ELECTRONIC SUPPLEMENTARY INFORMATION

Biorelevant reactions of the anti-tumor agent vanadocene dichloride

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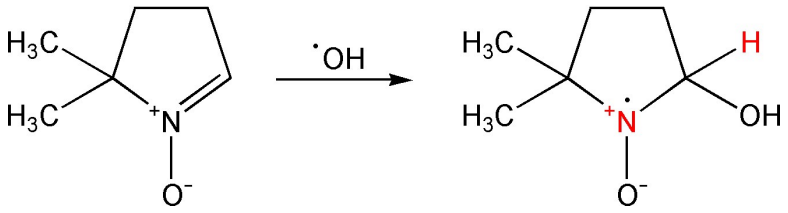
Table S1 Concentration of the relevant bioligands in the cytosol of the red blood cells[a]

Bioligand	Concentration	Bioligand	Concentration
Hemoglobin (Hb)	5.1 mM	Lactate (lact)	932 ± 211 μM
AMP	21 ± 3 μM	GSH	2.23 ± 0.35 mM
ADP	216 ± 36 μM	Glycine	347 ± 70 μM
ATP	1.35 ± 0.035 mM	NADPH	32 ± 2 μM
cAMP	15 ± 2.4 μM	$NADP^+$	1.4 ± 1.1 μM
Inorganic phosphate	480 ± 5 μmol	Ascorbic acid	28.9 ± 4.3 μM

[a] All the concentrations taken from *Williams Hematology, Eighth Edition*, The McGraw-Hill Companies, Inc., China, 2010.



Scheme S1 Adduct formation between the hydroxyl radical (·OH) and DMPO. In red the atoms with the strongest coupling with the unpaired electron are shown.

