wwPDB X-ray Structure Validation Summary Report (i)

Oct 31, 2023 – 12:36 PM EDT

PDB ID	:	3SSA
Title	:	Crystal structure of subunit B mutant N157T of the A1AO ATP synthase
Authors	:	Sundararaman, L.; Manimekalai, M.S.S.; Jeyakanthan, J.; Gruber, G.
Deposited on	:	2011-07-08
Resolution	:	1.70 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

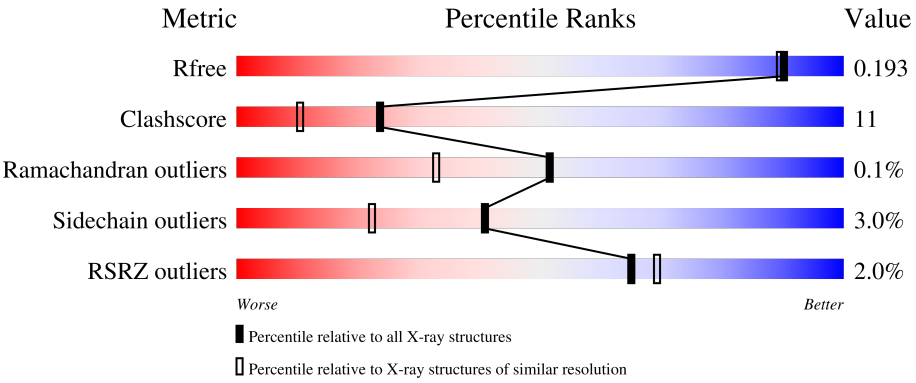
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

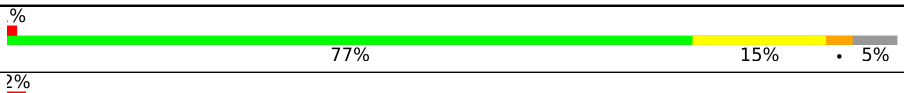
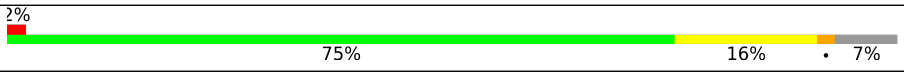
The reported resolution of this entry is 1.70 Å.

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}	130704	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

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 >=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 <=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	460	
1	B	460	

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
2	GOL	B	463	-	X	X	-
2	GOL	B	466	-	-	X	-
6	PEG	B	6073	-	-	X	-

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 8124 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.

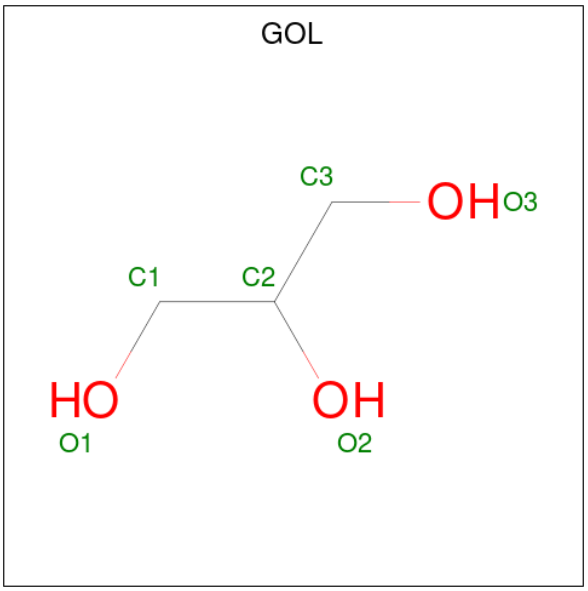
- Molecule 1 is a protein called V-type ATP synthase beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	436	Total	C	N	O	S	0	22	0
			3480	2207	601	660	12			
1	B	427	Total	C	N	O	S	0	16	0
			3383	2151	581	639	12			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	157	THR	ASN	ENGINEERED MUTATION	UNP Q60187
B	157	THR	ASN	ENGINEERED MUTATION	UNP Q60187

