



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 13, 2026 – 02:09 AM JST

PDB ID : 9WAS / pdb_00009was
Title : Human mitochondrial ClpP in complex with LZL25
Authors : Chen, Z.-Y.; Xiao, Y.-B.; Sun, H.-Y.
Deposited on : 2025-08-12
Resolution : 3.52 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:

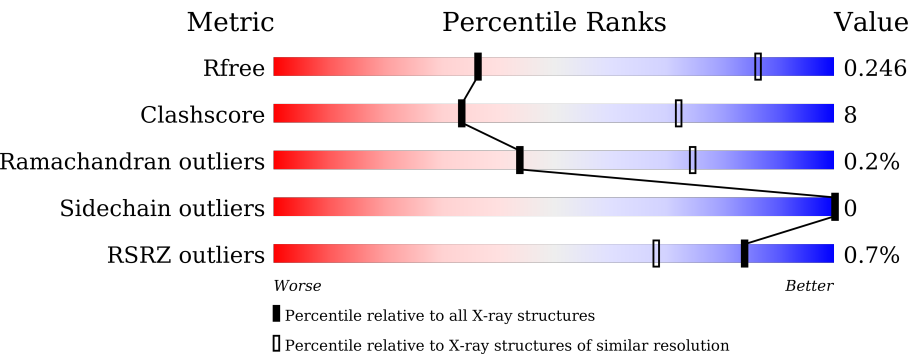
MolProbity : 4-5-2 with Phenix2.0
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 2.0
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.48.1

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 3.52 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}	164625	1089 (3.58-3.46)
Clashscore	180529	1165 (3.58-3.46)
Ramachandran outliers	177936	1150 (3.58-3.46)
Sidechain outliers	177891	1151 (3.58-3.46)
RSRZ outliers	164620	1088 (3.58-3.46)

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	194	<div><div>%</div><div><div></div><div>75%</div><div>15%</div><div>10%</div></div></div>
1	B	194	<div><div>%</div><div><div></div><div>71%</div><div>19%</div><div>10%</div></div></div>
1	C	194	<div><div>%</div><div><div></div><div>79%</div><div>13%</div><div>7%</div></div></div>
1	D	194	<div><div></div><div><div></div><div>75%</div><div>19%</div><div>6%</div></div></div>
1	E	194	<div><div>%</div><div><div></div><div>77%</div><div>19%</div><div>5%</div></div></div>
1	F	194	<div><div></div><div><div></div><div>73%</div><div>21%</div><div>6%</div></div></div>

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Mol	Chain	Length	Quality of chain
1	G	194	<div><div><div>%</div><div></div><div>80%</div><div>14%</div><div>5%</div></div></div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 10108 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.

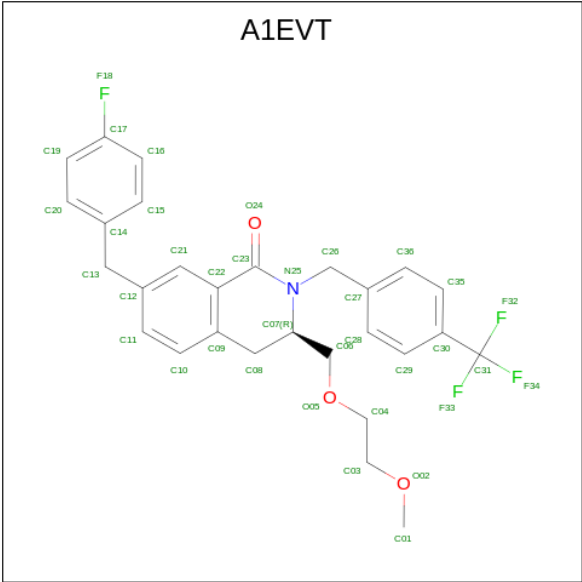
- Molecule 1 is a protein called ATP-dependent Clp protease proteolytic subunit, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	175	Total	C	N	O	S	0	2	0
			1369	872	230	253	14			
1	B	175	Total	C	N	O	S	0	1	0
			1367	873	232	249	13			
1	C	180	Total	C	N	O	S	0	1	0
			1401	892	238	258	13			
1	D	183	Total	C	N	O	S	0	2	0
			1432	913	243	262	14			
1	E	185	Total	C	N	O	S	0	0	0
			1429	910	242	264	13			
1	F	183	Total	C	N	O	S	0	1	0
			1425	908	241	263	13			
1	G	184	Total	C	N	O	S	0	1	0
			1433	912	243	265	13			

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	57	SER	-	expression tag	UNP Q16740
B	57	SER	-	expression tag	UNP Q16740
C	57	SER	-	expression tag	UNP Q16740
D	57	SER	-	expression tag	UNP Q16740
E	57	SER	-	expression tag	UNP Q16740
F	57	SER	-	expression tag	UNP Q16740
G	57	SER	-	expression tag	UNP Q16740

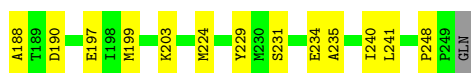
- Molecule 2 is (3 {R})-7-[(4-fluorophenyl)methyl]-3-(2-methoxyethoxymethyl)-2-[[4-(tri fluoromethyl)phenyl]methyl]-3,4-dihydroisoquinolin-1-one (CCD ID: A1EVT) (formula: C₂₈H₂₇F₄NO₃) (labeled as "Ligand of Interest" by depositor).



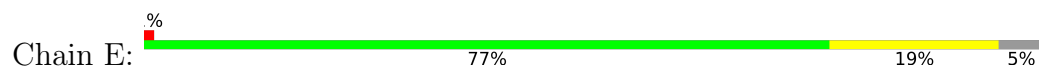
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	B	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	C	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	D	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	E	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	F	1	Total	C	F	N	O	0	0
			36	28	4	1	3		
2	G	1	Total	C	F	N	O	0	0
			36	28	4	1	3		

- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial

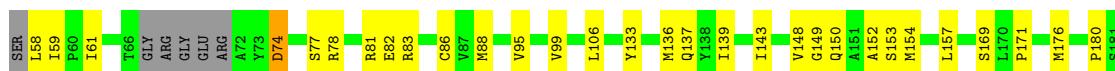




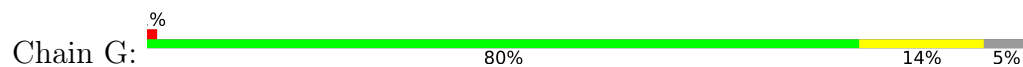
- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial



- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial



- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	143.17Å 151.85Å 104.55Å 90.00° 118.46° 90.00°	Depositor
Resolution (Å)	83.78 – 3.52 83.78 – 3.52	Depositor EDS
% Data completeness (in resolution range)	96.8 (83.78-3.52) 96.8 (83.78-3.52)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.04 (at 3.49Å)	Xtriage
Refinement program	PHENIX (1.16_3549: ???)	Depositor
R, R_{free}	0.178 , 0.247 0.172 , 0.246	Depositor DCC
R_{free} test set	2000 reflections (8.18%)	wwPDB-VP
Wilson B-factor (Å ²)	50.5	Xtriage
Anisotropy	0.091	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 53.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	10108	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.10% 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: A1EVT

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	0.17	0/1391	0.37	0/1879
1	B	0.18	0/1391	0.42	0/1880
1	C	0.17	0/1425	0.38	0/1928
1	D	0.18	0/1458	0.39	0/1974
1	E	0.17	0/1454	0.38	0/1968
1	F	0.17	0/1450	0.39	0/1963
1	G	0.17	0/1458	0.42	0/1973
All	All	0.17	0/10027	0.39	0/13565

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1369	0	1399	23	0
1	B	1367	0	1405	28	0
1	C	1401	0	1439	17	0
1	D	1432	0	1463	28	0
1	E	1429	0	1464	26	0
1	F	1425	0	1460	27	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	1433	0	1466	22	0
2	A	36	0	0	0	0
2	B	36	0	0	1	0
2	C	36	0	0	0	0
2	D	36	0	0	1	0
2	E	36	0	0	0	0
2	F	36	0	0	2	0
2	G	36	0	0	3	0
All	All	10108	0	10096	153	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 8.

