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**General information**

Proton ($^1$H NMR) nuclear magnetic resonance spectra were recorded at 500 MHz respectively. Carbon ($^{13}$C NMR) nuclear magnetic resonance spectra were recorded at 126 MHz respectively. Fluorine ($^{19}$F NMR) nuclear magnetic resonance spectra were recorded at 471 MHz respectively. The chemical shifts are given in parts per million (ppm) on the delta (δ) scale. The solvent peak was used as a reference value, for $^1$H NMR: CDCl$_3$ = 7.26 ppm, (CD$_3$)$_2$SO = 2.50 ppm, (CD$_3$)$_2$CO = 2.05 ppm; for $^{13}$C NMR: CDCl$_3$ = 77.23 ppm, (CD$_3$)$_2$SO = 39.51 ppm, (CD$_3$)$_2$CO = 206.23 ppm/29.82ppm. Analytical TLC was performed on precoated silica gel GF254 plates. Column chromatography was carried out on silica gel (200–300 mesh). HRMS were carried out on an Orbitrap analyzer.
Substrate Preparation

To a solution of aromatic aldehyde S1 (2.0 mmol, 1.0 equiv) in anhydrous THF at 0 °C under N₂ was added TMSCF₃ (2.4 mmol, 1.2 equiv) and TBAF (2.4 mmol, 2.4 mL, 1.0 mol/L in THF, 1.2 equiv) dropwise. Then the reaction was warmed to room temperature and monitored by TLC until the complete conversion. Then the mixture was quenched dropwise by a saturated aqueous NH₄Cl solution (5 mL). The organic layer was extracted with ethyl acetate (3×15 mL) and the combined organic layers were washed with saturated aqueous NaCl solution, dried over anhydrous MgSO₄, filtered and removed under vacuum. The residue was purified by a column chromatography on silica gel using ethyl acetate/petroleum ether as eluent to give the desired product S2. Then the product S2 was dissolved in HFIP (5 mL) and TfOH (0.05 equiv) and PhOH (3.0 equiv) were added to the solution. The mixture was heated to reflux and monitored by TLC until the complete conversion. Then the reaction was quenched by saturated aqueous NaHCO₃ solution (10 mL). The organic layer was extracted with CH₂Cl₂ (3×15 mL) and the combined organic layers were washed with saturated aqueous NaCl solution, dried over anhydrous MgSO₄, filtered and removed under vacuum. The residue was purified by a column chromatography on silica gel using ethyl acetate/petroleum ether as eluent to give the desired product S3. Then the product S3 was dissolved in CH₂Cl₂ and DDQ (1.1 equiv) and PTSA (0.01 equiv) were added to the solution at room temperature. Upon completion, the reaction was concentrated and purified by a flash column chromatography to give the desired product 1.
2,6-dimethyl-4-(2,2,2-trifluoro-1-phenylethylidene)cyclohexa-2,5-dienone (1a)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.56 (s, 1H), 7.52 –7.41 (m, 3H), 7.28 – 7.22 (m, 2H), 6.71 (s, 1H), 2.10 (s, 3H), 1.90 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.2, 138.9, 138.7, 137.6 (d, $J = 30.3$ Hz), 134.6, 133.6, 132.9, 130.7, 130.4, 129.6, 128.5, 123.5 (q, $J = 276.0$ Hz), 17.1, 16.7. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.8. HRMS (ESI) $m/z$ calculated for C$_{16}$H$_{14}$F$_3$O $[M + H]^+$ 279.0991, found 279.0995.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-methoxyphenyl)ethylidene)cyclohexa-2,5-dienone (1b)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.56 (s, 1H), 7.19 (d, $J = 8.4$ Hz, 2H), 6.99 (d, $J = 8.8$ Hz, 2H), 6.78 (s, 1H), 3.88 (s, 3H), 2.10 (s, 3H), 1.92 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.2, 160.7, 138.6, 138.4, 137.7 (q, $J = 30.0$ Hz), 134.4, 133.9, 132.2, 130.8, 124.9, 123.5 (q, $J = 276.2$ Hz), 113.0, 55.5, 17.1, 16.7. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.9. HRMS (ESI) $m/z$ calculated for C$_{17}$H$_{16}$F$_3$O$_2$ $[M + H]^+$ 309.1097, found 309.1105.
2,6-dimethyl-4-(2,2,2-trifluoro-1-(p-tolyl)ethylidene)cyclohexa-2,5-dienone (1c)

$^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.55 (s, 1H), 7.26 (d, $J = 7.7$ Hz, 2H), 7.13 (d, $J = 7.8$ Hz, 2H), 6.75 (s, 1H), 2.42 (s, 3H), 2.09 (s, 3H), 1.90 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 187.2, 139.8, 138.7, 138.5, 137.9 (q, $J = 32.7$ Hz), 134.5, 133.8, 130.7, 130.4, 129.9, 129.2, 123.5 (q, $J = 273.0$ Hz), 21.6, 17.1, 16.6. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -52.9. HRMS (ESI) $m/z$ calculated for C$_{17}$H$_{16}$F$_3$O $[M + H]^+$ 293.1153, found 293.1155.

