



# wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 11:31 PM GMT

PDB ID : 5COX  
Title : UNINHIBITED MOUSE CYCLOOXYGENASE-2 (PROSTAGLANDIN  
SYNTHASE-2)  
Authors : Kurumbail, R.; Stallings, W.  
Deposited on : 1996-12-18  
Resolution : 3.00 Å(reported)

This is a wwPDB X-ray Structure 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/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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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 : 1.7 (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

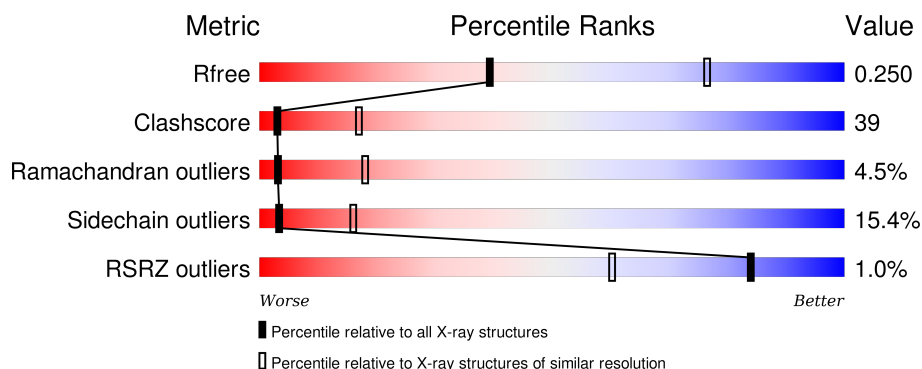
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 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	1578 (3.00-3.00)
Clashscore	102246	1912 (3.00-3.00)
Ramachandran outliers	100387	1853 (3.00-3.00)
Sidechain outliers	100360	1856 (3.00-3.00)
RSRZ outliers	91569	1592 (3.00-3.00)

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. 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	587	<div> <div>2%</div> <div>35% 45% 13% • 6%</div> </div>
1	B	587	<div> <div>35% 47% 11% • 6%</div> </div>
1	C	587	<div> <div>33% 47% 13% • 6%</div> </div>
1	D	587	<div> <div>2% 33% 49% 12% • 6%</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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	NAG	A	661	-	-	-	X
2	NAG	A	681	-	-	-	X
2	NAG	B	681	-	-	-	X
2	NAG	C	661	-	-	-	X
2	NAG	C	681	-	-	-	X
2	NAG	D	681	-	-	-	X

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 18232 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 CYCLOOXYGENASE-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	B	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	C	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			
1	D	552	Total	C	N	O	S	0	0	0
			4473	2886	748	814	25			

There are 8 discrepancies between the modelled and reference sequences:

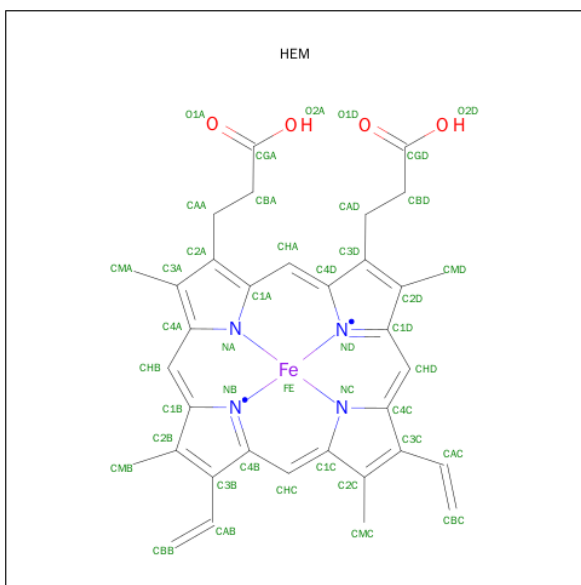
Chain	Residue	Modelled	Actual	Comment	Reference
A	310	GLN	ASN	CONFLICT	UNP Q05769
A	333	LYS	ARG	CONFLICT	UNP Q05769
B	310	GLN	ASN	CONFLICT	UNP Q05769
B	333	LYS	ARG	CONFLICT	UNP Q05769
C	310	GLN	ASN	CONFLICT	UNP Q05769
C	333	LYS	ARG	CONFLICT	UNP Q05769
D	310	GLN	ASN	CONFLICT	UNP Q05769
D	333	LYS	ARG	CONFLICT	UNP Q05769

