Full wwPDB X-ray Structure Validation Report (i)

Aug 20, 2023 – 08:35 AM EDT

PDB ID	:	2NY0
Title	:	HIV-1 gp120 Envelope Glycoprotein (M95W, W96C, T257S, V275C, S334A, S375W, A433M) Complexed with CD4 and Antibody 17b
Authors	:	Zhou, T.; Xu, L.; Dey, B.; Hessell, A.J.; Van Ryk, D.; Xiang, S.H.; Yang, X.; Zhang, M.Y.; Zwick, M.B.; Arthos, J.; Burton, D.R.; Dimitrov, D.S.; Sodroski, J.; Wyatt, R.; Nabel, G.J.; Kwong, P.D.
Deposited on	:	2006-11-20
Resolution	:	2.20 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:

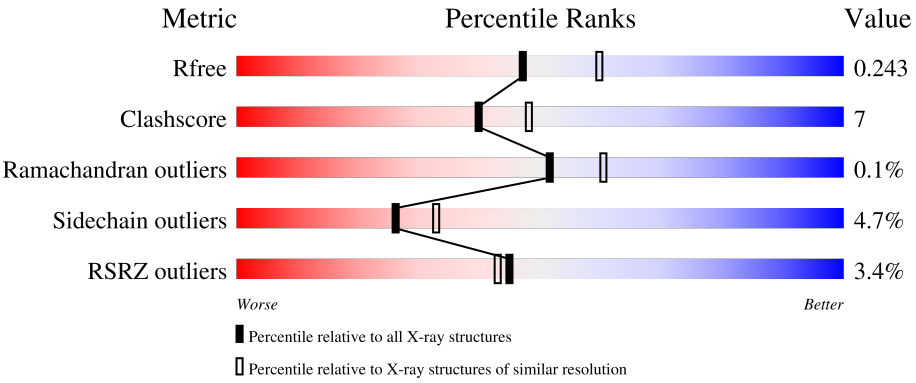
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.20 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	317	7% 79% 16%
2	B	184	2% 81% 16%
3	C	214	84% 15%
4	D	229	% 86% 9%

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
5	NAG	A	588	-	-	-	X
5	NAG	A	963	-	-	-	X

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 7662 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 GP120.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2370	1487	413	448	22			

- Molecule 2 is a protein called T-cell surface glycoprotein CD4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	181	Total	C	N	O	S	0	0	0
			1412	885	247	276	4			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1000	MET	-	initiating methionine	UNP P01730

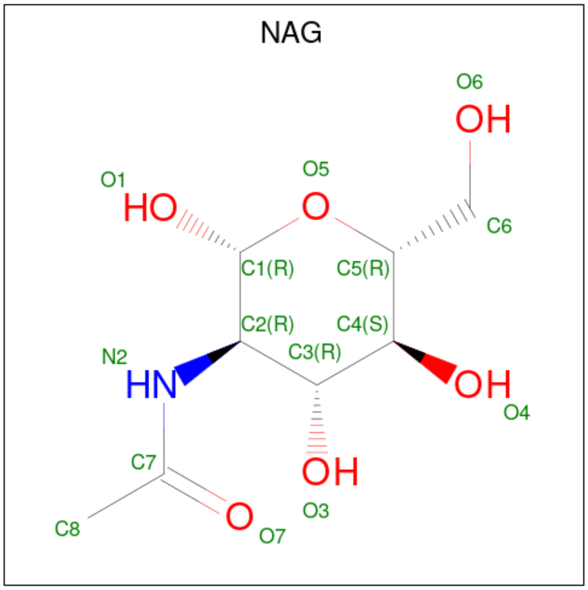
- Molecule 3 is a protein called ANTIBODY 17B, LIGHT CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	214	Total	C	N	O	S	0	0	0
			1646	1028	282	331	5			

- Molecule 4 is a protein called ANTIBODY 17B, HEAVY CHAIN.

