Full wwPDB X-ray Structure Validation Report (i)

Oct 21, 2024 – 11:23 AM EDT

PDB ID	:	2GK3
Title	:	Cytoplasmic Protein STM3548 from Salmonella typhimurium
Authors	:	Petrova, T.; Cuff, M.E.; Wu, R.Y.; Holzle, D.; Joachimiak, A.; Midwest Center for Structural Genomics (MCSG)
Deposited on	:	2006-03-31
Resolution	:	2.25 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
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 (i)) were used in the production of this report:

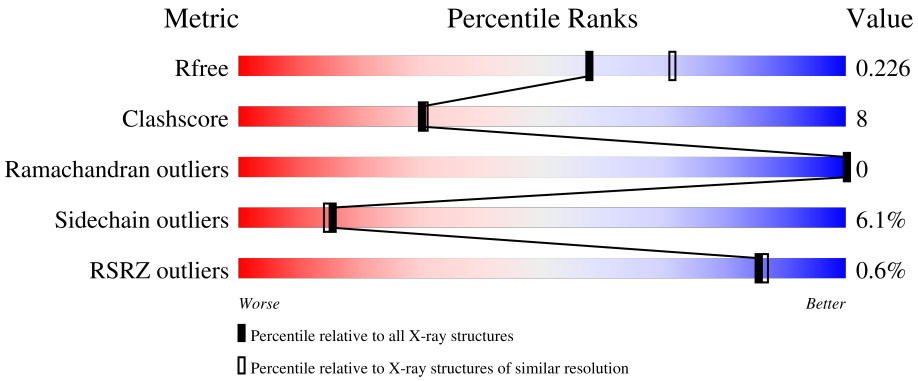
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.25 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	1763 (2.26-2.26)
Clashscore	180529	1919 (2.26-2.26)
Ramachandran outliers	177936	1884 (2.26-2.26)
Sidechain outliers	177891	1885 (2.26-2.26)
RSRZ outliers	164620	1763 (2.26-2.26)

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	256	80% 14%
1	B	256	78% 15%
1	C	256	76% 17%
1	D	256	% 79% 14%
1	E	256	82% 12%

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Mol	Chain	Length	Quality of chain
1	F	256	

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 12420 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 putative cytoplasmic protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	246	Total	C	N	O	S	Se	4	1	0
			1961	1265	313	372	4	7			
1	B	246	Total	C	N	O	S	Se	0	2	0
			1972	1272	317	372	4	7			
1	C	246	Total	C	N	O	S	Se	0	3	0
			1974	1273	316	373	5	7			
1	D	246	Total	C	N	O	S	Se	0	1	0
			1963	1267	315	370	4	7			
1	E	248	Total	C	N	O	S	Se	6	3	0
			1992	1285	323	373	4	7			
1	F	246	Total	C	N	O	S	Se	0	4	0
			1974	1273	319	371	4	7			

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	cloning artifact	UNP Q8ZLF9
A	-1	ASN	-	cloning artifact	UNP Q8ZLF9
A	0	ALA	-	cloning artifact	UNP Q8ZLF9
A	1	MSE	MET	modified residue	UNP Q8ZLF9
A	21	MSE	MET	modified residue	UNP Q8ZLF9
A	56	MSE	MET	modified residue	UNP Q8ZLF9
A	120	MSE	MET	modified residue	UNP Q8ZLF9
A	128	MSE	MET	modified residue	UNP Q8ZLF9
A	149	MSE	MET	modified residue	UNP Q8ZLF9
A	221	MSE	MET	modified residue	UNP Q8ZLF9
A	234	MSE	MET	modified residue	UNP Q8ZLF9
B	-2	SER	-	cloning artifact	UNP Q8ZLF9
B	-1	ASN	-	cloning artifact	UNP Q8ZLF9
B	0	ALA	-	cloning artifact	UNP Q8ZLF9
B	1	MSE	MET	modified residue	UNP Q8ZLF9
B	21	MSE	MET	modified residue	UNP Q8ZLF9
B	56	MSE	MET	modified residue	UNP Q8ZLF9

