



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 16, 2025 – 09:55 AM EST

PDB ID : 6EBZ / pdb\_00006ebz  
Title : Crystal Structure of the Class Ie Ribonucleotide Reductase Beta Subunit from *Aerococcus urinae* in Activated Form with Thiocyanate Bound  
Authors : Palowitch, G.M.; Boal, A.K.  
Deposited on : 2018-08-07  
Resolution : 1.66 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](mailto: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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.47

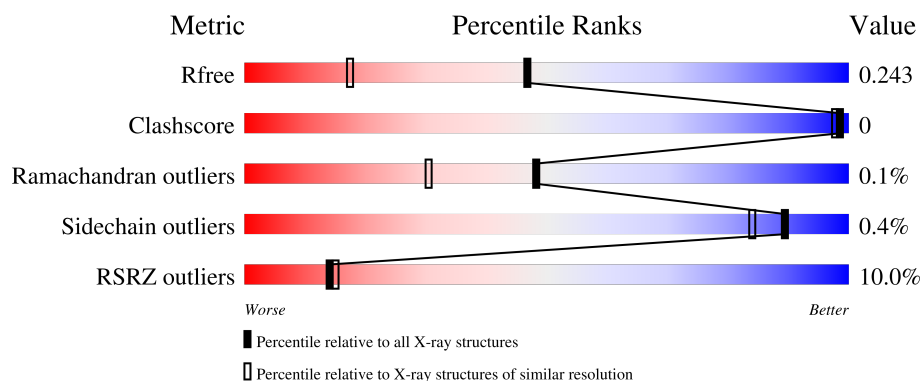
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.66 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))
$R_{free}$	164625	2328 (1.66-1.66)
Clashscore	180529	2515 (1.66-1.66)
Ramachandran outliers	177936	2475 (1.66-1.66)
Sidechain outliers	177891	2475 (1.66-1.66)
RSRZ outliers	164620	2328 (1.66-1.66)

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 of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. 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	355	<div> <div>10%</div> <div>86%</div> <div>12%</div> </div>
1	B	355	<div> <div>3%</div> <div>84%</div> <div>15%</div> </div>
1	C	355	<div> <div>6%</div> <div>83%</div> <div>15%</div> </div>
1	D	355	<div> <div>16%</div> <div>87%</div> <div>12%</div> </div>

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 10753 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 Ribonucleoside-diphosphate reductase, beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	312	Total	C	N	O	S	0	3	0
			2567	1657	417	487	6			
1	B	302	Total	C	N	O	S	0	1	0
			2469	1597	400	466	6			
1	C	303	Total	C	N	O	S	0	1	0
			2474	1599	401	468	6			
1	D	313	Total	C	N	O	S	0	1	0
			2564	1655	418	485	6			