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

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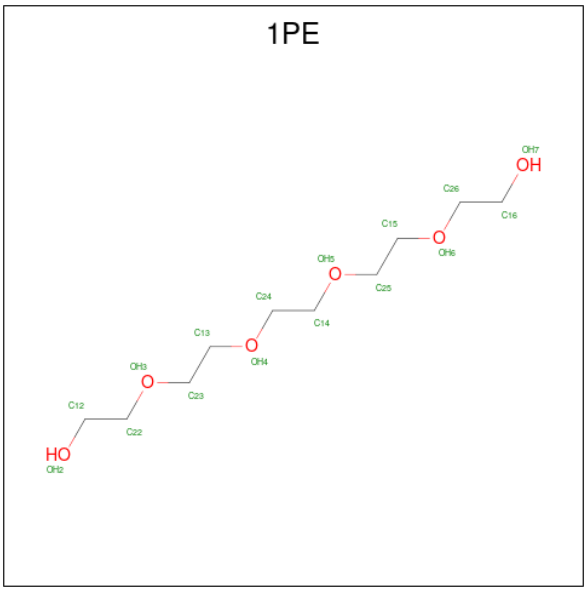
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	A	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0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

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

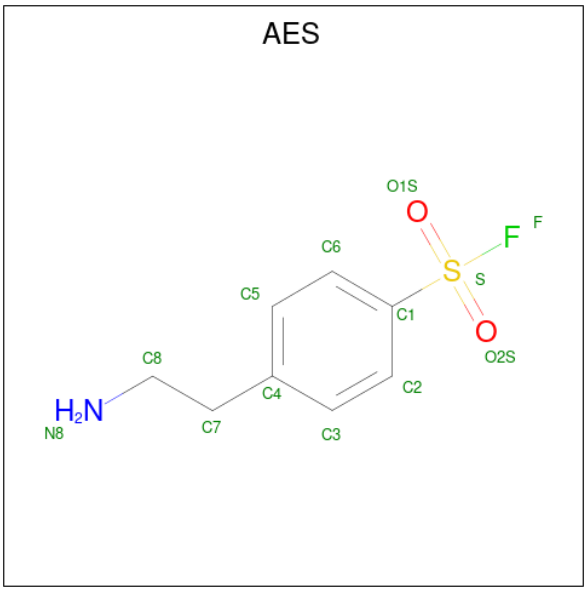
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Cl 1 1	0	0
3	B	2	Total Cl 2 2	0	0

- Molecule 4 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula: $C_{10}H_{22}O_6$).



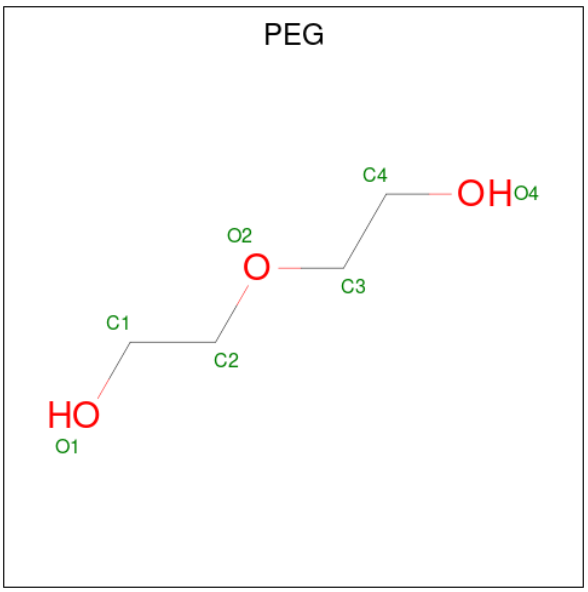
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 16 10 6	0	0
4	A	1	Total C O 13 8 5	0	0

- Molecule 5 is 4-(2-AMINOETHYL)BENZENESULFONYL FLUORIDE (three-letter code: AES) (formula: $C_8H_{10}FNO_2S$).



