



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 06:16 AM UTC

PDB ID : 7VMT / pdb_00007vmt
Title : Crystal structure of murine N-acetylglucosaminyl transferase IVa (GnT-IVa)
lectin domain in unliganded form
Authors : Nagae, M.
Deposited on : 2021-10-09
Resolution : 1.95 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

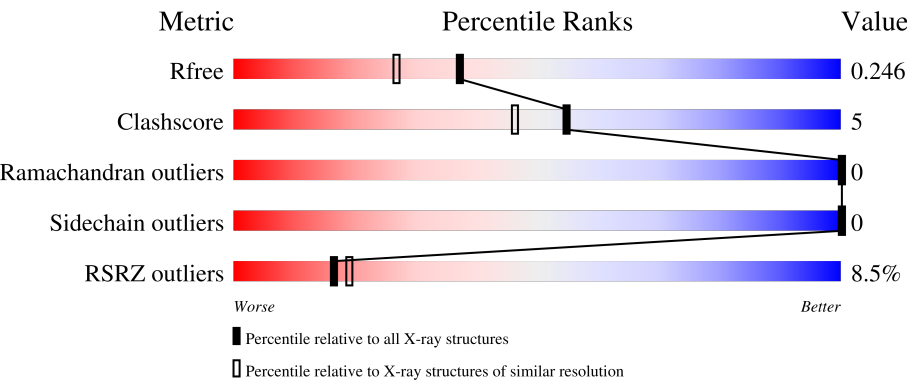
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.95 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}	180053	3494 (1.96-1.96)
Clashscore	190562	3612 (1.96-1.96)
Ramachandran outliers	187476	3587 (1.96-1.96)
Sidechain outliers	187428	3587 (1.96-1.96)
RSRZ outliers	180081	3495 (1.96-1.96)

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 $\leq 5\%$. 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	A	149	13% 78% 16% 6%
1	B	149	3% 92% 6%
1	C	149	7% 91% 7%
1	D	149	11% 90% 7%
1	E	149	7% 91% 6%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	149	9% 87% 10% ..

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7042 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 Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	140	Total	C	N	O	S	0	0	0
			1107	718	180	208	1			
1	B	146	Total	C	N	O	S	0	0	0
			1152	745	186	220	1			
1	C	139	Total	C	N	O	S	0	0	0
			1101	715	179	206	1			
1	D	145	Total	C	N	O	S	0	0	0
			1146	742	185	218	1			
1	E	144	Total	C	N	O	S	0	0	0
			1140	739	184	216	1			
1	F	145	Total	C	N	O	S	0	0	0
			1144	739	185	219	1			

There are 30 discrepancies between the modelled and reference sequences:

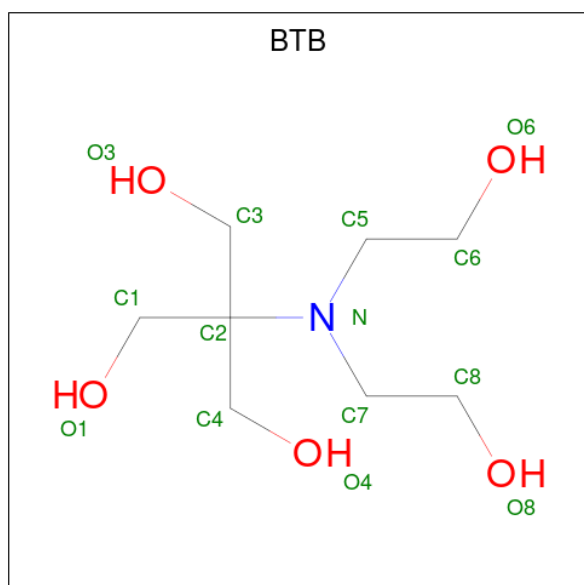
Chain	Residue	Modelled	Actual	Comment	Reference
A	378	GLY	-	expression tag	UNP Q812G0
A	379	PRO	-	expression tag	UNP Q812G0
A	380	LEU	-	expression tag	UNP Q812G0
A	381	GLY	-	expression tag	UNP Q812G0
A	445	ALA	ASP	engineered mutation	UNP Q812G0
B	378	GLY	-	expression tag	UNP Q812G0
B	379	PRO	-	expression tag	UNP Q812G0
B	380	LEU	-	expression tag	UNP Q812G0
B	381	GLY	-	expression tag	UNP Q812G0
B	445	ALA	ASP	engineered mutation	UNP Q812G0
C	378	GLY	-	expression tag	UNP Q812G0
C	379	PRO	-	expression tag	UNP Q812G0
C	380	LEU	-	expression tag	UNP Q812G0
C	381	GLY	-	expression tag	UNP Q812G0
C	445	ALA	ASP	engineered mutation	UNP Q812G0
D	378	GLY	-	expression tag	UNP Q812G0

