Metal-free α-arylation of α-fluoro-α-nitroacetamides employing diaryliodonium salts

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General experimental information

Unless otherwise specified, all reactions were performed under air atmosphere in oven dried round-bottom flasks. The reactions were monitored by TLC visualized by UV (254 nm) and/or with iodine. Column chromatography was performed on 100-200 mesh silica gel using the gradient system ethyl acetate-hexane. NMR data were recorded at Bruker AV 400 MHz in CDCl$_3$ using as internal standards the residual CHCl$_3$ signal for $^1$H NMR ($\delta = 7.26$ ppm) and the deuterated solvent signal for $^{13}$C NMR ($\delta = 77.16$ ppm). Coupling constants are given in Hertz (Hz) and the classical abbreviations are used to describe the signal multiplicities. Melting points were measured with a Büchi B-540 apparatus and are uncorrected. High resolution mass spectra were obtained using Q-TOF mass spectrometer. All commercially available reagents were used as received. $\alpha$-nitroacetamides $^1$ (1a-1x), $\alpha$-cyanoacetamides $^2$ (4a-4p) and diaryliodonium salts (2a-2w) were prepared by following a literature procedure. $^3$

Procedures

General procedure for the synthesis of $\alpha$-fluoro-$\alpha$-nitroacetamides 1

\[
\begin{align*}
\text{R}^1 & \quad \text{R}^2 \\
\text{N} & \quad \text{NO}_2 \\
\text{+ Selectfluor} & \quad \text{NaH (1.1 equiv)} \\
\text{THF/DMF (10:1)} & \quad 0^\circ \text{C}, 1 \text{ h} \\
\text{R}^1 & \quad \text{R}^2 \\
\text{N} & \quad \text{F} \\
\text{NO}_2
\end{align*}
\]

To a solution of $\alpha$-nitroacetamide (1.50 mmol) in THF (20 mL) was added NaH (1.65 mmol) at 0 °C. The resulting mixture was stirred at the same temperature for 30 min. Then selectfluor (1.5 mmol) solution in DMF (2 mL) was added dropwise to the mixture at 0 °C, and the reaction mixture was stirred to room temperature for 1 h. The reaction mixture was quenched by addition of water (10 mL) and the mixture was extracted with ethyl acetate (25 mL $\times$ 3). The organic layer was dried over Na$_2$SO$_4$ and evaporated under reduced pressure. The residue was purified using column chromatography (100-200 mesh silica gel) using ethyl acetate /hexane as the eluent to afford the desired $\alpha$-fluoro-$\alpha$-nitroacetamide 1 (40-76% yield) and the side product $\alpha$-$\alpha$-difluoronitroacetamide in traces. The same strategy was followed for the synthesis of $\alpha$-cyano-$\alpha$-fluoroacetamides 4.

Characterization data of compounds 1a and 4h

**Compound 1a: N-benzyl-2-fluoro-2-nitro-$N$-phenylacetamide**

White solid, 259 mg, 60%; $\text{Mp}$ 72-74 °C. $^{13}$C NMR (100 MHz, $\delta$ ppm/CDCl$_3$): 159.1 (d, $J_{CF} = 22.3$ Hz, C), 138.8 (C), 135.2 (C), 130.4 (CH), 130.4 (CH), 129.9 (CH), 129.1 (CH), 129.1 (CH), 128.8 (CH), 128.8 (CH), 128.6 (CH), 128.6 (CH), 128.3 (CH), 100.7 (d, $J_{CF} = 243.5$ Hz, CH), 54.3 (CH$_2$). $^1$H NMR (400 MHz, $\delta$ ppm/CDCl$_3$): 7.44-7.40 (m, 3H), 7.31-7.28 (m, 3H), 7.19-7.17 (m, 2H), 7.13-7.11 (m, 2H), 5.86 (d, $J = 48.8$ Hz, 1H), 4.96 (s, 2H). $^{19}$F NMR (376 MHz, $\delta$ ppm/CDCl$_3$): -145.5 (s). HRMS for C$_{15}$H$_{14}$F$_2$N$_2$O$_3^+$: calcd. [M+H]$^+$: 289.0983, found: 289.082.

**Compound 4h: N-benzyl-2-cyano-2-fluoro-$N$-phenylacetamide**

Colorless liquid, 185 mg, 46%; $^{13}$C NMR (100 MHz, $\delta$ ppm/CDCl$_3$): 159.8 (d, $J_{CF} = 22.6$ Hz, C), 138.2 (C), 135.4 (C), 130.4 (CH), 130.4 (CH), 130.0 (CH), 129.3 (CH), 129.3 (CH), 128.8 (CH), 128.8 (CH), 128.8 (CH), 128.8 (CH), 128.3 (CH), 112.6 (d, $J_{CF} = 30.8$ Hz, C), 74.5 (d, $J_{CF} = 189.8$ Hz, CH), 54.5 (CH$_2$). $^1$H NMR (400 MHz, $\delta$ ppm/CDCl$_3$): 7.44-7.38 (m, 3H), 7.30-7.27 (m, 3H), 7.19-7.17 (m, 2H), 7.06-7.04 (m, 2H), 5.36 (d, $J = 46.8$ Hz, 1H), 4.97 (d, $J = 14.4$ Hz, 1H), 4.88 (d, $J = 14.0$ Hz, 1H). $^{19}$F NMR (376 MHz, $\delta$ ppm/CDCl$_3$): -189.0 (s). HRMS for C$_{16}$H$_{15}$F$_2$O$: calcd. [M+H]$^+$: 269.1085, found: 269.1085.
General procedure for the α-arylation of α-fluoro-α-nitroacetamides

To an oven-dried round bottom flask were added α-fluoro-α-nitroacetamide 1 (0.20 mmol), aryl(mesityl)iodonium salt 2 (0.22 mmol), K$_2$CO$_3$ (0.24 mmol) under open air respectively and dissolved in toluene (2.0 mL). The reaction mixture was allowed to stir at 50 °C for 2 h. After the completion of reaction, as indicated by TLC, the reaction mixture was extracted using ethyl acetate (3 × 10 mL) and washed with saturated brine solution. The organic layer was dried over anhydrous Na$_2$SO$_4$ and evaporated under reduced pressure. The residue was purified using column chromatography (100-200 mesh silica gel) using ethylacetate/hexane as the eluent to afford the product 3.

Optimization of the Reaction Conditions for α-arylation of α-cyano-α-fluoroacetamides 4

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<th>yield (%)</th>
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General procedure for the α-arylation of α-cyano-α-fluoroacetamides

To an oven-dried round bottom flask were added α-cyano-α-fluoroacetamide 4 (0.20 mmol) and aryl(mesityl)iodonium salt 2 (0.22 mmol), which were then dissolved in THF (2.0 mL). Subsequently, t-BuOK (0.24 mmol) was added portionwise. The reaction mixture was allowed
to stir at 25 °C for 0.5 h. After the completion of reaction, as indicated by TLC, the reaction mixture was extracted using ethyl acetate (3 × 10 mL) and washed with saturated brine solution. Finally, the organic layer dried over anhydrous Na₂SO₄ and evaporated under reduced pressure. The residue was purified using column chromatography (100-200 mesh silica gel) using ethylacetate/hexane as the eluent to afford the product 5.

**Compound 3a: N-benzyl-2-fluoro-2-nitro-N₂,N₂-diphenylacetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3a (62 mg, 85%) as white solid. **Rf** (Ethyl acetate/Hexane: 10/90) = 0.40. **Mp** 97-99 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 160.8 (d, Jₑ₋ₑ = 21.5 Hz, C), 138.5 (C), 135.7 (C), 131.2 (CH), 130.4 (d, Jₑ₋ₑ = 21.6 Hz, C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.8 (CH), 128.7 (CH), 128.7 (CH), 128.4 (CH), 128.4 (CH), 128.2 (CH), 126.3 (d, Jₑ₋ₑ = 8.8 Hz, CH), 126.3 (d, Jₑ₋ₑ = 8.8 Hz, CH), 116.2 (d, Jₑ₋ₑ = 255.3 Hz, C), 56.1 (CH₂). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 7.42-6.27 (m, 15H), 4.95 (d, J = 14.0 Hz, 1H), 4.89 (d, J = 14.4 Hz, 1H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -122.6 (s). **HRMS** for C₂₁H₂₁FN₂O₃⁺: calcd. [M+NH₄]⁺: 382.1561, found: 382.1552.

**Compound 3b: N-benzyl-2-fluoro-2-(4-methoxyphenyl)-2-nitro-N-phenylacetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(4-methoxyphenyl)iodonium 4-methylbenzenesulfonate 2b (115 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 3 h followed by column chromatography afforded the product 3b (55 mg, 70%) as white solid. **Rf** (Ethyl acetate/Hexane: 10/90) = 0.30. **Mp** 95-97 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 161.8 (C), 161.0 (d, Jₑ₋ₑ = 16.8 Hz, C), 138.7 (C), 135.7 (C), 129.3 (CH), 129.3 (CH), 129.2 (CH), 128.8 (CH), 128.8 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.1 (CH), 128.0 (d, Jₑ₋ₑ = 7.1 Hz, CH), 128.0 (d, Jₑ₋ₑ = 7.1 Hz, CH), 122.4 (d, Jₑ₋ₑ = 17.4 Hz, C), 116.5 (d, Jₑ₋ₑ = 204.8 Hz, C), 113.9 (CH), 113.9 (CH), 56.1 (CH₂), 55.5 (CH₃). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 7.31-7.15 (m, 11H), 6.82-6.40 (m, 3H), 4.94 (d, J = 13.6 Hz, 1H), 4.83 (d, J = 14.0 Hz, 1H), 3.80 (s, 3H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -122.2 (s). **HRMS** for C₂₂H₂₃FN₃O₄⁺: calcd. [M+NH₄]⁺: 412.1667, found: 412.1669.
Compound 3c: \(N\)-benzyl-2-(4-(t-butyl)phenyl)-2-fluoro-2-nitro-\(N\)-phenylacetamide

Following the general procedure, treatment of \(N\)-benzyl-2-fluoro-2-nitro-\(N\)-phenylacetamide 1a (58 mg, 0.20 mmol) with (4-(t-butyl)phenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2c (121 mg, 0.22 mmol) in the presence of \(K_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3c (67 mg, 80%) as white solid. \(R_f\) (Ethyl acetate/Hexane: 10/90) = 0.40. \(M_p\) 120-122 °C. \(^{13}\)C NMR (100 MHz, \(\delta\) ppm/CDCl\(_3\)): 161.0 (d, \(J_{CF} = 21.5\) Hz, C), 154.6 (C), 138.6 (C), 135.8 (C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 128.7 (CH), 128.7 (CH), 128.6 (CH), 128.6 (CH), 128.1 (CH), 127.5 (d, \(J_{CF} = 22.0\) Hz, C), 126.1 (d, \(J_{CF} = 8.6\) Hz, CH), 126.1 (d, \(J_{CF} = 8.6\) Hz, CH), 125.4 (CH), 125.4 (CH), 116.2 (d, \(J_{CF} = 253.5\) Hz, C), 56.1 (CH\(_2\)), 35.0 (C), 31.2 (CH\(_3\)), 31.2 (CH\(_3\)), 31.2 (CH\(_3\)). \(^1\)H NMR (400 MHz, \(\delta\) ppm/CDCl\(_3\)): 7.30 (s, 4H), 7.24-7.24 (m, 3H), 7.17-7.03 (m, 7H), 4.90 (d, \(J = 11.2\) Hz, 1H), 4.85 (d, \(J = 11.2\) Hz, 1H), 1.29 (s, 9H). \(^{19}\)F NMR (376 MHz, \(\delta\) ppm/CDCl\(_3\)): -126.8 (s). HRMS for \(C_{25}H_{22}FN_2O_3^+\): calcd. [M+NH\(_4\)]\(^+\): 438.2187, found: 438.2178.