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Chain	Residue	Modelled	Actual	Comment	Reference
B	120	MSE	MET	modified residue	UNP Q8ZLF9
B	128	MSE	MET	modified residue	UNP Q8ZLF9
B	149	MSE	MET	modified residue	UNP Q8ZLF9
B	221	MSE	MET	modified residue	UNP Q8ZLF9
B	234	MSE	MET	modified residue	UNP Q8ZLF9
C	-2	SER	-	cloning artifact	UNP Q8ZLF9
C	-1	ASN	-	cloning artifact	UNP Q8ZLF9
C	0	ALA	-	cloning artifact	UNP Q8ZLF9
C	1	MSE	MET	modified residue	UNP Q8ZLF9
C	21	MSE	MET	modified residue	UNP Q8ZLF9
C	56	MSE	MET	modified residue	UNP Q8ZLF9
C	120	MSE	MET	modified residue	UNP Q8ZLF9
C	128	MSE	MET	modified residue	UNP Q8ZLF9
C	149	MSE	MET	modified residue	UNP Q8ZLF9
C	221	MSE	MET	modified residue	UNP Q8ZLF9
C	234	MSE	MET	modified residue	UNP Q8ZLF9
D	-2	SER	-	cloning artifact	UNP Q8ZLF9
D	-1	ASN	-	cloning artifact	UNP Q8ZLF9
D	0	ALA	-	cloning artifact	UNP Q8ZLF9
D	1	MSE	MET	modified residue	UNP Q8ZLF9
D	21	MSE	MET	modified residue	UNP Q8ZLF9
D	56	MSE	MET	modified residue	UNP Q8ZLF9
D	120	MSE	MET	modified residue	UNP Q8ZLF9
D	128	MSE	MET	modified residue	UNP Q8ZLF9
D	149	MSE	MET	modified residue	UNP Q8ZLF9
D	221	MSE	MET	modified residue	UNP Q8ZLF9
D	234	MSE	MET	modified residue	UNP Q8ZLF9
F	-2	SER	-	cloning artifact	UNP Q8ZLF9
F	-1	ASN	-	cloning artifact	UNP Q8ZLF9
F	0	ALA	-	cloning artifact	UNP Q8ZLF9
F	1	MSE	MET	modified residue	UNP Q8ZLF9
F	21	MSE	MET	modified residue	UNP Q8ZLF9
F	56	MSE	MET	modified residue	UNP Q8ZLF9
F	120	MSE	MET	modified residue	UNP Q8ZLF9
F	128	MSE	MET	modified residue	UNP Q8ZLF9
F	149	MSE	MET	modified residue	UNP Q8ZLF9
F	221	MSE	MET	modified residue	UNP Q8ZLF9
F	234	MSE	MET	modified residue	UNP Q8ZLF9
E	-2	SER	-	cloning artifact	UNP Q8ZLF9
E	-1	ASN	-	cloning artifact	UNP Q8ZLF9
E	0	ALA	-	cloning artifact	UNP Q8ZLF9
E	1	MSE	MET	modified residue	UNP Q8ZLF9

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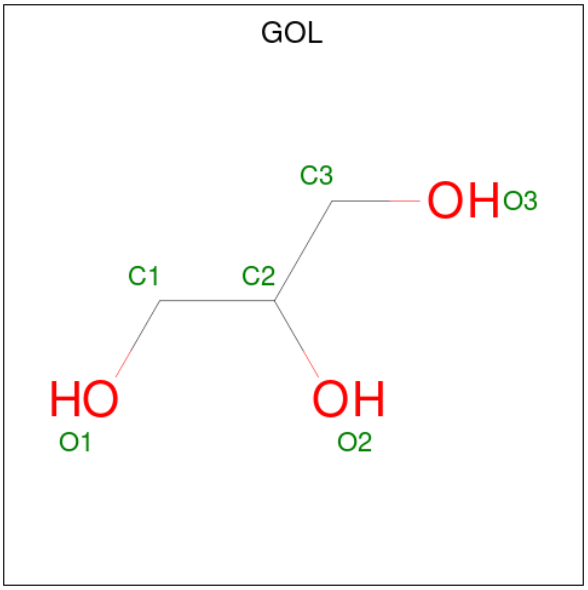
Chain	Residue	Modelled	Actual	Comment	Reference
E	21	MSE	MET	modified residue	UNP Q8ZLF9
E	56	MSE	MET	modified residue	UNP Q8ZLF9
E	120	MSE	MET	modified residue	UNP Q8ZLF9
E	128	MSE	MET	modified residue	UNP Q8ZLF9
E	149	MSE	MET	modified residue	UNP Q8ZLF9
E	221	MSE	MET	modified residue	UNP Q8ZLF9
E	234	MSE	MET	modified residue	UNP Q8ZLF9

- 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 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	C	1	Total C O 6 3 3	0	0
2	D	1	Total C O 6 3 3	0	0
2	E	1	Total C O 6 3 3	0	0
2	F	1	Total C O 6 3 3	0	0

- Molecule 3 is water.

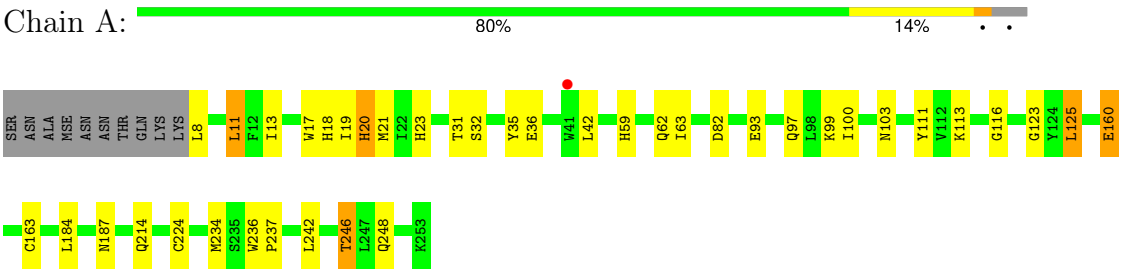
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	77	Total O 77 77	0	0
3	B	86	Total O 86 86	0	0
3	C	89	Total O 89 89	0	0
3	D	101	Total O 101 101	0	0
3	E	107	Total O 107 107	0	0
3	F	88	Total O 88 88	0	0

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.

