WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Oct 29, 2024 – 08:14 AM EDT

PDB ID	:	3S7X
Title	:	Unassembled Washington University Polyomavirus VP1 Pentamer R198K Mutant
Authors	:	Neu, U.; Wang, J.; Stehle, T.
Deposited on	:	2011-05-27
Resolution	:	2.90 Å(reported)

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

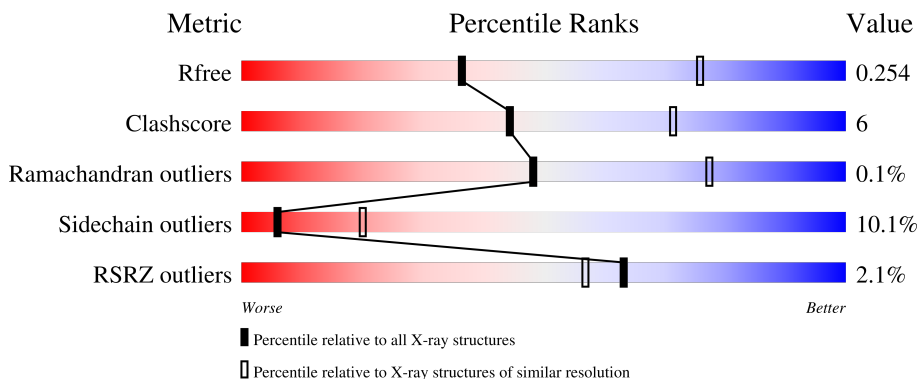|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance ⓘ

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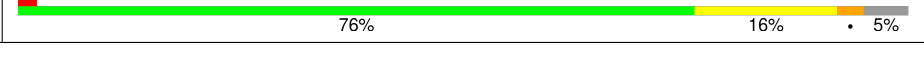*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 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	Percentile Ranks	Value
Rfree		0.254
Clashscore		6
Ramachandran outliers		0.1%
Sidechain outliers		10.1%
RSRZ outliers		2.1%

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	164625	2335 (2.90-2.90)
Clashscore	180529	2564 (2.90-2.90)
Ramachandran outliers	177936	2514 (2.90-2.90)
Sidechain outliers	177891	2516 (2.90-2.90)
RSRZ outliers	164620	2337 (2.90-2.90)

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	267	2% 81% 15% • •
1	B	267	2% 79% 16% • •
1	C	267	% 78% 18% • •
1	D	267	4% 79% 16% • •
1	E	267	2% 76% 16% • 5%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 9975 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 Major capsid protein VP1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	263	Total	C	N	O	S	0	0	0
			2009	1276	343	381	9			
1	B	261	Total	C	N	O	S	0	0	0
			1992	1267	340	376	9			
1	C	263	Total	C	N	O	S	0	0	0
			2005	1274	343	379	9			
1	D	260	Total	C	N	O	S	0	0	0
			1987	1263	338	378	8			
1	E	254	Total	C	N	O	S	0	0	0
			1942	1239	330	365	8			

There are 25 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	30	GLY	-	expression tag	UNP A5HBD5
A	31	SER	-	expression tag	UNP A5HBD5
A	32	HIS	-	expression tag	UNP A5HBD5
A	33	MET	-	expression tag	UNP A5HBD5
A	198	LYS	ARG	engineered mutation	UNP A5HBD5
B	30	GLY	-	expression tag	UNP A5HBD5
B	31	SER	-	expression tag	UNP A5HBD5
B	32	HIS	-	expression tag	UNP A5HBD5
B	33	MET	-	expression tag	UNP A5HBD5
B	198	LYS	ARG	engineered mutation	UNP A5HBD5
C	30	GLY	-	expression tag	UNP A5HBD5
C	31	SER	-	expression tag	UNP A5HBD5
C	32	HIS	-	expression tag	UNP A5HBD5
C	33	MET	-	expression tag	UNP A5HBD5
C	198	LYS	ARG	engineered mutation	UNP A5HBD5
D	30	GLY	-	expression tag	UNP A5HBD5
D	31	SER	-	expression tag	UNP A5HBD5
D	32	HIS	-	expression tag	UNP A5HBD5
D	33	MET	-	expression tag	UNP A5HBD5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	198	LYS	ARG	engineered mutation	UNP A5HBD5
E	30	GLY	-	expression tag	UNP A5HBD5
E	31	SER	-	expression tag	UNP A5HBD5
E	32	HIS	-	expression tag	UNP A5HBD5
E	33	MET	-	expression tag	UNP A5HBD5
E	198	LYS	ARG	engineered mutation	UNP A5HBD5