Compound 3d: \(N\)-benzyl-2-fluoro-2-(4-\(i\)-propylphenyl)-2-nitro-\(N\)-phenylacetamide

Following the general procedure, treatment of \(N\)-benzyl-2-fluoro-2-nitro-\(N\)-phenylacetamide 1a (58 mg, 0.20 mmol) with (4-\(i\)-propylphenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2d (118 mg, 0.22 mmol) in the presence of \(K_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3d (53 mg, 65%) as pale yellow solid. \(R_f\) (Ethyl acetate/Hexane: 10/90) = 0.45. \(M_p\) 108-110 °C. \(^{13}\)C NMR (100 MHz, \(\delta\) ppm/CDCl\(_3\)): 161.0 (d, \(J_{CF} = 21.6\) Hz, C), 152.4 (C), 138.6 (C), 135.8 (C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.6 (CH), 128.1 (CH), 127.8 (d, \(J_{CF} = 21.5\) Hz, C), 126.5 (CH), 126.5 (CH), 126.3 (d, \(J_{CF} = 8.7\) Hz, CH), 126.3 (d, \(J_{CF} = 8.7\) Hz, CH), 116.3 (d, \(J_{CF} = 254.8\) Hz, C), 56.1 (CH\(_2\)), 34.1 (CH), 23.9 (CH\(_3\)), 23.8 (CH\(_3\)). \(^1\)H NMR (400 MHz, \(\delta\) ppm/CDCl\(_3\)): 7.28-7.24 (m, 5H), 7.15-6.40 (m, 9H), 4.88 (s, 2H), 2.89 (s, 1H), 1.22 (s, 6H). \(^{19}\)F NMR (376 MHz, \(\delta\) ppm/CDCl\(_3\)): -122.1 (s). HRMS for \(C_{24}H_{23}FN_2O_3^+\): calcd. [M+Na\(^+\): 429.1585, found: 429.1577.
Compound 3e: N-benzyl-2-(4-ethylphenyl)-2-fluoro-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(4-ethylphenyl)iodonium 4-methylbenzenesulfonate 2e (115 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product (4-ethylphenyl)(mesityl)iodonium 4-methylbenzenesulfonate 3e (72 mg, 92%) as white solid. Rₓ(Ethyl acetate/Hexane: 10/90) = 0.45. Mp 101-103 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 161.0 (d, JCF = 21.4 Hz, C), 147.8 (C), 138.6 (C), 135.7 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.1 (CH), 127.9 (CH), 127.9 (CH), 127.7 (d, JCF = 21.3 Hz, C), 126.3 (d, JCF = 8.5 Hz, CH), 126.3 (d, JCF = 8.5 Hz, CH), 116.4 (d, JCF = 254.6 Hz, C), 56.1 (CH₂), 28.8 (CH₂), 15.4 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.28-7.22 (m, 5H), 7.17-6.31 (m, 9H), 4.89 (d, J = 11.2 Hz, 1H), 4.84 (d, J = 11.2 Hz, 1H), 2.62 (q, J = 6.0 Hz, 2H), 1.20 (t, J = 6.4 Hz, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -127.1 (s). HRMS for C₂₃H₂₅FN₃O₅⁺: calcd. [M+NH₄]⁺: 410.1874, found: 410.1863.

Compound 3f: N-benzyl-2-fluoro-2-nitro-N-phenyl-2-(p-tolyl)acetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(p-tolyl)iodonium 4-methylbenzenesulfonate 2f (112 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3f (72 mg, 95%) as white solid. Rₓ(Ethyl acetate/Hexane: 10/90) = 0.45. Mp 99-101 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.9 (d, JCF = 17.0 Hz, C), 141.6 (C), 138.7 (C), 135.8 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.1 (CH), 129.1 (CH), 128.8 (CH), 128.8 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.1 (CH), 127.6 (d, JCF = 17.3 Hz, C), 126.3 (d, JCF = 6.8 Hz, CH), 126.3 (d, JCF = 6.8 Hz, CH), 116.5 (d, JCF = 204.0 Hz, C), 56.1 (CH₂), 21.4 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.28-7.24 (m, 5H), 7.20-7.10 (m, 9H), 4.94 (d, J = 11.2 Hz, 1H), 4.83 (d, J = 11.6 Hz, 1H), 2.35 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.6 (s). HRMS for C₂₂H₂₃FN₃O₅⁺: calcd. [M+NH₄]⁺: 396.1718, found: 396.1707.
Compound 3g: 2-[[1,1'-biphenyl]-4-yl]-N-benzyl-2-fluoro-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with [1,1'-biphenyl]-4-yl(mesityl)iodonium 4-methylbenzenesulfonate 2g (126 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3g (83 mg, 94%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 132-134 °C. ^13C NMR (100 MHz, δ ppm/CDCl₃): 160.8 (d, J_CF = 21.3 Hz, C), 144.0 (C), 139.7 (C), 138.5 (d, J_CF = 2.5 Hz, C), 135.7 (C), 129.4 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.1 (CH), 129.1 (CH), 128.8 (C), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.3 (CH), 128.2 (CH), 127.3 (CH), 127.3 (CH), 127.0 (CH), 127.0 (CH), 126.8 (d, J_CF = 8.5 Hz, CH), 126.8 (d, J_CF = 8.5 Hz, CH), 116.2 (d, J_CF = 255.7 Hz, C), 56.1 (CH₂). ^1H NMR (400 MHz, δ ppm/CDCl₃): 7.55-7.50 (m, 4H), 7.45-7.42 (m, 4H), 7.36 (t, J = 1.5 Hz, 1H), 7.26-6.33 (m, 10H), 4.92 (d, J = 11.2 Hz, 1H), 4.86 (d, J = 11.2 Hz, 1H). ^19F NMR (376 MHz, δ ppm/CDCl₃): -122.3 (s). HRMS for C_{27}H_{25}FN_{2}O_{3}+: calcd. [M+NH₄]^+: 458.1874, found: 458.1874.

Compound 3h: 4-(2-(benzyl(phenyl)amino)-1-fluoro-1-nitro-2-oxoethyl)phenyl trifluoromethanesulphonate

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(4-(((trifluoromethyl)sulfonyl)oxy)phenyl)iodonium 4-methylbenzenesulfonate 2h (141 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3h (93 mg, 91%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 79-81 °C. ^13C NMR (100 MHz, δ ppm/CDCl₃): 160.2 (d, J_CF = 21.4 Hz, C), 151.1 (C), 138.0 (d, J_CF = 2.1 Hz, C), 135.4 (C), 130.7 (d, J_CF = 22.2 Hz, C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.1 (CH), 129.1 (CH), 128.8 (CH), 128.8 (CH), 128.7 (CH), 128.6 (CH), 128.4 (CH), 121.5 (CH), 121.5 (CH), 118.8 (q, J_CF = 318.9 Hz, CH), 114.8 (d, J_CF = 256.6 Hz, C), 56.3 (CH₂). ^1H NMR (400 MHz, δ ppm/CDCl₃): 7.53 (d, J = 2.2 Hz, 2H), 7.31-7.02 (m, 11H), 6.26 (s, 1H), 4.97 (d, J = 14.0 Hz, 1H), 4.86 (d, J = 13.6 Hz, 1H). ^19F NMR (376 MHz, δ ppm/CDCl₃): -72.7 (s), -121.6 (s). HRMS for C_{32}H_{20}F_{13}N_{4}O_{3}S+: calcd. [M+NH₄]^+: 530.1003, found: 530.0989.
Compound 3i: N-benzyl-2-(4-bromophenyl)-2-fluoro-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (4-bromophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2i (126 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3i (58 mg, 65%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.45. Mp 101-103 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.4 (d, J_CF = 17.0 Hz, C), 138.3 (d, J_CF = 2.0 Hz, C), 135.5 (C), 131.7 (CH), 131.7 (CH), 129.5 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.9 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.3 (CH), 127.9 (d, J_CF = 7.0 Hz, CH), 127.9 (d, J_CF = 7.0 Hz, CH), 126.0 (C), 115.6 (d, J_CF = 205.2 Hz, C), 56.2 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.47 (d, J = 7.6 Hz, 2H), 7.29-7.22 (m, 7H), 7.18-7.14 (m, 5H), 4.93 (d, J = 14.0 Hz, 1H), 4.85 (d, J = 14.0 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.6 (s). HRMS for C₂₁H₁₉BrFN₃O₃⁺: calcd. [M+NH₄⁺]: 460.0667, found: 460.0667.

Compound 3j: N-benzyl-2-fluoro-2-(4-fluorophenyl)-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (4-fluorophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2j (113 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3j (45 mg, 59%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.50. Mp 119-121 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 164.3 (d, J_CF = 250.9 Hz, C), 160.6 (d, J_CF = 21.3 Hz, C), 138.4 (d, J_CF = 2.6 Hz, C), 135.5 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.9 (CH), 128.8 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.6 (CH), 128.2 (CH), 126.4 (dd, J_CF = 21.8 Hz, 3.2 Hz, C), 115.6 (d, J_CF = 2.2 Hz, CH), 115.6 (d, J_CF = 2.2 Hz, CH), 115.6 (d, J_CF = 255.9 Hz, C), 56.1 (CH₂). ³H NMR (400 MHz, δ ppm/CDCl₃): 7.44-7.41 (m, 2H), 7.31-7.17 (m, 7H), 7.03 (t, J = 8.4 Hz, 3H), 6.23 (s, 2H), 4.95 (d, J = 14.0 Hz, 1H), 4.95 (d, J = 14.0 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -108.3 (s), -121.9 (s). HRMS for C₂₃H₂₀F₂N₃O₃⁺: calcd. [M+NH₄⁺]: 400.1467 found: 400.1464.

Compound 3k: methyl 4-(2-(benzyl(phenyl)amino)-1-fluoro-1-nitro-2-oxoethyl)benzoate

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(4-(methoxycarbonyl)phenyl)iodonium 4-methylbenzenesulfonate 2k (122 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded
the product 3k (58 mg, 69%) as yellow solid. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.50. \( \text{Mp} \) 77-79 °C. \(^{13}\text{C NMR} \) (100 MHz, δ ppm/CDCl\(_3\)): 166.1 (C), 160.3 (d, \( J_{CF} = 16.9 \) Hz, C), 138.2 (C), 135.5 (C), 134.6 (d, \( J_{CF} = 17.6 \) Hz, C), 132.7 (C), 129.5 (CH), 129.5 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.0 (CH), 128.9 (CH), 128.7 (CH), 128.7 (CH), 128.3 (CH), 126.5 (d, \( J_{CF} = 7.0 \) Hz, CH), 126.5 (d, \( J_{CF} = 7.0 \) Hz, CH), 115.6 (d, \( J_{CF} = 205.1 \) Hz, C), 56.2 (CH\(_2\)), 52.6 (CH\(_3\)). \(^{1}\text{H NMR} \) (400 MHz, δ ppm/CDCl\(_3\)): 7.97 (d, \( J = 2.1 \) Hz, 2H), 7.47 (d, \( J = 2.2 \) Hz, 2H), 7.28-7.18 (m, 5H), 7.17-6.99 (m, 5H), 4.93 (d, \( J = 14.0 \) Hz, 1H), 4.84 (d, \( J = 14.0 \) Hz, 1H), 3.93 (s, 3H). \(^{19}\text{F NMR} \) (376 MHz, δ ppm/CDCl\(_3\)): -122.3 (s). \( \text{HRMS} \) for C\(_{23}\)H\(_{32}\)F\(_3\)N\(_2\)O\(_5\): calcd. [M+NH\(_4\)]\(^+\): 440.1616, found: 440.1614.

**Compound 3l: N-benzyl-2-fluoro-2-nitro-N-phenyl-2-[(trifluoromethyl)phenyl]acetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(4-(trifluoromethyl)phenyl)iodonium 4-methylbenzenesulfonate 2l (124 mg, 0.22 mmol) in the presence of K\(_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 ml) at 50 °C for 2 h followed by column chromatography afforded the product 3l (46 mg, 53%) as white solid. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.45. \( \text{Mp} \) 105-107 °C. \(^{13}\text{C NMR} \) (100 MHz, δ ppm/CDCl\(_3\)): 160.2 (d, \( J_{CF} = 21.2 \) Hz, C), 138.1 (d, \( J_{CF} = 2.4 \) Hz, C), 135.4 (C), 134.0 (d, \( J_{CF} = 21.4 \) Hz, C), 133.2 (q, \( J_{CF} = 32.8 \) Hz, C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.0 (CH), 129.0 (CH), 129.0 (CH), 128.8 (CH), 128.8 (CH), 128.3 (CH), 126.9 (d, \( J_{CF} = 9.0 \) Hz, CH), 126.9 (d, \( J_{CF} = 9.0 \) Hz, CH), 125.4 (d, \( J_{CF} = 5.5 \) Hz, CH), 125.4 (d, \( J_{CF} = 5.5 \) Hz, CH), 125.4 (d, \( J_{CF} = 5.5 \) Hz, CH), 123.5 (q, \( J_{CF} = 271.0 \) Hz, C), 115.0 (d, \( J_{CF} = 257.1 \) Hz, C), 56.2 (CH\(_2\)). \(^{1}\text{H NMR} \) (400 MHz, δ ppm/CDCl\(_3\)): 7.63-7.58 (m, 4H), 7.33-7.01 (m, 9H), 6.31 (s, 1H), 4.94 (s, 2H). \(^{19}\text{F NMR} \) (376 MHz, δ ppm/CDCl\(_3\)): -63.1 (s), -122.1 (s). \( \text{HRMS} \) for C\(_{23}\)H\(_{29}\)F\(_4\)N\(_2\)O\(_3\): calcd. [M+NH\(_4\)]\(^+\): 450.1435, found: 450.1434.

