Full wwPDB X-ray Structure Validation Report (i)

Mar 6, 2026 – 11:20 PM UTC

PDB ID	:	9S0I / pdb_00009s0i
Title	:	Intermediate-state of CBD of TtCarH mutant - H132A after 10 ms illumination (SSX, DLS)
Authors	:	Poddar, H.; Coquelle, N.; Axford, D.; Rios-Santacruz, R.; Leys, D.; Owen, R.L.
Deposited on	:	2025-07-16
Resolution	:	2.20 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:

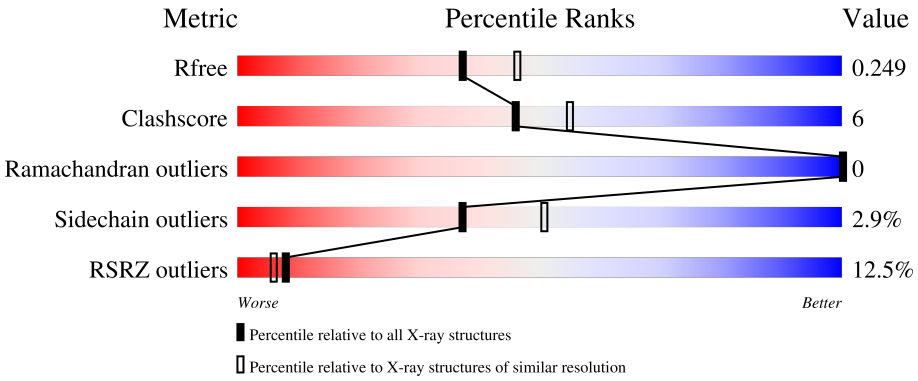
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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	215	80% 12% 8%
1	B	215	9% 79% 12% 9%
1	C	215	31% 81% 8% 9%
1	D	215	4% 82% 9% 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
3	5AD	B	302[B]	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 12906 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 Probable transcriptional regulator.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	197	Total	C	N	O	S	0	197	0
			2980	1908	540	528	4			
1	B	196	Total	C	N	O	S	0	196	0
			2958	1896	532	526	4			
1	C	195	Total	C	N	O	S	0	195	0
			2930	1874	528	524	4			
1	D	197	Total	C	N	O	S	0	197	0
			2972	1906	534	528	4			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	132	ALA	HIS	engineered mutation	UNP Q746J7
A	286	GLY	-	expression tag	UNP Q746J7
A	287	HIS	-	expression tag	UNP Q746J7
A	288	HIS	-	expression tag	UNP Q746J7
A	289	HIS	-	expression tag	UNP Q746J7
A	290	HIS	-	expression tag	UNP Q746J7
A	291	HIS	-	expression tag	UNP Q746J7
A	292	HIS	-	expression tag	UNP Q746J7
B	132	ALA	HIS	engineered mutation	UNP Q746J7
B	286	GLY	-	expression tag	UNP Q746J7
B	287	HIS	-	expression tag	UNP Q746J7
B	288	HIS	-	expression tag	UNP Q746J7
B	289	HIS	-	expression tag	UNP Q746J7
B	290	HIS	-	expression tag	UNP Q746J7
B	291	HIS	-	expression tag	UNP Q746J7
B	292	HIS	-	expression tag	UNP Q746J7
C	132	ALA	HIS	engineered mutation	UNP Q746J7
C	286	GLY	-	expression tag	UNP Q746J7
C	287	HIS	-	expression tag	UNP Q746J7
C	288	HIS	-	expression tag	UNP Q746J7
C	289	HIS	-	expression tag	UNP Q746J7

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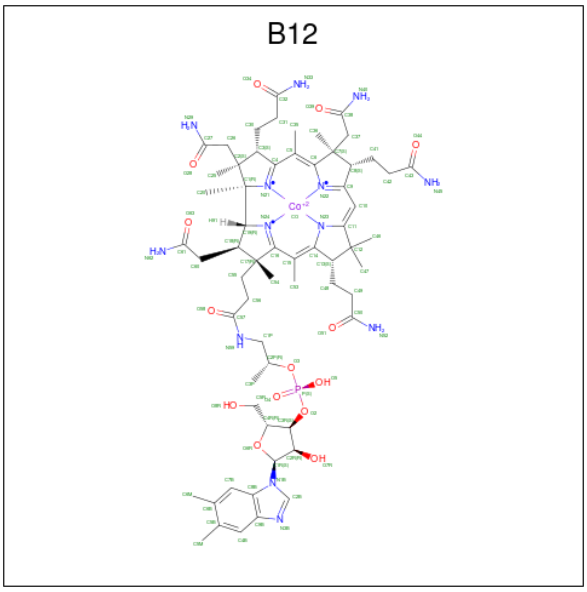
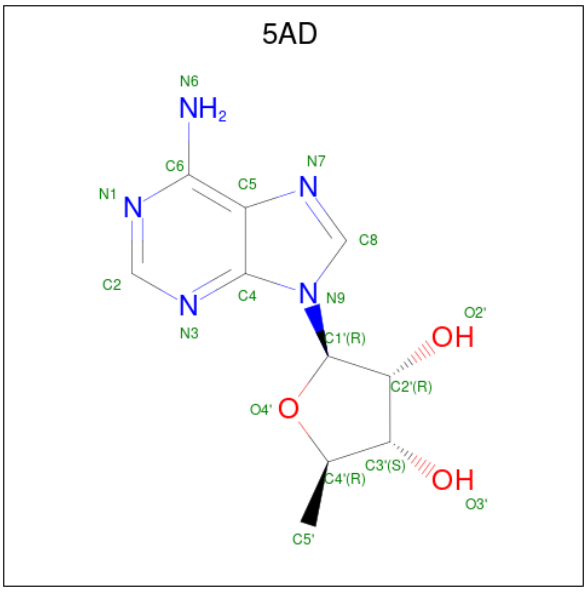
Chain	Residue	Modelled	Actual	Comment	Reference
C	290	HIS	-	expression tag	UNP Q746J7
C	291	HIS	-	expression tag	UNP Q746J7
C	292	HIS	-	expression tag	UNP Q746J7
D	132	ALA	HIS	engineered mutation	UNP Q746J7
D	286	GLY	-	expression tag	UNP Q746J7
D	287	HIS	-	expression tag	UNP Q746J7
D	288	HIS	-	expression tag	UNP Q746J7
D	289	HIS	-	expression tag	UNP Q746J7
D	290	HIS	-	expression tag	UNP Q746J7
D	291	HIS	-	expression tag	UNP Q746J7
D	292	HIS	-	expression tag	UNP Q746J7

- Molecule 2 is COBALAMIN (CCD ID: B12) (formula: $C_{62}H_{89}CoN_{13}O_{14}P$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	Co	N	O	P	0	1
			182	124	2	26	28	2		
2	B	1	Total	C	Co	N	O	P	0	1
			182	124	2	26	28	2		
2	C	1	Total	C	Co	N	O	P	0	1
			182	124	2	26	28	2		
2	D	1	Total	C	Co	N	O	P	0	1
			182	124	2	26	28	2		

- Molecule 3 is 5'-DEOXYADENOSINE (CCD ID: 5AD) (formula: $C_{10}H_{13}N_5O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	1
			36	20	10	6		
3	B	1	Total	C	N	O	0	1
			36	20	10	6		
3	C	1	Total	C	N	O	0	1
			36	20	10	6		
3	D	1	Total	C	N	O	0	1
			36	20	10	6		

- Molecule 4 is water.

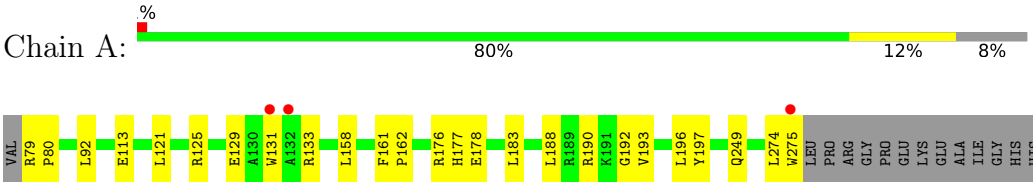
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	52	Total	O	0	52
			52	52		
4	B	57	Total	O	0	57
			57	57		
4	C	41	Total	O	0	41
			41	41		
4	D	44	Total	O	0	44
			44	44		

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.

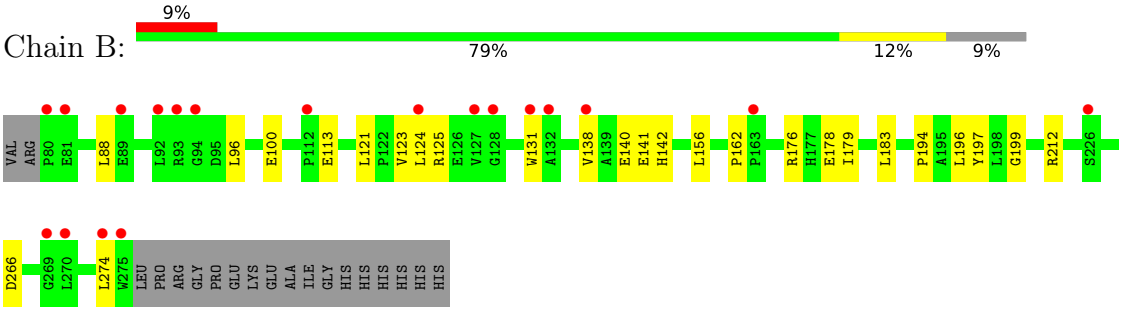
• Molecule 1: Probable transcriptional regulator

Chain A:



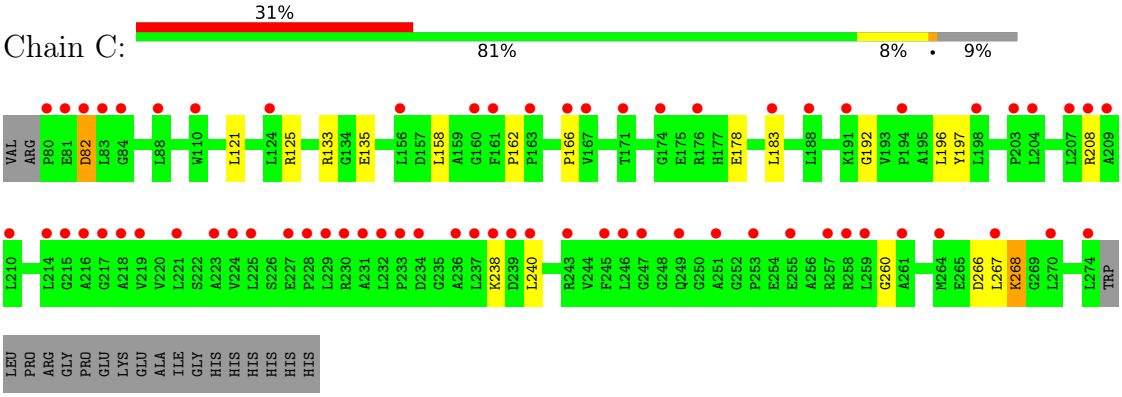
• Molecule 1: Probable transcriptional regulator

Chain B:



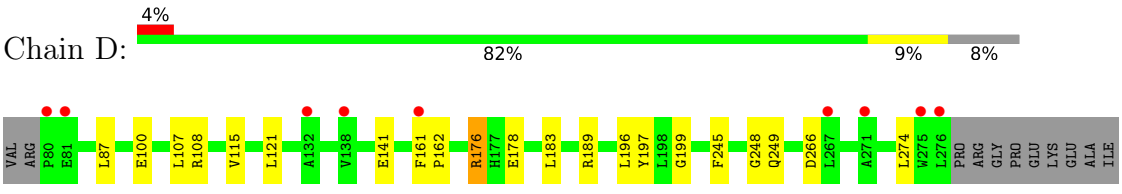
• Molecule 1: Probable transcriptional regulator

Chain C:



• Molecule 1: Probable transcriptional regulator

Chain D:



GLY
HIS
HIS
HIS
HIS
HIS
HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	64.51Å 71.43Å 206.70Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	67.51 – 2.20 67.51 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.6 (67.51-2.20) 99.6 (67.51-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.12 (at 2.20Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.200 , 0.250 0.200 , 0.249	Depositor DCC
R_{free} test set	2432 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å^2)	37.1	Xtriage
Anisotropy	0.065	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 52.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	12906	wwPDB-VP
Average B, all atoms (Å^2)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.13% 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: B12, 5AD

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	0.18	0/3048	0.30	0/4144
1	B	0.20	0/3026	0.35	0/4114
1	C	0.17	0/2994	0.32	0/4068
1	D	0.17	0/3042	0.31	0/4136
All	All	0.18	0/12110	0.32	0/16462

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	2980	0	3048	29	0
1	B	2958	0	3024	25	0
1	C	2930	0	3004	13	0
1	D	2972	0	3045	19	0
2	A	182	0	176	22	0
2	B	182	0	176	20	0
2	C	182	0	176	8	0
2	D	182	0	176	23	0
3	A	36	0	25	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	36	0	25	10	0
3	C	36	0	25	3	0
3	D	36	0	25	3	0
4	A	52	0	0	1	0
4	B	57	0	0	1	0
4	C	41	0	0	0	0
4	D	44	0	0	1	0
All	All	12906	0	12925	131	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 6.

