



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 09:25 AM UTC

PDB ID : 3AOU / pdb_00003aou
Title : Structure of the Na⁺ unbound rotor ring modified with N,N f-Dicyclohexylcarbodiimide of the Na⁺-transporting V-ATPase
Authors : Mizutani, K.; Yamamoto, M.; Yamato, I.; Kakinuma, Y.; Shirouzu, M.; Yokoyama, S.; Iwata, S.; Murata, T.
Deposited on : 2010-10-06
Resolution : 3.14 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:

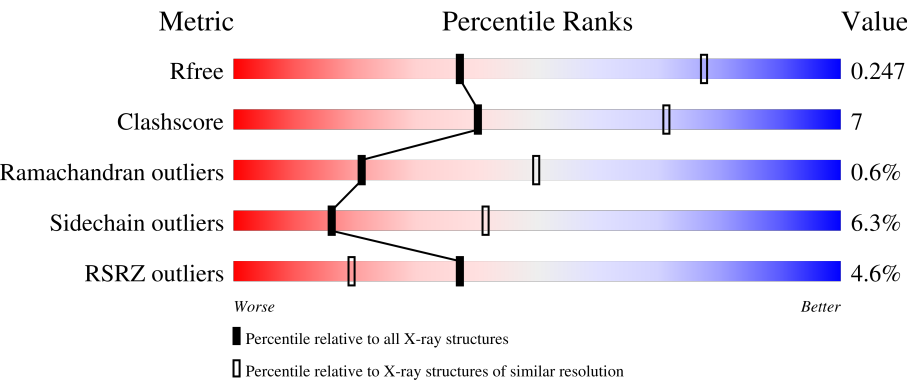
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.14 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	2351 (3.18-3.10)
Clashscore	190562	2452 (3.18-3.10)
Ramachandran outliers	187476	2324 (3.18-3.10)
Sidechain outliers	187428	2324 (3.18-3.10)
RSRZ outliers	180081	2351 (3.18-3.10)

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	156	4% 80% 17% ••
1	B	156	2% 81% 15% •
1	C	156	3% 76% 21% •
1	D	156	12% 83% 15% •

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Mol	Chain	Length	Quality of chain
1	E	156	4% 81% 16% ..
1	F	156	3% 79% 16% ..
1	G	156	4% 80% 17% ..
1	H	156	3% 85% 13% .
1	I	156	11% 83% 14% ..
1	J	156	83% 14% .

2 Entry composition

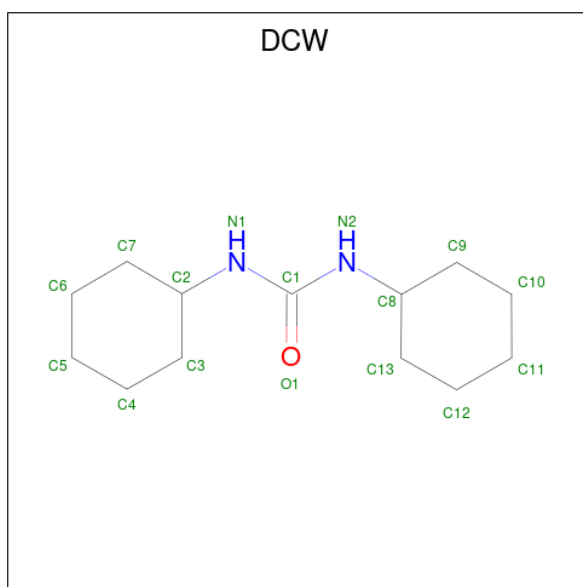
There are 4 unique types of molecules in this entry. The entry contains 11504 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 V-type sodium ATPase subunit K.

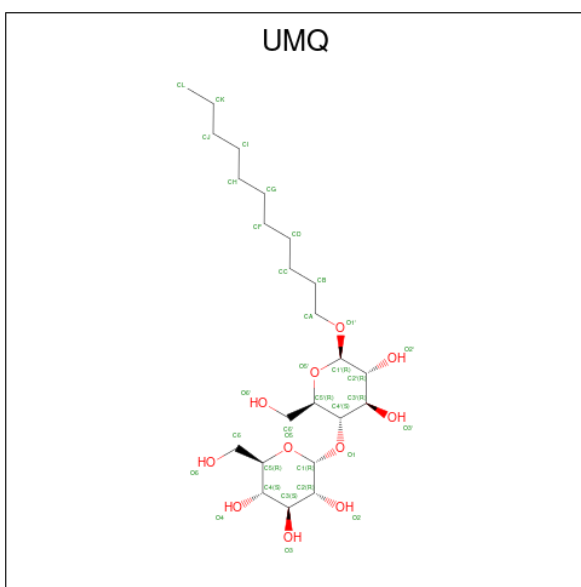
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	B	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	C	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	D	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	E	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	F	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	G	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	H	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	I	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			
1	J	156	Total	C	N	O	S	0	0	0
			1127	743	176	201	7			

- Molecule 2 is DICYCLOHEXYLUREA (CCD ID: DCW) (formula: $C_{13}H_{24}N_2O$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			16	13	2	1		
2	B	1	Total	C	N	O	0	0
			16	13	2	1		
2	C	1	Total	C	N	O	0	0
			16	13	2	1		
2	D	1	Total	C	N	O	0	0
			16	13	2	1		
2	E	1	Total	C	N	O	0	0
			16	13	2	1		
2	F	1	Total	C	N	O	0	0
			16	13	2	1		
2	G	1	Total	C	N	O	0	0
			16	13	2	1		
2	H	1	Total	C	N	O	0	0
			16	13	2	1		
2	I	1	Total	C	N	O	0	0
			16	13	2	1		
2	J	1	Total	C	N	O	0	0
			16	13	2	1		

- Molecule 3 is UNDECYL-MALTOSIDE (CCD ID: UMQ) (formula: $C_{23}H_{44}O_{11}$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total 34	C 23	O 11	0	0
3	F	1	Total 34	C 23	O 11	0	0

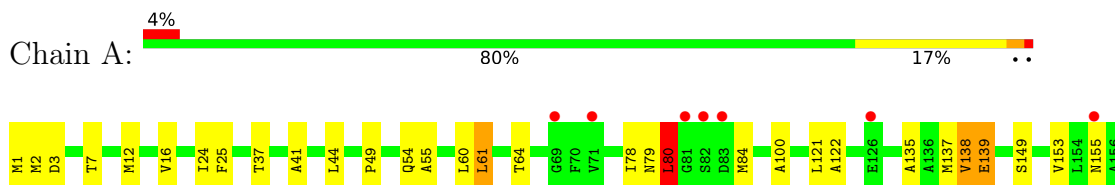
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	G	1	Total O 1 1	0	0
4	H	1	Total O 1 1	0	0
4	I	2	Total O 2 2	0	0
4	J	2	Total O 2 2	0	0

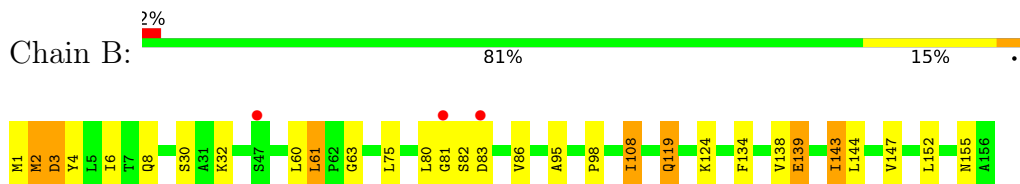
3 Residue-property plots [i](#)

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.

