



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 09:55 PM UTC

PDB ID : 4Q1Q / pdb_00004q1q
Title : Crystal structure of TibC-catalyzed hyper-glycosylated TibA55-350 fragment
Authors : Yao, Q.; Lu, Q.; Shao, F.
Deposited on : 2014-04-04
Resolution : 2.11 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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

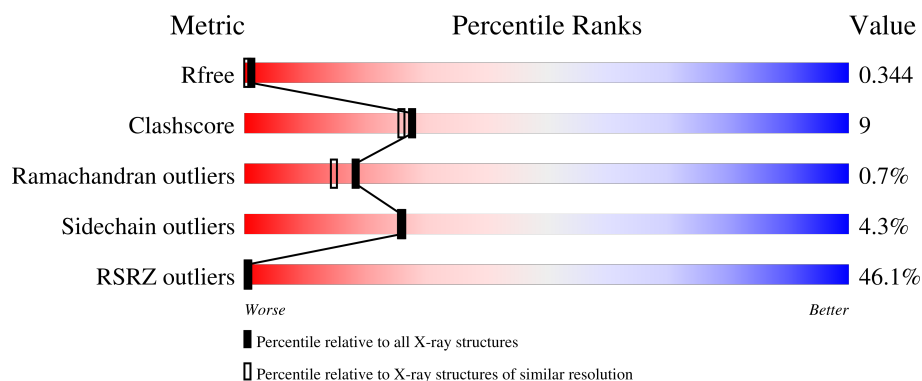
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.11 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	8290 (2.14-2.10)
Clashscore	190562	8817 (2.14-2.10)
Ramachandran outliers	187476	8738 (2.14-2.10)
Sidechain outliers	187428	8739 (2.14-2.10)
RSRZ outliers	180081	8294 (2.14-2.10)

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	305	30% 75% 14% 10%
1	B	305	51% 79% 10% 10%

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
2	289	A	402	X	-	-	-
2	289	A	406	X	-	-	-
2	289	A	413	-	-	X	-
2	289	A	421	X	-	-	-
2	289	A	433	X	-	-	-
2	289	A	435	X	-	-	-
2	289	B	408	X	-	-	-
2	289	B	433	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4712 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.

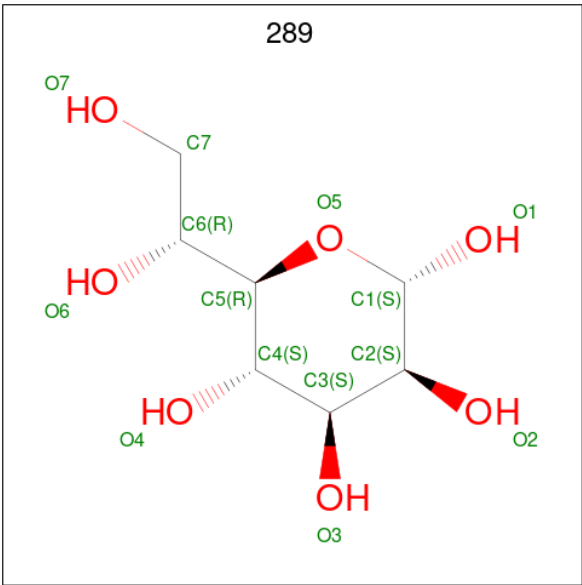
- Molecule 1 is a protein called Adhesin/invasin TibA autotransporter.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	274	Total	C	N	O	Se	0	0	0
			1864	1102	345	413	4			
1	B	274	Total	C	N	O	Se	0	0	0
			1864	1102	345	413	4			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	46	MSE	-	expression tag	UNP Q9XD84
A	47	ASP	-	expression tag	UNP Q9XD84
A	48	TYR	-	expression tag	UNP Q9XD84
A	49	LYS	-	expression tag	UNP Q9XD84
A	50	ASP	-	expression tag	UNP Q9XD84
A	51	ASP	-	expression tag	UNP Q9XD84
A	52	ASP	-	expression tag	UNP Q9XD84
A	53	ASP	-	expression tag	UNP Q9XD84
A	54	LYS	-	expression tag	UNP Q9XD84
B	46	MSE	-	expression tag	UNP Q9XD84
B	47	ASP	-	expression tag	UNP Q9XD84
B	48	TYR	-	expression tag	UNP Q9XD84
B	49	LYS	-	expression tag	UNP Q9XD84
B	50	ASP	-	expression tag	UNP Q9XD84
B	51	ASP	-	expression tag	UNP Q9XD84
B	52	ASP	-	expression tag	UNP Q9XD84
B	53	ASP	-	expression tag	UNP Q9XD84
B	54	LYS	-	expression tag	UNP Q9XD84