All (131) 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:D:178[A]:GLU:HG2	2:D:301[A]:B12:H522	1.48	0.77
2:C:301[B]:B12:H3	2:C:301[B]:B12:H291	1.49	0.77
2:D:301[B]:B12:H2B	2:D:301[B]:B12:O4	1.93	0.69
2:A:301[B]:B12:H3	2:A:301[B]:B12:H291	1.57	0.68
1:A:176[B]:ARG:H	2:A:301[B]:B12:H452	1.41	0.67
1:C:238[B]:LYS:HG3	1:C:260[B]:GLY:HA3	1.76	0.66
2:A:301[A]:B12:H3	2:A:301[A]:B12:H291	1.61	0.66
1:A:274[A]:LEU:O	1:A:275[A]:TRP:HB2	1.95	0.65
1:C:125[B]:ARG:NH2	2:C:301[B]:B12:O5	2.31	0.64
1:A:178[B]:GLU:H	2:A:301[B]:B12:H522	1.47	0.61
1:C:82[B]:ASP:N	1:C:82[B]:ASP:OD1	2.33	0.61
1:C:266[B]:ASP:OD2	1:C:268[B]:LYS:HB3	2.01	0.60
2:D:301[A]:B12:H2B	2:D:301[A]:B12:O4	2.01	0.60
1:D:178[B]:GLU:H	2:D:301[B]:B12:H522	1.50	0.59
2:A:301[B]:B12:N24	3:A:302[B]:5AD:H4'	2.18	0.58
2:C:301[B]:B12:H3	2:C:301[B]:B12:N29	2.11	0.58
1:A:274[B]:LEU:O	1:A:275[B]:TRP:HB2	2.04	0.58
1:A:176[A]:ARG:H	2:A:301[A]:B12:H452	1.51	0.57
2:A:301[A]:B12:H3	2:A:301[A]:B12:N29	2.20	0.57
1:B:131[A]:TRP:CZ2	3:B:302[A]:5AD:H8	2.39	0.56
1:A:178[A]:GLU:HG2	2:A:301[A]:B12:H522	1.70	0.56
2:A:301[A]:B12:H362	2:A:301[A]:B12:H351	1.88	0.55
1:B:178[A]:GLU:H	2:B:301[A]:B12:H522	1.55	0.55
2:D:301[B]:B12:N21	3:D:302[B]:5AD:H5'1	2.22	0.55
1:A:178[A]:GLU:H	2:A:301[A]:B12:H522	1.54	0.54
2:A:301[A]:B12:H552	2:A:301[A]:B12:H531	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:301[B]:B12:H261	3:A:302[B]:5AD:H5'3	1.90	0.53
1:D:178[A]:GLU:HB2	1:D:197[A]:TYR:OH	2.08	0.53
2:B:301[B]:B12:H362	2:B:301[B]:B12:H351	1.90	0.53
1:D:249[A]:GLN:HG3	2:D:301[A]:B12:O5	2.08	0.53
2:A:301[B]:B12:H362	2:A:301[B]:B12:H351	1.89	0.53
1:D:108[B]:ARG:NH1	4:D:402[B]:HOH:O	2.41	0.53
2:C:301[B]:B12:C5	3:C:302[B]:5AD:H5'1	2.38	0.53
1:B:131[A]:TRP:CD2	3:B:302[A]:5AD:H3'	2.44	0.52
1:C:208[B]:ARG:HB2	1:C:240[B]:LEU:HD23	1.91	0.52
1:D:178[B]:GLU:HB2	1:D:197[B]:TYR:OH	2.08	0.52
2:B:301[A]:B12:H362	2:B:301[A]:B12:H351	1.91	0.52
2:B:301[B]:B12:H3	2:B:301[B]:B12:H291	1.74	0.52
1:A:162[B]:PRO:HB3	1:C:192[B]:GLY:HA3	1.92	0.52
1:D:141[B]:GLU:HG3	3:D:302[B]:5AD:O3'	2.09	0.52
2:D:301[A]:B12:H351	2:D:301[A]:B12:H362	1.92	0.52
1:A:121[A]:LEU:HD21	1:A:183[A]:LEU:HD11	1.91	0.51
1:A:178[B]:GLU:HG2	2:A:301[B]:B12:H522	1.74	0.51
2:B:301[B]:B12:C5	3:B:302[B]:5AD:H5'1	2.41	0.51
1:C:133[B]:ARG:NE	1:C:135[B]:GLU:OE2	2.25	0.51
2:C:301[B]:B12:H362	2:C:301[B]:B12:H351	1.93	0.51
2:B:301[B]:B12:H261	3:B:302[B]:5AD:H5'3	1.93	0.51
1:C:208[B]:ARG:HG3	1:C:240[B]:LEU:HA	1.93	0.51
1:D:141[B]:GLU:OE2	2:D:301[B]:B12:H532	2.11	0.51
1:D:176[B]:ARG:H	2:D:301[B]:B12:H452	1.57	0.50
1:A:178[B]:GLU:HB2	1:A:197[B]:TYR:OH	2.10	0.50
1:D:107[A]:LEU:HD13	1:D:115[A]:VAL:HG11	1.93	0.50
1:A:192[B]:GLY:HA3	1:C:162[B]:PRO:HB3	1.94	0.50
1:D:121[B]:LEU:HD21	1:D:183[B]:LEU:HD11	1.94	0.50
1:A:79[B]:ARG:N	1:A:80[B]:PRO:HD2	2.28	0.49
1:A:158[B]:LEU:HD13	1:C:158[B]:LEU:HD13	1.94	0.49
2:A:301[B]:B12:H531	2:A:301[B]:B12:H552	1.95	0.49
1:D:178[B]:GLU:HG2	2:D:301[B]:B12:H522	1.77	0.49
1:B:178[B]:GLU:H	2:B:301[B]:B12:H522	1.61	0.48
1:B:131[B]:TRP:CH2	3:B:302[B]:5AD:H5'2	2.49	0.48
2:D:301[A]:B12:H552	2:D:301[A]:B12:H531	1.94	0.48
2:B:301[B]:B12:H552	2:B:301[B]:B12:H531	1.95	0.48
1:C:166[B]:PRO:HB3	1:C:196[B]:LEU:HD23	1.95	0.47
2:A:301[A]:B12:H262	2:A:301[A]:B12:H91	1.63	0.47
1:B:88[A]:LEU:HD13	1:B:123[A]:VAL:HG13	1.96	0.47
1:B:141[B]:GLU:HG3	3:B:302[B]:5AD:O3'	2.14	0.47
2:A:301[B]:B12:H3	2:A:301[B]:B12:N29	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:121[A]:LEU:HD21	1:B:183[A]:LEU:HD11	1.97	0.47
1:B:141[B]:GLU:OE1	3:B:302[B]:5AD:O2'	2.32	0.47
2:D:301[B]:B12:H362	2:D:301[B]:B12:H351	1.96	0.46
2:D:301[B]:B12:C4	3:D:302[B]:5AD:H5'1	2.45	0.46
2:B:301[A]:B12:H3	2:B:301[A]:B12:N29	2.31	0.46
1:B:121[B]:LEU:HD21	1:B:183[B]:LEU:HD11	1.98	0.46
1:A:125[B]:ARG:NH1	4:A:402[B]:HOH:O	2.47	0.46
1:A:129[B]:GLU:HB3	1:A:133[B]:ARG:HH12	1.81	0.46
1:B:121[A]:LEU:O	1:B:125[A]:ARG:HG3	2.16	0.46
1:A:129[B]:GLU:HB3	1:A:133[B]:ARG:NH1	2.30	0.45
1:A:121[B]:LEU:O	1:A:125[B]:ARG:HG3	2.15	0.45
2:B:301[B]:B12:C4	3:B:302[B]:5AD:H5'1	2.47	0.45
1:D:248[B]:GLY:HA2	2:D:301[B]:B12:O7R	2.17	0.45
2:D:301[B]:B12:H473	2:D:301[B]:B12:H481	1.88	0.45
1:B:121[B]:LEU:O	1:B:125[B]:ARG:HG3	2.17	0.45
2:D:301[B]:B12:H91	2:D:301[B]:B12:H262	1.72	0.45
1:D:245[B]:PHE:HE2	1:D:274[B]:LEU:HD13	1.82	0.45
1:B:178[B]:GLU:HB2	1:B:197[B]:TYR:OH	2.17	0.44
1:B:140[B]:GLU:OE1	4:B:401[B]:HOH:O	2.21	0.44
1:B:162[A]:PRO:O	1:B:194[A]:PRO:HB3	2.17	0.44
1:C:121[B]:LEU:HD21	1:C:183[B]:LEU:HD11	1.98	0.44
2:D:301[B]:B12:H8	2:D:301[B]:B12:N40	2.31	0.44
1:A:113[B]:GLU:OE2	1:A:190[B]:ARG:NE	2.37	0.44
1:A:177[B]:HIS:NE2	2:A:301[B]:B12:N23	2.66	0.44
2:B:301[A]:B12:H3	2:B:301[A]:B12:H291	1.83	0.44
2:B:301[B]:B12:H262	2:B:301[B]:B12:H91	1.70	0.44
2:C:301[B]:B12:H262	2:C:301[B]:B12:H91	1.79	0.43
2:B:301[B]:B12:H3	2:B:301[B]:B12:N29	2.33	0.43
1:A:196[A]:LEU:HD23	1:A:196[A]:LEU:HA	1.86	0.43
2:D:301[B]:B12:H552	2:D:301[B]:B12:H531	2.00	0.43
2:B:301[A]:B12:H363	2:B:301[A]:B12:H411	1.64	0.43
2:A:301[B]:B12:H601	2:A:301[B]:B12:H262	1.99	0.43
2:B:301[B]:B12:H541	2:B:301[B]:B12:H602	1.87	0.43
2:C:301[B]:B12:N23	3:C:302[B]:5AD:H4'	2.34	0.43
1:A:178[A]:GLU:HB2	1:A:197[A]:TYR:OH	2.18	0.43
1:A:188[B]:LEU:HB3	1:A:193[B]:VAL:HB	2.00	0.42
1:A:176[B]:ARG:HE	1:B:176[B]:ARG:NH1	2.16	0.42
1:B:124[B]:LEU:HD11	1:B:179[B]:ILE:HD13	2.01	0.42
1:D:176[A]:ARG:H	2:D:301[A]:B12:H452	1.66	0.42
1:A:162[B]:PRO:HG3	1:A:192[B]:GLY:O	2.20	0.42
2:B:301[A]:B12:H262	2:B:301[A]:B12:H91	1.69	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:161[B]:PHE:O	1:D:162[B]:PRO:N	2.52	0.42
1:A:161[A]:PHE:CE2	1:B:96[A]:LEU:HB2	2.54	0.42
1:A:176[A]:ARG:HH21	1:B:176[A]:ARG:NH1	2.18	0.42
1:D:249[B]:GLN:HG3	2:D:301[B]:B12:O5	2.20	0.42
2:A:301[B]:B12:H301	2:A:301[B]:B12:H253	1.85	0.42
2:B:301[A]:B12:H621	2:B:301[A]:B12:H18	1.51	0.42
1:D:197[B]:TYR:CZ	1:D:199[B]:GLY:HA2	2.55	0.42
1:A:131[A]:TRP:CZ2	3:A:302[A]:5AD:H8	2.55	0.41
1:B:141[B]:GLU:OE2	2:B:301[B]:B12:H532	2.20	0.41
2:D:301[A]:B12:H262	2:D:301[A]:B12:H91	1.72	0.41
2:A:301[B]:B12:H262	2:A:301[B]:B12:H91	1.67	0.41
1:C:178[B]:GLU:HB2	1:C:197[B]:TYR:OH	2.19	0.41
1:A:92[A]:LEU:HD23	1:A:92[A]:LEU:HA	1.85	0.41
2:C:301[B]:B12:C6	3:C:302[B]:5AD:H5'1	2.51	0.41
2:D:301[B]:B12:O4	2:D:301[B]:B12:H4R	2.21	0.41
1:B:131[A]:TRP:CE3	3:B:302[A]:5AD:H3'	2.56	0.41
1:B:197[B]:TYR:CZ	1:B:199[B]:GLY:HA2	2.55	0.41
1:B:179[B]:ILE:HG22	2:B:301[B]:B12:H3P3	2.03	0.40
2:A:301[B]:B12:C5	3:A:302[B]:5AD:H5'1	2.50	0.40
1:B:196[A]:LEU:HA	1:B:196[A]:LEU:HD23	1.91	0.40
1:D:248[A]:GLY:HA2	2:D:301[A]:B12:O7R	2.21	0.40
1:B:138[B]:VAL:HG22	3:B:302[B]:5AD:H2'	2.03	0.40
2:B:301[A]:B12:HM61	2:B:301[A]:B12:HM53	1.91	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	390/215 (181%)	382 (98%)	8 (2%)	0	100	100
1	B	388/215 (180%)	384 (99%)	4 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	386/215 (180%)	374 (97%)	12 (3%)	0	100	100
1	D	390/215 (181%)	380 (97%)	10 (3%)	0	100	100
All	All	1554/860 (181%)	1520 (98%)	34 (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	290/160 (181%)	288 (99%)	2 (1%)	76	87
1	B	288/160 (180%)	274 (95%)	14 (5%)	22	29
1	C	286/160 (179%)	280 (98%)	6 (2%)	47	63
1	D	290/160 (181%)	278 (96%)	12 (4%)	27	37
All	All	1154/640 (180%)	1120 (97%)	34 (3%)	37	51

