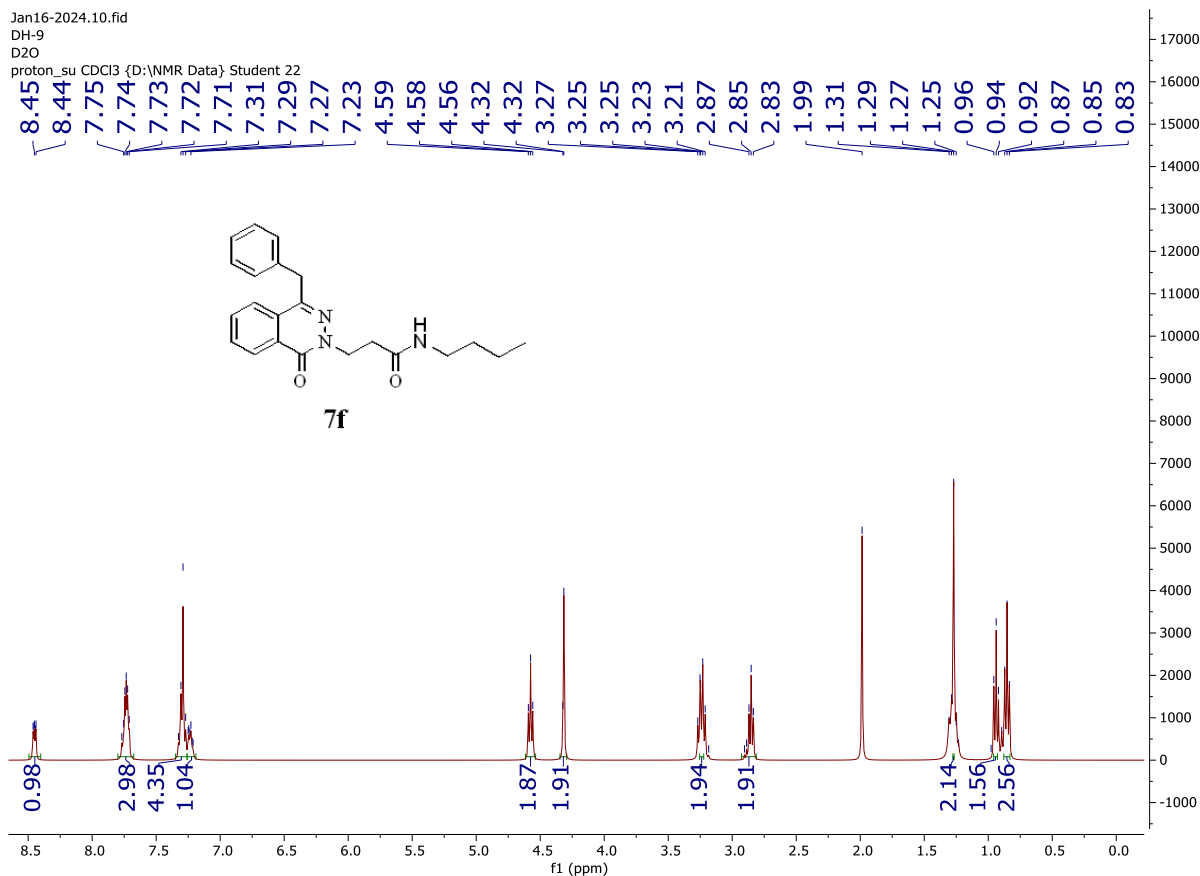


Figure S29 The D2O spectrum of compound 7f

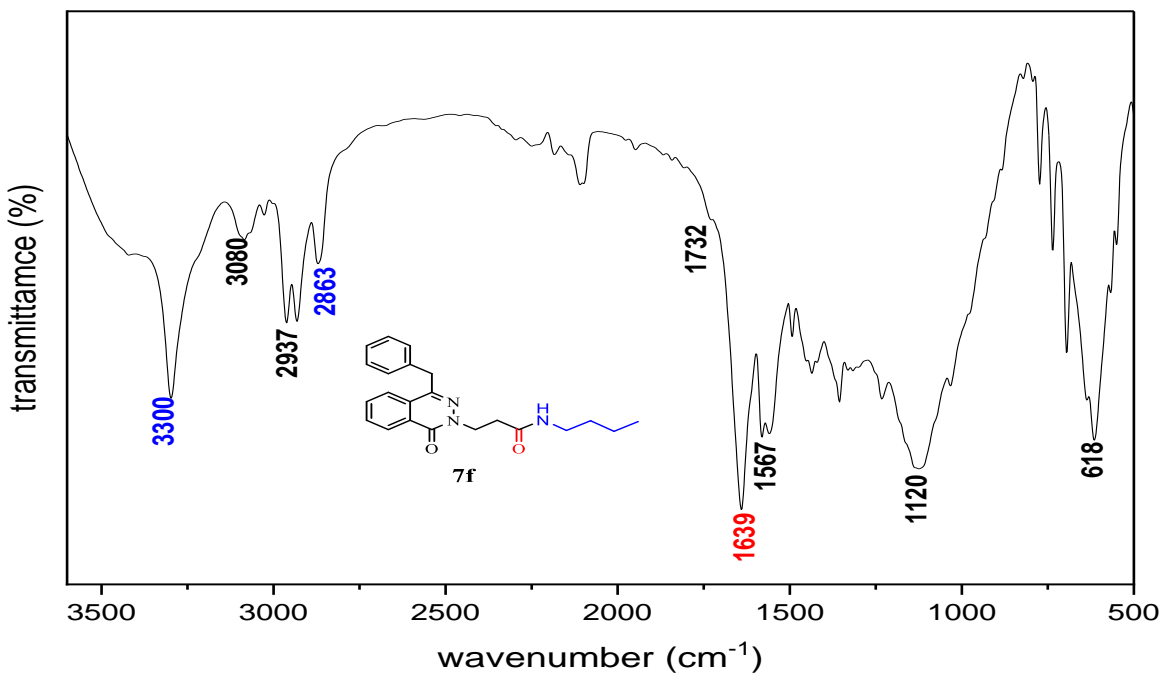


Figure S30 The IR spectrum of compound 7f

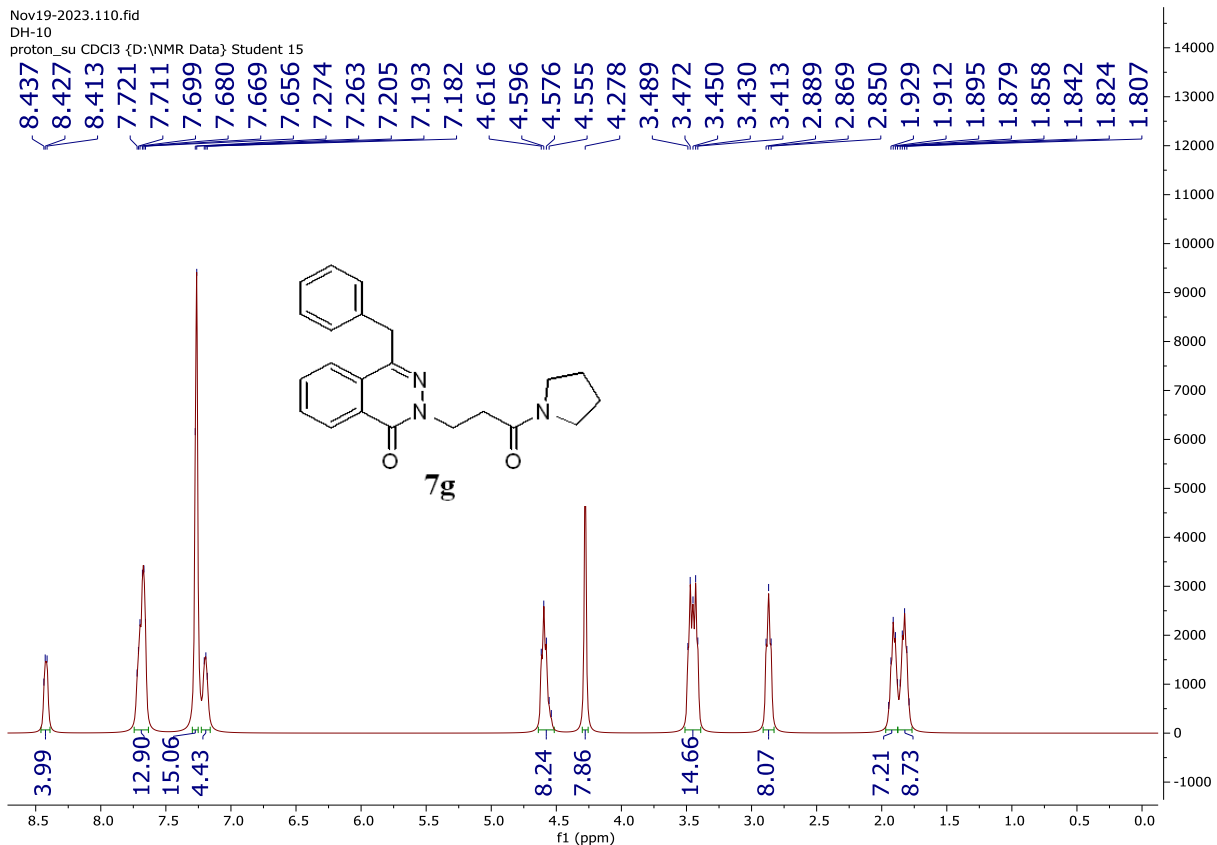


Figure S31 The ^1H -NMR spectrum of compound **7g**

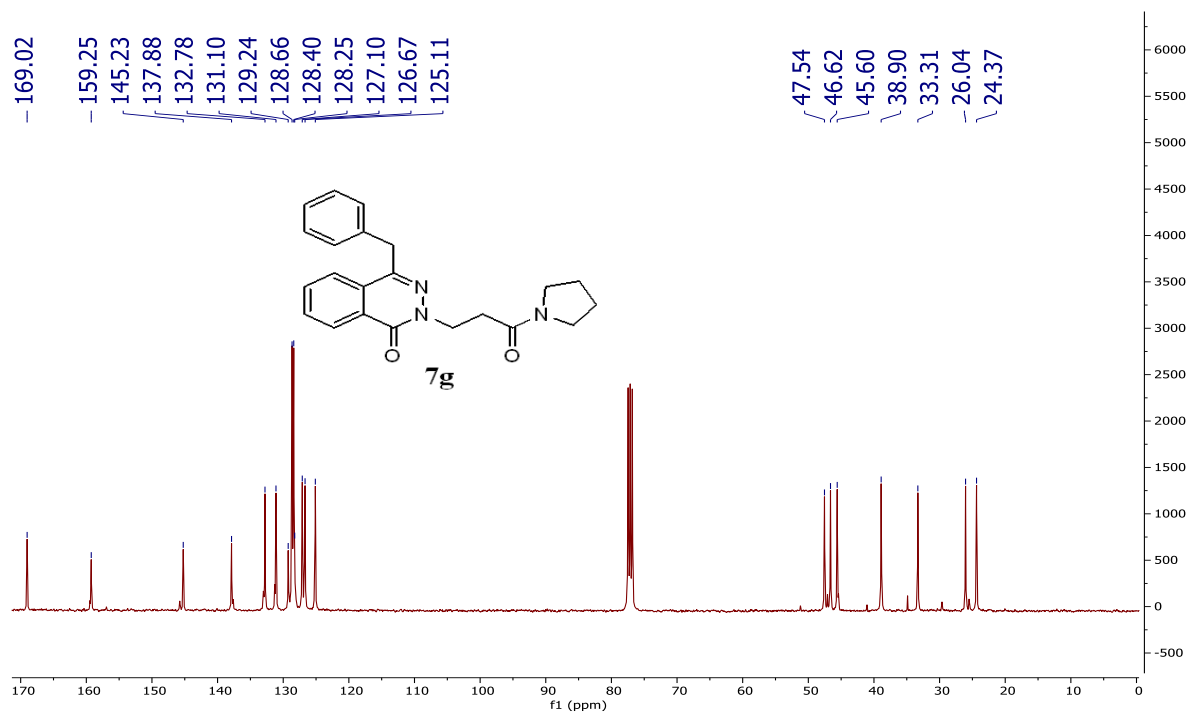


Figure S32 The ^{13}C -NMR spectrum of compound **7g**

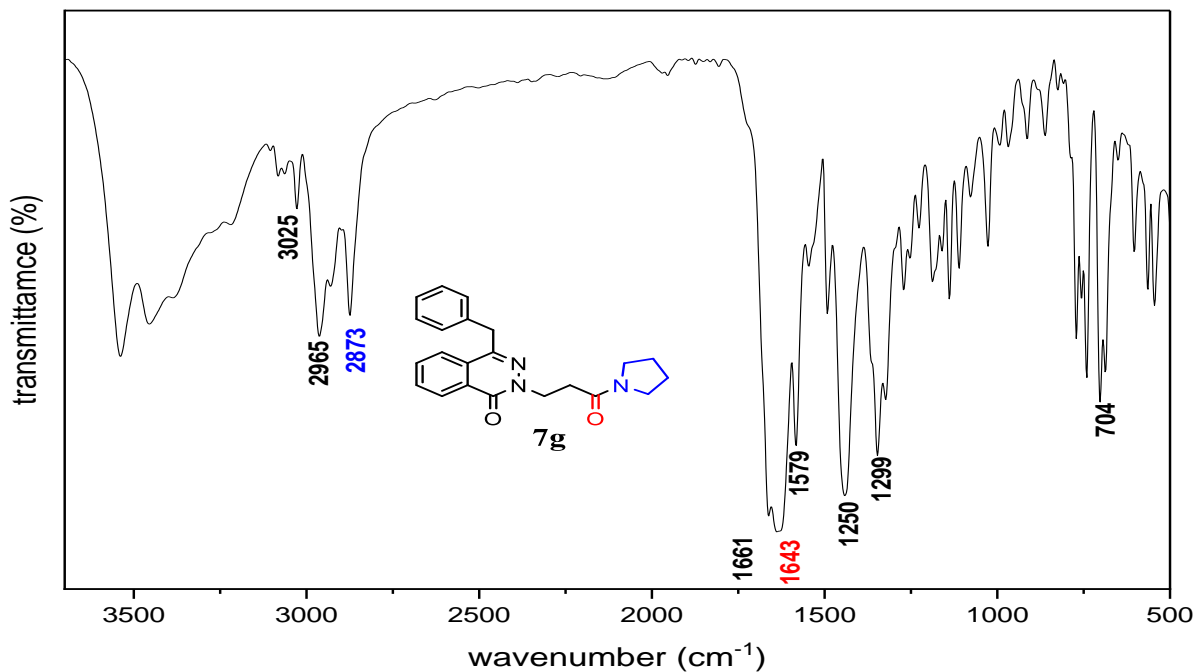


Figure S33 The IR spectrum of compound 7g

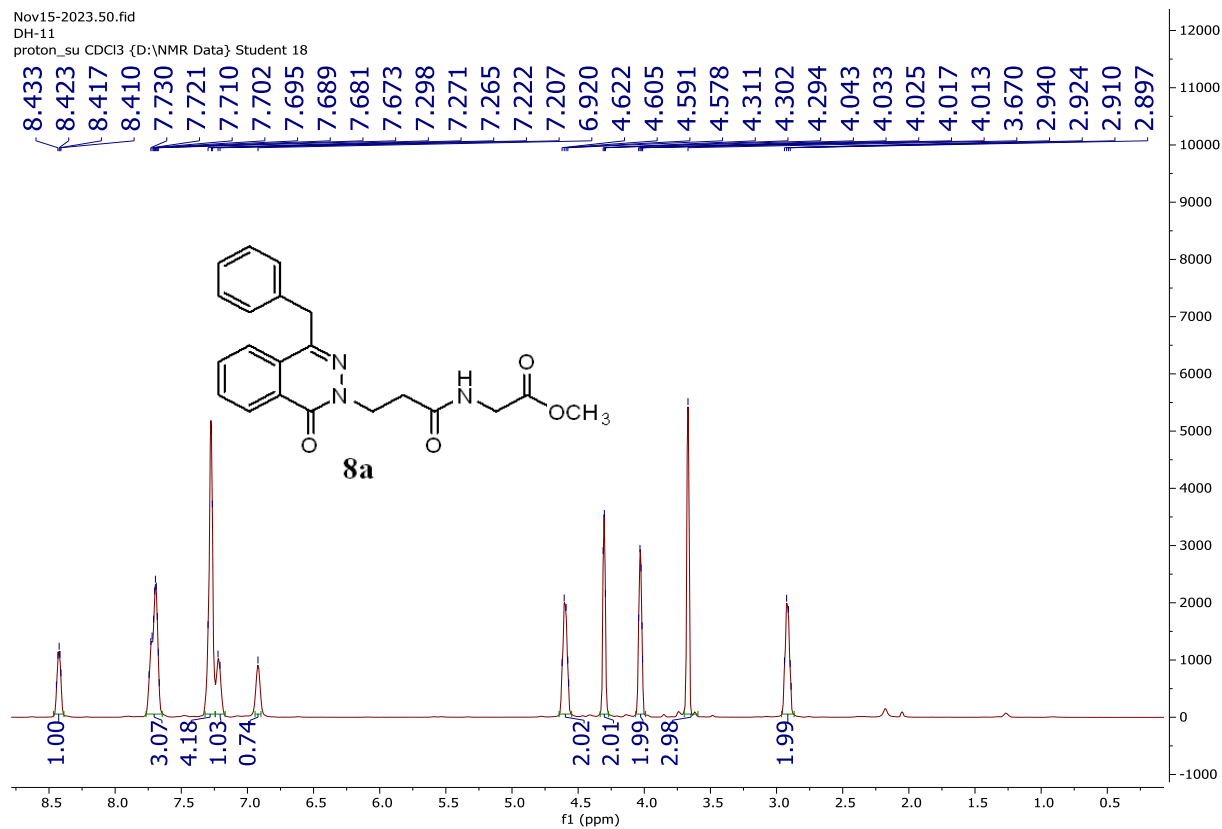


Figure S34 The ¹H-NMR spectrum of compound 8a

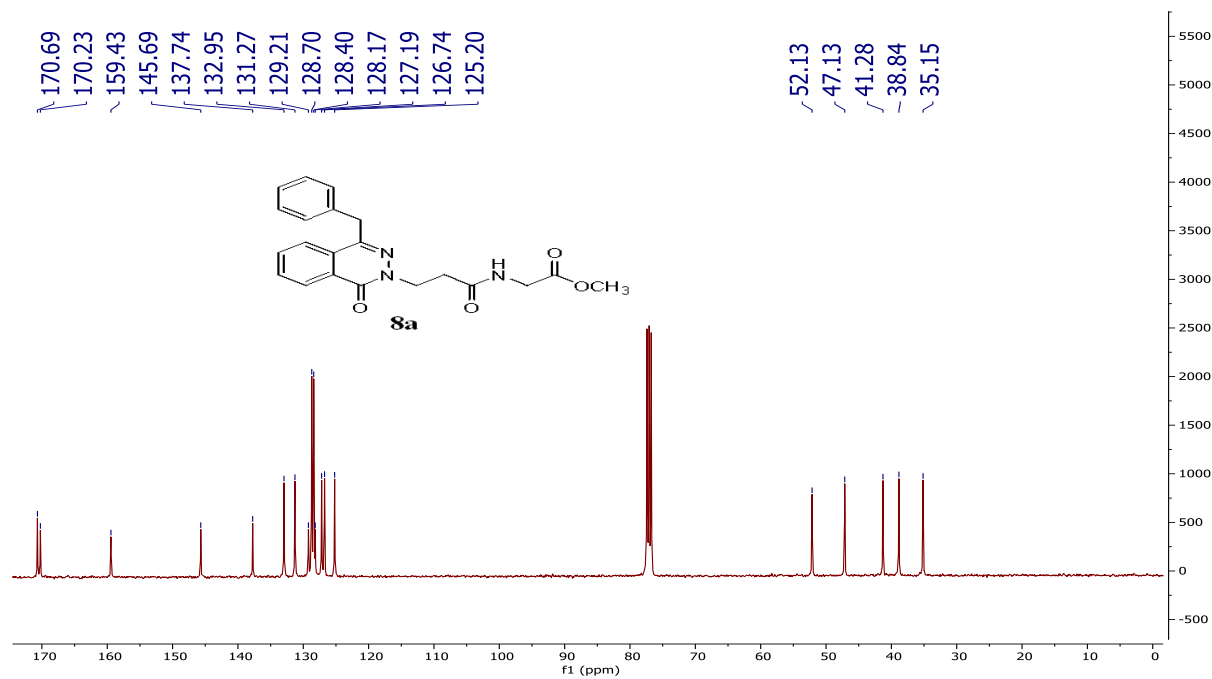


Figure S35 The ¹³C-NMR spectrum of compound **8a**

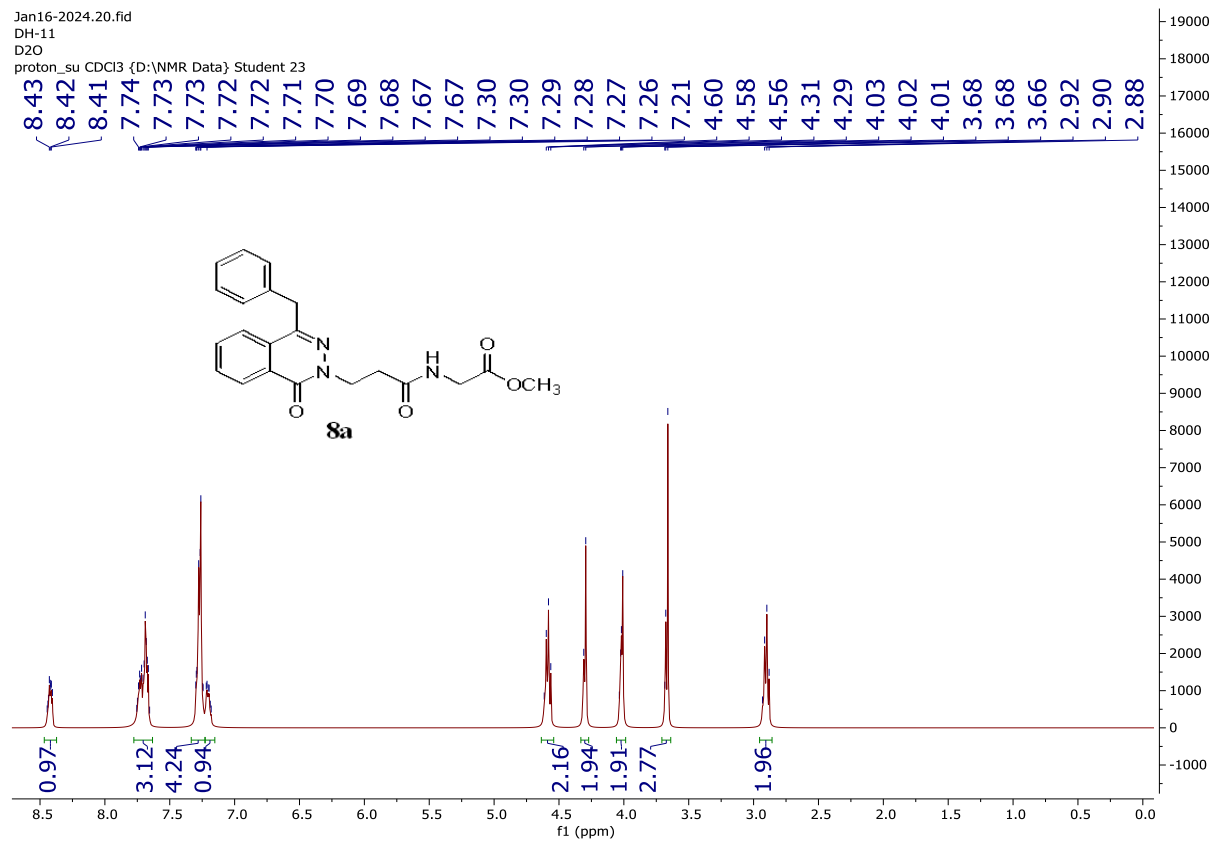


Figure S36 The D₂O spectrum of compound **8a**

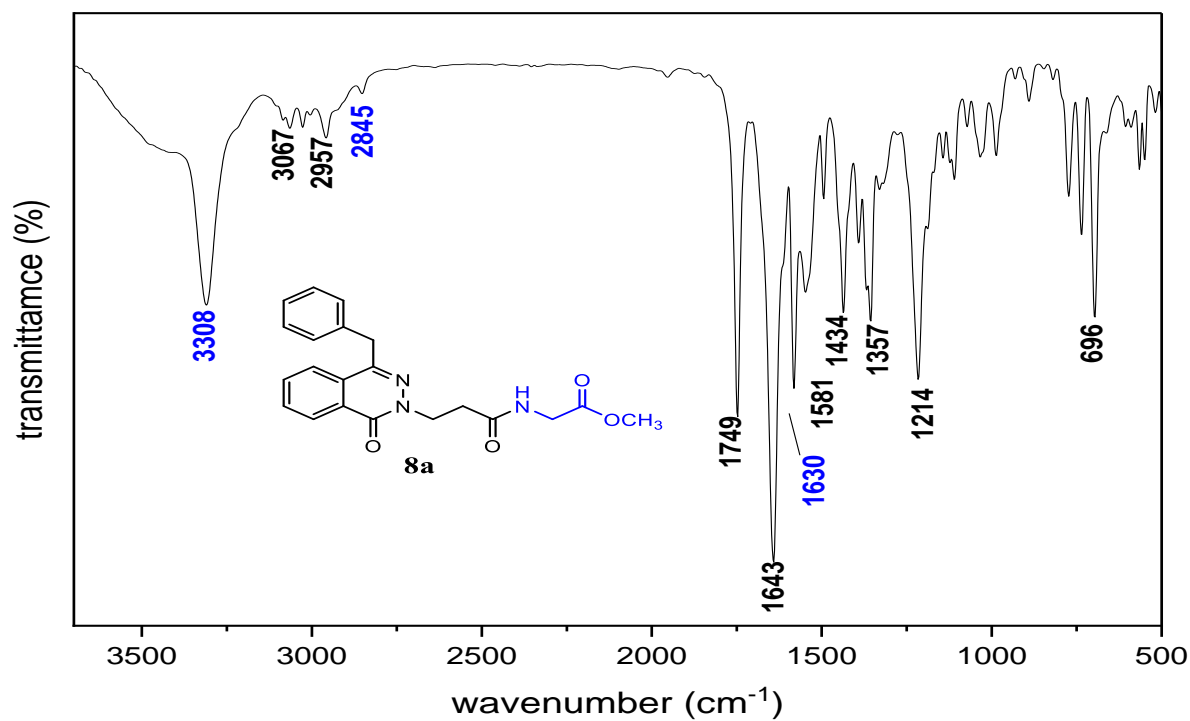


Figure S37 The IR spectrum of compound **8a**