**Compound 3m: N-benzyl-2-(4-cyanophenyl)-2-fluoro-2-nitro-N-phenylacetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (4-cyanophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2m (114 mg, 0.22 mmol) in the presence of K\(_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 ml) at 50 °C for 2 h followed by column chromatography afforded the product 3m (67 mg, 86%) as white solid. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.25. \( \text{Mp} \) 120-122 °C. \(^{13}\text{C NMR} \) (100 MHz, δ ppm/CDCl\(_3\)): 159.9 (d, \( J_{CF} = 16.9 \) Hz, C), 138.0 (C), 135.3 (C), 134.7 (d, \( J_{CF} = 18.0 \) Hz, C), 132.0 (CH), 132.0 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 129.2 (CH), 128.8 (CH), 128.8 (CH), 128.8 (CH), 127.2 (d, \( J_{CF} = 7.2 \) Hz, CH), 127.2 (d, \( J_{CF} = 7.2 \) Hz, CH), 117.6 (C), 117.6 (C), 115.1 (C), 114.7 (d, \( J_{CF} = 207.7 \) Hz, C), 56.3 (CH\(_2\)). \(^{1}\text{H NMR} \) (400 MHz, δ ppm/CDCl\(_3\)): 7.63 (d, \( J = 8.4 \) Hz, 1H), 7.56 (d, \( J = 8.4 \) Hz, 1H), 7.43-7.02 (m, 9H), 6.28 (s,
1H), 4.90 (s, 2H). \(^{19}\text{F NMR}\) (376 MHz, \(\delta\) ppm/CDCl\(_3\)): -122.4 (s). \(\text{HRMS}\) for C\(_{22}\)H\(_{20}\)F\(_3\)O\(_3\)^+: calcd. [M+NH\(_4\)]^+: 407.1514, found: 407.1511.

**Compound 3n: N-benzyl-2-fluoro-2-nitro-N-phenyl-2-(m-tolyl)acetamide**

Following the general procedure, treatment of \(N\)-benzyl-2-fluoro-2-nitro-\(N\)-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(m-tolyl)iodonium 4-methylbenzenesulfonate 2n (112 mg, 0.22 mmol) in the presence of K\(_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3n (72 mg, 95%) as pale yellow viscous liquid. \(R_f\) (Ethyl acetate/Hexane: 10/90) = 0.40. \(^{13}\text{C NMR}\) (100 MHz, \(\delta\) ppm/CDCl\(_3\)): 160.9 (d, \(J_{\text{CF}} = 21.4\) Hz, C), 138.5 (d, \(J_{\text{CF}} = 2.6\) Hz, C), 138.3 (d, \(J_{\text{CF}} = 1.9\) Hz, C), 135.7 (C), 131.9 (CH), 130.3 (d, \(J_{\text{CF}} = 21.4\) Hz, C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 128.6 (CH), 128.6 (CH), 128.6 (CH), 128.6 (CH), 128.6 (CH), 128.6 (CH), 128.1 (CH), 126.8 (d, \(J_{\text{CF}} = 8.6\) Hz, CH), 123.4 (d, \(J_{\text{CF}} = 8.7\) Hz, CH), 116.3 (d, \(J_{\text{CF}} = 255.3\) Hz, C), 56.1 (CH\(_2\)), 21.4 (CH\(_3\)). \(^{1}\text{H NMR}\) (400 MHz, \(\delta\) ppm/CDCl\(_3\)): 7.29-7.28 (m, 3H), 7.24-6.17 (m, 11H), 4.97 (d, \(J = 11.2\) Hz, 1H), 4.84 (d, \(J = 10.8\) Hz, 1H), 2.30 (s, 3H). \(^{19}\text{F NMR}\) (376 MHz, \(\delta\) ppm/CDCl\(_3\)): -122.3 (s). \(\text{HRMS}\) for C\(_{22}\)H\(_{20}\)F\(_3\)O\(_3\)^+: calcd. [M+NH\(_4\)]^+: 396.1718, found: 396.1718.

**Compound 3o: N-benzyl-2-(3-chlorophenyl)-2-fluoro-2-nitro-\(N\)-phenylacetamide**

Following the general procedure, treatment of \(N\)-benzyl-2-fluoro-2-nitro-\(N\)-phenylacetamide 1a (58 mg, 0.20 mmol) with (3-chlorophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2o (116 mg, 0.22 mmol) in the presence of K\(_2\)CO\(_3\) (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3o (72 mg, 90%) as pale yellow viscous liquid. \(R_f\) (Ethyl acetate/Hexane: 10/90) = 0.40. \(^{13}\text{C NMR}\) (100 MHz, \(\delta\) ppm/CDCl\(_3\)): 160.3 (d, \(J_{\text{CF}} = 21.2\) Hz, C), 138.1 (d, \(J_{\text{CF}} = 2.5\) Hz, C), 135.5 (C), 134.6 (d, \(J_{\text{CF}} = 2.2\) Hz, C), 132.1 (d, \(J_{\text{CF}} = 21.9\) Hz, C), 131.3 (CH), 129.7 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.9 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.2 (CH), 126.5 (d, \(J_{\text{CF}} = 9.5\) Hz, CH), 124.6 (d, \(J_{\text{CF}} = 8.4\) Hz, CH), 115.0 (d, \(J_{\text{CF}} = 256.8\) Hz, C), 56.1 (CH\(_2\)). \(^{1}\text{H NMR}\) (400 MHz, \(\delta\) ppm/CDCl\(_3\)): 7.40-7.38 (m, 1H), 7.34-7.33 (m, 2H), 7.29-7.21 (m, 5H), 7.17-7.00 (m, 5H), 6.23 (s, 1H), 4.91 (d, \(J = 11.2\) Hz, 1H), 4.88 (d, \(J = 11.2\) Hz, 1H). \(^{19}\text{F NMR}\) (376 MHz, \(\delta\) ppm/CDCl\(_3\)): -122.0 (s). \(\text{HRMS}\) for C\(_{21}\)H\(_{16}\)ClF\(_3\)O\(_3\)^+: calcd. [M+NH\(_4\)]^+: 416.1172, found: 416.1168.
Compound 3p: N-benzyl-2-(3-cyanophenyl)-2-fluoro-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (3-cyanophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2p (114 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3p (56 mg, 72%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. Mp 98-100 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 159.9 (d, J_C,F = 16.9 Hz, C), 138.0 (C), 135.3 (C), 134.5 (CH), 132.0 (d, J_C,F = 18.0 Hz, C), 130.8 (d, J_C,F = 6.8 Hz, CH), 129.9 (d, J_C,F = 7.9 Hz, CH), 130.0 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 129.2 (CH), 128.8 (CH), 128.8 (CH), 117.5 (C), 114.3 (d, J_C,F = 205.0 Hz, C), 113.0 (d, J_C,F = 1.6 Hz, C), 56.3 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.71-7.46 (m, 4H), 7.26-6.99 (m, 9H), 6.26 (s, 1H), 4.87 (s, 2H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.6 (s). HRMS for C₂₂H₂₀F₂N₄O₅⁺: calcd. [M+N⁺]⁺: 407.1514, found: 407.1515.

Compound 3q: N-benzyl-2-fluoro-2-nitro-N-phenyl-2-(o-tolyl)acetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(o-tolyl)iodonium 4-methylbenzenesulfonate 2q (112 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3q (26 mg, 35%) as colorless liquid. Rf (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 66-68 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.9 (d, J_C,F = 22.1 Hz, C), 138.7 (d, J_C,F = 2.7 Hz, C), 137.3 (C), 135.6 (C), 132.4 (CH), 131.1 (CH), 129.6 (CH), 129.6 (CH), 129.3 (d, J_C,F = 20.0 Hz, C), 129.1 (CH), 129.1 (CH), 128.7 (CH), 128.7 (CH), 128.6 (CH), 128.3 (CH), 127.9 (d, J_C,F = 9.4 Hz, CH), 125.8 (CH), 118.4 (d, J_C,F = 254.7 Hz, C), 56.2 (CH₂), 20.5 (d, J_C,F = 6.1 Hz, CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.34-7.26 (m, 4H), 7.23-7.20 (m, 3H), 7.16 (t, J = 7.2 Hz, 1H), 7.11-7.04 (m, 4H), 6.76 (s, 2H), 5.02 (d, J = 14.0 Hz, 1H), 4.86 (d, J = 14.0 Hz, 1H), 2.16 (d, J = 4.0 Hz, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -113.6 (s). HRMS for C₂₂H₂₃F₃N₃O₅⁺: calcd. [M+NH₄⁺]⁺: 396.1718, found: 396.1709.
Compound 3r: \textit{N}-benzyl-2-\{3-chloro-4-fluorophenyl\}-2-fluoro-2-nitro-\textit{N}-phenylacetamide

\begin{center}
\includegraphics[width=0.2\textwidth]{compound_3r}
\end{center}

Following the general procedure, treatment of \textit{N}-benzyl-2-fluoro-2-nitro-\textit{N}-phenylacetamide 1a (58 mg, 0.20 mmol) with (3-chloro-4-fluorophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2r (120 mg, 0.22 mmol) in the presence of K$_2$CO$_3$ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3r (52 mg, 62%) as white solid. R$_f$(Ethyl acetate/Hexane: 10/90) = 0.25. \textbf{Mp} 95-97 °C. $^{13}$C NMR (100 MHz, δ ppm/CDCl$_3$): 160.2 (d, $J_{CF} = 16.7$ Hz, C), 159.8 (d, $J_{CF} = 202.7$ Hz, C), 138.2 (C), 135.4 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 129.2 (CH), 129.1 (CH), 129.1 (CH), 128.8 (CH), 128.8 (CH), 128.8 (CH), 128.3 (CH), 127.4 (dd, $J_{CF} = 18.2$ Hz, 3.1 Hz, C), 126.8 (d, $J_{CF} = 6.7$ Hz, CH), 121.8 (d, $J_{CF} = 14.8$ Hz, C), 116.8 (d, $J_{CF} = 17.6$ Hz, CH), 114.5 (d, $J_{CF} = 205.8$ Hz, CH), 56.2 (C). $^1$H NMR (400 MHz, δ ppm/CDCl$_3$): 7.45-7.34 (m, 1H), 7.37-7.34 (m, 1H), 7.29-7.24 (m, 5H), 7.17-7.08 (m, 5H), 6.28 (s, 1H), 4.91 (d, $J = 14.0$ Hz, 1H), 4.87 (d, $J = 14.0$ Hz, 1H). $^{19}$F NMR (376 MHz, δ ppm/CDCl$_3$): -110.3 (s), -121.5 (s). HRMS for C$_{21}$H$_{16}$ClF$_2$N$_2$O$_3^+$: calcd. [M+NH$_4$]$^+$: 434.1078, found: 434.1077.

Compound 3t: \textit{N}-benzyl-2-fluoro-2-\{naphthalen-2-yl\}-2-nitro-\textit{N}-phenylacetamide

\begin{center}
\includegraphics[width=0.2\textwidth]{compound_3t}
\end{center}

Following the general procedure, treatment of \textit{N}-benzyl-2-fluoro-2-nitro-\textit{N}-phenylacetamide 1a (58 mg, 0.20 mmol) with mesityl(naphthalen-2-yl)iodonium 4-methylbenzenesulfonate 2t (120 mg, 0.22 mmol) in the presence of K$_2$CO$_3$ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3t (62 mg, 75%) as white solid. R$_f$(Ethyl acetate/Hexane: 10/90) = 0.35. \textbf{Mp} 129-131 °C. $^{13}$C NMR (100 MHz, δ ppm/CDCl$_3$): 160.8 (d, $J_{CF} = 17.0$ Hz, C), 138.6 (C), 135.7 (C), 134.2 (C), 132.2 (C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.7 (CH), 128.4 (CH), 128.2 (CH), 128.1 (CH), 127.8 (CH), 127.6 (C), 127.1 (CH), 126.8 (d, $J_{CF} = 7.7$ Hz, CH), 122.7 (d, $J_{CF} = 6.1$ Hz, CH), 116.4 (d, $J_{CF} = 204.7$ Hz, C), 56.1 (CH$_2$). $^1$H NMR (400 MHz, δ ppm/CDCl$_3$): 7.84-7.72 (m, 4H), 7.57-7.50 (m, 3H), 7.26-6.08 (m, 10H), 4.97 (d, $J = 14.0$ Hz, 1H), 4.85 (d, $J = 14.4$ Hz, 1H). $^{19}$F NMR (376 MHz, δ ppm/CDCl$_3$): -122.0 (s). HRMS for C$_{25}$H$_{23}$FN$_2$O$_3^+$: calcd. [M+NH$_4$]$^+$: 432.1718, found: 432.1715.
Compound 3u: **N-benzyl-2-fluoro-2-(4'-iodo-[1,1'-biphenyl]-4-yl)-2-nitro-N-phenylacetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (4'-iodo-[1,1'-biphenyl]-4-yl)(mesityl)iodonium 4-methylbenzenesulfonate 2u (153 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3u (68 mg, 60%) as white solid. **Rᶠ** (Ethyl acetate/Hexane: 10/90) = 0.45. **Mp** 125-127 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 160.7 (d, Jₐr = 21.1 Hz, C), 142.9 (C), 139.3 (C), 138.5 (d, Jₐr = 2.7 Hz, C), 138.2 (CH), 138.2 (CH), 135.6 (C), 129.7 (d, Jₐr = 21.8 Hz, C), 129.4 (CH), 129.4 (CH), 129.4 (CH), 129.1 (CH), 128.9 (CH), 128.9 (CH), 128.8 (CH), 128.7 (CH), 128.7 (CH), 128.2 (CH), 127.0 (d, Jₐr = 8.6 Hz, CH), 127.0 (d, Jₐr = 8.6 Hz, CH), 126.8 (CH), 126.8 (CH), 116.0 (d, Jₐr = 255.5 Hz, C), 94.3 (C), 56.2 (CH₂). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 7.77 (d, J = 1.6 Hz, 2H), 7.48-7.44 (m, 4H), 7.28-7.23 (m, 5H), 7.21-6.32 (m, 7H), 4.92 (d, J = 11.2 Hz, 1H), 4.85 (d, J = 11.2 Hz, 1H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -123.3 (s). **HRMS** for C₂₇H₂₀FiN₂O₃⁺: calcd. [M+Na⁺]: 589.0395, found: 589.0386.

