



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 5, 2023 – 04:21 pm BST

PDB ID : 6HWM
Title : Structure of Thermus thermophilus ClpP in complex with bortezomib
Authors : Felix, J.; Schanda, P.; Fraga, H.; Morlot, C.
Deposited on : 2018-10-12
Resolution : 2.70 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.32.2
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) : 2.32.2

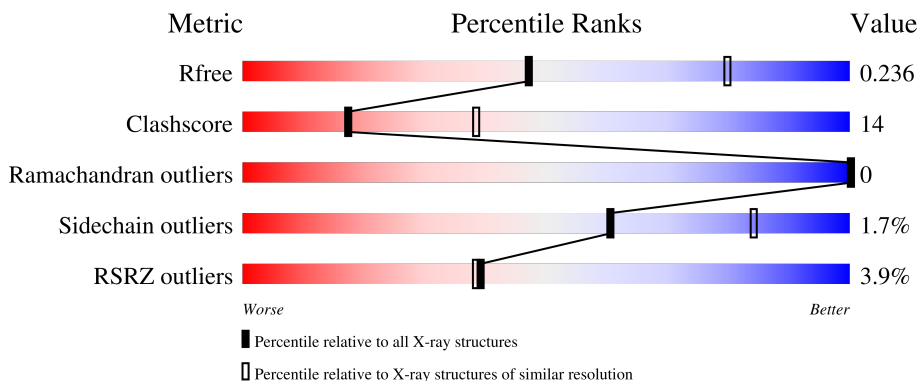
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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.



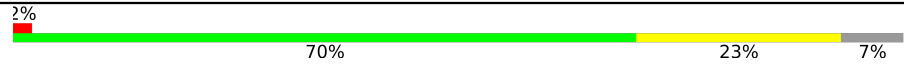

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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	204	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 72%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 19%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">2% 72% 19% 9%</p>
1	B	204	<div style="display: flex; align-items: center;"> <div style="width: 8%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 72%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">8% 72% 22% 6%</p>
1	C	204	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 67%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 23%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">5% 67% 23% 10%</p>
1	D	204	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 67%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 23%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">2% 67% 23% 10%</p>
1	E	204	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 74%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 20px;">3% 74% 22% .</p>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	F	204	 <p>2% 70% 23% 7%</p>
1	G	204	 <p>2% 67% 23% 10%</p>

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	BO2	C	301	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 10130 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.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	185	1417	906	237	270	4	0	0	0
1	B	192	1452	929	247	272	4	0	0	0
1	C	183	1374	883	227	260	4	0	0	0
1	D	184	1393	893	231	265	4	0	0	0
1	E	195	1462	937	246	275	4	0	0	0
1	F	189	1429	917	240	268	4	0	0	0
1	G	183	1386	890	230	262	4	0	0	0

There are 70 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	195	LEU	-	expression tag	UNP Q5SKM8
A	196	GLU	-	expression tag	UNP Q5SKM8
A	197	HIS	-	expression tag	UNP Q5SKM8
A	198	HIS	-	expression tag	UNP Q5SKM8
A	199	HIS	-	expression tag	UNP Q5SKM8
A	200	HIS	-	expression tag	UNP Q5SKM8
A	201	HIS	-	expression tag	UNP Q5SKM8
A	202	HIS	-	expression tag	UNP Q5SKM8
A	203	HIS	-	expression tag	UNP Q5SKM8
A	204	HIS	-	expression tag	UNP Q5SKM8
B	195	LEU	-	expression tag	UNP Q5SKM8
B	196	GLU	-	expression tag	UNP Q5SKM8
B	197	HIS	-	expression tag	UNP Q5SKM8
B	198	HIS	-	expression tag	UNP Q5SKM8
B	199	HIS	-	expression tag	UNP Q5SKM8

Continued on next page...

Continued from previous page...

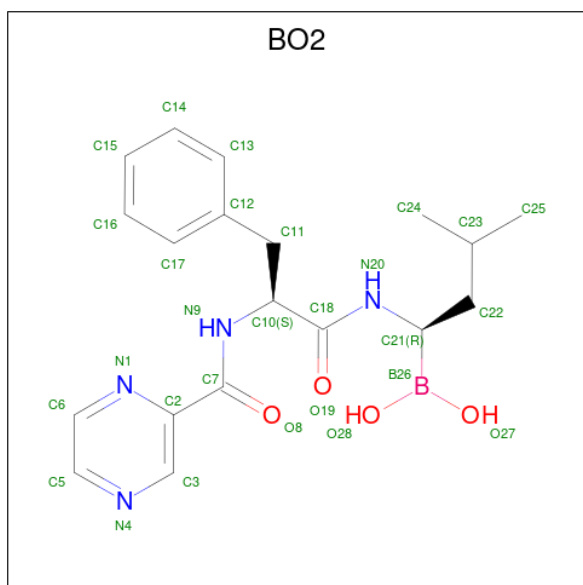
Chain	Residue	Modelled	Actual	Comment	Reference
B	200	HIS	-	expression tag	UNP Q5SKM8
B	201	HIS	-	expression tag	UNP Q5SKM8
B	202	HIS	-	expression tag	UNP Q5SKM8
B	203	HIS	-	expression tag	UNP Q5SKM8
B	204	HIS	-	expression tag	UNP Q5SKM8
C	195	LEU	-	expression tag	UNP Q5SKM8
C	196	GLU	-	expression tag	UNP Q5SKM8
C	197	HIS	-	expression tag	UNP Q5SKM8
C	198	HIS	-	expression tag	UNP Q5SKM8
C	199	HIS	-	expression tag	UNP Q5SKM8
C	200	HIS	-	expression tag	UNP Q5SKM8
C	201	HIS	-	expression tag	UNP Q5SKM8
C	202	HIS	-	expression tag	UNP Q5SKM8
C	203	HIS	-	expression tag	UNP Q5SKM8
C	204	HIS	-	expression tag	UNP Q5SKM8
D	195	LEU	-	expression tag	UNP Q5SKM8
D	196	GLU	-	expression tag	UNP Q5SKM8
D	197	HIS	-	expression tag	UNP Q5SKM8
D	198	HIS	-	expression tag	UNP Q5SKM8
D	199	HIS	-	expression tag	UNP Q5SKM8
D	200	HIS	-	expression tag	UNP Q5SKM8
D	201	HIS	-	expression tag	UNP Q5SKM8
D	202	HIS	-	expression tag	UNP Q5SKM8
D	203	HIS	-	expression tag	UNP Q5SKM8
D	204	HIS	-	expression tag	UNP Q5SKM8
E	195	LEU	-	expression tag	UNP Q5SKM8
E	196	GLU	-	expression tag	UNP Q5SKM8
E	197	HIS	-	expression tag	UNP Q5SKM8
E	198	HIS	-	expression tag	UNP Q5SKM8
E	199	HIS	-	expression tag	UNP Q5SKM8
E	200	HIS	-	expression tag	UNP Q5SKM8
E	201	HIS	-	expression tag	UNP Q5SKM8
E	202	HIS	-	expression tag	UNP Q5SKM8
E	203	HIS	-	expression tag	UNP Q5SKM8
E	204	HIS	-	expression tag	UNP Q5SKM8
F	195	LEU	-	expression tag	UNP Q5SKM8
F	196	GLU	-	expression tag	UNP Q5SKM8
F	197	HIS	-	expression tag	UNP Q5SKM8
F	198	HIS	-	expression tag	UNP Q5SKM8
F	199	HIS	-	expression tag	UNP Q5SKM8
F	200	HIS	-	expression tag	UNP Q5SKM8
F	201	HIS	-	expression tag	UNP Q5SKM8

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
F	202	HIS	-	expression tag	UNP Q5SKM8
F	203	HIS	-	expression tag	UNP Q5SKM8
F	204	HIS	-	expression tag	UNP Q5SKM8
G	195	LEU	-	expression tag	UNP Q5SKM8
G	196	GLU	-	expression tag	UNP Q5SKM8
G	197	HIS	-	expression tag	UNP Q5SKM8
G	198	HIS	-	expression tag	UNP Q5SKM8
G	199	HIS	-	expression tag	UNP Q5SKM8
G	200	HIS	-	expression tag	UNP Q5SKM8
G	201	HIS	-	expression tag	UNP Q5SKM8
G	202	HIS	-	expression tag	UNP Q5SKM8
G	203	HIS	-	expression tag	UNP Q5SKM8
G	204	HIS	-	expression tag	UNP Q5SKM8

- Molecule 2 is N-[(1R)-1-(DIHYDROXYBORYL)-3-METHYLBUTYL]-N-(PYRAZIN-2-YLCARBONYL)-L-PHENYLALANINAMIDE (three-letter code: BO2) (formula: C₁₉H₂₅BN₄O₄).



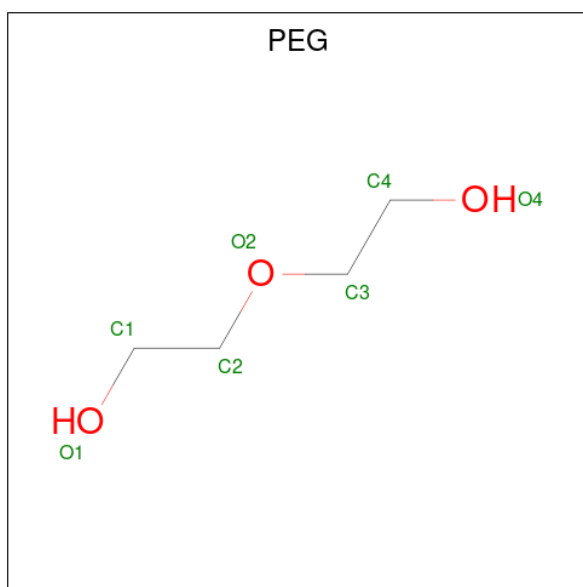
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	B	C	N			O
2	A	1	Total 28	B 1	C 19	N 4	O 4	0	0
2	B	1	Total 28	B 1	C 19	N 4	O 4	0	0
2	C	1	Total 28	B 1	C 19	N 4	O 4	0	0
2	D	1	Total 28	B 1	C 19	N 4	O 4	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	E	1	Total	B	C	N	O	0	0
			28	1	19	4	4		
2	F	1	Total	B	C	N	O	0	0
			28	1	19	4	4		
2	G	1	Total	B	C	N	O	0	0
			28	1	19	4	4		

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



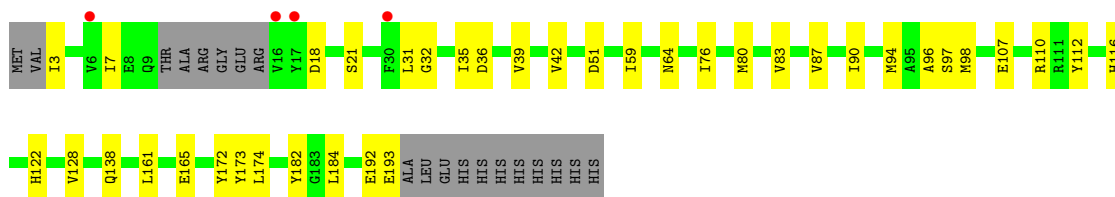
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	1	Total	C O	0	0
			7	4 3		
3	E	1	Total	C O	0	0
			7	4 3		
3	G	1	Total	C O	0	0
			7	4 3		

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.

