



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 16, 2023 – 02:14 AM EDT

PDB ID : 8E5N  
Title : Structure of ARG1 complex with pyrrolidine-based non-boronic acid inhibitor  
10  
Authors : Palte, R.L.; Gathiaka, S.  
Deposited on : 2022-08-22  
Resolution : 2.54 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](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>.

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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

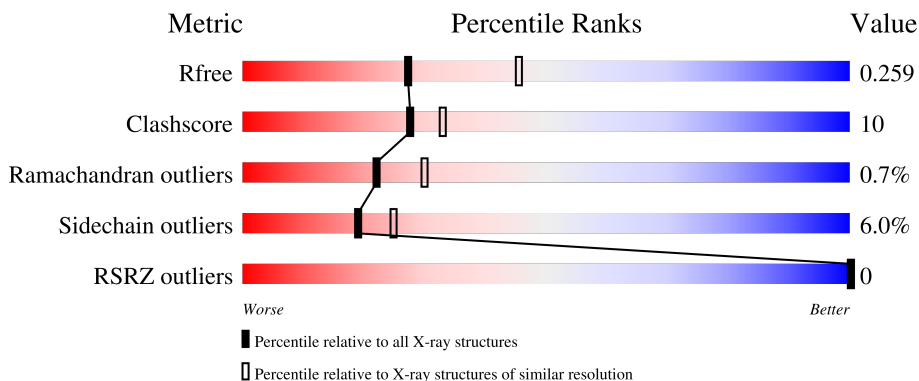
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.54 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	1284 (2.56-2.52)
Clashscore	141614	1332 (2.56-2.52)
Ramachandran outliers	138981	1315 (2.56-2.52)
Sidechain outliers	138945	1315 (2.56-2.52)
RSRZ outliers	127900	1272 (2.56-2.52)

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	322	74% (green), 23% (yellow), 3% (orange), 2% (red), 1% (grey)
1	B	322	72% (green), 25% (yellow), 3% (orange), 2% (red), 1% (grey)
1	C	322	72% (green), 24% (yellow), 3% (orange), 2% (red), 1% (grey)
1	D	322	72% (green), 23% (yellow), 3% (orange), 2% (red), 1% (grey)
1	E	322	75% (green), 22% (yellow), 3% (orange), 2% (red), 1% (grey)

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Mol	Chain	Length	Quality of chain
1	F	322	 75% 21% ..

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 14716 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.

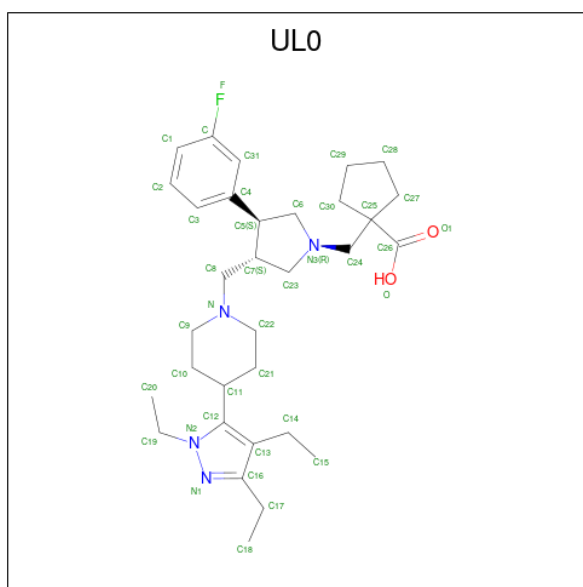
- Molecule 1 is a protein called Arginase-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	317	2409	1535	411	457	6	0	0	0
1	B	317	2409	1535	411	457	6	0	0	0
1	C	317	2409	1535	411	457	6	0	0	0
1	D	317	2409	1535	411	457	6	0	0	0
1	E	317	2409	1535	411	457	6	0	0	0
1	F	317	2409	1535	411	457	6	0	0	0

- Molecule 2 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Mn	0	0
			2	2		
2	B	2	Total	Mn	0	0
			2	2		
2	C	2	Total	Mn	0	0
			2	2		
2	D	2	Total	Mn	0	0
			2	2		
2	E	2	Total	Mn	0	0
			2	2		
2	F	2	Total	Mn	0	0
			2	2		

- Molecule 3 is 1-{{(3S,4S)-3-(3-fluorophenyl)-4-{{4-(1,3,4-triethyl-1H-pyrazol-5-yl)piperidin-1-yl}methyl}pyrrolidin-1-yl}methyl}cyclopentane-1-carboxylic acid (three-letter code: UL0) (formula: C<sub>32</sub>H<sub>47</sub>FN<sub>4</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	F	N	O		
3	A	1	Total 39	C 32	F 1	N 4	O 2	0	0
3	B	1	Total 39	C 32	F 1	N 4	O 2	0	0
3	C	1	Total 39	C 32	F 1	N 4	O 2	0	0
3	D	1	Total 39	C 32	F 1	N 4	O 2	0	0
3	E	1	Total 39	C 32	F 1	N 4	O 2	0	0
3	F	1	Total 39	C 32	F 1	N 4	O 2	0	0

- Molecule 4 is water.

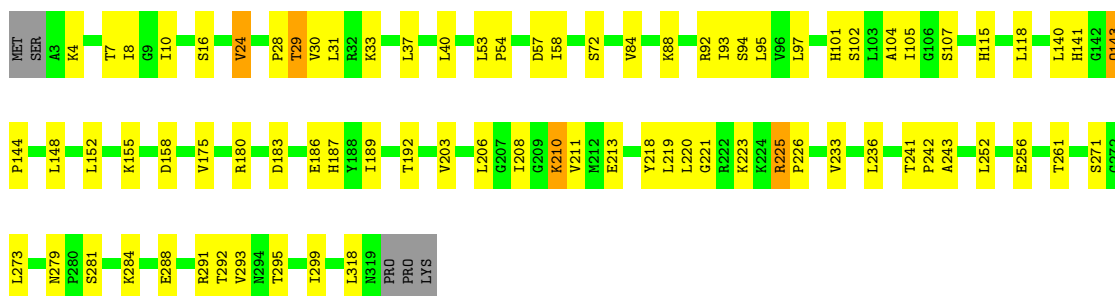
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total 2	O 2	0	0
4	B	2	Total 2	O 2	0	0
4	C	3	Total 3	O 3	0	0
4	D	4	Total 4	O 4	0	0
4	E	3	Total 3	O 3	0	0
4	F	2	Total 2	O 2	0	0

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

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

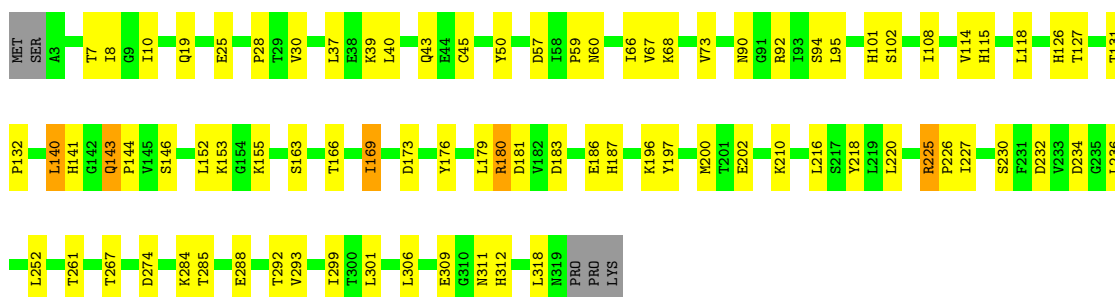
- Molecule 1: Arginase-1

Chain A: 



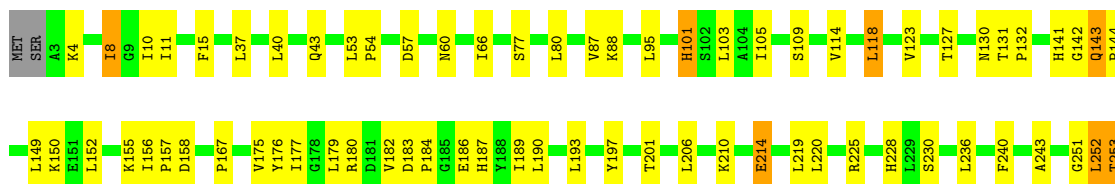
- Molecule 1: Arginase-1

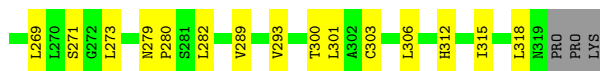
Chain B: 



- Molecule 1: Arginase-1

Chain C: 

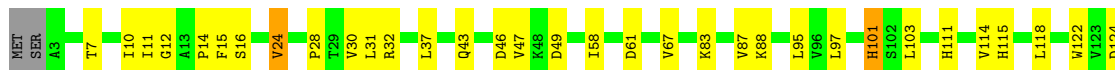




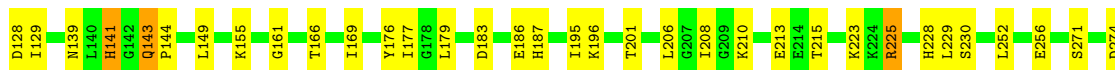
- Molecule 1: Arginase-1



- Molecule 1: Arginase-1



- Molecule 1: Arginase-1



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	53.42Å 287.54Å 67.35Å 90.00° 90.20° 90.00°	Depositor
Resolution (Å)	71.88 – 2.54 71.88 – 2.54	Depositor EDS
% Data completeness (in resolution range)	97.4 (71.88-2.54) 96.4 (71.88-2.54)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.98 (at 2.55Å)	Xtrriage
Refinement program	BUSTER 2.11.7 (20-MAY-2020)	Depositor
R, $R_{free}$	0.237 , 0.296 0.204 , 0.259	Depositor DCC
$R_{free}$ test set	3192 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	24.1	Xtrriage
Anisotropy	0.913	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 4.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.43$ , $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	0.349 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	14716	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	23.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.35% of the height of the origin peak. No significant pseudotranslation is detected.*

<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: MN, UL0

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	0.43	0/2459	0.63	0/3336
1	B	0.43	0/2459	0.64	0/3336
1	C	0.45	0/2459	0.64	0/3336
1	D	0.43	0/2459	0.64	0/3336
1	E	0.41	0/2459	0.61	0/3336
1	F	0.41	0/2459	0.62	0/3336
All	All	0.43	0/14754	0.63	0/20016

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [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	2409	0	2456	52	0
1	B	2409	0	2456	47	0
1	C	2409	0	2456	59	0
1	D	2409	0	2456	59	0
1	E	2409	0	2456	46	0
1	F	2409	0	2456	54	0
2	A	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
2	E	2	0	0	0	0
2	F	2	0	0	0	0
3	A	39	0	0	0	0
3	B	39	0	0	0	0
3	C	39	0	0	1	0
3	D	39	0	0	0	0
3	E	39	0	0	0	0
3	F	39	0	0	0	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
4	C	3	0	0	0	0
4	D	4	0	0	0	0
4	E	3	0	0	0	0
4	F	2	0	0	0	0
All	All	14716	0	14736	294	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 10.

