Supplementary Information

Figure S1. IR spectrum of compound 1. Figure S2. Negative mode HRESIMS data of compound 1. Figure S3. ¹H NMR spectrum of compound 1 in DMSO-*d6* (500 MHz). **Figure S4.** ¹³C NMR spectrum of compound 1 in DMSO- d_6 (125 MHz). Figure S5. HSQC spectrum of compound 1 in DMSO- d_6 . **Figure S6.** ¹H-¹H COSY spectrum of compound **1** in DMSO- d_6 . Figure S7. HMBC spectrum of compound 1 in DMSO- d_6 . **Figure S7-1.** HMBC spectrum of compound **1** in DMSO- d_6 (part amplification). Figure S8. NOESY spectrum of compound 1 in DMSO- d_6 . Figure S9. IR spectrum of compound 2. Figure S10. Negative mode HRESIMS data of compound 2. **Figure S11.** ¹H NMR spectrum of compound **2** in DMSO- d_6 (500 MHz). Figure S12. ¹³C NMR spectrum of compound 2 in DMSO- d_6 (125 MHz). Figure S13. HSQC spectrum of compound 2 in DMSO- d_6 . Figure S14. $^{1}H^{-1}H$ COSY spectrum of compound 2 in DMSO- d_{6} . Figure S15. HMBC spectrum of compound 2 in DMSO- d_6 . Figure S16. IR spectrum of compound 3. Figure S17. Negative mode HRESIMS data of compound 3. **Figure S18.** ¹H NMR spectrum of compound **3** in DMSO- d_6 (400 MHz). Figure S19. ¹³C NMR spectrum of compound 3 in DMSO- d_6 (100 MHz). Figure S20. HSQC spectrum of compound 3 in DMSO-d₆. Figure S21. $^{1}H^{-1}H$ COSY spectrum of compound 3 in DMSO- d_{6} . Figure S22. HMBC spectrum of compound 3 in DMSO-*d*₆. Figure S23. IR spectrum of compound 4. Figure S24. Negative mode HRESIMS data of compound 4. **Figure S25.** ¹H NMR spectrum of compound **4** in DMSO- d_6 (400 MHz). Figure S26. ¹³C NMR spectrum of compound 4 in DMSO- d_6 (100 MHz). Figure S27. HSQC spectrum of compound 4 in DMSO-*d*₆. **Figure S28.** ¹H-¹H COSY spectrum of compound **4** in DMSO- d_6 . Figure S29. HMBC spectrum of compound 4 in DMSO- d_6 . Figure S30. NOESY spectrum of compound 4 in DMSO-d₆. Figure S31. IR spectrum of compound 5. Figure S32. Negative mode HRESIMS data of compound 5. **Figure S33.** ¹H NMR spectrum of compound **5** in DMSO- d_6 (400 MHz). Figure S34. ¹³C NMR spectrum of compound 5 in DMSO- d_6 (100 MHz). Figure S35. HSQC spectrum of compound 5 in DMSO-*d*₆. **Figure S36.** ¹H-¹H COSY spectrum of compound **5** in DMSO- d_6 . Figure S37. HMBC spectrum of compound 5 in DMSO- d_6 . Figure S38. IR Spectrum of compound 6. Figure S39. Negative mode HRESIMS data of compound 6. **Figure S40.** ¹H NMR spectrum of compound **6** in DMSO- d_6 (600 MHz). Figure S41. ¹³C NMR spectrum of compound 6 in DMSO- d_6 (150 MHz). Figure S42. HSQC spectrum of compound 6 in DMSO- d_6 . **Figure S43.** ¹H-¹H COSY spectrum of compound **6** in DMSO- d_6 . Figure S44. HMBC spectrum of compound 6 in DMSO- d_6 . Figure S45. IR spectrum of compound 7. Figure S46. Negative mode HRESIMS data of compound 7.

