



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2018 – 01:54 am GMT

PDB ID : 3HQ9  
Title : CcpA from *G. sulfurreducens*, S134P variant  
Authors : Hoffmann, M.; Seidel, J.; Einsle, O.  
Deposited on : 2009-06-05  
Resolution : 1.52 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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

<https://www.wwpdb.org/validation/2017/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 : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : trunk30967  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk30967

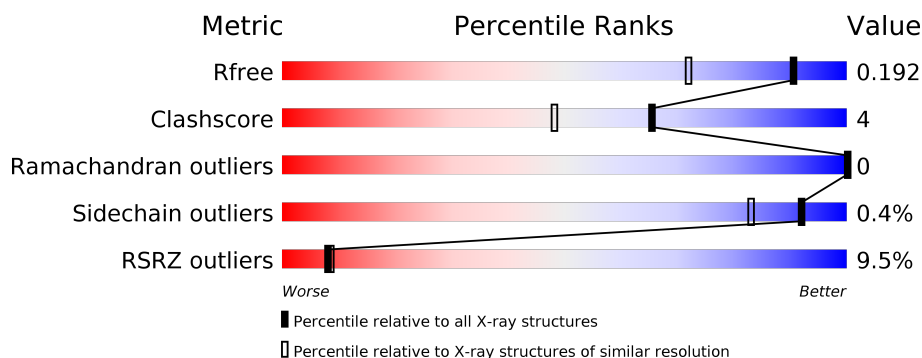
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.52 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))
$R_{free}$	111664	3365 (1.54-1.50)
Clashscore	122126	3586 (1.54-1.50)
Ramachandran outliers	120053	3504 (1.54-1.50)
Sidechain outliers	120020	3502 (1.54-1.50)
RSRZ outliers	108989	3301 (1.54-1.50)

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	345	<div> <div>11%</div> <div> <div></div> <div>86%</div> <div>5%</div> <div>10%</div> </div> </div>
1	B	345	<div> <div>6%</div> <div> <div></div> <div>84%</div> <div>•</div> <div>11%</div> </div> </div>

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 5448 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 Cytochrome c551 peroxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	312	Total	C	N	O	S	0	2	0
			2364	1513	403	439	9			
1	B	306	Total	C	N	O	S	0	3	0
			2313	1480	393	431	9			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	134	PRO	SER	ENGINEERED	UNP Q749D0
B	134	PRO	SER	ENGINEERED	UNP Q749D0

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



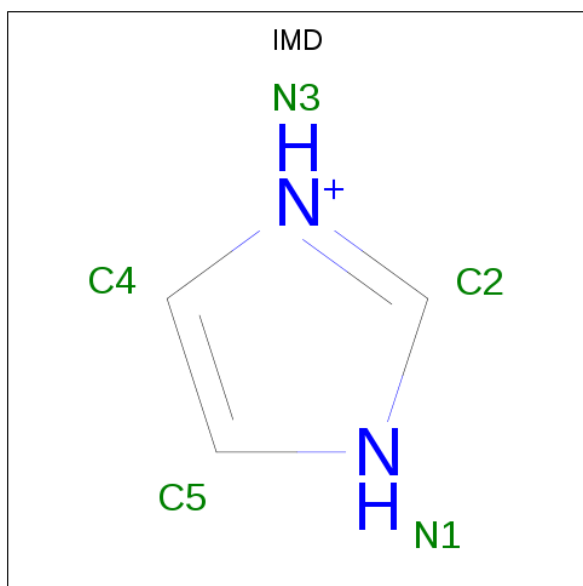
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
2	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