- Molecule 2 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



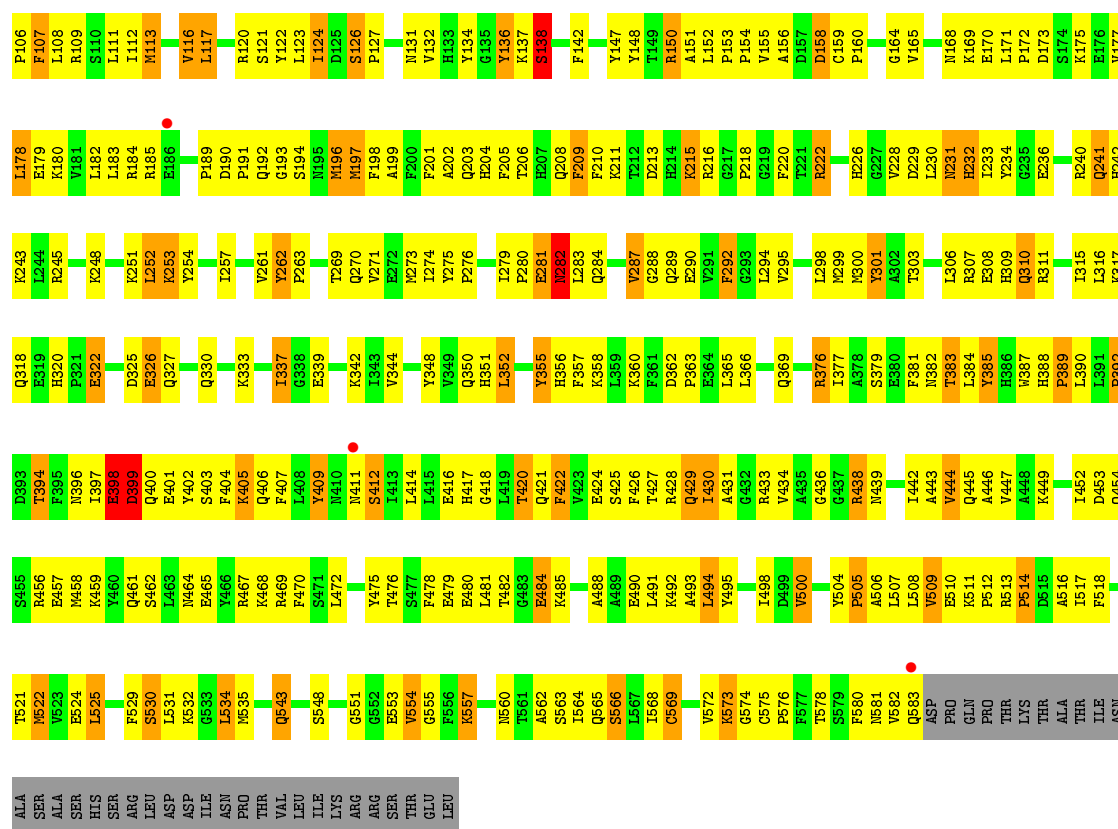
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	C	1	Total	C	N	O	0	0
			14	8	1	5		
2	C	1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

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).

