

## Supplementary Information for

### ORIGINAL ARTICLE

# Design, synthesis and biological evaluation of chalcone analogues with novel dual antioxidant mechanisms as potential anti-ischemic stroke agents

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<sup>†</sup>These authors made equal contributions to this work.

Running title: Chalcone analogues with novel dual antioxidant mechanisms as anti-ischemic stroke agents

\*Correspondence authors.

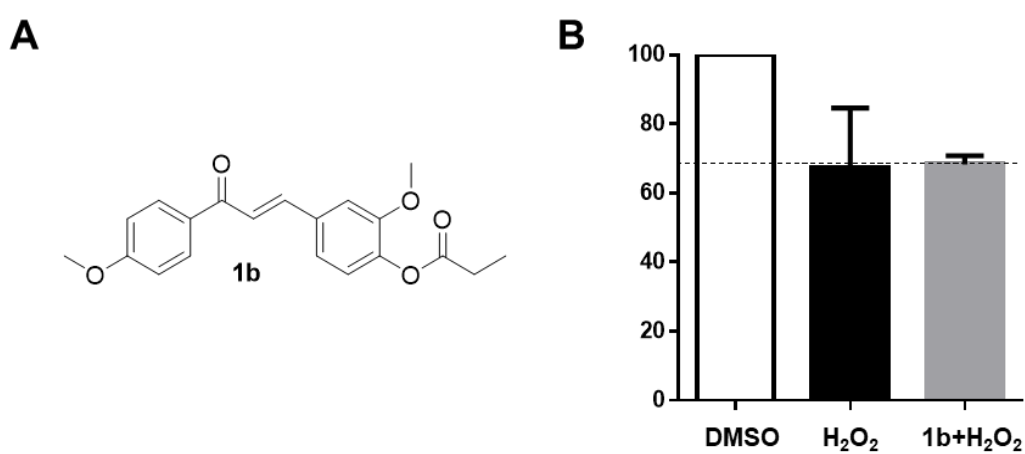
E-mail addresses: wjzwzmc@126.com (Peihong Qiu); [wjzwzmu@163.com](mailto:wjzwzmu@163.com) (Jianzhang Wu).

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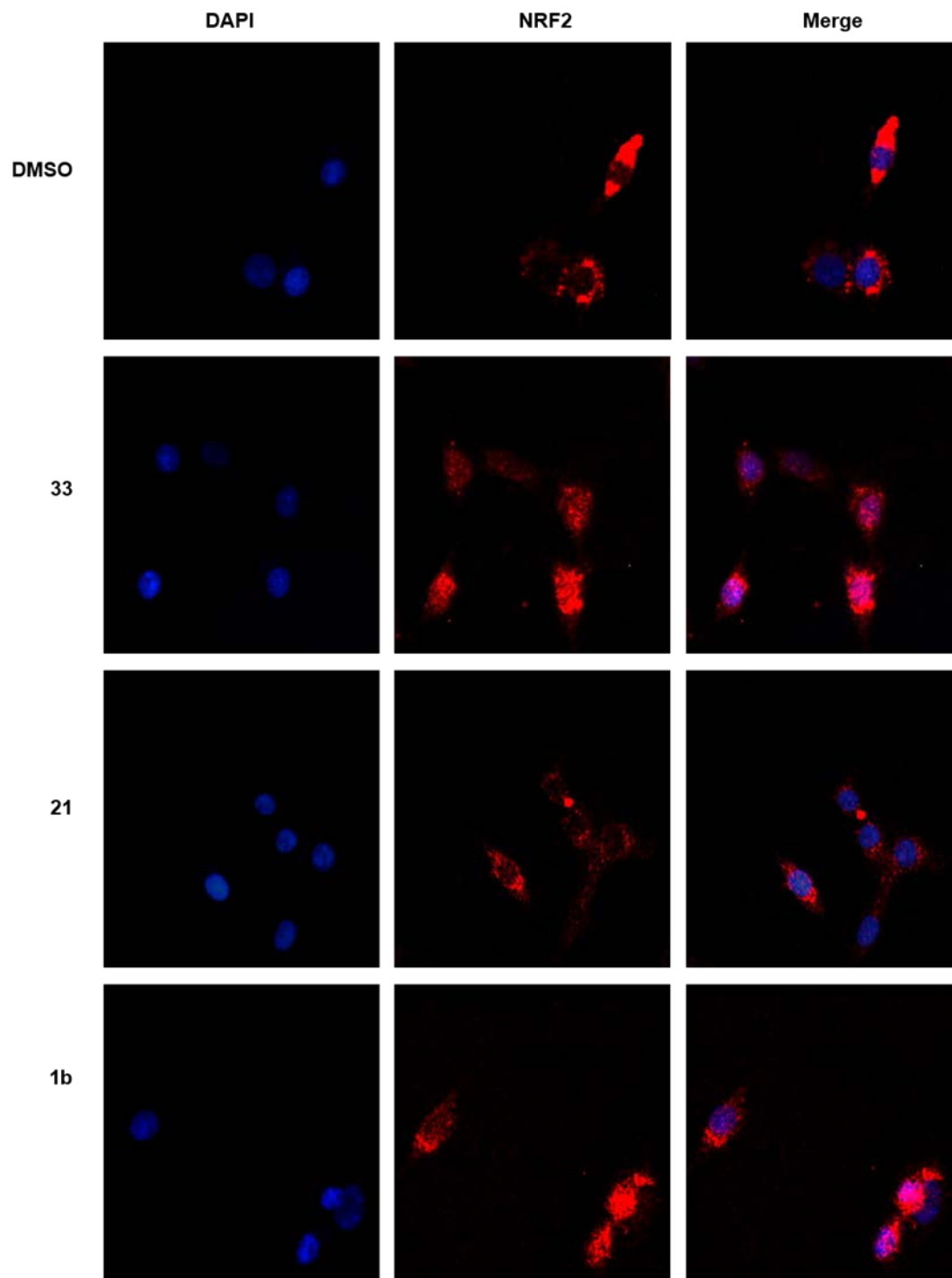
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**Figure S2** The nucleus translocation of NRF2 caused by **33** Page 3

**Figure S3-S43** LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compounds and original spectra of all compounds Page 4-44



**Figure S1** **1b**'s cytoprotection on PC12 cells in H<sub>2</sub>O<sub>2</sub> damage model. (A) The structure of **1b**. (B) PC12 cells were pretreated for 1h with **1b** (10  $\mu$ mol/L), then another 24 h exposure in H<sub>2</sub>O<sub>2</sub> (450  $\mu$ mol/L), finally determined by the MTT assay. The viability of untreated cells is defined as 100%.



**Figure S2** The nucleus translocation of NRF2 caused by **33**. PC12 cells were incubated with **33**, **21** and **1b** at 10  $\mu\text{mol/L}$  for 6 h, and then stained with NRF2 antibody and DAPI.

LC-MS,  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra of compounds and original spectra of all compounds

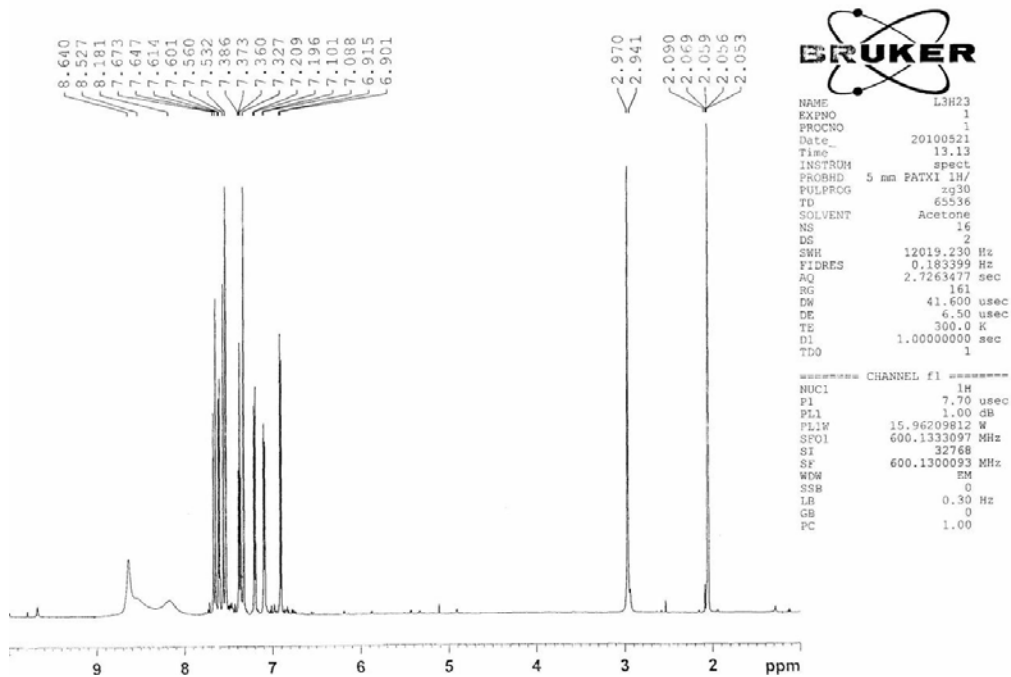
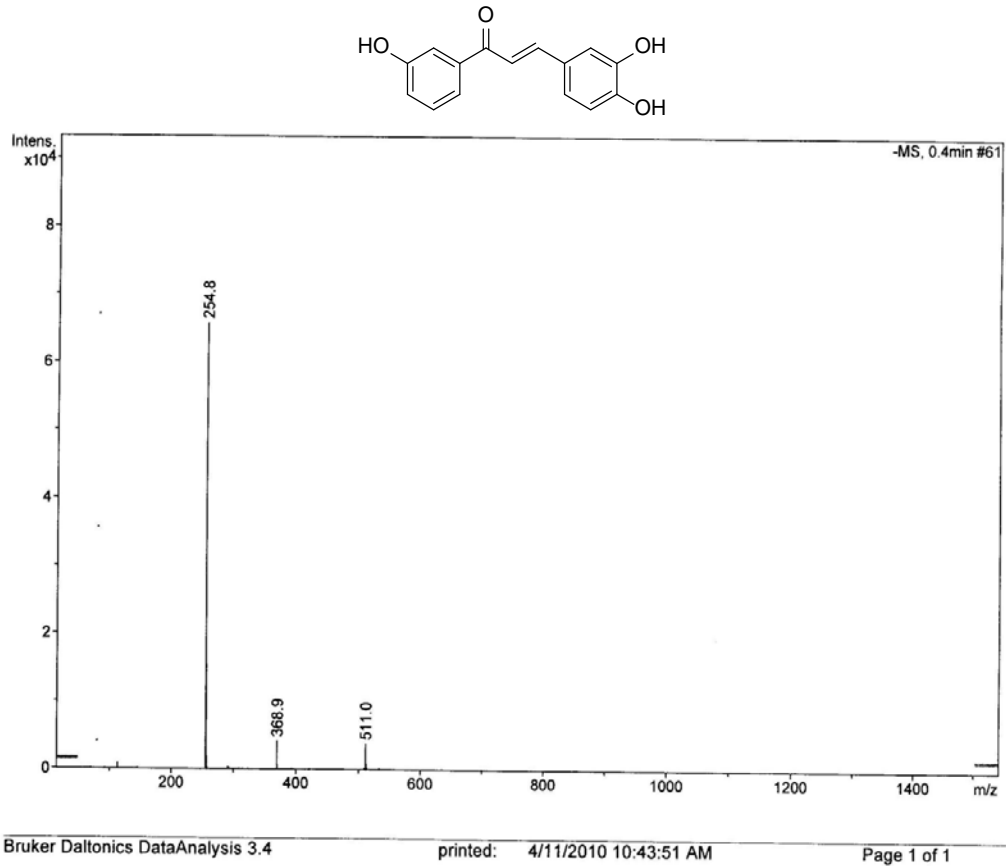
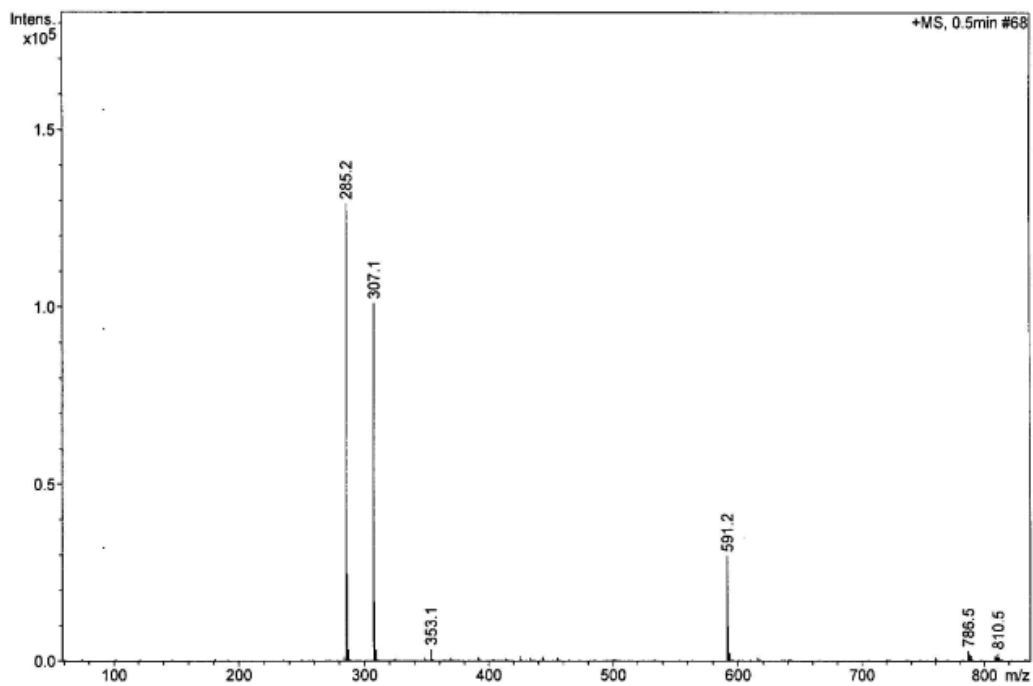
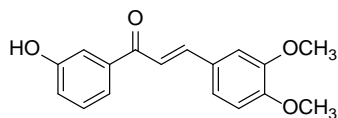


Figure S3 LC-MS and  $^1\text{H}$  NMR spectra of compound 1.



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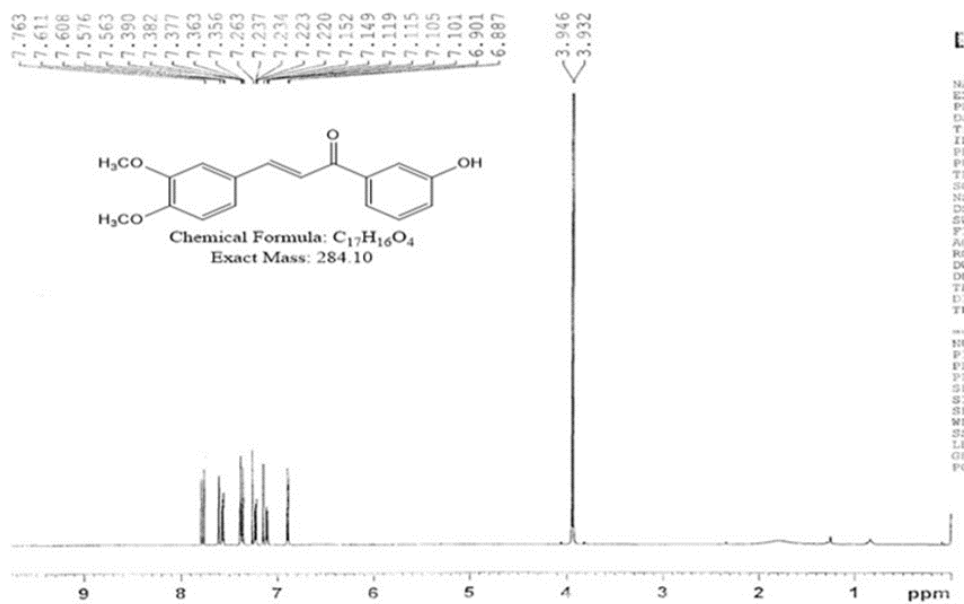


Figure S4 LC-MS and  $^1H$  NMR spectra of compound 2.