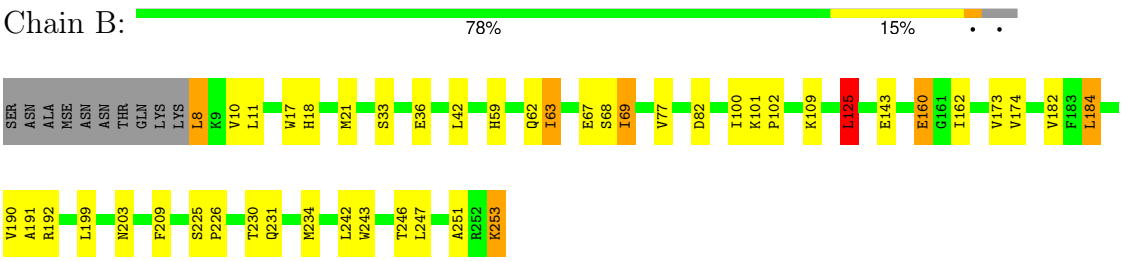
- Molecule 1: putative cytoplasmic protein

Chain A:



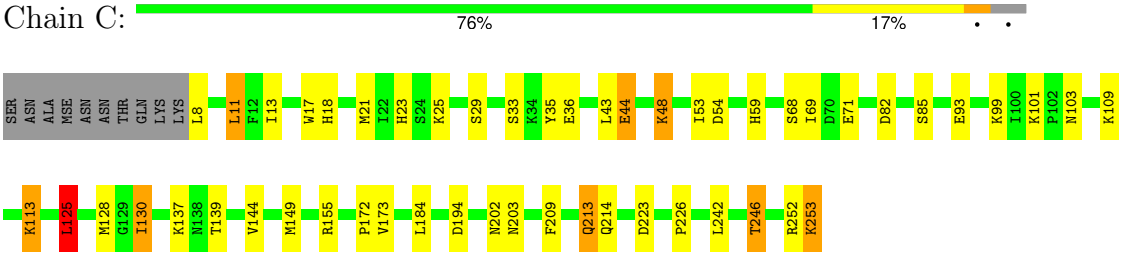
- Molecule 1: putative cytoplasmic protein

Chain B:



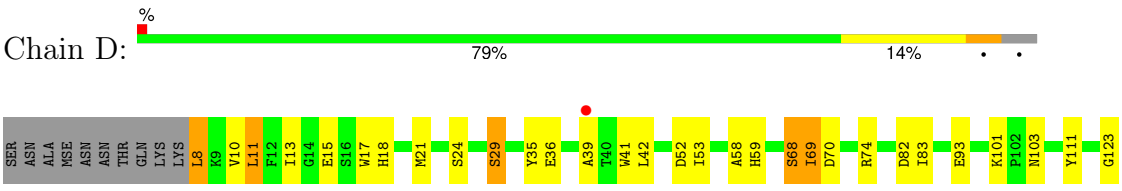
- Molecule 1: putative cytoplasmic protein

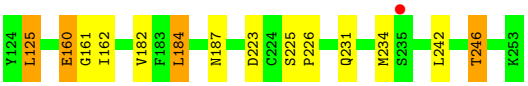
Chain C:



- Molecule 1: putative cytoplasmic protein

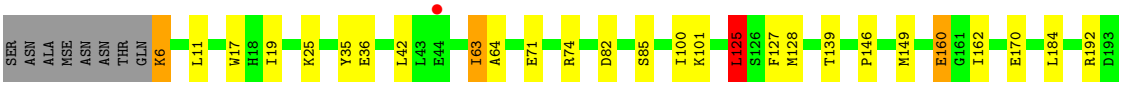
Chain D:

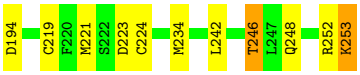




• Molecule 1: putative cytoplasmic protein

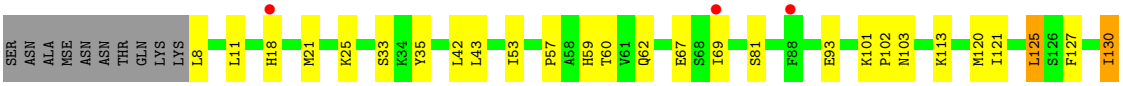
Chain E:

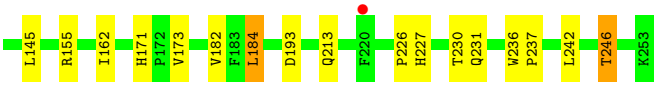




• Molecule 1: putative cytoplasmic protein

Chain F:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	182.89Å 79.37Å 115.66Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	115.47 – 2.25 115.47 – 2.25	Depositor EDS
% Data completeness (in resolution range)	93.9 (115.47-2.25) 94.0 (115.47-2.25)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.16 (at 2.24Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.177 , 0.226 0.176 , 0.226	Depositor DCC
R_{free} test set	3815 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	37.5	Xtriage
Anisotropy	0.204	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 34.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	12420	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.77% 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: 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	0/2005	0.68	2/2713 (0.1%)
1	B	0.58	0/2017	0.67	1/2729 (0.0%)
1	C	0.59	0/2022	0.65	1/2736 (0.0%)
1	D	0.62	0/2008	0.69	1/2717 (0.0%)
1	E	0.63	1/2037 (0.0%)	0.73	2/2753 (0.1%)
1	F	0.60	0/2019	0.68	1/2731 (0.0%)
All	All	0.60	1/12108 (0.0%)	0.68	8/16379 (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	A	1	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	6	LYS	CG-CD	-7.16	1.28	1.52

