



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 2, 2017 – 02:58 PM EDT

PDB ID : 3UFP
Title : Structure of rat nitric oxide synthase heme domain in complex with 6-(((3R,4R)-4-((5-(3-fluorophenyl)pentyl)oxy)pyrrolidin-3-yl)methyl)-4-methylpyridin-2-amine
Authors : Li, H.; Poulos, T.L.
Deposited on : unknown
Resolution : 2.10 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

<http://wwpdb.org/validation/2016/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 : 1.7.2 (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

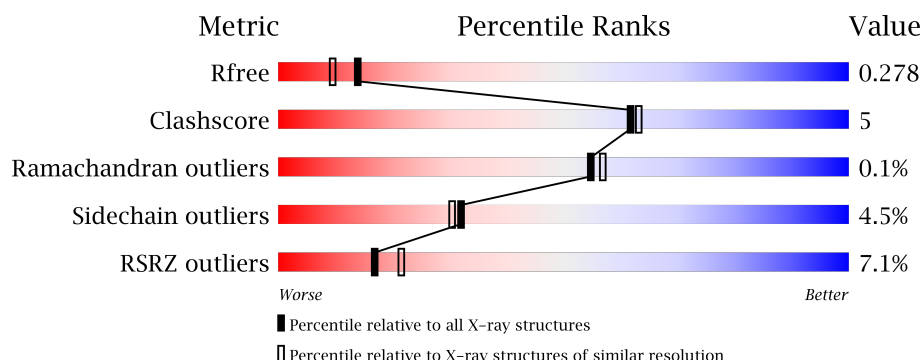
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	4243 (2.10-2.10)
Clashscore	112137	4788 (2.10-2.10)
Ramachandran outliers	110173	4740 (2.10-2.10)
Sidechain outliers	110143	4741 (2.10-2.10)
RSRZ outliers	101464	4275 (2.10-2.10)

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	422	<div> <div>10%</div> <div> <div></div> <div>81%</div> <div>14%</div> <div>• •</div> </div> </div>
1	B	422	<div> <div>4%</div> <div> <div></div> <div>86%</div> <div>11%</div> <div>• •</div> </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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	H4W	A	800	-	-	-	X
4	H4W	B	800	-	-	-	X
5	ACT	A	860	-	-	-	X
5	ACT	B	860	-	-	-	X

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 7103 atoms, of which 0 are hydrogens and 0 are deuteriums.

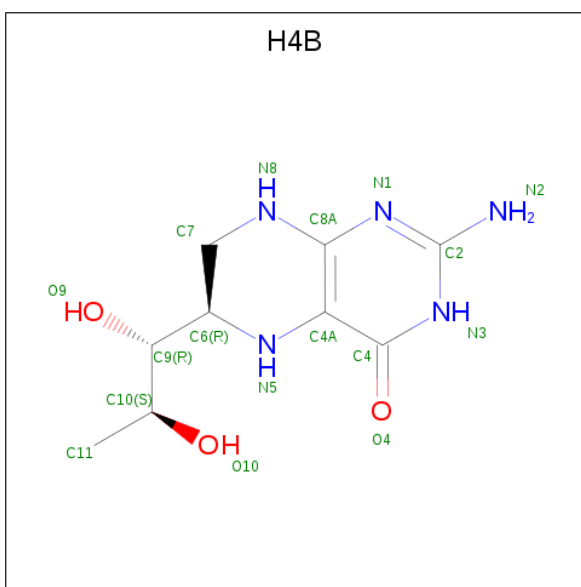
In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Nitric oxide synthase, brain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	407	Total	C	N	O	S	0	0	0
			3313	2121	566	605	21			
1	B	411	Total	C	N	O	S	0	1	0
			3348	2142	574	610	22			

