

Supplementary material

Synthesis and biological evaluation of novel *N*-(piperazin-1-yl)alkyl-1*H*-dibenzo[*a,c*]carbazole derivatives of dehydroabietic acid as potential MEK inhibitors

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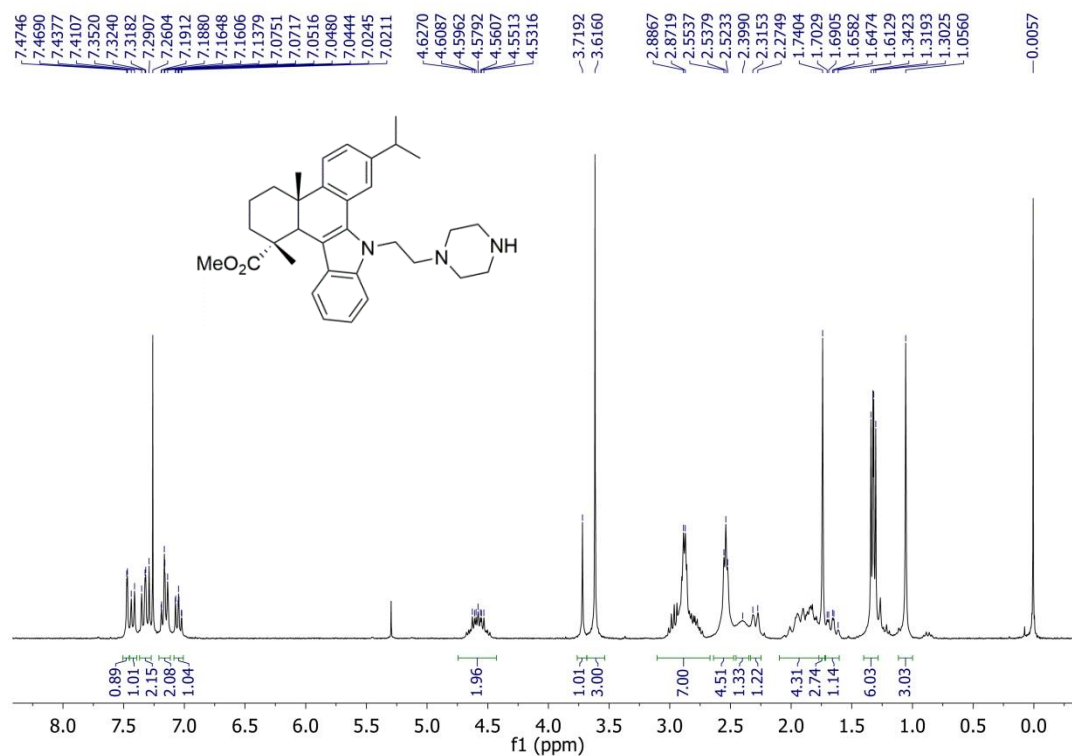


Fig. S1. ¹H-NMR spectrum of compound **6a** (300 MHz, CDCl₃)

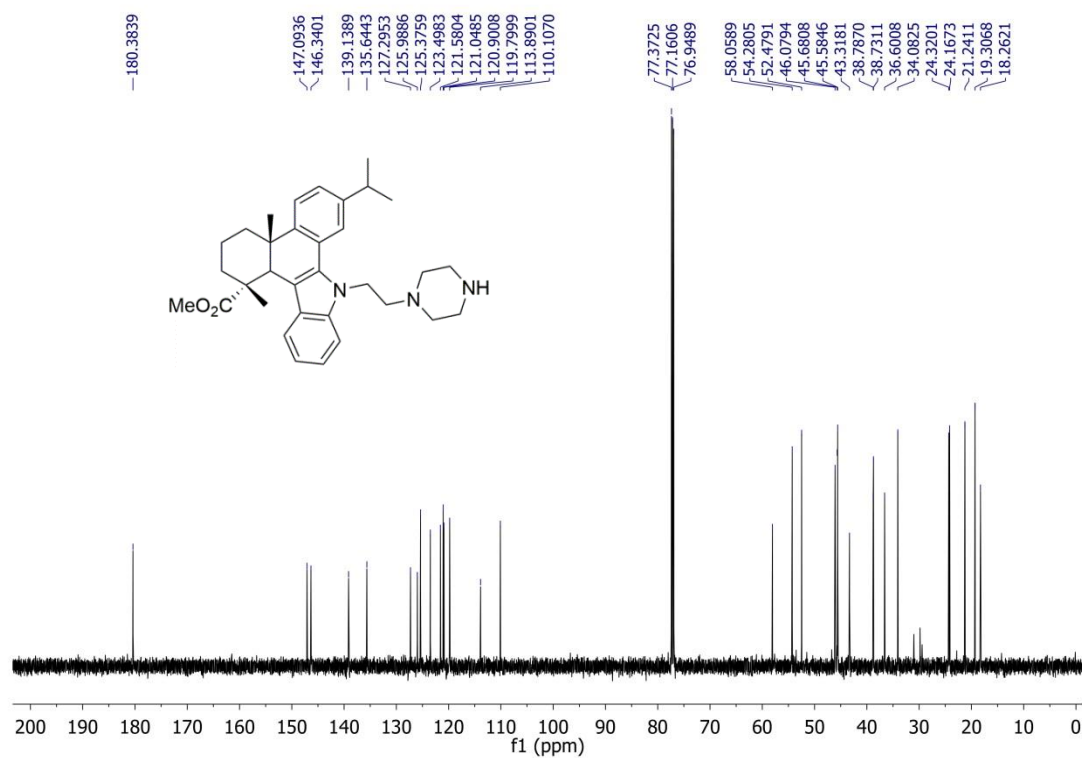


Fig. S2. ¹³C-NMR spectrum of compound **6a** (150 MHz, CDCl₃)

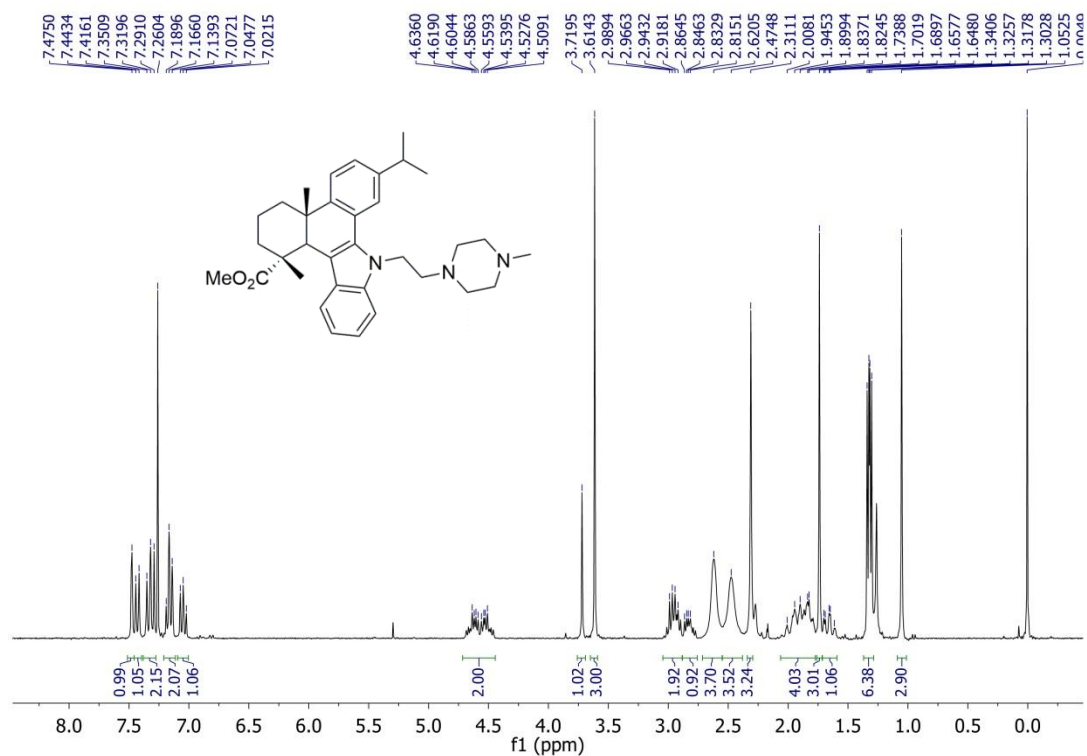


Fig. S3. ¹H-NMR spectrum of compound **6b** (300 MHz, CDCl₃)

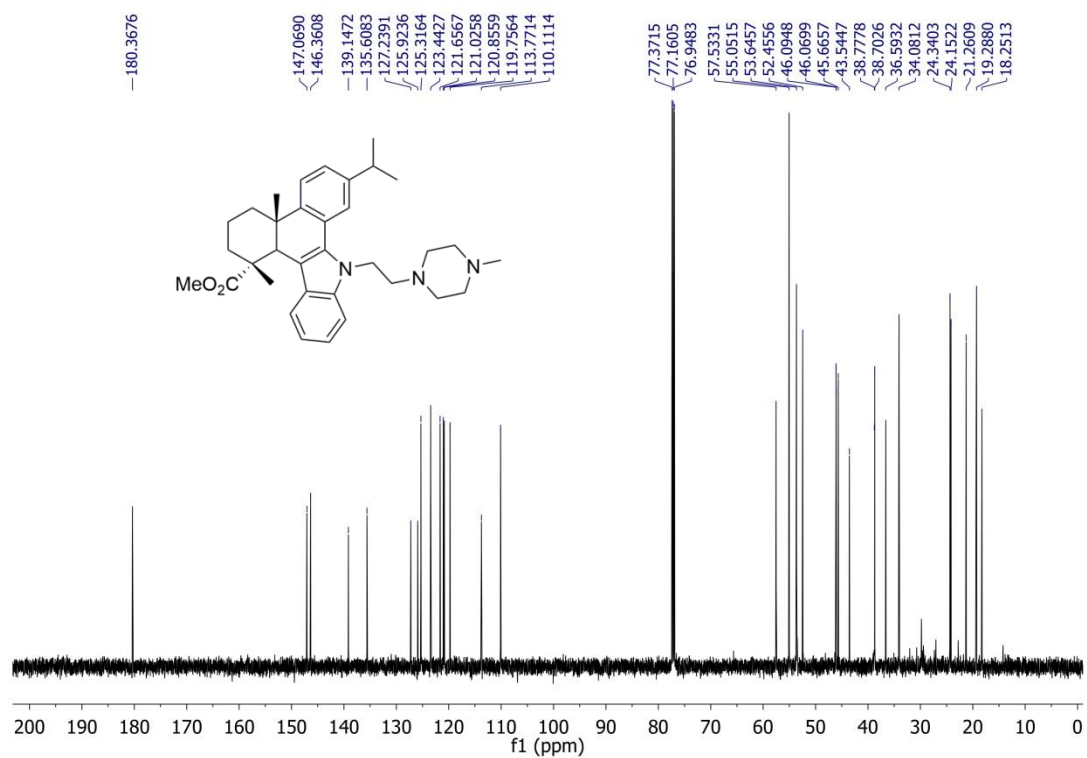


Fig. S4. ¹³C-NMR spectrum of compound **6b** (150 MHz, CDCl₃)

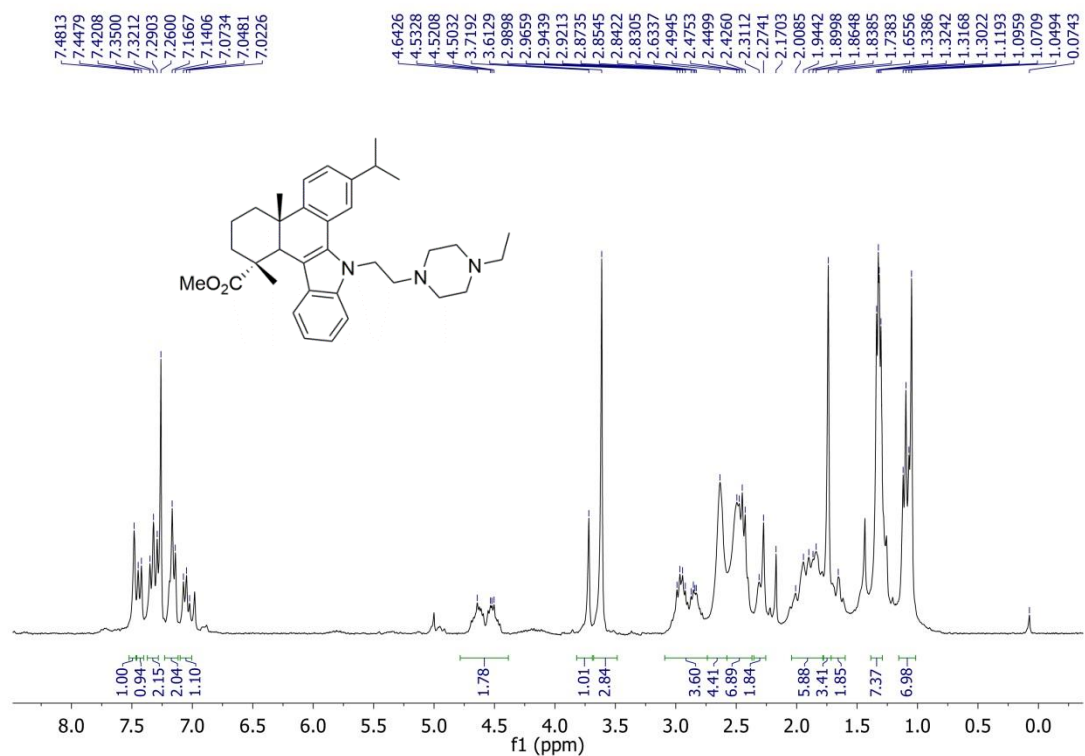


Fig. S5. ¹H-NMR spectrum of compound **6c** (300 MHz, CDCl₃)

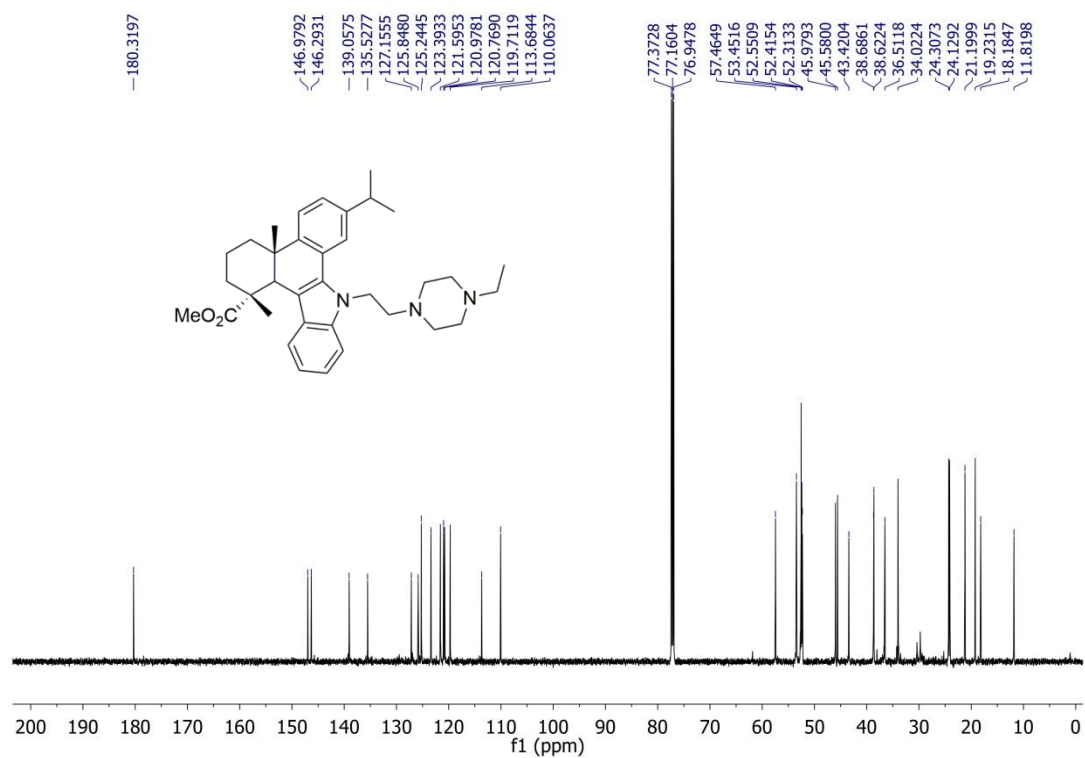


Fig. S6. ¹³C-NMR spectrum of compound **6c** (150 MHz, CDCl₃)

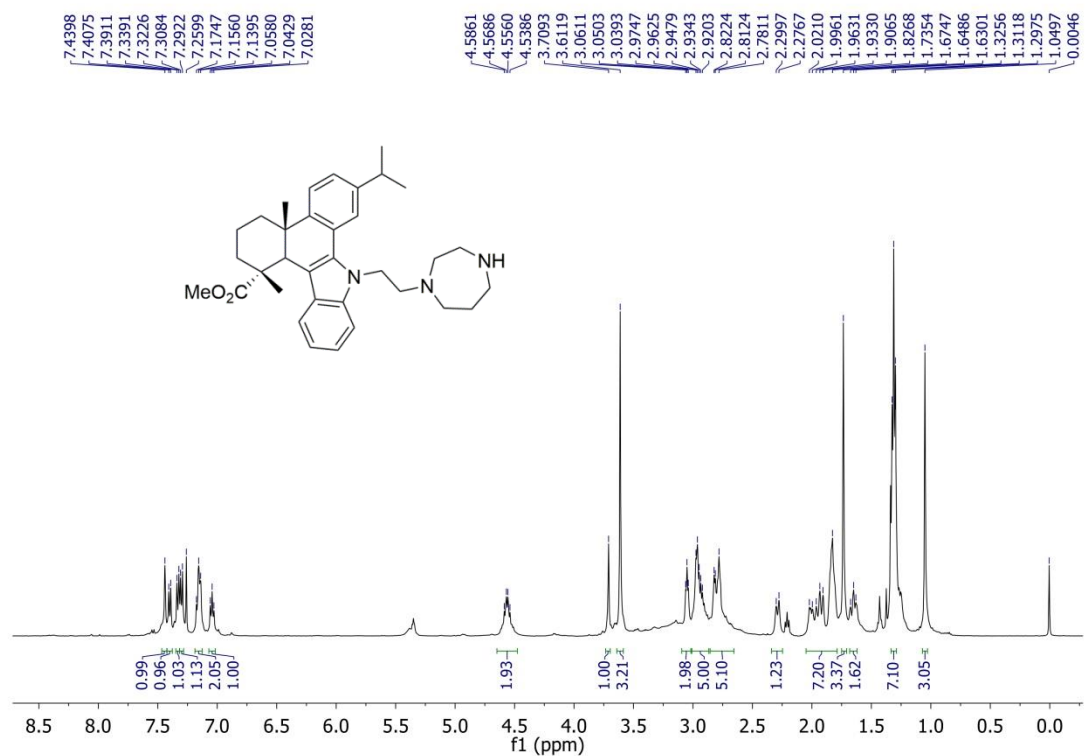


Fig. S7. ¹H-NMR spectrum of compound **6d** (500 MHz, CDCl₃)

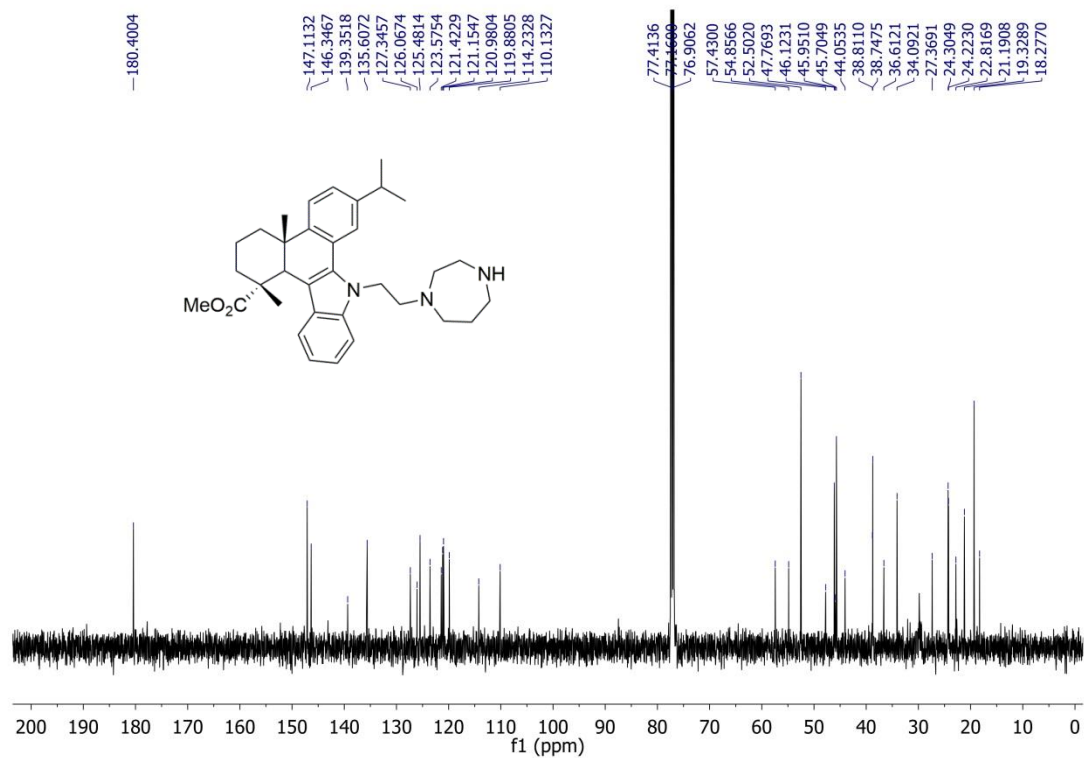


Fig. S8. ¹³C-NMR spectrum of compound **6d** (125 MHz, CDCl₃)

