



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:40 PM UTC

PDB ID : 5MUO / pdb_00005muo
Title : X-ray structure of the 2-22' locally-closed mutant of GLIC in complex with propofol
Authors : Fourati, Z.; Ruza, R.R.; Delarue, M.
Deposited on : 2017-01-13
Resolution : 3.19 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

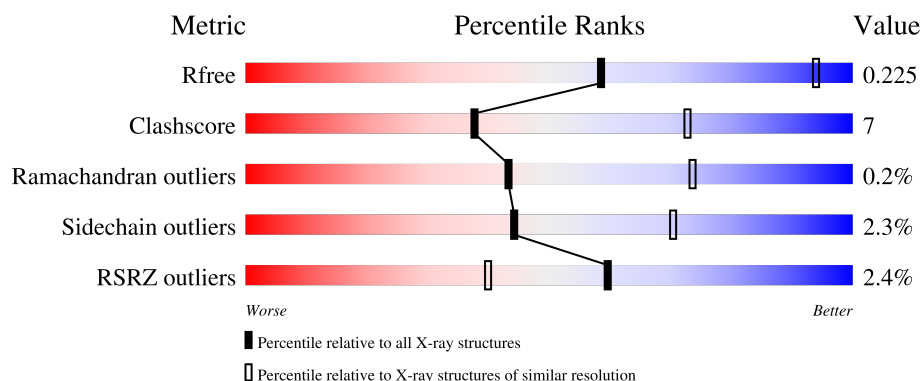
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.19 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	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

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	321	0% 78% 19% .
1	B	321	2% 81% 13% . . .
1	C	321	2% 81% 15% . .
1	D	321	3% 81% 16% . .
1	E	321	4% 80% 16% .

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	ACT	A	403	-	-	X	-
4	ACT	B	402	-	-	X	-
4	ACT	D	403	-	-	X	-
4	ACT	E	402	-	-	X	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 12770 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	311	Total	C	N	O	S	0	1	0
			2524	1661	403	455	5			
1	B	311	Total	C	N	O	S	0	1	0
			2532	1667	404	456	5			
1	C	311	Total	C	N	O	S	0	1	0
			2526	1662	403	456	5			
1	D	311	Total	C	N	O	S	0	4	0
			2546	1676	405	460	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:

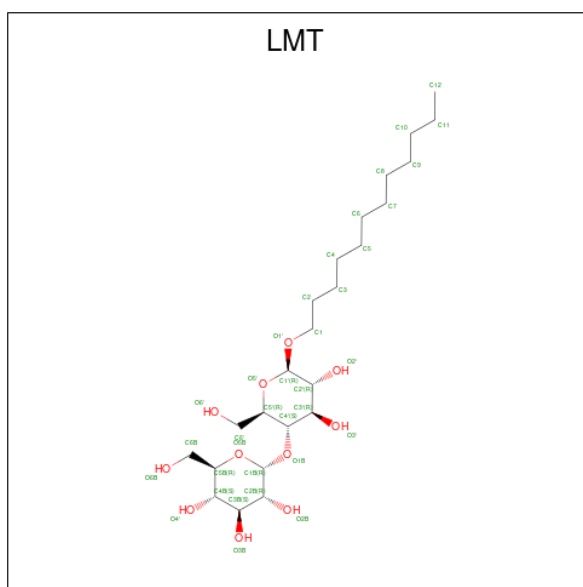
Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP Q7NDN8
A	-2	SER	-	expression tag	UNP Q7NDN8
A	-1	ALA	-	expression tag	UNP Q7NDN8
A	0	ALA	-	expression tag	UNP Q7NDN8
A	1	ALA	-	expression tag	UNP Q7NDN8
A	27	SER	CYS	conflict	UNP Q7NDN8
A	33	CYS	LYS	conflict	UNP Q7NDN8
A	246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

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

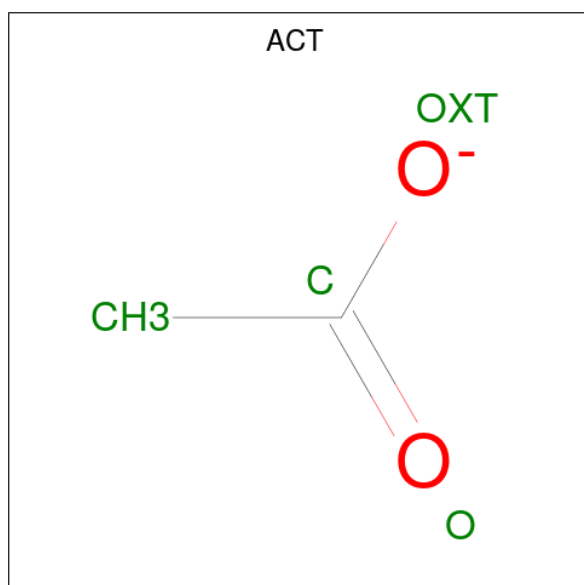


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C 12 12	0	0

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

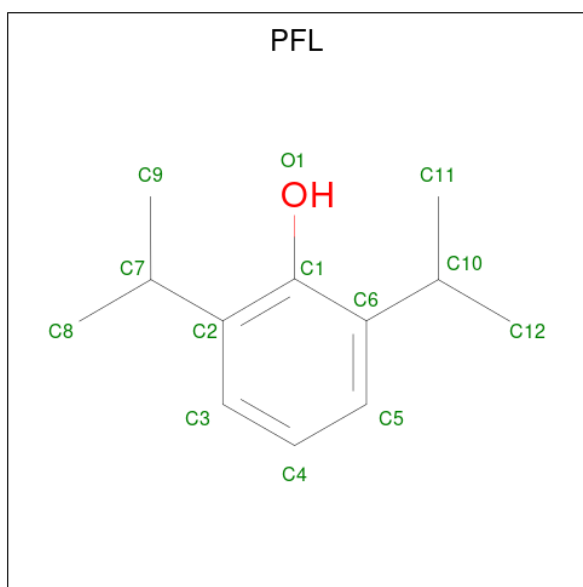
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Cl	0	0
			1	1		
3	B	1	Total	Cl	0	0
			1	1		
3	C	1	Total	Cl	0	0
			1	1		
3	D	1	Total	Cl	0	0
			1	1		
3	E	1	Total	Cl	0	0
			1	1		

