

# Supplementary materials

## Chemical Experimental Procedures

### General information

Solvents were distilled under positive pressure of dry argon before use and dried by standard methods. Unless otherwise noted, chemicals were obtained from local suppliers, having >98% purity, and were used as received. Thin layer chromatography (TLC) was carried out on precoated silica gel plates (Merck 60 PF254). Column chromatography was carried out on a column Merck silica gel 60 (230-400 mesh ASTM) (Merck KGaA, Darmstadt, Germany). Melting points were measured on a Fisher-Johns melting apparatus and are uncorrected. <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded in DMSO-*d*<sub>6</sub> or CDCl<sub>3</sub> on a Bruker AVANCE 500/125 MHz instrument. Chemical shifts are reported in parts per million (ppm) relative to tetramethylsilane (TMS). Electron-spray ionization mass spectra in positive mode (ESI-MS) data were recorded on a Bruker Esquire 3000t spectrometer.

### General procedure for synthesis of 4c and 4d

Dry HCl gas was bubbled into a stirred solution of 6-hydroxy-2,3-dihydro-*1H*-inden-1-one (**1**) (3.25 g, 21.9 mmol) and different hydroxybenzaldehyde (21.9 mmol) in ethanol (50 mL) at room temperature. The reaction mixture was stirred for overnight. The progress of the reaction was monitored by using TLC. Upon completion, ice water was added to the reaction mixture and then obtain yellow precipitation. The resulted precipitate was filtered, washed with excess water and dried. The solid residue was further purified by recrystallization using EtOH to afford target compounds **4c** and **4d**.

(*E*)-2-(3,4-Dihydroxybenzylidene)-6-hydroxy-2,3-dihydro-*1H*-inden-1-one (**4c**).

Yellow powder, 51.2% yield, m.p: 230.2-232.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.81 (1H, s, Ar-OH), 9.66 (1H, s, Ar-OH), 9.27 (1H, s, Ar-OH), 7.47 (1H, d, *J* = 8.18 Hz, ArH), 7.35 (1H, s, Ar-CH=), 7.21 (1H, s, ArH), 7.12 (2H, t, *J* = 8.69 Hz, ArH<sub>2</sub>), 7.07 (1H, s, ArH), 6.86 (1H, d, *J* = 8.18 Hz, ArH), 3.90 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.13, 157.07, 147.91, 145.57, 140.37, 138.89, 133.33, 132.37, 127.26, 126.48, 124.12, 122.87, 117.43, 116.02, 108.07, 31.23. ESI-MS *m/z*: 269.11 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(4-hydroxy-3-methoxybenzylidene)-2,3-dihydro-*1H*-inden-1-one (**4d**).

Yellow powder, 53.4% yield, m.p: 229.3-232.5 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.80 (1H, s, Ar-OH), 9.72 (1H, s, Ar-OH), 7.47 (1H, d, *J* = 8.22 Hz, ArH), 7.43 (1H, s, Ar-CH=), 7.32 (1H, s, ArH), 7.25 (1H, d, *J* = 8.34 Hz, ArH), 7.12 (1H, d, *J* = 8.17 Hz, ArH), 7.06 (1H, s, ArH), 6.90 (1H, d, *J* = 8.22 Hz, ArH), 3.96 (2H, s, Ar-CH<sub>2</sub>-), 3.86 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.16, 157.06, 148.86, 147.79, 140.49, 138.85, 133.28, 132.73, 127.27, 126.50, 124.92, 122.93, 115.94, 114.70, 108.08, 55.68, 31.07. ESI-MS *m/z*: 283.9 (M+1)<sup>+</sup>.

### Synthesis of 6-[(tetrahydro-2H-pyran-2-yl)oxy]-1-indanone (**2**)

A solution of 6-hydroxy-2,3-dihydro-*1H*-inden-1-one (**1**) (1.0 g, 6.75 mmol) in dry CH<sub>2</sub>Cl<sub>2</sub> (10 mL) was added 3,4-dihydro-2H-pyran (2.83 g, 33.75 mmol) portionwise, followed by PPTS (169 mg, 0.675 mmol). The reaction mixture was stirred at 40°C for 4h. The resulting solution was quenched with

redistilled water (40 mL) and extracted with EtOAc (3×50 mL). The combined organic layers were washed with water (100 mL), brine (100 mL), dried over anhydrous MgSO<sub>4</sub>, filtered, and concentrated under reduced pressure. The residue was purified by chromatography on silica gel provided desired product **2** (1.38 g, 92%) as a colorless liquid.

#### General procedure for synthesis of **4a-b** and **4e-t**

A mixture of O-THP protected 1-indanone **2** (0.05g, 0.22 mmol) and different substituted benzaldehydes (0.22 mmol) in ethanol (10 mL) was stirred at room temperature, 20% (w/v) NaOH aqueous solution (3 mL) was added slowly. The reaction mixture was stirred overnight. The progress of the reaction was monitored by using TLC. Upon completion, ice water was added to the reaction mixture and then obtain yellow precipitation. The resulted precipitate was filtered, washed with excess water and dried to give THP protected 2-benzylidene-1-indanone intermediates **3b-c** and **3h-y** in 90%-97%. These intermediates was then used directly for the next step without any further purification. Dissolved the THP protected 2-benzylidene-1-indanone intermediate in MeOH/THF=1:1 solution (5 mL), 1.0 mol/L HCl aqueous solution (0.5 mL) was then dropwised. The reaction mixture was stirred at room temperature, the reaction progress was monitored by using TLC. Upon completion, ice water was added to the reaction mixture and then obtain yellow precipitation. The resulted precipitate was filtered, washed with excess water and dried. The solid residue was further purified by recrystallization using EtOH to afford target products **4a-b** and **4e-t** in good to excellent yield.

