



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 15, 2023 – 01:29 AM EDT

PDB ID : 7UVR
Title : Crystal structure of human ClpP protease in complex with TR-65
Authors : Mabanglo, M.F.; Houry, W.A.
Deposited on : 2022-05-02
Resolution : 2.86 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

<https://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)
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

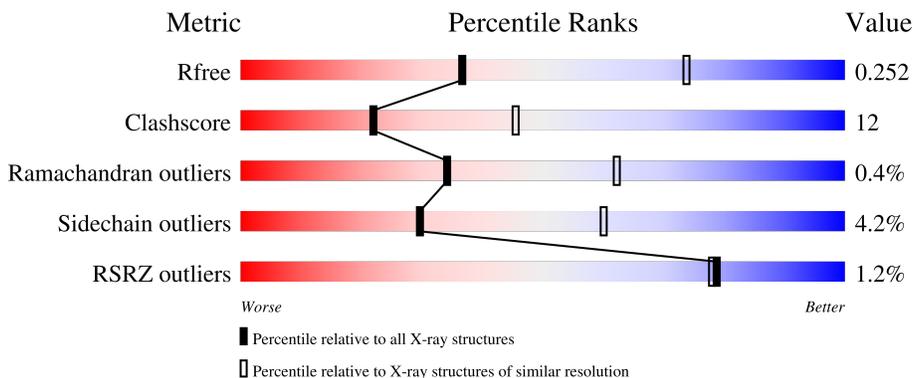
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.86 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	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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	221	
1	B	221	
1	C	221	
1	D	221	
1	E	221	

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Mol	Chain	Length	Quality of chain
1	F	221	 59% 19% 20%
1	G	221	 54% 24% 21%

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 9866 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
			Total	C	N	O	S			
1	A	176	1375	878	234	250	13	0	0	0
1	B	174	1360	870	232	245	13	0	0	0
1	C	173	1349	864	228	244	13	0	0	0
1	D	177	1382	883	235	251	13	0	0	0
1	E	171	1333	852	227	241	13	0	0	0
1	F	176	1374	879	234	247	14	0	1	0
1	G	175	1366	873	233	247	13	0	0	0

There are 7 discrepancies between the modelled and reference sequences:

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

- Molecule 2 is 3-{{(10R)-4-[(4-chlorophenyl)methyl]-5-oxo-1,2,4,5,8,9-hexahydroimidazo[1,2-a]pyrido[3,4-e]pyrimidin-7(6H)-yl]methyl}benzotrile (three-letter code: P JF) (formula: C₂₄H₂₂ClN₅O) (labeled as "Ligand of Interest" by depositor).

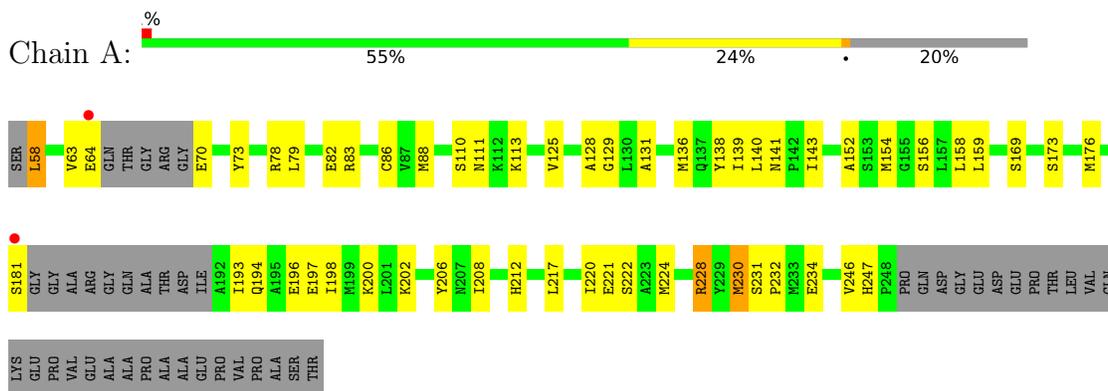
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	F	19	Total O 19 19	0	0
3	G	19	Total O 19 19	0	0

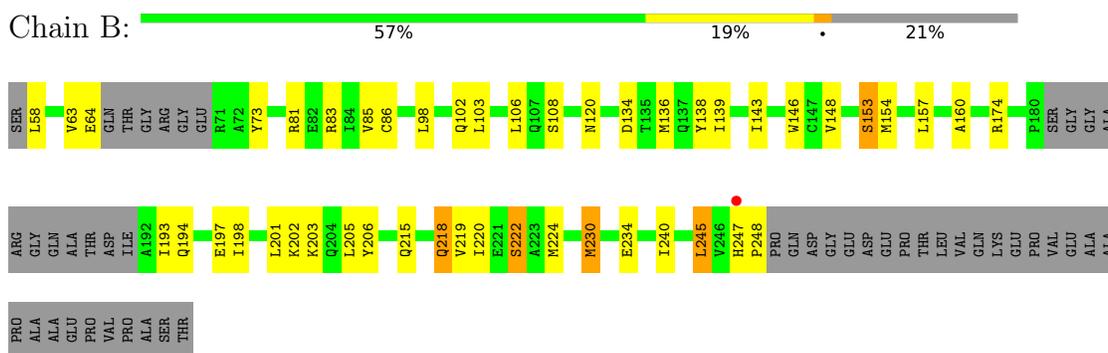
3 Residue-property plots [i](#)

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.

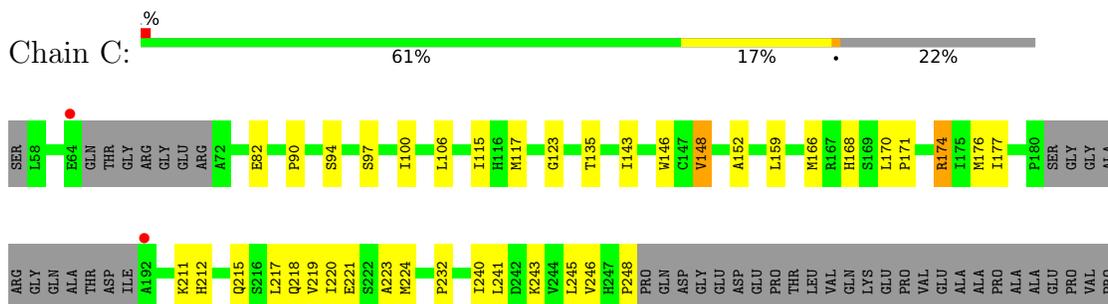
- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial

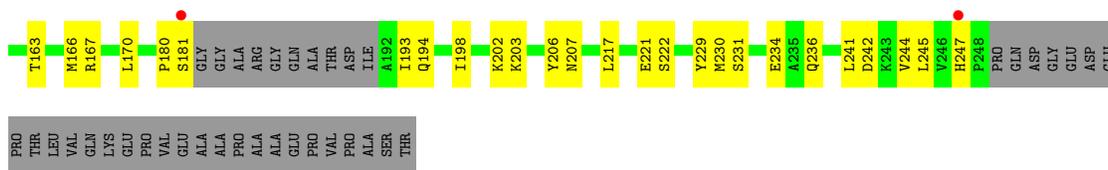


- Molecule 1: ATP-dependent Clp protease proteolytic subunit, mitochondrial



- 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	142.17Å 152.51Å 104.27Å 90.00° 118.10° 90.00°	Depositor
Resolution (Å)	29.35 – 2.86 29.35 – 2.86	Depositor EDS
% Data completeness (in resolution range)	99.4 (29.35-2.86) 99.4 (29.35-2.86)	Depositor EDS
R_{merge}	0.21	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.24 (at 2.85Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.203 , 0.253 0.206 , 0.252	Depositor DCC
R_{free} test set	1997 reflections (4.45%)	wwPDB-VP
Wilson B-factor (Å ²)	50.1	Xtrriage
Anisotropy	0.204	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 56.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	9866	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.92% 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 [i](#)

5.1 Standard geometry [i](#)

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

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	0.59	1/1399 (0.1%)	0.76	0/1891
1	B	0.57	0/1384	0.73	2/1871 (0.1%)
1	C	0.55	0/1373	0.73	0/1857
1	D	0.60	0/1407	0.80	3/1903 (0.2%)
1	E	0.61	0/1355	0.77	0/1830
1	F	0.57	0/1402	0.77	1/1896 (0.1%)
1	G	0.55	0/1390	0.74	0/1879
All	All	0.58	1/9710 (0.0%)	0.76	6/13127 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	86	CYS	CB-SG	-5.72	1.72	1.81

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	245	LEU	CA-CB-CG	6.91	131.20	115.30
1	F	166	MET	CG-SD-CE	5.38	108.81	100.20
1	B	103	LEU	CA-CB-CG	5.37	127.66	115.30
1	D	112	LYS	C-N-CA	-5.24	108.61	121.70
1	D	98	LEU	CA-CB-CG	5.05	126.91	115.30

There are no chirality outliers.

There are no planarity outliers.

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	1375	0	1415	39	1
1	B	1360	0	1404	35	0
1	C	1349	0	1391	28	0
1	D	1382	0	1422	34	1
1	E	1333	0	1380	49	1
1	F	1374	0	1419	29	0
1	G	1366	0	1409	39	1
2	A	31	0	0	3	0
2	B	31	0	0	0	0
2	C	31	0	0	2	0
2	D	31	0	0	1	0
2	E	31	0	0	1	0
2	F	31	0	0	0	0
2	G	31	0	0	2	0
3	A	19	0	0	2	0
3	B	10	0	0	0	0
3	C	8	0	0	0	0
3	D	18	0	0	1	0
3	E	17	0	0	3	0
3	F	19	0	0	1	0
3	G	19	0	0	0	0
All	All	9866	0	9840	232	2

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 12.

The worst 5 of 232 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:G:73:TYR:OH	1:G:81:ARG:NH1	2.05	0.90
1:B:203:LYS:HD3	1:B:206:TYR:HD2	1.40	0.85
2:A:301:PJF:N4	3:A:401:HOH:O	2.10	0.82
1:A:193:ILE:HD12	1:A:197:GLU:HG3	1.64	0.80
1:D:58:LEU:HD22	1:D:59:ILE:H	1.47	0.79

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:196:GLU:OE2	1:G:206:TYR:OH[2_556]	2.16	0.04
1:D:226:ARG:NH1	1:E:225:GLU:OE1[2_556]	2.16	0.04

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	170/221 (77%)	161 (95%)	8 (5%)	1 (1%)	25	53
1	B	168/221 (76%)	160 (95%)	8 (5%)	0	100	100
1	C	167/221 (76%)	156 (93%)	11 (7%)	0	100	100
1	D	171/221 (77%)	163 (95%)	8 (5%)	0	100	100
1	E	165/221 (75%)	157 (95%)	6 (4%)	2 (1%)	13	35
1	F	171/221 (77%)	163 (95%)	6 (4%)	2 (1%)	13	35
1	G	169/221 (76%)	165 (98%)	4 (2%)	0	100	100
All	All	1181/1547 (76%)	1125 (95%)	51 (4%)	5 (0%)	34	62

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	227	ASP
1	E	110	SER
1	F	110	SER
1	F	82	GLU
1	A	125	VAL

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	153/185 (83%)	146 (95%)	7 (5%)	27	56
1	B	151/185 (82%)	142 (94%)	9 (6%)	19	45
1	C	150/185 (81%)	144 (96%)	6 (4%)	31	62
1	D	154/185 (83%)	151 (98%)	3 (2%)	57	81
1	E	148/185 (80%)	141 (95%)	7 (5%)	26	56
1	F	153/185 (83%)	150 (98%)	3 (2%)	55	80
1	G	152/185 (82%)	142 (93%)	10 (7%)	16	40
All	All	1061/1295 (82%)	1016 (96%)	45 (4%)	30	60

5 of 45 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	168	HIS
1	G	63	VAL
1	E	199	MET
1	F	79	LEU
1	G	108	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	204	GLN
1	D	168	HIS
1	G	116	HIS

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 [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	PJF	G	301	-	35,35,35	0.89	3 (8%)	43,50,50	1.03	5 (11%)
2	PJF	F	301	-	35,35,35	0.75	1 (2%)	43,50,50	1.10	5 (11%)
2	PJF	B	301	-	35,35,35	0.65	0	43,50,50	1.06	4 (9%)
2	PJF	A	301	-	35,35,35	0.68	0	43,50,50	1.00	3 (6%)
2	PJF	D	301	-	35,35,35	0.78	1 (2%)	43,50,50	0.89	2 (4%)
2	PJF	C	301	-	35,35,35	0.78	1 (2%)	43,50,50	1.08	5 (11%)
2	PJF	E	301	-	35,35,35	0.85	2 (5%)	43,50,50	0.96	3 (6%)

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	PJF	G	301	-	-	0/10/25/25	0/5/5/5
2	PJF	F	301	-	-	0/10/25/25	0/5/5/5
2	PJF	B	301	-	-	0/10/25/25	0/5/5/5
2	PJF	A	301	-	-	0/10/25/25	0/5/5/5
2	PJF	D	301	-	-	1/10/25/25	0/5/5/5
2	PJF	C	301	-	-	0/10/25/25	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PJF	E	301	-	-	0/10/25/25	0/5/5/5

