



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 2, 2023 – 02:11 PM EDT

PDB ID : 8DLA
Title : ClpP2 from Chlamydia trachomatis bound by MAS1-12
Authors : Azadmanesh, J.; Struble, L.R.; Seleem, M.A.; Ouellette, S.; Conda-Sheridan, M.; Borgstahl, G.E.O.
Deposited on : 2022-07-07
Resolution : 2.66 Å (reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.34
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.34

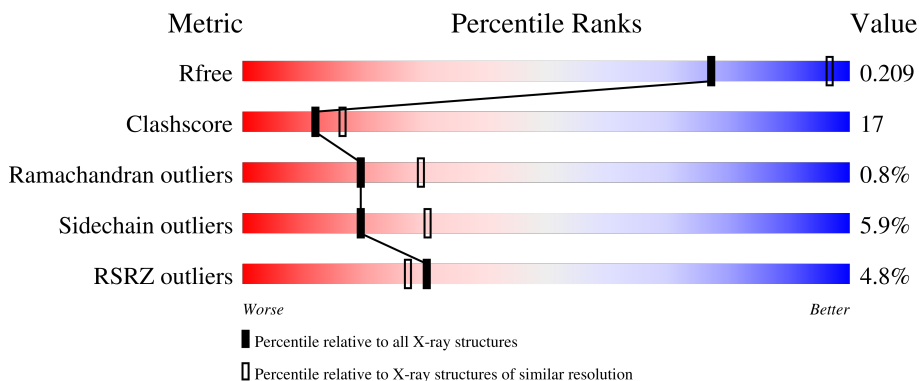
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

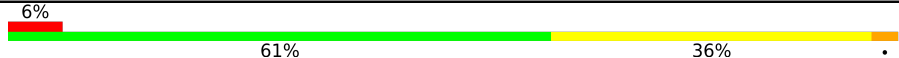
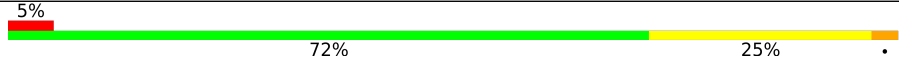


The reported resolution of this entry is 2.66 Å.

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}	130704	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

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	203	
1	B	203	
1	C	203	
1	D	203	
1	E	203	

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Mol	Chain	Length	Quality of chain	
1	F	203	6%	68% 28% ..
1	G	203	3%	65% 31% ..
1	H	203	5%	66% 30% ..
1	I	203	4%	67% 30% .
1	J	203	3%	65% 32% .
1	K	203	3%	67% 30% .
1	L	203	4%	70% 25% .
1	M	203	6%	68% 27% .
1	N	203	7%	69% 26% ..

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
3	NA	D	302	-	-	-	X

2 Entry composition [i](#)

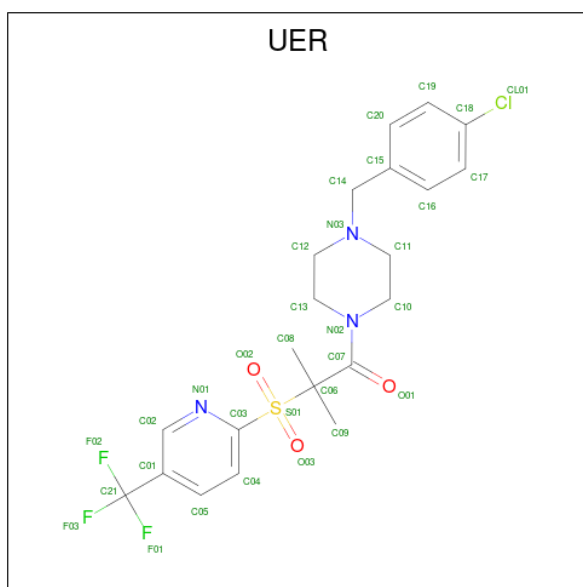
There are 5 unique types of molecules in this entry. The entry contains 22282 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	203	1542	974	256	301	11	0	0	0
1	B	203	1542	974	256	301	11	0	0	0
1	C	203	1542	974	256	301	11	0	0	0
1	D	203	1542	974	256	301	11	0	0	0
1	E	203	1542	974	256	301	11	0	0	0
1	F	203	1542	974	256	301	11	0	0	0
1	G	203	1542	974	256	301	11	0	0	0
1	H	203	1542	974	256	301	11	0	0	0
1	I	203	1542	974	256	301	11	0	0	0
1	J	203	1542	974	256	301	11	0	0	0
1	K	203	1542	974	256	301	11	0	0	0
1	L	203	1542	974	256	301	11	0	0	0
1	M	203	1542	974	256	301	11	0	0	0
1	N	203	1542	974	256	301	11	0	0	0

- Molecule 2 is 1-{4-[(4-chlorophenyl)methyl]piperazin-1-yl}-2-methyl-2-[5-(trifluoromethyl)pyridine-2-sulfonyl]propan-1-one (three-letter code: UER) (formula: C₂₁H₂₃ClF₃N₃O₃S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	
			Total	C	Cl	F	N	O			S
2	A	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		
2	A	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		
2	B	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		
2	D	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		
2	G	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		
2	M	1	Total	C	Cl	F	N	O	S	0	0
			32	21	1	3	3	3	1		

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

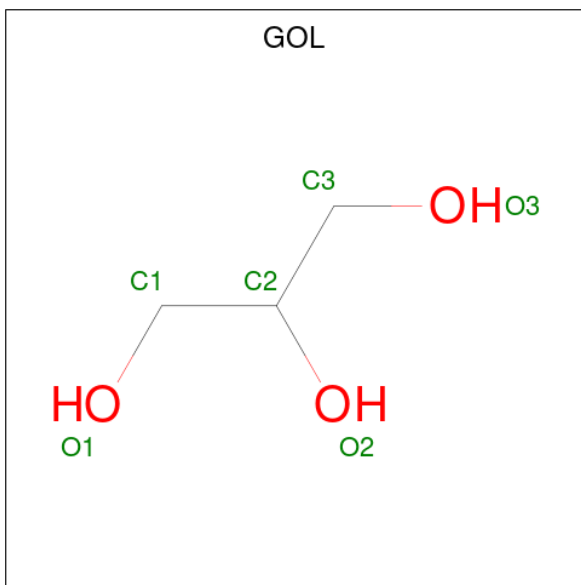
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Na	0	0
			1	1		
3	D	1	Total	Na	0	0
			1	1		
3	E	1	Total	Na	0	0
			1	1		
3	F	1	Total	Na	0	0
			1	1		
3	G	1	Total	Na	0	0
			1	1		
3	H	1	Total	Na	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	L	1	Total Na 1 1	0	0
3	N	1	Total Na 1 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	G	1	Total C O 6 3 3	0	0
4	N	1	Total C O 6 3 3	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	31	Total O 31 31	0	0
5	B	40	Total O 40 40	0	0
5	C	22	Total O 22 22	0	0

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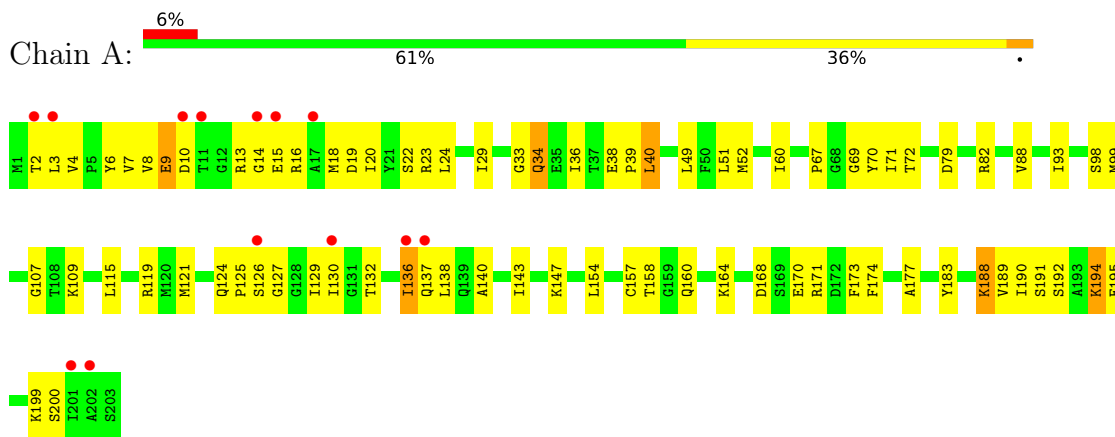
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	34	Total 34	O 34	0	0
5	E	37	Total 37	O 37	0	0
5	F	49	Total 49	O 49	0	0
5	G	31	Total 31	O 31	0	0
5	H	30	Total 30	O 30	0	0
5	I	31	Total 31	O 31	0	0
5	J	30	Total 30	O 30	0	0
5	K	43	Total 43	O 43	0	0
5	L	29	Total 29	O 29	0	0
5	M	36	Total 36	O 36	0	0
5	N	27	Total 27	O 27	0	0