Compound 3v: **N-benzyl-2-(6-chloropyridin-3-yl)-2-fluoro-2-nitro-N-phenylacetamide**

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-N-phenylacetamide 1a (58 mg, 0.20 mmol) with (6-chloropyridin-3-yl)(mesityl)iodonium 4-methylbenzenesulfonate 2v (117 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3v (70 mg, 87%) as white solid. **Rᶠ** (Ethyl acetate/Hexane: 10/90) = 0.30. **Mp** 102-104 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 159.7 (d, Jₐr = 21.1 Hz, C), 154.4 (C), 147.5 (d, Jₐr = 10.2 Hz, CH), 137.9 (C), 136.9 (d, Jₐr = 8.0 Hz, CH), 135.2 (C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.8 (CH), 128.8 (CH), 128.4 (CH), 125.8 (d, Jₐr = 22.1 Hz, C), 123.9 (CH), 113.9 (d, Jₐr = 258.1 Hz, C), 56.3 (CH₂). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 8.40 (s, 1H), 7.72 (d, J = 2.1 Hz, 1H), 7.29-7.12 (m, 10H), 6.38 (s, 1H), 4.89 (d, J = 14.0 Hz, 1H), 4.84 (d, J = 14.0 Hz, 1H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -123.9 (s). **HRMS** for C₂₀H₁₅ClFN₃O₃⁺: calcd. [M+H⁺]: 400.0859, found: 400.0861.
Compound 3w: N-benzyl-2-fluoro-N-(4-methoxyphenyl)-2-nitro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-N-(4-methoxyphenyl)-2-nitroacetamide 1b (64 mg, 0.20 mmol) with mesityl[phenyl]iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3w (75 mg, 95%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.30. Mp 64-66 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 161.0 (d, J_C-F = 20.7 Hz, C), 159.4 (C), 135.8 (C), 131.1 (CH), 130.8 (C), 130.5 (CH), 130.5 (d, J_C-F = 21.6 Hz, C), 129.3 (CH), 129.3 (CH), 128.6 (CH), 128.6 (CH), 128.3 (CH), 128.3 (CH), 128.1 (CH), 126.2 (d, J_C-F = 8.7 Hz, CH), 126.2 (d, J_C-F = 8.7 Hz, CH), 116.2 (d, J_C-F = 255.6 Hz, C), 113.8 (CH), 113.8 (CH), 56.1 (CH₂), 55.4 (CH₃). ³¹P NMR (400 MHz, δ ppm/CDCl₃): 7.44-7.40 (m, 3H), 7.35-7.31 (m, 2H), 7.29-7.27 (m, 3H), 7.19-7.17 (m, 2H), 6.75-6.04 (m, 4H), 4.89 (d, J = 14.0 Hz, 1H), 4.84 (d, J = 13.6 Hz, 1H), 3.72 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.5 (s). HRMS for C₂₂H₂₃F₂N₂O₄⁺: calcd. [M+NH₄]⁺: 412.1667, found: 412.1663.

Compound 3x: N-benzyl-2-fluoro-2-nitro-2-phenyl-N-(p-tolyl)acetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-2-N-(p-tolyl)acetamide 1c (60 mg, 0.20 mmol) with mesityl[phenyl]iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3x (61 mg, 80%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.35. Mp 58-60 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.9 (d, J_C-F = 21.1 Hz, C), 138.7 (C), 135.8 (C), 135.8 (C), 131.1 (CH), 130.5 (d, J_C-F = 21.8 Hz, C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 129.0 (CH), 129.0 (CH), 128.6 (CH), 128.6 (CH), 128.3 (CH), 128.3 (CH), 128.1 (CH), 126.3 (d, J_C-F = 8.8 Hz, CH), 126.3 (d, J_C-F = 8.8 Hz, CH), 116.2 (d, J_C-F = 255.8 Hz, C), 56.1 (CH₂), 21.1 (CH₃). ³¹P NMR (400 MHz, δ ppm/CDCl₃): 7.37 (d, J = 6.0 Hz, 3H), 7.29-7.23 (m, 5H), 7.14-6.10 (m, 6H), 4.87 (d, J = 11.2 Hz, 1H), 4.81 (d, J = 11.2 Hz, 1H), 2.22 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.5 (s). HRMS for C₂₂H₂₃F₂N₂O₃⁺: calcd. [M+NH₄]⁺: 396.1718, found: 396.1717.
Compound 3y: N-benzyl-2-fluoro-N-(4-iodophenyl)-2-nitro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-N-(4-iodophenyl)-2-nitroacetamide 1d (83 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3y (93 mg, 95%) as white solid. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.30. \( \text{Mp} \) 100-102 °C. \(^{13}\text{C} \text{NMR} \) (100 MHz, \( \delta \text{ ppm/CDCl}_3 \)): 160.6 (d, \( J_{CF} = 21.4 \text{ Hz} \), C), 138.2 (C), 138.1 (CH), 138.1 (CH), 135.3 (C), 131.4 (CH), 131.2 (CH), 131.2 (CH), 130.2 (d, \( J_{CF} = 21.6 \text{ Hz} \), C), 129.3 (CH), 129.3 (CH), 128.8 (CH), 128.8 (CH), 128.6 (CH), 128.6 (CH), 128.4 (CH), 126.3 (d, \( J_{CF} = 8.7 \text{ Hz} \), CH), 126.3 (d, \( J_{CF} = 8.7 \text{ Hz} \), CH), 116.0 (d, \( J_{CF} = 254.9 \text{ Hz} \), C), 94.6 (C), 56.0 (CH₂). \(^{1}H \text{NMR} \) (400 MHz, \( \delta \text{ ppm/CDCl}_3 \)): 7.46-7.25 (m, 5H), 7.36-7.25 (m, 5H), 7.15 (s, 2H), 6.38 (s, 2H), 4.88 (d, \( J = 11.2 \text{ Hz} \), 1H), 4.83 (d, \( J = 11.2 \text{ Hz} \), 1H). \(^{19}\text{F NMR} \) (376 MHz, \( \delta \text{ ppm/CDCl}_3 \)): -122.7 (s). \( \text{HRMS} \) for \( \text{C}_{21}\text{H}_{17}\text{FN}_{3}\text{O}_3 \)²⁺: calcd. [M+NH₄]²⁺: 508.0528, found: 508.0518.

Compound 3z: N-benzyl-N-(4-bromophenyl)-2-fluoro-2-nitro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-N-(4-bromophenyl)-2-fluoro-2-nitroacetamide 1e (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3z (76 mg, 86%) as white solid. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.35. \( \text{Mp} \) 65-67 °C. \(^{13}\text{C} \text{NMR} \) (100 MHz, \( \delta \text{ ppm/CDCl}_3 \)): 160.6 (d, \( J_{CF} = 21.4 \text{ Hz} \), C), 137.4 (C), 135.3 (C), 132.0 (CH), 132.0 (CH), 131.4 (CH), 131.0 (CH), 131.0 (CH), 130.2 (d, \( J_{CF} = 21.6 \text{ Hz} \), C), 129.3 (CH), 129.3 (CH), 128.8 (CH), 128.8 (CH), 128.6 (CH), 128.6 (CH), 128.4 (CH), 126.2 (d, \( J_{CF} = 8.7 \text{ Hz} \), CH), 126.2 (d, \( J_{CF} = 8.7 \text{ Hz} \), CH), 122.9 (C), 116.0 (d, \( J_{CF} = 254.8 \text{ Hz} \), C), 55.9 (CH₂). \(^{1}H \text{NMR} \) (400 MHz, \( \delta \text{ ppm/CDCl}_3 \)): 7.47-7.43 (m, 1H), 7.41-7.39 (m, 2H), 7.37-7.33 (m, 2H), 7.29-7.28 (m, 3H), 7.17-7.11 (m, 6H), 4.90 (d, \( J = 14.0 \text{ Hz} \), 1H), 4.84 (d, \( J = 14.0 \text{ Hz} \), 1H). \(^{19}\text{F NMR} \) (376 MHz, \( \delta \text{ ppm/CDCl}_3 \)): -122.8 (s). \( \text{HRMS} \) for \( \text{C}_{21}\text{H}_{17}\text{BrFN}_{3}\text{O}_3 \)²⁺: calcd. [M+H]²⁺: 443.0401, found: 443.0395.
**Compound 3aa: N-benzyl-N-(4-chlorophenyl)-2-fluoro-2-nitro-2-phenylacetamide**

![Structure of Compound 3aa](image)

Following the general procedure, treatment of N-benzyl-N-(4-chlorophenyl)-2-fluoro-2-nitroacetamide 1f (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3aa (56 mg, 70%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.30. Mp 72-74 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.7 (d, JᵥC = 21.4 Hz, C), 136.9 (C), 135.3 (C), 134.8 (C), 131.4 (CH), 130.7 (CH), 130.7 (CH), 130.2 (d, JᵥC = 21.6 Hz, C), 129.3 (C), 129.3 (CH), 129.0 (CH), 129.0 (CH), 128.8 (CH), 128.8 (CH), 128.5 (CH), 128.5 (CH), 128.4 (CH), 126.2 (d, JᵥC = 8.8 Hz, CH), 126.2 (d, JᵥC = 8.8 Hz, CH), 116.0 (d, JᵥC = 254.9 Hz, C), 56.0 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.46-7.39 (m, 3H), 7.36-7.32 (m, 2H), 7.29-6.78 (m, 8H), 6.20 (s, 1H), 4.90 (d, J = 14.0 Hz, 1H), 4.84 (d, J = 13.6 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.8 (s). HRMS for C₂₁H₁₇ClF₅N₂O₃⁺: calcd. [M+H]⁺: 399.0906, found: 399.0908.

**Compound 3ab: N-benzyl-2-fluoro-2-nitro-2-phenyl-N-(4-(trifluoromethyl) phenyl) acetamide**

![Structure of Compound 3ab](image)

Following the general procedure, treatment of N-benzyl-2-fluoro-2-nitro-2-phenyl-N-(4-(trifluoromethyl)phenyl)acetamide 1g (71 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ab (86 mg, 75%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 67-69 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.6 (d, JᵥC = 21.8 Hz, C), 141.7 (C), 135.1 (C), 131.5 (CH), 130.9 (d, JᵥC = 32.6 Hz, C), 130.2 (C), 130.0 (CH), 130.0 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.9 (CH), 128.7 (CH), 128.7 (CH), 128.5 (CH), 126.2 (d, JᵥC = 8.7 Hz, CH), 126.2 (d, JᵥC = 8.7 Hz, CH), 126.0 (CH), 126.0 (CH), 123.5 (d, JᵥC = 270.9 Hz, C), 115.9 (d, JᵥC = 254.1 Hz, C), 56.0 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.45 (t, J = 7.0 Hz, 2H), 7.38-7.33 (m, 5H), 7.31-7.28 (m, 3H), 7.16-7.14 (m, 2H), 6.73 (s, 2H), 4.91 (s, 2H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -62.8 (s), -122.8 (s). HRMS for C₂₂H₂₀F₄N₃O₃⁺: calcd. [M+N⁺]: 450.1435, found: 450.1447.
Compound 3ac: N-benzyl-2-fluoro-N-(4-fluorophenyl)-2-nitro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-N-(4-fluorophenyl)-2-nitroacetamide 1h (61 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ac (68 mg, 89%) as yellow viscous liquid. R₇ (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 102-104 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 162.6 (d, J_CF = 248.4 Hz, C), 160.8 (d, J_CF = 21.4 Hz, C), 135.4 (C), 134.3 (C), 131.3 (CH), 131.3 (CH), 130.3 (d, J_CF = 21.5 Hz, C), 129.4 (CH), 129.4 (CH), 128.8 (CH), 128.8 (CH), 128.5 (CH), 128.5 (CH), 128.3 (CH), 126.2 (d, J_CF = 8.8 Hz, CH), 126.2 (d, J_CF = 8.8 Hz, CH), 115.7 (CH), 115.7 (CH), 116.1 (d, J_CF = 254.6 Hz, C), 56.1 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.46-7.38 (m, 3H), 7.36-7.32 (m, 2H), 7.29-7.27 (m, 3H), 7.17-7.14 (m, 2H), 6.73-6.08 (m, 4H), 4.91 (d, J = 14.0 Hz, 1H), 4.84 (d, J = 14.0 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -111.6 (s), -122.8 (s). HRMS for C₂₁H₁₆F₂N₂O₃⁺: calcd. [M+Na]⁺: 405.1021, found: 405.1016.

