



# wwPDB X-ray Structure Validation Summary Report i

Oct 10, 2014 – 12:57 AM EDT

PDB ID : 4D1N  
Title : Structure of human nNOS heme domain with L-Arg bound  
Authors : Li, H.; Poulos, T.L.  
Deposited on : 2014-05-02  
Resolution : 2.03 Å(reported)

This is a wwPDB validation summary report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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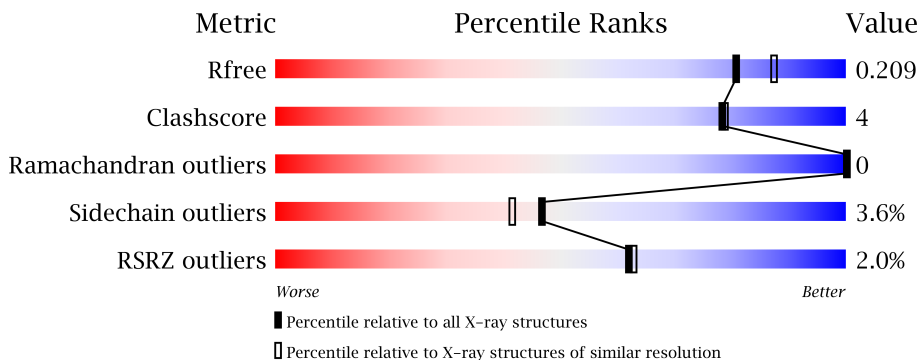
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.16 November 2013  
Xtriage (Phenix) : dev-1439  
EDS : stable23828  
Percentile statistics : 21963  
Refmac : 5.8.0049  
CCP4 : 6.3.0 (Settle)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : stable23828

# 1 Overall quality at a glance

The reported resolution of this entry is 2.03 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))
$R_{free}$	66092	6003 (2.04-2.00)
Clashscore	79885	7467 (2.04-2.00)
Ramachandran outliers	78287	7370 (2.04-2.00)
Sidechain outliers	78261	7368 (2.04-2.00)
RSRZ outliers	66119	6006 (2.04-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	420	
1	B	420	
1	C	420	
1	D	420	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	ARG	C	770	-	X
5	GOL	C	881	-	X
5	GOL	C	882	-	X

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 14747 atoms, of which 0 are hydrogen and 0 are deuterium.

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.

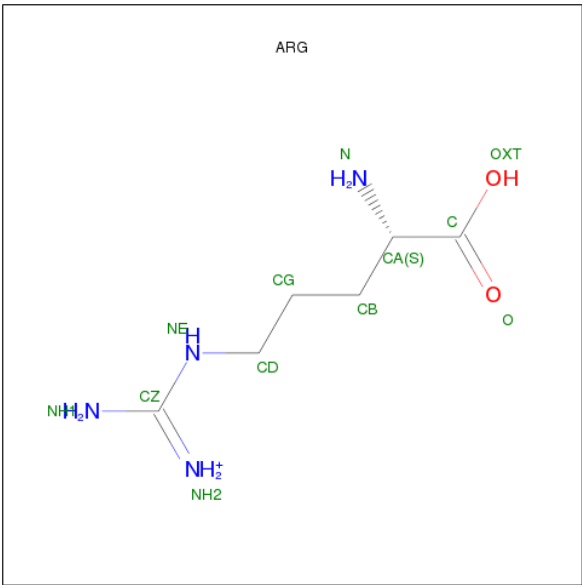
- Molecule 1 is a protein called NITRIC OXIDE SYNTHASE, BRAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	420	Total	C	N	O	S	0	1	0
			3430	2192	590	626	22			
1	B	411	Total	C	N	O	S	0	1	0
			3351	2147	571	611	22			
1	C	420	Total	C	N	O	S	0	1	0
			3430	2192	589	627	22			
1	D	411	Total	C	N	O	S	0	0	0
			3348	2145	571	610	22			

There are 8 discrepancies between the modelled and reference sequences:

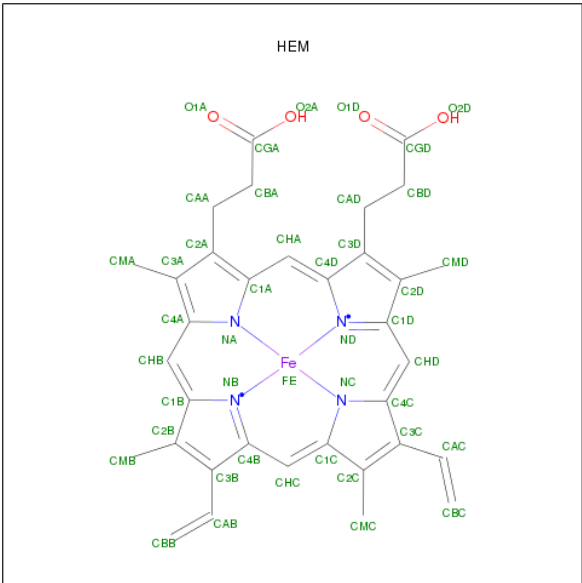
Chain	Residue	Modelled	Actual	Comment	Reference
A	354	ALA	ARG	ENGINEERED MUTATION	UNP P29475
A	357	ASP	GLY	ENGINEERED MUTATION	UNP P29475
B	354	ALA	ARG	ENGINEERED MUTATION	UNP P29475
B	357	ASP	GLY	ENGINEERED MUTATION	UNP P29475
C	354	ALA	ARG	ENGINEERED MUTATION	UNP P29475
C	357	ASP	GLY	ENGINEERED MUTATION	UNP P29475
D	354	ALA	ARG	ENGINEERED MUTATION	UNP P29475
D	357	ASP	GLY	ENGINEERED MUTATION	UNP P29475

- Molecule 2 is ARGinine (three-letter code: ARG) (formula: C<sub>6</sub>H<sub>15</sub>N<sub>4</sub>O<sub>2</sub>).



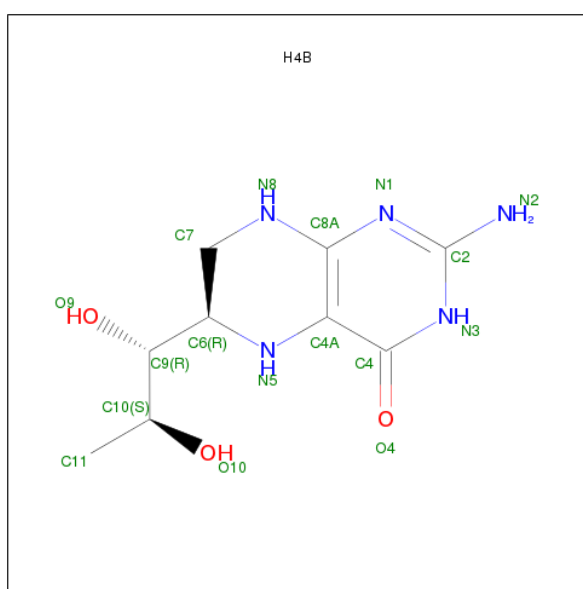
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			12	6	4	2		
2	B	1	Total	C	N	O	0	0
			12	6	4	2		
2	C	1	Total	C	N	O	0	0
			12	6	4	2		
2	D	1	Total	C	N	O	0	0
			12	6	4	2		

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C<sub>34</sub>H<sub>32</sub>FeN<sub>4</sub>O<sub>4</sub>).



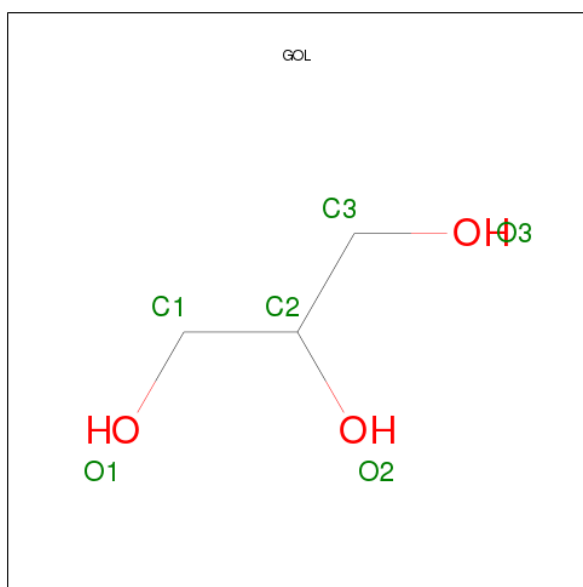
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	Fe	N	O	
			43	34	1	4	4	
3	B	1	Total	C	Fe	N	O	
			43	34	1	4	4	
3	C	1	Total	C	Fe	N	O	
			43	34	1	4	4	
3	D	1	Total	C	Fe	N	O	
			43	34	1	4	4	