(*E*)-6-Hydroxy-2-(4-methoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**4a**).

Yellow powder, 79.6% yield, m.p: 226.2-228.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.82 (1H, s, Ar-OH), 7.72 (2H, d, *J* = 8.65 Hz, ArH<sub>2</sub>), 7.46 (1H, d, *J* = 8.65 Hz, ArH), 7.45 (1H, s, Ar-CH=), 7.12 (1H, d, *J* = 8.13 Hz, ArH), 7.06 (1H, s, ArH), 7.05 (2H, d, *J* = 8.84 Hz, ArH<sub>2</sub>), 3.93 (2H, s, Ar-CH<sub>2</sub>-), 3.82 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.18, 160.53, 157.10, 140.54, 138.72, 133.58, 132.55×2, 132.37, 127.57, 127.31, 123.08, 114.54×2, 108.11, 55.34, 31.13. ESI-MS *m/z*: 267.28 (M)<sup>+</sup>.

(*E*)-2-(4-Ethoxybenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4b**).

Yellow powder, 58.3% yield, m.p: 220.4-222.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 7.71 (2H, d, *J* = 8.50 Hz, ArH<sub>2</sub>), 7.47 (1H, d, *J* = 9.03 Hz, ArH), 7.45 (1H, s, Ar-CH=), 7.12 (1H, d, *J* = 8.15 Hz, ArH), 7.07 (1H, s, ArH), 7.03 (2H, d, *J* = 8.50 Hz, ArH<sub>2</sub>), 4.09 (2H, m, Ar-O-CH<sub>2</sub>-), 3.93 (2H, s, Ar-CH<sub>2</sub>-), 1.34 (3H, t, *J* = 6.80 Hz, Ar-OCH<sub>2</sub>-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.18, 159.83, 157.10, 140.53, 138.73, 133.49, 132.57×2, 132.40, 127.42, 127.31, 123.06, 114.94×2, 108.11, 63.31, 31.14, 14.50. ESI-MS *m/z*: 281.18 (M)<sup>+</sup>.

(*E*)-2-(3,5-Dimethoxybenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4c**).

Yellow powder, 68.3% yield, m.p: 161.2-163.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.84 (1H, s, Ar-OH), 7.48 (1H, d, *J* = 6.73 Hz, ArH), 7.42 (1H, s, Ar-CH=), 7.14 (1H, d, *J* = 6.01 Hz, ArH), 7.07 (1H, s, ArH), 6.91 (2H, s, ArH<sub>2</sub>), 6.59 (1H, s, ArH), 3.99 (2H, s, Ar-CH<sub>2</sub>-), 3.81 (6H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.26, 160.63×2, 157.14, 140.84, 138.38, 136.72, 136.47, 132.45, 127.44, 123.48, 108.52×2, 108.13, 101.86, 55.33 × 2, 31.01. ESI-MS *m/z*: 297.17 (M)<sup>+</sup>.

(*E*)-2-(2,4-Dimethoxybenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4f**).

Yellow powder, 60.9% yield, m.p: 164.3-166.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 7.82 (1H, s, Ar-CH=), 7.71 (1H, d, *J* = 9.34 Hz, ArH), 7.45 (1H, d, *J* = 8.21 Hz, ArH), 7.11 (1H, d, *J* = 8.21 Hz, ArH), 7.06 (1H, s, ArH), 6.66 (1H, s, ArH), 6.66 (1H, d, *J* = 7.11 Hz, ArH), 3.89 (2H, s, Ar-CH<sub>2</sub>-), 3.89 (3H, s, Ar-OCH<sub>3</sub>), 3.84 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.18, 162.35, 160.26, 157.04, 140.52, 138.86, 132.99, 130.74, 127.25, 126.36, 122.90, 116.28, 108.10, 106.13, 98.38, 55.84, 55.47, 31.15. ESI-MS *m/z*: 297.17 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(3,4,5-trimethoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**4g**):

Yellow powder, 82.3% yield, m.p: 184.3-186.5 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.85 (1H, s, Ar-OH), 7.49 (1H, d, *J* = 8.22 Hz, ArH), 7.46 (1H, s, Ar-CH=), 7.14 (1H, d, *J* = 8.22 Hz, ArH), 7.08 (3H, s, ArH), 4.03 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (6H, s, Ar-OCH<sub>3</sub>), 3.73 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.22, 157.13, 153.01×2, 140.73, 139.16, 138.54, 135.09, 132.81, 130.43, 127.35, 123.32, 108.36×2, 108.15, 60.12, 56.02×2, 30.82. ESI-MS *m/z*: 327.25 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(2,3,4-trimethoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**4h**).

