



Supporting Information

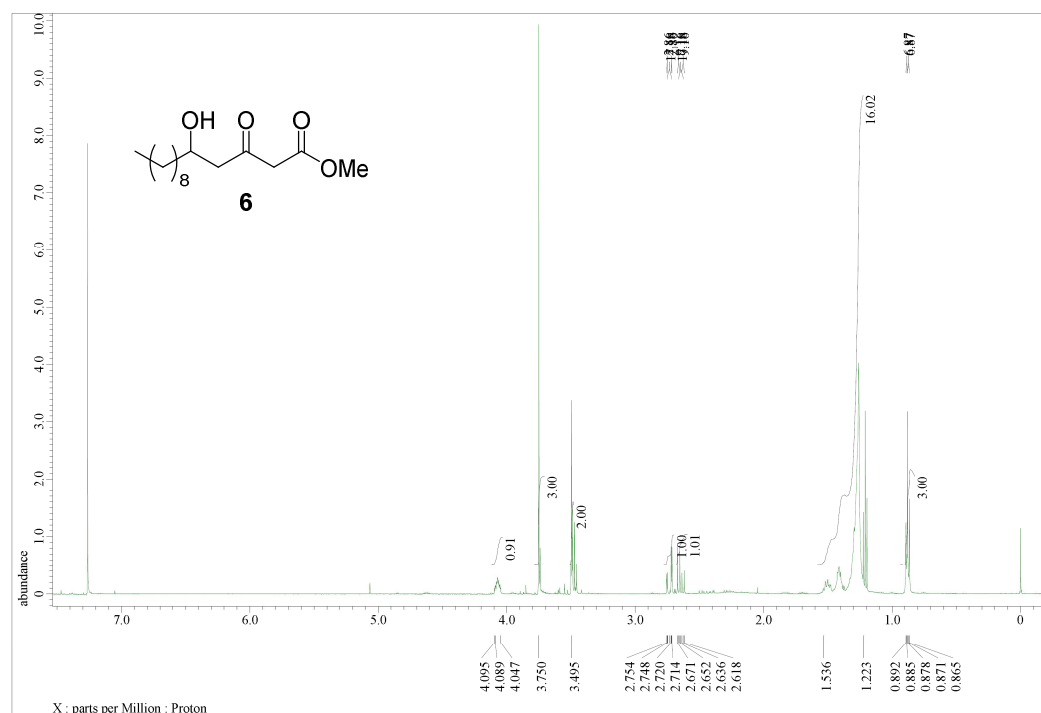
# Asymmetric total syntheses of both enantiomers of plym-uthipyranone B and its unnatural analogues: evaluation of *anti*-MRSA activity and its chiral discrimination

Mizuki Moriyama<sup>1</sup>, Xiaoxi Liu<sup>2</sup>, Yuki Enoki<sup>2</sup>, Kazuaki Matsumoto<sup>2</sup> and Yoo Tanabe<sup>1,\*</sup>

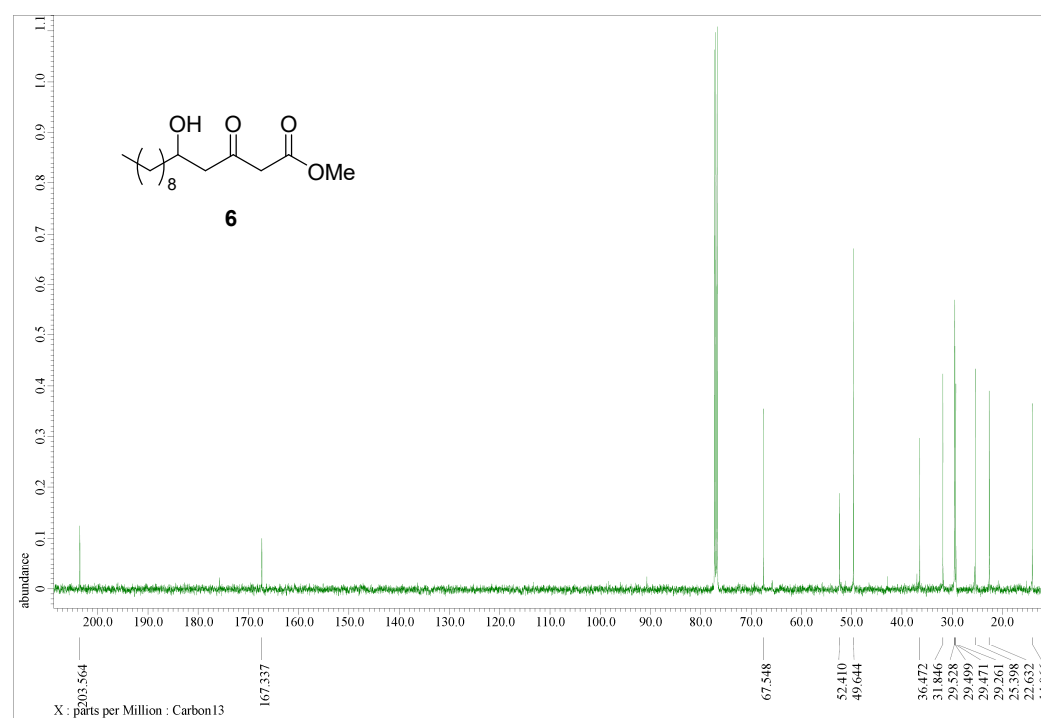
<sup>1</sup> Department of Chemistry, School of Science and Technology, Kwansei Gakuin University, 2-1 Gakuen, Sanda, Hyogo 669-1337, Japan; ixu18409@kwansei.ac.jp (M.M.)

<sup>2</sup> Division of Pharmacodynamics, Keio University Faculty of Pharmacy, 1-5-30 Shibakoen, Minato-ku, Tokyo 105-8512, Japan; aganeiliu@gmail.com (X.L.); enoki-yk@pha.keio.ac.jp (Y.E.); matsumoto-kz@pha.keio.ac.jp (K.M.)

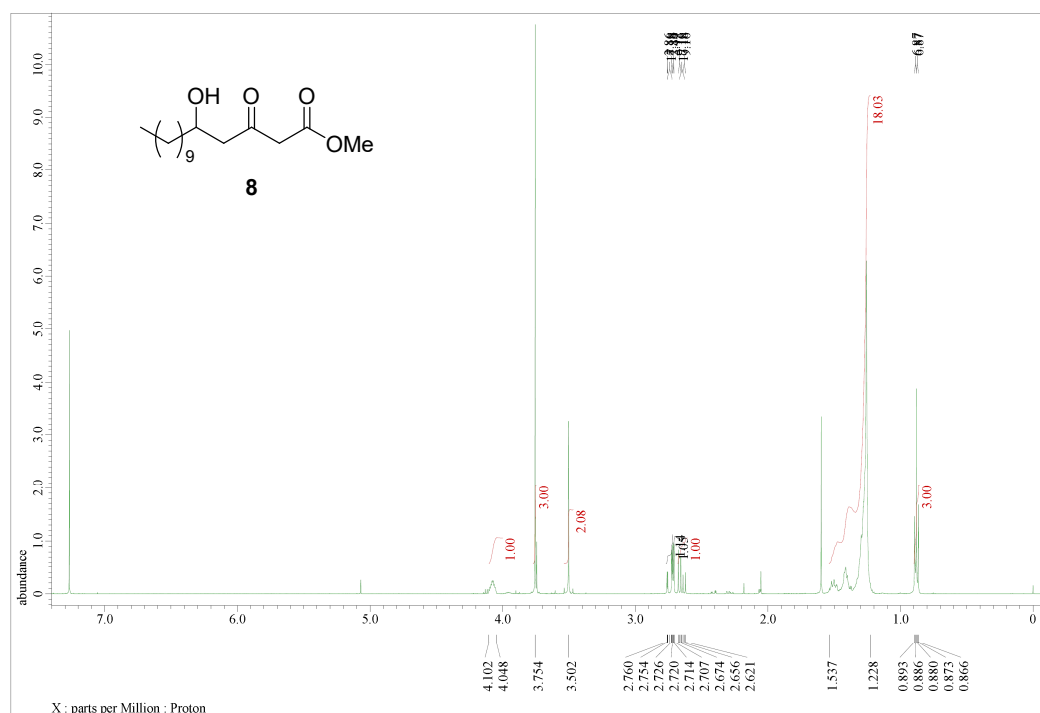
\* Correspondence: tanabe@kwansei.ac.jp; Tel. +81-795-565-8394



