Full wwPDB X-ray Structure Validation Report (i)

Jan 16, 2025 – 10:48 AM EST

PDB ID	:	6OZ3
Title	:	Crystal structure of broadly neutralizing antibody N49P9.1 Fab in complex with HIV-1 Clade A/E strain 93TH057 gp120 core
Authors	:	Tolbert, W.D.; Pazgier, M.
Deposited on	:	2019-05-15
Resolution	:	3.15 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 3.15 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
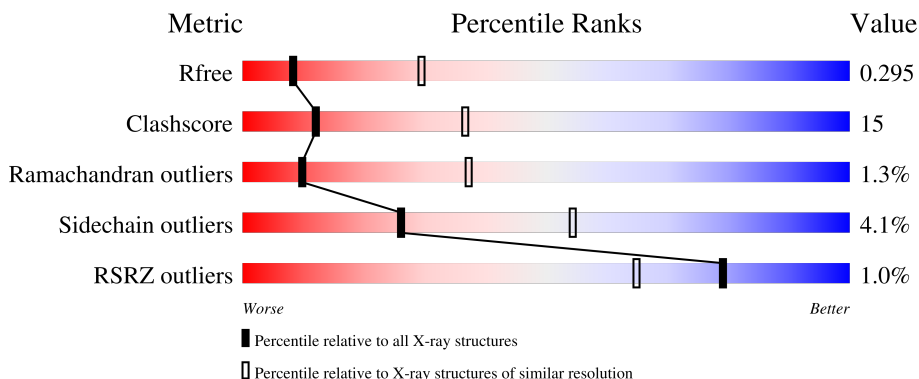
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2168 (3.20-3.12)
Clashscore	180529	2333 (3.20-3.12)
Ramachandran outliers	177936	2266 (3.20-3.12)
Sidechain outliers	177891	2265 (3.20-3.12)
RSRZ outliers	164620	2169 (3.20-3.12)

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	G	355	53% 35% · 10%
2	H	221	67% 28% · ·
3	L	203	66% 31% · ·

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 5817 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 clade A/E 93TH057 HIV-1 gp120 core.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	319	Total	C	N	O	S	0	0	0
			2506	1571	434	481	20			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	42	VAL	-	expression tag	UNP A0A0M3KKW9
G	43	PRO	-	expression tag	UNP A0A0M3KKW9
G	375	SER	HIS	engineered mutation	UNP A0A0M3KKW9

- Molecule 2 is a protein called N49P9.1 antibody Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	214	Total	C	N	O	S	0	0	0
			1647	1045	283	309	10			

- Molecule 3 is a protein called N49P9.1 antibody Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	L	200	Total	C	N	O	S	0	0	0
			1509	948	253	303	5			

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

NAG

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

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na).

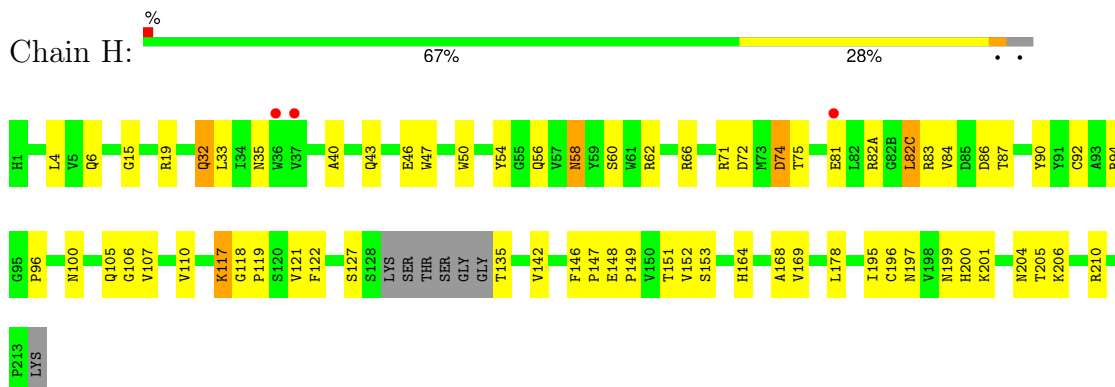| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	H	1	Total 1	Na 1	0	0