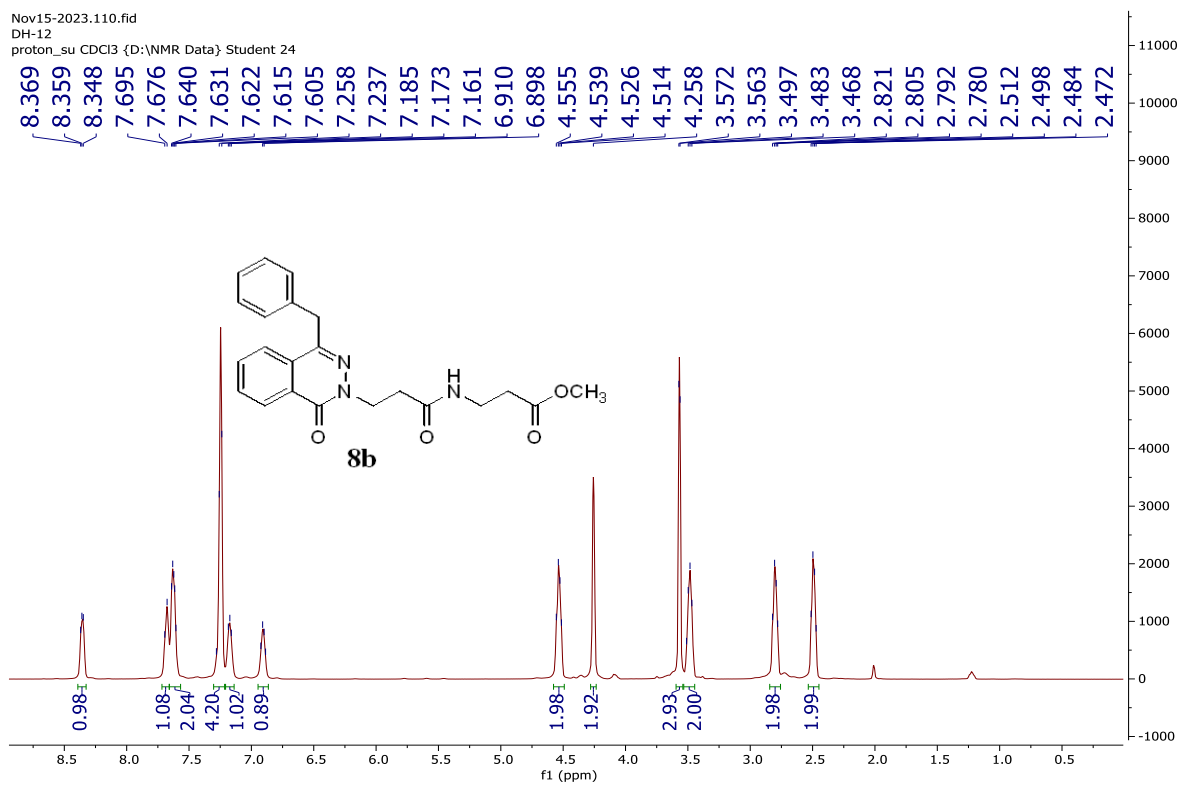


Figure S38 The ¹H-NMR spectrum of compound **8b**

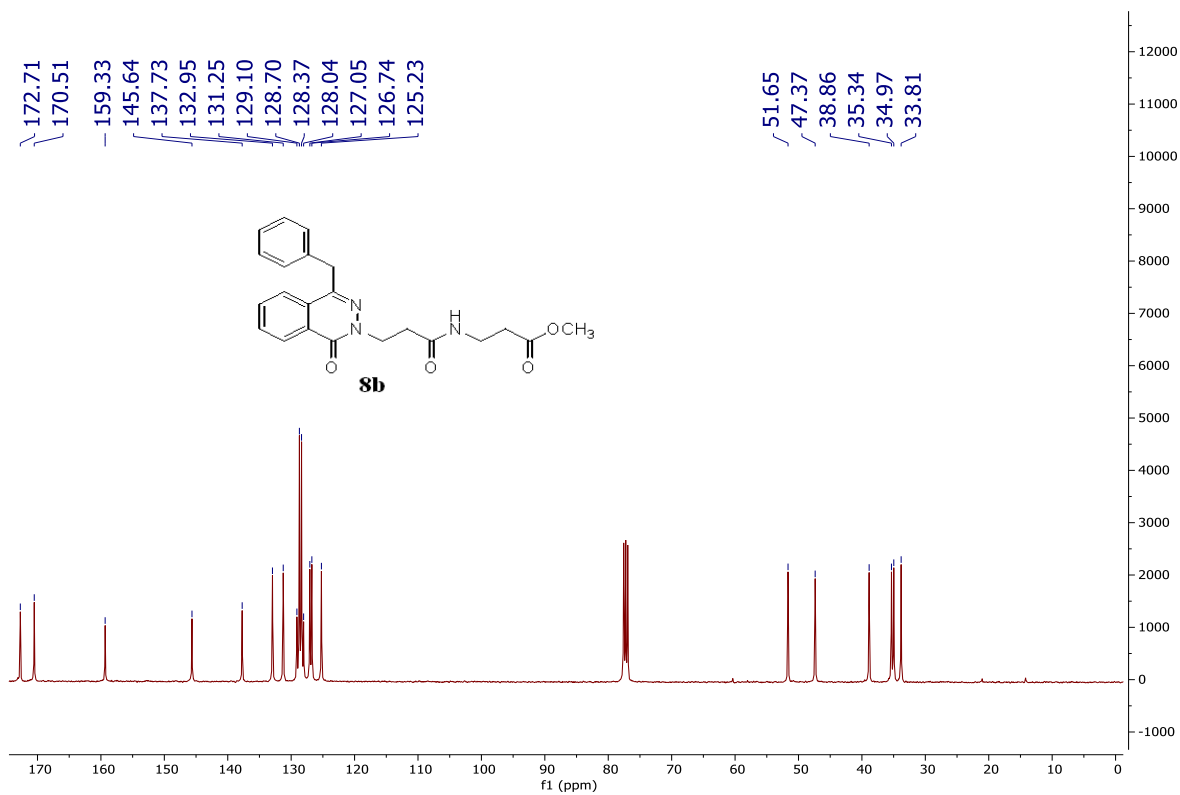


Figure S39 The ¹³C-NMR spectrum of compound **8b**

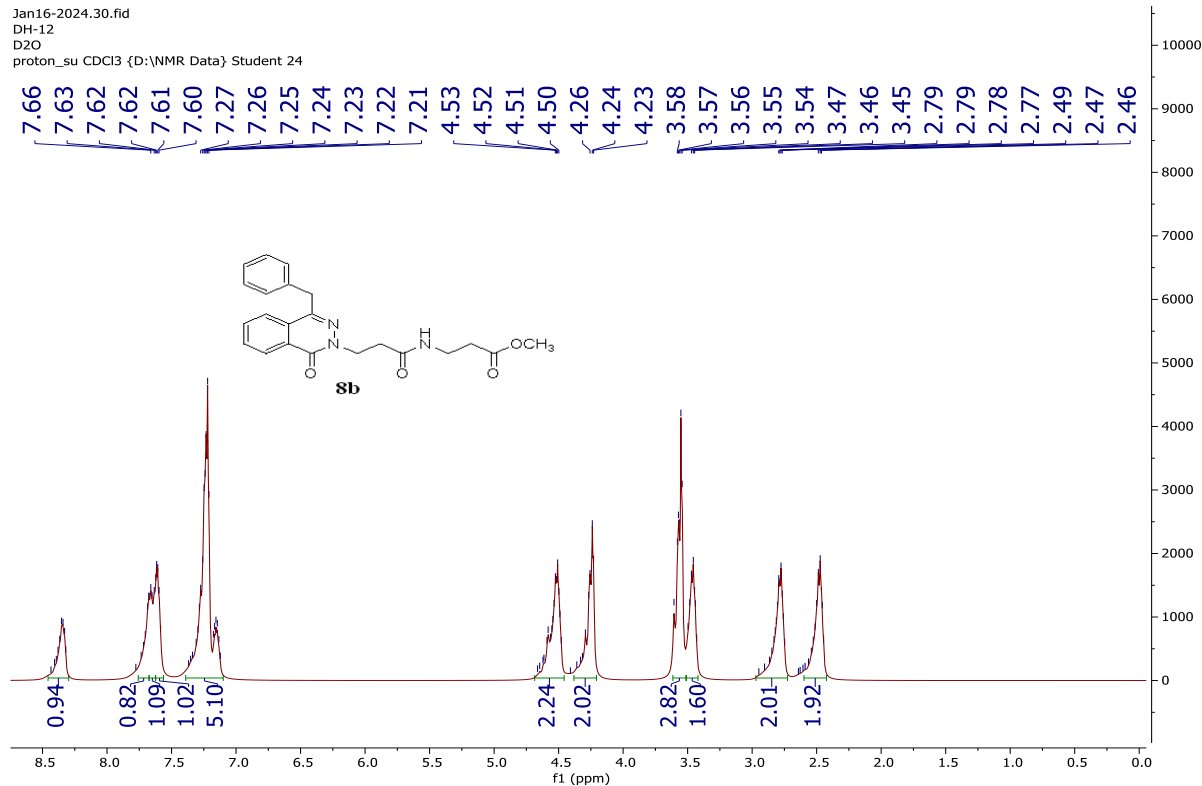


Figure S40 The D₂O spectrum of compound **8b**

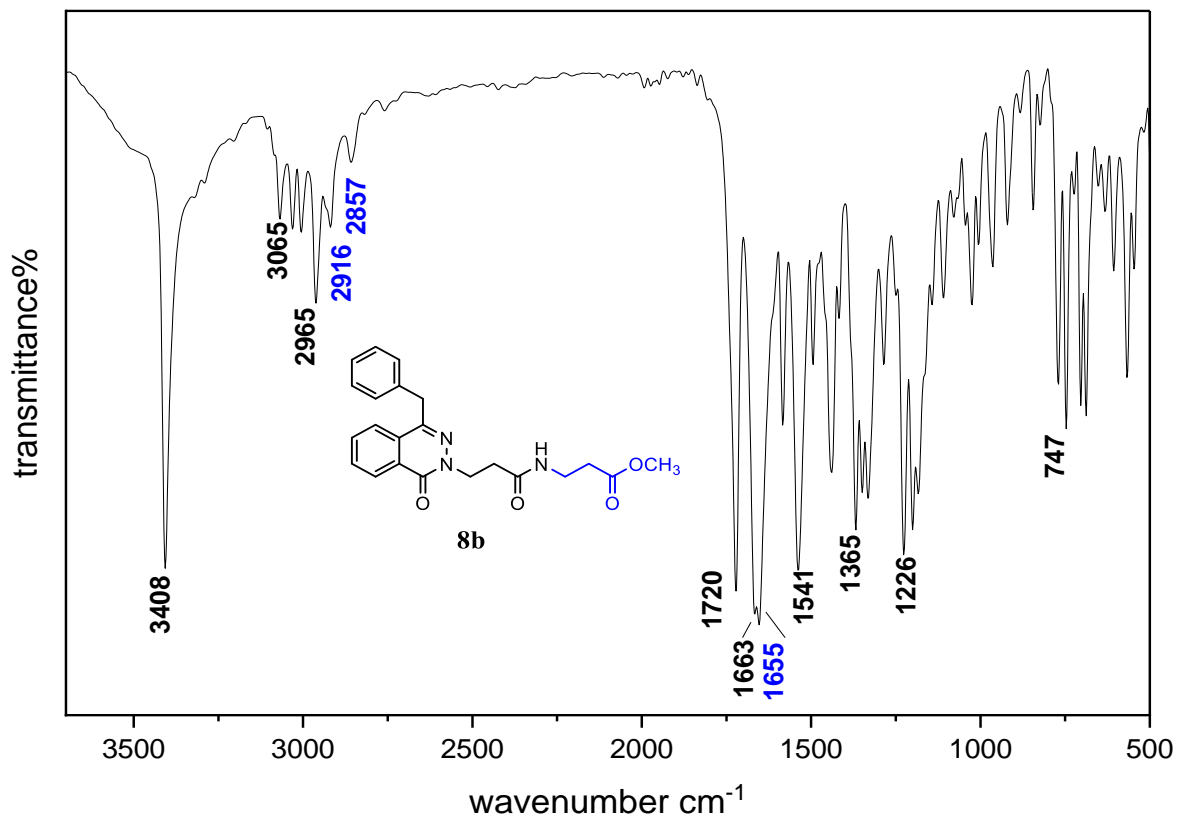


Figure S41 The IR spectrum of compound **8b**

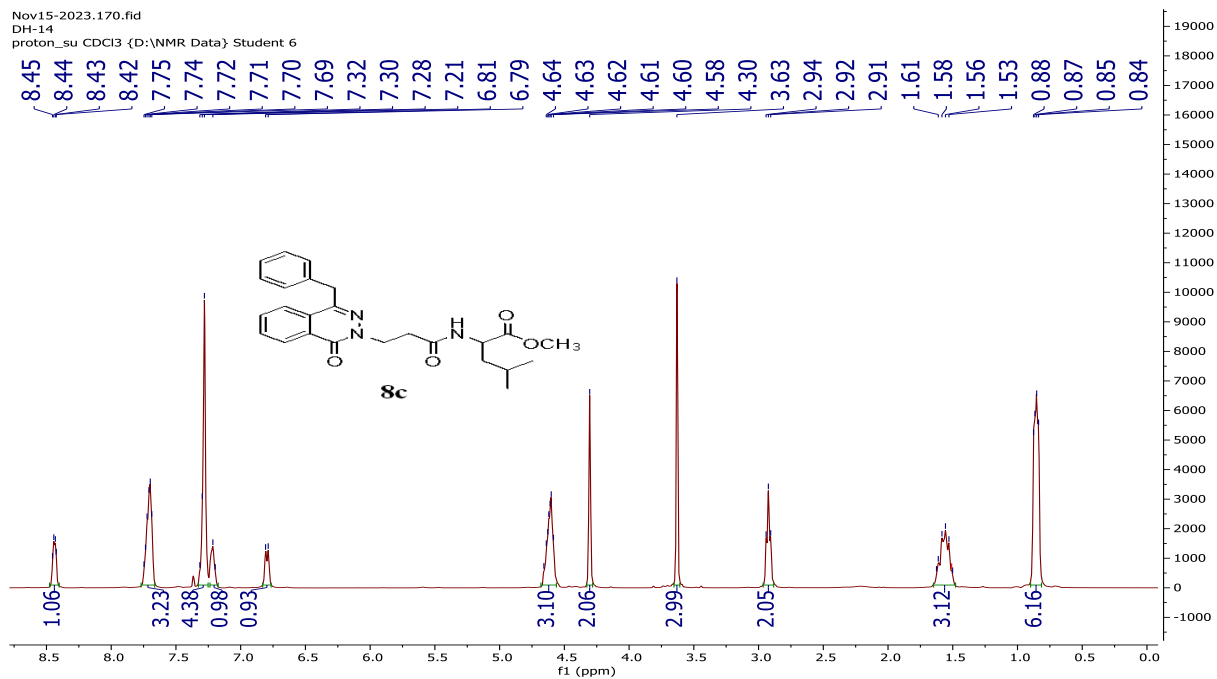


Figure S42 The $^1\text{H-NMR}$ spectrum of compound **8c**

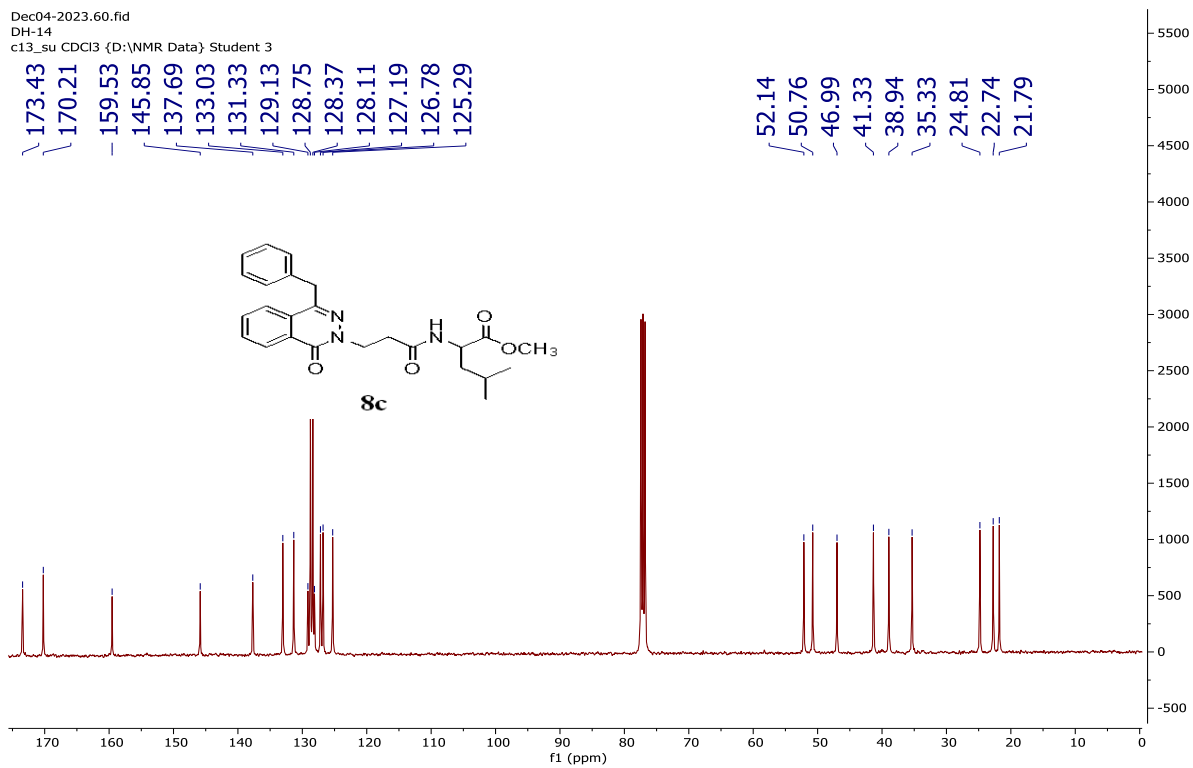


Figure S43 The ¹³C-NMR spectrum of compound **8c**

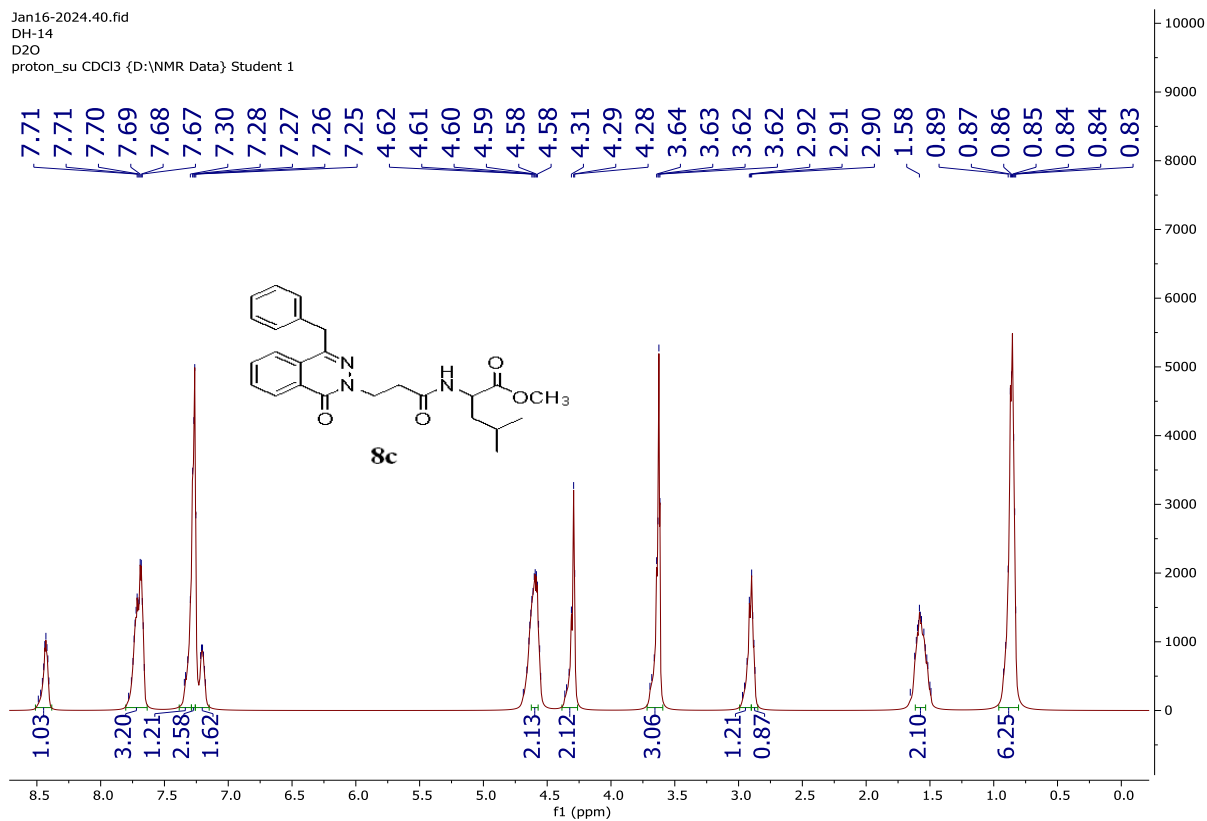


Figure S44 The D₂O spectrum of compound **8c**

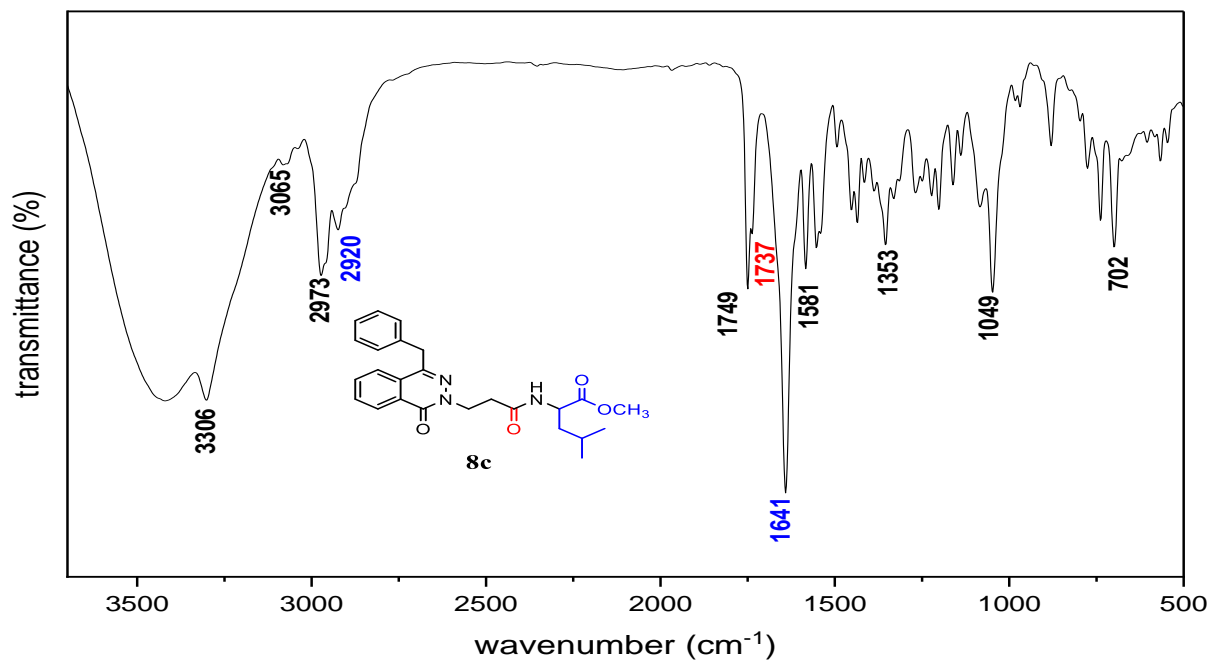


Figure S45 The IR spectrum of compound **8c**

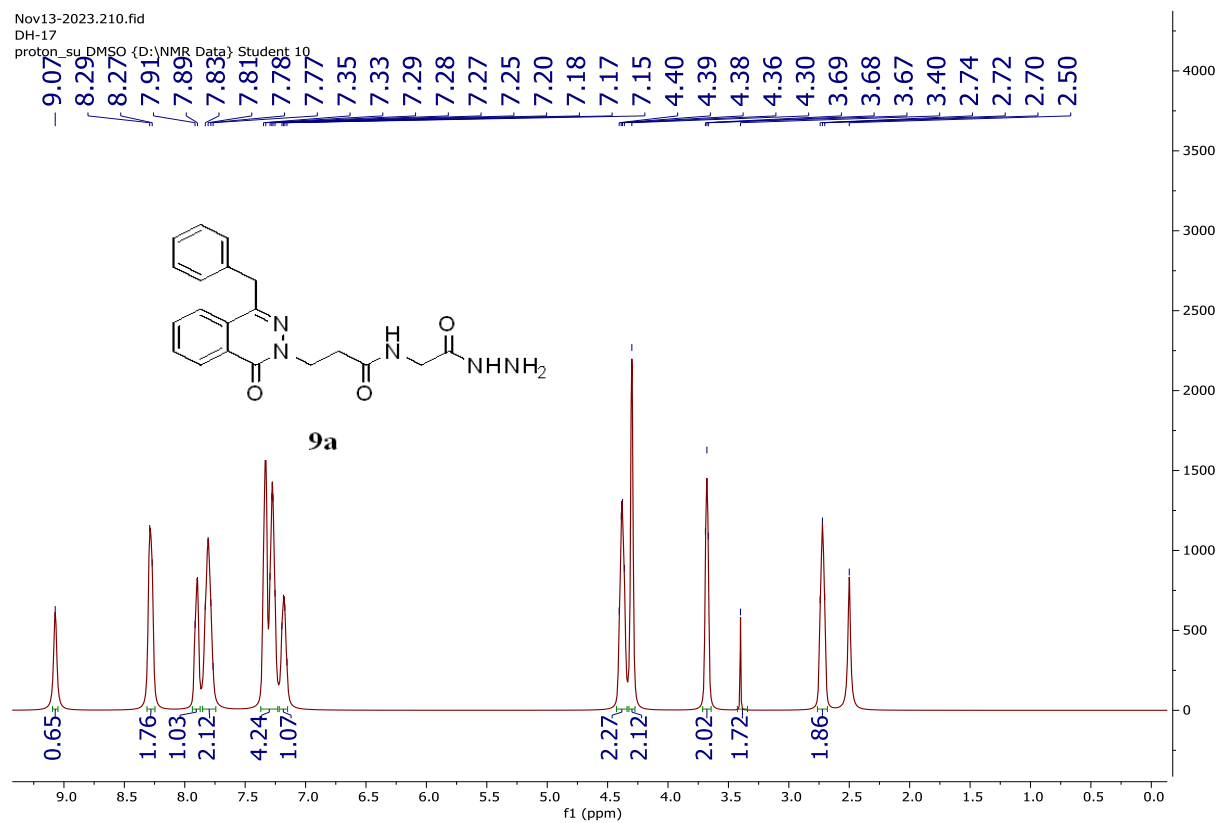


Figure S46 The ¹H-NMR spectrum of compound **9a**

