



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2018 – 01:59 am GMT

PDB ID : 4NQJ
Title : Structure of coiled-coil domain
Authors : Yang, M.; Li, Y.
Deposited on : 2013-11-25
Resolution : 2.15 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.3 (157068), CSD as539be (2018)
Xtriage (Phenix) : 1.13
EDS : trunk30967
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk30967

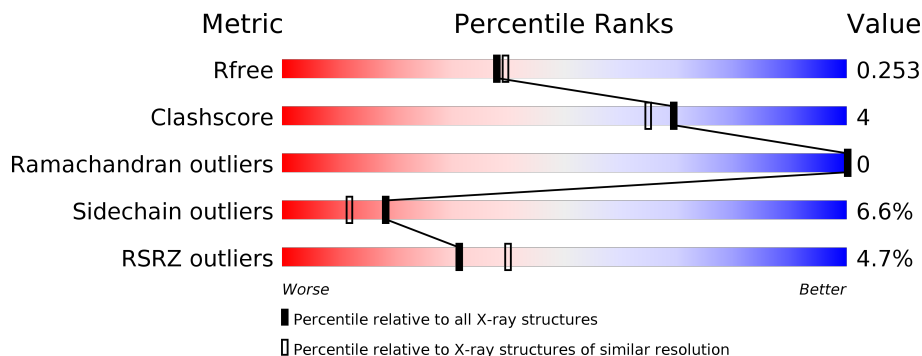
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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}	111664	1287 (2.16-2.16)
Clashscore	122126	1390 (2.16-2.16)
Ramachandran outliers	120053	1368 (2.16-2.16)
Sidechain outliers	120020	1367 (2.16-2.16)
RSRZ outliers	108989	1262 (2.16-2.16)

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

Mol	Chain	Length	Quality of chain
1	A	179	<div> <div>2%</div> <div>87%</div> <div>10%</div> <div>..</div> </div>
1	B	179	<div> <div>7%</div> <div>86%</div> <div>12%</div> <div>..</div> </div>
1	C	179	<div> <div>6%</div> <div>85%</div> <div>11%</div> <div>..</div> </div>

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 4716 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.

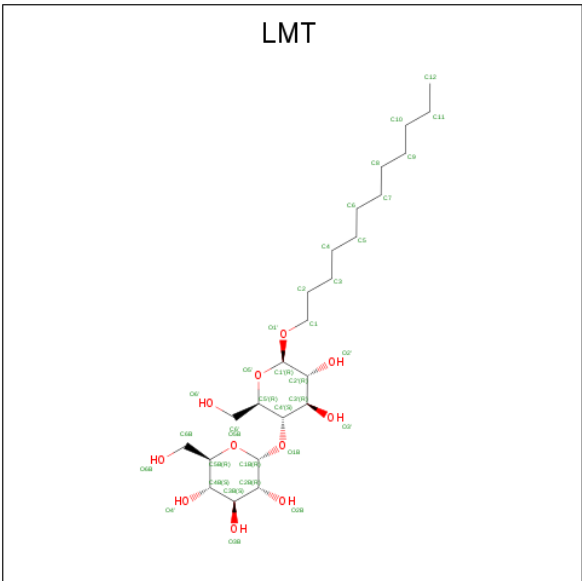
- Molecule 1 is a protein called E3 ubiquitin-protein ligase TRIM69.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	177	Total	C	N	O	S	0	2	0
			1456	919	250	277	10			
1	B	176	Total	C	N	O	S	0	0	0
			1438	907	247	274	10			
1	C	177	Total	C	N	O	S	0	1	0
			1451	916	249	276	10			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	161	MET	THR	SEE REMARK 999	UNP Q86WT6
B	161	MET	THR	SEE REMARK 999	UNP Q86WT6
C	161	MET	THR	SEE REMARK 999	UNP Q86WT6

- Molecule 2 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: C₂₄H₄₆O₁₁).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			35	24	11		
2	A	1	Total	C	O	0	0
			35	24	11		
2	B	1	Total	C	O	0	0
			35	24	11		
2	C	1	Total	C	O	0	0
			35	24	11		
2	C	1	Total	C	O	0	0
			35	24	11		

