SUPPLEMENTARY INFORMATION

1. Description of methods employed in the synthesis of intermediates/ final compounds and their spectral /purity data.

1.1 General chemistry

Reagents (synthetic grade or better) were purchased from Sigma Aldrich Chemical Co., Alfa Aesar (Thermo Fisher Scientific), Combi-Blocks Inc., San Diego, CA., USA, and Tokyo Chemical Industry Co. Ltd unless otherwise stated, and used without further purification. Reactions were monitored by TLC on aluminium-backed sheets coated with silica gel 60 (Merck) with visualization by UV. Compounds were purified by recrystallization from dichloromethane with diethyl ether or by column chromatography on silica gel 60 (230-400 mesh, Merck). ^{1}H and ^{13}C NMR spectra were recorded at 400 MHz and 100 MHz respectively on a Bruker 400 Ultrashield Plus Instrument (Bruker, Billerica, MA, USA) using $CDCl_3$ at room temperature. Chemical shifts are reported in parts per million (ppm) on the δ scale using residual protio-solvent signals (^{1}H NMR: $CDCl_3$ δ7.26; ^{13}C NMR: $CDCl_3$ δ77.16) as internal reference. Coupling constants (*J*) were reported in Hertz (Hz) and splitting patterns as singlet (s), doublet (d), doublet of doublets (dd), doublet of doublets of doublets (ddd), triplet (t), triplet of doublets (td), quartet (q), quintet (quint), sextet (sext), multiplet (m). Nominal mass spectra were captured on an LCMS 2020 LC/MS System (Shimadzu, Singapore) by electrospray ionization (ESI) or dual ion source, DUIS [(ESI and atmospheric pressure chemical ionization (APCI)], run in either positive or negative ionization mode. High resolution mass spectra were recorded on a Bruker micrOTOFQII mass spectrometer (Bruker, Billerica, MA, USA) by ESI (positive ionization mode). Compound purities were determined by reverse-phase HPLC using Polaris C18-A, 5 µM (particle size), 150 x 4.6 (length x ID mm); or Zorbax Eclipse XDB-C18, 5 µM, 150 x 4.6 mm, both obtained from Agilent Technologies, USA. Details of solvent systems and purity of synthesized compounds are given in the proceeding sections, together with spectral details of compounds. Lipophilicities of test compounds were estimated by clog*P* (ChemDraw Ultra Ver 12.0.21076, CambridgeSoft, PerkinElmer Informatics, Waltham, MA). Statistical Analyses (Spearman rank-order correlation analysis) were carried out on IBM-SPSS Statistics 24, Armonk, NY).

1.2 General procedure for the reaction of unsubstituted and substituted indoles with 1-bromo-3-chloropropane or 1-bromo-5-chloropentane

The commercially available indole or substituted indole (1 eq.) was reacted with sodium hydride (NaH, 60 % dispersion in mineral oil; 2 eq.) in anhydrous *N, N*-dimethylformamide (DMF) in an ice bath for 20 minutes. The required volume of 1-bromo-3-chloropropane or 1-bromo-5-chloropentane (1.2 eq.) in DMF was then added slowly to the stirring reaction mixture and allowed to warm to room temperature, with continuous stirring for a further 6-12 hours. The reaction was monitored by thin layer chromatography (TLC) and quenched by initial dilution of the mixture with isopropanol, followed by slow, drop wise addition of methanol and water. The crude product was extracted with dichloromethane (DCM, 3x 20 mL), washed twice with water and once with 1 M brine solution. The organic layers were combined and dried with anhydrous Na_2SO_4, filtered and concentrated under reduced pressure to obtain crude residues which were purified by silica column chromatography using hexane: ethyl acetate (30:1) to obtain the respective target products in yields ranging from 29 – 89 %.

1.3 General procedure for the reaction of 1-propyl-1*H*-indoles and 1-pentyl-1*H*-indoles with triphenylphosphine

This was modified from the method described by Dunn *et al*.[S1] Briefly, a mixture of substituted 1-propyl-1*H*-indole, or 1-pentyl-1*H*-indole (1 eq.), triphenylphosphine (TPP, 1.05 eq.), and potassium iodide (KI, 1.2 eq.) was refluxed with stirring at 85 °C in acetonitrile (ACN) and monitored by TLC. On completion, the mixture was filtered and ACN removed under vacuum. The crude residue was dissolved in minimal DCM, and the pure product precipitated out of solution by slow addition of diethyl ether. Solid products were re-crystallized in the same way, and dried; semi-solid products were purified by silica column chromatography using DCM: methanol (40:1). Yields obtained ranged from 28 – 90 %.

1.4. Characterization of intermediates and final compounds

1-(3-Chloropropyl)-4-fluoro-1*H*-indole ($C_{11}H_{11}ClFN$) (1a)

The method described in Section 1.2 was followed. 4-Fluoroindole (338 mg, 2.5 mmol) was reacted with NaH (60 % dispersion in mineral oil; 200 mg, 5 mmol) in anhydrous DMF (8 mL) in

an ice bath for 20 minutes. 1-Bromo-3-chloropropane (295 µL, 3 mmol) in DMF (3 mL) was then added slowly to the stirring reaction mixture and allowed to warm to room temperature.
Pale green oil; Yield: 85 % (450 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.20 – 7.13 (m, 2H, Ar-H), 7.11 (d, *J* = 3.3 Hz, 1H, Ar-H), 6.81 (ddd, *J* = 10.3, 6.3, 2.1 Hz, 1H, Ar-H), 6.61 (dd, *J* = 3.2, 0.6 Hz, 1H, Ar-H), 4.34 (t, *J* = 6.4 Hz, 2H, CH_2), 3.49 – 3.42 (m, 2H, CH_2), 2.27 (quint, *J* = 6.3 Hz, 2H, CH_2); MS (ESI) calcd for $C_{11}H_{11}ClFN$ 211.06, found 212.05 $[M+H]^+$.

1-(3-Chloropropyl)-5-fluoro-1*H*-indole ($C_{11}H_{11}ClFN$) (1b)

The method described in Section 1.2 was followed. The titled compound was prepared from 5-fluoroindole (338 mg, 2.5 mmol), NaH (60 % dispersion in mineral oil; 150 mg, 3.75 mmol) and 1-bromo-3-chloropropane (295 µL, 3 mmol).
Yellow oil; Yield: 74 % (394 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31 – 7.24 (m, 2H, Ar-H), 7.17 (d, *J* = 3.1 Hz, 1H, Ar-H), 6.97 (td, *J* = 2.5, 9.1 Hz, 1H, Ar-H), 6.46 (dd, *J* = 0.8, 3.1 Hz, 1H, Ar-H), 4.32 (t, *J* = 6.4 Hz, 2H, CH_2), 3.49 – 3.41 (m, 2H, CH_2), 2.26 (quint, *J* = 6.3 Hz, 2H, CH_2); MS (ESI) calcd for $C_{11}H_{11}ClFN$ 211.06, found 212.05 $[M+H]^+$.

1-(3-Chloropropyl)-6-fluoro-1*H*-indole ($C_{11}H_{11}ClFN$) (1c)

The method described in Section 1.2 was followed. The titled compound was prepared from 6-fluoroindole (270 mg, 2 mmol), NaH (60 % dispersion in mineral oil; 160 mg, 4 mmol) and 1-bromo-3-chloropropane (236 µL, 2.4 mmol).
Pale yellow oil; Yield: 59 % (250 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.55 (dd, *J* = 5.4, 8.7 Hz, 1H, Ar-H), 7.12 (d, *J* = 3.2 Hz, 1H, Ar-H), 7.06 (dd, *J* = 2.2, 9.9 Hz, 1H, Ar-H), 6.90 (ddd, *J* = 2.3, 8.6, 9.5 Hz, 1H, Ar-H), 6.50 (dd, *J* = 0.9, 3.2 Hz, 1H, Ar-H), 4.28 (t, *J* = 6.4 Hz, 2H, CH_2), 3.50 – 3.42 (m, 2H, CH_2), 2.26 (quint, *J* = 6.3 Hz, 2H, CH_2); MS (ESI) calcd for $C_{11}H_{11}ClFN$ 211.06, found 212.05 $[M+H]^+$.

1-(3-Chloropropyl)-7-fluoro-1*H*-indole ($C_{11}H_{11}ClFN$) (1d)

The method described in Section 1.2 was followed. The titled compound was prepared from 7-fluoroindole (338 mg, 2 mmol), NaH (60 % dispersion in mineral oil; 200 mg, 5 mmol) and 1-bromo-3-chloropropane (295 µL, 3 mmol).

Pale green oil; Yield: 69 % (365 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 (dt, *J* = 0.8, 7.9 Hz, 1H), 7.13 (d, *J* = 3.1 Hz, 1H), 7.02 (td, *J* = 4.6, 7.9 Hz, 1H), 6.90 (ddd, *J* = 0.9, 7.8, 12.8 Hz, 1H), 6.52 (dd, *J* = 2.5, 3.1 Hz, 1H), 4.49 (td, *J* = 0.8, 6.4 Hz, 2H), 3.50 – 3.43 (m, 2H), 2.31 (quint, *J* = 6.5 Hz, 2H); MS (ESI) calcd for $C_{11}H_{11}ClFN$ 211.06, found 212.05 $[M+H]^+$.

1-(3-Chloropropyl)-4-methoxy-1*H*-indole ($C_{12}H_{14}ClNO$) (2a)

The method described in Section 1.2 was followed. The titled compound was prepared from 4-methoxyindole (440 mg, 2.99 mmol), NaH (60 % dispersion in mineral oil; 239 mg, 5.98 mmol) and 1-bromo-3-chloropropane (353 µL, 3.59 mmol).
Pale red oil; Yield: 58 % (298 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.15 (t, *J* = 8.0 Hz, 1H, Ar-H), 7.04 (d, *J* = 3.1 Hz, 1H, Ar-H), 7.00 (dt, *J* = 0.7, 8.3 Hz, 1H, Ar-H), 6.62 (dd, *J* = 0.9, 3.1 Hz, 1H, Ar-H), 6.54 (dd, *J* = 0.6, 7.8 Hz, 1H, Ar-H), 4.32 (t, *J* = 6.4 Hz, 2H, CH_2), 3.97 (s, 3H, CH_3), 3.49 – 3.42 (m, 2H, CH_2), 2.26 (quint, *J* = 6.2 Hz, 2H, CH_2); MS (ESI) calcd for $C_{12}H_{14}ClNO$ 223.08, found 224.05 $[M+H]^+$.

1-(3-Chloropropyl)-5-methoxy-1*H*-indole ($C_{12}H_{14}ClNO$) (2b)

The method described in Section 1.2 was followed. The titled compound was prepared from 5-methoxyindole (368 mg, 2.5 mmol), NaH (60 % dispersion in mineral oil; 200 mg, 5 mmol) and 1-bromo-3-chloropropane (295 µL, 3 mmol).
Bright yellow oil; Yield: 80 % (450 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.16 (d, *J* = 8.9 Hz, 1H), 7.03 – 6.98 (m, 2H), 6.79 (dd, *J* = 2.4, 8.9 Hz, 1H), 6.33 (d, *J* = 2.9 Hz, 1H), 4.19 (t, *J* = 6.4 Hz, 2H), 3.76 (s, 3H), 3.36 – 3.30 (m, 2H), 2.14 (quint, *J* = 6.2 Hz, 2H); MS (ESI) calcd for $C_{12}H_{14}ClNO$ 223.08, found 224.05 $[M+H]^+$.

1-(3-Chloropropyl)-6-methoxy-1*H*-indole ($C_{12}H_{14}ClNO$) (2c)

The method described in Section 1.2 was followed. The titled compound was prepared from 6-methoxyindole (440 mg, 2.99 mmol), NaH (60 % dispersion in mineral oil; 239 mg, 5.98 mmol) and 1-bromo-3-chloropropane (353 µL, 3.59 mmol).
Pale yellow oil; Yield: 67 % (377 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.50 (dd, *J* = 0.6, 8.6 Hz, 1H), 7.02 (d, *J* = 2.8 Hz, 1H), 6.86 (d, *J* = 2.3 Hz, 1H), 6.80 (dd, *J* = 2.3, 8.6 Hz, 1H), 6.44 (d, *J* =

3.2 Hz, 1H), 4.29 (t, *J* = 6.4 Hz, 2H), 3.89 (s, 3H), 3.50 – 3.45 (m, 2H), 2.26 (quint, *J* = 6.2 Hz, 2H); MS (ESI) calcd for $C_{12}H_{14}ClNO$ 223.08, found 224.05 $[M+H]^+$.

1-(3-Chloropropyl)-7-methoxy-1*H*-indole ($C_{12}H_{14}ClNO$) (2d)

The method described in Section 1.2 was followed. The titled compound was prepared from 7-methoxyindole (440 mg, 2.99 mmol), NaH (60 % dispersion in mineral oil; 239 mg, 5.98 mmol) and 1-bromo-3-chloropropane (353 µL, 3.59 mmol).
Bright yellow oil; Yield: 58 % (298 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.23 (dd, *J* = 0.9, 8.0 Hz, 1H), 7.05 (d, *J* = 2.8 Hz, 1H), 7.01 (t, *J* = 7.8 Hz, 1H), 6.63 (dd, *J* = 0.8, 7.8 Hz, 1H), 6.44 (d, *J* = 3.1 Hz, 1H), 4.55 (t, *J* = 6.4 Hz, 2H), 3.95 (s, 3H), 3.45 (t, *J* = 6.2 Hz, 2H), 2.28 (p, *J* = 6.3 Hz, 2H); MS (ESI) calcd for $C_{12}H_{14}ClNO$ 223.08, found 224.05 $[M+H]^+$.

1-(3-Chloropropyl)-4-nitro-1*H*-indole ($C_{11}H_{11}ClN_2O_2$) (3a)

The method described in Section 1.2 was followed. The titled compound was prepared from 4-nitroindole (178 mg, 1.1 mmol), NaH (60 % dispersion in mineral oil; 88 mg, 2.2 mmol) and 1-bromo-3-chloropropane (130 µL, 1.32 mmol).
Bright yellow oil; Yield: 69 % (180 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (d, *J* = 8.0 Hz, 1H), 7.72 (d, *J* = 8.1 Hz, 1H), 7.40 (d, *J* = 3.1 Hz, 1H), 7.35 – 7.26 (m, 2H), 4.44 (t, *J* = 6.5 Hz, 2H), 3.49 – 3.44 (m, 2H), 2.30 (dt, *J* = 6.4, 12.3 Hz, 2H); MS (ESI) calcd for $C_{11}H_{11}ClN_2O_2$ 238.05, found 239.05 $[M+H]^+$.

1-(3-Chloropropyl)-5-nitro-1*H*-indole ($C_{11}H_{11}ClN_2O_2$) (3b)

The method described in Section 1.2 was followed. The titled compound was prepared from 5-nitroindole (178 mg, 1.1 mmol), NaH (60 % dispersion in mineral oil; 88 mg, 2.2 mmol) and 1-bromo-3-chloropropane (130 µL, 1.32 mmol).
Yellow solid; Yield: 36 % (95 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.58 (d, *J* = 2.2 Hz, 1H), 8.12 (dd, *J* = 2.2, 9.1 Hz, 1H), 7.41 (d, *J* = 9.1 Hz, 1H), 7.29 (d, *J* = 3.2 Hz, 1H), 6.70 (dd, *J* = 0.9, 3.3 Hz, 1H), 4.40 (t, *J* = 6.5 Hz, 2H), 3.51 – 3.42 (m, 2H), 2.30 (quint, *J* = 6.4 Hz, 2H); MS (ESI) calcd for $C_{11}H_{11}ClN_2O_2$ 238.05, found 239.05 $[M+H]^+$.