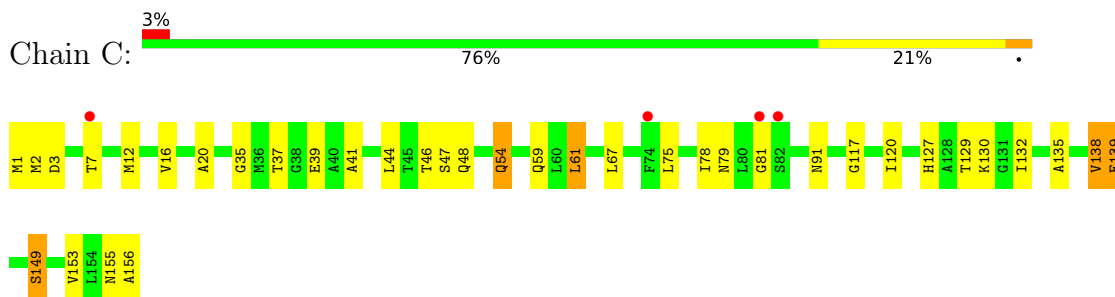
- Molecule 1: V-type sodium ATPase subunit K



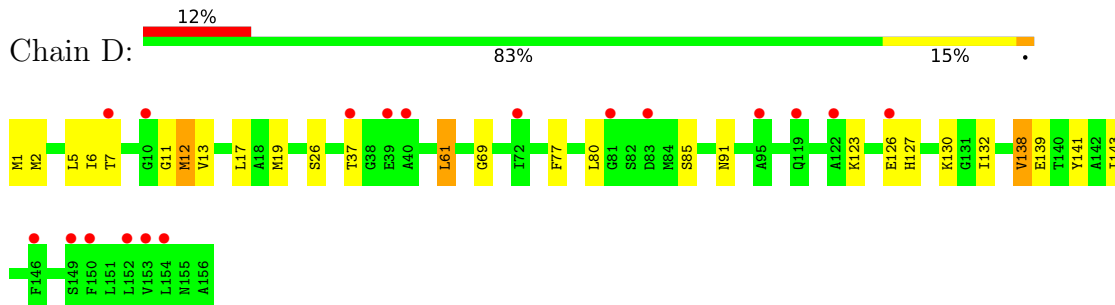
- Molecule 1: V-type sodium ATPase subunit K



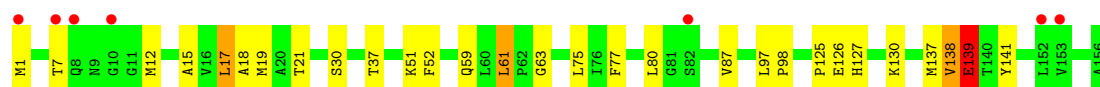
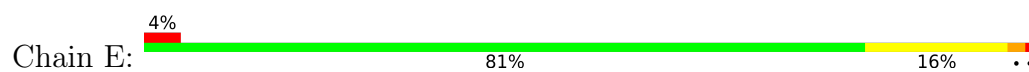
- Molecule 1: V-type sodium ATPase subunit K



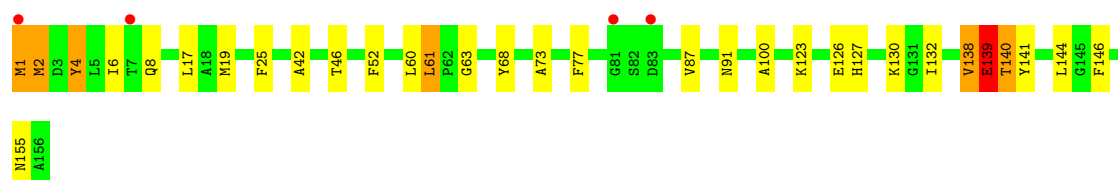
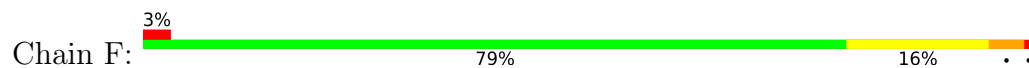
- Molecule 1: V-type sodium ATPase subunit K



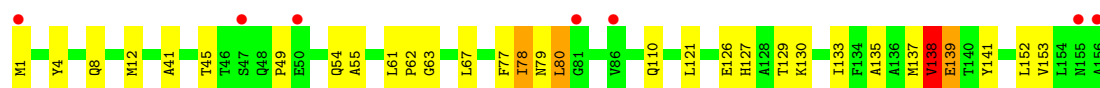
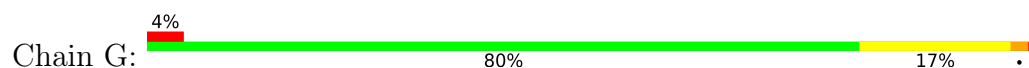
- Molecule 1: V-type sodium ATPase subunit K



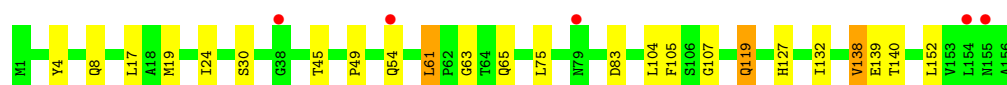
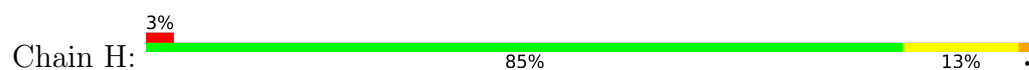
- Molecule 1: V-type sodium ATPase subunit K



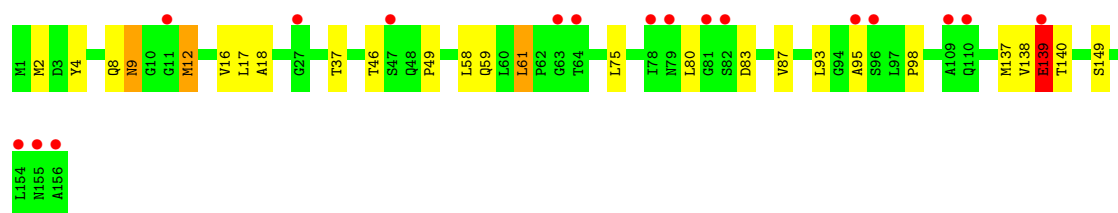
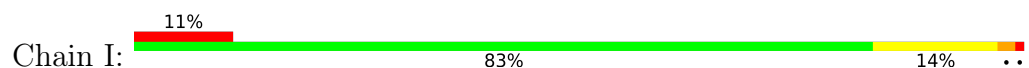
- Molecule 1: V-type sodium ATPase subunit K



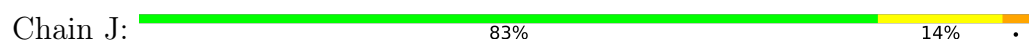
- Molecule 1: V-type sodium ATPase subunit K



- Molecule 1: V-type sodium ATPase subunit K



- Molecule 1: V-type sodium ATPase subunit K



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	120.41Å 124.94Å 208.22Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.79 – 3.14 48.79 – 3.14	Depositor EDS
% Data completeness (in resolution range)	93.8 (48.79-3.14) 93.4 (48.79-3.14)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.95 (at 3.12Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.209 , 0.248 0.210 , 0.247	Depositor DCC
R_{free} test set	2644 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å ²)	80.3	Xtriage
Anisotropy	0.295	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.26 , 29.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.000 for k,h,-l	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	11504	wwPDB-VP
Average B, all atoms (Å ²)	71.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.92% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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

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	0.71	2/1146 (0.2%)	1.46	7/1549 (0.5%)
1	B	0.71	1/1146 (0.1%)	1.24	5/1549 (0.3%)
1	C	0.73	1/1146 (0.1%)	1.51	5/1549 (0.3%)
1	D	0.70	0/1146	1.29	7/1549 (0.5%)
1	E	0.68	1/1146 (0.1%)	1.52	6/1549 (0.4%)
1	F	0.70	1/1146 (0.1%)	1.30	4/1549 (0.3%)
1	G	0.71	2/1146 (0.2%)	1.36	6/1549 (0.4%)
1	H	0.74	1/1146 (0.1%)	1.31	7/1549 (0.5%)
1	I	0.79	1/1146 (0.1%)	1.26	7/1549 (0.5%)
1	J	0.74	1/1146 (0.1%)	1.16	6/1549 (0.4%)
All	All	0.72	11/11460 (0.1%)	1.35	60/15490 (0.4%)

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	A	0	2
1	C	0	2
1	D	0	1
1	E	0	2
1	F	0	2
1	G	0	2
1	H	0	1
1	I	0	1
All	All	0	13

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	138	VAL	C-N	-6.66	1.25	1.33
1	A	138	VAL	C-N	-6.22	1.25	1.34
1	H	138	VAL	C-N	-6.06	1.25	1.33
1	C	138	VAL	C-N	-5.48	1.26	1.33
1	A	139	GLU	C-N	-5.43	1.27	1.33
1	I	138	VAL	C-N	-5.35	1.26	1.33
1	B	138	VAL	C-N	-5.28	1.26	1.33
1	E	138	VAL	C-N	-5.25	1.26	1.33
1	G	139	GLU	C-N	-5.25	1.27	1.33
1	J	138	VAL	C-N	-5.11	1.27	1.34
1	G	138	VAL	C-N	-5.02	1.26	1.33

