

LC-MS traces of ligands, complexes.....	S2
Titration of MnCl ₂ to isolated ligand.....	S4
Gd(III)-based contrast discussed in main text.....	S4
MRI SNR vs time curves for various organs.....	S5

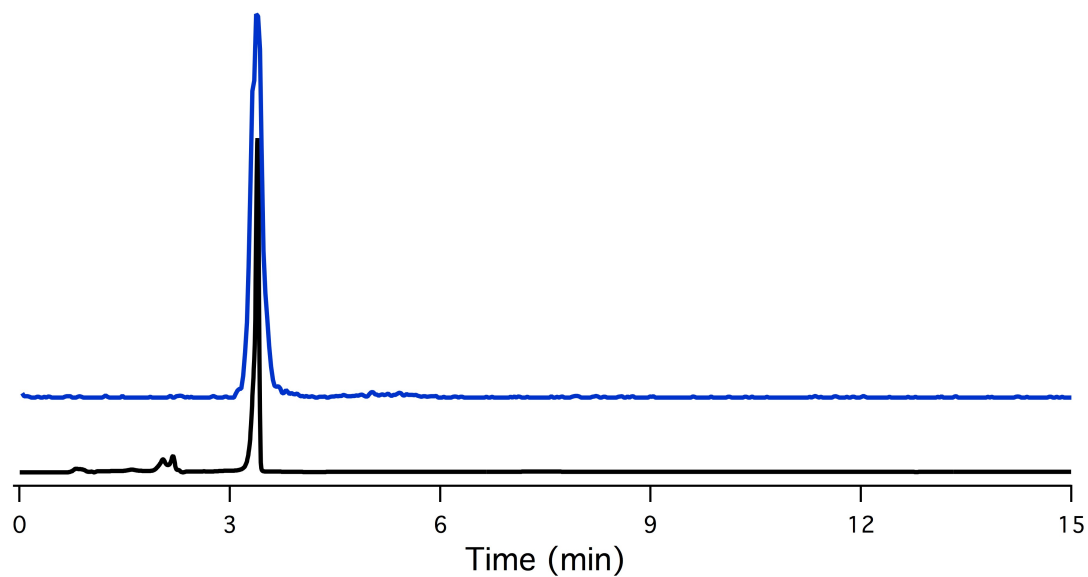


Figure S1. LC trace of monomer ligand at 280 nm detection (black) and MS chromatogram (blue) of extracted $m/z^+ = 399.2$.

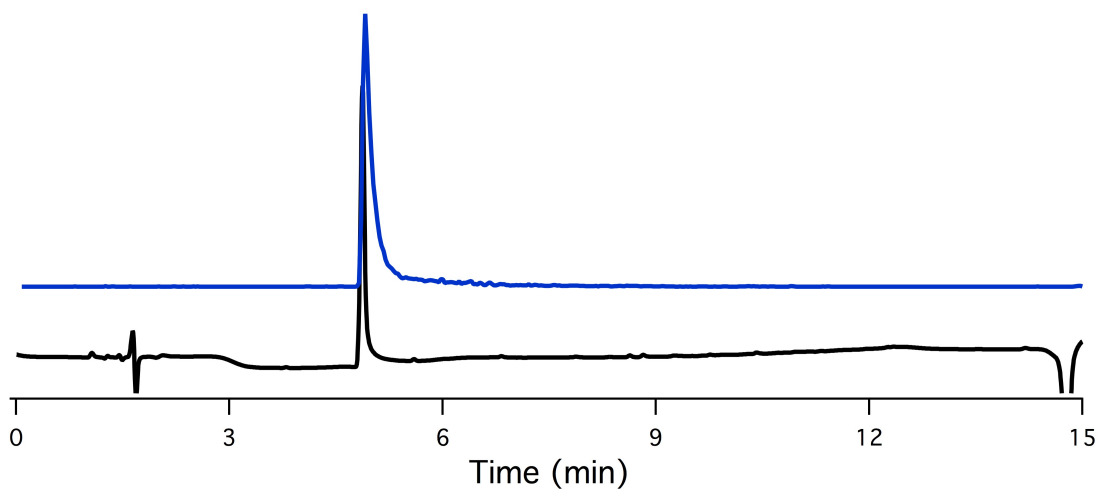


Figure S2. LC trace of hexamer ligand at 280 nm detection (black) and MS chromatogram (blue) of extracted $m/3z^+ = 840.8$.

