



# wwPDB X-ray Structure Validation Summary Report ⓘ

Apr 19, 2026 – 08:07 AM UTC

PDB ID : 8BKD / pdb\_00008bkd  
Title : structure of RutB  
Authors : Rajendran, C.  
Deposited on : 2022-11-09  
Resolution : 1.40 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

---

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

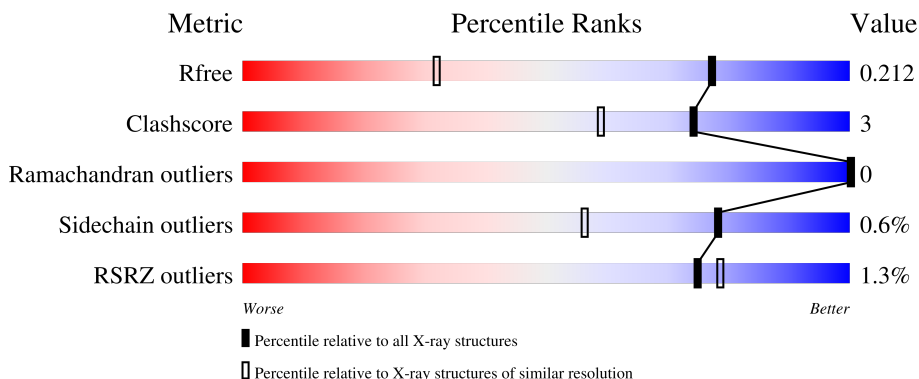
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	2563 (1.40-1.40)
Clashscore	190562	2660 (1.40-1.40)
Ramachandran outliers	187476	2611 (1.40-1.40)
Sidechain outliers	187428	2610 (1.40-1.40)
RSRZ outliers	180081	2561 (1.40-1.40)

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  $\geq 3$ , 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	230	
1	B	230	
1	C	230	
1	D	230	
1	E	230	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	230	 91% 6%
1	G	230	 92% 5%
1	H	230	 92% 5%
1	I	230	 92% 5%
1	J	230	 93% . .
1	K	230	 92% 5%
1	L	230	 93% . .
1	M	230	 91% 5%
1	N	230	 94% . .
1	O	230	 93% . .
1	P	230	 94% . .

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
2	URP	C	301	-	-	X	-
2	URP	D	301	-	-	X	-
2	URP	G	301	-	X	X	-
2	URP	J	301	-	-	X	-
2	URP	K	301	-	-	X	-
2	URP	L	301	-	-	X	-

## 2 Entry composition [i](#)

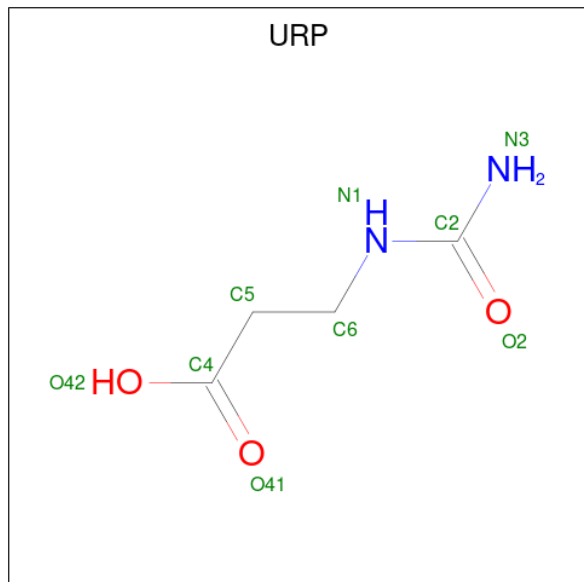
There are 3 unique types of molecules in this entry. The entry contains 32532 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Ureidoacrylate amidohydrolase RutB.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	222	1715	1104	285	321	2	3	0	0	0
1	B	222	1721	1107	288	321	2	3	0	0	0
1	C	222	1715	1104	285	321	2	3	0	0	0
1	D	222	1715	1104	285	321	2	3	0	0	0
1	E	224	1734	1114	290	325	2	3	0	0	0
1	F	224	1728	1111	287	325	2	3	0	0	0
1	G	224	1728	1111	287	325	2	3	0	0	0
1	H	224	1728	1111	287	325	2	3	0	0	0
1	I	224	1728	1111	287	325	2	3	0	0	0
1	J	224	1728	1111	287	325	2	3	0	0	0
1	K	223	1722	1108	286	323	2	3	0	0	0
1	L	223	1722	1108	286	323	2	3	0	0	0
1	M	222	1715	1104	285	321	2	3	0	0	0
1	N	222	1711	1102	284	320	2	3	0	0	0
1	O	223	1722	1108	286	323	2	3	0	0	0
1	P	222	1715	1104	285	321	2	3	0	0	0

- Molecule 2 is N-(AMINOCARBONYL)-BETA-ALANINE (CCD ID: URP) (formula:  $C_4H_8N_2O_3$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	C	1	Total	C	N	O	0	0
			9	4	2	3		
2	D	1	Total	C	N	O	0	0
			9	4	2	3		
2	F	1	Total	C	N	O	0	0
			9	4	2	3		
2	G	1	Total	C	N	O	0	0
			9	4	2	3		
2	H	1	Total	C	N	O	0	0
			9	4	2	3		
2	J	1	Total	C	N	O	0	0
			9	4	2	3		
2	K	1	Total	C	N	O	0	0
			9	4	2	3		
2	L	1	Total	C	N	O	0	0
			9	4	2	3		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	276	Total	O	0	0
			276	276		
3	B	351	Total	O	0	0
			351	351		

Continued on next page...

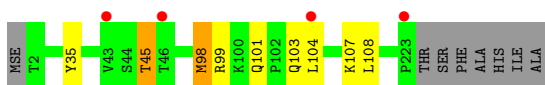
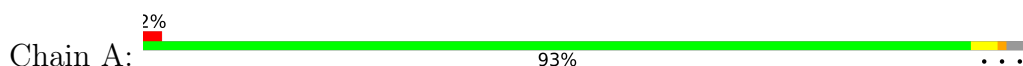
*Continued from previous page...*

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	301	Total 301	O 301	0	0
3	D	369	Total 369	O 369	0	0
3	E	297	Total 297	O 297	0	0
3	F	344	Total 344	O 344	0	0
3	G	313	Total 313	O 313	0	0
3	H	374	Total 374	O 374	0	0
3	I	320	Total 320	O 320	0	0
3	J	332	Total 332	O 332	0	0
3	K	272	Total 272	O 272	0	0
3	L	352	Total 352	O 352	0	0
3	M	216	Total 216	O 216	0	0
3	N	296	Total 296	O 296	0	0
3	O	236	Total 236	O 236	0	0
3	P	264	Total 264	O 264	0	0

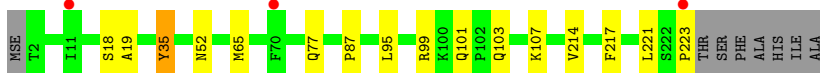
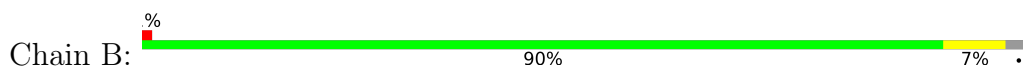
### 3 Residue-property plots [i](#)