All (153) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:97:SER:HB2	1:D:88:MET:HG2	1.68	0.75
1:E:63:VAL:C	1:E:64:GLU:OE2	2.33	0.71
1:D:64:GLU:HG3	1:D:78:ARG:HE	1.55	0.71
1:B:234:GLU:HA	1:B:237:GLU:HG2	1.75	0.69
1:F:83:ARG:NH2	1:F:106:LEU:O	2.28	0.64
1:A:97:SER:OG	1:B:76:TYR:OH	2.16	0.63
1:B:146:TRP:HZ3	1:B:245:LEU:HD21	1.62	0.63
1:A:97:SER:CB	1:B:88:MET:HG2	2.30	0.60
1:B:230:MET:HB3	1:B:234:GLU:HG3	1.83	0.60
1:F:153[A]:SER:OG	1:F:154:MET:N	2.34	0.60
1:B:146:TRP:CZ3	1:B:245:LEU:HD21	2.36	0.59
1:A:189:THR:OG1	1:A:191:ILE:O	2.20	0.58
1:A:97:SER:HB2	1:B:88:MET:HG2	1.86	0.57
1:F:169:SER:HB2	1:F:241:LEU:HD22	1.87	0.57
1:F:78:ARG:NH1	1:F:82:GLU:HG2	2.21	0.56
1:D:96:ALA:HA	1:D:132:ILE:HD11	1.87	0.56
1:G:153[A]:SER:OG	1:G:154:MET:N	2.39	0.56
1:F:139:ILE:HD11	1:F:143:ILE:HD11	1.88	0.55
1:C:78:ARG:HH12	1:C:82:GLU:HG2	1.71	0.55
1:C:144:CYS:SG	1:C:166:MET:HE2	2.47	0.55
1:C:88:MET:HE2	1:C:118:TYR:HB3	1.89	0.55
1:F:78:ARG:HH12	1:F:82:GLU:HG2	1.71	0.54
1:A:88:MET:HE2	1:A:118:TYR:HB3	1.89	0.54
1:B:139:ILE:HD11	1:B:143:ILE:HD11	1.89	0.54
1:E:189:THR:OG1	1:E:191:ILE:O	2.25	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:152:ALA:HB1	1:B:176:MET:HE2	1.90	0.54
1:E:86:CYS:HB3	1:E:88:MET:HG2	1.89	0.54
1:C:154:MET:HE1	1:C:157:LEU:HD13	1.89	0.53
1:F:74:ASP:HB3	1:F:77:SER:HB2	1.89	0.53
1:G:78:ARG:NH1	1:G:82:GLU:HG2	2.24	0.53
1:E:110:SER:O	1:E:141:ASN:ND2	2.42	0.52
1:G:79:LEU:O	1:G:84:ILE:HB	2.09	0.52
1:E:78:ARG:NH1	1:E:82:GLU:HG2	2.25	0.52
1:D:99:VAL:HA	1:D:102:GLN:HE21	1.74	0.52
1:C:171:PRO:HG3	1:C:246:VAL:HG22	1.91	0.52
1:A:229:TYR:HB2	1:G:197:GLU:OE1	2.10	0.51
1:C:157:LEU:HD21	1:C:208:ILE:HG21	1.91	0.51
1:E:78:ARG:HH12	1:E:82:GLU:HG2	1.75	0.51
1:F:152:ALA:HB1	1:F:176:MET:HE2	1.92	0.51
1:E:62:VAL:O	1:E:72:ALA:HB3	2.10	0.51
1:B:117:MET:HE1	1:B:136:MET:HG2	1.92	0.51
1:C:138:TYR:CZ	1:D:248:PRO:HG3	2.46	0.51
1:B:78:ARG:HD2	1:B:81:ARG:HB2	1.92	0.50
1:A:97:SER:HB3	1:B:88:MET:HG2	1.93	0.50
1:B:233:MET:HE2	1:B:233:MET:HA	1.94	0.50
1:E:209:TYR:HB3	1:E:220:ILE:HD12	1.94	0.50
1:D:138:TYR:CE1	1:E:248:PRO:HG3	2.47	0.49
1:G:74:ASP:OD1	1:G:74:ASP:N	2.41	0.49
1:D:110:SER:O	1:D:141:ASN:ND2	2.29	0.49
1:A:59:ILE:HD12	1:A:76:TYR:HE2	1.76	0.49
1:C:78:ARG:NH1	1:C:82:GLU:HG2	2.27	0.49
1:A:96:ALA:O	1:A:100:ILE:HG13	2.13	0.48
1:D:82:GLU:HG3	2:D:301:A1EVT:C30	2.43	0.48
1:F:82:GLU:HG3	2:F:301:A1EVT:C30	2.42	0.48
1:F:236:GLN:NE2	1:F:242:ASP:O	2.46	0.48
1:F:245:LEU:H	1:F:245:LEU:HD23	1.78	0.48
1:D:139:ILE:HD11	1:D:143:ILE:HD11	1.95	0.48
1:B:61:ILE:HG23	1:B:73:TYR:HB3	1.95	0.48
1:E:63:VAL:O	1:E:64:GLU:CD	2.57	0.48
1:D:231:SER:OG	1:D:234:GLU:HG3	2.14	0.48
1:A:146:TRP:HZ3	1:A:245:LEU:HD21	1.79	0.48
1:B:79:LEU:O	1:B:84:ILE:HB	2.14	0.48
1:C:97:SER:CB	1:D:88:MET:HG2	2.41	0.48
1:E:63:VAL:O	1:E:64:GLU:OE2	2.32	0.48
1:E:77:SER:HB3	1:F:61:ILE:H	1.78	0.47
1:A:65:GLN:OE1	1:A:71:ARG:NH2	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:61:ILE:O	1:D:61:ILE:HD12	2.13	0.47
1:B:74:ASP:HB3	1:B:77:SER:OG	2.14	0.47
1:D:177:ILE:HD12	1:D:224:MET:HG3	1.96	0.47
1:E:125:VAL:HB	1:E:128:ALA:HB3	1.96	0.47
1:C:169:SER:HB2	1:C:241:LEU:HD22	1.97	0.47
1:G:171:PRO:O	1:G:232:PRO:HG2	2.15	0.47
1:G:82:GLU:O	1:G:84:ILE:N	2.49	0.46
1:D:197:GLU:CD	1:E:229:TYR:HB2	2.40	0.46
1:E:87:VAL:HG22	1:E:99:VAL:HG21	1.97	0.46
1:F:58:LEU:HB3	1:F:59:ILE:H	1.60	0.46
1:E:138:TYR:HE1	1:F:245:LEU:HD12	1.80	0.46
1:G:146:TRP:HZ3	1:G:245:LEU:HD12	1.80	0.46
1:D:78:ARG:NH1	1:D:82:GLU:HG2	2.31	0.46
1:G:228:ARG:NH2	1:G:234:GLU:OE1	2.49	0.46
1:B:81:ARG:CZ	1:B:81:ARG:HA	2.46	0.46
1:D:199:MET:HG3	1:D:203:LYS:HE2	1.97	0.45
1:E:213:THR:HG22	1:E:239:GLY:C	2.41	0.45
1:B:153:SER:HB2	1:B:180:PRO:HD3	1.98	0.45
1:G:82:GLU:HG3	2:G:301:A1EVT:C30	2.46	0.45
1:A:98:LEU:O	1:A:102:GLN:HG3	2.16	0.45
1:F:248:PRO:HA	1:F:249:PRO:HD3	1.83	0.45
1:G:169:SER:HB2	1:G:241:LEU:HD22	1.97	0.45
1:D:98:LEU:HD11	1:E:59:ILE:HG22	1.98	0.45
1:F:95:VAL:O	1:F:99:VAL:HG23	2.16	0.45
1:G:202:LYS:HE2	1:G:206:TYR:OH	2.16	0.45
1:B:85:VAL:O	1:B:117:MET:HA	2.17	0.45
1:C:59:ILE:HG23	1:C:75:ILE:HG22	1.97	0.45
1:F:133:TYR:O	1:F:137:GLN:HG2	2.17	0.44
1:D:170:LEU:HD23	1:D:170:LEU:HA	1.85	0.44
1:E:153:SER:OG	1:E:180:PRO:HD3	2.17	0.44
1:F:157:LEU:HD13	1:F:205:LEU:HD22	1.98	0.44
1:F:157:LEU:HA	1:F:209:TYR:HE1	1.82	0.44
1:C:148:VAL:HG23	1:C:170:LEU:HD12	1.99	0.44
1:F:153[B]:SER:OG	1:F:180:PRO:HD3	2.17	0.44
1:D:190:ASP:OD2	1:E:150:GLN:NE2	2.50	0.44
1:E:75:ILE:O	1:E:79:LEU:HD13	2.17	0.44
1:B:171:PRO:HG3	1:B:246:VAL:HG22	1.99	0.44
1:G:194:GLN:O	1:G:198:ILE:HG13	2.17	0.44
1:B:107:GLN:NE2	1:B:139:ILE:HG22	2.32	0.43
1:F:136:MET:HE3	1:F:143:ILE:HG21	1.99	0.43
1:B:148[A]:VAL:HG23	1:B:170:LEU:HD12	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:174:ARG:HB3	1:D:229:TYR:CD2	2.54	0.43
1:E:110:SER:OG	1:E:113:LYS:HB2	2.19	0.43
1:F:148:VAL:HG11	2:F:301:A1EVT:F18	2.09	0.43
1:A:136:MET:HE3	1:A:143:ILE:HG21	1.99	0.43
1:G:79:LEU:HD23	2:G:301:A1EVT:F33	2.09	0.43
1:G:82:GLU:HG3	2:G:301:A1EVT:C35	2.49	0.43
1:B:228:ARG:NH2	1:B:234:GLU:OE1	2.52	0.42
1:G:177:ILE:O	1:G:224:MET:HG2	2.18	0.42
1:G:167:ARG:HE	1:G:167:ARG:HB2	1.60	0.42
1:C:117:MET:HE3	1:C:117:MET:HB2	1.89	0.42
1:D:169:SER:HB2	1:D:241:LEU:HD22	2.01	0.42
1:E:235:ALA:HB1	1:E:240:ILE:HB	2.01	0.42
1:F:148:VAL:O	1:F:150:GLN:N	2.52	0.42
1:G:78:ARG:HH12	1:G:82:GLU:HG2	1.84	0.42
1:A:197:GLU:HG3	1:B:229:TYR:HD1	1.84	0.42
1:A:204:GLN:OE1	1:B:174:ARG:NH1	2.53	0.42
1:B:148[B]:VAL:HG11	2:B:301:A1EVT:C17	2.49	0.42
1:G:65:GLN:H	1:G:72:ALA:N	2.18	0.42
1:A:86:CYS:SG	1:A:88:MET:HE3	2.60	0.42
1:A:198:ILE:HD12	1:A:201:LEU:HD12	2.02	0.41
1:C:213:THR:HG22	1:C:239:GLY:C	2.44	0.41
1:D:103:LEU:HD23	1:D:103:LEU:HA	1.92	0.41
1:B:236:GLN:NE2	1:B:242:ASP:O	2.53	0.41
1:D:167:ARG:HE	1:D:167:ARG:HB2	1.73	0.41
1:F:171:PRO:O	1:F:232:PRO:HG2	2.20	0.41
1:D:235:ALA:HB1	1:D:240:ILE:HB	2.01	0.41
1:F:208:ILE:O	1:F:212:HIS:HD2	2.03	0.41
1:G:231:SER:OG	1:G:234:GLU:HG3	2.21	0.41
1:A:104:LEU:HD23	1:A:104:LEU:HA	1.85	0.41
1:E:117:MET:HE3	1:E:117:MET:HB2	1.77	0.41
1:F:86:CYS:HB3	1:F:88:MET:HG2	2.02	0.41
1:G:104:LEU:HD23	1:G:104:LEU:HA	1.83	0.41
1:A:170:LEU:HD23	1:A:170:LEU:HA	1.90	0.41
1:F:78:ARG:NH1	1:F:81:ARG:HD2	2.35	0.41
1:A:122:PRO:O	1:G:191:ILE:HD11	2.20	0.41
1:A:58:LEU:HD22	1:A:58:LEU:HA	1.93	0.41
1:B:91:ILE:HB	1:B:124:GLY:HA3	2.03	0.41
1:D:117:MET:HE3	1:D:117:MET:HB2	1.93	0.41
1:D:197:GLU:OE1	1:E:229:TYR:HB2	2.21	0.41
1:C:111:ASN:HB3	1:C:140:LEU:HD12	2.04	0.40
1:D:80:LEU:HD11	1:D:102:GLN:HB3	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:126:VAL:HG23	1:D:188:ALA:HB2	2.03	0.40
1:C:136:MET:HE3	1:C:143:ILE:HG21	2.02	0.40
1:E:147:CYS:HB2	1:E:159:LEU:HD13	2.03	0.40
1:A:113:LYS:O	1:A:141:ASN:ND2	2.47	0.40
1:A:198:ILE:HD12	1:A:198:ILE:HA	1.87	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	169/194 (87%)	161 (95%)	8 (5%)	0	100	100
1	B	170/194 (88%)	161 (95%)	8 (5%)	1 (1%)	22	55
1	C	175/194 (90%)	165 (94%)	10 (6%)	0	100	100
1	D	179/194 (92%)	170 (95%)	9 (5%)	0	100	100
1	E	179/194 (92%)	173 (97%)	6 (3%)	0	100	100
1	F	178/194 (92%)	172 (97%)	4 (2%)	2 (1%)	12	44
1	G	179/194 (92%)	171 (96%)	8 (4%)	0	100	100
All	All	1229/1358 (90%)	1173 (95%)	53 (4%)	3 (0%)	44	75

