



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2018 – 06:28 pm GMT

PDB ID : 3WCW
Title : The structure of a deoxygenated 400 kda hemoglobin provides a more accurate description of the cooperative mechanism of giant hemoglobins: MG bound form
Authors : Numoto, N.; Nakagawa, T.; Ohara, R.; Hasegawa, T.; Kita, A.; Yoshida, T.; Maruyama, T.; Imai, K.; Fukumori, Y.; Miki, K.
Deposited on : 2013-06-01
Resolution : 2.50 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

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

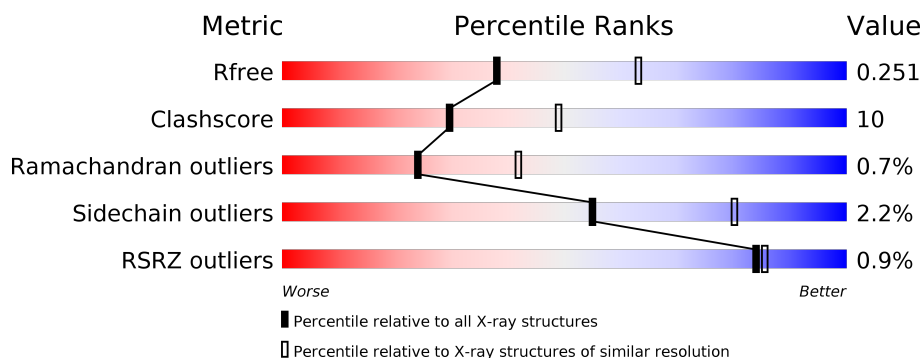
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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.



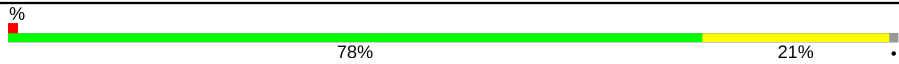

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	111664	4155 (2.50-2.50)
Clashscore	122126	4827 (2.50-2.50)
Ramachandran outliers	120053	4735 (2.50-2.50)
Sidechain outliers	120020	4737 (2.50-2.50)
RSRZ outliers	108989	4058 (2.50-2.50)

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 ≥ 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	146	<div> <div>76%</div> <div>23%</div> <div>.</div> </div>
1	E	146	<div> <div>78%</div> <div>20%</div> <div>.</div> </div>
2	B	144	<div> <div>%</div> <div>77%</div> <div>23%</div> <div>.</div> </div>
2	F	144	<div> <div>%</div> <div>81%</div> <div>18%</div> <div>.</div> </div>
3	C	150	<div> <div>%</div> <div>69%</div> <div>30%</div> <div>.</div> </div>
3	G	150	<div> <div>3%</div> <div>73%</div> <div>24%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
4	D	149	 78% 21%
4	H	149	 82% 17%

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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
9	MAN	D	206	-	-	-	X
9	MAN	D	207	-	-	-	X
9	MAN	H	205	-	-	-	X
9	MAN	H	206	-	-	-	X
9	MAN	H	207	-	-	-	X

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 9825 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 A1 globin chain of giant V2 hemoglobin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	146	Total	C	N	O	S	0	0	0
			1151	736	198	209	8			
1	E	146	Total	C	N	O	S	0	0	0
			1151	736	198	209	8			

- Molecule 2 is a protein called A2 globin chain of giant V2 hemoglobin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	144	Total	C	N	O	S	0	0	0
			1120	697	206	210	7			
2	F	144	Total	C	N	O	S	0	0	0
			1120	697	206	210	7			

- Molecule 3 is a protein called B2 globin chain of giant V2 hemoglobin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	150	Total	C	N	O	S	0	0	0
			1158	718	211	221	8			
3	G	150	Total	C	N	O	S	0	0	0
			1158	718	211	221	8			

- Molecule 4 is a protein called B1 globin chain of giant V2 hemoglobin.

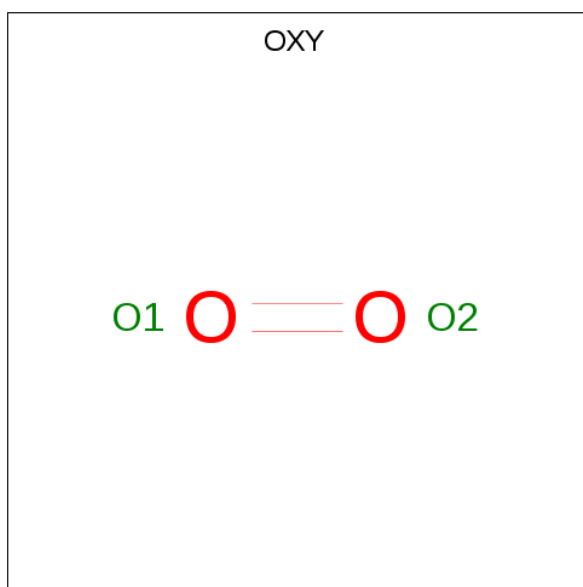
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	147	Total	C	N	O	S	0	0	0
			1125	719	194	205	7			
4	H	147	Total	C	N	O	S	0	0	0
			1125	719	194	205	7			

- Molecule 5 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C₃₄H₃₂FeN₄O₄).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	D	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	E	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	F	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	G	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
5	H	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

- Molecule 6 is OXYGEN MOLECULE (three-letter code: OXY) (formula: O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total O 2 2	0	0
6	B	1	Total O 2 2	0	0
6	C	1	Total O 2 2	0	0
6	D	1	Total O 2 2	0	0
6	E	1	Total O 2 2	0	0
6	F	1	Total O 2 2	0	0
6	G	1	Total O 2 2	0	0
6	H	1	Total O 2 2	0	0

- Molecule 7 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

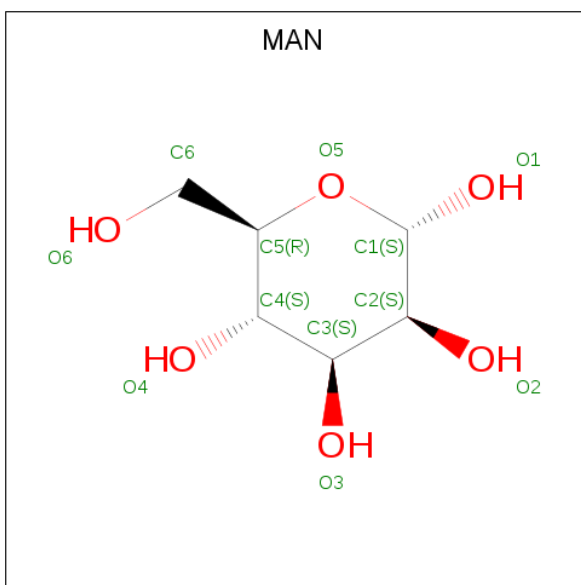
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total Mg 1 1	0	0
7	A	1	Total Mg 1 1	0	0
7	F	1	Total Mg 1 1	0	0

- Molecule 8 is N-ACETYL-D-GLUCOSAMINE (three-letter code: NAG) (formula: C₈H₁₅NO₆).