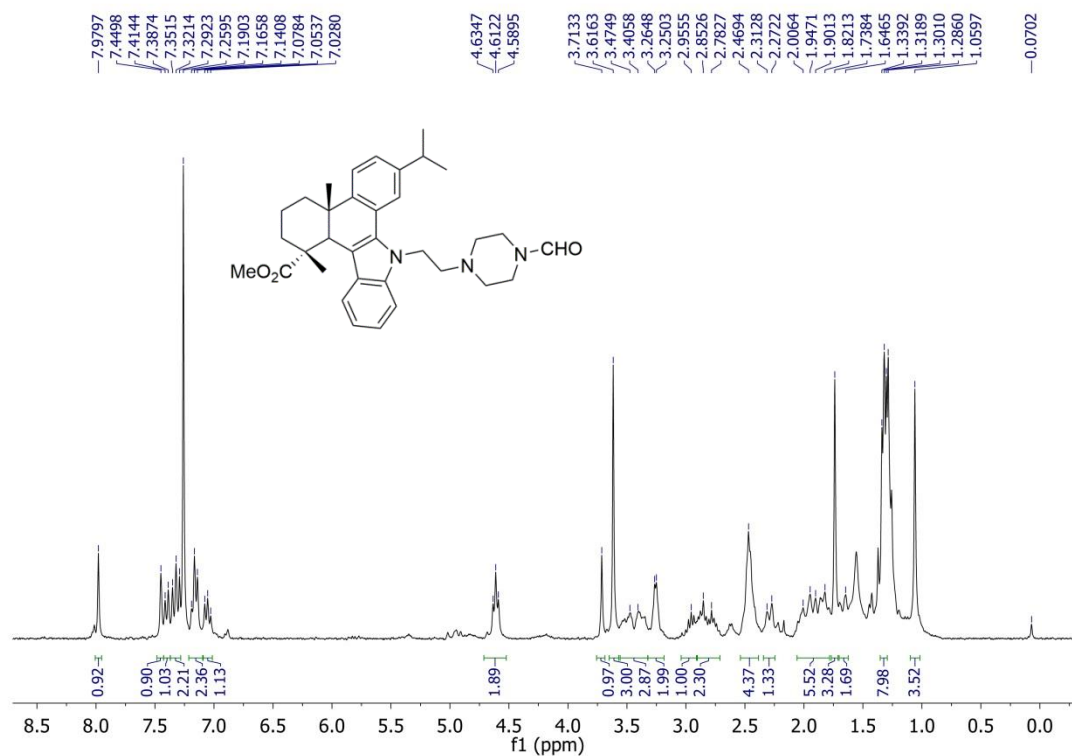


Fig. S9. ¹H-NMR spectrum of compound **6e** (300 MHz, CDCl₃)

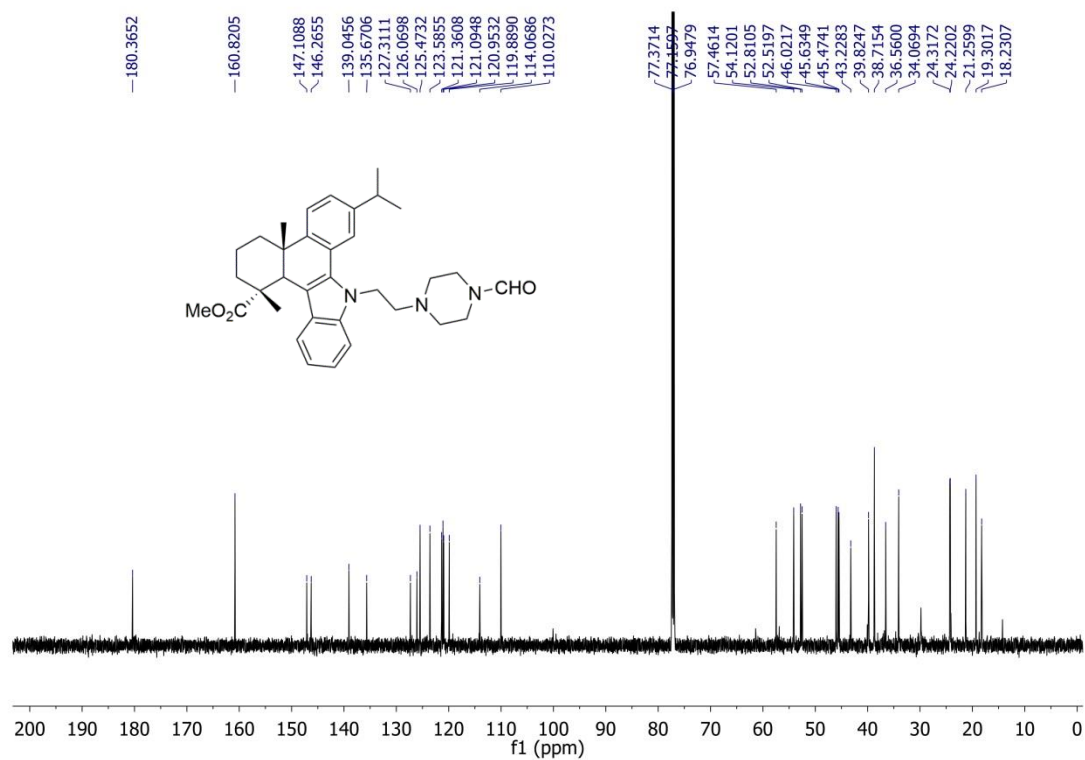


Fig. S10. ¹³C-NMR spectrum of compound **6e** (150 MHz, CDCl₃)

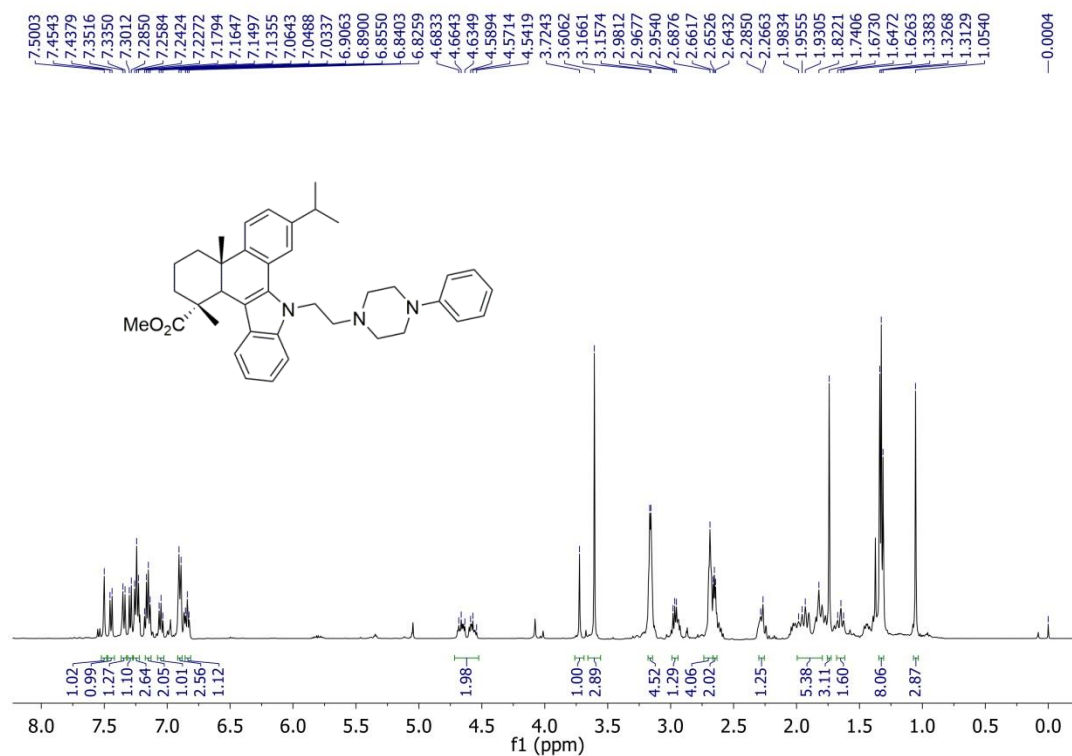


Fig. S11. ¹H-NMR spectrum of compound **6f** (500 MHz, CDCl₃)

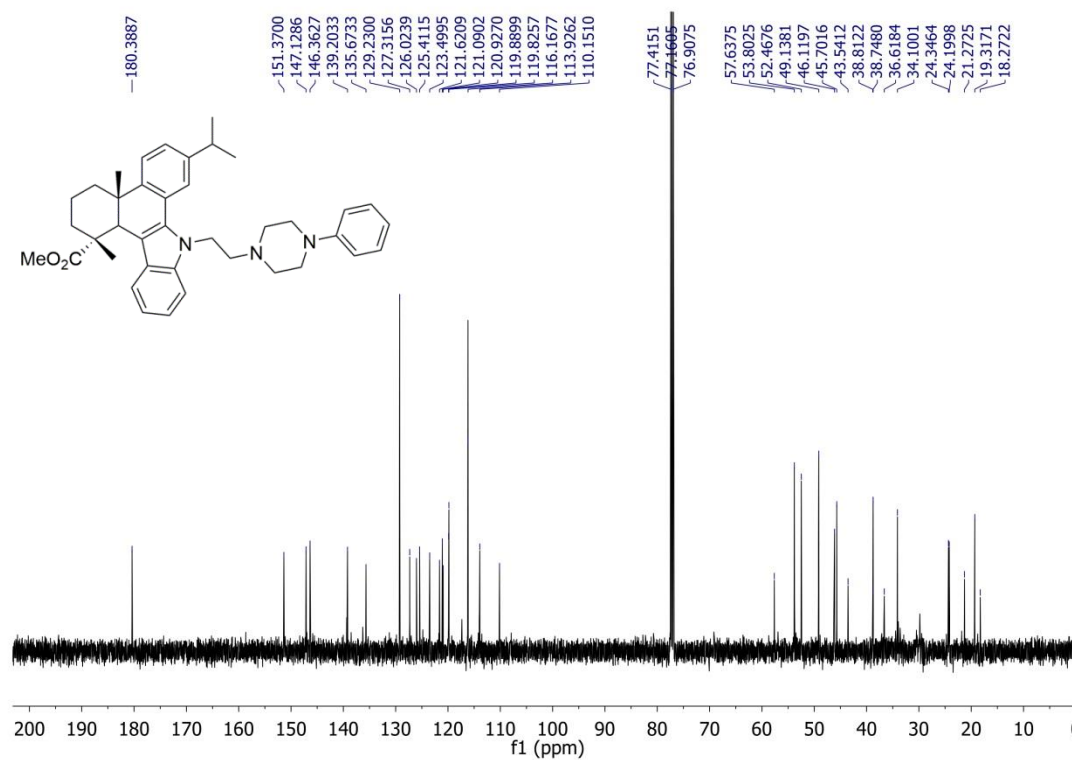


Fig. S12. ¹³C-NMR spectrum of compound **6f** (125 MHz, CDCl₃)

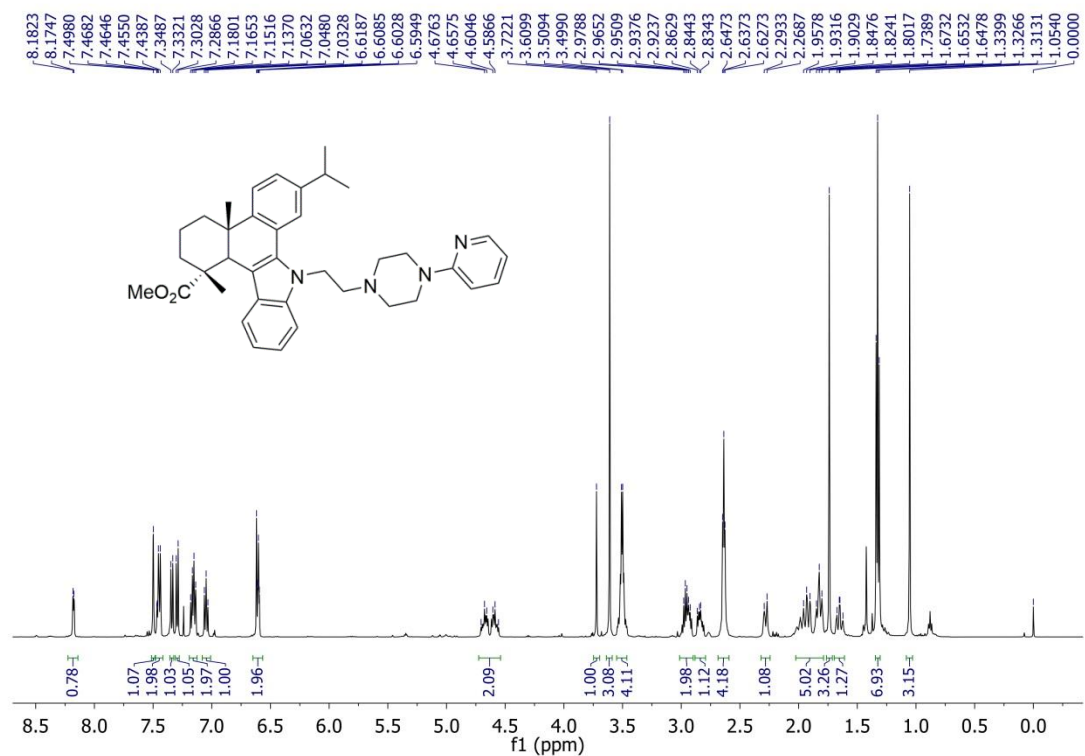


Fig. S13. ¹H-NMR spectrum of compound **6g** (500 MHz, CDCl₃)

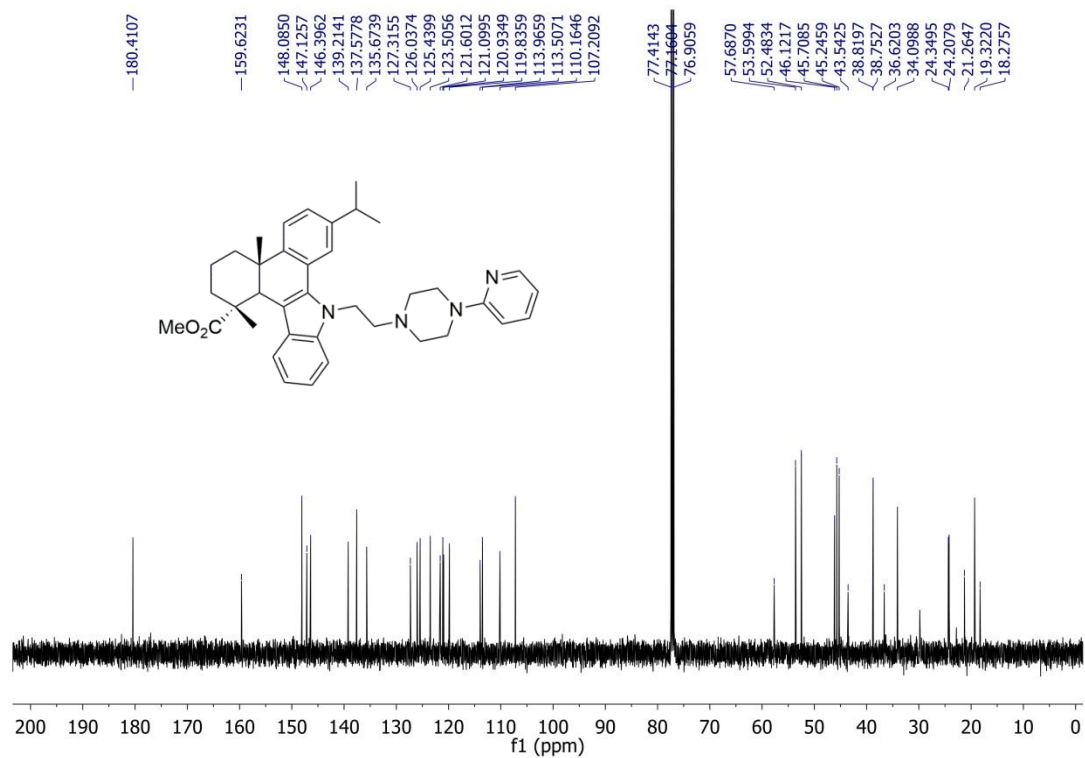


Fig. S14. ¹³C-NMR spectrum of compound **6g** (125 MHz, CDCl₃)

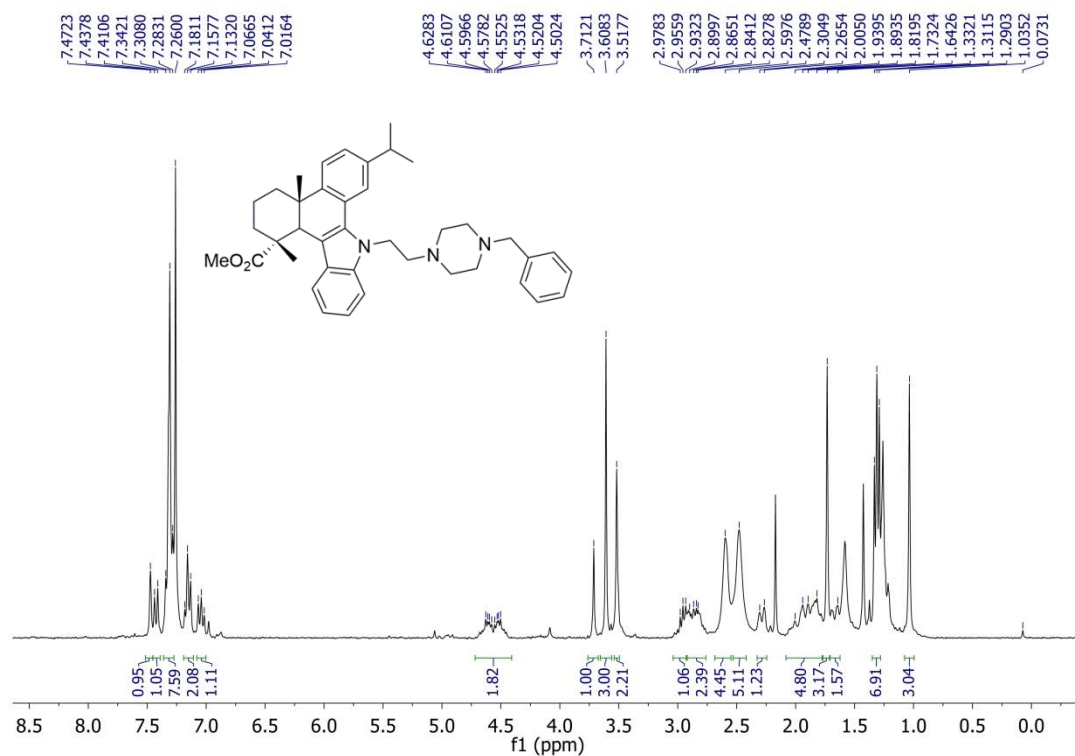


Fig. S15. ¹H-NMR spectrum of compound **6h** (300 MHz, CDCl₃)

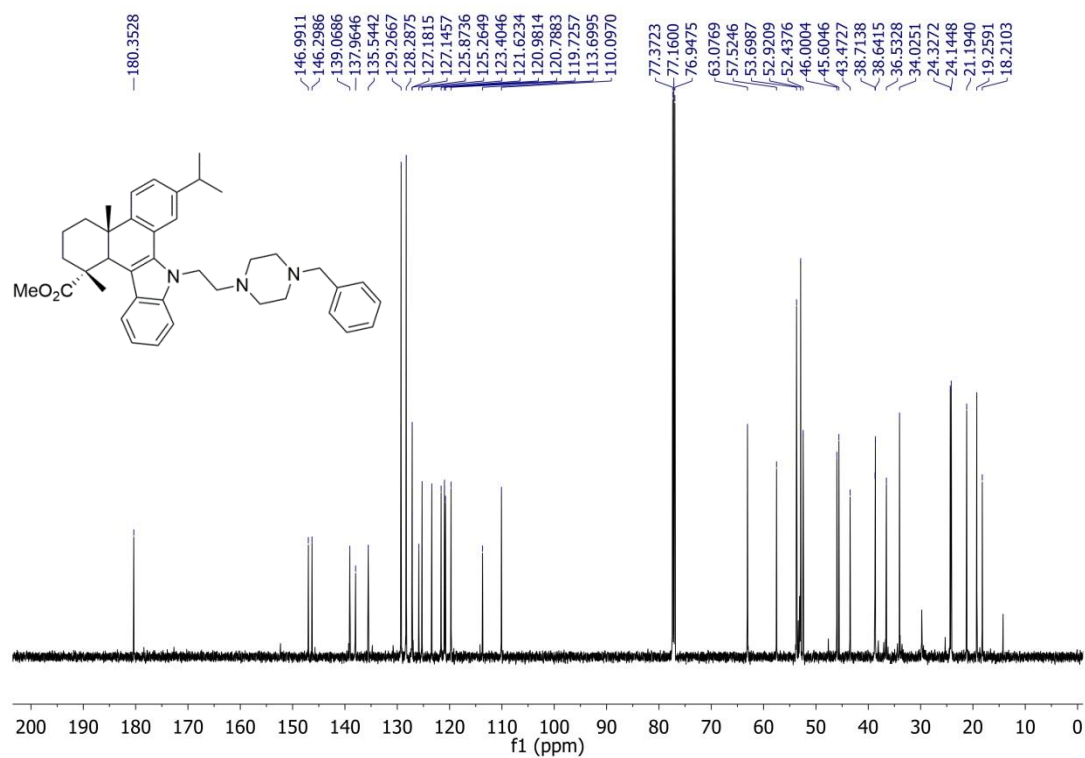


Fig. S16. ¹³C-NMR spectrum of compound **6h** (150 MHz, CDCl₃)

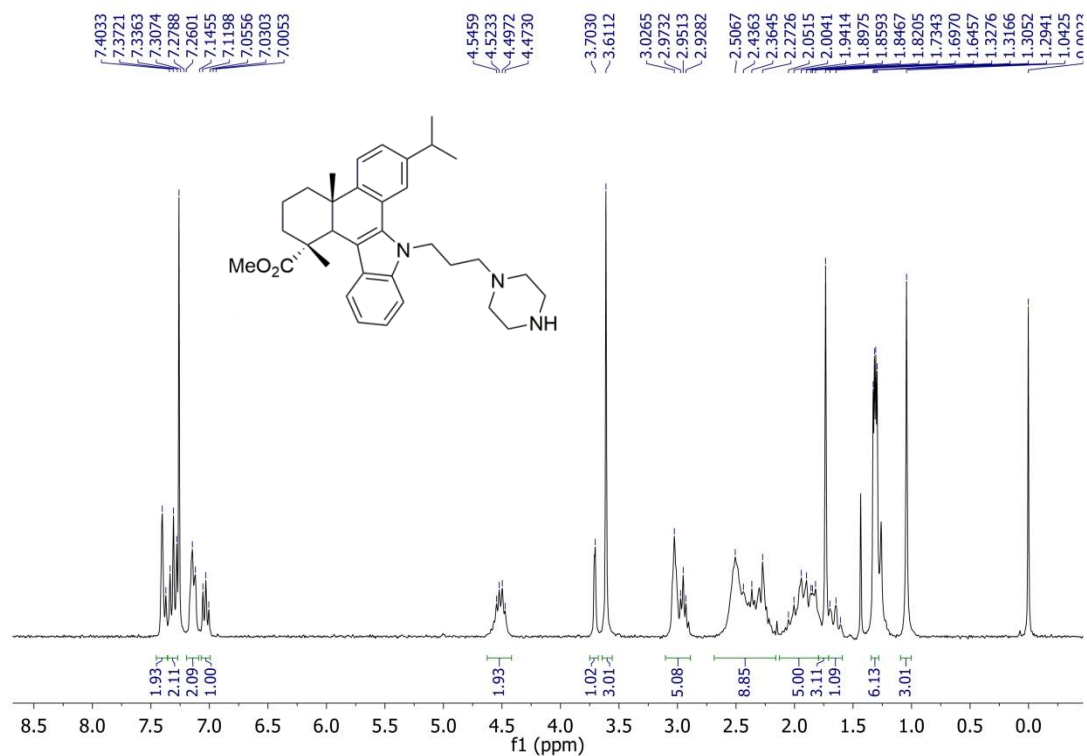


Fig. S17. ¹H-NMR spectrum of compound 7a (300 MHz, CDCl₃)