1-(3-Chloropropyl)-6-nitro-1*H*-indole ($C_{11}H_{11}ClN_2O_2$) (3c)

The method described in Section 1.2 was followed. The titled compound was prepared from 6-nitroindole (178 mg, 1.1 mmol), NaH (60 % dispersion in mineral oil; 88 mg, 2.2 mmol) and 1-bromo-3-chloropropane (130 µL, 1.32 mmol).

Yellow solid; Yield: 44 % (114 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.34 (d, *J* = 2.0 Hz, 1H), 7.98 (dd, *J* = 2.0, 8.8 Hz, 1H), 7.64 (d, *J* = 8.8 Hz, 1H), 7.43 (d, *J* = 3.1 Hz, 1H), 6.61 (dd, *J* = 0.9, 3.1 Hz, 1H), 4.42 (t, *J* = 6.5 Hz, 2H), 3.49 – 3.43 (m, 2H), 2.31 (quint, *J* = 6.4 Hz, 2H); MS (ESI) calcd for $C_{11}H_{11}ClN_2O_2$ 238.05, found 239.05 $[M+H]^+$.

1-(3-Chloropropyl)-7-nitro-1*H*-indole ($C_{11}H_{11}ClN_2O_2$) (3d)

The method described in Section 1.2 was followed. The titled compound was prepared from 7-nitroindole (178 mg, 1.1 mmol), NaH (60 % dispersion in mineral oil; 88 mg, 2.2 mmol) and 1-bromo-3-chloropropane (130 µL, 1.32 mmol).

Yellow oil; Yield: 44 % (115 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.86 (ddd, *J* = 1.1, 7.8, 14.4 Hz, 2H), 7.26 (d, *J* = 3.2 Hz, 1H), 7.15 (t, *J* = 7.8 Hz, 1H), 6.66 (d, *J* = 3.3 Hz, 1H), 4.48 (t, *J* = 6.6 Hz, 2H), 3.35 – 3.28 (m, 2H), 2.09 (dt, *J* = 6.6, 12.5 Hz, 2H); MS (ESI) calcd for $C_{11}H_{11}ClN_2O_2$ 238.05, found 239.05 $[M+H]^+$.

1-(5-Chloropentyl)-4-fluoro-1*H*-indole ($C_{13}H_{15}ClFN$) (4a)

Following the general method described in Section 1.2, the titled compound was prepared from 4-fluoroindole (270 mg, 2 mmol), NaH (60 % dispersion in mineral oil; 160 mg, 4 mmol) and 1-bromo-5-chloropentane (316 µL, 2.4 mmol).

Yellow oil; Yield: 89 % (429 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.17 – 7.09 (m, 2H, Ar-H), 7.06 (d, *J* = 3.2 Hz, 1H, Ar-H), 6.82 – 6.74 (m, 1H, Ar-H), 6.59 (dd, *J* = 3.2, 0.6 Hz, 1H, Ar-H), 4.13 (t, *J* = 7.0 Hz, 2H, CH_2), 3.51 (t, *J* = 6.6 Hz, 2H, CH_2), 1.92 – 1.83 (m, 2H, CH_2), 1.79 (dq, *J* = 8.1, 6.7 Hz, 2H, CH_2), 1.53 – 1.42 (m, 2H, CH_2); MS (ESI) calcd for $C_{13}H_{15}ClFN$ 239.09, found 240.10 $[M+H]^+$.

1-(5-Chloropentyl)-5-fluoro-1*H*-indole ($C_{13}H_{15}ClFN$) (4b)

The titled compound was prepared from 5-fluoroindole (203 mg, 1.5 mmol), NaH (60 % dispersion in mineral oil; 120 mg, 3 mmol) and 1-bromo-5-chloropentane (237 µL, 1.8 mmol), following the method described in Section 1.2.

Yellow oil; Yield: 56 % (202 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31 – 7.21 (m, 2H, Ar-H), 7.13 (d, *J* = 3.0 Hz, 1H, Ar-H), 6.96 (td, *J* = 2.5, 9.0 Hz, 1H, Ar-H), 6.45 (dd, *J* = 0.9, 3.1 Hz, 1H, Ar-H), 4.12 (t, *J* = 7.0 Hz, 2H, CH_2), 3.51 (t, *J* = 6.6 Hz, 2H, CH_2), 1.93 – 1.73 (m, 4H, 2[CH_2]), 1.52 – 1.41 (m, 2H, CH_2); MS (ESI) calcd for $C_{13}H_{15}ClFN$ 239.09, found 240.10 $[M+H]^+$.

1-(5-Chloropentyl)-6-fluoro-1*H*-indole ($C_{13}H_{15}ClFN$) (4c)

This intermediate was prepared from 6-fluoroindole (203 mg, 1.5 mmol), NaH (60 % dispersion in mineral oil; 120 mg, 3 mmol) and 1-bromo-5-chloropentane (237 µL, 1.8 mmol), following the general method described in Section 1.2.

Yellow oil; Yield: 58 % (210 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.53 (ddd, *J* = 0.5, 5.4, 8.7 Hz, 1H), 7.07 (d, *J* = 3.2 Hz, 1H), 7.00 (ddt, *J* = 0.6, 2.3, 9.9 Hz, 1H), 6.87 (ddd, *J* = 2.3, 8.6, 9.6 Hz, 1H), 6.47 (dd, *J* = 0.9, 3.2 Hz, 1H), 4.07 (t, *J* = 7.1 Hz, 2H), 3.51 (t, *J* = 6.6 Hz, 2H), 1.92 – 1.74 (m, 4H), 1.52 – 1.41 (m, 2H); MS (ESI) calcd for $C_{13}H_{15}ClFN$ 239.09, found 240.10 $[M+H]^+$.

1-(5-Chloropentyl)-7-fluoro-1*H*-indole ($C_{13}H_{15}ClFN$) (4d)

The intermediate was prepared from 7-fluoroindole (203 mg, 1.5 mmol), NaH (60 % dispersion in mineral oil; 120 mg, 3 mmol) and 1-bromo-5-chloropentane (237 µL, 1.8 mmol), following the method described in Section 1.2.

Yellow oil; Yield: 80 % (290 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38 (dd, *J* = 0.8, 7.9 Hz, 1H), 7.05 (d, *J* = 3.1 Hz, 1H), 6.98 (td, *J* = 4.5, 7.8 Hz, 1H), 6.87 (ddd, *J* = 0.9, 7.8, 12.9 Hz, 1H), 6.50 (dd, *J* = 2.4, 3.1 Hz, 1H), 4.29 (t, *J* = 7.1 Hz, 2H), 3.52 (t, *J* = 6.6 Hz, 2H), 1.94 – 1.74 (m, 4H), 1.53 – 1.41 (m, 2H); MS (ESI) calcd for $C_{13}H_{15}ClFN$ 239.09, found 240.10 $[M+H]^+$.

1-(5-Chloropentyl)-4-methoxy-1*H*-indole ($C_{14}H_{18}ClNO$) (5a)

The method described in Section 1.2 was followed. The titled compound was prepared from 4-methoxyindole (173 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).

Yellow oil; Yield: 36 % (107 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.14 (t, *J* = 8.0 Hz, 1H, Ar-H), 7.00 (d, *J* = 3.1 Hz, 1H, Ar-H), 6.97 (dt, *J* = 0.7, 8.2 Hz, 1H, Ar-H), 6.60 (dd, *J* = 0.9, 3.1 Hz, 1H, Ar-H), 6.53 (dd, *J* = 0.6, 7.8 Hz, 1H, Ar-H), 4.11 (t, *J* = 7.0 Hz, 2H, CH_2), 3.97 (s, 3H, CH_3), 3.50 (t, *J* = 6.6 Hz, 2H, CH_2), 1.91 – 1.82 (m, 2H, CH_2), 1.78 (dq, *J* = 6.7, 8.1 Hz, 2H, CH_2), 1.52 – 1.41 (m, 2H, CH_2); MS (ESI) calcd for $C_{14}H_{18}ClNO$ 251.11, found 252.10 $[M+H]^+$.

1-(5-Chloropentyl)-5-methoxy-1*H*-indole ($C_{14}H_{18}ClNO$) (5b)

The method described in Section 1.2 was followed. The titled compound was prepared from 5-methoxyindole (173 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Yellow oil; Yield: 44 % (132 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.22 (d, *J* = 8.9 Hz, 1H), 7.10 (d, *J* = 2.4 Hz, 1H), 7.06 (d, *J* = 2.1 Hz, 1H), 6.88 (dd, *J* = 2.4, 8.9 Hz, 1H), 6.41 (d, *J* = 3.0 Hz, 1H), 4.10 (t, *J* = 7.0 Hz, 2H), 3.86 (s, 3H), 3.50 (t, *J* = 6.6 Hz, 2H), 1.91 – 1.73 (m, 4H), 1.52 – 1.41 (m, 2H); MS (ESI) calcd for $C_{14}H_{18}ClNO$ 251.11, found 252.10 $[M+H]^+$.

1-(5-Chloropentyl)-6-methoxy-1*H*-indole ($C_{14}H_{18}ClNO$) (5c)

The method described in Section 1.2 was followed. The titled compound was prepared from 6-methoxyindole (173 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Yellow oil; Yield: 29 % (87 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.52 (d, *J* = 9.3 Hz, 1H), 7.00 (d, *J* = 3.0 Hz, 1H), 6.84 – 6.78 (m, 2H), 6.44 (dd, *J* = 0.8, 3.2 Hz, 1H), 4.08 (t, *J* = 7.0 Hz, 2H), 3.90 (s, 3H), 3.52 (t, *J* = 6.6 Hz, 2H), 1.92 – 1.75 (m, 4H), 1.54 – 1.43 (m, 2H); MS (ESI) calcd for $C_{14}H_{18}ClNO$ 251.11, found 252.10 $[M+H]^+$.

1-(5-Chloropentyl)-7-methoxy-1*H*-indole ($C_{14}H_{18}ClNO$) (5d)

The method described in Section 1.2 was followed. The titled compound was prepared from 7-methoxyindole (173 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Yellow oil; Yield: 67 % (203 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.22 (dd, *J* = 0.9, 7.9 Hz, 1H), 7.03 – 6.95 (m, 2H), 6.63 (dd, *J* = 0.9, 7.7 Hz, 1H), 6.43 (d, *J* = 3.0 Hz, 1H), 4.39 (t, *J* = 7.1 Hz,

2H), 3.95 (s, 3H), 3.52 (t, *J* = 6.7 Hz, 2H), 1.90 – 1.74 (m, 4H), 1.51 – 1.40 (m, 2H); MS (ESI) calcd for $C_{14}H_{18}ClNO$ 251.11, found 252.10 $[M+H]^+$.

1-(5-Chloropentyl)-4-nitro-1*H*-indole ($C_{13}H_{15}ClN_2O_2$) (6a)

The method described in Section 1.2 was followed. The titled compound was prepared from 4-nitroindole (195 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Yellow oil; Yield: 71 % (227 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.14 (dd, *J* = 0.8, 8.0 Hz, 1H, Ar-H), 7.66 (dt, *J* = 0.9, 8.1 Hz, 1H, Ar-H), 7.36 (d, *J* = 3.1 Hz, 1H, Ar-H), 7.31 – 7.26 (m, 1H, Ar-H), 7.24 (dd, *J* = 0.9, 3.1 Hz, 1H, Ar-H), 4.22 (t, *J* = 7.1 Hz, 2H, CH_2), 3.51 (t, *J* = 6.5 Hz, 2H, CH_2), 1.95 – 1.85 (m, 2H, CH_2), 1.85 – 1.75 (m, 2H, CH_2), 1.54 – 1.43 (m, 2H, CH_2); MS (ESI) calcd for $C_{13}H_{15}ClN_2O_2$ 266.08, found 267.10 $[M+H]^+$.

1-(5-Chloropentyl)-5-nitro-1*H*-indole ($C_{13}H_{15}ClN_2O_2$) (6b)

The compound was prepared from 5-nitroindole (194 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Pale yellow solid; Yield: 46 % (148 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.59 (d, *J* = 2.2 Hz, 1H), 8.11 (dd, *J* = 2.2, 9.1 Hz, 1H), 7.35 (d, *J* = 9.1 Hz, 1H), 7.25 (d, *J* = 3.2 Hz, 1H), 6.68 (dd, *J* = 0.8, 3.2 Hz, 1H), 4.19 (t, *J* = 7.1 Hz, 2H), 3.51 (t, *J* = 6.5 Hz, 2H), 1.94 – 1.85 (m, 2H), 1.80 (dt, *J* = 6.5, 14.9 Hz, 2H), 1.54 – 1.43 (m, 2H); MS (ESI) calcd for $C_{13}H_{15}ClN_2O_2$ 266.08, found 265.05 $[M-H]^-$.

1-(5-Chloropentyl)-6-nitro-1*H*-indole ($C_{13}H_{15}ClN_2O_2$) (6c)

The compound was prepared from 6-nitroindole (194 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Bright yellow oil; Yield: 68 % (219 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.31 (d, *J* = 1.7 Hz, 1H), 7.98 (dd, *J* = 2.0, 8.8 Hz, 1H), 7.63 (dd, *J* = 0.5, 8.8 Hz, 1H), 7.39 (d, *J* = 3.1 Hz, 1H), 6.59 (dd, *J* = 0.9, 3.1 Hz, 1H), 4.21 (t, *J* = 7.1 Hz, 2H), 3.51 (t, *J* = 6.5 Hz, 2H), 1.95 – 1.85 (m, 2H), 1.84 – 1.75 (m, 2H), 1.53 – 1.43 (m, 2H); MS (ESI) calcd for $C_{13}H_{15}ClN_2O_2$ 266.08, found 265.10 $[M-H]^-$
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1-(5-Chloropentyl)-7-nitro-1*H*-indole ($C_{13}H_{15}ClN_2O_2$) (6d)

The compound was prepared from 7-nitroindole (194 mg, 1.2 mmol), NaH (60 % dispersion in mineral oil; 96 mg, 2.4 mmol) and 1-bromo-5-chloropentane (189 µL, 1.44 mmol).
Bright yellow oil; Yield: 52 % (167 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.86 (dd, *J* = 1.1, 7.8 Hz, 1H), 7.80 (dd, *J* = 1.1, 7.9 Hz, 1H), 7.18 (d, *J* = 3.2 Hz, 1H), 7.12 (t, *J* = 7.8 Hz, 1H), 6.64 (d, *J* = 3.3 Hz, 1H), 4.28 – 4.21 (m, 2H), 3.46 (t, *J* = 6.6 Hz, 2H), 1.76 – 1.59 (m, 4H), 1.38 – 1.28 (m, 2H); MS (ESI) calcd for $C_{13}H_{15}ClN_2O_2$ 266.08, found 267.10 $[M+H]^+$.

1-(5-Chloropentyl)-1*H*-indole ($C_{13}H_{16}ClN$) (6e)

The compound was prepared from indole (234 mg, 2 mmol), NaH (60 % dispersion in mineral oil; 160 mg, 4 mmol) and 1-bromo-5-chloropentane (395 µL, 3 mmol).
Pale yellow oil; Yield: 76 % (338 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.67 (dt, *J* = 1.0, 7.9 Hz, 1H), 7.37 (dd, *J* = 0.9, 8.3 Hz, 1H), 7.28 – 7.21 (m, 1H), 7.18 – 7.09 (m, 2H), 6.53 (dd, *J* = 0.9, 3.1 Hz, 1H), 4.16 (t, *J* = 7.0 Hz, 2H), 3.52 (t, *J* = 6.6 Hz, 2H), 1.94 – 1.75 (m, 4H), 1.55 – 1.43 (m, 2H); MS (ESI) calcd for $C_{13}H_{16}ClN$ 221.10, found 222.10 $[M+H]^+$.

