

Supporting Information

Semisynthesis, Biological Evaluation and Molecular Docking Studies of Barbatic Acid Derivatives as Novel Diuretic Candidates

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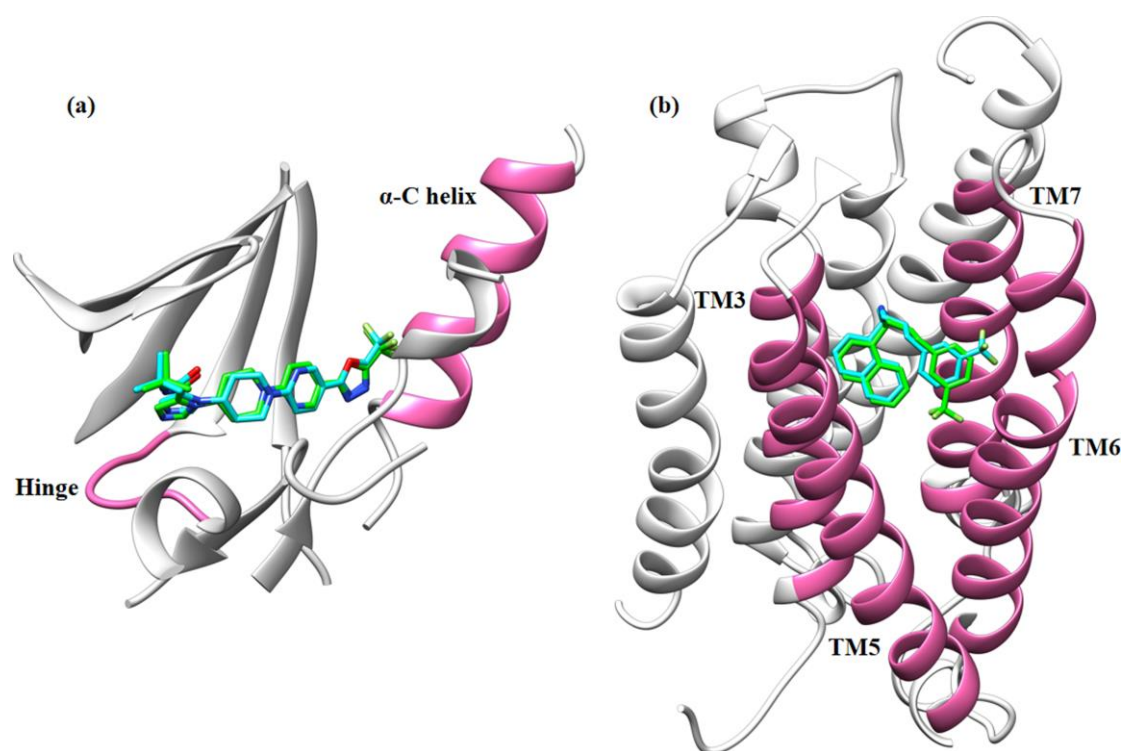


Figure S1. The binding mode of co-crystallized (green) and re-docked (cyan) WNK463 and cinacalcet in the WNK1 kinase domain and CaSR, respectively.

Item name: 7a-XYK-17
Item description:

Channel name: 1: Average Time 0.1334 min : TOF MS (50-1500) ESI+ : Centroided : Combined

5.77e6

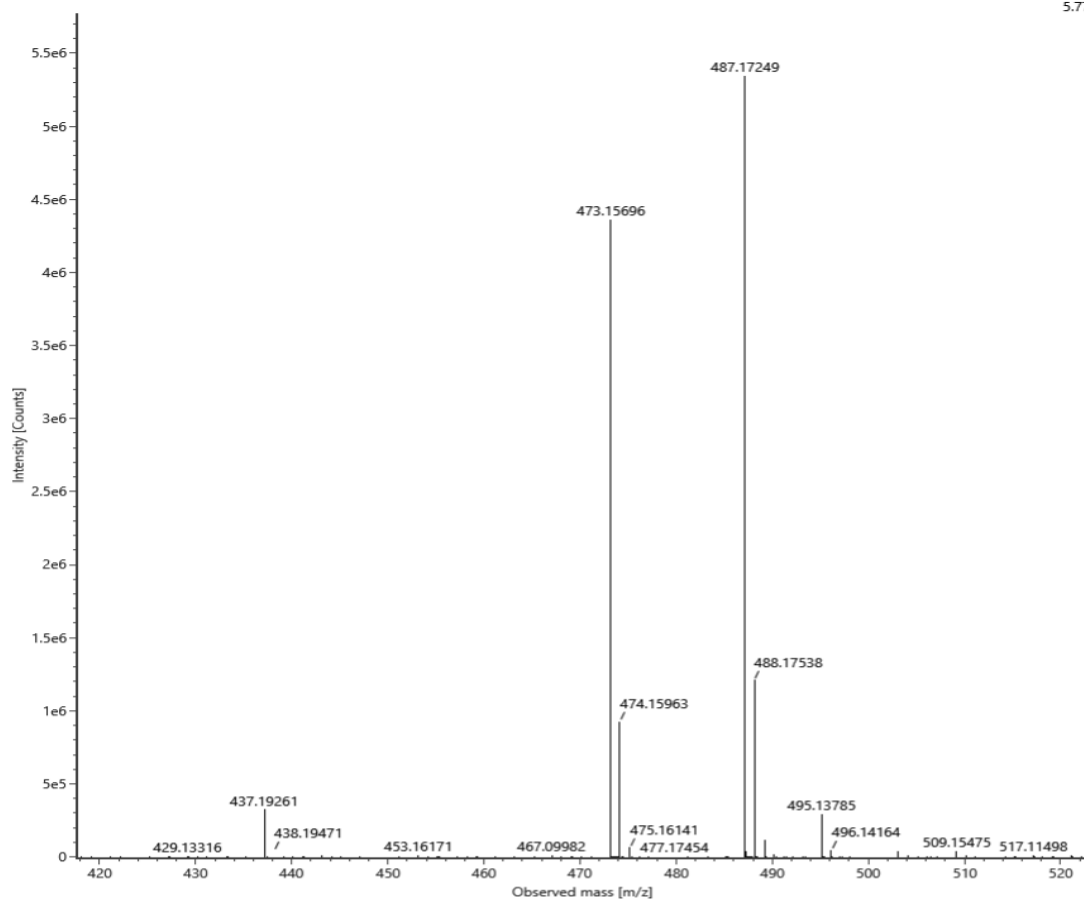


Figure S4. HRMS spectrum of compound **6a**

Jul101-2020-XYK-H. 1. 1. 1r

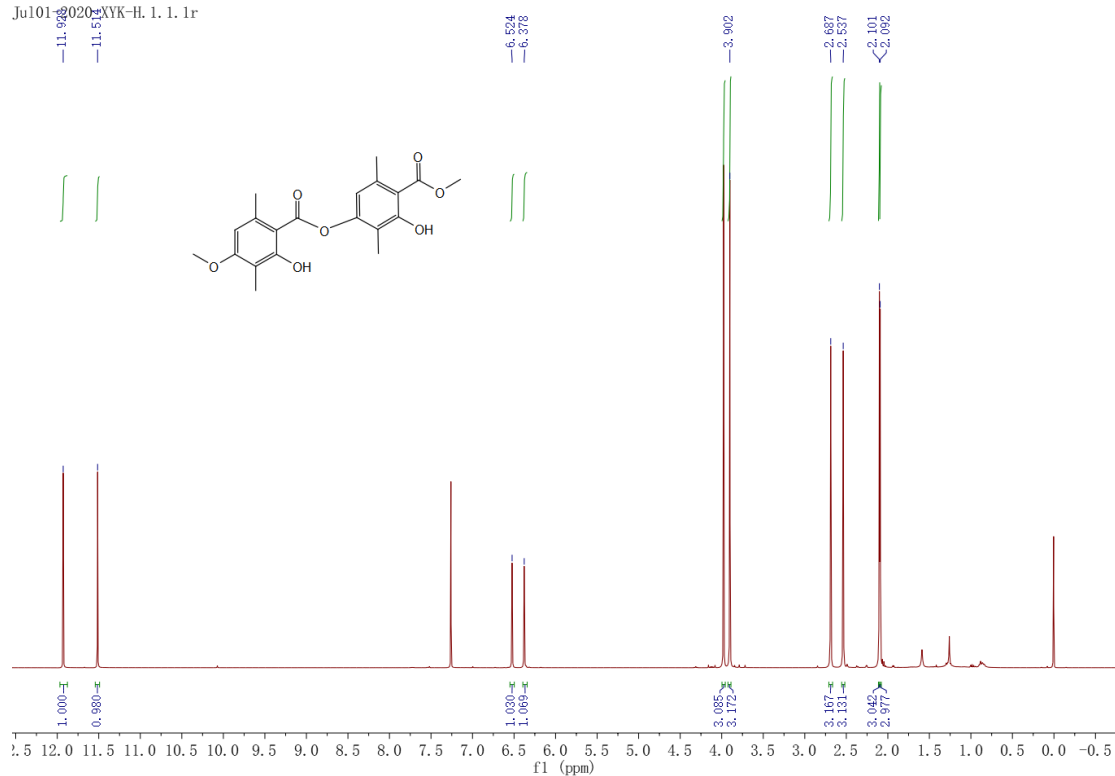


Figure S5. ^1H NMR spectrum of compound **6b**

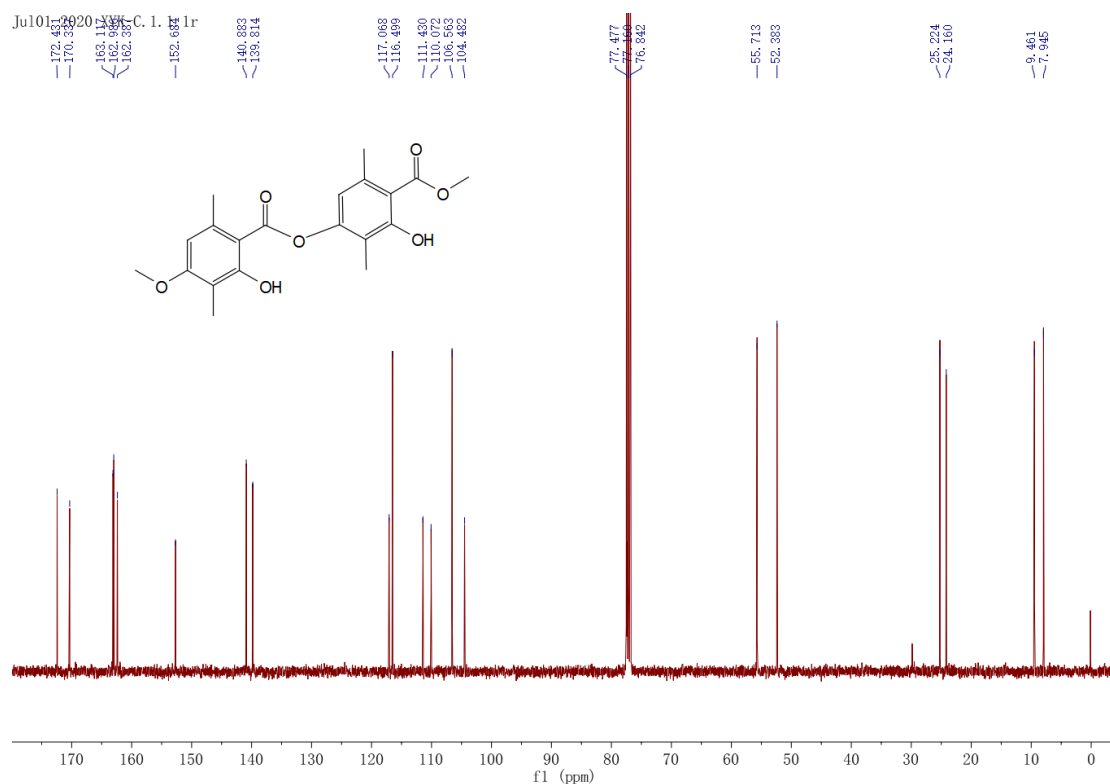


Figure S6. ^{13}C NMR spectrum of compound **6b**

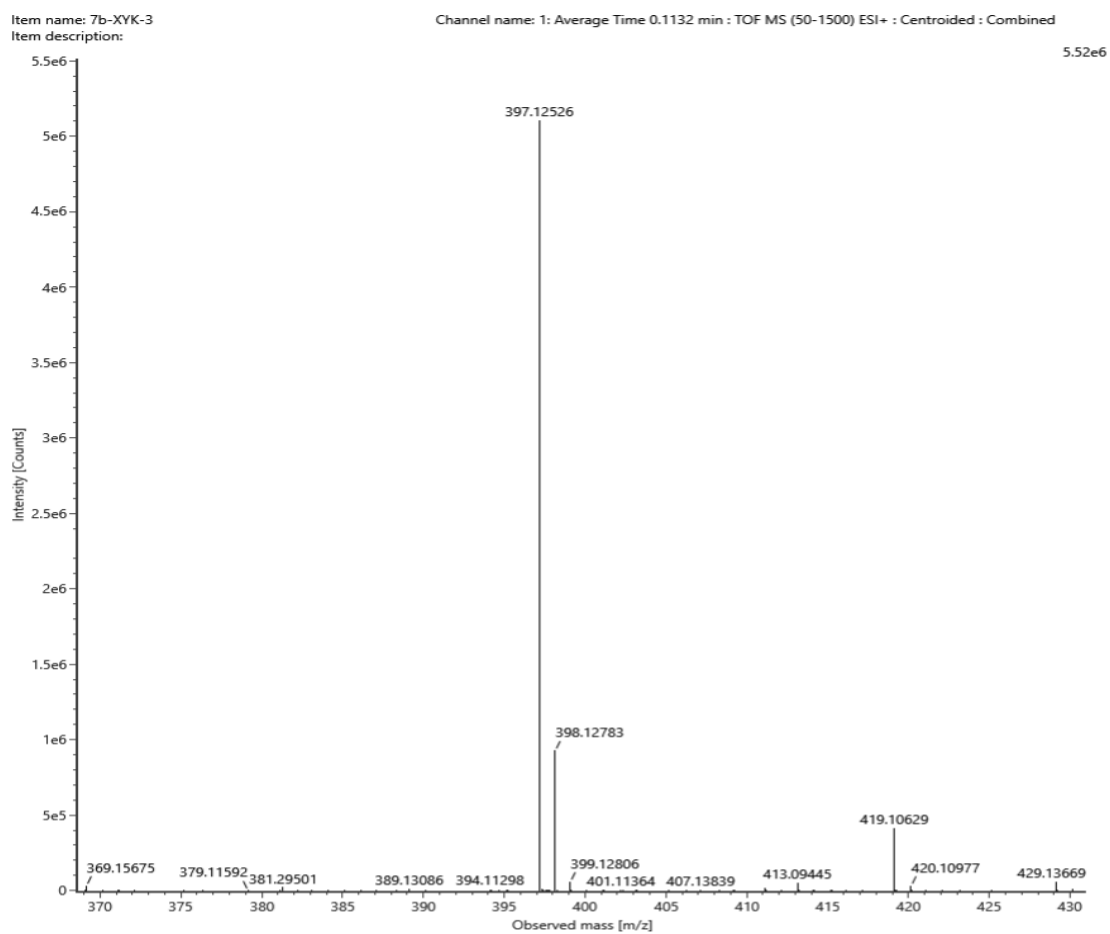


Figure S7. HRMS spectrum of compound **6b**

May10-2021, XWK-49, 1. 1. 1r

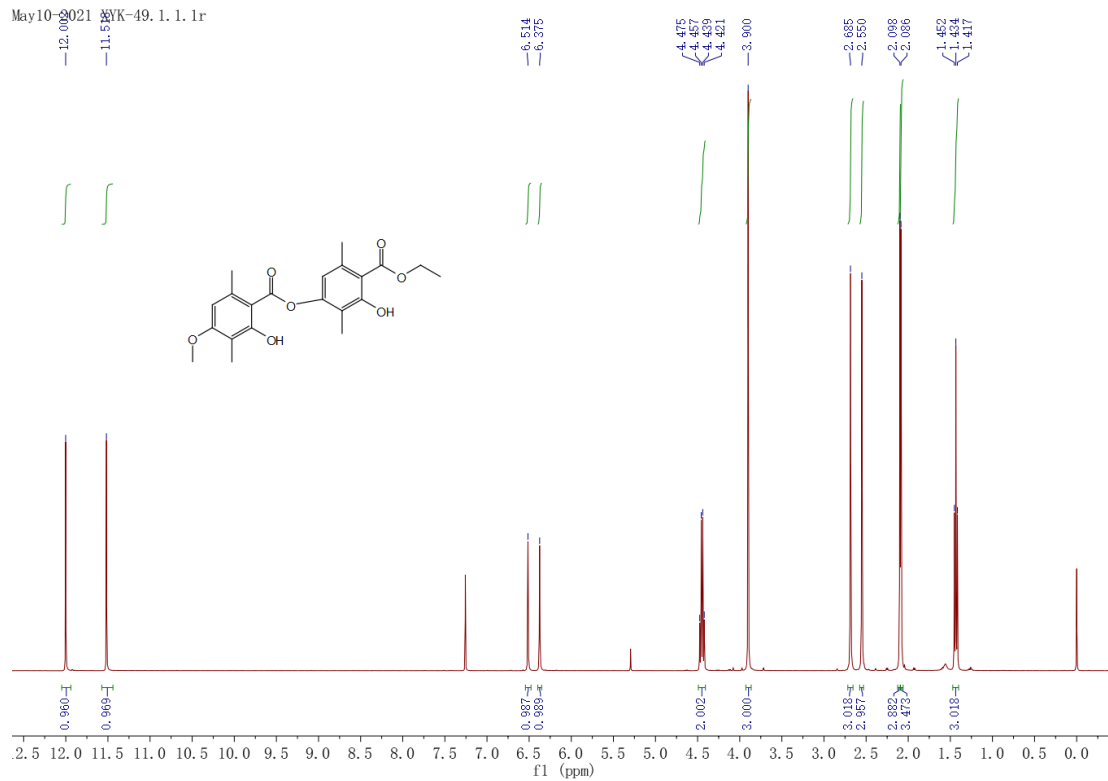


Figure S8. ¹H NMR spectrum of compound **6c**

May10-2021, XWK-49-C, 1. 1r

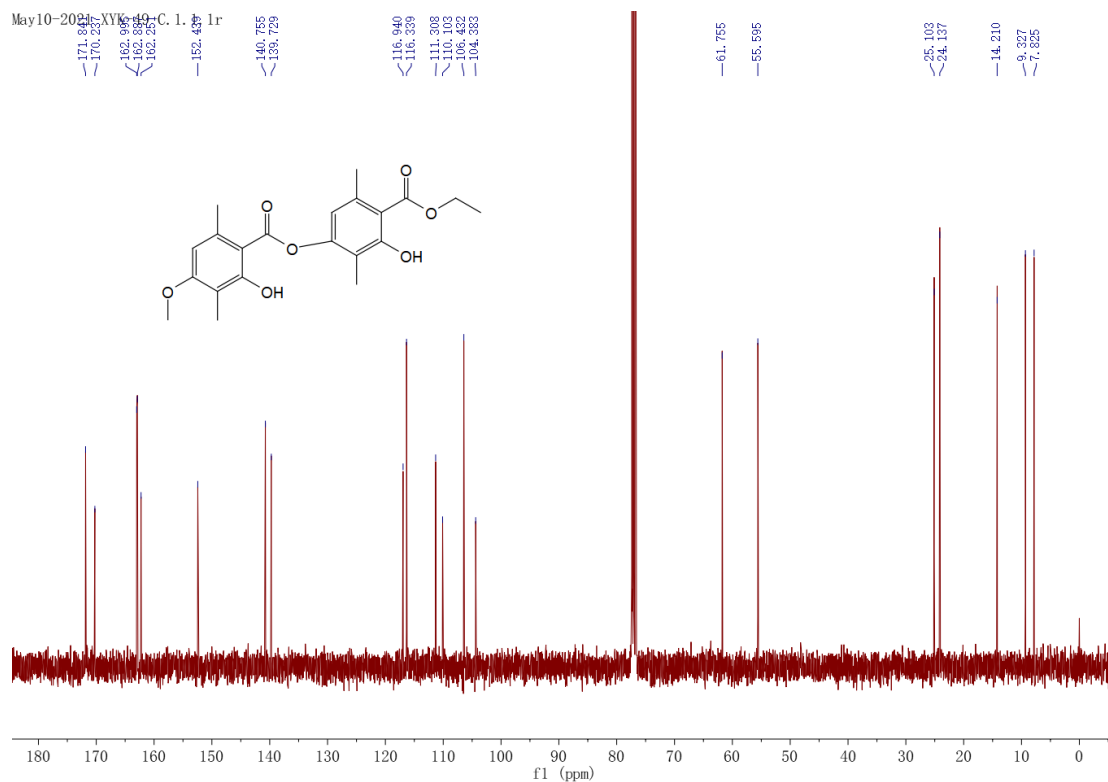


Figure S9. ¹³C NMR spectrum of compound **6c**

Item name: 7c-XYK-49
Item description:

Channel name: 1: Average Time 0.0788 min : TOF MS (50-1500) ESI+ : Centroided : Combined

5.91e6

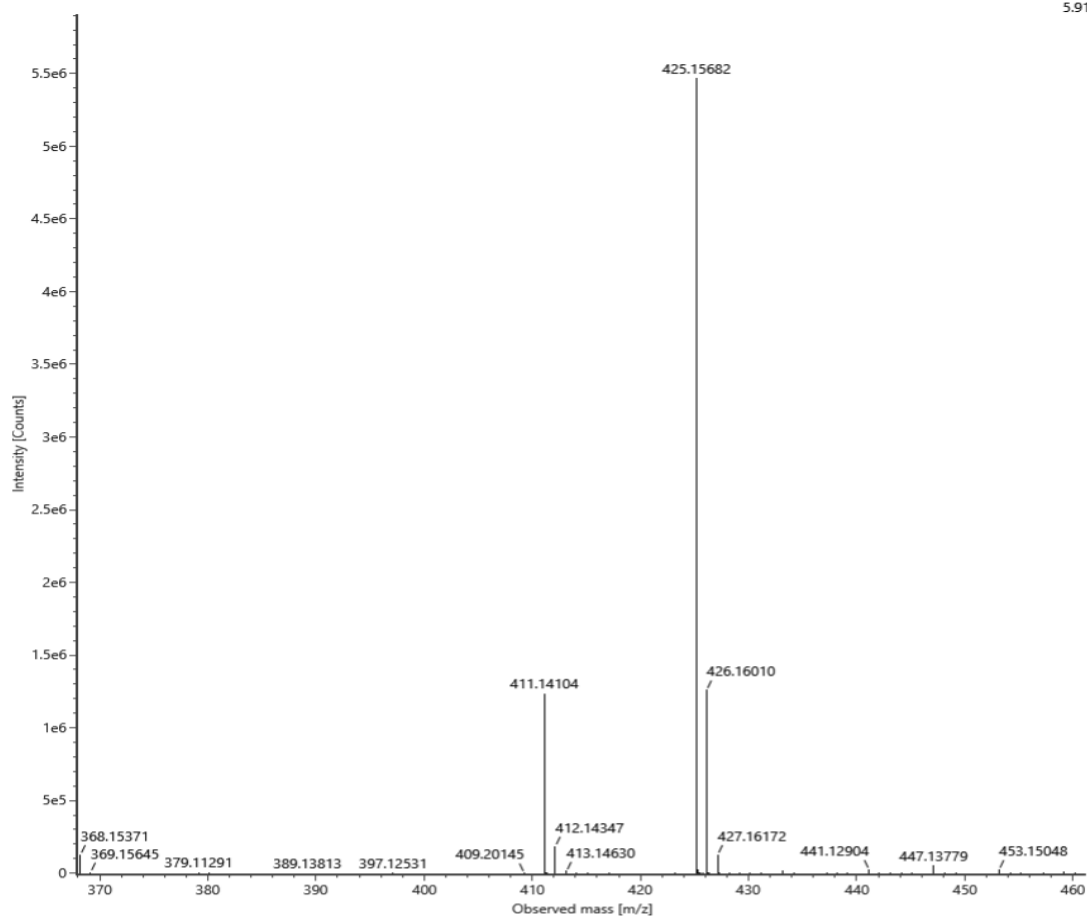


Figure S10. HRMS spectrum of compound 6c

May16-2021 XYK-90, 1. 1. 1r

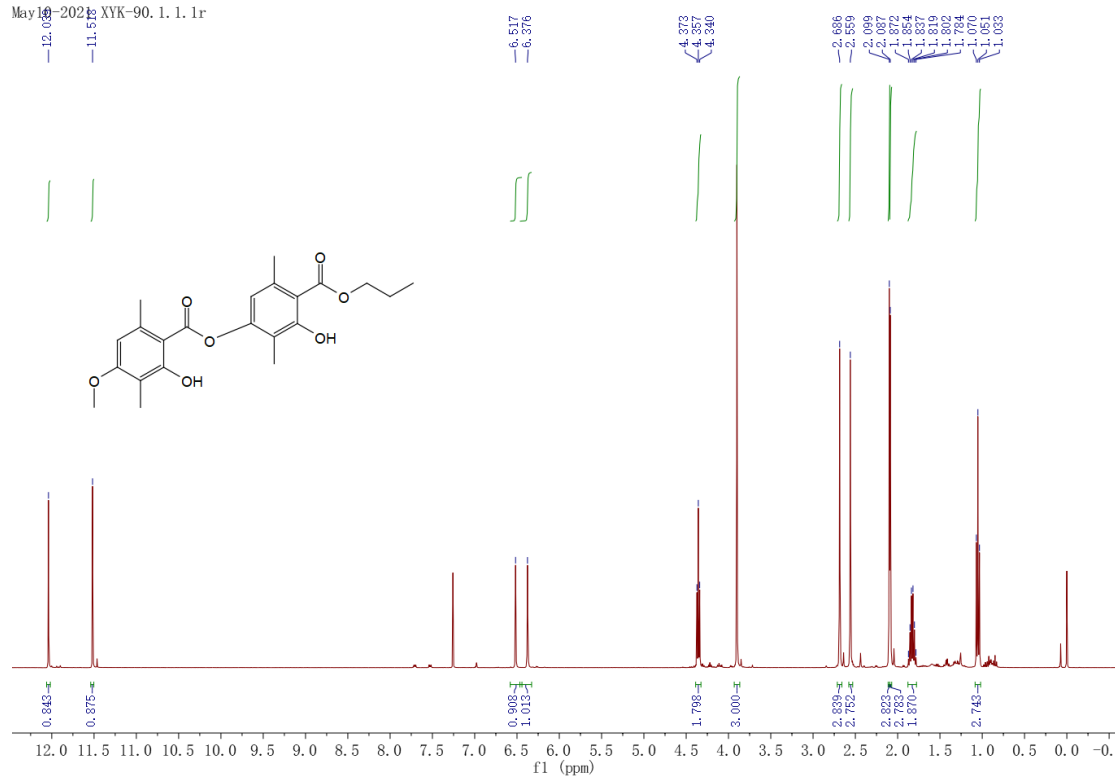


Figure S11. ¹H NMR spectrum of compound 6d

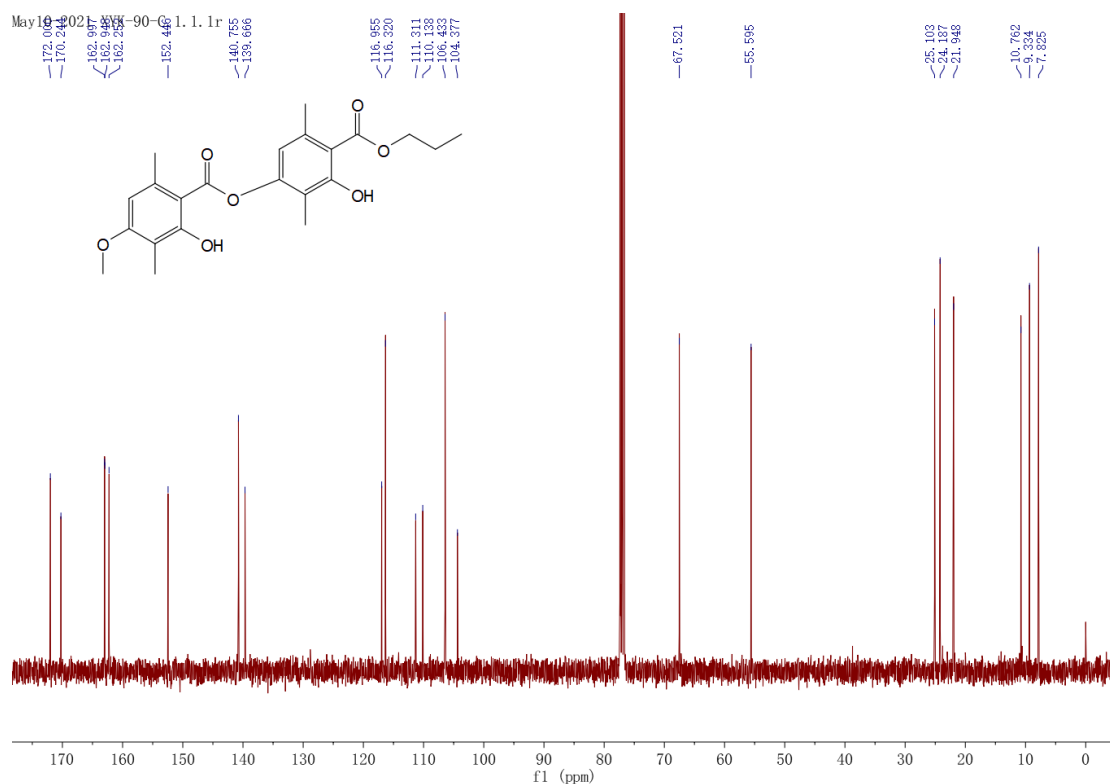


Figure S12. ^{13}C NMR spectrum of compound **6d**

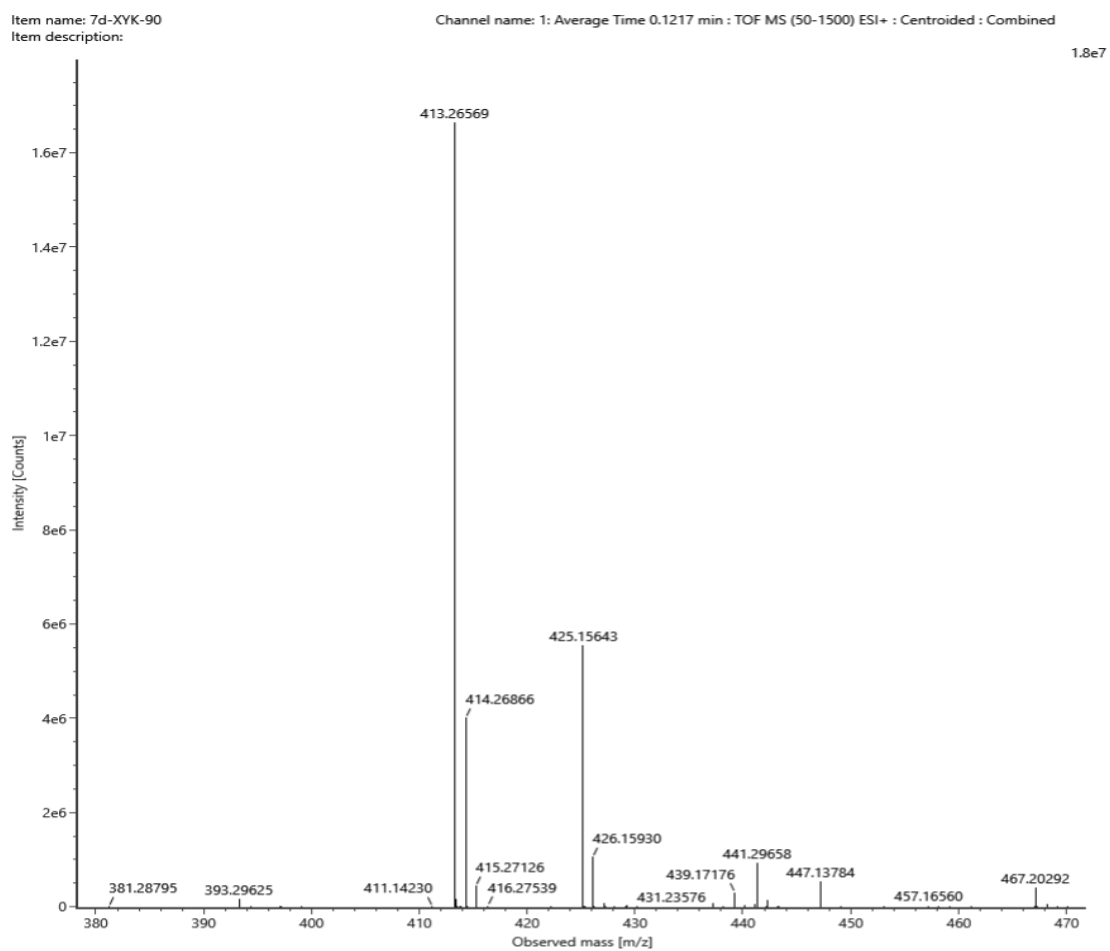


Figure S13. HRMS spectrum of compound **6d**

Jun28-2021 NK-107, 1. 1. 1r

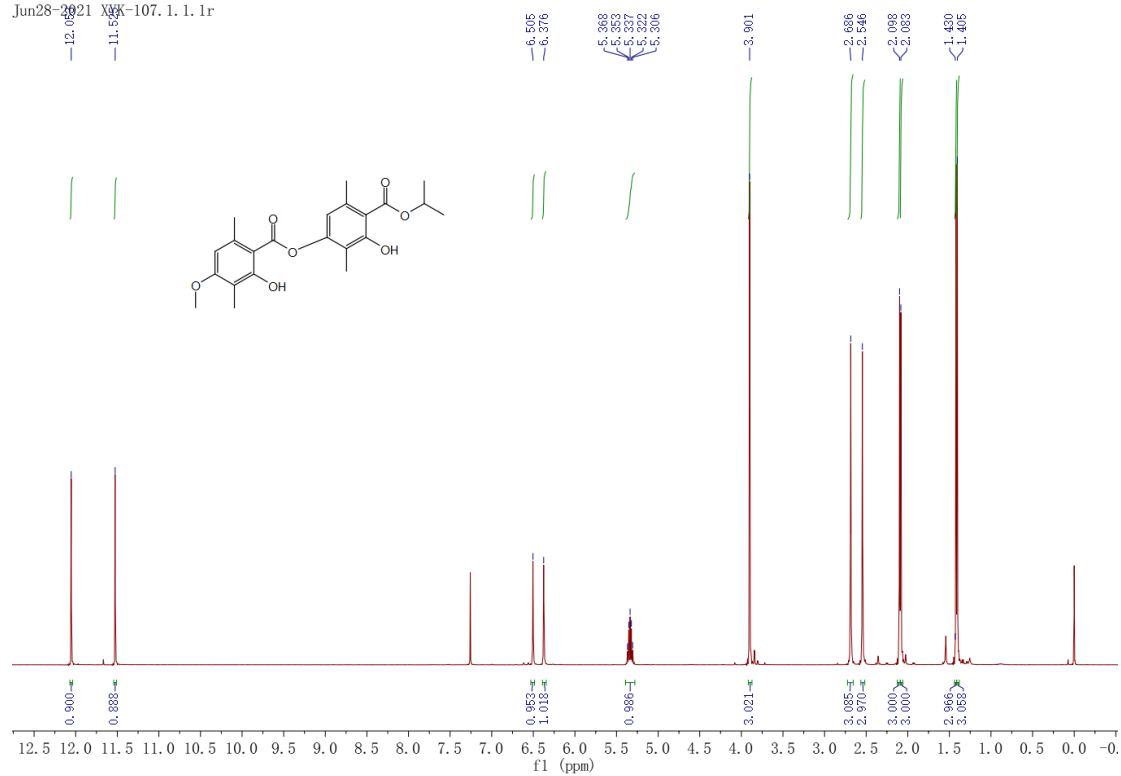


Figure S14. ¹H NMR spectrum of compound **6e**

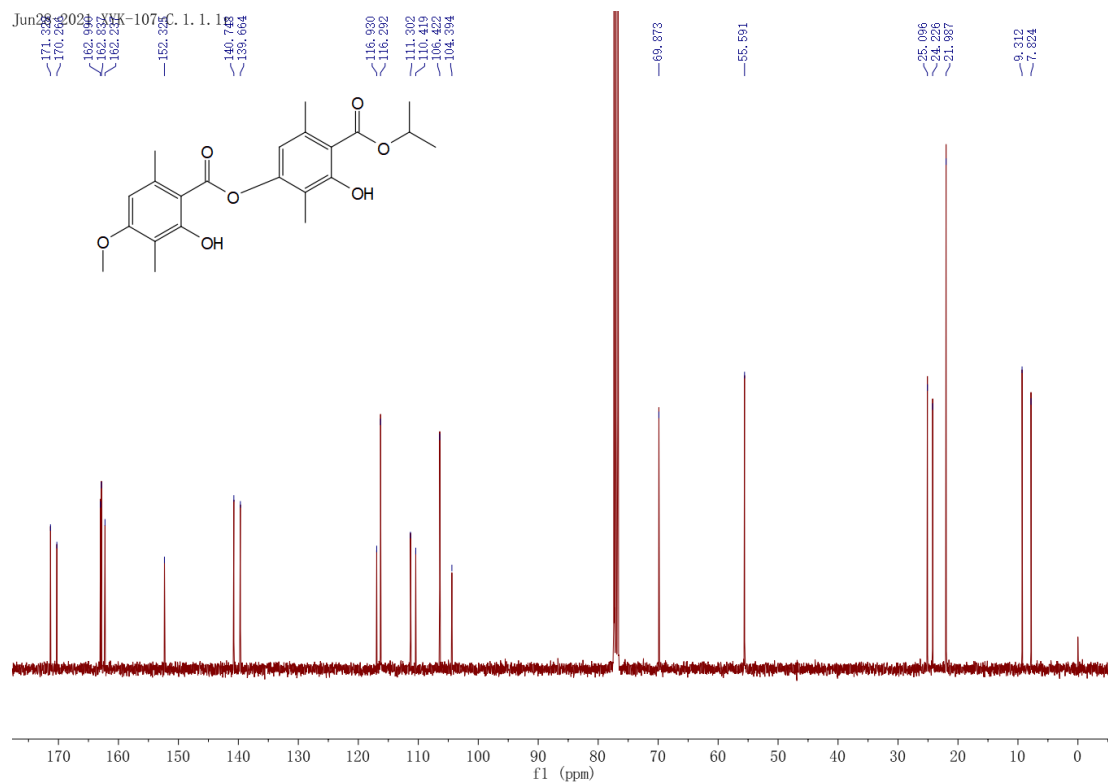


Figure S15. ¹³C NMR spectrum of compound **6e**

Item name: 7e-XYK-107
Item description:

Channel name: 1: Average Time 0.1217 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.74e7

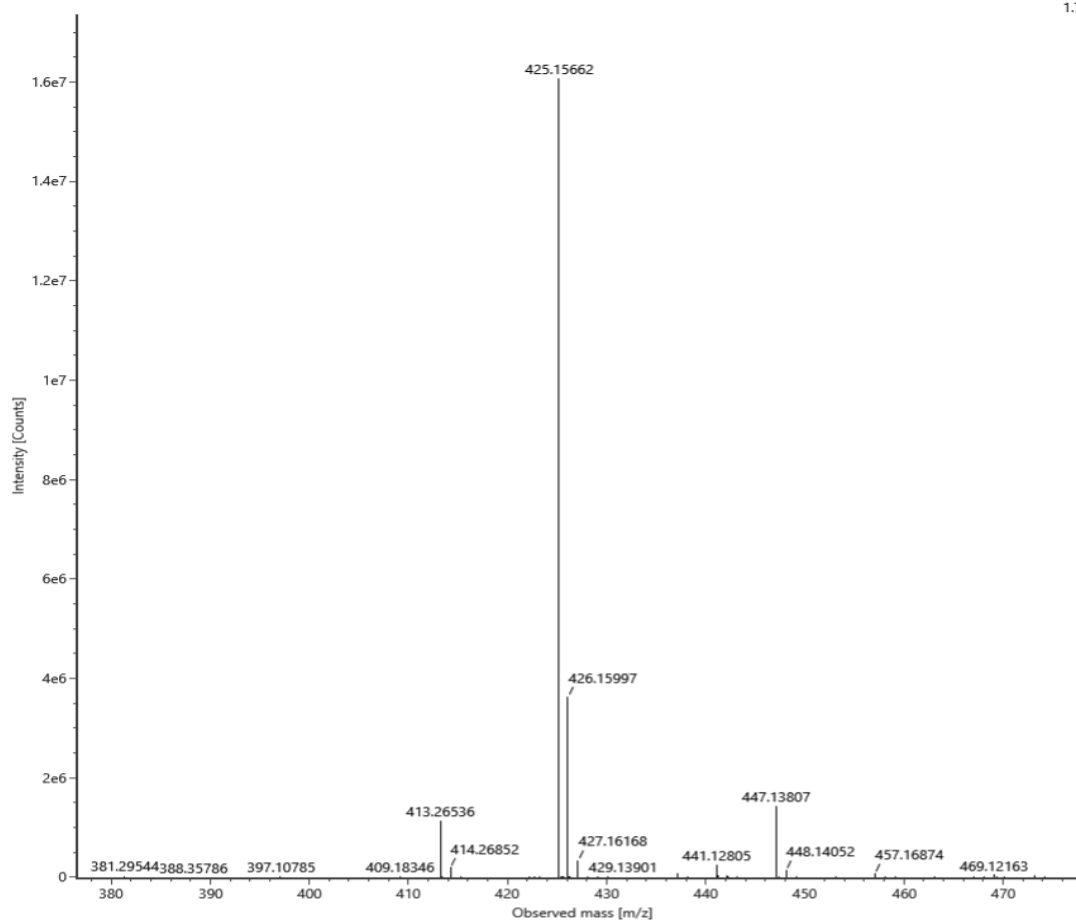
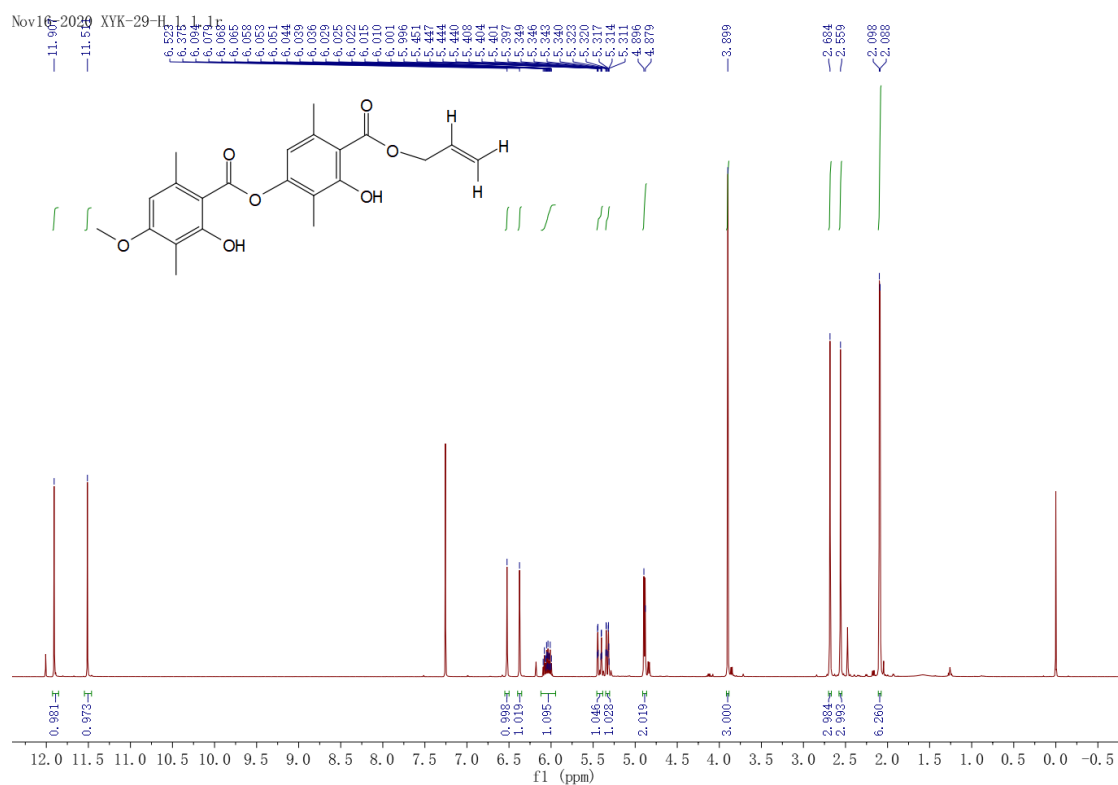


