



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 05:52 PM GMT

PDB ID : 4JSJ
Title : Structure of rat neuronal nitric oxide synthase heme domain in complex with 6-(((5-(((3-fluorophenethyl)amino)methyl)pyridin-3-yl)oxy)methyl)-4-methylpyridin-2-amine
Authors : Li, H.; Poulos, T.L.
Deposited on : 2013-03-22
Resolution : 1.92 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 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
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) : trunk26865

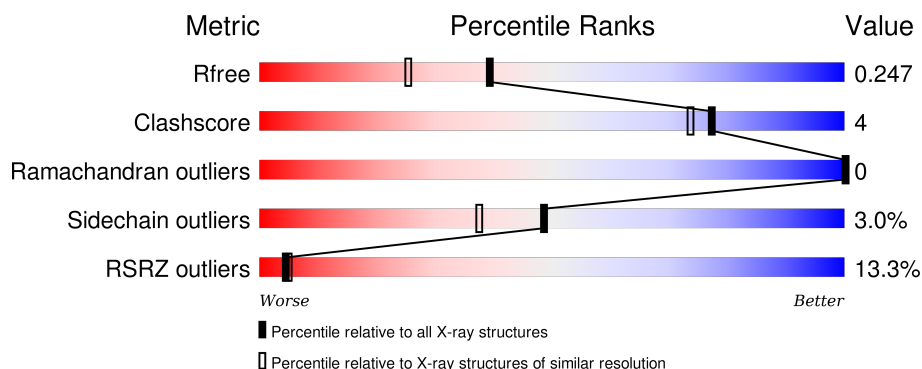
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.92 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}	91344	5832 (1.94-1.90)
Clashscore	102246	6540 (1.94-1.90)
Ramachandran outliers	100387	6464 (1.94-1.90)
Sidechain outliers	100360	6465 (1.94-1.90)
RSRZ outliers	91569	5846 (1.94-1.90)

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>16%</div> <div> <div></div> <div>85%</div> <div>11%</div> <div>• •</div> </div> </div>
1	B	422	<div> <div>10%</div> <div> <div></div> <div>91%</div> <div>7%</div> <div>•</div> </div> </div>

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 7237 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.

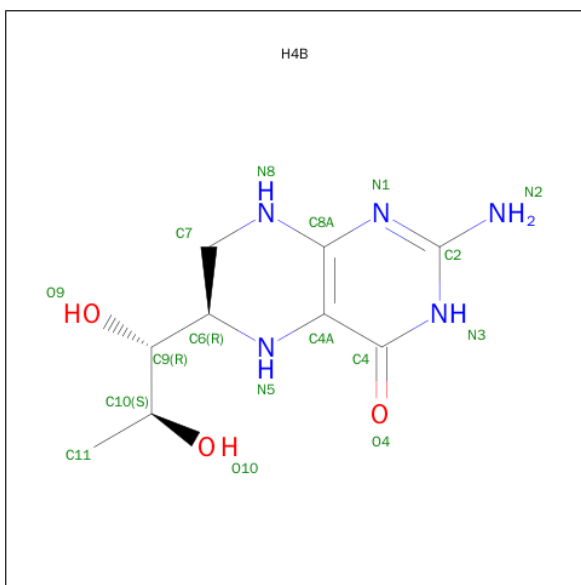
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	407	Total	C	N	O	S	0	3	0
			3328	2131	567	609	21			
1	B	411	Total	C	N	O	S	3	4	0
			3360	2150	574	614	22			