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	initiating methionine	UNP A0A178HFF8
A	-16	GLY	-	expression tag	UNP A0A178HFF8
A	-15	SER	-	expression tag	UNP A0A178HFF8
A	-14	SER	-	expression tag	UNP A0A178HFF8
A	-13	HIS	-	expression tag	UNP A0A178HFF8
A	-12	HIS	-	expression tag	UNP A0A178HFF8
A	-11	HIS	-	expression tag	UNP A0A178HFF8
A	-10	HIS	-	expression tag	UNP A0A178HFF8
A	-9	HIS	-	expression tag	UNP A0A178HFF8
A	-8	HIS	-	expression tag	UNP A0A178HFF8
A	-7	SER	-	expression tag	UNP A0A178HFF8
A	-6	SER	-	expression tag	UNP A0A178HFF8
A	-5	GLY	-	expression tag	UNP A0A178HFF8
A	-4	LEU	-	expression tag	UNP A0A178HFF8
A	-3	VAL	-	expression tag	UNP A0A178HFF8
A	-2	PRO	-	expression tag	UNP A0A178HFF8
A	-1	ARG	-	expression tag	UNP A0A178HFF8
A	0	GLY	-	expression tag	UNP A0A178HFF8
A	1	SER	-	expression tag	UNP A0A178HFF8
A	89	SER	ALA	conflict	UNP A0A178HFF8
A	226	ALA	VAL	conflict	UNP A0A178HFF8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	245	ASP	TYR	conflict	UNP A0A178HFF8
A	249	GLY	ASP	conflict	UNP A0A178HFF8
A	256	HIS	ARG	conflict	UNP A0A178HFF8
B	-17	MET	-	initiating methionine	UNP A0A178HFF8
B	-16	GLY	-	expression tag	UNP A0A178HFF8
B	-15	SER	-	expression tag	UNP A0A178HFF8
B	-14	SER	-	expression tag	UNP A0A178HFF8
B	-13	HIS	-	expression tag	UNP A0A178HFF8
B	-12	HIS	-	expression tag	UNP A0A178HFF8
B	-11	HIS	-	expression tag	UNP A0A178HFF8
B	-10	HIS	-	expression tag	UNP A0A178HFF8
B	-9	HIS	-	expression tag	UNP A0A178HFF8
B	-8	HIS	-	expression tag	UNP A0A178HFF8
B	-7	SER	-	expression tag	UNP A0A178HFF8
B	-6	SER	-	expression tag	UNP A0A178HFF8
B	-5	GLY	-	expression tag	UNP A0A178HFF8
B	-4	LEU	-	expression tag	UNP A0A178HFF8
B	-3	VAL	-	expression tag	UNP A0A178HFF8
B	-2	PRO	-	expression tag	UNP A0A178HFF8
B	-1	ARG	-	expression tag	UNP A0A178HFF8
B	0	GLY	-	expression tag	UNP A0A178HFF8
B	1	SER	-	expression tag	UNP A0A178HFF8
B	89	SER	ALA	conflict	UNP A0A178HFF8
B	226	ALA	VAL	conflict	UNP A0A178HFF8
B	245	ASP	TYR	conflict	UNP A0A178HFF8
B	249	GLY	ASP	conflict	UNP A0A178HFF8
B	256	HIS	ARG	conflict	UNP A0A178HFF8
C	-17	MET	-	initiating methionine	UNP A0A178HFF8
C	-16	GLY	-	expression tag	UNP A0A178HFF8
C	-15	SER	-	expression tag	UNP A0A178HFF8
C	-14	SER	-	expression tag	UNP A0A178HFF8
C	-13	HIS	-	expression tag	UNP A0A178HFF8
C	-12	HIS	-	expression tag	UNP A0A178HFF8
C	-11	HIS	-	expression tag	UNP A0A178HFF8
C	-10	HIS	-	expression tag	UNP A0A178HFF8
C	-9	HIS	-	expression tag	UNP A0A178HFF8
C	-8	HIS	-	expression tag	UNP A0A178HFF8
C	-7	SER	-	expression tag	UNP A0A178HFF8
C	-6	SER	-	expression tag	UNP A0A178HFF8
C	-5	GLY	-	expression tag	UNP A0A178HFF8
C	-4	LEU	-	expression tag	UNP A0A178HFF8
C	-3	VAL	-	expression tag	UNP A0A178HFF8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	PRO	-	expression tag	UNP A0A178HFF8
C	-1	ARG	-	expression tag	UNP A0A178HFF8
C	0	GLY	-	expression tag	UNP A0A178HFF8
C	1	SER	-	expression tag	UNP A0A178HFF8
C	89	SER	ALA	conflict	UNP A0A178HFF8
C	226	ALA	VAL	conflict	UNP A0A178HFF8
C	245	ASP	TYR	conflict	UNP A0A178HFF8
C	249	GLY	ASP	conflict	UNP A0A178HFF8
C	256	HIS	ARG	conflict	UNP A0A178HFF8
D	-17	MET	-	initiating methionine	UNP A0A178HFF8
D	-16	GLY	-	expression tag	UNP A0A178HFF8
D	-15	SER	-	expression tag	UNP A0A178HFF8
D	-14	SER	-	expression tag	UNP A0A178HFF8
D	-13	HIS	-	expression tag	UNP A0A178HFF8
D	-12	HIS	-	expression tag	UNP A0A178HFF8
D	-11	HIS	-	expression tag	UNP A0A178HFF8
D	-10	HIS	-	expression tag	UNP A0A178HFF8
D	-9	HIS	-	expression tag	UNP A0A178HFF8
D	-8	HIS	-	expression tag	UNP A0A178HFF8
D	-7	SER	-	expression tag	UNP A0A178HFF8
D	-6	SER	-	expression tag	UNP A0A178HFF8
D	-5	GLY	-	expression tag	UNP A0A178HFF8
D	-4	LEU	-	expression tag	UNP A0A178HFF8
D	-3	VAL	-	expression tag	UNP A0A178HFF8
D	-2	PRO	-	expression tag	UNP A0A178HFF8
D	-1	ARG	-	expression tag	UNP A0A178HFF8
D	0	GLY	-	expression tag	UNP A0A178HFF8
D	1	SER	-	expression tag	UNP A0A178HFF8
D	89	SER	ALA	conflict	UNP A0A178HFF8
D	226	ALA	VAL	conflict	UNP A0A178HFF8
D	245	ASP	TYR	conflict	UNP A0A178HFF8
D	249	GLY	ASP	conflict	UNP A0A178HFF8
D	256	HIS	ARG	conflict	UNP A0A178HFF8