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	125	LEU	CA-CB-CG	-8.75	95.17	115.30
1	F	125	LEU	CA-CB-CG	-7.26	98.61	115.30
1	B	125	LEU	CA-CB-CG	-7.08	99.01	115.30
1	A	20	HIS	N-CA-C	6.24	127.85	111.00
1	C	125	LEU	CA-CB-CG	-6.18	101.08	115.30
1	D	125	LEU	CA-CB-CG	-5.92	101.67	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	125	LEU	CA-CB-CG	-5.49	102.69	115.30
1	E	63	ILE	CB-CA-C	-5.12	101.36	111.60

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	20	HIS	CA

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	19	ILE	Peptide

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	1961	0	1896	23	0
1	B	1972	0	1906	38	0
1	C	1974	0	1907	44	0
1	D	1963	0	1899	37	0
1	E	1992	0	1936	38	0
1	F	1974	0	1909	35	0
2	A	6	0	8	0	0
2	B	6	0	8	0	0
2	C	6	0	8	3	0
2	D	6	0	8	2	0
2	E	6	0	8	2	0
2	F	6	0	8	3	0
3	A	77	0	0	1	0
3	B	86	0	0	4	0
3	C	89	0	0	3	0
3	D	101	0	0	9	1
3	E	107	0	0	1	1
3	F	88	0	0	7	0
All	All	12420	0	11501	193	1

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 8.