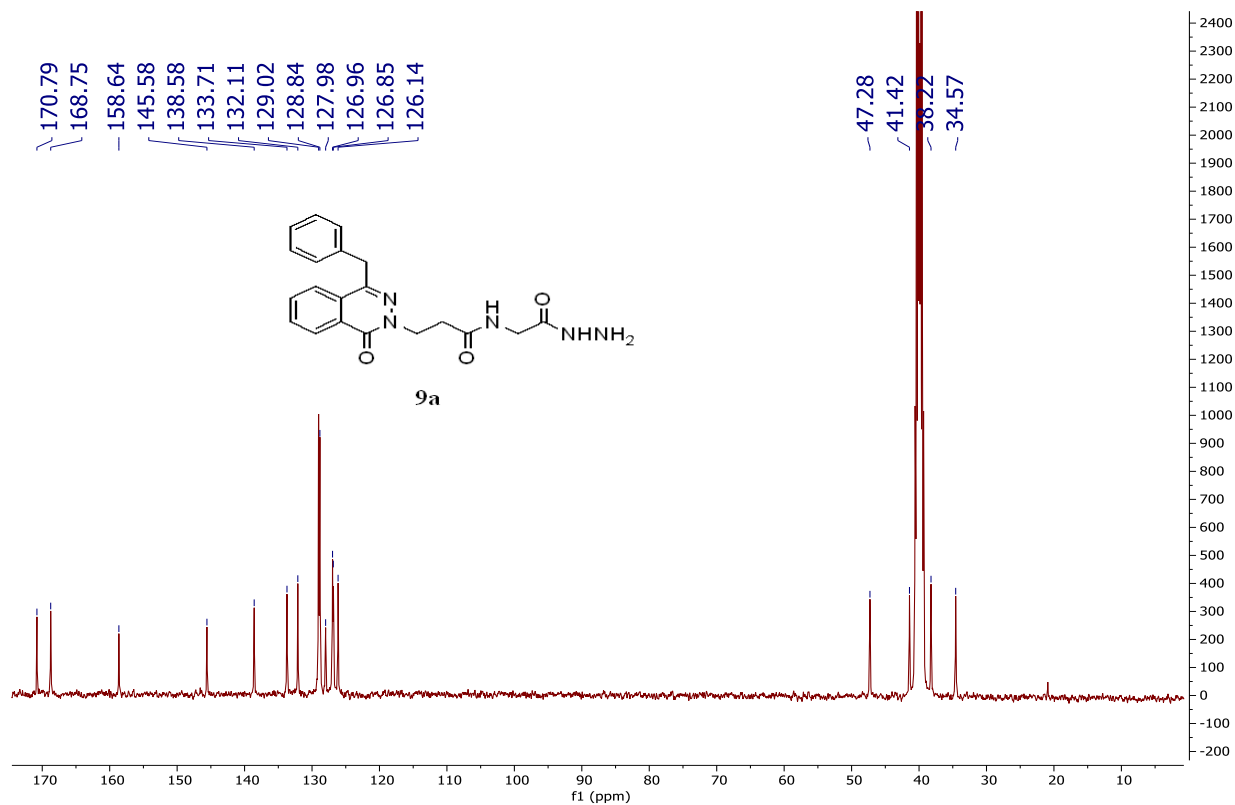


Figure S47 The $^{13}\text{C-NMR}$ spectrum of compound 9a

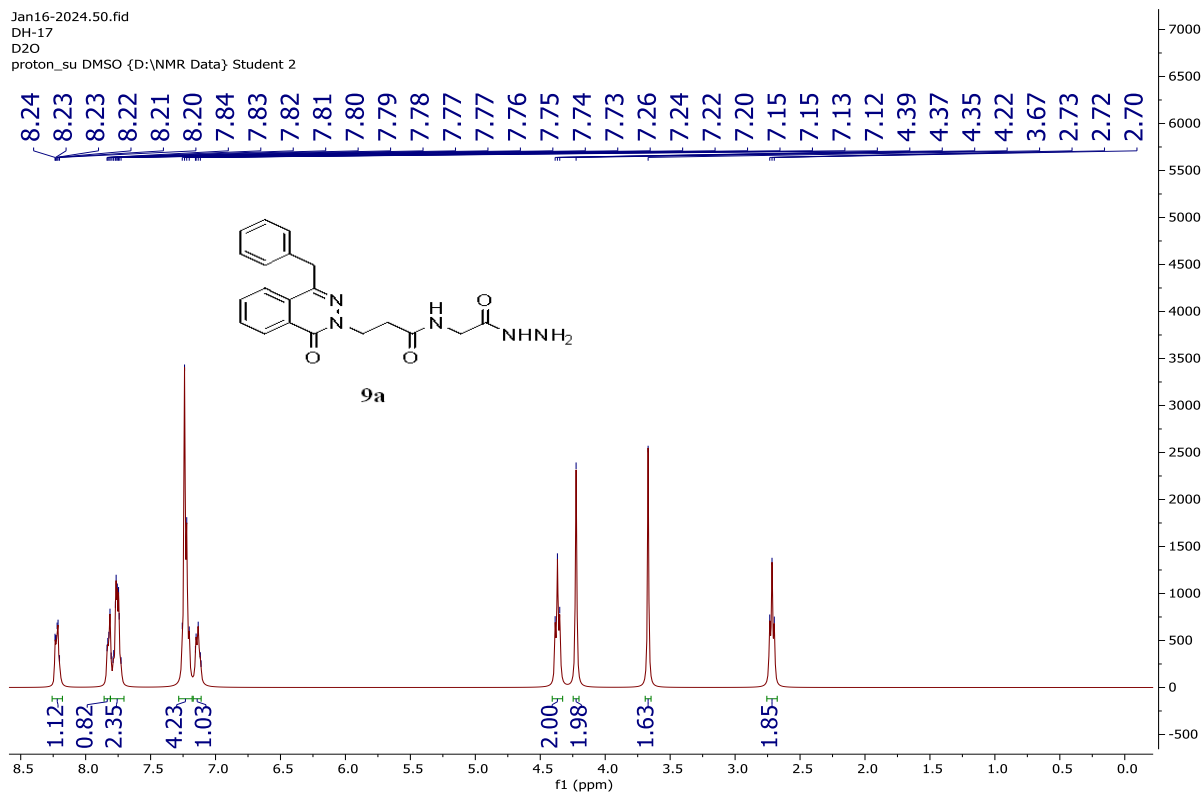


Figure S48 The D2O spectrum of compound 9a

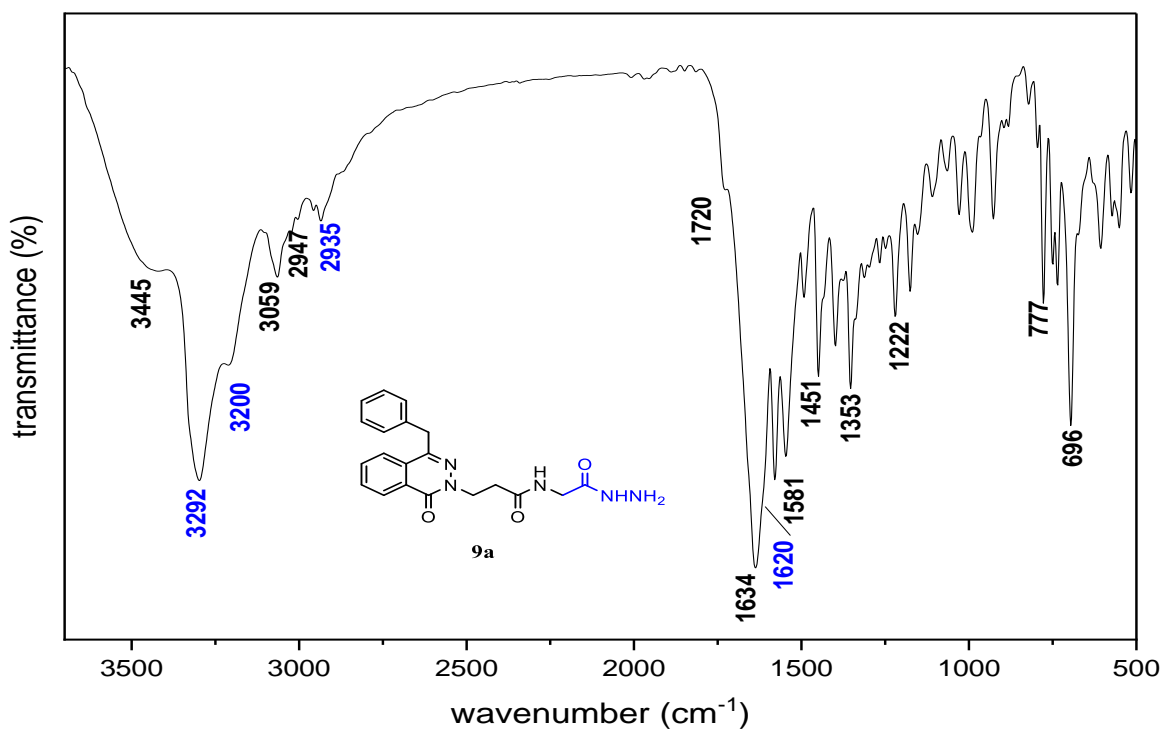


Figure S49 The IR spectrum of compound **9a**

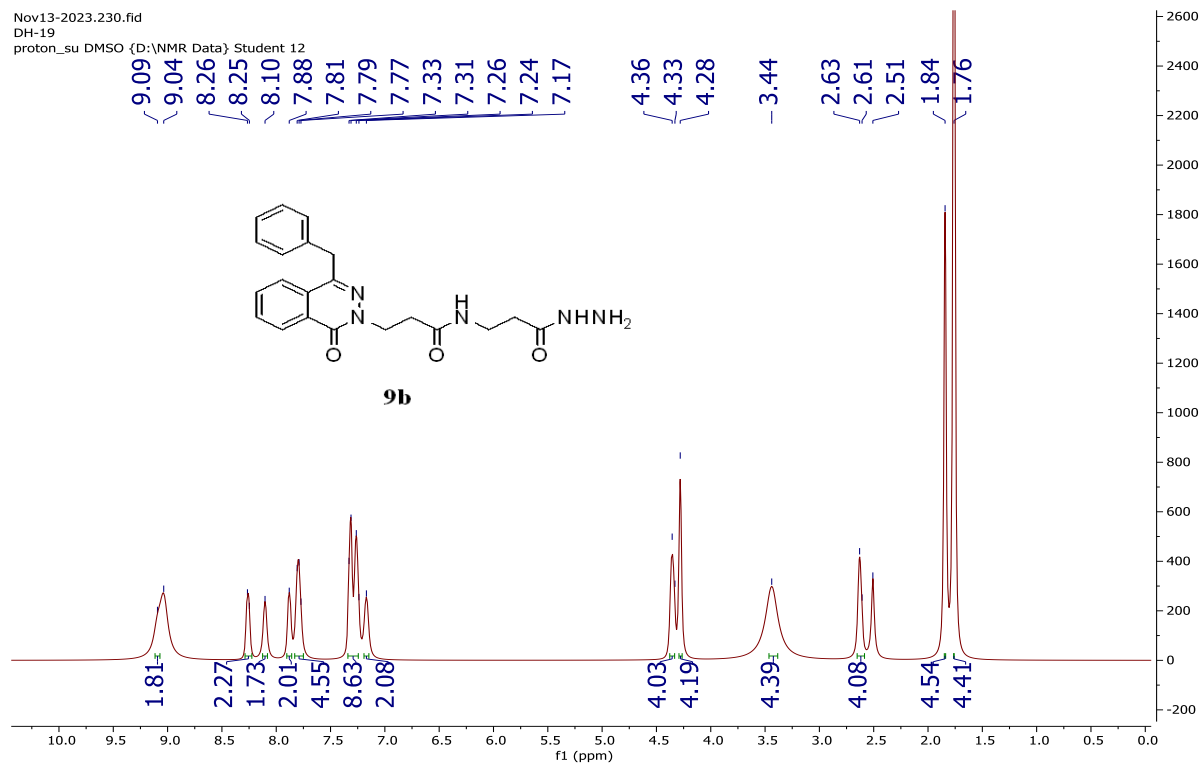


Figure S50 The ¹H-NMR spectrum of compound **9b**

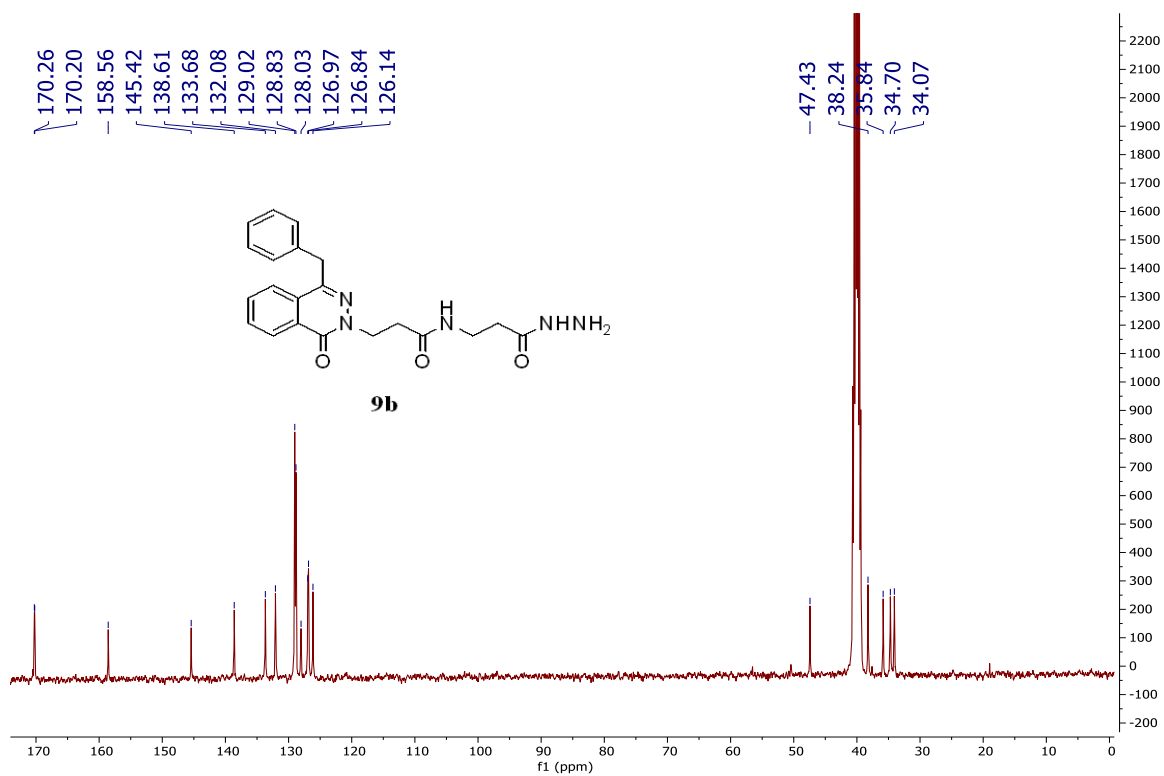


Figure S51 The ¹³C-NMR spectrum of compound **9b**

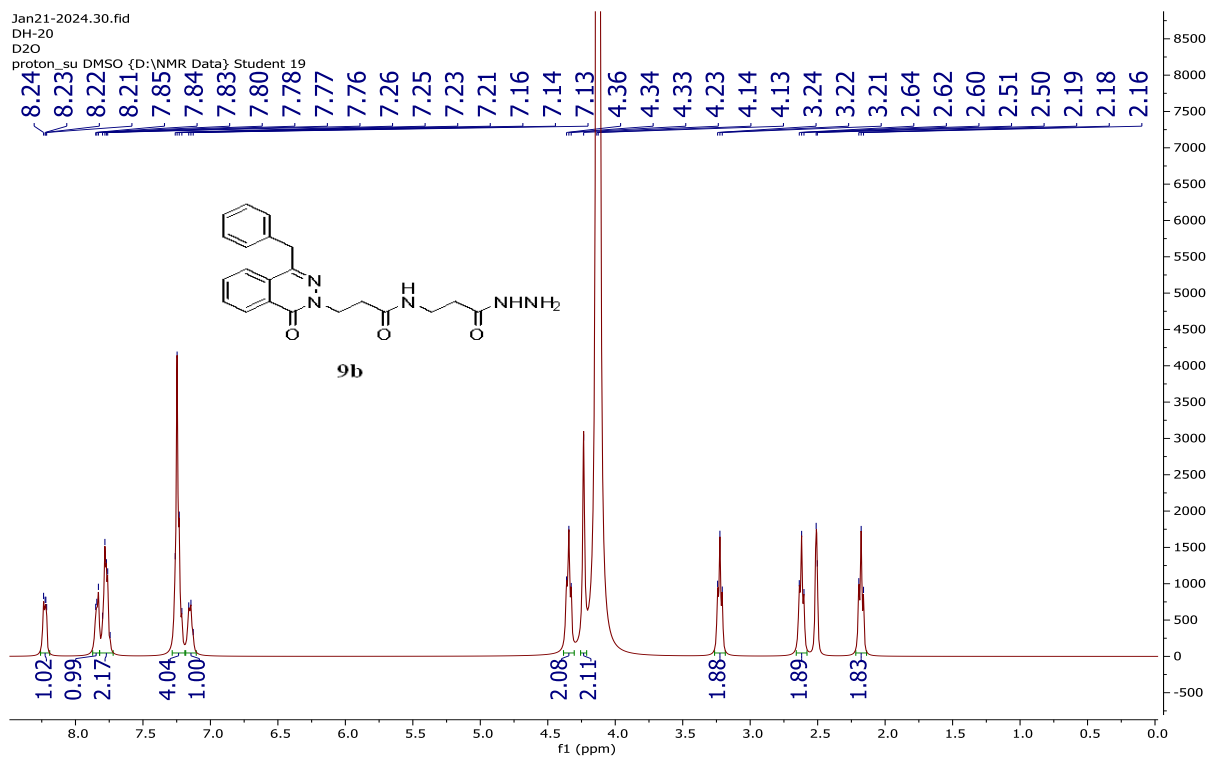


Figure S52 The D₂O spectrum of compound **9b**

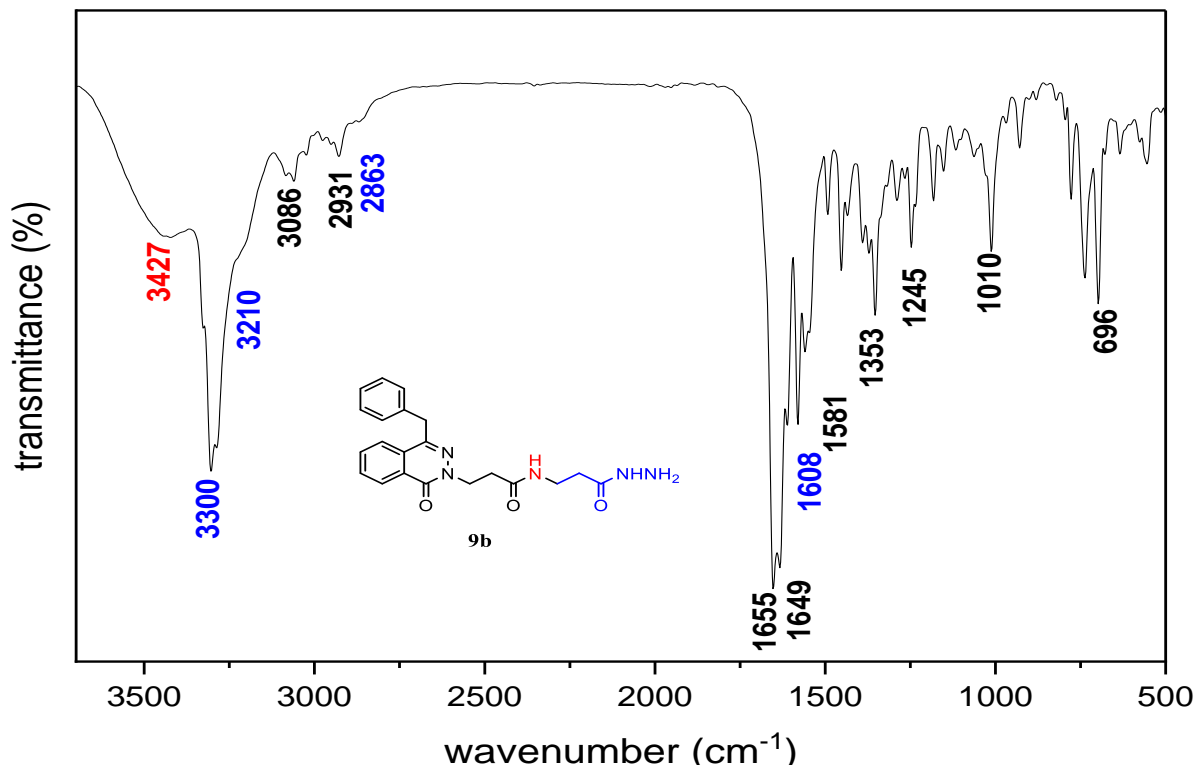


Figure S53 The IR spectrum of compound **9b**

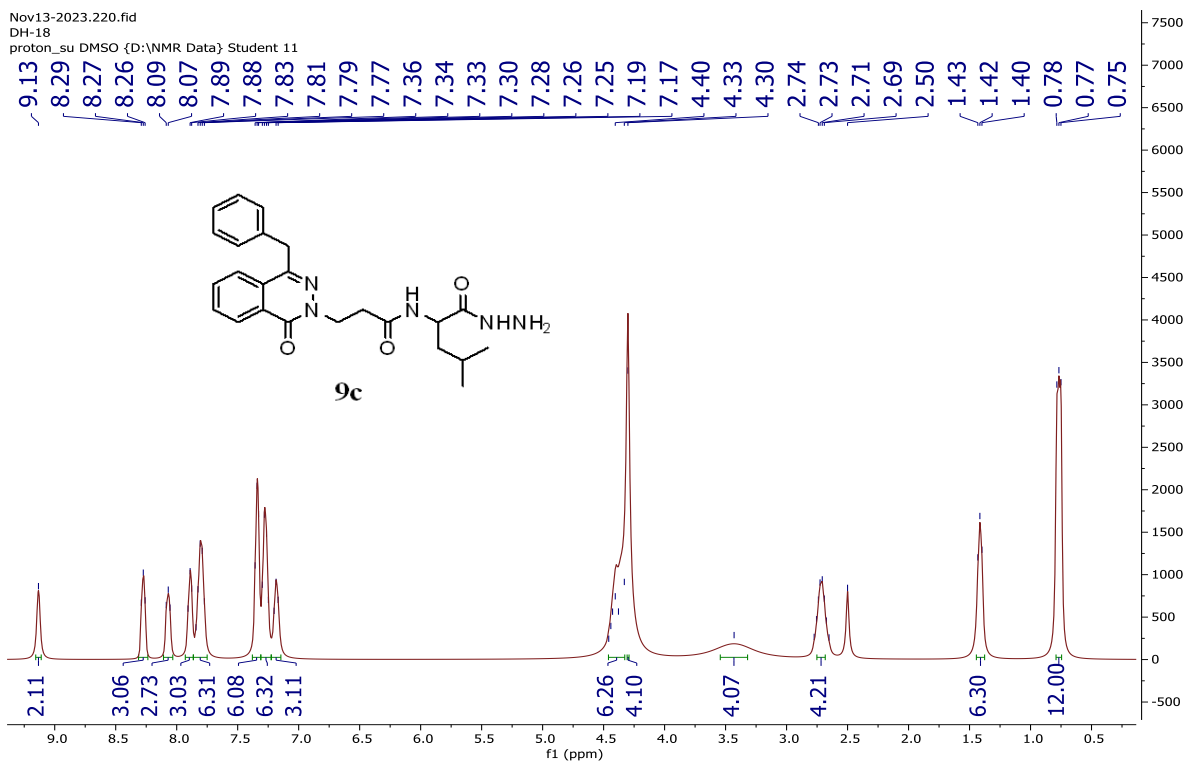


Figure S54 The $^1\text{H-NMR}$ spectrum of compound **9c**

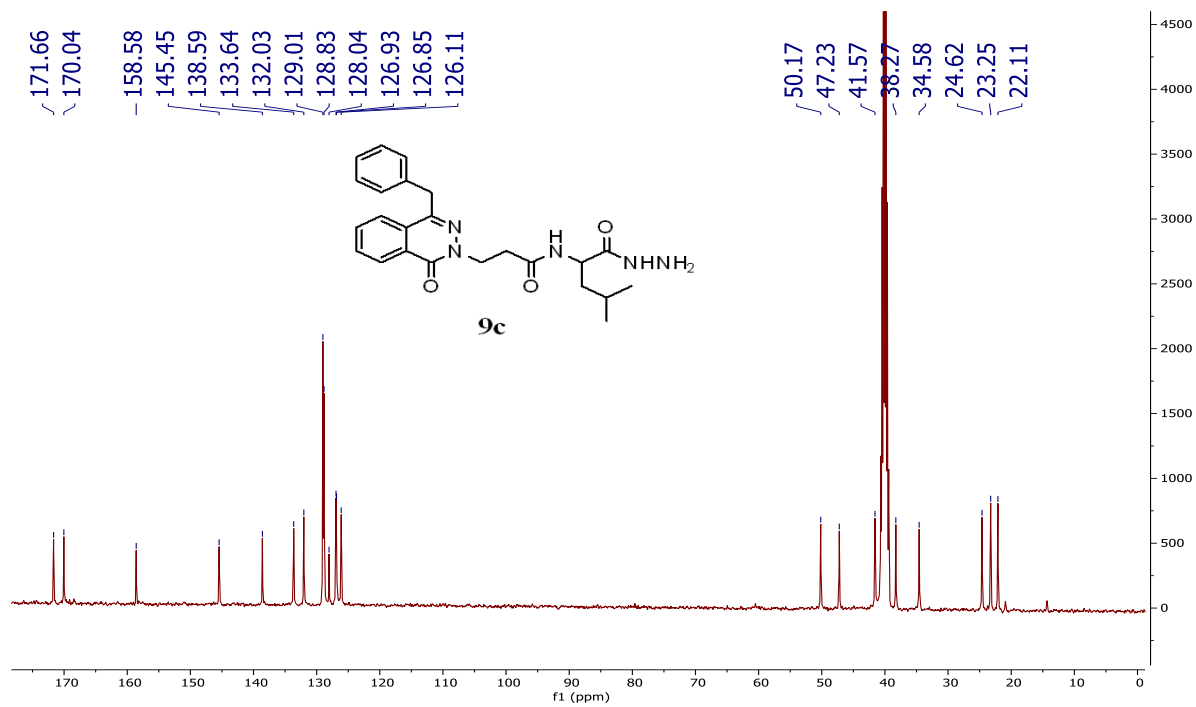