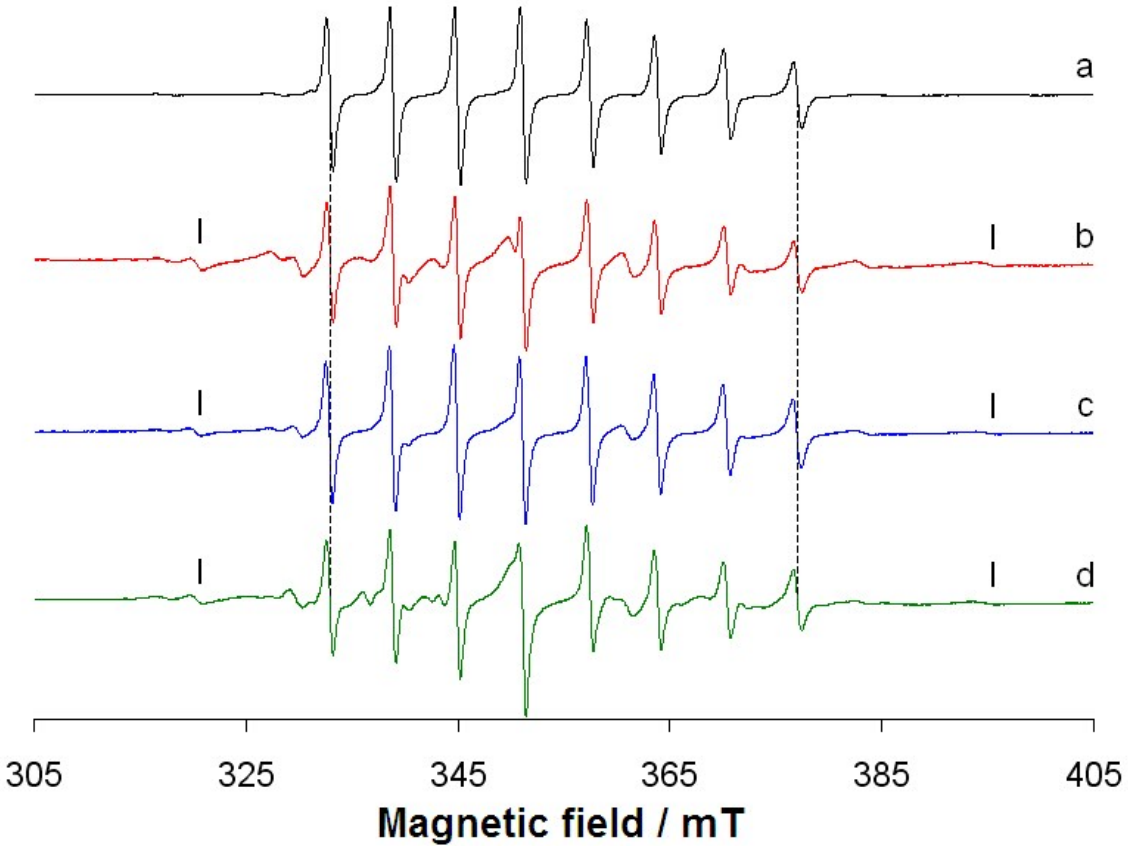


Fig. S1 Room temperature (298 K) EPR spectra recorded at pH 7.4 in aqueous solution in the systems containing: (a) VDC (spectrum of $[Cp_2V(OH)_2]$); (b) VDC/GSH 1/10; (c) VDC/$NADP^+$ 1/10 and (d) VDC/ascorbic acid 1/10. VDC concentration was 1.0×10^{-3} M. With the dotted lines the resonances M_I = -7/2, 7/2 of the complex $[Cp_2V(OH)_2]$ are shown. With **I** the resonances of $V^{IV}O^{2+}$ species present in small amount are indicated.

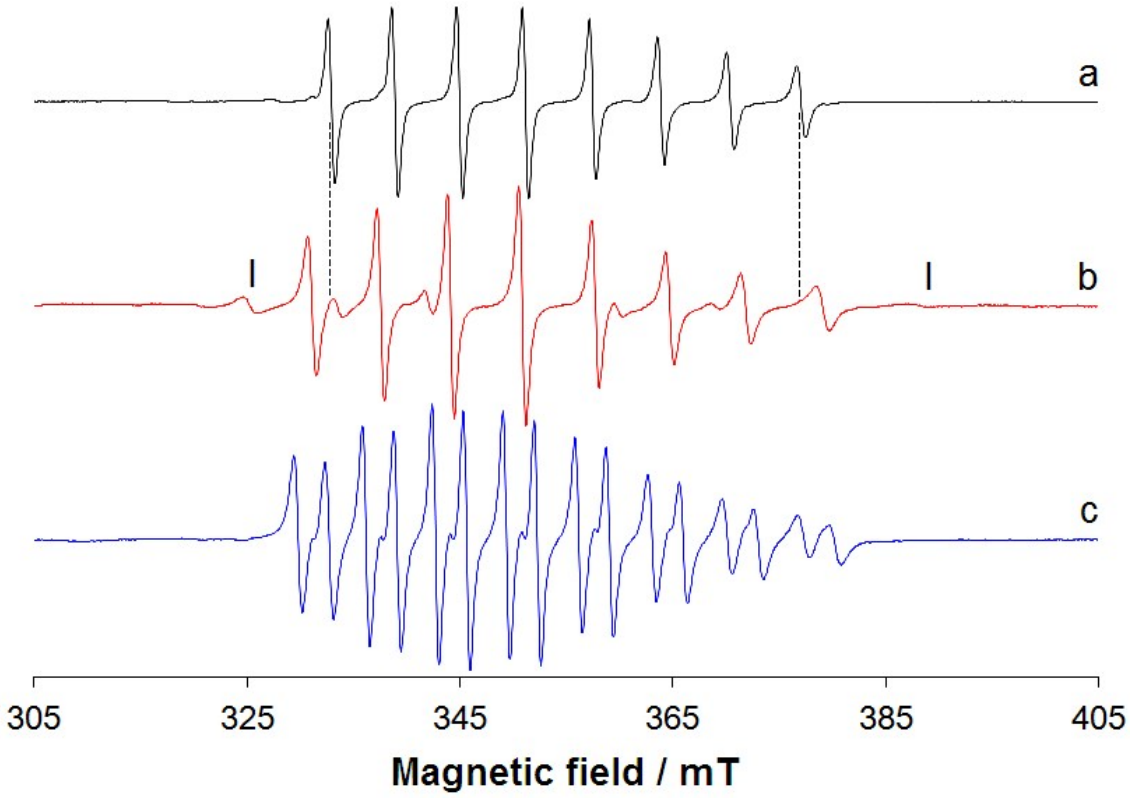


Fig. S2 Room temperature (298 K) EPR spectra recorded at pH 7.4 in aqueous solution in the systems containing: (a) VDC (spectrum of $[Cp_2V(OH)_2]$); (b) VDC/lactate 1/10 (spectrum of $[Cp_2V(lactH_{-1})]$) and (c) VDC/HPO_4^{2-} 1/10 (spectrum of $[Cp_2V(HPO_4)]$). VDC concentration was 1.0×10^{-3} M. With the dotted lines the resonances M_I = -7/2, 7/2 of $[Cp_2V(OH)_2]$ are shown. With **I** the resonances of $[VO(lactH_{-1})_2]^{2-}$ are indicated.