- Molecule 4 is ACETATE ION (CCD ID: ACT) (formula: C₂H₃O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		
4	D	1	Total	C	O	0	0
			4	2	2		
4	E	1	Total	C	O	0	0
			4	2	2		

- Molecule 5 is 2,6-BIS(1-METHYLETHYL)PHENOL (CCD ID: PFL) (formula: C₁₂H₁₈O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total	C	O	0	0
			13	12	1		

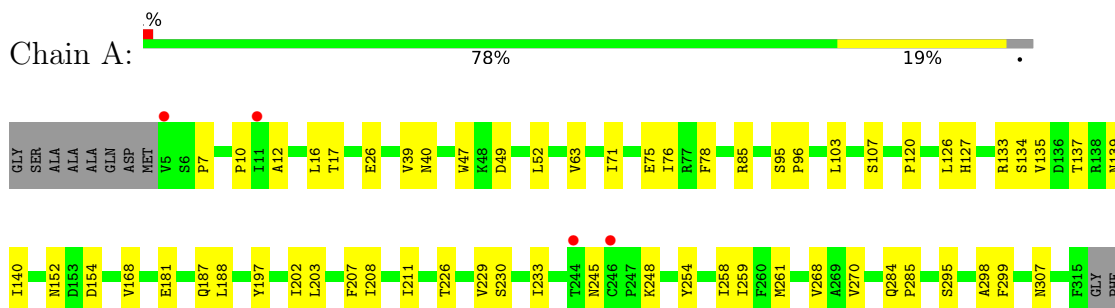
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	16	Total	O	0	0
			16	16		
6	B	21	Total	O	0	0
			21	21		
6	C	14	Total	O	0	0
			14	14		
6	D	11	Total	O	0	0
			11	11		
6	E	14	Total	O	0	0
			14	14		

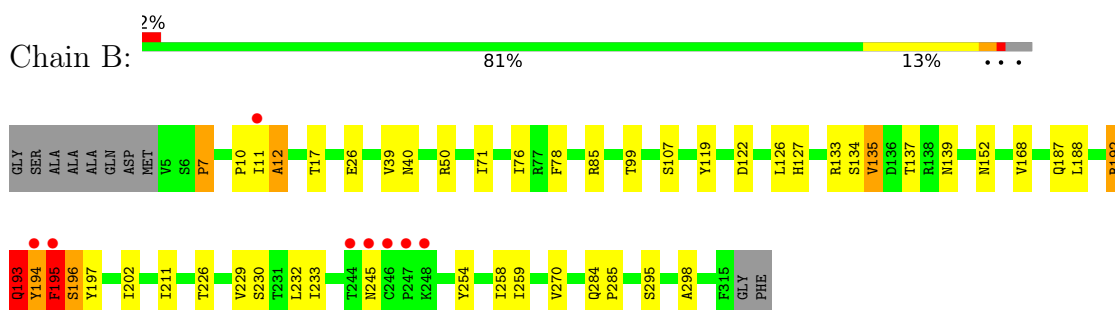
3 Residue-property plots [i](#)

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.