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: Ureidoacrylate amidohydrolase RutB



- Molecule 1: Ureidoacrylate amidohydrolase RutB



- Molecule 1: Ureidoacrylate amidohydrolase RutB



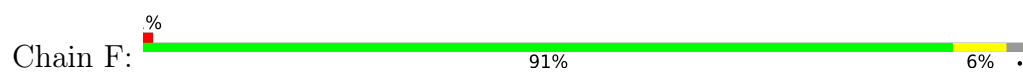
- Molecule 1: Ureidoacrylate amidohydrolase RutB



- Molecule 1: Ureidoacrylate amidohydrolase RutB



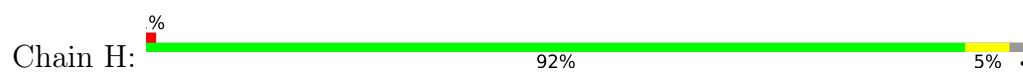
- Molecule 1: Ureidoacrylate amidohydrolase RutB



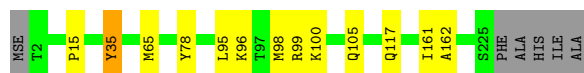
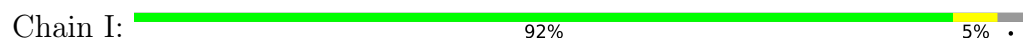
• Molecule 1: Ureidoacrylate amidohydrolase RutB



• Molecule 1: Ureidoacrylate amidohydrolase RutB



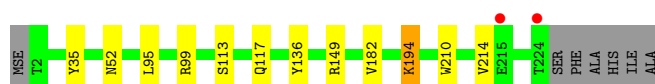
• Molecule 1: Ureidoacrylate amidohydrolase RutB



• Molecule 1: Ureidoacrylate amidohydrolase RutB



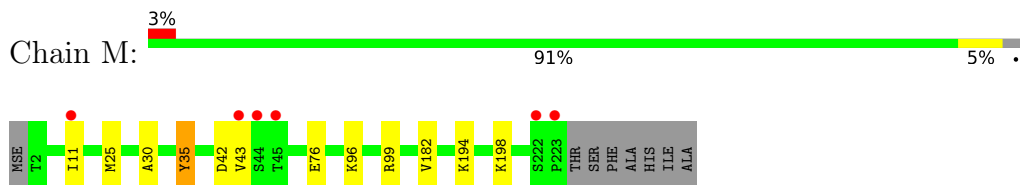
• Molecule 1: Ureidoacrylate amidohydrolase RutB



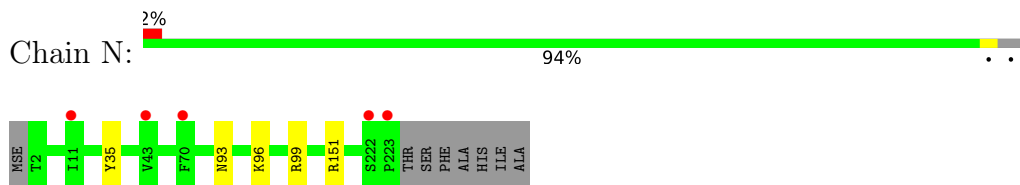
• Molecule 1: Ureidoacrylate amidohydrolase RutB



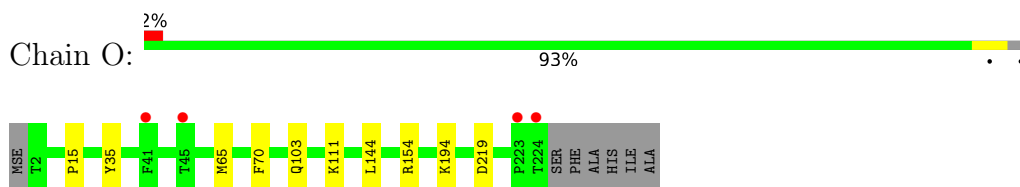
- Molecule 1: Ureidoacrylate amidohydrolase RutB



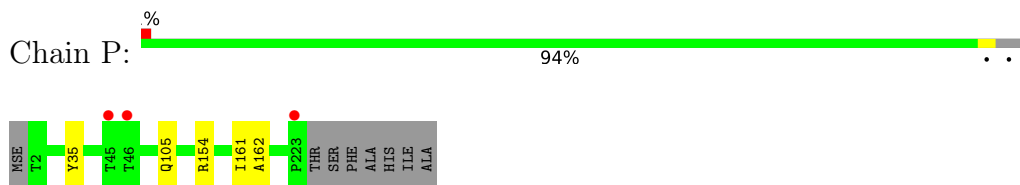
- Molecule 1: Ureidoacrylate amidohydrolase RutB



- Molecule 1: Ureidoacrylate amidohydrolase RutB



- Molecule 1: Ureidoacrylate amidohydrolase RutB



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	122.92Å 111.61Å 128.98Å 90.00° 99.14° 90.00°	Depositor
Resolution (Å)	48.22 – 1.40 48.22 – 1.40	Depositor EDS
% Data completeness (in resolution range)	98.3 (48.22-1.40) 98.3 (48.22-1.40)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.27 (at 1.40Å)	Xtrriage
Refinement program	PHENIX 1.18rc2	Depositor
R, $R_{free}$	0.169 , 0.212 0.169 , 0.212	Depositor DCC
$R_{free}$ test set	2003 reflections (0.30%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	15.0	Xtrriage
Anisotropy	0.274	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 48.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	0.000 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	32532	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	23.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 46.45 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.1431e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: URP

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	0.26	1/1757 (0.1%)	0.44	0/2392
1	B	0.26	0/1763	0.48	0/2399
1	C	0.24	0/1757	0.46	0/2392
1	D	0.27	0/1757	0.50	0/2392
1	E	0.22	0/1776	0.46	0/2417
1	F	0.28	0/1770	0.49	0/2410
1	G	0.23	0/1770	0.47	0/2410
1	H	0.29	0/1770	0.52	0/2410
1	I	0.23	0/1770	0.46	0/2410
1	J	0.28	0/1770	0.48	0/2410
1	K	0.21	0/1764	0.43	0/2402
1	L	0.25	0/1764	0.48	0/2402
1	M	0.20	0/1757	0.42	0/2392
1	N	0.24	0/1753	0.46	0/2387
1	O	0.20	0/1764	0.42	0/2402
1	P	0.24	0/1757	0.46	0/2392
All	All	0.24	1/28219 (0.0%)	0.47	0/38419

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	98	MSE	SE-CE	-5.32	1.79	1.95

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	1715	0	1675	11	0
1	B	1721	0	1686	12	0
1	C	1715	0	1675	14	0
1	D	1715	0	1675	12	0
1	E	1734	0	1698	8	0
1	F	1728	0	1687	11	0
1	G	1728	0	1687	14	0
1	H	1728	0	1687	11	0
1	I	1728	0	1687	8	0
1	J	1728	0	1687	10	0
1	K	1722	0	1682	11	0
1	L	1722	0	1682	9	0
1	M	1715	0	1675	11	0
1	N	1711	0	1669	5	0
1	O	1722	0	1682	6	0
1	P	1715	0	1675	5	0
2	C	9	0	7	7	0
2	D	9	0	7	7	0
2	F	9	0	7	3	0
2	G	9	0	7	7	0
2	H	9	0	7	3	0
2	J	9	0	7	6	0
2	K	9	0	7	6	0
2	L	9	0	7	6	0
3	A	276	0	0	2	0
3	B	351	0	0	2	1
3	C	301	0	0	4	0
3	D	369	0	0	5	0
3	E	297	0	0	4	1
3	F	344	0	0	5	0
3	G	313	0	0	7	0
3	H	374	0	0	6	0
3	I	320	0	0	2	0
3	J	332	0	0	3	1
3	K	272	0	0	2	1
3	L	352	0	0	3	1
3	M	216	0	0	7	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	N	296	0	0	3	1
3	O	236	0	0	3	2
3	P	264	0	0	4	2
All	All	32532	0	26965	168	5

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 3.

