



Full wwPDB X-ray Structure Validation Report ⓘ

May 27, 2024 – 10:11 am BST

PDB ID : 8Q1T
Title : X-ray structure of acetylcholine binding protein (AChBP) in complex with IOTA739
Authors : Cederfelt, D.; Lund, B.A.; Boronat, P.; Hennig, S.; Dobritzsch, D.; Danielson, U.H.
Deposited on : 2023-08-01
Resolution : 3.00 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 : 2.36.2
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) : 2.36.2

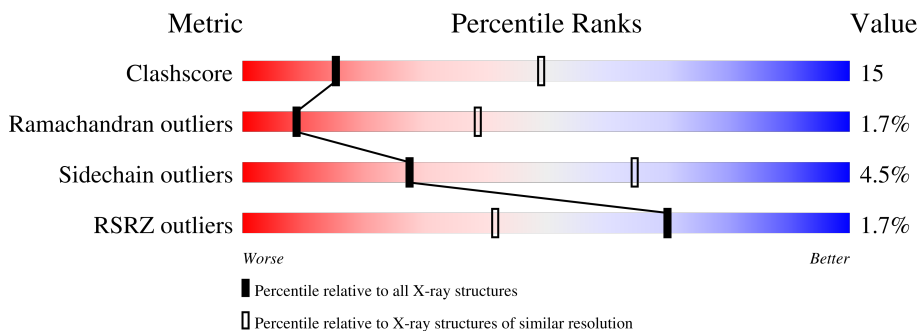
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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))
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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	206	67% (green), 28% (yellow), 2% (orange), 3% (grey)
1	B	206	67% (green), 29% (yellow), 2% (orange), 2% (grey)
1	C	206	68% (green), 28% (yellow), 2% (orange), 2% (grey)
1	D	206	2% (red), 71% (green), 25% (yellow), 2% (orange), 2% (grey)
1	E	206	2% (red), 59% (green), 37% (yellow), 2% (orange), 2% (grey)
1	F	206	2% (red), 66% (green), 30% (yellow), 2% (orange), 2% (grey)

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Mol	Chain	Length	Quality of chain
1	G	206	
1	H	206	
1	I	206	
1	J	206	

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	NAG	A	301	-	-	-	X
3	PHN	F	301	-	-	-	X
4	SO4	F	302	-	-	-	X
4	SO4	J	301	-	-	X	X

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 16393 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 Acetylcholine-binding protein.

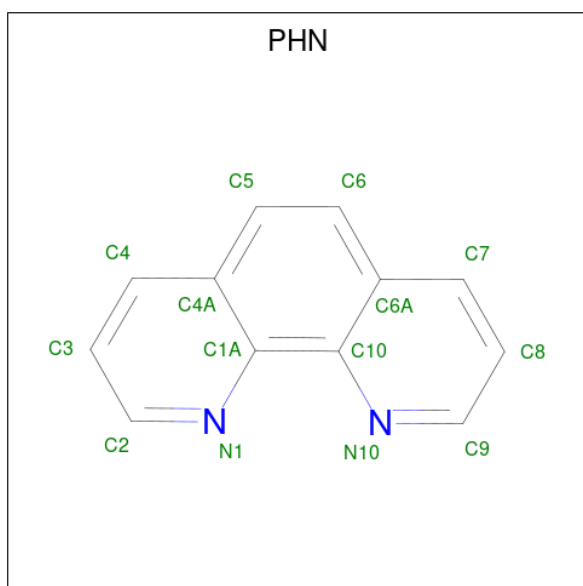
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	202	Total 1618	C 1014	N 277	O 322	S 5	0	0	0
1	B	200	Total 1602	C 1005	N 274	O 318	S 5	0	0	0
1	C	201	Total 1605	C 1007	N 275	O 318	S 5	0	0	0
1	D	205	Total 1638	C 1024	N 283	O 326	S 5	0	0	0
1	E	203	Total 1625	C 1017	N 278	O 325	S 5	0	0	0
1	F	202	Total 1614	C 1012	N 277	O 320	S 5	0	0	0
1	G	200	Total 1602	C 1005	N 274	O 318	S 5	0	0	0
1	H	202	Total 1614	C 1012	N 276	O 321	S 5	0	0	0
1	I	200	Total 1598	C 1003	N 274	O 316	S 5	0	0	0
1	J	199	Total 1594	C 1001	N 273	O 315	S 5	0	0	0

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



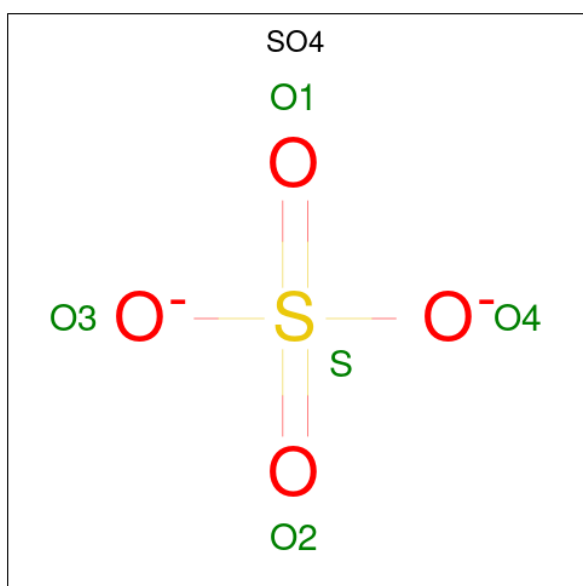
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	14	8	1	5	0	0
2	B	1	14	8	1	5	0	0
2	E	1	14	8	1	5	0	0

- Molecule 3 is 1,10-PHENANTHROLINE (three-letter code: PHN) (formula: $C_{12}H_8N_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			14	12	2		
3	B	1	Total	C	N	0	0
			14	12	2		
3	F	1	Total	C	N	0	0
			14	12	2		
3	G	1	Total	C	N	0	0
			14	12	2		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	F	1	Total	O	S	0	0
			5	4	1		
4	J	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	13	Total	O	0	0
			13	13		
5	B	14	Total	O	0	0
			14	14		
5	C	27	Total	O	0	0
			27	27		
5	D	20	Total	O	0	0
			20	20		

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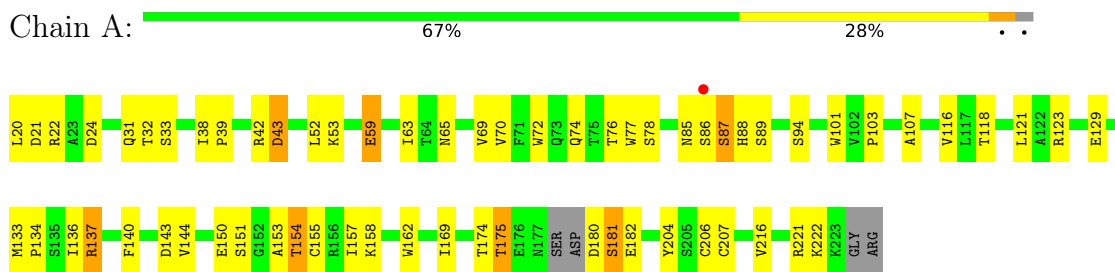
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	E	22	Total 22	O 22	0	0
5	F	13	Total 13	O 13	0	0
5	G	12	Total 12	O 12	0	0
5	H	24	Total 24	O 24	0	0
5	I	18	Total 18	O 18	0	0
5	J	12	Total 12	O 12	0	0

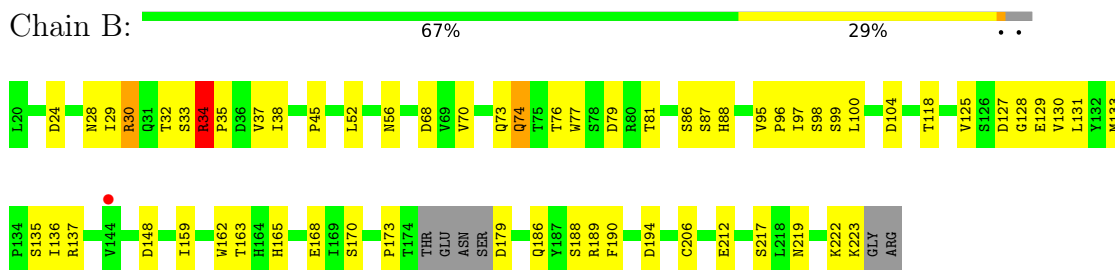
3 Residue-property plots [i](#)

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.

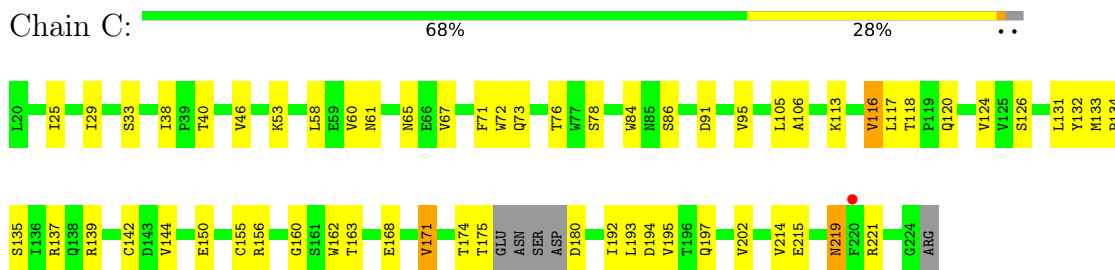
- Molecule 1: Acetylcholine-binding protein



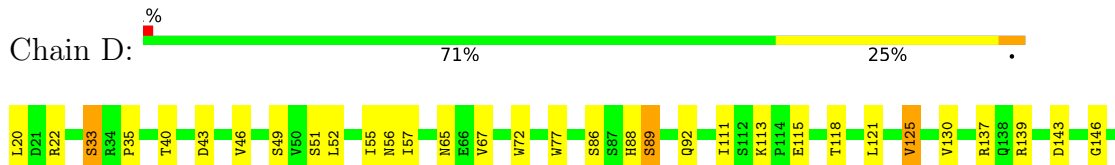
- Molecule 1: Acetylcholine-binding protein



- Molecule 1: Acetylcholine-binding protein

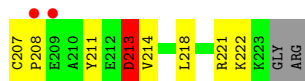
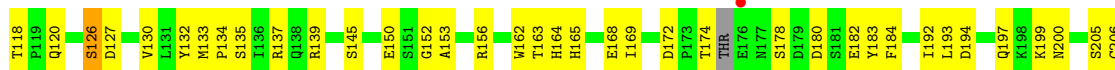
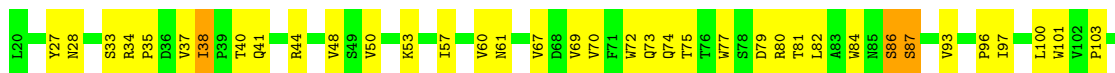