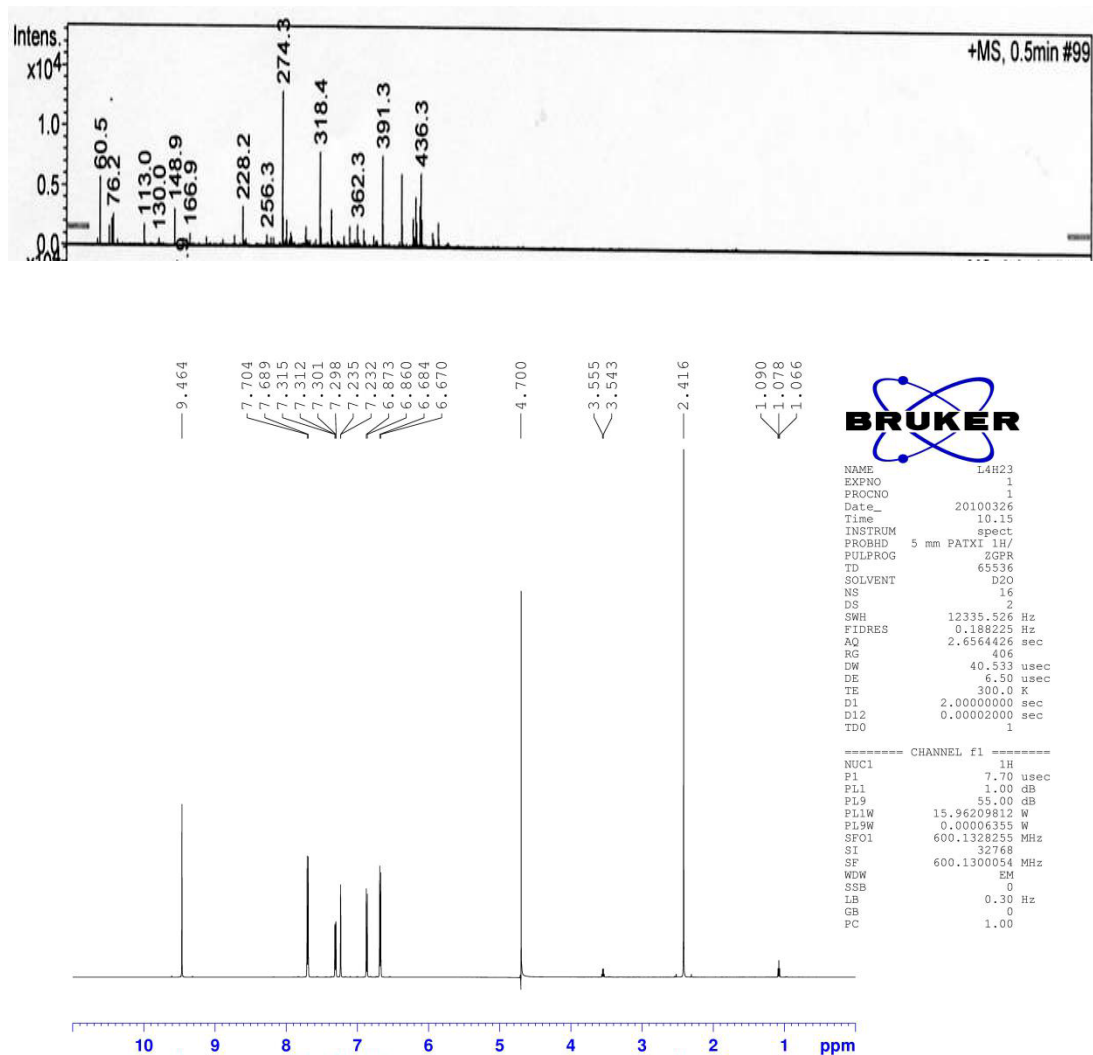
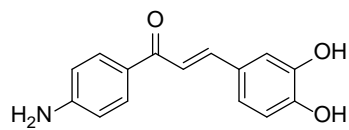
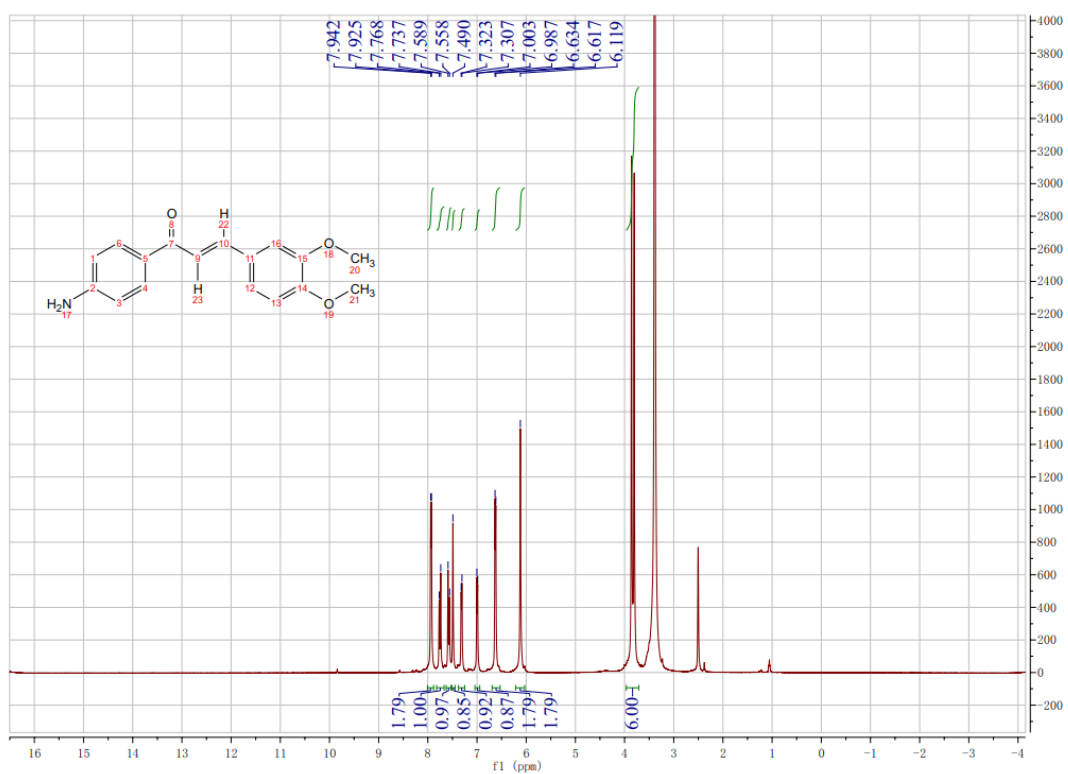
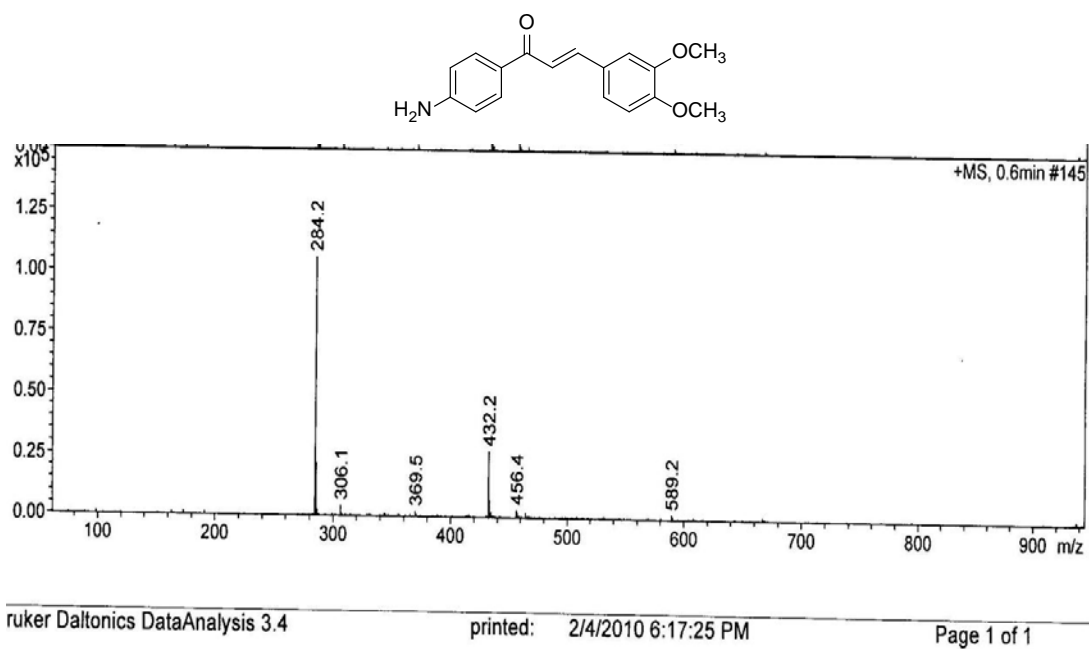
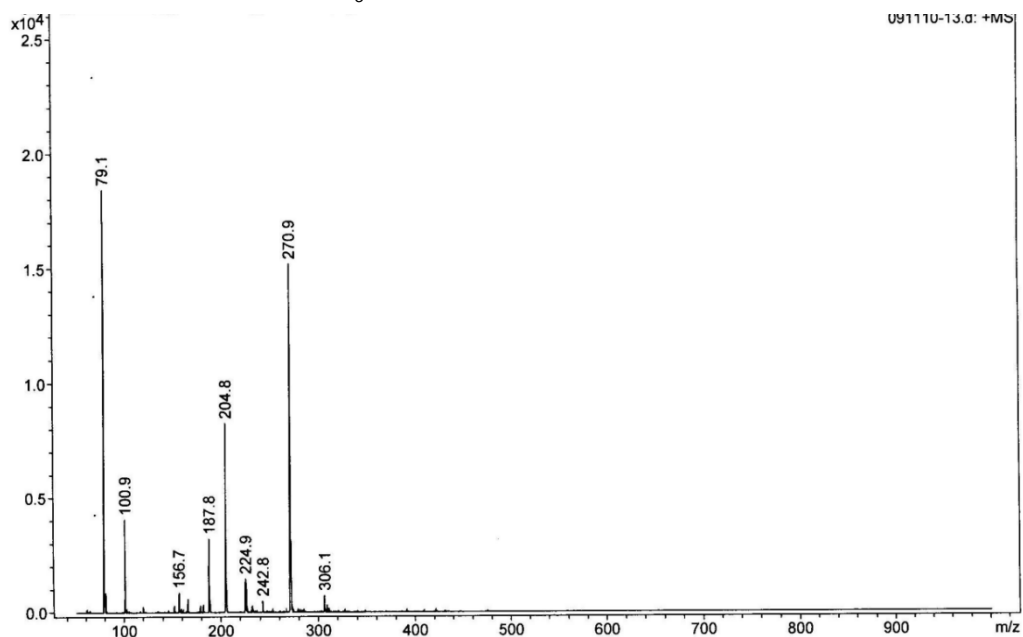
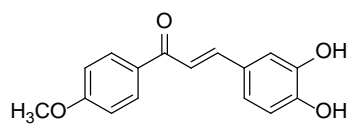


Figure S5 LC-MS and <sup>1</sup>H NMR spectra of compound 3.



**Figure S6** LC-MS and  $^1\text{H}$  NMR spectra of compound **4**.



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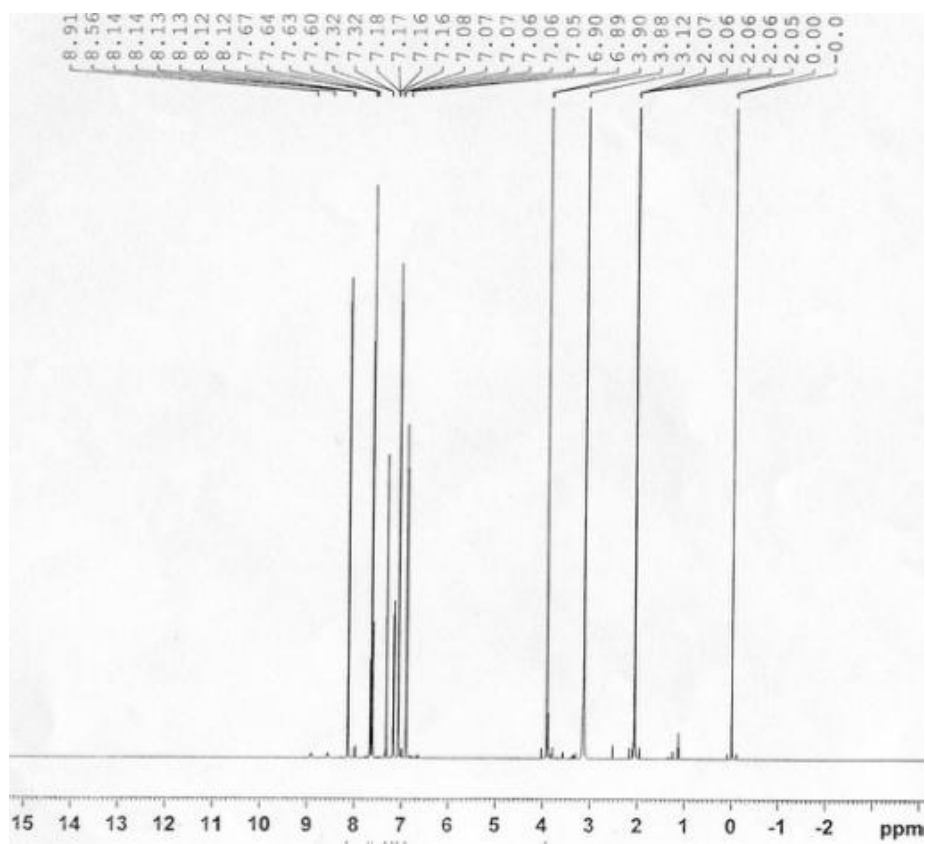
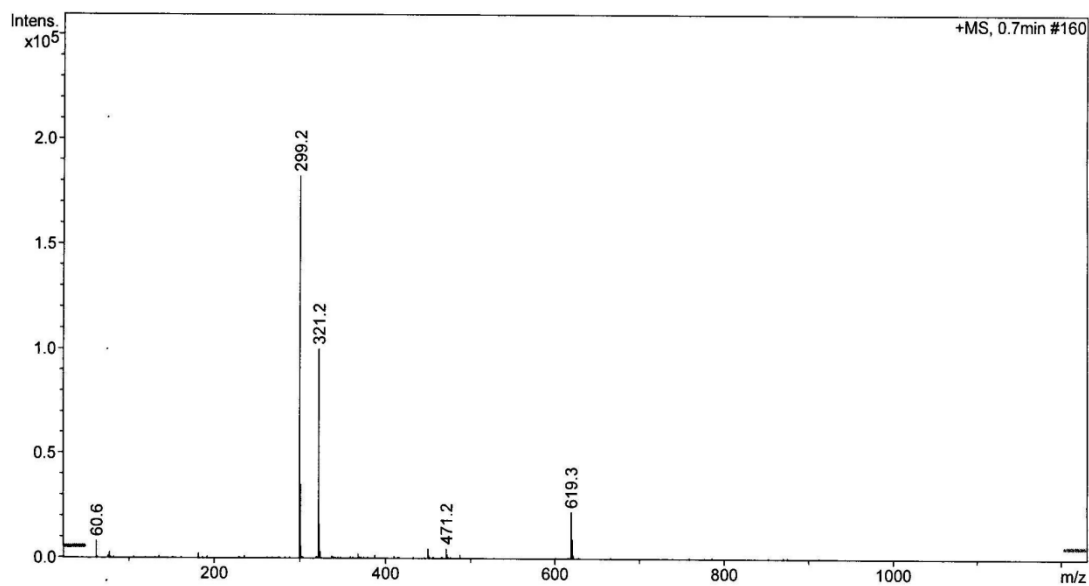
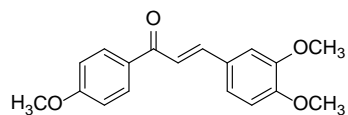


Figure S7 LC-MS and  $^1\text{H}$  NMR spectra of compound 5.





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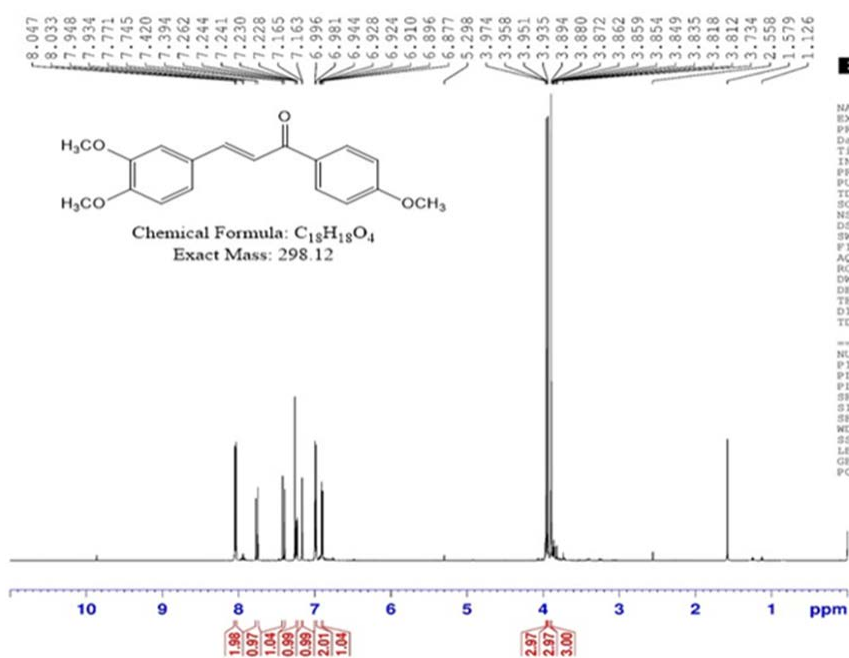
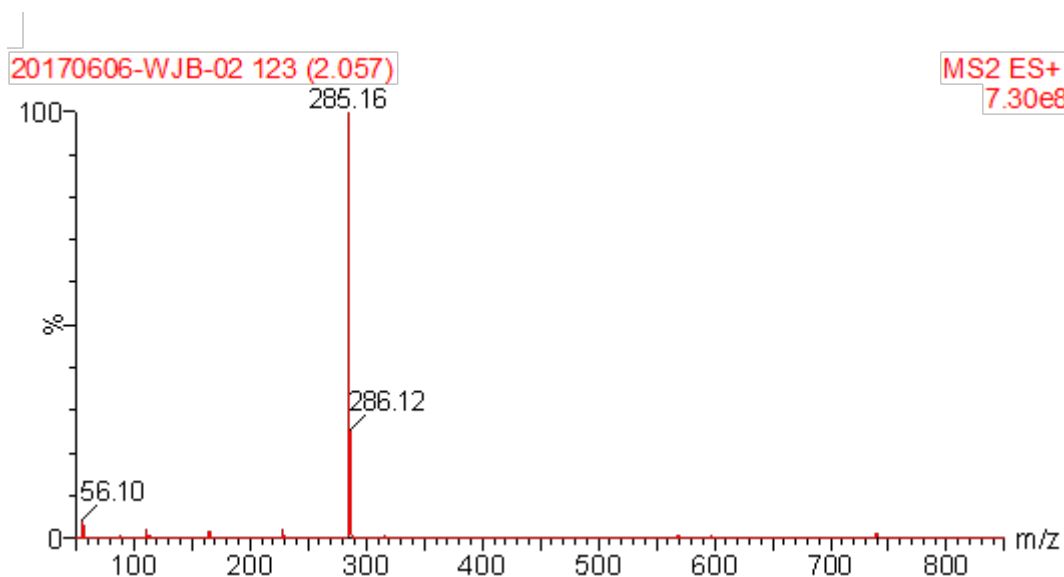
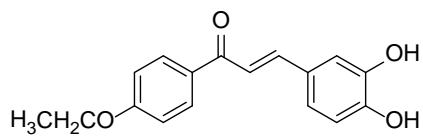


Figure S8 LC-MS and <sup>1</sup>H NMR spectra of compound 6.



MS2 ES+  
7.30e8

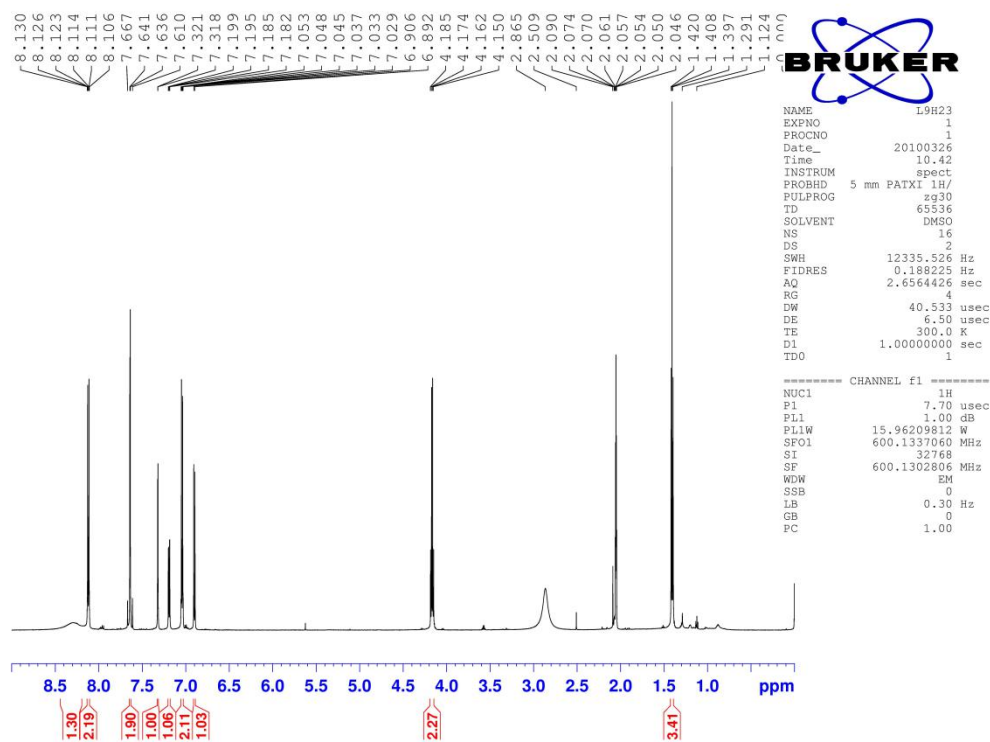


Figure S9 LC-MS and <sup>1</sup>H NMR spectra of compound 7.

