

## Supporting Information

### pH Dependent binding in *de novo* heterobimetallic coiled coils

Paul Teare<sup>†</sup>, Caitlin F. Smith<sup>†</sup>, Samuel J. Adams<sup>†</sup>, Sellamuthu Anbu<sup>†</sup>, Barbara Ciani<sup>‡</sup>, Lars J. C. Jeuken<sup>‡</sup>, Anna F. A. Peacock<sup>†\*</sup>

<sup>†</sup>*School of Chemistry, University of Birmingham, Edgbaston, B15 2TT, UK*

<sup>‡</sup>*Centre for Membrane Interactions and Dynamics, and Krebs Institute, Department of Chemistry, University of Sheffield, Sheffield, S3 7HF, UK*

<sup>‡</sup>*School of Biomedical Sciences and the Astbury Centre for Structural Molecular Biology, University of Leeds, Leeds, LS2 9JT, UK*

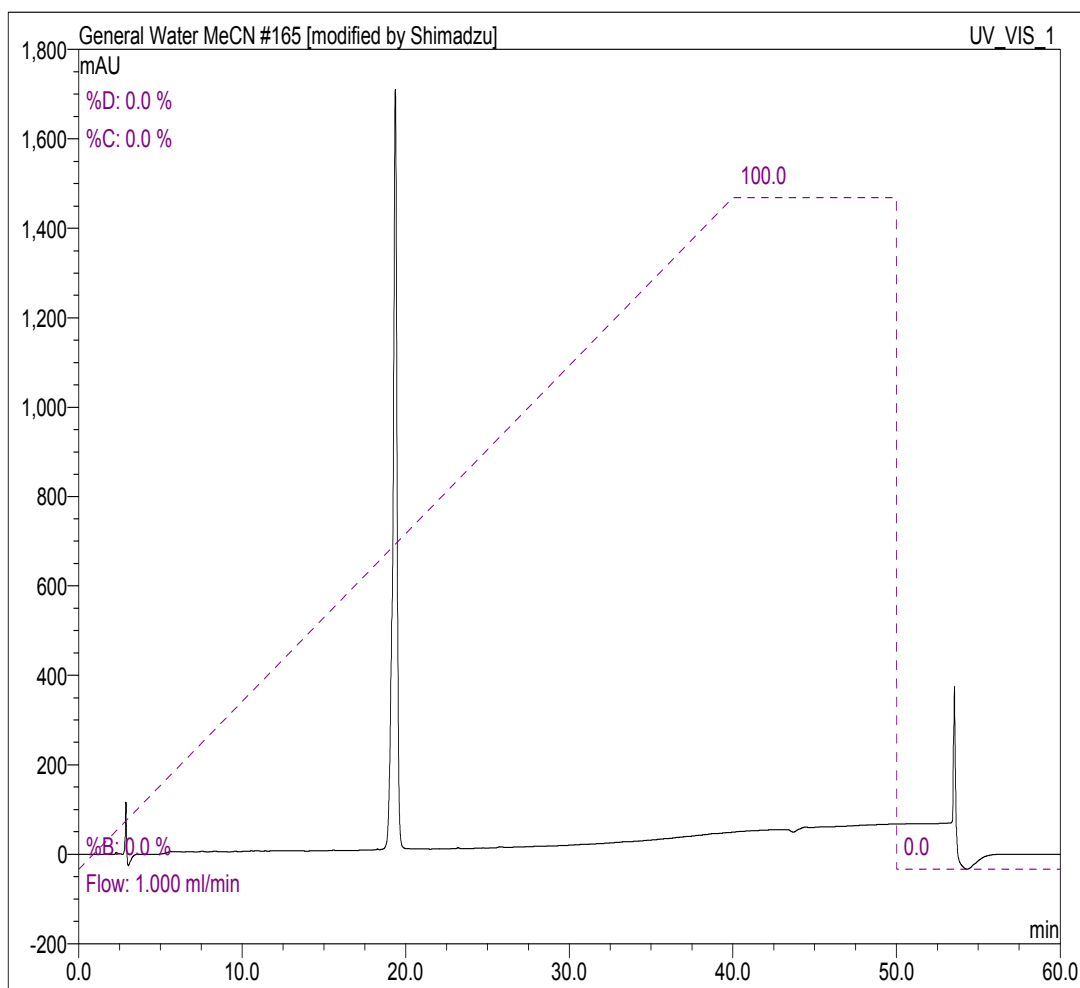
\*To whom correspondence should be addressed. E-mail:

a.f.a.peacock@bham.ac.uk

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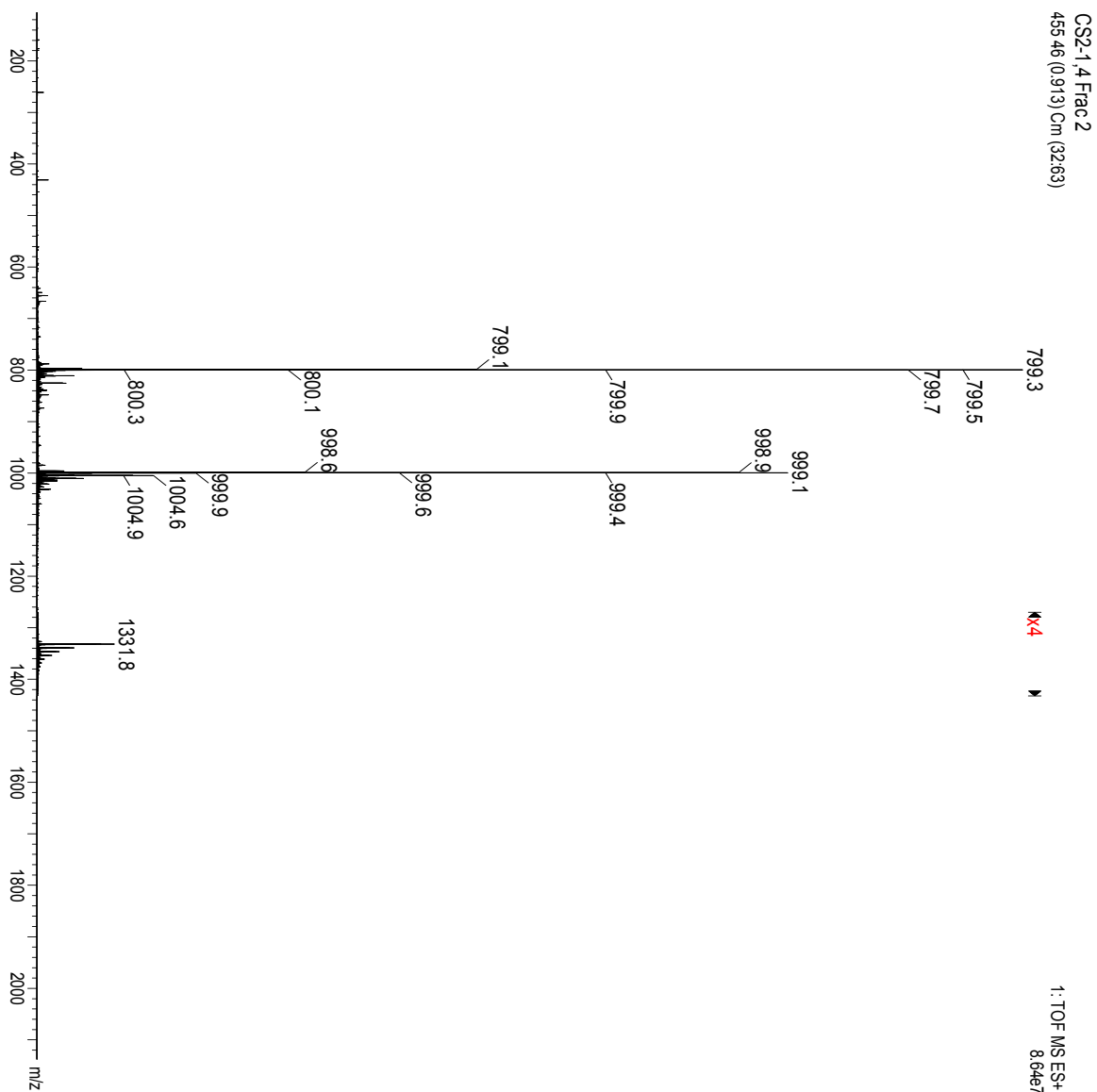
1. Figure S1 – HPLC for CS2-1,4
2. Figure S2 – Electrospray mass spectrum for CS2-1,4
3. Figure S3 – UV-visible Hg(II) titration of CS2-1,4
4. Figure S4 – Luminescence of CS2-1,4 +/- Tb(III) and Hg(II) at pH 8.6
5. Figure S5 – CD pH titrations of Tb(CS1-1)<sub>3</sub> and Tb(MB1-2)<sub>3</sub>

