



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:57 PM UTC

PDB ID : 5V6O / pdb_00005v6o
Title : Crystal Structure of the highly open channel-stabilized mutant G-2'I + I9'A of GLIC
Authors : Gonzalez-Gutierrez, G.; Grosman, C.
Deposited on : 2017-03-17
Resolution : 3.12 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
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
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

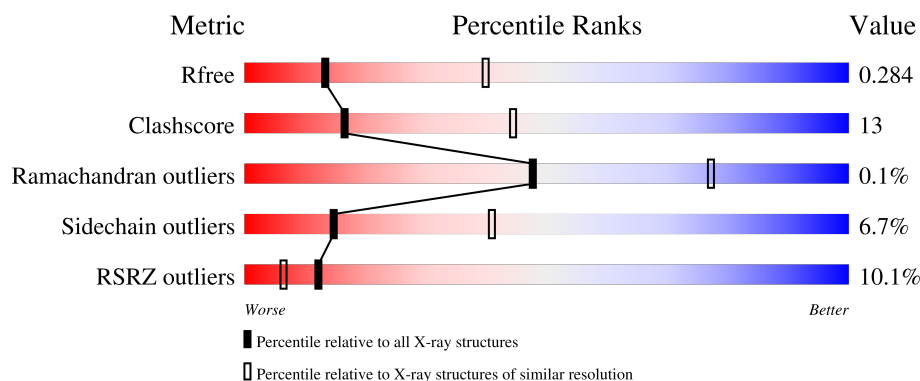
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.12 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	1816 (3.14-3.10)
Clashscore	190562	1906 (3.14-3.10)
Ramachandran outliers	187476	1802 (3.14-3.10)
Sidechain outliers	187428	1802 (3.14-3.10)
RSRZ outliers	180081	1816 (3.14-3.10)

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	310	12% 70% 26% .
1	B	310	9% 68% 28% .
1	C	310	11% 70% 26% .
1	D	310	8% 67% 30% .
1	E	310	10% 69% 28% .

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
4	NA	A	403	-	-	-	X
5	SO4	C	402	-	-	X	-
5	SO4	D	404	-	-	X	-
5	SO4	E	401	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 12711 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.

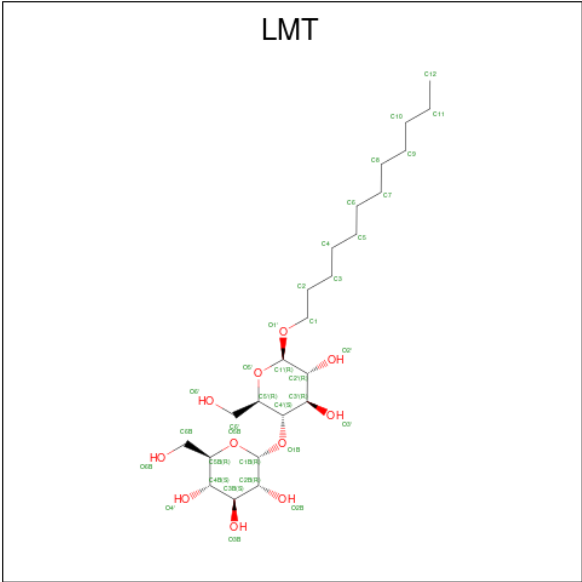
- Molecule 1 is a protein called Proton-gated ion channel.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	310	Total	C	N	O	S	0	0	0
			2516	1660	403	449	4			
1	B	310	Total	C	N	O	S	0	0	0
			2517	1660	403	450	4			
1	D	310	Total	C	N	O	S	0	0	0
			2516	1660	403	449	4			
1	E	310	Total	C	N	O	S	0	0	0
			2517	1660	403	450	4			
1	C	310	Total	C	N	O	S	0	0	0
			2517	1660	403	450	4			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	222	ILE	GLU	engineered mutation	UNP Q7NDN8
A	233	ALA	ILE	engineered mutation	UNP Q7NDN8
B	222	ILE	GLU	engineered mutation	UNP Q7NDN8
B	233	ALA	ILE	engineered mutation	UNP Q7NDN8
D	222	ILE	GLU	engineered mutation	UNP Q7NDN8
D	233	ALA	ILE	engineered mutation	UNP Q7NDN8
E	222	ILE	GLU	engineered mutation	UNP Q7NDN8
E	233	ALA	ILE	engineered mutation	UNP Q7NDN8
C	222	ILE	GLU	engineered mutation	UNP Q7NDN8
C	233	ALA	ILE	engineered mutation	UNP Q7NDN8

- Molecule 2 is DODECYL-BETA-D-MALTOSIDE (CCD ID: LMT) (formula: C₂₄H₄₆O₁₁).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C 12 12	0	0
2	B	1	Total C 12 12	0	0
2	D	1	Total C 12 12	0	0
2	D	1	Total C 12 12	0	0
2	E	1	Total C 12 12	0	0
2	C	1	Total C 12 12	0	0

- Molecule 3 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

- Molecule 4 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Na	0	0
			1	1		

- Molecule 5 is SULFATE ION (CCD ID: SO4) (formula: O₄S).

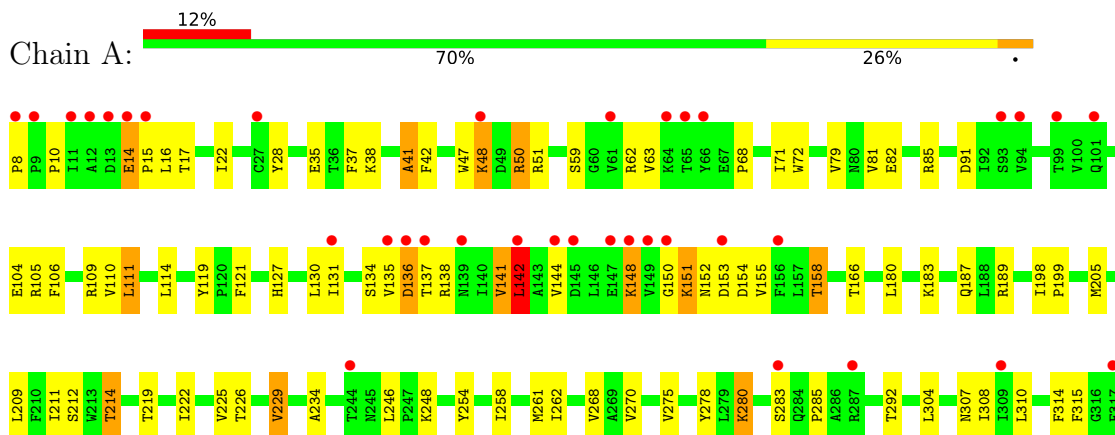


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	D	1	Total	O	S	0	0
			5	4	1		
5	E	1	Total	O	S	0	0
			5	4	1		
5	E	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		

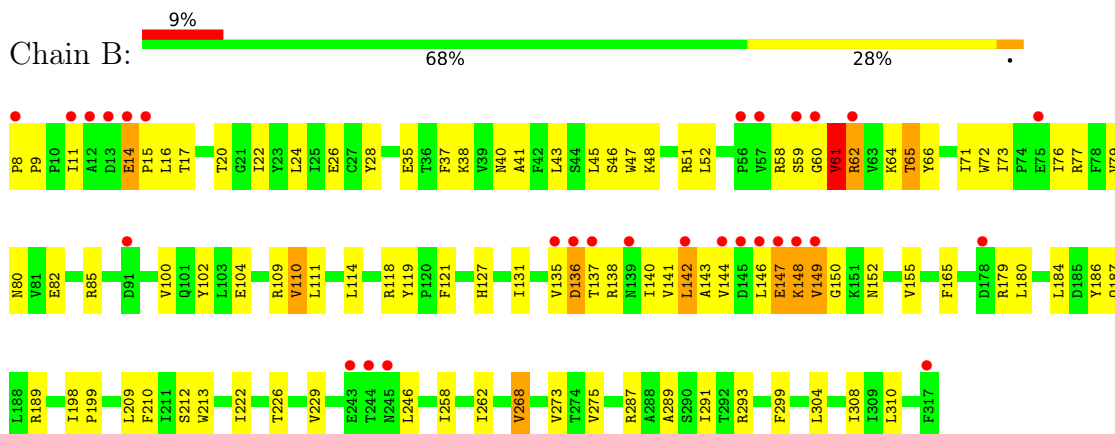
3 Residue-property plots [i](#)

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.