All (60) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	138	VAL	O-C-N	-30.47	84.48	122.57
1	E	138	VAL	O-C-N	-25.09	96.56	121.90
1	A	138	VAL	CA-C-N	21.73	151.58	120.28
1	A	138	VAL	C-N-CA	21.73	151.58	120.28
1	G	138	VAL	O-C-N	-21.68	100.01	121.90
1	H	138	VAL	O-C-N	-19.39	98.17	122.22
1	E	138	VAL	CA-C-N	18.89	157.62	121.54
1	E	138	VAL	C-N-CA	18.89	157.62	121.54
1	C	138	VAL	CA-C-N	18.22	161.15	121.80
1	C	138	VAL	C-N-CA	18.22	161.15	121.80
1	F	138	VAL	CA-C-N	18.09	144.53	120.65
1	F	138	VAL	C-N-CA	18.09	144.53	120.65
1	G	138	VAL	CA-C-N	16.79	153.60	121.54
1	G	138	VAL	C-N-CA	16.79	153.60	121.54
1	B	138	VAL	CA-C-N	15.31	150.79	121.54
1	B	138	VAL	C-N-CA	15.31	150.79	121.54
1	A	138	VAL	O-C-N	-15.02	102.29	122.26
1	E	139	GLU	O-C-N	-14.37	103.48	122.59
1	E	139	GLU	CA-C-N	14.26	142.21	120.82
1	E	139	GLU	C-N-CA	14.26	142.21	120.82
1	I	138	VAL	O-C-N	-14.24	108.06	121.87
1	D	138	VAL	CA-C-N	14.16	148.58	121.54
1	D	138	VAL	C-N-CA	14.16	148.58	121.54
1	D	138	VAL	O-C-N	-14.01	105.97	121.80
1	F	138	VAL	O-C-N	-13.28	104.25	122.31
1	I	139	GLU	O-C-N	-13.28	104.93	122.59
1	A	139	GLU	O-C-N	-13.05	106.95	122.22
1	A	139	GLU	CA-C-N	12.99	138.08	120.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	139	GLU	C-N-CA	12.99	138.08	120.54
1	H	138	VAL	CA-C-N	12.11	147.43	121.64
1	H	138	VAL	C-N-CA	12.11	147.43	121.64
1	D	139	GLU	CA-C-N	11.55	138.15	120.82
1	D	139	GLU	C-N-CA	11.55	138.15	120.82
1	I	138	VAL	CA-C-N	11.28	143.09	121.54
1	I	138	VAL	C-N-CA	11.28	143.09	121.54
1	J	138	VAL	CA-C-N	10.74	135.74	120.28
1	J	138	VAL	C-N-CA	10.74	135.74	120.28
1	B	138	VAL	O-C-N	-10.73	109.67	121.80
1	G	139	GLU	CA-C-N	9.31	133.13	120.38
1	G	139	GLU	C-N-CA	9.31	133.13	120.38
1	H	139	GLU	CA-C-N	8.37	137.52	121.54
1	H	139	GLU	C-N-CA	8.37	137.52	121.54
1	C	139	GLU	CA-C-N	8.11	137.02	121.54
1	C	139	GLU	C-N-CA	8.11	137.02	121.54
1	G	139	GLU	O-C-N	-7.32	112.86	122.59
1	B	139	GLU	CA-C-N	6.92	129.55	120.28
1	B	139	GLU	C-N-CA	6.92	129.55	120.28
1	I	139	GLU	CB-CG-CD	-6.81	101.03	112.60
1	I	139	GLU	CA-C-N	6.76	134.46	121.54
1	I	139	GLU	C-N-CA	6.76	134.46	121.54
1	F	139	GLU	CB-CG-CD	-6.38	101.75	112.60
1	A	139	GLU	CB-CG-CD	-5.93	102.52	112.60
1	H	139	GLU	CB-CG-CD	-5.71	102.89	112.60
1	H	24	ILE	N-CA-C	5.62	115.75	110.30
1	J	143	ILE	CB-CA-C	-5.53	104.89	111.97
1	J	139	GLU	CA-C-N	5.52	127.68	120.28
1	J	139	GLU	C-N-CA	5.52	127.68	120.28
1	J	139	GLU	CB-CG-CD	-5.34	103.52	112.60
1	D	61	LEU	CA-C-N	-5.13	113.43	119.84
1	D	61	LEU	C-N-CA	-5.13	113.43	119.84

There are no chirality outliers.

All (13) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	138	VAL	Mainchain
1	A	139	GLU	Mainchain
1	C	138	VAL	Mainchain
1	C	139	GLU	Mainchain
1	D	138	VAL	Mainchain

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Mol	Chain	Res	Type	Group
1	E	138	VAL	Peptide
1	E	139	GLU	Mainchain
1	F	1	MET	Peptide
1	F	138	VAL	Mainchain
1	G	138	VAL	Mainchain
1	G	139	GLU	Mainchain
1	H	138	VAL	Mainchain
1	I	139	GLU	Mainchain