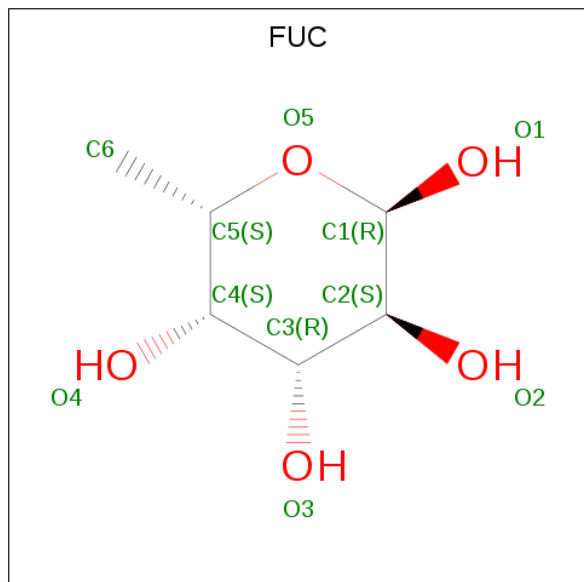
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	D	1	Total	C	N	O	0	0
			14	8	1	5		
8	D	1	Total	C	N	O	0	0
			14	8	1	5		
8	H	1	Total	C	N	O	0	0
			14	8	1	5		
8	H	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 9 is ALPHA-D-MANNOSE (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	D	1	Total C O 11 6 5	0	0
9	D	1	Total C O 11 6 5	0	0
9	D	1	Total C O 11 6 5	0	0
9	H	1	Total C O 11 6 5	0	0
9	H	1	Total C O 11 6 5	0	0
9	H	1	Total C O 11 6 5	0	0

- Molecule 10 is ALPHA-L-FUCOSE (three-letter code: FUC) (formula: C₆H₁₂O₅).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	D	1	Total C O 10 6 4	0	0
10	H	1	Total C O 10 6 4	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	A	47	Total O 47 47	0	0
11	B	22	Total O 22 22	0	0

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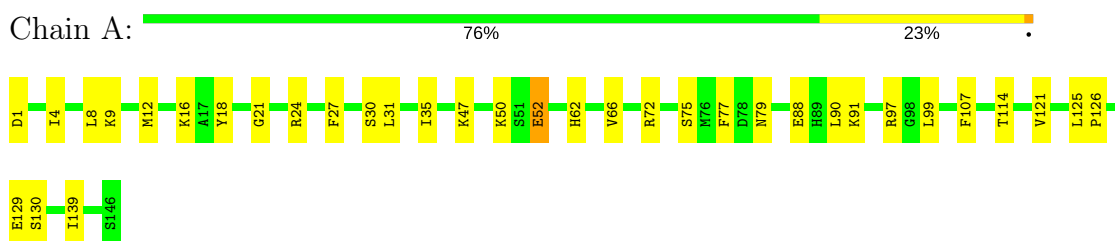
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	C	25	Total 25	O 25	0	0
11	D	26	Total 26	O 26	0	0
11	E	33	Total 33	O 33	0	0
11	F	18	Total 18	O 18	0	0
11	G	16	Total 16	O 16	0	0
11	H	25	Total 25	O 25	0	0

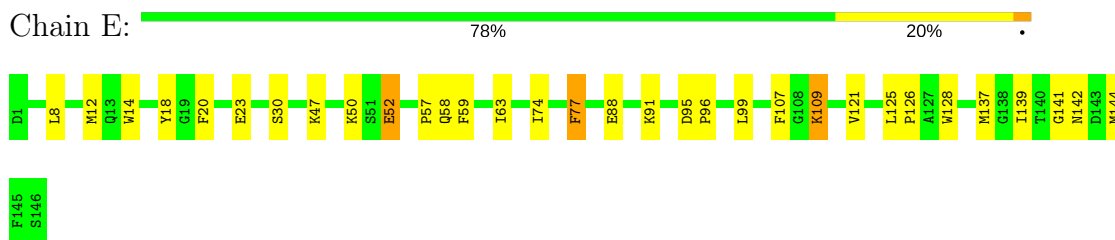
3 Residue-property plots [i](#)

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.

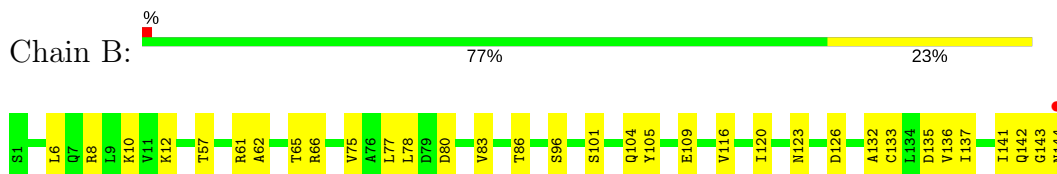
- Molecule 1: A1 globin chain of giant V2 hemoglobin



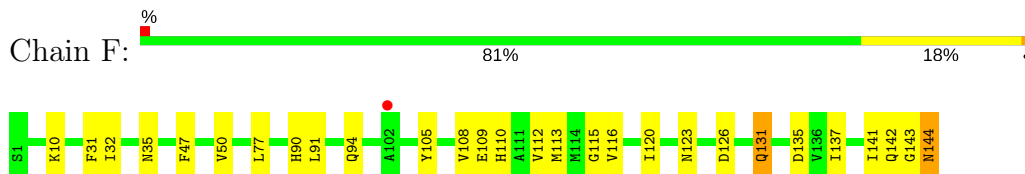
- Molecule 1: A1 globin chain of giant V2 hemoglobin



- Molecule 2: A2 globin chain of giant V2 hemoglobin

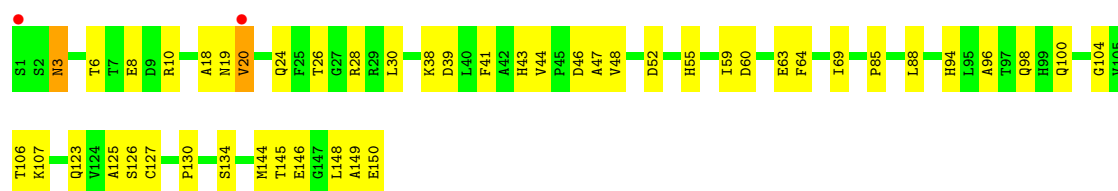


- Molecule 2: A2 globin chain of giant V2 hemoglobin

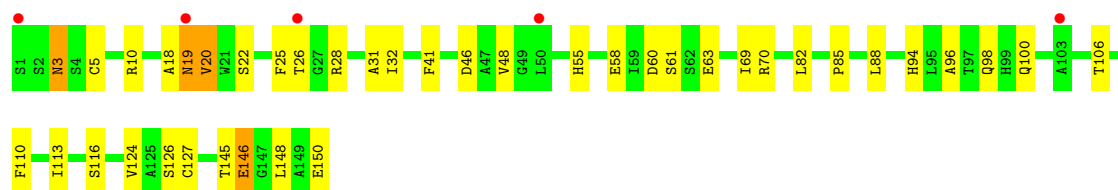
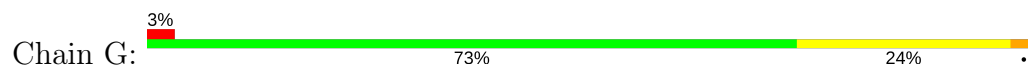