(3-(4-Fluoro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}FN\ P^+\ I^-$) (7a)

The method described in Section 1.3 was followed. Compound **7a** was prepared from **1a** (250 mg, 2.1 mmol), TPP (606 mg, 2.31 mmol), and KI (523 mg, 3.15 mmol) in ACN (15 mL).
White crystalline solid; Yield: 62 % (575 mg); Mp range: 231 – 233 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 – 7.67 (m, 3H, Ar-H), 7.64 – 7.51 (m, 12H, Ar-H), 7.45 (d, *J* = 3.2 Hz, 1H, Ar-H), 7.11 (d, *J* = 8.2 Hz, 1H, Ar-H), 7.02 (td, *J* = 5.2, 8.1 Hz, 1H, Ar-H), 6.74 (dd, *J* = 7.6, 10.3 Hz, 1H, Ar-H), 6.52 (dd, *J* = 0.8, 3.3 Hz, 1H, Ar-H), 4.66 (t, *J* = 6.1 Hz, 2H, CH_2), 3.84 – 3.72 (m, 2H, CH_2), 2.22 – 2.16 (m, 2H, CH_2); ^{13}C NMR (101 MHz, $CDCl_3$) δ 156.6 (d, *J* = 247.4 Hz), 138.5 (d, *J* = 11.5 Hz), 135.2 (d, *J* = 3.2 Hz, 3C), 133.6 (d, *J* = 10.2 Hz, 6C), 130.6 (d, *J* = 12.8 Hz, 6C), 129.4, 122.4 (d, *J* = 7.8 Hz), 117.9 (d, *J* = 22.4 Hz), 117.7 (d, *J* = 86.3 Hz, 3C), 106.2 (d, *J* = 3.5 Hz), 104.4 (d, *J* = 19.1 Hz), 97.5, 46.0 (d, *J* = 18.5 Hz), 23.4 (d, *J* = 3.8 Hz), 20.2 (d, *J* = 52.6 Hz); MS (ESI) calcd for $C_{29}H_{26}FNP$ 438.18, found 438.15 $[M-I^-]$.

(3-(5-Fluoro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}FN\ P^+\ I^-$) (7b)

The method described in Section 1.3 was employed. Compound **7b** was prepared from **1b** (394 mg, 1.9 mmol), TPP (548 mg, 2.09 mmol), and KI (473 mg, 2.85 mmol) in ACN (15 mL).
Off-white crystalline solid; Yield: 50 %; Mp range: 201 – 203 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.83 – 7.51 (m, 16H), 7.30 (d, *J* = 8.1 Hz, 2H), 6.88 (t, *J* = 9.0 Hz, 1H), 6.44 (s, 1H), 4.69 (t, *J* = 6.0 Hz, 2H), 3.80 (t, *J* = 14.4 Hz, 2H), 2.20 (sext, *J* = 6.4 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 158.0 (d, *J* = 234.6 Hz), 135.2 (d, *J* = 3.1 Hz, 3C), 133.6 (d, *J* = 10.1 Hz, 6C), 132.3, 130.9, 130.6 (d, *J* = 12.7 Hz, 6C), 129.2 (d, *J* = 10.4 Hz), 117.7 (d, *J* = 86.4 Hz, 3C), 110.8 (d, *J* = 9.8 Hz), 110.1 (d, *J* = 26.3 Hz), 105.7 (d, *J* = 23.3 Hz), 101.5 (d, *J* = 4.7 Hz), 45.9 (d, *J* = 18.3 Hz), 23.4 (d, *J* = 3.7 Hz), 20.2 (d, *J* = 52.8 Hz); MS (ESI) calcd for $C_{29}H_{26}FNP$ 438.18, found 438.15 [M-I^-].

3-(6-Fluoro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}FN\ P^+\ I^-$) (7c)

Compound **7c** was prepared, following the method described in Section 1.3, from **1c** (250 mg, 1.2 mmol), TPP (346 mg, 1.32 mmol), and KI (299 mg, 1.8 mmol) in ACN (15 mL).
Off-white crystalline solid; Yield: 80 %; Mp range: 203 – 204.6 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.76 – 7.68 (m, 3H), 7.65 – 7.48 (m, 14H), 6.88 – 6.81 (m, 2H), 6.43 (d, *J* = 3.1 Hz, 1H), 4.61 (t, *J* = 5.9 Hz, 2H), 3.83 – 3.71 (m, 2H), 2.23 – 2.09 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 159.7 (d, *J* = 237.9 Hz), 135.5 (d, *J* = 11.9 Hz), 135.2 (d, *J* = 3.0 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 130.6 (d, *J* = 12.6 Hz, 6C), 130.1 (d, *J* = 3.5 Hz), 125.4, 121.9 (d, *J* = 10.1 Hz), 117.7 (d, *J* = 86.4 Hz, 3C), 108.3 (d, *J* = 24.5 Hz), 101.6, 96.2 (d, *J* = 26.3 Hz), 45.9 (d, *J* = 18.1 Hz), 22.9 (d, *J* = 3.4 Hz), 20.1 (d, *J* = 52.8 Hz); MS (ESI) calcd for $C_{29}H_{26}FNP$ 438.18, found 438.15 [M-I^-].

(3-(7-Fluoro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}FN\ P^+\ I^-$) (7d)

The method described in Section 1.3 was followed. Compound **7d** was prepared from **1d** (365 mg, 1.7 mmol), TPP (490 mg, 1.87 mmol), and KI (423 mg, 2.55 mmol) in ACN (15 mL).
White crystalline solid; Yield: 42 %; Mp range: 225 – 227 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.72 (ddt, *J* = 1.8, 4.9, 8.9 Hz, 3H), 7.67 (d, *J* = 3.1 Hz, 1H), 7.64 – 7.51 (m, 12H), 7.36 (d, *J* = 7.9 Hz, 1H), 6.96 (td, *J* = 4.5, 7.9 Hz, 1H), 6.73 (dd, *J* = 7.7, 12.8 Hz, 1H), 6.45 (t, *J* = 2.8 Hz, 1H), 4.75 (t, *J* = 6.2 Hz, 2H), 3.80 – 3.68 (m, 2H), 2.19 (sext, *J* = 6.8 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 150.0 (d, *J* = 242.4 Hz), 135.2 (d, *J* = 3.1 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 132.1, 130.6 (d, *J* = 12.6 Hz, 6C), 128.6 (d, *J* = 12.1 Hz), 123.3 (d, *J* = 10.0 Hz), 120.0 (d, *J* = 6.7 Hz), 117.9 (d, *J* = 86.4 Hz, 3C), 117.1 (d, *J* = 3.4 Hz), 107.0 (d, *J* = 18.1 Hz), 102.0 (d, *J* = 1.5 Hz),

48.2 (dd, *J* = 3.4, 18.1 Hz), 24.6 (t, *J* = 3.7 Hz), 20.0 (d, *J* = 52.7 Hz); MS (ESI) calcd for $C_{29}H_{26}FNP$ 438.18, found 438.15 [M-I^-].

(3-(4-Methoxy-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{30}H_{29}NO\ P^+\ I^-$) (8a)

The method described in Section 1.3 was employed. Compound **8a** was prepared from **2a** (298 mg, 1.33 mmol), TPP (384 mg, 1.46 mmol), and KI (332 mg, 2 mmol) in ACN (15 mL).
Off-white crystalline solid; Yield: 40 %; Mp range: 187 – 189 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.75 – 7.65 (m, 3H), 7.62 – 7.49 (m, 12H), 7.34 (d, *J* = 3.1 Hz, 1H), 7.05 (t, *J* = 8.0 Hz, 1H), 6.91 (d, *J* = 8.3 Hz, 1H), 6.59 – 6.53 (dd, *J* = 0.6, 3.1 Hz, 1H), 6.51 (d, *J* = 7.7 Hz, 1H), 4.60 (t, *J* = 5.7 Hz, 2H), 3.95 (s, 3H), 3.78 – 3.61 (m, 2H), 2.26 – 2.07 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 153.5, 137.1, 135.1 (d, *J* = 2.9 Hz, 3C), 133.5 (d, *J* = 10.1 Hz, 6C), 130.5 (d, *J* = 12.6 Hz, 6C), 127.8, 122.7, 119.3, 117.6 (d, *J* = 86.5 Hz, 3C), 103.3, 99.5, 98.7, 55.4, 45.8 (d, *J* = 18.1 Hz), 23.3 (d, *J* = 3.5 Hz), 19.9 (d, *J* = 52.7 Hz); MS (ESI) calcd for $C_{30}H_{29}NOP$ 450.20, found 450.15 [M-I^-].

(3-(5-Methoxy-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{30}H_{29}NO\ P^+\ I^-$) (8b)

Following the method described in Section 1.3, **8b** was prepared from **2b** (450 mg, 2 mmol), TPP (577 mg, 2.2 mmol), and KI (498 mg, 3 mmol) in ACN (15 mL).
Off-white crystalline solid; Yield: 28 %; Mp: 205 – 206 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.77 – 7.66 (m, 3H), 7.64 – 7.51 (m, 12H), 7.44 (d, *J* = 3.1 Hz, 1H), 7.17 (d, *J* = 8.8 Hz, 1H), 7.08 (d, *J* = 2.4 Hz, 1H), 6.78 (dd, *J* = 2.4, 8.9 Hz, 1H), 6.38 (dd, *J* = 0.8, 3.0 Hz, 1H), 4.60 (t, *J* = 5.8 Hz, 2H), 3.84 (s, 3H), 3.79 – 3.66 (m, 2H), 2.24 – 2.09 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 154.2, 135.1 (d, *J* = 2.9 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 131.0, 130.6 (d, *J* = 12.5 Hz, 6C), 130.0, 129.4, 117.7 (d, *J* = 86.5 Hz, 3C), 112.1, 110.7, 102.8, 101.1, 56.0, 45.9 (d, *J* = 18.0 Hz), 23.4 (d, *J* = 3.6 Hz), 20.1 (d, *J* = 52.8 Hz); MS (ESI) calcd for $C_{30}H_{29}NOP$ 450.20, found 450.15 [M-I^-].

(3-(6-Methoxy-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{30}H_{29}NO\ P^+\ I^-$) (8c)

Following the method described in Section 1.3, **8c** was prepared from **2c** (377 mg, 1.7 mmol), TPP (490 mg, 1.87 mmol), and KI (423 mg, 2.55 mmol) in ACN (15 mL).

Off-white crystalline solid; Yield: 73 %; Mp: 225 – 226 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 – 7.66 (m, 3H), 7.65 – 7.50 (m, 12H), 7.45 (d, *J* = 8.6 Hz, 1H), 7.23 (d, *J* = 3.2 Hz, 1H), 6.89 (d, *J* = 2.2 Hz, 1H), 6.75 (dd, *J* = 2.2, 8.6 Hz, 1H), 6.38 (dd, *J* = 0.8, 3.2 Hz, 1H), 4.60 (t, *J* = 6.1 Hz, 2H), 3.83 (s, 3H), 3.82 – 3.74 (m, 2H), 2.23 – 2.10 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 156.5, 136.6, 135.1 (d, *J* = 2.9 Hz, 3C), 133.7 (d, *J* = 10.0 Hz, 6C), 130.5 (d, *J* = 12.5 Hz, 6C), 127.8, 123.0, 121.6, 117.8 (d, *J* = 85.2 Hz, 3C), 110.1, 101.5, 93.6, 56.7, 45.6 (d, *J* = 18.6 Hz), 23.3 (d, *J* = 2.9 Hz), 20.2 (d, *J* = 51.7 Hz); MS (ESI) calcd for $C_{30}H_{29}NOP$ 450.20, found 450.15 [M-I^-].

(3-(7-Methoxy-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{30}H_{29}NO\ P^+\ I^-$) (8d)

Compound **8d** was prepared from **2d** (485 mg, 2.17 mmol), TPP (626 mg, 2.39 mmol), and KI (540 mg, 3.26 mmol) in ACN (15 mL), following the method described in Section 1.3.
White crystalline solid; Yield: 46 %; Mp: 224 – 226 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.77 – 7.67 (m, 3H), 7.63 – 7.50 (m, 12H), 7.42 (d, *J* = 3.1 Hz, 1H), 7.19 (dd, *J* = 0.7, 8.0 Hz, 1H), 6.97 (t, *J* = 7.8 Hz, 1H), 6.51 (d, *J* = 7.6 Hz, 1H), 6.38 (d, *J* = 3.1 Hz, 1H), 4.74 (t, *J* = 6.0 Hz, 2H), 3.73 (s, 3H), 3.71 – 3.58 (m, 2H), 2.24 – 2.10 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 147.3, 135.1 (d, *J* = 3.0 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 131.6, 130.9, 130.5 (d, *J* = 12.6 Hz, 6C), 125.3, 120.3, 117.9 (d, *J* = 86.3 Hz, 3C), 114.0, 102.5, 101.4, 55.5, 48.7 (d, *J* = 18.4 Hz), 25.2 (d, *J* = 3.6 Hz), 19.9 (d, *J* = 52.6 Hz); MS (ESI) calcd for $C_{30}H_{29}NOP$ 450.20, found 450.15 [M-I^-].

(3-(4-Nitro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}N_2O_2\ P^+\ I^-$) (9a)

The method described in Section 1.3 was followed. Compound **9a** was prepared from **3a** (180 mg, 0.75 mmol), TPP (149 mg, 0.9 mmol), and KI (207 mg, 0.79 mmol) in ACN (10 mL).
Yellow solid; Yield: 72 %; Mp: charring (> 190 ˚C); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.05 (d, *J* = 7.8 Hz, 1H), 7.97 (d, *J* = 8.0 Hz, 1H), 7.73 – 7.62 (m, 10H), 7.61 – 7.52 (m, 6H), 7.20 (t, *J* = 8.0 Hz, 1H), 7.12 (d, *J* = 3.0 Hz, 1H), 4.84 (t, *J* = 6.7 Hz, 2H), 3.98 – 3.83 (m, 2H), 2.25 – 2.10 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 139.9, 137.9, 135.1 (d, *J* = 3.0 Hz, 3C), 133.5 (d, *J* = 10.1 Hz, 6C), 133.1, 130.4 (d, *J* = 12.6 Hz, 6C), 122.3, 120.5, 117.4, 117.3 (d, *J* = 86.5 Hz, 3C), 117.2, 101.8, 45.9 (d, *J* = 19.6 Hz), 23.7 (d, *J* = 3.3 Hz), 20.1 (d, *J* = 52.8 Hz); MS (ESI) calc'd for $C_{29}H_{26}N_2O_2P$ 465.17, found 465.15 [M-I^-].

(3-(5-Nitro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}N_2O_2\ P^+\ I^-$) (9b)

Following the method described in Section 1.3, **9b** was prepared from **3b** (95 mg, 0.4 mmol), TPP (129 mg, 0.49 mmol), and KI (94 mg, 0.56 mmol) in ACN (5 mL).

Pale yellow solid; Yield: 49 %; Mp: 216 – 218 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.49 (d, *J* = 2.2 Hz, 1H), 7.96 (dd, *J* = 2.3, 9.0 Hz, 1H), 7.75 – 7.63 (m, 10H), 7.62 – 7.53 (m, 6H), 7.49 (d, *J* = 9.1 Hz, 1H), 6.61 (d, *J* = 3.0 Hz, 1H), 4.78 (t, *J* = 6.7 Hz, 2H), 3.94 – 3.82 (m, 2H), 2.18 (sext, *J* = 7.0 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 141.7, 138.7, 135.3 (d, *J* = 2.9 Hz, 3C), 133.7 (d, *J* = 10.2 Hz, 6C), 132.5, 130.7 (d, *J* = 12.6 Hz, 6C), 127.9, 118.0 (d, *J* = 86.0 Hz, 3C), 117.4, 117.2, 110.2, 104.3, 46.3 (d, *J* = 19.3 Hz), 23.7 (d, *J* = 3.3 Hz), 20.4 (d, *J* = 52.8 Hz); MS (ESI) calcd for $C_{29}H_{26}N_2O_2P$ 465.17, found 465.20 [M-I^-].

(3-(6-Nitro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}N_2O_2\ P^+\ I^-$) (9c)

Following the method described in Section 1.3, **9c** was prepared from **3c** (114 mg, 0.47 mmol), TPP (129 mg, 0.49 mmol), and KI (94 mg, 0.56 mmol) in ACN (5 mL).