The worst 5 of 168 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:98:MSE:HE1	1:A:108:LEU:H	1.42	0.85
1:H:149:ARG:NH1	3:H:401:HOH:O	2.10	0.83
1:A:98:MSE:HE2	1:A:104:LEU:O	1.79	0.81
1:L:136:TYR:HE1	2:L:301:URP:H52	1.46	0.81
1:O:194:LYS:NZ	3:O:301:HOH:O	2.13	0.81

All (5) 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)
3:B:439:HOH:O	3:J:467:HOH:O[2_545]	2.04	0.16
3:E:521:HOH:O	3:O:443:HOH:O[2_646]	2.14	0.06
3:K:664:HOH:O	3:O:519:HOH:O[2_646]	2.15	0.05
3:N:577:HOH:O	3:P:547:HOH:O[2_655]	2.17	0.03
3:L:620:HOH:O	3:P:506:HOH:O[2_645]	2.19	0.01

## 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	220/230 (96%)	216 (98%)	4 (2%)	0	100	100
1	B	220/230 (96%)	216 (98%)	4 (2%)	0	100	100
1	C	220/230 (96%)	215 (98%)	5 (2%)	0	100	100
1	D	220/230 (96%)	216 (98%)	4 (2%)	0	100	100
1	E	222/230 (96%)	219 (99%)	3 (1%)	0	100	100
1	F	222/230 (96%)	219 (99%)	3 (1%)	0	100	100
1	G	222/230 (96%)	219 (99%)	3 (1%)	0	100	100
1	H	222/230 (96%)	218 (98%)	4 (2%)	0	100	100
1	I	222/230 (96%)	218 (98%)	4 (2%)	0	100	100
1	J	222/230 (96%)	218 (98%)	4 (2%)	0	100	100
1	K	221/230 (96%)	214 (97%)	7 (3%)	0	100	100
1	L	221/230 (96%)	218 (99%)	3 (1%)	0	100	100
1	M	220/230 (96%)	216 (98%)	4 (2%)	0	100	100
1	N	220/230 (96%)	217 (99%)	3 (1%)	0	100	100
1	O	221/230 (96%)	217 (98%)	4 (2%)	0	100	100
1	P	220/230 (96%)	216 (98%)	4 (2%)	0	100	100
All	All	3535/3680 (96%)	3472 (98%)	63 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	181/184 (98%)	179 (99%)	2 (1%)	65	37
1	B	182/184 (99%)	181 (100%)	1 (0%)	81	61
1	C	181/184 (98%)	180 (99%)	1 (1%)	78	56
1	D	181/184 (98%)	181 (100%)	0	100	100
1	E	184/184 (100%)	183 (100%)	1 (0%)	81	61

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	183/184 (100%)	181 (99%)	2 (1%)	65	37
1	G	183/184 (100%)	181 (99%)	2 (1%)	65	37
1	H	183/184 (100%)	183 (100%)	0	100	100
1	I	183/184 (100%)	182 (100%)	1 (0%)	81	61
1	J	183/184 (100%)	182 (100%)	1 (0%)	81	61
1	K	182/184 (99%)	181 (100%)	1 (0%)	81	61
1	L	182/184 (99%)	181 (100%)	1 (0%)	81	61
1	M	181/184 (98%)	180 (99%)	1 (1%)	78	56
1	N	180/184 (98%)	180 (100%)	0	100	100
1	O	182/184 (99%)	180 (99%)	2 (1%)	65	37
1	P	181/184 (98%)	180 (99%)	1 (1%)	78	56
All	All	2912/2944 (99%)	2895 (99%)	17 (1%)	78	56

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	O	35	TYR
1	P	35	TYR
1	G	35	TYR
1	G	225	SER
1	I	35	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 28 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	71	GLN
1	O	105	GLN
1	J	17	GLN
1	M	27	ASN
1	I	71	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](#)

8 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	URP	J	301	-	8,8,8	3.41	3 (37%)	9,9,9	1.80	2 (22%)
2	URP	C	301	-	8,8,8	3.41	3 (37%)	9,9,9	1.77	2 (22%)
2	URP	L	301	-	8,8,8	3.43	3 (37%)	9,9,9	1.73	2 (22%)
2	URP	G	301	-	8,8,8	3.41	3 (37%)	9,9,9	1.89	4 (44%)
2	URP	F	301	-	8,8,8	3.39	3 (37%)	9,9,9	2.02	2 (22%)
2	URP	K	301	-	8,8,8	3.44	3 (37%)	9,9,9	1.77	2 (22%)
2	URP	D	301	-	8,8,8	3.37	3 (37%)	9,9,9	1.99	2 (22%)
2	URP	H	301	-	8,8,8	3.47	3 (37%)	9,9,9	2.00	3 (33%)

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	URP	J	301	-	-	3/6/6/6	-
2	URP	C	301	-	-	3/6/6/6	-
2	URP	L	301	-	-	3/6/6/6	-
2	URP	G	301	-	-	3/6/6/6	-

*Continued on next page...*

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	URP	F	301	-	-	3/6/6/6	-
2	URP	K	301	-	-	4/6/6/6	-
2	URP	D	301	-	-	3/6/6/6	-
2	URP	H	301	-	-	2/6/6/6	-

The worst 5 of 24 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	301	URP	C2-N1	7.45	1.45	1.34
2	L	301	URP	C2-N1	7.37	1.45	1.34
2	G	301	URP	C2-N1	7.30	1.45	1.34
2	K	301	URP	C2-N1	7.30	1.45	1.34
2	C	301	URP	C2-N1	7.25	1.45	1.34

The worst 5 of 19 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	301	URP	C6-N1-C2	-3.95	117.49	122.64
2	D	301	URP	C6-N1-C2	-3.76	117.73	122.64
2	C	301	URP	C6-N1-C2	-3.46	118.13	122.64
2	J	301	URP	C6-N1-C2	-3.33	118.30	122.64
2	H	301	URP	C6-C5-C4	3.32	120.18	112.98

There are no chirality outliers.

5 of 24 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	301	URP	O42-C4-C5-C6
2	F	301	URP	O41-C4-C5-C6
2	L	301	URP	O42-C4-C5-C6
2	D	301	URP	O41-C4-C5-C6
2	F	301	URP	O42-C4-C5-C6

There are no ring outliers.