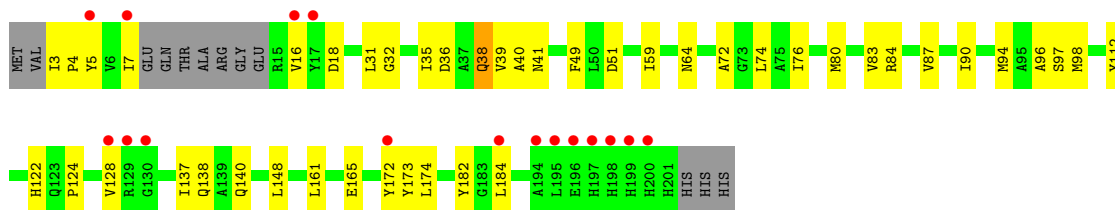
- Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain A: 



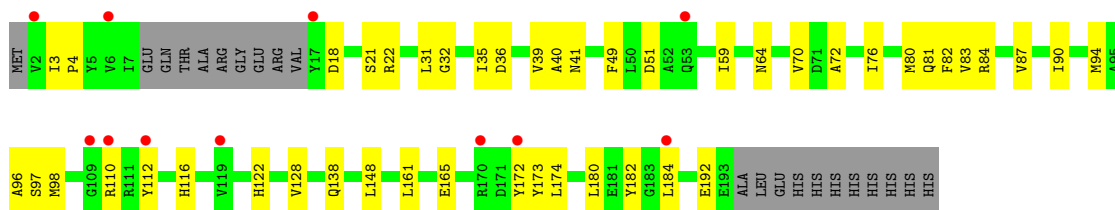
- Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain B: 



- Molecule 1: ATP-dependent Clp protease proteolytic subunit

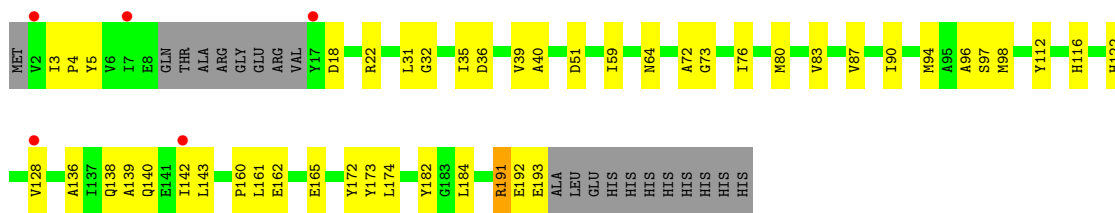
Chain C: 



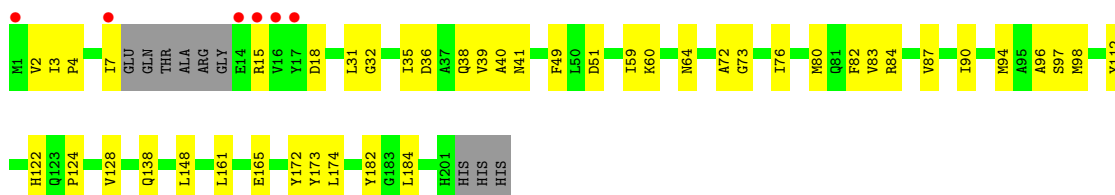
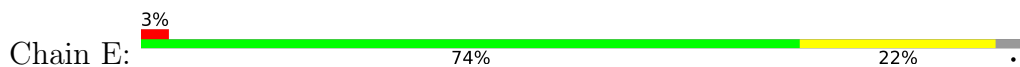
- Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain D: 

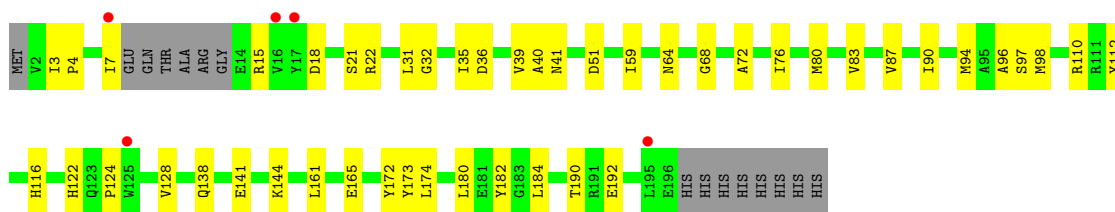




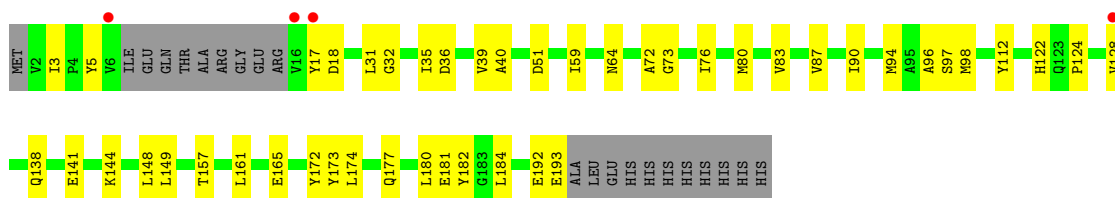
- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 1: ATP-dependent Clp protease proteolytic subunit



- Molecule 1: ATP-dependent Clp protease proteolytic subunit



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	135.14Å 168.74Å 166.08Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.29 – 2.70 49.56 – 2.70	Depositor EDS
% Data completeness (in resolution range)	99.9 (46.29-2.70) 100.0 (49.56-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.01 (at 2.69Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, R_{free}	0.205 , 0.236 0.203 , 0.236	Depositor DCC
R_{free} test set	5230 reflections (10.00%)	wwPDB-VP
Wilson B-factor (Å ²)	92.8	Xtrriage
Anisotropy	0.407	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 63.7	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	0.95	EDS
Total number of atoms	10130	wwPDB-VP
Average B, all atoms (Å ²)	103.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.00% 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: PEG, BO2

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	0/1440	0.77	0/1958
1	B	0.57	0/1480	0.74	0/2017
1	C	0.55	0/1397	0.75	0/1904
1	D	0.52	0/1416	0.72	0/1928
1	E	0.55	0/1488	0.74	0/2029
1	F	0.59	0/1452	0.75	0/1976
1	G	0.55	0/1409	0.74	0/1919
All	All	0.56	0/10082	0.74	0/13731

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	1417	0	1414	34	0
1	B	1452	0	1418	40	0
1	C	1374	0	1362	53	0
1	D	1393	0	1383	42	0
1	E	1462	0	1433	44	0
1	F	1429	0	1430	52	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	G	1386	0	1384	41	0
2	A	28	0	25	3	0
2	B	28	0	25	6	0
2	C	28	0	25	11	0
2	D	28	0	25	4	0
2	E	28	0	25	6	0
2	F	28	0	25	8	0
2	G	28	0	25	6	0
3	C	7	0	10	0	0
3	E	7	0	10	0	0
3	G	7	0	10	1	0
All	All	10130	0	10029	278	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 14.

All (278) 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:107:GLU:HG2	1:A:110:ARG:NH2	1.44	1.31
1:A:107:GLU:HG2	1:A:110:ARG:HH22	1.03	0.97
1:A:107:GLU:CG	1:A:110:ARG:NH2	2.30	0.94
1:A:107:GLU:CG	1:A:110:ARG:HH22	1.82	0.92
1:F:3:ILE:HD12	1:F:3:ILE:O	1.70	0.91
1:D:162:GLU:OE2	1:D:162:GLU:N	2.05	0.89
1:C:3:ILE:HD12	1:C:3:ILE:O	1.74	0.86
1:F:128:VAL:HG11	1:F:138:GLN:HG3	1.61	0.82
1:F:128:VAL:HB	1:F:138:GLN:NE2	1.98	0.78
1:C:82:PHE:CD2	1:D:191:ARG:O	2.37	0.78
1:E:60:LYS:NZ	1:E:90:ILE:HD11	1.97	0.78
1:B:3:ILE:O	1:B:3:ILE:HD12	1.86	0.76
1:D:3:ILE:HD12	1:D:3:ILE:O	1.86	0.76
1:G:3:ILE:O	1:G:3:ILE:HD12	1.86	0.75
1:E:3:ILE:O	1:E:3:ILE:HD12	1.86	0.75
1:F:97:SER:HB3	2:F:301:BO2:O28	1.87	0.73
1:E:82:PHE:CE2	1:F:192:GLU:HA	2.27	0.70
1:C:84:ARG:N	1:D:192:GLU:OE2	2.24	0.69
1:A:3:ILE:HD12	1:A:3:ILE:O	1.92	0.68
1:B:97:SER:HB3	2:B:301:BO2:O28	1.93	0.68
1:C:70:VAL:HG22	2:C:301:BO2:H3	1.75	0.67
1:D:161:LEU:O	1:D:165:GLU:HG3	1.94	0.67