- Molecule 3: B2 globin chain of giant V2 hemoglobin

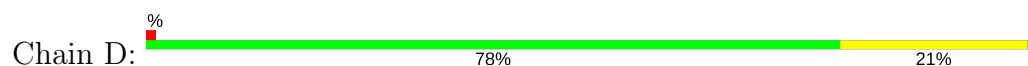




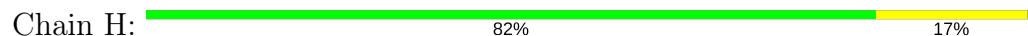
- Molecule 3: B2 globin chain of giant V2 hemoglobin



- Molecule 4: B1 globin chain of giant V2 hemoglobin



- Molecule 4: B1 globin chain of giant V2 hemoglobin



4 Data and refinement statistics

Property	Value	Source
Space group	P 63	Depositor
Cell constants a, b, c, α , β , γ	109.27 Å 109.27 Å 195.60 Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	43.44 – 2.50 43.44 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.9 (43.44-2.50) 99.9 (43.44-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.65 (at 2.51 Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, R_{free}	0.207 , 0.259 0.201 , 0.251	Depositor DCC
R_{free} test set	2300 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	36.6	Xtriage
Anisotropy	0.217	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 39.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.053 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	9825	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.93% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: MG, NAG, OXY, FUC, HEM, MAN

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	0.47	0/1178	0.58	0/1585
1	E	0.45	0/1178	0.57	0/1585
2	B	0.39	0/1143	0.57	0/1543
2	F	0.39	0/1143	0.58	0/1543
3	C	0.38	0/1181	0.58	0/1597
3	G	0.38	0/1181	0.58	0/1597
4	D	0.39	0/1149	0.57	0/1559
4	H	0.41	0/1149	0.56	0/1559
All	All	0.41	0/9302	0.57	0/12568

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	1151	0	1123	27	0
1	E	1151	0	1123	29	0
2	B	1120	0	1077	25	0
2	F	1120	0	1077	20	0
3	C	1158	0	1115	39	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	1158	0	1115	32	0
4	D	1125	0	1126	29	0
4	H	1125	0	1126	16	0
5	A	43	0	30	4	0
5	B	43	0	30	0	0
5	C	43	0	30	1	0
5	D	43	0	30	1	0
5	E	43	0	30	4	0
5	F	43	0	30	0	0
5	G	43	0	30	0	0
5	H	43	0	30	0	0
6	A	2	0	0	0	0
6	B	2	0	0	0	0
6	C	2	0	0	0	0
6	D	2	0	0	0	0
6	E	2	0	0	0	0
6	F	2	0	0	0	0
6	G	2	0	0	0	0
6	H	2	0	0	0	0
7	A	1	0	0	0	0
7	B	1	0	0	0	0
7	F	1	0	0	0	0
8	D	28	0	23	1	0
8	H	28	0	23	1	0
9	D	33	0	28	4	0
9	H	33	0	28	1	0
10	D	10	0	10	0	0
10	H	10	0	10	0	0
11	A	47	0	0	3	0
11	B	22	0	0	0	0
11	C	25	0	0	0	0
11	D	26	0	0	0	0
11	E	33	0	0	0	0
11	F	18	0	0	0	0
11	G	16	0	0	0	0
11	H	25	0	0	0	0
All	All	9825	0	9244	192	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 10.