8 monomers are involved in 45 short contacts:

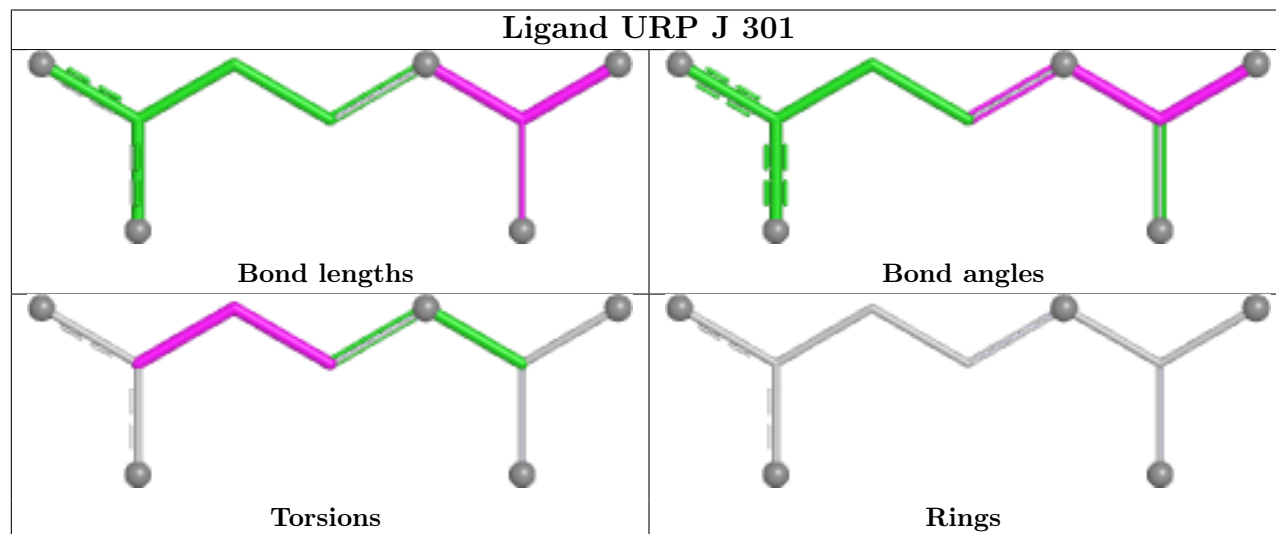
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	301	URP	6	0
2	C	301	URP	7	0
2	L	301	URP	6	0

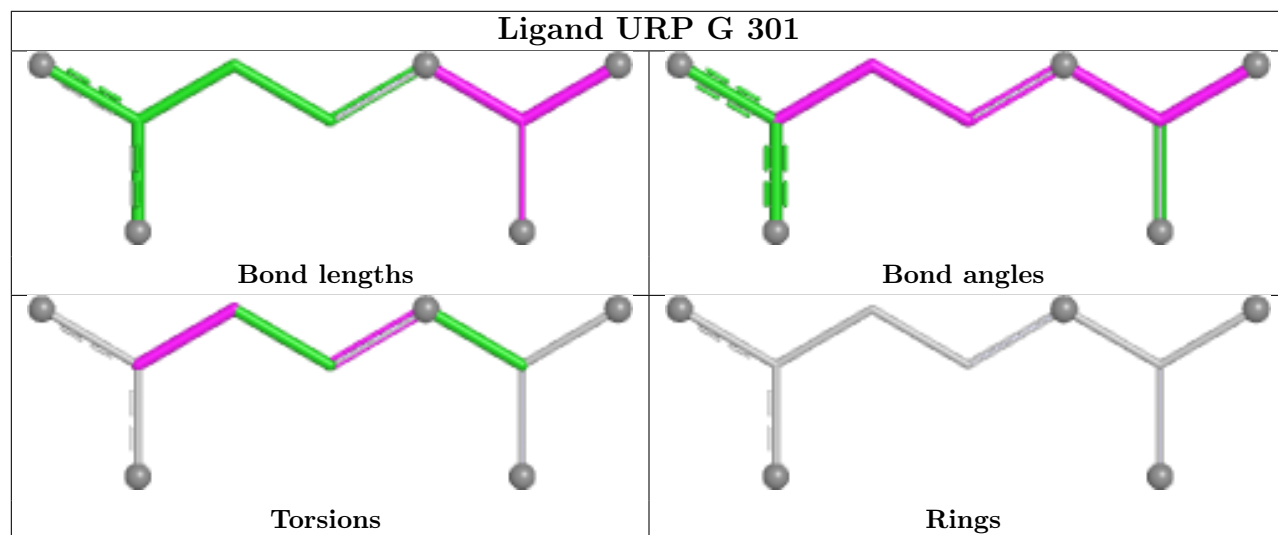
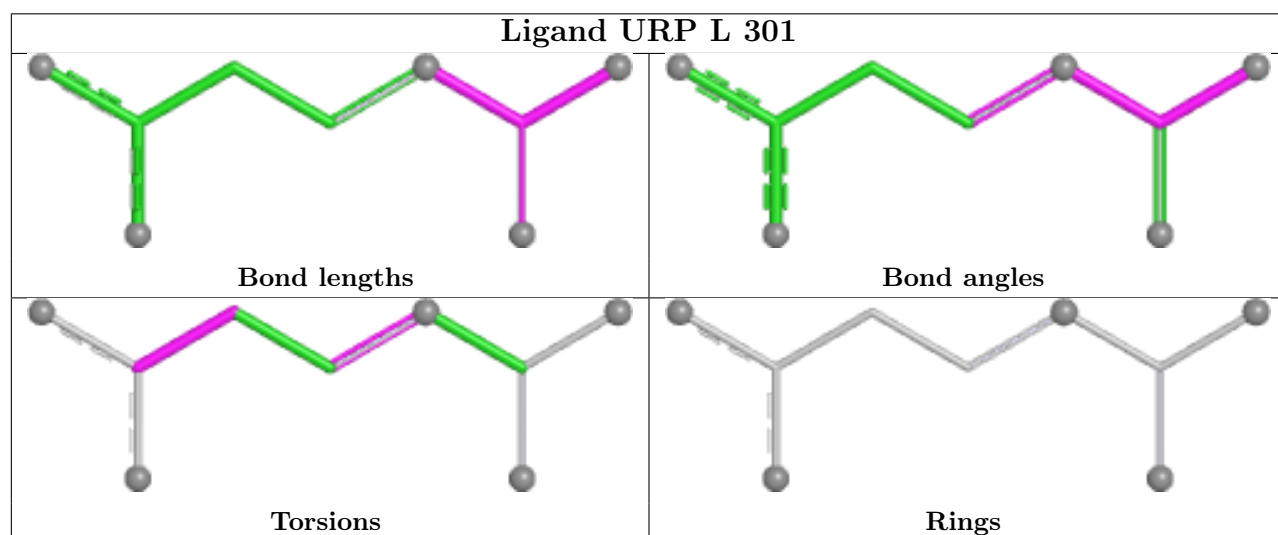
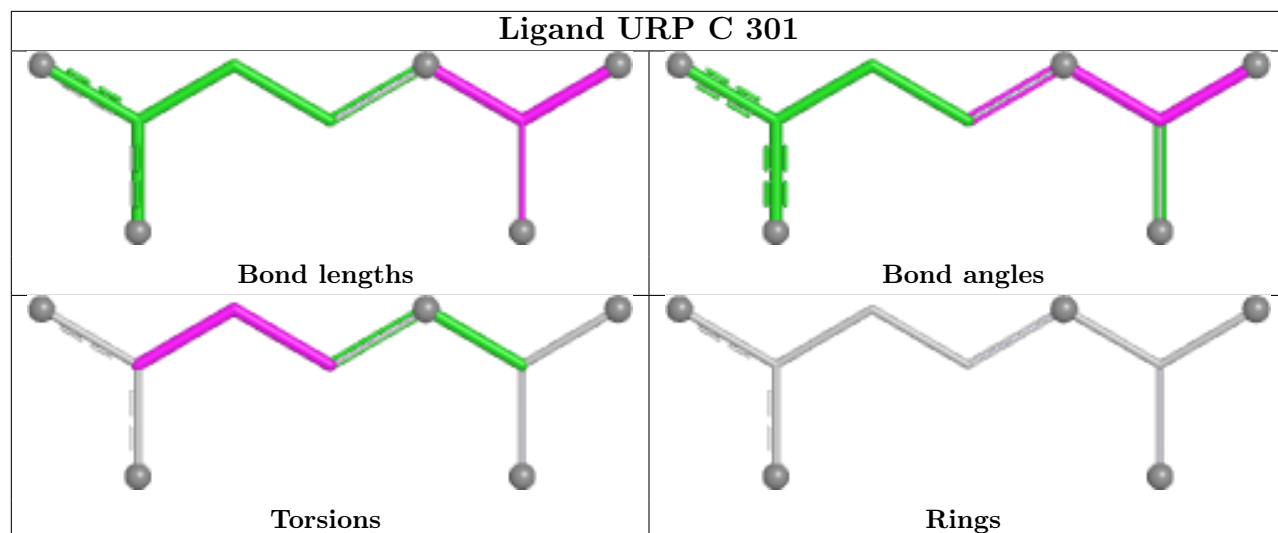
Continued on next page...