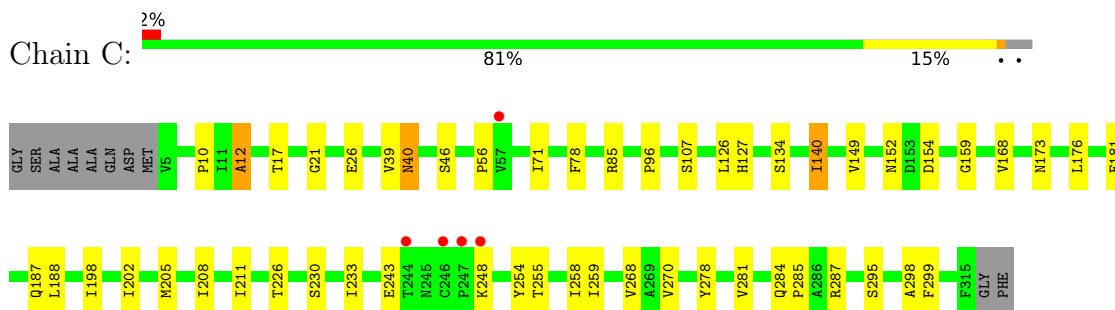
- Molecule 1: Proton-gated ion channel



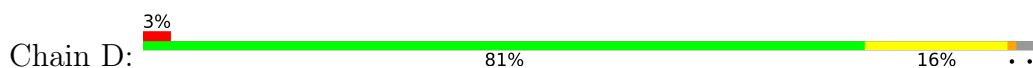
- Molecule 1: Proton-gated ion channel

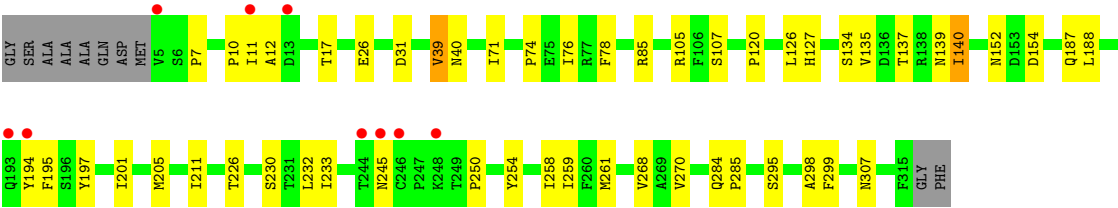


- Molecule 1: Proton-gated ion channel

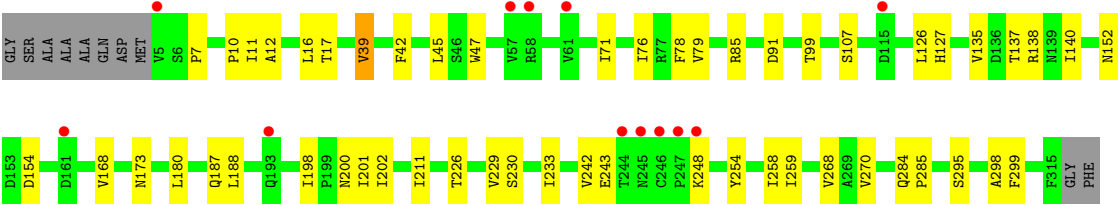
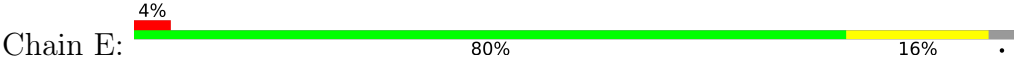


- Molecule 1: Proton-gated ion channel





● 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	180.98Å 132.90Å 159.92Å 90.00° 101.84° 90.00°	Depositor
Resolution (Å)	20.00 – 3.19 20.00 – 3.19	Depositor EDS
% Data completeness (in resolution range)	97.9 (20.00-3.19) 97.6 (20.00-3.19)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.04	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.67 (at 3.22Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.189 , 0.204 0.207 , 0.225	Depositor DCC
R_{free} test set	3069 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	90.5	Xtriage
Anisotropy	0.246	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 86.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	12770	wwPDB-VP
Average B, all atoms (Å ²)	102.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.32% 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: CL, ACT, LMT, PFL

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	0.84	0/2595	1.31	9/3549 (0.3%)
1	B	0.86	1/2601 (0.0%)	1.31	11/3557 (0.3%)
1	C	0.81	0/2597	1.28	8/3551 (0.2%)
1	D	0.83	0/2624	1.31	11/3589 (0.3%)
1	E	0.83	0/2588	1.30	10/3539 (0.3%)
All	All	0.83	1/13005 (0.0%)	1.30	49/17785 (0.3%)

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

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	193	GLN	CA-C	-5.67	1.46	1.52

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	245	ASN	CA-CB-CG	6.70	119.30	112.60
1	A	245	ASN	CA-CB-CG	6.61	119.21	112.60
1	D	245	ASN	CA-CB-CG	6.55	119.15	112.60
1	B	195	PHE	CA-CB-CG	-6.51	107.29	113.80
1	A	135	VAL	CA-C-N	6.22	128.86	120.65
1	A	135	VAL	C-N-CA	6.22	128.86	120.65
1	D	195	PHE	CA-CB-CG	6.15	119.95	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	135	VAL	CA-C-N	6.12	128.73	120.65
1	D	135	VAL	C-N-CA	6.12	128.73	120.65
1	A	154	ASP	CA-CB-CG	5.71	118.31	112.60
1	E	152	ASN	CA-CB-CG	5.66	118.26	112.60
1	A	152	ASN	CA-CB-CG	5.60	118.20	112.60
1	D	152	ASN	CA-CB-CG	5.60	118.20	112.60
1	B	12	ALA	N-CA-C	-5.58	98.92	110.80
1	D	11	ILE	CA-C-N	5.47	129.39	122.16
1	D	11	ILE	C-N-CA	5.47	129.39	122.16
1	B	135	VAL	CA-C-N	5.45	127.84	120.65
1	B	135	VAL	C-N-CA	5.45	127.84	120.65
1	E	91	ASP	CA-CB-CG	5.44	118.04	112.60
1	E	11	ILE	N-CA-C	-5.42	105.04	110.30
1	B	193	GLN	CA-C-N	-5.42	111.19	121.54
1	B	193	GLN	C-N-CA	-5.42	111.19	121.54
1	C	205	MET	CA-C-N	5.40	127.96	120.29
1	C	205	MET	C-N-CA	5.40	127.96	120.29
1	D	154	ASP	CA-CB-CG	5.39	117.99	112.60
1	C	152	ASN	CA-CB-CG	5.36	117.96	112.60
1	C	40	ASN	CA-CB-CG	5.29	117.89	112.60
1	C	12	ALA	N-CA-C	-5.27	99.58	110.80
1	D	31	ASP	CA-CB-CG	5.24	117.84	112.60
1	E	42	PHE	CA-CB-CG	5.23	119.03	113.80
1	B	152	ASN	CA-CB-CG	5.21	117.81	112.60
1	C	154	ASP	CA-CB-CG	5.17	117.77	112.60
1	E	168	VAL	CA-C-N	5.17	129.10	120.62
1	E	168	VAL	C-N-CA	5.17	129.10	120.62
1	E	154	ASP	CA-CB-CG	5.15	117.75	112.60
1	D	205	MET	CA-C-N	5.10	127.54	120.29
1	D	205	MET	C-N-CA	5.10	127.54	120.29
1	B	168	VAL	CA-C-N	5.09	128.96	120.62
1	B	168	VAL	C-N-CA	5.09	128.96	120.62
1	A	202	ILE	N-CA-C	5.07	115.29	110.42
1	C	168	VAL	CA-C-N	5.06	128.91	120.62
1	C	168	VAL	C-N-CA	5.06	128.91	120.62
1	E	242	VAL	CA-C-N	5.05	129.44	121.56
1	E	242	VAL	C-N-CA	5.05	129.44	121.56
1	A	207	PHE	CA-CB-CG	5.04	118.84	113.80
1	B	7	PRO	N-CA-C	5.04	115.30	110.47
1	A	168	VAL	CA-C-N	5.01	128.84	120.62
1	A	168	VAL	C-N-CA	5.01	128.84	120.62
1	E	201	ILE	N-CA-C	5.01	116.19	111.48