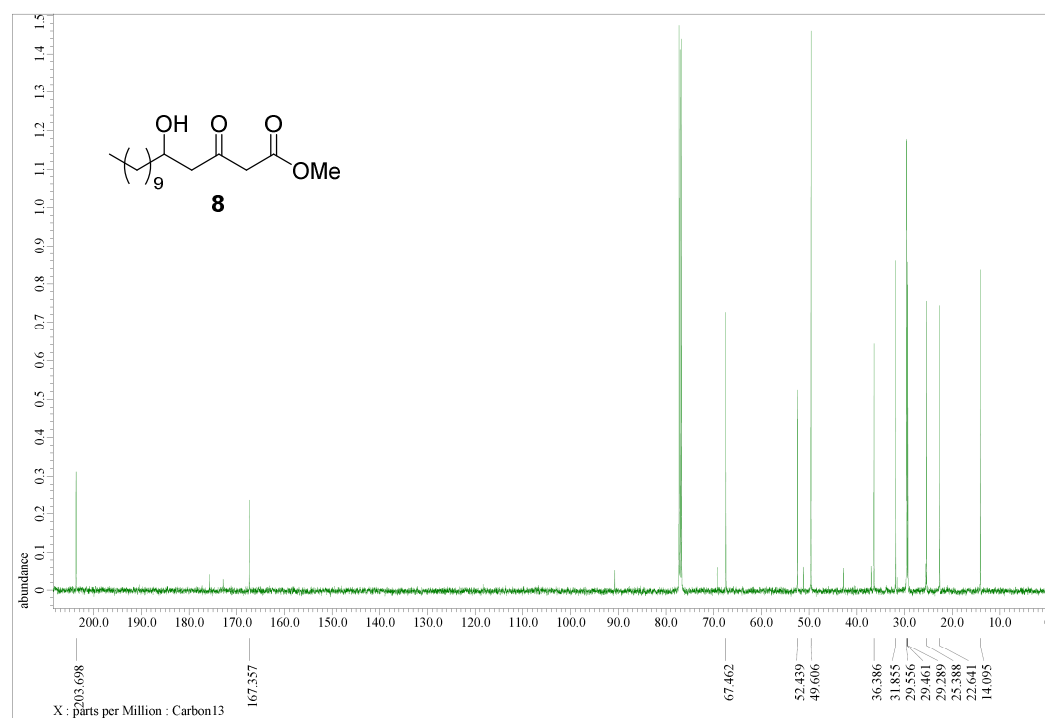
**Figure S1.** <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 6.



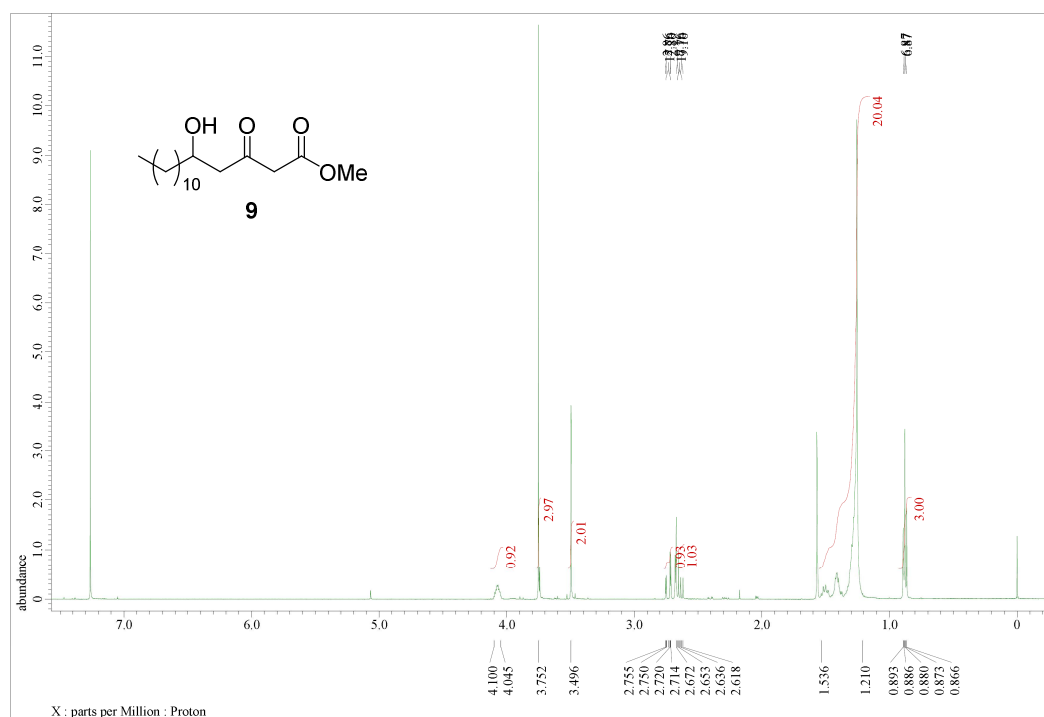
**Figure S2.** <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 6.



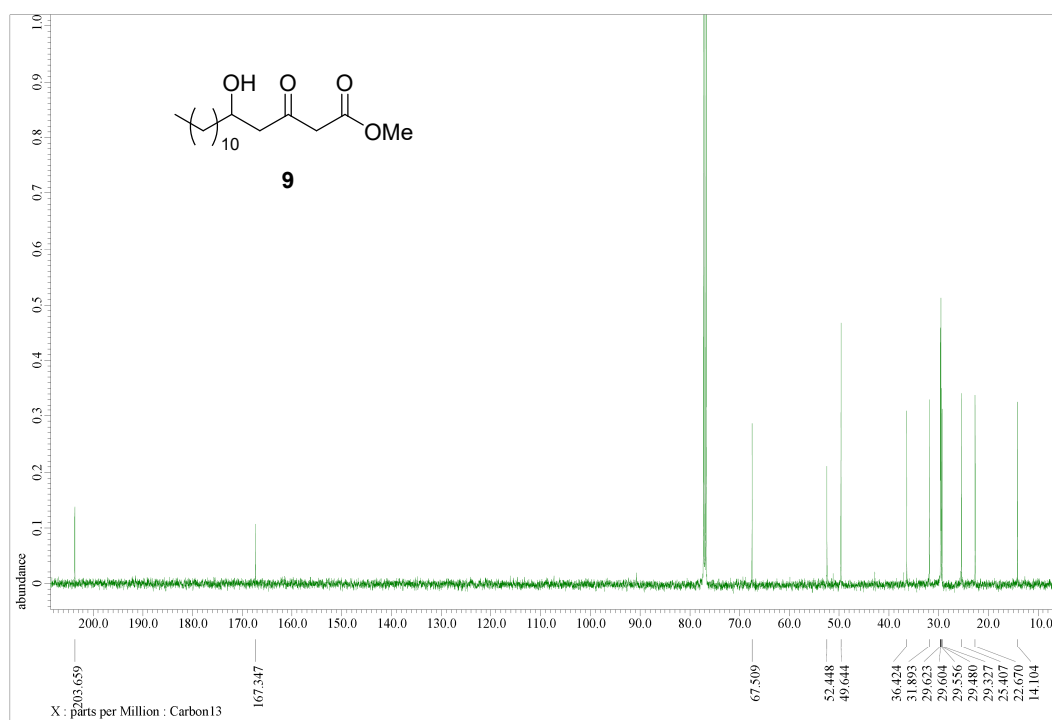
**Figure S3.**  $^1\text{H}$ NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 8.



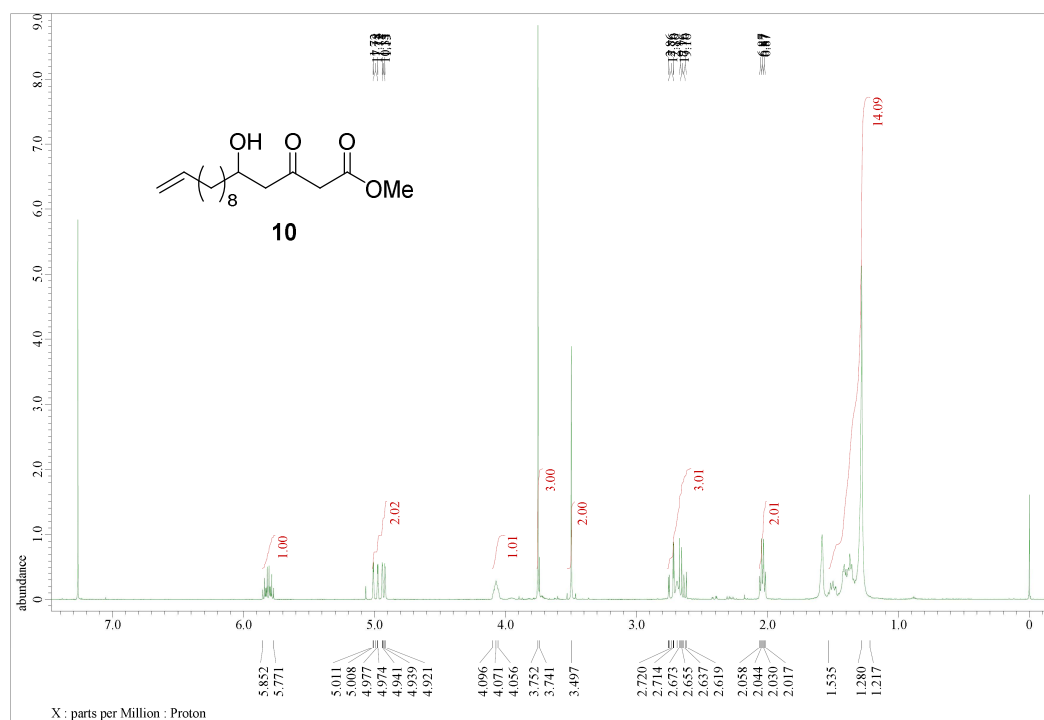
**Figure S4.**  $^{13}\text{C}$ NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 8.



