

Supporting Information

Synthesis, characterization, and *in vitro* evaluation of new coordination complexes of Platinum(II) and Rhenium(I) with a ligand targeting the translocator protein (TSPO).

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*NMR characterization of $[\{PtCl\}(CB256)\{ReCl(CO)_3\}]$ (**2**)*

The NMR characterization of **2** started from dipicolylaminic protons. In the 1H NMR, the two well separated doublets falling at 8.95 and 8.90 ppm (Figure S1) were assigned to protons 6''a and 6''b (see Chart 2 for numbering of protons), which are the most deshielded due to their closeness to the pyridinic nitrogen. These protons are deshielded with respect to the free ligand ($\Delta\delta_{Ha} = 0.46$ ppm, $\Delta\delta_{Hb} = 0.41$ ppm in Acetone- d_6) as a consequence of platinum coordination.

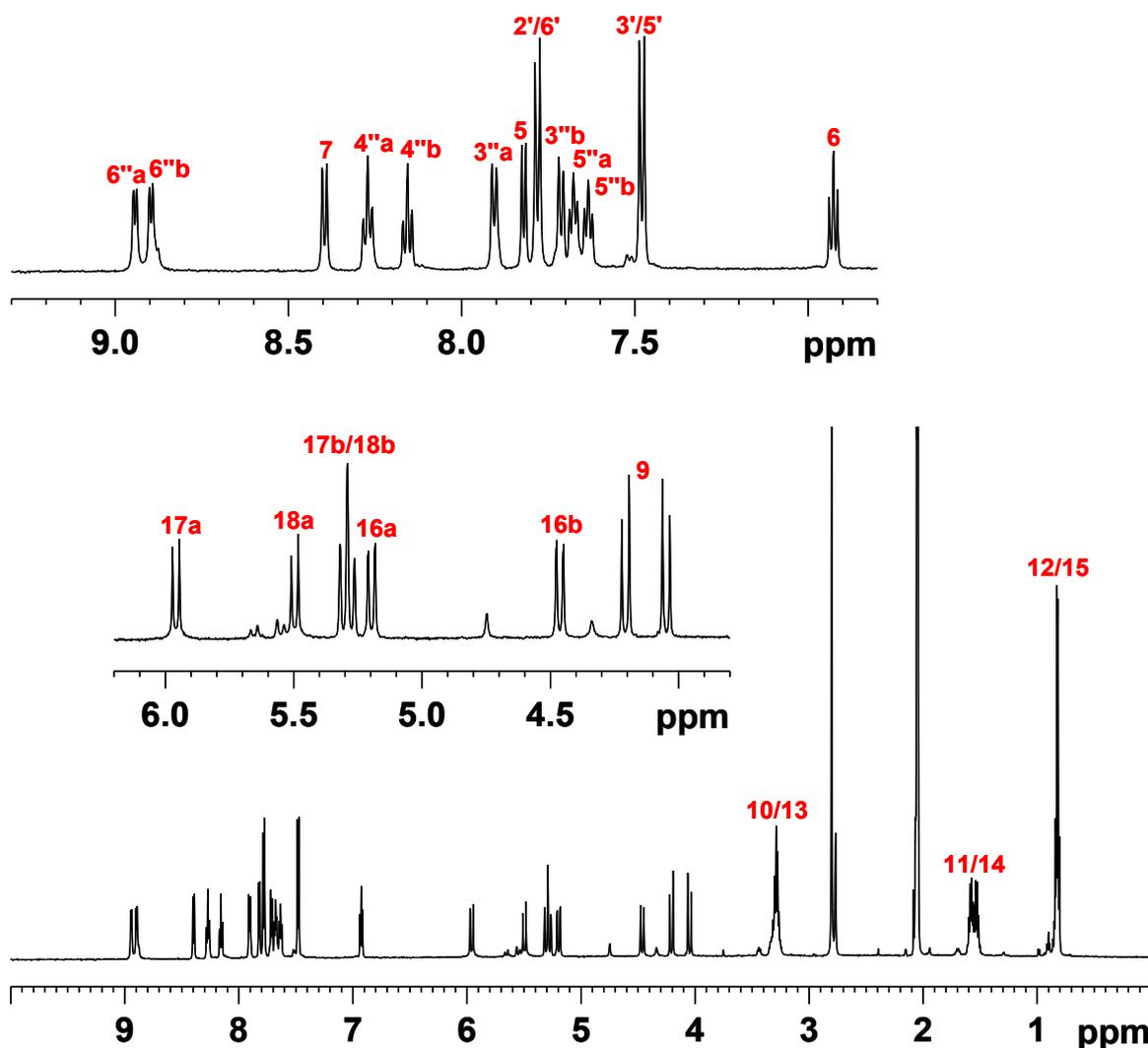


Figure S1: 1H -NMR (1H , 600MHz) spectrum of **1B** in Acetone- d_6 .

The two triplets at 7.68 and 7.63 ppm show COSY cross-peaks with the signals of protons 6''a (cross-peak A in Figure S2-B) and 6''b (B, Figure S2-B), respectively, and were assigned, in the

given order, to protons 5''a and 5''b. The signal assigned to 5''a shows a COSY cross-peak (C, Figure S2-B) with the triplet at 8.27 ppm which was assigned to the proton 4''a, while the signal assigned to 5''b shows a cross-peak (D, Figure S2-B) with the triplet at 8.16 ppm which was assigned to proton 4''b. Finally, the doublet falling at 7.91 ppm was assigned to proton 3''a on the basis of the cross-peak (E, Figure S2-B) with proton 4''a, while the doublet falling at 7.71 ppm was assigned to proton 3''b on the basis of a COSY cross-peak with proton 4''b (F, Figure S2-B).