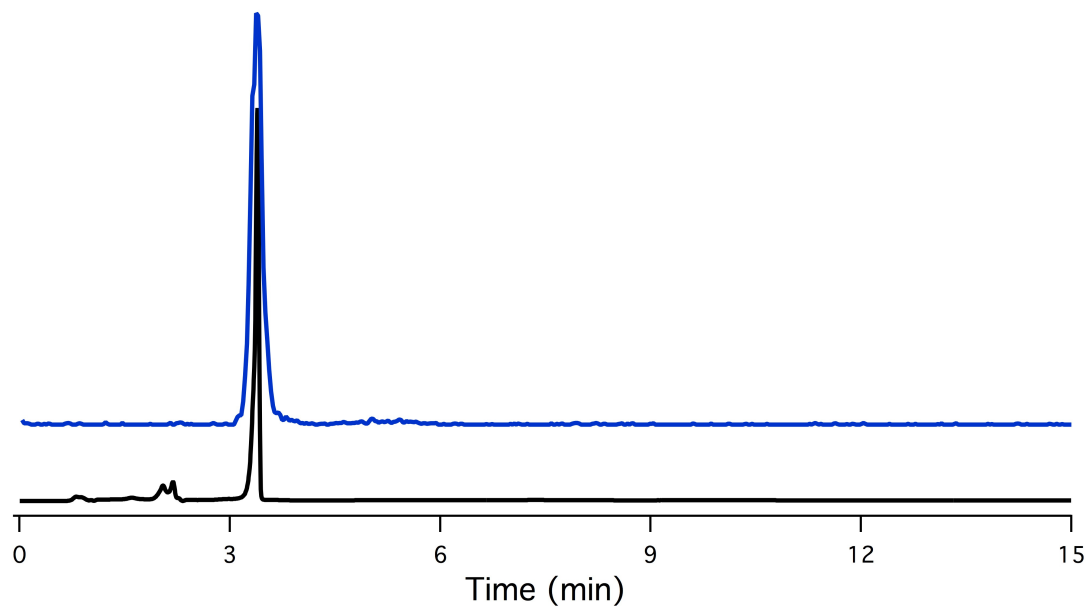


Figure S3. LC trace of monomeric complex at 280 nm detection (black) and MS chromatogram (blue) of extracted $m/z^+ = 452.0$.

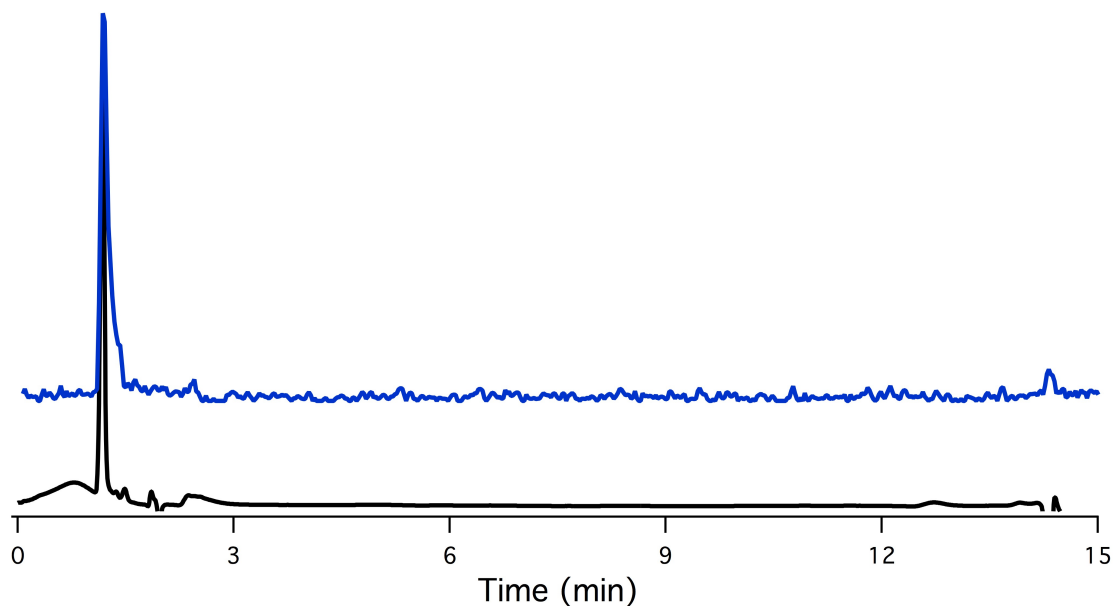


Figure S4. LC trace of hexameric complex at 280 nm detection (black) and MS chromatogram (blue) of extracted $m/3z^+ = 946.2$.

