

Supplementary Materials

Figure S1. ¹H-NMR spectrum of compound 5-A1.

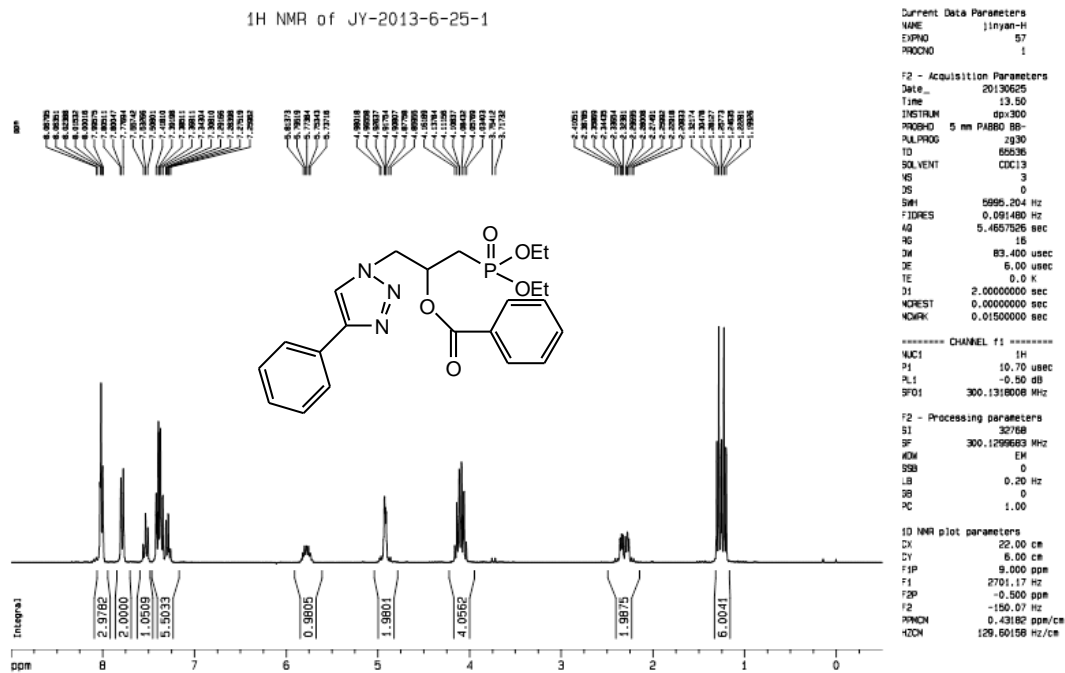


Figure S2. ¹³C-NMR spectrum of compound 5-A1.

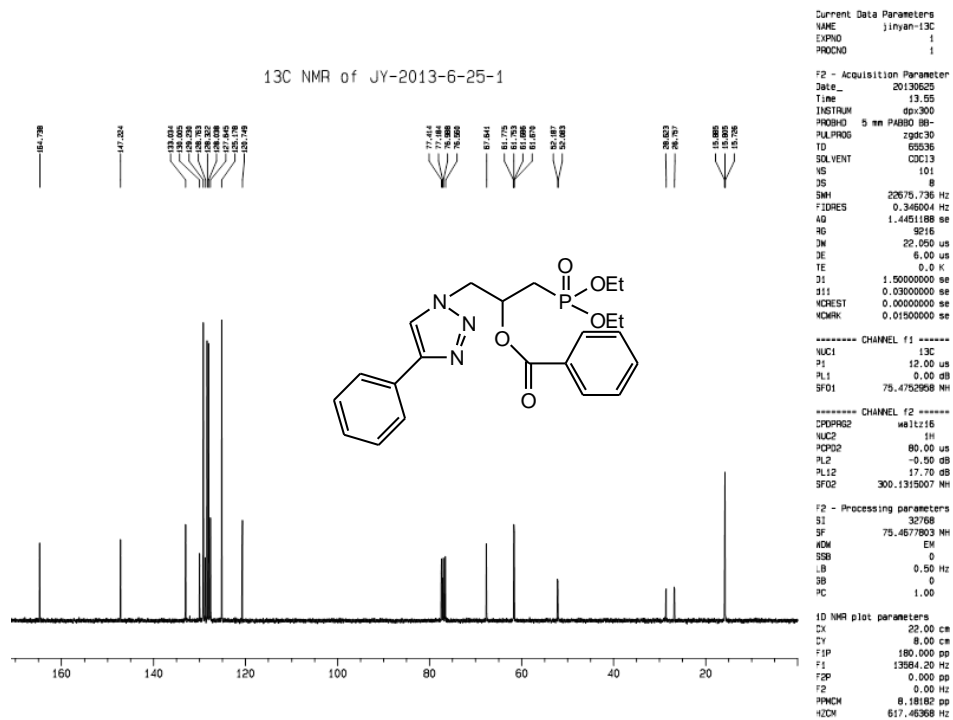


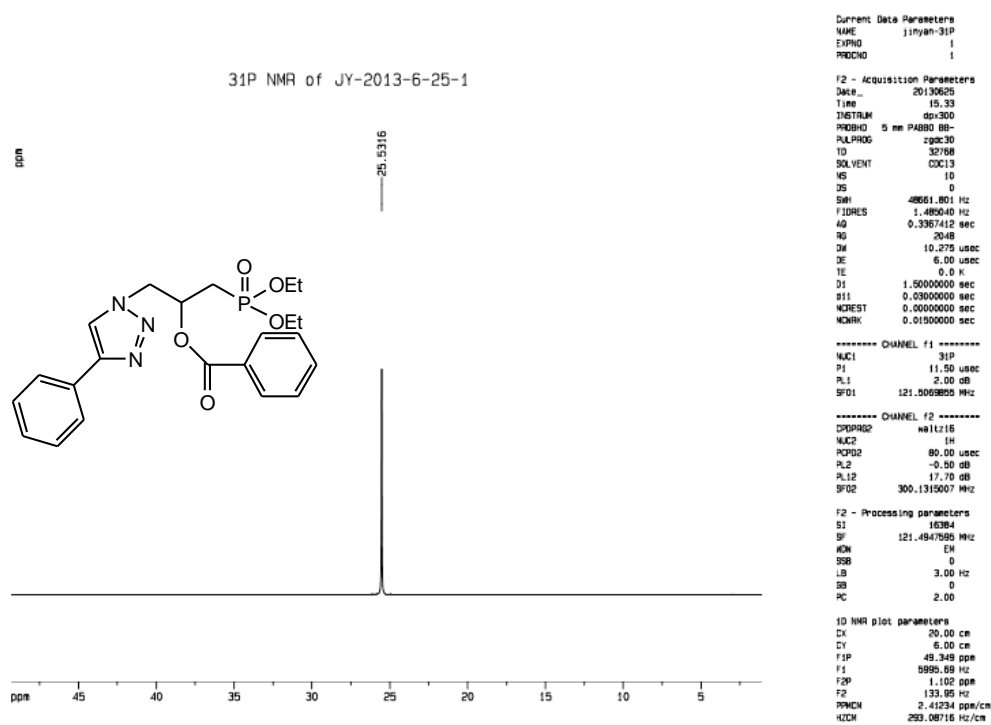
Figure S3. ^{31}P -NMR spectrum of compound 5-A1.

Figure S4. HRMS spectrum of compound 5-A1.

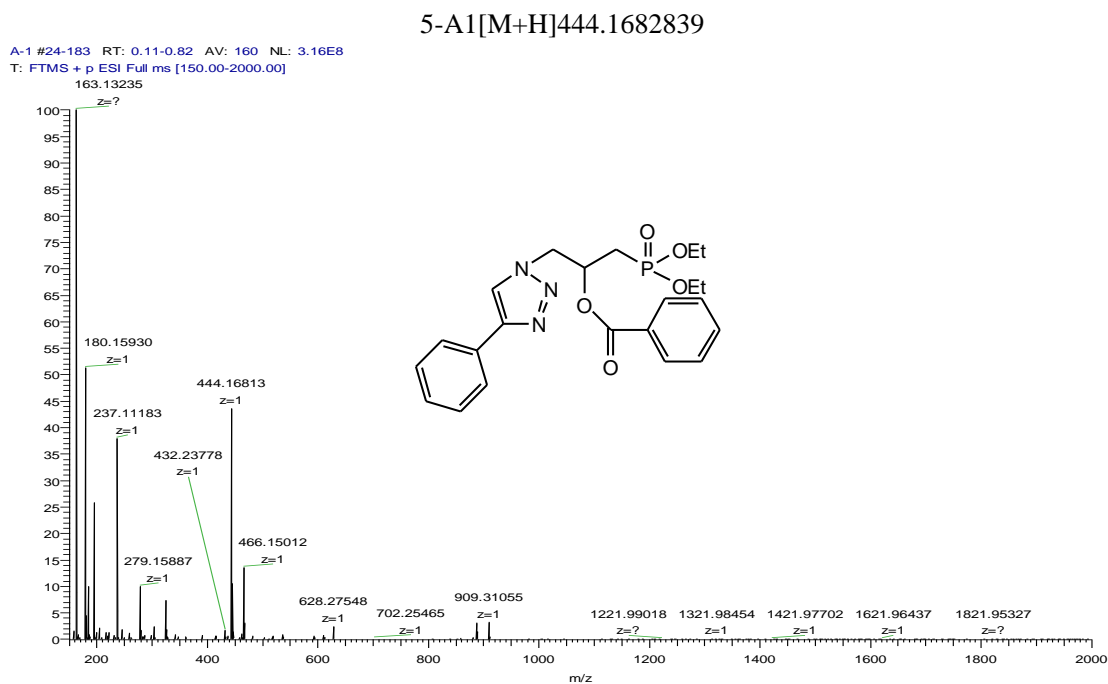


Figure S5. HRMS spectrum of compound 5-A1.

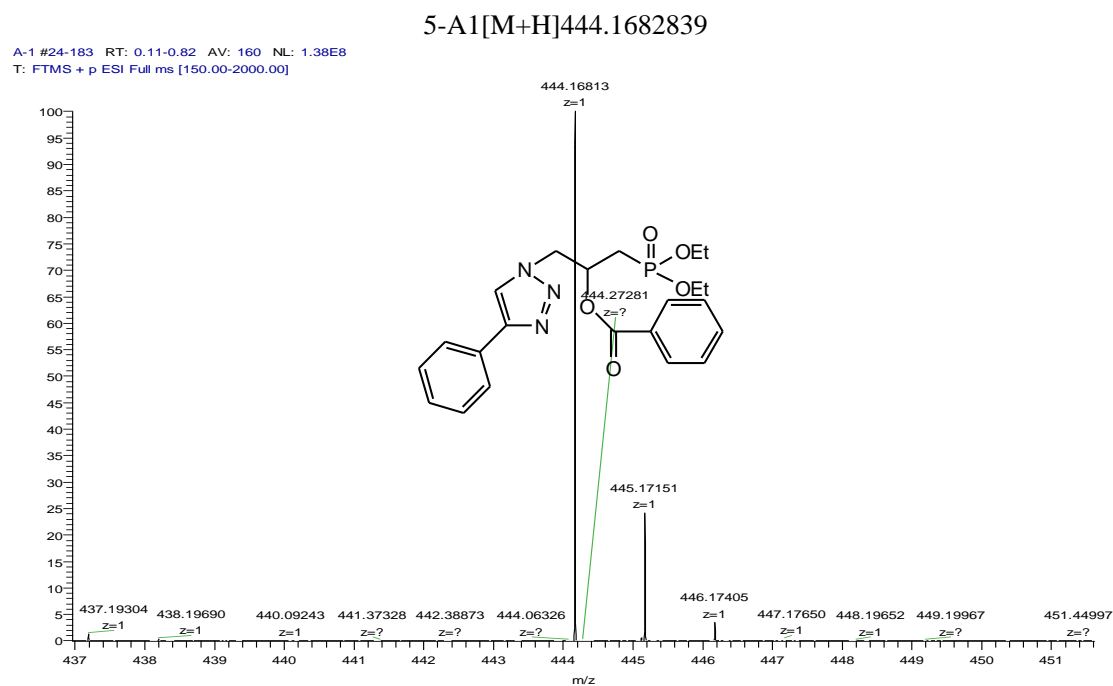
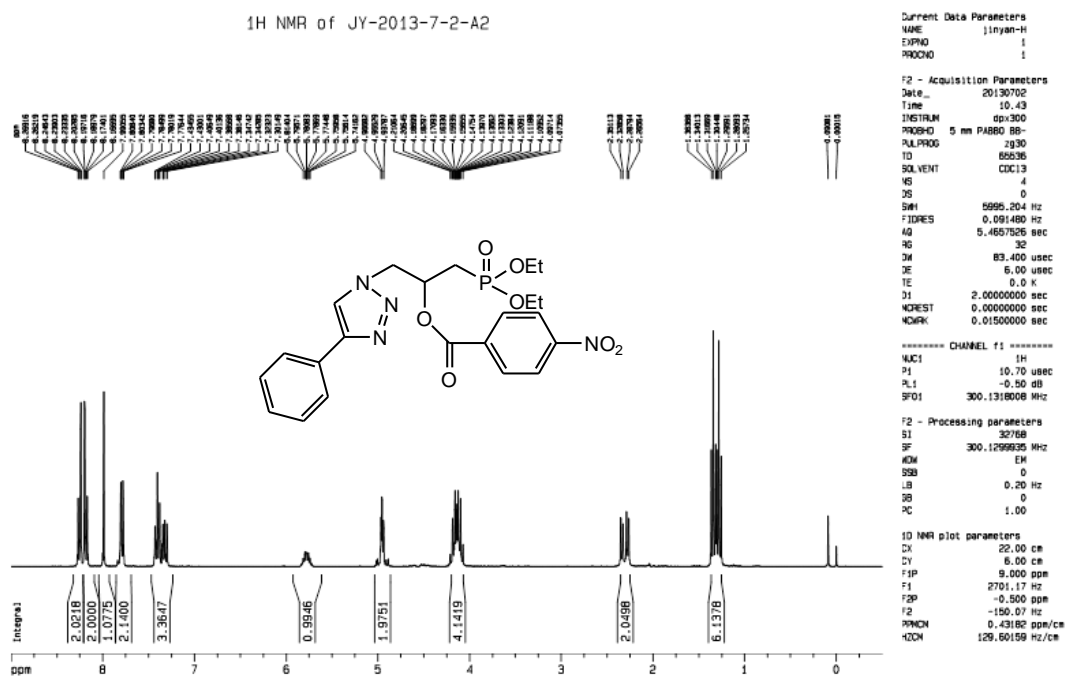
Figure S6. ¹H-NMR spectrum of compound 5-A2.

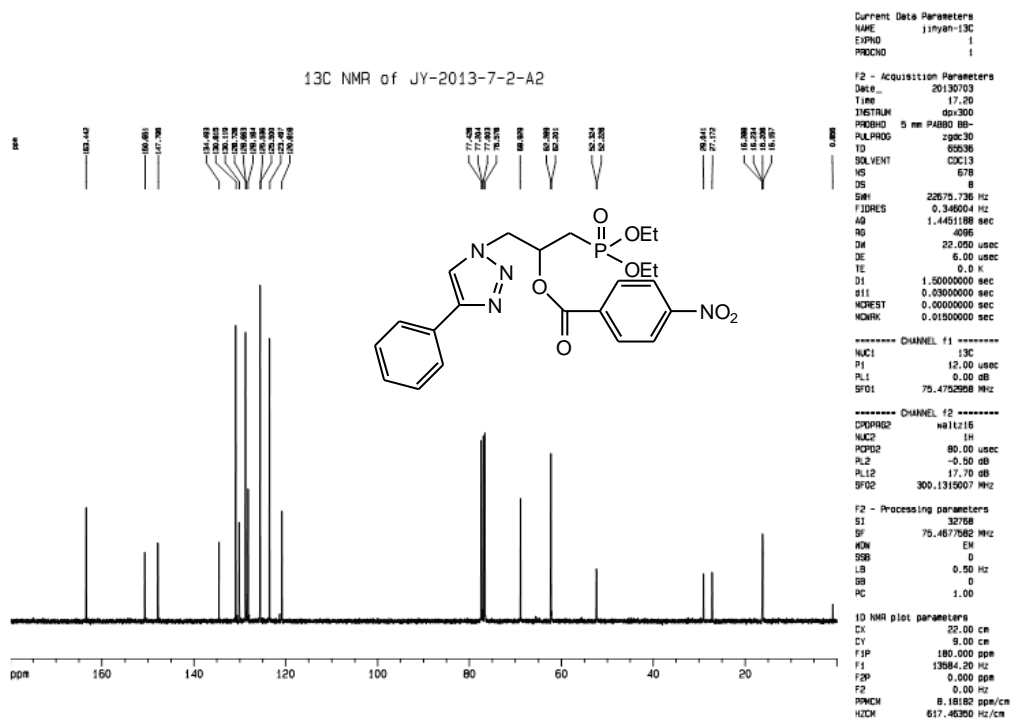
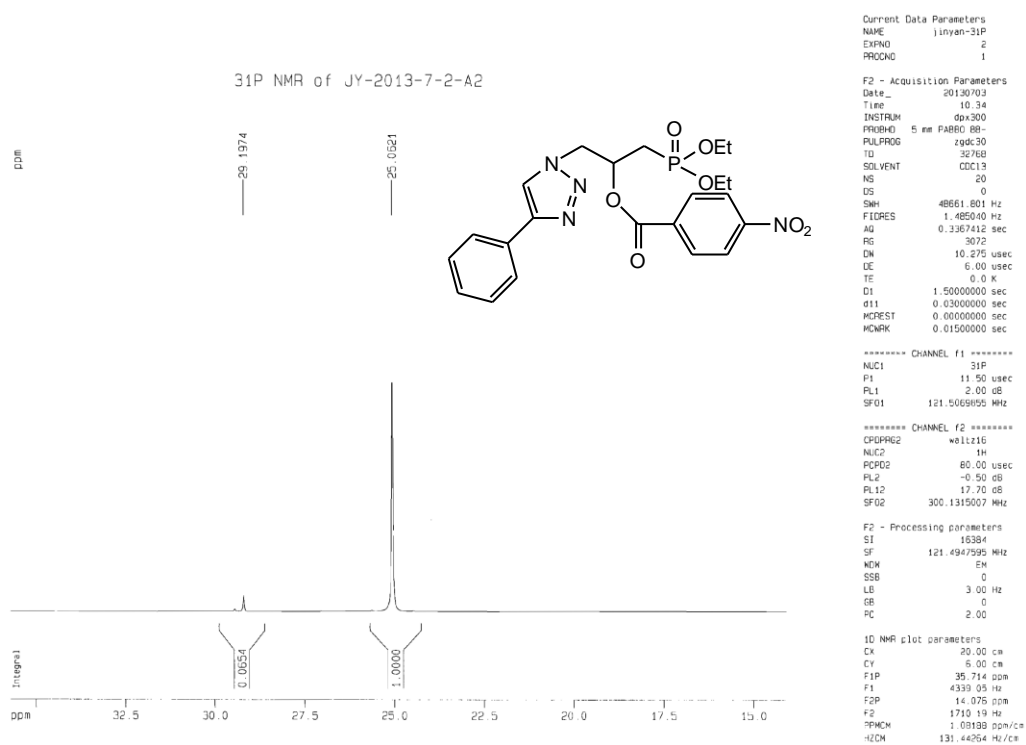
Figure S7. ^{13}C -NMR spectrum of compound 5-A2.Figure S8. ^{31}P -NMR spectrum of compound 5-A2.

Figure S9. HRMS spectrum of compound 5-A2.

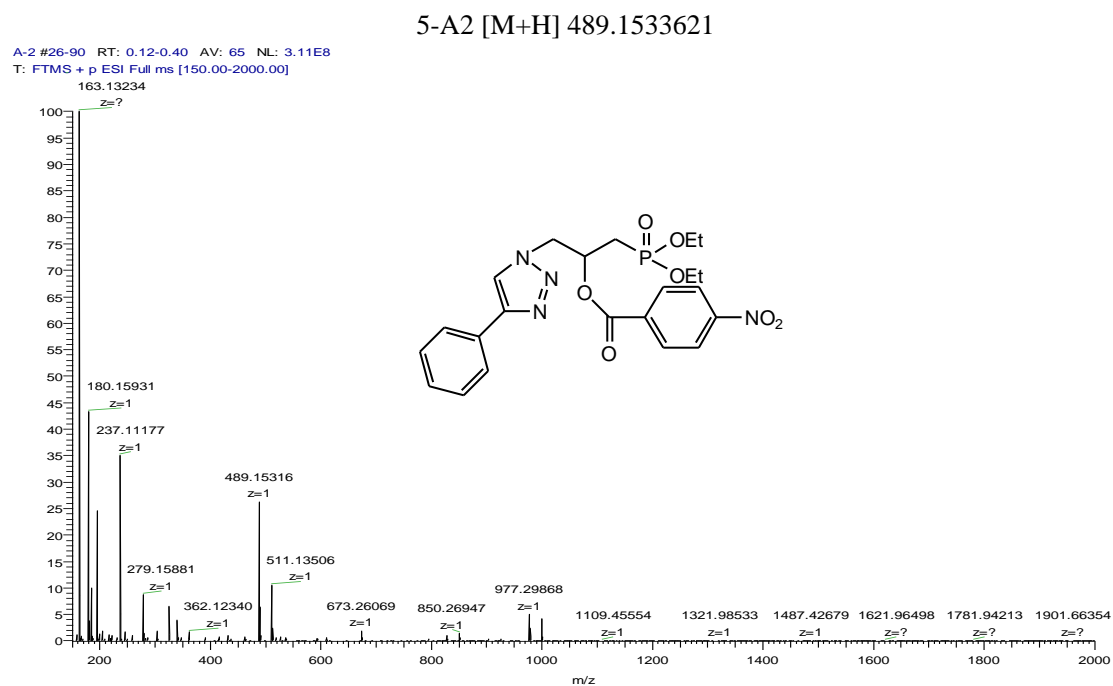


Figure S10. HRMS spectrum of compound 5-A2.

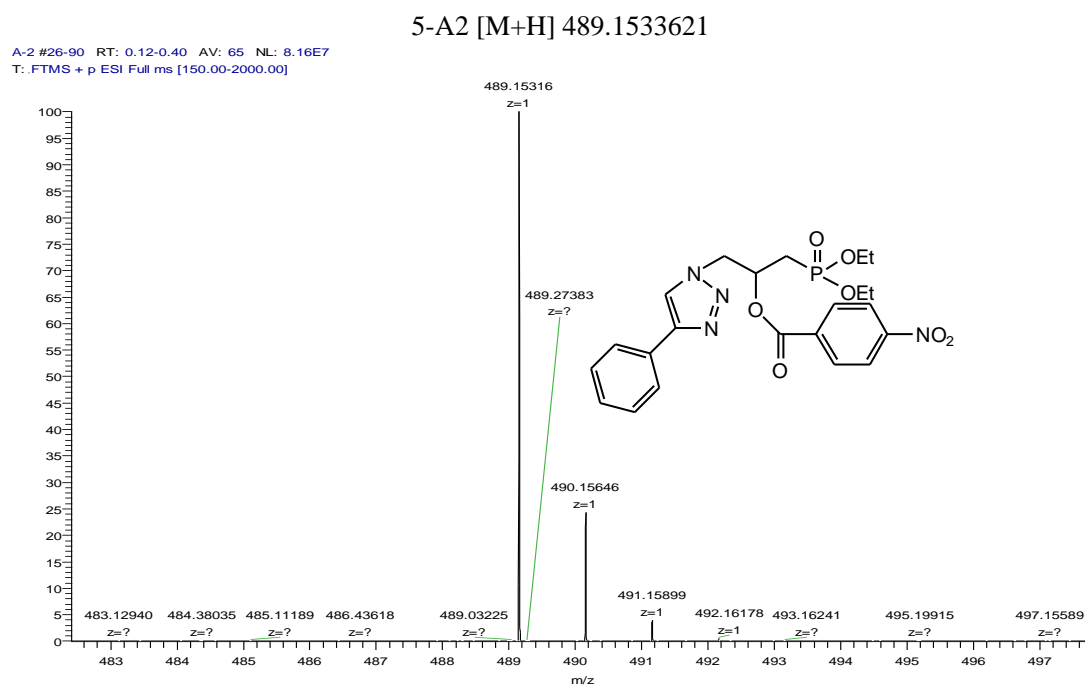


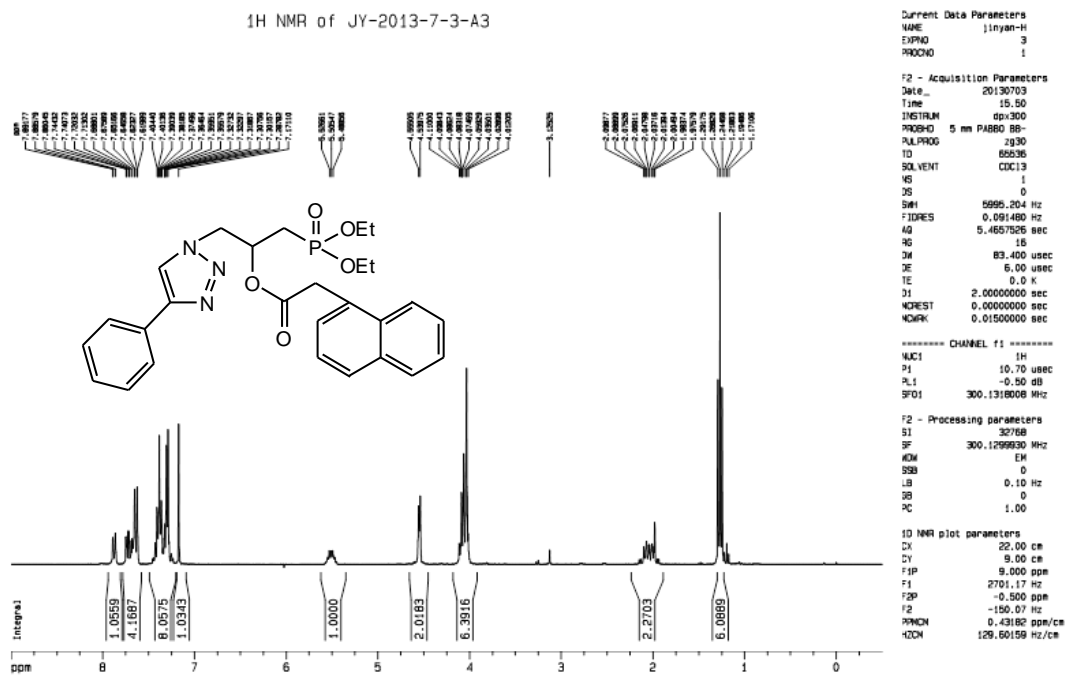
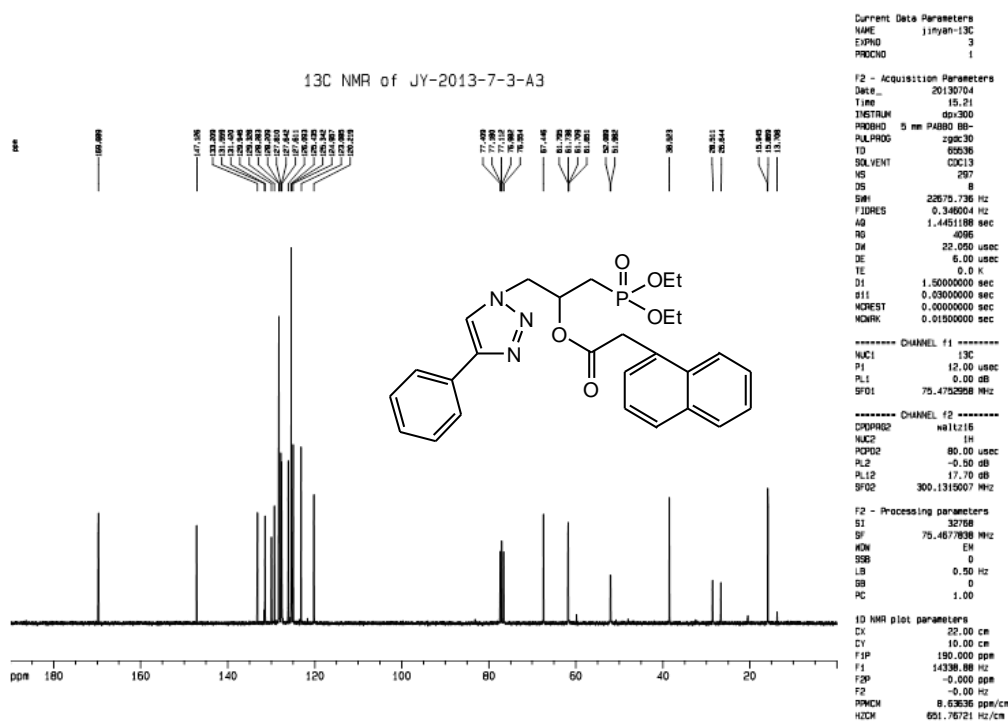
Figure S11. ¹H-NMR spectrum of compound 5-A3.Figure S12. ¹³C-NMR spectrum of compound 5-A3.

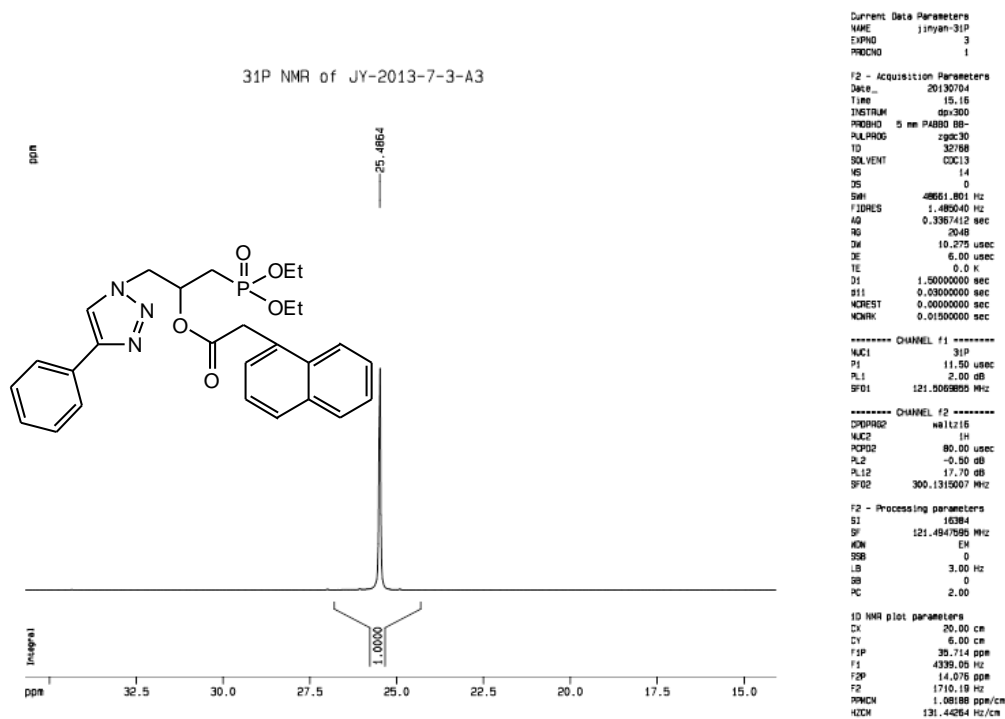
Figure S13. ^{31}P -NMR spectrum of compound 5-A3.

Figure S14. HRMS spectrum of compound 5-A3.

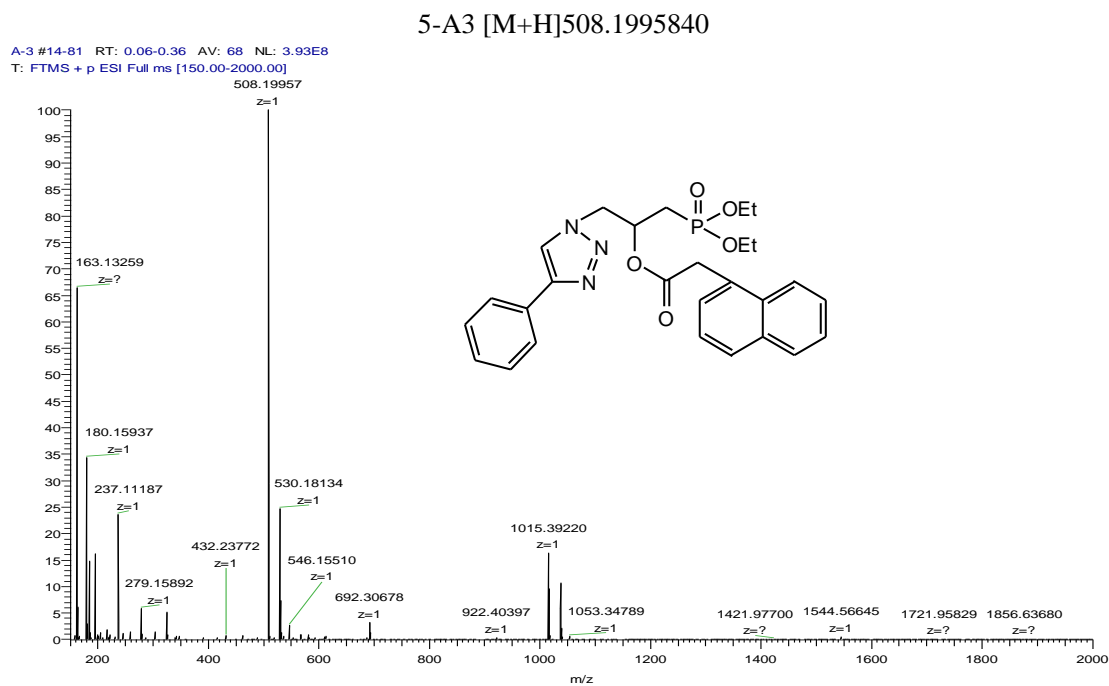


Figure S15. HRMS spectrum of compound 5-A3.

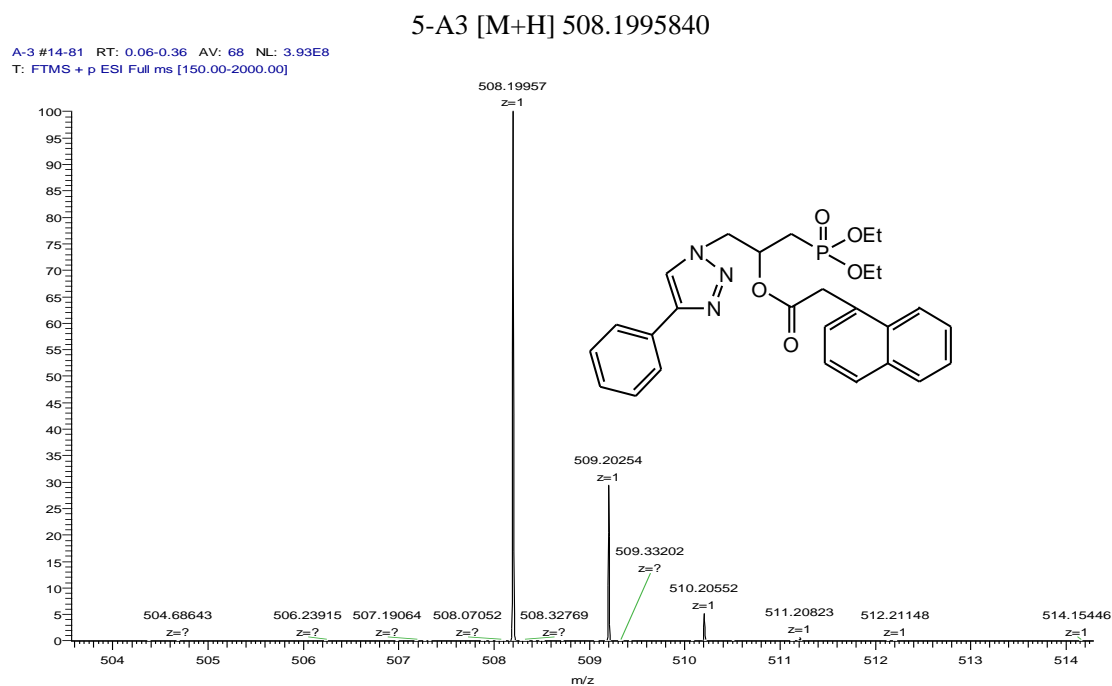
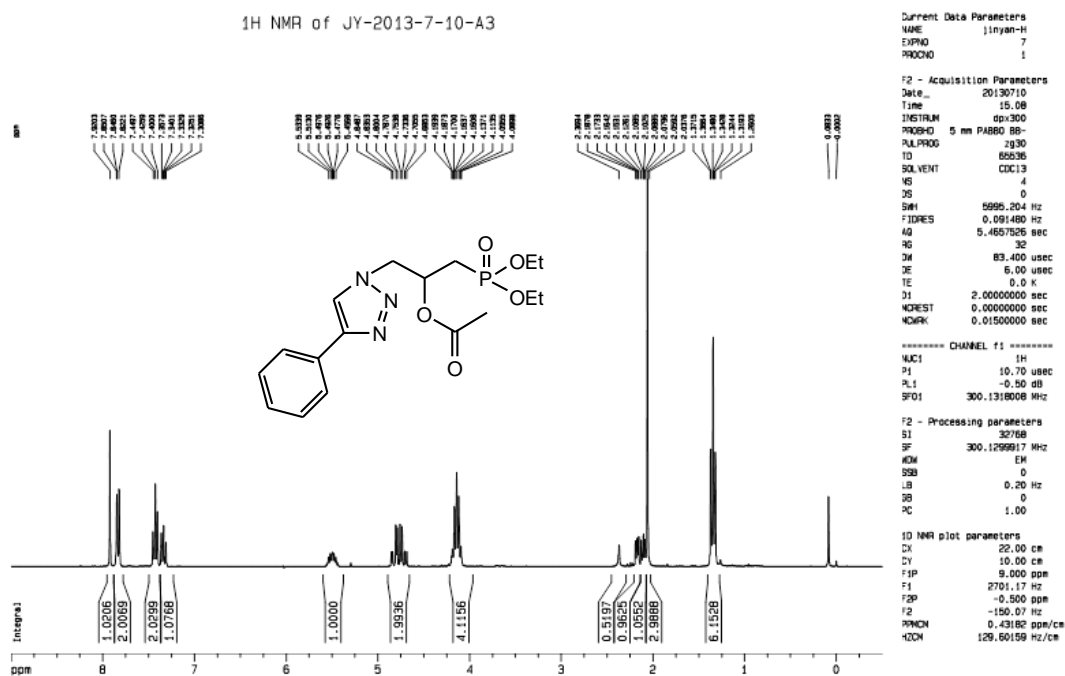
Figure S16. ¹H-NMR spectrum of compound 5-A4.

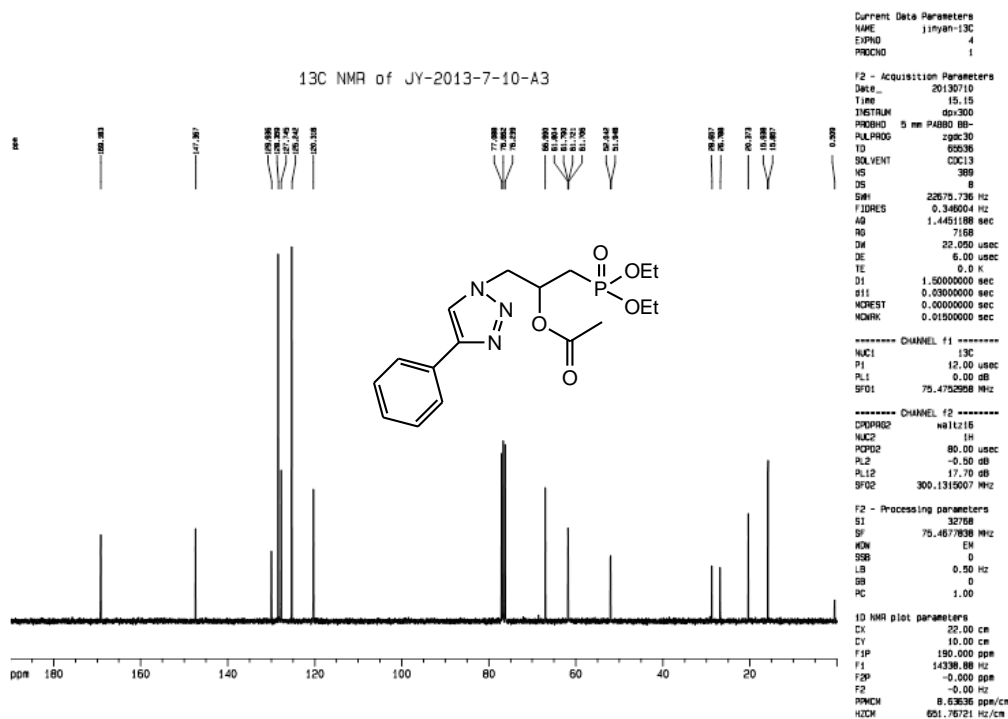
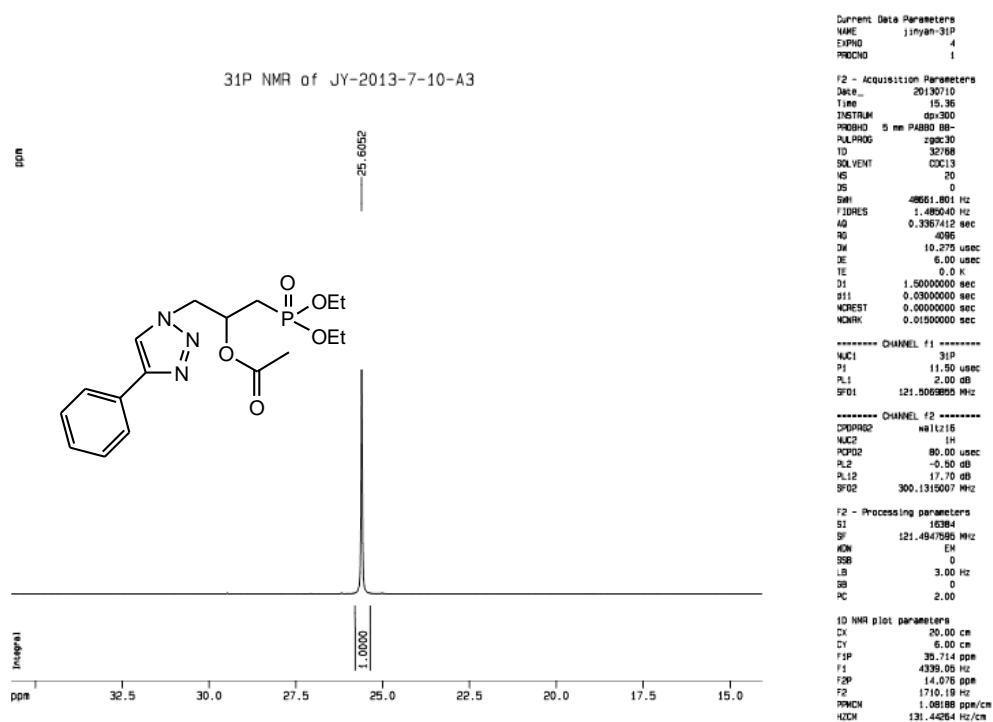
Figure S17. ^{13}C -NMR spectrum of compound 5-A4.Figure S18. ^{31}P -NMR spectrum of compound 5-A4.

Figure S19. HRMS spectrum of compound 5-A4.