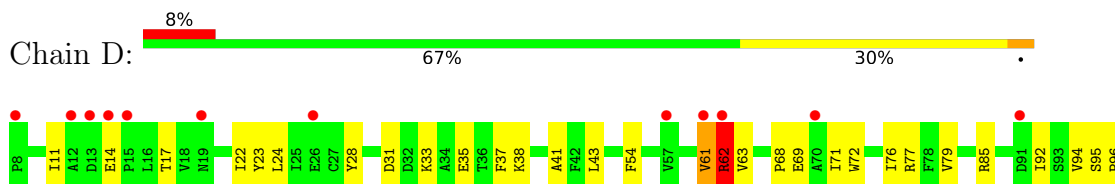
• Molecule 1: Proton-gated ion channel

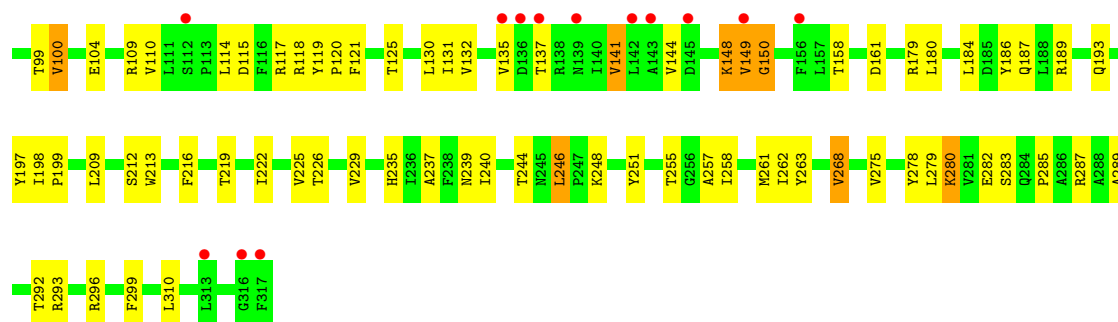


• Molecule 1: Proton-gated ion channel

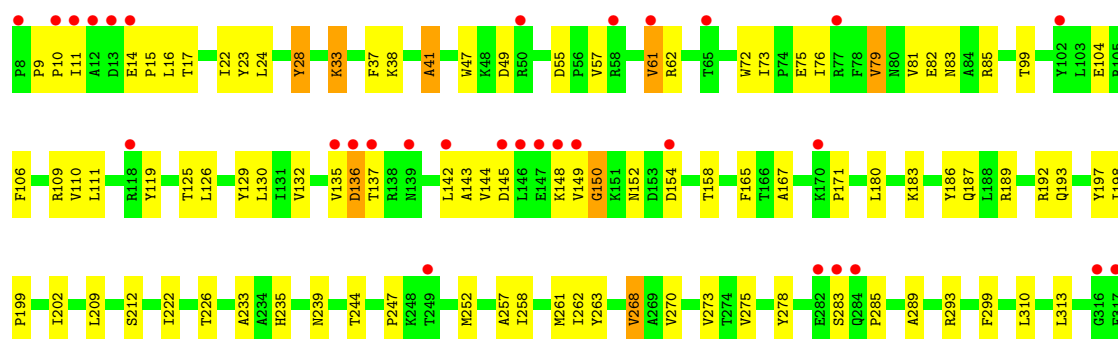


• Molecule 1: Proton-gated ion channel

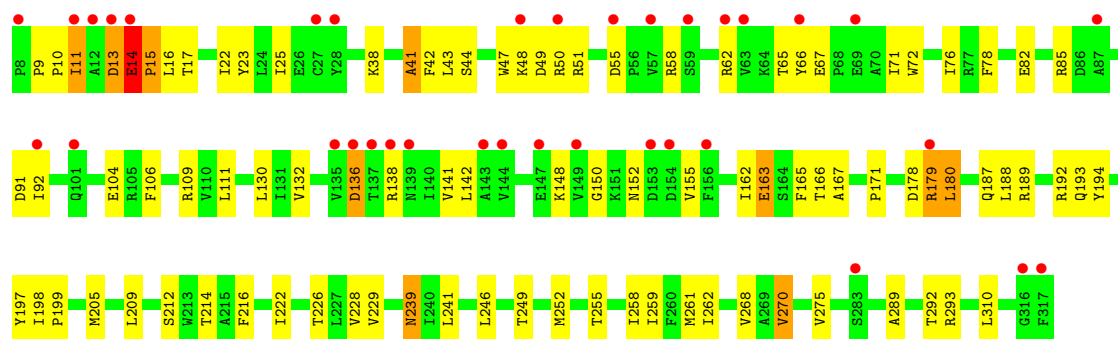




• Molecule 1: Proton-gated ion channel



• Molecule 1: Proton-gated ion channel



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	178.39Å 133.34Å 160.31Å 90.00° 101.77° 90.00°	Depositor
Resolution (Å)	70.44 – 3.12 70.44 – 3.12	Depositor EDS
% Data completeness (in resolution range)	99.7 (70.44-3.12) 99.7 (70.44-3.12)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.67 (at 3.13Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.240 , 0.280 0.246 , 0.284	Depositor DCC
R_{free} test set	3254 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	67.4	Xtriage
Anisotropy	0.260	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 27.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	12711	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.17% 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: NA, LMT, CL, SO4

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	0.69	1/2584 (0.0%)	1.07	7/3530 (0.2%)
1	B	0.67	0/2585	1.03	9/3530 (0.3%)
1	C	0.70	2/2585 (0.1%)	1.05	4/3530 (0.1%)
1	D	0.68	0/2584	1.07	9/3530 (0.3%)
1	E	0.66	0/2585	1.04	10/3530 (0.3%)
All	All	0.68	3/12923 (0.0%)	1.05	39/17650 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
1	D	0	1
All	All	0	2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	14	GLU	CA-C	5.69	1.59	1.52
1	C	25	ILE	CA-CB	-5.22	1.50	1.55
1	C	14	GLU	CA-C	5.06	1.59	1.52

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	149	VAL	N-CA-C	-9.17	96.55	108.93
1	D	150	GLY	N-CA-C	8.56	126.90	115.59
1	D	14	GLU	N-CA-C	8.06	115.24	108.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	62	ARG	N-CA-C	7.12	119.65	111.11
1	C	15	PRO	N-CA-C	6.96	122.60	111.26
1	B	62	ARG	N-CA-C	6.60	119.03	111.11
1	A	148	LYS	N-CA-C	-6.36	105.52	113.28
1	D	61	VAL	CA-C-N	6.25	128.98	120.54
1	D	61	VAL	C-N-CA	6.25	128.98	120.54
1	C	249	THR	CA-C-N	6.22	126.34	119.87
1	C	249	THR	C-N-CA	6.22	126.34	119.87
1	E	61	VAL	CA-C-N	6.16	128.85	120.54
1	E	61	VAL	C-N-CA	6.16	128.85	120.54
1	A	68	PRO	N-CA-C	6.03	121.79	113.65
1	E	41	ALA	N-CA-C	5.84	116.27	108.38
1	E	202	ILE	N-CA-C	5.71	115.84	110.30
1	A	158	THR	N-CA-C	5.67	118.55	110.10
1	B	9	PRO	CA-C-O	-5.67	116.82	120.90
1	B	9	PRO	O-C-N	5.62	123.90	121.31
1	B	147	GLU	N-CA-C	-5.62	106.27	113.02
1	D	41	ALA	N-CA-C	5.54	115.86	108.38
1	C	41	ALA	N-CA-C	5.50	115.81	108.38
1	B	14	GLU	N-CA-C	5.49	114.62	108.25
1	E	150	GLY	CA-C-N	-5.43	114.13	122.87
1	E	150	GLY	C-N-CA	-5.43	114.13	122.87
1	A	14	GLU	N-CA-CB	-5.43	105.70	111.29
1	D	28	TYR	N-CA-C	5.40	116.42	107.73
1	A	142	LEU	CA-CB-CG	5.31	134.89	116.30
1	A	151	LYS	N-CA-C	-5.23	102.42	109.95
1	E	119	TYR	CA-C-N	5.20	139.48	127.00
1	E	119	TYR	C-N-CA	5.20	139.48	127.00
1	E	28	TYR	N-CA-C	5.17	116.05	107.73
1	A	41	ALA	N-CA-C	5.09	115.26	108.38
1	B	41	ALA	N-CA-C	5.09	115.25	108.38
1	E	79	VAL	N-CA-C	5.09	115.31	110.53
1	B	61	VAL	CA-C-N	5.05	127.36	120.54
1	B	61	VAL	C-N-CA	5.05	127.36	120.54
1	D	246	LEU	CA-C-N	5.01	125.02	120.21
1	D	246	LEU	C-N-CA	5.01	125.02	120.21

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	61	VAL	Peptide

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Mol	Chain	Res	Type	Group
1	D	149	VAL	Peptide

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	2516	0	2536	63	0
1	B	2517	0	2536	67	0
1	C	2517	0	2536	71	0
1	D	2516	0	2536	73	0
1	E	2517	0	2536	65	0
2	A	12	0	23	1	0
2	B	12	0	23	3	0
2	C	12	0	23	2	0
2	D	24	0	46	10	0
2	E	12	0	23	2	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
4	A	1	0	0	0	0
5	A	5	0	0	0	0
5	B	15	0	0	0	0
5	C	15	0	0	5	0
5	D	5	0	0	5	0
5	E	10	0	0	3	0
All	All	12711	0	12818	330	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 13.