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	379	PRO	-	expression tag	UNP Q812G0
D	380	LEU	-	expression tag	UNP Q812G0
D	381	GLY	-	expression tag	UNP Q812G0
D	445	ALA	ASP	engineered mutation	UNP Q812G0
E	378	GLY	-	expression tag	UNP Q812G0
E	379	PRO	-	expression tag	UNP Q812G0
E	380	LEU	-	expression tag	UNP Q812G0
E	381	GLY	-	expression tag	UNP Q812G0
E	445	ALA	ASP	engineered mutation	UNP Q812G0
F	378	GLY	-	expression tag	UNP Q812G0
F	379	PRO	-	expression tag	UNP Q812G0
F	380	LEU	-	expression tag	UNP Q812G0
F	381	GLY	-	expression tag	UNP Q812G0
F	445	ALA	ASP	engineered mutation	UNP Q812G0

- Molecule 2 is 2-[BIS-(2-HYDROXY-ETHYL)-AMINO]-2-HYDROXYMETHYL-PROPAN E-1,3-DIOL (CCD ID: BTB) (formula: C₈H₁₉NO₅).



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

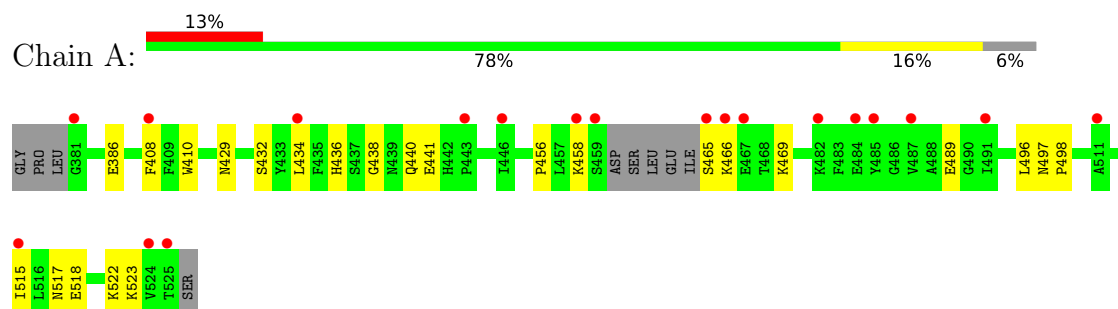
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	13	Total 13	O 13	0	0
3	B	48	Total 48	O 48	0	0
3	C	44	Total 44	O 44	0	0
3	D	33	Total 33	O 33	0	0
3	E	47	Total 47	O 47	0	0
3	F	25	Total 25	O 25	0	0

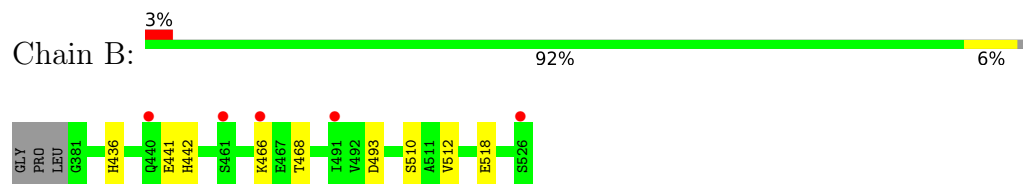
3 Residue-property plots [i](#)

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.