- Molecule 2 is D-glycero-alpha-D-manno-heptopyranose (CCD ID: 289) (formula: C₇H₁₄O₇).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		
2	A	1	Total	C	O	0	0
			13	7	6		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		
2	B	1	Total	C	O	0	0
			13	7	6		

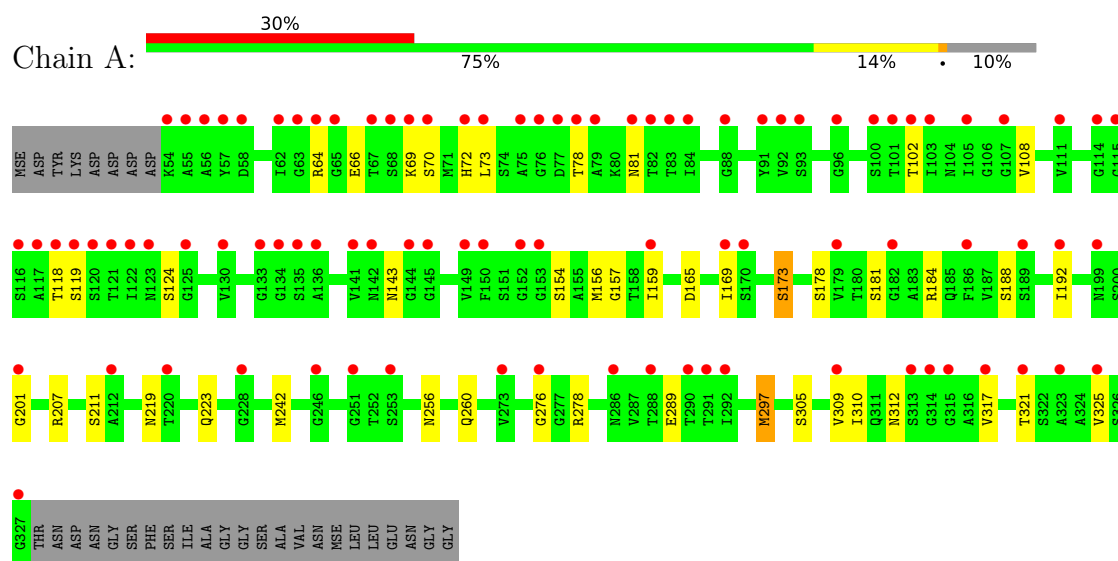
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	22	Total	O	0	0
			22	22		
3	B	52	Total	O	0	0
			52	52		