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

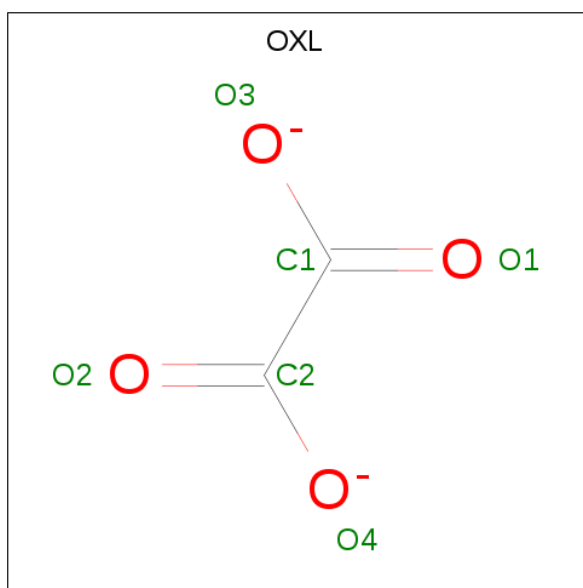
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Ca	0	0
			1	1		
3	A	1	Total	Ca	0	0
			1	1		

- Molecule 4 is IMIDAZOLE (three-letter code: IMD) (formula: C<sub>3</sub>H<sub>5</sub>N<sub>2</sub>).



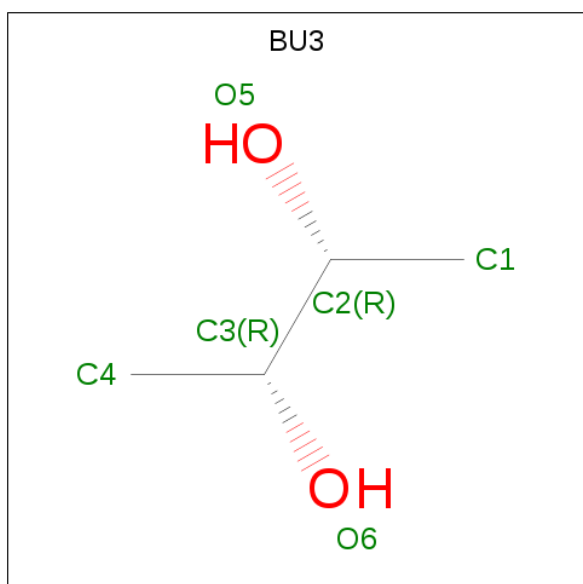
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	N	0	0
			5	3	2		
4	A	1	Total	C	N	0	0
			5	3	2		
4	B	1	Total	C	N	0	0
			5	3	2		
4	B	1	Total	C	N	0	0
			5	3	2		

- Molecule 5 is OXALATE ION (three-letter code: OXL) (formula:  $C_2O_4$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			6	2	4		
5	A	1	Total	C	O	0	0
			6	2	4		
5	B	1	Total	C	O	0	0
			6	2	4		
5	B	1	Total	C	O	0	0
			6	2	4		

- Molecule 6 is (R,R)-2,3-BUTANEDIOL (three-letter code: BU3) (formula:  $C_4H_{10}O_2$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			6	4	2		
6	B	1	Total	C	O	0	0
			6	4	2		

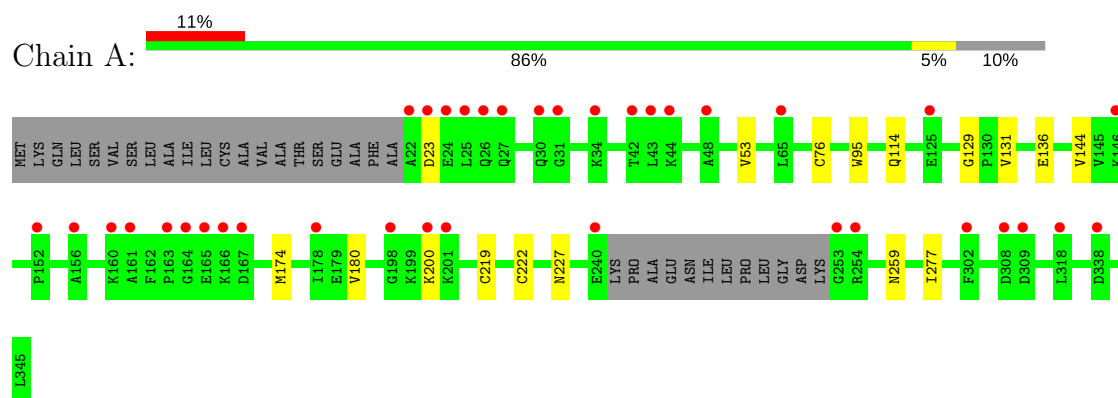
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	244	Total	O	0	0
			244	244		
7	B	297	Total	O	0	0
			297	297		