Yellow solid; Yield: 77 %; Mp: charring (> 200 ˚C); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.08 – 8.01 (m, 2H), 7.92 (dd, *J* = 1.9, 8.7 Hz, 1H), 7.78 – 7.52 (m, 16H), 6.53 (d, *J* = 2.8 Hz, 1H), 4.81 (t, *J* = 6.5 Hz, 2H), 3.86 – 3.72 (m, 2H), 2.21 (sext, *J* = 7.0 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 142.7, 136.2, 135.3 (d, *J* = 3.0 Hz, 3C), 134.0, 133.9, 133.6 (d, *J* = 10.1 Hz, 6C), 130.7 (d, *J* = 12.6 Hz, 6C), 121.0, 117.6 (d, *J* = 86.5 Hz, 3C), 115.0, 106.3, 102.5, 46.2 (d, *J* = 18.4 Hz), 23.2 (d, *J* = 3.4 Hz), 20.4 (d, *J* = 52.9 Hz); MS (ESI) calcd for $C_{29}H_{26}N_2O_2P$ 465.17, found 465.25 [M-I^-].

(3-(7-Nitro-1*H*-indol-1-yl) propyl) triphenylphosphonium iodide ($C_{29}H_{26}N_2O_2\ P^+\ I^-$) (9d)

Compound **9d** was prepared from **3d** (115 mg, 0.48 mmol), TPP (132 mg, 0.5 mmol), and KI (96 mg, 0.58 mmol) in ACN (5 mL), following the method described in Section 1.3.

Yellow solid; Yield: 45 %; Mp: charring (> 190 ˚C); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.88 – 7.80 (m, 2H), 7.79 – 7.55 (m, 16H), 7.10 (t, *J* = 7.8 Hz, 1H), 6.59 (d, *J* = 3.2 Hz, 1H), 4.81 (t, *J* = 6.9 Hz, 2H), 3.67 – 3.54 (m, 2H), 2.04 – 1.90 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 136.5, 135.3 (d, *J* = 3.0 Hz, 3C), 135.0, 134.2, 133.6 (d, *J* = 10.1 Hz, 6C), 130.7 (d, *J* = 12.6 Hz, 6C), 127.7, 125.7, 119.9, 118.7, 117.6 (d, *J* = 86.4 Hz, 3C), 103.1, 49.4 (d, *J* = 20.4 Hz), 24.1 (d, *J* = 3.4 Hz), 20.2 (d, *J* = 52.9 Hz); MS (ESI) calcd for $C_{29}H_{26}N_2O_2P$ 465.17, found 465.20 [M-I^-].

(5-(4-Fluoro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}FN\ P^+\ I^-$) (10a)

Following the method described in Section 1.3, **10a** was prepared from **4a** (424 mg, 1.77 mmol), TPP (487 mg, 1.86 mmol), and KI (441 mg, 2.66 mmol) in ACN (15 mL).
Yellow semi-solid; Yield: 42 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.80 – 7.58 (m, 15H), 7.08 – 6.97 (m, 3H), 6.66 (ddd, *J* = 1.0, 7.4, 10.4 Hz, 1H), 6.37 (d, *J* = 3.2 Hz, 1H), 4.09 (t, *J* = 6.7 Hz, 2H), 3.56 – 3.45 (m, 2H), 1.82 (m, 2H), 1.72 – 1.60 (m, 2H), 1.56 – 1.41 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 156.4 (d, *J* = 246.7 Hz), 138.6 (d, *J* = 11.6 Hz), 135.2 (d, *J* = 3.1 Hz, 3C), 133.6 (d, *J* = 10.1 Hz, 6C), 130.6 (d, *J* = 12.6 Hz, 6C), 128.3, 121.8 (d, *J* = 7.8 Hz), 118.0 (d, *J* = 85.9 Hz, 3C), 117.5 (d, *J* = 22.4 Hz), 105.9 (d, *J* = 3.4 Hz), 103.8 (d, *J* = 19.1 Hz), 96.9, 46.5, 29.5, 27.8 (d, *J* = 16.4 Hz), 23.0 (d, *J* = 50.4 Hz), 22.3 (d, *J* = 3.7 Hz); MS (ESI) calcd for $C_{31}H_{30}FNP$ 466.21, found 466.20 [M-I^-].

(5-(5-Fluoro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}FN\ P^+\ I^-$) (10b)

The method described in Section 1.3 was employed. Compound **10b** was prepared from **4b** (180 mg, 0.75 mmol), TPP (207 mg, 0.79 mmol), and KI (149 mg, 0.9 mmol) in ACN (10 mL).
Yellow semi-solid; Yield: 80 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.75 – 7.54 (m, 15H), 7.04 – 6.92 (m, 3H), 6.63 (ddd, *J* = 1.2, 7.3, 10.3 Hz, 1H), 6.35 – 6.31 (m, 1H), 4.06 (t, *J* = 6.6 Hz, 2H), 3.58 – 3.47 (m, 2H), 1.80 (quint, *J* = 6.7 Hz, 2H), 1.67 – 1.58 (m, 2H), 1.50 – 1.36 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 158.7 (d, *J* = 233.8 Hz), 135.2 (d, *J* = 3.1 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 132.5, 130.6 (d, *J* = 12.6 Hz, 6C), 129.9, 118.0 (d, *J* = 86.1 Hz, 3C), 110.3 (d, *J* = 9.8 Hz), 109.7 (d, *J* = 26.3 Hz), 105.4 (d, *J* = 23.1 Hz), 100.8 (d, *J* = 4.8 Hz), 96.9, 46.4, 29.6, 27.9 (d, *J* = 16.1 Hz), 23.0 (d, *J* = 50.6 Hz), 22.3 (d, *J* = 4.2 Hz; MS (ESI) calcd for $C_{31}H_{30}FNP$ 466.21, found 466.20 [M-I^-].

(5-(6-Fluoro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}FN\ P^+\ I^-$) (10c)

The method described in Section 1.3 was followed. Compound **10c** was prepared from **4c** (186 mg, 0.78 mmol), TPP (215 mg, 0.82 mmol), and KI (155 mg, 0.94 mmol) in ACN (10 mL).
Yellowish-red semi-solid; Yield: 82 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.84 – 7.61 (m, 15H), 7.45 (dd, *J* = 5.3, 8.6 Hz, 1H), 7.09 (d, *J* = 3.2 Hz, 1H), 6.91 (dd, *J* = 2.3, 10.0 Hz, 1H), 6.80 (ddd, *J* = 2.3, 8.6, 9.6 Hz, 1H), 6.34 (dd, *J* = 0.8, 3.1 Hz, 1H), 4.06 (t, *J* = 6.7 Hz, 2H), 3.71 – 3.58 (m, 2H), 1.91 – 1.79 (m, 2H), 1.71 – 1.63 (m, 6H), 1.60 – 1.46 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 159.6 (d, *J* = 237.1 Hz), 135.9 (d, *J* = 12.0 Hz), 135.2 (d, *J* = 3.0 Hz, 3C), 133.7 (d, *J* = 10.0 Hz,

6C), 130.6 (d, *J* = 12.6 Hz, 6C), 128.8 (d, *J* = 3.5 Hz), 125.0, 121.6 (d, *J* = 10.2 Hz), 118.0 (d, *J* = 86.0 Hz, 3C), 107.9 (d, *J* = 24.6 Hz), 101.1, 95.9 (d, *J* = 26.2 Hz), 46.2, 29.4, 27.8 (d, *J* = 16.0 Hz), 23.1 (d, *J* = 50.4 Hz), 22.3 (d, *J* = 4.2 Hz); MS (ESI) calcd for $C_{31}H_{30}FNP$ 466.21, found 466.20 [M-I^-].

(5-(7-Fluoro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}FN\ P^+\ I^-$) (10d)

Compound **10d** was prepared from **4d** (260 mg, 1.08 mmol), TPP (297 mg, 1.13 mmol), and KI (215 mg, 1.3 mmol) in ACN (12 mL), as described in Section 1.3.
Yellowish-red semi-solid; Yield: 40 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.57 (m, 15H), 7.24 (d, *J* = 7.9 Hz, 1H), 7.05 (d, *J* = 3.2 Hz, 1H), 6.86 (td, *J* = 4.5, 7.8 Hz, 1H), 6.71 (dd, *J* = 7.5, 13.1 Hz, 1H), 6.30 (t, *J* = 2.7 Hz, 1H), 4.19 (t, *J* = 6.8 Hz, 2H), 3.57 – 3.41 (m, 2H), 1.79 (quint, *J* = 6.9 Hz, 2H), 1.69 – 1.57 (m, 2H), 1.51 (sext, *J* = 7.5 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 150.1 (d, *J* = 243.1 Hz), 135.2 (d, *J* = 3.1 Hz, 3C), 133.9 (d, *J* = 10.2 Hz), 133.7 (d, *J* = 10.0 Hz, 6C), 130.6 (d, *J* = 12.5 Hz, 6C), 130.2, 123.7 (d, *J* = 9.6 Hz), 119.4 (d, *J* = 6.7 Hz), 118.0 (d, *J* = 86.0 Hz, 3C), 116.7 (d, *J* = 3.3 Hz), 106.8 (d, *J* = 18.1 Hz), 101.7 (d, *J* = 1.4 Hz), 48.6 (d, *J* = 4.7 Hz), 30.9, 27.5 (d, *J* = 16.1 Hz), 23.1 (d, *J* = 50.8 Hz), 22.3 (d, *J* = 4.4 Hz); MS (ESI) calcd for $C_{31}H_{30}FNP$ 466.21, found 466.20 [M-I^-].

(5-(4-Methoxy-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{32}H_{33}NO\ P^+\ I^-$) (11a)

The method described in Section 1.3 was followed. Compound **11a** was prepared from **5a** (107 mg, 0.43 mmol), TPP (118 mg, 0.45 mmol), and KI (86 mg, 0.52 mmol) in ACN (10 mL).
Bright yellowish-red semi-solid; Yield: 72 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.84 – 7.60 (m, 15H), 7.05 (t, *J* = 8.0 Hz, 1H), 6.98 – 6.86 (m, 2H), 6.50 – 6.42 (m, 2H), 4.10 (t, *J* = 6.5 Hz, 2H), 3.92 (s, 3H), 3.66 – 3.54 (m, 2H), 1.85 (quint, *J* = 6.6 Hz, 2H), 1.69 – 1.61 (m, 2H), 1.50 (sext, *J* = 8.5 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 153.3, 137.3, 135.1 (d, *J* = 3.0 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 130.6 (d, *J* = 12.6 Hz, 6C), 126.6, 122.2, 119.0, 117.9 (d, *J* = 86.0 Hz, 3C), 103.1, 99.1, 98.2, 55.3, 46.3, 29.5, 27.8 (d, *J* = 15.9 Hz), 23.0 (d, *J* = 50.5 Hz), 22.2 (d, *J* = 4.4 Hz); MS (ESI) calcd for $C_{32}H_{33}NOP$ 478.23, found 478.25 [M-I^-].

(5-(5-Methoxy-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{32}H_{33}NO\ P^+\ I^-$) (11b)

The method described in Section 1.3 was followed. Compound **11b** was prepared from **5b** (113 mg, 0.45 mmol), TPP (124 mg, 0.47 mmol), and KI (90 mg, 0.54 mmol) in ACN (10 mL).
Bright yellow semi-solid; Yield: 52 %;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 – 7.58 (m, 15H), 7.15 (d, *J* = 8.8 Hz, 1H), 7.02 (d, *J* = 11.8 Hz, 2H), 6.84 – 6.72 (m, 1H), 6.24 (s, 1H), 4.08 (t, *J* = 6.6 Hz, 2H), 3.81 (s, 3H), 3.65 – 3.41 (m, 2H), 1.80 – 1.62 (m, 4H), 1.55 – 1.41 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 153.9, 135.2 (d, *J* = 3.0 Hz, 3C), 133.7 (d, *J* = 10.0 Hz, 6C), 131.3, 130.6 (d, *J* = 12.6 Hz, 6C), 129.0, 128.9, 118.1 (d, *J* = 86.2 Hz, 3C), 111.7, 110.3, 102.7, 100.5, 56.0, 46.3, 29.7, 27.9 (d, *J* = 16.3 Hz), 23.1 (d, *J* = 50.5 Hz), 22.4 (d, *J* = 4.3 Hz); MS (ESI) calcd for $C_{32}H_{33}NOP$ 478.23, found 478.25 [M-I^-].

(5-(6-Methoxy-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{32}H_{33}NO\ P^+\ I^-$) (11c)

The method described in Section 1.3 was followed. Compound **11c** was prepared from **5c** (87 mg, 0.34 mmol), TPP (95 mg, 0.36 mmol), and KI (68 mg, 0.41 mmol) in ACN (8 mL).
Dark-brown semi-solid; Yield: 50 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.88 – 7.58 (m, 15H), 7.41 (d, *J* = 8.6 Hz, 1H), 6.94 (d, *J* = 2.0 Hz, 1H), 6.78 (d, *J* = 2.1 Hz, 1H), 6.73 (dd, *J* = 2.2, 8.6 Hz, 1H), 6.28 (d, *J* = 3.1 Hz, 1H), 4.09 (t, *J* = 6.6 Hz, 2H), 3.87 (s, 3H), 3.68 – 3.56 (m, 2H), 1.87 (quint, *J* = 6.6 Hz, 2H), 1.77 – 1.68 (m, 2H), 1.59 – 1.43 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 156.2, 136.6, 135.2 (d, *J* = 3.1 Hz, 3C), 133.8 (d, *J* = 10.0 Hz, 6C), 130.7 (d, *J* = 12.5 Hz, 6C), 127.2, 122.9, 121.4, 118.1 (d, *J* = 85.9 Hz, 3C), 109.4, 100.9, 93.3, 56.2, 46.2, 29.5, 28.0 (d, *J* = 16.0 Hz), 23.2 (d, *J* = 50.6 Hz), 22.5 (d, *J* = 4.3 Hz); MS (ESI) calcd for $C_{32}H_{33}NOP$ 478.23, found 478.25 [M-I^-].

(5-(7-Methoxy-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{32}H_{33}NO\ P^+\ I^-$) (11d)

The method described in Section 1.3 was followed. Compound **11d** was prepared from **5d** (185 mg, 0.73 mmol), TPP (201 mg, 0.77 mmol), and KI (145 mg, 0.88 mmol) in ACN (10 mL).
Off-white crystalline solid; Yield: 42 %; Mp: 58 – 59 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 – 7.57 (m, 15H), 7.13 (dd, *J* = 0.8, 7.9 Hz, 1H), 6.99 – 6.89 (m, 2H), 6.56 (d, *J* = 7.5 Hz, 1H), 6.27 (s, 1H), 4.35 (t, *J* = 6.5 Hz, 2H), 3.87 (s, 3H), 3.69 – 3.56 (m, 2H), 1.87 – 1.74 (m, 2H), 1.72 – 1.59 (m, 2H), 1.57 – 1.41 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 147.5, 135.2 (d, *J* = 3.0 Hz, 3C), 133.7 (d, *J* = 10.0 Hz, 6C), 131.0, 130.6 (d, *J* = 12.6 Hz, 6C), 129.4, 125.5, 119.7, 118.0 (d, *J* = 86.0 Hz, 3C), 113.7, 102.3, 101.0, 55.5, 49.0, 31.6, 27.7 (d, *J* = 15.9 Hz), 23.1 (d, *J* = 50.3 Hz),

22.4 (d, *J* = 4.4 Hz); MS (ESI) calc'd for $C_{32}H_{33}NOP$ 478.23, found 478.25 [M-I^-]; HRMS (ESI): Calcd for $C_{32}H_{33}NO\ P$ [M-I^-] 478.2294, found 478.2292.