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

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

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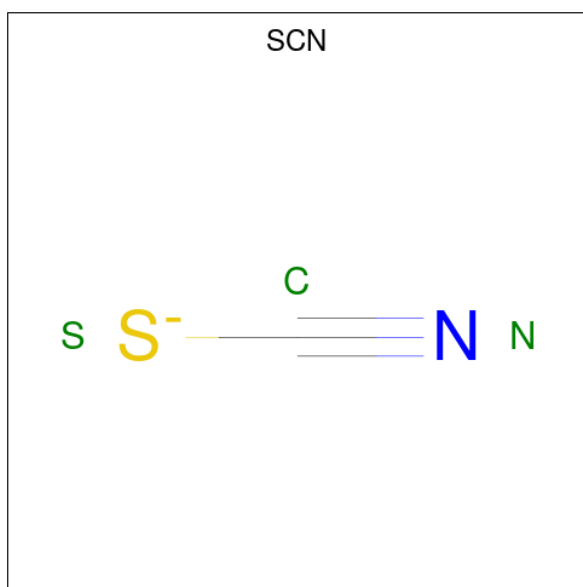
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	D	1	Total	Ca	0	0
			1	1		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula:  $C_3H_8O_3$ ).



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

- Molecule 4 is THIOCYANATE ION (CCD ID: SCN) (formula:  $CNS$ ).



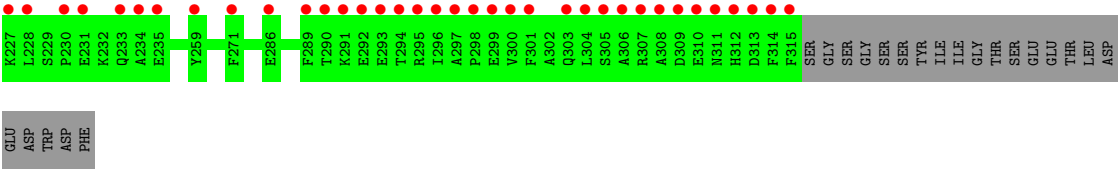
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	1	Total	C	N	S	0	0
			3	1	1	1		
4	B	1	Total	C	N	S	0	0
			3	1	1	1		
4	B	1	Total	C	N	S	0	0
			3	1	1	1		
4	C	1	Total	C	N	S	0	0
			3	1	1	1		
4	C	1	Total	C	N	S	0	0
			3	1	1	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	167	Total	O	0	0
			167	167		
5	B	177	Total	O	0	0
			177	177		
5	C	167	Total	O	0	0
			167	167		
5	D	135	Total	O	0	0
			135	135		







