

1 **Supplementary Table 1: Best-fit simulated parameters from the analysis of the Zn**
2 **K-edge raw EXAFS for Zn^{II}-MigC**

Sample ^a	<u>Nearest Neighbor Ligand Environment^b</u>				<u>Long-Range Ligand Environment^c</u>				<i>F</i> ^g
	Atom ^c	R(Å) ^d	C.N. ^e	σ^{2f}	Atom ^c	R(Å) ^d	C.N. ^e	σ^{2f}	
Zn ^{II} -MigC (150 mM NaBr)	S	2.32	3.0	3.90	C	3.36	0.5	5.71	0.12
	O/N	2.05	1.0	5.04	C	4.02	1.0	4.22	
Zn ^{II} -MigC (150 mM NaCl)	S	2.32	3.0	4.11	C	3.34	1.0	2.86	0.14
	O/N	2.06	1.0	5.61	C	4.05	2.0	3.30	

3 ^aData were fitted only over a k-range of 1–12.6 Å due to monochromator imperfections.

4 ^bIndependent metal-ligand scattering environment.

5 ^cScattering atoms: C (carbon), N (nitrogen) and O (oxygen).

6 ^dAverage metal-ligand bond length.

7 ^eAverage metal-ligand coordination number.

8 ^fAverage Debye-Waller factor in Å² x 10³.

9 ^gNumber of degrees of freedom weighted mean square deviation between data and fit.