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:161:LEU:O	1:E:165:GLU:HG3	1.94	0.67
1:C:161:LEU:O	1:C:165:GLU:HG3	1.94	0.67
1:G:161:LEU:O	1:G:165:GLU:HG3	1.94	0.67
1:F:161:LEU:O	1:F:165:GLU:HG3	1.94	0.67
1:A:161:LEU:O	1:A:165:GLU:HG3	1.94	0.66
1:B:161:LEU:O	1:B:165:GLU:HG3	1.94	0.66
1:C:98:MET:HG2	2:C:301:BO2:H221	1.78	0.66
1:C:70:VAL:CG2	2:C:301:BO2:H3	2.26	0.66
1:G:128:VAL:HG11	1:G:138:GLN:HB3	1.79	0.65
1:E:97:SER:CB	2:E:301:BO2:O27	2.44	0.65
1:B:172:TYR:CE2	1:B:174:LEU:HD21	2.33	0.64
1:A:98:MET:HG2	2:A:301:BO2:H221	1.79	0.64
1:D:172:TYR:CE2	1:D:174:LEU:HD21	2.33	0.64
1:G:97:SER:HB3	2:G:301:BO2:O27	1.97	0.64
1:C:172:TYR:CE2	1:C:174:LEU:HD21	2.33	0.64
1:G:172:TYR:CE2	1:G:174:LEU:HD21	2.33	0.64
1:F:172:TYR:CE2	1:F:174:LEU:HD21	2.33	0.64
1:E:172:TYR:CE2	1:E:174:LEU:HD21	2.33	0.63
1:F:97:SER:OG	2:F:301:BO2:C22	2.44	0.63
1:E:97:SER:HB3	2:E:301:BO2:O27	1.99	0.63
1:A:172:TYR:CE2	1:A:174:LEU:HD21	2.33	0.63
1:C:192:GLU:HG2	1:C:192:GLU:O	1.97	0.62
1:A:107:GLU:HG2	1:A:110:ARG:HH21	1.56	0.62
1:F:98:MET:HG2	2:F:301:BO2:H222	1.81	0.62
1:C:98:MET:HG2	2:C:301:BO2:C22	2.30	0.61
1:A:97:SER:HB3	2:A:301:BO2:O27	2.00	0.60
1:A:21:SER:HB3	1:B:5:TYR:O	2.03	0.59
1:B:148:LEU:HD21	1:C:116:HIS:HD2	1.68	0.58
1:A:39:VAL:O	1:A:42:VAL:HG12	2.03	0.58
1:D:182:TYR:HB3	1:D:184:LEU:HD23	1.87	0.56
1:E:182:TYR:HB3	1:E:184:LEU:HD23	1.86	0.56
1:E:60:LYS:NZ	1:E:90:ILE:CD1	2.69	0.56
1:G:182:TYR:HB3	1:G:184:LEU:HD23	1.86	0.56
1:B:182:TYR:HB3	1:B:184:LEU:HD23	1.87	0.56
1:E:38:GLN:OE1	1:E:38:GLN:N	2.35	0.56
1:A:182:TYR:HB3	1:A:184:LEU:HD23	1.87	0.56
1:F:41:ASN:ND2	1:G:32:GLY:HA3	2.20	0.56
1:D:97:SER:CB	2:D:301:BO2:O28	2.53	0.56
1:C:41:ASN:ND2	1:D:32:GLY:HA3	2.21	0.55
1:F:128:VAL:HB	1:F:138:GLN:HE21	1.70	0.55
1:E:76:ILE:O	1:E:80:MET:HG3	2.06	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:76:ILE:O	1:G:80:MET:HG3	2.06	0.55
1:B:84:ARG:HB2	1:C:192:GLU:OE2	2.06	0.55
1:D:136:ALA:O	1:D:140:GLN:HG3	2.07	0.55
1:B:7:ILE:HA	1:B:16:VAL:HA	1.88	0.55
1:C:76:ILE:O	1:C:80:MET:HG3	2.06	0.55
1:C:182:TYR:HB3	1:C:184:LEU:HD23	1.86	0.55
1:D:76:ILE:O	1:D:80:MET:HG3	2.06	0.55
1:F:76:ILE:O	1:F:80:MET:HG3	2.06	0.55
1:A:76:ILE:O	1:A:80:MET:HG3	2.07	0.55
1:B:76:ILE:O	1:B:80:MET:HG3	2.07	0.55
1:B:124:PRO:HA	2:B:301:BO2:H252	1.88	0.55
1:D:98:MET:HG2	2:D:301:BO2:H221	1.88	0.55
1:E:182:TYR:CD1	1:E:184:LEU:HD21	2.42	0.55
1:F:21:SER:HB3	1:G:5:TYR:O	2.07	0.55
1:G:182:TYR:CD1	1:G:184:LEU:HD21	2.42	0.54
1:B:182:TYR:CD1	1:B:184:LEU:HD21	2.43	0.54
1:D:182:TYR:CD1	1:D:184:LEU:HD21	2.43	0.54
1:C:182:TYR:CD1	1:C:184:LEU:HD21	2.42	0.54
1:F:97:SER:OG	2:F:301:BO2:H221	2.06	0.54
1:A:182:TYR:CD1	1:A:184:LEU:HD21	2.43	0.54
1:D:59:ILE:HB	1:D:87:VAL:HG12	1.90	0.54
1:E:59:ILE:HB	1:E:87:VAL:HG12	1.90	0.54
1:F:59:ILE:HB	1:F:87:VAL:HG12	1.90	0.54
1:B:148:LEU:HD11	1:C:116:HIS:CD2	2.43	0.54
1:B:59:ILE:HB	1:B:87:VAL:HG12	1.90	0.54
1:F:128:VAL:CG1	1:F:138:GLN:HG3	2.35	0.53
1:C:59:ILE:HB	1:C:87:VAL:HG12	1.90	0.53
1:F:141:GLU:OE1	1:F:144:LYS:HE3	2.09	0.53
1:E:82:PHE:O	1:F:192:GLU:HB2	2.08	0.53
1:A:59:ILE:HB	1:A:87:VAL:HG12	1.90	0.53
1:G:141:GLU:OE1	1:G:144:LYS:HE3	2.09	0.52
1:E:124:PRO:HA	2:E:301:BO2:H252	1.91	0.52
1:G:98:MET:HG2	2:G:301:BO2:H221	1.90	0.52
1:C:97:SER:OG	2:C:301:BO2:C22	2.46	0.52
1:G:59:ILE:HB	1:G:87:VAL:HG12	1.90	0.52
1:E:41:ASN:ND2	1:F:32:GLY:HA3	2.25	0.52
1:F:32:GLY:HA2	1:F:64:ASN:O	2.10	0.52
1:F:184:LEU:N	1:F:184:LEU:CD2	2.72	0.51
1:E:148:LEU:HD11	1:F:116:HIS:CD2	2.46	0.51
1:D:139:ALA:O	1:D:143:LEU:HG	2.10	0.51
1:B:49:PHE:HE1	1:C:22:ARG:NH1	2.09	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:192:GLU:O	1:A:192:GLU:HG2	2.10	0.50
1:B:36:ASP:OD1	1:B:39:VAL:HG12	2.12	0.50
1:E:2:VAL:HG23	1:E:2:VAL:O	2.12	0.50
1:B:38:GLN:O	1:B:38:GLN:HG2	2.11	0.50
1:C:36:ASP:OD1	1:C:39:VAL:HG12	2.12	0.50
1:D:36:ASP:OD1	1:D:39:VAL:HG12	2.12	0.50
1:D:160:PRO:HB2	1:D:162:GLU:CD	2.31	0.50
1:E:36:ASP:OD1	1:E:39:VAL:HG12	2.12	0.50
1:F:98:MET:HG2	2:F:301:BO2:C22	2.41	0.50
1:E:7:ILE:HA	1:E:15:ARG:O	2.11	0.50
1:E:60:LYS:HZ3	1:E:90:ILE:HD11	1.76	0.50
1:F:3:ILE:HD12	1:F:3:ILE:C	2.31	0.49
1:F:36:ASP:OD1	1:F:39:VAL:HG12	2.12	0.49
1:D:51:ASP:CG	1:D:83:VAL:HG22	2.33	0.49
1:B:51:ASP:CG	1:B:83:VAL:HG22	2.33	0.49
1:C:51:ASP:CG	1:C:83:VAL:HG22	2.33	0.49
1:A:36:ASP:H	1:A:39:VAL:HG12	1.78	0.49
1:D:97:SER:HB3	2:D:301:BO2:O28	2.13	0.49
1:G:36:ASP:OD1	1:G:39:VAL:HG12	2.12	0.49
1:B:148:LEU:HD21	1:C:116:HIS:CD2	2.47	0.49
1:E:51:ASP:CG	1:E:83:VAL:HG22	2.33	0.48
1:E:173:TYR:O	1:E:174:LEU:HD23	2.14	0.48
1:F:51:ASP:CG	1:F:83:VAL:HG22	2.33	0.48
1:F:182:TYR:HB3	1:F:184:LEU:HD23	1.94	0.48
1:F:184:LEU:N	1:F:184:LEU:HD22	2.28	0.48
1:A:51:ASP:CG	1:A:83:VAL:HG22	2.33	0.48
1:B:97:SER:OG	2:B:301:BO2:C22	2.54	0.48
1:B:173:TYR:O	1:B:174:LEU:HD23	2.14	0.48
1:E:182:TYR:HD1	1:E:184:LEU:CD2	2.26	0.48
1:C:173:TYR:O	1:C:174:LEU:HD23	2.14	0.48
1:G:128:VAL:HG11	1:G:138:GLN:CB	2.44	0.48
1:C:182:TYR:HD1	1:C:184:LEU:CD2	2.27	0.48
1:D:173:TYR:O	1:D:174:LEU:HD23	2.14	0.48
1:F:173:TYR:O	1:F:174:LEU:HD23	2.14	0.48
1:C:82:PHE:CE2	1:D:191:ARG:O	2.67	0.47
1:C:182:TYR:CD1	1:C:184:LEU:CD2	2.97	0.47
1:E:182:TYR:CD1	1:E:184:LEU:CD2	2.97	0.47
1:F:182:TYR:CD1	1:F:184:LEU:HD21	2.48	0.47
1:G:182:TYR:HD1	1:G:184:LEU:CD2	2.27	0.47
1:D:182:TYR:CD1	1:D:184:LEU:CD2	2.98	0.47
1:A:173:TYR:O	1:A:174:LEU:HD23	2.14	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:98:MET:HB3	1:B:98:MET:HE2	1.80	0.47
1:E:128:VAL:HG11	1:E:138:GLN:HB2	1.96	0.47
1:G:182:TYR:CD1	1:G:184:LEU:CD2	2.97	0.47
1:B:98:MET:HG2	2:B:301:BO2:C22	2.45	0.47
1:G:173:TYR:O	1:G:174:LEU:HD23	2.14	0.47
1:G:124:PRO:CA	2:G:301:BO2:H243	2.45	0.47
1:C:3:ILE:HD12	1:C:3:ILE:C	2.35	0.47
1:E:31:LEU:HD11	1:E:35:ILE:HG12	1.97	0.47
1:F:31:LEU:HD11	1:F:35:ILE:HG12	1.97	0.47
1:C:97:SER:HB3	2:C:301:BO2:O28	2.15	0.46
1:D:40:ALA:HB2	1:D:72:ALA:HB1	1.97	0.46
1:F:124:PRO:HA	2:F:301:BO2:H252	1.97	0.46
1:B:31:LEU:HD11	1:B:35:ILE:HG12	1.97	0.46
1:E:40:ALA:HB2	1:E:72:ALA:HB1	1.97	0.46
1:A:31:LEU:HD11	1:A:35:ILE:HG12	1.97	0.46
1:E:98:MET:HG2	2:E:301:BO2:C22	2.45	0.46
1:F:138:GLN:H	1:F:138:GLN:HG2	1.53	0.46
1:B:74:LEU:HD13	1:C:116:HIS:HB3	1.97	0.46
1:B:182:TYR:CD1	1:B:184:LEU:CD2	2.98	0.46
1:D:31:LEU:HD11	1:D:35:ILE:HG12	1.97	0.46
1:C:31:LEU:HD11	1:C:35:ILE:HG12	1.97	0.46
1:G:40:ALA:HB2	1:G:72:ALA:HB1	1.97	0.46
1:C:98:MET:HB3	1:C:98:MET:HE2	1.80	0.46
1:F:40:ALA:HB2	1:F:72:ALA:HB1	1.97	0.46
1:A:182:TYR:CD1	1:A:184:LEU:CD2	2.98	0.46
1:C:40:ALA:HB2	1:C:72:ALA:HB1	1.97	0.46
1:B:40:ALA:HB2	1:B:72:ALA:HB1	1.97	0.45
1:F:180:LEU:HD12	1:F:180:LEU:HA	1.72	0.45
2:F:301:BO2:H252	2:F:301:BO2:H21	1.79	0.45
1:G:31:LEU:HD11	1:G:35:ILE:HG12	1.97	0.45
1:F:182:TYR:HD1	1:F:184:LEU:HD21	1.81	0.45
1:A:7:ILE:CG1	1:G:17:TYR:OH	2.64	0.45
1:G:51:ASP:CG	1:G:83:VAL:HG22	2.36	0.45
1:D:182:TYR:HD1	1:D:184:LEU:CD2	2.30	0.45
1:G:51:ASP:OD2	1:G:83:VAL:HG22	2.17	0.45
1:A:128:VAL:HG11	1:A:138:GLN:HB3	1.99	0.45
1:A:182:TYR:HD1	1:A:184:LEU:CD2	2.30	0.45
1:D:98:MET:HB3	1:D:98:MET:HE2	1.82	0.45
1:E:98:MET:SD	2:E:301:BO2:H243	2.56	0.45
1:E:73:GLY:HA3	1:E:98:MET:HE2	2.00	0.44
1:C:180:LEU:HD12	1:C:180:LEU:HA	1.72	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:73:GLY:HA3	1:G:98:MET:HE2	1.98	0.44
1:A:98:MET:HB3	1:A:98:MET:HE2	1.81	0.44
1:F:182:TYR:HD1	1:F:184:LEU:CD2	2.30	0.44
1:B:41:ASN:ND2	1:C:32:GLY:HA3	2.32	0.44
1:D:142:ILE:HD13	2:D:301:BO2:C6	2.47	0.44
1:D:160:PRO:HB2	1:D:162:GLU:OE1	2.16	0.44
1:E:84:ARG:N	1:F:192:GLU:OE1	2.44	0.44
1:G:192:GLU:O	1:G:193:GLU:C	2.55	0.44
1:B:182:TYR:HD1	1:B:184:LEU:CD2	2.30	0.44
1:C:98:MET:H	2:C:301:BO2:H221	1.82	0.44
1:G:124:PRO:HA	2:G:301:BO2:H243	2.00	0.44
1:G:180:LEU:HA	1:G:180:LEU:HD12	1.72	0.44
1:F:3:ILE:HA	1:F:4:PRO:HD3	1.84	0.44
1:C:98:MET:N	2:C:301:BO2:H221	2.33	0.43
1:G:149:LEU:HD13	2:G:301:BO2:H242	2.01	0.43
1:B:98:MET:HG2	2:B:301:BO2:H222	2.00	0.43
1:C:98:MET:SD	2:C:301:BO2:H253	2.58	0.43
1:E:148:LEU:HD21	1:F:116:HIS:HD2	1.84	0.43
1:F:110:ARG:NH1	1:F:112:TYR:OH	2.52	0.43
1:A:94:MET:CE	1:A:96:ALA:HB2	2.49	0.43
1:E:49:PHE:HE1	1:F:22:ARG:NH1	2.17	0.43
1:G:97:SER:OG	2:G:301:BO2:C22	2.58	0.43
1:C:148:LEU:HD11	1:D:116:HIS:CD2	2.54	0.43
1:D:94:MET:CE	1:D:96:ALA:HB2	2.49	0.43
1:E:60:LYS:NZ	1:E:60:LYS:HB3	2.34	0.43
1:E:94:MET:CE	1:E:96:ALA:HB2	2.49	0.43
1:F:51:ASP:CB	1:F:83:VAL:HG22	2.49	0.43
1:G:32:GLY:HA2	1:G:64:ASN:O	2.19	0.43
1:C:3:ILE:HA	1:C:4:PRO:HD3	1.84	0.42
1:C:81:GLN:O	1:D:191:ARG:NH2	2.51	0.42
1:D:51:ASP:CB	1:D:83:VAL:HG22	2.49	0.42
1:A:98:MET:N	2:A:301:BO2:H252	2.34	0.42
1:B:3:ILE:HA	1:B:4:PRO:HD3	1.82	0.42
1:B:94:MET:CE	1:B:96:ALA:HB2	2.49	0.42
1:C:51:ASP:CB	1:C:83:VAL:HG22	2.49	0.42
1:C:98:MET:HG2	2:C:301:BO2:H222	2.01	0.42
1:C:110:ARG:HG2	1:C:112:TYR:OH	2.18	0.42
1:A:32:GLY:HA2	1:A:64:ASN:O	2.19	0.42
1:B:36:ASP:H	1:B:39:VAL:HG12	1.85	0.42
1:C:70:VAL:HG21	2:C:301:BO2:H3	2.01	0.42
1:E:3:ILE:HA	1:E:4:PRO:HD3	1.84	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:51:ASP:CB	1:A:83:VAL:HG22	2.49	0.42
1:C:32:GLY:HA2	1:C:64:ASN:O	2.19	0.42
1:E:36:ASP:H	1:E:39:VAL:HG12	1.85	0.42
1:B:51:ASP:CB	1:B:83:VAL:HG22	2.49	0.42
1:C:36:ASP:H	1:C:39:VAL:HG12	1.85	0.42
1:C:49:PHE:HE1	1:D:22:ARG:NH1	2.18	0.42
1:D:32:GLY:HA2	1:D:64:ASN:O	2.19	0.42
1:F:36:ASP:H	1:F:39:VAL:HG12	1.85	0.42
1:G:36:ASP:H	1:G:39:VAL:HG12	1.85	0.42
1:A:90:ILE:HA	1:A:112:TYR:O	2.20	0.42
1:D:128:VAL:HG11	1:D:138:GLN:CB	2.50	0.42
1:E:51:ASP:CB	1:E:83:VAL:HG22	2.49	0.42
1:G:94:MET:CE	1:G:96:ALA:HB2	2.49	0.42
1:C:94:MET:CE	1:C:96:ALA:HB2	2.49	0.42
1:D:36:ASP:H	1:D:39:VAL:HG12	1.85	0.42
1:E:32:GLY:HA2	1:E:64:ASN:O	2.19	0.42
1:F:90:ILE:HA	1:F:112:TYR:O	2.20	0.42
1:G:177:GLN:O	1:G:181:GLU:HG3	2.18	0.42
1:B:32:GLY:HA2	1:B:64:ASN:O	2.19	0.42
1:D:191:ARG:HD3	1:D:191:ARG:HA	1.45	0.42
1:E:98:MET:HG2	2:E:301:BO2:H221	2.02	0.42
1:F:21:SER:OG	1:G:5:TYR:N	2.34	0.42
1:F:94:MET:CE	1:F:96:ALA:HB2	2.49	0.42
1:F:98:MET:HE2	1:F:98:MET:HB3	1.81	0.42
1:B:36:ASP:H	1:B:39:VAL:CG1	2.33	0.41
1:E:90:ILE:HA	1:E:112:TYR:O	2.20	0.41
1:F:36:ASP:H	1:F:39:VAL:CG1	2.33	0.41
1:B:137:ILE:O	1:B:140:GLN:HG2	2.21	0.41
1:C:90:ILE:HA	1:C:112:TYR:O	2.20	0.41
1:E:36:ASP:H	1:E:39:VAL:CG1	2.33	0.41
1:F:190:THR:O	1:F:190:THR:HG22	2.21	0.41
1:B:90:ILE:HA	1:B:112:TYR:O	2.20	0.41
1:D:90:ILE:HA	1:D:112:TYR:O	2.20	0.41
1:E:98:MET:HE2	1:E:98:MET:HB3	1.83	0.41
1:F:7:ILE:HA	1:F:15:ARG:O	2.20	0.41
1:B:97:SER:OG	2:B:301:BO2:H221	2.19	0.41
1:A:192:GLU:O	1:A:193:GLU:C	2.59	0.41
1:F:68:GLY:O	2:F:301:BO2:N20	2.44	0.41
1:G:90:ILE:HA	1:G:112:TYR:O	2.20	0.41
1:G:157:THR:O	3:G:302:PEG:H31	2.21	0.41
1:A:116:HIS:HD2	1:G:148:LEU:HD21	1.86	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:36:ASP:H	1:G:39:VAL:CG1	2.33	0.41
1:C:36:ASP:H	1:C:39:VAL:CG1	2.33	0.40
1:D:36:ASP:H	1:D:39:VAL:CG1	2.33	0.40
1:G:98:MET:HE2	1:G:98:MET:HB3	1.84	0.40
1:B:128:VAL:HG11	1:B:138:GLN:HB2	2.02	0.40
1:C:21:SER:HB3	1:D:5:TYR:O	2.21	0.40
1:A:7:ILE:HG12	1:G:17:TYR:OH	2.22	0.40
1:C:128:VAL:HG11	1:C:138:GLN:HB3	2.04	0.40
1:D:3:ILE:HA	1:D:4:PRO:HD3	1.84	0.40
1:D:73:GLY:HA3	1:D:98:MET:HE2	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	181/204 (89%)	179 (99%)	2 (1%)	0	100	100
1	B	188/204 (92%)	186 (99%)	2 (1%)	0	100	100
1	C	179/204 (88%)	177 (99%)	2 (1%)	0	100	100
1	D	180/204 (88%)	176 (98%)	4 (2%)	0	100	100
1	E	191/204 (94%)	188 (98%)	3 (2%)	0	100	100
1	F	185/204 (91%)	180 (97%)	5 (3%)	0	100	100
1	G	179/204 (88%)	177 (99%)	2 (1%)	0	100	100
All	All	1283/1428 (90%)	1263 (98%)	20 (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	146/167 (87%)	144 (99%)	2 (1%)	67 86
1	B	146/167 (87%)	143 (98%)	3 (2%)	53 80
1	C	139/167 (83%)	137 (99%)	2 (1%)	67 86
1	D	142/167 (85%)	138 (97%)	4 (3%)	43 73
1	E	146/167 (87%)	144 (99%)	2 (1%)	67 86
1	F	145/167 (87%)	143 (99%)	2 (1%)	67 86
1	G	142/167 (85%)	140 (99%)	2 (1%)	67 86
All	All	1006/1169 (86%)	989 (98%)	17 (2%)	60 84