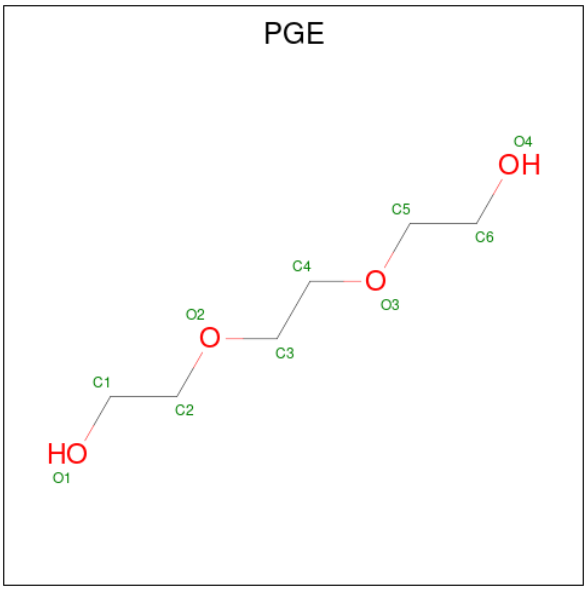
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C F N O S 13 8 1 1 2 1	0	0

- Molecule 6 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 7 4 3	0	0
6	A	1	Total C O 7 4 3	0	0
6	B	1	Total C O 7 4 3	0	0
6	B	1	Total C O 7 4 3	0	0

- Molecule 7 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 10 6 4	0	0

- Molecule 8 is water.

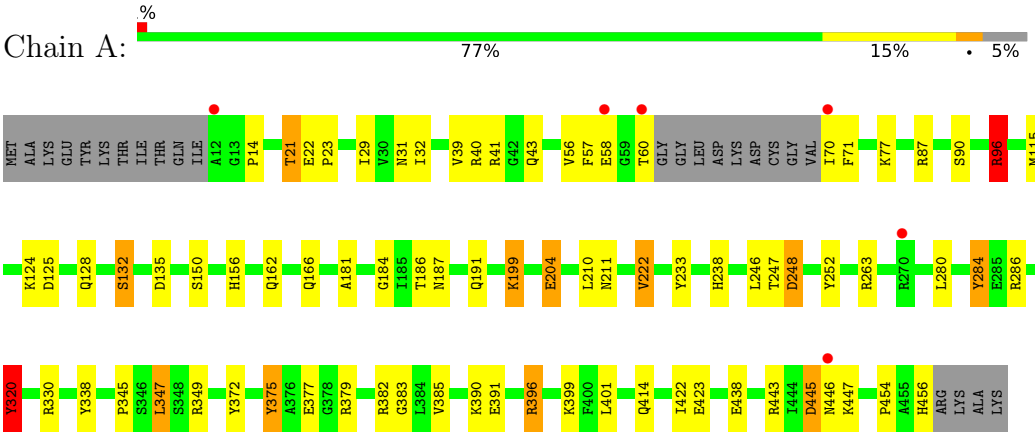
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	599	Total O 599 599	0	0
8	B	507	Total O 507 507	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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.