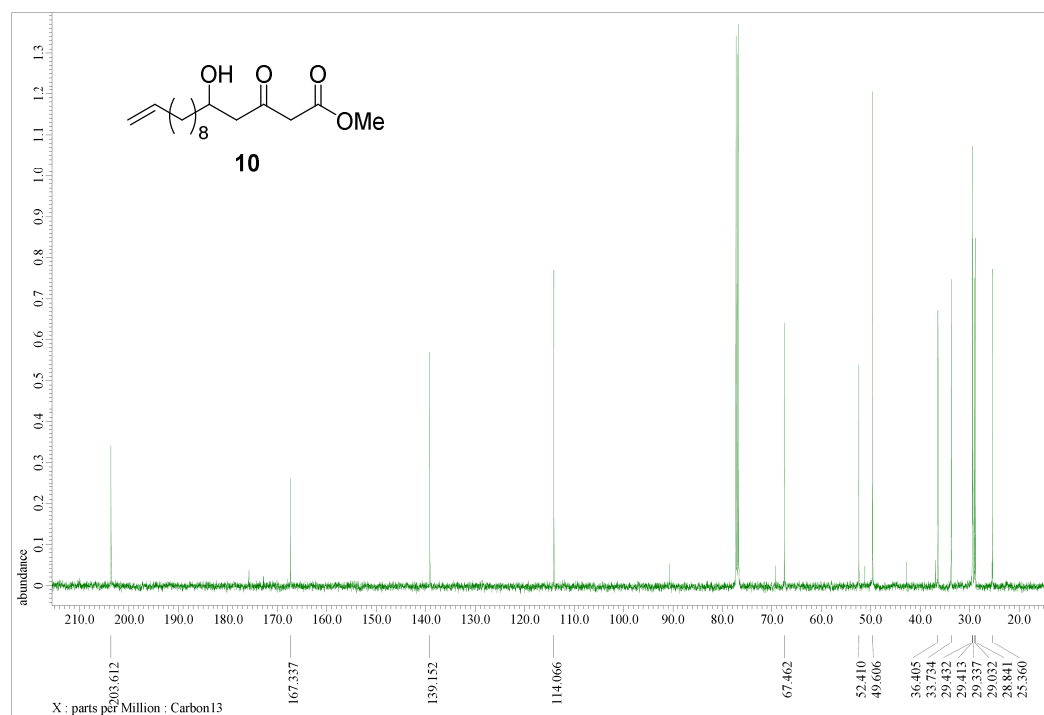
**Figure S5.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 9.



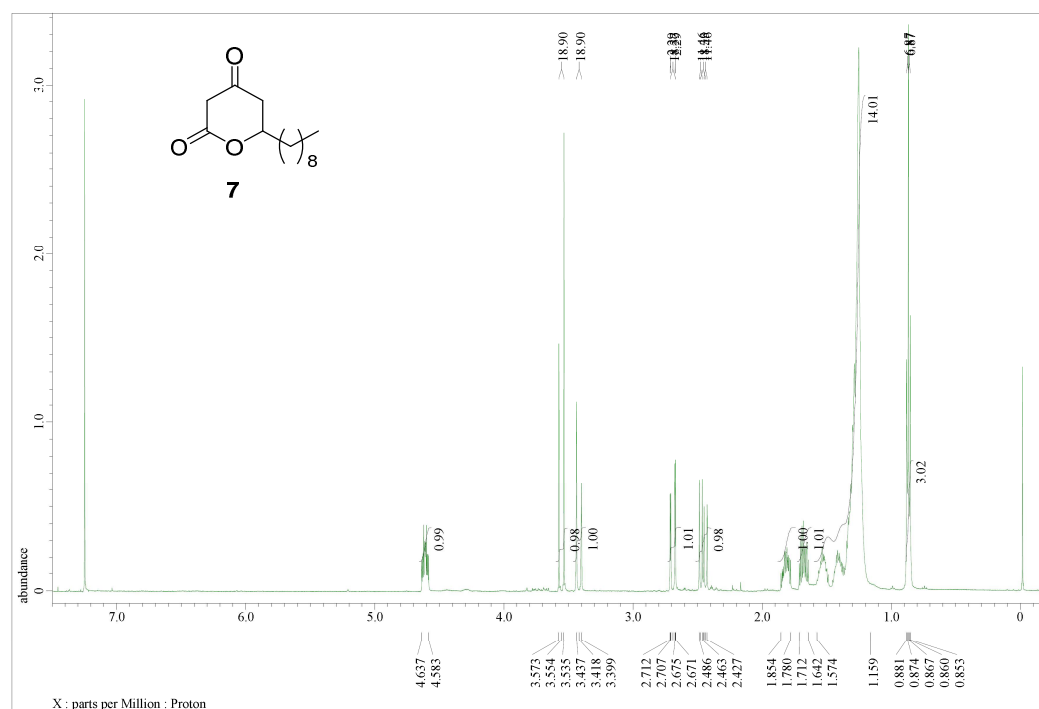
**Figure S6.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 9.



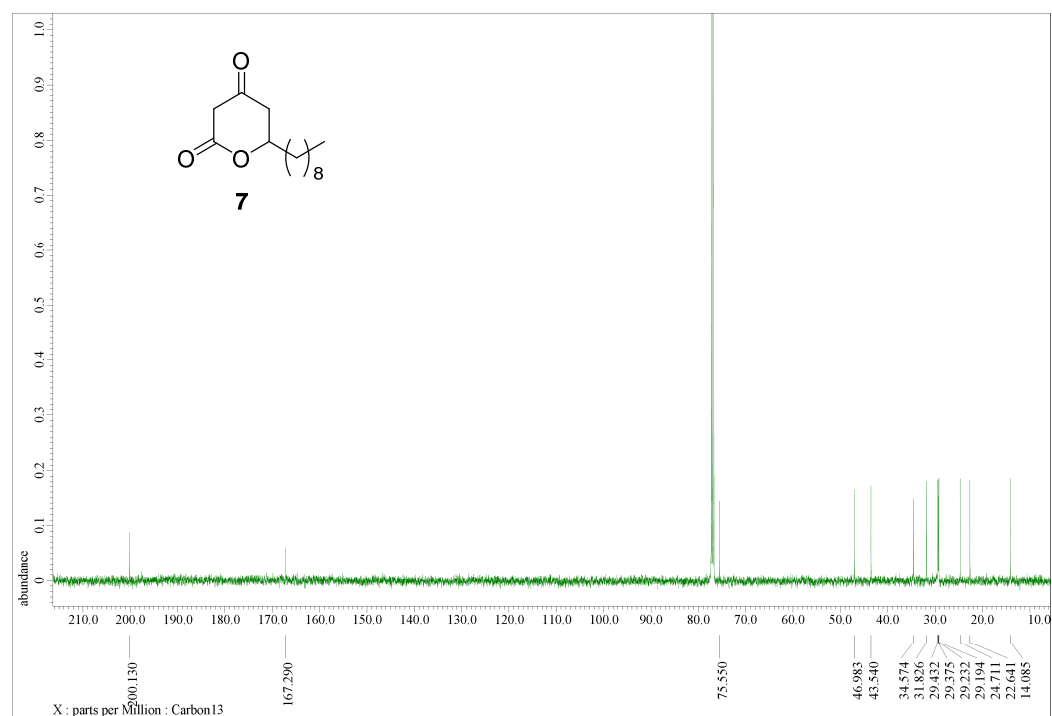
**Figure S7.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 10.