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	249[A]	GLN
1	A	249[B]	GLN
1	B	100[A]	GLU
1	B	100[B]	GLU
1	B	113[A]	GLU
1	B	113[B]	GLU
1	B	142[A]	HIS
1	B	142[B]	HIS
1	B	156[A]	LEU
1	B	156[B]	LEU
1	B	212[A]	ARG
1	B	212[B]	ARG
1	B	266[A]	ASP
1	B	266[B]	ASP

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Mol	Chain	Res	Type
1	B	274[A]	LEU
1	B	274[B]	LEU
1	C	82[A]	ASP
1	C	82[B]	ASP
1	C	267[A]	LEU
1	C	267[B]	LEU
1	C	268[A]	LYS
1	C	268[B]	LYS
1	D	87[A]	LEU
1	D	87[B]	LEU
1	D	100[A]	GLU
1	D	100[B]	GLU
1	D	176[A]	ARG
1	D	176[B]	ARG
1	D	189[A]	ARG
1	D	189[B]	ARG
1	D	196[A]	LEU
1	D	196[B]	LEU
1	D	266[A]	ASP
1	D	266[B]	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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)

16 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	B12	B	301[A]	1	94,101,101	1.11	6 (6%)	149,166,166	1.83	34 (22%)
2	B12	A	301[A]	1	94,101,101	1.07	4 (4%)	149,166,166	1.66	31 (20%)
3	5AD	B	302[A]	-	20,20,20	1.56	4 (20%)	28,30,30	2.15	8 (28%)
3	5AD	D	302[B]	-	20,20,20	1.57	4 (20%)	28,30,30	2.38	11 (39%)
3	5AD	C	302[A]	-	20,20,20	1.74	4 (20%)	28,30,30	2.48	11 (39%)
2	B12	A	301[B]	1	94,101,101	1.06	4 (4%)	149,166,166	1.61	29 (19%)
2	B12	B	301[B]	1	94,101,101	1.08	6 (6%)	149,166,166	1.75	28 (18%)
2	B12	D	301[B]	1	94,101,101	1.05	4 (4%)	149,166,166	1.68	30 (20%)
3	5AD	A	302[A]	-	20,20,20	1.69	4 (20%)	28,30,30	2.25	9 (32%)
3	5AD	B	302[B]	-	20,20,20	1.59	4 (20%)	28,30,30	2.42	10 (35%)
3	5AD	C	302[B]	-	20,20,20	1.64	4 (20%)	28,30,30	2.55	8 (28%)
3	5AD	A	302[B]	-	20,20,20	1.60	4 (20%)	28,30,30	2.44	8 (28%)
2	B12	C	301[A]	1	94,101,101	1.09	5 (5%)	149,166,166	1.72	35 (23%)
2	B12	D	301[A]	1	94,101,101	1.09	5 (5%)	149,166,166	1.68	31 (20%)
3	5AD	D	302[A]	-	20,20,20	1.63	4 (20%)	28,30,30	2.25	10 (35%)
2	B12	C	301[B]	1	94,101,101	1.10	5 (5%)	149,166,166	1.70	34 (22%)

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	B12	B	301[A]	1	-	18/56/223/223	0/3/11/11
2	B12	A	301[A]	1	-	17/56/223/223	0/3/11/11
3	5AD	B	302[A]	-	-	0/4/20/20	0/3/3/3
3	5AD	D	302[B]	-	-	0/4/20/20	0/3/3/3
3	5AD	C	302[A]	-	-	0/4/20/20	0/3/3/3
2	B12	A	301[B]	1	-	17/56/223/223	0/3/11/11
2	B12	B	301[B]	1	-	18/56/223/223	0/3/11/11

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	B12	D	301[B]	1	-	16/56/223/223	0/3/11/11
3	5AD	A	302[A]	-	-	0/4/20/20	0/3/3/3
3	5AD	B	302[B]	-	-	0/4/20/20	0/3/3/3
3	5AD	C	302[B]	-	-	0/4/20/20	0/3/3/3
3	5AD	A	302[B]	-	-	0/4/20/20	0/3/3/3
2	B12	C	301[A]	1	-	8/56/223/223	0/3/11/11
2	B12	D	301[A]	1	-	14/56/223/223	0/3/11/11
3	5AD	D	302[A]	-	-	0/4/20/20	0/3/3/3
2	B12	C	301[B]	1	-	16/56/223/223	0/3/11/11

All (71) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	302[A]	5AD	C5-C4	5.55	1.49	1.39
3	A	302[A]	5AD	C5-C4	5.33	1.48	1.39
3	C	302[B]	5AD	C5-C4	5.01	1.48	1.39
3	D	302[A]	5AD	C5-C4	5.00	1.48	1.39
3	B	302[B]	5AD	C5-C4	4.85	1.47	1.39
3	B	302[A]	5AD	C5-C4	4.85	1.47	1.39
3	A	302[B]	5AD	C5-C4	4.80	1.47	1.39
3	D	302[B]	5AD	C5-C4	4.69	1.47	1.39
2	A	301[A]	B12	C54-C17	3.66	1.60	1.54
2	B	301[B]	B12	C14-N23	3.54	1.39	1.35
2	C	301[A]	B12	C14-N23	3.47	1.39	1.35
2	B	301[A]	B12	C14-N23	3.46	1.39	1.35
2	C	301[B]	B12	C14-N23	3.43	1.39	1.35
2	B	301[A]	B12	C35-C5	3.34	1.57	1.50
2	A	301[B]	B12	C54-C17	3.33	1.60	1.54
2	D	301[B]	B12	C14-N23	3.32	1.39	1.35
2	A	301[A]	B12	C14-N23	3.31	1.39	1.35
2	D	301[A]	B12	C35-C5	3.29	1.57	1.50
2	A	301[A]	B12	C35-C5	3.24	1.57	1.50
2	D	301[A]	B12	C54-C17	3.19	1.59	1.54
2	A	301[B]	B12	C14-N23	3.15	1.39	1.35
2	C	301[B]	B12	C54-C17	3.13	1.59	1.54
2	B	301[B]	B12	C54-C17	3.10	1.59	1.54
2	D	301[A]	B12	C14-N23	3.02	1.39	1.35
3	C	302[A]	5AD	C5-C6	2.99	1.49	1.41
2	B	301[A]	B12	C54-C17	2.97	1.59	1.54
2	B	301[A]	B12	C55-C17	-2.93	1.48	1.54
2	C	301[A]	B12	C54-C17	2.82	1.59	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301[A]	B12	C35-C5	2.80	1.56	1.50
2	C	301[B]	B12	C35-C5	2.77	1.56	1.50
3	D	302[B]	5AD	C5-C6	2.77	1.48	1.41
2	D	301[B]	B12	C35-C5	2.77	1.56	1.50
3	B	302[B]	5AD	C5-C6	2.75	1.48	1.41
3	A	302[B]	5AD	C5-C6	2.74	1.48	1.41
2	A	301[B]	B12	C35-C5	2.72	1.56	1.50
3	C	302[B]	5AD	C5-C6	2.71	1.48	1.41
3	D	302[A]	5AD	C5-C6	2.71	1.48	1.41
2	D	301[B]	B12	C54-C17	2.67	1.58	1.54
2	B	301[B]	B12	C35-C5	2.65	1.56	1.50
2	D	301[B]	B12	C6B-C5B	2.63	1.47	1.40
2	C	301[B]	B12	C2B-N1B	-2.59	1.33	1.37
3	A	302[A]	5AD	C5-C6	2.56	1.48	1.41
3	D	302[A]	5AD	C8-N7	2.55	1.36	1.31
2	C	301[A]	B12	C2B-N1B	-2.52	1.33	1.37
3	A	302[A]	5AD	C5-N7	-2.50	1.34	1.39
3	C	302[B]	5AD	C5-N7	-2.45	1.34	1.39
3	B	302[B]	5AD	C8-N7	2.39	1.36	1.31
3	B	302[A]	5AD	C8-N7	2.38	1.36	1.31
3	A	302[A]	5AD	C8-N7	2.38	1.36	1.31
3	B	302[A]	5AD	C5-C6	2.37	1.47	1.41
3	D	302[B]	5AD	C8-N7	2.37	1.36	1.31
3	A	302[B]	5AD	C5-N7	-2.34	1.34	1.39
3	A	302[B]	5AD	C8-N7	2.34	1.36	1.31
2	D	301[A]	B12	C6B-C5B	2.33	1.46	1.40
3	D	302[A]	5AD	C5-N7	-2.31	1.34	1.39
2	B	301[A]	B12	C2B-N1B	-2.31	1.33	1.37
2	B	301[A]	B12	C6B-C5B	2.31	1.46	1.40
3	C	302[A]	5AD	C8-N7	2.31	1.36	1.31
3	C	302[A]	5AD	C5-N7	-2.24	1.35	1.39
2	C	301[B]	B12	C6B-C5B	2.22	1.46	1.40
3	B	302[A]	5AD	C5-N7	-2.22	1.35	1.39
3	D	302[B]	5AD	C5-N7	-2.21	1.35	1.39
2	A	301[B]	B12	C6B-C5B	2.20	1.46	1.40
2	B	301[B]	B12	C55-C17	-2.18	1.49	1.54
3	C	302[B]	5AD	C8-N7	2.17	1.35	1.31
2	B	301[B]	B12	C6B-C5B	2.16	1.46	1.40
3	B	302[B]	5AD	C5-N7	-2.12	1.35	1.39
2	D	301[A]	B12	C48-C13	2.11	1.59	1.54
2	C	301[A]	B12	C6B-C5B	2.11	1.46	1.40
2	B	301[B]	B12	C2B-N1B	-2.07	1.34	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301[A]	B12	C30-C3	2.00	1.59	1.54