- Molecule 4 is 5,6,7,8-TETRAHYDROBIOPTERIN (three-letter code: H4B) (formula:  $C_9H_{15}N_5O_3$ ).



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

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			6	3	3		
5	B	1	Total	C	O	0	0
			6	3	3		
5	C	1	Total	C	O	0	0
			6	3	3		
5	C	1	Total	C	O	0	0
			6	3	3		
5	C	1	Total	C	O	0	0
			6	3	3		
5	D	1	Total	C	O	0	0
			6	3	3		
5	D	1	Total	C	O	0	0
			6	3	3		

- 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		
6	C	1	Total	Zn	0	0
			1	1		

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	214	Total 214	O 214	0	0
7	B	206	Total 206	O 206	0	0
7	C	265	Total 265	O 265	0	0
7	D	171	Total 171	O 171	0	0





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	174.92Å 84.66Å 166.75Å 90.00° 90.94° 90.00°	Depositor
Resolution (Å)	46.60 – 2.03 46.56 – 2.03	Depositor EDS
% Data completeness (in resolution range)	94.5 (46.60-2.03) 94.6 (46.56-2.03)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.62 (at 2.03Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, $R_{free}$	0.177 , 0.209 0.177 , 0.209	Depositor DCC
$R_{free}$ test set	7549 reflections (5.32%)	DCC
Wilson B-factor (Å <sup>2</sup> )	35.9	Xtriage
Anisotropy	0.342	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 45.6	EDS
Estimated twinning fraction	0.014 for -h,-k,l	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 149427 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	14747	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 23.85 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 4.2984e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, ZN, H4B, 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	0.52	0/3532	0.63	0/4794
1	B	0.55	0/3450	0.65	1/4682 (0.0%)
1	C	0.58	0/3532	0.67	1/4794 (0.0%)
1	D	0.56	0/3444	0.67	2/4674 (0.0%)
All	All	0.55	0/13958	0.65	4/18944 (0.0%)

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

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	302	CYS	CA-CB-SG	-5.85	103.48	114.00
1	D	302	CYS	CA-CB-SG	-5.50	104.09	114.00
1	C	494	ASP	CB-CA-C	-5.18	100.04	110.40
1	D	528	LEU	CA-CB-CG	5.12	127.07	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	379	SER	Peptide

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3430	0	3332	26	0
1	B	3351	0	3260	29	0
1	C	3430	0	3330	22	0
1	D	3348	0	3255	25	0
2	A	12	0	12	0	0
2	B	12	0	12	0	0
2	C	12	0	12	0	0
2	D	12	0	12	0	0
3	A	43	0	30	0	0
3	B	43	0	30	2	0
3	C	43	0	30	1	0
3	D	43	0	30	2	0
4	A	17	0	15	0	0
4	B	17	0	15	0	0
4	C	17	0	15	1	0
4	D	17	0	15	1	0
5	A	6	0	8	1	0
5	B	6	0	8	0	0
5	C	18	0	24	0	0
5	D	12	0	16	0	0
6	A	1	0	0	0	0
6	C	1	0	0	0	0
7	A	214	0	0	1	0
7	B	206	0	0	0	0
7	C	265	0	0	5	0
7	D	171	0	0	1	0
All	All	14747	0	13461	99	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 4.