(5-(4-Nitro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}N_2O_2\ P^+\ I^-$) (12a)

The method described in Section 1.3 was followed. Compound **12a** was prepared from **6a** (210 mg, 0.79 mmol), TPP (218 mg, 0.83 mmol), and KI (157 mg, 0.95 mmol) in ACN (12 mL).
Yellowish red solid; Yield: 90 %; Mp: 44 – 47 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.07 – 8.03 (m, 1H), 7.82 – 7.60 (m, 16H), 7.42 (d, *J* = 3.2 Hz, 1H), 7.22 (t, *J* = 8.1 Hz, 1H), 7.08 – 7.06 (m, 1H), 4.26 (t, *J* = 6.7 Hz, 2H), 3.70 – 3.57 (m, 2H), 1.92 (quint, *J* = 6.8 Hz, 2H), 1.81 – 1.71 (m, 2H), 1.53 (sext, *J* = 7.9 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 139.9, 138.0, 135.1 (d, *J* = 3.1 Hz, 3C), 133.5 (d, *J* = 10.1 Hz, 6C), 132.9, 130.5 (d, *J* = 12.6 Hz, 6C), 122.3, 120.2, 117.7 (d, *J* = 86.2 Hz, 3C), 117.1, 116.9, 101.3, 46.5, 29.6, 27.7 (d, *J* = 16.4 Hz), 22.9 (d, *J* = 50.8 Hz), 22.1 (d, *J* = 4.2 Hz); MS (ESI) calc'd for $C_{31}H_{30}N_2O_2P$ 493.20, found 493.25 [M-I^-]; HRMS (ESI): Calcd for $C_{31}H_{30}N_2O_2P$ [M-I^-] 493.2039, found 493.2037.

(5-(5-Nitro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}N_2O_2\ P^+\ I^-$) (12b)

Following the method described in Section 1.3, **12b** was prepared from **6b** (100 mg, 0.37 mmol), TPP (102 mg, 0.39 mmol), and KI (74 mg, 0.44 mmol) in ACN (5 mL).
Dark brown solid; Yield: 21 %; Mp: 85 – 87 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.39 (d, *J* = 2.2 Hz, 1H), 7.92 (dd, *J* = 2.3, 9.1 Hz, 1H), 7.79 – 7.58 (m, 15H), 7.37 (d, *J* = 9.1 Hz, 1H), 7.33 (d, *J* = 3.2 Hz, 1H), 6.52 (d, *J* = 3.2 Hz, 1H), 4.18 (t, *J* = 6.9 Hz, 2H), 3.60 – 3.47 (m, 2H), 1.89 (quint, *J* = 7.0 Hz, 2H), 1.77 – 1.65 (m, 2H), 1.57 (sext, *J* = 7.8 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 141.3, 138.8, 135.2 (d, *J* = 3.0 Hz, 3C), 133.7 (d, *J* = 10.1 Hz, 6C), 131.8, 130.7 (d, *J* = 12.6 Hz, 6C), 127.6, 118.0 (d, *J* = 86.1 Hz, 3C), 117.9, 117.0, 109.8, 103.8, 46.7, 29.7, 27.8 (d, *J* = 16.5 Hz), 22.9 (d, *J* = 50.8 Hz), 22.3 (d, *J* = 4.1 Hz); MS (ESI) calcd for $C_{31}H_{30}N_2O_2P$ 493.20, found 493.20 [M-I^-].

(5-(6-Nitro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}N_2O_2\ P^+\ I^-$) (12c)

Following the method described in Section 1.3, **12c** was prepared from **6c** (217 mg, 0.81 mmol), TPP (223 mg, 0.85 mmol), and KI (161 mg, 0.97 mmol) in ACN (10 mL).

Yellow solid; Yield: 23 %; Mp: 46 – 48 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.19 (d, *J* = 2.0 Hz, 1H), 7.91 (dd, *J* = 2.0, 8.8 Hz, 1H), 7.82 – 7.70 (m, 9H), 7.70 – 7.63 (m, 6H), 7.61 – 7.54 (m, 2H), 6.50 (dd, *J* = 0.8, 3.0 Hz, 1H), 4.23 (t, *J* = 7.0 Hz, 2H), 3.72 – 3.60 (m, 2H), 1.93 (quint, *J* = 7.0 Hz, 2H), 1.80 – 1.68 (m, 2H), 1.62 (sext, *J* = 7.8 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 142.4, 135.2 (d, *J* = 3.0 Hz, 3C), 134.6, 134.2, 133.6 (d, *J* = 10.0 Hz, 6C), 133.4, 130.6 (d, *J* = 12.6 Hz, 6C), 120.6, 117.8 (d, *J* = 86.2 Hz, 3C), 114.5, 106.3, 102.1, 46.4, 29.6, 27.6 (d, *J* = 16.4 Hz), 22.9 (d, *J* = 50.7 Hz), 22.2 (d, *J* = 4.2 Hz); MS (ESI) calcd for $C_{31}H_{30}N_2O_2P$ 493.20, found 493.20 [M-I^-].

(5-(7-Nitro-1*H*-indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{30}N_2O_2\ P^+\ I^-$) (12d)

Compound **12d** was prepared from **6d** (162 mg, 0.61 mmol), TPP (168 mg, 0.64 mmol) and KI (121 mg, 0.73 mmol) in ACN (8 mL), following the method described in Section 1.3.
Yellow solid; Yield: 25 %; Mp: 45 – 48 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.59 (m, 17H), 7.29 (d, *J* = 3.2 Hz, 1H), 7.03 (t, *J* = 7.8 Hz, 1H), 6.50 (d, *J* = 3.2 Hz, 1H), 4.17 (t, *J* = 6.9 Hz, 2H), 3.52 – 3.38 (m, 2H), 1.64 – 1.46 (m, 6H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 136.6, 135.2 (d, *J* = 3.0 Hz, 3C), 133.8, 133.6 (d, *J* = 10.1 Hz, 6C), 130.6 (d, *J* = 12.6 Hz, 6C), 127.2, 125.8, 119.5, 118.3, 117.8 (d, *J* = 86.0 Hz, 3C), 102.8, 49.5, 29.8, 27.2 (d, *J* = 16.3 Hz), 22.8 (d, *J* = 51.0 Hz), 21.9 (d, *J* = 4.3 Hz); MS (ESI) calcd for $C_{31}H_{30}N_2O_2P$ 493.20, found 493.20 [M-I^-].

(5-(1*H*-Indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{31}NP^+\ I^-$) (12e)

Compound **12e** was prepared from **6e** (301 mg, 1.36 mmol), TPP (392 mg, 1.5 mmol) and KI (339 mg, 2.04 mmol) in ACN (10 mL), following the method described in Section 1.3.
Colourless gel; Yield: 35 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.77 – 7.68 (m, 3H), 7.67 – 7.56 (m, 12H), 7.48 (dt, *J* = 1.0, 7.9 Hz, 1H), 7.22 (dd, *J* = 0.9, 8.2 Hz, 1H), 7.11 – 7.01 (m, 2H), 7.00 – 6.94 (m, 1H), 6.27 (d, *J* = 3.0 Hz, 1H), 4.05 (t, *J* = 6.7 Hz, 2H), 3.48 – 3.36 (m, 2H), 1.80 (quint, *J* = 6.8 Hz, 2H), 1.68 – 1.56 (m, 2H), 1.45 (h, *J* = 8.5 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 135.6, 135.0 (d, *J* = 3.0 Hz, 3C), 133.5 (d, *J* = 10.0 Hz, 6C), 130.5 (d, *J* = 12.5 Hz, 6C), 128.4, 128.1, 121.2, 120.7, 119.0, 117.7 (d, *J* = 86.1 Hz, 3C), 109.4, 100.7, 45.9, 29.4, 27.8 (d, *J* = 16.0 Hz), 22.9 (d, *J* = 50.6 Hz), 22.1 (d, *J* = 4.2 Hz); MS (ESI) calcd for $C_{31}H_{31}NP$ 448.22, found 448.25 [M-I^-].

Propyltriphenylphosphonium iodide ($C_{21}H_{22}P^+\ I^-$) (13)

13 was prepared from 1-bromopropane (109 µL, 1.2 mmol), TPP (346 mg, 1.32 mmol), and KI (299 mg, 1.8 mmol) in ACN (10 mL) as described in Section 1.3.

White crystalline solid; Yield: 74%; Mp: 208.3 – 210.5 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.8–7.75 (m, 9H, Ar-H), 7.74 – 7.66 (m, 6H, Ar-H), 3.70 – 3.60 (m, 2H, CH_2), 1.77 – 1.67 (m, 2H, CH_2), 1.24 (td, *J* = 7.3, 1.8 Hz, 3H, CH_3); ^{13}C NMR (101 MHz, $CDCl_3$) δ 134.9 (d, *J* = 3.1 Hz, 3C), 133.3 (d, *J* = 10.1 Hz, 6C), 130.4 (d, *J* = 12.6 Hz, 6C), 117.7 (d, *J* = 85.9 Hz, 3C), 24.5 (d, *J* = 50.5 Hz), 16.2 (d, *J* = 4.1 Hz), 15.1 (d, *J* = 17.2 Hz); MS (ESI) calcd for $C_{21}H_{22}P$ 305.15, found 305.00 [M-I^-].

Pentyltriphenylphosphonium iodide ($C_{23}H_{26}P^+ I^-$) (14)

14 was prepared from 1-bromopentane (124 µL, 1 mmol), TPP (288.5 mg, 1.1 mmol), and KI (249 mg, 1.5 mmol) in ACN (10 mL) as described in Section 1.3.

White crystalline solid; Yield: 50% (168 mg); Mp: 174 – 176 ˚C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 – 7.76 (m, 9H, Ar-H), 7.75 – 7.67 (m, 6H, Ar-H), 3.61 (ddd, *J* = 4.9, 7.9, 15.2 Hz, 2H, CH_2), 1.70 – 1.55 (m, 4H, 2[CH_2]), 1.31 (h, *J* = 7.3 Hz, 2H, CH_2), 0.82 (t, *J* = 7.3 Hz, 3H, CH_3); ^{13}C NMR (101 MHz, $CDCl_3$) δ 135.2 (d, *J* = 3.2 Hz, 3C), 133.6 (d, *J* = 10.1 Hz, 6C), 130.6 (d, *J* = 12.6 Hz, 6C), 118.0 (d, *J* = 86.0 Hz, 3C), 32.4 (d, *J* = 15.5 Hz), 23.1 (d, *J* = 50.2 Hz), 22.2 (d, *J* = 4.4 Hz), 22.1, 13.6; MS (ESI) calcd for $C_{23}H_{26}P$ 333.18, found 333.15 [M-I^-].

5-Fluoro-1-propyl-1*H*-indole ($C_{11}H_{12}FN$) (15)

The method described in Section 1.2 was followed. 5-Fluoroindole (135 mg, 1 mmol) was reacted with NaH (60 % dispersion in mineral oil; 80 mg, 2 mmol) in anhydrous DMF (5 mL) in an ice bath for 20 minutes. 1-Bromopropane (109 µL, 1.2 mmol) in DMF (1 mL) was then added slowly to the stirring reaction mixture and allowed to warm to room temperature.

Yellow oil; Yield: 73 % (130 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.20 – 7.11 (m, 2H, Ar-H), 7.03 (d, *J* = 3.1 Hz, 1H, Ar-H), 6.85 (td, *J* = 9.1, 2.5 Hz, 1H, Ar-H), 6.34 (dd, *J* = 3.1, 0.8 Hz, 1H, Ar-H), 3.95 (t, *J* = 7.1 Hz, 2H, CH_2), 1.75 (h, *J* = 7.3 Hz, 2H, CH_2), 0.82 (t, *J* = 7.4 Hz, 3H, CH_3); ^{13}C NMR (101 MHz, $CDCl_3$) δ 157.9 (d, *J* = 233.8 Hz), 132.8, 129.5, 128.9 (d, *J* = 10.2 Hz), 110.1 (d, *J* = 10.3 Hz), 109.8 (d, *J* = 26.3 Hz), 105.7 (d, *J* = 23.3 Hz), 100.9 (d, *J* = 4.6 Hz), 48.4, 23.7, 11.6; MS (ESI) calcd for $C_{11}H_{12}FN$ 177.10, found 178.15 $[M+H]^+$.

7-Methoxy-1-pentyl-1*H*-indole ($C_{14}H_{19}NO$) (16)

7-Methoxyindole (147 mg, 1 mmol) and 1-bromopentane (149 µL, 1.2 mmol) were reacted in the presence of NaH as described for **15**.

Yellow oil; Yield: 30% (62 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30 (dd, *J* = 0.9, 7.9 Hz, 1H, Ar-H), 7.10 – 7.01 (m, 2H, Ar-H), 6.69 (dd, *J* = 0.8, 7.7 Hz, 1H, Ar-H), 6.50 (d, *J* = 3.1 Hz, 1H, Ar-H), 4.46 – 4.39 (m, 2H, CH_2), 4.00 (s, 3H, CH_3), 1.88 (quint, *J* = 7.3 Hz, 2H, CH_2), 1.48 – 1.30 (m, 4H, 2[CH_2]), 0.98 (t, *J* = 7.1 Hz, 3H, CH_3); ^{13}C NMR (101 MHz, $CDCl_3$) δ 147.7, 131.1, 129.1, 125.8, 119.7, 113.8, 102.3, 101.0, 55.3, 49.5, 32.0, 29.0, 22.5, 14.1; MS (ESI) calcd for $C_{14}H_{19}NO$ 217.15, found 218.10 $[M+H]^+$.

Decyltriphenylphosphonium iodide ($C_{28}H_{36}P^+I^-$) (17)

18 was prepared from 1-bromodecane (207 µL, 1 mmol), TPP (288.5 mg, 1.1 mmol), and KI (249 mg, 1.5 mmol) in ACN (10 mL) as described in Section 1.3.

Brown gel; Yield: 50 % (200 mg); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.77 – 7.57 (m, 15H), 3.51 – 3.38 (m, 2H), 1.51 (quint, *J* = 3.6 Hz, 4H), 1.22 – 1.00 (m, 12H), 0.73 (t, *J* = 6.9 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 135.0 (d, *J* = 3.0 Hz, 3C), 133.4 (d, *J* = 10.0 Hz, 6C), 130.4 (d, *J* = 12.5 Hz, 6C), 117.8 (d, *J* = 86.0 Hz, 3C), 31.5, 30.2 (d, *J* = 15.5 Hz), 29.2, 29.0, 28.9, 28.8, 23.0 (d, *J* = 50.2 Hz), 22.4, 22.3, 13.9; MS (ESI) calcd for $C_{28}H_{36}P$ 403.25, found 403.25 $[M\text{-}I^-]$.

Triphenyl(6-phenylhexyl)phosphonium iodide ($C_{30}H_{32}P^+I^-$) (18)

19 was prepared from 1-bromo-6-phenylhexane (121 mg, 0.5 mmol), TPP (144 mg, 0.55 mmol), and KI (125 mg, 0.75 mmol) in ACN (8 mL) as described in Section 1.3.

Colorless gel; Yield: 43 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.61 (m, 15H), 7.20 – 7.12 (m, 2H), 7.11 – 7.01 (m, 3H), 3.56 – 3.43 (m, 2H), 2.49 (t, *J* = 7.6 Hz, 2H), 1.67 – 1.42 (m, 6H), 1.27 (quint, *J* = 7.4 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 142.3, 135.1 (d, *J* = 3.0 Hz, 3C), 133.6 (d, *J* = 10.0 Hz, 6C), 132.0 (d, *J* = 9.8 Hz), 131.9, 130.6 (d, *J* = 12.6 Hz, 6C), 128.5 (d, *J* = 12.2 Hz), 128.2 (d, *J* = 19.6 Hz), 125.5, 118.0 (d, *J* = 86.1 Hz, 3C), 35.6, 30.8, 30.2 (d, *J* = 15.7 Hz), 28.5, 23.1 (d, *J* = 50.2 Hz), 22.4 (d, *J* = 4.5 Hz); MS (ESI) calcd for $C_{30}H_{32}P$ 423.22, found 423.20 $[M\text{-}I^-]$.