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: clade A/E 93TH057 HIV-1 gp120 core
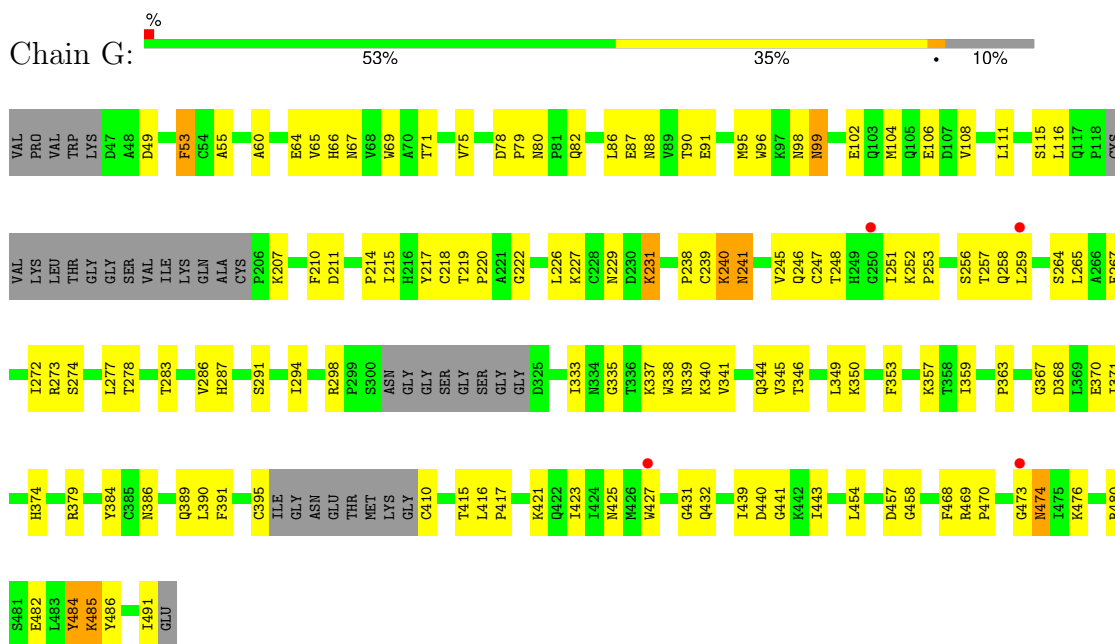
• Molecule 2: N49P9.1 antibody Fab heavy chain

• Molecule 3: N49P9.1 antibody Fab light chain

L3 A7 S12 A13 S14 S18 V19 S22 G25 T26 R27 H30 I31 I32 S33 A34 W35 F36 L46 I47 I48 F49 D50 D51 D52 K53 R54 P59 S60 R61 F62 S63 L73 Q79 P80 E81 D82 N89 R103 L104 T105 V106 L106A K110 S114 V115