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	301	PJF	C21-N4	3.14	1.30	1.28
2	F	301	PJF	C21-N4	2.54	1.30	1.28
2	G	301	PJF	C10-N5	-2.51	1.34	1.39
2	C	301	PJF	C21-N4	2.43	1.30	1.28
2	D	301	PJF	C21-N4	2.38	1.30	1.28

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	301	PJF	C7-N2-C12	3.36	114.96	110.53
2	C	301	PJF	C7-N2-C12	2.99	114.46	110.53
2	F	301	PJF	C9-C8-N2	-2.98	108.53	111.23
2	B	301	PJF	C22-C23-N5	-2.94	99.30	101.24
2	E	301	PJF	C11-C13-N3	2.93	120.32	115.17

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	301	PJF	C6-C7-N2-C8

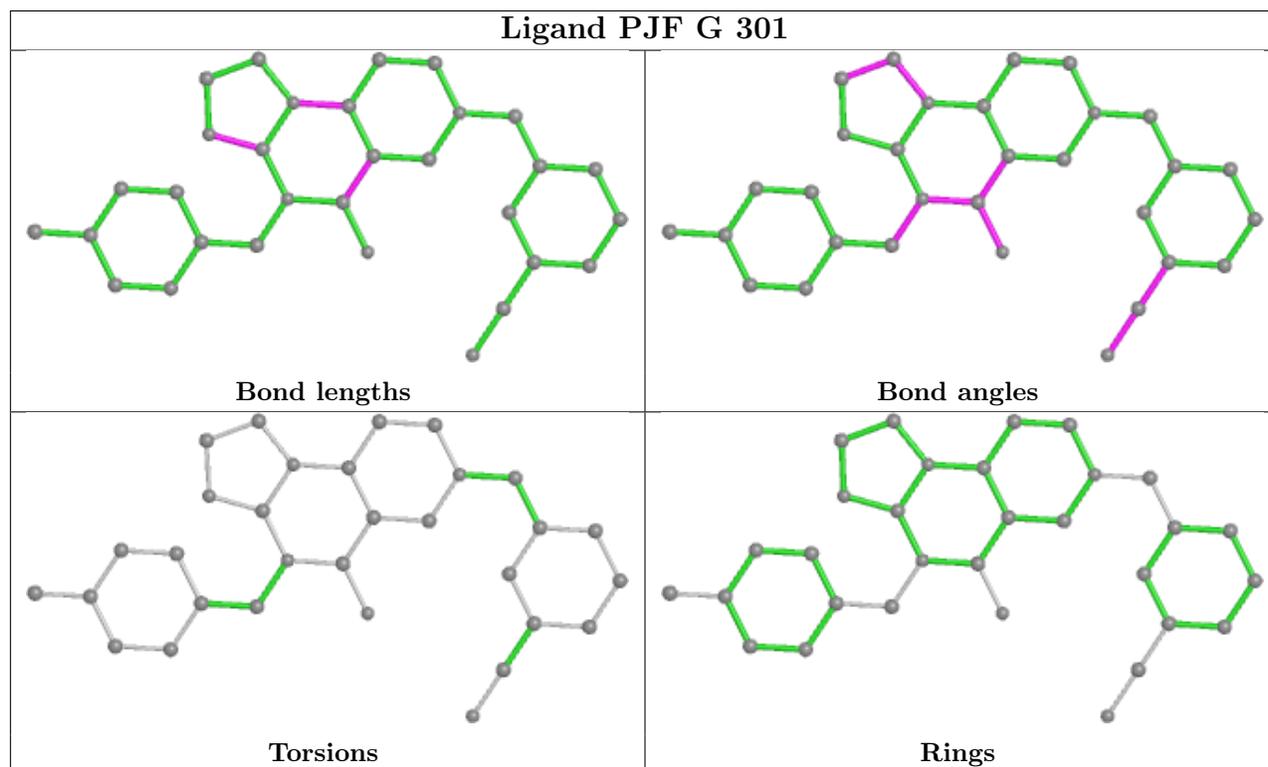
There are no ring outliers.

