



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2018 – 09:52 pm GMT

PDB ID : 1QWL
Title : Structure of Helicobacter pylori catalase
Authors : Loewen, P.C.; Carpena, X.; Perez-Luque, R.; Rovira, C.; Haas, R.; Obenbreit, S.; Nicholls, P.; Fita, I.
Deposited on : 2003-09-02
Resolution : 1.60 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

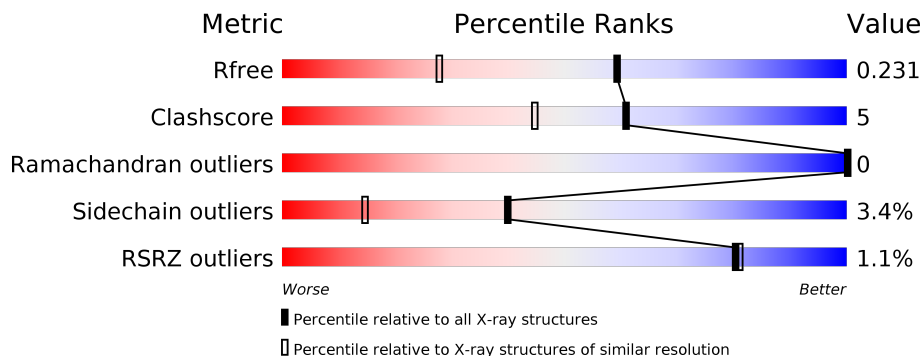
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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.



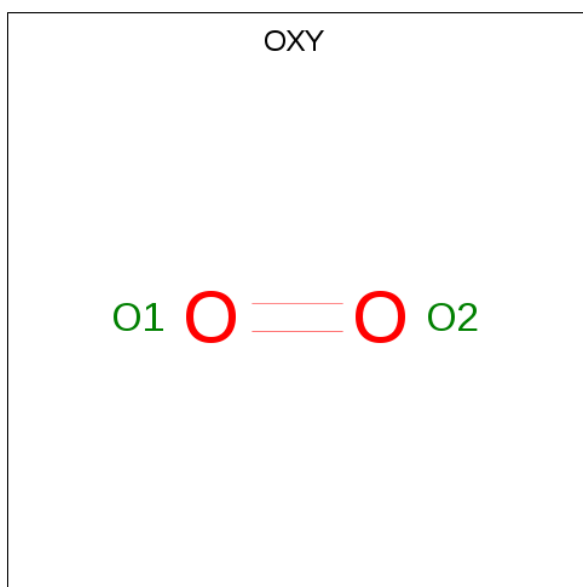
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	111664	2957 (1.60-1.60)
Clashscore	122126	3202 (1.60-1.60)
Ramachandran outliers	120053	3117 (1.60-1.60)
Sidechain outliers	120020	3116 (1.60-1.60)
RSRZ outliers	108989	2883 (1.60-1.60)

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	505	 % 83% 13% ..
1	B	505	 % 85% 11% ..

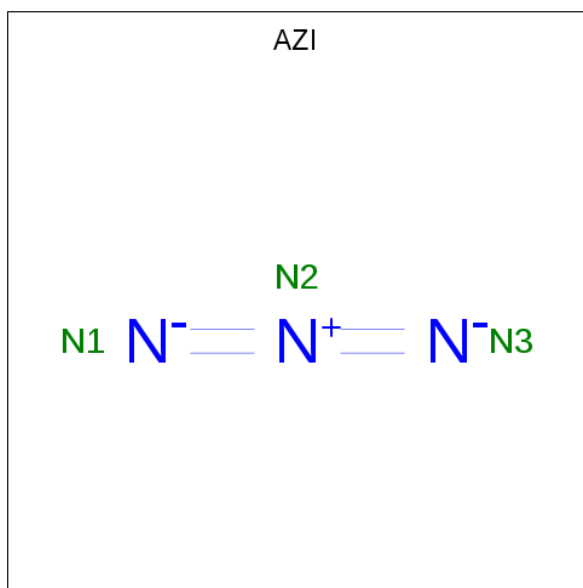
The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	OXY	A	1600	-	-	X	-
4	AZI	B	2600	-	-	X	-