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	ASP
1	A	122	HIS
1	B	18	ASP
1	B	38	GLN
1	B	122	HIS
1	C	18	ASP
1	C	122	HIS
1	D	18	ASP
1	D	122	HIS
1	D	191	ARG
1	D	193	GLU
1	E	18	ASP
1	E	122	HIS
1	F	18	ASP
1	F	122	HIS
1	G	18	ASP
1	G	122	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	81	GLN
1	B	81	GLN
1	C	81	GLN
1	D	81	GLN
1	E	81	GLN
1	E	201	HIS
1	F	81	GLN
1	G	81	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

10 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
3	PEG	C	302	-	6,6,6	0.70	0	5,5,5	0.80	0
2	BO2	D	301	1	25,29,29	1.62	2 (8%)	32,38,38	1.36	4 (12%)
2	BO2	B	301	1	25,29,29	1.70	3 (12%)	32,38,38	1.68	7 (21%)
2	BO2	E	301	1	25,29,29	1.64	3 (12%)	32,38,38	1.23	4 (12%)
2	BO2	C	301	1	25,29,29	1.72	2 (8%)	32,38,38	1.35	5 (15%)
2	BO2	F	301	1	25,29,29	1.74	2 (8%)	32,38,38	1.09	4 (12%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	BO2	G	301	1	25,29,29	1.63	4 (16%)	32,38,38	1.14	3 (9%)
2	BO2	A	301	1	25,29,29	1.55	3 (12%)	32,38,38	1.46	5 (15%)
3	PEG	E	302	-	6,6,6	0.70	0	5,5,5	0.56	0
3	PEG	G	302	-	6,6,6	0.65	0	5,5,5	0.36	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PEG	C	302	-	-	3/4/4/4	-
2	BO2	D	301	1	-	5/22/28/28	0/2/2/2
2	BO2	B	301	1	-	9/22/28/28	0/2/2/2
2	BO2	E	301	1	-	7/22/28/28	0/2/2/2
2	BO2	C	301	1	-	5/22/28/28	0/2/2/2
2	BO2	F	301	1	-	8/22/28/28	0/2/2/2
2	BO2	G	301	1	-	8/22/28/28	0/2/2/2
2	BO2	A	301	1	-	10/22/28/28	0/2/2/2
3	PEG	E	302	-	-	3/4/4/4	-
3	PEG	G	302	-	-	2/4/4/4	-

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	BO2	C7-N9	5.67	1.46	1.34
2	B	301	BO2	C18-N20	5.55	1.46	1.34
2	F	301	BO2	C7-N9	5.46	1.46	1.34
2	F	301	BO2	C18-N20	5.43	1.46	1.34
2	C	301	BO2	C18-N20	5.39	1.45	1.34
2	E	301	BO2	C18-N20	5.39	1.45	1.34
2	C	301	BO2	C7-N9	5.27	1.45	1.34
2	B	301	BO2	C7-N9	4.94	1.44	1.34
2	E	301	BO2	C7-N9	4.93	1.44	1.34
2	G	301	BO2	C7-N9	4.91	1.44	1.34
2	G	301	BO2	C18-N20	4.74	1.44	1.34
2	D	301	BO2	C18-N20	4.65	1.44	1.34
2	A	301	BO2	C18-N20	4.60	1.44	1.34
2	A	301	BO2	C7-N9	4.45	1.43	1.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	BO2	O19-C18	-3.01	1.17	1.23
2	G	301	BO2	O19-C18	-2.71	1.18	1.23
2	B	301	BO2	O19-C18	-2.37	1.18	1.23
2	G	301	BO2	O8-C7	-2.33	1.18	1.23
2	E	301	BO2	O19-C18	-2.01	1.19	1.23

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	301	BO2	C2-C7-N9	4.14	122.89	115.20
2	E	301	BO2	C21-C22-C23	3.21	119.43	115.39
2	B	301	BO2	C7-C2-N1	3.18	121.23	117.48
2	A	301	BO2	C2-C3-N4	-3.16	118.12	122.05
2	D	301	BO2	C6-N1-C2	3.00	120.82	116.93
2	A	301	BO2	C6-N1-C2	2.98	120.79	116.93
2	B	301	BO2	C6-N1-C2	2.95	120.76	116.93
2	C	301	BO2	C11-C10-C18	-2.84	102.89	110.25
2	B	301	BO2	O8-C7-N9	-2.82	117.26	122.45
2	G	301	BO2	C2-C3-N4	-2.81	118.56	122.05
2	A	301	BO2	C5-N4-C3	2.78	121.66	116.85
2	C	301	BO2	O8-C7-N9	-2.74	117.40	122.45
2	E	301	BO2	C5-C6-N1	-2.71	118.28	122.17
2	A	301	BO2	C5-C6-N1	-2.70	118.28	122.17
2	E	301	BO2	C2-C3-N4	-2.69	118.70	122.05
2	E	301	BO2	C6-N1-C2	2.63	120.34	116.93
2	B	301	BO2	C21-C22-C23	2.57	118.63	115.39
2	B	301	BO2	C21-N20-C18	2.55	129.36	122.77
2	G	301	BO2	C11-C10-C18	-2.46	103.87	110.25
2	F	301	BO2	C5-C6-N1	-2.40	118.72	122.17
2	C	301	BO2	C2-C7-N9	2.34	119.54	115.20
2	B	301	BO2	C3-C2-N1	-2.28	118.90	121.61
2	D	301	BO2	C5-C6-N1	-2.26	118.92	122.17
2	G	301	BO2	C5-C6-N1	-2.23	118.97	122.17
2	D	301	BO2	O19-C18-N20	-2.23	118.81	122.93
2	C	301	BO2	C6-N1-C2	2.20	119.79	116.93
2	F	301	BO2	O19-C18-N20	-2.15	118.95	122.93
2	F	301	BO2	C6-N1-C2	2.14	119.71	116.93
2	D	301	BO2	C7-C2-N1	2.14	120.01	117.48
2	A	301	BO2	O19-C18-N20	-2.14	118.97	122.93
2	C	301	BO2	C21-C22-C23	-2.07	112.79	115.39
2	F	301	BO2	C2-C7-N9	2.04	118.99	115.20

There are no chirality outliers.