All (294) 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:E:11:ILE:HD11	1:E:87:VAL:HG21	1.41	1.03
1:A:30:VAL:HA	1:A:33:LYS:HD2	1.47	0.94
1:D:102:SER:HA	1:D:144:PRO:HG3	1.52	0.92
1:E:88:LYS:NZ	1:E:271:SER:HB3	1.90	0.87
1:F:88:LYS:NZ	1:F:271:SER:HB3	1.89	0.87
1:C:88:LYS:NZ	1:C:271:SER:HB3	1.90	0.85
1:E:88:LYS:HZ1	1:E:271:SER:HB3	1.41	0.85
1:C:210:LYS:NZ	1:C:214:GLU:HB2	1.92	0.85
1:A:288:GLU:HG2	1:A:291:ARG:HH21	1.40	0.83
1:F:223:LYS:NZ	1:F:225:ARG:HB3	1.97	0.80
1:A:187:HIS:CE1	1:B:312:HIS:HD1	2.00	0.79
1:D:307:ALA:H	1:D:311:ASN:HD21	1.31	0.78
1:F:230:SER:HA	1:F:274:ASP:HB2	1.65	0.78
1:A:187:HIS:ND1	1:B:312:HIS:ND1	2.27	0.78
1:C:210:LYS:HZ1	1:C:214:GLU:HB2	1.49	0.77
1:C:43:GLN:OE1	1:C:306:LEU:HB2	1.84	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:HIS:ND1	1:E:312:HIS:ND1	2.32	0.76
1:F:15:PHE:HZ	1:F:73:VAL:HG22	1.51	0.76
1:F:93:ILE:HG12	1:F:271:SER:HA	1.67	0.75
1:F:88:LYS:HZ1	1:F:271:SER:HB3	1.49	0.74
1:F:223:LYS:HZ3	1:F:225:ARG:HB3	1.55	0.71
1:D:102:SER:HB3	1:D:141:HIS:HA	1.73	0.70
1:D:143:GLN:H	1:D:144:PRO:CD	2.05	0.70
1:E:295:THR:O	1:E:299:ILE:HG12	1.92	0.69
1:C:88:LYS:HZ3	1:C:271:SER:HB3	1.55	0.68
1:B:261:THR:HG21	1:B:299:ILE:HG23	1.76	0.68
1:A:30:VAL:HA	1:A:33:LYS:CD	2.24	0.68
1:A:4:LYS:O	1:A:93:ILE:HD11	1.94	0.68
1:B:114:VAL:HG12	1:B:115:HIS:CD2	2.30	0.67
1:E:114:VAL:HG12	1:E:115:HIS:CD2	2.31	0.65
1:C:88:LYS:HZ1	1:C:271:SER:HB3	1.62	0.65
1:A:16:SER:HB2	1:A:24:VAL:HG12	1.78	0.63
1:B:30:VAL:HG12	1:B:293:VAL:HG21	1.80	0.63
1:A:210:LYS:NZ	1:A:213:GLU:HB3	2.12	0.63
1:D:16:SER:HB2	1:D:24:VAL:HG12	1.79	0.63
1:D:242:PRO:HD2	1:D:292:THR:OG1	1.99	0.62
1:C:143:GLN:N	1:C:144:PRO:HD2	2.15	0.62
1:B:216:LEU:HD22	1:B:267:THR:HG21	1.82	0.62
1:F:101:HIS:CD2	1:F:276:MET:HG3	2.35	0.62
1:C:143:GLN:H	1:C:144:PRO:HD2	1.65	0.61
1:B:236:LEU:HD23	1:B:252:LEU:HB2	1.83	0.61
1:F:88:LYS:HZ3	1:F:271:SER:HB3	1.62	0.61
1:D:155:LYS:HZ1	1:F:319:ASN:CG	2.03	0.61
1:D:84:VAL:HG21	1:D:107:SER:HA	1.83	0.61
1:C:8:ILE:HD13	1:C:40:LEU:HD13	1.83	0.60
1:E:127:THR:HB	1:E:129:ILE:HG22	1.83	0.60
1:C:15:PHE:HB3	1:C:103:LEU:HD21	1.83	0.60
1:C:150:LYS:HA	1:C:167:PRO:HB2	1.84	0.60
1:A:210:LYS:HA	1:A:213:GLU:HB2	1.83	0.60
1:F:121:ILE:HG22	1:F:229:LEU:HD13	1.84	0.59
1:F:31:LEU:HD22	1:F:36:LEU:HD22	1.84	0.59
1:F:143:GLN:N	1:F:144:PRO:HD2	2.17	0.59
1:B:169:ILE:HG22	1:B:173:ASP:HB2	1.85	0.59
1:C:152:LEU:HD23	1:C:155:LYS:HG3	1.86	0.58
1:A:10:ILE:HG21	1:A:37:LEU:HD11	1.86	0.57
1:D:16:SER:CB	1:D:24:VAL:HG12	2.35	0.57
1:D:220:LEU:HD11	1:D:227:ILE:HD11	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:111:HIS:CE1	1:E:271:SER:HB2	2.39	0.57
1:D:130:ASN:HB2	1:D:142:GLY:O	2.05	0.57
1:D:187:HIS:NE2	1:F:309:GLU:OE2	2.37	0.57
1:C:130:ASN:HB2	1:C:142:GLY:O	2.06	0.56
1:E:127:THR:HG23	1:E:179:LEU:CD2	2.35	0.56
1:E:312:HIS:HB2	1:E:317:TYR:CE2	2.40	0.56
1:A:105:ILE:HA	1:A:148:LEU:HD21	1.86	0.56
1:A:261:THR:HG21	1:A:299:ILE:HG23	1.88	0.56
1:E:220:LEU:HD11	1:E:227:ILE:HD11	1.86	0.56
1:C:210:LYS:HZ3	1:C:214:GLU:HB2	1.68	0.56
1:D:15:PHE:HB3	1:D:103:LEU:HD11	1.87	0.56
1:F:15:PHE:CZ	1:F:73:VAL:HG22	2.37	0.56
1:C:11:ILE:HD11	1:C:87:VAL:HG21	1.87	0.56
1:D:7:THR:HA	1:D:46:ASP:HB3	1.87	0.56
1:F:223:LYS:HZ2	1:F:225:ARG:HB3	1.71	0.55
1:F:10:ILE:HG21	1:F:37:LEU:HD11	1.89	0.55
1:C:210:LYS:HZ1	1:C:214:GLU:CB	2.18	0.55
1:E:127:THR:HG23	1:E:179:LEU:HD21	1.87	0.55
1:A:203:VAL:HG22	1:A:211:VAL:HG21	1.89	0.55
1:D:95:LEU:HD13	1:D:273:LEU:HD23	1.87	0.55
1:B:187:HIS:ND1	1:E:312:HIS:CE1	2.75	0.54
1:C:143:GLN:H	1:C:144:PRO:CD	2.20	0.54
1:B:176:TYR:HB3	1:B:179:LEU:HD11	1.89	0.54
1:E:129:ILE:HG23	1:E:129:ILE:O	2.08	0.54
1:A:115:HIS:HB3	1:A:226:PRO:HG2	1.89	0.54
1:B:50:TYR:OH	1:B:90:ASN:ND2	2.41	0.54
1:B:114:VAL:HG12	1:B:115:HIS:NE2	2.22	0.54
1:F:31:LEU:HD13	1:F:97:LEU:HD22	1.90	0.54
1:D:206:LEU:HB2	1:D:210:LYS:HB3	1.90	0.53
1:F:71:ARG:HA	1:F:161:GLY:HA3	1.90	0.53
1:C:10:ILE:HD12	1:C:37:LEU:HG	1.90	0.53
1:F:139:ASN:HB3	1:F:141:HIS:HD2	1.73	0.53
1:A:242:PRO:HB3	1:A:284:LYS:HZ3	1.73	0.53
1:D:30:VAL:HG12	1:D:293:VAL:HG21	1.90	0.53
1:D:63:PRO:HA	1:D:70:PRO:HD3	1.90	0.53
1:C:80:LEU:HD22	1:C:103:LEU:HB3	1.90	0.53
1:D:175:VAL:HG22	1:D:196:LYS:HB3	1.91	0.52
1:B:25:GLU:O	1:B:28:PRO:HD2	2.10	0.52
1:A:219:LEU:O	1:A:225:ARG:HD2	2.10	0.52
1:B:101:HIS:CE1	1:B:232:ASP:HB2	2.46	0.51
1:E:101:HIS:O	1:E:144:PRO:HG3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:236:LEU:HA	1:C:252:LEU:HB2	1.92	0.51
1:A:8:ILE:HD13	1:A:40:LEU:HD13	1.91	0.51
1:A:95:LEU:HD13	1:A:273:LEU:HD23	1.93	0.51
1:E:7:THR:HA	1:E:46:ASP:HB3	1.93	0.51
1:F:176:TYR:HB3	1:F:179:LEU:HD11	1.93	0.51
1:F:177:ILE:HD11	1:F:215:THR:HG21	1.93	0.51
1:A:210:LYS:NZ	1:A:213:GLU:CB	2.74	0.51
1:C:101:HIS:NE2	1:C:230:SER:OG	2.31	0.51
1:C:206:LEU:HB3	1:C:210:LYS:HB3	1.91	0.51
1:B:40:LEU:O	1:B:45:CYS:HB2	2.10	0.50
1:D:102:SER:HA	1:D:144:PRO:CG	2.32	0.50
1:C:289:VAL:O	1:C:293:VAL:HG23	2.11	0.50
1:C:187:HIS:ND1	1:D:312:HIS:ND1	2.59	0.50
1:B:220:LEU:HD11	1:B:227:ILE:HD11	1.93	0.50
1:A:208:ILE:HB	1:A:256:GLU:HG2	1.94	0.50
1:B:176:TYR:HB2	1:B:197:TYR:HA	1.93	0.50
1:B:39:LYS:HB3	1:B:301:LEU:HD21	1.94	0.50
1:B:102:SER:HB3	1:B:141:HIS:HA	1.94	0.50
1:E:31:LEU:HD13	1:E:97:LEU:HD22	1.92	0.50
1:F:63:PRO:HB3	1:F:68:LYS:HA	1.94	0.49
1:B:101:HIS:ND1	1:B:232:ASP:HB2	2.27	0.49
1:D:48:LYS:HB2	1:D:92:ARG:CZ	2.42	0.49
1:B:59:PRO:O	1:B:60:ASN:HB2	2.12	0.49
1:C:182:VAL:HG13	1:C:186:GLU:HB2	1.94	0.49
1:D:101:HIS:CE1	1:D:122:TRP:NE1	2.81	0.49
1:A:102:SER:HA	1:A:144:PRO:HG3	1.95	0.49
1:A:187:HIS:CE1	1:B:312:HIS:ND1	2.74	0.49
1:F:16:SER:CB	1:F:24:VAL:HG12	2.43	0.49
1:B:108:ILE:HG21	1:B:169:ILE:HD11	1.95	0.49
1:B:126:HIS:CD2	1:B:181:ASP:HB3	2.48	0.49
1:A:242:PRO:HB3	1:A:284:LYS:NZ	2.28	0.49
1:C:105:ILE:O	1:C:109:SER:OG	2.28	0.49
1:D:143:GLN:N	1:D:144:PRO:CD	2.75	0.49
1:A:206:LEU:O	1:A:210:LYS:HB3	2.12	0.48
1:C:123:VAL:HG22	1:C:177:ILE:HB	1.94	0.48
1:B:10:ILE:HD12	1:B:95:LEU:HD23	1.95	0.48
1:E:122:TRP:CD1	1:E:124:ASP:HB2	2.48	0.48
1:E:16:SER:CB	1:E:24:VAL:HG12	2.43	0.48
1:D:261:THR:HG21	1:D:299:ILE:HG23	1.95	0.48
1:E:10:ILE:HG13	1:E:37:LEU:HD11	1.96	0.48
1:D:143:GLN:H	1:D:144:PRO:HD3	1.79	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:133:LEU:HD21	1:E:157:PRO:HG3	1.94	0.48
1:F:16:SER:HB3	1:F:24:VAL:HG12	1.95	0.48
1:A:31:LEU:HD23	1:A:293:VAL:HG13	1.95	0.47
1:B:200:MET:HB2	1:E:308:ARG:HD2	1.97	0.47
1:C:95:LEU:HD13	1:C:273:LEU:HD23	1.96	0.47
1:D:237:ASP:HB3	1:D:240:PHE:CD2	2.49	0.47
1:C:143:GLN:N	1:C:144:PRO:CD	2.77	0.47
1:D:149:LEU:HD23	1:D:169:ILE:HD12	1.96	0.47
1:E:16:SER:HB2	1:E:24:VAL:HG12	1.96	0.47
1:F:176:TYR:CB	1:F:179:LEU:HD11	2.44	0.47
1:A:183:ASP:HB2	1:A:186:GLU:HG3	1.95	0.47