Yellow powder, 67.2% yield, m.p: 165.8-166.6 °C <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.81 (1H, s, Ar-OH), 7.71 (1H, s, Ar-CH=), 7.53 (1H, d, *J* = 8.93 Hz, ArH), 7.46 (1H, d, *J* = 8.22 Hz, ArH), 7.12 (1H, d, *J* = 8.22 Hz, ArH), 7.06 (1H, s, ArH), 6.94 (1H, d, *J* = 8.93 Hz, ArH), 3.90 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 3.85 (3H, s, Ar-OCH<sub>3</sub>), 3.77 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.17, 157.10, 155.14, 153.56, 141.89, 140.60, 138.69, 134.51, 127.31, 126.28, 124.77, 123.12, 121.42, 108.34, 108.12, 61.61, 60.44, 56.01, 31.08. ESI-MS *m/z*: 327.19 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(2,4,6-trimethoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**4i**).

Yellow powder, 68.7% yield, m.p: 165.3-167.2 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.74 (1H, s, Ar-OH), 7.53 (1H, s, Ar-CH=), 7.38 (1H, d, *J* = 7.50 Hz, ArH), 7.08 (1H, d, *J* = 7.50 Hz, ArH), 7.03 (1H, s, ArH), 6.31 (2H, s, ArH<sub>2</sub>), 3.84 (9H, s, Ar-OCH<sub>3</sub>), 3.54 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.12, 162.67, 159.32×2, 156.83, 140.46, 138.98, 136.45, 127.14, 126.08, 122.94, 107.97, 105.21, 90.87×2, 55.69×2, 55.44, 31.61. ESI-MS *m/z*: 326.93 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(2,4,5-trimethoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**4j**).

Yellow powder, 59.4% yield, m.p: 161.2-163.5 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.79 (1H, s, Ar-OH), 7.84 (1H, s, Ar-CH=), 7.47 (1H, d, *J* = 8.01 Hz, ArH), 7.28 (1H, s, ArH), 7.11 (1H, d, *J* = 7.50 Hz, ArH), 7.06 (1H, s, ArH), 6.77 (1H, s, ArH), 3.97 (2H, s, Ar-CH<sub>2</sub>-), 3.90 (3H, s, Ar-OCH<sub>3</sub>), 3.88 (3H, s, Ar-OCH<sub>3</sub>), 3.82 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.18, 157.02, 154.72, 152.09, 142.79, 140.52, 138.89, 132.70, 127.24, 126.54, 122.87, 114.71, 112.88, 108.06, 97.74, 56.45, 56.28, 55.82, 30.90. ESI-MS *m/z*: 327.25 (M)<sup>+</sup>.

(*E*)-2-(2-Fluorobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4k**).

Yellow powder, 43.9% yield, m.p: 196.4-198.9 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.88 (1H, s, Ar-OH), 7.89 (1H, t, *J* = 7.71 Hz, ArH), 7.62 (1H, s, Ar-CH=), 7.54-7.46 (2H, m, ArH<sub>2</sub>),

7.37-7.32 (2H, m, ArH<sub>2</sub>), 7.17 (1H, d, *J* = 8.20 Hz, ArH), 7.10 (1H, s, ArH), 3.99 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.93, 157.21, 140.87, 138.22, 138.05, 131.83, 131.76, 130.10, 127.43, 124.91, 123.73, 122.87, 115.95, 115.78, 108.25, 30.84. ESI-MS *m/z*: 255.14 (M)<sup>+</sup>.

(*E*)-2-(2-Chlorobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4l**).

Yellow powder, 48.6% yield, m.p: 232.1-234.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.89 (1H, s, Ar-OH), 7.92 (1H, d, *J* = 6.45 Hz, ArH), 7.77 (1H, s, Ar-CH=), 7.60 (1H, d, *J* = 7.23 Hz, ArH), 7.50-7.44 (3H, m, ArH<sub>3</sub>), 7.17 (1H, d, *J* = 7.92 Hz, ArH), 7.10 (1H, s, ArH), 3.97 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.97, 157.22, 141.02, 138.55, 138.21, 134.79, 132.58, 131.00, 130.37, 129.98, 127.60, 127.45, 127.36, 123.79, 108.25, 30.55. ESI-MS *m/z*: 271.06 (M)<sup>+</sup>.

(*E*)-2-(2-Bromobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4m**).

Yellow powder, 45.7% yield, m.p: 226.4-228.1 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.89 (1H, s, Ar-OH), 7.90 (1H, d, *J* = 7.70 Hz, ArH), 7.77 (1H, d, *J* = 8.03 Hz, ArH), 7.71 (1H, s, Ar-CH=), 7.52 (1H, t, *J* = 7.50 Hz, ArH), 7.47 (1H, d, *J* = 8.23 Hz, ArH), 7.37 (1H, t, *J* = 7.90 Hz, ArH). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.95, 157.22, 141.05, 138.51, 138.23, 134.25, 133.24, 131.15, 130.49, 130.17, 128.13, 127.46, 125.72, 123.79, 108.24, 30.40. ESI-MS *m/z*: 315.05 (M)<sup>+</sup>.

(*E*)-2-(3-Bromobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4n**).

Yellow powder, 55.2% yield, m.p: 184.2-186.7 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 7.95 (1H, s, Ar-CH=), 7.78 (1H, d, *J* = 7.70 Hz, ArH), 7.64 (1H, d, *J* = 7.89 Hz, ArH), 7.50 (1H, d, *J* = 8.22 Hz, ArH), 7.47 (1H, d, *J* = 7.32 Hz, ArH), 7.45 (1H, t, *J* = 8.25 Hz, ArH), 7.16 (1H, d, *J* = 8.15 Hz, ArH), 7.09 (1H, s, ArH), 4.00 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.12, 157.20, 140.87, 138.24, 137.56, 137.41, 132.79, 132.18, 130.95, 130.65, 129.40, 127.48, 123.67, 122.23, 108.18, 30.93. ESI-MS *m/z*: 316.94 (M)<sup>+</sup>.