(5-(1*H*-Indol-1-yl) pentyl) triphenylphosphonium iodide ($C_{31}H_{31}NP^+I^-$) (19)

Compound **19** was prepared from 1-(5-chloropentyl)-1*H*-indole (301 mg, 1.36 mmol), TPP (392 mg, 1.5 mmol) and KI (339 mg, 2.04 mmol) in ACN (10 mL), following the method described in Section 1.3.

Colourless gel; Yield: 35 %; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.77 – 7.68 (m, 3H), 7.67 – 7.56 (m, 12H), 7.48 (dt, *J* = 1.0, 7.9 Hz, 1H), 7.22 (dd, *J* = 0.9, 8.2 Hz, 1H), 7.11 – 7.01 (m, 2H), 7.00 – 6.94 (m, 1H), 6.27 (d, *J* = 3.0 Hz, 1H), 4.05 (t, *J* = 6.7 Hz, 2H), 3.48 – 3.36 (m, 2H), 1.80 (quint, *J* = 6.8 Hz, 2H), 1.68 – 1.56 (m, 2H), 1.45 (h, *J* = 8.5 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 135.6, 135.0 (d, *J* = 3.0 Hz, 3C), 133.5 (d, *J* = 10.0 Hz, 6C), 130.5 (d, *J* = 12.5 Hz, 6C), 128.4, 128.1, 121.2, 120.7, 119.0, 117.7 (d, *J* = 86.1 Hz, 3C), 109.4, 100.7, 45.9, 29.4, 27.8 (d, *J* = 16.0 Hz), 22.9 (d, *J* = 50.6 Hz), 22.1 (d, *J* = 4.2 Hz); MS (ESI) calcd for $C_{31}H_{31}NP$ 448.22, found 448.25 [M-I^-].

1.5 Purity Determinations

Compound purity was determined by reverse phase HPLC. Chromatograms were collected on a Shimadzu Nexera SR HPLC system (Shimadzu Scientific Instruments, Columbia, MD, USA). Separations were carried out on a Polaris C18-A (150 x 4.6 mm, 5 µm) or Zorbax Eclipse XDB-C18 (150 x 4.6 mm, 5 µm; Agilent Tech. Inc., Loveland, CO) with eluents methanol-water or acetonitrile-water and detection at 250 or 290 nm. The chromatogram was run for 15 mins for the detection of the major peak of test compound which was expressed as a percentage of total peaks detected during the run. The mobile phase flow rate was 1.0 mL/min to 1.5 mL/min.

The following are the different solvent systems employed:

A: 95 % MeOH/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column (Polaris) warmed to 40 ˚C; flow rate 1.5 mL/ min; Detector channels 250/ 290 nm.

B: 95 % ACN/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column warmed to 40 ˚C; flow rate 1.5 mL/ min; Detector channels 250/ 290 nm.

C: 95 % MeOH/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column warmed to 40 ˚C; flow rate 1.2 mL/ min; Detector channels 250/ 290 nm.

D: 95 % ACN/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column warmed to 40 ˚C; flow rate 1.2 mL/ min; Detector channels 250/ 290 nm.

E: 95 % MeOH/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column warmed to 40 ˚C; flow rate 1.3 mL/ min; Detector channels 250/ 290 nm.

F: 95 % ACN/ 5 % H_2O + 0.1 % HCOOH + 25 mM $HCOONH_4$, column warmed to 40 ˚C; flow rate 1.3 mL/ min; Detector channels 250/ 290 nm.

G: 95 % MeOH/ 5 % H_2O + 25 mM $HCOONH_4$; flow rate 1 mL/ min on Zorbax column; Detector channels 250/ 290 nm.

H: 95 % ACN/ 5 % H_2O + 25 mM $HCOONH_4$; flow rate 1 mL/ min on Zorbax column; Detector channels 250/ 290 nm.

I: 85 % MeOH/ 15 % H_2O + 25 mM $HCOONH_4$; flow rate 0.9 mL/ min on Zorbax column; Detector channels 250/ 290 nm.

J: 85 % ACN/ 15 % H_2O + 25 mM $HCOONH_4$; flow rate 0.9 mL/ min on Zorbax column; Detector channels 250/ 290 nm.

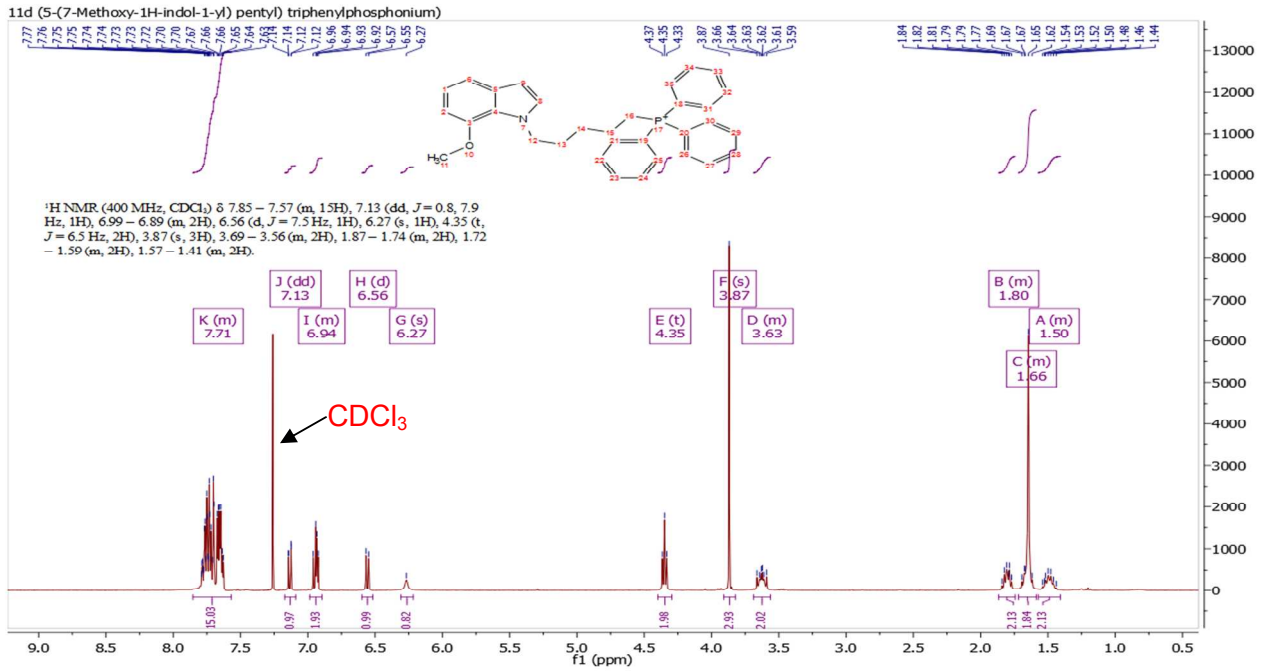
Purities of final compounds (**7a-d** to **12a-e, 13-16,** and **18-19**) are listed as follows:

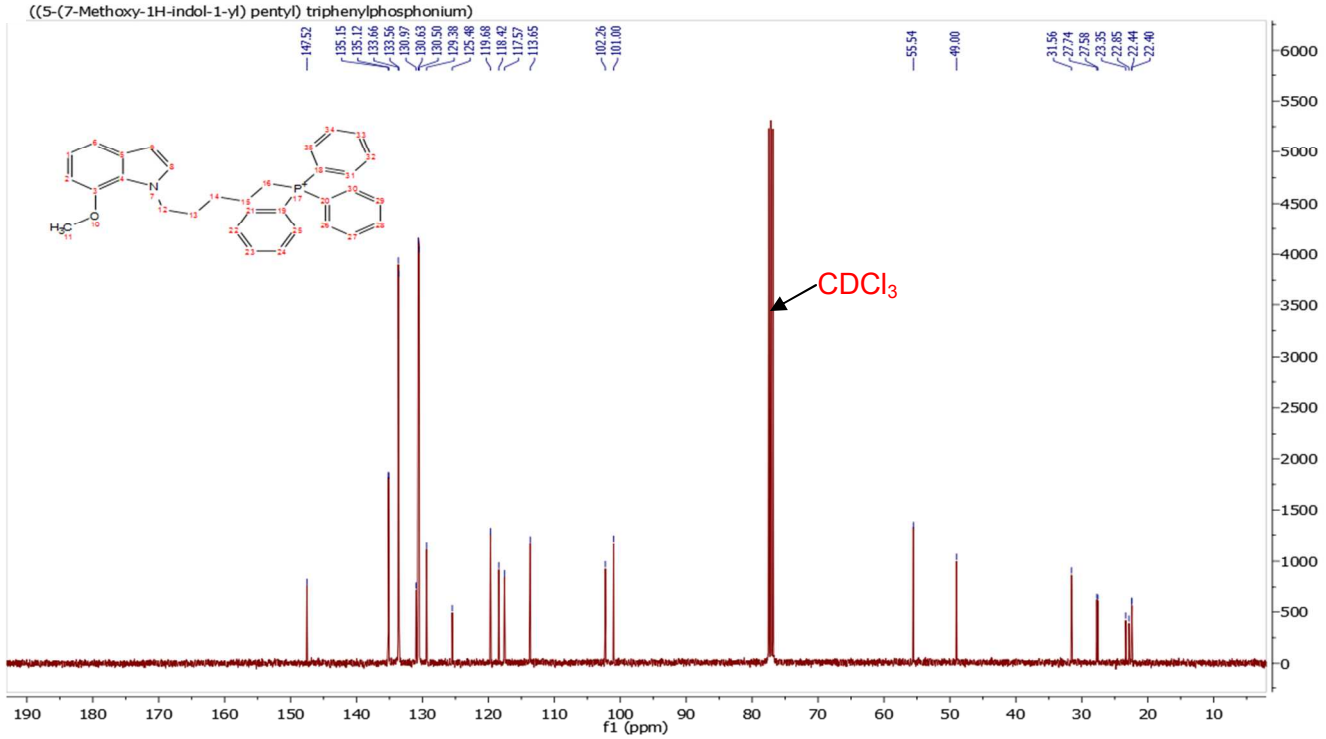
Compound	% Major Peak (250/ 290 nm)				Compound	% Major Peak (250/ 290 nm)			
	MeOH system		ACN system			MeOH system		ACN system	
7a	C	100	D	98.8	**10d**	E	100	F	97.4
7b	A	99.4	B	100	**11a**	E	100	F	100
7c	A	100	B	100	**11b**	E	100	F	100
7d	C	100	D	96.5	**11c**	E	100	F	100
8a	A	98.2	B	95.3	**11d**	E	100	F	96.4
8b	A	100	B	100	**12a**	E	99.9	F	99.8
8c	A	100	B	100	**12b**	I	96.3	J	97.0
8d	A	100	B	100	**12c**	I	95.8	J	96.1
9a	E	100	F	99.0	**12d**	I	95.2	J	95.0

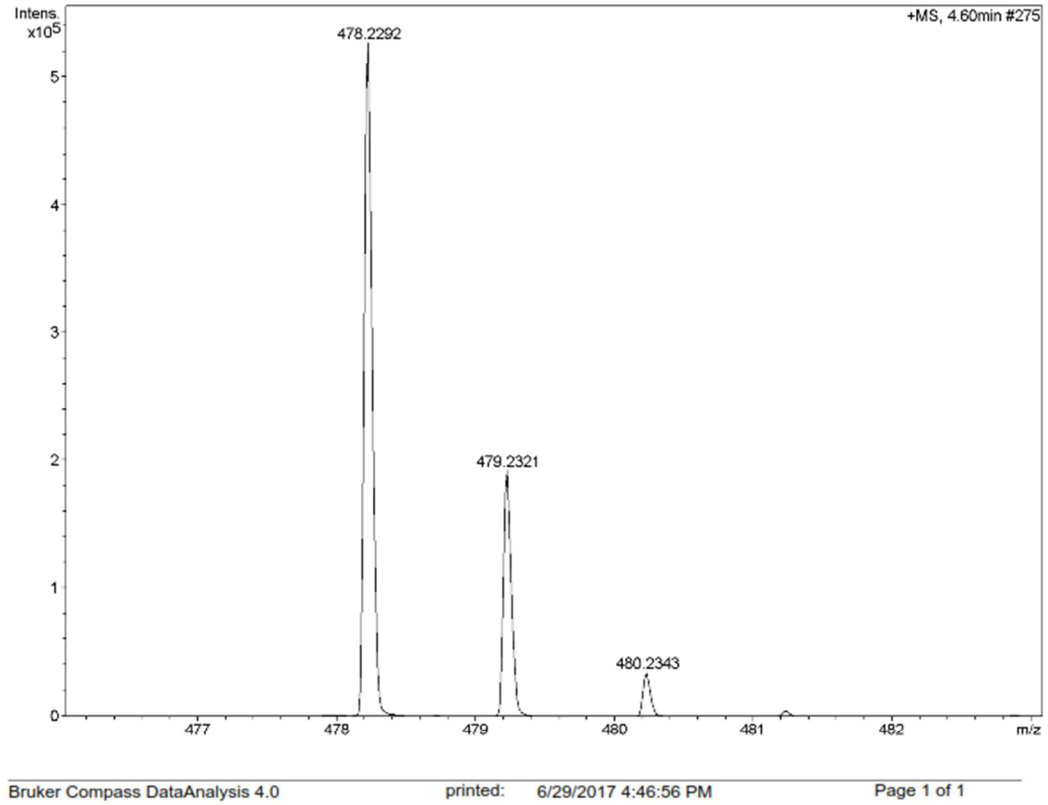
9b	I	97.7	J	98.3	**12e**	G	96.0	H	95.0
9c	I	95.5	J	96.5	**13**	A	98.7	B	98.7
9d	I	95.0	J	95.1	**14**	G	99.1	H	100
10a	E	100	F	100	**15**	C	99.2	D	98.3
10b	E	100	F	100	**16**	A	99.1	B	99.2
10c	E	100	F	100	**17**	G	98.2	H	97.0
					18	G	98.0	H	98.2
					19	G	98.0	H	98.2