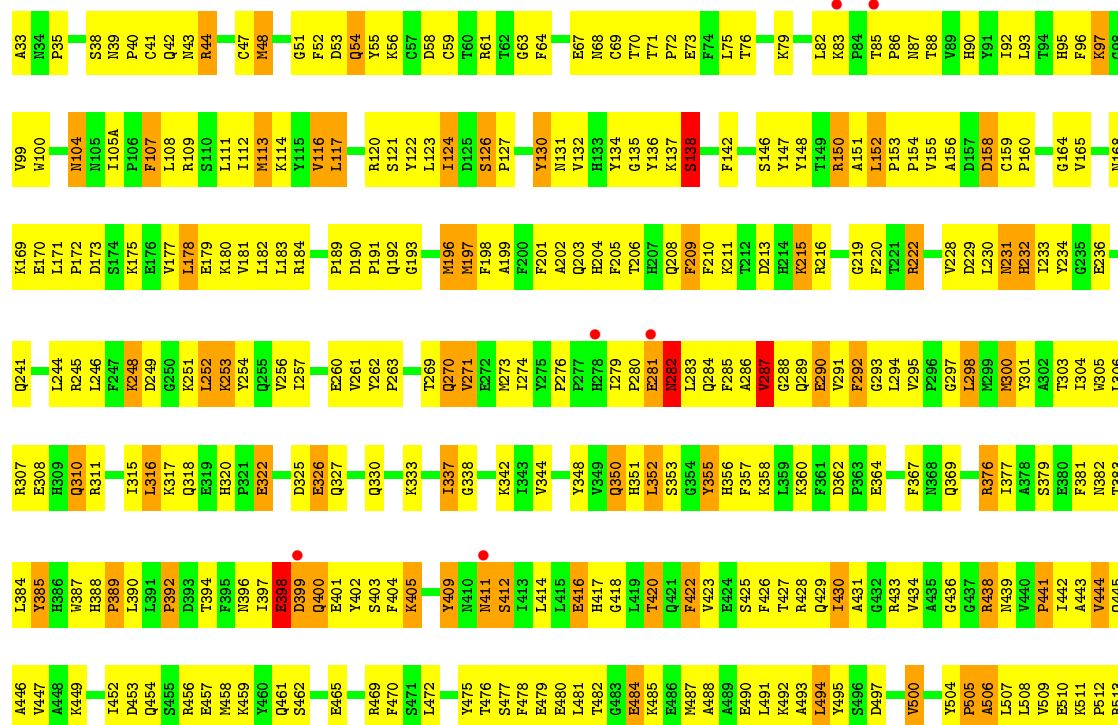


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
3	B	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
3	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
3	D	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

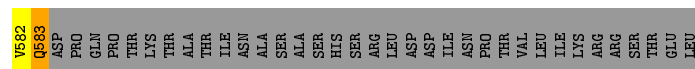
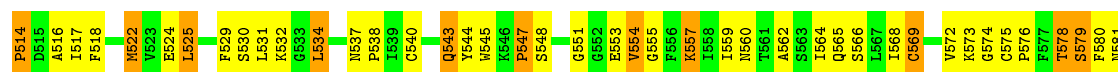




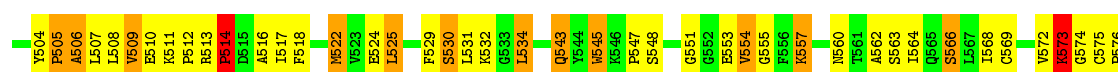
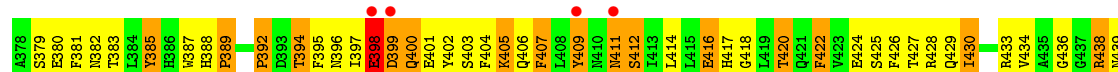
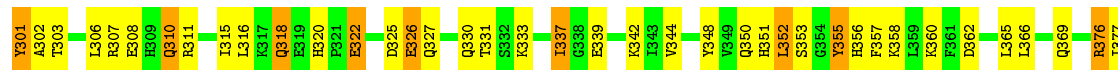
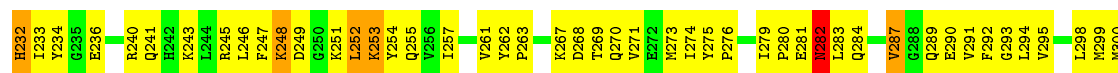
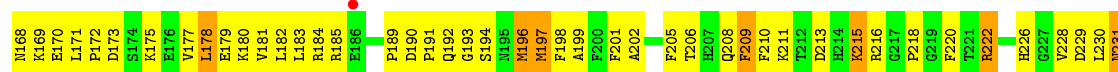
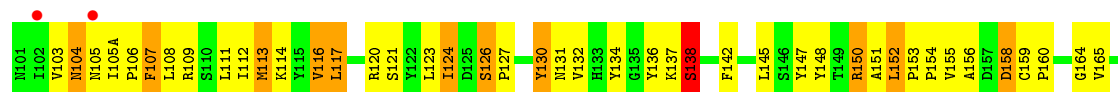
● Molecule 1: CYCLOOXYGENASE-2







# Molecule 1: CYCLOOXYGENASE-2



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 2 <sub>1</sub> 2 <sub>1</sub> 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	180.46Å 134.42Å 119.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 3.00 20.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	74.3 (8.00-3.00) 86.0 (20.00-3.00)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.74 (at 2.98Å)	Xtriage
Refinement program	X-PLOR 3.1	Depositor
R, $R_{free}$	0.321 , 0.308 0.251 , 0.250	Depositor DCC
$R_{free}$ test set	4811 reflections (11.26%)	DCC
Wilson B-factor (Å <sup>2</sup> )	37.2	Xtriage
Anisotropy	0.932	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 49.3	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtriage
Outliers	5 of 50392 reflections (0.010%)	Xtriage
$F_o, F_c$ correlation	0.87	EDS
Total number of atoms	18232	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	11.0	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 37.71 % 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 4.1137e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, NAG

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	0.73	0/4600	0.87	4/6237 (0.1%)
1	B	0.73	0/4600	0.88	4/6237 (0.1%)
1	C	0.71	0/4600	0.87	3/6237 (0.0%)
1	D	0.72	0/4600	0.88	4/6237 (0.1%)
All	All	0.72	0/18400	0.87	15/24948 (0.1%)

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	2
1	D	0	1
All	All	0	3

There are no bond length outliers.

