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## **Electronic Supplementary Information**

## Title: An Easy Access to $\alpha$ -Aryl Substituted $\gamma$ -Ketophosphonates: Lewis Acid Mediated Reactions of 1,3-diketones with $\alpha$ -hydroxyphosphonates and Tandem Regioselective C-C Bond Cleavage

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## Copies of <sup>1</sup>H/ <sup>13</sup>C/selected <sup>31</sup>P NMR/LC-MS spectra for all the compounds 3a-u (Fig S1- Fig

S52): S2-S27

## Copies of <sup>1</sup>H/ <sup>13</sup>C NMR spectra



Figure S1. <sup>1</sup>H NMR spectrum of compound 3a



Figure S2. <sup>13</sup>C NMR spectrum of compound 3a



Figure S3. <sup>1</sup>H NMR spectrum of compound 3b















**Figure S10**. <sup>13</sup>C NMR spectrum of compound **3g** 

10

200

190

50 40

30 20 10









Figure S16. <sup>1</sup>H NMR spectrum of compound 3j



Figure S18. DEPT spectrum of compound 3j



Figure S20. <sup>13</sup>C NMR spectrum of compound 3k



Figure S22. <sup>1</sup>H NMR spectrum of compound 3I



Figure S24. <sup>1</sup>H NMR spectrum for 3m+3ma















Figure S30. <sup>1</sup>H NMR spectrum of compound 3n









Figure S36. <sup>1</sup>H NMR spectrum of compound 3q



Figure S37. <sup>13</sup>C NMR spectrum of compound 3q



Figure S38. <sup>31</sup>P NMR spectrum of compound 3q



Figure S39. <sup>1</sup>H NMR spectrum of compound 3r



Figure S40. <sup>13</sup>C NMR spectrum of compound 3r



Figure S42. <sup>1</sup>H NMR spectrum of compound 3s



Figure S43. <sup>13</sup>C NMR spectrum of compound 3s





Figure S45. LC-MS spectrum of compound 3s



Figure S46. <sup>1</sup>H NMR spectrum of compound 3t



Figure S47. <sup>13</sup>C NMR spectrum of compound 3t





Figure S50. <sup>1</sup>H NMR spectrum of compound 3u



Figure S52. <sup>31</sup>P NMR spectrum of compound 3u