**1. Figure S1:**



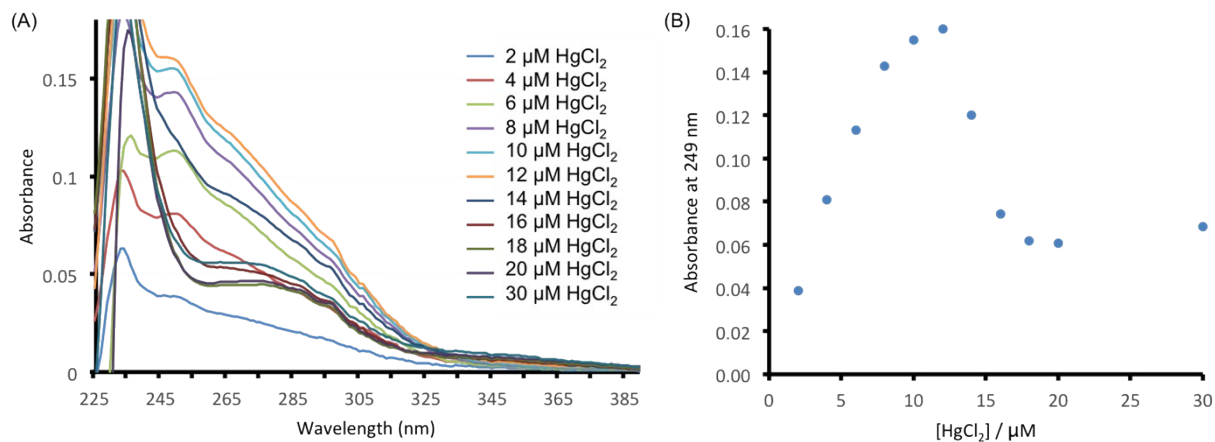
**Figure S1.** C18-analytical reverse phase HPLC-UV chromatogram monitored at 220 nm, of purified CS2-1,4 using a linear 0 to 100% MeCN + 0.05% TFA gradient in H<sub>2</sub>O + 0.05% TFA over 40 minutes.

2. Figure S2:



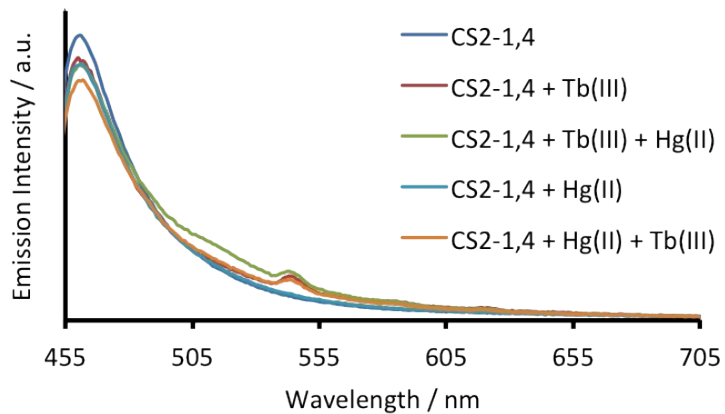
**Figure S2.** Electrospray mass spectrum showing the charge envelope of purified CS2-1,4.