(*E*)-2-(4-Bromobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4o**).

Yellow powder, 44.6% yield, m.p: 243.6-245.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.86 (1H, s, Ar-OH), 7.71 (2H, d, *J* = 8.75 Hz, ArH<sub>2</sub>), 7.70 (2H, d, *J* = 8.68 Hz, ArH<sub>2</sub>), 7.48 (1H, s, Ar-CH=), 7.46 (1H, d, *J* = 5.03 Hz, ArH), 7.15 (1H, d, *J* = 8.20 Hz, ArH), 7.07 (1H, s, ArH), 3.96 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.14, 157.20, 140.72, 138.35, 136.88, 134.19, 132.45×2, 131.90×2, 131.03, 127.39, 123.58, 123.12, 108.20, 31.04. ESI-MS *m/z*: 315.05 (M)<sup>+</sup>.

(*E*)-2-(4-Fluorobenzylidene)-6-hydroxy-2,3-dihydro-1*H*-inden-1-one (**4p**).

Yellow powder, 41.8% yield, m.p: 220.9-222.9 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.84 (1H, s, Ar-OH), 7.83 (2H, s, ArH<sub>2</sub>), 7.49 (1H, s, Ar-CH=), 7.47 (1H, d, *J* = 9.17 Hz, ArH), 7.35-7.26 (2H, m, ArH<sub>2</sub>), 7.14 (1H, d, *J* = 5.30 Hz, ArH), 7.08 (1H, s, ArH), 3.97 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.19, 157.17, 140.74, 138.42, 135.77, 132.97, 132.91, 131.61, 131.58, 131.18, 127.37, 123.44, 116.06, 115.89, 108.19, 30.96. ESI-MS *m/z*: 255.07 (M)<sup>+</sup>.

(*E*)-6-Hydroxy-2-(4-(trifluoromethyl)benzylidene)-2,3-dihydro-1*H*-inden-1-one (**4q**).

Yellow powder, 48.4% yield, m.p: 210.8-212.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.89 (1H, s, Ar-OH), 7.96 (2H, d, *J* = 8.04 Hz, ArH), 7.92 (2H, d, *J* = 8.11 Hz, ArH), 7.54 (1H, s, Ar-CH=), 7.48 (2H, d, *J* = 8.22 Hz, ArH), 7.16 (1H, d, *J* = 8.16 Hz, ArH), 7.09 (1H, s, ArH), 4.02 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.11, 157.25, 140.88, 138.95, 138.60, 138.18, 131.06×2, 130.44×2, 127.44, 125.63, 125.60, 123.80, 108.24, 31.00. ESI-MS *m/z*: 305.13 (M)<sup>+</sup>.

(*E*)-2-(3,4-Difluorobenzylidene)-6-hydroxy-2,3-dihydro-*IH*-inden-1-one (**4r**).

Yellow powder, 54.3% yield, m.p: 221.4-223.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.84 (1H, s, Ar-OH), 7.85 (1H, t, *J* = 9.68 Hz, ArH), 7.64 (1H, s, ArH), 7.57-7.52 (1H, m, ArH), 7.48 (1H, d, *J* = 9.16 Hz, ArH), 7.47 (1H, s, Ar-CH=), 7.16 (1H, d, *J* = 8.08 Hz, ArH), 7.08 (1H, s, ArH), 3.99 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.09, 157.20, 140.82, 138.22, 137.07, 130.13, 128.00, 127.97, 127.40, 123.64, 119.14, 119.00, 118.09, 117.95, 108.20, 30.76. ESI-MS *m/z*: 273.09 (M)<sup>+</sup>.

(*E*)-2-(3,4-Dichlorobenzylidene)-6-hydroxy-2,3-dihydro-*IH*-inden-1-one (**4s**).

Yellow powder, 48.9% yield, m.p: 220.1-222.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 8.01 (1H, s, Ar-CH=), 7.78-7.72 (2H, m, ArH<sub>2</sub>), 7.49 (1H, d, *J* = 8.00 Hz, ArH), 7.46 (1H, s, ArH), 7.16 (1H, d, *J* = 7.20 Hz, ArH), 7.08 (1H, s, ArH), 4.00 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.03, 157.22, 140.81, 138.17, 138.06, 135.74, 132.04, 132.00, 131.69, 130.97, 130.30, 129.66, 127.45, 123.75, 108.20, 30.84. ESI-MS *m/z*: 305.07 (M)<sup>+</sup>.

(*E*)-2-(4-Chloro-3-nitrobenzylidene)-6-hydroxy-2,3-dihydro-*IH*-inden-1-one (**4t**).

Yellow powder, 51.4% yield, m.p: 241.3-242.9 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.88 (1H, s, Ar-OH), 8.39 (1H, s, ArH), 8.05 (1H, s, ArH), 7.86 (1H, s, Ar-CH=), 7.51 (2H, s, ArH), 7.15 (1H, s, ArH), 7.06 (1H, s, ArH), 4.01 (2H, s, Ar-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.94, 157.28, 148.07, 140.82, 139.12, 138.07, 135.52, 134.97, 131.97, 128.79, 127.44, 126.53, 125.23, 123.93, 108.263, 30.75. ESI-MS *m/z*: 316.03 (M)<sup>+</sup>.