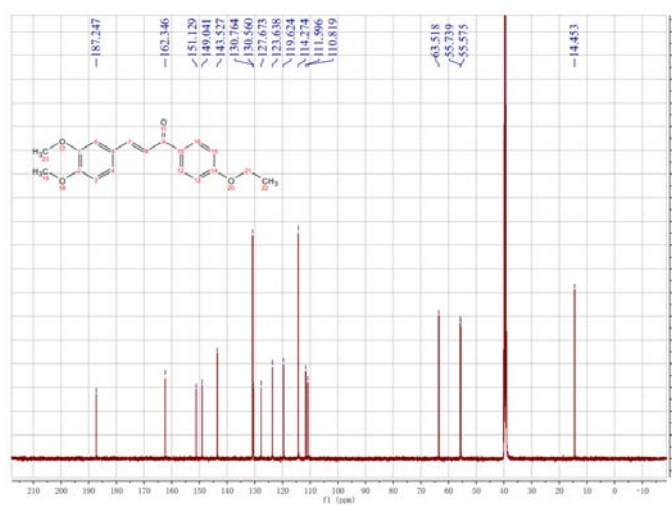
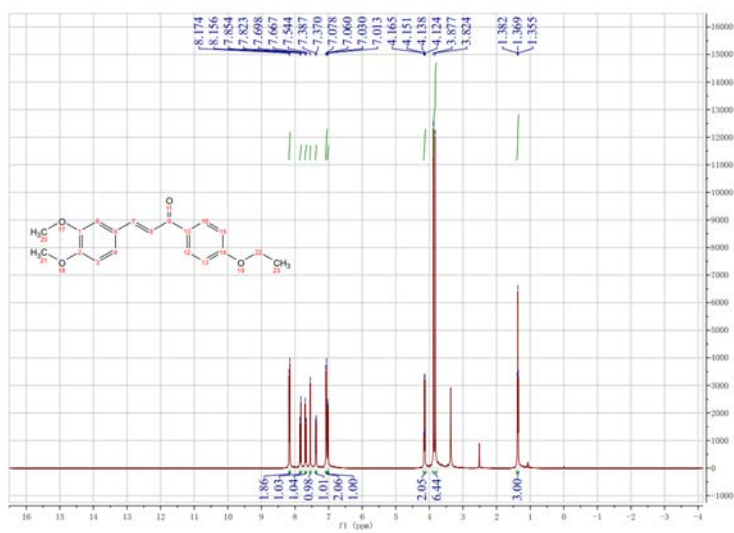
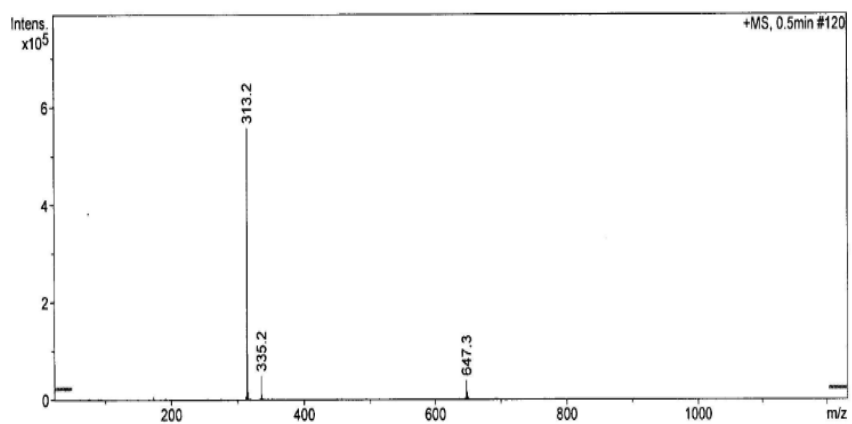
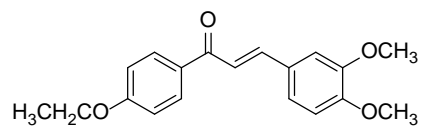
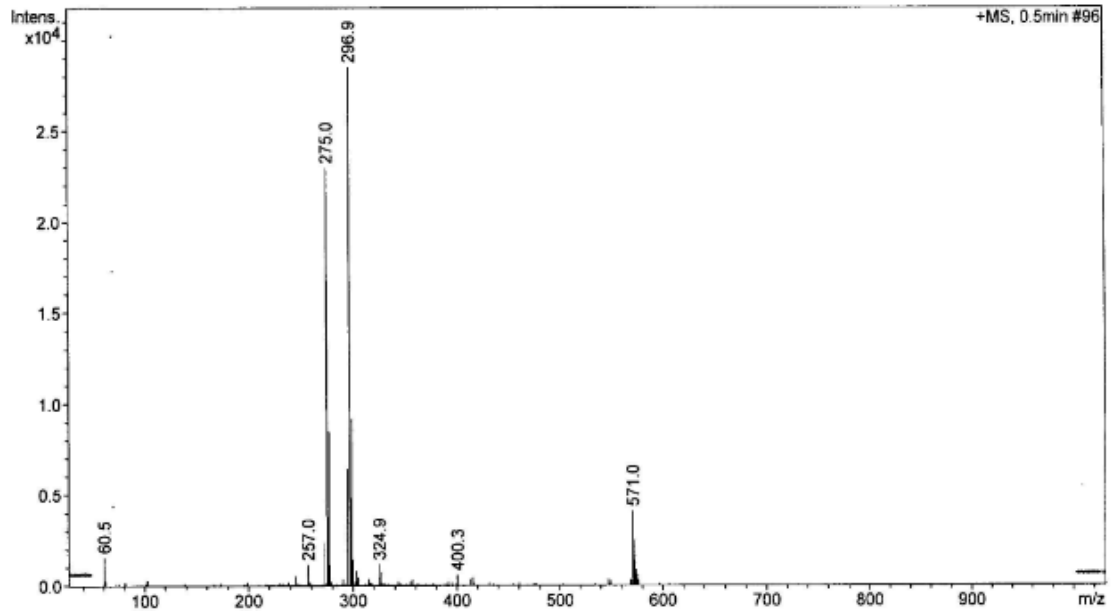
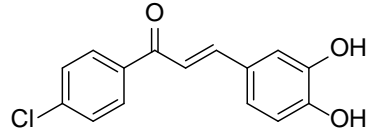


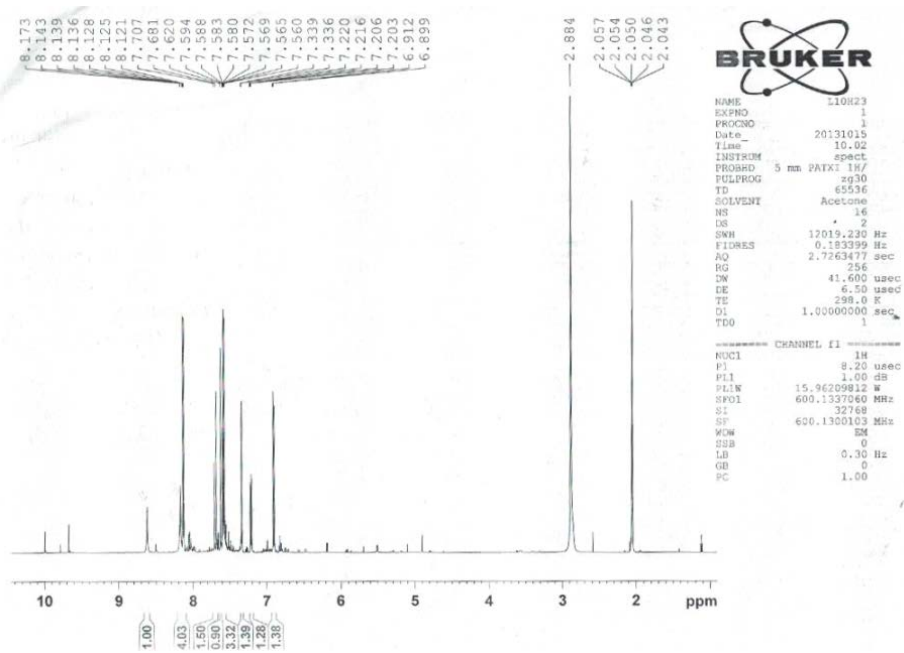
Figure S10 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 8.



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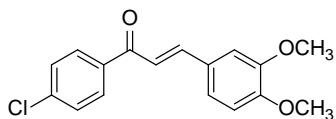
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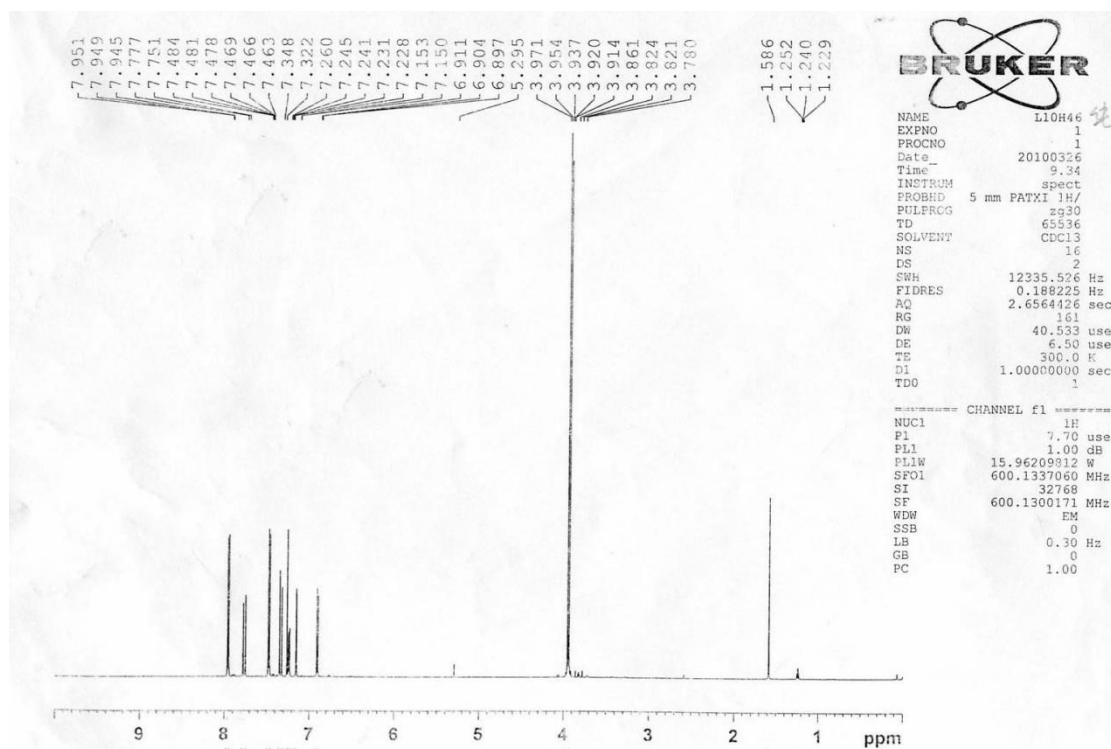
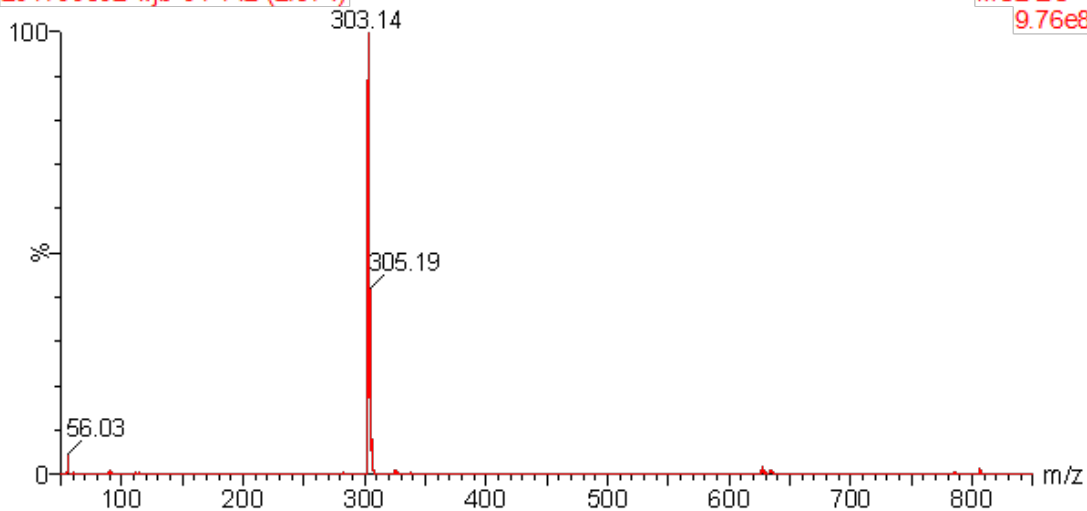
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Figure S11 LC-MS and <sup>1</sup>H NMR spectra of compound 9.



201700602-wjb-01 142 (2.374)

MS2 ES+  
9.76e8

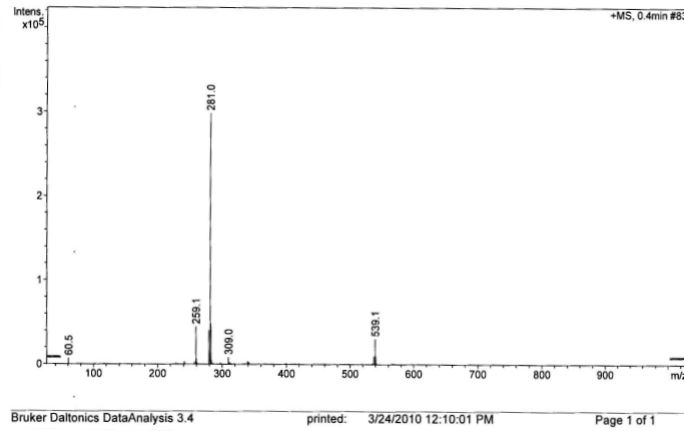
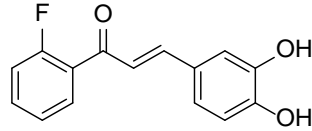


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Figure S12 LC-MS and <sup>1</sup>H NMR spectra of compound 10.



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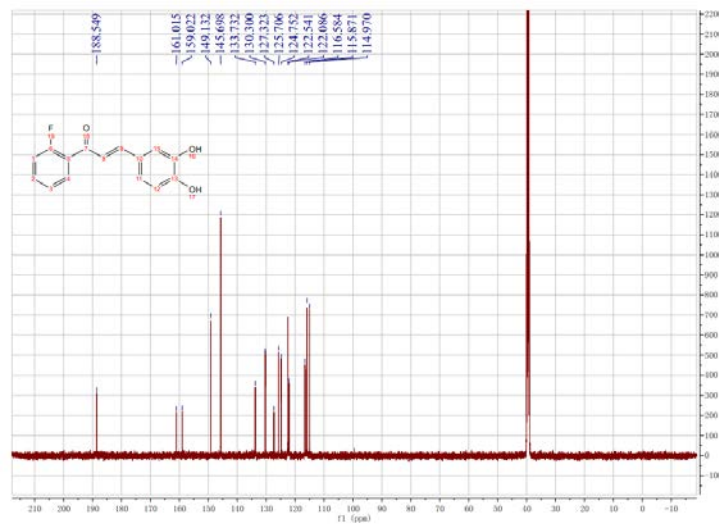
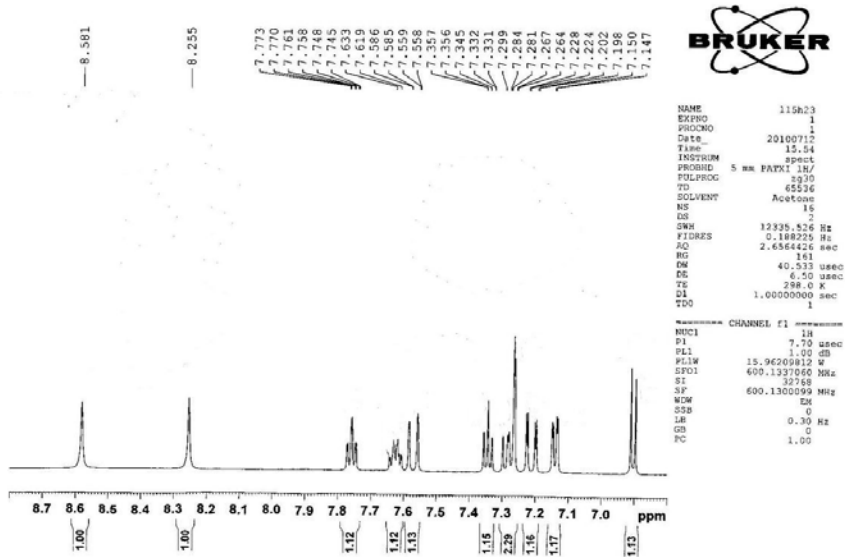
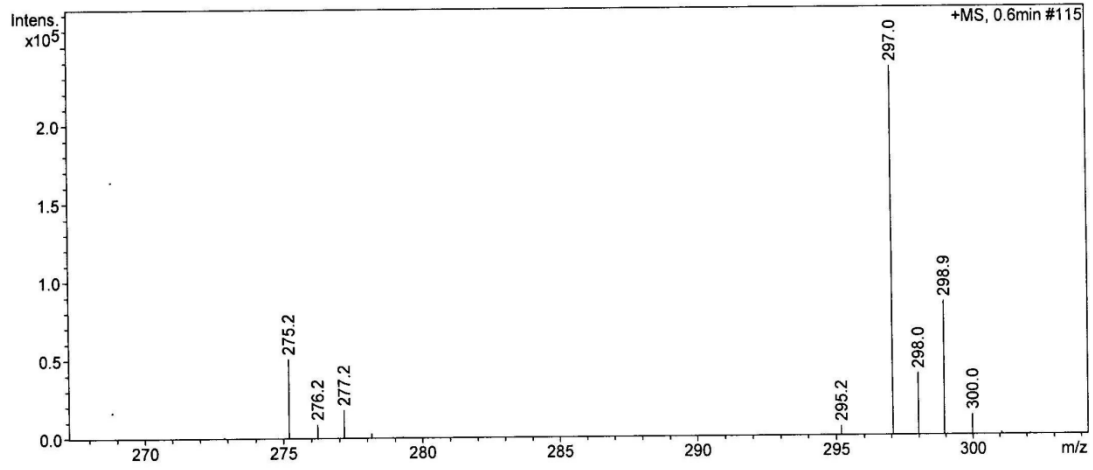
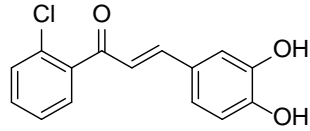


Figure S13 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 11.





