Full wwPDB X-ray Structure Validation Report (i)

Nov 10, 2026 – 12:28 PM EST

PDB ID	:	9YVU / pdb_00009yvu
Title	:	human Siderocalin bound to 343HOPO-Tb
Authors	:	Rupert, P.B.; Strong, R.K.
Deposited on	:	2025-10-23
Resolution	:	2.30 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 (i) 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 (i)) were used in the production of this report:

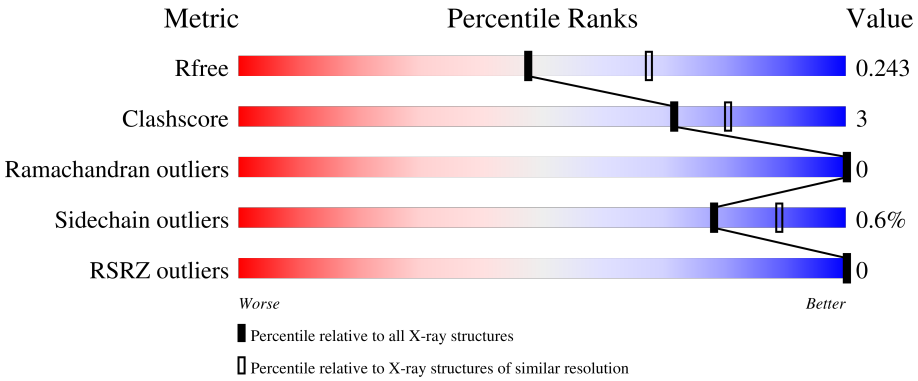
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 2.30 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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 <=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	178	92% 7%
1	B	178	92% 7%
1	C	178	92% 7%
1	D	178	93% 7%
1	E	178	93%

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Mol	Chain	Length	Quality of chain
1	F	178	90% 8%

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	A1DTB	A	301	X	-	-	-
2	A1DTB	B	202	X	-	-	-
2	A1DTB	C	301	X	-	-	-
2	A1DTB	D	301	X	-	-	-
2	A1DTB	E	202	X	-	-	-
2	A1DTB	F	301	X	-	-	-

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8832 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.

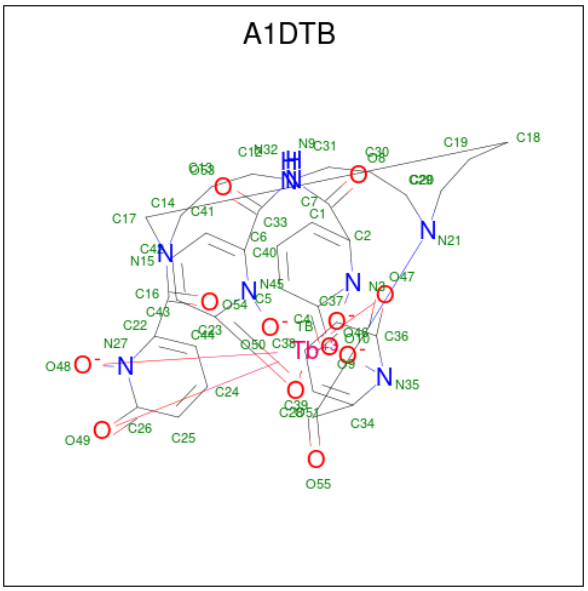
- Molecule 1 is a protein called Neutrophil gelatinase-associated lipocalin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	175	Total	C	N	O	S	0	2	0
			1400	908	232	256	4			
1	B	176	Total	C	N	O	S	0	2	0
			1396	906	228	258	4			
1	C	177	Total	C	N	O	S	0	2	0
			1420	918	237	261	4			
1	D	177	Total	C	N	O	S	0	2	0
			1413	914	234	261	4			
1	E	174	Total	C	N	O	S	0	1	0
			1381	895	229	253	4			
1	F	175	Total	C	N	O	S	0	1	0
			1375	891	229	251	4			

There are 6 discrepancies between the modelled and reference sequences:

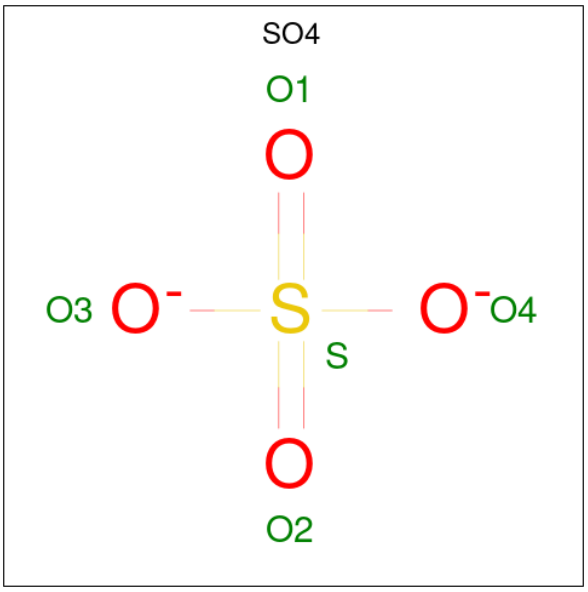
Chain	Residue	Modelled	Actual	Comment	Reference
A	87	SER	CYS	engineered mutation	UNP P80188
B	87	SER	CYS	engineered mutation	UNP P80188
C	87	SER	CYS	engineered mutation	UNP P80188
D	87	SER	CYS	engineered mutation	UNP P80188
E	87	SER	CYS	engineered mutation	UNP P80188
F	87	SER	CYS	engineered mutation	UNP P80188

- Molecule 2 is [(1R)-6-[(R)-(3-{[(1R)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,6-dihydropyridine-2-carbonyl]amino}propyl){4-[(S)-[(1S)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,6-dihydropyridine-2-carbonyl](3-{[(1R)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,6-dihydropyridine-2-carbonyl]amino}propyl)amino]butyl}carbamoyl]-2-(oxo-kappaO)pyridin-1(2H)-olato-kappaO]terbate(1-) (CCD ID: A1DTB) (formula: $C_{34}H_{34}N_8O_{12}Tb$) (labeled as "Ligand of Interest" by depositor).



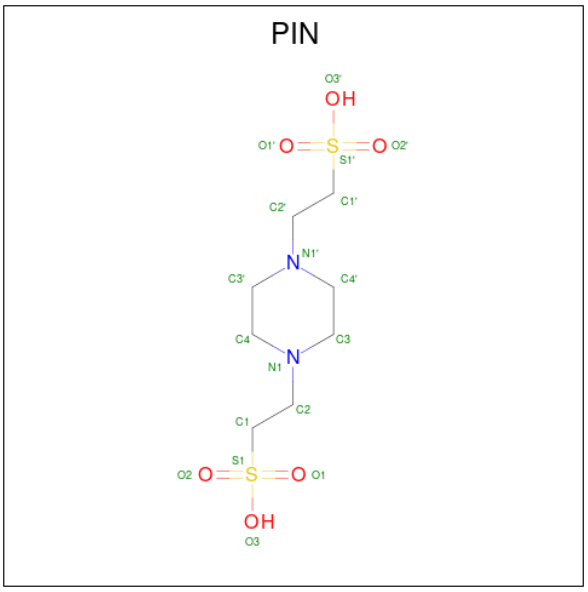
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	Tb	0	0
			55	34	8	12	1		
2	B	1	Total	C	N	O	Tb	0	0
			55	34	8	12	1		
2	C	1	Total	C	N	O	Tb	0	0
			16	9	3	3	1		
2	D	1	Total	C	N	O	Tb	0	0
			14	8	2	3	1		
2	E	1	Total	C	N	O	Tb	0	0
			55	34	8	12	1		
2	F	1	Total	C	N	O	Tb	0	0
			55	34	8	12	1		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0

- Molecule 4 is PIPERAZINE-N,N'-BIS(2-ETHANESULFONIC ACID) (CCD ID: PIN) (formula: $C_8H_{18}N_2O_6S_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	N	O	S	0	0
			18	8	2	6	2		
4	E	1	Total	C	N	O	S	0	0
			18	8	2	6	2		

- Molecule 5 is water.

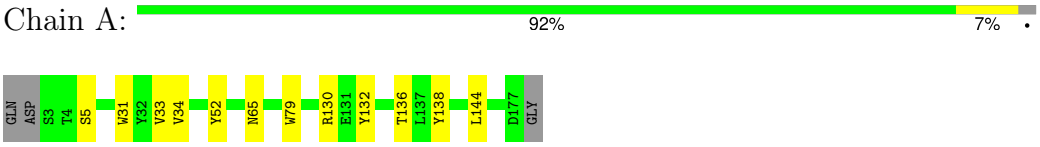
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	43	Total	O	0	0
			43	43		
5	B	46	Total	O	0	0
			46	46		
5	C	17	Total	O	0	0
			17	17		
5	D	16	Total	O	0	0
			16	16		
5	E	12	Total	O	0	0
			12	12		
5	F	7	Total	O	0	0
			7	7		

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.

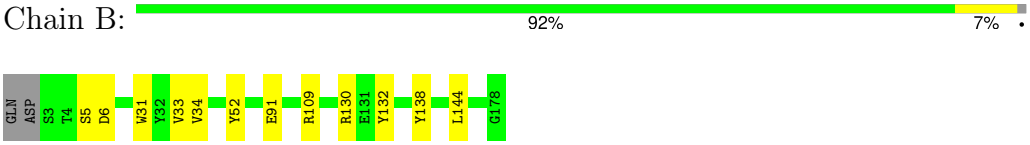
• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain A:



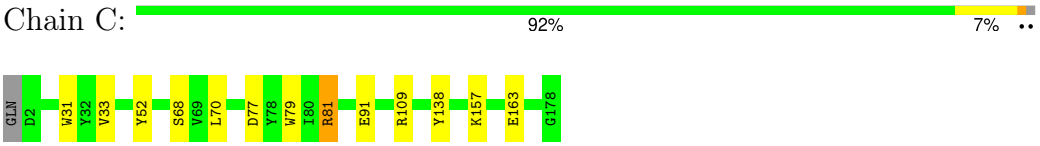
• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain B:



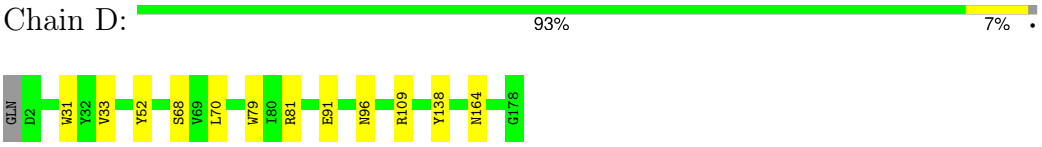
• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain C:



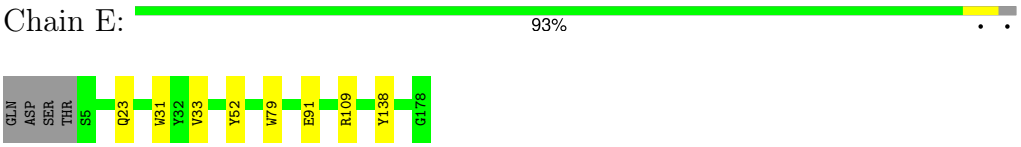
• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain D:



• Molecule 1: Neutrophil gelatinase-associated lipocalin

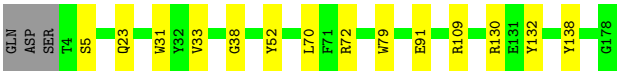
Chain E:



• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain F:




GLN
ASP
SER
T4
S5
Q23
W31
Y32
V33
G38
Y52
L70
F71
R72
W79
E91
R109
R130
E131
Y132
Y138
G178

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	116.08Å 115.99Å 118.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.47 – 2.30 41.47 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.0 (41.47-2.30) 99.6 (41.47-2.30)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.29 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.216 , 0.242 0.221 , 0.243	Depositor DCC
R_{free} test set	3652 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	40.7	Xtriage
Anisotropy	0.141	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 18.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.44$, $< L^2 > = 0.26$	Xtriage
Estimated twinning fraction	0.039 for l,-k,h 0.038 for -h,-l,-k 0.307 for k,h,-l 0.037 for l,h,k 0.037 for k,l,h	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	8832	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.80% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: SO4, A1DTB, PIN

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	0.48	0/1440	0.81	0/1958
1	B	0.48	0/1439	0.80	0/1957
1	C	0.49	0/1460	0.80	0/1983
1	D	0.48	0/1453	0.81	0/1975
1	E	0.47	0/1418	0.80	0/1928
1	F	0.47	0/1412	0.80	0/1921
All	All	0.48	0/8622	0.80	0/11722

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

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	1400	0	1359	8	0
1	B	1396	0	1353	9	0
1	C	1420	0	1382	11	0
1	D	1413	0	1369	11	0
1	E	1381	0	1329	4	0
1	F	1375	0	1312	7	0
2	A	55	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	55	0	0	1	0
2	C	16	0	0	0	0
2	D	14	0	0	0	0
2	E	55	0	0	2	0
2	F	55	0	0	2	0
3	A	10	0	0	0	0
3	B	5	0	0	0	0
3	D	5	0	0	1	0
4	B	18	0	18	1	0
4	E	18	0	18	1	0
5	A	43	0	0	1	0
5	B	46	0	0	2	0
5	C	17	0	0	0	0
5	D	16	0	0	0	0
5	E	12	0	0	0	0
5	F	7	0	0	1	0
All	All	8832	0	8140	56	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 3.

All (56) 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:70:LEU:HD23	1:C:79:TRP:CH2	2.20	0.77
1:D:70:LEU:HD23	1:D:79:TRP:CH2	2.21	0.76
1:E:23:GLN:NE2	4:E:201:PIN:O3'	2.16	0.74
1:A:5:SER:O	1:A:130:ARG:NH1	2.21	0.73
1:B:5:SER:O	1:B:130:ARG:NH2	2.22	0.73
1:F:5:SER:O	1:F:130:ARG:NH2	2.24	0.70
1:A:34:VAL:HG11	1:A:144:LEU:HB2	1.73	0.70
1:B:34:VAL:HG11	1:B:144:LEU:HB2	1.77	0.65
1:B:130:ARG:NH1	1:B:132:TYR:OH	2.29	0.65
1:A:130:ARG:NH2	1:A:132:TYR:OH	2.33	0.61
1:F:130:ARG:NH1	1:F:132:TYR:OH	2.34	0.61
2:B:202:A1DTB:N9	2:B:202:A1DTB:O10	2.36	0.58
2:A:301:A1DTB:N9	2:A:301:A1DTB:O10	2.37	0.58
1:A:34:VAL:CG1	1:A:144:LEU:HB2	2.34	0.57
1:C:68:SER:HB2	1:C:79:TRP:CE2	2.41	0.56
1:D:68:SER:HB2	1:D:79:TRP:CE2	2.41	0.56
1:B:34:VAL:CG1	1:B:144:LEU:HB2	2.37	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:136:THR:HG21	5:A:422:HOH:O	2.06	0.55
1:D:70:LEU:HD23	1:D:79:TRP:CZ3	2.42	0.54
2:E:202:A1DTB:O50	2:E:202:A1DTB:N32	2.40	0.54
1:C:70:LEU:HD23	1:C:79:TRP:CZ3	2.43	0.53
2:E:202:A1DTB:O10	2:E:202:A1DTB:N9	2.43	0.51
4:B:201:PIN:H41	5:B:327:HOH:O	2.10	0.51
2:F:301:A1DTB:C30	2:F:301:A1DTB:C34	2.89	0.50
1:F:70:LEU:CD1	1:F:72:ARG:HB2	2.42	0.49
1:F:38:GLY:HA3	5:F:401:HOH:O	2.12	0.49
1:C:70:LEU:HG	1:C:79:TRP:HZ3	1.78	0.49
1:C:81:ARG:HH11	1:C:81:ARG:HG2	1.78	0.48
1:B:144:LEU:HA	5:B:335:HOH:O	2.14	0.47
1:C:91:GLU:OE2	1:C:109:ARG:NH1	2.47	0.47
1:C:33:VAL:HG21	1:C:52:TYR:CE2	2.51	0.46
1:D:70:LEU:HG	1:D:79:TRP:HZ3	1.80	0.46
2:F:301:A1DTB:O50	2:F:301:A1DTB:N32	2.48	0.46
1:B:33:VAL:HG21	1:B:52:TYR:CE2	2.51	0.45
1:F:33:VAL:HG21	1:F:52:TYR:CE2	2.51	0.45
1:C:31:TRP:CE3	1:C:138:TYR:HB3	2.52	0.45
1:E:33:VAL:HG21	1:E:52:TYR:CE2	2.51	0.45
1:A:33:VAL:HG21	1:A:52:TYR:CE2	2.52	0.44
1:D:33:VAL:HG21	1:D:52:TYR:CE2	2.51	0.44
1:E:31:TRP:CE3	1:E:138:TYR:HB3	2.51	0.44
1:C:70:LEU:CD2	1:C:79:TRP:CZ3	3.01	0.44
1:A:31:TRP:CE3	1:A:138:TYR:HB3	2.53	0.43
1:D:70:LEU:CD2	1:D:79:TRP:CZ3	3.01	0.43
1:F:31:TRP:CE3	1:F:138:TYR:HB3	2.53	0.43
1:D:96[B]:ASN:OD1	1:D:96[B]:ASN:N	2.51	0.43
1:D:31:TRP:CE3	1:D:138:TYR:HB3	2.52	0.43
1:D:91:GLU:OE2	1:D:109:ARG:NH1	2.52	0.42
1:B:31:TRP:CE3	1:B:138:TYR:HB3	2.54	0.41
1:E:91:GLU:OE2	1:E:109:ARG:NH1	2.53	0.41
1:B:6:ASP:CG	1:C:77:ASP:OD1	2.63	0.41
1:B:91:GLU:OE2	1:B:109:ARG:NH1	2.46	0.41
1:C:157:LYS:NZ	1:C:163:GLU:OE1	2.43	0.41
1:A:65[A]:ASN:HD22	1:A:65[A]:ASN:HA	1.69	0.40
1:D:164:ASN:HB3	3:D:302:SO4:O2	2.22	0.40
1:F:91:GLU:OE2	1:F:109:ARG:NH1	2.53	0.40
1:D:81:ARG:HH21	1:D:81:ARG:HG3	1.85	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	175/178 (98%)	171 (98%)	4 (2%)	0	100	100
1	B	176/178 (99%)	172 (98%)	4 (2%)	0	100	100
1	C	177/178 (99%)	172 (97%)	5 (3%)	0	100	100
1	D	177/178 (99%)	173 (98%)	4 (2%)	0	100	100
1	E	173/178 (97%)	169 (98%)	4 (2%)	0	100	100
1	F	174/178 (98%)	170 (98%)	4 (2%)	0	100	100
All	All	1052/1068 (98%)	1027 (98%)	25 (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	152/163 (93%)	151 (99%)	1 (1%)	76	87
1	B	152/163 (93%)	152 (100%)	0	100	100
1	C	155/163 (95%)	154 (99%)	1 (1%)	78	89
1	D	154/163 (94%)	154 (100%)	0	100	100
1	E	148/163 (91%)	147 (99%)	1 (1%)	76	87
1	F	145/163 (89%)	143 (99%)	2 (1%)	59	76
All	All	906/978 (93%)	901 (99%)	5 (1%)	78	89

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	79	TRP
1	C	81	ARG
1	E	79	TRP
1	F	23	GLN
1	F	79	TRP

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

Mol	Chain	Res	Type
1	E	23	GLN
1	E	118	HIS
1	F	118	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	A1DTB	A	301	-	49,65,65	1.27	7 (14%)	62,114,114	1.80	12 (19%)
3	SO4	A	303	-	4,4,4	0.31	0	6,6,6	0.07	0
3	SO4	D	302	-	4,4,4	0.34	0	6,6,6	0.10	0
2	A1DTB	C	301	1	14,17,65	1.35	1 (7%)	15,22,114	1.84	4 (26%)
4	PIN	E	201	-	18,18,18	0.75	2 (11%)	24,26,26	0.76	0
2	A1DTB	F	301	-	49,65,65	1.29	7 (14%)	62,114,114	1.71	9 (14%)
3	SO4	B	203	-	4,4,4	0.34	0	6,6,6	0.09	0
2	A1DTB	D	301	-	12,15,65	1.33	1 (8%)	12,20,114	1.97	4 (33%)
4	PIN	B	201	-	18,18,18	0.73	2 (11%)	24,26,26	0.74	0
2	A1DTB	B	202	-	49,65,65	1.34	7 (14%)	62,114,114	1.86	12 (19%)
3	SO4	A	302	-	4,4,4	0.31	0	6,6,6	0.09	0
2	A1DTB	E	202	-	49,65,65	1.29	8 (16%)	62,114,114	1.80	15 (24%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	A1DTB	A	301	-	6/6/7/9	12/45/117/117	-
2	A1DTB	C	301	1	1/1/1/9	5/9/15/117	0/2/2/11
4	PIN	E	201	-	-	0/12/22/22	0/1/1/1
2	A1DTB	F	301	-	6/6/7/9	16/45/117/117	-
2	A1DTB	D	301	-	1/1/1/9	4/7/13/117	0/2/2/11
4	PIN	B	201	-	-	7/12/22/22	0/1/1/1
2	A1DTB	B	202	-	6/6/7/9	13/45/117/117	-
2	A1DTB	E	202	-	6/6/7/9	20/45/117/117	-