Figure S16. HRMS spectrum of compound 6e



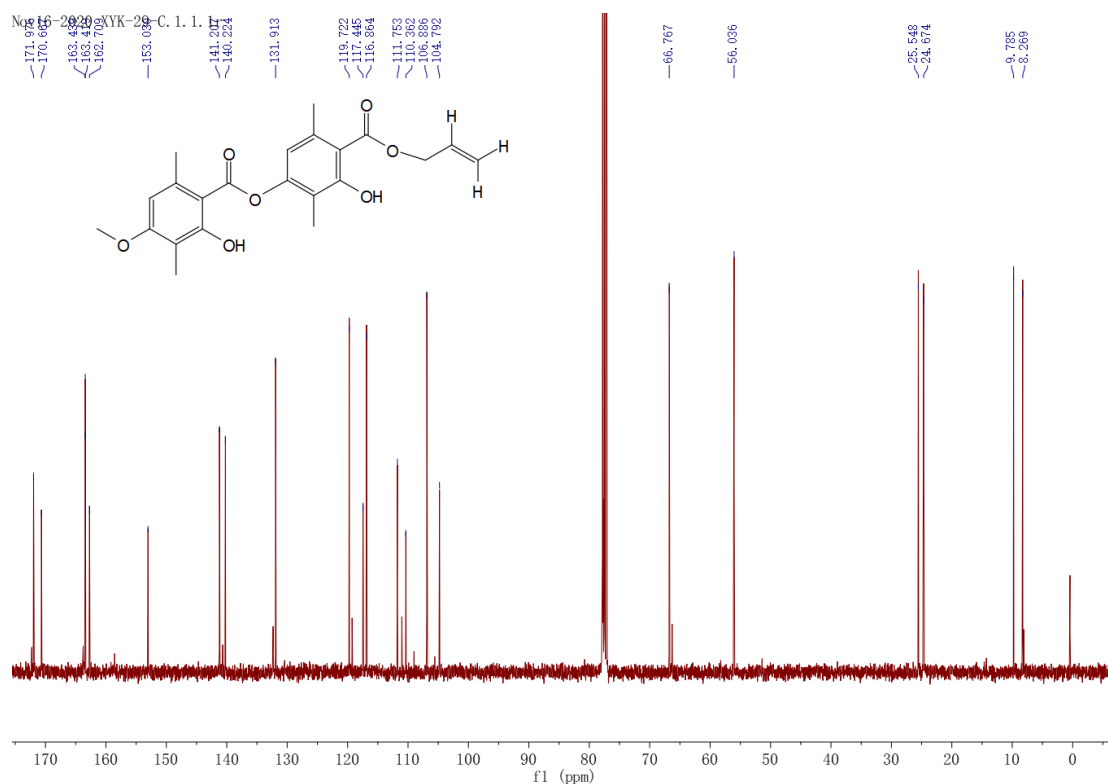


Figure S18. ^{13}C NMR spectrum of compound **6f**

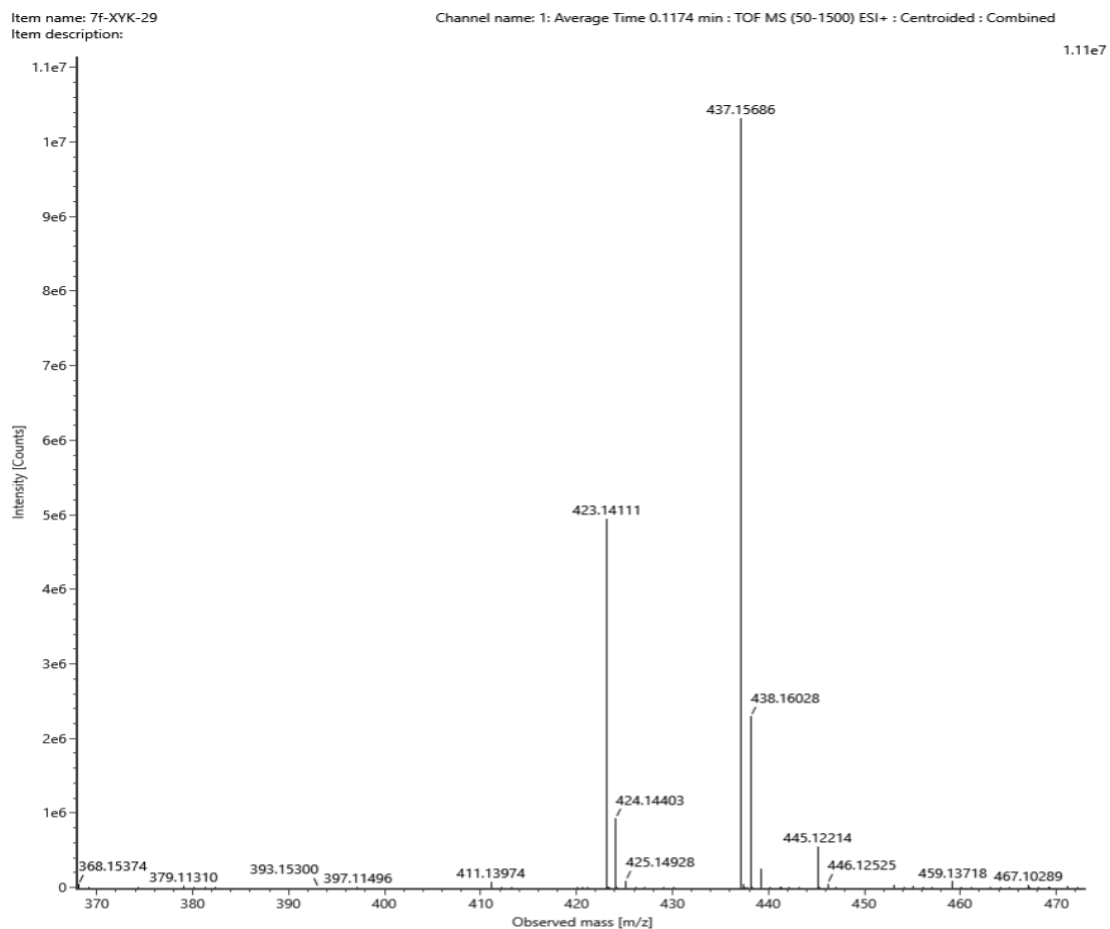


Figure S19. HRMS spectrum of compound **6f**

Jan06-2021 XYK-50-H. 1. 1. 1r

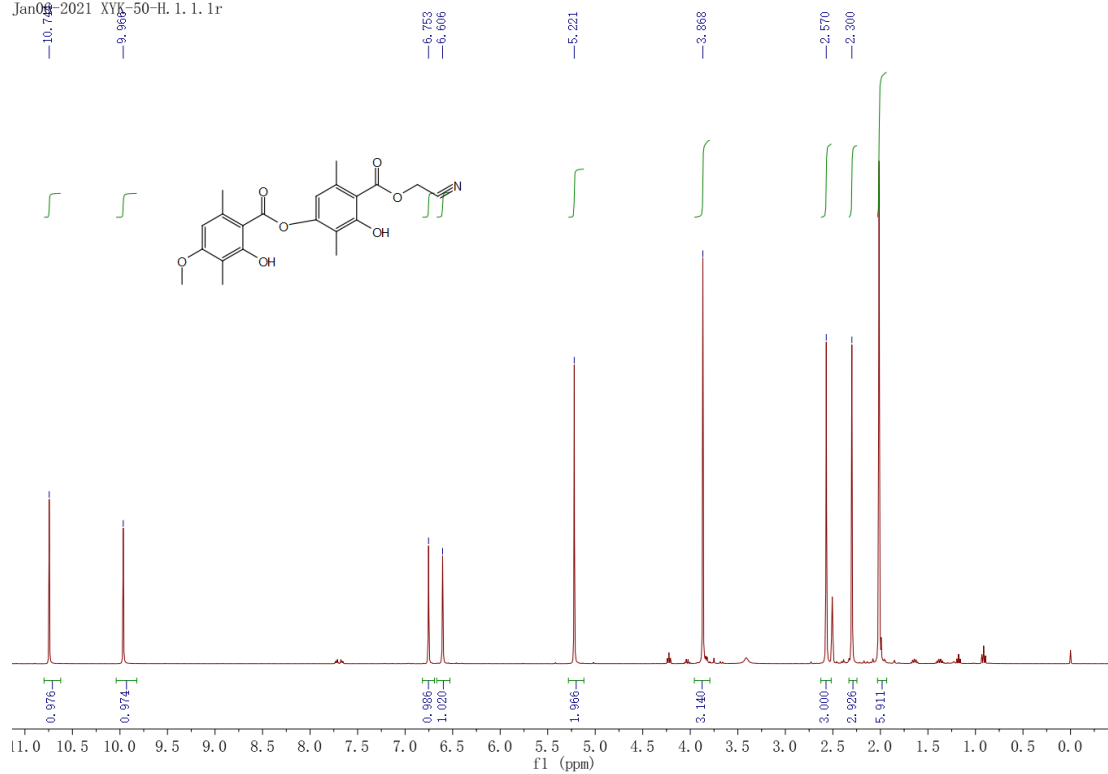


Figure S20. ¹H NMR spectrum of compound **6g**

Jan06-2021 XYK-50-H. 1. 1. 1r

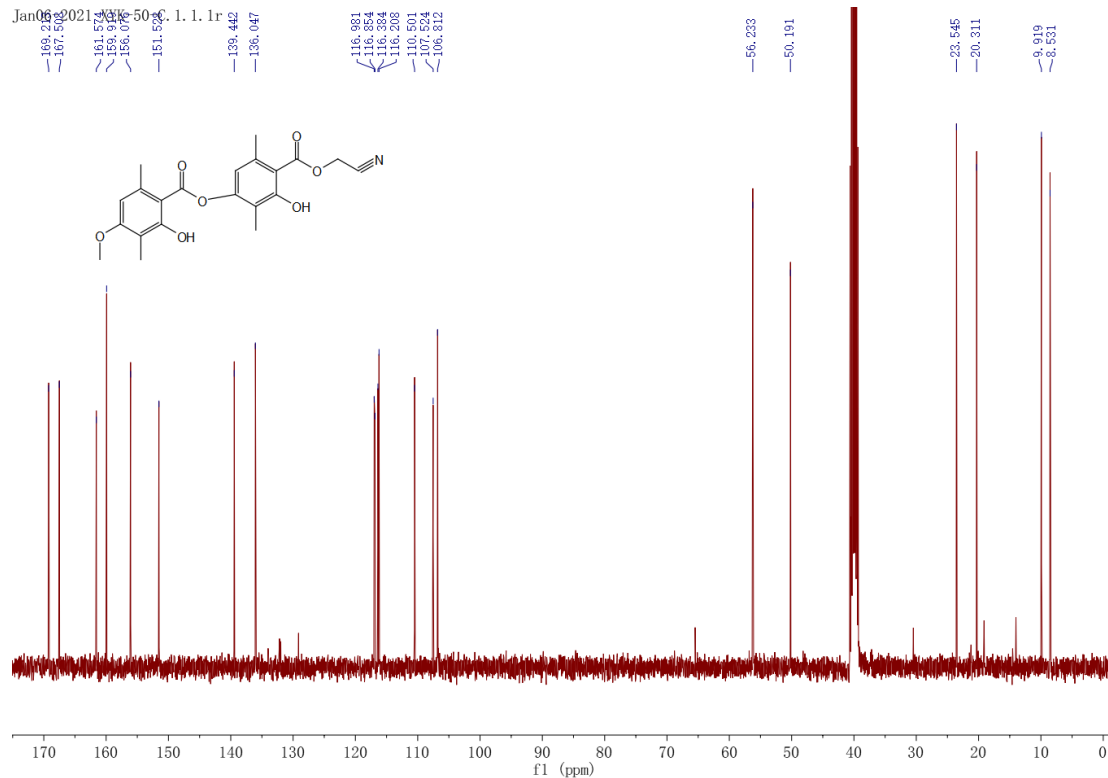


Figure S21. ¹³C NMR spectrum of compound **6g**

Item name: 7g-XYK-50
Item description:

Channel name: 1: Average Time 0.1334 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.68e6

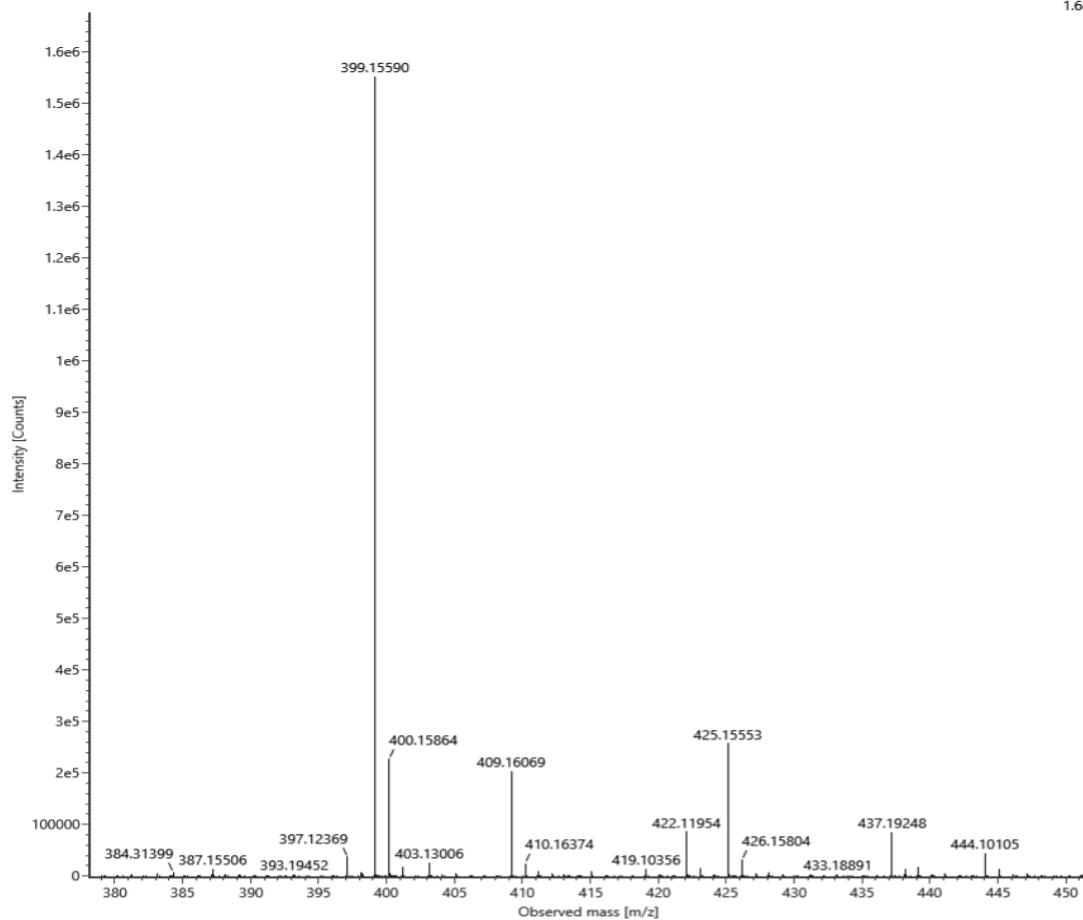


Figure S22. HRMS spectrum of compound 6g

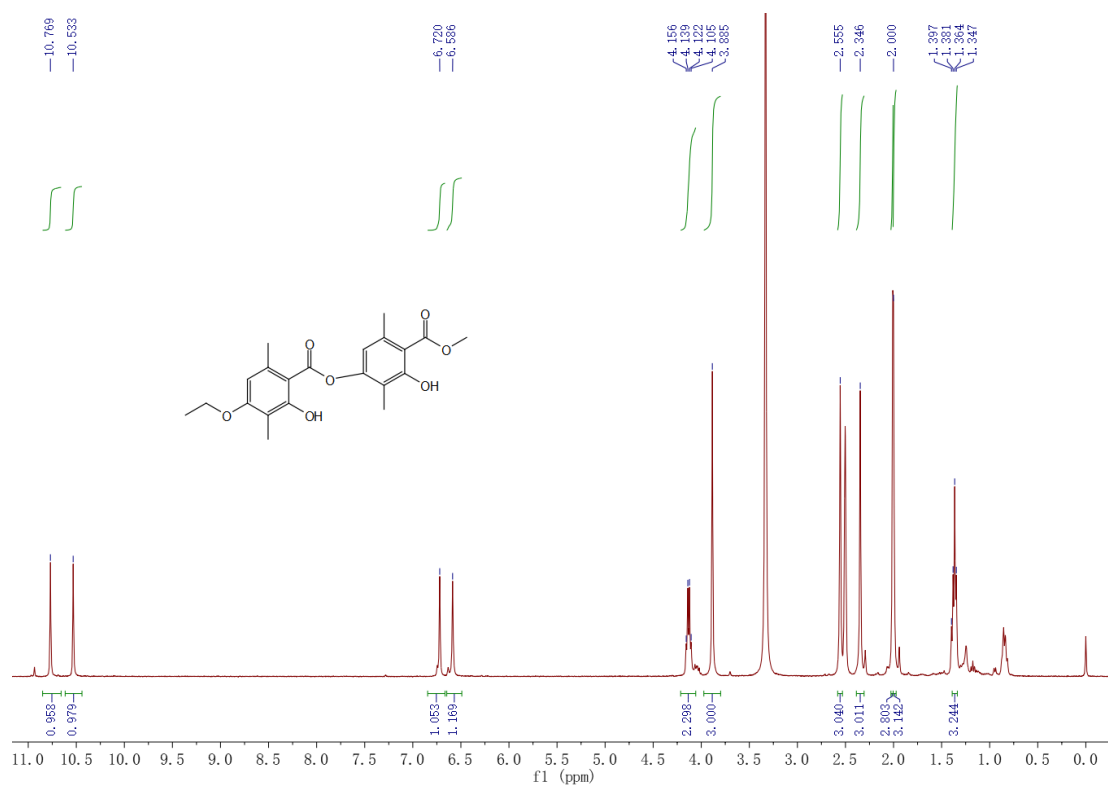


Figure S23. ¹H NMR spectrum of compound 6h

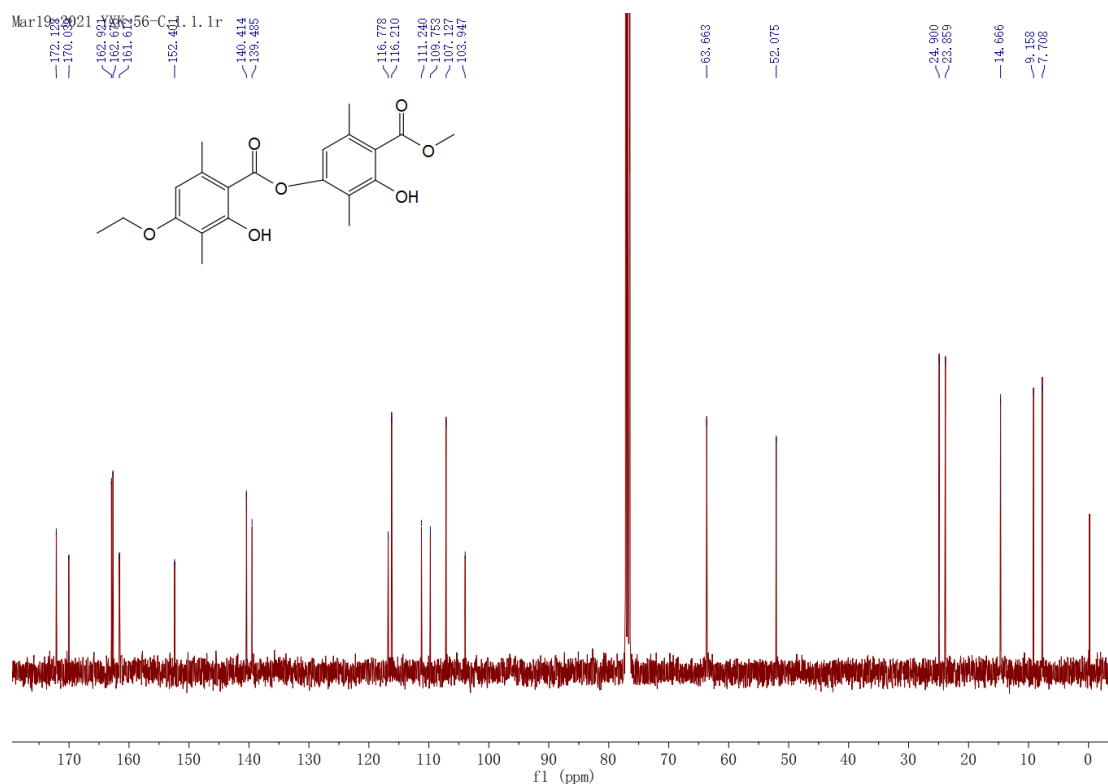


Figure S24. ¹³C NMR spectrum of compound **6h**

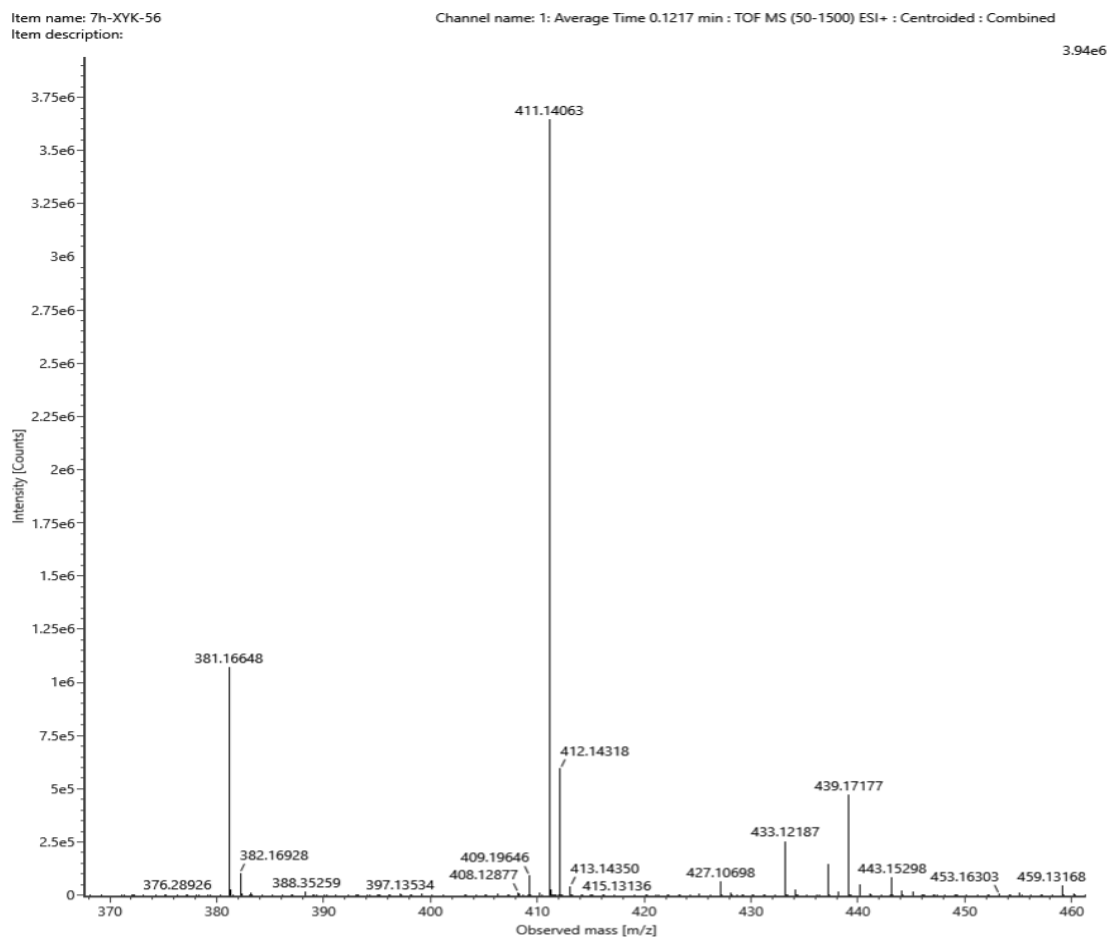


Figure S25. HRMS spectrum of compound **6h**

Jun 03-2021 XYK-77, 1. 1. 1r

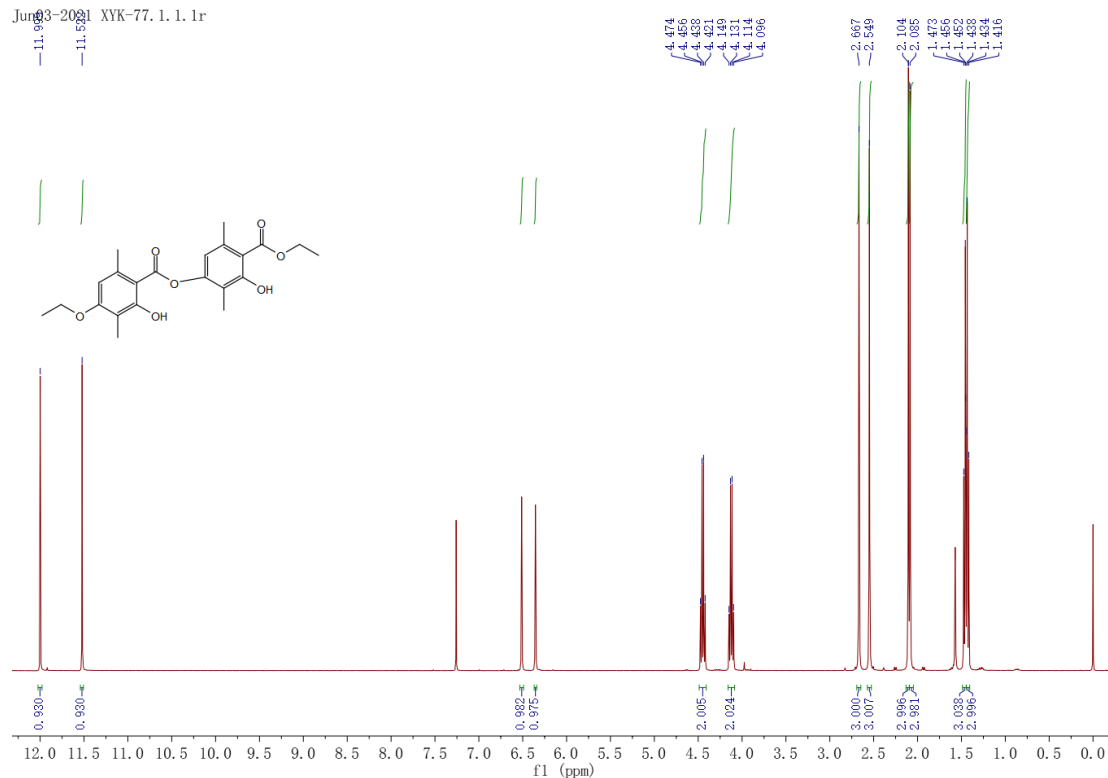


Figure S26. ^1H NMR spectrum of compound **6i**

Jun 03-2021 XYK-77, 1. 1. 1r

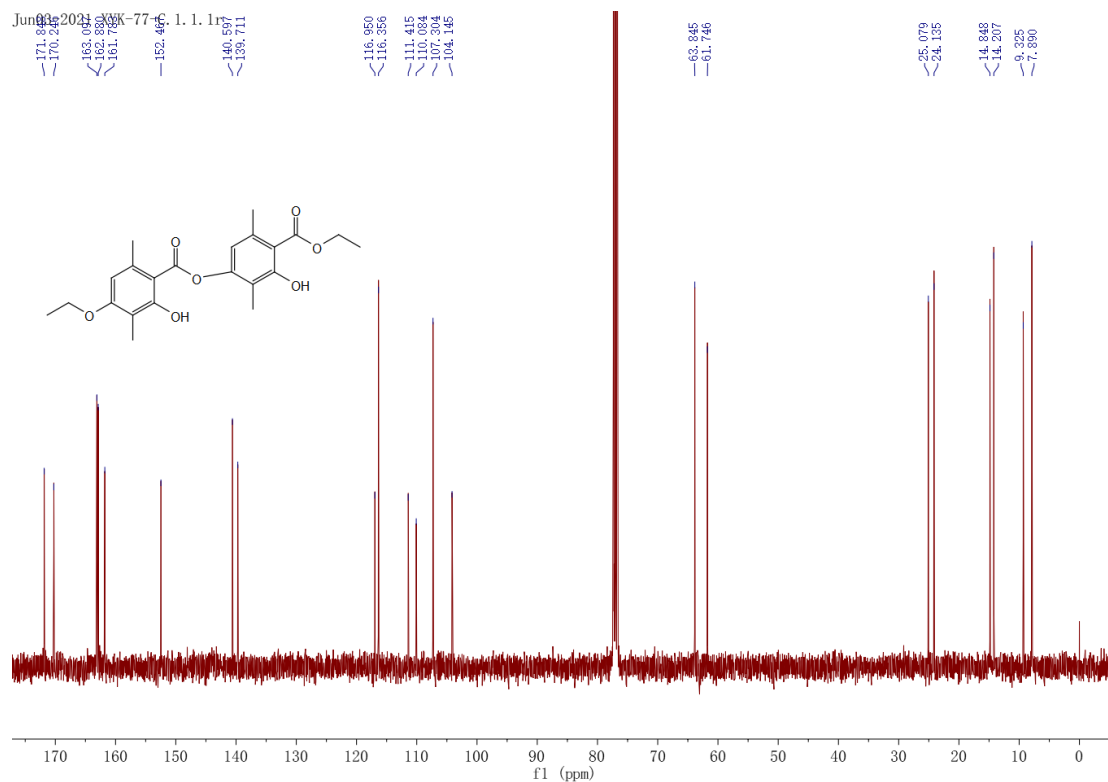


Figure S27. ^{13}C NMR spectrum of compound **6i**

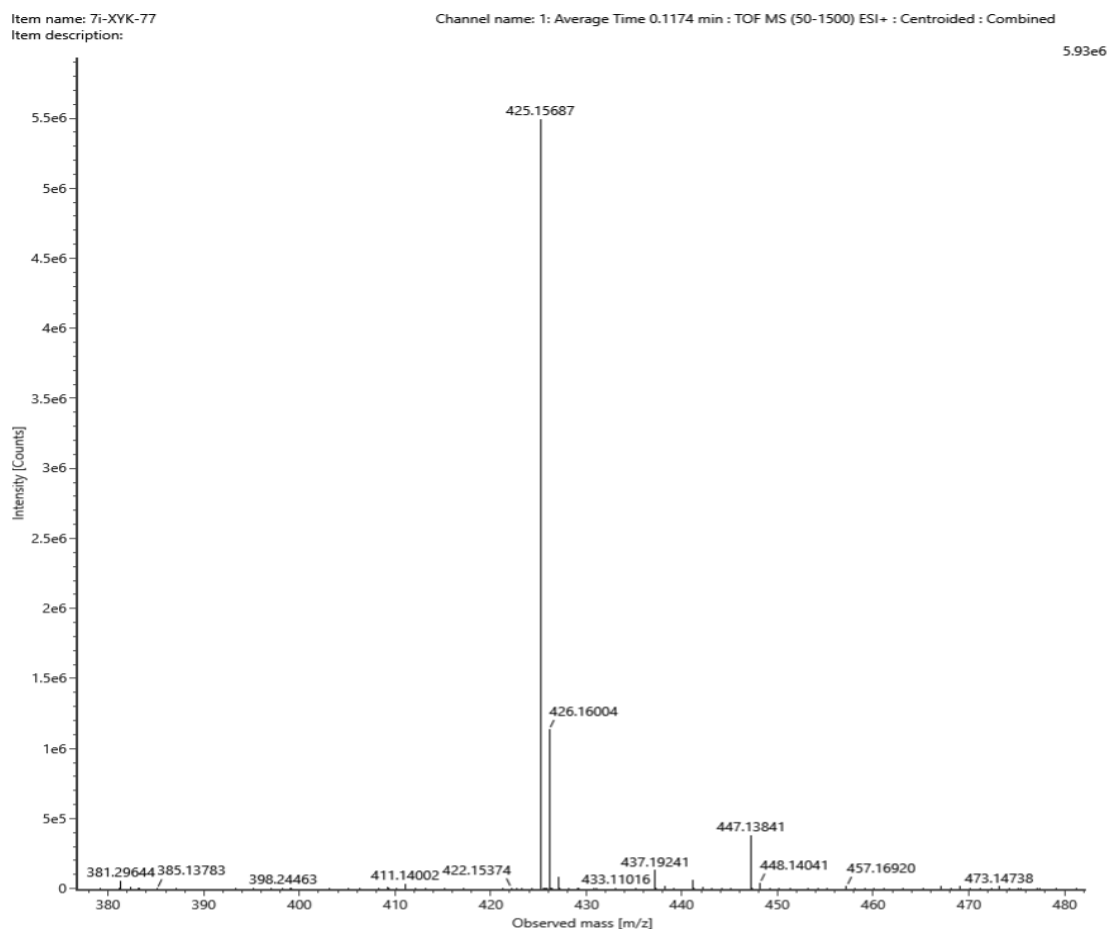


Figure S28. HRMS spectrum of compound **6i**

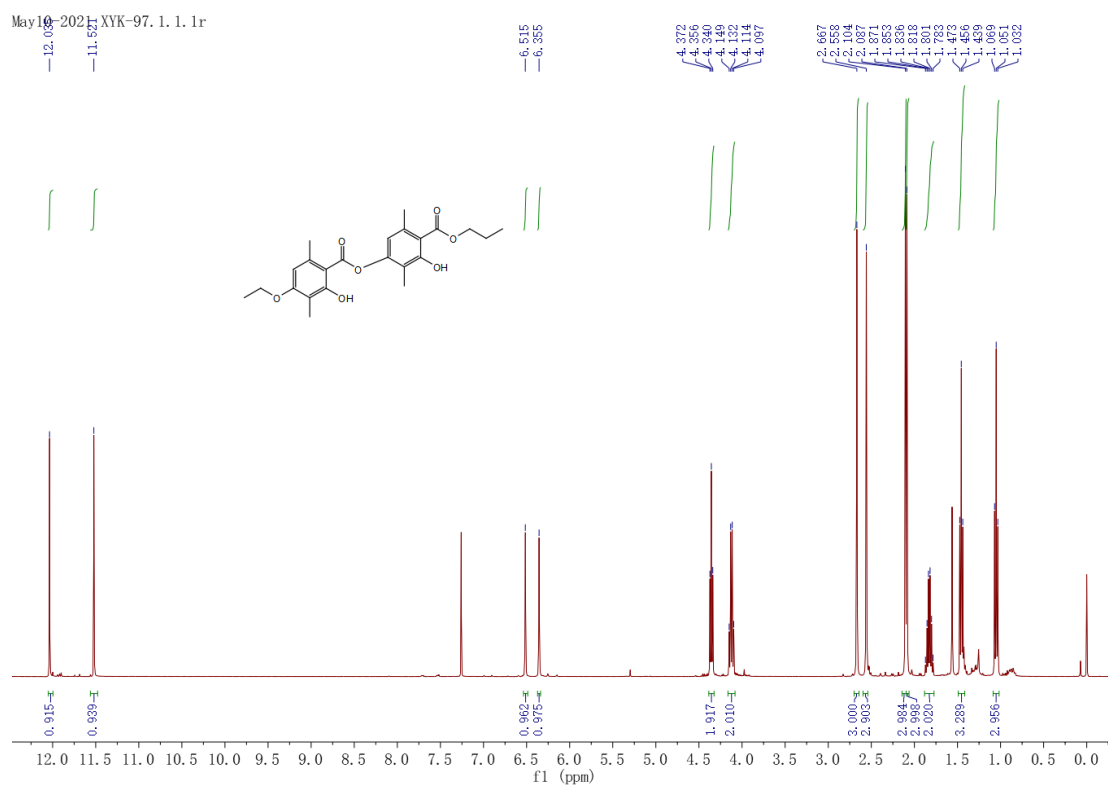


Figure S29. ^1H NMR spectrum of compound **6j**

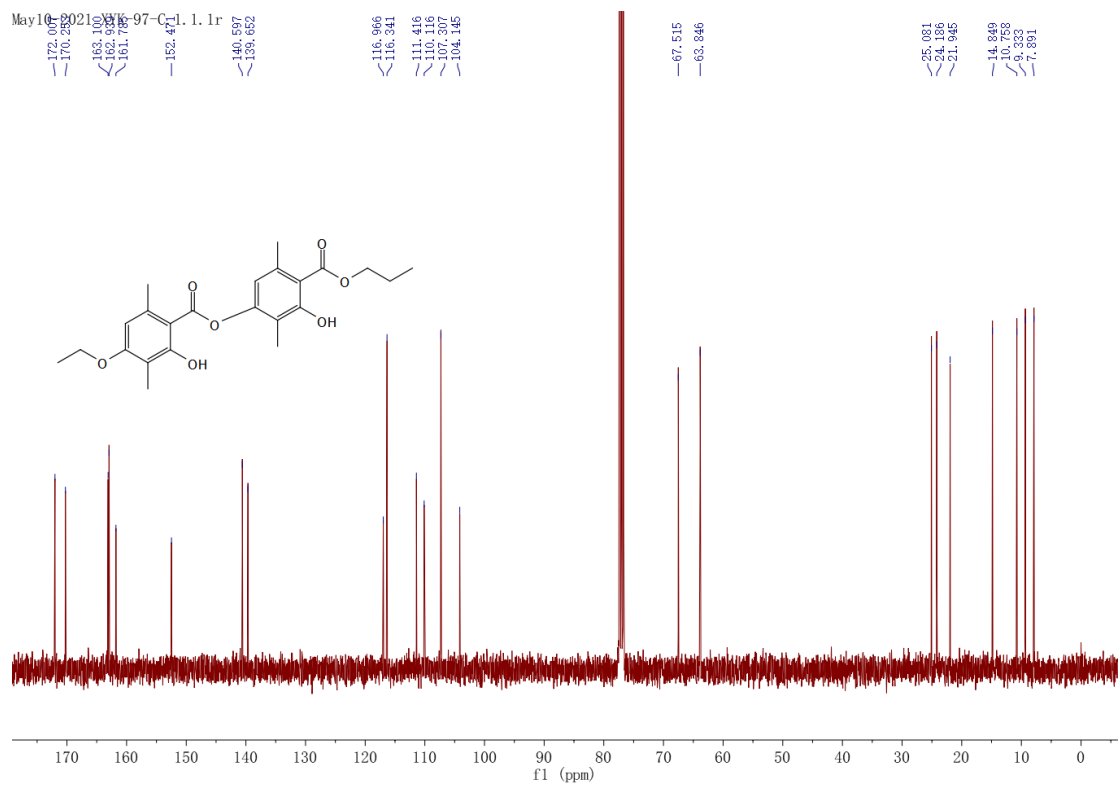


Figure S30. ^{13}C NMR spectrum of compound **6j**

Item name: Tj-XYK-97
Item description:

Channel name: 1: Average Time 0.1132 min : TOF MS (50-1500) ESI+ : Centroided : Combined

6.81e6

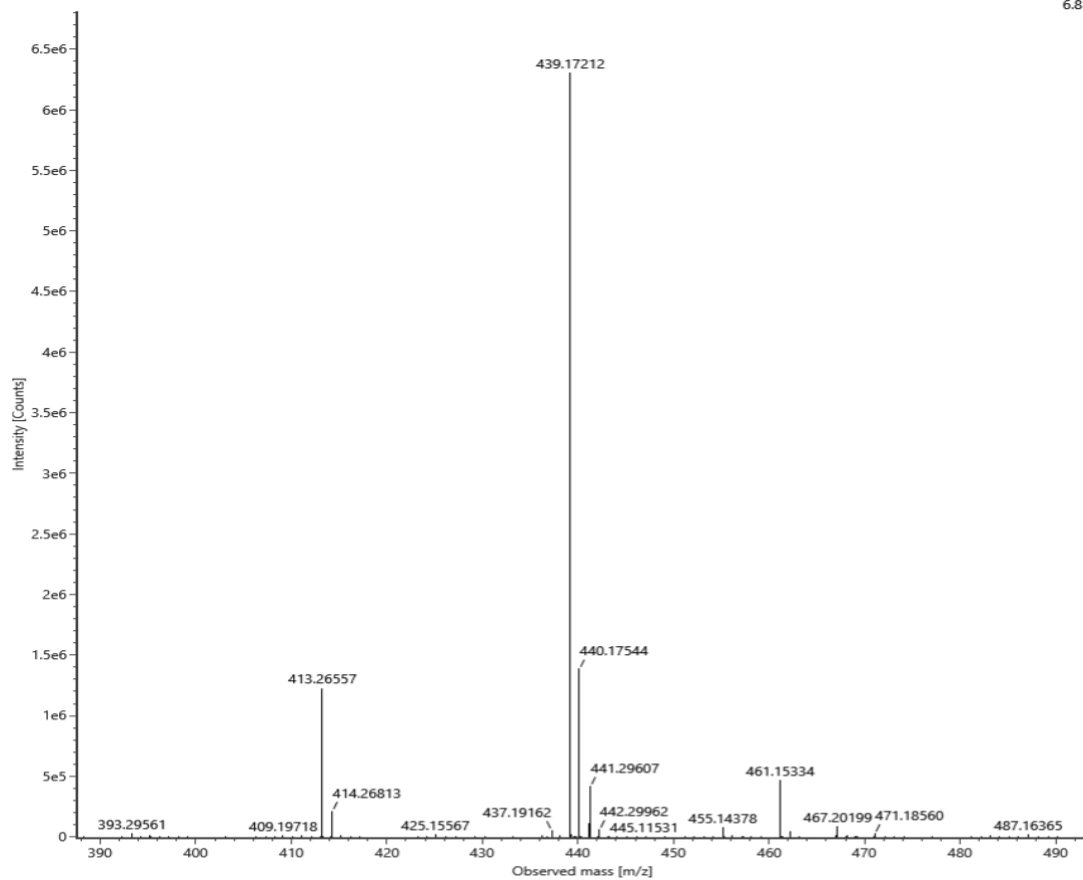


Figure S31. HRMS spectrum of compound **6j**

Jun28-2021 KYK-108. 1. 1. 1r

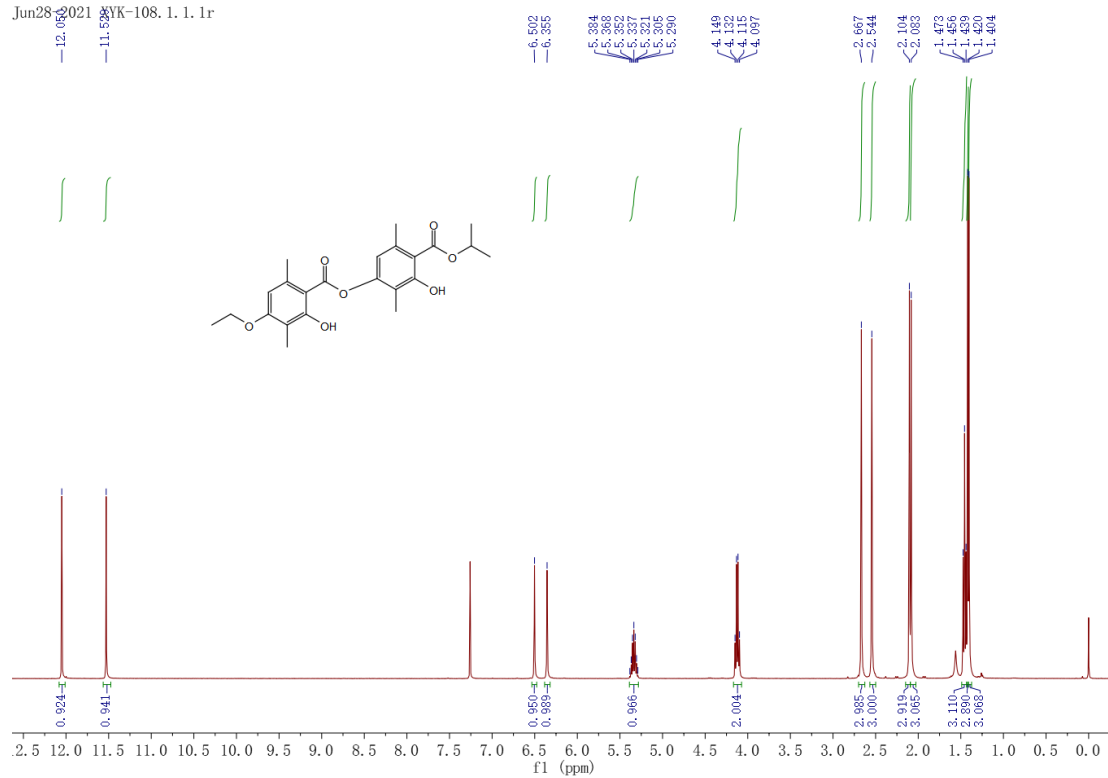


Figure S32. ¹H NMR spectrum of compound **6k**

Jun28-2021 KYK-108. 1. 1. 1r

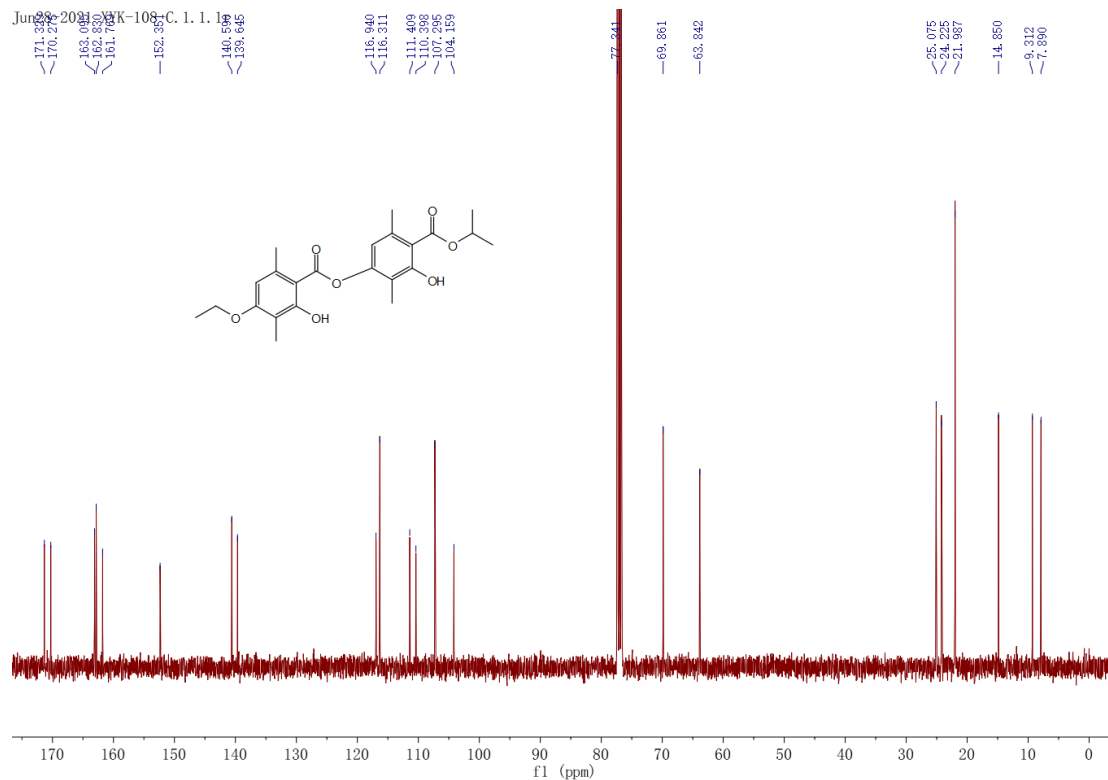


Figure S33. ¹³C NMR spectrum of compound **6k**

Item name: 7k-XYK-108
Item description:

Channel name: 1: Average Time 0.1131 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.44e7