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



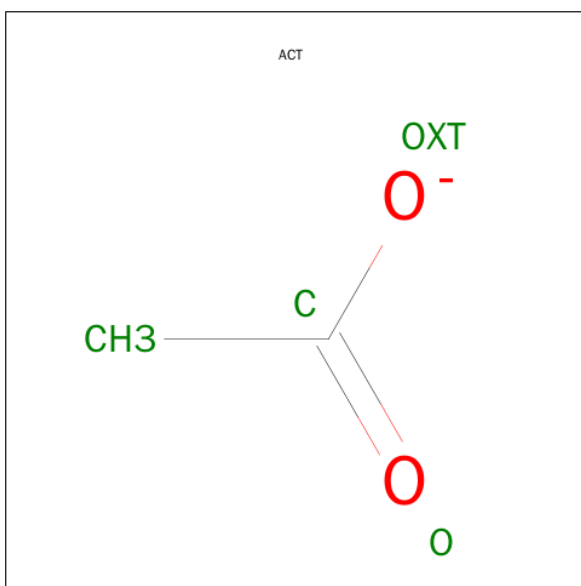
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 5,6,7,8-TETRAHYDROBIOPTERIN (three-letter code: H4B) (formula: $C_9H_{15}N_5O_3$).



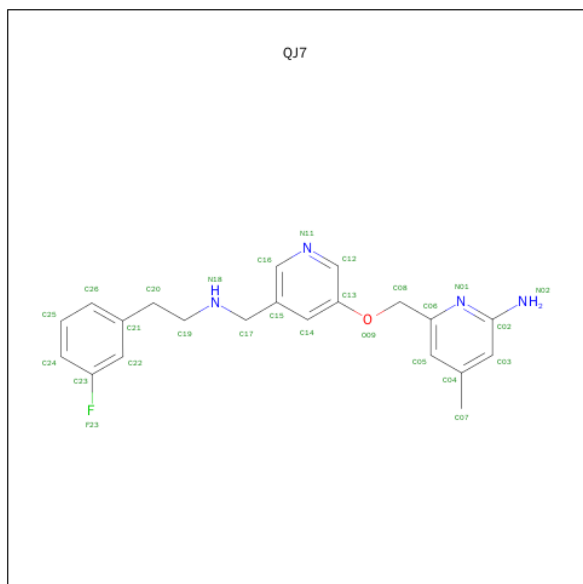
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total 17	C 9	N 5	O 3	0	0
3	B	1	Total 17	C 9	N 5	O 3	0	0

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula: $\text{C}_2\text{H}_3\text{O}_2$).



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

- Molecule 5 is 6-({[5-({[2-(3-FLUOROPHENYL)ETHYL]AMINO}METHYL)PYRIDIN-3-YL]OXY}METHYL)-4-METHYLPYRIDIN-2-AMINE (three-letter code: QJ7) (formula: $C_{21}H_{23}FN_4O$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	F	N	O	0	0
			27	21	1	4	1		
5	B	1	Total	C	F	N	O	0	0
			27	21	1	4	1		

- 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		

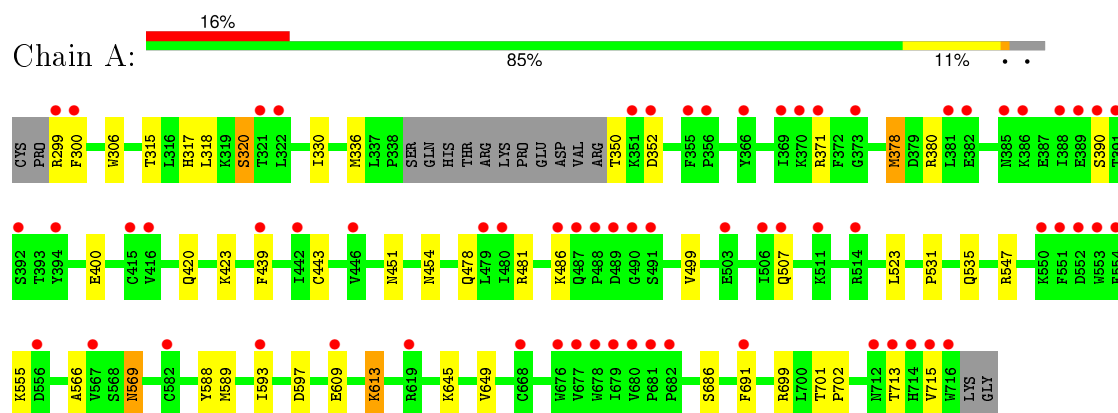
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	149	Total	O	0	0
			149	149		
7	B	217	Total	O	0	0
			217	217		

