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# Supplementary Materials: A Hybrid of Amodiaquine and Primaquine Linked by Gold(I) Is a Multistage Antimalarial Agent Targeting Heme Detoxification and Thiol Redox Homeostasis

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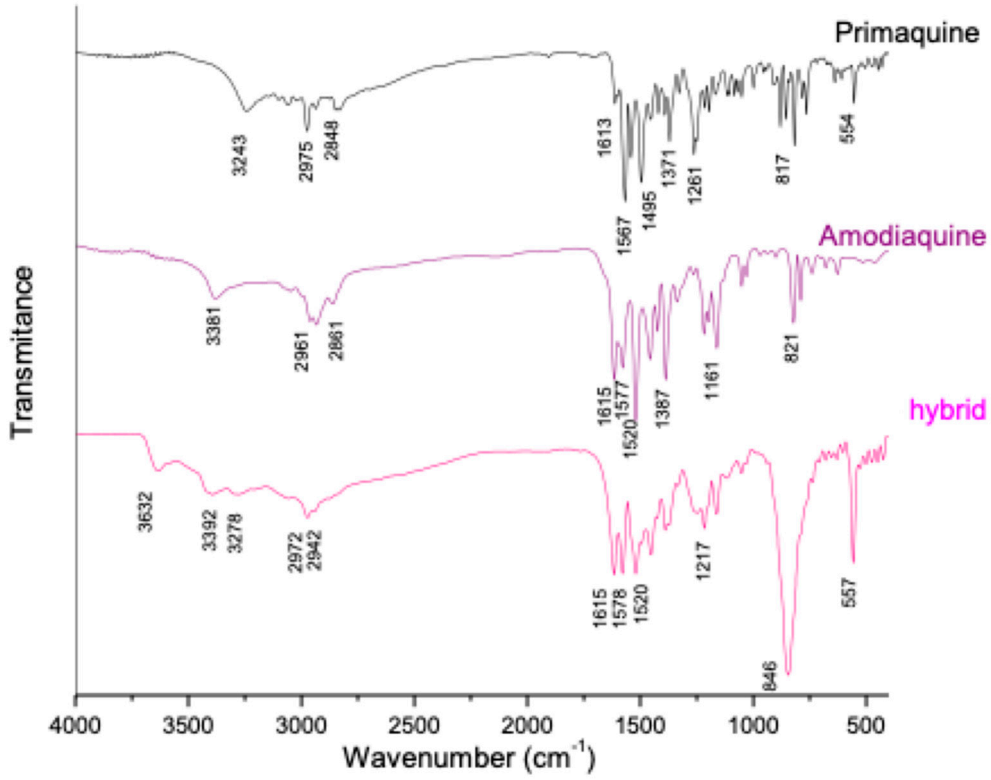