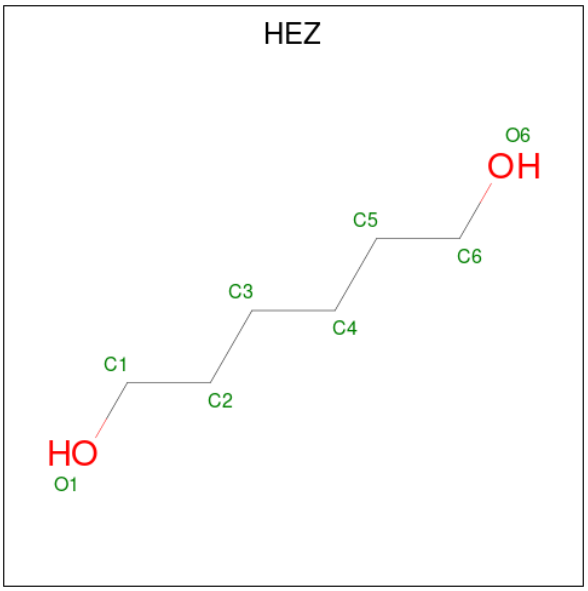
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	222	Total	C	N	O	S	0	0	0
			1677	1062	281	329	5			

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 6 is HEXANE-1,6-DIOL (three-letter code: HEZ) (formula: $C_6H_{14}O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 8 6 2	0	0

- Molecule 7 is water.

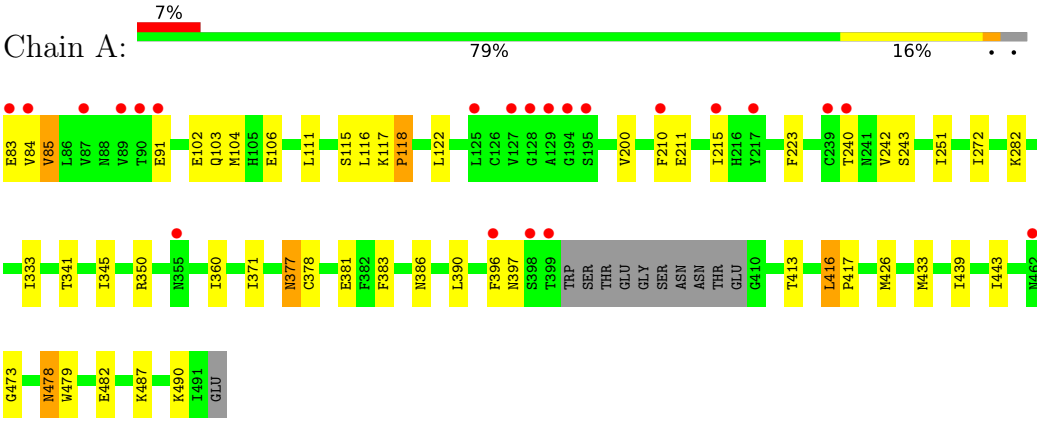
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	134	Total O 134 134	0	0
7	B	56	Total O 56 56	0	0
7	C	90	Total O 90 90	0	0
7	D	101	Total O 101 101	0	0

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.

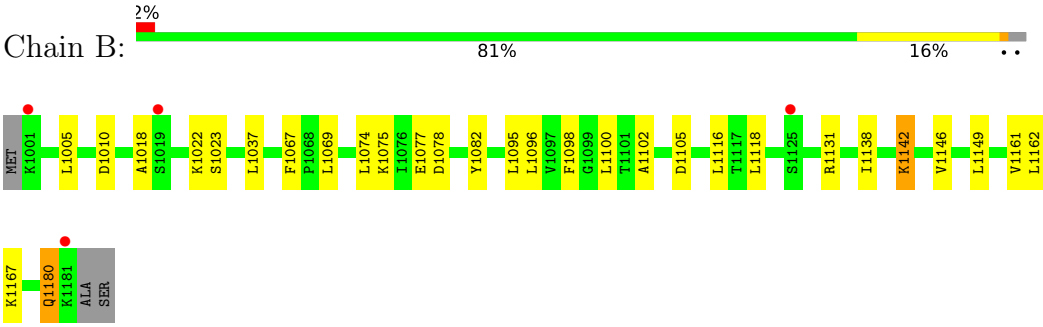
• Molecule 1: ENVELOPE GLYCOPROTEIN GP120

Chain A:



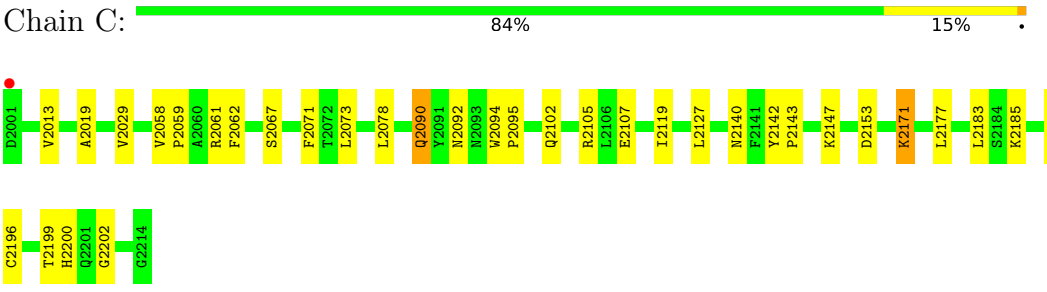
• Molecule 2: T-cell surface glycoprotein CD4

Chain B:



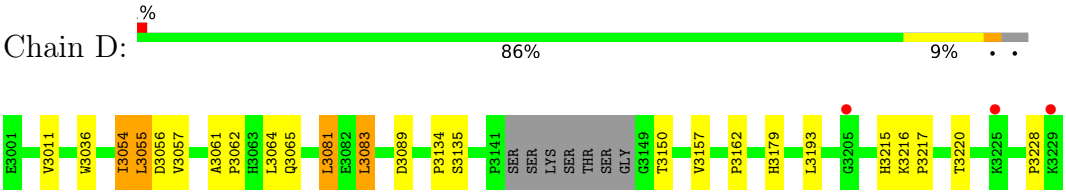
• Molecule 3: ANTIBODY 17B, LIGHT CHAIN

Chain C:



• Molecule 4: ANTIBODY 17B, HEAVY CHAIN

Chain D:


%
86%
9%
E3001
V3011
W3036
I3054
L3055
D3056
V3057
A3061
P3062
H3063
L3064
Q3065
L3081
E3082
L3083
D3089
P3134
S3135
P3141
SER
SER
LYS
SER
THR
SER
GLY
G3149
T3150
V3157
P3162
H3179
L3193
G3205
H3215
K3216
P3217
T3220
K3225
P3228
K3229

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	71.89Å 87.31Å 196.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.34 – 2.20 42.81 – 2.20	Depositor EDS
% Data completeness (in resolution range)	80.2 (48.34-2.20) 80.2 (42.81-2.20)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.73 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.202 , 0.242 0.202 , 0.243	Depositor DCC
R_{free} test set	2591 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	32.6	Xtriage
Anisotropy	0.708	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 47.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7662	wwPDB-VP
Average B, all atoms (Å^2)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.39% 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: HEZ, NAG

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	0.29	0/2418	0.47	0/3279
2	B	0.28	0/1432	0.48	0/1930
3	C	0.30	0/1683	0.49	0/2288
4	D	0.30	0/1716	0.48	0/2338
All	All	0.29	0/7249	0.48	0/9835

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

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	2370	0	2312	42	0
2	B	1412	0	1441	19	0
3	C	1646	0	1590	28	0
4	D	1677	0	1644	19	0
5	A	168	0	156	2	0
6	A	8	0	14	2	0
7	A	134	0	0	11	1
7	B	56	0	0	6	0
7	C	90	0	0	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	D	101	0	0	6	0
All	All	7662	0	7157	106	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 7.