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	74	ASP
1	F	74	ASP
1	F	149	GLY

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	153/164 (93%)	153 (100%)	0	100	100
1	B	152/164 (93%)	152 (100%)	0	100	100
1	C	157/164 (96%)	157 (100%)	0	100	100
1	D	159/164 (97%)	159 (100%)	0	100	100
1	E	159/164 (97%)	159 (100%)	0	100	100
1	F	159/164 (97%)	159 (100%)	0	100	100
1	G	160/164 (98%)	160 (100%)	0	100	100
All	All	1099/1148 (96%)	1099 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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	102	GLN
1	A	107	GLN
1	A	236	GLN
1	B	120	ASN
1	B	236	GLN
1	D	218	GLN
1	F	120	ASN
1	F	179	GLN
1	F	187	GLN
1	G	120	ASN
1	G	137	GLN

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](#)

7 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	A1EVT	B	301	-	39,39,39	1.83	5 (12%)	54,55,55	1.98	15 (27%)
2	A1EVT	A	301	-	39,39,39	1.85	5 (12%)	54,55,55	1.95	11 (20%)
2	A1EVT	E	301	-	39,39,39	1.83	4 (10%)	54,55,55	1.99	15 (27%)
2	A1EVT	F	301	-	39,39,39	1.83	4 (10%)	54,55,55	2.02	11 (20%)
2	A1EVT	C	301	-	39,39,39	1.81	5 (12%)	54,55,55	2.11	16 (29%)
2	A1EVT	G	301	-	39,39,39	1.82	5 (12%)	54,55,55	2.16	14 (25%)
2	A1EVT	D	301	-	39,39,39	1.82	4 (10%)	54,55,55	2.05	11 (20%)

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	A1EVT	B	301	-	-	4/20/36/36	0/4/4/4
2	A1EVT	A	301	-	-	4/20/36/36	0/4/4/4
2	A1EVT	E	301	-	-	4/20/36/36	0/4/4/4
2	A1EVT	F	301	-	-	3/20/36/36	0/4/4/4
2	A1EVT	C	301	-	-	4/20/36/36	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	A1EVT	G	301	-	-	3/20/36/36	0/4/4/4
2	A1EVT	D	301	-	-	3/20/36/36	0/4/4/4

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	A1EVT	C22-C09	-6.86	1.31	1.40
2	D	301	A1EVT	C22-C09	-6.77	1.31	1.40
2	A	301	A1EVT	C22-C09	-6.64	1.31	1.40
2	B	301	A1EVT	C22-C09	-6.49	1.32	1.40
2	G	301	A1EVT	C22-C09	-6.38	1.32	1.40
2	E	301	A1EVT	C22-C09	-6.36	1.32	1.40
2	C	301	A1EVT	C22-C09	-6.24	1.32	1.40
2	D	301	A1EVT	C08-C07	5.46	1.62	1.52
2	E	301	A1EVT	C08-C07	5.36	1.62	1.52
2	A	301	A1EVT	C08-C07	5.32	1.62	1.52
2	G	301	A1EVT	C08-C07	5.31	1.62	1.52
2	F	301	A1EVT	C08-C07	5.28	1.61	1.52
2	B	301	A1EVT	C08-C07	5.25	1.61	1.52
2	C	301	A1EVT	C08-C07	5.21	1.61	1.52
2	E	301	A1EVT	C23-N25	4.69	1.43	1.36
2	C	301	A1EVT	C23-N25	4.64	1.43	1.36
2	A	301	A1EVT	C23-N25	4.59	1.43	1.36
2	G	301	A1EVT	C23-N25	4.56	1.43	1.36
2	B	301	A1EVT	C23-N25	4.54	1.43	1.36
2	F	301	A1EVT	C23-N25	4.21	1.42	1.36
2	D	301	A1EVT	C23-N25	4.04	1.42	1.36
2	E	301	A1EVT	C08-C09	3.17	1.57	1.51
2	A	301	A1EVT	C08-C09	3.09	1.57	1.51
2	G	301	A1EVT	C08-C09	3.09	1.57	1.51
2	B	301	A1EVT	C08-C09	3.08	1.57	1.51
2	D	301	A1EVT	C08-C09	2.99	1.57	1.51
2	F	301	A1EVT	C08-C09	2.89	1.56	1.51
2	C	301	A1EVT	C08-C09	2.83	1.56	1.51
2	C	301	A1EVT	C21-C22	2.31	1.43	1.39
2	G	301	A1EVT	C21-C22	2.25	1.43	1.39
2	B	301	A1EVT	C21-C22	2.12	1.43	1.39
2	A	301	A1EVT	C21-C22	2.01	1.43	1.39