All (330) 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:B:15:PRO:HB3	1:B:138:ARG:HB2	1.47	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:239:ASN:HD22	1:C:259:ILE:HG21	1.39	0.86
1:A:48:LYS:HD2	1:A:50:ARG:HH21	1.41	0.85
1:D:23:TYR:HA	1:D:150:GLY:HA2	1.59	0.84
1:C:293:ARG:NH2	5:C:402:SO4:O2	2.10	0.83
1:D:293:ARG:NH1	5:D:404:SO4:O3	2.12	0.80
1:E:293:ARG:NH1	5:E:401:SO4:O1	2.12	0.79
1:B:150:GLY:HA3	1:B:165:PHE:HD2	1.47	0.79
1:B:38:LYS:HG2	1:B:109:ARG:HB3	1.65	0.79
1:D:38:LYS:HG2	1:D:109:ARG:HB3	1.65	0.78
1:A:148:LYS:HE3	1:A:166:THR:HA	1.66	0.77
1:D:135:VAL:HG22	1:D:179:ARG:HE	1.49	0.77
1:C:289:ALA:O	1:C:293:ARG:HG3	1.85	0.77
1:B:148:LYS:O	1:B:148:LYS:NZ	2.15	0.77
1:C:293:ARG:NH2	5:C:402:SO4:S	2.59	0.76
1:B:142:LEU:HD23	1:B:143:ALA:H	1.50	0.75
1:B:187:GLN:OE1	1:B:189:ARG:NH2	2.19	0.75
2:D:401:LMT:H72	2:C:403:LMT:H71	1.69	0.75
1:A:48:LYS:HD2	1:A:50:ARG:NH2	2.03	0.73
1:E:289:ALA:O	1:E:293:ARG:HG3	1.89	0.73
1:C:148:LYS:O	1:C:148:LYS:HG2	1.89	0.72
1:C:179:ARG:HG2	1:C:179:ARG:HH11	1.58	0.69
1:E:23:TYR:HA	1:E:150:GLY:HA2	1.75	0.69
1:C:16:LEU:HD11	1:C:47:TRP:HB2	1.75	0.69
1:A:38:LYS:HG2	1:A:109:ARG:HB3	1.75	0.69
1:B:24:LEU:N	1:B:150:GLY:O	2.26	0.68
1:A:187:GLN:OE1	1:A:189:ARG:NH2	2.25	0.68
1:E:38:LYS:HG2	1:E:109:ARG:HB3	1.76	0.68
1:C:239:ASN:HD22	1:C:259:ILE:CG2	2.06	0.68
1:D:261:MET:HE2	1:D:310:LEU:HD22	1.77	0.67
1:C:150:GLY:HA3	1:C:165:PHE:HD2	1.60	0.67
1:C:38:LYS:HG2	1:C:109:ARG:HB3	1.76	0.66
1:E:24:LEU:N	1:E:150:GLY:O	2.29	0.66
1:D:79:VAL:HG22	1:D:131:ILE:HG12	1.78	0.66
1:D:293:ARG:NH1	5:D:404:SO4:S	2.70	0.65
1:A:105:ARG:HD2	1:B:77:ARG:NH1	2.12	0.64
1:A:254:TYR:HA	1:A:314:PHE:CE2	2.32	0.64
1:C:141:VAL:O	1:C:142:LEU:HD12	1.96	0.64
1:C:78:PHE:HE1	1:C:85:ARG:HD3	1.62	0.64
1:A:261:MET:HE2	1:A:310:LEU:HD22	1.78	0.64
5:D:404:SO4:O1	1:E:278:TYR:OH	2.15	0.64
2:D:401:LMT:H71	2:D:402:LMT:H81	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:14:GLU:HB2	1:E:15:PRO:HD2	1.81	0.62
1:C:14:GLU:HG2	1:C:15:PRO:CD	2.29	0.62
1:B:289:ALA:O	1:B:293:ARG:HG3	1.99	0.61
1:C:293:ARG:NH1	5:C:402:SO4:O4	2.27	0.61
1:B:14:GLU:CD	1:B:15:PRO:HD2	2.26	0.61
1:B:61:VAL:HG12	1:B:62:ARG:HD3	1.83	0.61
1:B:22:ILE:O	1:B:148:LYS:NZ	2.33	0.61
1:D:135:VAL:HG22	1:D:179:ARG:NE	2.16	0.61
2:D:401:LMT:H122	2:D:402:LMT:H121	1.83	0.60
1:B:258:ILE:O	1:B:262:ILE:HG12	2.02	0.60
1:E:233:ALA:HB1	2:E:403:LMT:H22	1.81	0.60
1:A:119:TYR:CE1	1:A:246:LEU:HD11	2.36	0.60
1:D:35:GLU:OE2	1:D:114:LEU:N	2.35	0.59
1:C:148:LYS:HE3	1:C:166:THR:HA	1.84	0.59
2:D:401:LMT:H51	2:D:402:LMT:H61	1.83	0.59
1:E:61:VAL:HG22	1:E:62:ARG:H	1.68	0.59
1:E:10:PRO:HB3	1:E:49:ASP:OD1	2.02	0.59
1:D:148:LYS:O	1:D:148:LYS:HG2	2.02	0.58
1:E:142:LEU:HD12	1:E:171:PRO:HG3	1.85	0.58
1:A:254:TYR:HD1	1:A:314:PHE:HD2	1.51	0.58
1:D:76:ILE:O	1:D:85:ARG:NH2	2.36	0.58
1:B:138:ARG:HH11	1:B:180:LEU:HB3	1.69	0.58
1:C:10:PRO:HA	1:C:51:ARG:HE	1.69	0.57
1:C:55:ASP:HB2	1:C:58:ARG:HB3	1.86	0.57
1:C:152:ASN:O	1:C:155:VAL:HG22	2.04	0.57
1:A:10:PRO:HG3	1:A:16:LEU:HD22	1.87	0.57
1:A:148:LYS:O	1:A:148:LYS:HG2	2.03	0.57
1:E:239:ASN:HD22	1:E:263:TYR:HE2	1.53	0.57
1:A:138:ARG:NH1	1:A:180:LEU:H	2.03	0.57
1:B:222:ILE:HG23	1:C:222:ILE:HD12	1.86	0.57
1:A:258:ILE:O	1:A:262:ILE:HG12	2.05	0.56
1:B:287:ARG:O	1:B:291:ILE:HG13	2.06	0.56
1:B:85:ARG:NH1	1:B:104:GLU:OE1	2.39	0.56
1:B:141:VAL:HG23	1:B:184:LEU:HG	1.88	0.55
1:B:26:GLU:HB2	1:B:40:ASN:HB3	1.87	0.55
1:D:293:ARG:NH1	5:D:404:SO4:O4	2.40	0.55
1:C:209:LEU:O	1:C:212:SER:HB3	2.07	0.55
1:C:239:ASN:ND2	1:C:259:ILE:HG21	2.16	0.55
1:A:198:ILE:HB	1:A:199:PRO:HD3	1.88	0.55
1:E:82:GLU:HG3	1:E:109:ARG:HG3	1.88	0.55
1:B:209:LEU:HD13	1:B:262:ILE:HG23	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:148:LYS:O	1:C:150:GLY:N	2.39	0.54
1:E:145:ASP:HA	1:E:148:LYS:HE3	1.89	0.54
1:C:187:GLN:OE1	1:C:189:ARG:NH2	2.39	0.54
1:D:237:ALA:HB2	2:D:402:LMT:H62	1.89	0.54
1:B:135:VAL:C	1:B:137:THR:H	2.15	0.54
1:E:293:ARG:NH1	5:E:401:SO4:S	2.79	0.54
1:C:209:LEU:HD13	1:C:262:ILE:HG23	1.90	0.53
1:A:209:LEU:O	1:A:212:SER:HB3	2.08	0.53
1:A:82:GLU:HG3	1:A:109:ARG:HG3	1.90	0.53
1:E:187:GLN:OE1	1:E:189:ARG:NH2	2.40	0.53
1:A:16:LEU:HD11	1:A:47:TRP:HB2	1.91	0.53
1:D:68:PRO:HG3	1:D:92:ILE:HD11	1.89	0.53
1:D:209:LEU:O	1:D:212:SER:HB3	2.08	0.53
1:E:22:ILE:HD11	1:E:130:LEU:HD11	1.90	0.53
1:B:80:ASN:ND2	1:B:110:VAL:HG12	2.24	0.53
1:D:222:ILE:HD12	1:C:222:ILE:HG23	1.90	0.53
1:D:255:THR:HA	1:D:258:ILE:HG12	1.91	0.53
1:E:167:ALA:HB2	1:E:186:TYR:CD2	2.44	0.52
1:E:258:ILE:O	1:E:262:ILE:HG12	2.09	0.52
1:C:14:GLU:HG2	1:C:15:PRO:HD2	1.91	0.52
1:A:127:HIS:CE1	1:A:187:GLN:HG2	2.45	0.52
1:A:85:ARG:NH1	1:A:104:GLU:OE1	2.42	0.52
1:C:179:ARG:HG2	1:C:179:ARG:NH1	2.23	0.52
1:B:8:PRO:O	1:B:51:ARG:NH2	2.32	0.52
1:E:209:LEU:O	1:E:212:SER:HB3	2.10	0.52
1:C:14:GLU:HG2	1:C:15:PRO:HD3	1.91	0.52
1:E:79:VAL:HB	1:E:129:TYR:HB2	1.91	0.52
1:D:22:ILE:HD11	1:D:130:LEU:HD11	1.92	0.52
