Supporting Information

Synthesis, Structures, and DNA and Protein Binding of Ruthenium(II)-p-Cymene Complexes of Substituted Pyridylimidazo[1,5-a]pyridine: Enhanced Cytotoxicity of Complexes of Ligands Appended with Carbazole Moiety

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Figure S1. $^1$H NMR spectrum of L1 in CDCl$_3$. 
Figure S2. $^{13}$C NMR spectrum of L1 in CDCl$_3$. 
**Figure S3.** HRMS-ESI for L1, Calcd for $\text{C}_{18}\text{H}_{14}\text{N}_3$: 272.1188 [M+H]$^+$, Found: 272.1182 [M+H]$^+$. 
Figure S4. $^1$H NMR spectrum of L2 in CDCl$_3$. 
Figure S5. $^{13}$C NMR spectrum of L2 in CDCl$_3$. 
Figure S6. HRMS-ESI for L2. Calcd for C\textsubscript{20}H\textsubscript{19}N\textsubscript{4}: 315.1610 [M+H]\textsuperscript{+}, Found: 315.1604 [M+H]\textsuperscript{+}. 
Figure S7. $^1$H NMR spectrum of L3 in CDCl$_3$. 
Figure S8. $^{13}$C NMR spectrum of L3 in CDCl$_3$. 
Figure S9. HRMS-ESI for L3, Calcd for C\textsubscript{30}H\textsubscript{23}N\textsubscript{4}: 439.1923 [M+H]\textsuperscript{+}, Found: 439.1917 [M+H]\textsuperscript{+}.
Figure S10. $^1$H NMR spectrum of L4 in CDCl$_3$. 
Figure S11. $^{13}$C NMR spectrum of L4 in CDCl$_3$. 
Figure S12. HRMS-ESI for L4. Calcd for C$_{30}$H$_{21}$N$_{4}$: 437.1766 [M+H]*, Found: 437.1761 [M+H]*.
Figure S13. $^1$H NMR spectrum of L5 in CDCl$_3$. 

![Figure S13. $^1$H NMR spectrum of L5 in CDCl$_3$.](image)
Figure S14. $^{13}$C NMR spectrum of L5 in CDCl$_3$. 
Figure S15. HRMS-ESI for L5, Calcd for C_{26}H_{21}N_{4}: 389.1766 [M+H]^+, Found: 389.1716 [M+H]^+. 
Figure S16. $^1$H NMR spectrum of L6 in CDCl$_3$. 
Figure S17. $^{13}$C NMR spectrum of L6 in CDCl$_3$. 
Figure S18. HRMS-ESI for L6, Calcld for C_{26}H_{21}N_{4}S: 421.1487 [M+H]^+, Found: 421.1473 [M+H]^+.
Figure S19. $^1$H NMR spectrum of [Ru(η$^6$-cymene)(L1)Cl]BF$_4$ (I) in CDCl$_3$. 
Figure S20. ESI-MASS Spectrum of [Ru(η⁶-cymene)(L1)Cl]BF₄. (1)
Figure S21. $^1$H NMR spectrum of $[\text{Ru(}\eta^6\text{-cymene})(\text{L}2\text{Cl})\text{BF}_4]$ in DMSO-D$_6$. (2)
**Figure S22.** ESI-MASS Spectrum of [Ru(η⁶-cymene)(L2)Cl]BF₄. (2)
Figure S23. $^1$H NMR spectrum of [Ru($\eta^6$-cymene)(L3)Cl]BF$_4$ in DMSO-$d_6$. (3)
Figure S24. ESI-MASS Spectrum of [Ru(η^6-cymene)(L3)Cl]BF₄. (3)
Figure S25. $^1$H NMR spectrum of [Ru($\eta^6$-cymene)(L4)Cl]BF$_4$ in CDCl$_3$. (4)
Figure S26. ESI-MASS Spectrum of [Ru(η⁶-cymene)(L4)Cl]BF₄. (4)
Figure S27. $^1$H NMR spectrum of $[\text{Ru}(\eta^6\text{-cymene})(\text{L}5)\text{Cl}]\text{BF}_4$ in DMSO-D$_6$. (5)
Figure S28. ESI-MASS Spectrum of [Ru(η^6-cymene)(L5)Cl]BF₄. (5)
Figure S29. $^1$H NMR spectrum of $[\text{Ru}(\eta^6\text{-cymene})(\text{L6})\text{Cl}]\text{BF}_4$ in DMSO-D$_6$. (6)
Figure S30. ESI-MASS Spectrum of [Ru(η⁶-cymene)(L6)Cl]BF₄. (6)