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	202	A1DTB	C26-N27	4.59	1.43	1.38
2	C	301	A1DTB	C44-N45	4.11	1.42	1.38
2	F	301	A1DTB	C44-N45	4.10	1.42	1.38
2	E	202	A1DTB	C26-N27	3.98	1.42	1.38
2	E	202	A1DTB	C44-N45	3.91	1.42	1.38
2	A	301	A1DTB	C26-N27	3.91	1.42	1.38
2	F	301	A1DTB	C26-N27	3.66	1.42	1.38
2	D	301	A1DTB	C44-N45	3.59	1.42	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	202	A1DTB	C44-N45	3.27	1.41	1.38
2	A	301	A1DTB	C44-N45	3.25	1.41	1.38
2	B	202	A1DTB	C4-N3	3.23	1.41	1.38
2	F	301	A1DTB	C36-N35	3.05	1.41	1.38
2	E	202	A1DTB	C36-N35	2.99	1.41	1.38
2	A	301	A1DTB	C4-N3	2.97	1.41	1.38
2	F	301	A1DTB	C4-N3	2.73	1.41	1.38
2	E	202	A1DTB	C4-N3	2.56	1.41	1.38
2	B	202	A1DTB	C2-N3	2.50	1.42	1.37
2	A	301	A1DTB	C36-N35	2.44	1.40	1.38
2	A	301	A1DTB	C2-N3	2.44	1.42	1.37
2	B	202	A1DTB	C34-N35	2.27	1.41	1.37
2	F	301	A1DTB	C2-N3	2.27	1.41	1.37
2	B	202	A1DTB	C40-N45	2.26	1.41	1.37
2	F	301	A1DTB	C22-N27	2.25	1.41	1.37
2	B	202	A1DTB	C36-N35	2.23	1.40	1.38
4	E	201	PIN	O3-S1	2.19	1.55	1.47
2	A	301	A1DTB	C40-N45	2.16	1.41	1.37
2	E	202	A1DTB	C40-N45	2.12	1.41	1.37
4	B	201	PIN	O3-S1	2.11	1.55	1.47
4	E	201	PIN	O3'-S1'	2.10	1.55	1.47
2	E	202	A1DTB	C34-N35	2.09	1.41	1.37
2	E	202	A1DTB	C22-N27	2.06	1.41	1.37
2	F	301	A1DTB	C34-N35	2.03	1.41	1.37
2	A	301	A1DTB	C22-N27	2.01	1.41	1.37
4	B	201	PIN	O3'-S1'	2.01	1.54	1.47
2	E	202	A1DTB	C2-N3	2.00	1.41	1.37

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	202	A1DTB	C34-N35-C36	-5.84	119.06	123.72
2	B	202	A1DTB	C22-N27-C26	-5.72	119.17	123.72
2	B	202	A1DTB	C40-N45-C44	-5.60	119.26	123.72
2	A	301	A1DTB	C40-N45-C44	-5.55	119.30	123.72
2	F	301	A1DTB	C22-N27-C26	-5.46	119.37	123.72
2	C	301	A1DTB	C40-N45-C44	-5.20	119.57	123.72
2	F	301	A1DTB	C40-N45-C44	-5.19	119.58	123.72
2	A	301	A1DTB	C22-N27-C26	-4.94	119.78	123.72
2	A	301	A1DTB	C34-N35-C36	-4.94	119.78	123.72
2	E	202	A1DTB	C34-N35-C36	-4.94	119.78	123.72
2	E	202	A1DTB	C22-N27-C26	-4.84	119.87	123.72

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	202	A1DTB	C40-N45-C44	-4.83	119.87	123.72
2	F	301	A1DTB	C34-N35-C36	-4.75	119.93	123.72
2	D	301	A1DTB	C40-N45-C44	-4.67	120.00	123.72
2	F	301	A1DTB	C2-N3-C4	-4.57	120.08	123.72
2	B	202	A1DTB	C2-N3-C4	-4.19	120.38	123.72
2	A	301	A1DTB	C2-N3-C4	-4.07	120.47	123.72
2	E	202	A1DTB	C2-N3-C4	-3.79	120.70	123.72
2	E	202	A1DTB	C1-C2-N3	-3.78	115.49	122.38
2	B	202	A1DTB	C37-C36-N35	3.71	120.23	116.44
2	A	301	A1DTB	C25-C26-N27	3.66	120.17	116.44
2	F	301	A1DTB	C25-C26-N27	3.32	119.83	116.44
2	E	202	A1DTB	C37-C36-N35	3.21	119.72	116.44
2	B	202	A1DTB	C25-C26-N27	3.20	119.71	116.44
2	F	301	A1DTB	C37-C36-N35	3.08	119.58	116.44
2	E	202	A1DTB	C43-C44-N45	3.05	119.55	116.44
2	A	301	A1DTB	C37-C36-N35	3.02	119.53	116.44
2	A	301	A1DTB	C43-C44-N45	2.98	119.48	116.44
2	F	301	A1DTB	C5-C4-N3	2.89	119.39	116.44
2	A	301	A1DTB	C5-C4-N3	2.86	119.36	116.44
2	C	301	A1DTB	C43-C44-N45	2.86	119.36	116.44
2	B	202	A1DTB	C41-C40-N45	2.86	120.60	118.45
2	E	202	A1DTB	C7-C2-C1	2.86	124.60	119.27
2	B	202	A1DTB	C43-C44-N45	2.83	119.33	116.44
2	E	202	A1DTB	C25-C26-N27	2.79	119.29	116.44
2	D	301	A1DTB	C33-C40-N45	-2.75	117.36	122.38
2	D	301	A1DTB	C43-C44-N45	2.72	119.22	116.44
2	B	202	A1DTB	C5-C4-N3	2.68	119.17	116.44
2	F	301	A1DTB	C43-C44-N45	2.67	119.16	116.44
2	E	202	A1DTB	C22-C16-N15	2.63	122.39	118.45
2	A	301	A1DTB	C34-C28-N21	2.49	122.18	118.45
2	E	202	A1DTB	C34-C28-N21	2.49	122.18	118.45
2	C	301	A1DTB	C41-C40-N45	2.46	120.30	118.45
2	A	301	A1DTB	C41-C40-N45	2.41	120.26	118.45
2	F	301	A1DTB	C41-C40-N45	2.38	120.24	118.45
2	C	301	A1DTB	C33-C40-N45	-2.35	118.11	122.38
2	B	202	A1DTB	C39-C34-N35	2.30	120.18	118.45
2	E	202	A1DTB	C13-C12-N9	-2.27	105.83	112.20
2	E	202	A1DTB	C5-C4-N3	2.22	118.71	116.44
2	A	301	A1DTB	C39-C34-N35	2.20	120.11	118.45
2	D	301	A1DTB	C41-C40-N45	2.11	120.04	118.45
2	A	301	A1DTB	C17-N15-C14	-2.09	111.96	116.65
2	E	202	A1DTB	C30-C29-N21	-2.07	106.30	112.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	202	A1DTB	C1-C2-N3	-2.03	118.69	122.38
2	E	202	A1DTB	C2-C1-N9	-2.03	113.40	117.20
2	B	202	A1DTB	C23-C22-N27	2.01	119.96	118.45

All (26) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	301	A1DTB	N27
2	A	301	A1DTB	N15
2	A	301	A1DTB	N45
2	A	301	A1DTB	N3
2	A	301	A1DTB	N35
2	A	301	A1DTB	N21
2	B	202	A1DTB	N27
2	B	202	A1DTB	N15
2	B	202	A1DTB	N45
2	B	202	A1DTB	N3
2	B	202	A1DTB	N35
2	B	202	A1DTB	N21
2	C	301	A1DTB	N45
2	D	301	A1DTB	N45
2	E	202	A1DTB	N27
2	E	202	A1DTB	N15
2	E	202	A1DTB	N45
2	E	202	A1DTB	N3
2	E	202	A1DTB	N35
2	E	202	A1DTB	N21
2	F	301	A1DTB	N27
2	F	301	A1DTB	N15
2	F	301	A1DTB	N45
2	F	301	A1DTB	N3
2	F	301	A1DTB	N35
2	F	301	A1DTB	N21

All (77) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	A1DTB	O54-C16-N15-C14
2	A	301	A1DTB	O54-C16-N15-C17
2	A	301	A1DTB	C22-C16-N15-C14
2	A	301	A1DTB	C22-C16-N15-C17
2	B	202	A1DTB	O54-C16-N15-C14

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Mol	Chain	Res	Type	Atoms
2	B	202	A1DTB	O54-C16-N15-C17
2	B	202	A1DTB	C22-C16-N15-C14
2	B	202	A1DTB	C22-C16-N15-C17
2	B	202	A1DTB	N15-C16-C22-N27
2	E	202	A1DTB	O54-C16-N15-C14
2	E	202	A1DTB	O54-C16-N15-C17
2	E	202	A1DTB	C22-C16-N15-C14
2	E	202	A1DTB	C22-C16-N15-C17
2	E	202	A1DTB	N15-C16-C22-N27
2	E	202	A1DTB	O55-C28-N21-C20
2	E	202	A1DTB	C34-C28-N21-C20
2	F	301	A1DTB	O54-C16-N15-C14
2	F	301	A1DTB	O54-C16-N15-C17
2	F	301	A1DTB	C22-C16-N15-C14
2	F	301	A1DTB	C22-C16-N15-C17
4	B	201	PIN	C1-C2-N1-C4
4	B	201	PIN	C2'-C1'-S1'-O1'
2	F	301	A1DTB	N9-C12-C13-C14
2	C	301	A1DTB	C29-C30-C31-N32
2	A	301	A1DTB	C12-C13-C14-N15
2	B	202	A1DTB	N15-C17-C18-C19
2	E	202	A1DTB	O55-C28-N21-C29
2	E	202	A1DTB	C12-C13-C14-N15
2	A	301	A1DTB	N9-C12-C13-C14
2	B	202	A1DTB	N9-C12-C13-C14
2	E	202	A1DTB	N9-C12-C13-C14
2	B	202	A1DTB	C12-C13-C14-N15
2	F	301	A1DTB	N15-C17-C18-C19
2	F	301	A1DTB	C12-C13-C14-N15
2	A	301	A1DTB	N15-C17-C18-C19
4	B	201	PIN	C2-C1-S1-O3
4	B	201	PIN	C2'-C1'-S1'-O3'
2	C	301	A1DTB	O53-C33-C40-C41
2	D	301	A1DTB	O53-C33-C40-C41
2	E	202	A1DTB	O8-C1-C2-C7
2	F	301	A1DTB	O8-C1-C2-C7
2	C	301	A1DTB	N32-C33-C40-N45
2	C	301	A1DTB	N32-C33-C40-C41
2	C	301	A1DTB	O53-C33-C40-N45
2	D	301	A1DTB	N32-C33-C40-N45
2	D	301	A1DTB	N32-C33-C40-C41
2	D	301	A1DTB	O53-C33-C40-N45