1:A:295:THR:O	1:A:299:ILE:HG12	2.15	0.47
1:A:241:THR:HG22	1:A:292:THR:HG23	1.97	0.47
1:B:7:THR:HG22	1:B:92:ARG:HG2	1.96	0.47
1:B:146:SER:HA	1:B:152:LEU:HD12	1.97	0.47
1:F:143:GLN:N	1:F:144:PRO:CD	2.76	0.47
1:A:29:THR:O	1:A:33:LYS:HG3	2.14	0.47
1:D:41:LYS:NZ	1:D:47:VAL:HB	2.29	0.47
1:E:124:ASP:HB3	1:E:126:HIS:O	2.15	0.47
1:A:143:GLN:H	1:A:144:PRO:HD3	1.79	0.47
1:C:312:HIS:HD1	1:F:187:HIS:CE1	2.33	0.47
1:C:152:LEU:HB3	1:C:156:ILE:HD11	1.97	0.47
1:F:7:THR:HG22	1:F:92:ARG:HG2	1.96	0.47
1:D:155:LYS:HZ1	1:F:319:ASN:ND2	2.11	0.46
1:D:48:LYS:NZ	1:D:50:TYR:CE2	2.78	0.46
1:E:28:PRO:O	1:E:32:ARG:HG3	2.15	0.46
1:E:143:GLN:N	1:E:144:PRO:CD	2.79	0.46
1:A:243:ALA:HB1	1:A:279:ASN:O	2.16	0.46
1:C:280:PRO:HA	1:C:289:VAL:HG13	1.97	0.46
1:F:8:ILE:HD13	1:F:40:LEU:HD13	1.97	0.46
1:A:220:LEU:HD23	1:A:225:ARG:HG3	1.95	0.46
1:A:7:THR:HG22	1:A:92:ARG:HG2	1.97	0.46
1:B:155:LYS:HD2	1:E:318:LEU:HB3	1.96	0.46
1:D:10:ILE:HD12	1:D:95:LEU:HD23	1.98	0.46
1:D:150:LYS:HA	1:D:167:PRO:HB2	1.96	0.46
1:F:10:ILE:HG13	1:F:47:VAL:HG13	1.96	0.46
1:D:189:ILE:HG12	1:F:318:LEU:HD11	1.97	0.46
1:C:243:ALA:HA	1:C:282:LEU:O	2.15	0.46
1:C:40:LEU:HD23	1:C:301:LEU:HD23	1.96	0.45
1:A:143:GLN:N	1:A:144:PRO:CD	2.79	0.45
1:C:150:LYS:HA	1:C:167:PRO:CB	2.45	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:184:PRO:HA	1:D:311:ASN:O	2.16	0.45
1:E:111:HIS:NE2	1:E:271:SER:HB2	2.32	0.45
1:D:58:ILE:HD12	1:D:72:SER:HA	1.98	0.45
1:F:129:ILE:HD11	1:F:149:LEU:HD11	1.98	0.45
1:A:16:SER:CB	1:A:24:VAL:HG12	2.45	0.45
1:D:237:ASP:HB3	1:D:240:PHE:HD2	1.80	0.45
1:C:189:ILE:O	1:C:193:LEU:HB2	2.17	0.45
1:E:187:HIS:CD2	1:E:190:LEU:HD23	2.51	0.45
1:A:233:VAL:HB	1:A:241:THR:HG21	1.98	0.45
1:B:73:VAL:HG11	1:B:140:LEU:HB3	1.98	0.45
1:D:143:GLN:H	1:D:144:PRO:HD2	1.81	0.45
1:F:30:VAL:HG21	1:F:280:PRO:HG3	1.98	0.45
1:A:88:LYS:NZ	1:A:271:SER:HB3	2.32	0.45
1:B:43:GLN:OE1	1:B:306:LEU:HB2	2.17	0.45
1:A:236:LEU:HA	1:A:252:LEU:HB2	1.98	0.45
1:C:66:ILE:HD12	1:C:66:ILE:HA	1.93	0.45
1:D:199:SER:O	1:D:203:VAL:HG23	2.17	0.45
1:E:143:GLN:N	1:E:144:PRO:HD2	2.31	0.45
1:F:149:LEU:HD23	1:F:169:ILE:HG13	1.99	0.44
1:F:223:LYS:NZ	1:F:225:ARG:CB	2.76	0.44
1:C:183:ASP:HB2	1:C:186:GLU:HG3	1.99	0.44
1:D:200:MET:HB2	1:F:308:ARG:HD2	1.99	0.44
1:D:234:ASP:HB3	1:D:244:THR:HG21	1.99	0.44
1:F:54:PRO:O	1:F:79:GLN:OE1	2.35	0.44
1:B:183:ASP:HB2	1:B:186:GLU:HG3	1.98	0.44
1:E:88:LYS:HZ3	1:E:271:SER:HB3	1.77	0.44
1:D:73:VAL:HB	1:D:140:LEU:HD13	1.99	0.44
1:D:155:LYS:NZ	1:F:319:ASN:ND2	2.66	0.44
1:E:15:PHE:HB3	1:E:103:LEU:HD11	1.99	0.44
1:A:104:ALA:HA	1:A:107:SER:HB2	2.00	0.44
1:D:37:LEU:HG	1:D:47:VAL:HG11	2.00	0.44
1:B:114:VAL:CG1	1:B:115:HIS:NE2	2.80	0.44
1:C:318:LEU:HB3	1:F:155:LYS:HD2	1.99	0.44
1:D:187:HIS:ND1	1:F:312:HIS:ND1	2.64	0.44
1:C:132:PRO:HD2	1:C:157:PRO:HD2	1.99	0.44
1:F:183:ASP:HB2	1:F:186:GLU:HG3	1.99	0.44
1:A:192:THR:HG22	1:C:158:ASP:HB3	2.00	0.43
1:D:111:HIS:CG	1:D:118:LEU:HD22	2.53	0.43
1:D:190:LEU:HD12	1:D:195:ILE:HB	2.00	0.43
1:C:190:LEU:HG	1:C:197:TYR:CD1	2.53	0.43
1:E:183:ASP:HB2	1:E:186:GLU:HG3	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:189:ILE:HD11	1:B:318:LEU:HD21	1.99	0.43
1:E:190:LEU:HD12	1:E:195:ILE:HB	2.01	0.43
1:B:131:THR:HG22	1:B:146:SER:HB2	2.00	0.43
1:C:279:ASN:HB3	1:C:282:LEU:HB2	2.01	0.43
1:F:8:ILE:HD12	1:F:47:VAL:HG22	2.01	0.43
1:F:288:GLU:O	1:F:292:THR:OG1	2.28	0.43
1:B:143:GLN:N	1:B:144:PRO:CD	2.82	0.43
1:E:187:HIS:HD2	1:E:190:LEU:HD23	1.83	0.43
1:B:30:VAL:CG1	1:B:293:VAL:HG21	2.45	0.43
1:B:114:VAL:CG1	1:B:115:HIS:CD2	3.00	0.43
1:B:180:ARG:HB3	1:B:200:MET:HG2	2.01	0.43
1:E:153:LYS:HG3	1:E:167:PRO:HG2	2.01	0.43
1:C:149:LEU:HD12	1:C:152:LEU:HD12	1.99	0.43
1:E:12:GLY:O	1:E:14:PRO:HD3	2.19	0.43
1:F:58:ILE:HD13	1:F:72:SER:HA	2.01	0.43
1:F:206:LEU:HB3	1:F:210:LYS:HB3	2.01	0.43
1:C:183:ASP:OD1	3:C:1003:UL0:N3	2.51	0.43
1:D:127:THR:HG21	1:D:190:LEU:HD22	2.00	0.43
1:E:67:VAL:HG21	1:E:132:PRO:HA	2.01	0.43
1:A:58:ILE:HD13	1:A:72:SER:HA	2.01	0.43
1:D:101:HIS:CE1	1:D:122:TRP:CE2	3.07	0.42
1:F:208:ILE:HB	1:F:256:GLU:HG2	2.00	0.42
1:A:242:PRO:CB	1:A:284:LYS:NZ	2.82	0.42
1:B:225:ARG:H	1:B:225:ARG:HG3	1.56	0.42
1:B:288:GLU:O	1:B:292:THR:OG1	2.30	0.42
1:A:318:LEU:HD13	1:E:155:LYS:HG3	2.01	0.42
1:F:139:ASN:HB3	1:F:141:HIS:CD2	2.54	0.42
1:F:228:HIS:C	1:F:228:HIS:CD2	2.92	0.42
1:D:101:HIS:CE1	1:D:232:ASP:HB2	2.55	0.42
1:E:43:GLN:OE1	1:E:301:LEU:HB3	2.19	0.42
1:C:88:LYS:HB2	1:C:114:VAL:HG21	2.02	0.42
1:C:105:ILE:O	1:C:109:SER:CB	2.67	0.42
1:C:118:LEU:HD13	1:C:228:HIS:HB2	2.01	0.42
1:C:15:PHE:CB	1:C:103:LEU:HD21	2.49	0.42
1:A:175:VAL:HG22	1:A:218:TYR:CE2	2.55	0.42
1:A:155:LYS:NZ	1:C:60:ASN:HB2	2.34	0.42
1:C:300:THR:O	1:C:303:CYS:HB2	2.20	0.42
1:C:176:TYR:HB3	1:C:179:LEU:HD21	2.02	0.42
1:D:150:LYS:HA	1:D:167:PRO:CB	2.50	0.42
1:C:240:PHE:HE2	1:C:253:THR:HG22	1.85	0.41
1:F:126:HIS:HB2	1:F:128:ASP:OD1	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:312:HIS:HB2	1:D:317:TYR:CE2	2.55	0.41
1:E:263:GLU:HA	1:E:266:LYS:HG3	2.02	0.41
1:B:230:SER:HA	1:B:274:ASP:HB2	2.01	0.41
1:D:83:LYS:HA	1:D:83:LYS:HD3	1.89	0.41
1:D:243:ALA:HB3	1:D:292:THR:HG21	2.03	0.41
1:B:67:VAL:HG21	1:B:132:PRO:HB3	2.02	0.41
1:B:126:HIS:HE1	1:B:234:ASP:OD2	2.04	0.41
1:D:219:LEU:O	1:D:225:ARG:NH1	2.54	0.41
1:A:53:LEU:HA	1:A:54:PRO:HD3	1.98	0.41
1:C:180:ARG:CZ	1:C:251:GLY:HA3	2.51	0.41
1:A:84:VAL:HG21	1:A:107:SER:HA	2.02	0.41
1:C:53:LEU:HA	1:C:54:PRO:HD3	1.93	0.41
1:C:175:VAL:HG23	1:C:219:LEU:HD21	2.02	0.41
1:D:30:VAL:HG21	1:D:280:PRO:HG3	2.03	0.41
1:C:220:LEU:HD13	1:C:269:LEU:HD12	2.03	0.41
1:A:206:LEU:HB3	1:A:210:LYS:HG2	2.03	0.40
1:E:83:LYS:HA	1:E:83:LYS:HD3	1.93	0.40
1:B:196:LYS:HB2	1:B:218:TYR:CZ	2.56	0.40
1:D:180:ARG:HG3	1:D:248:VAL:HG11	2.03	0.40
1:E:30:VAL:HG21	1:E:280:PRO:HG3	2.03	0.40
1:F:117:ASP:HB2	1:F:223:LYS:NZ	2.36	0.40
1:F:252:LEU:HD22	1:F:256:GLU:HB3	2.03	0.40
1:B:115:HIS:HB3	1:B:226:PRO:HG2	2.03	0.40
1:D:6:ARG:HH21	1:D:305:GLY:HA3	1.84	0.40
1:E:175:VAL:HG11	1:E:215:THR:HG23	2.03	0.40
1:E:175:VAL:HG22	1:E:196:LYS:HB3	2.03	0.40
1:F:111:HIS:CG	1:F:118:LEU:HD22	2.56	0.40
1:A:155:LYS:HZ1	1:C:60:ASN:HB2	1.85	0.40
1:A:28:PRO:HG3	1:A:97:LEU:O	2.22	0.40
1:A:140:LEU:O	1:A:144:PRO:HD3	2.22	0.40
1:D:140:LEU:O	1:D:144:PRO:HD3	2.21	0.40
1:E:58:ILE:HG22	1:E:61:ASP:HB2	2.04	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	315/322 (98%)	289 (92%)	23 (7%)	3 (1%)	15	22
1	B	315/322 (98%)	290 (92%)	22 (7%)	3 (1%)	15	22
1	C	315/322 (98%)	301 (96%)	12 (4%)	2 (1%)	25	34
1	D	315/322 (98%)	293 (93%)	20 (6%)	2 (1%)	25	34
1	E	315/322 (98%)	287 (91%)	27 (9%)	1 (0%)	41	51
1	F	315/322 (98%)	299 (95%)	13 (4%)	3 (1%)	15	22
All	All	1890/1932 (98%)	1759 (93%)	117 (6%)	14 (1%)	22	30