All (192) 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:8:LEU:HB3	3:C:28:ARG:HH22	1.03	1.12
1:A:8:LEU:HB3	3:C:28:ARG:NH2	1.83	0.91
4:D:19:ILE:HD12	4:D:32:MET:HE3	1.53	0.87
1:A:121:VAL:HG11	1:E:30:SER:HB3	1.57	0.87
4:D:50:LEU:HD13	4:D:105:LEU:HD12	1.59	0.84
1:E:57:PRO:HG2	1:E:58:GLN:NE2	1.99	0.77
3:C:28:ARG:HH21	3:C:28:ARG:HG3	1.48	0.77
2:F:137:ILE:O	2:F:141:ILE:HG12	1.85	0.76
3:G:32:ILE:HD11	3:G:124:VAL:HG21	1.66	0.76
3:G:145:THR:HA	3:G:148:LEU:HD12	1.67	0.76
4:D:77:MET:HE1	4:D:91:LEU:HD22	1.68	0.75
1:A:139:ILE:HD12	5:A:201:HEM:HBB2	1.67	0.75
1:E:137:MET:HE3	1:E:141:GLY:HA2	1.69	0.74
4:H:19:ILE:HD12	4:H:32:MET:HE3	1.71	0.72
3:C:145:THR:HA	3:C:148:LEU:HD12	1.72	0.71
3:C:38:LYS:HG2	3:C:59:ILE:HD13	1.73	0.70
4:H:15:GLN:HB3	4:H:125:ILE:HG21	1.74	0.69
1:E:139:ILE:HD12	5:E:200:HEM:HBB2	1.75	0.69
2:F:10:LYS:HE2	2:F:126:ASP:OD1	1.94	0.68
2:B:105:TYR:O	2:B:109:GLU:HG3	1.94	0.67
4:H:102:ARG:HB2	4:H:105:LEU:HD13	1.77	0.67
4:D:19:ILE:HD12	4:D:32:MET:CE	2.26	0.66
2:B:143:GLY:O	2:B:144:ASN:HB2	1.96	0.66
2:F:110:HIS:HA	2:F:113:MET:HE3	1.77	0.66
3:C:20:VAL:HG21	3:C:125:ALA:HB2	1.77	0.64
2:F:77:LEU:CD2	3:G:26:THR:HG21	2.28	0.64
3:G:22:SER:HB2	3:G:28:ARG:HB3	1.81	0.63
3:C:44:VAL:HG12	3:C:47:ALA:H	1.64	0.62
2:B:8:ARG:HD3	2:B:78:LEU:O	1.99	0.61
2:F:90:HIS:CD2	3:G:70:ARG:HD3	2.35	0.61
3:G:146:GLU:HA	3:G:146:GLU:OE2	2.02	0.59
1:E:57:PRO:HG2	1:E:58:GLN:HE22	1.67	0.59
1:E:74:ILE:HA	1:E:77:PHE:CD2	2.38	0.59
3:G:58:GLU:HB3	3:G:61:SER:HB3	1.83	0.59
1:E:20:PHE:HE1	4:H:21:ASN:HB2	1.68	0.58
3:C:96:ALA:O	3:C:100:GLN:HG3	2.03	0.58
9:D:205:MAN:O4	9:D:207:MAN:H2	2.03	0.58
2:F:142:GLN:O	2:F:144:ASN:N	2.36	0.57
3:G:55:HIS:CG	3:G:63:GLU:HG3	2.39	0.57
1:A:50:LYS:HA	1:A:52:GLU:OE1	2.04	0.57
2:B:123:ASN:ND2	4:D:127:ASN:HD21	2.03	0.57
2:B:10:LYS:HE2	2:B:126:ASP:OD1	2.04	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:50:LYS:HD3	1:E:58:GLN:OE1	2.05	0.56
3:C:55:HIS:CD2	3:C:63:GLU:HG3	2.40	0.56
3:G:55:HIS:CE1	3:G:63:GLU:HG3	2.40	0.56
4:D:15:GLN:HB3	4:D:125:ILE:HG21	1.87	0.56
2:F:112:VAL:O	2:F:116:VAL:HG23	2.05	0.56
2:B:105:TYR:CE2	2:B:142:GLN:HG2	2.40	0.56
1:A:121:VAL:HG11	1:E:30:SER:CB	2.34	0.55
2:B:77:LEU:HD21	3:C:69:ILE:CD1	2.36	0.55
3:G:18:ALA:C	3:G:20:VAL:H	2.09	0.55
3:C:28:ARG:HG3	3:C:28:ARG:NH2	2.17	0.55
1:E:8:LEU:HD11	3:G:31:ALA:HB3	1.88	0.55
4:D:50:LEU:CD1	4:D:105:LEU:HD12	2.34	0.55
1:A:30:SER:HB3	1:E:121:VAL:HG11	1.88	0.54
3:C:104:GLY:O	3:C:106:THR:HG23	2.08	0.54
3:C:6:THR:O	3:C:10:ARG:HG3	2.06	0.54
9:D:205:MAN:O4	9:D:206:MAN:H2	2.06	0.54
2:B:101:SER:OG	2:B:104:GLN:HG3	2.06	0.54
2:F:91:LEU:HD23	2:F:94:GLN:OE1	2.08	0.54
2:B:123:ASN:ND2	4:D:127:ASN:ND2	2.56	0.53
3:C:6:THR:OG1	3:C:8:GLU:HG2	2.09	0.53
4:D:21:ASN:OD1	4:D:24:ILE:HG12	2.09	0.53
3:G:41:PHE:CG	3:G:48:VAL:HG22	2.43	0.53
2:B:57:THR:O	2:B:61:ARG:HG3	2.09	0.53
3:C:126:SER:O	3:C:127:CYS:HB2	2.08	0.53
3:G:55:HIS:ND1	3:G:63:GLU:HG3	2.23	0.53
4:H:82:LEU:HA	4:H:88:LEU:HD22	1.91	0.53
2:B:137:ILE:O	2:B:141:ILE:HG12	2.09	0.53
4:H:77:MET:CE	4:H:91:LEU:HD22	2.39	0.53
1:A:107:PHE:CE1	5:A:201:HEM:HAB	2.44	0.52
1:E:99:LEU:HD13	5:E:200:HEM:HAC	1.91	0.52
4:D:77:MET:CE	4:D:91:LEU:HD22	2.39	0.52
1:A:121:VAL:CG1	1:E:30:SER:HB3	2.36	0.52
3:G:96:ALA:O	3:G:100:GLN:HG3	2.09	0.52
1:E:107:PHE:CE1	5:E:200:HEM:HAB	2.45	0.52
4:D:138:LEU:HB3	4:D:139:PRO:HD3	1.92	0.52
1:A:125:LEU:O	1:A:129:GLU:HG3	2.11	0.51
4:D:50:LEU:HD13	4:D:105:LEU:CD1	2.36	0.51
2:F:77:LEU:HD21	3:G:69:ILE:CD1	2.40	0.51
3:C:107:LYS:HG2	3:C:145:THR:HB	1.92	0.51
4:D:105:LEU:HB3	4:D:148:LEU:HD22	1.93	0.50
1:A:47:LYS:NZ	1:A:47:LYS:HB2	2.27	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:9:LYS:HE3	3:C:123:GLN:O	2.11	0.50
1:A:4:ILE:O	1:A:4:ILE:HD12	2.12	0.49
2:B:75:VAL:HA	2:B:78:LEU:HG	1.94	0.49
3:C:41:PHE:CG	3:C:48:VAL:HG22	2.47	0.49
2:B:80:ASP:OD1	2:B:83:VAL:HG23	2.13	0.49
4:H:41:PHE:CE2	4:H:48:GLU:HA	2.48	0.49
3:G:25:PHE:CZ	4:H:28:SER:HB3	2.48	0.49
1:A:27:PHE:CE2	1:A:114:THR:HG22	2.47	0.49
2:F:77:LEU:HD21	3:G:26:THR:HG21	1.95	0.48
1:A:1:ASP:HB3	1:A:130:SER:HB3	1.95	0.47
2:F:47:PHE:HB3	2:F:50:VAL:HG23	1.95	0.47
3:C:26:THR:O	3:C:30:LEU:HD13	2.15	0.47