1:E:148:LYS:HD3	1:E:167:ALA:HB3	1.91	0.52
1:B:144:VAL:HG12	1:B:147:GLU:H	1.75	0.52
1:E:135:VAL:C	1:E:137:THR:H	2.18	0.52
1:C:48:LYS:HD2	1:C:50:ARG:NH2	2.25	0.51
1:A:79:VAL:HG22	1:A:131:ILE:HG12	1.91	0.51
1:C:71:ILE:HG22	1:C:72:TRP:O	2.10	0.51
1:D:268:VAL:HG23	1:D:299:PHE:CZ	2.46	0.51
1:D:289:ALA:O	1:D:293:ARG:HG2	2.10	0.51
1:B:152:ASN:O	1:B:155:VAL:HG22	2.10	0.51
1:E:135:VAL:O	1:E:137:THR:N	2.41	0.51
1:B:79:VAL:HG22	1:B:131:ILE:HG12	1.92	0.50
1:A:35:GLU:OE2	1:A:114:LEU:N	2.39	0.50
1:A:8:PRO:O	1:A:51:ARG:NH2	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:76:ILE:O	1:B:85:ARG:NH2	2.45	0.50
1:D:239:ASN:HD22	1:D:263:TYR:HE2	1.59	0.50
1:D:258:ILE:O	1:D:262:ILE:HG12	2.11	0.50
1:A:222:ILE:HG23	1:B:222:ILE:HD12	1.93	0.50
1:D:119:TYR:CE2	1:D:246:LEU:HD11	2.47	0.50
1:C:178:ASP:O	1:C:179:ARG:HG2	2.12	0.50
1:D:278:TYR:OH	5:C:402:SO4:O4	2.25	0.49
1:E:16:LEU:HD11	1:E:47:TRP:HB2	1.94	0.49
1:C:198:ILE:HB	1:C:199:PRO:HD3	1.95	0.49
1:B:82:GLU:HG3	1:B:109:ARG:HG3	1.95	0.49
1:A:130:LEU:O	1:A:183:LYS:HA	2.11	0.49
1:D:117:ARG:HG3	1:D:251:TYR:CD2	2.48	0.49
1:C:293:ARG:NH2	5:C:402:SO4:O3	2.45	0.49
1:A:283:SER:C	1:A:285:PRO:HD3	2.38	0.49
1:C:258:ILE:O	1:C:262:ILE:HG12	2.11	0.49
1:A:111:LEU:HD11	1:E:28:TYR:HB3	1.95	0.48
1:C:148:LYS:HD2	1:C:167:ALA:HB3	1.96	0.48
1:A:41:ALA:HB3	1:A:106:PHE:CZ	2.48	0.48
1:B:198:ILE:HB	1:B:199:PRO:HD3	1.96	0.48
1:D:213:TRP:HB2	1:D:216:PHE:CE2	2.48	0.48
1:D:240:ILE:O	1:D:244:THR:HG23	2.14	0.48
1:E:257:ALA:HB1	1:E:310:LEU:HD21	1.96	0.48
1:B:52:LEU:HD11	1:B:71:ILE:HG23	1.96	0.48
1:B:148:LYS:O	1:B:149:VAL:C	2.57	0.48
1:D:85:ARG:NH1	1:D:104:GLU:OE1	2.47	0.48
1:E:268:VAL:HG23	1:E:299:PHE:CZ	2.47	0.48
1:E:198:ILE:HB	1:E:199:PRO:HD3	1.95	0.48
1:A:121:PHE:HB2	1:A:315:PHE:CE2	2.49	0.48
1:A:138:ARG:HH11	1:A:180:LEU:H	1.62	0.48
1:A:152:ASN:OD1	1:A:153:ASP:N	2.47	0.47
1:A:248:LYS:HE2	1:E:197:TYR:CZ	2.48	0.47
1:A:48:LYS:O	1:A:48:LYS:HG2	2.13	0.47
1:B:209:LEU:O	1:B:212:SER:HB3	2.14	0.47
1:A:258:ILE:HD13	1:A:310:LEU:HD23	1.96	0.47
1:B:35:GLU:OE2	1:B:114:LEU:N	2.44	0.47
1:E:76:ILE:HD13	1:E:132:VAL:HB	1.95	0.47
1:D:135:VAL:HG21	1:C:91:ASP:OD2	2.14	0.47
1:A:280:LYS:O	1:A:280:LYS:HG3	2.15	0.47
1:E:37:PHE:CE1	1:E:110:VAL:HB	2.50	0.47
1:E:235:HIS:CD2	1:E:262:ILE:HG21	2.50	0.47
1:C:255:THR:HA	1:C:258:ILE:HG12	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:118:ARG:HB3	1:B:121:PHE:O	2.15	0.47
1:C:138:ARG:HD3	1:C:180:LEU:HG	1.96	0.47
1:B:37:PHE:CE1	1:B:110:VAL:HB	2.50	0.47
1:B:77:ARG:NH2	1:B:131:ILE:HD12	2.30	0.47
2:D:401:LMT:H31	2:E:403:LMT:H21	1.95	0.47
1:C:66:TYR:CG	1:C:71:ILE:HD11	2.50	0.47
1:A:261:MET:HE1	1:A:307:ASN:ND2	2.31	0.46
1:B:127:HIS:CE1	1:B:187:GLN:HG2	2.51	0.46
1:D:222:ILE:HG23	1:E:222:ILE:HD12	1.97	0.46
5:D:404:SO4:S	1:E:278:TYR:OH	2.72	0.46
1:E:61:VAL:HG22	1:E:62:ARG:N	2.29	0.46
1:E:148:LYS:O	1:E:148:LYS:HG3	2.15	0.46
1:D:118:ARG:O	1:D:121:PHE:N	2.47	0.46
1:D:161:ASP:OD1	1:D:193:GLN:NE2	2.41	0.46
1:E:33:LYS:NZ	1:E:244:THR:O	2.32	0.46
1:C:136:ASP:C	1:C:136:ASP:OD1	2.58	0.46
1:C:162:ILE:HG23	1:C:188:LEU:HD11	1.97	0.46
1:A:278:TYR:OH	5:E:401:SO4:O3	2.17	0.46
1:B:138:ARG:NH1	1:B:180:LEU:HB3	2.31	0.46
1:C:142:LEU:HD12	1:C:171:PRO:HG3	1.97	0.46
1:A:141:VAL:O	1:A:142:LEU:HD23	2.15	0.46
1:B:304:LEU:O	1:B:308:ILE:HG12	2.15	0.46
1:B:135:VAL:O	1:B:137:THR:N	2.44	0.46
1:C:10:PRO:HB3	1:C:49:ASP:CG	2.40	0.46
1:A:135:VAL:C	1:A:137:THR:H	2.24	0.46
1:C:22:ILE:HD11	1:C:130:LEU:HD11	1.98	0.46
1:A:151:LYS:HG3	1:A:152:ASN:O	2.16	0.45
1:D:71:ILE:HG22	1:D:72:TRP:O	2.16	0.45
1:D:148:LYS:HG3	1:D:186:TYR:HE2	1.80	0.45
1:E:85:ARG:NH1	1:E:104:GLU:OE1	2.48	0.45
1:C:82:GLU:HG2	1:C:109:ARG:HG3	1.98	0.45
1:B:210:PHE:O	1:B:213:TRP:N	2.50	0.45
1:D:61:VAL:CG1	1:D:62:ARG:H	2.30	0.45
1:C:194:TYR:O	1:C:197:TYR:HB2	2.16	0.45
1:B:64:LYS:HD2	1:B:65:THR:H	1.81	0.45
1:D:257:ALA:HB1	1:D:310:LEU:HD21	1.97	0.45
1:E:310:LEU:HD12	1:E:310:LEU:HA	1.82	0.45
1:A:209:LEU:HD13	1:A:262:ILE:HG23	1.98	0.45
1:A:225:VAL:O	1:A:229:VAL:HB	2.16	0.45
2:B:402:LMT:H71	2:D:401:LMT:H61	1.99	0.45
1:E:37:PHE:CD1	1:E:126:LEU:HD13	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:402:LMT:H71	2:D:401:LMT:H81	1.98	0.45
1:A:22:ILE:HA	1:A:42:PHE:O	2.16	0.45
1:E:209:LEU:HD13	1:E:262:ILE:HG23	1.98	0.45
1:C:192:ARG:HG3	1:C:193:GLN:N	2.32	0.45
1:C:216:PHE:O	1:C:292:THR:HG22	2.17	0.45
1:D:248:LYS:HE2	1:C:197:TYR:CZ	2.52	0.45
1:D:278:TYR:O	1:D:282:GLU:HG2	2.16	0.45
1:B:268:VAL:HG23	1:B:299:PHE:CZ	2.52	0.45
1:B:148:LYS:CD	1:B:186:TYR:HE2	2.29	0.44
1:D:94:VAL:HG22	1:D:100:VAL:HG13	1.97	0.44
1:D:119:TYR:CD2	1:D:246:LEU:HD11	2.52	0.44
1:D:76:ILE:HD13	1:D:132:VAL:HB	2.00	0.44
1:E:261:MET:HE2	1:E:310:LEU:HD22	1.99	0.44
1:C:55:ASP:OD2	1:C:58:ARG:HB3	2.16	0.44
1:B:48:LYS:HE3	1:B:48:LYS:HB2	1.78	0.44
1:D:148:LYS:HG3	1:D:186:TYR:CE2	2.52	0.44
1:C:9:PRO:HA	1:C:72:TRP:CD1	2.52	0.44
1:C:23:TYR:HA	1:C:150:GLY:HA2	1.99	0.44
1:C:252:MET:HE2	1:C:252:MET:HB2	1.85	0.44