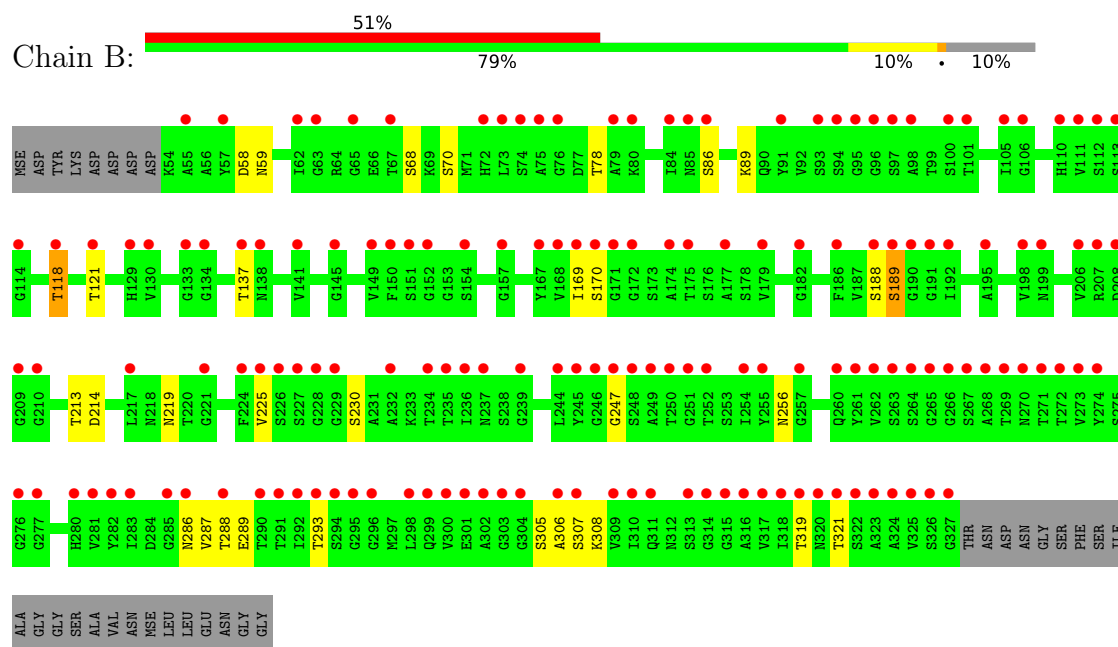
3 Residue-property plots

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: Adhesin/invasin TibA autotransporter



- Molecule 1: Adhesin/invasin TibA autotransporter



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	46.81Å 62.17Å 97.29Å 90.00° 90.90° 90.00°	Depositor
Resolution (Å)	19.87 – 2.11 19.87 – 2.11	Depositor EDS
% Data completeness (in resolution range)	97.8 (19.87-2.11) 97.8 (19.87-2.11)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.31 (at 2.11Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.205 , 0.248 0.336 , 0.344	Depositor DCC
R_{free} test set	1598 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	46.1	Xtriage
Anisotropy	0.456	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 31.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.024 for h,-k,-l	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	4712	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.05% 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:
289

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	0.45	0/1877	1.09	2/2530 (0.1%)
1	B	0.47	0/1877	1.09	1/2530 (0.0%)
All	All	0.46	0/3754	1.09	3/5060 (0.1%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	297	MSE	N-CA-C	5.42	118.29	108.69
1	B	188	SER	N-CA-C	5.42	116.21	108.74
1	A	108	VAL	N-CA-C	5.41	115.91	108.12

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1864	0	1737	26	4
1	B	1864	0	1737	19	2
2	A	455	0	419	32	6
2	B	455	0	407	24	9
3	A	22	0	0	0	0
3	B	52	0	0	1	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	4712	0	4300	80	11

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 9.

The worst 5 of 80 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)
2:B:435:289:C2	2:B:435:289:C3	1.79	1.58
2:B:433:289:C2	2:B:433:289:C3	1.85	1.51
2:A:413:289:O5	2:A:413:289:C5	1.64	1.44
2:B:433:289:O5	2:B:433:289:C5	1.64	1.42
2:B:406:289:O2	2:B:408:289:O6	1.55	1.24

The worst 5 of 11 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:312:ASN:OD1	3:B:549:HOH:O[2_656]	1.57	0.63
2:A:420:289:C7	2:B:416:289:O7[1_665]	1.59	0.61
2:A:403:289:O4	2:B:409:289:O7[1_665]	1.76	0.44
2:A:403:289:O3	2:B:409:289:O4[1_665]	1.81	0.39
2:A:408:289:O6	2:B:430:289:O3[1_655]	2.06	0.14

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	272/305 (89%)	257 (94%)	13 (5%)	2 (1%)	18	15
1	B	272/305 (89%)	260 (96%)	10 (4%)	2 (1%)	18	15

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	544/610 (89%)	517 (95%)	23 (4%)	4 (1%)	18	15