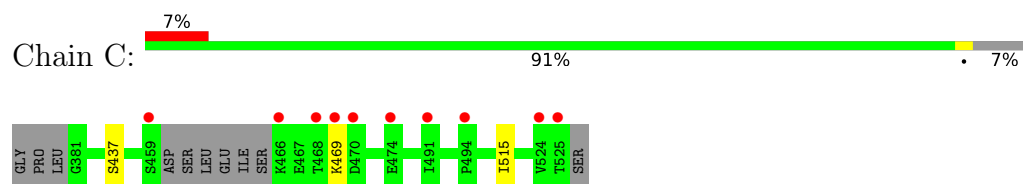
- Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



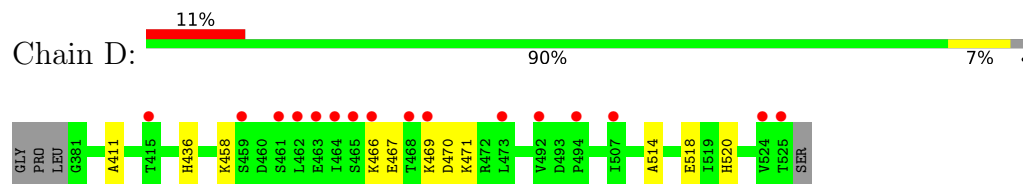
- Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



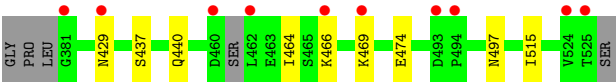
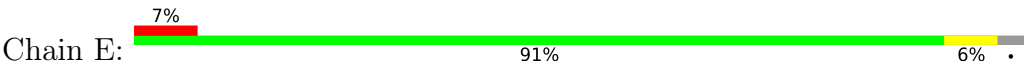
- Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



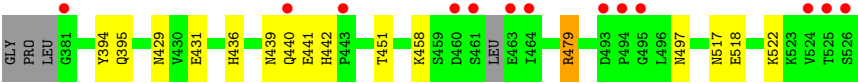
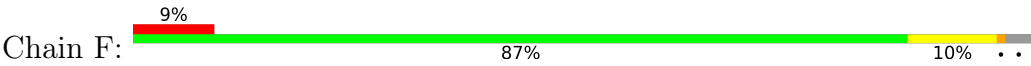
- Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



- Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



● Molecule 1: Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase A soluble form



4 Data and refinement statistics

Property	Value	Source
Space group	I 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	82.91Å 82.50Å 148.87Å 90.00° 105.66° 90.00°	Depositor
Resolution (Å)	46.96 – 1.95 46.96 – 1.95	Depositor EDS
% Data completeness (in resolution range)	99.7 (46.96-1.95) 99.7 (46.96-1.95)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 1.95Å)	Xtriage
Refinement program	PHENIX 1.12_2829	Depositor
R, R_{free}	0.208 , 0.244 0.212 , 0.246	Depositor DCC
R_{free} test set	3535 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	36.8	Xtriage
Anisotropy	0.053	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 25.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	7042	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.56% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BTB

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	0.30	0/1135	0.49	0/1540
1	B	0.36	0/1181	0.54	0/1604
1	C	0.38	0/1129	0.54	0/1532
1	D	0.35	0/1175	0.53	0/1596
1	E	0.37	0/1168	0.54	0/1585
1	F	0.32	0/1172	0.55	1/1590 (0.1%)
All	All	0.35	0/6960	0.53	1/9447 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	479	ARG	CA-CB-CG	5.23	124.56	114.10