The worst 5 of 99 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:379:SER:HB2	1:B:380:LYS:HB2	1.31	1.06

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:C:519:ARG:HD2	7:C:2167:HOH:O	1.64	0.97
1:D:355:THR:H	1:D:358:GLN:HE21	1.27	0.83
1:B:528:LEU:HD22	1:B:536:PRO:HB2	1.64	0.78
1:C:494:ASP:HB3	1:C:496:SER:H	1.52	0.74

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone ⓘ

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	419/420 (100%)	411 (98%)	8 (2%)	0	100	100
1	B	408/420 (97%)	396 (97%)	12 (3%)	0	100	100
1	C	419/420 (100%)	411 (98%)	8 (2%)	0	100	100
1	D	407/420 (97%)	396 (97%)	11 (3%)	0	100	100
All	All	1653/1680 (98%)	1614 (98%)	39 (2%)	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	376/375 (100%)	363 (96%)	13 (4%)	48	43
1	B	368/375 (98%)	356 (97%)	12 (3%)	50	45
1	C	376/375 (100%)	362 (96%)	14 (4%)	45	40

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	367/375 (98%)	352 (96%)	15 (4%)	41	35
All	All	1487/1500 (99%)	1433 (96%)	54 (4%)	47	41

5 of 54 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	632	ASP
1	C	512	GLN
1	D	560	LYS
1	C	302	CYS
1	C	376	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	702	ASN
1	C	430	GLN
1	D	532	ASN
1	C	342	HIS
1	C	358	GLN

### 5.3.3 RNA ⓘ

There are no RNA chains 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 21 ligands modelled in this entry, 2 are monoatomic - leaving 19 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	$\# Z  > 2$
3	HEM	A	750	1	42,50,50	2.55	12 (28%)	27,82,82	1.52	5 (18%)
4	H4B	A	760	-	18,18,18	1.19	2 (11%)	24,26,26	1.79	6 (25%)
2	ARG	A	770	-	11,11,11	0.66	0	13,13,13	0.97	1 (7%)
5	GOL	A	880	-	5,5,5	0.25	0	5,5,5	0.32	0
3	HEM	B	750	1	42,50,50	2.59	12 (28%)	27,82,82	1.38	5 (18%)
4	H4B	B	760	-	18,18,18	1.13	1 (5%)	24,26,26	1.64	5 (20%)
2	ARG	B	770	-	11,11,11	0.79	0	13,13,13	0.99	1 (7%)
5	GOL	B	880	-	5,5,5	0.43	0	5,5,5	0.65	0
3	HEM	C	750	1	42,50,50	2.68	11 (26%)	27,82,82	1.46	3 (11%)
4	H4B	C	760	-	18,18,18	1.16	1 (5%)	24,26,26	1.66	5 (20%)
2	ARG	C	770	-	11,11,11	0.98	0	13,13,13	0.92	0
5	GOL	C	880	-	5,5,5	0.25	0	5,5,5	0.21	0
5	GOL	C	881	-	5,5,5	0.19	0	5,5,5	0.38	0
5	GOL	C	882	-	5,5,5	0.25	0	5,5,5	0.46	0
3	HEM	D	750	1	42,50,50	2.65	14 (33%)	27,82,82	1.38	4 (14%)
4	H4B	D	760	-	18,18,18	1.19	2 (11%)	24,26,26	1.61	6 (25%)
2	ARG	D	770	-	11,11,11	0.85	0	13,13,13	1.06	1 (7%)
5	GOL	D	880	-	5,5,5	0.29	0	5,5,5	0.29	0
5	GOL	D	881	-	5,5,5	0.33	0	5,5,5	0.39	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
3	HEM	A	750	1	-	0/14/114/114	0/0/8/8
4	H4B	A	760	-	-	0/8/17/17	0/2/2/2
2	ARG	A	770	-	-	0/11/11/11	0/0/0/0
5	GOL	A	880	-	-	0/4/4/4	0/0/0/0
3	HEM	B	750	1	-	0/14/114/114	0/0/8/8
4	H4B	B	760	-	-	0/8/17/17	0/2/2/2
2	ARG	B	770	-	-	0/11/11/11	0/0/0/0
5	GOL	B	880	-	-	0/4/4/4	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	HEM	C	750	1	-	0/14/114/114	0/0/8/8
4	H4B	C	760	-	-	0/8/17/17	0/2/2/2
2	ARG	C	770	-	-	0/11/11/11	0/0/0/0
5	GOL	C	880	-	-	0/4/4/4	0/0/0/0
5	GOL	C	881	-	-	0/4/4/4	0/0/0/0
5	GOL	C	882	-	-	0/4/4/4	0/0/0/0
3	HEM	D	750	1	-	0/14/114/114	0/0/8/8
4	H4B	D	760	-	-	0/8/17/17	0/2/2/2
2	ARG	D	770	-	-	0/11/11/11	0/0/0/0
5	GOL	D	880	-	-	0/4/4/4	0/0/0/0
5	GOL	D	881	-	-	0/4/4/4	0/0/0/0