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O 2 2	0	0

- Molecule 4 is AZIDE ION (three-letter code: AZI) (formula: N₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total N 3 3	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	482	Total 482	O 482	0	0
5	B	523	Total 523	O 523	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	64.26Å 154.50Å 95.76Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	28.00 – 1.60 27.85 – 1.60	Depositor EDS
% Data completeness (in resolution range)	100.0 (28.00-1.60) 94.4 (27.85-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.24 (at 1.60Å)	Xtrriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.181 , 0.229 0.184 , 0.231	Depositor DCC
R_{free} test set	6017 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	9.4	Xtrriage
Anisotropy	0.027	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9221	wwPDB-VP
Average B, all atoms (Å ²)	12.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.66% 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: AZI, OXY, 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	0.92	0/4239	1.00	19/5737 (0.3%)
1	B	0.96	1/4238 (0.0%)	1.03	18/5737 (0.3%)
All	All	0.94	1/8477 (0.0%)	1.01	37/11474 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	45	PHE	CE1-CZ	5.44	1.47	1.37

All (37) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	137	ARG	NE-CZ-NH1	-8.26	116.17	120.30
1	B	341	ASP	CB-CG-OD2	7.88	125.39	118.30
1	A	109	ASP	CB-CG-OD2	7.83	125.35	118.30
1	A	279	ASP	CB-CG-OD2	7.83	125.34	118.30
1	B	138	ASP	CB-CG-OD1	7.44	125.00	118.30
1	B	125	ASP	CB-CG-OD2	7.25	124.83	118.30
1	B	238	ASP	CB-CG-OD2	6.91	124.52	118.30
1	A	125	ASP	CB-CG-OD2	6.75	124.38	118.30
1	A	71	ASP	CB-CG-OD2	6.50	124.15	118.30
1	A	101[A]	ARG	N-CA-C	6.49	128.53	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	101[B]	ARG	N-CA-C	6.49	128.53	111.00
1	B	346	ARG	NE-CZ-NH1	6.36	123.48	120.30
1	B	240	ASP	CB-CG-OD2	6.28	123.95	118.30
1	A	18	ASP	CB-CG-OD2	6.13	123.82	118.30
1	A	472	ASP	CB-CG-OD2	5.95	123.65	118.30
1	B	330	ARG	NE-CZ-NH2	-5.90	117.35	120.30
1	B	248	ASP	CB-CG-OD1	5.88	123.60	118.30
1	B	446	ASP	CB-CG-OD2	5.87	123.58	118.30
1	A	422	ASP	CB-CG-OD2	5.80	123.53	118.30
1	B	472	ASP	CB-CG-OD2	5.79	123.51	118.30
1	B	184	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	A	399	ASP	CB-CG-OD2	5.77	123.49	118.30
1	A	240	ASP	CB-CG-OD2	5.71	123.44	118.30
1	B	151	ARG	NE-CZ-NH2	-5.71	117.45	120.30
1	B	439	ASP	CB-CG-OD2	5.55	123.30	118.30
1	A	245	ASP	CB-CG-OD2	5.53	123.28	118.30
1	B	18	ASP	CB-CG-OD2	5.35	123.11	118.30
1	A	329	ASP	CB-CG-OD2	5.33	123.10	118.30
1	B	184	ARG	NE-CZ-NH2	-5.33	117.64	120.30
1	B	329	ASP	CB-CG-OD1	5.27	123.04	118.30
1	A	46	ASP	CB-CG-OD2	5.27	123.04	118.30
1	B	462	ASP	CB-CG-OD1	5.17	122.95	118.30
1	B	161	ASP	CB-CG-OD2	5.17	122.95	118.30
1	A	446	ASP	CB-CG-OD2	5.13	122.92	118.30
1	A	152	ASP	CB-CG-OD2	5.08	122.87	118.30
1	A	490	MET	N-CA-C	5.07	124.68	111.00
1	A	424	ASP	CB-CG-OD2	5.02	122.81	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	490	MET	Peptide

5.2 Too-close contacts

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	4061	0	3888	37	1
1	B	4064	0	3891	40	2
2	A	43	0	30	6	0
2	B	43	0	30	2	0
3	A	2	0	0	2	0
4	B	3	0	0	2	0
5	A	482	0	0	10	5
5	B	523	0	0	12	6
All	All	9221	0	7839	77	8

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.