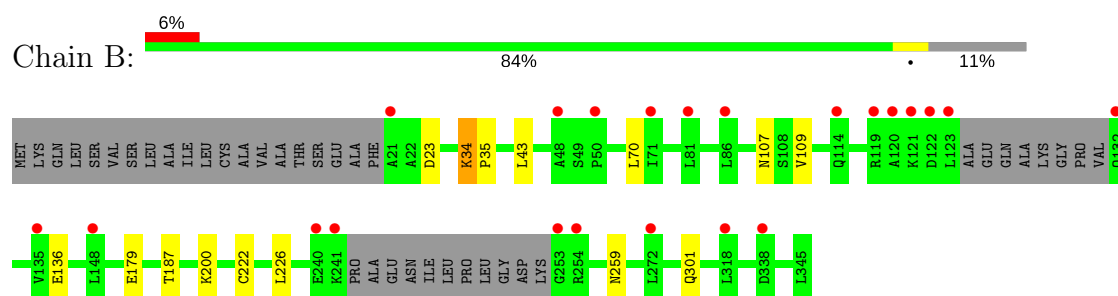
### 3 Residue-property plots [i](#)

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: Cytochrome c551 peroxidase



#### • Molecule 1: Cytochrome c551 peroxidase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	50.90Å 55.47Å 68.61Å 104.71° 99.39° 108.97°	Depositor
Resolution (Å)	63.92 – 1.52 26.65 – 1.52	Depositor EDS
% Data completeness (in resolution range)	90.1 (63.92-1.52) 90.2 (26.65-1.52)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.43 (at 1.52Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, $R_{free}$	0.160 , 0.184 0.172 , 0.192	Depositor DCC
$R_{free}$ test set	4560 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	17.6	Xtriage
Anisotropy	0.036	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.44 , 54.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	5448	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.00% 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: OXL, BU3, CA, IMD, HEM

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	0.42	0/2428	0.55	0/3297
1	B	0.46	0/2378	0.59	0/3232
All	All	0.44	0/4806	0.57	0/6529

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	2364	0	2359	27	1
1	B	2313	0	2284	16	1
2	A	86	0	60	15	0
2	B	86	0	60	4	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	10	0	9	3	0
4	B	10	0	9	0	0
5	A	12	0	0	0	0
5	B	12	0	0	0	0
6	A	6	0	10	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	6	0	10	2	0
7	A	244	0	0	3	0
7	B	297	0	0	5	0
All	All	5448	0	4801	43	1

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 4.