Figure S55 The ¹³C-NMR spectrum of compound **9c**

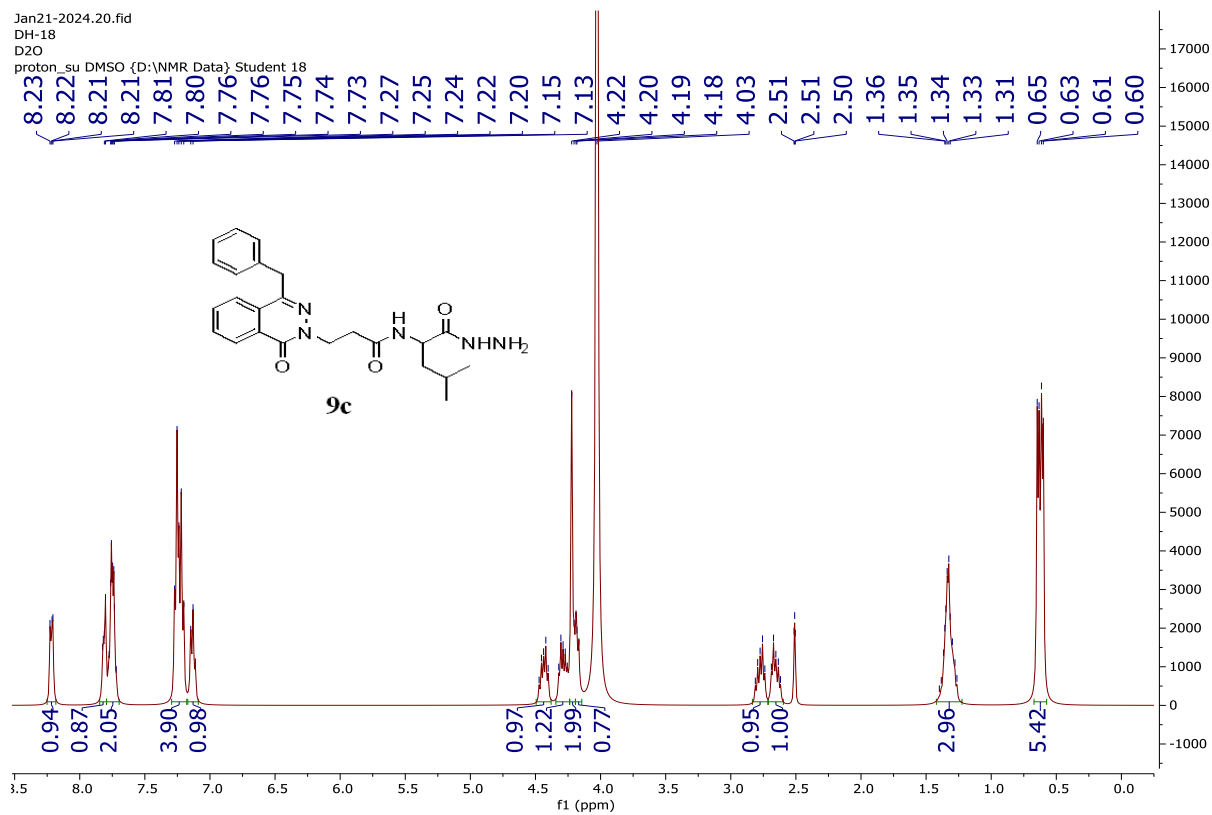


Figure S56 The D₂O spectrum of compound **9c**

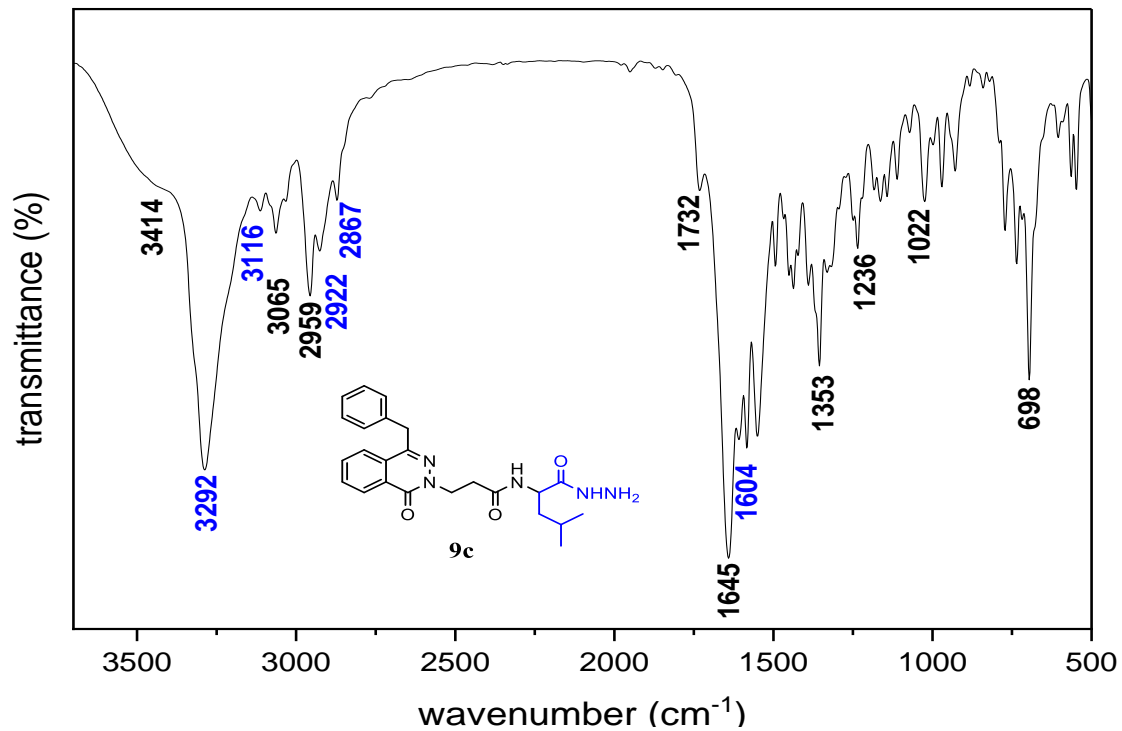


Figure S57: The IR spectrum of compound 9c

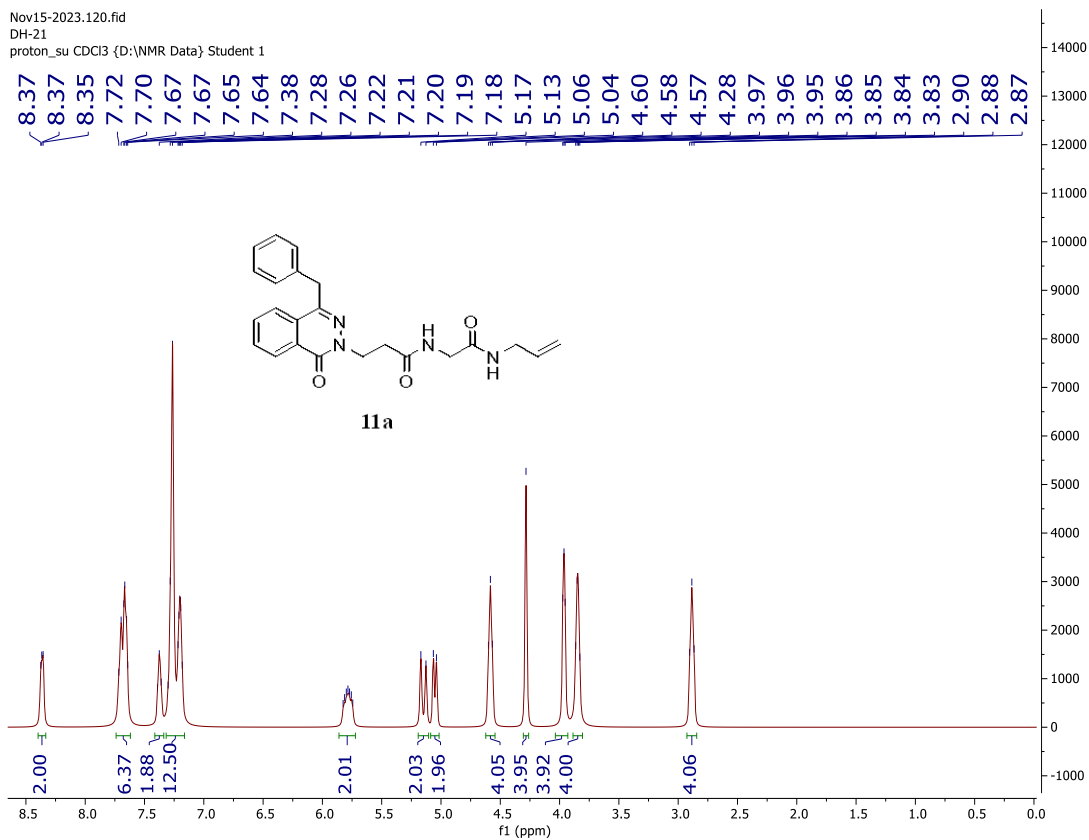


Figure S58: The ¹H-NMR spectrum of compound 11a

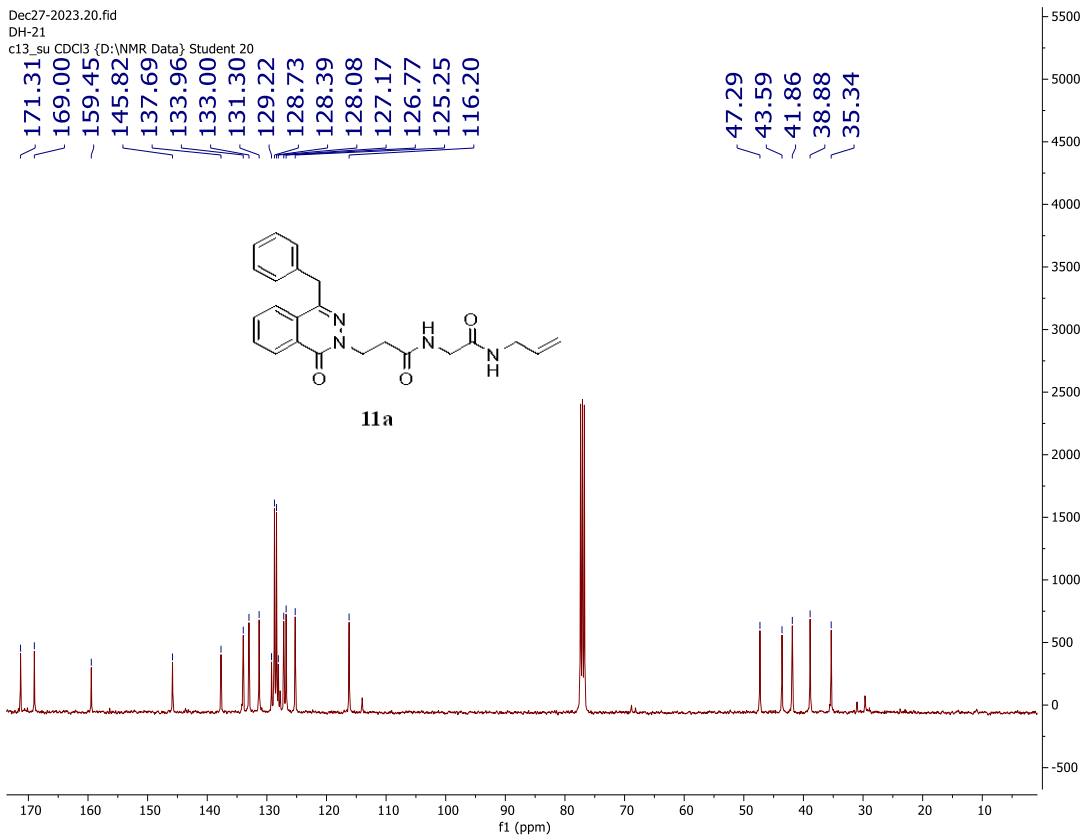


Figure S59: The ^{13}C -NMR spectrum of compound 11a

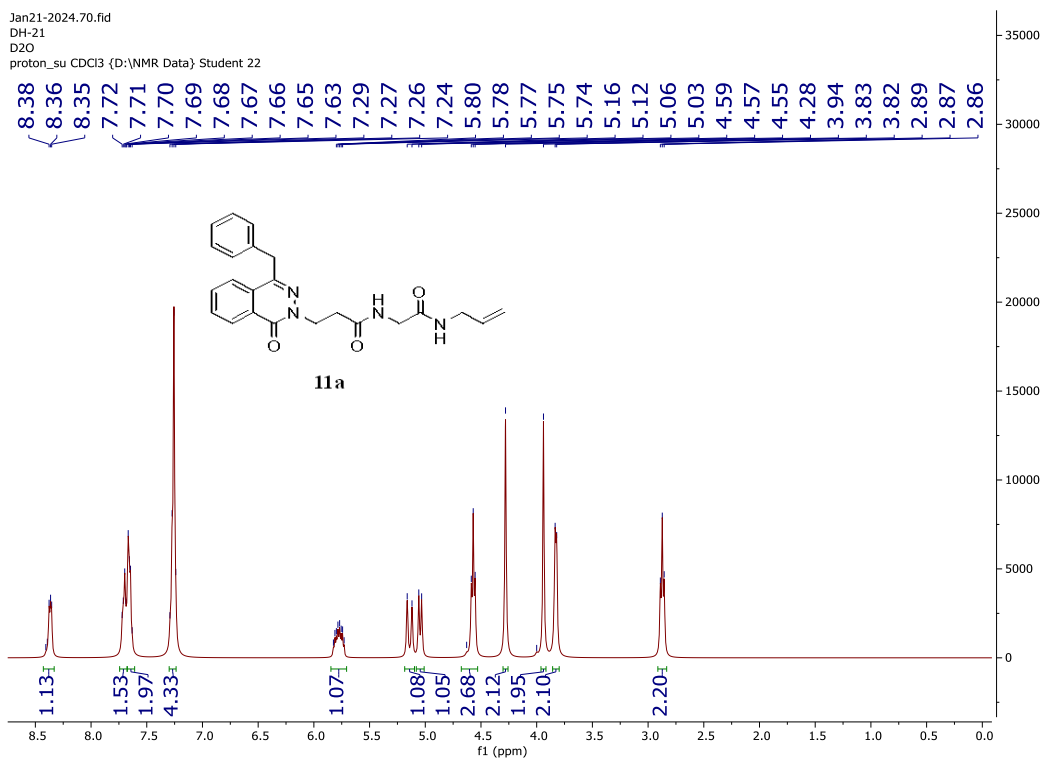


Figure S60: The D2O spectrum of compound 11a

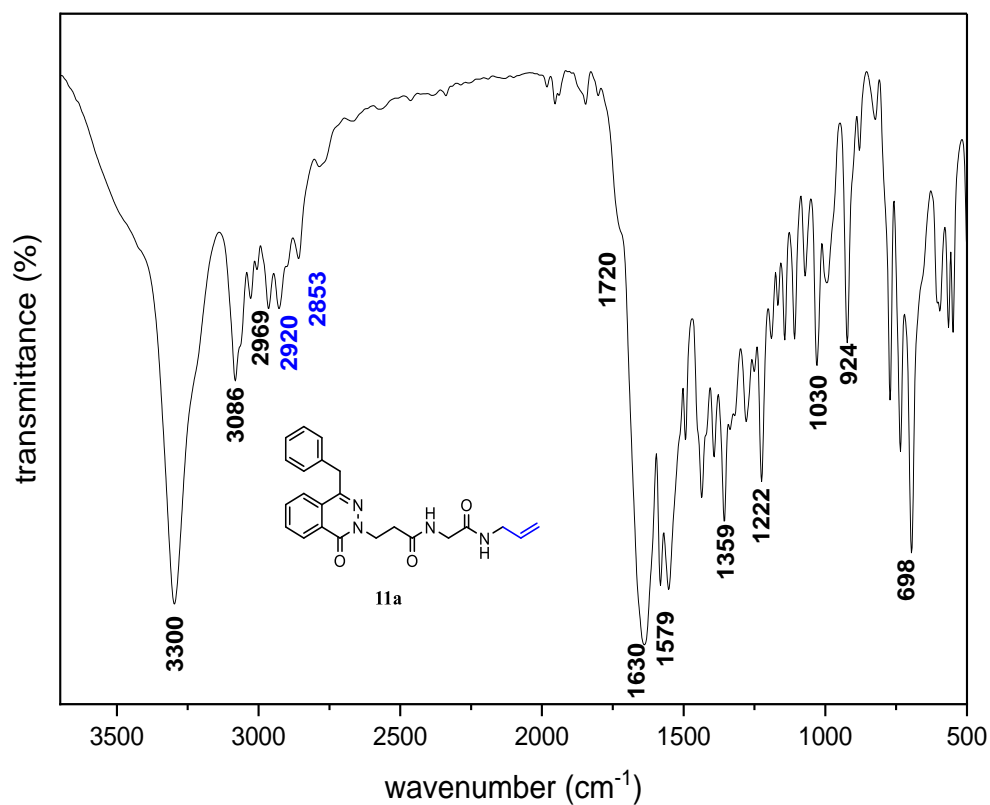


Figure S61: The IR spectrum of compound **11a**

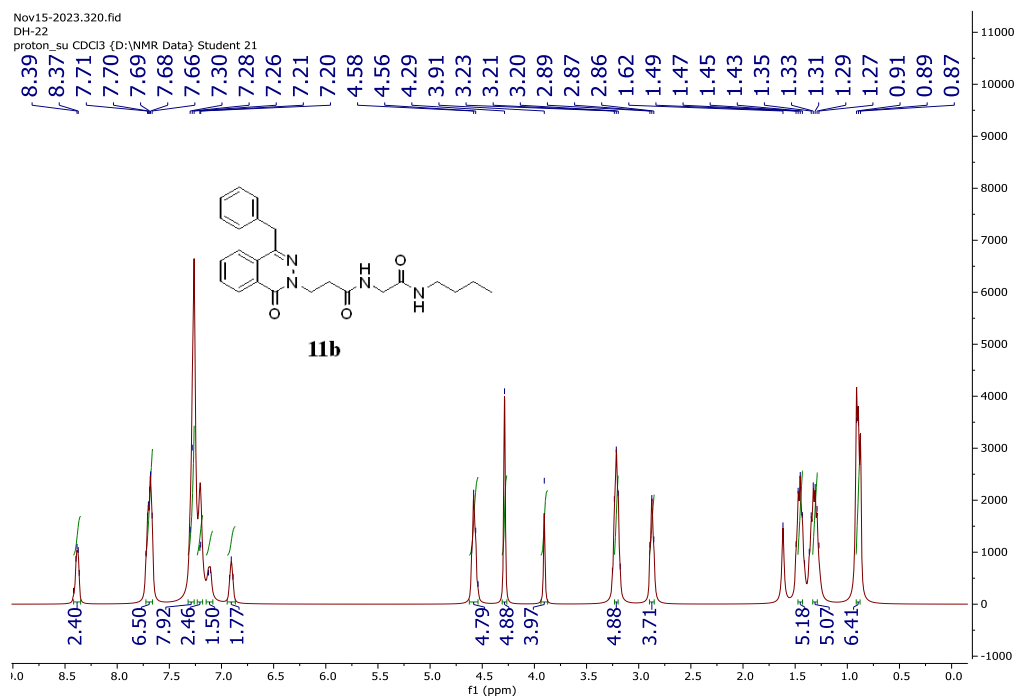


Figure 62: The ¹H-NMR spectrum of compound **11b**

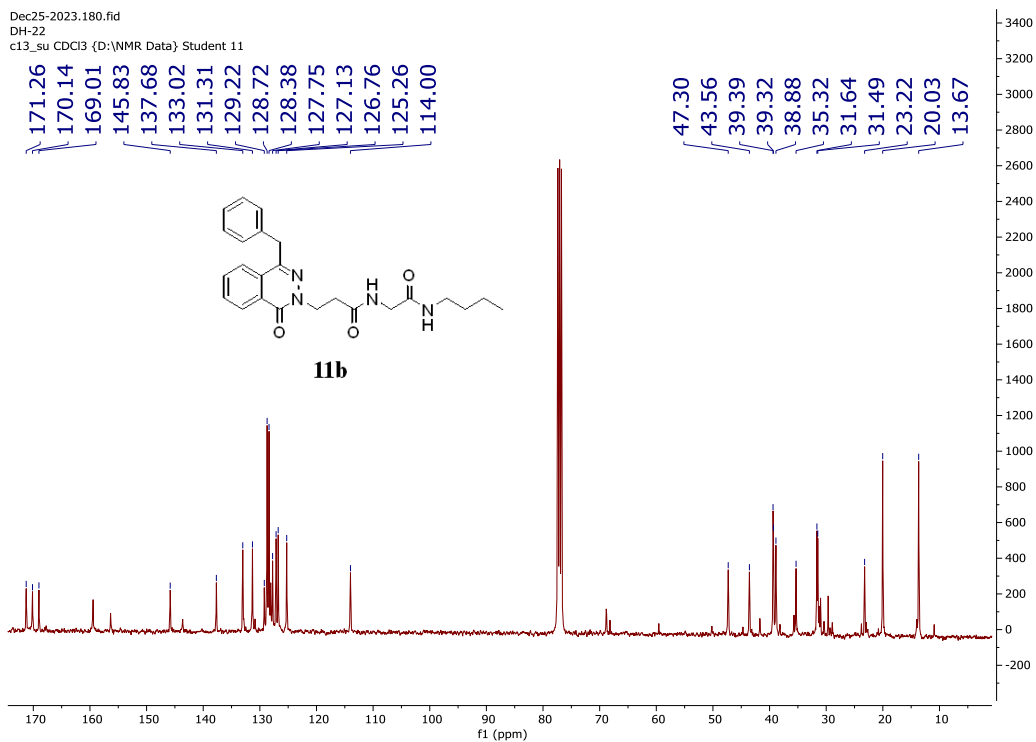


Figure 63: The ^{13}C -NMR spectrum of compound **11b**

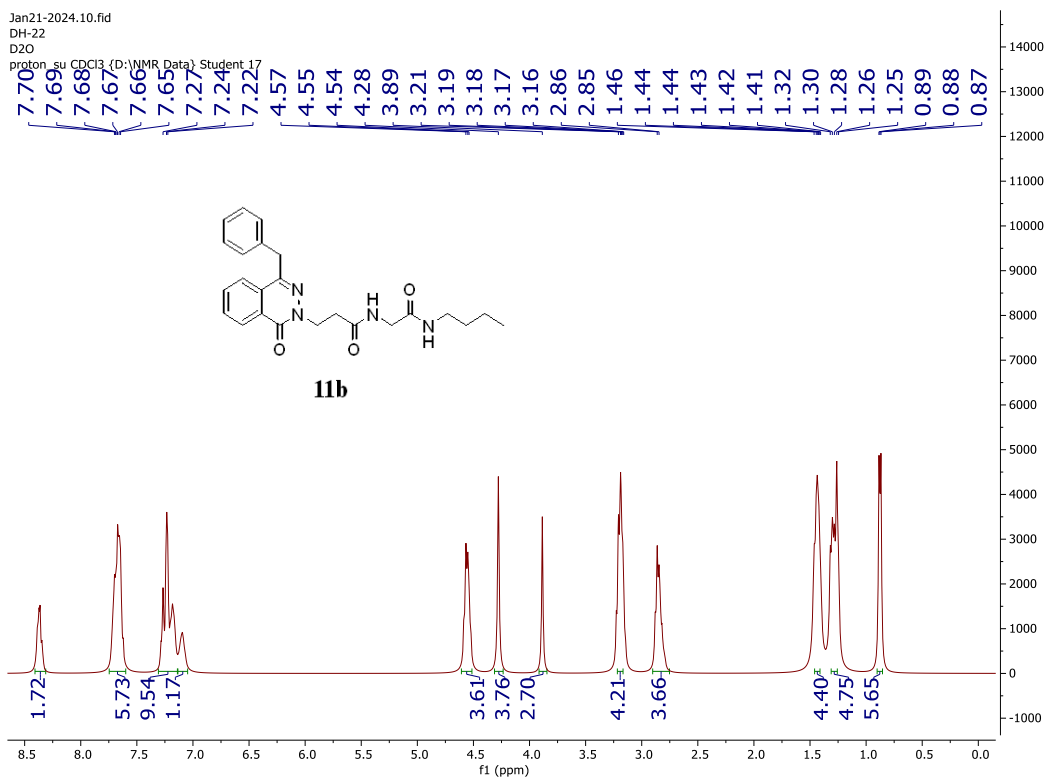