All (77) 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:B:349[B]:VAL:HG23	5:B:2650:HOH:O	1.59	1.02
1:B:463:LYS:HE2	5:B:3121:HOH:O	1.66	0.95
1:A:32[A]:LEU:HD23	1:B:32[A]:LEU:HD23	1.49	0.94
4:B:2600:AZI:N1	5:B:3103:HOH:O	2.09	0.84
4:B:2600:AZI:N3	5:B:3091:HOH:O	2.10	0.84
1:B:272:LYS:HE3	5:B:3050:HOH:O	1.77	0.83
1:B:487:GLN:O	1:B:491:LYS:HB3	1.80	0.80
1:A:66:PHE:HD1	1:A:297[A]:VAL:HG13	1.47	0.79
1:A:89:GLU:OE1	5:A:1764:HOH:O	2.04	0.76
1:B:459[A]:GLU:HG3	5:B:2890:HOH:O	1.87	0.75
1:B:353:GLN:HE22	1:B:374:ASN:H	1.35	0.74
1:A:364:HIS:HD2	5:A:1967:HOH:O	1.72	0.72
2:A:550:HEM:NC	3:A:1600:OXY:O1	2.23	0.71
1:A:32[A]:LEU:CD2	1:B:32[A]:LEU:HD23	2.21	0.71
1:B:66:PHE:HD1	1:B:297[A]:VAL:HG13	1.57	0.69
1:B:490:MET:CB	1:B:491:LYS:HB2	2.24	0.68
1:A:353:GLN:HE22	1:A:374:ASN:H	1.42	0.66
1:A:355:PRO:HA	1:A:358:LYS:HD3	1.77	0.66
1:A:101[A]:ARG:O	5:A:2042:HOH:O	2.12	0.66
1:A:207:LYS:HG3	5:A:1895:HOH:O	1.96	0.65
1:B:490:MET:CA	1:B:491:LYS:HB2	2.28	0.64
1:B:272:LYS:CE	5:B:3050:HOH:O	2.43	0.61
1:A:66:PHE:HB2	1:A:297[A]:VAL:HG12	1.84	0.58
1:B:487:GLN:O	1:B:491:LYS:CB	2.52	0.58
1:A:254:ASP:OD2	5:A:1922:HOH:O	2.17	0.57
1:B:272:LYS:HE2	5:B:3049:HOH:O	2.03	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:139:ALA:HB2	2:A:550:HEM:HBB1	1.87	0.56
1:B:268:GLU:OE2	5:B:2996:HOH:O	2.18	0.56
1:A:171:PRO:HB3	1:A:467:HIS:CE1	2.41	0.56
1:A:304:GLU:OE2	5:A:1991:HOH:O	2.17	0.54
1:A:207:LYS:HD2	5:A:2075:HOH:O	2.09	0.53
1:A:129:ASN:CG	2:A:550:HEM:HAC	2.29	0.53
1:A:354:ILE:O	1:A:358:LYS:HG3	2.11	0.51
1:A:32[A]:LEU:CD2	1:B:32[A]:LEU:CD2	2.88	0.51
1:B:118:TYR:CD1	1:B:360:ARG:HD3	2.45	0.51
1:B:490:MET:HB2	1:B:491:LYS:HB2	1.93	0.51
1:A:444[A]:LEU:HD11	1:A:448:ILE:HD11	1.92	0.50
1:A:76:THR:HB	1:A:203:LEU:HB3	1.93	0.49
1:A:358:LYS:HD2	5:A:1942:HOH:O	2.11	0.49
1:B:364:HIS:HD2	5:B:2811:HOH:O	1.94	0.49
1:B:490:MET:HB3	1:B:491:LYS:HD3	1.93	0.49
1:A:395:LYS:O	1:A:398:ARG:HB3	2.14	0.48
1:A:402:PHE:HB3	1:B:413:VAL:HB	1.94	0.48
1:B:139:ALA:CB	2:B:550:HEM:HBB1	2.44	0.47
1:B:274[A]:ARG:NH1	1:B:288:ASP:OD1	2.47	0.47
1:B:25:ALA:O	1:B:29:GLY:HA3	2.14	0.47
1:B:66:PHE:CD1	1:B:297[A]:VAL:HG13	2.45	0.47
2:A:550:HEM:NA	3:A:1600:OXY:O1	2.48	0.47
1:A:66:PHE:CD1	1:A:297[A]:VAL:HG13	2.37	0.46
1:B:135:PHE:CZ	1:B:176:GLN:HG3	2.50	0.46
1:A:359:PRO:HG2	1:A:363:PHE:CD2	2.51	0.46
1:A:58:LYS:HD2	5:A:2056:HOH:O	2.15	0.46
1:A:216:HIS:HE1	5:A:1811:HOH:O	1.97	0.45
1:A:139:ALA:CB	2:A:550:HEM:HBB1	2.46	0.45
1:B:358:LYS:HD2	5:B:2875:HOH:O	2.17	0.45
1:B:355:PRO:HA	1:B:358:LYS:HG3	1.98	0.44
1:A:56:HIS:HA	1:A:96:THR:O	2.17	0.44
1:A:63:TYR:HB2	1:A:301[A]:LYS:HB3	1.99	0.44
1:A:335:ARG:HG3	2:A:550:HEM:HBB2	2.00	0.44
1:B:271:LYS:HD2	1:B:405:ALA:O	2.18	0.44
1:B:358:LYS:HB3	1:B:358:LYS:HE3	1.61	0.44
1:A:490:MET:N	1:A:491:LYS:HA	2.33	0.43
1:A:444[B]:LEU:HD21	1:A:475:TYR:CE2	2.54	0.43
1:B:139:ALA:HB3	5:B:3053:HOH:O	2.18	0.42
1:B:272:LYS:HB2	1:B:272:LYS:NZ	2.34	0.42
1:B:139:ALA:HB2	2:B:550:HEM:HBB1	2.00	0.42
1:B:258:TRP:HB2	1:B:297[A]:VAL:HG23	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:SER:O	1:A:111:ARG:HA	2.20	0.42
1:B:66:PHE:HB2	1:B:297[A]:VAL:HG12	2.01	0.42
1:A:316:THR:HA	1:A:317:PRO:HD3	1.95	0.42
1:B:135:PHE:CE2	1:B:176:GLN:HG3	2.55	0.41
1:A:135:PHE:CZ	1:A:176:GLN:HG3	2.56	0.41
1:B:148:THR:HG21	1:B:166:PHE:HB2	2.02	0.41
1:A:358:LYS:HB2	1:A:358:LYS:HE3	1.52	0.41
1:B:79:LYS:HB3	1:B:120[A]:GLU:CD	2.41	0.41
1:B:233:GLU:OE2	1:B:236:LYS:NZ	2.38	0.40