![Structure of 2,6-dimethyl-4-(2,2,2-trifluoro-1-(p-tolyl)ethylidene)cyclohexa-2,5-dienone (1c)](image)

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-(methylthio)phenyl)ethylidene)cyclohexa-2,5-dienone (1d)

$^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.54 (s, 1H), 7.30 (d, $J = 8.4$ Hz, 2H), 7.16 (d, $J = 8.2$ Hz, 2H), 6.76 (s, 1H), 2.53 (s, 3H), 2.09 (s, 3H), 1.91 (s, 3H). $^{13}$C NMR (126 MHz, CD$_3$CN) $\delta$ 187.0, 141.3, 138.7, 137.1 (q, $J = 30.3$ Hz), 138.6, 134.6, 133.5, 130.9, 130.5, 128.9, 125.5, 123.4 (q, $J = 276.2$ Hz), 17.1, 16.6, 15.2. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -58.1. HRMS (ESI) $m/z$ calculated for C$_{17}$H$_{16}$F$_3$OS $[M + H]^+$ 325.0868, found 325.0875.

![Structure of 2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-(methylthio)phenyl)ethylidene)cyclohexa-2,5-dienone (1d)](image)

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-fluorophenyl)ethylidene)cyclohexa-2,5-dienone (1e)

$^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.55 (s, 1H), 7.27 – 7.21 (m, 2H), 7.21 – 7.13 (m, 2H),
6.69 (s, 1H), 2.10 (s, 3H), 1.92 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.1, 164.5, 162.5, 139.0, 138.9, 136.3 (q, $J$ = 30.6 Hz), 135.0, 133.2, 132.5, 132.4, 130.4, 128.7, 123.3 (q, $J$ = 276.0 Hz), 115.9 (d, $J$ = 21.8 Hz), 17.1, 16.7. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.9, -110.8. HRMS (ESI) $m/z$ calculated for C$_{16}$H$_{13}$F$_4$O [M + H]$^+$ 297.0897, found 297.0892.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(3-methoxyphenyl)ethylidene)cyclohexa-2,5-dienone (1f)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.47 (s, 1H), 7.33 – 7.26 (m, 1H), 6.93 (d, $J$ = 10.9 Hz, 1H), 6.74 (d, $J$ = 7.6 Hz, 1H), 6.70 (s, 1H), 6.66 (s, 1H), 3.76 (s, 3H), 2.02 (s, 3H), 1.83 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.1, 159.5, 138.9, 138.6, 137.3 (q, $J$ = 30.5 Hz), 134.6, 134.1, 133.5, 130.5, 129.7, 123.4 (q, $J$ = 276.1 Hz), 122.7, 115.9, 114.9, 55.5, 17.1, 16.6. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.9. HRMS (ESI) $m/z$ calculated for C$_{17}$H$_{16}$F$_3$O$_2$ [M + H]$^+$ 309.1097, found 309.1090.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(3-fluorophenyl)ethylidene)cyclohexa-2,5-diene (1g)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.54 (s, 1H), 7.49 – 7.41 (m, 1H), 7.23 – 7.16 (m, 1H), 7.04 (d, $J$ = 7.6 Hz, 1H), 7.00 (d, $J$ = 9.0 Hz, 1H), 6.68 (s, 1H), 2.11 (s, 3H), 1.92 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.0, 163.5, 161.5, 139.3, 139.1, 135.7 (q, $J$ = 30.2 Hz), 135.1, 133.0, 130.4, 130.3, 126.3, 123.2 (q, $J$ = 276.0 Hz), 117.5 (d, $J$ = 22.4
Hz), 116.7 (d, J = 21.0 Hz), 17.1, 16.7. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.5, -111.9. HRMS (ESI) m/z calculated for C$_{16}$H$_{13}$F$_4$O [M + H]$^+$ 297.0897, found 297.0888.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(o-tolyl)ethylidene)cyclohexa-2,5-dienone (1h)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.55 (s, 1H), 7.41 – 7.35 (m, 1H), 7.34 – 7.25 (m, 2H), 7.10 (d, J = 7.4 Hz, 1H), 6.53 (s, 1H), 2.21 (s, 3H), 2.11 (s, 3H), 1.89 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.0, 138.8, 138.7, 137.3 (q, J = 30.8 Hz), 137.2, 134.7, 132.8, 132.5, 130.3, 130.2, 129.9, 129.5, 125.8, 123.2 (q, J = 276.0 Hz), 20.0, 16.9, 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -53.3. HRMS (ESI) m/z calculated for C$_{17}$H$_{16}$F$_3$O [M + H]$^+$ 293.1148, found 293.1155.

4-(1-(3,5-dimethylphenyl)-2,2,2-trifluoroethylidene)-2,6-dimethylcyclohexa-2,5-dienone (1i)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.55 (s, 1H), 7.11 (s, 1H), 6.86 (s, 2H), 6.75 (s, 1H), 2.38 (s, 6H), 2.11 (s, 3H), 1.92 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 187.2, 138.7, 138.4, 138.2, 138.2 (q, J = 30.2 Hz), 134.4, 133.8, 132.7, 131.2, 130.7, 127.9, 123.5 (q, J = 276.0 Hz), 21.4, 17.1, 16.6. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.9. HRMS (ESI) m/z calculated for C$_{18}$H$_{18}$F$_3$O [M + H]$^+$ 307.1304, found 307.1312.
2,6-diisopropyl-4-(2,2,2-trifluoro-1-(4-methoxyphenyl)ethylidene)cyclohexa-2,5-dienone (1j)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.50 (s, 1H), 7.21 (d, $J = 8.5$ Hz, 2H), 6.99 (d, $J = 8.7$ Hz, 2H), 6.75 (s, 1H), 3.89 (s, 3H), 3.18 (dt, $J = 13.7$, 6.9 Hz, 1H), 3.06 (dt, $J = 13.7$, 6.8 Hz, 1H), 1.18 (d, $J = 6.9$ Hz, 6H), 0.97 (d, $J = 6.9$ Hz, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 185.3, 160.7, 148.2, 148.1, 137.8, 137.6, 134.7, 132.2, 130.3, 127.2, 125.1, 123.7 (d, $J = 276.2$ Hz), 113.9, 55.6, 27.4, 27.2, 22.1, 21.9. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.9. HRMS (ESI) $m/z$ calculated for C$_{21}$H$_{24}$F$_3$O$_2$ [M + H]$^+$ 365.1723, found 365.1730.