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	64	ARG
1	A	124	SER
1	B	86	SER
1	B	189	SER

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	197/216 (91%)	186 (94%)	11 (6%)	19	17
1	B	197/216 (91%)	191 (97%)	6 (3%)	36	40
All	All	394/432 (91%)	377 (96%)	17 (4%)	26	26

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	121	THR
1	B	321	THR
1	A	173	SER
1	A	178	SER
1	A	305	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	320	ASN
1	A	312	ASN
1	A	161	ASN
1	A	142	ASN

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Mol	Chain	Res	Type
1	A	219	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 ⓘ

70 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	289	B	413	1	13,13,14	0.49	0	16,18,20	1.66	3 (18%)
2	289	B	421	1	13,13,14	0.46	0	16,18,20	1.43	3 (18%)
2	289	A	428	1	13,13,14	0.20	0	16,18,20	1.90	4 (25%)
2	289	B	407	1	13,13,14	0.26	0	16,18,20	1.96	3 (18%)
2	289	B	416	1	13,13,14	5.13	5 (38%)	16,18,20	3.39	7 (43%)
2	289	B	414	1	13,13,14	0.31	0	16,18,20	1.43	2 (12%)
2	289	A	430	1	13,13,14	0.29	0	16,18,20	1.09	0
2	289	B	426	1	13,13,14	0.25	0	16,18,20	3.00	6 (37%)
2	289	B	430	1	13,13,14	0.32	0	16,18,20	1.48	2 (12%)
2	289	B	422	1	13,13,14	0.27	0	16,18,20	1.08	0
2	289	A	414	1	13,13,14	0.28	0	16,18,20	1.59	2 (12%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	289	B	420	1	13,13,14	0.43	0	16,18,20	2.13	3 (18%)
2	289	A	433	1	13,13,14	0.31	0	16,18,20	1.25	3 (18%)
2	289	A	408	1	13,13,14	0.24	0	16,18,20	1.49	1 (6%)
2	289	A	410	1	13,13,14	0.24	0	16,18,20	0.48	0
2	289	A	402	1	13,13,14	0.33	0	16,18,20	1.17	1 (6%)
2	289	B	427	1	13,13,14	0.28	0	16,18,20	1.40	3 (18%)
2	289	A	419	1	13,13,14	0.21	0	16,18,20	1.96	5 (31%)
2	289	B	415	1	13,13,14	0.34	0	16,18,20	1.49	4 (25%)
2	289	A	416	1	13,13,14	0.45	0	16,18,20	1.50	2 (12%)
2	289	B	433	1	13,13,14	9.11	6 (46%)	16,18,20	3.72	7 (43%)
2	289	A	412	1	13,13,14	0.46	0	16,18,20	1.84	4 (25%)
2	289	B	431	1	13,13,14	0.30	0	16,18,20	1.45	3 (18%)
2	289	B	410	1	13,13,14	0.32	0	16,18,20	1.38	1 (6%)
2	289	B	435	1	13,13,14	8.17	5 (38%)	16,18,20	6.82	11 (68%)
2	289	B	403	1	13,13,14	0.33	0	16,18,20	1.20	0
2	289	A	417	1	13,13,14	0.34	0	16,18,20	2.04	3 (18%)
2	289	B	408	1	13,13,14	0.34	0	16,18,20	1.64	4 (25%)
2	289	A	425	1	13,13,14	0.40	0	16,18,20	1.99	6 (37%)
2	289	A	431	1	13,13,14	0.21	0	16,18,20	0.97	1 (6%)
2	289	A	401	1	13,13,14	0.39	0	16,18,20	2.13	5 (31%)