Figure S64: The D₂O spectrum of compound **11b**

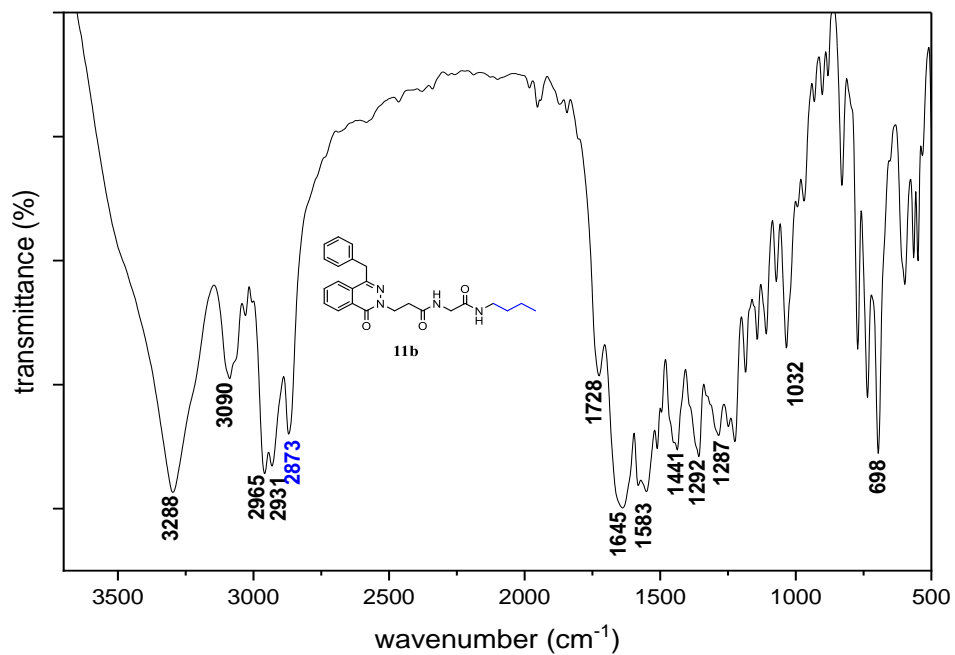


Figure S65: The IR spectrum of compound **11b**

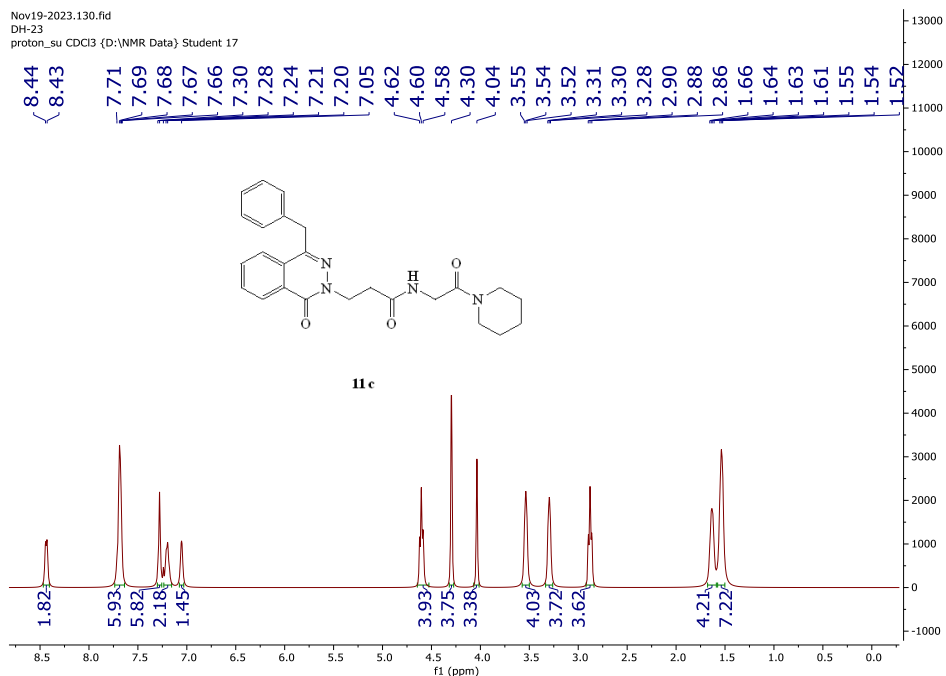


Figure S66: The ^1H -NMR spectrum of compound **11c**

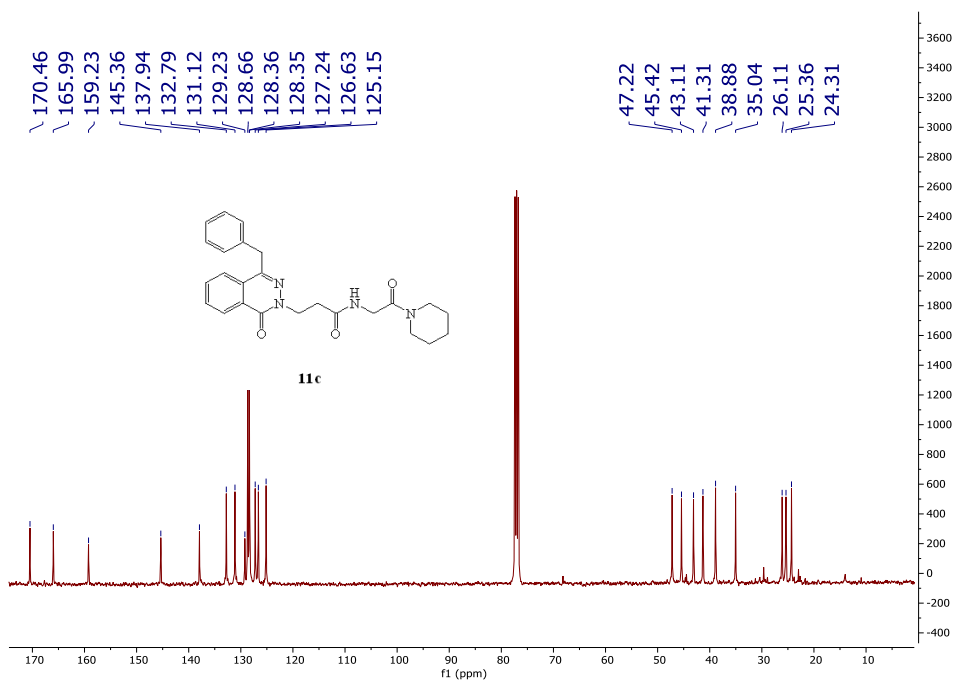


Figure S67: The ^{13}C -NMR spectrum of compound **11c**

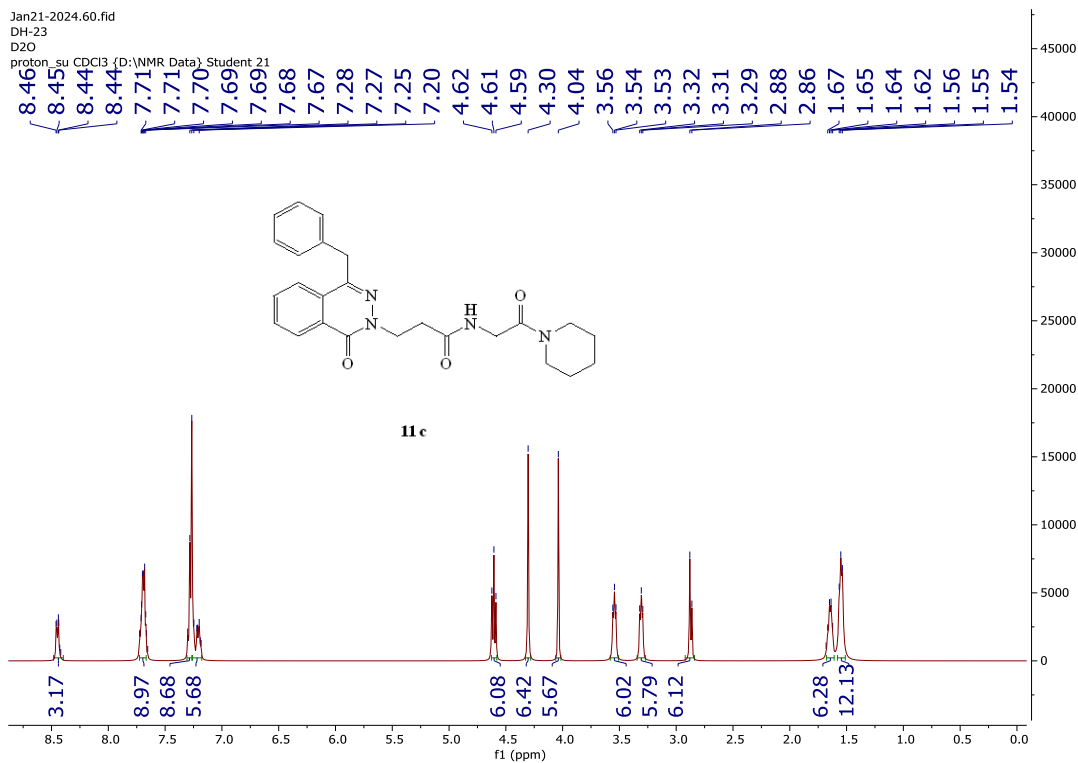


Figure S68: The D2O spectrum of compound **11c**

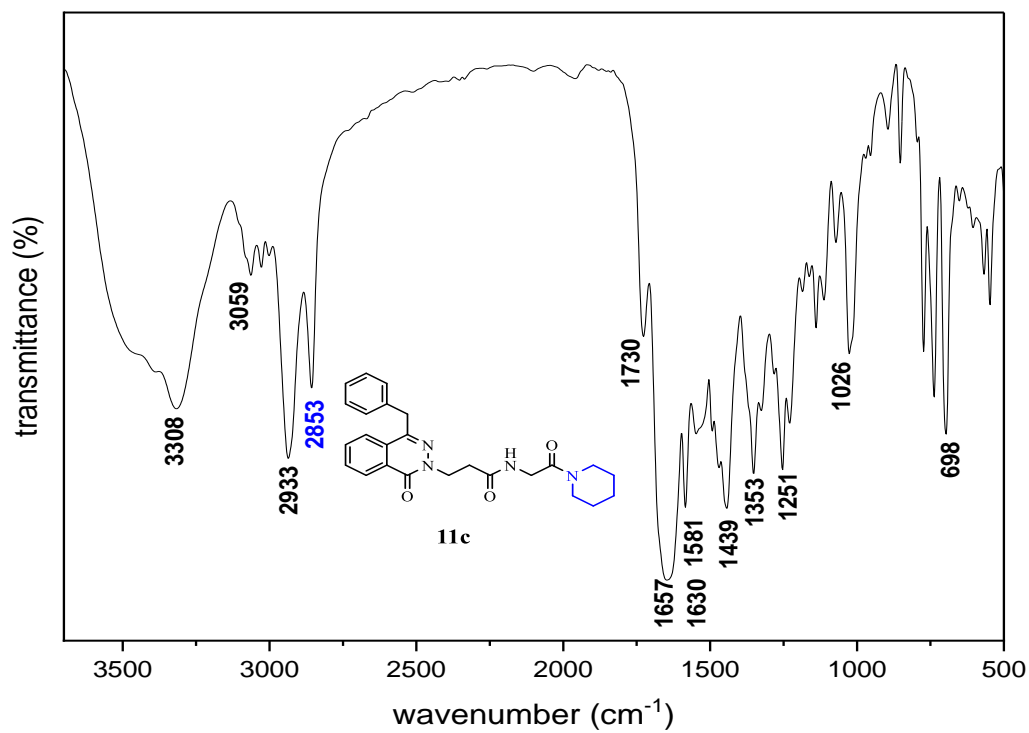


Figure S69: The IR spectrum of compound **11c**

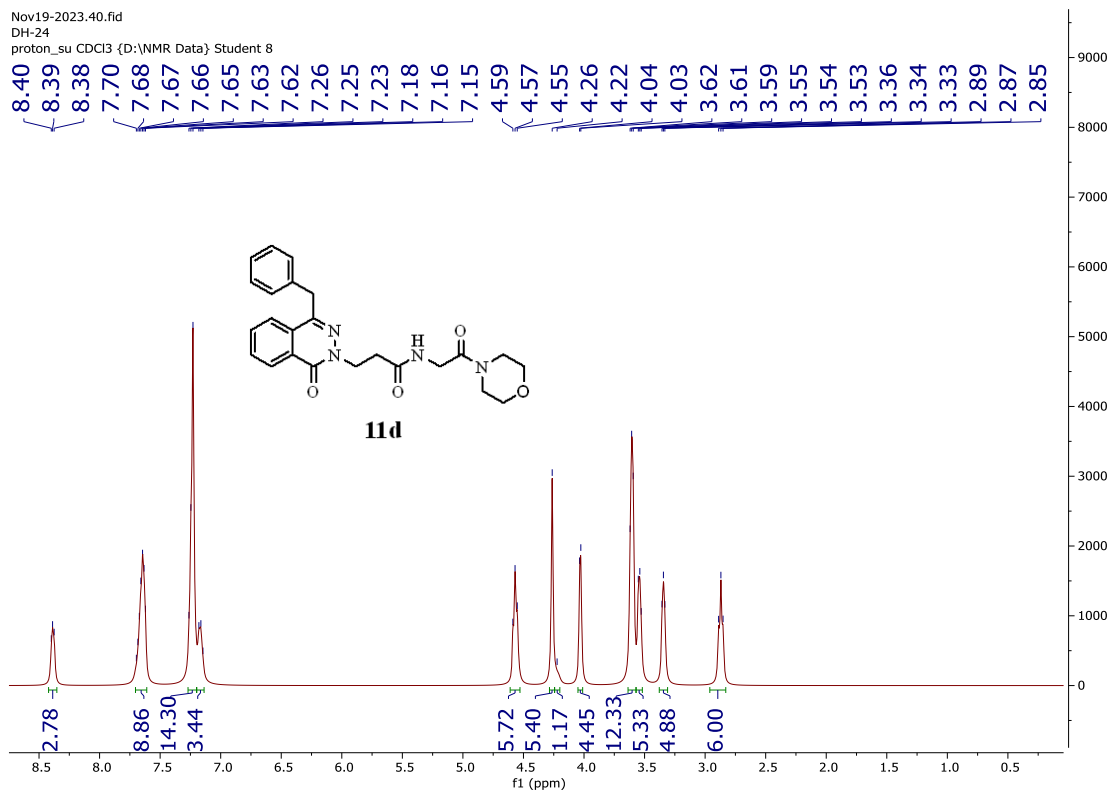


Figure S70 : The ^1H -NMR spectrum of compound **11d**

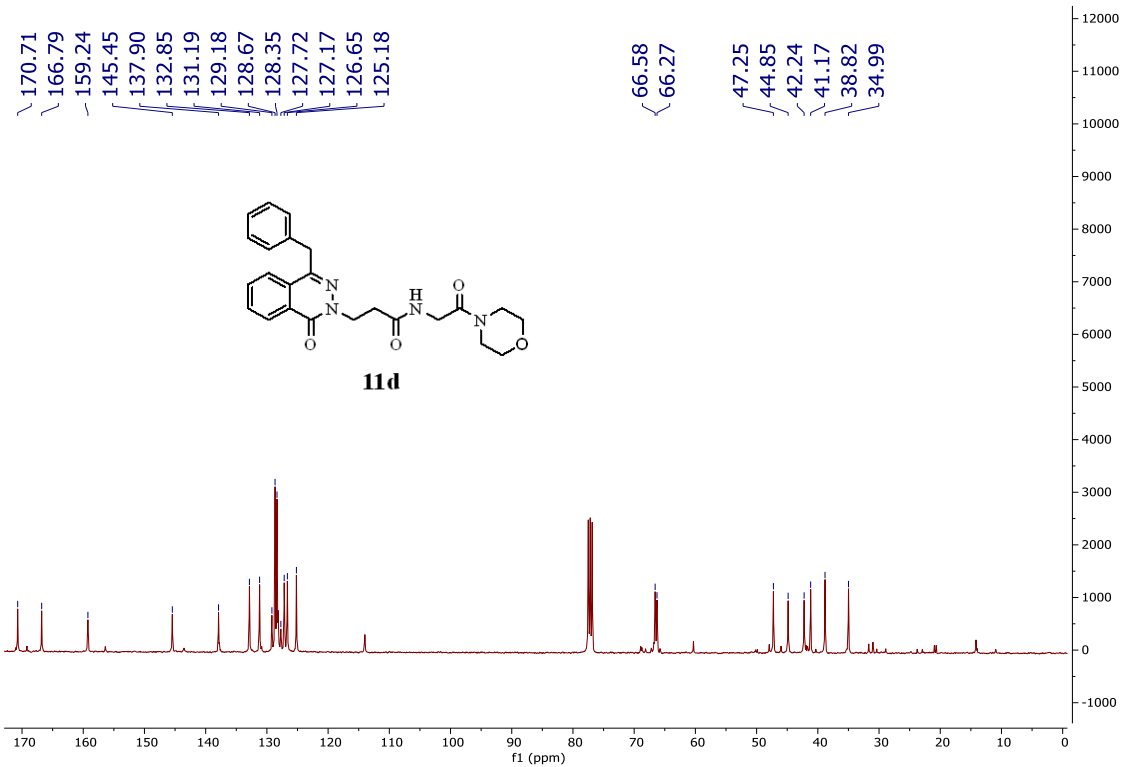


Figure S71: The ^{13}C -NMR spectrum of compound **11d**

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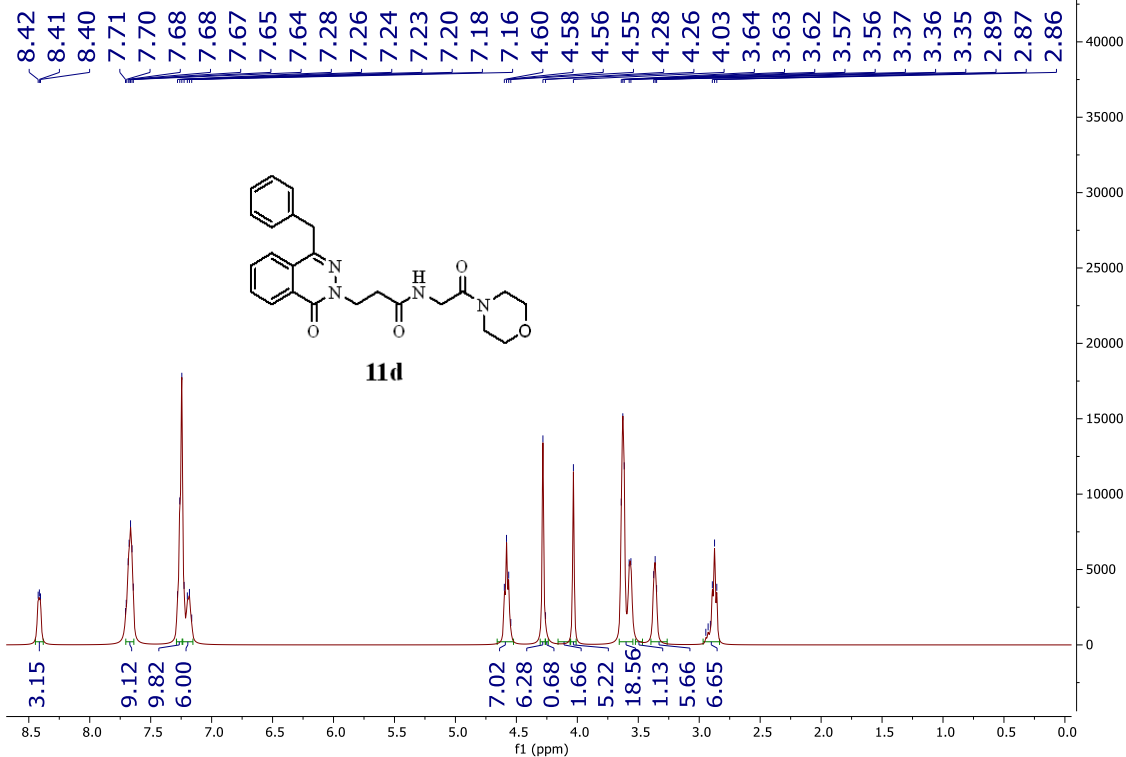