**Figure S1.** Infrared spectra for the quinolinic ligands and the [AuAQPQ]$PF_6$ hybrid.

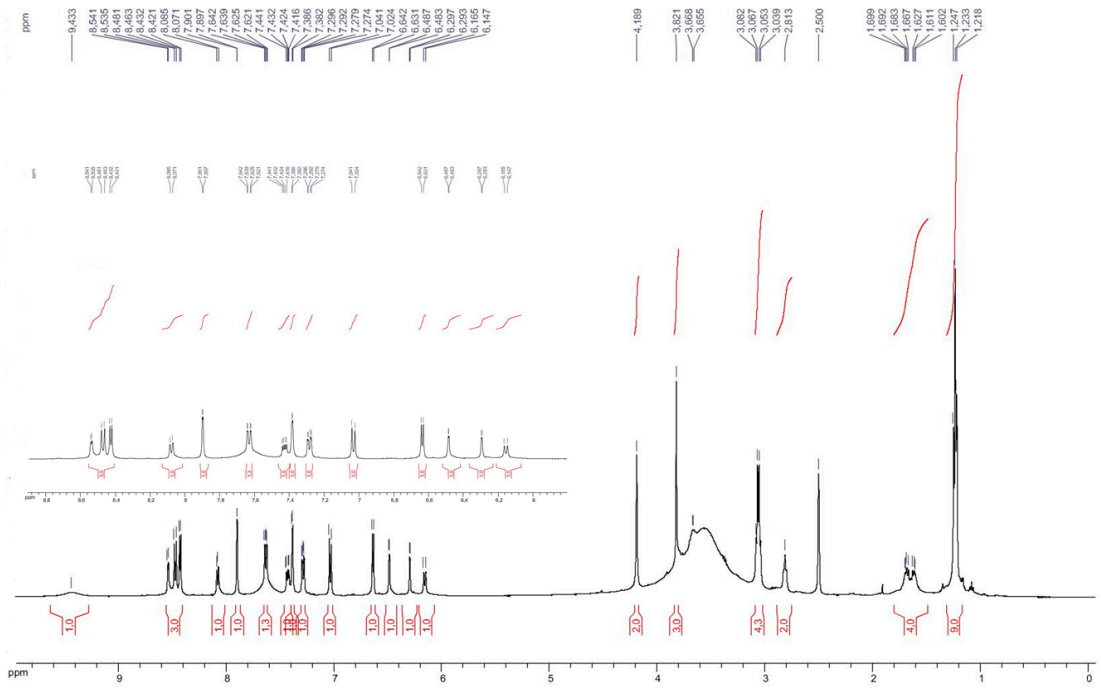

**Figure S2.** $^{1}$H NMR (DMSO-d$_6$, 298K, 500 MHz) of [AuAQPQ]PF$_6$ hybrid.

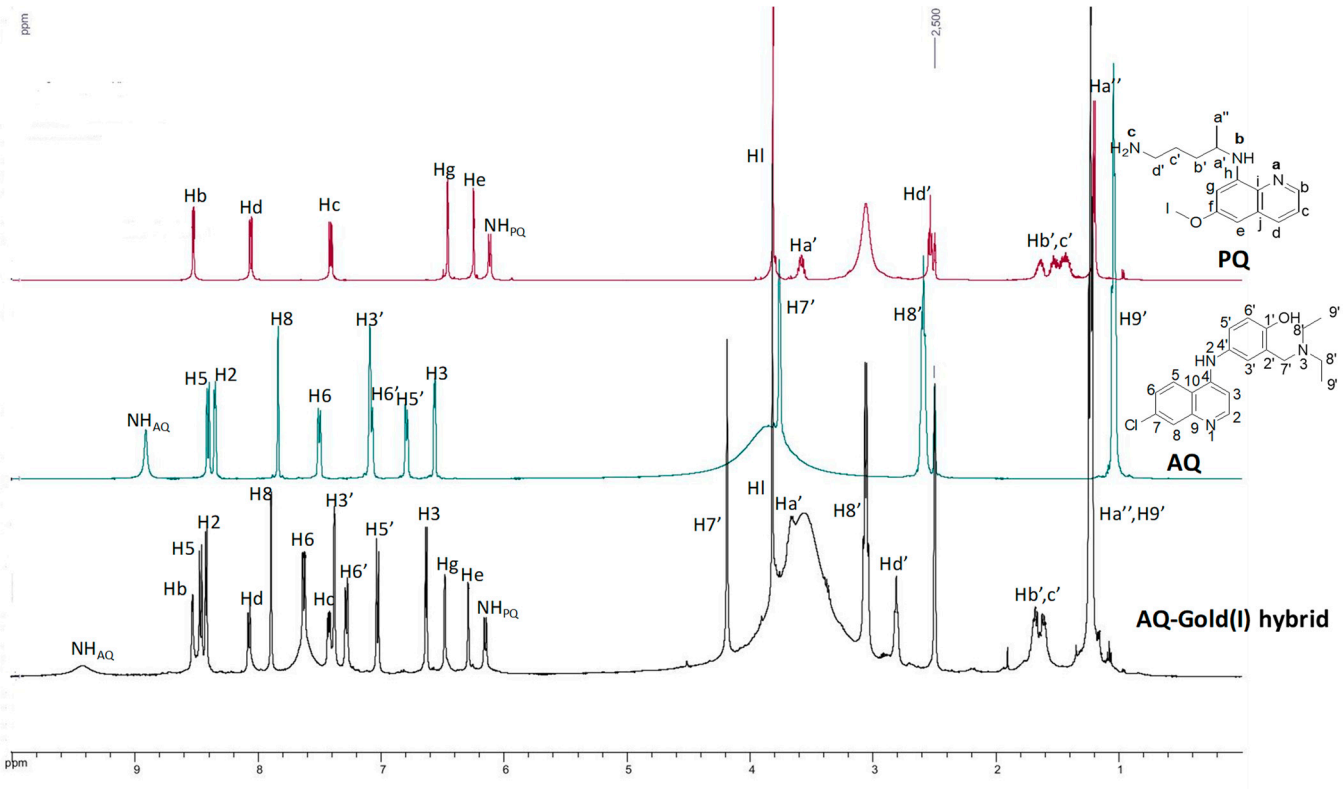


**Figure S3.** $^{1}$H NMR (DMSO-d$_6$, 298K, 500 MHz) of the metal-free quinolines and of [AuAQPQ]PF$_6$ hybrid.