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1127	0	1181	18	0
1	B	1127	0	1181	20	0
1	C	1127	0	1181	24	0
1	D	1127	0	1181	19	0
1	E	1127	0	1181	22	0
1	F	1127	0	1181	31	0
1	G	1127	0	1181	24	0
1	H	1127	0	1181	11	0
1	I	1127	0	1182	15	0
1	J	1127	0	1182	13	0
2	A	16	0	23	0	0
2	B	16	0	23	1	0
2	C	16	0	23	0	0
2	D	16	0	23	0	0
2	E	16	0	23	0	0
2	F	16	0	23	0	0
2	G	16	0	23	0	0
2	H	16	0	23	0	0
2	I	16	0	23	0	0
2	J	16	0	23	0	0
3	C	34	0	44	1	0
3	F	34	0	44	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
4	I	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	J	2	0	0	0	0
All	All	11504	0	12130	157	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 (157) 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:F:1:MET:HG3	1:F:2:MET:H	1.37	0.89
1:A:1:MET:HB2	1:J:2:MET:HG2	1.68	0.76
1:F:87:VAL:HG23	1:G:4:TYR:HE2	1.50	0.74
1:F:1:MET:HG3	1:F:2:MET:N	2.04	0.73
1:F:87:VAL:HG23	1:G:4:TYR:CE2	2.26	0.71
1:I:9:ASN:OD1	1:I:83:ASP:HA	1.90	0.70
1:C:91:ASN:HB3	1:C:156:ALA:HB1	1.75	0.68
1:A:2:MET:HG2	1:B:1:MET:HB2	1.78	0.66
1:F:68:TYR:HB3	1:F:146:PHE:CD1	2.31	0.66
1:C:149:SER:O	1:C:153:VAL:HG23	1.96	0.64
1:G:77:PHE:HA	1:G:80:LEU:HD23	1.81	0.62
1:C:61:LEU:HD21	1:C:132:ILE:HG23	1.84	0.60
1:F:2:MET:HG3	1:G:1:MET:HB2	1.83	0.60
1:G:110:GLN:HG3	1:G:138:VAL:HB	1.85	0.59
1:C:44:LEU:HD11	1:C:48:GLN:HE21	1.69	0.57
1:C:127:HIS:HB3	1:C:130:LYS:HD2	1.85	0.57
1:F:4:TYR:CE1	1:F:8:GLN:HG3	2.40	0.57
1:I:2:MET:HG2	1:J:1:MET:HB2	1.86	0.57
1:J:61:LEU:HD21	1:J:132:ILE:HG23	1.85	0.57
1:B:4:TYR:CD1	1:B:8:GLN:HG3	2.40	0.56
1:J:80:LEU:O	1:J:80:LEU:HG	2.04	0.56
1:C:91:ASN:HD21	1:D:12:MET:HG2	1.71	0.55
1:D:91:ASN:HD21	1:E:12:MET:HG2	1.71	0.55
1:G:61:LEU:HD23	1:G:135:ALA:HB3	1.89	0.55
1:B:119:GLN:HB3	1:C:46:THR:HG21	1.88	0.55
1:H:61:LEU:HD21	1:H:132:ILE:HG23	1.88	0.55
1:B:2:MET:HG2	1:C:1:MET:HB2	1.89	0.55
1:E:19:MET:HE3	1:E:77:PHE:HB2	1.89	0.55
1:F:42:ALA:O	1:F:46:THR:HG23	2.07	0.54
1:E:87:VAL:HG23	1:F:4:TYR:OH	2.09	0.53
1:D:130:LYS:HG2	1:E:52:PHE:CD1	2.44	0.53
1:E:37:THR:HG21	1:E:59:GLN:HA	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:4:TYR:CE1	1:H:8:GLN:HG3	2.44	0.53
1:A:2:MET:SD	1:B:1:MET:HE2	2.49	0.52
1:A:54:GLN:HB2	1:A:121:LEU:HD21	1.90	0.52
1:H:119:GLN:HB3	1:I:46:THR:HG21	1.92	0.52
1:H:152:LEU:HD13	1:I:16:VAL:HG13	1.91	0.52
1:E:51:LYS:HE2	1:E:125:PRO:HB3	1.92	0.52
1:F:123:LYS:HE2	1:F:123:LYS:HA	1.91	0.51
1:D:2:MET:CG	1:E:1:MET:HB2	2.41	0.51
1:E:19:MET:CE	1:E:77:PHE:HB2	2.41	0.51
1:F:91:ASN:HD21	1:G:12:MET:HE3	1.77	0.50
1:H:104:LEU:HD23	1:H:105:PHE:CE1	2.46	0.50
1:E:137:MET:SD	1:F:60:LEU:HD21	2.51	0.50
1:B:143:ILE:O	1:B:147:VAL:HG23	2.12	0.50
1:E:37:THR:CG2	1:E:59:GLN:HA	2.42	0.50
1:I:4:TYR:CD1	1:I:8:GLN:HG3	2.47	0.49
1:J:137:MET:HA	1:J:137:MET:HE2	1.95	0.49
1:I:12:MET:HE1	1:I:80:LEU:HB3	1.94	0.49
1:D:2:MET:HA	1:D:5:LEU:HD12	1.95	0.49
1:C:2:MET:HG2	1:D:1:MET:HB2	1.95	0.48
1:F:139:GLU:O	1:F:141:TYR:N	2.46	0.48
1:F:1:MET:CG	1:F:2:MET:H	2.13	0.48
1:B:98:PRO:HG3	1:C:20:ALA:HA	1.95	0.48
1:F:19:MET:CE	1:F:77:PHE:HB2	2.44	0.47
1:G:77:PHE:HA	1:G:80:LEU:CD2	2.43	0.47
1:F:2:MET:CG	1:G:1:MET:HB2	2.44	0.47
1:B:3:ASP:HA	1:B:6:ILE:HD12	1.95	0.47
1:A:61:LEU:HD23	1:A:135:ALA:HB3	1.97	0.47
1:B:61:LEU:C	1:B:63:GLY:H	2.22	0.47
1:D:61:LEU:HD21	1:D:132:ILE:HG23	1.96	0.47
1:F:144:LEU:HD11	1:G:67:LEU:HD23	1.96	0.47
1:I:18:ALA:HB2	1:I:93:LEU:HA	1.96	0.47
1:G:45:THR:HG23	1:G:49:PRO:HA	1.96	0.47
1:C:78:ILE:HG13	1:C:79:ASN:ND2	2.30	0.46
1:E:141:TYR:OH	1:F:63:GLY:HA2	2.15	0.46
1:F:127:HIS:HB3	1:F:130:LYS:HD2	1.95	0.46
1:B:144:LEU:HD11	1:C:67:LEU:HD23	1.97	0.46
1:C:54:GLN:H	1:C:54:GLN:HG2	1.29	0.46
1:H:54:GLN:HA	1:H:54:GLN:OE1	2.16	0.46
1:A:44:LEU:HD13	1:A:122:ALA:HB2	1.95	0.46
1:G:54:GLN:HB2	1:G:121:LEU:HD21	1.97	0.46
1:F:139:GLU:O	1:F:140:THR:C	2.57	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:152:LEU:HD22	1:C:16:VAL:HG13	1.97	0.46
1:D:61:LEU:HD12	1:D:61:LEU:HA	1.78	0.46
1:C:78:ILE:HG13	1:C:79:ASN:HD22	1.81	0.46
1:E:141:TYR:OH	1:F:63:GLY:CA	2.63	0.46
1:J:38:GLY:N	1:J:59:GLN:HG3	2.31	0.46
1:A:60:LEU:O	1:A:61:LEU:C	2.57	0.45
1:C:78:ILE:C	1:C:79:ASN:HD22	2.24	0.45
1:G:152:LEU:HD21	1:H:19:MET:SD	2.56	0.45
1:A:12:MET:O	1:A:16:VAL:HG23	2.16	0.45
1:G:127:HIS:HB3	1:G:130:LYS:HD2	1.97	0.45
1:A:80:LEU:HD12	1:A:84:MET:HE1	1.98	0.45
1:D:19:MET:CE	1:D:77:PHE:HB2	2.46	0.45
1:I:137:MET:HA	1:I:137:MET:HE2	1.99	0.45
1:A:41:ALA:HB1	1:A:55:ALA:HB1	1.99	0.45
1:F:61:LEU:HD12	1:F:61:LEU:HA	1.79	0.45
1:A:78:ILE:HG13	1:A:79:ASN:ND2	2.31	0.45
1:C:37:THR:CG2	1:C:59:GLN:HA	2.47	0.45
1:G:126:GLU:HG2	1:G:127:HIS:CD2	2.51	0.44
1:J:80:LEU:HA	1:J:84:MET:CE	2.47	0.44
1:E:61:LEU:HD13	1:E:61:LEU:HA	1.78	0.44
1:I:4:TYR:CE1	1:I:8:GLN:HG3	2.51	0.44
1:J:7:THR:HB	1:J:8:GLN:HE21	1.82	0.44
1:B:2:MET:HE1	1:B:86:VAL:HG11	2.00	0.44
1:G:4:TYR:CD1	1:G:8:GLN:HG3	2.53	0.44
1:A:25:PHE:HB2	1:A:100:ALA:HB1	1.99	0.43
1:F:6:ILE:HG23	1:G:4:TYR:CD1	2.53	0.43
1:I:37:THR:HG21	1:I:59:GLN:HA	2.00	0.43
1:I:87:VAL:HG23	1:J:4:TYR:CE2	2.53	0.43
1:I:17:LEU:HD23	1:I:17:LEU:HA	1.77	0.43
1:C:35:GLY:O	1:C:39:GLU:HG3	2.19	0.43
1:C:117:GLY:O	1:C:120:ILE:HB	2.18	0.43
1:E:97:LEU:N	1:E:98:PRO:CD	2.82	0.43
1:F:6:ILE:HD11	1:G:1:MET:HA	2.00	0.43
1:F:126:GLU:HG2	1:F:127:HIS:CD2	2.53	0.43
1:F:61:LEU:HD21	1:F:132:ILE:HG23	2.01	0.43
1:G:141:TYR:OH	1:H:63:GLY:CA	2.67	0.43
1:B:1:MET:O	1:B:3:ASP:N	2.51	0.42
1:G:61:LEU:N	1:G:62:PRO:HD2	2.34	0.42
1:D:2:MET:HG2	1:E:1:MET:HB2	2.00	0.42
1:F:19:MET:HE3	1:F:73:ALA:O	2.20	0.42
1:A:149:SER:O	1:A:153:VAL:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:41:ALA:HB1	1:G:55:ALA:HB1	2.01	0.42
1:G:61:LEU:C	1:G:63:GLY:H	2.27	0.42
1:E:15:ALA:O	1:E:18:ALA:HB3	2.18	0.42
1:J:12:MET:HE2	1:J:12:MET:HB2	1.79	0.42
1:J:51:LYS:HE2	1:J:125:PRO:HB3	2.00	0.42
1:J:72:ILE:HG13	1:J:99:ILE:HG21	2.01	0.42
1:A:49:PRO:O	1:J:130:LYS:HE2	2.20	0.42
1:G:78:ILE:HG13	1:G:79:ASN:HD22	1.85	0.42
1:H:127:HIS:CE1	1:I:49:PRO:HB2	2.55	0.42
1:A:12:MET:O	1:A:12:MET:HG2	2.18	0.42
1:B:2:MET:HE2	1:C:1:MET:SD	2.60	0.42
1:D:6:ILE:HD11	1:E:1:MET:HA	2.02	0.42
1:E:130:LYS:HG2	1:F:52:PHE:CD1	2.55	0.42
1:A:80:LEU:HD12	1:A:80:LEU:HA	1.76	0.42
1:C:12:MET:HE2	1:C:81:GLY:O	2.20	0.42
1:C:61:LEU:HD23	1:C:135:ALA:HB3	2.02	0.42
1:I:95:ALA:O	1:I:98:PRO:HD2	2.19	0.42
1:D:123:LYS:N	1:D:123:LYS:HD2	2.34	0.41
1:F:61:LEU:C	1:F:63:GLY:H	2.29	0.41
1:A:137:MET:SD	1:B:60:LEU:HD21	2.60	0.41
1:D:126:GLU:HG2	1:D:127:HIS:CD2	2.55	0.41
1:D:141:TYR:CZ	1:E:30:SER:HB3	2.55	0.41
1:D:141:TYR:OH	1:E:63:GLY:CA	2.68	0.41
1:D:126:GLU:H	1:D:126:GLU:CD	2.27	0.41
1:F:25:PHE:HB2	1:F:100:ALA:HB1	2.02	0.41
1:B:61:LEU:HD12	2:B:201:DCW:H61C	2.03	0.41
1:B:80:LEU:HB2	1:B:81:GLY:H	1.77	0.41
1:E:126:GLU:HG2	1:E:127:HIS:CD2	2.55	0.41
1:H:45:THR:HG23	1:H:49:PRO:HA	2.01	0.41
1:A:12:MET:HE2	1:A:12:MET:HB3	1.87	0.41
1:B:32:LYS:HD3	1:B:108:ILE:HD11	2.01	0.41
3:C:202:UMQ:HL3	3:C:202:UMQ:HF2	2.01	0.41
1:D:11:GLY:HA3	1:D:85:SER:O	2.21	0.41
1:E:17:LEU:O	1:E:21:THR:OG1	2.35	0.41
1:D:26:SER:OG	1:D:69:GLY:HA3	2.20	0.41
1:D:127:HIS:HB3	1:D:130:LYS:HD2	2.03	0.41
1:G:133:ILE:HG23	1:G:137:MET:HE3	2.03	0.41
1:C:2:MET:HE3	1:C:2:MET:O	2.21	0.41
1:F:4:TYR:CD1	1:F:8:GLN:HG3	2.56	0.41
1:B:95:ALA:HB2	1:B:152:LEU:HB3	2.03	0.40
1:B:134:PHE:CZ	1:C:41:ALA:HB1	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:58:LEU:HA	1:I:61:LEU:HD22	2.02	0.40
1:H:65:GLN:NE2	1:H:107:GLY:HA2	2.36	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	154/156 (99%)	144 (94%)	8 (5%)	2 (1%)	9	32
1	B	154/156 (99%)	144 (94%)	8 (5%)	2 (1%)	9	32
1	C	154/156 (99%)	145 (94%)	9 (6%)	0	100	100
1	D	154/156 (99%)	149 (97%)	5 (3%)	0	100	100
1	E	154/156 (99%)	146 (95%)	7 (4%)	1 (1%)	21	50
1	F	154/156 (99%)	142 (92%)	11 (7%)	1 (1%)	21	50
1	G	154/156 (99%)	146 (95%)	7 (4%)	1 (1%)	21	50
1	H	154/156 (99%)	148 (96%)	5 (3%)	1 (1%)	21	50
1	I	154/156 (99%)	145 (94%)	7 (4%)	2 (1%)	9	32
1	J	154/156 (99%)	146 (95%)	8 (5%)	0	100	100
All	All	1540/1560 (99%)	1455 (94%)	75 (5%)	10 (1%)	21	50