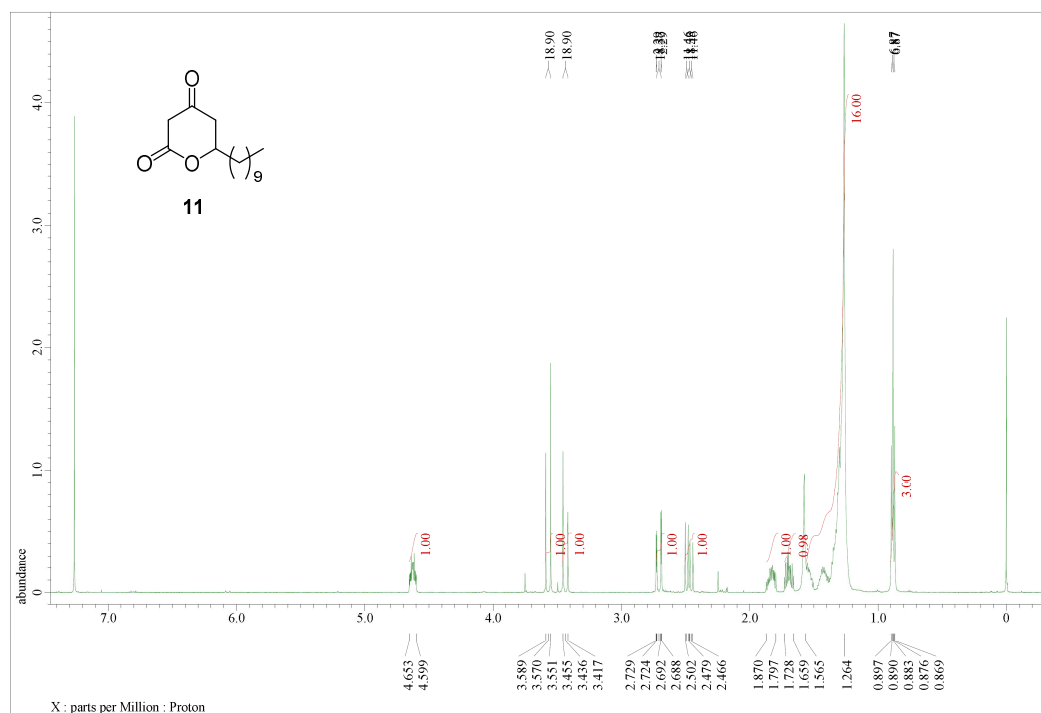
**Figure S8.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 10.



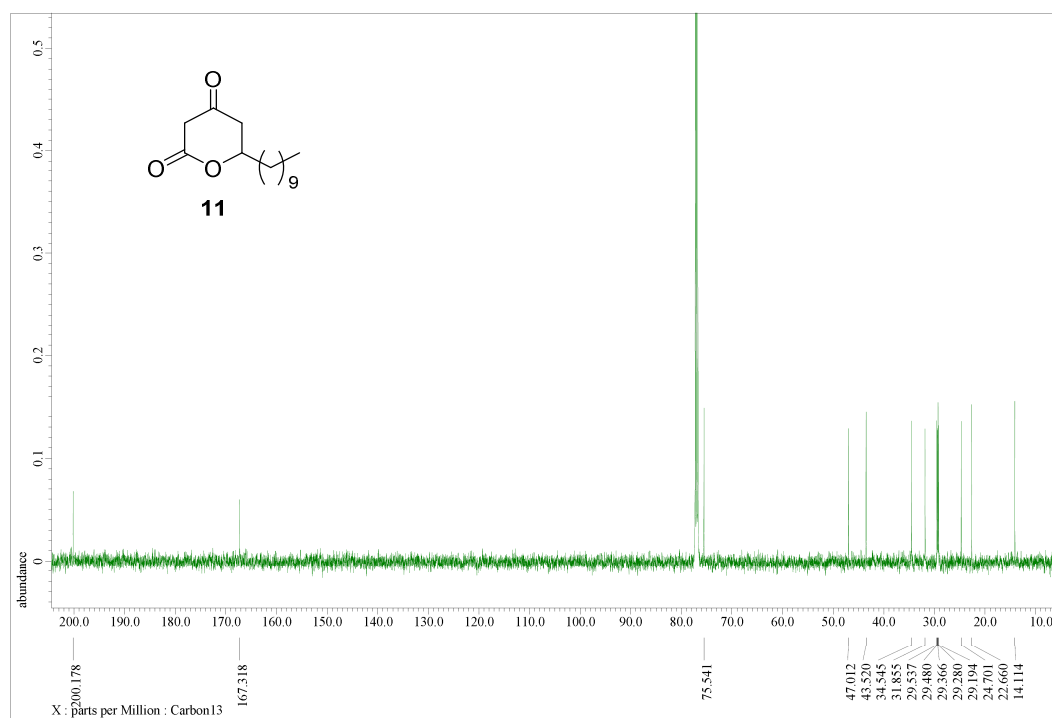
**Figure S9.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 7.



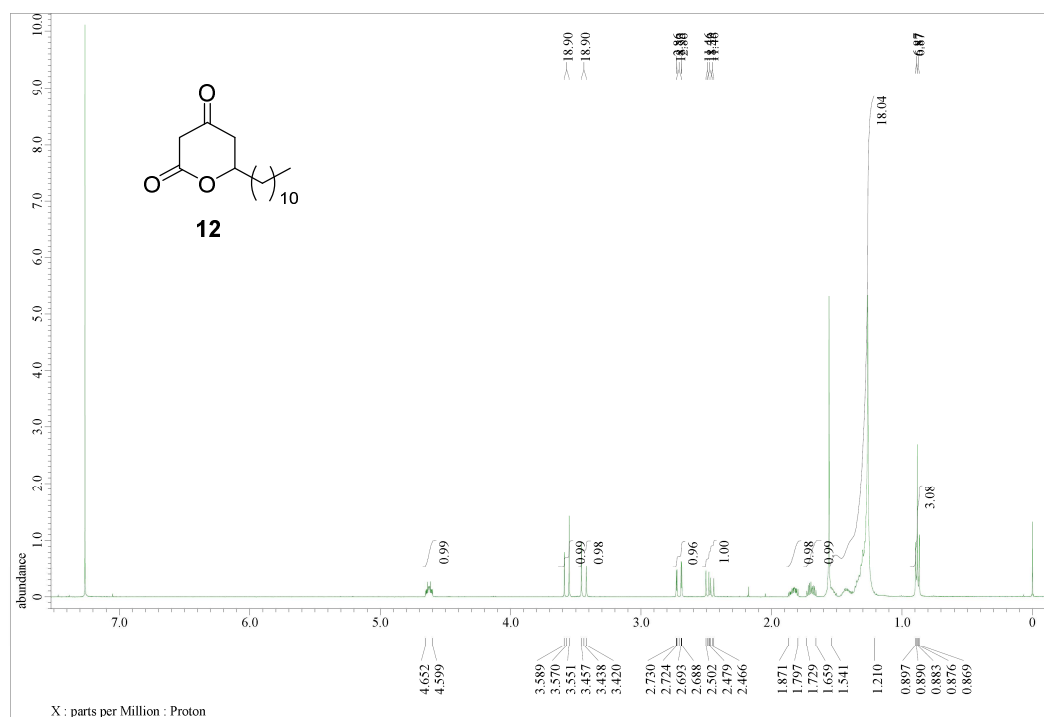
**Figure S10.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 7.



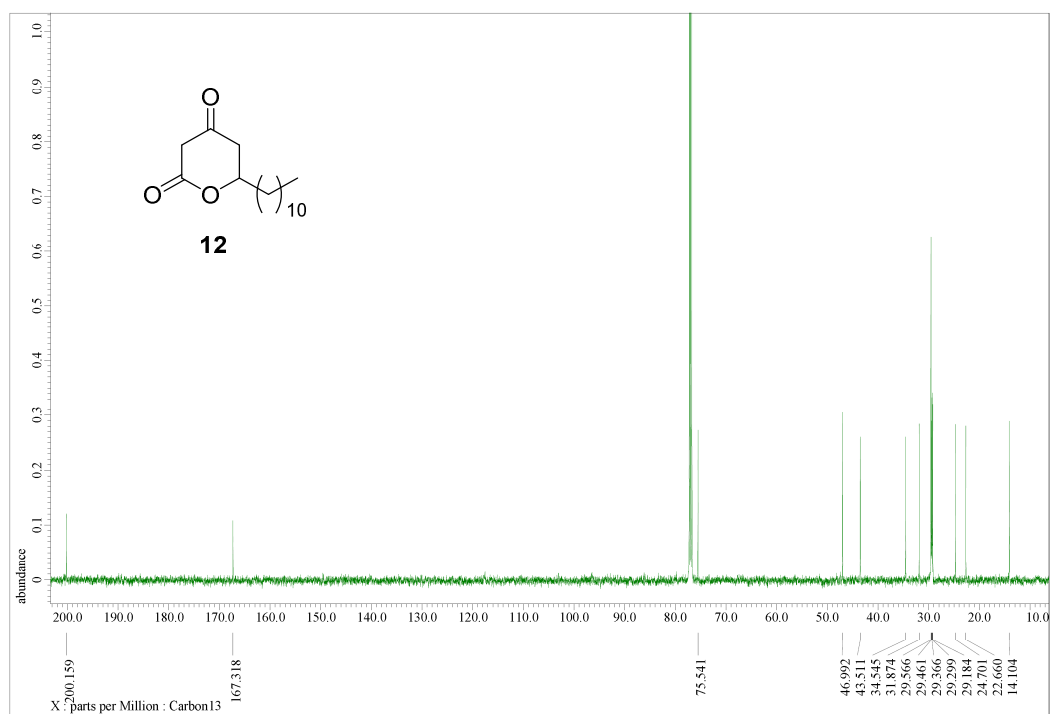
**Figure S11.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **11**.