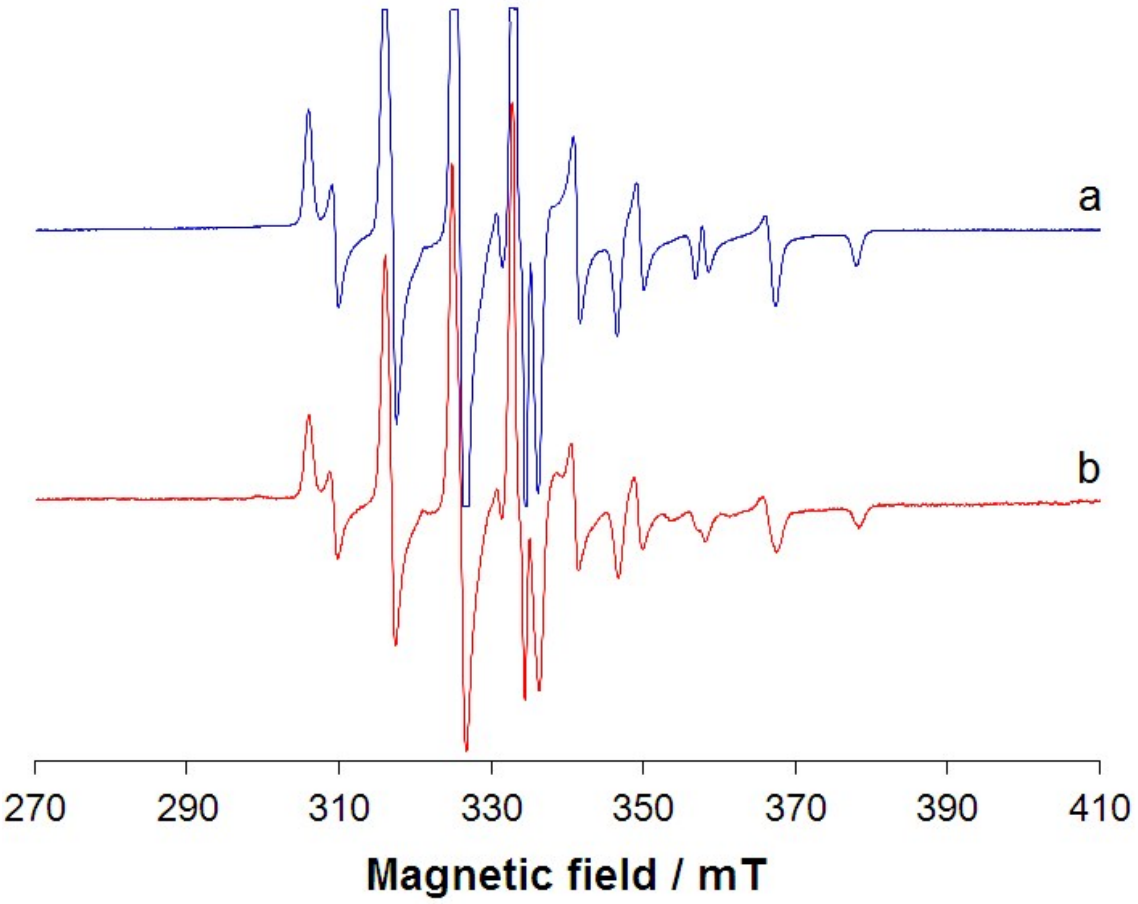


Fig. S3 Low temperature EPR spectra (120 K) recorded at pH 7.4 in aqueous solution in the systems containing: (a) VDC (spectrum of $[Cp_2V(OH)_2]$) and (b) VDC/CT-DNA at ratio 1/10. The concentration of VDC was 1.0×10^{-3} M.