All (43) 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:A:76:CYS:SG	2:A:400:HEM:CAC	2.05	1.45
1:A:219:CYS:SG	2:A:401:HEM:CAB	2.06	1.42
1:B:222:CYS:SG	2:B:401:HEM:CAC	2.15	1.34
1:A:222:CYS:SG	2:A:401:HEM:CAC	2.24	1.25
1:A:219:CYS:SG	2:A:401:HEM:HAB	1.71	1.23
1:A:76:CYS:SG	2:A:400:HEM:HAC	1.78	1.16
1:A:131:VAL:HG13	7:A:494:HOH:O	1.43	1.14
1:A:222:CYS:SG	2:A:401:HEM:HAC	1.97	1.04
1:B:222:CYS:SG	2:B:401:HEM:HAC	1.98	1.02
1:A:222:CYS:HG	2:A:401:HEM:CAC	1.71	0.96
1:B:259[B]:ASN:OD1	7:B:379:HOH:O	1.94	0.85
1:A:76:CYS:SG	2:A:400:HEM:C3C	2.77	0.78
6:B:350:BU3:H42	7:B:572:HOH:O	1.89	0.72
1:A:76:CYS:SG	2:A:400:HEM:CBC	2.77	0.71
1:B:222:CYS:SG	2:B:401:HEM:C3C	2.83	0.71
1:B:222:CYS:SG	2:B:401:HEM:CBC	2.80	0.70
1:A:219:CYS:SG	2:A:401:HEM:CBB	2.80	0.69
1:B:301:GLN:OE1	7:B:476:HOH:O	2.10	0.69
1:A:53:VAL:HG22	1:A:180[A]:VAL:HG12	1.75	0.69
1:B:107:ASN:HD21	1:B:187:THR:H	1.42	0.67
1:A:222:CYS:SG	2:A:401:HEM:C3C	2.88	0.66
1:A:219:CYS:SG	2:A:401:HEM:C3B	2.90	0.62
1:B:23:ASP:OD1	1:B:200:LYS:HE2	2.03	0.58
1:A:131:VAL:HG12	7:A:537:HOH:O	2.02	0.58
1:B:259[B]:ASN:CG	7:B:379:HOH:O	2.40	0.56
1:A:53:VAL:HG22	1:A:180[A]:VAL:CG1	2.36	0.55
1:A:144:VAL:HG11	1:A:174:MET:SD	2.47	0.55
1:B:179:GLU:OE2	6:B:350:BU3:H43	2.07	0.54
1:B:34:LYS:HB2	1:B:226[B]:LEU:HD23	1.92	0.51
1:B:35:PRO:O	1:B:226[B]:LEU:HD21	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:114:GLN:HE22	1:A:129:GLY:H	1.62	0.48
1:A:131:VAL:HG23	4:A:346:IMD:H4	1.96	0.47
1:A:76:CYS:CB	2:A:400:HEM:C3C	2.98	0.47
1:B:43:LEU:HD21	1:B:109:VAL:CG2	2.45	0.47
1:A:136:GLU:HB3	2:A:400:HEM:HBC2	1.97	0.46
1:A:222:CYS:SG	2:A:401:HEM:CBC	3.00	0.43
1:A:23:ASP:HA	1:A:200:LYS:NZ	2.34	0.43
1:A:131:VAL:CG1	7:A:494:HOH:O	2.27	0.43
1:B:34:LYS:O	1:B:226[B]:LEU:HD22	2.19	0.42
1:B:136:GLU:OE2	7:B:500:HOH:O	2.21	0.42
1:A:95:TRP:CH2	1:B:70:LEU:HD12	2.55	0.41
1:A:277:ILE:O	4:A:347:IMD:H5	2.21	0.41
1:A:131:VAL:HG23	4:A:346:IMD:C4	2.51	0.41

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:259:ASN:ND2	1:B:259[B]:ASN:ND2[1_454]	2.14	0.06

## 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	310/345 (90%)	306 (99%)	4 (1%)	0	100	100
1	B	303/345 (88%)	300 (99%)	3 (1%)	0	100	100
All	All	613/690 (89%)	606 (99%)	7 (1%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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	250/276 (91%)	249 (100%)	1 (0%)	92	83
1	B	243/276 (88%)	242 (100%)	1 (0%)	92	83
All	All	493/552 (89%)	491 (100%)	2 (0%)	92	83

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	227	ASN
1	B	34	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	114	GLN
1	A	126	GLN
1	B	107	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

Of 16 ligands modelled in this entry, 2 are monoatomic - leaving 14 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
4	IMD	A	346	2	3,5,5	0.59	0	4,5,5	0.74	0
4	IMD	A	347	-	3,5,5	0.50	0	4,5,5	0.68	0
5	OXL	A	348	-	0,5,5	0.00	-	0,6,6	0.00	-
5	OXL	A	349	-	0,5,5	0.00	-	0,6,6	0.00	-
6	BU3	A	350	-	4,5,5	0.23	0	6,6,6	0.34	0
2	HEM	A	400	1,4	27,50,50	2.01	6 (22%)	17,82,82	1.62	4 (23%)
2	HEM	A	401	1	27,50,50	2.13	6 (22%)	17,82,82	1.58	5 (29%)
4	IMD	B	346	2	3,5,5	0.53	0	4,5,5	0.86	0
4	IMD	B	347	-	3,5,5	0.51	0	4,5,5	0.69	0
5	OXL	B	348	-	0,5,5	0.00	-	0,6,6	0.00	-
5	OXL	B	349	-	0,5,5	0.00	-	0,6,6	0.00	-
6	BU3	B	350	-	4,5,5	0.42	0	6,6,6	0.44	0
2	HEM	B	400	1,4	27,50,50	2.06	7 (25%)	17,82,82	1.47	1 (5%)
2	HEM	B	401	1	27,50,50	1.97	5 (18%)	17,82,82	1.61	5 (29%)