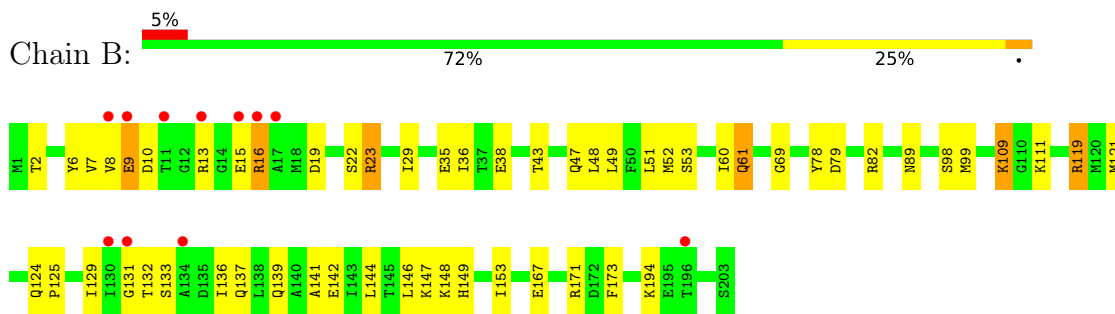
3 Residue-property plots

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.

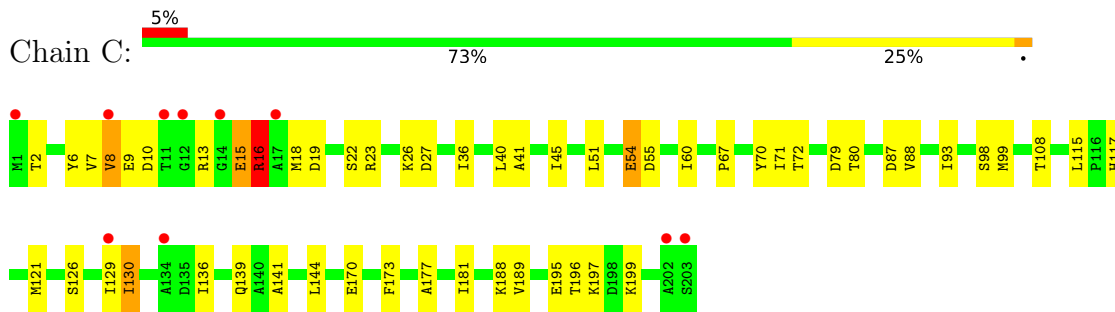
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



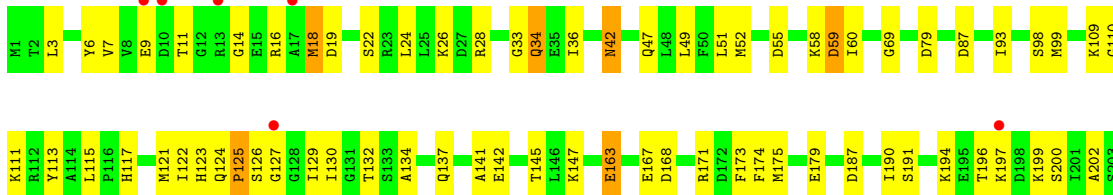
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



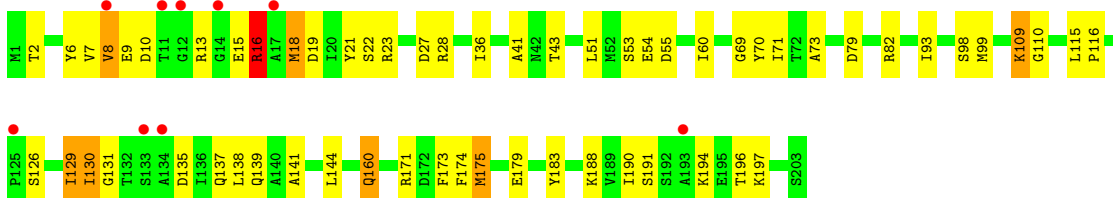
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



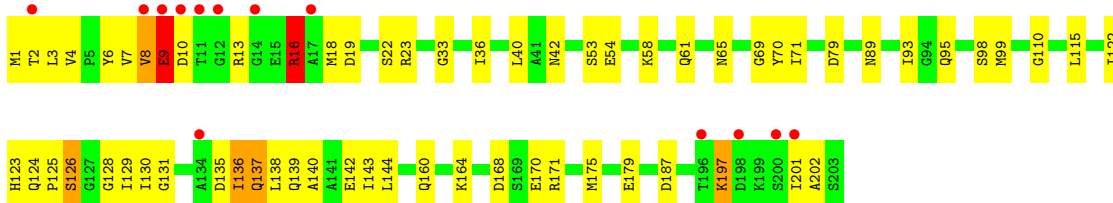
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



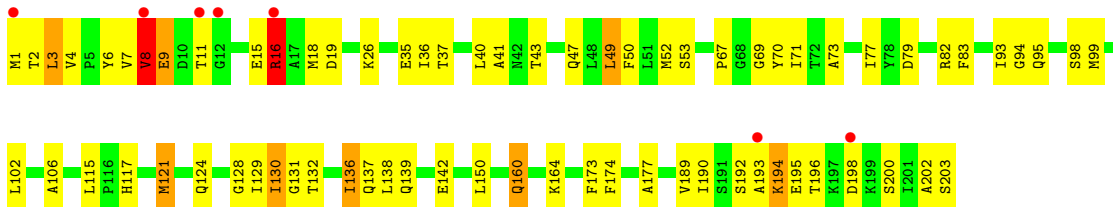
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



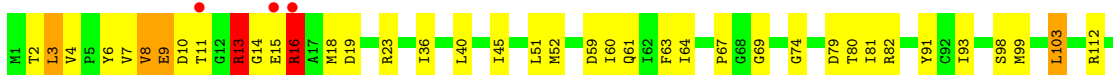
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



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- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

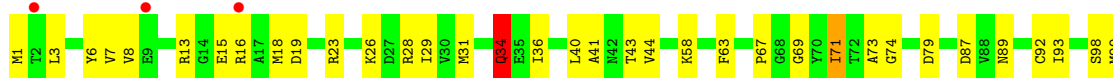




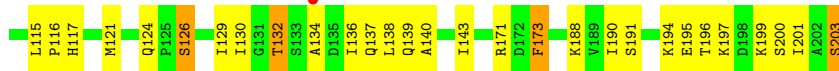
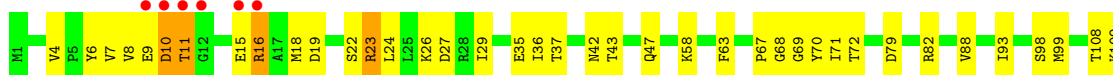
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



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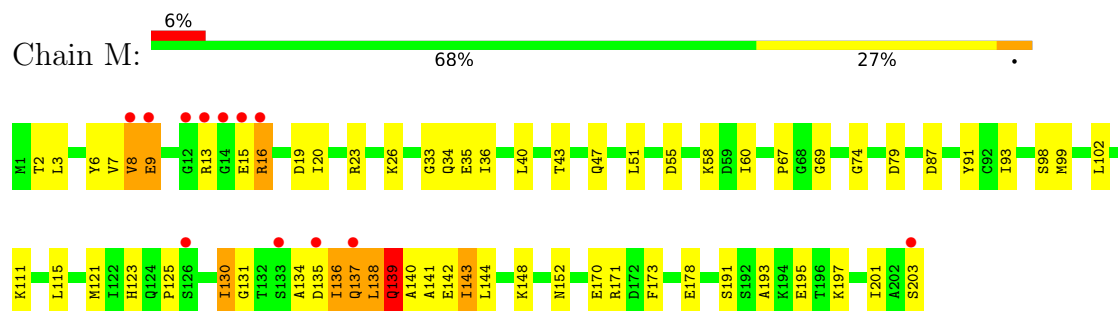
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