P120 N128 K129 A130 T131 L132 V133 C134 L135 I136 P141 W148 K149 A150 D151 P154 V159 T162 S168 Y177 L178 S179 L180 T181 P182 E183 Q184 C193 Q194 V195 V202 E203 T209 GLU CYS SER
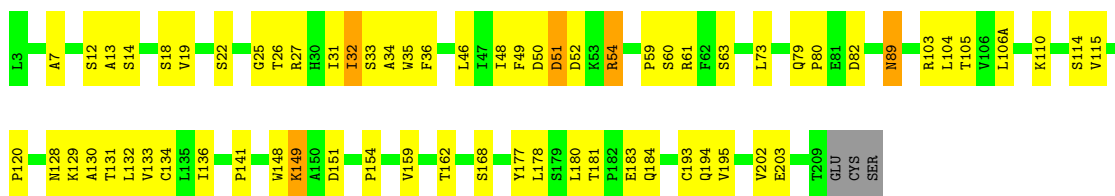
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	I 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	104.75Å 110.45Å 152.16Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	34.03 – 3.15 34.03 – 3.15	Depositor EDS
% Data completeness (in resolution range)	93.9 (34.03-3.15) 94.2 (34.03-3.15)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.10 (at 3.12Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.247 , 0.300 0.247 , 0.295	Depositor DCC
R_{free} test set	789 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	116.1	Xtriage
Anisotropy	0.258	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 71.0	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	5817	wwPDB-VP
Average B, all atoms (Å^2)	121.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.94% 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: NA, 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	G	0.26	0/2558	0.52	0/3472
2	H	0.27	0/1692	0.56	0/2306
3	L	0.26	0/1549	0.52	0/2117
All	All	0.26	0/5799	0.54	0/7895

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	2506	0	2429	93	0
2	H	1647	0	1601	43	0
3	L	1509	0	1469	45	0
4	G	154	0	143	3	0
5	H	1	0	0	0	0
All	All	5817	0	5642	176	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 15.