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	193	GLN	Mainchain

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	2524	0	2536	42	0
1	B	2532	0	2537	55	0
1	C	2526	0	2535	28	0
1	D	2546	0	2554	46	0
1	E	2520	0	2529	33	0
2	A	12	0	23	0	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	4	0	3	4	0
4	B	4	0	3	6	0
4	D	4	0	3	7	0
4	E	4	0	3	5	0
5	D	13	0	18	5	0
6	A	16	0	0	0	0
6	B	21	0	0	0	0
6	C	14	0	0	1	0
6	D	11	0	0	0	0
6	E	14	0	0	0	0
All	All	12770	0	12744	177	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 7.

All (177) 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:103:LEU:HD22	1:B:133:ARG:NH2	1.42	1.34
1:A:103:LEU:CD2	1:B:133:ARG:NH2	1.91	1.32
1:D:74:PRO:O	4:D:403:ACT:H3	1.25	1.30
1:D:74:PRO:O	4:D:403:ACT:CH3	1.81	1.26
1:D:76:ILE:N	4:D:403:ACT:H1	1.69	1.06
1:D:76:ILE:H	4:D:403:ACT:H1	0.88	1.01
1:D:76:ILE:H	4:D:403:ACT:CH3	1.74	1.00
1:A:103:LEU:CD2	1:B:133:ARG:HH22	1.65	0.98
1:D:230:SER:OG	5:D:402:PFL:HC4	1.62	0.98
1:D:40[B]:ASN:HD21	1:D:105:ARG:HH21	1.12	0.96
1:A:103:LEU:HD21	1:B:133:ARG:NH2	1.77	0.96
1:A:76:ILE:H	4:A:403:ACT:H2	1.32	0.92
1:E:10:PRO:HB2	1:E:12:ALA:O	1.75	0.87
1:A:76:ILE:N	4:A:403:ACT:H2	1.90	0.86
1:A:103:LEU:HD22	1:B:133:ARG:HH22	1.08	0.86
1:B:194[B]:TYR:O	1:B:196:SER:N	2.08	0.86
1:B:197:TYR:HD1	1:B:202:ILE:CD1	1.89	0.85
1:B:197:TYR:HD1	1:B:202:ILE:HD11	1.39	0.84
1:C:10:PRO:HB2	1:C:12:ALA:O	1.78	0.83
1:D:10:PRO:HB2	1:D:12:ALA:O	1.78	0.82
1:B:10:PRO:HB2	1:B:12:ALA:O	1.78	0.82
1:D:230:SER:OG	5:D:402:PFL:C4	2.27	0.81
1:A:10:PRO:HB2	1:A:12:ALA:O	1.80	0.80
1:A:103:LEU:CD2	1:B:133:ARG:HH21	1.92	0.80
1:B:194[B]:TYR:CE2	1:B:197:TYR:HD2	1.99	0.79
1:A:103:LEU:HD21	1:B:133:ARG:HH21	1.48	0.79
1:B:197:TYR:CD1	1:B:202:ILE:HD11	2.19	0.76
1:D:40[B]:ASN:ND2	1:D:105:ARG:HH21	1.84	0.76
1:B:122:ASP:CG	1:B:192:ARG:HH11	1.94	0.75
1:B:194[B]:TYR:CD2	1:B:197:TYR:HD2	2.05	0.75
1:D:74:PRO:O	4:D:403:ACT:H2	1.88	0.74
1:B:11:ILE:HG23	1:B:50:ARG:NH2	2.02	0.73
1:B:78:PHE:HE2	1:B:85:ARG:HD3	1.54	0.73
1:A:78:PHE:HE2	1:A:85:ARG:HD3	1.54	0.73
1:E:78:PHE:HE2	1:E:85:ARG:HD3	1.55	0.70
1:C:78:PHE:HE2	1:C:85:ARG:HD3	1.56	0.70
1:C:46:SER:HB2	6:C:510:HOH:O	1.90	0.69
1:D:78:PHE:HE2	1:D:85:ARG:HD3	1.54	0.69
1:A:76:ILE:H	4:A:403:ACT:CH3	2.06	0.69
1:E:45:LEU:HD11	4:E:402:ACT:H3	1.75	0.67
1:D:194[B]:TYR:O	1:D:194[B]:TYR:CG	2.48	0.66
1:D:201:ILE:HD11	1:E:248:LYS:HD2	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:85:ARG:HH22	4:B:402:ACT:H3	1.62	0.65
1:B:194[B]:TYR:O	1:B:195:PHE:C	2.39	0.65
1:A:75:GLU:HA	4:A:403:ACT:H3	1.79	0.64
1:A:78:PHE:CE2	1:A:85:ARG:HD3	2.33	0.63
1:A:261:MET:HE1	1:A:307:ASN:OD1	1.98	0.63
1:B:11:ILE:HG23	1:B:50:ARG:CZ	2.29	0.62
1:B:194[B]:TYR:OH	1:C:248:LYS:HB2	1.99	0.62
1:D:78:PHE:CE2	1:D:85:ARG:HD3	2.33	0.62
1:A:103:LEU:HD22	1:B:133:ARG:CZ	2.27	0.62
1:E:78:PHE:CE2	1:E:85:ARG:HD3	2.35	0.62
1:D:194[B]:TYR:O	1:D:194[B]:TYR:CD2	2.53	0.62