All (327) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	302[B]	5AD	C5'-C4'-C3'	-7.32	108.01	115.70
3	C	302[A]	5AD	C5-C4-N3	-6.21	118.16	126.72
3	A	302[B]	5AD	C5-C4-N3	-6.09	118.33	126.72
3	C	302[B]	5AD	C5-C4-N3	-6.02	118.42	126.72
2	C	301[A]	B12	C19-N24-C16	6.01	113.86	107.29
3	A	302[A]	5AD	C5-C4-N3	-5.97	118.50	126.72
3	A	302[B]	5AD	C5'-C4'-C3'	-5.94	109.46	115.70
3	B	302[B]	5AD	C5-C4-N3	-5.88	118.63	126.72
3	D	302[A]	5AD	C5-C4-N3	-5.82	118.71	126.72
2	C	301[B]	B12	C19-N24-C16	5.76	113.59	107.29
3	B	302[A]	5AD	C5-C4-N3	-5.75	118.80	126.72
2	D	301[B]	B12	C19-N24-C16	5.74	113.56	107.29
2	B	301[A]	B12	C1P-N59-C57	-5.74	110.37	122.69
3	D	302[B]	5AD	C5-C4-N3	-5.64	118.95	126.72
2	A	301[A]	B12	C19-N24-C16	5.52	113.33	107.29
2	B	301[B]	B12	C1-C19-C18	-5.48	113.02	121.90
2	A	301[B]	B12	C19-N24-C16	5.42	113.22	107.29
2	B	301[A]	B12	C19-N24-C16	5.36	113.15	107.29
3	B	302[B]	5AD	C5'-C4'-C3'	-5.33	110.10	115.70
2	B	301[B]	B12	C19-N24-C16	5.24	113.01	107.29
2	D	301[A]	B12	C19-N24-C16	5.21	112.98	107.29
2	B	301[B]	B12	C18-C17-C16	5.17	106.92	100.69
2	C	301[B]	B12	C1-C19-C18	-5.05	113.72	121.90
3	C	302[B]	5AD	N3-C4-N9	4.97	135.63	127.17
3	D	302[B]	5AD	C5'-C4'-C3'	-4.90	110.56	115.70
3	C	302[A]	5AD	N3-C4-N9	4.85	135.41	127.17
3	A	302[B]	5AD	N3-C4-N9	4.83	135.38	127.17
3	D	302[A]	5AD	N3-C4-N9	4.75	135.25	127.17
3	A	302[A]	5AD	N3-C4-N9	4.72	135.19	127.17
2	A	301[B]	B12	C55-C17-C16	4.72	125.81	116.59
3	B	302[B]	5AD	N3-C4-N9	4.71	135.18	127.17
3	B	302[A]	5AD	N3-C4-N9	4.71	135.17	127.17
2	B	301[B]	B12	C54-C17-C18	-4.70	106.24	112.99
2	B	301[B]	B12	C9-N22-C6	4.66	110.89	105.28
3	C	302[A]	5AD	C5'-C4'-C3'	-4.65	110.81	115.70
2	D	301[B]	B12	C18-C17-C16	4.62	106.26	100.69
2	C	301[B]	B12	C55-C17-C16	4.60	125.58	116.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	301[B]	B12	C9-N22-C6	4.58	110.79	105.28
2	B	301[A]	B12	C18-C17-C16	4.55	106.18	100.69
3	D	302[B]	5AD	N3-C4-N9	4.52	134.85	127.17
2	D	301[B]	B12	C1-C19-C18	-4.49	114.62	121.90
2	B	301[A]	B12	C56-C55-C17	-4.46	106.98	115.58
2	A	301[A]	B12	C55-C17-C16	4.45	125.30	116.59
2	B	301[A]	B12	C55-C56-C57	-4.45	101.32	111.25
2	D	301[B]	B12	C55-C17-C16	4.45	125.29	116.59
2	C	301[A]	B12	C9-N22-C6	4.37	110.54	105.28
2	D	301[B]	B12	C9-N22-C6	4.37	110.54	105.28
2	C	301[B]	B12	C18-C17-C16	4.36	105.94	100.69
2	A	301[A]	B12	C2P-C1P-N59	-4.34	106.54	112.92
2	B	301[A]	B12	C54-C17-C18	-4.27	106.86	112.99
2	A	301[A]	B12	C1P-N59-C57	-4.20	113.68	122.69
2	D	301[A]	B12	C16-C15-C14	-4.20	114.86	121.26
2	B	301[B]	B12	C1P-N59-C57	-4.13	113.83	122.69
2	C	301[A]	B12	C18-C17-C16	4.08	105.61	100.69
2	D	301[A]	B12	C55-C17-C16	4.08	124.58	116.59
2	A	301[A]	B12	C9-N22-C6	4.06	110.17	105.28
2	B	301[A]	B12	C2-C1-C19	-3.99	112.42	118.61
2	B	301[A]	B12	C9-N22-C6	3.97	110.05	105.28
2	C	301[A]	B12	C55-C17-C16	3.93	124.28	116.59
3	C	302[A]	5AD	O4'-C1'-N9	3.93	115.63	108.09
2	D	301[A]	B12	C9-N22-C6	3.93	110.00	105.28
2	D	301[B]	B12	C54-C17-C18	-3.89	107.41	112.99
2	B	301[B]	B12	C55-C17-C16	3.89	124.19	116.59
2	B	301[A]	B12	C1-C19-C18	-3.88	115.62	121.90
2	D	301[A]	B12	C1P-N59-C57	-3.87	114.38	122.69
2	B	301[A]	B12	C15-C16-N24	3.87	127.94	122.42
2	A	301[B]	B12	C1-C19-C18	-3.86	115.64	121.90
3	D	302[A]	5AD	C2-N3-C4	3.85	121.24	111.83
2	D	301[B]	B12	C16-C15-C14	-3.83	115.41	121.26
2	A	301[B]	B12	C2P-C1P-N59	-3.83	107.29	112.92
2	A	301[B]	B12	C54-C17-C18	-3.80	107.53	112.99
3	C	302[A]	5AD	C2-N3-C4	3.78	121.06	111.83
2	D	301[A]	B12	C15-C16-N24	3.76	127.78	122.42
3	B	302[B]	5AD	C2-N3-C4	3.73	120.94	111.83
3	C	302[A]	5AD	C4-C5-N7	-3.72	106.33	110.58
3	A	302[A]	5AD	C2-N3-C4	3.71	120.90	111.83
3	B	302[A]	5AD	C2-N3-C4	3.71	120.89	111.83
3	A	302[B]	5AD	C2-N3-C4	3.70	120.87	111.83
2	B	301[B]	B12	C15-C16-N24	3.70	127.69	122.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	301[A]	B12	C13-C14-C15	-3.69	118.70	124.32
3	B	302[A]	5AD	N3-C2-N1	-3.68	123.01	128.58
2	D	301[A]	B12	C54-C17-C18	-3.66	107.74	112.99
2	D	301[B]	B12	C54-C17-C16	-3.66	93.45	112.41
3	D	302[B]	5AD	C2-N3-C4	3.66	120.77	111.83
2	A	301[B]	B12	C18-C17-C16	3.65	105.10	100.69
2	C	301[A]	B12	C9B-C8B-N1B	3.63	106.92	105.30
2	D	301[B]	B12	C1P-N59-C57	-3.61	114.95	122.69
2	B	301[A]	B12	C17-C16-N24	-3.58	105.70	111.17
3	C	302[B]	5AD	C2-N3-C4	3.58	120.57	111.83
2	C	301[A]	B12	C2-C1-C19	-3.58	113.05	118.61
2	C	301[A]	B12	C2P-C1P-N59	-3.58	107.66	112.92
2	C	301[A]	B12	C15-C16-N24	3.57	127.51	122.42
3	D	302[B]	5AD	C4-C5-N7	-3.57	106.50	110.58
3	A	302[B]	5AD	C4-C5-N7	-3.56	106.51	110.58
2	B	301[B]	B12	C54-C17-C16	-3.56	93.99	112.41
2	A	301[B]	B12	C54-C17-C16	-3.55	94.03	112.41
2	D	301[B]	B12	C15-C16-N24	3.53	127.46	122.42
2	C	301[A]	B12	C56-C55-C17	-3.52	108.80	115.58
2	A	301[B]	B12	C9-N22-C6	3.51	109.50	105.28
2	B	301[A]	B12	C9B-C8B-N1B	3.51	106.86	105.30
2	C	301[B]	B12	C15-C16-N24	3.48	127.38	122.42
2	C	301[A]	B12	C17-C16-N24	-3.48	105.86	111.17
2	D	301[A]	B12	O2-C3R-C2R	3.48	124.16	111.68
2	B	301[B]	B12	C55-C56-C57	-3.45	103.55	111.25
3	D	302[A]	5AD	N3-C2-N1	-3.42	123.40	128.58
2	C	301[B]	B12	C54-C17-C16	-3.40	94.77	112.41
2	D	301[A]	B12	C54-C17-C16	-3.40	94.81	112.41
2	C	301[B]	B12	C55-C56-C57	-3.38	103.72	111.25
3	B	302[B]	5AD	C4-C5-N7	-3.37	106.72	110.58
3	A	302[A]	5AD	N3-C2-N1	-3.36	123.49	128.58
3	A	302[A]	5AD	C5'-C4'-C3'	-3.33	112.20	115.70
2	B	301[B]	B12	C18-C19-N24	3.32	107.32	102.33
3	C	302[B]	5AD	C4-C5-N7	-3.31	106.80	110.58
3	D	302[B]	5AD	N3-C2-N1	-3.30	123.58	128.58
2	B	301[A]	B12	C2P-C1P-N59	-3.30	108.07	112.92
2	A	301[A]	B12	C2-C1-C19	-3.30	113.49	118.61
3	B	302[B]	5AD	N3-C2-N1	-3.29	123.60	128.58
2	D	301[A]	B12	C9B-C8B-N1B	3.29	106.76	105.30
2	B	301[A]	B12	C55-C17-C16	3.28	123.02	116.59
3	D	302[A]	5AD	C4-C5-N7	-3.27	106.84	110.58
2	D	301[A]	B12	C1-C19-C18	-3.26	116.62	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	301[A]	B12	C56-C55-C17	-3.26	109.30	115.58
2	C	301[A]	B12	C20-C1-C19	3.25	112.48	109.35
2	C	301[A]	B12	C54-C17-C16	-3.25	95.55	112.41
2	A	301[A]	B12	C9B-C8B-N1B	3.25	106.74	105.30
2	B	301[A]	B12	C16-C15-C14	-3.23	116.34	121.26
2	B	301[B]	B12	C2P-C1P-N59	-3.19	108.23	112.92
2	D	301[A]	B12	C18-C17-C16	3.18	104.53	100.69
2	B	301[B]	B12	C16-C15-C14	-3.18	116.41	121.26
2	B	301[A]	B12	C13-C14-C15	-3.17	119.50	124.32
2	A	301[A]	B12	C54-C17-C16	-3.14	96.16	112.41
2	B	301[A]	B12	C54-C17-C16	-3.13	96.22	112.41
2	D	301[B]	B12	C18-C19-N24	3.11	107.00	102.33
2	B	301[B]	B12	C17-C16-N24	-3.09	106.46	111.17
2	A	301[B]	B12	C1P-N59-C57	-3.08	116.09	122.69
2	C	301[A]	B12	C54-C17-C18	-3.07	108.58	112.99
2	D	301[B]	B12	O2-C3R-C2R	3.07	122.70	111.68
3	B	302[A]	5AD	C4-C5-N7	-3.06	107.08	110.58
2	D	301[A]	B12	C7B-C8B-C9B	3.06	126.15	122.47
2	A	301[B]	B12	C18-C19-N24	3.06	106.93	102.33
3	A	302[A]	5AD	C4-C5-N7	-3.05	107.09	110.58
2	A	301[A]	B12	C56-C55-C17	-3.05	109.70	115.58
2	C	301[A]	B12	C7B-C8B-C9B	3.04	126.12	122.47
2	A	301[B]	B12	C15-C16-N24	3.04	126.75	122.42
2	A	301[A]	B12	C18-C17-C16	3.04	104.35	100.69
2	C	301[B]	B12	C54-C17-C18	-3.03	108.64	112.99
3	C	302[B]	5AD	N3-C2-N1	-3.02	124.00	128.58
3	A	302[B]	5AD	N3-C2-N1	-3.00	124.04	128.58
2	D	301[A]	B12	C17-C16-N24	-3.00	106.59	111.17
2	D	301[B]	B12	C13-C14-C15	-2.99	119.77	124.32
2	D	301[B]	B12	C17-C16-N24	-2.96	106.65	111.17
3	D	302[B]	5AD	C4-N9-C8	2.95	108.84	105.74
2	B	301[B]	B12	C2-C1-C19	-2.95	114.03	118.61
3	C	302[A]	5AD	N3-C2-N1	-2.94	124.13	128.58
2	B	301[B]	B12	C13-C14-C15	-2.93	119.85	124.32
3	D	302[A]	5AD	C4-N9-C8	2.93	108.81	105.74
2	A	301[B]	B12	C7B-C8B-C9B	2.93	125.99	122.47
2	C	301[B]	B12	C16-C15-C14	-2.92	116.81	121.26
2	A	301[A]	B12	C36-C7-C37	2.90	115.67	110.74
2	B	301[B]	B12	C9B-C8B-N1B	2.88	106.58	105.30
2	D	301[B]	B12	C7B-C8B-C9B	2.86	125.91	122.47
2	A	301[A]	B12	C54-C17-C18	-2.85	108.89	112.99
2	D	301[A]	B12	C3R-C2R-C1R	2.83	106.11	99.89

