Supplemental Information

Table S1. Batches of cells analyzed.

Batch	Packing Expt.	Mössbauer Spectroscopy	EPR Spectroscopy	UV-Vis Spectroscopy	ICP-MS
C01-C05	*Whole cells in from C01-C05 were used solely for mitochondria isolation and Western Blot analysis for purity*				
C06	Yes	Weak	Table 1	-	Table S4
C07	-	Figure 5A, 5B, and 5C	Table 1	-	Table S4
C08	Yes	-	-	-	Table S4
C09	-	-	-	Table 1	-
C10	-	-	-	Figure 3C and 3D	-
C11	-	-	Figure 4A and 4B	-	Table S4
C12	-	-	-	Table 1	-
C13	-	Figure S1A and S1B	Table 1	Table 1	-
C14	Table S3	-	-	-	Table S4

Table S2. Batches of mitochondria analyzed

Batch	Cell batch used	Western Blot	EM	Packing Expt.	Mössbauer Spectroscopy	EPR	UV-Vis	ICP-MS
M01	C01	Yes	-	-	-	Table 1	Table 1	-
M02	C02	Yes	Yes	-	-	-	-	Table S4
M03	C06	Figure 1	Yes	-	Figure S1D	-	Table 1	-
M04	C08	-	-	-	Figure 2A, 2B, 2C	-	-	-
M05	C09	-	-	Yes	-	Figure 4C	Table 1	Table S4
M06	C10	-	Figure 1	Yes	Table 1	Figure 4A and 4B	Figure 3A and 3B	Table S4
M07	C11	-	-	Yes	-	Table 1	Table 1	Table S4
M08	C13	-	-	-	Figure S1C	Table 1	-	-
M09	C14	-	-	Table S3	-	-	-	Table S4

Table S3. Volumes of pellets of whole cells and isolated mitochondria determined from packing experiments and calculated packing efficiencies.

Sample (Run)	$C_{sup1,2}$ (μM)	$V_{sup1,2}$ (μL)	$V_{int1,2}$ (μL)	$V_{pellet\ 1,2}$ (μL)	Packing efficiency (%)
Whole cells					
C14.1 (1)	82	200	43	250	83
C14.1 (2)	18	200	57	250	77
C14.2 (1)	91	200	18	250	93
C14.2 (2)	20	210	59	225	74
C14.3 (1)	84	200	38	250	85
C14.3 (2)	19	210	61	250	76
C14.4 (1)	77	200	59	300	80
C14.4 (2)	15	200	48	275	83
Mean packing efficiency of whole cells					**81±6**
Mitochondria					
M09.1 (1)	65	151	80	175	55
M09.1 (2)	10	143	26	100	74
M09.2 (1)	67	151	73	150	51
M09.2 (2)	12	140	31	100	69
M09.3 (1)	76	149	48	150	68
M09.3 (2)	13	150	31	100	69
M09.4 (1)	64	149	85	175	51
M09.4 (2)	10	140	26	100	74
M09.5 (1)	64	200	112	225	50
M09.5 (2)	12	195	45	175	74
M09.6 (1)	82	195	45	200	77
M09.6 (2)	14	210	43	150	72
Mean packing efficiency of mitochondria					**65±10**

Table S4. Metal concentrations from each batch

	[Fe] (µM)	**[Cu] (µM)**	**[Mn] (µM)**	**[Zn] (µM)**
Whole cell batch				
C06	336	22	6.7	323
C06	346	25	7.0	353
C07	341	25	7.4	385
C07	385	29	7.4	384
C08	469	30	7.4	574
C08	509	36	6.8	617
C11	447	33	7.4	665
C11	468	29	6.7	555
C14	325	27	8.6	630
Average ± SD	402 ±70	28±4	7.2±0.6	498±135
Mitochondria batch				
M02	1140	112	17	72
M05	1160	115	17	57
M06	1210	129	11	245
M07	1130	112	11	232
M09	960	108	16	227
Average ± SD	1120±95	115±8	14±3	167±94