The eight doublets in the range 6.0 – 4.0 ppm (insert in Figure S1) have been assigned to the methylenic protons 16, 17, 18, and 9 with the help of a 2D NOESY experiment. The proton 3''b shows, in the NOESY spectrum (Figure S2-A), a cross peak (G) with the doublet falling at 5.49 which was assigned to one proton of methylene 18 (18a), while proton 3''a shows a NOESY cross peak (H) with the signal falling at 5.96 which was assigned to one proton of methylene 17 (17a). Moreover, the doublet falling at 4.46 ppm shows a NOESY cross-peak (I) with 17a and was assigned to one proton of methylene 16 (16b). As a consequence, the AB spin system centered at 4.13 ppm was assigned to the two different protons of methylene 9. The most shielded doublet (4.04 ppm) of the AB system shows a NOESY cross-peak (J, Figure S2-A) with the doublet falling at 7.78 ppm (2H, $^3J_{\text{H-H}} = 8.43$ Hz), assigned to protons 2'/6' of the 4-Cl-phenyl group, while the least shielded doublet of the AB system (4.20 ppm) shows a NOESY cross-peak (K, Figure S2-A) with the doublet falling at 7.82 ppm (1H, $^3J_{\text{H-H}} = 6.60$ Hz) assigned to proton 5 of the imidazopyridine ring system. Thus the doublet at 7.48 ppm (2H), which shows a COSY cross-peak (L, Figure S2-B) with the doublet at 7.78 ppm, was assigned to protons 3'/5' of the 4-Cl-phenyl group. The characterization of the imidazopyridine ring system was completed by assigning the triplet at 6.93 ppm (1H, $^3J_{\text{H-H}} = 7.33$ Hz) to proton 6 on the basis of a COSY cross-peak (M, Figure S2-B) with proton 5 and a COSY cross-peak (N, Figure S2-B) with the doublet falling at 8.39 ppm (1H, $^3J_{\text{H-H}} = 7.70$ Hz), this latter assigned to proton 7.