All (176) 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:410:CYS:N	4:G:509:NAG:HO6	1.67	0.91
2:H:87:THR:HG23	2:H:110:VAL:HA	1.59	0.84
1:G:219:THR:HG23	1:G:246:GLN:HE21	1.47	0.80
1:G:395:CYS:SG	1:G:410:CYS:N	2.59	0.76
2:H:6:GLN:O	2:H:105:GLN:NE2	2.24	0.70
1:G:258:GLN:HG2	1:G:470:PRO:HB2	1.75	0.68
1:G:389:GLN:NE2	1:G:415:THR:O	2.26	0.68
3:L:25:GLY:O	3:L:27:ARG:N	2.27	0.68
1:G:386:ASN:HB3	1:G:417:PRO:HG2	1.77	0.67
3:L:130:ALA:HB3	3:L:180:LEU:O	1.95	0.67
1:G:104:MET:O	1:G:108:VAL:HG23	1.97	0.64
1:G:335:GLY:O	1:G:339:ASN:ND2	2.29	0.64
2:H:146:PHE:CD1	2:H:147:PRO:HA	2.32	0.63
2:H:90:TYR:O	2:H:106:GLY:HA2	1.99	0.63
2:H:148:GLU:HG2	2:H:149:PRO:HA	1.80	0.63
3:L:61:ARG:NH1	3:L:82:ASP:OD2	2.32	0.63
2:H:81:GLU:OE1	2:H:82(A):ARG:NH2	2.32	0.63
1:G:64:GLU:HG3	1:G:66:HIS:H	1.62	0.62
1:G:78:ASP:O	1:G:80:ASN:N	2.30	0.62
1:G:258:GLN:HE21	1:G:470:PRO:HG2	1.65	0.61
1:G:90:THR:HA	1:G:239:CYS:O	2.01	0.61
2:H:54:TYR:HB2	2:H:56:GLN:NE2	2.16	0.61
2:H:66:ARG:NH2	2:H:86:ASP:OD2	2.32	0.60
2:H:151:THR:HG23	2:H:199:ASN:HB3	1.81	0.60
1:G:102:GLU:O	1:G:106:GLU:HG2	2.02	0.60
1:G:298:ARG:NH1	1:G:441:GLY:O	2.34	0.60
2:H:35:ASN:ND2	2:H:50:TRP:HB3	2.16	0.60
2:H:19:ARG:HD3	2:H:81:GLU:HG2	1.84	0.59
1:G:368:ASP:OD2	2:H:71:ARG:NH2	2.32	0.59
1:G:341:VAL:O	1:G:345:VAL:HG23	2.03	0.58
3:L:34:ALA:HB3	3:L:89:ASN:HD21	1.68	0.58
1:G:226:LEU:O	1:G:486:TYR:HA	2.04	0.58
1:G:219:THR:O	1:G:246:GLN:NE2	2.36	0.58
3:L:181:THR:HB	3:L:184:GLN:HG3	1.86	0.57
1:G:410:CYS:N	4:G:509:NAG:O6	2.36	0.57
3:L:148:TRP:CZ3	3:L:193:CYS:HB2	2.40	0.56
2:H:72:ASP:OD2	2:H:75:THR:OG1	2.24	0.56
3:L:31:ILE:O	3:L:32:ILE:HG13	2.06	0.56
1:G:294:ILE:HG13	1:G:333:ILE:HG22	1.89	0.55
1:G:241:ASN:OD1	1:G:241:ASN:N	2.37	0.55
1:G:245:VAL:HG12	1:G:247:CYS:H	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:50:ASP:O	3:L:52:ASP:N	2.39	0.55
1:G:53:PHE:CE1	1:G:218:CYS:HB2	2.42	0.55
1:G:340:LYS:O	1:G:344:GLN:HG3	2.08	0.54
3:L:180:LEU:HD11	3:L:184:GLN:HB2	1.88	0.54
