Full wwPDB X-ray Structure Validation Report (i)

Oct 22, 2024 – 09:20 AM EDT

PDB ID	:	3TLV
Title	:	The GLIC pentameric Ligand-Gated Ion Channel Loop2-22' oxidized mutant in a locally-closed conformation (LC3 subtype)
Authors	:	Sauguet, L.; Nury, H.; Corringer, P.J.; Delarue, M.
Deposited on	:	2011-08-30
Resolution	:	2.90 Å(reported)

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

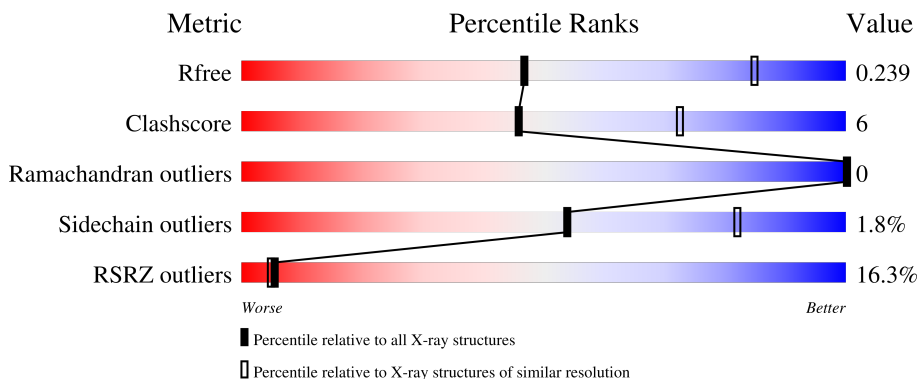|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.90 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	Percentile Ranks	Value
Rfree		0.239
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		1.8%
RSRZ outliers		16.3%

Worse — *Better*

▮ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2335 (2.90-2.90)
Clashscore	180529	2564 (2.90-2.90)
Ramachandran outliers	177936	2514 (2.90-2.90)
Sidechain outliers	177891	2516 (2.90-2.90)
RSRZ outliers	164620	2337 (2.90-2.90)

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

Mol	Chain	Length	Quality of chain
1	A	321	15% / 84% 13% •
1	B	321	16% / 86% 11% •
1	C	321	12% / 83% 13% • •
1	D	321	20% / 80% 17% •
1	E	321	17% / 83% 14% •

2　Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 12722 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 Glr4197 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	B	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	C	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	D	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	E	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP Q7NDN8
A	-2	SER	-	expression tag	UNP Q7NDN8
A	-1	ALA	-	expression tag	UNP Q7NDN8
A	0	ALA	-	expression tag	UNP Q7NDN8
A	1	ALA	-	expression tag	UNP Q7NDN8
A	27	SER	CYS	engineered mutation	UNP Q7NDN8
A	33	CYS	LYS	engineered mutation	UNP Q7NDN8
A	246	CYS	LEU	engineered mutation	UNP Q7NDN8
B	-3	GLY	-	expression tag	UNP Q7NDN8
B	-2	SER	-	expression tag	UNP Q7NDN8
B	-1	ALA	-	expression tag	UNP Q7NDN8
B	0	ALA	-	expression tag	UNP Q7NDN8
B	1	ALA	-	expression tag	UNP Q7NDN8
B	27	SER	CYS	engineered mutation	UNP Q7NDN8
B	33	CYS	LYS	engineered mutation	UNP Q7NDN8
B	246	CYS	LEU	engineered mutation	UNP Q7NDN8
C	-3	GLY	-	expression tag	UNP Q7NDN8
C	-2	SER	-	expression tag	UNP Q7NDN8
C	-1	ALA	-	expression tag	UNP Q7NDN8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	0	ALA	-	expression tag	UNP Q7NDN8
C	1	ALA	-	expression tag	UNP Q7NDN8
C	27	SER	CYS	engineered mutation	UNP Q7NDN8
C	33	CYS	LYS	engineered mutation	UNP Q7NDN8
C	246	CYS	LEU	engineered mutation	UNP Q7NDN8
D	-3	GLY	-	expression tag	UNP Q7NDN8
D	-2	SER	-	expression tag	UNP Q7NDN8
D	-1	ALA	-	expression tag	UNP Q7NDN8
D	0	ALA	-	expression tag	UNP Q7NDN8
D	1	ALA	-	expression tag	UNP Q7NDN8
D	27	SER	CYS	engineered mutation	UNP Q7NDN8
D	33	CYS	LYS	engineered mutation	UNP Q7NDN8
D	246	CYS	LEU	engineered mutation	UNP Q7NDN8
E	-3	GLY	-	expression tag	UNP Q7NDN8
E	-2	SER	-	expression tag	UNP Q7NDN8
E	-1	ALA	-	expression tag	UNP Q7NDN8
E	0	ALA	-	expression tag	UNP Q7NDN8
E	1	ALA	-	expression tag	UNP Q7NDN8
E	27	SER	CYS	engineered mutation	UNP Q7NDN8
E	33	CYS	LYS	engineered mutation	UNP Q7NDN8
E	246	CYS	LEU	engineered mutation	UNP Q7NDN8

- Molecule 2 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).