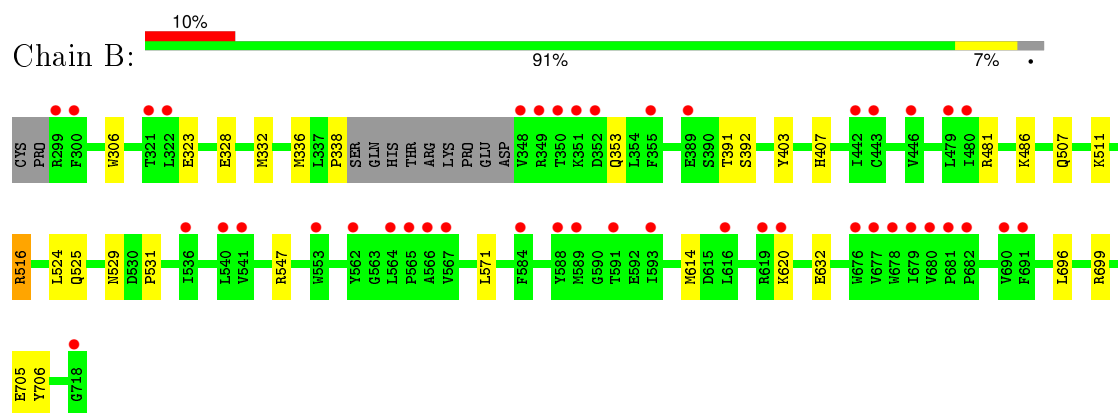
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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	51.77Å 111.28Å 164.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.80 – 1.92 43.80 – 1.92	Depositor EDS
% Data completeness (in resolution range)	99.0 (43.80-1.92) 99.0 (43.80-1.92)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.03 (at 1.92Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.193 , 0.225 0.211 , 0.247	Depositor DCC
R_{free} test set	3625 reflections (5.24%)	DCC
Wilson B-factor (Å ²)	31.3	Xtriage
Anisotropy	0.844	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 42.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 72982 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	7237	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtriage'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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, ZN, QJ7, 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	0.65	0/3430	0.69	0/4655
1	B	0.76	0/3465	0.71	0/4697
All	All	0.71	0/6895	0.70	0/9352

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

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	3328	0	3240	28	0
1	B	3360	0	3280	17	0
2	A	43	0	30	4	0
2	B	43	0	30	5	0
3	A	17	0	15	0	0
3	B	17	0	15	0	0
4	A	4	0	3	0	0
4	B	4	0	3	0	0
5	A	27	0	23	2	0
5	B	27	0	23	3	0
6	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	149	0	0	3	0
7	B	217	0	0	2	0
All	All	7237	0	6662	50	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 4.