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	195	ILE
1	A	221	GLY
1	D	143	GLN
1	A	180	ARG
1	B	57	ASP
1	C	143	GLN
1	D	4	LYS
1	F	67	VAL
1	B	143	GLN
1	B	180	ARG
1	C	252	LEU
1	A	143	GLN
1	E	143	GLN
1	F	143	GLN

### 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	265/270 (98%)	252 (95%)	13 (5%)	25	34
1	B	265/270 (98%)	245 (92%)	20 (8%)	13	17
1	C	265/270 (98%)	251 (95%)	14 (5%)	22	30
1	D	265/270 (98%)	248 (94%)	17 (6%)	17	23
1	E	265/270 (98%)	248 (94%)	17 (6%)	17	23
1	F	265/270 (98%)	251 (95%)	14 (5%)	22	30
All	All	1590/1620 (98%)	1495 (94%)	95 (6%)	19	25

All (95) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	VAL
1	A	29	THR
1	A	57	ASP
1	A	94	SER
1	A	101	HIS
1	A	118	LEU
1	A	141	HIS
1	A	152	LEU
1	A	158	ASP
1	A	210	LYS
1	A	223	LYS
1	A	225	ARG
1	A	281	SER
1	B	8	ILE
1	B	19	GLN
1	B	37	LEU
1	B	66	ILE
1	B	68	LYS
1	B	94	SER
1	B	118	LEU
1	B	127	THR
1	B	140	LEU
1	B	153	LYS
1	B	163	SER
1	B	166	THR
1	B	169	ILE
1	B	202	GLU
1	B	210	LYS
1	B	225	ARG
1	B	284	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	285	THR
1	B	309	GLU
1	B	311	ASN
1	C	4	LYS
1	C	8	ILE
1	C	57	ASP
1	C	77	SER
1	C	101	HIS
1	C	118	LEU
1	C	127	THR
1	C	131	THR
1	C	141	HIS
1	C	201	THR
1	C	214	GLU
1	C	225	ARG
1	C	253	THR
1	C	315	ILE
1	D	8	ILE
1	D	21	ARG
1	D	24	VAL
1	D	48	LYS
1	D	62	SER
1	D	83	LYS
1	D	118	LEU
1	D	140	LEU
1	D	141	HIS
1	D	153	LYS
1	D	190	LEU
1	D	206	LEU
1	D	223	LYS
1	D	225	ARG
1	D	254	TYR
1	D	271	SER
1	D	284	LYS
1	E	24	VAL
1	E	47	VAL
1	E	49	ASP
1	E	95	LEU
1	E	101	HIS
1	E	118	LEU
1	E	127	THR
1	E	141	HIS

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Mol	Chain	Res	Type
1	E	158	ASP
1	E	206	LEU
1	E	217	SER
1	E	223	LYS
1	E	225	ARG
1	E	266	LYS
1	E	303	CYS
1	E	315	ILE
1	E	319	ASN
1	F	24	VAL
1	F	31	LEU
1	F	39	LYS
1	F	65	GLN
1	F	79	GLN
1	F	101	HIS
1	F	126	HIS
1	F	141	HIS
1	F	166	THR
1	F	196	LYS
1	F	201	THR
1	F	213	GLU
1	F	225	ARG
1	F	303	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	115	HIS
1	B	90	ASN
1	B	126	HIS
1	D	311	ASN
1	E	115	HIS
1	E	187	HIS
1	F	79	GLN
1	F	126	HIS
1	F	141	HIS
1	F	143	GLN
1	F	319	ASN

### 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](#)

Of 18 ligands modelled in this entry, 12 are monoatomic - leaving 6 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
3	UL0	C	1003	-	40,43,43	1.71	5 (12%)	50,62,62	1.36	6 (12%)
3	UL0	B	1003	-	40,43,43	1.83	5 (12%)	50,62,62	1.63	7 (14%)
3	UL0	E	1003	-	40,43,43	1.87	5 (12%)	50,62,62	1.29	9 (18%)
3	UL0	A	1003	-	40,43,43	1.65	5 (12%)	50,62,62	1.49	6 (12%)
3	UL0	F	1003	-	40,43,43	1.80	5 (12%)	50,62,62	1.57	8 (16%)
3	UL0	D	1003	-	40,43,43	1.83	5 (12%)	50,62,62	1.45	7 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	UL0	C	1003	-	-	4/27/60/60	0/5/5/5
3	UL0	B	1003	-	-	4/27/60/60	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	UL0	E	1003	-	-	4/27/60/60	0/5/5/5
3	UL0	A	1003	-	-	7/27/60/60	0/5/5/5
3	UL0	F	1003	-	-	3/27/60/60	0/5/5/5
3	UL0	D	1003	-	-	3/27/60/60	0/5/5/5

All (30) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1003	UL0	C23-N3	8.29	1.58	1.47
3	D	1003	UL0	C23-N3	8.17	1.58	1.47
3	B	1003	UL0	C23-N3	7.60	1.57	1.47
3	C	1003	UL0	C23-N3	7.36	1.56	1.47
3	F	1003	UL0	C23-N3	7.17	1.56	1.47
3	A	1003	UL0	C23-N3	6.84	1.56	1.47
3	F	1003	UL0	C6-N3	5.98	1.55	1.47
3	E	1003	UL0	C6-N3	5.85	1.54	1.47
3	B	1003	UL0	C6-N3	5.76	1.54	1.47
3	A	1003	UL0	C6-N3	5.36	1.54	1.47
3	C	1003	UL0	C6-N3	5.25	1.54	1.47
3	D	1003	UL0	C6-N3	4.17	1.52	1.47
3	D	1003	UL0	C24-N3	3.80	1.51	1.47
3	F	1003	UL0	C24-N3	3.73	1.51	1.47
3	A	1003	UL0	C24-N3	3.73	1.51	1.47
3	E	1003	UL0	C24-N3	3.70	1.51	1.47
3	B	1003	UL0	C24-N3	3.66	1.51	1.47
3	D	1003	UL0	C13-C16	3.60	1.44	1.39
3	C	1003	UL0	C24-N3	3.56	1.51	1.47
3	E	1003	UL0	C13-C16	3.51	1.44	1.39
3	D	1003	UL0	C16-N1	-3.49	1.29	1.34
3	B	1003	UL0	C16-N1	-3.26	1.29	1.34
3	C	1003	UL0	C13-C16	3.25	1.44	1.39
3	F	1003	UL0	C13-C16	3.23	1.44	1.39
3	F	1003	UL0	C16-N1	-3.15	1.29	1.34
3	A	1003	UL0	C13-C16	2.94	1.43	1.39
3	C	1003	UL0	C16-N1	-2.74	1.30	1.34
3	E	1003	UL0	C16-N1	-2.64	1.30	1.34
3	B	1003	UL0	C13-C16	2.57	1.43	1.39
3	A	1003	UL0	C16-N1	-2.37	1.30	1.34