LMT
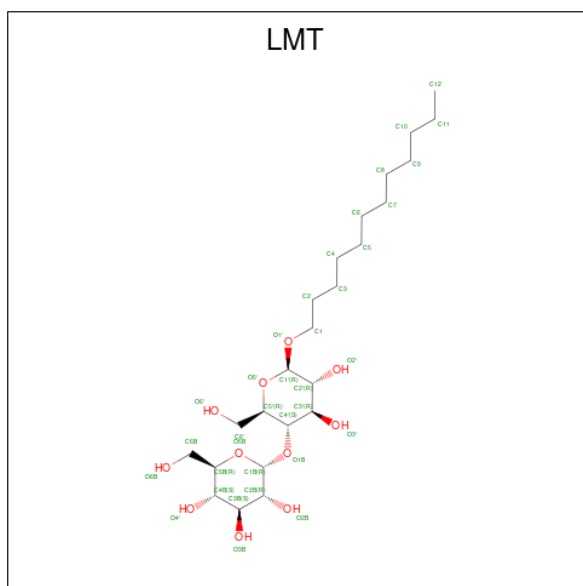
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 12	C 12	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	Cl 1	0	0
3	B	1	Total 1	Cl 1	0	0
3	C	1	Total 1	Cl 1	0	0
3	D	1	Total 1	Cl 1	0	0
3	E	1	Total 1	Cl 1	0	0

- Molecule 4 is water.

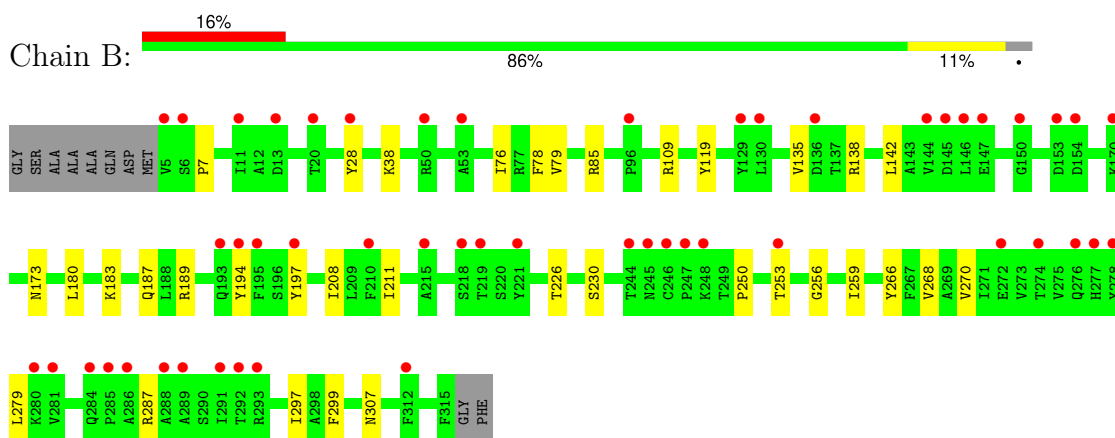| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	22	Total 22	O 22	0	0
4	B	26	Total 26	O 26	0	0
4	C	20	Total 20	O 20	0	0
4	D	17	Total 17	O 17	0	0
4	E	20	Total 20	O 20	0	0

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.
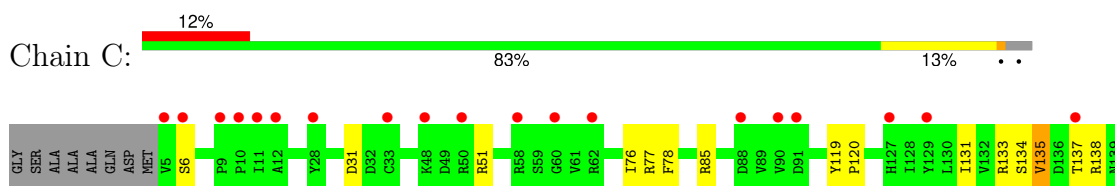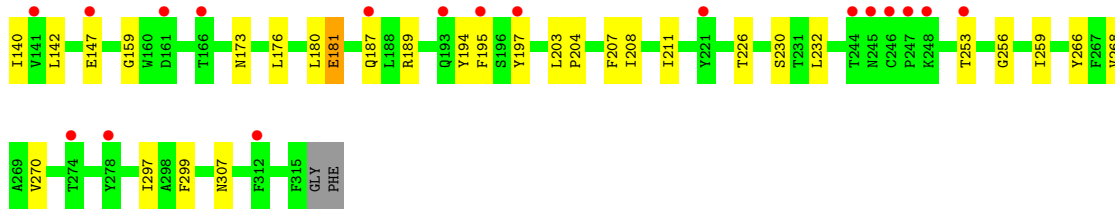
• Molecule 1: Glr4197 protein
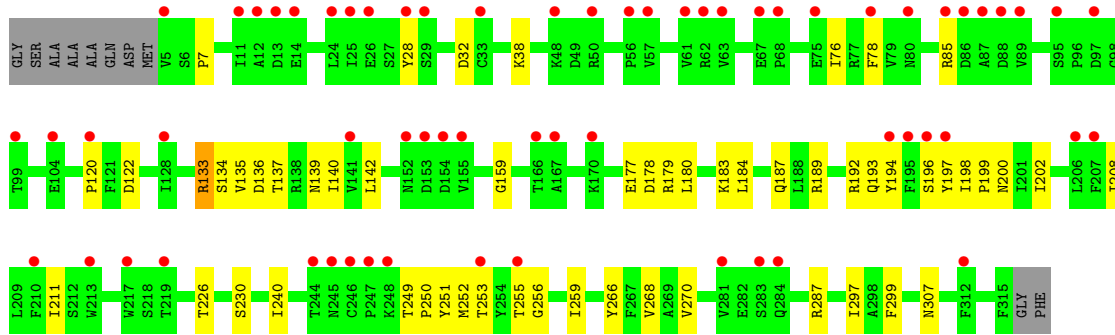
Chain A:

• Molecule 1: Glr4197 protein

Chain B:

• Molecule 1: Glr4197 protein

Chain C:

I140 V141 L142 E147 G159 W160 D161 T166 N173 L176 L180 E181 Q187 L188 R189 Q193 Y194 F195 S196 Y197 L203 P204 F207 I208 I211 Y221 T226 S230 T231 L232 T244 N245 C246 P247 K248 T253 G256 I259 Y266 F267 V268

A269 V270 T274 Y278 I297 A298 F299 N307 F312 F315 GLY PHE

• Molecule 1: Glr4197 protein

Chain D:

20%

80%   17%   •

GLY SER ALA ALA ALA GLN ASP MET V5 S6 P7 I11 A12 D13 E14 L24 I25 E26 S27 Y28 S29 D32 C33 K38 K48 D49 R50 P56 V57 V61 R62 V63 E67 P68 E75 I76 R77 F78 V79 N80 R85 D86 A87 D88 V89 S95 P96 D97 G98

T99 E104 P120 F121 D122 I128 R133 S134 V135 D136 T137 R138 N139 I140 V141 L142 N152 D153 D154 V155 G159 T166 A167 K170 E177 D178 R179 L180 K183 L184 Q187 L188 R189 R192 Q193 Y194 F195 S196 Y197 I198 P199 N200 I201 I202 L206 F207 I208

L209 F210 I211 S212 W213 W217 S218 T219 T226 S230 I240 T244 N245 C246 P247 K248 T249 P250 Y251 M252 T253 Y254 T255 G256 I259 Y266 F267 V268 A269 V270 V281 E282 S283 Q284 R287 I297 A298 F299 N307 F312 F315 GLY PHE

• Molecule 1: Glr4197 protein

Chain E:

17%

83%   14%   •

GLY SER ALA ALA ALA GLN ASP MET V5 S6 P7 P8 P9 P10 I11 A12 L16 N19 D32 C33 F37 K38 V39 D55 R58 Y66 E67 P68 E69 A70 R77 F78 V79 N80 R85 V89 V90 D91 I92 S93 Q101 P120 Y129 S134 V135 D136

T137 R138 N139 V144 D145 L146 E147 N152 D153 D154 G159 W160 D161 I162 T166 K170 N173 D178 R179 L180 L184 Q187 L188 R189 I190 Q193 Y194 F195 S196 Y197 I198 P199 N200 I201 I202 L203 I208 L209 F210 I211 E222 T226 S230 T244 N245

C246 P247 K248 T249 P250 Y251 M252 T253 Y254 T255 G256 A257 I258 I259 Y266 F267 V268 A269 V270 Y278 E282 S283 Q284 P285 A286 R287 I297 A298 F299 N307 F312 F315 GLY PHE

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	179.14Å 127.76Å 160.87Å 90.00° 101.55° 90.00°	Depositor
Resolution (Å)	49.23 – 2.90 49.23 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.8 (49.23-2.90) 99.7 (49.23-2.90)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.04	Depositor
$< I/\sigma(I) >$ [1]	2.23 (at 2.91Å)	Xtriage
Refinement program	BUSTER-TNT BUSTER 2.11.1, BUSTER 2.11.1	Depositor
R, R_{free}	0.215 , 0.229 0.223 , 0.239	Depositor DCC
R_{free} test set	3932 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	69.4	Xtriage
Anisotropy	0.213	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 40.2	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	12722	wwPDB-VP
Average B, all atoms (Å^2)	78.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.75% 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 ⓘ

5.1   Standard geometry ⓘ

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

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	0.49	0/2588	0.68	0/3539
1	B	0.51	0/2588	0.69	0/3539
1	C	0.51	0/2588	0.69	0/3539
1	D	0.50	0/2588	0.67	0/3539
1	E	0.51	0/2588	0.71	0/3539
All	All	0.50	0/12940	0.69	0/17695

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	2520	0	2529	32	0
1	B	2520	0	2529	23	0
1	C	2520	0	2529	30	0
1	D	2520	0	2529	44	0
1	E	2520	0	2529	28	0
2	A	12	0	23	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
4	A	22	0	0	0	0
4	B	26	0	0	1	0
4	C	20	0	0	3	0
4	D	17	0	0	0	0
4	E	20	0	0	2	0
All	All	12722	0	12668	143	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 6.