1:C:310:LEU:HD23	1:C:310:LEU:HA	1.67	0.44
2:A:401:LMT:H71	2:D:401:LMT:H82	2.00	0.44
1:D:61:VAL:CG1	1:D:62:ARG:N	2.81	0.44
1:D:135:VAL:C	1:D:137:THR:H	2.26	0.44
1:E:192:ARG:HG3	1:E:193:GLN:N	2.32	0.44
1:A:304:LEU:O	1:A:308:ILE:HG12	2.18	0.44
1:A:38:LYS:HE2	1:A:109:ARG:HD2	2.00	0.43
1:D:198:ILE:HB	1:D:199:PRO:HD3	1.99	0.43
1:C:246:LEU:HA	1:C:246:LEU:HD12	1.82	0.43
1:A:105:ARG:HD2	1:B:77:ARG:HH12	1.81	0.43
1:E:283:SER:C	1:E:285:PRO:HD3	2.44	0.43
1:B:71:ILE:HG22	1:B:72:TRP:O	2.18	0.43
1:D:187:GLN:OE1	1:D:189:ARG:NH1	2.52	0.43
1:A:211:ILE:O	1:A:214:THR:HG22	2.19	0.43
1:B:119:TYR:CE1	1:B:246:LEU:HD11	2.53	0.43
1:B:148:LYS:HD3	1:B:186:TYR:CE2	2.53	0.43
1:D:222:ILE:CG2	1:E:222:ILE:HD12	2.48	0.43
1:D:235:HIS:CD2	1:D:262:ILE:HG21	2.54	0.43
1:A:14:GLU:HG2	1:A:15:PRO:HD2	2.00	0.43
1:A:71:ILE:HG22	1:A:72:TRP:O	2.18	0.43
1:D:95:SER:HB3	1:D:99:THR:HB	2.01	0.43
1:E:136:ASP:OD1	1:E:136:ASP:C	2.61	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:37:PHE:CE1	1:A:110:VAL:HB	2.54	0.43
1:E:41:ALA:HB3	1:E:106:PHE:CZ	2.54	0.43
1:E:148:LYS:HD3	1:E:167:ALA:CB	2.47	0.43
1:C:13:ASP:OD1	1:C:13:ASP:N	2.51	0.43
1:A:121:PHE:HB2	1:A:315:PHE:HE2	1.84	0.43
1:D:33:LYS:HD3	1:D:244:THR:O	2.19	0.43
1:E:150:GLY:HA3	1:E:165:PHE:HD2	1.84	0.43
1:C:76:ILE:HD13	1:C:132:VAL:HB	2.01	0.43
1:D:222:ILE:HD12	1:C:222:ILE:CG2	2.49	0.42
1:B:20:THR:O	1:B:143:ALA:HA	2.19	0.42
1:D:283:SER:C	1:D:285:PRO:HD3	2.44	0.42
1:C:41:ALA:HB3	1:C:106:PHE:CE1	2.54	0.42
1:A:8:PRO:O	1:A:51:ARG:NH1	2.51	0.42
1:A:62:ARG:HG2	1:A:63:VAL:HG23	2.01	0.42
1:B:38:LYS:HE2	1:B:109:ARG:HD2	2.00	0.42
1:E:55:ASP:OD1	1:E:57:VAL:HG22	2.19	0.42
1:C:261:MET:HE2	1:C:310:LEU:HD12	2.01	0.42
1:A:14:GLU:CG	1:A:15:PRO:HD2	2.49	0.42
1:D:54:PHE:CE1	1:D:96:PRO:HA	2.54	0.42
1:D:119:TYR:CD1	1:D:120:PRO:HA	2.54	0.42
1:E:143:ALA:CB	1:E:148:LYS:NZ	2.82	0.42
1:A:28:TYR:HB3	1:B:111:LEU:HD11	2.02	0.42
1:B:59:SER:O	1:B:60:GLY:C	2.62	0.42
1:D:213:TRP:HB2	1:D:216:PHE:CD2	2.54	0.42
1:A:254:TYR:HA	1:A:314:PHE:CD2	2.55	0.42
1:E:33:LYS:HA	1:E:247:PRO:HB3	2.01	0.42
1:A:134:SER:HB3	1:A:138:ARG:HA	2.01	0.42
1:D:37:PHE:CE1	1:D:110:VAL:HB	2.55	0.42
1:E:239:ASN:ND2	1:E:263:TYR:HE2	2.16	0.42
1:A:136:ASP:C	1:A:136:ASP:OD1	2.62	0.42
1:A:234:ALA:HA	2:B:402:LMT:H22	2.01	0.42
1:C:43:LEU:HB3	1:C:104:GLU:CG	2.50	0.42
1:B:38:LYS:CE	1:B:109:ARG:HD2	2.50	0.42
1:D:184:LEU:HD23	1:D:184:LEU:HA	1.92	0.42
1:E:143:ALA:HB1	1:E:148:LYS:NZ	2.35	0.42
1:E:145:ASP:OD1	1:E:148:LYS:HE3	2.20	0.42
1:D:179:ARG:HG3	1:D:179:ARG:HH11	1.84	0.41
1:E:75:GLU:O	1:E:132:VAL:HG23	2.20	0.41
1:E:130:LEU:O	1:E:183:LYS:HA	2.20	0.41
1:D:240:ILE:HG12	1:C:241:LEU:HD22	2.02	0.41
1:D:280:LYS:O	1:D:280:LYS:HG3	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:292:THR:O	1:D:296:ARG:HG3	2.19	0.41
1:C:163:GLU:HG2	1:C:189:ARG:HB2	2.02	0.41
1:D:115:ASP:OD1	1:D:117:ARG:HB2	2.19	0.41
2:D:401:LMT:H52	2:C:403:LMT:H51	2.01	0.41
1:E:152:ASN:ND2	1:E:154:ASP:HB2	2.35	0.41
1:B:136:ASP:OD1	1:B:136:ASP:C	2.63	0.41
1:D:24:LEU:N	1:D:150:GLY:O	2.48	0.41
1:A:151:LYS:HB2	1:A:155:VAL:HG21	2.01	0.41
1:B:16:LEU:HD11	1:B:47:TRP:HB2	2.03	0.41
1:D:77:ARG:NH2	1:C:42:PHE:HZ	2.18	0.41
1:D:141:VAL:HG23	1:D:184:LEU:HG	2.02	0.41
1:E:148:LYS:O	1:E:149:VAL:C	2.62	0.41
1:C:78:PHE:CE1	1:C:85:ARG:HD3	2.50	0.41
1:C:148:LYS:C	1:C:150:GLY:N	2.76	0.41
1:A:152:ASN:ND2	1:A:154:ASP:HB2	2.36	0.41
1:B:150:GLY:HA3	1:B:165:PHE:CD2	2.39	0.41
1:D:125:THR:HG23	1:D:189:ARG:HG2	2.02	0.41
1:D:225:VAL:O	1:D:229:VAL:HG13	2.20	0.41
1:E:61:VAL:CG2	1:E:62:ARG:H	2.33	0.41
1:E:252:MET:HE2	1:E:252:MET:HB2	1.87	0.41
1:D:43:LEU:HB3	1:D:104:GLU:CG	2.51	0.41
1:D:77:ARG:NH2	1:D:131:ILE:HD12	2.36	0.41
1:D:268:VAL:HG23	1:D:299:PHE:HZ	1.84	0.41
1:E:9:PRO:HB3	1:E:72:TRP:CZ2	2.55	0.41
1:E:143:ALA:CB	1:E:148:LYS:HZ3	2.34	0.41
1:E:313:LEU:HA	1:E:313:LEU:HD12	1.89	0.41
1:C:11:ILE:HG12	1:C:51:ARG:HD3	2.02	0.41
1:A:91:ASP:OD2	1:B:179:ARG:NH1	2.54	0.41
1:B:45:LEU:HB2	1:B:102:TYR:HB3	2.03	0.41
1:B:66:TYR:CG	1:B:71:ILE:HD11	2.56	0.41
1:B:46:SER:HA	1:B:100:VAL:O	2.21	0.40
1:D:119:TYR:OH	1:D:197:TYR:HE2	2.04	0.40
1:B:222:ILE:CG2	1:C:222:ILE:HD12	2.51	0.40
1:A:14:GLU:CD	1:A:15:PRO:HD2	2.45	0.40
1:B:43:LEU:HB3	1:B:104:GLU:CG	2.52	0.40
1:B:140:ILE:O	1:B:140:ILE:HG13	2.21	0.40
1:B:310:LEU:HD12	1:B:310:LEU:HA	1.89	0.40
1:D:31:ASP:O	1:D:35:GLU:N	2.51	0.40
1:C:228:VAL:HG11	1:C:270:VAL:HG23	2.02	0.40
1:C:255:THR:HG22	1:C:258:ILE:HD11	2.03	0.40
1:D:279:LEU:HD13	1:D:287:ARG:HG2	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:28:TYR:HB3	1:C:111:LEU:HD11	2.03	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	308/310 (99%)	302 (98%)	5 (2%)	1 (0%)	36	65
1	B	308/310 (99%)	302 (98%)	5 (2%)	1 (0%)	36	65
1	C	308/310 (99%)	301 (98%)	7 (2%)	0	100	100
1	D	308/310 (99%)	302 (98%)	6 (2%)	0	100	100
1	E	308/310 (99%)	302 (98%)	6 (2%)	0	100	100
All	All	1540/1550 (99%)	1509 (98%)	29 (2%)	2 (0%)	48	77