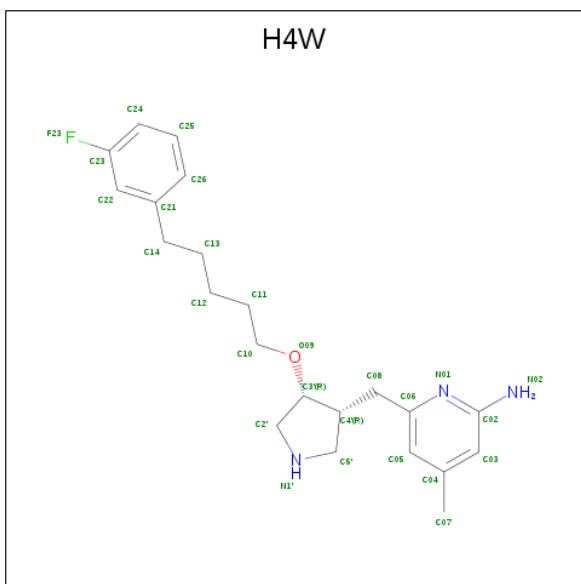
- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 17	C 9	N 5	O 3	0	0
3	B	1	Total 17	C 9	N 5	O 3	0	0

- Molecule 4 is 6-[[[(3R,4R)-4-[[5-(3-fluorophenyl)pentyl]oxy]pyrrolidin-3-yl]methyl]-4-methylpyridin-2-amine (three-letter code: H4W) (formula: C₂₂H₃₀FN₃O).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	F	N	O	0	0
			27	22	1	3	1		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	F	N	O	0	0
			27	22	1	3	1		

- Molecule 5 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



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

- Molecule 6 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Zn	0	0
			1	1		

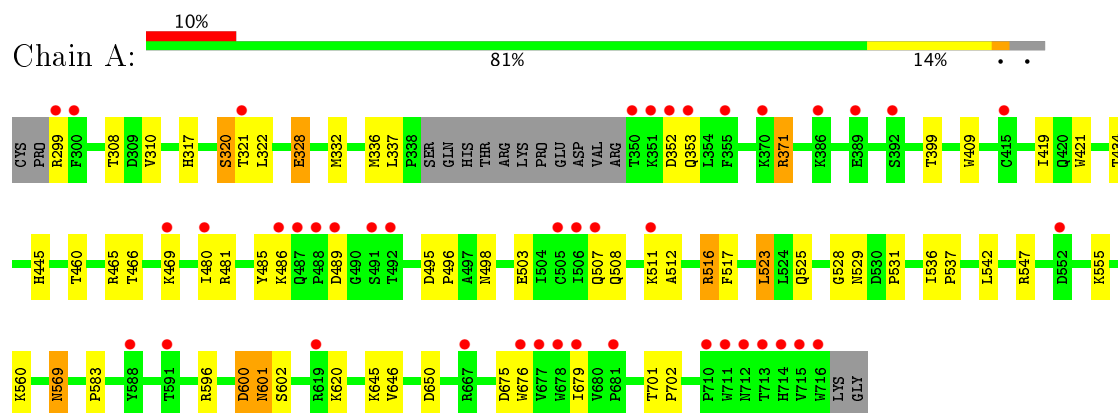
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	100	Total	O	0	0
			100	100		
7	B	159	Total	O	0	0
			159	159		

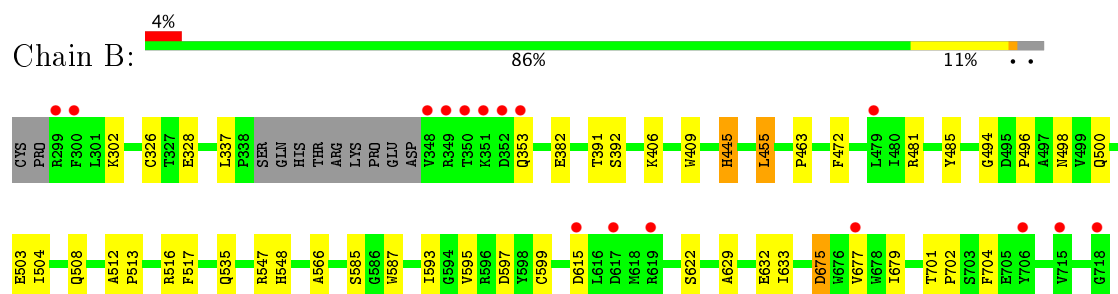
3 Residue-property plots [i](#)