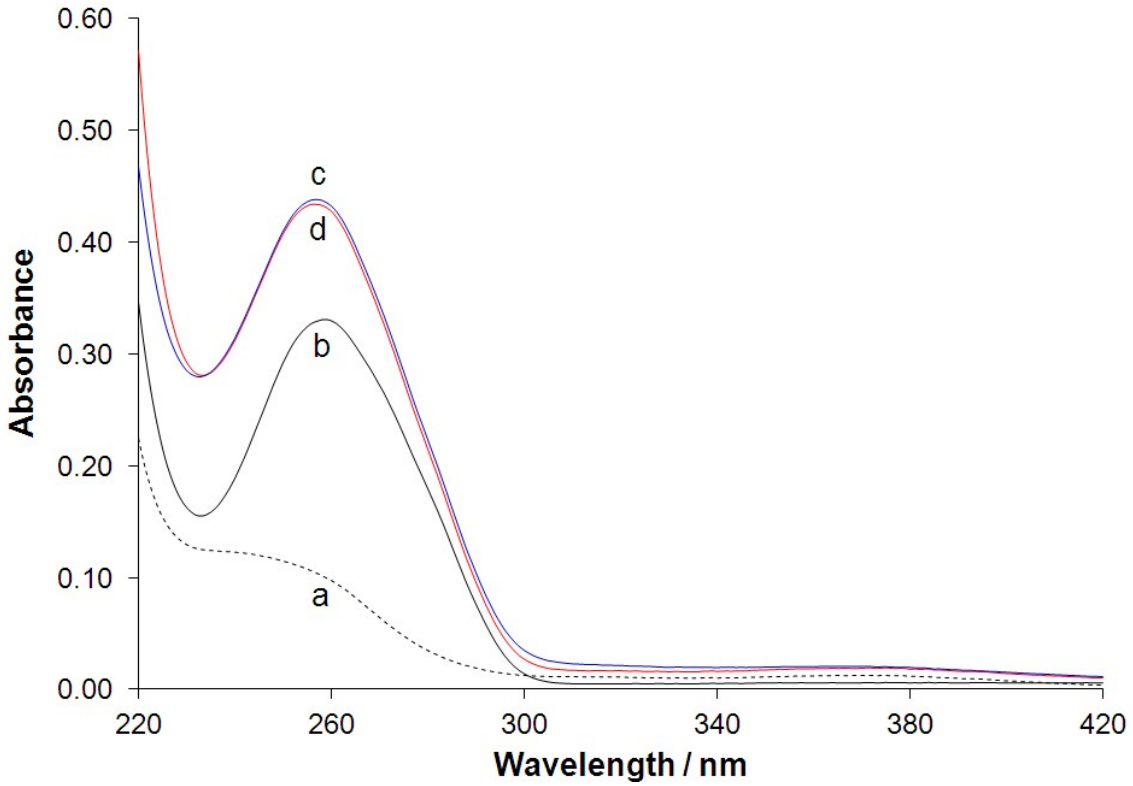


Fig. S4 UV-Vis absorption spectra (1 mm optical path) recorded at 298 K and pH 7.4 in aqueous solution in the systems containing: (a) VDC (black, dotted line); (b) CT-DNA (black, full line); (c) VDC/CT-DNA 1/4 after 10 min (blue) and (d) sum of the spectra (red) in the traces a (VDC) and b (CT-DNA). The concentration of VDC and CT-DNA was 1.0×10^{-4} M and 4.0×10^{-4} M, respectively.

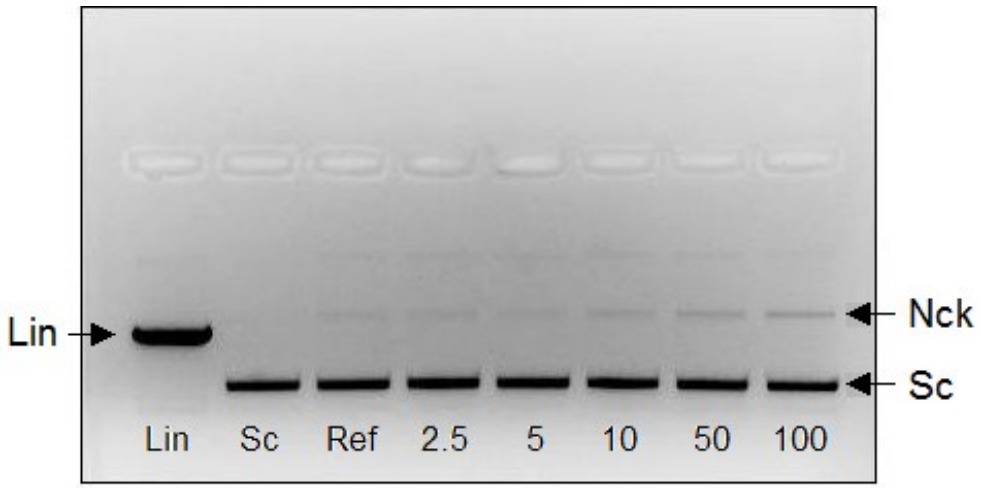


Fig. S5 Agarose gel electrophoresis showing the effect of concentration of VDC on plasmid DNA cleavage. Lin is the linearized form of pSK, Sc is the supercoiled form of pSK, Nck is the nicked form of pSK and Ref is a reference incubation in phosphate buffer without VDC. The concentration of VDC used (in μM) is indicated below the lanes 4-8.