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	301[B]	B12	C17-C16-N24	-2.82	106.86	111.17
2	C	301[B]	B12	C18-C19-N24	2.81	106.55	102.33
2	A	301[B]	B12	C16-C15-C14	-2.79	117.00	121.26
2	B	301[A]	B12	O2-C3R-C4R	-2.79	100.19	110.03
2	D	301[A]	B12	C4B-C5B-C6B	2.78	123.76	119.69
2	B	301[A]	B12	C13-C14-N23	2.77	112.84	109.09
3	A	302[B]	5AD	C5-N7-C8	2.75	107.77	103.45
2	C	301[A]	B12	C4B-C5B-C6B	2.75	123.72	119.69
2	C	301[A]	B12	C8B-C9B-N3B	-2.74	107.03	110.00
2	B	301[B]	B12	C13-C14-N23	2.74	112.80	109.09
2	B	301[B]	B12	C4B-C5B-C6B	2.74	123.71	119.69
2	D	301[B]	B12	C9B-C8B-N1B	2.74	106.52	105.30
2	B	301[B]	B12	C7B-C8B-C9B	2.73	125.75	122.47
3	D	302[B]	5AD	C5-N7-C8	2.73	107.73	103.45
3	B	302[B]	5AD	C2'-C3'-C4'	2.72	106.37	102.36
3	C	302[A]	5AD	C5-N7-C8	2.68	107.67	103.45
2	C	301[B]	B12	O6R-C1R-N1B	-2.68	102.94	108.09
2	A	301[A]	B12	C13-C14-C15	-2.68	120.24	124.32
2	B	301[A]	B12	C8B-C9B-N3B	-2.67	107.11	110.00
2	C	301[B]	B12	O58-C57-N59	2.67	128.27	123.03
2	C	301[A]	B12	C2-C1-N21	2.65	105.47	101.78
2	C	301[B]	B12	C13-C14-C15	-2.65	120.29	124.32
2	C	301[B]	B12	C9B-C8B-N1B	2.64	106.47	105.30
2	B	301[B]	B12	C8B-C9B-N3B	-2.63	107.15	110.00
2	C	301[A]	B12	C16-C15-C14	-2.61	117.28	121.26
2	A	301[A]	B12	C15-C16-N24	2.61	126.14	122.42
3	D	302[A]	5AD	C5-N7-C8	2.61	107.55	103.45
2	D	301[A]	B12	C1-C2-C3	-2.60	98.33	101.60
2	C	301[A]	B12	C5M-C5B-C6B	-2.60	115.46	120.76
2	A	301[A]	B12	C17-C16-N24	-2.59	107.21	111.17
3	B	302[B]	5AD	C4-N9-C8	2.58	108.45	105.74
3	A	302[A]	5AD	C3'-C2'-C1'	2.58	106.34	101.46
2	C	301[A]	B12	C7-C37-C38	-2.57	106.68	114.28
3	B	302[A]	5AD	C4-N9-C8	2.57	108.43	105.74
2	C	301[B]	B12	C37-C7-C8	-2.57	101.59	108.37
2	D	301[B]	B12	C56-C55-C17	-2.56	110.64	115.58
3	C	302[B]	5AD	C5-N7-C8	2.55	107.46	103.45
2	A	301[B]	B12	C4B-C5B-C6B	2.55	123.43	119.69
2	A	301[A]	B12	C7B-C8B-C9B	2.55	125.53	122.47
2	C	301[A]	B12	C13-C14-N23	2.55	112.54	109.09
3	D	302[B]	5AD	C2'-C3'-C4'	2.55	106.12	102.36
2	A	301[A]	B12	C8B-C9B-N3B	-2.54	107.25	110.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	301[B]	B12	C7B-C8B-C9B	2.54	125.51	122.47
2	A	301[B]	B12	C2-C1-C19	-2.53	114.68	118.61
2	A	301[A]	B12	C16-C15-C14	-2.52	117.42	121.26
2	C	301[A]	B12	O3-C2P-C1P	2.52	111.93	106.94
3	B	302[B]	5AD	C5-N7-C8	2.52	107.41	103.45
2	D	301[A]	B12	C5M-C5B-C6B	-2.51	115.63	120.76
2	D	301[B]	B12	C4B-C5B-C6B	2.51	123.38	119.69
2	B	301[B]	B12	C5M-C5B-C6B	-2.51	115.63	120.76
2	C	301[A]	B12	O28-C27-N29	-2.50	115.84	122.53
2	D	301[B]	B12	C3R-C2R-C1R	2.49	105.38	99.89
2	A	301[A]	B12	C4B-C5B-C6B	2.49	123.35	119.69
2	A	301[B]	B12	C56-C55-C17	-2.48	110.80	115.58
2	C	301[B]	B12	C2-C1-C19	-2.47	114.77	118.61
2	D	301[A]	B12	O28-C27-N29	-2.47	115.94	122.53
2	D	301[A]	B12	C2-C3-C4	2.47	104.42	101.64
2	D	301[A]	B12	C41-C8-C9	-2.46	106.90	111.19
2	B	301[B]	B12	C56-C55-C17	-2.46	110.84	115.58
2	B	301[A]	B12	C9B-N3B-C2B	2.46	107.42	104.40
2	C	301[B]	B12	C5M-C5B-C6B	-2.45	115.76	120.76
2	C	301[B]	B12	C4B-C5B-C6B	2.44	123.27	119.69
2	C	301[A]	B12	C1-C19-C18	-2.44	117.95	121.90
3	A	302[B]	5AD	C4-N9-C8	2.43	108.29	105.74
3	C	302[B]	5AD	C4-N9-C8	2.42	108.28	105.74
2	D	301[B]	B12	C8B-C9B-N3B	-2.42	107.38	110.00
2	A	301[A]	B12	C5M-C5B-C6B	-2.41	115.84	120.76
2	C	301[B]	B12	C8B-C9B-N3B	-2.41	107.39	110.00
2	C	301[B]	B12	C3R-C2R-C1R	2.39	105.15	99.89
3	A	302[A]	5AD	C5-N7-C8	2.39	107.21	103.45
2	A	301[B]	B12	C41-C8-C9	-2.38	107.03	111.19
2	D	301[B]	B12	C49-C48-C13	-2.38	107.91	114.65
2	D	301[A]	B12	C9B-C4B-C5B	-2.38	116.42	120.83
2	A	301[B]	B12	C13-C14-C15	-2.37	120.71	124.32
3	B	302[A]	5AD	C5-N7-C8	2.36	107.17	103.45
2	C	301[B]	B12	C36-C7-C37	2.36	114.75	110.74
2	B	301[A]	B12	C36-C7-C8	-2.36	107.69	112.05
2	B	301[A]	B12	C4R-O6R-C1R	2.35	114.65	109.47
2	A	301[A]	B12	C37-C7-C8	-2.34	102.20	108.37
2	B	301[B]	B12	C9B-N3B-C2B	2.33	107.26	104.40
2	D	301[B]	B12	C53-C15-C16	2.32	124.30	120.36
2	C	301[B]	B12	C13-C14-N23	2.31	112.22	109.09
2	A	301[A]	B12	C2R-C1R-N1B	2.31	119.04	113.30
2	A	301[A]	B12	C1-C19-C18	-2.30	118.17	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	301[B]	B12	O2-C3R-C2R	2.29	119.88	111.68
2	D	301[A]	B12	C13-C14-N23	2.29	112.19	109.09
2	A	301[A]	B12	O28-C27-N29	-2.28	116.44	122.53
2	A	301[B]	B12	O28-C27-N29	-2.28	116.44	122.53
2	A	301[A]	B12	C3R-C2R-C1R	2.28	104.89	99.89
2	D	301[A]	B12	C8B-C9B-N3B	-2.27	107.54	110.00
3	D	302[B]	5AD	N9-C8-N7	-2.26	110.73	113.94
2	B	301[B]	B12	C3R-C2R-C1R	2.26	104.86	99.89
2	C	301[B]	B12	C35-C5-C4	-2.26	112.22	116.79
2	A	301[B]	B12	C9B-C8B-N1B	2.24	106.30	105.30
2	C	301[B]	B12	P-O3-C2P	2.24	128.76	121.10
2	C	301[A]	B12	C7B-C8B-N1B	-2.24	126.96	131.39
2	D	301[B]	B12	O28-C27-N29	-2.24	116.55	122.53
2	B	301[B]	B12	C9B-C4B-C5B	-2.24	116.67	120.83
2	B	301[B]	B12	O28-C27-N29	-2.24	116.55	122.53
3	D	302[A]	5AD	N9-C8-N7	-2.24	110.76	113.94
2	B	301[A]	B12	O28-C27-N29	-2.24	116.56	122.53
2	C	301[A]	B12	C9B-C4B-C5B	-2.23	116.69	120.83
2	B	301[A]	B12	C4B-C5B-C6B	2.23	122.96	119.69
2	A	301[A]	B12	C13-C14-N23	2.23	112.11	109.09
2	A	301[A]	B12	O6R-C1R-N1B	-2.22	103.82	108.09
2	C	301[B]	B12	C9B-C4B-C5B	-2.21	116.73	120.83
2	B	301[A]	B12	C7B-C8B-C9B	2.21	125.12	122.47
2	B	301[A]	B12	C3R-C2R-C1R	2.21	104.74	99.89
2	C	301[A]	B12	C55-C56-C57	-2.21	106.33	111.25
2	A	301[A]	B12	C9B-N3B-C2B	2.20	107.11	104.40
2	C	301[B]	B12	C1-C2-C3	-2.20	98.83	101.60
2	B	301[A]	B12	C36-C7-C37	2.20	114.47	110.74
2	A	301[B]	B12	C5M-C5B-C6B	-2.20	116.28	120.76
2	A	301[B]	B12	C17-C16-N24	-2.19	107.83	111.17
2	C	301[B]	B12	O28-C27-N29	-2.19	116.69	122.53
2	C	301[A]	B12	C1-C2-C3	-2.19	98.85	101.60
2	C	301[A]	B12	C48-C13-C12	-2.18	110.28	116.52
3	D	302[B]	5AD	C6-C5-N7	2.18	136.30	132.09
2	D	301[A]	B12	C7B-C8B-N1B	-2.18	127.09	131.39
3	A	302[A]	5AD	O4'-C1'-N9	2.17	112.26	108.09
2	C	301[A]	B12	C12-C11-N23	2.17	114.81	111.83
3	B	302[A]	5AD	C2-N1-C6	2.16	122.28	118.73
2	B	301[A]	B12	C1-C19-N24	-2.16	103.84	106.25
2	C	301[A]	B12	C36-C7-C37	2.16	114.40	110.74
2	A	301[B]	B12	C3R-C2R-C1R	2.15	104.62	99.89
2	D	301[B]	B12	C9B-C4B-C5B	-2.15	116.84	120.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	301[A]	B12	C48-C13-C12	-2.14	110.39	116.52
3	D	302[A]	5AD	C6-C5-N7	2.13	136.21	132.09
2	D	301[B]	B12	C13-C14-N23	2.13	111.98	109.09
2	D	301[A]	B12	O28-C27-C26	2.13	128.57	121.98
2	B	301[A]	B12	O39-C38-C37	-2.12	115.40	121.98
2	B	301[B]	B12	C20-C1-N21	2.12	113.77	110.26
3	C	302[A]	5AD	C4-N9-C8	2.12	107.96	105.74
2	D	301[B]	B12	C9B-N3B-C2B	2.12	107.00	104.40
2	B	301[A]	B12	C20-C1-C19	-2.11	107.32	109.35
2	C	301[B]	B12	C56-C55-C17	-2.10	111.53	115.58
2	D	301[A]	B12	C37-C7-C8	-2.10	102.82	108.37
2	B	301[A]	B12	C9B-C4B-C5B	-2.09	116.96	120.83
2	C	301[B]	B12	C56-C57-N59	-2.09	112.54	116.34
2	D	301[B]	B12	C2-C3-C4	2.09	103.99	101.64
2	A	301[A]	B12	O2-C3R-C4R	-2.08	102.70	110.03
2	A	301[B]	B12	C9B-C4B-C5B	-2.07	116.98	120.83
2	A	301[B]	B12	C8B-C9B-N3B	-2.06	107.77	110.00
2	A	301[B]	B12	O6R-C1R-N1B	-2.06	104.13	108.09
3	C	302[A]	5AD	C6-C5-N7	2.06	136.06	132.09
2	B	301[A]	B12	O3-C2P-C1P	-2.06	102.87	106.94
2	C	301[A]	B12	O44-C43-N45	-2.05	117.07	122.53
2	D	301[B]	B12	C42-C43-N45	2.04	123.05	116.49
2	A	301[B]	B12	C37-C7-C8	-2.04	102.97	108.37
3	D	302[A]	5AD	O4'-C1'-N9	2.04	112.01	108.09
2	C	301[A]	B12	C42-C43-N45	2.04	123.04	116.49
2	B	301[A]	B12	C31-C32-N33	2.04	123.03	116.49
3	C	302[A]	5AD	C3'-C2'-C1'	2.04	105.32	101.46
3	B	302[B]	5AD	C6-C5-N7	2.04	136.02	132.09
2	C	301[A]	B12	C4B-C9B-N3B	2.03	133.92	130.51
2	C	301[A]	B12	C13-C14-C15	-2.03	121.23	124.32
2	D	301[B]	B12	C41-C8-C9	-2.02	107.66	111.19
2	D	301[B]	B12	C1-C2-C3	-2.02	99.06	101.60
2	C	301[B]	B12	C53-C15-C16	2.02	123.78	120.36
2	D	301[A]	B12	C49-C48-C13	-2.01	108.94	114.65
2	D	301[A]	B12	C53-C15-C16	2.01	123.78	120.36
2	A	301[B]	B12	C2-C3-C4	2.01	103.91	101.64
2	A	301[A]	B12	C49-C48-C13	-2.01	108.95	114.65
2	C	301[B]	B12	C2-C26-C27	-2.01	109.60	115.19

There are no chirality outliers.