All (106) 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)
3:C:2196:CYS:SG	7:C:139:HOH:O	2.07	1.11
1:A:83:GLU:N	7:A:5065:HOH:O	1.94	1.00
1:A:111:LEU:O	7:A:5040:HOH:O	1.84	0.96
2:B:1180:GLN:HE21	2:B:1180:GLN:H	1.14	0.94
4:D:3134:PRO:HB2	7:D:342:HOH:O	1.73	0.86
4:D:3215:HIS:HB3	4:D:3220:THR:CG2	2.09	0.82
3:C:2029:VAL:HG11	3:C:2090:GLN:HG3	1.61	0.81
1:A:211:GLU:OE1	7:A:5030:HOH:O	2.00	0.80
1:A:223:PHE:HE2	1:A:490:LYS:HD2	1.50	0.76
1:A:286:VAL:HG11	1:A:345:ILE:HD12	1.66	0.76
1:A:426:MET:SD	7:A:5090:HOH:O	2.44	0.74
3:C:2061:ARG:HG2	7:C:316:HOH:O	1.89	0.72
3:C:2200:HIS:CD2	3:C:2202:GLY:H	2.07	0.72
1:A:122:LEU:HD22	1:A:200:VAL:HG22	1.71	0.71
4:D:3215:HIS:HB3	4:D:3220:THR:HG22	1.71	0.70
1:A:210:PHE:HB3	7:A:5069:HOH:O	1.92	0.70
2:B:1082:TYR:HE1	7:B:237:HOH:O	1.75	0.69
1:A:478:ASN:HD22	1:A:478:ASN:H	1.42	0.67
4:D:3135:SER:O	7:D:342:HOH:O	2.13	0.66
2:B:1078:ASP:O	7:B:237:HOH:O	2.12	0.65
1:A:223:PHE:CE2	1:A:490:LYS:HD2	2.31	0.65
3:C:2029:VAL:HG11	3:C:2090:GLN:CG	2.26	0.65
1:A:295:ASN:HD22	5:A:795:NAG:H83	1.60	0.65
1:A:417:PRO:HB2	6:A:5000:HEZ:H51	1.78	0.64
3:C:2062:PHE:HD2	7:C:316:HOH:O	1.82	0.63
3:C:2147:LYS:HB3	3:C:2199:THR:HB	1.83	0.60
3:C:2200:HIS:HD2	3:C:2202:GLY:H	1.50	0.59
4:D:3134:PRO:HD2	4:D:3220:THR:HG21	1.84	0.58
3:C:2062:PHE:CD2	7:C:316:HOH:O	2.51	0.58
3:C:2094:TRP:HA	3:C:2095:PRO:C	2.24	0.58
4:D:3065:GLN:NE2	7:D:103:HOH:O	2.36	0.57
1:A:478:ASN:HD22	1:A:478:ASN:N	2.01	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:122:LEU:CD2	1:A:200:VAL:HG22	2.36	0.55
1:A:295:ASN:ND2	5:A:795:NAG:H83	2.21	0.55
1:A:333:ILE:HD12	1:A:390:LEU:HD21	1.89	0.55
4:D:3065:GLN:CG	7:D:402:HOH:O	2.56	0.52
4:D:3216:LYS:N	4:D:3217:PRO:CD	2.73	0.52
1:A:91:GLU:OE2	1:A:487:LYS:HE2	2.09	0.52
1:A:378:CYS:HB3	1:A:383:PHE:CE1	2.44	0.51
3:C:2140:ASN:HD21	4:D:3179:HIS:CE1	2.28	0.51
3:C:2029:VAL:CG1	3:C:2090:GLN:HG3	2.38	0.50
2:B:1180:GLN:HE21	2:B:1180:GLN:N	1.96	0.50
1:A:371:ILE:HD11	1:A:473:GLY:CA	2.42	0.50
1:A:85:VAL:HA	1:A:243:SER:HB3	1.95	0.49
2:B:1077:GLU:H	2:B:1077:GLU:CD	2.15	0.49
2:B:1164:ASN:O	2:B:1165:GLN:HB2	2.13	0.49
1:A:104:MET:CE	1:A:479:TRP:HB3	2.43	0.48
2:B:1138:ILE:HD13	2:B:1146:VAL:CG2	2.43	0.48
1:A:115:SER:N	7:A:5040:HOH:O	2.45	0.48
4:D:3193:LEU:C	4:D:3193:LEU:HD12	2.34	0.48
1:A:111:LEU:C	7:A:5040:HOH:O	2.44	0.48
1:A:341:THR:O	1:A:345:ILE:HG12	2.13	0.48
1:A:377:ASN:HB2	7:A:5015:HOH:O	2.14	0.48
3:C:2090:GLN:OE1	3:C:2092:ASN:N	2.43	0.48