3:L:34:ALA:HB3	3:L:89:ASN:ND2	2.23	0.54
1:G:298:ARG:HD3	1:G:443:ILE:HD12	1.89	0.54
1:G:256:SER:OG	1:G:259:LEU:O	2.21	0.54
1:G:363:PRO:O	1:G:469:ARG:NH1	2.41	0.54
1:G:222:GLY:HA2	1:G:491:ILE:HB	1.90	0.53
1:G:227:LYS:NZ	1:G:229:ASN:OD1	2.30	0.53
1:G:458:GLY:H	2:H:58:ASN:HD21	1.56	0.53
1:G:278:THR:HG21	4:G:504:NAG:H61	1.90	0.53
3:L:35:TRP:HB2	3:L:48:ILE:HB	1.89	0.53
1:G:386:ASN:O	1:G:416:LEU:HD22	2.09	0.53
2:H:119:PRO:HB3	2:H:142:VAL:HG23	1.91	0.53
2:H:74:ASP:OD1	2:H:74:ASP:N	2.41	0.53
2:H:169:VAL:HB	3:L:162:THR:HG22	1.91	0.53
2:H:200:HIS:O	2:H:204:ASN:N	2.31	0.52
3:L:32:ILE:HD12	3:L:33:SER:N	2.24	0.52
1:G:345:VAL:O	1:G:349:LEU:HG	2.08	0.52
3:L:120:PRO:HD3	3:L:132:LEU:HG	1.90	0.52
1:G:96:TRP:HA	1:G:480:ARG:HD3	1.92	0.52
1:G:379:ARG:HG2	1:G:443:ILE:HG12	1.90	0.52
1:G:346:THR:HG23	1:G:359:ILE:HB	1.90	0.52
1:G:207:LYS:HD3	1:G:439:ILE:HB	1.91	0.52
3:L:7:ALA:O	3:L:103:ARG:NH1	2.43	0.51
1:G:65:VAL:HG23	1:G:66:HIS:HD2	1.74	0.51
3:L:115:VAL:HG23	3:L:136:ILE:HG13	1.91	0.51
1:G:98:ASN:OD1	1:G:99:ASN:N	2.44	0.51
2:H:40:ALA:HB3	2:H:43:GLN:HB2	1.93	0.51
1:G:53:PHE:HE1	1:G:218:CYS:HB2	1.74	0.51
2:H:195:ILE:HG12	2:H:210:ARG:HA	1.92	0.50
3:L:46:LEU:HD21	3:L:49:PHE:HB3	1.92	0.50
1:G:251:ILE:HD13	1:G:482:GLU:HB3	1.93	0.50
1:G:264:SER:O	1:G:287:HIS:NE2	2.27	0.50
3:L:33:SER:N	3:L:51:ASP:OD1	2.44	0.50
3:L:136:ILE:HG12	3:L:195:VAL:HG11	1.93	0.50
1:G:272:ILE:HD12	1:G:286:VAL:HG22	1.94	0.50
1:G:60:ALA:HB2	1:G:71:THR:HG21	1.93	0.50
3:L:149:LYS:HD3	3:L:194:GLN:OE1	2.12	0.49
3:L:180:LEU:HD12	3:L:181:THR:H	1.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:194:GLN:NE2	3:L:203:GLU:OE1	2.45	0.49
1:G:95:MET:HE2	1:G:273:ARG:HD2	1.94	0.49
1:G:102:GLU:HG3	1:G:476:LYS:NZ	2.27	0.49
1:G:229:ASN:O	1:G:241:ASN:ND2	2.46	0.49
1:G:55:ALA:HA	1:G:75:VAL:O	2.11	0.49
2:H:168:ALA:HA	2:H:178:LEU:HB3	1.93	0.48
1:G:64:GLU:OE2	1:G:211:ASP:N	2.41	0.48
1:G:265:LEU:HD21	1:G:291:SER:H	1.78	0.48