- Molecule 1: Acetylcholine-binding protein

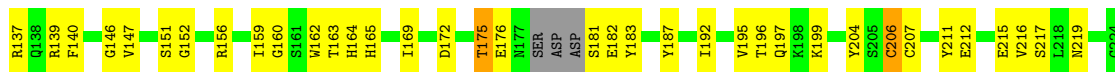




- Molecule 1: Acetylcholine-binding protein

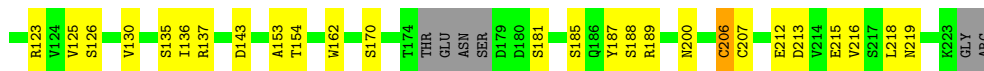


- Molecule 1: Acetylcholine-binding protein

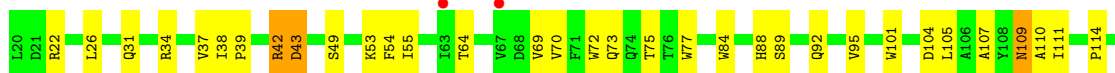


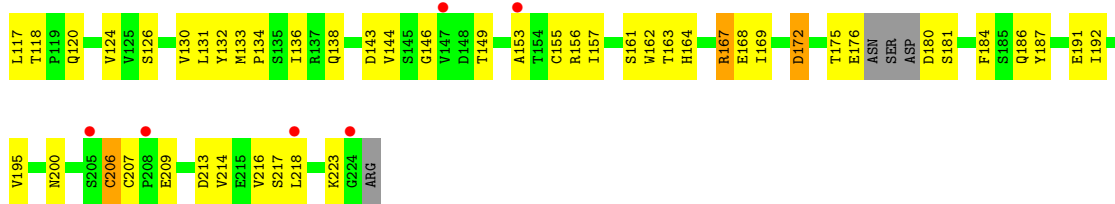
ARG

- Molecule 1: Acetylcholine-binding protein

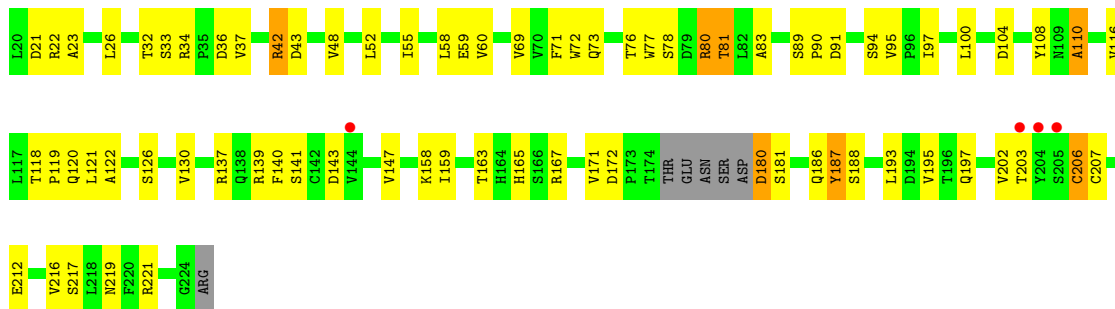


- Molecule 1: Acetylcholine-binding protein

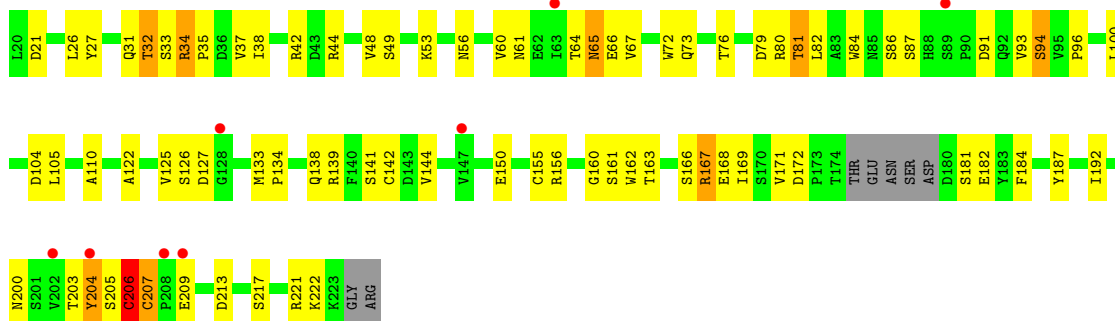




● Molecule 1: Acetylcholine-binding protein



● Molecule 1: Acetylcholine-binding protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	74.95Å 117.85Å 239.75Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.60 – 3.00 49.59 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.9 (49.60-3.00) 100.0 (49.59-3.00)	Depositor EDS
R_{merge}	0.22	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.26 (at 3.01Å)	Xtrriage
Refinement program	REFMAC 5.8.0419	Depositor
R, R_{free}	0.230 , (Not available) 0.241 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	78.1	Xtrriage
Anisotropy	0.155	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 58.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	16393	wwPDB-VP
Average B, all atoms (Å ²)	91.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 28.69 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.7621e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PHN, NAG, SO4

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	0.39	0/1653	0.74	0/2255
1	B	0.40	0/1637	0.77	0/2233
1	C	0.40	0/1640	0.76	0/2237
1	D	0.38	0/1673	0.77	2/2281 (0.1%)
1	E	0.41	0/1660	0.81	1/2264 (0.0%)
1	F	0.39	0/1649	0.80	0/2249
1	G	0.38	0/1637	0.77	0/2233
1	H	0.38	0/1649	0.76	0/2249
1	I	0.40	0/1633	0.74	0/2227
1	J	0.38	0/1629	0.73	0/2222
All	All	0.39	0/16460	0.77	3/22450 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	2
1	D	0	1
1	E	0	2
1	F	0	2
1	G	0	1
1	H	0	3
1	I	0	2
1	J	0	1
All	All	0	16

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	213	ASP	CB-CA-C	-5.82	98.77	110.40
1	D	204	TYR	N-CA-CB	5.80	121.04	110.60
1	D	204	TYR	CB-CA-C	-5.04	100.32	110.40

There are no chirality outliers.

All (16) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	137	ARG	Sidechain
1	A	151	SER	Peptide
1	B	206	CYS	Peptide
1	B	30	ARG	Sidechain
1	D	40	THR	Peptide
1	E	139	ARG	Sidechain
1	E	213	ASP	Peptide
1	F	206	CYS	Peptide
1	F	22	ARG	Sidechain
1	G	206	CYS	Peptide
1	H	206	CYS	Peptide
1	H	22	ARG	Sidechain
1	H	42	ARG	Sidechain
1	I	180	ASP	Peptide
1	I	80	ARG	Sidechain
1	J	167	ARG	Sidechain

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1618	0	1564	44	0
1	B	1602	0	1549	49	0
1	C	1605	0	1556	51	0
1	D	1638	0	1584	48	0
1	E	1625	0	1566	59	0
1	F	1614	0	1564	42	0
1	G	1602	0	1550	48	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	H	1614	0	1562	55	0
1	I	1598	0	1549	62	0
1	J	1594	0	1546	57	0
2	A	14	0	13	0	0
2	B	14	0	13	1	0
2	E	14	0	13	0	0
3	A	14	0	8	2	0
3	B	14	0	8	0	0
3	F	14	0	8	4	0
3	G	14	0	8	0	0
4	F	5	0	0	1	0
4	J	5	0	0	3	0
5	A	13	0	0	1	0
5	B	14	0	0	7	0
5	C	27	0	0	23	0
5	D	20	0	0	9	0
5	E	22	0	0	14	0
5	F	13	0	0	0	0
5	G	12	0	0	10	0
5	H	24	0	0	7	0
5	I	18	0	0	18	0
5	J	12	0	0	7	0
All	All	16393	0	15661	475	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 15.