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).
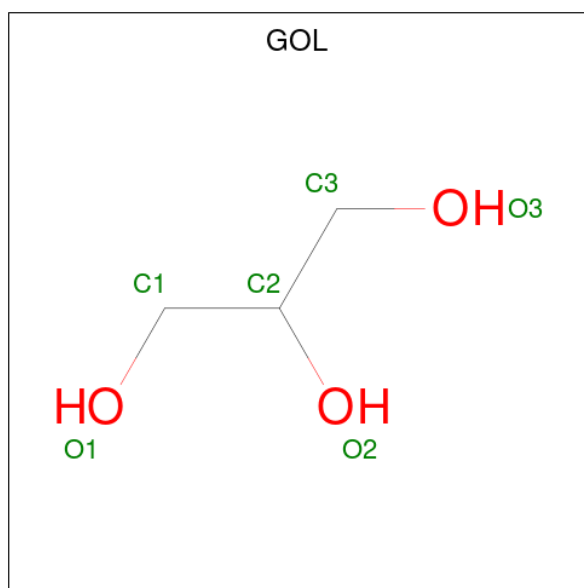
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 6	C 3	O 3	0	0
2	B	1	Total 6	C 3	O 3	0	0
2	C	1	Total 6	C 3	O 3	0	0
2	D	1	Total 6	C 3	O 3	0	0
2	E	1	Total 6	C 3	O 3	0	0

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

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

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

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na).

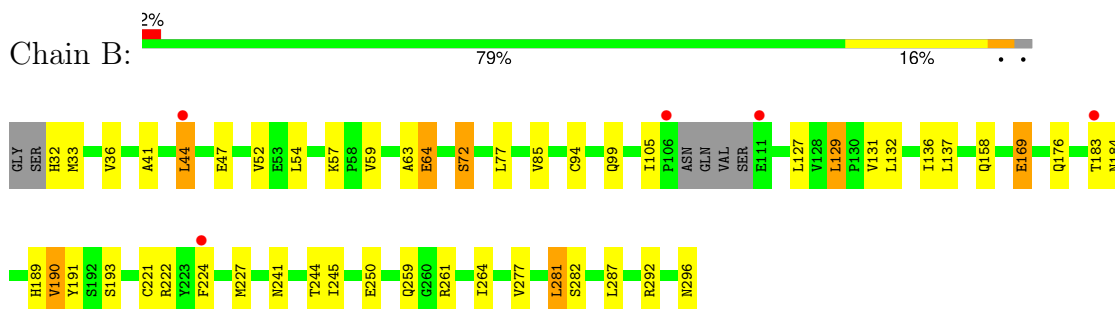| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Na 1	0	0
4	B	1	Total 1	Na 1	0	0
4	C	1	Total 1	Na 1	0	0
4	D	1	Total 1	Na 1	0	0
4	E	1	Total 1	Na 1	0	0

3 Residue-property plots ⓘ

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.
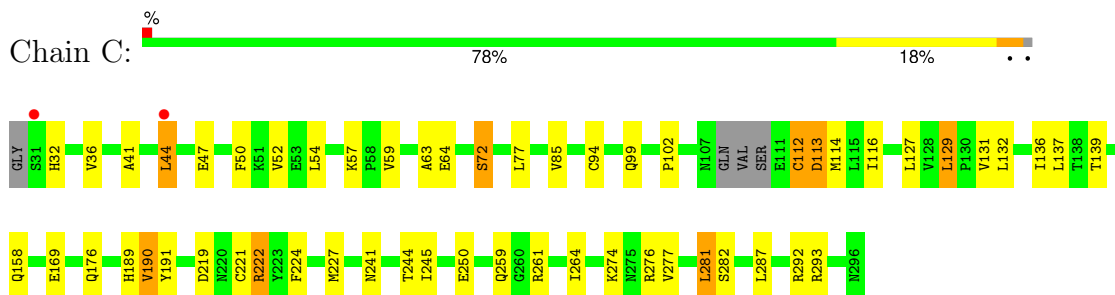
- Molecule 1: Major capsid protein VP1