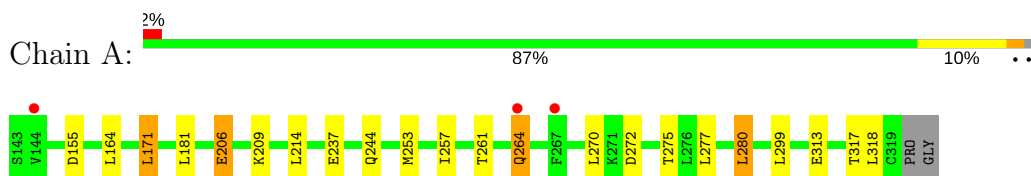
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	74	Total	O	0	0
			74	74		
3	B	69	Total	O	0	0
			69	69		
3	C	53	Total	O	0	0
			53	53		

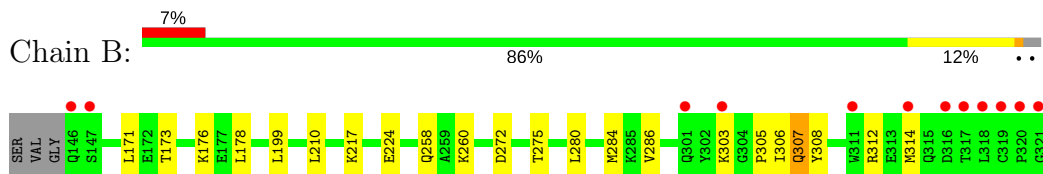
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

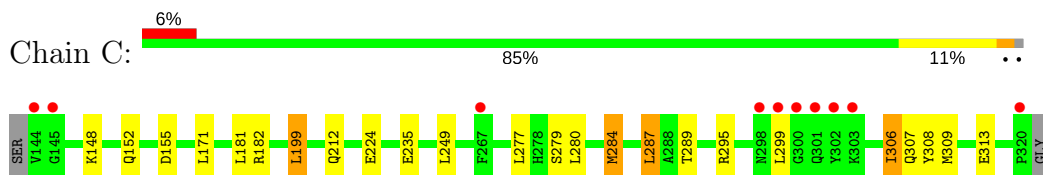
- Molecule 1: E3 ubiquitin-protein ligase TRIM69



- Molecule 1: E3 ubiquitin-protein ligase TRIM69



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4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	83.10Å 101.06Å 233.25Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.14 – 2.15 39.14 – 2.15	Depositor EDS
% Data completeness (in resolution range)	98.7 (39.14-2.15) 94.6 (39.14-2.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.27 (at 2.16Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.216 , 0.251 0.217 , 0.253	Depositor DCC
R_{free} test set	2691 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	39.3	Xtriage
Anisotropy	0.603	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 58.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	4716	wwPDB-VP
Average B, all atoms (Å ²)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.07% 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: LMT

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	0.40	0/1481	0.50	0/1984
1	B	0.36	0/1457	0.51	0/1952
1	C	0.38	0/1473	0.48	0/1974
All	All	0.38	0/4411	0.50	0/5910

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	1456	0	1475	12	0
1	B	1438	0	1458	8	0
1	C	1451	0	1475	16	1
2	A	70	0	92	3	0
2	B	35	0	46	2	0
2	C	70	0	92	4	0
3	A	74	0	0	1	0
3	B	69	0	0	2	1
3	C	53	0	0	4	0
All	All	4716	0	4638	37	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 4.