All (475) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:135:SER:HA	5:C:301:HOH:O	1.33	1.26
1:E:33:SER:O	5:E:401:HOH:O	1.59	1.17
1:C:142:CYS:SG	5:C:327:HOH:O	2.01	1.14
1:C:116:VAL:HA	5:C:313:HOH:O	1.49	1.12
1:D:22:ARG:HD2	5:D:307:HOH:O	1.51	1.10
1:I:110:ALA:HA	5:I:306:HOH:O	1.56	1.06
1:F:199:LYS:NZ	1:F:212:GLU:OE1	1.93	1.00
1:J:34:ARG:NH1	4:J:301:SO4:O2	1.95	1.00
1:D:206:CYS:SG	1:D:207:CYS:N	2.36	0.98
1:H:105:LEU:O	5:H:301:HOH:O	1.83	0.95
1:B:56:ASN:OD1	1:B:188:SER:HB3	1.67	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:155:CYS:SG	5:C:327:HOH:O	2.25	0.94
1:C:71:PHE:O	5:C:301:HOH:O	1.85	0.93
1:E:182:GLU:N	5:E:404:HOH:O	2.03	0.89
1:I:206:CYS:C	1:I:207:CYS:SG	2.52	0.89
1:E:80:ARG:NH1	5:E:405:HOH:O	2.06	0.88
1:I:22:ARG:O	1:I:26:LEU:HD12	1.73	0.87
1:I:36:ASP:HB3	5:I:317:HOH:O	1.74	0.86
1:C:105:LEU:HA	5:C:303:HOH:O	1.74	0.85
1:I:34:ARG:HA	5:I:310:HOH:O	1.77	0.84
1:I:206:CYS:O	1:I:207:CYS:SG	2.35	0.84
1:J:37:VAL:N	5:J:401:HOH:O	2.09	0.84
1:C:174:THR:OG1	5:C:302:HOH:O	1.96	0.83
1:J:37:VAL:O	5:J:401:HOH:O	1.97	0.83
1:C:67:VAL:HG21	5:C:327:HOH:O	1.76	0.83
1:I:36:ASP:CB	5:I:317:HOH:O	2.25	0.82
1:E:152:GLY:O	5:E:402:HOH:O	1.98	0.81
1:C:160:GLY:O	5:C:303:HOH:O	1.99	0.81
1:I:140:PHE:CD2	5:I:306:HOH:O	2.33	0.81
1:D:202:VAL:HG12	1:D:203:THR:N	1.96	0.81
1:E:50:VAL:HA	5:E:407:HOH:O	1.81	0.80
1:I:90:PRO:O	5:I:301:HOH:O	2.00	0.80
1:D:202:VAL:HG12	1:D:203:THR:H	1.47	0.79
1:I:95:VAL:HG11	1:I:100:LEU:HD21	1.63	0.79
1:J:167:ARG:NH2	1:J:209:GLU:OE2	2.14	0.79
1:A:180:ASP:O	1:A:181:SER:OG	2.00	0.79
1:G:130:VAL:O	5:G:401:HOH:O	2.00	0.78
1:J:166:SER:C	5:J:402:HOH:O	2.20	0.78
1:E:153:ALA:C	5:E:403:HOH:O	2.21	0.78
1:E:50:VAL:HB	1:E:214:VAL:HG21	1.65	0.77
1:A:65:ASN:OD1	1:A:144:VAL:N	2.17	0.76
1:E:153:ALA:O	5:E:403:HOH:O	2.03	0.76
5:I:317:HOH:O	1:J:96:PRO:HG2	1.85	0.76
1:F:204:TYR:CD2	3:F:301:PHN:H7	2.20	0.76
1:C:67:VAL:CG2	5:C:327:HOH:O	2.33	0.75
1:D:51:SER:OG	1:D:174:THR:OG1	2.03	0.75
1:B:33:SER:O	1:B:35:PRO:HD3	1.87	0.75
1:I:32:THR:HA	5:I:303:HOH:O	1.86	0.75
1:C:72:TRP:HD1	5:C:301:HOH:O	1.70	0.74
1:A:206:CYS:SG	1:A:207:CYS:N	2.62	0.73
1:H:64:THR:O	5:H:302:HOH:O	2.07	0.73
1:J:33:SER:HB2	4:J:301:SO4:O1	1.88	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:87:SER:N	5:B:403:HOH:O	2.23	0.72
1:B:190:PHE:O	5:B:402:HOH:O	2.07	0.72
1:H:101:TRP:HA	5:H:303:HOH:O	1.89	0.71
1:D:33:SER:N	5:D:301:HOH:O	2.23	0.70
1:E:53:LYS:HB2	1:E:72:TRP:HB2	1.74	0.69
1:D:33:SER:CB	5:D:301:HOH:O	2.40	0.69
1:J:94:SER:HA	1:J:122:ALA:O	1.92	0.69
1:H:161:SER:OG	1:H:169:ILE:HD12	1.93	0.68
1:H:104:ASP:OD1	1:H:161:SER:OG	2.10	0.68
1:G:162:TRP:CZ2	1:H:118:THR:HG21	2.29	0.68
1:A:180:ASP:HB3	5:A:407:HOH:O	1.93	0.67
1:D:165:HIS:HB3	1:D:211:TYR:CE1	2.29	0.67
1:J:125:VAL:HB	1:J:127:ASP:OD1	1.94	0.67
1:C:160:GLY:C	5:C:303:HOH:O	2.32	0.67
1:I:37:VAL:HG22	1:J:26:LEU:HD12	1.77	0.67
1:C:72:TRP:HA	5:C:301:HOH:O	1.94	0.67
1:E:183:TYR:N	5:E:404:HOH:O	2.25	0.67
1:H:73:GLN:O	1:H:133:MET:HA	1.95	0.67
1:E:97:ILE:HD11	1:E:120:GLN:HB3	1.78	0.66
1:D:111:ILE:HG22	1:E:70:VAL:HG21	1.78	0.66
1:G:36:ASP:O	1:H:26:LEU:HD13	1.94	0.66
1:I:59:GLU:OE1	1:I:139:ARG:NH2	2.29	0.66
1:D:77:TRP:CZ2	1:D:130:VAL:HG11	2.31	0.66
1:D:207:CYS:HB2	1:D:208:PRO:HD3	1.78	0.66
1:J:84:TRP:CZ3	1:J:126:SER:HA	2.31	0.65
1:A:221:ARG:HG3	1:A:222:LYS:O	1.96	0.65
1:C:156:ARG:NH2	5:C:306:HOH:O	2.30	0.65
1:B:56:ASN:OD1	1:B:188:SER:CB	2.45	0.65
1:J:37:VAL:C	5:J:401:HOH:O	2.32	0.65
1:D:111:ILE:O	1:E:137:ARG:NH1	2.30	0.65
1:A:78:SER:HA	1:A:129:GLU:HA	1.79	0.64
1:B:162:TRP:CZ2	1:C:118:THR:HG21	2.32	0.64
1:C:174:THR:O	1:C:175:THR:C	2.34	0.64
1:G:70:VAL:C	5:G:404:HOH:O	2.35	0.64
1:I:110:ALA:CA	5:I:306:HOH:O	2.28	0.64
1:E:73:GLN:O	1:E:133:MET:HA	1.97	0.64
1:E:33:SER:O	1:E:35:PRO:HD3	1.98	0.63
1:B:125:VAL:HG22	1:B:129:GLU:HB2	1.80	0.63
1:F:121:LEU:HB3	1:J:163:THR:HG21	1.80	0.63
1:B:52:LEU:HD11	1:B:159:ILE:HD11	1.79	0.63
1:C:113:LYS:N	5:C:305:HOH:O	2.26	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:21:ASP:OD1	1:A:24:ASP:OD2	2.17	0.63
1:H:49:SER:HA	1:H:172:ASP:O	1.98	0.63
1:J:166:SER:O	5:J:402:HOH:O	2.15	0.62
1:I:34:ARG:HB2	5:I:312:HOH:O	1.99	0.62
1:I:60:VAL:HG12	1:I:60:VAL:O	1.99	0.62
1:H:53:LYS:HB2	1:H:72:TRP:HB2	1.80	0.62
1:I:43:ASP:C	5:I:304:HOH:O	2.38	0.62
1:I:180:ASP:N	5:I:302:HOH:O	2.32	0.62
1:I:36:ASP:HA	5:I:317:HOH:O	1.99	0.62
1:F:204:TYR:CG	3:F:301:PHN:H7	2.35	0.62
1:A:107:ALA:HA	1:A:158:LYS:O	2.01	0.61
1:A:53:LYS:HA	1:A:180:ASP:OD1	2.01	0.61
1:A:87:SER:OG	1:A:88:HIS:N	2.33	0.61
1:E:145:SER:N	5:E:408:HOH:O	2.27	0.61
1:J:53:LYS:HB2	1:J:72:TRP:HB2	1.83	0.60
1:J:79:ASP:HB3	1:J:82:LEU:HD12	1.83	0.60
1:F:162:TRP:O	3:F:301:PHN:C4	2.50	0.60
1:H:84:TRP:CE2	1:H:126:SER:HB3	2.36	0.60
1:B:88:HIS:N	5:B:403:HOH:O	2.33	0.60
1:G:143:ASP:HB2	1:H:187:TYR:CE1	2.36	0.60
1:D:65:ASN:ND2	5:D:303:HOH:O	2.33	0.60
5:H:301:HOH:O	1:I:119:PRO:HD3	2.02	0.59
1:I:34:ARG:CB	5:I:312:HOH:O	2.51	0.59
1:G:170:SER:HB2	1:G:212:GLU:OE1	2.02	0.58
1:D:52:LEU:HD11	1:D:159:ILE:HD11	1.84	0.58
1:C:162:TRP:CZ2	1:D:118:THR:HG21	2.38	0.58
1:F:30:ARG:HG3	1:F:30:ARG:HH11	1.68	0.58
1:F:104:ASP:OD2	1:F:163:THR:OG1	2.15	0.58
1:A:94:SER:HB2	1:E:164:HIS:CE1	2.40	0.57
1:A:121:LEU:HB2	1:E:163:THR:HG21	1.86	0.57
1:F:197:GLN:HA	1:F:215:GLU:O	2.04	0.57
1:H:120:GLN:NE2	1:H:132:TYR:OH	2.36	0.57
1:B:99:SER:OG	5:B:401:HOH:O	2.06	0.57
1:C:197:GLN:HA	1:C:215:GLU:O	2.03	0.57
1:F:111:ILE:O	1:G:137:ARG:NH1	2.36	0.57
1:C:171:VAL:HG23	1:C:214:VAL:HG23	1.85	0.57
1:C:162:TRP:CE2	1:D:118:THR:HG21	2.39	0.57
1:J:64:THR:O	1:J:65:ASN:HB2	2.05	0.57
1:C:53:LYS:HB2	1:C:72:TRP:HB2	1.87	0.57
1:E:182:GLU:HG2	1:E:182:GLU:O	2.04	0.56
1:F:94:SER:N	4:F:302:SO4:O1	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:33:SER:N	5:I:303:HOH:O	2.38	0.56
1:C:150:GLU:O	1:C:221:ARG:NH1	2.37	0.56
1:F:118:THR:HG23	1:F:135:SER:HB3	1.87	0.56
1:I:32:THR:CA	5:I:303:HOH:O	2.50	0.56
1:F:176:GLU:OE1	1:F:181:SER:N	2.39	0.55
1:G:71:PHE:HD1	5:G:404:HOH:O	1.88	0.55
1:H:167:ARG:NH2	1:H:209:GLU:OE1	2.38	0.55
1:A:182:GLU:OE2	1:E:205:SER:OG	2.16	0.55
1:D:67:VAL:O	1:D:139:ARG:HA	2.06	0.55
1:A:118:THR:HG21	1:E:162:TRP:CH2	2.42	0.55
1:F:204:TYR:CD2	3:F:301:PHN:C7	2.90	0.55
1:G:29:ILE:O	1:G:33:SER:HB2	2.07	0.55
1:A:180:ASP:O	1:A:181:SER:CB	2.55	0.55
1:E:74:GLN:O	5:E:407:HOH:O	2.18	0.55
1:I:186:GLN:O	1:I:188:SER:N	2.35	0.55
1:D:46:VAL:HG23	1:D:168:GLU:O	2.06	0.55
1:E:67:VAL:HG23	1:E:69:VAL:HG23	1.89	0.55
1:J:31:GLN:O	1:J:32:THR:HG23	2.05	0.55
1:H:195:VAL:HA	1:H:217:SER:O	2.06	0.54
1:B:33:SER:C	1:B:35:PRO:HD3	2.26	0.54
1:J:84:TRP:CE3	1:J:126:SER:HA	2.43	0.54
1:H:117:LEU:HD12	1:H:117:LEU:N	2.22	0.54
1:A:144:VAL:O	1:A:153:ALA:CB	2.56	0.54
1:B:45:PRO:HB3	1:B:168:GLU:N	2.22	0.54
1:F:118:THR:HG21	1:J:162:TRP:CZ2	2.42	0.54
1:B:52:LEU:HD11	1:B:159:ILE:CD1	2.37	0.54
1:B:162:TRP:CE2	1:C:118:THR:HG21	2.41	0.54
1:H:34:ARG:NE	5:H:304:HOH:O	2.40	0.54
1:B:77:TRP:CZ2	1:B:130:VAL:HG11	2.43	0.54