All (193) 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:D:231:GLN:HA	3:D:1075:HOH:O	1.55	1.05
1:F:120:MSE:HE3	1:F:127:PHE:CE1	1.92	1.04
1:C:252:ARG:HA	1:C:253:LYS:HB3	1.38	1.01
1:C:128:MSE:HG2	1:C:149:MSE:HE3	1.40	1.00
1:C:242:LEU:O	1:C:246:THR:HG23	1.62	0.98
1:B:68:SER:HB3	3:B:1051:HOH:O	1.62	0.97
1:E:224:CYS:O	1:E:234:MSE:HE1	1.66	0.94
1:B:191:ALA:HB1	1:B:192:ARG:HA	1.52	0.91
1:E:219:CYS:CB	1:E:221:MSE:HE1	2.02	0.90
1:B:191:ALA:CB	1:B:192:ARG:HA	2.02	0.88
1:E:242:LEU:O	1:E:246:THR:HG23	1.72	0.88
1:C:93:GLU:HB2	1:C:101:LYS:HD2	1.56	0.88
1:C:214:GLN:O	1:C:253:LYS:HE3	1.75	0.87
1:E:219:CYS:HB2	1:E:221:MSE:HE1	1.57	0.86
1:D:223:ASP:OD2	2:D:1004:GOL:H11	1.77	0.84
1:C:252:ARG:HA	1:C:253:LYS:CB	2.09	0.82
1:D:242:LEU:O	1:D:246:THR:HG23	1.81	0.81
1:E:223:ASP:OD2	2:E:1006:GOL:H11	1.80	0.81
1:D:123:GLY:H	1:D:187:ASN:HD21	1.28	0.80
2:F:1005:GOL:H31	3:F:1072:HOH:O	1.81	0.80
1:C:128:MSE:HG2	1:C:149:MSE:CE	2.13	0.79
1:D:41:TRP:CD1	1:D:234:MSE:HB3	2.17	0.79
2:F:1005:GOL:C3	3:F:1072:HOH:O	2.31	0.79
1:A:224:CYS:O	1:A:234:MSE:HE1	1.84	0.78
1:B:191:ALA:HB1	1:B:192:ARG:CA	2.14	0.78
1:C:137:LYS:HB2	1:C:149:MSE:HE2	1.64	0.77
1:D:234:MSE:HB2	3:D:1075:HOH:O	1.85	0.76
1:E:252:ARG:O	1:E:253:LYS:HB2	1.83	0.76
1:F:184:LEU:CD2	1:F:230:THR:HG22	2.17	0.75
1:F:120:MSE:HE3	1:F:127:PHE:CD1	2.22	0.75
1:A:242:LEU:O	1:A:246:THR:HG23	1.87	0.74
1:D:160:GLU:CG	1:F:103:ASN:HB2	2.18	0.74
1:C:128:MSE:CG	1:C:149:MSE:HE3	2.17	0.74
1:C:223:ASP:OD2	2:C:1003:GOL:H11	1.90	0.71
1:F:184:LEU:HD22	1:F:230:THR:CG2	2.21	0.70
1:F:120:MSE:CE	1:F:145:LEU:HD13	2.22	0.70
1:E:219:CYS:HB3	1:E:221:MSE:HE1	1.73	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:184:LEU:HD22	1:F:230:THR:HG22	1.70	0.70
1:D:225:SER:HB2	1:D:226:PRO:CD	2.22	0.69
1:C:44:GLU:HG3	1:C:48:LYS:HE2	1.74	0.69
1:F:171:HIS:HD2	1:F:173:VAL:H	1.41	0.69
1:F:242:LEU:O	1:F:246:THR:HG22	1.92	0.68
2:F:1005:GOL:C2	3:F:1072:HOH:O	2.40	0.68
1:B:191:ALA:CB	1:B:192:ARG:CA	2.69	0.68
1:B:242:LEU:O	1:B:246:THR:HG23	1.94	0.68
1:C:252:ARG:CA	1:C:253:LYS:HB3	2.17	0.67
1:D:160:GLU:HG3	1:F:103:ASN:HB2	1.76	0.67
1:E:219:CYS:CB	1:E:221:MSE:CE	2.72	0.67
1:A:123:GLY:H	1:A:187:ASN:HD21	1.43	0.67
1:A:59:HIS:HB2	1:F:35:TYR:HB3	1.76	0.66
1:E:219:CYS:HB3	1:E:221:MSE:CE	2.24	0.66
1:C:128:MSE:SE	1:C:149:MSE:CE	2.96	0.64
1:B:63:ILE:HD11	1:E:36:GLU:HA	1.79	0.64
1:D:59:HIS:CD2	3:D:1007:HOH:O	2.50	0.64
1:B:101:LYS:HB2	1:B:102:PRO:CD	2.29	0.62
1:D:59:HIS:HD2	3:D:1007:HOH:O	1.82	0.62
1:F:120:MSE:HE1	1:F:145:LEU:HD13	1.80	0.62
1:A:160:GLU:HG3	1:C:103:ASN:HB2	1.80	0.62
1:F:93:GLU:OE1	1:F:101:LYS:HE2	1.99	0.62
1:C:113:LYS:HG2	1:C:213:GLN:HG3	1.80	0.61
1:C:226:PRO:O	2:C:1003:GOL:H12	2.01	0.61
1:D:24:SER:HA	1:D:29:SER:HB3	1.82	0.61
1:E:127:PHE:C	1:E:149:MSE:HE3	2.20	0.61
1:E:242:LEU:O	1:E:246:THR:CG2	2.48	0.60
1:D:68:SER:HB3	3:D:1036:HOH:O	2.02	0.60
1:F:171:HIS:CD2	1:F:173:VAL:H	2.19	0.59
1:F:120:MSE:HE1	1:F:145:LEU:CD1	2.33	0.59
1:F:81:SER:HB2	1:F:121:ILE:HB	1.85	0.59
1:B:10:VAL:HG22	1:B:77:VAL:HB	1.85	0.58
1:A:103:ASN:HB2	1:B:160:GLU:HG3	1.85	0.58
1:A:242:LEU:O	1:A:246:THR:CG2	2.52	0.58
1:F:242:LEU:O	1:F:246:THR:CG2	2.51	0.58
1:D:74:ARG:HB3	3:D:1037:HOH:O	2.02	0.58
1:B:63:ILE:HD12	1:E:35:TYR:CD2	2.39	0.57
1:E:128:MSE:HG2	1:E:149:MSE:CE	2.34	0.57
1:B:63:ILE:HD12	1:E:35:TYR:HD2	1.69	0.57
1:E:71:GLU:HG3	1:E:74:ARG:HH22	1.70	0.57
1:B:190:VAL:HG12	1:B:191:ALA:N	2.20	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:219:CYS:HB2	1:E:221:MSE:CE	2.32	0.56
1:D:53:ILE:HG12	3:D:1094:HOH:O	2.05	0.56
1:D:103:ASN:HB2	1:E:160:GLU:HG3	1.88	0.56
1:E:128:MSE:N	1:E:149:MSE:HE3	2.21	0.55
1:D:225:SER:HA	1:D:234:MSE:HE3	1.89	0.55
1:E:128:MSE:HG2	1:E:149:MSE:HE3	1.88	0.55
1:B:21:MSE:HG2	1:F:21:MSE:HG2	1.89	0.55
1:C:44:GLU:HA	1:C:44:GLU:OE1	2.07	0.54
1:F:120:MSE:CE	1:F:145:LEU:CD1	2.85	0.54
1:D:225:SER:HB2	1:D:226:PRO:HD2	1.89	0.54
1:C:43:LEU:HD22	1:C:53:ILE:HG21	1.89	0.54
1:C:128:MSE:CG	1:C:149:MSE:CE	2.83	0.54
1:D:161:GLY:HA2	1:D:184:LEU:HD12	1.90	0.54
1:C:202:ASN:O	1:C:203:ASN:HB2	2.06	0.54
1:B:62:GLN:HG2	3:B:1004:HOH:O	2.09	0.53
1:B:191:ALA:HB3	1:B:192:ARG:HA	1.89	0.53
3:C:1028:HOH:O	1:D:18[B]:HIS:CD2	2.60	0.53
1:F:43:LEU:HD22	1:F:53:ILE:HG21	1.89	0.53
1:C:125:LEU:HD13	1:E:25:LYS:HD2	1.91	0.53