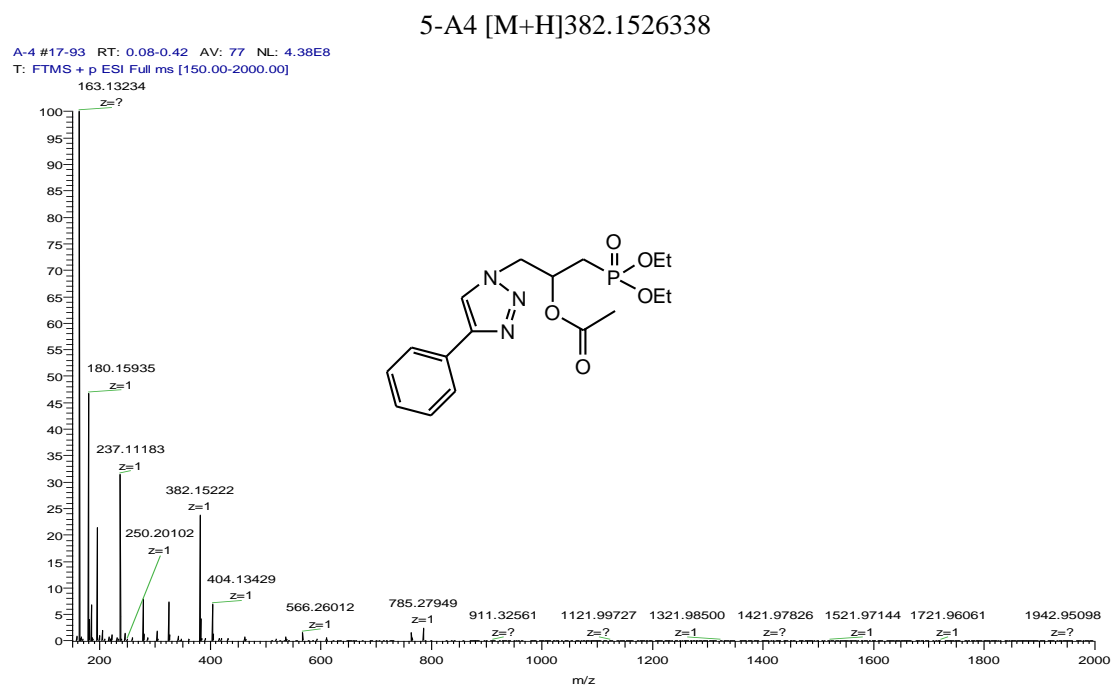


Figure S20. HRMS spectrum of compound 5-A4.

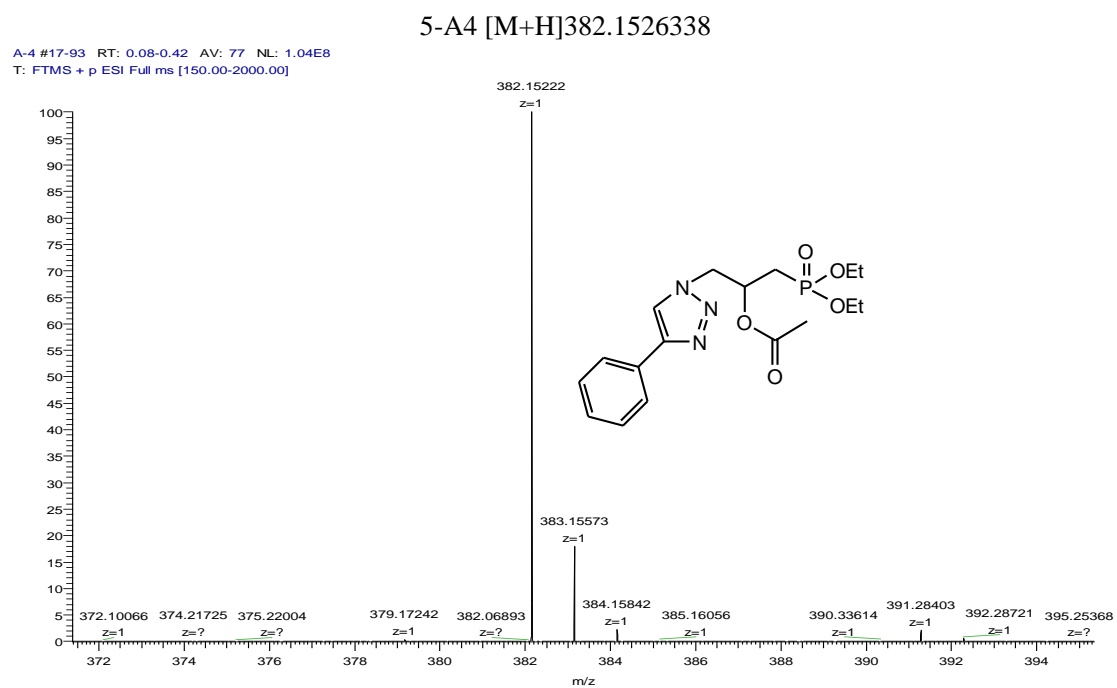


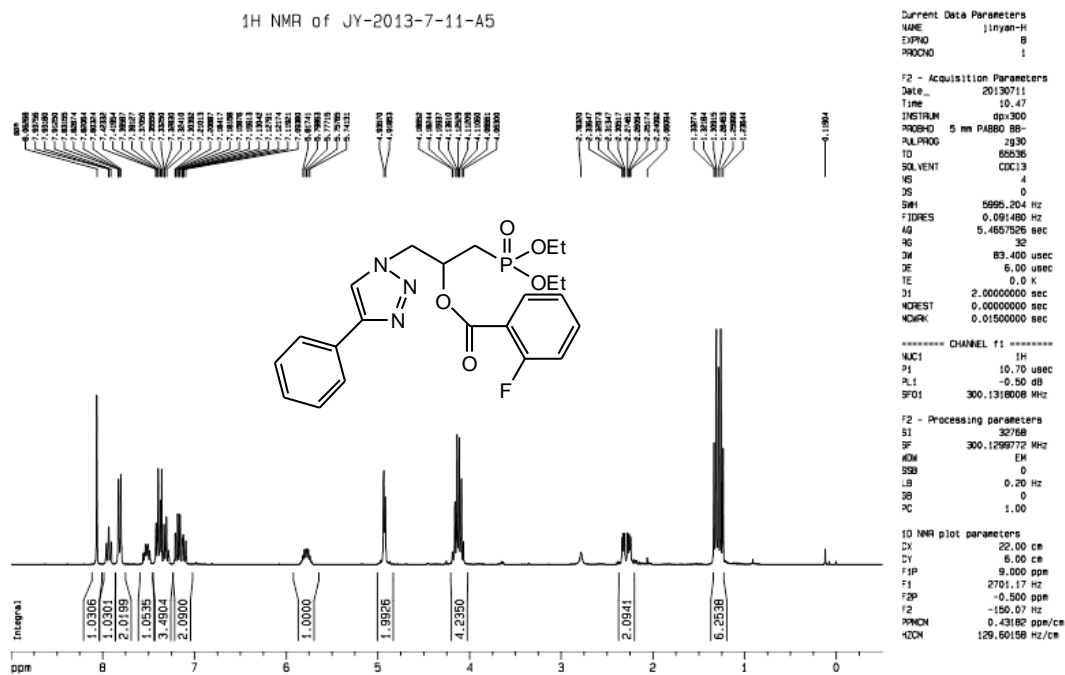
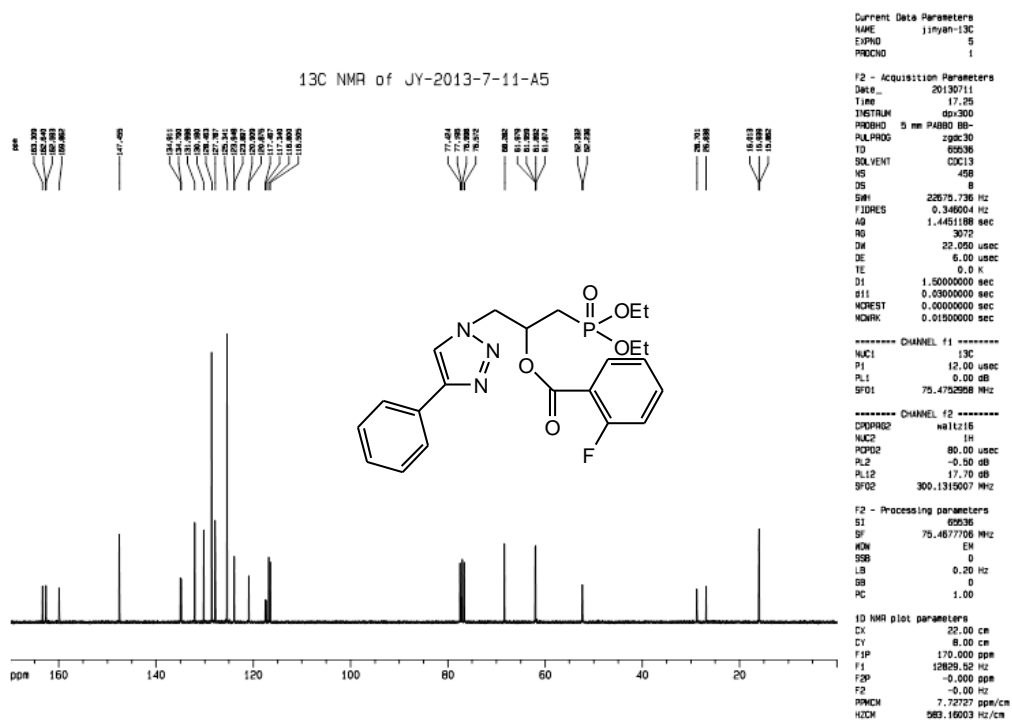
Figure S21. ¹H-NMR spectrum of compound 5-A5.Figure S22. ¹³C-NMR spectrum of compound 5-A5.

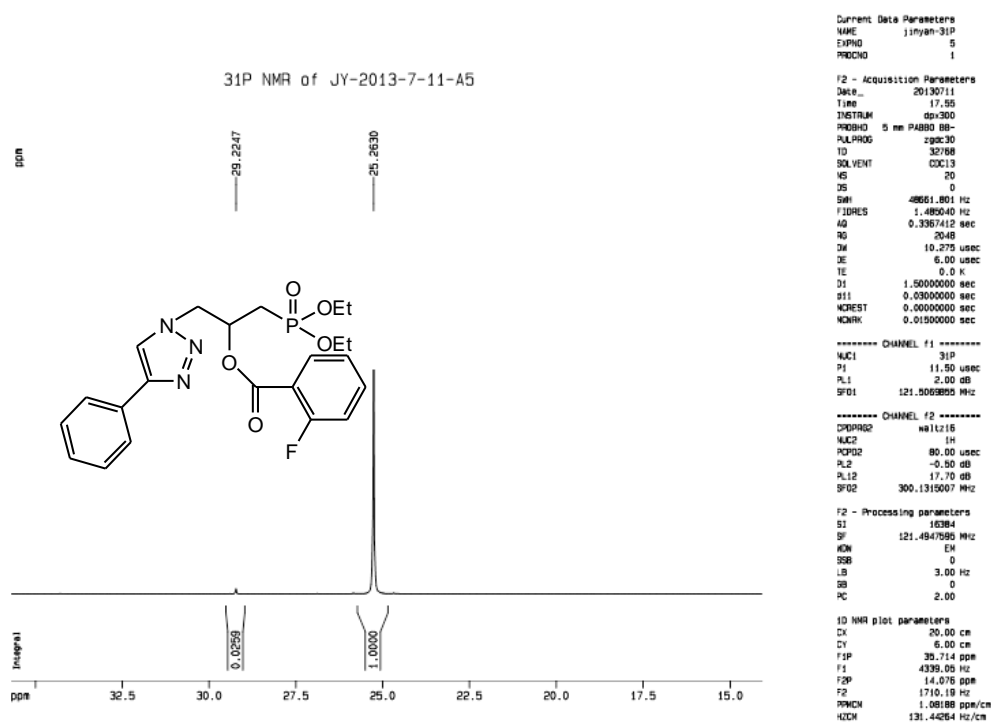
Figure S23. ³¹P-NMR spectrum of compound 5-A5.

Figure S24. HRMS spectrum of compound 5-A5.

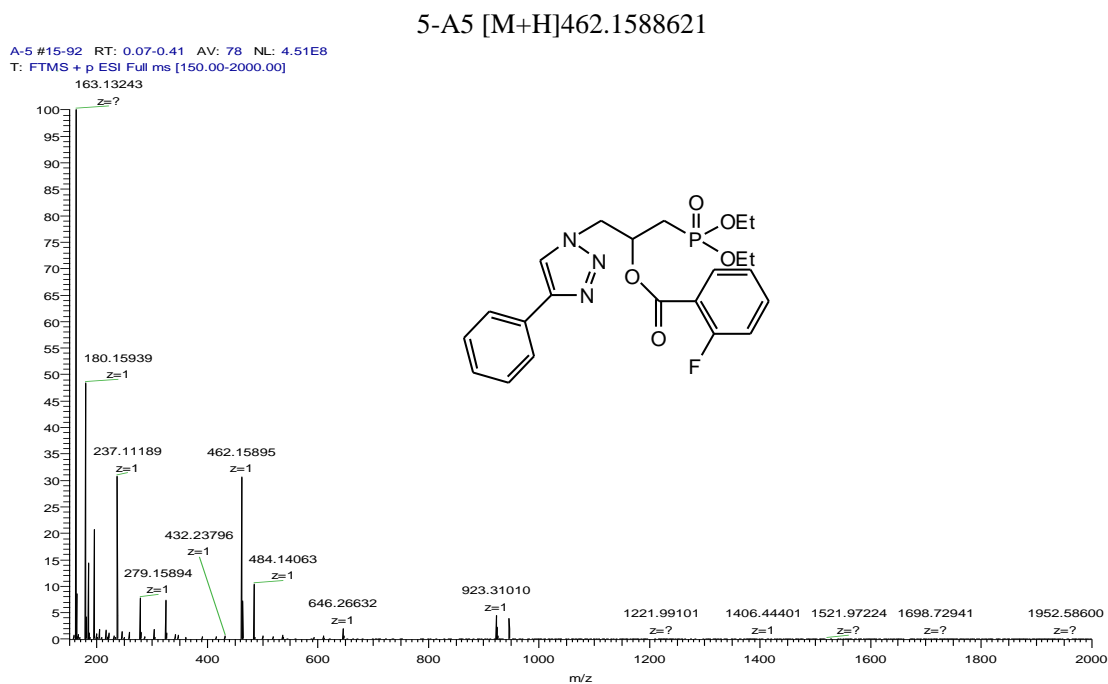


Figure S25. HRMS spectrum of compound 5-A5.

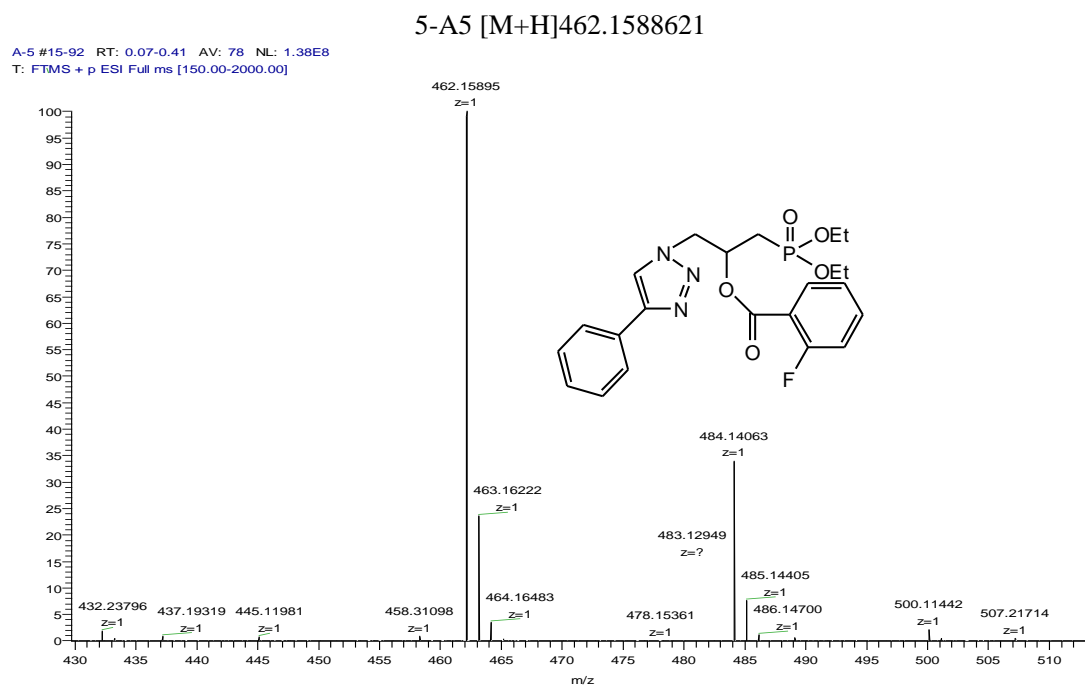
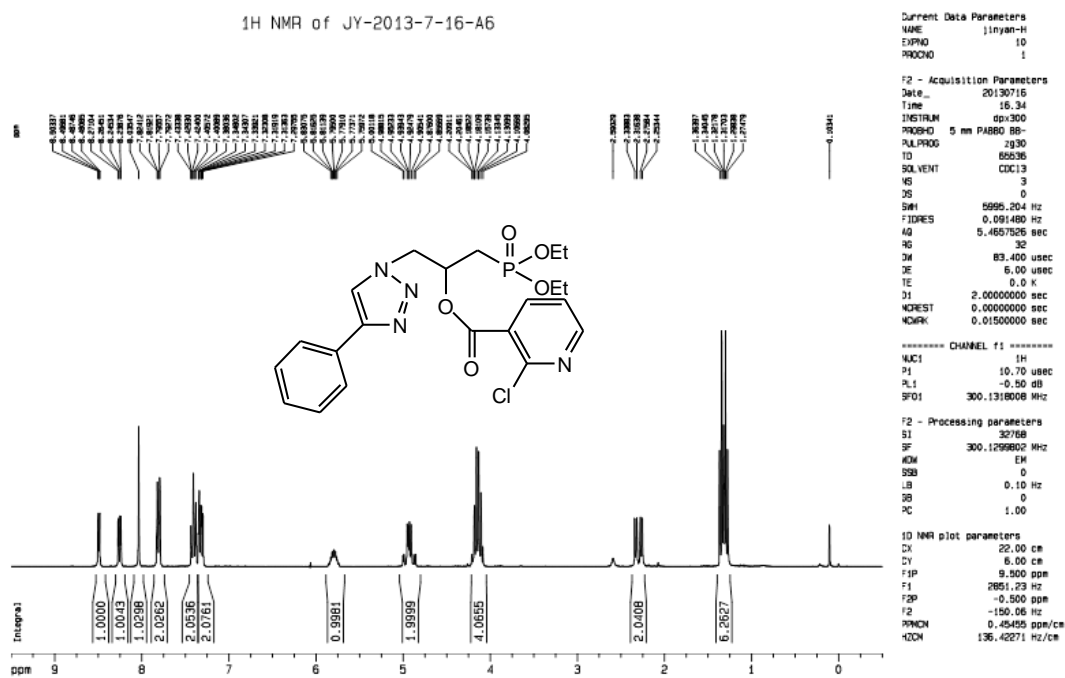
Figure S26. ¹H-NMR spectrum of compound 5-A6.

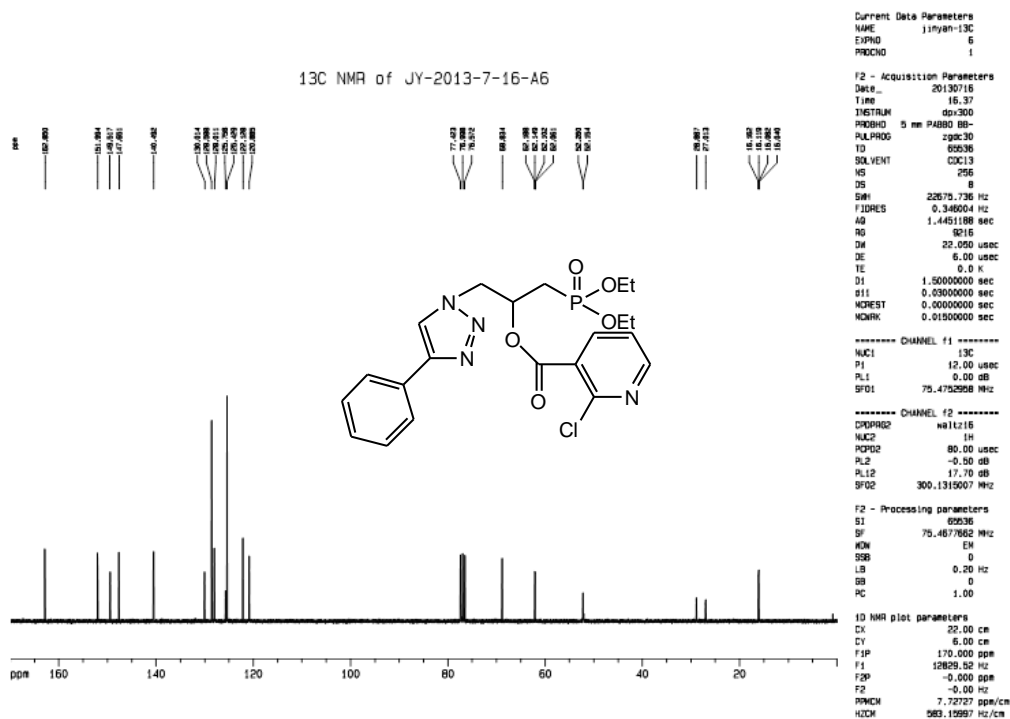
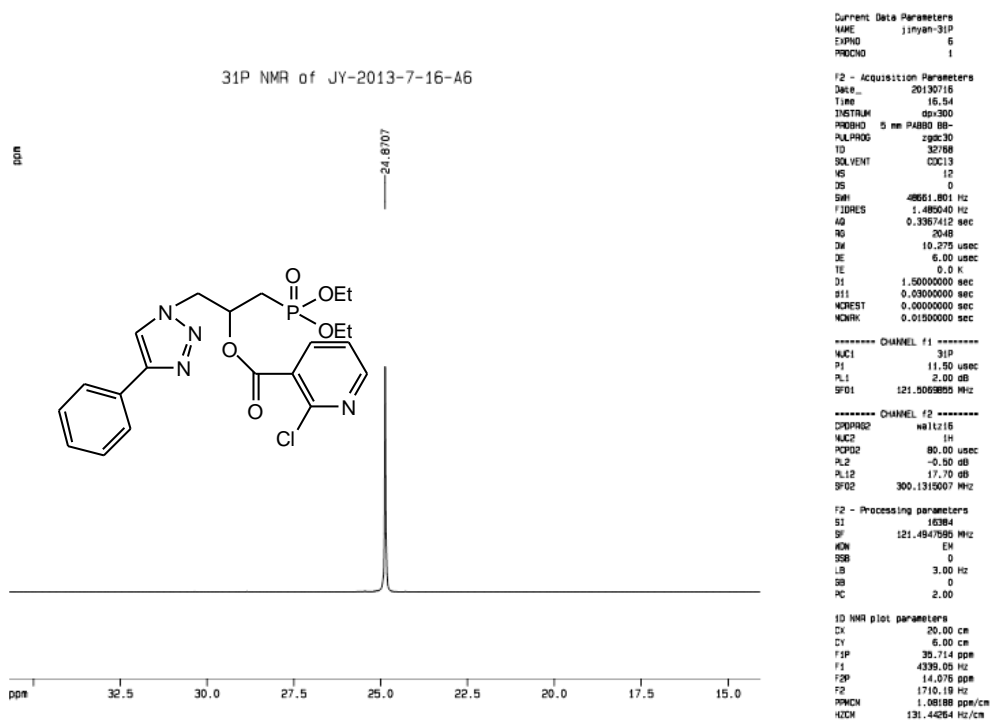
Figure S27. ^{13}C -NMR spectrum of compound 5-A6.Figure S28. ^{31}P -NMR spectrum of compound 5-A6.

Figure S29. HRMS spectrum of compound 5-A6.

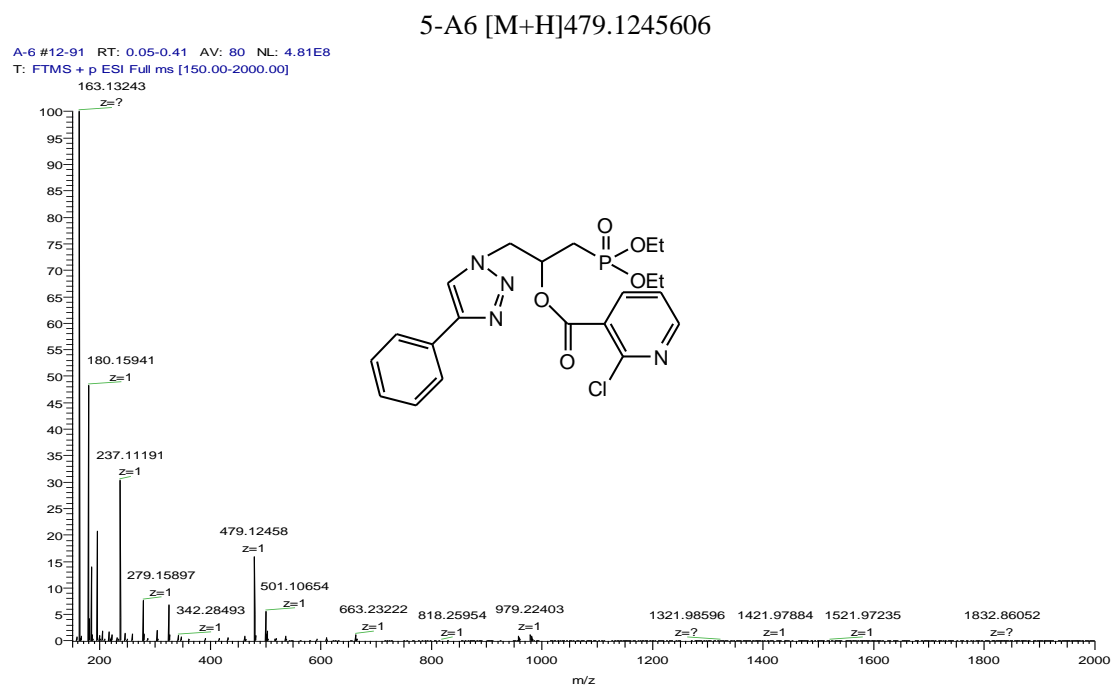


Figure S30. HRMS spectrum of compound 5-A6.

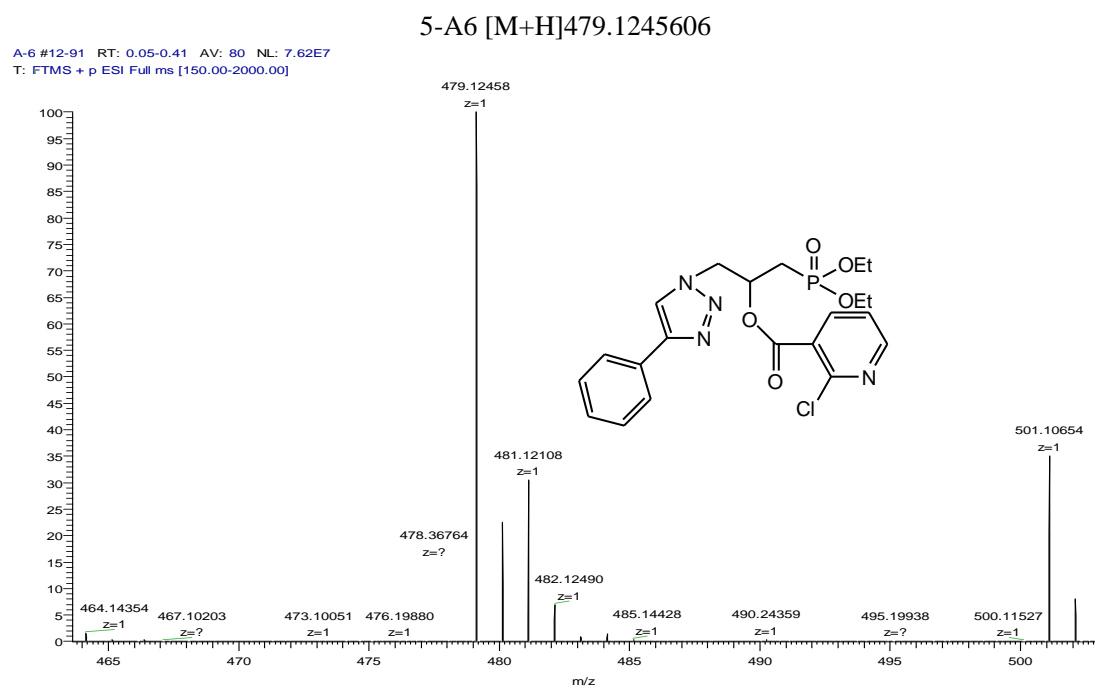


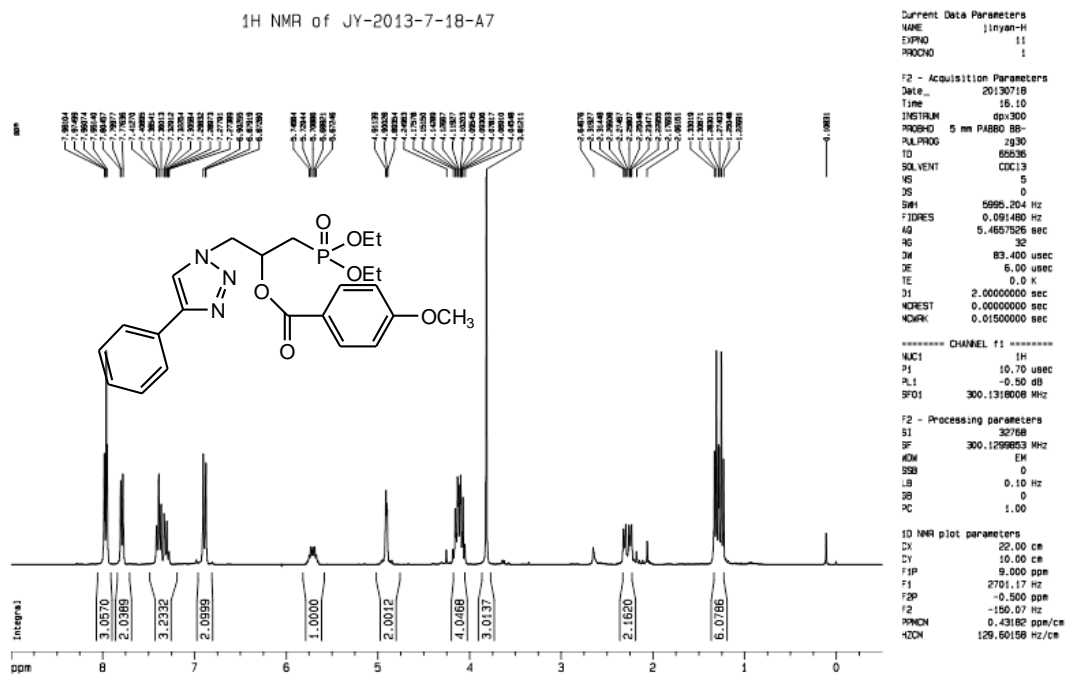
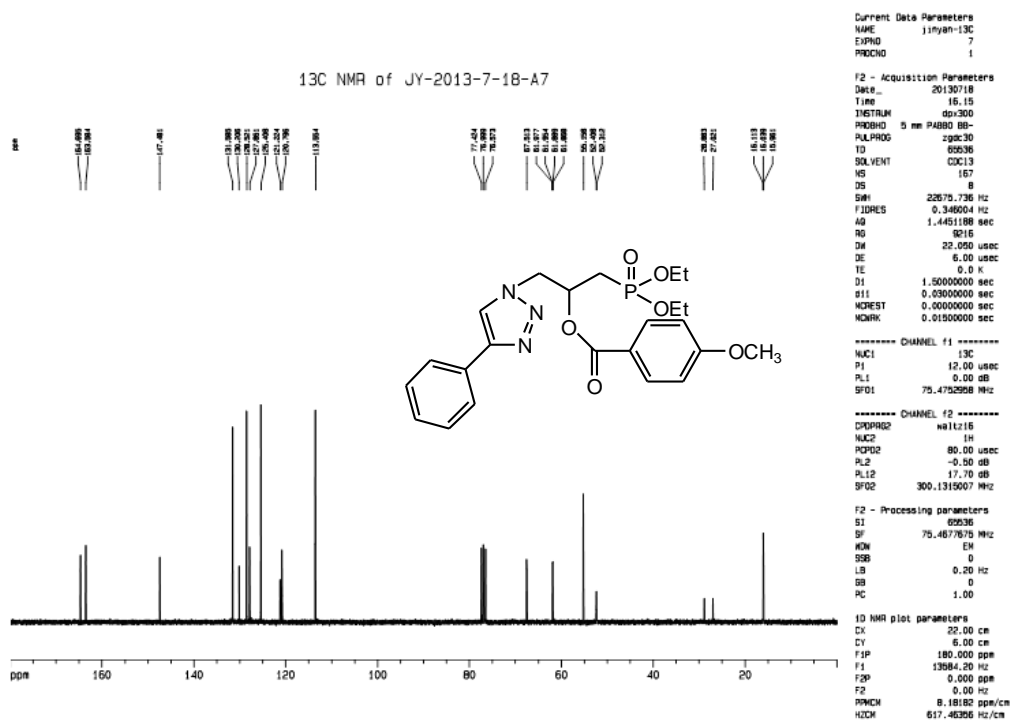
Figure S31. ¹H-NMR spectrum of compound 5-A7.Figure S32. ¹³C-NMR spectrum of compound 5-A7.

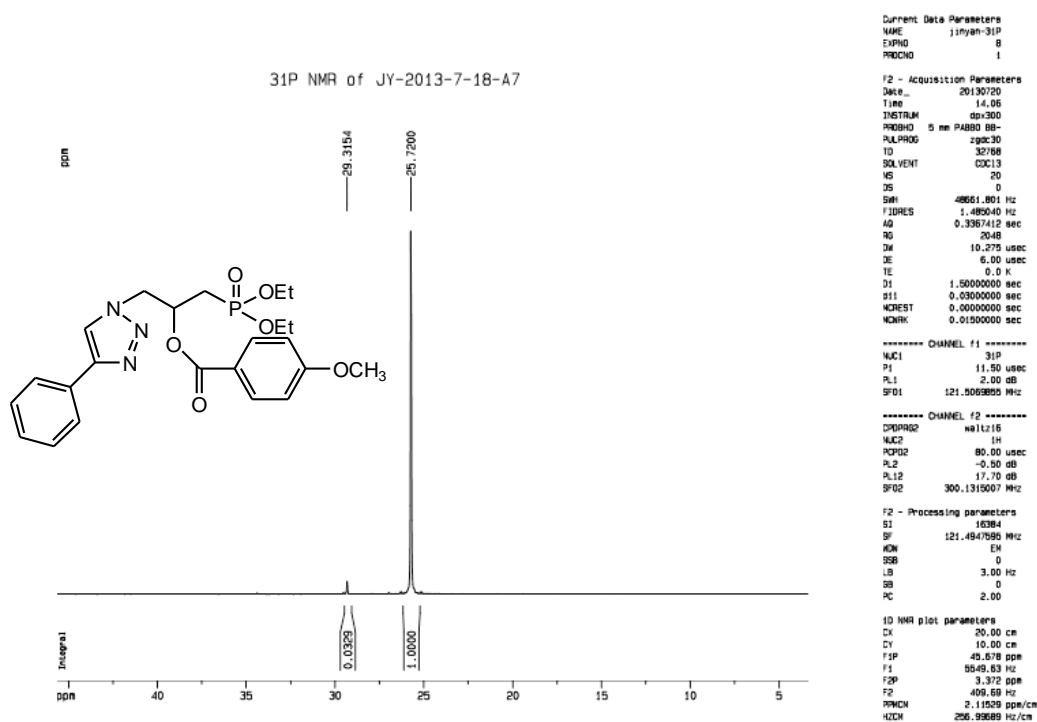
Figure S33. ^{31}P -NMR spectrum of compound 5-A7.

Figure S34. HRMS spectrum of compound 5-A7.

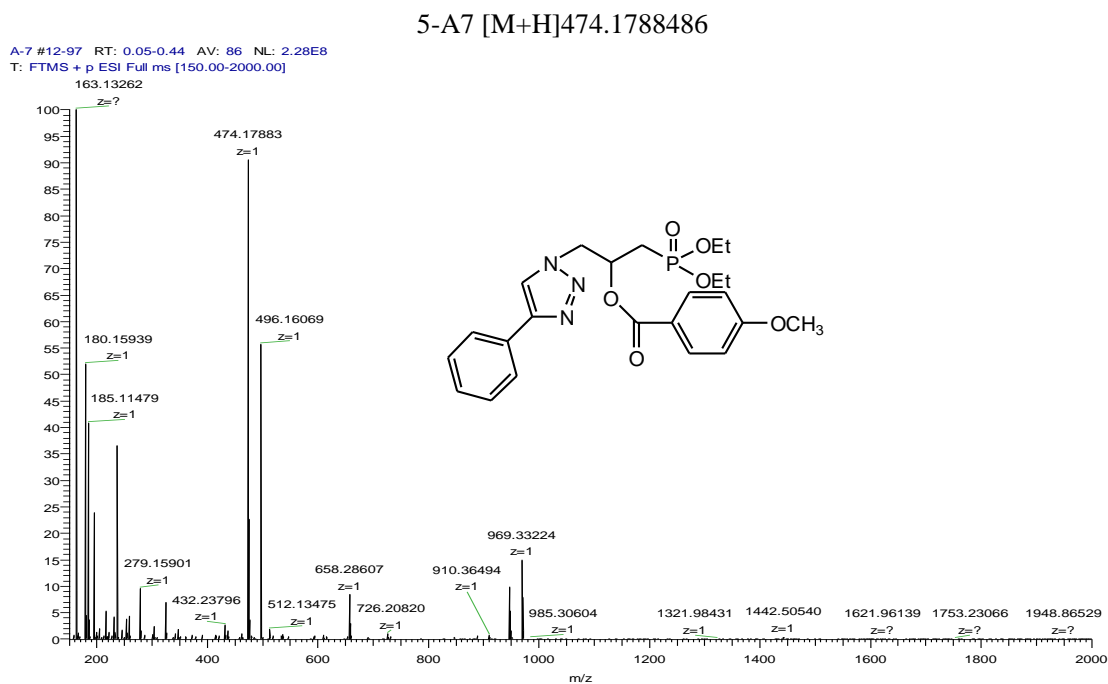


Figure S35. HRMS spectrum of compound 5-A7.

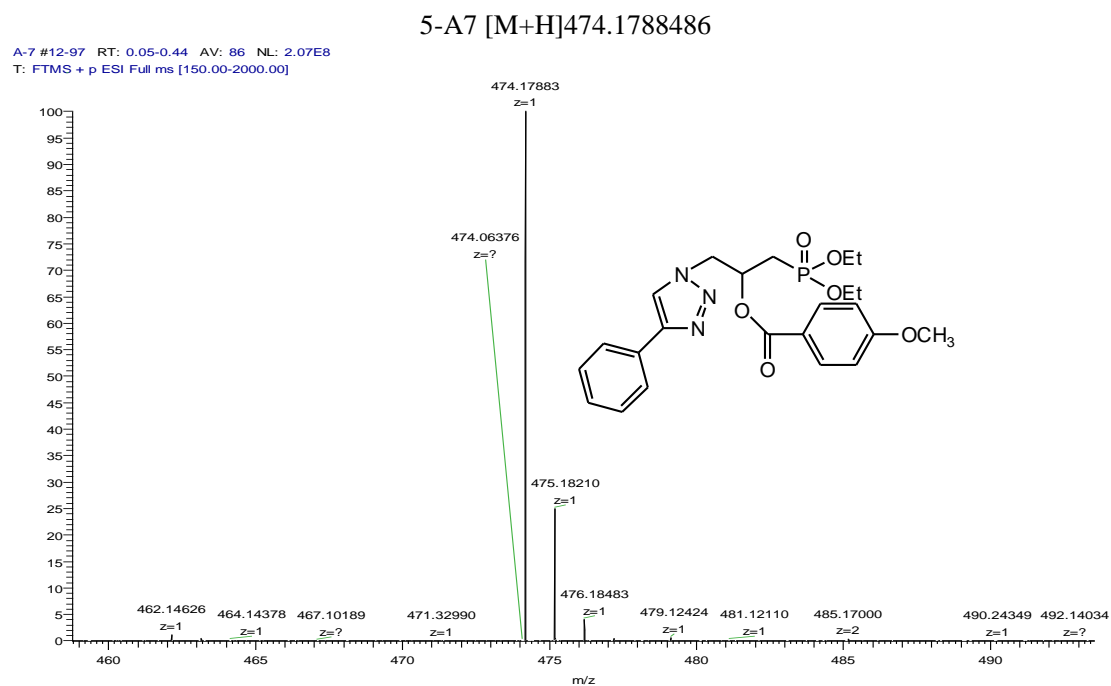
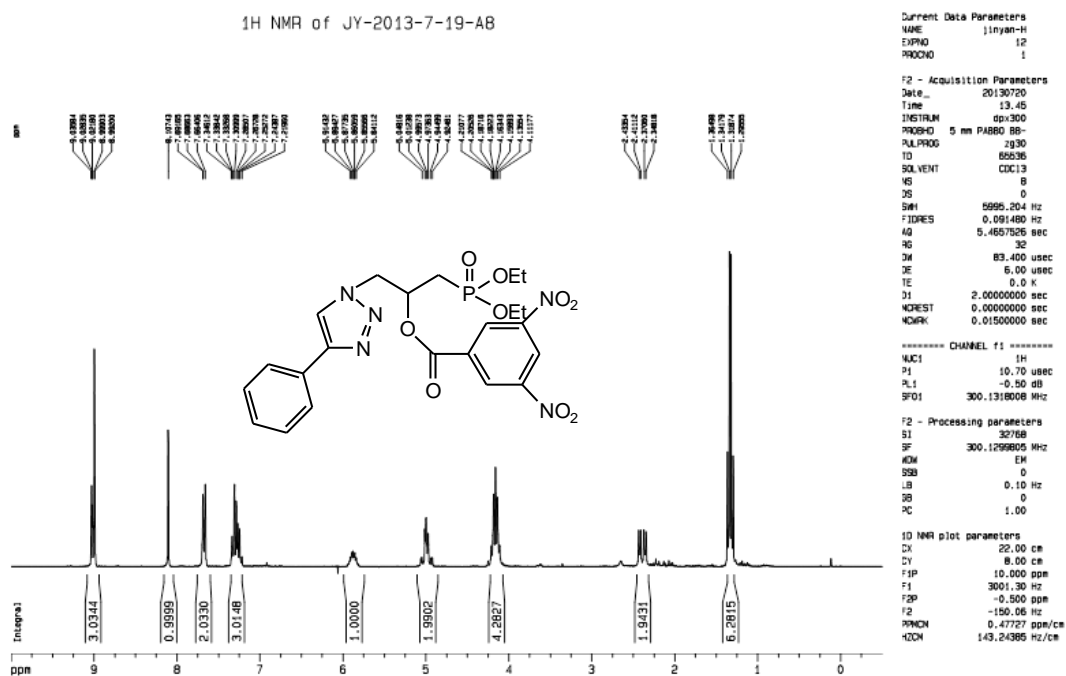
Figure S36. ¹H-NMR spectrum of compound 5-A8.