All (8) 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:154:GLN:CG	5:A:2060:HOH:O[2_665]	1.58	0.62
5:A:1930:HOH:O	5:B:3081:HOH:O[1_554]	1.77	0.43
5:B:2872:HOH:O	5:B:2992:HOH:O[2_665]	1.86	0.34
1:B:236:LYS:NZ	5:B:3116:HOH:O[2_665]	1.89	0.31
5:A:1896:HOH:O	5:B:3003:HOH:O[2_665]	2.07	0.13
1:B:236:LYS:CE	5:B:3116:HOH:O[2_665]	2.11	0.09
5:A:1891:HOH:O	5:A:2043:HOH:O[2_665]	2.16	0.04
5:A:2064:HOH:O	5:B:3104:HOH:O[2_665]	2.19	0.01

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	499/505 (99%)	478 (96%)	21 (4%)	0	100	100
1	B	499/505 (99%)	480 (96%)	19 (4%)	0	100	100
All	All	998/1010 (99%)	958 (96%)	40 (4%)	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	438/442 (99%)	423 (97%)	15 (3%)	40	15
1	B	438/442 (99%)	422 (96%)	16 (4%)	37	12
All	All	876/884 (99%)	845 (96%)	31 (4%)	40	14

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	74	LYS
1	A	131	THR
1	A	175	TYR
1	A	219	THR
1	A	267	GLU
1	A	287	GLN
1	A	292	MET
1	A	358	LYS
1	A	377	TYR
1	A	385	PRO
1	A	398	ARG
1	A	414	TRP
1	A	418	TYR
1	A	475	TYR
1	A	491	LYS
1	B	74	LYS
1	B	175	TYR
1	B	207	LYS
1	B	219	THR
1	B	267	GLU
1	B	274[A]	ARG
1	B	274[B]	ARG
1	B	297[A]	VAL
1	B	297[B]	VAL
1	B	316	THR

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Mol	Chain	Res	Type
1	B	358	LYS
1	B	377	TYR
1	B	418	TYR
1	B	475	TYR
1	B	488	LYS
1	B	491	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	34	GLN
1	A	353	GLN
1	A	364	HIS
1	B	149	GLN
1	B	353	GLN
1	B	364	HIS

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](#)

4 ligands are modelled in this entry.