1:C:33:SER:HB3	5:C:310:HOH:O	2.08	0.54
1:H:107:ALA:HB3	1:H:110:ALA:HB2	1.90	0.53
1:C:25:ILE:HD13	1:C:84:TRP:CE2	2.44	0.53
1:G:38:ILE:HG22	1:G:101:TRP:CZ2	2.43	0.53
1:B:32:THR:HG23	1:G:32:THR:HG23	1.90	0.53
1:E:79:ASP:HB3	1:E:82:LEU:HD12	1.91	0.53
1:A:182:GLU:O	1:A:182:GLU:HG2	2.09	0.53
1:J:38:ILE:HD11	1:J:169:ILE:HG13	1.90	0.53
1:J:206:CYS:SG	1:J:207:CYS:N	2.82	0.53
1:I:202:VAL:HG12	1:I:203:THR:N	2.24	0.53
1:B:24:ASP:O	1:B:28:ASN:OD1	2.26	0.52
1:E:200:ASN:HB3	1:E:213:ASP:HB2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:104:ASP:OD2	1:I:163:THR:OG1	2.19	0.52
1:D:173:PRO:HD3	1:D:214:VAL:HG22	1.92	0.52
1:E:197:GLN:NE2	5:E:409:HOH:O	2.43	0.52
1:A:20:LEU:N	1:A:89:SER:OG	2.42	0.52
1:A:22:ARG:NH2	1:E:168:GLU:OE2	2.43	0.52
1:J:37:VAL:CA	5:J:401:HOH:O	2.56	0.52
1:C:78:SER:O	5:C:304:HOH:O	2.19	0.51
1:E:81:THR:HG23	5:E:421:HOH:O	2.09	0.51
1:J:86:SER:HB2	1:J:91:ASP:OD1	2.10	0.51
1:G:153:ALA:O	1:G:219:ASN:HA	2.11	0.51
1:J:203:THR:O	1:J:204:TYR:O	2.28	0.51
1:H:146:GLY:HA2	1:H:149:THR:HG23	1.93	0.51
1:E:38:ILE:HD11	1:E:169:ILE:CG1	2.41	0.51
1:F:33:SER:OG	1:F:99:SER:O	2.23	0.51
1:B:28:ASN:O	1:B:32:THR:OG1	2.22	0.51
1:C:120:GLN:OE1	1:C:132:TYR:OH	2.28	0.51
1:G:85:ASN:ND2	5:G:403:HOH:O	2.43	0.51
1:A:85:ASN:O	1:A:87:SER:N	2.44	0.51
1:D:166:SER:OG	1:D:210:ALA:HB3	2.11	0.51
1:G:61:ASN:OD1	1:G:61:ASN:C	2.49	0.51
1:I:108:TYR:HB2	1:I:158:LYS:HB2	1.93	0.51
1:A:118:THR:HG21	1:E:162:TRP:CZ2	2.46	0.50
1:B:79:ASP:OD1	1:B:81:THR:OG1	2.28	0.50
1:A:204:TYR:CE2	3:A:302:PHN:C4	2.95	0.50
1:F:69:VAL:O	1:F:137:ARG:HA	2.11	0.50
1:D:180:ASP:HB3	1:D:195:VAL:HG23	1.93	0.50
1:J:100:LEU:HA	4:J:301:SO4:O1	2.12	0.50
1:B:29:ILE:O	1:B:30:ARG:C	2.50	0.50
5:D:311:HOH:O	1:E:96:PRO:HD3	2.10	0.50
1:A:77:TRP:CH2	1:A:103:PRO:HD2	2.47	0.50
1:D:92:GLN:HB3	1:D:125:VAL:HA	1.94	0.50
1:I:171:VAL:HG12	1:I:212:GLU:HB3	1.93	0.50
1:J:49:SER:HA	1:J:172:ASP:O	2.12	0.50
1:I:36:ASP:OD1	1:I:36:ASP:N	2.40	0.49
1:D:115:GLU:OE2	1:D:137:ARG:NH2	2.46	0.49
1:G:130:VAL:C	5:G:401:HOH:O	2.45	0.49
1:D:88:HIS:CD2	1:J:42:ARG:HD2	2.48	0.49
1:F:165:HIS:HB3	1:F:211:TYR:CE1	2.47	0.49
1:E:34:ARG:HB2	1:E:37:VAL:HB	1.94	0.49
1:G:69:VAL:HG12	5:G:404:HOH:O	2.12	0.49
1:G:162:TRP:CE2	1:H:118:THR:HG21	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:150:GLU:O	1:A:221:ARG:HD3	2.13	0.49
1:J:33:SER:O	1:J:35:PRO:HD3	2.13	0.49
1:I:52:LEU:HD11	1:I:159:ILE:HD12	1.95	0.49
1:E:206:CYS:SG	1:E:207:CYS:N	2.86	0.49
1:A:133:MET:O	1:A:133:MET:HG2	2.13	0.49
1:D:55:ILE:HG13	1:D:72:TRP:CD1	2.48	0.49
1:G:71:PHE:HB3	5:G:404:HOH:O	2.13	0.49
1:H:200:ASN:HB2	1:H:213:ASP:OD1	2.12	0.49
1:I:143:ASP:HB2	1:J:187:TYR:CE1	2.47	0.49
1:E:48:VAL:HG11	1:E:103:PRO:HG3	1.95	0.49
1:D:86:SER:HA	1:D:89:SER:HB2	1.95	0.48
1:E:86:SER:O	1:E:87:SER:C	2.51	0.48
1:E:184:PHE:CD1	1:E:192:ILE:HD11	2.48	0.48
1:H:164:HIS:ND1	1:H:168:GLU:OE1	2.46	0.48
1:J:184:PHE:CD1	1:J:192:ILE:HD11	2.47	0.48
1:F:109:ASN:ND2	1:F:156:ARG:O	2.46	0.48
1:J:26:LEU:O	1:J:27:TYR:C	2.52	0.48
1:F:156:ARG:HD2	1:F:215:GLU:OE2	2.13	0.48
1:J:150:GLU:O	1:J:221:ARG:NH1	2.43	0.48
1:A:182:GLU:O	1:A:182:GLU:CG	2.61	0.48
1:F:30:ARG:HG3	1:F:30:ARG:NH1	2.28	0.48
1:G:181:SER:HA	5:G:407:HOH:O	2.13	0.48
1:E:150:GLU:O	1:E:221:ARG:HD3	2.14	0.48
2:B:301:NAG:H4	5:B:408:HOH:O	2.12	0.48
1:J:73:GLN:O	1:J:133:MET:HA	2.14	0.48
1:H:111:ILE:O	1:I:137:ARG:NH1	2.47	0.47
1:I:97:ILE:HG22	1:I:122:ALA:HB2	1.95	0.47
1:G:206:CYS:SG	1:G:207:CYS:N	2.88	0.47
1:E:35:PRO:HD3	5:E:401:HOH:O	2.14	0.47
1:G:55:ILE:HG12	1:G:71:PHE:HA	1.97	0.47
1:G:187:TYR:O	1:G:188:SER:C	2.53	0.47
1:B:190:PHE:N	1:B:190:PHE:CD1	2.82	0.47
1:F:146:GLY:O	1:F:152:GLY:HA2	2.14	0.47
1:G:41:GLN:HB3	1:G:42:ARG:HE	1.79	0.47
1:G:185:SER:C	1:G:187:TYR:H	2.17	0.47
1:B:86:SER:HA	5:B:403:HOH:O	2.14	0.47
1:C:131:LEU:HB3	5:C:325:HOH:O	2.14	0.47
1:D:46:VAL:N	1:D:168:GLU:O	2.46	0.47
1:F:107:ALA:HB1	1:F:140:PHE:HE2	1.79	0.47
1:F:187:TYR:OH	1:J:156:ARG:NH1	2.32	0.47
1:G:58:LEU:HD11	1:G:70:VAL:HG23	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:109:ASN:HD21	1:H:157:ILE:HA	1.80	0.47
1:J:48:VAL:HB	1:J:171:VAL:HG12	1.97	0.47
3:A:302:PHN:C8	1:B:131:LEU:HD23	2.45	0.47
1:G:86:SER:O	1:G:88:HIS:N	2.47	0.47
1:I:147:VAL:O	1:I:221:ARG:HA	2.14	0.47
1:J:105:LEU:HA	1:J:160:GLY:O	2.14	0.47
1:A:53:LYS:HB2	1:A:72:TRP:HB2	1.96	0.47
1:I:48:VAL:HA	1:I:76:THR:O	2.15	0.47
1:C:46:VAL:N	1:C:168:GLU:O	2.48	0.47
1:G:76:THR:HA	5:G:401:HOH:O	2.14	0.47
1:J:42:ARG:HA	1:J:42:ARG:NE	2.30	0.47
1:H:34:ARG:HD2	5:H:304:HOH:O	2.15	0.47
1:H:191:GLU:HB3	1:H:223:LYS:HE3	1.97	0.47
1:C:156:ARG:NH1	1:D:187:TYR:OH	2.48	0.46
1:H:37:VAL:HG22	1:I:23:ALA:HA	1.97	0.46
1:B:95:VAL:HB	1:B:100:LEU:HD21	1.97	0.46
1:B:125:VAL:CG2	1:B:129:GLU:HB2	2.44	0.46
1:B:222:LYS:HG2	1:B:223:LYS:N	2.30	0.46
1:H:75:THR:O	1:H:131:LEU:HA	2.15	0.46
1:C:95:VAL:HG21	1:C:124:VAL:HG21	1.97	0.46
1:G:34:ARG:O	1:G:36:ASP:N	2.48	0.46
1:J:60:VAL:HG13	1:J:67:VAL:HG12	1.97	0.46
1:A:143:ASP:HB3	1:A:154:THR:O	2.15	0.46
1:C:117:LEU:HB2	1:C:135:SER:HB3	1.98	0.46
1:E:38:ILE:HD11	1:E:169:ILE:HG13	1.96	0.46
1:E:97:ILE:HG12	1:E:120:GLN:O	2.15	0.46
1:F:70:VAL:HA	1:F:136:ILE:O	2.15	0.46
1:I:80:ARG:O	1:I:81:THR:C	2.53	0.46
1:I:90:PRO:C	5:I:301:HOH:O	2.51	0.46
1:B:70:VAL:HA	1:B:136:ILE:O	2.15	0.46
1:B:118:THR:HG23	1:B:135:SER:HB3	1.98	0.46
1:D:165:HIS:CD2	1:D:209:GLU:HG2	2.51	0.46
1:H:180:ASP:O	1:H:181:SER:OG	2.29	0.46
1:I:77:TRP:CZ2	1:I:130:VAL:HG11	2.50	0.46
1:E:74:GLN:HE21	1:E:174:THR:HG21	1.81	0.46
1:G:125:VAL:O	1:G:126:SER:C	2.54	0.46
1:H:55:ILE:HB	1:H:70:VAL:O	2.16	0.46
1:A:116:VAL:HG13	1:A:134:PRO:HB2	1.98	0.46
1:J:60:VAL:HG12	1:J:144:VAL:HG11	1.98	0.46
1:H:54:PHE:HE1	1:H:69:VAL:HG11	1.79	0.46
1:J:49:SER:HB2	1:J:76:THR:OG1	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:33:SER:CA	5:D:301:HOH:O	2.59	0.46
1:F:181:SER:HB3	1:F:192:ILE:HG21	1.98	0.46
1:E:77:TRP:CZ2	1:E:130:VAL:HG11	2.51	0.46
1:H:156:ARG:HA	1:H:216:VAL:O	2.15	0.46
1:A:63:ILE:O	1:B:189:ARG:HD2	2.16	0.45
1:G:102:VAL:HG13	1:G:103:PRO:HD2	1.97	0.45
1:G:95:VAL:HB	1:G:100:LEU:HD11	1.98	0.45
1:J:34:ARG:H	1:J:34:ARG:HE	1.64	0.45
1:F:42:ARG:O	1:F:43:ASP:C	2.54	0.45
1:H:84:TRP:CZ3	1:H:126:SER:HA	2.51	0.45
1:E:73:GLN:O	1:E:134:PRO:HD2	2.16	0.45
1:H:88:HIS:O	1:H:89:SER:OG	2.30	0.45
1:D:207:CYS:HB2	1:D:208:PRO:CD	2.44	0.45
1:H:104:ASP:O	1:I:119:PRO:HG2	2.17	0.45
1:I:186:GLN:HG3	1:I:187:TYR:N	2.31	0.45
1:B:76:THR:HA	1:B:130:VAL:O	2.17	0.45
1:E:192:ILE:O	1:E:193:LEU:HD23	2.16	0.45
1:F:105:LEU:HA	1:F:160:GLY:O	2.17	0.45
1:F:62:GLU:OE1	1:F:147:VAL:HG12	2.17	0.45
1:I:193:LEU:N	1:I:219:ASN:O	2.50	0.45
1:E:172:ASP:OD2	1:E:199:LYS:HD2	2.17	0.45
1:G:200:ASN:ND2	1:G:213:ASP:OD2	2.49	0.45
1:H:144:VAL:HG12	1:H:144:VAL:O	2.17	0.45
1:I:89:SER:HB3	1:I:90:PRO:HD2	1.99	0.45
1:E:84:TRP:CZ3	1:E:126:SER:HA	2.51	0.45
1:A:174:THR:O	1:A:175:THR:C	2.55	0.44
1:G:92:GLN:HB3	1:G:125:VAL:HA	1.98	0.44
1:I:42:ARG:H	1:I:42:ARG:CZ	2.29	0.44