2:B:1161:VAL:O	2:B:1167:LYS:HA	2.15	0.47
2:B:1075:LYS:HE3	7:B:284:HOH:O	2.14	0.47
2:B:1100:LEU:HD21	2:B:1116:LEU:HB3	1.96	0.47
1:A:294:ILE:HD12	1:A:333:ILE:HD11	1.96	0.47
1:A:111:LEU:HD22	1:A:215:ILE:HD11	1.97	0.47
2:B:1095:LEU:HD23	7:B:237:HOH:O	2.14	0.47
1:A:371:ILE:HD11	1:A:473:GLY:HA2	1.97	0.46
4:D:3054:ILE:HG23	4:D:3055:LEU:HD13	1.98	0.46
3:C:2013:VAL:HG11	3:C:2078:LEU:HD12	1.97	0.46
4:D:3065:GLN:HG3	7:D:402:HOH:O	2.16	0.46
3:C:2102:GLN:NE2	7:C:350:HOH:O	2.49	0.46
2:B:1138:ILE:HD13	2:B:1146:VAL:HG22	1.97	0.46
4:D:3036:TRP:CE2	4:D:3081:LEU:HB2	2.51	0.46
1:A:122:LEU:HD21	4:D:3057:VAL:HG21	1.98	0.45
6:A:5000:HEZ:H62	6:A:5000:HEZ:H32	1.73	0.45
3:C:2153:ASP:HA	3:C:2193:VAL:HG12	1.99	0.45
2:B:1102:ALA:HA	2:B:1116:LEU:HD23	1.98	0.45
2:B:1095:LEU:HB3	7:B:237:HOH:O	2.16	0.45
1:A:381:GLU:HG3	1:A:443:ILE:HD13	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:2019:ALA:HB2	3:C:2078:LEU:HD11	1.98	0.44
2:B:1131:ARG:HD3	7:B:149:HOH:O	2.17	0.44
3:C:2140:ASN:HD21	4:D:3179:HIS:HE1	1.65	0.44
1:A:286:VAL:HG11	1:A:345:ILE:CD1	2.43	0.44
1:A:104:MET:HE2	1:A:479:TRP:HB3	1.99	0.44
2:B:1118:LEU:O	2:B:1142:LYS:HD3	2.19	0.43
1:A:117:LYS:HA	1:A:118:PRO:HD3	1.86	0.43
3:C:2058:VAL:HA	3:C:2059:PRO:HD3	1.92	0.43
3:C:2177:LEU:C	3:C:2177:LEU:HD23	2.39	0.43
1:A:386:ASN:O	1:A:416:LEU:HG	2.19	0.43
1:A:426:MET:HG2	1:A:433:MET:HG3	2.01	0.42
4:D:3061:ALA:HA	4:D:3062:PRO:HD3	1.90	0.42
1:A:350:ARG:HD3	1:A:396:PHE:CE1	2.55	0.41
2:B:1022:LYS:HG2	2:B:1023:SER:N	2.35	0.41
1:A:251:ILE:HD12	1:A:482:GLU:HB3	2.02	0.41
4:D:3011:VAL:HG21	4:D:3162:PRO:HG3	2.01	0.41
3:C:2062:PHE:N	7:C:316:HOH:O	2.52	0.41
3:C:2142:TYR:CG	3:C:2143:PRO:HA	2.56	0.41
1:A:211:GLU:HB3	7:A:5036:HOH:O	2.21	0.41
1:A:360:ILE:HB	1:A:467:ILE:HD13	2.03	0.41
4:D:3083:LEU:HD23	4:D:3083:LEU:HA	1.94	0.41
3:C:2105:ARG:HD3	7:C:306:HOH:O	2.19	0.41
3:C:2143:PRO:O	3:C:2200:HIS:HE1	2.04	0.41
1:A:102:GLU:O	1:A:106:GLU:HG2	2.21	0.41
4:D:3157:VAL:HA	7:D:342:HOH:O	2.21	0.41
1:A:111:LEU:HD21	7:A:5053:HOH:O	2.21	0.40
3:C:2067:SER:HA	3:C:2071:PHE:CE2	2.56	0.40
1:A:282:LYS:HE2	7:A:5110:HOH:O	2.22	0.40
2:B:1005:LEU:HD22	2:B:1098:PHE:HE2	1.86	0.40
2:B:1018:ALA:HB2	2:B:1067:PHE:HE1	1.86	0.40
3:C:2119:ILE:HD12	7:C:139:HOH:O	2.19	0.40
3:C:2171:LYS:HE3	3:C:2171:LYS:HA	2.04	0.40
3:C:2185:LYS:HE2	3:C:2189:GLU:OE2	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)
7:A:5120:HOH:O	7:A:5120:HOH:O[4_556]	2.17	0.03