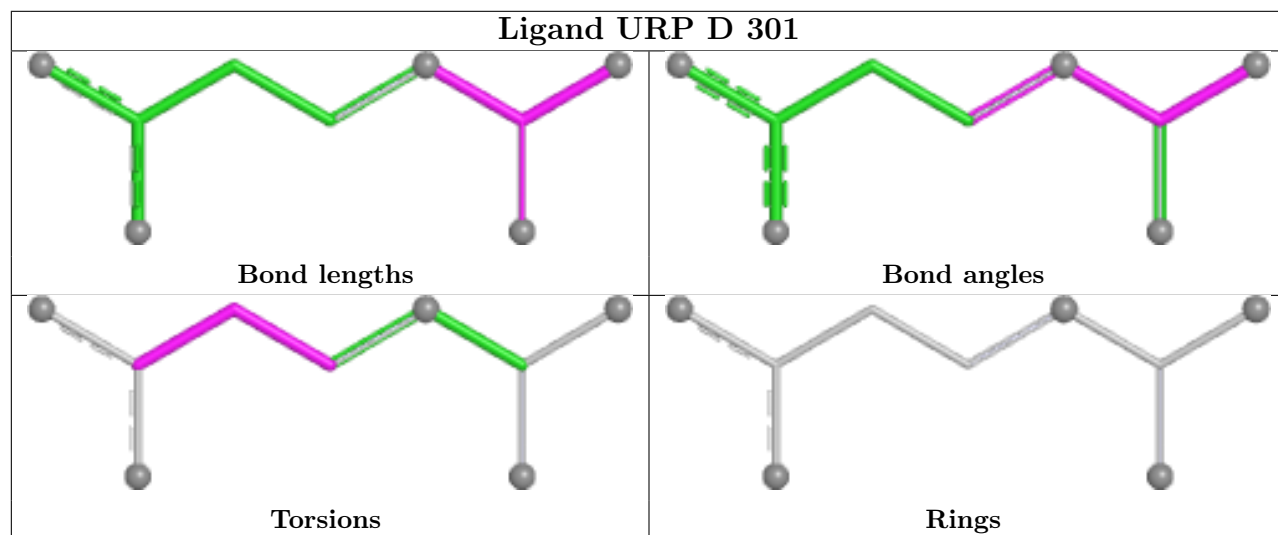
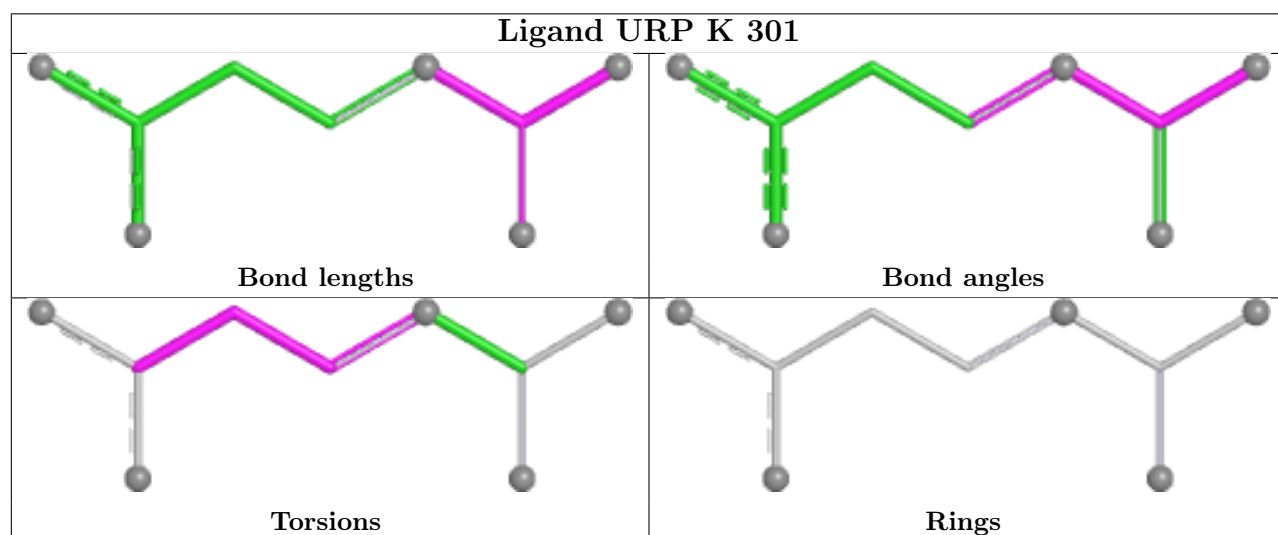
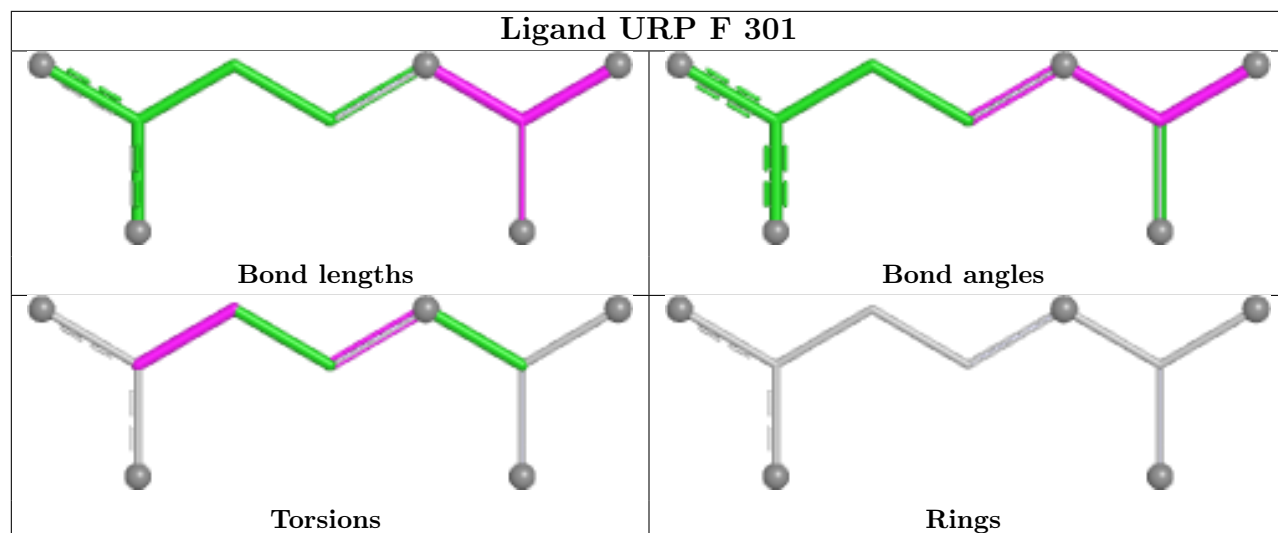
*Continued from previous page...*