All (143) 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:A:197:TYR:CE2	1:A:202:ILE:HD11	1.75	1.22
1:A:197:TYR:CD2	1:A:202:ILE:HD11	1.78	1.18
1:A:197:TYR:CD2	1:A:202:ILE:CD1	2.42	1.02
1:B:7:PRO:HG3	1:B:135:VAL:HG21	1.47	0.97
1:A:55:ASP:O	1:A:59:SER:OG	1.86	0.93
1:A:197:TYR:CE2	1:A:202:ILE:CD1	2.60	0.83
1:C:253:THR:HG23	1:C:256:GLY:H	1.44	0.82
1:B:253:THR:HG23	1:B:256:GLY:H	1.45	0.81
1:D:253:THR:HG23	1:D:256:GLY:H	1.46	0.80
1:A:253:THR:HG23	1:A:256:GLY:H	1.45	0.79
1:E:253:THR:HG23	1:E:256:GLY:H	1.46	0.79
1:C:211:ILE:HG23	1:D:270:VAL:HG11	1.71	0.72
1:C:208:ILE:HG22	1:C:266:TYR:OH	1.91	0.70
1:C:133:ARG:NH1	1:C:176:LEU:O	2.24	0.70
1:E:278:TYR:CE1	1:E:282:GLU:OE1	2.46	0.69
1:D:193:GLN:CG	1:D:193:GLN:O	2.39	0.69
1:E:55:ASP:OD2	1:E:58:ARG:HG3	1.92	0.68
1:D:197:TYR:CE2	1:D:202:ILE:HD11	2.27	0.68
1:A:197:TYR:CD2	1:A:202:ILE:HD12	2.29	0.67
1:D:193:GLN:O	1:D:193:GLN:HG2	1.95	0.67
1:C:147:GLU:HB3	4:C:326:HOH:O	1.93	0.67
1:C:207:PHE:O	1:C:211:ILE:HG13	1.97	0.64
1:A:32:ASP:OD1	1:A:192:ARG:NH2	2.31	0.62
1:A:197:TYR:HE2	1:A:202:ILE:HD11	1.56	0.61
1:B:208:ILE:HG22	1:B:266:TYR:OH	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:122:ASP:OD1	1:D:192:ARG:NH1	2.33	0.59
1:C:131:ILE:HD11	1:C:181:GLU:HG2	1.85	0.58
1:C:195:PHE:HE1	1:D:252:MET:HB2	1.69	0.58
1:E:208:ILE:HG22	1:E:266:TYR:OH	2.03	0.57
1:B:211:ILE:HG23	1:C:270:VAL:HG11	1.85	0.57
1:D:194:TYR:CD2	1:D:197:TYR:HB2	2.41	0.56
1:A:197:TYR:HD2	1:A:202:ILE:CD1	2.14	0.56
1:A:253:THR:HG23	1:A:256:GLY:N	2.20	0.55
1:D:208:ILE:HG22	1:D:266:TYR:OH	2.06	0.55
1:A:270:VAL:HG11	1:E:211:ILE:HG23	1.89	0.55
1:C:253:THR:HG23	1:C:256:GLY:N	2.20	0.53
1:D:253:THR:HG23	1:D:256:GLY:N	2.21	0.53
1:E:253:THR:HG23	1:E:256:GLY:N	2.21	0.53
1:E:173:ASN:HB3	1:E:180:LEU:HD11	1.89	0.53
1:B:253:THR:HG23	1:B:256:GLY:N	2.21	0.53
2:A:318:LMT:H52	1:D:240:ILE:HG21	1.89	0.53
1:E:7:PRO:HG3	1:E:135:VAL:HG21	1.90	0.53
1:B:109:ARG:NH2	4:B:341:HOH:O	2.43	0.52
1:C:173:ASN:HB3	1:C:180:LEU:HD11	1.92	0.52
1:D:134:SER:HB3	1:D:139:ASN:HA	1.91	0.52
1:B:28:TYR:CE1	1:B:38:LYS:HB2	2.44	0.52
1:D:28:TYR:CE1	1:D:38:LYS:HB2	2.45	0.51
1:A:159:GLY:HA2	1:B:250:PRO:HB3	1.92	0.51
1:C:6:SER:O	1:C:51:ARG:NH2	2.45	0.50
1:E:187:GLN:OE1	1:E:189:ARG:NH2	2.45	0.50
1:D:198:ILE:HB	1:D:199:PRO:CD	2.42	0.50
1:B:279:LEU:HD13	1:B:287:ARG:HB3	1.94	0.50
1:D:120:PRO:HG3	1:D:197:TYR:CG	2.46	0.50
1:D:196:SER:O	1:D:200:ASN:HB2	2.12	0.49
1:C:211:ILE:HD13	1:D:270:VAL:HG21	1.95	0.49
1:B:135:VAL:HG23	1:B:138:ARG:H	1.78	0.49
1:D:28:TYR:CE1	1:D:38:LYS:HD2	2.48	0.48
1:A:211:ILE:HG23	1:B:270:VAL:HG11	1.96	0.48
1:D:287:ARG:HH11	1:D:287:ARG:HA	1.79	0.48
1:A:134:SER:HB3	1:A:139:ASN:HA	1.96	0.48
1:B:173:ASN:HB3	1:B:180:LEU:HD11	1.96	0.48
1:C:77:ARG:NH1	4:C:321:HOH:O	2.46	0.47
1:A:78:PHE:CE2	1:A:85:ARG:HD3	2.49	0.47
1:C:135:VAL:HG23	1:C:137:THR:H	1.80	0.47
1:C:226:THR:O	1:C:230:SER:HB2	2.14	0.47
1:E:278:TYR:CZ	1:E:282:GLU:OE1	2.68	0.47

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Full wwPDB X-ray Structure Validation Report