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	302/317 (95%)	285 (94%)	17 (6%)	0	100	100
2	B	179/184 (97%)	171 (96%)	8 (4%)	0	100	100
3	C	212/214 (99%)	203 (96%)	9 (4%)	0	100	100
4	D	218/229 (95%)	213 (98%)	4 (2%)	1 (0%)	29	31
All	All	911/944 (96%)	872 (96%)	38 (4%)	1 (0%)	51	60

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	3228	PRO

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	271/281 (96%)	257 (95%)	14 (5%)	23	28
2	B	164/166 (99%)	154 (94%)	10 (6%)	18	21
3	C	184/184 (100%)	178 (97%)	6 (3%)	38	49
4	D	187/193 (97%)	179 (96%)	8 (4%)	29	36
All	All	806/824 (98%)	768 (95%)	38 (5%)	26	33

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	84	VAL
1	A	85	VAL
1	A	103	GLN
1	A	116	LEU
1	A	118	PRO
1	A	240	THR
1	A	242	VAL
1	A	272	ILE
1	A	377	ASN
1	A	397	ASN
1	A	413	THR
1	A	416	LEU
1	A	439	ILE
1	A	478	ASN
2	B	1010	ASP
2	B	1037	LEU
2	B	1069	LEU
2	B	1074	LEU
2	B	1096	LEU
2	B	1105	ASP
2	B	1142	LYS
2	B	1149	LEU
2	B	1162	LEU
2	B	1180	GLN
3	C	2073	LEU
3	C	2090	GLN
3	C	2107	GLU
3	C	2127	LEU
3	C	2171	LYS
3	C	2183	LEU
4	D	3054	ILE
4	D	3055	LEU
4	D	3056	ASP
4	D	3064	LEU
4	D	3081	LEU
4	D	3083	LEU
4	D	3089	ASP
4	D	3150	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	GLN

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Mol	Chain	Res	Type
1	A	352	GLN
1	A	355	ASN
1	A	397	ASN
1	A	478	ASN
2	B	1040	GLN
2	B	1163	GLN
2	B	1180	GLN
3	C	2140	ASN
3	C	2200	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

13 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	$\#\|Z\| > 2$
5	NAG	A	795	1	14,14,15	0.66	0	17,19,21	0.96	1 (5%)
5	NAG	A	741	1	14,14,15	0.63	0	17,19,21	1.03	1 (5%)
6	HEZ	A	5000	-	7,7,7	0.38	0	6,6,6	0.37	0
5	NAG	A	734	1	14,14,15	0.49	0	17,19,21	0.73	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
5	NAG	A	789	1	14,14,15	0.50	0	17,19,21	0.91	0
5	NAG	A	839	1	14,14,15	0.60	0	17,19,21	1.02	0
5	NAG	A	963	1	14,14,15	0.56	0	17,19,21	0.68	0
5	NAG	A	886	1	14,14,15	0.49	0	17,19,21	0.82	0
5	NAG	A	588	1	14,14,15	0.50	0	17,19,21	0.65	0
5	NAG	A	776	1	14,14,15	0.60	0	17,19,21	1.35	2 (11%)
5	NAG	A	762	1	14,14,15	0.54	0	17,19,21	1.06	1 (5%)
5	NAG	A	948	1	14,14,15	0.50	0	17,19,21	0.79	0
5	NAG	A	892	1	14,14,15	0.52	0	17,19,21	0.63	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
5	NAG	A	795	1	-	2/6/23/26	0/1/1/1
5	NAG	A	741	1	-	4/6/23/26	0/1/1/1
6	HEZ	A	5000	-	-	4/5/5/5	-
5	NAG	A	734	1	-	6/6/23/26	0/1/1/1
5	NAG	A	789	1	-	1/6/23/26	0/1/1/1
5	NAG	A	839	1	-	2/6/23/26	0/1/1/1
5	NAG	A	963	1	-	0/6/23/26	0/1/1/1
5	NAG	A	886	1	-	2/6/23/26	0/1/1/1
5	NAG	A	588	1	-	3/6/23/26	0/1/1/1
5	NAG	A	776	1	-	2/6/23/26	0/1/1/1
5	NAG	A	762	1	-	0/6/23/26	0/1/1/1
5	NAG	A	948	1	-	0/6/23/26	0/1/1/1
5	NAG	A	892	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	776	NAG	C4-C3-C2	3.58	116.26	111.02
5	A	741	NAG	C4-C3-C2	2.89	115.26	111.02
5	A	776	NAG	C3-C4-C5	2.39	114.50	110.24
5	A	762	NAG	O5-C5-C6	2.37	110.92	107.20
5	A	795	NAG	O5-C5-C6	2.19	110.63	107.20