2,6-dimethoxy-4-(2,2,2-trifluoro-1-(4-methoxyphenyl)ethylidene)cyclohexa-2,5-dienone (1k)

$^1$H NMR (500 MHz, CDCl$_3$) δ 7.21 (d, $J = 8.5$ Hz, 2H), 7.01-6.95 (m, 2H), 6.85 (s, 1H), 6.08 (d, $J = 1.8$ Hz, 1H), 3.87 (s, 6H), 3.55 (s, 3H); $^{13}$C NMR (126 MHz, CDCl$_3$) δ 175.7, 160.5, 152.9, 152.7, 135.1, 134.9, 133.6, 132.1, 125.4, 125.4, 124.8, 122.6, 114.0, 108.0, 105.0, 55.9, 55.6, 55.5; $^{19}$F NMR (471 MHz, CDCl$_3$) δ -52.8; HRMS (ESI) $m/z$ calculated for C$_{17}$H$_{16}$F$_3$O$_4$ [M + H]$^+$ 341.0995, found 341.0999.
2-methyl-4-(2,2,2-trifluoro-1-(4-methoxyphenyl)ethylidene)cyclohexa-2,5-dienone (1l)

1l was obtained as a mixture of the Z/E isomers. $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.73 (d, $J = 10.2$ Hz, 1H), 7.61 (s, 1H), 7.24 – 7.16 (m, 4H), 7.05 – 6.94 (m, 4H), 6.85 (s, 1H), 6.50 (d, $J = 10.2$ Hz, 1H), 6.34 (d, $J = 10.1$ Hz, 1H), 3.89 (s, 3H), 3.87 (s, 3H), 2.11 (s, 3H), 1.93 (s, 3H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 186.9, 186.9, 161.0, 160.9, 139.8, 139.0, 138.9, 137.6, 134.4, 134.2, 132.2, 132.1, 131.1, 130.6, 130.4, 124.6, 123.4 (q, $J = 276.4$ Hz), 114.1, 55.6, 16.9, 16.5. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -53.1, -53.6.

HRMS (ESI) $m/z$ calculated for C$_{16}$H$_{14}$F$_3$O$_2$ [M + H]$^+$ 295.0940, found 295.0945.
**General procedure**

To a solution of 1 (0.1 mmol, 1.0 equiv) in CH₂Cl₂ (3.0 mL) was successively added Bi(OTf)₃ (0.01 mmol, 0.1 equiv) and 2 (0.12 mmol, 1.2 equiv) at room temperature. The mixture was stirred at the same temperature and monitored by TLC until the complete conversion. Then the reaction was concentrated and purified by a flash column chromatography to give the desired product.
Analytical data for products

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-phenylethyl)phenol (3a)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3a (35.7 mg, 96%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.35 – 7.29 (m, 3H), 7.20 – 7.13 (m, 2H), 7.01 (d, $J$ = 8.8 Hz, 2H), 6.77 (d, $J$ = 8.9 Hz, 2H), 6.73 (s, 2H), 4.85 (s, 1H), 4.66 (s, 1H), 4.18 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 154.9, 151.7, 140.9, 133.1, 132.1, 131.6, 130.4, 130.1, 128.4 (q, $J$ = 286.0 Hz), 128.2, 127.7, 122.6, 115.0, 64.2 (q, $J$ = 23.8 Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -58.6. HRMS (ESI) $m/z$ calculated for C$_{22}$H$_{18}$F$_3$O$_2$ [M - H]$^-$ 371.1264, found 371.1260.

2,6-dimethoxy-4-(2,2,2-trifluoro-1-(4-hydroxy-3,5-dimethylphenyl)-1-phenylethyl)phenol (3b)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3b (42.3 mg, 98%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.38 – 7.30 (m, 3H), 7.22 – 7.13 (m, 2H), 6.76 (s, 2H), 6.37 (s, 2H), 5.59 (s, 1H), 4.72 (s, 1H), 3.71 (s, 6H), 2.20 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 151.8, 146.5, 140.8, 134.3, 131.8, 130.4, 130.1, 128.4 (q, $J$ = 286.4 Hz).
Hz), 128.1, 127.8, 122.6, 107.8, 64.7 (q, J = 23.5 Hz), 56.4, 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -58.2. HRMS (ESI) $m/z$ calculated for C$_{24}$H$_{22}$F$_3$O$_4$ [M - H]$^-$ 431.1476, found 431.1468.