1:C:180:ASP:HB3	1:C:195:VAL:HB	1.98	0.44
1:F:34:ARG:HH22	1:G:27:TYR:HB2	1.80	0.44
1:J:60:VAL:HG12	1:J:61:ASN:N	2.32	0.44
1:E:222:LYS:NZ	5:E:406:HOH:O	2.17	0.44
1:B:38:ILE:O	1:B:38:ILE:HG23	2.17	0.44
1:H:162:TRP:CZ2	1:I:118:THR:HG21	2.52	0.44
1:A:21:ASP:OD1	1:A:21:ASP:N	2.50	0.44
1:C:72:TRP:CD1	5:C:301:HOH:O	2.55	0.44
1:D:49:SER:HB2	1:D:174:THR:CG2	2.48	0.44
1:H:117:LEU:HD12	1:H:117:LEU:H	1.82	0.44
1:B:30:ARG:NH2	5:B:405:HOH:O	2.45	0.44
1:C:76:THR:HG23	1:C:131:LEU:HD23	1.99	0.44
1:C:163:THR:HG21	1:D:121:LEU:HB2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:60:VAL:HG13	1:E:61:ASN:N	2.32	0.44
1:F:34:ARG:NH2	1:G:27:TYR:HB2	2.33	0.44
1:J:169:ILE:N	5:J:402:HOH:O	2.51	0.44
1:D:179:ASP:HB3	1:D:182:GLU:HB2	2.00	0.44
1:B:73:GLN:O	1:B:74:GLN:C	2.56	0.43
1:B:96:PRO:C	1:B:98:SER:H	2.22	0.43
1:D:156:ARG:NH2	5:D:304:HOH:O	2.41	0.43
1:G:200:ASN:HD21	1:G:215:GLU:HB2	1.82	0.43
1:I:116:VAL:HG12	1:I:118:THR:H	1.83	0.43
1:E:213:ASP:HB3	1:E:214:VAL:O	2.18	0.43
1:F:107:ALA:HB2	1:F:159:ILE:CD1	2.48	0.43
1:J:72:TRP:HA	1:J:134:PRO:O	2.18	0.43
1:D:33:SER:HB2	5:D:301:HOH:O	2.12	0.43
1:F:52:LEU:HG	1:F:216:VAL:HG21	2.00	0.43
1:G:70:VAL:HA	1:G:136:ILE:O	2.18	0.43
1:G:86:SER:O	1:G:89:SER:N	2.52	0.43
1:I:52:LEU:CD2	1:I:73:GLN:HG3	2.48	0.43
1:D:146:GLY:O	1:D:152:GLY:C	2.57	0.43
1:G:79:ASP:OD1	1:G:81:THR:OG1	2.28	0.43
1:H:175:THR:HG23	1:H:176:GLU:HG2	2.00	0.43
1:H:114:PRO:HD3	1:H:138:GLN:OE1	2.18	0.43
1:J:38:ILE:HG23	1:J:38:ILE:O	2.18	0.43
1:J:200:ASN:HB3	1:J:213:ASP:OD1	2.18	0.43
1:A:70:VAL:HA	1:A:136:ILE:O	2.19	0.43
1:D:49:SER:CB	1:D:174:THR:CG2	2.96	0.43
1:G:52:LEU:HG	1:G:216:VAL:HG21	1.99	0.43
1:G:87:SER:OG	1:G:88:HIS:N	2.49	0.43
1:H:184:PHE:CD1	1:H:192:ILE:HD12	2.54	0.43
1:I:55:ILE:HD11	1:I:72:TRP:CG	2.53	0.43
1:A:162:TRP:CZ2	1:B:118:THR:HG21	2.54	0.43
1:B:74:GLN:HA	1:B:133:MET:HB2	2.01	0.43
1:C:58:LEU:CD1	1:C:137:ARG:HH11	2.32	0.43
1:F:206:CYS:SG	1:F:207:CYS:N	2.92	0.43
1:J:104:ASP:OD2	1:J:163:THR:OG1	2.31	0.43
1:A:42:ARG:O	1:A:43:ASP:C	2.58	0.42
1:B:127:ASP:OD1	1:B:128:GLY:N	2.52	0.42
1:D:56:ASN:OD1	1:D:57:ILE:N	2.52	0.42
1:B:170:SER:HA	1:B:212:GLU:OE1	2.19	0.42
1:B:127:ASP:OD1	1:B:127:ASP:C	2.58	0.42
1:H:134:PRO:HG2	1:H:136:ILE:HD11	2.02	0.42
1:A:94:SER:OG	1:A:123:ARG:NH1	2.47	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:67:VAL:CG1	5:C:327:HOH:O	2.67	0.42
1:E:156:ARG:HB2	1:E:156:ARG:CZ	2.48	0.42
1:F:22:ARG:NH2	1:J:168:GLU:OE2	2.53	0.42
1:H:146:GLY:O	1:H:153:ALA:N	2.53	0.42
1:J:104:ASP:OD1	1:J:161:SER:OG	2.29	0.42
1:D:207:CYS:CB	1:D:208:PRO:HD3	2.49	0.42
1:E:82:LEU:HD11	1:E:100:LEU:HD22	2.01	0.42
1:H:186:GLN:NE2	1:H:187:TYR:CZ	2.82	0.42
1:I:55:ILE:HG12	1:I:71:PHE:HA	2.01	0.42
1:I:195:VAL:HA	1:I:217:SER:O	2.19	0.42
1:C:38:ILE:HG12	1:C:40:THR:HG23	2.02	0.42
1:H:77:TRP:CZ2	1:H:130:VAL:HG11	2.55	0.42
1:I:180:ASP:OD1	1:I:181:SER:N	2.52	0.42
1:I:197:GLN:HG2	1:I:216:VAL:HG22	2.01	0.42
1:A:38:ILE:HG13	1:A:39:PRO:HD2	2.02	0.42
1:B:127:ASP:OD1	1:B:129:GLU:HG2	2.20	0.42
1:G:92:GLN:HG3	1:G:123:ARG:HH21	1.85	0.42
1:J:66:GLU:HB3	1:J:139:ARG:HH11	1.85	0.42
1:J:156:ARG:CZ	1:J:156:ARG:HB2	2.50	0.42
1:B:118:THR:HG23	1:B:135:SER:CB	2.50	0.42
1:C:67:VAL:HG11	5:C:327:HOH:O	2.19	0.42
1:E:38:ILE:HG13	1:E:101:TRP:CZ2	2.55	0.42
1:F:107:ALA:HB2	1:F:159:ILE:HD13	2.02	0.42
1:I:165:HIS:CE1	1:I:167:ARG:HB2	2.54	0.42
1:G:118:THR:HG23	1:G:135:SER:HB3	2.02	0.42
1:C:29:ILE:O	1:C:33:SER:HB2	2.19	0.42
1:C:65:ASN:HA	1:C:144:VAL:CG2	2.50	0.42
1:D:174:THR:O	1:D:175:THR:C	2.58	0.42
1:H:84:TRP:CZ2	1:H:126:SER:HB3	2.54	0.42
1:I:197:GLN:HG2	1:I:216:VAL:HG13	2.01	0.42
1:A:31:GLN:HB3	1:H:31:GLN:HB3	2.02	0.41
1:A:52:LEU:HG	1:A:216:VAL:HG21	2.02	0.41
1:B:194:ASP:O	1:B:219:ASN:HB3	2.20	0.41
1:C:116:VAL:CG1	5:C:313:HOH:O	2.66	0.41
1:D:33:SER:C	1:D:35:PRO:HD3	2.40	0.41
1:A:32:THR:O	1:A:33:SER:C	2.59	0.41
1:A:69:VAL:O	1:A:137:ARG:HA	2.20	0.41
1:B:127:ASP:OD1	1:B:129:GLU:N	2.49	0.41
1:E:27:TYR:O	1:E:28:ASN:C	2.58	0.41
1:G:154:THR:HA	1:G:218:LEU:O	2.21	0.41
1:A:140:PHE:CE2	1:A:157:ILE:HG23	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:194:ASP:H	1:C:219:ASN:HB3	1.85	0.41
1:E:57:ILE:HD11	1:E:218:LEU:HD21	2.01	0.41
1:E:156:ARG:HH11	1:E:156:ARG:HG3	1.85	0.41
1:F:53:LYS:HB3	1:F:183:TYR:HD2	1.85	0.41
1:F:195:VAL:HA	1:F:217:SER:O	2.20	0.41
1:G:83:ALA:HA	1:G:126:SER:O	2.21	0.41
1:I:69:VAL:O	1:I:137:ARG:HA	2.20	0.41
1:F:107:ALA:HA	1:F:159:ILE:HD13	2.01	0.41
1:I:34:ARG:HB3	5:I:312:HOH:O	2.19	0.41
1:J:80:ARG:O	1:J:82:LEU:N	2.53	0.41
1:D:49:SER:CB	1:D:174:THR:HG22	2.50	0.41
1:G:71:PHE:N	5:G:404:HOH:O	2.49	0.41
1:D:171:VAL:HG23	1:D:171:VAL:O	2.20	0.41
1:F:164:HIS:HB2	1:F:169:ILE:HD12	2.02	0.41
1:B:34:ARG:HB3	1:B:37:VAL:CG2	2.50	0.41
1:C:84:TRP:CZ3	1:C:126:SER:HA	2.56	0.41
1:H:95:VAL:CG2	1:H:124:VAL:HG21	2.51	0.41
1:C:60:VAL:HG12	1:C:61:ASN:N	2.35	0.41
1:C:192:ILE:HG22	1:C:193:LEU:N	2.35	0.41
1:F:38:ILE:HG12	1:F:40:THR:HG23	2.03	0.41
1:J:65:ASN:HB3	1:J:142:CYS:O	2.21	0.41
1:A:118:THR:HG21	1:E:162:TRP:CZ3	2.55	0.41
1:B:68:ASP:OD2	1:B:137:ARG:NE	2.53	0.41
1:B:104:ASP:OD2	1:B:163:THR:OG1	2.27	0.41
1:C:73:GLN:O	1:C:133:MET:HA	2.21	0.41
1:E:75:THR:N	1:E:132:TYR:O	2.53	0.41
1:H:34:ARG:CD	5:H:304:HOH:O	2.69	0.41
1:I:97:ILE:HG12	1:I:120:GLN:HB3	2.03	0.41
1:B:148:ASP:HA	1:B:222:LYS:HE3	2.02	0.41
1:D:171:VAL:O	1:D:199:LYS:HD2	2.21	0.41
1:D:202:VAL:CG1	1:D:203:THR:N	2.68	0.41
1:D:223:LYS:NZ	5:D:306:HOH:O	2.53	0.41
1:H:195:VAL:HG22	1:H:218:LEU:HA	2.03	0.41
1:B:32:THR:CG2	1:G:32:THR:HG23	2.51	0.40
1:D:20:LEU:N	1:D:89:SER:OG	2.55	0.40
1:E:41:GLN:O	1:E:44:ARG:N	2.51	0.40
1:H:75:THR:OG1	1:H:132:TYR:O	2.29	0.40
1:H:143:ASP:HB2	1:I:187:TYR:CE1	2.57	0.40
1:A:101:TRP:HZ2	1:A:169:ILE:HD11	1.87	0.40
1:C:106:ALA:N	5:C:303:HOH:O	2.39	0.40
1:E:118:THR:HG23	1:E:135:SER:CB	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:38:ILE:HG13	1:H:39:PRO:HD2	2.03	0.40
1:J:222:LYS:HE3	1:J:222:LYS:HB2	1.87	0.40
1:B:70:VAL:HG22	1:B:137:ARG:HB2	2.03	0.40
1:F:139:ARG:HG2	1:F:139:ARG:HH11	1.87	0.40
1:H:163:THR:HG21	1:I:121:LEU:CB	2.52	0.40
1:C:73:GLN:HB3	1:C:134:PRO:HD2	2.04	0.40
1:I:197:GLN:CG	1:I:216:VAL:HG13	2.51	0.40
1:J:110:ALA:HB1	1:J:138:GLN:NE2	2.36	0.40
1:F:132:TYR:CD1	1:F:134:PRO:HD3	2.56	0.40
1:G:55:ILE:HG13	1:G:72:TRP:CD1	2.57	0.40
1:H:164:HIS:HB3	1:H:168:GLU:HB2	2.04	0.40
1:I:80:ARG:O	1:I:83:ALA:N	2.49	0.40
1:I:141:SER:OG	1:J:56:ASN:ND2	2.51	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	198/206 (96%)	166 (84%)	25 (13%)	7 (4%)	3	20
1	B	196/206 (95%)	169 (86%)	23 (12%)	4 (2%)	7	34
1	C	197/206 (96%)	172 (87%)	24 (12%)	1 (0%)	29	68
1	D	201/206 (98%)	177 (88%)	22 (11%)	2 (1%)	15	53
1	E	199/206 (97%)	174 (87%)	22 (11%)	3 (2%)	10	42
1	F	198/206 (96%)	183 (92%)	13 (7%)	2 (1%)	15	53
1	G	196/206 (95%)	181 (92%)	13 (7%)	2 (1%)	15	53
1	H	198/206 (96%)	175 (88%)	22 (11%)	1 (0%)	29	68
1	I	196/206 (95%)	168 (86%)	25 (13%)	3 (2%)	10	42
1	J	195/206 (95%)	166 (85%)	20 (10%)	9 (5%)	2	14