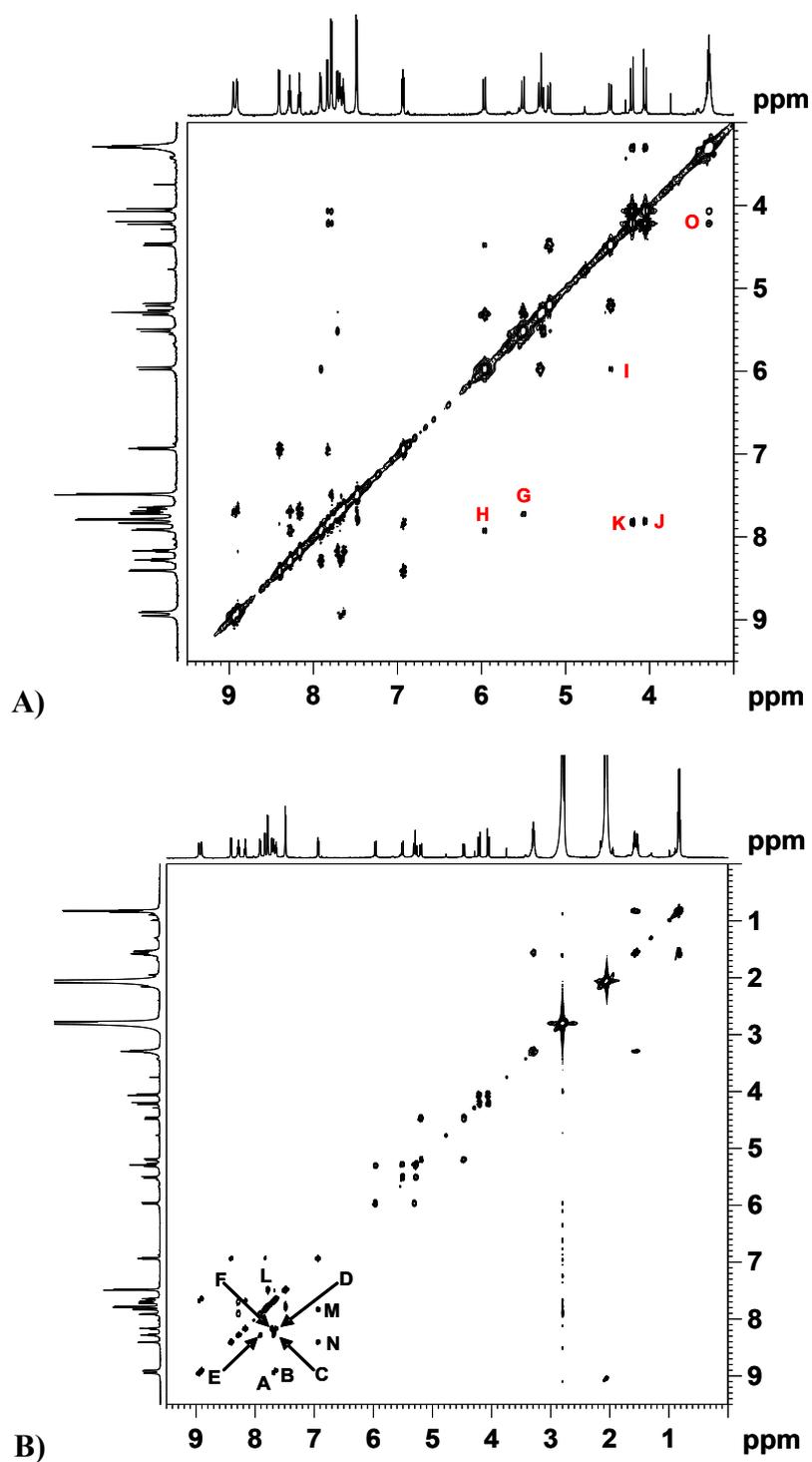


Figure S2: Portion of 2D NOESY (A) and COSY (B) spectra of **2** in Acetone-*d*₆ (¹H, 600MHz).

The characterization of the dipropylacetamidic chains started from the multiplets falling in the range 3.40 – 3.10 ppm which were assigned to the methylenic protons 10 and 13 because of their spatial correlation (NOESY cross-peak O, Figure S2-A) with methylene 9. As a consequence, by

COSY experiment, it was possible to assign the overlapping sextets falling in the range 1.70 – 1.40 ppm to the methylenic protons 11 and 14, and the two overlapping triplets falling in the range 0.90 – 0.70 ppm to methylenes 12 and 15.

