



# wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 8, 2017 – 08:37 PM EST

PDB ID : 4LMH  
Title : Crystal structure of the outer membrane decaheme cytochrome OmcA  
Authors : Edwards, M.J.; Baiden, N.; Clarke, T.A.  
Deposited on : unknown  
Resolution : 2.70 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20030345
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	rb-20030345

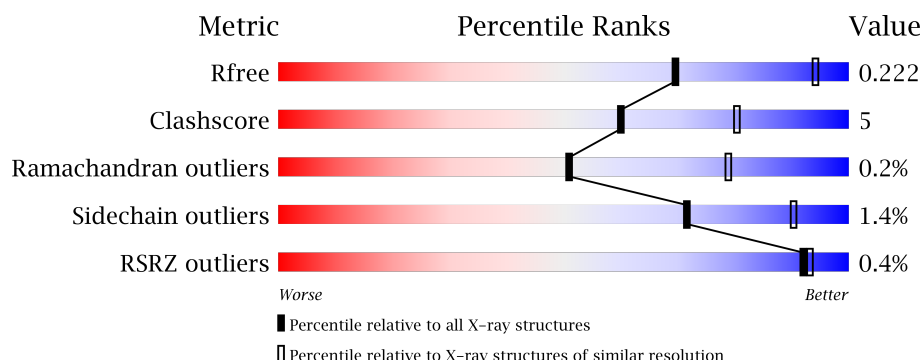
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	100719	2259 (2.70-2.70)
Clashscore	112137	2590 (2.70-2.70)
Ramachandran outliers	110173	2550 (2.70-2.70)
Sidechain outliers	110143	2550 (2.70-2.70)
RSRZ outliers	101464	2275 (2.70-2.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	760	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 1%, orange 1%, yellow 1%, green 82%, grey 9%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>1%</span> <span>82%</span> <span>9%</span> <span>9%</span> </div> </div>
1	B	760	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 1%, orange 1%, yellow 10%, green 81%, grey 9%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>1%</span> <span>81%</span> <span>10%</span> <span>9%</span> </div> </div>
1	C	760	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, green 83%, yellow 8%, grey 9%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>83%</span> <span>8%</span> <span>9%</span> </div> </div>
1	D	760	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, green 83%, yellow 8%, grey 9%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>83%</span> <span>8%</span> <span>9%</span> </div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	DMS	A	813	-	-	-	X
4	DMS	A	814	-	-	-	X
4	DMS	B	914	-	-	-	X
4	DMS	B	915	-	-	-	X
4	DMS	C	814	-	-	-	X
4	DMS	C	815	-	-	-	X
4	DMS	C	816	-	-	-	X
4	DMS	D	814	-	-	-	X
4	DMS	D	815	-	-	-	X
4	DMS	D	816	-	-	-	X

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 24443 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Extracellular iron oxide respiratory system surface decaheme cytochrome c component OmcA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	693	Total	C	N	O	S	0	0	0
			5222	3229	916	1047	30			
1	B	694	Total	C	N	O	S	0	0	0
			5231	3235	918	1048	30			
1	C	692	Total	C	N	O	S	0	0	0
			5215	3224	915	1046	30			
1	D	695	Total	C	N	O	S	0	0	0
			5235	3237	919	1049	30			

There are 208 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	6	MET	-	INITIATING METHIONINE	UNP Q8EG33
A	7	LYS	-	EXPRESSION TAG	UNP Q8EG33
A	8	PHE	-	EXPRESSION TAG	UNP Q8EG33
A	9	LYS	-	EXPRESSION TAG	UNP Q8EG33
A	10	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	11	ASN	-	EXPRESSION TAG	UNP Q8EG33
A	12	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	13	ILE	-	EXPRESSION TAG	UNP Q8EG33
A	14	THR	-	EXPRESSION TAG	UNP Q8EG33
A	15	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	16	ALA	-	EXPRESSION TAG	UNP Q8EG33
A	17	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	18	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	19	ALA	-	EXPRESSION TAG	UNP Q8EG33
A	20	ASN	-	EXPRESSION TAG	UNP Q8EG33
A	21	THR	-	EXPRESSION TAG	UNP Q8EG33
A	22	GLY	-	EXPRESSION TAG	UNP Q8EG33
A	23	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	24	ALA	-	EXPRESSION TAG	UNP Q8EG33
A	25	VAL	-	EXPRESSION TAG	UNP Q8EG33

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Chain	Residue	Modelled	Actual	Comment	Reference
A	26	ALA	-	EXPRESSION TAG	UNP Q8EG33
A	27	ALA	-	EXPRESSION TAG	UNP Q8EG33
A	736	LYS	-	EXPRESSION TAG	UNP Q8EG33
A	737	GLY	-	EXPRESSION TAG	UNP Q8EG33
A	738	GLU	-	EXPRESSION TAG	UNP Q8EG33
A	739	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	740	LYS	-	EXPRESSION TAG	UNP Q8EG33
A	741	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	742	GLU	-	EXPRESSION TAG	UNP Q8EG33
A	743	GLY	-	EXPRESSION TAG	UNP Q8EG33
A	744	LYS	-	EXPRESSION TAG	UNP Q8EG33
A	745	PRO	-	EXPRESSION TAG	UNP Q8EG33
A	746	ILE	-	EXPRESSION TAG	UNP Q8EG33
A	747	PRO	-	EXPRESSION TAG	UNP Q8EG33
A	748	ASN	-	EXPRESSION TAG	UNP Q8EG33
A	749	PRO	-	EXPRESSION TAG	UNP Q8EG33
A	750	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	751	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	752	GLY	-	EXPRESSION TAG	UNP Q8EG33
A	753	LEU	-	EXPRESSION TAG	UNP Q8EG33
A	754	ASP	-	EXPRESSION TAG	UNP Q8EG33
A	755	SER	-	EXPRESSION TAG	UNP Q8EG33
A	756	THR	-	EXPRESSION TAG	UNP Q8EG33
A	757	ARG	-	EXPRESSION TAG	UNP Q8EG33
A	758	THR	-	EXPRESSION TAG	UNP Q8EG33
A	759	GLY	-	EXPRESSION TAG	UNP Q8EG33
A	760	HIS	-	EXPRESSION TAG	UNP Q8EG33
A	761	HIS	-	EXPRESSION TAG	UNP Q8EG33
A	762	HIS	-	EXPRESSION TAG	UNP Q8EG33
A	763	HIS	-	EXPRESSION TAG	UNP Q8EG33
A	764	HIS	-	EXPRESSION TAG	UNP Q8EG33
A	765	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	6	MET	-	INITIATING METHIONINE	UNP Q8EG33
B	7	LYS	-	EXPRESSION TAG	UNP Q8EG33
B	8	PHE	-	EXPRESSION TAG	UNP Q8EG33
B	9	LYS	-	EXPRESSION TAG	UNP Q8EG33
B	10	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	11	ASN	-	EXPRESSION TAG	UNP Q8EG33
B	12	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	13	ILE	-	EXPRESSION TAG	UNP Q8EG33
B	14	THR	-	EXPRESSION TAG	UNP Q8EG33
B	15	LEU	-	EXPRESSION TAG	UNP Q8EG33