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Mol	Chain	Res	Type	Atoms
2	F	301	A1DTB	N9-C1-C2-C7
2	E	202	A1DTB	N15-C17-C18-C19
2	E	202	A1DTB	C17-C18-C19-C20
2	A	301	A1DTB	C18-C19-C20-N21
2	E	202	A1DTB	O54-C16-C22-N27
2	E	202	A1DTB	O8-C1-C2-N3
2	F	301	A1DTB	N9-C1-C2-N3
2	F	301	A1DTB	O8-C1-C2-N3
2	E	202	A1DTB	C18-C19-C20-N21
2	A	301	A1DTB	C17-C18-C19-C20
2	F	301	A1DTB	C17-C18-C19-C20
4	B	201	PIN	C2-C1-S1-O1
4	B	201	PIN	C2-C1-S1-O2
4	B	201	PIN	C2'-C1'-S1'-O2'
2	E	202	A1DTB	C34-C28-N21-C29
2	B	202	A1DTB	C13-C14-N15-C16
2	F	301	A1DTB	C30-C29-N21-C28
2	B	202	A1DTB	O54-C16-C22-N27
2	F	301	A1DTB	C18-C19-C20-N21
2	E	202	A1DTB	N9-C1-C2-N3
2	B	202	A1DTB	C17-C18-C19-C20
2	B	202	A1DTB	O55-C28-N21-C20
2	B	202	A1DTB	O54-C16-C22-C23
2	E	202	A1DTB	O54-C16-C22-C23
2	A	301	A1DTB	O54-C16-C22-N27
2	F	301	A1DTB	O54-C16-C22-N27
2	E	202	A1DTB	N9-C1-C2-C7
2	A	301	A1DTB	C13-C14-N15-C16
2	A	301	A1DTB	O54-C16-C22-C23
2	F	301	A1DTB	O54-C16-C22-C23

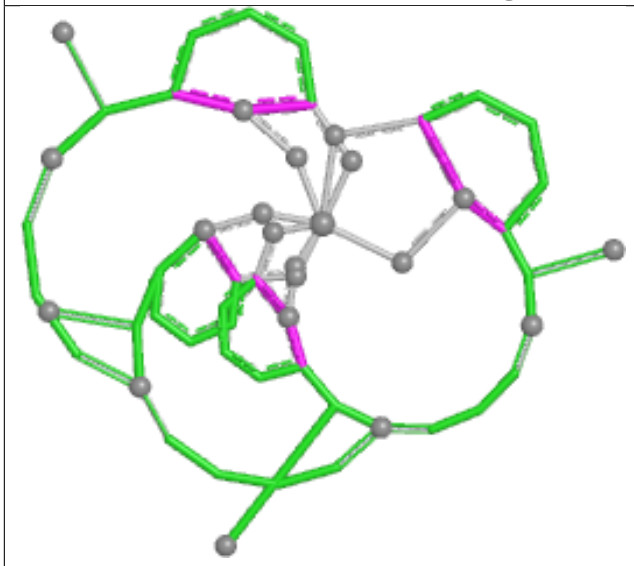
There are no ring outliers.

7 monomers are involved in 9 short contacts:

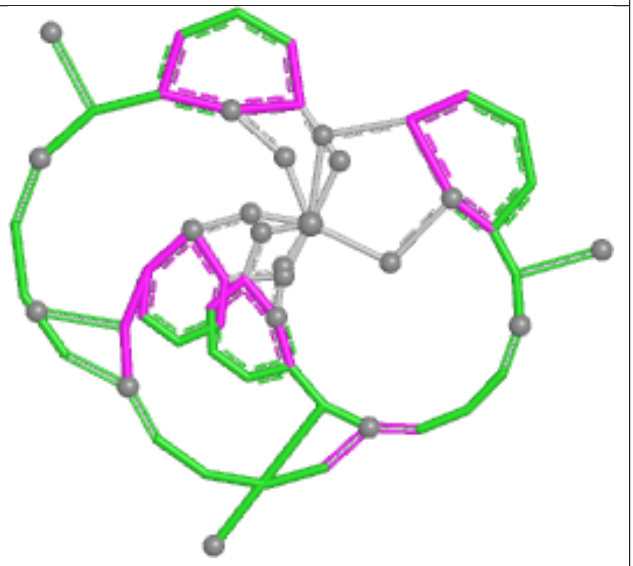
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	A1DTB	1	0
3	D	302	SO4	1	0
4	E	201	PIN	1	0
2	F	301	A1DTB	2	0
4	B	201	PIN	1	0
2	B	202	A1DTB	1	0
2	E	202	A1DTB	2	0

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 then 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.

