## Experimental

A suspension of **Zn-1** (91.3 mg, 63.6 μmol) and **Sn-2** (69.1 mg, 63.6 μmol) in $CH_2Cl_2$ (ca. 10 mL) was stirred at room temperature for 24 h, afterwhich the solution was filtered and the solvent removed under reduced pressure. The residue was recrystallised from $CH_2Cl_2$/MeOH to give **[Sn-2/Zn-1]** as a purple solid. Yield: 92%. $^1$H NMR (500 MHz, $CDCl_3$, 300K): $\delta$ 10.25 (s, 2H, Zn-*meso*-H), 10.18 (s, 2H, Sn-*meso*-H), 8.43 (s, 2H, Zn-$H_8$), 8.27 (d, $J$ = 7.6 Hz, 2H, Zn-$H_9$), 7.98 (d, $J$ = 7.6 Hz, 2H, Zn-$H_{11}$), 7.87 (s, 2H, Sn-$H_b$), 7.83 (s, 1H, Sn-$H_a$), 7.78 (t, $J$ = 7.7 Hz, 2H, Zn-$H_{10}$), 7.35 (s, 4H, tolyl $H_6$ & $H_7$), 7.01 (s, 2H, tolyl-$H_5$), 6.61 (d, $J$ = 7.6 Hz, 2H, benzoate-$H_4$), 6.50 (d, $J$ = 5.9 Hz, 2H, Sn-pyridyl-$H_\beta$), 6.09 (t, $J$ = 7.6 Hz, 2H, benzoate-$H_3$), 4.93 (s, 2H, benzoate-$H_1$), 4.47 (d, $J$ = 7.6 Hz, 2H, benzoate-$H_2$), 4.14-3.96 (m, 8H, Zn-$^1CH_2$), 3.82 (t, 4H, $^1CH_2$ on the side of t-$Bu_2$ phenyl in Sn), 3.66 (t, 4H, $^1CH_2$ on the side of pyridine in Sn), 2.76 (d, $J$ = 6.1 Hz, 2H, Sn-pyridyl-$H_\alpha$), 2.63 (s, 12H, Zn-$CH_3$), 2.41 (s, 6H, $CH_3$ on the side of t-$Bu_2$ phenyl in Sn), 2.32 (s, tolyl-$CH_3$), 1.58 - 1.21 (the remaining protons of the hexyl groups appear as a complex overlay of multiplets), 1.48 (s, 18H, t-Bu), 1.13 (s, 6H, $CH_3$ on the pyridyl-side of the Sn porphyrin), 0.92 (t, 12H, Zn-$^6CH_3$), 0.85 (t, 6H, $^6CH_3$ on the phenyl di-*t*-$Bu_2$-side of the Sn porphyrin), 0.83 (t, 6H, $^6CH_3$ on the pyridyl-side of the Sn porphyrin). $^{13}$CNMR (100 MHz, $CDCl_3$, 300K): $\delta$ 161.5, 150.3, 147.6, 146.6, 145.2, 143.5, 137.6, 137.4, 132.0, 130.0, 130.7, 130.1, 127.7, 126.7, 125.8, 120.8, 117.5, 110.6, 97.3, 96.7, 35.2, 33.6, 32.9, 32.7, 32.1, 31.8, 31.6, 30.2, 30.1, 31.6, 30.2, 30.1, 29.9, 28.7, 27.0, 26.8, 26.6, 22.9, 22.7, 21.1, 15.8, 14.9, 14.4, 14.2, 14.1. UV-vis ($CH_2Cl_2$): $\lambda_{max}$ (log $\varepsilon$) 414 (5.30), 422 (5.17), 546 (4.28), 582 (4.07) nm. MALDI-MS: m/z 2523.05 $(M+K)^+$, ($C_{161}H_{177}N_9O_4SnZn$+K) requires 2523.18.

**[Sn-3/(Zn-4)$_2$]** was prepared by mixing two equiv. of **Zn-4** with one equiv. of **Sn-3** according to the procedure reported for **[Sn-2/Zn-1]**. Yield: 90 %. $^1$H NMR (500 MHz, $CDCl_3$, 280K): $\delta$ 10.22 (s, 4H, Zn-*meso*-H), 10.07 (s, 2H, Sn-*meso*-H), 8.61 (s, 1H, Zn-iodophenyl-$H_{12}$), 8.56 (s, 1H, Zn-iodophenyl-$H_{12'}$), 8.44 (s, 2H, Zn-$H_8$), 8.17 (d, 1H, Zn-iodophenyl-$H_{15}$), 8.15 (d, 3H, Zn-iodophenyl-$H_{15'}$ & Zn-$H_9$), 7.99 (d, 2H, Zn-$H_{11}$), 7.76 (t, 2H, Zn-$H_{10}$), 7.50 (m, 4H, Zn-iodophenyl-$H_{12'}$ & Zn-iodophenyl-$H_{13}$), 7.40 (t, 2H, tolyl-$H_7$), 7.28 (t, 2H, tolyl-$H_5$), 7.05 (t, 2H, tolyl-$H_6$), 6.56 (d, 2H, benzoate-$H_4$), 6.04 (q, 2H, benzoate-), 4.73-4.57 (m, 4H, benzoate-$H_1$ & benzoate-$H_2$), 4.10-3.93 (m, 8H, Zn-$CH_2$), 3.60

(t, 4H, Sn-$CH_2$), 2.59 (s, 12H, Zn-$CH_3$), 2.57 (s, 12H, Zn-$CH_3$), 2.35 (s, 6H, tolyl-$CH_3$), 2.23 (m, 16H, Zn-$^2CH_3$), 1.78-1.21 (several multiplets, rest of hexyl groups), 0.98 (s, 12H, Sn-$CH_3$), 0.90-0.81 (m, 36H, Zn- & Sn-$CH_3$). UV-vis ($CH_2Cl_2$): $\lambda_{max}$ (log $\varepsilon$) 412 (5.25), 422 (5.16), 544 (4.32), 576 (4.14) nm. MALDI-MS: m/z 3588.59 $(M+Na)^+$, ($C_{214}H_{234}N_{14}O_4I_2SnZn_2$+Na) requires 3588.41.