1.6. ^{1}H NMR, ^{13}C NMR and HRMS spectra of 11d and 12a

Compound 11d

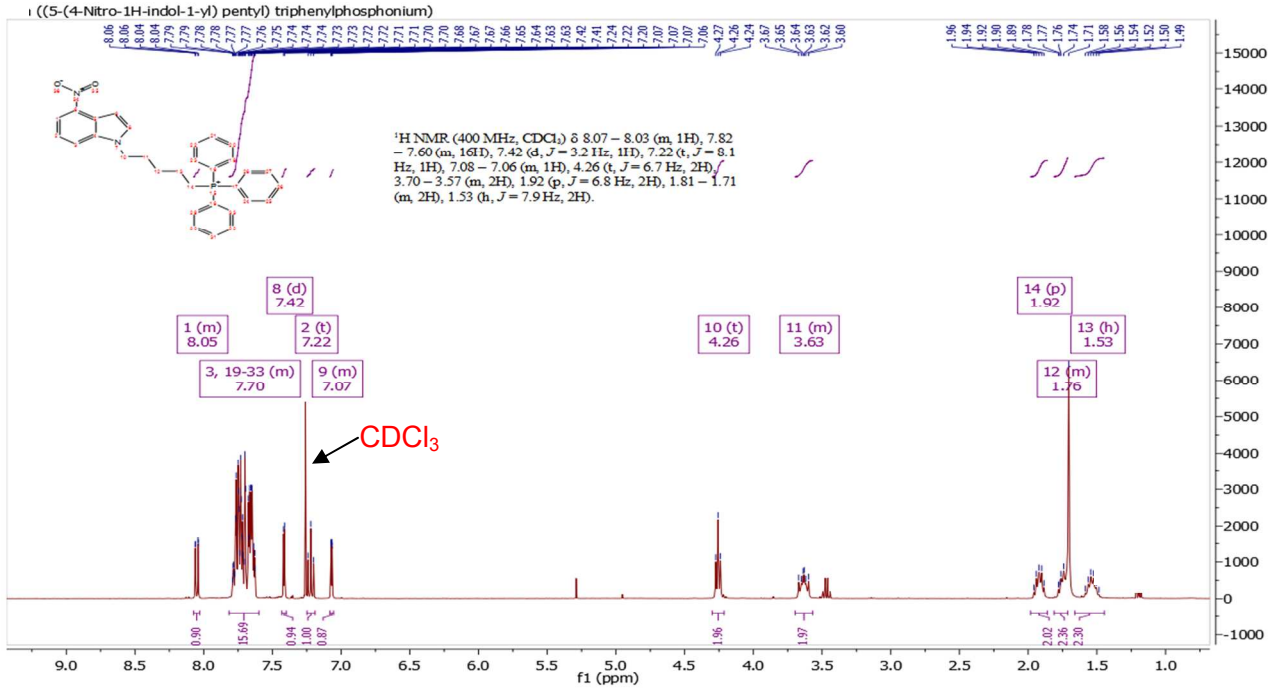


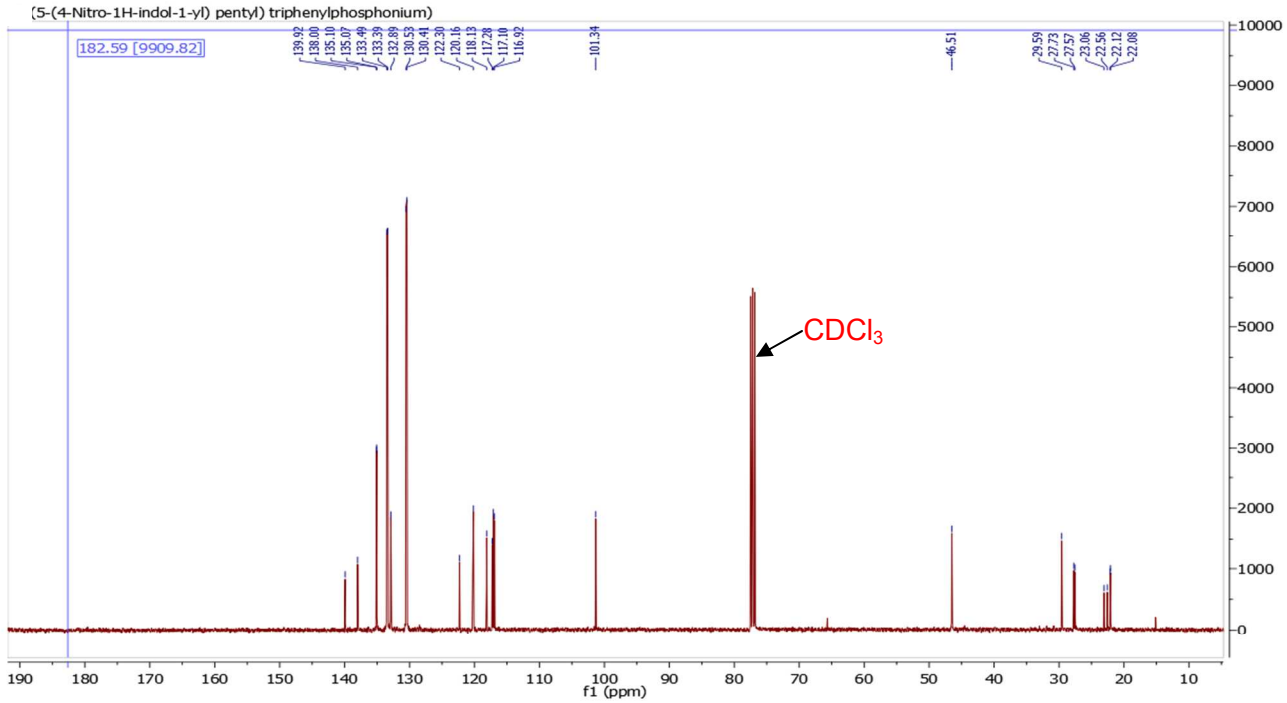


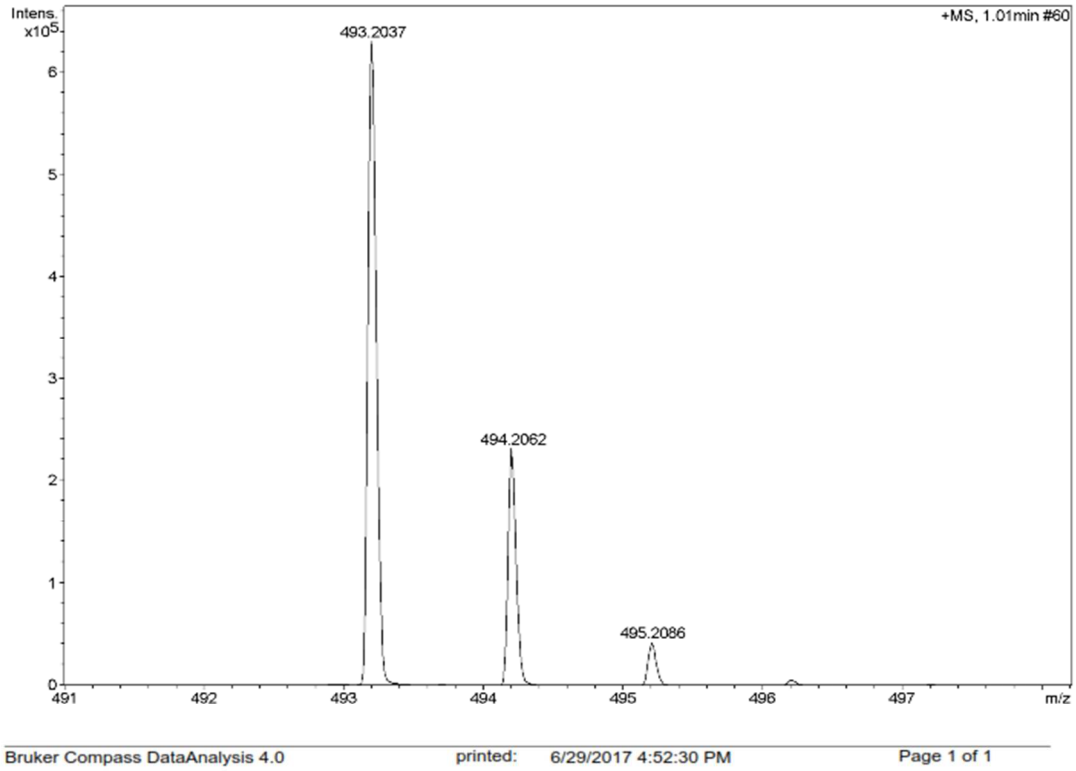


Bruker Compass DataAnalysis 4.0 printed: 6/29/2017 4:46:56 PM Page 1 of 1

Compound 12a







2. Bacterial strains and culture conditions. *Mycobacterium bovis* BCG (ATCC 35734) and *Mycobacterium tuberculosis* H37Rv (ATCC 27294) were grown in Middlebrook 7H9 broth (BD Difco, Detroit, Michigan) supplemented with 0.5% bovine albumin, 0.2% glucose, 0.085% NaCl, 0.5% glycerol, 0.0003% catalase, and 0.05% Tween-80. CFU (colony forming unit) enumeration of *M. bovis* BCG was performed by plating 10μL of appropriate dilutions of cultures onto each well of 12-well plates (SPL life sciences, cell culture plate) containing Middlebrook 7H10 agar supplemented with 0.5% bovine albumin, 0.2% glucose, 0.085% NaCl, 0.5% glycerol, 0.0003% catalase, and 0.006% oleic acid.

3. Minimum inhibitory concentration (MIC) determination. The minimum inhibitory concentration (MIC) was performed to determine the antibacterial activity of test compounds using the broth dilution method. *M. bovis* BCG and *M. tuberculosis* H37Rv cultures were grown to mid-log phase (OD_{600} = 0.4-0.6), spun down and resuspended in complete 7H9 broth. Turbidity of suspension was then adjusted to OD_{600} = 0.1. 100 μL of this bacterial suspension was then dispensed into each well of flat-bottomed transparent 96-well plates (Costar Corning) containing 100 μL of serially-diluted test compounds. Plates were then sealed with Breathe-

Easy sealing membrane (Sigma-Aldrich) and incubated for 5 days (*M. bovis* BCG) or 7 days (*M. tuberculosis* H37Rv) at 37˚C with agitation at 110 rpm (80 rpm). After incubation, cultures were manually resuspended and absorbance at 600 nm was read on a Tecan Infinite M200 PRO plate reader. Percentage growth was plotted against concentration to give MIC_{50} and MIC_{90} which are concentrations required to inhibit 50% and 90% of growth respectively as compared to untreated controls. Isoniazid (Sigma-Aldrich) was used as a positive control against both organisms. Experiments were performed at least in two independent biological replicates with technical replicates.

4. Minimum bactericidal concentration (MBC) determinations. MBC was determined by CFU enumeration on agar plates using 12-well plates after exposure to a given concentration of test compound. Bacterial (*M. bovis* BCG) cultures were grown to mid-log phase, adjusted to a final OD_{600} = 0.05 (approximately 5 x 10^6 CFU/mL) and then treated with concentrations equivalent to 1x, 2x, 4x or 8x MIC_{90} of test compound for 5 days at 37˚C. Drug-free cultures were plated at the start of the experiment to determine the bacterial load of the inoculum. After incubation for 5 days, the compound-treated cultures were plated to determine CFU. MBC_{99} and $MBC_{99.9}$ are defined as the concentrations of the test compound that caused 100 and 1000-fold reduction respectively, in CFU as compared to the untreated inoculum at time point zero.

5. Cytotoxicity determinations

5.1. Cytotoxicity determinations on African Green Monkey Vero E6 cells

Vero E6 (ATCC CRL-1586) was purchased from ATCC, Manassas, VA and grown in Dulbecco's Modified Eagle's Media (DMEM) supplemented with 1 % penicillin and 10 % heat inactivated fetal bovine serum. All reagents were obtained from Hyclone Laboratories, GE Healthcare, Buckinghamshire, UK. Stock solutions of test compounds (20 mM) were prepared in DMSO. Cytotoxicity of test compounds were determined with Celltitre 96 ®Aqueous One Solution (Promega, Madison, WS), following manufacturer's instructions. This reagent employs 3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2*H*-tetrazolium (MTS) in combination with an electron coupling reagent phenazine.

To each well in a 96-well plate was seeded 30,000 Vero-E6 cells in 100 µL media. The plate was incubated at 37 °C, 24 h, 5 % CO_2 for cell adherence. After this time, media was removed from the well by aspiration and replaced with 100 µL solution made up of fresh media (99 µL) and test compound (1 µL from a DMSO stock solution that was 200-fold more concentrated than

the final concentration in the well). DMSO content in each well was 0.5 % v/v. Treated plates were incubated for 48 h (5 % CO_2, 37 °C) after which 10 µL of Celltitre 96 ®Aqueous One Solution was added to each well (without removal of media) and incubated for further 3 h. Thereafter, absorbance readings were taken at 490 nm on a Tecan GENios Microplate reader. Cell viability was determined from the expression:

$$\text{Cell viability (\%)} = \frac{\text{Absorbance (cells + cpd)} - \text{Absorbance (cpd)}}{\text{Absorbance (cells + vc)} - \text{Absorbance (vc)}} \times 100\%$$

Where Absorbance (cells + cpd) = absorbance of wells containing cells and test compound in vehicle (media + 0.5% DMSO); Absorbance (cpd) = absorbance of wells containing test compound in vehicle without cells (compound control); Absorbance (cells + vc) = absorbance of wells containing cells in vehicle (vc) only (untreated cells); Absorbance (vc) = absorbance of wells containing vehicle without cells (vehicle control).

The percentage viability readings were plotted against log concentration on GraphPad Prism (Version 5.0, San Diego, CA) to give a sigmoidal curve from which IC_{50} (concentration required to reduce viability by 50 % compared to control/untreated cells) was obtained. The plot was constrained to ≥ 0 and ≤ 100%. At least 3 separate determinations were carried out.

5.2. Compound-induced hemolysis of Human Red Blood Cells

Human red blood cells were obtained from Interstate Blood Bank, Inc. Laboratory, USA. Hemolytic activity was evaluated by exposing 5 x 10^6 red blood cells to 2-fold serial dilutions of compounds in phosphate-buffered saline for 1 h (highest concentration, 300 µM). Red blood cells were subsequently centrifuged at 1000 g for 10 minutes and the supernatant was collected and homogenized by vortexing. Absorbance was read at 540 nm on an Infinite M200Pro plate reader (Tecan). Triton X-100 (2 %) treated control was used to define 100 % of hemoglobin release. HC_{50} (concentration required to induce 50 % hemolysis compared to Triton X-100 treated cells) of test compound was determined from percentage hemolysis versus concentration plots.

6. Effects on Membrane Integrity

6.1. Differential Scanning Calorimetry (DSC) Measurements

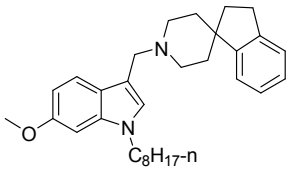
Multilamellar vesicles (MLVs) were prepared by transferring an aliquot (5 mL) of 20 mM stock solution of DMPG, [1, 2-dimyristoyl-*sn* -glycero-3-phospho-(1'-rac-glycerol) (sodium salt)] (Avanti Polar Lipids Inc, Alabastar, AL) in HPLC-grade $CHCl_3$ (Fischer Scientific) to a round-bottom flask. Solvent was removed under reduced pressure leaving behind a thin lipid film on the flask interior which was then dried under vacuum overnight and then hydrated with 1 mL of Tris-HCl buffer (0.05 M prepared in ultrapure Grade 1 deionized water, pH 7.2) in the following way: after vortexing for 1 min, the flask with its contents was agitated on a rotary evaporator at 45 ^oC, 15 mins and then further agitated for 2 h, 150 rpm (Shel Lab S12 thermostated shaking incubator) at 29 ^oC. To prepare DMPG vesicles containing test compound in the ratio of 10 parts lipid to 1 part compound, a stock solution (2 mM) of test compound was prepared in $CHCl_3$ and an aliquot (5 mL) added to 5 mL of DMPG (20 mM in $CHCl_3$) in a flask and processed in the same way. Control DMPG vesicles and compound-DMPG vesicles in Tris-HCl buffer were freshly prepared for DSC determinations. An aliquot (10 µL) of the aqueous dispersion of MLVs was placed in an aluminium calorimetric pan [(6 x 1.6) mm, Shimadzu, Singapore]. The pan was hermetically sealed and immediately analyzed on a Shimadzu DSC 60 Plus instrument. The reference was an empty hermetically sealed pan. The temperature was first reduced to 0 ^oC with liquid N_2 and then heated at a rate of 2 °C/ min to 30^oC. Each determination was carried out at least twice on separate occasions. The data was analyzed using the software, Shimadzu TA-60 Analyzer, pre-installed on the instrument.

6.2. Time-kill Kinetics and Membrane Permeability Determinations using Propidium Iodide

Time-kill curves were determined as follows: 10^6 CFU/ml *M. bovis* BCG cultures were treated with 2x MIC_{90} of isoniazid (1.6 µM) or test compound (6 µM). Samples were taken at various time points for CFU determination on agar plates. Membrane permeability was determined using propidium iodide (Invitrogen Molecular Probe). Briefly, 1 mL from the treated sample was washed twice and re-suspended in 0.8 % NaCl with the dye as described by the manufacturer. Samples were then processed on a BD LSR Fortessa (BD Biosciences) flow cytometer. Untreated culture inoculum was used as control.