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	1974/2060 (96%)	1731 (88%)	209 (11%)	34 (2%)	9	39

All (34) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	87	SER
1	F	43	ASP
1	I	110	ALA
1	J	87	SER
1	J	181	SER
1	J	204	TYR
1	A	43	ASP
1	A	86	SER
1	A	87	SER
1	A	175	THR
1	B	173	PRO
1	D	207	CYS
1	G	87	SER
1	B	74	GLN
1	D	202	VAL
1	I	187	TYR
1	J	205	SER
1	F	175	THR
1	H	43	ASP
1	I	81	THR
1	J	81	THR
1	J	206	CYS
1	A	59	GLU
1	A	74	GLN
1	E	165	HIS
1	G	35	PRO
1	J	32	THR
1	J	65	ASN
1	J	94	SER
1	A	181	SER
1	B	34	ARG
1	B	97	ILE
1	C	202	VAL
1	E	208	PRO

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	189/192 (98%)	185 (98%)	4 (2%)	53 82
1	B	187/192 (97%)	182 (97%)	5 (3%)	44 77
1	C	187/192 (97%)	181 (97%)	6 (3%)	39 74
1	D	191/192 (100%)	182 (95%)	9 (5%)	26 63
1	E	190/192 (99%)	180 (95%)	10 (5%)	22 58
1	F	188/192 (98%)	175 (93%)	13 (7%)	15 48
1	G	187/192 (97%)	180 (96%)	7 (4%)	34 70
1	H	188/192 (98%)	178 (95%)	10 (5%)	22 58
1	I	186/192 (97%)	177 (95%)	9 (5%)	25 62
1	J	186/192 (97%)	175 (94%)	11 (6%)	19 54
All	All	1879/1920 (98%)	1795 (96%)	84 (4%)	27 64

All (84) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	GLU
1	A	76	THR
1	A	154	THR
1	A	155	CYS
1	B	34	ARG
1	B	165	HIS
1	B	179	ASP
1	B	186	GLN
1	B	217	SER
1	C	86	SER
1	C	91	ASP
1	C	116	VAL
1	C	139	ARG
1	C	171	VAL
1	C	219	ASN
1	D	33	SER

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Mol	Chain	Res	Type
1	D	43	ASP
1	D	89	SER
1	D	113	LYS
1	D	125	VAL
1	D	143	ASP
1	D	206	CYS
1	D	207	CYS
1	D	209	GLU
1	E	38	ILE
1	E	40	THR
1	E	86	SER
1	E	93	VAL
1	E	126	SER
1	E	127	ASP
1	E	178	SER
1	E	180	ASP
1	E	194	ASP
1	E	211	TYR
1	F	33	SER
1	F	36	ASP
1	F	56	ASN
1	F	59	GLU
1	F	76	THR
1	F	91	ASP
1	F	121	LEU
1	F	151	SER
1	F	172	ASP
1	F	175	THR
1	F	182	GLU
1	F	196	THR
1	F	219	ASN
1	G	49	SER
1	G	61	ASN
1	G	63	ILE
1	G	69	VAL
1	G	76	THR
1	G	112	SER
1	G	189	ARG
1	H	42	ARG
1	H	43	ASP
1	H	92	GLN
1	H	109	ASN

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Mol	Chain	Res	Type
1	H	155	CYS
1	H	167	ARG
1	H	172	ASP
1	H	206	CYS
1	H	207	CYS
1	H	214	VAL
1	I	21	ASP
1	I	42	ARG
1	I	58	LEU
1	I	78	SER
1	I	91	ASP
1	I	94	SER
1	I	126	SER
1	I	172	ASP
1	I	206	CYS
1	J	21	ASP
1	J	34	ARG
1	J	44	ARG
1	J	81	THR
1	J	93	VAL
1	J	141	SER
1	J	155	CYS
1	J	182	GLU
1	J	206	CYS
1	J	207	CYS
1	J	217	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	138	GLN
1	A	219	ASN
1	B	28	ASN
1	D	88	HIS
1	E	120	GLN
1	E	177	ASN
1	G	200	ASN
1	H	120	GLN
1	H	219	ASN
1	I	61	ASN
1	I	120	GLN
1	I	138	GLN

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Mol	Chain	Res	Type
1	I	164	HIS
1	I	219	ASN
1	J	41	GLN
1	J	138	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](#)

9 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	PHN	G	301	-	16,16,16	1.41	4 (25%)	22,22,22	1.70	8 (36%)
4	SO4	F	302	-	4,4,4	0.38	0	6,6,6	0.19	0
3	PHN	B	302	-	16,16,16	1.17	0	22,22,22	1.16	2 (9%)
3	PHN	F	301	-	16,16,16	1.25	0	22,22,22	1.36	3 (13%)
2	NAG	E	301	1	14,14,15	0.43	0	17,19,21	1.21	2 (11%)
3	PHN	A	302	-	16,16,16	1.40	3 (18%)	22,22,22	1.59	7 (31%)
4	SO4	J	301	-	4,4,4	0.43	0	6,6,6	0.11	0
2	NAG	A	301	1	14,14,15	0.54	0	17,19,21	1.68	2 (11%)
2	NAG	B	301	1	14,14,15	0.53	0	17,19,21	1.58	3 (17%)

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	PHN	G	301	-	-	-	0/3/3/3
3	PHN	B	302	-	-	-	0/3/3/3
3	PHN	F	301	-	-	-	0/3/3/3
2	NAG	E	301	1	-	2/6/23/26	0/1/1/1
3	PHN	A	302	-	-	-	0/3/3/3
2	NAG	A	301	1	-	0/6/23/26	0/1/1/1
2	NAG	B	301	1	-	2/6/23/26	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	301	PHN	C2-N1	2.73	1.38	1.32
3	A	302	PHN	C6A-C10	-2.44	1.36	1.41
3	G	301	PHN	C10-N10	2.35	1.39	1.36
3	A	302	PHN	C1A-N1	2.26	1.39	1.36
3	A	302	PHN	C7-C6A	-2.14	1.36	1.41
3	G	301	PHN	C9-N10	2.11	1.36	1.32
3	G	301	PHN	C1A-N1	2.06	1.39	1.36

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	301	NAG	O5-C1-C2	4.82	118.89	111.29
2	B	301	NAG	O5-C1-C2	4.36	118.17	111.29
2	A	301	NAG	C1-O5-C5	3.58	117.05	112.19
2	E	301	NAG	C1-C2-N2	3.58	116.60	110.49
3	A	302	PHN	C8-C9-N10	-3.32	118.86	123.94
3	G	301	PHN	C10-C1A-N1	3.19	122.14	118.23
3	G	301	PHN	C8-C9-N10	-3.16	119.09	123.94
2	B	301	NAG	C2-N2-C7	2.99	127.16	122.90
3	A	302	PHN	C10-C1A-N1	2.92	121.80	118.23
3	F	301	PHN	C8-C9-N10	-2.72	119.77	123.94
3	F	301	PHN	C3-C2-N1	-2.68	119.84	123.94
3	G	301	PHN	C4A-C1A-N1	-2.64	117.84	122.51
3	G	301	PHN	C2-N1-C1A	2.59	121.75	117.12
3	G	301	PHN	C1A-C10-N10	2.50	121.29	118.23
3	F	301	PHN	C5-C6-C6A	-2.47	117.54	121.36
3	A	302	PHN	C9-N10-C10	2.44	121.49	117.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	302	PHN	C3-C2-N1	-2.42	120.23	123.94
3	G	301	PHN	C9-N10-C10	2.39	121.38	117.12
2	E	301	NAG	O5-C1-C2	2.36	115.02	111.29
2	B	301	NAG	C1-O5-C5	2.29	115.30	112.19
3	B	302	PHN	C8-C9-N10	-2.29	120.44	123.94
3	A	302	PHN	C4A-C1A-N1	-2.26	118.52	122.51
3	A	302	PHN	C1A-C10-N10	2.17	120.89	118.23
3	A	302	PHN	C6A-C10-N10	-2.14	118.72	122.51
3	A	302	PHN	C3-C2-N1	-2.09	120.73	123.94
3	G	301	PHN	C6A-C10-N10	-2.02	118.93	122.51
3	G	301	PHN	C3-C2-N1	-2.01	120.87	123.94

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	301	NAG	C8-C7-N2-C2
2	B	301	NAG	O7-C7-N2-C2
2	E	301	NAG	O7-C7-N2-C2
2	E	301	NAG	C8-C7-N2-C2

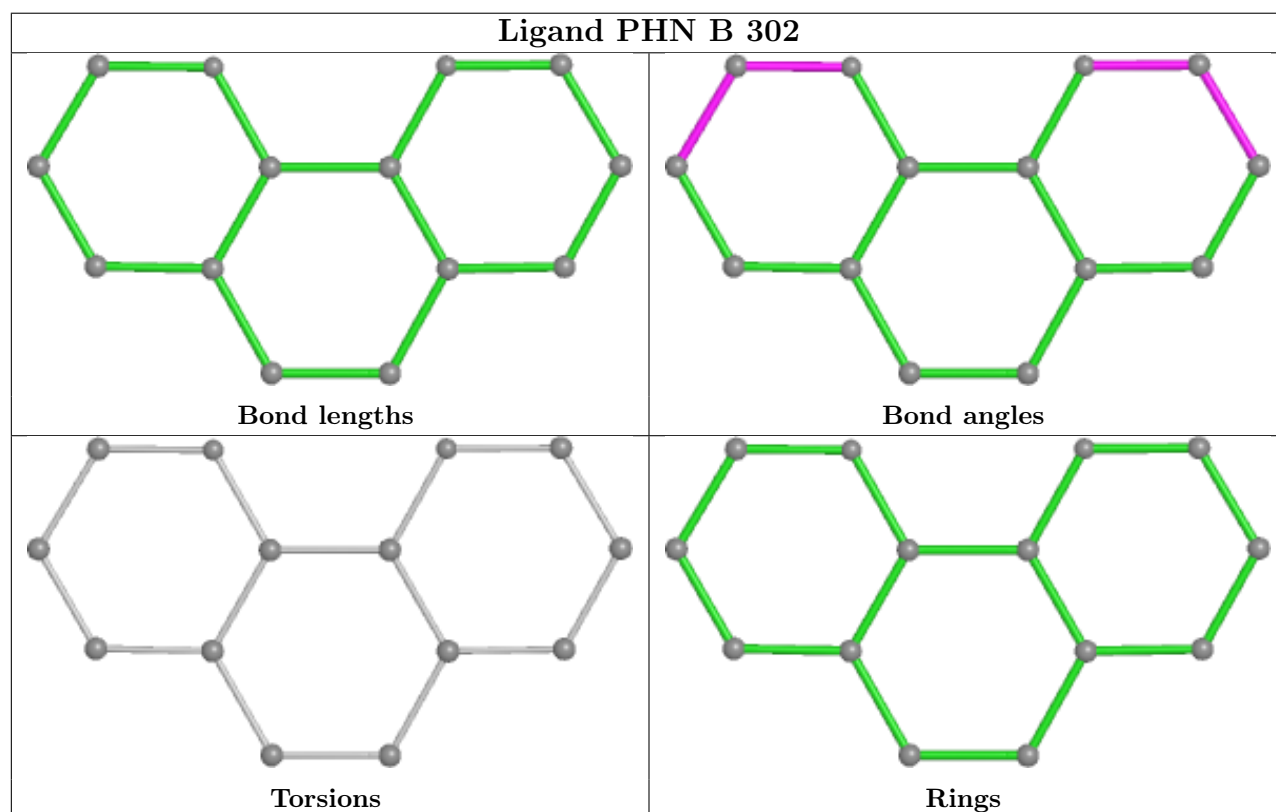
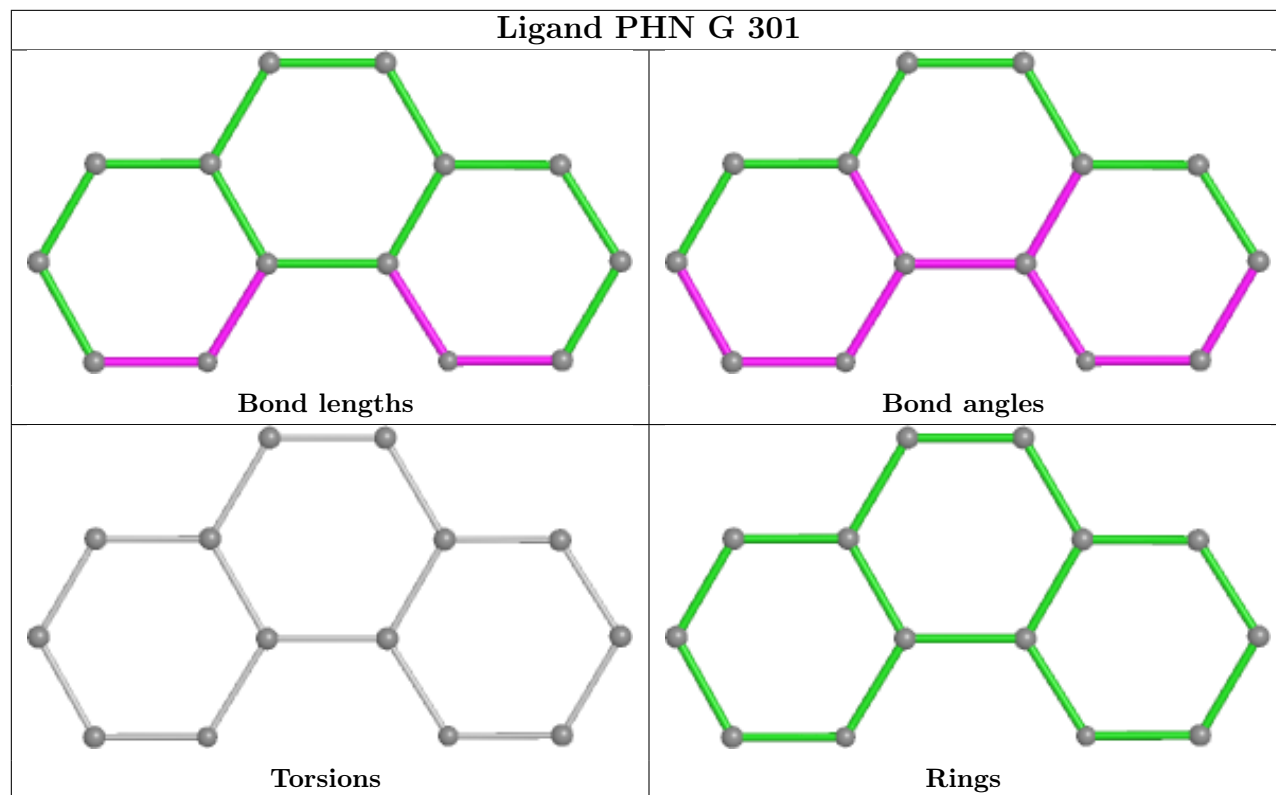
There are no ring outliers.