All (50) 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)
2:A:801:HEM:HMC2	2:A:801:HEM:HBC2	1.60	0.82
1:A:701[B]:THR:HG22	7:A:920:HOH:O	1.81	0.78
1:B:332:MET:CE	1:B:338:PRO:HB3	2.18	0.74
1:A:535:GLN:HG2	7:A:1039:HOH:O	1.88	0.74
1:A:317:HIS:O	1:A:320:SER:HB3	1.88	0.73
1:B:699:ARG:NH2	1:B:705:GLU:OE1	2.22	0.73
1:A:300:PHE:HD2	1:A:315:THR:HG22	1.61	0.65
1:A:300:PHE:CD2	1:A:315:THR:HG22	2.33	0.64
1:B:516:ARG:HD2	7:B:949:HOH:O	1.98	0.62
1:A:380:ARG:HD3	1:A:400:GLU:OE1	1.99	0.62
1:B:332:MET:HE3	1:B:338:PRO:HB3	1.80	0.62
1:A:378:MET:CE	1:A:378:MET:HA	2.33	0.59
1:A:486:LYS:HE2	1:A:499:VAL:HG11	1.84	0.58
1:B:511:LYS:HE2	7:B:1090:HOH:O	2.04	0.56
1:A:478:GLN:HB2	1:A:481:ARG:HG3	1.88	0.54
1:A:523:LEU:HD22	1:A:531:PRO:HB2	1.89	0.54
2:B:801:HEM:CBA	5:B:803:QJ7:H17	2.39	0.52
1:A:378:MET:HA	1:A:378:MET:HE2	1.91	0.52
1:A:330:ILE:HD11	1:B:696:LEU:HD22	1.92	0.51
1:A:609:GLU:O	1:A:613:LYS:HG2	2.10	0.51
1:A:701[B]:THR:HG23	1:A:702:PRO:HA	1.93	0.51
1:B:391:THR:O	1:B:392:SER:HB2	2.12	0.50
2:A:801:HEM:CMC	2:A:801:HEM:HBC2	2.36	0.48
1:A:299:ARG:HG3	1:A:318:LEU:HD21	1.94	0.48
2:B:801:HEM:HBA2	5:B:803:QJ7:H17	1.95	0.48
2:A:801:HEM:CBA	5:A:804:QJ7:H17	2.43	0.48
1:B:328:GLU:H	1:B:328:GLU:CD	2.18	0.47
1:B:525:GLN:HG3	1:B:529:ASN:O	2.15	0.46
2:B:801:HEM:HBC2	2:B:801:HEM:CMC	2.46	0.45
1:A:306:TRP:NE1	1:B:336:MET:HG3	2.32	0.44
1:A:451:ASN:HB3	1:A:454:ASN:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:593:ILE:HA	1:A:597:ASP:HB2	2.00	0.44
2:A:801:HEM:HBA1	5:A:804:QJ7:H17	2.00	0.43
1:B:403:TYR:CE1	1:B:407:HIS:CE1	3.06	0.43
1:A:589:MET:HA	1:A:649:VAL:O	2.18	0.42
1:A:588:TYR:CD1	1:A:593:ILE:HD11	2.54	0.42
1:B:332:MET:HE2	1:B:338:PRO:HB3	1.97	0.42
1:B:614:MET:CE	1:B:632:GLU:HG3	2.50	0.42
1:A:371:ARG:HG3	1:A:371:ARG:HH21	1.85	0.42
1:B:706:TYR:OH	2:B:801:HEM:O1D	2.24	0.41
1:A:420:GLN:OE1	1:A:423:LYS:HE2	2.21	0.41
1:A:701[B]:THR:HG21	7:A:952:HOH:O	2.18	0.41
1:A:686:SER:HA	1:A:691:PHE:CG	2.55	0.41
1:B:571:LEU:HD23	1:B:571:LEU:C	2.41	0.41
1:B:524:LEU:O	1:B:531:PRO:HA	2.21	0.40
1:A:478:GLN:HA	1:A:566:ALA:O	2.22	0.40
2:B:801:HEM:C1C	5:B:803:QJ7:H24	2.56	0.40
1:A:336:MET:HG3	1:B:306:TRP:NE1	2.37	0.40
1:A:569:ASN:H	1:A:569:ASN:HD22	1.70	0.40
1:A:439:PHE:CZ	1:A:443:CYS:SG	3.15	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	406/422 (96%)	393 (97%)	13 (3%)	0	100	100
1	B	411/422 (97%)	402 (98%)	9 (2%)	0	100	100
All	All	817/844 (97%)	795 (97%)	22 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	366/377 (97%)	352 (96%)	14 (4%)	40	27
1	B	370/377 (98%)	362 (98%)	8 (2%)	60	52
All	All	736/754 (98%)	714 (97%)	22 (3%)	48	37