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
4	IMD	A	346	2	-	0/0/0/0	0/1/1/1
4	IMD	A	347	-	-	0/0/0/0	0/1/1/1
5	OXL	A	348	-	-	0/0/4/4	0/0/0/0
5	OXL	A	349	-	-	0/0/4/4	0/0/0/0
6	BU3	A	350	-	-	0/4/4/4	0/0/0/0
2	HEM	A	400	1,4	-	0/6/54/54	0/0/8/8
2	HEM	A	401	1	-	0/6/54/54	0/0/8/8
4	IMD	B	346	2	-	0/0/0/0	0/1/1/1
4	IMD	B	347	-	-	0/0/0/0	0/1/1/1
5	OXL	B	348	-	-	0/0/4/4	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	OXL	B	349	-	-	0/0/4/4	0/0/0/0
6	BU3	B	350	-	-	0/4/4/4	0/0/0/0
2	HEM	B	400	1,4	-	0/6/54/54	0/0/8/8
2	HEM	B	401	1	-	0/6/54/54	0/0/8/8

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	400	HEM	C3B-C2B	-5.10	1.33	1.40
2	A	401	HEM	C3C-C2C	-4.84	1.33	1.40
2	A	400	HEM	C3B-C2B	-4.66	1.33	1.40
2	B	401	HEM	C3B-C2B	-4.53	1.34	1.40
2	B	400	HEM	C3C-C2C	-4.51	1.34	1.40
2	A	400	HEM	C3C-C2C	-4.20	1.34	1.40
2	A	401	HEM	C3B-C2B	-3.98	1.34	1.40
2	B	401	HEM	C3C-C2C	-3.78	1.35	1.40
2	A	400	HEM	CAA-C2A	2.04	1.55	1.52
2	B	400	HEM	CMA-C3A	2.17	1.56	1.51
2	A	401	HEM	C4A-NA	2.34	1.41	1.36
2	B	400	HEM	CAA-C2A	2.34	1.55	1.52
2	B	401	HEM	C3B-CAB	2.78	1.53	1.47
2	B	400	HEM	C3B-CAB	3.17	1.54	1.47
2	B	400	HEM	C3C-CAC	3.36	1.54	1.47
2	A	400	HEM	C3B-CAB	3.57	1.55	1.47
2	A	401	HEM	C3B-CAB	3.78	1.55	1.47
2	B	401	HEM	C3D-C2D	3.83	1.49	1.37
2	A	400	HEM	C3C-CAC	3.96	1.55	1.47
2	A	400	HEM	C3D-C2D	4.10	1.49	1.37
2	B	400	HEM	C3D-C2D	4.16	1.50	1.37
2	A	401	HEM	C3D-C2D	4.24	1.50	1.37
2	B	401	HEM	C3C-CAC	4.38	1.56	1.47
2	A	401	HEM	C3C-CAC	4.50	1.56	1.47

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	400	HEM	CBD-CAD-C3D	-3.48	105.82	112.47
2	A	400	HEM	CBD-CAD-C3D	-3.48	105.84	112.47
2	B	401	HEM	CBD-CAD-C3D	-3.21	106.34	112.47
2	A	400	HEM	CMA-C3A-C4A	-2.91	123.99	128.46
2	A	401	HEM	CBA-CAA-C2A	-2.54	107.64	112.48
2	A	400	HEM	C1D-C2D-C3D	-2.53	105.24	107.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	401	HEM	CBA-CAA-C2A	-2.47	107.76	112.48
2	A	401	HEM	CBD-CAD-C3D	-2.27	108.13	112.47
2	B	401	HEM	CMA-C3A-C4A	-2.25	125.00	128.46
2	A	401	HEM	CMA-C3A-C4A	-2.21	125.06	128.46
2	A	401	HEM	C1D-C2D-C3D	-2.07	105.56	107.00
2	B	401	HEM	CMB-C2B-C3B	2.08	128.67	124.88
2	A	400	HEM	C4A-C3A-C2A	2.21	108.53	107.00
2	B	401	HEM	C4A-C3A-C2A	2.24	108.56	107.00
2	A	401	HEM	CMB-C2B-C3B	2.37	129.19	124.88