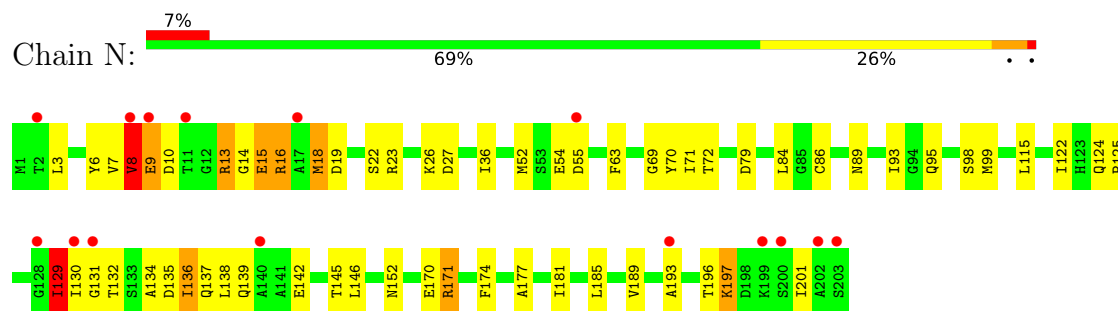
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	97.00Å 98.01Å 97.97Å 97.16° 114.15° 114.16°	Depositor
Resolution (Å)	33.09 – 2.66 33.09 – 2.66	Depositor EDS
% Data completeness (in resolution range)	78.2 (33.09-2.66) 78.1 (33.09-2.66)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.22 (at 2.65Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.173 , 0.210 0.172 , 0.209	Depositor DCC
R_{free} test set	2033 reflections (3.21%)	wwPDB-VP
Wilson B-factor (Å ²)	36.4	Xtrriage
Anisotropy	0.018	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 25.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.449 for -h,-l,-k	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	22282	wwPDB-VP
Average B, all atoms (Å ²)	44.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.36% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: NA, GOL, UER

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	0.27	0/1562	0.54	0/2106
1	B	0.29	0/1562	0.53	0/2106
1	C	0.43	3/1562 (0.2%)	0.87	5/2106 (0.2%)
1	D	0.27	0/1562	0.55	0/2106
1	E	0.33	0/1562	0.60	2/2106 (0.1%)
1	F	0.29	0/1562	0.64	3/2106 (0.1%)
1	G	0.52	3/1562 (0.2%)	0.68	3/2106 (0.1%)
1	H	0.38	2/1562 (0.1%)	0.71	4/2106 (0.2%)
1	I	0.36	1/1562 (0.1%)	1.26	10/2106 (0.5%)
1	J	0.35	0/1562	0.64	2/2106 (0.1%)
1	K	0.29	0/1562	0.55	0/2106
1	L	0.28	0/1562	0.56	1/2106 (0.0%)
1	M	0.30	0/1562	0.59	2/2106 (0.1%)
1	N	0.33	0/1562	0.75	7/2106 (0.3%)
All	All	0.34	9/21868 (0.0%)	0.70	39/29484 (0.1%)

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	D	0	2
1	E	0	1
1	F	0	3
1	G	0	1
1	H	0	4
1	I	0	1
1	J	0	1
1	M	0	1
1	N	0	4

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Mol	Chain	#Chirality outliers	#Planarity outliers
All	All	0	18

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	9	GLU	CD-OE1	-11.66	1.12	1.25
1	C	16	ARG	CB-CG	-6.59	1.34	1.52
1	C	16	ARG	CG-CD	-6.53	1.35	1.51
1	I	9	GLU	CB-CG	5.60	1.62	1.52
1	G	9	GLU	CD-OE2	5.49	1.31	1.25

The worst 5 of 39 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	9	GLU	OE1-CD-OE2	-38.23	77.42	123.30
1	C	16	ARG	CG-CD-NE	-25.66	57.92	111.80
1	I	9	GLU	CG-CD-OE1	21.69	161.69	118.30
1	H	3	LEU	CA-CB-CG	13.67	146.73	115.30
1	I	9	GLU	CG-CD-OE2	-13.53	91.24	118.30

There are no chirality outliers.

5 of 18 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	125	PRO	Peptide
1	D	127	GLY	Peptide
1	E	16	ARG	Sidechain
1	F	8	VAL	Peptide
1	F	9	GLU	Sidechain

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	1542	0	1578	81	0
1	B	1542	0	1578	47	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1542	0	1577	64	0
1	D	1542	0	1578	62	0
1	E	1542	0	1578	57	0
1	F	1542	0	1577	70	0
1	G	1542	0	1577	71	0
1	H	1542	0	1578	65	0
1	I	1542	0	1578	63	0
1	J	1542	0	1578	67	0
1	K	1542	0	1578	74	0
1	L	1542	0	1578	47	0
1	M	1542	0	1578	67	0
1	N	1542	0	1578	74	0
2	A	64	0	0	3	0
2	B	32	0	0	0	0
2	D	32	0	0	0	0
2	G	32	0	0	1	0
2	M	32	0	0	1	0
3	B	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
3	L	1	0	0	0	0
3	N	1	0	0	0	0
4	B	6	0	8	0	0
4	C	6	0	8	0	0
4	G	6	0	8	3	0
4	N	6	0	8	2	0
5	A	31	0	0	4	0
5	B	40	0	0	1	0
5	C	22	0	0	1	0
5	D	34	0	0	3	0
5	E	37	0	0	2	0
5	F	49	0	0	1	0
5	G	31	0	0	1	0
5	H	30	0	0	8	0
5	I	31	0	0	2	0
5	J	30	0	0	0	0
5	K	43	0	0	5	0
5	L	29	0	0	1	0
5	M	36	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	N	27	0	0	2	0
All	All	22282	0	22121	754	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 17.

The worst 5 of 754 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:9:GLU:OE2	1:C:23:ARG:NE	1.83	1.12
1:J:34:GLN:HG3	1:J:40:LEU:CD1	1.84	1.07
1:C:129:ILE:HD12	1:H:138:LEU:HD21	1.40	1.01
1:J:34:GLN:HG3	1:J:40:LEU:HD12	1.46	0.96
1:L:124:GLN:HB3	1:M:139:GLN:NE2	1.81	0.94

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	201/203 (99%)	185 (92%)	16 (8%)	0	100	100
1	B	201/203 (99%)	182 (90%)	19 (10%)	0	100	100
1	C	201/203 (99%)	180 (90%)	20 (10%)	1 (0%)	29	43
1	D	201/203 (99%)	184 (92%)	17 (8%)	0	100	100
1	E	201/203 (99%)	180 (90%)	18 (9%)	3 (2%)	10	15
1	F	201/203 (99%)	184 (92%)	14 (7%)	3 (2%)	10	15
1	G	201/203 (99%)	184 (92%)	15 (8%)	2 (1%)	15	23
1	H	201/203 (99%)	181 (90%)	19 (10%)	1 (0%)	29	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	I	201/203 (99%)	182 (90%)	17 (8%)	2 (1%)	15 23
1	J	201/203 (99%)	179 (89%)	20 (10%)	2 (1%)	15 23
1	K	201/203 (99%)	176 (88%)	24 (12%)	1 (0%)	29 43
1	L	201/203 (99%)	180 (90%)	17 (8%)	4 (2%)	7 10
1	M	201/203 (99%)	182 (90%)	17 (8%)	2 (1%)	15 23
1	N	201/203 (99%)	185 (92%)	15 (8%)	1 (0%)	29 43
All	All	2814/2842 (99%)	2544 (90%)	248 (9%)	22 (1%)	19 29

5 of 22 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	J	129	ILE
1	M	130	ILE
1	C	130	ILE
1	F	136	ILE
1	G	130	ILE

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	167/167 (100%)	156 (93%)	11 (7%)	16 25
1	B	167/167 (100%)	156 (93%)	11 (7%)	16 25
1	C	167/167 (100%)	162 (97%)	5 (3%)	41 59
1	D	167/167 (100%)	159 (95%)	8 (5%)	25 39
1	E	167/167 (100%)	154 (92%)	13 (8%)	12 20
1	F	167/167 (100%)	159 (95%)	8 (5%)	25 39
1	G	167/167 (100%)	160 (96%)	7 (4%)	30 45
1	H	167/167 (100%)	153 (92%)	14 (8%)	11 16
1	I	167/167 (100%)	159 (95%)	8 (5%)	25 39
1	J	167/167 (100%)	159 (95%)	8 (5%)	25 39

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	K	167/167 (100%)	157 (94%)	10 (6%)	19	30
1	L	167/167 (100%)	153 (92%)	14 (8%)	11	16
1	M	167/167 (100%)	156 (93%)	11 (7%)	16	25
1	N	167/167 (100%)	156 (93%)	11 (7%)	16	25
All	All	2338/2338 (100%)	2199 (94%)	139 (6%)	19	30

5 of 139 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	196	THR
1	M	8	VAL
1	N	10	ASP
1	F	1	MET
1	E	194	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	J	34	GLN
1	M	47	GLN
1	J	123	HIS
1	L	42	ASN
1	N	95	GLN

5.3.3 RNA [i](#)

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 monosaccharides in this entry.