1:D:230:SER:HG	5:D:402:PFL:HC4	1.64	0.61
1:B:78:PHE:CE2	1:B:85:ARG:HD3	2.33	0.61
1:E:76:ILE:N	4:E:402:ACT:O	2.31	0.60
1:C:78:PHE:CE2	1:C:85:ARG:HD3	2.37	0.60
1:B:85:ARG:NH2	4:B:402:ACT:H3	2.17	0.60
1:D:40[B]:ASN:HD21	1:D:105:ARG:NH2	1.92	0.59
1:C:134:SER:HA	1:C:140:ILE:HD12	1.86	0.57
1:A:248:LYS:HD2	1:E:200:ASN:HD22	1.67	0.57
1:D:105:ARG:HH22	1:E:79:VAL:HA	1.69	0.57
1:B:194[B]:TYR:CE2	1:B:197:TYR:CD2	2.87	0.56
1:E:45:LEU:CD1	4:E:402:ACT:CH3	2.84	0.56
1:B:76:ILE:O	4:B:402:ACT:H1	2.07	0.55
1:B:85:ARG:HH22	4:B:402:ACT:CH3	2.21	0.54
1:C:278:TYR:HA	1:C:281:VAL:HG22	1.90	0.54
1:B:194[B]:TYR:OH	1:C:248:LYS:CB	2.55	0.53
1:B:119:TYR:HD2	1:B:192:ARG:NH1	2.06	0.52
1:D:134:SER:HA	1:D:140:ILE:HD12	1.92	0.52
1:E:45:LEU:CD1	4:E:402:ACT:H3	2.40	0.52
1:E:7:PRO:HG2	1:E:137:THR:OG1	2.10	0.51
1:A:7:PRO:HG2	1:A:137:THR:OG1	2.10	0.51
1:C:26:GLU:HB2	1:C:40:ASN:HD22	1.76	0.51
1:D:7:PRO:HG2	1:D:137:THR:OG1	2.11	0.51
1:A:134:SER:HB3	1:A:139:ASN:HA	1.92	0.51
1:D:230:SER:HG	5:D:402:PFL:C4	2.22	0.51
1:C:126:LEU:HB2	1:C:188:LEU:HB3	1.93	0.50
1:C:284:GLN:HE22	1:C:287:ARG:HH11	1.58	0.50
1:B:39:VAL:O	1:B:107:SER:HA	2.12	0.50
1:B:193:GLN:O	1:B:194[B]:TYR:CB	2.56	0.49
1:B:193:GLN:O	1:B:194[B]:TYR:HB2	2.10	0.49
5:D:402:PFL:H92	1:E:226:THR:HG23	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:134:SER:HB3	1:D:139:ASN:HA	1.95	0.49
1:D:26:GLU:HB2	1:D:40[A]:ASN:HD22	1.78	0.49
1:A:39:VAL:O	1:A:107:SER:HA	2.13	0.49
1:B:122:ASP:OD2	1:B:192:ARG:NH1	2.46	0.49
1:B:134:SER:HB3	1:B:139:ASN:HA	1.94	0.49
1:B:7:PRO:HG2	1:B:137:THR:OG1	2.13	0.49
1:B:194[B]:TYR:CD2	1:B:197:TYR:CD2	2.94	0.48
1:D:194[A]:TYR:OH	1:E:248:LYS:HB3	2.13	0.48
1:A:16:LEU:HD11	1:A:47:TRP:HB2	1.95	0.48
1:D:127:HIS:HE1	1:D:187:GLN:HE21	1.62	0.48
1:E:254:TYR:CZ	1:E:258:ILE:HD11	2.49	0.48
1:B:254:TYR:CZ	1:B:258:ILE:HD11	2.49	0.48
1:B:26:GLU:HB2	1:B:40:ASN:HD22	1.79	0.48
1:E:126:LEU:HB2	1:E:188:LEU:HB3	1.96	0.48
1:C:254:TYR:CZ	1:C:258:ILE:HD11	2.50	0.47
1:B:76:ILE:O	4:B:402:ACT:CH3	2.62	0.47
1:A:229:VAL:CG1	1:E:230:SER:HB3	2.44	0.47
1:A:133:ARG:HD2	1:A:181:GLU:OE2	2.15	0.47
1:C:208:ILE:HG12	1:D:232:LEU:HD21	1.97	0.47
1:C:39:VAL:O	1:C:107:SER:HA	2.14	0.47
1:D:39:VAL:O	1:D:107:SER:HA	2.15	0.47
1:A:126:LEU:HB2	1:A:188:LEU:HB3	1.96	0.47
1:D:230:SER:HB3	1:E:229:VAL:CG1	2.45	0.47
1:B:197:TYR:CD1	1:B:202:ILE:CD1	2.80	0.47
1:D:126:LEU:HB2	1:D:188:LEU:HB3	1.96	0.47
1:B:122:ASP:OD1	1:B:192:ARG:NH1	2.41	0.46
1:E:39:VAL:O	1:E:107:SER:HA	2.15	0.46
1:E:295:SER:HA	1:E:298:ALA:HB3	1.96	0.46
1:A:295:SER:HA	1:A:298:ALA:HB3	1.98	0.46
1:C:295:SER:HA	1:C:298:ALA:HB3	1.98	0.46
1:C:26:GLU:HB2	1:C:40:ASN:HB2	1.97	0.46
1:C:127:HIS:HE1	1:C:187:GLN:HE21	1.64	0.46
1:E:127:HIS:HE1	1:E:187:GLN:HE21	1.64	0.46
1:D:26:GLU:HB2	1:D:40[A]:ASN:HB2	1.98	0.46
1:D:284:GLN:N	1:D:285:PRO:HD3	2.31	0.46
1:A:230:SER:HB3	1:B:229:VAL:CG1	2.45	0.46