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	588	NAG	C3-C2-N2-C7
5	A	588	NAG	C8-C7-N2-C2
5	A	588	NAG	O7-C7-N2-C2
5	A	734	NAG	C8-C7-N2-C2
5	A	734	NAG	O7-C7-N2-C2
5	A	741	NAG	C8-C7-N2-C2
5	A	741	NAG	O7-C7-N2-C2
5	A	776	NAG	C8-C7-N2-C2
5	A	776	NAG	O7-C7-N2-C2
5	A	839	NAG	C8-C7-N2-C2
5	A	839	NAG	O7-C7-N2-C2
5	A	886	NAG	C8-C7-N2-C2
5	A	886	NAG	O7-C7-N2-C2
5	A	734	NAG	C4-C5-C6-O6
5	A	734	NAG	O5-C5-C6-O6
5	A	795	NAG	C8-C7-N2-C2
5	A	734	NAG	C1-C2-N2-C7
5	A	795	NAG	O7-C7-N2-C2
5	A	892	NAG	O5-C5-C6-O6
5	A	741	NAG	C4-C5-C6-O6
6	A	5000	HEZ	C4-C5-C6-O6
5	A	741	NAG	O5-C5-C6-O6
5	A	789	NAG	O5-C5-C6-O6
5	A	892	NAG	C4-C5-C6-O6
6	A	5000	HEZ	C2-C3-C4-C5
6	A	5000	HEZ	O1-C1-C2-C3
5	A	734	NAG	C3-C2-N2-C7
6	A	5000	HEZ	C3-C4-C5-C6

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	795	NAG	2	0
6	A	5000	HEZ	2	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	306/317 (96%)	0.30	23 (7%)	14	13	28, 46, 93, 130	0
2	B	181/184 (98%)	0.07	4 (2%)	62	59	32, 53, 84, 99	0
3	C	214/214 (100%)	-0.29	1 (0%)	91	90	27, 42, 91, 107	0
4	D	222/229 (96%)	-0.26	3 (1%)	75	73	25, 37, 85, 125	0
All	All	923/944 (97%)	-0.02	31 (3%)	45	43	25, 44, 90, 130	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	129	ALA	10.3
1	A	399	THR	6.1
1	A	195	SER	5.6
1	A	127	VAL	5.4
1	A	210	PHE	5.1
1	A	398	SER	4.7
2	B	1001	LYS	4.7
4	D	3229	LYS	4.7
1	A	128	GLY	4.3
1	A	194	GLY	3.9
1	A	83	GLU	3.8
1	A	89	VAL	3.8
2	B	1181	LYS	3.5
1	A	90	THR	3.4
2	B	1019	SER	3.3
1	A	239	CYS	3.0
1	A	240	THR	2.7
3	C	2001	ASP	2.6
1	A	463	ASN	2.6
4	D	3205	GLY	2.5
2	B	1125	SER	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	84	VAL	2.4
1	A	87	VAL	2.4
1	A	215	ILE	2.4
1	A	462	ASN	2.3
1	A	217	TYR	2.3
4	D	3225	LYS	2.2
1	A	91	GLU	2.2
1	A	396	PHE	2.1
1	A	355	ASN	2.1
1	A	125	LEU	2.1

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 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
5	NAG	A	963	14/15	0.62	0.62	71,72,73,73	0
5	NAG	A	588	14/15	0.67	0.49	78,79,79,79	0
5	NAG	A	741	14/15	0.69	0.39	69,70,71,71	0
5	NAG	A	892	14/15	0.71	0.39	58,60,60,61	0
5	NAG	A	839	14/15	0.77	0.39	60,62,62,62	0
6	HEZ	A	5000	8/8	0.82	0.19	42,43,44,44	0
5	NAG	A	948	14/15	0.83	0.15	50,50,51,51	0
5	NAG	A	886	14/15	0.87	0.15	48,49,50,51	0
5	NAG	A	734	14/15	0.89	0.28	70,71,72,72	0
5	NAG	A	776	14/15	0.91	0.13	55,56,57,57	0
5	NAG	A	789	14/15	0.94	0.11	44,44,45,45	0
5	NAG	A	795	14/15	0.95	0.15	38,38,39,39	0
5	NAG	A	762	14/15	0.97	0.12	41,42,42,42	0

6.5 Other polymers (i)

There are no such residues in this entry.