Compound 3ad: N-benzyl-2-fluoro-N-(3-methoxyphenyl)-2-nitro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-fluoro-N-(3-methoxyphenyl)-2-nitroacetamide 1i (64 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ad (53 mg, 67%) as yellow viscous liquid. R₇ (Ethyl acetate/Hexane: 10/90) = 0.25. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.7 (d, J_CF = 21.5 Hz, C), 159.6 (C), 139.5 (C), 135.8 (C), 131.2 (CH), 130.5 (d, J_CF = 21.5 Hz, C), 129.4 (CH), 129.4 (CH), 128.7 (CH), 128.7 (CH), 128.4 (CH), 128.4 (CH), 128.2 (CH), 126.4 (d, J_CF = 8.7 Hz, CH), 126.4 (d, J_CF = 8.7 Hz, CH), 121.5 (C), 116.2 (d, J_CF = 256.0 Hz, C), 115.2 (CH), 114.3 (CH), 56.0 (CH₂), 55.2 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.45-7.41 (m, 3H), 7.34 (d, J = 7.6 Hz, 2H), 7.29-7.26 (m, 4H), 7.20-7.18 (m, 2H), 6.99 (s, 1H), 6.74 (dd, J = 2.1 Hz, 0.6 Hz, 2H), 7.93 (d, J = 14.0 Hz, 1H), 4.85 (d, J = 14.0 Hz, 1H), 3.45 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.8 (s). HRMS for C₂₂H₂₃F₃O₄⁺: calcd. [M+NH₄]⁺: 412.1667, found: 412.1661.
Following the general procedure, treatment of N-benzyl-N-(3-chlorophenyl)-2-fluoro-2-nitro-2-phenylacetamide 1j (65 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ae (48 mg, 60%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.35. Mp 89-91 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.7 (d, J_CF = 18.6 Hz, C), 139.6 (C), 135.2 (C), 134.2 (C), 131.5 (CH), 130.2 (d, J_CF = 27.4 Hz, C), 129.7 (CH), 129.7 (CH), 129.1 (CH), 129.1 (CH), 128.8 (CH), 128.8 (CH), 128.6 (CH), 128.6 (CH), 128.4 (CH), 127.8 (C), 126.2 (d, J_CF = 8.7 Hz, CH), 126.2 (d, J_CF = 8.7 Hz, CH), 116.1 (d, J_CF = 255.0 Hz, C), 56.0 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.47-7.33 (m, 5H), 7.29-7.26 (m, 3H), 7.19-6.17 (m, 6H), 4.88 (s, 2H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -123.3 (s). HRMS for C₂₁H₁₆ClF₅N₃O₃⁺: calcd. [M+NH₄]⁺: 416.1172, found: 416.1162.

Following the general procedure, treatment of 2-fluoro-N-(4-methoxybenzyl)-2-nitro-N,2-diphenylacetamide 1k (64 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3af (64 mg, 81%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. Mp 96-98 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.6 (d, J_CF = 16.9 Hz, C), 159.5 (C), 138.4 (C), 131.1 (CH), 130.8 (CH), 130.8 (CH), 130.4 (d, J_CF = 17.2 Hz, C), 129.4 (CH), 129.4 (CH), 128.7 (CH), 128.6 (CH), 128.6 (CH), 128.4 (CH), 128.4 (CH), 127.8 (C), 126.2 (d, J_CF = 6.9 Hz, CH), 126.2 (d, J_CF = 6.9 Hz, CH), 116.2 (d, J_CF = 204.2 Hz, C), 114.0 (CH), 114.0 (CH), 55.5 (CH₂), 55.3 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.43-7.36 (m, 3H), 7.33-7.29 (m, 2H), 7.19 (t, J = 7.2 Hz, 2H), 7.09-6.98 (m, 4H), 6.79 (d, J = 8.4 Hz, 2H), 6.18 (s, 1H), 4.88 (d, J = 13.6 Hz, 1H), 4.79 (d, J = 14.0 Hz, 1H), 3.78 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.6 (s). HRMS for C₂₂H₁₉F₂ClNO₄⁺: calcd. [M+NH₄]⁺: 412.1667, found: 412.1664.
Compound 3ag: 2-fluoro-N-(4-isopropylbenzyl)-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-N-(4-isopropylbenzyl)-2-nitro-N-phenylacetamide 1l (66 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ag (72 mg, 89%) as yellow liquid. Rᶠ (Ethyl acetate/Hexane: 10/90) = 0.40. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.7 (d, Jₑ₋ᶠ = 21.1 Hz, C), 148.8 (C), 138.6 (C), 132.9 (C), 131.1 (CH), 130.5 (d, Jₑ₋ᶠ = 21.4 Hz, C), 129.4 (CH), 129.4 (CH), 129.3 (CH), 129.3 (CH), 128.6 (CH), 128.6 (CH), 128.4 (CH), 128.4 (CH), 128.6 (CH), 128.6 (CH), 126.3 (d, Jₑ₋ᶠ = 8.7 Hz, CH), 126.3 (d, Jₑ₋ᶠ = 8.7 Hz, CH), 116.2 (d, Jₑ₋ᶠ = 255.3 Hz, C), 55.9 (CH₂), 33.9 (CH), 24.0 (CH₃), 24.0 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.45-7.39 (m, 4H), 7.32 (t, J = 7.8 Hz, 2H), 7.20 (t, J = 7.6 Hz, 2H), 7.16-6.11 (m, 6H), 4.89 (d, J = 14.0 Hz, 1H), 4.85 (d, J = 14.0 Hz, 1H), 2.93-2.86 (m, 1H), 1.24 (d, J = 6.8 Hz, 6H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.5 (s). HRMS for C₂₄H₂₃FN₂O₃⁺: calcd. [M+NH₄]⁺: 424.2031, found: 424.2025.

Compound 3ah: N-[[1,1’-biphenyl]-4-ylmethyl]-2-fluoro-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of N-[[1,1’-biphenyl]-4-ylmethyl]-2-fluoro-2-nitro-N-phenylacetamide 1m (73 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ah (79 mg, 90%) as white solid. Rᶠ (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 92-94 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.8 (d, Jₑ₋ᶠ = 21.1 Hz, C), 141.0 (C), 140.6 (C), 138.6 (C), 134.7 (C), 131.2 (CH), 130.4 (d, Jₑ₋ᶠ = 21.3 Hz, C), 129.8 (CH), 129.8 (CH), 129.4 (CH), 129.4 (CH), 128.9 (CH), 128.9 (CH), 128.9 (CH), 128.7 (CH), 128.4 (CH), 128.4 (CH), 127.6 (CH), 127.3 (CH), 127.3 (CH), 127.1 (CH), 127.1 (CH), 126.3 (d, Jₑ₋ᶠ = 8.8 Hz, CH), 126.3 (d, Jₑ₋ᶠ = 8.8 Hz, CH), 116.1 (d, Jₑ₋ᶠ = 255.6 Hz, C), 55.9 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.63 (d, J = 7.6 Hz, 2H), 7.57 (d, J = 7.6 Hz, 2H), 7.51-7.45 (m, 5H), 7.42-7.36 (m, 3H), 7.30-7.13 (m, 6H), 6.39 (s, 1H), 5.02 (d, J = 14.0 Hz, 1H), 4.96 (d, J = 14.0 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.6 (s). HRMS for C₂₇H₂₅FN₃O₃⁺: calcd. [M+NH₄]⁺: 458.1874, found: 458.1875.
Compound 3ai: 2-fluoro-N-(4-fluorobenzyl)-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-N-(4-fluorobenzyl)-2-nitro-N-phenylacetamide 1n (61 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ai (57 mg, 75%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.45. Mp 102-104 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 162.7 (d, Jₐ = 245.5 Hz, C), 160.8 (d, Jₐ = 21.4 Hz, C), 138.3 (C), 131.6 (d, Jₐ = 8.8 Hz, CH), 126.3 (d, Jₐ = 8.8 Hz, CH), 116.1 (d, Jₐ = 255.0 Hz, C), 115.7 (CH), 115.5 (CH), 55.4 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.45-7.40 (m, 1H), 7.36-7.23 (t, 1H), 7.24-7.13 (m, 3H), 6.99-6.93 (m, 3H), 6.18 (s, 1H), 4.89 (d, J = 14.0 Hz, 1H), 4.82 (d, J = 14.0 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -113.7 (s), -122.8 (s). HRMS for C₂₁H₁₈F₂N₂O₃+: calcd. [M+NH₄]⁺: 400.1467, found: 400.1466.

Compound 3aj: N-(4-cyanobenzyl)-2-fluoro-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of N-(4-cyanobenzyl)-2-fluoro-2-nitro-N-phenylacetamide 1o (63 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3aj (65 mg, 84%) as colorless liquid. Rf (Ethyl acetate/Hexane: 10/90) = 0.20. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 161.1 (d, Jₐ = 21.5 Hz, C), 140.9 (C), 138.3 (C), 132.5 (CH), 132.5 (CH), 131.4 (CH), 130.0 (d, Jₐ = 21.6 Hz, C), 129.8 (CH), 129.8 (CH), 129.2 (CH), 129.1 (CH), 129.1 (CH), 129.0 (CH), 129.0 (CH), 128.5 (CH), 128.5 (CH), 126.2 (d, Jₐ = 8.8 Hz, CH), 126.2 (d, Jₐ = 8.8 Hz, CH), 118.6 (C), 115.8 (d, Jₐ = 255.2 Hz, C), 112.2 (C), 55.8 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.77 (d, J = 8.0 Hz, 2H), 7.46-7.42 (m, 1H), 7.39-7.35 (m, 3H), 7.33-7.30 (m, 3H), 7.23 (t, J = 8.4 Hz, 1H), 7.11-6.34 (m, 4H), 4.95 (d, J = 14.4 Hz, 1H), 4.90 (d, J = 14.4 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.9 (s). HRMS for C₂₂H₂₀F₆N₄O₃⁺: calcd. [M+NH₄]⁺: 407.1514, found: 407.1508.
Compound 3ak: 2-fluoro-2-nitro-N,2-diphenyl-N-(4-(trifluoromethyl)benzyl)acetamide

Following the general procedure, treatment of 2-fluoro-2-nitro-N-phenyl-N-(4-(trifluoromethyl)benzyl)acetamide 1p (71 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ak (68 mg, 79%) as white solid. RF (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 67-69 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 161.1 (d, J_CF = 21.6 Hz, C), 139.6 (C), 138.4 (C), 131.3 (CH), 130.4 (d, J_CF = 27.4 Hz, C), 130.2 (d, J_CF = 16.6 Hz, C), 129.5 (CH), 129.5 (CH), 129.1 (CH), 129.1 (CH), 129.0 (CH), 129.0 (CH), 128.5 (CH), 128.5 (CH), 126.2 (d, J_CF = 8.8 Hz, CH), 126.2 (d, J_CF = 8.8 Hz, CH), 125.7 (d, J_CF = 3.8 Hz, CH), 125.7 (d, J_CF = 3.8 Hz, CH), 124.1 (q, J_CF = 270.6 Hz, C), 116.0 (d, J_CF = 255.2 Hz, C), 55.7 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.55 (d, J = 7.6 Hz, 2H), 7.46-7.38 (m, 3H), 7.33 (t, J = 7.8 Hz, 4H), 7.23 (t, J = 6.8 Hz, 1H), 7.18-7.31 (m, 4H), 4.95 (s, 2H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -62.6 (s), -122.8 (s). HRMS for C₂₂H₂₀F₅N₅O₅⁺: calcd. [M+Na⁺]: 455.0989, found: 450.0987.

Compound 3al: 2-fluoro-N-methyl-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-N-methyl-2-nitro-N-phenylacetamide 1q (42 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3al (50 mg, 87%) as brown oil. RF (Ethyl acetate/Hexane: 10/90) = 0.35. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.8 (d, J_CF = 21.5 Hz, C), 140.5 (C), 131.2 (CH), 130.5 (d, J_CF = 21.6 Hz, C), 129.2 (CH), 129.2 (CH), 128.7 (CH), 128.5 (CH), 128.2 (CH), 128.2 (CH), 126.3 (d, J_CF = 8.7 Hz, CH), 126.3 (d, J_CF = 8.7 Hz, CH), 116.1 (d, J_CF = 255.1 Hz, C), 40.4 (CH₃). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.73-7.39 (m, 4H), 7.33 (t, J = 7.2 Hz, 2H), 7.26-7.17 (m, 2H), 6.85 (s, 2H), 3.34 (s, 3H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.4 (s). HRMS for C₁₅H₁₃F₂N₂O₃⁺: calcd. [M+Na⁺]: 311.0802, found: 311.0794.

Compound 3am: 2-(4-bromophenyl)-2-fluoro-N-methyl-2-nitro-N-phenylacetamide

Following the general procedure, treatment of N-(4-bromophenyl)-2-fluoro-N-methyl-2-nitroacetamide 1r (58 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3am (59 mg, 81%) as white solid. RF (Ethyl...
acetate/Hexane: 10/90) = 0.35. **Mp** 76-78 °C. **13C NMR** (100 MHz, δ ppm/CDCl₃): 160.6 (d, Jᵥ = 21.5 Hz, C), 139.5 (C), 132.4 (CH), 132.4 (CH), 131.4 (CH), 130.2 (d, Jᵥ = 20.9 Hz, C), 129.9 (CH), 129.9 (CH), 128.6 (CH), 128.6 (CH), 126.3 (d, Jᵥ = 8.7 Hz, CH), 126.3 (d, Jᵥ = 8.7 Hz, CH), 122.7 (C), 116.0 (d, Jᵥ = 254.1 Hz, C), 40.3 (C₃H₃). **1H NMR** (400 MHz, δ ppm/CDCl₃): 7.55-7.45 (m, 2H), 7.41-7.29 (m, 5H), 6.72 (s, 2H), 3.31 (s, 3H). **19F NMR** (376 MHz, δ ppm/CDCl₃): -122.6 (s). **HRMS** for C₁₅H₁₃BrFN₃O₅⁺: calcd. [M+H]⁺: 367.0088, found: 367.0077.