2	289	A	423	1	13,13,14	0.28	0	16,18,20	1.34	2 (12%)
2	289	A	405	1	13,13,14	0.24	0	16,18,20	1.33	2 (12%)
2	289	B	404	1	13,13,14	0.34	0	16,18,20	1.77	4 (25%)
2	289	A	407	1	13,13,14	0.28	0	16,18,20	1.48	3 (18%)
2	289	B	429	1	13,13,14	0.30	0	16,18,20	1.96	6 (37%)
2	289	B	434	1	13,13,14	7.38	7 (53%)	16,18,20	3.89	12 (75%)
2	289	A	409	1	13,13,14	0.44	0	16,18,20	1.58	4 (25%)
2	289	B	417	1	13,13,14	0.35	0	16,18,20	0.91	1 (6%)
2	289	B	419	1	13,13,14	0.25	0	16,18,20	1.65	3 (18%)
2	289	A	418	1	13,13,14	0.40	0	16,18,20	1.21	1 (6%)
2	289	A	411	1	13,13,14	0.33	0	16,18,20	2.07	5 (31%)
2	289	A	406	1	13,13,14	0.38	0	16,18,20	1.11	1 (6%)
2	289	A	435	1	13,13,14	0.35	0	16,18,20	1.23	1 (6%)
2	289	A	404	1	13,13,14	0.25	0	16,18,20	1.63	4 (25%)
2	289	A	403	1	13,13,14	0.40	0	16,18,20	0.85	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	289	B	423	1	13,13,14	0.23	0	16,18,20	1.27	2 (12%)
2	289	A	420	1	13,13,14	0.21	0	16,18,20	0.44	0
2	289	B	401	1	13,13,14	0.39	0	16,18,20	1.54	3 (18%)
2	289	B	405	1	13,13,14	0.21	0	16,18,20	1.34	1 (6%)
2	289	A	421	1	13,13,14	0.22	0	16,18,20	1.06	1 (6%)
2	289	B	412	1	13,13,14	0.36	0	16,18,20	2.56	8 (50%)
2	289	B	425	1	13,13,14	0.34	0	16,18,20	2.07	7 (43%)
2	289	B	432	1	13,13,14	0.39	0	16,18,20	1.44	4 (25%)
2	289	A	415	1	13,13,14	0.31	0	16,18,20	1.57	2 (12%)
2	289	A	429	1	13,13,14	0.24	0	16,18,20	1.45	2 (12%)
2	289	A	413	1	13,13,14	4.61	1 (7%)	16,18,20	4.40	2 (12%)
2	289	A	424	1	13,13,14	0.25	0	16,18,20	1.23	3 (18%)
2	289	B	418	1	13,13,14	0.28	0	16,18,20	1.43	1 (6%)
2	289	B	409	1	13,13,14	0.31	0	16,18,20	1.33	3 (18%)
2	289	B	424	1	13,13,14	0.30	0	16,18,20	2.12	6 (37%)
2	289	B	406	1	13,13,14	0.20	0	16,18,20	0.43	0
2	289	A	434	1	13,13,14	2.88	6 (46%)	16,18,20	4.16	9 (56%)
2	289	B	428	1	13,13,14	0.25	0	16,18,20	1.09	1 (6%)
2	289	A	432	1	13,13,14	0.22	0	16,18,20	0.46	0
2	289	B	411	1	13,13,14	0.37	0	16,18,20	1.59	2 (12%)
2	289	A	427	1	13,13,14	0.27	0	16,18,20	1.46	3 (18%)
2	289	B	402	1	13,13,14	0.17	0	16,18,20	1.55	2 (12%)
2	289	A	426	1	13,13,14	0.27	0	16,18,20	0.87	1 (6%)
2	289	A	422	1	13,13,14	0.21	0	16,18,20	1.17	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	289	B	413	1	-	4/6/23/26	0/1/1/1
2	289	B	421	1	-	4/6/23/26	0/1/1/1
2	289	A	428	1	-	4/6/23/26	0/1/1/1
2	289	B	407	1	-	6/6/23/26	0/1/1/1
2	289	B	416	1	-	0/6/23/26	0/1/1/1
