

**Table S2. Dissociation constants derived from the microcalorimetric titrations of different proteins with ligands.** SD: standard deviation. The pH optima are highlighted.

LBDs of periplasmic location, $\alpha/\beta$ folds										
	CtpM-LBD		McpV-LBD		McpH-LBD		PctA-LBD		McpU-LBD	
pH	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD
2.5										
3.0							1.33	0.3		
3.5					0.80	0.2	0.86	0.2		
4.0					6.85	1	1.38	0.3		
4.5	147	122					0.69	0.1	78.8	21
5.0	136	32	55.3	5	<b>1.68</b>	<b>0.3</b>	0.98	0.1	9.90	0.2
5.5	49.7	3					<b>0.59</b>	<b>0.1</b>	3.70	0.1
6.0	39.5	2	119	9	2.61	0.4	0.87	0.1	1.87	0.1
6.5	<b>38.7</b>	<b>2</b>					0.70	0.1	1.51	0.1
7.0	44.0	2	<b>33.1</b>	<b>3</b>	1.91	0.1	1.82	0.2	1.07	0.1
7.5	80.0	6					1.31	0.1		
8.0	55.0	2	84.7	7	1.86	0.2	0.87	0.1	0.93	0.1
8.5	86.4	10					1.32	0.2	<b>0.70</b>	<b>0.1</b>
9.0	145	20	53.8	3	3.61	0.1	0.92	0.1	0.80	0.1
9.5							1.20	0.1	1.22	0.1
10.0			70.4	9	35.7	2	1.27	0.1	2.35	0.1
10.5							1.50	0.8	5.11	0.1
11.0			79.4	6			3.88	0.5	13.3	0.1
11.5			641	68			46.6	7	89.2	31

**LBDs of periplasmic location, four-helix bundle folds**

pH	Tar-LBD		PcaY_PP-LBD		McpS-LBD		McpQ-LBD			
	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD		
2.5										
3.0	19.4	3			131	90				
3.5	1.80	0.1	95.4	5	113	32				
4.0	0.71	0.1	5.18	0.2	143	50				
4.5	0.46	0.1			42.0	6				
5.0	<b>0.40</b>	<b>0.1</b>	<b>1.22</b>	<b>0.1</b>	50.0	7	840	59		
5.5	0.98	0.1			<b>4.00</b>	<b>0.4</b>				
6.0	0.96	0.1	2.03	0.2	5.70	0.5	<b>153</b>	<b>5</b>		
6.5	1.10	0.1			5.20	0.9				
7.0	1.64	0.1	1.52	0.3	20.0	1	308	59		
7.5	2.20	0.1			21.1	1				
8.0	3.20	0.1	4.78	0.4	14.4	0.4	505	28		
8.5	3.30	0.2			13.0	0.3				
9.0	3.90	0.2	8.77	0.3	14.4	0.7	699	42		
9.5	4.70	0.2			15.6	2				
10.0	16.1	2	12.2	1	12.5	9	406	30		
10.5	40.7	20								
11.0			86.2	9			401	73		
11.5			510	53						

**Periplasmic solute binding proteins**

pH	MBP		E6B08_RS28125	
	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD
2.5	26.3	1		
3.0	11.0	0.6	15.4	1
3.5				
4.0	3.05	0.2	6.02	1
4.5				
5.0	1.67	0.1	20.9	4
5.5				
6.0	2.65	0.1	1.47	0.2
6.5				
7.0	1.71	0.1	1.28	0.1
7.5				
8.0	1.20	0.1	0.98	0.1
8.5				
9.0	<b>0.63</b>	<b>0.1</b>	<b>0.66</b>	<b>0.1</b>
9.5				
10.0	1.00		1.69	0.1
10.5				
11.0	1.00		7.24	0.2
11.5				

**LBDs of cytosolic location**

pH	TodS-Nter		AdmX-LBD		TtgV	
	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD	$K_D$ ( $\mu$ M)	SD
2.5						
3.0						
3.5						
4.0						
4.5						
5.0					826	153
5.5	0.35	0.1				
6.0	0.26	0.1			<b>67.6</b>	<b>5</b>
6.5	<b>0.25</b>	<b>0.1</b>				
7.0	0.26	0.1			75.8	3
7.5	0.53	0.1	22.0	5		
8.0	0.79	0.1	<b>12.7</b>	<b>2</b>	113	6
8.5	1.50	0.2				
9.0	2.40	0.3			102	15
9.5	1.90	0.3				
10.0						
10.5						
11.0						
11.5						