1:B:126:LEU:HB2	1:B:188:LEU:HB3	1.97	0.46
1:B:7:PRO:HG3	1:B:135:VAL:HG21	1.99	0.46
1:D:254:TYR:CZ	1:D:258:ILE:HD11	2.51	0.46
1:A:127:HIS:HE1	1:A:187:GLN:HE21	1.63	0.45
1:A:254:TYR:CZ	1:A:258:ILE:HD11	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:211:ILE:HG23	1:C:270:VAL:HG11	1.97	0.45
1:D:295:SER:HA	1:D:298:ALA:HB3	1.97	0.45
1:A:211:ILE:HG23	1:B:270:VAL:HG11	1.97	0.45
1:B:127:HIS:HE1	1:B:187:GLN:HE21	1.65	0.45
1:B:295:SER:HA	1:B:298:ALA:HB3	1.99	0.45
1:D:85:ARG:NH2	4:D:403:ACT:OXT	2.49	0.45
1:E:173:ASN:HB3	1:E:180:LEU:HD11	1.98	0.45
1:B:11:ILE:HG23	1:B:50:ARG:HH22	1.81	0.45
1:B:226:THR:O	1:B:230:SER:HB2	2.17	0.44
1:C:159:GLY:HA2	1:D:250:PRO:HB3	1.99	0.44
1:A:268:VAL:HG12	1:A:299:PHE:CZ	2.52	0.44
1:E:226:THR:O	1:E:230:SER:HB2	2.17	0.44
1:C:198:ILE:HA	1:C:202:ILE:HD12	2.00	0.44
1:E:268:VAL:HG12	1:E:299:PHE:CZ	2.53	0.44
1:A:49:ASP:HB3	1:A:52:LEU:HD12	2.00	0.44
1:A:95:SER:HB2	1:A:96:PRO:HD2	2.00	0.44
1:A:270:VAL:HG11	1:E:211:ILE:HG23	2.00	0.44
1:C:56:PRO:HD3	1:C:96:PRO:HB3	1.99	0.44
1:D:226:THR:O	1:D:230:SER:HB2	2.18	0.44
1:A:63:VAL:HG12	1:A:95:SER:HA	2.00	0.43
1:C:284:GLN:N	1:C:285:PRO:HD3	2.33	0.43
1:E:135:VAL:HG23	1:E:138:ARG:H	1.83	0.43
1:B:26:GLU:HB2	1:B:40:ASN:HB2	2.01	0.43
1:E:284:GLN:N	1:E:285:PRO:HD3	2.34	0.43
1:B:194[B]:TYR:CD1	1:B:196:SER:OG	2.71	0.43
1:D:194[A]:TYR:CE2	1:D:197:TYR:HD1	2.36	0.43
1:A:120:PRO:HG3	1:A:197:TYR:CD2	2.54	0.43
1:C:268:VAL:HG12	1:C:299:PHE:CZ	2.54	0.43
1:A:26:GLU:HB2	1:A:40:ASN:HD22	1.84	0.42
1:C:21:GLY:HA2	1:C:149:VAL:HG22	2.01	0.42
1:D:120:PRO:HG3	1:D:197:TYR:CD2	2.53	0.42
1:B:284:GLN:N	1:B:285:PRO:HD3	2.34	0.42
1:E:45:LEU:CD1	4:E:402:ACT:H2	2.49	0.42
1:A:26:GLU:HB2	1:A:40:ASN:HB2	2.01	0.42
1:C:176:LEU:HB3	1:C:181[A]:GLU:HG3	2.01	0.42
1:A:284:GLN:N	1:A:285:PRO:HD3	2.35	0.42
1:C:226:THR:O	1:C:230:SER:HB2	2.19	0.42
1:A:208:ILE:HG12	1:B:232:LEU:HD21	2.02	0.41
1:D:7:PRO:CG	1:D:137:THR:OG1	2.68	0.41
1:D:197:TYR:CD1	1:D:201:ILE:HD13	2.54	0.41
1:E:16:LEU:HD11	1:E:47:TRP:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:76:ILE:H	4:B:402:ACT:H1	1.85	0.41
1:D:268:VAL:HG12	1:D:299:PHE:CZ	2.55	0.41
1:A:229:VAL:HG11	1:E:230:SER:HB3	2.01	0.41
1:C:211:ILE:HG23	1:D:270:VAL:HG11	2.01	0.41
1:A:226:THR:O	1:A:230:SER:HB2	2.21	0.41
1:D:230:SER:HB3	1:E:229:VAL:HG11	2.03	0.41
1:D:261:MET:HE1	1:D:307:ASN:ND2	2.36	0.41
1:E:198:ILE:HA	1:E:202:ILE:HD12	2.01	0.41
1:E:7:PRO:CG	1:E:137:THR:OG1	2.69	0.40
1:A:203:LEU:HD23	1:A:203:LEU:HA	1.92	0.40
1:D:211:ILE:HG23	1:E:270:VAL:HG11	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	310/321 (97%)	296 (96%)	14 (4%)	0	100	100
1	B	310/321 (97%)	292 (94%)	14 (4%)	4 (1%)	9	40
1	C	310/321 (97%)	296 (96%)	14 (4%)	0	100	100
1	D	313/321 (98%)	298 (95%)	15 (5%)	0	100	100
1	E	309/321 (96%)	296 (96%)	13 (4%)	0	100	100
All	All	1552/1605 (97%)	1478 (95%)	70 (4%)	4 (0%)	43	68

