



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 13, 2018 – 03:26 pm GMT

PDB ID : 4TVP
Title : Crystal Structure of the HIV-1 BG505 SOSIP.664 Env Trimer Ectodomain, Comprising Atomic-Level Definition of Pre-Fusion gp120 and gp41, in Complex with Human Antibodies PGT122 and 35O22
Authors : Pancera, M.; Zhou, T.; Kwong, P.D.
Deposited on : 2014-06-27
Resolution : 3.10 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 ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.3 (157068), CSD as539be (2018)
Xtriage (Phenix) : 1.13
EDS : trunk31020
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk31020

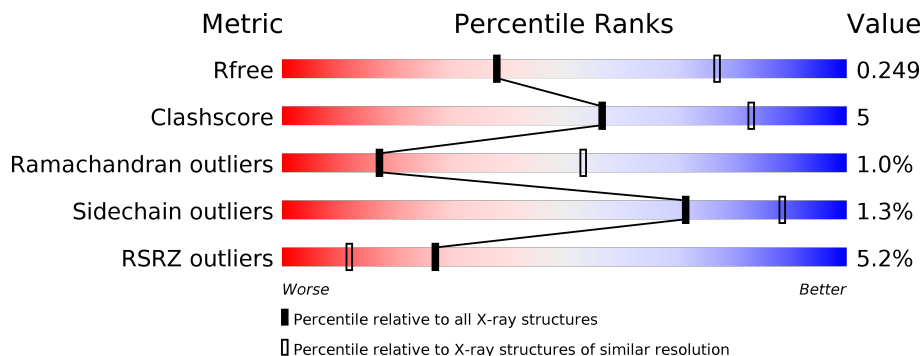
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.10 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}	111664	1115 (3.12-3.08)
Clashscore	122126	1042 (3.10-3.10)
Ramachandran outliers	120053	1010 (3.10-3.10)
Sidechain outliers	120020	1010 (3.10-3.10)
RSRZ outliers	108989	1089 (3.12-3.08)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	G	481	<div style="display: flex; align-items: center;"> <div style="width: 10%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 15%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">78% 15% 6%</p>
2	B	153	<div style="display: flex; align-items: center;"> <div style="width: 10%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 66%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 18%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">66% 14% 18%</p>
3	L	213	<div style="display: flex; align-items: center;"> <div style="width: 81%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">81% 17% ..</p>
4	H	235	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 81%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 16%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">81% 16% .</p>
5	D	243	<div style="display: flex; align-items: center;"> <div style="width: 15%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 88%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">15% 88% 12%</p>
6	E	216	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 86%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">12% 86% 13% .</p>

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
10	SO4	G	606	-	-	-	X
7	NAG	G	1387	-	-	-	X
9	MAN	G	1140	-	-	-	X

2 Entry composition [i](#)

There are 11 unique types of molecules in this entry. The entry contains 12188 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 Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	G	453	3565	2236	630	671	28	0	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	332	ASN	THR	engineered mutation	UNP Q2N0S5
G	501	CYS	ALA	engineered mutation	UNP Q2N0S5
G	509	ARG	-	expression tag	UNP Q2N0S5
G	510	ARG	-	expression tag	UNP Q2N0S5
G	511	ARG	-	expression tag	UNP Q2N0S5
G	512	ARG	-	expression tag	UNP Q2N0S5
G	513	ARG	-	expression tag	UNP Q2N0S5

- Molecule 2 is a protein called Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	126	1001	633	172	190	6	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	559	PRO	ILE	engineered mutation	UNP Q2N0S5
B	605	CYS	THR	engineered mutation	UNP Q2N0S5

- Molecule 3 is a protein called PGT122 Light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	210	1589	998	267	320	4	0	0	0

- Molecule 4 is a protein called PGT122 Heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	H	228	Total 1742	C 1109	N 295	O 333	S 5	0	0	0

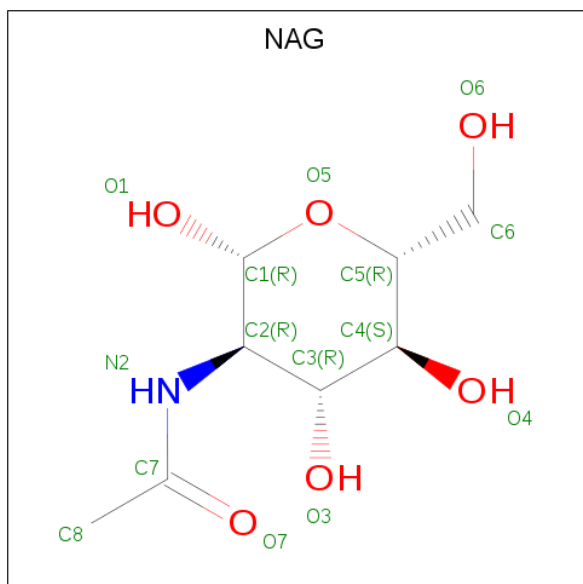
- Molecule 5 is a protein called 35O22 Heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	D	242	Total 1832	C 1165	N 306	O 353	S 8	0	0	0

- Molecule 6 is a protein called 35O22 Light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	E	213	Total 1615	C 1012	N 267	O 328	S 8	0	0	0

- Molecule 7 is N-ACETYL-D-GLUCOSAMINE (three-letter code: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
7	G	1	Total 14	C 8	N 1	O 5	0	0
7	G	1	Total 14	C 8	N 1	O 5	0	0
7	G	1	Total 14	C 8	N 1	O 5	0	0

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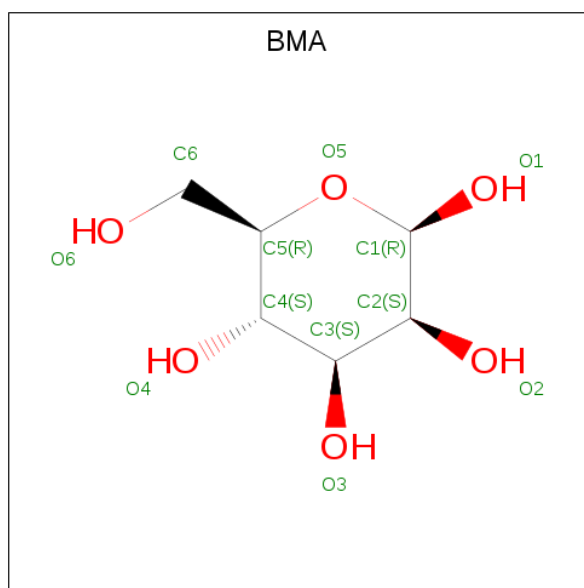
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		