Figure S72: The D2O spectrum of compound **11d**

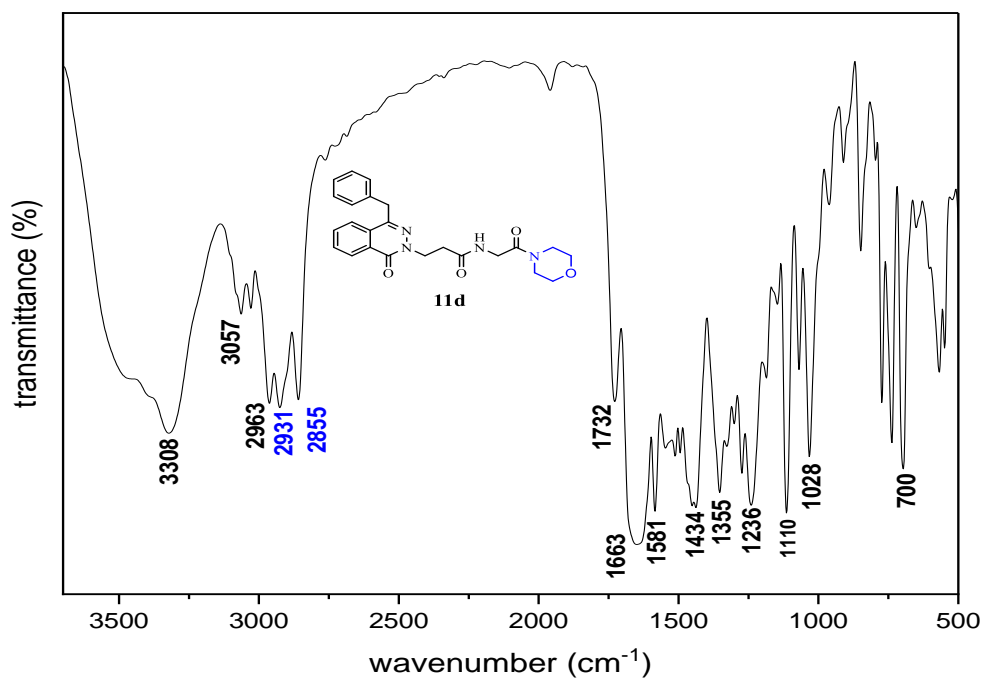


Figure S73: The IR spectrum of compound **11d**

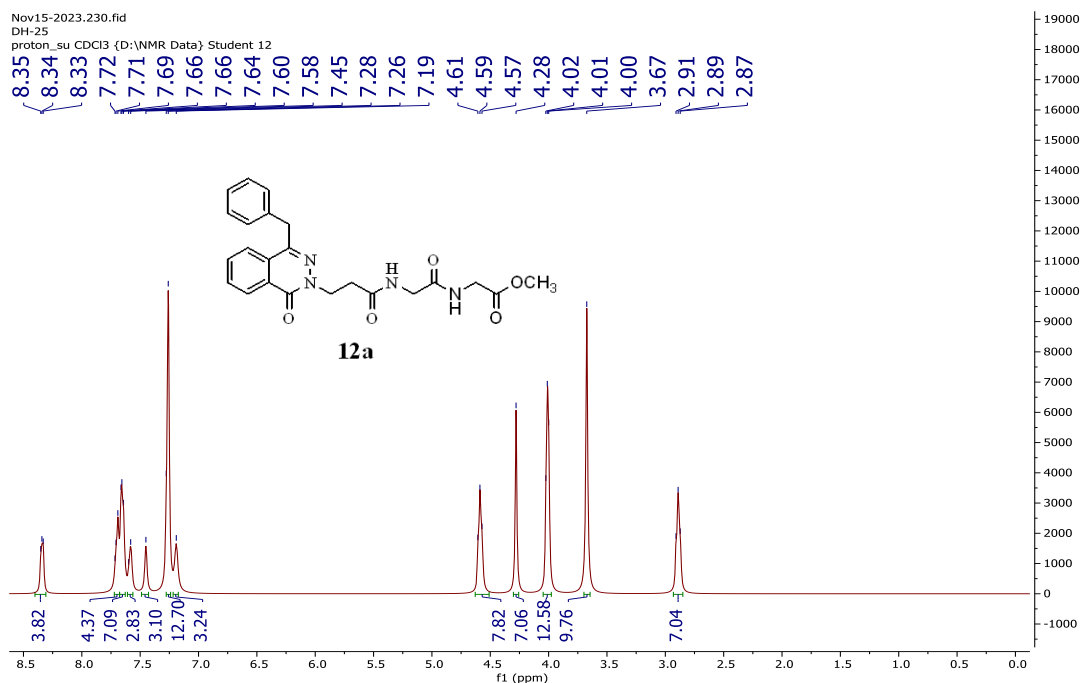


Figure S74: The ^1H -NMR spectrum of compound **12a**

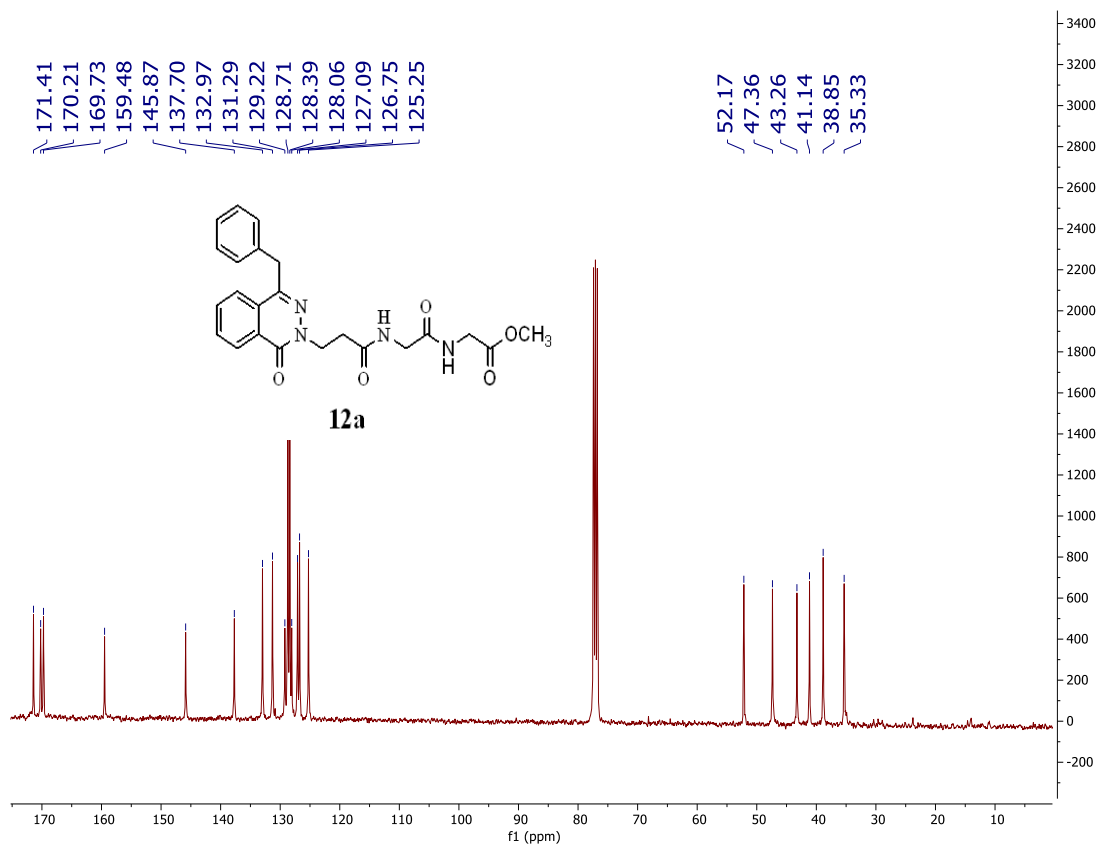


Figure S75: The ^{13}C -NMR spectrum of compound **12a**

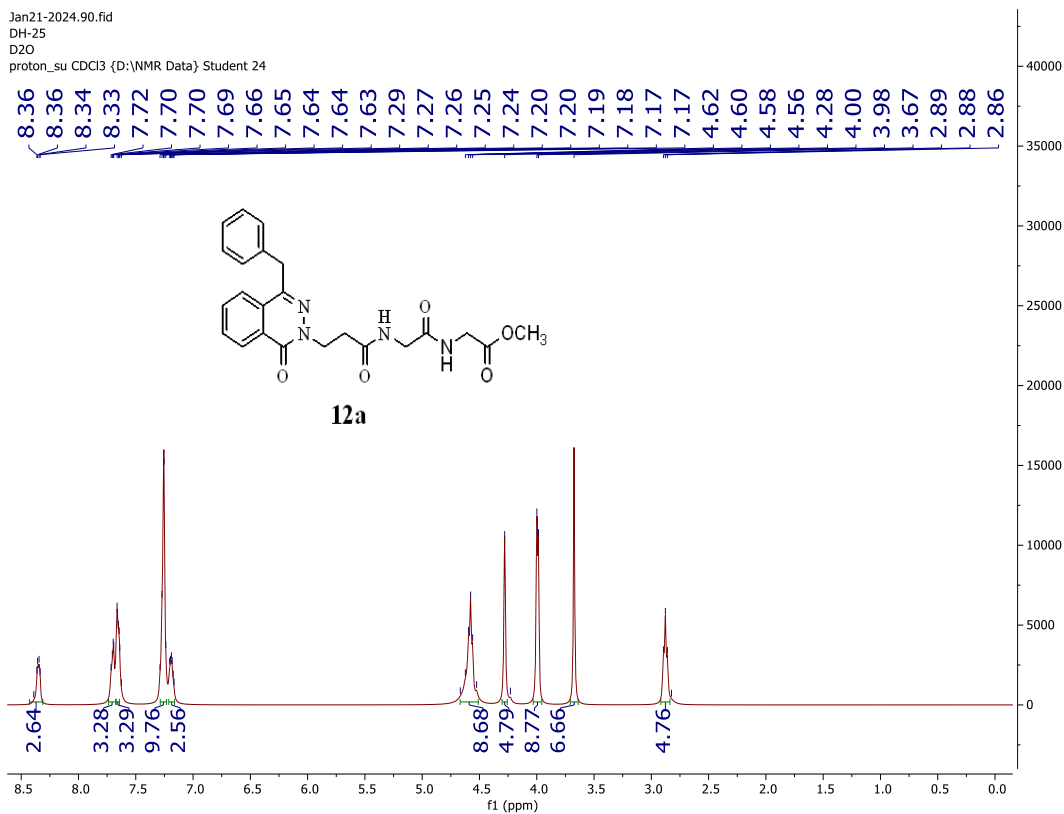


Figure S76: The D2O spectrum of compound **12a**

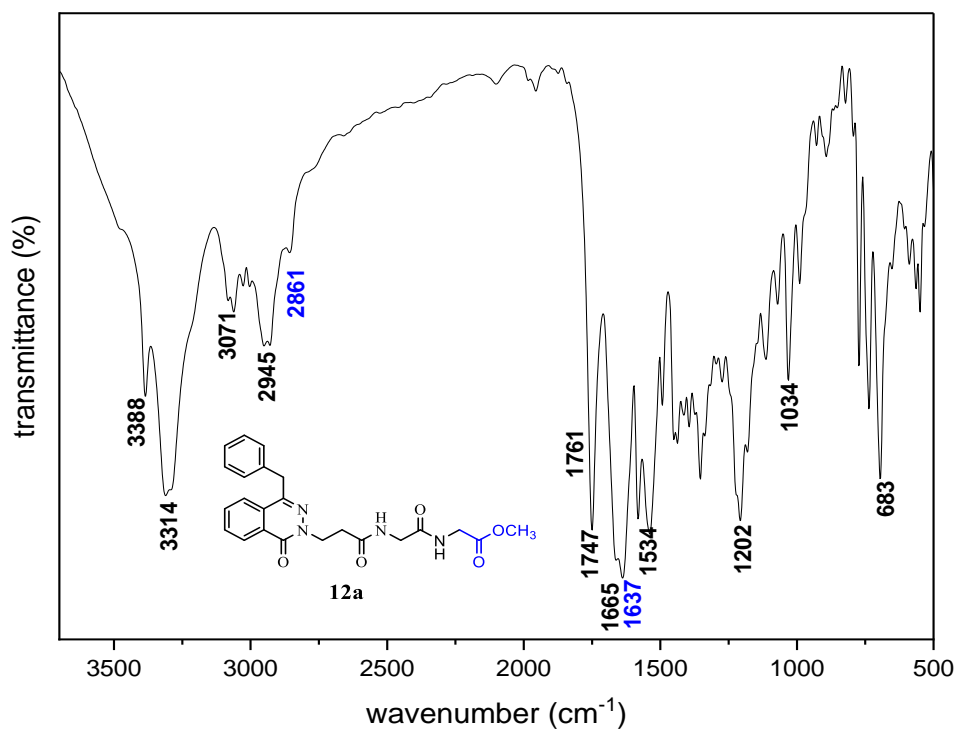


Figure S77: The IR spectrum of compound **12a**

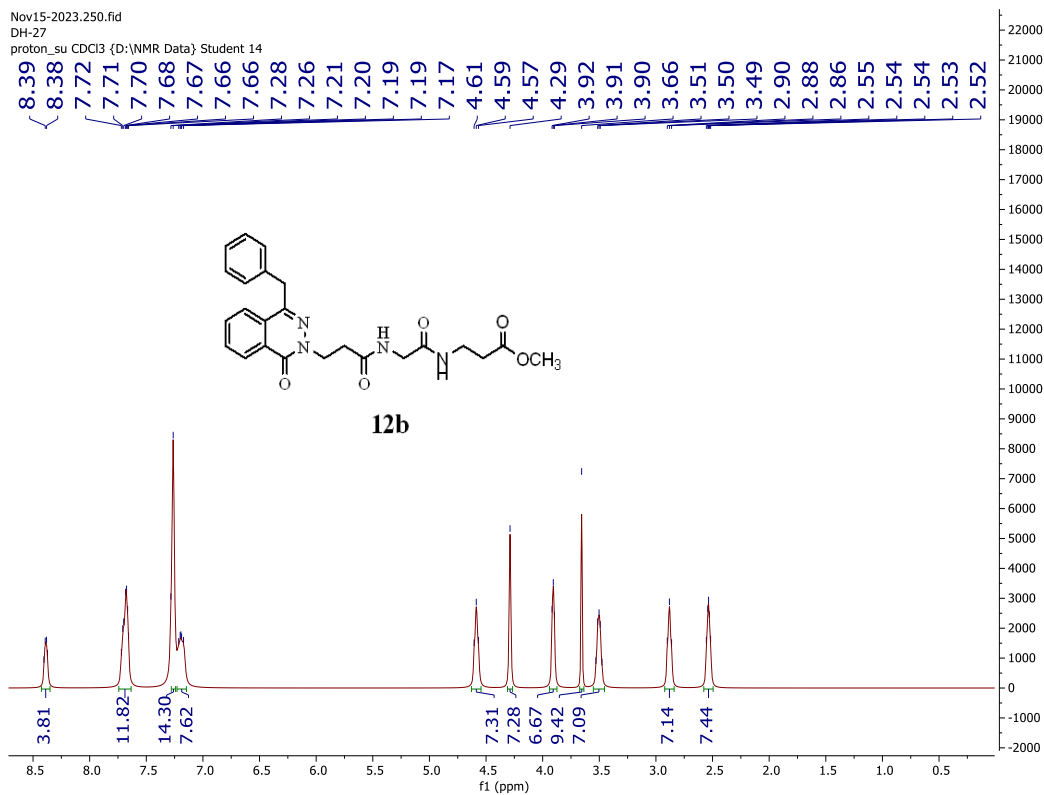


Figure S78: The ^1H -NMR spectrum of compound **12b**

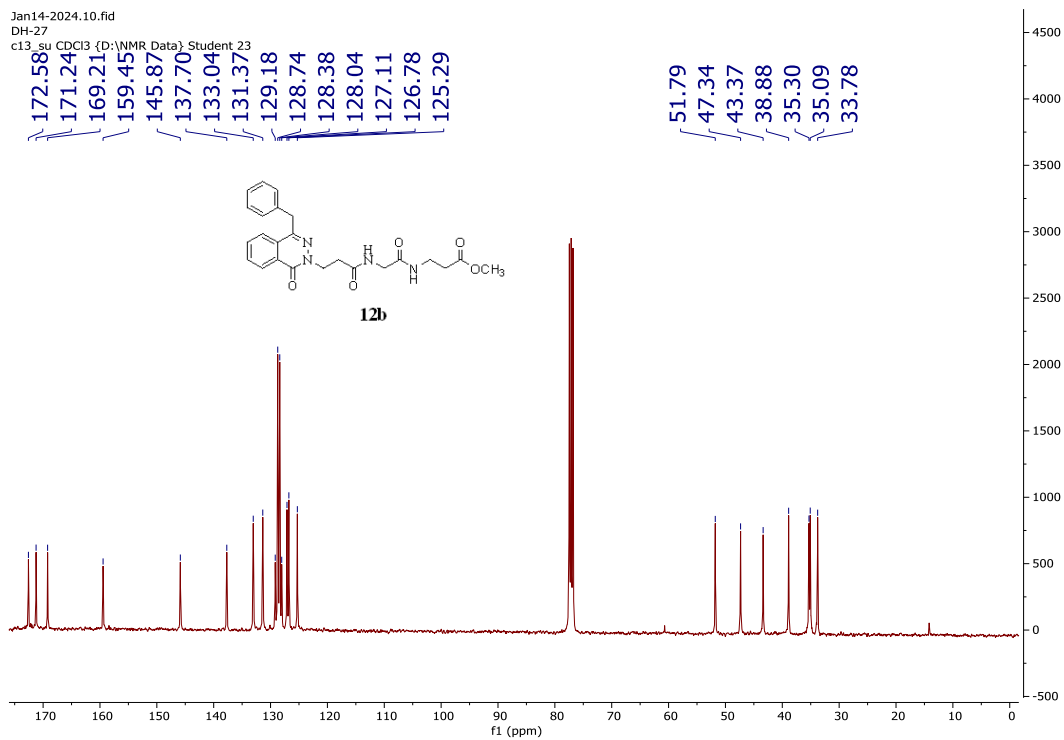


Figure S79: The ^{13}C -NMR spectrum of compound **12b**

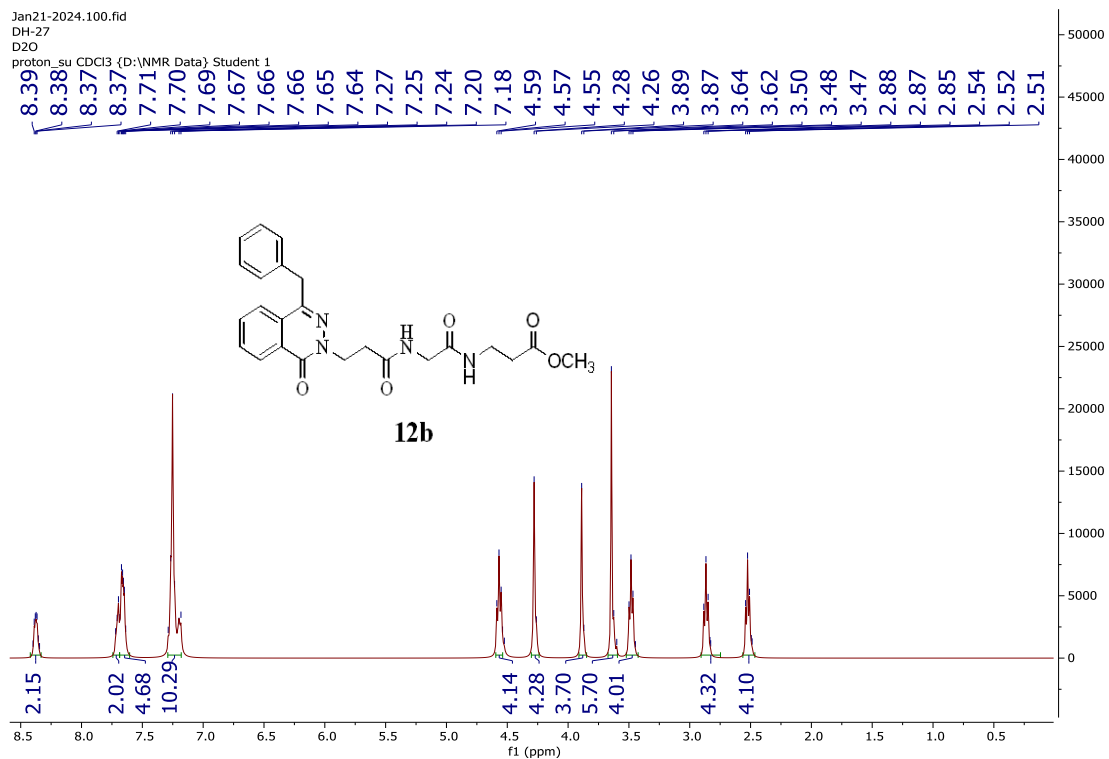


Figure S80: The D2O spectrum of compound **12b**