3:G:145:THR:CA	3:G:148:LEU:HD12	2.42	0.47
3:C:144:MET:SD	5:C:200:HEM:HBB2	2.54	0.47
3:G:20:VAL:CG1	3:G:32:ILE:HD13	2.45	0.47
3:C:130:PRO:O	3:C:134:SER:HB2	2.14	0.47
1:E:125:LEU:HB3	1:E:126:PRO:HD3	1.96	0.47
4:D:134:ARG:NH1	4:D:134:ARG:HB2	2.30	0.47
4:H:141:LYS:HB3	4:H:141:LYS:HE3	1.80	0.46
3:C:18:ALA:C	3:C:20:VAL:H	2.18	0.46
2:F:31:PHE:CD2	2:F:115:GLY:HA2	2.51	0.46
3:C:55:HIS:NE2	3:C:63:GLU:HG3	2.30	0.46
4:H:19:ILE:HD12	4:H:32:MET:CE	2.45	0.46
4:D:21:ASN:CG	4:D:24:ILE:HG12	2.36	0.46
3:G:126:SER:O	3:G:127:CYS:HB2	2.15	0.46
4:D:121:LEU:N	4:D:122:PRO:HD2	2.31	0.46
3:C:106:THR:HB	3:C:149:ALA:O	2.16	0.46
3:G:110:PHE:CD2	3:G:145:THR:HG22	2.51	0.46
2:B:116:VAL:O	2:B:120:ILE:HG12	2.15	0.45
3:C:94:HIS:O	3:C:98:GLN:HG3	2.16	0.45
2:F:105:TYR:CE2	2:F:142:GLN:HG2	2.51	0.45
4:D:116:VAL:O	4:D:120:VAL:HG23	2.16	0.45
2:F:108:VAL:O	2:F:112:VAL:HG23	2.16	0.45
8:H:204:NAG:H62	9:H:205:MAN:C1	2.47	0.45
1:A:31:LEU:O	1:A:35:ILE:HG13	2.17	0.45
4:D:15:GLN:O	4:D:18:GLN:HB3	2.17	0.45
1:E:8:LEU:HD11	3:G:31:ALA:CB	2.47	0.45
2:B:12:LYS:NZ	3:C:24:GLN:O	2.46	0.45
1:A:91:LYS:HG3	1:A:139:ILE:O	2.17	0.45
2:F:32:ILE:O	2:F:35:ASN:HB3	2.17	0.45
4:D:17:ASN:HA	4:D:20:TYR:O	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:26:ALA:HA	4:D:29:ARG:HD3	1.99	0.44
3:C:55:HIS:CE1	3:C:63:GLU:HG3	2.53	0.44
3:C:85:PRO:HA	3:C:88:LEU:HB3	2.00	0.44
2:B:123:ASN:CG	4:D:127:ASN:HD21	2.21	0.44
3:C:19:ASN:C	3:C:20:VAL:HG23	2.38	0.44
3:C:39:ASP:O	3:C:43:HIS:ND1	2.45	0.44
1:E:91:LYS:HG3	1:E:139:ILE:O	2.17	0.44
3:G:106:THR:HB	3:G:150:GLU:O	2.16	0.44
3:G:113:ILE:O	3:G:116:SER:HB2	2.17	0.44
4:H:6:GLU:HA	4:H:83:ASN:OD1	2.17	0.44
4:H:32:MET:HE3	4:H:124:LEU:HD13	2.00	0.44
1:A:18:TYR:CZ	1:A:24:ARG:HD3	2.53	0.44
2:B:133:CYS:O	2:B:137:ILE:HG13	2.18	0.44
1:A:99:LEU:HD13	5:A:201:HEM:HAC	1.99	0.44
3:G:85:PRO:O	3:G:88:LEU:HB3	2.18	0.44
1:A:125:LEU:HB3	1:A:126:PRO:HD3	1.99	0.43
1:A:97:ARG:HD3	5:A:201:HEM:HMD1	2.00	0.43
3:C:30:LEU:HD11	3:C:69:ILE:CG1	2.48	0.43
1:E:59:PHE:O	1:E:63:ILE:HG13	2.17	0.43
3:G:146:GLU:OE2	3:G:146:GLU:CA	2.65	0.43
3:C:106:THR:HB	3:C:150:GLU:O	2.18	0.43
4:D:136:CYS:O	4:D:139:PRO:HD2	2.18	0.43
1:E:95:ASP:N	1:E:96:PRO:HD2	2.33	0.43
2:F:105:TYR:O	2:F:109:GLU:HG3	2.19	0.43
3:G:3:ASN:HD22	3:G:3:ASN:HA	1.50	0.43
1:A:126:PRO:HG3	1:E:109:LYS:HG2	2.01	0.43
1:A:16:LYS:HE2	11:A:334:HOH:O	2.19	0.43
3:G:19:ASN:O	3:G:20:VAL:HG23	2.19	0.43
2:B:6:LEU:HD11	4:D:120:VAL:HG13	2.01	0.42
11:A:305:HOH:O	1:E:121:VAL:HG13	2.18	0.42
4:D:96:ALA:O	4:D:100:VAL:HG23	2.19	0.42
1:E:14:TRP:HB2	1:E:128:TRP:HH2	1.85	0.42
2:F:116:VAL:O	2:F:120:ILE:HG12	2.19	0.42
1:A:62:HIS:O	1:A:66:VAL:HG23	2.20	0.42
2:B:77:LEU:HD21	3:C:69:ILE:HD11	2.01	0.42
4:D:112:ALA:O	4:D:116:VAL:HG23	2.20	0.42
9:D:205:MAN:HO4	9:D:207:MAN:H2	1.82	0.42
2:F:131:GLN:O	2:F:135:ASP:OD2	2.37	0.42
1:E:20:PHE:O	1:E:23:GLU:HB2	2.20	0.42
3:G:10:ARG:HG2	3:G:82:LEU:HB3	2.02	0.42
1:E:47:LYS:HB2	1:E:47:LYS:NZ	2.35	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:18:TYR:HD2	4:H:22:ALA:HB2	1.85	0.42
1:E:144:MET:HG2	1:E:144:MET:O	2.18	0.41
3:G:5:CYS:SG	3:G:10:ARG:HG3	2.60	0.41
4:H:44:LYS:C	4:H:46:GLU:OE1	2.58	0.41
2:B:132:ALA:O	2:B:136:VAL:HG23	2.19	0.41
3:G:94:HIS:O	3:G:98:GLN:HG3	2.20	0.41
1:A:72:ARG:NH2	1:A:90:LEU:HD21	2.35	0.41
8:D:204:NAG:H61	9:D:205:MAN:C1	2.51	0.41
1:E:142:ASN:OD1	1:E:144:MET:HB3	2.20	0.41
2:F:123:ASN:OD1	4:H:127:ASN:ND2	2.52	0.41
1:A:79:ASN:ND2	4:D:30:TRP:HH2	2.18	0.41
1:A:50:LYS:HG2	11:A:340:HOH:O	2.19	0.41
3:C:19:ASN:O	3:C:20:VAL:CG2	2.69	0.41
4:H:7:ALA:O	4:H:11:ILE:HG13	2.21	0.41
3:C:3:ASN:HA	3:C:3:ASN:HD22	1.69	0.41
4:D:32:MET:O	4:D:36:ILE:HG13	2.20	0.41
1:E:50:LYS:HA	1:E:52:GLU:OE1	2.20	0.41
3:C:59:ILE:HA	3:C:64:PHE:CD2	2.55	0.41
2:B:123:ASN:HD21	4:D:127:ASN:ND2	2.18	0.41
2:B:86:THR:HG21	3:C:63:GLU:HA	2.02	0.41
2:B:77:LEU:HD21	3:C:69:ILE:HD13	2.03	0.41
3:G:19:ASN:O	3:G:20:VAL:CG2	2.69	0.41
4:D:110:PHE:CE2	5:D:201:HEM:HBB2	2.57	0.40
2:B:66:ARG:HD3	3:C:94:HIS:CD2	2.56	0.40
1:E:107:PHE:CZ	5:E:200:HEM:HAB	2.57	0.40
2:B:62:ALA:O	2:B:65:THR:HB	2.22	0.40
2:F:47:PHE:HB3	2:F:50:VAL:CG2	2.51	0.40