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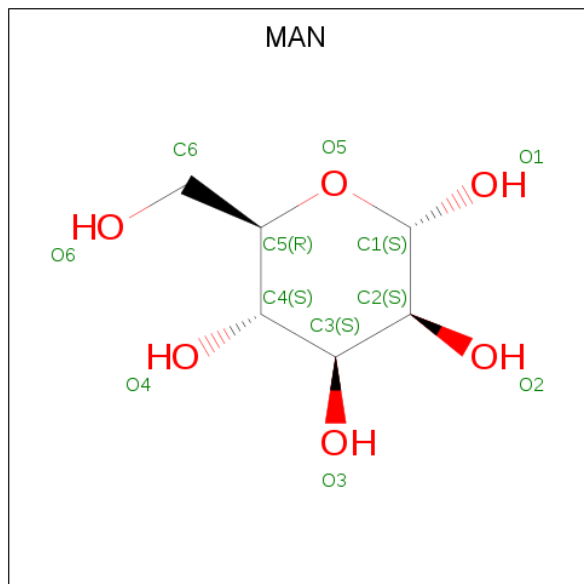
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	G	1	Total	C	N	O	0	0
			14	8	1	5		
7	B	1	Total	C	N	O	0	0
			14	8	1	5		
7	B	1	Total	C	N	O	0	0
			14	8	1	5		
7	B	1	Total	C	N	O	0	0
			14	8	1	5		
7	H	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 8 is BETA-D-MANNOSE (three-letter code: BMA) (formula: C₆H₁₂O₆).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	G	1	Total C O 11 6 5	0	0
8	G	1	Total C O 11 6 5	0	0
8	G	1	Total C O 11 6 5	0	0
8	G	1	Total C O 11 6 5	0	0
8	G	1	Total C O 11 6 5	0	0
8	G	1	Total C O 11 6 5	0	0

- Molecule 9 is ALPHA-D-MANNOSE (three-letter code: MAN) (formula: C₆H₁₂O₆).



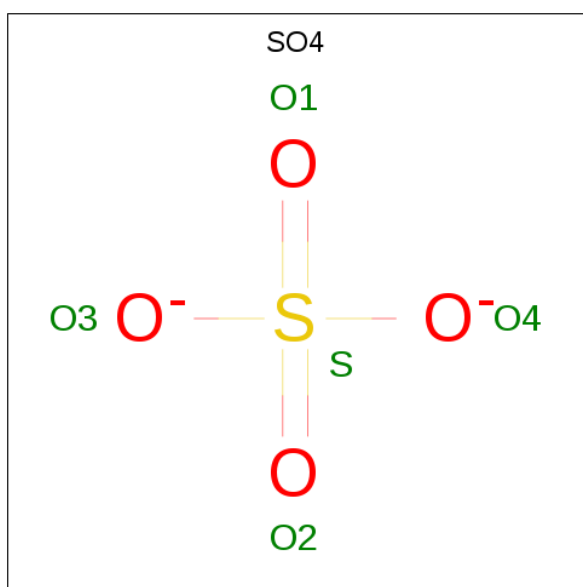
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	G	1	Total C O 11 6 5	0	0
9	G	1	Total C O 11 6 5	0	0
9	G	1	Total C O 11 6 5	0	0
9	G	1	Total C O 11 6 5	0	0
9	G	1	Total C O 11 6 5	0	0
9	G	1	Total C O 11 6 5	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		
9	G	1	Total	C	O	0	0
			11	6	5		

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	G	1	Total O S 5 4 1	0	0
10	B	1	Total O S 5 4 1	0	0
10	B	1	Total O S 5 4 1	0	0
10	L	1	Total O S 5 4 1	0	0

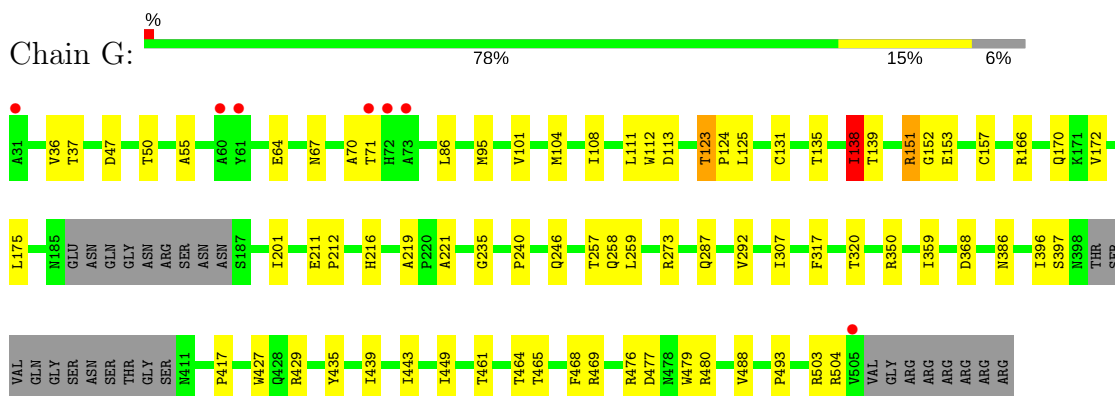
- Molecule 11 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	G	17	Total O 17 17	0	0
11	B	2	Total O 2 2	0	0
11	L	3	Total O 3 3	0	0
11	H	2	Total O 2 2	0	0
11	D	11	Total O 11 11	0	0
11	E	2	Total O 2 2	0	0

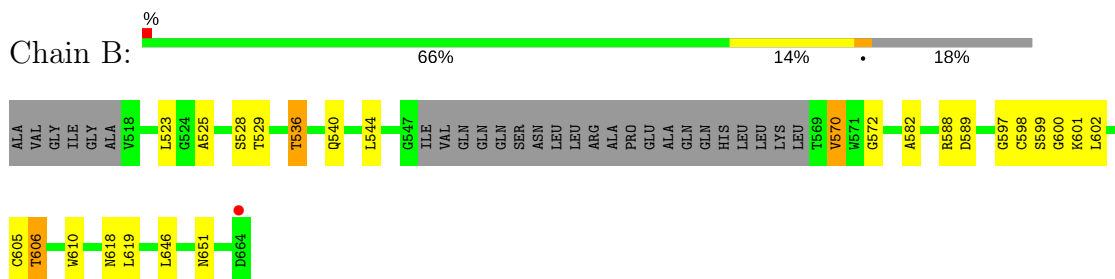
3 Residue-property plots [i](#)

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

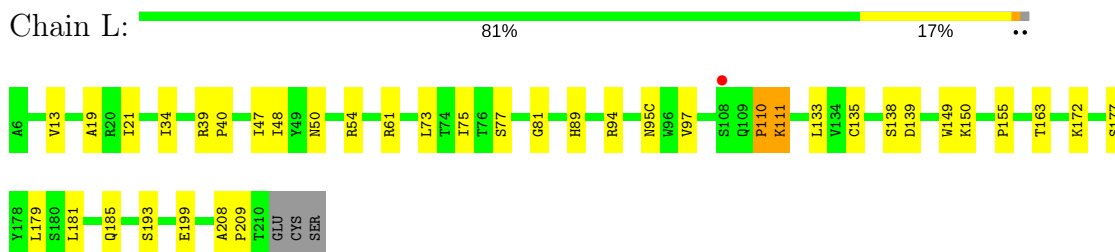
- Molecule 1: Envelope glycoprotein gp160