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- Molecule 1: Major capsid protein VP1

GLY SER HIS MET GLY G35 V36 D37 A41 L44 E47 F50 K51 V52 E53 L54 K57 P58 V59 A63 E64 S72 L77 N84 V85 C94 Q99 P102 N107 GLN VAL S110 E111 C112 L127 V128 L129 P130 V131 L132 I136 L137 G143

E169 Q176 T183 H189 V190 Y191 C221 R222 Y223 F224 M227 P235 N241 T244 I245 E250 Q259 G260 R261 I264 K274 N275 R276 V277 L281 S282 L287 R292 R295 N296

• Molecule 1: Major capsid protein VP1

Chain E:

2%
76%   16%   •   5%

GLY SER HIS MET GLY VAL D37 A41 L44 E47 F50 K51 V52 E53 L54 K57 A63 E64 S72 L77 N84 V85 Q99 P102 P106 ASN GLN VAL SER E111 C112 D113 M114 L115 L127 V128 L129 P130 V131 L132 I136 L137 I145

E169 Q176 T183 H189 V190 Y191 S192 S193 V201 C221 R222 Y223 F224 M227 V228 G229 N241 T244 I245 E250 Q259 G260 R261 I264 R276 V277 L281 S282 L287 R292 R293 V294 ARG ASN

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	166.20Å　166.20Å　127.57Å 90.00°　　90.00°　　90.00°	Depositor
Resolution (Å)	43.36　–　2.90 43.36　–　2.90	Depositor EDS
% Data completeness (in resolution range)	98.7 (43.36-2.90) 98.8 (43.36-2.90)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.19 (at 2.90Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.234　,　0.253 0.234　,　0.254	Depositor DCC
R_{free} test set	3033 reflections (7.65%)	wwPDB-VP
Wilson B-factor (Å^2)	61.9	Xtriage
Anisotropy	0.423	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 26.4	EDS
L-test for twinning [2]	$< |L| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9975	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.15% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 (i)

5.1   Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: CL, GOL, NA

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	0.40	0/2058	0.61	0/2811
1	B	0.42	0/2041	0.61	0/2788
1	C	0.41	0/2054	0.60	0/2806
1	D	0.44	0/2035	0.61	0/2781
1	E	0.41	0/1990	0.60	0/2721
All	All	0.42	0/10178	0.60	0/13907

There are no bond length outliers.

There are no bond angle outliers.

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	2009	0	1979	32	0
1	B	1992	0	1967	32	0
1	C	2005	0	1975	33	2
1	D	1987	0	1960	32	0
1	E	1942	0	1926	34	2
2	A	6	0	8	0	0
2	B	6	0	8	0	0
2	C	6	0	8	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	6	0	8	0	0
2	E	6	0	8	1	0
3	A	2	0	0	1	0
3	B	1	0	0	0	0
3	D	2	0	0	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
All	All	9975	0	9847	117	2

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 6.