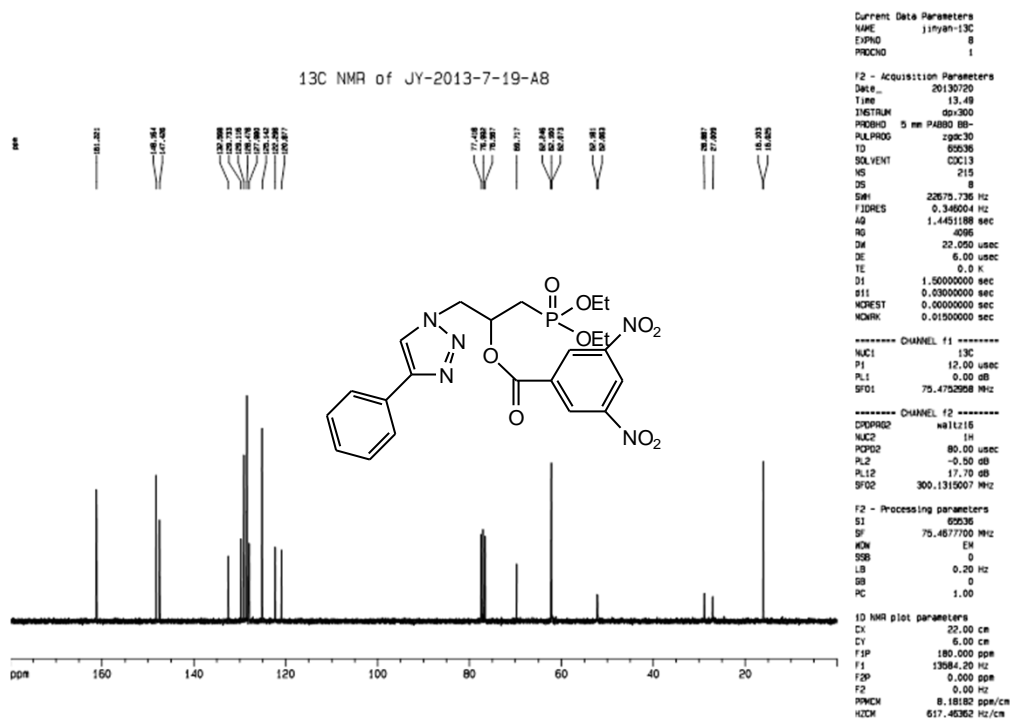
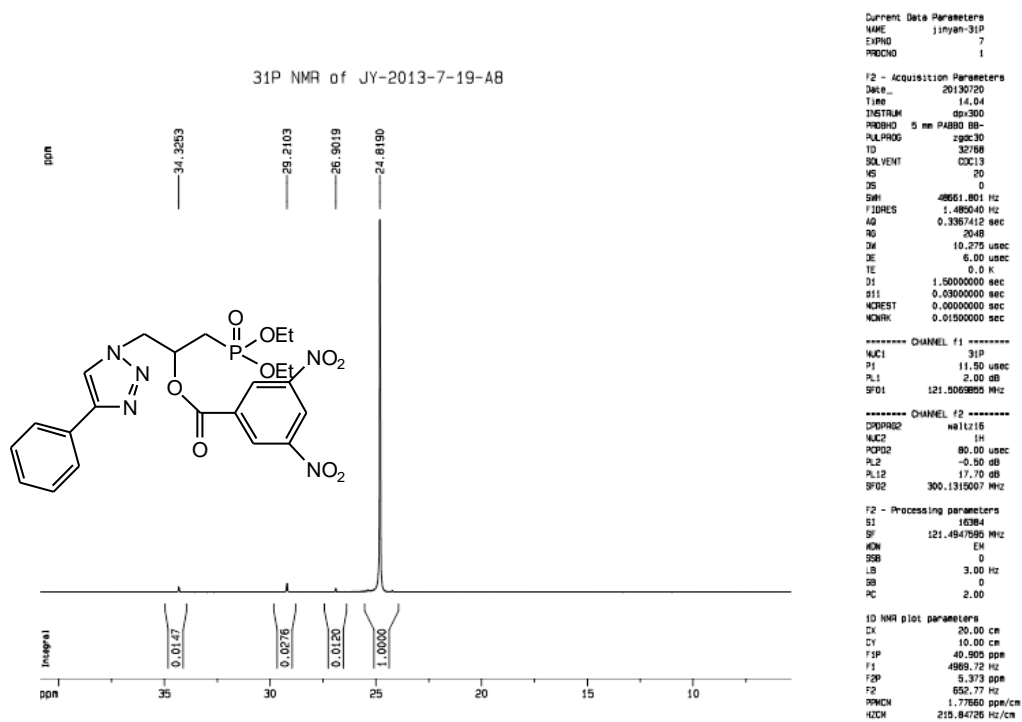
Figure S37. ^{13}C -NMR spectrum of compound 5-A8.Figure S38. ^{31}P -NMR spectrum of compound 5-A8.

Figure S39. HRMS spectrum of compound 5-A8

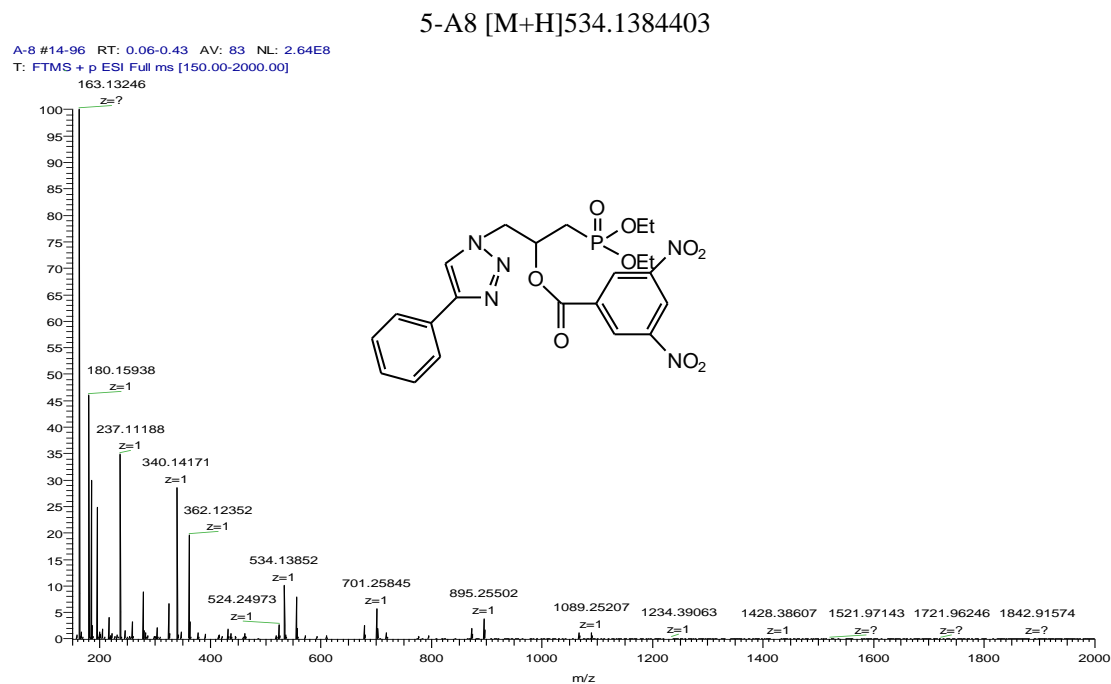


Figure S40. HRMS spectrum of compound 5-A8

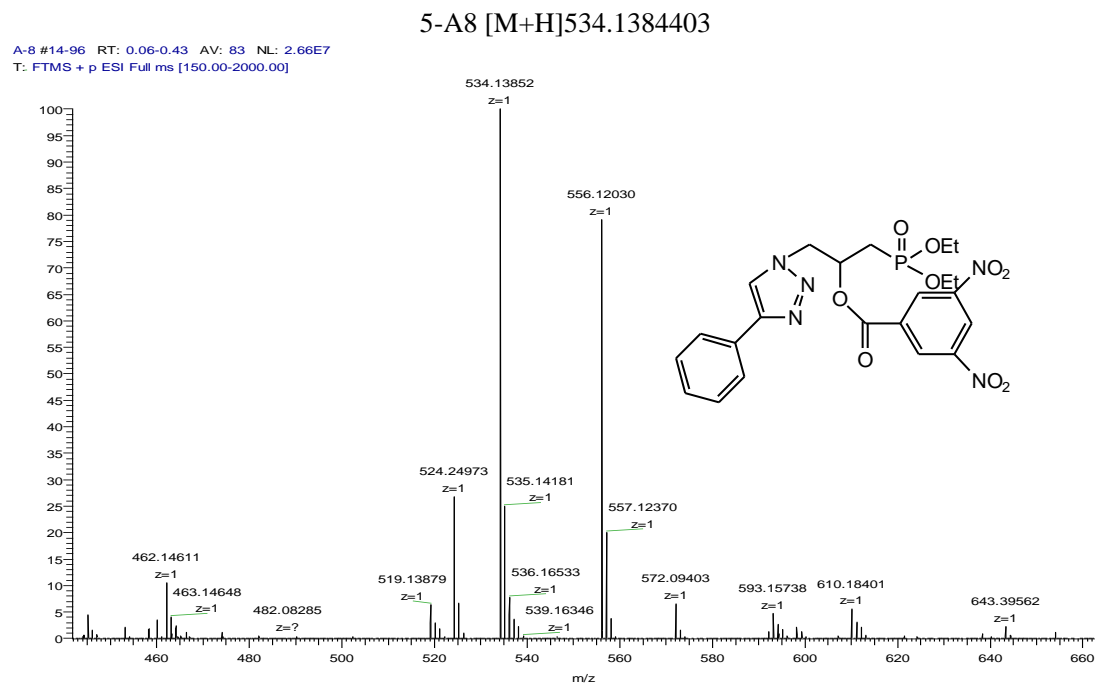


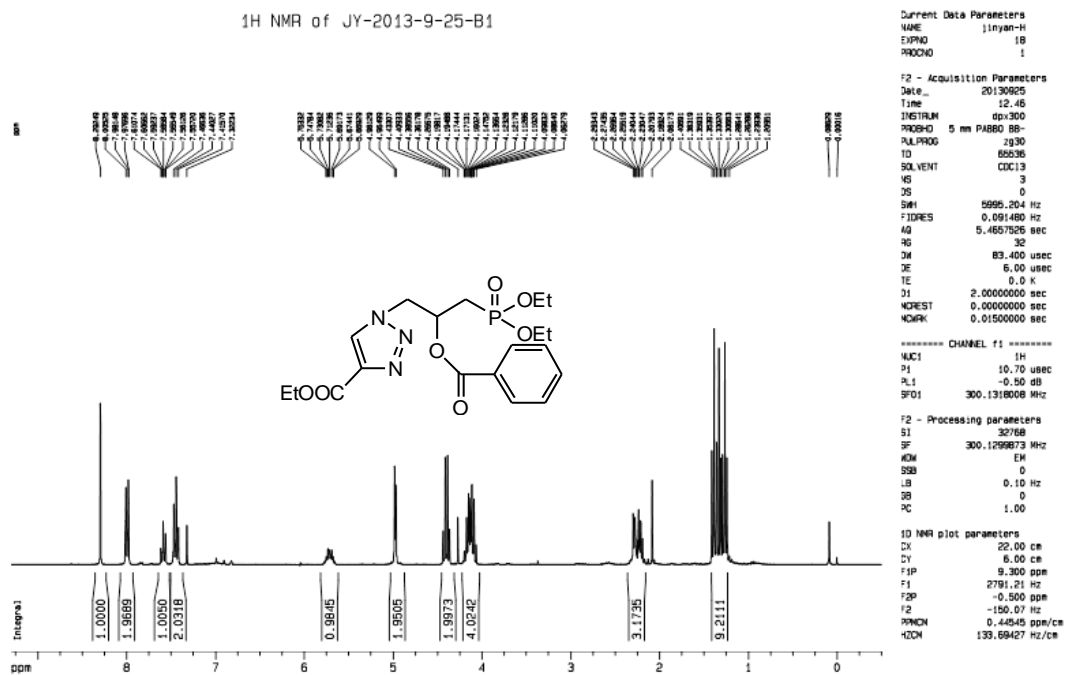
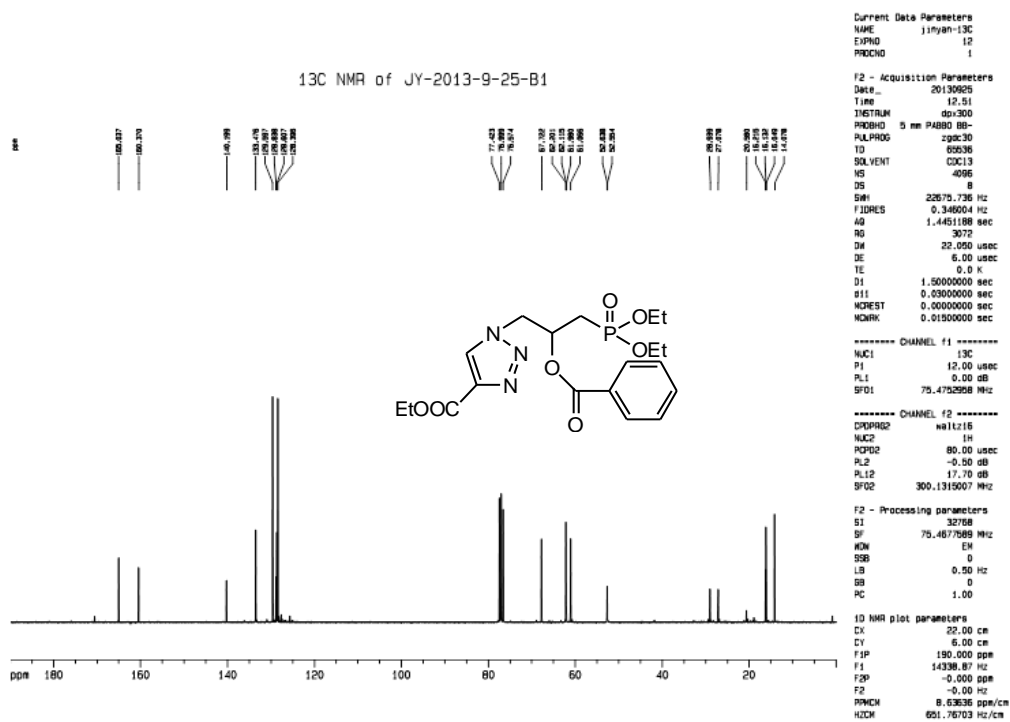
Figure S41. ¹H-NMR spectrum of compound 5-B1.Figure S42. ¹³C-NMR spectrum of compound 5-B1.

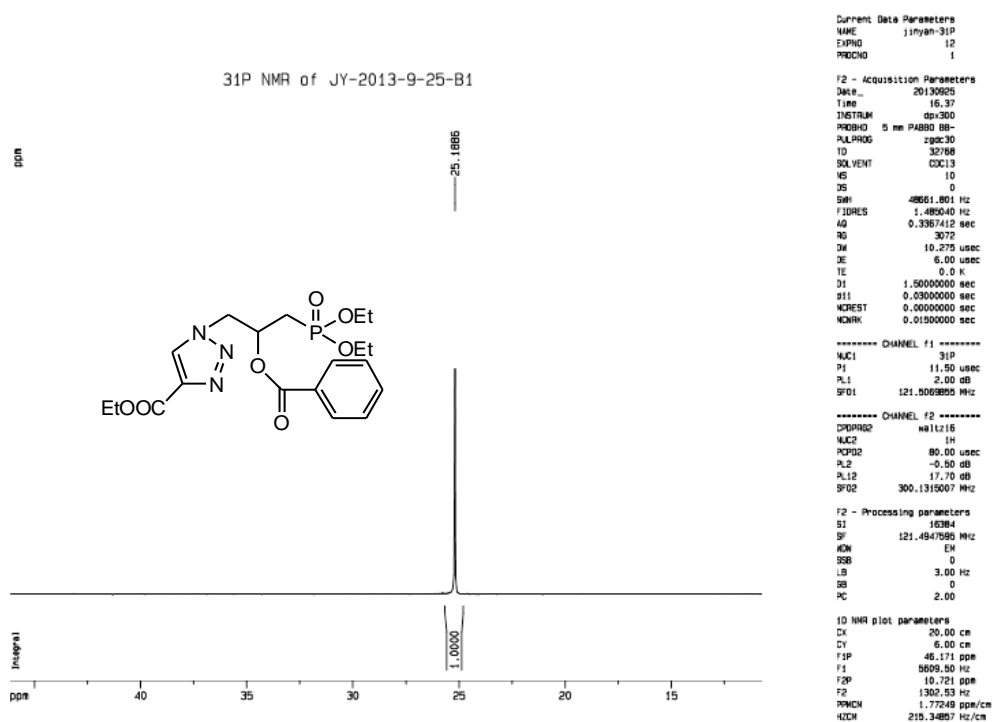
Figure S43. ^{31}P -NMR spectrum of compound 5-B1.

Figure S44. HRMS spectrum of compound 5-B1.

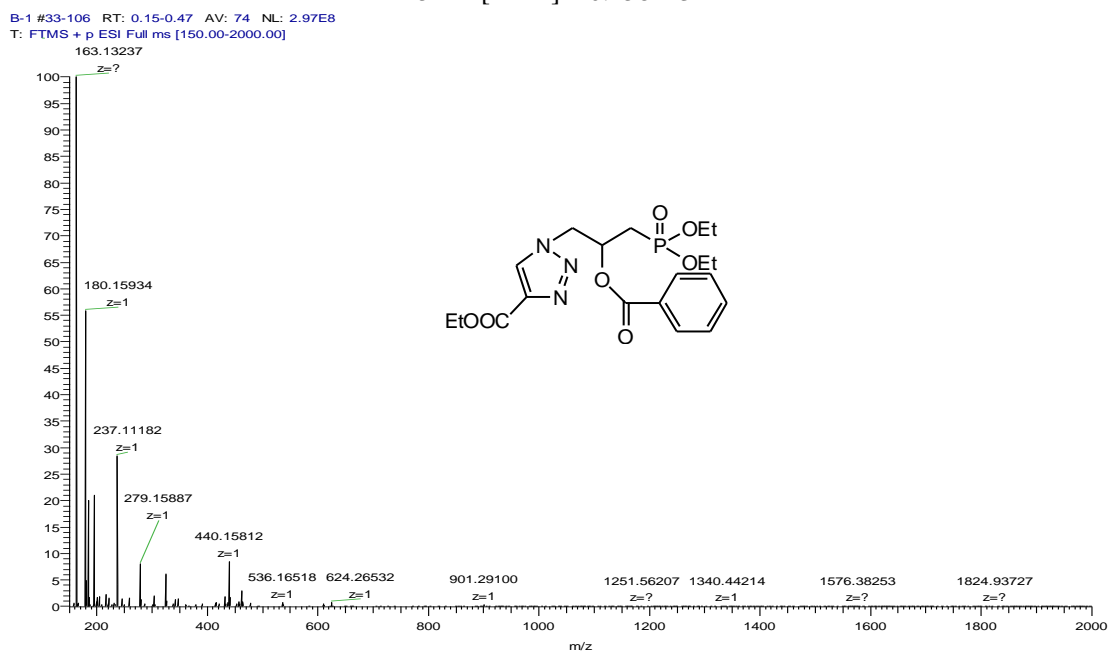
5-B1 [M+H]⁺440.1581131

Figure S45. HRMS spectrum of compound 5-B1.

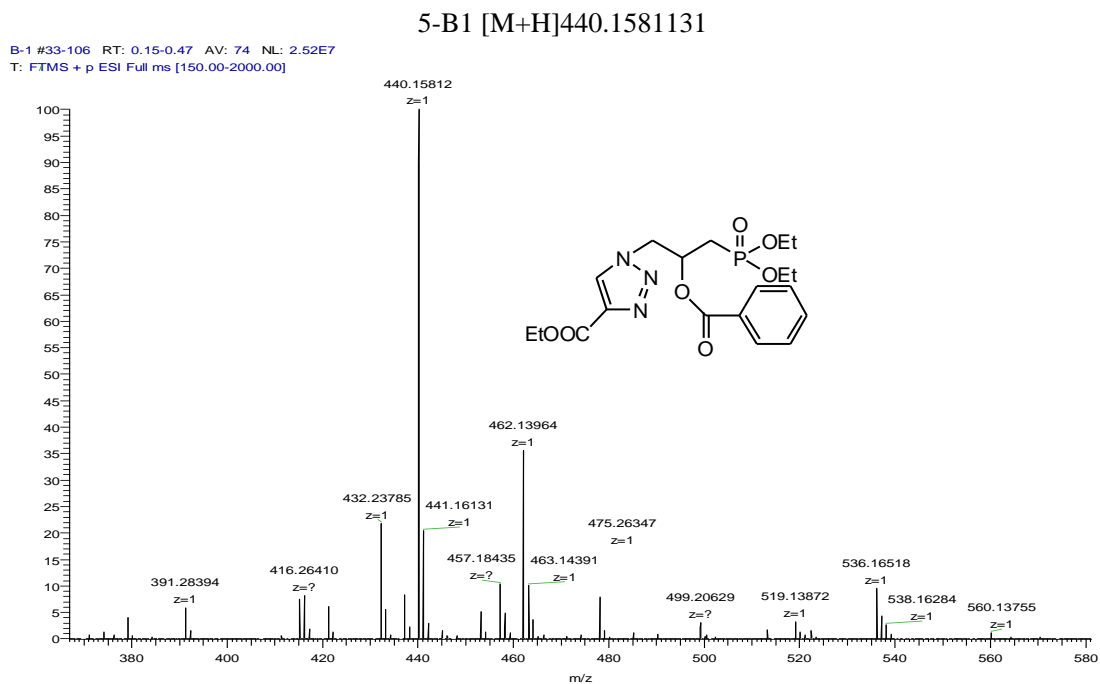
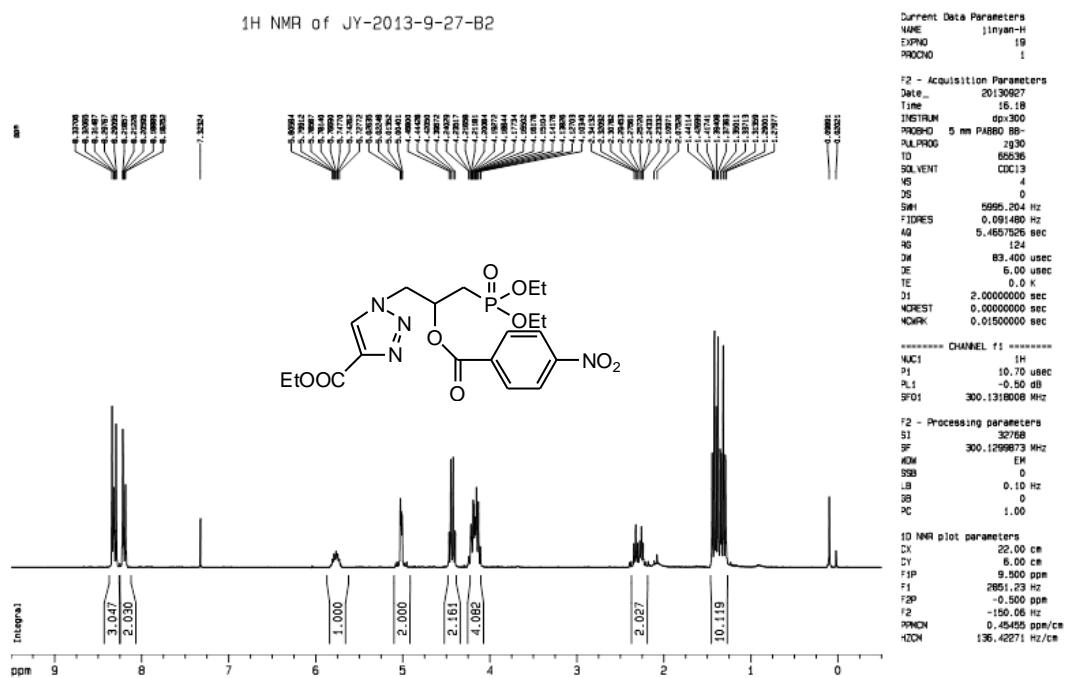
Figure S46. ¹H-NMR spectrum of compound 5-B2.

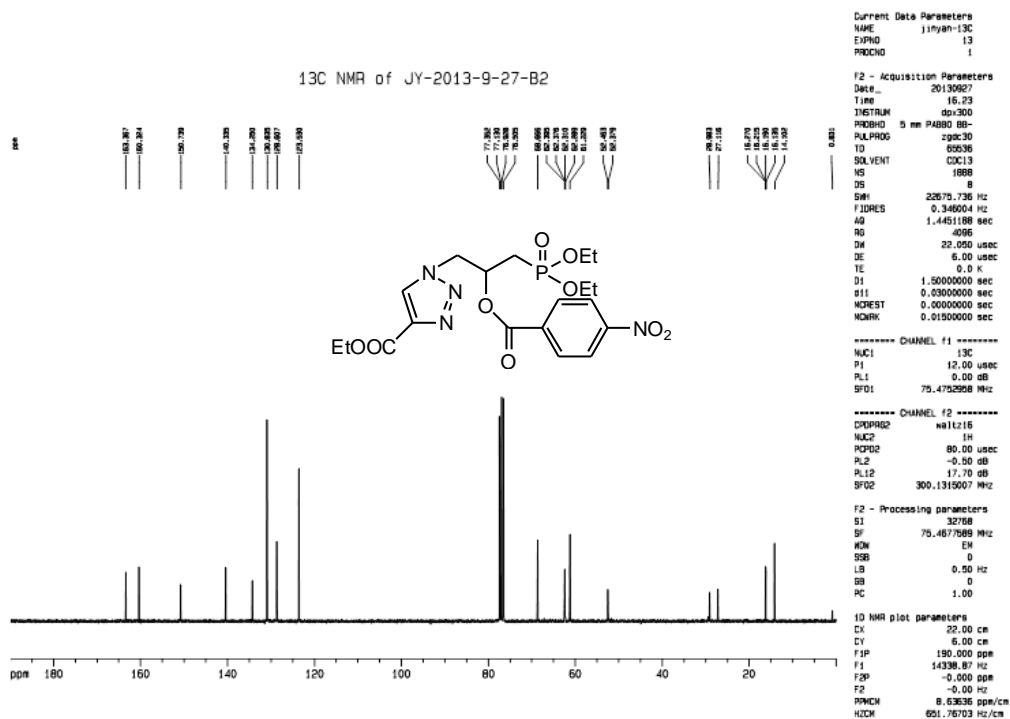
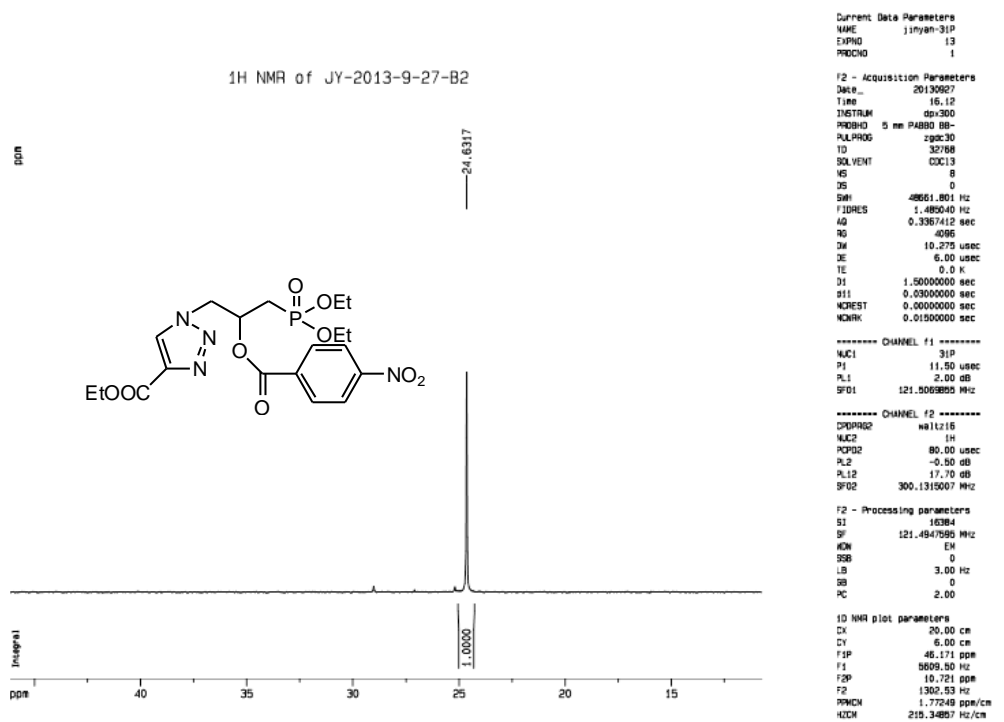
Figure S47. ^{13}C -NMR spectrum of compound 5-B2.Figure S48. ^{31}P -NMR spectrum of compound 5-B2.

Figure S49. HRMS spectrum of compound 5-B2.

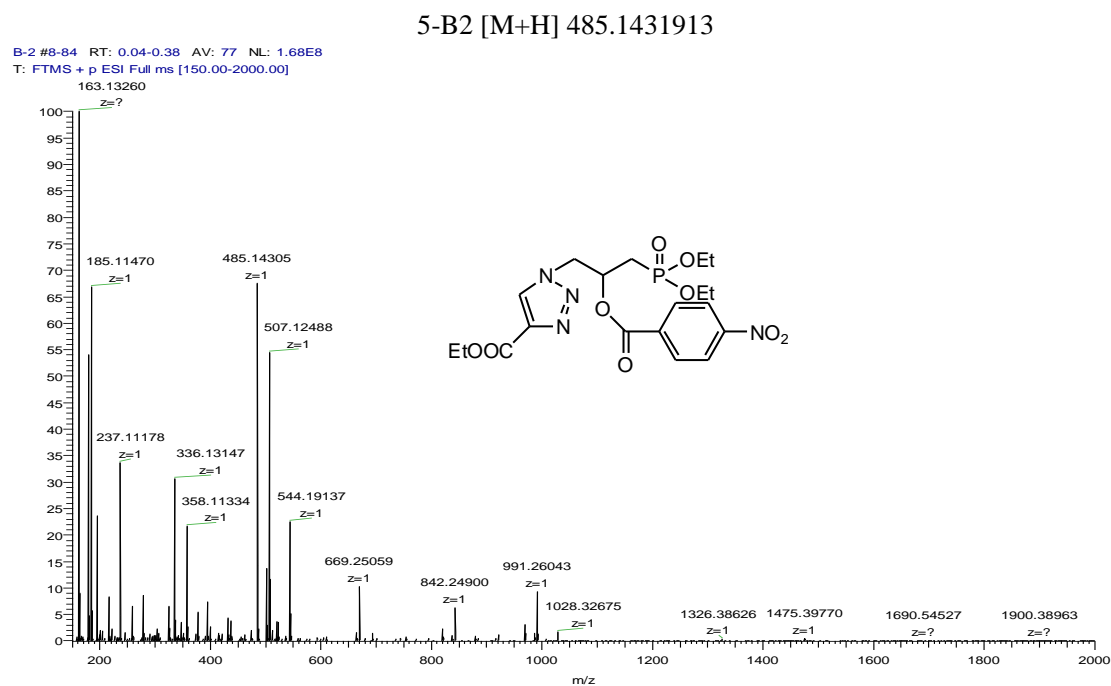


Figure S50. HRMS spectrum of compound 5-B2.

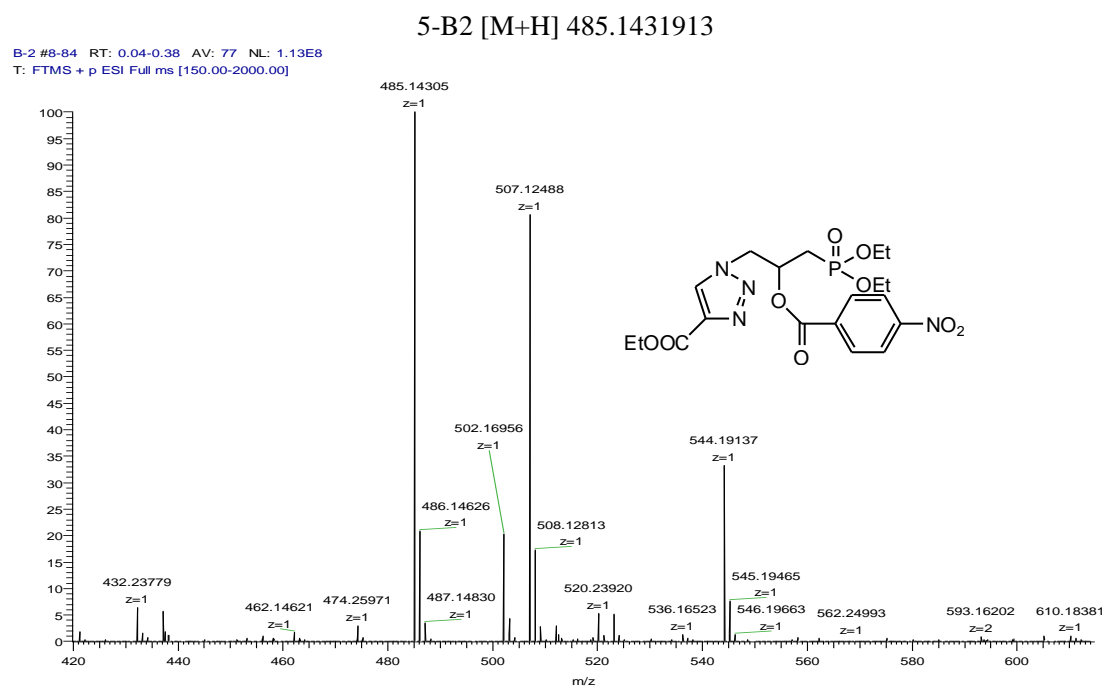


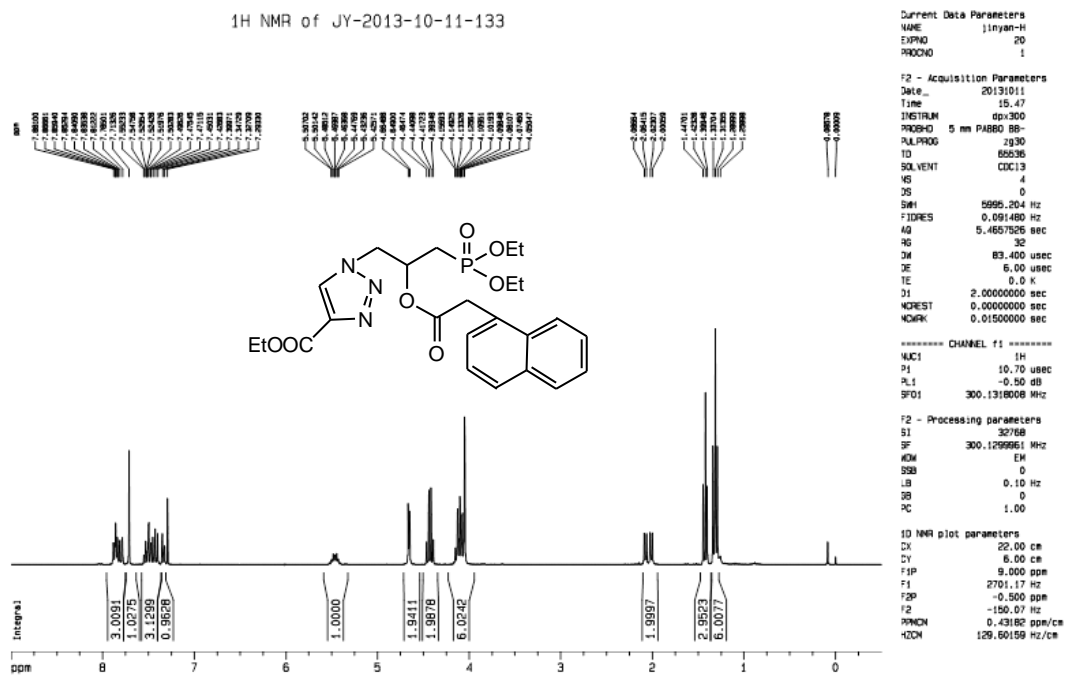
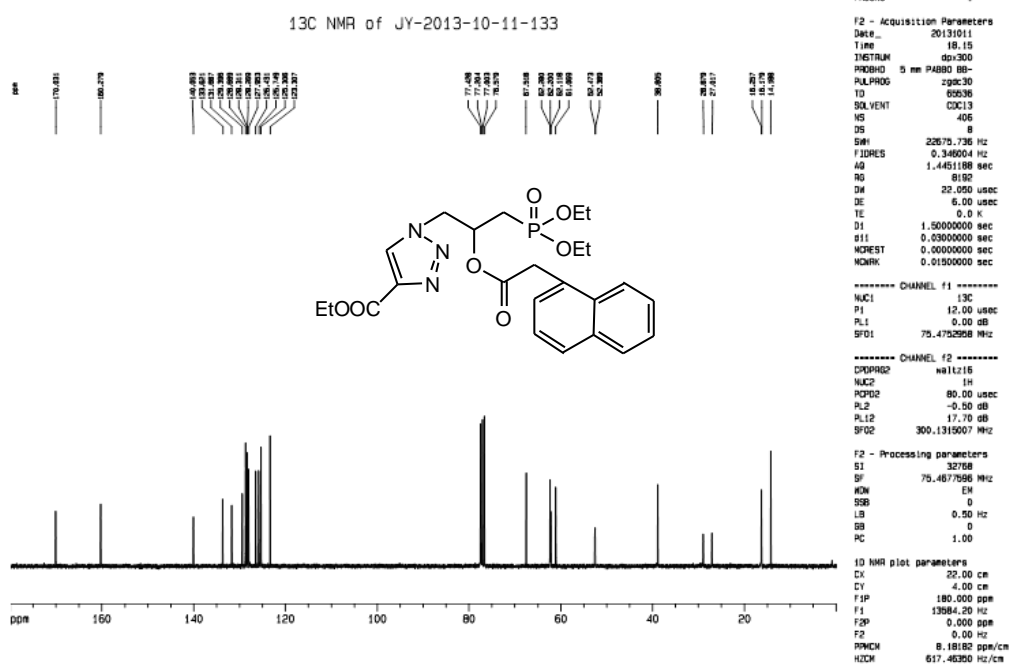
Figure S51. ¹H-NMR spectrum of compound 5-B3.Figure S52. ¹³C-NMR spectrum of compound 5-B3.

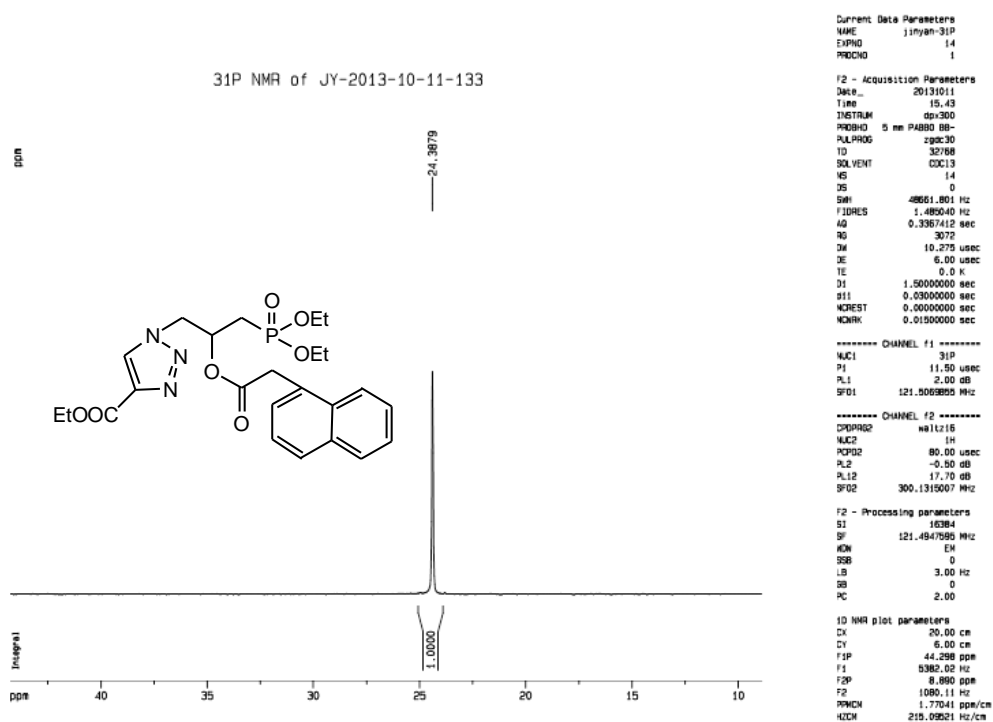
Figure S53. ³¹P-NMR spectrum of compound 5-B3.

Figure S54. HRMS spectrum of compound 5-B3.

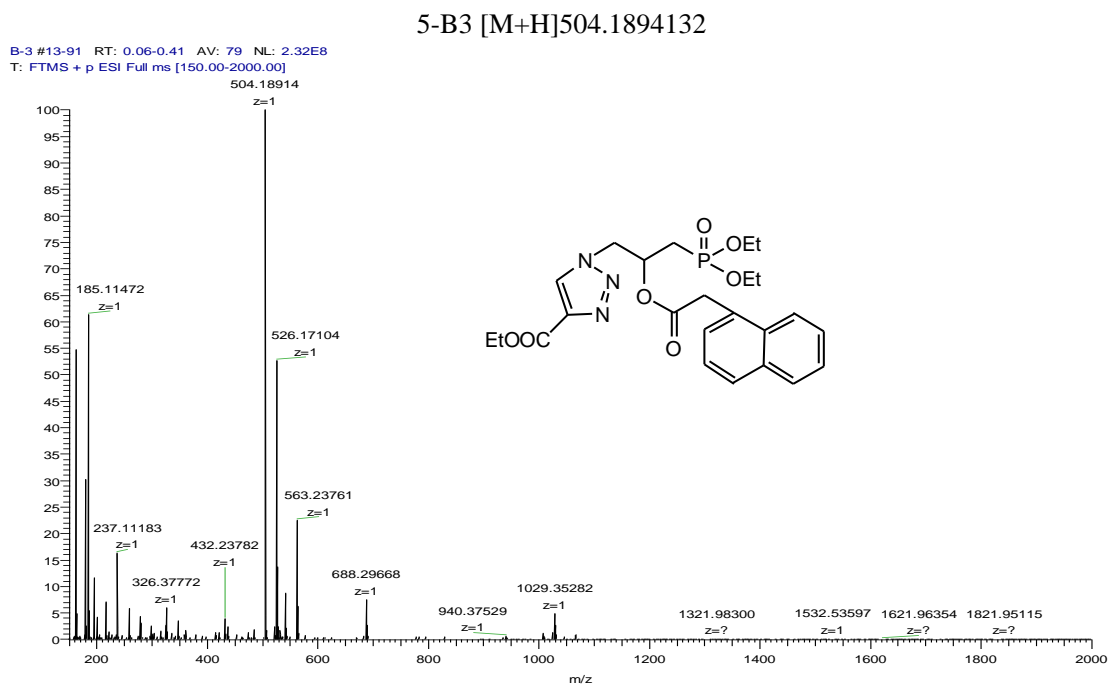


Figure S55. HRMS spectrum of compound 5-B3.

