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Supporting Information

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3,4,3-LI(1,2-HOPO): *In Vitro* Formation of Highly Stable Lanthanide Complexes Translates into Efficacious *In Vivo* Europium Decorporation

Manuel Sturzbecher-Hoehne,^a Clara Ng Pak Leung,^a Anthony D'Aléo,^a Birgitta Kullgren,^a Anne-Laure Prigent,^a David K. Shuh,^a Kenneth N. Raymond^{a,b} and Rebecca J. Abergel^{*a}

^aChemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA. E-mail: rjabergel@lbl.gov; Fax: +1 510 486 5596; Tel: +1 510 486 5249

^bDepartment of Chemistry, University of California, Berkeley, CA 94720-1460, USA.

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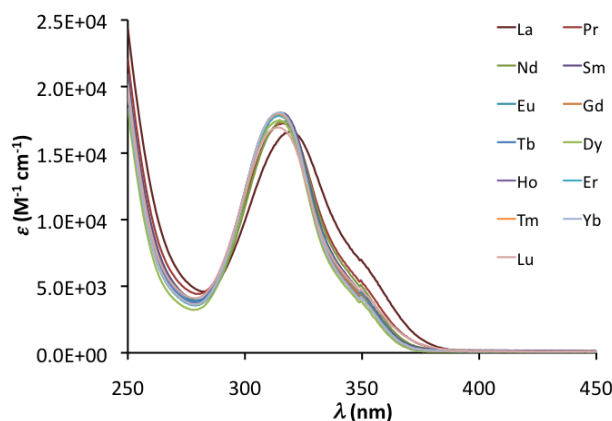


Figure S1. Absorption spectra of $[\text{Ln}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]$ complexes in the visible, pH = 7.4, $I = 0.1\text{M}$ (KCl).

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20 Table S1. Lanthanide Hydrolysis Constants Included in Stability Constants Refinement.^a

Species	La	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
MH ₁ ^b	-8.8	-8.3	-8.2	-8.1	-8.1	-8.1	-7.9	-7.9	-7.8	-7.7	-7.7	-7.7	-7.4
MH ₂ ^c		-15.6	-15.3		-14.4	-14.5		-13.6					
MH ₃ ^d	-20.3	-22.3	-23.2	-23.9	-24.5	-24.1	-24.3	-23.9	-24.5	-24.7	-24.7	-24.7	-25.1
M ₂ H ₂ ^c	-17.1			-14.1						-13.1		-12.7	

^aAll values are reported as log β and were previously reported in A. E. Martell, R. M. Smith, R. J. Motekaitis, NIST Critically Selected Stability Constants of Metal Complexes: Version 8.0.

^bThe values for MH₁ are corrected for $I = 0.1\text{M}$ with the help of the equation used in Klungness, G.D. and Byrne, R.H.

^c*Polyhedron*, 2000, **19**, 99-107.

^d $I = 2.0\text{M}$.

^e $I = 0.0\text{M}$.

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Table S2. Observed Mass-to-Charge Ratios for $[\text{Ln}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$ complexes at pH 7.4.^a

Metal	Species	m/z ^b
La	$[\text{La}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	885
Pr	$[\text{Pr}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	887
Nd	$[\text{Nd}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	890
Sm	$[\text{Sm}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	898
Eu	$[\text{Eu}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	899
Gd	$[\text{Gd}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	904
Tb	$[\text{Tb}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	905
Dy	$[\text{Dy}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	910
Ho	$[\text{Ho}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	911
Er	$[\text{Er}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	914
Tm	$[\text{Tm}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	915
Yb	$[\text{Yb}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	920
Lu	$[\text{Lu}^{\text{III}}(3,4,3\text{-LI}(1,2\text{-HOPO}))]^-$	921

^a $[3,4,3\text{-LI}(1,2\text{-HOPO})] = 0.5 \text{ mM}$ $[\text{Ln}^{\text{III}}] = 0.05 \text{ mM}$, no buffer added.

^bReported numbers correspond to the main peaks in each spectrum.

Table S3. Promotion of ^{152}Eu Excretion in Mice by Injected Octadentate Ligands.^a

Ligand	Fraction of injected ^{152}Eu (% , mean \pm SD) at 24 h					Excreta ^b	
	Liver	Skeleton	Soft tissue	Kidneys	Whole body	Feces	Urine
Control	30.7 \pm 1.93	28.9 \pm 1.25	6.29 \pm 0.90	1.0 \pm 0.22	67.0 \pm 1.21	2.19	30.8
DTPA	22.0 \pm 0.90	25.9 \pm 2.17	4.94 \pm 0.27	0.78 \pm 0.09	53.7 \pm 1.78	8.71	37.6
3,4,3-LI(1,2-HOPO)	1.24 \pm 0.22	12.8 \pm 0.47	3.12 \pm 0.31	0.44 \pm 0.10	17.6 \pm 0.71	52.6	29.8

^aGroups of five mice were injected intravenously with ^{152}Eu ; mice were injected intraperitoneally with 30 $\mu\text{mol/kg}$ of a ligand at 1 h; control mice were given 0.14 M NaCl (normal saline) intraperitoneally; mice were euthanized at 24 h. Data, expressed as percent of injected ^{152}Eu (% , mean \pm SD), were normalized to 100% material recovery for each five-mouse group. Discrepancies are due to rounding. $\text{SD} = [\sum \text{dev}^2 (n-1)^{-1}]^{1/2}$; for tissues, n = number of mice.

^bExcreta of each five-mouse group were pooled; no SD is available.

Table S4. In Vivo Stability of Intraperitoneally Injected ^{152}Eu Complexes.^a

Ligand	Fraction of injected ^{152}Eu (% , mean \pm SD) at 24 h					Excreta ^b	
	Liver	Skeleton	Soft tissue	Kidneys	Whole body	Feces	Urine
DTPA	0.09 \pm 0.02	0.07 \pm 0.05	0.22 \pm 0.11	0.11 \pm 0.025	0.49 \pm 0.12	10.1	89.4
3,4,3-LI(1,2-HOPO)	0.05 \pm 0.03	0.02 \pm 0.03	0.10 \pm 0.04	0.022 \pm 0.004	0.20 \pm 0.07	89.3	10.5

^aGroups of five mice were injected intraperitoneally with ^{152}Eu -ligand complexes; 5 $\mu\text{mol/kg}$ of ligand; ligand:Eu molar ratio > 20; mice were euthanized at 24 h. Data, expressed as percent of injected ^{152}Eu (% , mean \pm SD), were normalized to 100% material recovery for each five-mouse group. Discrepancies are due to rounding. $\text{SD} = [\sum \text{dev}^2 (n-1)^{-1}]^{1/2}$; for tissues, n = number of mice.

^bExcreta of each five-mouse group were pooled; no SD is available.