All (117) 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:72:SER:HB3	1:B:189:HIS:O	1.75	0.86
1:D:72:SER:HB3	1:E:189:HIS:O	1.74	0.86
1:C:72:SER:HB3	1:D:189:HIS:O	1.76	0.84
1:A:189:HIS:O	1:E:72:SER:HB3	1.78	0.83
1:B:77:LEU:HD11	1:B:277:VAL:HG23	1.60	0.82
1:A:72:SER:H	1:B:189:HIS:HD2	1.25	0.81
1:B:72:SER:HB3	1:C:189:HIS:O	1.79	0.81
1:E:77:LEU:HD11	1:E:277:VAL:HG23	1.63	0.80
1:C:77:LEU:HD11	1:C:277:VAL:HG23	1.63	0.79
1:D:77:LEU:HD11	1:D:277:VAL:HG23	1.66	0.78
1:A:189:HIS:HD2	1:E:72:SER:H	1.31	0.77
1:C:72:SER:H	1:D:189:HIS:HD2	1.32	0.76
1:D:72:SER:H	1:E:189:HIS:HD2	1.31	0.76
1:A:77:LEU:HD11	1:A:277:VAL:HG23	1.67	0.75
1:B:72:SER:H	1:C:189:HIS:HD2	1.33	0.75
1:D:136:ILE:HD11	1:E:77:LEU:HD23	1.71	0.73
1:A:77:LEU:HD23	1:E:136:ILE:HD11	1.76	0.68
1:A:136:ILE:HD11	1:B:77:LEU:HD23	1.75	0.68
1:C:136:ILE:HD11	1:D:77:LEU:HD23	1.78	0.65
1:B:136:ILE:HD11	1:C:77:LEU:HD23	1.78	0.65
1:B:32:HIS:CE1	1:B:158:GLN:HG3	2.34	0.63
1:C:32:HIS:HB2	1:C:219:ASP:HB2	1.80	0.62
1:B:32:HIS:HE1	1:B:158:GLN:CD	2.04	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:129:LEU:HD22	1:B:281:LEU:HD21	1.85	0.59
1:C:44:LEU:HD23	1:C:44:LEU:H	1.69	0.57
1:A:221:CYS:O	1:E:241:ASN:ND2	2.39	0.56
1:E:44:LEU:H	1:E:44:LEU:HD23	1.68	0.56
1:E:129:LEU:HD22	1:E:281:LEU:HD21	1.87	0.56
1:B:44:LEU:H	1:B:44:LEU:HD23	1.71	0.56
1:C:129:LEU:HD22	1:C:281:LEU:HD21	1.87	0.56
1:C:241:ASN:ND2	1:D:221:CYS:O	2.39	0.56
1:D:44:LEU:H	1:D:44:LEU:HD23	1.70	0.56
1:D:241:ASN:ND2	1:E:221:CYS:O	2.39	0.55
1:A:44:LEU:H	1:A:44:LEU:HD23	1.71	0.55
1:D:129:LEU:HD22	1:D:281:LEU:HD21	1.87	0.55
1:A:264:ILE:HD11	1:A:287:LEU:HD11	1.89	0.55
1:C:32:HIS:CE1	1:C:158:GLN:HG3	2.42	0.55
1:C:32:HIS:ND1	1:C:158:GLN:HG3	2.22	0.54
1:D:57:LYS:HG2	1:E:190:VAL:HG13	1.90	0.54
1:A:57:LYS:HG2	1:B:190:VAL:HG13	1.91	0.53
1:B:241:ASN:ND2	1:C:221:CYS:O	2.41	0.53
1:E:99:GLN:HE21	1:E:261:ARG:HD2	1.75	0.52
1:D:264:ILE:HD11	1:D:287:LEU:HD11	1.90	0.52
1:A:129:LEU:HD22	1:A:281:LEU:HD21	1.91	0.52
1:B:264:ILE:HD11	1:B:287:LEU:HD11	1.93	0.50
1:A:276:ARG:NH1	1:B:169:GLU:OE1	2.40	0.50
1:C:99:GLN:HE21	1:C:261:ARG:HD2	1.77	0.50
1:C:264:ILE:HD11	1:C:287:LEU:HD11	1.93	0.50
1:E:264:ILE:HD11	1:E:287:LEU:HD11	1.94	0.49
1:A:57:LYS:NZ	3:A:298:CL:CL	2.82	0.49
1:C:113:ASP:OD2	1:C:293:ARG:HD3	2.12	0.49
1:C:241:ASN:HD22	1:D:222:ARG:HA	1.78	0.49
1:D:57:LYS:HE2	1:E:191:TYR:O	2.12	0.49
1:A:99:GLN:HE21	1:A:261:ARG:HD2	1.77	0.49
1:D:99:GLN:HE21	1:D:261:ARG:HD2	1.77	0.49
1:A:222:ARG:HA	1:E:241:ASN:HD22	1.77	0.48
1:B:63:ALA:O	1:B:176:GLN:HG2	2.13	0.48
1:C:57:LYS:HG2	1:D:190:VAL:HG13	1.95	0.48