### Compound 3an: N-ethyl-2-fluoro-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of N-ethyl-2-fluoro-2-nitro-N,2-diphenylacetamide 1s (45 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulphonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3an (56 mg, 92%) as white solid. **Rᶠ** (Ethyl acetate/Hexane: 10/90) = 0.35. **Mp** 80-82 °C. **13C NMR** (100 MHz, δ ppm/CDCl₃): 160.2 (d, Jᵥ = 21.2 Hz, C), 138.6 (d, Jᵥ = 2.5 Hz, C), 131.1 (CH), 130.5 (d, Jᵥ = 21.6 Hz, C), 129.2 (CH), 129.2 (CH), 128.9 (CH), 128.9 (CH), 128.6 (CH), 128.4 (CH), 128.4 (CH), Jᵥ = 255.1 Hz, C), 47.5 (C₀H₂), 12.3 (C₃H₃). **1H NMR** (400 MHz, δ ppm/CDCl₃): 7.73-7.31 (m, 6H), 7.24-6.49 (m, 4H), 3.82-3.73 (m, 2H), 1.16 (t, J = 7.2 Hz, 3H). **19F NMR** (376 MHz, δ ppm/CDCl₃): -122.6 (s). **HRMS** for C₁₅H₁₃BrFN₃O₅⁺: calcd. [M+Na]⁺: 325.0959, found: 325.0959.

### Compound 3ao: N-ethyl-2-fluoro-2-nitro-N,N-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-2-nitro-N,N-diphenylacetamide 1t (55 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulphonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ao (53 mg, 75%) as white solid. **Rᶠ** (Ethyl acetate/Hexane: 10/90) = 0.25. **Mp** 140-142 °C. **13C NMR** (100 MHz, δ ppm/CDCl₃): 160.1 (d, Jᵥ = 21.9 Hz, C), 131.4 (C), 131.4 (C), 131.4 (C), 130.4 (d, Jᵥ = 21.3 Hz, C), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 128.9 (CH), 128.6 (CH), 128.6 (CH), 128.6 (d, Jᵥ = 8.8 Hz, CH), 128.6 (d, Jᵥ = 8.8 Hz, CH), 128.6 (d, Jᵥ = 8.8 Hz, CH), 128.6 (d, Jᵥ = 8.8 Hz, CH), 126.4 (d, Jᵥ = 8.8 Hz, CH), 126.4 (d, Jᵥ = 8.8 Hz, CH), 116.2 (d, Jᵥ = 255.6 Hz, C). **1H NMR** (400 MHz, δ ppm/CDCl₃): 7.52-7.46 (m, 3H), 7.39 (t, J = 7.6 Hz, 2H), 7.33-7.01 (m, 10H). **19F NMR** (376 MHz, δ ppm/CDCl₃): -122.7 (s). **HRMS** for C₂₀H₁₉FN₃O₅⁺: calcd. [M+NH₄]⁺: 368.1405, found: 368.1398.
Compound 3ap: 2-fluoro-N-(naphthalen-1-ylmethyl)-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-N-(naphthalen-1-ylmethyl)-2-nitro-N-phenylacetamide 1u (68 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ap (47 mg, 57%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.30. **Mp** 104-106 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 160.5 (d, J_C-F = 21.1 Hz, C), 137.5 (C), 133.8 (C), 131.8 (C), 131.2 (CH), 130.8 (C), 130.4 (d, J_C-F = 21.7 Hz, C), 129.5 (CH), 129.5 (CH), 129.3 (CH), 129.2 (CH), 128.9 (CH), 128.6 (CH), 128.5 (CH), 128.4 (CH), 126.9 (CH), 126.3 (d, J_C-F = 8.7 Hz, CH), 126.3 (d, J_C-F = 8.7 Hz, CH), 126.2 (CH), 125.0 (CH), 123.9 (CH), 116.3 (d, J_C-F = 256.1 Hz, C), 53.2 (CH₂). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 8.07 (d, J = 8.4 Hz, 1H), 7.84 (d, J = 8.0 Hz, 1H), 7.73 (d, J = 8.0 Hz, 1H), 7.58-7.50 (m, 2H), 7.39-7.36 (m, 3H), 7.28-7.24 (m, 2H), 7.18 (t, J = 7.6 Hz, 1H), 7.08 (t, J = 7.2 Hz, 1H), 6.94-5.92 (m, 4H), 5.92 (s, 1H), 5.56 (d, J = 14.0 Hz, 1H), 5.28 (d, J = 14.0 Hz, 1H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -122.8 (s). **HRMS** for C₂₅H₁₉FN₂O₃⁺: calcd. [M+NH₄]⁺: 432.1718, found: 432.1717.

Compound 3aq: 2-fluoro-2-nitro-N,2-diphenyl-N-(thiophen-3-ylmethyl)acetamide

Following the general procedure, treatment of 2-fluoro-2-nitro-N-phenyl-N-(thiophen-3-ylmethyl)acetamide 1v (59 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3aq (47 mg, 63%) as white solid. R_f (Ethyl acetate/Hexane: 10/90) = 0.50. **Mp** 113-115 °C. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 160.6 (d, J_C-F = 17.2 Hz, C), 138.5 (C), 136.0 (C), 131.2 (CH), 130.4 (d, J_C-F = 17.2 Hz, C), 129.2 (CH), 129.2 (CH), 128.8 (CH), 128.8 (CH), 128.7 (CH), 128.4 (CH), 128.4 (CH), 128.3 (CH), 126.3 (CH), 126.3 (CH), 126.2 (CH), 125.0 (CH), 116.1 (d, J_C-F = 204.1 Hz, C), 50.9 (CH₂). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 7.40 (t, J = 7.2 Hz, 1H), 7.36 (d, J = 8.0 Hz, 2H), 7.31-7.24 (m, 3H), 7.20 (t, J = 7.2 Hz, 1H), 7.01-6.61 (m, 5H), 6.18 (s, 1H), 4.91 (d, J = 14.0 Hz, 1H), 4.80 (d, J = 14.0 Hz, 1H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -122.7 (s). **HRMS** for C₁₉H₁₅FN₃O₃⁺: calcd. [M+NH₄]⁺: 388.1126, found: 388.1122.
Compound 3ar: 2-fluoro-N-(furan-3-ylmethyl)-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-N-(furan-3-ylmethyl)-2-nitro-N-phenylacetamide 1w (56 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3ar (48 mg, 68%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.30. Mp 81-83 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 160.6 (d, J_CF = 17.0 Hz, C), 143.5 (CH), 141.9 (CH), 138.5 (C), 131.2 (CH), 130.4 (d, J_CF = 17.1 Hz, C), 129.2 (CH), 129.2 (CH), 128.9 (CH), 128.4 (CH), 128.4 (CH), 126.3 (d, J_CF = 7.0 Hz, CH), 119.6 (C), 116.1 (d, J_CF = 204.3 Hz, C), 111.1 (CH), 47.0 (CH₂). ¹H NMR (400 MHz, δ ppm/CDCl₃): 7.45-7.36 (m, 5 H), 7.32 (t, J = 7.6 Hz, 2H), 7.22 (t, J = 7.2 Hz, 2H), 7.08 (s, 2H), 6.36 (s, 2H), 4.77 (d, J = 14.4 Hz, 1H), 4.64 (d, J = 14.4 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -122.8 (s). HRMS for C₁₉H₁₉FN₄O₄⁺: calcd. [M+NH₄]⁺: 372.1354, found: 372.1346.

Compound 3as: 2-fluoro-2-nitro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-fluoro-2-nitro-N-phenylacetamide 1x (40 mg, 0.20 mmol) with 2a (109 mg, 0.22 mmol) in the presence of K₂CO₃ (33 mg, 0.24 mmol) in toluene (2 mL) at 50 °C for 2 h followed by column chromatography afforded the product 3as (13 mg, 23%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.40. Mp 111-113 °C. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 158.2 (d, J_CF = 22.6 Hz, C), 135.7 (C), 132.1 (CH), 129.5 (CH), 129.5 (CH), 129.3 (C), 129.1 (CH), 129.1 (CH), 126.9 (d, J_CF = 8.4 Hz, CH), 126.9 (d, J_CF = 8.4 Hz, CH), 126.3 (CH), 120.5 (CH), 120.5 (CH), 113.8 (d, J_CF = 248.4 Hz, C). ¹H NMR (400 MHz, δ ppm/CDCl₃): 8.06 (s, 1H), 7.84 (d, J = 7.2 Hz, 2H), 7.59-7.50 (m, 5H), 7.38 (d, J = 7.6 Hz, 2H), 7.22 (d, J = 7.6 Hz, 1H). ¹⁹F NMR (376 MHz, δ ppm/CDCl₃): -124.3 (s). HRMS for C₁₄H₁₁FN₂O₃⁺: calcd. [M+NH₄]⁺: 292.1092, found: 292.1089.

Compound 5a: 2-cyano-2-fluoro-N-methyl-N,2-diphenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-methyl-N-phenylacetamide 4a (38 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5a (38 mg, 70%) as yellow oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. ¹³C NMR (100 MHz, δ ppm/CDCl₃): 162.1 (d, J_CF = 23.7 Hz, C), 140.4 (C), 133.0 (d, J_CF = 23.2 Hz, C), 130.6 (CH), 129.3 (CH), 129.3 (CH), 129.0 (CH), 129.0 (CH), 128.8 (CH), 128.5 (CH), 128.5 (CH), 125.2 (d, J_CF = 5.5 Hz, CH),
125.2 (d, J_CF = 5.5 Hz, CH), 114.9 (d, J_CF = 34.6 Hz, C), 89.9 (d, J_CF = 197.8 Hz, C), 40.7 (CH₃). **¹H NMR** (400 MHz, δ ppm/CDCl₃): 7.41 (t, J = 7.2 Hz, 1H), 7.33 (t, J = 7.2 Hz, 2H), 7.30-7.25 (m, 3H), 7.20 (t, J = 7.6 Hz, 2H), 6.81 (s, 2H), 3.30 (s, 3H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -137.5 (s). **HRMS** for C₁₈H₁₄FN₂O⁺: calcd. [M+H]⁺: 269.1085, found: 269.1083.

**Compound 5b: 2-cyano-2-(4-ethylphenyl)-2-fluoro-N-methyl-N-phenylacetamide**

Following the general procedure, treatment of 2-cyano-N-methyl-2-fluoro-N-phenylacetamide 4a (38 mg, 0.20 mmol) with (4-ethylphenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2e (115 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5b (36 mg, 61%) as colorless oil. Rₑ (Ethyl acetate/Hexane: 10/90) = 0.40. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 162.3 (d, J_CF = 24.2 Hz, C), 147.3 (C), 140.5 (C), 130.4 (d, J_CF = 18.7 Hz, CH), 129.3 (CH), 129.3 (CH), 128.7 (CH), 128.6 (CH), 128.6 (CH), 128.6 (CH), 125.5 (d, J_CF = 5.3 Hz, CH), 125.5 (d, J_CF = 5.3 Hz, CH), 115.0 (d, J_CF = 34.5 Hz, C), 89.8 (d, J_CF = 196.7 Hz, C), 40.7 (CH₂), 28.7 (CH₃), 15.5 (CH₃). **²H NMR** (400 MHz, δ ppm/CDCl₃): 7.31-7.26 (m, 1H), 7.22-7.17 (m, 6H), 6.83 (s, 2H), 3.31 (s, 3H), 2.67 (q, J = 7.6 Hz, 2H), 1.24 (t, J = 7.6 Hz, 3H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -135.5 (s). **HRMS** for C₁₈H₁₈FN₂O⁺: calcd. [M+H]⁺: 297.1398, found: 297.1400.