2-ethyl-6-methyl-4-(2,2,2-trifluoro-1-(4-hydroxy-3,5-dimethylphenyl)-1-phenylethyl)phenol (3c)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3c (40.6 mg, 98%). $^1$H NMR (500 MHz, Acetone) δ 7.46 (s, 1H), 7.42 (s, 1H), 7.37 – 7.29 (m, 3H), 7.20 – 7.12 (m, 2H), 6.78 – 6.65 (m, 4H), 2.59 (q, J = 7.3 Hz, 2H), 2.17 (s, 3H), 2.16 (s, 6H), 1.08 (t, J = 7.5 Hz, 3H). $^{13}$C NMR (126 MHz, Acetone) δ 153.5, 153.0, 142.1, 132.1, 132.1, 130.9, 130.8, 130.7, 130.3, 129.6, 129.5 (q, J = 285.9 Hz), 128.7, 128.3, 124.2, 124.1, 64.9 (q, J = 23.1 Hz), 24.2, 17.1, 16.9, 14.8. $^{19}$F NMR (471 MHz, Acetone) δ -58.8. HRMS (ESI) $m/z$ calculated for C$_{25}$H$_{24}$F$_3$O$_2$ [M - H]$^-$ 413.1734, found 413.1725.

4-(1-(3-ethoxy-4-hydroxyphenyl)-2,2,2-trifluoro-1-phenylethyl)-2,6-dimethylphenol (3d)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3d (38.7 mg, 93%). $^1$H
NMR (500 MHz, Acetone) δ 7.81 (s, 1H), 7.48 (s, 1H), 7.41 – 7.31 (m, 3H), 7.22 – 7.12 (m, 2H), 6.79 (d, J = 8.5 Hz, 1H), 6.74 – 6.66 (m, 3H), 6.50 (dd, J = 8.5, 2.2 Hz, 1H), 3.88 (q, J = 7.0 Hz, 2H), 2.17 (s, 6H), 1.28 (t, J = 7.0 Hz, 3H). ¹³C NMR (126 MHz, Acetone) δ 153.7, 147.4, 146.8, 141.9, 132.4, 131.9, 130.9, 130.7, 129.4 (q, J = 285.9 Hz), 128.8, 128.4, 124.2, 124.0, 115.8, 115.2, 65.1, 65.1 (q, J = 23.3 Hz), 17.0, 14.9. ¹⁹F NMR (471 MHz, Acetone) δ -58.9. HRMS (ESI) m/z calculated for C₂₄H₂₂F₃O₃ [M - H]⁻ 415.1527, found 415.1525.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxy-2-methoxyphenyl)-1-phenylethyl)phenol (3e)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3e (38.6 mg, 96%). ¹H NMR (500 MHz, DMSO) δ 9.63 (s, 1H), 8.32 (s, 1H), 7.38 – 7.21 (m, 3H), 7.13 (d, J = 7.3 Hz, 2H), 6.69 (d, J = 8.6 Hz, 1H), 6.63 (s, 2H), 6.42 (d, J = 2.4 Hz, 1H), 6.35 (dd, J = 8.7, 2.5 Hz, 1H), 3.21 (s, 3H), 2.08 (s, 6H). ¹³C NMR (126 MHz, DMSO) δ 158.8, 158.5, 152.3, 139.9, 130.8, 129.3, 129.0, 127.8 (q, J = 251.3 Hz), 127.5, 127.0, 123.1, 119.2, 106.8, 101.1, 62.5 (q, J = 24.0 Hz), 55.0, 17.0. ¹⁹F NMR (471 MHz, DMSO) δ -57.1. HRMS (ESI) m/z calculated for C₂₃H₂₀F₃O₃ [M - H]⁻ 401.1370, found 401.1365.
4-(2,2,2-trifluoro-1-(4-hydroxy-3,5-dimethylphenyl)-1-phenylethyl)naphthalen-1-ol (3f)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3f (40.1 mg, 95%). \(^1\)H NMR (500 MHz, Acetone) \(\delta\) 9.34 (s, 1H), 8.29 (d, \(J = 9.4\) Hz, 1H), 7.53 – 7.24 (m, 9H), 7.05 – 6.97 (m, 3H), 6.93 (d, \(J = 8.3\) Hz, 1H), 2.14 (s, 6H). \(^1\)C NMR (126 MHz, Acetone) \(\delta\) 154.4, 153.6, 140.5, 134.0, 131.5, 131.3, 130.1, 129.2 (q, \(J = 286.6\) Hz), 129.2, 128.7, 128.3, 127.9, 127.2, 125.5, 124.6, 124.1, 123.4, 107.4, 65.2 (q, \(J = 22.9\) Hz), 17.0. \(^{19}\)F NMR (471 MHz, Acetone) \(\delta\) -59.5. HRMS (ESI) \(m/z\) calculated for \(\text{C}_{26}\text{H}_{20}\text{F}_{3}\text{O}_{2} \ [\text{M} - \text{H}]^-\) 421.1421, found 421.1413.

![Structural formula of 3f](attachment:image)