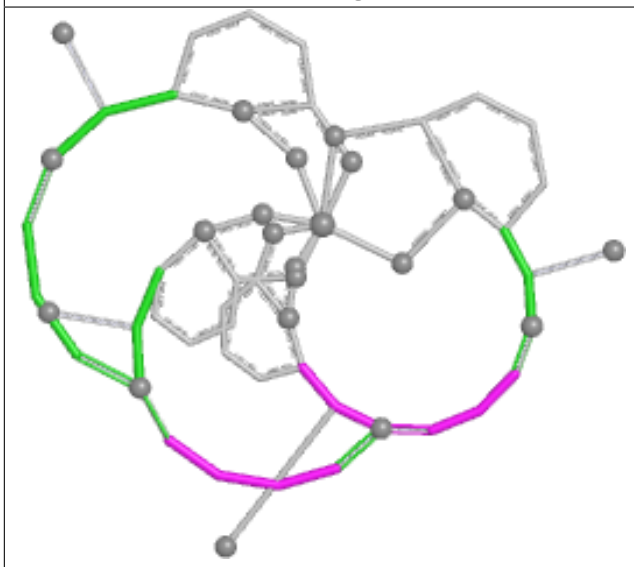
Ligand A1DTB A 301



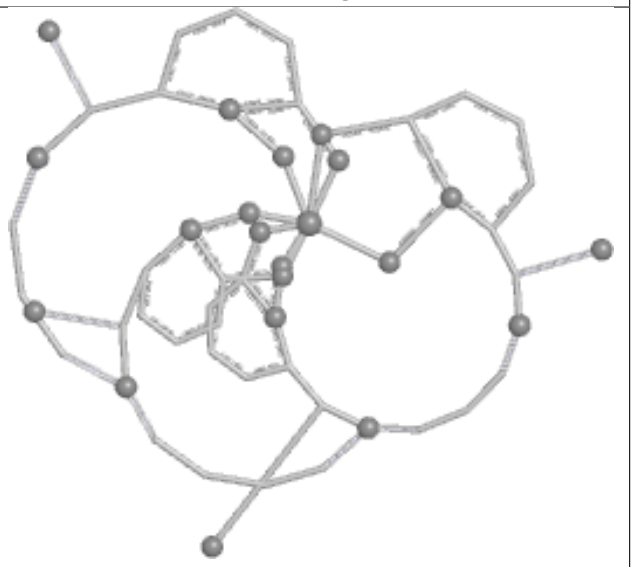
Bond lengths



Bond angles

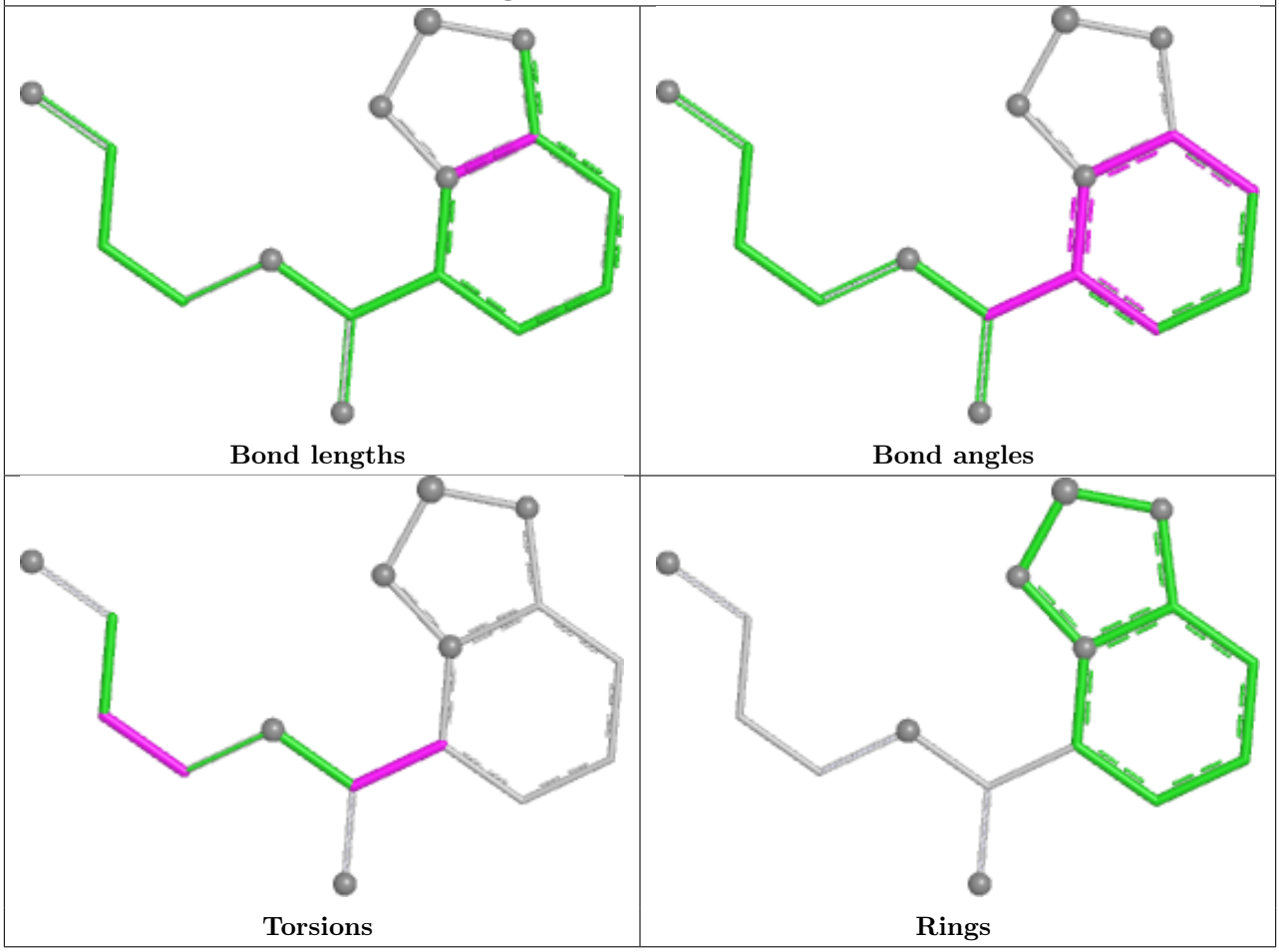


Torsions

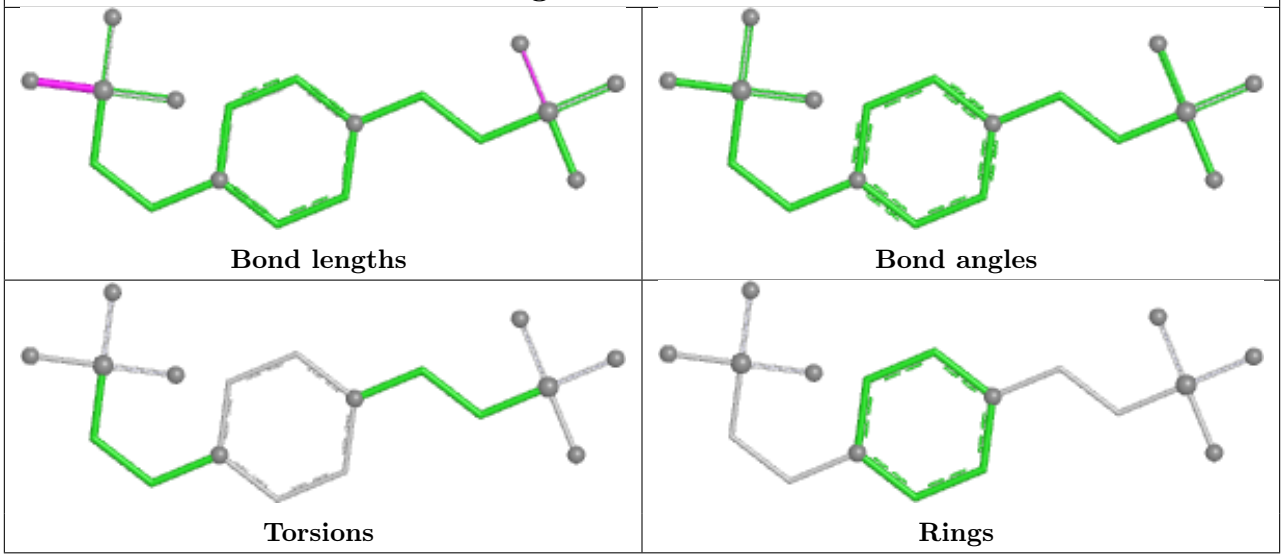


Rings

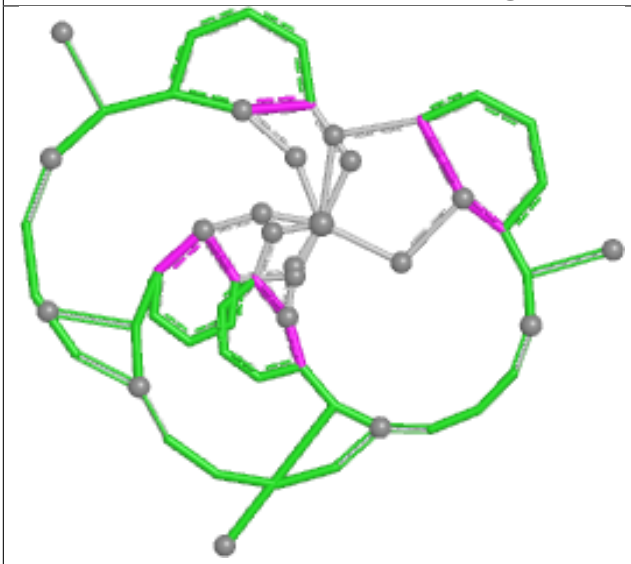
Ligand A1DTB C 301



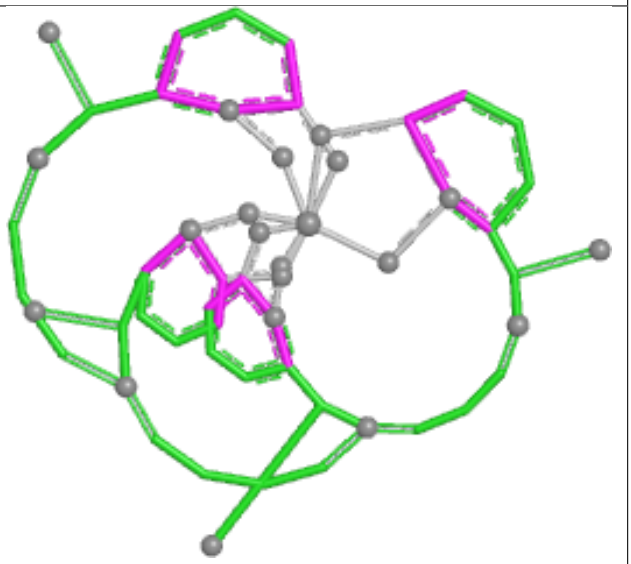
Ligand PIN E 201



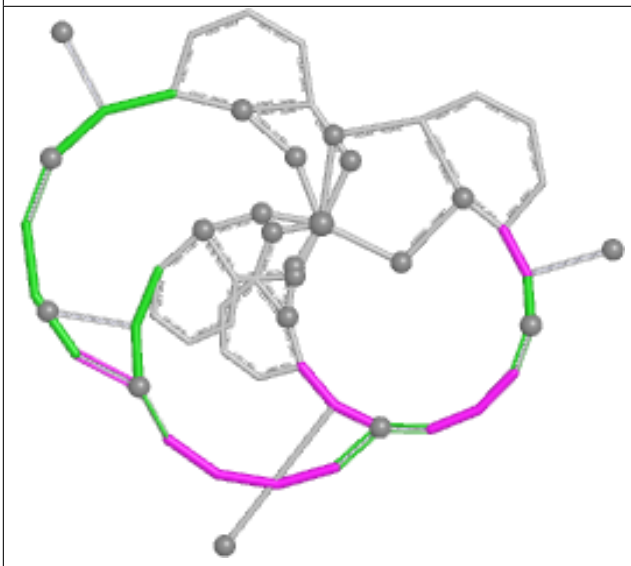
Ligand A1DTB F 301



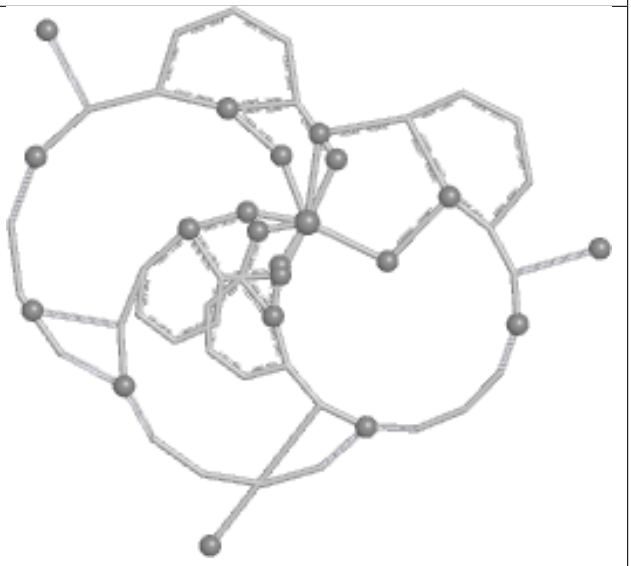
Bond lengths



Bond angles

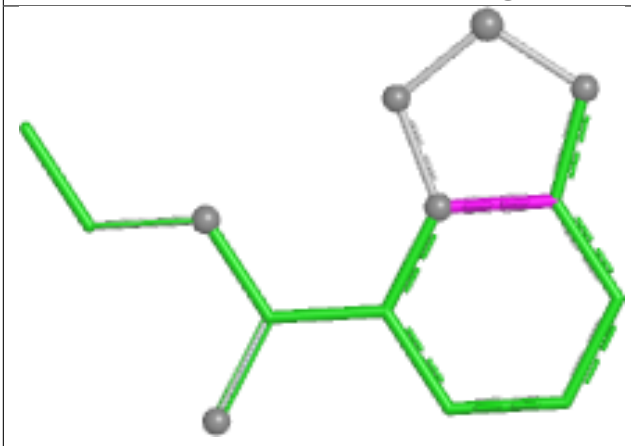


Torsions

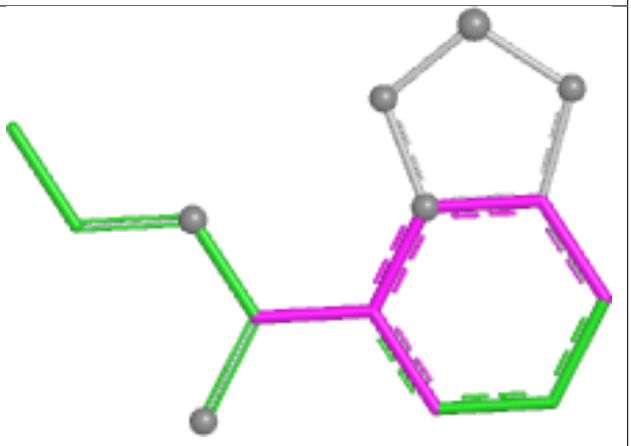


Rings

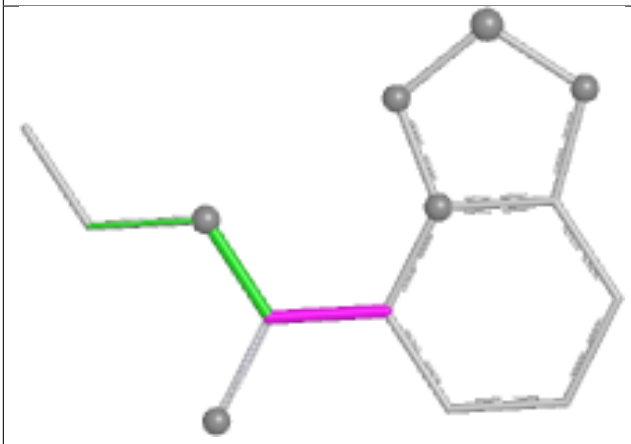
Ligand A1DTB D 301



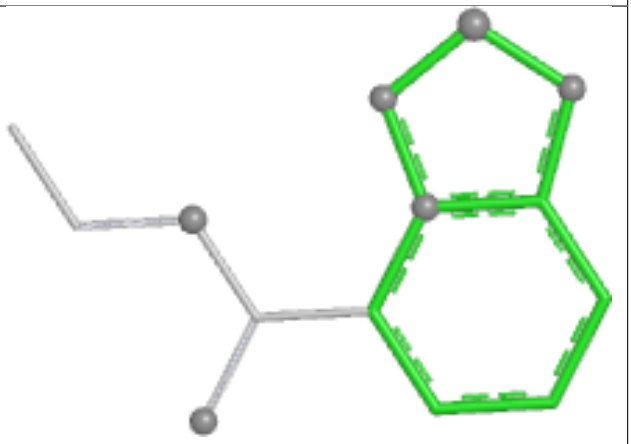
Bond lengths



Bond angles

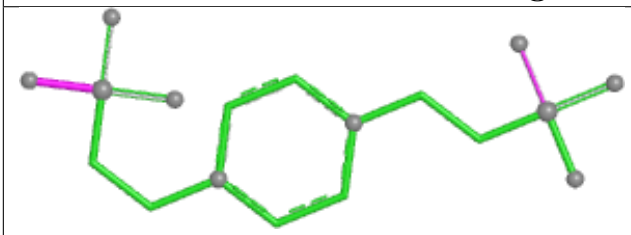


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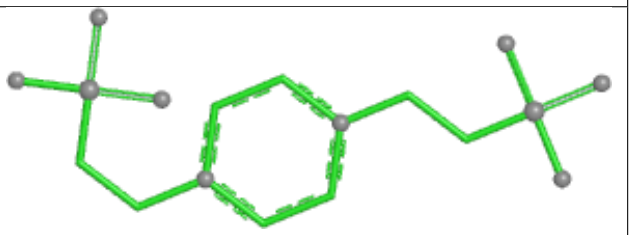