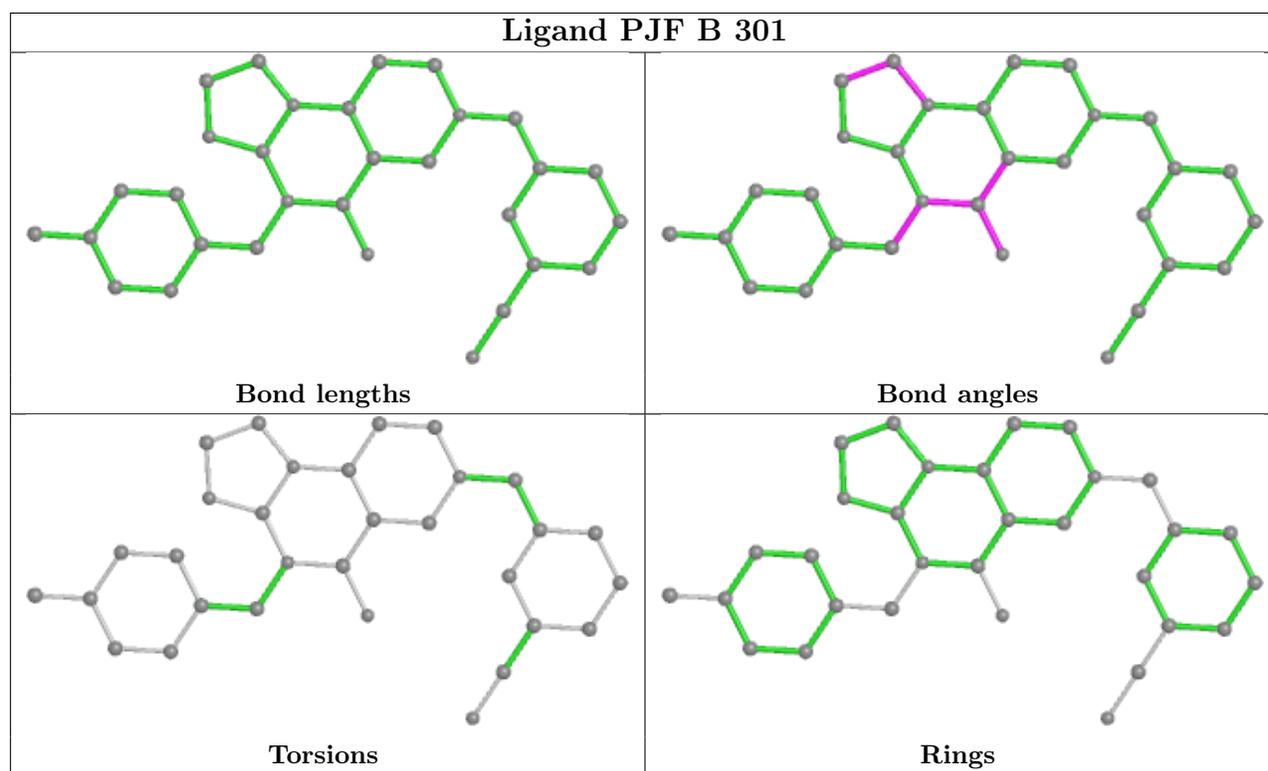
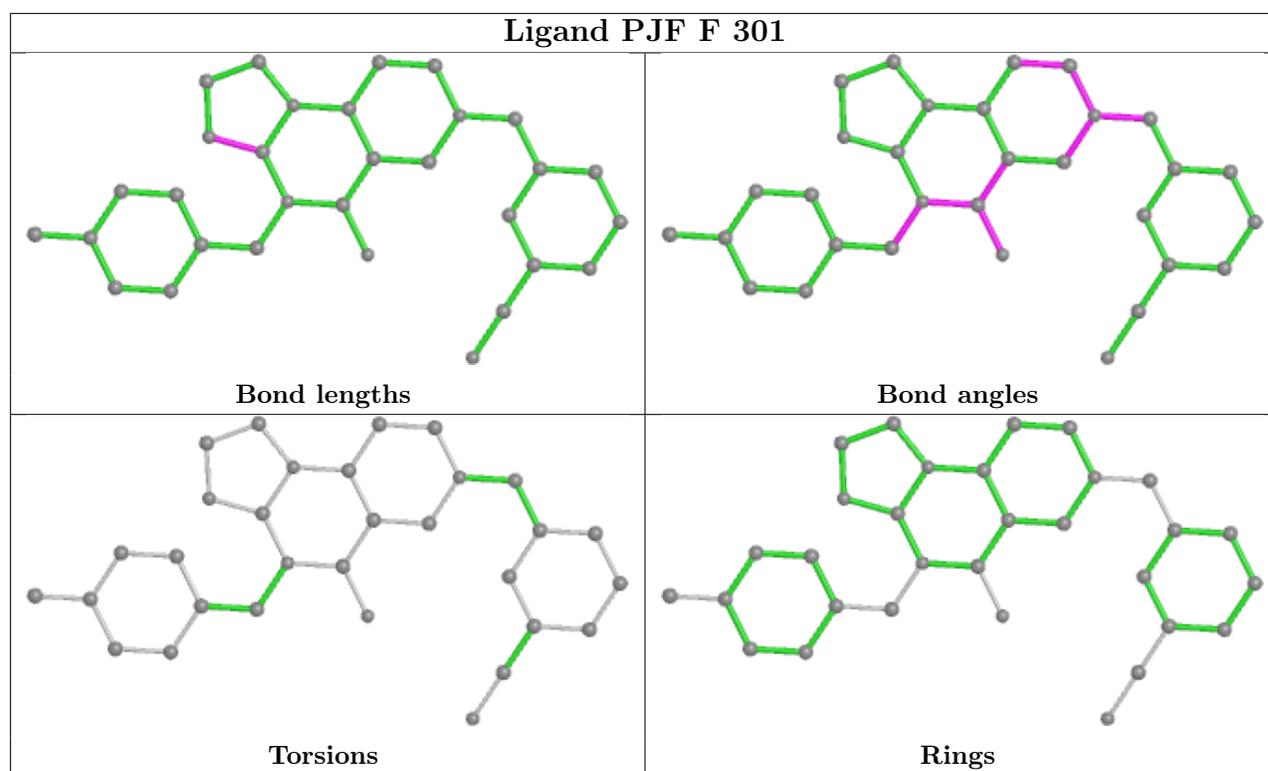
5 monomers are involved in 9 short contacts:

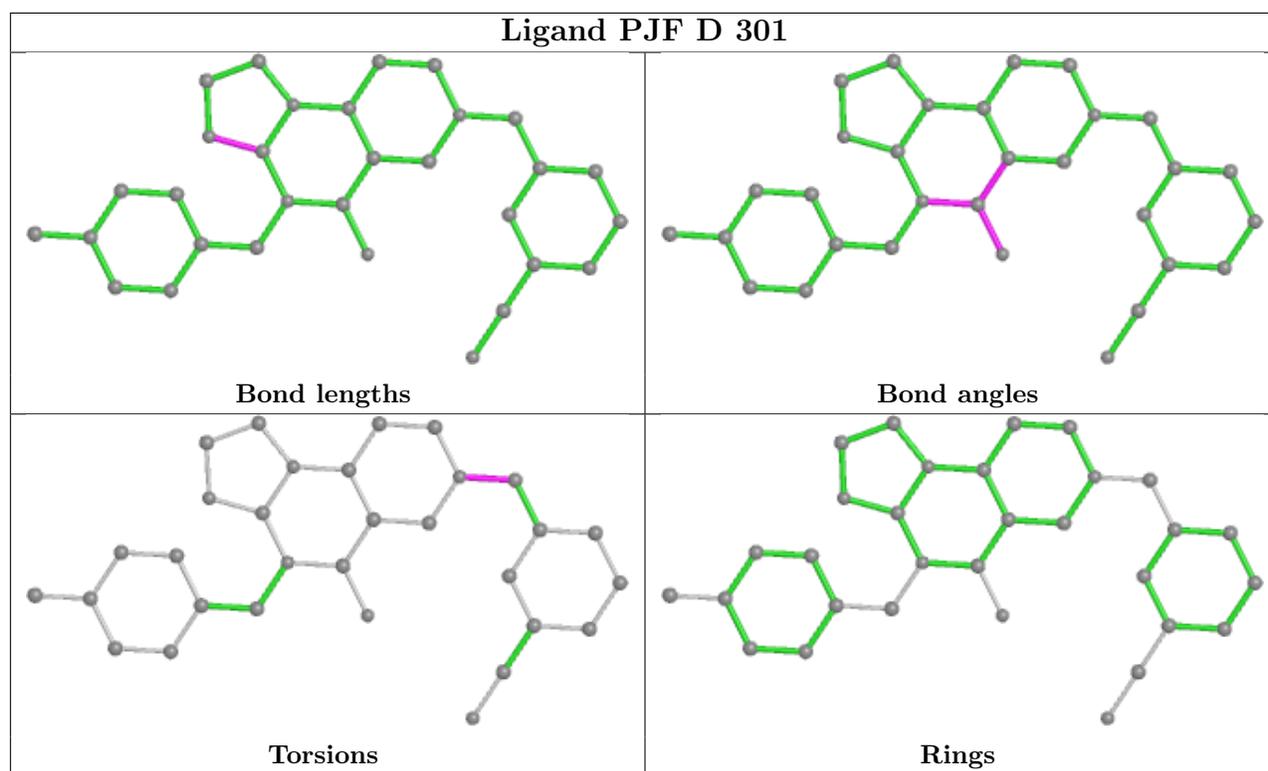
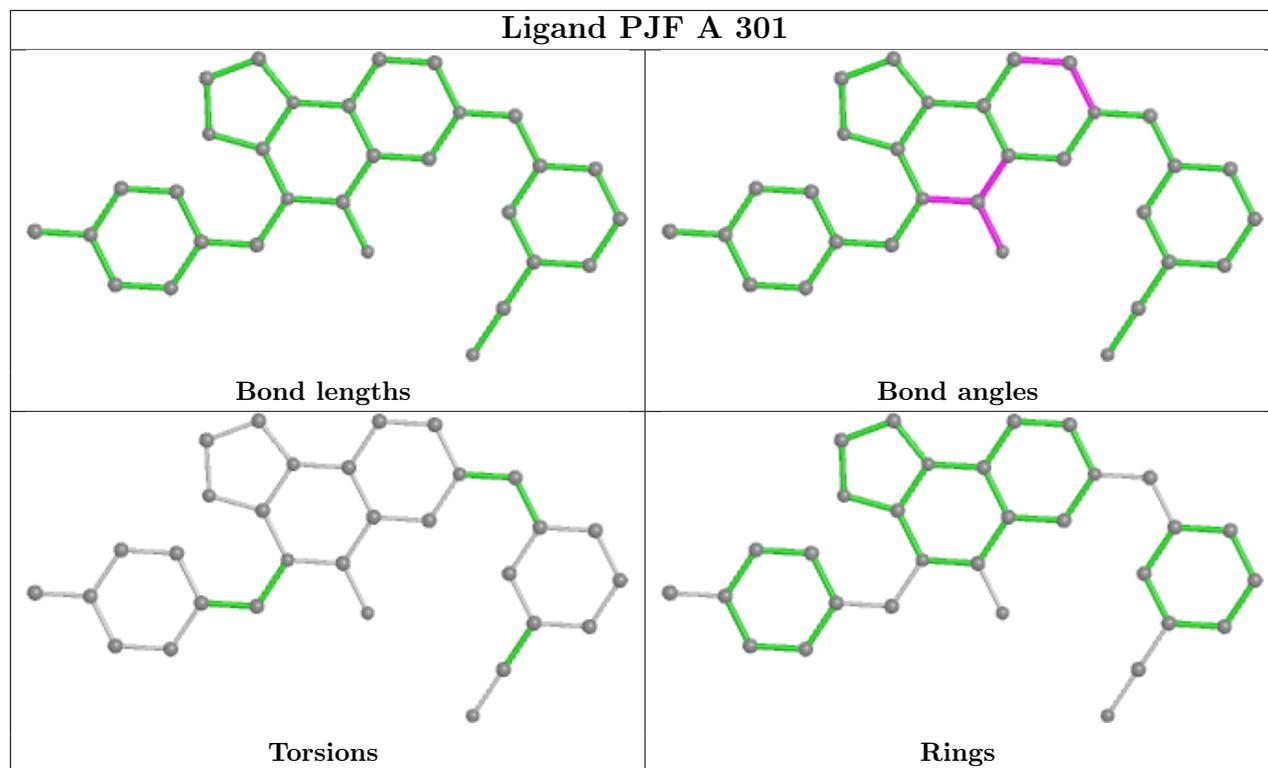
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	301	PJF	2	0
2	A	301	PJF	3	0
2	D	301	PJF	1	0
2	C	301	PJF	2	0
2	E	301	PJF	1	0

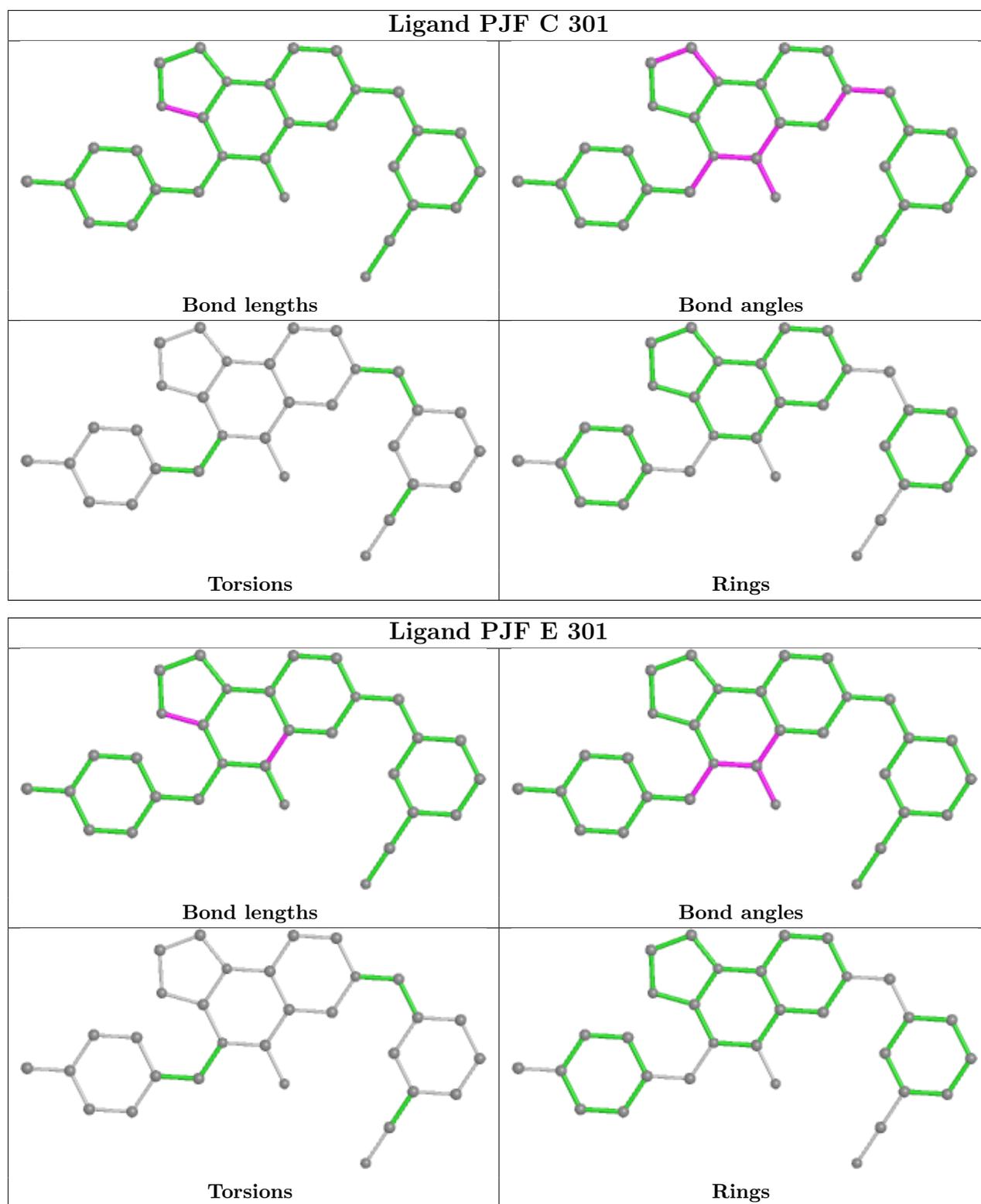
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