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	139	GLU
1	F	140	THR
1	B	2	MET
1	H	140	THR
1	I	140	THR

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Mol	Chain	Res	Type
1	B	139	GLU
1	A	80	LEU
1	I	139	GLU
1	A	24	ILE
1	G	78	ILE

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	113/113 (100%)	106 (94%)	7 (6%)	16	42
1	B	113/113 (100%)	102 (90%)	11 (10%)	8	27
1	C	113/113 (100%)	104 (92%)	9 (8%)	11	33
1	D	113/113 (100%)	106 (94%)	7 (6%)	16	42
1	E	113/113 (100%)	108 (96%)	5 (4%)	25	52
1	F	113/113 (100%)	107 (95%)	6 (5%)	20	47
1	G	113/113 (100%)	110 (97%)	3 (3%)	39	63
1	H	113/113 (100%)	107 (95%)	6 (5%)	20	47
1	I	113/113 (100%)	107 (95%)	6 (5%)	20	47
1	J	113/113 (100%)	102 (90%)	11 (10%)	8	27
All	All	1130/1130 (100%)	1059 (94%)	71 (6%)	16	41

All (71) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ASP
1	A	7	THR
1	A	37	THR
1	A	61	LEU
1	A	64	THR
1	A	80	LEU
1	A	155	ASN
1	B	3	ASP

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Mol	Chain	Res	Type
1	B	30	SER
1	B	61	LEU
1	B	75	LEU
1	B	82	SER
1	B	83	ASP
1	B	108	ILE
1	B	119	GLN
1	B	124	LYS
1	B	143	ILE
1	B	155	ASN
1	C	3	ASP
1	C	7	THR
1	C	47	SER
1	C	54	GLN
1	C	61	LEU
1	C	75	LEU
1	C	129	THR
1	C	149	SER
1	C	155	ASN
1	D	7	THR
1	D	12	MET
1	D	13	VAL
1	D	17	LEU
1	D	37	THR
1	D	80	LEU
1	D	143	ILE
1	E	7	THR
1	E	17	LEU
1	E	61	LEU
1	E	75	LEU
1	E	80	LEU
1	F	2	MET
1	F	4	TYR
1	F	17	LEU
1	F	61	LEU
1	F	139	GLU
1	F	155	ASN
1	G	80	LEU
1	G	129	THR
1	G	153	VAL
1	H	17	LEU
1	H	30	SER

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Mol	Chain	Res	Type
1	H	61	LEU
1	H	75	LEU
1	H	83	ASP
1	H	119	GLN
1	I	9	ASN
1	I	12	MET
1	I	61	LEU
1	I	75	LEU
1	I	139	GLU
1	I	149	SER
1	J	3	ASP
1	J	7	THR
1	J	12	MET
1	J	13	VAL
1	J	17	LEU
1	J	61	LEU
1	J	64	THR
1	J	75	LEU
1	J	78	ILE
1	J	80	LEU
1	J	143	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	79	ASN
1	B	88	GLN
1	B	155	ASN
1	C	9	ASN
1	C	48	GLN
1	C	79	ASN
1	C	91	ASN
1	C	155	ASN
1	D	9	ASN
1	D	79	ASN
1	E	155	ASN
1	F	54	GLN
1	F	155	ASN
1	G	79	ASN
1	G	91	ASN
1	I	8	GLN
1	I	48	GLN

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Mol	Chain	Res	Type
1	J	8	GLN

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 ⓘ

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	DCW	E	201	1	17,17,17	1.20	2 (11%)	21,21,21	1.46	4 (19%)
2	DCW	F	201	1	17,17,17	1.29	2 (11%)	21,21,21	1.40	4 (19%)
2	DCW	J	201	1	17,17,17	1.28	2 (11%)	21,21,21	1.49	4 (19%)
2	DCW	A	201	1	17,17,17	1.32	2 (11%)	21,21,21	1.66	5 (23%)
3	UMQ	C	202	-	35,35,35	0.67	1 (2%)	46,46,46	1.02	4 (8%)
2	DCW	D	201	1	17,17,17	1.35	2 (11%)	21,21,21	1.48	4 (19%)
3	UMQ	F	202	-	35,35,35	0.55	1 (2%)	46,46,46	1.10	2 (4%)
2	DCW	B	201	1	17,17,17	1.29	2 (11%)	21,21,21	1.55	4 (19%)
2	DCW	H	201	1	17,17,17	1.14	2 (11%)	21,21,21	1.60	4 (19%)
2	DCW	I	201	1	17,17,17	1.18	2 (11%)	21,21,21	1.55	4 (19%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	DCW	G	201	1	17,17,17	1.19	2 (11%)	21,21,21	2.02	7 (33%)
2	DCW	C	201	1	17,17,17	1.18	2 (11%)	21,21,21	1.59	3 (14%)