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Chain	Residue	Modelled	Actual	Comment	Reference
B	16	ALA	-	EXPRESSION TAG	UNP Q8EG33
B	17	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	18	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	19	ALA	-	EXPRESSION TAG	UNP Q8EG33
B	20	ASN	-	EXPRESSION TAG	UNP Q8EG33
B	21	THR	-	EXPRESSION TAG	UNP Q8EG33
B	22	GLY	-	EXPRESSION TAG	UNP Q8EG33
B	23	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	24	ALA	-	EXPRESSION TAG	UNP Q8EG33
B	25	VAL	-	EXPRESSION TAG	UNP Q8EG33
B	26	ALA	-	EXPRESSION TAG	UNP Q8EG33
B	27	ALA	-	EXPRESSION TAG	UNP Q8EG33
B	736	LYS	-	EXPRESSION TAG	UNP Q8EG33
B	737	GLY	-	EXPRESSION TAG	UNP Q8EG33
B	738	GLU	-	EXPRESSION TAG	UNP Q8EG33
B	739	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	740	LYS	-	EXPRESSION TAG	UNP Q8EG33
B	741	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	742	GLU	-	EXPRESSION TAG	UNP Q8EG33
B	743	GLY	-	EXPRESSION TAG	UNP Q8EG33
B	744	LYS	-	EXPRESSION TAG	UNP Q8EG33
B	745	PRO	-	EXPRESSION TAG	UNP Q8EG33
B	746	ILE	-	EXPRESSION TAG	UNP Q8EG33
B	747	PRO	-	EXPRESSION TAG	UNP Q8EG33
B	748	ASN	-	EXPRESSION TAG	UNP Q8EG33
B	749	PRO	-	EXPRESSION TAG	UNP Q8EG33
B	750	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	751	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	752	GLY	-	EXPRESSION TAG	UNP Q8EG33
B	753	LEU	-	EXPRESSION TAG	UNP Q8EG33
B	754	ASP	-	EXPRESSION TAG	UNP Q8EG33
B	755	SER	-	EXPRESSION TAG	UNP Q8EG33
B	756	THR	-	EXPRESSION TAG	UNP Q8EG33
B	757	ARG	-	EXPRESSION TAG	UNP Q8EG33
B	758	THR	-	EXPRESSION TAG	UNP Q8EG33
B	759	GLY	-	EXPRESSION TAG	UNP Q8EG33
B	760	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	761	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	762	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	763	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	764	HIS	-	EXPRESSION TAG	UNP Q8EG33
B	765	HIS	-	EXPRESSION TAG	UNP Q8EG33

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Chain	Residue	Modelled	Actual	Comment	Reference
C	6	MET	-	INITIATING METHIONINE	UNP Q8EG33
C	7	LYS	-	EXPRESSION TAG	UNP Q8EG33
C	8	PHE	-	EXPRESSION TAG	UNP Q8EG33
C	9	LYS	-	EXPRESSION TAG	UNP Q8EG33
C	10	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	11	ASN	-	EXPRESSION TAG	UNP Q8EG33
C	12	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	13	ILE	-	EXPRESSION TAG	UNP Q8EG33
C	14	THR	-	EXPRESSION TAG	UNP Q8EG33
C	15	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	16	ALA	-	EXPRESSION TAG	UNP Q8EG33
C	17	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	18	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	19	ALA	-	EXPRESSION TAG	UNP Q8EG33
C	20	ASN	-	EXPRESSION TAG	UNP Q8EG33
C	21	THR	-	EXPRESSION TAG	UNP Q8EG33
C	22	GLY	-	EXPRESSION TAG	UNP Q8EG33
C	23	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	24	ALA	-	EXPRESSION TAG	UNP Q8EG33
C	25	VAL	-	EXPRESSION TAG	UNP Q8EG33
C	26	ALA	-	EXPRESSION TAG	UNP Q8EG33
C	27	ALA	-	EXPRESSION TAG	UNP Q8EG33
C	736	LYS	-	EXPRESSION TAG	UNP Q8EG33
C	737	GLY	-	EXPRESSION TAG	UNP Q8EG33
C	738	GLU	-	EXPRESSION TAG	UNP Q8EG33
C	739	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	740	LYS	-	EXPRESSION TAG	UNP Q8EG33
C	741	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	742	GLU	-	EXPRESSION TAG	UNP Q8EG33
C	743	GLY	-	EXPRESSION TAG	UNP Q8EG33
C	744	LYS	-	EXPRESSION TAG	UNP Q8EG33
C	745	PRO	-	EXPRESSION TAG	UNP Q8EG33
C	746	ILE	-	EXPRESSION TAG	UNP Q8EG33
C	747	PRO	-	EXPRESSION TAG	UNP Q8EG33
C	748	ASN	-	EXPRESSION TAG	UNP Q8EG33
C	749	PRO	-	EXPRESSION TAG	UNP Q8EG33
C	750	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	751	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	752	GLY	-	EXPRESSION TAG	UNP Q8EG33
C	753	LEU	-	EXPRESSION TAG	UNP Q8EG33
C	754	ASP	-	EXPRESSION TAG	UNP Q8EG33
C	755	SER	-	EXPRESSION TAG	UNP Q8EG33