### 3. Figure S3:



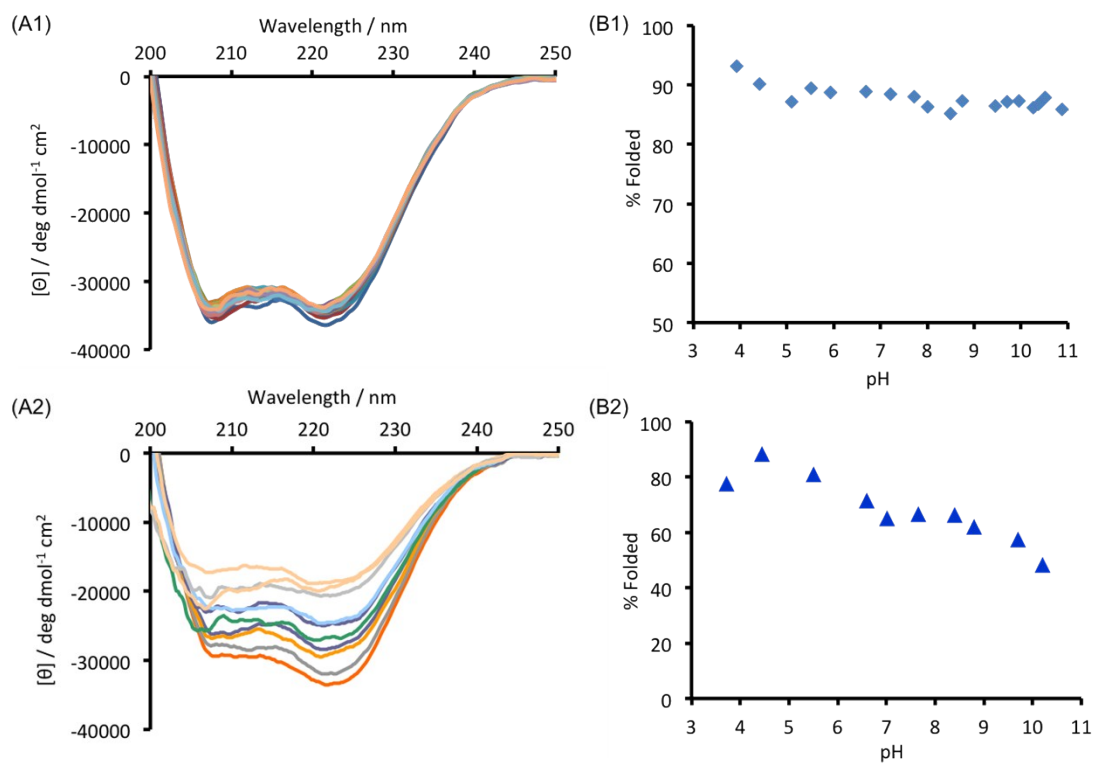
**Figure S3.** (A) UV-visible difference spectra of a titration of HgCl<sub>2</sub> into a solution of 30 μM CS<sub>2</sub>-1,4 peptide monomer, in 5 mM HEPES buffer pH 8.6. (B) Plot of absorbance at 249 nm, indicative of trigonal HgS<sub>3</sub>, as a function of Hg(II) concentration.

#### 4. Figure S4:



**Figure S4.** Steady state luminescence spectra of 30  $\mu\text{M}$  CS2-1,4 monomer in the absence and presence of 10  $\mu\text{M}$   $\text{TbCl}_3$  and 10  $\mu\text{M}$   $\text{HgCl}_2$  in 5 mM HEPES buffer pH 8.6, in different combinations and orders of addition.  $\lambda_{\text{exc}} = 280$  nm.

## 5. Figure S5:



**Figure S5.** CD spectra (A) and plot (B) showing the change in folding as a function of pH for a solution containing 10  $\mu\text{M}$  Tb(III) and 30  $\mu\text{M}$  of (1) CS1-1 or (2) MB1-2 monomer.