1-(2,2,2-trifluoro-1-(4-hydroxy-3,5-dimethylphenyl)-1-phenylethyl)naphthalen-2-ol (3g)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3g (40.1 mg, 95%). \(^1\)H NMR (500 MHz, Acetone) \(\delta\) 8.76 (s, 1H), 7.68 (d, \(J = 8.9\) Hz, 1H), 7.63 (d, \(J = 8.9\) Hz, 1H), 7.51 (s, 1H), 7.43 – 7.10 (m, 9H), 6.75 (s, 2H), 2.17 (s, 6H). \(^1\)C NMR (126 MHz, Acetone) \(\delta\) 157.1, 153.8, 141.5, 135.9, 135.1, 131.5, 131.0, 130.4, 129.4 (q, \(J = 286.1\) Hz), 129.0, 128.6, 128.5, 128.4, 126.8, 124.3, 119.7, 109.5, 65.5 (q, \(J = 23.4\) Hz), 17.0. \(^{19}\)F NMR (471 MHz, Acetone) \(\delta\) -58.6. HRMS (ESI) \(m/z\) calculated for \(\text{C}_{26}\text{H}_{20}\text{F}_{3}\text{O}_{2} \ [\text{M} - \text{H}]^-\) 421.1421, found 421.1413.
2,6-dimethyl-4-(2,2,2-trifluoro-1-(furan-2-yl)-1-phenylethyl)phenol (3h)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3h (31.1 mg, 90%). $^1$H NMR (500 MHz, CDCl$_3$) δ 7.52 (d, $J$ = 1.1 Hz, 1H), 7.39 – 7.31 (m, 3H), 7.25 – 7.19 (m, 2H), 6.79 (s, 2H), 6.43 – 6.36 (m, 1H), 6.01 (d, $J$ = 3.3 Hz, 1H), 4.68 (s, 1H), 2.22 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 153.0, 152.1, 143.1, 138.9, 130.1, 129.8, 129.5, 128.3, 128.1, 126.8 (q, $J$ = 286.2 Hz), 122.7, 112.4, 110.3, 60.8 (q, $J$ = 25.4 Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -62.5. HRMS (ESI) m/z calculated for C$_{20}$H$_{16}$F$_3$O$_2$ [M - H]$^-$ 345.1108, found 345.1115.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(5-methylfuran-2-yl)-1-phenylethyl)phenol (3i)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3i (34.2 mg, 95%). $^1$H NMR (500 MHz, CDCl$_3$) δ 7.39 – 7.30 (m, 3H), 7.26 – 7.19 (m, 2H), 6.80 (s, 2H), 5.95 (d, $J$ = 3.9 Hz, 1H), 5.80 (d, $J$ = 3.1 Hz, 1H), 4.68 (s, 1H), 2.33 (s, 3H), 2.21 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 153.0, 152.0, 151.0, 139.2, 130.3, 129.9, 129.6, 128.2, 128.0, 126.9 (q, $J$ = 283.4 Hz), 122.6, 113.3, 106.2, 60.8 (q, $J$ = 25.5 Hz), 16.4, 13.9. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -62.2. HRMS (ESI) m/z calculated for C$_{21}$H$_{18}$F$_3$O$_2$ [M - H]$^-$ 359.1264, found 359.1275.
4-(1-(benzofuran-2-yl)-2,2,2-trifluoro-1-phenylethyl)-2,6-dimethylphenol (3j)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3j (38.4 mg, 97%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.57 – 7.45 (m, 2H), 7.41 – 7.15 (m, 7H), 6.83 (s, 2H), 6.34 (s, 1H), 2.19 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 155.9, 155.4, 152.3, 138.4, 129.9, 129.6, 129.5, 128.4, 128.3, 127.7, 126.7 (q, $J = 286.5$ Hz), 124.8, 123.2, 122.9, 121.3, 111.9, 109.6, 61.4 (q, $J = 25.7$ Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -61.7. HRMS (ESI) $m/z$ calculated for C$_{24}$H$_{18}$F$_3$O$_2$ [M - H] 395.1264, found 395.1270.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(5-methylthiophen-2-yl)-1-phenylethyl)phenol (3k)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3k (36.1 mg, 96%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.38 – 7.28 (m, 5H), 6.87 (s, 2H), 6.74 (d, $J = 3.5$ Hz, 1H), 6.69 (d, $J = 2.5$ Hz, 1H), 2.44 (s, 3H), 2.21 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 152.1, 141.7, 140.8, 140.6, 132.0, 130.0, 129.7, 128.0, 129.1, 128.1, 127.5 (q, $J = 285.8$ Hz), 124.9, 122.5, 61.7 (q, $J = 25.0$ Hz), 16.4, 15.3. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -62.1. HRMS (ESI) $m/z$ calculated for C$_{21}$H$_{18}$F$_3$OS [M - H] 375.1036, found 375.1045.
2,6-dimethyl-4-(2,2,2-trifluoro-1-(5-iodothiophen-2-yl)-1-phenylethyl)phenol (3l)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3l (46.3 mg, 95%). $^1$H NMR (500 MHz, CDCl$_3$) δ 7.39 – 7.31 (m, 3H), 7.30 – 7.23 (m, 2H), 7.20 (d, $J$ = 3.9 Hz, 1H), 6.83 (s, 2H), 6.68 (d, $J$ = 3.7 Hz, 1H), 4.72 (s, 1H), 2.21 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 152.3, 150.5, 140.2, 136.8, 131.3, 130.6, 129.9, 129.5, 128.4, 128.3, 127.3 (q, $J$ = 285.4 Hz), 122.8, 74.7, 61.8 (q, $J$ = 25.2 Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -62.2. HRMS (ESI) m/z calculated for C$_{20}$H$_{15}$F$_3$IOS [M-H]$^-$ 486.9846, found 486.9855.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(5-methyl-1H-pyrrol-2-yl)-1-phenylethyl)phenol (3m)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3m (35.2 mg, 98%). $^1$H NMR (500 MHz, CDCl$_3$) δ 7.65 (s, 1H), 7.39 – 7.31 (m, 3H), 7.26 – 7.19 (m, 2H), 6.82 (s, 2H), 5.86 (s, 1H), 5.77 (s, 1H), 4.30 (s, 1H), 2.25 (s, 3H), 2.21 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) δ 152.0, 139.9, 130.9, 129.9, 129.6, 128.5, 128.3, 128.0, 127.9, 127.7 (q, $J$ = 285.5 Hz), 122.7, 111.9, 106.0, 60.2 (q, $J$ = 24.4 Hz), 16.4, 13.3. $^{19}$F NMR (471 MHz, CDCl$_3$) δ -62.2. HRMS (ESI) m/z calculated for C$_{21}$H$_{19}$F$_3$NO [M-H]$^-$ 358.1424, found 358.1432.
2,6-dimethyl-4-(2,2,2-trifluoro-1-phenyl-1-(5-phenyl-1H-pyrrol-2-yl)ethyl)phenol (3n)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3n (40.8 mg, 97%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 8.06 (s, 1H), 7.38 – 7.05 (m, 10H), 6.76 (s, 2H), 6.48 – 6.28 (m, 1H), 6.06 – 5.73 (m, 1H), 4.61 (s, 1H), 2.12 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 152.2, 139.2, 132.7, 132.6, 130.7, 130.5, 129.9, 129.6, 129.1, 128.4, 128.2, 127.6 (q, $J = 285.5$ Hz), 126.6, 124.0, 122.9, 113.3, 106.0, 60.4 (q, $J = 25.1$ Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -62.0. HRMS (ESI) $m/z$ calculated for C$_{26}$H$_{21}$F$_3$NO $[M - H]$ - 420.1581, found 420.1577.