1:G:421:LYS:HE3	1:G:423:ILE:HG13	1.96	0.48
2:H:33:LEU:HD12	2:H:100:ASN:HD22	1.77	0.48
1:G:217:TYR:O	1:G:248:THR:HG23	2.14	0.48
1:G:350:LYS:HG2	1:G:357:LYS:O	2.14	0.48
2:H:135:THR:O	2:H:135:THR:OG1	2.31	0.48
1:G:64:GLU:HB3	1:G:67:ASN:HB2	1.95	0.47
3:L:54:ARG:NH1	3:L:59:PRO:O	2.47	0.47
3:L:48:ILE:HD13	3:L:54:ARG:HB3	1.95	0.47
3:L:54:ARG:HH12	3:L:60:SER:HA	1.80	0.47
1:G:337:LYS:O	1:G:341:VAL:HG13	2.15	0.47
3:L:133:VAL:HG22	3:L:177:TYR:CD1	2.50	0.46
1:G:64:GLU:HG3	1:G:65:VAL:N	2.30	0.46
3:L:61:ARG:NH2	3:L:82:ASP:OD1	2.48	0.46
1:G:240:LYS:HD2	1:G:241:ASN:N	2.30	0.46
1:G:353:PHE:O	1:G:357:LYS:HB2	2.15	0.46
2:H:205:THR:O	2:H:205:THR:OG1	2.33	0.46
1:G:248:THR:HB	1:G:486:TYR:HE2	1.81	0.46
3:L:13:ALA:HB2	3:L:19:VAL:HG11	1.98	0.46
1:G:338:TRP:CZ2	1:G:390:LEU:HB3	2.50	0.46
3:L:180:LEU:HD12	3:L:181:THR:N	2.31	0.45
1:G:220:PRO:O	1:G:246:GLN:NE2	2.49	0.45
3:L:36:PHE:HE1	3:L:89:ASN:ND2	2.15	0.45
1:G:454:LEU:HD13	1:G:468:PHE:HB3	1.98	0.45
2:H:153:SER:O	2:H:197:ASN:N	2.50	0.45
3:L:120:PRO:HB3	3:L:131:THR:H	1.82	0.45
3:L:134:CYS:HB2	3:L:148:TRP:CH2	2.51	0.45
1:G:367:GLY:HA3	1:G:371:ILE:HD11	1.99	0.44
1:G:457:ASP:HA	2:H:58:ASN:ND2	2.33	0.44
1:G:283:THR:HG21	1:G:473:GLY:HA3	1.99	0.44
1:G:69:TRP:CG	1:G:111:LEU:HD13	2.52	0.44
1:G:370:GLU:HG3	1:G:384:TYR:HE2	1.82	0.44
3:L:12:SER:OG	3:L:106(A):LEU:HD21	2.17	0.44
1:G:227:LYS:HE2	1:G:485:LYS:HE2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:274:SER:HB3	1:G:277:LEU:HD12	2.00	0.43
1:G:391:PHE:CE2	1:G:470:PRO:HG3	2.53	0.43
1:G:427:TRP:HA	2:H:54:TYR:OH	2.18	0.43
2:H:195:ILE:HG22	2:H:196:CYS:O	2.18	0.43
1:G:273:ARG:HH22	1:G:287:HIS:CG	2.36	0.43
1:G:95:MET:CE	1:G:273:ARG:HD2	2.48	0.43
2:H:201:LYS:O	2:H:204:ASN:ND2	2.52	0.43
1:G:440:ASP:OD1	1:G:441:GLY:N	2.52	0.43
2:H:15:GLY:O	2:H:82(C):LEU:HD12	2.18	0.43
1:G:214:PRO:C	1:G:215:ILE:HD13	2.39	0.43
2:H:54:TYR:HB2	2:H:56:GLN:HE21	1.82	0.43
3:L:159:VAL:HG22	3:L:178:LEU:HD13	2.01	0.43
2:H:46:GLU:OE2	2:H:62:ARG:NE	2.52	0.42