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	80.04Å 108.97Å 84.03Å 90.00° 90.14° 90.00°	Depositor
Resolution (Å)	45.04 – 1.66 45.04 – 1.66	Depositor EDS
% Data completeness (in resolution range)	86.4 (45.04-1.66) 91.8 (45.04-1.66)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.08 (at 1.65Å)	Xtriage
Refinement program	REFMAC 5.8.0135	Depositor
R, $R_{free}$	0.196 , 0.215 0.224 , 0.243	Depositor DCC
$R_{free}$ test set	7941 reflections (4.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	17.3	Xtriage
Anisotropy	0.049	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 28.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.36$	Xtriage
Estimated twinning fraction	0.000 for l,k,-h 0.117 for h,-k,-l 0.003 for l,-k,h	Xtriage
Reported twinning fraction	0.733 for H, K, L 0.267 for -h,-k,l	Depositor
Outliers	0 of 156066 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	10753	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	15.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.26% of the height of the origin peak. No significant pseudotranslation is detected.*

<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, 0.333 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: CA, DAH, SCN, GOL

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	0.55	0/2621	0.80	0/3557
1	B	0.54	0/2520	0.80	0/3421
1	C	0.55	0/2521	0.79	0/3421
1	D	0.55	0/2615	0.81	1/3548 (0.0%)
All	All	0.55	0/10277	0.80	1/13947 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	179	LEU	N-CA-C	5.49	117.26	111.28

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	2567	0	2479	3	0
1	B	2469	0	2406	2	0
1	C	2474	0	2408	3	0
1	D	2564	0	2483	1	0
2	A	1	0	0	0	0
2	B	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	2	0	0	0	0
2	D	1	0	0	0	0
3	A	6	0	8	0	0
3	B	6	0	8	0	0
4	B	9	0	0	0	0
4	C	6	0	0	0	0
5	A	167	0	0	0	0
5	B	177	0	0	0	0
5	C	167	0	0	0	0
5	D	135	0	0	0	0
All	All	10753	0	9792	9	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 0.

All (9) 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:85:ASP:OD2	1:B:123:DAH:OE2	2.21	0.58
1:C:259:TYR:O	1:C:261:GLY:N	2.42	0.53
1:C:85:ASP:OD2	1:C:123:DAH:OE2	2.29	0.50
1:A:85:ASP:OD2	1:A:123:DAH:OE2	2.33	0.46
1:D:85:ASP:OD2	1:D:123:DAH:OE2	2.35	0.45
1:B:221:TYR:CZ	1:B:225:VAL:HG11	2.54	0.42
1:C:59:ASP:OD2	1:C:199:THR:HG23	2.20	0.41
1:A:88:GLN:HB3	1:A:116:VAL:HG11	2.03	0.41
1:A:175:MET:HB3	1:A:176:PRO:HD3	2.02	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	312/355 (88%)	307 (98%)	5 (2%)	0	100	100
1	B	300/355 (84%)	297 (99%)	3 (1%)	0	100	100
1	C	301/355 (85%)	296 (98%)	4 (1%)	1 (0%)	37	21
1	D	311/355 (88%)	307 (99%)	4 (1%)	0	100	100
All	All	1224/1420 (86%)	1207 (99%)	16 (1%)	1 (0%)	48	30

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	260	ASP

### 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	275/310 (89%)	273 (99%)	2 (1%)	81	71
1	B	266/310 (86%)	266 (100%)	0	100	100
1	C	266/310 (86%)	265 (100%)	1 (0%)	89	84
1	D	275/310 (89%)	274 (100%)	1 (0%)	89	84
All	All	1082/1240 (87%)	1078 (100%)	4 (0%)	89	84

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ASN
1	A	169	LYS
1	C	169	LYS
1	D	4	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	ASN

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Mol	Chain	Res	Type
1	A	88	GLN
1	A	99	ASN
1	A	111	ASN
1	A	214	ASN
1	B	96	GLN
1	B	111	ASN
1	C	20	GLN
1	C	72	GLN
1	C	99	ASN
1	C	282	ASN
1	D	20	GLN
1	D	22	GLN
1	D	72	GLN
1	D	99	ASN
1	D	214	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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$
1	DAH	D	123	1	12,13,14	1.58	1 (8%)	12,17,19	0.71	0
1	DAH	A	123	1	12,13,14	1.50	1 (8%)	12,17,19	0.82	0
1	DAH	B	123	1	12,13,14	1.61	1 (8%)	12,17,19	0.79	0
1	DAH	C	123	1	12,13,14	1.67	1 (8%)	12,17,19	0.96	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
1	DAH	D	123	1	-	0/5/6/8	0/1/1/1
1	DAH	A	123	1	-	0/5/6/8	0/1/1/1
1	DAH	B	123	1	-	0/5/6/8	0/1/1/1
1	DAH	C	123	1	-	0/5/6/8	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	123	DAH	CZ-CE2	5.58	1.49	1.40
1	B	123	DAH	CZ-CE2	5.36	1.49	1.40
1	D	123	DAH	CZ-CE2	5.20	1.48	1.40
1	A	123	DAH	CZ-CE2	4.98	1.48	1.40