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
3	OXY	A	1600	2	1,1,1	0.05	0	0,0,0	0.00	-
2	HEM	A	550	1,3	27,50,50	1.75	5 (18%)	17,82,82	2.76	8 (47%)
4	AZI	B	2600	-	0,2,2	0.00	-	0,1,1	0.00	-
2	HEM	B	550	1	27,50,50	1.95	8 (29%)	17,82,82	2.52	6 (35%)

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
3	OXY	A	1600	2	-	0/0/0/0	0/0/0/0
2	HEM	A	550	1,3	-	0/6/54/54	0/0/8/8
4	AZI	B	2600	-	-	0/0/0/0	0/0/0/0
2	HEM	B	550	1	-	0/6/54/54	0/0/8/8

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	550	HEM	C3B-C2B	-4.16	1.34	1.40
2	B	550	HEM	C3B-C2B	-3.71	1.35	1.40
2	A	550	HEM	C3C-C2C	-2.81	1.36	1.40
2	B	550	HEM	C3C-C2C	-2.80	1.36	1.40
2	B	550	HEM	C4B-NB	2.04	1.40	1.36
2	A	550	HEM	CMA-C3A	2.18	1.56	1.51
2	B	550	HEM	C1A-NA	2.62	1.41	1.36
2	B	550	HEM	CMA-C3A	2.72	1.57	1.51
2	B	550	HEM	C3B-CAB	3.22	1.54	1.47
2	A	550	HEM	C3D-C2D	3.57	1.48	1.37
2	B	550	HEM	C3C-CAC	3.60	1.54	1.47
2	A	550	HEM	C3C-CAC	3.77	1.55	1.47
2	B	550	HEM	C3D-C2D	3.79	1.48	1.37

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	550	HEM	CAD-CBD-CGD	-6.94	100.80	112.66
2	B	550	HEM	CAD-CBD-CGD	-5.27	103.66	112.66
2	B	550	HEM	C1D-C2D-C3D	-4.85	103.62	107.00
2	A	550	HEM	C3B-C4B-NB	-4.56	103.32	109.21
2	B	550	HEM	CMA-C3A-C4A	-3.31	123.38	128.46
2	A	550	HEM	C3C-C4C-NC	-2.49	106.25	110.94

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	550	HEM	CMA-C3A-C4A	-2.39	124.80	128.46
2	A	550	HEM	CBD-CAD-C3D	-2.32	108.04	112.47
2	A	550	HEM	CBA-CAA-C2A	-2.14	108.39	112.48
2	A	550	HEM	CAA-CBA-CGA	2.19	116.41	112.66
2	B	550	HEM	C4A-C3A-C2A	2.47	108.72	107.00
2	B	550	HEM	CAA-CBA-CGA	2.58	117.07	112.66
2	B	550	HEM	CMB-C2B-C3B	4.27	132.65	124.88
2	A	550	HEM	C4C-C3C-C2C	4.34	109.93	106.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1600	OXY	2	0
2	A	550	HEM	6	0
4	B	2600	AZI	2	0
2	B	550	HEM	2	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	491/505 (97%)	-0.23	7 (1%) 75 75	5, 11, 21, 51	1 (0%)
1	B	491/505 (97%)	-0.30	4 (0%) 86 86	5, 10, 20, 50	1 (0%)
All	All	982/1010 (97%)	-0.26	11 (1%) 80 81	5, 11, 21, 51	2 (0%)

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	491	LYS	6.0
1	A	491	LYS	4.7
1	B	490	MET	4.5
1	A	490	MET	3.8
1	A	489	MET	3.6
1	A	2	VAL	3.5
1	B	488	LYS	2.6
1	B	489	MET	2.6
1	A	287	GLN	2.5
1	A	488	LYS	2.3
1	A	268	GLU	2.2

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. 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(\AA^2)	Q<0.9
4	AZI	B	2600	3/3	0.95	0.09	11,11,16,21	0
2	HEM	A	550	43/43	0.98	0.07	4,8,12,19	0
2	HEM	B	550	43/43	0.98	0.07	2,7,12,19	0
3	OXY	A	1600	2/2	0.98	0.16	15,15,15,27	0

6.5 Other polymers [i](#)

There are no such residues in this entry.