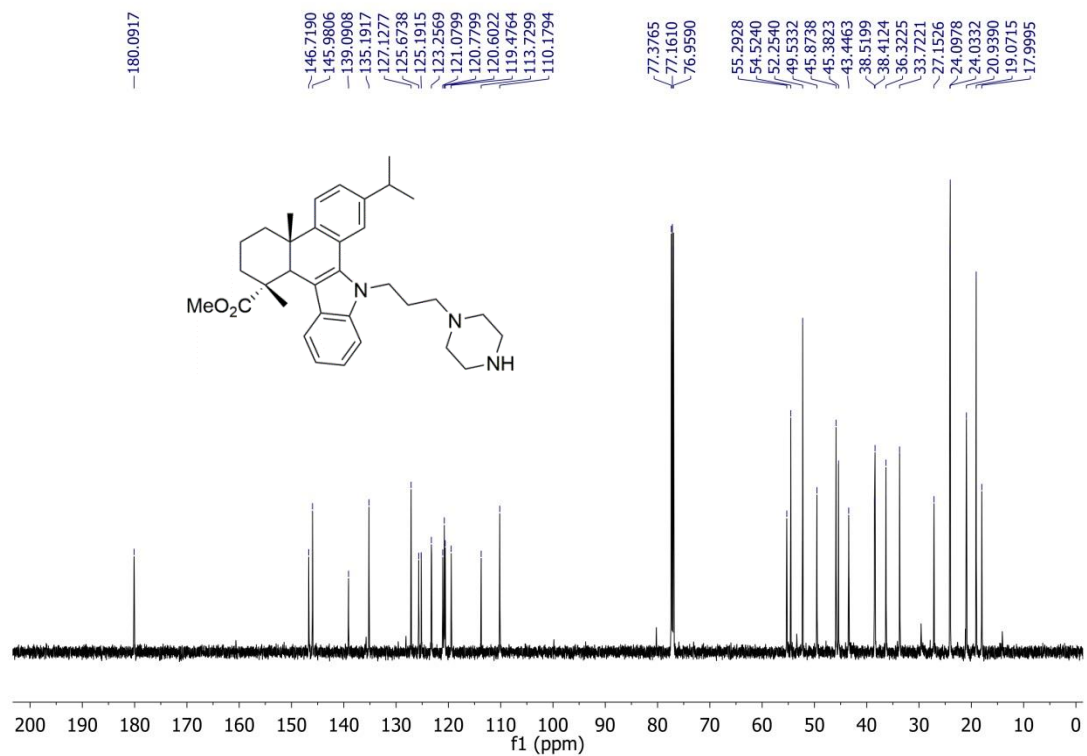


Fig. S18. ¹³C-NMR spectrum of compound 7a (150 MHz, CDCl₃)

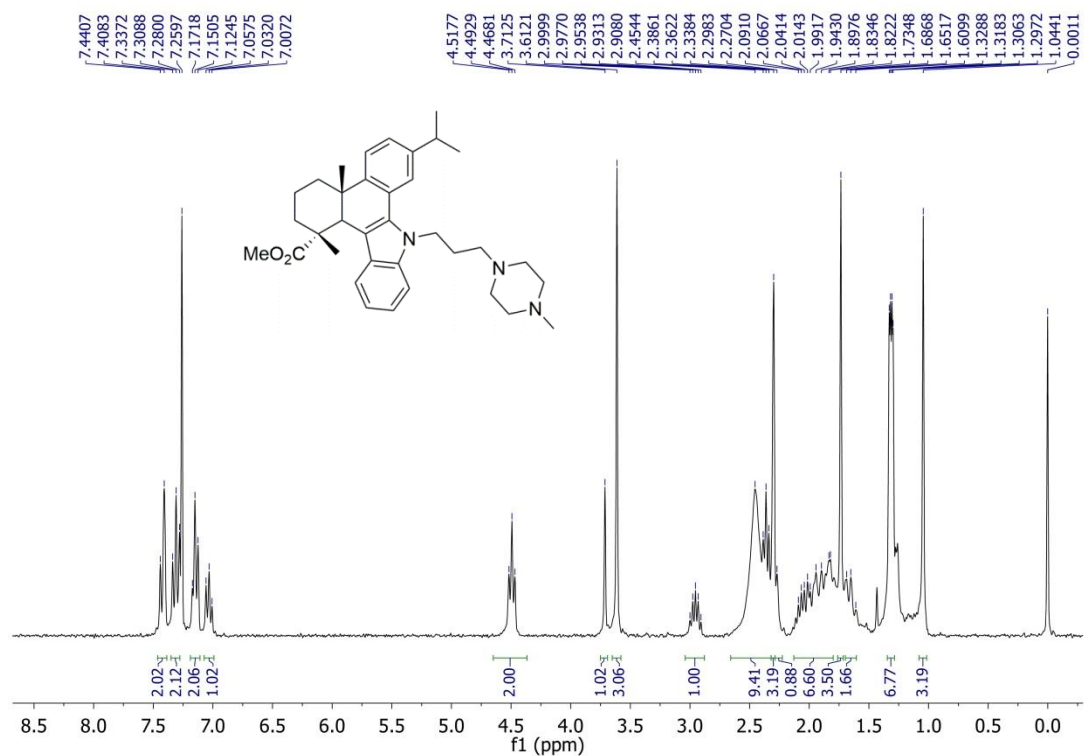


Fig. S19. ¹H-NMR spectrum of compound **7b** (300 MHz, CDCl₃)

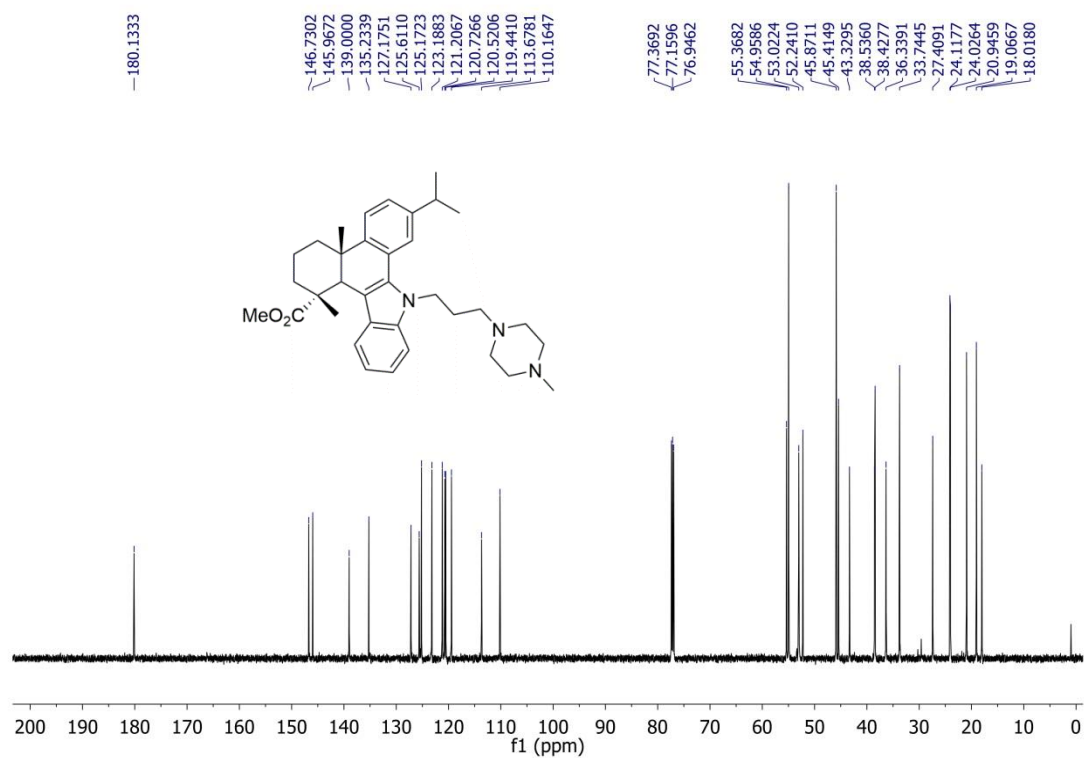


Fig. S20. ¹³C-NMR spectrum of compound **7b** (150 MHz, CDCl₃)

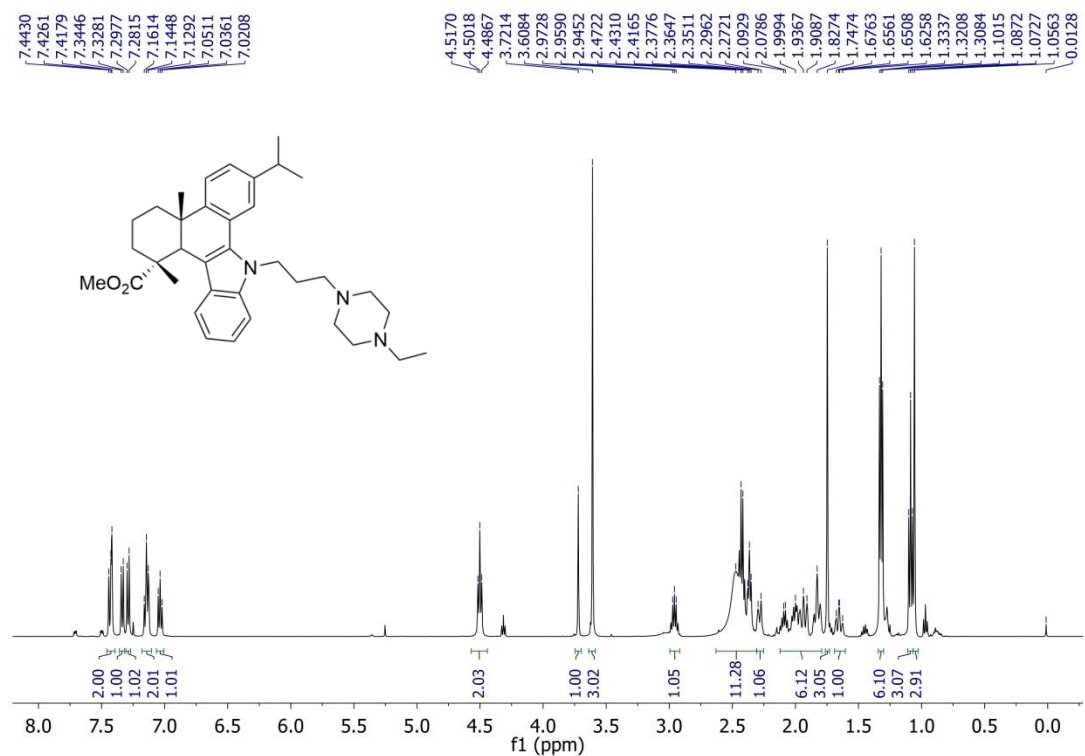


Fig. S21. ¹H-NMR spectrum of compound 7c (500 MHz, CDCl₃)

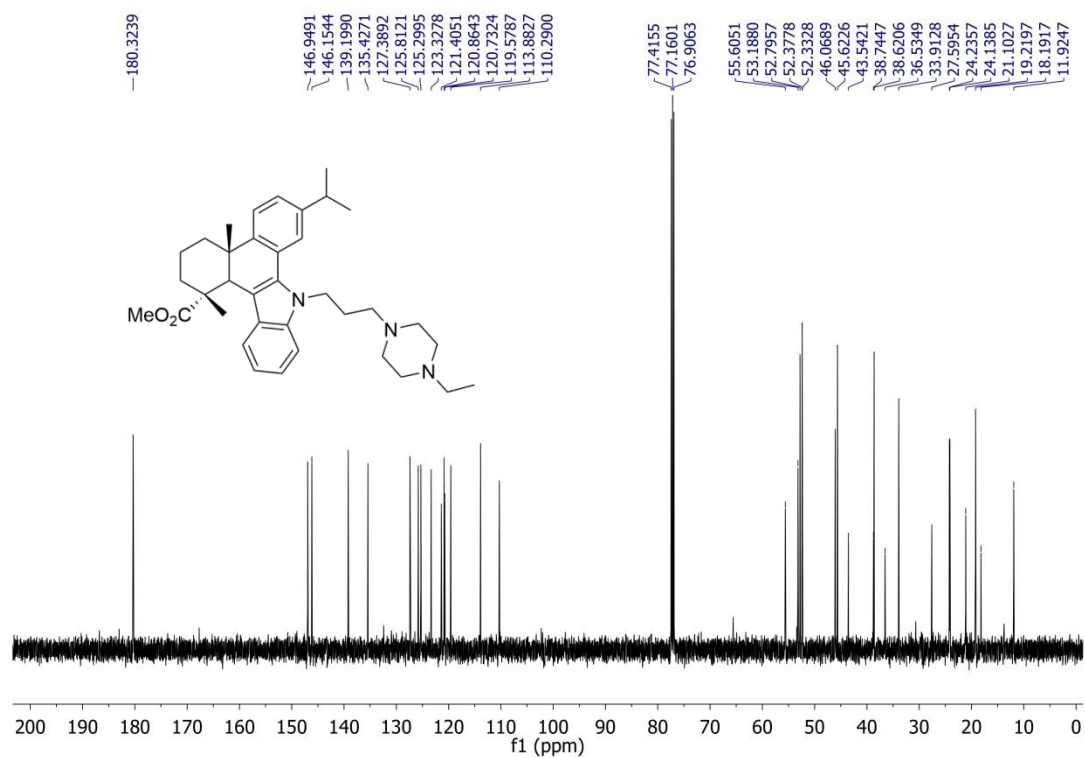


Fig. S22. ¹³C-NMR spectrum of compound 7c (125 MHz, CDCl₃)

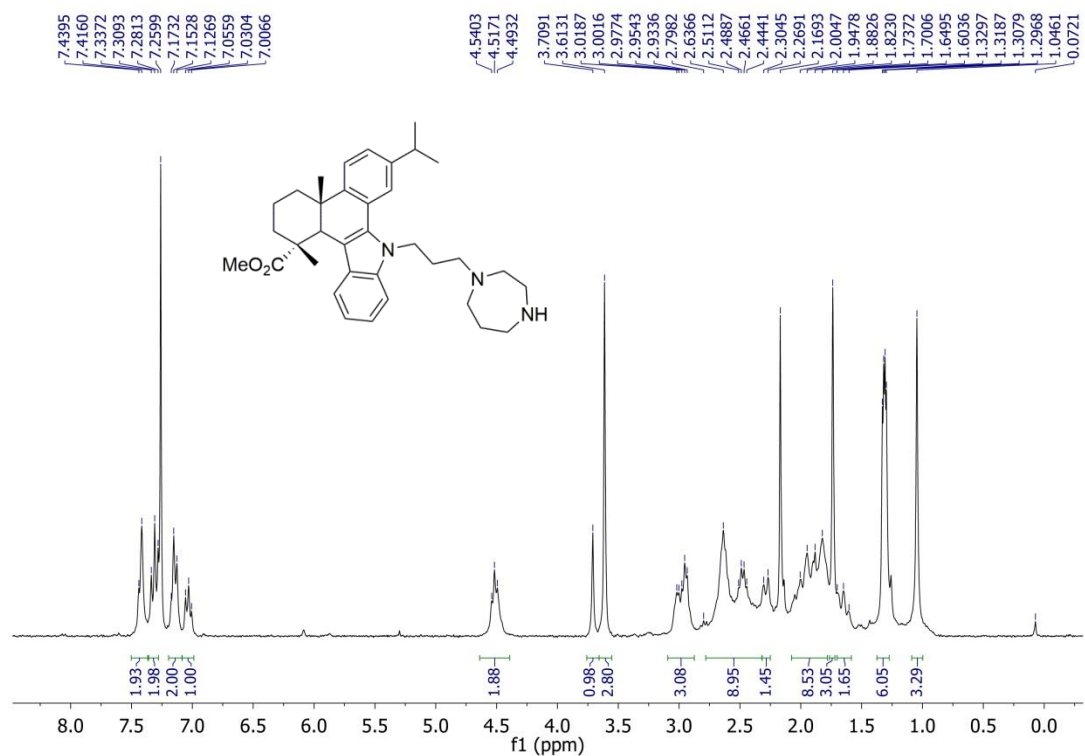


Fig. S23. ¹H-NMR spectrum of compound 7d (300 MHz, CDCl₃)

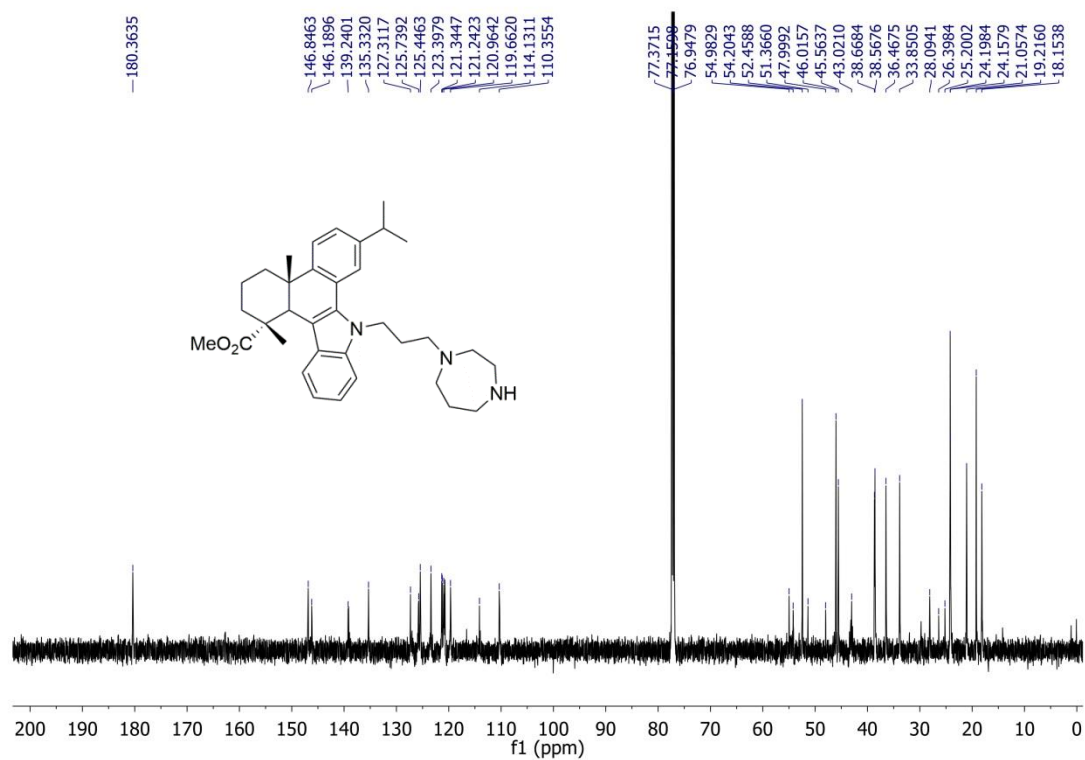


Fig. S24. ¹³C-NMR spectrum of compound 7d (150 MHz, CDCl₃)

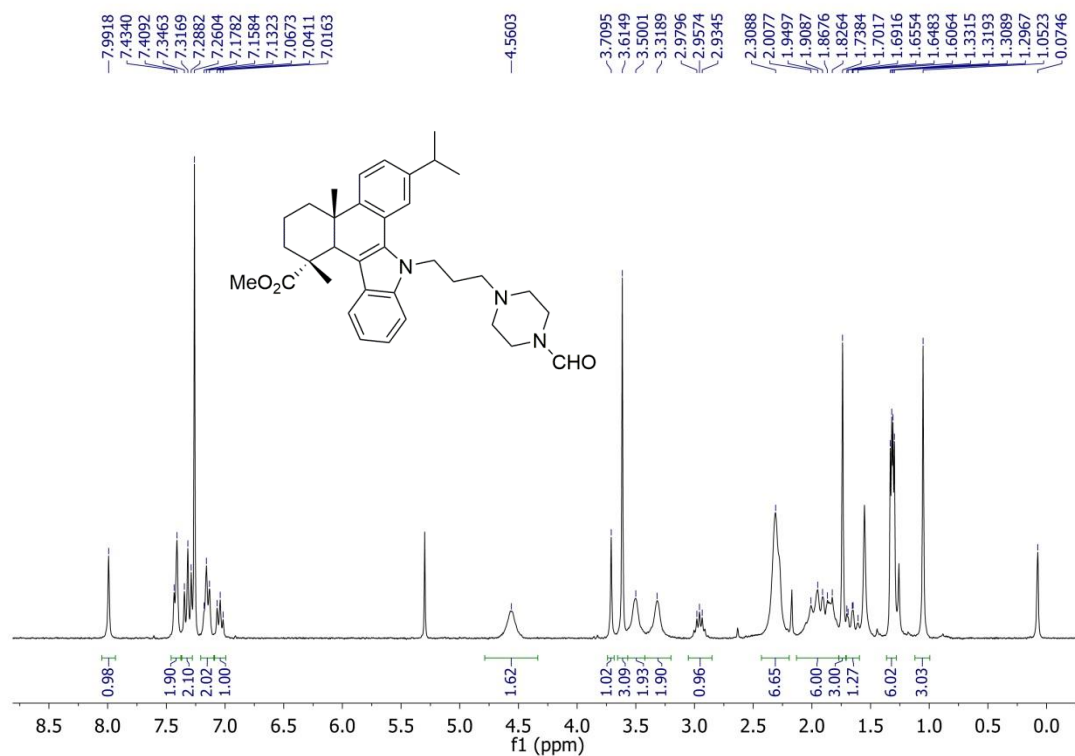


Fig. S25. ¹H-NMR spectrum of compound 7e (300 MHz, CDCl₃)

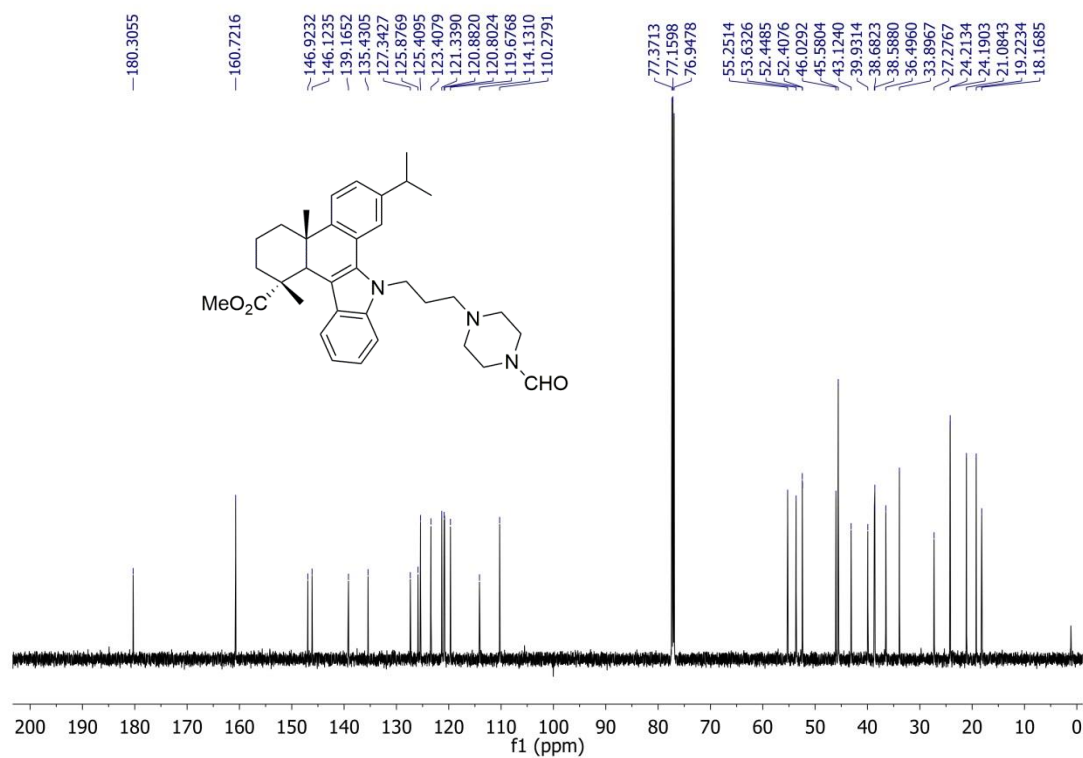


Fig. S26. ¹³C-NMR spectrum of compound 7e (150 MHz, CDCl₃)