1:B:99:GLN:HE21	1:B:261:ARG:HD2	1.77	0.48
1:B:63:ALA:HB3	1:B:64:GLU:OE2	2.14	0.47
1:A:72:SER:H	1:B:189:HIS:CD2	2.17	0.47
1:B:41:ALA:HA	1:B:292:ARG:HG3	1.96	0.47
1:D:41:ALA:HA	1:D:292:ARG:HG3	1.97	0.47
1:B:244:THR:HG22	1:B:245:ILE:N	2.30	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:127:LEU:HD12	1:C:282:SER:HB2	1.96	0.47
1:A:57:LYS:HE2	1:B:191:TYR:O	2.15	0.46
1:D:276:ARG:NH1	1:E:169:GLU:OE1	2.43	0.46
1:D:50:PHE:CD1	1:D:102:PRO:HB3	2.50	0.46
1:C:41:ALA:HA	1:C:292:ARG:HG3	1.98	0.46
1:C:57:LYS:HE2	1:D:191:TYR:O	2.16	0.46
1:D:241:ASN:HD22	1:E:222:ARG:HA	1.80	0.46
1:E:63:ALA:O	1:E:176:GLN:HG2	2.16	0.46
1:C:63:ALA:O	1:C:176:GLN:HG2	2.15	0.46
1:A:41:ALA:HA	1:A:292:ARG:HG3	1.97	0.46
1:E:41:ALA:HA	1:E:292:ARG:HG3	1.97	0.46
1:E:127:LEU:HD12	1:E:282:SER:HB2	1.97	0.46
1:A:244:THR:HG22	1:A:245:ILE:N	2.31	0.46
1:D:136:ILE:CD1	1:E:77:LEU:HD23	2.43	0.46
1:E:244:THR:HG22	1:E:245:ILE:N	2.31	0.45
1:C:50:PHE:CD1	1:C:102:PRO:HB3	2.52	0.44
1:B:127:LEU:HD12	1:B:282:SER:HB2	1.98	0.44
1:A:191:TYR:O	1:E:57:LYS:HE2	2.17	0.44
1:E:131:VAL:O	1:E:131:VAL:HG23	2.18	0.44
1:D:63:ALA:O	1:D:176:GLN:HG2	2.17	0.44
1:C:131:VAL:HG23	1:C:131:VAL:O	2.18	0.44
1:A:63:ALA:O	1:A:176:GLN:HG2	2.17	0.44
1:A:58:PRO:HD2	1:B:190:VAL:HG22	2.00	0.43
1:D:59:VAL:HG12	1:D:94:CYS:HB2	1.99	0.43
1:D:274:LYS:NZ	1:E:84:ASN:OD1	2.45	0.43
1:A:241:ASN:ND2	1:B:221:CYS:O	2.51	0.43
1:D:244:THR:HG22	1:D:245:ILE:N	2.33	0.43
1:B:131:VAL:HG23	1:B:131:VAL:O	2.18	0.43
1:D:131:VAL:HG23	1:D:131:VAL:O	2.18	0.43
1:D:235:PRO:HD2	1:E:229:GLY:HA3	2.01	0.43
1:D:127:LEU:HD12	1:D:282:SER:HB2	2.00	0.43
1:B:59:VAL:HG12	1:B:94:CYS:HB2	2.01	0.43
1:B:57:LYS:HE2	1:C:191:TYR:O	2.19	0.43
1:A:190:VAL:HG13	1:E:57:LYS:HG2	1.99	0.43
1:C:276:ARG:NH1	1:D:169:GLU:OE1	2.44	0.42
1:A:127:LEU:HD12	1:A:282:SER:HB2	2.01	0.42
1:B:129:LEU:CD2	1:B:281:LEU:HD21	2.50	0.42
1:B:57:LYS:HG2	1:C:190:VAL:HG13	2.01	0.42
1:E:50:PHE:CD1	1:E:102:PRO:HB3	2.55	0.42
1:A:131:VAL:O	1:A:131:VAL:HG23	2.19	0.41
1:E:131:VAL:HG21	1:E:145:ILE:HG13	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:50:PHE:CD1	1:A:102:PRO:HB3	2.55	0.41
1:A:77:LEU:HD23	1:E:136:ILE:CD1	2.49	0.41
1:C:274:LYS:NZ	1:D:84:ASN:OD1	2.50	0.41
1:E:114:MET:CE	1:E:115:LEU:H	2.34	0.41
1:B:136:ILE:CD1	1:C:77:LEU:HD23	2.50	0.41
1:C:244:THR:HG22	1:C:245:ILE:N	2.34	0.41
1:A:33:MET:HA	1:A:33:MET:HE2	2.02	0.41
1:E:137:LEU:HB2	2:E:1:GOL:O2	2.21	0.41
1:A:59:VAL:HG12	1:A:94:CYS:HB2	2.03	0.40
1:B:241:ASN:HD22	1:C:222:ARG:HA	1.87	0.40
1:A:169:GLU:OE1	1:E:276:ARG:NH1	2.41	0.40
1:C:59:VAL:HG12	1:C:94:CYS:HB2	2.02	0.40