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	320	SER
1	A	350	THR
1	A	352	ASP
1	A	378	MET
1	A	390	SER
1	A	507	GLN
1	A	547	ARG
1	A	555	LYS
1	A	569	ASN
1	A	613	LYS
1	A	645	LYS
1	A	699	ARG
1	A	713	THR
1	A	715	VAL
1	B	323	GLU
1	B	353	GLN
1	B	481	ARG
1	B	486	LYS
1	B	507	GLN
1	B	516	ARG
1	B	547	ARG
1	B	620	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	454	ASN
1	A	569	ASN
1	A	605	ASN
1	A	628	GLN
1	A	642	GLN
1	A	697	ASN
1	B	353	GLN
1	B	364	GLN
1	B	385	ASN
1	B	454	ASN
1	B	507	GLN
1	B	527	ASN
1	B	605	ASN
1	B	642	GLN
1	B	697	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 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	801	1	30,50,50	2.33	8 (26%)	24,82,82	2.83	10 (41%)
3	H4B	A	802	-	13,18,18	1.02	1 (7%)	11,26,26	2.88	6 (54%)
4	ACT	A	803	-	1,3,3	1.30	0	0,3,3	0.00	-
5	QJ7	A	804	-	29,29,29	0.93	1 (3%)	37,38,38	1.59	7 (18%)
2	HEM	B	801	1	30,50,50	2.05	7 (23%)	24,82,82	2.90	12 (50%)
3	H4B	B	802	-	13,18,18	1.03	1 (7%)	11,26,26	2.62	2 (18%)
5	QJ7	B	803	-	29,29,29	0.98	1 (3%)	37,38,38	1.88	10 (27%)
4	ACT	B	804	-	1,3,3	1.59	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	801	1	-	0/10/54/54	0/0/8/8
3	H4B	A	802	-	-	0/8/17/17	0/2/2/2
4	ACT	A	803	-	-	0/0/0/0	0/0/0/0
5	QJ7	A	804	-	-	0/12/12/12	0/3/3/3
2	HEM	B	801	1	-	0/10/54/54	0/0/8/8
3	H4B	B	802	-	-	0/8/17/17	0/2/2/2
5	QJ7	B	803	-	-	0/12/12/12	0/3/3/3
4	ACT	B	804	-	-	0/0/0/0	0/0/0/0

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	HEM	C3B-C4B	-6.90	1.45	1.51
2	A	801	HEM	C3D-C4D	-6.77	1.42	1.51
2	B	801	HEM	C3D-C4D	-5.68	1.44	1.51
2	B	801	HEM	C3B-C4B	-5.19	1.47	1.51
2	A	801	HEM	C2C-C1C	-4.02	1.44	1.52
2	B	801	HEM	C2C-C1C	-3.94	1.45	1.52
2	A	801	HEM	C2D-C1D	-2.52	1.43	1.51
2	B	801	HEM	C2B-C1B	-2.52	1.43	1.51
2	B	801	HEM	C2D-C1D	-2.48	1.43	1.51
2	A	801	HEM	C2B-C1B	-2.30	1.44	1.51
3	A	802	H4B	C2-N2	2.00	1.38	1.34
2	A	801	HEM	C3C-CAC	2.11	1.55	1.51
2	A	801	HEM	C1C-NC	2.23	1.38	1.36
3	B	802	H4B	C7-N8	2.30	1.49	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	804	QJ7	C12-C13	2.43	1.41	1.38
2	B	801	HEM	FE-NC	2.55	2.05	1.95
2	B	801	HEM	C1C-NC	2.65	1.39	1.36
5	B	803	QJ7	C12-C13	2.86	1.42	1.38
2	A	801	HEM	FE-NC	3.13	2.08	1.95