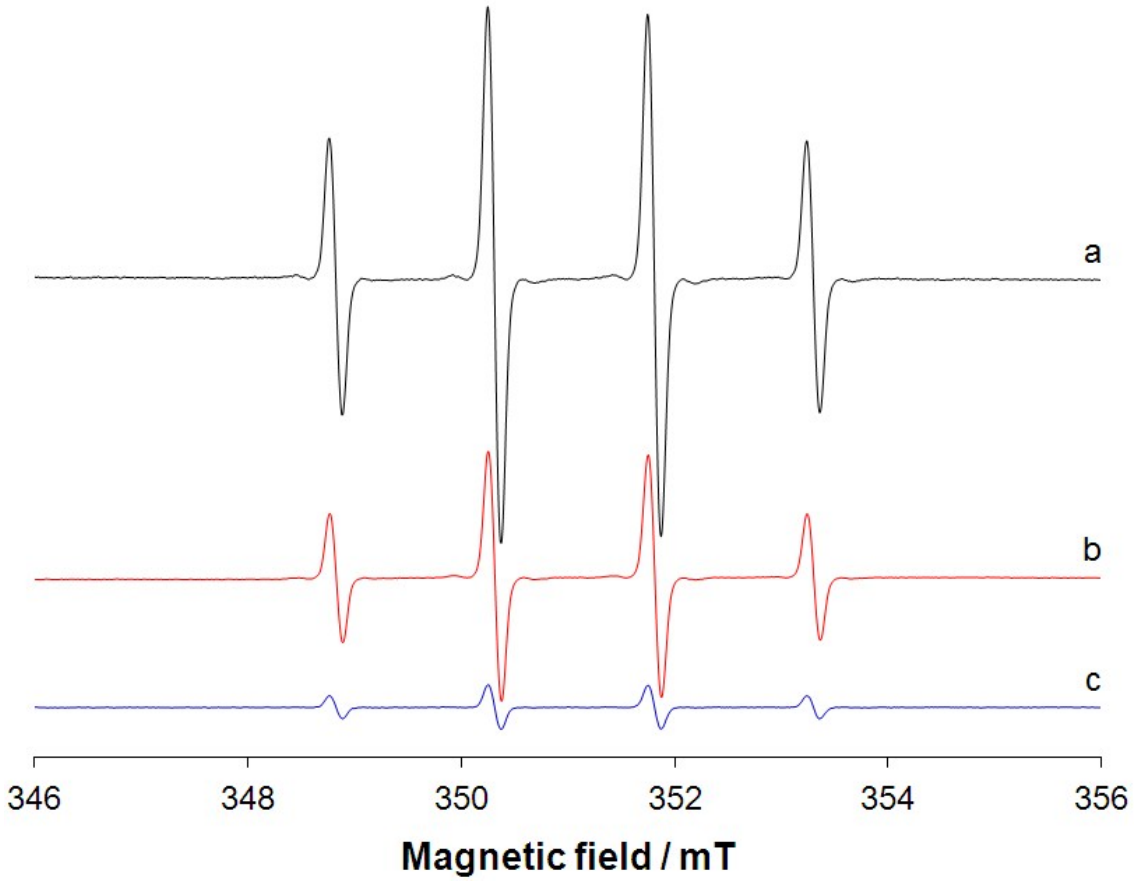


Fig. S6 Isotropic EPR spectra of the adduct DMPO–OH produced in Fenton-like reactions in the systems containing: (a) $[VO(H_2O)_5]^{2+}$ (V concentration 2.5×10^{-5} M, pH 3.0); (b) $[Cp_2V(H_2O)_2]^{2+}$ (V concentration 2.5×10^{-5} M, pH 3.0) and (c) $[Cp_2V(OH)_2]$ (V concentration 2.5×10^{-5} M, pH 7.0). The instrumental gain was the same for all the spectra.