1:D:234:MSE:HE1	3:D:1055:HOH:O	2.08	0.53
1:C:21:MSE:HE2	1:C:23:HIS:CE1	2.44	0.52
1:C:109:LYS:HG3	1:C:144:VAL:CG2	2.38	0.52
1:E:223:ASP:OD2	2:E:1006:GOL:C1	2.55	0.52
1:C:25:LYS:HG2	1:E:17:TRP:HB3	1.92	0.52
1:F:18[B]:HIS:CE1	1:F:33:SER:HB3	2.45	0.52
1:D:11:LEU:HD13	1:D:13:ILE:HD11	1.91	0.52
1:C:18[A]:HIS:CE1	1:C:33:SER:HB3	2.45	0.51
1:A:18:HIS:HE1	3:B:1061:HOH:O	1.93	0.51
1:A:62:GLN:HG2	3:A:1032:HOH:O	2.11	0.51
1:A:23:HIS:NE2	1:A:32:SER:HB2	2.26	0.51
1:A:93:GLU:HA	1:A:97:GLN:HB2	1.93	0.51
1:D:74:ARG:NH1	3:D:1103:HOH:O	2.44	0.51
1:B:69:ILE:O	1:B:69:ILE:HG13	2.11	0.51
1:D:103:ASN:HB2	1:E:160:GLU:CG	2.40	0.50
1:B:173:VAL:HG11	1:B:246:THR:HG22	1.92	0.50
1:C:68:SER:HB3	1:C:71:GLU:HG3	1.94	0.50
1:F:231:GLN:HG2	3:F:1039:HOH:O	2.11	0.50
1:A:35:TYR:HB3	1:F:59:HIS:HB2	1.94	0.50
1:B:173:VAL:HG21	1:B:209:PHE:CZ	2.47	0.49
1:E:192:ARG:C	1:E:194:ASP:H	2.14	0.49
1:B:225:SER:HB3	1:B:226:PRO:HD2	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:67:GLU:OE1	1:F:101:LYS:NZ	2.44	0.49
1:F:184:LEU:HD21	1:F:230:THR:HG22	1.91	0.49
1:B:59:HIS:HB2	1:E:35:TYR:CB	2.43	0.49
1:C:173:VAL:HG21	1:C:209:PHE:CZ	2.48	0.48
1:F:62:GLN:HG2	3:F:1076:HOH:O	2.14	0.48
1:F:226:PRO:HB3	3:F:1050:HOH:O	2.14	0.48
1:B:253:LYS:HE3	3:B:1068:HOH:O	2.13	0.48
1:D:17:TRP:NE1	1:D:36:GLU:HB2	2.30	0.47
1:A:63:ILE:HD11	1:F:35:TYR:HD2	1.80	0.47
1:B:67:GLU:HG3	1:B:102:PRO:HG2	1.97	0.47
1:F:236:TRP:CD1	1:F:237:PRO:HD2	2.50	0.47
1:A:18:HIS:CD2	3:F:1032:HOH:O	2.68	0.46
1:C:35:TYR:HB3	1:D:59:HIS:HB2	1.97	0.46
1:E:128:MSE:SE	1:E:149:MSE:CE	3.13	0.46
1:B:63:ILE:HD11	1:E:35:TYR:O	2.15	0.46
1:C:11:LEU:HD23	1:C:54:ASP:O	2.16	0.46
1:E:71:GLU:HG3	1:E:74:ARG:NH2	2.31	0.46
1:F:130:ILE:HD12	1:F:155:ARG:CZ	2.46	0.46
1:A:17:TRP:NE1	1:A:36:GLU:HB2	2.32	0.45
1:A:21:MSE:HG2	1:D:21:MSE:HG2	1.98	0.45
1:C:17:TRP:NE1	1:C:36:GLU:HB2	2.32	0.45
1:C:93:GLU:HB3	1:C:99:LYS:HD3	1.98	0.45
1:E:100:ILE:N	1:E:100:ILE:HD12	2.30	0.45
1:E:128:MSE:SE	1:E:149:MSE:HE2	2.66	0.45
1:E:146:PRO:HD2	1:E:219:CYS:SG	2.55	0.45
1:F:184:LEU:HD23	1:F:227:HIS:O	2.17	0.45
1:B:17:TRP:NE1	1:B:36:GLU:HB2	2.31	0.45
1:E:85:SER:HB2	1:E:139:THR:HG21	1.99	0.45
1:B:59:HIS:O	1:B:62:GLN:HB2	2.17	0.45
1:B:190:VAL:CG1	1:B:191:ALA:N	2.79	0.45
1:B:100:ILE:HG12	1:C:184:LEU:HD11	1.99	0.45
1:D:8:LEU:HD22	1:D:10:VAL:HG23	1.99	0.44
1:E:63:ILE:HG22	1:E:64:ALA:HB2	1.98	0.44
1:C:18[B]:HIS:CE1	1:C:35:TYR:CD1	3.06	0.44
1:E:17:TRP:CD1	1:E:19:ILE:HD11	2.53	0.44
1:C:223:ASP:OD2	2:C:1003:GOL:C1	2.61	0.44
1:C:253:LYS:HE2	3:C:1008:HOH:O	2.17	0.44
1:B:231:GLN:HA	1:B:234:MSE:HG3	1.98	0.43
1:D:242:LEU:O	1:D:246:THR:CG2	2.59	0.43
1:B:125:LEU:HD13	1:F:25:LYS:HD2	1.99	0.43
1:C:59:HIS:HB2	1:D:35:TYR:HB3	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:69:ILE:HD11	1:D:111:TYR:HA	1.98	0.43
1:A:160:GLU:CG	1:C:103:ASN:HB2	2.47	0.43
1:C:130:ILE:HD12	1:C:155:ARG:CZ	2.47	0.43
1:B:18[A]:HIS:NE2	1:B:33:SER:HB3	2.34	0.43
1:F:101:LYS:HG3	1:F:102:PRO:HD2	2.01	0.43
1:A:100:ILE:HG12	1:B:184:LEU:HD11	2.01	0.43
1:C:252:ARG:HG3	1:C:253:LYS:HG2	1.99	0.43
1:C:11:LEU:HD13	1:C:13:ILE:HD11	2.00	0.42
1:A:113:LYS:O	1:A:214:GLN:HB2	2.20	0.42
1:B:8:LEU:HD21	1:B:251:ALA:HB2	2.01	0.42
1:B:174:VAL:HG11	1:B:199:LEU:HD21	2.01	0.42
1:D:225:SER:CB	1:D:226:PRO:CD	2.91	0.42
1:C:85:SER:HB2	1:C:139:THR:HG21	2.01	0.42
3:C:1028:HOH:O	1:D:18[B]:HIS:HD2	1.99	0.42
1:D:58:ALA:HA	1:D:83:ILE:HD12	2.01	0.42
1:F:113:LYS:HG3	1:F:213:GLN:OE1	2.20	0.42
1:A:234:MSE:HE2	1:A:234:MSE:HA	2.02	0.42
1:D:93:GLU:OE1	1:D:101:LYS:HE3	2.20	0.42
1:A:111:TYR:CZ	1:A:116:GLY:HA3	2.55	0.41
1:C:23:HIS:O	1:C:29:SER:HA	2.20	0.41
1:C:25:LYS:HD2	1:E:125:LEU:HD13	2.02	0.41
1:B:243:TRP:O	1:B:247:LEU:HG	2.20	0.41
1:D:223:ASP:OD2	2:D:1004:GOL:C1	2.59	0.41
1:E:128:MSE:HG2	1:E:149:MSE:HE2	2.02	0.41
1:F:57:PRO:HD2	1:F:60:THR:OG1	2.20	0.41
1:A:236:TRP:HA	1:A:237:PRO:HD2	1.98	0.41
1:B:230:THR:O	1:B:234:MSE:HG2	2.20	0.41
1:D:15:GLU:HG3	1:D:39:ALA:HB2	2.02	0.40
1:C:173:VAL:CG1	1:C:246:THR:HG22	2.51	0.40
1:B:101:LYS:HB2	1:B:102:PRO:HD2	2.00	0.40
1:A:11:LEU:HD13	1:A:13:ILE:HD11	2.02	0.40
1:B:109:LYS:HE2	1:B:143:GLU:OE2	2.22	0.40
1:E:101:LYS:HE3	3:E:1021:HOH:O	2.22	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1079:HOH:O	3:E:1084:HOH:O[2_665]	2.19	0.01