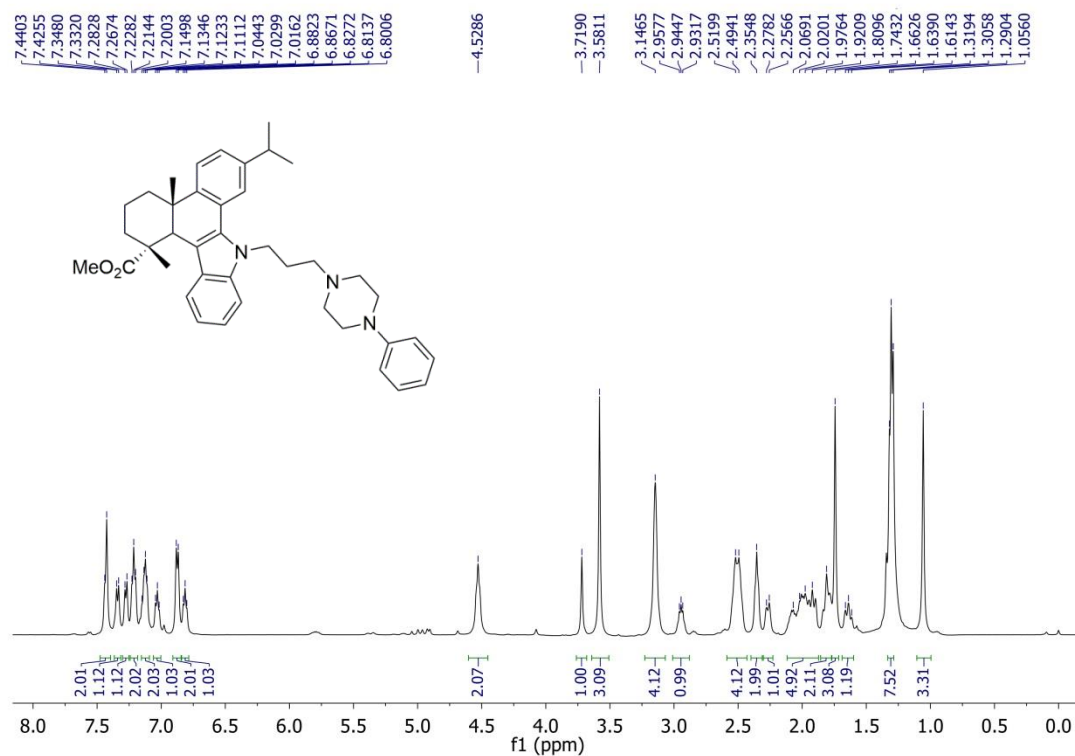


Fig. S27. ¹H-NMR spectrum of compound **7f** (500 MHz, CDCl₃)

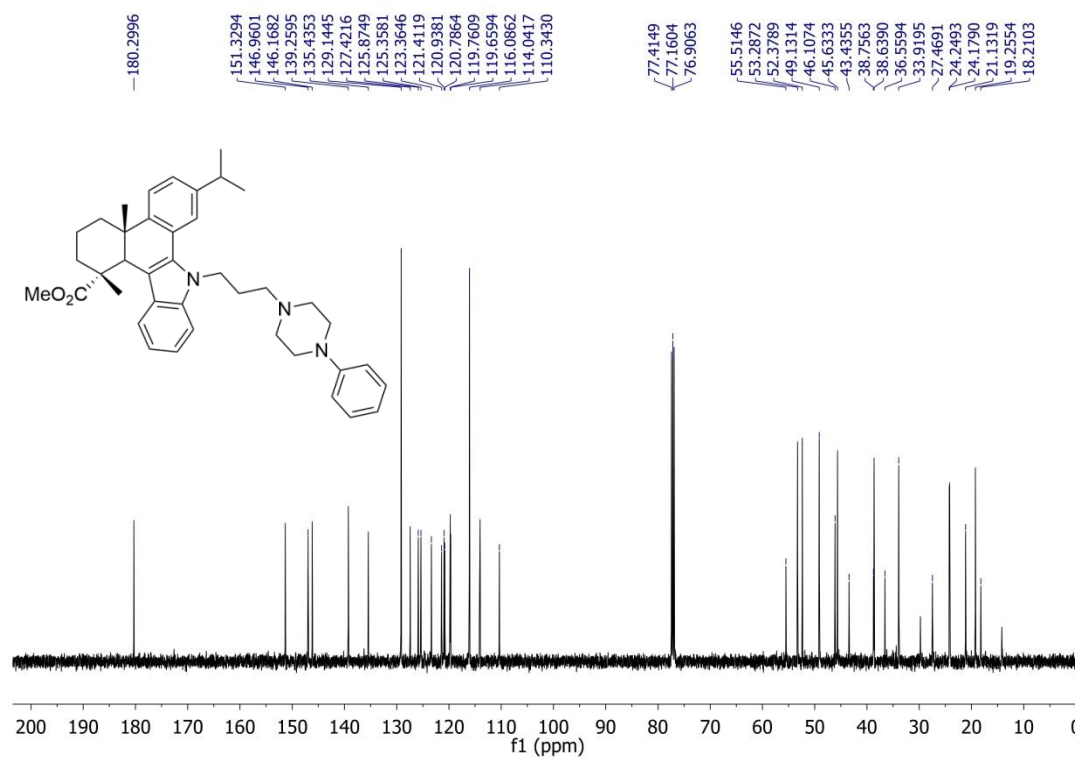


Fig. S28. ¹³C-NMR spectrum of compound **7f** (125 MHz, CDCl₃)

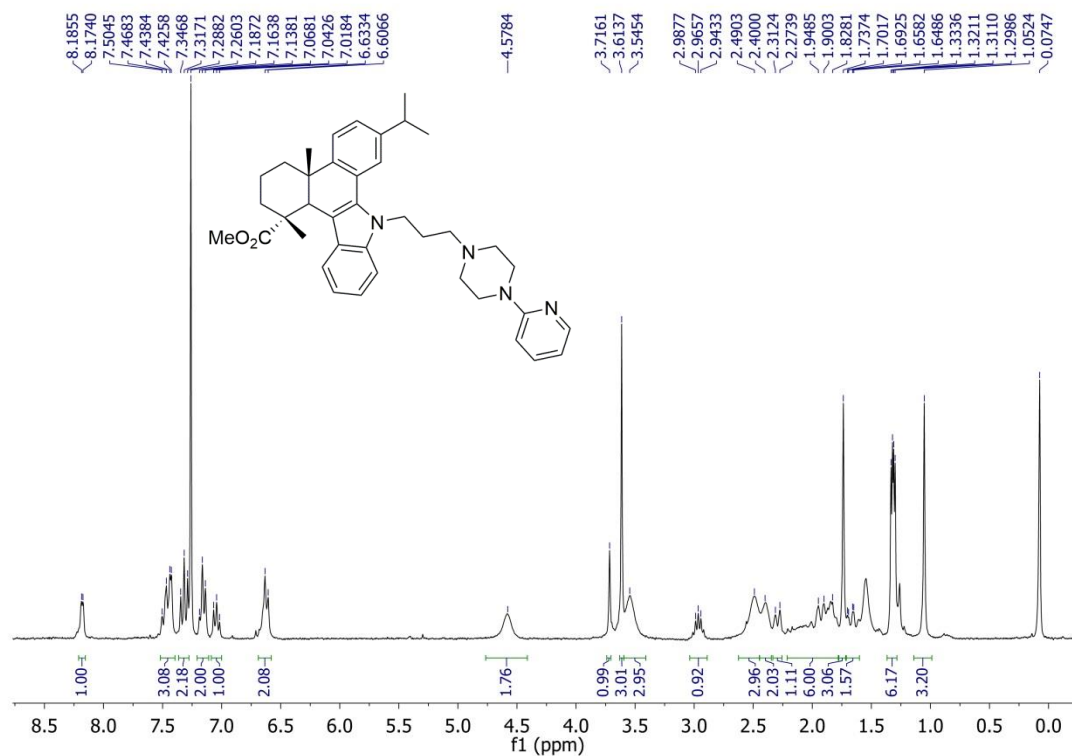


Fig. S29. ¹H-NMR spectrum of compound 7g (300 MHz, CDCl₃)

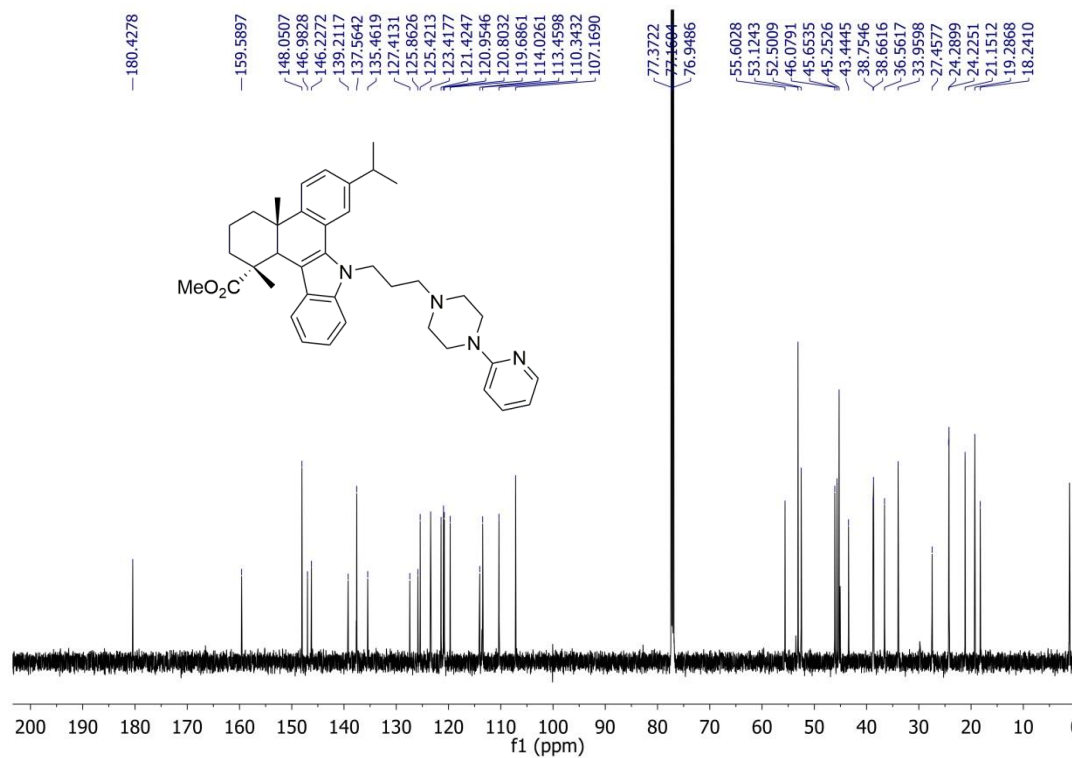


Fig. S30. ¹³C-NMR spectrum of compound 7g (150 MHz, CDCl₃)

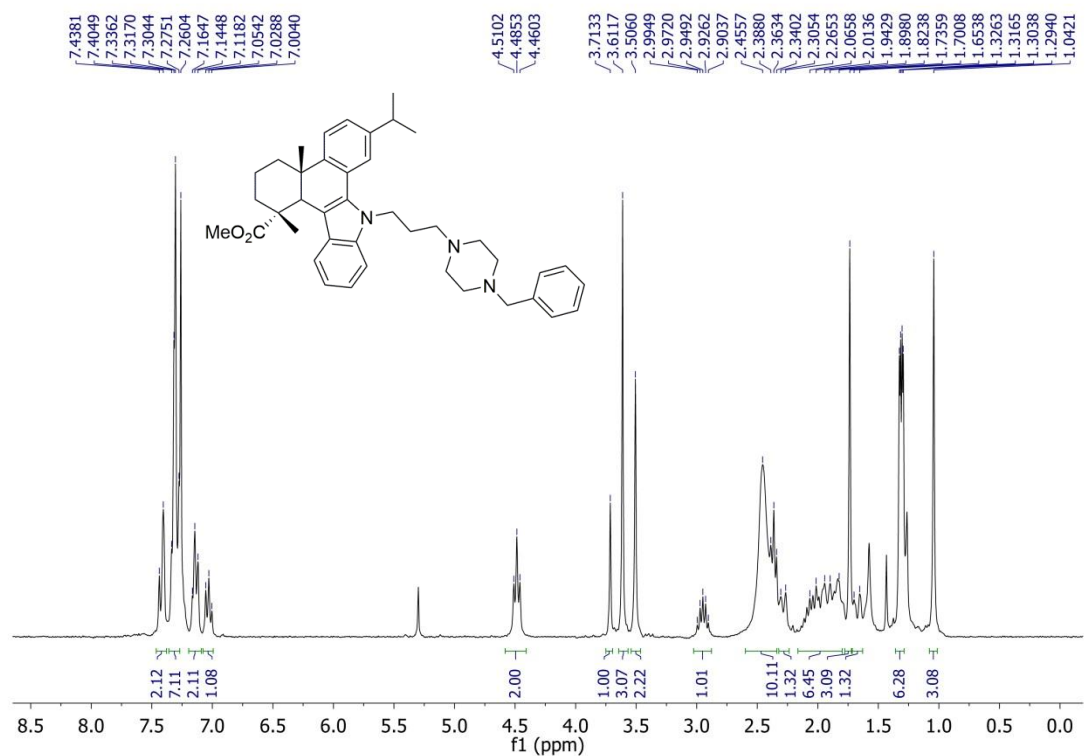


Fig. S31. ¹H-NMR spectrum of compound **7h** (300 MHz, CDCl₃)

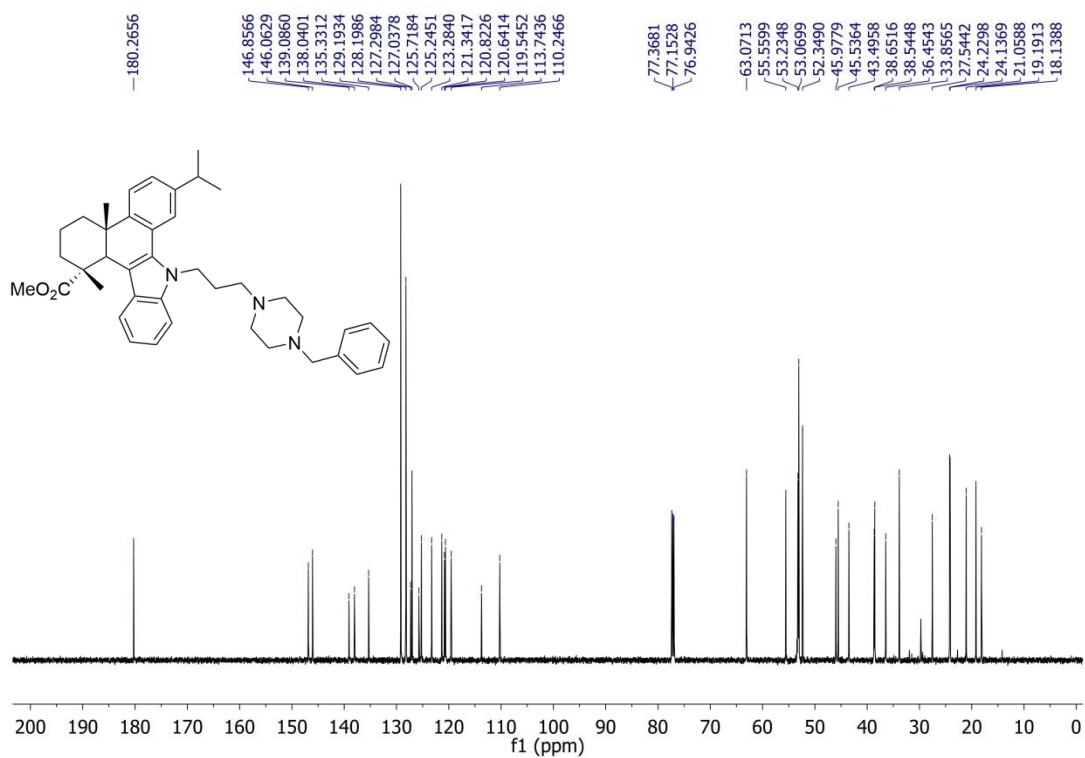


Fig. S32. ¹³C-NMR spectrum of compound **7h** (150 MHz, CDCl₃)

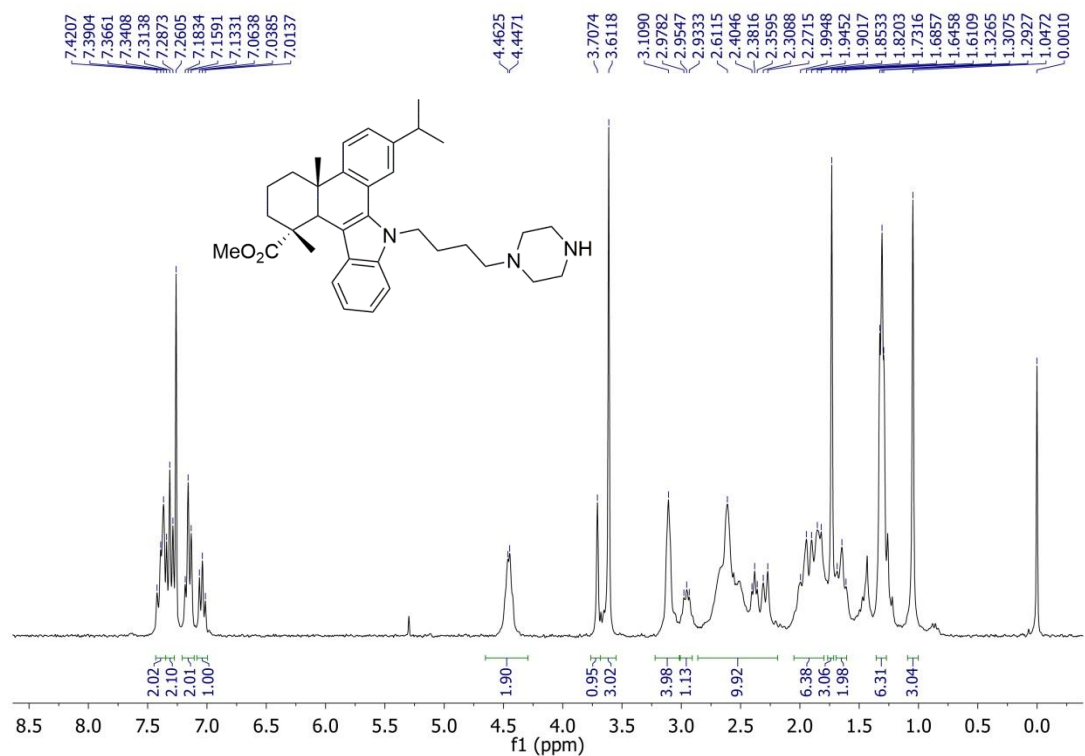


Fig. S33. ¹H-NMR spectrum of compound **8a** (300 MHz, CDCl₃)

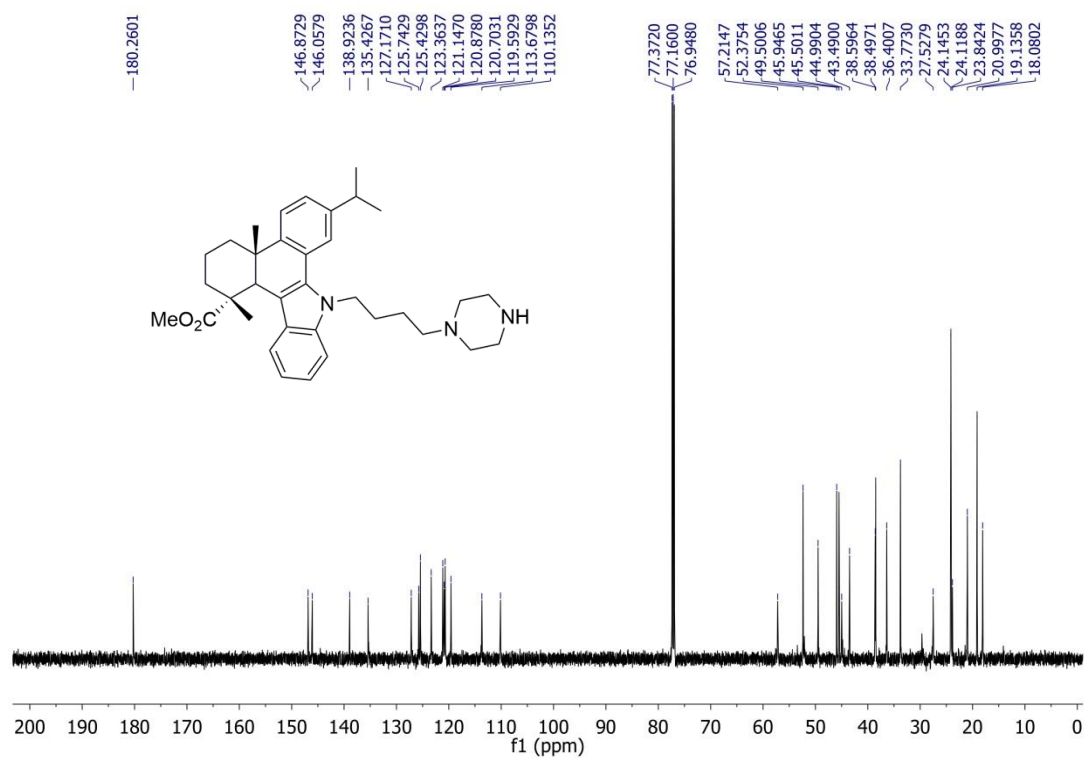


Fig. S34. ¹³C-NMR spectrum of compound **8a** (150 MHz, CDCl₃)