All (2) 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)
1:C:112:CYS:SG	1:E:112:CYS:CB[8_554]	2.13	0.07
1:C:112:CYS:CB	1:E:112:CYS:SG[8_554]	2.19	0.01

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	259/267 (97%)	242 (93%)	17 (7%)	0	100	100
1	B	257/267 (96%)	240 (93%)	17 (7%)	0	100	100
1	C	259/267 (97%)	243 (94%)	16 (6%)	0	100	100
1	D	256/267 (96%)	232 (91%)	24 (9%)	0	100	100
1	E	250/267 (94%)	231 (92%)	18 (7%)	1 (0%)	30	60
All	All	1281/1335 (96%)	1188 (93%)	92 (7%)	1 (0%)	48	77

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	201	VAL

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	220/225 (98%)	200 (91%)	20 (9%)	7	25
1	B	218/225 (97%)	193 (88%)	25 (12%)	4	15
1	C	219/225 (97%)	195 (89%)	24 (11%)	5	16
1	D	218/225 (97%)	197 (90%)	21 (10%)	7	22
1	E	213/225 (95%)	193 (91%)	20 (9%)	7	23
All	All	1088/1125 (97%)	978 (90%)	110 (10%)	6	20

All (110) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	33	MET
1	A	36	VAL
1	A	44	LEU
1	A	47	GLU
1	A	52	VAL
1	A	54	LEU
1	A	72	SER
1	A	85	VAL
1	A	129	LEU
1	A	132	LEU
1	A	137	LEU
1	A	139	THR
1	A	169	GLU
1	A	190	VAL
1	A	222	ARG
1	A	224	PHE
1	A	227	MET

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Mol	Chain	Res	Type
1	A	250	GLU
1	A	259	GLN
1	A	281	LEU
1	B	33	MET
1	B	36	VAL
1	B	44	LEU
1	B	47	GLU
1	B	52	VAL
1	B	54	LEU
1	B	64	GLU
1	B	72	SER
1	B	85	VAL
1	B	105	ILE
1	B	129	LEU
1	B	132	LEU
1	B	137	LEU
1	B	169	GLU
1	B	183	THR
1	B	184	ASN
1	B	190	VAL
1	B	193	SER
1	B	222	ARG
1	B	224	PHE
1	B	227	MET
1	B	250	GLU
1	B	259	GLN
1	B	281	LEU
1	B	296	ASN
1	C	36	VAL
1	C	44	LEU
1	C	47	GLU
1	C	52	VAL
1	C	54	LEU
1	C	64	GLU
1	C	72	SER
1	C	85	VAL
1	C	112	CYS
1	C	113	ASP
1	C	114	MET
1	C	116	ILE
1	C	129	LEU
1	C	132	LEU

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Mol	Chain	Res	Type
1	C	137	LEU
1	C	139	THR
1	C	169	GLU
1	C	190	VAL
1	C	222	ARG
1	C	224	PHE
1	C	227	MET
1	C	250	GLU
1	C	259	GLN
1	C	281	LEU
1	D	36	VAL
1	D	37	ASP
1	D	44	LEU
1	D	47	GLU
1	D	52	VAL
1	D	54	LEU
1	D	72	SER
1	D	85	VAL
1	D	112	CYS
1	D	129	LEU
1	D	132	LEU
1	D	137	LEU
1	D	169	GLU
1	D	183	THR
1	D	190	VAL
1	D	222	ARG
1	D	224	PHE
1	D	227	MET
1	D	250	GLU
1	D	259	GLN
1	D	281	LEU
1	E	44	LEU
1	E	47	GLU
1	E	52	VAL
1	E	54	LEU
1	E	64	GLU
1	E	72	SER
1	E	85	VAL
1	E	129	LEU
1	E	132	LEU
1	E	137	LEU
1	E	169	GLU