**Compound 5c: 2-(4-bromophenyl)-2-cyano-2-fluoro-N-methyl-N-phenylacetamide**

Following the general procedure, treatment of 2-cyano-N-methyl-2-fluoro-N-phenylacetamide 4a (38 mg, 0.20 mmol) with (4-bromophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2i (126 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5c (51 mg, 73%) as colorless oil. Rₑ (Ethyl acetate/Hexane: 10/90) = 0.40. **¹³C NMR** (100 MHz, δ ppm/CDCl₃): 161.7 (d, J_CF = 23.5 Hz, C), 140.3 (C), 132.1 (C), 132.3 (CH), 132.3 (CH), 129.5 (CH), 129.5 (CH), 129.0 (CH), 128.5 (CH), 128.5 (CH), 126.9 (d, J_CF = 5.8 Hz, CH), 126.9 (d, J_CF = 5.8 Hz, CH), 125.2 (C), 114.5 (d, J_CF = 34.4 Hz, C), 89.5 (d, J_CF = 200.1 Hz, C), 40.8 (CH₃). **²H NMR** (400 MHz, δ ppm/CDCl₃): 7.48 (d, J = 8.0 Hz, 2H), 7.35-7.30 (m, 1H), 7.25 (t, J = 7.2 Hz, 2H), 7.01 (d, J = 8.0 Hz, 2H), 6.86 (d, J = 7.2 Hz, 2H), 3.31 (s, 3H). **¹⁹F NMR** (376 MHz, δ ppm/CDCl₃): -138.8 (s). **HRMS** for C₁₆H₁₃BrF₂NO⁺: calcd. [M+H]⁺: 347.0190, found: 347.0188.
Compound 5d: 2-cyano-2-fluoro-2-(4'-iodo-[1,1'-biphenyl]-4-yl)-N-methyl-N-phenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-methyl-N-phenylacetamide 4a (38 mg, 0.20 mmol) with (4'-iodo-[1,1'-biphenyl]-4-yl)(mesityl)iodonium 4-methylbenzenesulfonate 2u (153 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25°C for 30 min followed by column chromatography afforded the product 5d (48 mg, 51%) as colorless solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.20. $^{13}$C NMR (100 MHz, δ ppm/CDCl₃): 162.0 (d, $J_{CF} = 23.7$ Hz, C), 142.4 (C), 140.5 (C), 139.2 (C), 138.2 (CH), 138.2 (CH), 132.3 (d, $J_{CF} = 22.2$ Hz, C), 129.4 (CH), 129.4 (CH), 129.0 (CH), 129.0 (CH), 128.9 (CH), 128.5 (CH), 127.4 (CH), 127.4 (CH), 125.9 (d, $J_{CF} = 5.6$ Hz, CH), 125.9 (d, $J_{CF} = 5.6$ Hz, CH), 114.9 (d, $J_{CF} = 34.6$ Hz, C), 94.2 (C), 89.7 (d, $J_{CF} = 199.0$ Hz, C), 40.8 (CH₃). $^1$H NMR (400 MHz, δ ppm/CDCl₃): 7.80 (d, $J = 7.6$ Hz, 2H), 7.59-7.46 (m, 3H), 7.36-7.24 (m, 6H), 6.90 (s, 2H), 3.34 (s, 3H). $^{19}$F NMR (376 MHz, δ ppm/CDCl₃): -137.6 (s). HRMS for C₂₂H₁₈F₂N₂O⁺: calcd. [M+H]⁺: 471.0364, found: 471.0361.

Compound 5e: methyl 4-(1-cyano-1-fluoro-2-(methyl(phenyl)amino)-2-oxoethyl)benzoate

Following the general procedure, treatment of 2-cyano-2-fluoro-N-methyl-N-phenylacetamide 4a (38 mg, 0.20 mmol) with mesityl(4-(methoxycarbonyl)phenyl)iodonium 4-methylbenzenesulfonate 2k (122 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25°C for 30 min followed by column chromatography afforded the product 5e (42 mg, 64%) as yellow oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.20. $^{13}$C NMR (100 MHz, δ ppm/CDCl₃): 166.0 (C), 161.6 (d, $J_{CF} = 22.9$ Hz, C), 140.1 (C), 137.3 (d, $J_{CF} = 22.4$ Hz, C), 132.1 (C), 130.1 (CH), 130.1 (CH), 129.4 (CH), 129.4 (CH), 129.0 (CH), 128.4 (CH), 128.4 (CH), 125.2 (d, $J_{CF} = 6.0$ Hz, CH), 125.2 (d, $J_{CF} = 6.0$ Hz, CH), 114.5 (d, $J_{CF} = 34.2$ Hz, C), 89.8 (d, $J_{CF} = 199.7$ Hz, C), 52.5 (CH₃), 40.7 (CH₃). $^1$H NMR (400 MHz, δ ppm/CDCl₃): 7.93 (d, $J = 8.0$ Hz, 2H), 7.27-7.21 (m, 3H), 7.15 (t, $J = 8.0$ Hz, 2H), 6.76 (s, 2H), 3.87 (s, 3H), 3.24 (s, 3H). $^{19}$F NMR (376 MHz, δ ppm/CDCl₃): -140.6 (s). HRMS for C₁₈H₁₅F₂N₂O₃⁺: calcd. [M+H]⁺: 327.1139, found: 327.1142.
Compound 5f: 2-cyano-2-fluoro-2-(2-fluorophenyl)-N-methyl-N-phenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-methyl-N-phenylacetamide 4a (38 mg, 0.20 mmol) with (2-fluorophenyl)(mesityl)iodonium 4-methylbenzenesulfonate 2w (113 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5f (37 mg, 65%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. Mp 64-66 °C. $^{13}$C NMR (100 MHz, δ ppm/CDCl$_3$): 160.9 (d, $J_{CF}$ = 24.0 Hz, C), 159.5 (d, $J_{CF}$ = 24.0 Hz, C), 140.6 (C), 132.6 (d, $J_{CF}$ = 8.2 Hz, C), 129.5 (CH), 129.5 (CH), 129.5 (CH), 128.2 (CH), 128.2 (CH), 127.8 (CH), 124.6 (CH), 116.4 (d, $J_{CF}$ = 19.8 Hz, CH), 114.0 (d, $J_{CF}$ = 33.5 Hz, C), 87.3 (d, $J_{CF}$ = 196.3 Hz, C), 40.8 (CH$_3$). $^1$H NMR (400 MHz, δ ppm/CDCl$_3$): 7.40-7.34 (m, 1H), 7.25-7.18 (m, 3H), 7.11-7.0 (m, 5H), 3.37 (s, 3H). $^{19}$F NMR (376 MHz, δ ppm/CDCl$_3$): -112.5 (s), -137.6 (s). HRMS for C$_{16}$H$_{12}$F$_2$N$_2$O$: $^\text{calcd.} [\text{M+H}]^+$: 287.0990, found: 287.0987.

Compound 5g: 2-(6-chloropyridin-3-yl)-2-cyano-2-fluoro-N-methyl-N-phenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-methyl-N-phenylacetamide 4a (38 mg, 0.20 mmol) with (6-chloropyridin-3-yl)(mesityl)iodonium 4-methylbenzenesulfonate 2v (117 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5g (33 mg, 55%) as colorless oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.20. $^{13}$C NMR (100 MHz, δ ppm/CDCl$_3$): 161.0 (d, $J_{CF}$ = 18.4 Hz, C), 153.9 (C), 146.6 (d, $J_{CF}$ = 5.4 Hz, CH), 140.1 (C), 135.9 (C), 129.8 (CH), 129.8 (CH), 129.8 (CH), 129.5 (CH), 128.3 (CH), 128.3 (CH), 124.5 (CH), 114.0 (d, $J_{CF}$ = 27.1 Hz, C), 88.0 (d, $J_{CF}$ = 161.2 Hz, C), 40.9 (CH$_3$). $^1$H NMR (400 MHz, δ ppm/CDCl$_3$): 8.22 (s, 1H), 7.62 (d, $J$ = 7.6 Hz, 1H), 7.40-7.30 (m, 4H), 6.95 (d, $J$ = 7.6 Hz, 2H), 3.33 (s, 3H). $^{19}$F NMR (376 MHz, δ ppm/CDCl$_3$): -141.5 (s). HRMS for C$_{15}$H$_{13}$ClFN$_3$O$: $^\text{calcd.} [\text{M+H}]^+$: 304.0647, found: 304.0644.

Compound 5h: N-benzyl-2-cyano-2-fluoro-N$_2$-diphenylacetamide

Following the general procedure, treatment of N-benzyl-2-cyano-2-fluoro-N-phenylacetamide 4b (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5h (43 mg, 62%) as yellow oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.35. $^{13}$C NMR (100 MHz, δ ppm/CDCl$_3$): 162.1 (d, $J_{CF}$ = 23.7 Hz, C), 138.2 (C), 135.7 (C), 132.9 (d, $J_{CF}$ = 22.6 Hz, C), 130.6 (CH), 129.7 (CH), 129.7 (CH), 129.2 (CH), 129.2 (CH), 129.0 (CH), 129.0 (CH), 128.8 (CH), 128.8 (CH), 128.8 (CH).
Compound 5i: N-benzyl-2-cyano-2-fluoro-N-(4-methoxyphenyl)-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-cyano-2-fluoro-N-(4-methoxyphenyl)acetamide 4c (60 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5i (54 mg, 72%) as yellow oil. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.20. \(^{13}C\) NMR (100 MHz, \( \delta \) ppm/CDCl\(_3\)): 162.3 (d, \( J_{CF} = 24.4 \) Hz, C), 159.7 (C), 135.9 (C), 133.0 (d, \( J_{CF} = 22.7 \) Hz, C), 131.2 (CH), 131.2 (CH), 130.6 (C), 130.6 (CH), 129.3 (CH), 129.3 (CH), 129.0 (CH), 129.0 (CH), 128.6 (CH), 128.6 (CH), 128.1 (CH), 125.4 (d, \( J_{CF} = 5.2 \) Hz, CH), 125.4 (d, \( J_{CF} = 5.2 \) Hz, CH), 114.9 (d, \( J_{CF} = 35.0 \) Hz, C), 113.9 (CH), 113.9 (CH), 89.6 (d, \( J_{CF} = 195.5 \) Hz, C), 56.3 (CH\(_2\)), 56.3 (CH\(_2\)), 55.3 (CH\(_3\)). \(^1H\) NMR (400 MHz, \( \delta \) ppm/CDCl\(_3\)): 7.36 (t, \( J = 6.8 \) Hz, 1H), 7.28 (t, \( J = 7.6 \) Hz, 2H), 7.23-7.20 (m, 5H), 7.12-7.09 (m, 2H), 6.51-6.23 (m, 4H), 4.83 (d, \( J = 14.0 \) Hz, 1H), 4.77 (d, \( J = 14.0 \) Hz, 1H), 3.71 (s, 3H). \(^{19}F\) NMR (376 MHz, \( \delta \) ppm/CDCl\(_3\)): -134.4 (s). HRMS for C\(_{23}\)H\(_{19}\)F\(_2\)N\(_2\)O\(_2\)^+: calcd. [M+H]^+: 375.1503, found: 375.1505.

Compound 5j: N-benzyl-N-(4-(tert-butyl)phenyl)-2-cyano-2-fluoro-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-N-(4-(tert-butyl)phenyl)-2-cyano-2-fluoroacetamide 4d (65 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5j (66 mg, 83%) as yellow oil. \( R_f \) (Ethyl acetate/Hexane: 10/90) = 0.35. \(^{13}C\) NMR (100 MHz, \( \delta \) ppm/CDCl\(_3\)): 162.3 (d, \( J_{CF} = 24.4 \) Hz, C), 152.1 (C), 136.0 (C), 135.5 (C), 133.0 (d, \( J_{CF} = 22.7 \) Hz, C), 130.4 (CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 128.9 (CH), 128.9 (CH), 128.6 (CH), 128.6 (CH), 128.0 (CH), 125.7 (CH), 125.7 (CH), 125.2 (d, \( J_{CF} = 5.4 \) Hz, CH), 125.2 (d, \( J_{CF} = 5.4 \) Hz, CH), 114.9 (d, \( J_{CF} = 34.6 \) Hz, C), 89.8 (d, \( J_{CF} = 195.7 \) Hz, C), 56.2 (CH\(_2\)), 34.7 (C), 31.3 (CH\(_3\)), 31.3 (CH\(_3\)), 31.3 (CH\(_3\)). \(^1H\) NMR (400 MHz, \( \delta \) ppm/CDCl\(_3\)): 7.28 (t, \( J = 7.2 \) Hz, 1H), 7.19-7.16 (m, 5H), 7.11-7.07 (m, 4H), 6.97 (d, \( J = 8.4 \) Hz, 2H), 6.40 (s, 2H), 4.78 (s, 2H), 1.18 (s, 9H). \(^{19}F\) NMR (376 MHz, \( \delta \) ppm/CDCl\(_3\)): -135.0 (s). HRMS for C\(_{26}\)H\(_{26}\)F\(_2\)N\(_2\)O^+: calcd. [M+H]^+: 401.2024, found: 401.2023.
Compound 5k: N-benzyl-2-cyano-2-fluoro-N-(4-fluorophenyl)-2-phenylacetamide

Following the general procedure, treatment of N-benzyl-2-cyano-2-fluoro-N-(4-fluorophenyl)acetamide 4e (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5k (54 mg, 74%) as colorless oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.30. 13C NMR (100 MHz, δ ppm/CDCl3): 162.4 (d, JCF = 248.5 Hz, C), 162.1 (d, JCF = 23.8 Hz, C), 135.5 (C), 134.1 (C), 132.8 (d, JCF = 22.8 Hz, C), 131.8 (d, JCF = 8.8 Hz, CH), 131.8 (d, JCF = 8.8 Hz, CH), 130.7 (d, JCF = 2.1 Hz, CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 129.2 (CH), 128.7 (CH), 128.7 (CH), 128.3 (CH), 125.1 (d, JCF = 5.5 Hz, CH), 125.1 (d, JCF = 5.5 Hz, CH), 115.8 (d, JCF = 22.7 Hz, CH), 115.8 (d, JCF = 22.7 Hz, CH), 114.8 (d, JCF = 35.0 Hz, C), 89.9 (d, JCF = 197.1 Hz, C), 56.3 (CH2). 1H NMR (400 MHz, δ ppm/CDCl3): 7.36 (t, J = 7.2 Hz, 1H), 7.28 (t, J = 7.6 Hz, 2H), 7.24-7.18 (m, 5H), 7.13-7.10 (m, 2H), 7.05 (t, J = 8.0 Hz, 2H), 6.46 (d, J = 7.6 Hz, 2H), 4.88 (d, J = 14.0 Hz, 1H), 4.83 (d, J = 13.6 Hz, 1H). 19F NMR (376 MHz, δ ppm/CDCl3): -111.3 (s), -137.0 (s). HRMS for C22H16F2N2O+: calcd. [M+H]+: 363.1303, found: 363.1316.