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: Nitric oxide synthase, brain



- Molecule 1: Nitric oxide synthase, brain



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	52.04Å 110.90Å 164.48Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.99 – 2.10 38.99 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.4 (38.99-2.10) 99.4 (38.99-2.10)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.18 (at 2.10Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.208 , 0.262 0.225 , 0.278	Depositor DCC
R_{free} test set	2772 reflections (5.19%)	DCC
Wilson B-factor (Å ²)	32.9	Xtriage
Anisotropy	0.294	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 45.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7103	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.00% 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: H4W, HEM, ZN, H4B, ACT

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	0.69	0/3406	0.71	0/4621
1	B	0.77	1/3444 (0.0%)	0.76	1/4669 (0.0%)
All	All	0.73	1/6850 (0.0%)	0.73	1/9290 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	704	PHE	CE2-CZ	5.33	1.47	1.37

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	675	ASP	CB-CG-OD1	5.14	122.93	118.30

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	3313	0	3221	39	0
1	B	3348	0	3264	28	0
2	A	43	0	30	1	0
2	B	43	0	30	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	17	0	15	0	0
3	B	17	0	15	0	0
4	A	27	0	30	1	0
4	B	27	0	30	4	0
5	A	4	0	3	0	0
5	B	4	0	3	0	0
6	A	1	0	0	0	0
7	A	100	0	0	5	0
7	B	159	0	0	1	0
All	All	7103	0	6641	69	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.