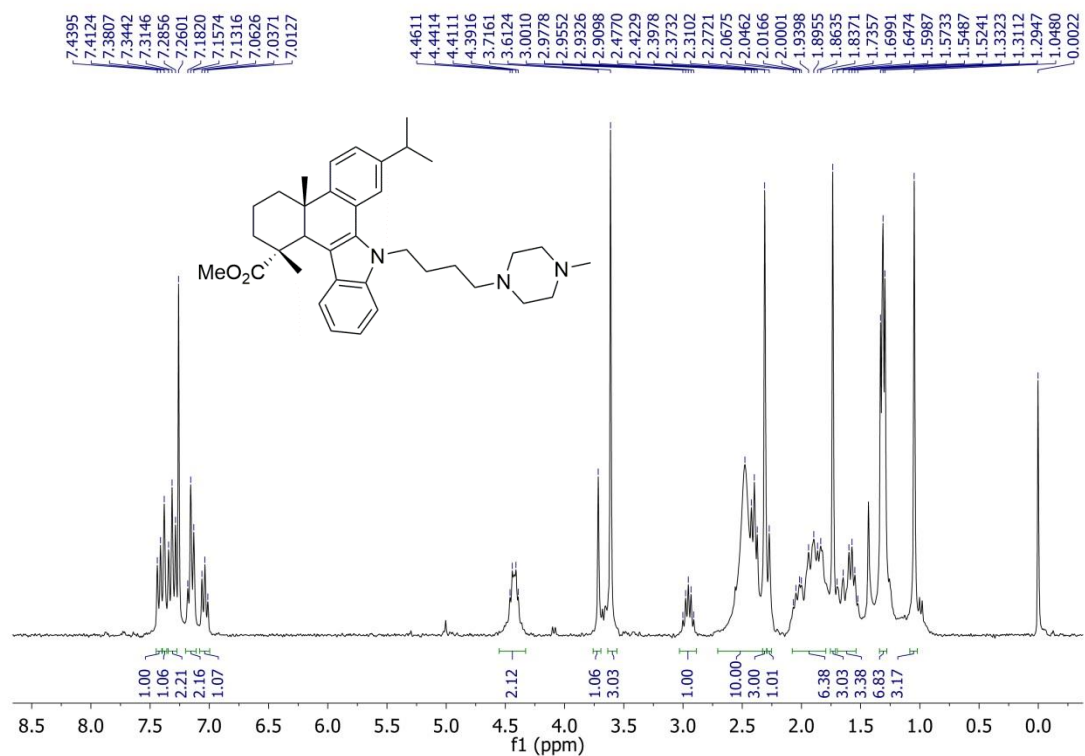


Fig. S35. ¹H-NMR spectrum of compound **8b** (300 MHz, CDCl₃)

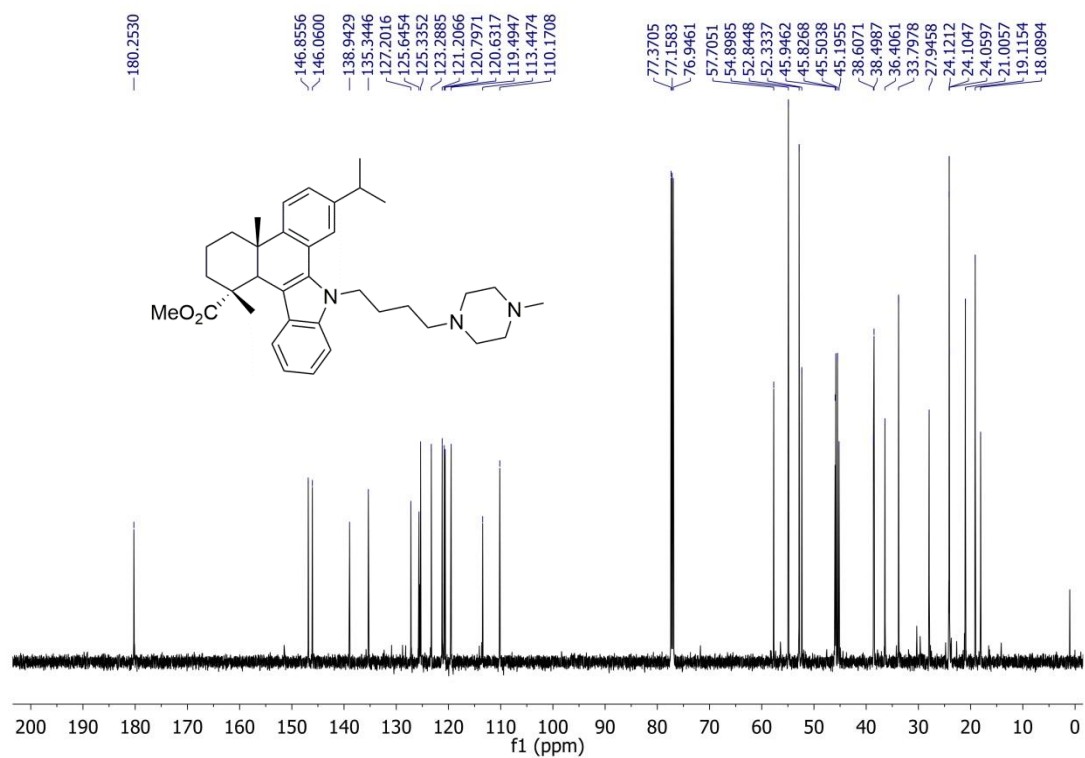


Fig. S36. ¹³C-NMR spectrum of compound **8b** (150 MHz, CDCl₃)

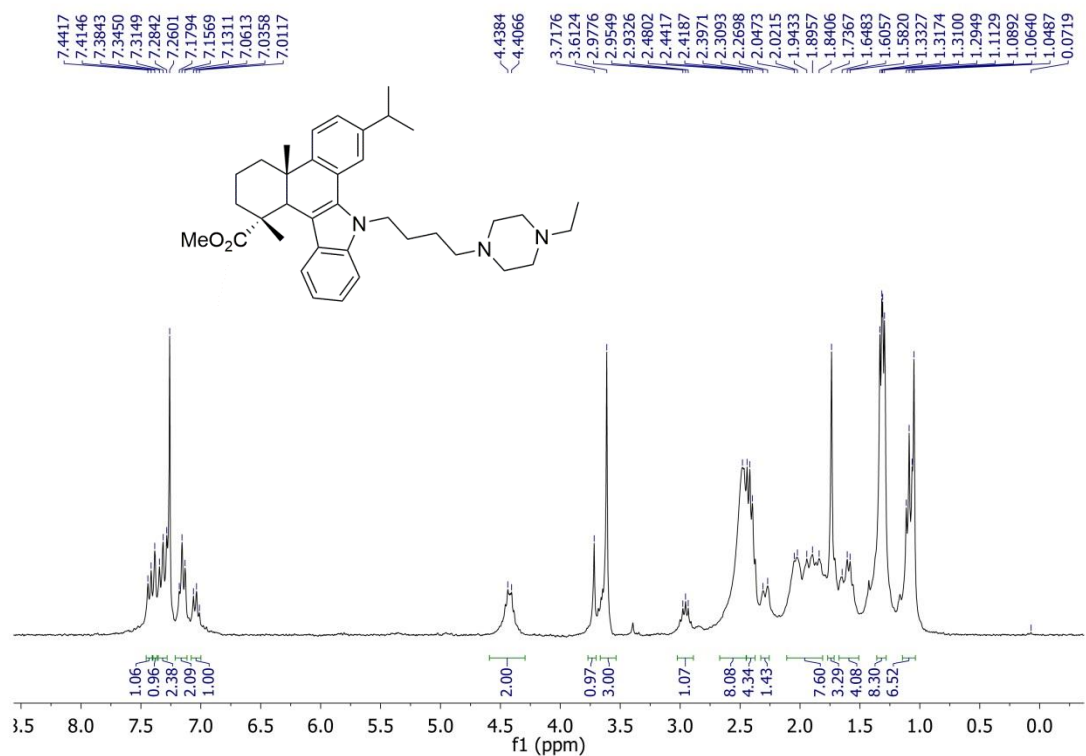


Fig. S37. ¹H-NMR spectrum of compound **8c** (300 MHz, CDCl₃)

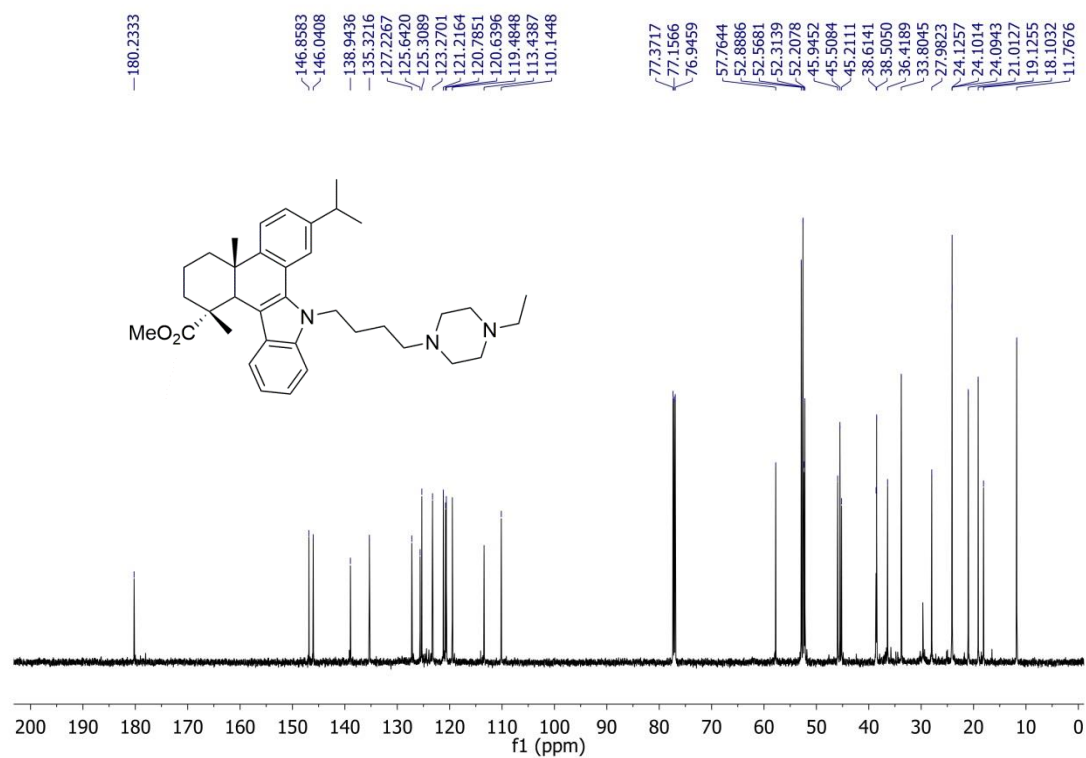


Fig. S38. ¹³C-NMR spectrum of compound **8c** (150 MHz, CDCl₃)

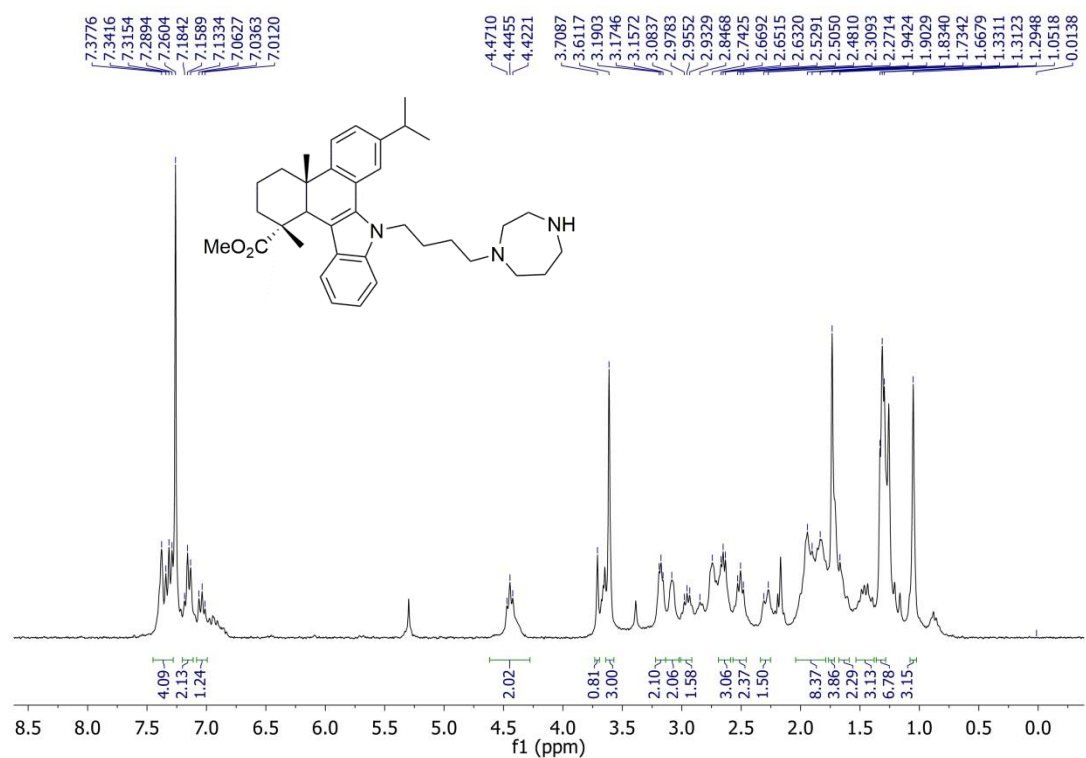


Fig. S39. ¹H-NMR spectrum of compound **8d** (300 MHz, CDCl₃)

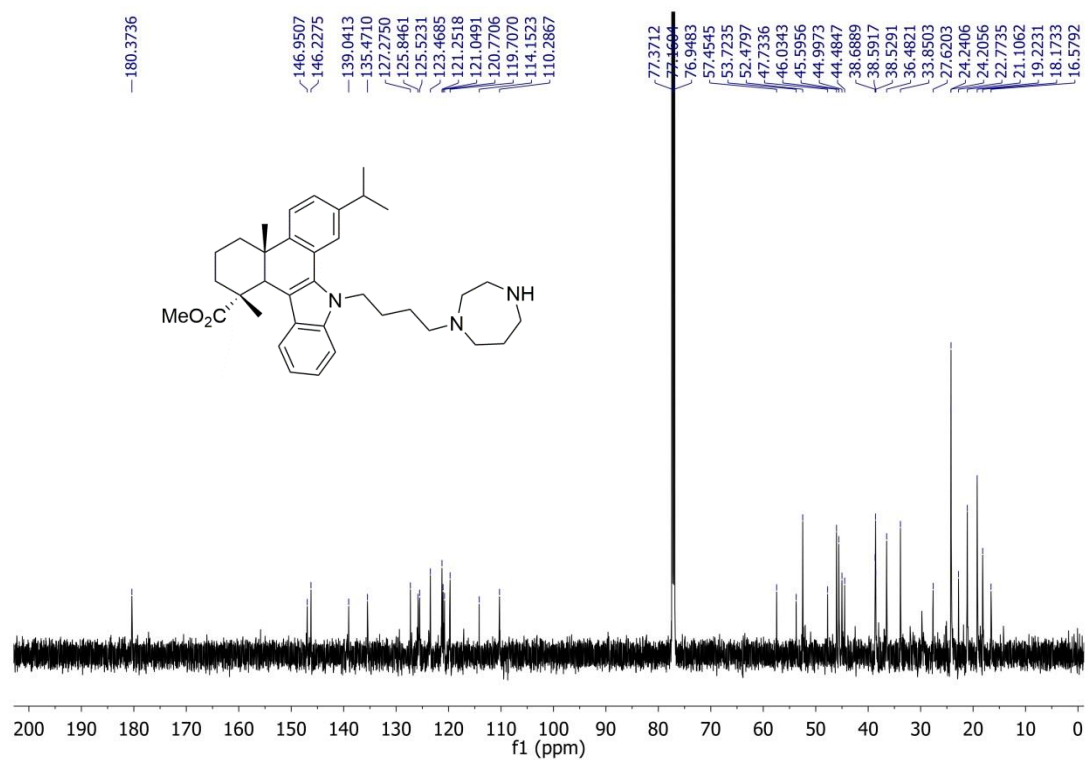


Fig. S40. ¹³C-NMR spectrum of compound **8d** (150 MHz, CDCl₃)

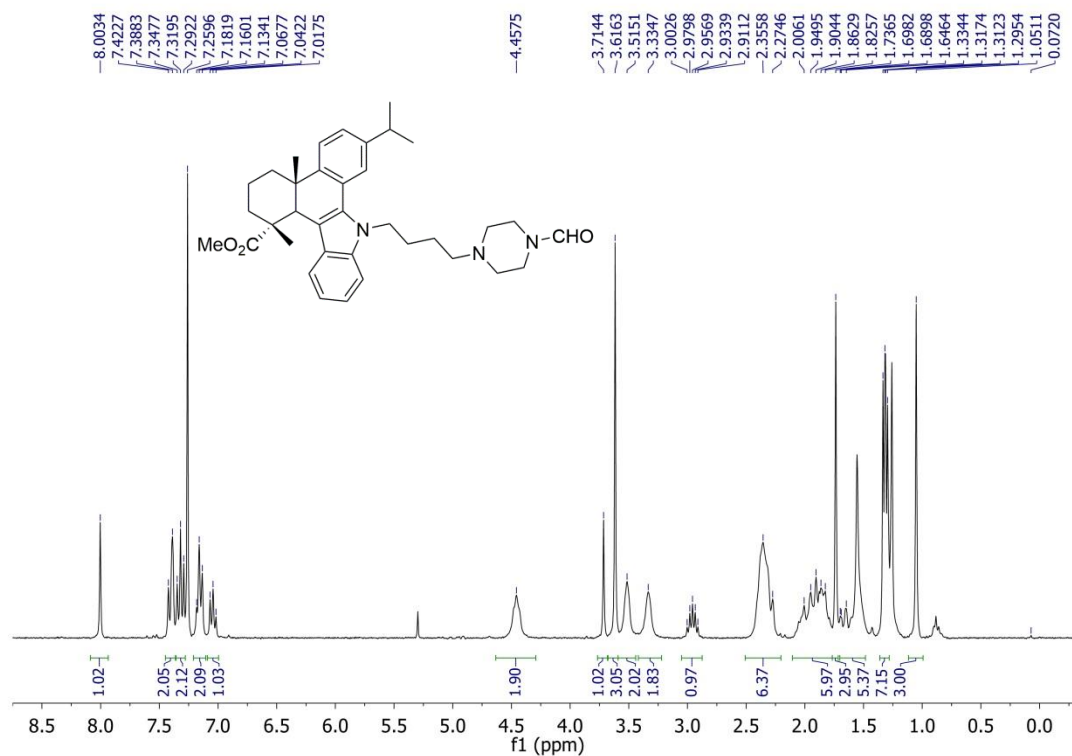


Fig. S41. ¹H-NMR spectrum of compound **8e** (300 MHz, CDCl₃)

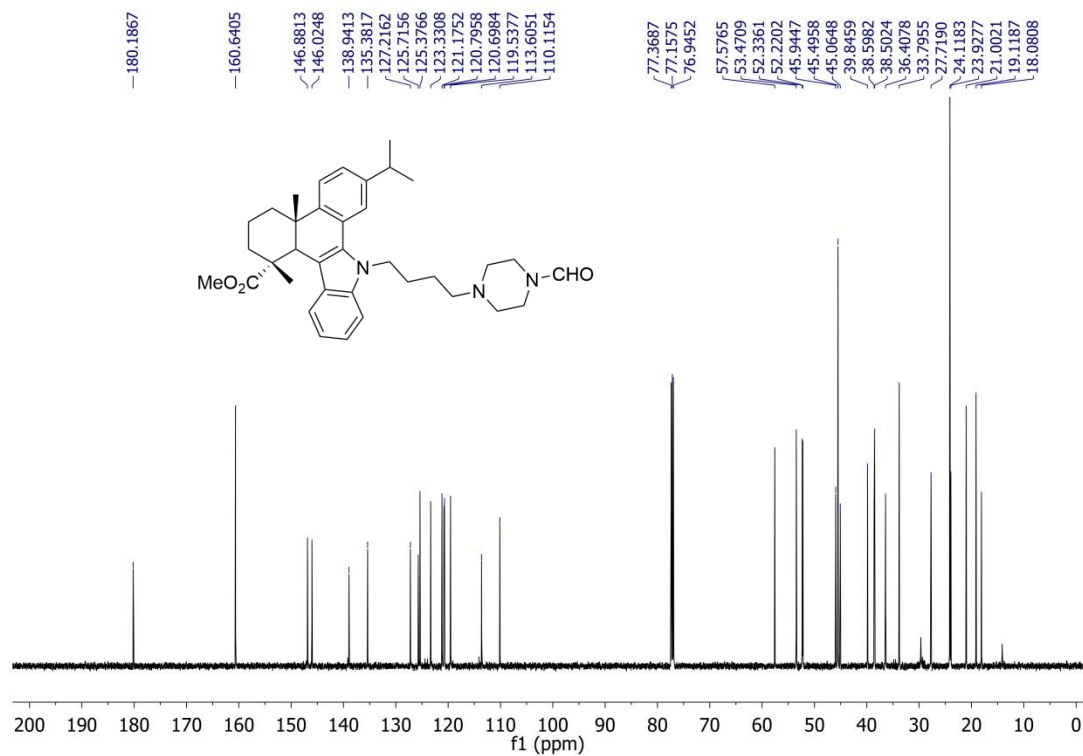


Fig. S42. ¹³C-NMR spectrum of compound **8e** (150 MHz, CDCl₃)

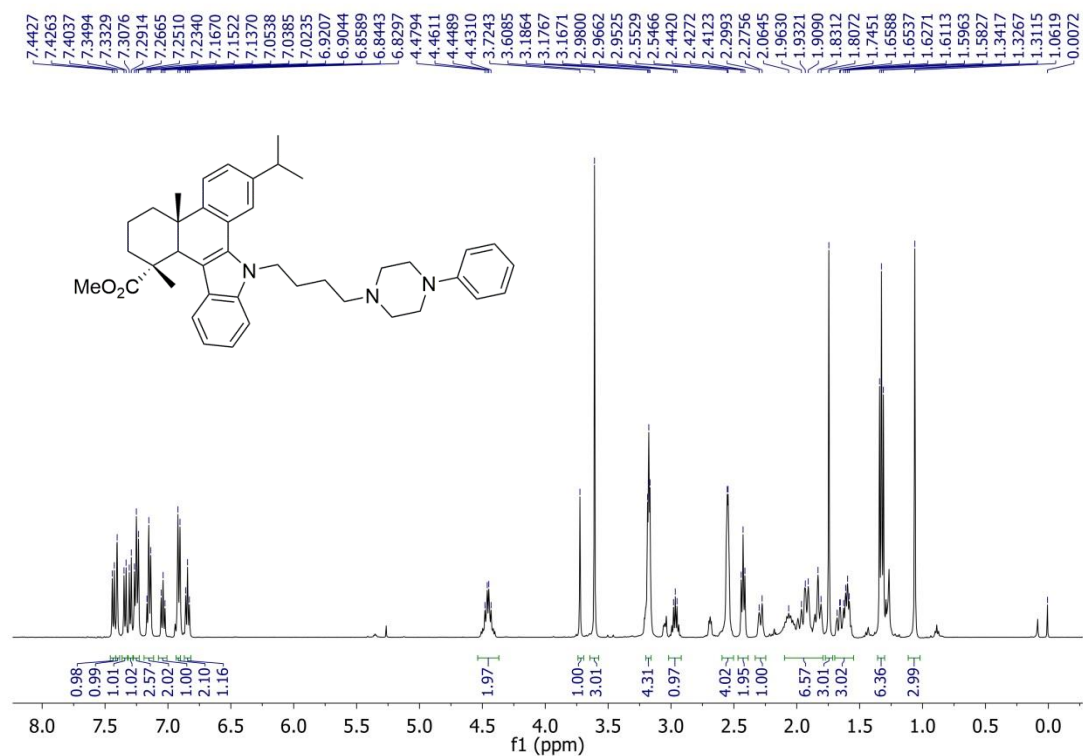


Fig. S43. ¹H-NMR spectrum of compound **8f** (500 MHz, CDCl₃)