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	D	123	DAH	1	0
1	A	123	DAH	1	0
1	B	123	DAH	1	0
1	C	123	DAH	1	0

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 6 are monoatomic - leaving 7 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	$\# Z  > 2$
4	SCN	B	402	-	1,2,2	0.19	0	0,1,1	-	-
3	GOL	A	402	-	5,5,5	0.26	0	5,5,5	0.29	0
4	SCN	C	401	-	1,2,2	0.34	0	0,1,1	-	-
4	SCN	C	402	-	1,2,2	0.29	0	0,1,1	-	-
4	SCN	B	403	-	1,2,2	0.33	0	0,1,1	-	-
3	GOL	B	406	-	5,5,5	0.34	0	5,5,5	0.23	0
4	SCN	B	401	-	1,2,2	0.33	0	0,1,1	-	-

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	GOL	A	402	-	-	1/4/4/4	-
3	GOL	B	406	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	406	GOL	O1-C1-C2-O2
3	B	406	GOL	O1-C1-C2-C3
3	A	402	GOL	O2-C2-C3-O3

There are no ring outliers.

No monomer is involved in short contacts.

## 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	311/355 (87%)	0.72	36 (11%) 11 11	6, 14, 29, 38	3 (0%)
1	B	301/355 (84%)	0.31	10 (3%) 49 53	6, 12, 22, 31	1 (0%)
1	C	302/355 (85%)	0.56	21 (6%) 24 26	6, 14, 24, 35	1 (0%)
1	D	312/355 (87%)	1.06	56 (17%) 4 5	9, 18, 34, 41	1 (0%)
All	All	1226/1420 (86%)	0.66	123 (10%) 14 15	6, 14, 27, 41	6 (0%)

All (123) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	315	PHE	6.0
1	C	305	SER	5.9
1	D	315	PHE	5.8
1	B	304	LEU	5.4
1	A	53	ASN	5.0
1	C	306	ALA	4.9
1	C	260	ASP	4.6
1	A	307	ARG	4.5
1	D	296	ILE	4.0
1	A	260	ASP	4.0
1	A	312	HIS	3.9
1	A	55	PRO	3.9
1	A	314	PHE	3.9
1	D	300	VAL	3.9
1	B	163	ASP	3.9
1	D	231	GLU	3.9
1	A	308	ALA	3.9
1	D	54	ILE	3.8
1	D	301	PHE	3.8
1	A	163	ASP	3.6
1	D	292	GLU	3.6