Compound 5l: 2-cyano-N-ethyl-2-fluoro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-ethyl-N-phenylacetamide 4f (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5l (37 mg, 66%) as brown oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.35. 13C NMR (100 MHz, δ ppm/CDCl3): 161.5 (d, JCF = 23.1 Hz, C), 138.6 (C), 133.2 (d, JCF = 22.8 Hz, C), 130.5 (CH), 129.6 (CH), 129.6 (CH), 129.1 (CH), 129.1 (CH), 129.0 (CH), 128.8 (CH), 125.2 (d, JCF = 5.5 Hz, CH), 125.2 (d, JCF = 5.5 Hz, CH), 115.0 (d, JCF = 34.8 Hz, C), 89.9 (d, JCF = 197.6 Hz, C), 47.7 (CH2), 12.4 (CH3). 1H NMR (400 MHz, δ ppm/CDCl3): 7.39 (t, J = 7.2 Hz, 1H), 7.33-7.21 (m, 5H), 7.60 (t, J = 7.6 Hz, 2H), 6.73 (d, J = 8.0 Hz, 2H), 3.77-3.68 (m, 2H), 1.10 (t, J = 7.2 Hz, 3H). 19F NMR (376 MHz, δ ppm/CDCl3): -137.3 (s). HRMS for C17H16F2N2O+: calcd. [M+H]+: 283.1241, found: 283.1243.
Compound 5m: 2-cyano-2-fluoro-N,N,2-triphenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N,N-diphenylacetamide 4g (51 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5m (44 mg, 66%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. Mp 114-116 °C. $^{13}$C NMR (100 MHz, δ ppm/CDCl₃): 162.3 (d, J_CF = 24.1 Hz, C), 140.4 (C), 133.0 (d, J_CF = 22.7 Hz, C), 130.7 (d, J_CF = 2.1 Hz, CH), 130.7 (d, J_CF = 2.1 Hz, CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.3 (CH), 129.2 (CH), 129.2 (CH), 128.2 (C), 128.2 (C), 125.3 (d, J_CF = 5.5 Hz, CH), 125.3 (d, J_CF = 5.5 Hz, CH), 125.3 (d, J_CF = 5.5 Hz, CH), 114.9 (d, J_CF = 34.6 Hz, C), 90.0 (d, J_CF = 198.1 Hz, C). $^{1}$H NMR (400 MHz, δ ppm/CDCl₃): 7.42-7.04 (m, 15H). $^{19}$F NMR (376 MHz, δ ppm/CDCl₃): -136.2 (s). HRMS for C₂₁H₁₅F₃N₂O$: $\text{calcd. } [\text{M+H}]^+: 331.1241$, found: 331.1230.

Compound 5n: N-cinnamyl-2-cyano-2-fluoro-N,2-diphenylacetamide

Following the general procedure, treatment of N-cinnamyl-2-cyano-2-fluoro-N-phenylacetamide 4h (59 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5n (54 mg, 73%) as yellow oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. $^{13}$C NMR (100 MHz, δ ppm/CDCl₃): 161.9 (d, J_CF = 23.8 Hz, C), 138.6 (C), 136.4 (C), 135.2 (CH), 133.0 (d, J_CF = 22.4 Hz, C), 130.6 (CH), 129.7 (CH), 129.7 (CH), 129.1 (CH), 129.1 (CH), 129.1 (CH), 129.0 (CH), 128.7 (CH), 128.7 (CH), 128.2 (CH), 126.6 (CH), 126.6 (CH), 125.3 (d, J_CF = 5.6 Hz, CH), 125.3 (d, J_CF = 5.6 Hz, CH), 122.1 (CH), 114.9 (d, J_CF = 34.7 Hz, C), 89.9 (d, J_CF = 197.7 Hz, C), 55.1 (CH₂). $^{1}$H NMR (400 MHz, δ ppm/CDCl₃): 7.39 (t, J = 7.2 Hz, 1H), 7.33-7.20 (m, 10H), 7.15 (t, J = 7.6 Hz, 2H), 6.76 (d, J = 8.0 Hz, 2H), 6.35 (d, J = 16.0 Hz, 1H), 6.23-6.16 (m, 1H), 4.41 (d, J = 6.8 Hz, 2H). $^{19}$F NMR (376 MHz, δ ppm/CDCl₃): -137.5 (s). HRMS for C₂₄H₂₆F₂N₂O$: $\text{calcd. } [\text{M+H}]^+: 371.1554$, found: 371.1550.
Compound 5o: 2-cyano-2-fluoro-N,2-diphenyl-N-(thiophen-2-ylmethyl)acetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-phenyl-N-(thiophen-2-ylmethyl)acetamide 4i (55 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5o (50 mg, 72%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.30. Mp 99-101 °C. 13C NMR (100 MHz, δ ppm/CDCl3): 162.0 (d, JCF = 19.3 Hz, C), 138.2 (C), 137.4 (C), 132.9 (d, JCF = 18.1 Hz, C), 130.6 (CH), 129.7 (CH), 129.1 (CH), 129.0 (CH), 129.0 (CH), 129.0 (CH), 128.5 (CH), 126.6 (d, JCF = 6.5 Hz, CH), 126.6 (d, JCF = 6.5 Hz, CH), 125.3 (d, JCF = 4.4 Hz, CH), 114.8 (d, JCF = 27.9 Hz, C), 89.7 (d, JCF = 158.6 Hz, C), 50.9 (CH2). 1H NMR (400 MHz, δ ppm/CDCl3): 7.35 (t, J = 7.2 Hz, 1H), 7.26 (t, J = 7.6 Hz, 2H), 7.22-7.18 (m, 4H), 7.08 (t, J = 7.6 Hz, 2H), 6.83-6.81 (m, 1H), 6.71 (d, J = 3.6 Hz, 1H), 6.54 (d, J = 8.0 Hz, 2H), 4.96 (s, 2H). 19F NMR (376 MHz, δ ppm/CDCl3): -137.0 (s). HRMS for C20H16FN2OS+: calcd. [M+H]+: 351.0962, found: 351.0959.

Compound 5p: 2-cyano-2-fluoro-N-(furan-3-ylmethyl)-N,2-diphenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-(furan-3-ylmethyl)-N-phenylacetamide 4j (53 mg, 0.20 mmol) with mesityl(phenyl)iodonium 4-methylbenzenesulfonate 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5p (51 mg, 76%) as yellow oil. Rf (Ethyl acetate/Hexane: 10/90) = 0.25. 13C NMR (100 MHz, δ ppm/CDCl3): 162.0 (d, JCF = 24.0 Hz, C), 143.4 (CH), 141.8 (CH), 138.3 (C), 132.9 (d, JCF = 22.8 Hz, C), 130.6 (CH), 129.6 (CH), 129.0 (CH), 128.9 (CH), 128.9 (CH), 128.9 (CH), 125.2 (d, JCF = 5.5 Hz, CH), 125.2 (d, JCF = 5.5 Hz, CH), 119.6 (C), 114.9 (d, JCF = 34.9 Hz, C), 111.0 (CH), 89.8 (d, JCF = 197.4 Hz, C), 47.2 (CH2). 1H NMR (400 MHz, δ ppm/CDCl3): 7.37 (t, J = 7.2 Hz, 1H), 7.32-7.17 (m, 7H), 7.10 (t, J = 8.0 Hz, 2H), 6.58 (d, J = 8.0 Hz, 2H), 6.30 (s, 1H), 4.65 (s, 2H). 19F NMR (376 MHz, δ ppm/CDCl3): -137.1 (s). HRMS for C20H16FN2O2+: calcd. [M+H]+: 335.1190, found: 335.1195.

Compound 5q: 2-cyano-2-fluoro-N,2-diphenylacetamide

Following the general procedure, treatment of 2-cyano-2-fluoro-N-phenylacetamide 4k (36 mg, 0.20 mmol) with 2a (109 mg, 0.22 mmol) in the presence of t-BuOK (27 mg, 0.24 mmol) in THF (2 mL) at 25 °C for 30 min followed by column chromatography afforded the product 5q (15 mg, 30%) as white solid. Rf (Ethyl acetate/Hexane: 10/90) = 0.30. Mp 124-126 °C. 13C NMR (100
1H NMR (400 MHz, δ ppm/CDCl₃): 8.10 (s, 1H), 7.71-7.68 (m, 2H), 7.57 (d, J = 7.6 Hz, 2H), 7.53-7.48 (m, 3H), 7.38 (d, J = 7.6 Hz, 2H), 7.22 (t, J = 7.6 Hz, 1H). 19F NMR (376 MHz δ ppm/CDCl₃): -142.8 (s). HRMS for C₁₅H₁₂FN₂O⁺: calcd. [M+H]⁺: 255.0928, found: 255.0925.
X-Ray Data Collection and Structure Refinement Details for compound 3am:

A good quality colorless single crystal of size 0.38 x 0.21 x 0.10 mm, was selected under a polarizing microscope and was mounted on a glass fiber for data collection. Single crystal X-ray data for compound 3am were collected on the Rigaku Kappa 3 circle diffractometer equipped with the AFC12 goniometer and enhanced sensitivity (HG) Saturn724+ CCD detector in the 4x4 bin mode using the monochromated Mo-Kα radiation generated from the microfocus sealed tube MicroMax-003 X-ray generator equipped with specially designed confocal multilayer optics. Data collection was performed using ω-scans of 0.5° steps at 293(2) K. Cell determination, data collection and data reduction was performed using the Rigaku CrystalClear-SM Expert 2.1 b24 software. Asymmetric unit contains four molecules of compound 3am along with two water molecules. Structure solution and refinement were performed by using SHELXTL-NT. Refinement of coordinates and anisotropic thermal parameters of non-hydrogen atoms were carried out by the full-matrix least-squares method. The hydrogen atoms attached to carbon atoms were generated with idealized geometries and isotropically refined using a riding model.

Figure S1. ORTEP diagram drawn with 30% ellipsoid probability for non-H atoms of the crystal structure of compound 3am determined at 293 K.
Table S1 Crystal data and structure refinement details for 3am.

<table>
<thead>
<tr>
<th>Compound</th>
<th>3am</th>
</tr>
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<tbody>
<tr>
<td>Empirical formula</td>
<td>C_{15}H_{12}BrFN_{2}O_{3}</td>
</tr>
<tr>
<td>Formula weight</td>
<td>367.18</td>
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<tr>
<td>Crystal System</td>
<td>Monoclinic</td>
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<tr>
<td>Space group</td>
<td>P 2_1/c</td>
</tr>
<tr>
<td>a (Å)</td>
<td>15.548(5)</td>
</tr>
<tr>
<td>b (Å)</td>
<td>24.427(7)</td>
</tr>
<tr>
<td>c (Å)</td>
<td>8.266(2)</td>
</tr>
<tr>
<td>α (°)</td>
<td>90.00</td>
</tr>
<tr>
<td>β (°)</td>
<td>91.708(5)</td>
</tr>
<tr>
<td>γ (°)</td>
<td>90.00</td>
</tr>
<tr>
<td>V (Å³)</td>
<td>3138.0(16)</td>
</tr>
<tr>
<td>Z</td>
<td>8</td>
</tr>
<tr>
<td>Dc (g/cm³)</td>
<td>1.554</td>
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<tr>
<td>F_{000}</td>
<td>1472</td>
</tr>
<tr>
<td>μ (mm⁻¹)</td>
<td>2.643</td>
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<tr>
<td>θ_{max} (°)</td>
<td>25.36</td>
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<tr>
<td>Total reflections</td>
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</tr>
<tr>
<td>Unique reflections</td>
<td>5599</td>
</tr>
<tr>
<td>Reflections [I &gt; 2σ(I)]</td>
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</tr>
<tr>
<td>Parameters</td>
<td>399</td>
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<tr>
<td>R_{int}</td>
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<td>Goodness-of-fit</td>
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<tr>
<td>R [F^2 &gt; 2σ(F^2)]</td>
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<tr>
<td>wR (F^2, all data)</td>
<td>0.1405</td>
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<tr>
<td>CCDC No.</td>
<td>1940141</td>
</tr>
</tbody>
</table>

1. CrystalClear 2.1, Rigaku Corporation, Tokyo, Japan
3a
376 MHz/CDCl₃

3b
400 MHz/CDCl₃
3ai
376 MHz/CDCl₃

3am
400 MHz/CDCl₃
$\text{S103}$
$\text{Ph\^N} \text{O} \text{Ph}^F \text{CN}$

$5m$

$376 \text{ MHz/CDCl}_3$

$\text{Ph}^N \text{N} \text{Ph}^F \text{CN}$

$5n$

$400 \text{ MHz/CDCl}_3$