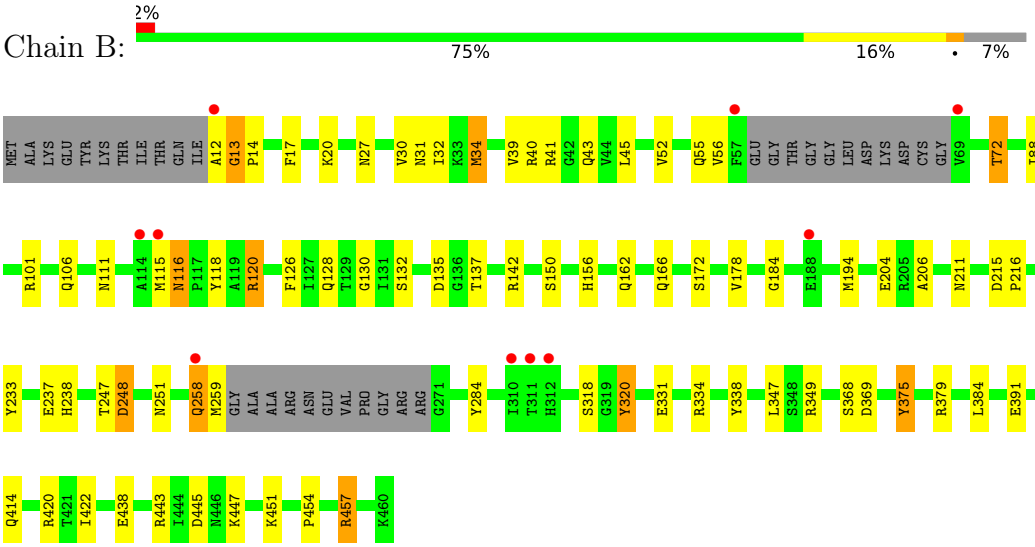
• Molecule 1: V-type ATP synthase beta chain

Chain A:



• Molecule 1: V-type ATP synthase beta chain

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	73.33Å 95.80Å 130.37Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	13.45 – 1.70 13.45 – 1.70	Depositor EDS
% Data completeness (in resolution range)	99.7 (13.45-1.70) 99.6 (13.45-1.70)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.02 (at 1.70Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.146 , 0.193 0.146 , 0.193	Depositor DCC
R_{free} test set	5072 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	19.5	Xtriage
Anisotropy	0.080	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.40 , 67.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	8124	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 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: PEG, GOL, PGE, AES, CL, 1PE

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	1.36	13/3611 (0.4%)	1.25	20/4891 (0.4%)
1	B	1.36	9/3493 (0.3%)	1.20	13/4730 (0.3%)
All	All	1.36	22/7104 (0.3%)	1.23	33/9621 (0.3%)

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	A	1	6
1	B	0	3
All	All	1	9

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	375	TYR	CE1-CZ	8.56	1.49	1.38
1	A	118	TYR	CE2-CZ	7.48	1.48	1.38
1	A	132	SER	CB-OG	7.43	1.51	1.42
1	B	320	TYR	CE2-CZ	7.02	1.47	1.38
1	A	383	GLY	N-CA	6.62	1.55	1.46

The worst 5 of 33 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	96[A]	ARG	NE-CZ-NH1	-12.44	114.08	120.30
1	A	96[B]	ARG	NE-CZ-NH1	-12.44	114.08	120.30
1	A	96[A]	ARG	NE-CZ-NH2	10.63	125.61	120.30
1	A	96[B]	ARG	NE-CZ-NH2	10.63	125.61	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	248	ASP	CB-CG-OD1	-10.00	109.30	118.30

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	21	THR	CB

5 of 9 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	247	THR	Peptide,Mainchain
1	A	338	TYR	Peptide,Mainchain
1	A	96[A]	ARG	Sidechain
1	A	96[B]	ARG	Sidechain
1	B	248[A]	ASP	Mainchain

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	3480	0	3535	68	0
1	B	3383	0	3439	75	0
2	A	36	0	47	6	0
2	B	36	0	48	16	0
3	A	1	0	0	1	0
3	B	2	0	0	0	0
4	A	29	0	39	2	0
5	A	13	0	10	2	0
6	A	14	0	20	3	0
6	B	14	0	20	10	0
7	A	10	0	14	2	0
8	A	599	0	0	19	0
8	B	507	0	0	15	0
All	All	8124	0	7172	159	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 11.