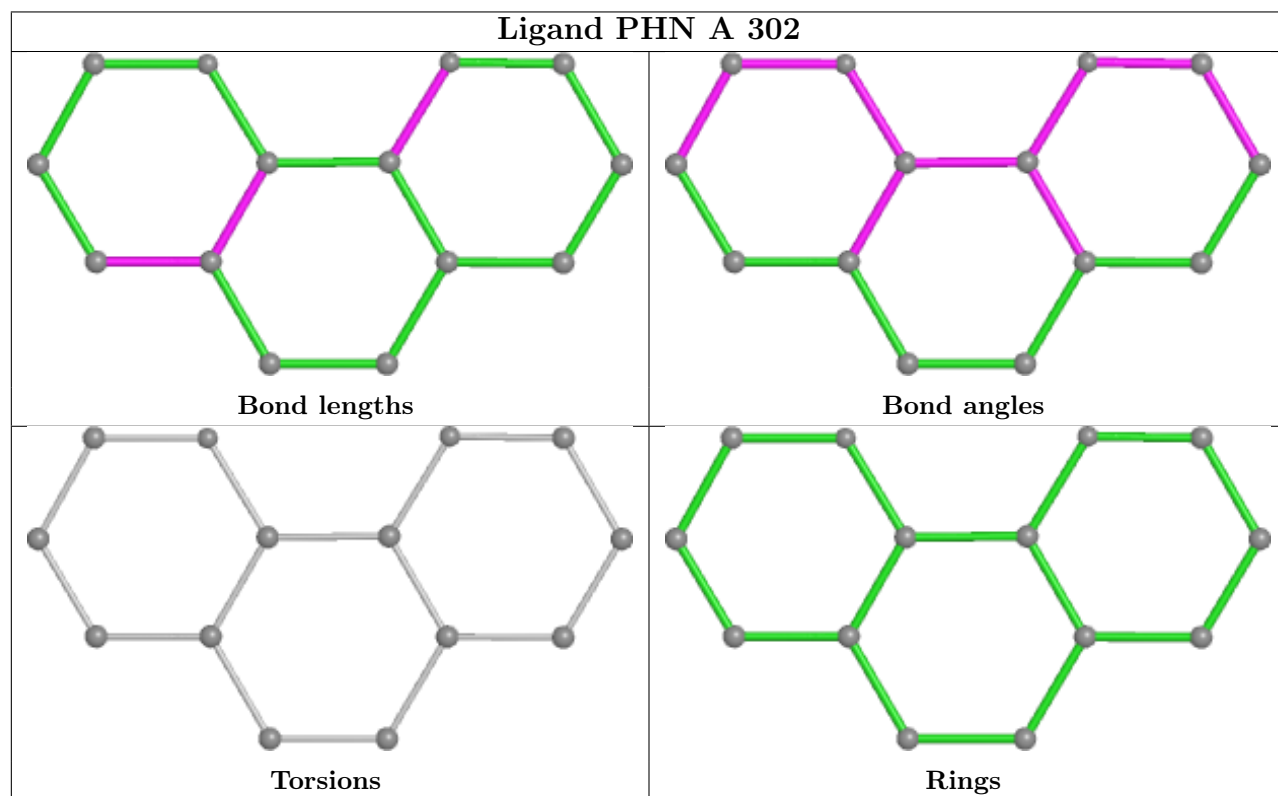
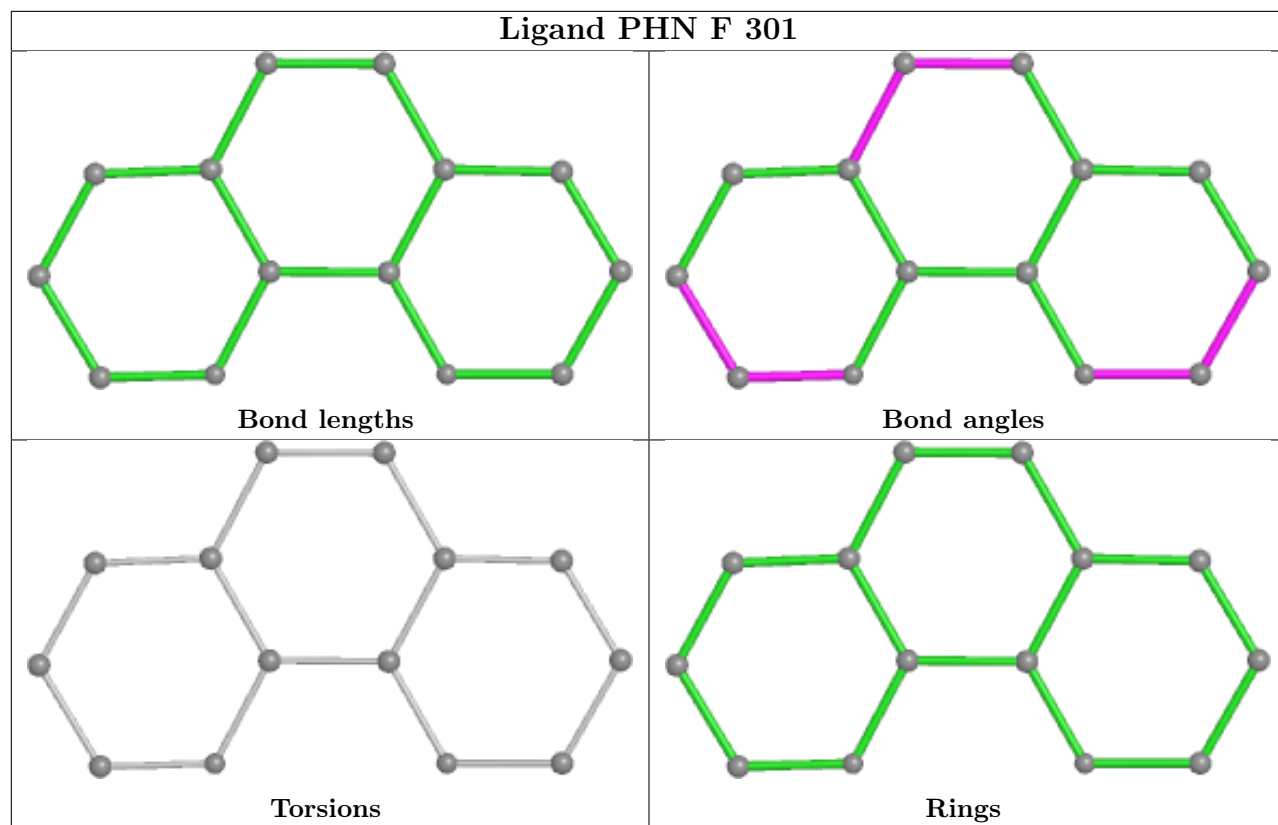
5 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	302	SO4	1	0
3	F	301	PHN	4	0
3	A	302	PHN	2	0
4	J	301	SO4	3	0
2	B	301	NAG	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	202/206 (98%)	-0.31	1 (0%) 91 75	47, 82, 120, 167	0
1	B	200/206 (97%)	-0.23	1 (0%) 91 75	52, 85, 120, 164	0
1	C	201/206 (97%)	-0.31	1 (0%) 91 75	58, 86, 128, 178	0
1	D	205/206 (99%)	-0.20	3 (1%) 73 46	55, 85, 125, 206	0
1	E	203/206 (98%)	-0.28	3 (1%) 73 46	57, 80, 124, 146	0
1	F	202/206 (98%)	-0.18	4 (1%) 65 36	53, 89, 129, 204	0
1	G	200/206 (97%)	-0.24	1 (0%) 91 75	55, 85, 127, 150	0
1	H	202/206 (98%)	-0.02	8 (3%) 38 15	60, 88, 142, 215	0
1	I	200/206 (97%)	-0.15	4 (2%) 65 36	59, 94, 148, 197	0
1	J	199/206 (96%)	-0.02	8 (4%) 38 15	59, 96, 141, 253	0
All	All	2014/2060 (97%)	-0.19	34 (1%) 70 41	47, 87, 133, 253	0

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	205	SER	5.4
1	D	204	TYR	4.9
1	J	209	GLU	4.9
1	F	87	SER	4.4
1	J	202	VAL	3.6
1	H	147	VAL	3.5
1	H	205	SER	3.4
1	H	63	ILE	3.3
1	D	207	CYS	3.2
1	J	204	TYR	3.2
1	C	220	PHE	3.0
1	H	224	GLY	2.8
1	J	208	PRO	2.8

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Mol	Chain	Res	Type	RSRZ
1	J	63	ILE	2.8
1	E	176	GLU	2.6
1	H	153	ALA	2.6
1	F	43	ASP	2.5
1	H	67	VAL	2.5
1	I	144	VAL	2.4
1	D	206	CYS	2.4
1	H	208	PRO	2.3
1	I	204	TYR	2.3
1	J	128	GLY	2.3
1	J	147	VAL	2.2
1	G	88	HIS	2.2
1	E	208	PRO	2.2
1	B	144	VAL	2.2
1	I	203	THR	2.2
1	H	218	LEU	2.1
1	F	90	PRO	2.1
1	E	209	GLU	2.1
1	J	89	SER	2.1
1	A	86	SER	2.0
1	F	86	SER	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