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	1107	0	1095	21	0
1	B	1152	0	1138	6	0
1	C	1101	0	1090	2	0
1	D	1146	0	1133	15	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	1140	0	1127	8	0
1	F	1144	0	1126	9	0
2	A	14	0	19	1	0
2	B	14	0	19	0	0
2	F	14	0	19	3	0
3	A	13	0	0	4	0
3	B	48	0	0	0	0
3	C	44	0	0	0	0
3	D	33	0	0	0	0
3	E	47	0	0	1	0
3	F	25	0	0	0	0
All	All	7042	0	6766	65	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 (65) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:466:LYS:HG2	1:D:469:LYS:NZ	1.48	1.25
1:D:466:LYS:CG	1:D:469:LYS:HZ1	1.73	1.01
1:D:466:LYS:HG2	1:D:469:LYS:HZ3	1.22	0.98
1:D:466:LYS:CG	1:D:469:LYS:NZ	2.28	0.92
1:A:496:LEU:O	3:A:701:HOH:O	1.92	0.88
1:A:498:PRO:O	3:A:701:HOH:O	1.96	0.82
1:D:466:LYS:HA	1:D:469:LYS:HG2	1.62	0.79
1:D:466:LYS:HG2	1:D:469:LYS:HZ1	1.28	0.79
1:C:469:LYS:NZ	1:C:469:LYS:O	2.16	0.78
1:A:434:LEU:HD23	1:A:489:GLU:HB3	1.71	0.73
1:A:408:PHE:HD1	1:A:515:ILE:HD12	1.56	0.70
1:A:408:PHE:CD1	1:A:515:ILE:HD12	2.28	0.69
1:D:467:GLU:O	1:D:471:LYS:HD3	1.98	0.64
1:E:464:ILE:O	1:E:469:LYS:NZ	2.30	0.64
1:A:386:GLU:OE2	3:A:702:HOH:O	2.16	0.63
1:B:436:HIS:HB3	1:B:518:GLU:HB2	1.79	0.63
1:D:466:LYS:CD	1:D:469:LYS:HZ1	2.12	0.62
1:E:474:GLU:H	1:E:474:GLU:CD	2.07	0.62
1:A:458:LYS:HZ1	1:A:497:ASN:C	2.08	0.62
1:A:458:LYS:NZ	1:A:498:PRO:HD2	2.18	0.59
1:A:466:LYS:HA	1:A:469:LYS:HB3	1.83	0.59
1:A:436:HIS:HB3	1:A:518:GLU:HB2	1.85	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:410:TRP:CD2	1:A:515:ILE:HD11	2.40	0.55
1:E:466:LYS:NZ	3:E:602:HOH:O	2.39	0.55
1:F:394:TYR:CE2	1:F:395:GLN:HG3	2.41	0.55
1:F:441:GLU:HG3	1:F:442:HIS:ND1	2.23	0.54
1:F:436:HIS:HB3	1:F:518:GLU:HB2	1.90	0.53
1:A:432:SER:OG	1:A:522:LYS:HE2	2.08	0.53
1:D:466:LYS:CB	1:D:469:LYS:HZ1	2.22	0.51
1:A:465:SER:O	1:A:466:LYS:HB3	2.11	0.51
1:D:436:HIS:HB3	1:D:518:GLU:HB2	1.93	0.50
1:D:411:ALA:HB3	1:D:514:ALA:HB3	1.92	0.50
1:F:431:GLU:HB3	1:F:522:LYS:HD3	1.92	0.50
1:A:458:LYS:HZ1	1:A:498:PRO:HD2	1.76	0.49
1:F:429:ASN:HD22	1:F:497:ASN:HB3	1.76	0.49
1:B:510:SER:OG	1:B:512:VAL:HG12	2.13	0.48
1:B:510:SER:HG	1:B:512:VAL:HG12	1.78	0.47
1:A:440:GLN:O	1:A:441:GLU:HB3	2.14	0.47
1:E:469:LYS:HZ2	1:E:469:LYS:HG3	1.51	0.47
1:D:518:GLU:OE1	1:D:520:HIS:NE2	2.46	0.46
1:A:458:LYS:HZ1	1:A:498:PRO:CD	2.29	0.46
1:F:458:LYS:HD3	1:F:458:LYS:HA	1.58	0.46
1:F:440:GLN:HG2	1:F:441:GLU:N	2.32	0.45
1:D:467:GLU:H	1:D:467:GLU:CD	2.25	0.44
1:E:429:ASN:OD1	1:E:497:ASN:HB3	2.17	0.44
1:A:458:LYS:HZ1	1:A:498:PRO:N	2.14	0.44
1:A:456:PRO:HB3	3:A:701:HOH:O	2.18	0.43
1:F:451:THR:HB	1:F:479:ARG:HD3	2.00	0.43
1:B:466:LYS:HE2	1:B:466:LYS:HB3	1.84	0.42
1:E:437:SER:HA	1:E:515:ILE:O	2.19	0.42
2:A:601:BTB:H72	2:A:601:BTB:H41	1.85	0.42
1:D:458:LYS:HA	1:D:458:LYS:HD2	1.89	0.42
1:A:429:ASN:H	1:A:523:LYS:NZ	2.18	0.42
2:F:601:BTB:H82	2:F:601:BTB:H61	2.00	0.42
1:B:441:GLU:HG3	1:B:442:HIS:ND1	2.34	0.42
1:A:410:TRP:CE2	1:A:515:ILE:HD11	2.55	0.41
1:A:438:GLY:O	1:A:517:ASN:ND2	2.52	0.41
1:E:474:GLU:CD	1:E:474:GLU:N	2.77	0.41
1:D:469:LYS:HG3	1:D:470:ASP:N	2.35	0.41
2:F:601:BTB:H11	2:F:601:BTB:H52	1.76	0.41
1:B:468:THR:OG1	1:B:493:ASP:OD2	2.30	0.40
1:C:437:SER:HA	1:C:515:ILE:O	2.21	0.40
2:F:601:BTB:H72	2:F:601:BTB:H41	1.83	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:440:GLN:OE1	1:E:440:GLN:N	2.53	0.40
1:F:439:ASN:HB3	1:F:517:ASN:ND2	2.36	0.40