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	DCW	E	201	1	-	3/8/24/24	0/2/2/2
2	DCW	F	201	1	-	2/8/24/24	0/2/2/2
2	DCW	J	201	1	-	3/8/24/24	0/2/2/2
2	DCW	A	201	1	-	3/8/24/24	0/2/2/2
3	UMQ	C	202	-	-	14/20/60/60	0/2/2/2
2	DCW	D	201	1	-	3/8/24/24	0/2/2/2
3	UMQ	F	202	-	-	7/20/60/60	0/2/2/2
2	DCW	B	201	1	-	3/8/24/24	0/2/2/2
2	DCW	H	201	1	-	3/8/24/24	0/2/2/2
2	DCW	I	201	1	-	2/8/24/24	0/2/2/2
2	DCW	G	201	1	-	3/8/24/24	0/2/2/2
2	DCW	C	201	1	-	3/8/24/24	0/2/2/2

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	201	DCW	C1-N1	4.19	1.47	1.35
2	J	201	DCW	C1-N1	4.17	1.47	1.35
2	F	201	DCW	C1-N1	4.10	1.46	1.35
2	A	201	DCW	C1-N1	4.10	1.46	1.35
2	B	201	DCW	C1-N1	3.95	1.46	1.35
2	C	201	DCW	C1-N1	3.81	1.46	1.35
2	H	201	DCW	C1-N1	3.79	1.45	1.35
2	I	201	DCW	C1-N1	3.64	1.45	1.35
2	G	201	DCW	C1-N1	3.45	1.45	1.35
2	E	201	DCW	C1-N1	3.42	1.45	1.35
2	D	201	DCW	C2-N1	2.85	1.52	1.46
2	B	201	DCW	C2-N1	2.85	1.52	1.46
2	G	201	DCW	C2-N1	2.80	1.52	1.46
2	E	201	DCW	C2-N1	2.78	1.52	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	202	UMQ	O1'-C1'	2.68	1.44	1.40
2	A	201	DCW	C2-N1	2.60	1.52	1.46
2	F	201	DCW	C2-N1	2.50	1.51	1.46
2	J	201	DCW	C2-N1	2.50	1.51	1.46
2	I	201	DCW	C2-N1	2.27	1.51	1.46
3	F	202	UMQ	O1'-C1'	2.26	1.44	1.40
2	C	201	DCW	C2-N1	2.23	1.51	1.46
2	H	201	DCW	C2-N1	2.09	1.51	1.46

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	202	UMQ	C1'-O5'-C5'	4.05	121.63	113.72
2	A	201	DCW	C13-C8-N2	-3.97	102.65	110.57
2	G	201	DCW	C2-N1-C1	-3.91	114.51	122.92
2	G	201	DCW	C7-C2-N1	3.72	118.01	110.57
2	C	201	DCW	C2-N1-C1	-3.68	114.98	122.92
2	G	201	DCW	C9-C8-N2	-3.63	103.33	110.57
3	F	202	UMQ	O5'-C5'-C4'	3.59	117.14	109.72
2	H	201	DCW	C13-C8-N2	-3.59	103.41	110.57
2	I	201	DCW	C13-C8-N2	-3.46	103.65	110.57
2	J	201	DCW	C2-N1-C1	-3.46	115.47	122.92
2	I	201	DCW	C2-N1-C1	-3.43	115.53	122.92
2	F	201	DCW	C2-N1-C1	-3.38	115.63	122.92
2	G	201	DCW	C13-C8-N2	-3.35	103.89	110.57
2	I	201	DCW	C9-C8-N2	-3.34	103.91	110.57
2	B	201	DCW	C3-C2-N1	3.29	117.15	110.57
2	J	201	DCW	C13-C8-N2	-3.28	104.02	110.57
2	H	201	DCW	C2-N1-C1	-3.24	115.94	122.92
2	E	201	DCW	C2-N1-C1	-3.13	116.18	122.92
2	A	201	DCW	C3-C2-N1	3.10	116.76	110.57
2	D	201	DCW	C7-C2-N1	3.07	116.71	110.57
2	E	201	DCW	C7-C2-N1	3.05	116.66	110.57
2	B	201	DCW	C7-C2-N1	2.88	116.32	110.57
2	D	201	DCW	C13-C8-N2	-2.87	104.84	110.57
2	G	201	DCW	C6-C7-C2	-2.78	106.12	111.09
2	E	201	DCW	C13-C8-N2	-2.75	105.08	110.57
2	C	201	DCW	C7-C2-N1	2.67	115.91	110.57
2	H	201	DCW	C8-N2-C1	2.61	128.53	122.92
2	F	201	DCW	C13-C8-N2	-2.61	105.37	110.57
2	A	201	DCW	C7-C2-N1	2.54	115.65	110.57
2	D	201	DCW	C2-N1-C1	-2.53	117.48	122.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	201	DCW	C9-C8-N2	-2.46	105.67	110.57
2	B	201	DCW	C13-C8-N2	-2.45	105.68	110.57
2	G	201	DCW	C7-C2-C3	-2.40	106.65	110.80
2	C	201	DCW	C3-C2-N1	2.23	115.03	110.57
3	C	202	UMQ	O1'-C1'-C2'	2.22	111.65	108.27
2	H	201	DCW	C7-C2-N1	2.22	115.01	110.57
2	J	201	DCW	C9-C8-N2	-2.20	106.17	110.57
2	F	201	DCW	C7-C2-N1	2.20	114.97	110.57
2	A	201	DCW	C9-C8-N2	-2.19	106.21	110.57
2	J	201	DCW	C7-C2-N1	2.18	114.93	110.57
2	G	201	DCW	C3-C2-N1	2.16	114.89	110.57
2	I	201	DCW	C7-C2-N1	2.14	114.85	110.57
2	E	201	DCW	C9-C8-N2	-2.14	106.30	110.57
3	C	202	UMQ	C4-C3-C2	-2.10	107.14	110.83
2	A	201	DCW	C4-C3-C2	-2.10	107.33	111.09
2	B	201	DCW	C11-C10-C9	2.09	115.71	111.42
2	F	201	DCW	C9-C8-N2	-2.06	106.46	110.57
3	C	202	UMQ	CA-O1'-C1'	2.04	117.16	113.68
3	C	202	UMQ	O1-C1-C2	2.02	113.05	108.09

There are no chirality outliers.

All (49) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	DCW	O1-C1-N1-C2
2	A	201	DCW	N2-C1-N1-C2
2	B	201	DCW	O1-C1-N1-C2
2	B	201	DCW	N2-C1-N1-C2
2	B	201	DCW	C3-C2-N1-C1
2	C	201	DCW	O1-C1-N1-C2
2	C	201	DCW	N2-C1-N1-C2
2	D	201	DCW	N2-C1-N1-C2
2	E	201	DCW	O1-C1-N1-C2
2	E	201	DCW	N2-C1-N1-C2
2	F	201	DCW	N2-C1-N1-C2
2	G	201	DCW	N2-C1-N1-C2
2	H	201	DCW	O1-C1-N1-C2
2	H	201	DCW	N2-C1-N1-C2
2	I	201	DCW	N2-C1-N1-C2
2	J	201	DCW	N2-C1-N1-C2
2	F	201	DCW	O1-C1-N1-C2
2	G	201	DCW	O1-C1-N1-C2