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	176/221 (79%)	-0.27	2 (1%) 80 80	35, 43, 63, 81	0
1	B	174/221 (78%)	-0.29	1 (0%) 89 89	37, 47, 63, 82	0
1	C	173/221 (78%)	-0.26	2 (1%) 79 78	34, 46, 61, 77	0
1	D	177/221 (80%)	-0.33	4 (2%) 60 57	34, 43, 69, 92	0
1	E	171/221 (77%)	-0.25	2 (1%) 79 78	36, 44, 60, 76	0
1	F	176/221 (79%)	-0.38	1 (0%) 89 89	33, 43, 64, 79	0
1	G	175/221 (79%)	-0.23	3 (1%) 70 68	37, 44, 62, 88	0
All	All	1222/1547 (78%)	-0.29	15 (1%) 79 78	33, 45, 64, 92	0

The worst 5 of 15 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	71	ARG	4.0
1	E	192	ALA	3.2
1	A	181	SER	3.2
1	G	181	SER	3.0
1	B	247	HIS	2.9

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](#)

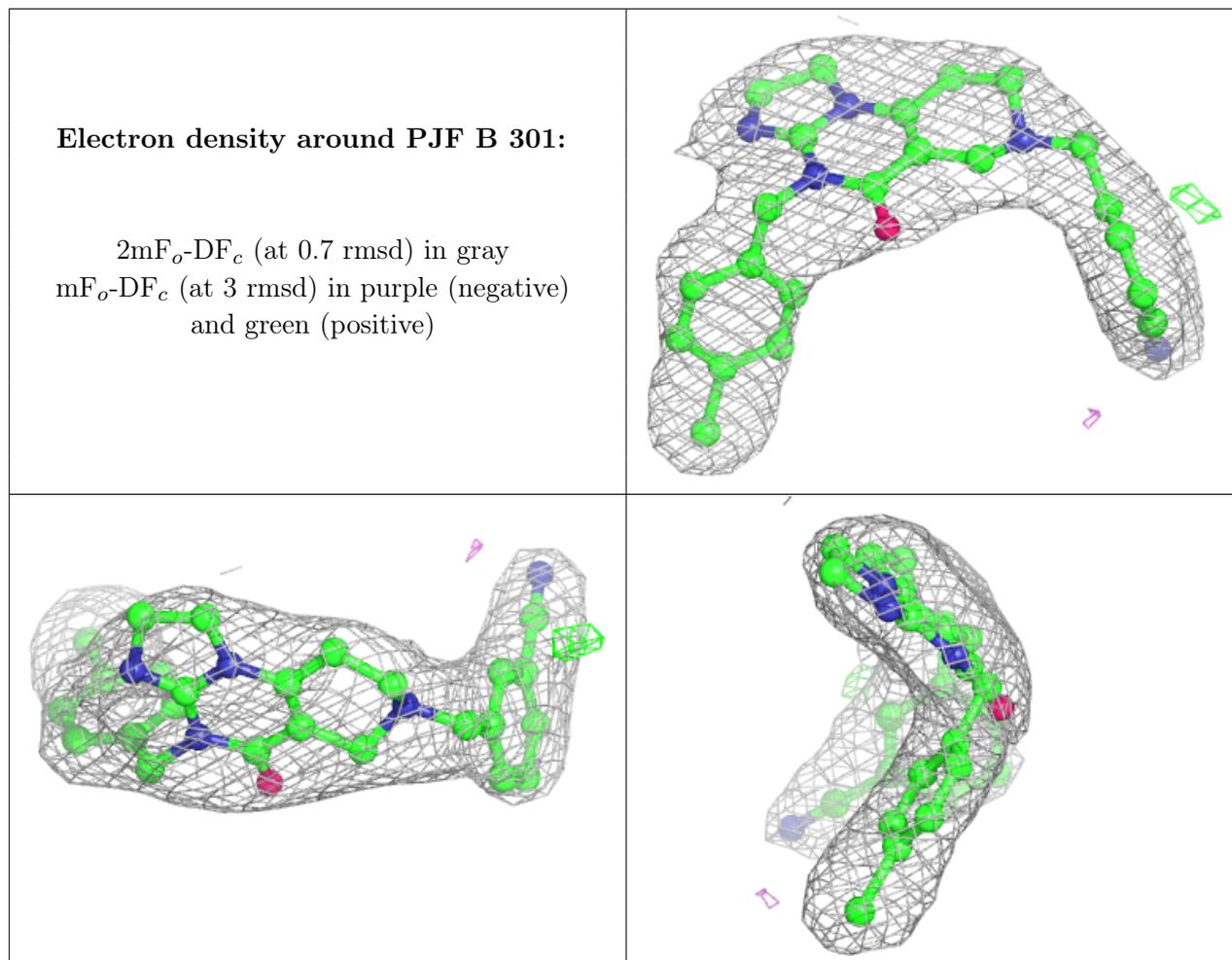
There are no monosaccharides in this entry.

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.

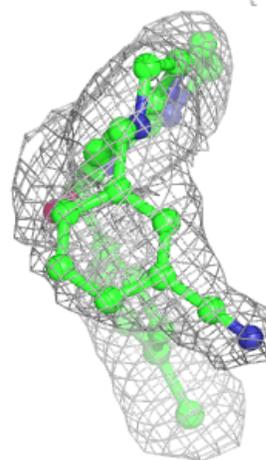
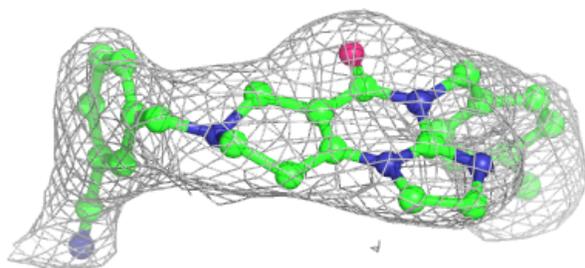
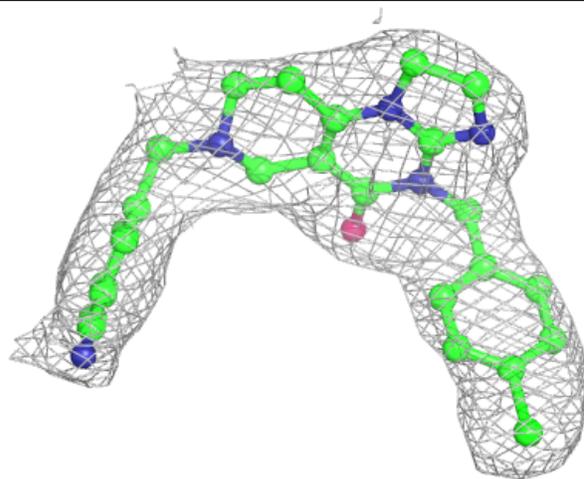
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	PJF	B	301	31/31	0.95	0.15	42,47,53,64	0
2	PJF	C	301	31/31	0.95	0.15	39,48,55,62	0
2	PJF	D	301	31/31	0.96	0.14	38,47,52,59	0
2	PJF	E	301	31/31	0.96	0.14	34,43,49,60	0
2	PJF	F	301	31/31	0.96	0.14	37,44,50,59	0
2	PJF	A	301	31/31	0.97	0.13	34,42,47,61	0
2	PJF	G	301	31/31	0.97	0.13	33,40,43,62	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.