All (60) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	BO2	C3-C2-C7-O8
2	A	301	BO2	C3-C2-C7-N9
2	A	301	BO2	C21-C22-C23-C24
2	A	301	BO2	C21-C22-C23-C25
2	B	301	BO2	C3-C2-C7-O8
2	B	301	BO2	C3-C2-C7-N9
2	B	301	BO2	C21-C22-C23-C24
2	B	301	BO2	C21-C22-C23-C25
2	C	301	BO2	C3-C2-C7-O8
2	C	301	BO2	C3-C2-C7-N9
2	D	301	BO2	C3-C2-C7-O8
2	D	301	BO2	C3-C2-C7-N9
2	E	301	BO2	C3-C2-C7-O8
2	E	301	BO2	C3-C2-C7-N9
2	E	301	BO2	C21-C22-C23-C24
2	E	301	BO2	C21-C22-C23-C25
2	F	301	BO2	C3-C2-C7-O8
2	F	301	BO2	C3-C2-C7-N9
2	F	301	BO2	C21-C22-C23-C24
2	G	301	BO2	C3-C2-C7-O8
2	G	301	BO2	C3-C2-C7-N9
2	G	301	BO2	C21-C22-C23-C24
2	G	301	BO2	C21-C22-C23-C25
2	B	301	BO2	N1-C2-C7-O8
2	B	301	BO2	N1-C2-C7-N9
2	E	301	BO2	N1-C2-C7-N9
2	A	301	BO2	N1-C2-C7-O8
2	C	301	BO2	N1-C2-C7-O8
2	E	301	BO2	N1-C2-C7-O8
2	F	301	BO2	N1-C2-C7-O8
2	A	301	BO2	N1-C2-C7-N9
2	C	301	BO2	N1-C2-C7-N9
2	F	301	BO2	N1-C2-C7-N9
2	G	301	BO2	N1-C2-C7-N9
2	G	301	BO2	N1-C2-C7-O8
2	B	301	BO2	N20-C21-C22-C23
2	E	301	BO2	N20-C21-C22-C23
2	F	301	BO2	N20-C21-C22-C23
3	C	302	PEG	O2-C3-C4-O4
2	C	301	BO2	N20-C21-C22-C23

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	C	302	PEG	O1-C1-C2-O2
2	D	301	BO2	N1-C2-C7-O8
3	E	302	PEG	O2-C3-C4-O4
2	G	301	BO2	N20-C21-C22-C23
2	D	301	BO2	N1-C2-C7-N9
3	G	302	PEG	O1-C1-C2-O2
3	E	302	PEG	C4-C3-O2-C2
3	C	302	PEG	C4-C3-O2-C2
2	A	301	BO2	C22-C21-N20-C18
2	F	301	BO2	C21-C22-C23-C25
3	E	302	PEG	C1-C2-O2-C3
2	D	301	BO2	N20-C21-C22-C23
2	A	301	BO2	N20-C21-C22-C23
2	F	301	BO2	C22-C21-N20-C18
2	G	301	BO2	C22-C21-N20-C18
3	G	302	PEG	O2-C3-C4-O4
2	A	301	BO2	N9-C10-C18-O19
2	A	301	BO2	N9-C10-C18-N20
2	B	301	BO2	C22-C21-N20-C18
2	B	301	BO2	N9-C10-C18-N20

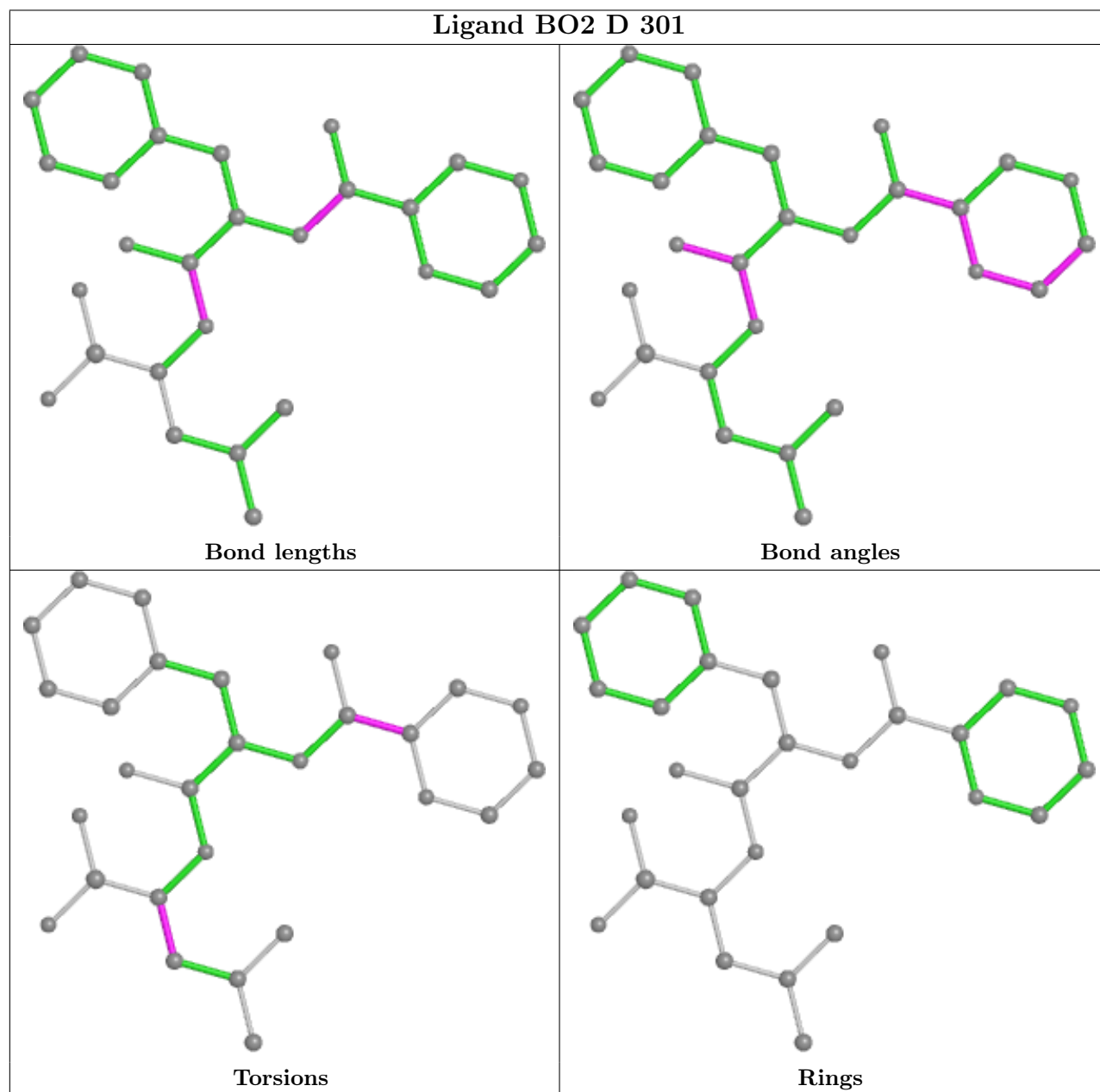
There are no ring outliers.

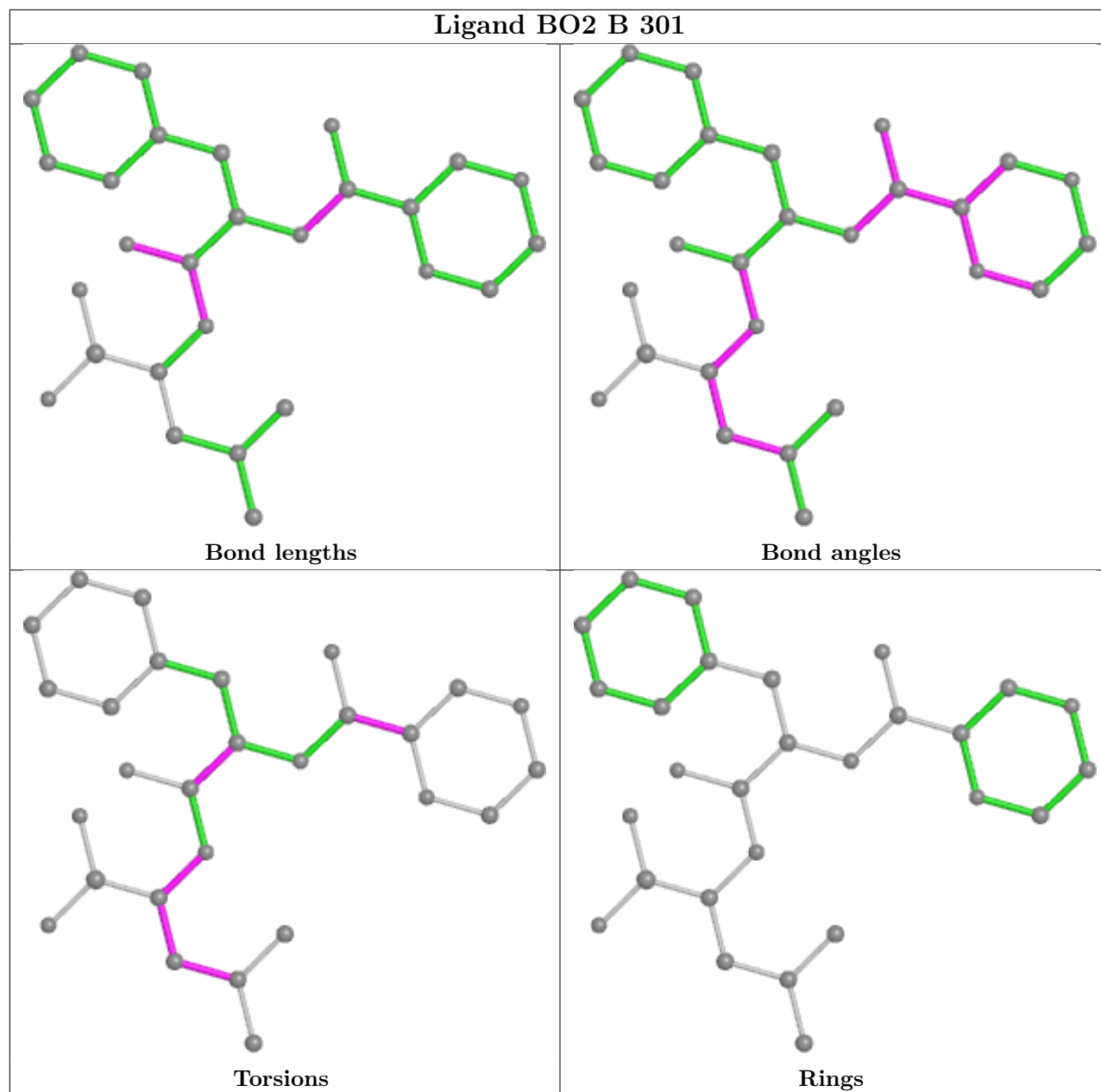
8 monomers are involved in 45 short contacts:

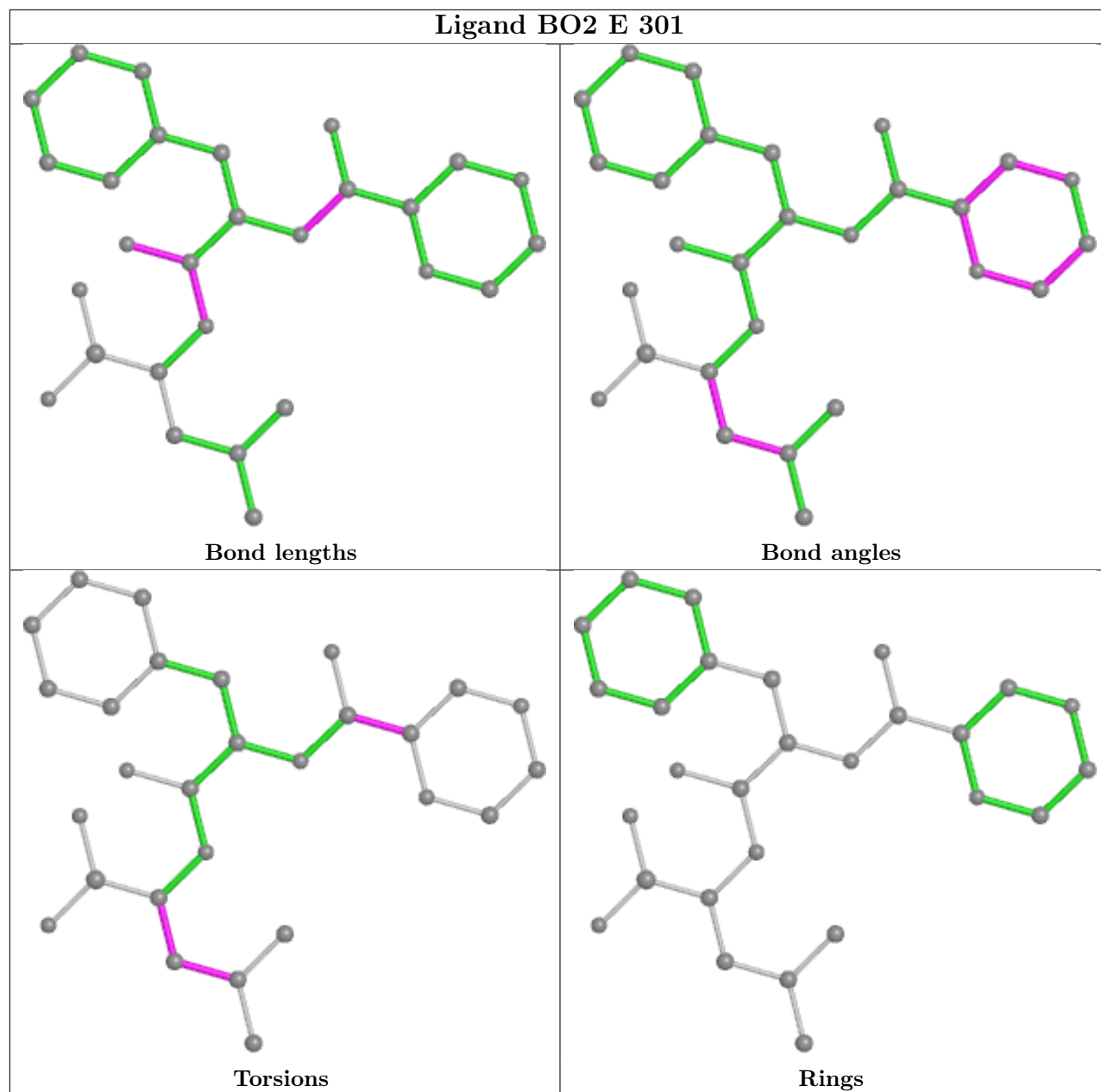
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	301	BO2	4	0
2	B	301	BO2	6	0
2	E	301	BO2	6	0
2	C	301	BO2	11	0
2	F	301	BO2	8	0
2	G	301	BO2	6	0
2	A	301	BO2	3	0
3	G	302	PEG	1	0

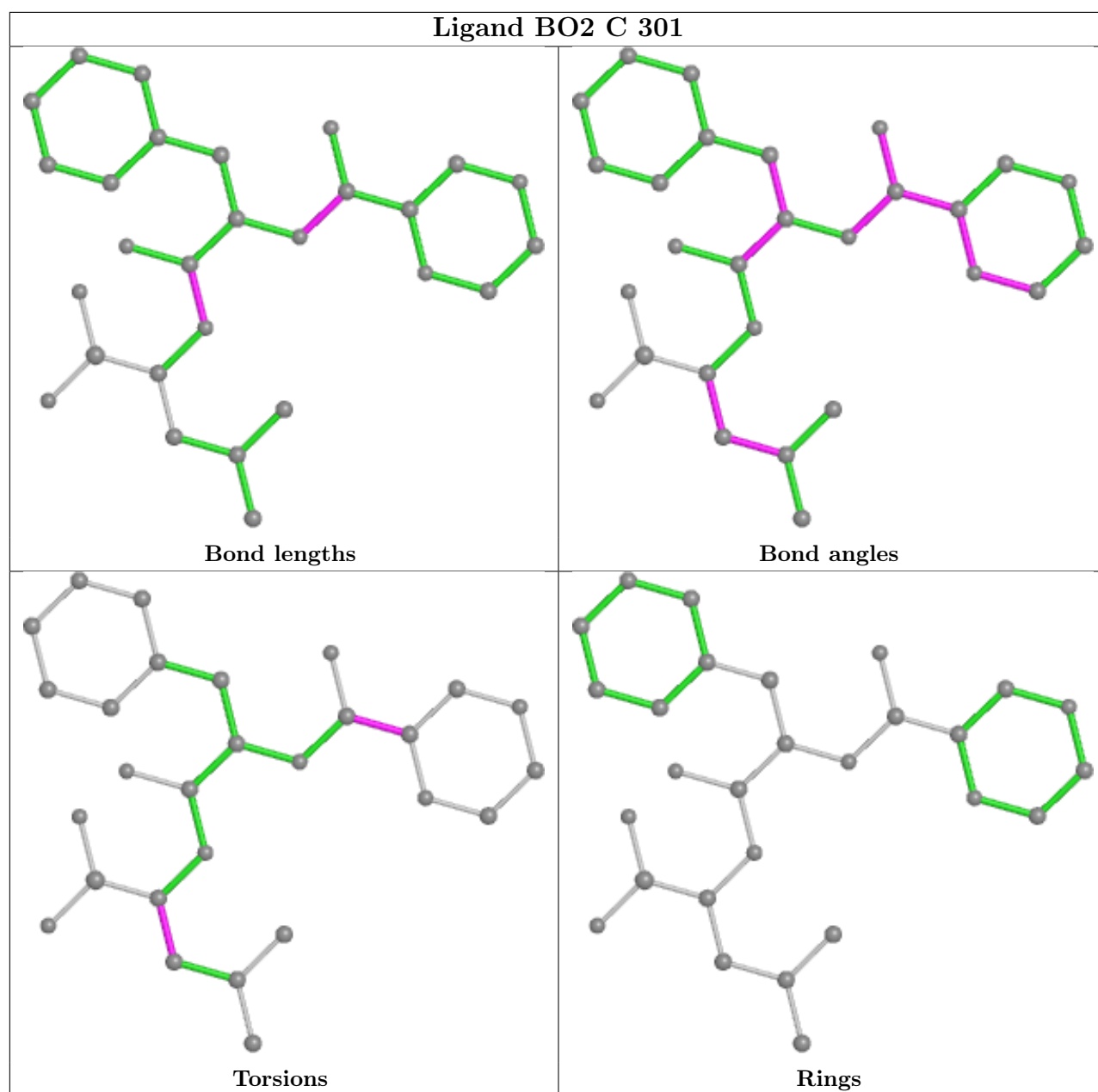
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

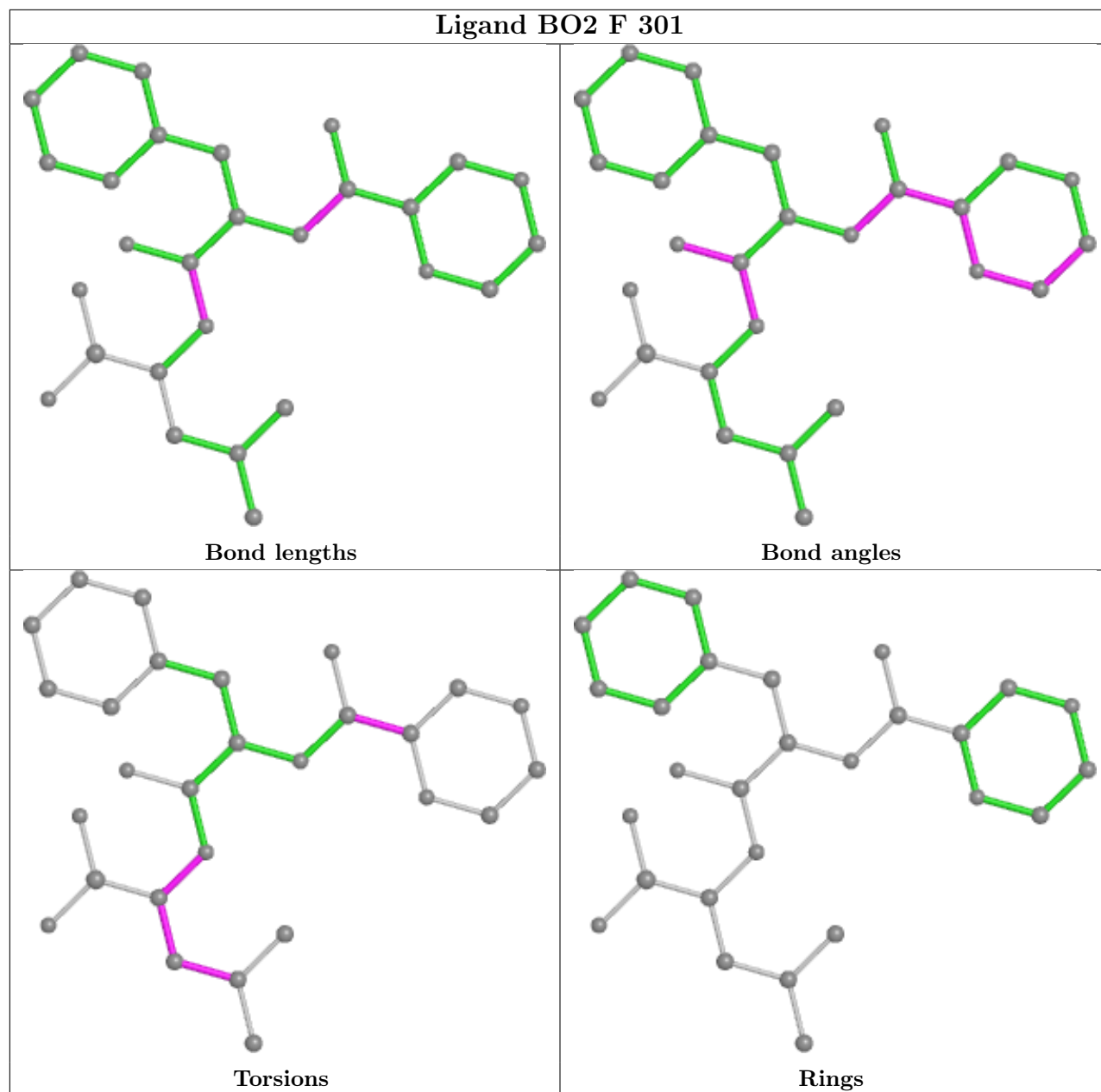
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents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