All (93) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	A1EVT	C08-C07-N25	7.75	121.00	110.03
2	G	301	A1EVT	C08-C07-N25	7.73	120.97	110.03
2	D	301	A1EVT	C08-C07-N25	6.88	119.77	110.03
2	B	301	A1EVT	C08-C07-N25	6.36	119.04	110.03
2	F	301	A1EVT	C08-C07-N25	6.19	118.79	110.03
2	E	301	A1EVT	C08-C07-N25	6.07	118.63	110.03
2	A	301	A1EVT	C08-C07-N25	6.05	118.59	110.03
2	F	301	A1EVT	C11-C10-C09	-4.99	114.81	121.39
2	A	301	A1EVT	C11-C10-C09	-4.98	114.82	121.39
2	C	301	A1EVT	C11-C10-C09	-4.96	114.86	121.39
2	E	301	A1EVT	C11-C10-C09	-4.93	114.90	121.39
2	G	301	A1EVT	C11-C10-C09	-4.83	115.03	121.39
2	B	301	A1EVT	C11-C10-C09	-4.74	115.14	121.39
2	D	301	A1EVT	C11-C10-C09	-4.74	115.14	121.39
2	F	301	A1EVT	C09-C22-C23	4.73	124.34	120.91
2	G	301	A1EVT	C09-C22-C23	4.61	124.25	120.91
2	D	301	A1EVT	C09-C22-C23	4.60	124.25	120.91
2	C	301	A1EVT	C10-C09-C22	4.51	123.87	118.47
2	C	301	A1EVT	C09-C22-C23	4.38	124.09	120.91
2	E	301	A1EVT	C10-C09-C22	4.33	123.66	118.47
2	B	301	A1EVT	C10-C09-C22	4.25	123.56	118.47
2	A	301	A1EVT	C09-C22-C23	4.24	123.99	120.91
2	E	301	A1EVT	C09-C22-C23	4.18	123.95	120.91
2	F	301	A1EVT	C10-C09-C22	4.09	123.37	118.47
2	A	301	A1EVT	C22-C21-C12	-4.08	114.93	121.41
2	G	301	A1EVT	C10-C09-C22	4.04	123.31	118.47
2	B	301	A1EVT	C09-C22-C23	4.02	123.83	120.91
2	C	301	A1EVT	C22-C21-C12	-3.98	115.09	121.41
2	F	301	A1EVT	C22-C21-C12	-3.97	115.11	121.41
2	A	301	A1EVT	C10-C09-C22	3.96	123.21	118.47
2	D	301	A1EVT	C10-C09-C22	3.91	123.16	118.47
2	E	301	A1EVT	C22-C21-C12	-3.90	115.22	121.41
2	G	301	A1EVT	C22-C21-C12	-3.86	115.28	121.41
2	B	301	A1EVT	C22-C21-C12	-3.84	115.32	121.41
2	D	301	A1EVT	C22-C21-C12	-3.81	115.36	121.41
2	G	301	A1EVT	C08-C07-C06	-3.80	106.72	112.46
2	A	301	A1EVT	C21-C22-C09	3.73	123.50	119.50
2	F	301	A1EVT	C21-C22-C09	3.72	123.48	119.50
2	C	301	A1EVT	C08-C09-C10	-3.51	112.00	121.58
2	D	301	A1EVT	C22-C23-N25	3.40	119.66	116.24
2	D	301	A1EVT	C21-C22-C09	3.32	123.05	119.50
2	F	301	A1EVT	C08-C07-C06	-3.30	107.48	112.46
2	G	301	A1EVT	C22-C23-N25	3.28	119.54	116.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	A1EVT	C08-C07-C06	-3.24	107.57	112.46
2	G	301	A1EVT	C08-C09-C10	-3.22	112.78	121.58
2	F	301	A1EVT	C21-C22-C23	-3.20	112.17	118.37
2	C	301	A1EVT	C08-C07-C06	-3.16	107.69	112.46
2	E	301	A1EVT	C21-C22-C09	3.15	122.88	119.50
2	G	301	A1EVT	C21-C22-C09	3.15	122.88	119.50
2	A	301	A1EVT	C21-C22-C23	-3.03	112.51	118.37
2	B	301	A1EVT	C21-C22-C09	3.02	122.73	119.50
2	F	301	A1EVT	C22-C23-N25	2.97	119.23	116.24
2	B	301	A1EVT	C08-C09-C10	-2.97	113.48	121.58
2	D	301	A1EVT	O24-C23-N25	-2.96	119.65	121.96
2	D	301	A1EVT	C21-C22-C23	-2.94	112.68	118.37
2	B	301	A1EVT	C08-C07-C06	-2.90	108.08	112.46
2	C	301	A1EVT	C21-C22-C09	2.87	122.57	119.50
2	D	301	A1EVT	C08-C09-C10	-2.85	113.80	121.58
2	G	301	A1EVT	C21-C22-C23	-2.84	112.87	118.37
2	A	301	A1EVT	C08-C09-C10	-2.81	113.89	121.58
2	A	301	A1EVT	C22-C23-N25	2.80	119.06	116.24
2	E	301	A1EVT	C22-C23-N25	2.76	119.01	116.24
2	E	301	A1EVT	C08-C09-C10	-2.75	114.07	121.58
2	F	301	A1EVT	C08-C09-C10	-2.71	114.16	121.58
2	D	301	A1EVT	C08-C07-C06	-2.70	108.38	112.46
2	E	301	A1EVT	C21-C22-C23	-2.68	113.18	118.37
2	C	301	A1EVT	C22-C23-N25	2.65	118.91	116.24
2	B	301	A1EVT	C22-C23-N25	2.60	118.86	116.24
2	C	301	A1EVT	C21-C22-C23	-2.60	113.34	118.37
2	B	301	A1EVT	C21-C22-C23	-2.55	113.43	118.37
2	C	301	A1EVT	C08-C09-C22	2.49	124.13	119.39
2	E	301	A1EVT	C19-C17-C16	-2.44	119.58	122.83
2	G	301	A1EVT	C08-C09-C22	2.38	123.91	119.39
2	G	301	A1EVT	O24-C23-N25	-2.34	120.13	121.96
2	E	301	A1EVT	C09-C08-C07	-2.31	108.15	112.08
2	B	301	A1EVT	O24-C23-N25	-2.31	120.16	121.96
2	C	301	A1EVT	O24-C23-N25	-2.25	120.20	121.96
2	B	301	A1EVT	C09-C08-C07	-2.25	108.25	112.08
2	E	301	A1EVT	C15-C16-C17	2.23	120.67	118.36
2	B	301	A1EVT	F32-C31-C30	-2.21	108.07	112.93
2	G	301	A1EVT	F32-C31-C30	-2.18	108.13	112.93
2	C	301	A1EVT	C11-C12-C21	2.11	121.49	118.54
2	E	301	A1EVT	C26-N25-C23	2.11	122.06	119.30
2	F	301	A1EVT	C19-C17-C16	-2.10	120.03	122.83
2	A	301	A1EVT	C19-C17-C16	-2.08	120.06	122.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	A1EVT	C14-C13-C12	-2.08	106.42	113.84
2	E	301	A1EVT	C11-C12-C21	2.07	121.44	118.54
2	C	301	A1EVT	C26-N25-C23	2.06	122.00	119.30
2	B	301	A1EVT	C06-C07-N25	-2.04	106.36	110.47
2	C	301	A1EVT	C06-C07-N25	-2.03	106.38	110.47
2	G	301	A1EVT	C19-C17-C16	-2.02	120.14	122.83
2	B	301	A1EVT	C11-C12-C21	2.02	121.37	118.54
2	A	301	A1EVT	C08-C07-C06	-2.01	109.43	112.46

There are no chirality outliers.

All (25) torsion outliers are listed below:

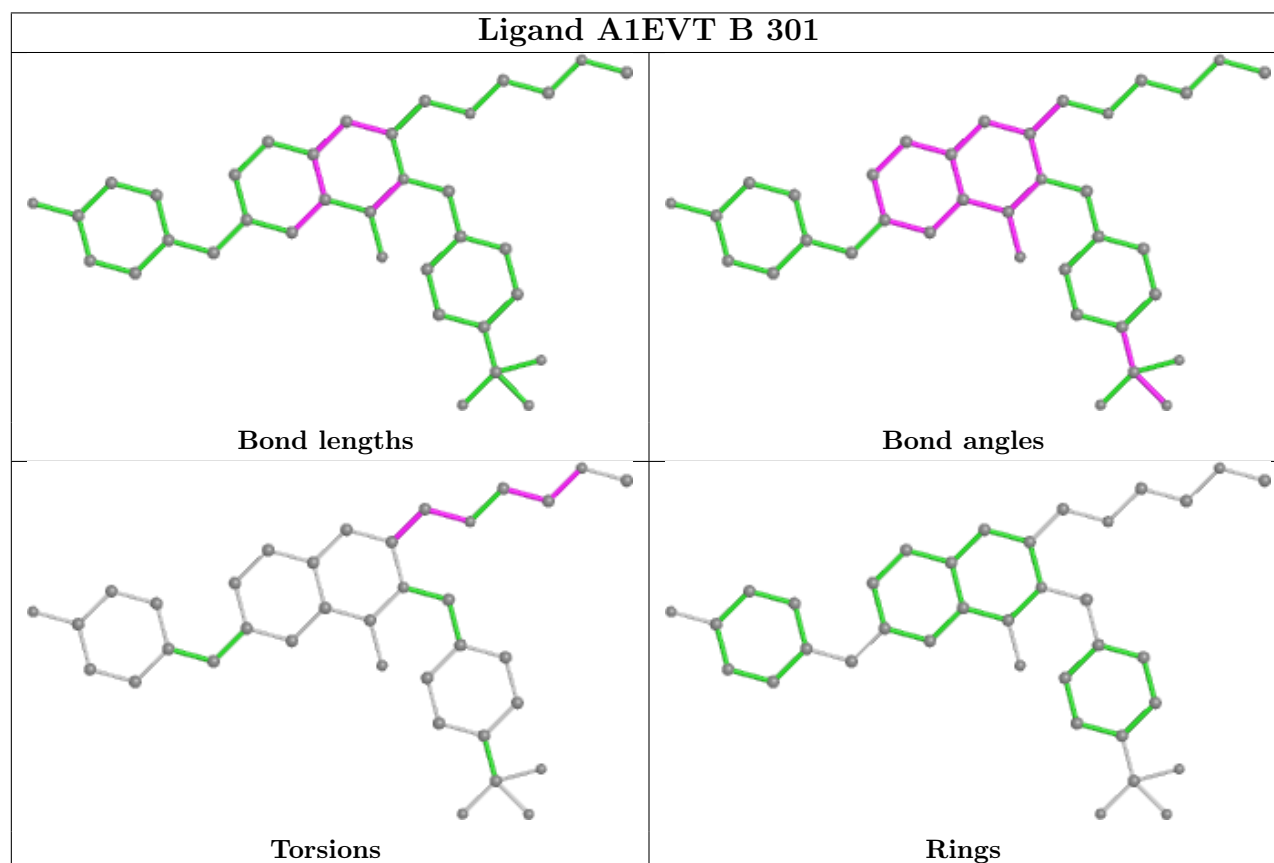
Mol	Chain	Res	Type	Atoms
2	A	301	A1EVT	O05-C06-C07-C08
2	A	301	A1EVT	O05-C06-C07-N25
2	B	301	A1EVT	O05-C06-C07-C08
2	C	301	A1EVT	O05-C06-C07-C08
2	C	301	A1EVT	O05-C06-C07-N25
2	D	301	A1EVT	O05-C06-C07-C08
2	D	301	A1EVT	O05-C06-C07-N25
2	G	301	A1EVT	C03-C04-O05-C06
2	E	301	A1EVT	C04-C03-O02-C01
2	F	301	A1EVT	O02-C03-C04-O05
2	D	301	A1EVT	O02-C03-C04-O05
2	E	301	A1EVT	O02-C03-C04-O05
2	G	301	A1EVT	O02-C03-C04-O05
2	C	301	A1EVT	O02-C03-C04-O05
2	A	301	A1EVT	O02-C03-C04-O05
2	B	301	A1EVT	O02-C03-C04-O05
2	A	301	A1EVT	C07-C06-O05-C04
2	B	301	A1EVT	C07-C06-O05-C04
2	G	301	A1EVT	C04-C03-O02-C01
2	C	301	A1EVT	C07-C06-O05-C04
2	F	301	A1EVT	C07-C06-O05-C04
2	E	301	A1EVT	C12-C13-C14-C20
2	E	301	A1EVT	C12-C13-C14-C15
2	F	301	A1EVT	C04-C03-O02-C01
2	B	301	A1EVT	C04-C03-O02-C01

There are no ring outliers.