All (69) 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:701:THR:HB	7:A:22:HOH:O	1.60	0.99
1:A:371:ARG:CG	1:A:371:ARG:HH21	1.95	0.79
1:B:615:ASP:HA	7:B:94:HOH:O	1.84	0.77
1:B:391:THR:O	1:B:392:SER:HB2	1.85	0.76
1:A:596:ARG:O	1:A:600:ASP:HB2	1.89	0.73
1:A:523:LEU:HD22	1:A:531:PRO:HB2	1.73	0.70
1:B:593:ILE:HA	1:B:597:ASP:HB2	1.75	0.69
1:A:317:HIS:O	1:A:320:SER:HB3	1.95	0.67
1:A:371:ARG:HG2	1:A:371:ARG:HH21	1.59	0.66
1:A:516:ARG:HB3	1:A:517:PHE:CD1	2.32	0.64
1:A:517:PHE:HB2	1:A:560:LYS:HE3	1.81	0.62
1:A:371:ARG:HG2	1:A:371:ARG:NH2	2.15	0.60
1:B:675:ASP:O	1:B:679:ILE:HG12	2.02	0.60
1:B:587:TRP:H	2:B:750:HEM:HAB	1.67	0.58
1:B:595:VAL:O	1:B:599:CYS:HB2	2.03	0.58
1:A:480:ILE:HA	7:A:106:HOH:O	2.06	0.55
1:A:419:ILE:O	1:A:419:ILE:HG12	2.07	0.55
1:A:371:ARG:HG3	1:A:371:ARG:HH21	1.74	0.53
1:A:371:ARG:CG	1:A:371:ARG:NH2	2.62	0.53
1:A:399:THR:HG23	7:A:240:HOH:O	2.09	0.53
1:A:525:GLN:HG3	1:A:529:ASN:O	2.08	0.53
1:B:504:ILE:O	1:B:508:GLN:HG2	2.09	0.53
1:B:481:ARG:NH1	1:B:498:ASN:OD1	2.43	0.52
1:A:701:THR:CB	7:A:22:HOH:O	2.34	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:409:TRP:CE3	1:A:421:TRP:HA	2.47	0.50
1:A:321:THR:HG23	1:A:322:LEU:HG	1.94	0.50
1:A:328:GLU:HB3	1:B:326:CYS:O	2.11	0.50
1:A:460:THR:O	1:A:583:PRO:HD2	2.12	0.50
1:A:525:GLN:HE21	1:A:528:GLY:HA2	1.77	0.49
1:B:337:LEU:HD21	4:B:800:H4W:H4	1.95	0.49
4:B:800:H4W:H8	4:B:800:H4W:H13	1.55	0.48
1:B:409:TRP:CZ3	2:B:750:HEM:HMC3	2.49	0.47
1:B:302:LYS:HE3	1:B:302:LYS:HB2	1.48	0.47
1:B:445:HIS:C	1:B:445:HIS:CD2	2.89	0.46
1:B:500:GLN:O	1:B:503:GLU:HB2	2.15	0.46
1:A:507:GLN:HB2	7:A:135:HOH:O	2.16	0.46
1:A:328:GLU:H	1:A:328:GLU:CD	2.20	0.45
1:A:517:PHE:CB	1:A:560:LYS:HE3	2.45	0.45
1:A:569:ASN:HD22	1:A:569:ASN:H	1.63	0.45
1:B:516:ARG:HG2	1:B:517:PHE:CE1	2.51	0.45
2:A:750:HEM:C1C	4:A:800:H4W:H30	2.51	0.45
1:B:701:THR:HA	1:B:702:PRO:C	2.36	0.45
1:B:463:PRO:HD2	1:B:472:PHE:CD2	2.52	0.43
1:B:455:LEU:HD23	1:B:587:TRP:HB3	2.01	0.43
2:B:750:HEM:HBC2	2:B:750:HEM:CMC	2.48	0.43
1:B:494:GLY:O	1:B:496:PRO:HD3	2.17	0.43
4:B:800:H4W:C11	4:B:800:H4W:C2'	2.95	0.43
1:B:485:TYR:HE2	1:B:512:ALA:HB1	1.82	0.43
1:A:542:LEU:HD21	1:A:646:VAL:HG22	2.00	0.43
1:A:536:ILE:O	1:A:537:PRO:C	2.56	0.43
1:B:485:TYR:CE2	1:B:512:ALA:HB1	2.53	0.43
1:A:445:HIS:C	1:A:445:HIS:CD2	2.92	0.42
1:A:481:ARG:HD3	1:A:498:ASN:HD21	1.84	0.42
1:B:391:THR:O	1:B:392:SER:CB	2.62	0.42
1:A:569:ASN:ND2	1:A:569:ASN:H	2.18	0.42
1:A:495:ASP:HA	1:A:496:PRO:HD3	1.90	0.41
1:A:465:ARG:HG3	1:A:466:THR:N	2.35	0.41
1:A:650:ASP:OD1	1:B:622:SER:HB3	2.21	0.41
1:A:601:ASN:HA	1:A:601:ASN:HD22	1.65	0.41
1:A:701:THR:OG1	1:A:702:PRO:HA	2.21	0.41
1:B:548:HIS:NE2	1:B:632:GLU:OE1	2.53	0.41
1:A:676:TRP:CZ3	1:B:677:VAL:HG13	2.56	0.41
1:A:675:ASP:O	1:A:679:ILE:HG12	2.21	0.41
1:B:629:ALA:O	1:B:633:ILE:HD12	2.21	0.40
1:B:512:ALA:HA	1:B:513:PRO:HD2	1.96	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:THR:HB	1:A:310:VAL:HG23	2.01	0.40
1:B:566:ALA:HB2	1:B:585:SER:HB3	2.03	0.40
2:B:750:HEM:O2D	4:B:800:H4W:H1	2.21	0.40
1:A:485:TYR:HE2	1:A:512:ALA:HB1	1.86	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	403/422 (96%)	383 (95%)	19 (5%)	1 (0%)	51	52
1	B	408/422 (97%)	393 (96%)	15 (4%)	0	100	100
All	All	811/844 (96%)	776 (96%)	34 (4%)	1 (0%)	55	57