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	61	VAL
1	A	150	GLY

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	277/277 (100%)	256 (92%)	21 (8%)	12	37
1	B	277/277 (100%)	261 (94%)	16 (6%)	18	46
1	C	277/277 (100%)	256 (92%)	21 (8%)	12	37
1	D	277/277 (100%)	260 (94%)	17 (6%)	17	44
1	E	277/277 (100%)	259 (94%)	18 (6%)	15	42
All	All	1385/1385 (100%)	1292 (93%)	93 (7%)	15	41

All (93) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	THR
1	A	48	LYS
1	A	50	ARG
1	A	59	SER
1	A	81	VAL
1	A	111	LEU
1	A	136	ASP
1	A	141	VAL
1	A	142	LEU
1	A	144	VAL
1	A	158	THR
1	A	205	MET
1	A	214	THR
1	A	219	THR
1	A	226	THR
1	A	229	VAL
1	A	268	VAL
1	A	270	VAL
1	A	275	VAL
1	A	280	LYS
1	A	292	THR
1	B	11	ILE
1	B	17	THR
1	B	58	ARG
1	B	61	VAL
1	B	65	THR
1	B	73	ILE
1	B	110	VAL
1	B	136	ASP
1	B	142	LEU
1	B	146	LEU

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Mol	Chain	Res	Type
1	B	148	LYS
1	B	226	THR
1	B	229	VAL
1	B	268	VAL
1	B	273	VAL
1	B	275	VAL
1	D	11	ILE
1	D	17	THR
1	D	62	ARG
1	D	63	VAL
1	D	69	GLU
1	D	100	VAL
1	D	141	VAL
1	D	144	VAL
1	D	148	LYS
1	D	149	VAL
1	D	158	THR
1	D	180	LEU
1	D	219	THR
1	D	226	THR
1	D	268	VAL
1	D	275	VAL
1	D	280	LYS
1	E	11	ILE
1	E	17	THR
1	E	33	LYS
1	E	73	ILE
1	E	81	VAL
1	E	83	ASN
1	E	99	THR
1	E	111	LEU
1	E	125	THR
1	E	136	ASP
1	E	144	VAL
1	E	158	THR
1	E	180	LEU
1	E	226	THR
1	E	268	VAL
1	E	270	VAL
1	E	273	VAL
1	E	275	VAL
1	C	11	ILE

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Mol	Chain	Res	Type
1	C	13	ASP
1	C	14	GLU
1	C	17	THR
1	C	44	SER
1	C	62	ARG
1	C	65	THR
1	C	67	GLU
1	C	92	ILE
1	C	136	ASP
1	C	163	GLU
1	C	179	ARG
1	C	180	LEU
1	C	205	MET
1	C	214	THR
1	C	226	THR
1	C	229	VAL
1	C	239	ASN
1	C	268	VAL
1	C	270	VAL
1	C	275	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	83	ASN
1	A	235	HIS
1	A	239	ASN
1	A	307	ASN
1	B	239	ASN
1	B	245	ASN
1	D	239	ASN
1	D	245	ASN
1	E	239	ASN
1	C	173	ASN
1	C	239	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 22 ligands modelled in this entry, 6 are monoatomic - leaving 16 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	B	402	-	11,11,36	0.19	0	10,10,47	0.59	0
2	LMT	D	401	-	11,11,36	0.18	0	10,10,47	0.74	0
5	SO4	C	405	-	4,4,4	0.28	0	6,6,6	0.20	0
2	LMT	C	403	-	11,11,36	0.16	0	10,10,47	0.68	0
5	SO4	E	402	-	4,4,4	0.28	0	6,6,6	0.16	0
5	SO4	B	405	-	4,4,4	0.24	0	6,6,6	0.28	0
5	SO4	C	401	-	4,4,4	0.27	0	6,6,6	0.25	0
5	SO4	D	404	-	4,4,4	0.28	0	6,6,6	0.24	0
2	LMT	A	401	-	11,11,36	0.21	0	10,10,47	0.67	0
2	LMT	E	403	-	11,11,36	0.20	0	10,10,47	0.64	0
5	SO4	C	402	-	4,4,4	0.25	0	6,6,6	0.31	0
2	LMT	D	402	-	11,11,36	0.14	0	10,10,47	0.77	0
5	SO4	B	401	-	4,4,4	0.31	0	6,6,6	0.21	0
5	SO4	B	404	-	4,4,4	0.26	0	6,6,6	0.38	0
5	SO4	A	404	-	4,4,4	0.26	0	6,6,6	0.06	0
5	SO4	E	401	-	4,4,4	0.24	0	6,6,6	0.49	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	B	402	-	-	2/9/9/61	-
2	LMT	D	401	-	-	2/9/9/61	-
2	LMT	C	403	-	-	2/9/9/61	-
2	LMT	A	401	-	-	4/9/9/61	-
2	LMT	E	403	-	-	2/9/9/61	-
2	LMT	D	402	-	-	2/9/9/61	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	403	LMT	C2-C3-C4-C5
2	E	403	LMT	C2-C3-C4-C5
2	B	402	LMT	C9-C10-C11-C12
2	D	402	LMT	C9-C10-C11-C12
2	D	401	LMT	C11-C10-C9-C8
2	D	401	LMT	C9-C10-C11-C12
2	E	403	LMT	C1-C2-C3-C4
2	A	401	LMT	C5-C6-C7-C8
2	D	402	LMT	C1-C2-C3-C4
2	A	401	LMT	C7-C8-C9-C10
2	C	403	LMT	C6-C7-C8-C9
2	A	401	LMT	C4-C5-C6-C7
2	A	401	LMT	C11-C10-C9-C8
2	B	402	LMT	C5-C6-C7-C8

There are no ring outliers.

9 monomers are involved in 25 short contacts:

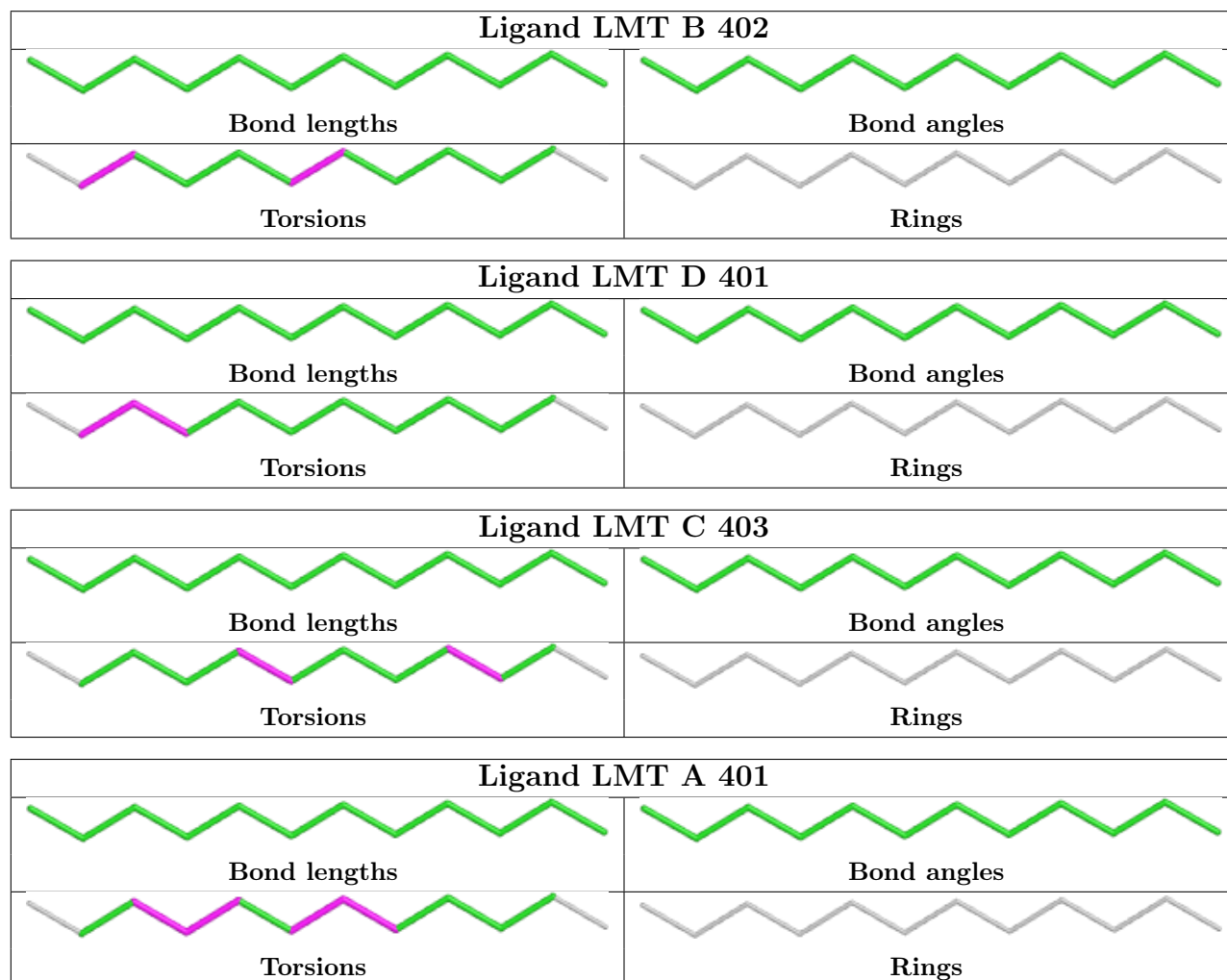
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	402	LMT	3	0
2	D	401	LMT	9	0
2	C	403	LMT	2	0
5	D	404	SO4	5	0
2	A	401	LMT	1	0
2	E	403	LMT	2	0
5	C	402	SO4	5	0
2	D	402	LMT	4	0