Figure S47. ¹H NMR spectrum of compound **7** in DMSO- d_6 (400 MHz). Figure S48. ¹³C NMR spectrum of compound 7 in DMSO- d_6 (100 MHz). Figure S49. HSQC spectrum of compound 7 in DMSO-d₆. **Figure S50.** ¹H-¹H COSY spectrum of compound **7** in DMSO- d_6 . Figure S51. HMBC spectrum of compound 7 in DMSO-d6. Figure S52. IR spectrum of compound 8. Figure S53. Negative mode HRESIMS data of compound 8. **Figure S54.** ¹H NMR spectrum of compound **8** in DMSO- d_6 (500 MHz). **Figure S55.** ¹³C NMR spectrum of compound **8** in DMSO- d_6 (125 MHz). Figure S56. HSQC spectrum of compound 8 in DMSO- d_6 . Figure S57. $^{1}H^{-1}H$ COSY spectrum of compound 8 in DMSO- d_{6} . Figure S58. HMBC spectrum of compound 8 in DMSO- d_6 . Figure S59. IR spectrum of compound 9. Figure S60. Negative mode HRESIMS data of compound 9. **Figure S61.** ¹H NMR spectrum of compound **9** in DMSO- d_6 (400 MHz). Figure S62. ¹³C NMR spectrum of compound 9 in DMSO- d_6 (100 MHz). Figure S63. HSQC spectrum of compound 9 in DMSO- d_6 . **Figure S64.** ¹H-¹H COSY spectrum of compound **9** in DMSO- d_6 . Figure S65. HMBC spectrum of compound 9 in DMSO-d₆. Figure S66. IR spectrum of compound 10. Figure S67. Negative mode HRESIMS data of compound 10. **Figure S68.** ¹H NMR spectrum of compound **10** in DMSO- d_6 (500 MHz). Figure S69. ¹³C NMR spectrum of compound 10 in DMSO- d_6 (125 MHz). Figure S70. HSQC spectrum of compound 10 in DMSO-d₆. Figure S71. ¹H-¹H COSY spectrum of compound 10 in DMSO-*d*₆. Figure S72. HMBC spectrum of compound 10 in DMSO-d₆. Figure S73. IR spectrum of compound 11. Figure S74. Negative mode HRESIMS data of compound 11. **Figure S75.** ¹H NMR spectrum of compound **11** in DMSO- d_6 (400 MHz). Figure S76. ¹³C NMR spectrum of compound 11 in DMSO-*d*₆ (100 MHz). Figure S77. HSQC spectrum of compound 11 in DMSO- d_6 . **Figure S78.** 1 H- 1 H COSY spectrum of compound **11** in DMSO- d_{6} . Figure S79. HMBC spectrum of compound 11 in DMSO-d₆. Figure S80. Negative mode ESIMS data of compound 10a. Figure S81. ¹H NMR spectrum of compound 10a in CDCl₃ (400 MHz). Figure S82. ¹³C NMR spectrum of compound 10a in CDCl₃ (100 MHz). Figure S83. HSQC spectrum of compound 10a in CDCl₃. Figure S84. ¹H-¹H COSY spectrum of compound 10a in CDCl₃.

Figure S85. HMBC spectrum of compound 10a in CDCl₃.



Figure S1. IR spectrum of compound 1.



Figure S2. Negative mode HRESIMS data of compound 1.

DMSO F19-8-17-4 500 MHz -9.9858 -9.7258 .3.3592 -2.5079 -2.4809 -2.4658 4213 4065 3919 3775 8376 8376 8376 8376 8376 8376 7949 -6.5745-5.9657 0000 512 OH CI C CI OH () ΗÓ 10 10 10 10 10 10 10 9 8 7 6 5 4 3 2 ppm 10.1 <u>1.00</u> 4.12 60) <u>10:4</u>

Figure S3. ¹H NMR spectrum of compound **1** in DMSO-d6 (500 MHz).

F19-8-17-4 APT 125 MHz DMSO



Figure S4. ¹³C NMR spectrum of compound **1** in DMSO-d6 (125 MHz).



Figure S5. HSQC spectrum of compound 1 in DMSO-d6.



Figure S6. ¹H-¹H COSY spectrum of compound **1** in DMSO-d6.



Figure S7. HMBC spectrum of compound 1 in DMSO-d6.



Figure S7-1. HMBC spectrum of compound 1 in DMSO-d6 (part amplification).



Figure S8. NOESY spectrum of compound 1 in DMSO-d6.



Figure S9. IR spectrum of compound 2.



Figure S10. Negative mode HRESIMS data of compound 2.

F19-8-18-2 500 MHz DMSO



Figure S11. ¹H NMR spectrum of compound **2** in DMSO-d6 (500 MHz).

F19-8-18-2 APT 125 MHz DMSO



Figure S12. ¹³C NMR spectrum of compound 2 in DMSO-d6 (125 MHz).