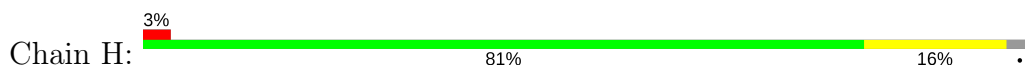
- Molecule 2: Envelope glycoprotein gp160

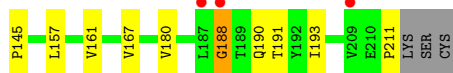


- Molecule 3: PGT122 Light chain

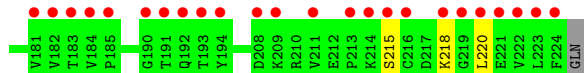
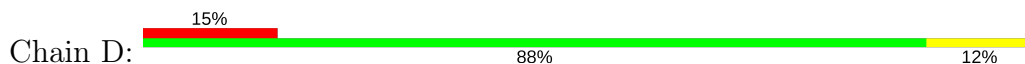


- Molecule 4: PGT122 Heavy chain

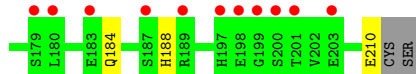
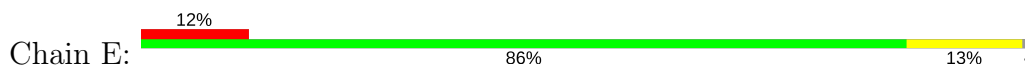




• Molecule 5: 35O22 Heavy chain



• Molecule 6: 35O22 Light chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 63	Depositor
Cell constants a, b, c, α , β , γ	128.89Å 128.89Å 313.42Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.74 – 3.10 40.74 – 3.10	Depositor EDS
% Data completeness (in resolution range)	55.0 (40.74-3.10) 55.1 (40.74-3.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.51 (at 3.12Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: dev_1702)	Depositor
R, R_{free}	0.213 , 0.248 0.216 , 0.249	Depositor DCC
R_{free} test set	1451 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	76.8	Xtrriage
Anisotropy	0.028	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.24 , 56.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.086 for h,-h-k,-l	Xtrriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	12188	wwPDB-VP
Average B, all atoms (Å ²)	109.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.14% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: SO4, BMA, NAG, MAN

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	G	0.21	0/3639	0.40	0/4941
2	B	0.20	0/1019	0.37	0/1382
3	L	0.20	0/1632	0.39	0/2236
4	H	0.20	0/1789	0.38	0/2443
5	D	0.20	0/1880	0.37	0/2560
6	E	0.20	0/1659	0.37	0/2269
All	All	0.20	0/11618	0.39	0/15831

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	G	3565	0	3495	43	0
2	B	1001	0	975	15	0
3	L	1589	0	1530	22	0
4	H	1742	0	1715	21	0
5	D	1832	0	1806	16	0
6	E	1615	0	1542	16	0
7	B	42	0	39	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	G	448	0	396	6	0
7	H	14	0	13	0	0
8	G	66	0	51	1	0
9	G	187	0	162	5	0
10	B	10	0	0	1	0
10	G	35	0	0	2	0
10	L	5	0	0	0	0
11	B	2	0	0	0	0
11	D	11	0	0	0	0
11	E	2	0	0	0	0
11	G	17	0	0	0	0
11	H	2	0	0	0	0
11	L	3	0	0	0	0
All	All	12188	0	11724	128	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 5.