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:187:GLN:OE1	1:D:189:ARG:NH2	2.48	0.47
1:D:198:ILE:HB	1:D:199:PRO:HD3	1.96	0.47
1:D:211:ILE:HG23	1:E:270:VAL:HG11	1.96	0.47
1:A:226:THR:O	1:A:230:SER:HB2	2.15	0.47
1:E:77:ARG:NH1	4:E:333:HOH:O	2.47	0.47
1:C:134:SER:HA	1:C:140:ILE:HD12	1.97	0.46
1:B:78:PHE:CE2	1:B:85:ARG:HD3	2.50	0.46
1:B:119:TYR:HH	1:B:197:TYR:HE1	1.61	0.46
1:A:187:GLN:OE1	1:A:189:ARG:NH2	2.49	0.46
1:C:187:GLN:OE1	1:C:189:ARG:NH2	2.48	0.46
1:D:28:TYR:CE1	1:D:38:LYS:CB	2.99	0.46
1:D:136:ASP:OD1	1:D:179:ARG:NH1	2.34	0.46
1:D:133:ARG:NH1	1:D:177:GLU:HB2	2.30	0.45
1:E:226:THR:O	1:E:230:SER:HB2	2.17	0.45
1:C:159:GLY:HA2	1:D:250:PRO:HB3	1.98	0.45
1:A:120:PRO:HG3	1:A:197:TYR:CD2	2.51	0.45
1:D:197:TYR:HE2	1:D:202:ILE:HD11	1.76	0.45
1:B:28:TYR:CE1	1:B:38:LYS:CB	3.00	0.45
1:B:226:THR:O	1:B:230:SER:HB2	2.17	0.45
1:D:78:PHE:CE2	1:D:85:ARG:HD3	2.52	0.45
1:D:226:THR:O	1:D:230:SER:HB2	2.17	0.45
1:E:78:PHE:CE2	1:E:85:ARG:HD3	2.52	0.45
1:B:187:GLN:OE1	1:B:189:ARG:NH2	2.49	0.45
1:B:79:VAL:HG21	1:B:183:LYS:HD2	1.99	0.44
1:D:197:TYR:OH	1:D:255:THR:HG23	2.17	0.44
1:A:79:VAL:HG21	1:A:183:LYS:HD2	1.99	0.44
1:C:194:TYR:HA	1:C:197:TYR:CD2	2.53	0.44
1:E:8:PRO:HG2	1:E:16:LEU:HD13	2.00	0.44
1:E:162:ILE:HG13	1:E:190:ILE:HG22	2.00	0.44
1:A:135:VAL:HG22	1:A:140:ILE:HD11	2.00	0.44
1:D:28:TYR:HE1	1:D:38:LYS:HD2	1.83	0.44
1:A:197:TYR:HD2	1:A:202:ILE:HD11	1.60	0.43
1:D:120:PRO:HG3	1:D:197:TYR:CD2	2.53	0.43
1:A:279:LEU:HD13	1:A:287:ARG:HB3	2.00	0.43
1:C:78:PHE:CE2	1:C:85:ARG:HD3	2.52	0.43
1:D:183:LYS:HG3	1:D:184:LEU:N	2.33	0.43
1:E:194:TYR:HA	1:E:197:TYR:CD2	2.54	0.43
1:D:133:ARG:HH11	1:D:177:GLU:HB2	1.84	0.43
1:C:120:PRO:O	1:C:194:TYR:HB3	2.19	0.43
1:C:119:TYR:HH	1:C:197:TYR:HE1	1.66	0.43
1:E:120:PRO:O	1:E:194:TYR:HB3	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:28:TYR:CE1	1:B:38:LYS:HD2	2.54	0.42
1:B:208:ILE:HG12	1:C:232:LEU:HD21	2.01	0.42
1:E:134:SER:HB3	1:E:139:ASN:HA	2.00	0.42
1:A:248:LYS:HD3	1:E:201:ILE:HD11	2.01	0.42
1:C:31:ASP:C	1:C:31:ASP:OD2	2.58	0.42
1:C:203:LEU:HD23	1:C:203:LEU:HA	1.81	0.42
1:B:76:ILE:HD12	1:B:142:LEU:HD21	2.01	0.42
1:C:268:VAL:HG12	1:C:299:PHE:CZ	2.55	0.42
1:C:76:ILE:HD12	1:C:142:LEU:HD21	2.01	0.42
1:C:138:ARG:HB2	4:C:324:HOH:O	2.20	0.41
1:E:254:TYR:CZ	1:E:258:ILE:HD11	2.54	0.41
1:B:194:TYR:HA	1:B:197:TYR:CD2	2.56	0.41
1:D:249:THR:HG21	1:D:251:TYR:CE1	2.55	0.41
1:A:76:ILE:HD12	1:A:142:LEU:HD21	2.02	0.41
1:D:76:ILE:HD12	1:D:142:LEU:HD21	2.03	0.41
1:B:268:VAL:HG12	1:B:299:PHE:CZ	2.56	0.41
1:D:122:ASP:OD2	1:D:192:ARG:NH1	2.54	0.41
1:D:193:GLN:O	1:D:193:GLN:HG3	2.20	0.41
1:A:268:VAL:HG12	1:A:299:PHE:CZ	2.56	0.41
1:A:120:PRO:O	1:A:194:TYR:HB3	2.21	0.41
1:A:197:TYR:OH	1:A:255:THR:CG2	2.69	0.41
1:A:250:PRO:HB3	1:E:159:GLY:HA2	2.03	0.41
1:E:32:ASP:OD2	4:E:338:HOH:O	2.22	0.41
1:E:268:VAL:HG12	1:E:299:PHE:CZ	2.56	0.41
1:A:152:ASN:HB3	1:A:155:VAL:HG23	2.03	0.41
1:D:268:VAL:HG12	1:D:299:PHE:CZ	2.56	0.41
1:E:144:VAL:HG22	1:E:184:LEU:HD13	2.03	0.41
1:D:120:PRO:HG3	1:D:197:TYR:CD1	2.57	0.40
1:D:159:GLY:HA2	1:E:250:PRO:HB3	2.03	0.40
1:E:282:GLU:O	1:E:282:GLU:HG2	2.21	0.40
1:A:278:TYR:HA	1:A:281:VAL:HG12	2.03	0.40
1:A:270:VAL:HG11	1:E:211:ILE:HG12	2.02	0.40
1:C:203:LEU:HB2	1:C:204:PRO:HD3	2.03	0.40
1:D:135:VAL:HG22	1:D:140:ILE:HD11	2.04	0.40
1:D:32:ASP:OD1	1:D:192:ARG:NH2	2.53	0.40
1:D:7:PRO:HG2	1:D:137:THR:OG1	2.22	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	A	309/321 (96%)	298 (96%)	11 (4%)	0	100	100
1	B	309/321 (96%)	299 (97%)	10 (3%)	0	100	100
1	C	309/321 (96%)	302 (98%)	7 (2%)	0	100	100
1	D	309/321 (96%)	302 (98%)	7 (2%)	0	100	100
1	E	309/321 (96%)	299 (97%)	10 (3%)	0	100	100
All	All	1545/1605 (96%)	1500 (97%)	45 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	280/285 (98%)	275 (98%)	5 (2%)	54	82
1	B	280/285 (98%)	277 (99%)	3 (1%)	70	90
1	C	280/285 (98%)	275 (98%)	5 (2%)	54	82
1	D	280/285 (98%)	274 (98%)	6 (2%)	48	78
1	E	280/285 (98%)	274 (98%)	6 (2%)	48	78
All	All	1400/1425 (98%)	1375 (98%)	25 (2%)	54	82