5.6 Ligand geometry

Of 18 ligands modelled in this entry, 8 are monoatomic - leaving 10 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	UER	A	301	-	32,34,34	6.84	11 (34%)	45,52,52	3.39	19 (42%)
2	UER	B	301	-	32,34,34	6.88	10 (31%)	45,52,52	2.81	16 (35%)
2	UER	G	302	-	32,34,34	6.86	11 (34%)	45,52,52	3.27	16 (35%)
4	GOL	G	301	-	5,5,5	0.91	0	5,5,5	0.95	0
4	GOL	N	301	-	5,5,5	0.94	0	5,5,5	0.97	0
2	UER	A	302	-	32,34,34	6.86	10 (31%)	45,52,52	3.10	17 (37%)
4	GOL	C	301	-	5,5,5	0.89	0	5,5,5	0.96	0
2	UER	M	301	-	32,34,34	6.87	11 (34%)	45,52,52	3.19	17 (37%)
2	UER	D	301	-	32,34,34	6.87	11 (34%)	45,52,52	3.06	16 (35%)
4	GOL	B	303	-	5,5,5	0.92	0	5,5,5	0.97	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	UER	A	301	-	-	15/31/45/45	0/3/3/3
2	UER	B	301	-	-	7/31/45/45	0/3/3/3
2	UER	G	302	-	-	17/31/45/45	0/3/3/3
4	GOL	G	301	-	-	0/4/4/4	-
4	GOL	N	301	-	-	2/4/4/4	-
2	UER	A	302	-	-	11/31/45/45	0/3/3/3
4	GOL	C	301	-	-	0/4/4/4	-
2	UER	M	301	-	-	18/31/45/45	0/3/3/3
2	UER	D	301	-	-	5/31/45/45	0/3/3/3
4	GOL	B	303	-	-	0/4/4/4	-

The worst 5 of 64 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	302	UER	O02-S01	24.96	1.65	1.44
2	B	301	UER	O03-S01	24.94	1.65	1.44
2	A	301	UER	O02-S01	24.93	1.65	1.44
2	D	301	UER	O02-S01	24.91	1.65	1.44
2	B	301	UER	O02-S01	24.90	1.65	1.44

The worst 5 of 101 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	M	301	UER	O03-S01-O02	-10.01	107.98	118.98
2	A	301	UER	C06-C07-N02	9.81	130.13	120.90
2	G	302	UER	O03-S01-O02	-9.67	108.35	118.98
2	D	301	UER	O03-S01-O02	-9.55	108.49	118.98
2	A	302	UER	O03-S01-O02	-9.05	109.04	118.98

There are no chirality outliers.

5 of 75 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	UER	C04-C03-S01-O02
2	A	301	UER	N01-C03-S01-O02
2	A	301	UER	C08-C06-C07-O01
2	A	301	UER	C09-C06-C07-N02
2	A	301	UER	C07-C06-S01-O02

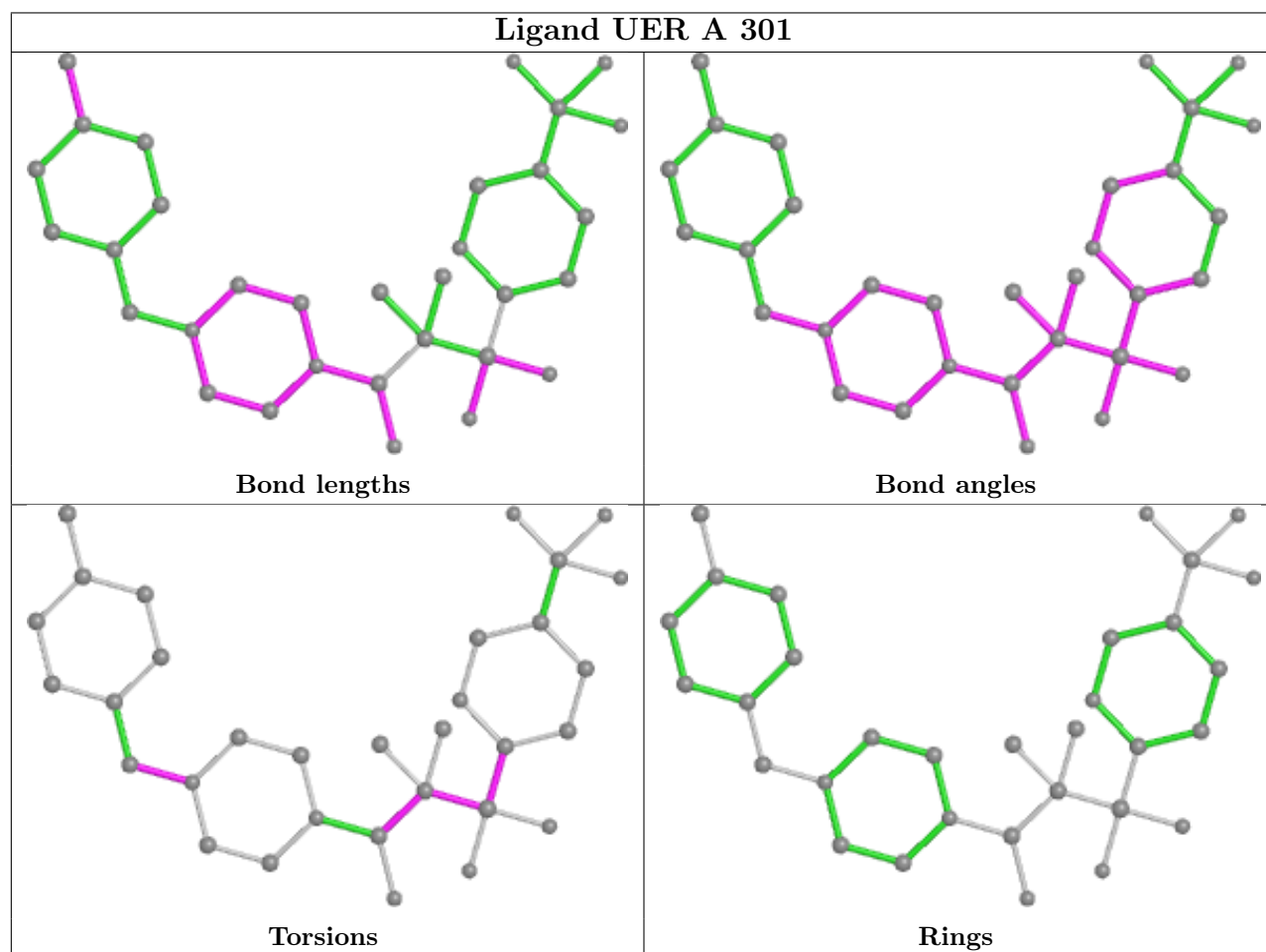
There are no ring outliers.