### General procedure for synthesis of **8a** and **8b**

Following general procedure 5.1.2, the solid residue was further purified by recrystallization using EtOH to furnish target products **8a** and **8b**.

(*E*)-7-Hydroxy-2-(4-hydroxy-3-methoxybenzylidene)-2,3-dihydro-*IH*-inden-1-one (**8a**).

Yellow powder, 80.9% yield, m.p: 250.2-252.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 10.00 (1H, s, Ar-OH), 9.71 (1H, s, Ar-OH), 7.48 (1H, t, *J* = 6.18 Hz, ArH), 7.39 (1H, s, Ar-CH=), 7.32 (1H, s, Ar-OH), 7.25 (1H, d, *J* = 7.31 Hz, ArH), 7.05 (1H, d, *J* = 4.72 Hz, ArH), 6.90 (1H, d, *J* = 7.77 Hz, ArH), 6.80 (1H, d, *J* = 7.64 Hz, ArH), 4.02 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.05, 156.73, 150.73, 148.78, 147.78, 136.30, 132.53, 131.93, 126.45, 124.84, 123.92, 116.71, 115.93, 114.67, 114.07, 55.69, 31.73. ESI-MS *m/z*: 283.01 (M)<sup>+</sup>.

(*E*)-5-Hydroxy-2-(4-hydroxy-3-methoxybenzylidene)-2,3-dihydro-*IH*-inden-1-one (**8b**).

Yellow powder, 73.8% yield, m.p: 245.1-246.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 10.57 (1H, s, Ar-OH), 9.66 (1H, s, Ar-OH), 7.62 (1H, d, *J* = 8.26 Hz, ArH), 7.36 (1H, s, Ar-CH=), 7.30 (1H, s, ArH), 7.22 (1H, d, *J* = 8.00 Hz, ArH), 6.96 (1H, s, ArH), 6.89 (1H, d, *J* = 8.14 Hz, ArH), 6.85 (1H, d, *J* = 8.21 Hz, ArH), 3.99 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 191.39, 163.55, 152.74, 148.50, 147.75, 132.52, 131.79, 129.58, 126.67, 125.50, 124.53, 115.94, 115.89, 114.57, 111.87, 55.69, 31.70. ESI-MS *m/z*: 283.01 (M)<sup>+</sup>.

#### General procedure for synthesis of **8c-s**

Following general procedure 5.1.3-5.1.4, the crude residue was purified by flash silica gel column chromatography to furnish target products **8c-s**.

#### (*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-6-methoxy-2,3-dihydro-1*H*-inden-1-one (**8c**).

Yellow powder, 52.5% yield, m.p: 183.9-185.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.75 (1H, s, Ar-OH), 7.57 (1H, d, *J* = 8.29 Hz, ArH), 7.47 (1H, s, Ar-CH=), 7.34 (1H, s, ArH), 7.27 (1H, d, *J* = 8.12 Hz, ArH), 7.26 (1H, d, *J* = 6.24 Hz, ArH), 7.23 (1H, s, ArH), 6.90 (1H, d, *J* = 8.18 Hz, ArH), 4.00 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 3.83 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.99, 159.09, 148.95, 147.80, 142.29, 138.84, 133.61, 132.47, 127.36, 126.43, 125.02, 122.87, 115.95, 114.72, 105.55, 55.68, 55.46, 31.13. ESI-MS *m/z*: 297.17 (M)<sup>+</sup>.

#### (*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-5-methoxy-2,3-dihydro-1*H*-inden-1-one (**8d**).

Yellow powder, 56.8% yield, m.p: 198.2-200.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.70 (1H, s, Ar-OH), 7.70 (1H, d, *J* = 8.29 Hz, ArH), 7.39 (1H, s, Ar-CH=), 7.32 (1H, s, ArH), 7.23 (1H, d, *J* = 7.79 Hz, ArH), 7.19 (1H, s, ArH), 7.01 (1H, d, *J* = 8.16 Hz, ArH), 6.90 (1H, d, *J* = 7.94 Hz, ArH), 4.04 (2H, s, Ar-CH<sub>2</sub>-), 3.89 (3H, s, Ar-OCH<sub>3</sub>), 3.87 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 191.55, 164.63, 152.68, 148.67, 147.79, 132.31, 132.23, 130.84, 126.56, 125.15, 124.82, 115.90, 115.28, 114.42, 110.04, 55.72, 55.65, 31.92. ESI-MS *m/z*: 297.17 (M)<sup>+</sup>.

#### (*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-4-methoxy-2,3-dihydro-1*H*-inden-1-one (**8e**).

Yellow powder, 59.3% yield, m.p: 197.4-199.8 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ: 9.75 (1H, s, Ar-OH), 7.48 (1H, s, Ar-CH=), 7.45 (1H, t, *J* = 7.75 Hz, ArH), 7.35 (1H, t, *J* = 7.42 Hz, ArH), 7.30 (1H, d, *J* = 8.62 Hz, ArH), 7.28 (1H, d, *J* = 8.05 Hz, ArH), 6.93 (1H, d, *J* = 8.20 Hz, ArH), 3.92 (3H, s, Ar-OCH<sub>3</sub>), 3.91 (2H, s, Ar-CH<sub>2</sub>-), 3.86 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.10, 156.47, 149.02, 147.78, 139.02, 137.65, 133.97, 131.32, 129.26, 126.34, 124.72, 116.07, 115.66, 115.28, 115.03, 55.74, 55.54, 28.76. ESI-MS *m/z*: 297.10 (M)<sup>+</sup>.