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

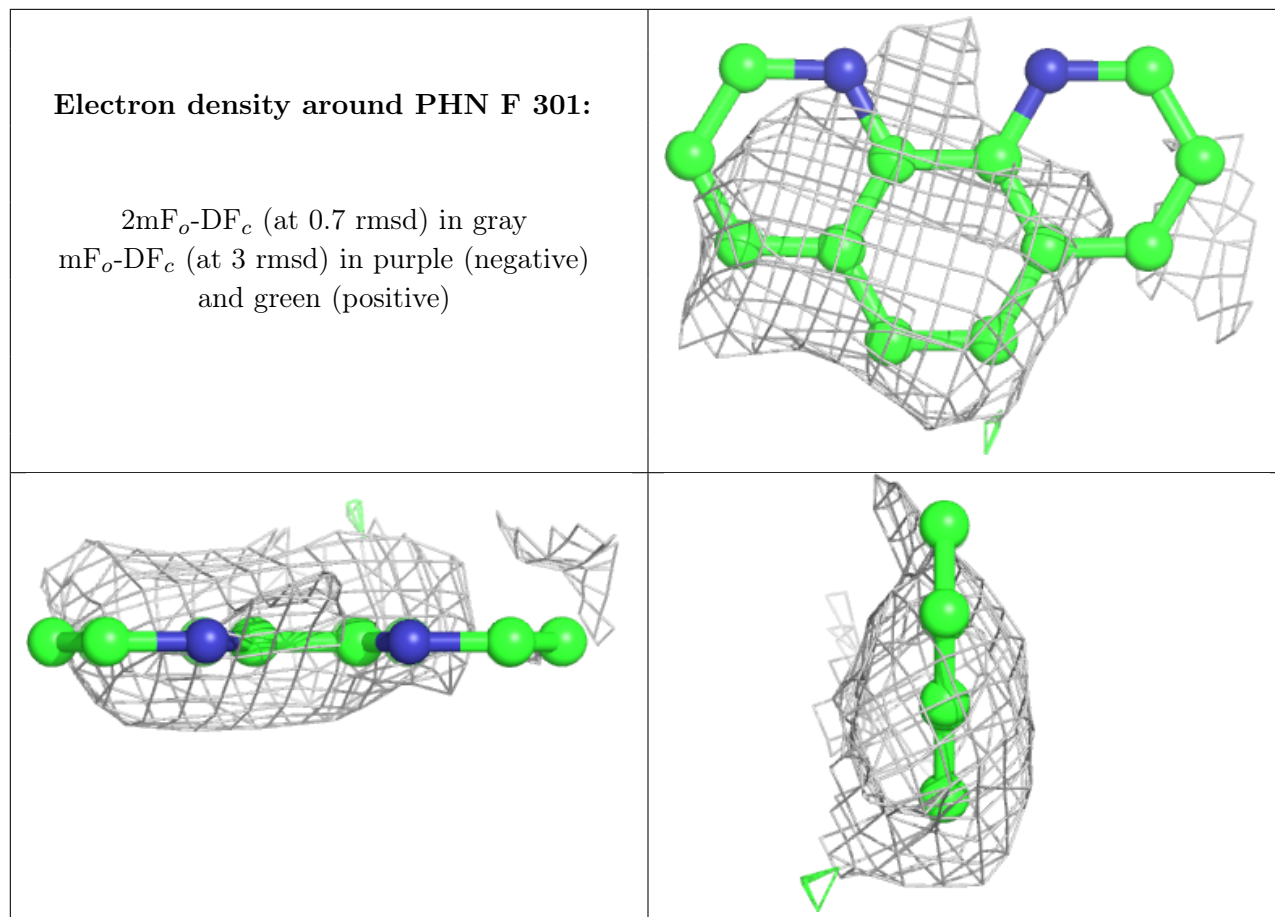
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	NAG	E	301	14/15	0.68	0.34	98,151,169,171	0
4	SO4	J	301	5/5	0.71	1.81	269,295,301,327	0

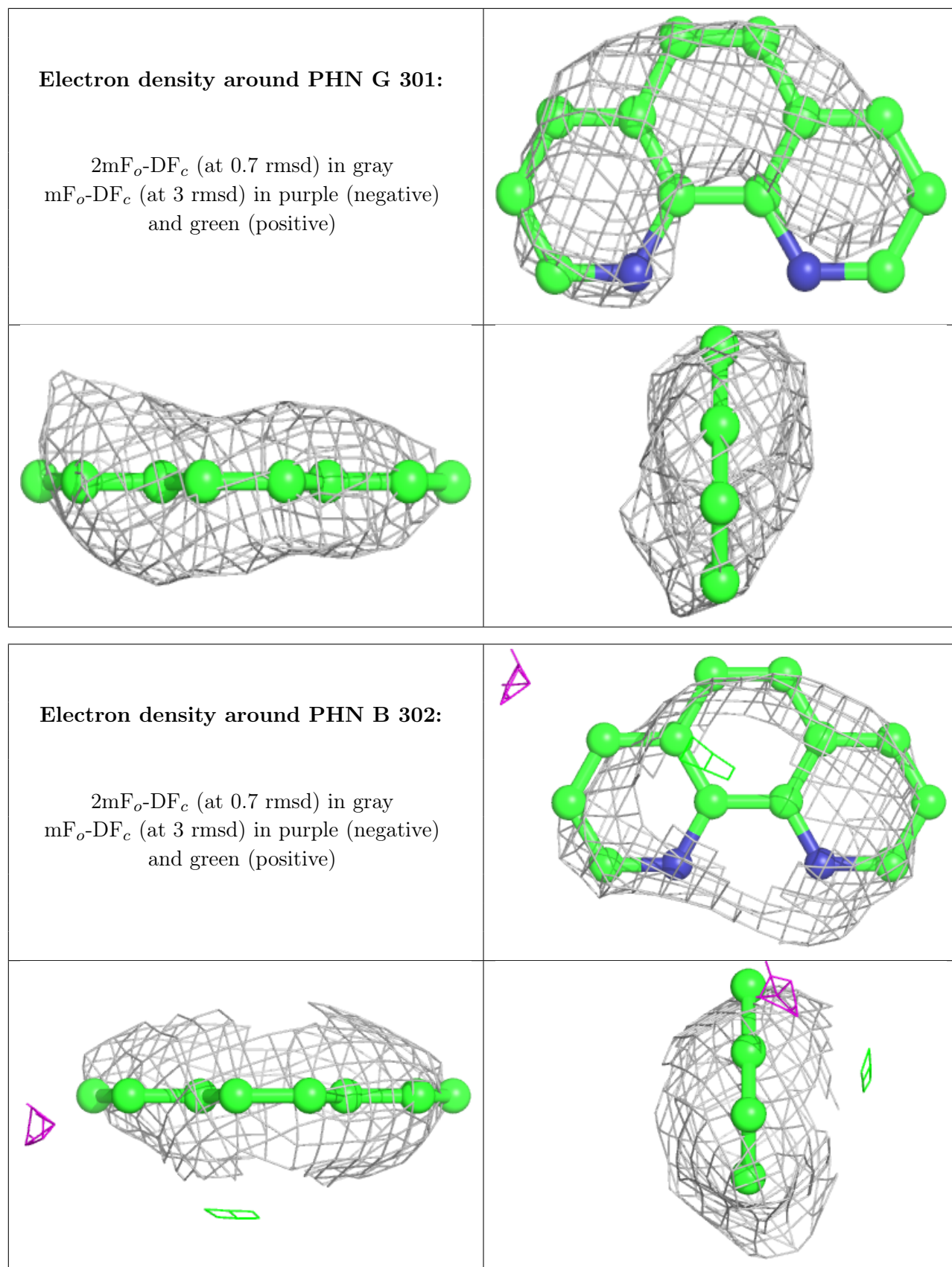
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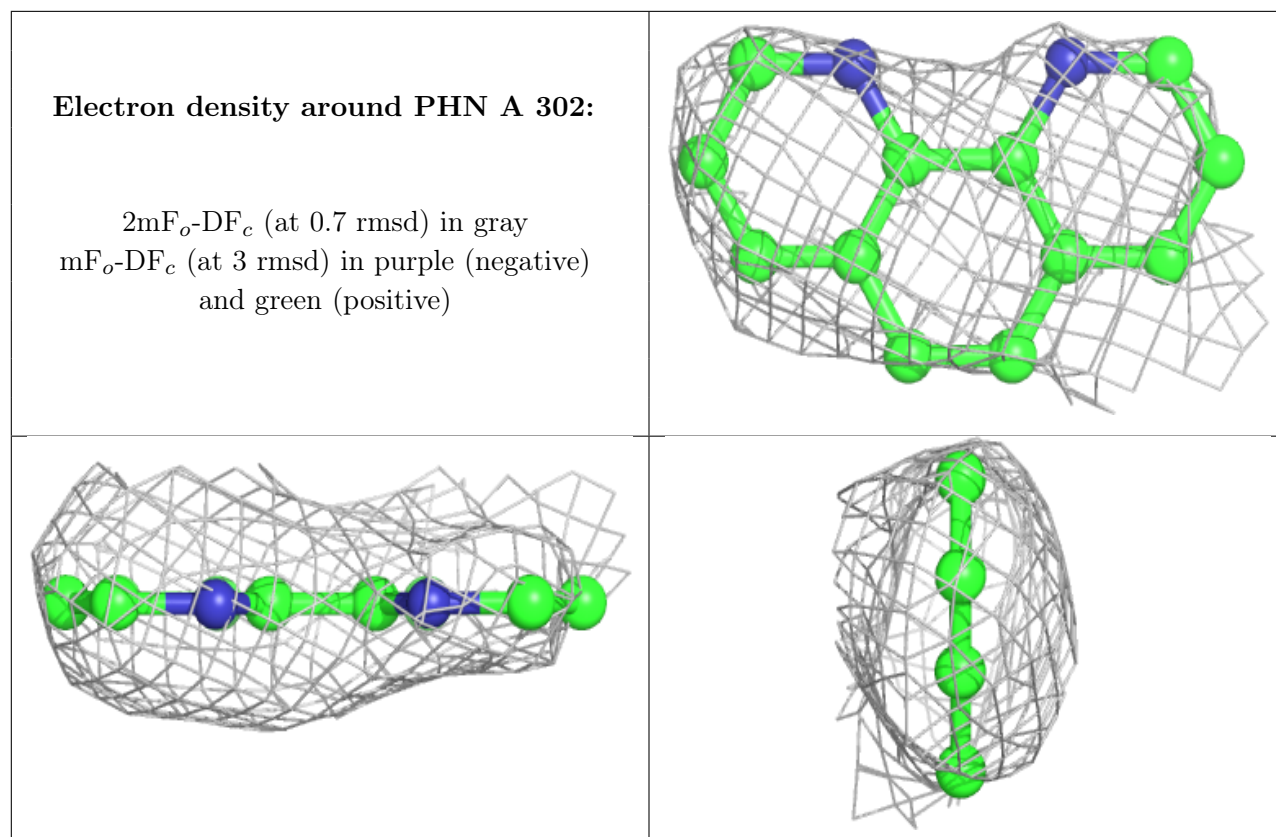
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	PHN	F	301	14/14	0.74	0.40	112,140,168,180	0
2	NAG	A	301	14/15	0.74	0.74	116,148,173,182	0
4	SO4	F	302	5/5	0.77	0.92	136,176,189,207	0
2	NAG	B	301	14/15	0.77	0.21	105,143,186,191	0
3	PHN	G	301	14/14	0.87	0.23	118,132,174,178	0
3	PHN	B	302	14/14	0.89	0.21	110,139,163,166	0
3	PHN	A	302	14/14	0.95	0.22	84,109,125,136	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.







6.5 Other polymers [i](#)

There are no such residues in this entry.