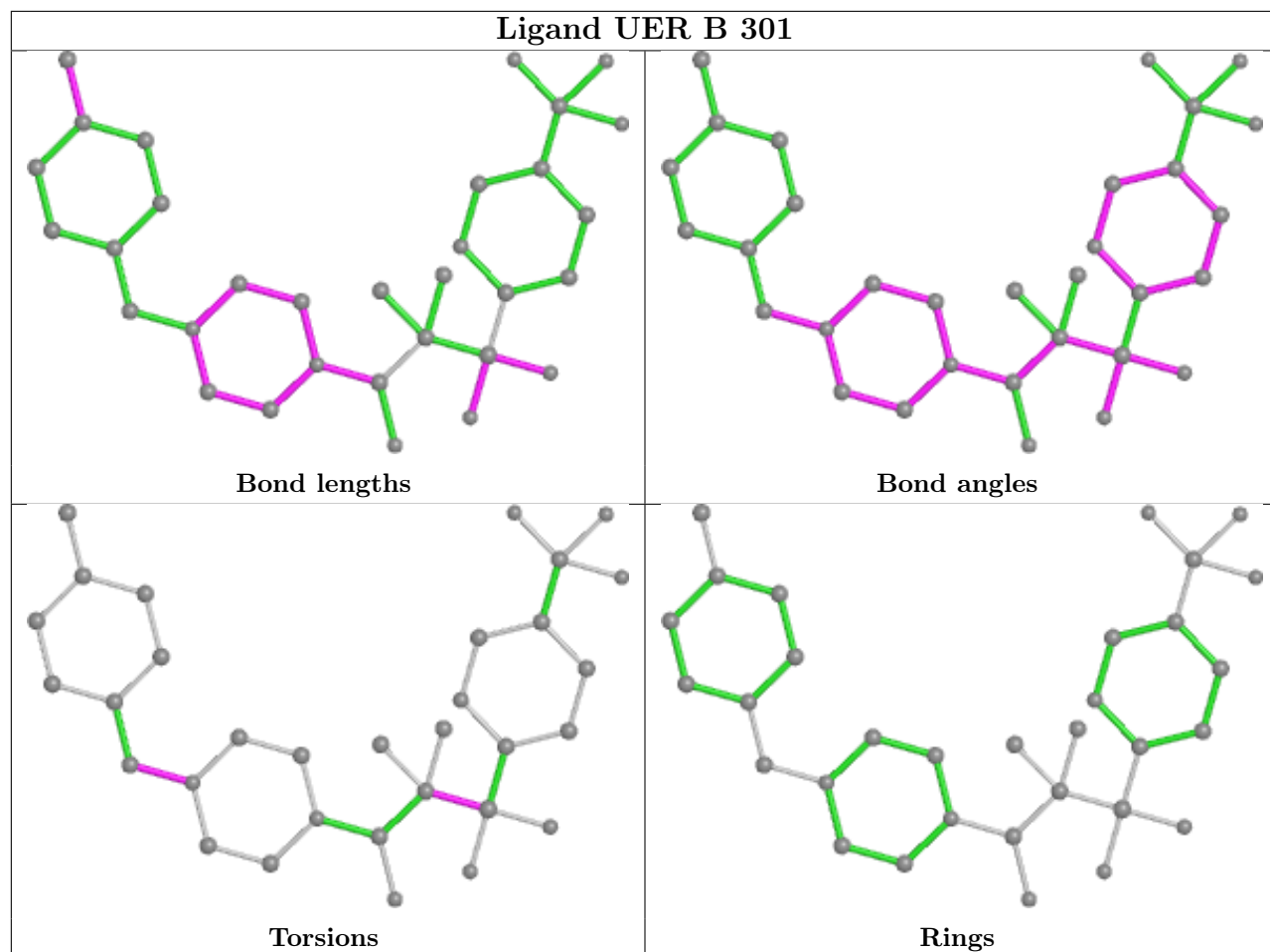
6 monomers are involved in 10 short contacts:

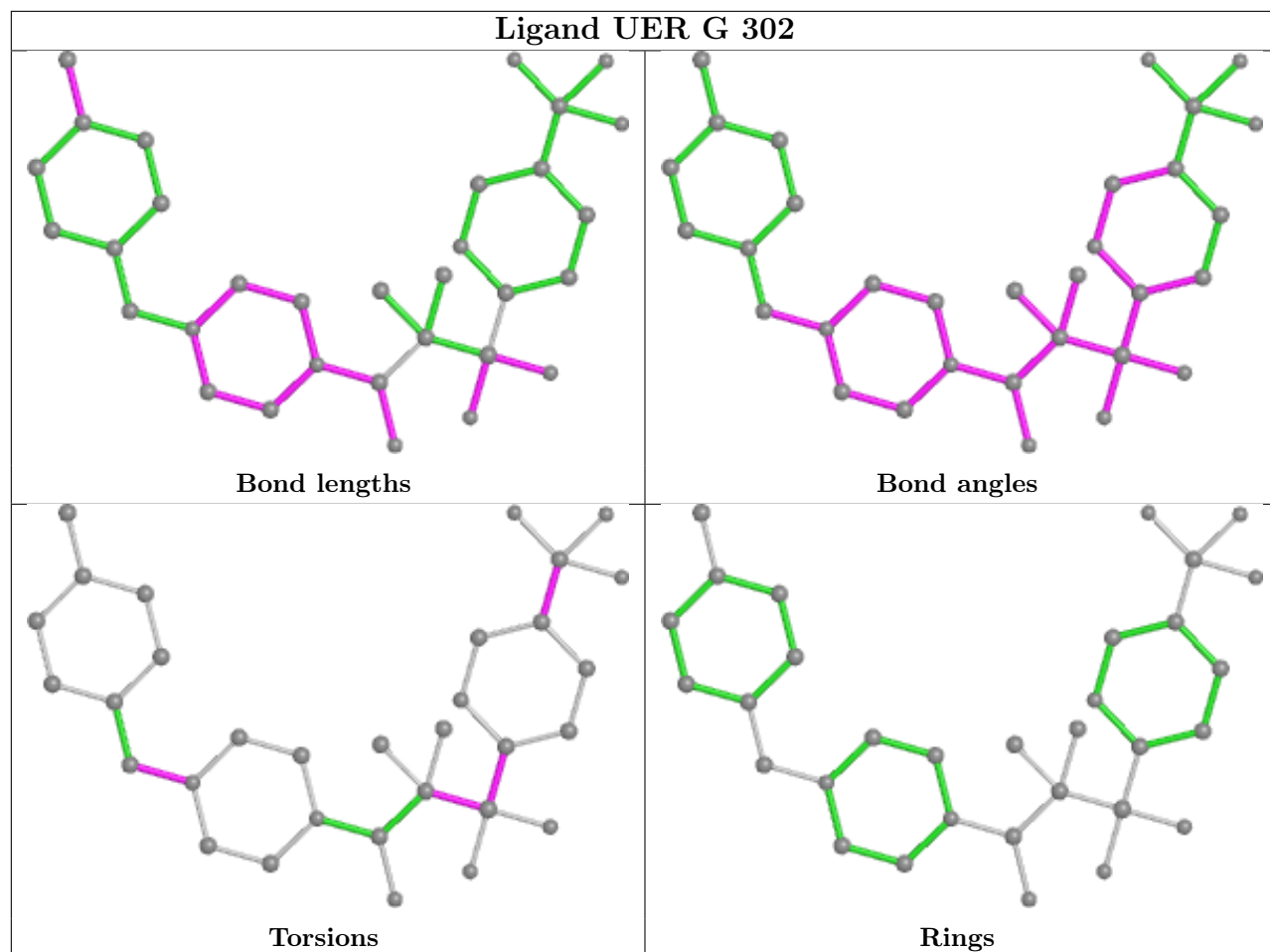
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	UER	1	0
2	G	302	UER	1	0
4	G	301	GOL	3	0
4	N	301	GOL	2	0
2	A	302	UER	2	0
2	M	301	UER	1	0