Rings

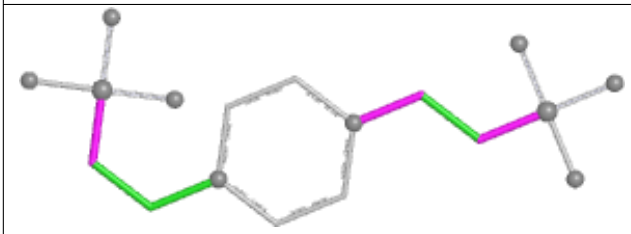
Ligand PIN B 201



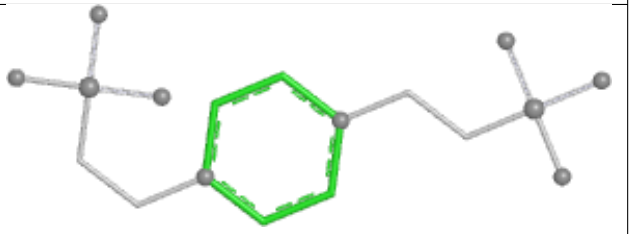
Bond lengths



Bond angles

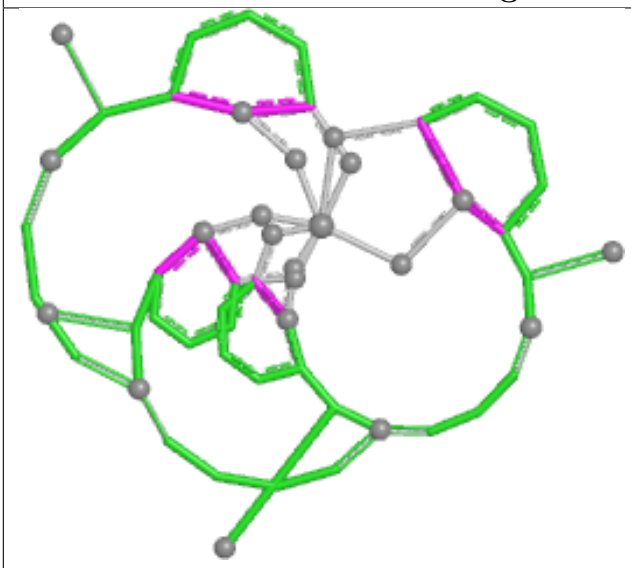


Torsions

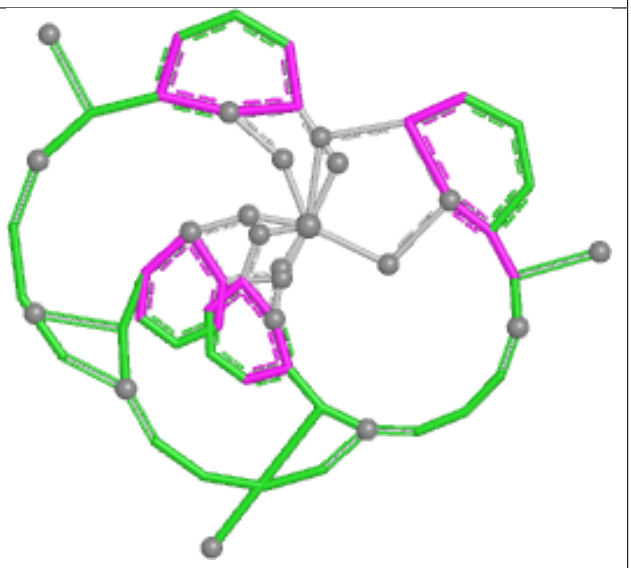


Rings

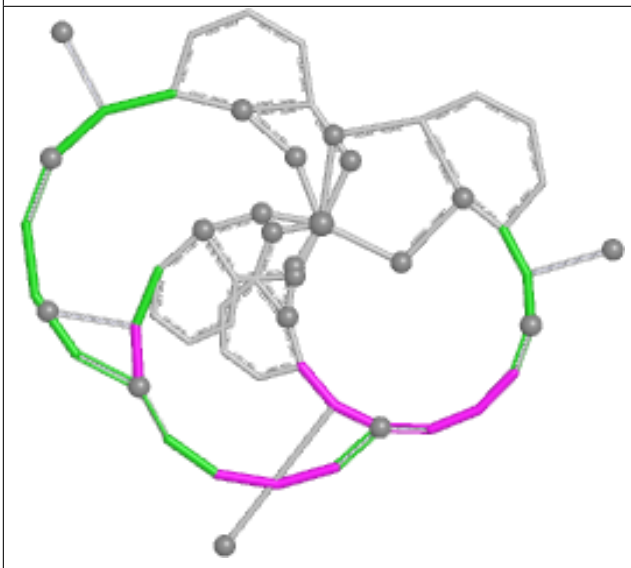
Ligand A1DTB B 202



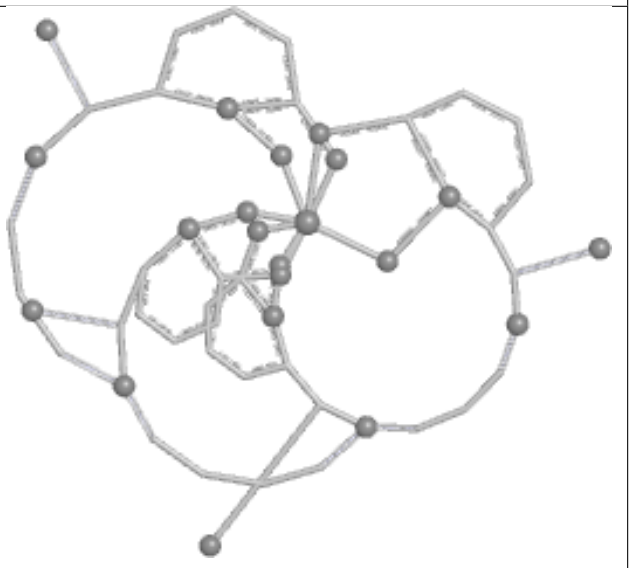
Bond lengths



Bond angles

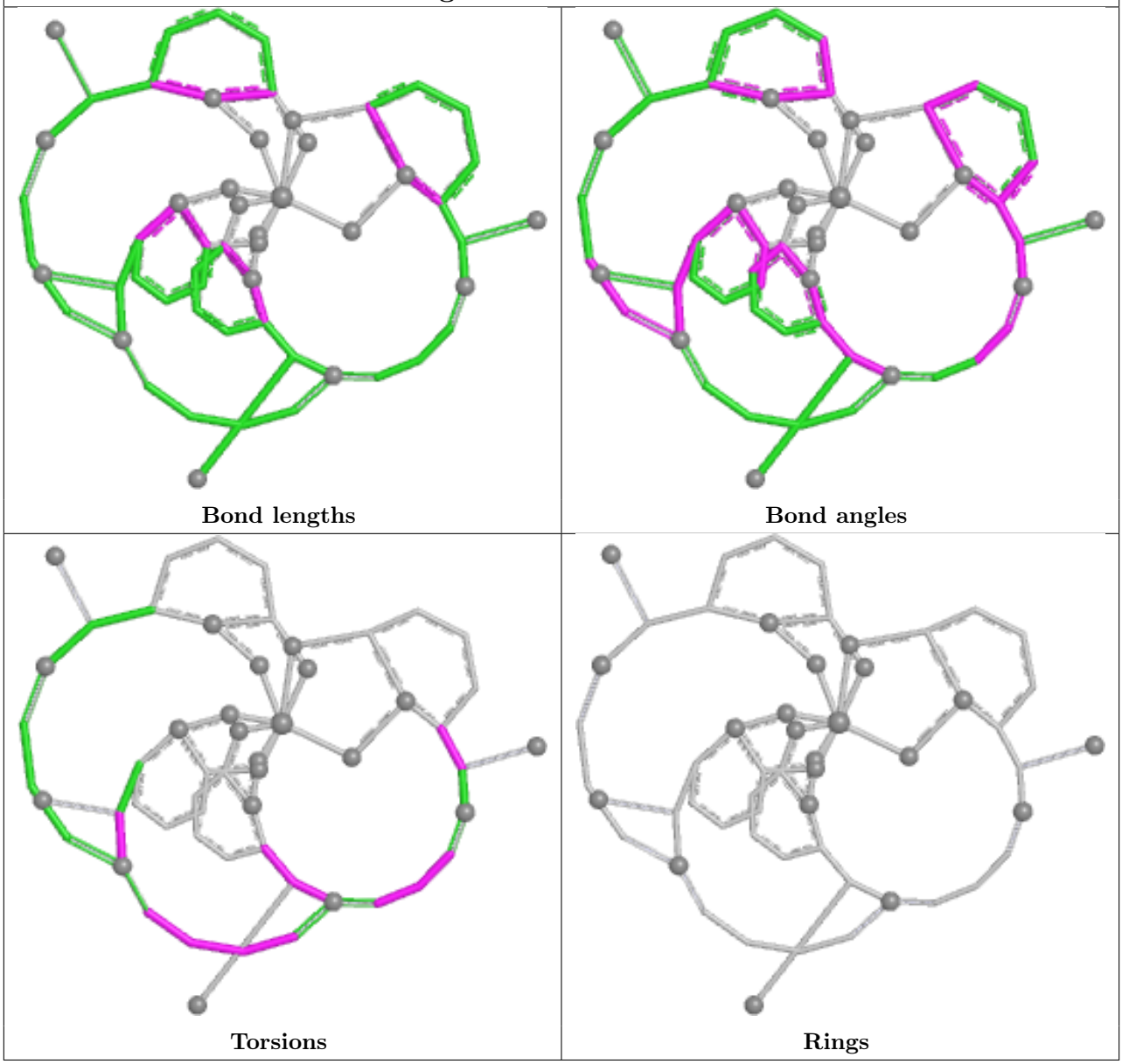


Torsions



Rings

Ligand A1DTB E 202



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, 95^{th} 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	175/178 (98%)	-1.37	0	100	100	20, 33, 62, 107	2 (1%)
1	B	176/178 (98%)	-1.41	0	100	100	16, 33, 64, 90	2 (1%)
1	C	177/178 (99%)	-1.28	0	100	100	21, 40, 72, 114	2 (1%)
1	D	177/178 (99%)	-1.23	0	100	100	26, 43, 77, 112	2 (1%)
1	E	174/178 (97%)	-1.07	0	100	100	25, 51, 86, 178	1 (0%)
1	F	175/178 (98%)	-0.76	0	100	100	25, 61, 97, 158	1 (0%)
All	All	1054/1068 (98%)	-1.19	0	100	100	16, 44, 86, 178	10 (0%)

There are no RSRZ outliers to report.

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

There are no oligosaccharides in this entry.

6.4 Ligands

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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	SO4	A	302	5/5	0.97	0.06	49,71,77,79	0

Continued on next page...