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Mol	Chain	Res	Type	Atoms
2	I	201	DCW	O1-C1-N1-C2
2	J	201	DCW	O1-C1-N1-C2
2	D	201	DCW	O1-C1-N1-C2
3	F	202	UMQ	C4-C5-C6-O6
2	A	201	DCW	C3-C2-N1-C1
2	C	201	DCW	C3-C2-N1-C1
2	D	201	DCW	C3-C2-N1-C1
2	E	201	DCW	C3-C2-N1-C1
2	G	201	DCW	C3-C2-N1-C1
2	J	201	DCW	C3-C2-N1-C1
3	F	202	UMQ	O5'-C5'-C6'-O6'
3	C	202	UMQ	O5'-C1'-O1'-CA
3	F	202	UMQ	O5-C5-C6-O6
3	C	202	UMQ	C2'-C1'-O1'-CA
3	F	202	UMQ	C4'-C5'-C6'-O6'
3	C	202	UMQ	C4-C5-C6-O6
3	F	202	UMQ	O1'-CA-CB-CC
2	H	201	DCW	C3-C2-N1-C1
3	C	202	UMQ	CH-CI-CJ-CK
3	F	202	UMQ	CD-CF-CG-CH
3	C	202	UMQ	CC-CD-CF-CG
3	C	202	UMQ	CG-CH-CI-CJ
3	C	202	UMQ	O1'-CA-CB-CC
3	C	202	UMQ	C4'-C5'-C6'-O6'
3	C	202	UMQ	CI-CJ-CK-CL
3	C	202	UMQ	CA-CB-CC-CD
3	C	202	UMQ	CD-CF-CG-CH
3	C	202	UMQ	O5-C5-C6-O6
3	C	202	UMQ	O5'-C5'-C6'-O6'
3	F	202	UMQ	CF-CG-CH-CI
3	C	202	UMQ	CF-CG-CH-CI

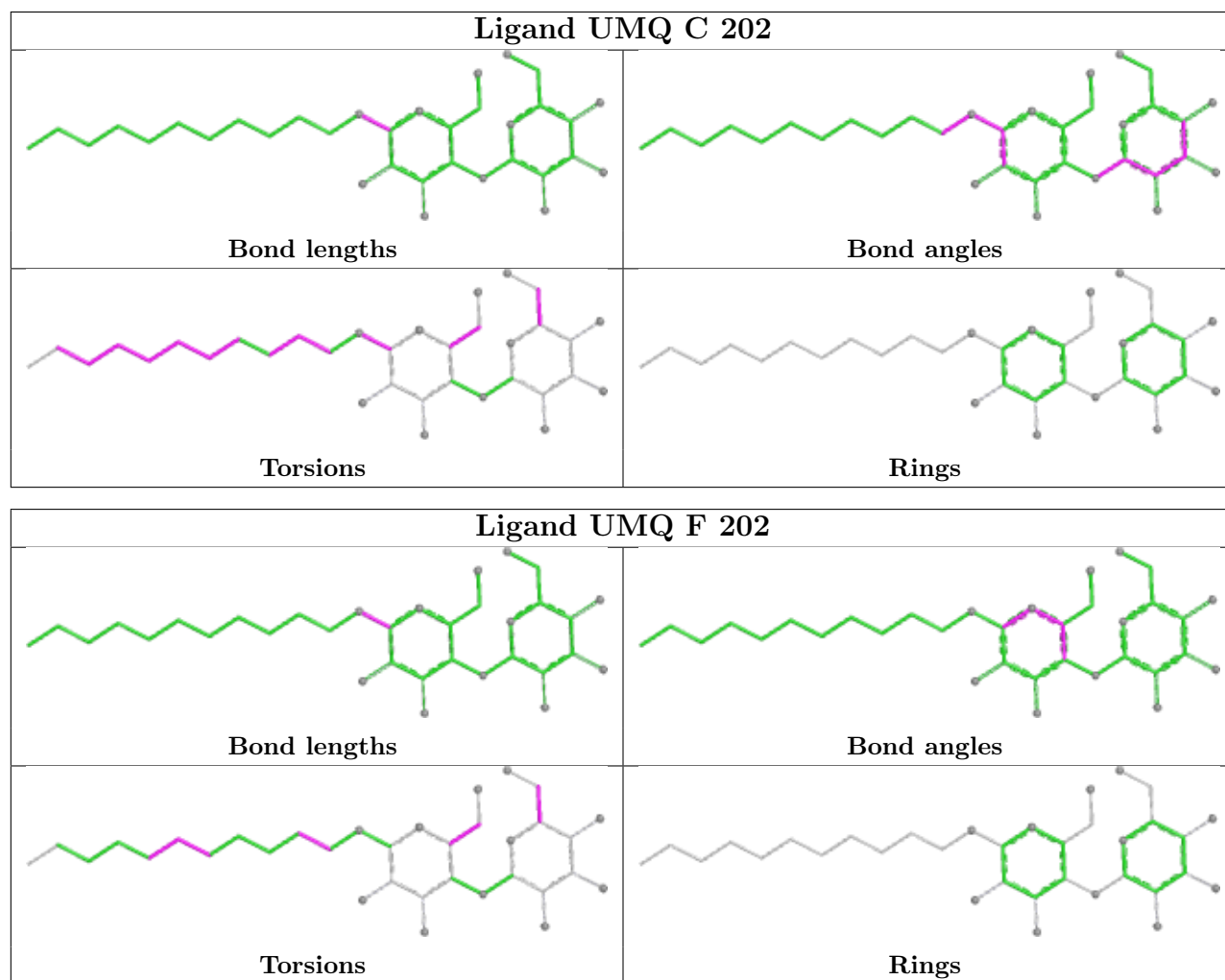
There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	202	UMQ	1	0
2	B	201	DCW	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 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	156/156 (100%)	0.01	7 (4%)	38	20	49, 66, 108, 118	0
1	B	156/156 (100%)	-0.15	3 (1%)	66	45	51, 69, 115, 124	0
1	C	156/156 (100%)	-0.11	4 (2%)	57	35	55, 73, 125, 135	0
1	D	156/156 (100%)	0.69	18 (11%)	9	5	56, 75, 127, 141	0
1	E	156/156 (100%)	0.07	7 (4%)	38	20	53, 73, 132, 142	0
1	F	156/156 (100%)	-0.12	4 (2%)	57	35	49, 68, 129, 140	0
1	G	156/156 (100%)	0.06	7 (4%)	38	20	47, 64, 118, 136	0
1	H	156/156 (100%)	-0.10	5 (3%)	50	29	42, 56, 98, 108	0
1	I	156/156 (100%)	0.47	17 (10%)	10	5	42, 51, 81, 95	0
1	J	156/156 (100%)	-0.27	0	100	100	41, 56, 74, 86	0
All	All	1560/1560 (100%)	0.06	72 (4%)	37	19	41, 66, 113, 142	0

All (72) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	83	ASP	7.2
1	E	7	THR	5.1
1	I	64	THR	4.6
1	I	155	ASN	4.5
1	I	79	ASN	4.2
1	E	10	GLY	4.0
1	D	119	GLN	3.8
1	B	81	GLY	3.8
1	A	126	GLU	3.6
1	D	126	GLU	3.6
1	E	8	GLN	3.5
1	D	153	VAL	3.5
1	C	74	PHE	3.4

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Mol	Chain	Res	Type	RSRZ
1	D	7	THR	3.4
1	I	96	SER	3.4
1	A	83	ASP	3.4
1	D	95	ALA	3.4
1	H	155	ASN	3.3
1	I	47	SER	3.3
1	E	152	LEU	3.3
1	F	1	MET	3.3
1	D	81	GLY	3.2
1	D	10	GLY	3.1
1	I	81	GLY	3.0
1	D	40	ALA	3.0
1	A	155	ASN	3.0
1	G	156	ALA	2.9
1	G	81	GLY	2.9
1	F	7	THR	2.9
1	G	47	SER	2.9
1	C	7	THR	2.9
1	G	50	GLU	2.9
1	I	95	ALA	2.8
1	D	146	PHE	2.8
1	D	150	PHE	2.7
1	B	47	SER	2.7
1	D	39	GLU	2.7
1	I	27	GLY	2.7
1	F	81	GLY	2.6
1	I	11	GLY	2.6
1	C	81	GLY	2.6
1	F	83	ASP	2.6
1	D	122	ALA	2.5
1	A	81	GLY	2.5
1	C	82	SER	2.5
1	H	54	GLN	2.4
1	A	82	SER	2.4
1	E	82	SER	2.4
1	B	83	ASP	2.4
1	A	69	GLY	2.4
1	I	63	GLY	2.4
1	D	152	LEU	2.4
1	I	109	ALA	2.3
1	D	154	LEU	2.2
1	I	110	GLN	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	149	SER	2.2
1	I	82	SER	2.2
1	I	154	LEU	2.2
1	I	78	ILE	2.2
1	D	37	THR	2.2
1	I	139	GLU	2.1
1	E	1	MET	2.1
1	D	72	ILE	2.1
1	G	1	MET	2.1
1	H	38	GLY	2.1
1	E	153	VAL	2.1
1	A	71	VAL	2.0
1	G	155	ASN	2.0
1	H	79	ASN	2.0
1	I	156	ALA	2.0
1	H	154	LEU	2.0
1	G	86	VAL	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.