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	SER
1	A	259	ILE
1	A	292	THR
1	A	297	ILE
1	A	307	ASN
1	B	259	ILE
1	B	297	ILE
1	B	307	ASN
1	C	135	VAL
1	C	181	GLU
1	C	259	ILE
1	C	297	ILE
1	C	307	ASN
1	D	133	ARG
1	D	178	ASP
1	D	180	LEU
1	D	259	ILE
1	D	297	ILE
1	D	307	ASN
1	E	19	ASN
1	E	39	VAL
1	E	93	SER
1	E	259	ILE
1	E	297	ILE
1	E	307	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	239	ASN
1	A	284	GLN
1	B	239	ASN
1	D	101	GLN
1	E	239	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 6 ligands modelled in this entry, 5 are monoatomic - leaving 1 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	$\#|Z| > 2$
2	LMT	A	318	-	11,11,36	0.58	0	10,10,47	0.71	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	LMT	A	318	-	-	3/9/9/61	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	318	LMT	C11-C10-C9-C8
2	A	318	LMT	C7-C8-C9-C10
2	A	318	LMT	C2-C3-C4-C5

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	318	LMT	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand LMT A 318

Bond lengths   Bond angles

Torsions   Rings
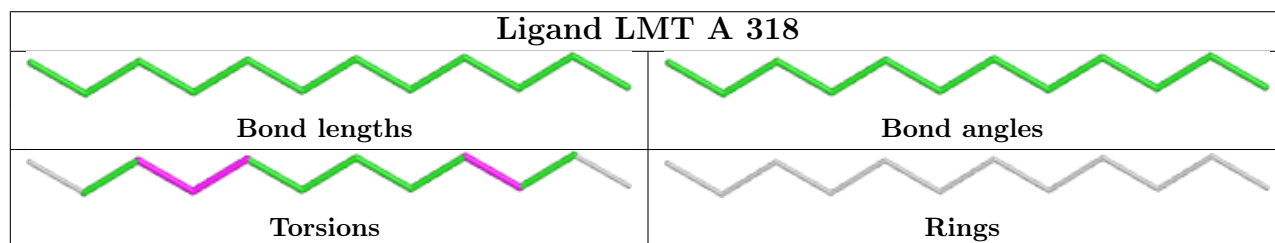
5.7 Other polymers ⓘ

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	A	311/321 (96%)	0.83	47 (15%)	6	5	53, 79, 115, 151	0
1	B	311/321 (96%)	0.92	51 (16%)	5	5	48, 74, 103, 124	0
1	C	311/321 (96%)	0.70	37 (11%)	10	9	48, 72, 101, 118	0
1	D	311/321 (96%)	1.05	63 (20%)	3	3	54, 76, 110, 141	0
1	E	311/321 (96%)	0.93	55 (17%)	4	4	47, 74, 105, 127	0
All	All	1555/1605 (96%)	0.89	253 (16%)	5	5	47, 75, 107, 151	0

All (253) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	248	LYS	9.1
1	E	245	ASN	8.5
1	A	245	ASN	8.4
1	D	153	ASP	8.2
1	B	5	VAL	7.2
1	A	57	VAL	7.0
1	B	245	ASN	6.9
1	E	153	ASP	6.7
1	B	147	GLU	6.6
1	D	154	ASP	6.5
1	C	245	ASN	6.5
1	A	244	THR	6.3
1	E	248	LYS	6.2
1	C	5	VAL	6.0
1	E	244	THR	5.9
1	E	5	VAL	5.7
1	C	11	ILE	5.7
1	B	195	PHE	5.6
1	D	245	ASN	5.5
1	A	246	CYS	5.5