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	144/146 (99%)	136 (94%)	7 (5%)	1 (1%)	24	42
1	E	144/146 (99%)	138 (96%)	6 (4%)	0	100	100
2	B	142/144 (99%)	134 (94%)	7 (5%)	1 (1%)	24	42
2	F	142/144 (99%)	133 (94%)	8 (6%)	1 (1%)	24	42
3	C	148/150 (99%)	139 (94%)	7 (5%)	2 (1%)	12	22
3	G	148/150 (99%)	140 (95%)	5 (3%)	3 (2%)	8	13
4	D	145/149 (97%)	140 (97%)	5 (3%)	0	100	100
4	H	145/149 (97%)	141 (97%)	4 (3%)	0	100	100
All	All	1158/1178 (98%)	1101 (95%)	49 (4%)	8 (1%)	24	42

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	21	GLY
2	B	96	SER
3	G	19	ASN
3	G	146	GLU
3	C	20	VAL
3	C	146	GLU
3	G	20	VAL
2	F	143	GLY

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	120/120 (100%)	115 (96%)	5 (4%)	32	57
1	E	120/120 (100%)	115 (96%)	5 (4%)	32	57
2	B	116/116 (100%)	115 (99%)	1 (1%)	81	93
2	F	116/116 (100%)	114 (98%)	2 (2%)	63	85
3	C	124/124 (100%)	120 (97%)	4 (3%)	42	69
3	G	124/124 (100%)	121 (98%)	3 (2%)	52	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	D	120/122 (98%)	120 (100%)	0	100	100
4	H	120/122 (98%)	119 (99%)	1 (1%)	83	94
All	All	960/964 (100%)	939 (98%)	21 (2%)	55	80

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	MET
1	A	52	GLU
1	A	75	SER
1	A	77	PHE
1	A	88	GLU
2	B	135	ASP
3	C	3	ASN
3	C	46	ASP
3	C	52	ASP
3	C	60	ASP
1	E	12	MET
1	E	52	GLU
1	E	77	PHE
1	E	88	GLU
1	E	109	LYS
2	F	131	GLN
2	F	144	ASN
3	G	3	ASN
3	G	46	ASP
3	G	60	ASP
4	H	140	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	ASN
2	B	123	ASN
3	C	3	ASN
3	C	14	GLN
4	D	127	ASN
1	E	103	ASN
2	F	123	ASN
2	F	131	GLN

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Mol	Chain	Res	Type
2	F	144	ASN
3	G	3	ASN
3	G	14	GLN
3	G	19	ASN
3	G	100	GLN
4	H	17	ASN
4	H	52	ASN
4	H	127	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 [i](#)

Of 31 ligands modelled in this entry, 3 are monoatomic - leaving 28 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	$\# Z > 2$
5	HEM	A	201	1,6	27,50,50	1.68	5 (18%)	17,82,82	2.22	7 (41%)
6	OXY	A	202	5	1,1,1	0.01	0	0,0,0	0.00	-
5	HEM	B	201	2,6	27,50,50	1.76	5 (18%)	17,82,82	2.10	8 (47%)
6	OXY	B	202	5	1,1,1	0.02	0	0,0,0	0.00	-
5	HEM	C	200	3,6	27,50,50	1.67	6 (22%)	17,82,82	2.51	9 (52%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	OXY	C	201	5	1,1,1	0.03	0	0,0,0	0.00	-
5	HEM	D	201	4,6	27,50,50	1.78	7 (25%)	17,82,82	2.25	8 (47%)
6	OXY	D	202	5	1,1,1	0.04	0	0,0,0	0.00	-
8	NAG	D	203	10,4,8	14,14,15	0.68	0	17,19,21	1.28	2 (11%)
8	NAG	D	204	9,8	14,14,15	0.91	0	17,19,21	1.54	3 (17%)
9	MAN	D	205	9,8	11,11,12	0.99	1 (9%)	15,15,17	2.26	4 (26%)
9	MAN	D	206	9	11,11,12	1.07	0	15,15,17	1.25	1 (6%)
9	MAN	D	207	9	11,11,12	0.90	0	15,15,17	1.04	1 (6%)
10	FUC	D	208	8	9,10,11	0.73	0	13,14,16	0.81	0
5	HEM	E	200	1,6	27,50,50	1.76	4 (14%)	17,82,82	2.22	8 (47%)
6	OXY	E	201	5	1,1,1	0.02	0	0,0,0	0.00	-
5	HEM	F	201	2,6	27,50,50	1.70	6 (22%)	17,82,82	2.32	7 (41%)
6	OXY	F	202	5	1,1,1	0.01	0	0,0,0	0.00	-
5	HEM	G	200	3,6	27,50,50	1.81	7 (25%)	17,82,82	2.33	8 (47%)
6	OXY	G	201	5	1,1,1	0.03	0	0,0,0	0.00	-
5	HEM	H	201	4,6	27,50,50	1.79	7 (25%)	17,82,82	2.44	9 (52%)
6	OXY	H	202	5	1,1,1	0.02	0	0,0,0	0.00	-
8	NAG	H	203	8,4,10	14,14,15	0.60	0	17,19,21	0.77	1 (5%)
8	NAG	H	204	9,8	14,14,15	0.52	0	17,19,21	1.02	1 (5%)
9	MAN	H	205	9,8	11,11,12	1.02	1 (9%)	15,15,17	1.94	2 (13%)
9	MAN	H	206	9	11,11,12	0.67	0	15,15,17	0.97	1 (6%)
9	MAN	H	207	9	11,11,12	0.85	0	15,15,17	1.00	2 (13%)
10	FUC	H	208	8	9,10,11	0.52	0	13,14,16	0.72	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
5	HEM	A	201	1,6	-	0/6/54/54	0/0/8/8
6	OXY	A	202	5	-	0/0/0/0	0/0/0/0
5	HEM	B	201	2,6	-	0/6/54/54	0/0/8/8
6	OXY	B	202	5	-	0/0/0/0	0/0/0/0
5	HEM	C	200	3,6	-	0/6/54/54	0/0/8/8
6	OXY	C	201	5	-	0/0/0/0	0/0/0/0
5	HEM	D	201	4,6	-	0/6/54/54	0/0/8/8
6	OXY	D	202	5	-	0/0/0/0	0/0/0/0
8	NAG	D	203	10,4,8	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	NAG	D	204	9,8	-	0/6/23/26	0/1/1/1
9	MAN	D	205	9,8	-	0/2/19/22	0/1/1/1
9	MAN	D	206	9	-	0/2/19/22	0/1/1/1
9	MAN	D	207	9	-	0/2/19/22	0/1/1/1
10	FUC	D	208	8	-	0/0/17/20	0/1/1/1
5	HEM	E	200	1,6	-	0/6/54/54	0/0/8/8
6	OXY	E	201	5	-	0/0/0/0	0/0/0/0
5	HEM	F	201	2,6	-	0/6/54/54	0/0/8/8
6	OXY	F	202	5	-	0/0/0/0	0/0/0/0
5	HEM	G	200	3,6	-	0/6/54/54	0/0/8/8
6	OXY	G	201	5	-	0/0/0/0	0/0/0/0
5	HEM	H	201	4,6	-	0/6/54/54	0/0/8/8
6	OXY	H	202	5	-	0/0/0/0	0/0/0/0
8	NAG	H	203	8,4,10	-	0/6/23/26	0/1/1/1
8	NAG	H	204	9,8	-	0/6/23/26	0/1/1/1
9	MAN	H	205	9,8	-	0/2/19/22	0/1/1/1
9	MAN	H	206	9	-	0/2/19/22	0/1/1/1
9	MAN	H	207	9	-	0/2/19/22	0/1/1/1
10	FUC	H	208	8	-	0/0/17/20	0/1/1/1