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1003	UL0	C6-C5-C4	-7.57	104.92	115.02
3	D	1003	UL0	C6-C5-C4	-6.50	106.36	115.02
3	F	1003	UL0	C6-C5-C4	-6.45	106.41	115.02
3	A	1003	UL0	C14-C13-C12	5.60	133.92	127.19
3	B	1003	UL0	C14-C13-C12	4.68	132.81	127.19
3	C	1003	UL0	C21-C11-C12	4.31	117.46	112.06
3	A	1003	UL0	C6-C5-C4	-4.29	109.31	115.02
3	F	1003	UL0	C14-C13-C12	3.99	131.98	127.19
3	C	1003	UL0	C6-C5-C4	-3.83	109.92	115.02
3	A	1003	UL0	C14-C13-C16	-3.78	122.64	127.19
3	E	1003	UL0	C6-C5-C4	-3.67	110.13	115.02
3	A	1003	UL0	C17-C16-C13	-3.58	124.24	130.34
3	F	1003	UL0	C23-C7-C5	3.43	108.51	103.56
3	C	1003	UL0	C14-C13-C12	3.38	131.25	127.19
3	D	1003	UL0	C10-C11-C12	3.21	116.09	112.06
3	D	1003	UL0	C14-C13-C12	3.10	130.91	127.19
3	E	1003	UL0	C14-C13-C12	3.09	130.90	127.19
3	E	1003	UL0	C17-C16-C13	-3.09	125.07	130.34
3	B	1003	UL0	C17-C16-C13	-3.09	125.07	130.34
3	C	1003	UL0	C30-C25-C26	3.03	116.81	108.57
3	E	1003	UL0	C10-C11-C12	-3.01	108.29	112.06
3	B	1003	UL0	C14-C13-C16	-2.88	123.72	127.19
3	F	1003	UL0	C30-C25-C26	2.79	116.16	108.57
3	C	1003	UL0	C17-C16-C13	-2.78	125.60	130.34
3	E	1003	UL0	C30-C25-C26	2.74	116.02	108.57
3	F	1003	UL0	C17-C16-C13	-2.57	125.95	130.34
3	F	1003	UL0	C21-C11-C12	2.52	115.22	112.06
3	D	1003	UL0	C12-C13-C16	-2.47	103.18	106.69
3	C	1003	UL0	C12-C13-C16	-2.45	103.20	106.69
3	A	1003	UL0	C12-C13-C16	-2.34	103.36	106.69
3	F	1003	UL0	C12-C13-C16	-2.33	103.38	106.69
3	E	1003	UL0	C12-C13-C16	-2.32	103.39	106.69
3	B	1003	UL0	C10-C11-C12	-2.31	109.16	112.06
3	E	1003	UL0	C23-C7-C5	2.30	106.89	103.56
3	B	1003	UL0	C30-C25-C26	2.29	114.80	108.57
3	E	1003	UL0	C21-C11-C12	2.27	114.91	112.06
3	B	1003	UL0	C12-C13-C16	-2.26	103.47	106.69
3	D	1003	UL0	C30-C25-C26	2.23	114.64	108.57
3	F	1003	UL0	C14-C13-C16	-2.12	124.63	127.19
3	D	1003	UL0	C17-C16-C13	-2.07	126.80	130.34
3	E	1003	UL0	C23-N3-C6	2.07	107.27	104.19
3	D	1003	UL0	C21-C11-C12	2.04	114.61	112.06
3	A	1003	UL0	C30-C25-C26	2.02	114.07	108.57



There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1003	UL0	C25-C24-N3-C6
3	A	1003	UL0	C7-C8-N-C9
3	A	1003	UL0	N1-C16-C17-C18
3	B	1003	UL0	C25-C24-N3-C6
3	B	1003	UL0	N1-C16-C17-C18
3	B	1003	UL0	N3-C24-C25-C30
3	C	1003	UL0	C25-C24-N3-C6
3	E	1003	UL0	C25-C24-N3-C6
3	E	1003	UL0	C27-C25-C26-O
3	F	1003	UL0	C25-C24-N3-C6
3	A	1003	UL0	C24-C25-C26-O1
3	A	1003	UL0	C24-C25-C26-O
3	C	1003	UL0	C27-C25-C26-O1
3	E	1003	UL0	C27-C25-C26-O1
3	F	1003	UL0	C27-C25-C26-O
3	C	1003	UL0	C27-C25-C26-O
3	D	1003	UL0	C27-C25-C26-O1
3	D	1003	UL0	C27-C25-C26-O
3	F	1003	UL0	C27-C25-C26-O1
3	B	1003	UL0	N3-C24-C25-C27
3	A	1003	UL0	C13-C16-C17-C18
3	A	1003	UL0	C25-C24-N3-C23
3	C	1003	UL0	C25-C24-N3-C23
3	D	1003	UL0	C25-C24-N3-C6
3	E	1003	UL0	C25-C24-N3-C23

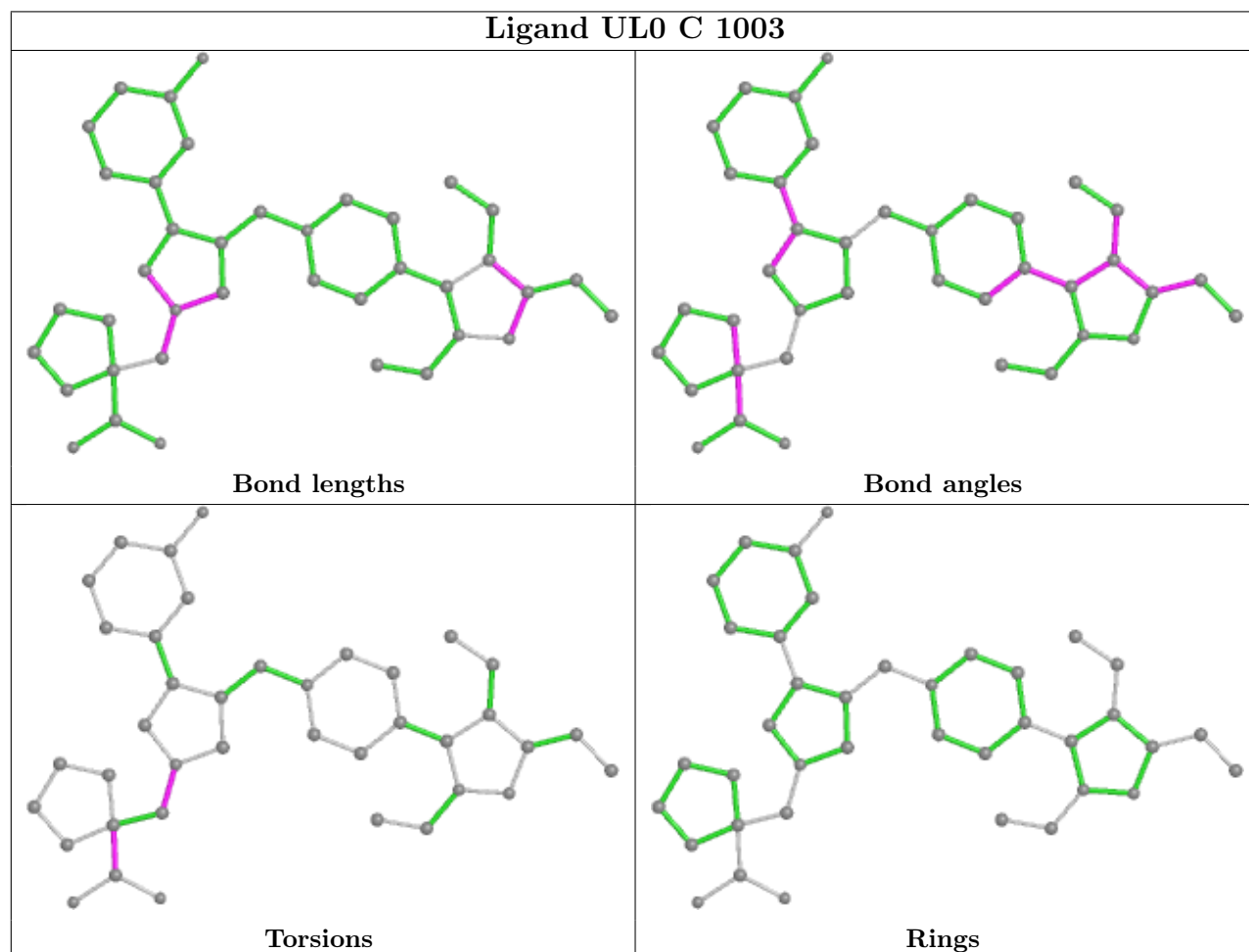
There are no ring outliers.