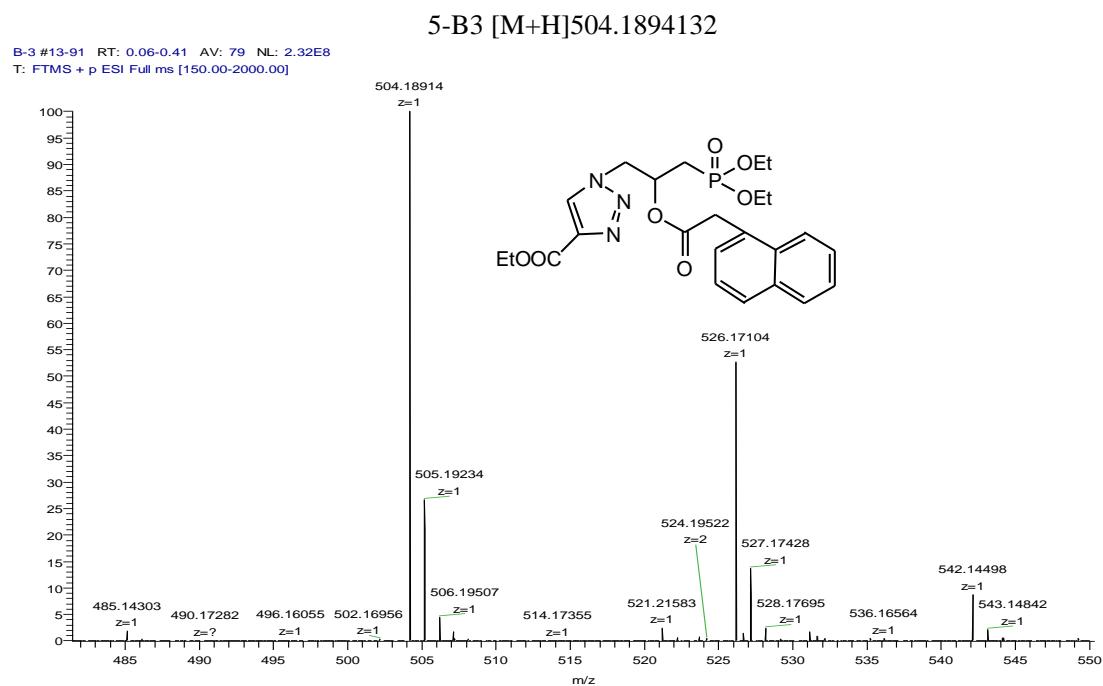
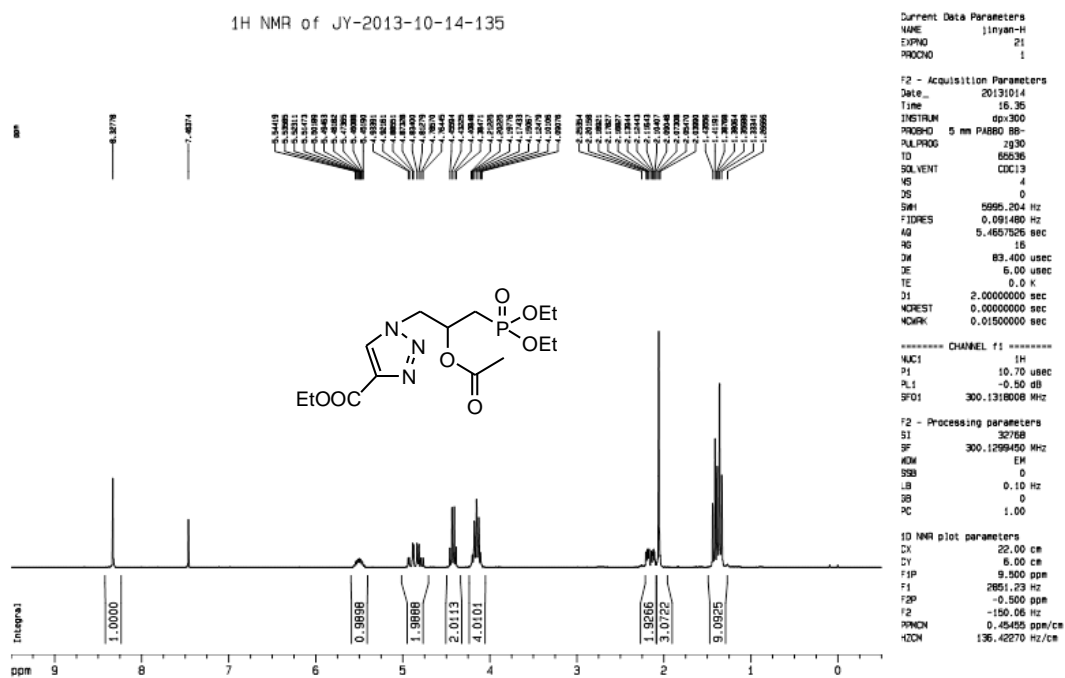
Figure S56. ¹H-NMR spectrum of compound 5-B4.

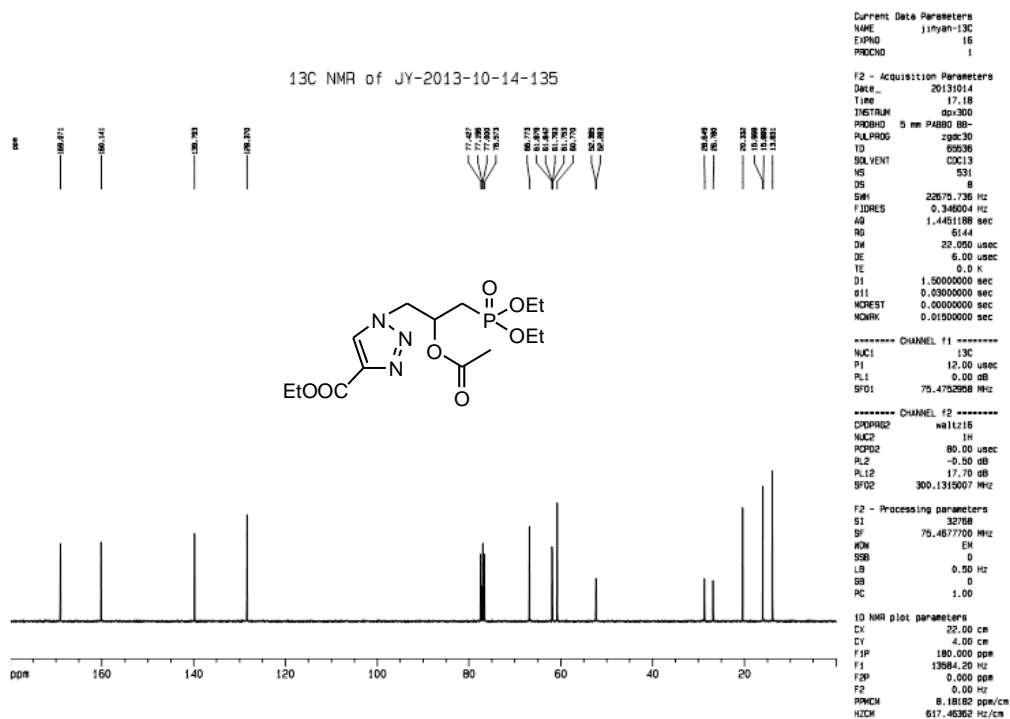
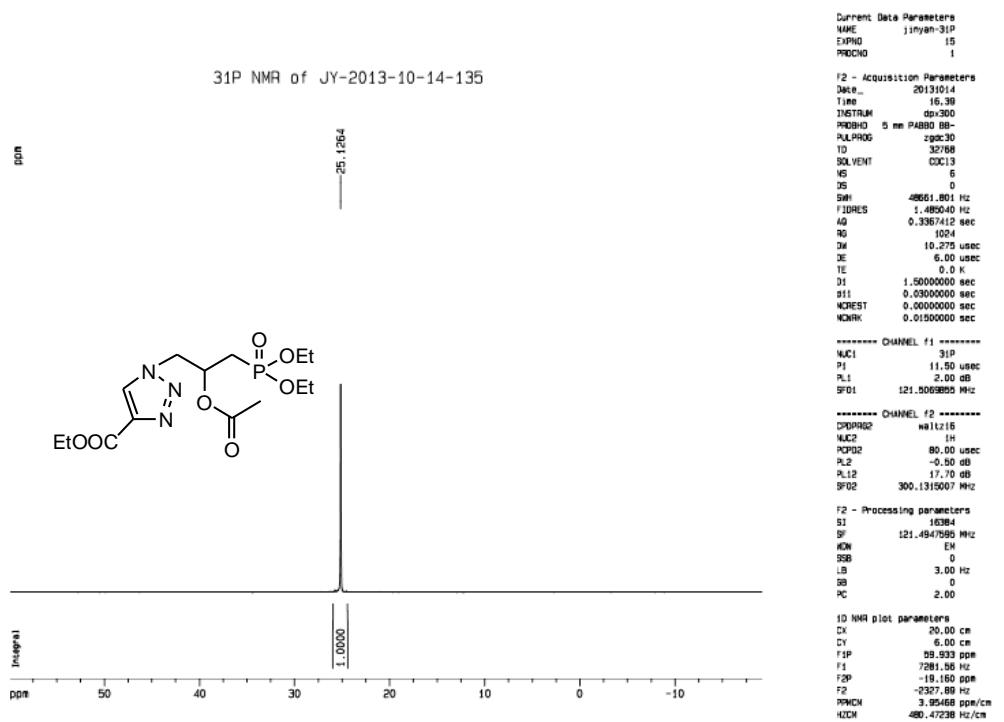
Figure S57. ^{13}C -NMR spectrum of compound 5-B4.Figure S58. ^{31}P -NMR spectrum of compound 5-B4.

Figure S59. HRMS spectrum of compound 5-B4

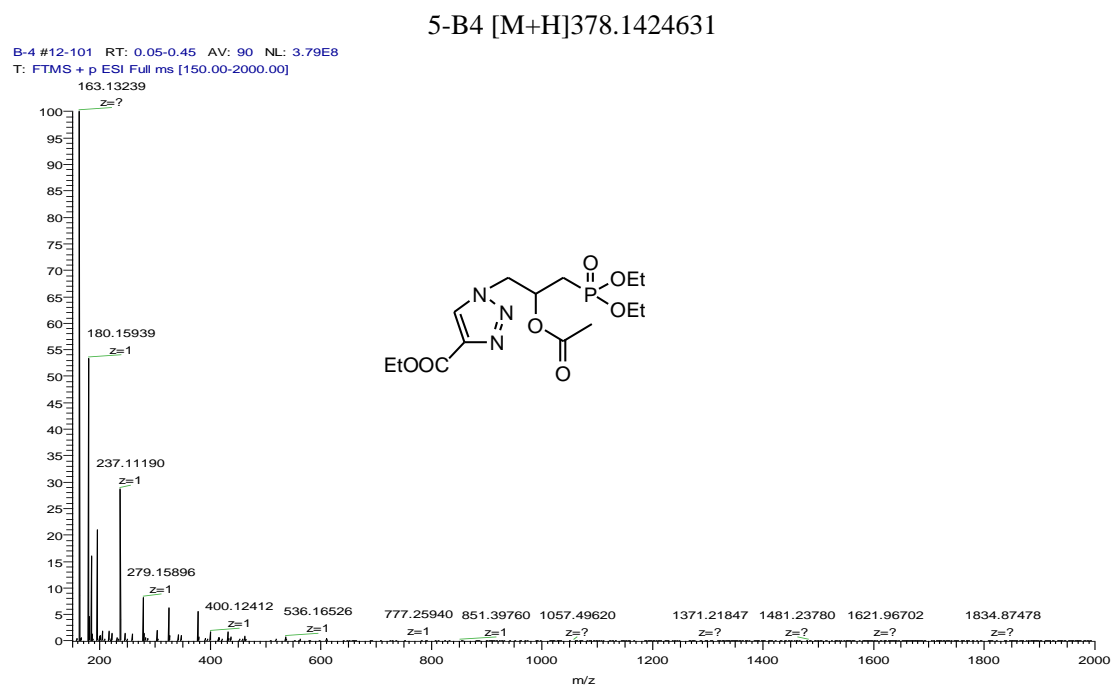


Figure S60. HRMS spectrum of compound 5-B4.

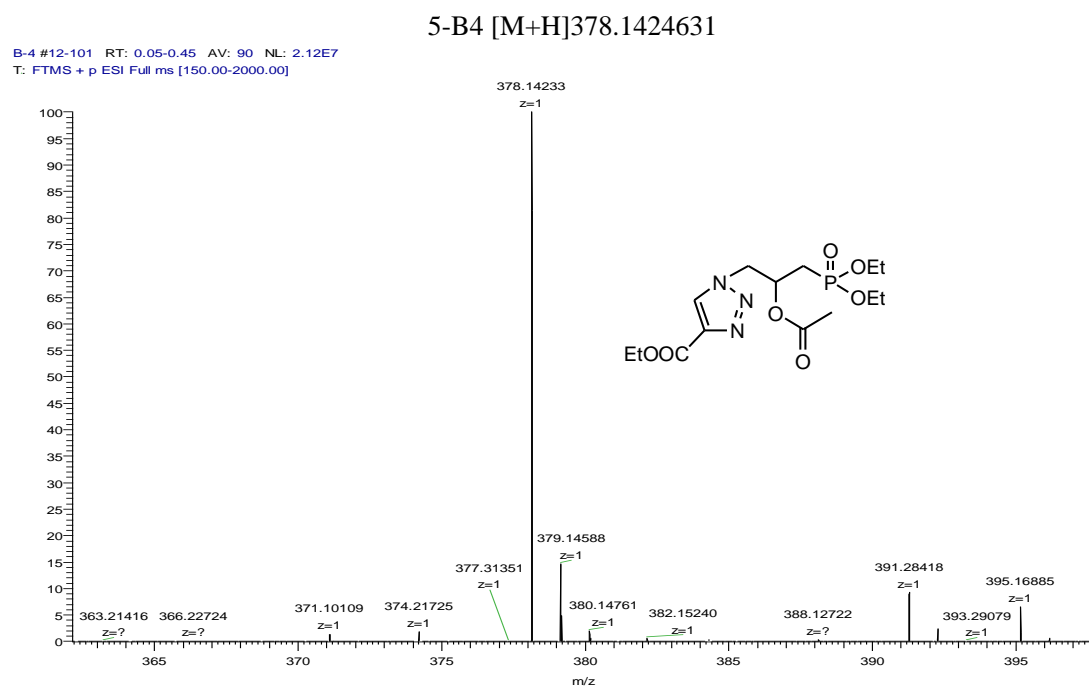


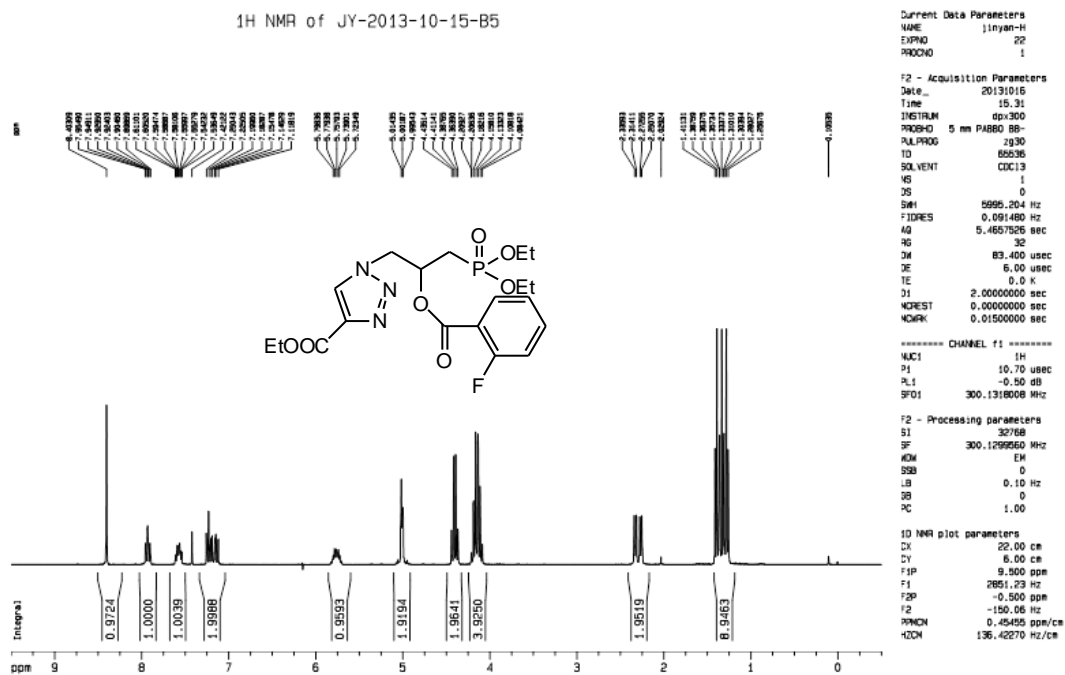
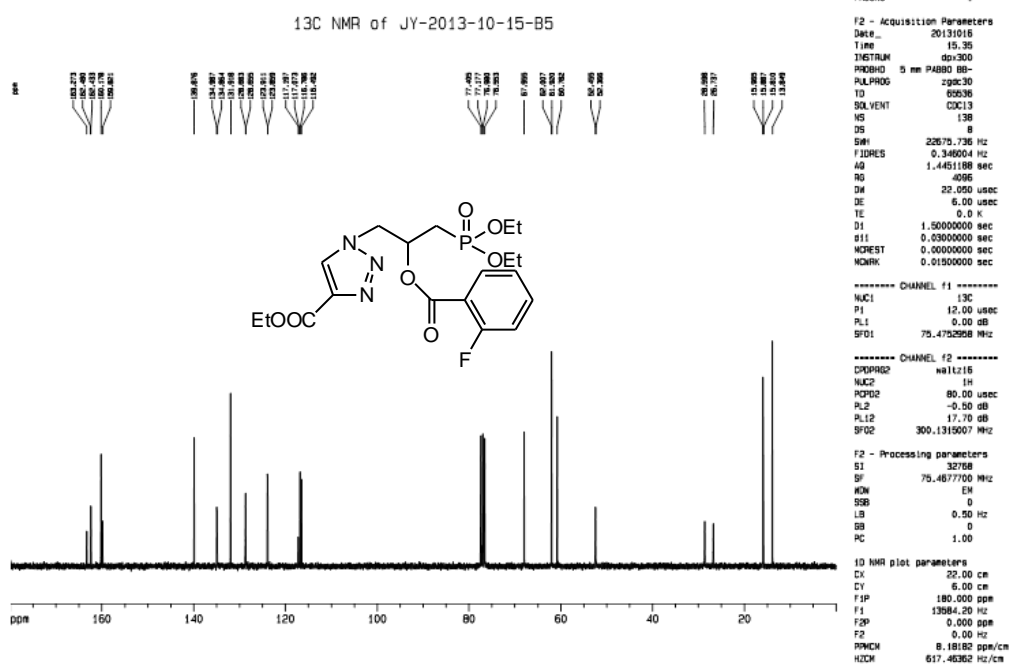
Figure S61. ¹H-NMR spectrum of compound 5-B5.Figure S62. ¹³C-NMR spectrum of compound 5-B5.

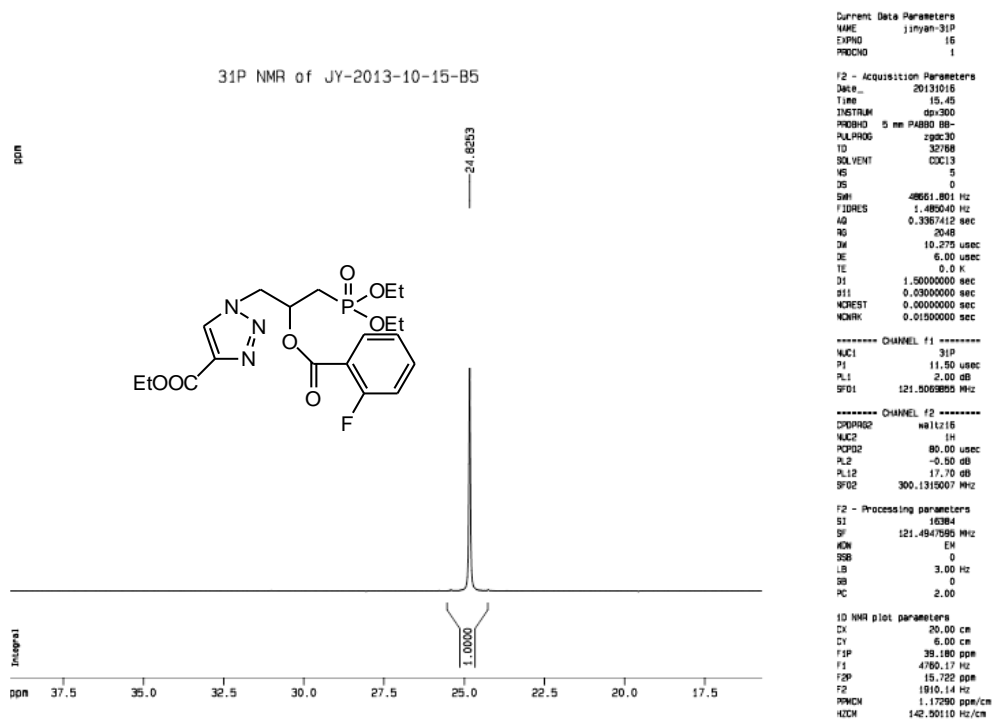
Figure S63. ^{31}P -NMR spectrum of compound 5-B5.

Figure S64. HRMS spectrum of compound 5-B5.

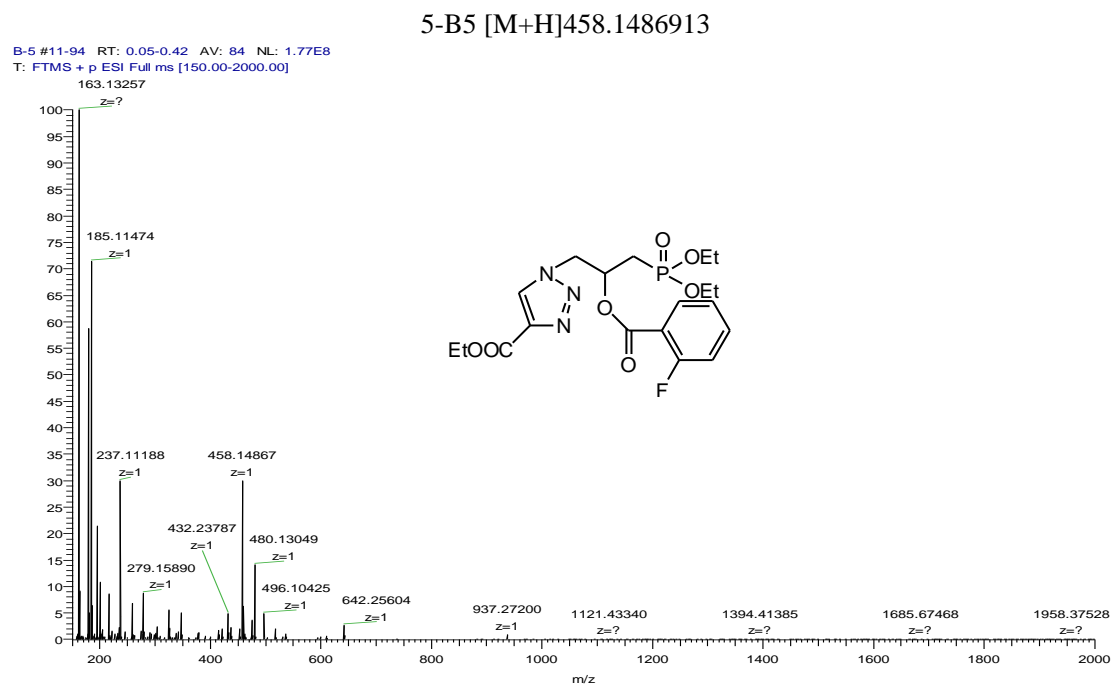


Figure S65. HRMS spectrum of compound 5-B5.

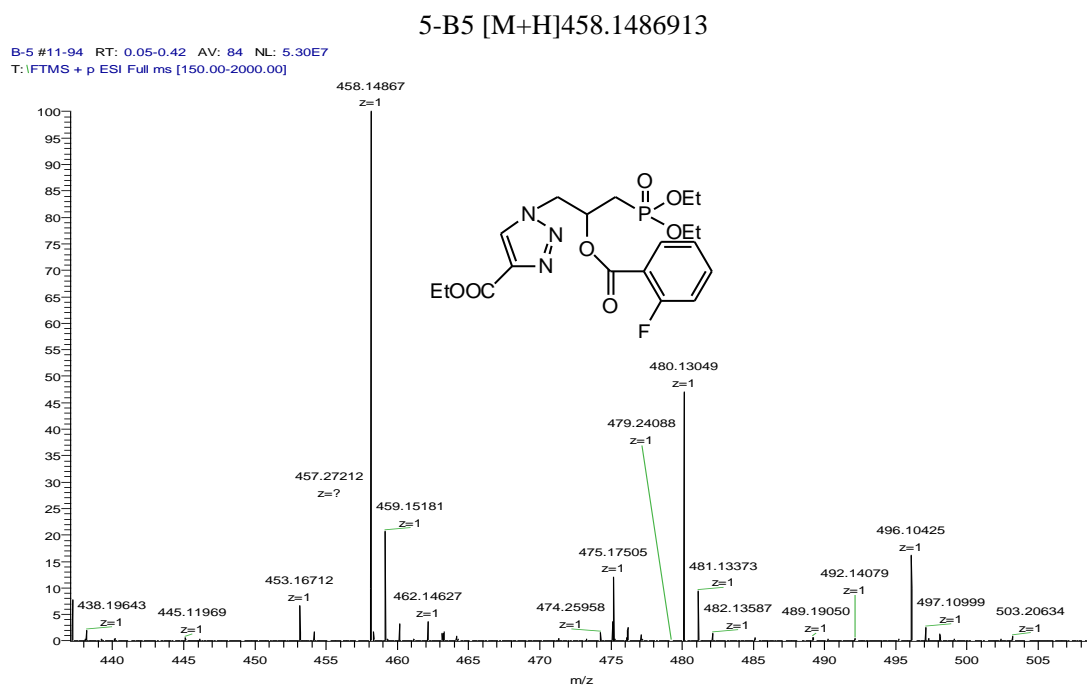
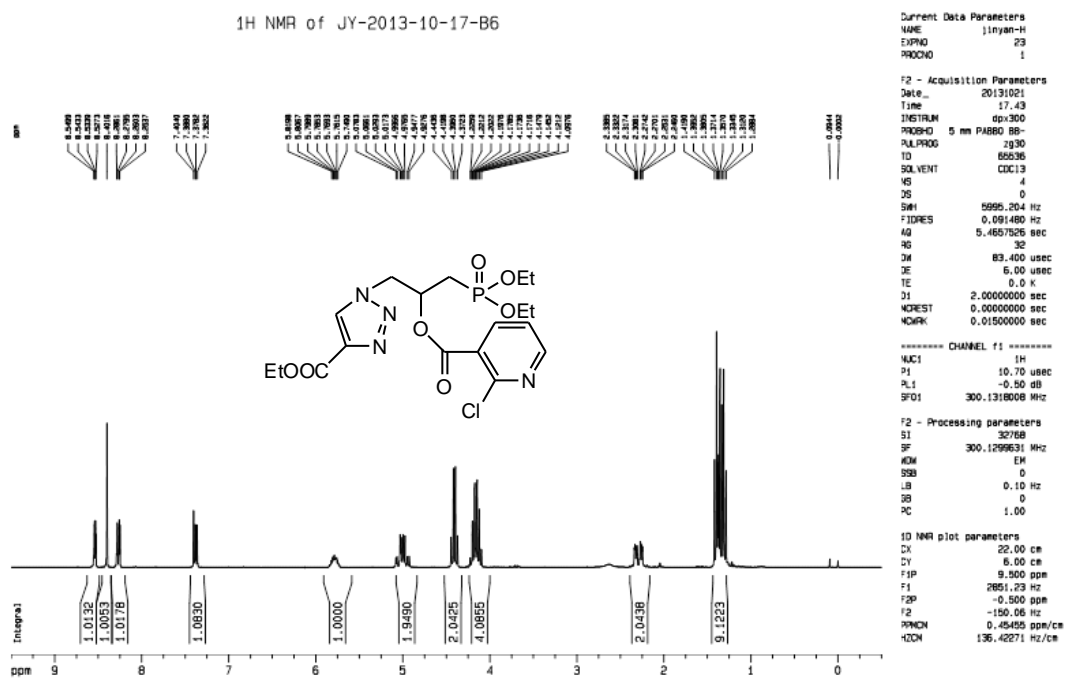
Figure S66. ¹H-NMR spectrum of compound 5-B6.

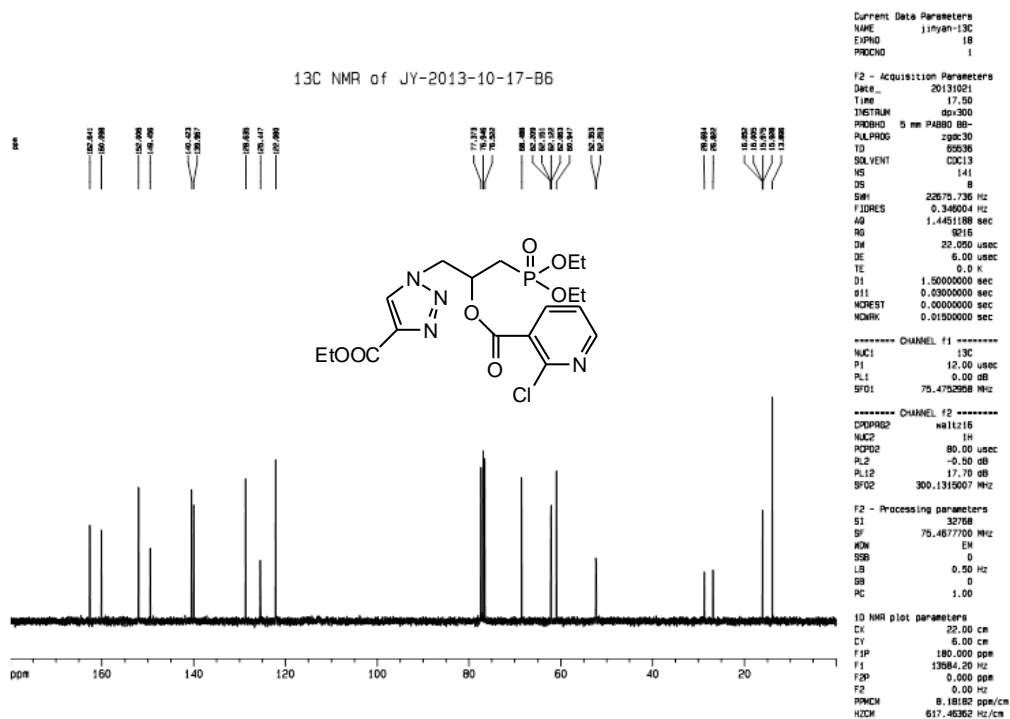
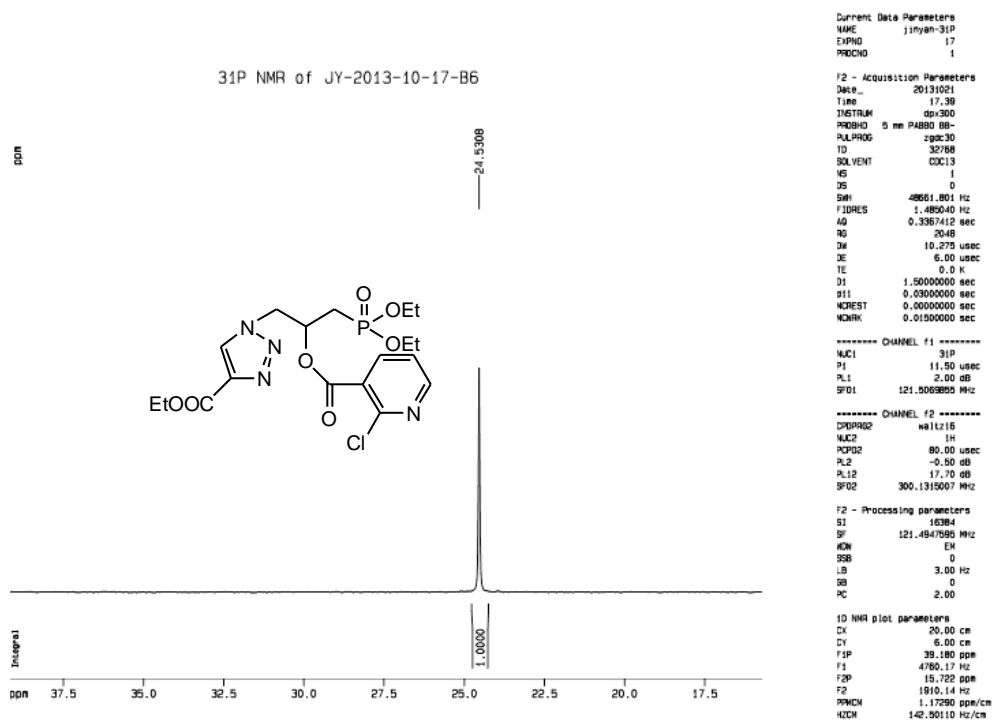
Figure S67. ^{13}C -NMR spectrum of compound 5-B6.Figure S68. ^{31}P -NMR spectrum of compound 5-B6.

Figure S69. HRMS spectrum of compound 5-B6.

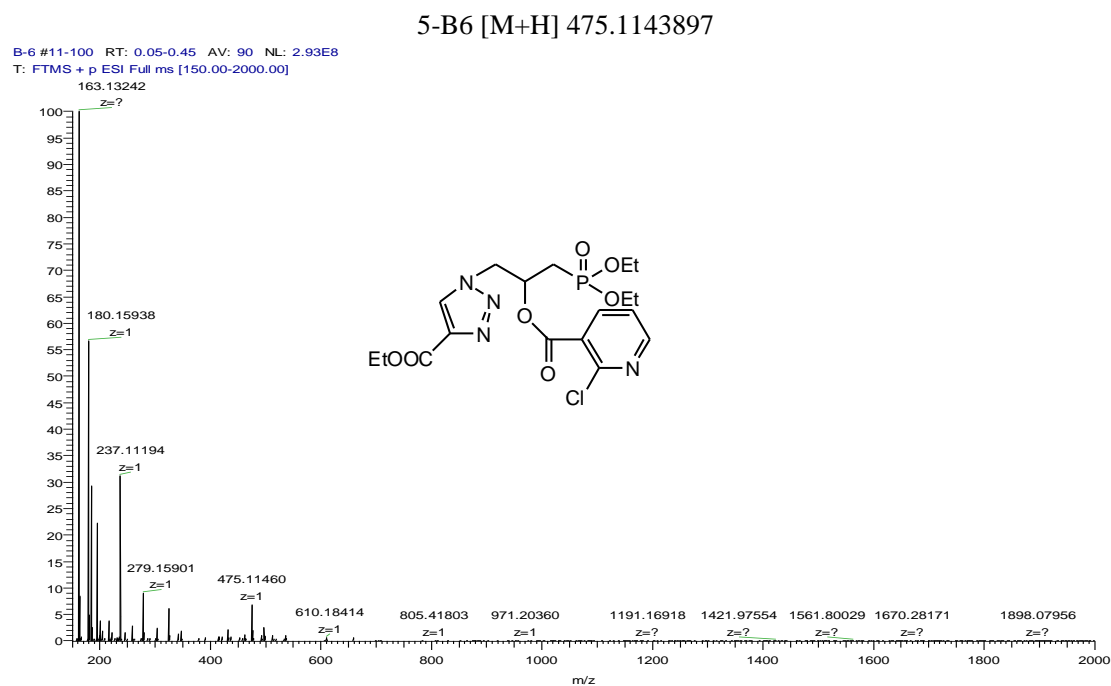


Figure S70. HRMS spectrum of compound 5-B6.

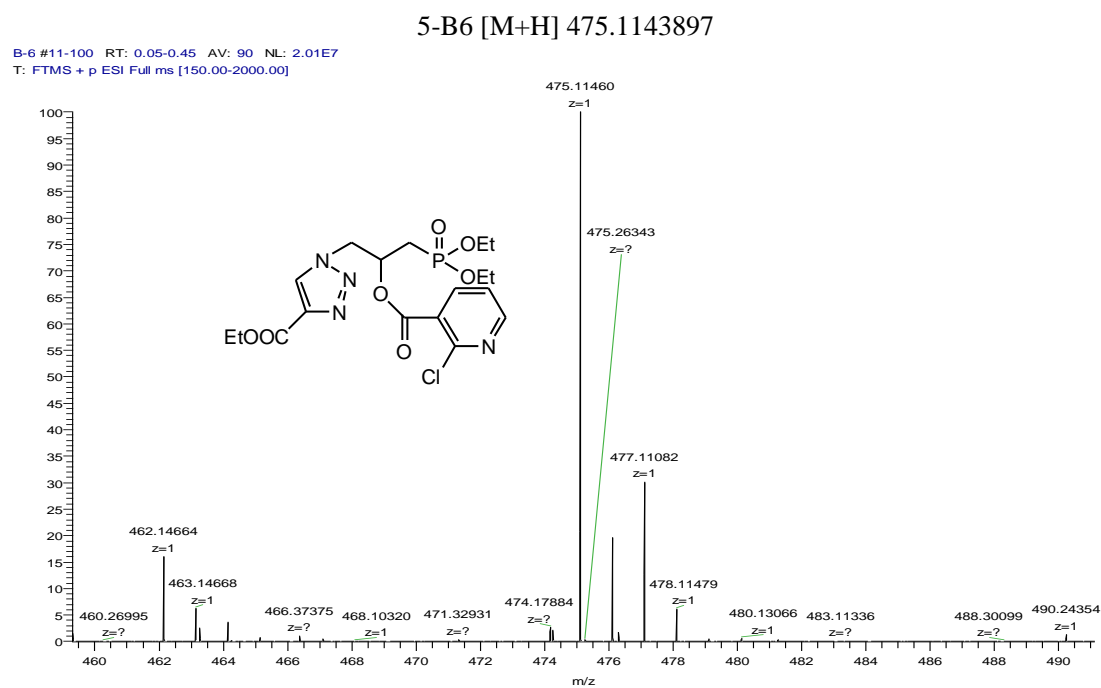


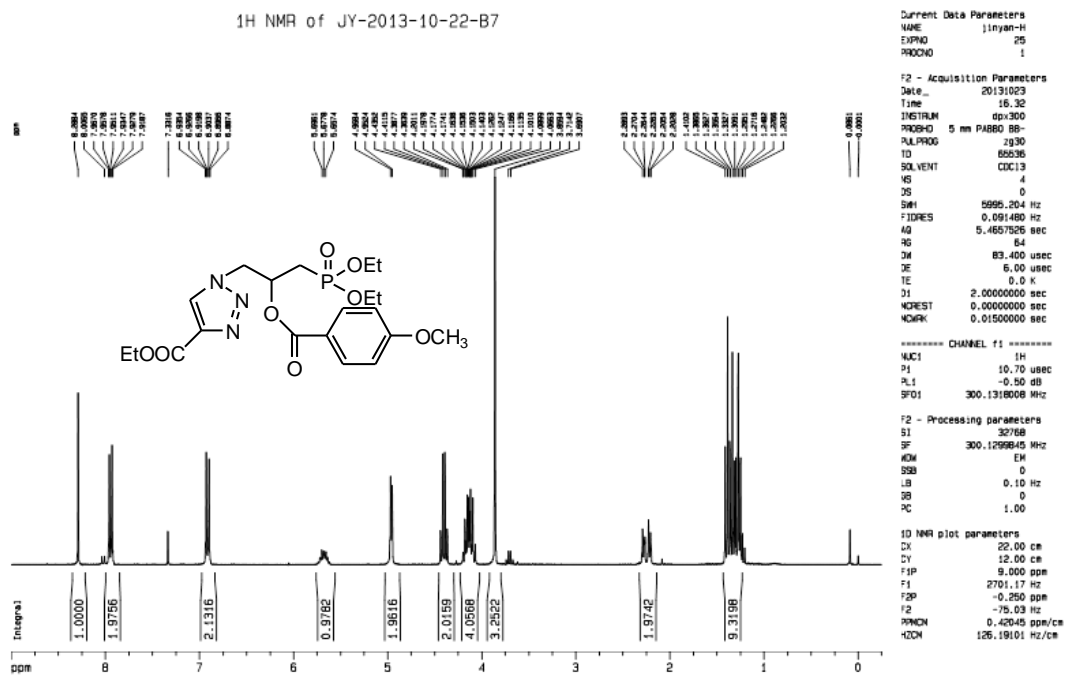
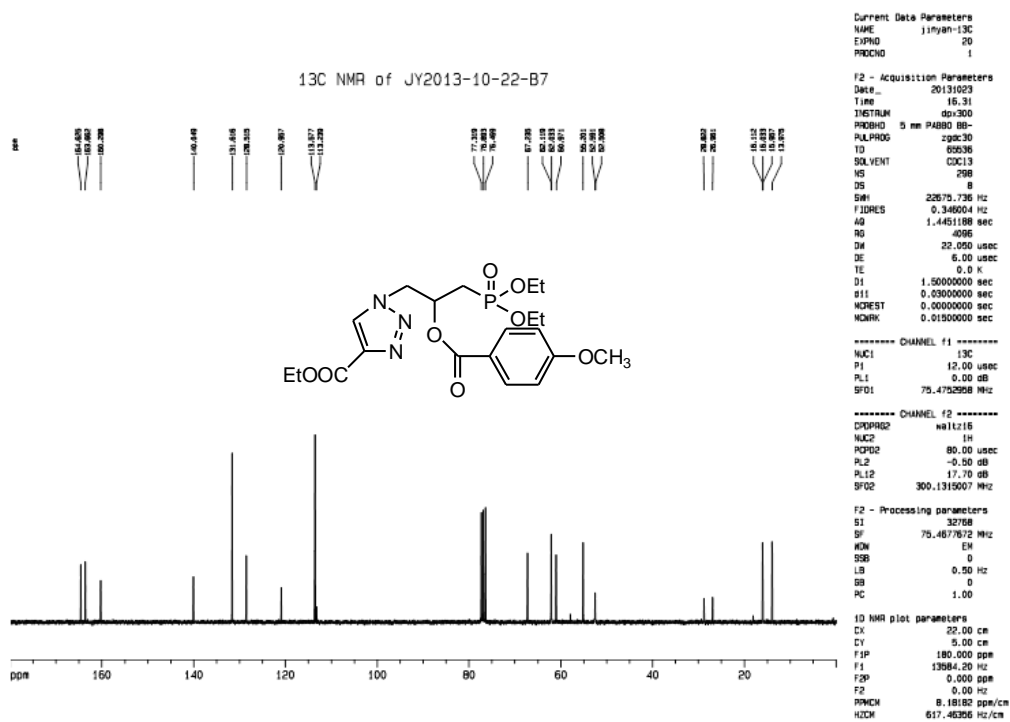
Figure S71. ¹H-NMR spectrum of compound 5-B7.Figure S72. ¹³C-NMR spectrum of compound 5-B7.

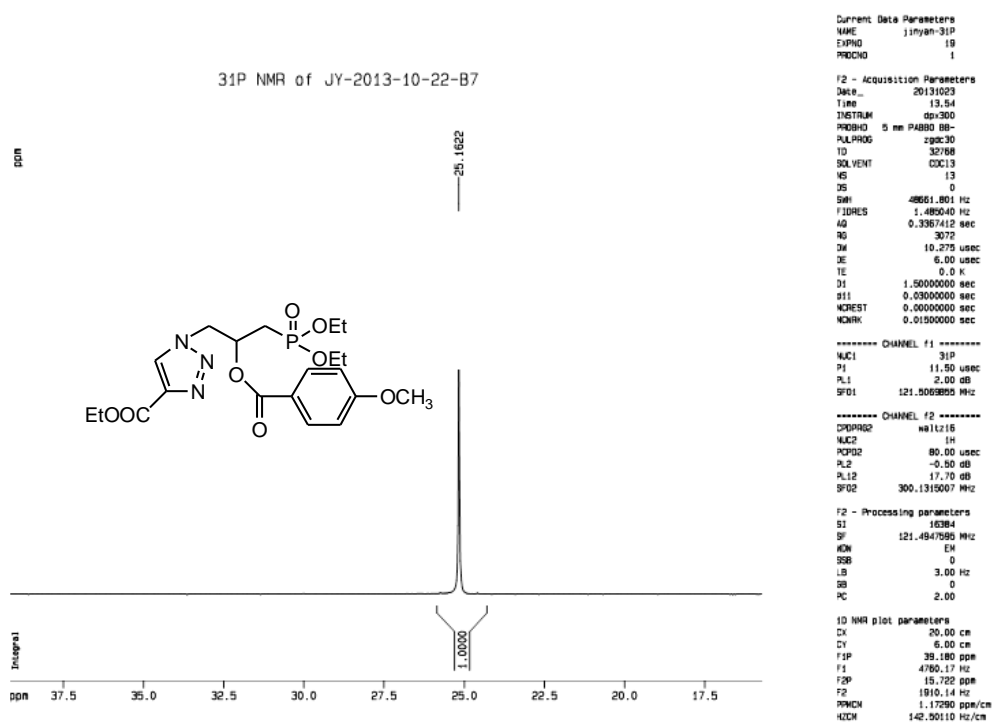
Figure S73. ^{31}P -NMR spectrum of compound 5-B7.

Figure S74. HRMS spectrum of compound 5-B7.