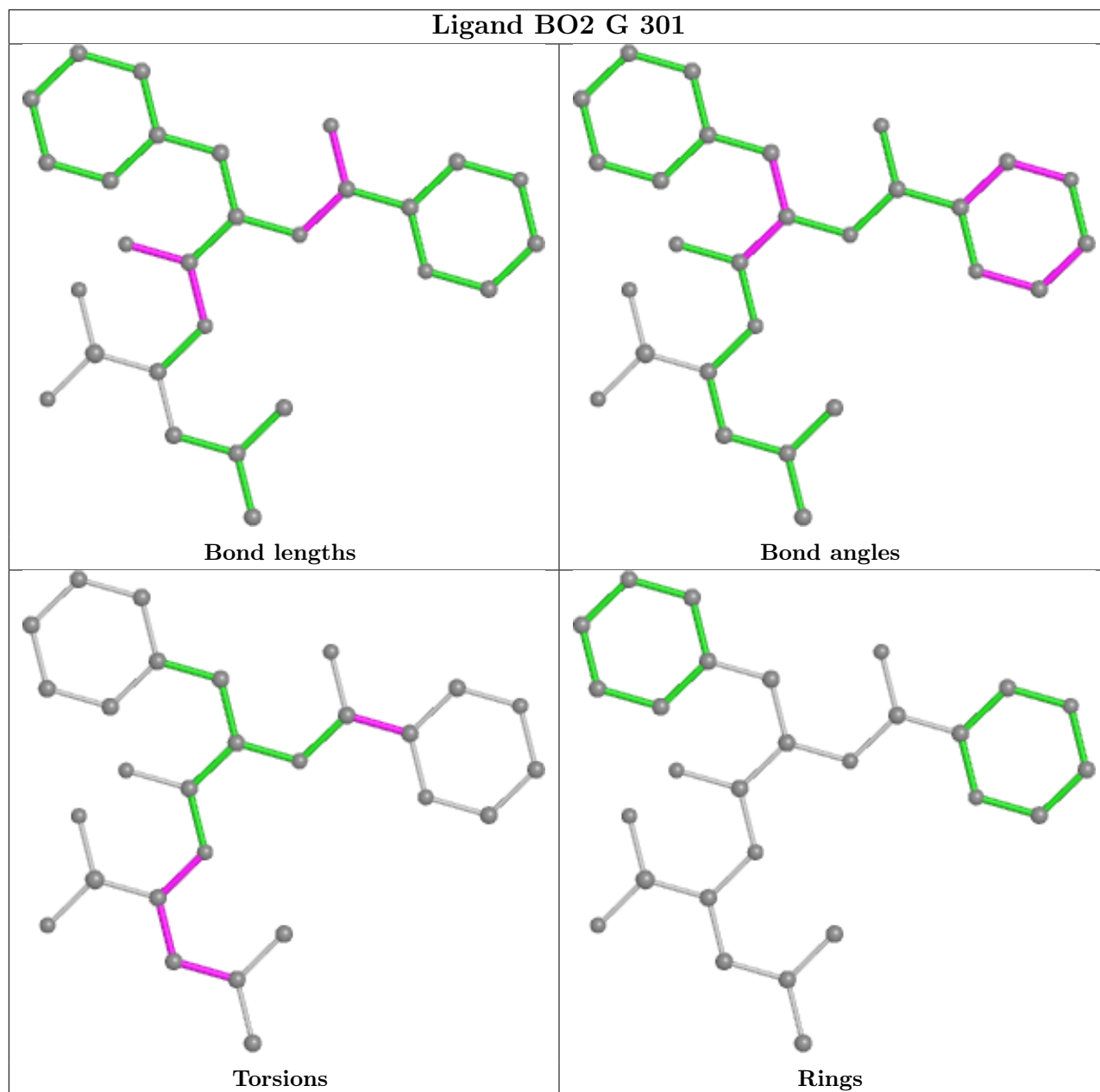


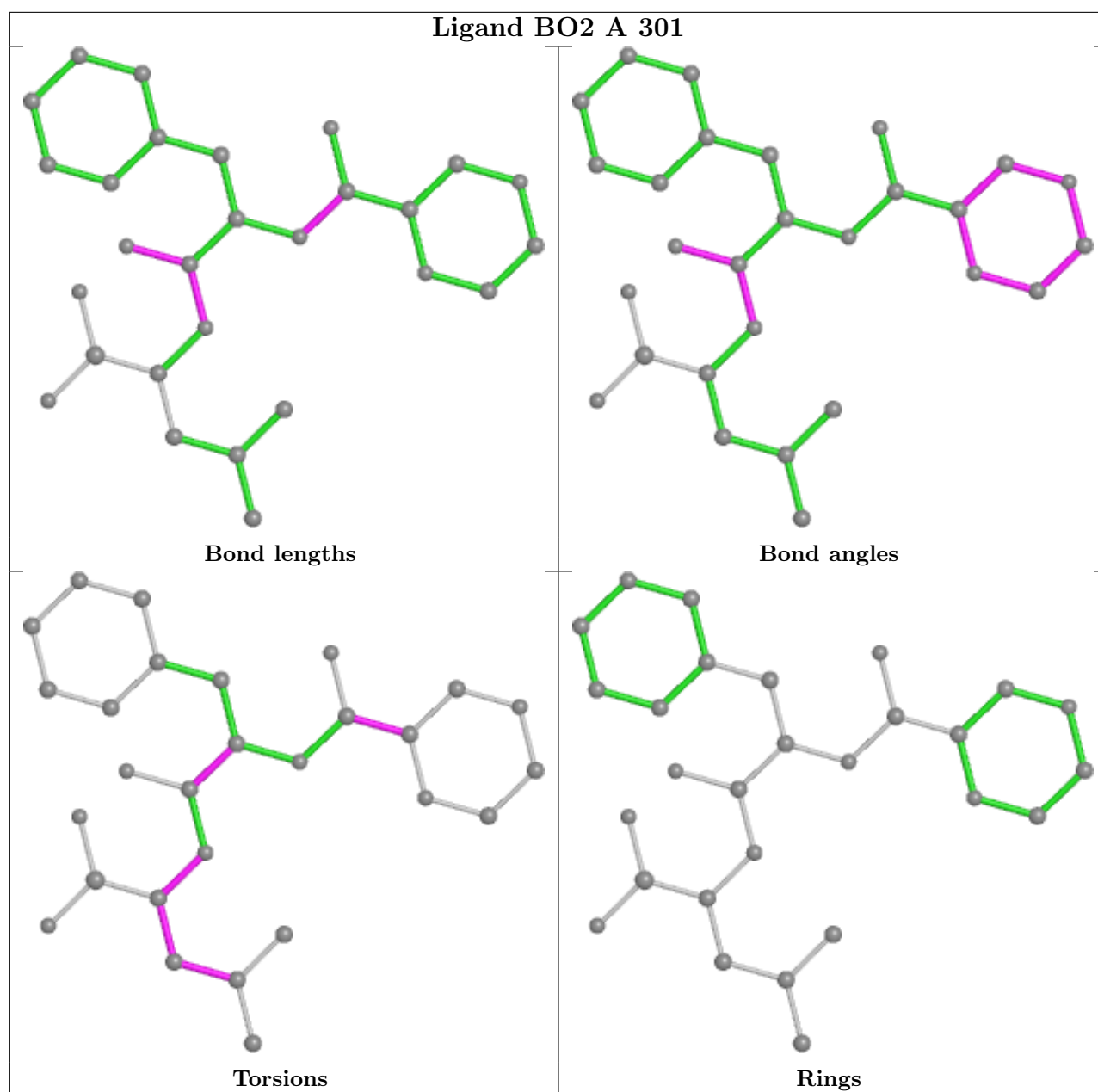












5.7 Other polymers [i](#)

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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	185/204 (90%)	0.04	4 (2%) 62 63	81, 103, 145, 183	0
1	B	192/204 (94%)	0.28	16 (8%) 11 9	75, 105, 158, 226	0
1	C	183/204 (89%)	0.20	11 (6%) 21 20	79, 101, 134, 181	0
1	D	184/204 (90%)	0.13	5 (2%) 54 55	73, 95, 133, 171	0
1	E	195/204 (95%)	0.12	6 (3%) 49 49	74, 93, 156, 191	0
1	F	189/204 (92%)	-0.01	5 (2%) 56 57	66, 88, 129, 162	0
1	G	183/204 (89%)	-0.18	4 (2%) 62 63	73, 97, 130, 167	0
All	All	1311/1428 (91%)	0.08	51 (3%) 39 38	66, 97, 145, 226	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	197	HIS	10.9
1	A	16	VAL	6.3
1	B	195	LEU	6.1
1	E	16	VAL	5.8
1	G	16	VAL	4.9
1	A	17	TYR	4.9
1	B	16	VAL	4.7
1	B	199	HIS	4.7
1	D	2	VAL	4.4
1	B	196	GLU	4.3
1	F	16	VAL	4.2
1	F	17	TYR	4.0
1	B	198	HIS	4.0
1	G	17	TYR	3.9
1	B	130	GLY	3.7
1	B	194	ALA	3.7
1	E	14	GLU	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	200	HIS	3.5
1	G	6	VAL	3.5
1	C	112	TYR	3.4
1	E	17	TYR	3.2
1	E	15	ARG	3.2
1	B	5	TYR	3.1
1	C	2	VAL	3.0
1	D	17	TYR	3.0
1	D	128	VAL	3.0
1	D	7	ILE	2.8
1	B	17	TYR	2.8
1	C	184	LEU	2.7
1	C	109	GLY	2.6
1	G	128	VAL	2.6
1	C	119	VAL	2.5
1	E	1	MET	2.5
1	C	170	ARG	2.5
1	C	6	VAL	2.5
1	F	125	TRP	2.4
1	B	184	LEU	2.4
1	E	7	ILE	2.3
1	B	128	VAL	2.3
1	F	195	LEU	2.3
1	C	17	TYR	2.3
1	C	110	ARG	2.2
1	C	53	GLN	2.2
1	A	6	VAL	2.2
1	C	172	TYR	2.1
1	D	142	ILE	2.1
1	B	7	ILE	2.1
1	B	129	ARG	2.1
1	A	30	PHE	2.1
1	F	7	ILE	2.1
1	B	172	TYR	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