NMR characterization of $[\{\text{Re}(\text{CO})_3\}(\text{CB256})\{\text{ReBr}(\text{CO})_3\}]$ (3)

The ^1H NMR spectrum recorded on compound **3** in Acetone- d_6 (Figure S3) exhibits a broad signal at 8.97 ppm assigned to protons 6'' (see Chart 2 for numbering of protons), which are the most deshielded due to their closeness to the pyridinic nitrogen. These protons undergo a downfield shift with respect to the free ligand ($\Delta\delta = 0.49$ ppm in Acetone- d_6) as a consequence of rhenium coordination.

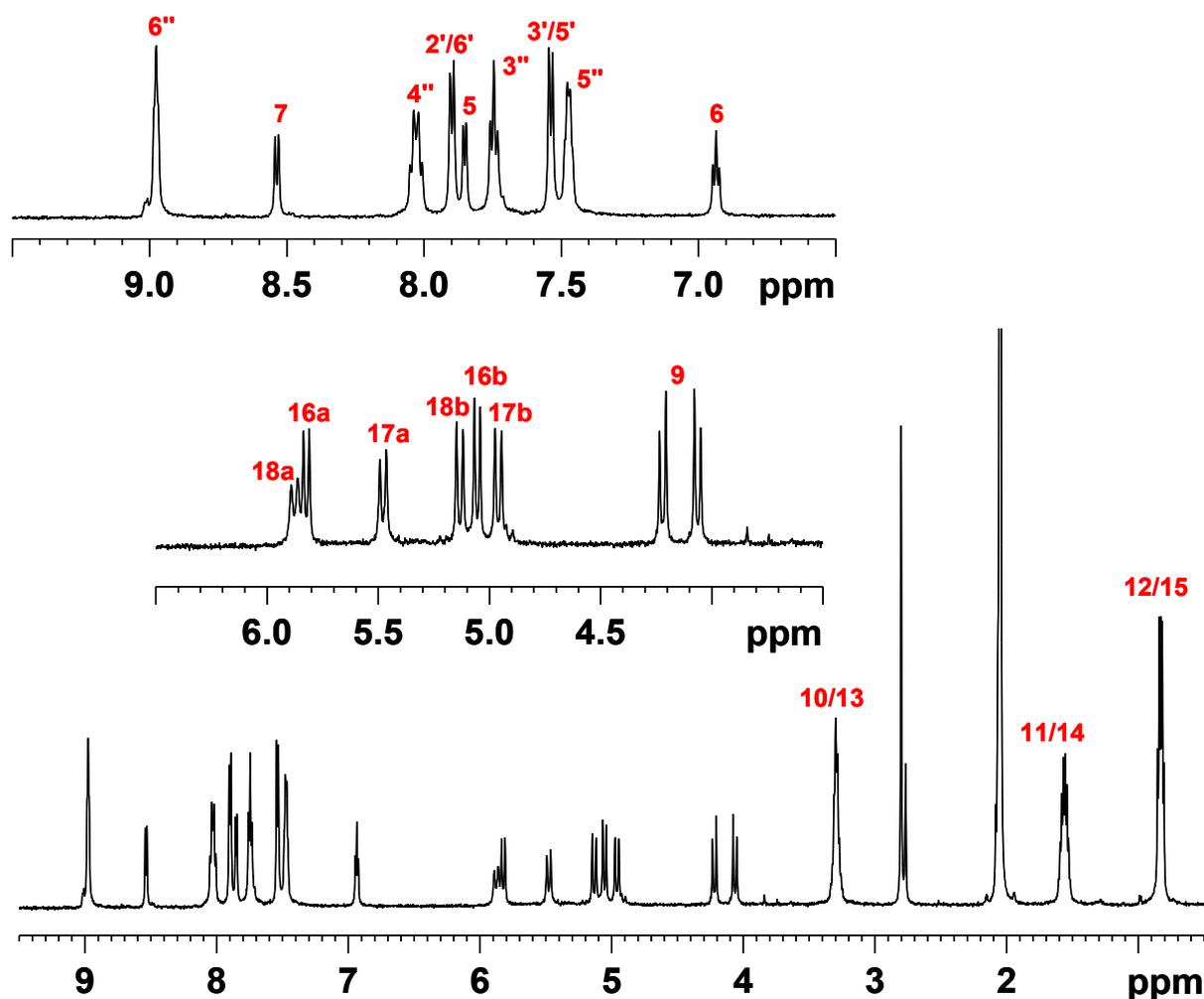


Figure S3: ^1H -NMR (^1H , 600MHz) spectrum of **3** in Acetone- d_6 .