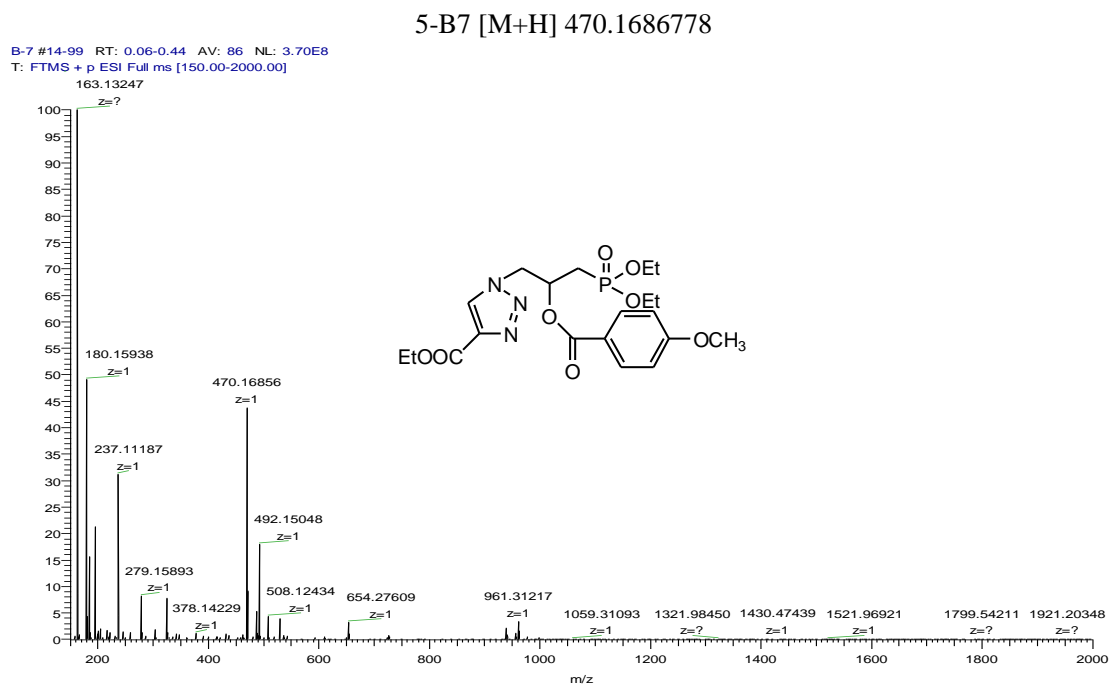


Figure S75. HRMS spectrum of compound 5-B7.

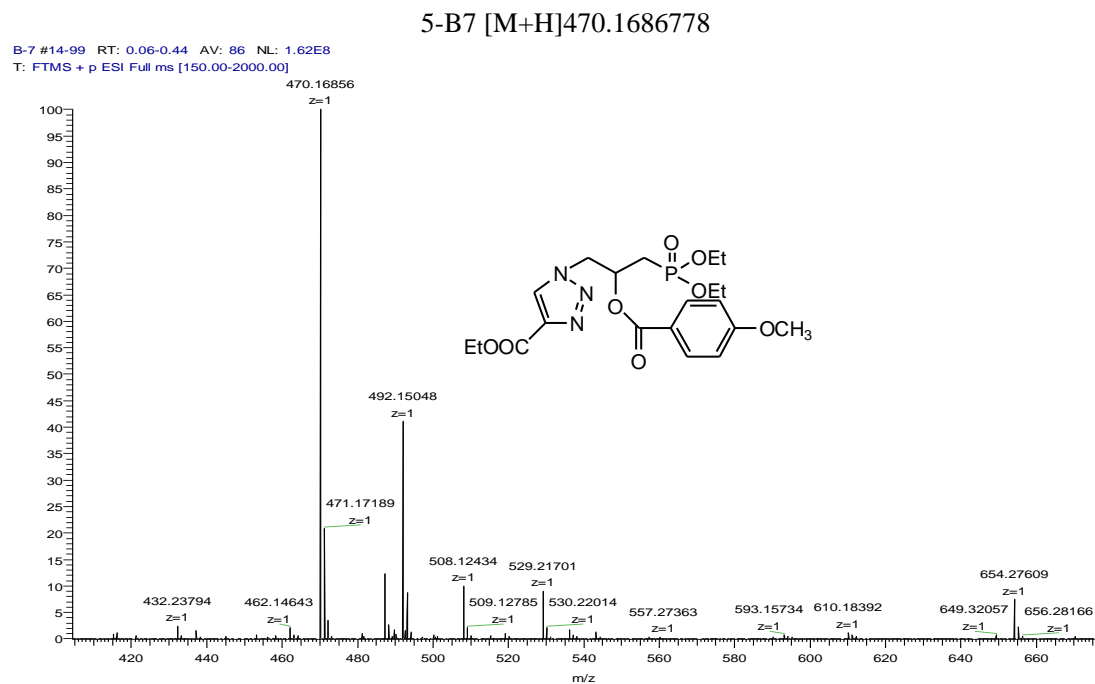
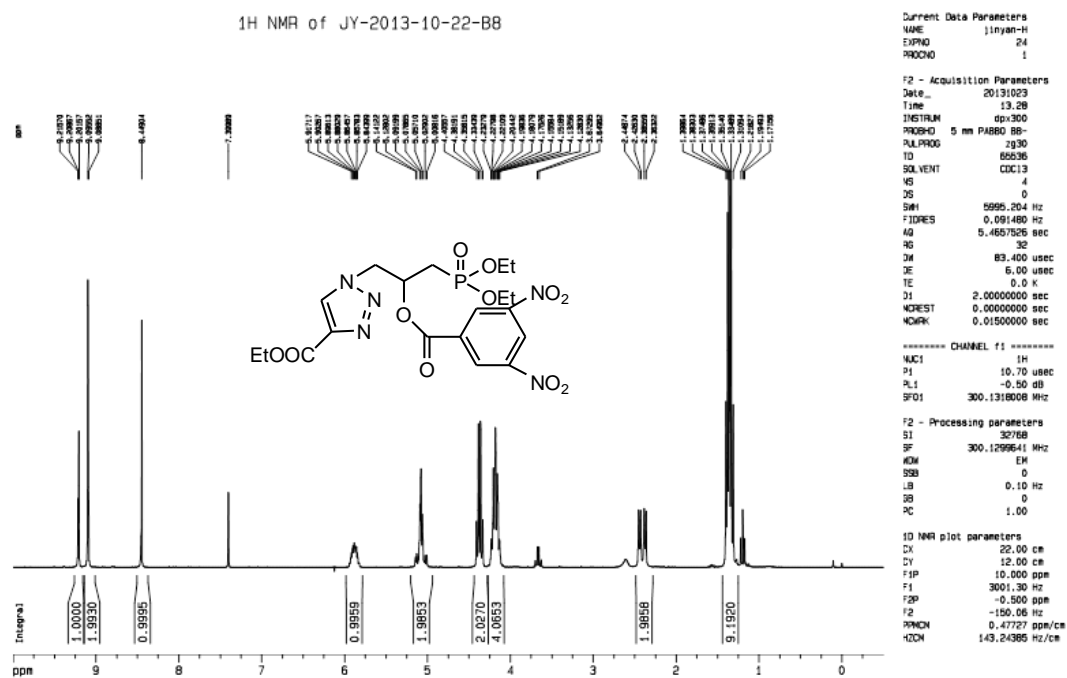
Figure S76. ¹H-NMR spectrum of compound 5-B8.

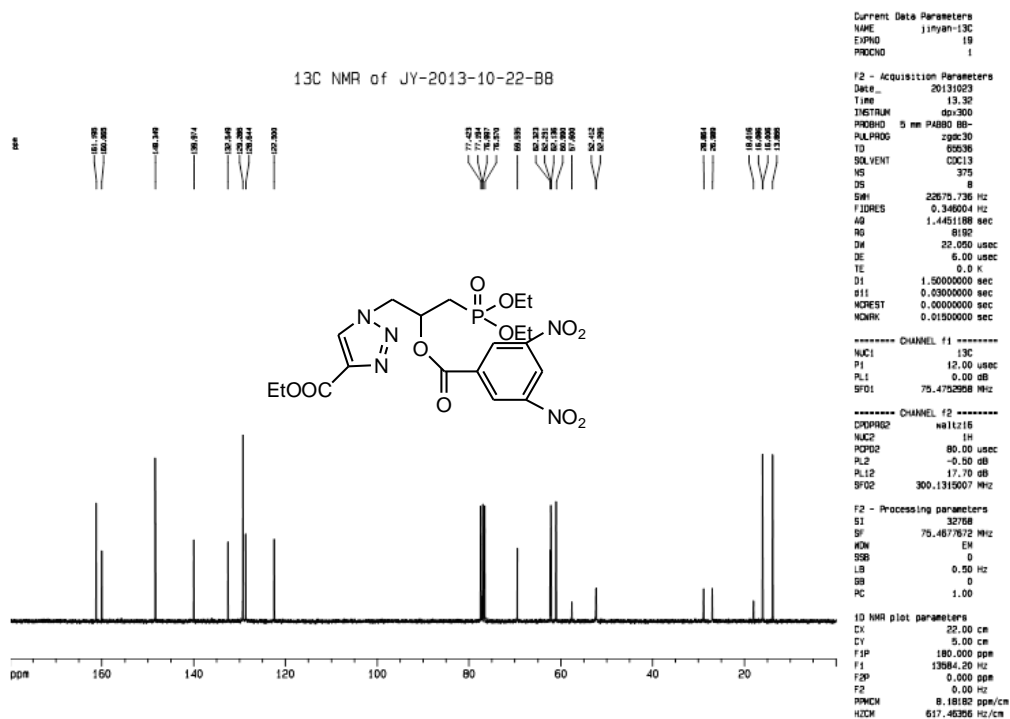
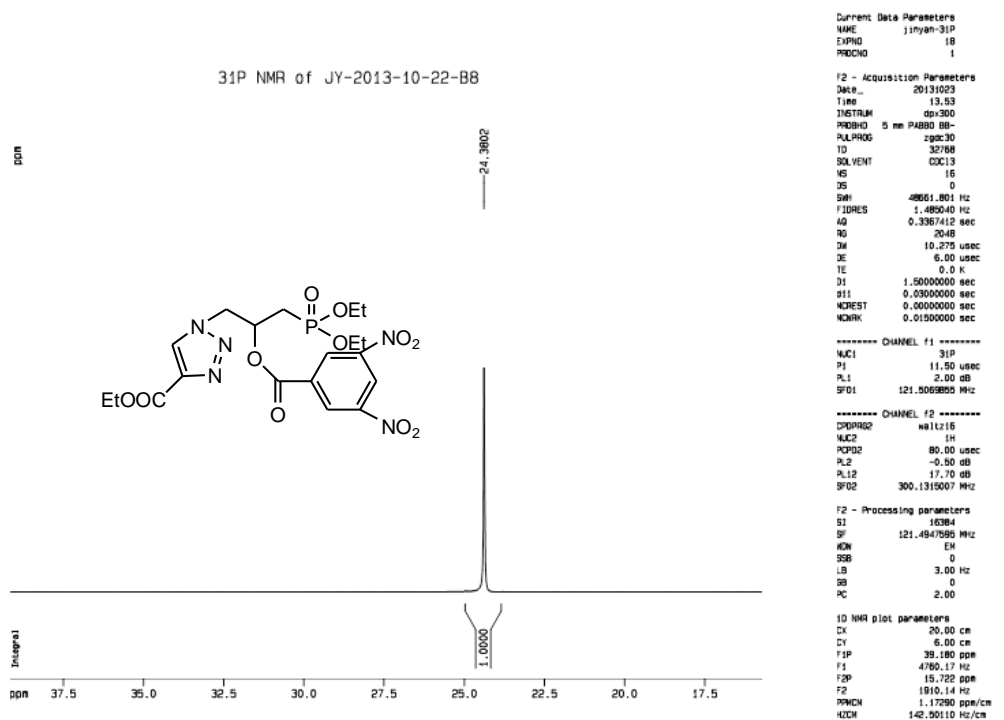
Figure S77. ^{13}C -NMR spectrum of compound 5-B8.Figure S78. ^{31}P -NMR spectrum of compound 5-B8.

Figure S79. HRMS spectrum of compound 5-B8.

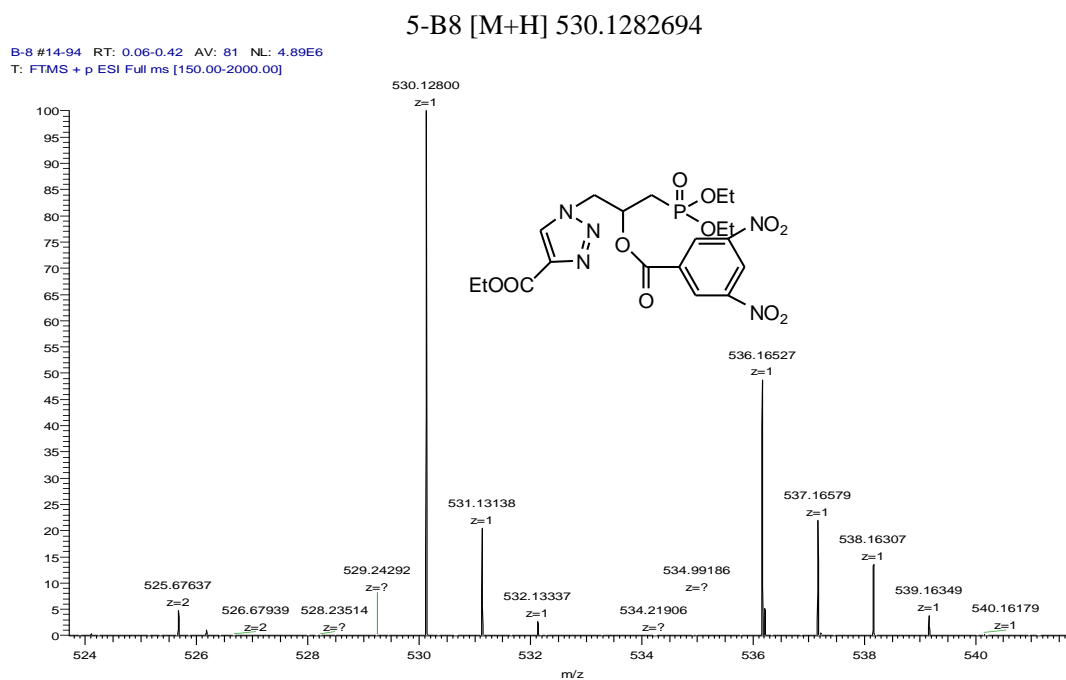
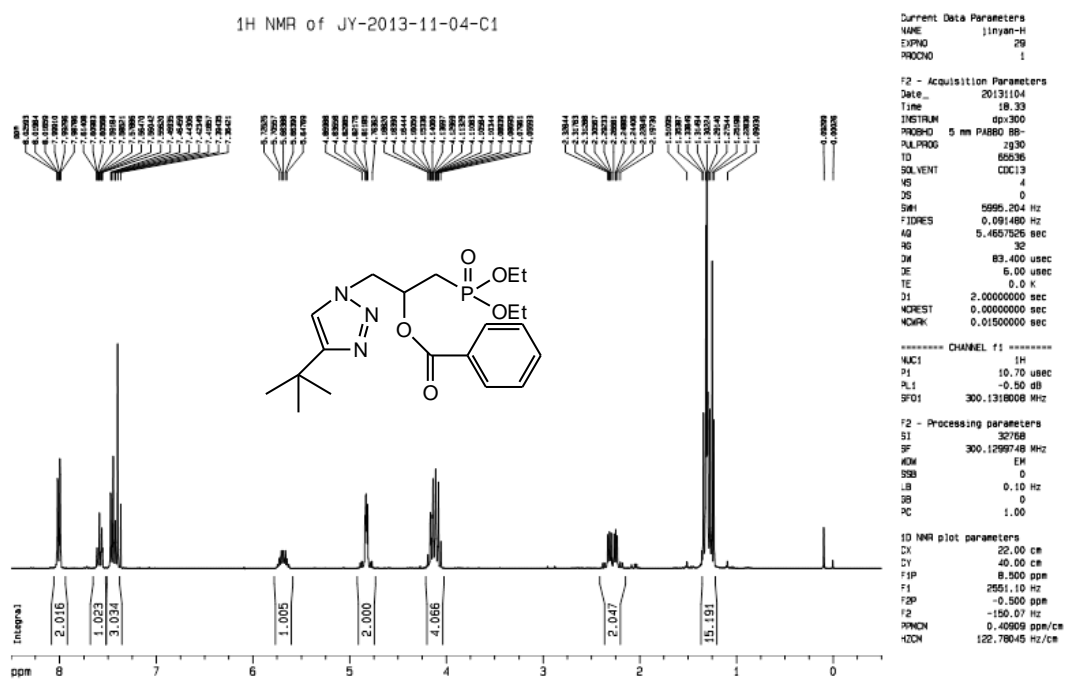
Figure S80. ¹H-NMR spectrum of compound 5-C1.

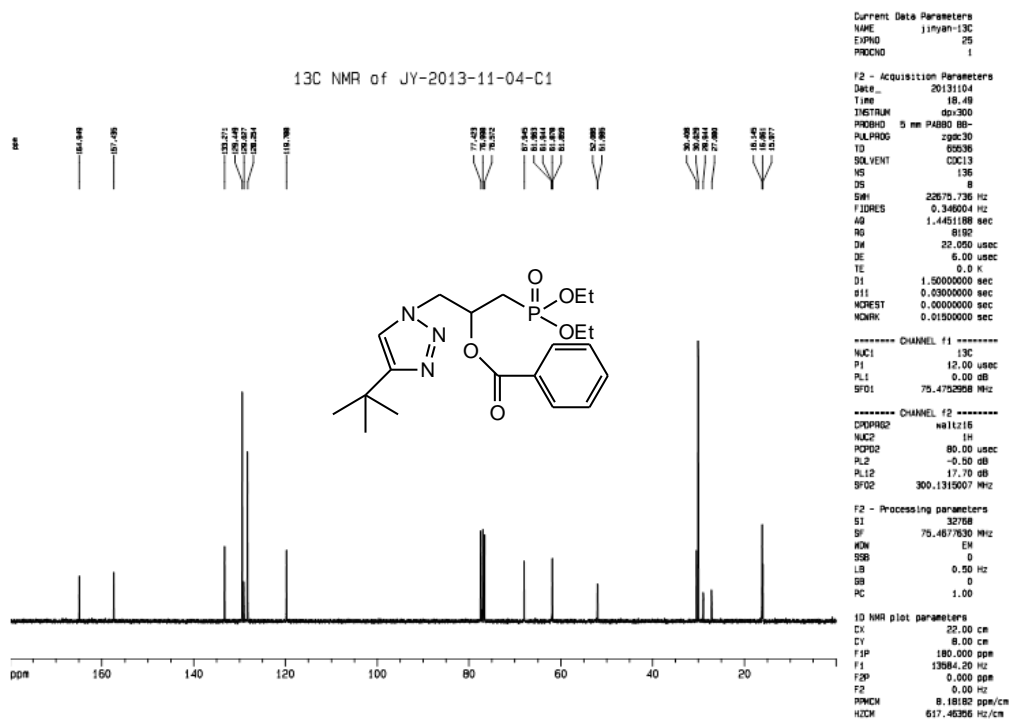
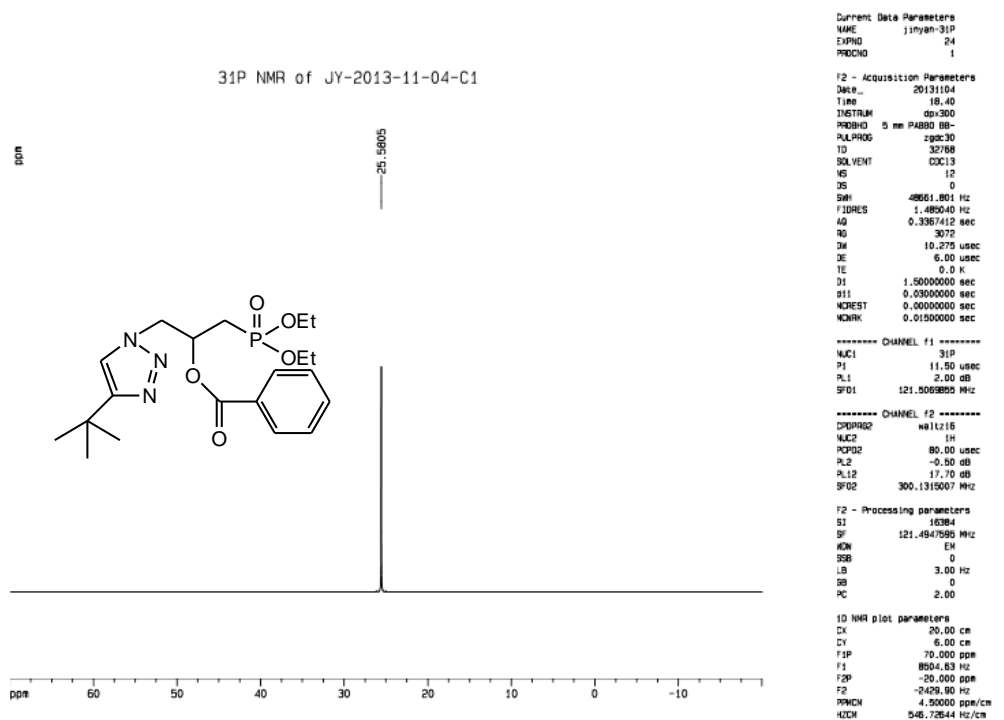
Figure S81. ^{13}C -NMR spectrum of compound 5-C1.Figure S82. ^{31}P -NMR spectrum of compound 5-C1.

Figure S83. HRMS spectrum of compound 5-C1.

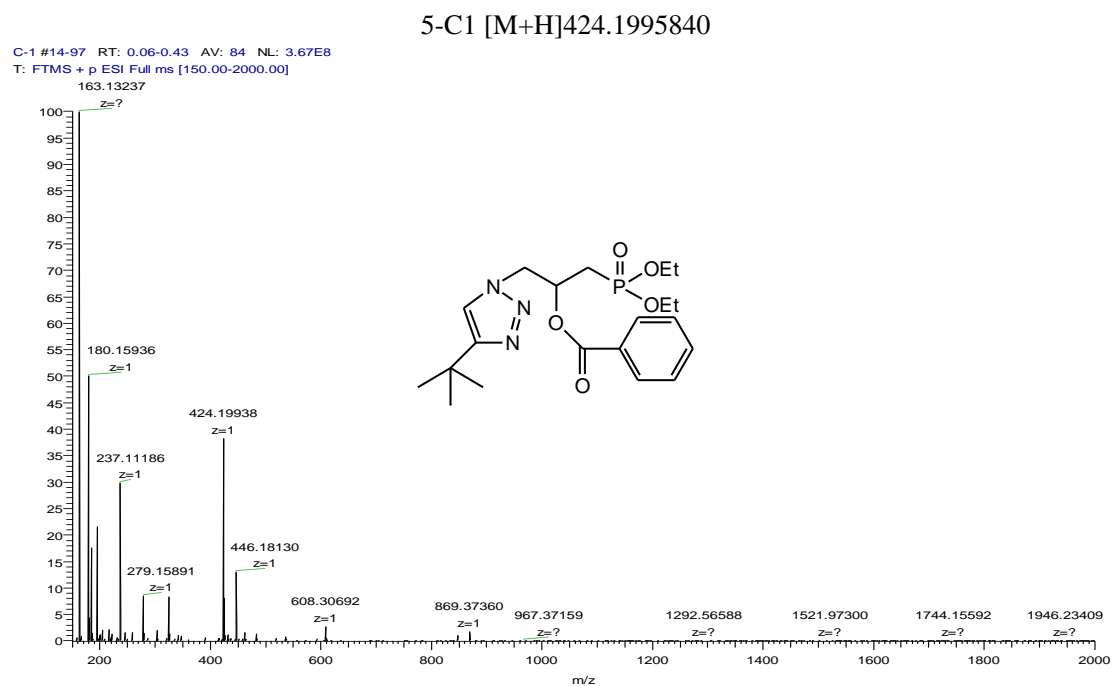


Figure S84. HRMS spectrum of compound 5-C1.

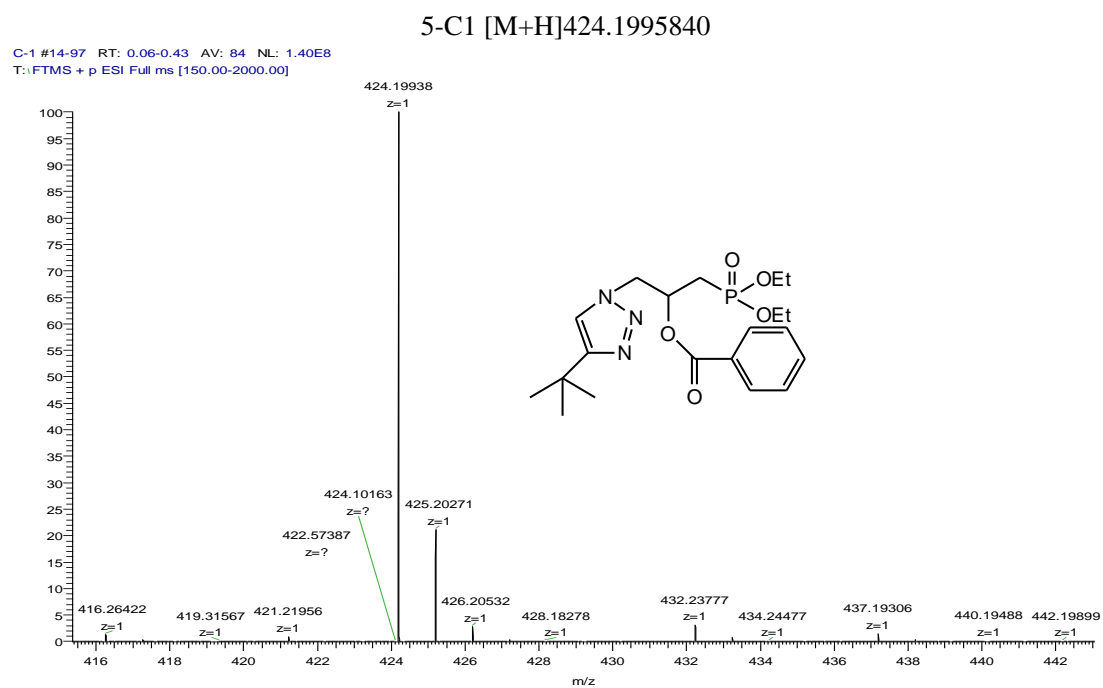


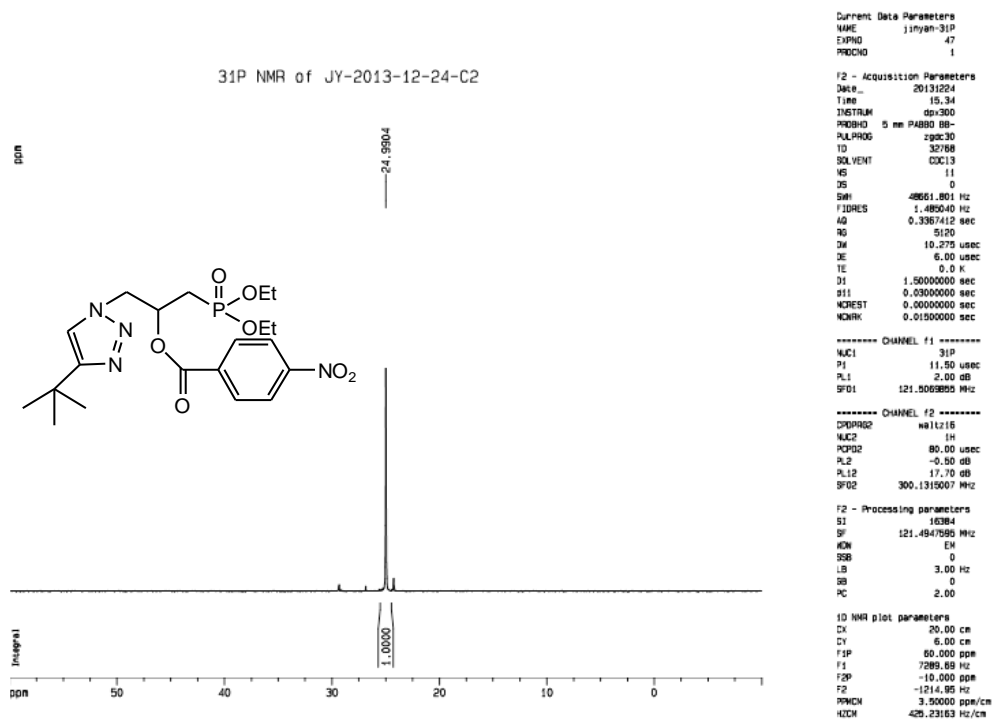
Figure S87. ^{31}P -NMR spectrum of compound 5-C2.

Figure S88. HRMS spectrum of compound 5-C2.

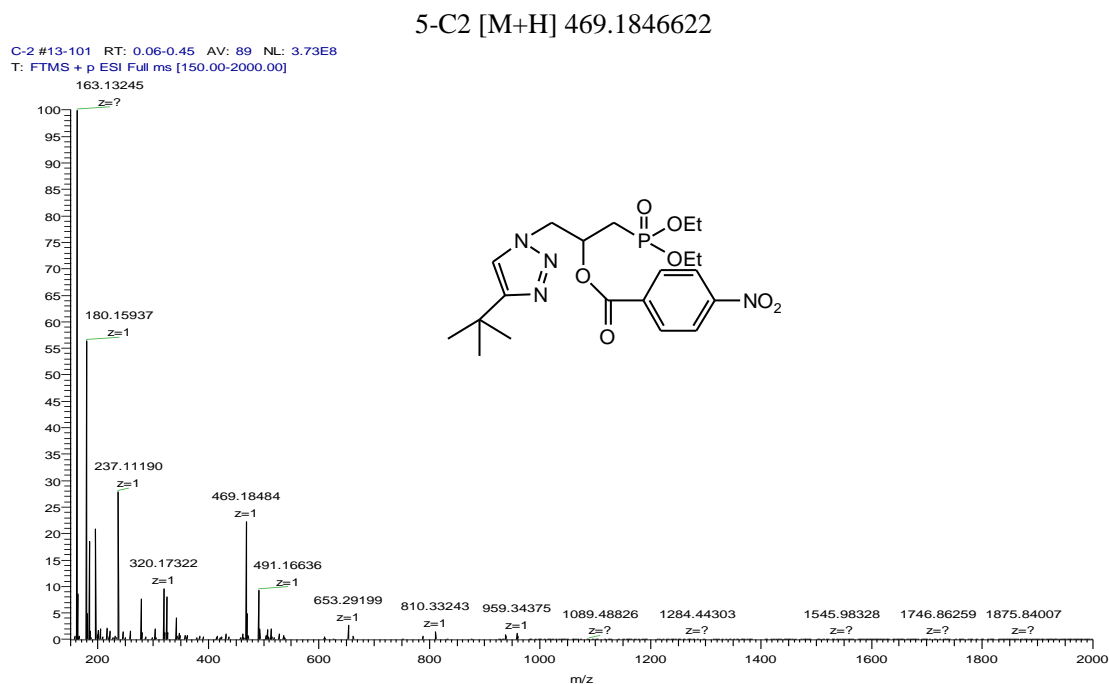


Figure S89. HRMS spectrum of compound 5-C2.

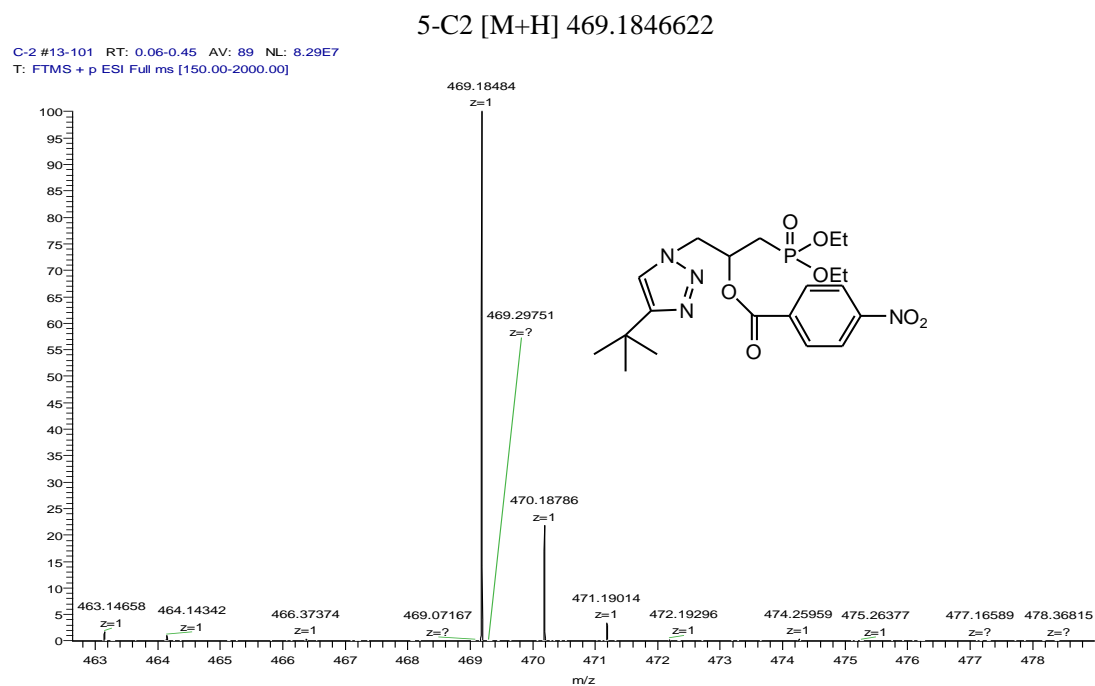
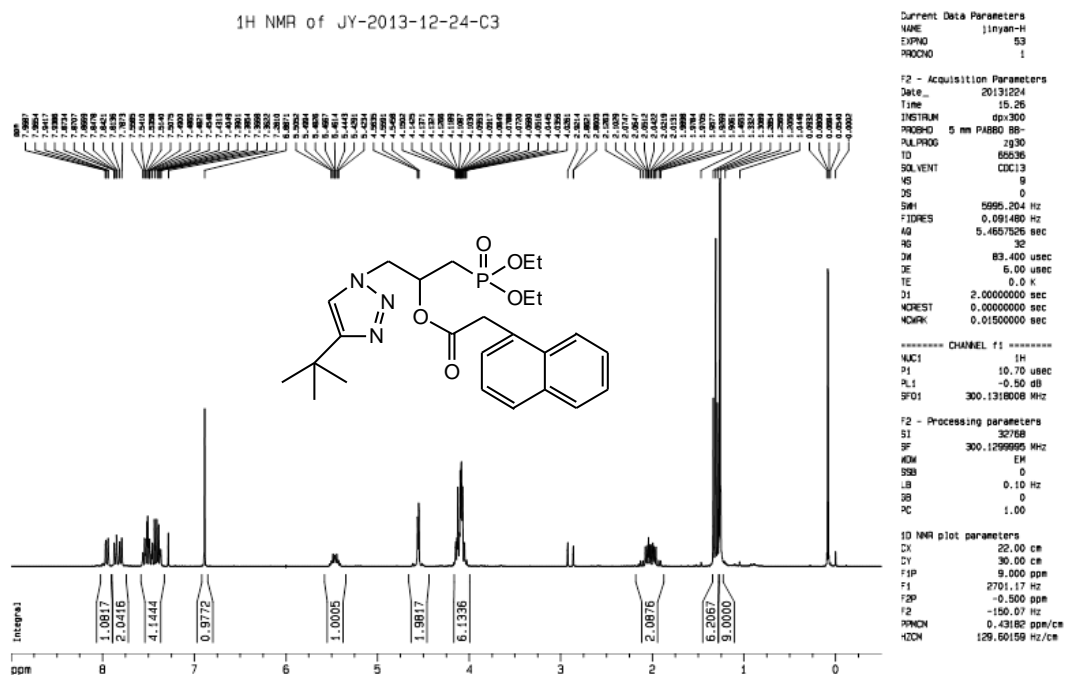
Figure S90. ¹H-NMR spectrum of compound 5-C3.

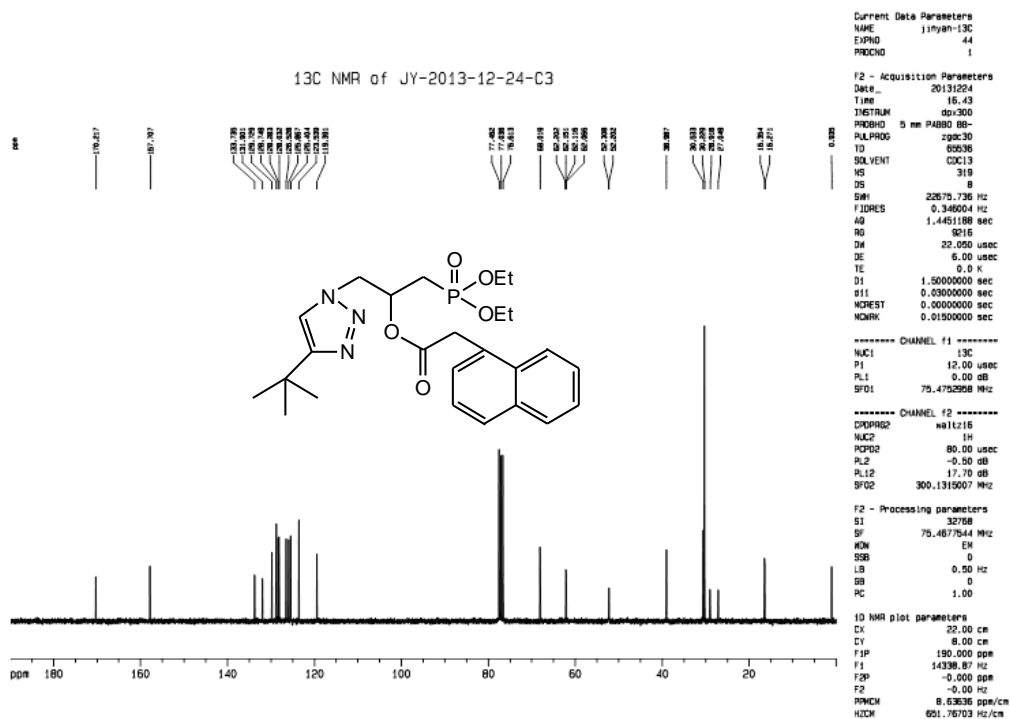
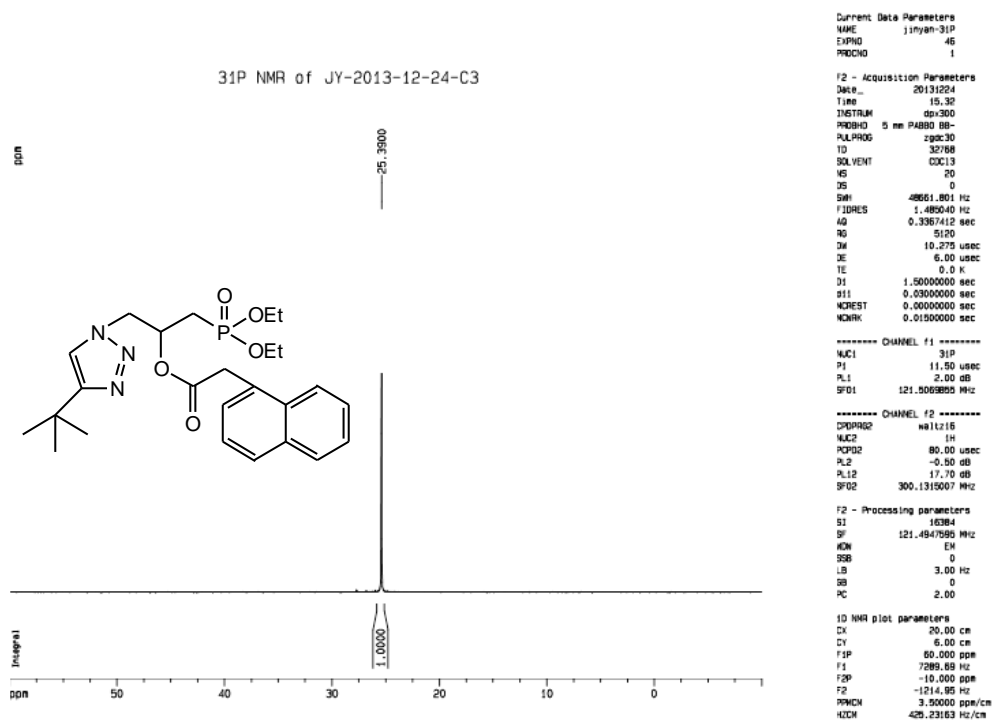
Figure S91. ^{13}C -NMR spectrum of compound 5-C3.Figure S92. ^{31}P -NMR spectrum of compound 5-C3.

Figure S93. HRMS spectrum of compound 5-C3.

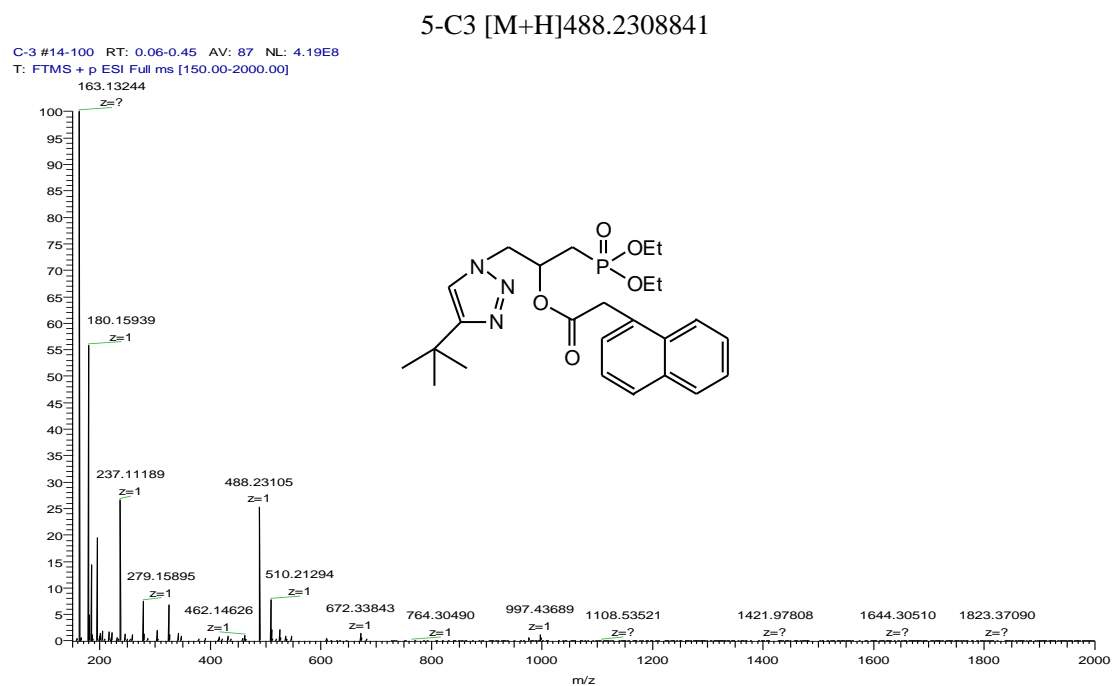


Figure S94. HRMS spectrum of compound 5-C3.