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Chain	Residue	Modelled	Actual	Comment	Reference
C	756	THR	-	EXPRESSION TAG	UNP Q8EG33
C	757	ARG	-	EXPRESSION TAG	UNP Q8EG33
C	758	THR	-	EXPRESSION TAG	UNP Q8EG33
C	759	GLY	-	EXPRESSION TAG	UNP Q8EG33
C	760	HIS	-	EXPRESSION TAG	UNP Q8EG33
C	761	HIS	-	EXPRESSION TAG	UNP Q8EG33
C	762	HIS	-	EXPRESSION TAG	UNP Q8EG33
C	763	HIS	-	EXPRESSION TAG	UNP Q8EG33
C	764	HIS	-	EXPRESSION TAG	UNP Q8EG33
C	765	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	6	MET	-	INITIATING METHIONINE	UNP Q8EG33
D	7	LYS	-	EXPRESSION TAG	UNP Q8EG33
D	8	PHE	-	EXPRESSION TAG	UNP Q8EG33
D	9	LYS	-	EXPRESSION TAG	UNP Q8EG33
D	10	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	11	ASN	-	EXPRESSION TAG	UNP Q8EG33
D	12	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	13	ILE	-	EXPRESSION TAG	UNP Q8EG33
D	14	THR	-	EXPRESSION TAG	UNP Q8EG33
D	15	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	16	ALA	-	EXPRESSION TAG	UNP Q8EG33
D	17	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	18	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	19	ALA	-	EXPRESSION TAG	UNP Q8EG33
D	20	ASN	-	EXPRESSION TAG	UNP Q8EG33
D	21	THR	-	EXPRESSION TAG	UNP Q8EG33
D	22	GLY	-	EXPRESSION TAG	UNP Q8EG33
D	23	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	24	ALA	-	EXPRESSION TAG	UNP Q8EG33
D	25	VAL	-	EXPRESSION TAG	UNP Q8EG33
D	26	ALA	-	EXPRESSION TAG	UNP Q8EG33
D	27	ALA	-	EXPRESSION TAG	UNP Q8EG33
D	736	LYS	-	EXPRESSION TAG	UNP Q8EG33
D	737	GLY	-	EXPRESSION TAG	UNP Q8EG33
D	738	GLU	-	EXPRESSION TAG	UNP Q8EG33
D	739	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	740	LYS	-	EXPRESSION TAG	UNP Q8EG33
D	741	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	742	GLU	-	EXPRESSION TAG	UNP Q8EG33
D	743	GLY	-	EXPRESSION TAG	UNP Q8EG33
D	744	LYS	-	EXPRESSION TAG	UNP Q8EG33
D	745	PRO	-	EXPRESSION TAG	UNP Q8EG33

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Chain	Residue	Modelled	Actual	Comment	Reference
D	746	ILE	-	EXPRESSION TAG	UNP Q8EG33
D	747	PRO	-	EXPRESSION TAG	UNP Q8EG33
D	748	ASN	-	EXPRESSION TAG	UNP Q8EG33
D	749	PRO	-	EXPRESSION TAG	UNP Q8EG33
D	750	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	751	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	752	GLY	-	EXPRESSION TAG	UNP Q8EG33
D	753	LEU	-	EXPRESSION TAG	UNP Q8EG33
D	754	ASP	-	EXPRESSION TAG	UNP Q8EG33
D	755	SER	-	EXPRESSION TAG	UNP Q8EG33
D	756	THR	-	EXPRESSION TAG	UNP Q8EG33
D	757	ARG	-	EXPRESSION TAG	UNP Q8EG33
D	758	THR	-	EXPRESSION TAG	UNP Q8EG33
D	759	GLY	-	EXPRESSION TAG	UNP Q8EG33
D	760	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	761	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	762	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	763	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	764	HIS	-	EXPRESSION TAG	UNP Q8EG33
D	765	HIS	-	EXPRESSION TAG	UNP Q8EG33

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- The chemical structure of HEC (Hydroxyethylchlorin) is shown. It features a central iron atom (Fe) coordinated by four nitrogen atoms (N) in a porphyrin-like ring. The structure includes various side chains and a central hydrogen atom (H). The atoms are labeled with their respective identifiers: O1A, O2A, O1D, O2D, CGA, CGD, CBA, CBD, CAA, CAD, CMA, CMB, CMC, CMC, CBB, CAB, C3A, C3B, C3C, C3D, C2A, C2B, C2C, C2D, C1A, C1B, C1C, C1D, C4A, C4B, C4C, C4D, CHA, CHB, CHC, CHD, NA, NB, NC, ND, and FE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0



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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

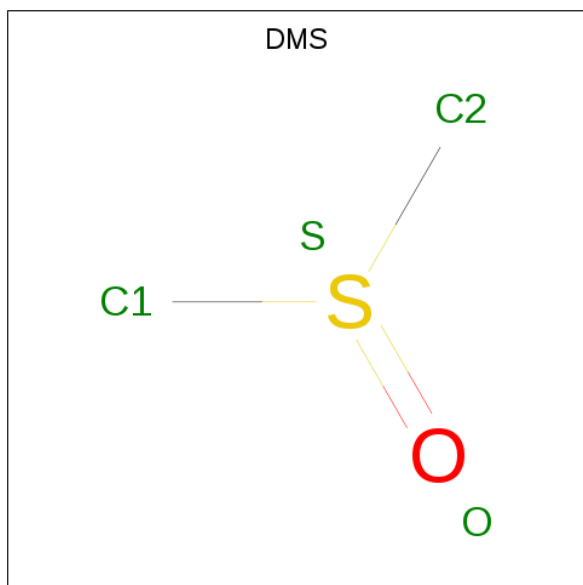
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	2	Total	Ca	0	0
			2	2		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Ca 2	0	0
3	D	2	Total 2	Ca 2	0	0
3	C	2	Total 2	Ca 2	0	0