All (124) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301[A]	B12	C1P-C2P-O3-P
2	A	301[A]	B12	C3P-C2P-O3-P
2	A	301[B]	B12	C1P-C2P-O3-P
2	A	301[B]	B12	C3P-C2P-O3-P
2	A	301[B]	B12	C2R-C1R-N1B-C8B
2	B	301[A]	B12	C18-C60-C61-O63
2	B	301[A]	B12	C18-C60-C61-N62
2	B	301[A]	B12	N59-C1P-C2P-O3
2	B	301[A]	B12	C3R-O2-P-O3
2	B	301[A]	B12	C3R-O2-P-O4
2	B	301[B]	B12	C18-C60-C61-O63
2	B	301[B]	B12	C18-C60-C61-N62
2	B	301[B]	B12	C3R-O2-P-O3
2	B	301[B]	B12	C3R-O2-P-O4
2	C	301[A]	B12	C3P-C2P-O3-P
2	C	301[A]	B12	C3R-C4R-C5R-O8R
2	C	301[B]	B12	C1P-C2P-O3-P
2	C	301[B]	B12	C3P-C2P-O3-P
2	C	301[B]	B12	C3R-C4R-C5R-O8R
2	C	301[B]	B12	O6R-C4R-C5R-O8R
2	D	301[A]	B12	C2R-C3R-O2-P
2	C	301[A]	B12	O6R-C4R-C5R-O8R
2	A	301[A]	B12	O6R-C4R-C5R-O8R
2	A	301[A]	B12	C3R-C4R-C5R-O8R
2	D	301[B]	B12	C2R-C3R-O2-P
2	D	301[A]	B12	C4R-C3R-O2-P
2	D	301[B]	B12	C4R-C3R-O2-P
2	D	301[B]	B12	C4-C3-C30-C31
2	A	301[B]	B12	C2-C26-C27-N29
2	A	301[A]	B12	C2R-C1R-N1B-C8B
2	A	301[A]	B12	O6R-C1R-N1B-C8B
2	A	301[B]	B12	O6R-C1R-N1B-C8B
2	B	301[A]	B12	C2R-C1R-N1B-C8B
2	B	301[A]	B12	O6R-C1R-N1B-C8B
2	B	301[B]	B12	C2R-C1R-N1B-C8B
2	B	301[B]	B12	O6R-C1R-N1B-C8B
2	C	301[A]	B12	C2R-C1R-N1B-C8B
2	C	301[A]	B12	O6R-C1R-N1B-C8B
2	C	301[B]	B12	C2R-C1R-N1B-C8B
2	C	301[B]	B12	O6R-C1R-N1B-C8B
2	D	301[A]	B12	C2R-C1R-N1B-C8B
2	D	301[A]	B12	O6R-C1R-N1B-C8B
2	D	301[B]	B12	C2R-C1R-N1B-C8B

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Mol	Chain	Res	Type	Atoms
2	D	301[B]	B12	O6R-C1R-N1B-C8B
2	D	301[A]	B12	O6R-C4R-C5R-O8R
2	C	301[A]	B12	C1P-C2P-O3-P
2	D	301[B]	B12	C1P-C2P-O3-P
2	A	301[B]	B12	C2-C26-C27-O28
2	A	301[A]	B12	C2-C26-C27-N29
2	C	301[B]	B12	C2-C26-C27-N29
2	B	301[A]	B12	N59-C1P-C2P-C3P
2	A	301[A]	B12	C48-C49-C50-O51
2	B	301[B]	B12	C48-C49-C50-O51
2	B	301[B]	B12	C48-C49-C50-N52
2	D	301[A]	B12	C48-C49-C50-O51
2	D	301[A]	B12	C48-C49-C50-N52
2	D	301[B]	B12	C2-C3-C30-C31
2	A	301[A]	B12	C48-C49-C50-N52
2	A	301[B]	B12	C48-C49-C50-O51
2	A	301[B]	B12	C48-C49-C50-N52
2	B	301[A]	B12	C1P-C2P-O3-P
2	B	301[B]	B12	C1P-C2P-O3-P
2	B	301[B]	B12	C3P-C2P-O3-P
2	D	301[B]	B12	C3P-C2P-O3-P
2	D	301[B]	B12	C12-C13-C48-C49
2	A	301[A]	B12	N59-C1P-C2P-C3P
2	A	301[B]	B12	N59-C1P-C2P-C3P
2	A	301[A]	B12	C17-C18-C60-C61
2	D	301[B]	B12	C17-C18-C60-C61
2	B	301[A]	B12	C48-C49-C50-O51
2	A	301[B]	B12	C38-C37-C7-C36
2	B	301[B]	B12	C38-C37-C7-C36
2	C	301[B]	B12	C38-C37-C7-C36
2	A	301[A]	B12	C3R-O2-P-O4
2	A	301[B]	B12	C3R-O2-P-O4
2	B	301[B]	B12	N59-C1P-C2P-O3
2	C	301[B]	B12	C30-C31-C32-N33
2	C	301[B]	B12	C2-C26-C27-O28
2	C	301[B]	B12	C30-C31-C32-O34
2	A	301[A]	B12	C42-C41-C8-C9
2	B	301[A]	B12	C42-C41-C8-C9
2	A	301[A]	B12	C2-C26-C27-O28
2	D	301[A]	B12	N59-C1P-C2P-C3P
2	D	301[B]	B12	N59-C1P-C2P-C3P
2	A	301[A]	B12	C19-C18-C60-C61

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Mol	Chain	Res	Type	Atoms
2	B	301[A]	B12	C17-C18-C60-C61
2	B	301[B]	B12	C17-C18-C60-C61
2	C	301[A]	B12	C17-C18-C60-C61
2	C	301[A]	B12	C19-C18-C60-C61
2	C	301[B]	B12	C17-C18-C60-C61
2	A	301[B]	B12	C42-C41-C8-C9
2	D	301[B]	B12	C14-C13-C48-C49
2	B	301[A]	B12	C48-C49-C50-N52
2	A	301[A]	B12	C38-C37-C7-C36
2	B	301[B]	B12	C42-C41-C8-C9
2	A	301[A]	B12	C2P-C1P-N59-C57
2	A	301[B]	B12	C17-C18-C60-C61
2	A	301[B]	B12	C19-C18-C60-C61
2	B	301[A]	B12	C19-C18-C60-C61
2	B	301[B]	B12	C19-C18-C60-C61
2	C	301[B]	B12	C19-C18-C60-C61
2	D	301[A]	B12	C17-C18-C60-C61
2	D	301[A]	B12	C19-C18-C60-C61
2	D	301[B]	B12	C19-C18-C60-C61
2	D	301[A]	B12	C4-C3-C30-C31
2	D	301[B]	B12	C42-C41-C8-C9
2	D	301[A]	B12	C18-C60-C61-O63
2	B	301[A]	B12	C55-C56-C57-O58
2	B	301[A]	B12	C3P-C2P-O3-P
2	B	301[B]	B12	C55-C56-C57-O58
2	D	301[A]	B12	C42-C41-C8-C9
2	D	301[B]	B12	C48-C49-C50-O51
2	B	301[A]	B12	C55-C56-C57-N59
2	C	301[B]	B12	C18-C17-C55-C56
2	A	301[B]	B12	C3-C30-C31-C32
2	B	301[B]	B12	C55-C56-C57-N59
2	D	301[A]	B12	C2P-C1P-N59-C57
2	B	301[A]	B12	C38-C37-C7-C36
2	B	301[B]	B12	C38-C37-C7-C8
2	D	301[B]	B12	C48-C49-C50-N52
2	C	301[B]	B12	C55-C56-C57-O58
2	A	301[B]	B12	C55-C56-C57-O58
2	A	301[B]	B12	C38-C37-C7-C8
2	C	301[B]	B12	C38-C37-C7-C8

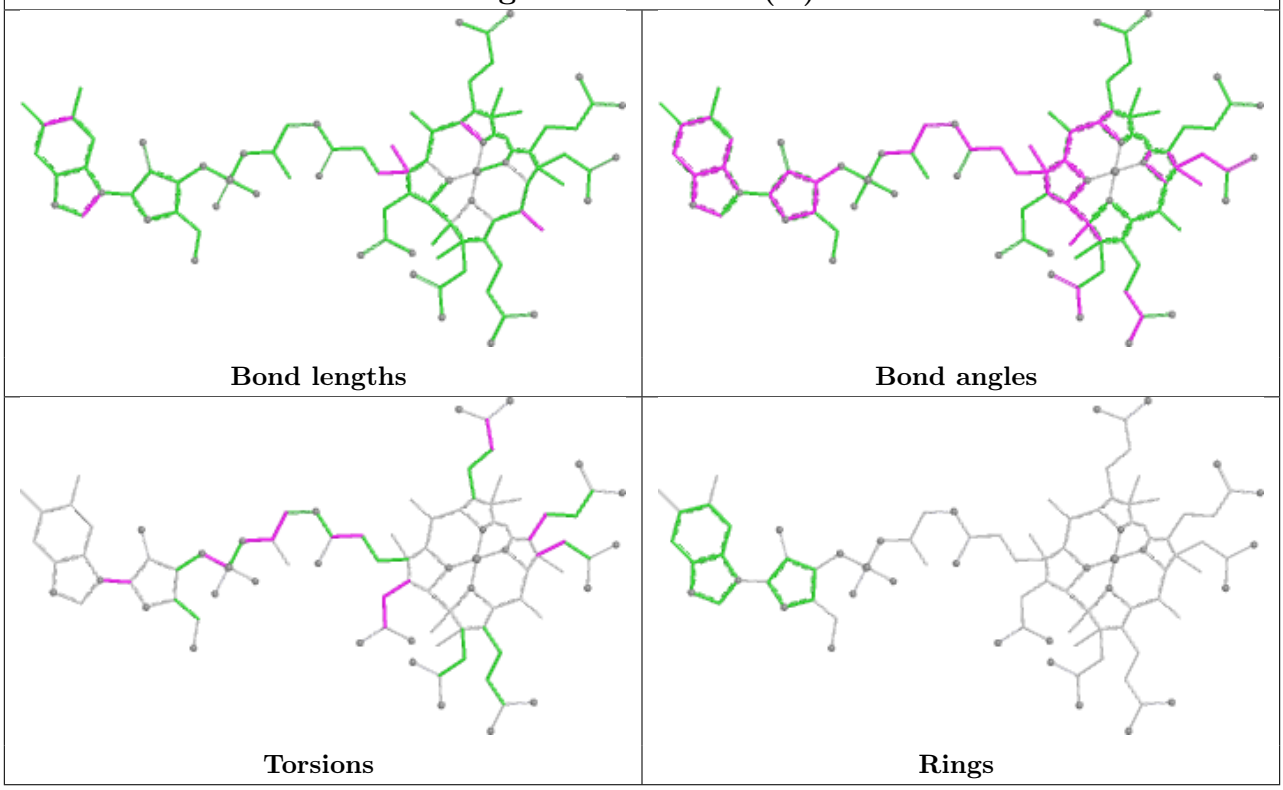
There are no ring outliers.