All (49) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	201	HEM	C3C-CAC	-5.94	1.35	1.47
5	A	201	HEM	C3C-CAC	-5.76	1.36	1.47
5	H	201	HEM	C3C-CAC	-5.73	1.36	1.47
5	G	200	HEM	C3C-CAC	-5.71	1.36	1.47
5	E	200	HEM	C3C-CAC	-5.63	1.36	1.47
5	D	201	HEM	C3C-CAC	-5.62	1.36	1.47
5	F	201	HEM	C3C-CAC	-5.49	1.36	1.47
5	C	200	HEM	C3C-CAC	-4.61	1.38	1.47
5	E	200	HEM	C4A-CHB	-2.88	1.32	1.40
5	B	201	HEM	C4A-CHB	-2.62	1.33	1.40
5	G	200	HEM	C4A-CHB	-2.61	1.33	1.40
5	C	200	HEM	C4A-CHB	-2.53	1.33	1.40
5	A	201	HEM	C4A-CHB	-2.36	1.33	1.40
5	H	201	HEM	C4A-CHB	-2.32	1.34	1.40
5	F	201	HEM	C4A-CHB	-2.21	1.34	1.40
5	D	201	HEM	C4A-CHB	-2.08	1.34	1.40
9	D	205	MAN	C1-C2	2.06	1.57	1.52
5	G	200	HEM	C1C-C2C	2.13	1.47	1.42
5	B	201	HEM	C4D-C3D	2.15	1.47	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	201	HEM	C4D-C3D	2.15	1.47	1.42
5	C	200	HEM	C1A-NA	2.15	1.40	1.36
5	G	200	HEM	C4D-C3D	2.20	1.47	1.42
5	D	201	HEM	C1C-C2C	2.23	1.47	1.42
5	A	201	HEM	C4D-C3D	2.25	1.47	1.42
5	H	201	HEM	C1A-NA	2.26	1.40	1.36
5	H	201	HEM	C1C-C2C	2.27	1.47	1.42
9	H	205	MAN	C2-C3	2.28	1.55	1.52
5	G	200	HEM	C1A-NA	2.29	1.40	1.36
5	F	201	HEM	C1A-NA	2.30	1.40	1.36
5	C	200	HEM	C1C-C2C	2.43	1.48	1.42
5	D	201	HEM	C1A-NA	2.60	1.41	1.36
5	H	201	HEM	C4D-C3D	2.62	1.48	1.42
5	A	201	HEM	C3B-C2B	2.64	1.44	1.40
5	D	201	HEM	C4D-C3D	2.67	1.48	1.42
5	B	201	HEM	C3B-C2B	2.74	1.44	1.40
5	B	201	HEM	C4B-NB	2.77	1.41	1.36
5	A	201	HEM	C4B-NB	2.88	1.42	1.36
5	F	201	HEM	C3B-C2B	2.97	1.44	1.40
5	H	201	HEM	C4B-NB	3.00	1.42	1.36
5	C	200	HEM	C4B-NB	3.04	1.42	1.36
5	E	200	HEM	C4B-NB	3.05	1.42	1.36
5	G	200	HEM	C3B-C2B	3.05	1.44	1.40
5	D	201	HEM	C4B-NB	3.10	1.42	1.36
5	F	201	HEM	C4B-NB	3.16	1.42	1.36
5	H	201	HEM	C3B-C2B	3.16	1.44	1.40
5	C	200	HEM	C3B-C2B	3.26	1.44	1.40
5	D	201	HEM	C3B-C2B	3.30	1.44	1.40
5	G	200	HEM	C4B-NB	3.44	1.43	1.36
5	E	200	HEM	C3B-C2B	3.71	1.45	1.40

All (82) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	200	HEM	C4C-C3C-C2C	-5.88	102.79	106.90
5	H	201	HEM	C4C-C3C-C2C	-5.37	103.15	106.90
5	G	200	HEM	C4C-C3C-C2C	-5.33	103.18	106.90
5	D	201	HEM	C4C-C3C-C2C	-5.24	103.24	106.90
5	F	201	HEM	C4C-C3C-C2C	-5.13	103.31	106.90
5	E	200	HEM	C4C-C3C-C2C	-5.00	103.40	106.90
5	A	201	HEM	C4C-C3C-C2C	-4.86	103.50	106.90
5	B	201	HEM	C4C-C3C-C2C	-4.80	103.55	106.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	200	HEM	C1D-C2D-C3D	-4.29	104.01	107.00
5	H	201	HEM	C1D-C2D-C3D	-3.96	104.24	107.00
5	A	201	HEM	C1D-C2D-C3D	-3.77	104.37	107.00
5	E	200	HEM	C1D-C2D-C3D	-3.73	104.40	107.00
5	G	200	HEM	C1D-C2D-C3D	-3.70	104.42	107.00
5	D	201	HEM	C1D-C2D-C3D	-3.54	104.53	107.00
5	F	201	HEM	C1D-C2D-C3D	-3.46	104.59	107.00
5	B	201	HEM	C1D-C2D-C3D	-3.36	104.66	107.00
8	D	204	NAG	C2-N2-C7	-3.33	118.09	122.94
8	D	203	NAG	C2-N2-C7	-3.11	118.41	122.94
5	F	201	HEM	CMA-C3A-C4A	-3.11	123.69	128.46
5	C	200	HEM	CMA-C3A-C4A	-3.02	123.83	128.46
5	A	201	HEM	CMA-C3A-C4A	-2.90	124.01	128.46
5	H	201	HEM	CMA-C3A-C4A	-2.80	124.15	128.46
5	G	200	HEM	CMA-C3A-C4A	-2.80	124.16	128.46
5	B	201	HEM	CMA-C3A-C4A	-2.80	124.17	128.46
5	D	201	HEM	CMA-C3A-C4A	-2.78	124.19	128.46
5	E	200	HEM	CMA-C3A-C4A	-2.78	124.20	128.46
8	D	204	NAG	C4-C3-C2	-2.60	107.20	111.02
5	G	200	HEM	CMD-C2D-C1D	-2.60	124.46	128.46
8	H	204	NAG	C2-N2-C7	-2.57	119.19	122.94
5	A	201	HEM	CMD-C2D-C1D	-2.48	124.64	128.46
5	F	201	HEM	CMD-C2D-C1D	-2.48	124.65	128.46
9	D	205	MAN	C3-C4-C5	-2.40	105.94	110.24
5	D	201	HEM	CMD-C2D-C1D	-2.37	124.81	128.46
8	H	203	NAG	C2-N2-C7	-2.35	119.51	122.94
5	C	200	HEM	CBD-CAD-C3D	-2.27	108.14	112.47
5	H	201	HEM	CBD-CAD-C3D	-2.26	108.16	112.47
5	H	201	HEM	CMD-C2D-C1D	-2.22	125.05	128.46
8	D	203	NAG	C4-C3-C2	-2.21	107.78	111.02
5	E	200	HEM	CMD-C2D-C1D	-2.21	125.07	128.46
5	C	200	HEM	CMD-C2D-C1D	-2.20	125.08	128.46
5	B	201	HEM	CMD-C2D-C1D	-2.08	125.26	128.46
5	D	201	HEM	CMB-C2B-C3B	2.05	128.61	124.88
5	H	201	HEM	CMB-C2B-C3B	2.11	128.72	124.88
5	G	200	HEM	CMB-C2B-C3B	2.15	128.79	124.88
5	B	201	HEM	CMB-C2B-C3B	2.17	128.82	124.88
5	H	201	HEM	C3B-C4B-NB	2.18	112.03	109.21
5	E	200	HEM	C4A-C3A-C2A	2.21	108.53	107.00
5	E	200	HEM	C3B-C4B-NB	2.22	112.08	109.21
5	C	200	HEM	C3B-C4B-NB	2.23	112.09	109.21
5	B	201	HEM	C4A-C3A-C2A	2.35	108.63	107.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	200	HEM	CMB-C2B-C3B	2.37	129.19	124.88
5	B	201	HEM	C3B-C4B-NB	2.38	112.28	109.21
5	G	200	HEM	C3B-C4B-NB	2.42	112.34	109.21
5	D	201	HEM	C3B-C4B-NB	2.46	112.39	109.21
9	H	207	MAN	C1-C2-C3	2.47	112.78	109.66
5	F	201	HEM	C3B-C4B-NB	2.49	112.43	109.21
5	A	201	HEM	C3B-C4B-NB	2.51	112.45	109.21
5	C	200	HEM	C4A-C3A-C2A	2.52	108.75	107.00
5	A	201	HEM	C4A-C3A-C2A	2.61	108.81	107.00
5	G	200	HEM	C4A-C3A-C2A	2.64	108.83	107.00
5	E	200	HEM	CMB-C2B-C3B	2.66	129.72	124.88
9	H	207	MAN	C1-O5-C5	2.68	115.88	112.19
5	D	201	HEM	C4A-C3A-C2A	2.68	108.86	107.00
9	D	207	MAN	C1-O5-C5	2.72	115.92	112.19
5	B	201	HEM	CMD-C2D-C3D	2.72	130.08	124.94
5	E	200	HEM	CMD-C2D-C3D	2.96	130.53	124.94
5	D	201	HEM	CMD-C2D-C3D	3.03	130.65	124.94
5	H	201	HEM	CMD-C2D-C3D	3.05	130.70	124.94
5	H	201	HEM	C4A-C3A-C2A	3.07	109.13	107.00
5	F	201	HEM	CMD-C2D-C3D	3.09	130.77	124.94
5	F	201	HEM	C4A-C3A-C2A	3.14	109.18	107.00
5	C	200	HEM	CMD-C2D-C3D	3.16	130.90	124.94
9	H	206	MAN	C1-O5-C5	3.18	116.56	112.19
5	A	201	HEM	CMD-C2D-C3D	3.20	130.98	124.94
8	D	204	NAG	C1-O5-C5	3.22	116.61	112.19
5	G	200	HEM	CMD-C2D-C3D	3.28	131.12	124.94
9	D	206	MAN	C1-O5-C5	3.40	116.87	112.19
9	H	205	MAN	C2-C3-C4	3.43	116.82	110.87
9	D	205	MAN	C1-O5-C5	4.14	117.88	112.19
9	D	205	MAN	O5-C1-C2	4.53	117.83	110.78
9	D	205	MAN	C1-C2-C3	5.36	116.44	109.66
9	H	205	MAN	C1-C2-C3	5.94	117.17	109.66