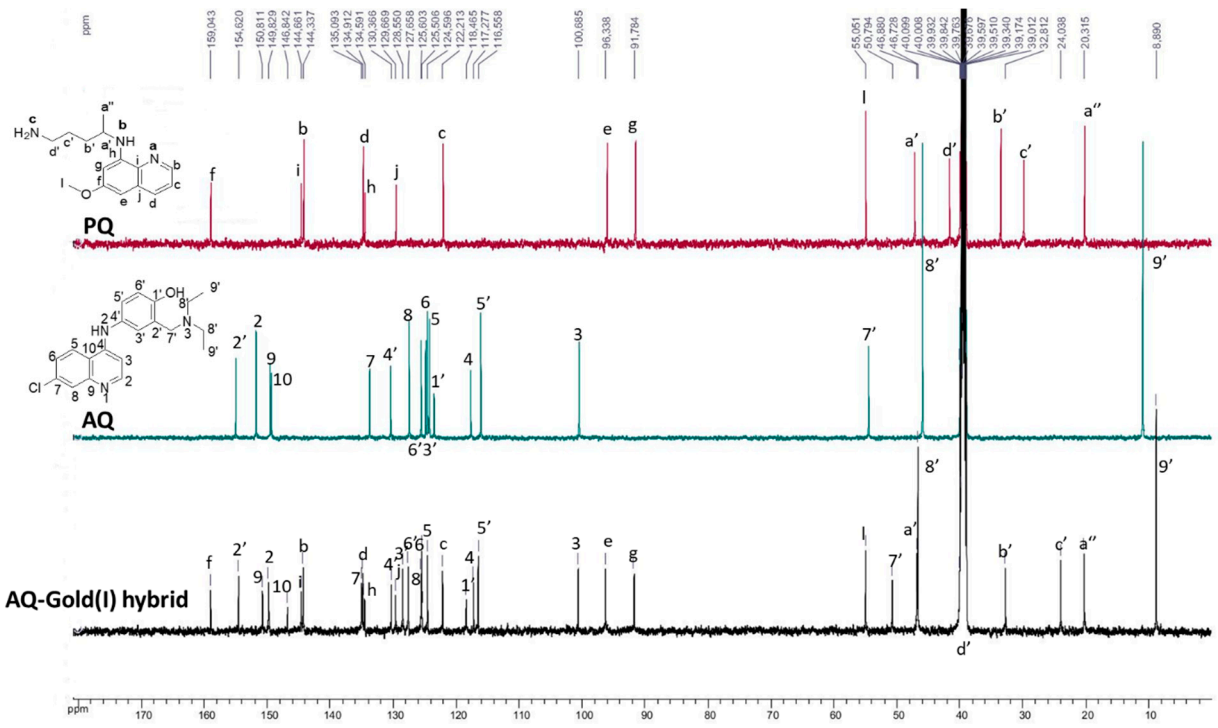


**Figure S4.** $^{13}$C NMR (DMSO-d$_6$, 298K, 125 MHz) of the quinolinic ligands and of [AuAQPQ]PF$_6$ hybrid.

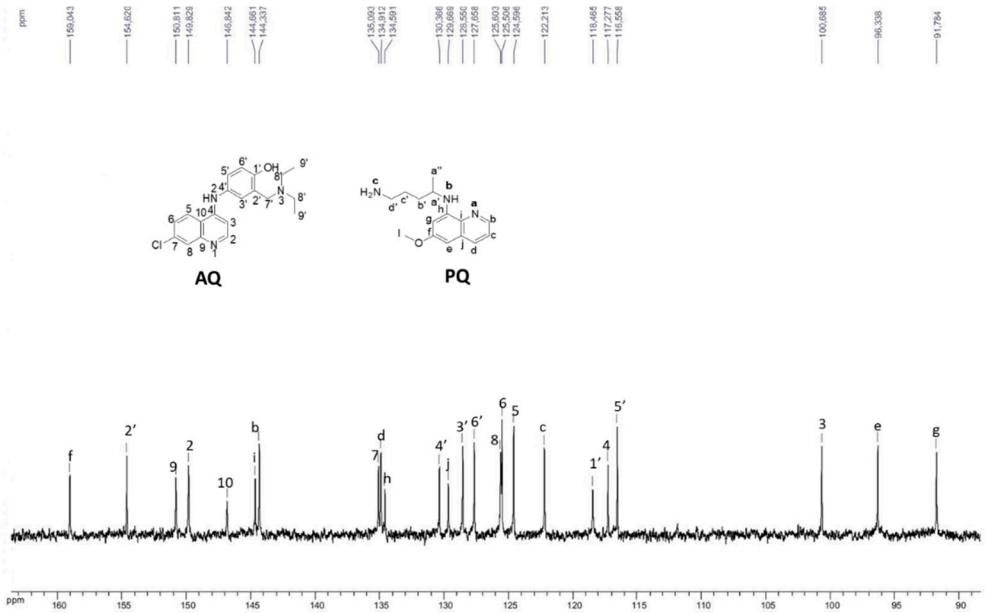


**Figure S5.** Expansion of $^{13}$C NMR (DMSO-d$_6$, 298K, 125 MHz) in the aromatic region for the [AuAQPQ]PF$_6$ hybrid.