All (128) 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:G:70:ALA:HB2	1:G:111:LEU:HD11	1.69	0.75
1:G:55:ALA:HB3	1:G:216:HIS:HB2	1.71	0.71
6:E:37:GLN:HB2	6:E:47:ILE:HD11	1.74	0.68
1:G:350:ARG:NH2	1:G:396:ILE:O	2.27	0.66
5:D:6:GLN:H	5:D:105:GLN:HE22	1.43	0.66
2:B:536:THR:O	2:B:540:GLN:NE2	2.29	0.66
3:L:110:PRO:HG2	3:L:111:LYS:HD2	1.79	0.64
5:D:12:LYS:HG3	5:D:18:VAL:HB	1.80	0.63
1:G:219:ALA:O	1:G:246:GLN:NE2	2.31	0.63
3:L:163:THR:HG22	4:H:167:VAL:HB	1.81	0.62
3:L:47:ILE:HG22	3:L:48:ILE:HG13	1.80	0.62
1:G:37:THR:HG22	2:B:605:CYS:HA	1.81	0.62
4:H:99:ARG:HG2	4:H:100(L):THR:HG22	1.83	0.60
3:L:181:LEU:HD22	3:L:185:GLN:HG2	1.83	0.60
1:G:201:ILE:HD11	1:G:435:TYR:HB2	1.82	0.60
3:L:139:ASP:H	3:L:172:LYS:HG3	1.67	0.59
3:L:39:ARG:NH1	3:L:81:GLY:O	2.35	0.59
1:G:166:ARG:NH2	10:G:606:SO4:O2	2.34	0.59
1:G:464:THR:OG1	1:G:465:THR:N	2.34	0.58
7:G:1332:NAG:H2	4:H:100(D):VAL:HA	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:113:ASP:OD1	1:G:429:ARG:NH1	2.37	0.58
2:B:588:ARG:NH2	10:B:701:SO4:O3	2.37	0.57
1:G:292:VAL:HB	1:G:449:ILE:HB	1.85	0.57
7:G:1161:NAG:H83	7:G:1161:NAG:H3	1.87	0.57
5:D:100(E):LEU:HD12	5:D:100(F):PRO:HD2	1.87	0.57
7:G:1089:NAG:H3	7:G:1089:NAG:H83	1.87	0.56
3:L:39:ARG:HG3	3:L:40:PRO:HD2	1.87	0.56
7:G:1276:NAG:H3	7:G:1276:NAG:H83	1.88	0.55
5:D:128:SER:HB2	5:D:220:LEU:HB2	1.89	0.55
1:G:469:ARG:NH2	10:G:602:SO4:O4	2.40	0.55
5:D:4:LEU:HG	5:D:24:THR:HG22	1.90	0.54
1:G:36:VAL:HG12	2:B:610:TRP:HE3	1.74	0.53
6:E:127:ALA:N	6:E:128:ASN:HA	2.22	0.53
5:D:126:PRO:HB2	5:D:215:SER:HB2	1.91	0.53
1:G:257:THR:O	1:G:259:LEU:N	2.40	0.52
4:H:30:ARG:HD3	4:H:73:LYS:HD2	1.91	0.52
5:D:218:LYS:NZ	6:E:210:GLU:OE1	2.42	0.52
6:E:84:THR:OG1	6:E:85:THR:N	2.41	0.52
5:D:87:THR:HG23	5:D:110:THR:HA	1.92	0.52
3:L:97:VAL:HG22	4:H:46:GLU:HG3	1.93	0.51
1:G:175:LEU:HB3	1:G:320:THR:HB	1.92	0.51
4:H:188:GLY:HA3	4:H:190:GLN:N	2.26	0.51
2:B:529:THR:HG23	5:D:98:ARG:HD2	1.93	0.50
1:G:359:ILE:HD12	1:G:468:PHE:HE2	1.76	0.50
5:D:11:LEU:HD13	5:D:147:PRO:HG3	1.94	0.50
2:B:618:ASN:OD1	2:B:619:LEU:N	2.43	0.50
7:G:1160:NAG:H62	7:G:1161:NAG:H82	1.94	0.49
6:E:113:PRO:HB3	6:E:139:PHE:HB3	1.93	0.49
4:H:63:LEU:HD22	4:H:66:ARG:HH21	1.78	0.49
1:G:240:PRO:HG3	5:D:72(D):PRO:HG2	1.93	0.49
1:G:477:ASP:OD1	1:G:480:ARG:NH1	2.46	0.49
7:B:1618:NAG:H83	6:E:54:ARG:HH21	1.78	0.49
1:G:439:ILE:HB	1:G:443:ILE:HD11	1.95	0.49
3:L:150:LYS:HB2	3:L:193:SER:HB2	1.95	0.49
6:E:24:THR:OG1	6:E:25:GLY:N	2.45	0.49
3:L:133:LEU:HD12	3:L:179:LEU:HD23	1.95	0.49
2:B:588:ARG:NH1	2:B:589:ASP:OD1	2.46	0.48
4:H:117:PRO:HB3	4:H:143:TYR:HB3	1.94	0.48
3:L:61:ARG:HD2	3:L:77:SER:HB2	1.95	0.48
3:L:149:TRP:HE1	3:L:177:SER:HG	1.62	0.48
2:B:598:CYS:O	2:B:600:GLY:N	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:191:THR:HG22	4:H:193:ILE:HG13	1.96	0.47
1:G:476:ARG:HA	1:G:479:TRP:CD1	2.49	0.47
1:G:221:ALA:HB3	2:B:582:ALA:HB1	1.96	0.47
1:G:170:GLN:HG2	1:G:172:VAL:HG13	1.96	0.47
1:G:95:MET:SD	1:G:273:ARG:HD3	2.55	0.47
4:H:100(D):VAL:O	4:H:100(F):ALA:N	2.43	0.47
4:H:53:ASP:OD1	4:H:54:SER:N	2.42	0.46
5:D:47:TRP:CZ2	5:D:49:GLY:HA2	2.51	0.46
1:G:386:ASN:HB3	1:G:417:PRO:HD2	1.97	0.46
5:D:144:ASP:H	5:D:177:SER:HG	1.62	0.46
1:G:123:THR:HG23	1:G:124:PRO:HD3	1.97	0.46
1:G:138:ILE:CB	1:G:139:THR:HA	2.46	0.46
2:B:525:ALA:HB1	2:B:528:SER:HB2	1.97	0.45
5:D:96:LEU:HG	5:D:97:LEU:HG	1.98	0.45
1:G:138:ILE:HB	1:G:139:THR:HA	1.98	0.45
3:L:138:SER:HB2	3:L:172:LYS:HE2	1.99	0.45
1:G:101:VAL:HG13	1:G:479:TRP:HB2	1.99	0.45
1:G:101:VAL:HG21	1:G:480:ARG:HG2	1.98	0.45
4:H:20:LEU:HD12	4:H:80:LEU:HD22	1.98	0.45
3:L:150:LYS:HD3	3:L:155:PRO:HA	1.99	0.45
6:E:153:SER:HA	6:E:154:PRO:HD2	1.76	0.44
4:H:144:PHE:HA	4:H:145:PRO:HA	1.78	0.44
2:B:606:THR:HG21	2:B:646:LEU:HD22	1.98	0.44
9:G:1140:MAN:H62	4:H:100(L):THR:HG21	1.99	0.44
1:G:135:THR:O	3:L:94:ARG:NE	2.42	0.44
3:L:21:ILE:HB	3:L:73:LEU:HB3	1.98	0.44
6:E:4:LEU:HB3	6:E:99:GLY:HA2	1.99	0.43
4:H:161:VAL:HG22	4:H:180:VAL:HG22	2.00	0.43
4:H:16:GLU:HG2	4:H:17:THR:H	1.82	0.43
6:E:38:TRP:CG	6:E:44:PRO:HB3	2.53	0.43
4:H:22:CYS:HB3	4:H:78:VAL:HB	2.01	0.43
3:L:19:ALA:HB3	3:L:75:ILE:HB	1.99	0.43
2:B:570:VAL:C	2:B:572:GLY:H	2.22	0.43
6:E:184:GLN:O	6:E:188:HIS:ND1	2.47	0.43
4:H:157:LEU:HD21	4:H:180:VAL:HG11	2.00	0.43
5:D:126:PRO:O	5:D:215:SER:OG	2.31	0.42
6:E:27(C):CYS:HA	6:E:28:CYS:HA	1.58	0.42
1:G:493:PRO:HG3	2:B:544:LEU:HD21	2.00	0.42
4:H:13:LYS:NZ	4:H:112:ALA:O	2.52	0.42
9:G:1093:MAN:H2	6:E:94:ASN:HD21	1.85	0.42
3:L:13:VAL:HG21	3:L:19:ALA:HA	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:G:1090:BMA:H61	9:G:1092:MAN:H2	1.29	0.42
9:G:1091:MAN:H2	6:E:93:HIS:CG	2.55	0.42
1:G:396:ILE:HG22	1:G:397:SER:H	1.84	0.42
1:G:86:LEU:HD22	2:B:523:LEU:O	2.20	0.41
3:L:135:CYS:HB3	3:L:177:SER:HB3	2.01	0.41
9:G:1336:MAN:H2	9:G:1340:MAN:H2	1.86	0.41
1:G:503:ARG:HB3	1:G:504:ARG:H	1.76	0.41
3:L:208:ALA:HA	3:L:209:PRO:HD3	1.88	0.41
1:G:131:CYS:HA	1:G:157:CYS:HA	2.02	0.41
1:G:211:GLU:HA	1:G:212:PRO:HD3	1.90	0.41
1:G:273:ARG:NH1	1:G:287:GLN:OE1	2.52	0.41
1:G:138:ILE:HB	7:G:1137:NAG:H61	2.03	0.41
3:L:34:ILE:HD13	3:L:50:ASN:H	1.86	0.41
6:E:46:LEU:HG	6:E:55:ALA:HB2	2.03	0.41
1:G:151:ARG:O	1:G:153:GLU:N	2.54	0.41
1:G:307:ILE:HD11	1:G:317:PHE:HD2	1.86	0.41
4:H:124:PRO:HD2	4:H:211:PRO:HA	2.02	0.41
1:G:50:THR:HG22	1:G:488:VAL:HG11	2.03	0.41
3:L:89:HIS:NE2	3:L:95(C):ASN:O	2.38	0.41
5:D:139:GLY:HA2	5:D:154:TRP:CZ2	2.56	0.40
7:B:1618:NAG:H4	6:E:53:GLU:HG2	2.04	0.40
1:G:112:TRP:CG	1:G:427:TRP:HZ3	2.39	0.40
4:H:100(P):MET:SD	4:H:100(P):MET:N	2.94	0.40
2:B:597:GLY:HA2	2:B:651:ASN:HD21	1.87	0.40
1:G:95:MET:SD	1:G:235:GLY:HA3	2.61	0.40
1:G:104:MET:O	1:G:108:ILE:HG12	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	447/481 (93%)	405 (91%)	35 (8%)	7 (2%)	11	41
2	B	122/153 (80%)	108 (88%)	11 (9%)	3 (2%)	6	30
3	L	208/213 (98%)	196 (94%)	10 (5%)	2 (1%)	17	53
4	H	224/235 (95%)	211 (94%)	11 (5%)	2 (1%)	19	56
5	D	240/243 (99%)	228 (95%)	12 (5%)	0	100	100
6	E	211/216 (98%)	197 (93%)	14 (7%)	0	100	100
All	All	1452/1541 (94%)	1345 (93%)	93 (6%)	14 (1%)	17	53