- Molecule 4 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula:  $C_2H_6OS$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 4	C 2	O 1	S 1	0	0
4	A	1	Total 4	C 2	O 1	S 1	0	0
4	A	1	Total 4	C 2	O 1	S 1	0	0
4	A	1	Total 4	C 2	O 1	S 1	0	0
4	B	1	Total 4	C 2	O 1	S 1	0	0
4	B	1	Total 4	C 2	O 1	S 1	0	0
4	B	1	Total 4	C 2	O 1	S 1	0	0
4	B	1	Total 4	C 2	O 1	S 1	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	C	1	Total 4	C 2	O 1	S 1	0	0
4	C	1	Total 4	C 2	O 1	S 1	0	0
4	C	1	Total 4	C 2	O 1	S 1	0	0
4	C	1	Total 4	C 2	O 1	S 1	0	0
4	D	1	Total 4	C 2	O 1	S 1	0	0
4	D	1	Total 4	C 2	O 1	S 1	0	0
4	D	1	Total 4	C 2	O 1	S 1	0	0
4	D	1	Total 4	C 2	O 1	S 1	0	0

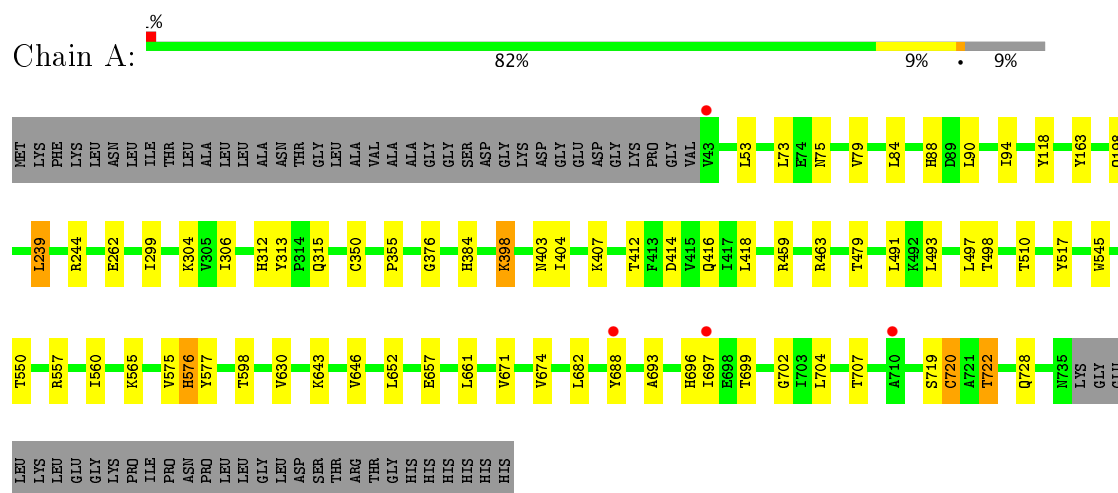
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	397	Total 397	O 397	0	0
5	B	420	Total 420	O 420	0	0
5	C	380	Total 380	O 380	0	0
5	D	551	Total 551	O 551	0	0

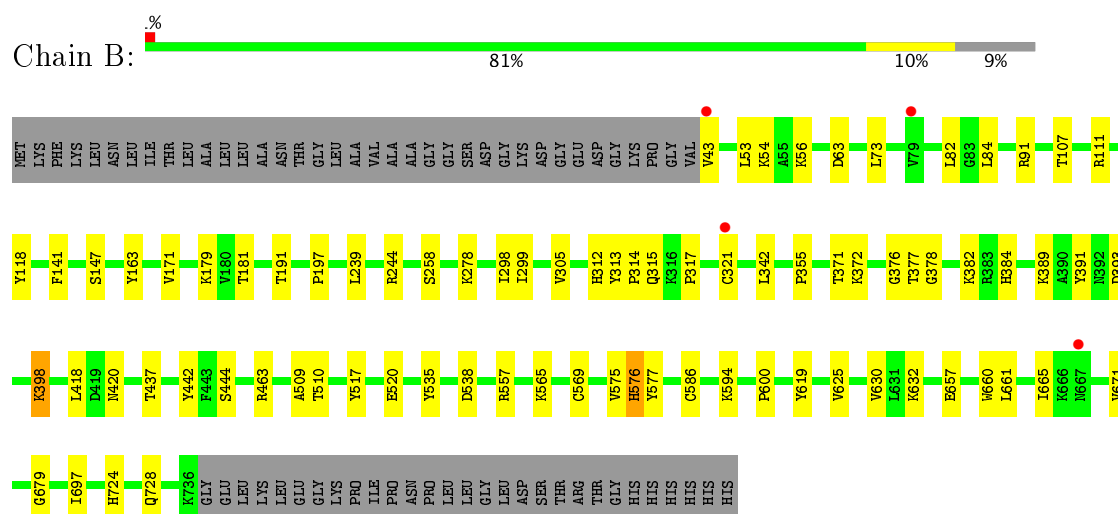
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

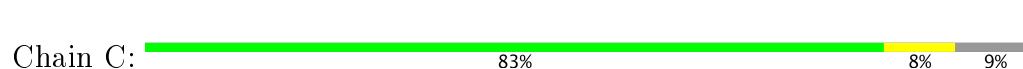
- Molecule 1: Extracellular iron oxide respiratory system surface decaheme cytochrome c component OmcA

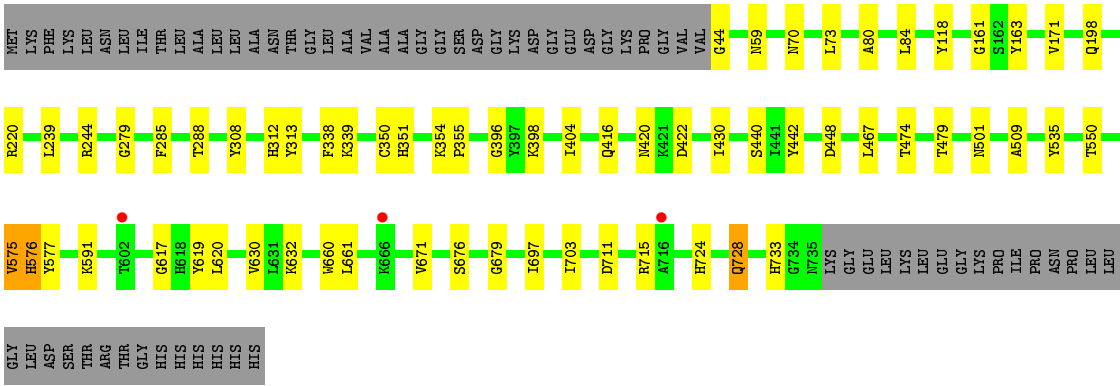


- Molecule 1: Extracellular iron oxide respiratory system surface decaheme cytochrome c component OmcA