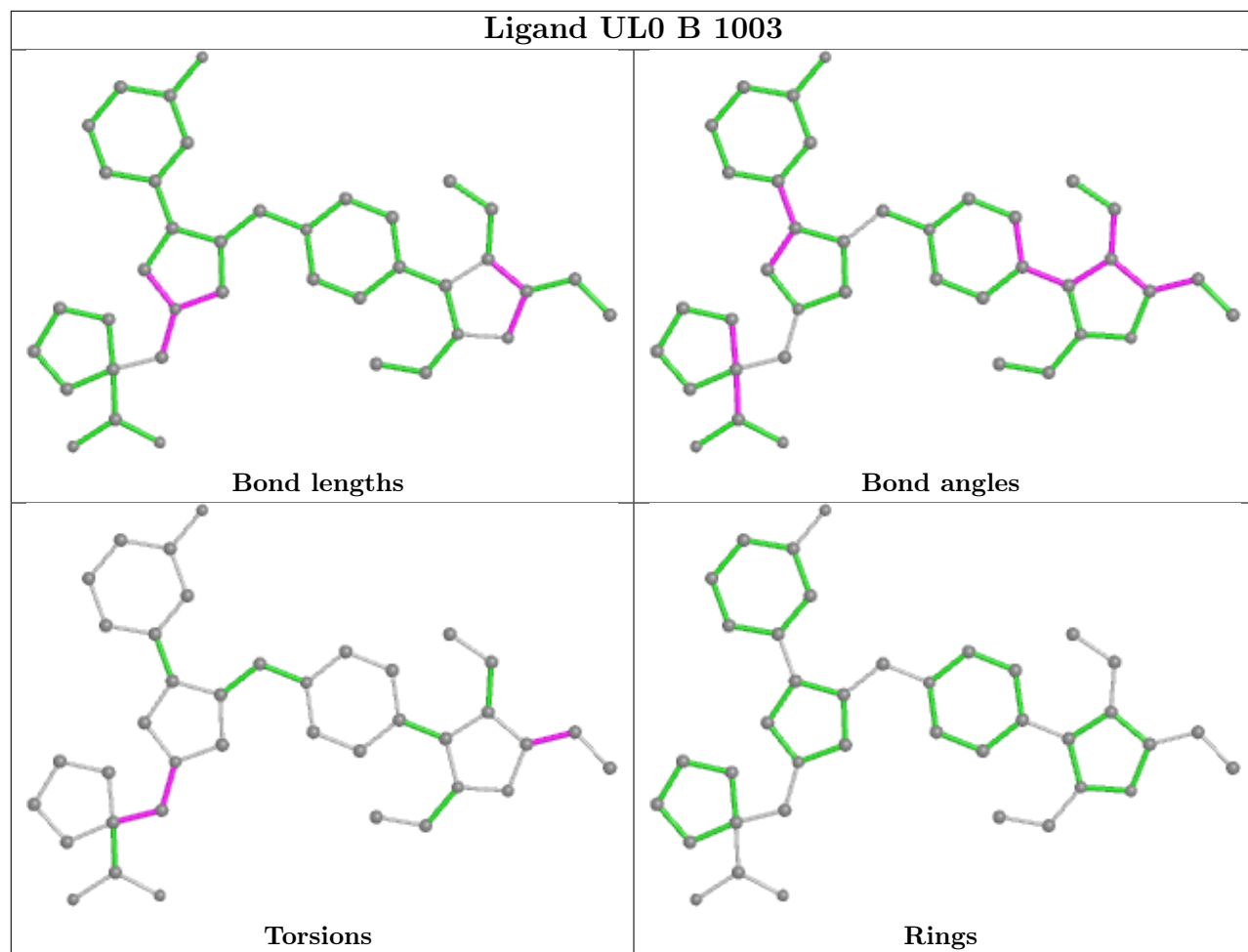
1 monomer is involved in 1 short contact:

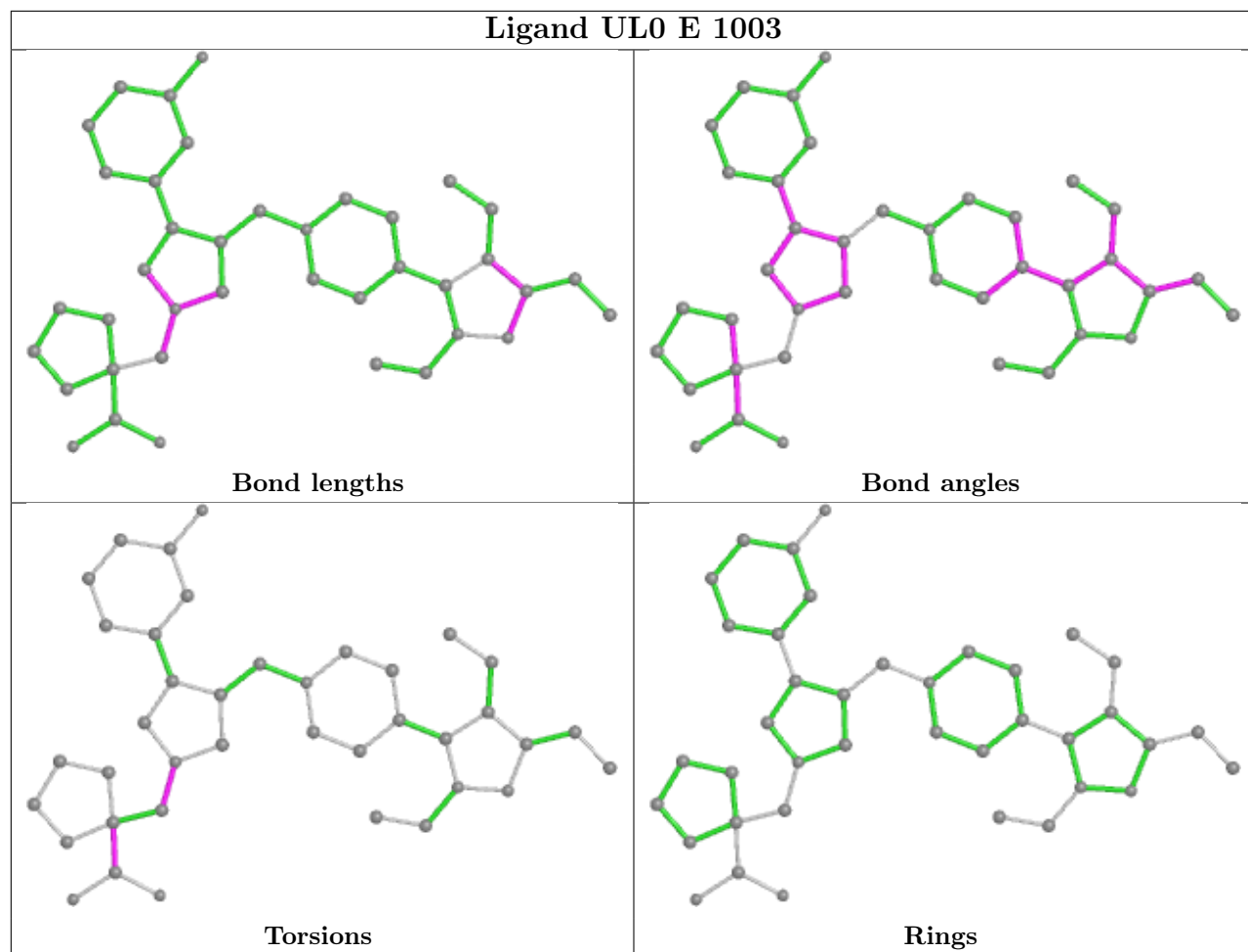
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1003	UL0	1	0

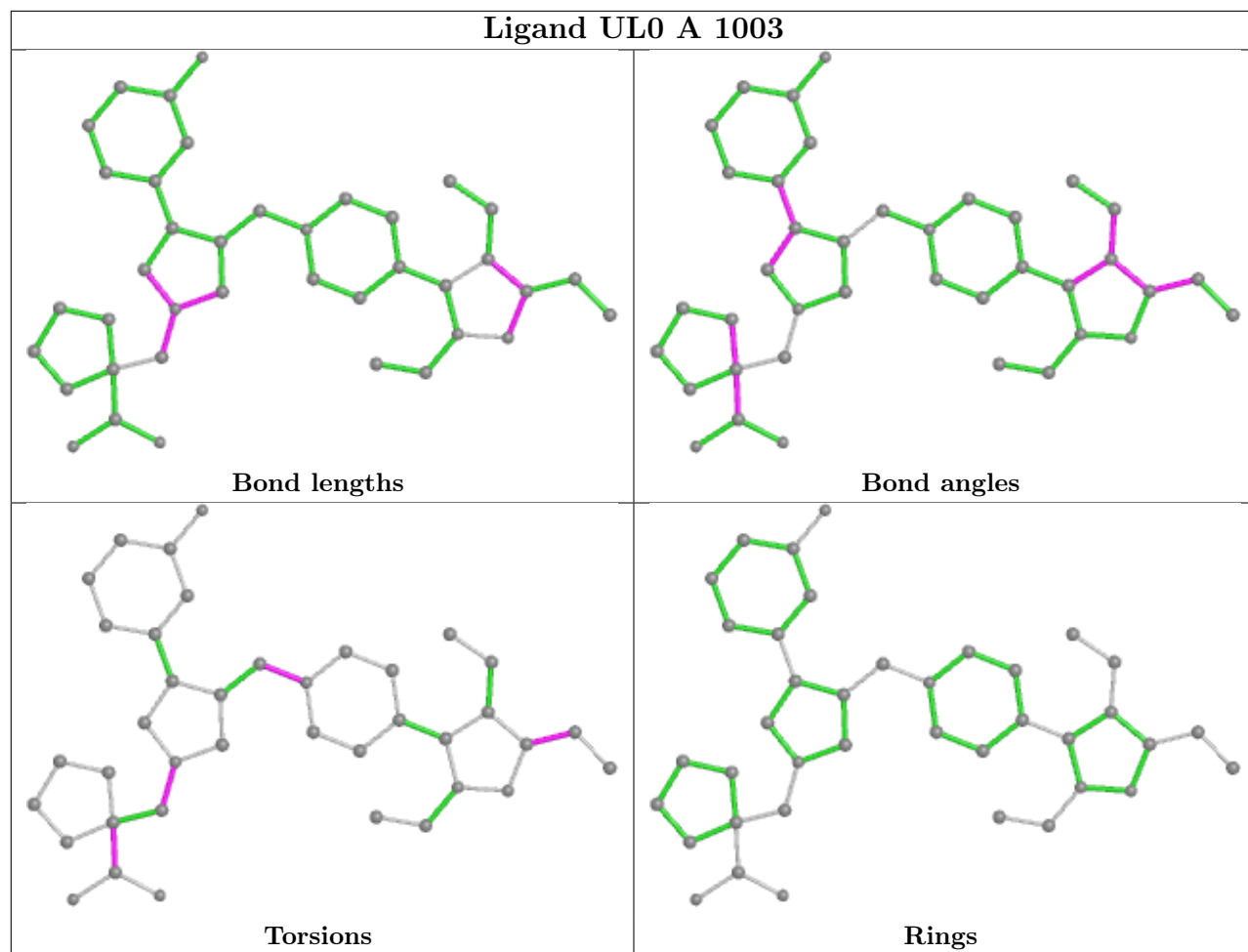
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