13 monomers are involved in 82 short contacts:

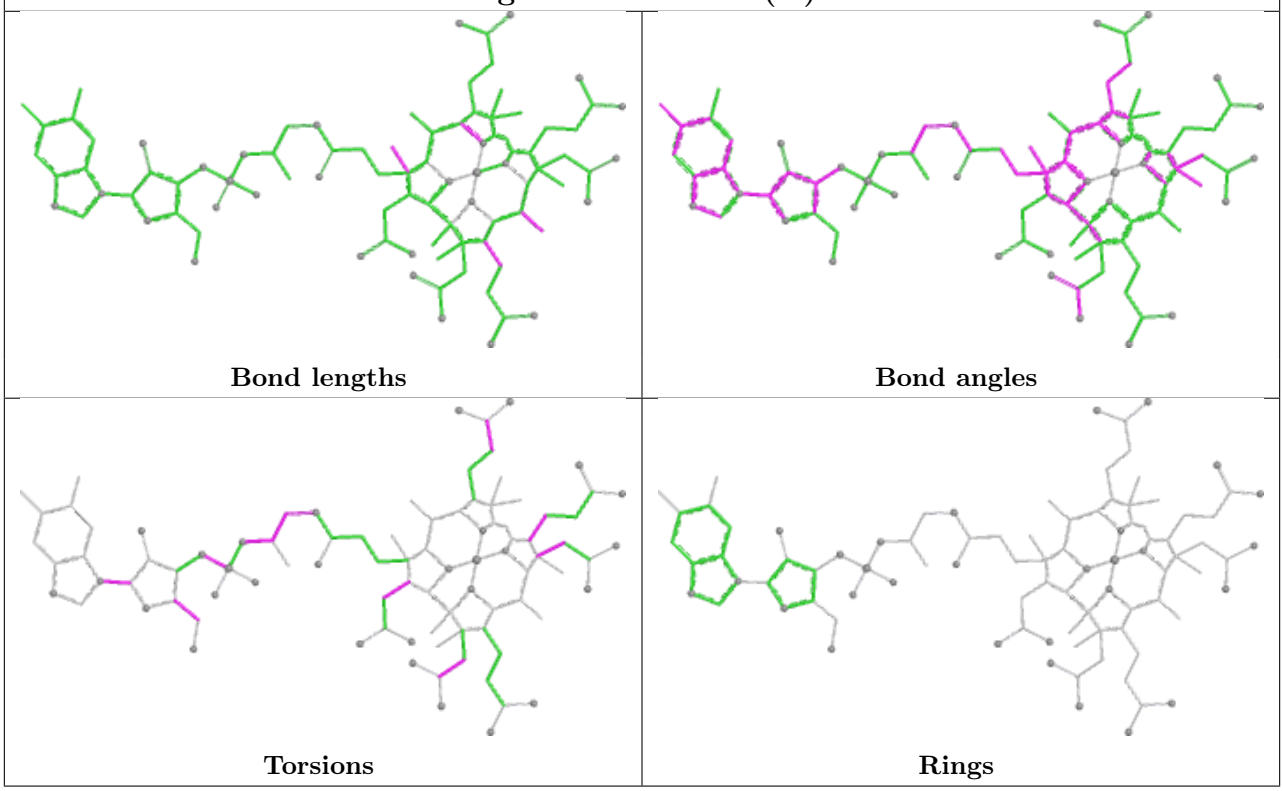
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	301[A]	B12	8	0
2	A	301[A]	B12	8	0
3	B	302[A]	5AD	3	0
3	D	302[B]	5AD	3	0
2	A	301[B]	B12	14	0
2	B	301[B]	B12	12	0
2	D	301[B]	B12	15	0
3	A	302[A]	5AD	1	0
3	B	302[B]	5AD	7	0
3	C	302[B]	5AD	3	0
3	A	302[B]	5AD	3	0
2	D	301[A]	B12	8	0
2	C	301[B]	B12	8	0

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.

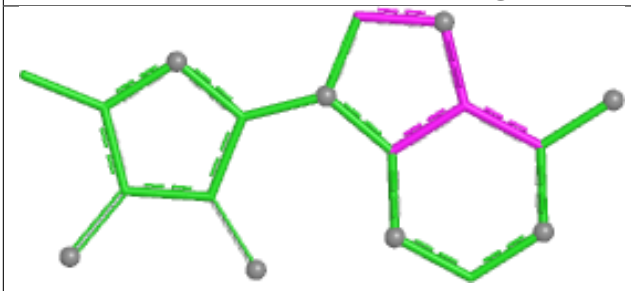
Ligand B12 B 301 (A)



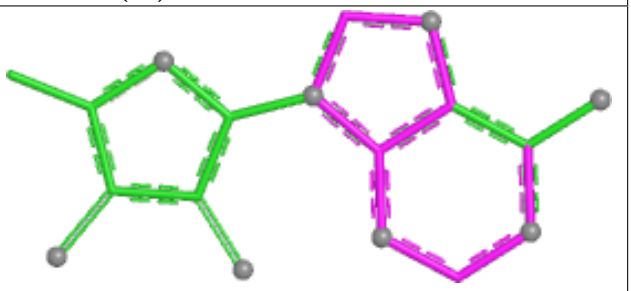
Ligand B12 A 301 (A)



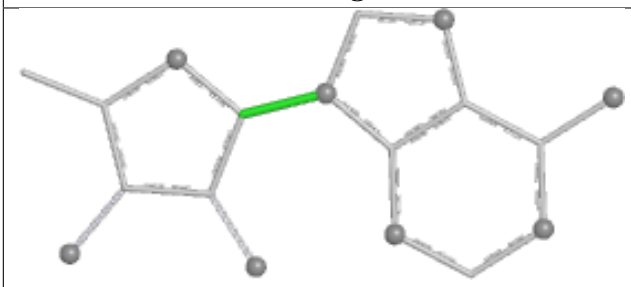
Ligand 5AD B 302 (A)



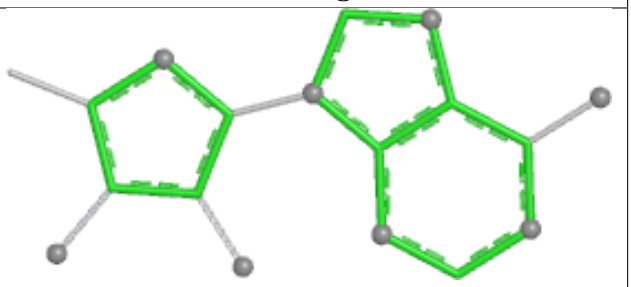
Bond lengths



Bond angles

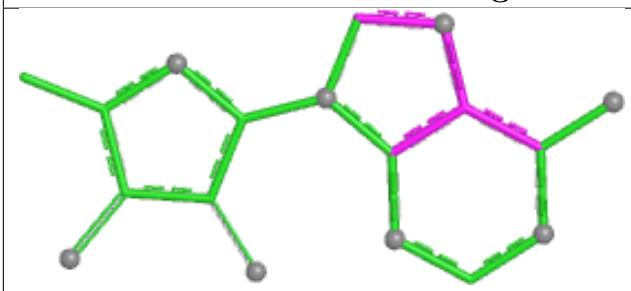


Torsions

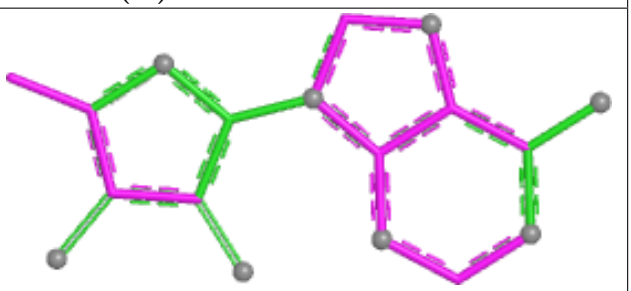


Rings

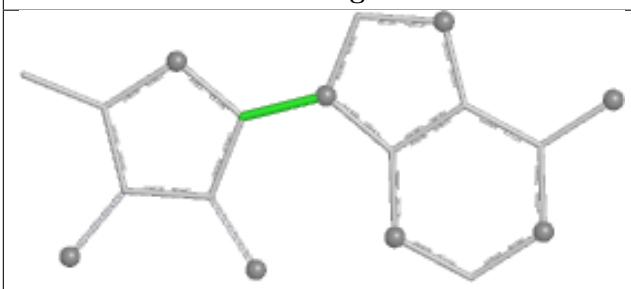
Ligand 5AD D 302 (B)



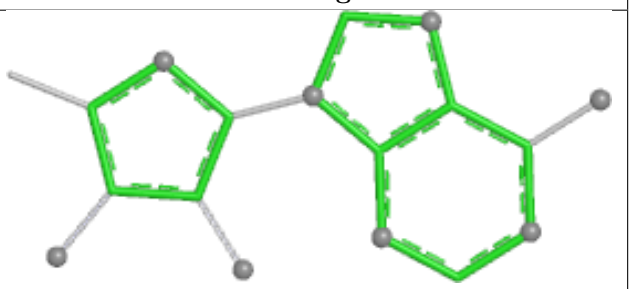
Bond lengths



Bond angles

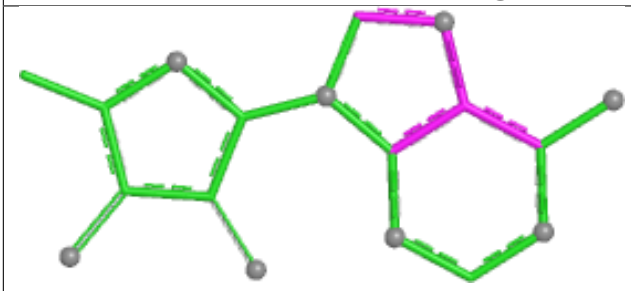


Torsions

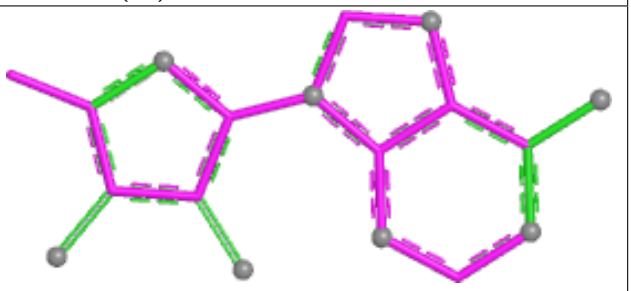


Rings

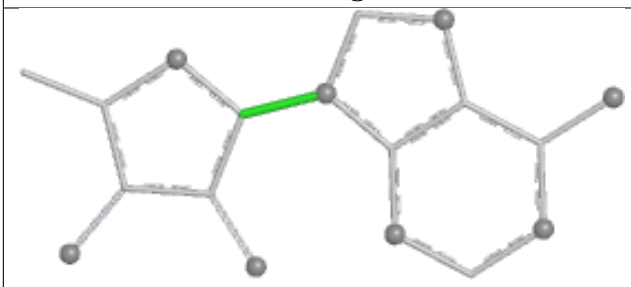
Ligand 5AD C 302 (A)



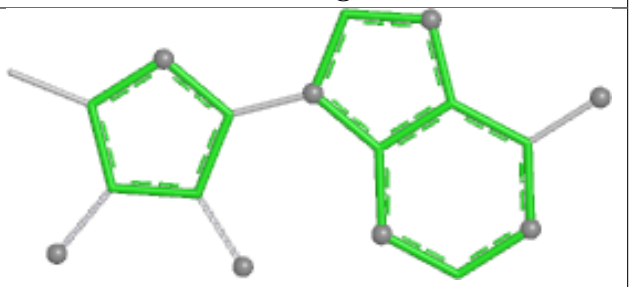
Bond lengths



Bond angles

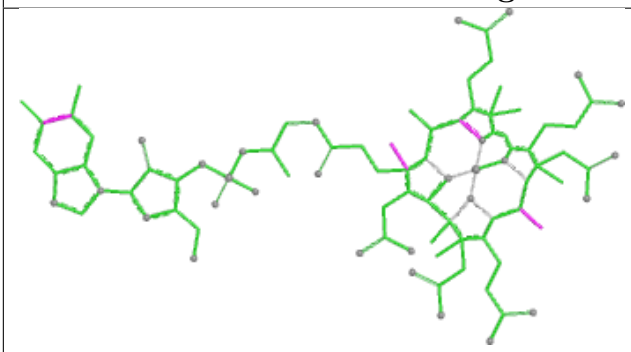


Torsions

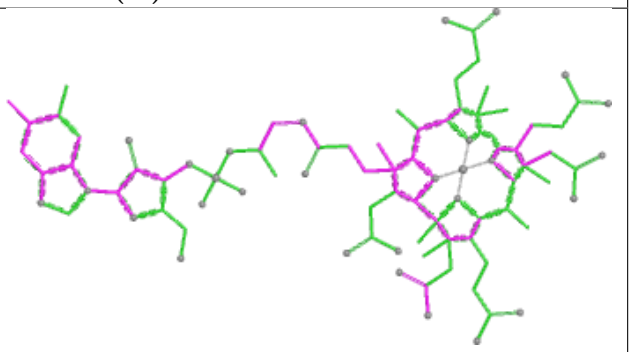


Rings

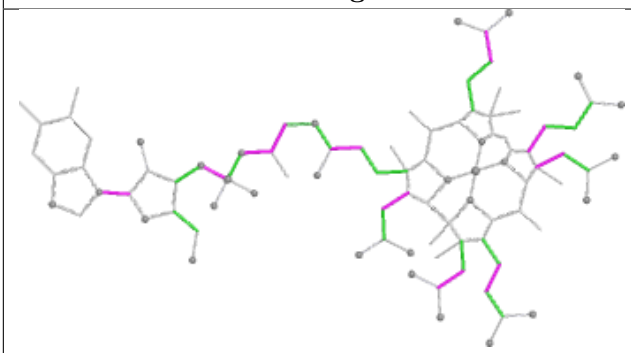
Ligand B12 A 301 (B)