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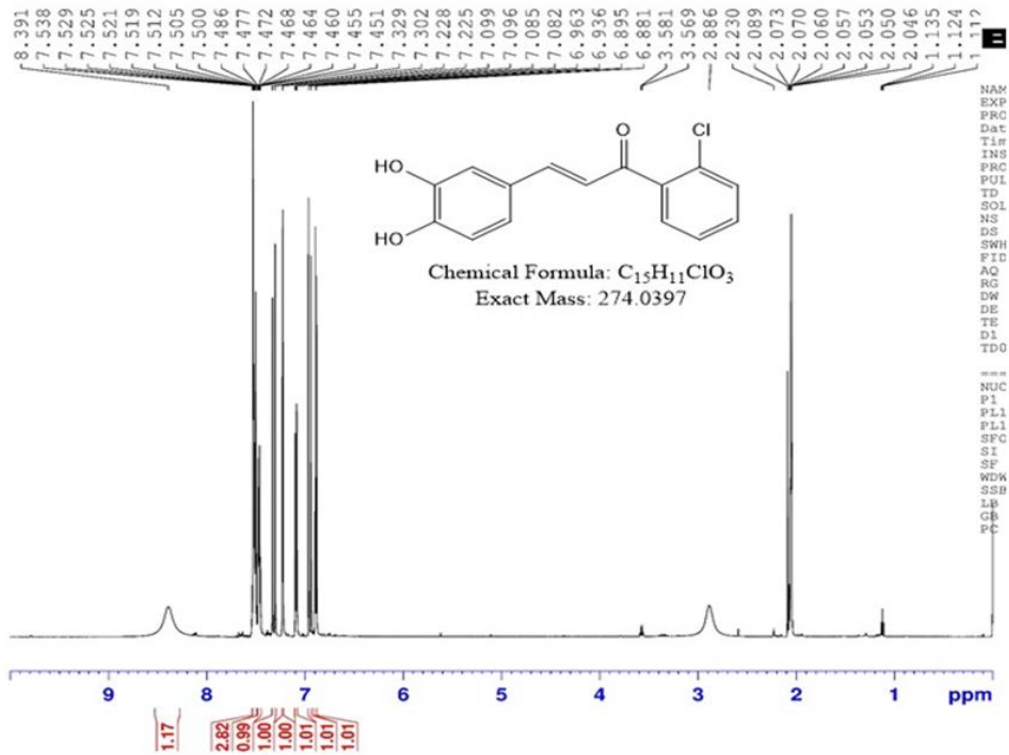
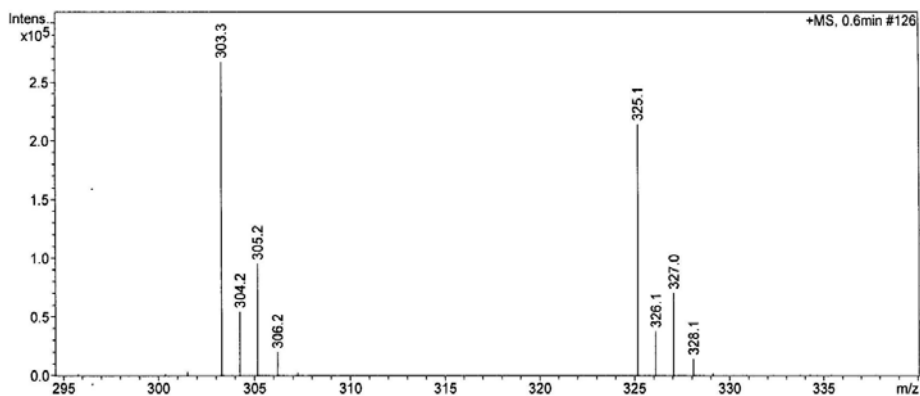
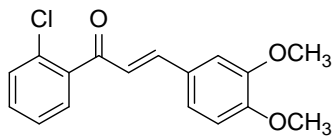


Figure S15 LC-MS and <sup>1</sup>H NMR spectra of compound 13.





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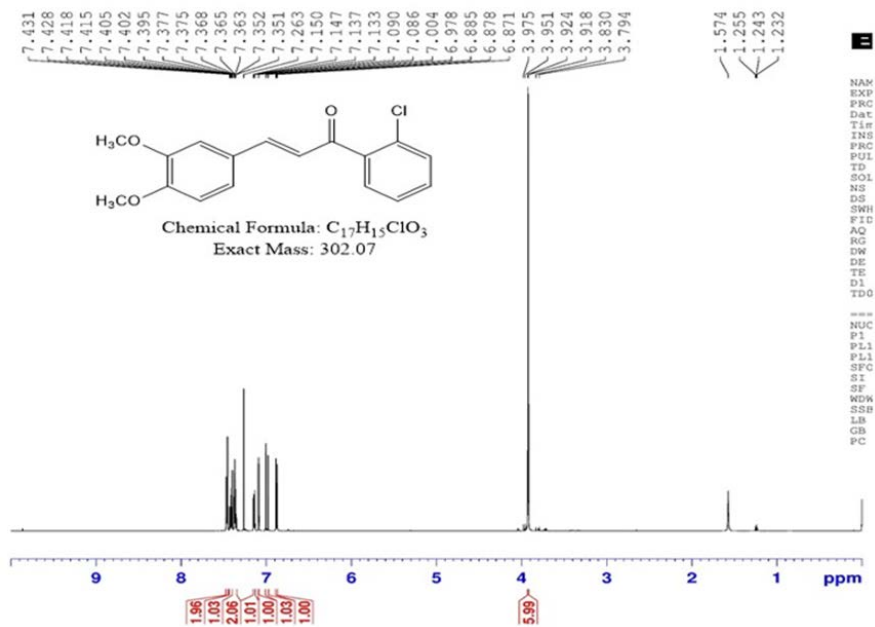
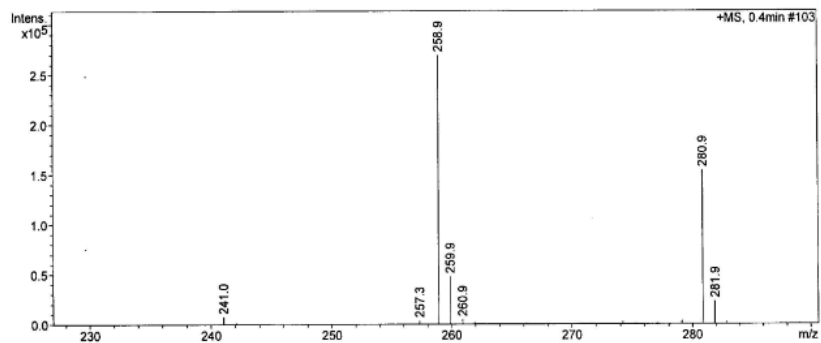
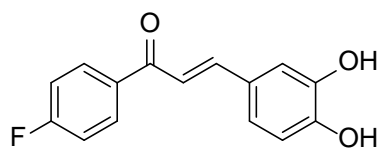


Figure S16 LC-MS and <sup>1</sup>H NMR spectra of compound 14.



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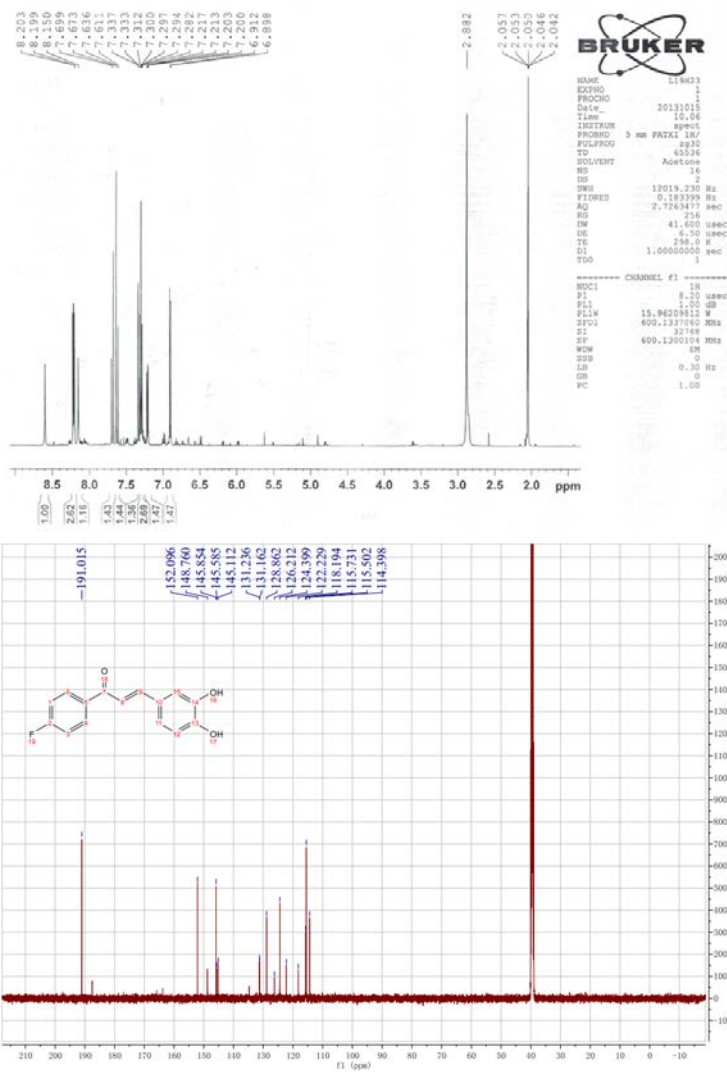
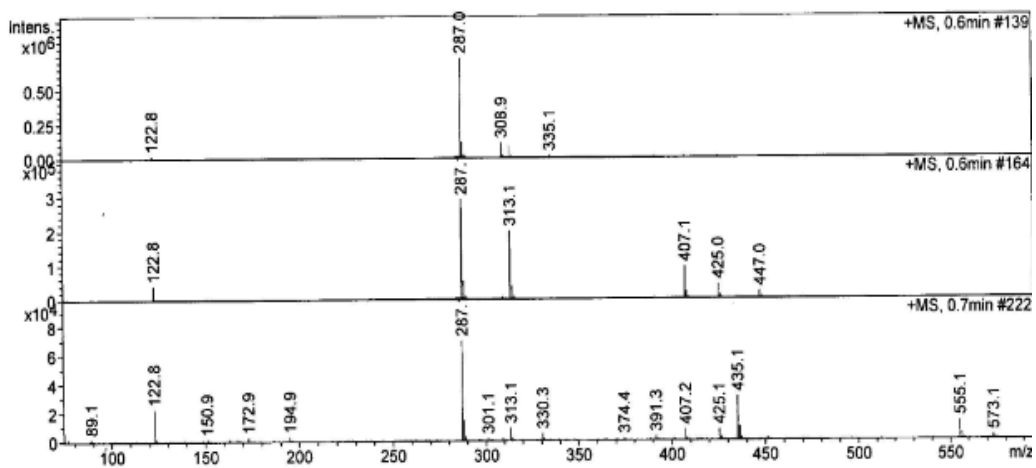
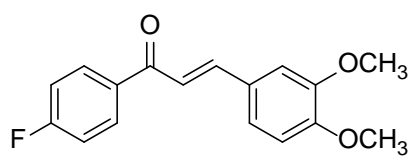


Figure S17 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 15.



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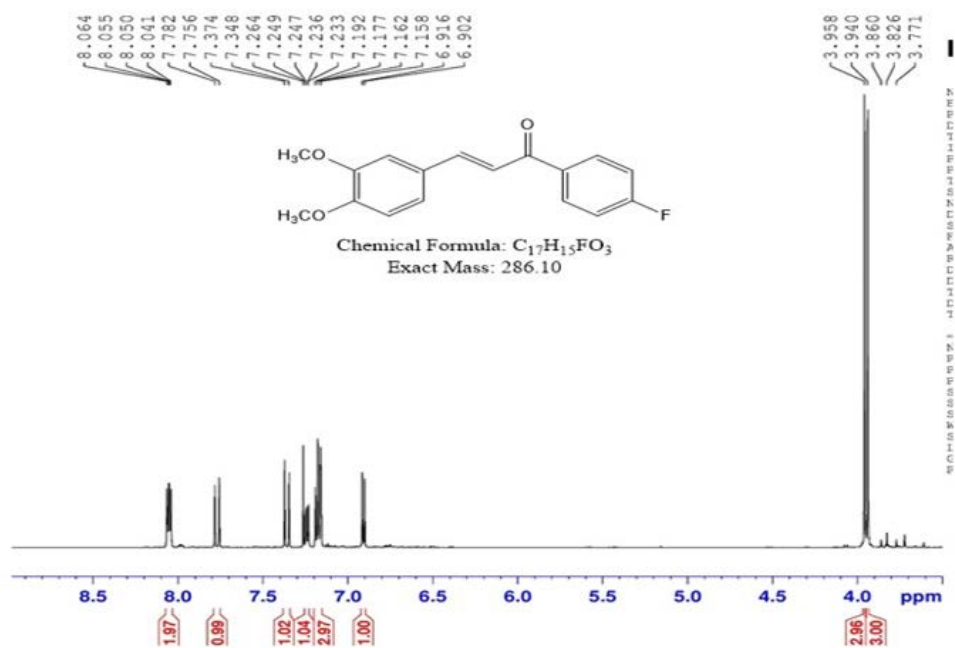


Figure S18 LC-MS and <sup>1</sup>H NMR spectra of compound 16.

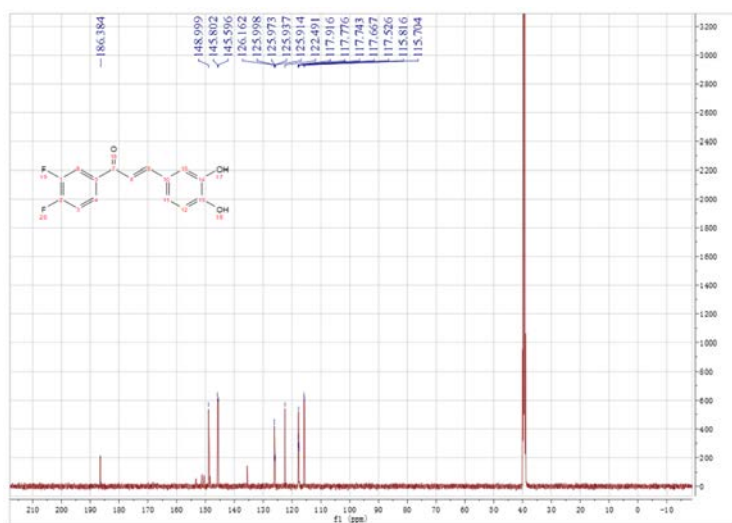
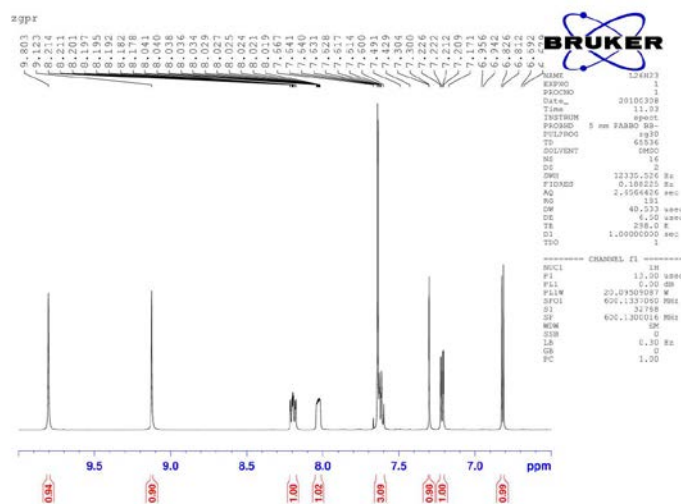
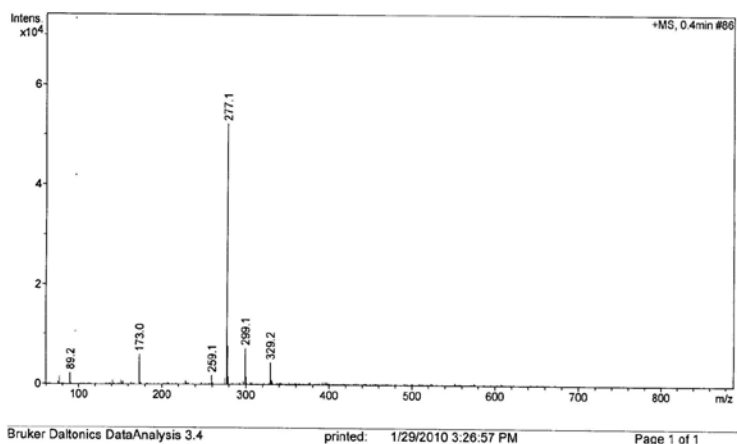
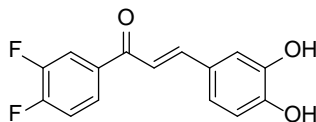
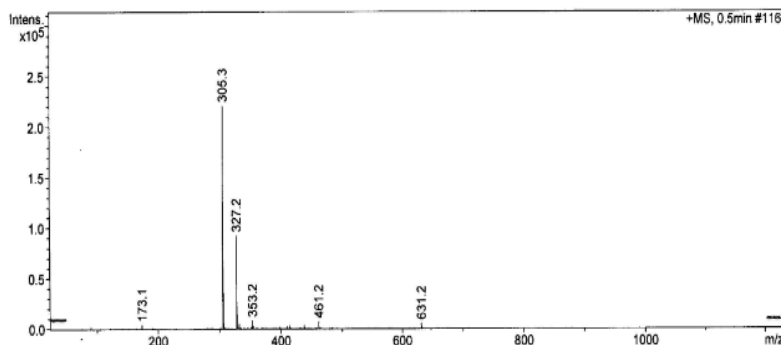
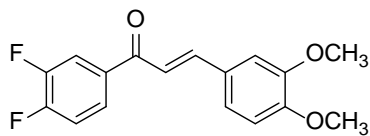


Figure S19 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 17.



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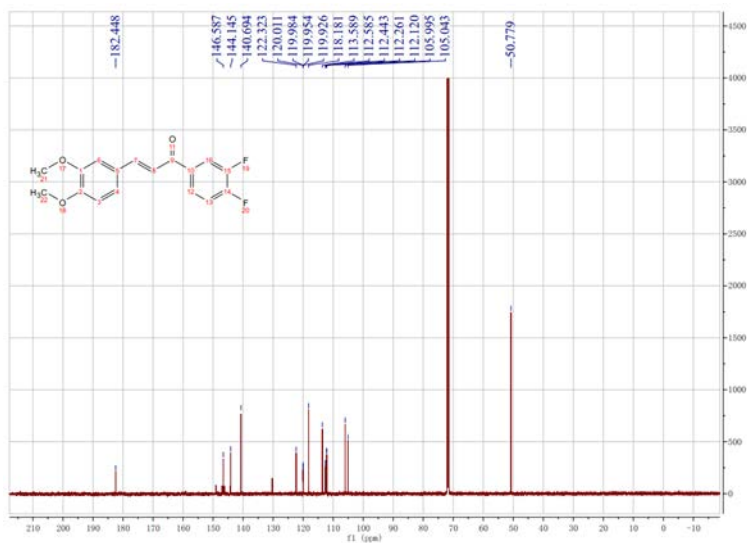
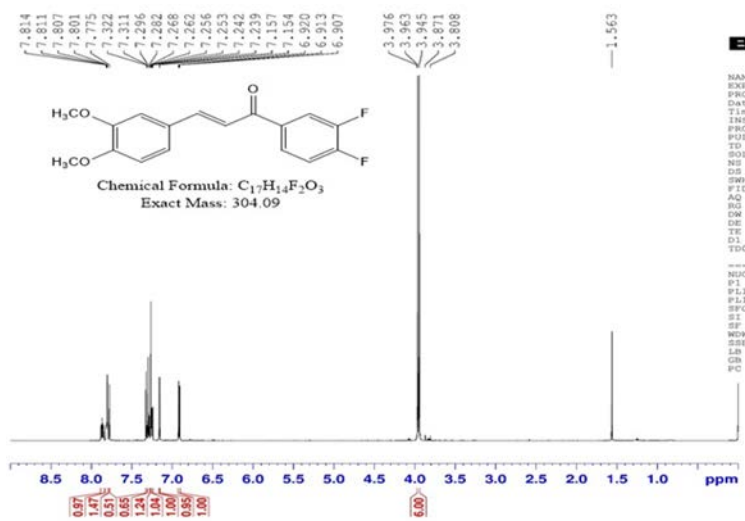
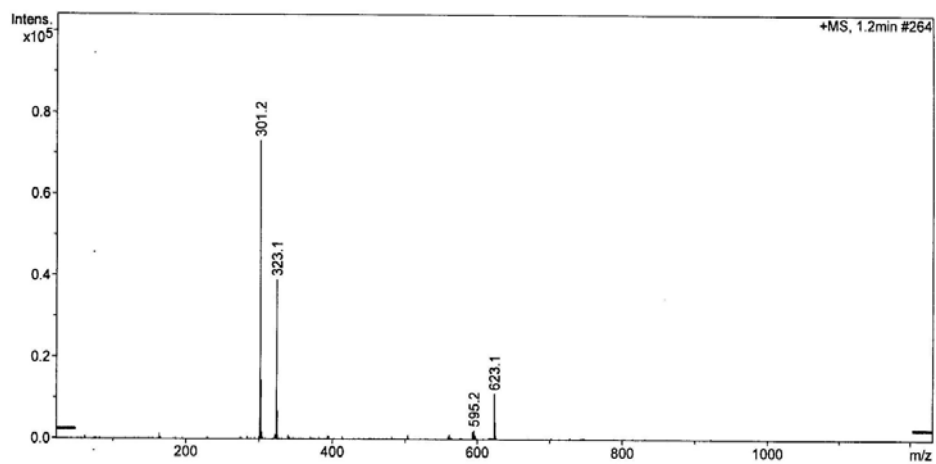
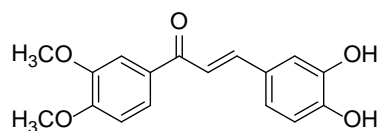


Figure S20 LC-MS,  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra of compound 18.