There are no symmetry-related clashes.

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	136/149 (91%)	132 (97%)	4 (3%)	0	100	100
1	B	144/149 (97%)	143 (99%)	1 (1%)	0	100	100
1	C	135/149 (91%)	135 (100%)	0	0	100	100
1	D	143/149 (96%)	139 (97%)	4 (3%)	0	100	100
1	E	140/149 (94%)	139 (99%)	1 (1%)	0	100	100
1	F	141/149 (95%)	140 (99%)	1 (1%)	0	100	100
All	All	839/894 (94%)	828 (99%)	11 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	121/129 (94%)	121 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	127/129 (98%)	127 (100%)	0	100	100
1	C	120/129 (93%)	120 (100%)	0	100	100
1	D	126/129 (98%)	126 (100%)	0	100	100
1	E	125/129 (97%)	125 (100%)	0	100	100
1	F	126/129 (98%)	126 (100%)	0	100	100
All	All	745/774 (96%)	745 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	397	HIS
1	C	442	HIS
1	C	520	HIS
1	D	449	ASN
1	E	508	GLN
1	E	517	ASN
1	E	520	HIS
1	F	397	HIS
1	F	429	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 ⓘ

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	BTB	A	601	-	13,13,13	0.66	0	7,16,16	0.51	0
2	BTB	F	601	-	13,13,13	0.65	0	7,16,16	0.48	0
2	BTB	B	601	-	13,13,13	0.99	1 (7%)	7,16,16	2.07	2 (28%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	BTB	A	601	-	-	6/21/21/21	-
2	BTB	F	601	-	-	4/21/21/21	-
2	BTB	B	601	-	-	8/21/21/21	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	BTB	C7-N	-2.14	1.44	1.48

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	BTB	O8-C8-C7	-3.68	96.05	111.22
2	B	601	BTB	C8-C7-N	3.62	125.74	111.59

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	BTB	O1-C1-C2-N
2	A	601	BTB	C1-C2-C4-O4
2	A	601	BTB	C3-C2-C4-O4
2	B	601	BTB	C1-C2-N-C5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
2	B	601	BTB	C1-C2-N-C7
2	B	601	BTB	C3-C2-N-C7
2	B	601	BTB	C4-C2-N-C7
2	B	601	BTB	C6-C5-N-C7
2	F	601	BTB	C1-C2-C4-O4
2	F	601	BTB	C3-C2-C4-O4
2	F	601	BTB	N-C2-C4-O4
2	B	601	BTB	N-C7-C8-O8
2	F	601	BTB	N-C7-C8-O8
2	A	601	BTB	N-C7-C8-O8
2	A	601	BTB	O1-C1-C2-C4
2	A	601	BTB	N-C2-C4-O4
2	B	601	BTB	C3-C2-N-C5
2	B	601	BTB	C4-C2-N-C5