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	G	138	ILE
3	L	110	PRO
1	G	71	THR
1	G	152	GLY
2	B	602	LEU
1	G	151	ARG
1	G	258	GLN
3	L	199	GLU
4	H	142	ASP
1	G	64	GLU
1	G	67	ASN
2	B	599	SER
2	B	601	LYS
4	H	188	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	G	404/428 (94%)	398 (98%)	6 (2%)	67	87
2	B	108/129 (84%)	105 (97%)	3 (3%)	47	77
3	L	178/181 (98%)	176 (99%)	2 (1%)	76	90

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	H	198/205 (97%)	195 (98%)	3 (2%)	67	87
5	D	205/206 (100%)	204 (100%)	1 (0%)	90	95
6	E	186/189 (98%)	185 (100%)	1 (0%)	90	95
All	All	1279/1338 (96%)	1263 (99%)	16 (1%)	71	88

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	47	ASP
1	G	123	THR
1	G	125	LEU
1	G	138	ILE
1	G	368	ASP
1	G	461	THR
2	B	536	THR
2	B	570	VAL
2	B	606	THR
3	L	54	ARG
3	L	111	LYS
4	H	23	ASN
4	H	100(J)	TRP
4	H	139	LEU
5	D	80	MET
6	E	96	CYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry

69 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
7	NAG	B	1611	2	14,14,15	0.23	0	17,19,21	0.46	0
7	NAG	B	1618	2	14,14,15	0.21	0	17,19,21	0.40	0
7	NAG	B	1637	2	14,14,15	0.25	0	17,19,21	0.46	0
10	SO4	B	701	-	4,4,4	0.16	0	6,6,6	0.07	0
10	SO4	B	702	-	4,4,4	0.16	0	6,6,6	0.07	0
7	NAG	G	1088	1,7	14,14,15	0.33	0	17,19,21	0.45	0
7	NAG	G	1089	8,7	14,14,15	0.43	0	17,19,21	1.26	1 (5%)
8	BMA	G	1090	9,7	11,11,12	0.67	0	15,15,17	0.79	0
9	MAN	G	1091	8	11,11,12	0.65	0	15,15,17	1.22	2 (13%)
9	MAN	G	1092	9,8	11,11,12	0.83	1 (9%)	15,15,17	1.32	3 (20%)
9	MAN	G	1093	9	11,11,12	0.62	0	15,15,17	1.10	2 (13%)
9	MAN	G	1094	9	11,11,12	0.70	0	15,15,17	1.03	2 (13%)
7	NAG	G	1133	1	14,14,15	0.24	0	17,19,21	0.44	0
7	NAG	G	1137	1,7	14,14,15	0.44	0	17,19,21	0.51	0
7	NAG	G	1138	8,7	14,14,15	0.40	0	17,19,21	0.42	0
8	BMA	G	1139	9,7	11,11,12	0.53	0	15,15,17	0.81	0
9	MAN	G	1140	8	11,11,12	0.68	0	15,15,17	1.07	2 (13%)
7	NAG	G	1156	1,7	14,14,15	0.25	0	17,19,21	0.42	0
7	NAG	G	1157	8,7	14,14,15	0.22	0	17,19,21	0.42	0
8	BMA	G	1158	9,7	11,11,12	0.60	0	15,15,17	0.79	0
9	MAN	G	1159	8	11,11,12	0.71	0	15,15,17	1.07	2 (13%)
7	NAG	G	1160	1,7	14,14,15	0.28	0	17,19,21	0.49	0
7	NAG	G	1161	7	14,14,15	0.45	0	17,19,21	1.24	1 (5%)
9	MAN	G	1169	8	11,11,12	0.69	0	15,15,17	1.12	2 (13%)
7	NAG	G	1197	1,7	14,14,15	0.21	0	17,19,21	0.46	0
7	NAG	G	1198	7	14,14,15	0.21	0	17,19,21	0.45	0
7	NAG	G	1234	1,7	14,14,15	0.17	0	17,19,21	0.46	0
7	NAG	G	1235	7	14,14,15	0.21	0	17,19,21	0.43	0
7	NAG	G	1262	1,7	14,14,15	0.24	0	17,19,21	0.52	0
7	NAG	G	1263	8,7	14,14,15	0.33	0	17,19,21	0.47	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	BMA	G	1264	9,7	11,11,12	0.66	0	15,15,17	0.72	0
9	MAN	G	1265	8	11,11,12	0.64	0	15,15,17	1.12	2 (13%)
9	MAN	G	1268	9,8	11,11,12	0.69	0	15,15,17	1.06	2 (13%)
9	MAN	G	1269	9	11,11,12	0.77	0	15,15,17	1.21	2 (13%)
7	NAG	G	1276	1	14,14,15	0.44	0	17,19,21	1.25	2 (11%)
7	NAG	G	1295	1,7	14,14,15	0.26	0	17,19,21	0.51	0
7	NAG	G	1296	7	14,14,15	0.19	0	17,19,21	0.46	0
7	NAG	G	1301	1,7	14,14,15	0.19	0	17,19,21	0.44	0
7	NAG	G	1302	7	14,14,15	0.23	0	17,19,21	0.46	0
7	NAG	G	1331	1,7	14,14,15	0.26	0	17,19,21	0.44	0
7	NAG	G	1332	8,7	14,14,15	0.30	0	17,19,21	0.56	0
8	BMA	G	1333	9,7	11,11,12	0.76	0	15,15,17	1.28	3 (20%)
9	MAN	G	1334	9,8	11,11,12	0.80	0	15,15,17	1.02	2 (13%)
9	MAN	G	1335	9	11,11,12	0.72	0	15,15,17	1.03	2 (13%)
9	MAN	G	1336	9	11,11,12	0.70	0	15,15,17	1.03	2 (13%)
9	MAN	G	1337	9,8	11,11,12	0.63	0	15,15,17	1.13	2 (13%)
9	MAN	G	1338	9	11,11,12	0.59	0	15,15,17	1.05	1 (6%)
9	MAN	G	1339	9	11,11,12	0.60	0	15,15,17	1.41	3 (20%)
9	MAN	G	1340	9	11,11,12	0.80	0	15,15,17	1.19	2 (13%)
7	NAG	G	1355	1	14,14,15	0.22	0	17,19,21	0.43	0
7	NAG	G	1363	1,7	14,14,15	0.22	0	17,19,21	0.43	0
7	NAG	G	1364	7	14,14,15	0.20	0	17,19,21	0.48	0
7	NAG	G	1386	1,7	14,14,15	0.22	0	17,19,21	0.64	0
7	NAG	G	1387	7	14,14,15	0.22	0	17,19,21	0.45	0
7	NAG	G	1392	1,7	14,14,15	0.25	0	17,19,21	0.49	0
7	NAG	G	1393	7	14,14,15	0.30	0	17,19,21	0.50	0
7	NAG	G	1448	1,7	14,14,15	0.19	0	17,19,21	0.54	0
7	NAG	G	1449	8,7	14,14,15	0.25	0	17,19,21	0.41	0
8	BMA	G	1450	7	11,11,12	0.56	0	15,15,17	0.87	0
7	NAG	G	1839	1	14,14,15	0.25	0	17,19,21	0.44	0
10	SO4	G	601	-	4,4,4	0.16	0	6,6,6	0.07	0
10	SO4	G	602	-	4,4,4	0.15	0	6,6,6	0.07	0
10	SO4	G	603	-	4,4,4	0.16	0	6,6,6	0.07	0
10	SO4	G	604	-	4,4,4	0.16	0	6,6,6	0.08	0
10	SO4	G	605	-	4,4,4	0.16	0	6,6,6	0.07	0
10	SO4	G	606	-	4,4,4	0.19	0	6,6,6	0.18	0
10	SO4	G	607	-	4,4,4	0.16	0	6,6,6	0.07	0
7	NAG	H	523	4	14,14,15	0.24	0	17,19,21	0.44	0
10	SO4	L	301	-	4,4,4	0.15	0	6,6,6	0.08	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
7	NAG	B	1611	2	-	0/6/23/26	0/1/1/1
7	NAG	B	1618	2	-	0/6/23/26	0/1/1/1
7	NAG	B	1637	2	-	0/6/23/26	0/1/1/1
10	SO4	B	701	-	-	0/0/0/0	0/0/0/0
10	SO4	B	702	-	-	0/0/0/0	0/0/0/0
7	NAG	G	1088	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1089	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1090	9,7	-	0/2/19/22	0/1/1/1
9	MAN	G	1091	8	-	0/2/19/22	0/1/1/1
9	MAN	G	1092	9,8	-	0/2/19/22	0/1/1/1
9	MAN	G	1093	9	-	0/2/19/22	0/1/1/1
9	MAN	G	1094	9	-	0/2/19/22	0/1/1/1
7	NAG	G	1133	1	-	0/6/23/26	0/1/1/1
7	NAG	G	1137	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1138	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1139	9,7	-	0/2/19/22	0/1/1/1
9	MAN	G	1140	8	-	0/2/19/22	0/1/1/1
7	NAG	G	1156	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1157	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1158	9,7	-	0/2/19/22	0/1/1/1
9	MAN	G	1159	8	-	0/2/19/22	0/1/1/1
7	NAG	G	1160	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1161	7	-	0/6/23/26	0/1/1/1
9	MAN	G	1169	8	-	0/2/19/22	0/1/1/1
7	NAG	G	1197	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1198	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1234	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1235	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1262	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1263	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1264	9,7	-	0/2/19/22	0/1/1/1
9	MAN	G	1265	8	-	0/2/19/22	0/1/1/1
9	MAN	G	1268	9,8	-	0/2/19/22	0/1/1/1
9	MAN	G	1269	9	-	0/2/19/22	1/1/1/1
7	NAG	G	1276	1	-	0/6/23/26	0/1/1/1
7	NAG	G	1295	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1296	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1301	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1302	7	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	G	1331	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1332	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1333	9,7	-	0/2/19/22	0/1/1/1
9	MAN	G	1334	9,8	-	0/2/19/22	0/1/1/1
9	MAN	G	1335	9	-	0/2/19/22	0/1/1/1
9	MAN	G	1336	9	-	0/2/19/22	0/1/1/1
9	MAN	G	1337	9,8	-	0/2/19/22	0/1/1/1
9	MAN	G	1338	9	-	0/2/19/22	0/1/1/1
9	MAN	G	1339	9	-	0/2/19/22	0/1/1/1
9	MAN	G	1340	9	-	0/2/19/22	1/1/1/1
7	NAG	G	1355	1	-	0/6/23/26	0/1/1/1
7	NAG	G	1363	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1364	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1386	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1387	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1392	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1393	7	-	0/6/23/26	0/1/1/1
7	NAG	G	1448	1,7	-	0/6/23/26	0/1/1/1
7	NAG	G	1449	8,7	-	0/6/23/26	0/1/1/1
8	BMA	G	1450	7	-	0/2/19/22	0/1/1/1
7	NAG	G	1839	1	-	0/6/23/26	0/1/1/1
10	SO4	G	601	-	-	0/0/0/0	0/0/0/0
10	SO4	G	602	-	-	0/0/0/0	0/0/0/0
10	SO4	G	603	-	-	0/0/0/0	0/0/0/0
10	SO4	G	604	-	-	0/0/0/0	0/0/0/0
10	SO4	G	605	-	-	0/0/0/0	0/0/0/0
10	SO4	G	606	-	-	0/0/0/0	0/0/0/0
10	SO4	G	607	-	-	0/0/0/0	0/0/0/0
7	NAG	H	523	4	-	0/6/23/26	0/1/1/1
10	SO4	L	301	-	-	0/0/0/0	0/0/0/0