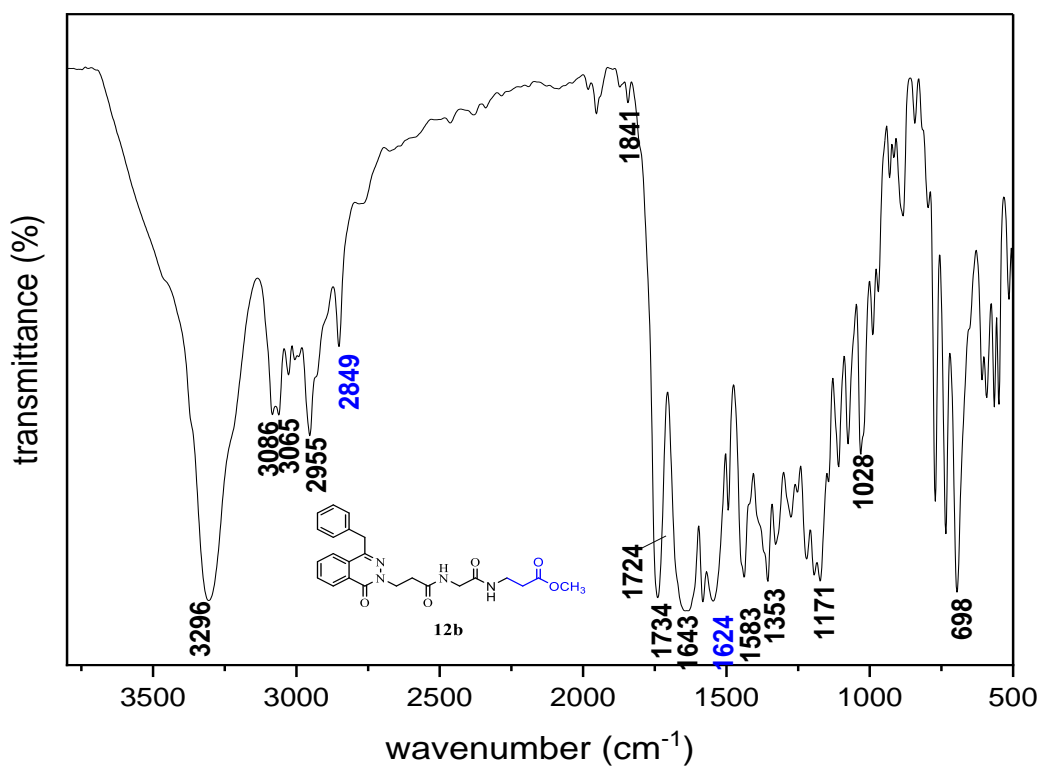


Figure S81: The IR spectrum of compound **12b**

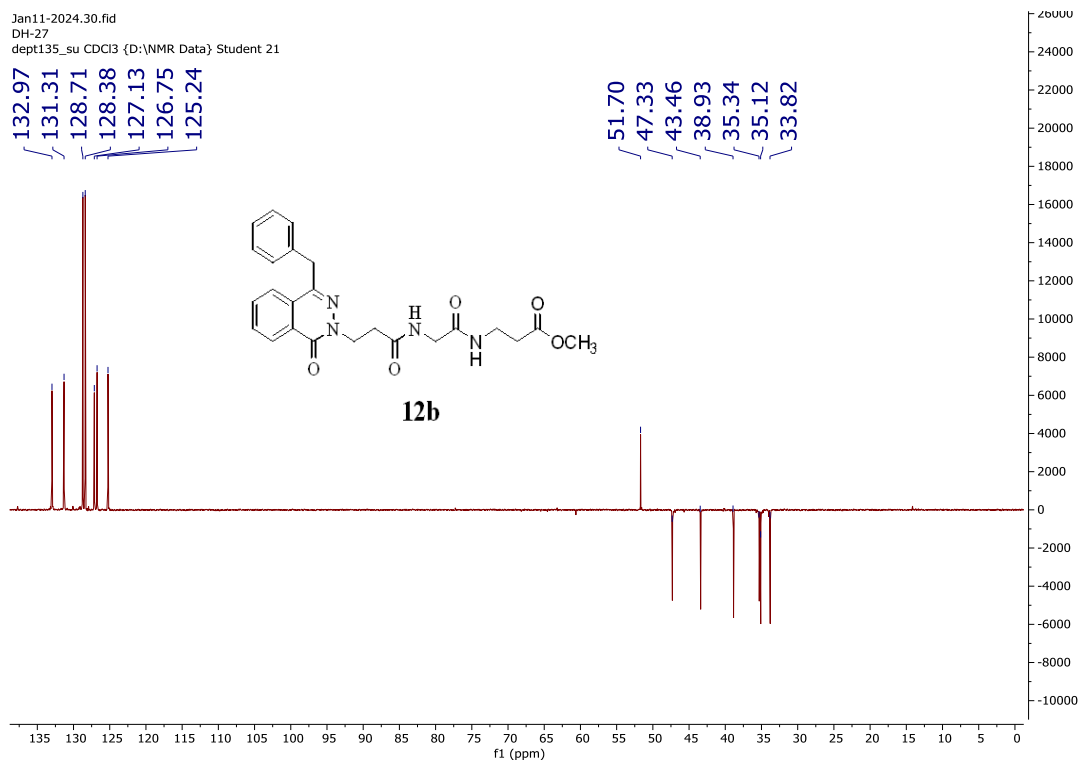


Figure S82: The dept135 spectrum of compound **12b**

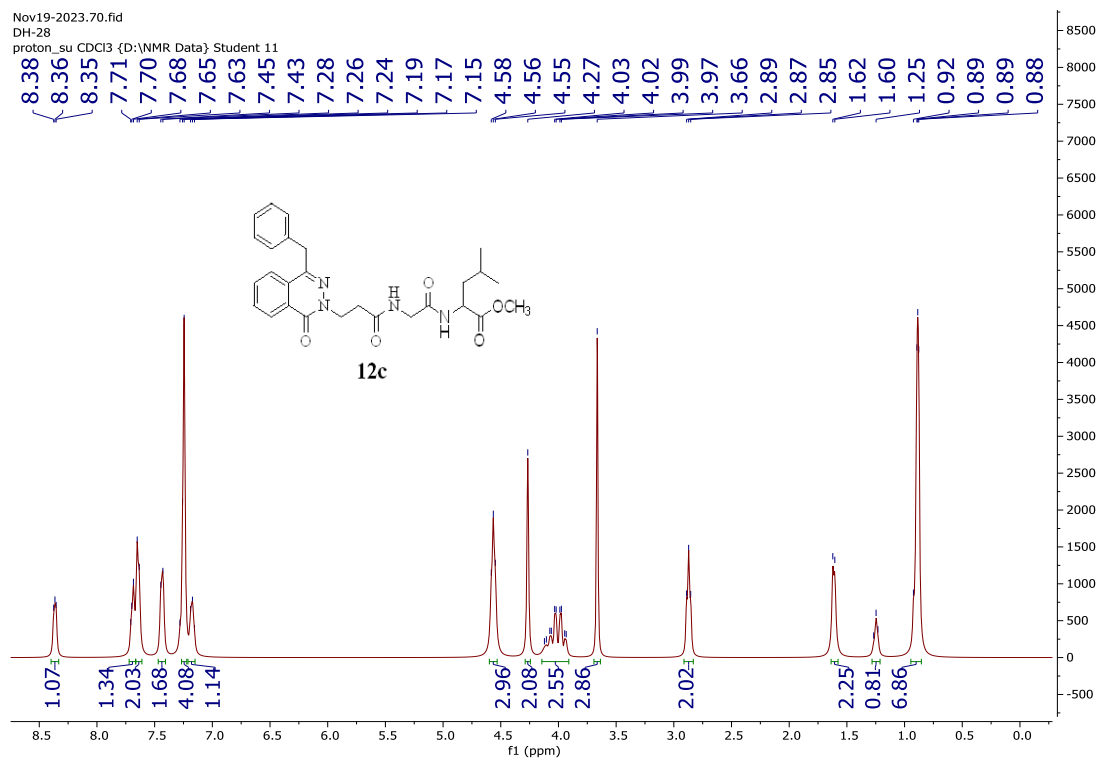


Figure S83: The ^1H -NMR spectrum of compound **12c**

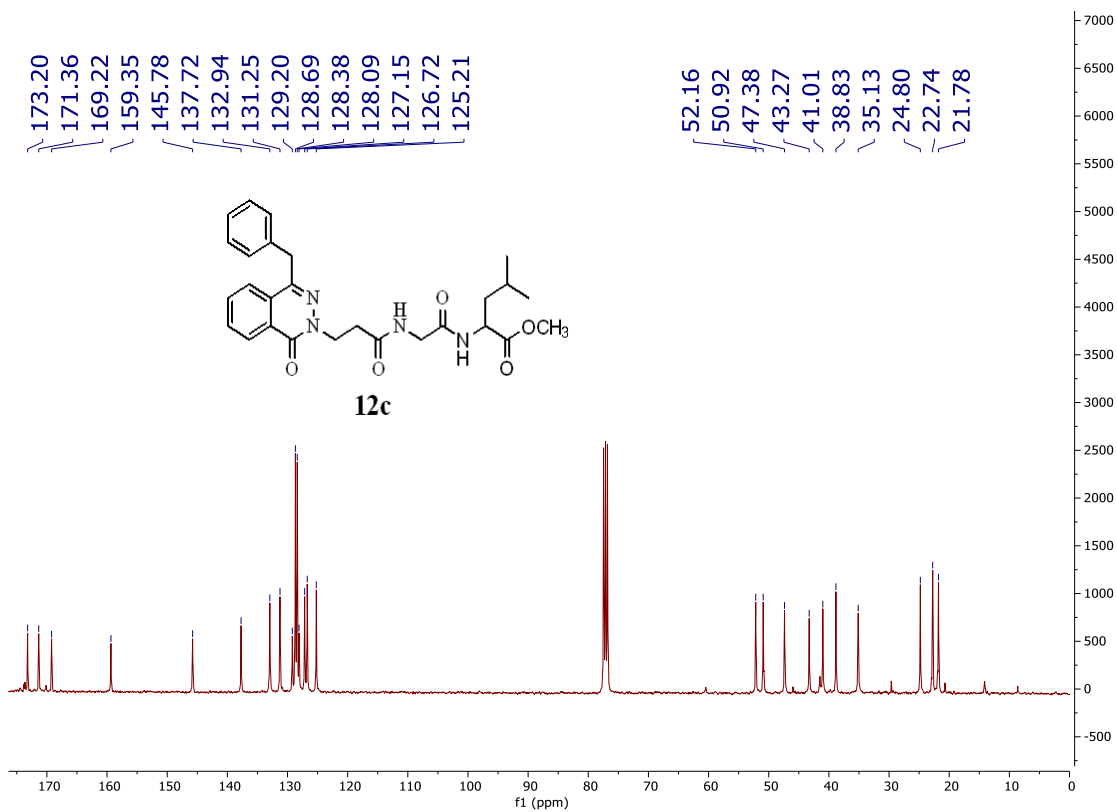


Figure S84: The ^{13}C -NMR spectrum of compound **12c**

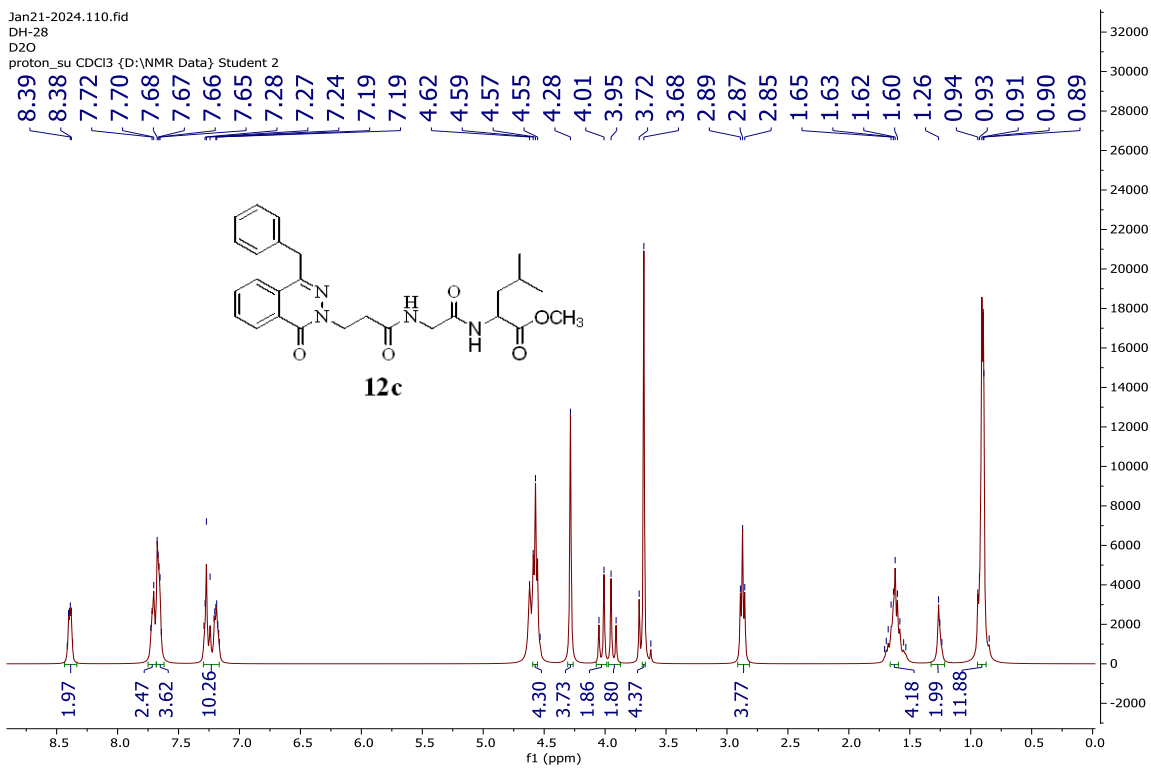


Figure S85: The D₂O spectrum of compound **12c**

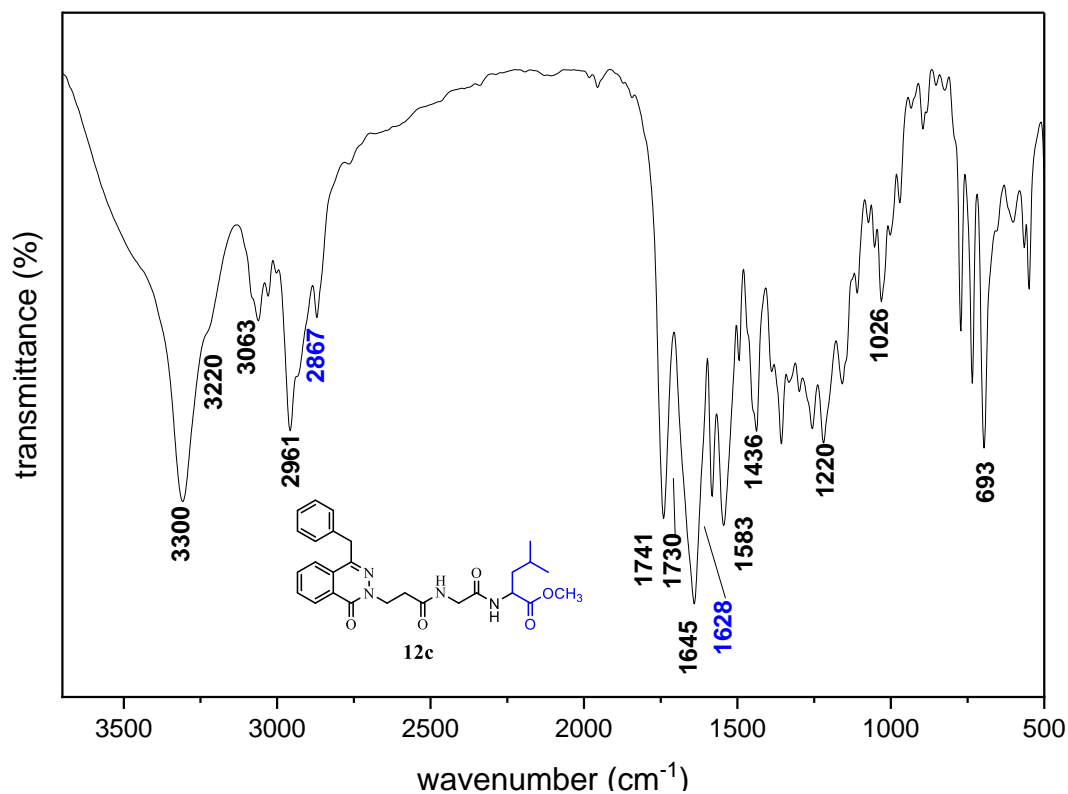


Figure S86: The IR spectrum of compound 12c

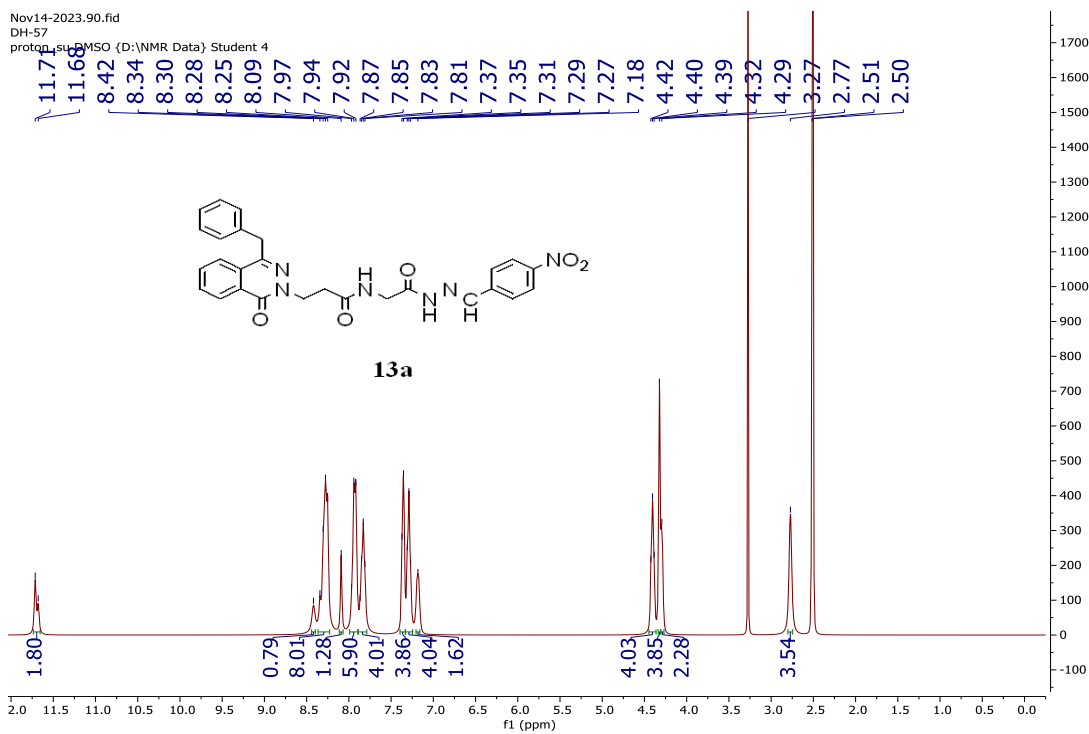


Figure S87: The ¹H-NMR spectrum of compound 13a

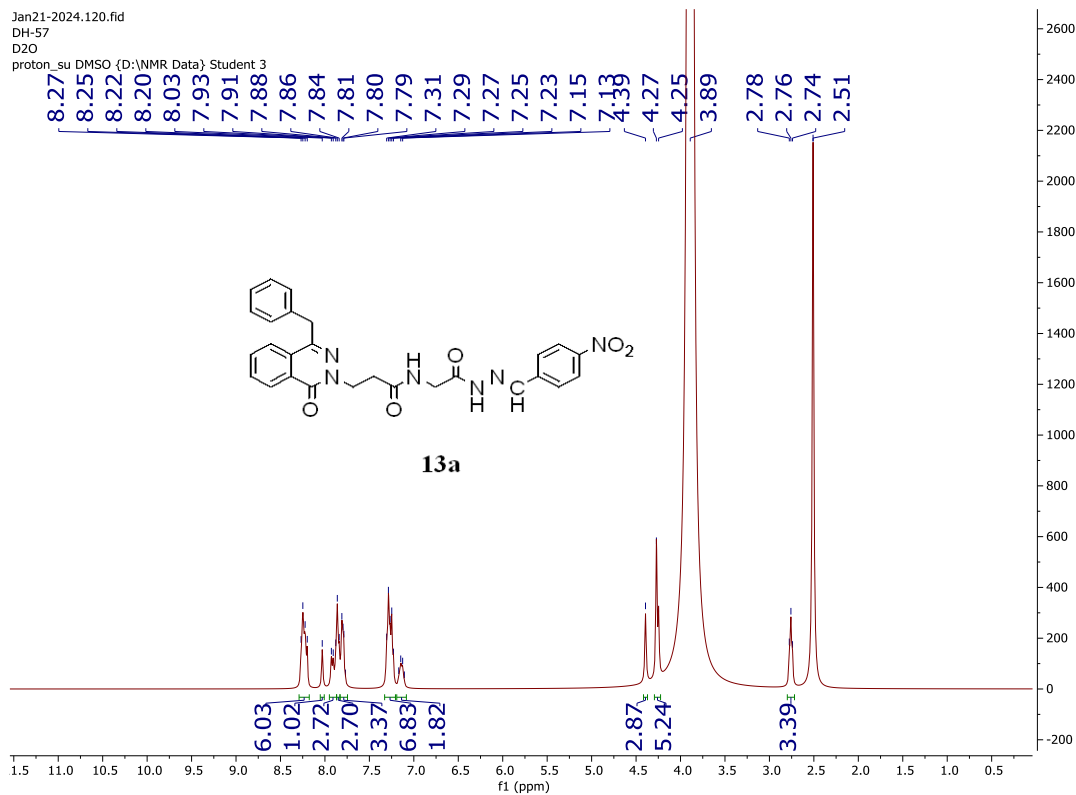


Figure S88: The D2O spectrum of compound **13a**

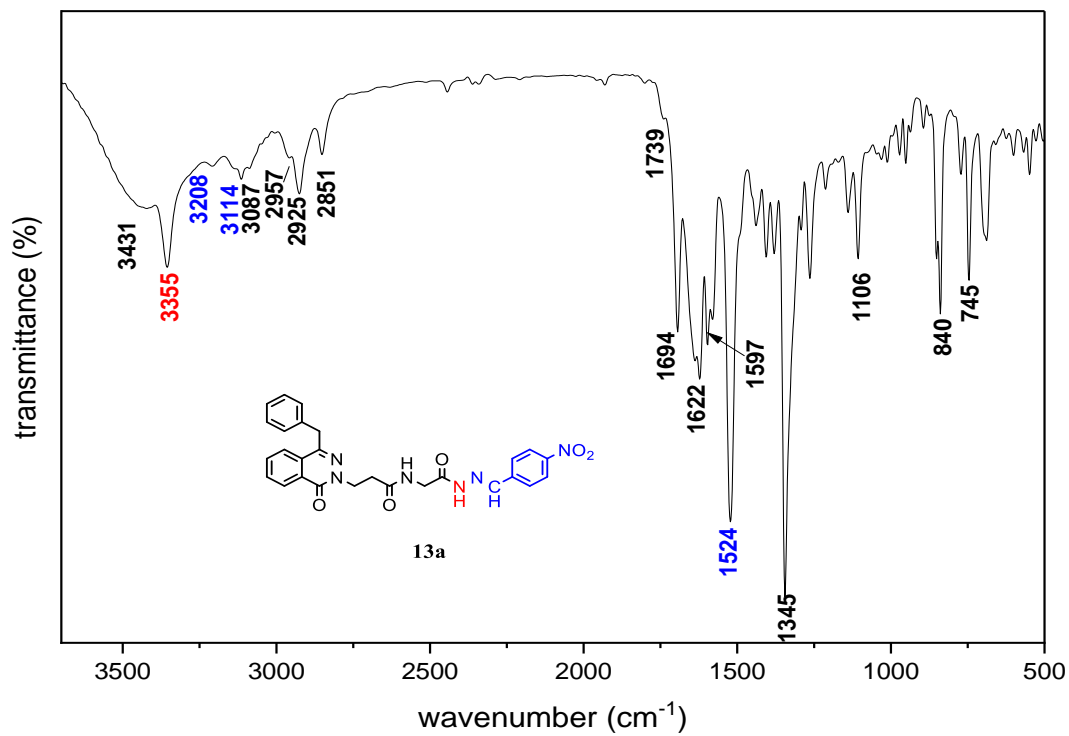