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	245/256 (96%)	234 (96%)	11 (4%)	0	100	100
1	B	246/256 (96%)	238 (97%)	8 (3%)	0	100	100
1	C	247/256 (96%)	240 (97%)	7 (3%)	0	100	100
1	D	245/256 (96%)	237 (97%)	8 (3%)	0	100	100
1	E	248/256 (97%)	244 (98%)	4 (2%)	0	100	100
1	F	246/256 (96%)	236 (96%)	10 (4%)	0	100	100
All	All	1477/1536 (96%)	1429 (97%)	48 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	214/214 (100%)	201 (94%)	13 (6%)	15	14
1	B	215/214 (100%)	202 (94%)	13 (6%)	16	15
1	C	216/214 (101%)	201 (93%)	15 (7%)	13	11
1	D	214/214 (100%)	199 (93%)	15 (7%)	12	11
1	E	217/214 (101%)	205 (94%)	12 (6%)	18	18
1	F	215/214 (100%)	204 (95%)	11 (5%)	20	21
All	All	1291/1284 (100%)	1212 (94%)	79 (6%)	15	14

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	LEU
1	A	11	LEU
1	A	20	HIS
1	A	31	THR
1	A	42	LEU
1	A	82	ASP
1	A	99	LYS
1	A	125	LEU
1	A	160	GLU
1	A	163	CYS
1	A	184	LEU
1	A	246	THR
1	A	248	GLN
1	B	8	LEU
1	B	11	LEU
1	B	42	LEU
1	B	63	ILE
1	B	69	ILE
1	B	82	ASP
1	B	125	LEU
1	B	160	GLU
1	B	162	ILE
1	B	182	VAL
1	B	184	LEU
1	B	203	ASN
1	B	253	LYS
1	C	8	LEU
1	C	11	LEU
1	C	44	GLU
1	C	48	LYS
1	C	69	ILE
1	C	82	ASP
1	C	113	LYS
1	C	125	LEU
1	C	130	ILE
1	C	172	PRO
1	C	194[A]	ASP
1	C	194[B]	ASP
1	C	213	GLN
1	C	246	THR
1	C	253	LYS
1	D	8	LEU