**Figure S12.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **11**.

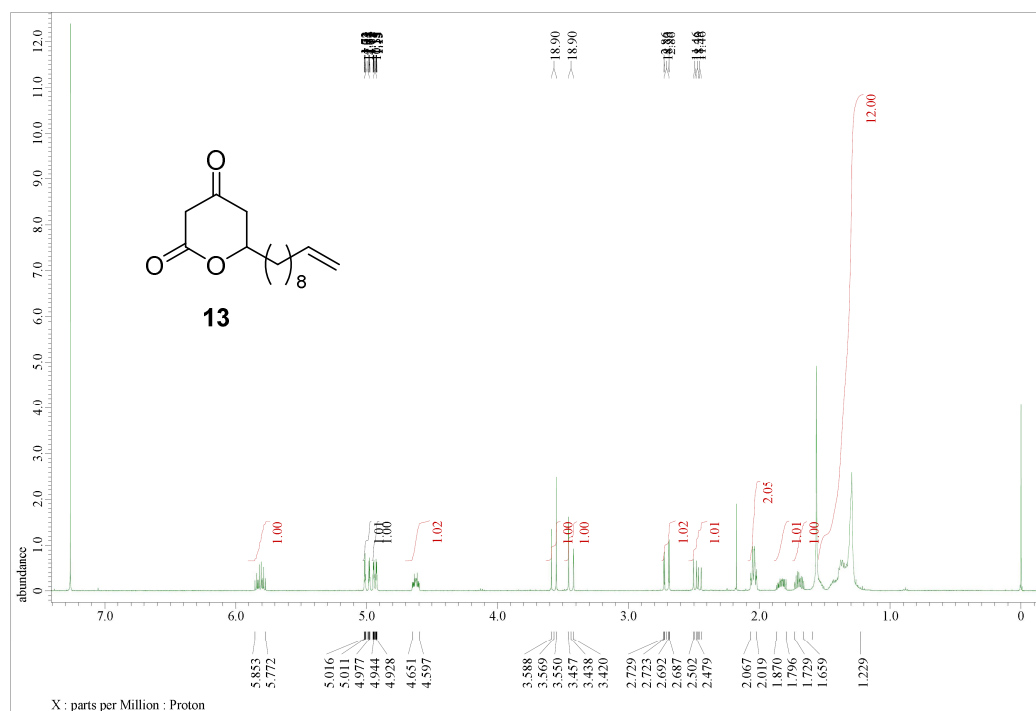


**Figure S13.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 12.

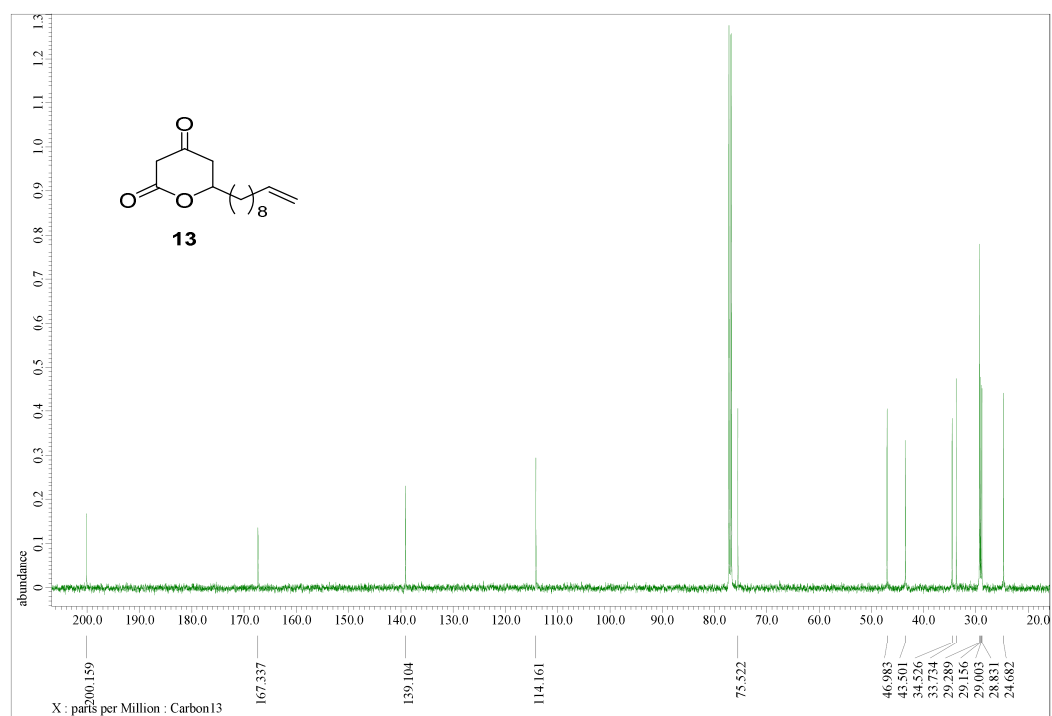


**Figure S14.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound 12.





**Figure S15.**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **13**.



**Figure S16.**  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **13**.

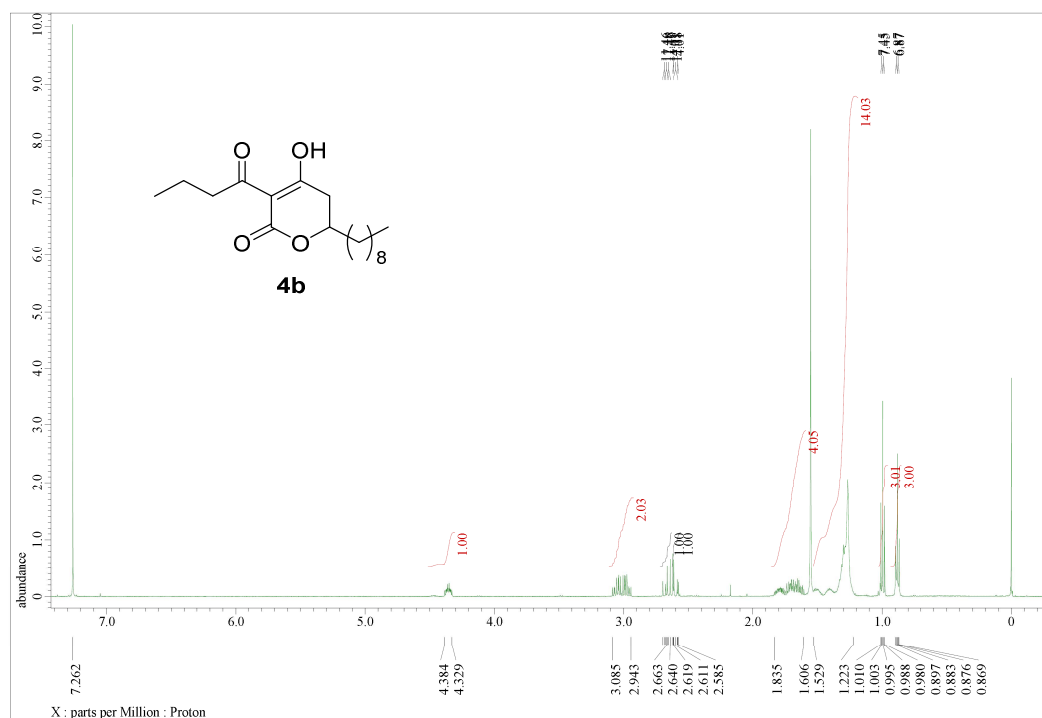


Figure S17.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4b**.