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	G	1092	MAN	C1-C2	2.26	1.57	1.52

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	G	1268	MAN	O2-C2-C3	-2.81	104.71	110.19
9	G	1091	MAN	O2-C2-C3	-2.40	105.50	110.19
9	G	1265	MAN	O2-C2-C3	-2.38	105.55	110.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	G	1093	MAN	O2-C2-C3	-2.38	105.55	110.19
9	G	1169	MAN	O2-C2-C3	-2.36	105.59	110.19
9	G	1140	MAN	O2-C2-C3	-2.35	105.60	110.19
9	G	1159	MAN	O2-C2-C3	-2.34	105.62	110.19
9	G	1094	MAN	O2-C2-C3	-2.31	105.68	110.19
9	G	1339	MAN	O2-C2-C3	-2.31	105.69	110.19
9	G	1269	MAN	O2-C2-C3	-2.30	105.70	110.19
9	G	1092	MAN	O2-C2-C3	-2.29	105.73	110.19
9	G	1335	MAN	O2-C2-C3	-2.28	105.75	110.19
9	G	1340	MAN	O2-C2-C3	-2.27	105.77	110.19
9	G	1334	MAN	O2-C2-C3	-2.22	105.86	110.19
9	G	1336	MAN	O2-C2-C3	-2.17	105.96	110.19
9	G	1337	MAN	O2-C2-C3	-2.04	106.21	110.19
7	G	1276	NAG	C1-C2-N2	2.01	113.91	110.49
9	G	1334	MAN	C1-O5-C5	2.01	114.95	112.19
9	G	1092	MAN	O5-C1-C2	2.05	113.98	110.78
8	G	1333	BMA	O5-C1-C2	2.07	114.01	110.78
9	G	1094	MAN	C1-O5-C5	2.10	115.08	112.19
9	G	1335	MAN	C1-O5-C5	2.12	115.11	112.19
9	G	1159	MAN	C1-O5-C5	2.18	115.19	112.19
9	G	1140	MAN	C1-O5-C5	2.20	115.22	112.19
8	G	1333	BMA	C1-C2-C3	2.21	112.46	109.66
9	G	1339	MAN	O5-C1-C2	2.31	114.38	110.78
9	G	1336	MAN	C1-O5-C5	2.33	115.39	112.19
9	G	1169	MAN	C1-O5-C5	2.35	115.42	112.19
9	G	1268	MAN	C1-O5-C5	2.36	115.44	112.19
9	G	1265	MAN	C1-O5-C5	2.47	115.58	112.19
9	G	1093	MAN	C1-O5-C5	2.48	115.60	112.19
9	G	1338	MAN	C1-O5-C5	2.60	115.76	112.19
8	G	1333	BMA	C1-O5-C5	2.65	115.83	112.19
9	G	1091	MAN	C1-O5-C5	2.74	115.95	112.19
9	G	1337	MAN	C1-O5-C5	2.80	116.03	112.19
9	G	1092	MAN	C1-O5-C5	2.83	116.08	112.19
9	G	1340	MAN	C1-O5-C5	3.22	116.62	112.19
9	G	1269	MAN	C1-O5-C5	3.27	116.69	112.19
9	G	1339	MAN	C1-O5-C5	3.82	117.44	112.19
7	G	1161	NAG	C2-N2-C7	4.16	129.01	122.94
7	G	1276	NAG	C2-N2-C7	4.21	129.09	122.94
7	G	1089	NAG	C2-N2-C7	4.22	129.10	122.94

There are no chirality outliers.

There are no torsion outliers.

All (2) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	G	1340	MAN	C1-C2-C3-C4-C5-O5
9	G	1269	MAN	C1-C2-C3-C4-C5-O5

17 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	B	1618	NAG	2	0
10	B	701	SO4	1	0
7	G	1089	NAG	1	0
8	G	1090	BMA	1	0
9	G	1091	MAN	1	0
9	G	1092	MAN	1	0
9	G	1093	MAN	1	0
7	G	1137	NAG	1	0
9	G	1140	MAN	1	0
7	G	1160	NAG	1	0
7	G	1161	NAG	2	0
7	G	1276	NAG	1	0
7	G	1332	NAG	1	0
9	G	1336	MAN	1	0
9	G	1340	MAN	1	0
10	G	602	SO4	1	0
10	G	606	SO4	1	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, 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	G	453/481 (94%)	-0.36	7 (1%) 73 54	33, 72, 145, 193	0
2	B	126/153 (82%)	-0.28	1 (0%) 86 72	38, 77, 145, 176	0
3	L	210/213 (98%)	-0.47	1 (0%) 90 81	60, 96, 142, 172	0
4	H	228/235 (97%)	-0.22	6 (2%) 56 32	65, 111, 160, 199	0
5	D	242/243 (99%)	0.41	37 (15%) 2 1	51, 123, 284, 386	0
6	E	213/216 (98%)	0.36	25 (11%) 4 2	82, 146, 238, 257	0
All	All	1472/1541 (95%)	-0.12	77 (5%) 27 12	33, 97, 220, 386	0

All (77) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	D	218	LYS	7.1
5	D	214	LYS	7.0
6	E	157	ALA	7.0
5	D	185	PRO	6.6
6	E	197	HIS	6.4
5	D	215	SER	5.9
5	D	222	VAL	5.8
5	D	127	SER	5.5
5	D	213	PRO	5.5
5	D	216	CYS	5.2
6	E	180	LEU	5.0
5	D	221	GLU	5.0
5	D	192	GLN	4.7
6	E	199	GLY	4.6
1	G	31	ALA	4.4
5	D	184	VAL	4.4
6	E	117	LEU	4.4
1	G	61	TYR	4.3
5	D	132	SER	4.3

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Mol	Chain	Res	Type	RSRZ
5	D	138	LEU	4.3
5	D	224	PHE	4.2
6	E	156	LYS	4.0
5	D	191	THR	3.9
6	E	198	GLU	3.9
5	D	190	GLY	3.8
6	E	118	PHE	3.7
1	G	60	ALA	3.6
5	D	139	GLY	3.6
5	D	211	VAL	3.5
5	D	126	PRO	3.5
3	L	108	SER	3.5
4	H	209	VAL	3.4
6	E	203	GLU	3.3
5	D	121	VAL	3.3
5	D	193	THR	3.2
5	D	183	THR	3.2
5	D	123	PRO	3.1
1	G	73	ALA	3.1
6	E	142	GLY	3.0
5	D	122	PHE	3.0
5	D	220	LEU	2.9
2	B	664	ASP	2.9
4	H	126	SER	2.8
6	E	119	PRO	2.8
1	G	72	HIS	2.7
5	D	223	LEU	2.7
6	E	111	ALA	2.7
6	E	200	SER	2.7
6	E	115	VAL	2.7
6	E	136	ILE	2.7
5	D	182	VAL	2.6
5	D	181	VAL	2.6
5	D	208	ASP	2.6
6	E	114	SER	2.5
5	D	219	GLY	2.5
1	G	505	VAL	2.5
4	H	138	CYS	2.5
5	D	194	TYR	2.4
6	E	201	THR	2.4
5	D	152	VAL	2.4
6	E	128	ASN	2.4