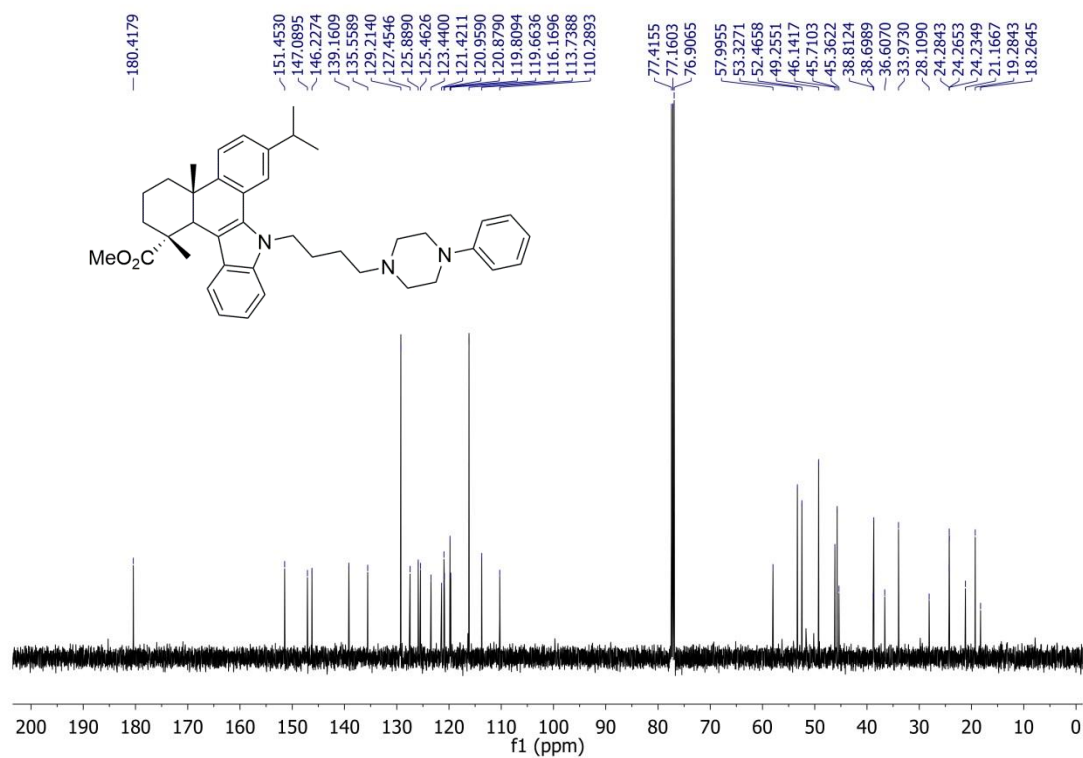


Fig. S44. ¹³C-NMR spectrum of compound **8f** (125 MHz, CDCl₃)

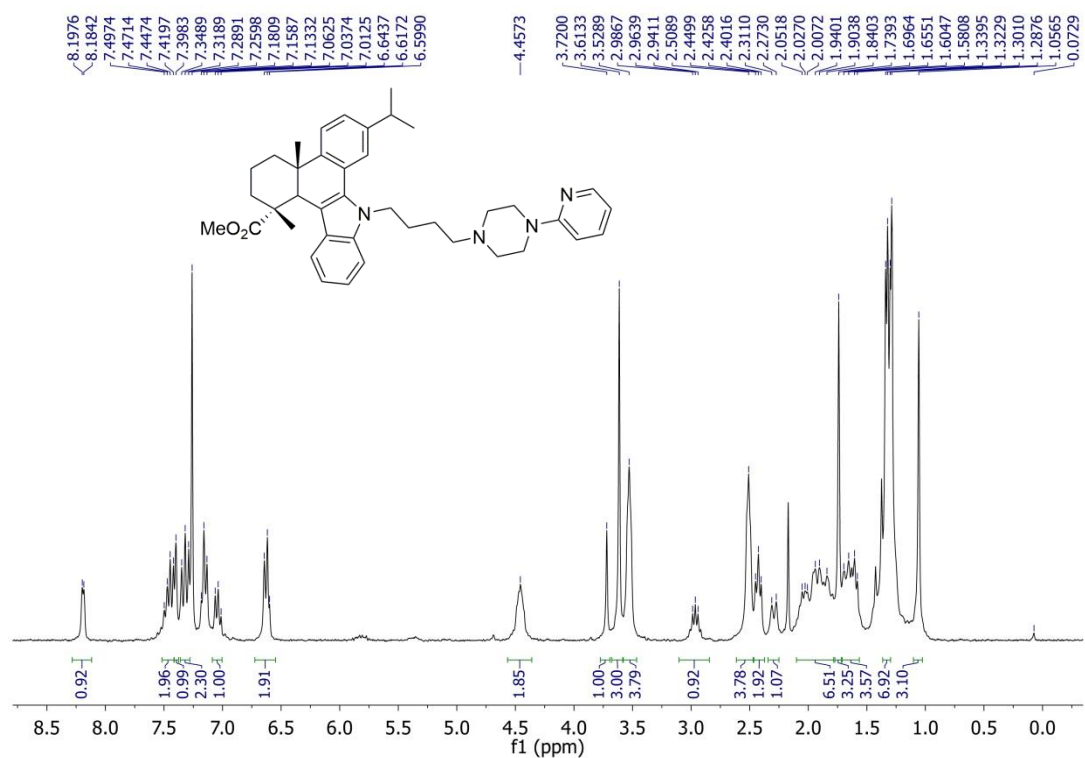


Fig. S45. ¹H-NMR spectrum of compound **8g** (300 MHz, CDCl₃)

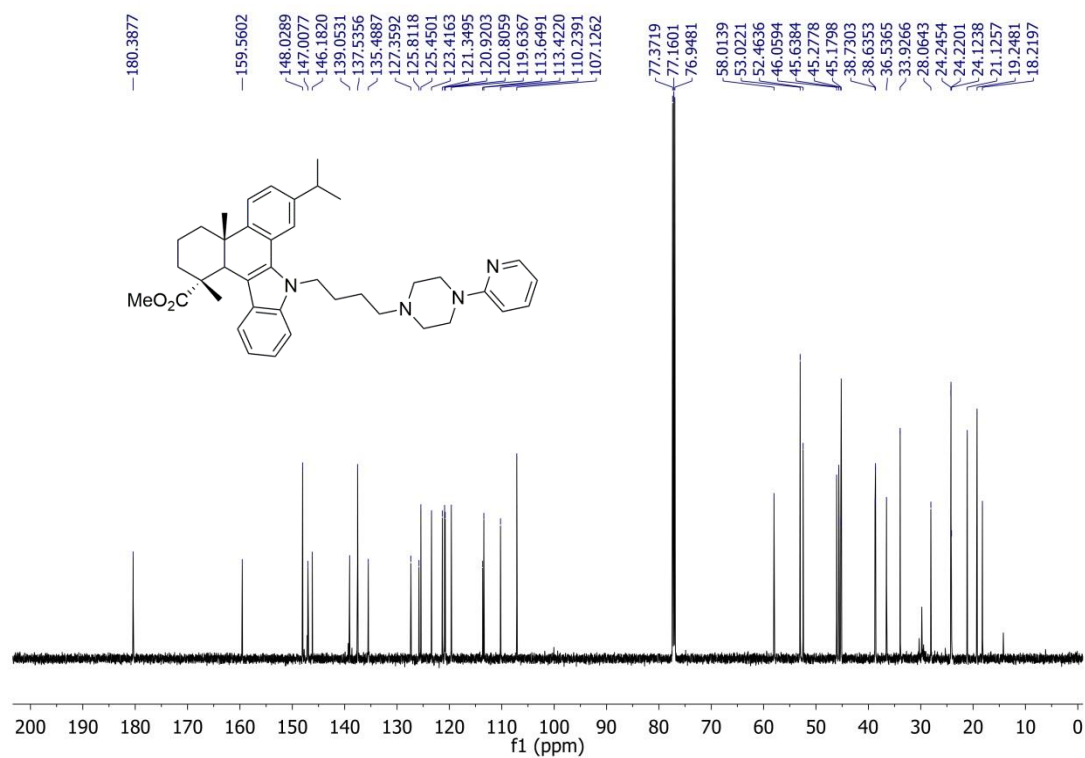


Fig. S46. ¹³C-NMR spectrum of compound **8g** (150 MHz, CDCl₃)

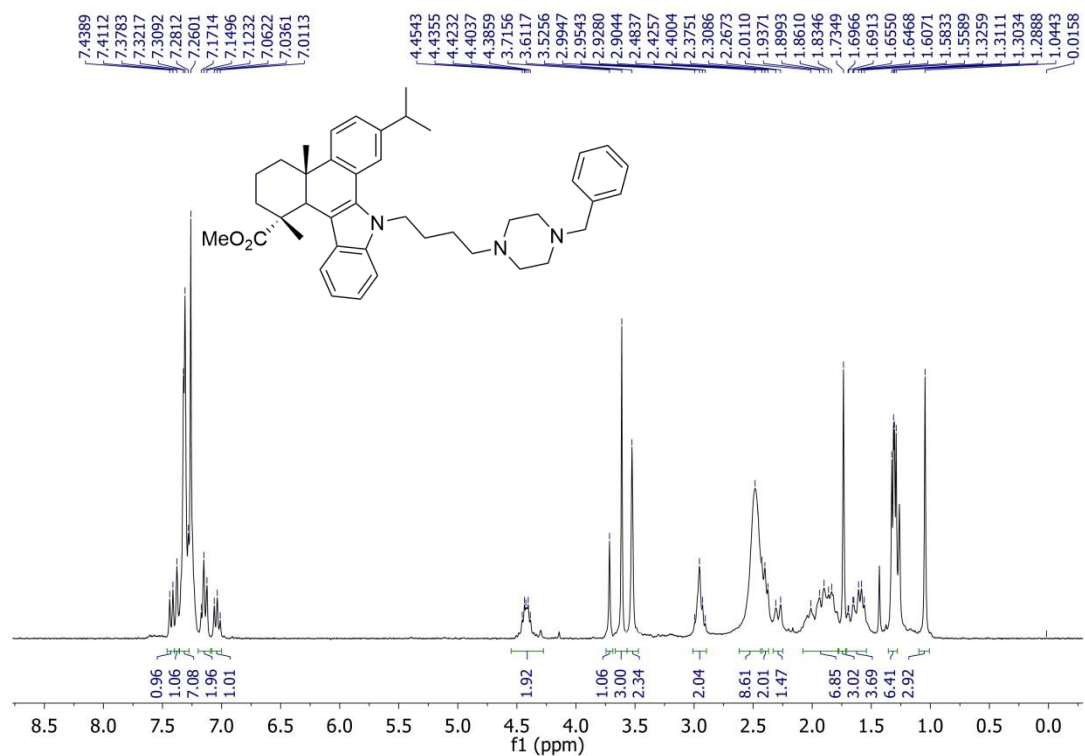


Fig. S47. ¹H-NMR spectrum of compound **8h** (300 MHz, CDCl₃)

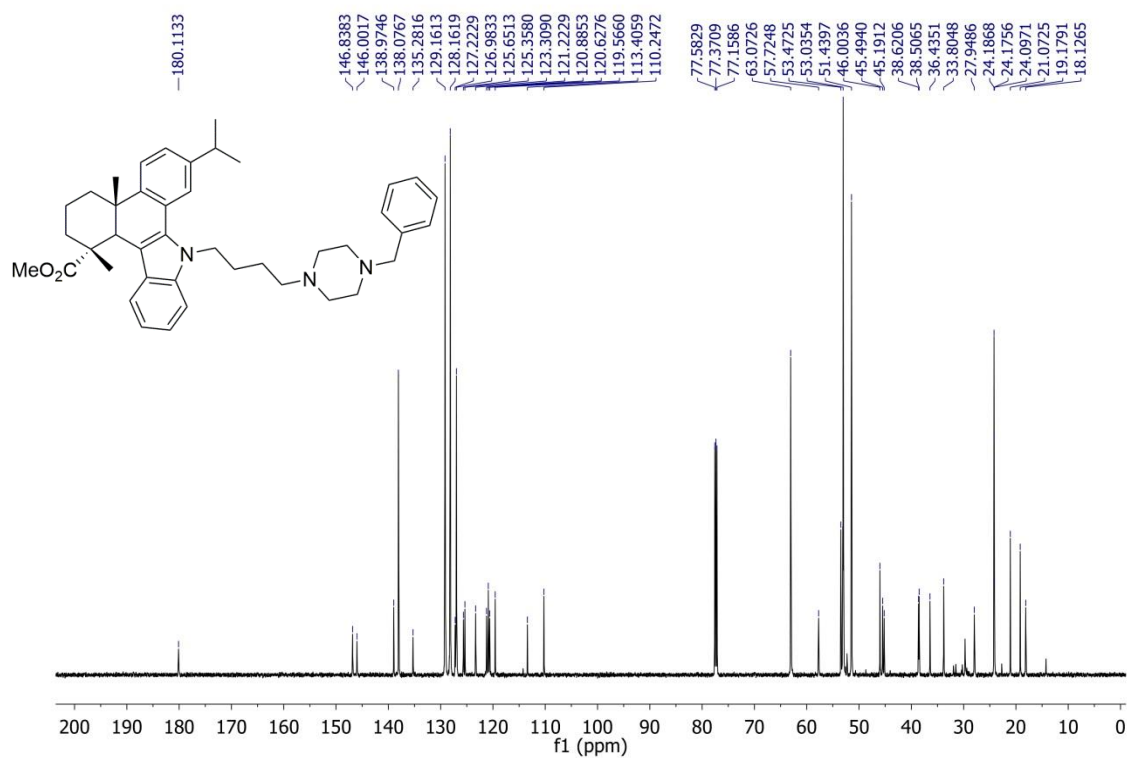


Fig. S48. ¹³C-NMR spectrum of compound **8h** (150 MHz, CDCl₃)

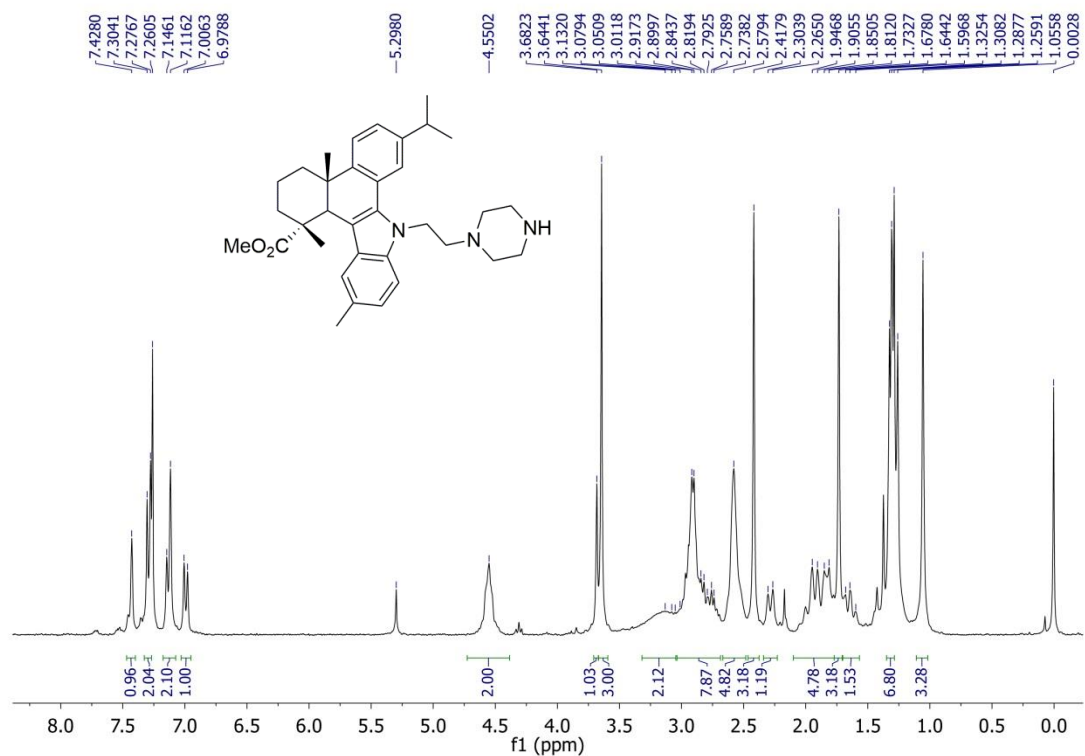


Fig. S49. ¹H-NMR spectrum of compound 10a (300 MHz, CDCl₃)

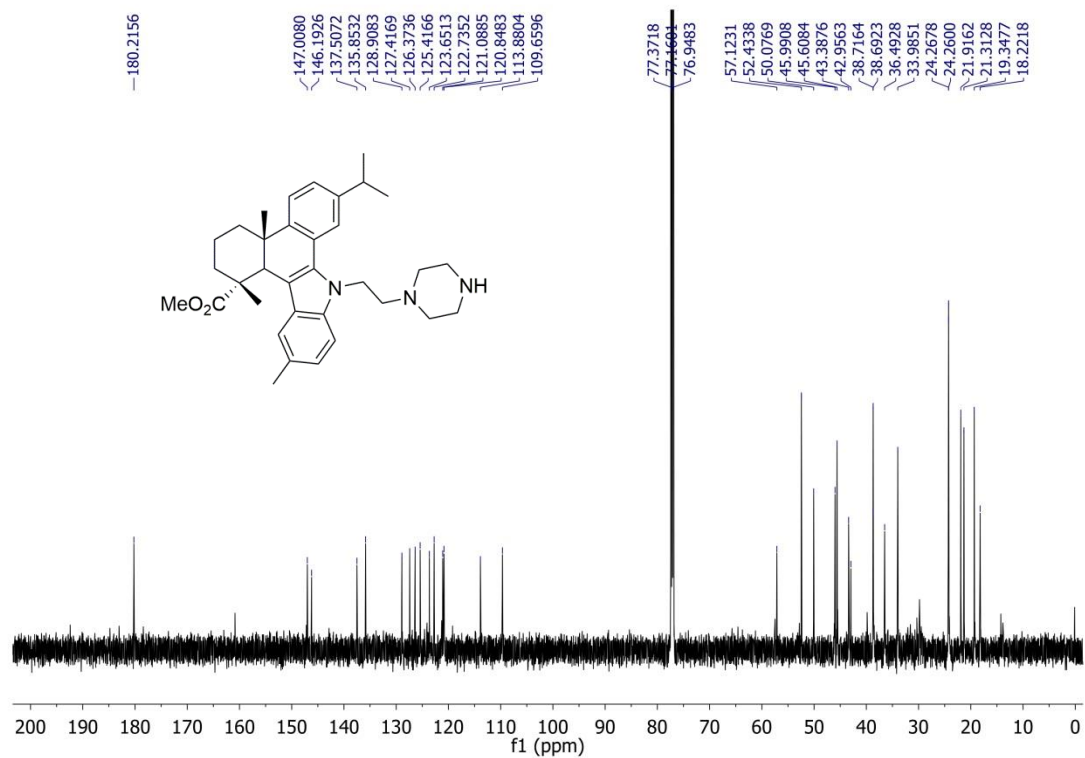


Fig. S50. ¹³C-NMR spectrum of compound 10a (150 MHz, CDCl₃)

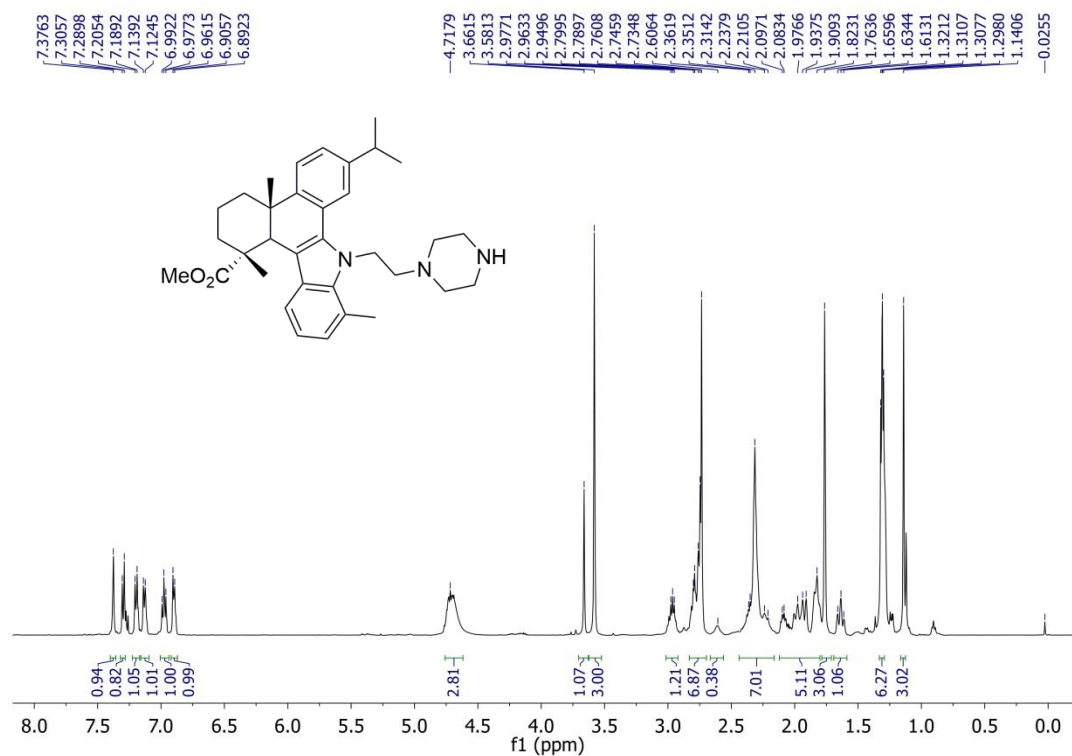


Fig. S51. ¹H-NMR spectrum of compound **10b** (500 MHz, CDCl₃)