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Mol	Chain	Res	Type	RSRZ
1	D	314	PHE	3.5
1	D	312	HIS	3.5
1	C	304	LEU	3.5
1	D	309	ASP	3.4
1	D	53	ASN	3.4
1	D	55	PRO	3.4
1	A	311	ASN	3.4
1	A	54	ILE	3.4
1	A	56	VAL	3.3
1	D	291	LYS	3.3
1	D	306	ALA	3.3
1	C	163	ASP	3.2
1	D	180	LEU	3.2
1	A	309	ASP	3.2
1	C	292	GLU	3.2
1	A	306	ALA	3.2
1	D	215	PHE	3.2
1	C	231	GLU	3.1
1	C	53	ASN	3.1
1	D	307	ARG	3.1
1	D	310	GLU	3.1
1	A	301	PHE	3.0
1	A	296	ILE	3.0
1	D	311	ASN	3.0
1	D	230	PRO	3.0
1	A	180	LEU	2.9
1	A	52	GLU	2.9
1	A	292	GLU	2.9
1	A	4	ASN	2.9
1	B	305	SER	2.9
1	A	225	VAL	2.9
1	D	308	ALA	2.9
1	A	297	ALA	2.8
1	D	289	PHE	2.8
1	C	32	ILE	2.7
1	A	310	GLU	2.7
1	C	172	ALA	2.7
1	A	65	GLU	2.7
1	B	175	MET	2.7
1	D	294	THR	2.7
1	D	293	GLU	2.6
1	D	295	ARG	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	299	GLU	2.6
1	B	302	ALA	2.6
1	B	292	GLU	2.5
1	D	65	GLU	2.5
1	D	228	LEU	2.5
1	D	234	ALA	2.5
1	C	298	PRO	2.5
1	C	286	GLU	2.5
1	D	304	LEU	2.5
1	A	282	ASN	2.5
1	D	163	ASP	2.5
1	D	313	ASP	2.5
1	D	172	ALA	2.5
1	A	300	VAL	2.4
1	D	305[A]	SER	2.4
1	A	184	PHE	2.4
1	B	231	GLU	2.4
1	D	298	PRO	2.4
1	A	295	ARG	2.4
1	C	301	PHE	2.4
1	D	3	LYS	2.4
1	D	56	VAL	2.4
1	A	258	LEU	2.4
1	B	228	LEU	2.4
1	D	207	LEU	2.4
1	D	51	PRO	2.3
1	A	266	ASP	2.3
1	C	302	ALA	2.3
1	D	60	LEU	2.3
1	A	299	GLU	2.3
1	D	303	GLN	2.2
1	D	235	GLU	2.2
1	D	259	TYR	2.2
1	C	227	LYS	2.2
1	A	286	GLU	2.2
1	D	286	GLU	2.2
1	D	184	PHE	2.2
1	D	290	THR	2.2
1	C	4	ASN	2.2
1	D	271	PHE	2.2
1	A	313	ASP	2.2
1	C	228	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	226	ALA	2.1
1	A	289	PHE	2.1
1	D	194	GLY	2.1
1	C	180	LEU	2.1
1	D	19	ASP	2.1
1	D	297	ALA	2.1
1	C	199	THR	2.1
1	D	179	LEU	2.1
1	D	227	LYS	2.1
1	B	260	ASP	2.1
1	D	142	TRP	2.1
1	B	4	ASN	2.1
1	C	226	ALA	2.0
1	D	43	ARG	2.0
1	A	32	ILE	2.0
1	D	233	GLN	2.0
1	C	18	PHE	2.0
1	A	305	SER	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [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, 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	B-factors(Å <sup>2</sup> )	Q<0.9
1	DAH	B	123	13/14	0.88	0.10	10,12,13,14	1
1	DAH	D	123	13/14	0.89	0.10	15,16,17,17	1
1	DAH	A	123	13/14	0.90	0.09	11,13,14,14	1
1	DAH	C	123	13/14	0.91	0.09	10,12,14,15	1

## 6.3 Carbohydrates [i](#)

There are no oligosaccharides 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, 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	B-factors(Å <sup>2</sup> )	Q<0.9
3	GOL	A	402	6/6	0.59	0.22	26,27,27,27	0
3	GOL	B	406	6/6	0.64	0.26	33,33,34,34	0
4	SCN	B	402	3/3	0.81	0.22	33,33,33,35	0
4	SCN	C	402	3/3	0.85	0.18	29,29,29,30	0
4	SCN	B	403	3/3	0.94	0.18	26,26,26,26	0
4	SCN	B	401	3/3	0.94	0.13	28,28,29,30	0
2	CA	D	401	1/1	0.95	0.06	17,17,17,17	0
4	SCN	C	401	3/3	0.96	0.11	26,26,26,26	0
2	CA	C	404	1/1	0.98	0.03	15,15,15,15	0
2	CA	A	401	1/1	0.98	0.04	14,14,14,14	0
2	CA	B	404	1/1	0.98	0.10	16,16,16,16	0
2	CA	C	403	1/1	0.99	0.07	16,16,16,16	0
2	CA	B	405	1/1	0.99	0.04	14,14,14,14	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.