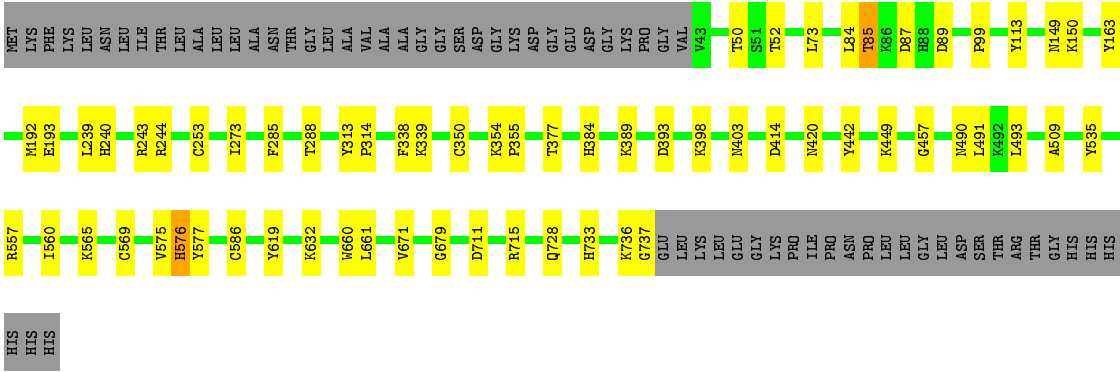
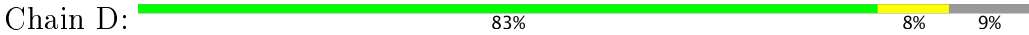


- Molecule 1: Extracellular iron oxide respiratory system surface decaheme cytochrome c component OmcA





● Molecule 1: Extracellular iron oxide respiratory system surface decaheme cytochrome c component OmcA



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	92.64Å 245.38Å 135.63Å 90.00° 97.89° 90.00°	Depositor
Resolution (Å)	50.97 – 2.70 52.54 – 2.70	Depositor EDS
% Data completeness (in resolution range)	98.4 (50.97-2.70) 98.4 (52.54-2.70)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.70 (at 2.69Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.3_928)	Depositor
R, $R_{free}$	0.193 , 0.230 0.184 , 0.222	Depositor DCC
$R_{free}$ test set	8077 reflections (5.01%)	DCC
Wilson B-factor (Å <sup>2</sup> )	36.2	Xtriage
Anisotropy	0.039	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 39.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	24443	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.51% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CA, DMS, HEC

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.27	0/5337	0.44	0/7254
1	B	0.27	0/5346	0.44	0/7265
1	C	0.27	0/5330	0.43	0/7244
1	D	0.28	0/5350	0.44	0/7270
All	All	0.27	0/21363	0.44	0/29033

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5222	0	4957	50	0
1	B	5231	0	4971	59	0
1	C	5215	0	4948	48	0
1	D	5235	0	4974	47	0
2	A	430	0	301	24	0
2	B	430	0	302	35	0
2	C	430	0	301	17	0
2	D	430	0	302	28	0
3	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
4	A	16	0	24	3	0
4	B	16	0	24	1	0
4	C	16	0	24	2	0
4	D	16	0	24	1	0
5	A	397	0	0	5	0
5	B	420	0	0	2	0
5	C	380	0	0	2	0
5	D	551	0	0	0	0
All	All	24443	0	21152	222	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

The worst 5 of 222 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:253:CYS:SG	2:D:802:HEC:HAC	1.35	1.63
1:D:350:CYS:SG	2:D:804:HEC:HAC	1.53	1.47
1:C:350:CYS:SG	2:C:804:HEC:HAC	1.56	1.44
1:A:350:CYS:SG	2:A:804:HEC:HAC	1.64	1.34
1:B:586:CYS:SG	2:B:908:HEC:HAC	1.70	1.25

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	691/760 (91%)	656 (95%)	34 (5%)	1 (0%)	55 82

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	692/760 (91%)	669 (97%)	22 (3%)	1 (0%)	55	82
1	C	690/760 (91%)	664 (96%)	24 (4%)	2 (0%)	44	73
1	D	693/760 (91%)	670 (97%)	22 (3%)	1 (0%)	55	82
All	All	2766/3040 (91%)	2659 (96%)	102 (4%)	5 (0%)	51	79

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	575	VAL
1	A	575	VAL
1	C	676	SER
1	D	575	VAL
1	C	575	VAL

### 5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	558/609 (92%)	547 (98%)	11 (2%)	60	86
1	B	559/609 (92%)	550 (98%)	9 (2%)	68	89
1	C	557/609 (92%)	552 (99%)	5 (1%)	82	94
1	D	559/609 (92%)	553 (99%)	6 (1%)	78	93
All	All	2233/2436 (92%)	2202 (99%)	31 (1%)	71	90

5 of 31 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	191	THR
1	B	420	ASN
1	D	398	LYS
1	B	321	CYS
1	B	576	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	59	ASN
1	D	735	ASN
1	C	70	ASN
1	A	713	GLN
1	C	735	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