#### (*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-5,6-dimethoxy-2,3-dihydro-1*H*-inden-1-one (**8f**).

Yellow powder, 72.3% yield, m.p: 154.1-155.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.68 (1H, s, Ar-OH), 7.37 (1H, s, Ar-CH=), 7.32 (1H, s, ArH), 7.22 (1H, s, ArH), 7.21 (1H, s, ArH), 7.21 (1H, s, ArH), 7.21 (1H, d, *J* = 6.84 Hz, ArH), 6.89 (1H, d, *J* = 8.15 Hz, ArH), 3.98 (2H, s, Ar-CH<sub>2</sub>-), 3.90 (3H, s, Ar-OCH<sub>3</sub>), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 3.83 (3H, s, Ar-OCH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 191.84, 154.98, 149.24, 148.57, 147.78, 144.72, 132.51, 131.86, 130.25, 126.62, 124.81, 115.88, 114.22, 108.09, 104.55, 55.95, 55.63, 55.60, 31.51. ESI-MS *m/z*: 327.12 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-7-propoxy-2,3-dihydro-1*H*-inden-1-one (**8g**).

Yellow powder, 62.6% yield, m.p: 142.7-144.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.67 (1H, s, Ar-OH), 7.58 (1H, t, *J* = 7.85 Hz, ArH), 7.32 (1H, s, Ar-CH=), 7.29 (1H, s, ArH), 7.21 (1H, d, *J* = 8.16 Hz, ArH), 7.14 (1H, d, *J* = 7.34 Hz, ArH), 6.97 (1H, d, *J* = 8.17 Hz, ArH), 6.89 (1H, d, *J* = 8.12 Hz, ArH), 4.07 (2H, t, *J* = 6.33 Hz, -O-CH<sub>2</sub>), 4.01 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.81-1.74 (2H, m, CH<sub>3</sub>-CH<sub>2</sub>-), 1.03 (3H, t, *J* = 7.30 Hz, CH<sub>3</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 190.67, 157.53, 151.94, 148.54, 147.77, 136.07, 132.21, 131.84, 126.61, 125.72, 124.61, 117.83, 115.90, 114.49, 110.74, 69.38, 55.69, 31.59, 21.90, 10.29. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-6-propoxy-2,3-dihydro-1*H*-inden-1-one (**8h**).

Yellow powder, 63.5% yield, m.p: 152.8-154.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.74 (1H, s, Ar-OH), 7.55 (1H, d, *J* = 7.53 Hz, ArH), 7.46 (1H, s, Ar-CH=), 7.33 (1H, s, ArH), 7.26 (1H, d, *J* = 7.11 Hz, ArH), 7.20 (1H, s, ArH), 6.90 (1H, d, *J* = 7.43 Hz, ArH), 3.99 (4H, s, -O-CH<sub>2</sub>, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.81-1.68 (2H, m, CH<sub>3</sub>-CH<sub>2</sub>-), 0.99 (3H, s, CH<sub>3</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 192.98, 158.47, 148.94, 147.80, 142.15, 138.82, 133.56, 132.49, 127.36, 126.43, 124.99, 123.25, 115.94, 114.73, 106.14, 69.34, 55.68, 31.12, 21.91, 10.30. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-5-propoxy-2,3-dihydro-1*H*-inden-1-one (**8i**).

Yellow powder, 68.7% yield, m.p: 135.7-137.5 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.70 (1H, s, Ar-OH), 7.68 (1H, d, *J* = 8.33 Hz, ArH), 7.39 (1H, s, Ar-CH=), 7.32 (1H, s, ArH), 7.23 (1H, d, *J* = 7.89 Hz, ArH), 7.17 (1H, s, ArH), 7.00 (1H, d, *J* = 8.16 Hz, ArH), 6.90 (1H, d, *J* = 8.03 Hz, ArH), 4.06 (2H, t, *J* = 6.08 Hz, -O-CH<sub>2</sub>), 4.03 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.79-1.75 (2H, m, CH<sub>3</sub>-CH<sub>2</sub>-), 1.00 (3H, t, *J* = 7.14 Hz, CH<sub>3</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 191.51, 164.07, 152.66, 148.65, 147.78, 132.24×2, 130.68, 126.57, 125.15, 124.74, 115.90, 115.61, 114.46, 110.49, 69.54, 55.65, 31.91, 21.86, 10.26. ESI-MS *m/z*: 325.17 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-4-propoxy-2,3-dihydro-1*H*-inden-1-one (**8j**).

Yellow powder, 42.6% yield, m.p: 130.1-131.8 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.76 (1H, s, Ar-OH), 7.48 (1H, s, Ar-CH=), 7.42 (1H, t, *J* = 6.47 Hz, ArH), 7.34 (1H, s, ArH), 7.33 (1H, d, *J* = 7.91 Hz, ArH), 7.29 (1H, d, *J* = 8.69 Hz, ArH), 7.26 (1H, d, *J* = 8.18 Hz, ArH), 6.94 (1H, d, *J* = 7.90 Hz, ArH), 4.09 (2H, s, -O-CH<sub>2</sub>), 3.89 (2H, s, Ar-CH<sub>2</sub>-), 3.86 (3H, s, Ar-OCH<sub>3</sub>), 1.86-1.76 (2H, m, CH<sub>3</sub>-CH<sub>2</sub>-), 1.04 (3H, s, CH<sub>3</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.13, 155.86, 148.98, 147.75, 139.06, 137.89, 133.92, 131.43, 129.22, 126.38, 124.49, 116.68, 116.09, 115.37, 114.97, 69.42, 55.63, 28.71, 21.98, 10.31. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-7-isopropoxy-2,3-dihydro-1*H*-inden-1-one (**8k**).

