Electronic Supplementary Information

Title: An Easy Access to α-Aryl Substituted γ-Ketophosphonates: Lewis Acid Mediated Reactions of 1,3-diketones with α-hydroxyphosphonates and Tandem Regioselective C-C Bond Cleavage

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Copies of 1H/ 13C/selected 31P NMR/LC-MS spectra for all the compounds 3a-u (Fig S1- Fig S52 ): S2-S27
Copies of $^1$H/ $^{13}$C NMR spectra

**Figure S1.** $^1$H NMR spectrum of compound 3a

**Figure S2.** $^{13}$C NMR spectrum of compound 3a
Figure S3. $^1$H NMR spectrum of compound 3b

Figure S4. $^{13}$C NMR spectrum of compound 3b
Figure S5. $^1$H NMR spectrum of compound 3c

Figure S6. $^{13}$C NMR spectrum of compound 3c
Figure S7. $^1$H NMR spectrum of compound 3d

Figure S8. $^{13}$C NMR spectrum of compound 3d
Figure S9. $^1$H NMR spectrum of compound 3g

Figure S10. $^{13}$C NMR spectrum of compound 3g
Figure S11. $^1$H NMR spectrum of compound 3h

Figure S12. $^{13}$C NMR spectrum of compound 3h
Figure S13. $^{31}$P NMR spectrum of compound 3h

Figure S14. $^1$H NMR spectrum of compound 3i
Figure S15. $^{13}$C NMR spectrum of compound 3i

Figure S16. $^1$H NMR spectrum of compound 3j
Figure S17. $^{13}$C NMR spectrum of compound 3j

Figure S18. DEPT spectrum of compound 3j
Figure S19. $^1$H NMR spectrum of compound 3k

Figure S20. $^{13}$C NMR spectrum of compound 3k
Figure S21. DEPT spectrum of compound 3k

Figure S22. $^1$H NMR spectrum of compound 3l
Figure S23. $^{13}$C NMR spectrum of compound 3l

Figure S24. $^1$H NMR spectrum for 3m+3ma
Figure S25. $^{13}$C NMR spectrum for 3m+3ma

Figure S26. DEPT spectrum of 3m + 3ma
Figure S27. $^{31}$P NMR spectrum for 3m + 3ma

Figure S28. $^1$H NMR spectrum of 3ma
Figure S29. $^{13}$C NMR spectrum of 3ma

Figure S30. $^1$H NMR spectrum of compound 3n
Figure S31. $^{13}$C NMR spectrum of compound 3n

Figure S32. $^1$H NMR spectrum of compound 3o
Figure S33. $^{13}$C NMR spectrum of compound 3o

Figure S34. $^1$H NMR spectrum of compound 3p
Figure S35. $^{13}$C NMR spectrum of compound 3p

Figure S36. $^1$H NMR spectrum of compound 3q
Figure S37. $^{13}$C NMR spectrum of compound 3q

Figure S38. $^{31}$P NMR spectrum of compound 3q
Figure S39. $^1$H NMR spectrum of compound 3r

Figure S40. $^{13}$C NMR spectrum of compound 3r
Figure S41. $^{31}$P NMR spectrum of compound 3r

Figure S42. $^1$H NMR spectrum of compound 3s
Figure S43. $^{13}$C NMR spectrum of compound 3s

Figure S44. $^{31}$P NMR spectrum of compound 3s
Figure S45. LC-MS spectrum of compound 3s

Figure S46. $^1$H NMR spectrum of compound 3t
Figure S47. $^{13}$C NMR spectrum of compound 3t

Figure S48. $^{31}$P NMR spectrum of compound 3t
Figure S49. LC-MS spectrum of compound 3t

Figure S50. $^1$H NMR spectrum of compound 3u
Figure S51. $^{13}$C NMR spectrum of compound 3u

Figure S52. $^{31}$P NMR spectrum of compound 3u