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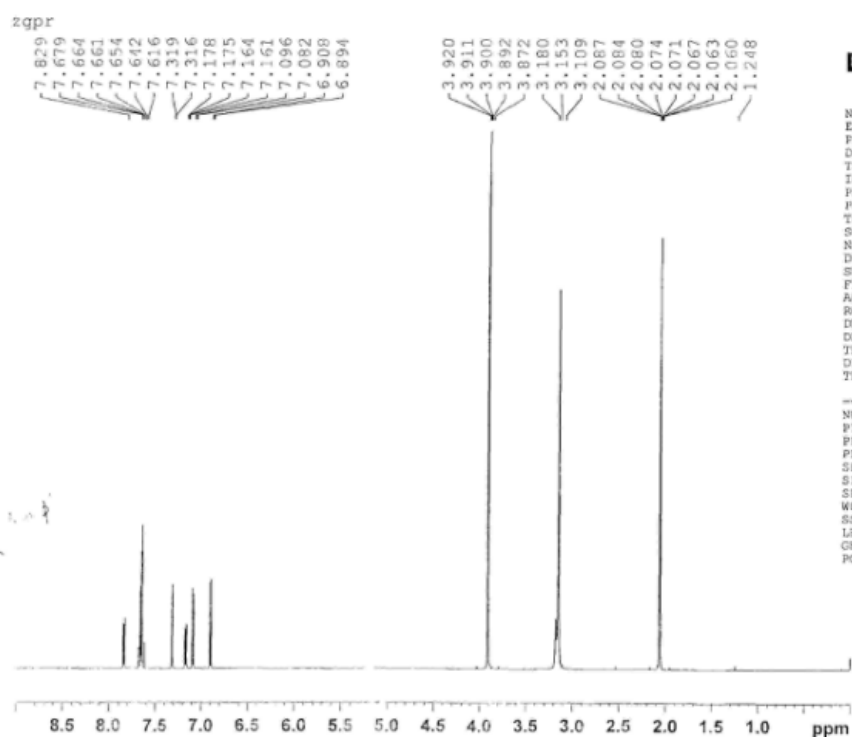


Figure S21 LC-MS and <sup>1</sup>H NMR spectra of compound 19.

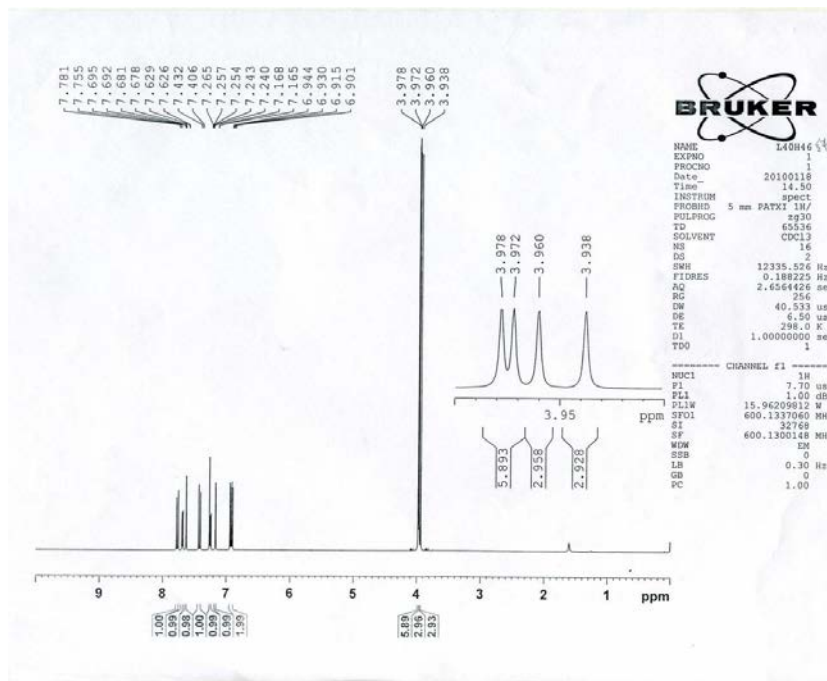
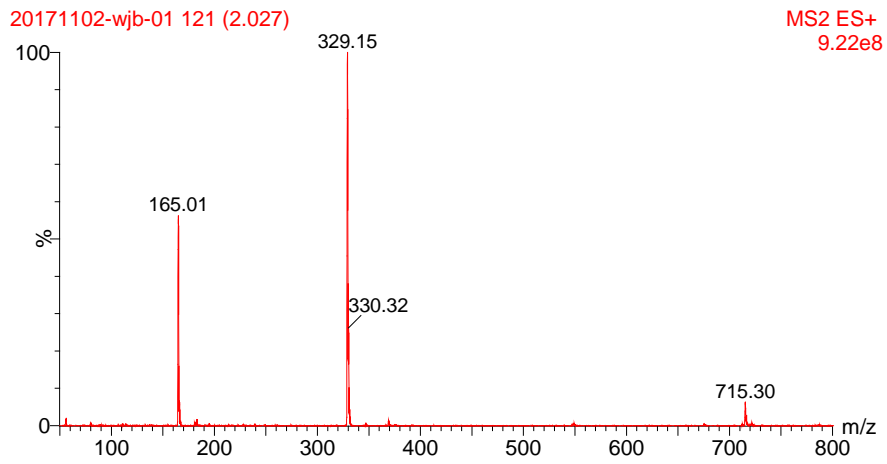
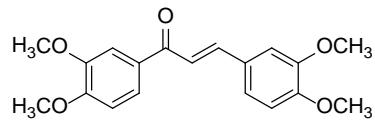


Figure S22 LC-MS and <sup>1</sup>H NMR spectra of compound 20.

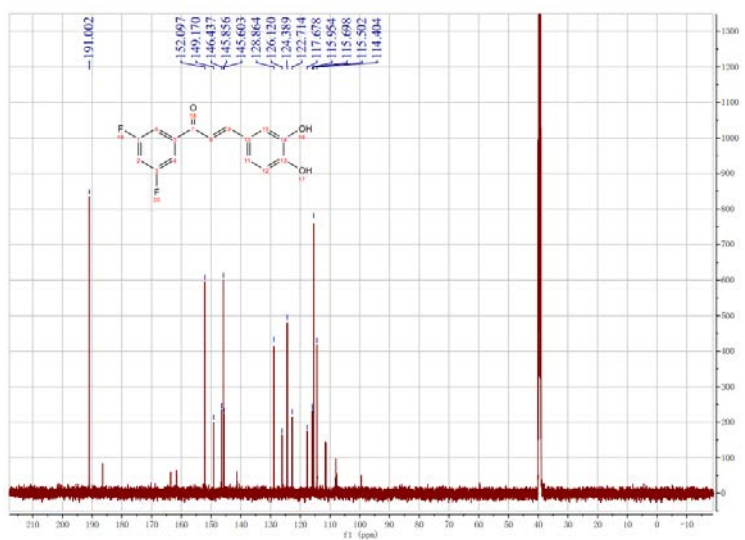
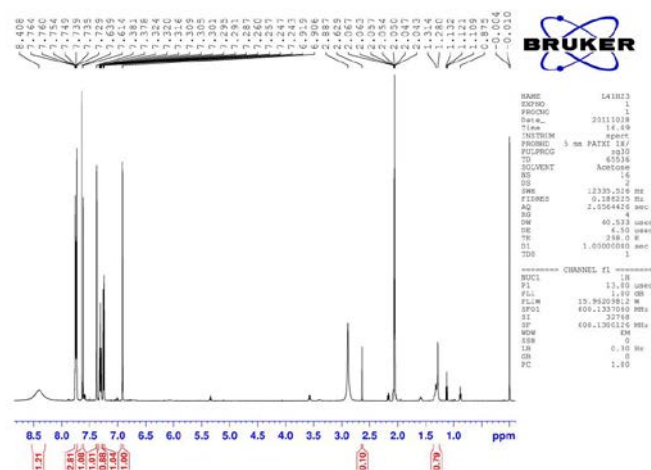
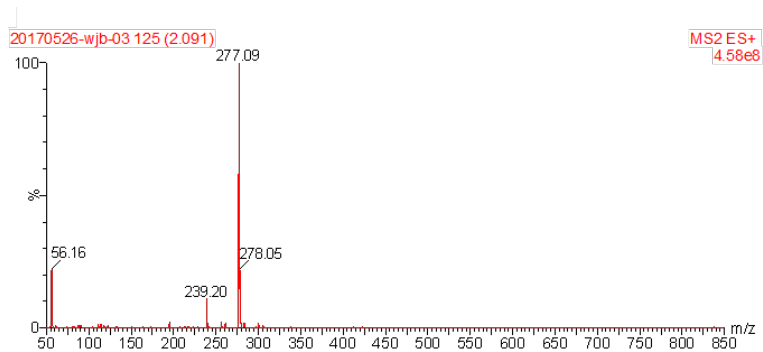
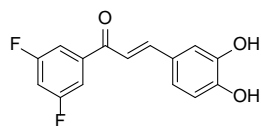
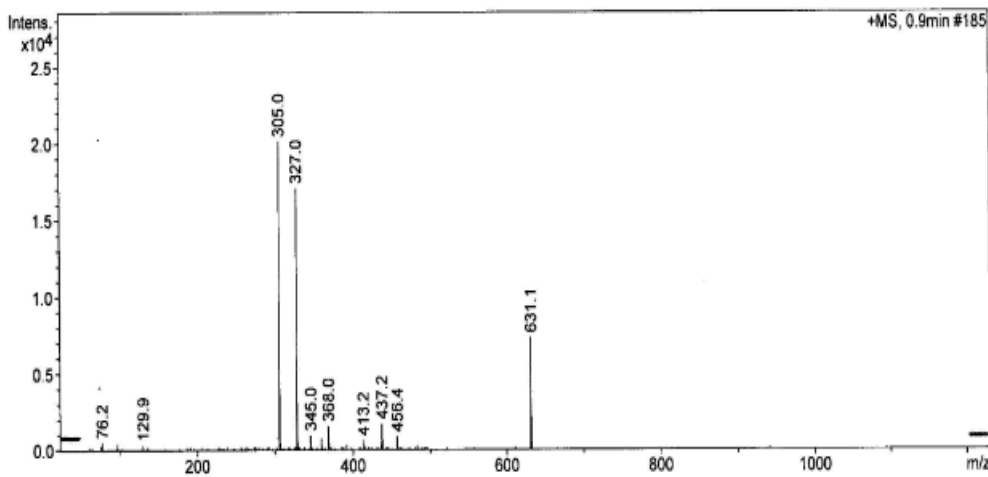
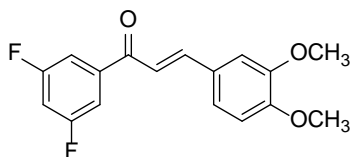


Figure S23 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 21.





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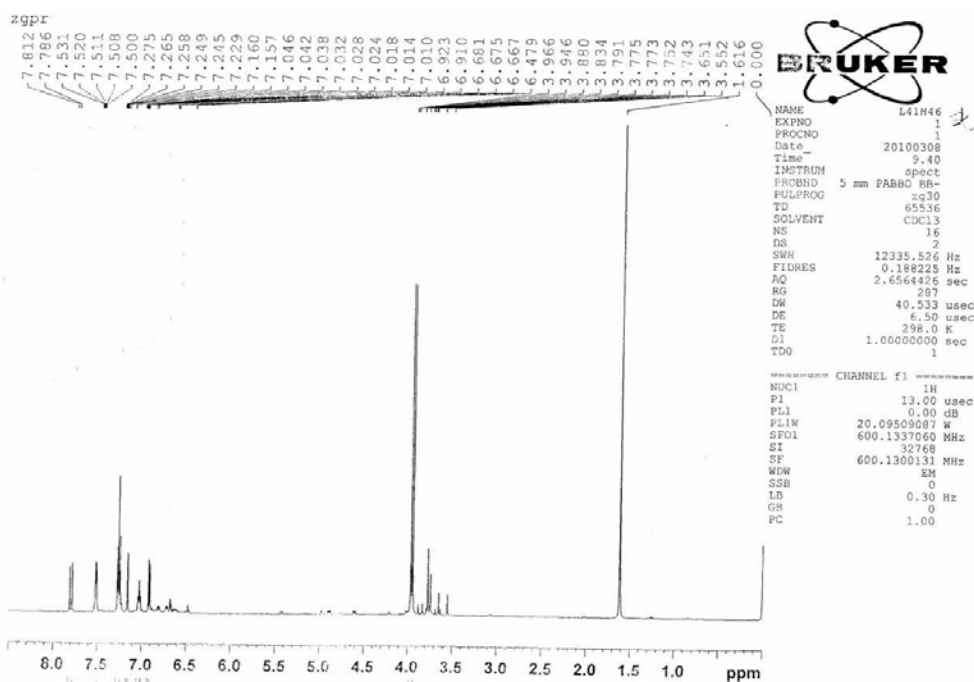
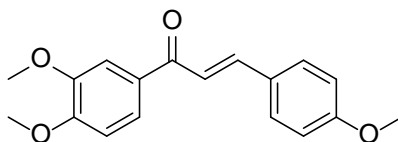


Figure S24 LC-MS and <sup>1</sup>H NMR spectra of compound 22.





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1.27e9

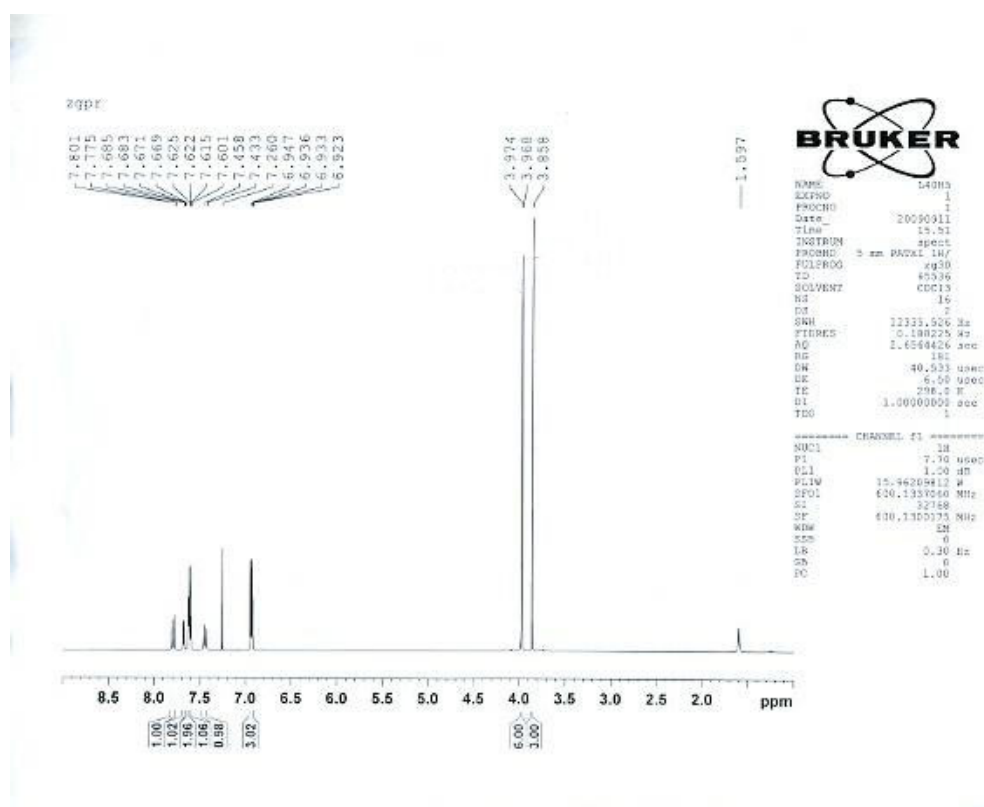
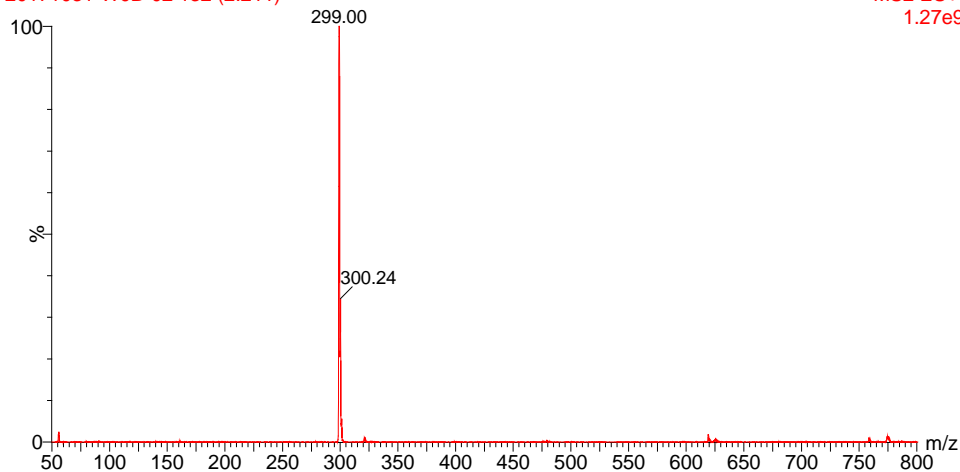


Figure S26 LC-MS and <sup>1</sup>H NMR spectra of compound 24.