Figure S13. HSQC spectrum of compound 2 in DMSO-d6.



Figure S14. ¹H-¹H COSY spectrum of compound **2** in DMSO-d6.



Figure S15. HMBC spectrum of compound 2 in DMSO-d6.



Figure S16. IR spectrum of compound 3.



Figure S17. Negative mode HRESIMS data of compound 3.



Figure S18. ¹H NMR spectrum of compound 3 in DMSO-d6 (400 MHz).

F19-7-9-4-2-5 APT 100 MHz DMSO



Figure S19. ¹³C NMR spectrum of compound 3 in DMSO-d6 (100 MHz).



Figure S20. HSQC spectrum of compound 3 in DMSO-d6.



Figure S21. ¹H-¹H COSY spectrum of compound **3** in DMSO-d6.



Figure S22. HMBC spectrum of compound 3 in DMSO-d6.



Figure S23. IR spectrum of compound 4.



Figure S24. Negative mode HRESIMS data of compound 4.



Figure S25. ¹H NMR spectrum of compound 4 in DMSO-d6 (400 MHz).

F19-9-20-5-2 APT 100 MHz DMSO .158.83 .157.10 .155.22 .150.80 -141.86 -136.95 -132.59 169.54 -115.68 $\sim^{24.29}_{23.45}$ 40.19 39.98 35.52 31.98 $<^{14.39}_{14.20}$ 1.1 OH OH 0 ĊООН НÓ 150 140 130 120 110 100 70 170 160 90 80 60 50 40 30 20 10 ppm

Figure S26. ¹³C NMR spectrum of compound 4 in DMSO-d6 (100 MHz).



Figure S27. HSQC spectrum of compound 4 in DMSO-d6.



Figure S28. ¹H-¹H COSY spectrum of compound **4** in DMSO-d6.







Figure S30. NOESY spectrum of compound 4 in DMSO-d6.



Figure S31. IR spectrum of compound 5.



Figure S32. Negative mode HRESIMS data of compound 5.

F19-9-20-4-1 400 MHz DMSO .3710 6.3949 6.3886 6.2550 6.2487 6.2487 6.2487 6.1934 6.1934 5.6689 $\sim^{9.3891}_{9.3381}$ 12 0 0 000 00 ----0 OH OH `O соон H₃CÓ 12 11 10 3 0 ppm 9 8 7 6 5 2 1 4 2.06 3.04 2.09 1.02 61 0.94

Figure S33. ¹H NMR spectrum of compound 5 in DMSO-d6 (400 MHz).
F19-9-20-4-1 APT 100 MHz DMSO



Figure S34. ¹³C NMR spectrum of compound 5 in DMSO-d6 (100 MHz).



Figure S35. HSQC spectrum of compound 5 in DMSO-d6.



Figure S36. ¹H-¹H COSY spectrum of compound **5** in DMSO-d6.



Figure S37. HMBC spectrum of compound 5 in DMSO-d6.



Figure S38. IR spectrum of compound 6.



Figure S39. Negative mode HRESIMS data of compound 6.



Figure S40. ¹H NMR spectrum of compound 6 in DMSO-d6 (600 MHz).

F19-8-11-3-8-1-3 APT 150 MHz DMSO



Figure S41. ¹³C NMR spectrum of compound 6 in DMSO-d6 (150 MHz).



Figure S42. HSQC spectrum of compound 6 in DMSO-d6.



Figure S43. ¹H-¹H COSY spectrum of compound **6** in DMSO-d6.

F19-8-11-3-8-1-3 HMBC DMSO J ppm -20 ŌН C 40 . . . ÓН O соон 60 10' ٠ • • 80 -100 - 120 . . : ·_ --140 • • . . ٠ -160 -10 8 7 6 5 3 2 1 ppm 9 4

Figure S44. HMBC spectrum of compound 6 in DMSO-d6.



Figure S45. IR spectrum of compound 7.



Figure S46. Negative mode HRESIMS data of compound 7.

F19-9-20-5-1 400 MHz DMSO





Figure S47. ¹H NMR spectrum of compound 7 in DMSO-d6 (400 MHz).



Figure S48. ¹³C NMR spectrum of compound 7 in DMSO-d6 (100 MHz).



Figure S49. HSQC spectrum of compound 7 in DMSO-d6.



Figure S50. ¹H-¹H COSY spectrum of compound **7** in DMSO-d6.