3:L:181:THR:HG22	3:L:183:GLU:H	1.83	0.42
1:G:474:ASN:OD1	1:G:474:ASN:N	2.52	0.42
2:H:6:GLN:H	2:H:105:GLN:NE2	2.17	0.42
2:H:32:GLN:NE2	2:H:96:PRO:O	2.52	0.42
1:G:80:ASN:ND2	1:G:82:GLN:HE22	2.18	0.42
1:G:86:LEU:HD23	1:G:86:LEU:HA	1.87	0.42
3:L:128:ASN:O	3:L:129:LYS:HD3	2.20	0.42
3:L:133:VAL:HG22	3:L:177:TYR:HD1	1.84	0.42
2:H:121:VAL:C	2:H:122:PHE:HD1	2.22	0.42
1:G:64:GLU:HG2	1:G:67:ASN:H	1.84	0.42
1:G:87:GLU:O	1:G:87:GLU:HG2	2.19	0.42
1:G:425:ASN:HA	1:G:431:GLY:O	2.20	0.42
1:G:257:THR:O	1:G:374:HIS:ND1	2.47	0.41
1:G:338:TRP:CE2	1:G:390:LEU:HB3	2.55	0.41
2:H:32:GLN:HB3	2:H:94:ARG:HE	1.85	0.41
3:L:195:VAL:HG22	3:L:202:VAL:HG13	2.01	0.41
1:G:257:THR:O	1:G:259:LEU:N	2.50	0.41
3:L:149:LYS:HZ2	3:L:154:PRO:HB3	1.84	0.41
2:H:152:VAL:HA	2:H:197:ASN:O	2.20	0.41
1:G:484:TYR:CE1	1:G:485:LYS:HD3	2.54	0.41
3:L:105:THR:HG21	3:L:141:PRO:HB3	2.02	0.41
3:L:104:LEU:HD12	3:L:105:THR:N	2.35	0.41
1:G:484:TYR:H	1:G:484:TYR:HD1	1.69	0.41
3:L:79:GLN:HB3	3:L:80:PRO:CD	2.50	0.41
1:G:485:LYS:HG3	1:G:486:TYR:CD1	2.56	0.41
3:L:63:SER:O	3:L:73:LEU:HD12	2.21	0.41
3:L:79:GLN:HB3	3:L:80:PRO:HD2	2.03	0.41
3:L:129:LYS:HD3	3:L:129:LYS:HA	1.71	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:231:LYS:HA	1:G:267:GLU:OE1	2.21	0.41
1:G:252:LYS:HA	1:G:253:PRO:HD3	1.93	0.40
1:G:91:GLU:O	1:G:238:PRO:HA	2.22	0.40
1:G:115:SER:OG	1:G:116:LEU:HD12	2.22	0.40
2:H:35:ASN:ND2	2:H:47:TRP:HE1	2.17	0.40
2:H:84:VAL:O	2:H:87:THR:OG1	2.26	0.40
2:H:6:GLN:HG3	2:H:107:VAL:HG13	2.02	0.40
1:G:49:ASP:OD1	1:G:49:ASP:N	2.55	0.40
2:H:83:ARG:N	2:H:86:ASP:OD2	2.39	0.40
2:H:118:GLY:HA2	2:H:119:PRO:HD3	1.91	0.40
2:H:206:LYS:HE2	2:H:206:LYS:HB2	1.84	0.40
1:G:86:LEU:O	1:G:88:ASN:N	2.53	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	311/355 (88%)	281 (90%)	28 (9%)	2 (1%)	22	54
2	H	210/221 (95%)	188 (90%)	20 (10%)	2 (1%)	13	43
3	L	198/203 (98%)	178 (90%)	15 (8%)	5 (2%)	4	23
All	All	719/779 (92%)	647 (90%)	63 (9%)	9 (1%)	10	37