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	195	PHE
1	B	194[A]	TYR
1	B	194[B]	TYR

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Mol	Chain	Res	Type
1	B	196	SER

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	281/285 (99%)	276 (98%)	5 (2%)	51	74
1	B	281/285 (99%)	275 (98%)	6 (2%)	47	71
1	C	281/285 (99%)	274 (98%)	7 (2%)	42	69
1	D	284/285 (100%)	278 (98%)	6 (2%)	47	71
1	E	280/285 (98%)	272 (97%)	8 (3%)	37	67
All	All	1407/1425 (99%)	1375 (98%)	32 (2%)	44	70

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

Mol	Chain	Res	Type
1	A	17	THR
1	A	71	ILE
1	A	140	ILE
1	A	233	ILE
1	A	259	ILE
1	B	17	THR
1	B	71	ILE
1	B	99	THR
1	B	192	ARG
1	B	233	ILE
1	B	259	ILE
1	C	17	THR
1	C	71	ILE
1	C	140	ILE
1	C	233	ILE
1	C	243	GLU
1	C	255	THR
1	C	259	ILE

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Mol	Chain	Res	Type
1	D	17	THR
1	D	39	VAL
1	D	71	ILE
1	D	140	ILE
1	D	233	ILE
1	D	259	ILE
1	E	17	THR
1	E	39	VAL
1	E	71	ILE
1	E	99	THR
1	E	140	ILE
1	E	233	ILE
1	E	243	GLU
1	E	259	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	40	ASN
1	A	152	ASN
1	A	235	HIS
1	A	239	ASN
1	B	40	ASN
1	B	127	HIS
1	B	152	ASN
1	B	193	GLN
1	B	235	HIS
1	B	239	ASN
1	C	40	ASN
1	C	284	GLN
1	D	127	HIS
1	D	139	ASN
1	D	235	HIS
1	D	307	ASN
1	E	40	ASN
1	E	101	GLN
1	E	127	HIS
1	E	200	ASN
1	E	235	HIS
1	E	239	ASN
1	E	307	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 11 ligands modelled in this entry, 5 are monoatomic - leaving 6 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
4	ACT	E	402	-	3,3,3	1.38	0	3,3,3	1.16	0
2	LMT	A	401	-	11,11,36	0.51	0	10,10,47	0.82	0
4	ACT	D	403	-	3,3,3	1.81	1 (33%)	3,3,3	1.24	0
4	ACT	A	403	-	3,3,3	1.31	1 (33%)	3,3,3	0.70	0
4	ACT	B	402	-	3,3,3	0.70	0	3,3,3	1.38	0
5	PFL	D	402	-	13,13,13	0.63	0	18,18,18	0.46	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
5	PFL	D	402	-	-	0/8/8/8	0/1/1/1
2	LMT	A	401	-	-	2/9/9/61	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	403	ACT	OXT-C	-2.62	1.18	1.30
4	A	403	ACT	OXT-C	-2.05	1.21	1.30

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

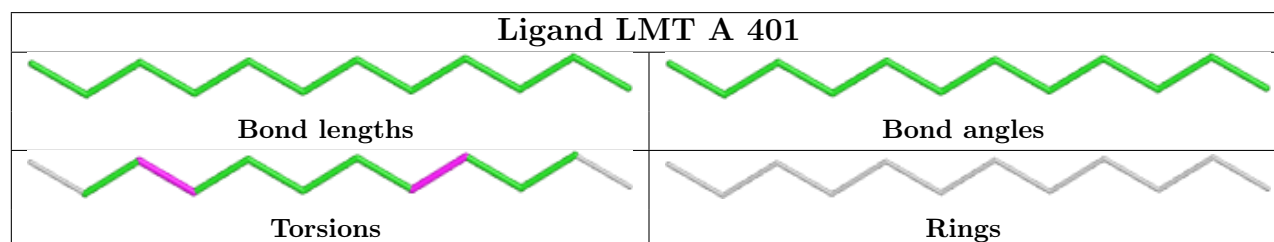
Mol	Chain	Res	Type	Atoms
2	A	401	LMT	C3-C4-C5-C6
2	A	401	LMT	C11-C10-C9-C8

There are no ring outliers.

5 monomers are involved in 27 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	402	ACT	5	0
4	D	403	ACT	7	0
4	A	403	ACT	4	0
4	B	402	ACT	6	0
5	D	402	PFL	5	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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	193:GLN	C	194[B]:TYR	N	1.18

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	311/321 (96%)	-0.10	4 (1%) 75 55	52, 98, 146, 193	1 (0%)
1	B	311/321 (96%)	-0.12	8 (2%) 57 37	52, 93, 133, 149	1 (0%)
1	C	311/321 (96%)	-0.10	5 (1%) 70 51	61, 96, 141, 183	1 (0%)
1	D	311/321 (96%)	-0.04	9 (2%) 53 35	52, 100, 149, 195	4 (1%)
1	E	311/321 (96%)	-0.00	12 (3%) 43 27	69, 99, 146, 188	0
All	All	1555/1605 (96%)	-0.07	38 (2%) 59 40	52, 97, 143, 195	7 (0%)