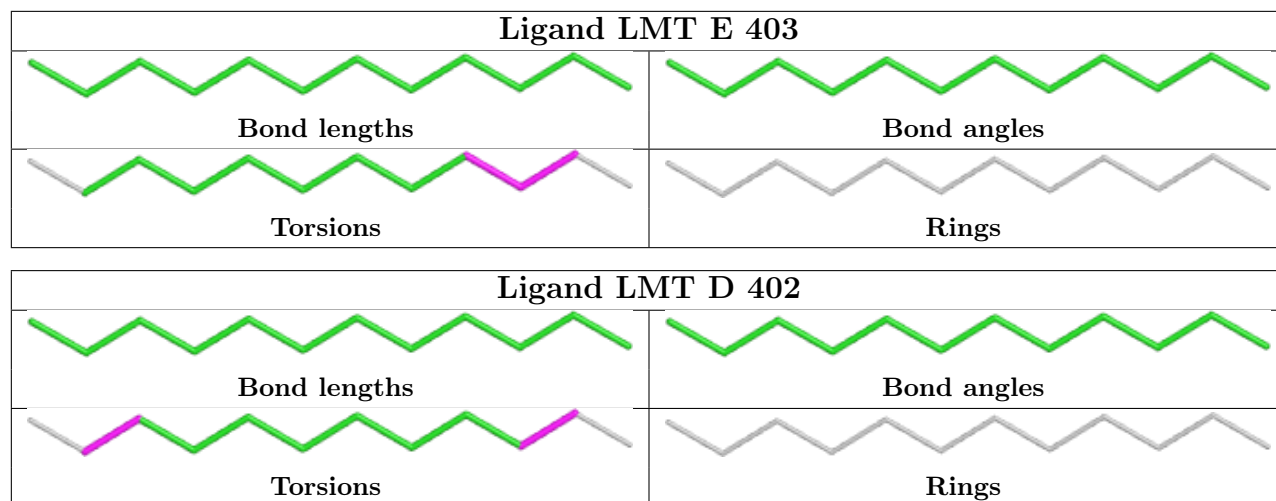
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	E	401	SO4	3	0

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 than 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.





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	310/310 (100%)	0.73	36 (11%) 9 5	47, 61, 90, 118	0
1	B	310/310 (100%)	0.68	29 (9%) 14 8	50, 64, 98, 123	0
1	C	310/310 (100%)	0.75	35 (11%) 10 5	51, 64, 95, 116	0
1	D	310/310 (100%)	0.62	25 (8%) 18 10	49, 63, 92, 117	0
1	E	310/310 (100%)	0.66	31 (10%) 12 6	48, 64, 86, 123	0
All	All	1550/1550 (100%)	0.69	156 (10%) 12 6	47, 63, 94, 123	0

All (156) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	317	PHE	8.5
1	B	149	VAL	6.8
1	C	283	SER	6.8
1	C	137	THR	6.4
1	A	149	VAL	6.3
1	B	8	PRO	5.6
1	D	13	ASP	5.3
1	E	316	GLY	5.2
1	C	149	VAL	5.2
1	A	8	PRO	5.1
1	C	8	PRO	5.0
1	B	145	ASP	4.9
1	D	317	PHE	4.9
1	A	317	PHE	4.7
1	E	13	ASP	4.6
1	C	135	VAL	4.6
1	E	8	PRO	4.6
1	C	48	LYS	4.4
1	C	12	ALA	4.4
1	D	149	VAL	4.4

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Mol	Chain	Res	Type	RSRZ
1	B	317	PHE	4.3
1	E	149	VAL	4.2
1	C	317	PHE	4.2
1	A	135	VAL	4.2
1	D	12	ALA	4.1
1	A	66	TYR	4.1
1	A	147	GLU	4.1
1	C	11	ILE	4.0
1	C	14	GLU	4.0
1	D	145	ASP	4.0
1	A	48	LYS	4.0
1	A	136	ASP	3.9
1	D	61	VAL	3.8
1	E	12	ALA	3.8
1	A	283	SER	3.8
1	C	13	ASP	3.8
1	C	136	ASP	3.8
1	A	101	GLN	3.7
1	B	13	ASP	3.7
1	A	14	GLU	3.7
1	D	135	VAL	3.7
1	C	156	PHE	3.6
1	E	283	SER	3.6
1	D	136	ASP	3.6
1	D	8	PRO	3.5
1	A	11	ILE	3.5
1	B	146	LEU	3.5
1	B	137	THR	3.4
1	E	137	THR	3.4
1	E	136	ASP	3.4
1	A	64	LYS	3.4
1	D	14	GLU	3.4
1	B	244	THR	3.4
1	B	75	GLU	3.4
1	B	148	LYS	3.4
1	A	150	GLY	3.4
1	C	154	ASP	3.3
1	A	145	ASP	3.3
1	E	135	VAL	3.3
1	E	14	GLU	3.3
1	C	101	GLN	3.2
1	B	245	ASN	3.1

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Mol	Chain	Res	Type	RSRZ
1	E	11	ILE	3.1
1	C	57	VAL	3.1
1	D	139	ASN	3.0
1	A	61	VAL	3.0
1	B	135	VAL	3.0
1	B	14	GLU	3.0
1	B	12	ALA	3.0
1	B	243	GLU	3.0
1	C	316	GLY	3.0
1	B	136	ASP	3.0
1	A	65	THR	3.0
1	C	50	ARG	2.9
1	C	139	ASN	2.9
1	B	142	LEU	2.9
1	A	13	ASP	2.9
1	B	178	ASP	2.9
1	A	142	LEU	2.9
1	D	26	GLU	2.8
1	B	15	PRO	2.8
1	C	55	ASP	2.8
1	D	143	ALA	2.8
1	E	58	ARG	2.8
1	E	284	GLN	2.8
1	A	148	LYS	2.7
1	C	27	CYS	2.7
1	D	156	PHE	2.7
1	C	69	GLU	2.7
1	C	147	GLU	2.7
1	A	137	THR	2.7
1	D	313	LEU	2.7
1	E	154	ASP	2.6
1	B	56	PRO	2.6
1	C	59	SER	2.6
1	B	139	ASN	2.6
1	B	57	VAL	2.6
1	B	11	ILE	2.5
1	C	92	ILE	2.5
1	C	66	TYR	2.5
1	A	144	VAL	2.5
1	E	282	GLU	2.5
1	D	316	GLY	2.5
1	B	144	VAL	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	62	ARG	2.5
1	D	112	SER	2.5
1	A	244	THR	2.5
1	A	131	ILE	2.4
1	A	139	ASN	2.4
1	E	118	ARG	2.4
1	D	142	LEU	2.4
1	A	156	PHE	2.4
1	E	139	ASN	2.4
1	E	145	ASP	2.4
1	A	94	VAL	2.4
1	A	27	CYS	2.4
1	D	57	VAL	2.4
1	D	137	THR	2.3
1	B	147	GLU	2.3
1	C	63	VAL	2.3
1	A	287	ARG	2.3
1	B	60	GLY	2.3
1	E	146	LEU	2.3
1	E	77	ARG	2.3
1	C	144	VAL	2.3
1	E	61	VAL	2.3
1	C	143	ALA	2.2
1	A	12	ALA	2.2
1	E	170	LYS	2.2
1	A	15	PRO	2.2
1	E	102	TYR	2.2
1	C	28	TYR	2.2
1	B	59	SER	2.2
1	E	148	LYS	2.2
1	C	153	ASP	2.2
1	E	147	GLU	2.2
1	D	15	PRO	2.2
1	A	99	THR	2.1
1	D	70	ALA	2.1
1	B	91	ASP	2.1
1	D	91	ASP	2.1
1	B	62	ARG	2.1
1	A	153	ASP	2.1
1	E	50	ARG	2.1
1	C	179	ARG	2.1
1	E	142	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	9	PRO	2.1
1	D	19	ASN	2.1
1	A	309	ILE	2.1
1	C	138	ARG	2.1
1	E	249	THR	2.1
1	C	87	ALA	2.0
1	E	10	PRO	2.0
1	A	93	SER	2.0
1	E	65	THR	2.0
1	C	62	ARG	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.