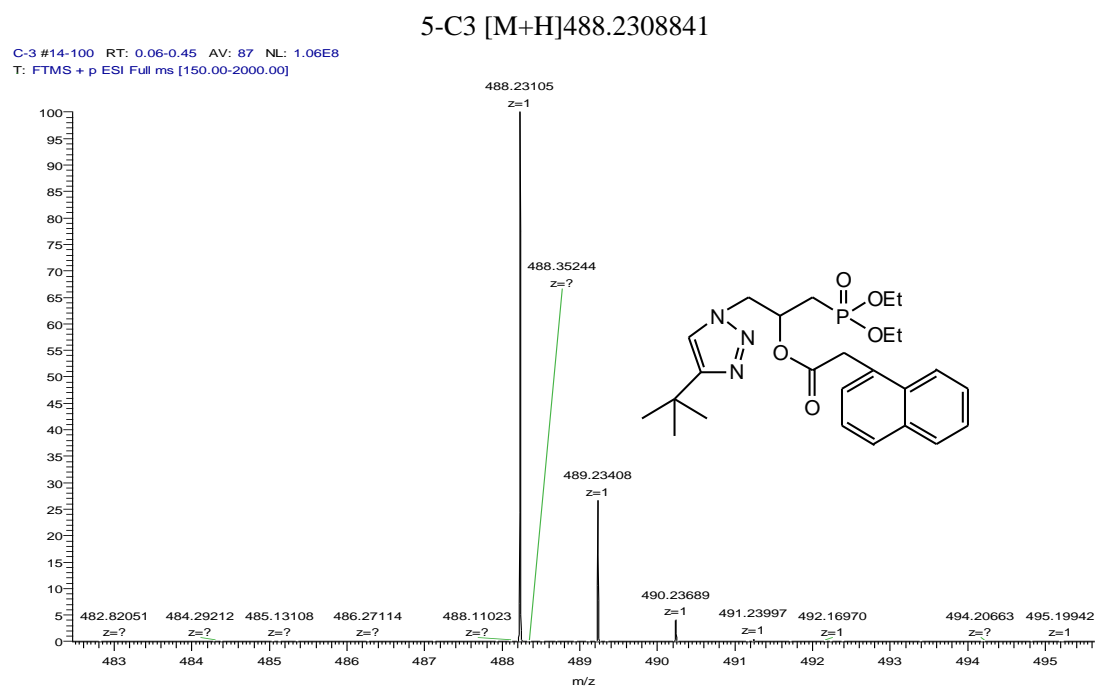


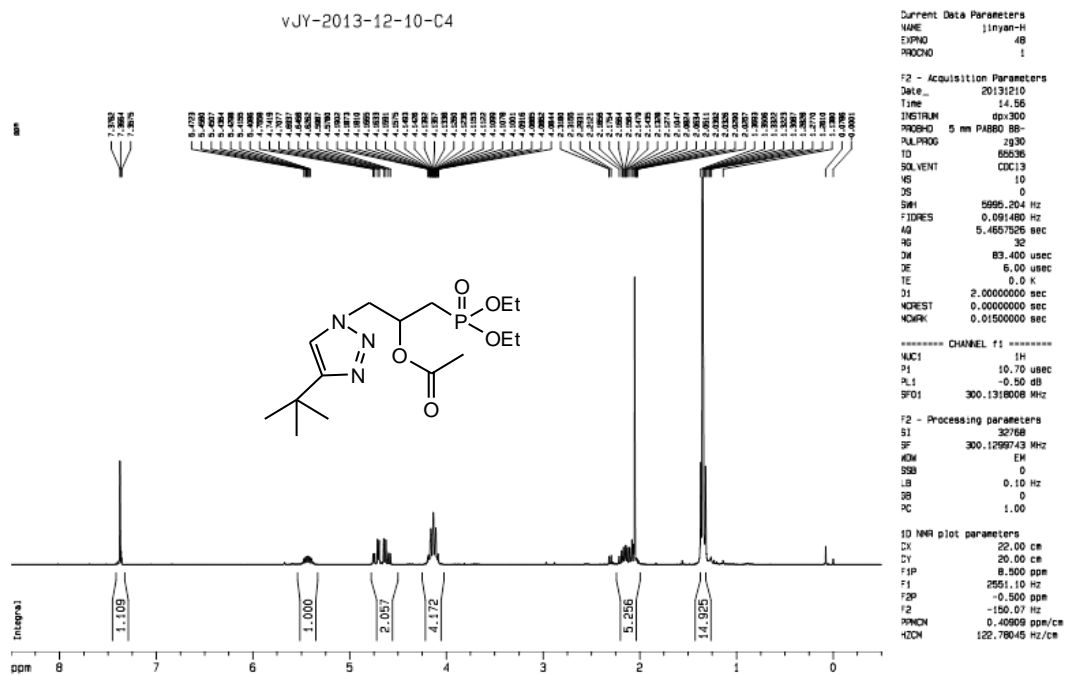
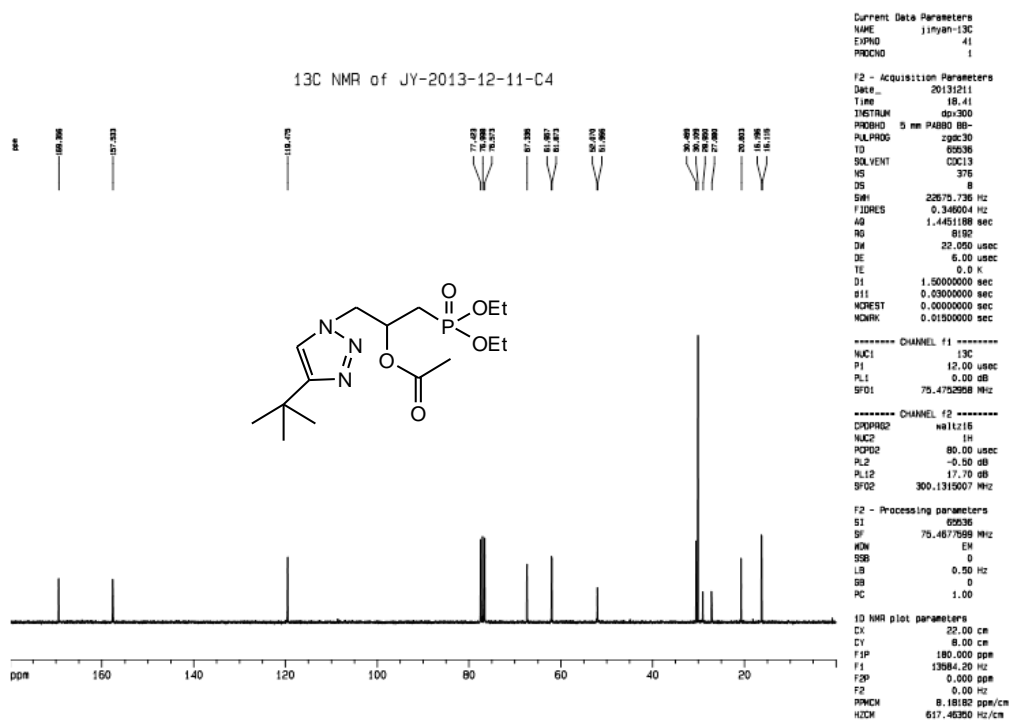
Figure S95. ¹H-NMR spectrum of compound 5-C4.Figure S96. ¹³C-NMR spectrum of compound 5-C4.

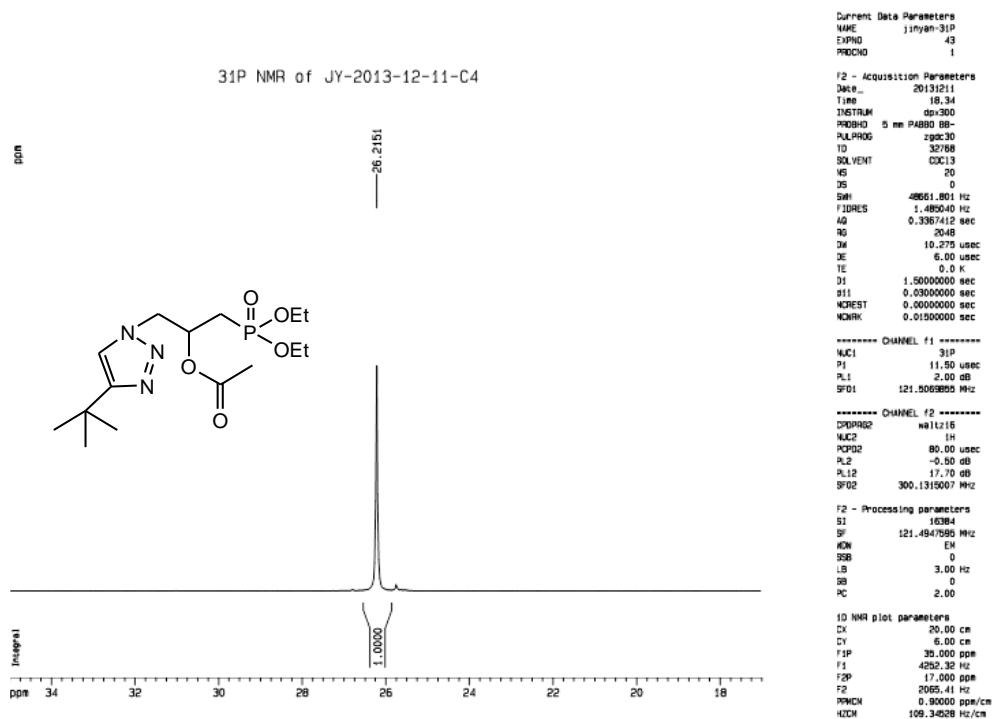
Figure S97. ^{31}P -NMR spectrum of compound 5-C4.

Figure S98. HRMS spectrum of compound 5-C4.

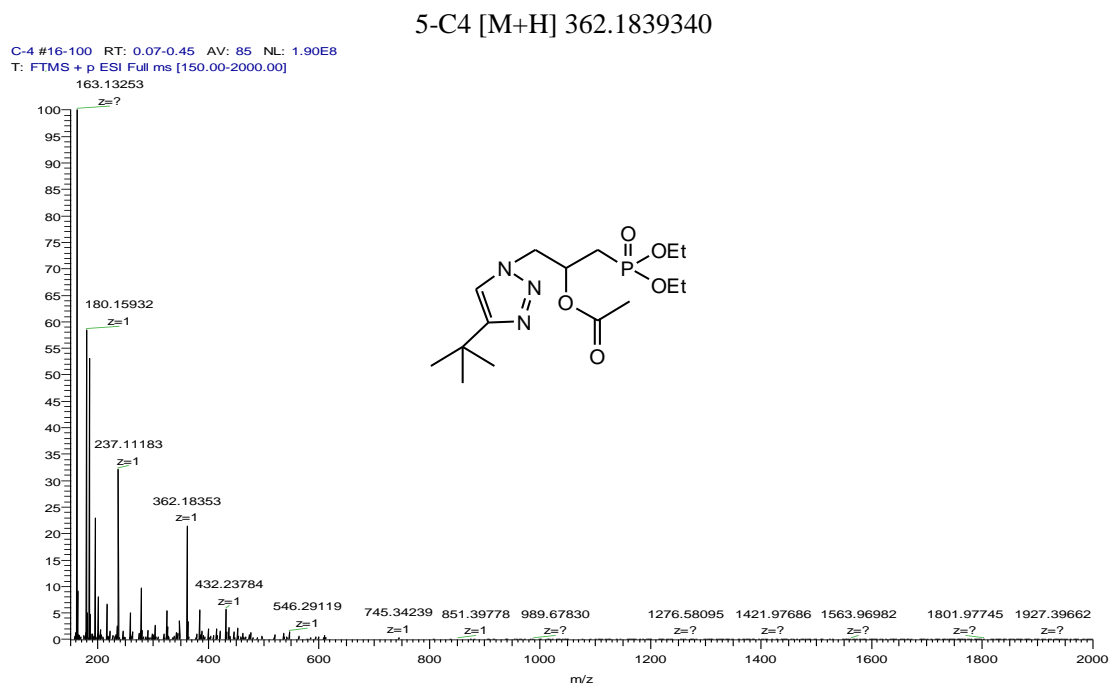


Figure S99. HRMS spectrum of compound 5-C4.

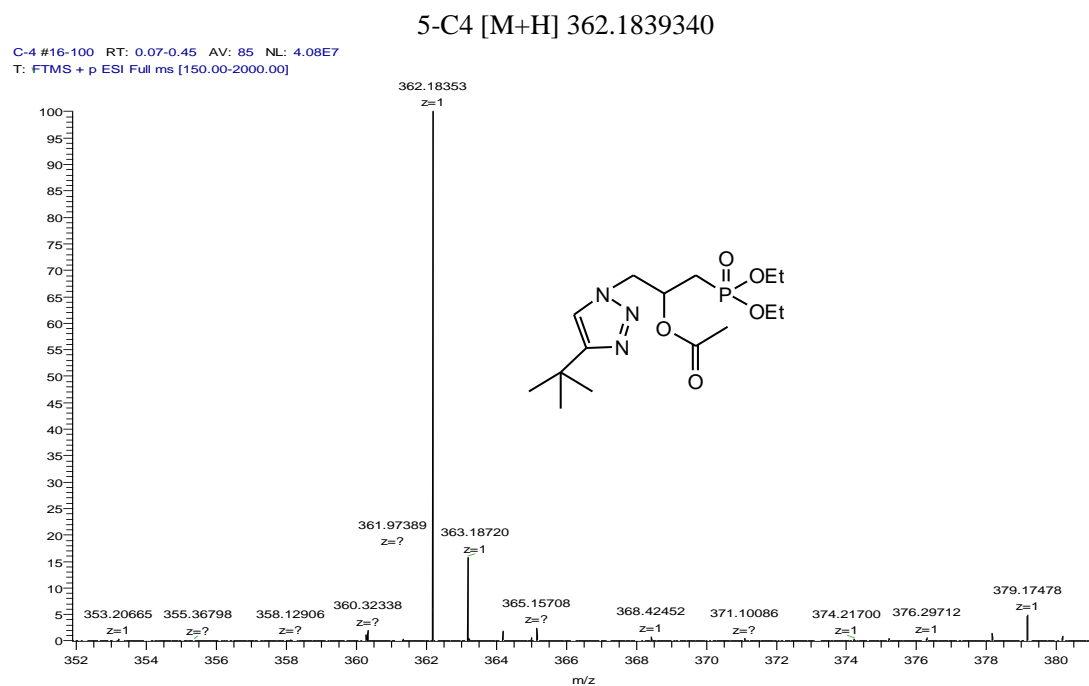
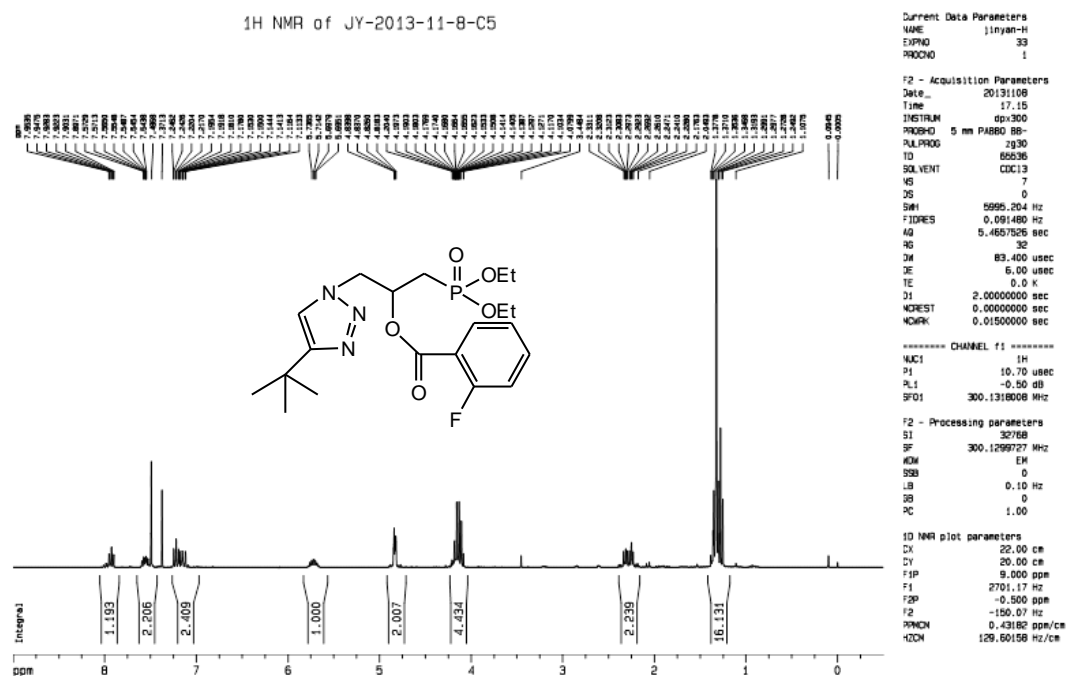
Figure S100. ¹H-NMR spectrum of compound 5-C5.

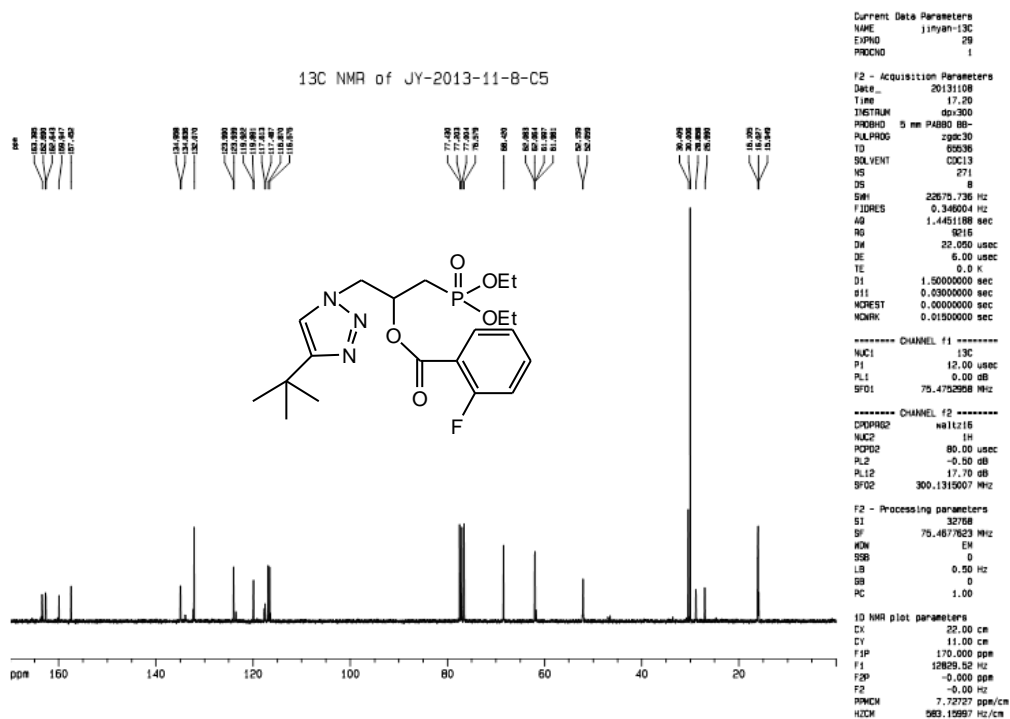
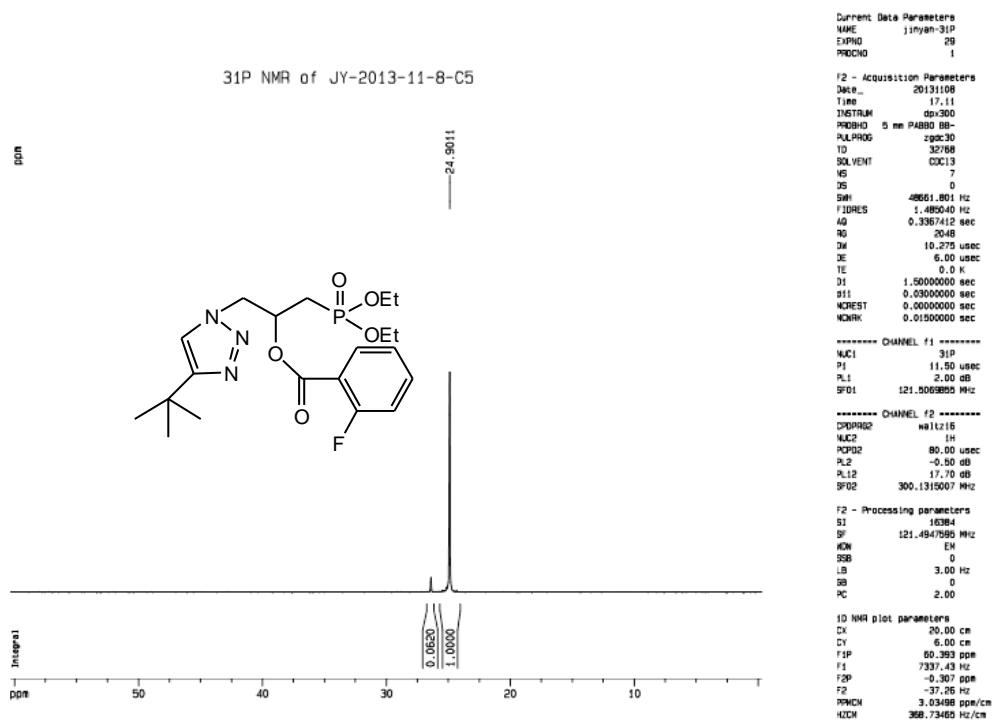
Figure S101. ^{13}C -NMR spectrum of compound 5-C5.Figure S102. ^{31}P -NMR spectrum of compound 5-C5.

Figure S103. HRMS spectrum of compound 5-C5.

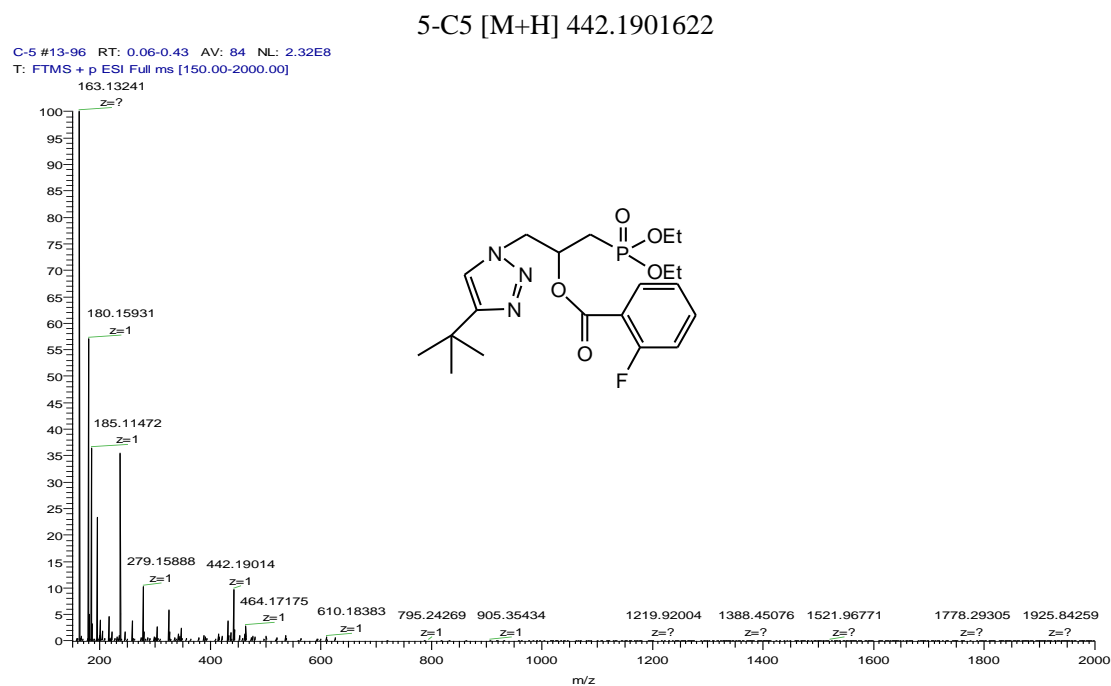


Figure S104. HRMS spectrum of compound 5-C5.

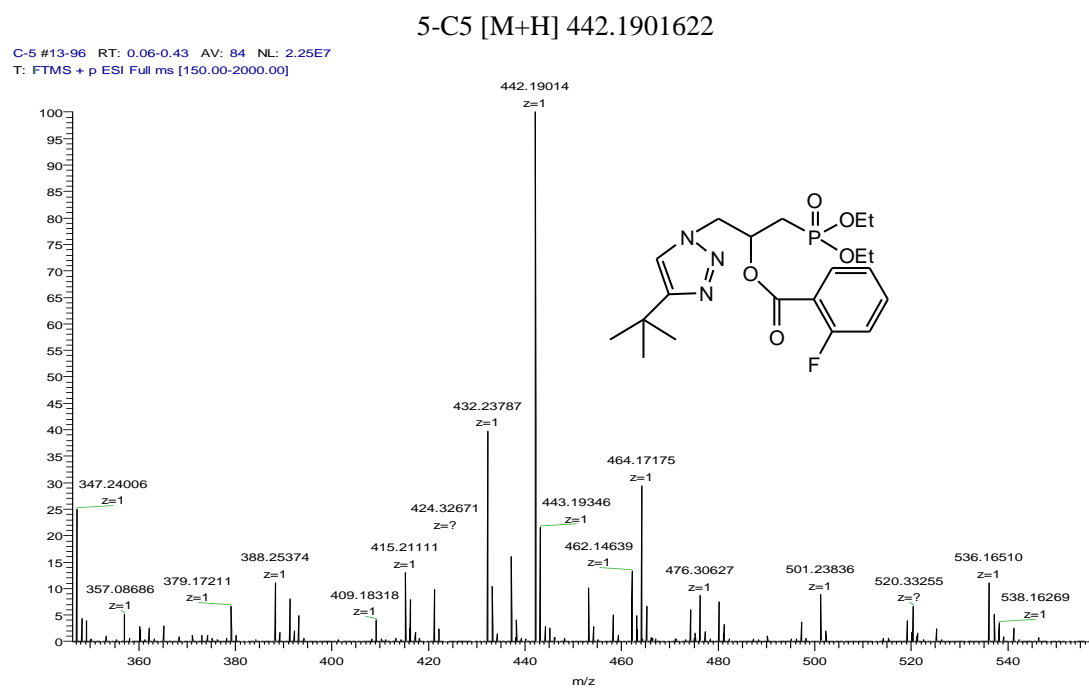


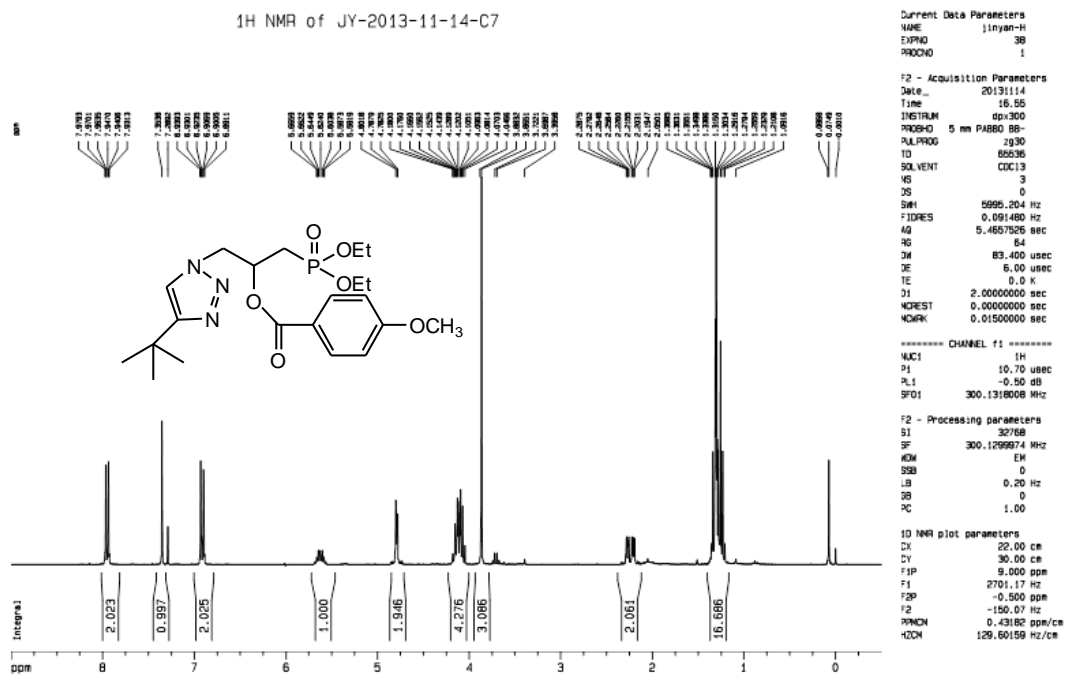
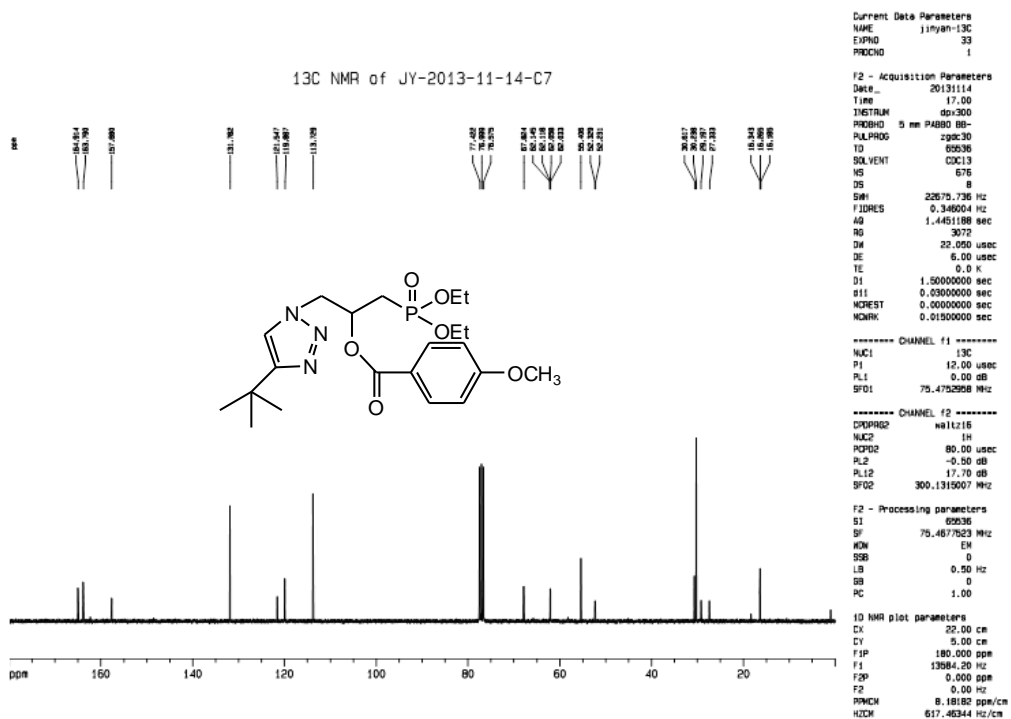
Figure S105. $^1\text{H-NMR}$ spectrum of compound 5-C6.Figure S106. $^{13}\text{C-NMR}$ spectrum of compound 5-C6.

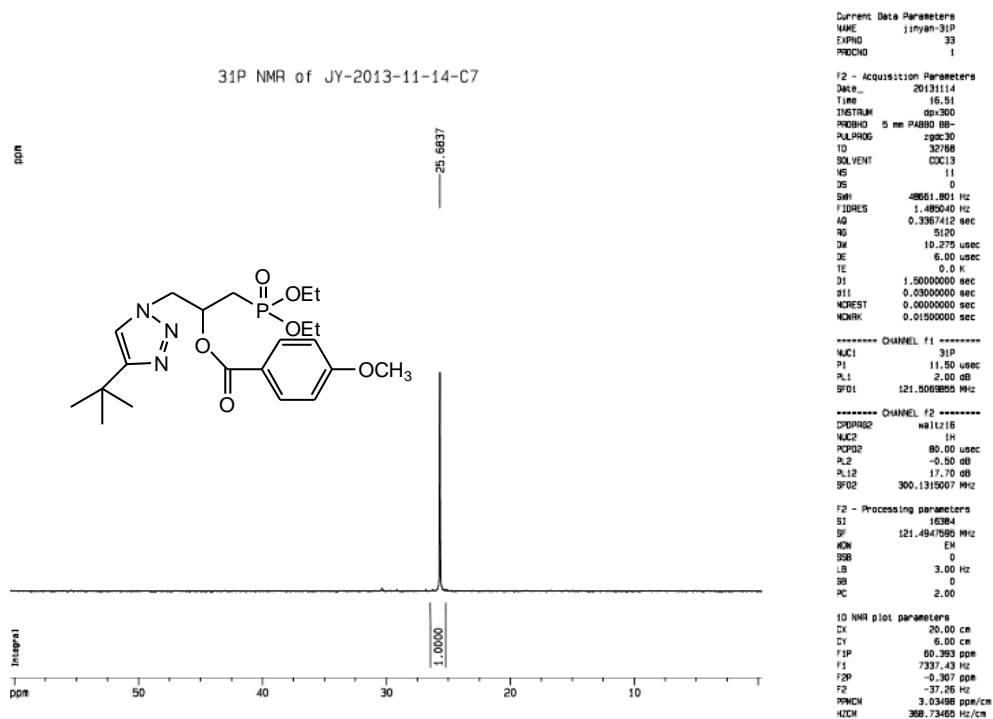
Figure S107. ^{31}P -NMR spectrum of compound 5-C6.

Figure S108. HRMS spectrum of compound 5-C6.

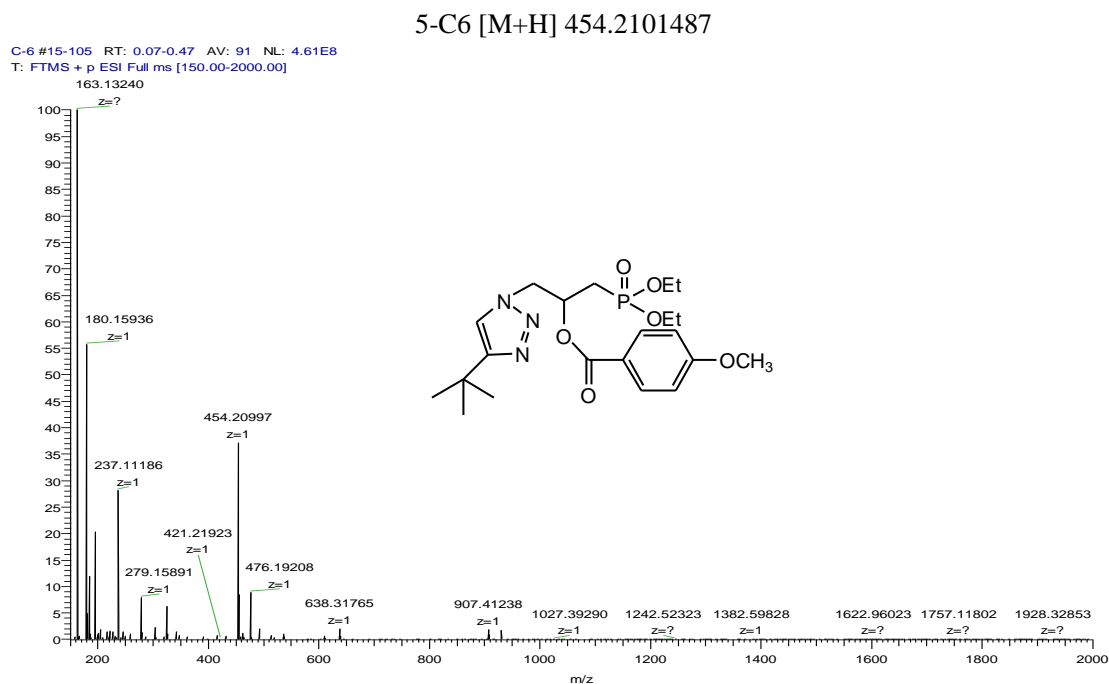


Figure S109. HRMS spectrum of compound 5-C6.

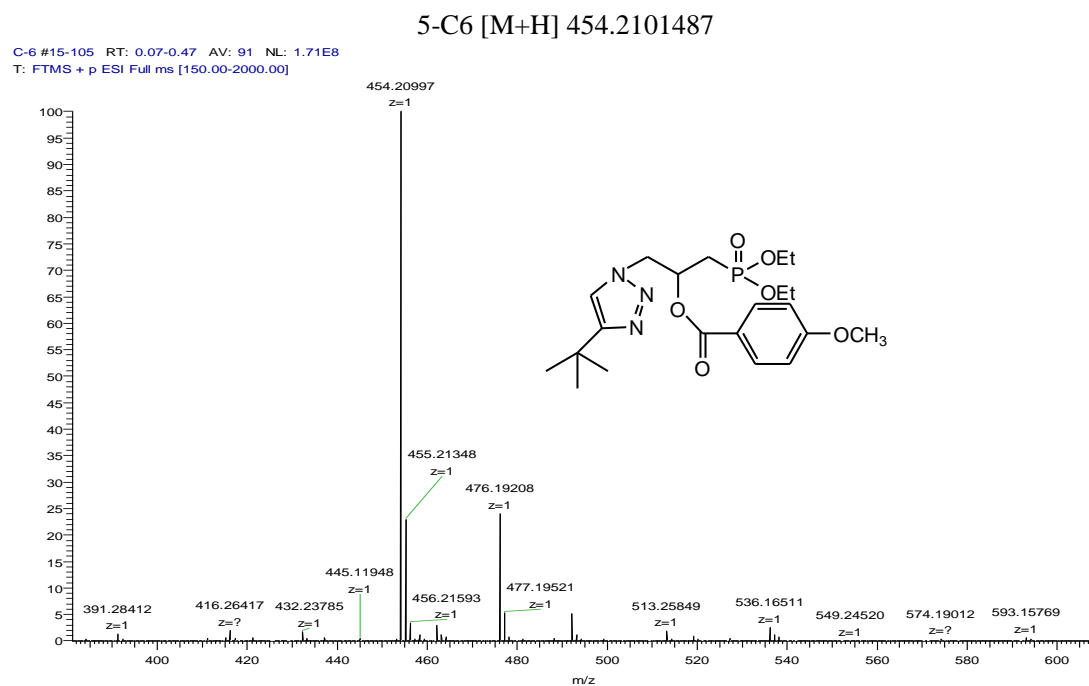
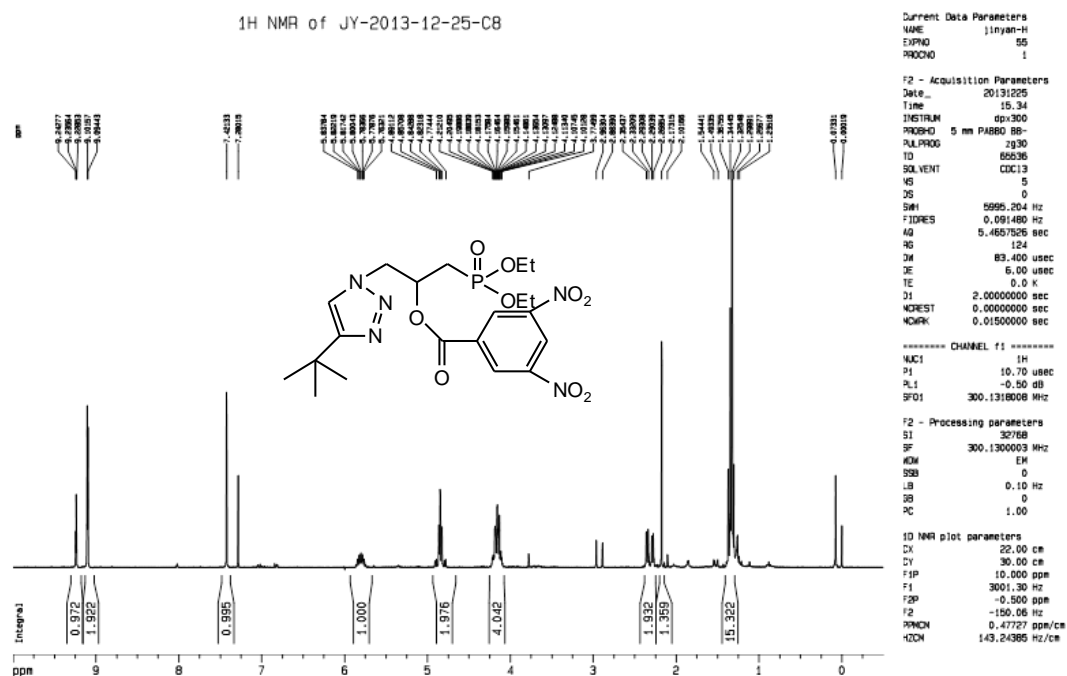
Figure S110. ¹H-NMR spectrum of compound 5-C7.

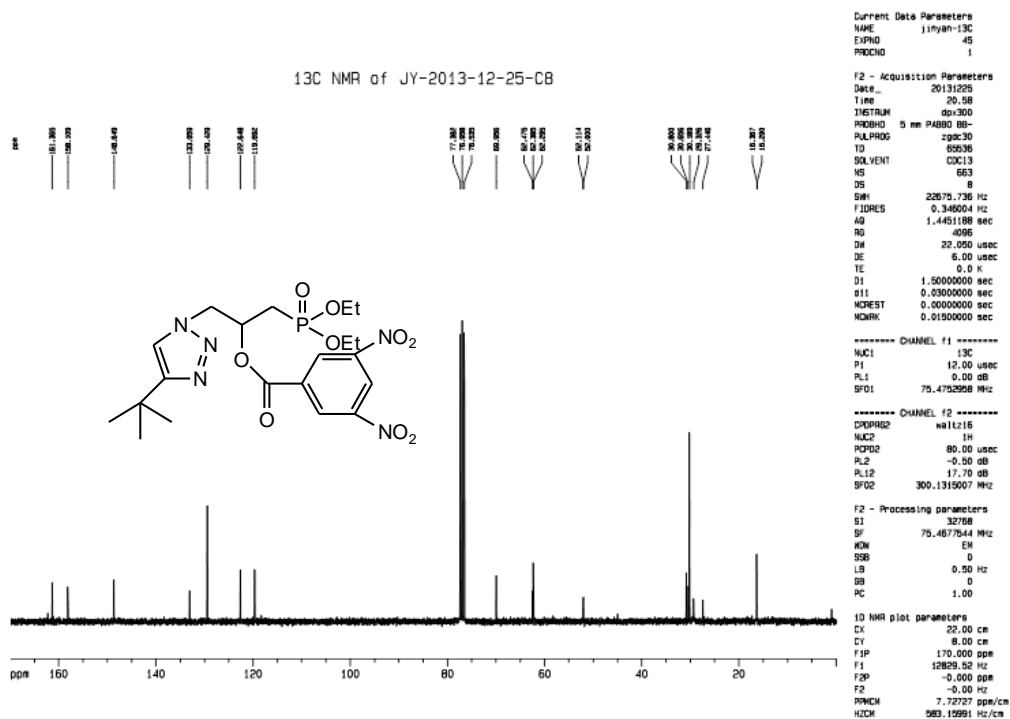
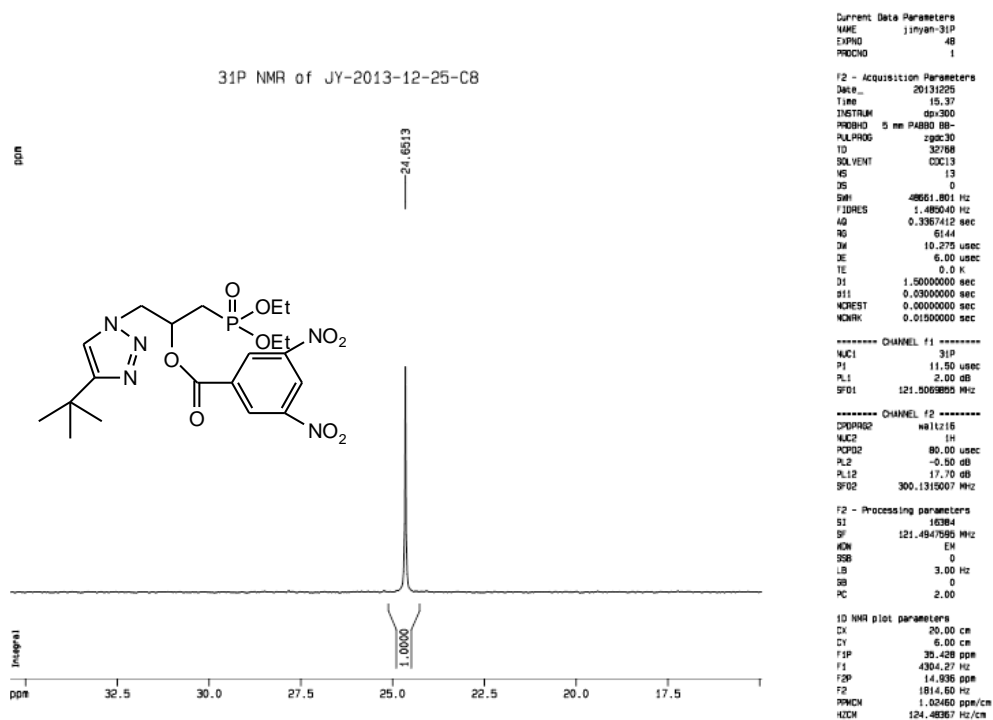
Figure S111. ^{13}C -NMR spectrum of compound 5-C7.Figure S112. ^{31}P -NMR spectrum of compound 5-C7.