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	555	LYS

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	363/377 (96%)	338 (93%)	25 (7%)	18	14

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	367/377 (97%)	359 (98%)	8 (2%)	57	62
All	All	730/754 (97%)	697 (96%)	33 (4%)	32	30

All (33) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	299	ARG
1	A	320	SER
1	A	328	GLU
1	A	332	MET
1	A	336	MET
1	A	337	LEU
1	A	352	ASP
1	A	353	GLN
1	A	371	ARG
1	A	434	THR
1	A	469	LYS
1	A	486	LYS
1	A	489	ASP
1	A	503	GLU
1	A	508	GLN
1	A	511	LYS
1	A	516	ARG
1	A	523	LEU
1	A	547	ARG
1	A	569	ASN
1	A	600	ASP
1	A	601	ASN
1	A	602	SER
1	A	620	LYS
1	A	645	LYS
1	B	328	GLU
1	B	353	GLN
1	B	382	GLU
1	B	406	LYS
1	B	445	HIS
1	B	455	LEU
1	B	535	GLN
1	B	547	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	353	GLN
1	A	569	ASN
1	A	601	ASN
1	A	605	ASN
1	A	642	GLN
1	A	697	ASN
1	B	364	GLN
1	B	454	ASN
1	B	527	ASN
1	B	601	ASN
1	B	605	ASN
1	B	642	GLN
1	B	697	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 9 ligands modelled in this entry, 1 is monoatomic - leaving 8 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	HEM	A	750	1	28,50,50	2.30	9 (32%)	17,82,82	2.17	7 (41%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	H4B	A	760	-	14,18,18	1.25	1 (7%)	12,26,26	2.53	8 (66%)
4	H4W	A	800	-	26,29,29	0.84	1 (3%)	32,38,38	1.51	7 (21%)
5	ACT	A	860	-	1,3,3	1.53	0	0,3,3	0.00	-
2	HEM	B	750	1	28,50,50	2.37	11 (39%)	17,82,82	1.66	4 (23%)
3	H4B	B	760	-	14,18,18	1.06	1 (7%)	12,26,26	2.72	7 (58%)
4	H4W	B	800	-	26,29,29	0.92	1 (3%)	32,38,38	2.02	9 (28%)
5	ACT	B	860	-	1,3,3	1.55	0	0,3,3	0.00	-

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	HEM	A	750	1	-	0/6/54/54	0/0/8/8
3	H4B	A	760	-	-	0/8/17/17	0/2/2/2
4	H4W	A	800	-	-	0/13/23/23	0/3/3/3
5	ACT	A	860	-	-	0/0/0/0	0/0/0/0
2	HEM	B	750	1	-	0/6/54/54	0/0/8/8
3	H4B	B	760	-	-	0/8/17/17	0/2/2/2
4	H4W	B	800	-	-	0/13/23/23	0/3/3/3
5	ACT	B	860	-	-	0/0/0/0	0/0/0/0