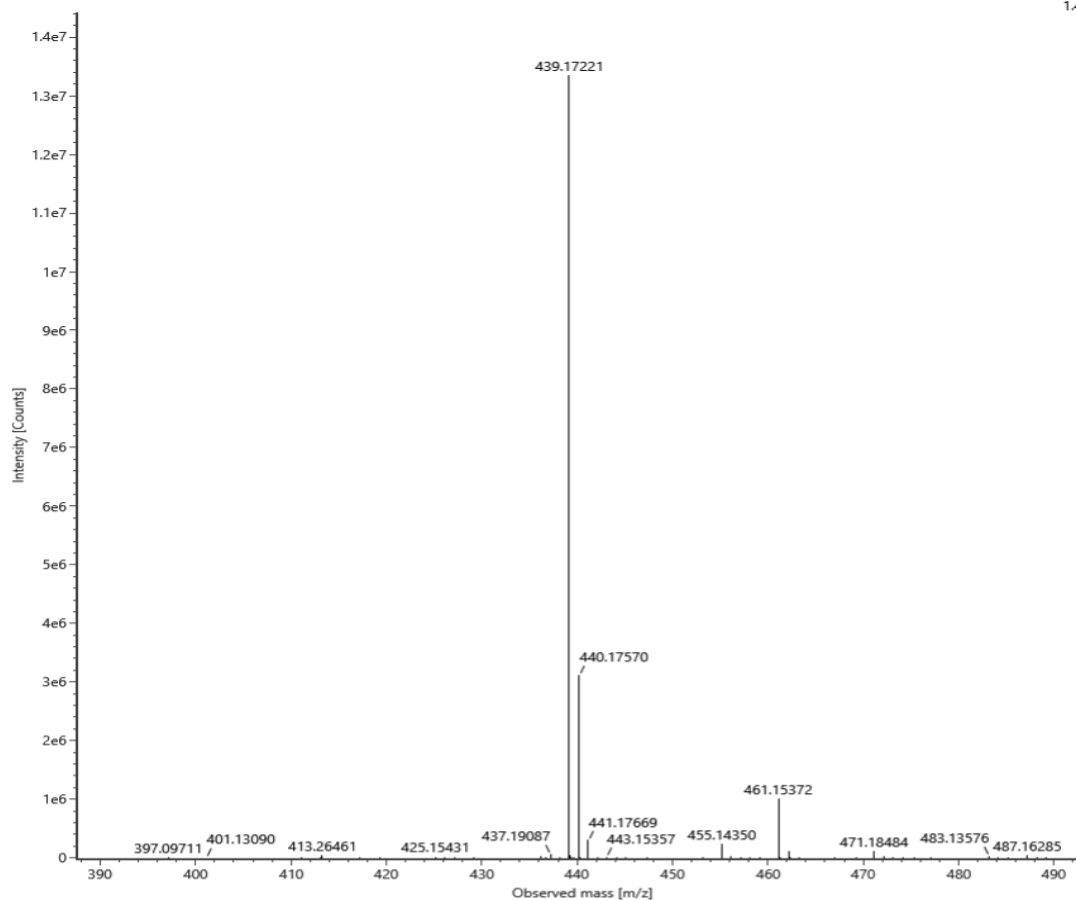


Figure S34. HRMS spectrum of compound 6k

Jan 18, 2021 XYK-57-H, 1. 1. 1r

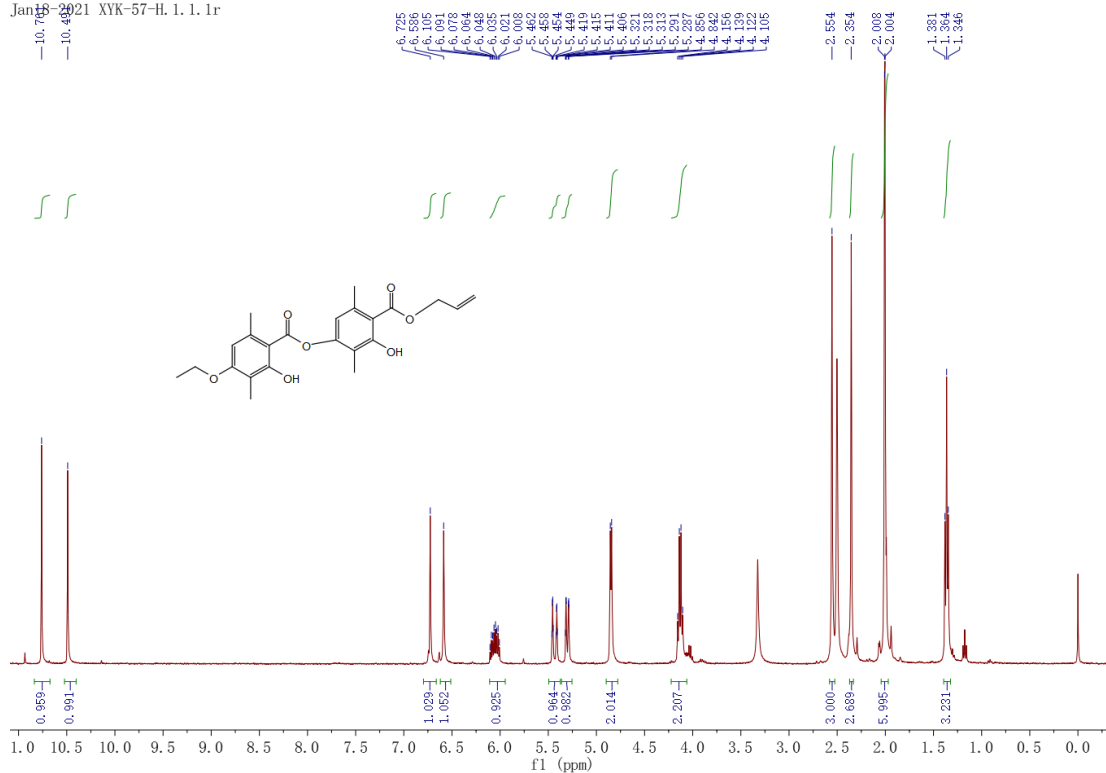


Figure S35. ¹H NMR spectrum of compound 6l

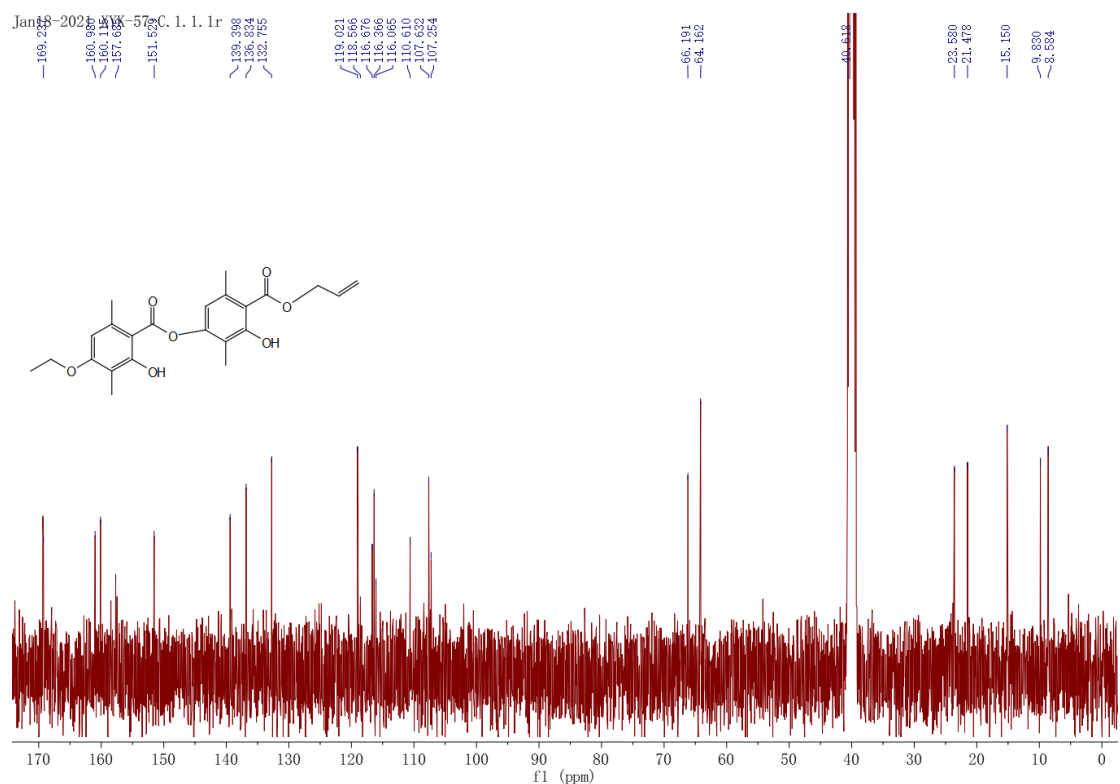


Figure S36. ^{13}C NMR spectrum of compound **6l**

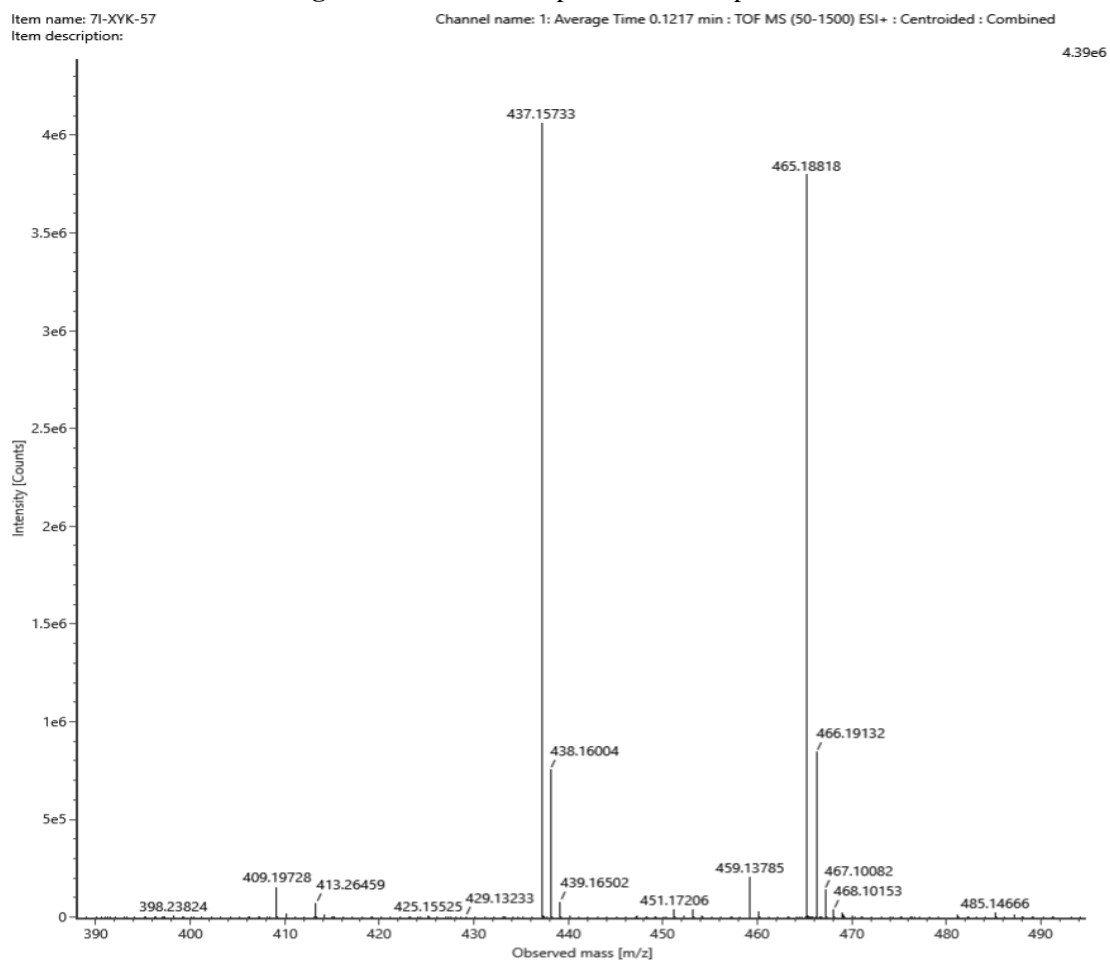


Figure S37. HRMS spectrum of compound **6l**

Apr07-2021 XYK-72. 1. 1. 1r

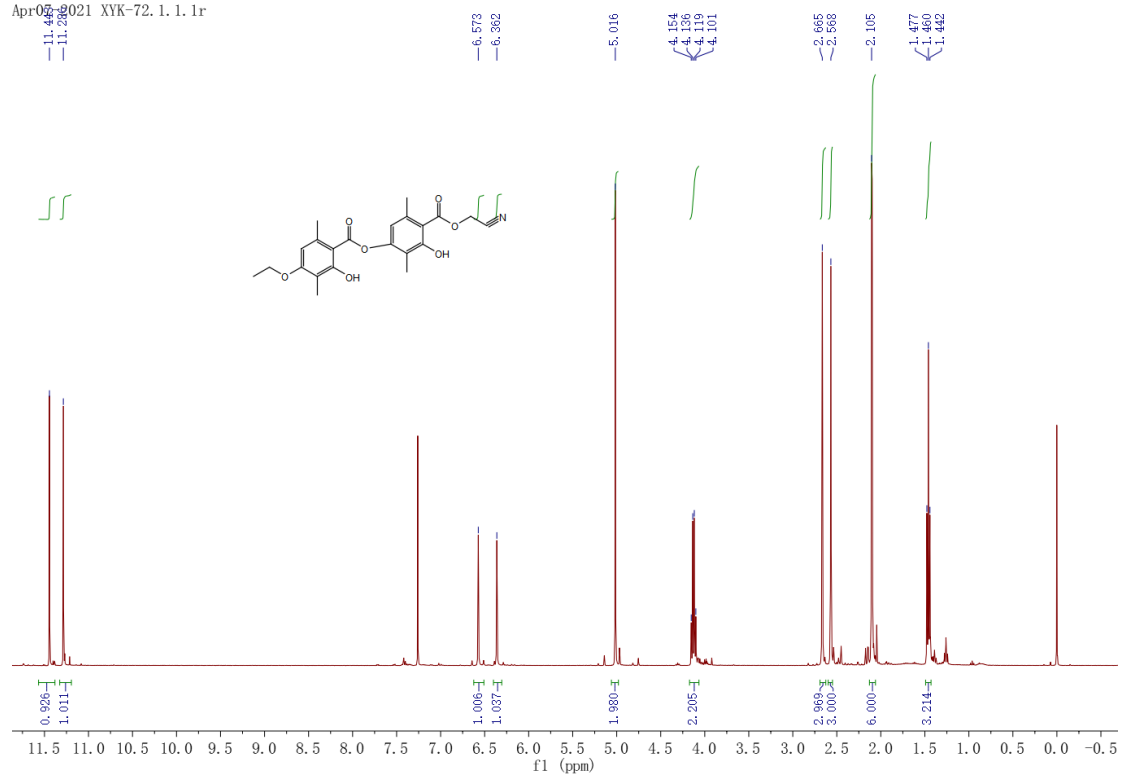


Figure S38. ¹H NMR spectrum of compound 6m

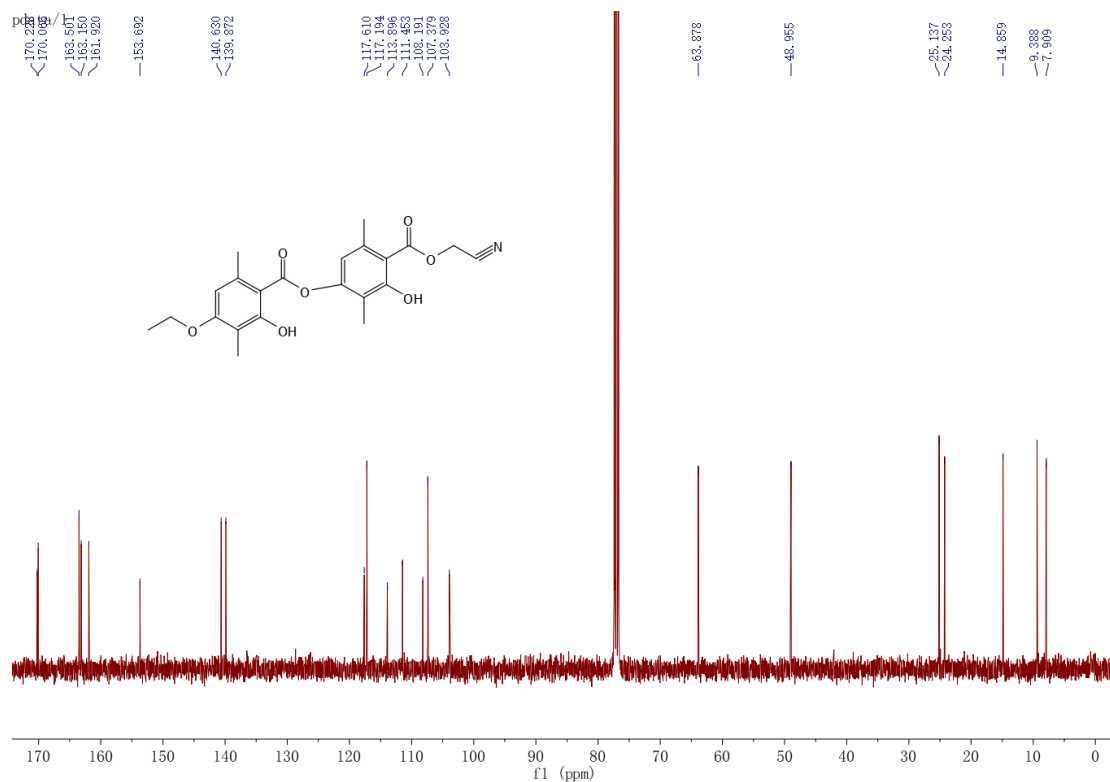


Figure S39. ¹³C NMR spectrum of compound 6m

Item name: 7m-XYK-72-2
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

3.17e6

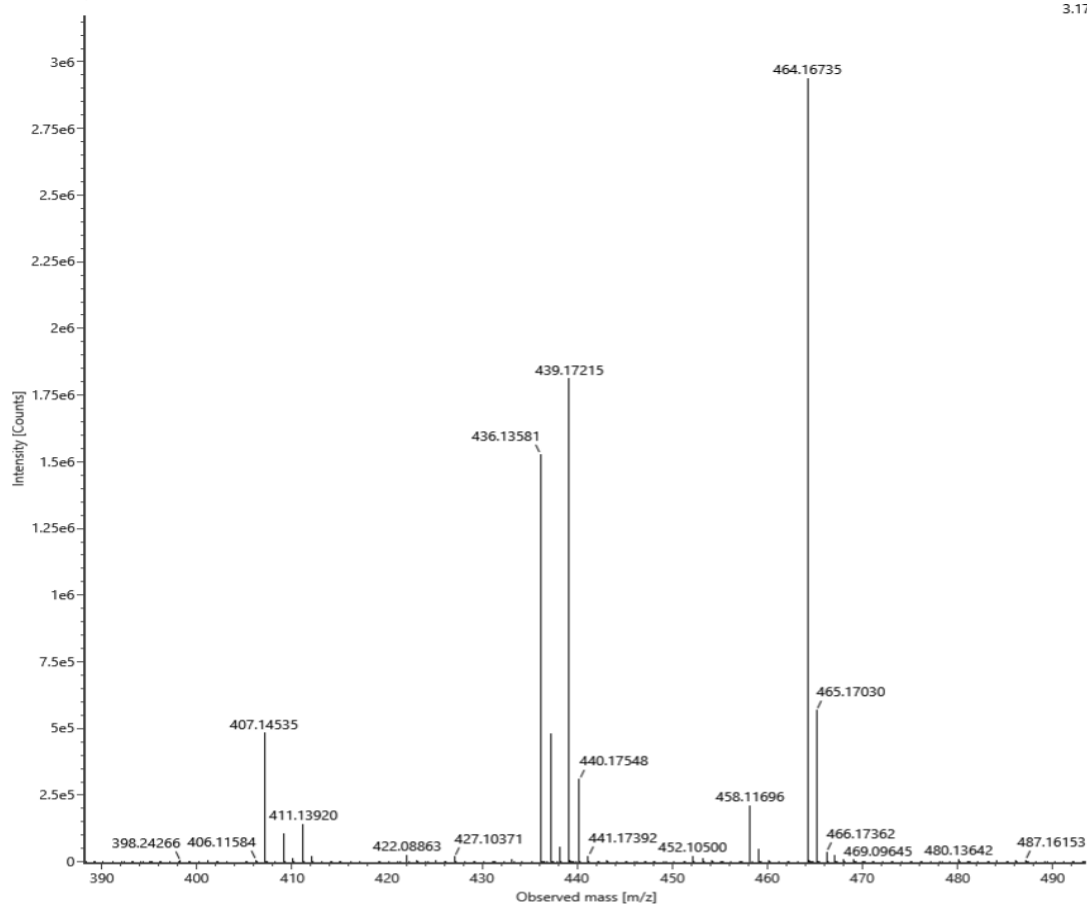


Figure S40. HRMS spectrum of compound 6m

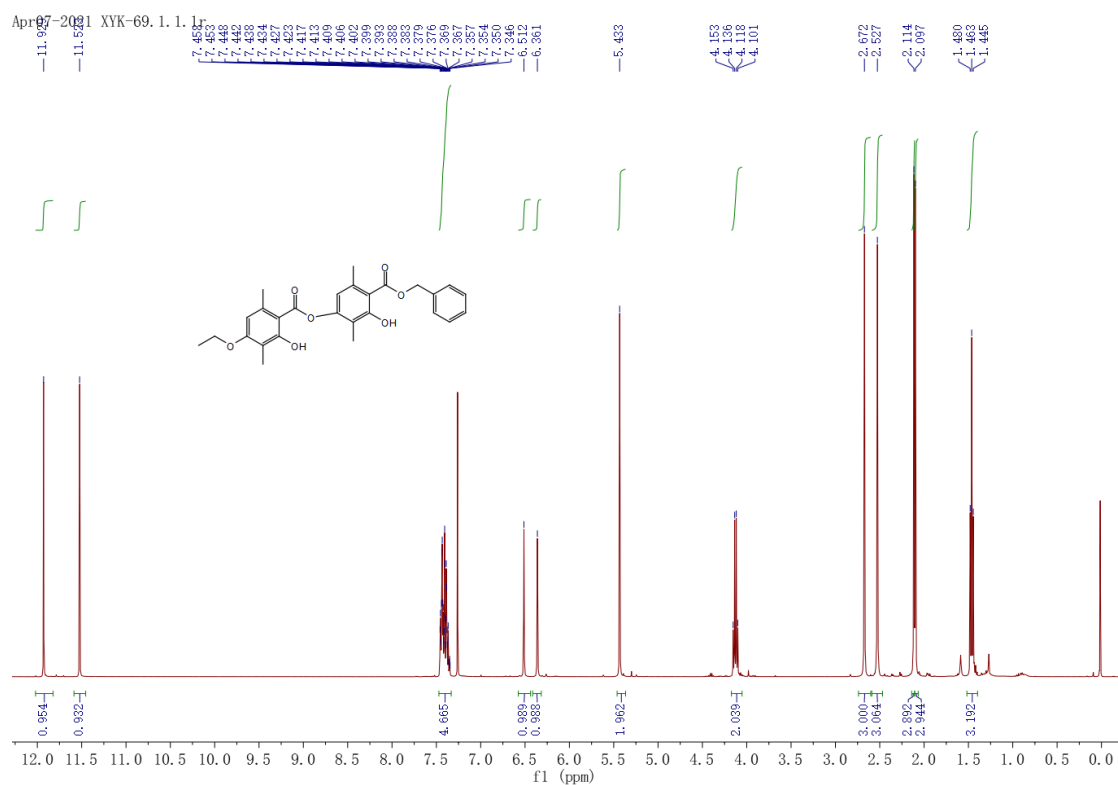


Figure S41. ¹H NMR spectrum of compound 6n

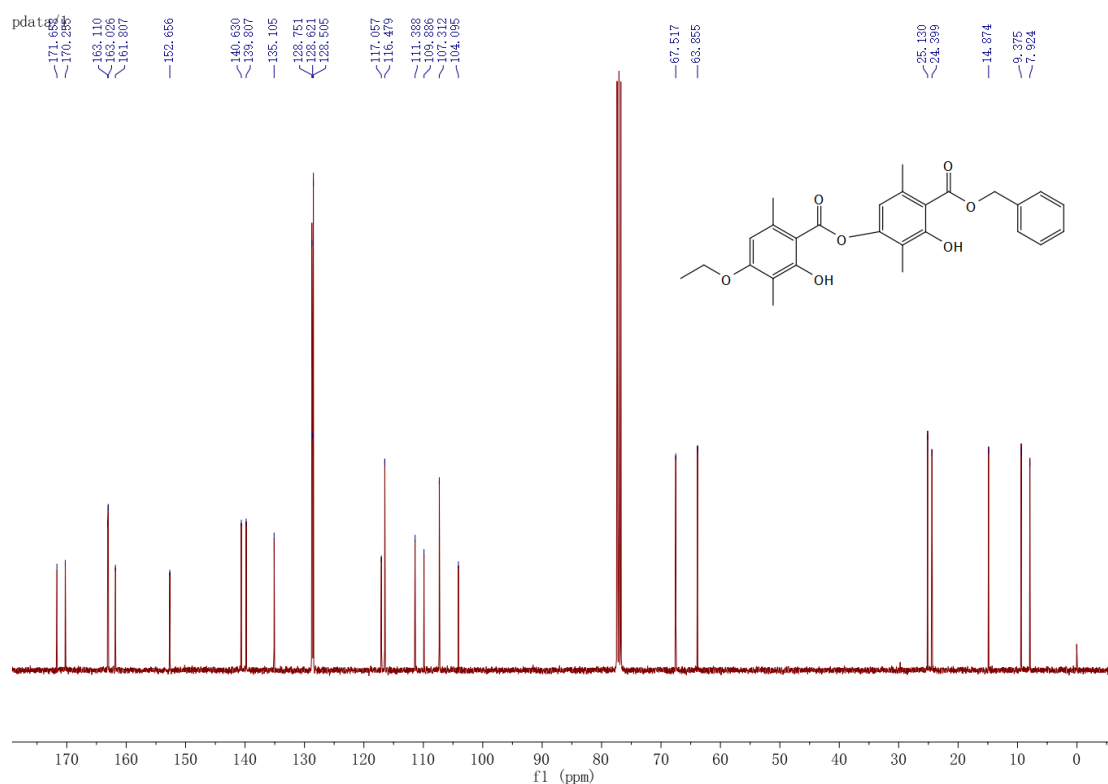


Figure S42. ^{13}C NMR spectrum of compound **6n**

Item name: 7n-XYK-69-1
Item description:

Channel name: 1: Average Time 0.1217 min : TOF MS (50-1500) ESI+ : Centroided : Combined

5.49e6

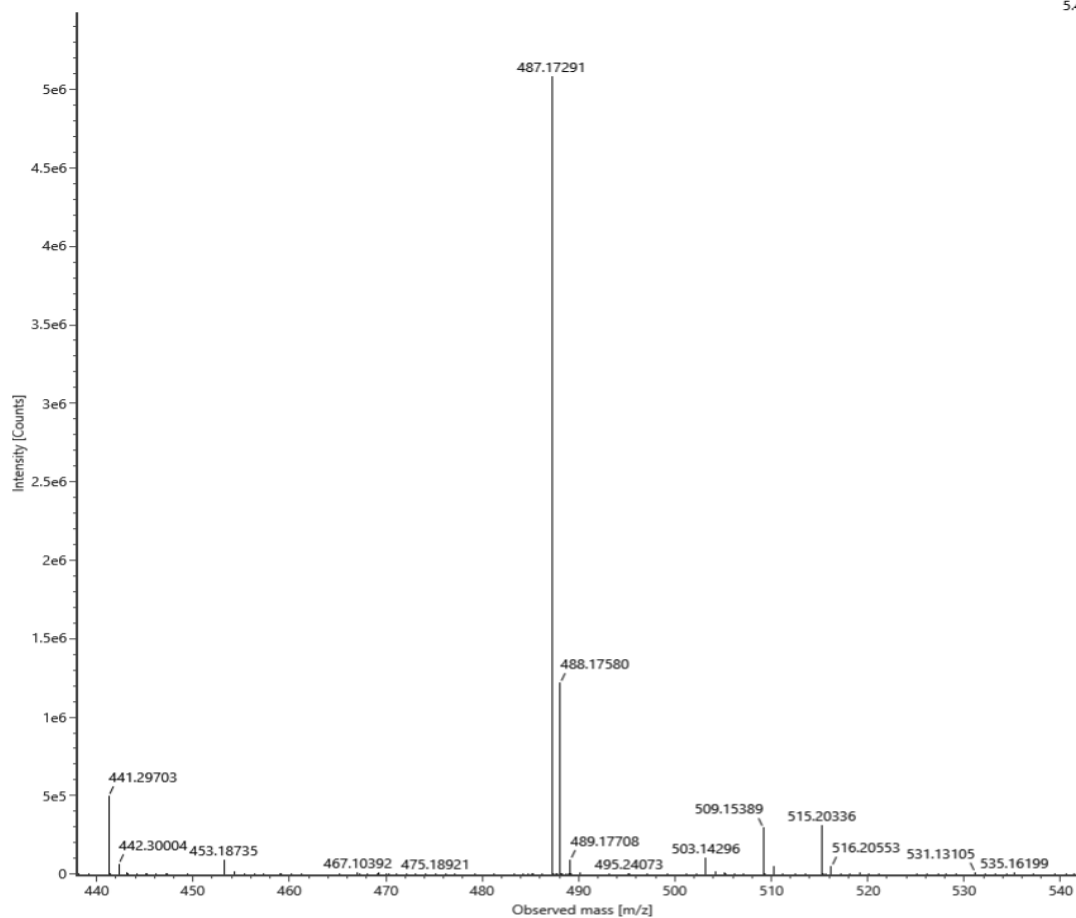


Figure S43. HRMS spectrum of compound **6n**

Apr20-2021 XYK-82. 1. 1. 1r

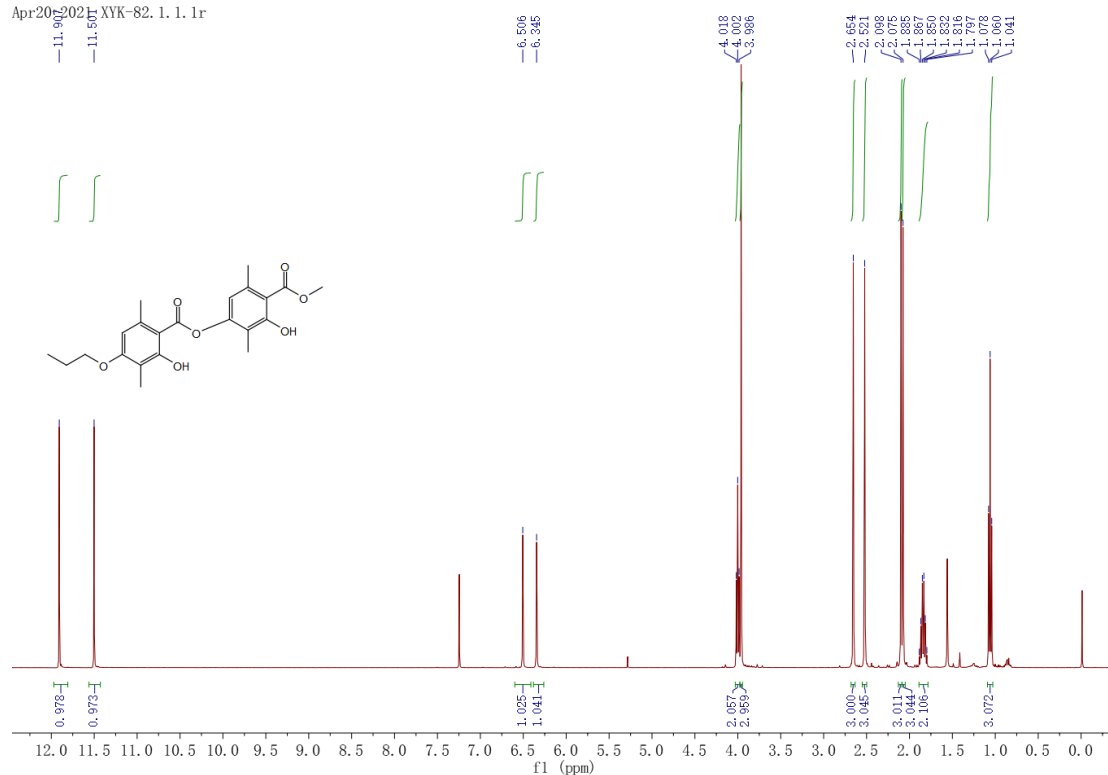


Figure S44. ¹H NMR spectrum of compound **60**

Apr20-2021 XYK-82. 1. 1. 1r

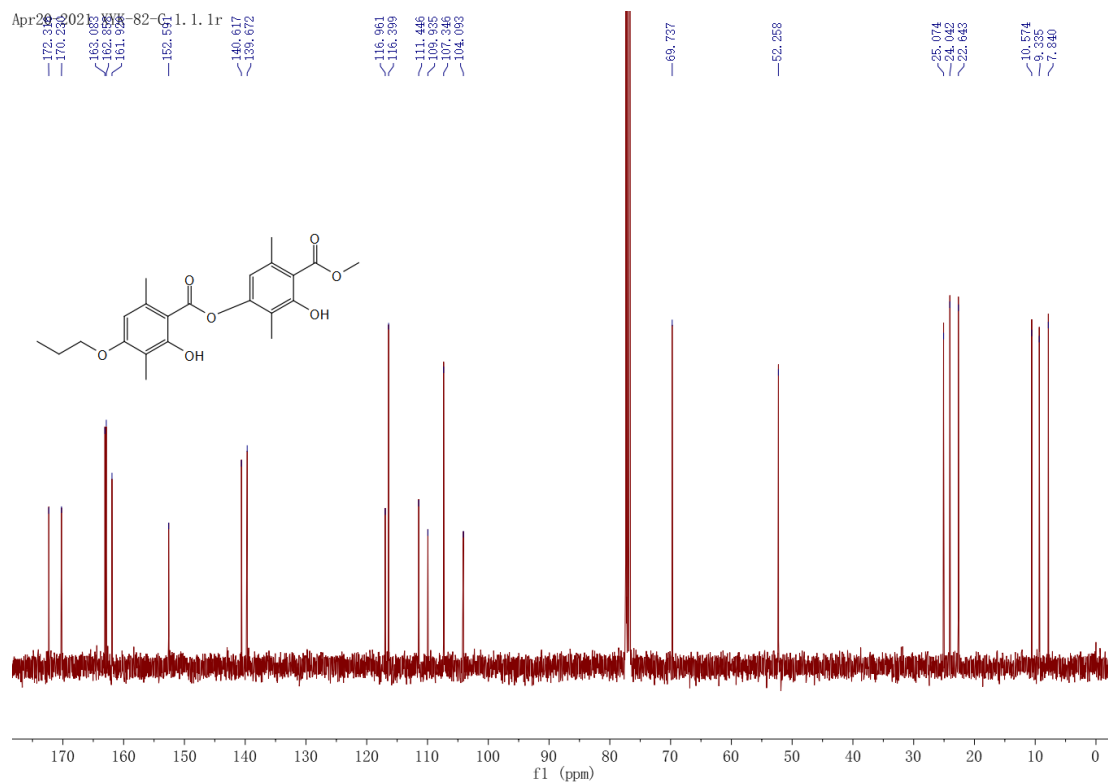


Figure S45. ¹³C NMR spectrum of compound **60**

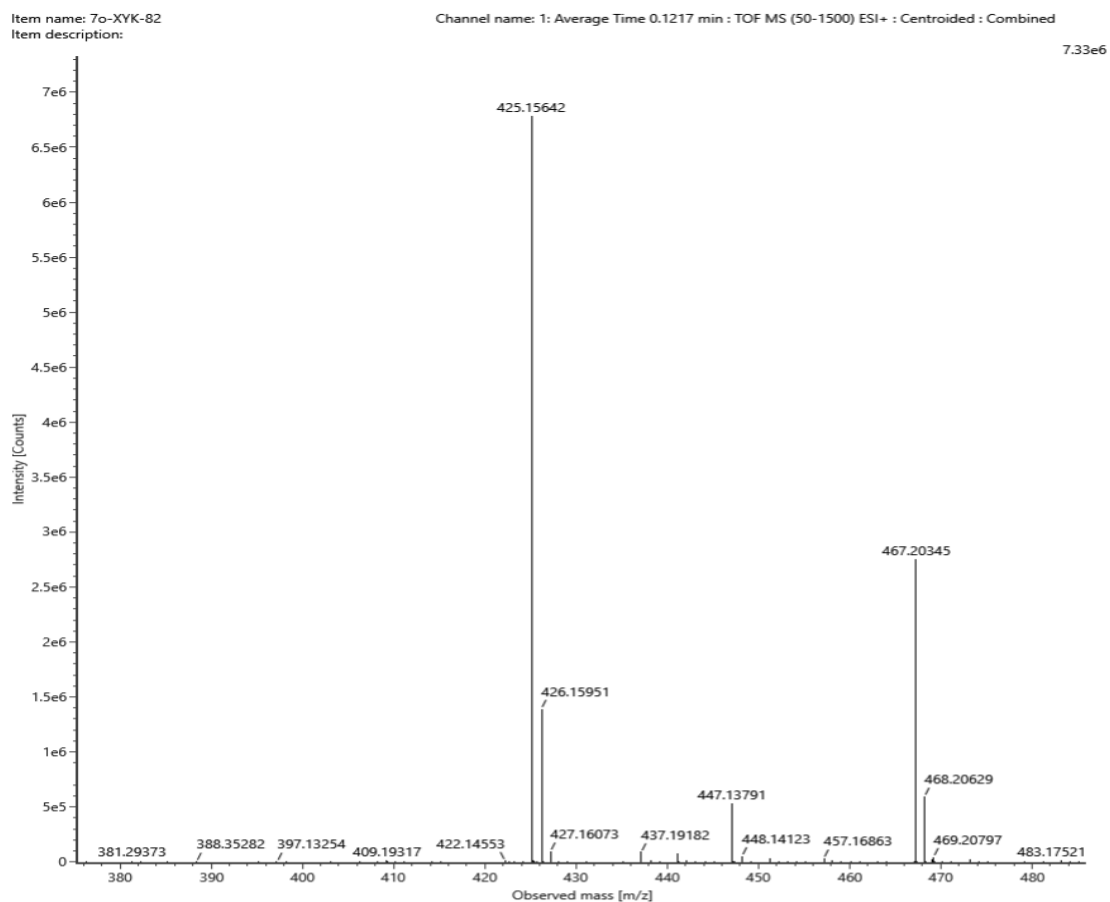


Figure S46. HRMS spectrum of compound **60**

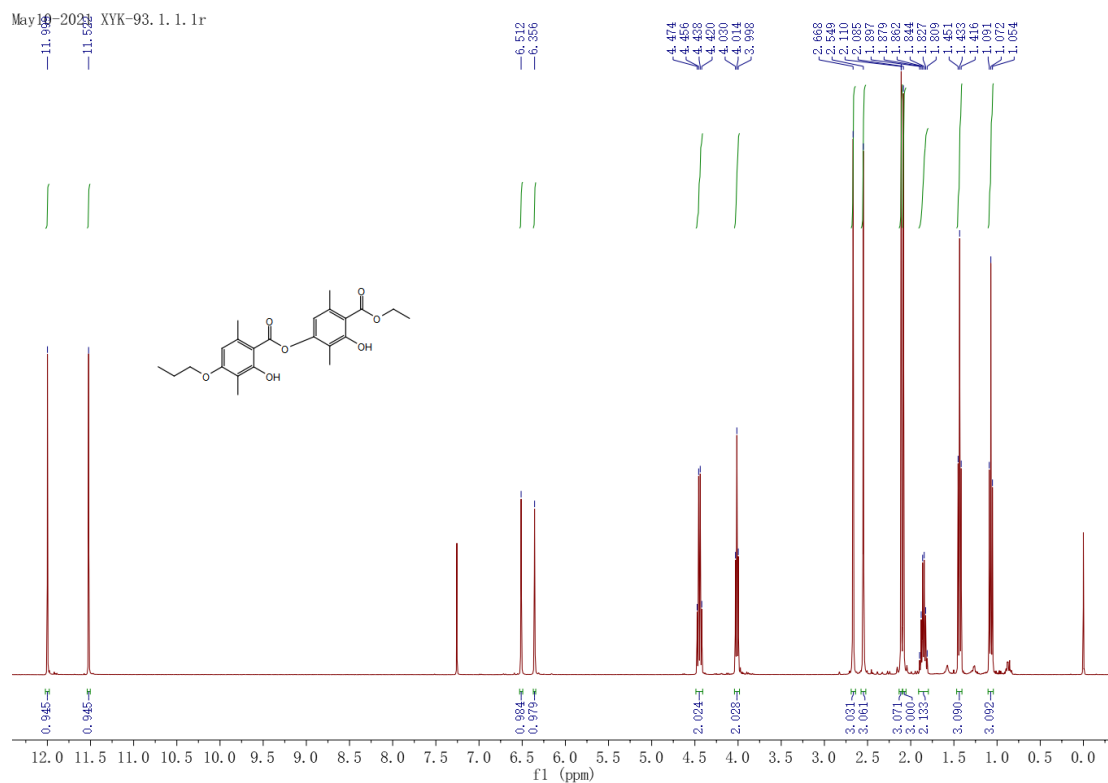


Figure S47. ^1H NMR spectrum of compound **6p**

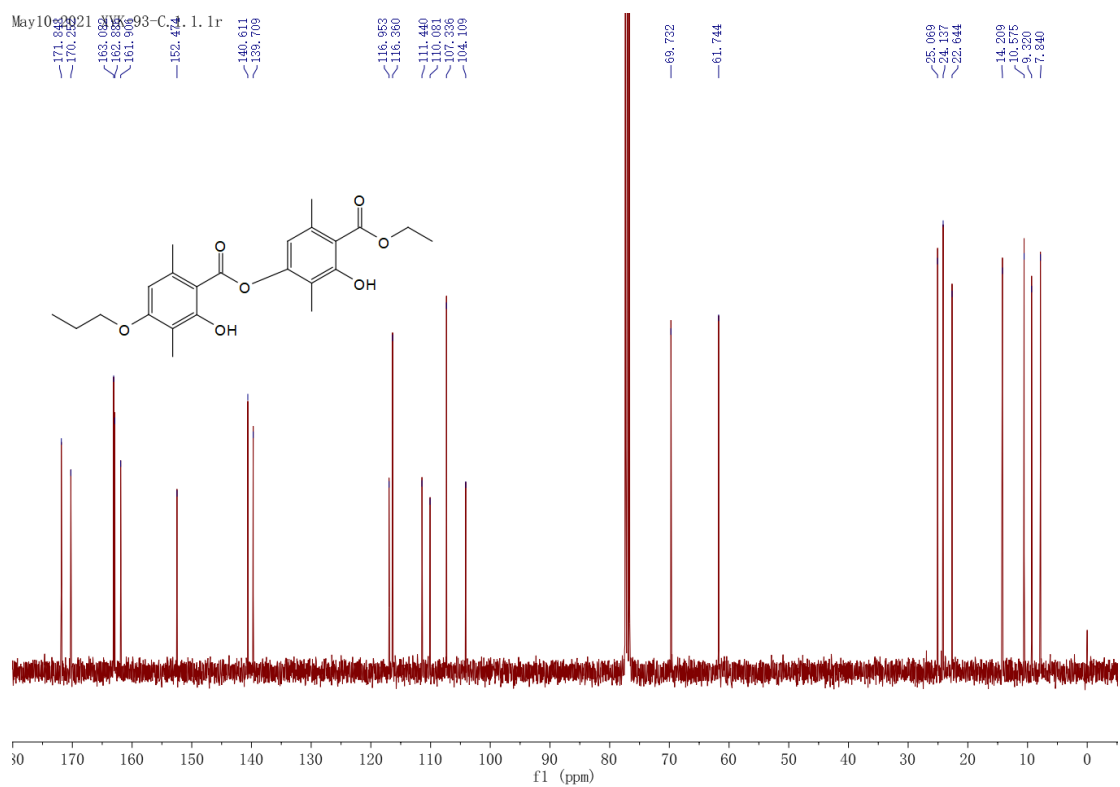


Figure S48. ^{13}C NMR spectrum of compound **6p**

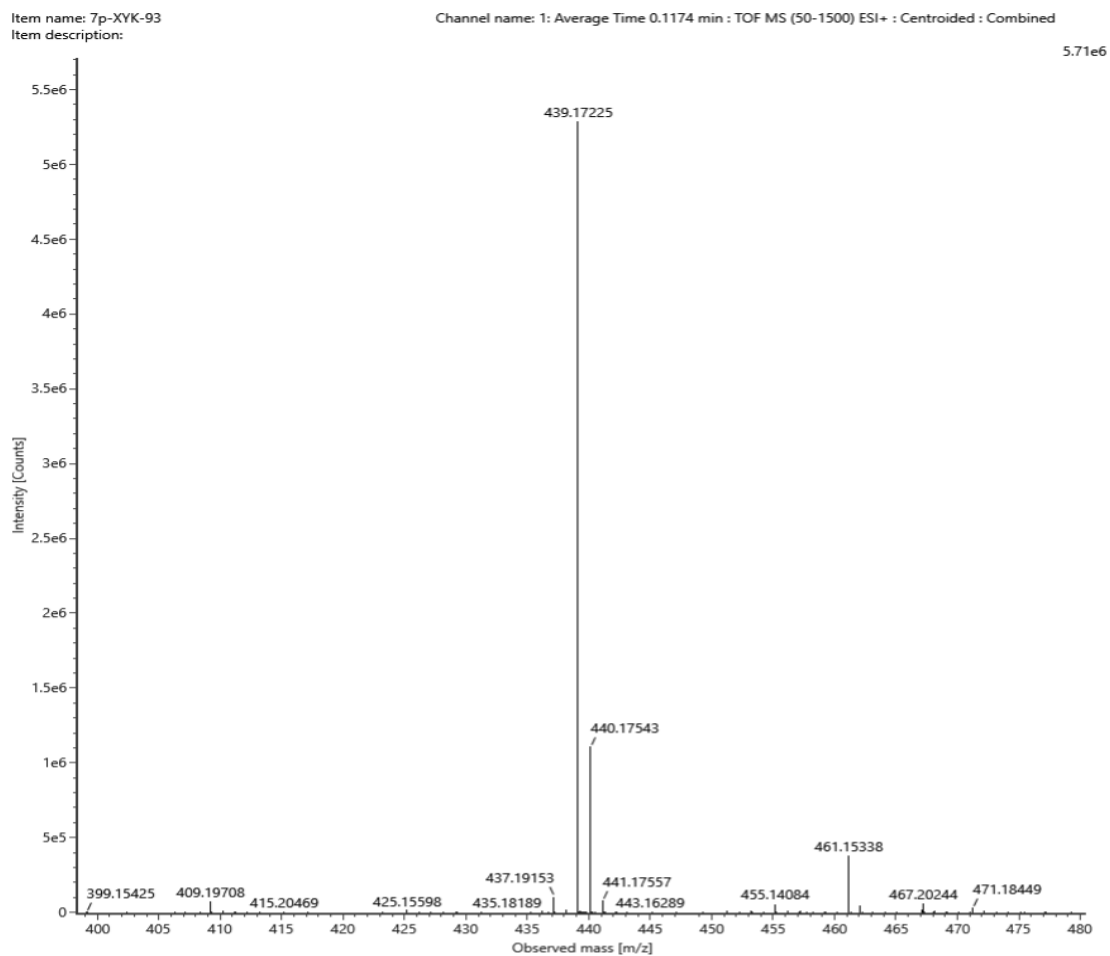


Figure S49. HRMS spectrum of compound **6p**

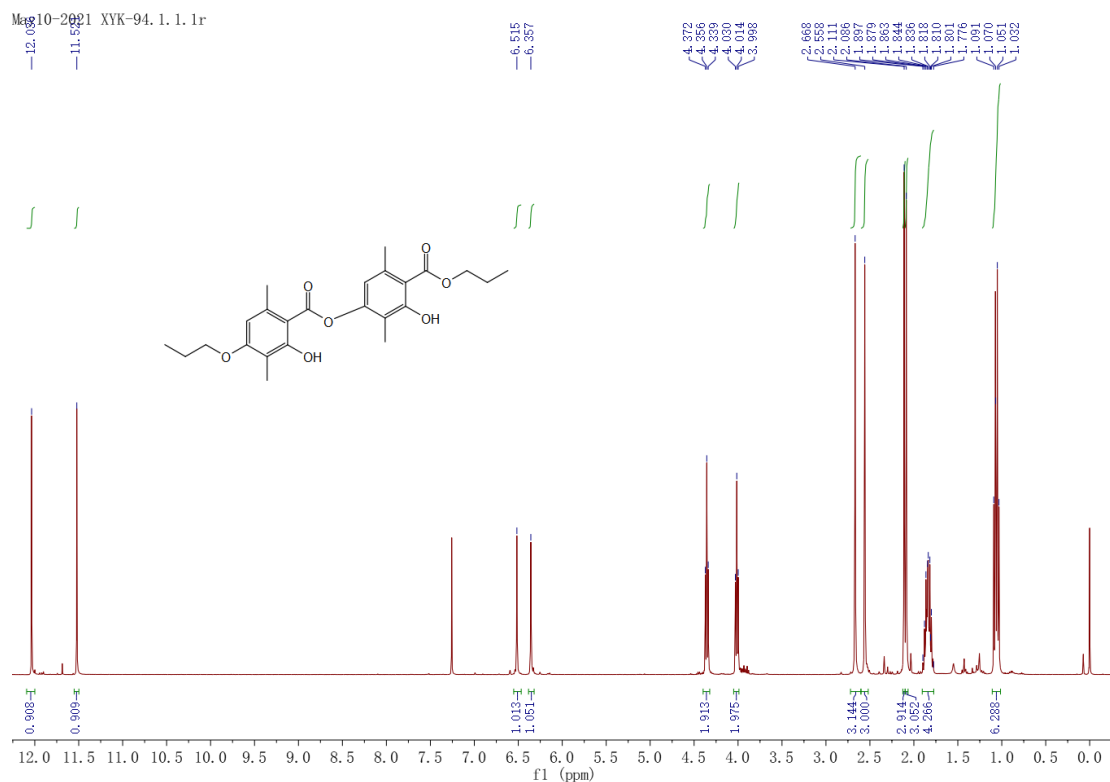


Figure S50. ^1H NMR spectrum of compound 6q

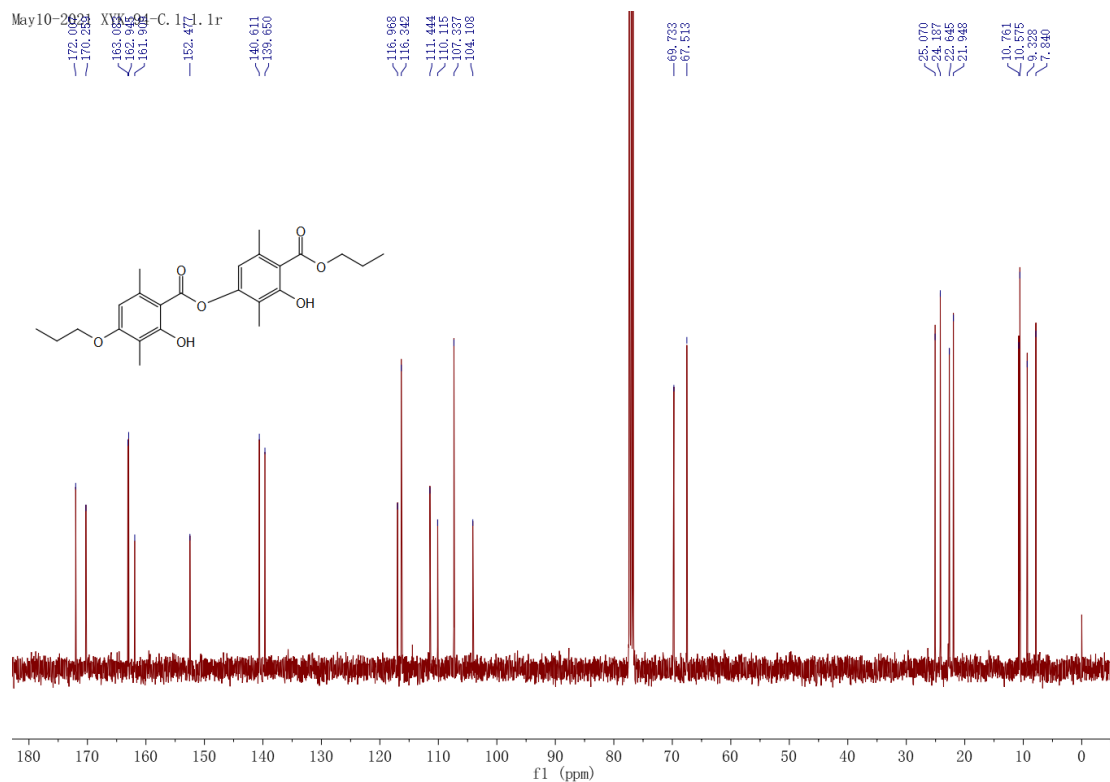


Figure S51. ^{13}C NMR spectrum of compound 6q

Item name: 7q-XYK-94
Item description:

Channel name: 1: Average Time 0.1217 min : TOF MS (50-1500) ESI+ : Centroided : Combined

9.69e6

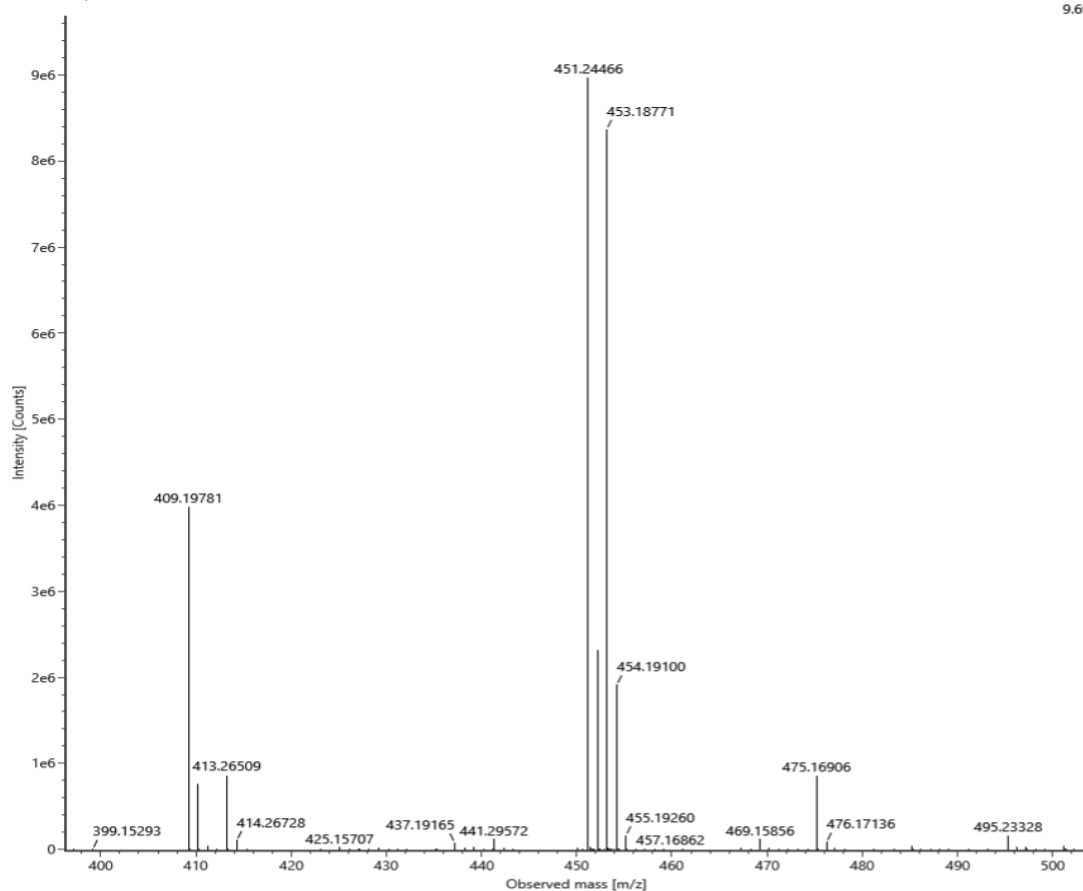


Figure S52. HRMS spectrum of compound 6q

May10-2021 XYK-96, 1. 1. 1r

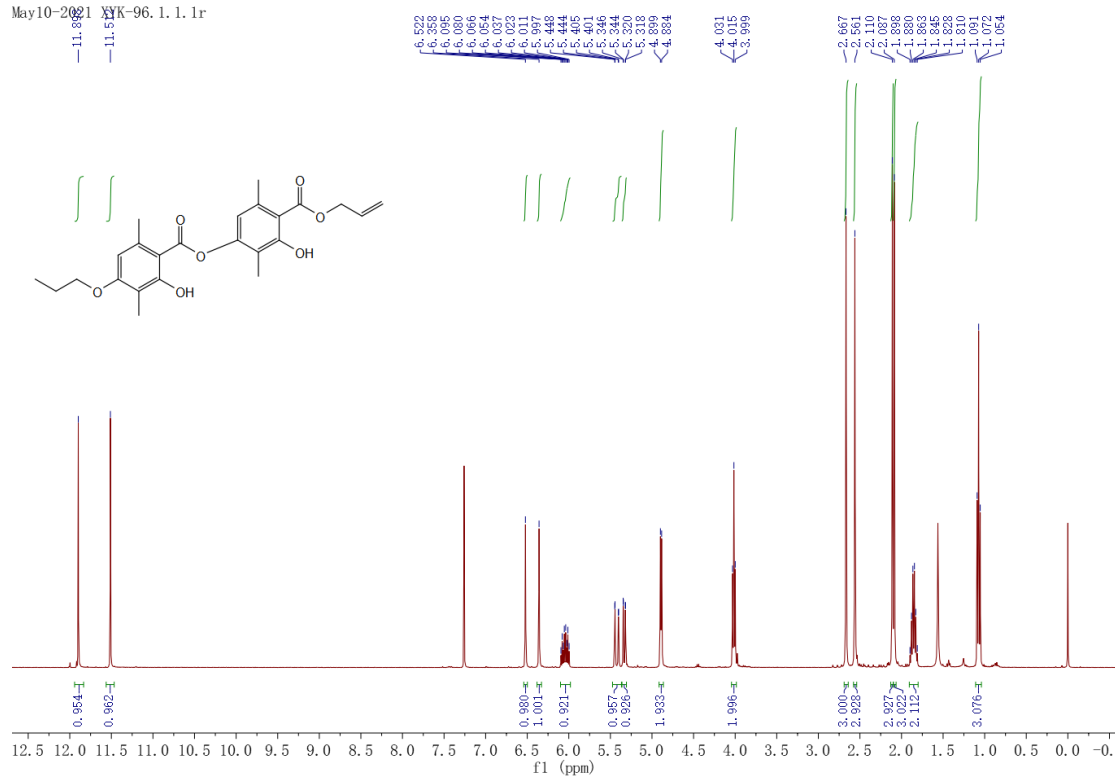


Figure S53. ¹H NMR spectrum of compound 6r

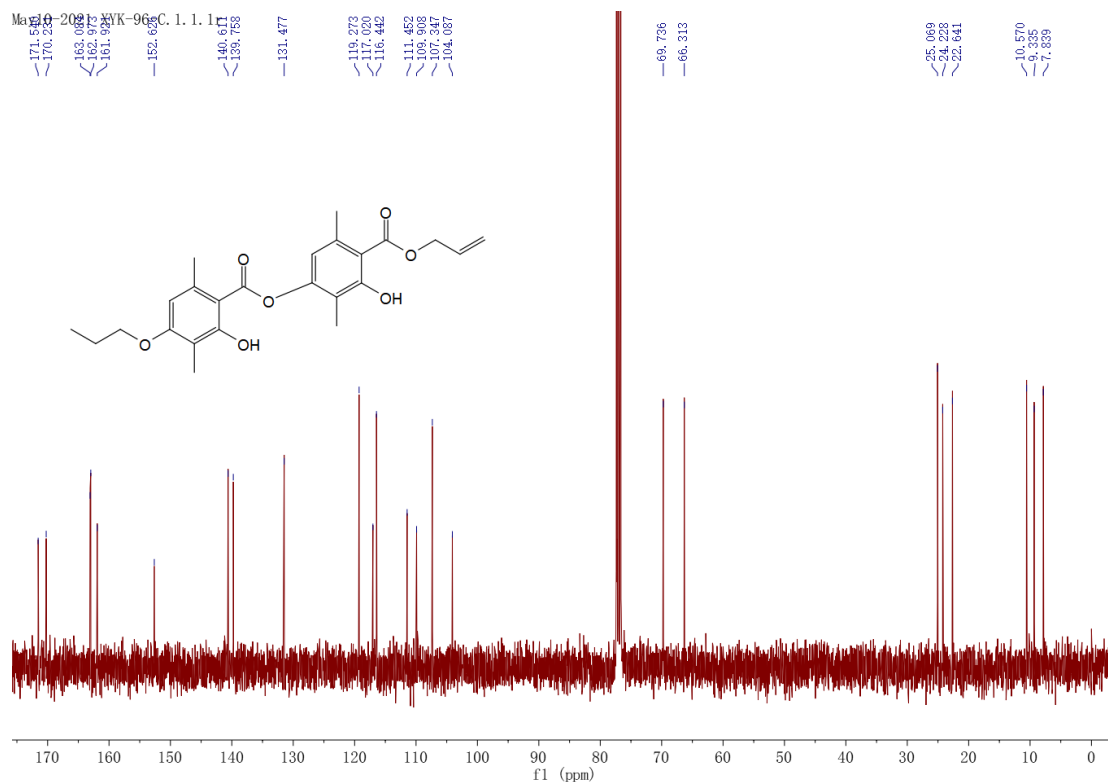


Figure S54. ^{13}C NMR spectrum of compound **6r**

Item name: 7r-XYK-96
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

9.46e6

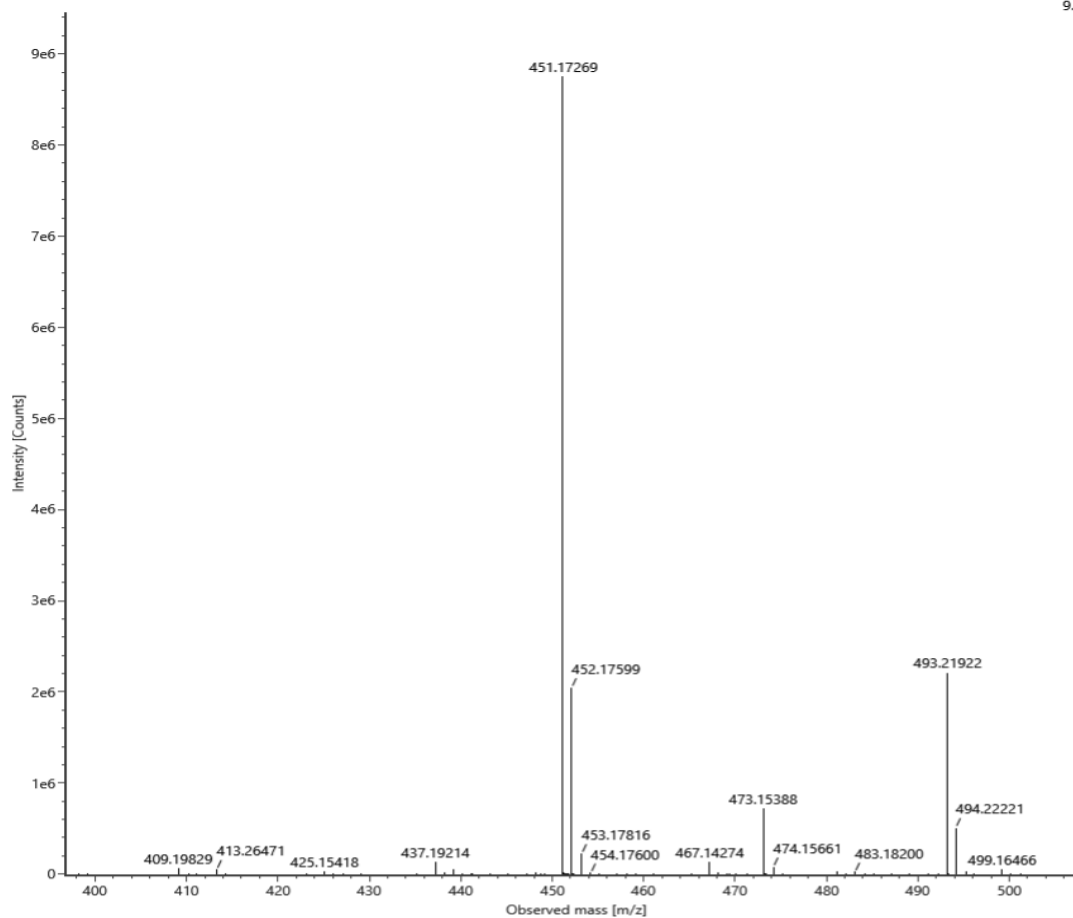


Figure S55. HRMS spectrum of compound **6r**

Apr20-2021 XYK-84. 1. 1. 1r

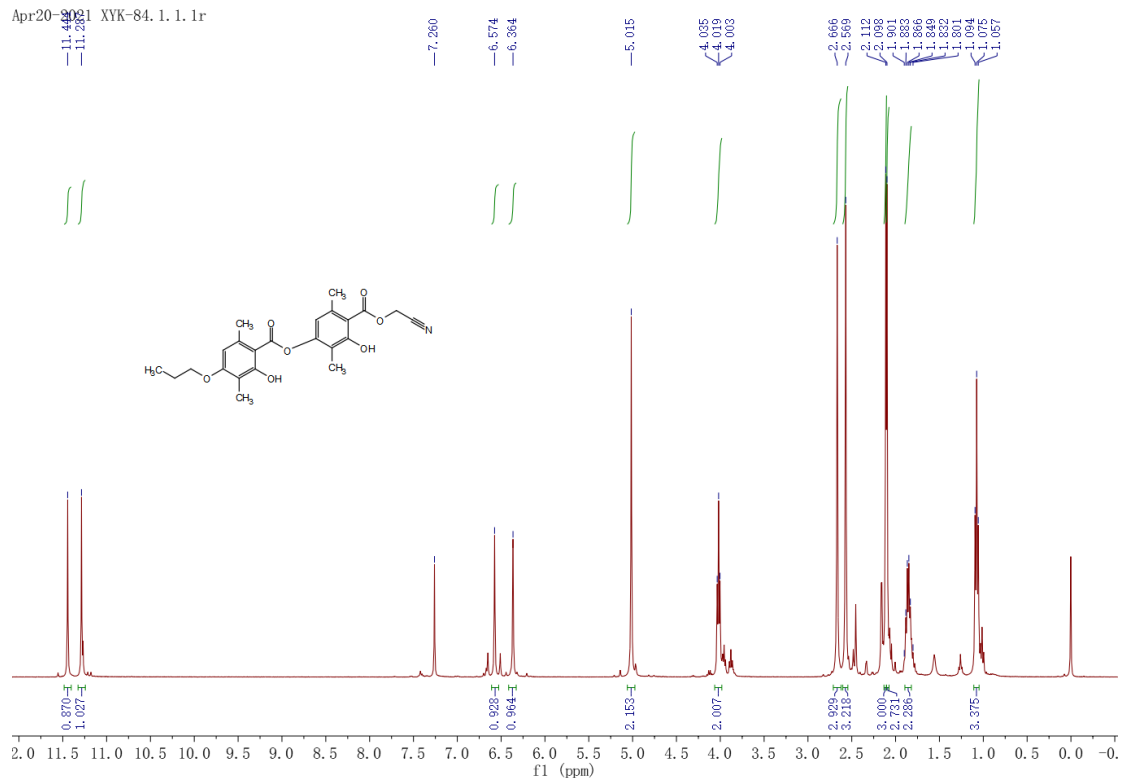


Figure S56. ¹H NMR spectrum of compound 6s

Apr20-2021 XYK-84. C. 1. 1. 1r

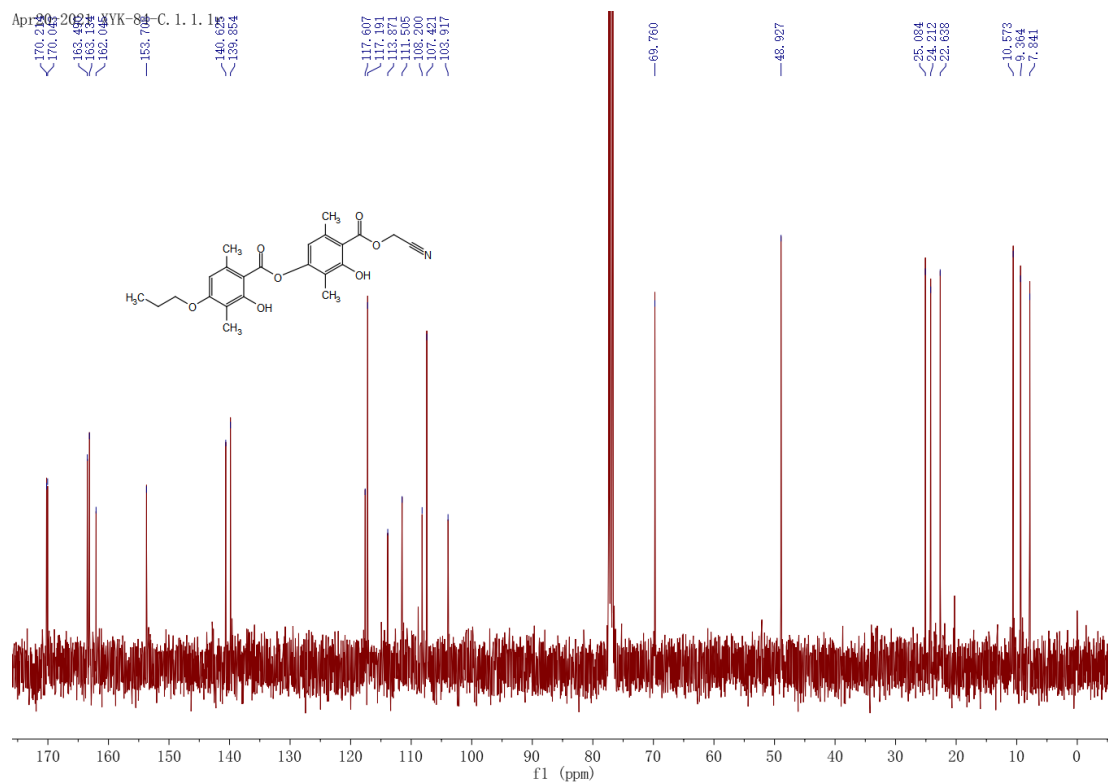


Figure S57. ¹³C NMR spectrum of compound 6s

Item name: 7s-XYK-84
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

4.98e6

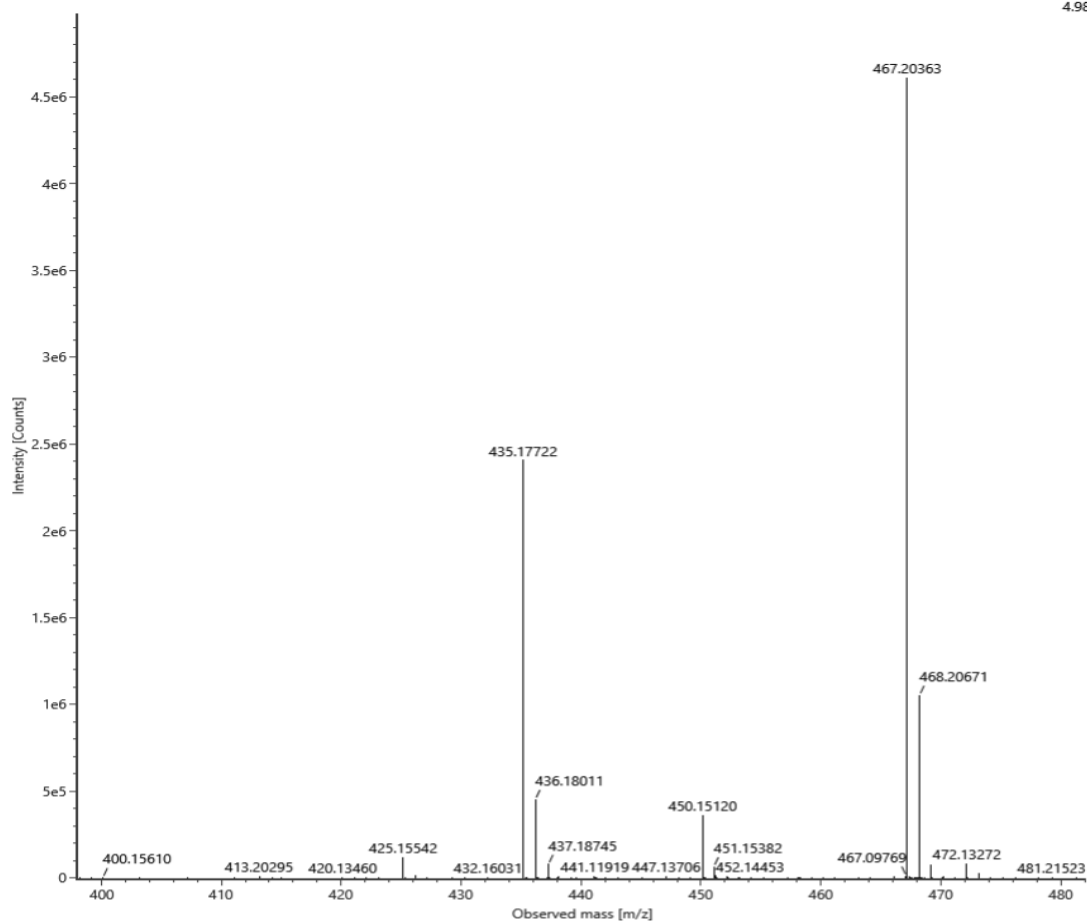


Figure S58. HRMS spectrum of compound 6s

Jul22, 2021, XYK-109, 1, 1, 1r

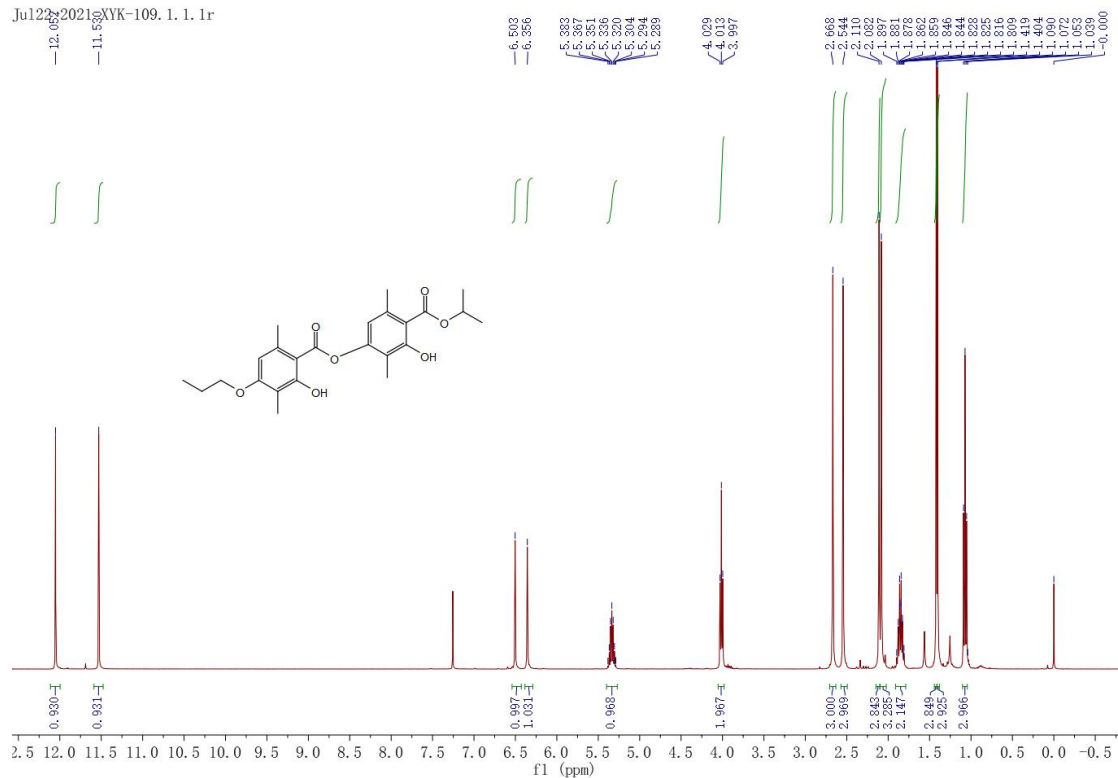


Figure S59. ¹H NMR spectrum of compound 6t

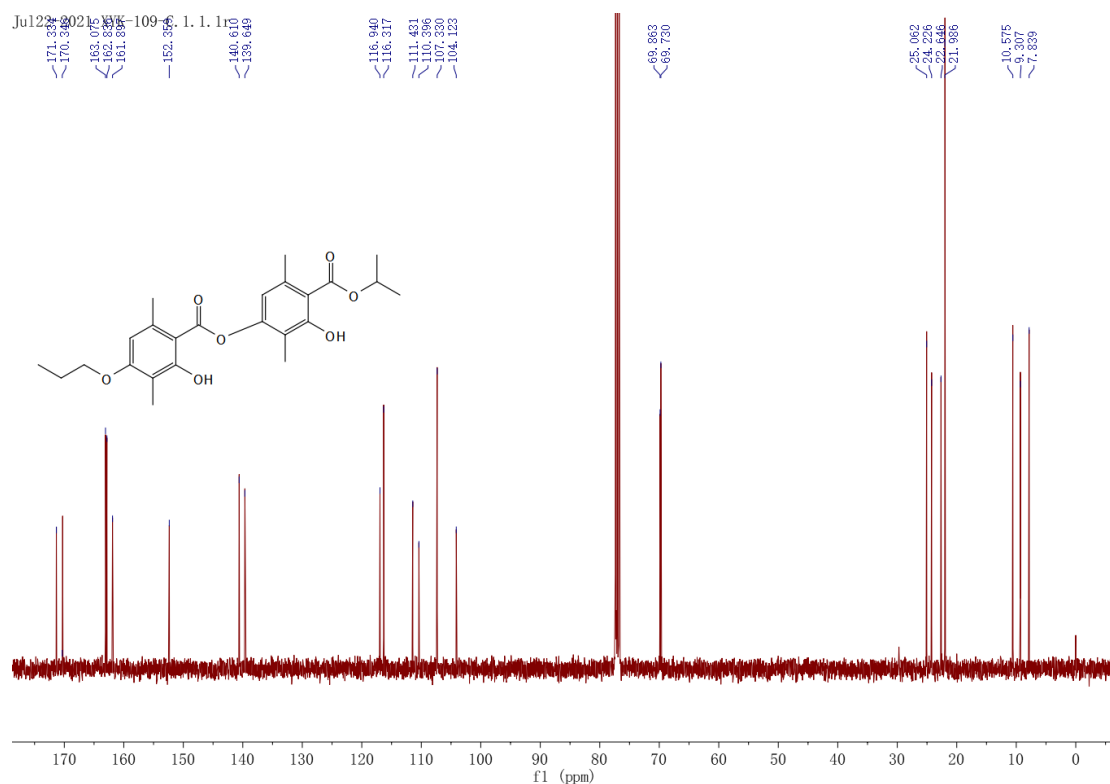


Figure S60. ^{13}C NMR spectrum of compound **6t**

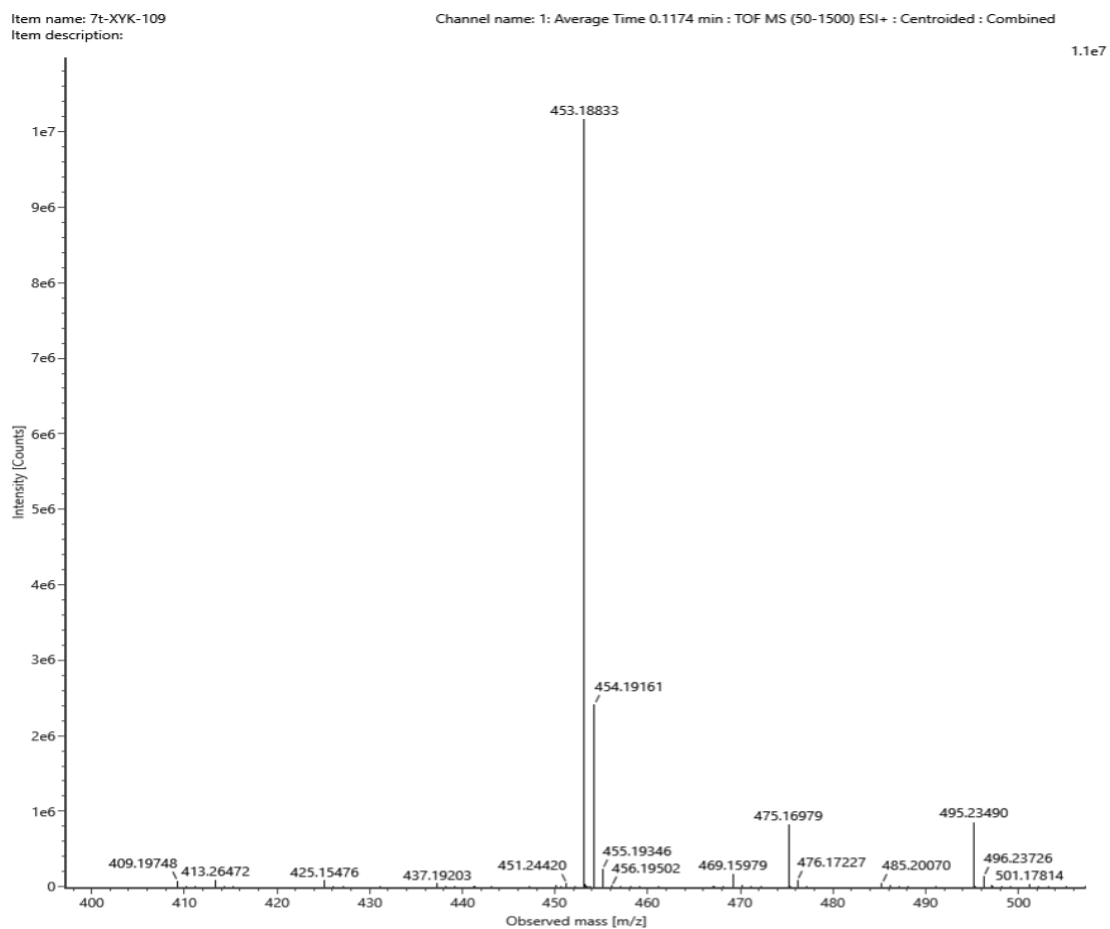


Figure S61. HRMS spectrum of compound **6t**

Apr20-2021-XYK-83. 1. 1. 1r

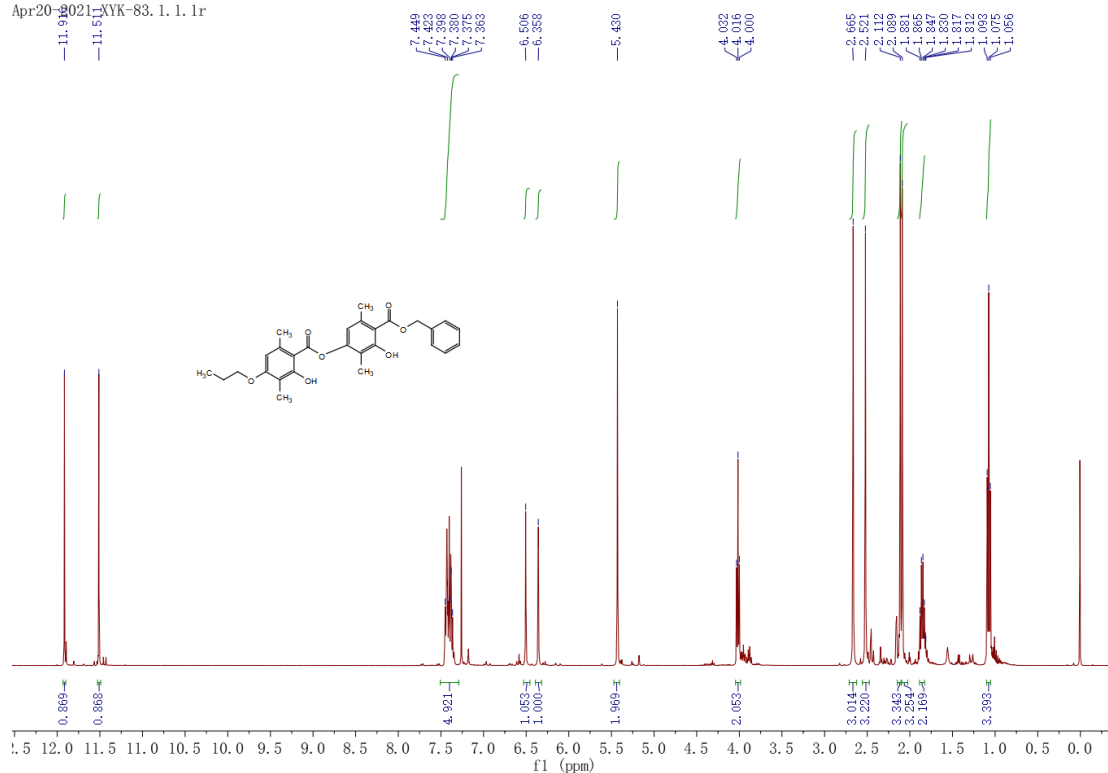


Figure S62. ¹H NMR spectrum of compound 6u

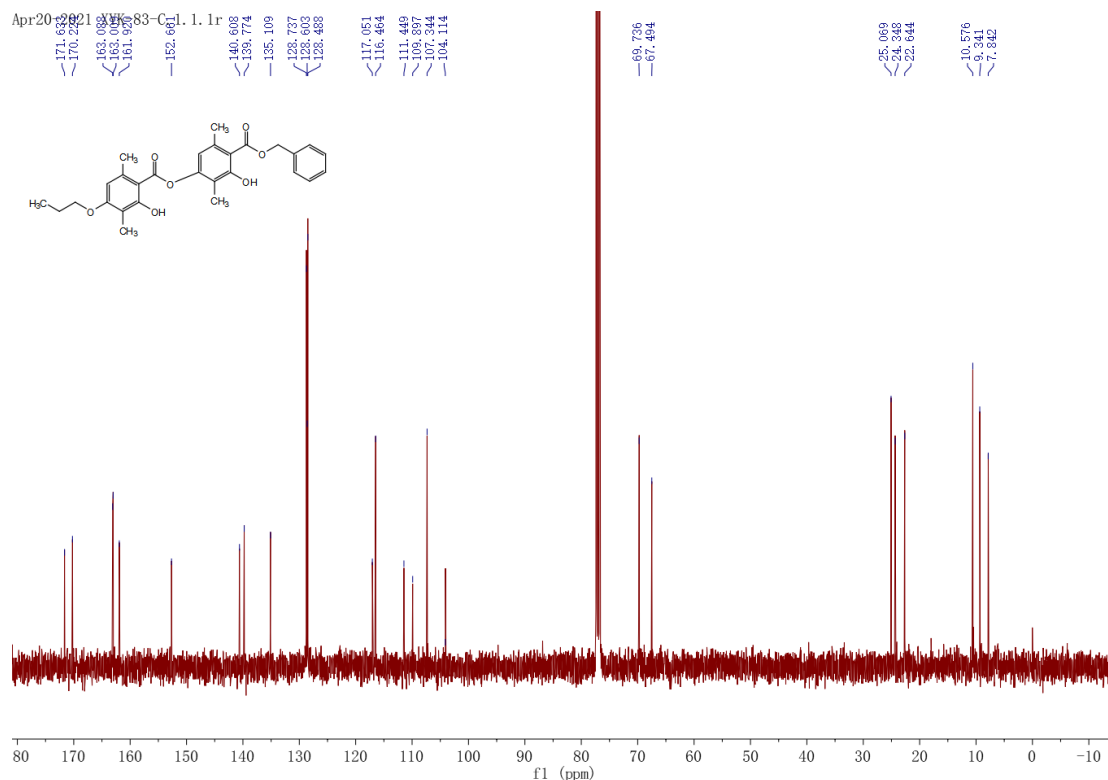


Figure S63. ¹³C NMR spectrum of compound 6u

Item name: 7v-XYK-83
Item description:

Channel name: 1: Average Time 0.1334 min : TOF MS (50-1500) ESI+ : Centroided : Combined