The worst 5 of 55 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	750	HEM	C3B-C2B	-8.95	1.36	1.45
3	B	750	HEM	C3B-C2B	-8.72	1.37	1.45
3	A	750	HEM	C3B-C2B	-8.60	1.37	1.45
3	D	750	HEM	C3B-C2B	-8.47	1.37	1.45
3	B	750	HEM	C3C-C2C	-7.78	1.39	1.45

The worst 5 of 42 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	760	H4B	C4-C4A-C8A	4.75	118.86	114.56
4	D	760	H4B	C4-C4A-C8A	4.71	118.83	114.56
4	C	760	H4B	C4-C4A-C8A	4.54	118.67	114.56
3	C	750	HEM	CBA-CAA-C2A	-4.52	105.11	112.63
3	A	750	HEM	CBD-CAD-C3D	-4.43	104.89	114.51

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.



## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	420/420 (100%)	0.20	7 (1%) 67 68	27, 45, 66, 83	0
1	B	411/420 (97%)	0.18	8 (1%) 64 64	26, 42, 68, 87	0
1	C	420/420 (100%)	0.07	3 (0%) 84 86	24, 39, 61, 78	0
1	D	411/420 (97%)	0.24	16 (3%) 37 37	24, 43, 71, 96	0
All	All	1662/1680 (98%)	0.17	34 (2%) 62 63	24, 42, 67, 96	0

The worst 5 of 34 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	720	VAL	8.7
1	D	720	VAL	8.1
1	D	721	TRP	6.1
1	A	720	VAL	5.2
1	B	721	TRP	5.1

### 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

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. 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, 95<sup>th</sup> percentile and maximum values of B factors

of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
5	GOL	C	882	6/6	0.16	4.64	43,53,55,57	0
5	GOL	C	881	6/6	0.24	3.39	67,71,73,73	0
2	ARG	C	770	12/12	0.15	2.39	35,39,42,42	0
5	GOL	B	880	6/6	0.16	0.82	53,58,61,62	0
5	GOL	D	881	6/6	0.15	0.75	66,74,74,74	0
2	ARG	D	770	12/12	0.13	0.70	40,43,45,46	0
3	HEM	A	750	43/43	0.15	0.66	33,37,42,46	0
5	GOL	D	880	6/6	0.14	0.57	48,55,58,58	0
3	HEM	B	750	43/43	0.13	0.47	32,35,39,44	0
3	HEM	C	750	43/43	0.13	0.44	27,32,36,38	0
2	ARG	A	770	12/12	0.14	0.43	42,45,48,48	0
3	HEM	D	750	43/43	0.12	0.36	31,34,42,45	0
2	ARG	B	770	12/12	0.11	0.02	39,43,48,49	0
5	GOL	C	880	6/6	0.12	-0.02	43,51,54,54	0
4	H4B	A	760	17/17	0.16	-0.15	28,31,32,32	0
4	H4B	C	760	17/17	0.17	-0.25	23,26,30,30	0
5	GOL	A	880	6/6	0.12	-0.53	51,57,60,63	0
4	H4B	D	760	17/17	0.15	-0.62	27,29,31,32	0
4	H4B	B	760	17/17	0.15	-0.70	29,31,32,33	0
6	ZN	A	900	1/1	0.16	-1.71	28,28,28,28	0
6	ZN	C	900	1/1	0.13	-3.27	27,27,27,27	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.