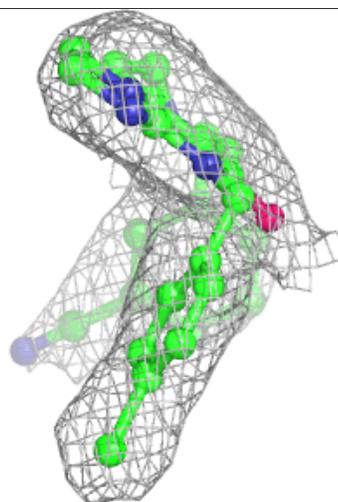
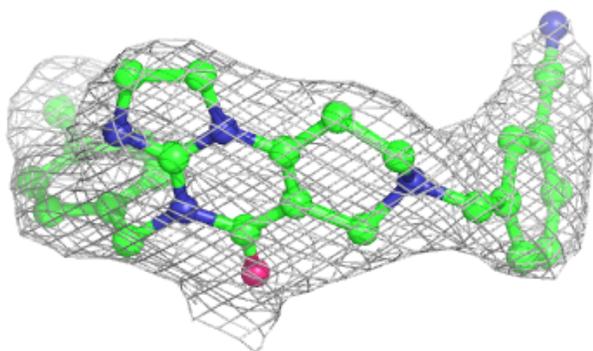
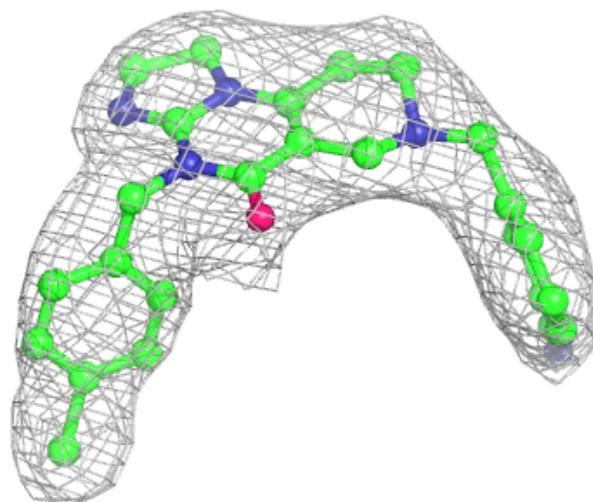
Electron density around PJF C 301:

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



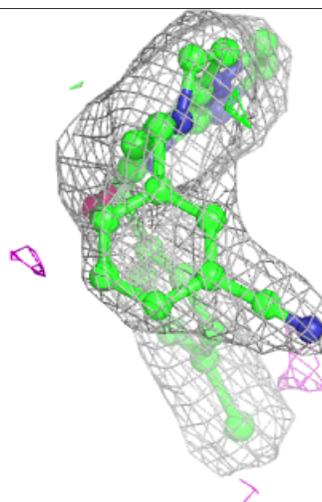
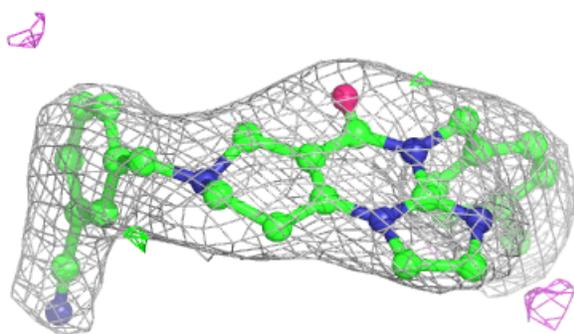
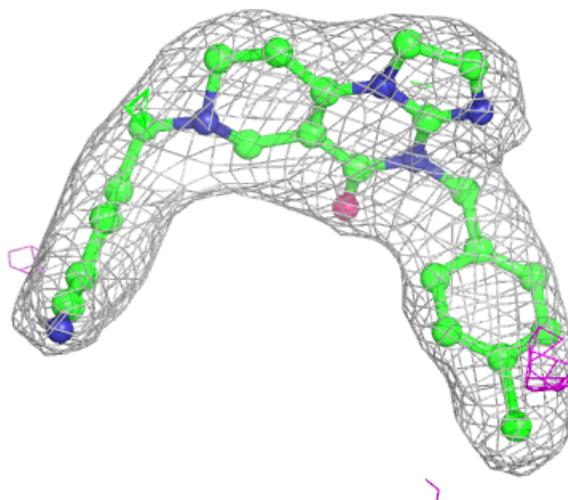
Electron density around PJF D 301:

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



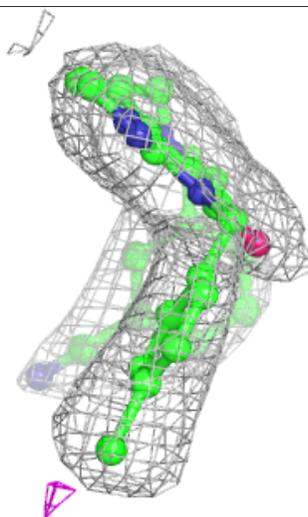
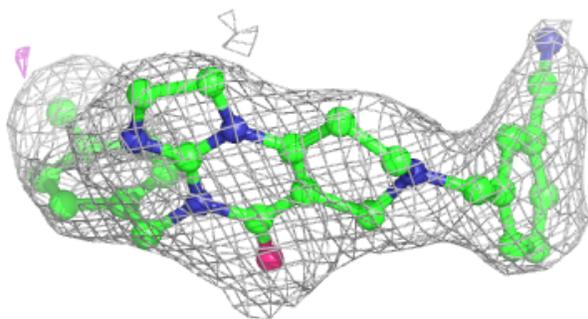
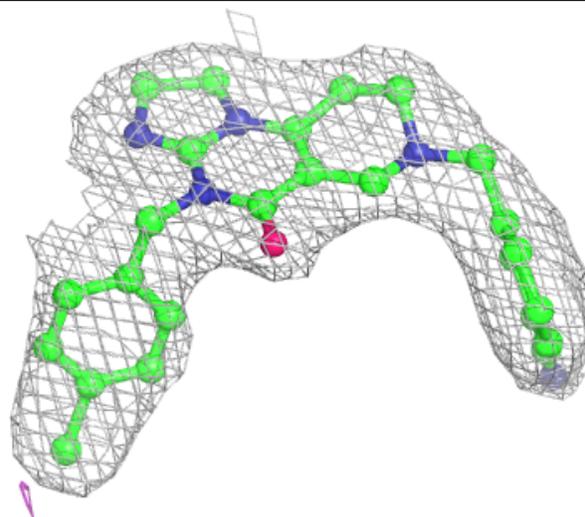
Electron density around PJF E 301:

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



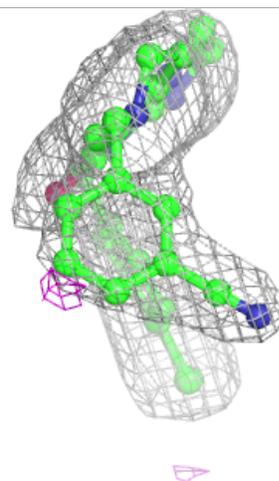
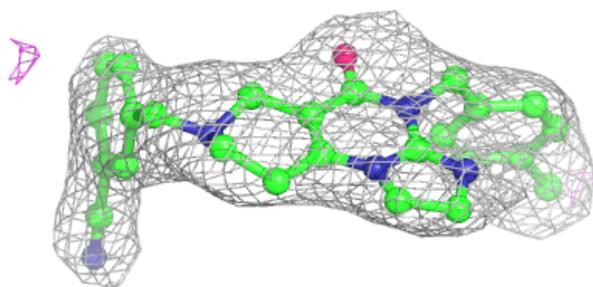
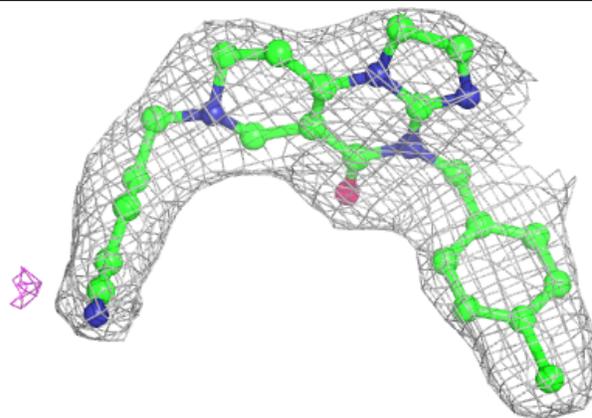
Electron density around PJF F 301:

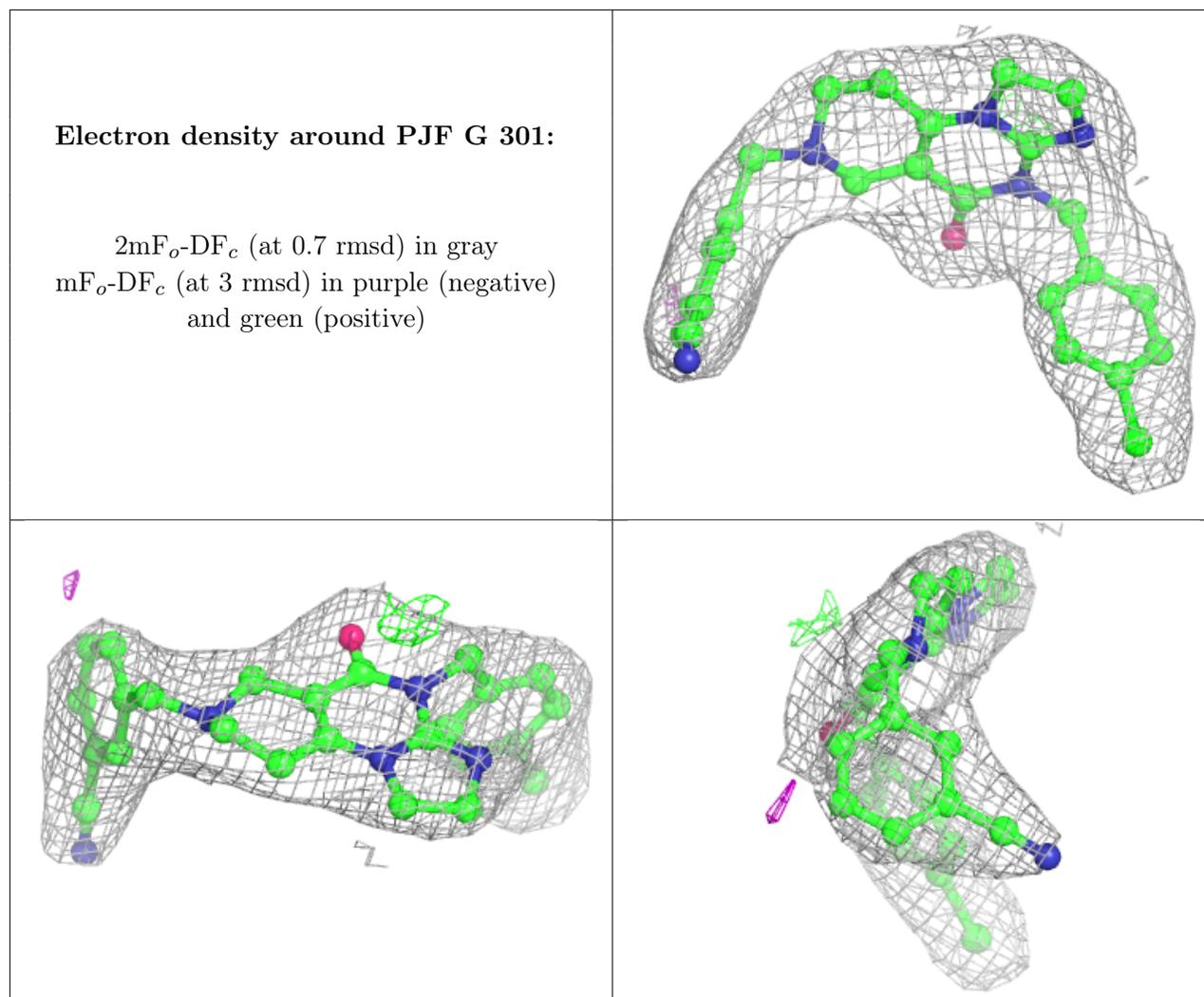
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around PJJ 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)





6.5 Other polymers [i](#)

There are no such residues in this entry.