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Mol	Chain	Res	Type	RSRZ
1	C	244	THR	5.4
1	B	312	PHE	5.4
1	E	11	ILE	5.3
1	E	195	PHE	5.3
1	A	195	PHE	5.0
1	E	253	THR	5.0
1	D	152	ASN	4.9
1	D	246	CYS	4.8
1	D	253	THR	4.7
1	D	11	ILE	4.7
1	D	210	PHE	4.6
1	A	5	VAL	4.6
1	C	62	ARG	4.6
1	A	61	VAL	4.6
1	E	67	GLU	4.6
1	B	246	CYS	4.5
1	E	68	PRO	4.5
1	E	247	PRO	4.5
1	D	5	VAL	4.4
1	D	244	THR	4.4
1	A	62	ARG	4.3
1	B	244	THR	4.3
1	B	276	GLN	4.2
1	A	56	PRO	4.2
1	E	255	THR	4.2
1	C	33	CYS	4.2
1	C	246	CYS	4.2
1	D	62	ARG	4.2
1	D	28	TYR	4.2
1	D	48	LYS	4.2
1	C	195	PHE	4.1
1	B	154	ASP	4.1
1	D	75	GLU	4.1
1	B	197	TYR	4.1
1	D	194	TYR	4.0
1	D	26	GLU	4.0
1	A	170	LYS	4.0
1	A	284	GLN	3.9
1	E	33	CYS	3.9
1	E	246	CYS	3.8
1	E	154	ASP	3.8
1	D	155	VAL	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	280	LYS	3.7
1	D	247	PRO	3.6
1	A	127	HIS	3.6
1	B	6	SER	3.6
1	D	97	ASP	3.6
1	A	248	LYS	3.6
1	A	65	THR	3.6
1	D	283	SER	3.6
1	E	312	PHE	3.5
1	B	292	THR	3.5
1	E	10	PRO	3.5
1	B	194	TYR	3.5
1	D	78	PHE	3.5
1	A	13	ASP	3.4
1	B	247	PRO	3.4
1	D	12	ALA	3.4
1	A	69	GLU	3.4
1	C	312	PHE	3.4
1	D	57	VAL	3.4
1	A	50	ARG	3.4
1	D	170	LYS	3.3
1	A	63	VAL	3.3
1	E	6	SER	3.3
1	D	197	TYR	3.3
1	C	9	PRO	3.3
1	A	33	CYS	3.2
1	C	166	THR	3.2
1	D	255	THR	3.2
1	D	89	VAL	3.2
1	A	11	ILE	3.2
1	D	50	ARG	3.2
1	B	210	PHE	3.2
1	A	12	ALA	3.2
1	C	129	TYR	3.1
1	C	10	PRO	3.1
1	C	147	GLU	3.1
1	E	193	GLN	3.1
1	A	60	GLY	3.1
1	D	99	THR	3.1
1	A	154	ASP	3.1
1	D	213	TRP	3.1
1	E	9	PRO	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	61	VAL	3.1
1	E	147	GLU	3.1
1	E	252	MET	3.1
1	C	193	GLN	3.0
1	B	248	LYS	3.0
1	E	101	GLN	3.0
1	C	247	PRO	3.0
1	B	272	GLU	3.0
1	A	283	SER	3.0
1	D	67	GLU	3.0
1	B	150	GLY	2.9
1	E	69	GLU	2.9
1	E	197	TYR	2.9
1	E	89	VAL	2.9
1	C	12	ALA	2.8
1	D	63	VAL	2.8
1	D	195	PHE	2.8
1	A	129	TYR	2.8
1	E	285	PRO	2.8
1	C	197	TYR	2.8
1	A	9	PRO	2.7
1	A	58	ARG	2.7
1	C	50	ARG	2.7
1	C	187	GLN	2.7
1	E	79	VAL	2.7
1	D	95	SER	2.7
1	B	278	TYR	2.7
1	B	11	ILE	2.7
1	C	127	HIS	2.7
1	C	88	ASP	2.7
1	E	226	THR	2.7
1	C	137	THR	2.7
1	A	187	GLN	2.7
1	E	152	ASN	2.6
1	E	210	PHE	2.6
1	B	218	SER	2.6
1	B	129	TYR	2.6
1	D	281	VAL	2.6
1	B	286	ALA	2.6
1	D	166	THR	2.6
1	A	48	LYS	2.6
1	A	219	THR	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	86	ASP	2.6
1	B	289	ALA	2.6
1	A	312	PHE	2.5
1	B	291	ILE	2.5
1	A	247	PRO	2.5
1	B	50	ARG	2.5
1	D	167	ALA	2.5
1	A	10	PRO	2.5
1	D	104	GLU	2.5
1	B	53	ALA	2.5
1	B	145	ASP	2.5
1	B	193	GLN	2.5
1	E	250	PRO	2.5
1	E	12	ALA	2.5
1	C	91	ASP	2.5
1	C	161	ASP	2.5
1	D	88	ASP	2.5
1	E	287	ARG	2.5
1	D	56	PRO	2.5
1	A	281	VAL	2.5
1	E	90	VAL	2.5
1	A	280	LYS	2.4
1	E	178	ASP	2.4
1	C	90	VAL	2.4
1	A	194	TYR	2.4
1	A	218	SER	2.4
1	C	6	SER	2.4
1	B	170	LYS	2.4
1	D	196	SER	2.4
1	D	85	ARG	2.4
1	B	130	LEU	2.4
1	D	24	LEU	2.3
1	D	87	ALA	2.3
1	C	274	THR	2.3
1	E	203	LEU	2.3
1	B	144	VAL	2.3
1	E	91	ASP	2.3
1	E	66	TYR	2.3
1	E	129	TYR	2.3
1	D	128	ILE	2.3
1	B	136	ASP	2.3
1	B	215	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	29	SER	2.3
1	E	286	ALA	2.3
1	B	20	THR	2.3
1	C	253	THR	2.3
1	D	68	PRO	2.3
1	E	199	PRO	2.3
1	D	80	ASN	2.3
1	B	284	GLN	2.3
1	E	70	ALA	2.3
1	A	278	TYR	2.2
1	C	60	GLY	2.2
1	C	221	TYR	2.2
1	C	278	TYR	2.2
1	A	88	ASP	2.2
1	B	153	ASP	2.2
1	C	248	LYS	2.2
1	B	28	TYR	2.2
1	D	207	PHE	2.2
1	E	145	ASP	2.2
1	E	166	THR	2.2
1	D	284	GLN	2.2
1	C	58	ARG	2.2
1	E	170	LYS	2.2
1	D	120	PRO	2.2
1	E	136	ASP	2.2
1	E	137	THR	2.2
1	A	197	TYR	2.2
1	A	315	PHE	2.2
1	E	80	ASN	2.2
1	E	222	GLU	2.2
1	E	267	PHE	2.1
1	C	48	LYS	2.1
1	D	33	CYS	2.1
1	B	281	VAL	2.1
1	D	141	VAL	2.1
1	B	219	THR	2.1
1	B	274	THR	2.1
1	D	206	LEU	2.1
1	B	13	ASP	2.1
1	D	219	THR	2.1
1	E	37	PHE	2.1
1	A	285	PRO	2.1