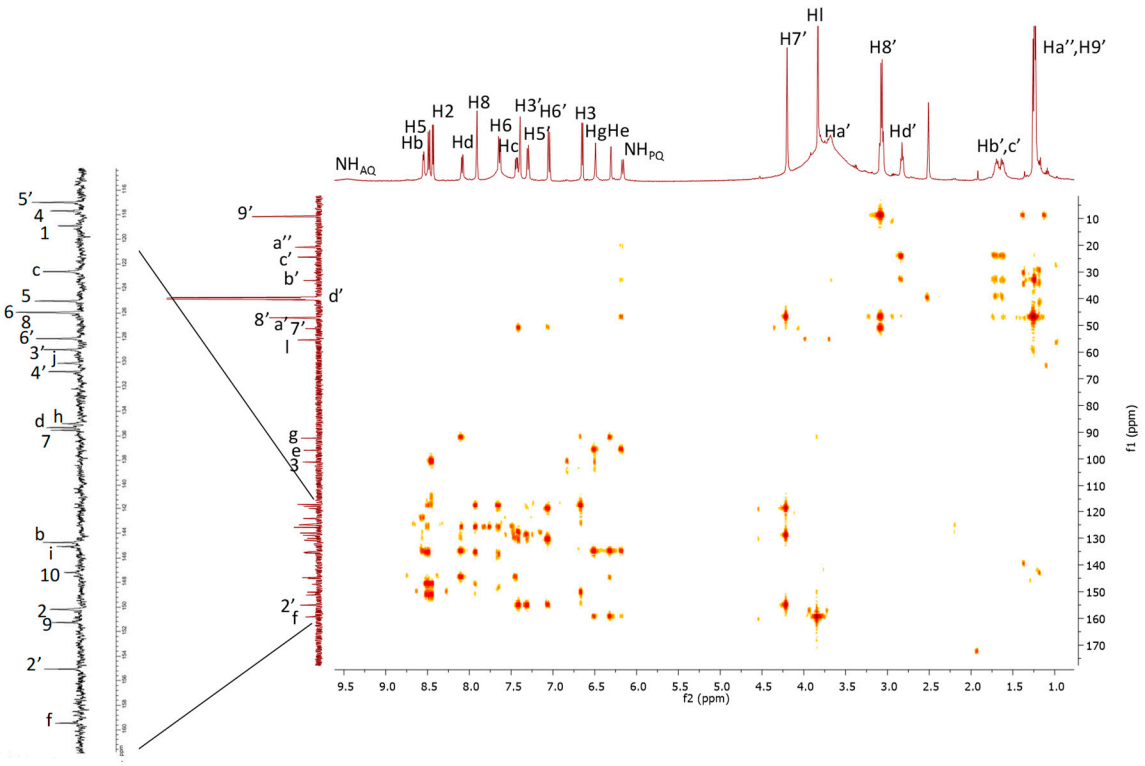


**Figure S6.** $^{13}C$-$^{1}H$ HMBC (DMSO-d$_6$, 298K) of the [AuAQPQ]PF$_6$ hybrid.

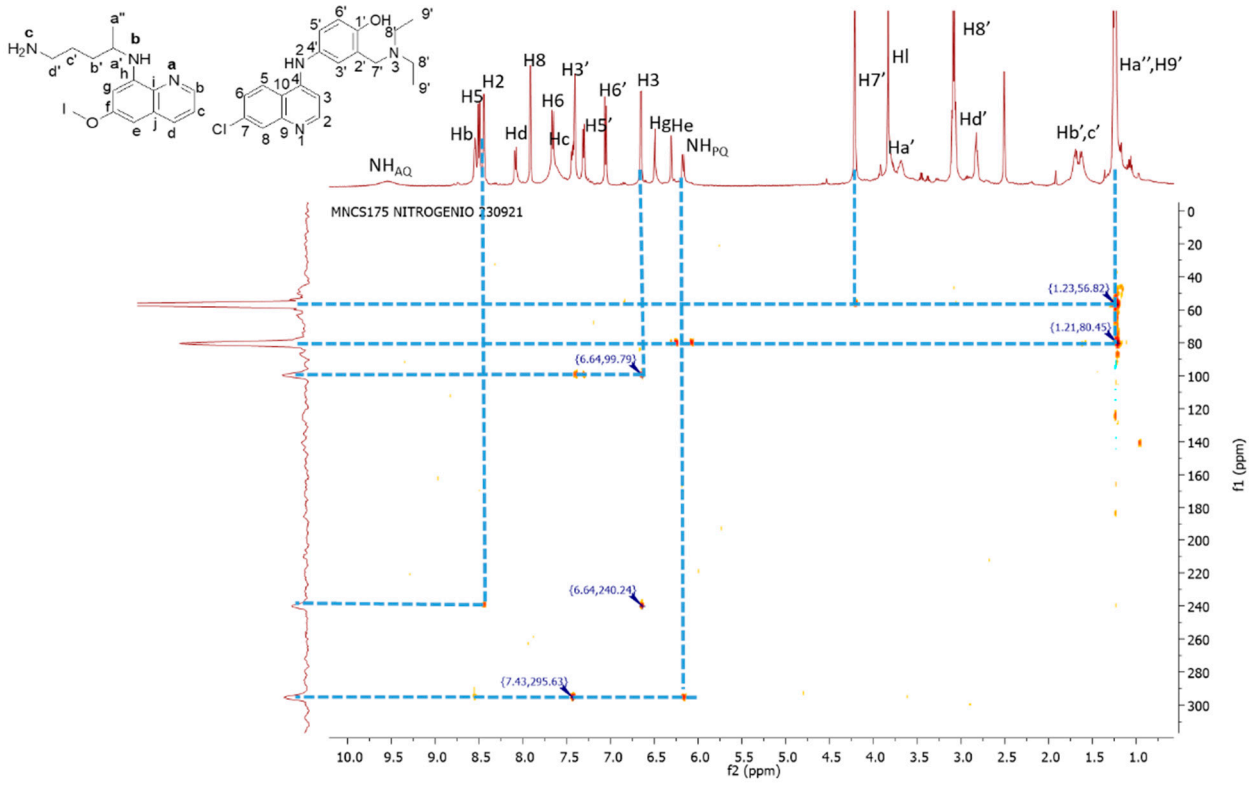


**Figure S7.** $^{15}N$-$^{1}H$ HMBC (DMSO-d$_6$, 298K) of the [AuAQPQ]PF$_6$ hybrid.

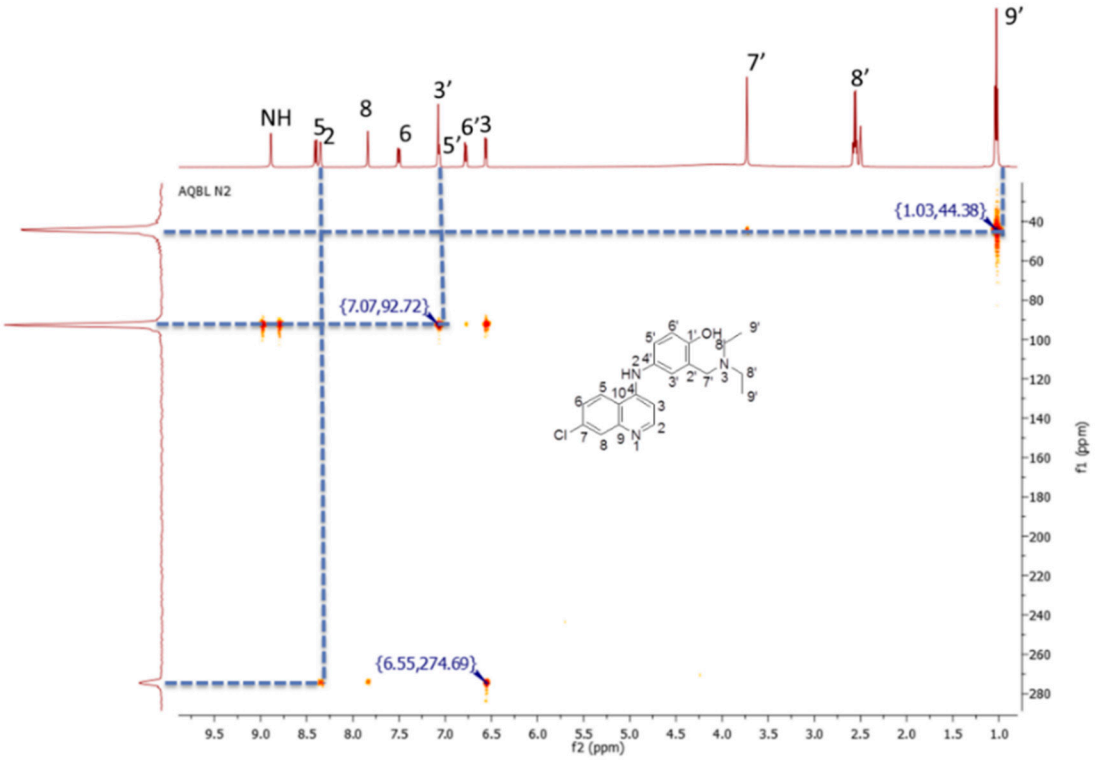