The worst 5 of 159 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:90:SER:HA	1:A:96[A]:ARG:NH1	1.36	1.41
1:B:120:ARG:HG3	8:B:1048:HOH:O	1.47	1.14
1:B:40[B]:ARG:HG2	1:B:40[B]:ARG:HH11	1.19	1.06
6:B:6073:PEG:H11	8:B:1013:HOH:O	1.56	1.04
1:A:90:SER:CA	1:A:96[A]:ARG:NH1	2.21	1.04

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	454/460 (99%)	444 (98%)	10 (2%)	0	100 100
1	B	437/460 (95%)	427 (98%)	9 (2%)	1 (0%)	47 30
All	All	891/920 (97%)	871 (98%)	19 (2%)	1 (0%)	51 33

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	13	GLY

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	377/374 (101%)	364 (97%)	13 (3%)	37	18
1	B	366/374 (98%)	354 (97%)	12 (3%)	38	19
All	All	743/748 (99%)	718 (97%)	25 (3%)	41	18

5 of 25 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	72	THR
1	B	116	ASN
1	B	454	PRO
1	B	101	ARG
1	B	120	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	111	ASN
1	B	156	HIS
1	B	128	GLN
1	B	166	GLN
1	A	238	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 23 ligands modelled in this entry, 3 are monoatomic - leaving 20 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	GOL	A	467	-	5,5,5	0.37	0	5,5,5	0.90	0
2	GOL	B	466	-	5,5,5	1.05	0	5,5,5	0.91	0
4	1PE	A	464	-	15,15,15	0.60	0	14,14,14	0.78	0
2	GOL	A	465	-	5,5,5	0.62	0	5,5,5	1.19	0
6	PEG	A	470	-	6,6,6	0.77	0	5,5,5	1.00	0
6	PEG	B	6073	-	6,6,6	1.19	0	5,5,5	0.97	0
2	GOL	B	461	-	5,5,5	0.72	0	5,5,5	1.57	1 (20%)
2	GOL	B	463	-	5,5,5	0.86	0	5,5,5	1.72	2 (40%)
5	AES	A	1474	-	11,13,13	1.76	2 (18%)	16,18,18	2.22	7 (43%)
2	GOL	B	462	-	5,5,5	0.47	0	5,5,5	0.98	0
2	GOL	B	467	-	5,5,5	0.58	0	5,5,5	1.76	1 (20%)
6	PEG	B	465	-	6,6,6	0.63	0	5,5,5	1.59	2 (40%)
2	GOL	A	463	-	5,5,5	0.47	0	5,5,5	0.62	0
2	GOL	B	469	-	5,5,5	0.28	0	5,5,5	1.42	2 (40%)
2	GOL	A	468	-	5,5,5	0.42	0	5,5,5	0.37	0
2	GOL	A	469	-	5,5,5	0.91	0	5,5,5	1.82	1 (20%)
7	PGE	A	471	-	9,9,9	0.99	0	8,8,8	1.05	1 (12%)
6	PEG	A	6073	-	6,6,6	0.73	0	5,5,5	0.39	0
2	GOL	A	461	-	5,5,5	0.54	0	5,5,5	0.69	0
4	1PE	A	466	-	12,12,15	0.34	0	11,11,14	0.90	1 (9%)

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	GOL	A	467	-	-	4/4/4/4	-
2	GOL	B	466	-	-	2/4/4/4	-
4	1PE	A	464	-	-	6/13/13/13	-
2	GOL	A	465	-	-	3/4/4/4	-
6	PEG	A	470	-	-	3/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	PEG	B	6073	-	-	2/4/4/4	-
2	GOL	B	461	-	-	4/4/4/4	-
2	GOL	B	463	-	-	4/4/4/4	-
5	AES	A	1474	-	-	6/9/9/9	0/1/1/1
2	GOL	B	462	-	-	0/4/4/4	-
2	GOL	B	467	-	-	4/4/4/4	-
6	PEG	B	465	-	-	1/4/4/4	-
2	GOL	A	463	-	-	2/4/4/4	-
2	GOL	B	469	-	-	0/4/4/4	-
2	GOL	A	468	-	-	2/4/4/4	-
2	GOL	A	469	-	-	0/4/4/4	-
7	PGE	A	471	-	-	7/7/7/7	-
6	PEG	A	6073	-	-	3/4/4/4	-
2	GOL	A	461	-	-	1/4/4/4	-
4	1PE	A	466	-	-	7/10/10/13	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1474	AES	O1S-S	3.76	1.50	1.42
5	A	1474	AES	O2S-S	-3.57	1.34	1.42

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	1474	AES	O2S-S-C1	4.16	114.99	110.74
2	B	467	GOL	C3-C2-C1	-3.57	97.84	111.70
5	A	1474	AES	F-S-O1S	-3.33	98.92	106.49
2	A	469	GOL	O2-C2-C1	-3.25	94.82	109.12
5	A	1474	AES	C5-C4-C3	3.12	123.07	118.17

There are no chirality outliers.