2.56e6

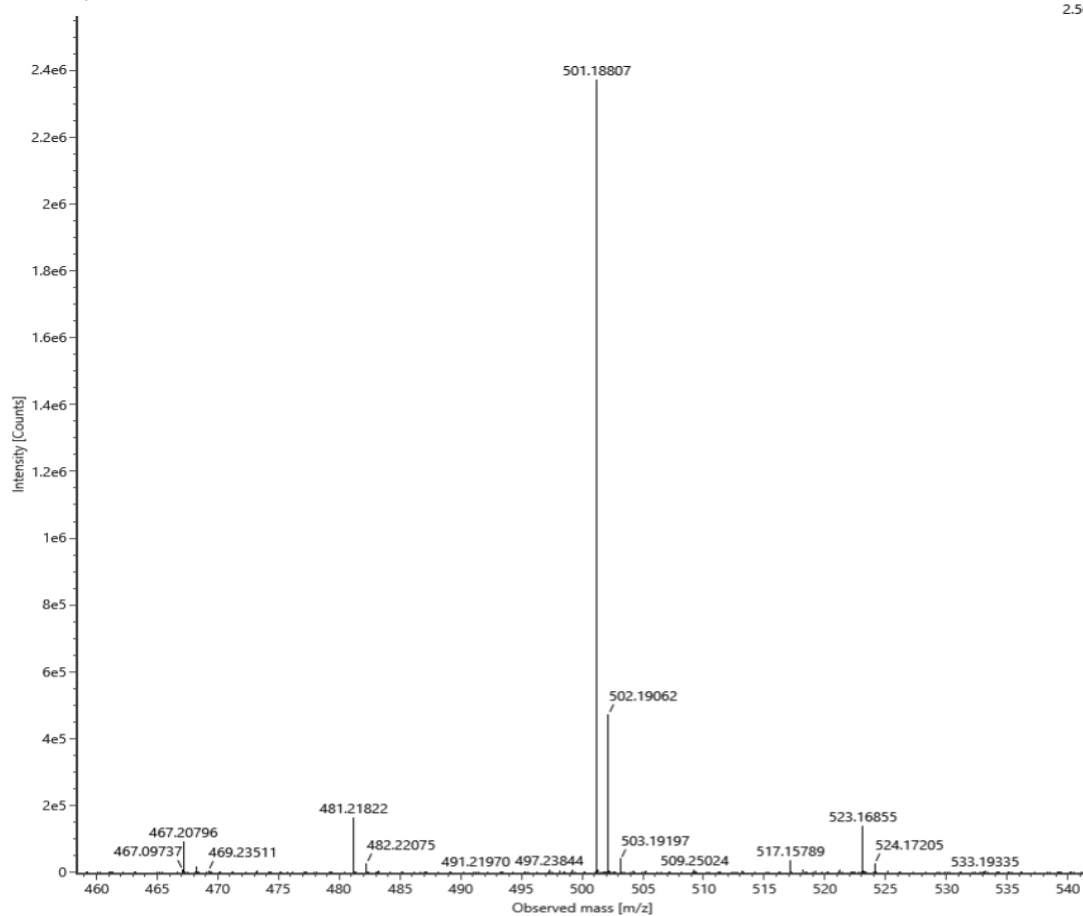


Figure S64. HRMS spectrum of compound 6u

Jun28-2021 XYK-110. 1. 1. 1r

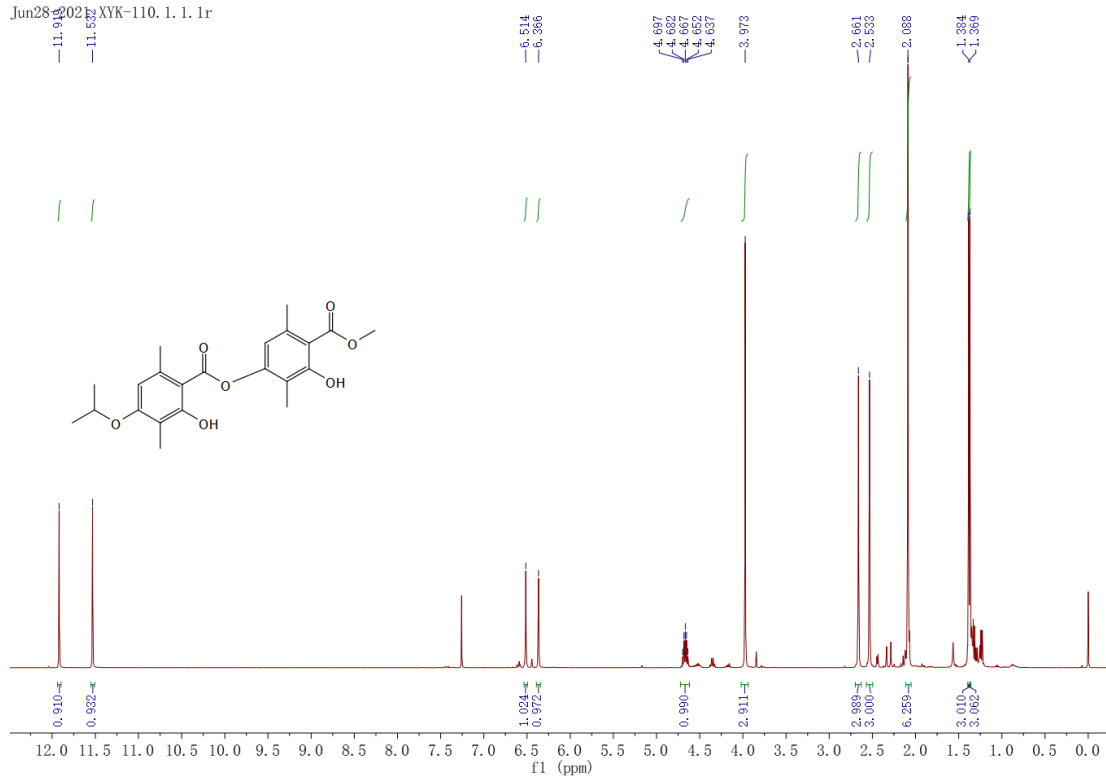


Figure S65. ¹H NMR spectrum of compound 6v

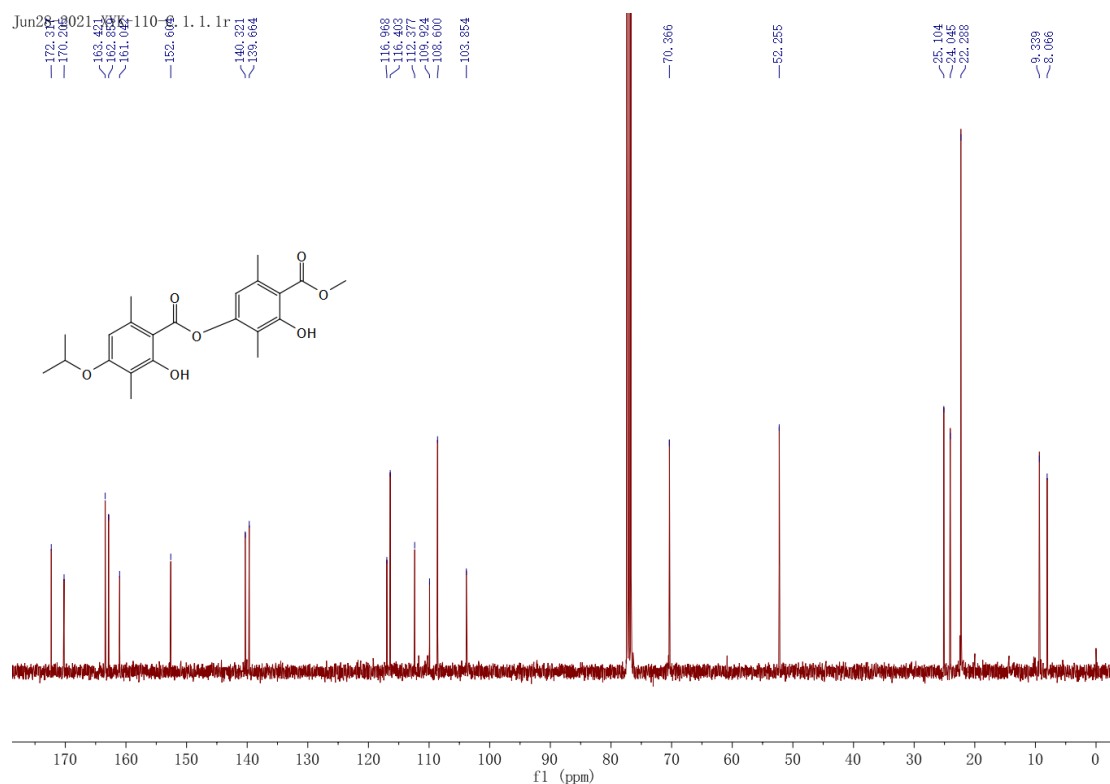


Figure S66. ^{13}C NMR spectrum of compound **6v**

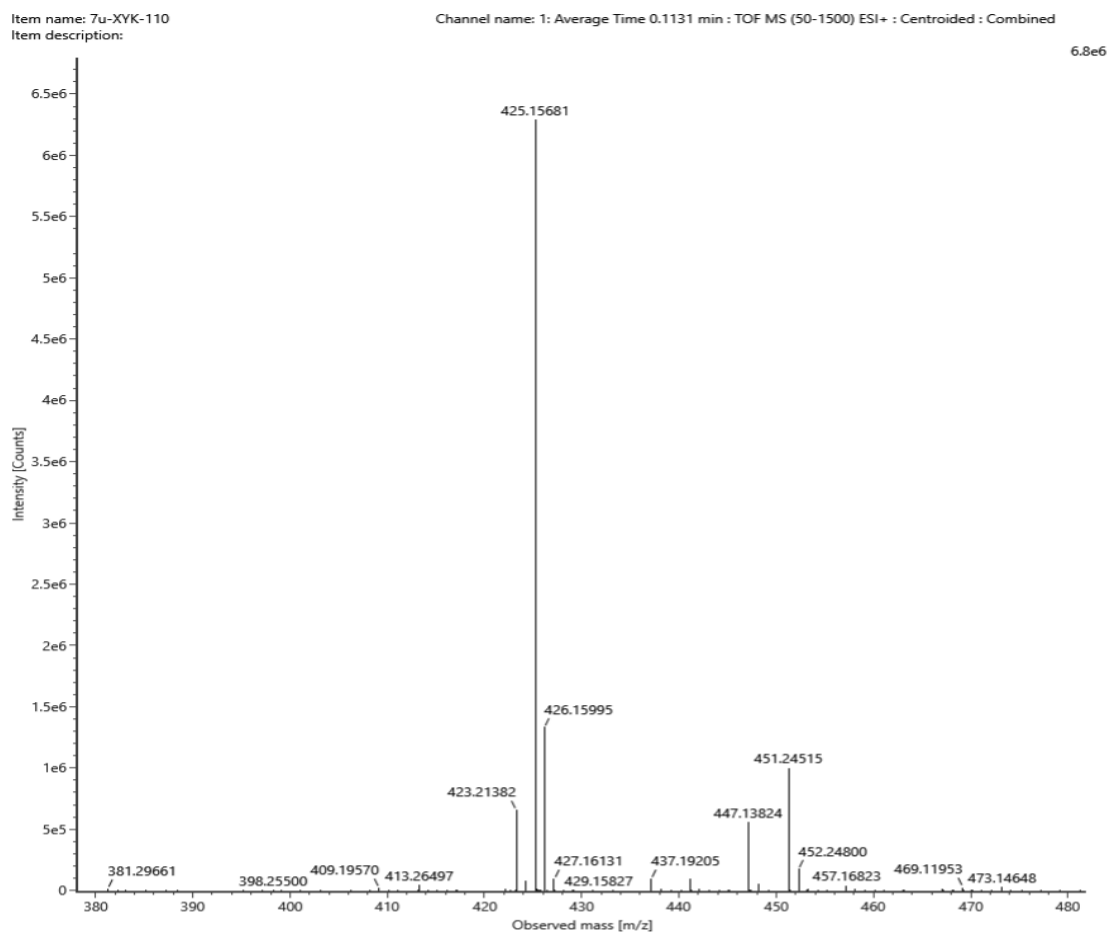


Figure S67. HRMS spectrum of compound **6v**

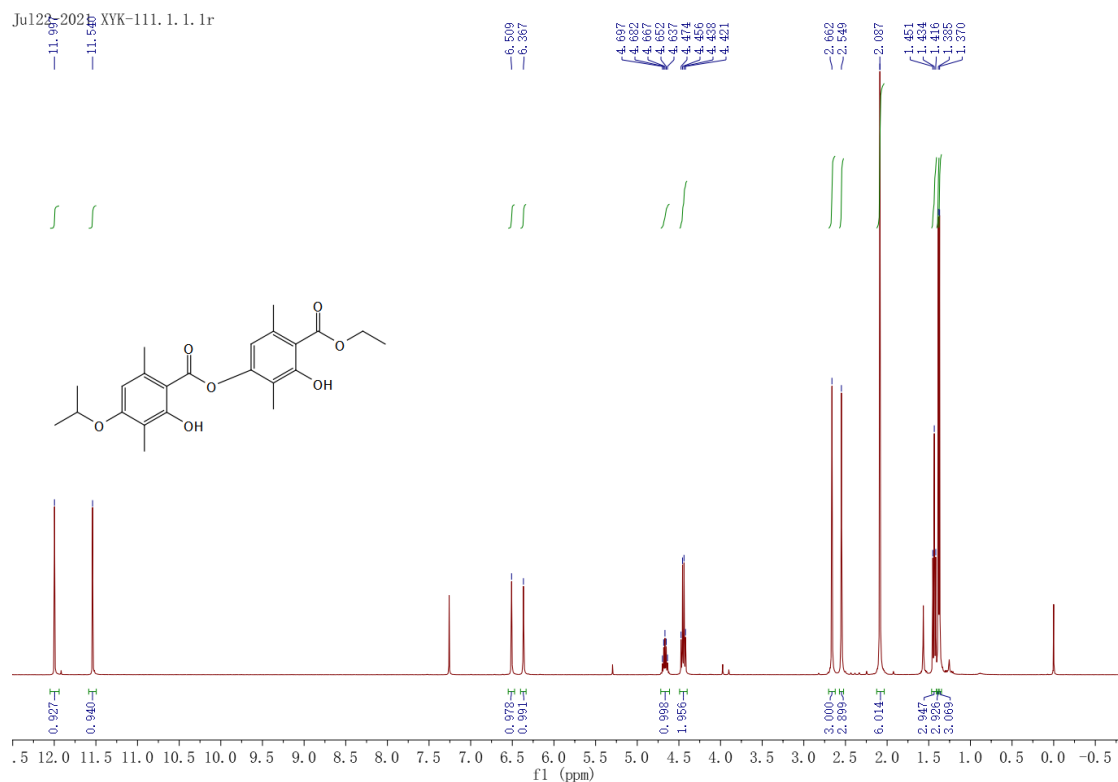


Figure S68. ¹H NMR spectrum of compound 6w

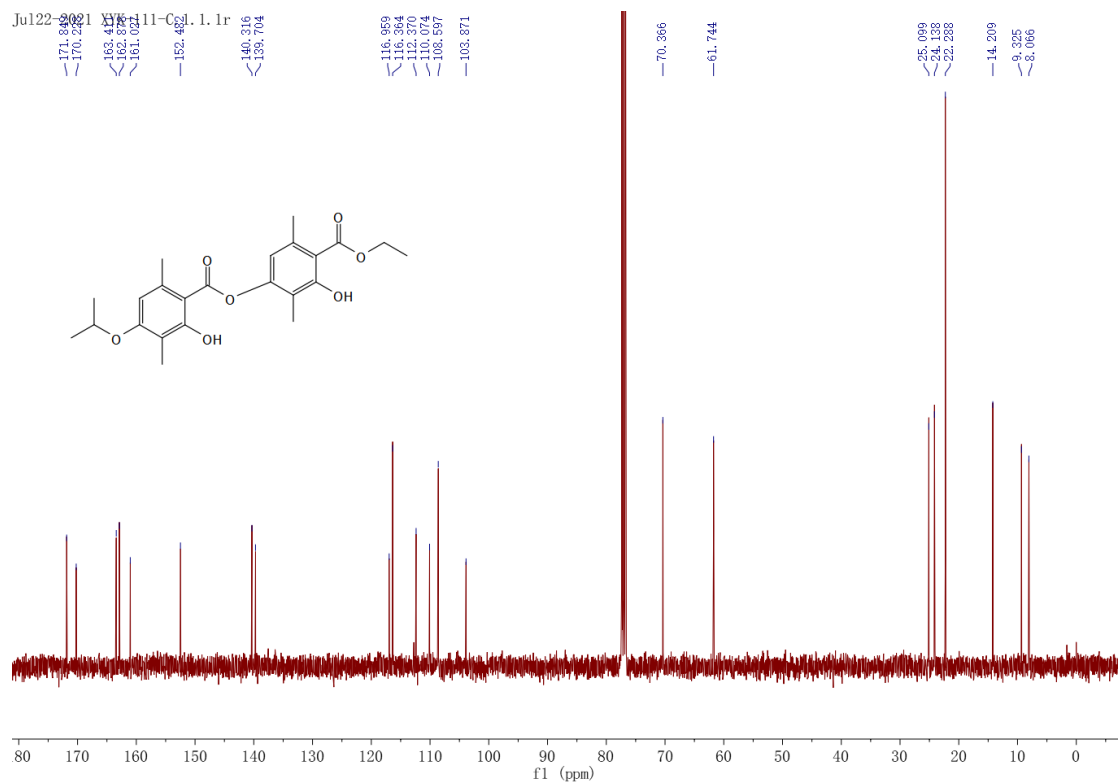


Figure S69. ¹³C NMR spectrum of compound 6w

Item name: 7w-XYK-111
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

4.99e7

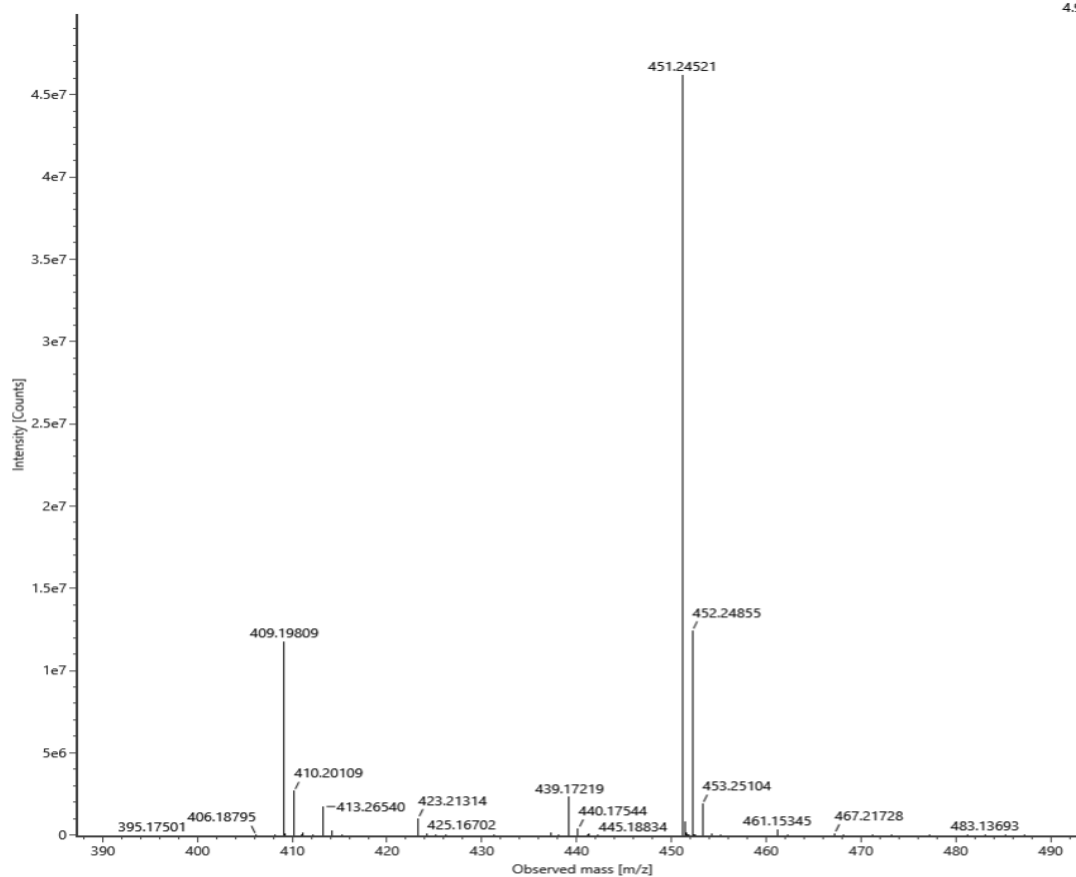


Figure S70. HRMS spectrum of compound 6w

Jun28-2021 XYK-112. 1. 1. 1r

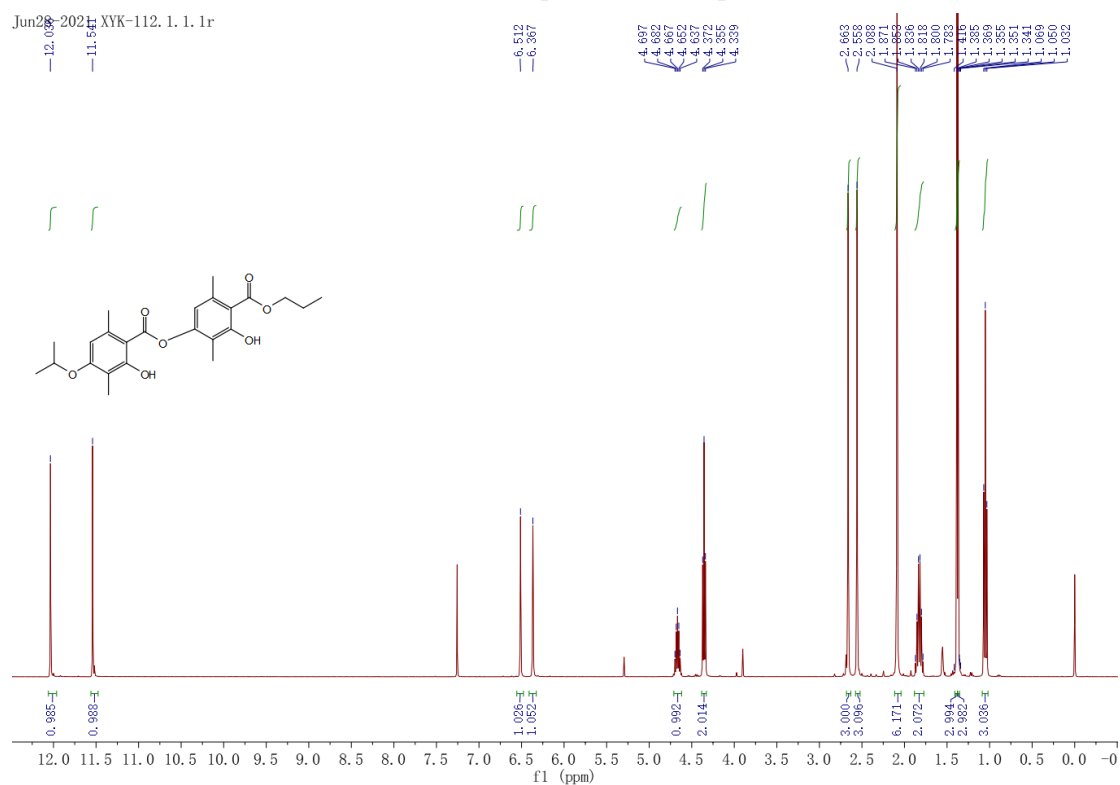


Figure S71. ¹H NMR spectrum of compound 6x

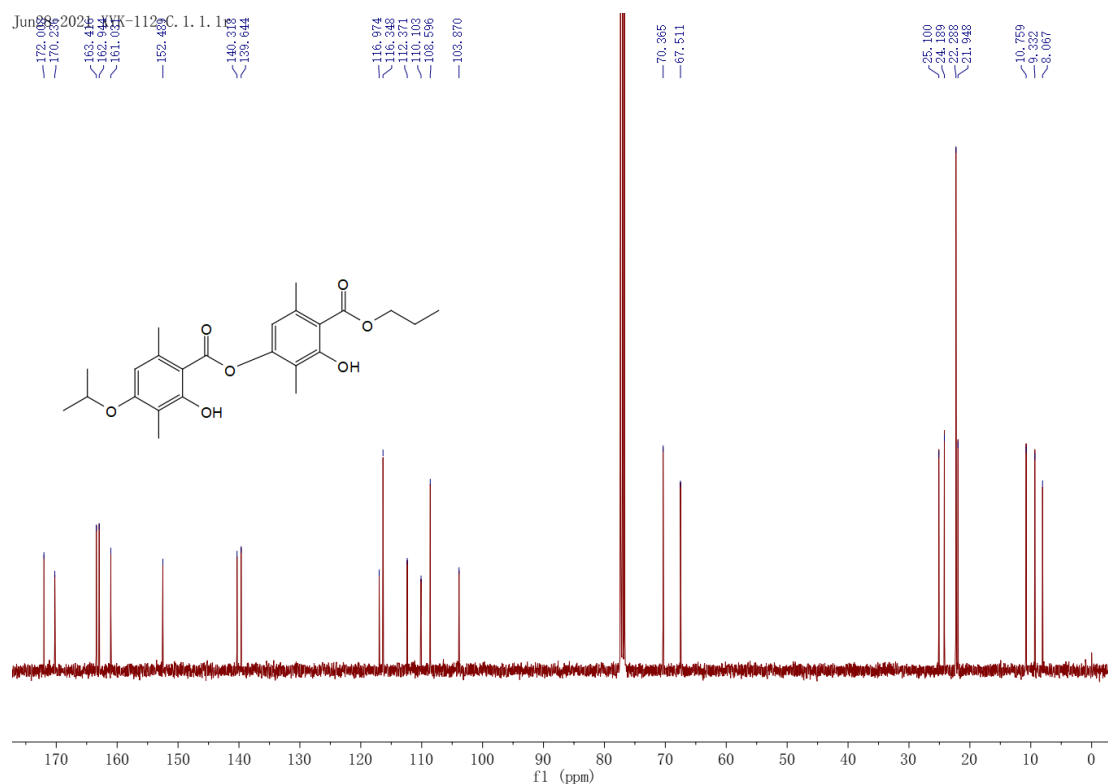


Figure S72. ^{13}C NMR spectrum of compound **6x**

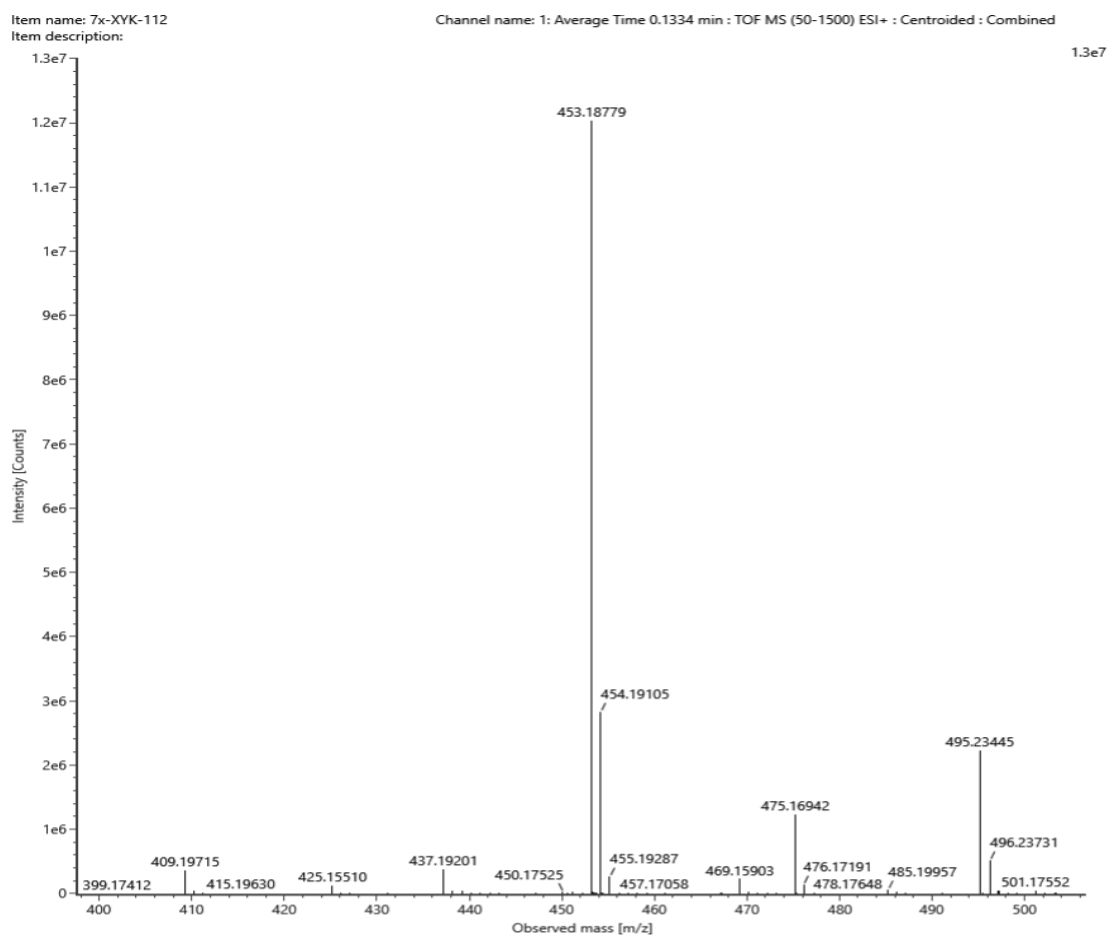


Figure S73. HRMS spectrum of compound **6x**

Jul29-2021 XYK-115. 1. 1. 1r

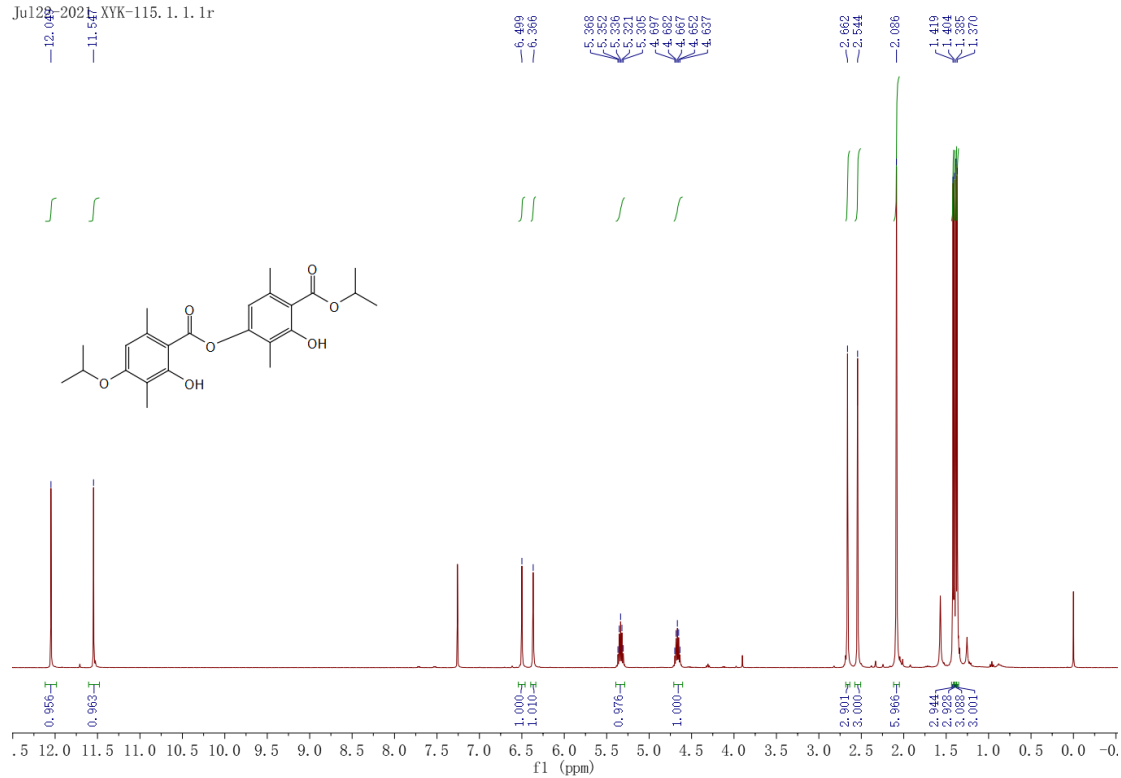


Figure S74. ¹H NMR spectrum of compound 6y

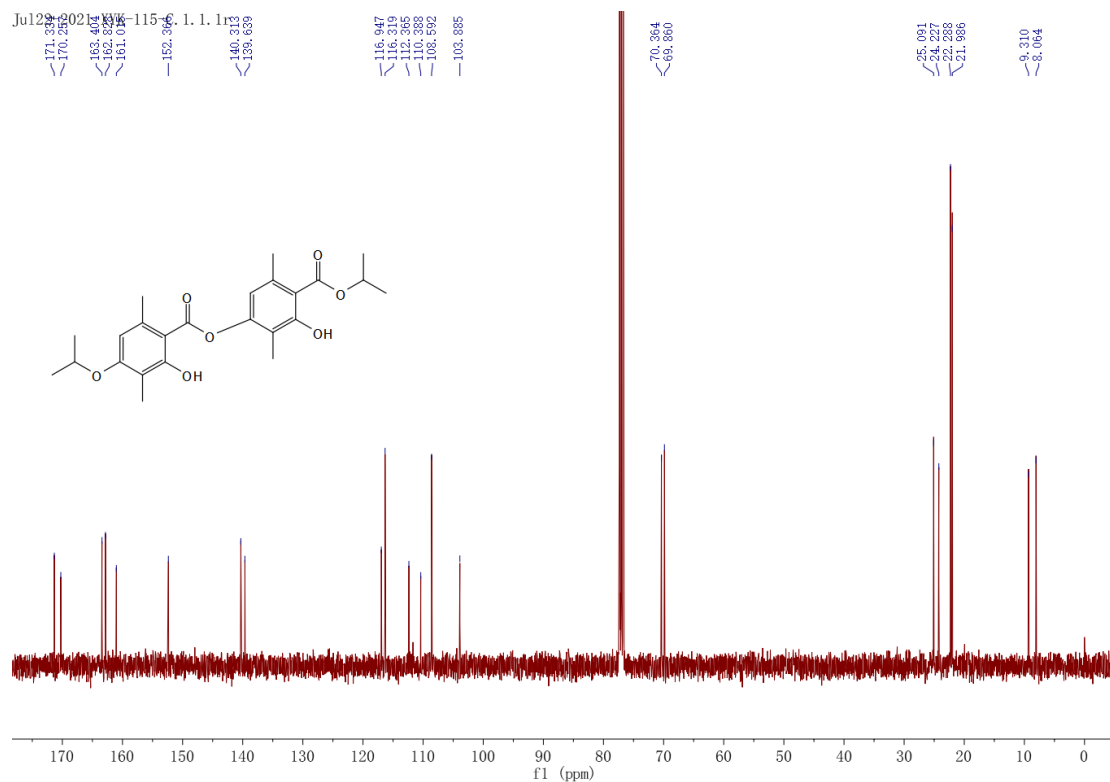


Figure S75. ¹³C NMR spectrum of compound 6y

Item name: 7y-XYK-115
Item description:

Channel name: 1: Average Time 0.1548 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.95e7

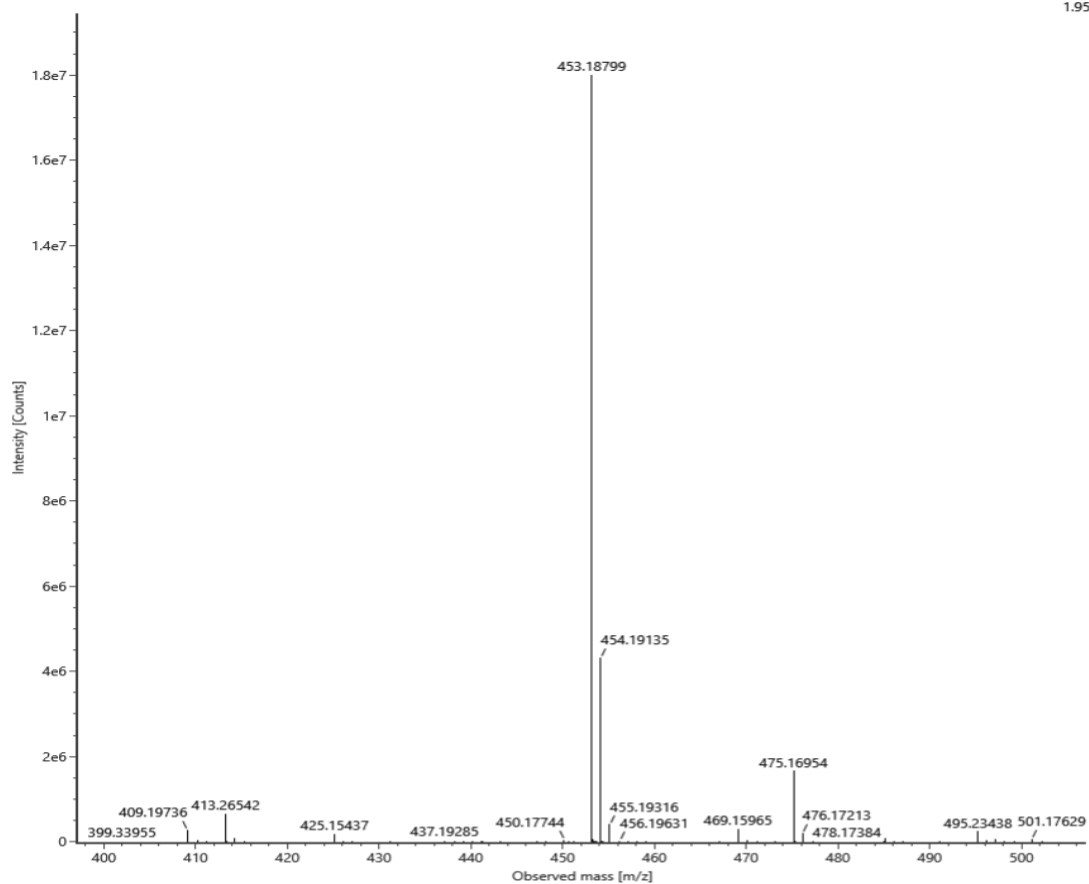


Figure S76. HRMS spectrum of compound **6y**

Jun28-2021 XYK-113. 1. 1. 1r

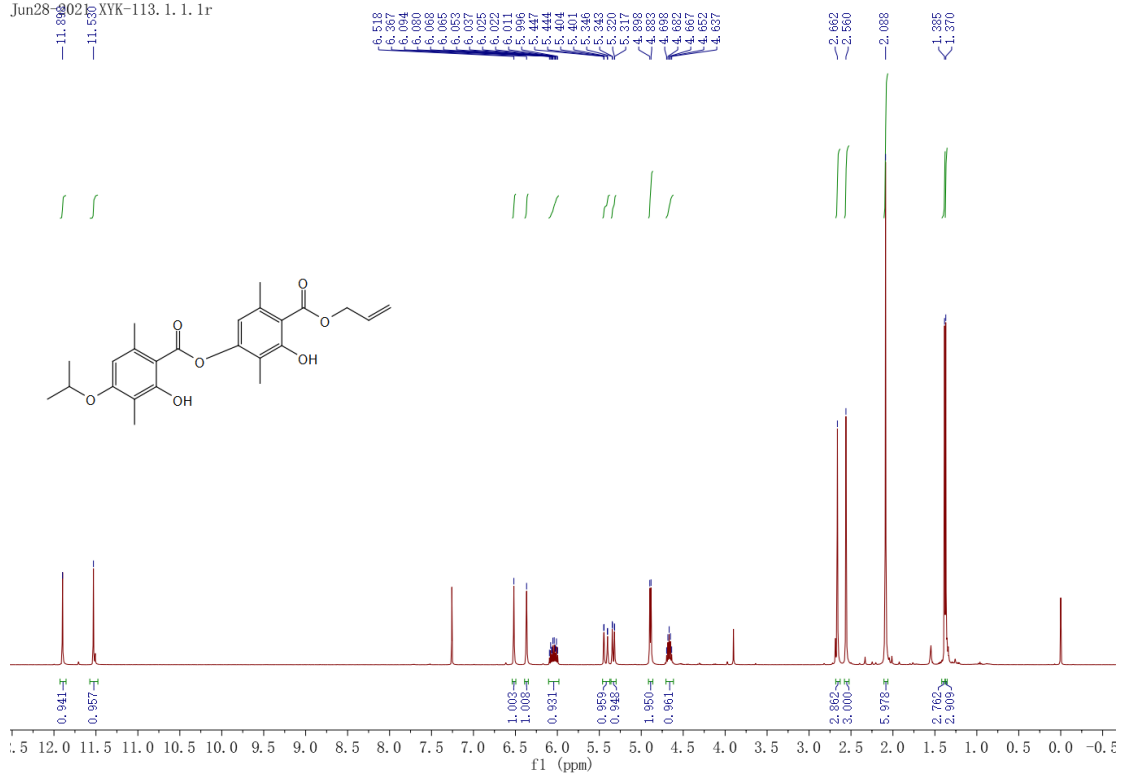


Figure S77. ^1H NMR spectrum of compound **6z**

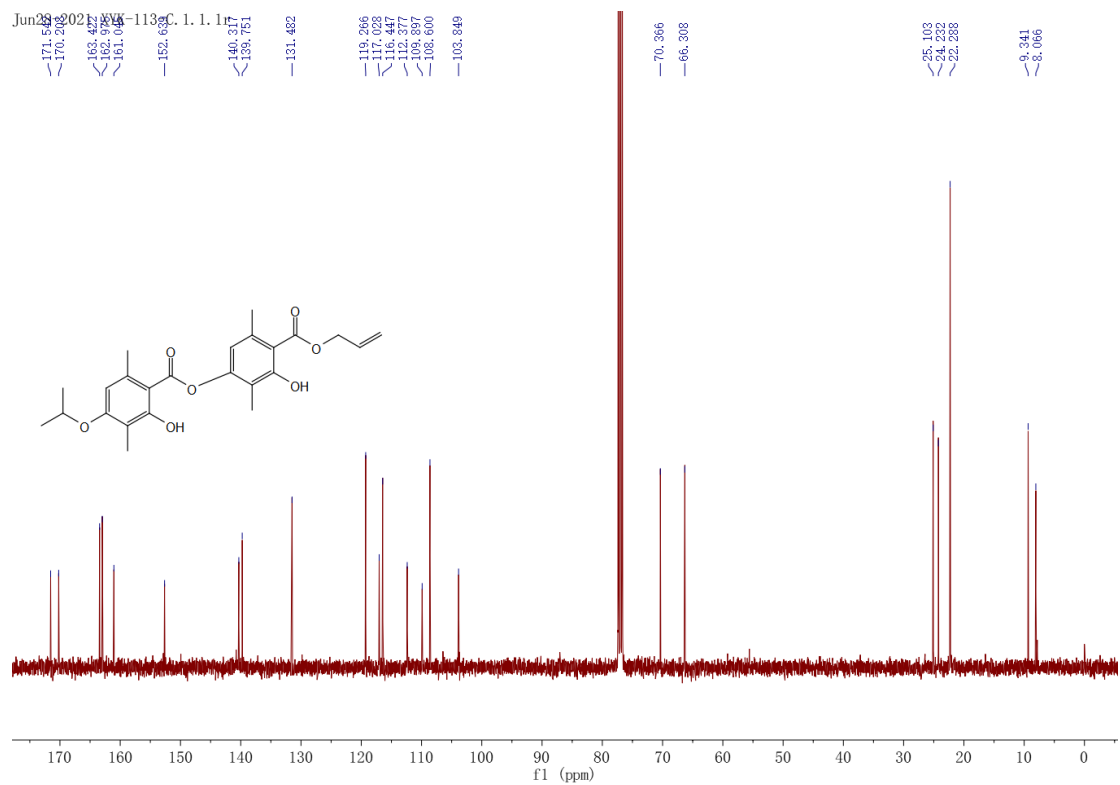


Figure S78. ^{13}C NMR spectrum of compound **6z**

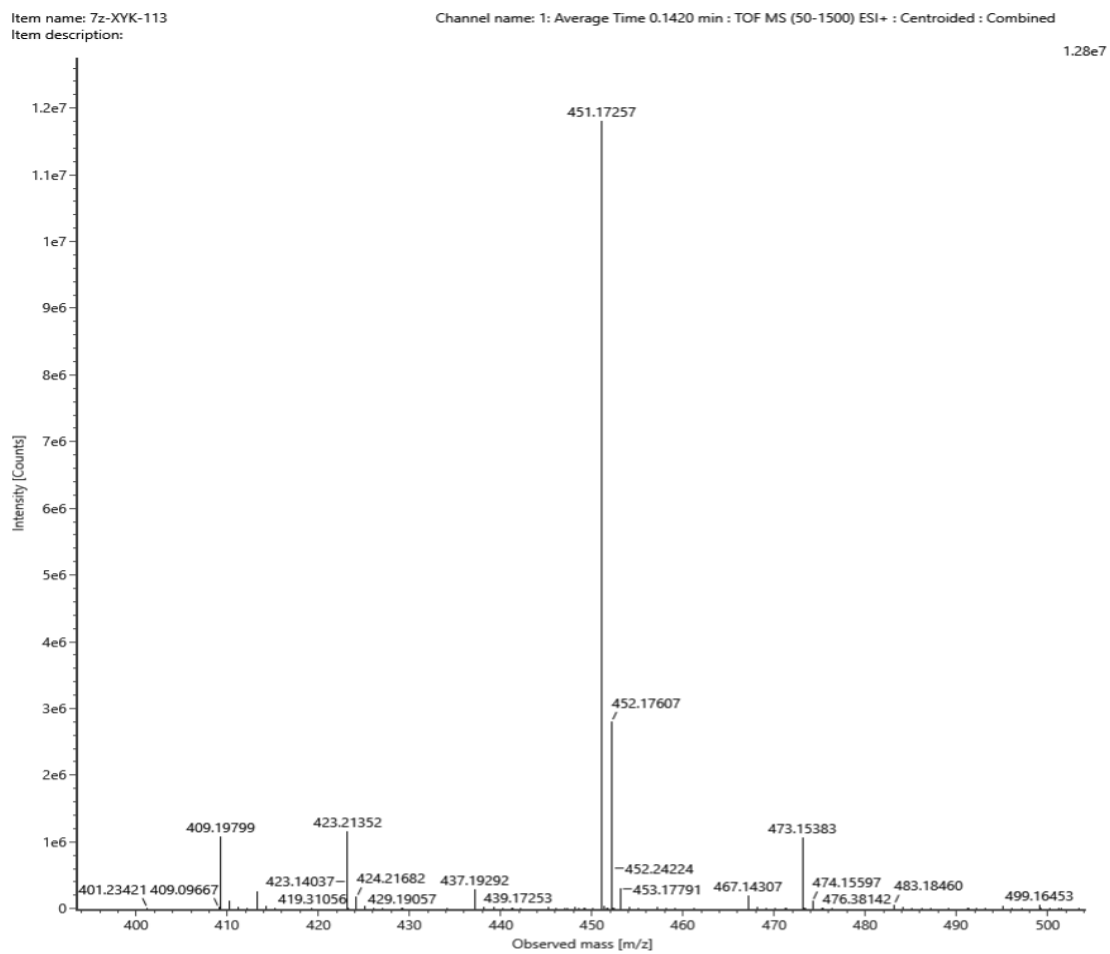


Figure S79. HRMS spectrum of compound **6z**

Jul26-2021 XYK-118. 1. 1. 1r

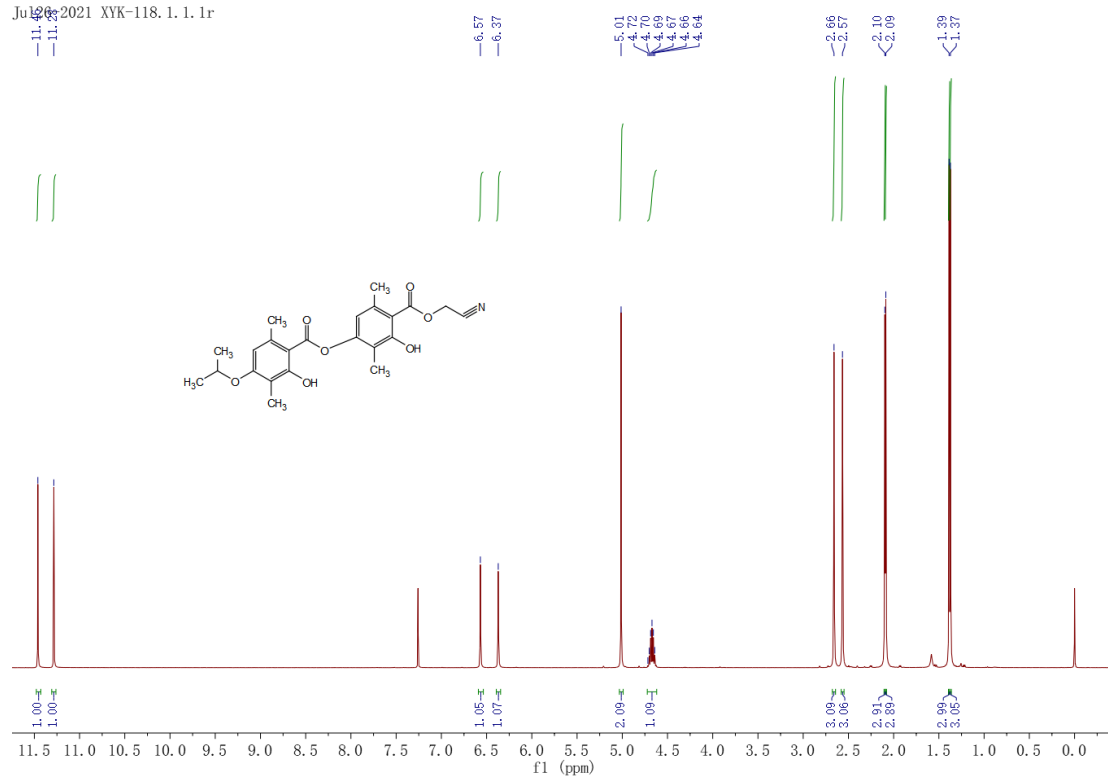


Figure S80. ¹H NMR spectrum of compound 6a'