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	601	BTB	1	0
2	F	601	BTB	3	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	140/149 (93%)	1.09	19 (13%) 7 7	32, 48, 76, 93	0
1	B	146/149 (97%)	0.34	5 (3%) 48 54	27, 35, 55, 72	0
1	C	139/149 (93%)	0.47	10 (7%) 21 25	26, 35, 65, 87	0
1	D	145/149 (97%)	0.57	16 (11%) 10 12	28, 37, 79, 89	0
1	E	144/149 (96%)	0.33	10 (6%) 23 26	27, 35, 57, 88	0
1	F	145/149 (97%)	0.69	13 (8%) 15 17	30, 40, 71, 91	0
All	All	859/894 (96%)	0.58	73 (8%) 16 19	26, 38, 70, 93	0

All (73) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	462	LEU	6.4
1	A	381	GLY	6.4
1	D	462	LEU	5.2
1	A	465	SER	5.0
1	E	525	THR	4.5
1	F	381	GLY	4.2
1	D	464	ILE	4.1
1	C	525	THR	3.8
1	C	459	SER	3.7
1	F	461	SER	3.7
1	D	525	THR	3.7
1	A	487	VAL	3.6
1	F	464	ILE	3.3
1	D	466	LYS	3.2
1	E	460	ASP	3.2
1	C	466	LYS	3.2
1	F	526	SER	3.2
1	B	440	GLN	3.2
1	A	485	TYR	3.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	F	460	ASP	3.1
1	A	408	PHE	3.0
1	C	469	LYS	2.8
1	F	463	GLU	2.8
1	F	495	GLY	2.7
1	C	494	PRO	2.7
1	A	458	LYS	2.7
1	F	440	GLN	2.7
1	A	459	SER	2.7
1	C	524	VAL	2.7
1	D	473	LEU	2.6
1	D	415	THR	2.6
1	A	511	ALA	2.6
1	E	494	PRO	2.6
1	E	524	VAL	2.6
1	C	474	GLU	2.5
1	F	493	ASP	2.5
1	C	468	THR	2.5
1	D	468	THR	2.5
1	A	443	PRO	2.5
1	F	525	THR	2.5
1	E	493	ASP	2.5
1	A	434	LEU	2.4
1	A	446	ILE	2.4
1	C	470	ASP	2.4
1	B	461	SER	2.4
1	F	443	PRO	2.4
1	A	467	GLU	2.3
1	A	525	THR	2.3
1	A	482	LYS	2.3
1	E	381	GLY	2.3
1	A	491	ILE	2.3
1	B	526	SER	2.3
1	D	463	GLU	2.3
1	A	466	LYS	2.3
1	D	465	SER	2.2
1	D	524	VAL	2.2
1	B	466	LYS	2.2
1	E	429	ASN	2.2
1	F	524	VAL	2.2
1	A	484	GLU	2.2
1	D	494	PRO	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	515	ILE	2.2
1	A	524	VAL	2.2
1	F	494	PRO	2.2
1	C	491	ILE	2.1
1	D	461	SER	2.1
1	B	491	ILE	2.1
1	D	507	ILE	2.1
1	E	469	LYS	2.1
1	D	492	VAL	2.1
1	D	459	SER	2.0
1	D	469	LYS	2.0
1	E	466	LYS	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 oligosaccharides 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
2	BTB	B	601	14/14	0.94	0.08	25,29,33,37	0
2	BTB	A	601	14/14	0.95	0.07	29,31,33,33	0
2	BTB	F	601	14/14	0.97	0.06	27,30,31,33	0

6.5 Other polymers [i](#)

There are no such residues in this entry.