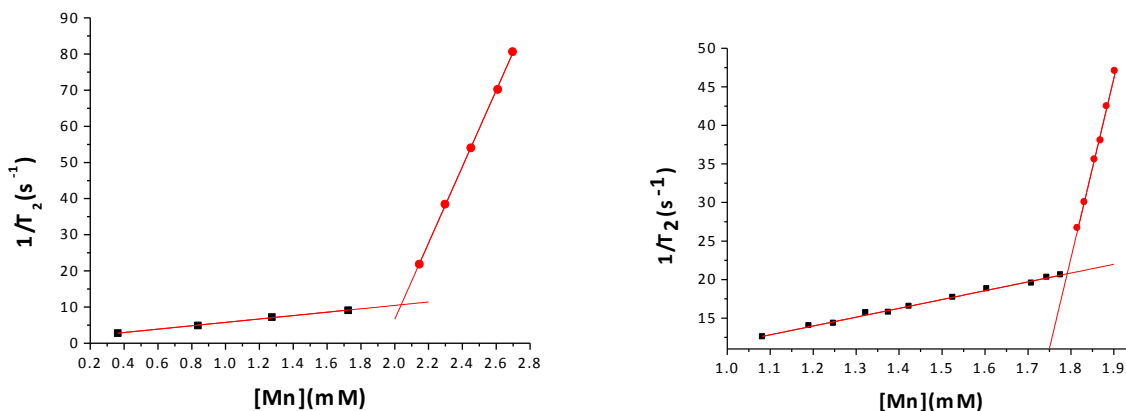


Figure S5. MnCl_2 titrated to a solution of the monomeric (left) and dendrimeric (right) chelates. The sharp increase in $1/T_2$ occurs when $[\text{Mn}] > [\text{L}]$. The molecular weight of the isolated ligand was determined by dividing mol Mn present at the point of inflection by weight of dissolved ligand material.

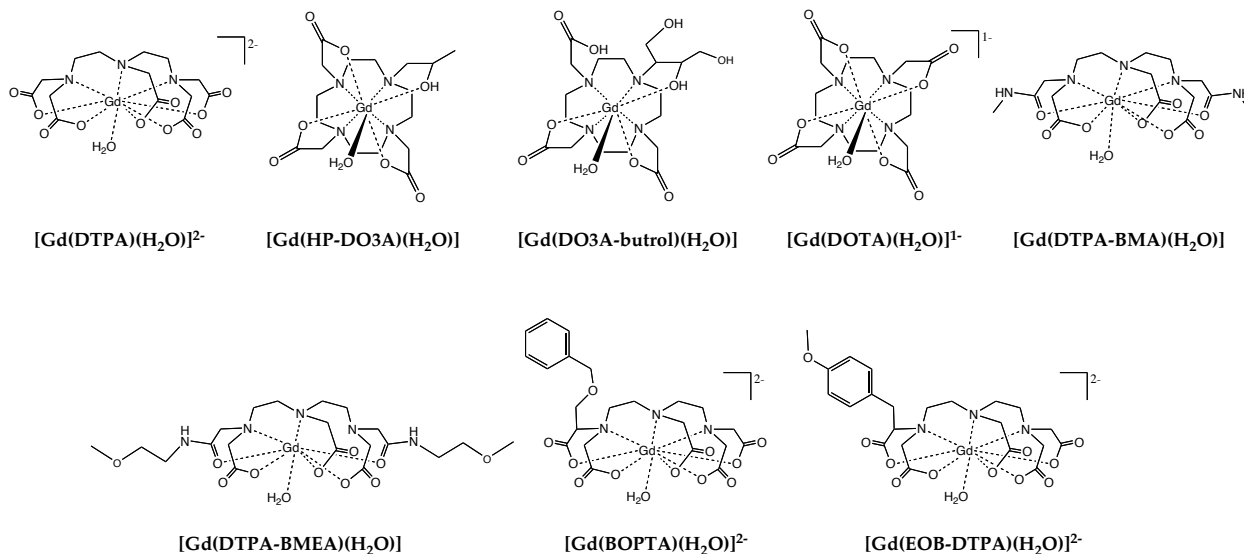


Figure S6. Clinically utilized Gd(III) complexes discussed for comparison in this study.