Figure S113. HRMS spectrum of compound 5-C7.

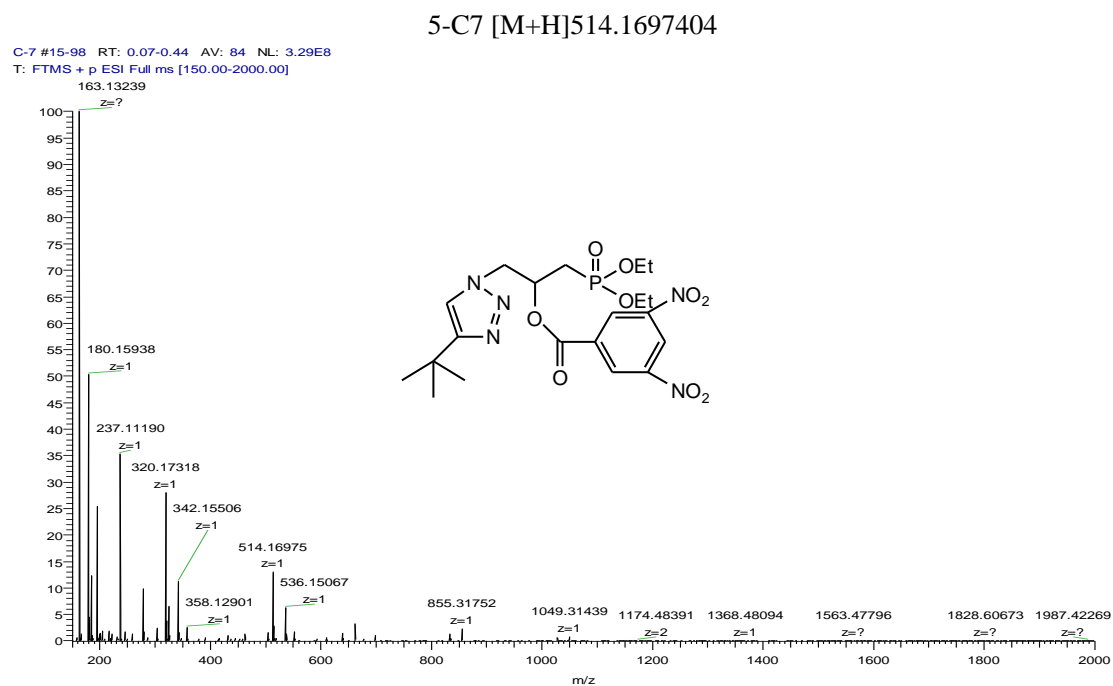


Figure S114. HRMS spectrum of compound 5-C7.

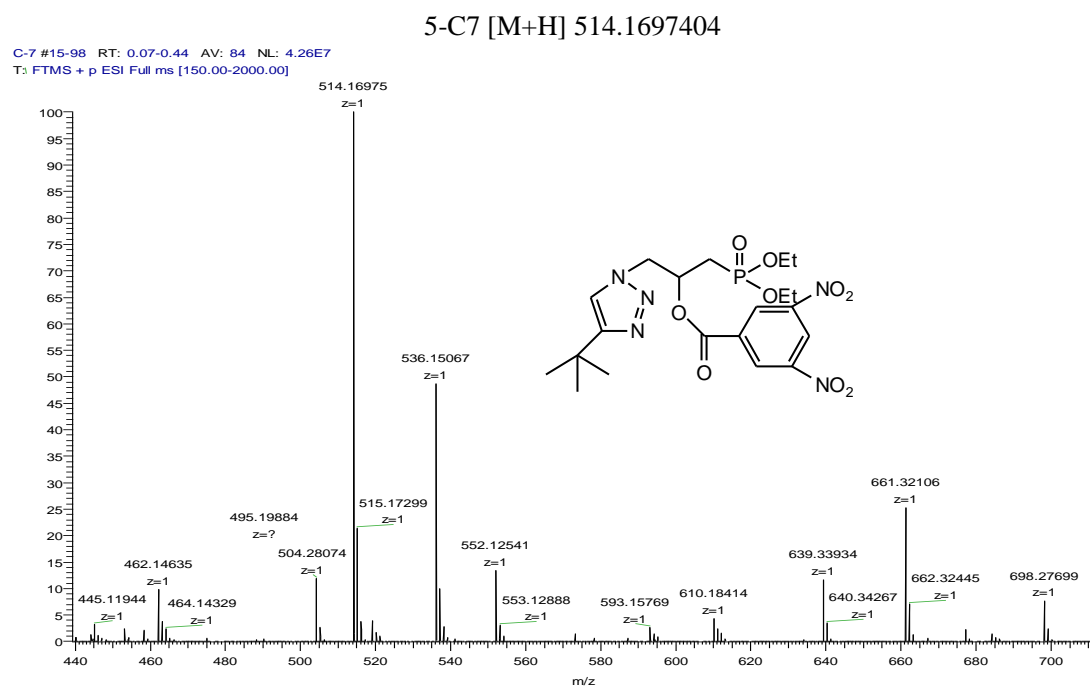


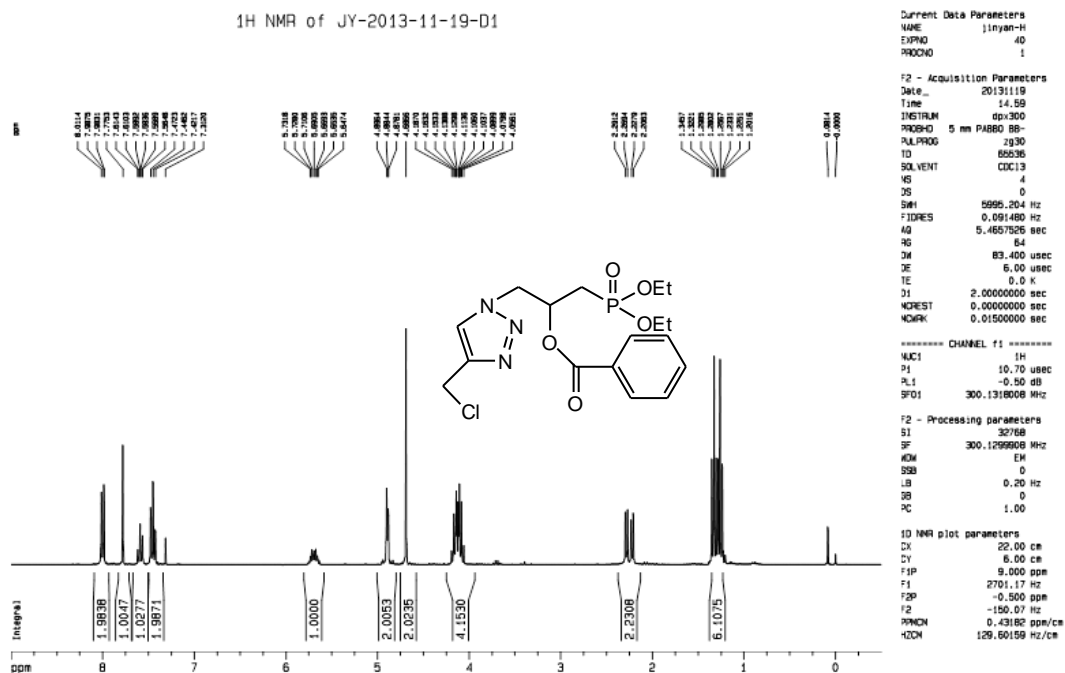
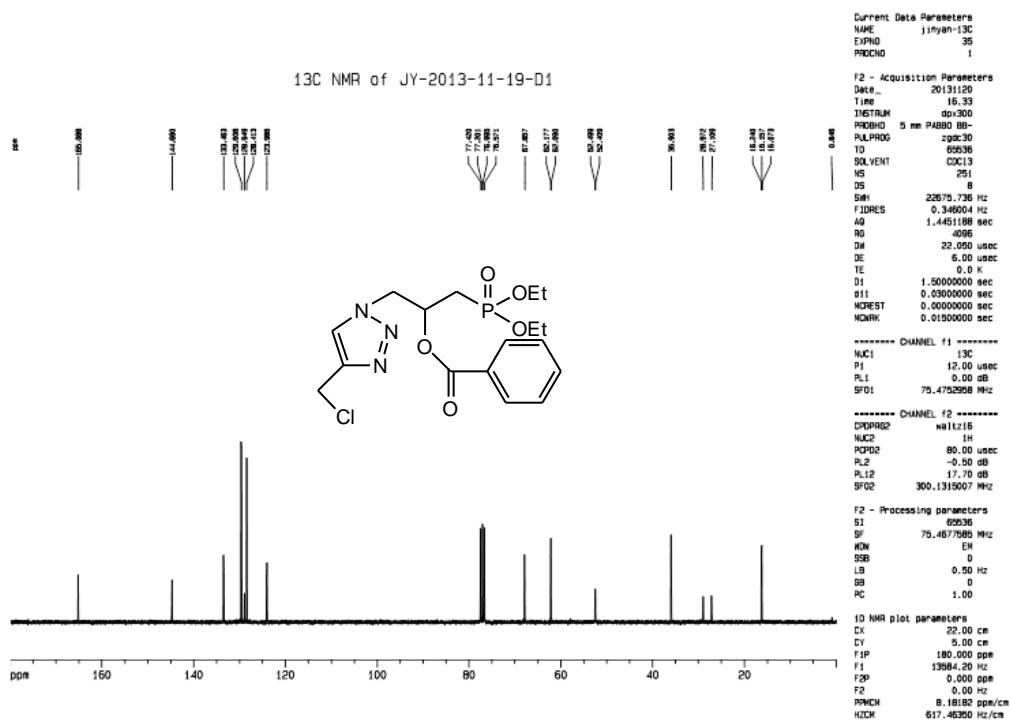
Figure S115. ¹H-NMR spectrum of compound 5-D1.Figure S116. ¹³C-NMR spectrum of compound 5-D1.

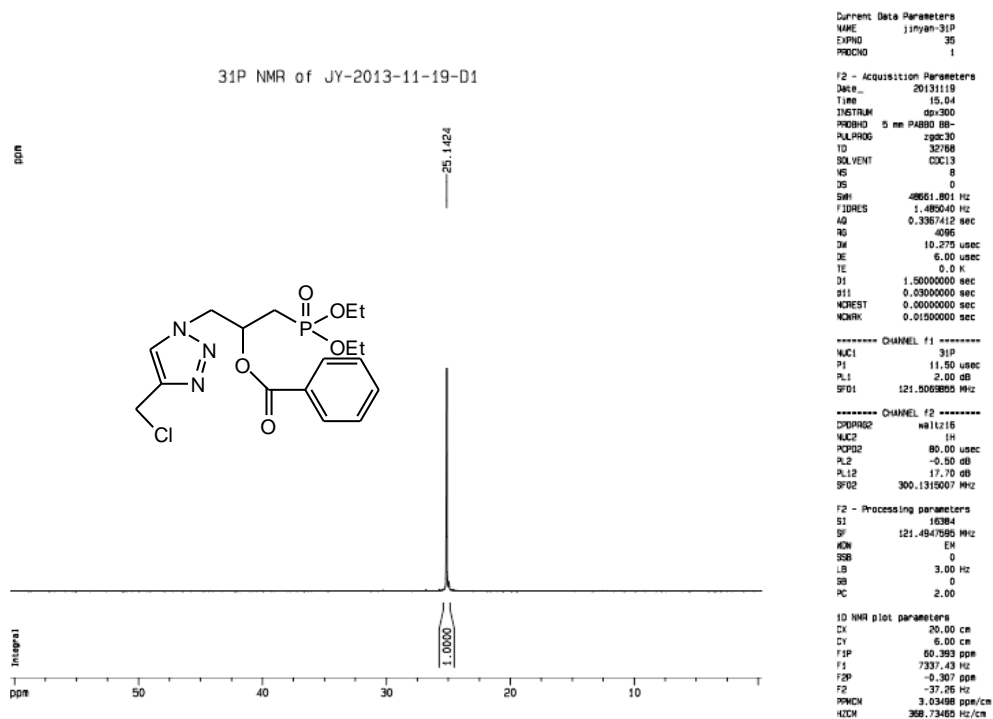
Figure S117. ^{31}P -NMR spectrum of compound 5-D1.

Figure S118. HRMS spectrum of compound 5-D1.

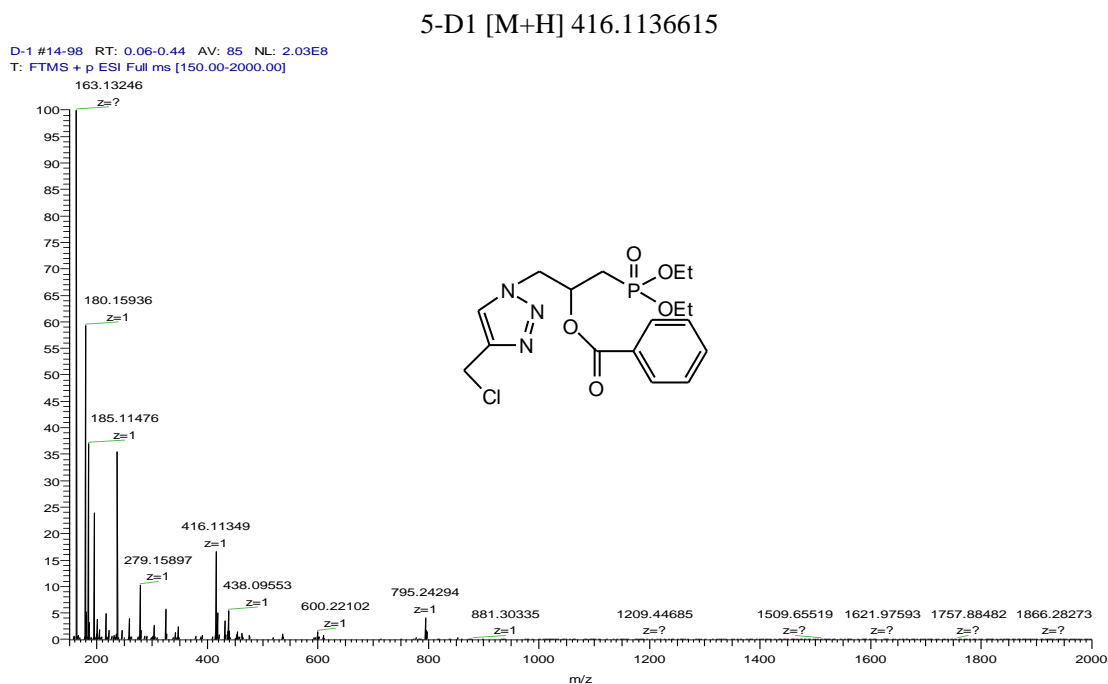


Figure S119. HRMS spectrum of compound 5-D1.

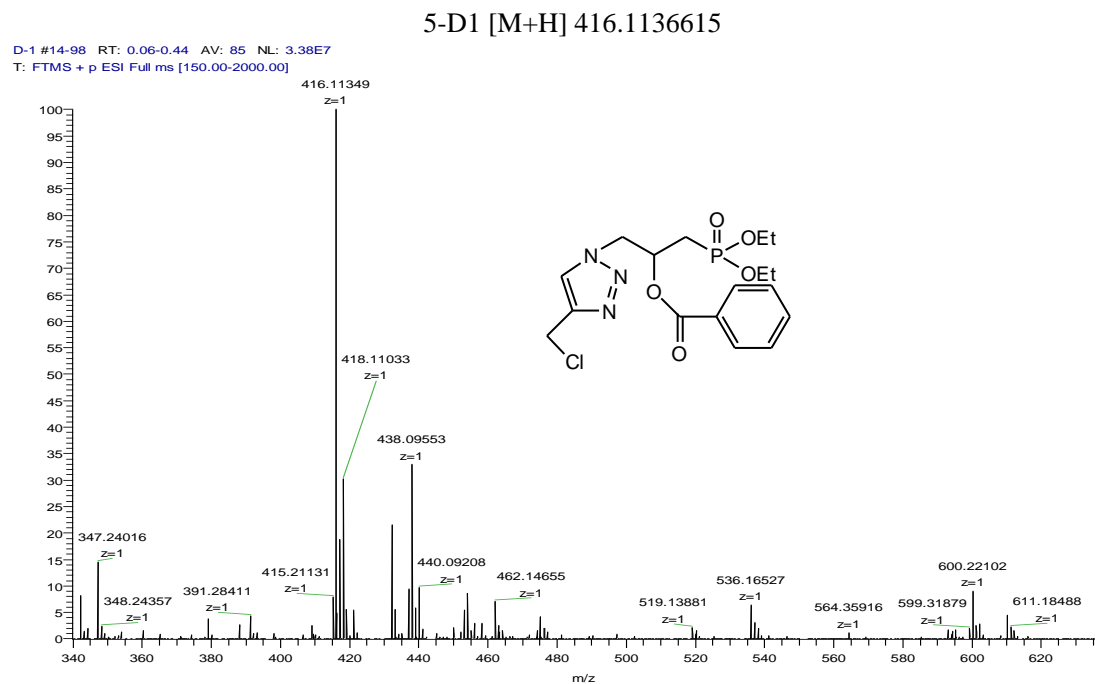
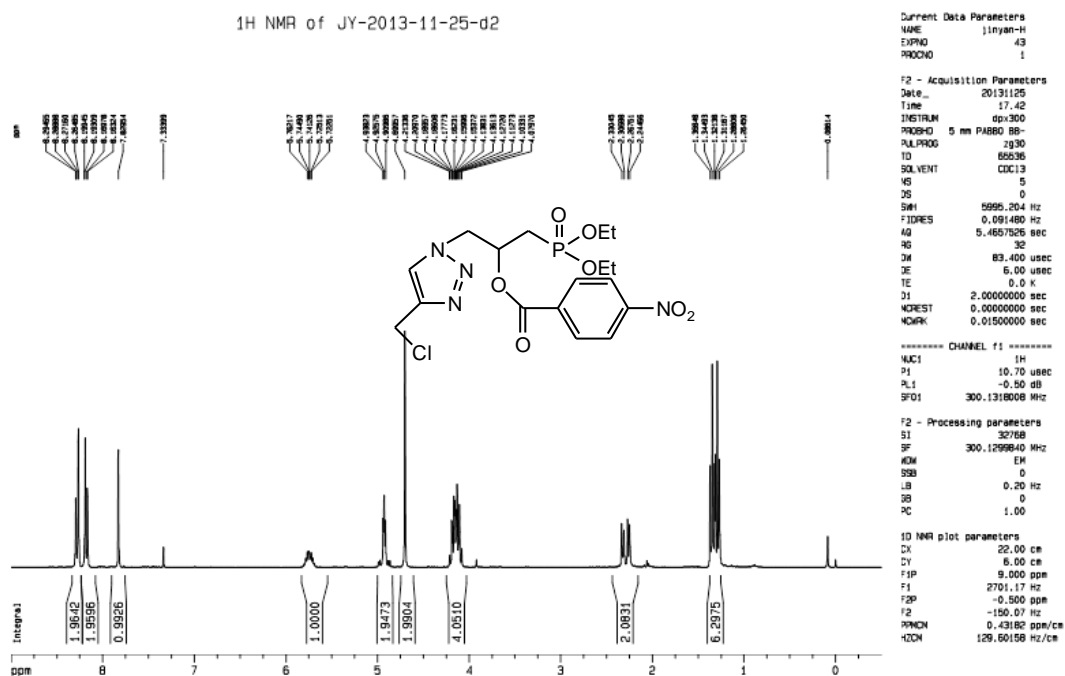
Figure S120. ¹H-NMR spectrum of compound 5-D2.

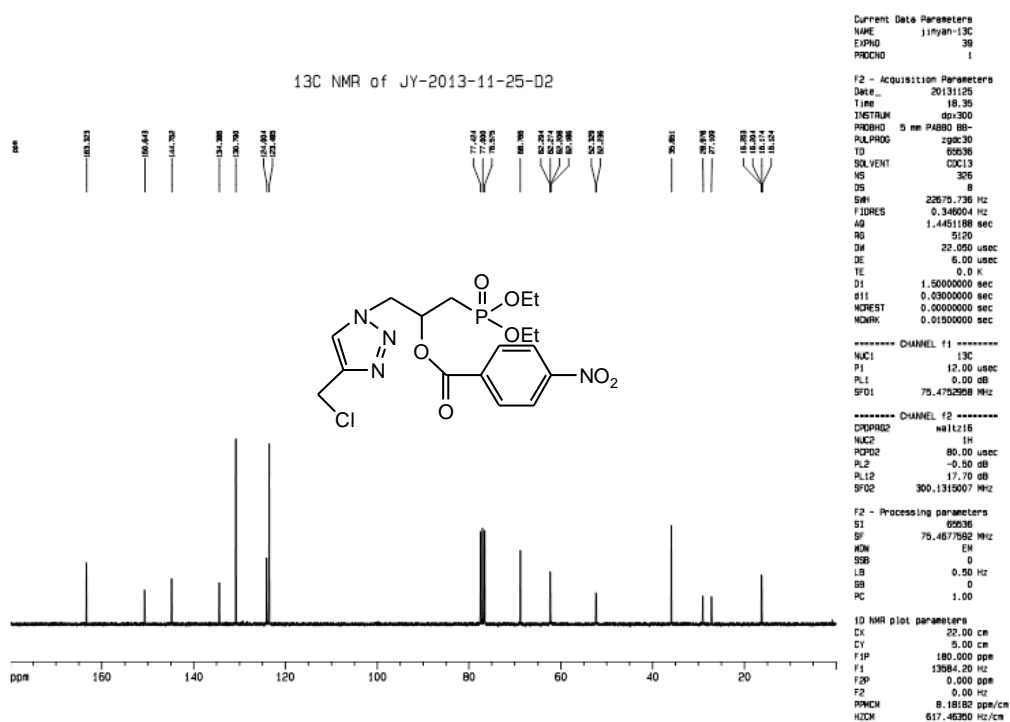
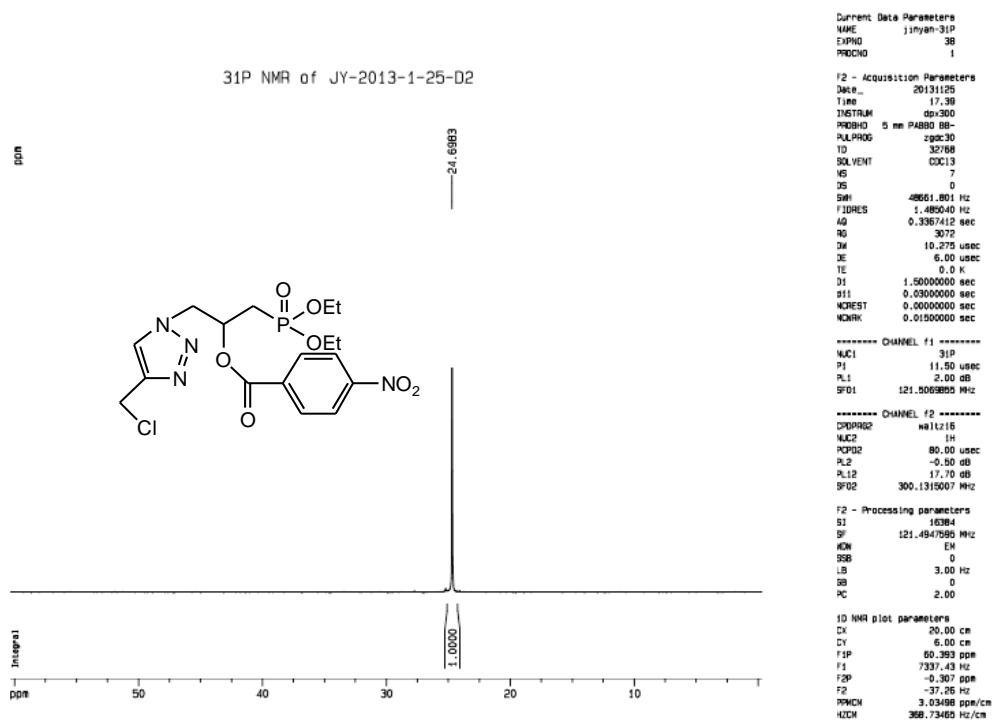
Figure S121. ^{13}C -NMR spectrum of compound 5-D2.Figure S122. ^{31}P -NMR spectrum of compound 5-D2.

Figure S123. HRMS spectrum of compound 5-D2.

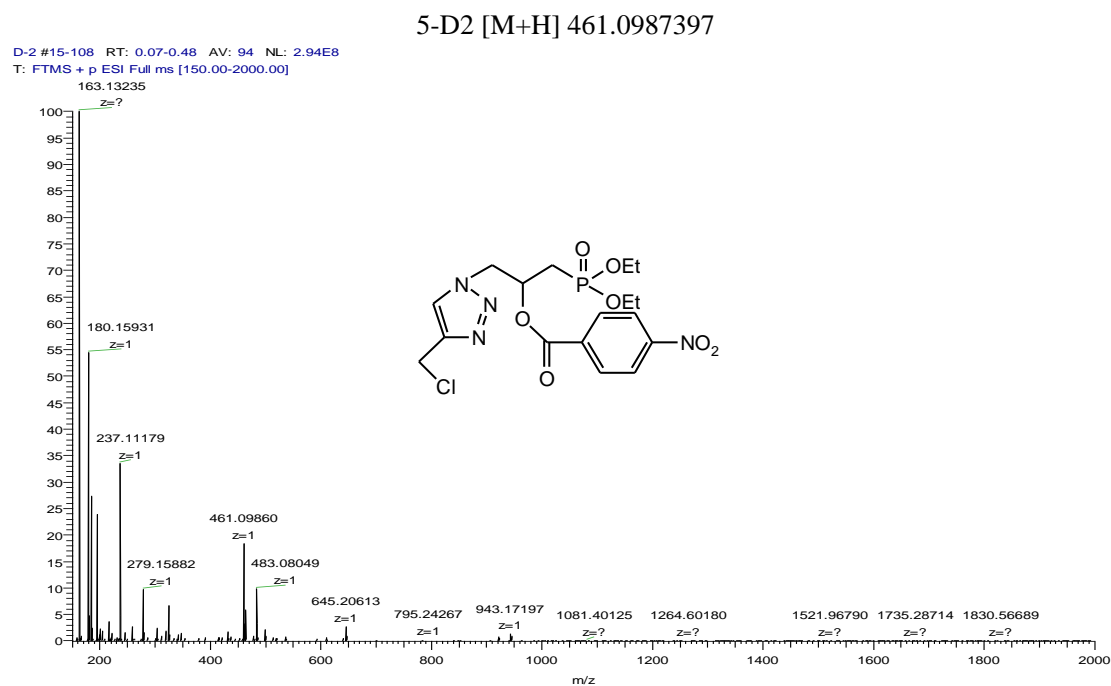


Figure S124. HRMS spectrum of compound 5-D2.

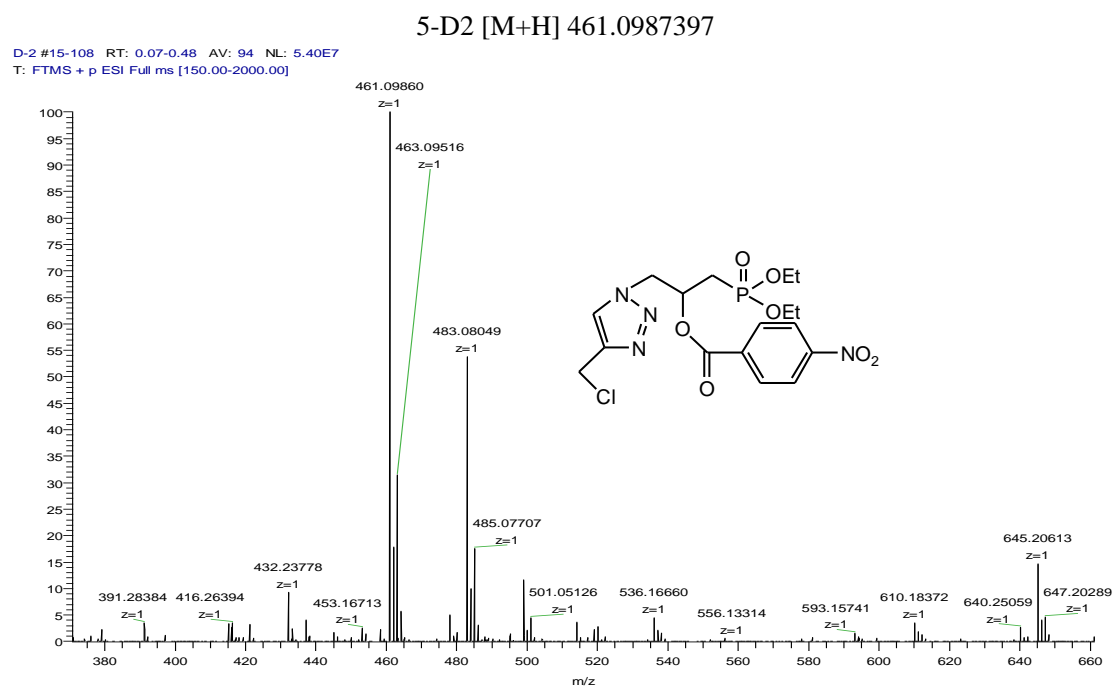


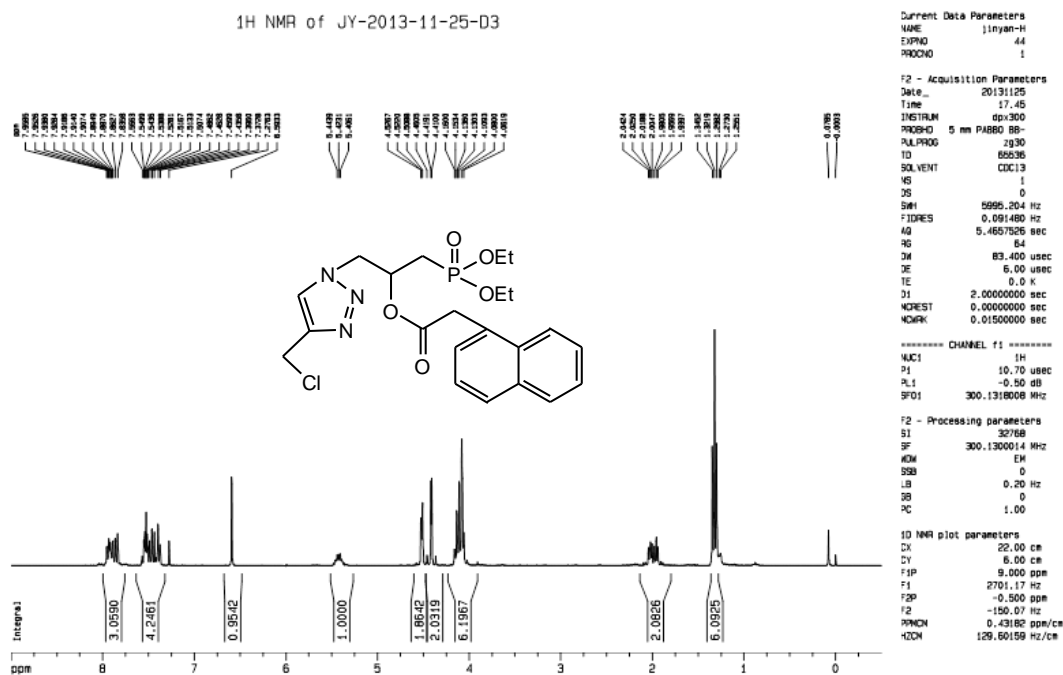
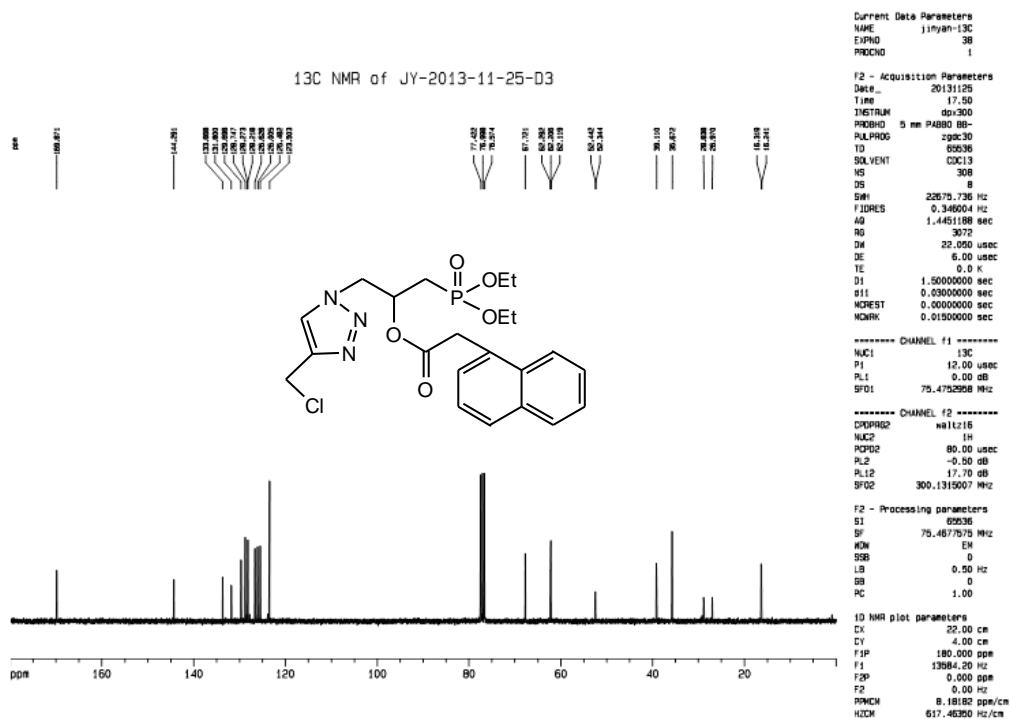
Figure S125. ^1H -NMR spectrum of compound 5-D3.Figure S126. ^{13}C -NMR spectrum of compound 5-D3.

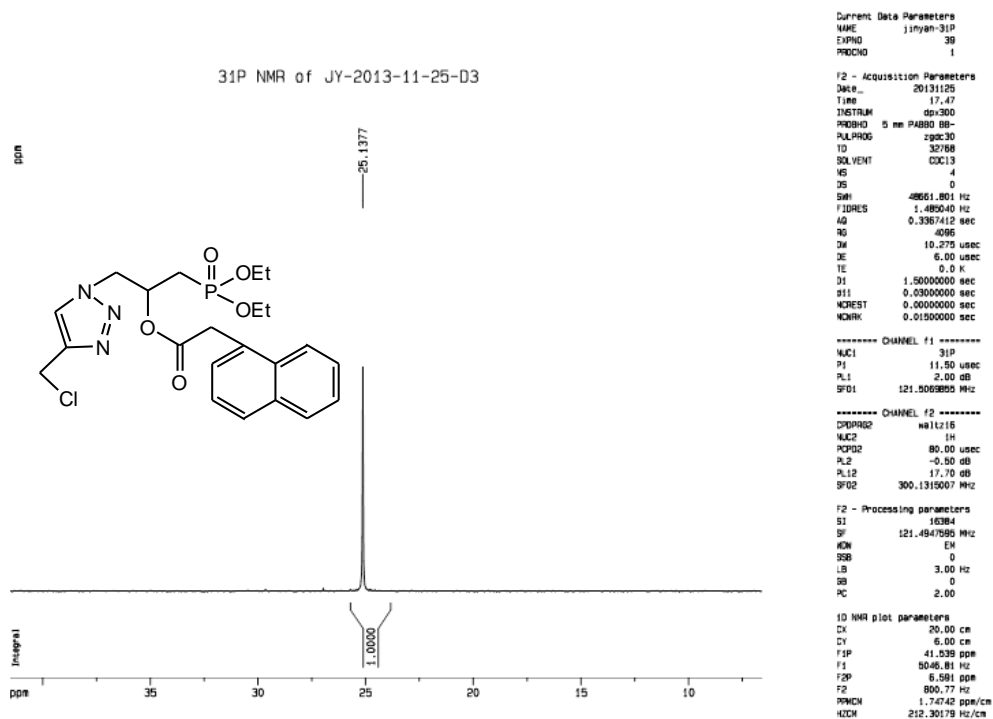
Figure S127. ^{31}P -NMR spectrum of compound 5-D3.

Figure S128. HRMS spectrum of compound 5-D3.

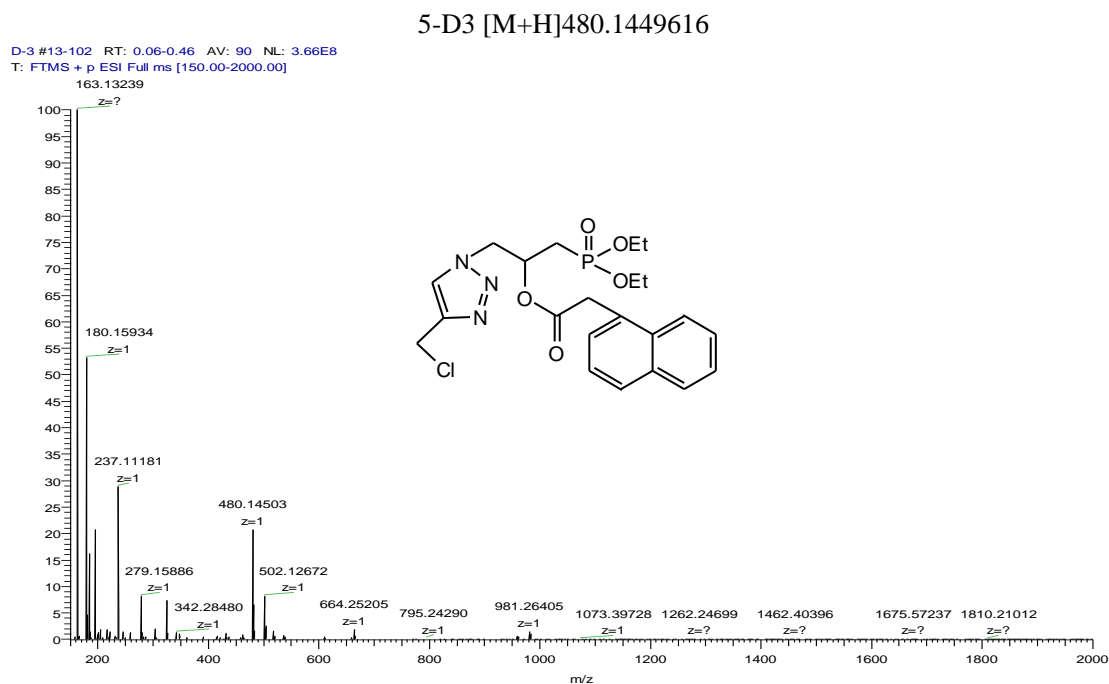


Figure S129. HRMS spectrum of compound 5-D3.

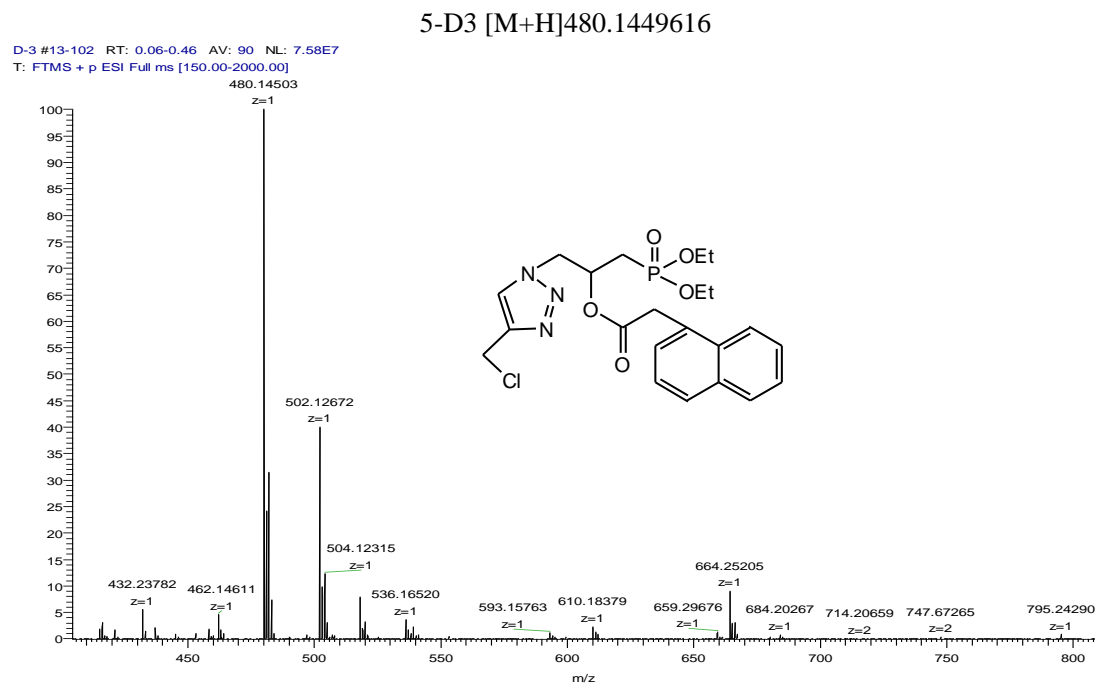
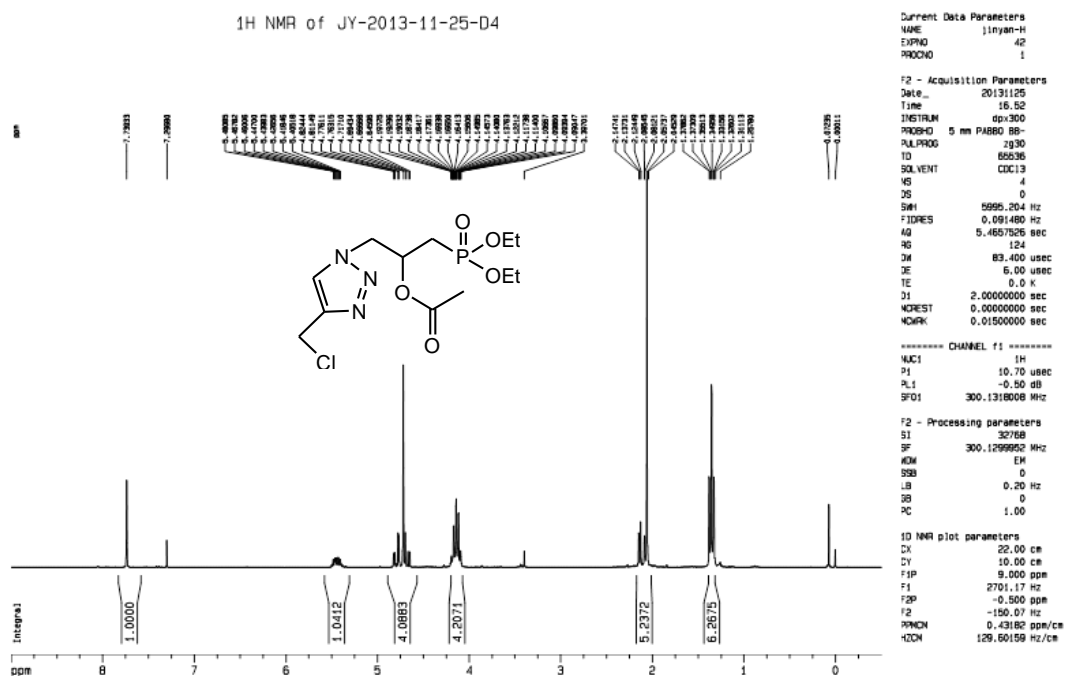
Figure S130. ¹H-NMR spectrum of compound 5-D4.