2	289	B	414	1	-	6/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	289	A	430	1	-	3/6/23/26	0/1/1/1
2	289	B	426	1	-	2/6/23/26	0/1/1/1
2	289	B	430	1	-	3/6/23/26	0/1/1/1
2	289	B	422	1	-	0/6/23/26	0/1/1/1
2	289	A	414	1	-	1/6/23/26	0/1/1/1
2	289	B	420	1	-	4/6/23/26	0/1/1/1
2	289	A	433	1	1/1/5/6	4/6/23/26	0/1/1/1
2	289	A	408	1	-	4/6/23/26	0/1/1/1
2	289	A	410	1	-	1/6/23/26	0/1/1/1
2	289	A	402	1	1/1/5/6	2/6/23/26	0/1/1/1
2	289	B	427	1	-	1/6/23/26	0/1/1/1
2	289	A	419	1	-	4/6/23/26	0/1/1/1
2	289	B	415	1	-	4/6/23/26	0/1/1/1
2	289	A	416	1	-	2/6/23/26	0/1/1/1
2	289	B	433	1	-	0/6/23/26	0/1/1/1
2	289	A	412	1	-	3/6/23/26	0/1/1/1
2	289	B	431	1	-	6/6/23/26	0/1/1/1
2	289	B	410	1	-	6/6/23/26	0/1/1/1
2	289	B	435	1	-	0/6/23/26	0/1/1/1
2	289	B	408	1	1/1/5/6	0/6/23/26	0/1/1/1
2	289	A	417	1	-	4/6/23/26	0/1/1/1
2	289	B	403	1	-	3/6/23/26	0/1/1/1
2	289	A	425	1	-	6/6/23/26	0/1/1/1
2	289	A	431	1	-	0/6/23/26	0/1/1/1
2	289	A	401	1	-	2/6/23/26	0/1/1/1
2	289	A	423	1	-	3/6/23/26	0/1/1/1
2	289	A	405	1	-	1/6/23/26	0/1/1/1
2	289	B	404	1	-	3/6/23/26	0/1/1/1
2	289	A	407	1	-	4/6/23/26	0/1/1/1
2	289	B	429	1	-	2/6/23/26	0/1/1/1
2	289	B	434	1	-	0/6/23/26	0/1/1/1
2	289	A	409	1	-	4/6/23/26	0/1/1/1
2	289	B	417	1	-	1/6/23/26	0/1/1/1
2	289	B	419	1	-	4/6/23/26	0/1/1/1
2	289	A	418	1	-	6/6/23/26	0/1/1/1
2	289	A	411	1	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	289	A	406	1	1/1/5/6	6/6/23/26	0/1/1/1
2	289	A	435	1	1/1/5/6	5/6/23/26	0/1/1/1
2	289	A	404	1	-	0/6/23/26	0/1/1/1
2	289	A	403	1	-	4/6/23/26	0/1/1/1
2	289	B	423	1	-	4/6/23/26	0/1/1/1
2	289	A	420	1	-	1/6/23/26	0/1/1/1
2	289	B	401	1	-	1/6/23/26	0/1/1/1
2	289	B	405	1	-	2/6/23/26	0/1/1/1
2	289	A	421	1	1/1/5/6	0/6/23/26	0/1/1/1
2	289	B	412	1	-	4/6/23/26	0/1/1/1
2	289	B	425	1	-	6/6/23/26	0/1/1/1
2	289	B	432	1	-	4/6/23/26	0/1/1/1
2	289	A	415	1	-	2/6/23/26	0/1/1/1
2	289	A	429	1	-	4/6/23/26	0/1/1/1
2	289	A	413	1	-	1/6/23/26	0/1/1/1
2	289	A	424	1	-	4/6/23/26	0/1/1/1
2	289	B	418	1	-	6/6/23/26	0/1/1/1
2	289	B	409	1	-	0/6/23/26	0/1/1/1
2	289	B	424	1	-	5/6/23/26	0/1/1/1
2	289	B	406	1	-	0/6/23/26	0/1/1/1
2	289	A	434	1	-	0/6/23/26	0/1/1/1
2	289	B	428	1	-	4/6/23/26	0/1/1/1
2	289	A	432	1	-	1/6/23/26	0/1/1/1
2	289	B	411	1	-	2/6/23/26	1/1/1/1
2	289	A	427	1	-	4/6/23/26	0/1/1/1
2	289	B	402	1	-	4/6/23/26	0/1/1/1
2	289	A	426	1	-	5/6/23/26	0/1/1/1
2	289	A	422	1	-	1/6/23/26	0/1/1/1