All (47) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	801	HEM	CBA-CAA-C2A	-7.21	99.60	112.53
2	A	801	HEM	CBA-CAA-C2A	-5.86	102.02	112.53
2	A	801	HEM	C3C-CAC-CBC	-4.57	117.45	124.46
2	B	801	HEM	CAA-C2A-C1A	-3.77	122.91	127.01
5	A	804	QJ7	C24-C23-C22	-3.47	118.87	123.35
2	A	801	HEM	CBD-CAD-C3D	-3.14	104.41	113.55
3	A	802	H4B	N3-C2-N1	-3.13	120.40	125.53
2	B	801	HEM	CBD-CAD-C3D	-2.99	104.85	113.55
2	B	801	HEM	C3C-CAC-CBC	-2.96	119.92	124.46
5	B	803	QJ7	C24-C23-C22	-2.77	119.77	123.35
5	B	803	QJ7	C19-C20-C21	-2.73	107.16	112.83
5	B	803	QJ7	C05-C06-N01	-2.72	119.89	122.96
5	A	804	QJ7	C05-C06-N01	-2.70	119.92	122.96
5	B	803	QJ7	C13-C14-C15	-2.55	117.00	119.69
5	B	803	QJ7	C15-C17-N18	-2.25	107.30	112.88
2	B	801	HEM	CMA-C3A-C4A	-2.14	124.83	128.36
2	B	801	HEM	C3B-C4B-NB	-2.12	107.57	111.63
5	A	804	QJ7	C13-C12-N11	-2.01	121.07	122.78
5	A	804	QJ7	C21-C22-C23	2.01	120.51	118.84
5	B	803	QJ7	C08-C06-C05	2.10	123.60	120.75
5	A	804	QJ7	F23-C23-C22	2.13	121.06	118.22
5	B	803	QJ7	F23-C23-C22	2.30	121.29	118.22
5	B	803	QJ7	O09-C08-C06	2.49	116.02	109.48
2	B	801	HEM	CMD-C2D-C3D	2.69	126.27	114.35
2	A	801	HEM	C3B-C4B-CHC	2.79	127.09	123.16
2	A	801	HEM	CMD-C2D-C3D	2.87	127.02	114.35
2	B	801	HEM	C2D-C3D-C4D	2.88	106.38	101.50
3	A	802	H4B	C2-N1-C8A	2.91	121.08	114.54
2	A	801	HEM	C2D-C3D-C4D	3.01	106.59	101.50
5	A	804	QJ7	C14-C15-C16	3.03	119.88	116.57
3	A	802	H4B	N2-C2-N3	3.13	122.39	117.20
3	A	802	H4B	C4A-C8A-N8	3.39	122.42	118.43
2	A	801	HEM	CMB-C2B-C3B	3.43	125.10	116.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	801	HEM	CAD-C3D-C2D	4.00	124.72	113.22
3	B	802	H4B	C4-N3-C2	4.01	121.50	115.94
2	A	801	HEM	CAD-C3D-C4D	4.05	126.75	112.47
2	B	801	HEM	CMC-C2C-C3C	4.10	126.78	116.53
3	A	802	H4B	C4-N3-C2	4.28	121.88	115.94
5	A	804	QJ7	C02-N01-C06	4.34	121.31	118.23
5	B	803	QJ7	C14-C15-C16	4.60	121.59	116.57
2	B	801	HEM	CAD-C3D-C4D	4.66	128.89	112.47
2	A	801	HEM	CAD-C3D-C2D	4.67	126.63	113.22
2	B	801	HEM	CMB-C2B-C3B	4.99	128.99	116.53
2	A	801	HEM	CMC-C2C-C3C	5.40	130.02	116.53
3	A	802	H4B	C4-C4A-C8A	5.59	119.62	114.56
5	B	803	QJ7	C02-N01-C06	6.06	122.53	118.23
3	B	802	H4B	C4-C4A-C8A	7.06	120.96	114.56

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	HEM	4	0
5	A	804	QJ7	2	0
2	B	801	HEM	5	0
5	B	803	QJ7	3	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%)	0.96	66 (16%) 3 3	27, 49, 86, 112	0
1	B	411/422 (97%)	0.66	43 (10%) 8 9	26, 39, 62, 90	0
All	All	818/844 (96%)	0.81	109 (13%) 4 5	26, 43, 82, 112	0

All (109) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	300	PHE	8.9
1	A	716	TRP	7.8
1	B	348	VAL	7.5
1	A	300	PHE	7.0
1	A	488	PRO	6.4
1	A	352	ASP	5.9
1	A	715	VAL	5.6
1	B	352	ASP	5.5
1	A	355	PHE	5.3
1	B	350	THR	5.1
1	B	718	GLY	5.1
1	B	619	ARG	4.8
1	A	351	LYS	4.8
1	A	322	LEU	4.6
1	A	713	THR	4.5
1	A	486	LYS	4.4
1	B	479	LEU	4.2
1	B	677	VAL	4.0
1	A	507	GLN	4.0
1	A	373	GLY	3.9
1	A	714	HIS	3.9
1	B	567	VAL	3.7
1	B	321	THR	3.7
1	A	321	THR	3.7