Jul26-2021 XYK-118. 1. 1. 1r

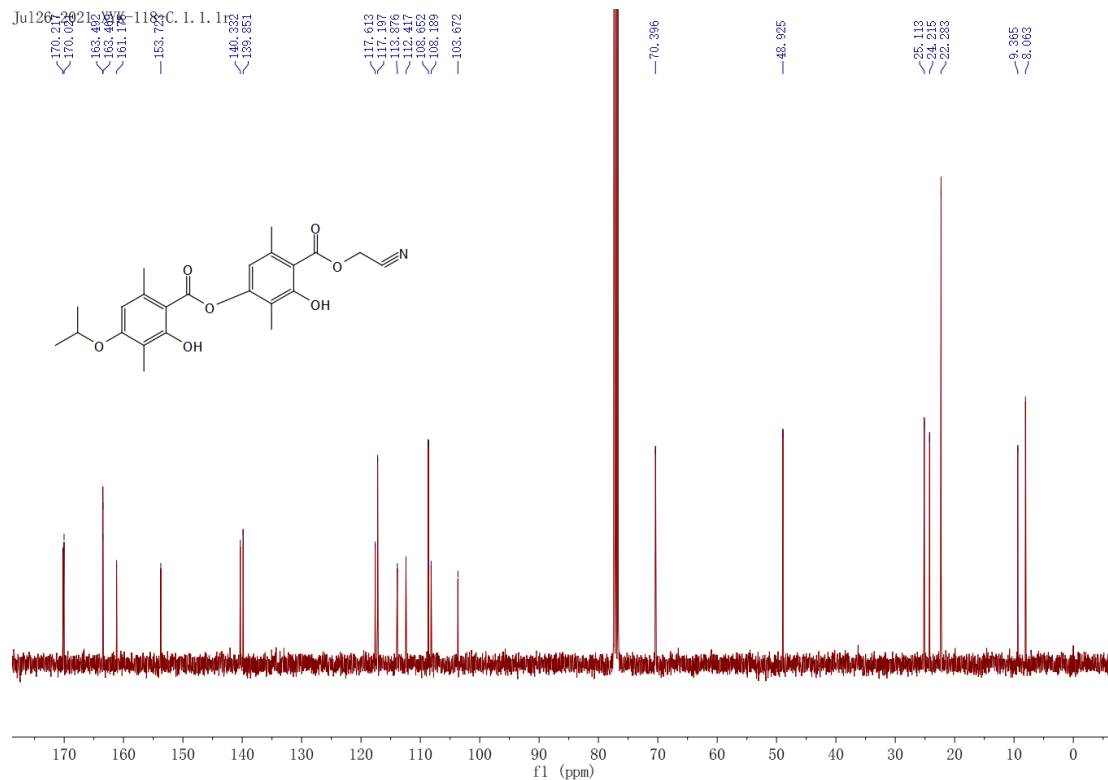


Figure S81. ¹³C NMR spectrum of compound 6a'

Item name: 7A-XYK-118
Item description:

Channel name: 1: Average Time 0.1217 min : TOF MS (50-1500) ESI+ : Centroided : Combined

2.35e6

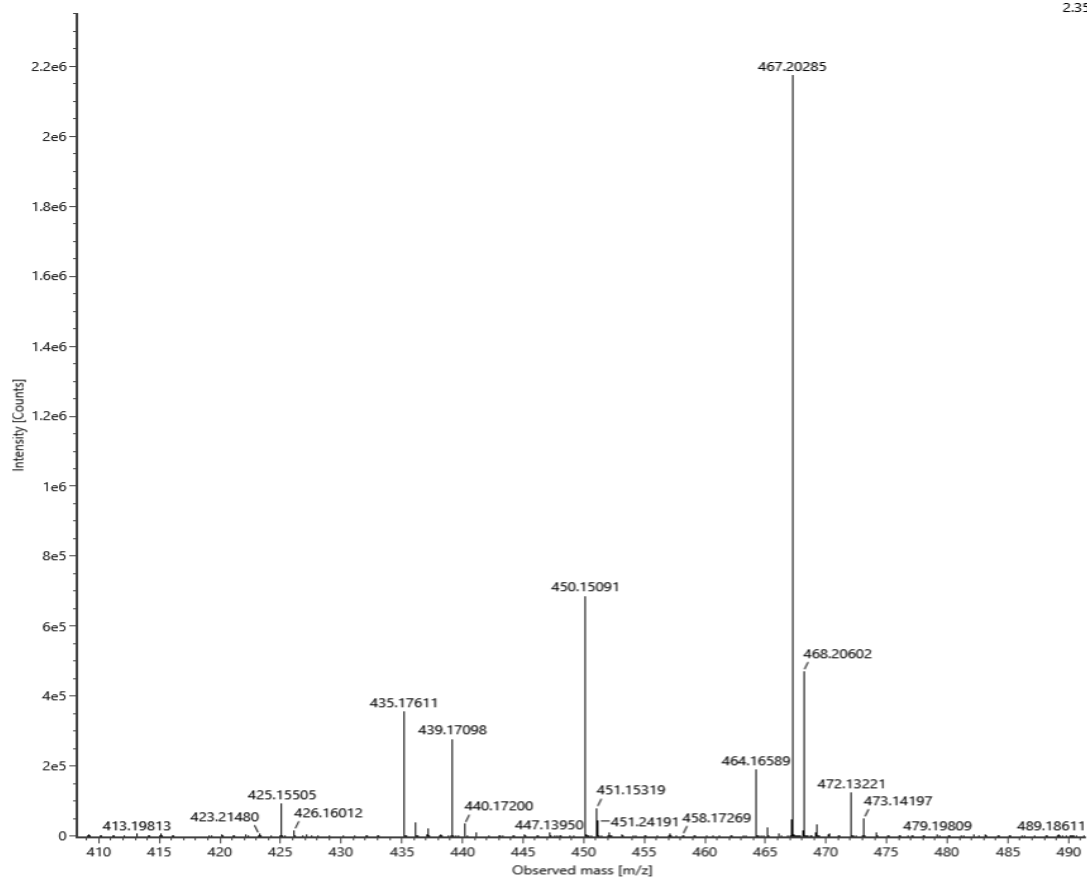


Figure S82. HRMS spectrum of compound 6a'

Jun 28 - 2021 XYK-114. 1. 1. 1r

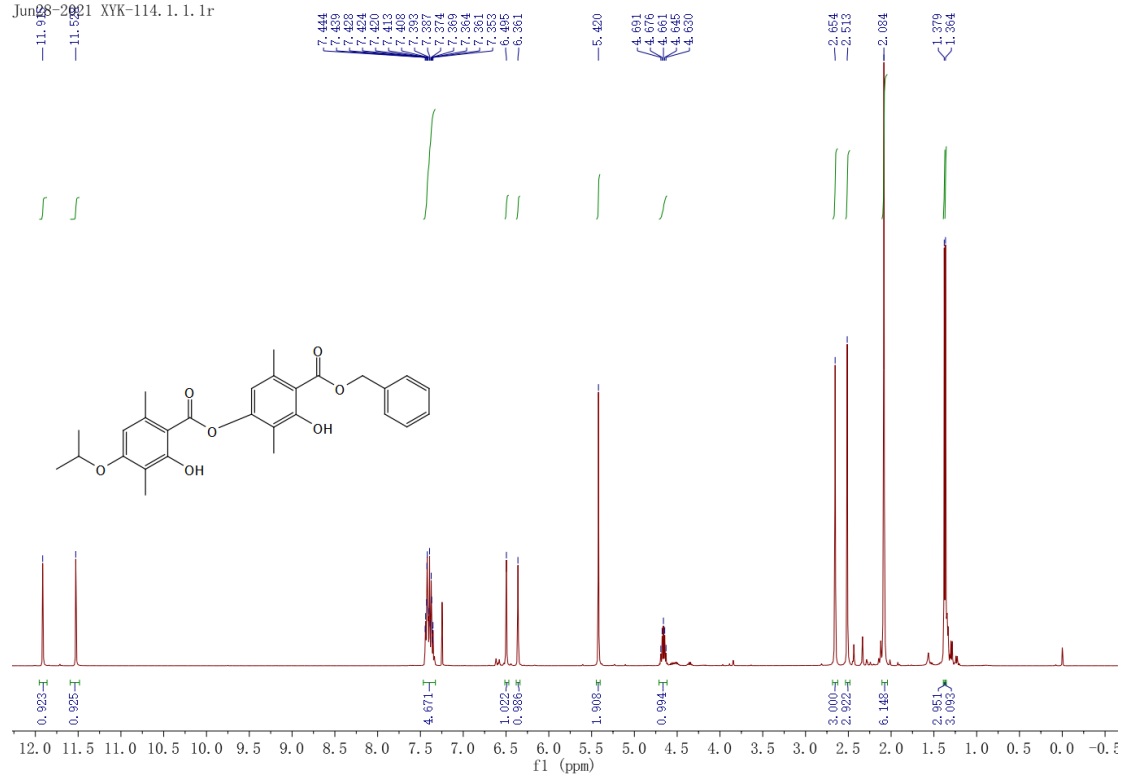


Figure S83. ¹H NMR spectrum of compound 6b'

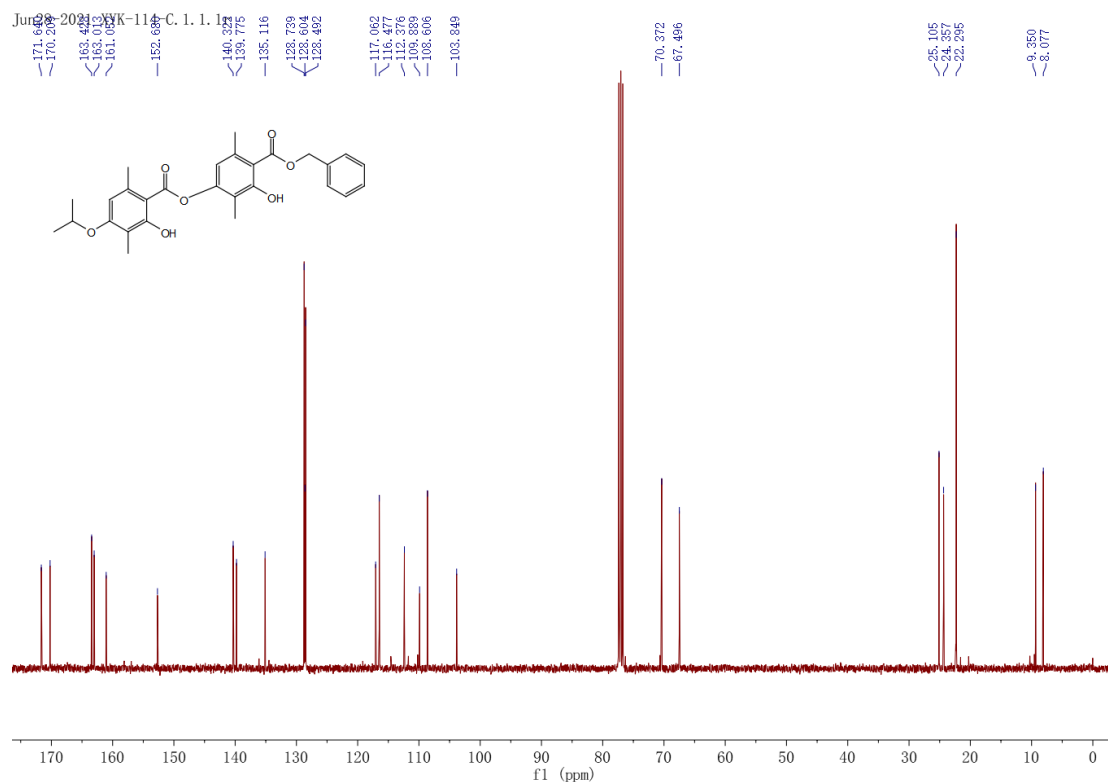


Figure S84. ^{13}C NMR spectrum of compound **6b'**

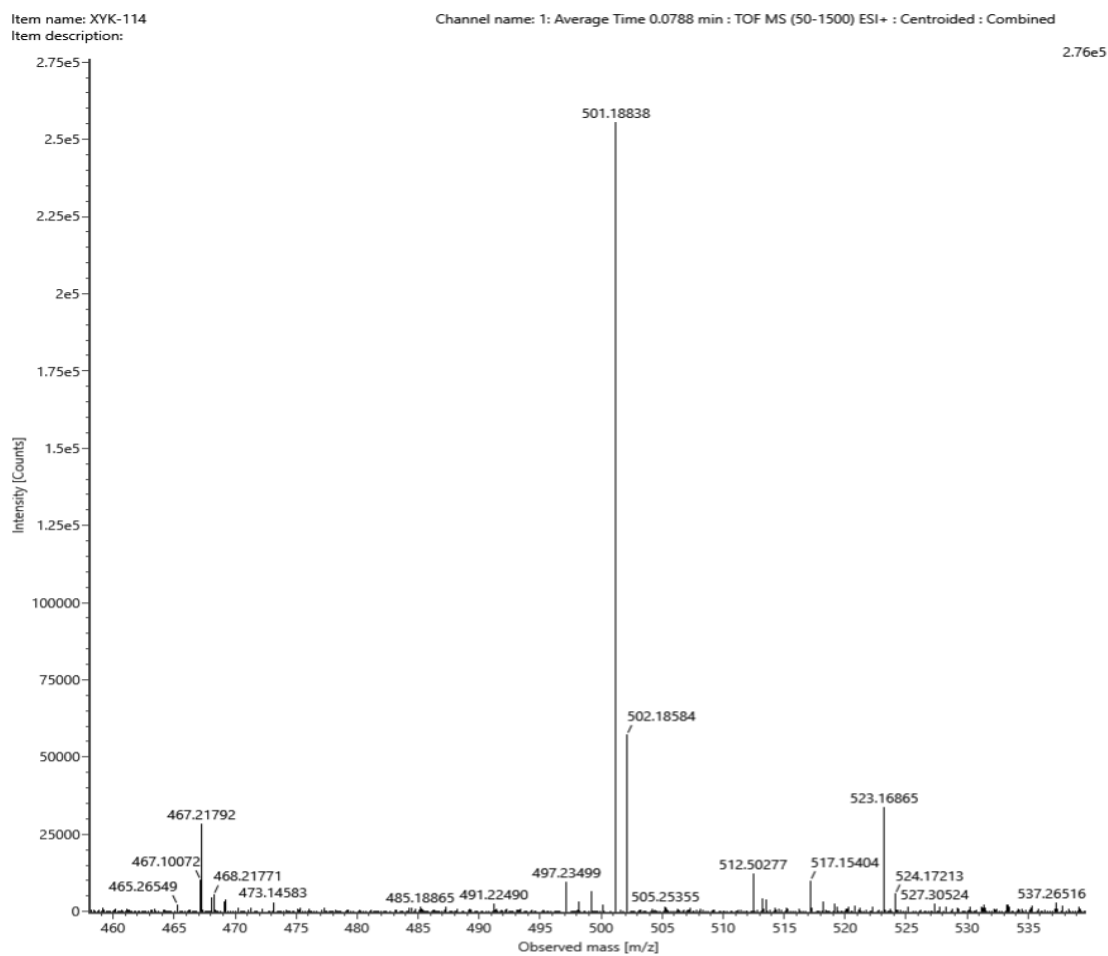


Figure S85. HRMS spectrum of compound **6b'**

Jan 18, 2021 XYK-52-H. 1. 1. 1r

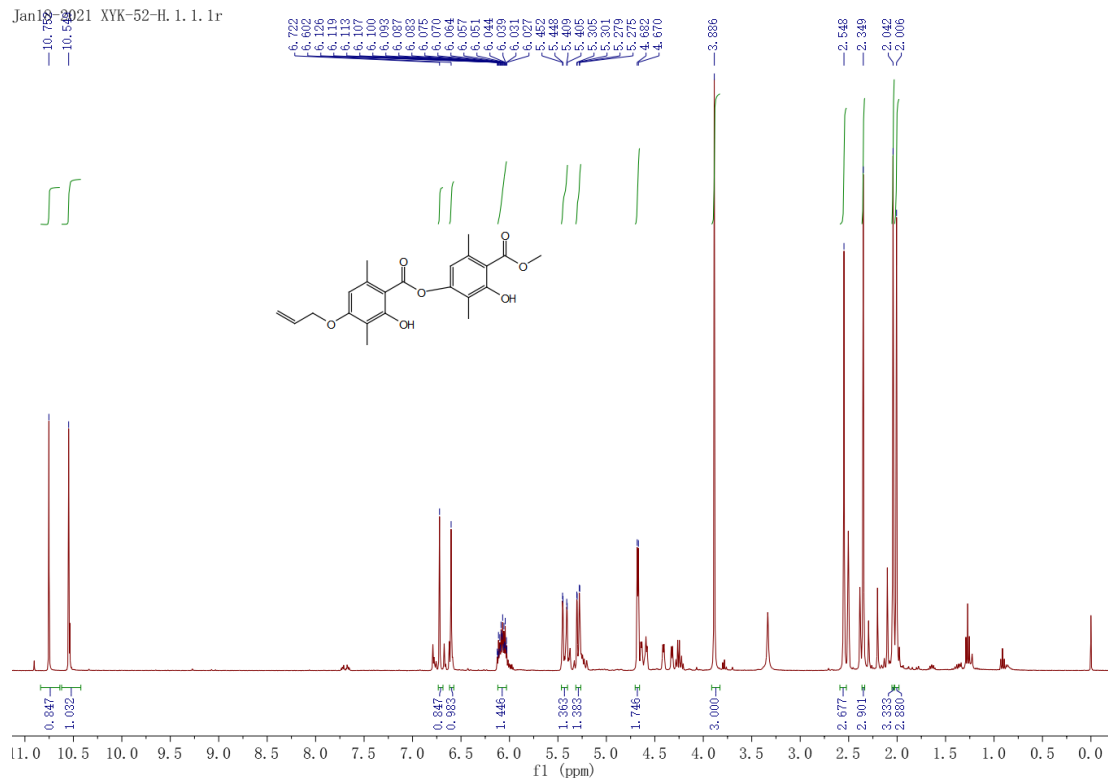


Figure S86. ¹H NMR spectrum of compound 6c'

Jan 18, 2021 XYK-52-H. 1. 1. 1r

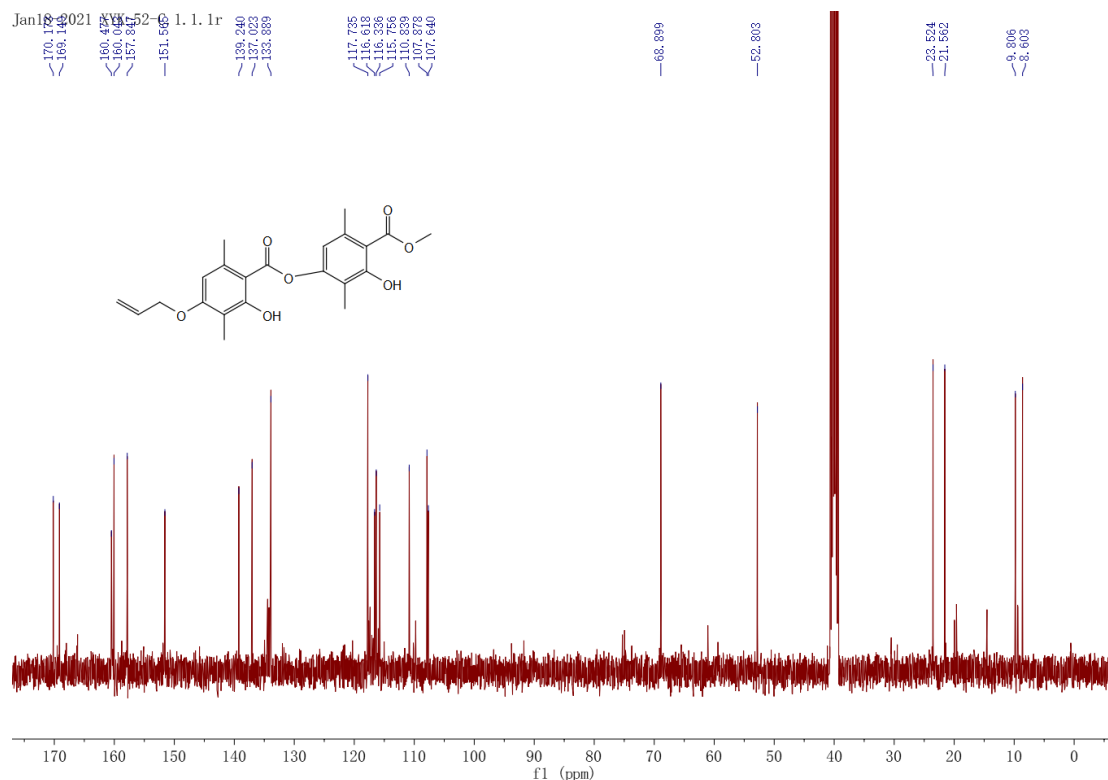


Figure S87. ¹³C NMR spectrum of compound 6c'

Item name: 7C-XYK-52
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

3.47e6

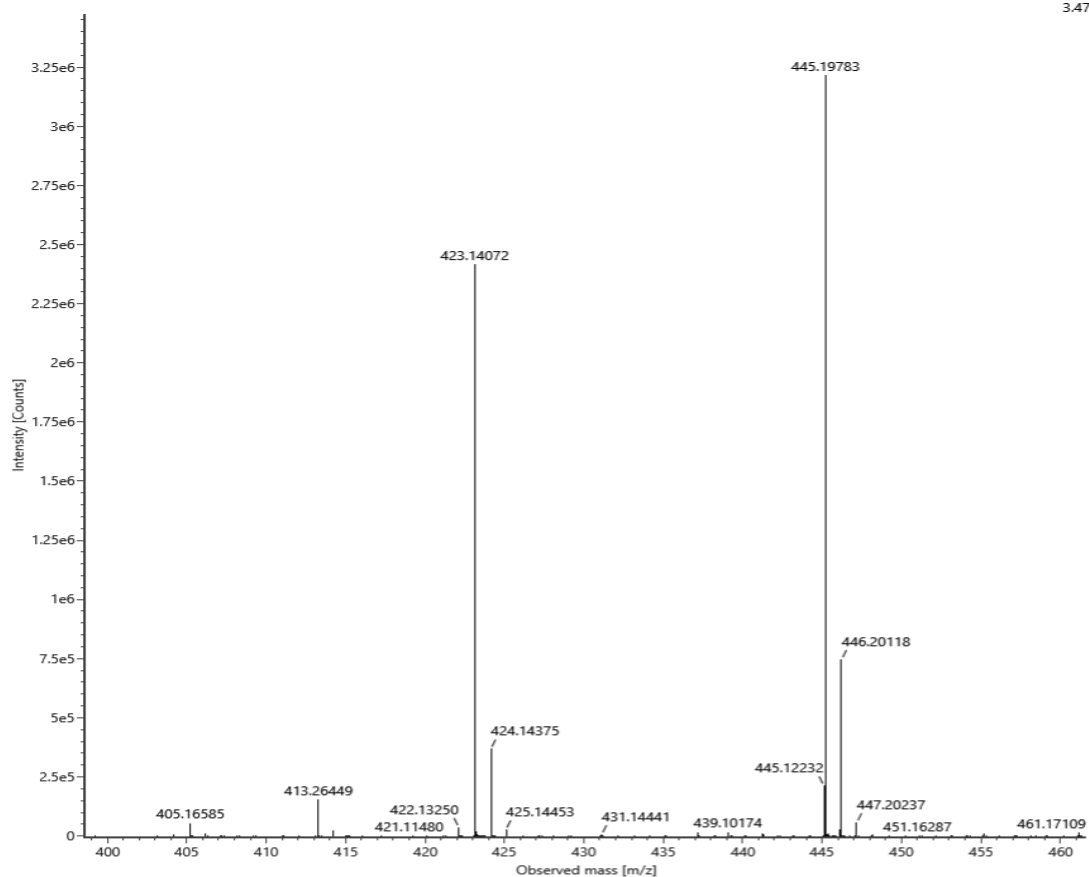


Figure S88. HRMS spectrum of compound 6c'

Jan 18, 2021 XYK-59-H. 1. 1. 1r

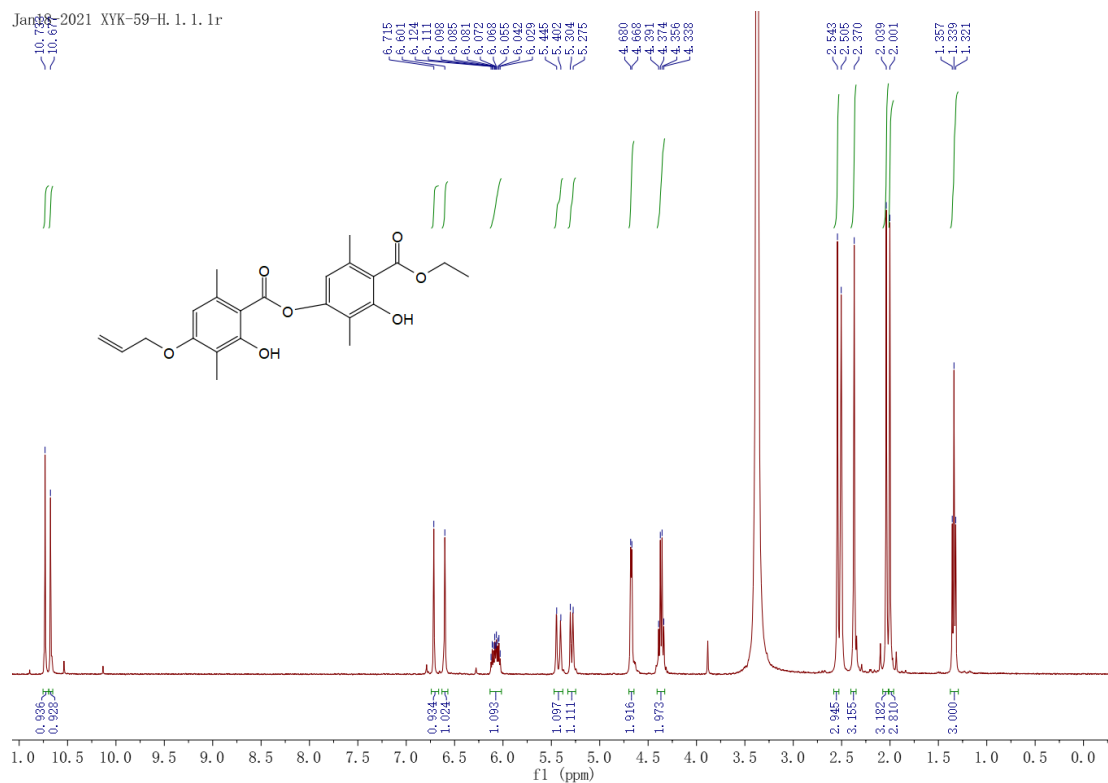


Figure S89. ¹H NMR spectrum of compound 6d'

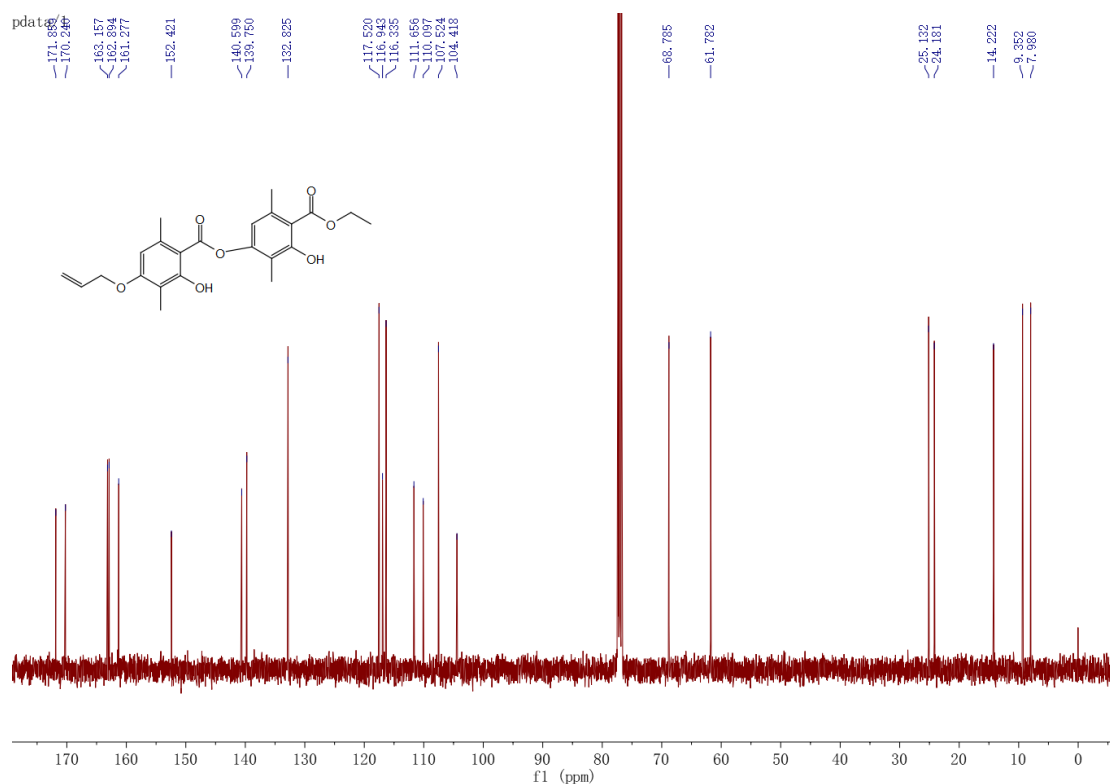


Figure S90. ^{13}C NMR spectrum of compound **6d'**

Item name: 7D-XYK-59
Item description:

Channel name: 1: Average Time 0.1217 min : TOF MS (50-1500) ESI+ : Centroided : Combined

9.92e6

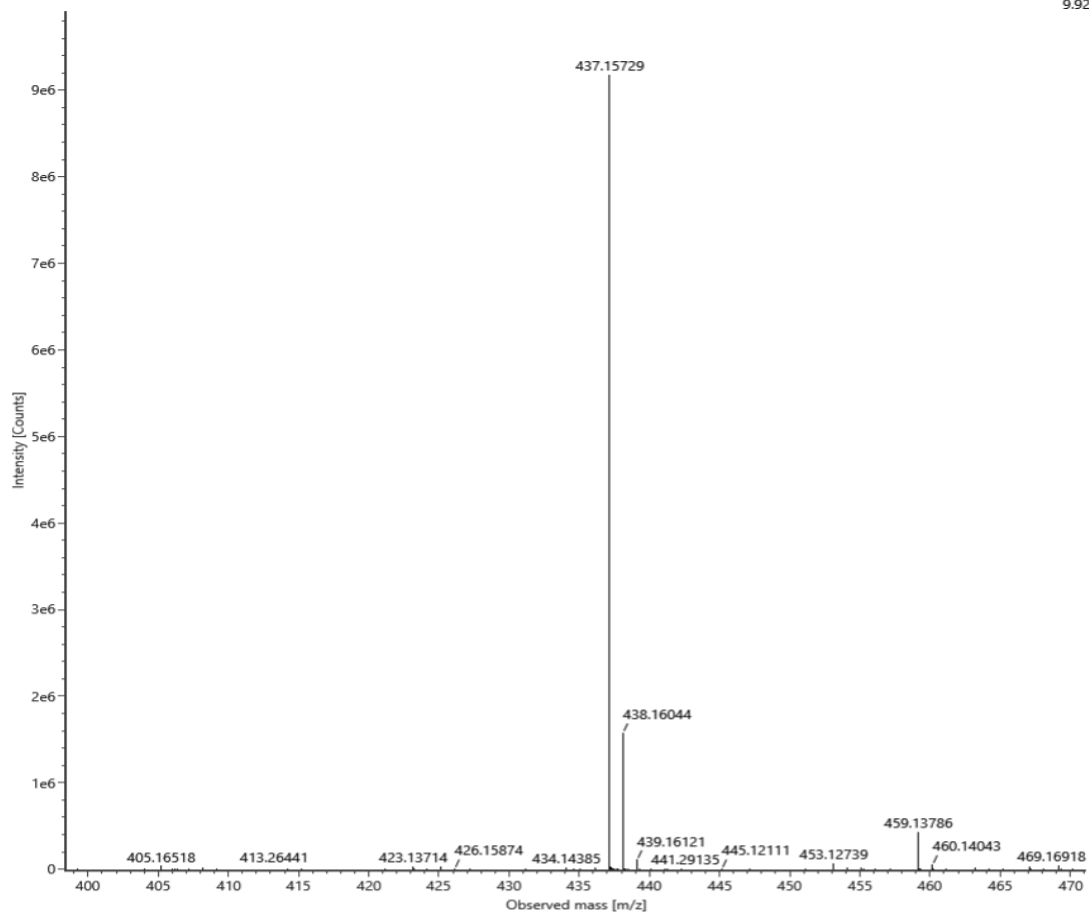


Figure S91. HRMS spectrum of compound **6d'**

May10-2021 XYK-98, 1. 1. 1r

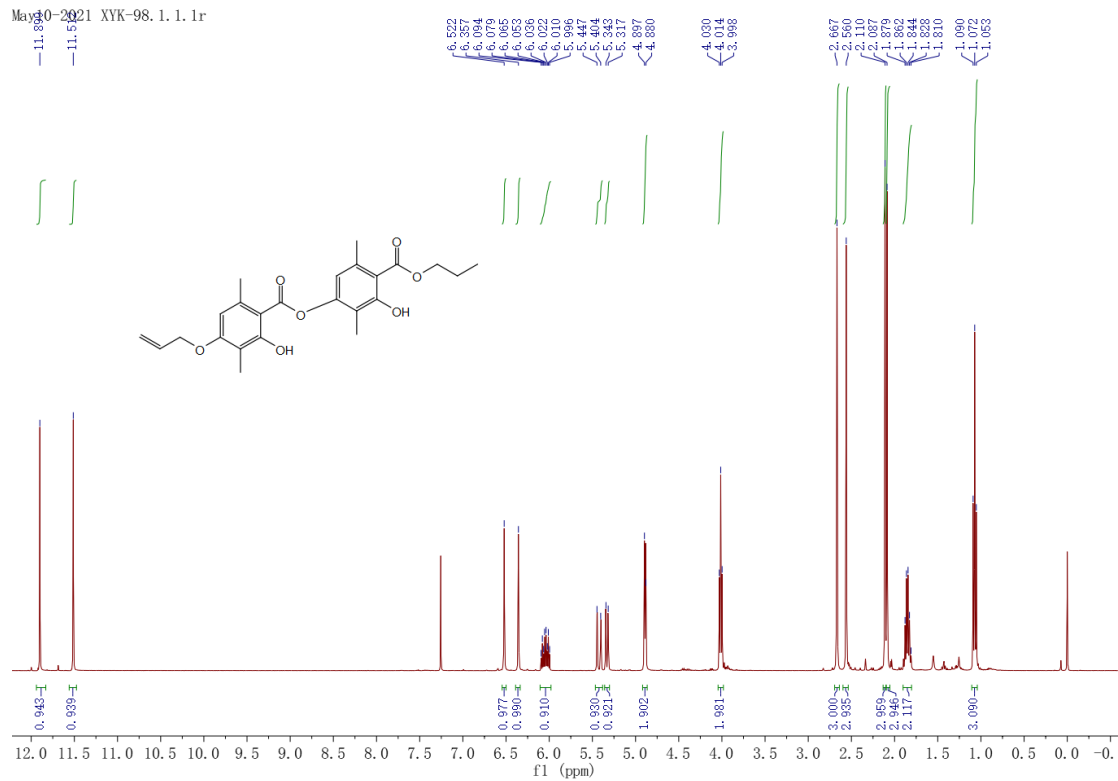


Figure S92. ¹H NMR spectrum of compound 6e'

May10-2021 XYK-98-C, 1. 1r

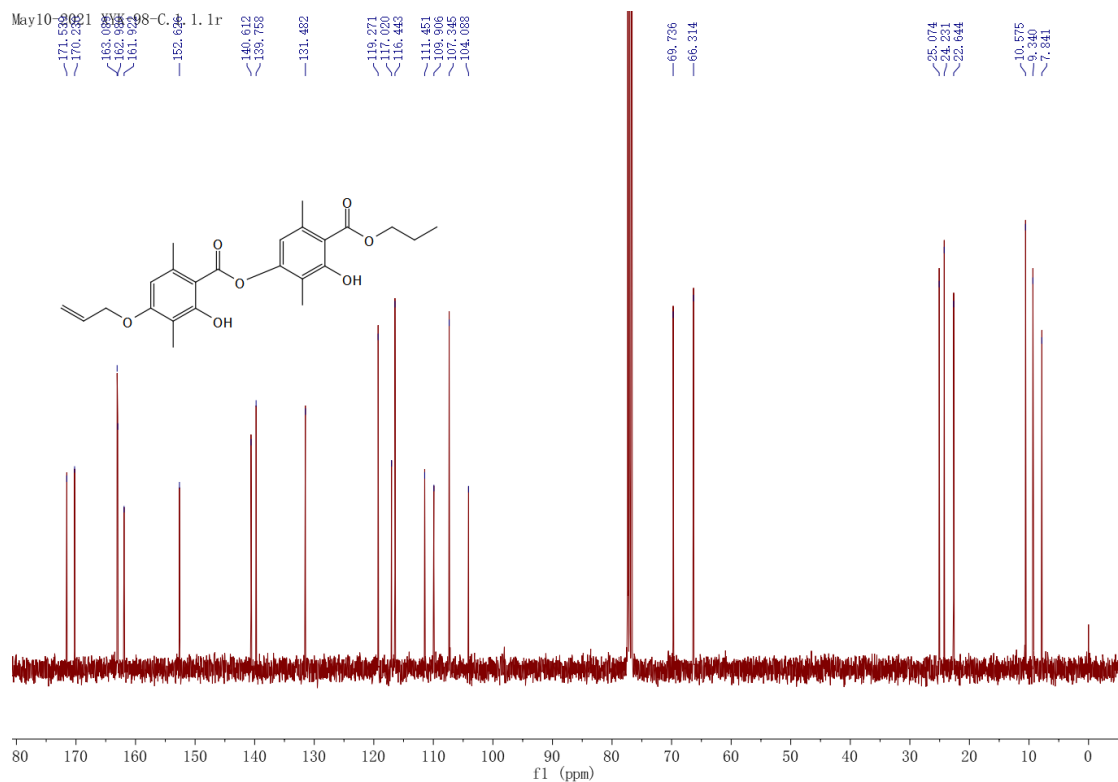


Figure S93. ¹³C NMR spectrum of compound 6e'

Item name: 7E-XYK-98
Item description:

Channel name: 1: Average Time 0.1634 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.47e7

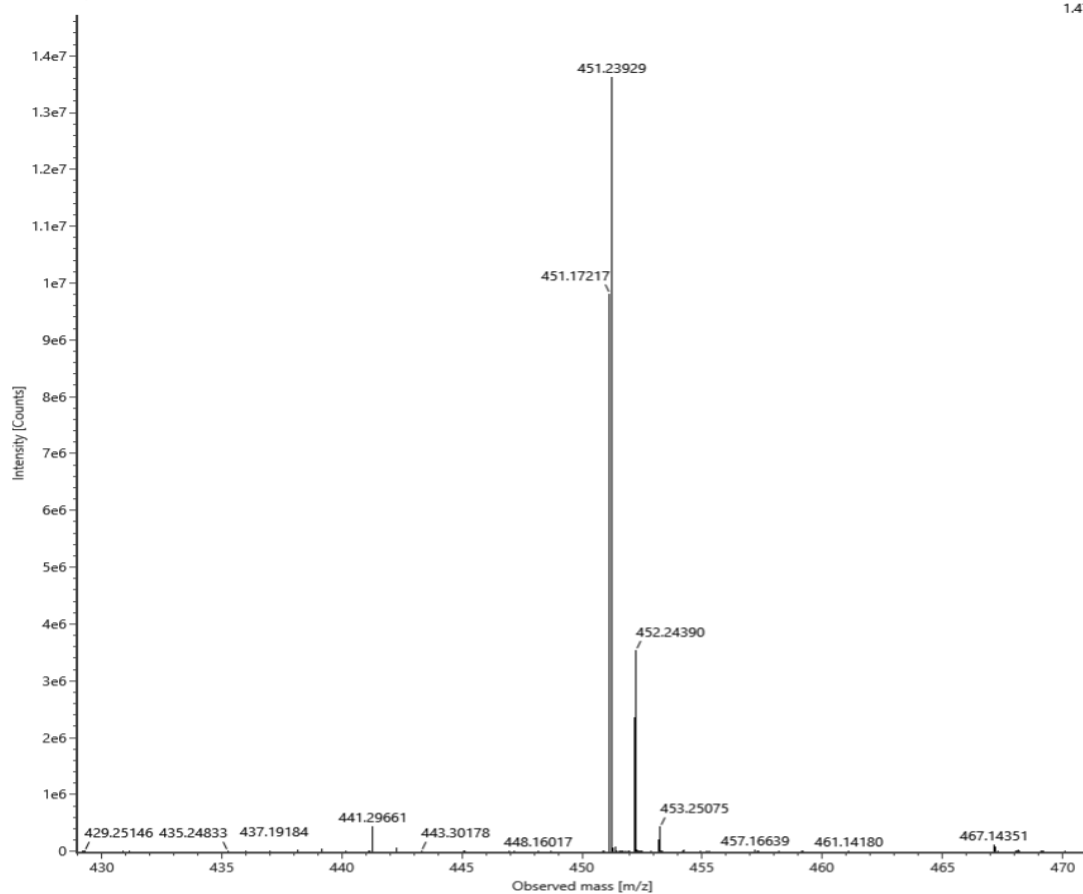


Figure S94. HRMS spectrum of compound 6e'

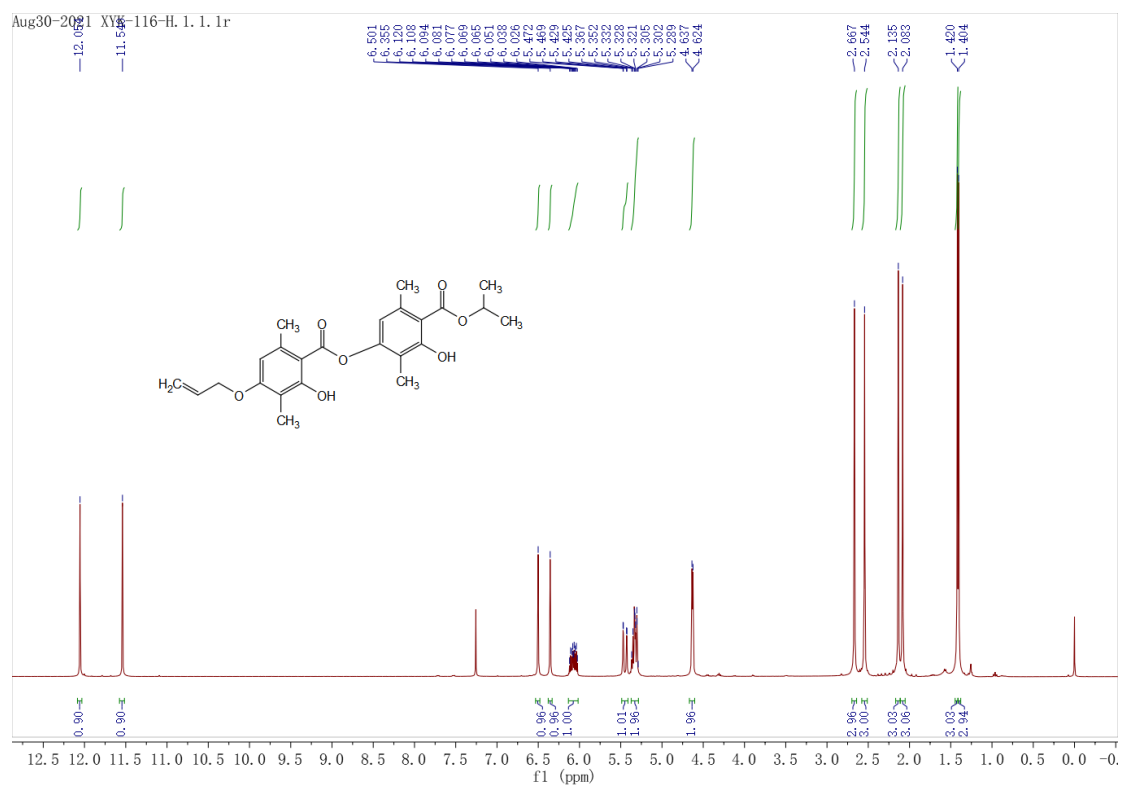


Figure S95. ¹H NMR spectrum of compound 6f'