### 5.6 Ligand geometry ⓘ

Of 64 ligands modelled in this entry, 8 are monoatomic - leaving 56 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	HEC	A	801	1	28,50,50	2.29	3 (10%)	16,82,82	1.67	5 (31%)
2	HEC	A	802	1,3	28,50,50	2.20	4 (14%)	16,82,82	1.44	2 (12%)
2	HEC	A	803	1	28,50,50	2.24	3 (10%)	16,82,82	1.69	4 (25%)
2	HEC	A	804	1	28,50,50	2.24	3 (10%)	16,82,82	1.73	5 (31%)
2	HEC	A	805	1	28,50,50	2.24	3 (10%)	16,82,82	1.77	4 (25%)
2	HEC	A	806	1	28,50,50	2.27	3 (10%)	16,82,82	1.83	5 (31%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	HEC	A	807	1	28,50,50	2.22	3 (10%)	16,82,82	1.36	1 (6%)
2	HEC	A	808	1	28,50,50	2.29	3 (10%)	16,82,82	1.60	4 (25%)
2	HEC	A	809	1	28,50,50	2.27	3 (10%)	16,82,82	1.71	4 (25%)
2	HEC	A	810	1	28,50,50	2.29	3 (10%)	16,82,82	1.43	2 (12%)
4	DMS	A	813	-	3,3,3	2.62	1 (33%)	3,3,3	0.45	0
4	DMS	A	814	-	3,3,3	2.64	1 (33%)	3,3,3	0.50	0
4	DMS	A	815	-	3,3,3	2.65	1 (33%)	3,3,3	0.50	0
4	DMS	A	816	-	3,3,3	2.64	1 (33%)	3,3,3	0.35	0
4	DMS	B	901	-	3,3,3	2.64	1 (33%)	3,3,3	0.37	0
2	HEC	B	902	1	28,50,50	2.26	3 (10%)	16,82,82	1.42	2 (12%)
2	HEC	B	903	1,3	28,50,50	2.21	3 (10%)	16,82,82	1.54	4 (25%)
2	HEC	B	904	1	28,50,50	2.07	6 (21%)	16,82,82	1.74	2 (12%)
2	HEC	B	905	1	28,50,50	2.21	3 (10%)	16,82,82	1.62	3 (18%)
2	HEC	B	906	1	28,50,50	2.25	3 (10%)	16,82,82	1.55	2 (12%)
2	HEC	B	907	1	28,50,50	2.30	3 (10%)	16,82,82	1.76	4 (25%)
2	HEC	B	908	1	28,50,50	2.16	3 (10%)	16,82,82	1.58	3 (18%)
2	HEC	B	909	1	28,50,50	2.26	3 (10%)	16,82,82	1.51	2 (12%)
2	HEC	B	910	1	28,50,50	2.26	3 (10%)	16,82,82	1.63	4 (25%)
2	HEC	B	911	1	28,50,50	2.24	3 (10%)	16,82,82	1.50	3 (18%)
4	DMS	B	914	-	3,3,3	2.64	1 (33%)	3,3,3	0.39	0
4	DMS	B	915	-	3,3,3	2.66	1 (33%)	3,3,3	0.54	0
4	DMS	B	916	-	3,3,3	2.66	1 (33%)	3,3,3	0.55	0
2	HEC	C	801	1	28,50,50	2.31	4 (14%)	16,82,82	1.58	2 (12%)
2	HEC	C	802	1,3	28,50,50	2.19	3 (10%)	16,82,82	1.45	2 (12%)
2	HEC	C	803	1	28,50,50	2.25	3 (10%)	16,82,82	1.62	3 (18%)
2	HEC	C	804	1	28,50,50	2.24	3 (10%)	16,82,82	1.48	3 (18%)
2	HEC	C	805	1	28,50,50	2.23	3 (10%)	16,82,82	1.56	3 (18%)
2	HEC	C	806	1	28,50,50	2.26	3 (10%)	16,82,82	1.81	5 (31%)
2	HEC	C	807	1	28,50,50	2.22	4 (14%)	16,82,82	1.62	3 (18%)
2	HEC	C	808	1	28,50,50	2.24	3 (10%)	16,82,82	1.57	3 (18%)
2	HEC	C	809	1	28,50,50	2.26	3 (10%)	16,82,82	1.60	3 (18%)
2	HEC	C	810	1	28,50,50	2.29	3 (10%)	16,82,82	1.49	2 (12%)
4	DMS	C	813	-	3,3,3	2.63	1 (33%)	3,3,3	0.44	0
4	DMS	C	814	-	3,3,3	2.60	1 (33%)	3,3,3	0.44	0
4	DMS	C	815	-	3,3,3	2.66	1 (33%)	3,3,3	0.54	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	DMS	C	816	-	3,3,3	2.67	1 (33%)	3,3,3	0.52	0
2	HEC	D	801	1	28,50,50	2.25	3 (10%)	16,82,82	1.46	2 (12%)
2	HEC	D	802	1,3	28,50,50	2.26	3 (10%)	16,82,82	1.39	3 (18%)
2	HEC	D	803	1	28,50,50	2.26	3 (10%)	16,82,82	1.55	3 (18%)
2	HEC	D	804	1	28,50,50	2.29	4 (14%)	16,82,82	1.47	3 (18%)
2	HEC	D	805	1	28,50,50	2.26	3 (10%)	16,82,82	1.55	2 (12%)
2	HEC	D	806	1	28,50,50	2.26	3 (10%)	16,82,82	1.89	5 (31%)
2	HEC	D	807	1	28,50,50	2.15	4 (14%)	16,82,82	1.50	2 (12%)
2	HEC	D	808	1	28,50,50	2.20	3 (10%)	16,82,82	1.73	5 (31%)
2	HEC	D	809	1	28,50,50	2.26	3 (10%)	16,82,82	1.63	4 (25%)
2	HEC	D	810	1	28,50,50	2.31	5 (17%)	16,82,82	1.53	2 (12%)
4	DMS	D	813	-	3,3,3	2.64	1 (33%)	3,3,3	0.40	0
4	DMS	D	814	-	3,3,3	2.59	1 (33%)	3,3,3	0.40	0
4	DMS	D	815	-	3,3,3	2.68	1 (33%)	3,3,3	0.54	0
4	DMS	D	816	-	3,3,3	2.66	1 (33%)	3,3,3	0.59	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEC	A	801	1	-	0/6/54/54	0/0/8/8
2	HEC	A	802	1,3	-	0/6/54/54	0/0/8/8
2	HEC	A	803	1	-	0/6/54/54	0/0/8/8
2	HEC	A	804	1	-	0/6/54/54	0/0/8/8
2	HEC	A	805	1	-	0/6/54/54	0/0/8/8
2	HEC	A	806	1	-	0/6/54/54	0/0/8/8
2	HEC	A	807	1	-	0/6/54/54	0/0/8/8
2	HEC	A	808	1	-	0/6/54/54	0/0/8/8
2	HEC	A	809	1	-	0/6/54/54	0/0/8/8
2	HEC	A	810	1	-	0/6/54/54	0/0/8/8
4	DMS	A	813	-	-	0/0/0/0	0/0/0/0
4	DMS	A	814	-	-	0/0/0/0	0/0/0/0
4	DMS	A	815	-	-	0/0/0/0	0/0/0/0
4	DMS	A	816	-	-	0/0/0/0	0/0/0/0
4	DMS	B	901	-	-	0/0/0/0	0/0/0/0
2	HEC	B	902	1	-	0/6/54/54	0/0/8/8
2	HEC	B	903	1,3	-	0/6/54/54	0/0/8/8