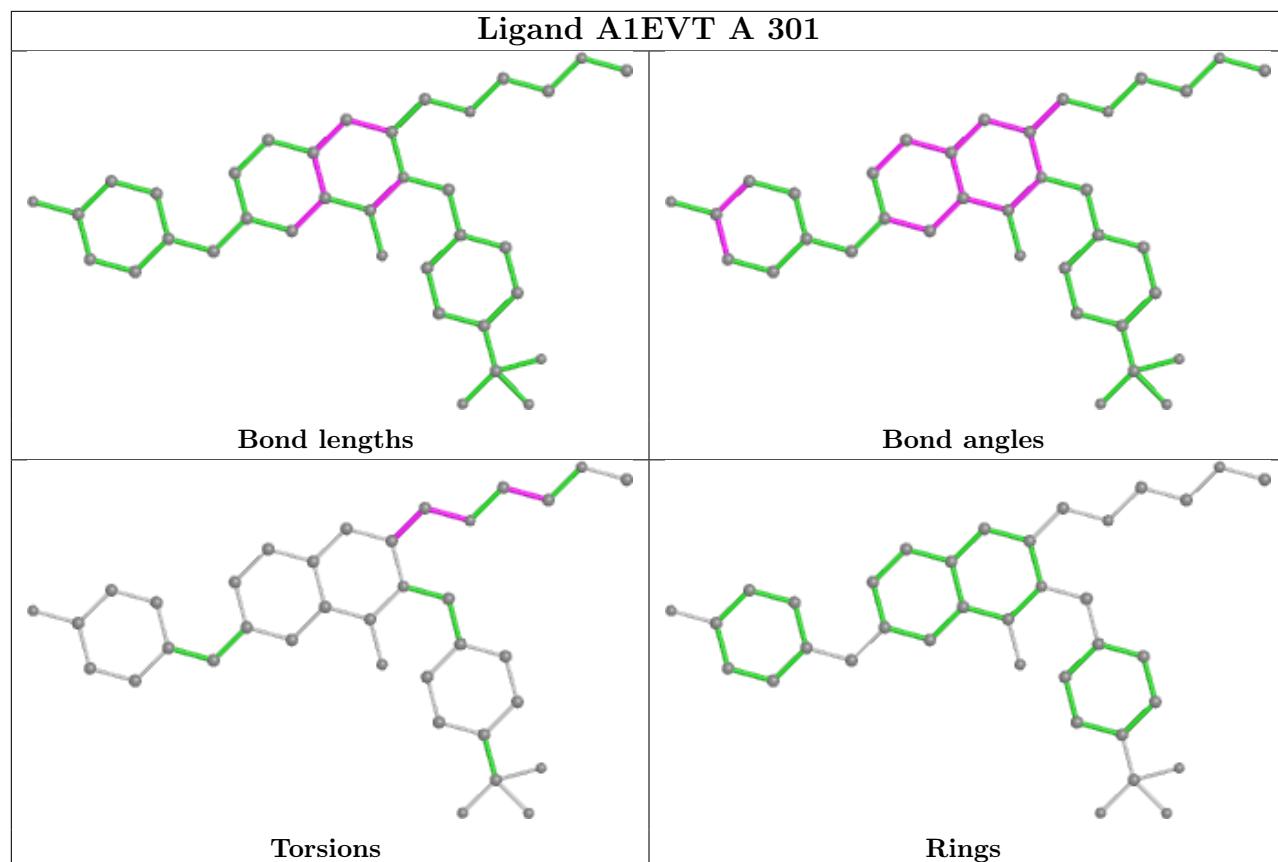
4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	301	A1EVT	1	0
2	F	301	A1EVT	2	0
2	G	301	A1EVT	3	0
2	D	301	A1EVT	1	0

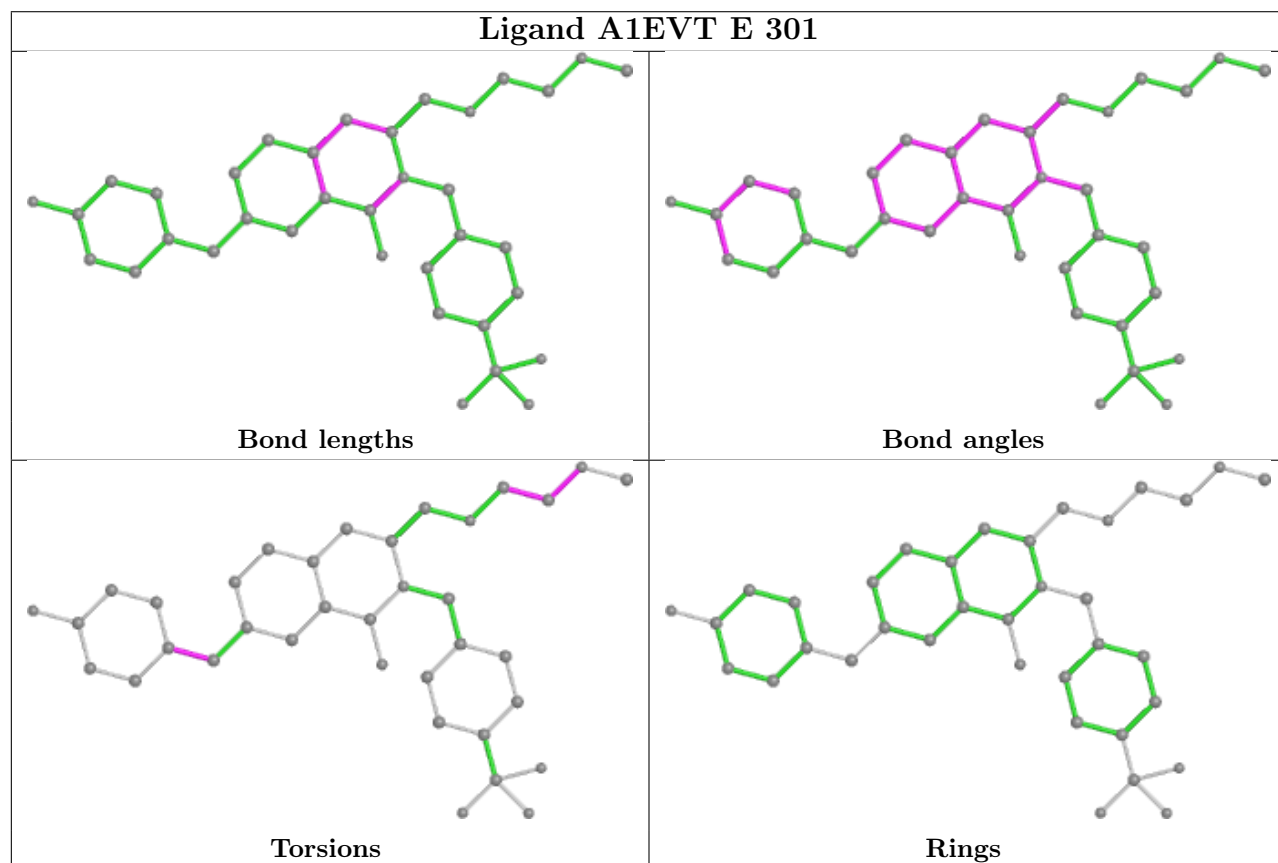
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.