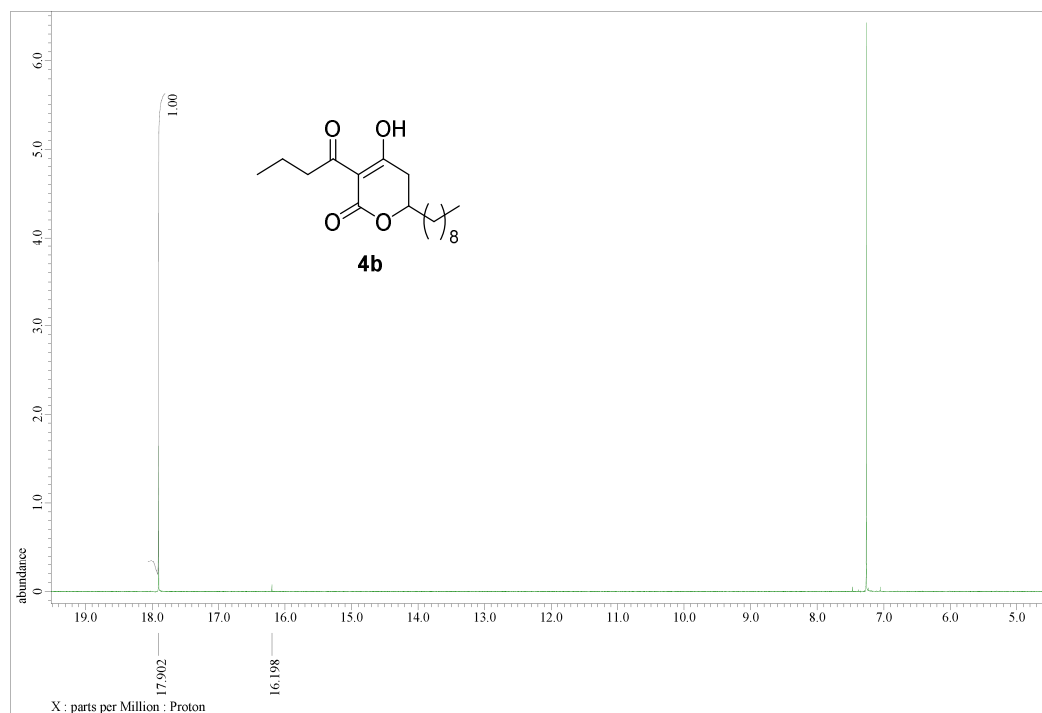


Figure S18.  $^{13}\text{C}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4b**.

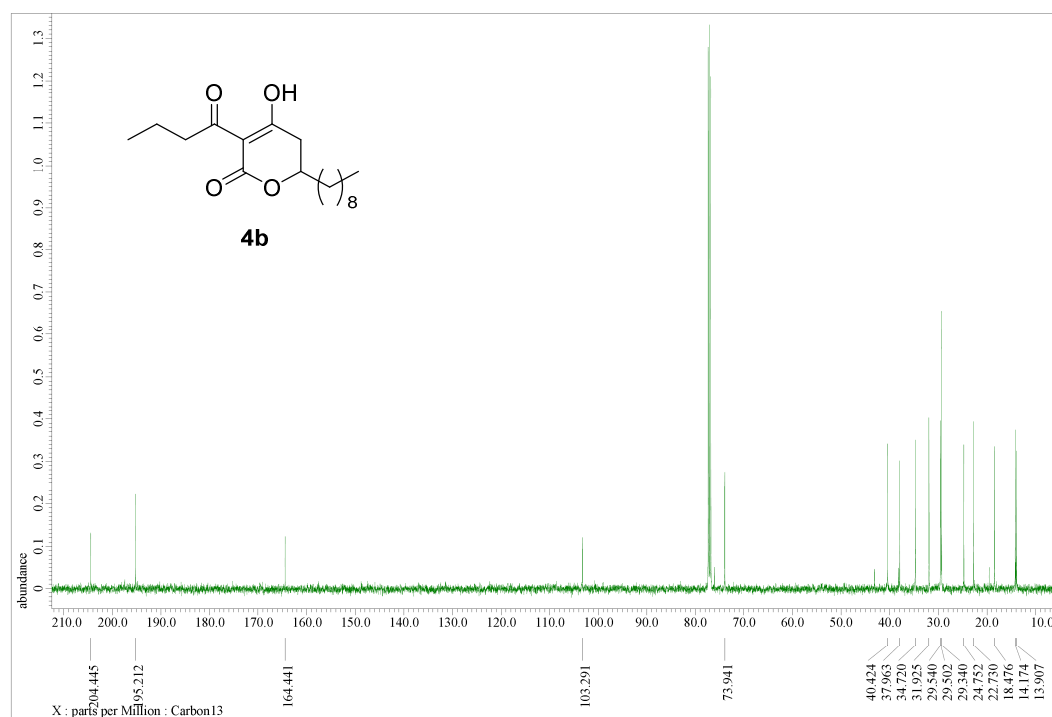


Figure S19. <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 4b.

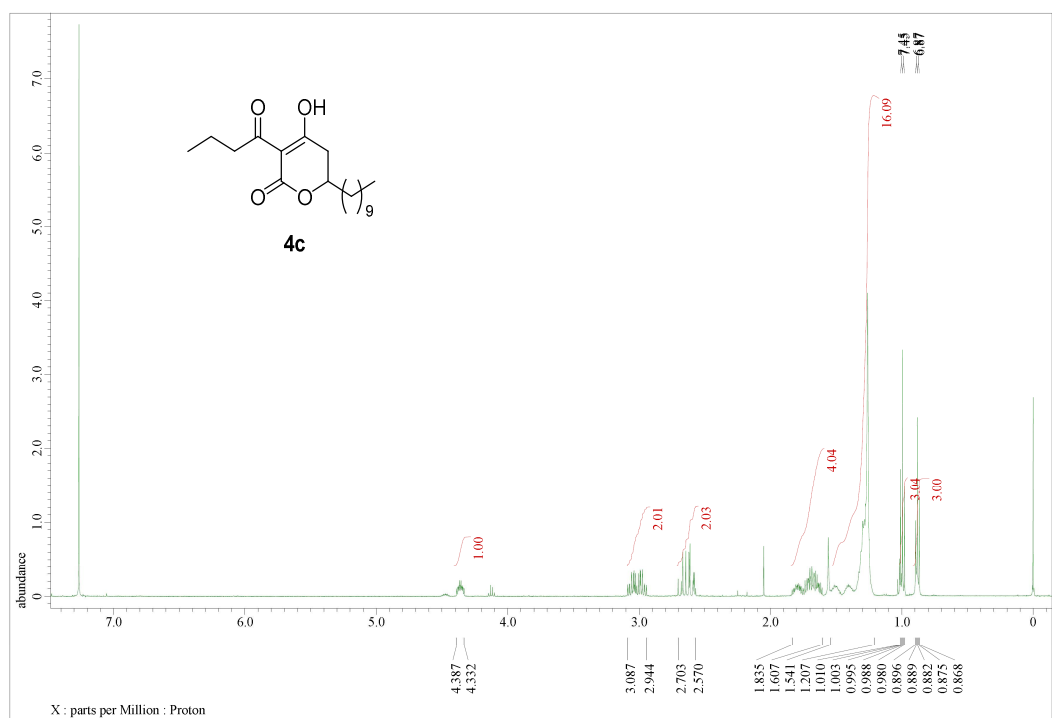


Figure S20. <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 4c.

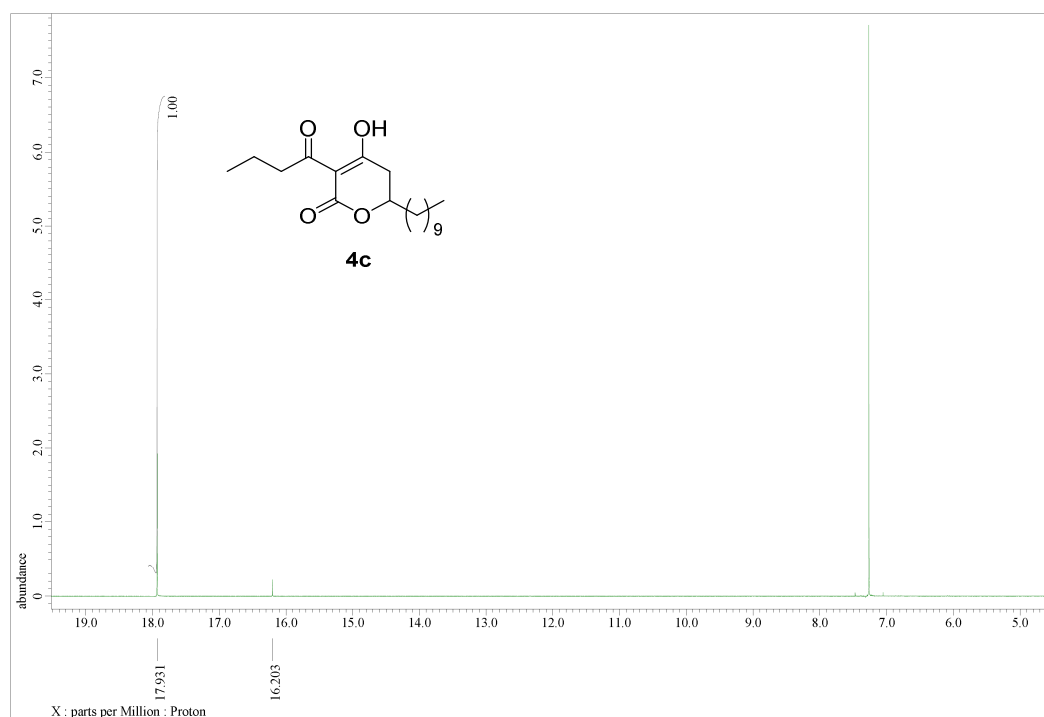


Figure S21.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4c**.