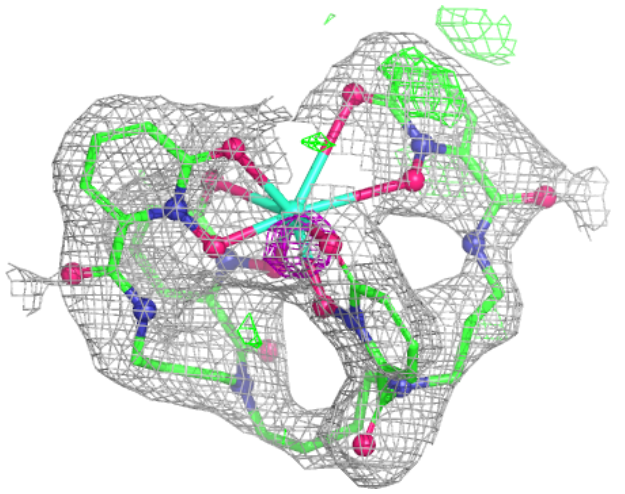
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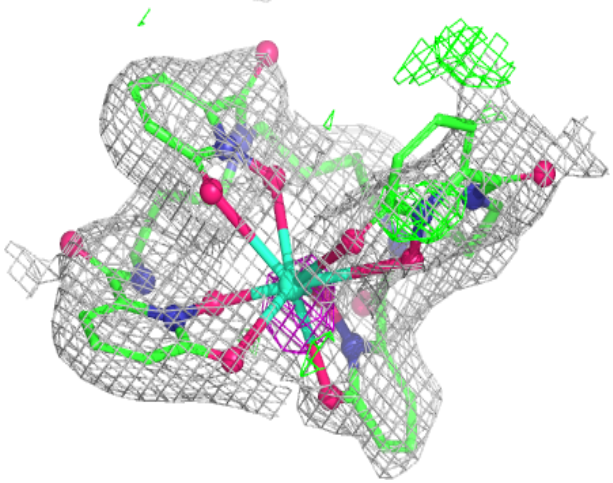
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	SO4	B	203	5/5	0.98	0.06	47,55,73,73	0
3	SO4	D	302	5/5	0.98	0.04	52,65,88,94	0
2	A1DTB	F	301	55/55	0.99	0.06	44,73,117,121	0
2	A1DTB	C	301	16/55	0.99	0.06	38,62,89,99	0
3	SO4	A	303	5/5	0.99	0.05	63,80,97,100	0
2	A1DTB	D	301	14/55	0.99	0.05	48,64,89,102	0
2	A1DTB	E	202	55/55	0.99	0.06	45,80,111,127	0
4	PIN	B	201	18/18	0.99	0.04	49,59,88,111	0
4	PIN	E	201	18/18	0.99	0.05	41,63,88,101	0
2	A1DTB	A	301	55/55	1.00	0.04	32,48,65,84	0
2	A1DTB	B	202	55/55	1.00	0.03	29,46,64,84	0

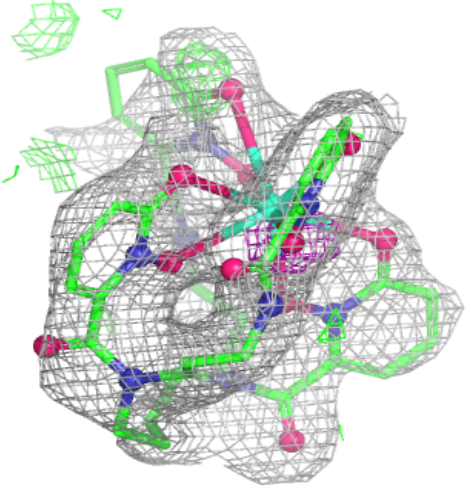
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1DTB 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)

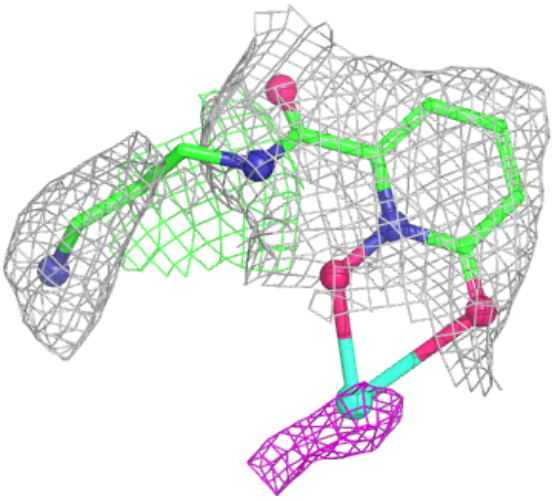


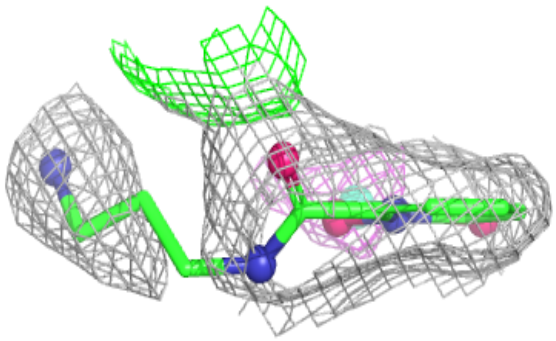


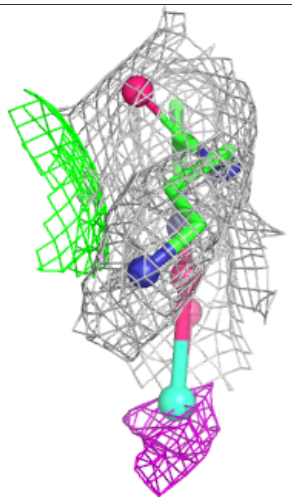


Electron density around A1DTB C 301:

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

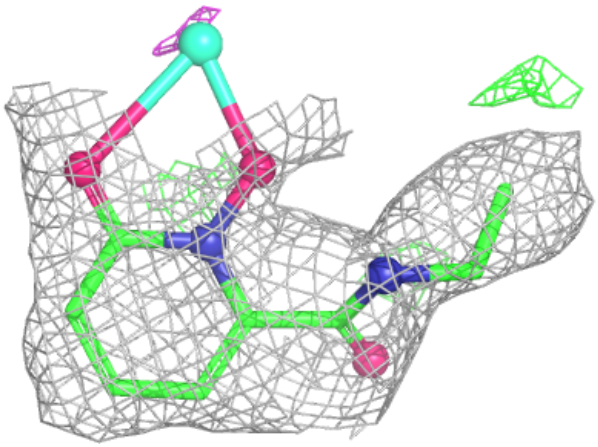


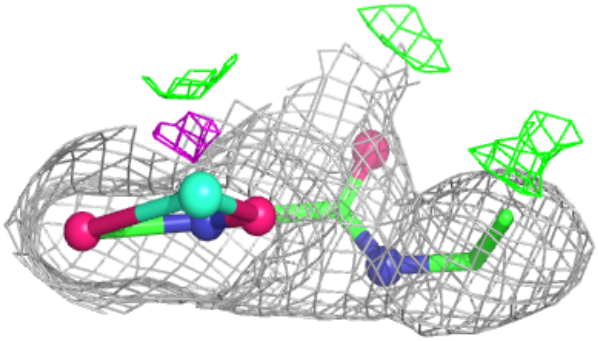


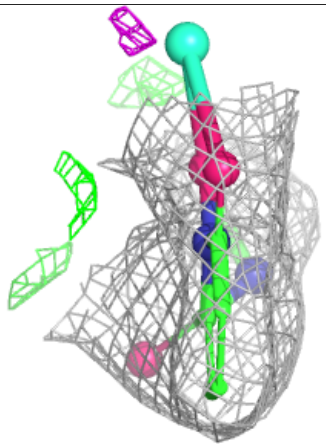


Electron density around A1DTB D 301:

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

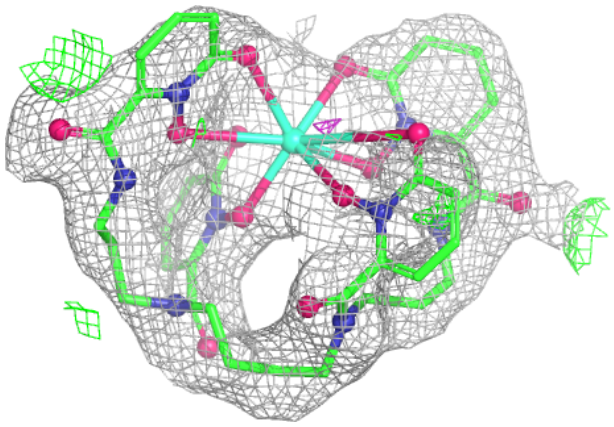


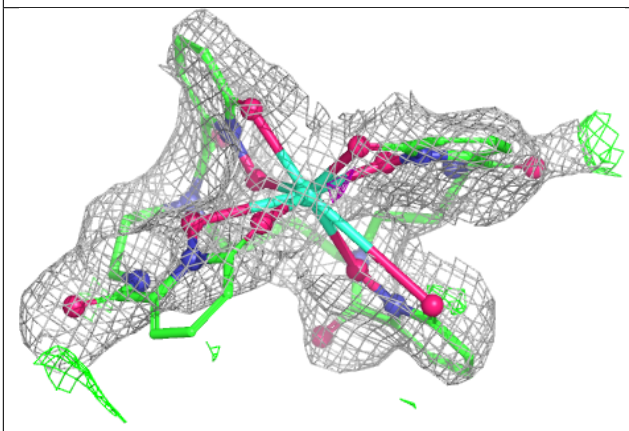


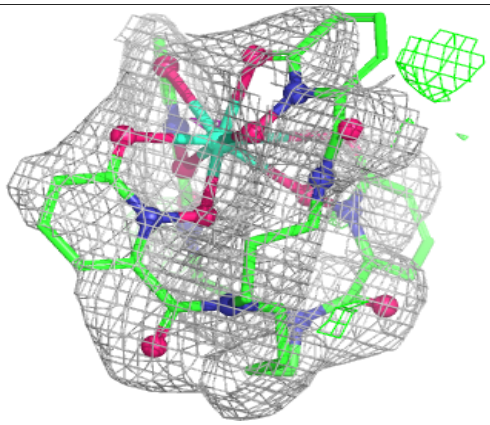


Electron density around A1DTB E 202:

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

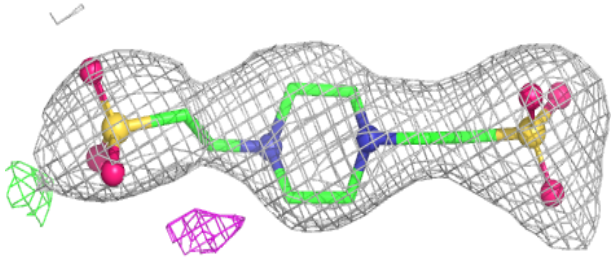


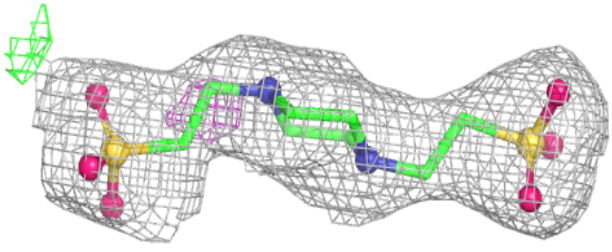


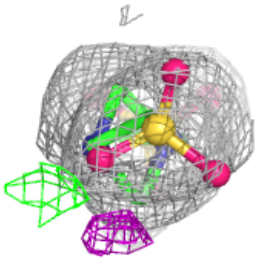


Electron density around PIN B 201:

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

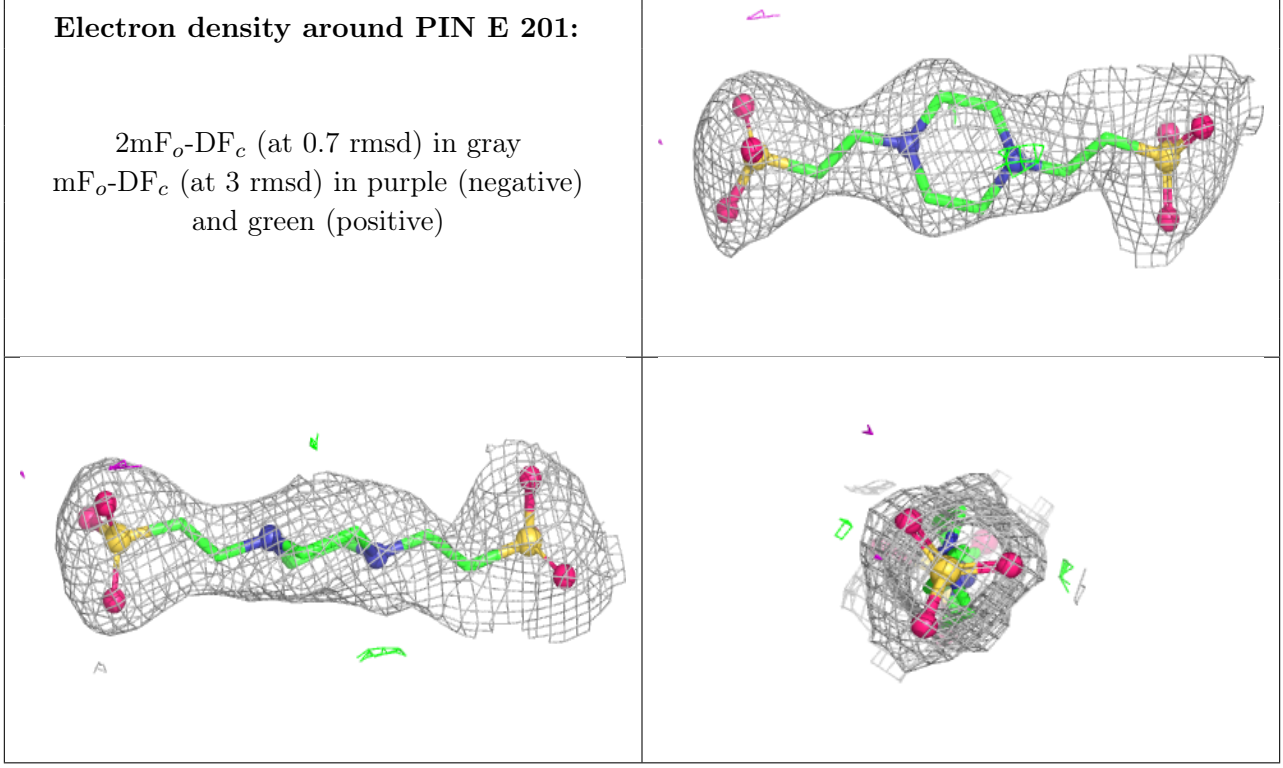






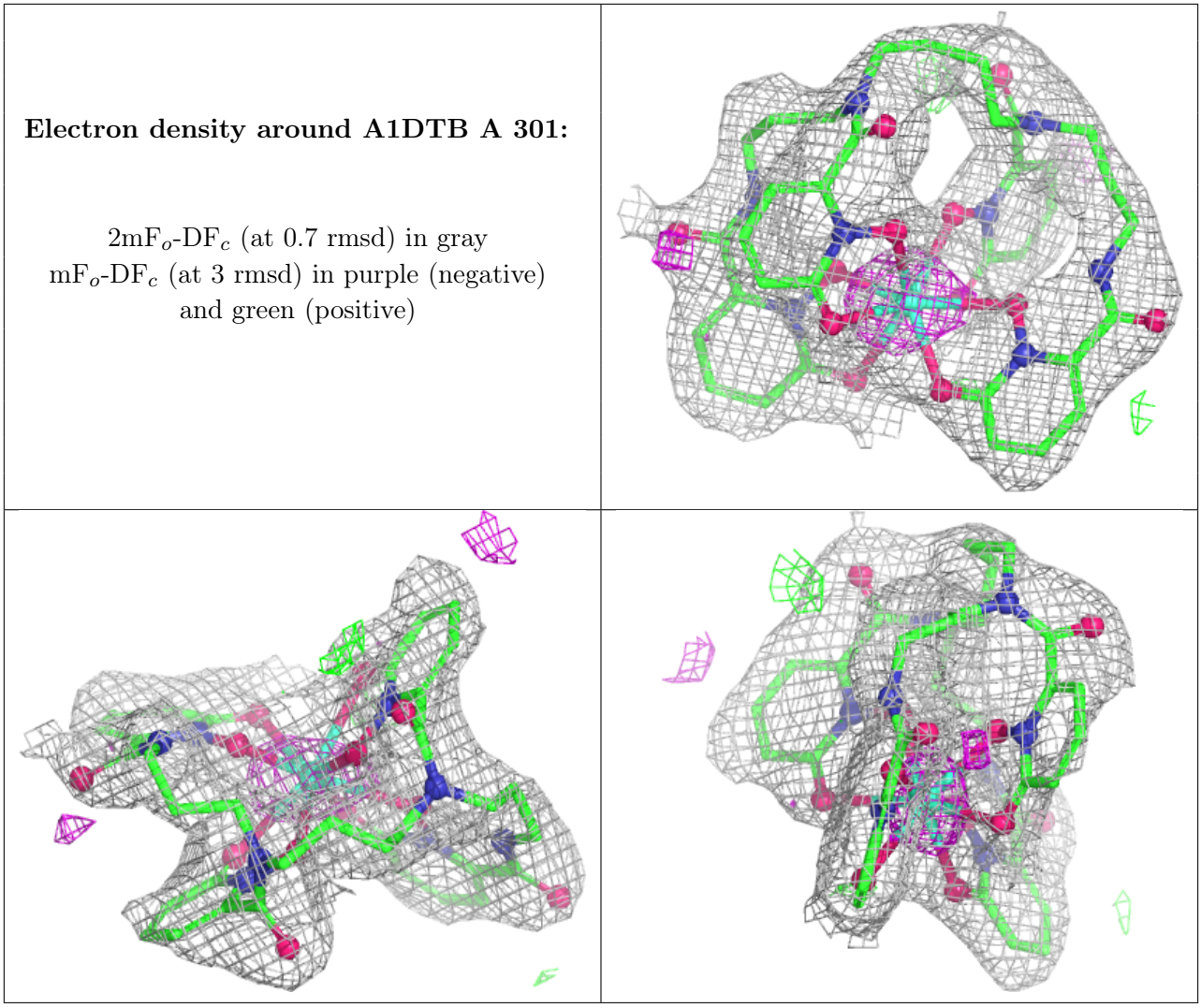
Electron density around PIN E 201:

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



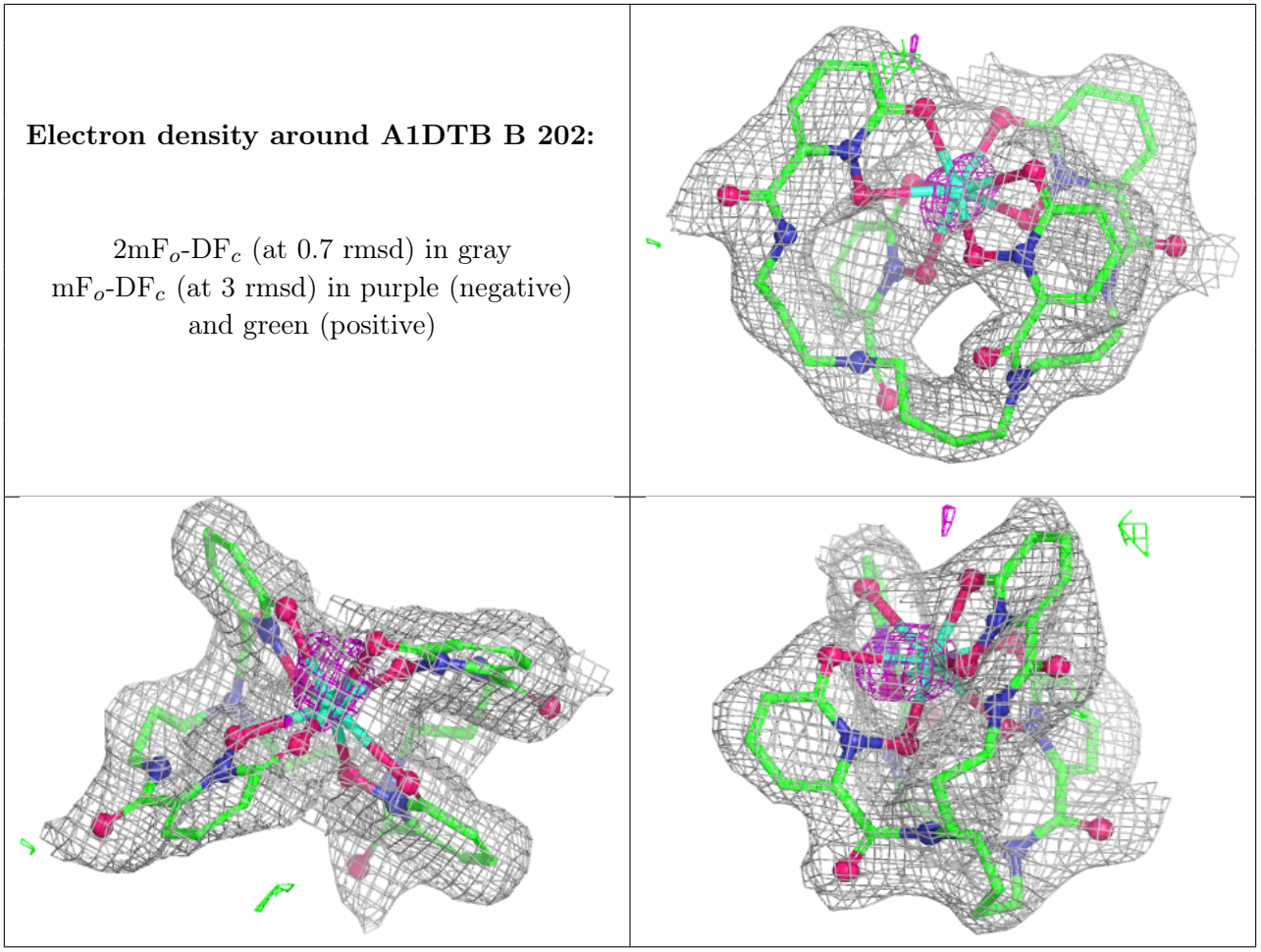
Electron density around A1DTB A 301:

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



Electron density around A1DTB B 202:

$2mF_o$-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

There are no such residues in this entry.