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Mol	Chain	Res	Type	RSRZ
1	E	202	ILE	2.1
1	A	313	LEU	2.1
1	B	253	THR	2.1
1	B	221	TYR	2.1
1	C	28	TYR	2.1
1	B	285	PRO	2.1
1	A	226	THR	2.0
1	D	13	ASP	2.0
1	E	161	ASP	2.0
1	B	288	ALA	2.0
1	D	25	ILE	2.0
1	B	293	ARG	2.0
1	B	146	LEU	2.0
1	B	277	HIS	2.0
1	A	292	THR	2.0
1	E	284	GLN	2.0
1	A	59	SER	2.0
1	B	96	PRO	2.0
1	D	14	GLU	2.0
1	A	293	ARG	2.0
1	C	141	VAL	2.0
1	D	217	TRP	2.0
1	D	312	PHE	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.
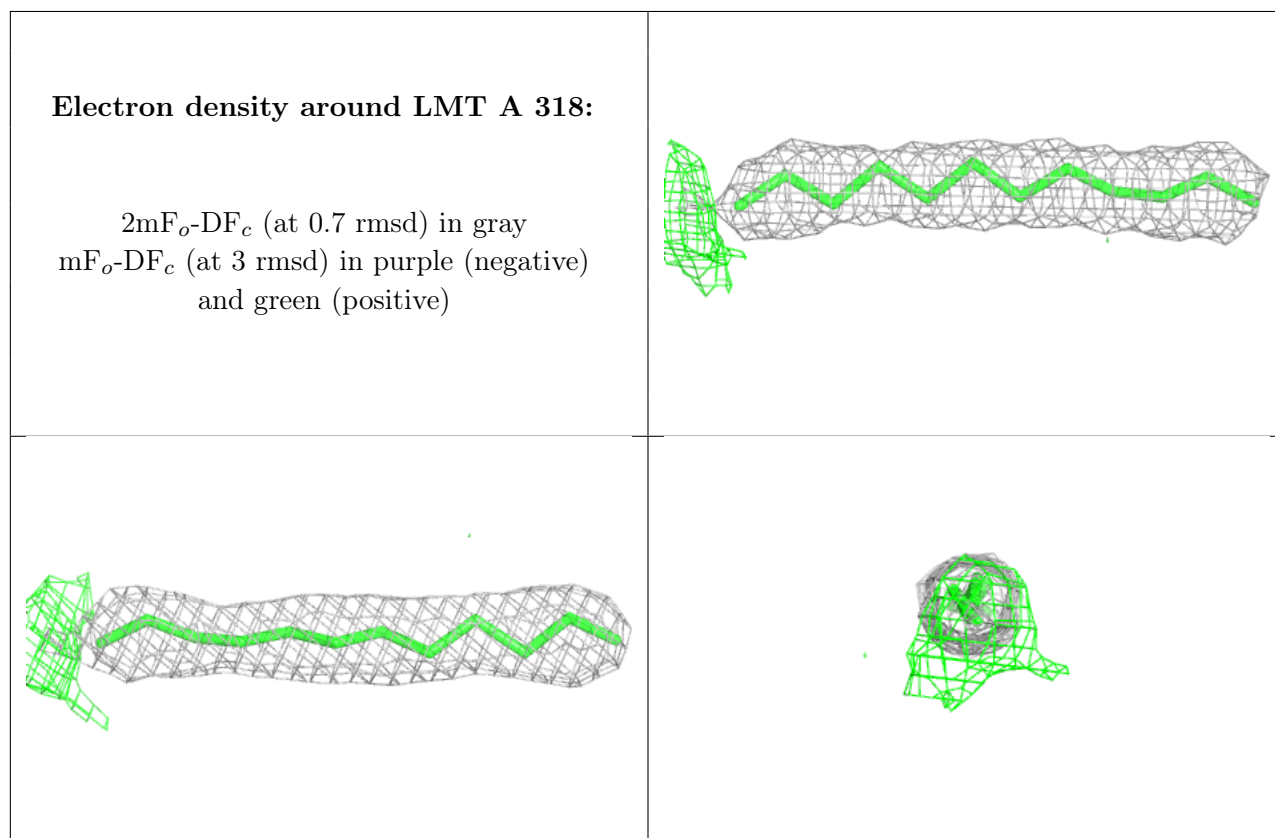
6.4 Ligands ⓘ

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.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	LMT	A	318	12/35	0.94	0.17	59,64,65,65	0
3	CL	B	318	1/1	0.97	0.10	62,62,62,62	0
3	CL	A	319	1/1	0.98	0.06	61,61,61,61	0
3	CL	D	318	1/1	0.98	0.15	64,64,64,64	0
3	CL	C	318	1/1	0.99	0.05	58,58,58,58	0
3	CL	E	318	1/1	0.99	0.17	64,64,64,64	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around LMT A 318:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

6.5 Other polymers ⓘ

There are no such residues in this entry.