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	HEC	B	904	1	-	0/6/54/54	0/0/8/8
2	HEC	B	905	1	-	0/6/54/54	0/0/8/8
2	HEC	B	906	1	-	0/6/54/54	0/0/8/8
2	HEC	B	907	1	-	0/6/54/54	0/0/8/8
2	HEC	B	908	1	-	0/6/54/54	0/0/8/8
2	HEC	B	909	1	-	0/6/54/54	0/0/8/8
2	HEC	B	910	1	-	0/6/54/54	0/0/8/8
2	HEC	B	911	1	-	0/6/54/54	0/0/8/8
4	DMS	B	914	-	-	0/0/0/0	0/0/0/0
4	DMS	B	915	-	-	0/0/0/0	0/0/0/0
4	DMS	B	916	-	-	0/0/0/0	0/0/0/0
2	HEC	C	801	1	-	0/6/54/54	0/0/8/8
2	HEC	C	802	1,3	-	0/6/54/54	0/0/8/8
2	HEC	C	803	1	-	0/6/54/54	0/0/8/8
2	HEC	C	804	1	-	0/6/54/54	0/0/8/8
2	HEC	C	805	1	-	0/6/54/54	0/0/8/8
2	HEC	C	806	1	-	0/6/54/54	0/0/8/8
2	HEC	C	807	1	-	0/6/54/54	0/0/8/8
2	HEC	C	808	1	-	0/6/54/54	0/0/8/8
2	HEC	C	809	1	-	0/6/54/54	0/0/8/8
2	HEC	C	810	1	-	0/6/54/54	0/0/8/8
4	DMS	C	813	-	-	0/0/0/0	0/0/0/0
4	DMS	C	814	-	-	0/0/0/0	0/0/0/0
4	DMS	C	815	-	-	0/0/0/0	0/0/0/0
4	DMS	C	816	-	-	0/0/0/0	0/0/0/0
2	HEC	D	801	1	-	0/6/54/54	0/0/8/8
2	HEC	D	802	1,3	-	0/6/54/54	0/0/8/8
2	HEC	D	803	1	-	0/6/54/54	0/0/8/8
2	HEC	D	804	1	-	0/6/54/54	0/0/8/8
2	HEC	D	805	1	-	0/6/54/54	0/0/8/8
2	HEC	D	806	1	-	0/6/54/54	0/0/8/8
2	HEC	D	807	1	-	0/6/54/54	0/0/8/8
2	HEC	D	808	1	-	0/6/54/54	0/0/8/8
2	HEC	D	809	1	-	0/6/54/54	0/0/8/8
2	HEC	D	810	1	-	0/6/54/54	0/0/8/8
4	DMS	D	813	-	-	0/0/0/0	0/0/0/0
4	DMS	D	814	-	-	0/0/0/0	0/0/0/0
4	DMS	D	815	-	-	0/0/0/0	0/0/0/0
4	DMS	D	816	-	-	0/0/0/0	0/0/0/0

The worst 5 of 146 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	907	HEC	C3B-C2B	-6.34	1.34	1.40
2	A	805	HEC	C3B-C2B	-6.15	1.34	1.40
2	D	810	HEC	C3B-C2B	-6.14	1.34	1.40
2	B	902	HEC	C3C-C2C	-6.12	1.34	1.40
2	D	802	HEC	C3B-C2B	-6.10	1.34	1.40

The worst 5 of 125 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	905	HEC	CMC-C2C-C1C	-4.42	121.67	128.46
2	B	904	HEC	CMC-C2C-C1C	-4.42	121.68	128.46
2	D	806	HEC	CBA-CAA-C2A	-3.99	104.86	112.47
2	B	907	HEC	CBA-CAA-C2A	-3.71	105.39	112.47
2	A	806	HEC	CBA-CAA-C2A	-3.65	105.51	112.47

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

42 monomers are involved in 108 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	HEC	1	0
2	A	802	HEC	5	0
2	A	803	HEC	2	0
2	A	804	HEC	5	0
2	A	805	HEC	1	0
2	A	806	HEC	3	0
2	A	807	HEC	4	0
2	A	808	HEC	3	0
2	A	810	HEC	1	0
4	A	814	DMS	2	0
4	A	816	DMS	1	0
2	B	902	HEC	3	0
2	B	903	HEC	7	0
2	B	904	HEC	4	0
2	B	905	HEC	4	0
2	B	906	HEC	4	0
2	B	907	HEC	4	0
2	B	908	HEC	7	0
2	B	909	HEC	3	0
2	B	910	HEC	1	0
2	B	911	HEC	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	915	DMS	1	0
2	C	801	HEC	2	0
2	C	802	HEC	5	0
2	C	803	HEC	1	0
2	C	804	HEC	2	0
2	C	806	HEC	2	0
2	C	807	HEC	4	0
2	C	809	HEC	1	0
2	C	810	HEC	1	0
4	C	815	DMS	2	0
2	D	801	HEC	1	0
2	D	802	HEC	7	0
2	D	803	HEC	2	0
2	D	804	HEC	2	0
2	D	805	HEC	3	0
2	D	806	HEC	3	0
2	D	807	HEC	5	0
2	D	808	HEC	2	0
2	D	809	HEC	1	0
2	D	810	HEC	2	0
4	D	813	DMS	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	693/760 (91%)	-0.28	4 (0%) 89 90	18, 36, 70, 148	0
1	B	694/760 (91%)	-0.25	4 (0%) 89 90	18, 35, 63, 113	0
1	C	692/760 (91%)	-0.23	3 (0%) 92 93	17, 37, 74, 110	0
1	D	695/760 (91%)	-0.40	0 100 100	15, 31, 55, 111	0
All	All	2774/3040 (91%)	-0.29	11 (0%) 92 93	15, 34, 67, 148	0