1-(5-(2,2,2-trifluoro-1-(4-hydroxy-3,5-dimethylphenyl)-1-phenylethyl)-1H-pyrrol-2-yl)ethanone (1o)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3o (36.7 mg, 95%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 9.59 (s, 1H), 7.61 – 7.43 (m, 2H), 7.41 – 7.32 (m, 3H), 7.10 (s, 2H), 7.04 (s, 1H), 6.94 (s, 1H), 6.36 – 6.20 (m, 1H), 2.44 (s, 3H), 2.23 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 188.4, 152.6, 139.8, 132.3, 131.2, 128.6, 128.3, 127.9, 127.6, 125.6 (q, $J = 283.9$ Hz), 125.0, 123.0, 117.3, 110.9, 79.3 (q, $J = 28.5$ Hz), 25.6, 16.3. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -74.3. HRMS (ESI) $m/z$ calculated for C$_{22}$H$_{19}$F$_3$NO$_2$ [M - H]$^-$ 386.1373, found 386.1385.

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2,6-dimethyl-4-(2,2,2-trifluoro-1-(1H-indol-3-yl)-1-phenylethyl)phenol (3p)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 3p (38.7 mg, 98%). $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 8.10 (s, 1H), 7.42 – 7.29 (m, 6H), 7.19 (t, $J$ = 7.6 Hz, 1H), 7.06 (d, $J$ = 8.2 Hz, 1H), 7.00 – 6.95 (m, 1H), 6.94 (s, 2H), 6.70 (d, $J$ = 2.6 Hz, 1H), 4.67 (s, 1H), 2.18 (s, 6H). $^{13}$C NMR (126 MHz, CDCl$_3$) $\delta$ 151.7, 140.3, 136.9, 131.4, 130.2, 129.9, 128.3 (d, $J$ = 286.2 Hz), 128.1, 127.6, 126.9, 126.6, 122.7, 122.5, 122.3, 119.9, 116.6, 111.3, 60.0 (q, $J$ = 24.8 Hz), 16.4. $^{19}$F NMR (471 MHz, CDCl$_3$) $\delta$ -60.3. HRMS (ESI) m/z calculated for C$_{24}$H$_{19}$F$_3$NO [M - H]$^-$ 394.1424, found 394.1436.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4a)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4a (37.2 mg, 92%). $^1$H NMR (500 MHz, Acetone) $\delta$ 8.53 (s, 1H), 7.46 (s, 1H), 7.05 (d, $J$ = 8.9 Hz, 2H), 6.95 (d, $J$ = 8.8 Hz, 2H), 6.90 (d, $J$ = 9.1 Hz, 2H), 6.81 (d, $J$ = 8.9 Hz, 2H), 6.72 (s, 2H), 3.80 (s, 3H), 2.17 (s, 6H). $^{13}$C NMR (126 MHz, Acetone) $\delta$ 159.7, 157.5, 153.4, 133.6, 132.3, 132.2, 131.8, 131.7, 130.6, 129.4 (q, $J$ = 285.7 Hz), 124.0, 115.4, 113.9, 64.0 (q, $J$ = 23.4 Hz), 55.4, 16.7. $^{19}$F NMR (471 MHz, Acetone) $\delta$ -59.4. HRMS (ESI) m/z calculated for C$_{24}$H$_{20}$F$_3$O$_3$ [M - H]$^-$ 401.1370, found 401.1376.
2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(p-tolyl)ethyl)phenol (4b)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4b (36.7 mg, 95%). ¹H NMR (500 MHz, Acetone) δ 8.52 (s, 1H), 7.45 (s, 1H), 7.16 (d, J = 8.2 Hz, 2H), 7.03 (d, J = 8.3 Hz, 2H), 6.94 (d, J = 8.8 Hz, 2H), 6.81 (d, J = 8.9 Hz, 2H), 6.72 (s, 2H), 2.33 (s, 3H), 2.17 (s, 6H). ¹³C NMR (126 MHz, Acetone) δ 157.5, 153.5, 138.9, 137.9, 132.2, 132.0, 131.9, 130.7, 130.5, 129.4, 127.1 (q, J = 285.7 Hz), 124.0, 115.5, 64.4 (q, J = 23.3 Hz), 20.8, 16.9. ¹⁹F NMR (471 MHz, Acetone) δ -59.2. HRMS (ESI) m/z calculated for C₂₃H₂₀F₃O₂ [M - H]⁻ 385.1421, found 385.1411.