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

10 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	201	HEM	4	0
5	C	200	HEM	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	201	HEM	1	0
8	D	204	NAG	1	0
9	D	205	MAN	4	0
9	D	206	MAN	1	0
9	D	207	MAN	2	0
5	E	200	HEM	4	0
8	H	204	NAG	1	0
9	H	205	MAN	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, 95th 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 ²)	Q<0.9
1	A	146/146 (100%)	-0.61	0 100 100	20, 29, 46, 57	0
1	E	146/146 (100%)	-0.61	0 100 100	21, 34, 51, 61	0
2	B	144/144 (100%)	-0.39	1 (0%) 87 88	25, 42, 59, 71	0
2	F	144/144 (100%)	-0.34	1 (0%) 87 88	23, 42, 61, 74	0
3	C	150/150 (100%)	-0.22	2 (1%) 77 78	25, 42, 65, 78	0
3	G	150/150 (100%)	0.00	5 (3%) 46 50	28, 44, 72, 77	0
4	D	147/149 (98%)	-0.43	2 (1%) 75 77	27, 39, 61, 71	0
4	H	147/149 (98%)	-0.53	0 100 100	27, 38, 57, 69	0
All	All	1174/1178 (99%)	-0.39	11 (0%) 84 85	20, 39, 64, 78	0

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	G	1	SER	7.4
3	C	1	SER	5.8
2	B	144	ASN	3.8
4	D	101	ALA	3.7
3	G	19	ASN	3.2
2	F	102	ALA	3.1
3	G	103	ALA	2.6
4	D	105	LEU	2.4
3	C	20	VAL	2.3
3	G	50	LEU	2.3
3	G	26	THR	2.1

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 ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

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, 95th 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 ²)	Q<0.9
9	MAN	H	206	11/12	0.14	0.90	157,158,160,161	0
9	MAN	H	207	11/12	0.16	0.77	161,163,165,165	0
9	MAN	H	205	11/12	0.24	0.60	140,148,153,157	0
7	MG	B	203	1/1	0.46	0.20	58,58,58,58	0
9	MAN	D	207	11/12	0.52	0.46	117,118,119,121	0
9	MAN	D	206	11/12	0.52	0.57	121,123,124,124	0
9	MAN	D	205	11/12	0.56	0.30	112,114,118,119	0
7	MG	F	203	1/1	0.57	0.11	59,59,59,59	0
8	NAG	H	204	14/15	0.81	0.28	113,115,120,130	0
8	NAG	H	203	14/15	0.83	0.15	85,95,99,106	0
8	NAG	D	204	14/15	0.83	0.24	94,99,101,106	0
8	NAG	D	203	14/15	0.85	0.13	83,86,89,94	0
10	FUC	D	208	10/11	0.85	0.14	85,86,87,88	0
10	FUC	H	208	10/11	0.89	0.21	82,84,84,85	0
7	MG	A	203	1/1	0.89	0.16	2,2,2,2	1
5	HEM	G	200	43/43	0.96	0.14	37,41,50,53	0
5	HEM	B	201	43/43	0.96	0.13	38,41,47,51	0
5	HEM	D	201	43/43	0.96	0.14	31,38,43,44	0
5	HEM	C	200	43/43	0.97	0.12	37,40,49,51	0
6	OXY	E	201	2/2	0.97	0.15	37,37,37,37	0
6	OXY	F	202	2/2	0.97	0.11	51,51,51,53	0
5	HEM	H	201	43/43	0.97	0.12	31,34,41,45	0
5	HEM	F	201	43/43	0.97	0.13	35,39,43,46	0
5	HEM	E	200	43/43	0.98	0.12	28,31,36,39	0
6	OXY	G	201	2/2	0.98	0.18	47,47,47,50	0
5	HEM	A	201	43/43	0.98	0.12	23,26,32,39	0
6	OXY	H	202	2/2	0.99	0.21	43,43,43,51	0
6	OXY	D	202	2/2	0.99	0.10	41,41,41,47	0
6	OXY	C	201	2/2	0.99	0.10	47,47,47,53	0
6	OXY	B	202	2/2	1.00	0.09	47,47,47,48	0
6	OXY	A	202	2/2	1.00	0.06	29,29,29,29	0

6.5 Other polymers [i](#)

There are no such residues in this entry.