Figure S89: The IR spectrum of compound **13a**

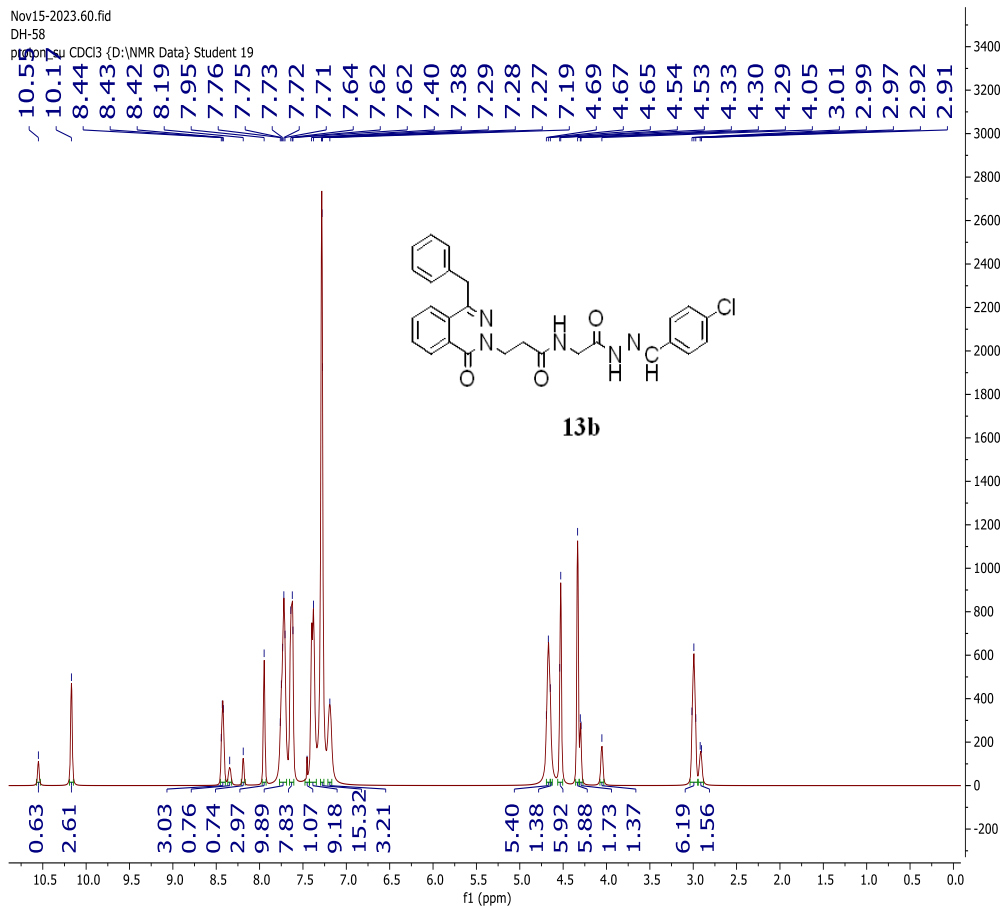


Figure S90: The $^1\text{H-NMR}$ spectrum of compound **13b**

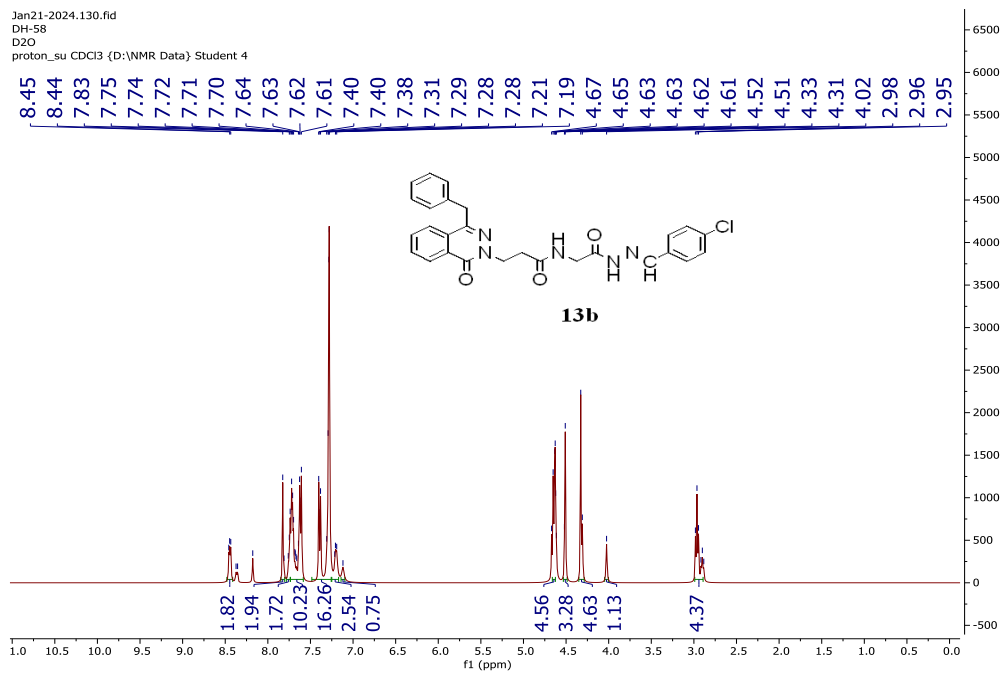


Figure S91: The D_2O spectrum of compound **13b**

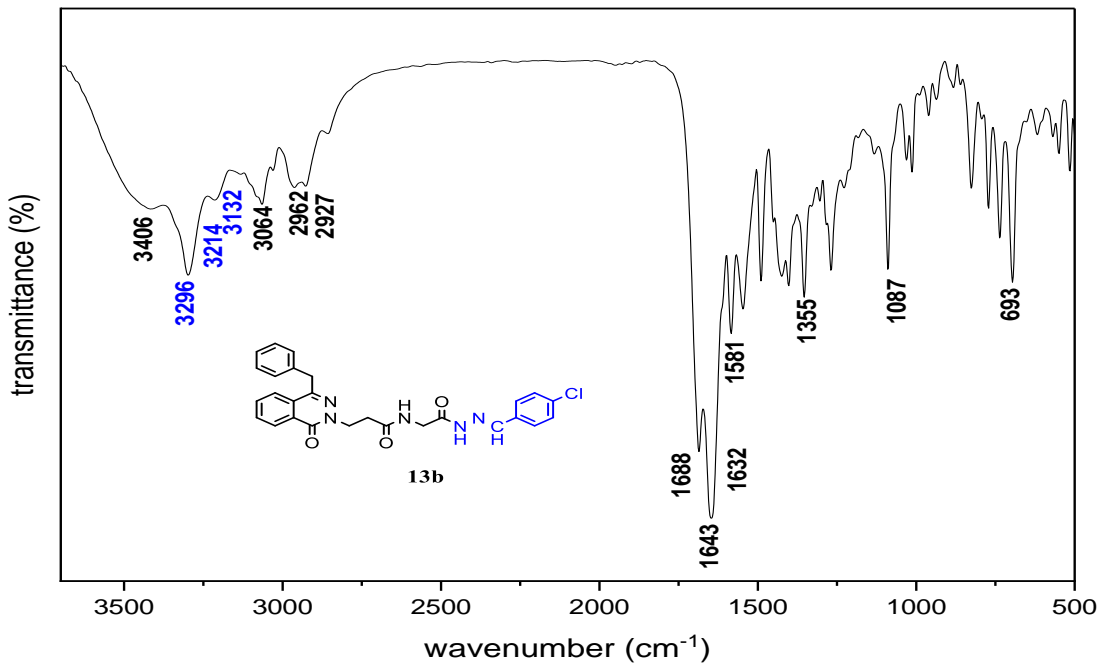


Figure S92:The IR spectrum of compound **13b**

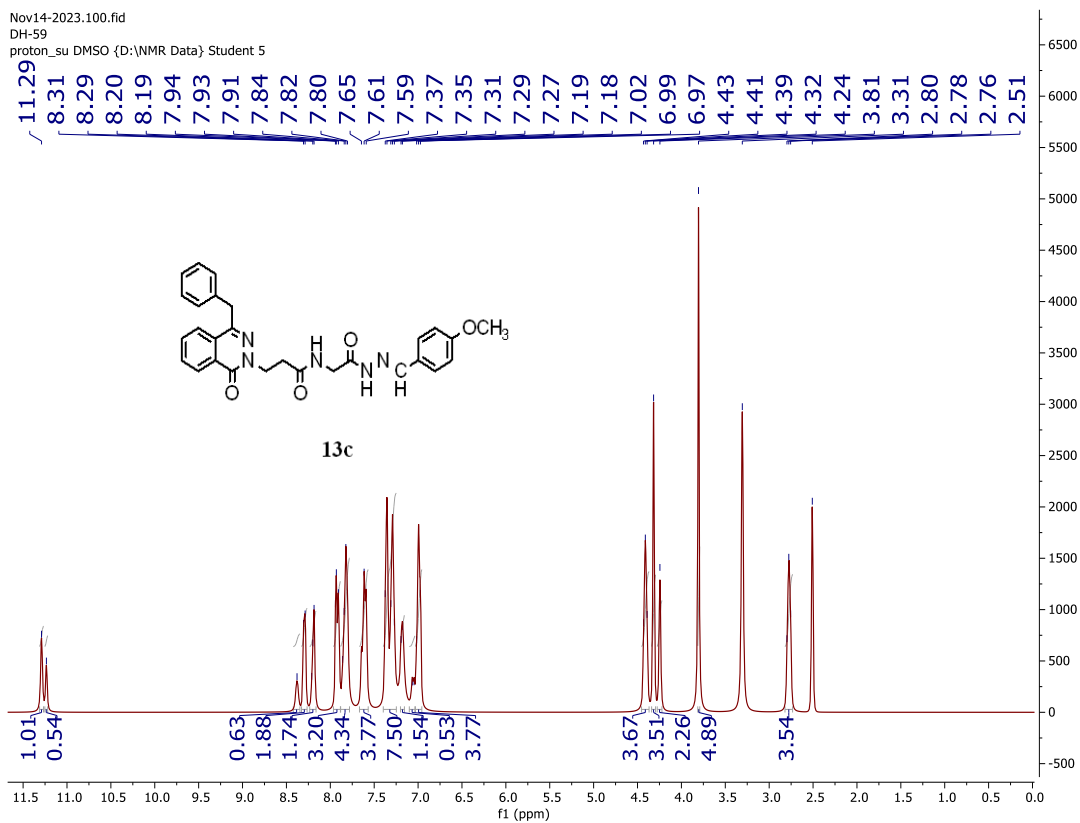


Figure S93:The ¹H-NMR spectrum of compound **13c**

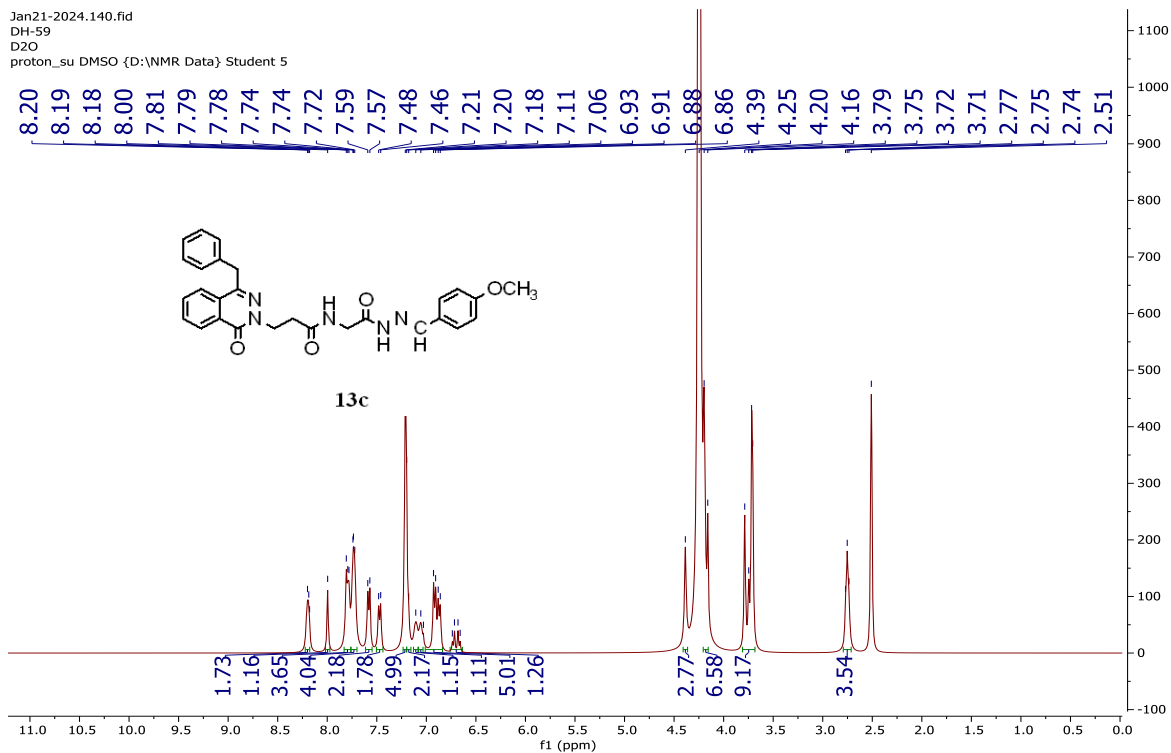


Figure S94: The D2O spectrum of compound 13c

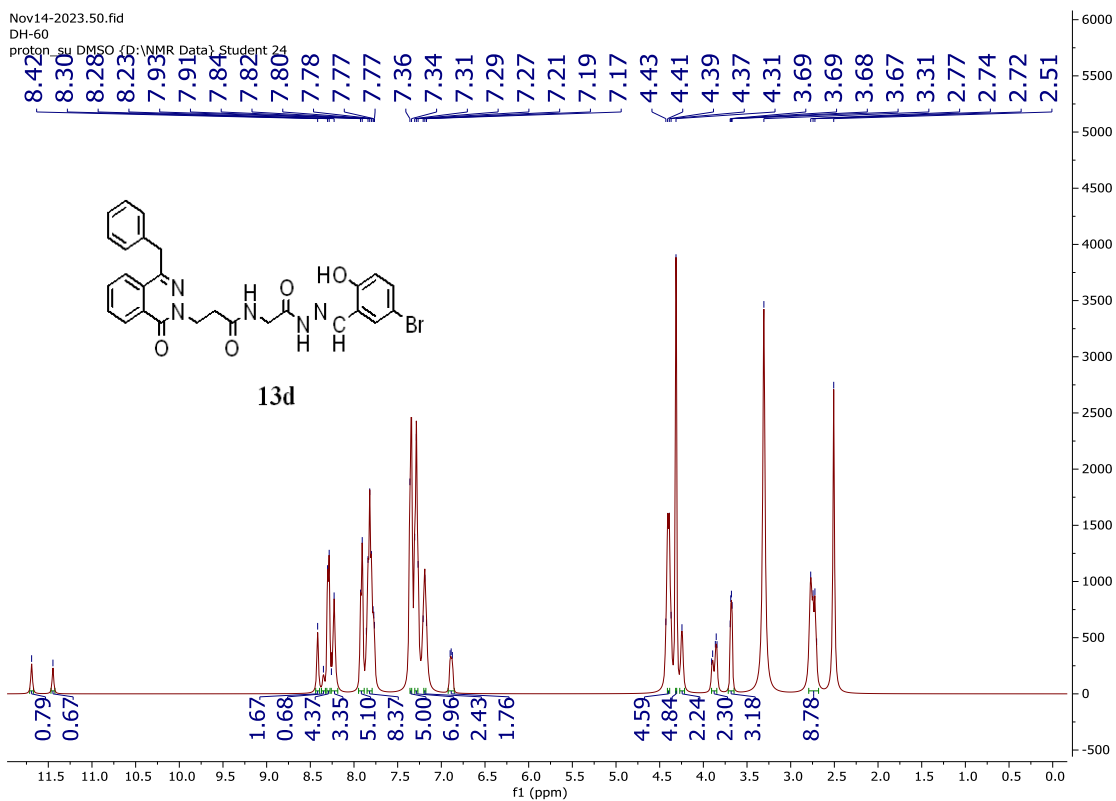


Figure S95: The ¹H-NMR spectrum of compound 13d

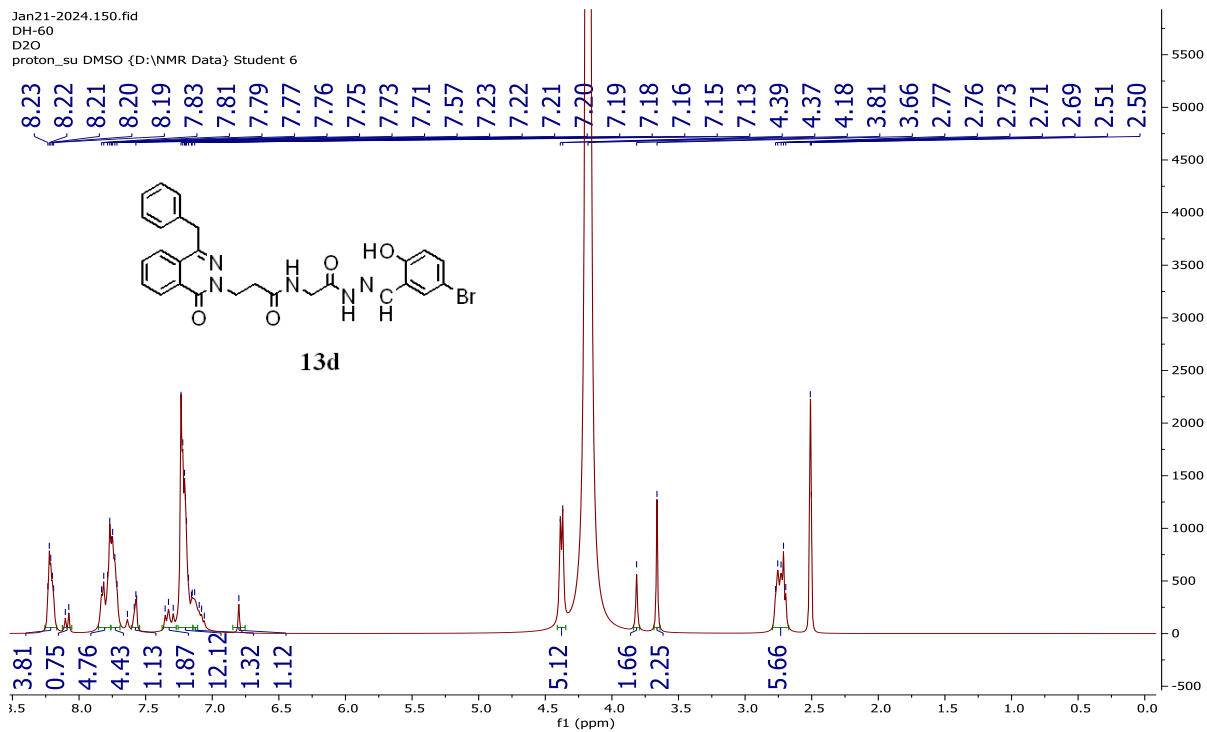


Figure S96:The D2O spectrum of compound **13d**

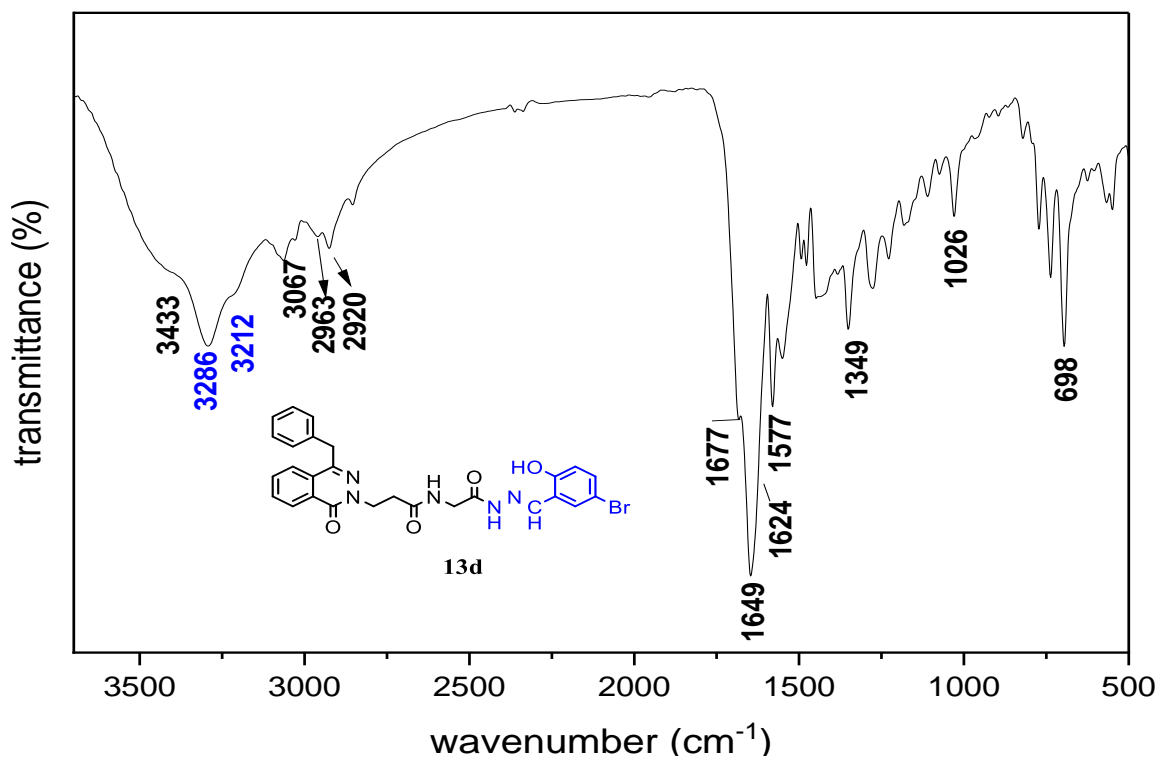


Figure S97:The IR spectrum of compound **13d**