**Figure S8.** $^{15}$N-$^{1}$H HMBC (DMSO-d$_6$, 298K) of amodiaquine (AQ).

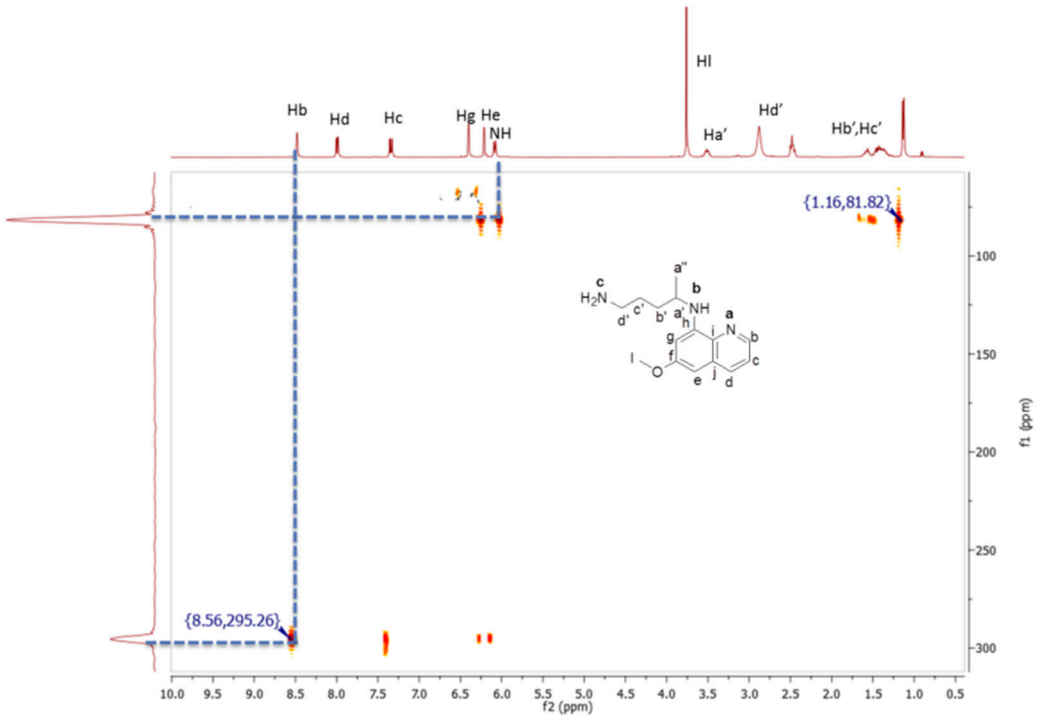


**Figure S9.** $^{15}$N-$^{1}$H HMBC (DMSO-d$_6$, 298K) of primaquine (PQ).

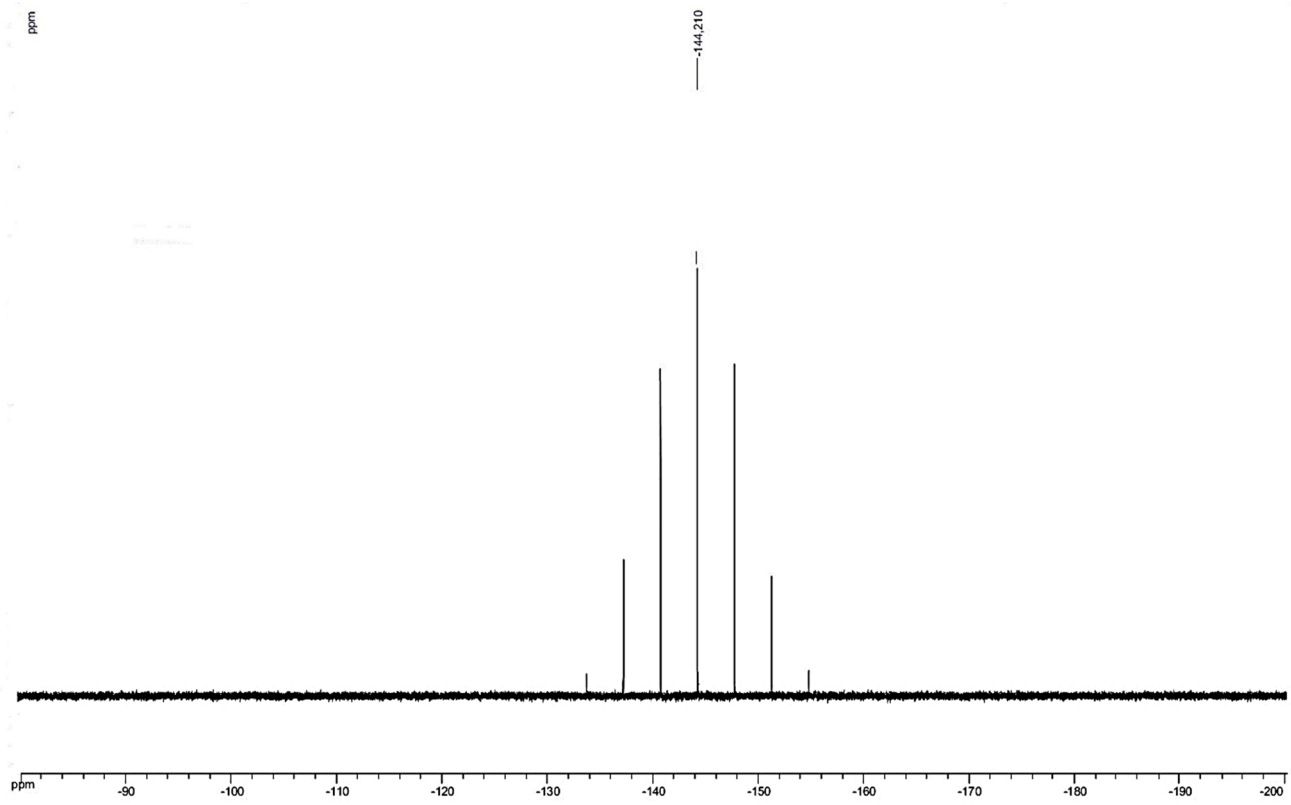