Figure S51. HMBC spectrum of compound 7 in DMSO-d6.



Figure S52. IR spectrum of compound 8.



Figure S53. Negative mode HRESIMS data of compound 8.

F19-9-20-4-2 500 MHz DMSO



Figure S54. ¹H NMR spectrum of compound 8 in DMSO-d6 (500 MHz).

F19-9-20-4-2 APT 125 MHz DMSO



Figure S55. ¹³C NMR spectrum of compound 8 in DMSO-d6 (125 MHz).



Figure S56. HSQC spectrum of compound 8 in DMSO-d6.



Figure S57. ¹H-¹H COSY spectrum of compound **8** in DMSO-d6.



Figure S58. HMBC spectrum of compound 8 in DMSO-d6.



Figure S59. IR spectrum of compound 9.



Figure S60. Negative mode HRESIMS data of compound 9.

F19-8-11-4-1 400 MHz DMSO



Figure S61. ¹H NMR spectrum of compound 9 in DMSO-d6 (400 MHz).

F19-8-11-4-1 APT 100 MHz DMSO



Figure S62. ¹³C NMR spectrum of compound 9 in DMSO-d6 (100 MHz).



Figure S63. HSQC spectrum of compound 9 in DMSO-d6.



Figure S64. ¹H-¹H COSY spectrum of compound **9** in DMSO-d6.



Figure S65. HMBC spectrum of compound 9 in DMSO-d6.



Figure S66. IR spectrum of compound 10.

Mar. Drugs 2015, 13



Figure S67. Negative mode HRESIMS data of compound 10.

F19-8-11-10-4 400 MHz DMSO





Figure S68. ¹H NMR spectrum of compound 10 in DMSO-d6 (400 MHz).

F19-8-11-10-4 APT 100 MHz DMSO



Figure S69. ¹³C NMR spectrum of compound 10 in DMSO-d6 (100 MHz).


Figure S70. HSQC spectrum of compound 10 in DMSO-d6.

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F19-8-11-10-4 COSY DMSO
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Figure S71. ¹H-¹H COSY spectrum of compound **10** in DMSO-d6.

F19-8-11-10-4 HMBC DMSO ppm ٠ 4 20 ΟH HOOC O • • ٠ 40 -OH ٠ ٠ нό 60 80 -100 . .. 1 ••• -120 -140 ٩ \$ ٠ ٠ -160 ٠ -180 11 10 9 8 5 3 2 ppm7 6 4 1

Figure S72. HMBC spectrum of compound 10 in DMSO-d6.



Figure S73. IR spectrum of compound 11.



Figure S74. Negative mode HRESIMS data of compound 11.

F19-8-11-9-4 500 MHz DMSO



Figure S75. ¹H NMR spectrum of compound 11 in DMSO-d6 (500 MHz).

F19-8-11-9-4 APT 125 MHz DMSO



Figure S76. ¹³C NMR spectrum of compound 11 in DMSO-d6 (100MHz).



Figure S77. HSQC spectrum of compound 11 in DMSO-d6.



Figure S78. ¹H-¹H COSY spectrum of compound **11** in DMSO-d6.

F19-8-11-9-4 HMBC DMSO



Figure S79. HMBC spectrum of compound 11 in DMSO-d6.



Figure S80. Negative mode ESIMS data of compound 10a.



Figure S81. ¹H NMR spectrum of compound 10a in CDCl₃ (400 MHz).

F19-8-11-10-4-M APT 100 MHz CDC13

-168.45 -166.35 -161.88 -153.56 -157.34 -152.51 143.48-121.11<115.17<114.36-96.30 77.35 77.03 76.71 56.07 56.05 55.42 52.24 $< \frac{36.10}{35.55}$ $<^{24.57}_{24.03}$ $<^{14.11}_{13.98}$ M MOCH₃ H₃COOC 0 OCH₃ Ô H₃CÓ 150 140 130 120 110 100 90 170 80 70 60 50 160 40 30 20 ppm

Figure S82. ¹³C NMR spectrum of compound 10a in CDCl₃ (100 MHz).

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F19-8-11-10-4-M HSQC CDC13
```



Figure S83. HSQC spectrum of compound 10a in CDCl₃.





Figure S84. ¹H-¹H COSY spectrum of compound 10a in CDCl₃.



Figure S85. HMBC spectrum of compound 10a in CDCl₃.

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