Yellow powder, 48.6% yield, m.p: 155.1-157.7 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.66 (1H, s, Ar-OH), 7.57 (1H, t, *J* = 7.71 Hz, ArH), 7.31 (1H, s, Ar-CH=), 7.28 (1H, s, ArH), 7.21 (1H, d, *J* = 8.14 Hz, ArH), 7.14 (1H, d, *J* = 7.33 Hz, ArH), 6.98 (1H, d, *J* = 8.18 Hz, ArH), 6.89 (1H, d, *J* = 8.16 Hz, ArH), 4.77-4.72 (1H, m, -O-CH-), 4.01 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.32 (6H, d, *J* = 5.96 Hz, CH<sub>3</sub>-CH-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 190.65, 156.52, 152.14, 148.53, 147.77, 135.93, 132.26, 131.83, 126.62, 126.47, 124.61, 117.94, 115.90, 114.49, 112.71, 70.61, 55.69, 31.57, 21.78×2. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-6-isopropoxy-2,3-dihydro-1*H*-inden-1-one (**8l**).

Yellow powder, 48.5% yield, m.p: 162.2-164.2 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.74 (1H, s, Ar-OH), 7.55 (1H, d, *J* = 8.27 Hz, ArH), 7.47 (1H, s, Ar-CH=), 7.34 (1H, s, ArH), 7.26 (1H, d, *J* = 7.67 Hz, ArH), 7.24 (1H, d, *J* = 8.34 Hz, ArH), 7.20 (1H, s, ArH), 6.90 (1H, d, *J* = 8.19 Hz, ArH), 4.73-4.68 (1H, m, -O-CH-), 3.99 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.29 (6H, d, *J* = 5.96 Hz, CH<sub>3</sub>-CH-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.00, 157.20, 148.95, 147.80, 142.03, 138.84, 133.55, 132.52, 127.50, 126.44, 124.99, 124.24, 115.95, 114.76, 107.51, 69.72, 55.69, 31.12, 21.67×2. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-5-isopropoxy-2,3-dihydro-1*H*-inden-1-one (**8m**).

Yellow powder, 56.5% yield, m.p: 137.0-139.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 7.67 (1H, d, *J* = 8.46 Hz, ArH), 7.39 (1H, s, Ar-CH=), 7.31 (1H, s, ArH), 7.23 (1H, d, *J* = 8.26 Hz, ArH), 7.16 (1H, s, ArH), 6.97 (1H, d, *J* = 8.43 Hz, ArH), 6.89 (1H, d, *J* = 8.19 Hz, ArH), 4.91-4.76 (1H, m, -O-CH-), 4.03 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 1.32 (6H, d, *J* = 6.00 Hz, CH<sub>3</sub>-CH-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 191.46, 162.97, 152.67, 148.85, 147.82, 132.23×2, 130.50, 126.46, 125.22, 124.76, 116.29, 115.94, 114.52, 111.31, 69.96, 55.67, 31.93, 21.69×2. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-4-isopropoxy-2,3-dihydro-1*H*-inden-1-one (**8n**).

Yellow powder, 57.2% yield, m.p: 146.7-149.3 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.77 (1H, s, Ar-OH), 7.49 (1H, s, Ar-CH=), 7.42 (1H, d, *J* = 6.87 Hz, ArH), 7.33-7.29 (4H, m, ArH), 6.95 (1H, d, *J* = 6.88 Hz, ArH), 4.77-4.75 (1H, m, -O-CH-), 3.86 (5H, s, Ar-CH<sub>2</sub>-, Ar-OCH<sub>3</sub>), 1.35 (6H, d, *J* = 5.13 Hz, CH<sub>3</sub>-CH-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.16, 154.89, 148.98, 147.74, 139.264, 138.65, 133.89, 131.50, 129.16, 126.38, 124.32, 118.21, 116.10, 115.610, 114.98, 70.26, 55.70, 28.84, 21.90×2. ESI-MS *m/z*: 325.23 (M)<sup>+</sup>.

(*E*)-6-(Diethylamino)-2-(4-hydroxy-3-methoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**8o**).

Yellow powder, 54.9% yield, m.p: 163.7-166.5 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.72 (1H, s, Ar-OH), 7.43 (2H, s, ArH, Ar-CH=), 7.33 (1H, s, ArH), 7.25 (1H, d, *J* = 6.21 Hz, ArH), 7.08 (1H, d, *J* = 6.04 Hz, ArH), 6.90 (1H, s, ArH), 6.87 (1H, s, ArH), 3.92 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 3.37 (4H, s, -CH<sub>2</sub>-N-CH<sub>2</sub>-), 1.10 (6H, s, CH<sub>3</sub>-CH<sub>2</sub>-N-CH<sub>2</sub>-CH<sub>3</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.56, 148.72, 147.77, 147.14, 138.60, 136.77, 132.99, 132.83, 126.91, 126.63, 124.83, 119.61, 115.91, 114.58, 103.76, 55.64, 43.92×2, 30.80, 12.21×2. ESI-MS *m/z*: 337.83 (M)<sup>+</sup>.