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	346	IMD	2	0
4	A	347	IMD	1	0
2	A	400	HEM	6	0
2	A	401	HEM	9	0
6	B	350	BU3	2	0
2	B	401	HEM	4	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 ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

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	312/345 (90%)	0.83	37 (11%) 4 4	12, 19, 30, 37	0
1	B	306/345 (88%)	0.53	22 (7%) 15 16	11, 16, 29, 38	0
All	All	618/690 (89%)	0.68	59 (9%) 8 8	11, 17, 30, 38	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	253	GLY	8.8
1	A	23	ASP	7.9
1	B	253	GLY	6.8
1	A	22	ALA	6.6
1	B	123	LEU	6.6
1	B	21	ALA	4.9
1	B	122	ASP	4.8
1	A	164	GLY	4.5
1	A	24	GLU	4.3
1	A	27	GLN	4.3
1	A	44	LYS	4.2
1	A	166	LYS	4.1
1	A	254	ARG	4.0
1	B	241	LYS	4.0
1	B	132	GLN	3.9
1	B	254	ARG	3.5
1	A	163	PRO	3.5
1	B	121	LYS	3.4
1	A	201	LYS	3.4
1	A	48	ALA	3.4
1	A	167	ASP	3.2
1	A	240	GLU	3.1
1	B	120	ALA	2.9
1	B	338	ASP	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	156	ALA	2.8
1	A	25	LEU	2.7
1	B	119	ARG	2.7
1	A	198	GLY	2.6
1	A	200	LYS	2.6
1	B	240	GLU	2.6
1	A	160	LYS	2.6
1	A	309	ASP	2.6
1	B	318	LEU	2.6
1	A	308	ASP	2.6
1	B	71	ILE	2.4
1	B	81	LEU	2.4
1	A	178	ILE	2.3
1	B	48	ALA	2.3
1	A	31	GLY	2.3
1	A	65	LEU	2.3
1	A	34	LYS	2.3
1	B	135	VAL	2.3
1	A	302	PHE	2.2
1	A	125	GLU	2.2
1	A	338	ASP	2.2
1	B	114	GLN	2.2
1	A	165	GLU	2.2
1	B	50	PRO	2.1
1	A	42	THR	2.1
1	B	148	LEU	2.1
1	A	152	PRO	2.1
1	A	43	LEU	2.1
1	B	86	LEU	2.1
1	A	161	ALA	2.1
1	A	146	LYS	2.1
1	B	272	LEU	2.1
1	A	26	GLN	2.0
1	A	30	GLN	2.0
1	A	318	LEU	2.0

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

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. 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	B-factors(Å <sup>2</sup> )	Q<0.9
6	BU3	B	350	6/6	0.78	0.14	38,41,42,43	0
5	OXL	B	349	6/6	0.81	0.18	40,41,42,43	0
5	OXL	A	349	6/6	0.85	0.15	31,33,34,35	0
5	OXL	A	348	6/6	0.90	0.14	27,28,30,33	0
6	BU3	A	350	6/6	0.91	0.16	25,26,27,28	0
5	OXL	B	348	6/6	0.92	0.11	34,36,37,38	0
4	IMD	B	347	5/5	0.93	0.12	18,20,20,20	0
4	IMD	A	347	5/5	0.94	0.12	20,20,22,22	0
4	IMD	B	346	5/5	0.94	0.11	22,23,25,25	0
2	HEM	A	401	43/43	0.96	0.14	13,14,18,19	0
4	IMD	A	346	5/5	0.96	0.16	16,17,20,21	0
2	HEM	B	400	43/43	0.97	0.10	10,13,22,28	0
2	HEM	A	400	43/43	0.98	0.12	11,13,21,26	0
2	HEM	B	401	43/43	0.98	0.11	9,11,13,14	0
3	CA	B	402	1/1	1.00	0.09	10,10,10,10	0
3	CA	A	402	1/1	1.00	0.08	13,13,13,13	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.