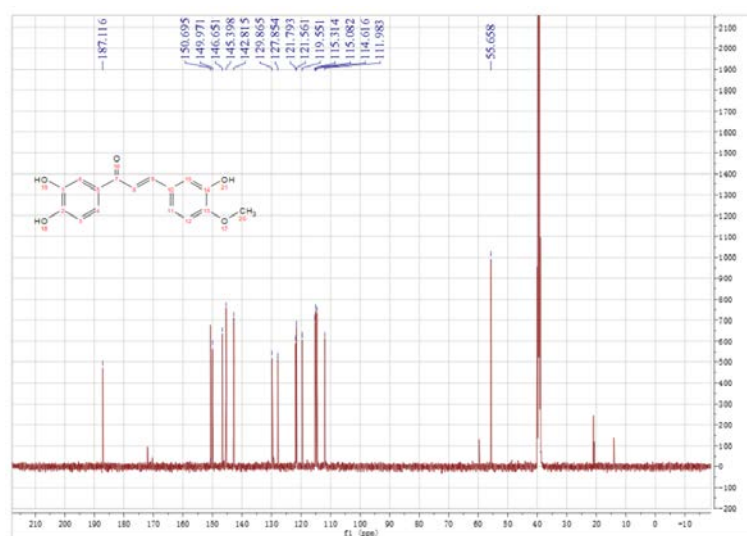
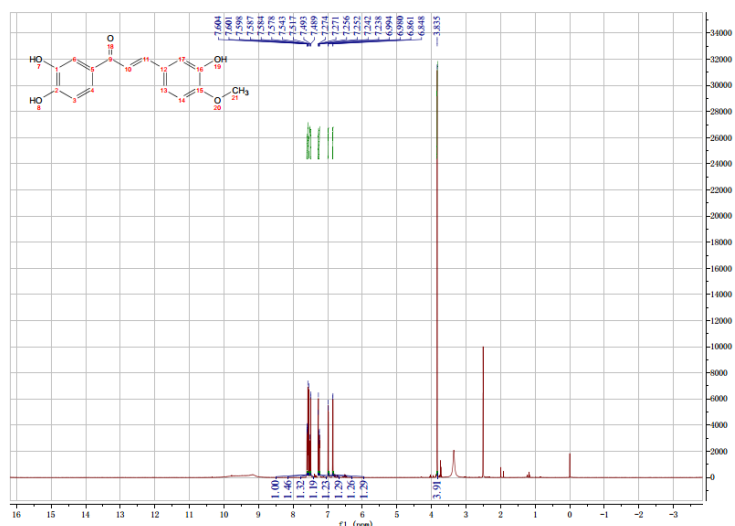
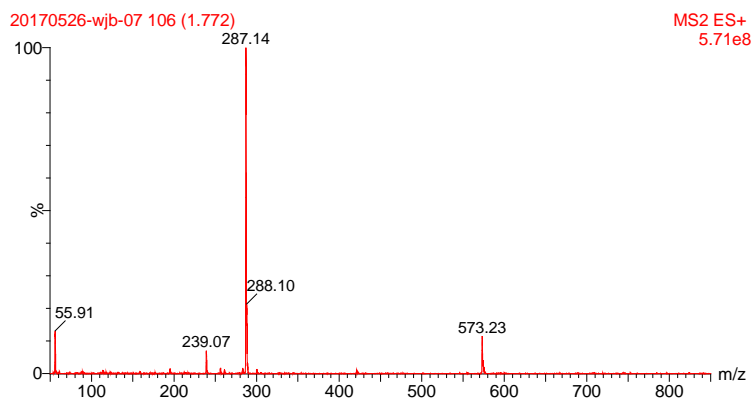
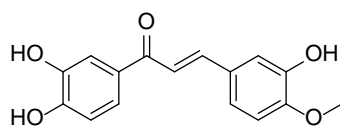
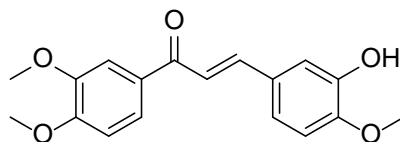


Figure S27 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound **25**.



20170606-WJB-01 120 (2.007)

MS2 ES+  
1.27e9

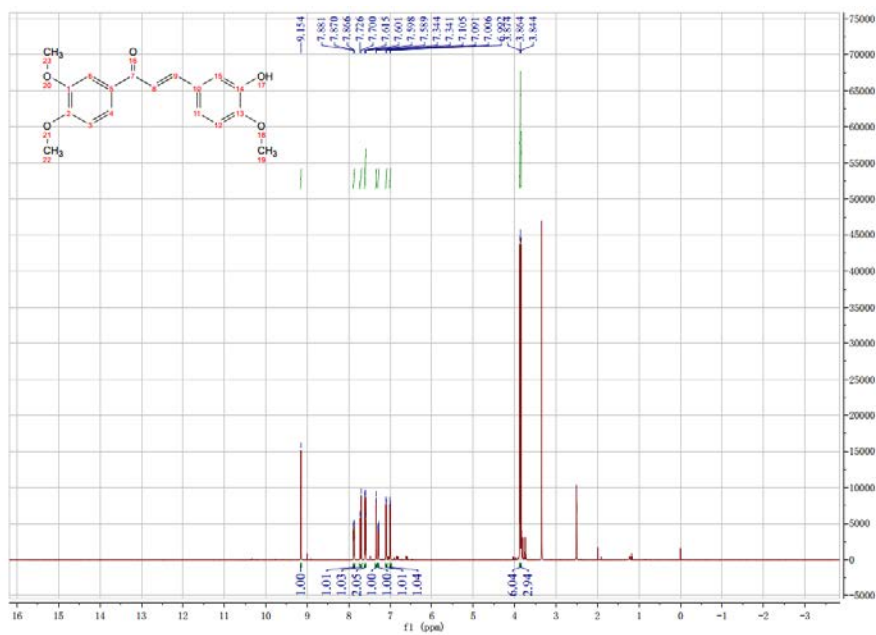
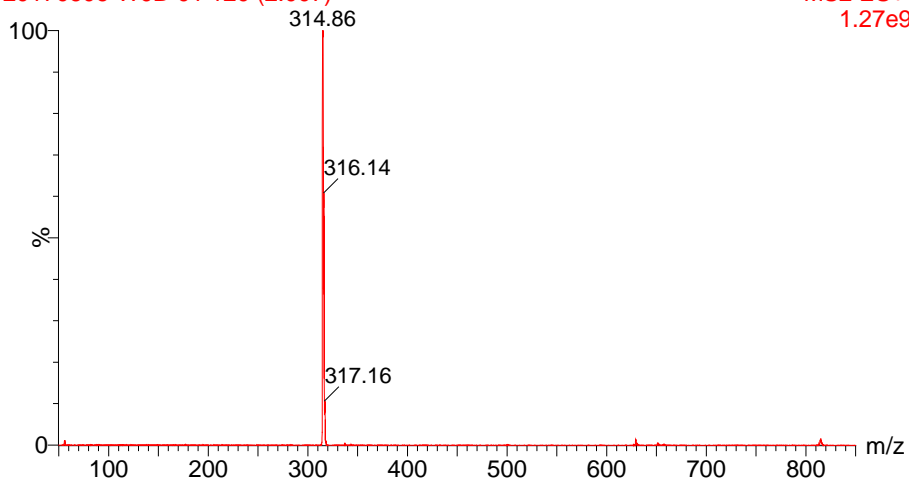


Figure S28 LC-MS and <sup>1</sup>H NMR spectra of compound 26.

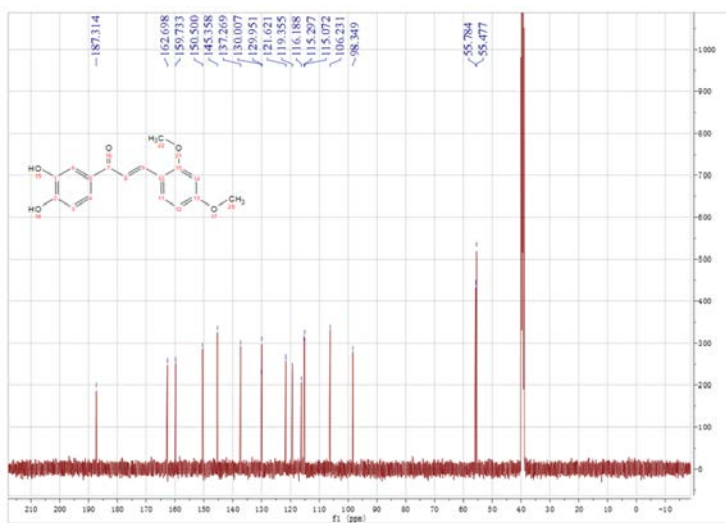
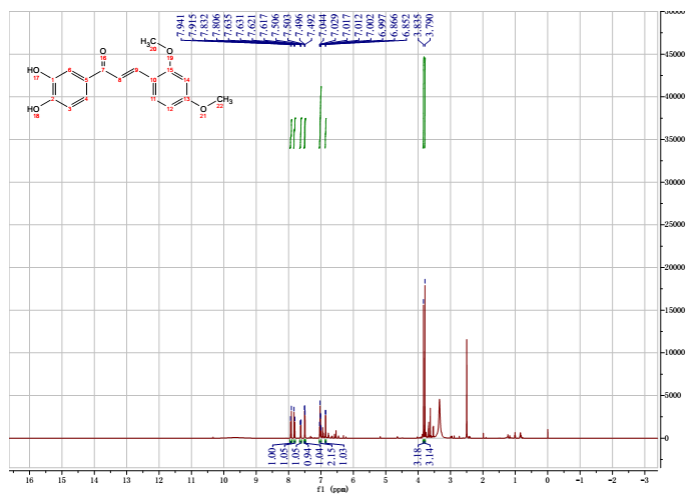
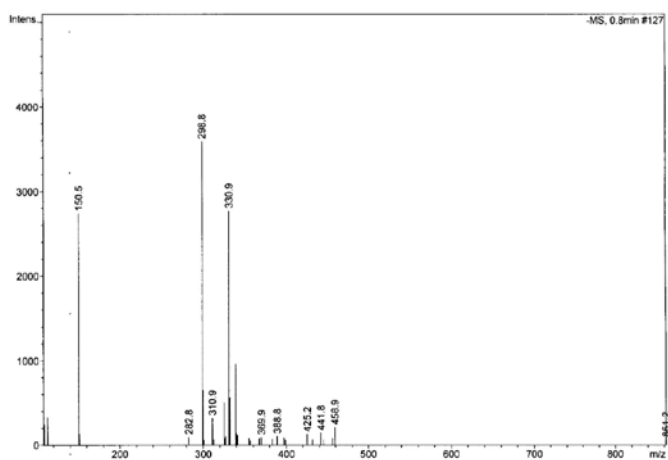
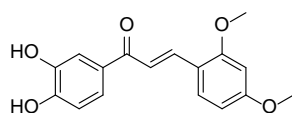


Figure S29 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 27.



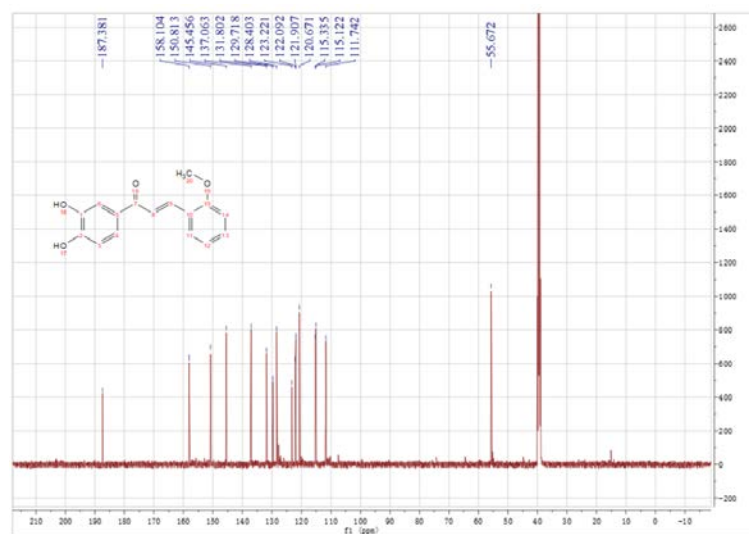
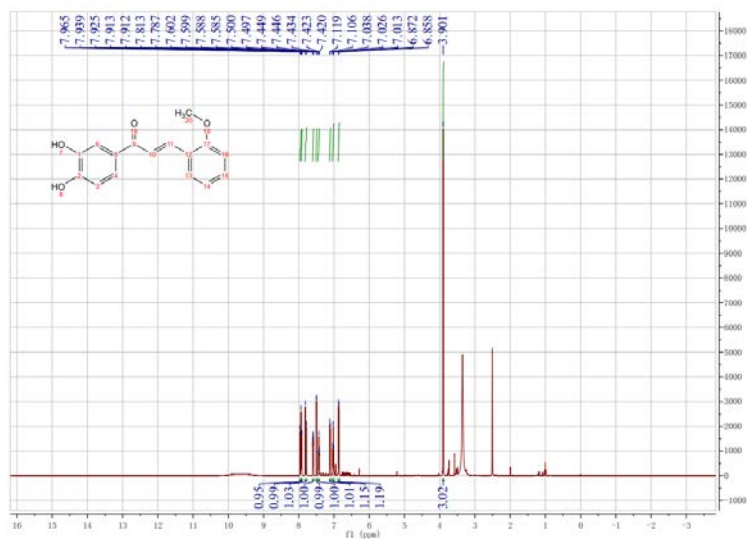
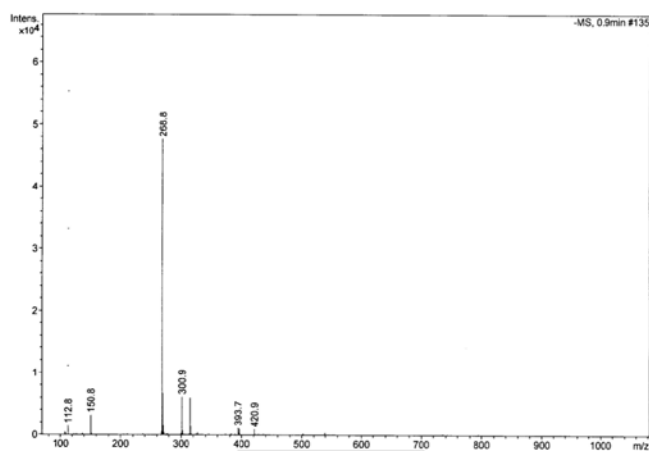
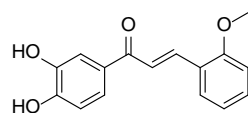


Figure S31 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 29.



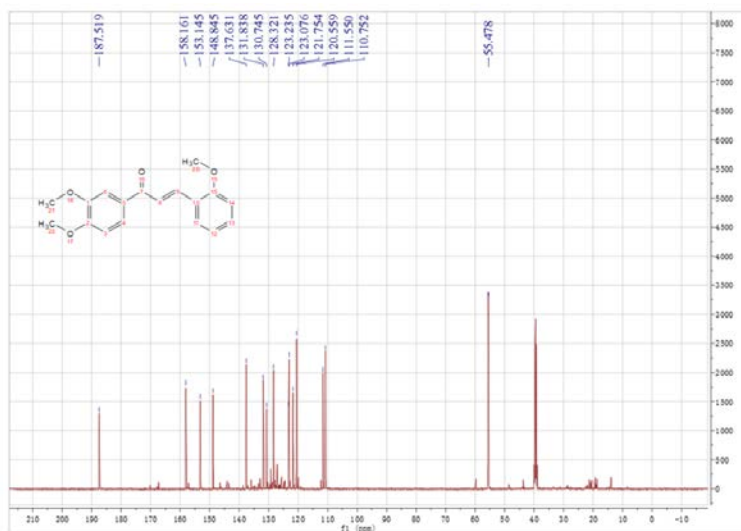
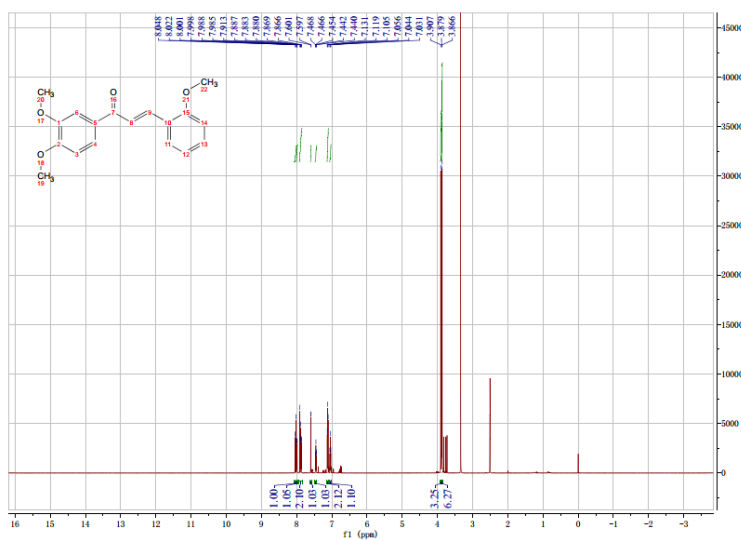
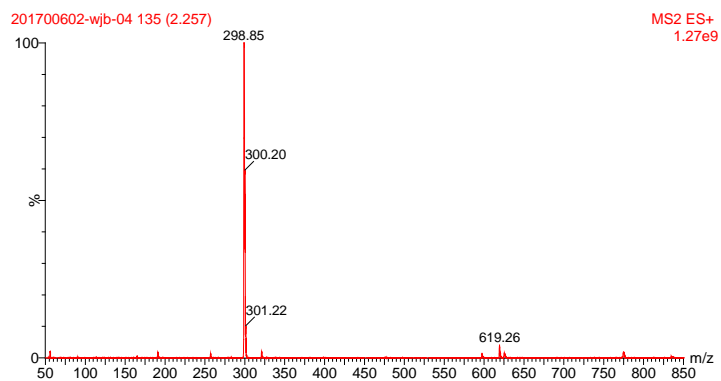
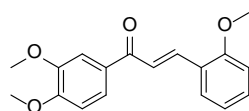


Figure S32 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 30.

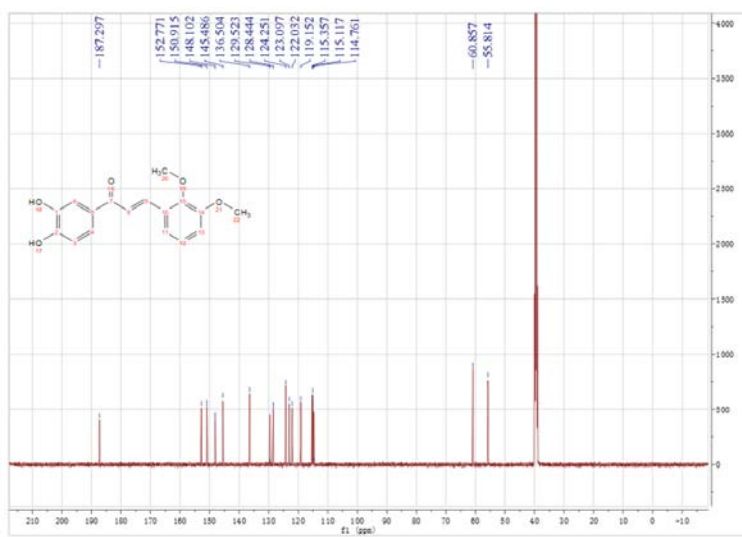
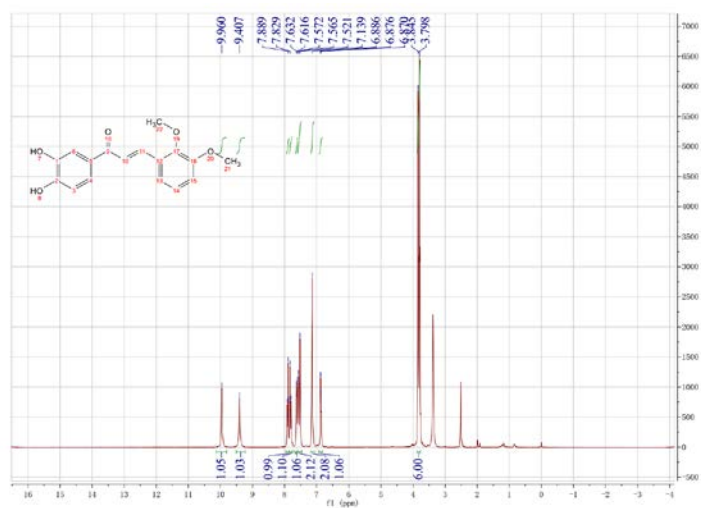
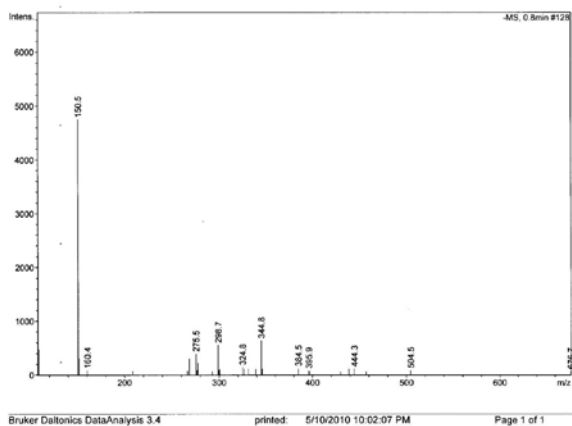
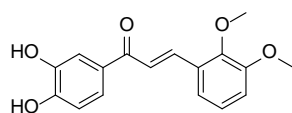
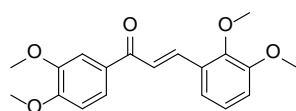


Figure S33 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 31.