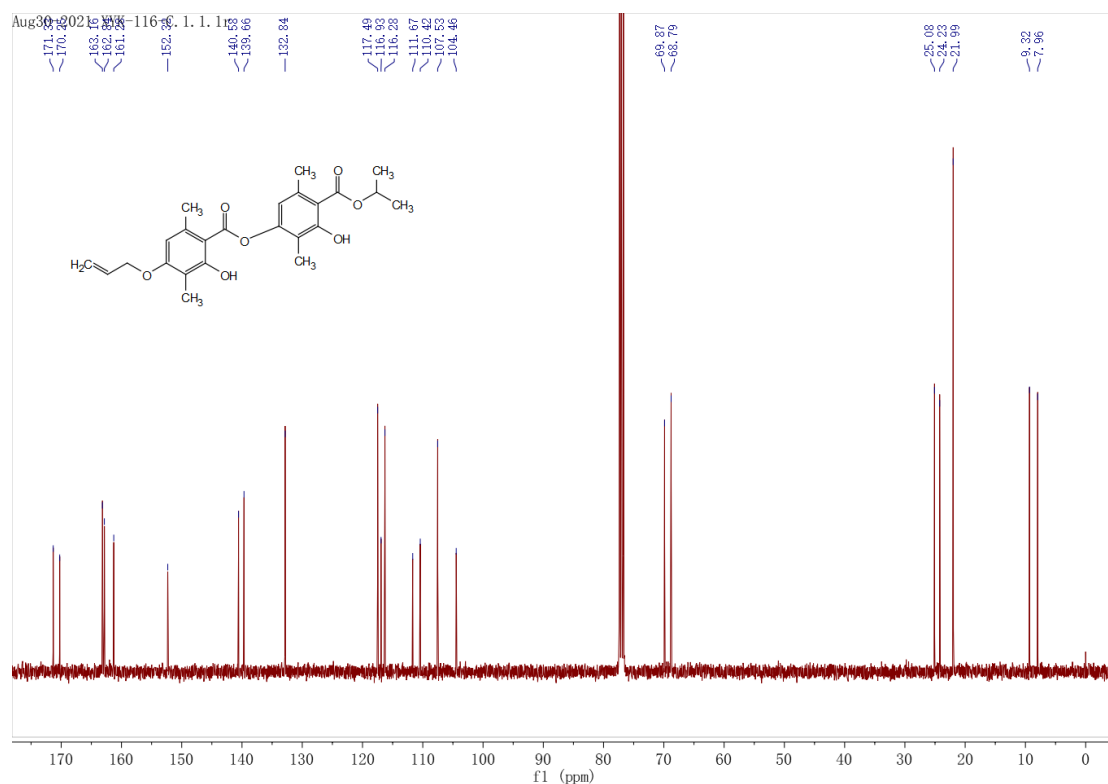


Figure S96. ^{13}C NMR spectrum of compound **6f'**

Item name: 7F-XYK-116
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

1.03e7

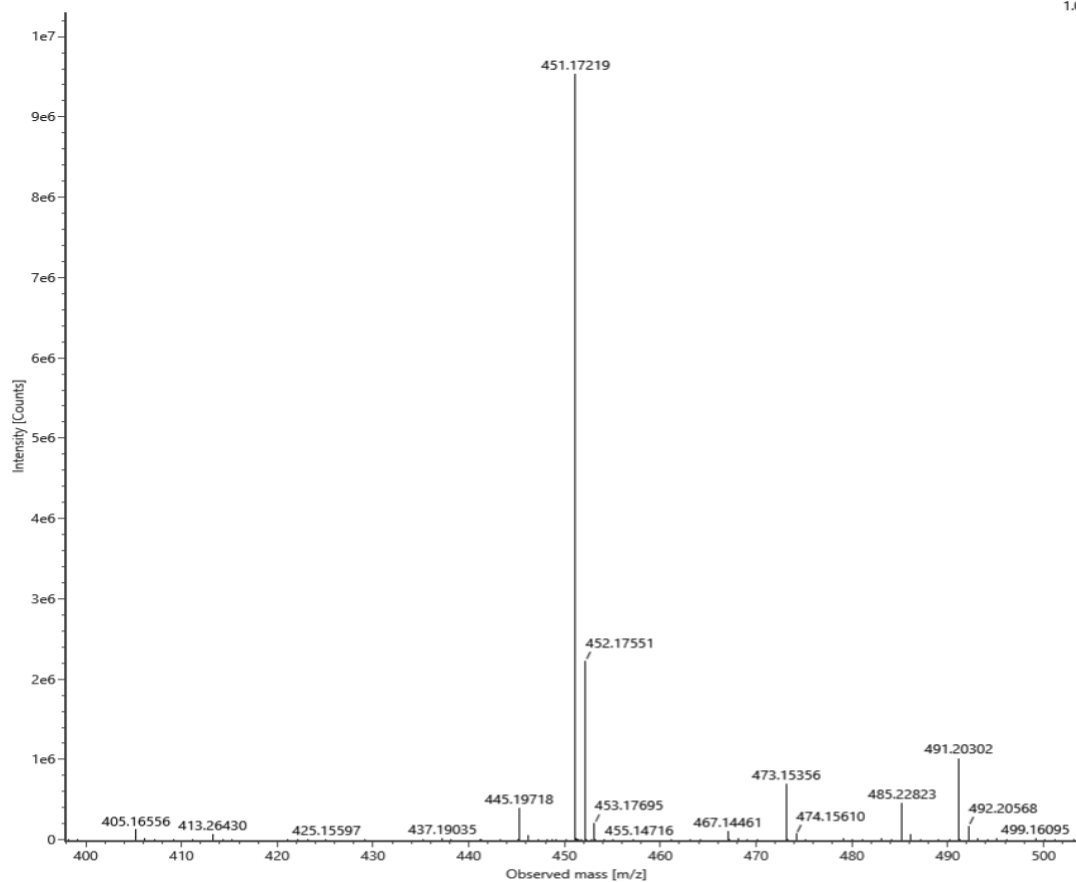


Figure S97. HRMS spectrum of compound **6f'**

Jan06-2021 XYK-55-H. 1. 1. 1r

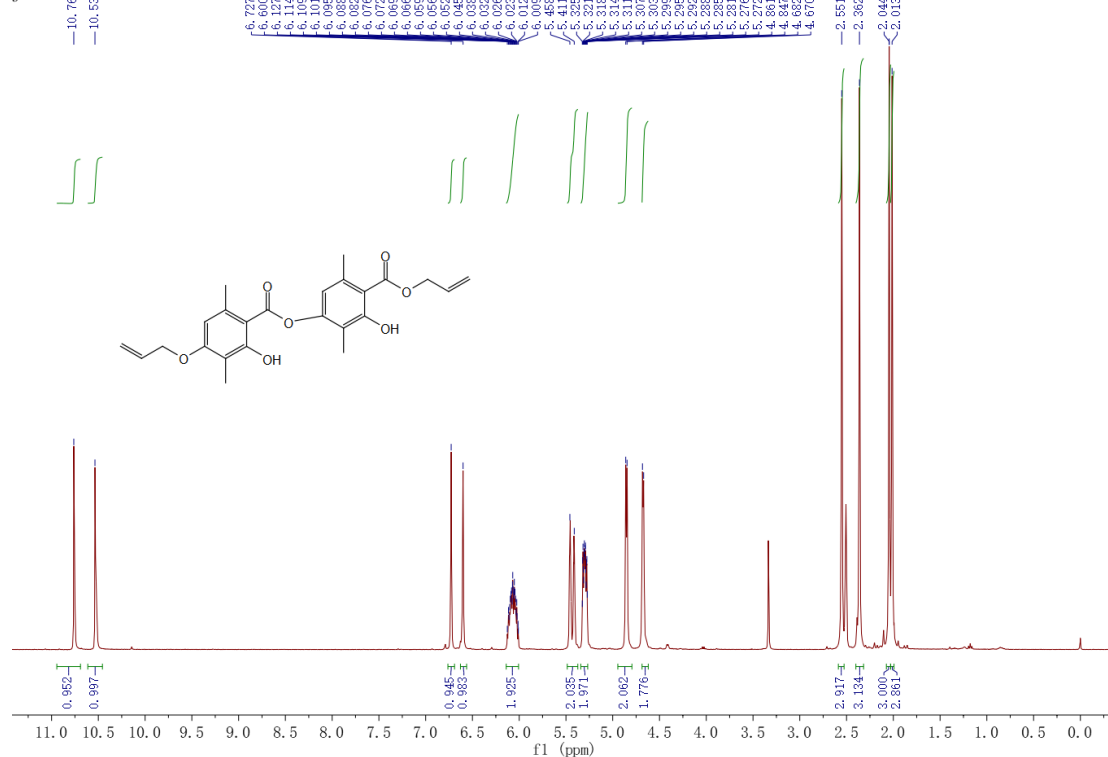


Figure S98. ¹H NMR spectrum of compound **6g'**

Jan06-2021 XYK-55-H. 1. 1. 1r

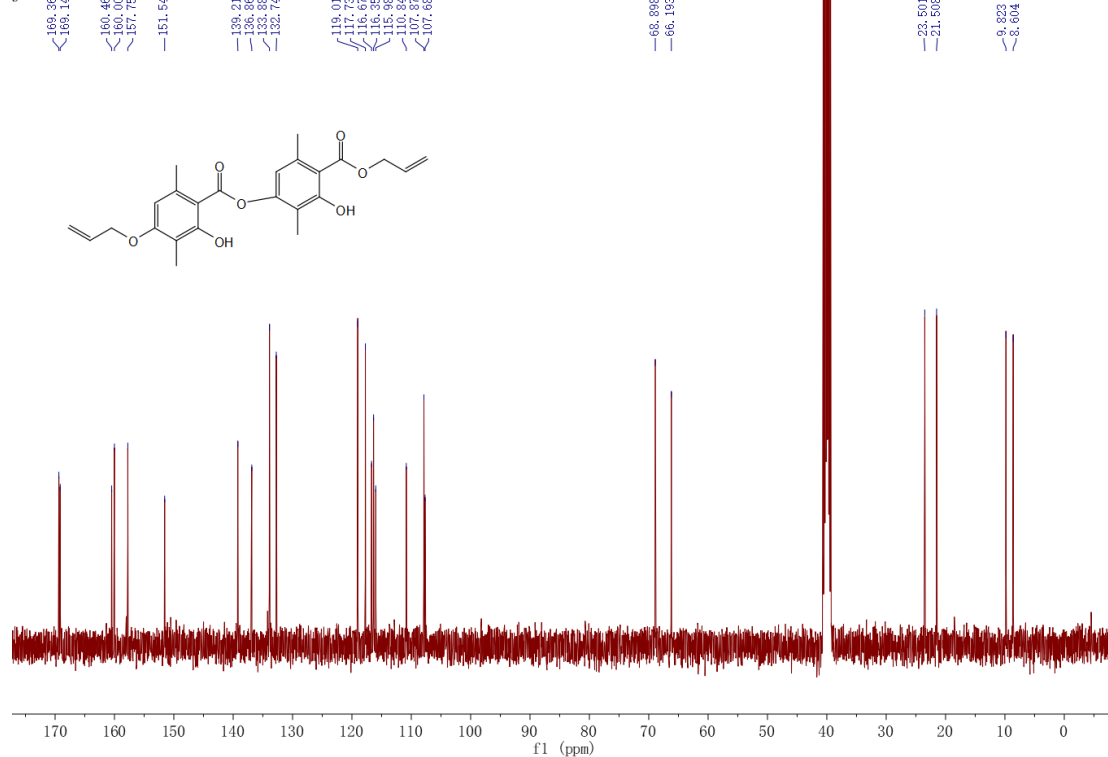


Figure S99. ¹³C NMR spectrum of compound **6g'**

Item name: 7G-XYK-55
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

2.95e6

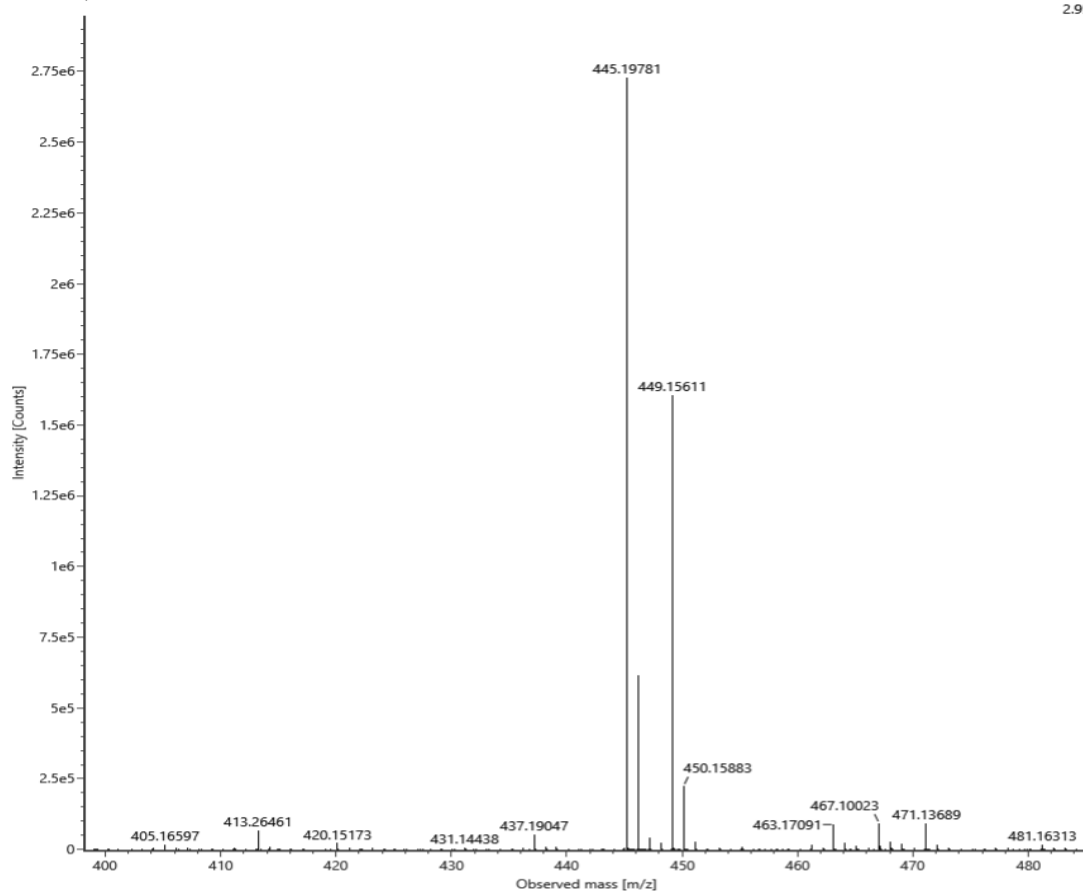


Figure S100. HRMS spectrum of compound **6g'**

Apr07-2023, XYK-54, 1. 1. 1r

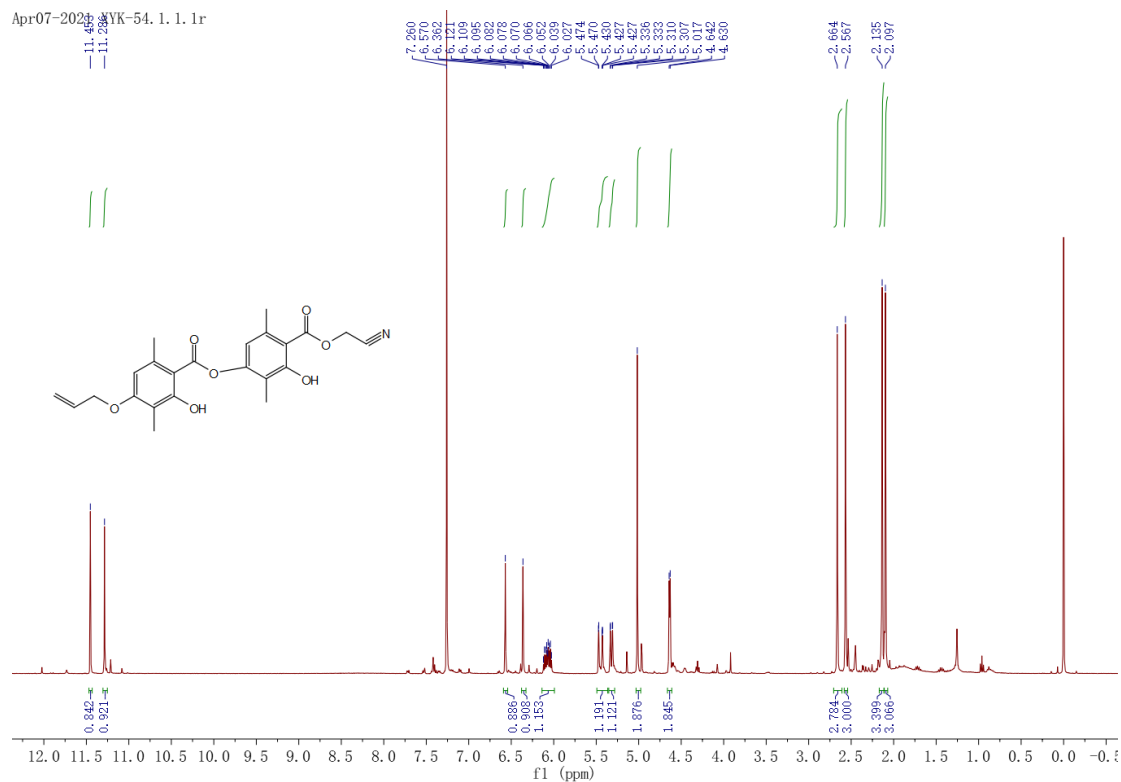


Figure S101. ^1H NMR spectrum of compound **6h'**

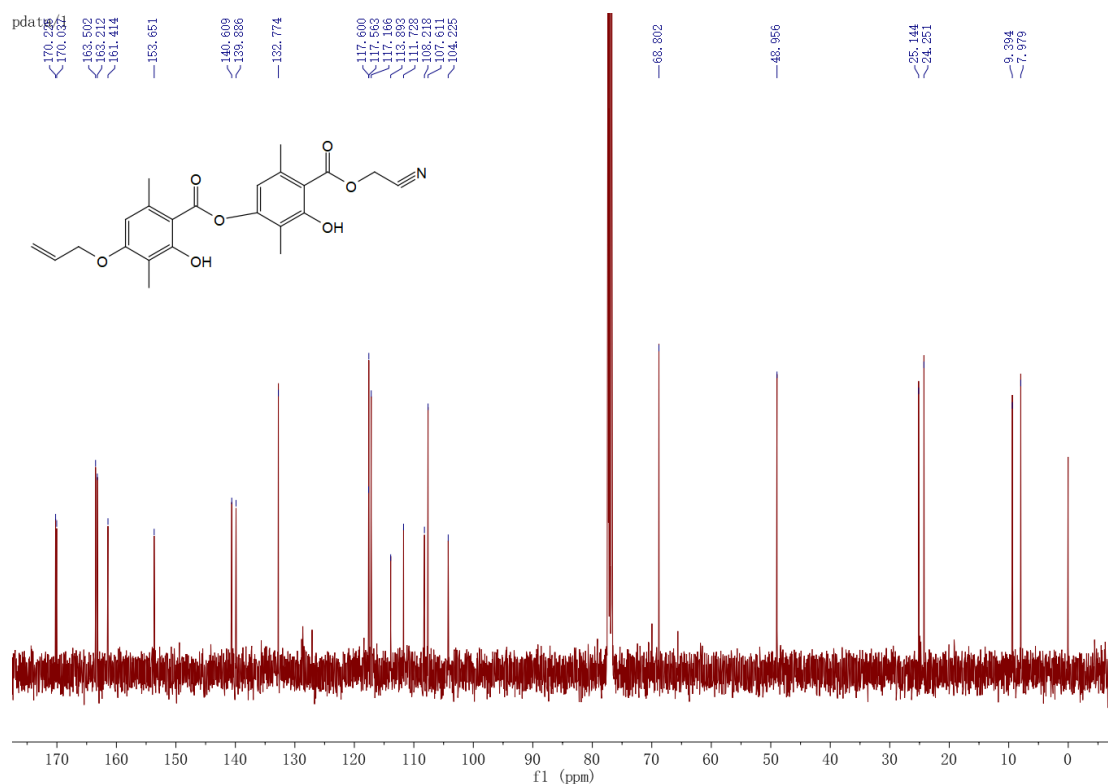


Figure S102. ^{13}C NMR spectrum of compound 6h'

Item name: 7H-XYK-54
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

3.08e6

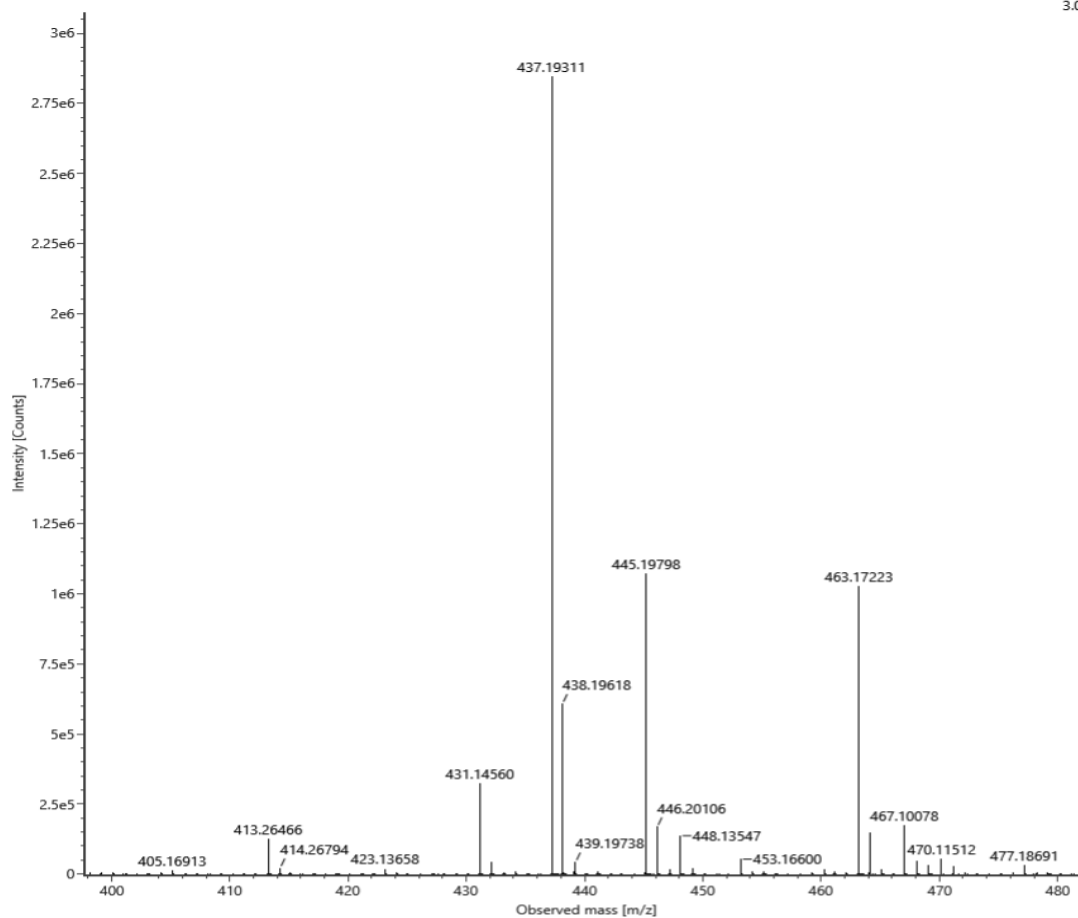


Figure S103. HRMS spectrum of compound 6h'

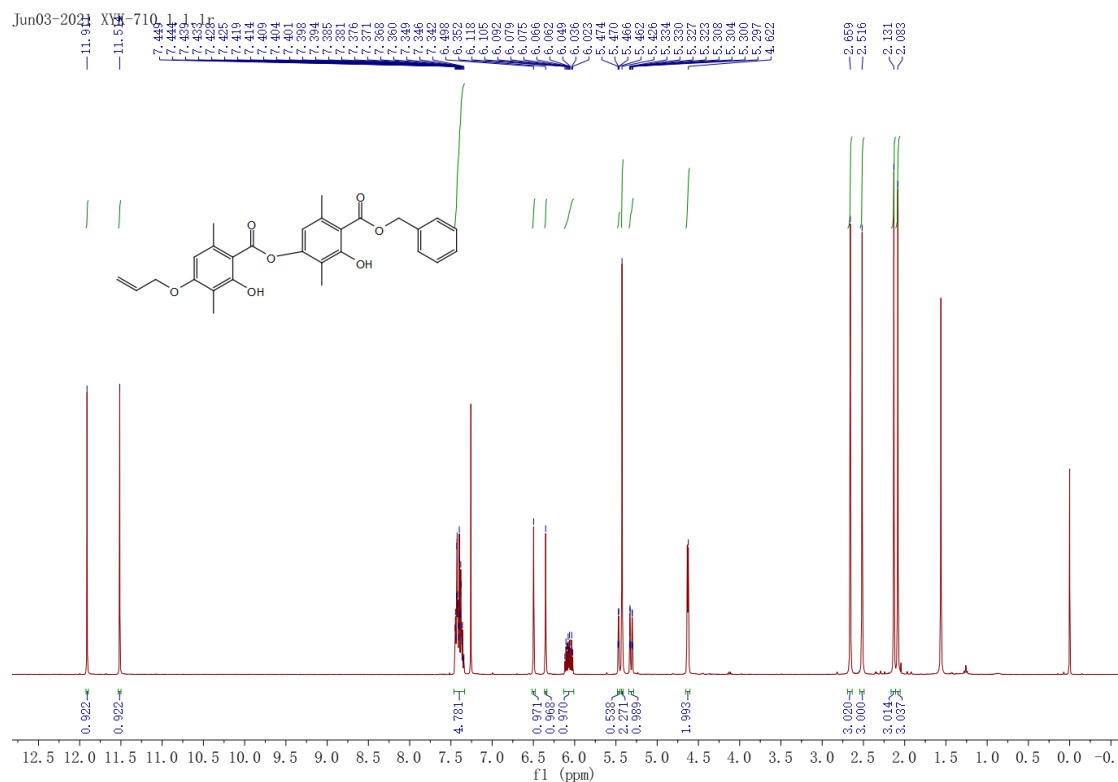


Figure S104. ¹H NMR spectrum of compound **6i'**

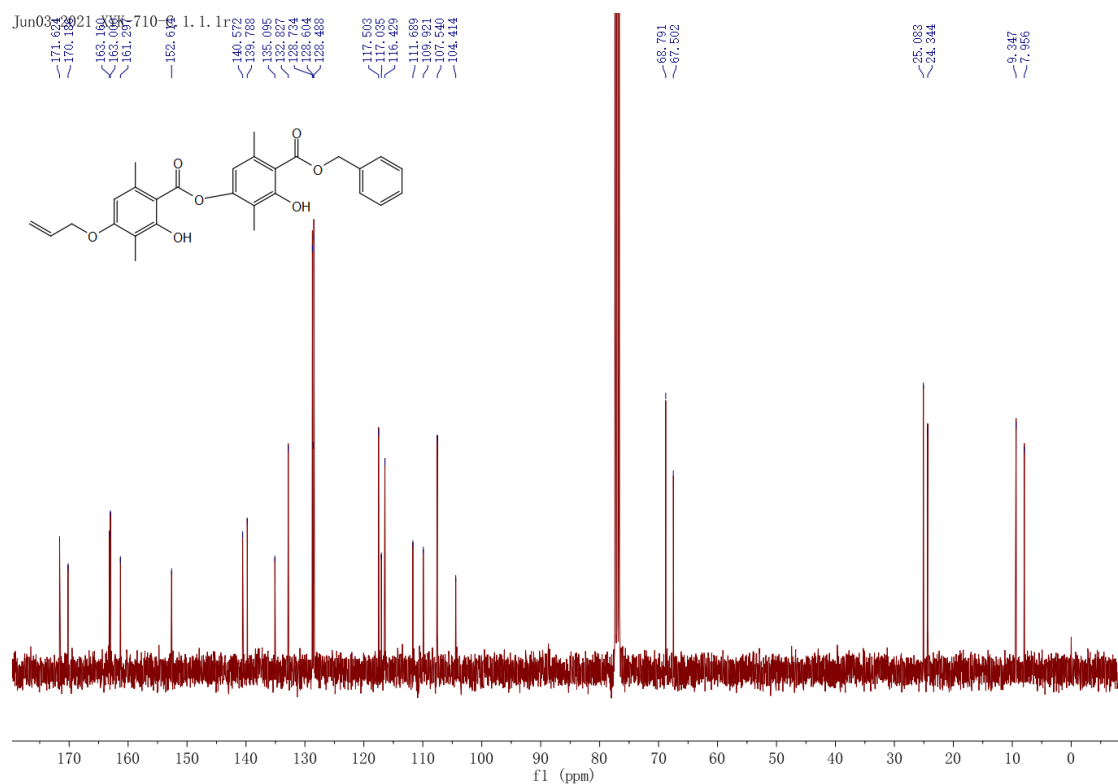


Figure S105. ¹³C NMR spectrum of compound **6i'**

Item name: 71-XYK-71
Item description:

Channel name: 1: Average Time 0.0788 min : TOF MS (50-1500) ESI+ : Centroided : Combined

8.98e5

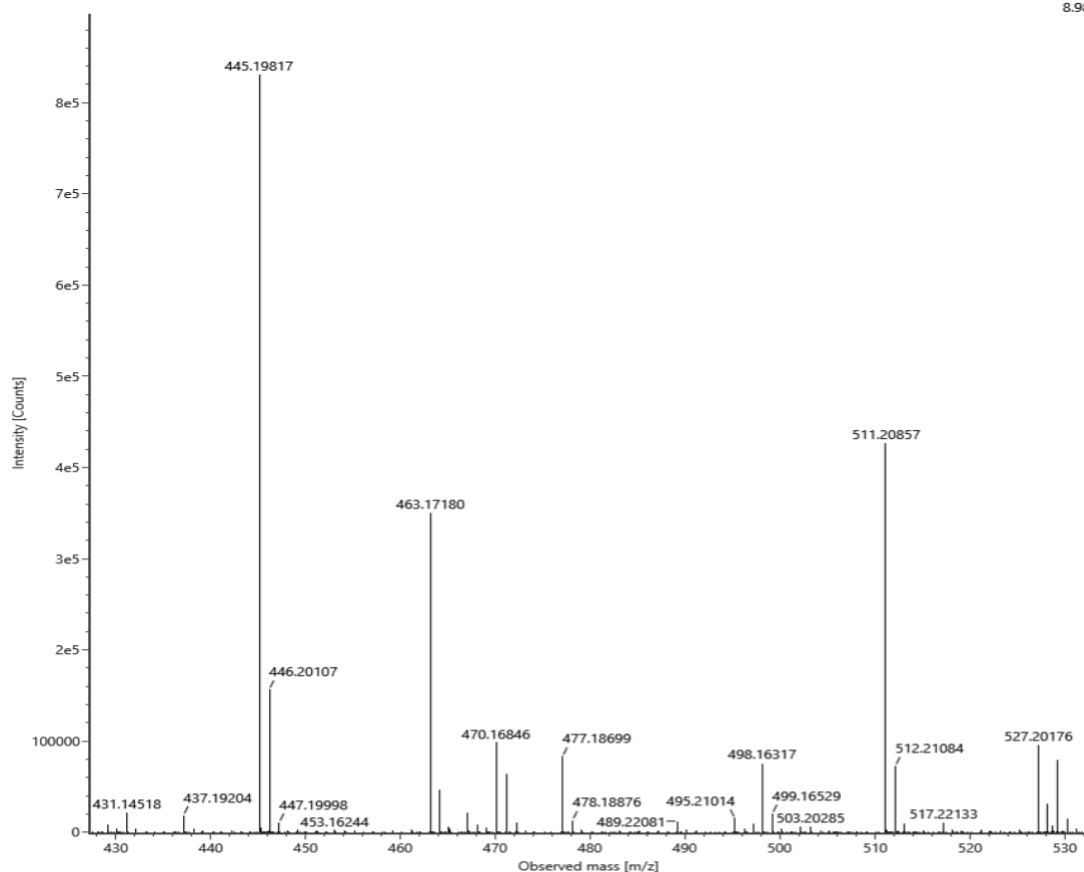


Figure S106. HRMS spectrum of compound 6i

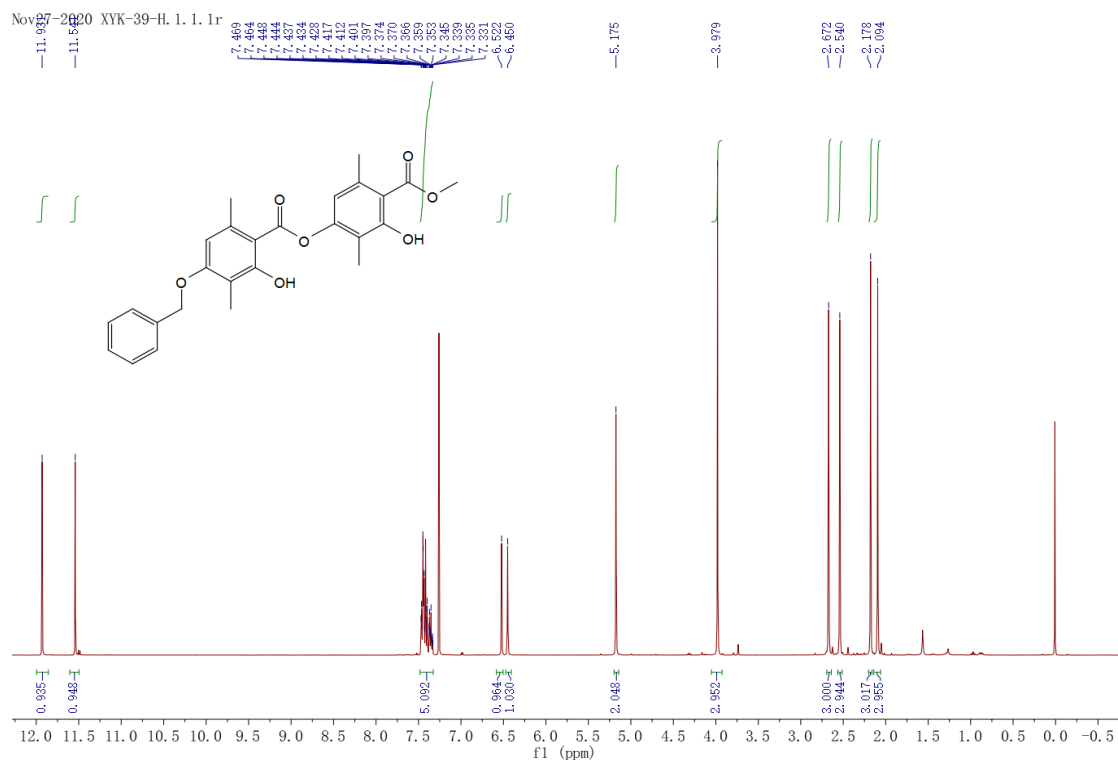


Figure S107. ¹H NMR spectrum of compound 6j

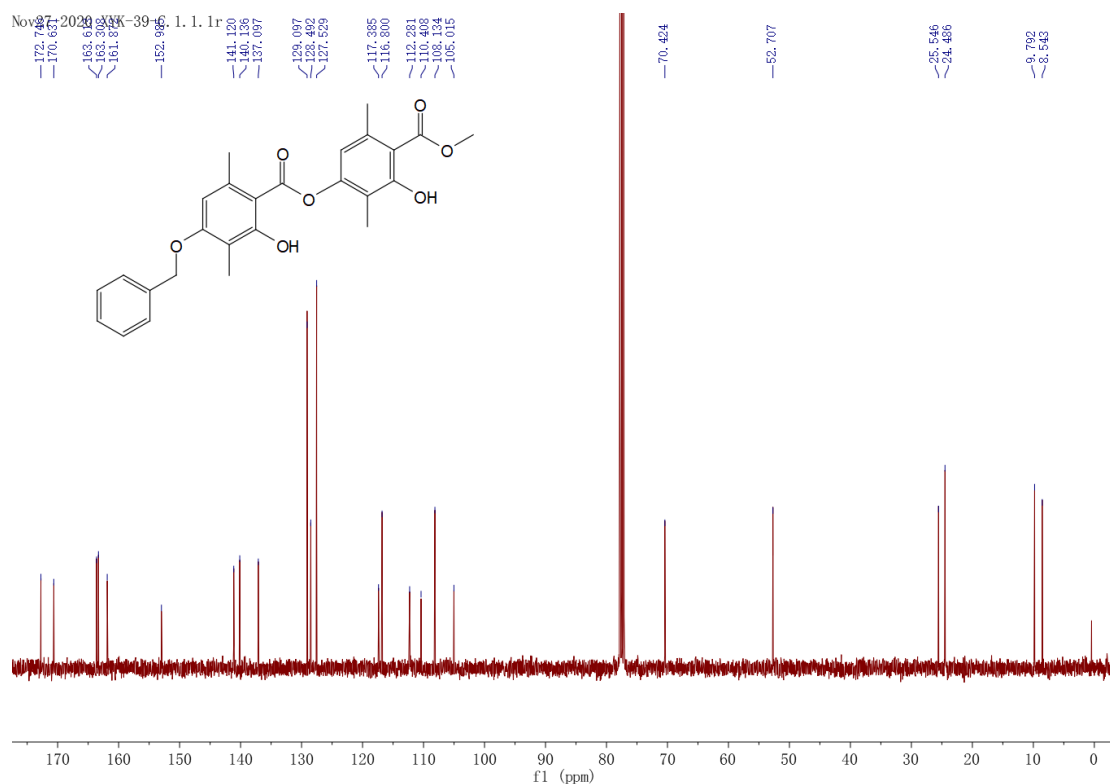


Figure S108. ^{13}C NMR spectrum of compound **6j'**

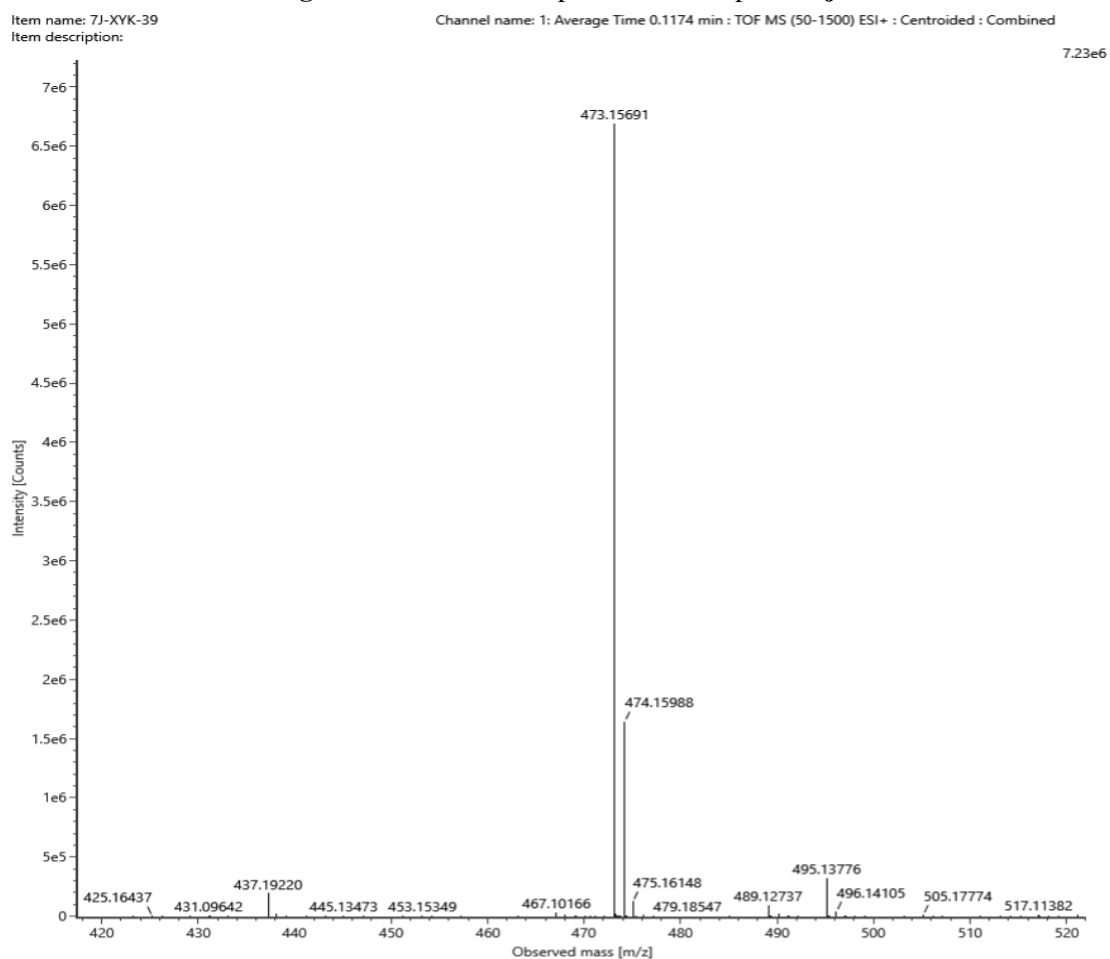


Figure S109. HRMS spectrum of compound **6j'**

May 10, 2021, XYK-58, 1. 1. 1r

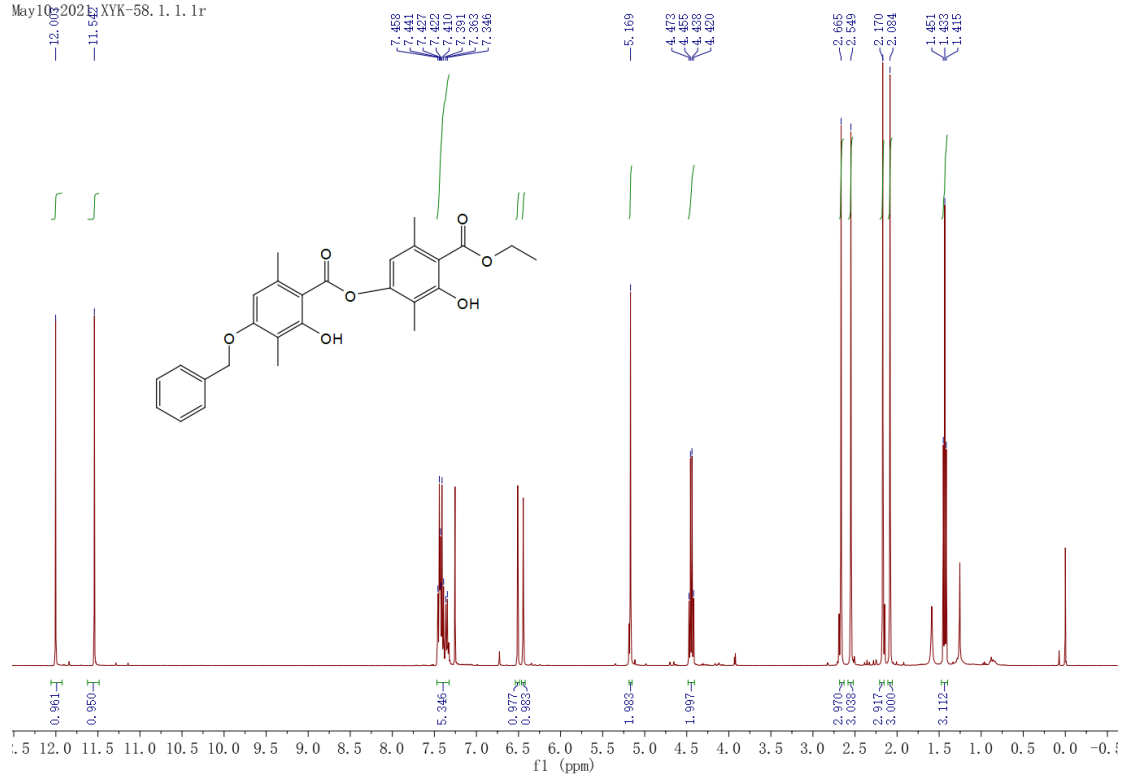


Figure S110. ¹H NMR spectrum of compound 6k'

May 10, 2021, XYK-58-Cl, 1. 1. 1r

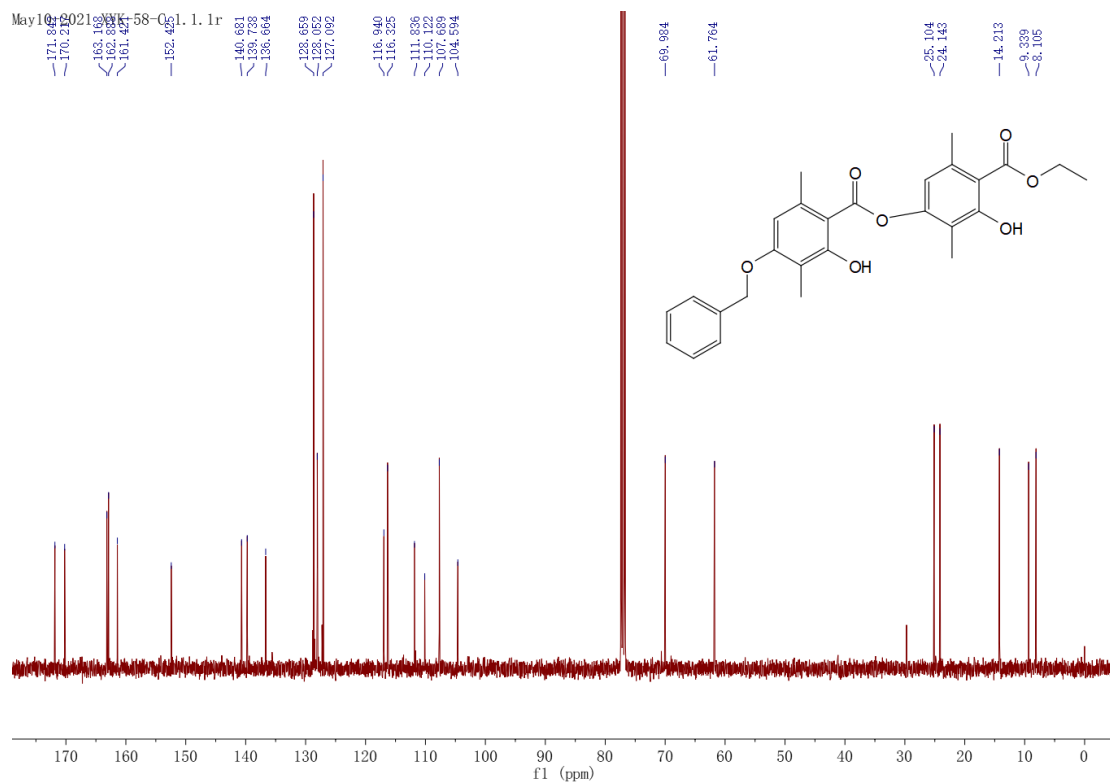


Figure S111. ¹³C NMR spectrum of compound 6k'