All (37) 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:C:155:ASP:HB3	2:C:402:LMT:H12	1.59	0.84
2:B:401:LMT:O3'	2:B:401:LMT:O6B	2.11	0.68
1:A:244:GLN:HG2	1:C:182:ARG:HH21	1.60	0.67
1:C:148:LYS:NZ	2:C:402:LMT:O6B	2.29	0.65
1:C:235:GLU:OE1	1:C:295:ARG:NH1	2.31	0.64
1:C:249:LEU:HD23	1:C:287:LEU:HD13	1.83	0.61
1:A:155:ASP:OD2	2:A:401:LMT:O2'	2.20	0.59
1:A:206:GLU:HG2	3:C:504:HOH:O	2.04	0.58
1:B:275:THR:HG23	3:B:502:HOH:O	2.04	0.57
1:C:289:THR:O	1:C:289:THR:OG1	2.23	0.57
1:B:173:THR:HA	1:B:176:LYS:HE2	1.88	0.56
1:A:171:LEU:HD13	1:C:284:MET:HE1	1.88	0.54
1:B:303:LYS:HB2	1:B:307:GLN:HG3	1.87	0.54
2:C:401:LMT:O3'	2:C:401:LMT:O2B	2.25	0.53
1:C:280:LEU:O	1:C:284:MET:HG2	2.09	0.53
1:A:209:LYS:HD2	2:A:402:LMT:H6'1	1.90	0.52
1:A:237:GLU:OE1	3:A:560:HOH:O	2.18	0.52
2:B:401:LMT:H3O2	2:B:401:LMT:H6B	1.47	0.52
1:C:224:GLU:OE2	1:C:308:TYR:OH	2.22	0.50
1:A:272:ASP:O	1:A:275:THR:OG1	2.30	0.50
1:A:257:ILE:O	1:A:261:THR:HG23	2.14	0.48
1:A:313:GLU:O	1:A:317:THR:HG23	2.15	0.47
1:B:307:GLN:H	1:B:307:GLN:CD	2.17	0.47
2:A:402:LMT:H101	2:A:402:LMT:H72	1.65	0.47
1:C:182:ARG:NH1	3:C:545:HOH:O	2.43	0.47
1:C:152:GLN:OE1	3:C:510:HOH:O	2.20	0.46
1:B:260:LYS:NZ	1:B:272:ASP:OD1	2.45	0.46
1:C:155:ASP:HB3	2:C:402:LMT:H1'	1.99	0.45
1:A:171:LEU:HD13	1:C:284:MET:CE	2.48	0.43
1:B:305:PRO:HG2	1:B:306:ILE:HD12	2.01	0.43
1:B:224:GLU:OE1	1:B:308:TYR:OH	2.18	0.43
1:C:306:ILE:HG23	3:C:504:HOH:O	2.20	0.42
1:C:199:LEU:HA	1:C:199:LEU:HD12	1.90	0.41
1:C:309:MET:O	1:C:313:GLU:HG2	2.21	0.41
1:B:217:LYS:NZ	3:B:551:HOH:O	2.54	0.41
1:A:253:MET:HE3	1:A:280:LEU:HA	2.03	0.41
1:A:264:GLN:H	1:A:264:GLN:HG2	1.46	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)
1:C:212[B]:GLN:OE1	3:B:541:HOH:O[7_455]	2.18	0.02

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	177/179 (99%)	174 (98%)	3 (2%)	0	100	100
1	B	174/179 (97%)	172 (99%)	2 (1%)	0	100	100
1	C	176/179 (98%)	175 (99%)	1 (1%)	0	100	100
All	All	527/537 (98%)	521 (99%)	6 (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	163/163 (100%)	152 (93%)	11 (7%)	18	11
1	B	161/163 (99%)	150 (93%)	11 (7%)	17	11
1	C	163/163 (100%)	153 (94%)	10 (6%)	20	15
All	All	487/489 (100%)	455 (93%)	32 (7%)	18	12

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	164	LEU
1	A	171	LEU
1	A	181	LEU
1	A	206	GLU
1	A	214	LEU
1	A	264	GLN
1	A	270	LEU
1	A	277	LEU
1	A	280	LEU
1	A	299	LEU
1	A	318	LEU
1	B	171	LEU
1	B	178	LEU
1	B	199	LEU
1	B	210	LEU
1	B	258	GLN
1	B	280	LEU
1	B	284	MET
1	B	286	VAL
1	B	307	GLN
1	B	312	ARG
1	B	314	MET
1	C	171	LEU
1	C	181	LEU
1	C	199	LEU
1	C	277	LEU
1	C	279	SER
1	C	284	MET
1	C	287	LEU
1	C	299	LEU
1	C	306	ILE
1	C	307	GLN

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

5 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	LMT	A	401	-	36,36,36	0.98	1 (2%)	47,47,47	1.71	11 (23%)
2	LMT	A	402	-	36,36,36	0.99	1 (2%)	47,47,47	1.15	3 (6%)
2	LMT	B	401	-	36,36,36	1.12	2 (5%)	47,47,47	1.47	4 (8%)
2	LMT	C	401	-	36,36,36	0.99	2 (5%)	47,47,47	1.26	4 (8%)
2	LMT	C	402	-	36,36,36	1.05	3 (8%)	47,47,47	1.19	3 (6%)

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	LMT	A	401	-	-	0/21/61/61	0/2/2/2
2	LMT	A	402	-	-	0/21/61/61	0/2/2/2
2	LMT	B	401	-	-	0/21/61/61	0/2/2/2
2	LMT	C	401	-	-	0/21/61/61	0/2/2/2
2	LMT	C	402	-	-	0/21/61/61	0/2/2/2