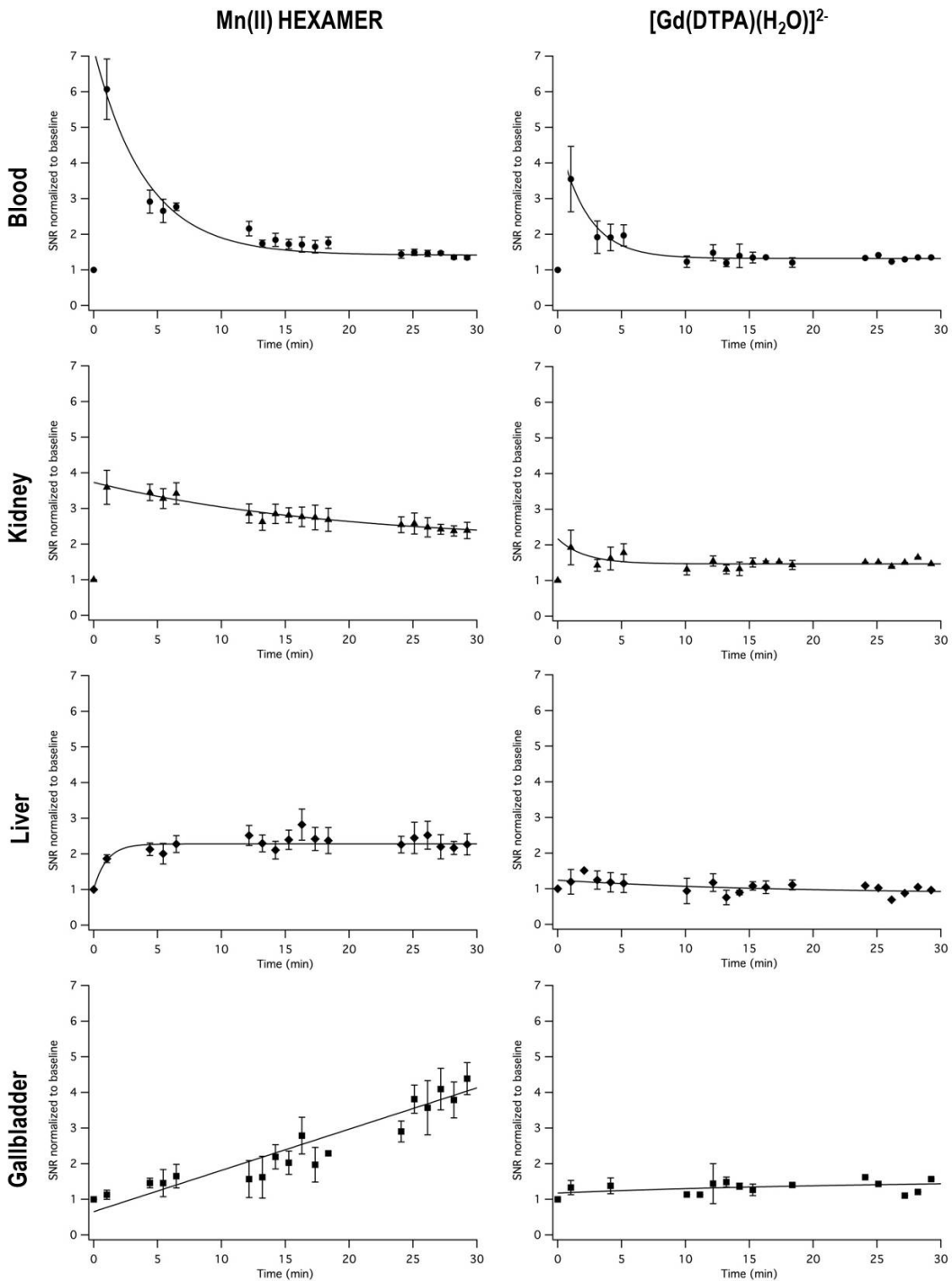


Figure S7. Signal-to-noise ratio (SNR) vs time curves for blood, kidney, liver, and gallbladder. After injection of both Mn(II) dendrimer and [Gd(DTPA)(H₂O)]²⁻ the blood pool signal exhibited an immediate increase, followed by rapid decrease to baseline. The increase in vascular SNR one minute post injection compared to baseline resulted in a 255±79% SNR increase for [Gd(DTPA)(H₂O)]²⁻ compared with a 507±73% SNR increase for the Mn dendrimer, a 2-fold improvement. The time course of signal

enhancement in the kidneys, liver, and gallbladder demonstrated both renal and hepatobiliary clearance for Mn(II) Hexamer, while $[\text{Gd}(\text{DTPA})(\text{H}_2\text{O})]^{2-}$ is exclusively cleared via the kidneys.