The worst 5 of 30 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	434	289	C7-C6	-22.67	0.96	1.52
2	B	435	289	O3-C3	-21.82	0.88	1.43
2	B	433	289	C2-C3	21.62	1.85	1.52
2	B	435	289	C2-C3	17.75	1.79	1.52
2	B	433	289	O5-C5	16.58	1.64	1.43

The worst 5 of 212 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	435	289	O3-C3-C2	22.19	155.34	110.05
2	A	413	289	O5-C5-C4	-17.05	80.78	110.73
2	A	434	289	C1-C2-C3	-9.78	95.41	109.64
2	B	416	289	O2-C2-C1	-9.43	87.63	109.22
2	A	434	289	C2-C3-C4	9.31	127.23	110.86

5 of 6 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	402	289	C1
2	A	406	289	C1
2	A	421	289	C1
2	A	433	289	C1
2	A	435	289	C1

5 of 201 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	402	289	O6-C6-C7-O7
2	A	403	289	C4-C5-C6-C7
2	A	403	289	O5-C5-C6-O6
2	A	403	289	C4-C5-C6-O6
2	A	406	289	O6-C6-C7-O7

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	411	289	C1-C2-C3-C4-C5-O5

30 monomers are involved in 65 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	416	289	1	3
2	A	430	289	1	0
2	B	430	289	0	1
2	A	414	289	1	0
2	B	420	289	0	1
2	A	433	289	2	0
2	A	408	289	0	1
2	A	410	289	5	0
2	A	416	289	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	433	289	11	0
2	A	412	289	5	0
2	B	435	289	3	0
2	B	408	289	2	0
2	A	425	289	2	0
2	A	431	289	1	0
2	B	404	289	2	0
2	A	406	289	2	0
2	A	403	289	0	2
2	A	420	289	2	3
2	B	425	289	1	0
2	B	432	289	1	0
2	A	413	289	6	0
2	A	424	289	1	0
2	B	409	289	0	2
2	B	424	289	1	1
2	B	406	289	4	0
2	A	434	289	4	0
2	B	428	289	1	1
2	A	432	289	2	0
2	B	411	289	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	270/305 (88%)	1.73	92 (34%) 1 1	40, 55, 83, 95	0
1	B	270/305 (88%)	2.38	157 (58%) 0 0	33, 46, 76, 98	0
All	All	540/610 (88%)	2.06	249 (46%) 0 0	33, 51, 81, 98	0

The worst 5 of 249 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	327	GLY	7.7
1	A	76	GLY	6.5
1	B	73	LEU	6.0
1	B	321	THR	5.9
1	B	320	ASN	5.7