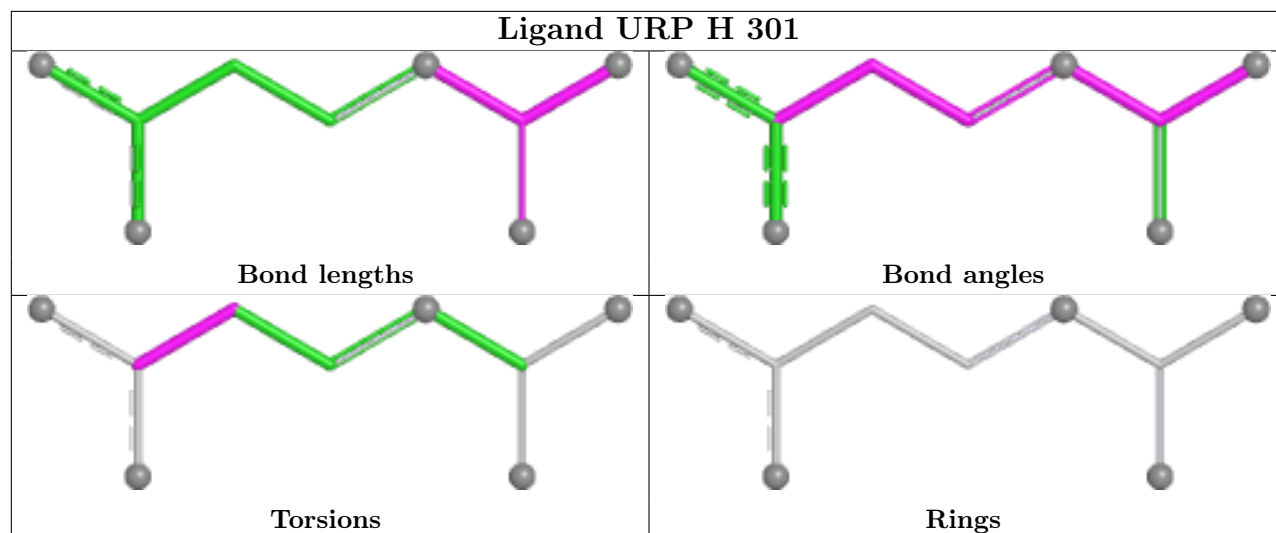
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	301	URP	7	0
2	F	301	URP	3	0
2	K	301	URP	6	0
2	D	301	URP	7	0
2	H	301	URP	3	0

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	219/230 (95%)	-0.09	4 (1%) 67 71	12, 21, 38, 50	0
1	B	219/230 (95%)	-0.35	3 (1%) 73 76	10, 17, 30, 53	0
1	C	219/230 (95%)	-0.26	3 (1%) 73 76	14, 19, 30, 44	0
1	D	219/230 (95%)	-0.47	1 (0%) 87 89	10, 15, 25, 42	0
1	E	221/230 (96%)	-0.20	5 (2%) 61 63	14, 18, 31, 57	0
1	F	221/230 (96%)	-0.44	3 (1%) 73 76	10, 15, 26, 55	0
1	G	221/230 (96%)	-0.28	1 (0%) 87 89	14, 18, 31, 53	0
1	H	221/230 (96%)	-0.50	2 (0%) 81 84	9, 14, 26, 52	0
1	I	221/230 (96%)	-0.26	0 100 100	13, 19, 33, 45	0
1	J	221/230 (96%)	-0.38	1 (0%) 87 89	9, 17, 29, 44	0
1	K	220/230 (95%)	-0.09	2 (0%) 81 84	16, 21, 32, 50	0
1	L	220/230 (95%)	-0.36	1 (0%) 87 89	11, 16, 28, 41	0
1	M	219/230 (95%)	0.12	6 (2%) 56 58	15, 24, 44, 61	0
1	N	219/230 (95%)	-0.18	5 (2%) 61 63	11, 19, 36, 51	0
1	O	220/230 (95%)	0.13	4 (1%) 67 71	14, 23, 43, 62	0
1	P	219/230 (95%)	-0.15	3 (1%) 73 76	11, 20, 36, 47	0
All	All	3519/3680 (95%)	-0.23	44 (1%) 75 79	9, 18, 34, 62	0

The worst 5 of 44 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	O	224	THR	4.7
1	E	224	THR	4.5
1	B	223	PRO	4.4
1	G	225	SER	3.5
1	M	11	ILE	3.4

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 6.4 Ligands [i](#)