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	355	TYR	N-CA-C	6.18	127.69	111.00
1	A	355	TYR	N-CA-C	5.84	126.78	111.00
1	B	355	TYR	N-CA-C	5.79	126.65	111.00
1	D	355	TYR	N-CA-C	5.77	126.58	111.00
1	A	281	GLU	N-CA-C	-5.64	95.78	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	262	TYR	Sidechain
1	B	301	TYR	Sidechain
1	D	301	TYR	Sidechain

## 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	4473	0	4374	353	0
1	B	4473	0	4375	341	0
1	C	4473	0	4374	343	0
1	D	4473	0	4374	386	0
2	A	42	0	39	0	0
2	B	42	0	39	1	0
2	C	42	0	39	3	0
2	D	42	0	39	5	0
3	A	43	0	30	1	0
3	B	43	0	30	2	0
3	C	43	0	30	2	0
3	D	43	0	30	2	0
All	All	18232	0	17773	1388	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 39.

The worst 5 of 1388 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:322:GLU:HG2	1:B:52:PHE:H	1.23	1.00
1:C:322:GLU:HG2	1:D:52:PHE:H	1.29	0.94
1:C:52:PHE:H	1:D:322:GLU:HG2	1.32	0.91
1:A:52:PHE:H	1:B:322:GLU:HG2	1.35	0.90
1:D:189:PRO:HB2	1:D:430:ILE:HD13	1.54	0.90

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	550/587 (94%)	446 (81%)	78 (14%)	26 (5%)	3	17
1	B	550/587 (94%)	442 (80%)	87 (16%)	21 (4%)	4	22
1	C	550/587 (94%)	443 (80%)	80 (14%)	27 (5%)	3	16
1	D	550/587 (94%)	440 (80%)	85 (16%)	25 (4%)	3	18
All	All	2200/2348 (94%)	1771 (80%)	330 (15%)	99 (4%)	3	18

5 of 99 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	138	SER
1	A	429	GLN
1	A	438	ARG
1	A	514	PRO
1	A	573	LYS

### 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	493/525 (94%)	417 (85%)	76 (15%)	3	16
1	B	493/525 (94%)	418 (85%)	75 (15%)	3	16
1	C	493/525 (94%)	416 (84%)	77 (16%)	3	16
1	D	493/525 (94%)	417 (85%)	76 (15%)	3	16
All	All	1972/2100 (94%)	1668 (85%)	304 (15%)	3	16

5 of 304 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	484	GLU
1	C	152	LEU
1	D	405	LYS
1	B	522	MET
1	C	54	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 65 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	417	HIS
1	C	203	GLN
1	D	411	ASN
1	B	454	GLN
1	C	39	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](#)

16 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
2	NAG	A	661	1	14,14,15	0.63	0	15,19,21	0.79	0
2	NAG	A	671	1	14,14,15	0.83	0	15,19,21	1.69	3 (20%)
2	NAG	A	681	1	14,14,15	0.38	0	15,19,21	0.88	1 (6%)
3	HEM	A	682	1	30,50,50	2.95	10 (33%)	24,82,82	1.90	6 (25%)
2	NAG	B	661	1	14,14,15	0.69	1 (7%)	15,19,21	0.90	0
2	NAG	B	671	1	14,14,15	0.81	0	15,19,21	1.55	3 (20%)
2	NAG	B	681	1	14,14,15	0.55	0	15,19,21	1.00	2 (13%)
3	HEM	B	682	1	30,50,50	2.85	10 (33%)	24,82,82	1.96	6 (25%)
2	NAG	C	661	1	14,14,15	0.55	0	15,19,21	1.04	1 (6%)
2	NAG	C	671	1	14,14,15	0.82	0	15,19,21	1.73	3 (20%)
2	NAG	C	681	1	14,14,15	0.61	0	15,19,21	0.92	1 (6%)
3	HEM	C	682	1	30,50,50	2.81	8 (26%)	24,82,82	1.92	6 (25%)
2	NAG	D	661	1	14,14,15	0.60	0	15,19,21	0.96	1 (6%)
2	NAG	D	671	1	14,14,15	0.62	0	15,19,21	1.38	2 (13%)
2	NAG	D	681	1	14,14,15	0.62	0	15,19,21	0.88	1 (6%)
3	HEM	D	682	1	30,50,50	2.82	10 (33%)	24,82,82	1.98	6 (25%)