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-(methylthio)phenyl)ethyl)phenol (4c)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4c (38.5 mg, 92%). ¹H NMR (500 MHz, Acetone) δ 8.56 (s, 1H), 7.49 (s, 1H), 7.24 (d, J = 8.7 Hz, 2H), 7.07 (d, J = 8.6 Hz, 2H), 6.94 (d, J = 8.8 Hz, 2H), 6.82 (d, J = 8.9 Hz, 2H), 6.72 (s, 2H), 2.49 (s, 3H), 2.17 (s, 6H). ¹³C NMR (126 MHz, Acetone) δ 157.6, 153.6, 139.2, 138.2, 131.9, 131.8, 131.1, 130.7, 129.3 (q, J = 285.9 Hz), 126.0, 124.2, 115.6, 64.3 (q, J = 23.3 Hz), 16.9, 14.9. ¹⁹F NMR (471 MHz, Acetone) δ -59.3. HRMS (ESI) m/z calculated for C₂₃H₂₀F₃O₂S [M - H]⁻ 417.1142, found 417.1137.
2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-fluorophenyl)-1-(4-hydroxyphenyl)ethyl)phenol (4d)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4d (37.4 mg, 96%). $^1$H NMR (500 MHz, Acetone) δ 8.58 (s, 1H), 7.51 (s, 1H), 7.26 – 7.07 (m, 4H), 6.94 (d, $J$ = 8.7 Hz, 2H), 6.83 (d, $J$ = 8.9 Hz, 2H), 6.70 (s, 2H), 2.17 (s, 6H). $^{13}$C NMR (126 MHz, Acetone) δ 163.7, 161.7, 157.7, 153.6, 137.9, 132.6, 131.8, 131.7, 130.6, 129.2 (d, $J$ = 285.6 Hz), 124.2, 115.6, 115.4 (d, $J$ = 21.4 Hz), 64.2 (q, $J$ = 23.5 Hz), 16.9. $^{19}$F NMR (471 MHz, Acetone) δ -59.4, -116.5. HRMS (ESI) m/z calculated for C$_{22}$H$_{17}$F$_{4}$O$_{2}$ [M - H] - 389.1170, found 389.1172.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(3-methoxyphenyl)ethyl)phenol (4e)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4e (39.4 mg, 98%). $^1$H NMR (500 MHz, Acetone) δ 8.54 (s, 1H), 7.47 (s, 1H), 7.28 (t, $J$ = 8.1 Hz, 1H), 7.01 – 6.89 (m, 3H), 6.82 (d, $J$ = 8.9 Hz, 2H), 6.77 (d, $J$ = 8.0 Hz, 1H), 6.73 (s, 2H), 6.67 (s, 1H), 3.71 (s, 3H), 2.17 (s, 6H). $^{13}$C NMR (126 MHz, Acetone) δ 160.2, 157.6, 153.5, 143.3, 131.9, 131.8, 131.8, 130.7, 129.7, 129.3 (q, $J$ = 285.8 Hz), 124.1, 122.9, 122.9,
117.7, 115.5, 112.7, 64.7 (q, $J = 23.5$ Hz), 55.3, 16.9. $^{19}$F NMR (471 MHz, Acetone) $\delta$ -58.9. HRMS (ESI) $m/z$ calculated for C$_{23}$H$_{20}$F$_3$O$_3$ [M - H]$^-$ 401.1370, found 401.1377.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(3-fluorophenyl)-1-(4-hydroxyphenyl)ethyl)phenol (4f)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4f (35.1 mg, 90%). $^1$H NMR (500 MHz, Acetone) $\delta$ 8.60 (s, 1H), 7.53 (s, 1H), 7.42 (dd, $J = 14.5$, 8.1 Hz, 1H), 7.15 (t, $J = 8.3$ Hz, 1H), 7.03 (d, $J = 8.0$ Hz, 1H), 6.95 (d, $J = 8.8$ Hz, 2H), 6.88 – 6.79 (m, 3H), 6.71 (s, 2H), 2.18 (s, 6H). $^{13}$C NMR (126 MHz, Acetone) $\delta$ 164.2, 162.3, 157.8, 153.8, 144.7, 131.8, 131.4, 131.3, 130.7, 130.6, 129.1 (q, $J = 285.8$ Hz), 126.7, 124.4, 117.7 (d, $J = 21.9$ Hz), 115.8, 115.3 (d, $J = 21.1$ Hz), 64.7 (q, $J = 23.7$ Hz), 16.9. $^{19}$F NMR (471 MHz, Acetone) $\delta$ -59.3, -114.1. HRMS (ESI) $m/z$ calculated for C$_{22}$H$_{17}$F$_4$O$_2$ [M - H]$^-$ 389.1170, found 389.1179.