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Mol	Chain	Res	Type	RSRZ
6	E	179	SER	2.3
6	E	125	LEU	2.3
5	D	131	THR	2.2
6	E	183	GLU	2.2
4	H	187	LEU	2.2
4	H	125	SER	2.2
5	D	133	GLY	2.1
4	H	188	GLY	2.1
6	E	113	PRO	2.1
6	E	187	SER	2.1
5	D	129	LYS	2.1
6	E	189	ARG	2.0
1	G	71	THR	2.0
5	D	124	LEU	2.0
5	D	209	LYS	2.0
6	E	135	LEU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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
10	SO4	G	606	5/5	0.45	0.41	229,229,230,246	5
7	NAG	G	1387	14/15	0.73	0.41	131,149,156,158	0
9	MAN	G	1140	11/12	0.74	0.59	139,156,166,167	0
9	MAN	G	1265	11/12	0.74	0.38	122,141,149,150	0
8	BMA	G	1450	11/12	0.77	0.27	161,197,227,281	0
9	MAN	G	1340	11/12	0.79	0.25	142,149,153,154	0
9	MAN	G	1169	11/12	0.79	0.32	153,155,158,160	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
8	BMA	G	1264	11/12	0.80	0.14	123,129,144,150	0
7	NAG	B	1611	14/15	0.80	0.23	110,127,140,144	0
7	NAG	G	1198	14/15	0.81	0.33	143,152,162,166	0
7	NAG	G	1393	14/15	0.82	0.34	121,142,144,145	0
7	NAG	B	1618	14/15	0.82	0.38	95,108,114,122	0
7	NAG	G	1302	14/15	0.83	0.39	117,131,141,146	0
7	NAG	G	1364	14/15	0.83	0.35	142,148,156,161	0
8	BMA	G	1158	11/12	0.84	0.21	126,135,145,155	0
8	BMA	G	1139	11/12	0.84	0.30	123,133,142,149	0
10	SO4	G	607	5/5	0.84	0.24	155,157,158,160	0
7	NAG	G	1355	14/15	0.84	0.29	121,137,144,146	0
7	NAG	G	1386	14/15	0.85	0.22	74,111,130,137	0
9	MAN	G	1339	11/12	0.85	0.24	115,120,125,126	0
7	NAG	G	1235	14/15	0.86	0.49	135,137,140,141	0
9	MAN	G	1269	11/12	0.86	0.29	131,135,139,140	0
9	MAN	G	1092	11/12	0.86	0.16	107,114,122,123	0
7	NAG	G	1839	14/15	0.87	0.30	107,125,132,137	0
7	NAG	G	1296	14/15	0.87	0.40	117,131,142,150	0
9	MAN	G	1159	11/12	0.88	0.18	110,122,126,127	0
9	MAN	G	1334	11/12	0.88	0.11	100,117,123,132	0
7	NAG	G	1161	14/15	0.88	0.24	93,107,118,125	0
9	MAN	G	1094	11/12	0.88	0.19	116,133,144,153	0
7	NAG	G	1449	14/15	0.89	0.28	102,124,150,177	0
7	NAG	G	1276	14/15	0.90	0.33	113,122,128,128	0
7	NAG	G	1138	14/15	0.90	0.21	109,118,126,127	0
9	MAN	G	1335	11/12	0.90	0.16	94,109,115,117	0
7	NAG	G	1157	14/15	0.90	0.20	91,105,116,127	0
10	SO4	B	702	5/5	0.90	0.17	154,155,156,156	0
7	NAG	G	1392	14/15	0.90	0.37	110,120,137,140	0
7	NAG	H	523	14/15	0.90	0.24	113,124,132,136	0
10	SO4	G	603	5/5	0.91	0.19	147,147,152,153	0
9	MAN	G	1336	11/12	0.91	0.24	135,138,146,152	0
7	NAG	G	1234	14/15	0.91	0.17	85,99,116,124	0
7	NAG	G	1448	14/15	0.91	0.16	73,91,103,106	0
7	NAG	G	1197	14/15	0.91	0.17	75,106,125,140	0
7	NAG	B	1637	14/15	0.91	0.26	99,117,130,131	0
9	MAN	G	1268	11/12	0.91	0.14	117,128,138,144	0
7	NAG	G	1332	14/15	0.91	0.16	71,88,108,114	0
9	MAN	G	1093	11/12	0.92	0.22	97,104,117,118	0
7	NAG	G	1363	14/15	0.92	0.17	81,90,114,132	0
10	SO4	G	604	5/5	0.92	0.13	135,139,141,142	0
9	MAN	G	1338	11/12	0.93	0.18	76,80,93,100	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
7	NAG	G	1133	14/15	0.93	0.28	104,119,131,133	0
10	SO4	G	605	5/5	0.94	0.14	147,147,151,157	0
7	NAG	G	1160	14/15	0.94	0.16	66,90,98,111	0
8	BMA	G	1090	11/12	0.94	0.14	66,77,101,104	0
9	MAN	G	1091	11/12	0.95	0.15	68,74,91,105	0
10	SO4	G	601	5/5	0.95	0.15	123,126,128,132	0
8	BMA	G	1333	11/12	0.95	0.13	65,82,97,99	0
7	NAG	G	1137	14/15	0.95	0.15	72,98,116,118	0
7	NAG	G	1301	14/15	0.96	0.13	62,77,90,104	0
7	NAG	G	1156	14/15	0.96	0.12	27,73,91,94	0
7	NAG	G	1295	14/15	0.96	0.11	59,75,100,110	0
7	NAG	G	1263	14/15	0.96	0.12	77,92,102,112	0
10	SO4	G	602	5/5	0.96	0.18	107,114,116,121	0
10	SO4	B	701	5/5	0.97	0.15	81,82,86,101	0
7	NAG	G	1089	14/15	0.97	0.13	44,56,72,76	0
9	MAN	G	1337	11/12	0.97	0.14	49,55,72,92	0
7	NAG	G	1331	14/15	0.97	0.12	51,62,79,84	0
7	NAG	G	1262	14/15	0.98	0.14	34,54,70,80	0
10	SO4	L	301	5/5	0.98	0.11	90,90,92,93	5
7	NAG	G	1088	14/15	0.98	0.15	35,43,56,57	0

6.5 Other polymers [i](#)

There are no such residues in this entry.