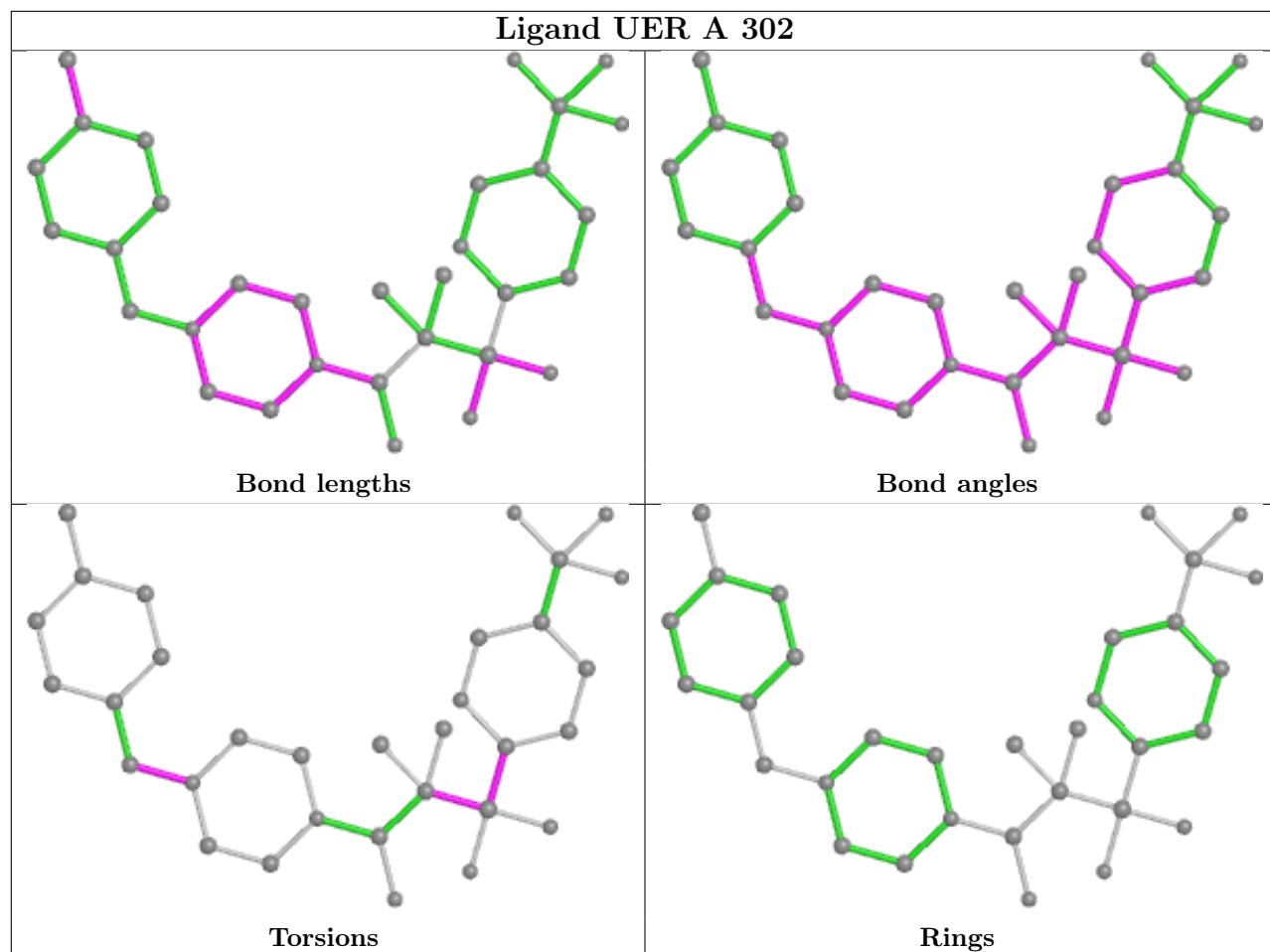
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

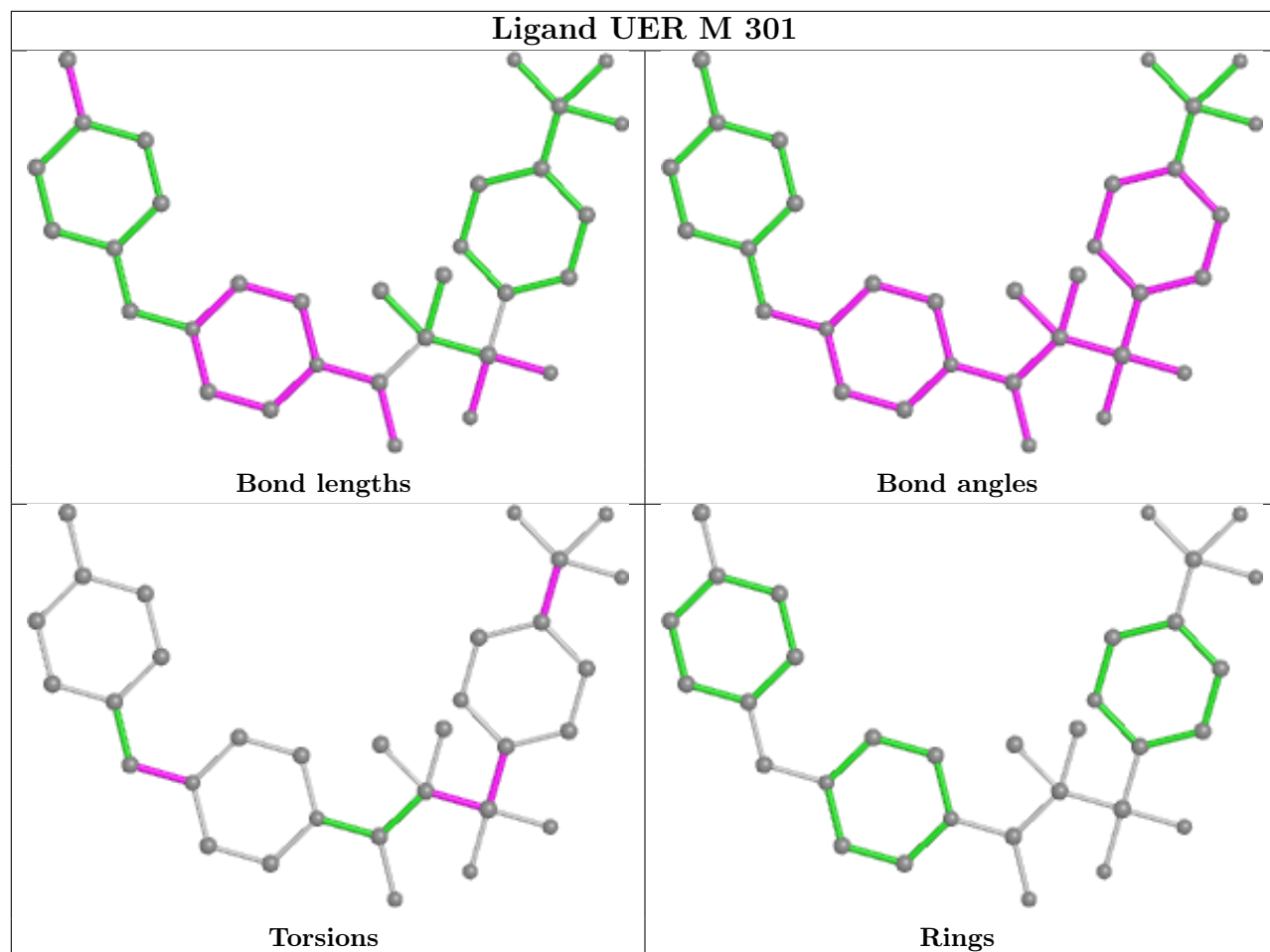
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.