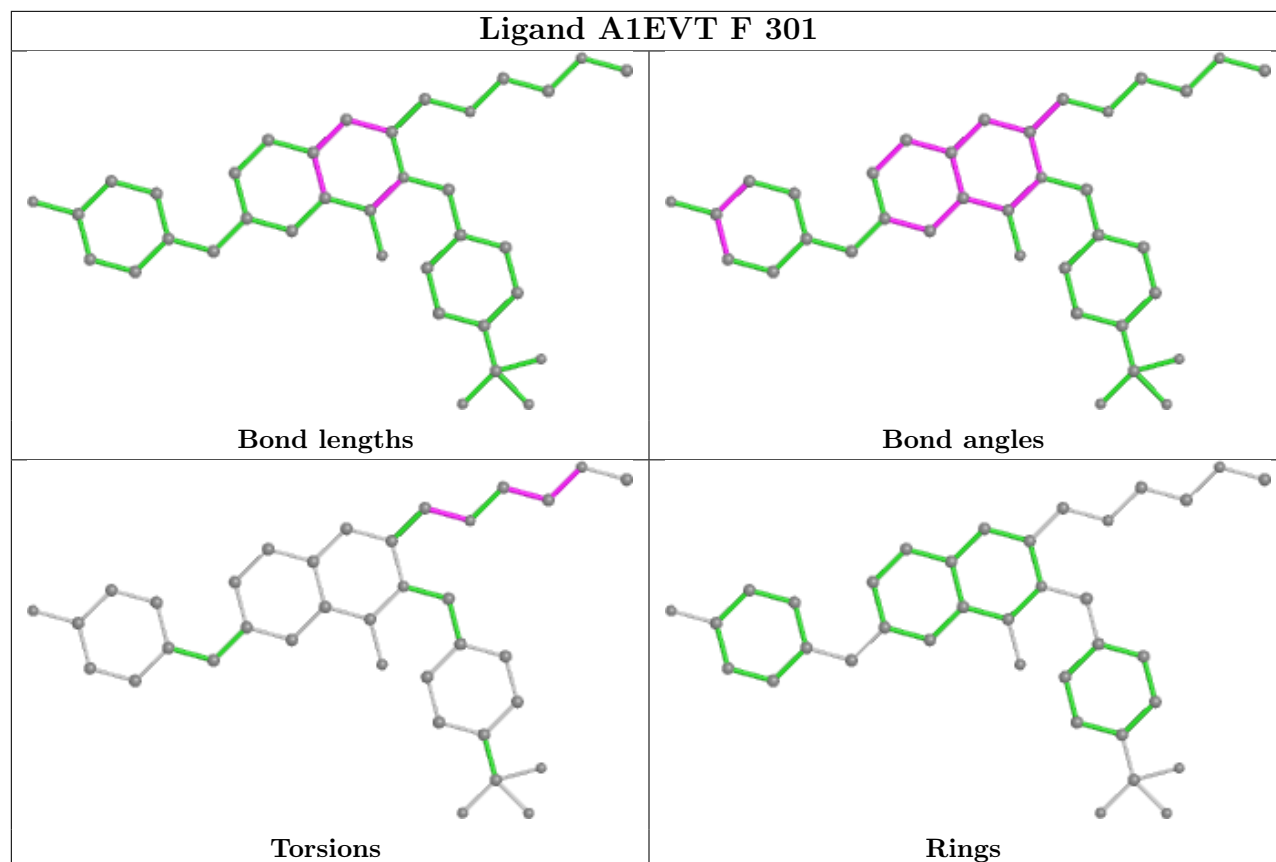
Ligand A1EVT A 301



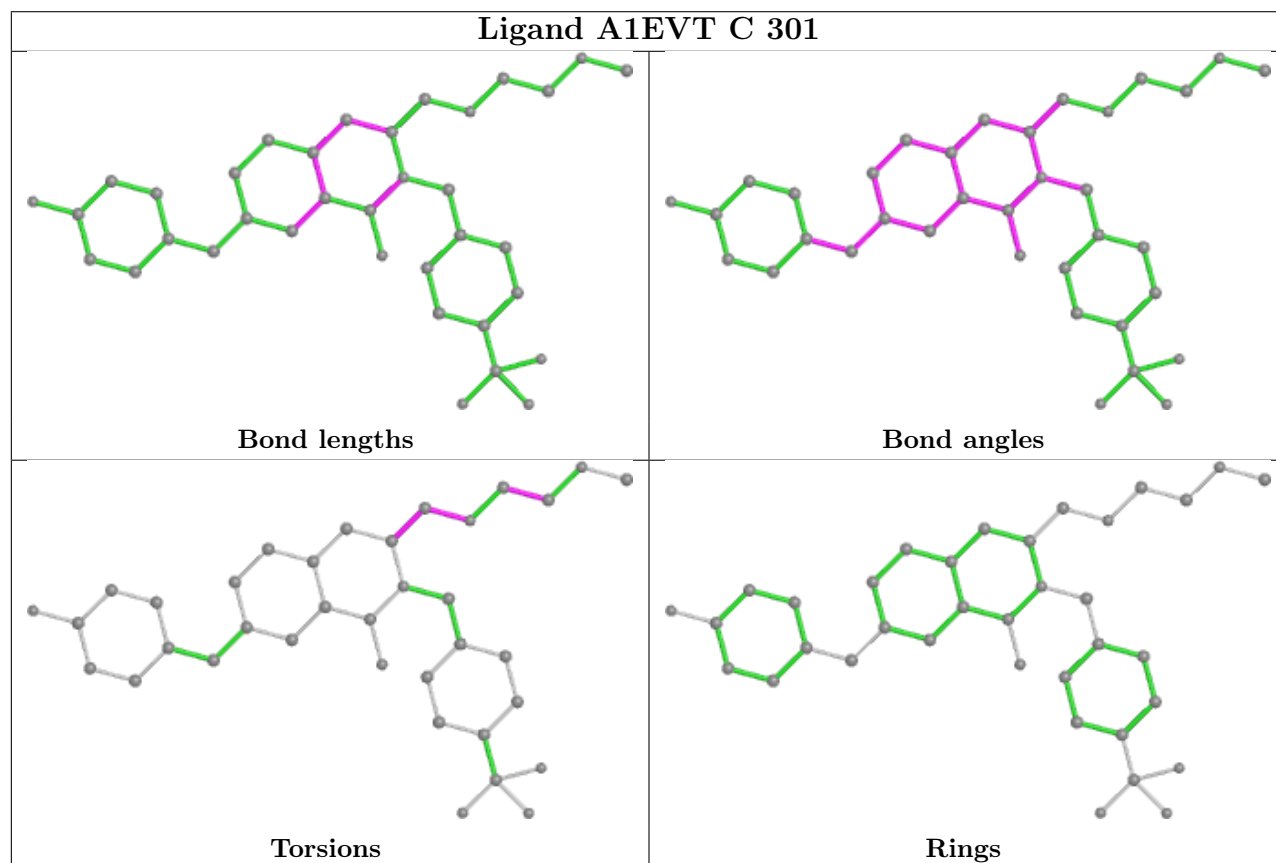
Ligand A1EVT E 301



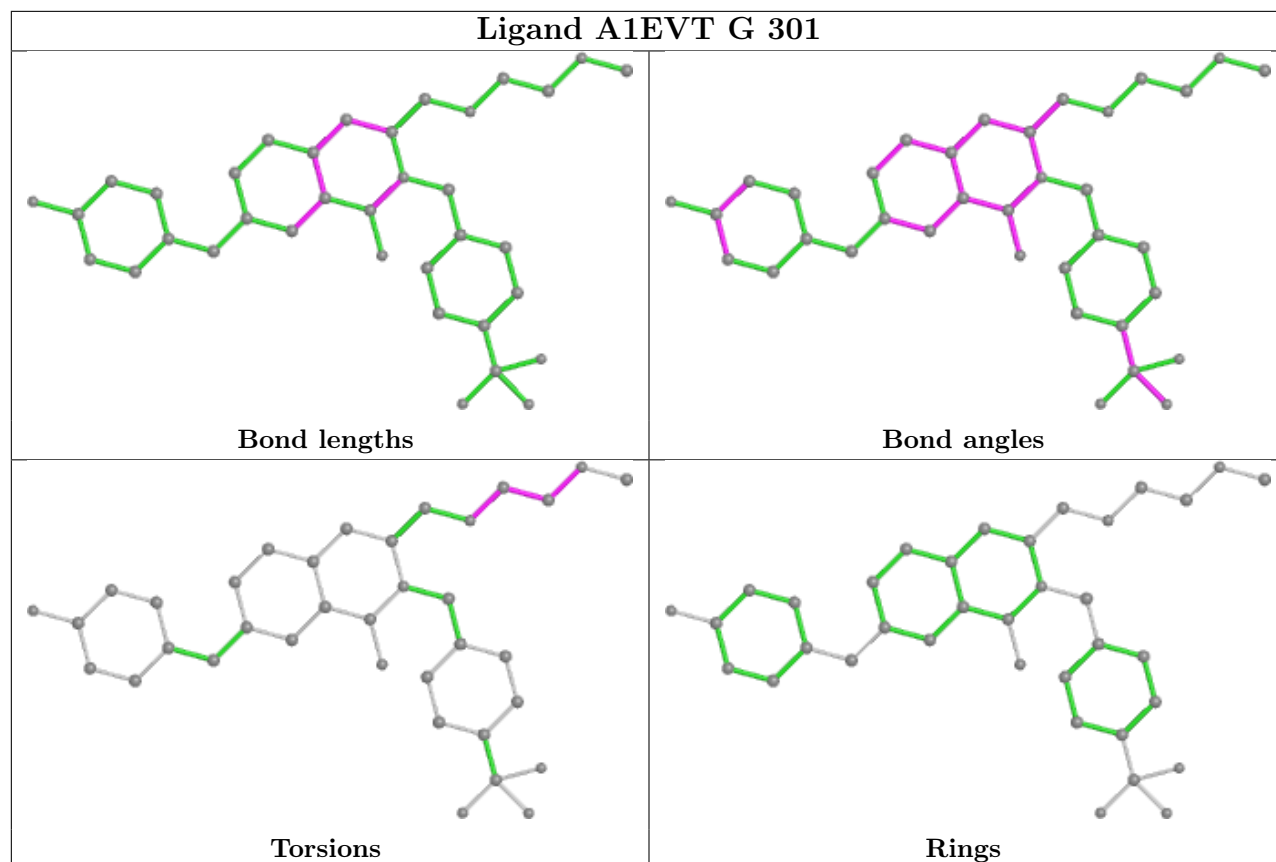
Ligand A1EVT F 301



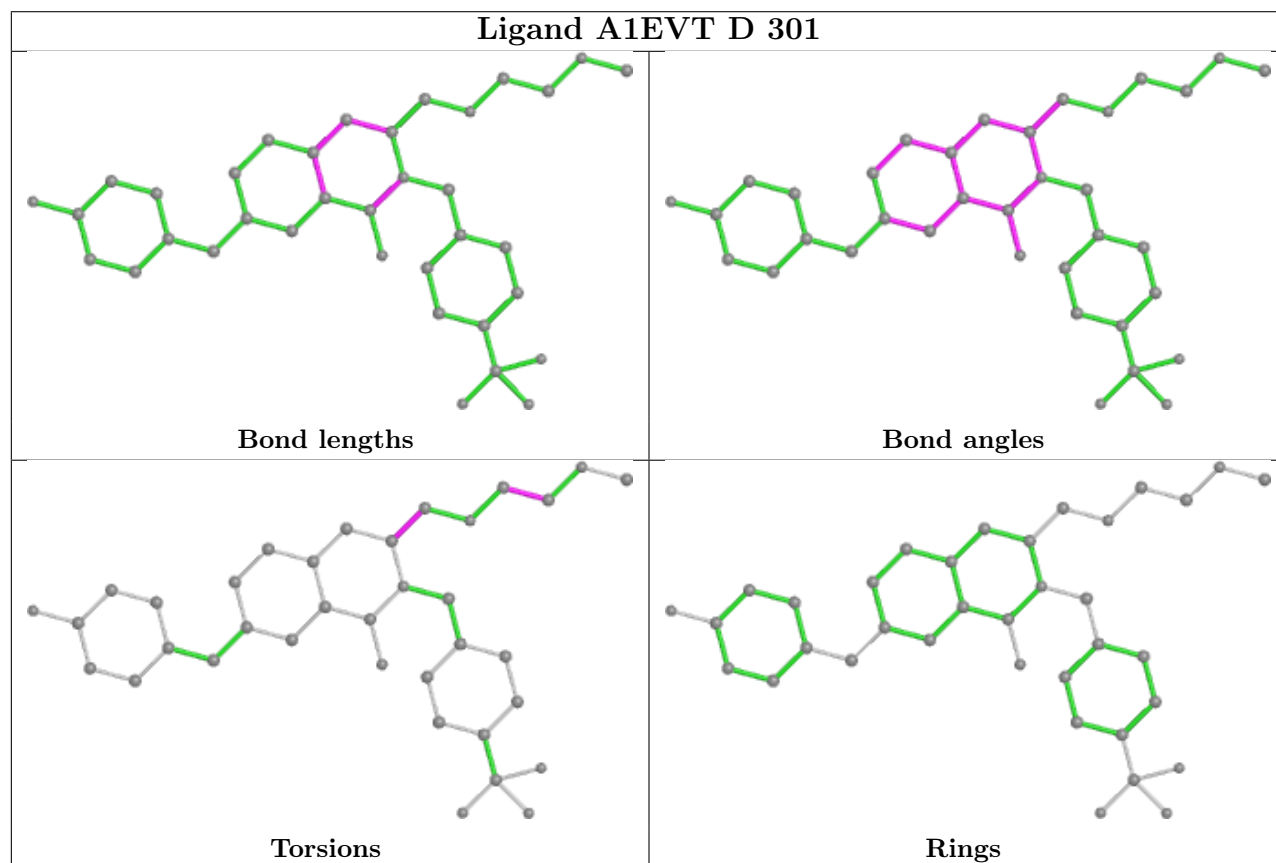
Ligand A1EVT C 301



Ligand A1EVT G 301



Ligand A1EVT D 301



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	175/194 (90%)	-0.49	2 (1%) 77 58	16, 38, 71, 115	2 (1%)
1	B	175/194 (90%)	-0.44	2 (1%) 77 58	17, 39, 69, 107	1 (0%)
1	C	180/194 (92%)	-0.54	1 (0%) 85 71	20, 33, 79, 102	1 (0%)
1	D	183/194 (94%)	-0.48	0 100 100	21, 35, 79, 107	2 (1%)
1	E	185/194 (95%)	-0.42	2 (1%) 77 58	22, 35, 76, 107	0
1	F	183/194 (94%)	-0.47	0 100 100	17, 37, 77, 109	1 (0%)
1	G	184/194 (94%)	-0.50	2 (1%) 77 58	19, 36, 77, 135	1 (0%)
All	All	1265/1358 (93%)	-0.48	9 (0%) 84 68	16, 36, 77, 135	8 (0%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	182	GLY	3.2
1	G	249	PRO	3.0
1	E	182	GLY	2.8
1	B	192	ALA	2.8
1	B	182	GLY	2.4
1	G	250	GLN	2.3
1	A	188	ALA	2.1
1	E	250	GLN	2.1