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	750	HEM	C3B-C2B	-5.95	1.32	1.40
2	B	750	HEM	C3C-C2C	-5.26	1.33	1.40
2	B	750	HEM	C3B-C2B	-4.77	1.34	1.40
2	A	750	HEM	C3C-C2C	-4.28	1.34	1.40
3	A	760	H4B	C4-C4A	-3.09	1.37	1.41
3	B	760	H4B	C4-C4A	-2.10	1.38	1.41
2	B	750	HEM	CAA-C2A	2.02	1.55	1.52
4	B	800	H4W	C24-C23	2.08	1.41	1.37
2	A	750	HEM	CAA-C2A	2.12	1.55	1.52
2	B	750	HEM	C4A-NA	2.21	1.40	1.36
2	B	750	HEM	CMD-C2D	2.28	1.56	1.51
4	A	800	H4W	C24-C23	2.30	1.41	1.37
2	A	750	HEM	C1D-ND	2.35	1.41	1.36
2	A	750	HEM	CMC-C2C	2.38	1.56	1.51
2	B	750	HEM	CMB-C2B	2.41	1.56	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	750	HEM	CMC-C2C	2.65	1.57	1.51
2	B	750	HEM	C3B-CAB	2.68	1.53	1.47
2	A	750	HEM	C4D-ND	2.84	1.40	1.36
2	A	750	HEM	C3C-CAC	2.90	1.53	1.47
2	B	750	HEM	C3C-CAC	3.41	1.54	1.47
2	A	750	HEM	C3B-CAB	3.47	1.54	1.47
2	B	750	HEM	C4D-ND	3.54	1.41	1.36
2	A	750	HEM	C3D-C2D	4.88	1.52	1.37
2	B	750	HEM	C3D-C2D	5.25	1.53	1.37

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	800	H4W	C24-C23-C22	-4.25	117.72	123.29
2	A	750	HEM	CBD-CAD-C3D	-4.21	104.43	112.47
2	B	750	HEM	C1D-C2D-C3D	-3.95	104.25	107.00
4	B	800	H4W	C05-C06-N01	-3.67	118.93	122.91
3	B	760	H4B	N3-C2-N1	-3.34	120.04	125.45
4	A	800	H4W	C24-C23-C22	-3.03	119.31	123.29
3	A	760	H4B	N3-C2-N1	-2.81	120.89	125.45
2	A	750	HEM	C1D-C2D-C3D	-2.75	105.08	107.00
4	A	800	H4W	C05-C06-N01	-2.75	119.93	122.91
2	B	750	HEM	CBD-CAD-C3D	-2.67	107.38	112.47
3	A	760	H4B	O9-C9-C6	-2.61	102.75	108.98
3	A	760	H4B	C4A-N5-C6	-2.46	114.45	121.16
2	A	750	HEM	CAA-CBA-CGA	-2.41	108.54	112.66
3	B	760	H4B	C4A-C4-N3	-2.37	116.96	123.91
4	B	800	H4W	C07-C04-C05	-2.35	117.48	120.94
3	A	760	H4B	C6-C7-N8	-2.33	107.32	111.01
2	A	750	HEM	C3C-C4C-NC	-2.29	106.62	110.94
3	B	760	H4B	C6-C7-N8	-2.28	107.39	111.01
2	A	750	HEM	CMA-C3A-C4A	-2.10	125.24	128.46
2	A	750	HEM	CAD-CBD-CGD	-2.05	109.16	112.66
2	B	750	HEM	CMB-C2B-C3B	2.02	128.65	124.89
4	A	800	H4W	F23-C23-C24	2.07	122.15	118.53
4	A	800	H4W	C02-N01-C06	2.08	119.64	118.17
4	B	800	H4W	N02-C02-N01	2.11	120.20	116.64
3	B	760	H4B	C2-N1-C8A	2.28	119.64	114.51
3	B	760	H4B	N2-C2-N3	2.34	120.98	117.24
4	B	800	H4W	C5'-C4'-C3'	2.39	106.44	103.40
3	A	760	H4B	C4-N3-C2	2.43	119.55	116.06
4	A	800	H4W	C21-C22-C23	2.64	121.02	118.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	800	H4W	C2'-N1'-C5'	2.68	111.65	105.40
2	B	750	HEM	C4C-C3C-C2C	2.90	108.92	106.90
3	A	760	H4B	C2-N1-C8A	3.00	121.28	114.51
4	A	800	H4W	C2'-N1'-C5'	3.12	112.65	105.40
4	B	800	H4W	C21-C22-C23	3.33	121.58	118.84
3	A	760	H4B	N2-C2-N3	3.82	123.35	117.24
4	B	800	H4W	C08-C06-N01	3.98	123.40	117.12
4	A	800	H4W	C08-C06-N01	4.01	123.44	117.12
3	A	760	H4B	C4-C4A-C8A	4.24	118.40	114.56
2	A	750	HEM	C4C-C3C-C2C	4.67	110.16	106.90
3	B	760	H4B	C4-N3-C2	4.73	122.87	116.06
4	B	800	H4W	C02-N01-C06	4.92	121.65	118.17
3	B	760	H4B	C4-C4A-C8A	5.06	119.15	114.56