5 of 61 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	463	GOL	O1-C1-C2-C3
2	A	465	GOL	O1-C1-C2-C3
2	A	467	GOL	C1-C2-C3-O3
2	B	461	GOL	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
2	B	463	GOL	O1-C1-C2-C3

There are no ring outliers.

16 monomers are involved in 37 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	466	GOL	4	0
4	A	464	1PE	2	0
2	A	465	GOL	2	0
6	A	470	PEG	2	0
6	B	6073	PEG	7	0
2	B	461	GOL	1	0
2	B	463	GOL	5	0
5	A	1474	AES	2	0
2	B	462	GOL	3	0
2	B	467	GOL	1	0
6	B	465	PEG	3	0
2	B	469	GOL	2	0
2	A	469	GOL	3	0
7	A	471	PGE	2	0
6	A	6073	PEG	1	0
2	A	461	GOL	1	0

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^{th} 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	436/460 (94%)	-0.47	6 (1%)	75	79	12, 20, 36, 53	0
1	B	427/460 (92%)	-0.45	11 (2%)	56	60	12, 19, 36, 47	0
All	All	863/920 (93%)	-0.46	17 (1%)	65	69	12, 19, 36, 53	0

The worst 5 of 17 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	12	ALA	7.4
1	A	270	ARG	4.6
1	A	60	THR	4.4
1	B	69	VAL	4.4
1	B	258[A]	GLN	3.9

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 monosaccharides 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. The B-factors column lists the minimum, median, 95^{th} 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^2)	Q<0.9
6	PEG	A	6073	7/7	0.63	0.19	63,66,69,69	0
2	GOL	A	468	6/6	0.70	0.24	75,76,77,78	0
6	PEG	B	465	7/7	0.70	0.21	49,53,58,59	0
2	GOL	B	469	6/6	0.77	0.20	52,55,56,57	0
2	GOL	A	465	6/6	0.80	0.17	47,49,50,51	0
6	PEG	A	470	7/7	0.81	0.18	46,48,50,51	0
2	GOL	A	461	6/6	0.81	0.15	39,44,48,51	0
2	GOL	A	463	6/6	0.83	0.21	61,65,66,70	0
4	1PE	A	464	16/16	0.84	0.16	37,50,66,66	0
2	GOL	B	463	6/6	0.85	0.22	37,46,50,53	0
7	PGE	A	471	10/10	0.87	0.14	40,51,60,60	0
2	GOL	B	462	6/6	0.88	0.15	44,52,57,57	0
3	CL	B	464	1/1	0.90	0.10	54,54,54,54	0
2	GOL	B	467	6/6	0.90	0.22	25,50,54,55	0
2	GOL	A	467	6/6	0.90	0.16	24,49,52,53	0
2	GOL	A	469	6/6	0.91	0.15	24,35,39,43	0
2	GOL	B	466	6/6	0.91	0.15	31,34,41,44	0
6	PEG	B	6073	7/7	0.92	0.17	21,32,34,35	0
4	1PE	A	466	13/16	0.95	0.08	41,44,51,53	0
5	AES	A	1474	13/13	0.96	0.10	18,24,34,42	13
2	GOL	B	461	6/6	0.96	0.07	16,22,36,40	0
3	CL	A	462	1/1	0.99	0.03	20,20,20,20	0
3	CL	B	468	1/1	0.99	0.05	23,23,23,23	0

6.5 Other polymers (i)

There are no such residues in this entry.