6.3. Structure of compound 20:

Compound **20** (3-{[2,3-dihydrospiro(indene-1,4'-piperidin)-1'-yl]methyl}-6 -methoxy-1-octyl-1*H*-indole) was included as a positive control. Structure of **20** is as follows:



Compound **20**

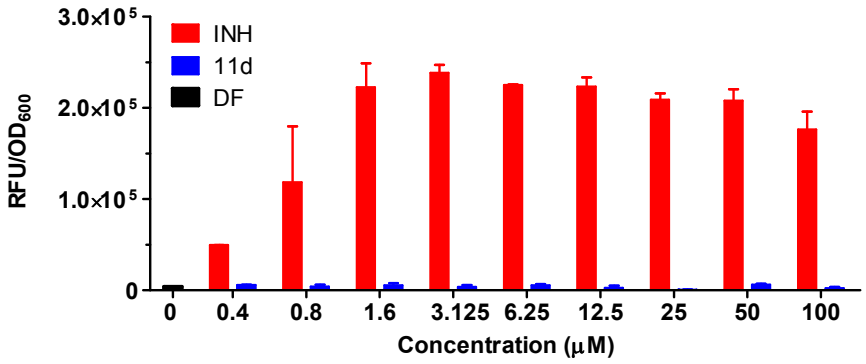
6.4. *pini*BAC Cell Envelope Stress Reporter System.

M. bovis-p*ini*BAC-RFP strain was used to evaluate the effect of test compounds on envelope-stress associated promoter activity. To generate these recombinant strains, *M. bovis* BCG was transformed via electroporation with an integrative plasmid (*i.e.* the plasmid does not possess a mycobacterial origin of replication and integrates into the bacterial chromosome) carrying a kanamycin resistance gene and the mCherry Red Fluorescent Protein (mRFP) gene under the control of the *ini*BAC operon promoter (p*ini*BAC) as described in Yang *et al*.[S2] Evaluation of envelope stress was done as follows:

An OD_{600} 0.2 inoculum from mid-log phase pre-culture of *M. bovis*-p*ini*BAC-RFP was exposed to a range of 2-fold serial dilutions (highest concentration, 100 µM) of test compound or isoniazid (positive control) for 24 h. OD_{600} and fluorescence (λ_{ex} = 587 nm/ λ_{em} = 630 nm) were measured on a Tecan Infinite M200 PRO plate reader to give normalized fluorescence (RFU / OD_{600}). The experiment was repeated independently at least 2 times.

11d did not induce piniBAC activity over the entire test concentration range, in contrast to the positive control isoniazid which strongly stimulated promoter activity in a dose dependent manner.

6.5. Figure S1. Induction of *pini*BAC promoter activity by 11d.



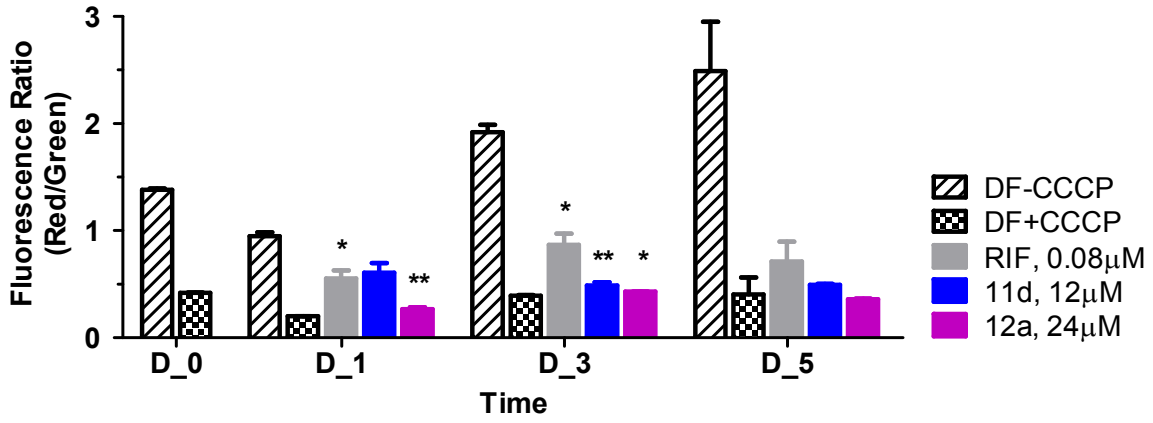
7. Determination of Membrane Potential.

Membrane potential was measured using the *Bac*light™ Bacterial Membrane Potential Kit (Life Technologies, CA, USA). Briefly, *M. bovis* BCG cultures were harvested at mid-log phase, and adjusted to OD_{600} = 0.1 in complete 7H9 media with test compound or Rifampicin as a control drug at 4-fold MIC_{90} concentration. At each time point, sufficient volumes of culture were spun down and concentrated in 500 µL of 1x PBS (Phosphate Buffer Saline, Vivantis) to an OD_{600} = 0.5. Each sample was incubated with 30 µM of $DiOC_2$ (3, 3-diethyloxacarbocyanine iodide) in the dark at 37 ºC for 20 min. For this assay, drug-free cultures and 100 µM of CCCP (carbonyl cyanide m-chlorophenyl hydrazone)-treated cultures served as negative and positive controls, respectively. Dye-treated cultures were spun down, resuspended in 500 µL of 1x PBS and dispensed into flat-bottomed 96-well black plates (SPL Life Sciences) (200 µL/well). Green and red fluorescence were recorded at λ_{ex} = 488 nm/ λ_{em} = 530 nm and λ_{ex} = 488 nm/ λ_{em} = 630 nm respectively, using Tecan Infinite M200 PRO plate reader. Experiments were performed in two independent biological replicates with technical replicates.

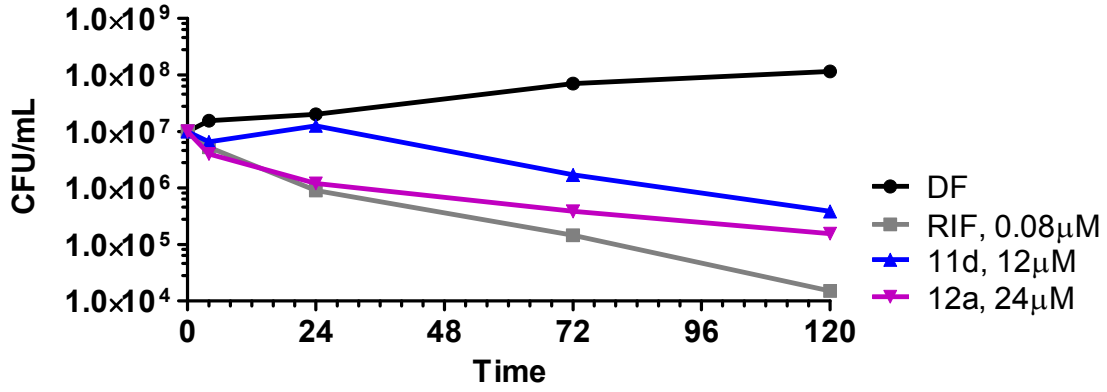
7.1. Figure S2. (A) Changes in membrane potential of cultures treated with 11d and 12a at 4x MIC90 of 11d and 12a over 1-3 days; (B) Time kill curves of cultures treated with 11d and 12a at 4x MIC90 over 1-3 days.

(A) Changes in membrane potential (as reflected by red/green fluorescent ratio of $DiOC_2$) of *M. bovis* BCG cultures treated with test compound **11d** (12 µM), **12a** (24 µM), **14** (24 µM), **16** (24 µM), rifampicin (RIF, 0.08 µM) and CCCP, an ionophore that rapidly dissipates membrane potential. **11d** and **12a** were tested at 4xMIC_{90}, which was re-determined for this experiment and found to be 3 µM (**11d**) and 6 µM (**12a**). Mean and SD of 3 biological -replicates. Means for each day were significantly different from drug-free (without CCCP) control on the same day with p values < 0.05 (*), < 0.01 (**) and < 0.001 (***), Student's t-test (B) Corresponding changes in viability of treated-cultures (CFU / mL) under similar conditions described in (A).

(A)

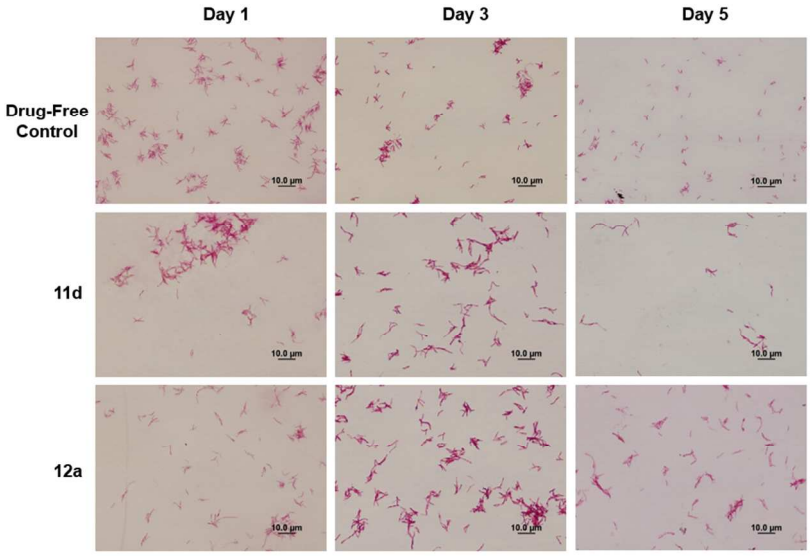


(B)



8. Acid-Fast Staining and Light Microscopy. Acid-fast staining was carried out using a TB stain kit (BD, 212520) according to manufacturer's instructions and observed under a light microscope (Olympus BX60, brightfield).

8.1. Figure 3: Acid fast staining images of *M. bovis* BCG cultures treated with MIC_{90} of 11d (3 μM) and 12a (6 μM) at Days 1, 3 and 5.



9. Reduction of MTT

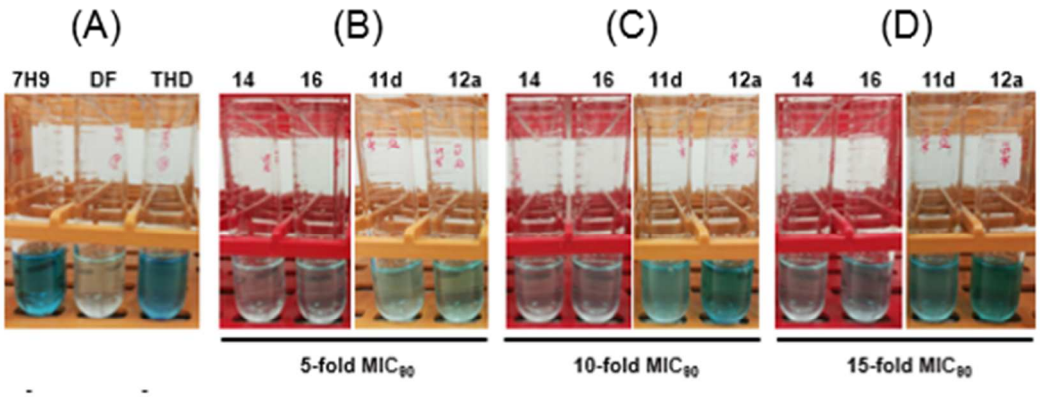
M. bovis BCG at an OD_{600} = 0.3 in complete 7H9 broth was treated with serially diluted test compound in 96-well plates (Costar Corning) (100 µL/well). Plates were incubated at 37 ºC for 30 min or 1 h before the addition of 25 µL of 2 mg/mL MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide, Sigma-Aldrich]. The reaction was stopped after 2 h by the addition of 25 µL of 10% SDS. Absorbance at 595 nm was read on a Tecan Infinite M200 PRO plate reader. CCCP was used as a positive control and Isoniazid as a control TB drug.

10. Oxygen Consumption Assay

The method of Dhiman et al. was followed with modifications. [S3] The effect of drugs on oxygen consumption by *M. bovis* BCG was investigated in clear round bottom tubes that were placed in an anaerobic jar (BD GasPak™ EZ). Oxygen was removed by GasPak™ EZ anaerobe paper sachet (BD) and monitored by BD BBL™ dry anaerobic indicator strips. Briefly, 2 mL of mid-log phase *M. bovis* BCG cultures (~$4*10^7$ CFU/mL) were treated with 5-fold, 10-fold or 15-fold MIC_{90} concentrations of **11d** (MIC_{90} = 3µM) and **12a** (MIC_{90} = 6µM). The drug-treated cultures were pre-incubated (37°C, 1 h, with agitation at 160 rpm), methylene blue (0.001%) was added, the tubes were transferred to the anaerobic jar and incubated for 37 °C, 12 h. Thioridazine (80 µM), which is known to block oxygen consumption, [S4] was used as the positive control.

Fragments **14** and **16** were used as negative controls. By the end of incubation, cultures were serially diluted and plated to 12-well 7H10 agar plates for CFU enumeration.

10.1. Figure S4: Oxygen consumption of methylene blue-treated *M. bovis* BCG cultures containing positive control thioridazine (THD), negative controls **14,16**, and test compounds **11d,12a**.



(A) Control tubes containing 0.001% methylene blue and 2 mL 7H9 medium (7H9), 7H9 medium (2 mL) and mid-log phase *M. bovis* BCG without test compound (drug free, DF) and 7H9 medium (2 mL), mid-log phase *M. bovis* BCG and positive control thioridazine THD (80 μM). Cultures were incubated at 37^{o}C, 12 h in an oxygen-free environment. No oxygen consumption was observed in the 7H9 control tube as seen from the absence of decolorization. Decolorization of methylene blue in the DF control tube indicated consumption of oxygen. THD is a known inhibitor of the ETC and as anticipated, no oxygen consumption was observed in its presence. (B) *M. bovis* BCG cultures (mid log phase) containing 0.001% methylene blue treated with 14, 16, 11d or 12a at 5x MIC_{90}. Cultures were incubated at 37^{o}C, 12 h in an oxygen-free environment. MIC_{90} were 3 μM (11d) and 6 μM (12a, 14, 16). (C) and (D): As in (B) except that test compounds were employed at 10x MIC_{90} in (C) and 15x MIC_{90} in (D). Methylene blue was decolorized in tubes containing 14 and 16 at all concentrations, signalling their inability to prevent oxygen consumption. In contrast, 11d and 12a demonstrated dose-dependent decolorization of methylene blue.

11. Plasmid and primers used in construction of *pini*BAC-RFP reporter system.

Promoters of *ini*BAC (p*ini*BAC) were amplified by standard polymerase chain reaction (PCR) from the genomic DNA of *M. bovis* BCG using primers as detailed in Table S1. Similarly,

mCherry red fluorescent protein (RFP) was amplified from pGMEH-P38-mRFP plasmid, obtained from Addgene, courtesy of Dirk Schnappinger (Cornell University), using the primers as indicated in the table. Amplicons were digested with respective restriction enzymes as indicated in the table and cloned in the pre-digested integrative plasmid backbone, pMV306 (gift from William R. Jacob, Albert Einstein College of Medicine). The resulting plasmid was used to transform *M. bovis* BCG.

Table S1: Plasmid and primers used in the construction of p*ini*BAC-RFP reporter system.

	Plasmid name	Vector (Digested with)	Inserted Promoters (PCR-amplified DNA fragments)				Reporter gene (PCR-amplified DNA fragments)	
			Gene	Size (bp)	Primer Name	Primer Sequence	Primer Name	Primer Sequence
2	P-iniB-RFP	pMV306 (NotI---EcoRI)	BCG_0380	191	P-iniB-F(NotI)	gcggccgcTAAGTTCCGGACCGGCGTA	mCh-F(BamH)	ccgggatccATGGTGAGCAAGGGCGAGG
					P-iniB-R(BamH)	ccgggatccCTTCATTTCCCTTCAATCGAAGA	mCh-R(EcoR)	ccggaattcCTACTTGTACAGCTCGTCCAT

12. References

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