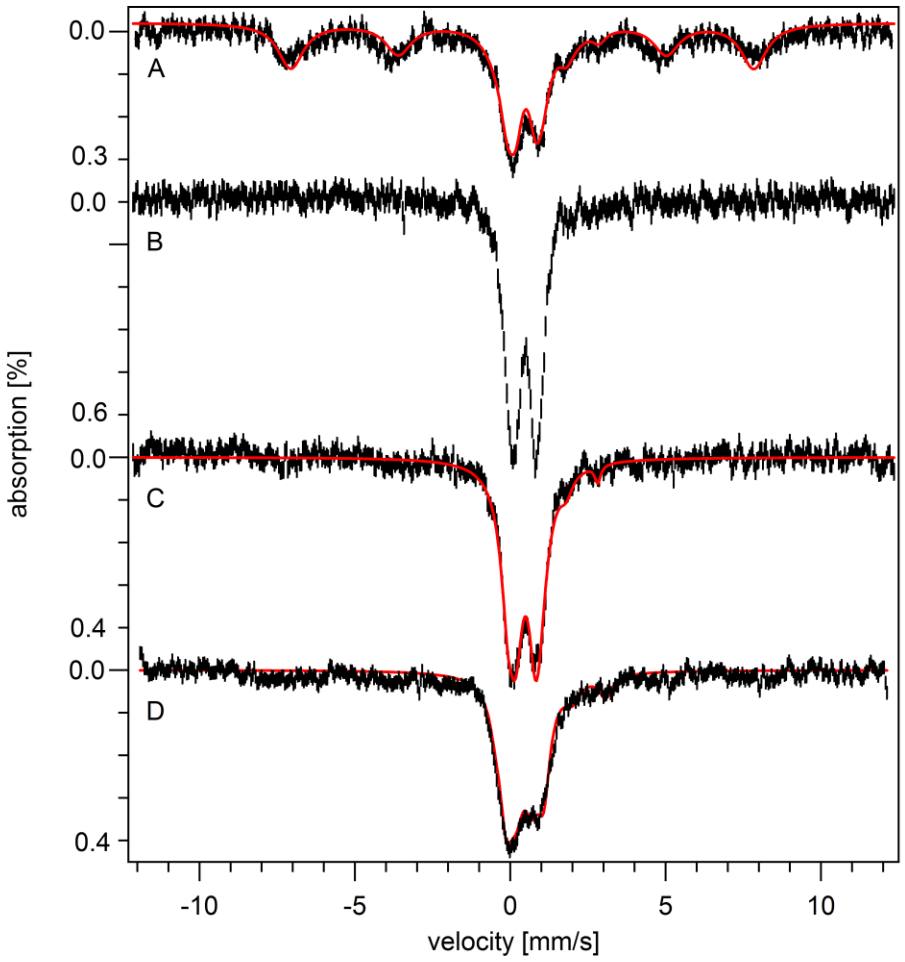
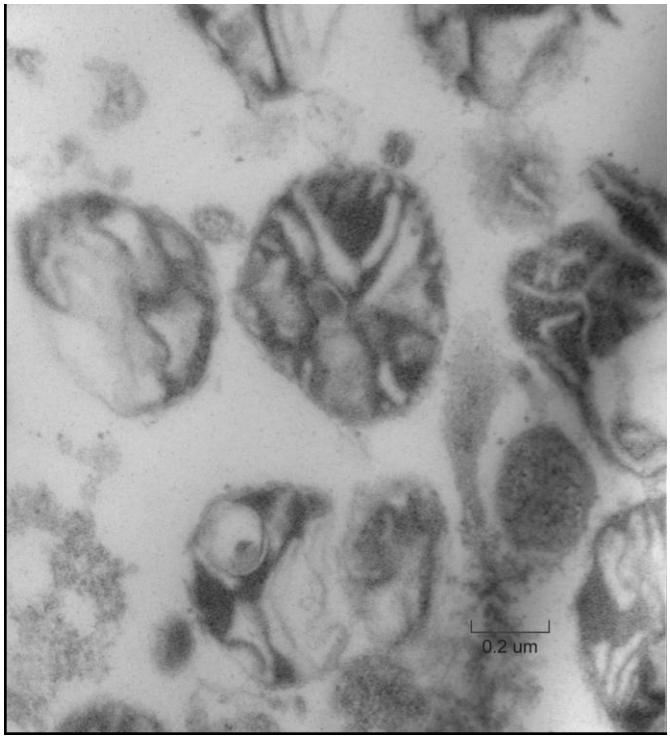


Figure S1. Low field (0.05 T) Mössbauer spectra of other batches. A, 5 K spectrum of whole cells, batch C13 (Table S1), with simulation in red (11% NHHS Fe^{II}, 28% CD, 3% HS Fe^{II} Hemes, 18% Fe^{III} oxyhydroxide nanoparticles, 40% ferritin). B, 70 K spectrum of the same batch of cells. C, 5 K spectrum of isolated mitochondria, batch M08 (Table S2), with simulation in red (7% NHHS Fe^{II}, 27% CD, 5% HS Fe^{II} Hemes, 40% Fe^{III} oxyhydroxide nanoparticles, 19% ferritin-like). D, 5 K spectrum of isolated mitochondria, batch M03 (Table S2), with simulation in red (9% NHHS Fe^{II}, 29% CD, 5% HS Fe^{II} Hemes, 37% Fe^{III} oxyhydroxide nanoparticles, 18% ferritin-like). For all spectra, the field was applied parallel to the radiation.



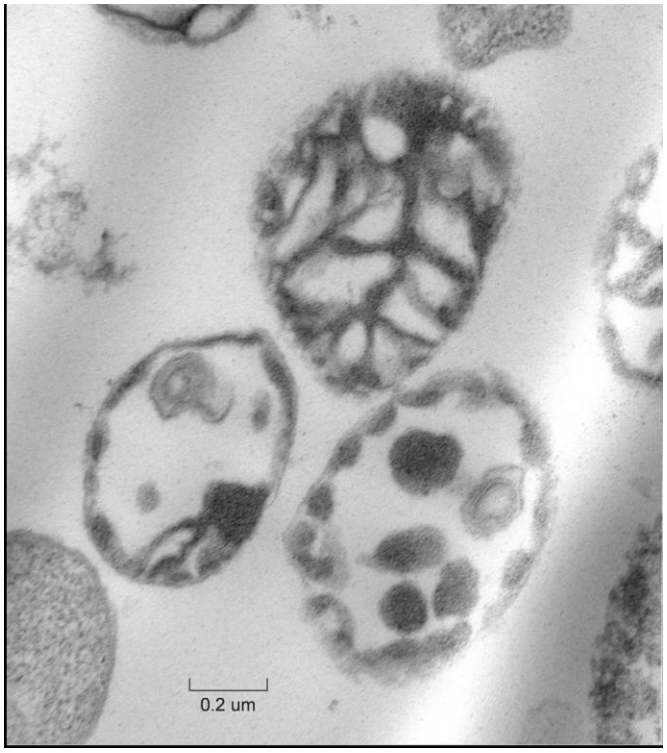


Figure S2. Additional electron micrographs of isolated mitochondria (X 40 000).