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	401	LMT	C3'-C4'	2.01	1.57	1.52
2	C	402	LMT	C4B-C3B	2.02	1.57	1.52
2	C	402	LMT	C4B-C5B	2.10	1.57	1.53
2	B	401	LMT	C4B-C3B	2.31	1.58	1.52
2	C	401	LMT	C4B-C3B	2.32	1.58	1.52
2	A	401	LMT	C3'-C4'	2.34	1.58	1.52
2	A	402	LMT	C4B-C3B	2.44	1.58	1.52
2	C	402	LMT	C4'-C5'	3.06	1.61	1.52
2	B	401	LMT	C4'-C5'	3.12	1.61	1.52

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	401	LMT	C1'-C2'-C3'	-6.05	97.31	109.98
2	A	401	LMT	C2'-C3'-C4'	-4.24	99.94	109.68
2	A	401	LMT	O5'-C5'-C4'	-4.07	101.12	109.76
2	A	401	LMT	C1-O1'-C1'	-3.53	107.83	113.85
2	C	402	LMT	C1'-C2'-C3'	-3.34	102.98	109.98
2	C	402	LMT	C4B-C3B-C2B	-3.28	105.07	110.83
2	A	402	LMT	C1'-C2'-C3'	-2.93	103.84	109.98
2	C	401	LMT	O5'-C1'-O1'	-2.91	103.08	109.96
2	A	401	LMT	C1'-C2'-C3'	-2.90	103.91	109.98
2	C	401	LMT	C1'-C2'-C3'	-2.86	104.00	109.98
2	C	402	LMT	O2'-C2'-C3'	-2.73	103.98	110.34
2	C	401	LMT	C1B-O1B-C4'	-2.69	111.24	117.97
2	A	402	LMT	C2'-C3'-C4'	-2.47	104.01	109.68
2	A	401	LMT	O2'-C2'-C3'	-2.45	104.63	110.34
2	A	401	LMT	O5'-C1'-O1'	-2.41	104.26	109.96
2	B	401	LMT	C2'-C3'-C4'	-2.39	104.19	109.68
2	B	401	LMT	C1-O1'-C1'	-2.36	109.83	113.85
2	A	401	LMT	C3B-C4B-C5B	-2.34	106.06	110.24
2	A	401	LMT	O3B-C3B-C4B	-2.27	105.04	110.34
2	C	401	LMT	O5'-C5'-C4'	-2.22	105.05	109.76
2	A	402	LMT	O5'-C1'-O1'	-2.14	104.89	109.96
2	A	401	LMT	C3'-C4'-C5'	-2.04	106.19	110.93
2	A	401	LMT	O4'-C4B-C5B	-2.00	104.29	109.31
2	A	401	LMT	O1B-C4'-C3'	2.18	113.14	107.27
2	B	401	LMT	C1'-O5'-C5'	2.68	118.98	113.71

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	LMT	1	0
2	A	402	LMT	2	0
2	B	401	LMT	2	0
2	C	401	LMT	1	0
2	C	402	LMT	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	177/179 (98%)	0.16	3 (1%) 70 75	39, 60, 92, 109	0
1	B	176/179 (98%)	0.41	12 (6%) 17 23	41, 57, 101, 128	0
1	C	177/179 (98%)	0.35	10 (5%) 24 32	39, 61, 92, 108	0
All	All	530/537 (98%)	0.31	25 (4%) 31 40	39, 60, 95, 128	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	321	GLY	9.2
1	B	320	PRO	5.1
1	C	299	LEU	4.2
1	B	319	CYS	3.8
1	C	145	GLY	3.7
1	C	144	VAL	3.4
1	C	302	TYR	3.2
1	B	311	TRP	3.2
1	B	314	MET	3.1
1	B	318	LEU	3.0
1	B	303	LYS	3.0
1	B	301	GLN	2.9
1	C	301	GLN	2.9
1	B	146	GLN	2.8
1	C	267	PHE	2.7
1	B	316	ASP	2.7
1	C	303	LYS	2.7
1	C	298	ASN	2.7
1	A	267	PHE	2.6
1	C	300	GLY	2.6
1	B	147	SER	2.6
1	A	264	GLN	2.5
1	A	144	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	317	THR	2.1
1	C	320	PRO	2.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	LMT	C	402	35/35	0.57	0.29	61,93,134,138	0
2	LMT	B	401	35/35	0.73	0.31	84,124,136,163	0
2	LMT	C	401	35/35	0.76	0.34	91,106,133,136	0
2	LMT	A	402	35/35	0.83	0.34	92,108,134,158	0
2	LMT	A	401	35/35	0.84	0.16	43,64,87,100	0

6.5 Other polymers [i](#)

There are no such residues in this entry.