2,6-dimethyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(o-tolyl)ethyl)phenol (4g)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4g (34.7 mg, 90%). $^1$H NMR (500 MHz, Acetone) $\delta$ 8.57 (s, 1H), 7.60 – 7.52 (m, 1H), 7.49 (s, 1H), 7.33 –
7.25 (m, 2H), 7.21 (d, J = 8.8 Hz, 2H), 7.16 – 7.08 (m, 1H), 6.97 (s, 2H), 6.83 (d, J = 9.0 Hz, 2H), 2.18 (s, 6H), 1.47 (s, 3H). 13C NMR (126 MHz, Acetone) δ 157.6, 153.5, 140.3, 139.7, 133.8, 132.3, 131.2, 129.5, 129.2, 129.0 (q, J = 286.1 Hz), 128.3, 126.4, 124.0, 115.4, 64.2 (q, J = 22.8 Hz), 23.4, 16.9. 19F NMR (471 MHz, Acetone) δ -60.9. HRMS (ESI) m/z calculated for C23H20F3O2 [M - H]- 385.1421, found 385.1416.

4-(1-(3,5-dimethylphenyl)-2,2,2-trifluoro-1-(4-hydroxyphenyl)ethyl)-2,6-dimethylphenol (4h)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4h (38.4 mg, 96%). 1H NMR (500 MHz, Acetone) δ 8.53 (s, 1H), 7.45 (s, 1H), 6.98 (s, 1H), 6.94 (d, J = 8.8 Hz, 2H), 6.81 (d, J = 8.9 Hz, 2H), 6.78 (s, 2H), 6.71 (s, 2H), 2.23 (s, 6H), 2.17 (s, 6H). 13C NMR (126 MHz, Acetone) δ 157.5, 153.5, 141.8, 137.9, 132.2, 132.0, 131.9, 130.8, 129.7, 129.4 (q, J = 285.9 Hz), 128.5, 124.0, 115.4, 64.6 (q, J = 23.1 Hz), 21.5, 16.9. 19F NMR (471 MHz, Acetone) δ -58.8. HRMS (ESI) m/z calculated for C24H22F3O2 [M - H]- 399.1577, found 399.1585.

2,6-diisopropyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4i)

It was prepared following the general procedure by flash chromatography on silica gel
using ethyl acetate/petroleum ether (10:90) as eluent to afford 4i (45.4 mg, 93%). $^1$H NMR (500 MHz, Acetone) δ 8.55 (s, 1H), 7.33 (s, 1H), 7.06 (d, $J = 8.1$ Hz, 2H), 6.96 (d, $J = 7.7$ Hz, 2H), 6.91 (d, $J = 9.1$ Hz, 2H), 6.85 – 6.77 (m, 4H), 3.80 (s, 3H), 3.33 (dt, $J = 13.6$, 6.8 Hz, 2H), 1.08 (d, $J = 6.9$ Hz, 12H). $^{13}$C NMR (126 MHz, Acetone) δ 159.8, 157.6, 150.9, 134.8, 133.8, 132.6, 131.8, 129.6 (q, $J = 285.8$ Hz), 125.9, 115.5, 113.9, 64.5 (q, $J = 23.3$ Hz), 55.5, 27.5, 23.2. $^{19}$F NMR (471 MHz, Acetone) δ -59.5. HRMS (ESI) $m/z$ calculated for C$_{27}$H$_{28}$F$_3$O$_3$ [M - H] - 457.1996, found 457.1990.

![Image of 2,6-dimethoxy-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4j)](image)

2,6-dimethoxy-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4j)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford 4k (30.4 mg, 70%). $^1$H NMR (500 MHz, Acetone) δ 8.61 (s, 1H), 7.54 (s, 1H), 7.07 (d, $J = 8.9$ Hz, 2H), 6.97 (d, $J = 8.8$ Hz, 2H), 6.94-6.89 (m, 2H), 6.86-6.81 (m, 2H), 6.38 (s, 2H), 3.81 (s, 3H), 3.64 (s, 6H); $^{13}$C NMR (126 MHz, Acetone) δ 159.8, 157.6, 148.0, 136.6, 133.2, 131.9, 131.7, 131.6, 130.4, 129.5, 115.5, 113.9, 109.1, 65.0, 64.6, 64.4, 64.2, 64.1, 56.5, 55.4; $^{19}$F NMR (471 MHz, Acetone) δ -59.4; HRMS (ESI) $m/z$ calculated for C$_{23}$H$_{20}$F$_3$O$_5$ [M - H] - 433.1268, found 433.1273.

![Image of 2-methyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4k)](image)

2-methyl-4-(2,2,2-trifluoro-1-(4-hydroxyphenyl)-1-(4-methoxyphenyl)ethyl)phenol (4k)

It was prepared following the general procedure by flash chromatography on silica gel
using ethyl acetate/petroleum ether (10:90) as eluent to afford 4j (34.9 mg, 90%). $^1$H NMR (500 MHz, Acetone) δ 8.54 (s, 1H), 8.42 (s, 1H), 7.04 (d, $J = 8.9$ Hz, 2H), 6.94 (d, $J = 8.7$ Hz, 2H), 6.92 – 6.87 (m, 3H), 6.84 – 6.67 (m, 4H), 3.80 (s, 3H), 2.14 (s, 3H). $^{13}$C NMR (126 MHz, Acetone) δ 159.8, 157.6, 155.6, 133.6, 132.9, 132.4, 132.2, 131.8, 129.5 (q, $J = 285.7$ Hz), 129.2, 124.5, 115.5, 114.8, 114.0, 64.1 (q, $J = 23.4$ Hz), 55.5, 16.5. $^{19}$F NMR (471 MHz, Acetone) δ -59.5. HRMS (ESI) $m/z$ calculated for C$_{22}$H$_{17}$F$_3$O$_3$ [M - H]$^-$ 387.1214, found 387.1220.
NMR spectra

1a