20181225-xjw-11 66 (2.217)

1: MS2 ES+  
1.26e9

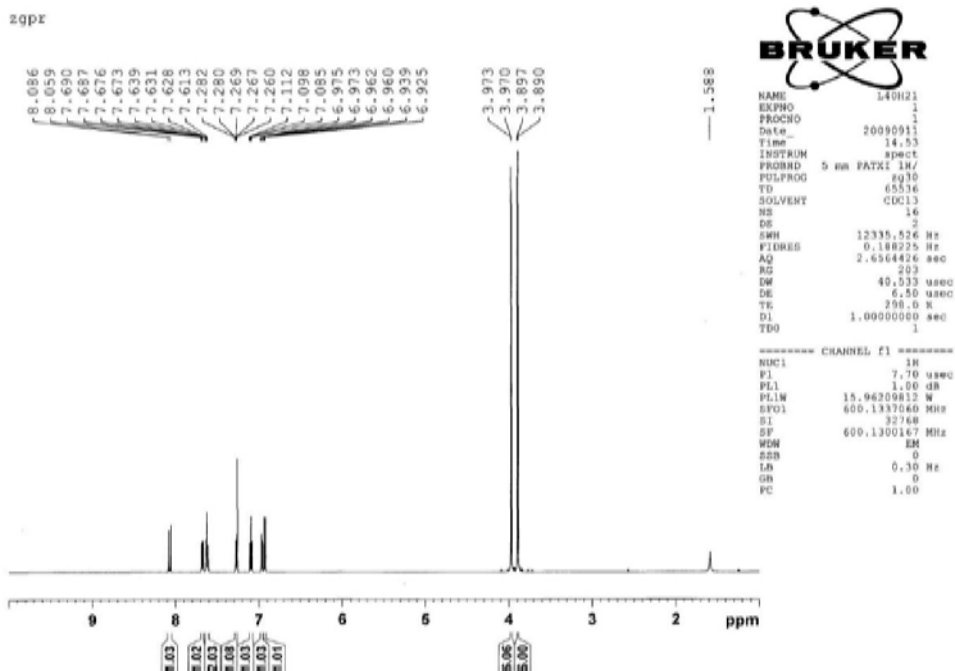
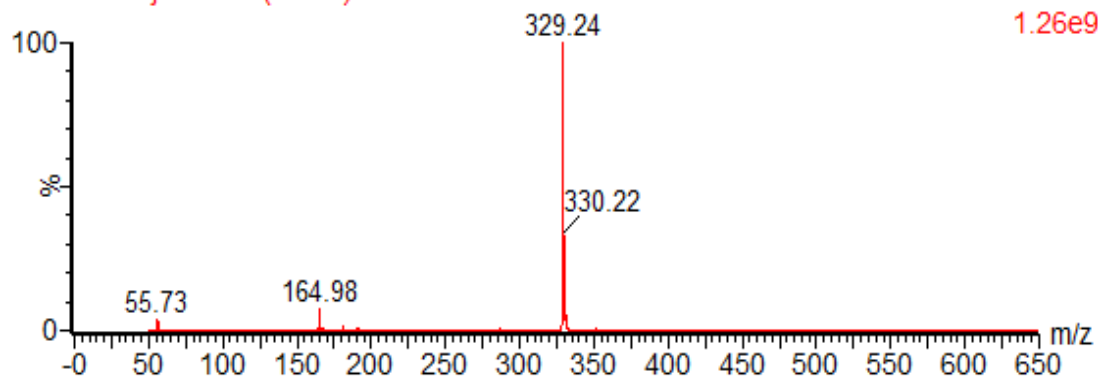


Figure S34 LC-MS and <sup>1</sup>H NMR spectra of compound 32.

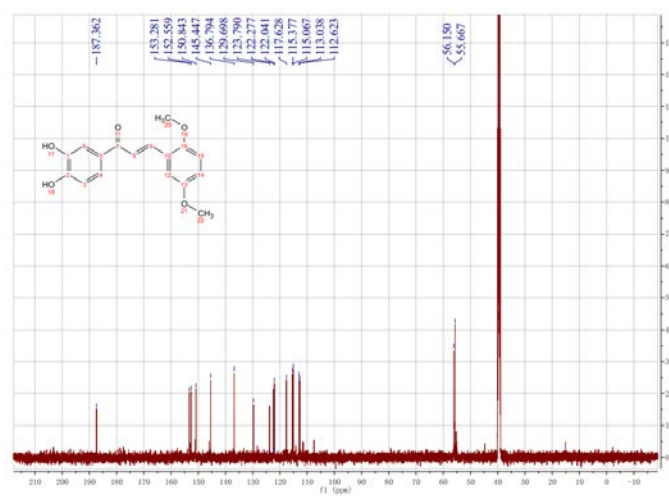
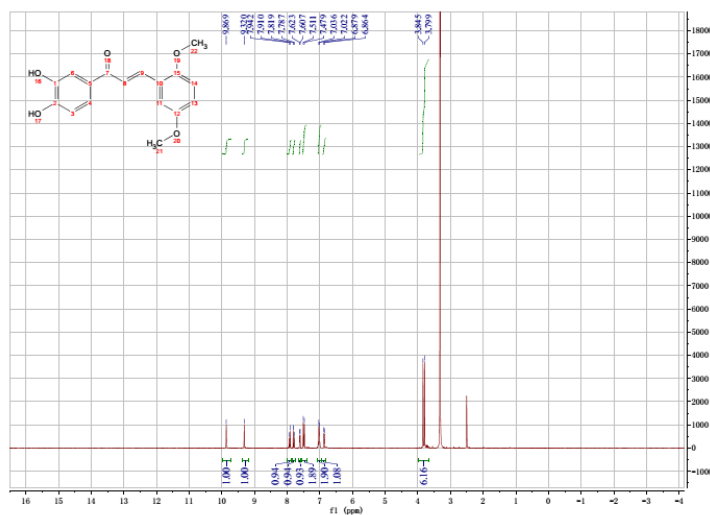
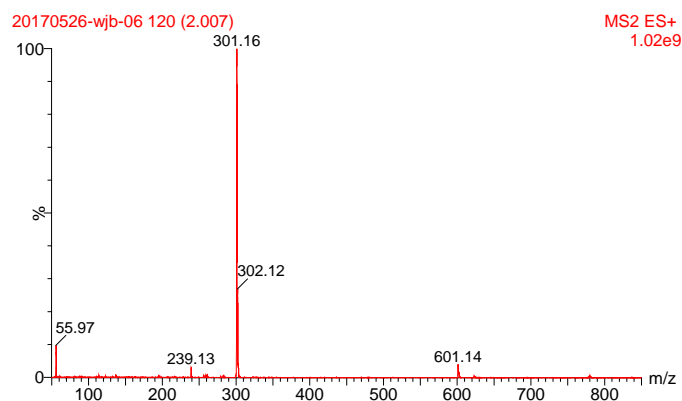
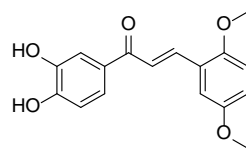


Figure S35 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 33.

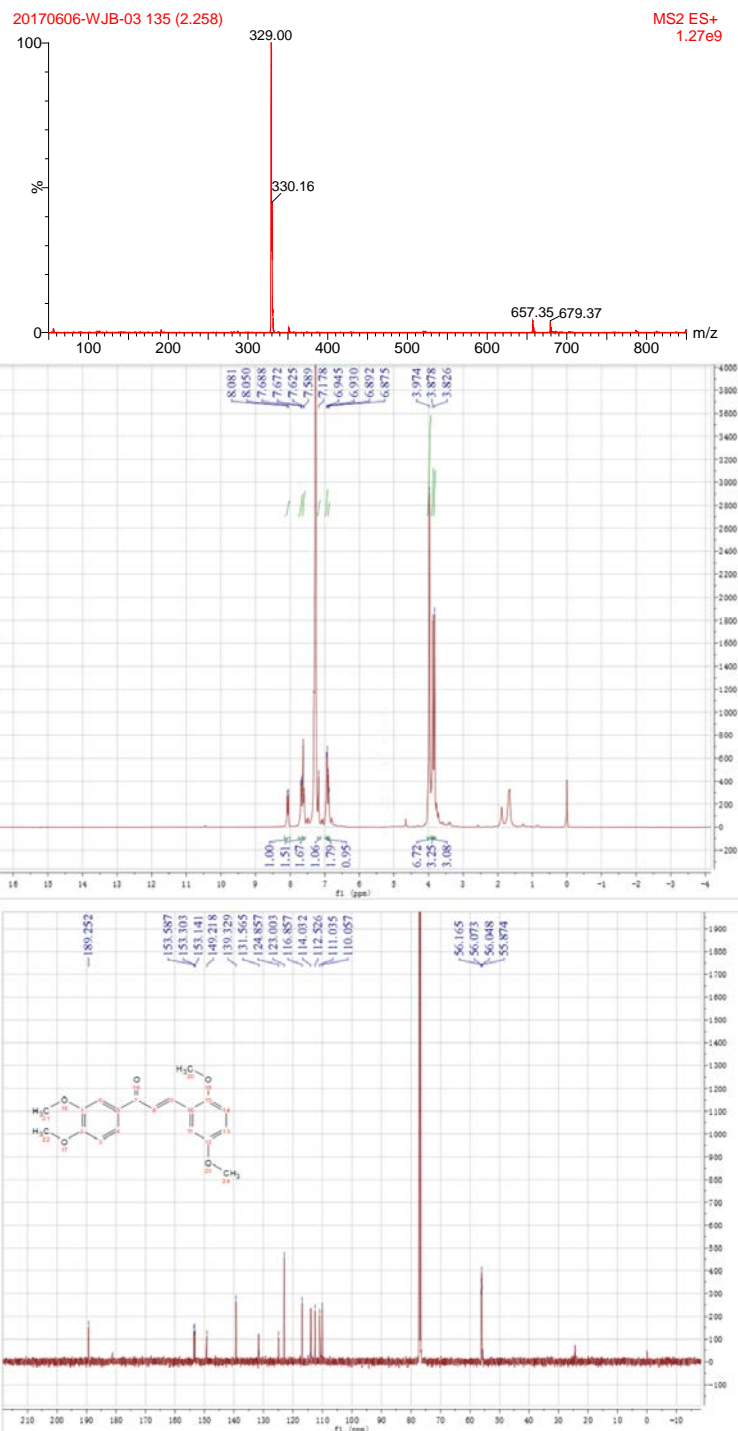
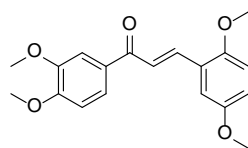


Figure S36 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 34.

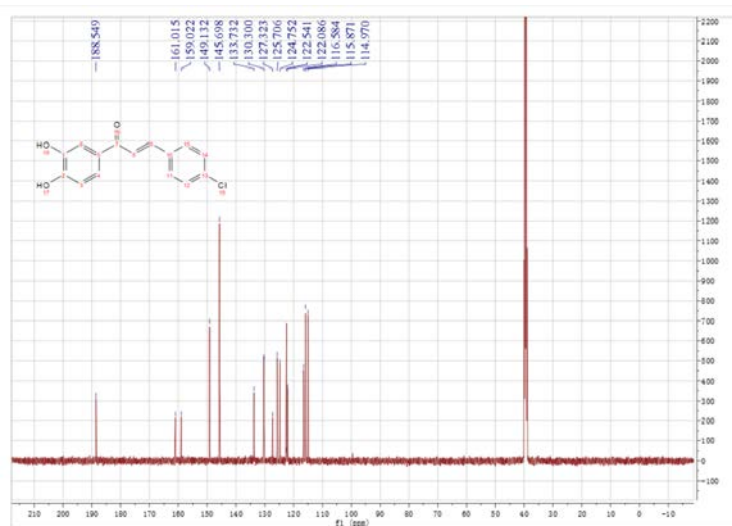
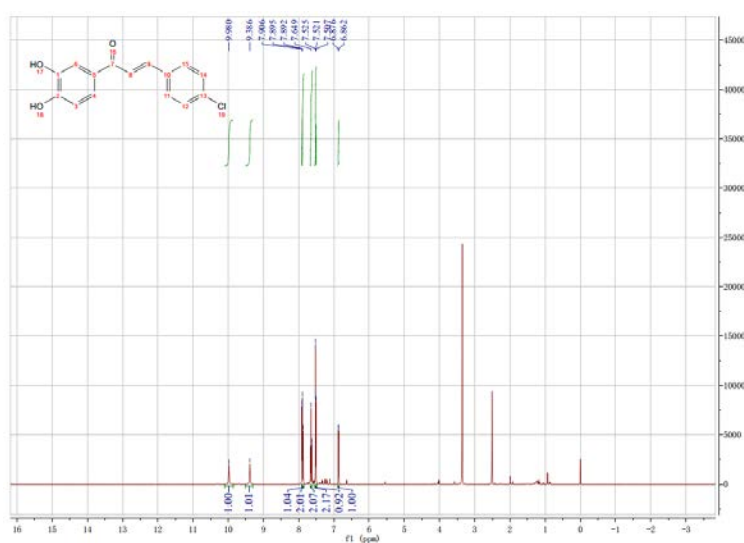
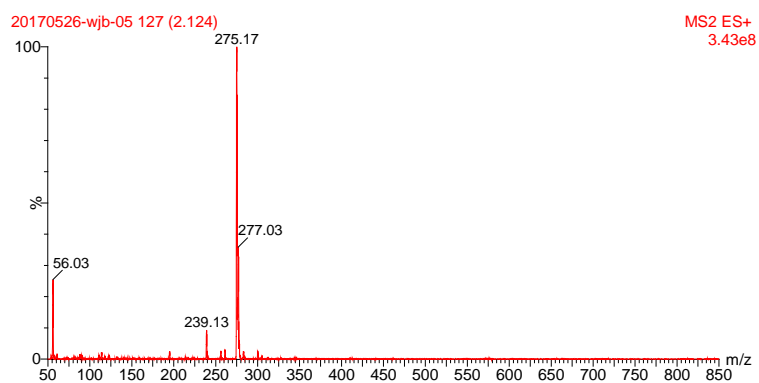
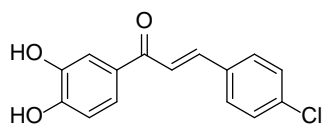
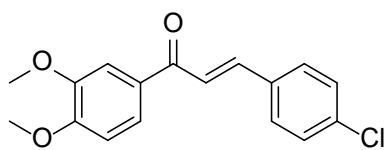


Figure S37 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 35.



20170526-wjb-02 142 (2.375)

MS2 ES+  
1.06e9

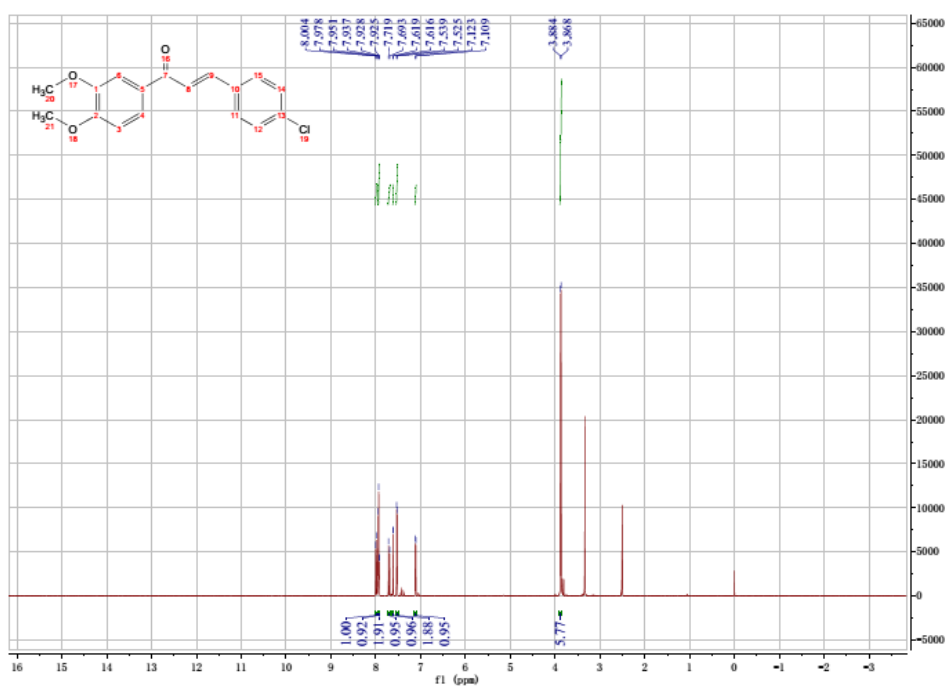
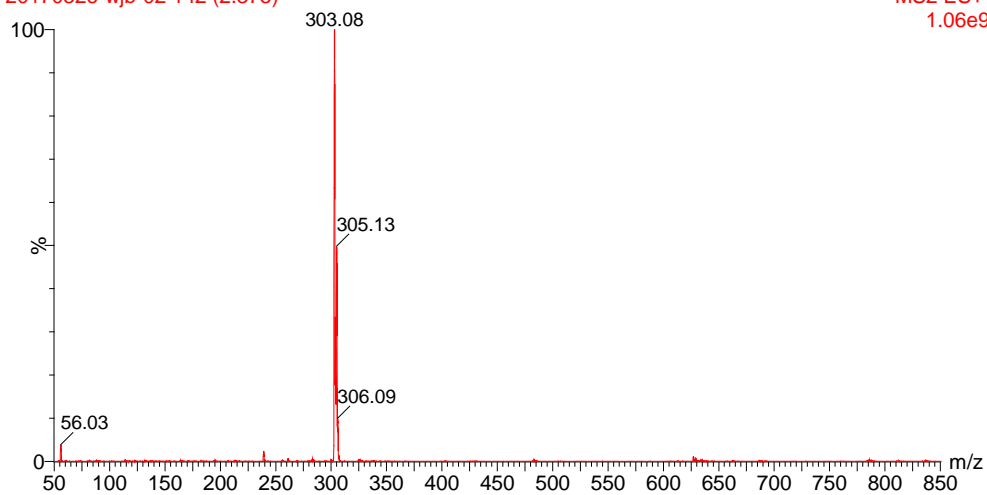
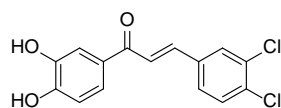


Figure S38 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 36.