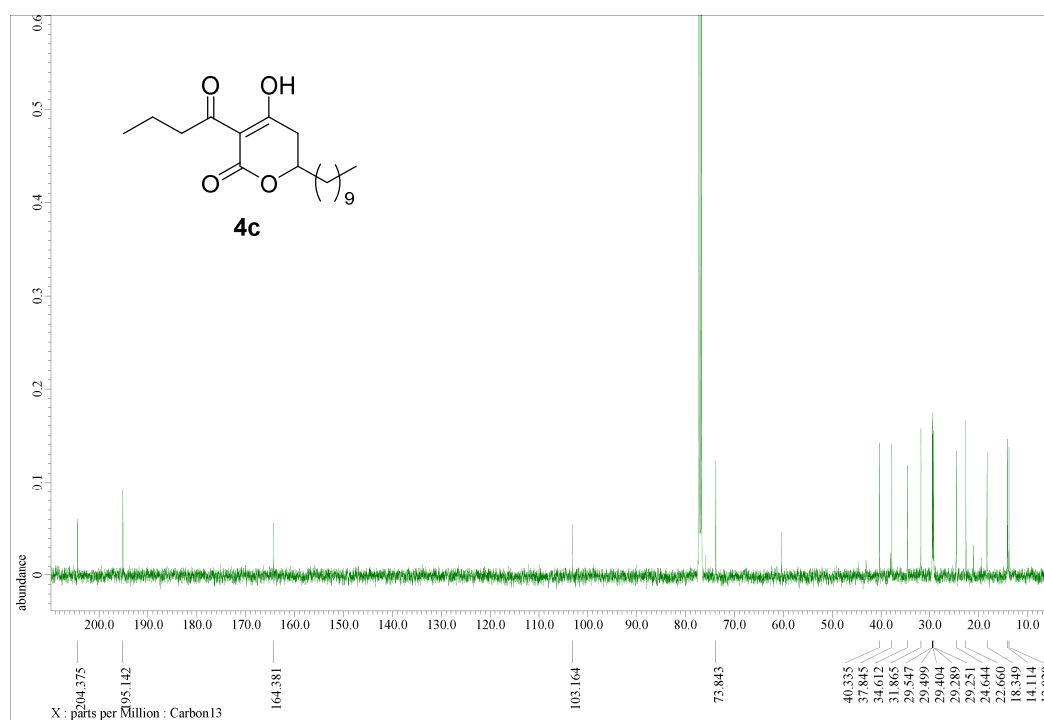


Figure S22.  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4c**.

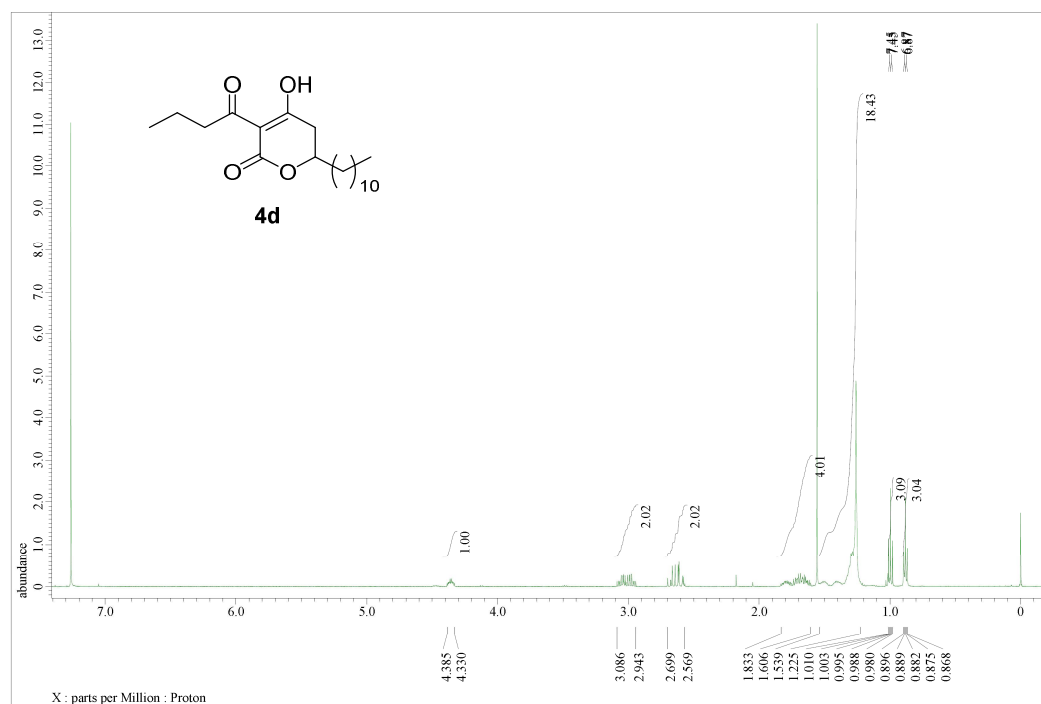


Figure S23.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4d**.

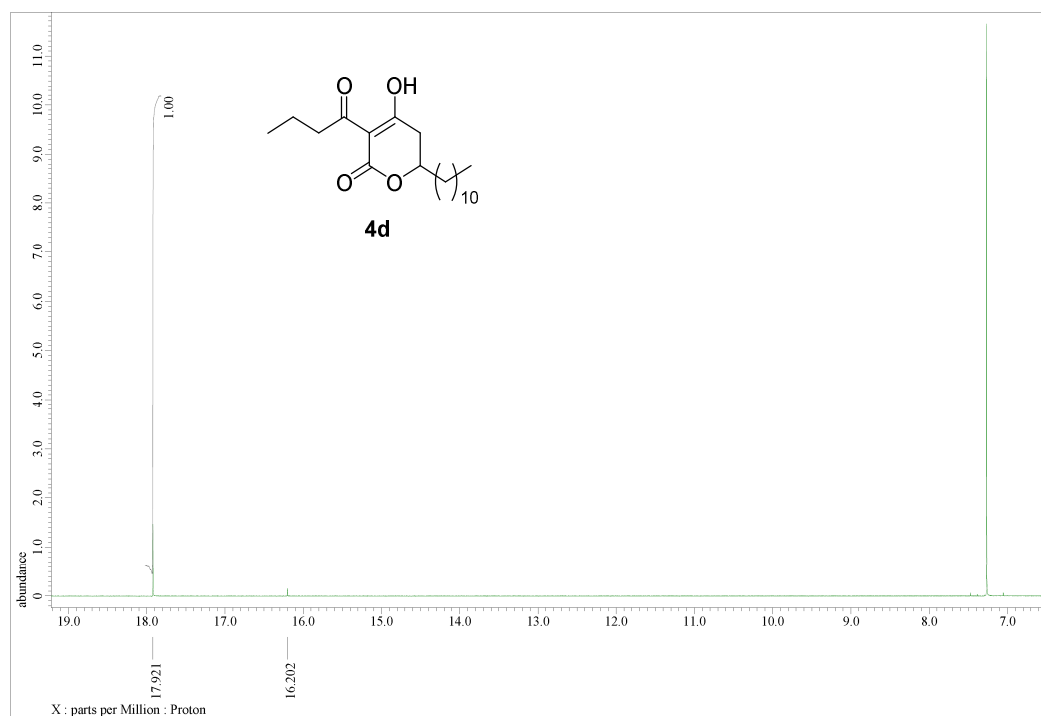


Figure S24.  $^{13}\text{C}$  NMR (500 MHz,  $\text{CDCl}_3$ ) Spectrum of the Compound **4d**.