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Mol	Chain	Res	Type
1	E	183	THR
1	E	190	VAL
1	E	193	SER
1	E	222	ARG
1	E	224	PHE
1	E	227	MET
1	E	250	GLU
1	E	259	GLN
1	E	281	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	99	GLN
1	A	189	HIS
1	A	241	ASN
1	A	273	ASN
1	B	32	HIS
1	B	99	GLN
1	B	189	HIS
1	B	241	ASN
1	C	99	GLN
1	C	189	HIS
1	C	241	ASN
1	D	99	GLN
1	D	189	HIS
1	D	241	ASN
1	D	273	ASN
1	E	99	GLN
1	E	184	ASN
1	E	189	HIS
1	E	241	ASN

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 ⓘ

Of 15 ligands modelled in this entry, 10 are monoatomic - leaving 5 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	B	1	-	5,5,5	0.40	0	5,5,5	0.54	0
2	GOL	C	1	-	5,5,5	0.37	0	5,5,5	0.47	0
2	GOL	A	1	-	5,5,5	0.30	0	5,5,5	0.52	0
2	GOL	E	1	-	5,5,5	0.37	0	5,5,5	0.45	0
2	GOL	D	1	-	5,5,5	0.36	0	5,5,5	0.37	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	B	1	-	-	0/4/4/4	-
2	GOL	C	1	-	-	2/4/4/4	-
2	GOL	A	1	-	-	2/4/4/4	-
2	GOL	E	1	-	-	0/4/4/4	-
2	GOL	D	1	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1	GOL	O1-C1-C2-C3
2	C	1	GOL	O1-C1-C2-C3
2	D	1	GOL	O1-C1-C2-C3
2	A	1	GOL	O1-C1-C2-O2
2	D	1	GOL	O1-C1-C2-O2
2	C	1	GOL	O1-C1-C2-O2

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	1	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, 95th 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	263/267 (98%)	0.08	5 (1%)	66	60	36, 58, 84, 100	0
1	B	261/267 (97%)	0.06	5 (1%)	66	60	36, 58, 83, 100	0
1	C	263/267 (98%)	0.06	2 (0%)	82	78	36, 58, 83, 100	0
1	D	260/267 (97%)	0.22	10 (3%)	44	38	36, 58, 81, 100	0
1	E	254/267 (95%)	0.01	5 (1%)	64	58	36, 58, 81, 100	0
All	All	1301/1335 (97%)	0.09	27 (2%)	63	57	36, 58, 83, 100	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	31	SER	4.6
1	E	44	LEU	3.6
1	A	31	SER	3.2
1	B	44	LEU	3.1
1	B	106	PRO	3.1
1	D	110	SER	3.1
1	A	183	THR	3.0
1	D	224	PHE	2.6
1	C	44	LEU	2.6
1	E	183	THR	2.5
1	D	295	ARG	2.5
1	A	295	ARG	2.4
1	D	143	GLY	2.4
1	E	37	ASP	2.4
1	E	111	GLU	2.4
1	B	111	GLU	2.3
1	D	64	GLU	2.3
1	E	224	PHE	2.3
1	B	183	THR	2.3
1	A	224	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	183	THR	2.2
1	D	35	GLY	2.2
1	B	224	PHE	2.1
1	A	44	LEU	2.1
1	D	44	LEU	2.1
1	D	63	ALA	2.1
1	D	107	ASN	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 ⓘ

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, 95th 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	E	1	6/6	0.63	0.19	76,77,78,78	0
2	GOL	D	1	6/6	0.66	0.18	70,71,72,72	0
3	CL	D	298	1/1	0.76	0.18	80,80,80,80	0
2	GOL	A	1	6/6	0.78	0.20	73,74,74,75	0
2	GOL	C	1	6/6	0.79	0.20	75,75,76,76	0
2	GOL	B	1	6/6	0.79	0.22	70,71,71,71	0
3	CL	A	297	1/1	0.80	0.18	84,84,84,84	0
3	CL	A	298	1/1	0.81	0.17	76,76,76,76	0
3	CL	D	297	1/1	0.84	0.16	75,75,75,75	0
3	CL	B	297	1/1	0.85	0.19	78,78,78,78	0
4	NA	A	299	1/1	0.91	0.15	44,44,44,44	0
4	NA	B	298	1/1	0.92	0.21	48,48,48,48	0
4	NA	C	297	1/1	0.95	0.11	36,36,36,36	0
4	NA	D	299	1/1	0.96	0.17	38,38,38,38	0
4	NA	E	297	1/1	0.96	0.19	37,37,37,37	0

6.5 Other polymers ⓘ

There are no such residues in this entry.