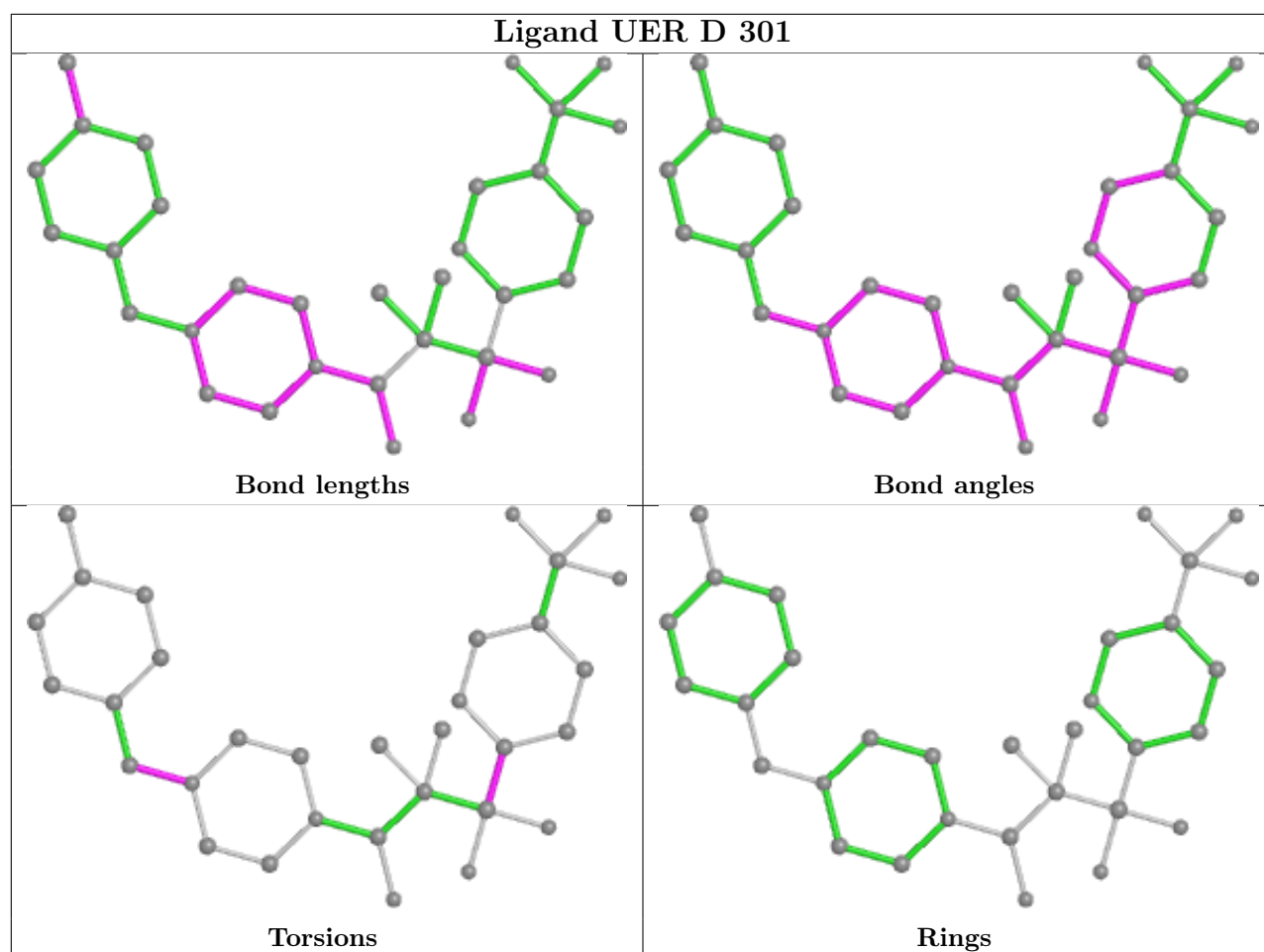












5.7 Other polymers [\(i\)](#)

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	203/203 (100%)	-0.29	13 (6%) 19 16	21, 37, 101, 132	0
1	B	203/203 (100%)	-0.39	11 (5%) 25 23	17, 34, 103, 132	0
1	C	203/203 (100%)	-0.33	10 (4%) 29 26	21, 38, 100, 136	0
1	D	203/203 (100%)	-0.43	6 (2%) 50 47	18, 34, 93, 120	0
1	E	203/203 (100%)	-0.29	9 (4%) 34 31	17, 32, 95, 131	0
1	F	203/203 (100%)	-0.34	13 (6%) 19 16	22, 33, 103, 132	0
1	G	203/203 (100%)	-0.45	7 (3%) 45 41	16, 33, 93, 129	0
1	H	203/203 (100%)	-0.37	11 (5%) 25 23	19, 36, 109, 131	0
1	I	203/203 (100%)	-0.31	8 (3%) 39 35	20, 34, 99, 135	0
1	J	203/203 (100%)	-0.42	7 (3%) 45 41	21, 37, 99, 114	0
1	K	203/203 (100%)	-0.39	7 (3%) 45 41	20, 34, 97, 137	0
1	L	203/203 (100%)	-0.35	8 (3%) 39 35	21, 32, 94, 134	0
1	M	203/203 (100%)	-0.38	12 (5%) 22 19	14, 30, 96, 138	0
1	N	203/203 (100%)	-0.25	15 (7%) 14 12	20, 35, 108, 133	0
All	All	2842/2842 (100%)	-0.36	137 (4%) 30 27	14, 35, 103, 138	0

The worst 5 of 137 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	14	GLY	10.4
1	B	134	ALA	7.9
1	C	202	ALA	7.3
1	M	203	SER	7.2
1	H	201	ILE	6.3

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 monosaccharides in this entry.

6.4 Ligands [i](#)

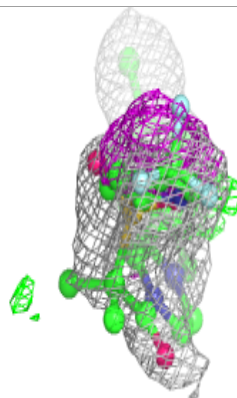
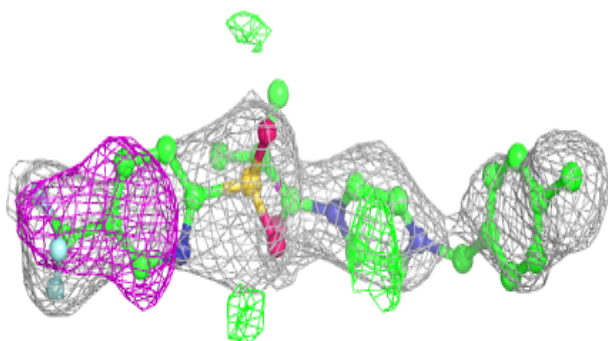
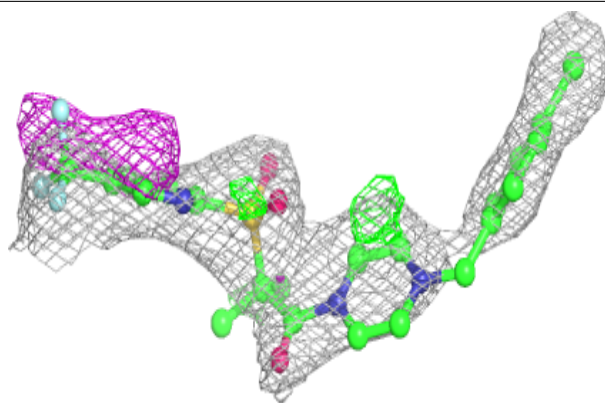
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	NA	D	302	1/1	0.37	1.11	64,64,64,64	0
3	NA	B	302	1/1	0.77	0.13	41,41,41,41	0
2	UER	A	302	32/32	0.84	0.25	65,80,93,94	0
2	UER	G	302	32/32	0.85	0.32	74,96,104,106	0
2	UER	D	301	32/32	0.86	0.25	59,74,88,91	0
2	UER	M	301	32/32	0.89	0.19	51,89,108,113	0
2	UER	A	301	32/32	0.90	0.23	75,122,133,135	0
2	UER	B	301	32/32	0.91	0.21	43,97,121,130	0
3	NA	L	301	1/1	0.92	0.08	38,38,38,38	0
4	GOL	B	303	6/6	0.92	0.08	38,48,52,60	0
4	GOL	N	301	6/6	0.92	0.18	24,28,30,35	0
3	NA	F	301	1/1	0.93	0.08	19,19,19,19	0
4	GOL	G	301	6/6	0.95	0.26	27,29,35,46	0
4	GOL	C	301	6/6	0.96	0.15	37,39,42,46	0
3	NA	E	301	1/1	0.96	0.06	20,20,20,20	0
3	NA	H	301	1/1	0.96	0.08	21,21,21,21	0
3	NA	G	303	1/1	0.97	0.10	32,32,32,32	0
3	NA	N	302	1/1	0.98	0.06	15,15,15,15	0