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	L	32	ILE
1	G	231	LYS
3	L	26	THR
2	H	117	LYS
3	L	51	ASP

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Mol	Chain	Res	Type
1	G	79	PRO
3	L	110	LYS
2	H	32	GLN
3	L	151	ASP

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	G	287/313 (92%)	278 (97%)	9 (3%)	35	62
2	H	182/187 (97%)	173 (95%)	9 (5%)	21	50
3	L	172/175 (98%)	164 (95%)	8 (5%)	22	51
All	All	641/675 (95%)	615 (96%)	26 (4%)	26	54

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	53	PHE
1	G	99	ASN
1	G	210	PHE
1	G	240	LYS
1	G	241	ASN
1	G	432	GLN
1	G	474	ASN
1	G	484	TYR
1	G	485	LYS
2	H	4	LEU
2	H	58	ASN
2	H	60	SER
2	H	74	ASP
2	H	82(C)	LEU
2	H	92	CYS
2	H	117	LYS
2	H	127	SER
2	H	164	HIS

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Mol	Chain	Res	Type
3	L	14	SER
3	L	18	SER
3	L	22	SER
3	L	54	ARG
3	L	89	ASN
3	L	114	SER
3	L	149	LYS
3	L	168	SER

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

Mol	Chain	Res	Type
1	G	80	ASN
1	G	103	GLN
1	G	246	GLN
1	G	389	GLN
1	G	432	GLN
2	H	35	ASN
2	H	58	ASN
2	H	105	GLN
2	H	204	ASN
3	L	89	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 12 ligands modelled in this entry, 1 is monoatomic - leaving 11 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	$\#|Z| > 2$
4	NAG	G	506	1	14,14,15	0.26	0	17,19,21	0.51	0
4	NAG	G	503	1	14,14,15	0.22	0	17,19,21	0.45	0
4	NAG	G	511	1	14,14,15	0.41	0	17,19,21	0.51	0
4	NAG	G	510	1	14,14,15	0.24	0	17,19,21	0.48	0
4	NAG	G	509	1	14,14,15	0.51	0	17,19,21	0.48	0
4	NAG	G	502	1	14,14,15	0.24	0	17,19,21	0.51	0
4	NAG	G	508	1	14,14,15	0.36	0	17,19,21	0.37	0
4	NAG	G	501	1	14,14,15	0.19	0	17,19,21	0.39	0
4	NAG	G	505	1	14,14,15	0.38	0	17,19,21	0.40	0
4	NAG	G	504	1	14,14,15	0.41	0	17,19,21	0.35	0
4	NAG	G	507	1	14,14,15	0.65	0	17,19,21	0.52	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
4	NAG	G	506	1	-	0/6/23/26	0/1/1/1
4	NAG	G	503	1	-	0/6/23/26	0/1/1/1
4	NAG	G	511	1	-	2/6/23/26	0/1/1/1
4	NAG	G	510	1	-	4/6/23/26	0/1/1/1
4	NAG	G	509	1	-	2/6/23/26	0/1/1/1
4	NAG	G	502	1	-	2/6/23/26	0/1/1/1
4	NAG	G	508	1	-	4/6/23/26	0/1/1/1
4	NAG	G	501	1	-	2/6/23/26	0/1/1/1
4	NAG	G	505	1	-	2/6/23/26	0/1/1/1
4	NAG	G	504	1	-	2/6/23/26	0/1/1/1
4	NAG	G	507	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	G	511	NAG	O5-C5-C6-O6
4	G	505	NAG	O5-C5-C6-O6
4	G	502	NAG	C4-C5-C6-O6
4	G	505	NAG	C4-C5-C6-O6
4	G	511	NAG	C4-C5-C6-O6
4	G	504	NAG	O5-C5-C6-O6
4	G	501	NAG	O5-C5-C6-O6
4	G	502	NAG	O5-C5-C6-O6
4	G	510	NAG	O5-C5-C6-O6
4	G	501	NAG	C4-C5-C6-O6
4	G	508	NAG	C8-C7-N2-C2
4	G	508	NAG	O7-C7-N2-C2
4	G	509	NAG	C8-C7-N2-C2
4	G	509	NAG	O7-C7-N2-C2
4	G	510	NAG	C8-C7-N2-C2
4	G	510	NAG	O7-C7-N2-C2
4	G	508	NAG	O5-C5-C6-O6
4	G	510	NAG	C4-C5-C6-O6
4	G	504	NAG	C4-C5-C6-O6
4	G	508	NAG	C4-C5-C6-O6
4	G	507	NAG	O5-C5-C6-O6
4	G	507	NAG	C4-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	G	509	NAG	2	0
4	G	504	NAG	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(Å²)	Q<0.9
1	G	319/355 (89%)	-0.28	4 (1%)	74	59	83, 130, 190, 229	0
2	H	214/221 (96%)	-0.17	3 (1%)	73	58	76, 106, 169, 214	0
3	L	200/203 (98%)	-0.34	0	100	100	79, 104, 153, 181	0
All	All	733/779 (94%)	-0.26	7 (0%)	79	65	76, 114, 179, 229	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	37	VAL	4.0
1	G	427	TRP	3.9
2	H	36	TRP	3.3
2	H	81	GLU	2.6
1	G	259	LEU	2.4
1	G	250	GLY	2.0
1	G	473	GLY	2.0

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
4	NAG	G	509	14/15	0.24	0.11	158,183,199,210	0
4	NAG	G	511	14/15	0.35	0.09	127,159,169,169	0
4	NAG	G	502	14/15	0.39	0.13	149,165,174,178	0
4	NAG	G	504	14/15	0.58	0.10	102,127,134,138	0
4	NAG	G	510	14/15	0.69	0.08	101,122,134,134	0
4	NAG	G	507	14/15	0.73	0.07	164,174,187,189	0
4	NAG	G	506	14/15	0.77	0.08	112,135,150,160	0
4	NAG	G	508	14/15	0.84	0.09	106,110,154,162	0
4	NAG	G	501	14/15	0.88	0.08	92,116,132,134	0
4	NAG	G	505	14/15	0.89	0.07	113,127,143,150	0
4	NAG	G	503	14/15	0.94	0.08	95,121,132,143	0
5	NA	H	301	1/1	0.97	0.18	61,61,61,61	1

6.5 Other polymers ⓘ

There are no such residues in this entry.