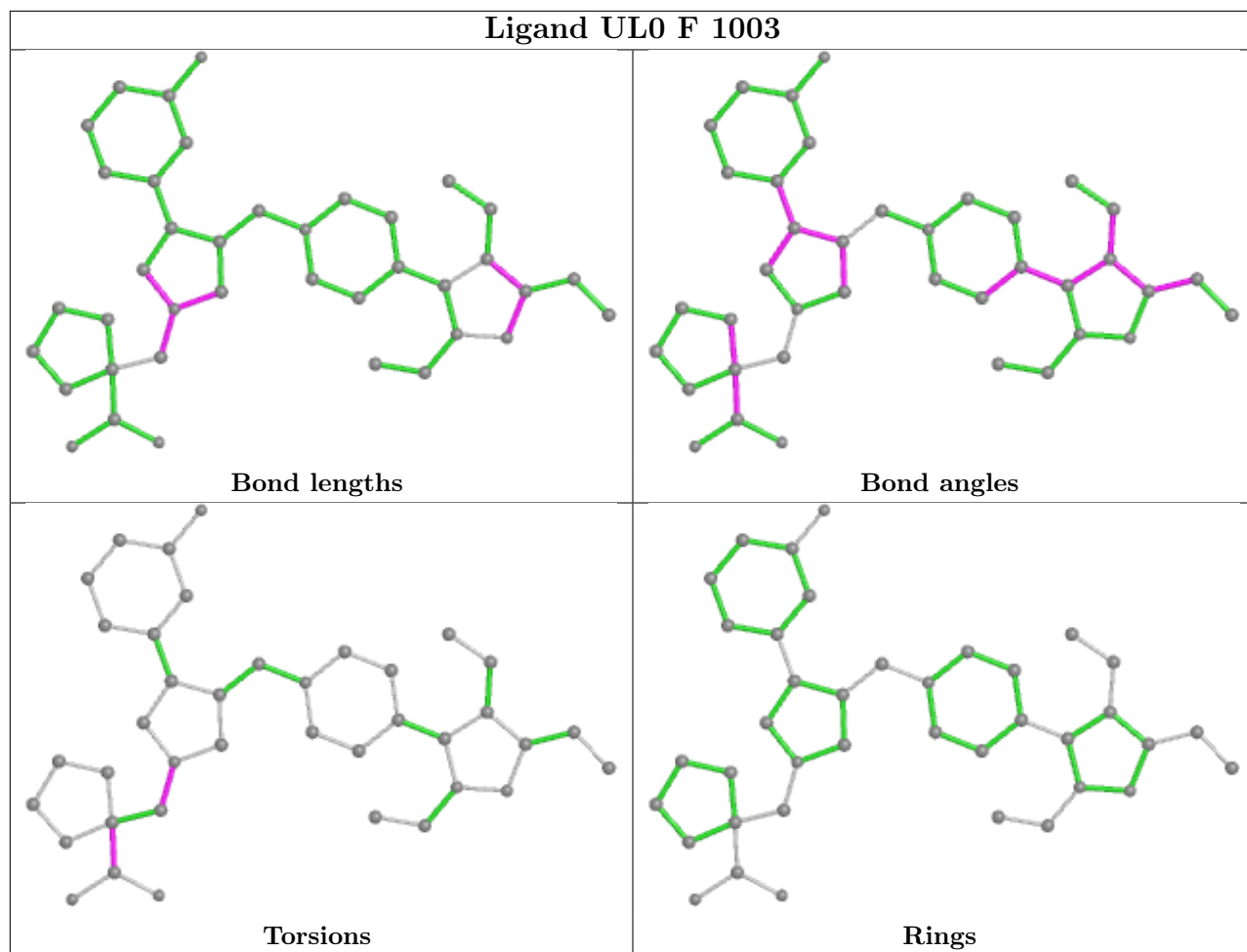
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

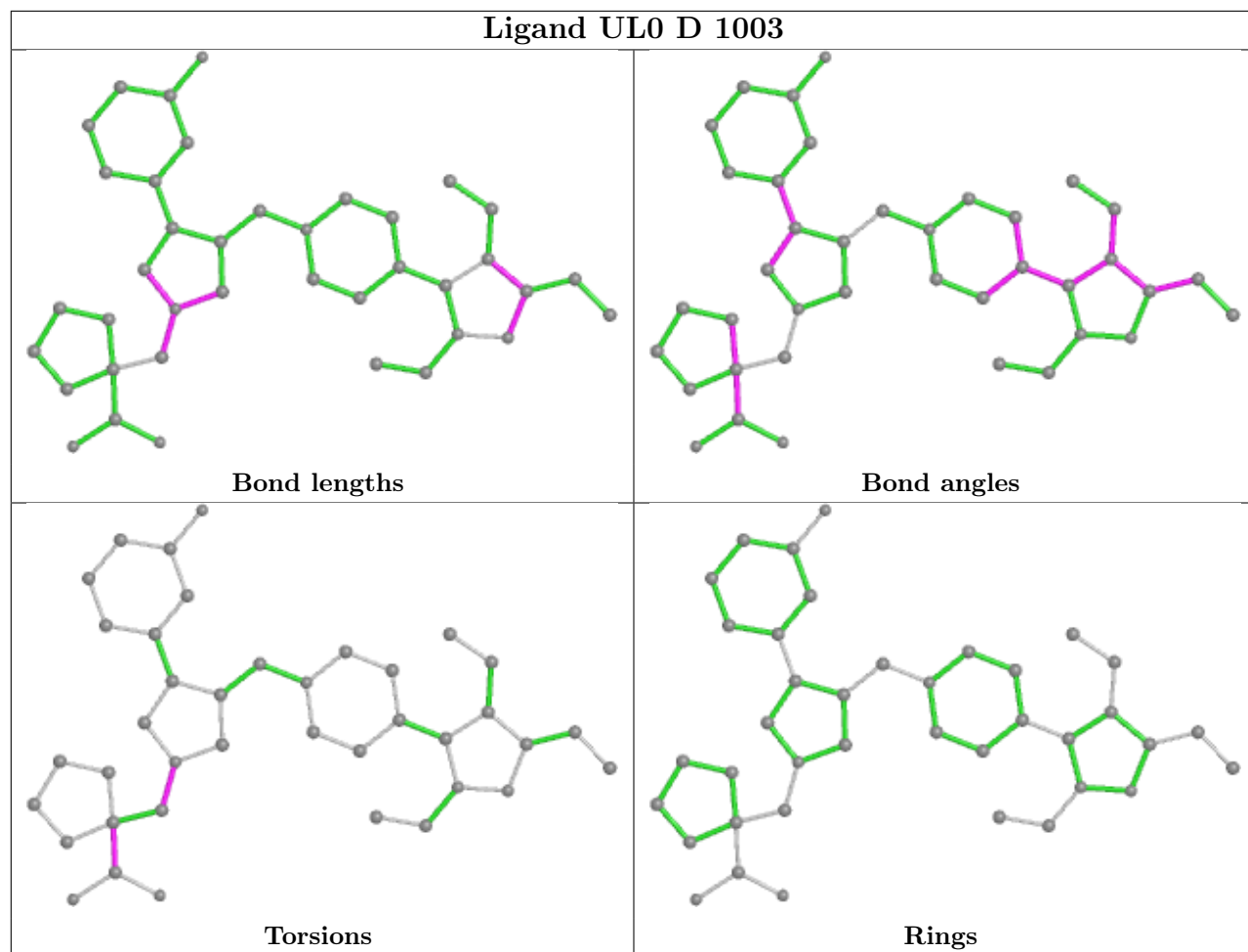












## 5.7 Other polymers [i](#)

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, 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	317/322 (98%)	-0.56	0 100 100	11, 21, 35, 42	0
1	B	317/322 (98%)	-0.51	0 100 100	8, 21, 30, 44	0
1	C	317/322 (98%)	-0.54	0 100 100	10, 21, 33, 43	0
1	D	317/322 (98%)	-0.46	0 100 100	9, 22, 30, 38	0
1	E	317/322 (98%)	-0.35	0 100 100	10, 27, 41, 51	0
1	F	317/322 (98%)	-0.41	0 100 100	11, 25, 41, 47	0
All	All	1902/1932 (98%)	-0.47	0 100 100	8, 22, 37, 51	0

There are no RSRZ outliers to report.

### 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, 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
3	UL0	B	1003	39/39	0.95	0.15	18,22,25,25	0

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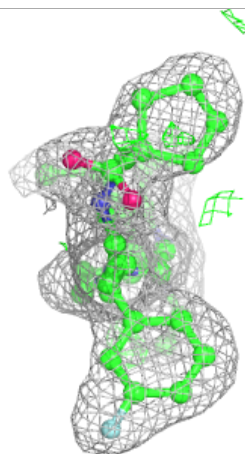
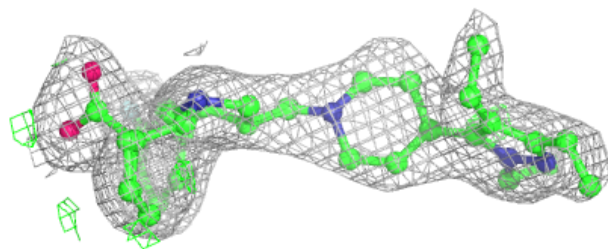
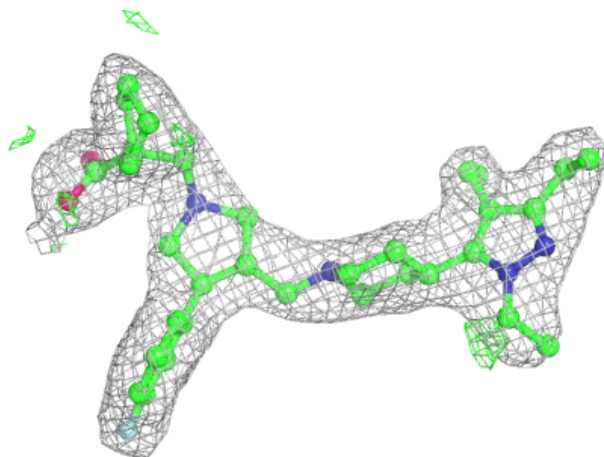
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	UL0	C	1003	39/39	0.96	0.17	17,19,24,25	0
3	UL0	D	1003	39/39	0.96	0.13	13,16,18,18	0
3	UL0	E	1003	39/39	0.96	0.17	24,27,28,28	0
3	UL0	F	1003	39/39	0.96	0.14	16,23,25,26	0
3	UL0	A	1003	39/39	0.97	0.14	14,16,19,19	0
2	MN	D	1001	1/1	0.97	0.13	40,40,40,40	0
2	MN	F	1001	1/1	0.98	0.09	38,38,38,38	0
2	MN	F	1002	1/1	0.98	0.14	28,28,28,28	0
2	MN	A	1002	1/1	0.99	0.15	19,19,19,19	0
2	MN	B	1001	1/1	0.99	0.10	21,21,21,21	0
2	MN	B	1002	1/1	0.99	0.10	16,16,16,16	0
2	MN	C	1001	1/1	0.99	0.17	26,26,26,26	0
2	MN	A	1001	1/1	0.99	0.13	15,15,15,15	0
2	MN	D	1002	1/1	0.99	0.14	35,35,35,35	0
2	MN	E	1001	1/1	0.99	0.08	24,24,24,24	0
2	MN	E	1002	1/1	0.99	0.11	22,22,22,22	0
2	MN	C	1002	1/1	1.00	0.11	26,26,26,26	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.