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	NAG	A	661	1	-	0/6/23/26	0/1/1/1
2	NAG	A	671	1	-	0/6/23/26	0/1/1/1
2	NAG	A	681	1	-	0/6/23/26	0/1/1/1
3	HEM	A	682	1	-	0/10/54/54	0/0/8/8
2	NAG	B	661	1	-	0/6/23/26	0/1/1/1
2	NAG	B	671	1	-	0/6/23/26	0/1/1/1
2	NAG	B	681	1	-	0/6/23/26	0/1/1/1
3	HEM	B	682	1	-	0/10/54/54	0/0/8/8
2	NAG	C	661	1	-	0/6/23/26	0/1/1/1
2	NAG	C	671	1	-	0/6/23/26	0/1/1/1
2	NAG	C	681	1	-	0/6/23/26	0/1/1/1
3	HEM	C	682	1	-	0/10/54/54	0/0/8/8
2	NAG	D	661	1	-	0/6/23/26	0/1/1/1
2	NAG	D	671	1	-	0/6/23/26	0/1/1/1
2	NAG	D	681	1	-	0/6/23/26	0/1/1/1
3	HEM	D	682	1	-	0/10/54/54	0/0/8/8

The worst 5 of 39 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	682	HEM	C3C-CAC	-7.11	1.38	1.51
3	A	682	HEM	C3D-C4D	-6.96	1.42	1.51
3	A	682	HEM	C2D-C3D	-6.70	1.34	1.54
3	C	682	HEM	C3C-CAC	-6.48	1.39	1.51
3	B	682	HEM	C2D-C3D	-6.46	1.35	1.54

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	671	NAG	C4-C3-C2	-4.94	103.55	111.23
2	C	671	NAG	C4-C3-C2	-4.59	104.10	111.23
2	D	671	NAG	C4-C3-C2	-4.47	104.28	111.23
2	B	671	NAG	C4-C3-C2	-4.40	104.38	111.23
2	C	671	NAG	C2-N2-C7	-3.64	118.36	123.04

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

9 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	682	HEM	1	0
2	B	681	NAG	1	0
3	B	682	HEM	2	0
2	C	661	NAG	2	0
2	C	671	NAG	1	0
3	C	682	HEM	2	0
2	D	661	NAG	1	0
2	D	681	NAG	4	0
3	D	682	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, 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	552/587 (94%)	-0.27	5 (0%) 85 64	2, 8, 25, 40	0
1	B	552/587 (94%)	-0.25	3 (0%) 91 76	2, 8, 26, 38	0
1	C	552/587 (94%)	-0.18	6 (1%) 82 58	2, 8, 28, 38	0
1	D	552/587 (94%)	-0.15	9 (1%) 74 47	2, 9, 27, 41	0
All	All	2208/2348 (94%)	-0.21	23 (1%) 84 60	2, 8, 27, 41	0

The worst 5 of 23 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	411	ASN	4.0
1	D	583	GLN	3.8
1	D	398	GLU	3.2
1	D	105	ASN	3.0
1	C	411	ASN	3.0

### 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, 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	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	NAG	C	661	14/15	0.79	0.33	4.88	24,26,29,30	0
2	NAG	A	681	14/15	0.82	0.32	4.81	23,29,34,36	0
2	NAG	A	661	14/15	0.84	0.31	3.66	21,25,30,32	0
2	NAG	D	681	14/15	0.72	0.38	3.18	21,31,33,37	0
2	NAG	B	681	14/15	0.76	0.42	2.89	22,32,33,33	0
2	NAG	C	681	14/15	0.89	0.35	2.73	24,29,32,36	0
2	NAG	A	671	14/15	0.77	0.33	1.74	2,6,18,20	0
2	NAG	B	661	14/15	0.88	0.30	1.46	22,25,31,33	0
2	NAG	D	661	14/15	0.82	0.28	1.39	20,25,29,31	0
2	NAG	D	671	14/15	0.85	0.24	1.03	4,7,18,21	0
2	NAG	C	671	14/15	0.73	0.31	0.85	4,7,17,21	0
3	HEM	A	682	43/43	0.91	0.21	0.14	2,4,24,31	0
3	HEM	D	682	43/43	0.91	0.20	-0.08	2,9,26,27	0
3	HEM	B	682	43/43	0.93	0.19	-0.11	2,8,24,28	0
2	NAG	B	671	14/15	0.88	0.18	-0.31	4,7,17,20	0
3	HEM	C	682	43/43	0.92	0.20	-0.32	2,5,25,30	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.