**Figure S10.** $^{31}P\{^{1}H\}$ NMR (DMSO-$d_6$, 298K, 202 MHz) of the [AuAQPQ]$PF_6$ hybrid.

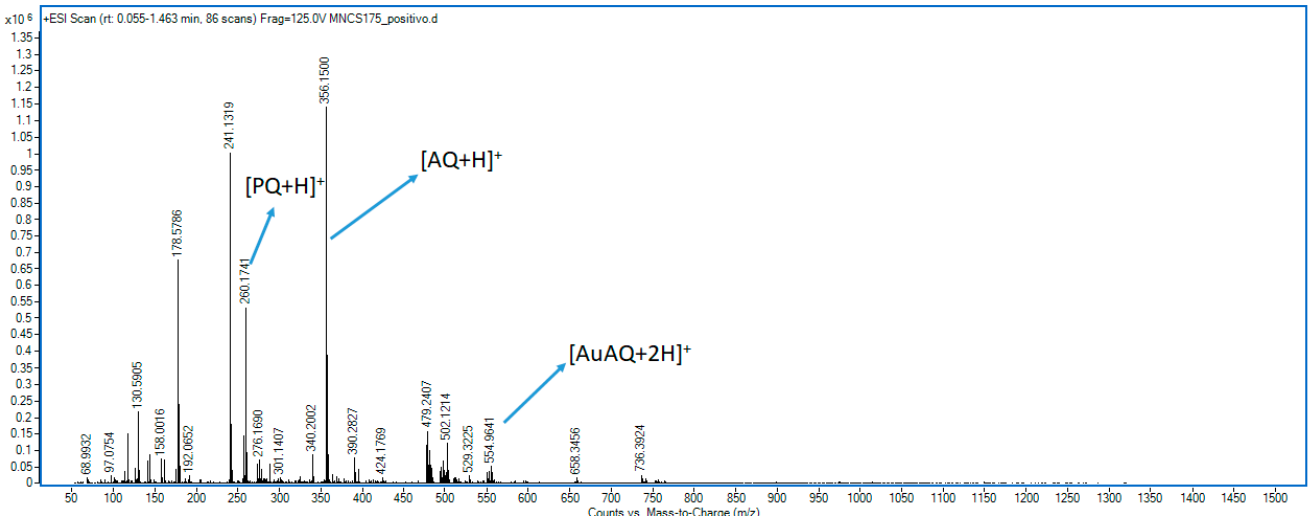


**Figure S11.** ESI-MS spectrum of the [AuAQPQ]$PF_6$ hybrid.

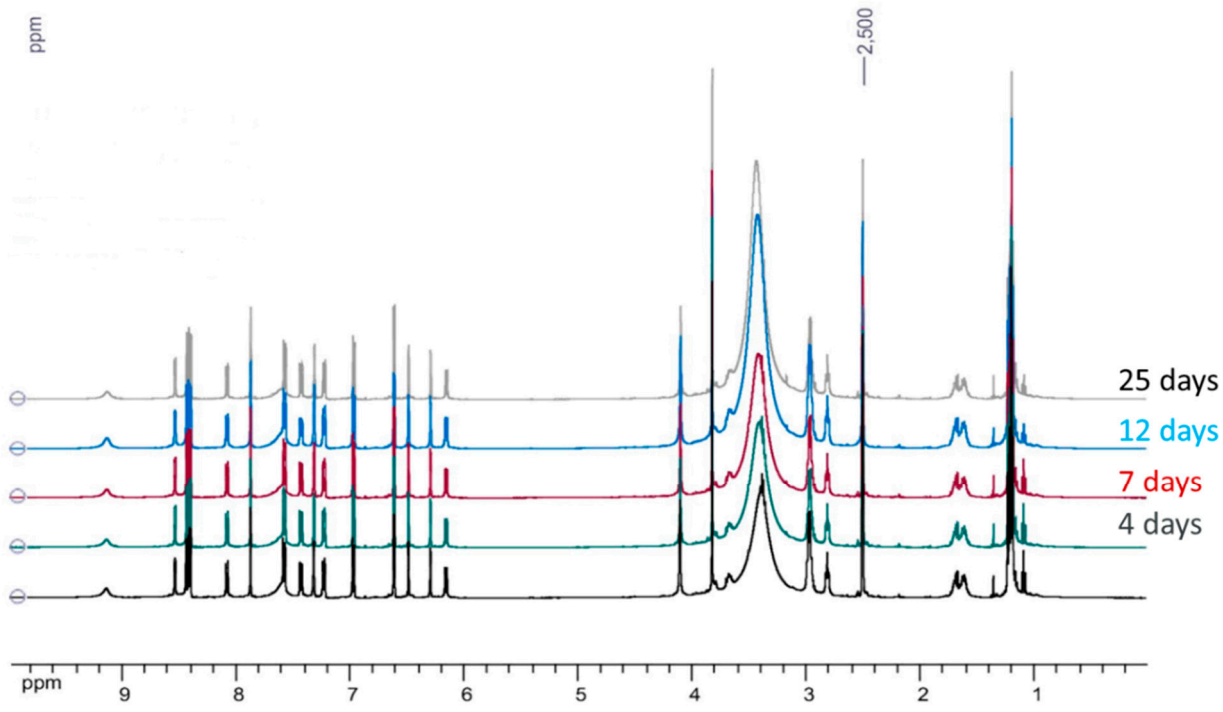