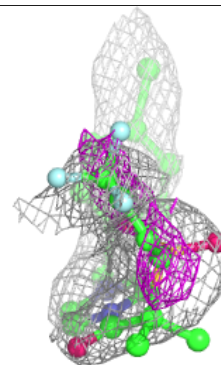
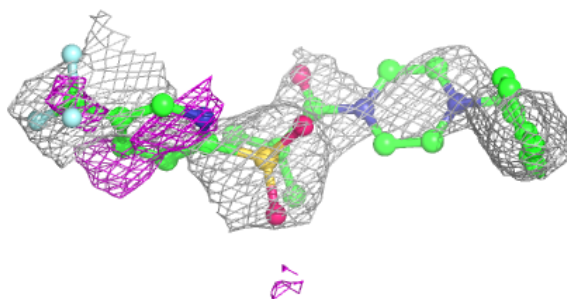
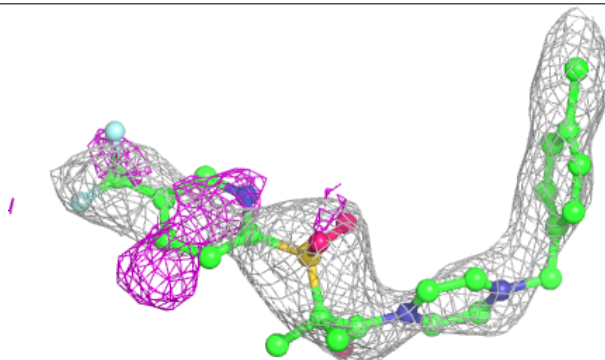
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around UER A 302:

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

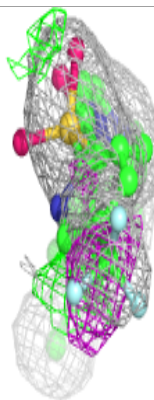
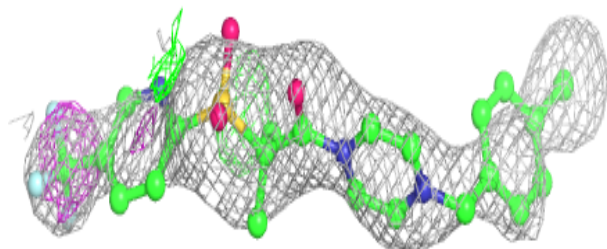
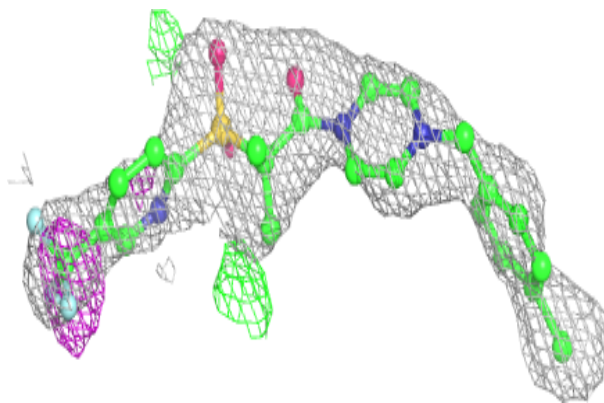
**Electron density around UER G 302:**

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

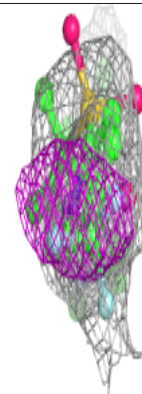
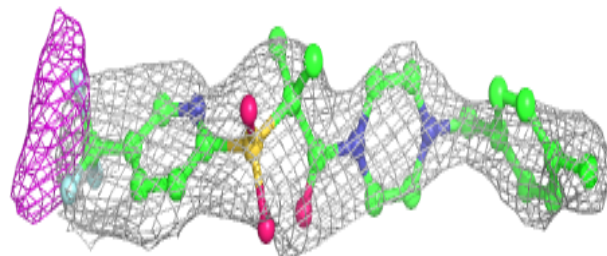
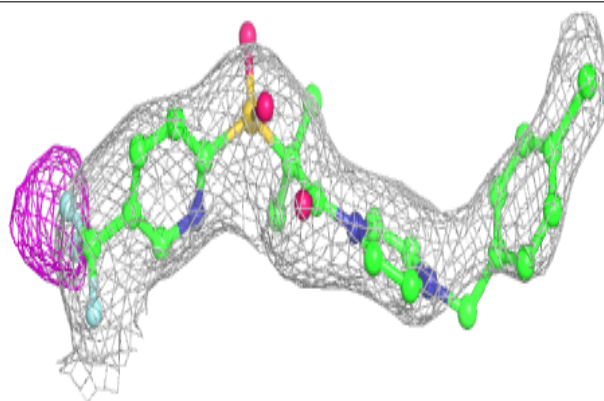


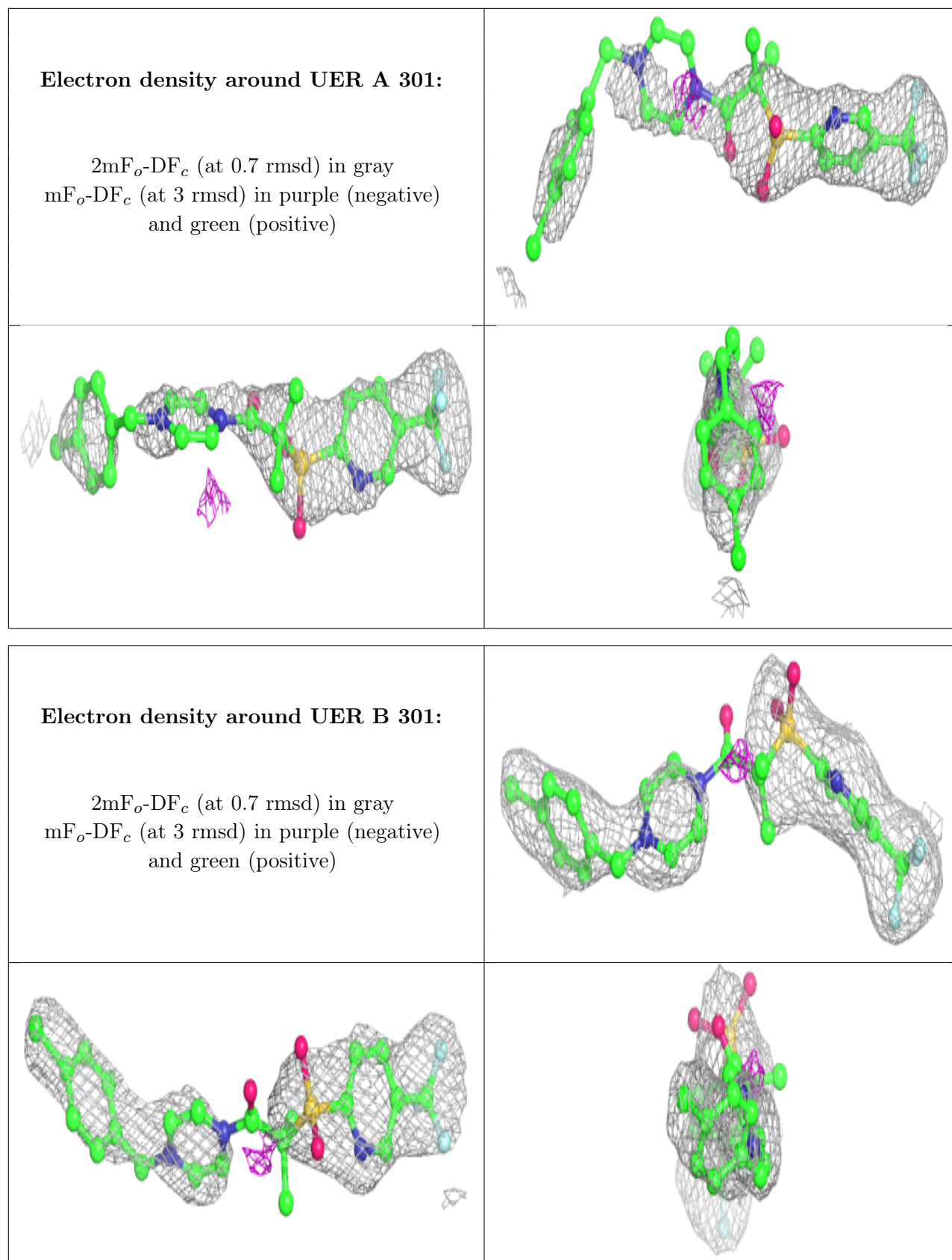
Electron density around UER D 301:

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

**Electron density around UER M 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 [i](#)

There are no such residues in this entry.