A suspension of **Zn-1** (31.8 mg, 22.2 mmol) and **Sn-3** (23.2 mg, 23.2 mmol) in $CH_2Cl_2$ (ca. 10 mL) was stirred at roon temperature. After 24 h, the solution was evaporated under reduced pressure. The residue was recrystallised from $CH_2Cl_2$/MeOH to give **[Sn-3/Zn-1]** as a purple solid. Yield: 90 %. $^1$H NMR (500 MHz, $CDCl_3$, 300K): $\delta$ 10.25 (s, 2H, Zn-*meso*-H), 10.22 (s, 2H, Sn-*meso*-H), 8.38 (s, 2H, Zn-$H_8$), 8.29 (d, 2H, Zn-$H_9$), 7.99 (d, 2H, Zn-$H_{11}$), 7.80 (t, 2H, Zn-$H_{10}$), 7.36 (s, 2H, tolyl-$H_6$), 7.33 (s, 2H, tolyl-$H_7$), 7.03 (s, 2H, tolyl-$H_5$), 6.63 (d, 2H, benzoate-$H_4$), 6.13 (t, 2H, benzoate-$H_3$), 4.71 (s, 2H, benzoate-$H_1$), 4.59 (d, benzoate-$H_2$), 4.13 (m, 4H, Zn-$^1CH_2$), 4.01 (m, 4H, Zn-$^1CH_2$), 3.74 (t, 8H, Sn-$^1CH_2$), 2.63 (s, 12H, Zn-$CH_3$), 2.61 (s, 12H, Sn-$CH_3$), 2.33 (s, 6H, tolyl-$CH_3$), 2.26 (m, 8H, Zn-$^2CH_2$), 1.91 (m, 8H, Sn-$^2CH_2$), 1.81-1.26 (several multipletes, the rest hexyl groups of Zn and Sn), 0.91 (t, 12H, Zn-$^6CH_2$), 0.85 (t, 12H, Sn-$^6CH_2$). UV-vis ($CH_2Cl_2$): $\lambda_{max}$ (log $\varepsilon$) 414 (5.27), 422 (5.12), 546 (4.30), 582 (4.10) nm. MALDI-MS: m/z 2414.57 $(M+K)^+$, ($C_{152}H_{160}N_{10}O_4SnZn$+K) requires 2414.19.

A solution of **Ru-5** (7.4 mg, 7.3 $\mu$mol) in $CH_2Cl_2$ (3 mL) was added to a solution of **[Sn-3/Zn-1]** (17.3 mg, $\mu$mol) in $CH_2Cl_2$ (3 mL). The mixture was stirred at room temperature for 30 min. after which the solution was concentrated to 1 mL and layered with methanol (10 mL) to give **[Ru-5/Sn-3/Zn-1]** as a red solid. Yield: 96 %. $^1$H NMR (500 MHz, $CDCl_3$, 300K): $\delta$ 10.18 (s, 2H, Zn-*meso*-H), 9.95 (s, 2H, Ru-*meso*-H), 9.92 (s, 2H, Sn-*meso*-H), 8.33 (s, 2H, Zn-$H_8$), 8.23 (d, 2H, Zn-$H_9$), 8.14 (d, 2H, Ru-$H_{16}$), 8.09 (d, 2H, Ru-$H_{12}$), 7.94 (d, 2H, Zn-$H_{10}$), 7.77-7.74 (m, 6H, Zn-$H_{11}$, Ru-$H_{14}$ & Ru-$H_{15}$), 7.64 (d, 2H, Ru-$H_{13}$), 7.31 (s, 2H, tolyl-$H_7$), 7.23 (s, 2H, tolyl-$H_5$), 6.96 (s, 2H, tolyl-$H_6$), 6.50 (d, 2H, benzoate-$H_4$), 6.36 (d, 2H, Sn-pyridyl-H$\beta$), 5.87 (m, 4H, benzoate-$H_3$ & Sn-pyridyl-H$\beta'$), 4.52 (s, 2H, benzoate-$H_1$), 4.09 (m, 6H, benzoate-$H_2$ & Zn-$^1CH_2$), 3.91 (m, 12H, Zn-$^1CH_2$ & Ru-$^1CH_2$), 3.50 (m, 8H, Sn-$^1CH_2$), 2.70 (d, 2H, Sn-pyridyl-H$\alpha$), 2.57 (s, 12H, Zn-$CH_3$), 2.43 (s, 12H, Ru-$CH_3$), 2.19 (s, 6H, tolyl-$CH_3$), 1.72 (d, 2H, Sn-pyridyl-H$\alpha'$), 1.80-1.15 (several multiplets, the rest hexyl

groups of Zn, Sn and Ru), 1.02 (s, 6H, Sn-$CH_3$ facing Zn), 0.90-0.86 (m, 36H, Zn-, Sn- & Ru-$^6CH_3$), 0.85. (s, 6H, Sn-$CH_3$ facing Ru). UV-vis ($CH_2Cl_2$): $\lambda_{max}$ (log $\varepsilon$) 414 (5.33), 424 (5.17), 548 (4.26), 580 (4.02) nm. MALDI-MS: m/z 3368.57 $(M\text{-}CO+K)^+$, ($C_{213}H_{236}N_{14}O_5RuSnZn$-CO+K) requires 3368.58.