**Figure S12.** Stability of [AuAQPQ]$PF_6$ hybrid in a DMSO-$d_6$ solution at 298K monitored by $^1H$ NMR (500 MHz).

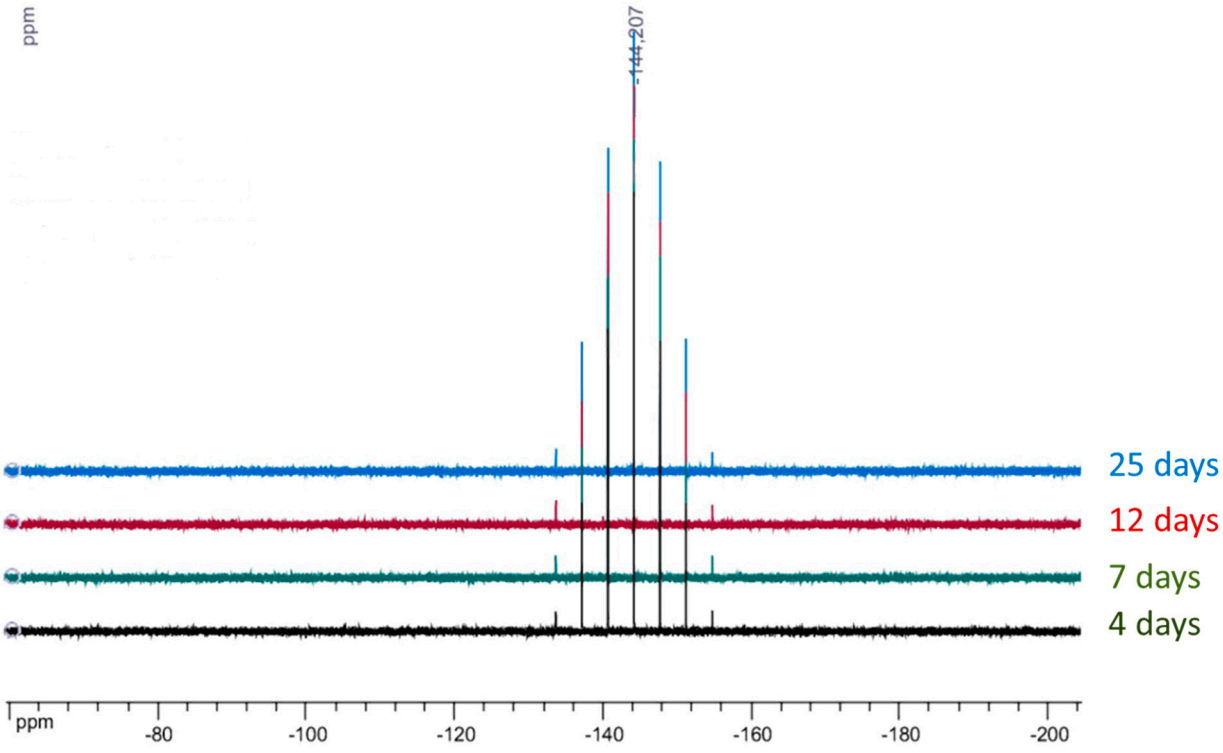


**Figure S13.** Evaluation of stability of [AuAQPQ]$PF_6$ hybrid in a DMSO solution at 298K monitored by $^{31}P\{^1H\}$ (202 MHz).