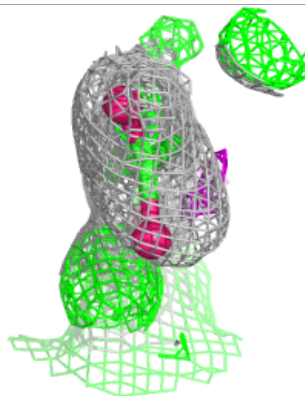
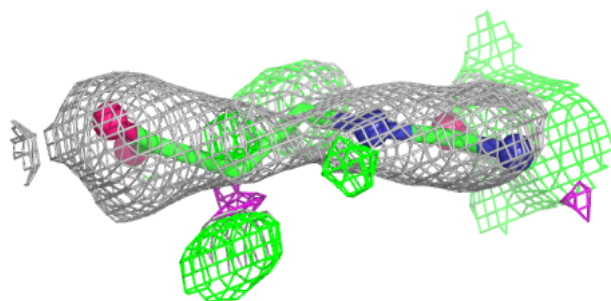
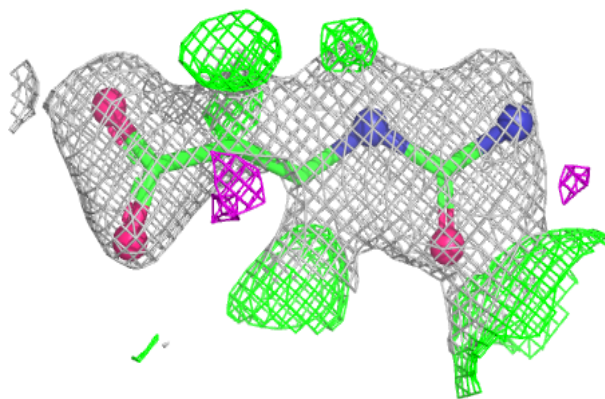
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	URP	L	301	9/9	0.76	0.23	21,49,59,74	0
2	URP	F	301	9/9	0.77	0.21	18,35,53,67	0
2	URP	J	301	9/9	0.78	0.17	24,42,48,55	0
2	URP	K	301	9/9	0.79	0.20	29,42,63,82	0
2	URP	H	301	9/9	0.81	0.18	19,33,58,64	0
2	URP	G	301	9/9	0.82	0.19	25,49,60,70	0
2	URP	C	301	9/9	0.86	0.18	27,53,59,61	0
2	URP	D	301	9/9	0.86	0.17	19,34,59,66	0

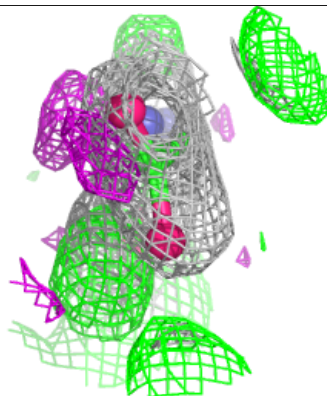
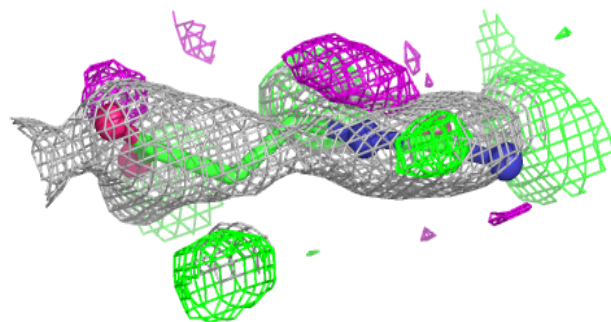
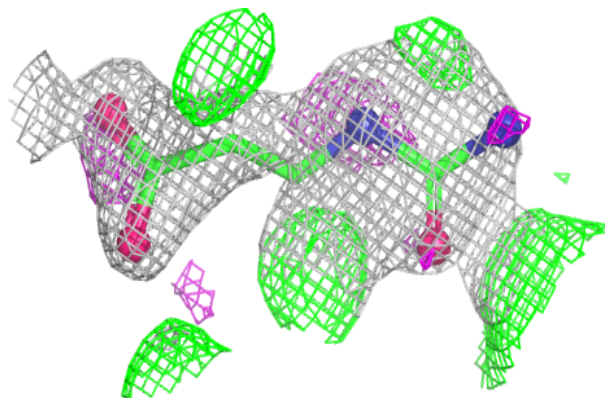
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around URP L 301:**

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

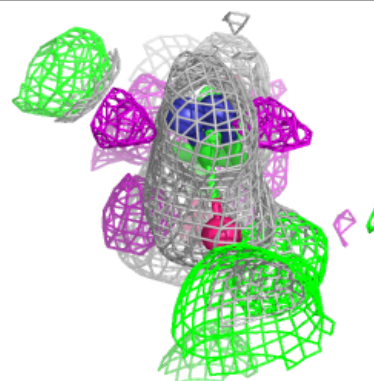
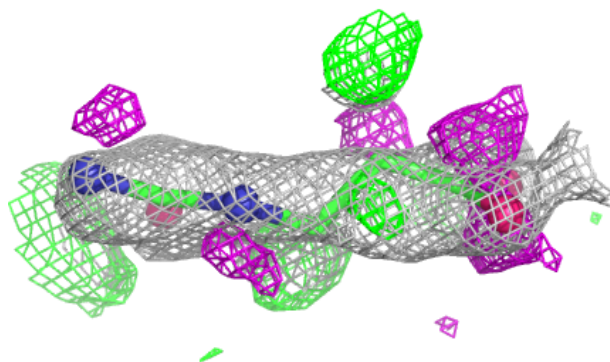
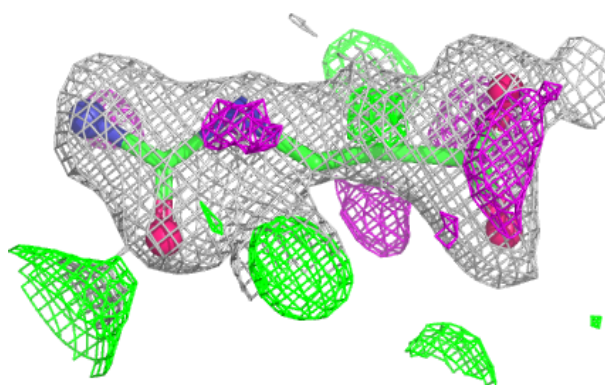
**Electron density around URP F 301:**

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

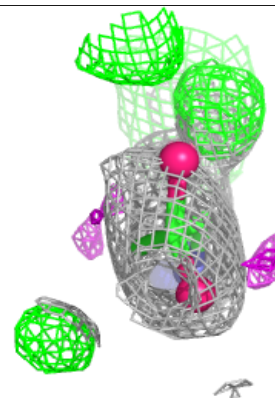
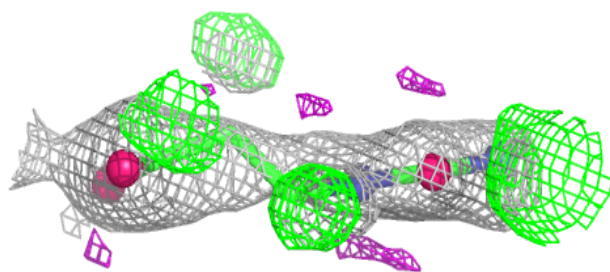
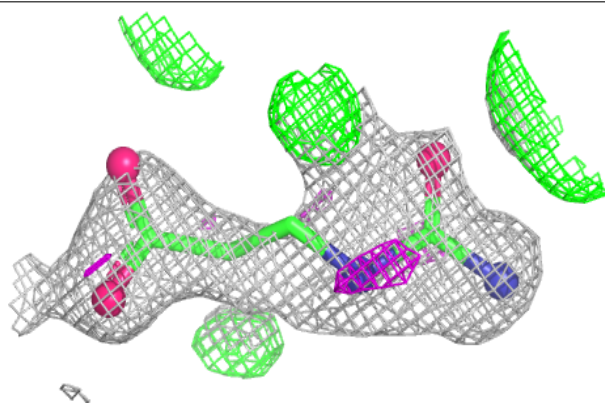