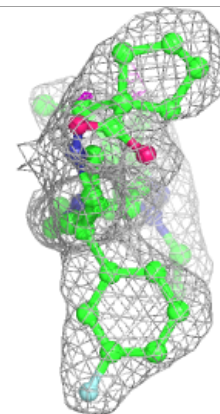
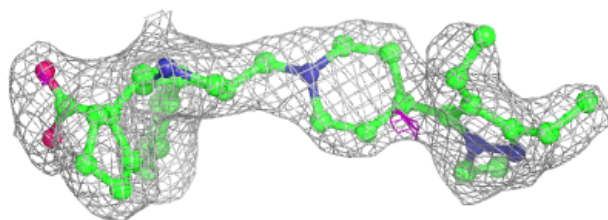
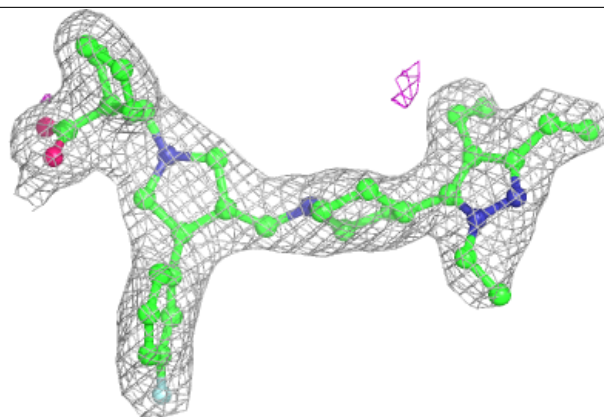
**Electron density around UL0 B 1003:**

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

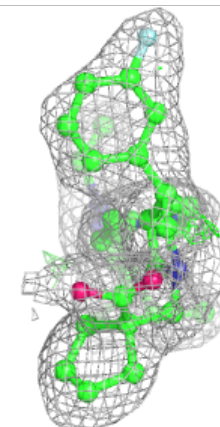
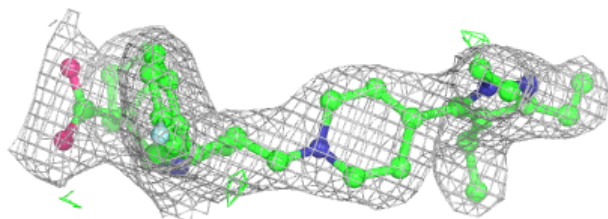
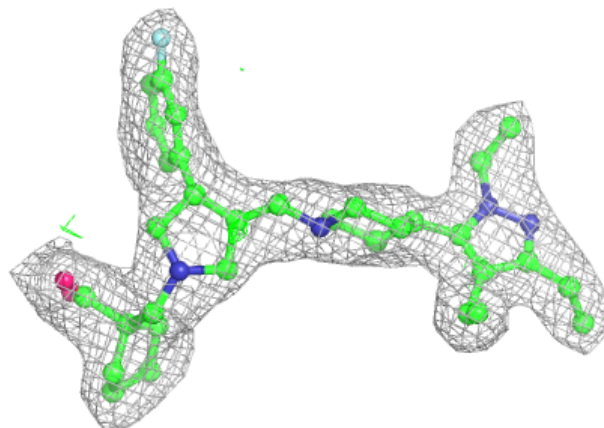


**Electron density around UL0 C 1003:**

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

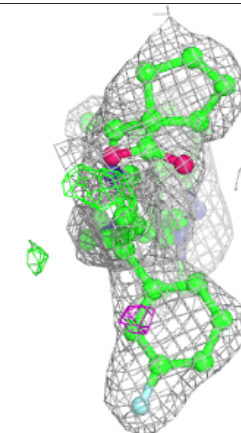
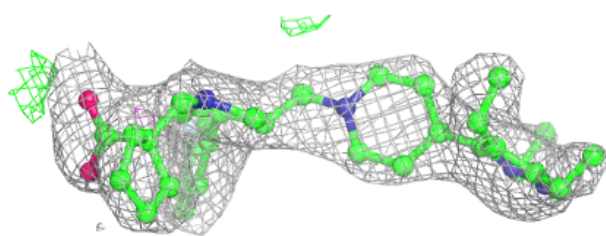
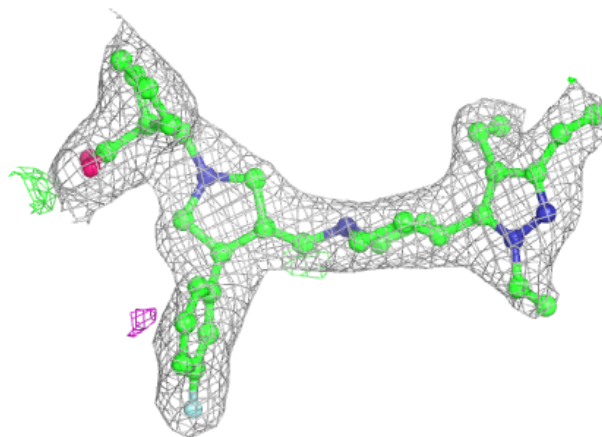
**Electron density around UL0 D 1003:**

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

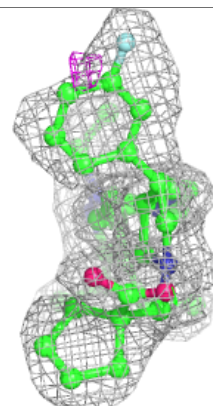
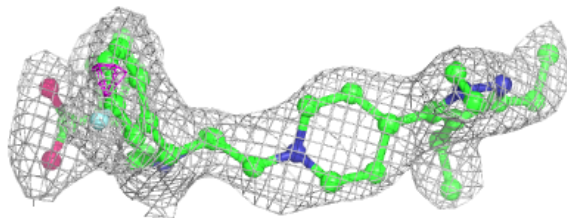
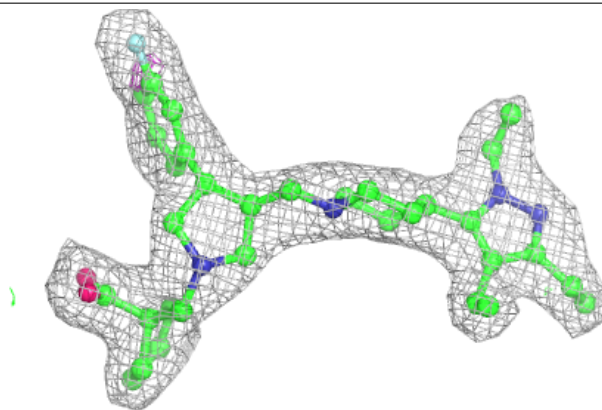


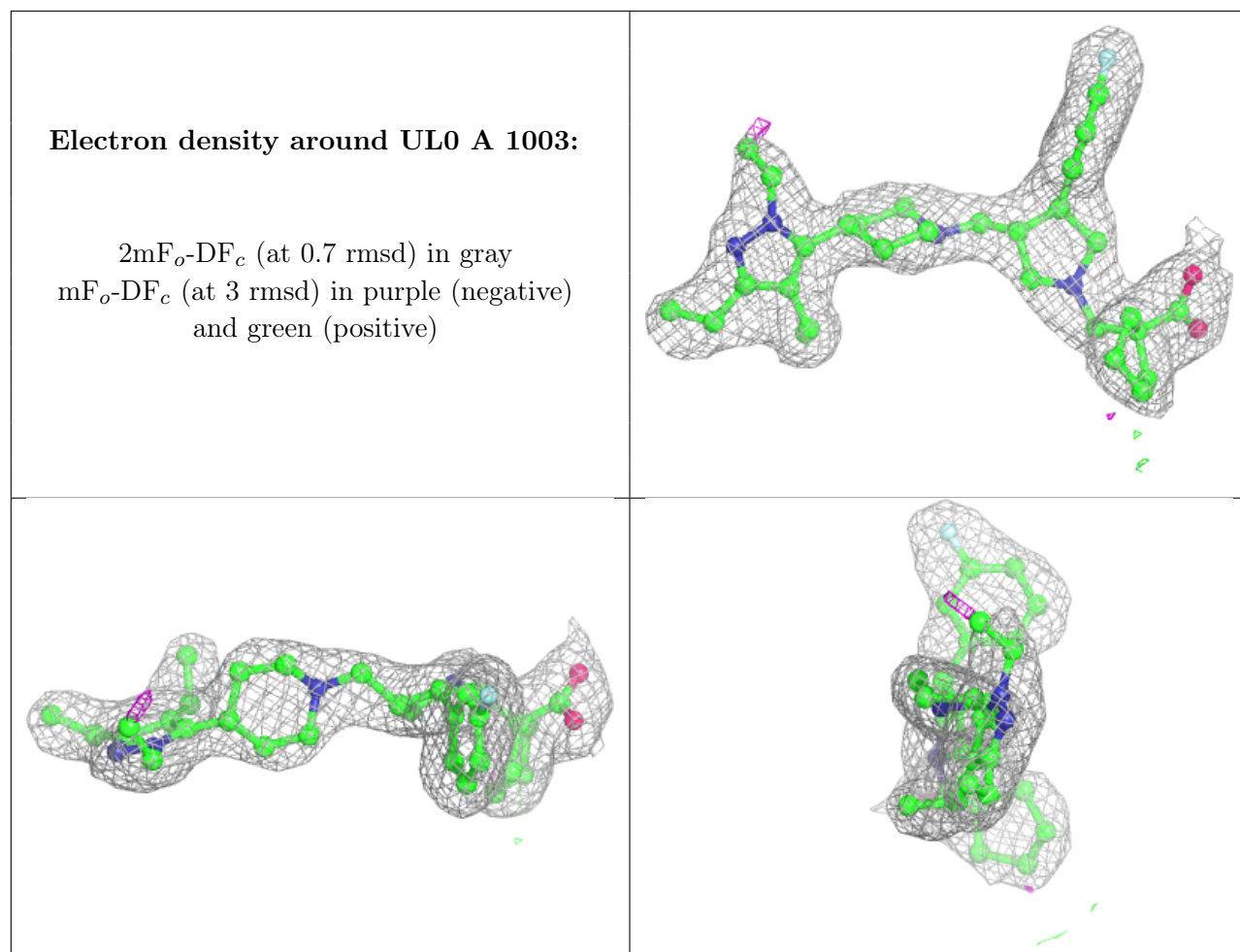
**Electron density around UL0 E 1003:**

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

**Electron density around UL0 F 1003:**

$2mF_o-DF_c$  (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.