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Mol	Chain	Res	Type	RSRZ
1	A	385	ASN	3.7
1	A	490	GLY	3.5
1	B	351	LYS	3.5
1	B	442	ILE	3.4
1	B	566	ALA	3.4
1	B	680	VAL	3.4
1	B	679	ILE	3.4
1	B	322	LEU	3.4
1	A	491	SER	3.3
1	A	619	ARG	3.3
1	A	678	TRP	3.3
1	B	443	CYS	3.2
1	A	487	GLN	3.2
1	A	489	ASP	3.2
1	A	386	LYS	3.1
1	B	678	TRP	3.1
1	B	564	LEU	3.1
1	A	554	PHE	3.1
1	A	567	VAL	3.0
1	B	480	ILE	3.0
1	A	680	VAL	3.0
1	A	388	ILE	2.9
1	B	591	THR	2.9
1	A	503	GLU	2.9
1	A	299	ARG	2.9
1	A	677	VAL	2.9
1	A	390	SER	2.9
1	B	676	TRP	2.9
1	A	391	THR	2.8
1	B	536	ILE	2.8
1	A	479	LEU	2.7
1	B	446	VAL	2.6
1	A	392	SER	2.6
1	A	691	PHE	2.6
1	A	712	ASN	2.6
1	A	389	GLU	2.6
1	A	369	ILE	2.6
1	B	349	ARG	2.6
1	A	668	CYS	2.6
1	A	553	TRP	2.5
1	A	442	ILE	2.5
1	B	355	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	588	TYR	2.5
1	A	609	GLU	2.5
1	B	540	LEU	2.5
1	B	682	PRO	2.5
1	A	681	PRO	2.5
1	B	620	LYS	2.4
1	B	691	PHE	2.4
1	A	676	TRP	2.4
1	B	616	LEU	2.4
1	B	553	TRP	2.4
1	B	565	PRO	2.4
1	B	681	PRO	2.4
1	B	593	ILE	2.3
1	A	382	GLU	2.3
1	A	415	CYS	2.3
1	A	682	PRO	2.3
1	B	690	VAL	2.3
1	A	366	TYR	2.3
1	A	381	LEU	2.2
1	A	551	PHE	2.2
1	A	679	ILE	2.2
1	A	416	VAL	2.2
1	A	556	ASP	2.2
1	B	584	PHE	2.2
1	A	480	ILE	2.2
1	B	389	GLU	2.2
1	B	541	VAL	2.2
1	A	514	ARG	2.2
1	B	299	ARG	2.2
1	B	589	MET	2.2
1	A	394	TYR	2.1
1	A	552	ASP	2.1
1	A	439	PHE	2.1
1	A	506	ILE	2.1
1	A	582	CYS	2.1
1	A	550	LYS	2.1
1	A	593	ILE	2.1
1	A	370	LYS	2.1
1	B	562	TYR	2.1
1	A	511	LYS	2.1
1	A	356	PRO	2.0
1	A	371	ARG	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	446	VAL	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 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
3	H4B	B	802	17/17	0.96	0.21	0.82	27,31,36,39	0
3	H4B	A	802	17/17	0.95	0.20	0.79	28,31,38,39	0
2	HEM	B	801	43/43	0.97	0.19	0.69	25,30,39,42	0
5	QJ7	A	804	27/27	0.89	0.19	0.52	28,47,69,70	0
5	QJ7	B	803	27/27	0.88	0.21	0.51	31,47,63,67	0
4	ACT	A	803	4/4	0.93	0.13	0.23	50,52,53,54	0
4	ACT	B	804	4/4	0.97	0.12	0.13	43,44,45,46	0
2	HEM	A	801	43/43	0.98	0.16	0.03	27,33,40,43	0
6	ZN	A	805	1/1	0.99	0.08	-1.04	36,36,36,36	0

6.5 Other polymers [i](#)

There are no such residues in this entry.