1	A	233[A]	MET	2.1

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates

There are no oligosaccharides in this entry.

6.4 Ligands

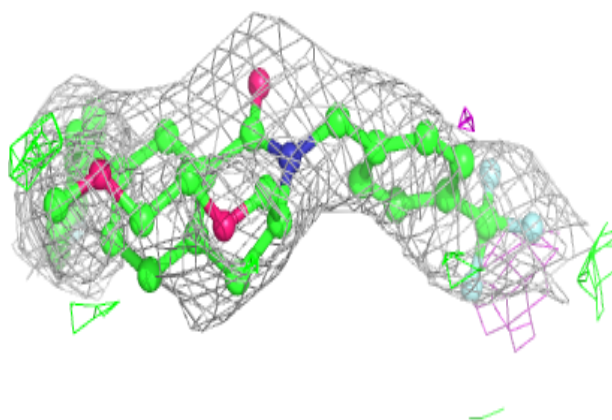
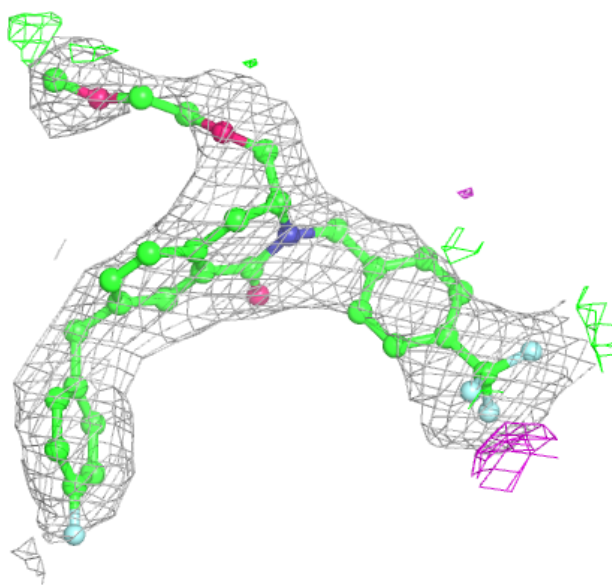
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	A1EVT	A	301	36/36	0.92	0.11	24,40,61,74	0
2	A1EVT	G	301	36/36	0.93	0.10	22,38,62,73	0
2	A1EVT	E	301	36/36	0.94	0.11	23,36,47,68	0
2	A1EVT	B	301	36/36	0.94	0.10	34,53,67,72	0
2	A1EVT	C	301	36/36	0.95	0.10	19,39,57,61	0
2	A1EVT	F	301	36/36	0.95	0.11	24,37,71,75	0
2	A1EVT	D	301	36/36	0.95	0.09	22,35,52,55	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.

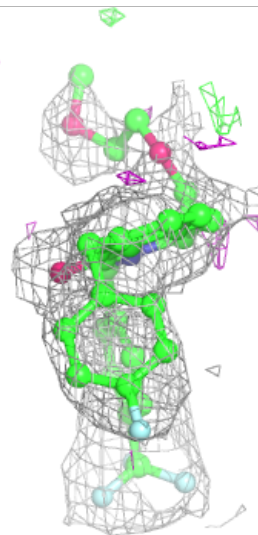
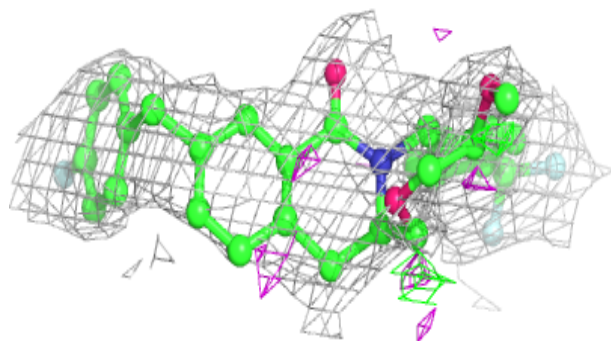
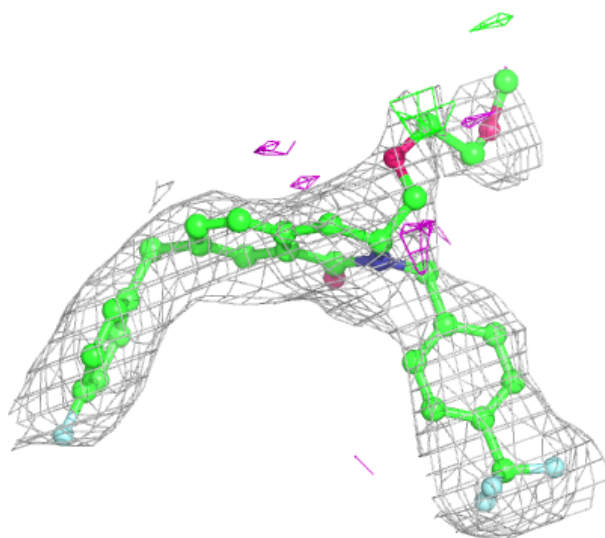
Electron density around A1EVT A 301:

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



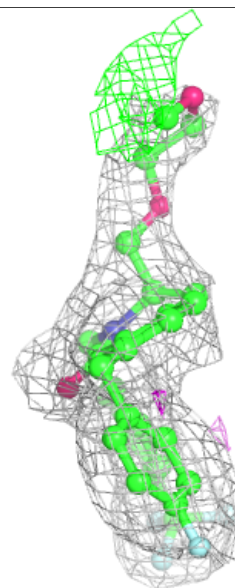
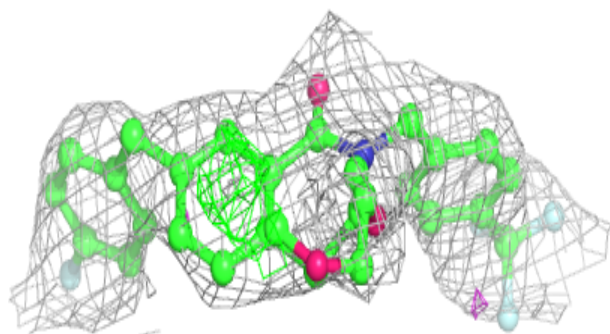
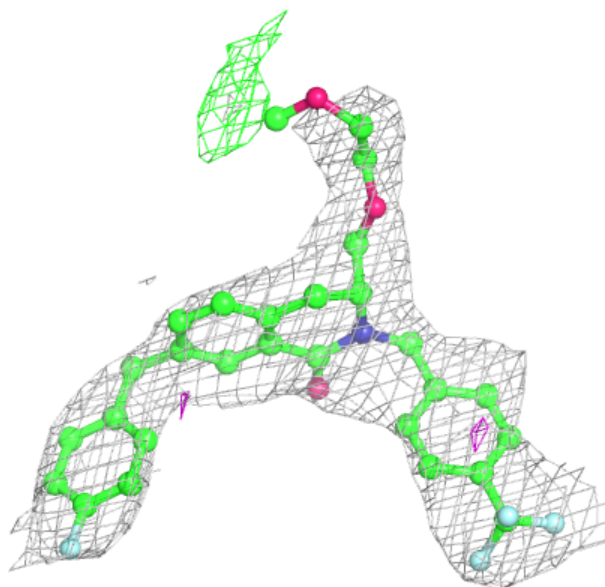
Electron density around A1EVT G 301:

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



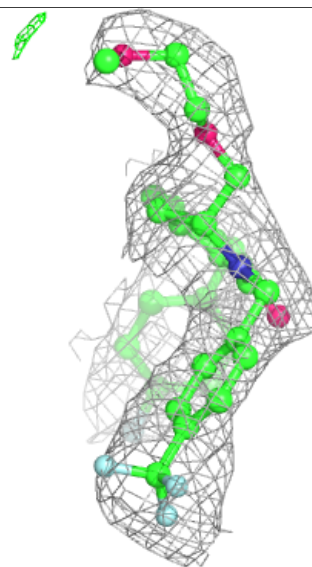
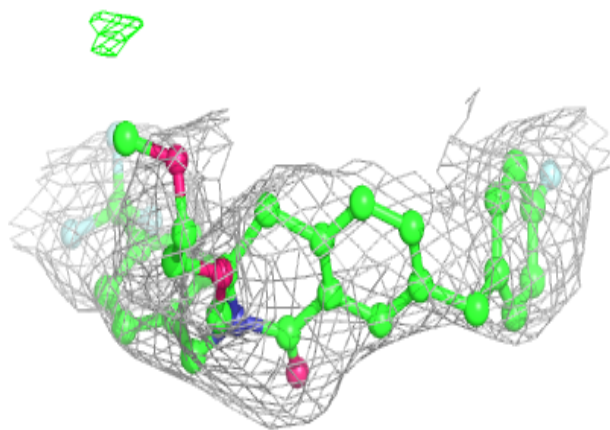
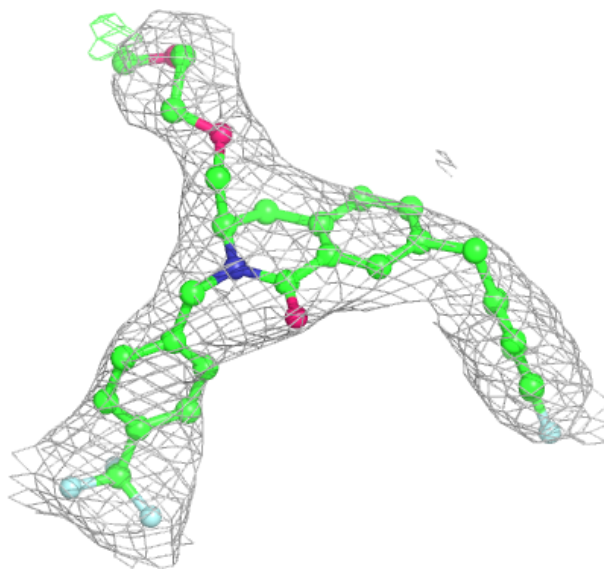
Electron density around A1EVT E 301:

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



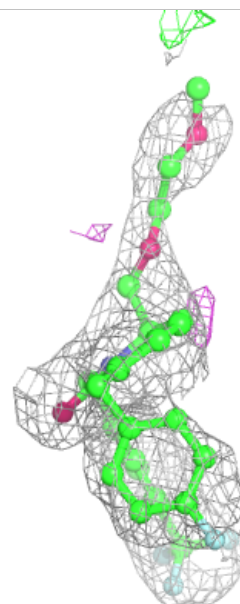
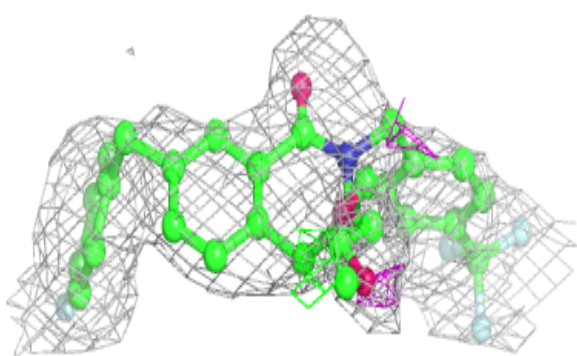
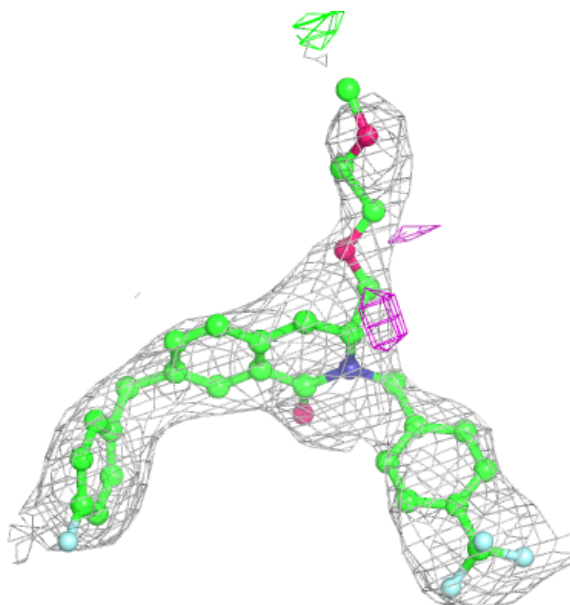
Electron density around A1EVT B 301:

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



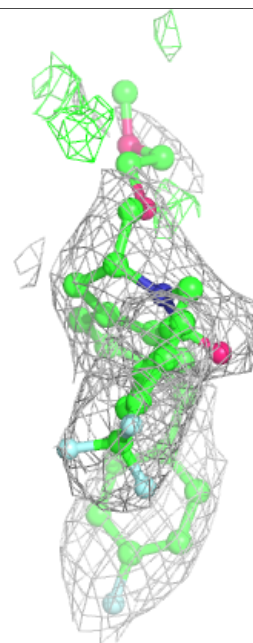
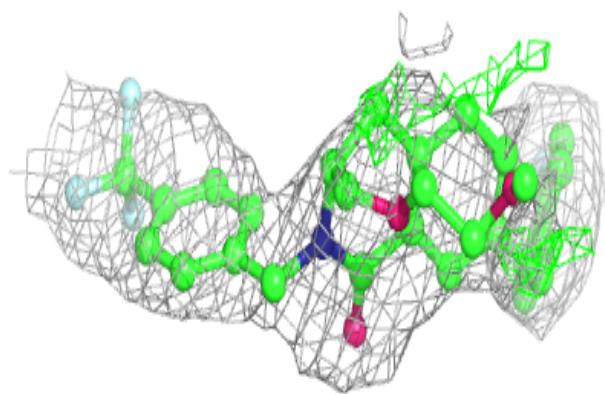
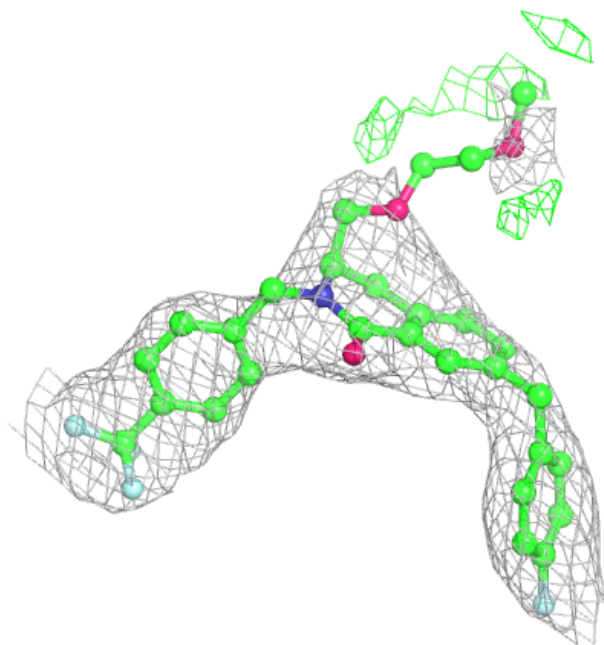
Electron density around A1EVT C 301:

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



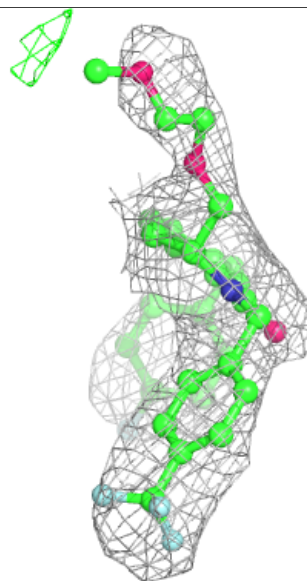
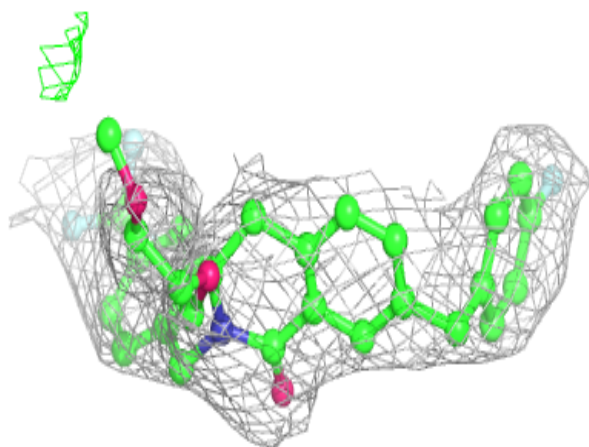
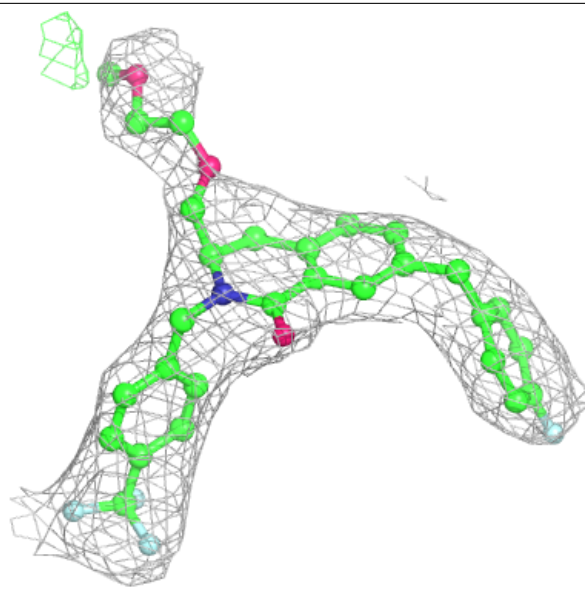
Electron density around A1EVT F 301:

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



Electron density around A1EVT D 301:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.