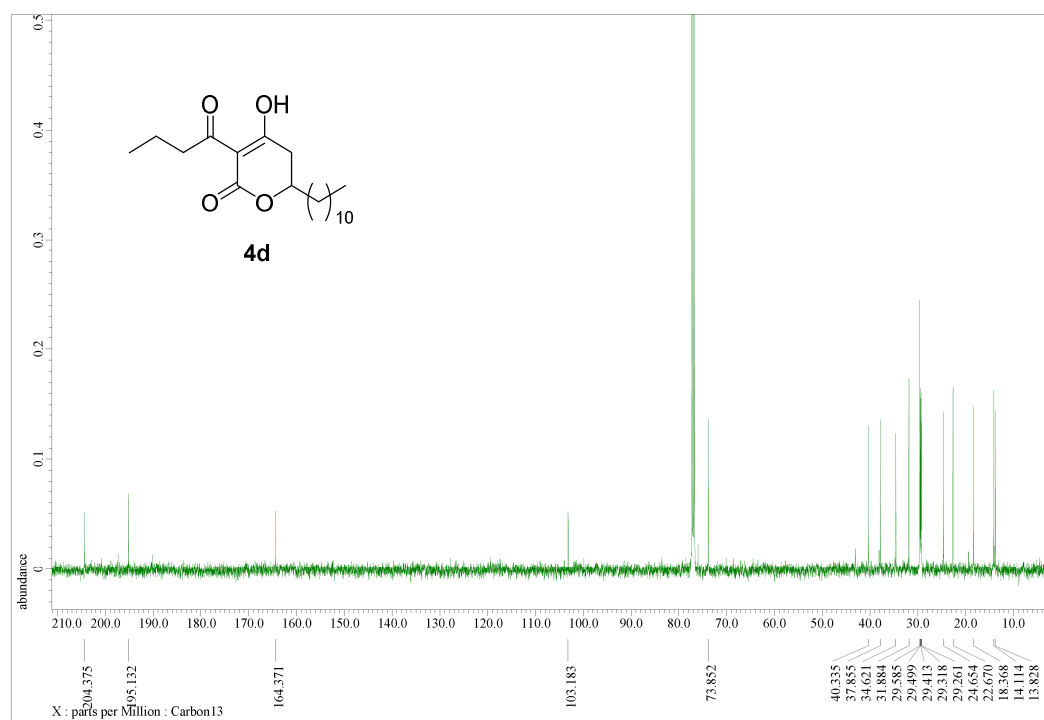


Figure S25. <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 4d.

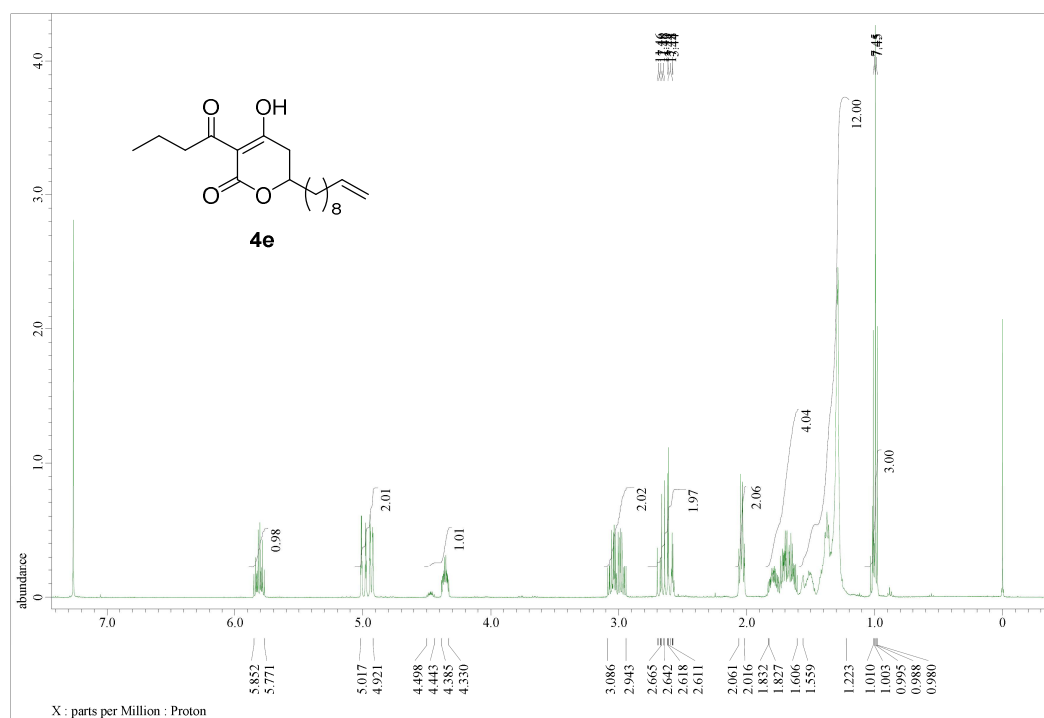


Figure S26. <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) Spectrum of the Compound 4e.

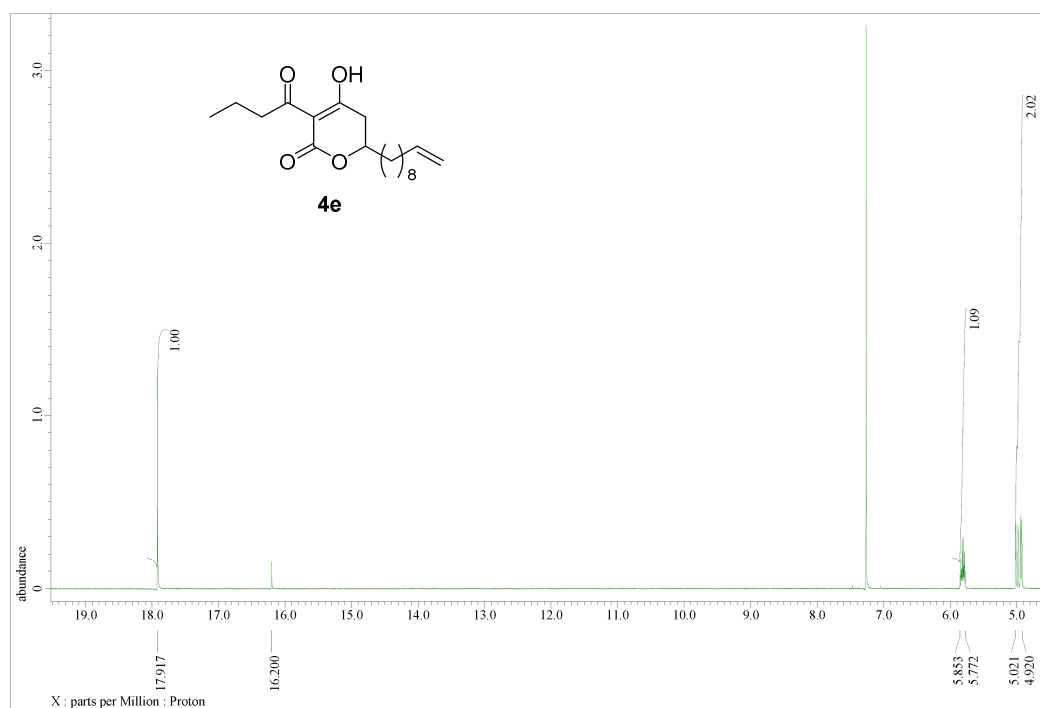


Figure S27. <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) Spectrum of the Compound **4e**.

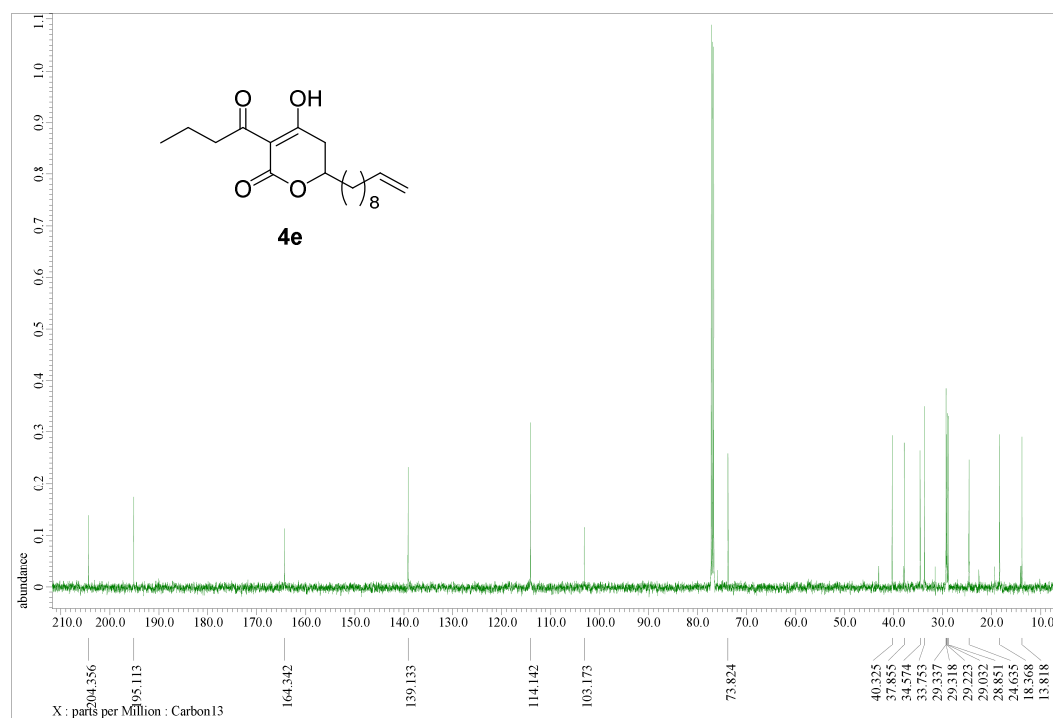


Figure S28. <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) Spectrum of the Compound **4e**.