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Mol	Chain	Res	Type
1	D	11	LEU
1	D	29	SER
1	D	42	LEU
1	D	52	ASP
1	D	68	SER
1	D	69	ILE
1	D	70	ASP
1	D	82	ASP
1	D	125	LEU
1	D	160	GLU
1	D	162	ILE
1	D	182	VAL
1	D	184	LEU
1	D	246	THR
1	E	6	LYS
1	E	11	LEU
1	E	42	LEU
1	E	82	ASP
1	E	125	LEU
1	E	160	GLU
1	E	162	ILE
1	E	170	GLU
1	E	184	LEU
1	E	246	THR
1	E	248	GLN
1	E	253	LYS
1	F	8	LEU
1	F	11	LEU
1	F	42	LEU
1	F	69	ILE
1	F	125	LEU
1	F	130	ILE
1	F	162	ILE
1	F	182	VAL
1	F	184	LEU
1	F	193	ASP
1	F	246	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	HIS

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Mol	Chain	Res	Type
1	A	187	ASN
1	C	59	HIS
1	D	59	HIS
1	D	187	ASN
1	F	59	HIS
1	F	91	GLN
1	F	171	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry

6 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	GOL	D	1004	-	5,5,5	0.38	0	5,5,5	0.93	0
2	GOL	E	1006	-	5,5,5	0.34	0	5,5,5	0.91	0
2	GOL	C	1003	-	5,5,5	0.21	0	5,5,5	0.86	0
2	GOL	B	1002	-	5,5,5	0.45	0	5,5,5	0.82	0
2	GOL	A	1001	-	5,5,5	0.37	0	5,5,5	0.70	0
2	GOL	F	1005	-	5,5,5	0.62	0	5,5,5	1.14	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
2	GOL	D	1004	-	-	2/4/4/4	-
2	GOL	E	1006	-	-	2/4/4/4	-
2	GOL	C	1003	-	-	0/4/4/4	-
2	GOL	B	1002	-	-	2/4/4/4	-
2	GOL	A	1001	-	-	4/4/4/4	-
2	GOL	F	1005	-	-	4/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	1002	GOL	C1-C2-C3-O3
2	B	1002	GOL	O2-C2-C3-O3
2	D	1004	GOL	O1-C1-C2-C3
2	E	1006	GOL	O1-C1-C2-C3
2	F	1005	GOL	C1-C2-C3-O3
2	A	1001	GOL	O1-C1-C2-C3
2	F	1005	GOL	O1-C1-C2-C3
2	A	1001	GOL	O1-C1-C2-O2
2	D	1004	GOL	O1-C1-C2-O2
2	E	1006	GOL	O1-C1-C2-O2
2	F	1005	GOL	O2-C2-C3-O3
2	F	1005	GOL	O1-C1-C2-O2
2	A	1001	GOL	C1-C2-C3-O3
2	A	1001	GOL	O2-C2-C3-O3

There are no ring outliers.

4 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	1004	GOL	2	0
2	E	1006	GOL	2	0
2	C	1003	GOL	3	0
2	F	1005	GOL	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, 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	239/256 (93%)	-0.25	1 (0%) 89 90	17, 39, 55, 57	2 (0%)
1	B	239/256 (93%)	-0.22	0 100 100	16, 40, 55, 59	4 (1%)
1	C	239/256 (93%)	-0.33	0 100 100	18, 38, 52, 59	4 (1%)
1	D	239/256 (93%)	-0.36	2 (0%) 82 83	18, 36, 54, 60	1 (0%)
1	E	241/256 (94%)	-0.51	1 (0%) 89 90	17, 34, 45, 55	6 (2%)
1	F	239/256 (93%)	-0.31	4 (1%) 69 70	9, 37, 50, 59	5 (2%)
All	All	1436/1536 (93%)	-0.33	8 (0%) 85 87	9, 37, 53, 60	22 (1%)

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	88[A]	PHE	7.2
1	F	220[A]	PHE	6.6
1	E	44[B]	GLU	4.4
1	A	41	TRP	3.2
1	F	69	ILE	2.7
1	F	18[A]	HIS	2.5
1	D	39	ALA	2.2
1	D	235	SER	2.1

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 monosaccharides 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^{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
2	GOL	D	1004	6/6	0.81	0.13	34,36,37,37	0
2	GOL	A	1001	6/6	0.82	0.15	37,39,40,41	0
2	GOL	E	1006	6/6	0.83	0.14	29,36,37,37	0
2	GOL	B	1002	6/6	0.84	0.11	29,33,33,34	0
2	GOL	C	1003	6/6	0.87	0.15	37,38,39,40	0
2	GOL	F	1005	6/6	0.93	0.08	27,28,31,31	0

6.5 Other polymers (i)

There are no such residues in this entry.