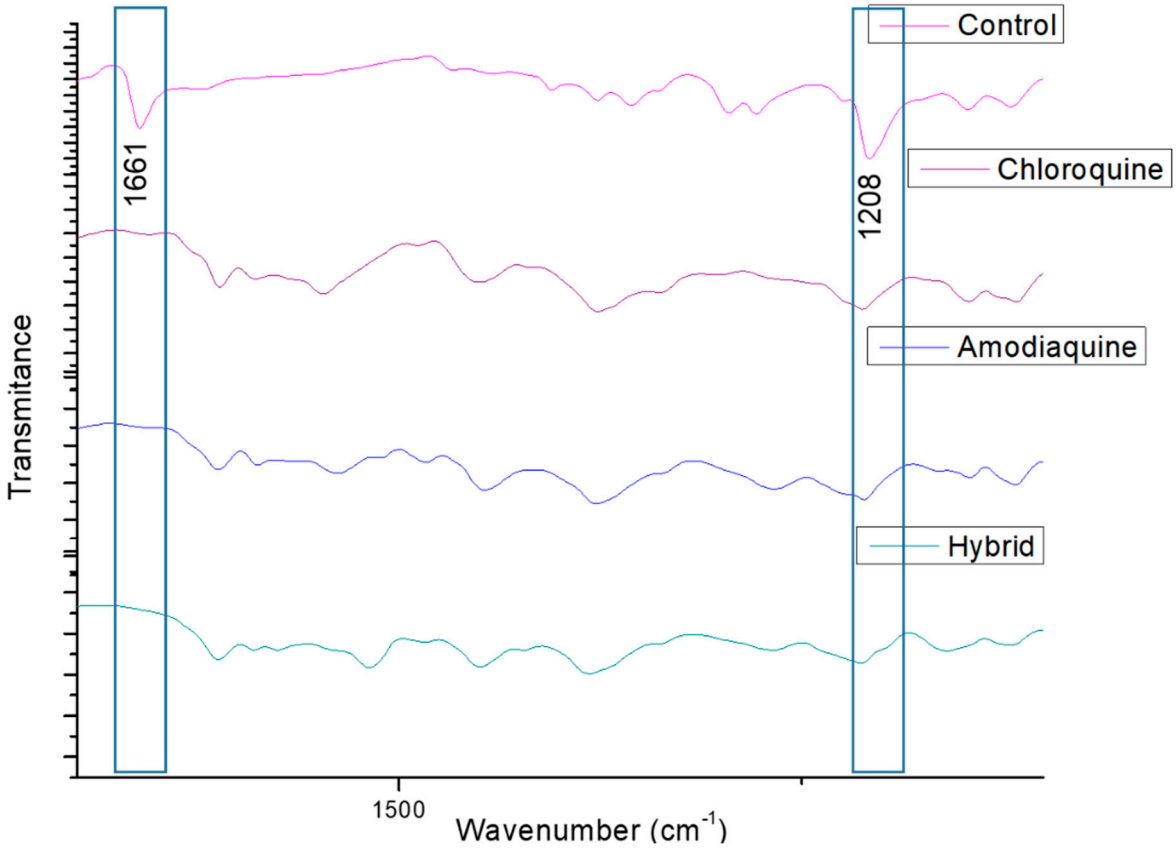


**Figure S14.** Formation of β-hematin monitored by IR and its inhibition by [AuAQPQ]$PF_6$ hybrid (**2**).

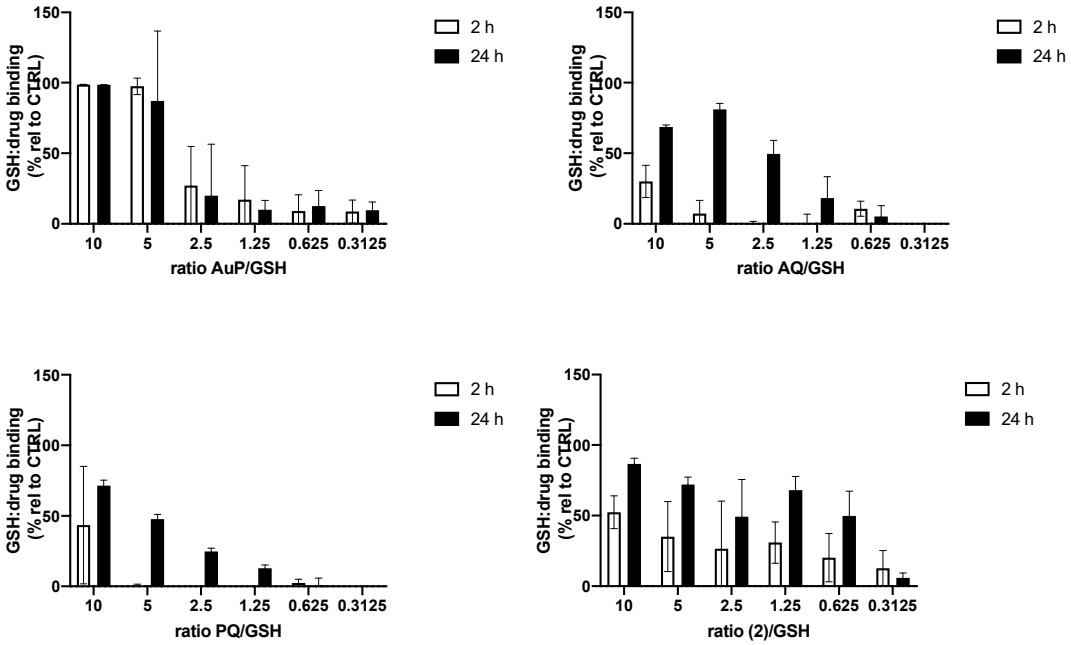


**Figure S15.** Interaction of compounds with reduced glutathione (GSH) at indicated time of incubation. Values are the mean ± S.D. from two independent experiments. GSH was detected using monochlorobimane and the percent of drug:GSH binding was determined in comparison to untreated samples (no drug). AuP = [AuClPPh3].

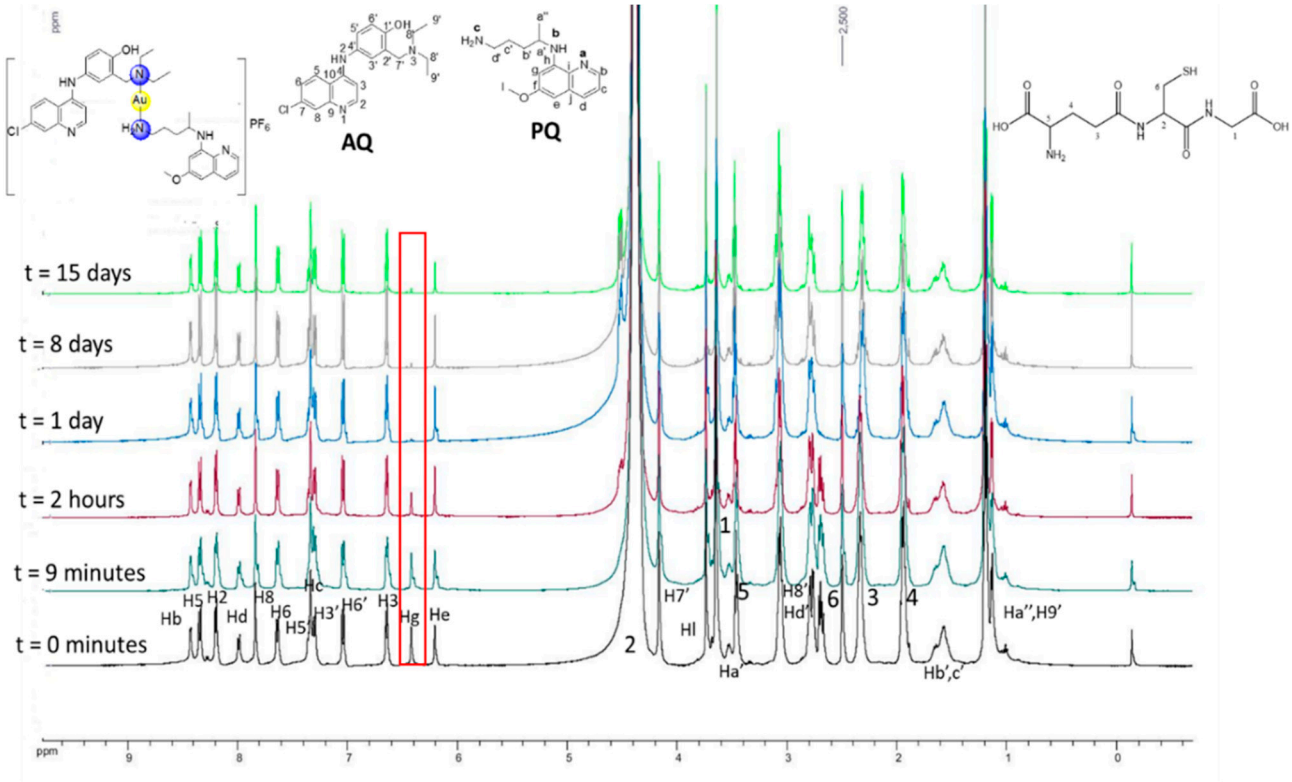


**Figure S16.** Evaluation of the interaction of the [AuAQPQ]$PF_6$ hybrid and glutathione by $H^1$-NMR (DMSO-$d_6$:$D_2O$ / 300:200 μL, 298K, 500 MHz).