(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-6-(pyrrolidin-1-yl)-2,3-dihydro-1*H*-inden-1-one (**8p**).

Yellow powder, 72.3% yield, m.p: 236.5-238.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.70 (1H, s, Ar-OH), 7.44 (1H, d, *J* = 8.33 Hz, ArH), 7.42 (1H, s, Ar-CH=), 7.32 (1H, s, ArH), 7.24 (1H, d, *J* = 7.97 Hz, ArH), 6.93 (1H, d, *J* = 7.29 Hz, ArH), 6.89 (1H, d, *J* = 8.13 Hz, ArH), 6.75 (1H, s, ArH), 3.92 (2H, s, Ar-CH<sub>2</sub>-), 3.86 (3H, s, Ar-OCH<sub>3</sub>), 3.26 (4H, s, -CH<sub>2</sub>-N-CH<sub>2</sub>-), 1.97 (4H, s, -CH<sub>2</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.62, 148.72, 147.77, 147.35, 147.31, 138.37, 136.79, 132.95, 132.83, 126.65, 124.85, 119.56, 115.91, 114.56, 103.70, 55.65, 47.53×2, 30.90, 24.93×2. ESI-MS *m/z*: 336.19 (M)<sup>+</sup>.



(*E*)-2-(4-Hydroxy-3-methoxybenzylidene)-6-(piperidin-1-yl)-2,3-dihydro-1*H*-inden-1-one (**8q**). Yellow powder, 53.5% yield, m.p: 203.5-205.8 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.71 (1H, s, Ar-OH), 7.48 (1H, d, *J* = 8.24 Hz, ArH), 7.44 (1H, s, Ar-CH=), 7.35 (1H, d, *J* = 8.46 Hz, ArH), 7.33 (1H, s, ArH), 7.25 (1H, d, *J* = 7.83 Hz, ArH), 7.13 (1H, s, ArH), 6.90 (1H, d, *J* = 8.07 Hz, ArH), 3.95 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 3.34 (4H, s, -CH<sub>2</sub>-N-CH<sub>2</sub>-), 1.63 (4H, s, -CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-), 1.54 (2H, d, *J* = 3.79Hz, -CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.33, 151.41, 148.80, 147.79, 140.15, 138.40, 133.09, 132.75, 126.69, 126.56, 124.88, 124.04, 115.93, 114.66, 108.00, 55.67, 49.71×2, 30.97, 25.07×2, 23.78. ESI-MS *m/z*: 350.29 (M)<sup>+</sup>.

(*E*)-6-(Azepan-1-yl)-2-(4-hydroxy-3-methoxybenzylidene)-2,3-dihydro-1*H*-inden-1-one (**8r**). Yellow powder, 65.6% yield, m.p: 207.8-209.4 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 9.71 (1H, s, Ar-OH), 7.43 (1H, d, *J* = 9.14Hz, ArH), 7.42 (1H, s, Ar-CH=), 7.33 (1H, s, ArH), 7.25 (1H, d, *J* = 8.14Hz, ArH), 7.09 (1H, d, *J* = 8.45Hz, ArH), 6.90 (1H, d, *J* = 8.02Hz, ArH), 6.89 (1H, s, ArH), 3.92 (2H, s, Ar-CH<sub>2</sub>-), 3.86 (3H, s, Ar-OCH<sub>3</sub>), 3.50 (4H, t, *J* = 5.71Hz, -CH<sub>2</sub>-N-CH<sub>2</sub>-), 1.74 (4H, s, -CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-), 1.46 (4H, s, -CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.59, 148.72, 148.11, 147.78, 138.64, 136.61, 133.03, 132.80, 126.92, 126.66, 124.81, 118.99, 115.92, 114.644, 103.19, 55.67, 48.91×2, 30.81, 26.73×2, 26.38×2. ESI-MS *m/z*: 364.19 (M)<sup>+</sup>.

(*E*)-*N*-(2-(4-Hydroxy-3-methoxybenzylidene)-3-oxo-2,3-dihydro-1*H*-inden-5-yl)acetamide (**8s**). Yellow powder, 58.2% yield, m.p: 241.7-243.6 °C. <sup>1</sup>H NMR (500 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 10.17 (1H, s, Ar-NH-), 9.75 (1H, s, Ar-OH), 8.12 (1H, s, ArH), 7.74 (1H, t, *J* = 7.14 Hz, ArH), 7.59 (1H, t, *J* = 7.22 Hz, ArH), 7.47 (1H, s, Ar-CH=), 7.34 (1H, s, ArH), 7.26 (1H, t, *J* = 6.81Hz, ArH), 6.90 (1H, t, *J* = 7.51 Hz, ArH), 4.02 (2H, s, Ar-CH<sub>2</sub>-), 3.87 (3H, s, Ar-OCH<sub>3</sub>), 2.08 (3H, s, -CO-CH<sub>3</sub>). <sup>13</sup>C NMR (125 MHz, DMSO-*d*<sub>6</sub>) δ (ppm): 193.09, 168.51, 148.95, 147.79, 144.28, 138.83, 137.98, 133.63, 132.22, 126.64, 126.42, 125.59, 125.03, 115.94, 114.71, 112.81, 55.67, 31.36, 23.98. ESI-MS *m/z*: 324.12 (M)<sup>+</sup>.