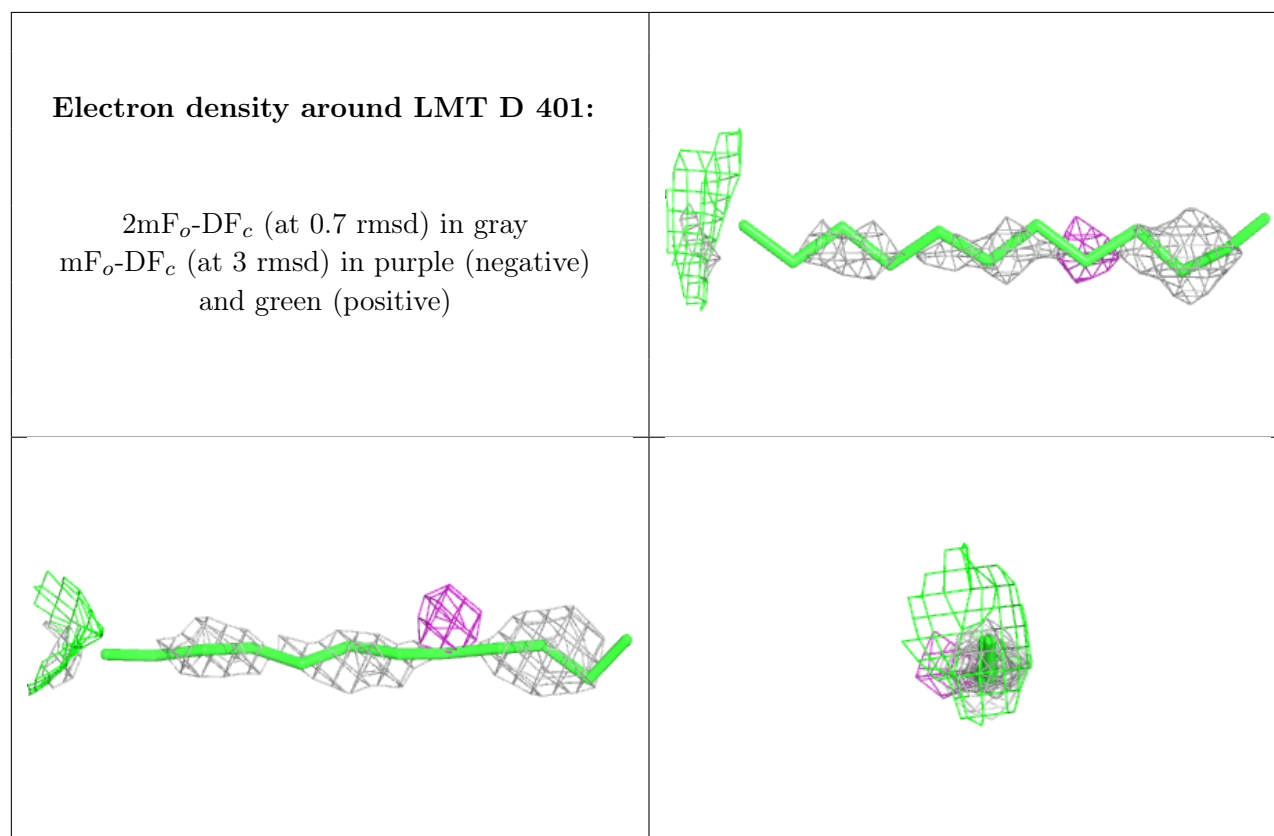
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	NA	A	403	1/1	0.65	0.56	65,65,65,65	0
5	SO4	D	404	5/5	0.66	0.21	89,96,114,115	0
5	SO4	B	401	5/5	0.72	0.11	100,111,130,136	0
5	SO4	C	402	5/5	0.73	0.20	92,100,121,123	0
5	SO4	E	402	5/5	0.75	0.12	109,110,120,129	0
5	SO4	A	404	5/5	0.75	0.11	106,107,117,126	0
5	SO4	C	401	5/5	0.77	0.12	98,106,109,117	0
2	LMT	D	401	12/35	0.79	0.33	60,75,91,91	0
5	SO4	B	405	5/5	0.79	0.11	78,96,106,109	0
5	SO4	E	401	5/5	0.80	0.17	75,88,94,94	0
5	SO4	C	405	5/5	0.80	0.11	102,109,118,130	0
5	SO4	B	404	5/5	0.81	0.13	79,84,94,105	0
3	CL	A	402	1/1	0.84	0.12	73,73,73,73	0

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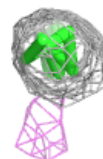
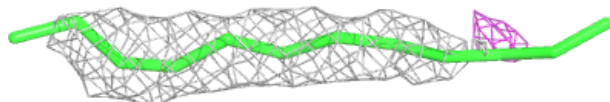
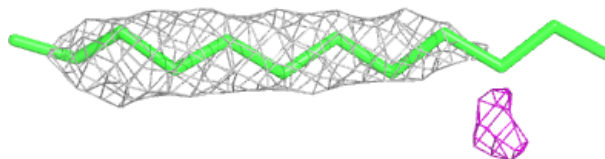
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	LMT	C	403	12/35	0.91	0.23	59,65,73,76	0
3	CL	E	404	1/1	0.92	0.10	68,68,68,68	0
2	LMT	D	402	12/35	0.92	0.21	56,63,67,71	0
2	LMT	B	402	12/35	0.92	0.21	60,62,65,68	0
2	LMT	A	401	12/35	0.92	0.22	57,63,67,72	0
3	CL	C	404	1/1	0.93	0.13	76,76,76,76	0
3	CL	D	403	1/1	0.93	0.12	75,75,75,75	0
2	LMT	E	403	12/35	0.94	0.18	58,68,71,80	0
3	CL	B	403	1/1	0.94	0.07	76,76,76,76	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.

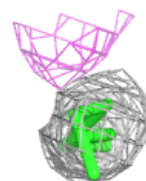
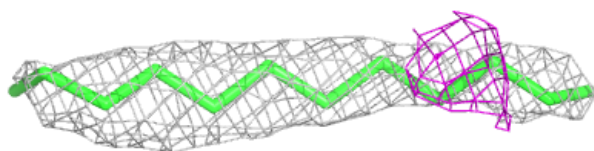
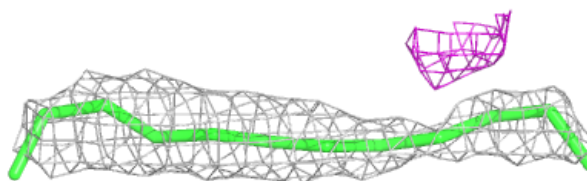


Electron density around LMT C 403:

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

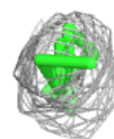
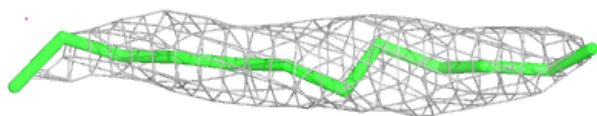
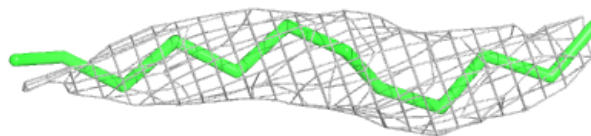
**Electron density around LMT D 402:**

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

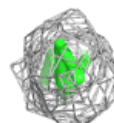
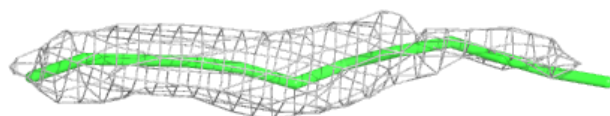
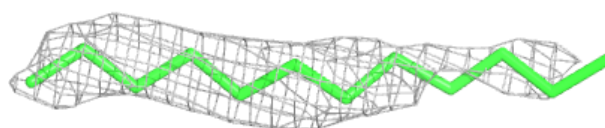


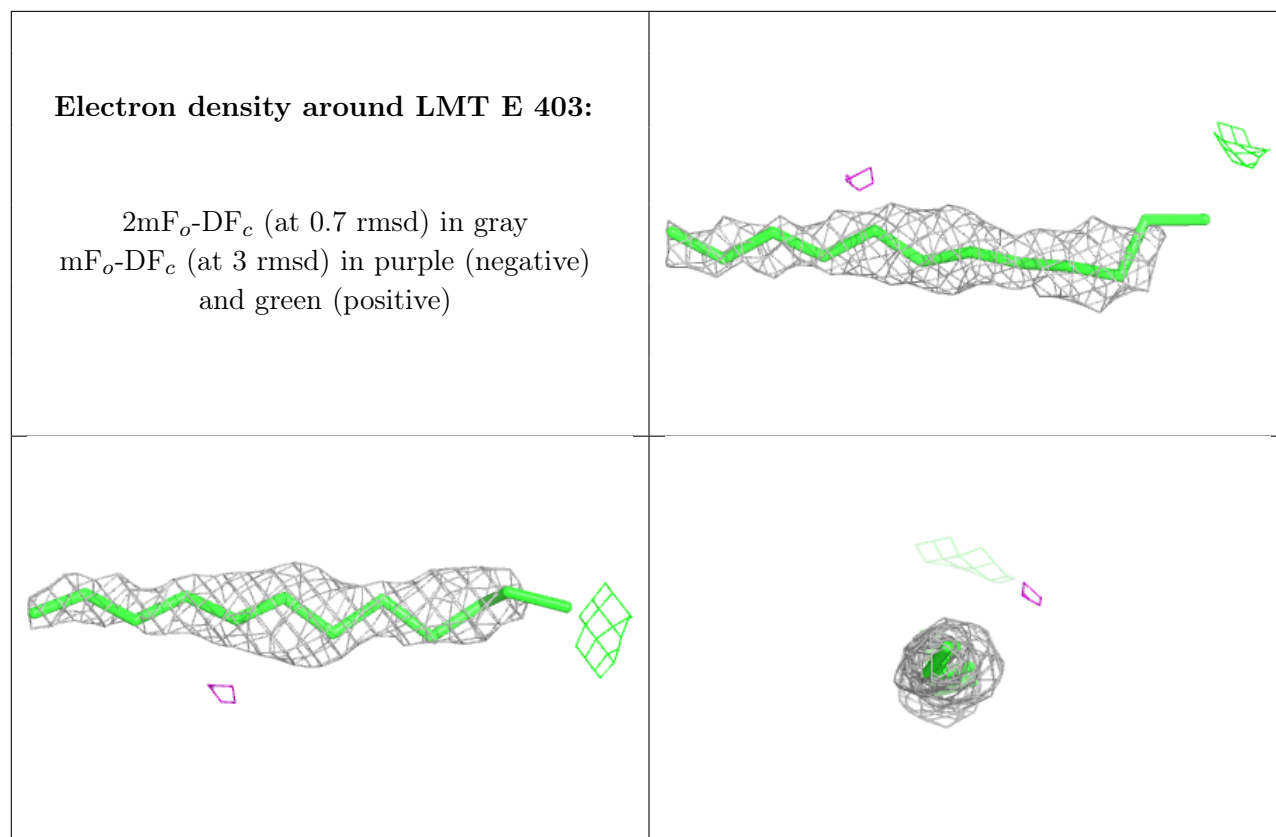
Electron density around LMT B 402:

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

**Electron density around LMT A 401:**

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





6.5 Other polymers [i](#)

There are no such residues in this entry.