

1 **SUPPLEMENTARY INFORMATION**

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3 **Supplementary Table 1: Determination of the equilibration time for dialysis experiments.** To
4 determine the time required for the equilibration, dialysis units were set up with one chamber containing
5 100 μM AgNO_3 and the other containing only buffer. AgNO_3 concentration was measured after 24, 48,
6 72, and 96 hours by ICP-MS and is reported as a percentage of total metal content in both the chambers
7 along with the standard error.

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Time (hours)	% Metal content in Dialysis unit	
	Chamber 1	Chamber 2
24.00	64.52 ± 2.62	35.48 ± 1.02
48.00	50.73 ± 0.73	49.28 ± 0.33
72.00	49.16 ± 0.33	50.84 ± 3.40
96.00	49.97 ± 0.82	50.03 ± 1.80

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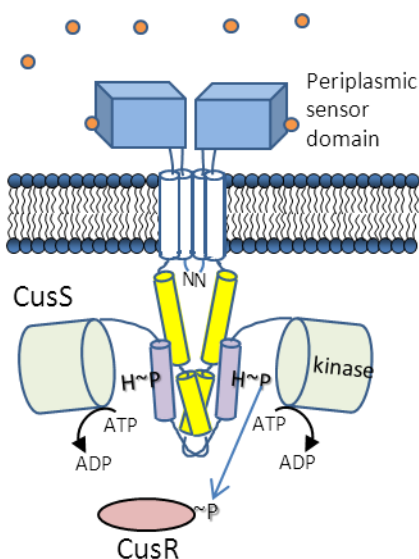
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1 **Supplementary Figure 1:** Schematic overview of the CusR/CusS two-component system. A) CusS is
 2 shown as a dimer with domains labels. B) The amino acid sequence of the *E. coli* histidine kinase CusS
 3 with transmembrane helices and domains indicated in color as predicted by KeGG database
 4 (http://www.genome.jp/dbget-bin/www_bget?eco:b0570) and HMMTOP and TMHMM transmembrane
 5 topology prediction software (this work). The numbers in the sequence indicate the position of the
 6 domain in the full-length CusS.

7 A)



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9 B)

10 1 mvskpfqrpfl slatrltffi slatiaaffa fawimihsvk vhaeqdind lkeisatler
 11
 12 61 vlnhpdetqa rrlmtlediv sgysnvlisl adsqgktvyh spgapdiref trdaipdkda
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 14 121 qggevyllsg ptmmpghgh ghmehsnwrmlnlpvgplvd gkpiytlyia lsidfhlhyi
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 16 181 ndlmnklimt asvisilivf ivllavhkgh apirsvsrqi qnitskdldv rldpqtvpie
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 18 241 leqlvlsfnh mieriedvft rqsnsadia heirtpitnl itqteialsq srsqkeledv
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 20 301 lysnleeltr makmvsdmlf laqadnnqli pekkmlnlad evgkvdfdf e alaedrgvel
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 22 361 rfvgdkcqva gdplmlrral snllsnalry tptgetivvr cqtvdhlvqv ivenpgtpia
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 24 421 pehlprlfd r fyrvdpsrqr kgegsgigla ivksivvahk gtvavtsdar gtrfvitlpa
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 26 **TM helices**
 27 **HAMP**
 28 **dimerization/phosphoacceptor**
 29 **ATPase**
 30 **39-187-cloned sensor domain**

1 **Supplementary Figure 2: Sedimentation velocity analytical ultracentrifugation analysis of CuS_s**
2 **samples in the presence of Zn(II) and Ni(II).** The $c(s)$ distribution plots show one sedimentation species
3 for each sample.

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