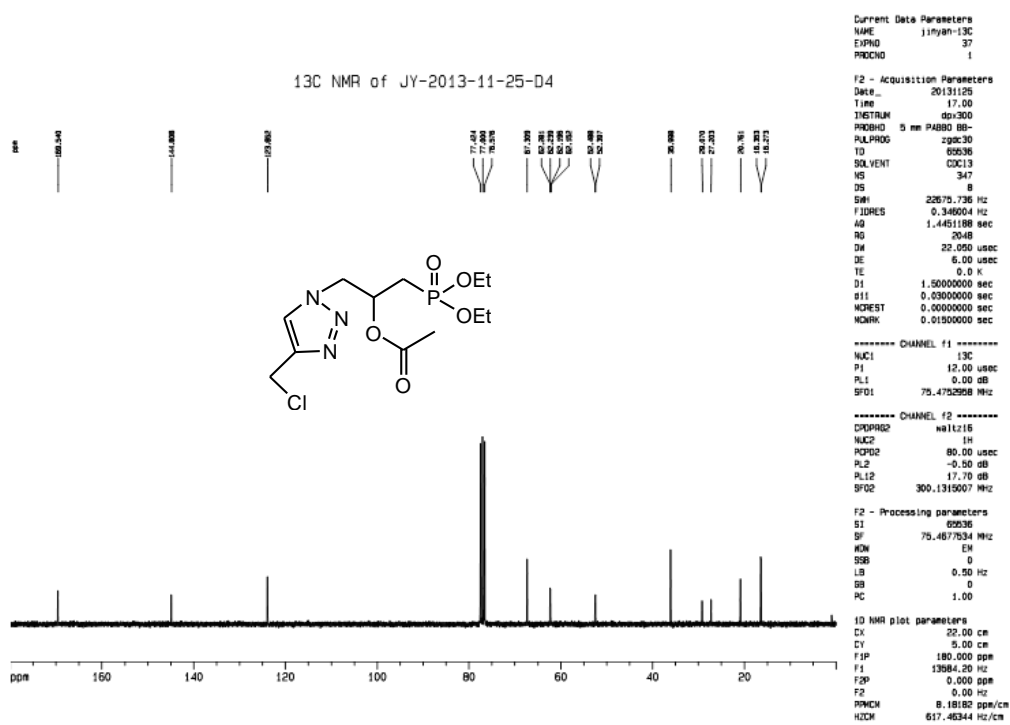
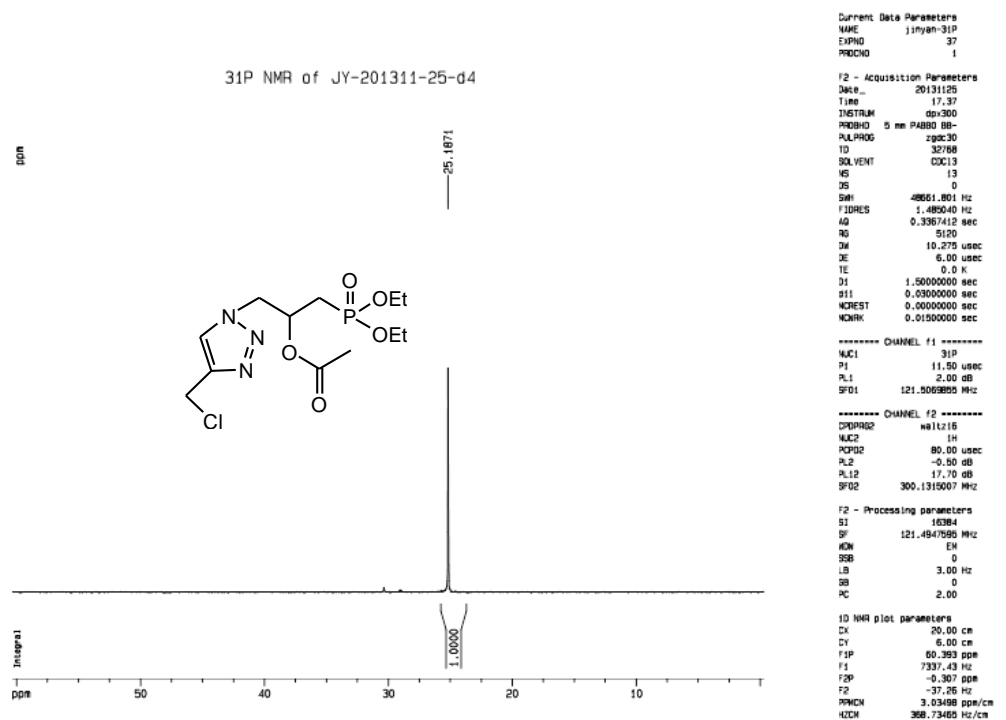
Figure S131. ^{13}C -NMR spectrum of compound 5-D4.Figure S132. ^{31}P -NMR spectrum of compound 5-D4.

Figure S133. HRMS spectrum of compound 5-D4.

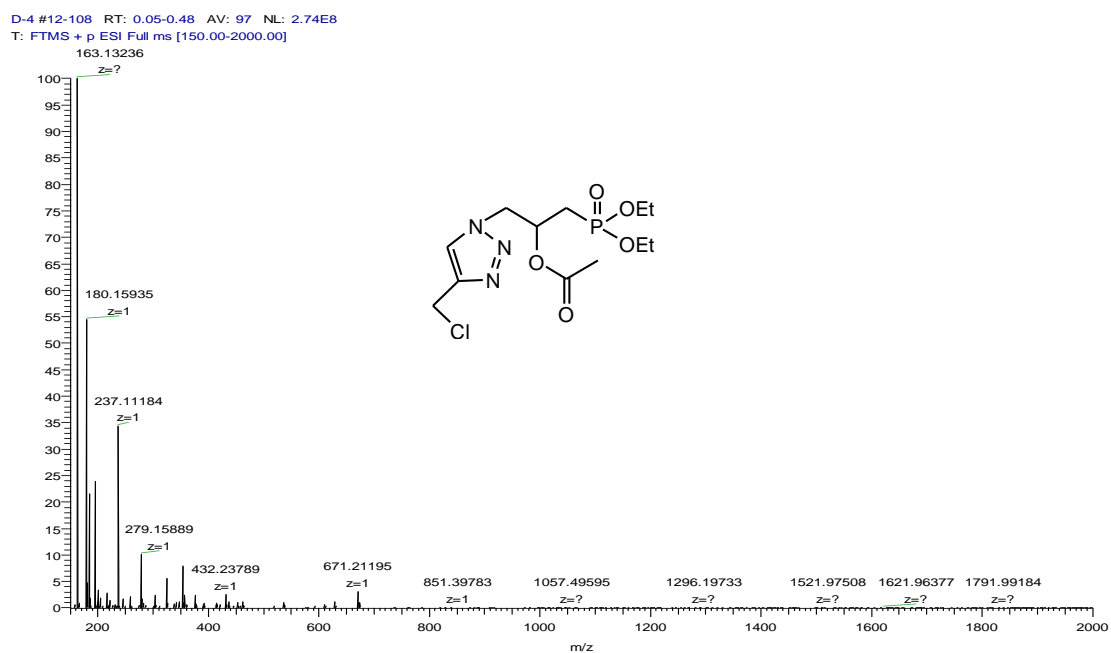
5-D4 [M+H]⁺354.0980115

Figure S134. HRMS spectrum of compound 5-D4.

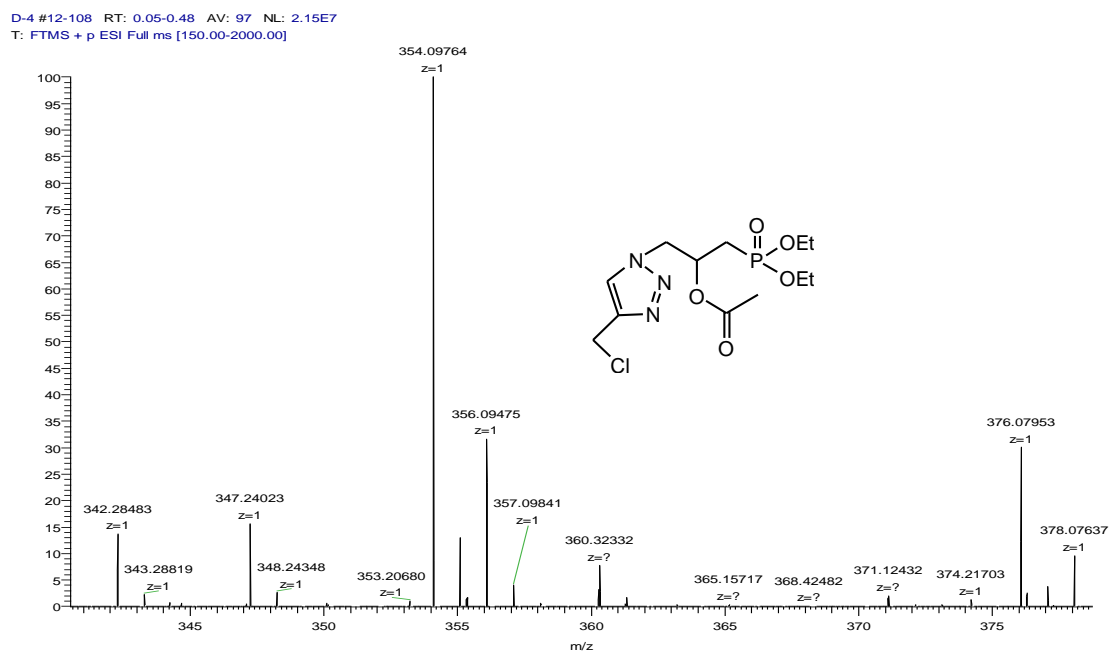
5-D4 [M+H]⁺354.0980115

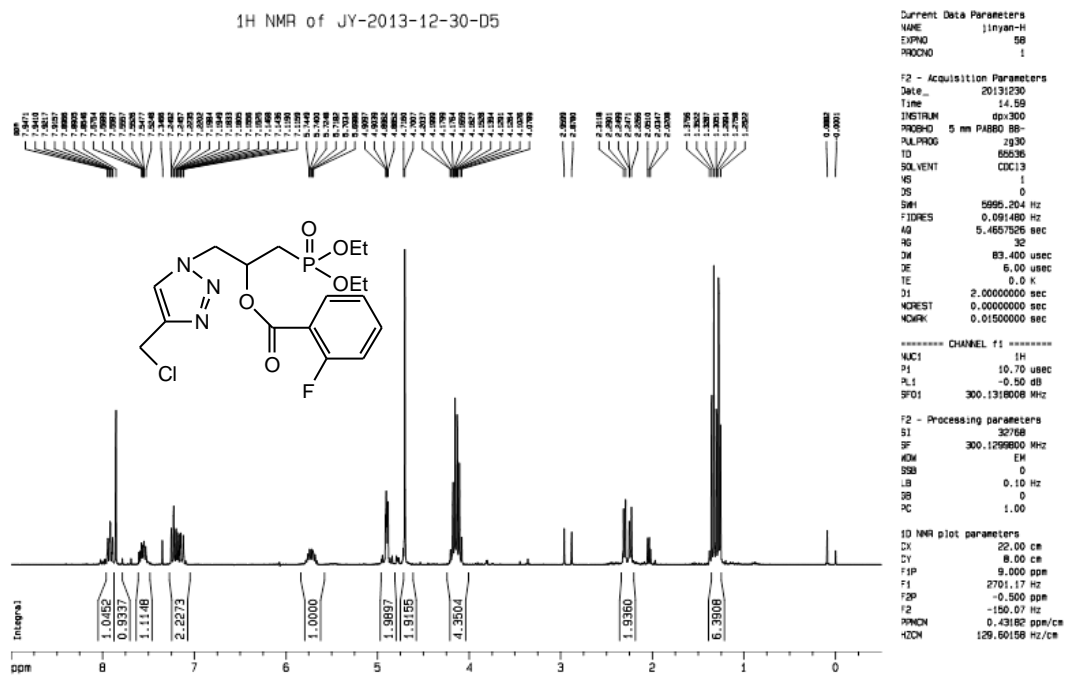
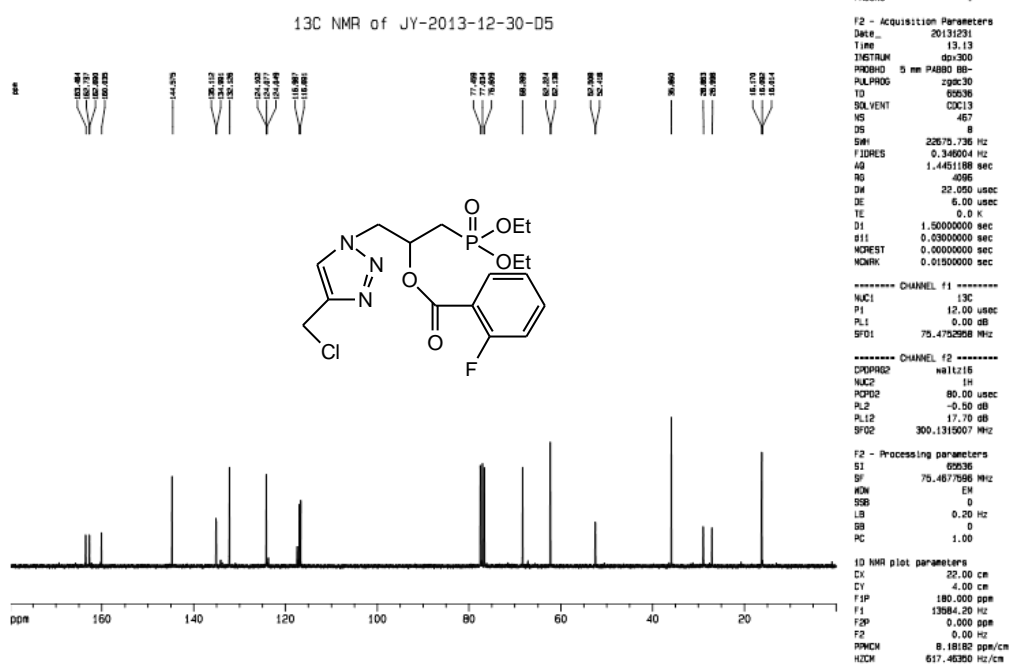
Figure S135. $^1\text{H-NMR}$ spectrum of compound 5-D5.Figure S136. $^{13}\text{C-NMR}$ spectrum of compound 5-D5.

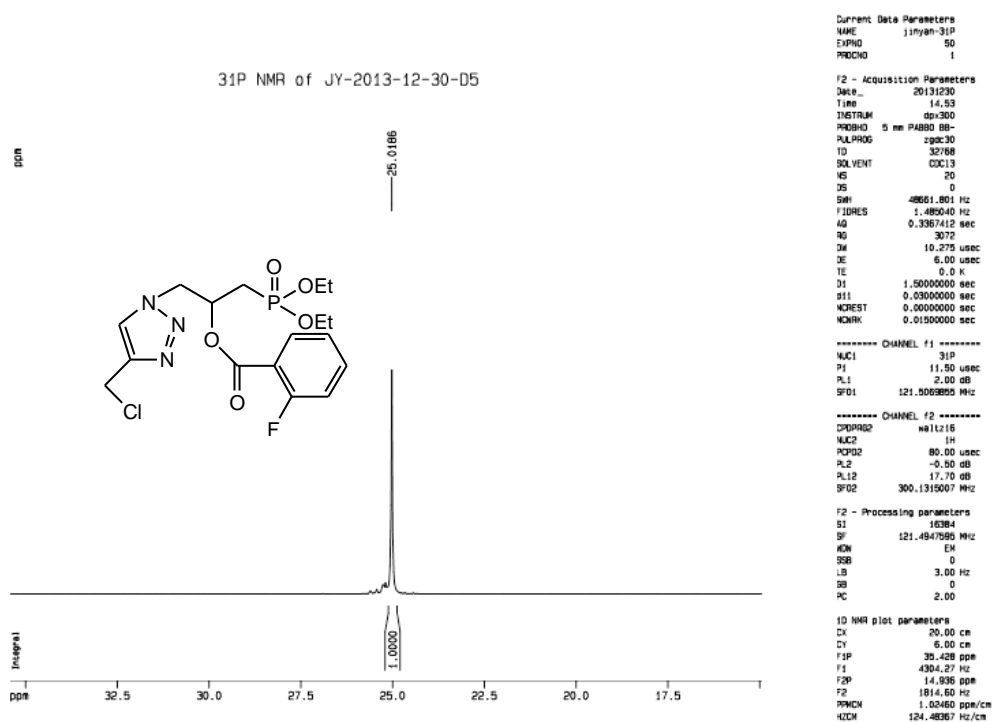
Figure S137. ^{31}P -NMR spectrum of compound 5-D5.

Figure S138. HRMS spectrum of compound 5-D5.

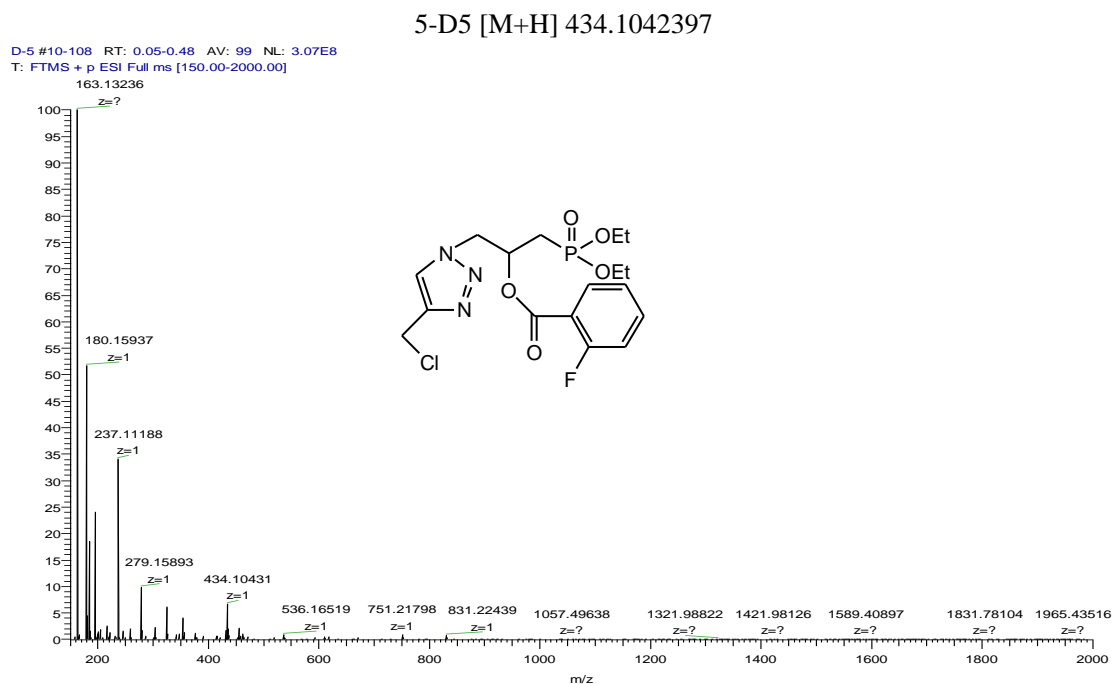


Figure S139. HRMS spectrum of compound 5-D5.

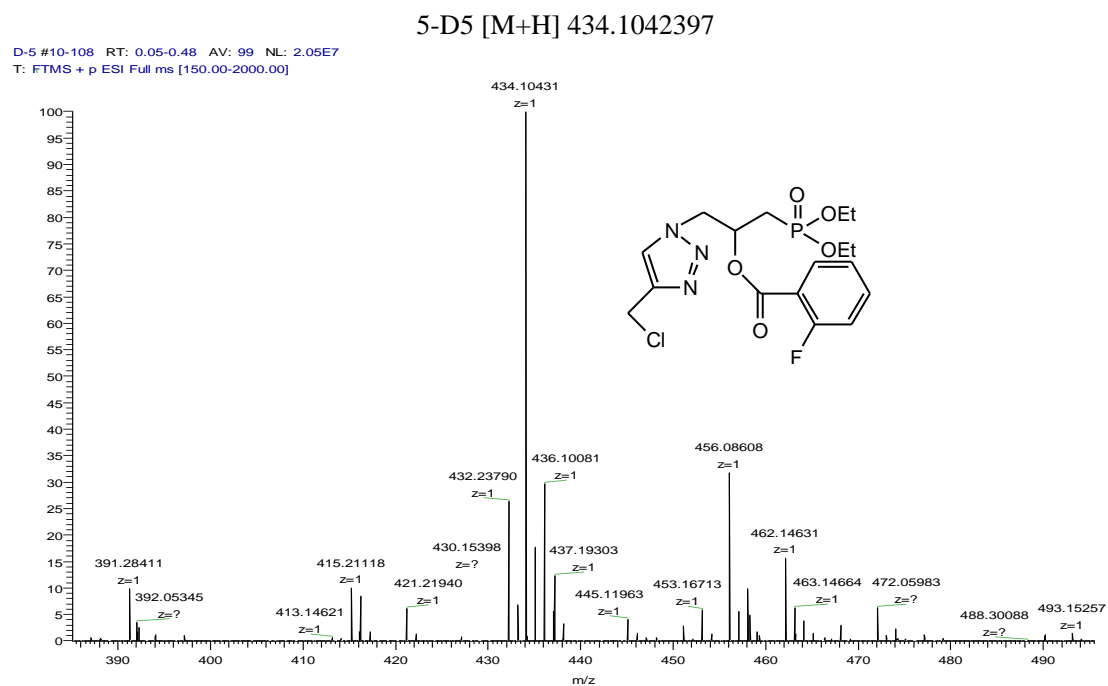
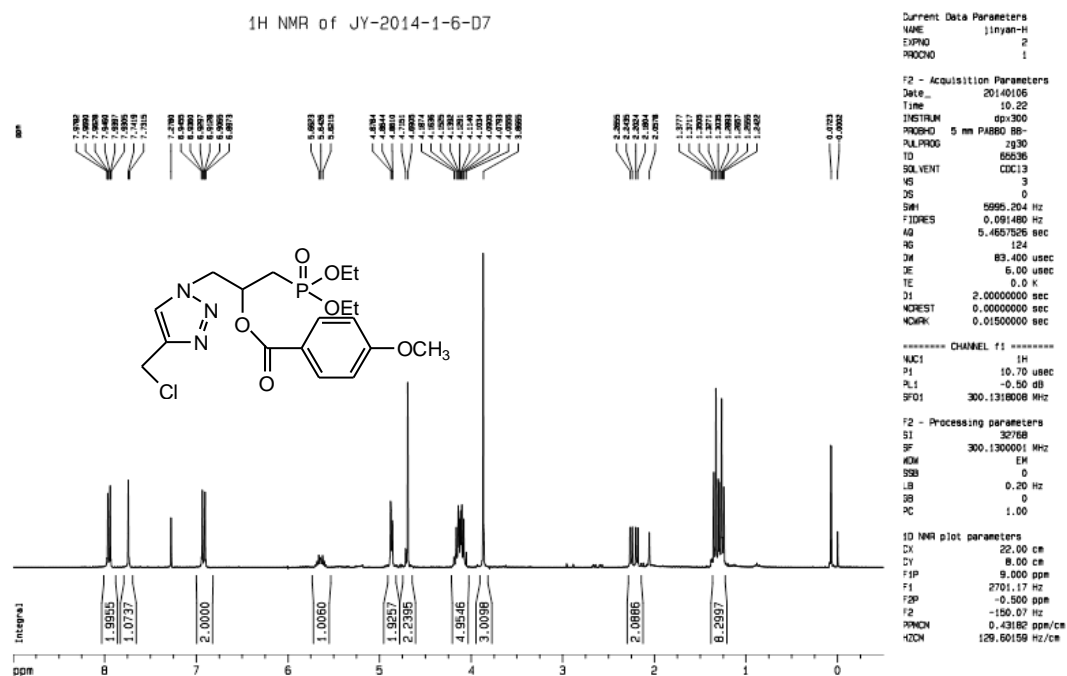
Figure S140. ¹H-NMR spectrum of compound 5-D6.

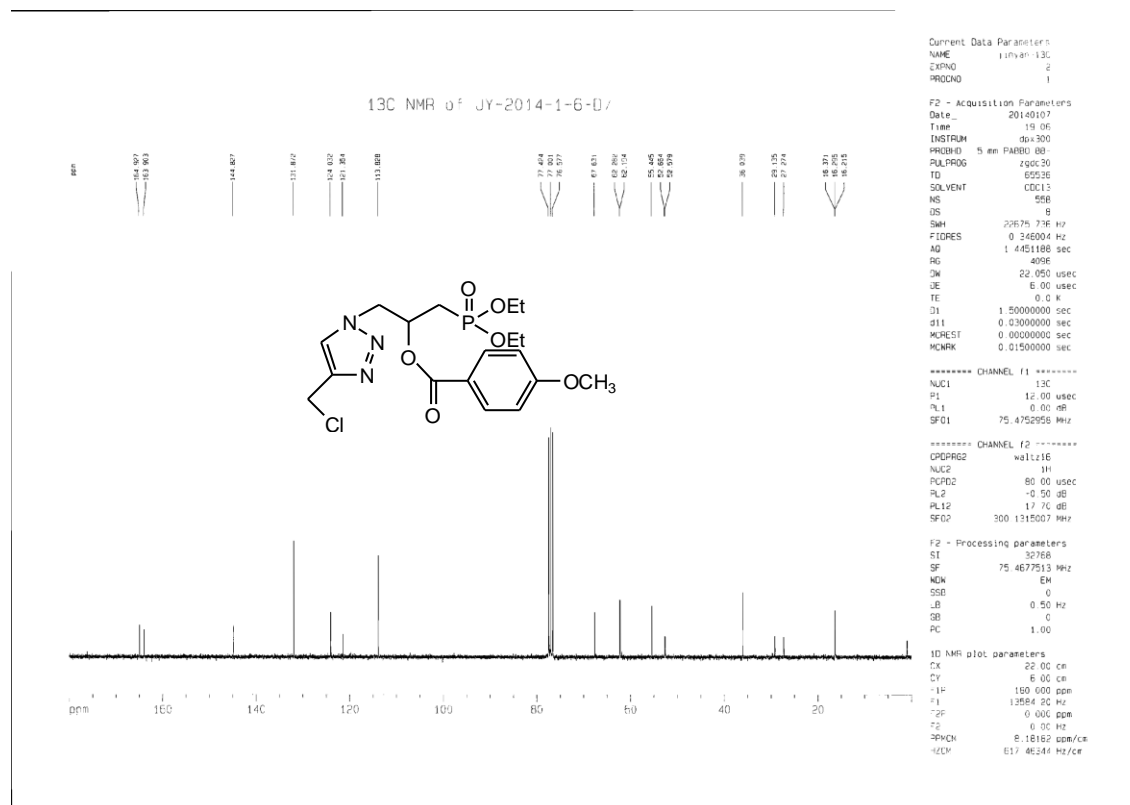
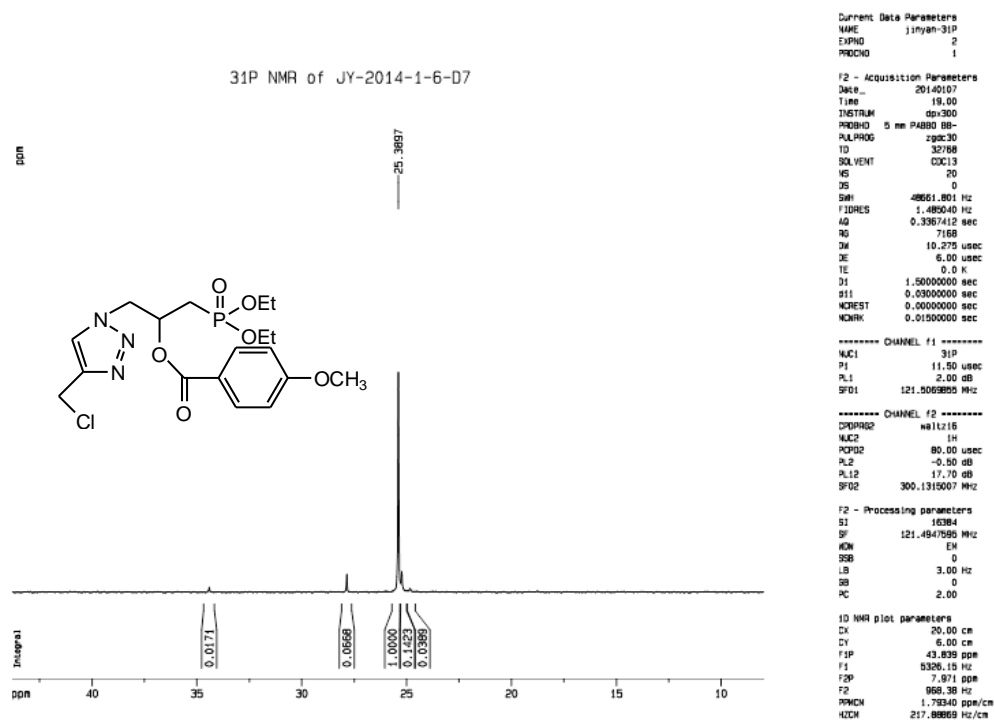
Figure S141. ^{13}C -NMR spectrum of compound 5-D6.Figure S142. ^{31}P -NMR spectrum of compound 5-D6.

Figure S143. HRMS spectrum of compound 5-D6.

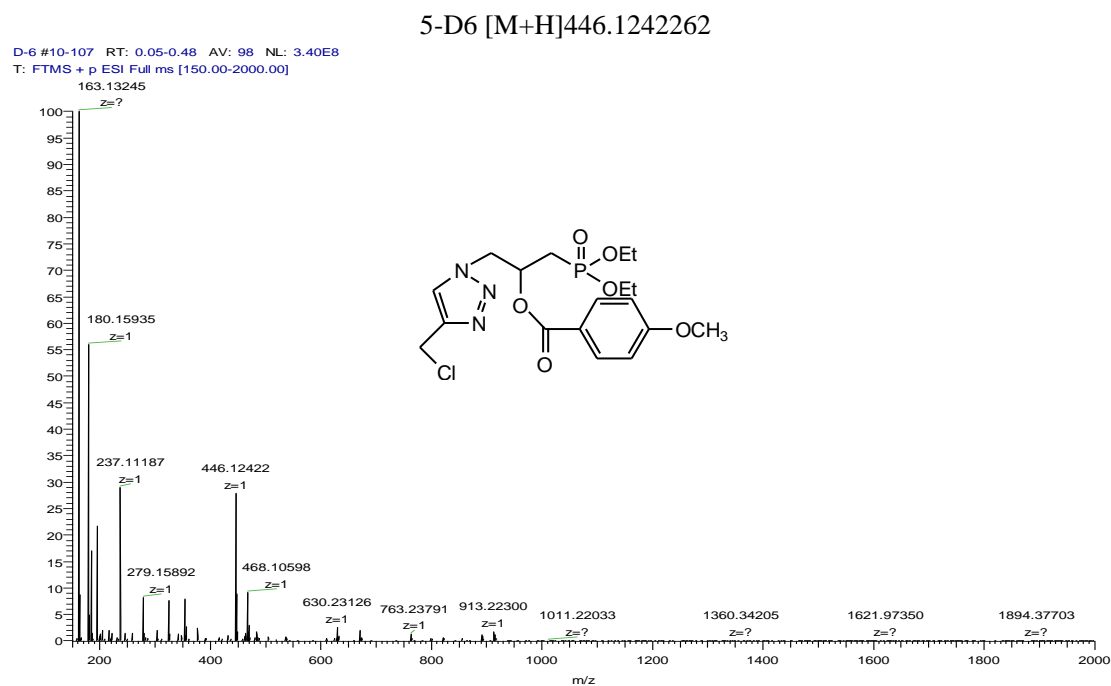


Figure S144. HRMS spectrum of compound 5-D6.

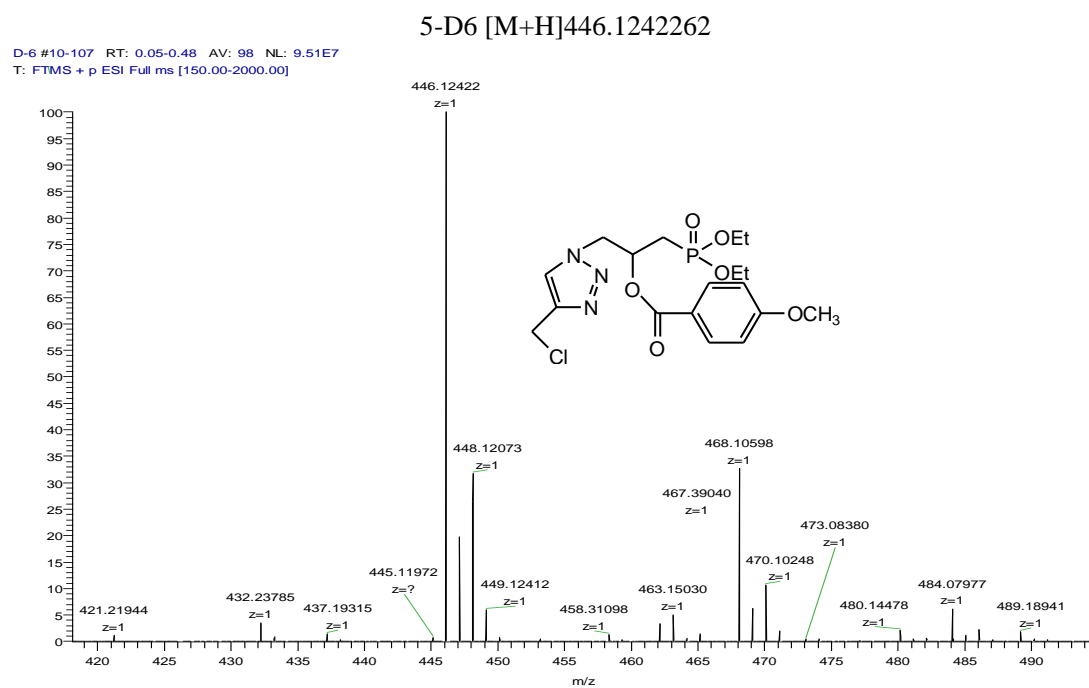


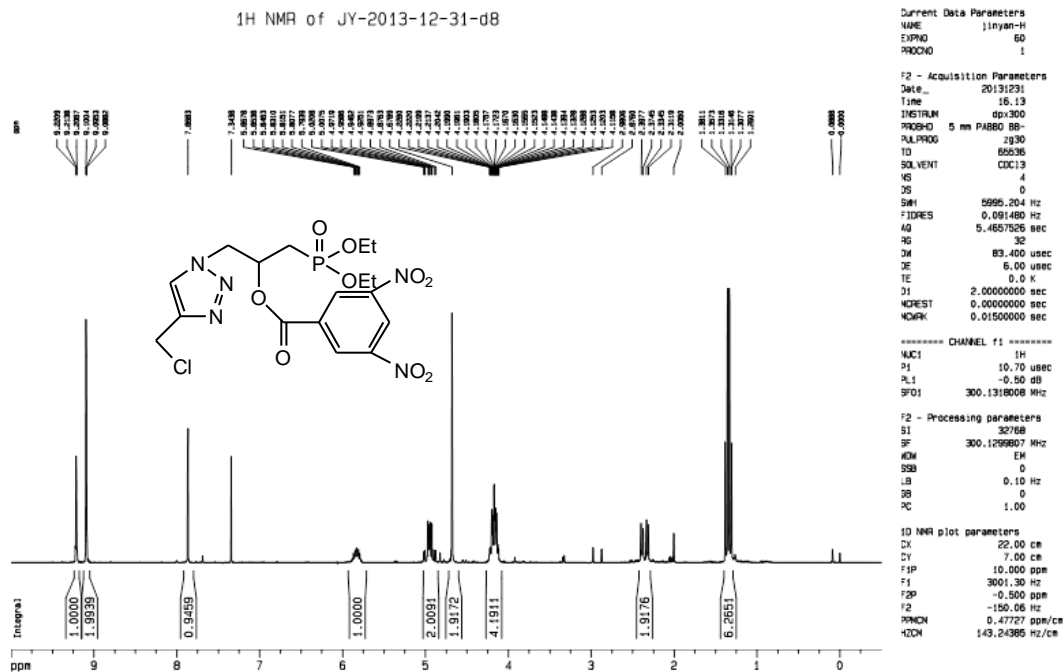
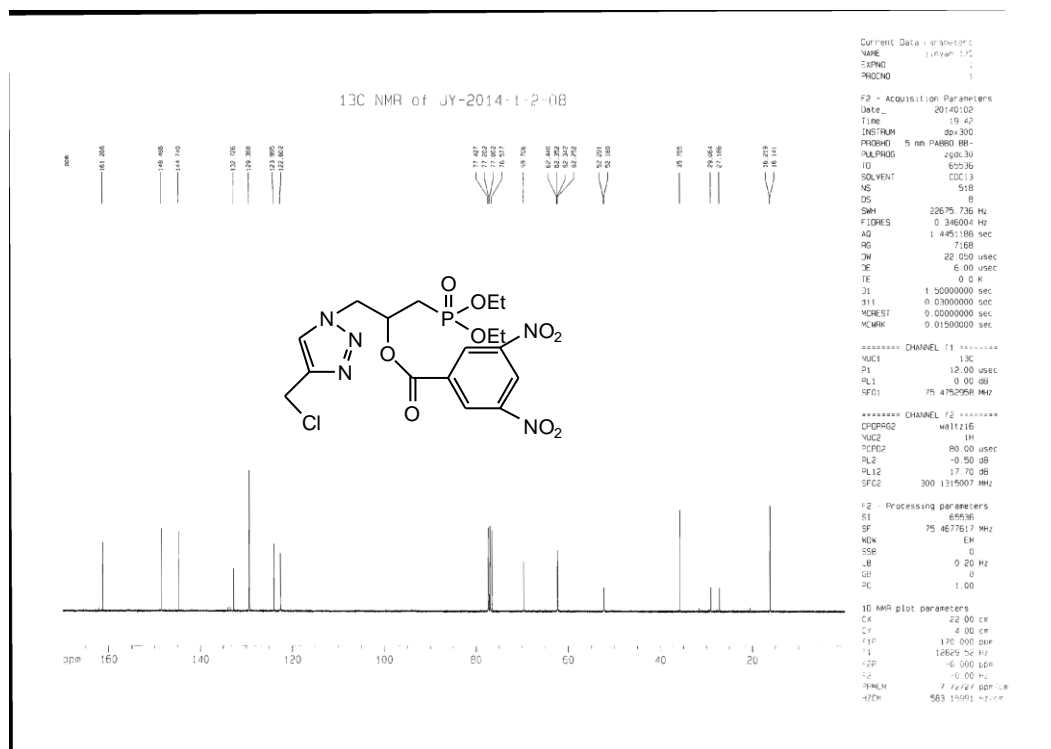
Figure S145. ¹H-NMR spectrum of compound 5-D7.Figure S146. ¹³C-NMR spectrum of compound 5-D7.

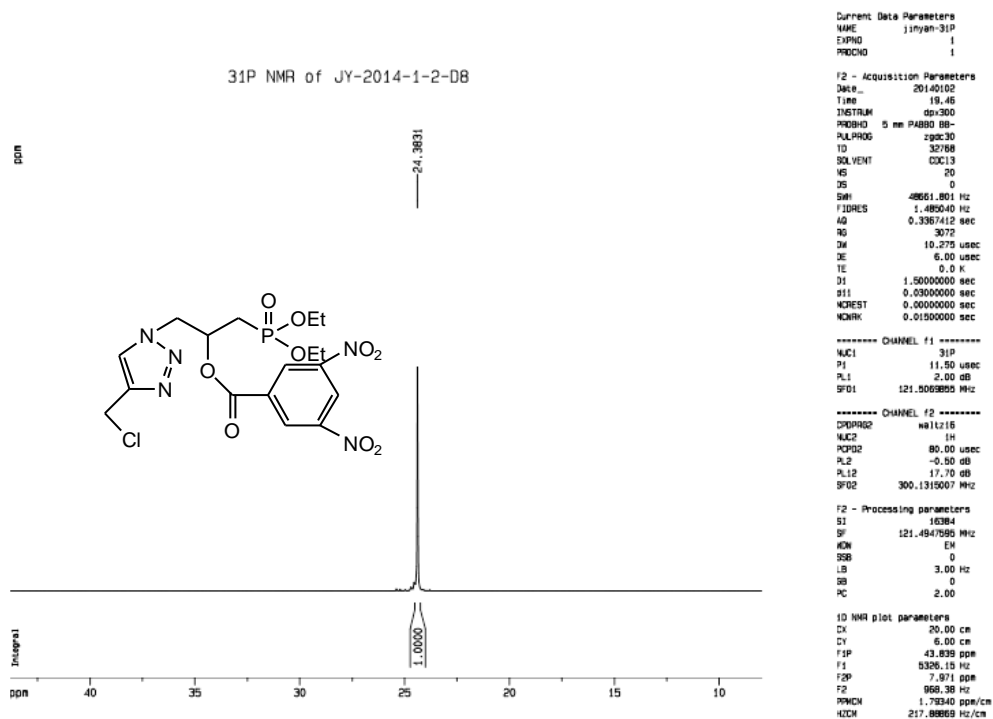
Figure S147. ^{31}P -NMR spectrum of compound 5-D7.

Figure S148. HRMS spectrum of compound 5-D7.

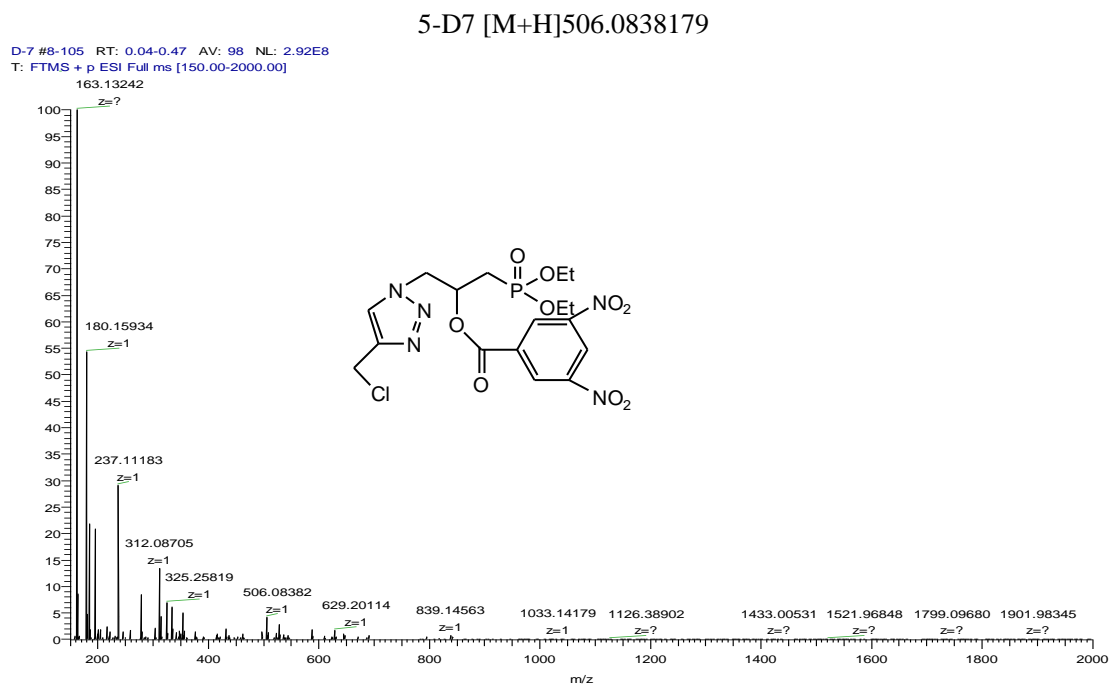


Figure S149. HRMS spectrum of compound 5-D7.

5-D7 [M+H]⁺506.0838179D-7 #8-105 RT: 0.04-0.47 AV: 98 NL: 1.22E7
T:\FTMS + p ESI Full ms [150.00-2000.00]