Protons 6" have a COSY cross-peak (A, Figure S4-B) with two overlapping triplets in the range 7.50 – 7.40 ppm (2H) which were assigned to protons 5". Protons 5" show a COSY cross-peak (B, Figure S4-B) with the signal at 8.03 which was assigned to protons 4" which, in turn, show a COSY cross-peak (C, Figure S4-B) with the triplet at 7.74 ppm, assigned to protons 3".

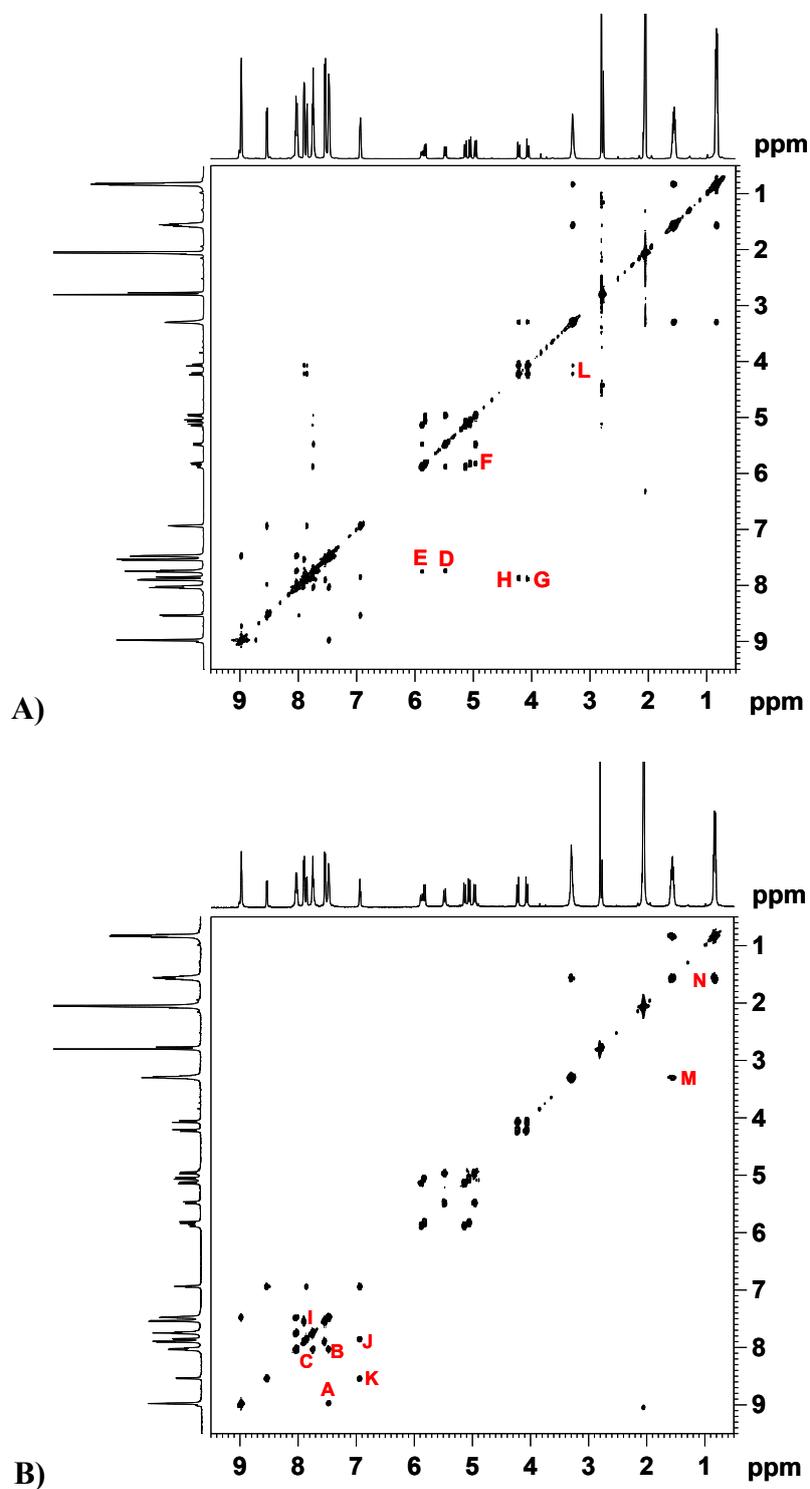


Figure S4: 2D NOESY (A) and COSY (B) spectra of **3** in Acetone- d_6 (^1H , 600MHz).

The four AB spin systems in the range 6.0 – 3.90 ppm were assigned, on the basis of 2D NOESY and COSY experiments, to the methylenic protons 16, 17, 18, and 9. Also in this case, because of the asymmetry of the rhenium center, the two protons of each methylenic group become diastereotopic and generate an AB spin system. Protons 3" show, in the NOESY spectrum (Figure S4-A), a cross peak (D) with the doublet falling at 5.48 ppm and assigned to one proton of methylene 17 (17a). Consequently, the signal falling at 4.96 ppm was assigned to the second proton of methylene 17 (17b). A second cross peak (E) between protons 3" and the doublet falling at 5.87 ppm assigns this latter signal to one proton of methylene 18 (18a), while the signal falling at 5.13 ppm was assigned to the second proton of methylene 18 (18b). Finally, the doublet at 5.82 ppm was assigned to one proton of the methylenic group 16 (16a) on the basis of a NOESY cross-peak (F) with proton 17a. Consequently, the signal falling at 5.05 ppm was assigned to the second proton of methylene 16 (16b). The last two doublets belong to an AB system centered at 4.14 ppm (${}^2J_{\text{H-H}} = 17.07$ Hz) and assigned to methylene 9. The most shielded doublet of the AB system shows a NOESY cross-peak (G, Figure S4-A) with the doublet falling at 7.90 ppm (2H, ${}^3J_{\text{H-H}} = 8.07$ Hz), assigned to protons 2'/6' of the 4-Cl-phenyl group, while the least shielded doublet shows a NOESY cross-peak (H, Figure S4-A) with the doublet falling at 7.86 ppm (1H, ${}^3J_{\text{H-H}} = 6.60$ Hz) and assigned to proton 5 of the imidazopyridine ring system. The doublet at 7.54 ppm (2H), which shows a COSY cross-peak (I, Figure S4-B) with the doublet at 7.90 ppm, was assigned to protons 3'/5' of the 4-Cl-phenyl group. The characterization of the imidazopyridine ring system was completed by assigning the triplet at 6.94 ppm (1H, ${}^3J_{\text{H-H}} = 7.11$ Hz) to proton 6 on the basis of a COSY cross-peaks (J, Figure S4-B) with the doublets related to proton 5 and a second COSY cross-peak (K, Figure S4-B) with the doublet falling at 8.54 ppm (1H, ${}^3J_{\text{H-H}} = 7.70$ Hz), this latter assigned to proton 7. Concerning the dipropylacetamidic chains, the two multiplets falling in the range 3.40 – 3.15 ppm were assigned to the methylenic protons 10 and 13 due to the presence of a NOESY cross-peak (L, Figure S4-A) with methylene 9. As a consequence, the overlapping multiplets falling in the range 1.70 – 1.40 ppm were assigned to the methylenic protons 11 and 14

due to the presence of a COSY cross-peak (M, Figure S4-B) with methylenes 10 and 13 and a COSY cross-peak (N, Figure S4-B) with the overlapping triplets falling in the range 0.90 – 0.75 ppm and assigned to the methyl groups 12 and 15.