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	750	HEM	1	0
4	A	800	H4W	1	0
2	B	750	HEM	4	0
4	B	800	H4W	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, 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	407/422 (96%)	0.57	42 (10%) 7 9	23, 49, 87, 115	0
1	B	411/422 (97%)	0.14	16 (3%) 40 47	19, 38, 64, 86	0
All	All	818/844 (96%)	0.35	58 (7%) 17 21	19, 43, 83, 115	0

All (58) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	300	PHE	6.5
1	B	348	VAL	6.5
1	B	718	GLY	6.5
1	A	352	ASP	5.8
1	A	716	TRP	5.1
1	A	488	PRO	5.0
1	B	619	ARG	4.9
1	A	713	THR	4.7
1	B	350	THR	4.4
1	A	355	PHE	4.1
1	A	351	LYS	3.9
1	A	715	VAL	3.9
1	A	486	LYS	3.8
1	A	299	ARG	3.5
1	A	469	LYS	3.4
1	B	352	ASP	3.4
1	A	619	ARG	3.3
1	A	714	HIS	3.3
1	A	350	THR	3.3
1	B	351	LYS	3.2
1	A	506	ILE	2.9
1	A	480	ILE	2.8
1	A	511	LYS	2.8
1	B	299	ARG	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	677	VAL	2.7
1	A	300	PHE	2.7
1	A	392	SER	2.7
1	A	507	GLN	2.7
1	B	677	VAL	2.7
1	B	349	ARG	2.6
1	A	711	TRP	2.6
1	A	389	GLU	2.6
1	B	615	ASP	2.5
1	A	712	ASN	2.5
1	A	487	GLN	2.5
1	B	715	VAL	2.5
1	A	491	SER	2.4
1	A	710	PRO	2.4
1	A	588	TYR	2.4
1	A	505	CYS	2.4
1	A	678	TRP	2.3
1	B	617	ASP	2.3
1	A	667	ARG	2.2
1	A	676	TRP	2.2
1	A	415	CYS	2.2
1	A	489	ASP	2.2
1	A	321	THR	2.2
1	B	353	GLN	2.2
1	B	479	LEU	2.2
1	A	681	PRO	2.2
1	A	386	LYS	2.1
1	A	353	GLN	2.1
1	A	552	ASP	2.1
1	A	591	THR	2.1
1	A	370	LYS	2.1
1	A	679	ILE	2.0
1	A	492	THR	2.0
1	B	706	TYR	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. 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, 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	LLDF	B-factors(Å ²)	Q<0.9
5	ACT	A	860	4/4	0.90	0.26	5.60	53,53,53,55	0
4	H4W	A	800	27/27	0.85	0.33	3.74	26,56,87,87	0
5	ACT	B	860	4/4	0.91	0.15	3.35	55,56,56,56	0
4	H4W	B	800	27/27	0.86	0.24	2.28	27,54,64,65	0
2	HEM	A	750	43/43	0.96	0.22	1.37	25,29,37,45	0
2	HEM	B	750	43/43	0.97	0.16	0.71	19,24,39,47	0
3	H4B	A	760	17/17	0.93	0.19	0.66	27,32,39,42	0
3	H4B	B	760	17/17	0.94	0.18	0.59	27,31,37,38	0
6	ZN	A	900	1/1	0.99	0.10	-0.93	34,34,34,34	0

6.5 Other polymers [i](#)

There are no such residues in this entry.