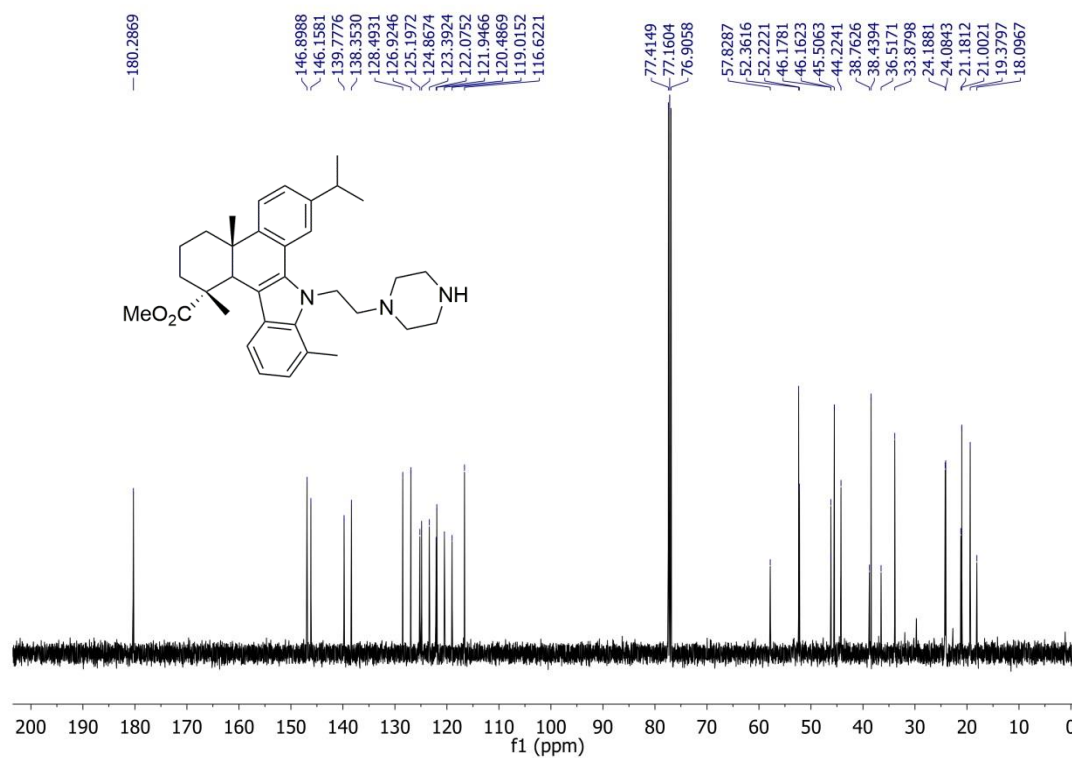


Fig. S52. ¹³C-NMR spectrum of compound **10b** (125 MHz, CDCl₃)

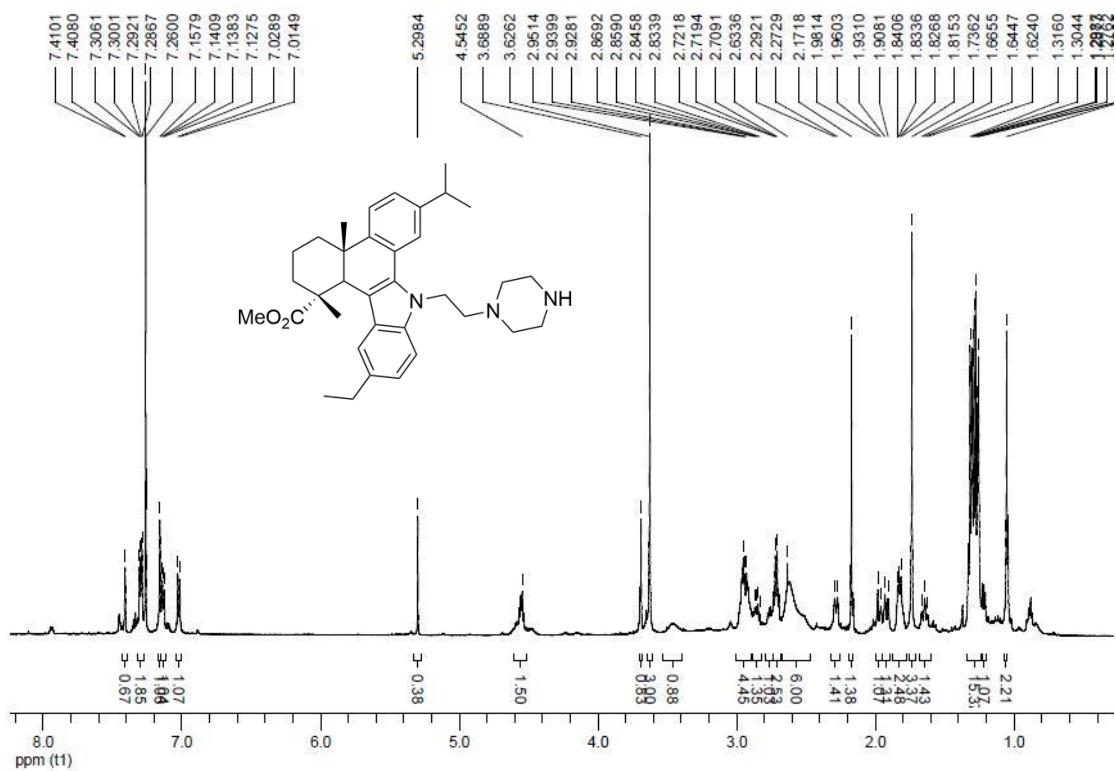


Fig. S53. ¹H-NMR spectrum of compound **10c** (600 MHz, CDCl₃)

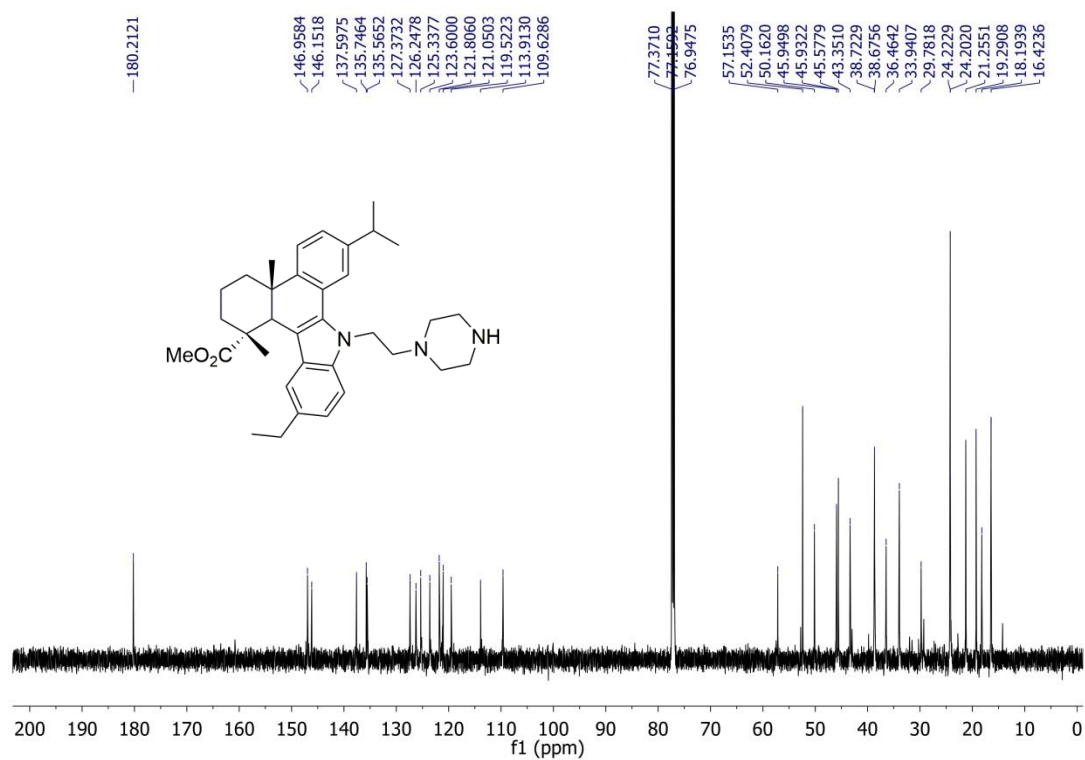


Fig. S54. ¹³C-NMR spectrum of compound **10c** (150 MHz, CDCl₃)

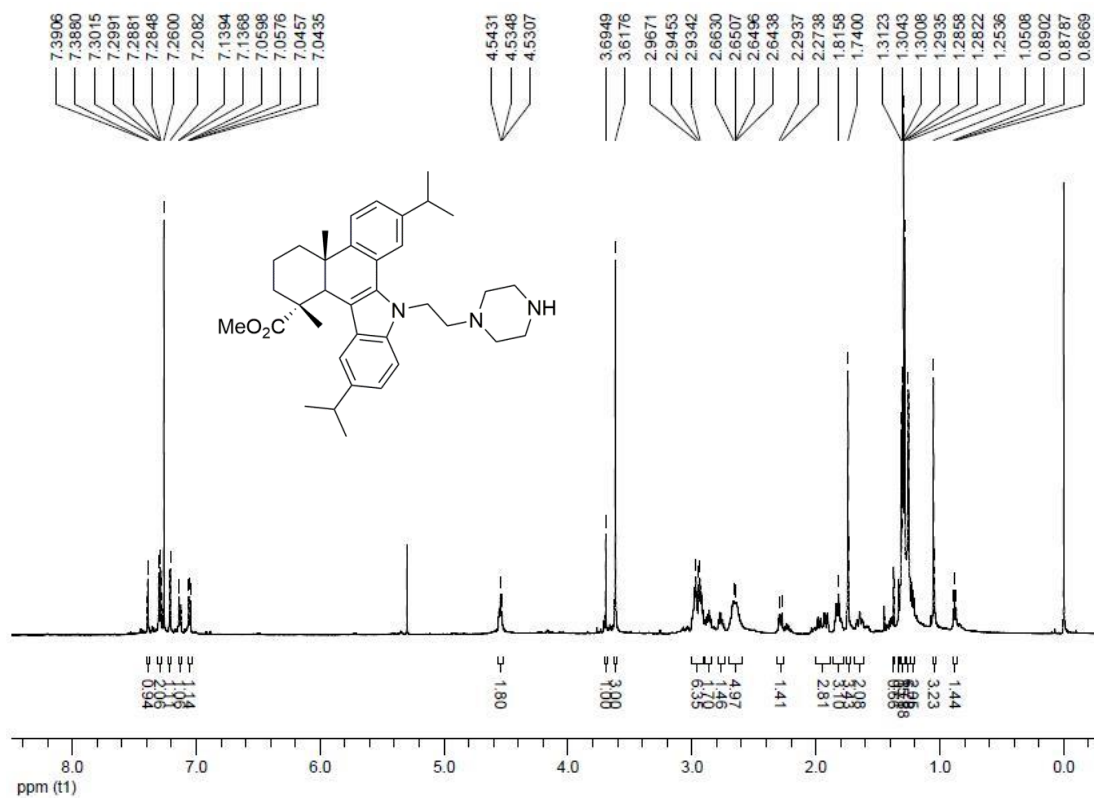


Fig. S55. ¹H-NMR spectrum of compound **10d** (600 MHz, CDCl₃)

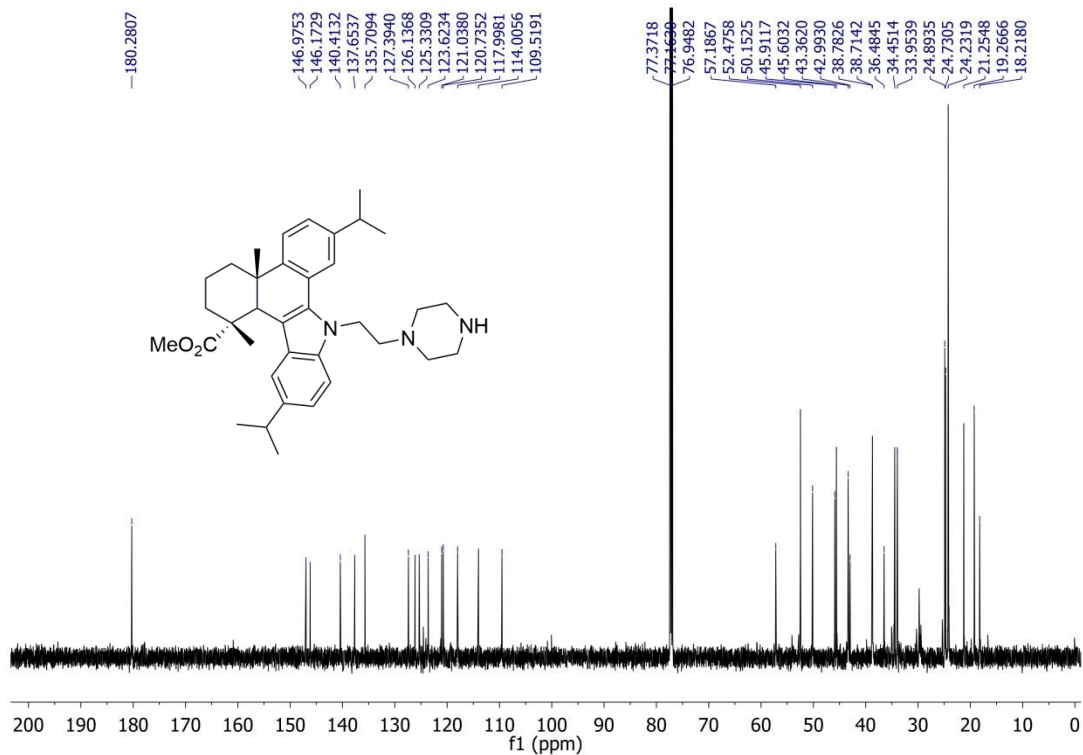


Fig. S56. ^{13}C -NMR spectrum of compound **10d** (150 MHz, CDCl_3)

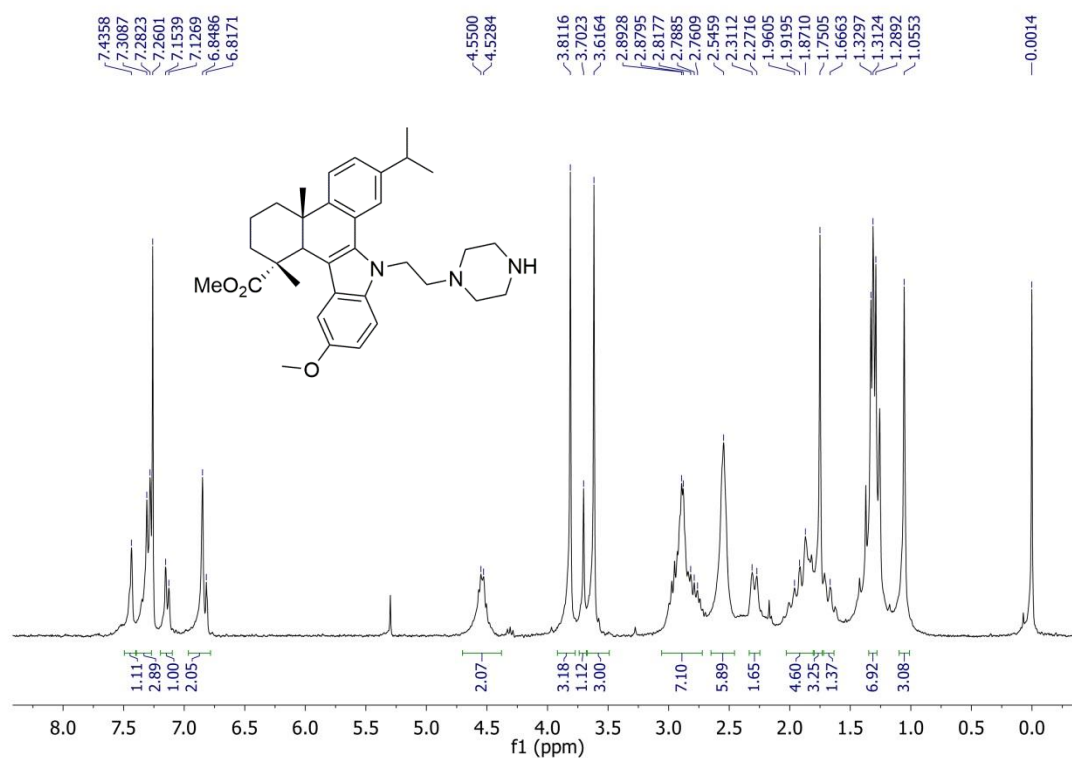


Fig. S57. ^1H -NMR spectrum of compound **10e** (300 MHz, CDCl_3)

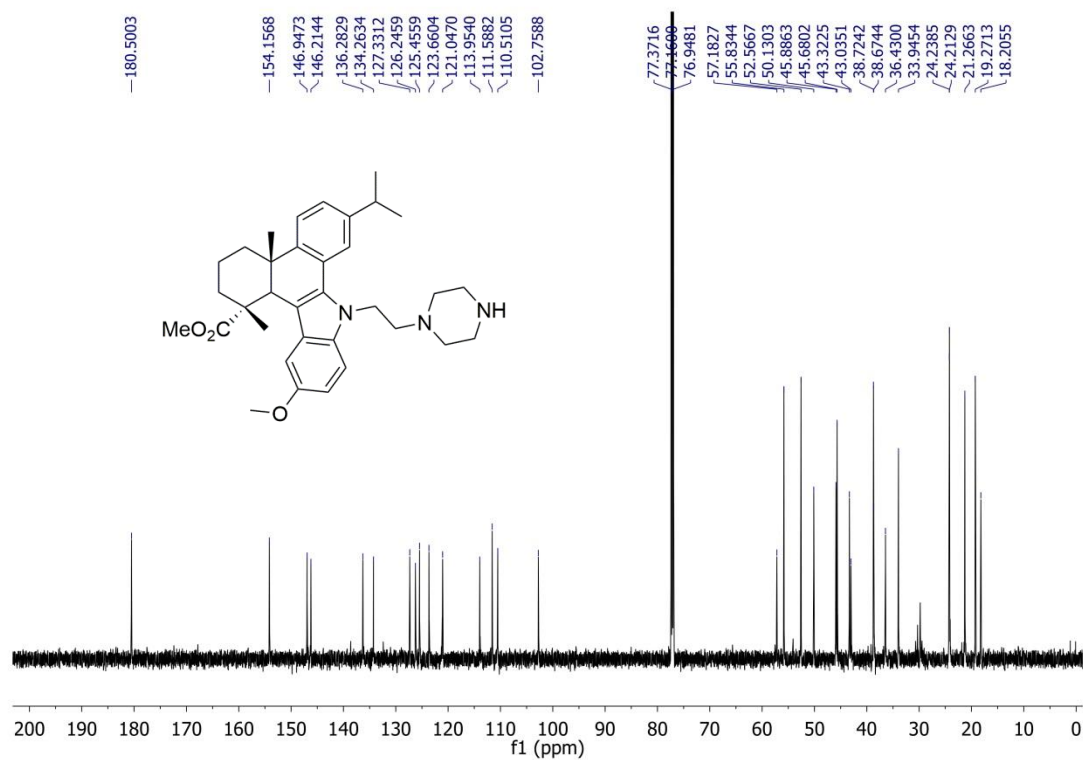


Fig. S58. ^{13}C -NMR spectrum of compound **10e** (150 MHz, CDCl_3)

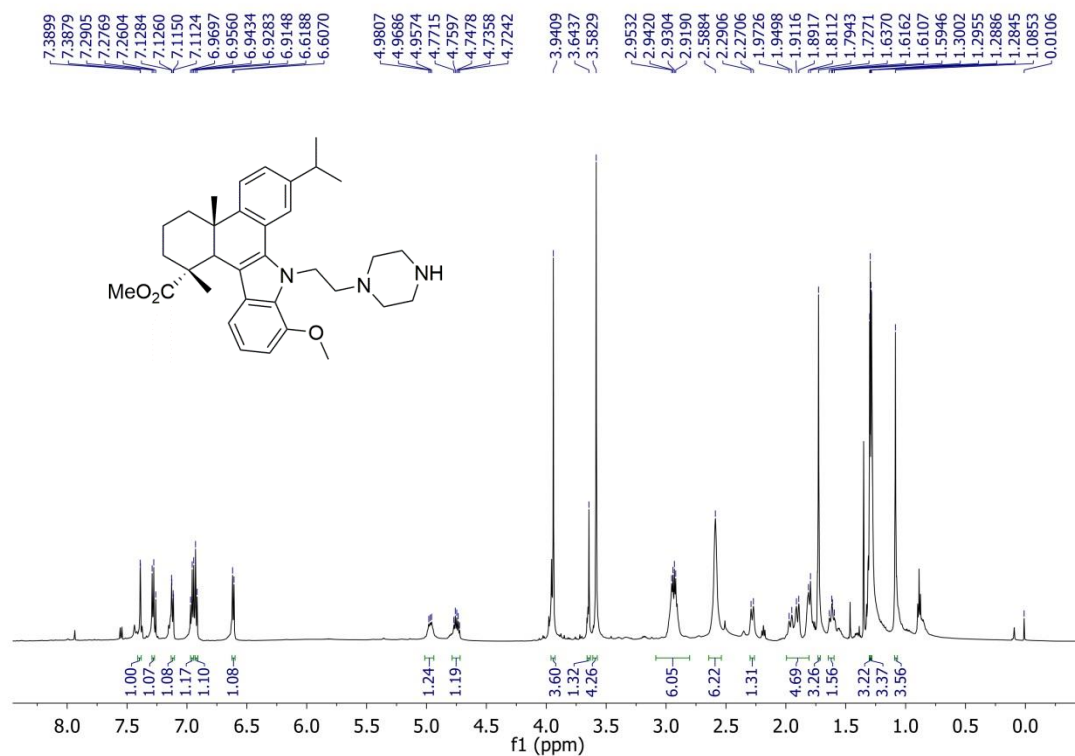


Fig. S59. ¹H-NMR spectrum of compound 10f (600 MHz, CDCl₃)