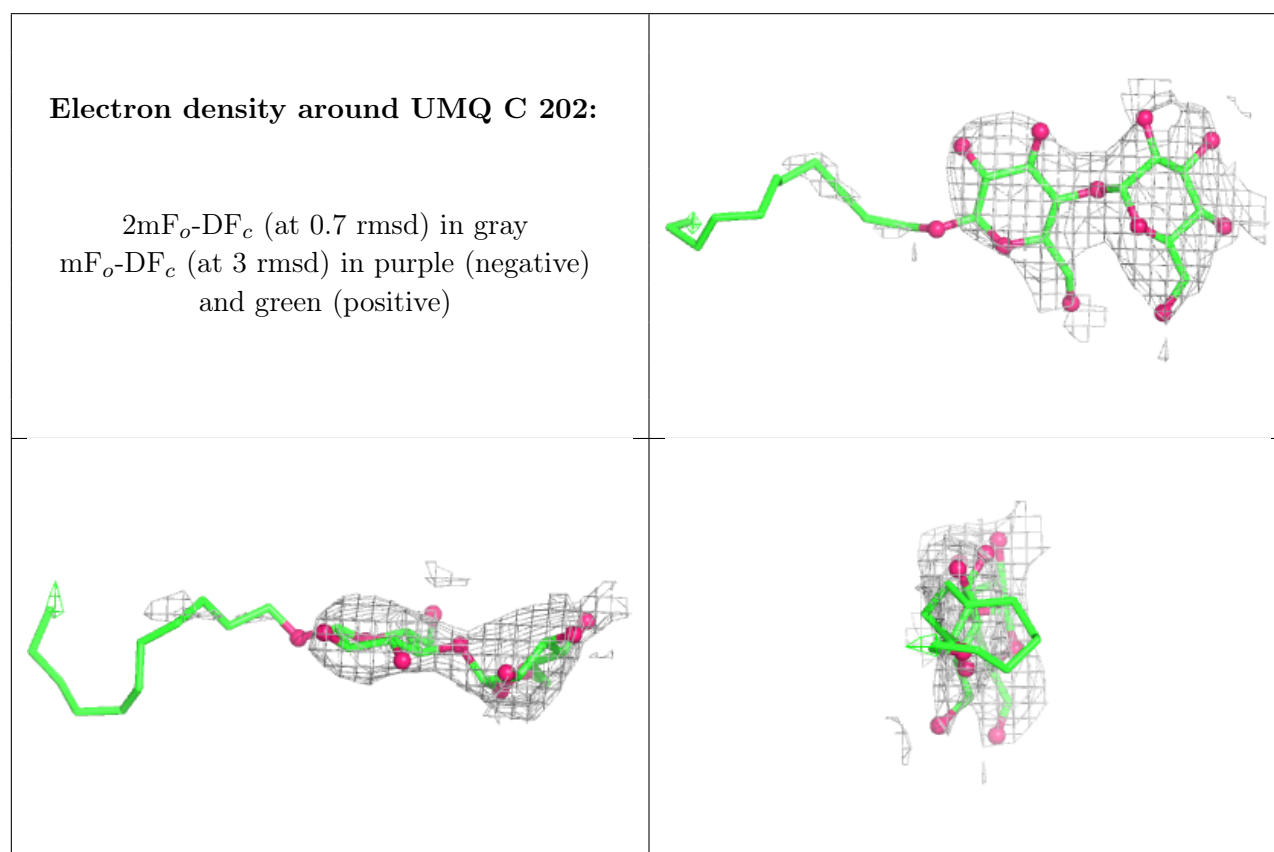
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	UMQ	C	202	34/34	0.87	0.27	142,148,151,154	0
3	UMQ	F	202	34/34	0.90	0.21	122,130,133,136	0
2	DCW	J	201	16/16	0.91	0.15	71,76,82,83	0
2	DCW	H	201	16/16	0.92	0.16	68,70,72,75	0
2	DCW	F	201	16/16	0.92	0.15	80,84,86,87	0
2	DCW	C	201	16/16	0.93	0.15	89,91,93,93	0

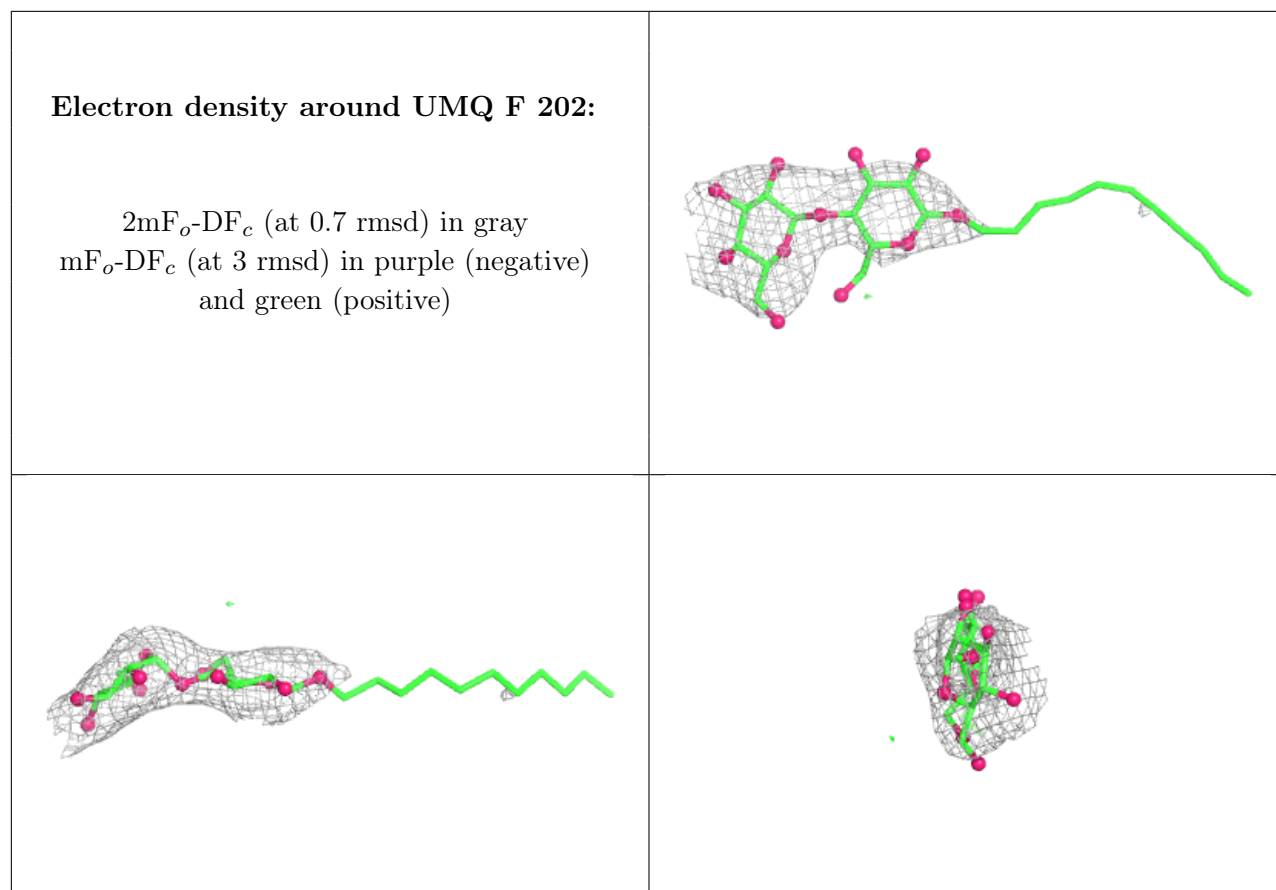
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	DCW	D	201	16/16	0.94	0.12	89,94,98,99	0
2	DCW	G	201	16/16	0.94	0.14	73,76,77,78	0
2	DCW	E	201	16/16	0.95	0.14	88,91,94,95	0
2	DCW	A	201	16/16	0.95	0.12	76,82,89,89	0
2	DCW	I	201	16/16	0.95	0.11	65,67,69,70	0
2	DCW	B	201	16/16	0.96	0.11	79,82,86,86	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 ⓘ

There are no such residues in this entry.