**Electron density around URP J 301:**

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

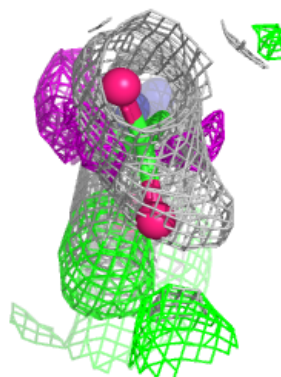
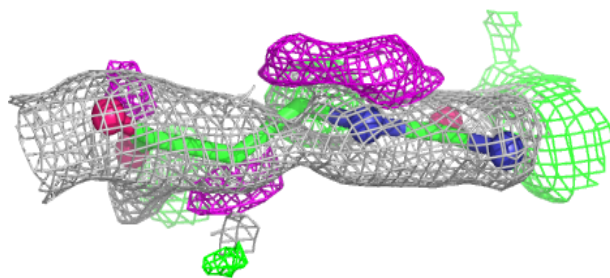
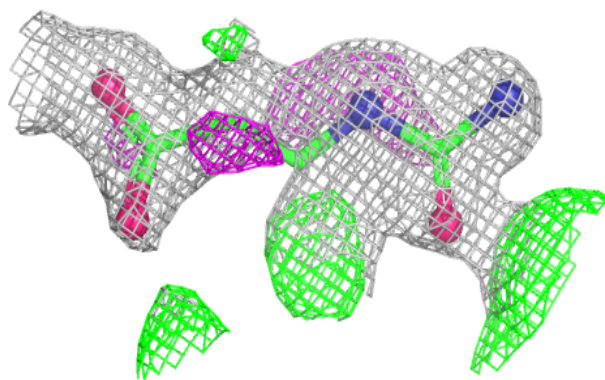
**Electron density around URP K 301:**

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

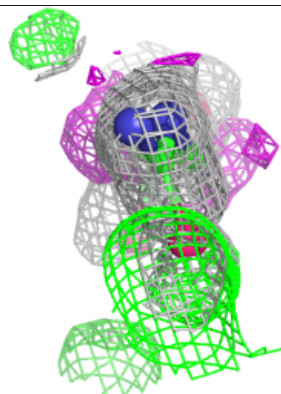
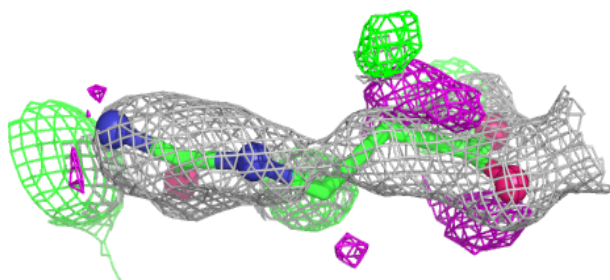
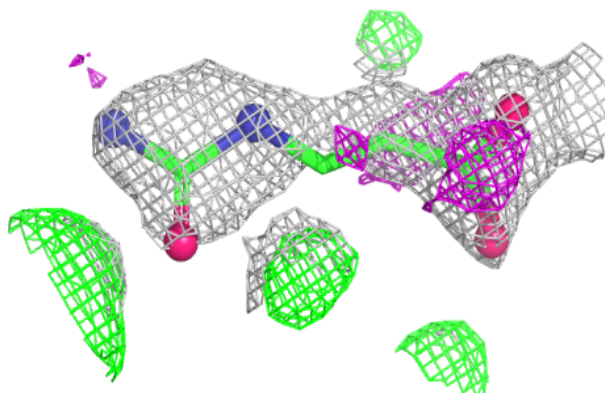


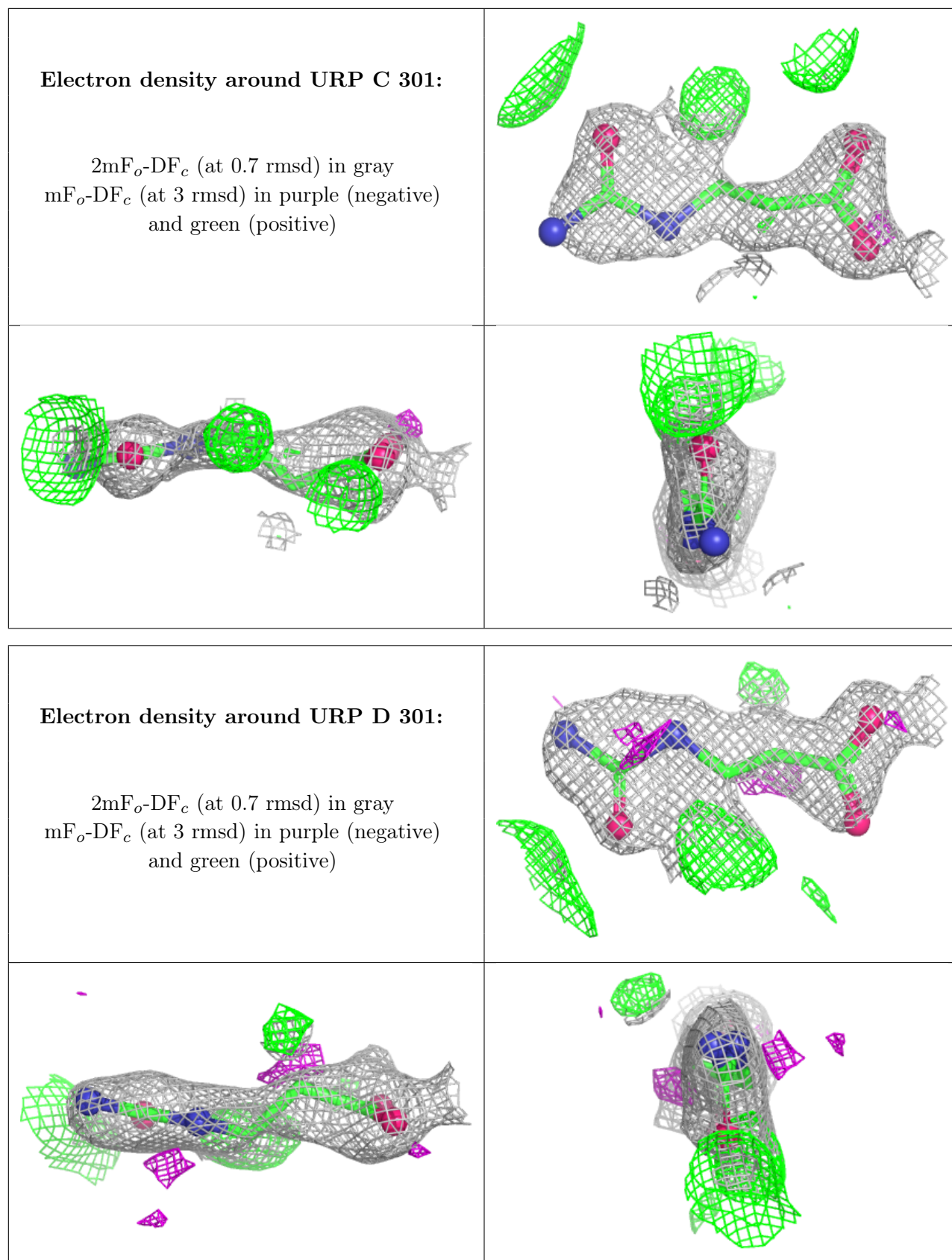
**Electron density around URP H 301:**

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

**Electron density around URP 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)





## 6.5 Other polymers [i](#)

There are no such residues in this entry.