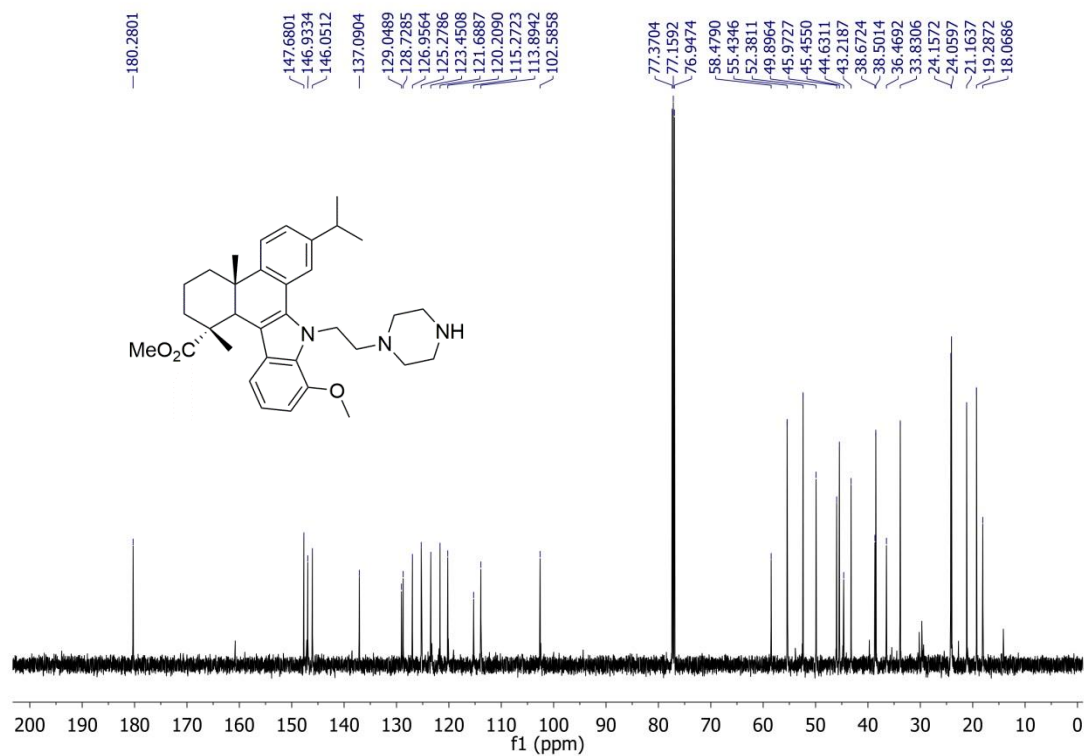


Fig. S60. ¹³C-NMR spectrum of compound 10f (150 MHz, CDCl₃)

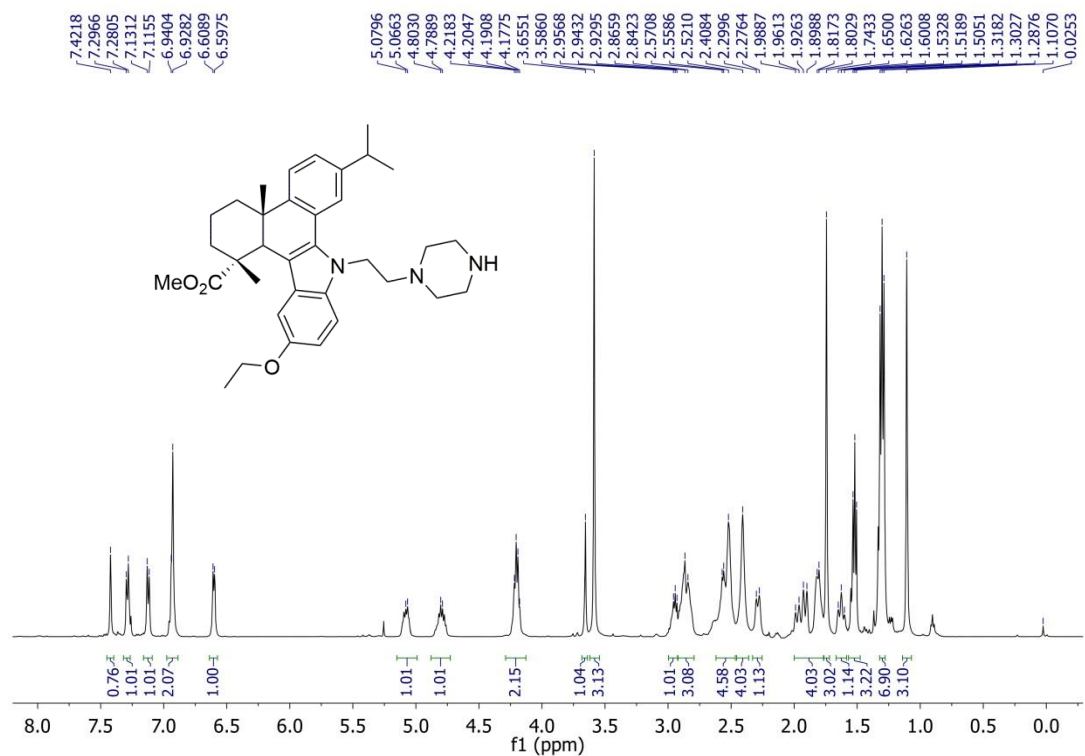


Fig. S61. ¹H-NMR spectrum of compound **10g** (500 MHz, CDCl₃)

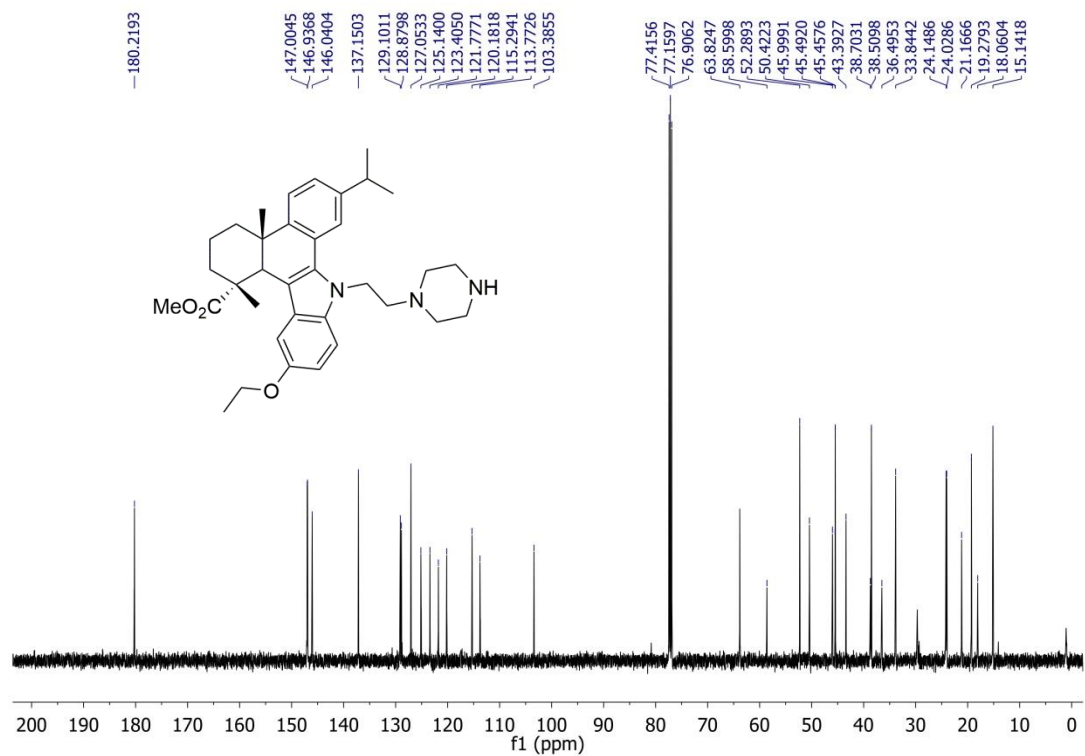


Fig. S62. ¹³C-NMR spectrum of compound **10g** (125 MHz, CDCl₃)

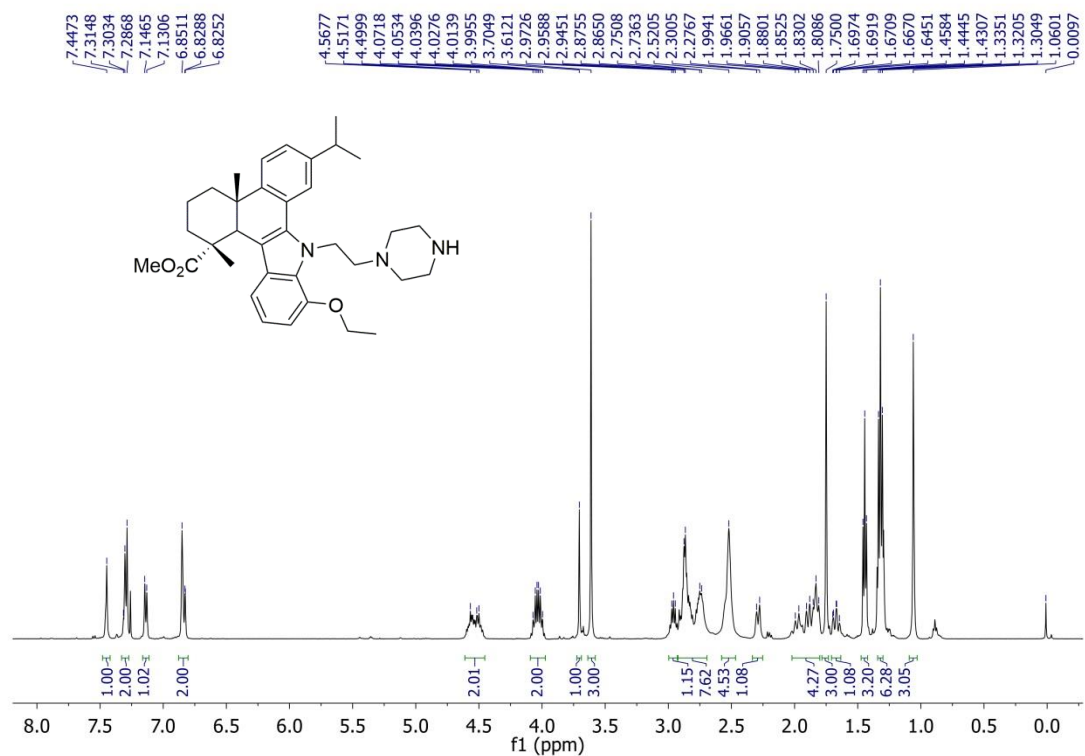


Fig. S63. ¹H-NMR spectrum of compound 10h (500 MHz, CDCl₃)

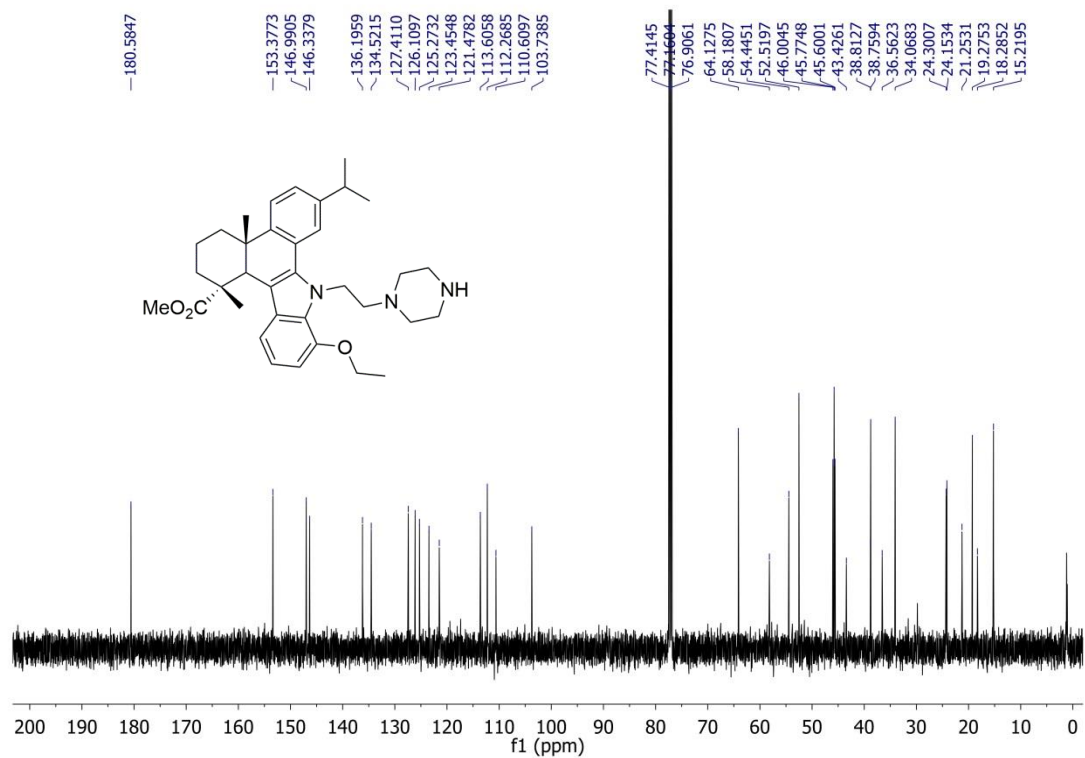


Fig. S64. ¹³C-NMR spectrum of compound 10h (125 MHz, CDCl₃)

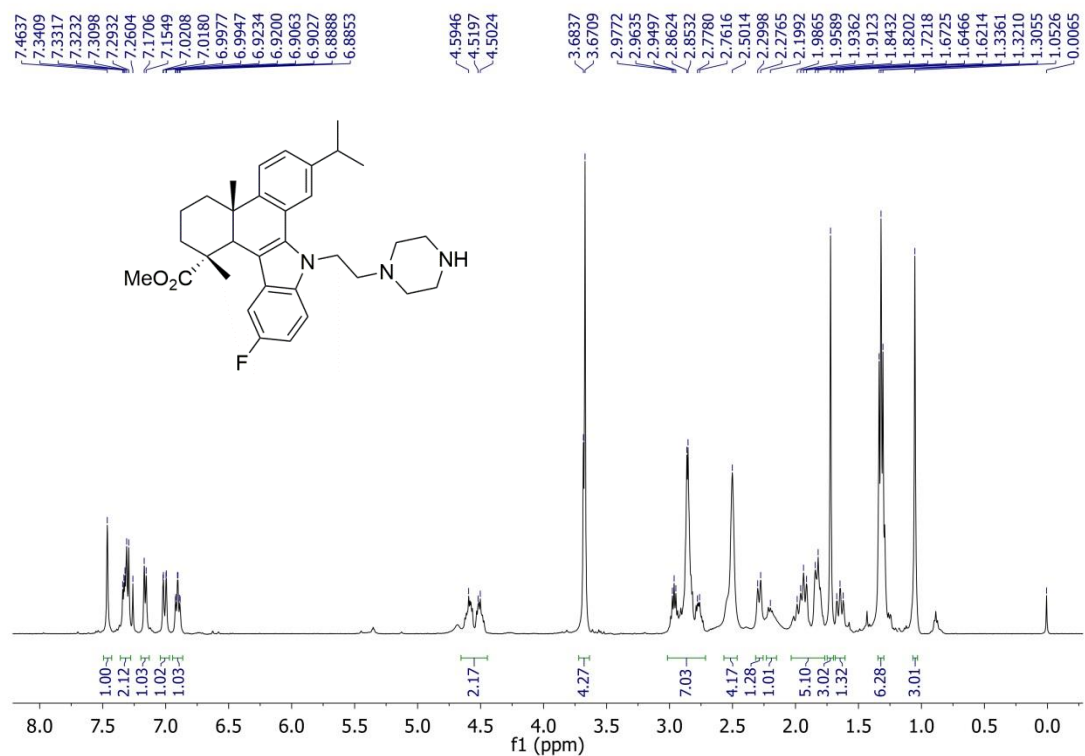


Fig. S65. ¹H-NMR spectrum of compound **10i** (500 MHz, CDCl₃)

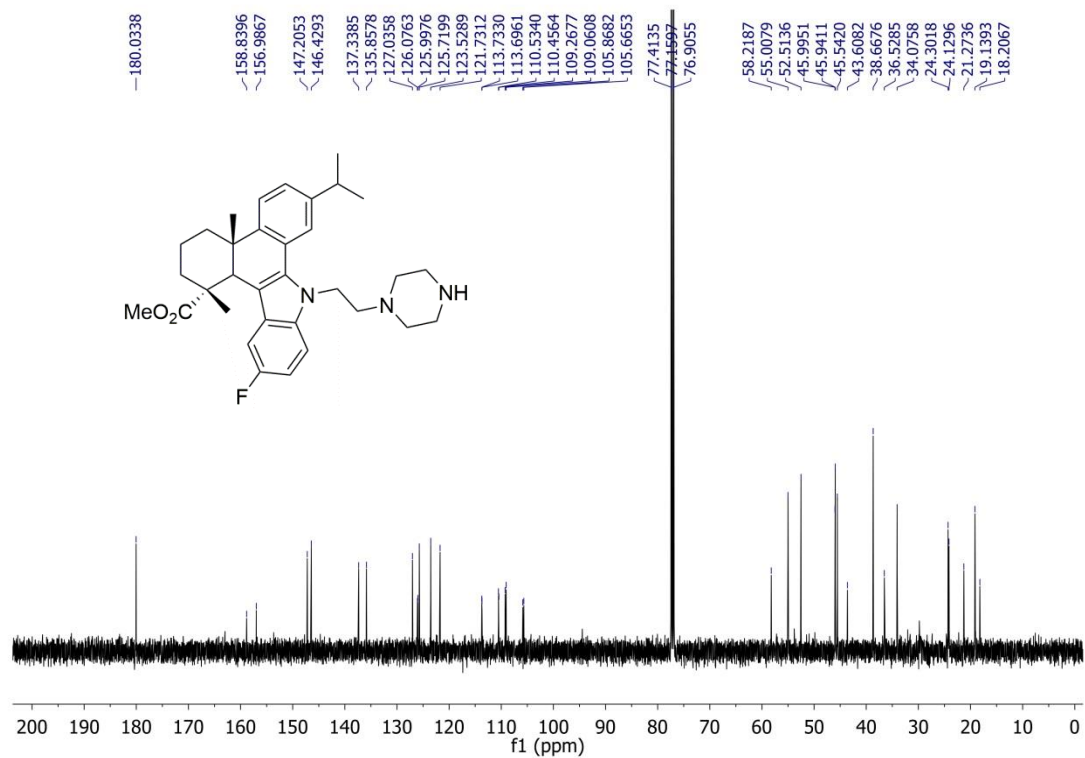


Fig. S66. ¹³C-NMR spectrum of compound **10i** (125 MHz, CDCl₃)

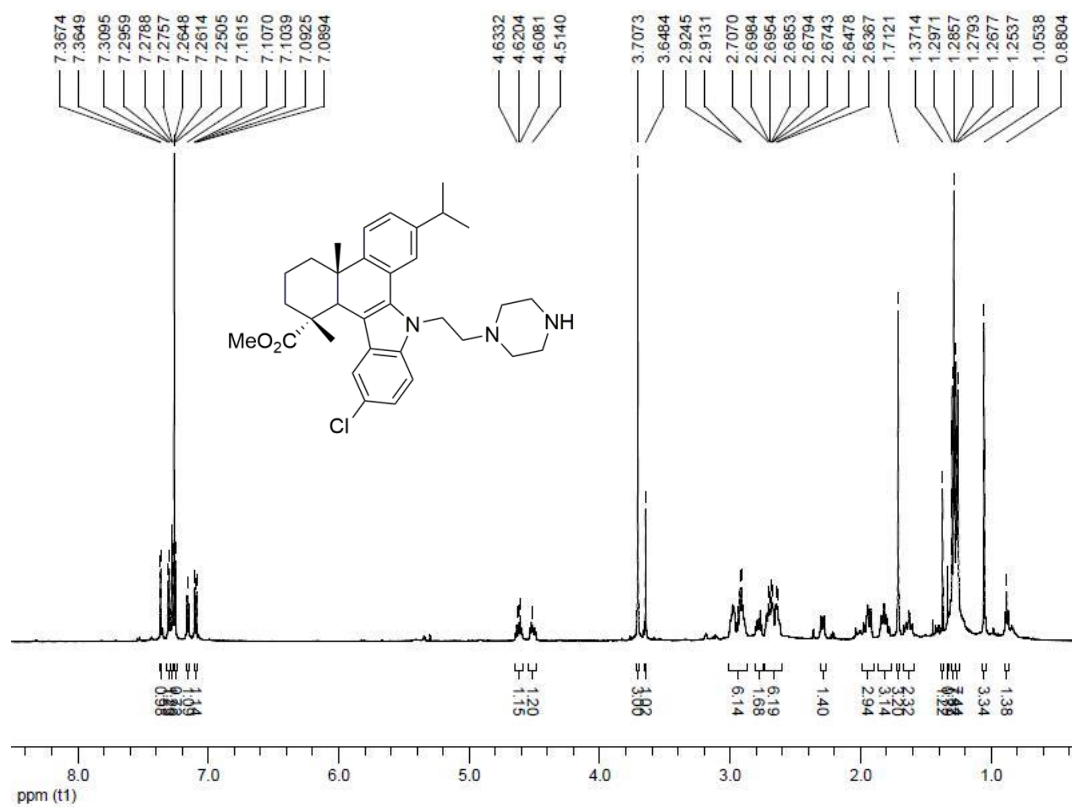


Fig. S67. ¹H-NMR spectrum of compound **10j** (600 MHz, CDCl₃)

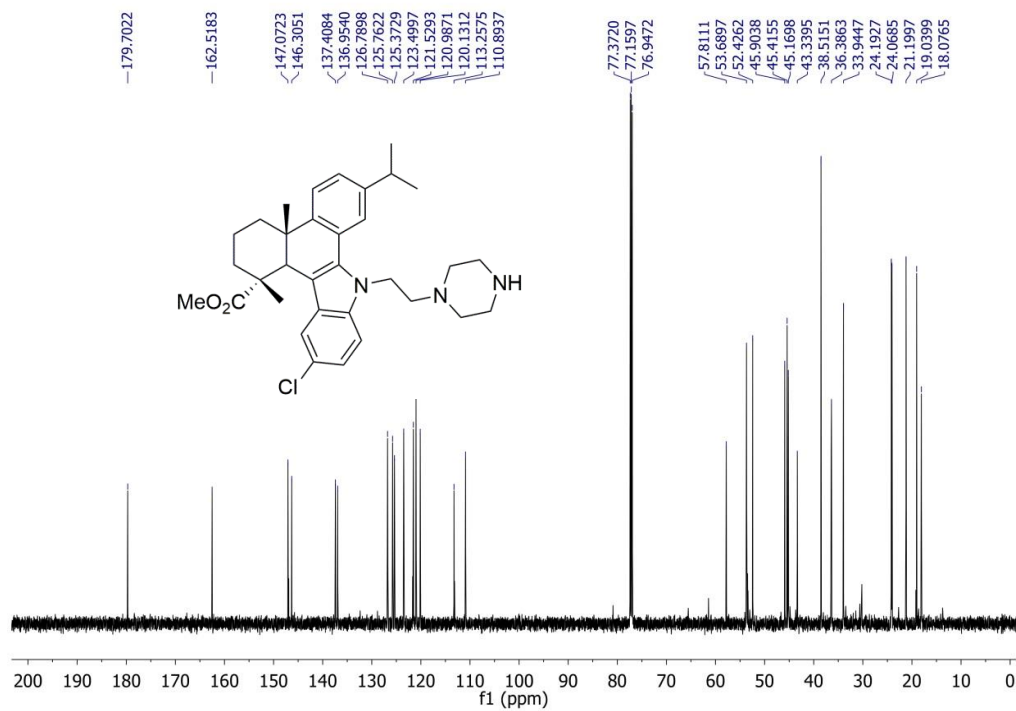


Fig. S68. ¹³C-NMR spectrum of compound **10j** (150 MHz, CDCl₃)