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($\text{\AA}^2$)	Q<0.9
2	289	A	413	13/14	0.43	0.17	117,121,127,128	0
2	289	A	432	13/14	0.43	0.15	106,114,124,128	0
2	289	B	435	13/14	0.43	0.16	94,107,115,131	0
2	289	B	406	13/14	0.44	0.20	78,88,100,105	0
2	289	B	425	13/14	0.50	0.16	51,56,73,76	0
2	289	A	433	13/14	0.50	0.14	95,100,106,106	0
2	289	A	420	13/14	0.51	0.12	81,95,101,101	0
2	289	A	408	13/14	0.51	0.19	76,87,100,106	0
2	289	A	434	13/14	0.53	0.19	86,93,101,102	0
2	289	A	401	13/14	0.54	0.18	93,99,109,111	0
2	289	B	426	13/14	0.54	0.19	47,56,66,67	0
2	289	B	413	13/14	0.54	0.15	74,88,101,105	0
2	289	A	404	13/14	0.55	0.14	78,98,108,114	0
2	289	B	409	13/14	0.55	0.14	105,115,124,129	0
2	289	A	430	13/14	0.57	0.12	66,76,94,97	0
2	289	B	415	13/14	0.58	0.16	73,79,92,94	0
2	289	B	423	13/14	0.62	0.13	53,60,77,83	0
2	289	B	427	13/14	0.62	0.18	49,56,60,63	0
2	289	B	408	13/14	0.62	0.18	90,103,112,124	0
2	289	B	401	13/14	0.64	0.16	86,98,102,111	0
2	289	B	424	13/14	0.64	0.17	48,55,67,69	0
2	289	A	416	13/14	0.64	0.15	75,80,95,106	0
2	289	A	435	13/14	0.65	0.15	98,114,121,124	0
2	289	B	416	13/14	0.65	0.18	96,114,120,129	0
2	289	A	410	13/14	0.65	0.16	64,80,94,96	0
2	289	B	432	13/14	0.65	0.14	88,101,109,117	0
2	289	A	409	13/14	0.65	0.16	80,95,106,112	0
2	289	B	404	13/14	0.66	0.13	72,85,96,97	0
2	289	B	421	13/14	0.66	0.14	61,73,80,80	0
2	289	B	434	13/14	0.66	0.21	88,101,124,125	0
2	289	B	410	13/14	0.66	0.17	54,70,84,86	0
2	289	B	428	13/14	0.67	0.17	67,74,85,94	0
2	289	A	403	13/14	0.68	0.14	89,101,117,117	0
2	289	B	414	13/14	0.68	0.13	49,65,82,93	0
2	289	B	411	13/14	0.68	0.17	80,87,100,100	0
2	289	B	412	13/14	0.68	0.21	71,93,108,116	0
2	289	B	418	13/14	0.68	0.15	44,51,64,70	0
2	289	B	422	13/14	0.69	0.14	63,71,79,81	0
2	289	B	402	13/14	0.69	0.18	58,67,90,105	0
2	289	B	433	13/14	0.70	0.17	91,99,105,112	0
2	289	B	431	13/14	0.70	0.12	58,65,72,74	0
2	289	B	419	13/14	0.70	0.14	54,59,72,72	0
2	289	A	411	13/14	0.71	0.15	77,92,105,110	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	289	A	412	13/14	0.71	0.13	73,84,89,99	0
2	289	A	415	13/14	0.72	0.16	62,68,88,89	0
2	289	B	403	13/14	0.72	0.16	73,85,94,100	0
2	289	B	429	13/14	0.72	0.12	51,59,82,91	0
2	289	A	423	13/14	0.72	0.14	76,80,87,93	0
2	289	A	427	13/14	0.73	0.14	65,71,89,97	0
2	289	A	417	13/14	0.73	0.11	49,61,81,82	0
2	289	A	426	13/14	0.73	0.15	69,78,88,94	0
2	289	A	406	13/14	0.74	0.13	77,86,101,101	0
2	289	B	407	13/14	0.74	0.15	47,56,71,89	0
2	289	A	422	13/14	0.74	0.16	71,82,92,94	0
2	289	B	417	13/14	0.74	0.14	84,92,104,118	0
2	289	B	405	13/14	0.74	0.16	53,63,83,86	0
2	289	A	421	13/14	0.75	0.13	83,90,101,103	0
2	289	A	405	13/14	0.75	0.12	58,67,80,83	0
2	289	B	430	13/14	0.75	0.12	75,81,89,93	0
2	289	A	431	13/14	0.75	0.13	74,81,90,95	0
2	289	A	419	13/14	0.77	0.12	57,65,74,77	0
2	289	A	428	13/14	0.79	0.10	59,66,73,85	0
2	289	A	402	13/14	0.80	0.12	62,73,83,88	0
2	289	A	425	13/14	0.81	0.13	66,74,95,101	0
2	289	A	414	13/14	0.81	0.12	60,66,87,89	0
2	289	A	424	13/14	0.82	0.12	67,73,81,93	0
2	289	A	429	13/14	0.82	0.11	66,70,83,86	0
2	289	B	420	13/14	0.84	0.14	40,44,71,74	0
2	289	A	407	13/14	0.86	0.12	56,65,76,88	0
2	289	A	418	13/14	0.86	0.12	48,51,78,83	0

6.5 Other polymers [i](#)

There are no such residues in this entry.