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	194[A]	TYR	9.7
1	D	194[A]	TYR	8.0
1	E	244	THR	5.0
1	B	244	THR	4.7
1	E	246	CYS	4.5
1	C	244	THR	4.4
1	B	246	CYS	4.4
1	D	244	THR	4.3
1	C	246	CYS	3.7
1	A	244	THR	3.4
1	A	5	VAL	3.2
1	B	11	ILE	3.1
1	E	247	PRO	3.1
1	E	248	LYS	3.1
1	E	57	VAL	3.1
1	B	247	PRO	3.1
1	D	248	LYS	3.0
1	D	245	ASN	2.9
1	E	161	ASP	2.9
1	A	246	CYS	2.9

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Mol	Chain	Res	Type	RSRZ
1	E	193	GLN	2.8
1	C	247	PRO	2.8
1	D	246	CYS	2.7
1	E	5	VAL	2.7
1	B	248	LYS	2.5
1	E	58	ARG	2.4
1	D	13	ASP	2.4
1	B	195	PHE	2.4
1	D	5	VAL	2.3
1	D	193	GLN	2.3
1	C	248	LYS	2.3
1	B	245	ASN	2.3
1	A	11	ILE	2.2
1	E	245	ASN	2.2
1	E	115	ASP	2.2
1	E	61	VAL	2.1
1	C	57	VAL	2.1
1	D	11	ILE	2.1

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.

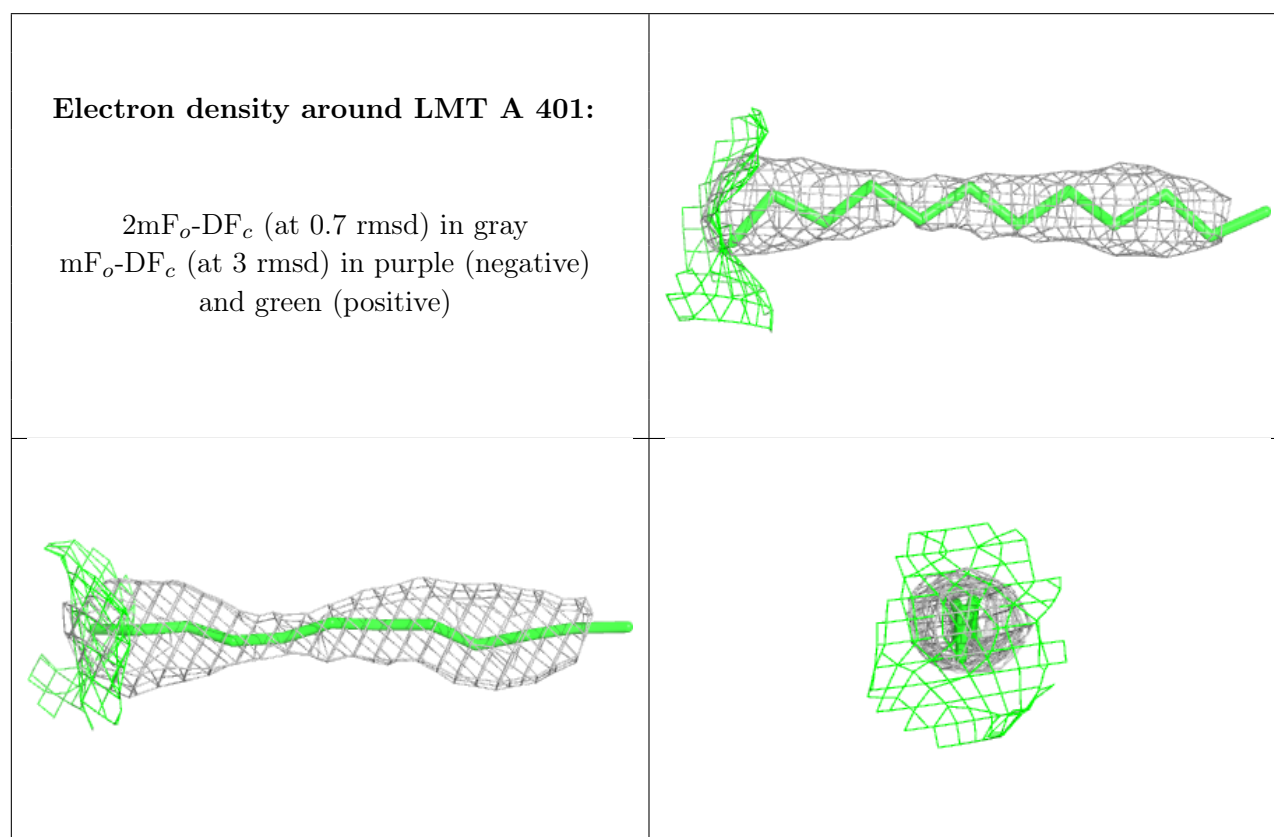
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	ACT	A	403	4/4	0.80	0.18	110,114,114,117	0
5	PFL	D	402	13/13	0.85	0.34	153,157,165,166	0
4	ACT	D	403	4/4	0.86	0.22	122,127,129,130	0
4	ACT	E	402	4/4	0.86	0.20	132,136,136,140	0
2	LMT	A	401	12/35	0.86	0.25	62,68,71,72	2

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	ACT	B	402	4/4	0.91	0.12	101,101,101,101	0
3	CL	E	401	1/1	0.92	0.11	104,104,104,104	0
3	CL	C	401	1/1	0.96	0.07	106,106,106,106	0
3	CL	D	401	1/1	0.96	0.08	108,108,108,108	0
3	CL	B	401	1/1	0.97	0.07	95,95,95,95	0
3	CL	A	402	1/1	0.98	0.06	99,99,99,99	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.