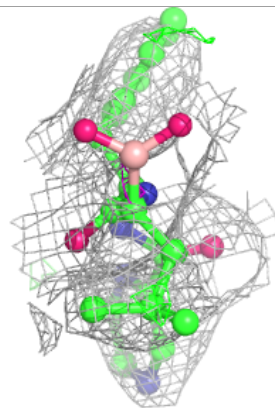
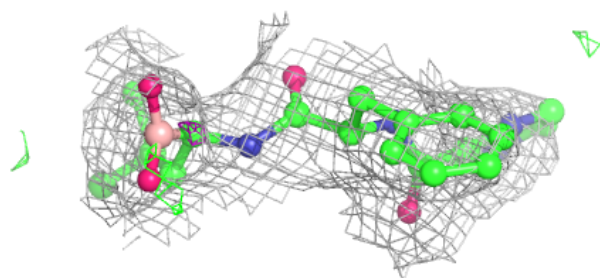
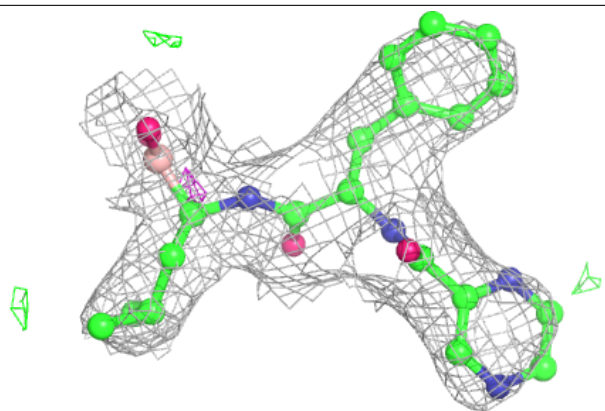
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PEG	E	302	7/7	0.62	0.29	106,110,131,132	0
3	PEG	G	302	7/7	0.77	0.26	107,111,117,119	0
3	PEG	C	302	7/7	0.83	0.18	104,112,119,119	0
2	BO2	E	301	28/28	0.88	0.19	82,119,138,141	0
2	BO2	D	301	28/28	0.88	0.28	86,117,141,148	0
2	BO2	F	301	28/28	0.89	0.38	102,123,144,148	0
2	BO2	B	301	28/28	0.89	0.28	98,115,135,138	0
2	BO2	A	301	28/28	0.90	0.23	94,112,129,142	0
2	BO2	C	301	28/28	0.91	0.20	91,111,126,130	0
2	BO2	G	301	28/28	0.92	0.20	93,116,149,152	0

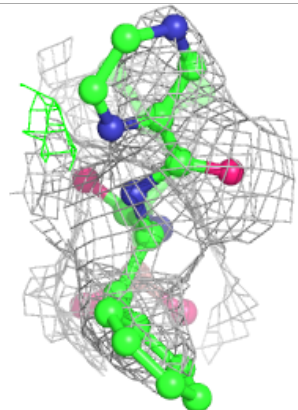
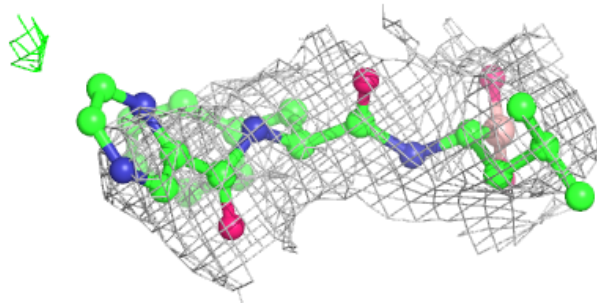
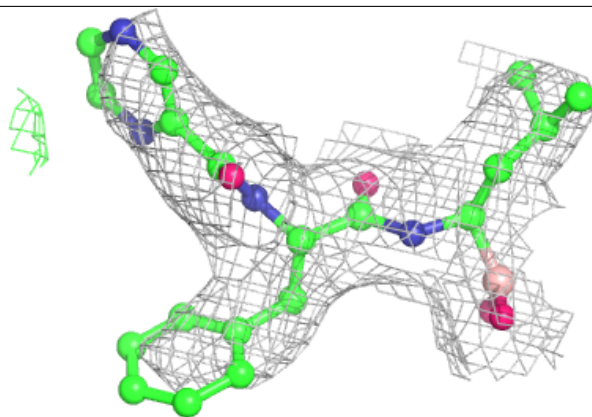
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around BO2 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)

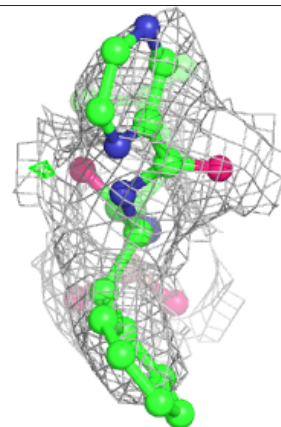
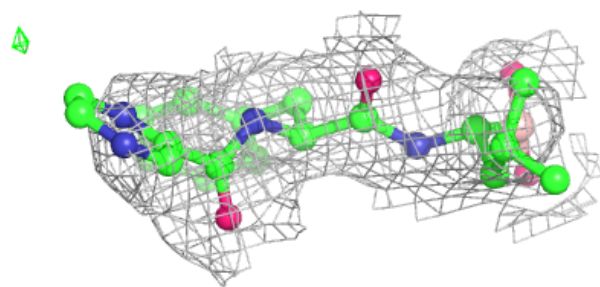
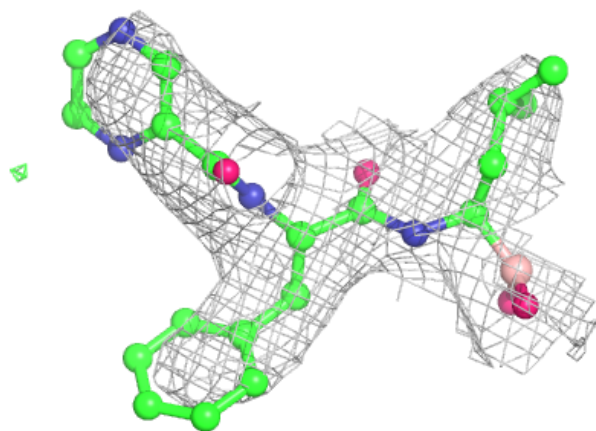
**Electron density around BO2 D 301:**

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



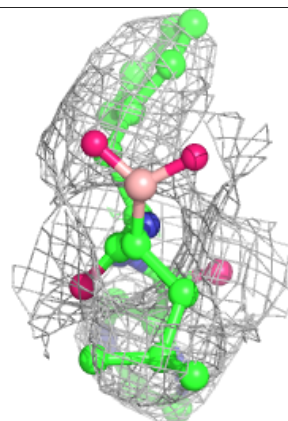
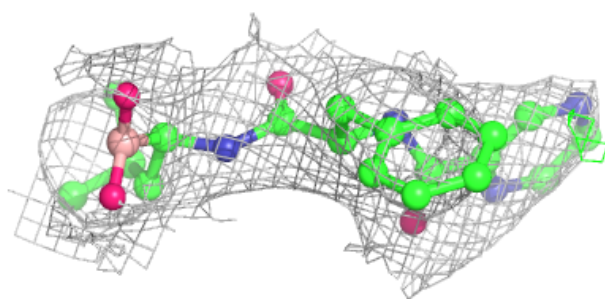
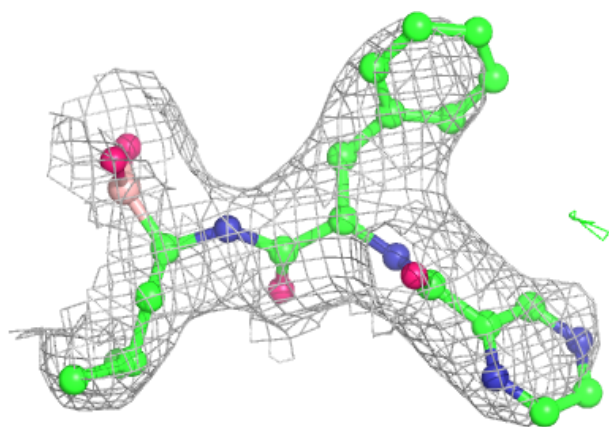
Electron density around BO2 F 301:

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

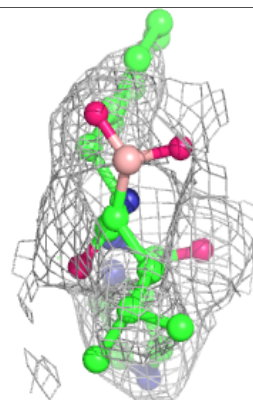
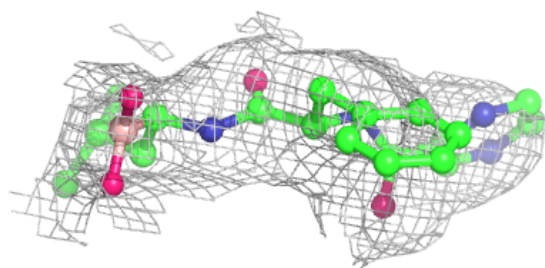


Electron density around BO2 B 301:

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

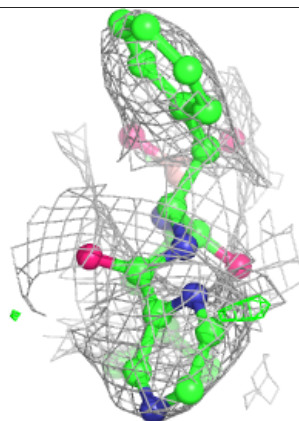
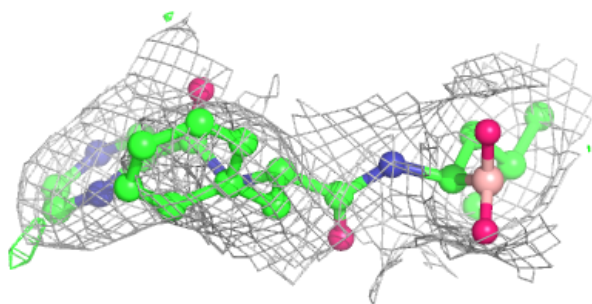
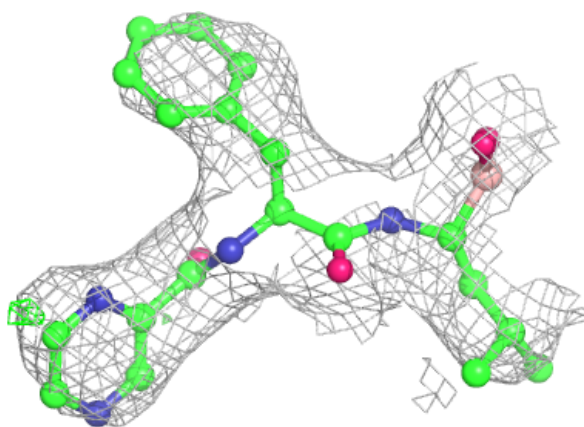
**Electron density around BO2 A 301:**

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

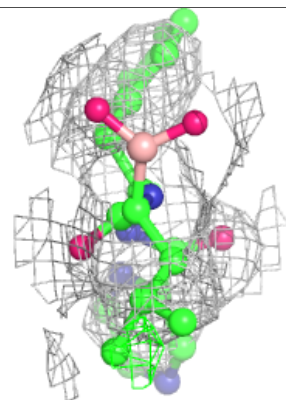
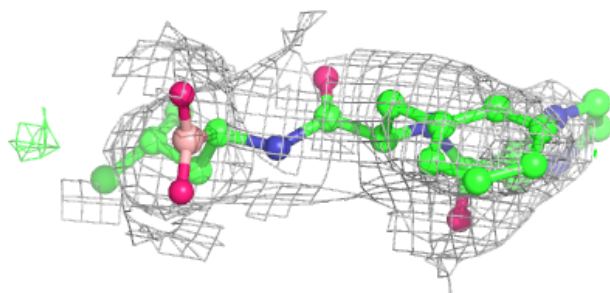
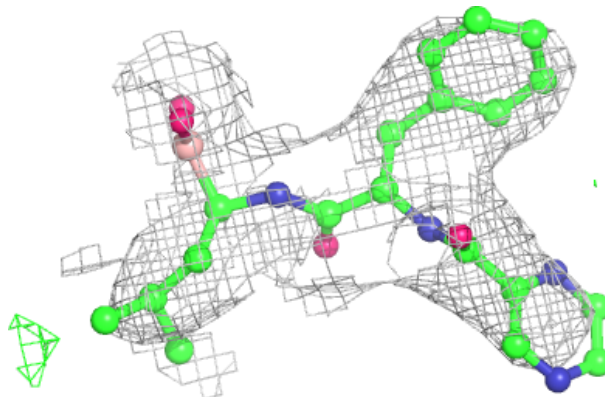


Electron density around BO2 C 301:

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

**Electron density around BO2 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.