The worst 5 of 11 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	688	TYR	3.2
1	A	43	VAL	2.7
1	B	321	CYS	2.7
1	A	710	ALA	2.3
1	C	716	ALA	2.3

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors

of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
4	DMS	D	815	4/4	0.52	0.56	18.88	115,115,115,115	0
4	DMS	B	914	4/4	0.95	0.29	5.46	46,49,57,59	0
4	DMS	B	915	4/4	0.78	0.34	5.25	92,92,92,92	0
4	DMS	A	814	4/4	0.89	0.28	4.90	61,67,77,91	0
4	DMS	C	815	4/4	0.86	0.29	4.59	84,84,84,84	0
4	DMS	A	813	4/4	0.99	0.21	3.44	46,50,53,58	0
4	DMS	C	814	4/4	0.94	0.23	3.17	59,59,59,59	0
4	DMS	C	816	4/4	0.88	0.22	3.02	56,67,67,88	0
4	DMS	D	814	4/4	0.98	0.19	2.44	23,35,38,42	0
4	DMS	D	816	4/4	0.92	0.19	2.44	66,66,66,66	0
4	DMS	A	815	4/4	0.93	0.18	1.86	57,58,61,80	0
4	DMS	B	901	4/4	0.99	0.21	1.73	31,36,37,45	0
4	DMS	D	813	4/4	0.97	0.21	1.47	36,43,45,52	0
4	DMS	C	813	4/4	0.97	0.21	1.19	41,42,46,47	0
2	HEC	C	804	43/43	0.98	0.15	1.12	20,27,37,43	0
2	HEC	B	907	43/43	0.98	0.16	1.10	18,24,35,42	0
2	HEC	B	908	43/43	0.98	0.16	0.73	19,26,35,54	0
2	HEC	D	807	43/43	0.98	0.16	0.73	18,25,36,62	0
2	HEC	A	804	43/43	0.98	0.14	0.70	20,27,33,51	0
2	HEC	B	911	43/43	0.97	0.16	0.54	26,32,52,58	0
2	HEC	C	802	43/43	0.98	0.17	0.51	16,23,30,36	0
2	HEC	D	804	43/43	0.98	0.15	0.43	24,31,36,51	0
2	HEC	B	905	43/43	0.97	0.15	0.33	26,33,42,50	0
2	HEC	C	808	43/43	0.98	0.16	0.32	29,37,43,48	0
2	HEC	D	802	43/43	0.97	0.16	0.31	21,27,36,44	0
2	HEC	A	805	43/43	0.98	0.15	0.30	25,30,35,37	0
2	HEC	C	809	43/43	0.96	0.18	0.25	46,60,71,75	0
4	DMS	A	816	4/4	0.99	0.16	0.24	28,31,36,41	0
2	HEC	B	910	43/43	0.98	0.15	0.23	24,31,67,73	0
2	HEC	D	806	43/43	0.98	0.15	0.21	17,22,36,43	0
2	HEC	A	802	43/43	0.98	0.15	0.16	15,22,29,35	0
4	DMS	B	916	4/4	0.95	0.17	0.10	46,48,50,71	0
2	HEC	D	809	43/43	0.98	0.14	0.06	21,29,59,69	0
3	CA	A	811	1/1	0.97	0.14	0.06	30,30,30,30	0
2	HEC	B	904	43/43	0.97	0.16	0.04	25,32,37,40	0
2	HEC	B	903	43/43	0.97	0.15	0.03	24,31,43,46	0
2	HEC	C	801	43/43	0.98	0.14	0.02	20,23,28,30	0
2	HEC	C	810	43/43	0.95	0.21	0.02	62,71,76,83	0
2	HEC	B	906	43/43	0.98	0.15	-0.03	27,34,37,39	0
2	HEC	A	803	43/43	0.99	0.14	-0.06	16,20,24,32	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	HEC	D	810	43/43	0.98	0.14	-0.09	22,27,44,48	0
2	HEC	C	806	43/43	0.98	0.14	-0.10	27,31,43,52	0
2	HEC	A	806	43/43	0.98	0.14	-0.14	23,29,41,45	0
2	HEC	A	809	43/43	0.96	0.15	-0.15	40,53,71,81	0
2	HEC	D	801	43/43	0.99	0.14	-0.17	16,20,26,28	0
2	HEC	C	807	43/43	0.97	0.15	-0.17	28,34,46,63	0
2	HEC	A	810	43/43	0.95	0.18	-0.18	58,67,75,80	0
2	HEC	A	801	43/43	0.99	0.13	-0.22	18,22,29,34	0
2	HEC	D	808	43/43	0.99	0.13	-0.27	16,23,27,30	0
2	HEC	B	902	43/43	0.99	0.15	-0.31	19,24,27,30	0
2	HEC	C	803	43/43	0.98	0.14	-0.36	18,23,27,32	0
2	HEC	A	807	43/43	0.98	0.14	-0.36	27,33,41,49	0
2	HEC	D	805	43/43	0.98	0.13	-0.42	23,32,39,46	0
2	HEC	C	805	43/43	0.98	0.14	-0.44	23,28,34,46	0
2	HEC	B	909	43/43	0.98	0.13	-0.52	17,24,28,32	0
3	CA	C	811	1/1	0.94	0.13	-0.59	39,39,39,39	0
2	HEC	D	803	43/43	0.99	0.13	-0.77	19,26,30,33	0
2	HEC	A	808	43/43	0.98	0.13	-0.91	28,38,43,44	0
3	CA	D	811	1/1	0.97	0.07	-3.32	38,38,38,38	0
3	CA	B	912	1/1	0.99	0.08	-6.74	51,51,51,51	0
3	CA	D	812	1/1	0.88	0.15	-	60,60,60,60	0
3	CA	A	812	1/1	0.69	0.23	-	69,69,69,69	0
3	CA	C	812	1/1	0.91	0.13	-	57,57,57,57	0
3	CA	B	913	1/1	0.97	0.16	-	58,58,58,58	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.