Item name: 7K-XYK-58
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

4.83e6

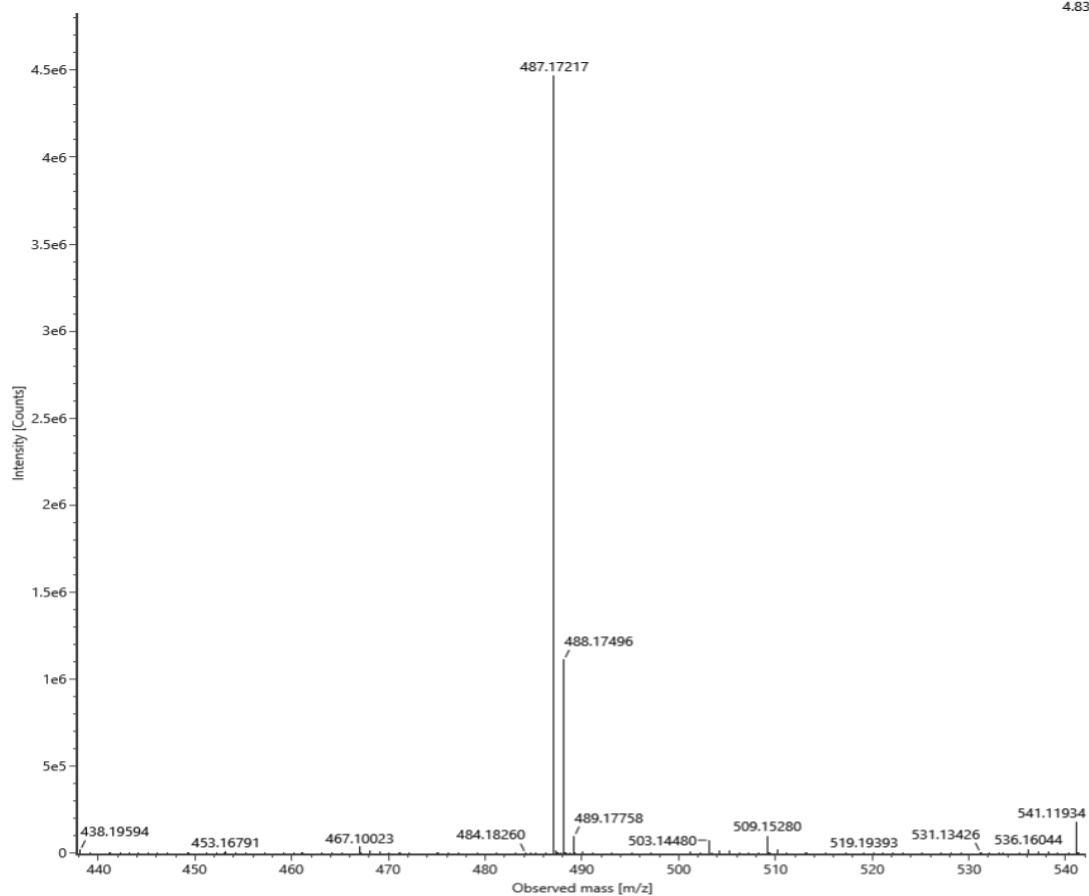


Figure S112. HRMS spectrum of compound 6k'

Jun03-2021-XYK-95. 1. 1. 1r

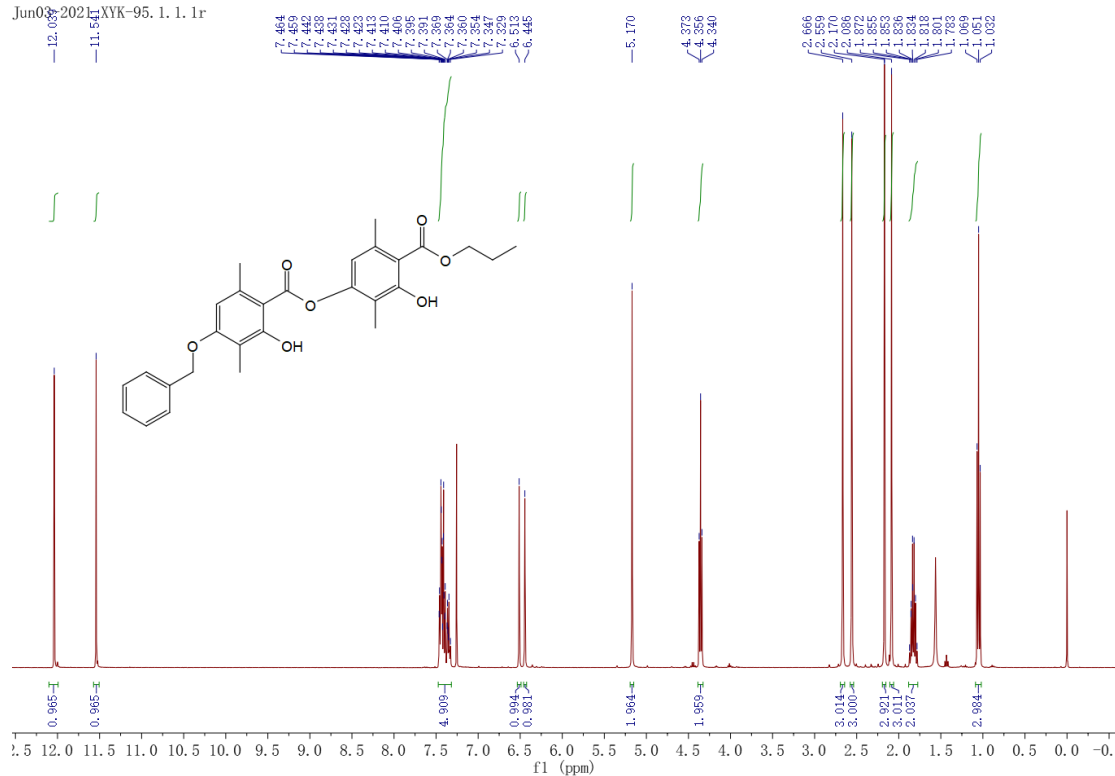


Figure S113. ¹H NMR spectrum of compound 6l'

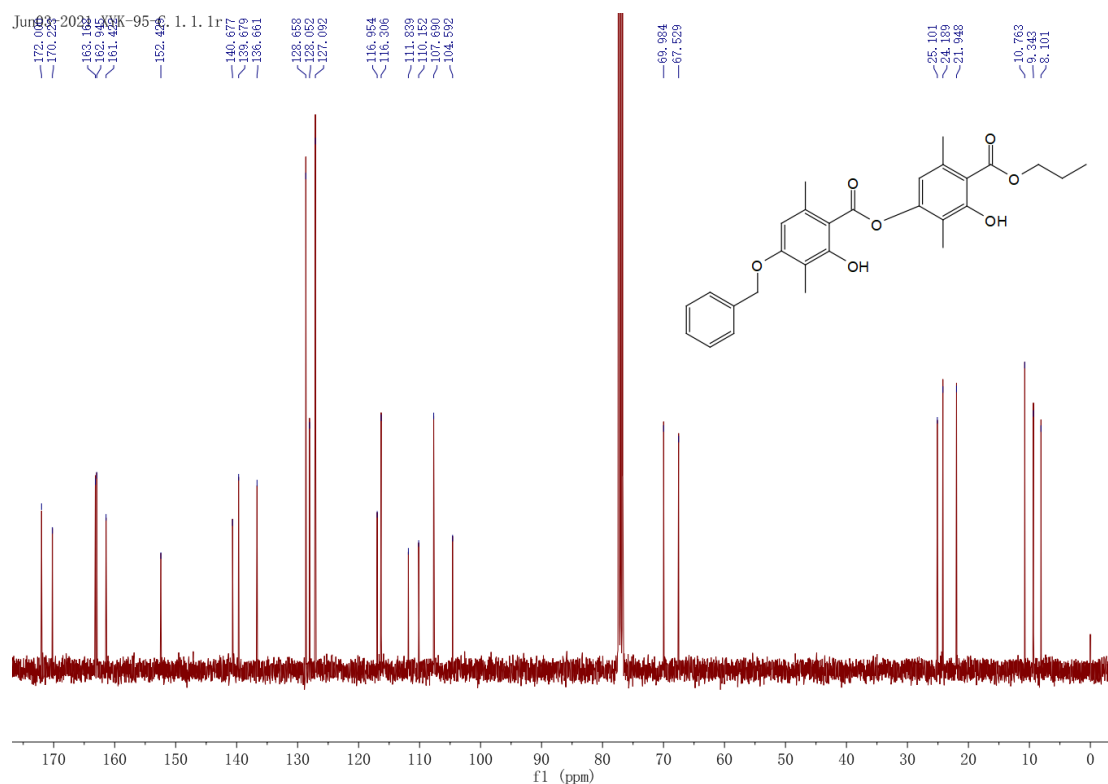


Figure S114. ^{13}C NMR spectrum of compound **6l'**

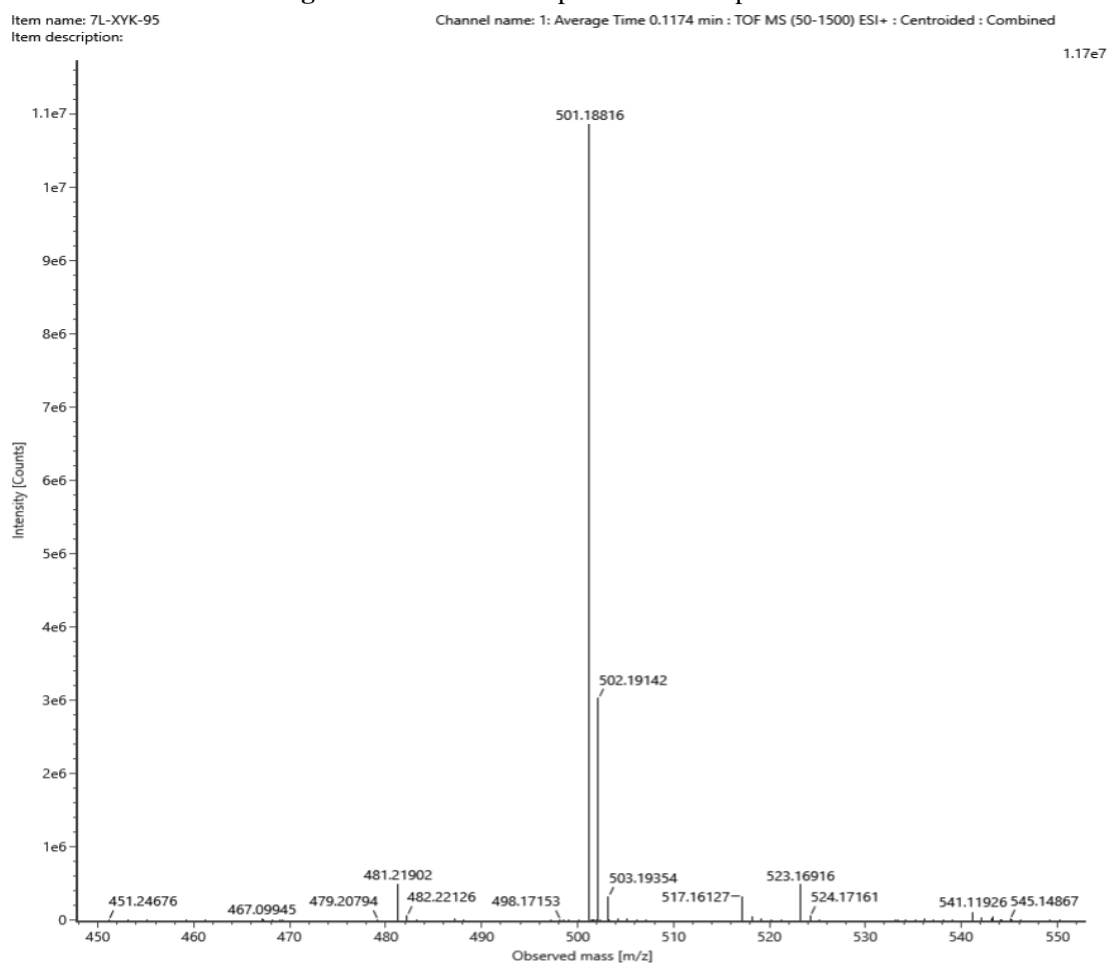


Figure S115. HRMS spectrum of compound **6l'**

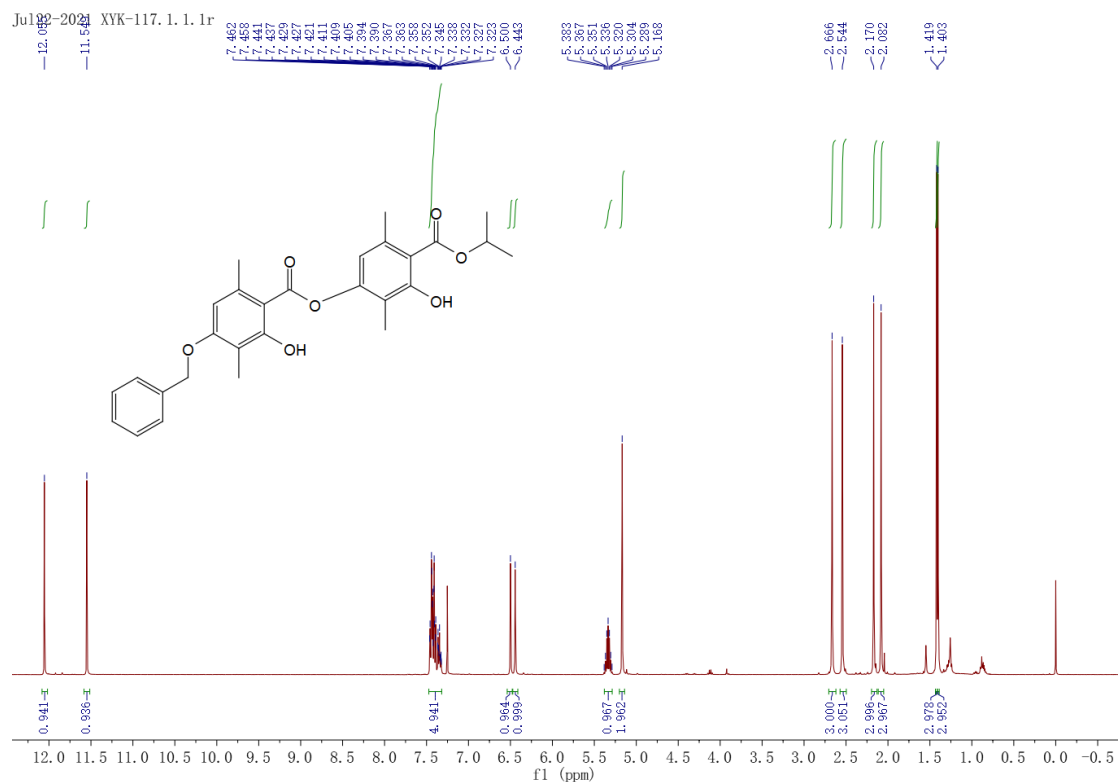


Figure S116. ¹H NMR spectrum of compound **6m'**

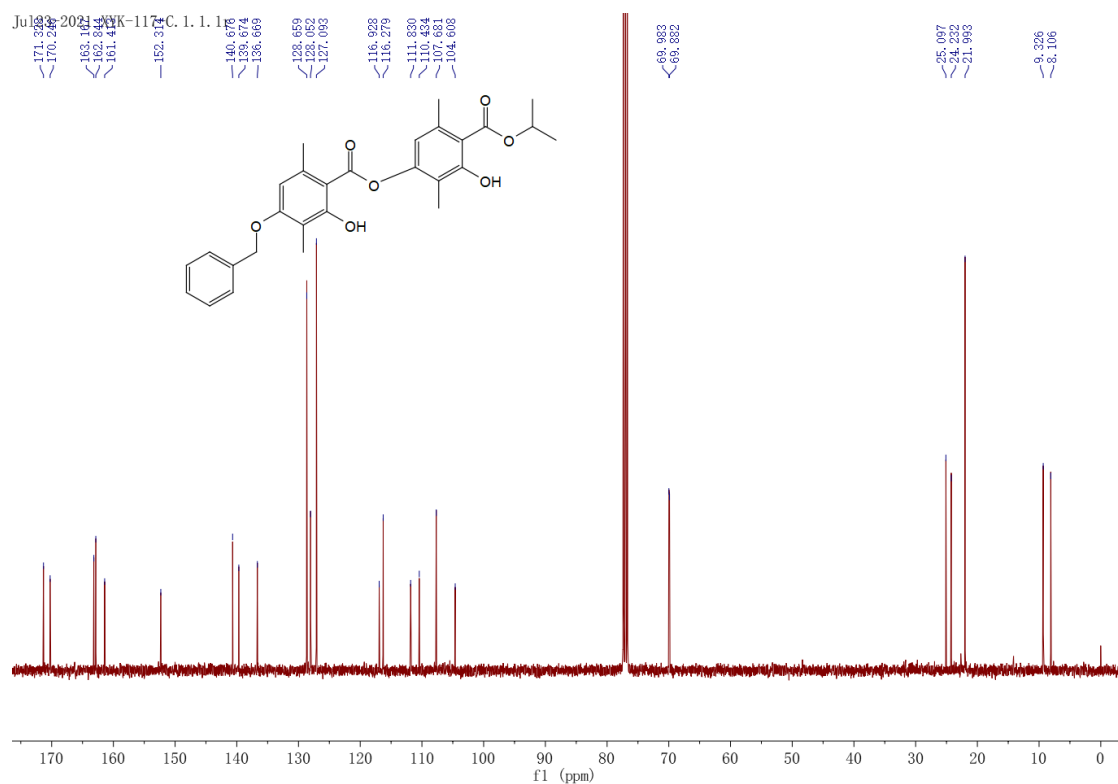
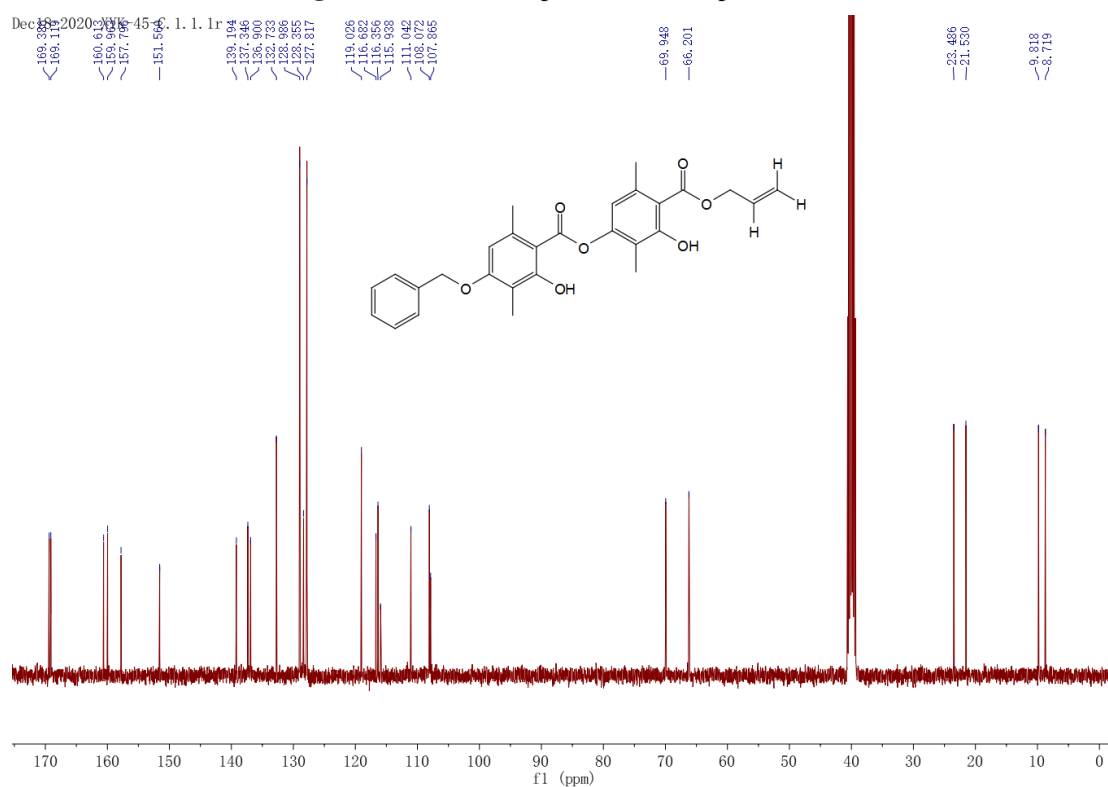
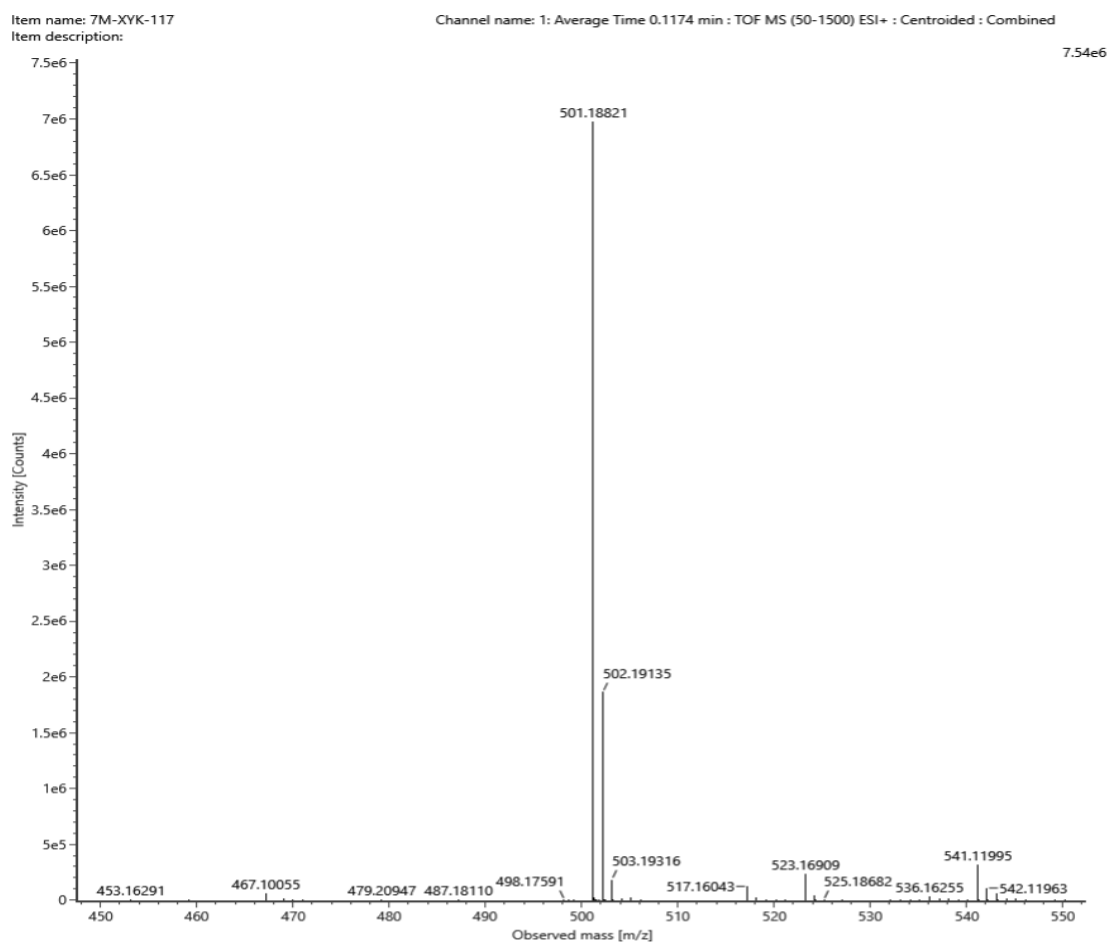
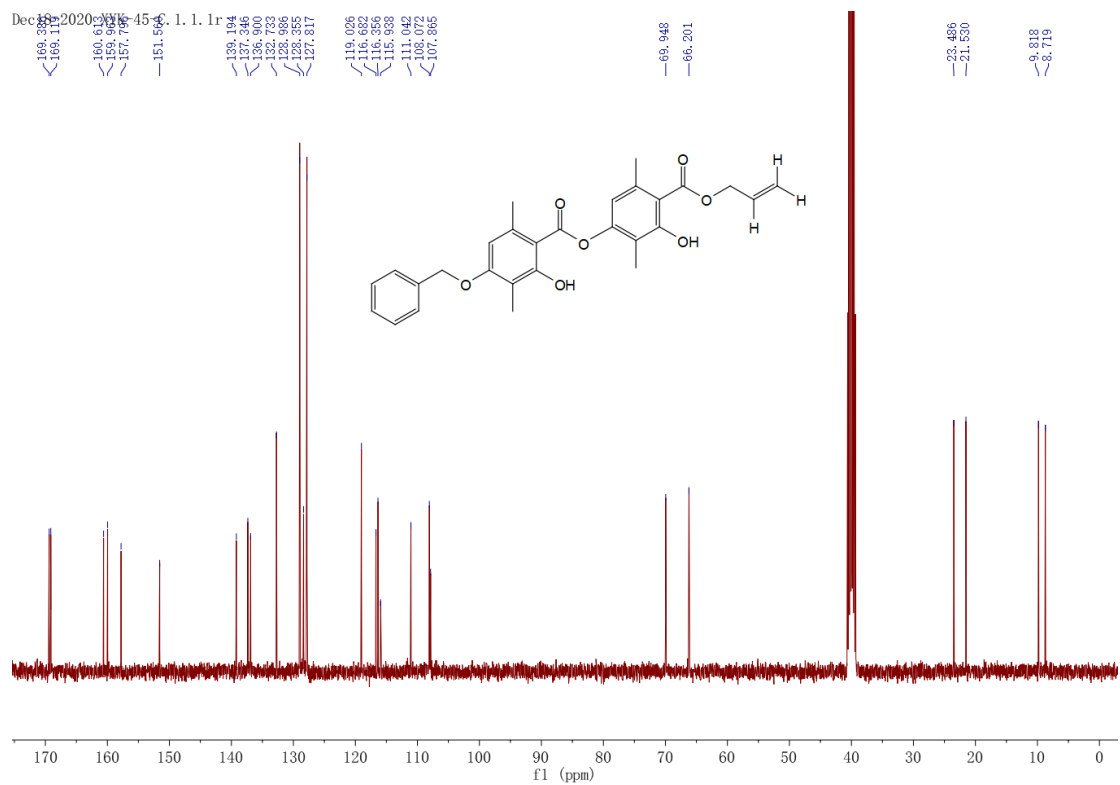


Figure S117. ¹³C NMR spectrum of compound **6m'**

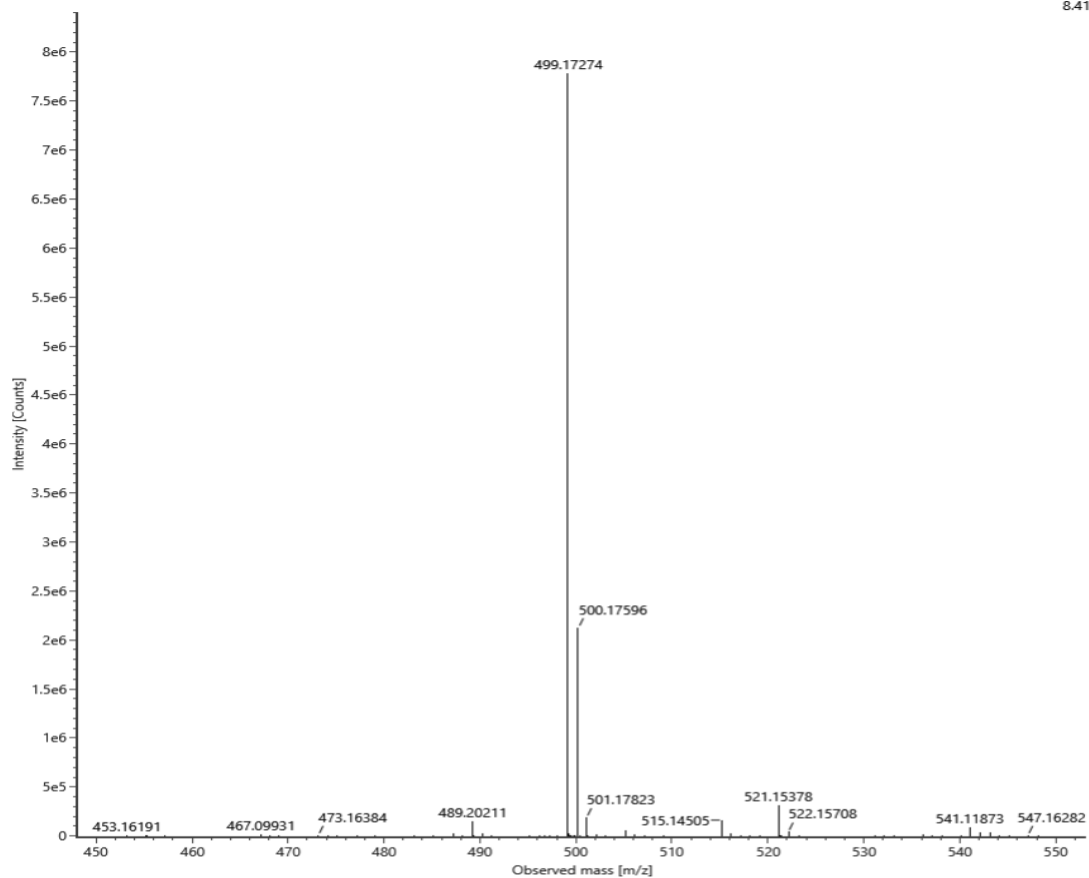




Item name: 7N-XYK-45
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

8.41e6



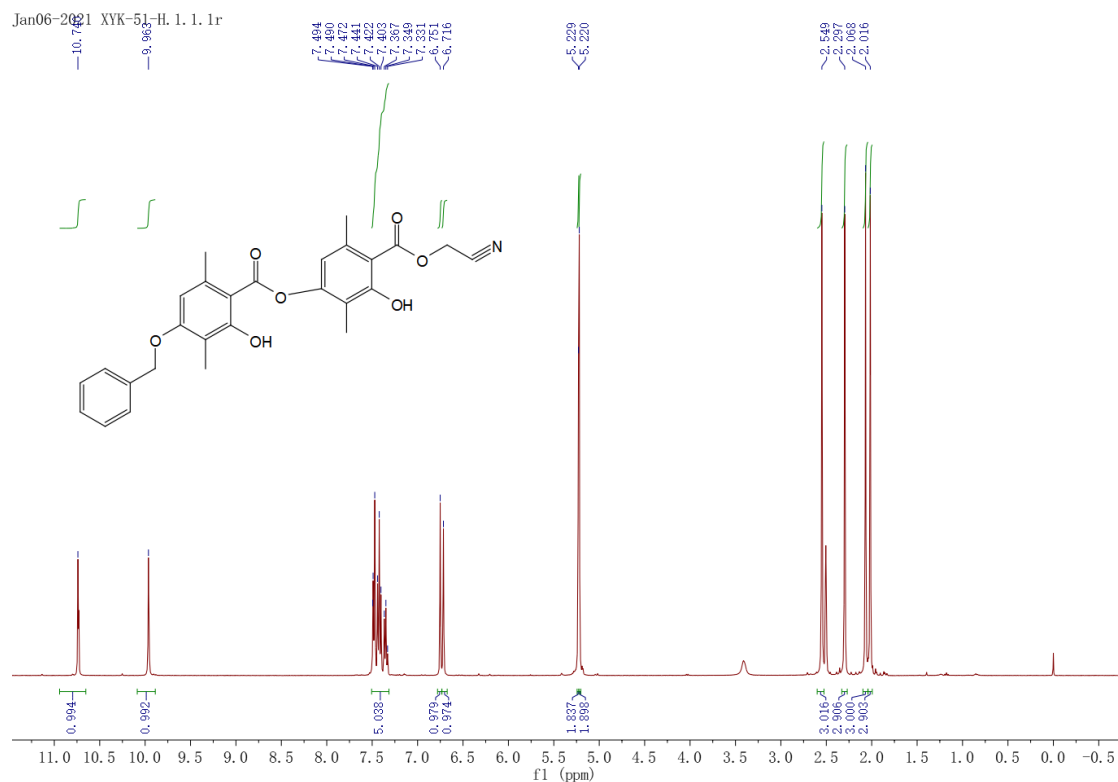


Figure S122. ¹H NMR spectrum of compound **60'**

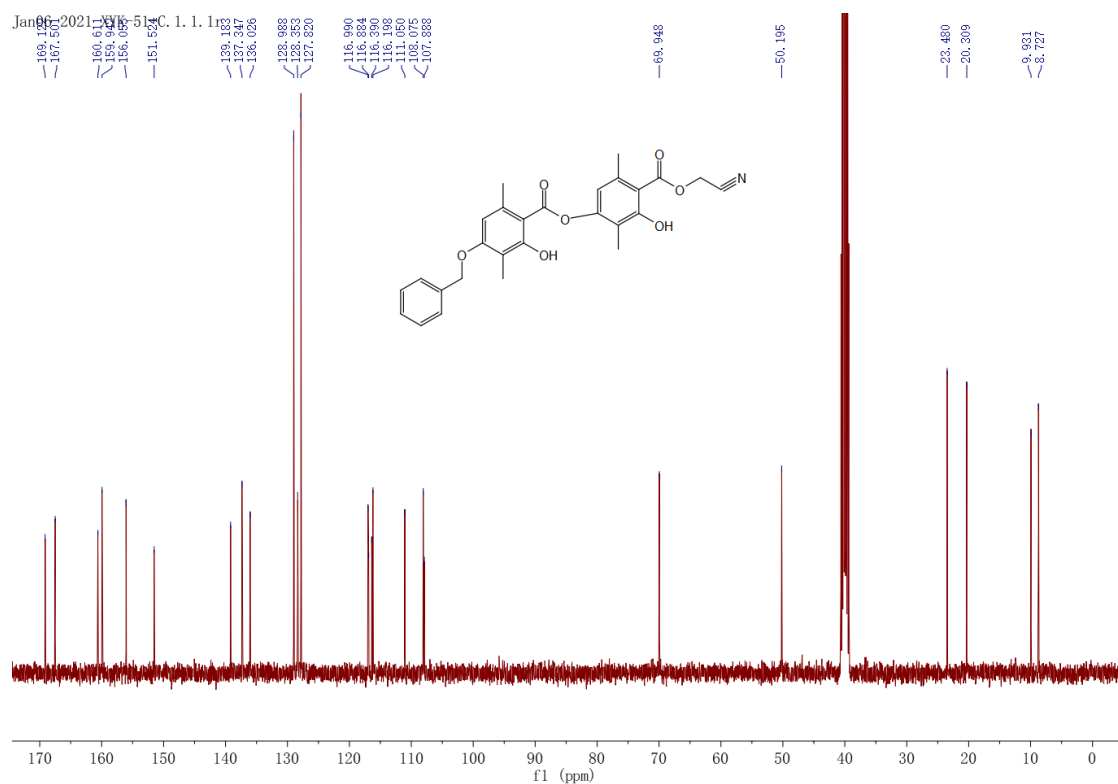


Figure S123. ¹³C NMR spectrum of compound **60'**

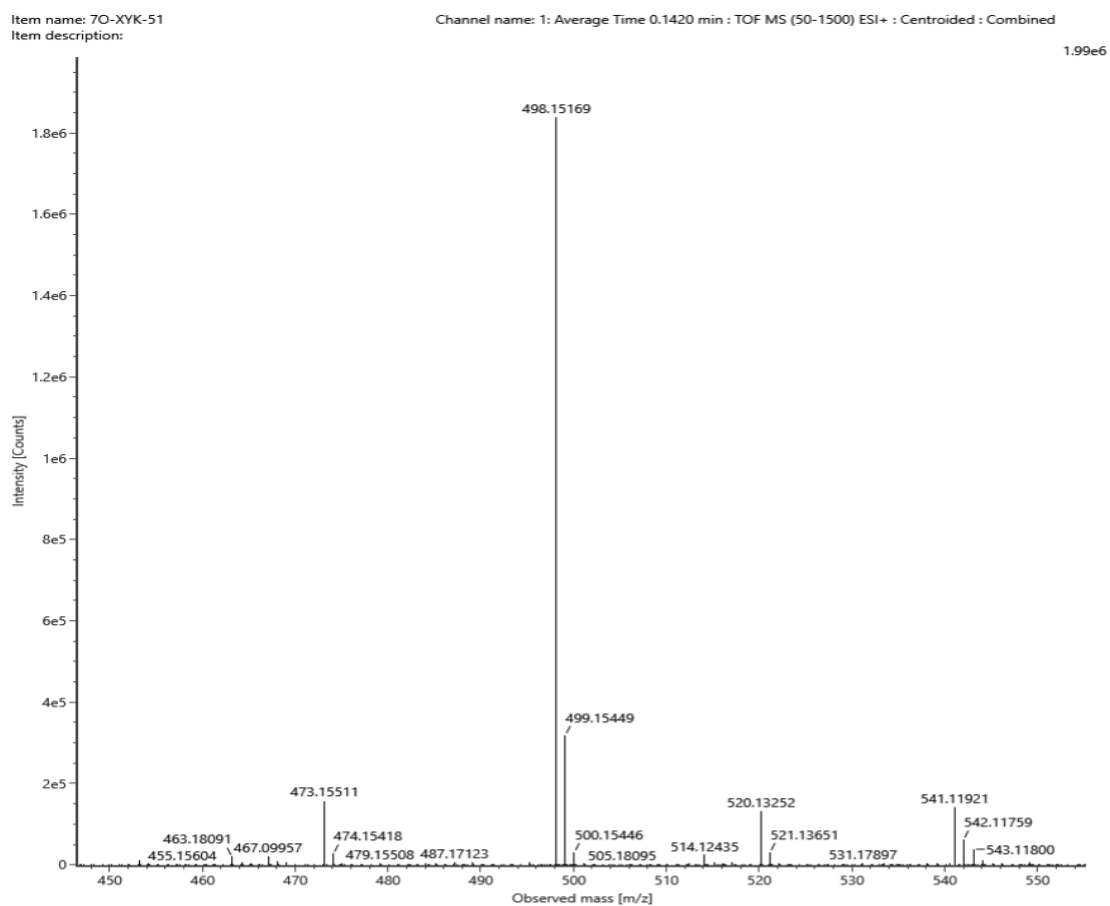


Figure S124. HRMS spectrum of compound **60p**

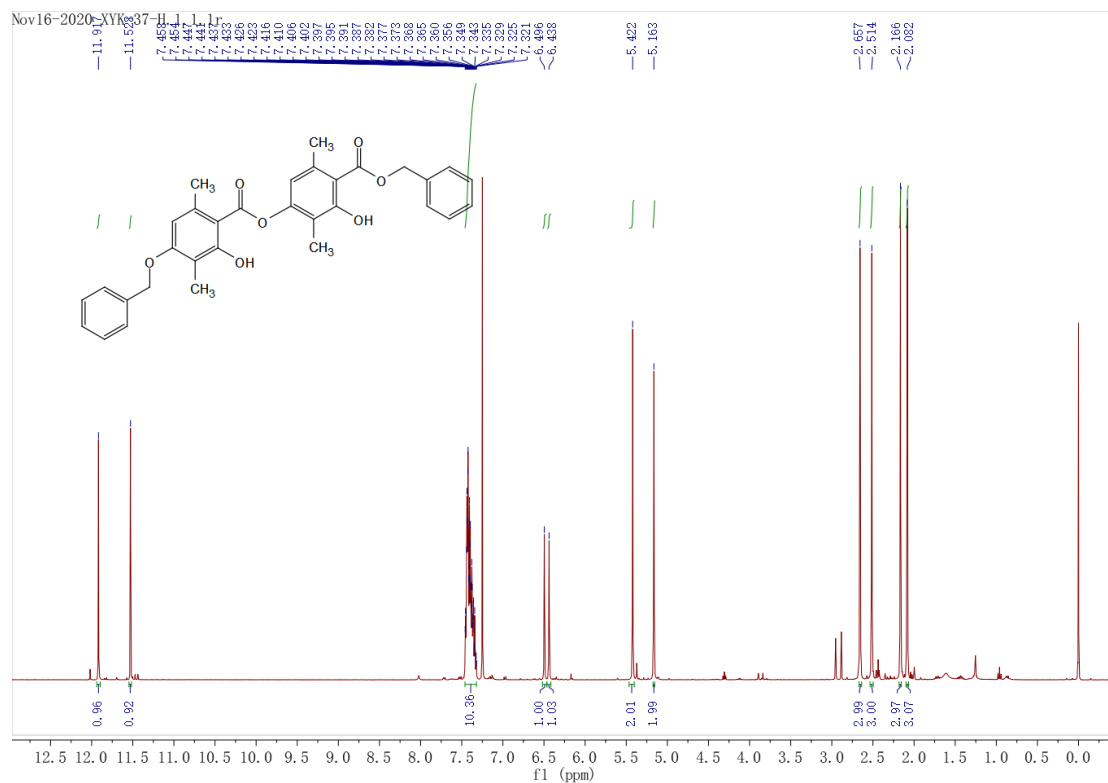


Figure S125. ^1H NMR spectrum of compound **6p**

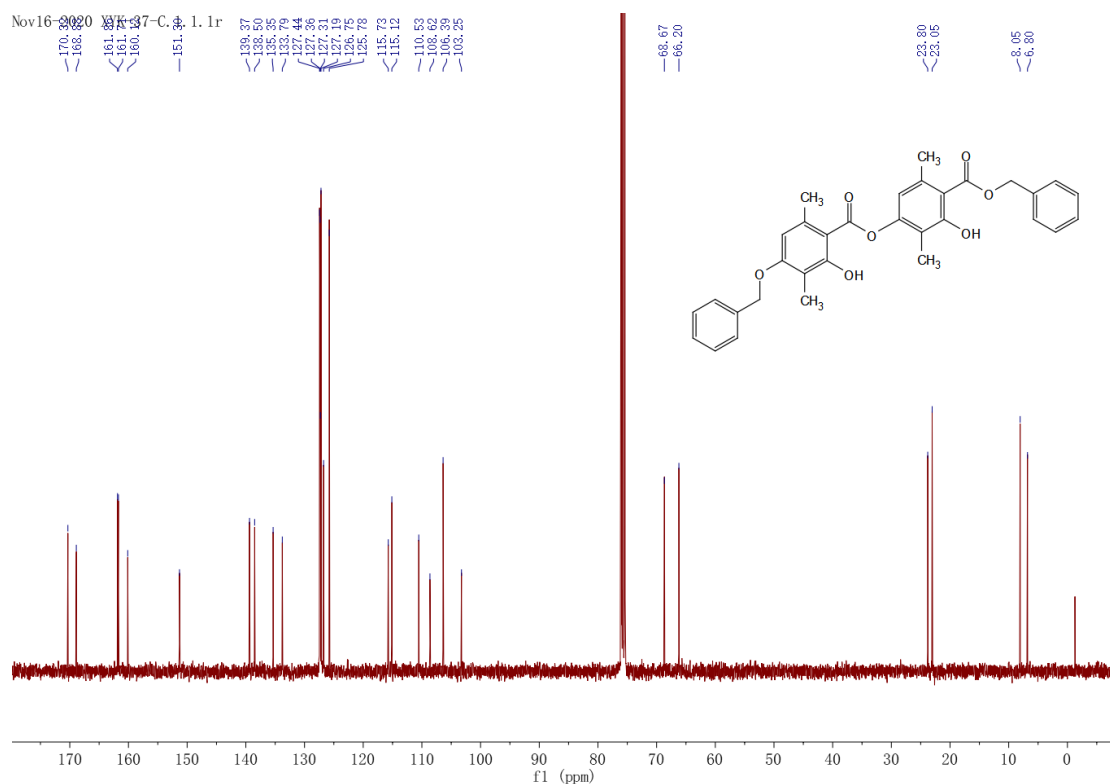


Figure S126. ^{13}C NMR spectrum of compound **6p'**

Item name: 7P-XYK-37
Item description:

Channel name: 1: Average Time 0.1174 min : TOF MS (50-1500) ESI+ : Centroided : Combined

3.19e6

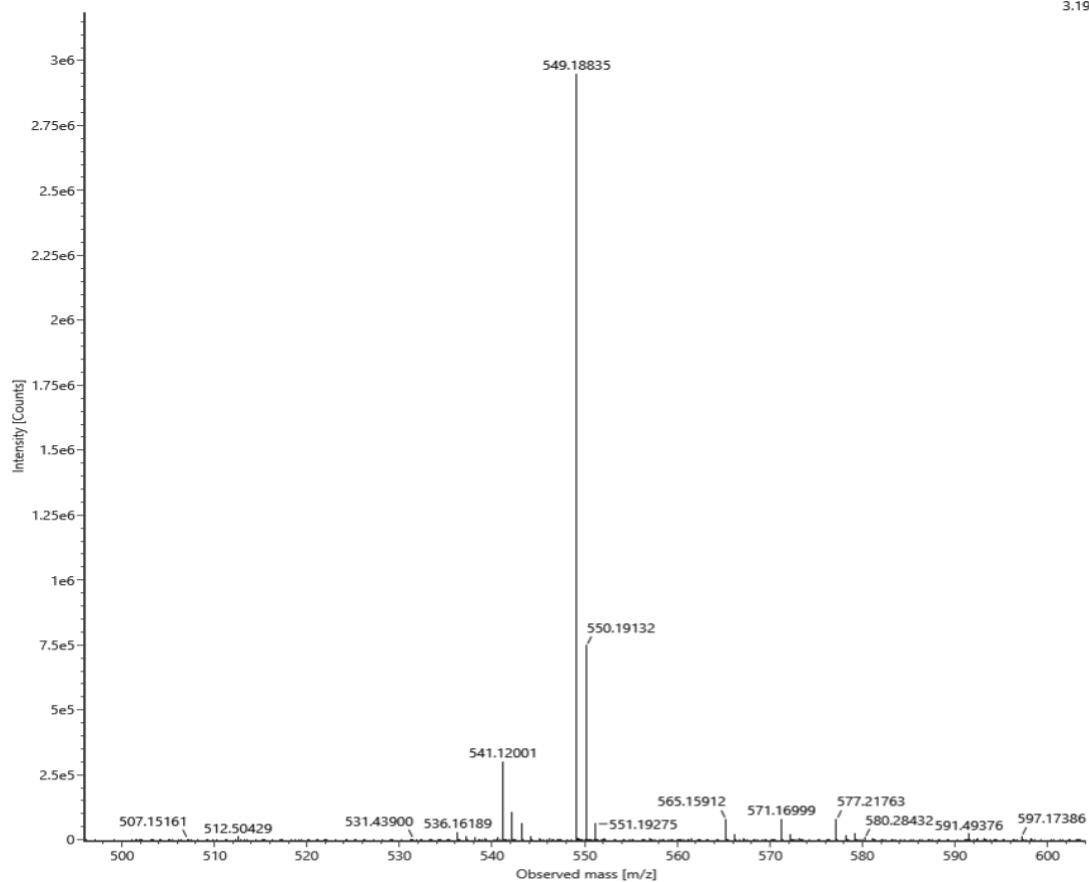


Figure S127. HRMS spectrum of compound **6p'**