20180821-XJW-02 169 (2.832)

MS2 ES+  
3.90e7

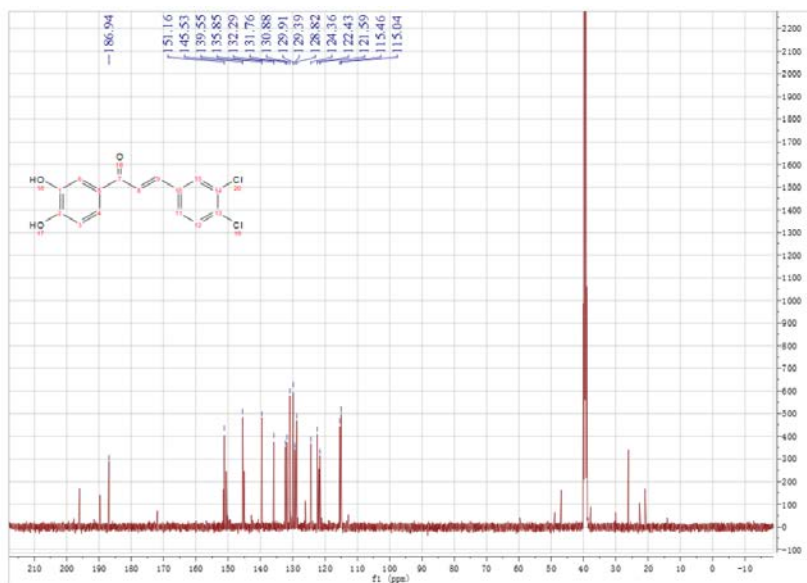
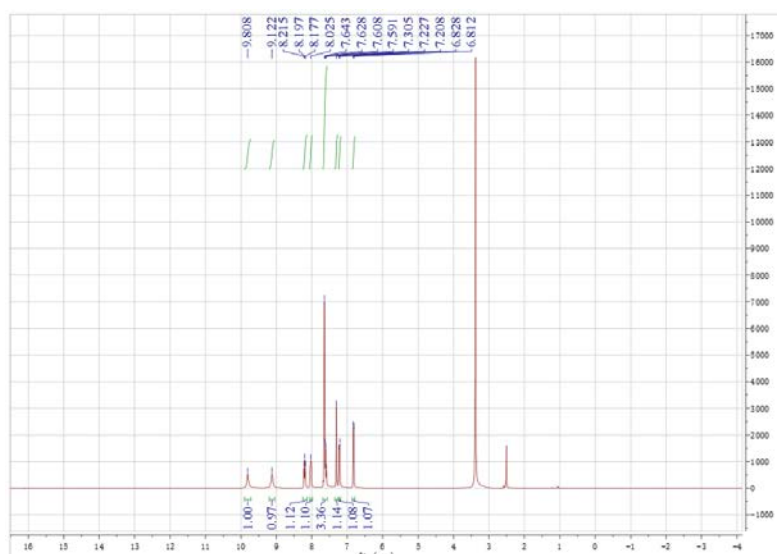
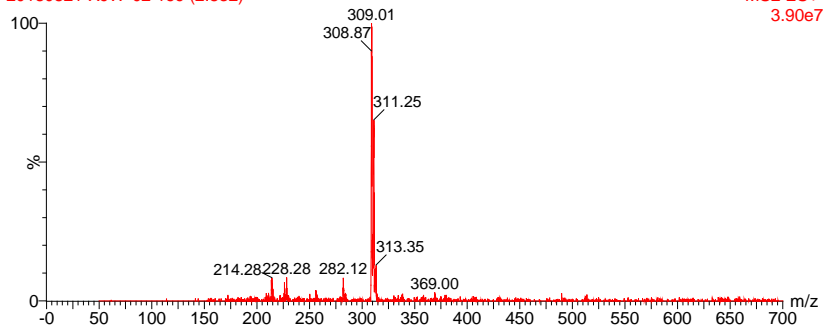
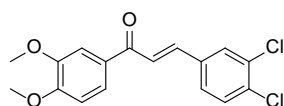


Figure S39 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound 37.





20170526-wjb-01 150 (2.509)

MS2 ES+  
2.28e8

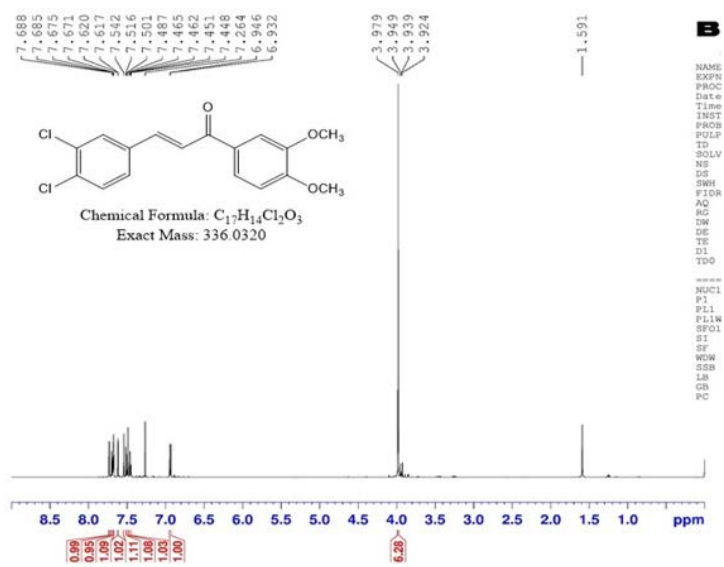
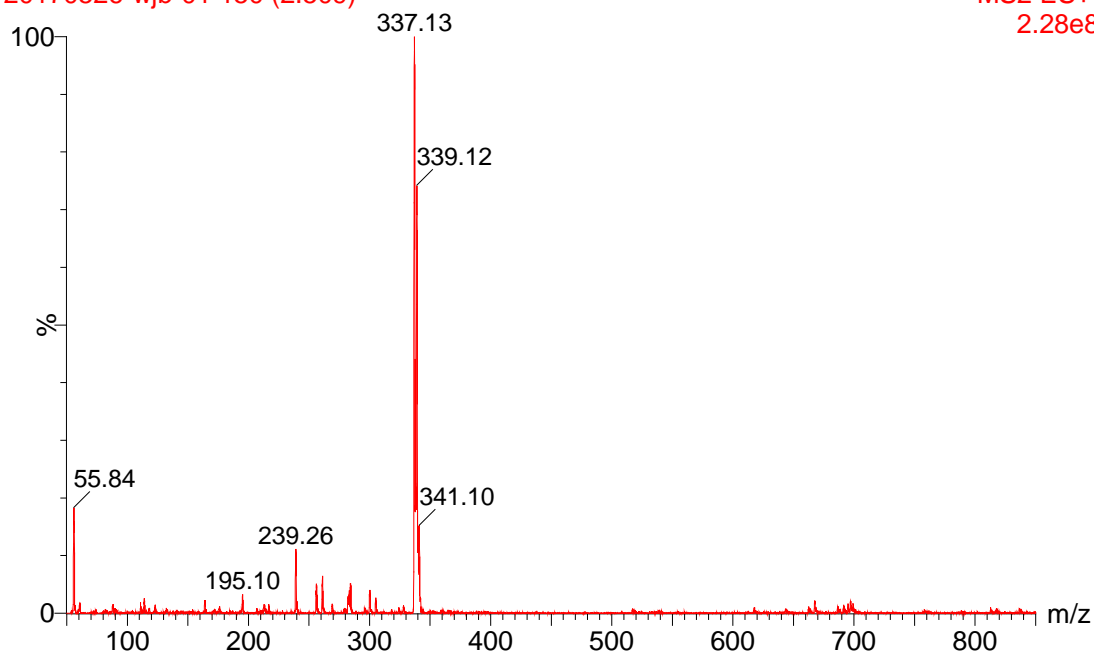


Figure S40 LC-MS and <sup>1</sup>H NMR spectra of compound 38.

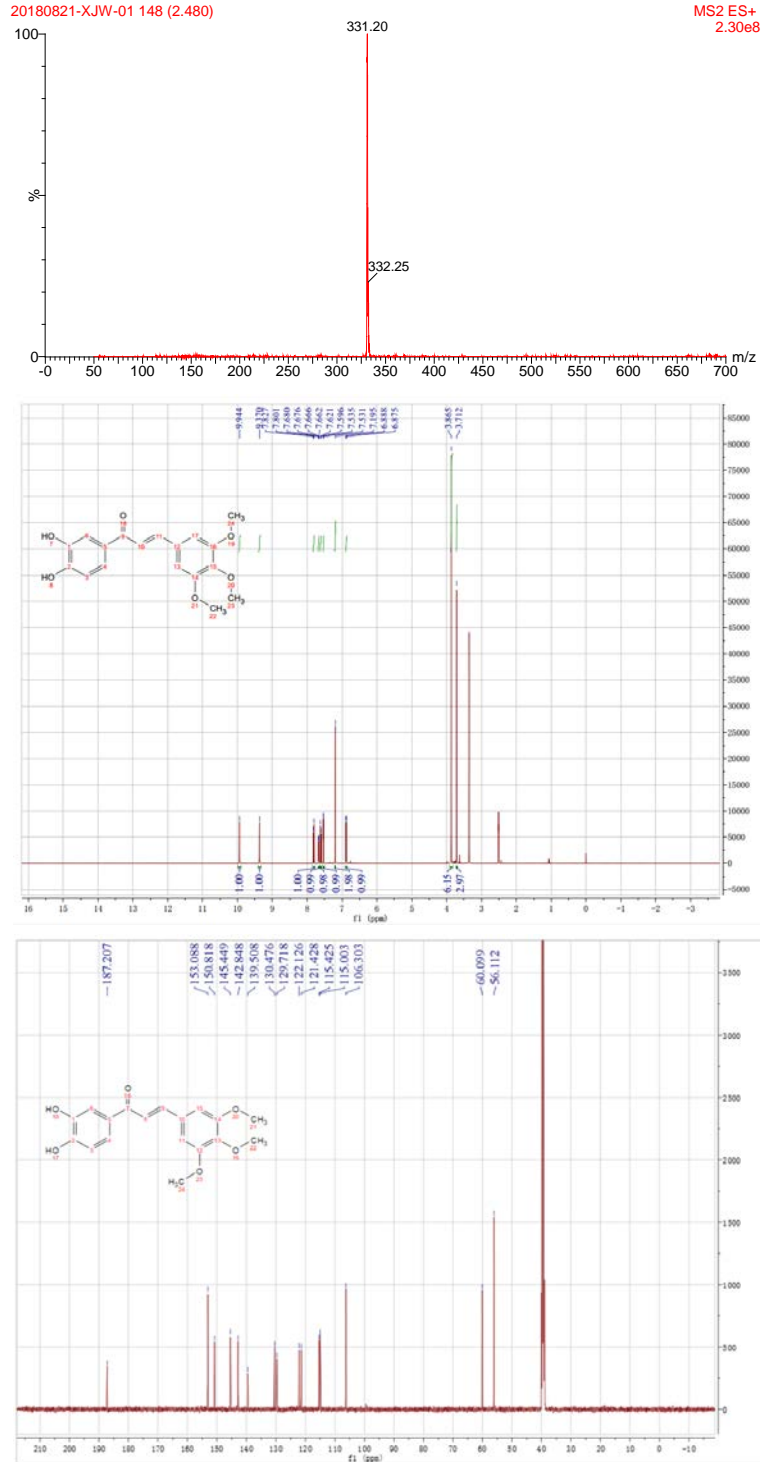
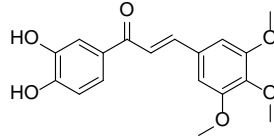
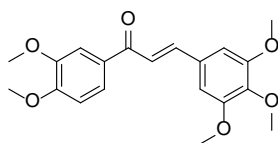


Figure S41 LC-MS,  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra of compound **39**.



20171031-WJB-04 128 (2.145)

MS2 ES+  
1.09e9

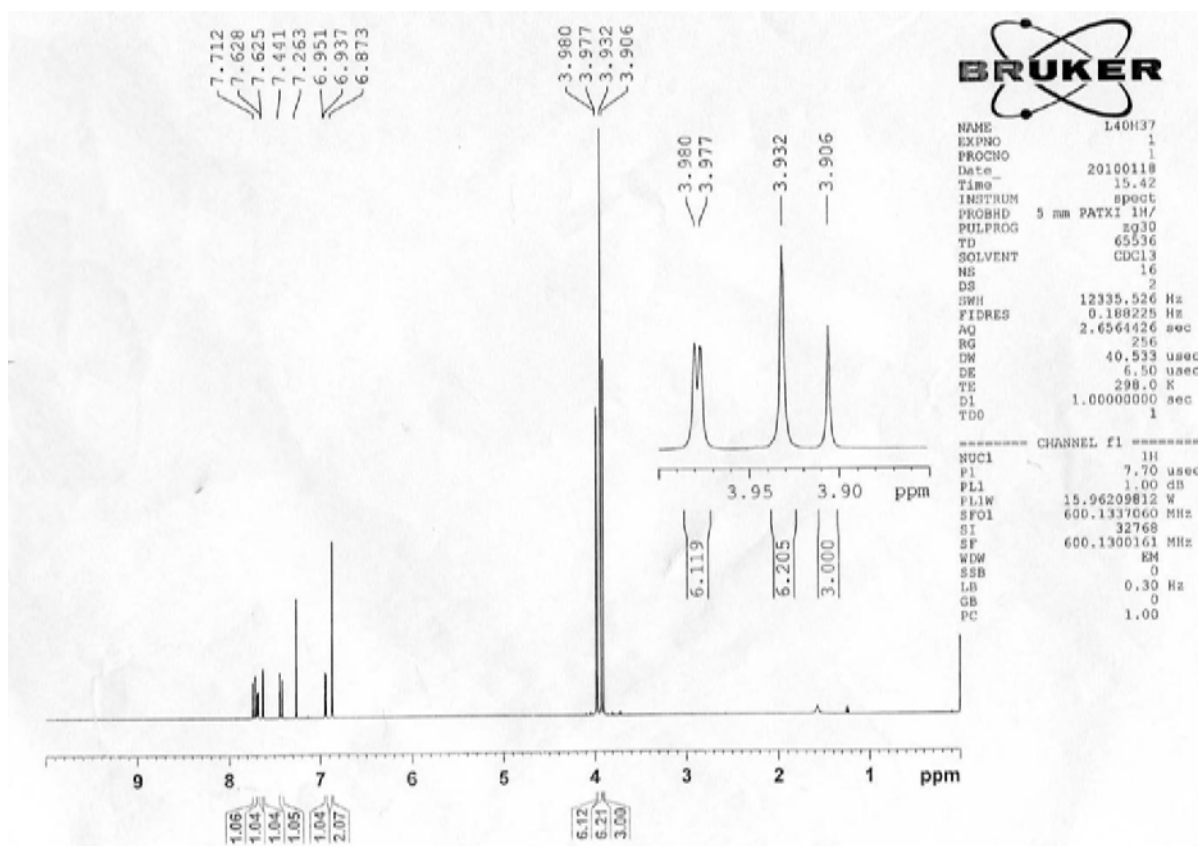
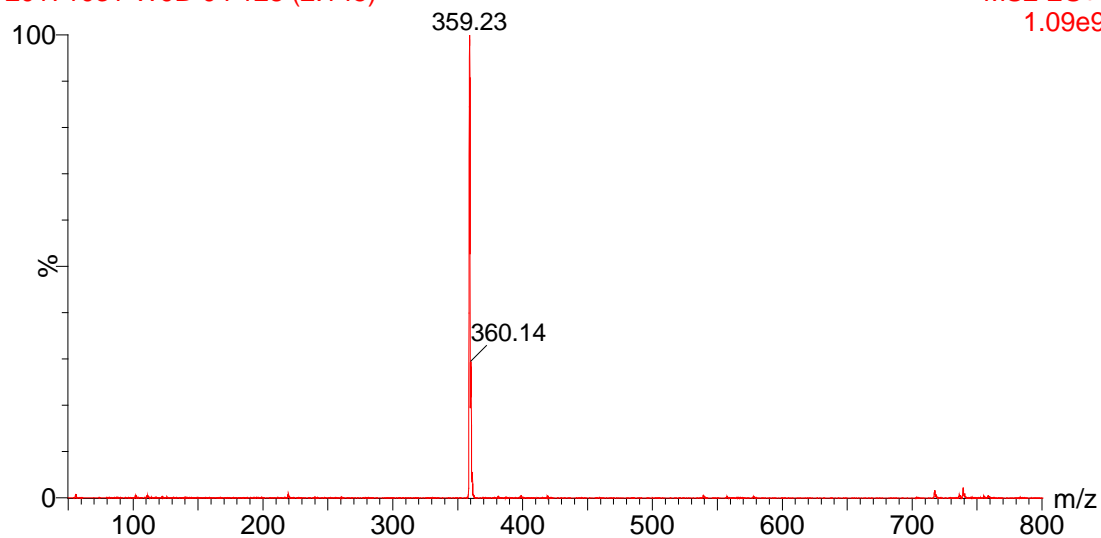
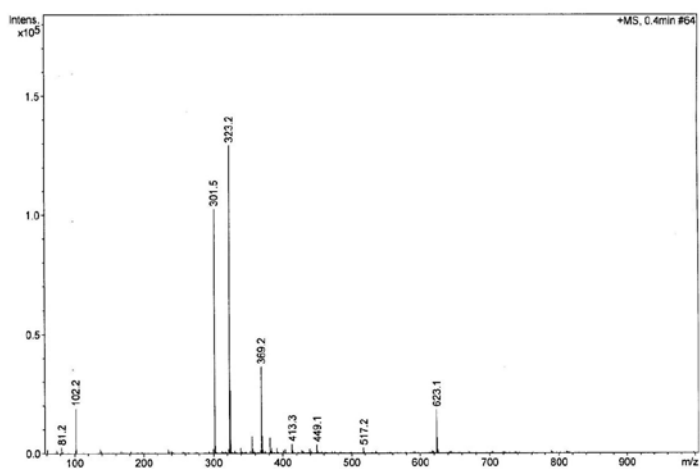
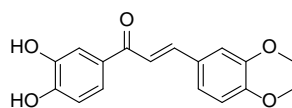


Figure S42 LC-MS and <sup>1</sup>H NMR spectra of compound 40.



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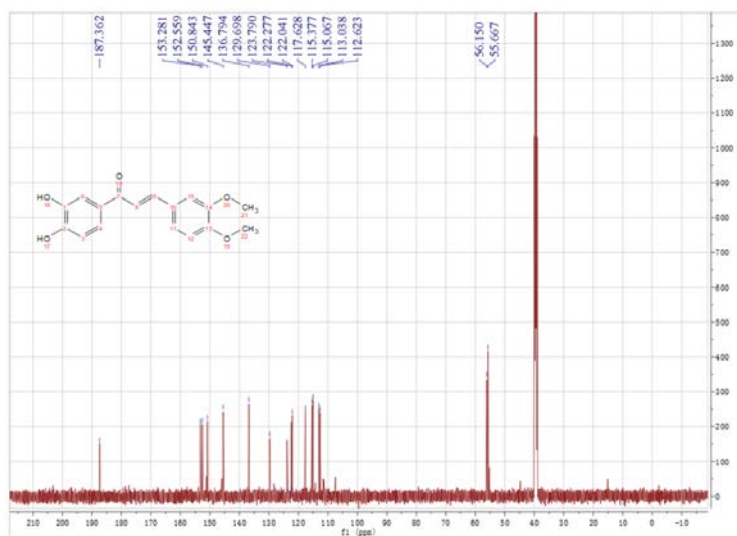
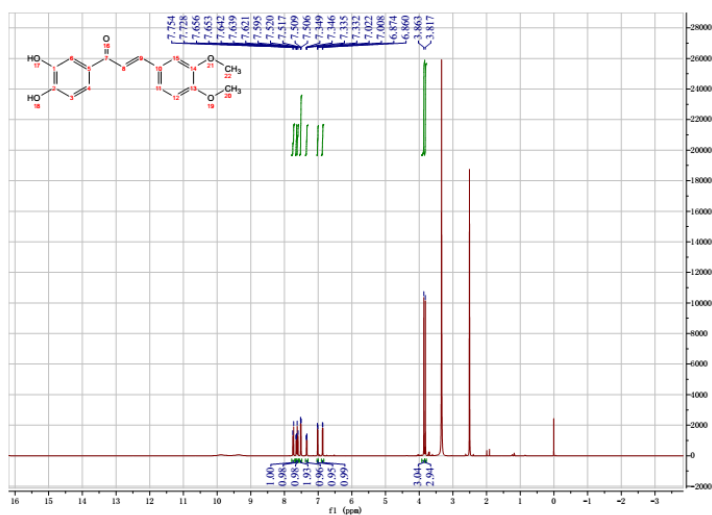


Figure S43 LC-MS, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of compound **41**.