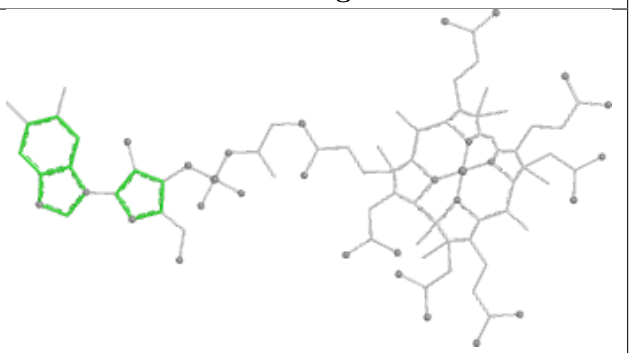
Bond lengths



Bond angles

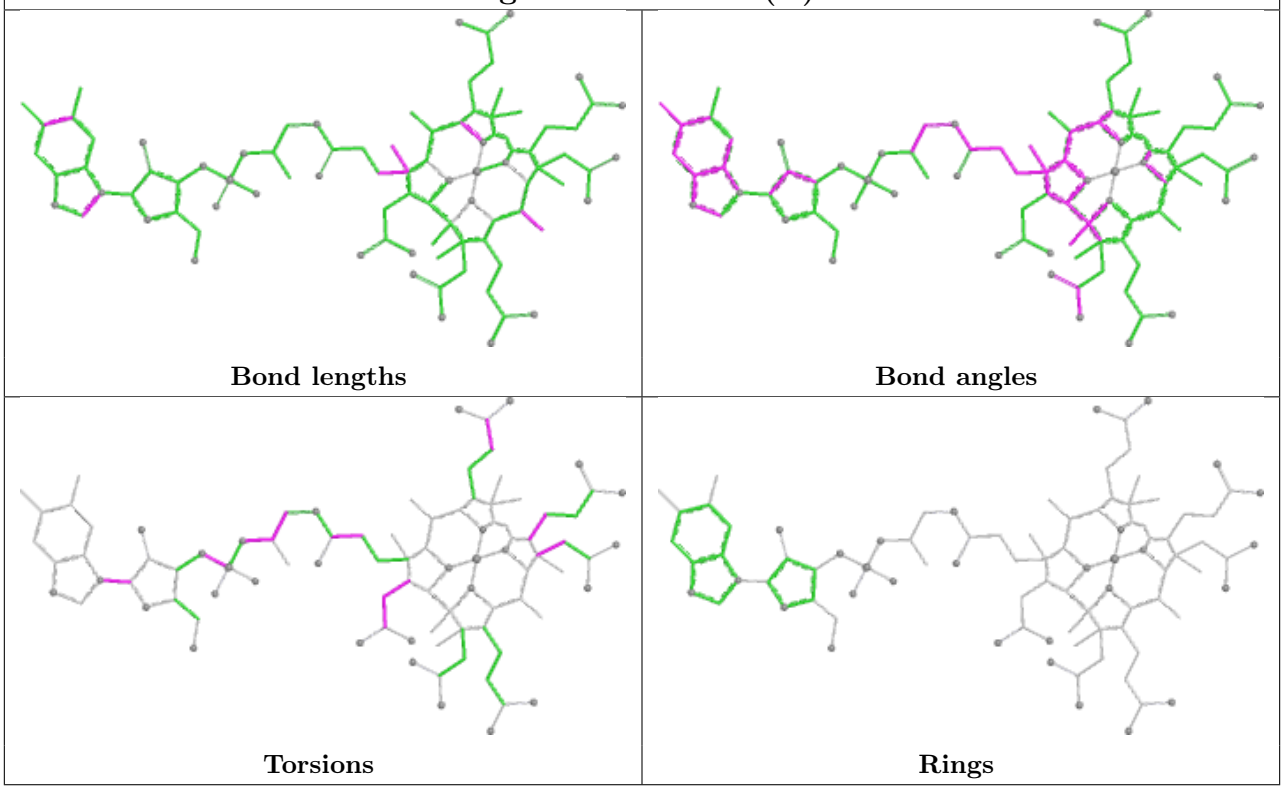


Torsions

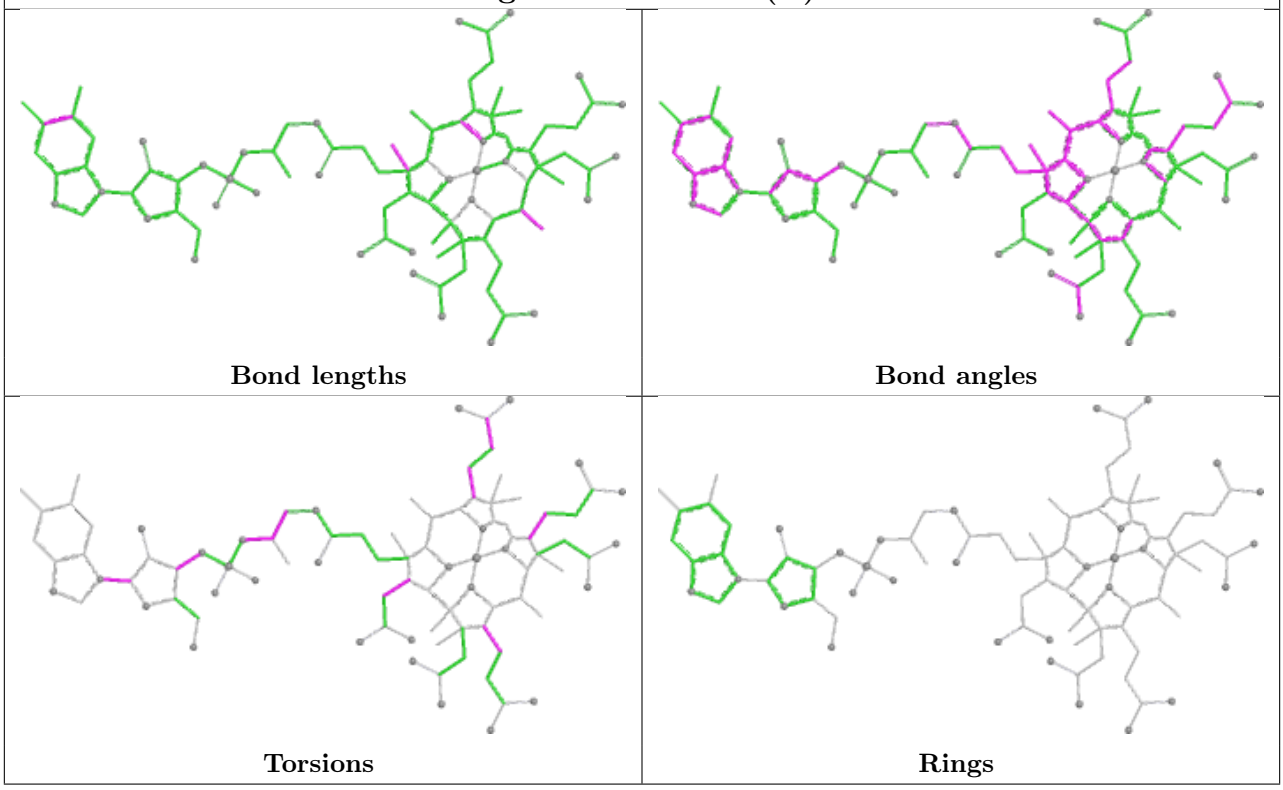


Rings

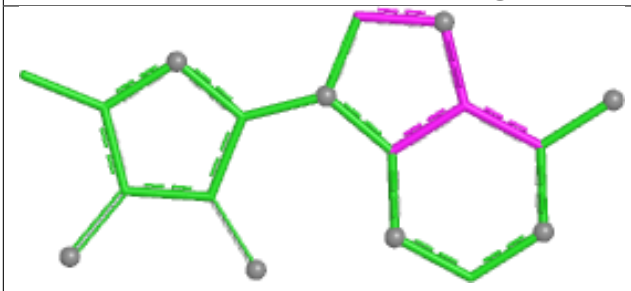
Ligand B12 B 301 (B)



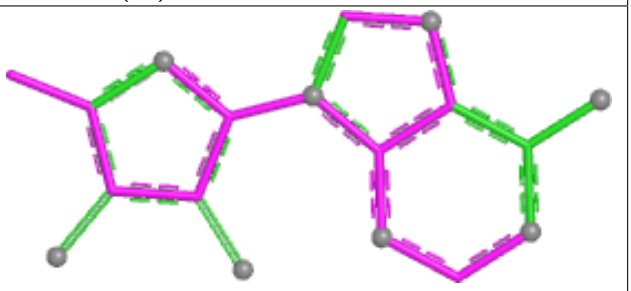
Ligand B12 D 301 (B)



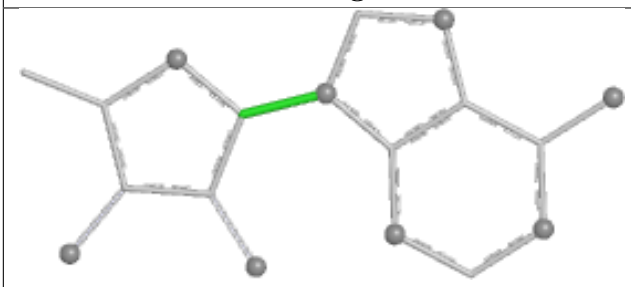
Ligand 5AD A 302 (A)



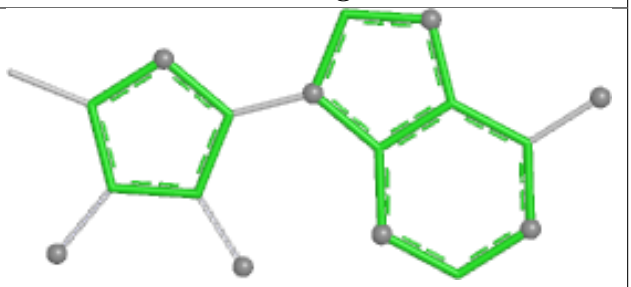
Bond lengths



Bond angles

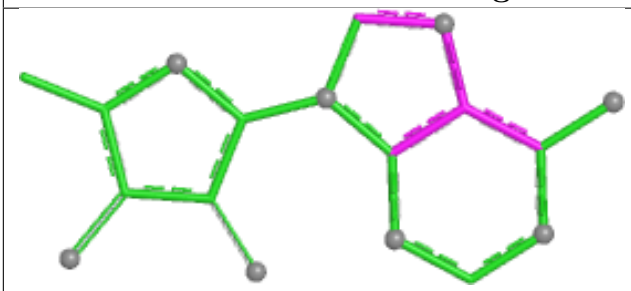


Torsions

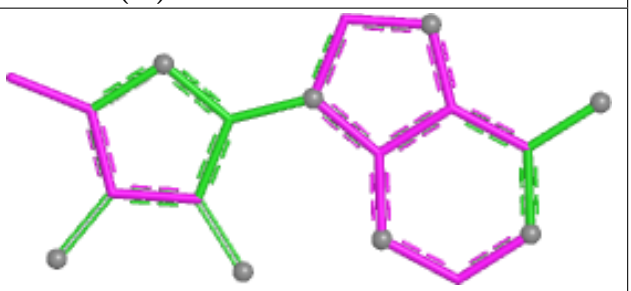


Rings

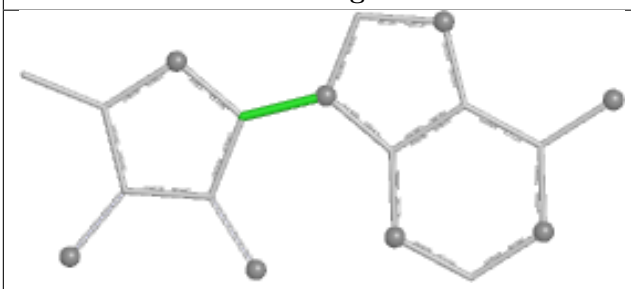
Ligand 5AD B 302 (B)



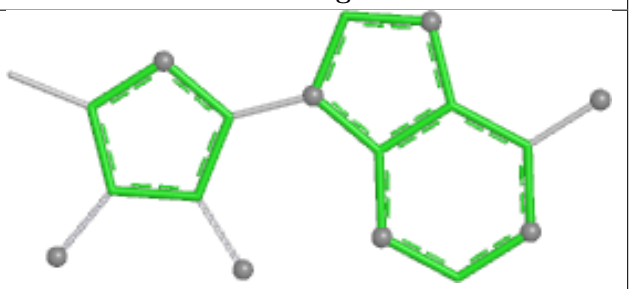
Bond lengths



Bond angles

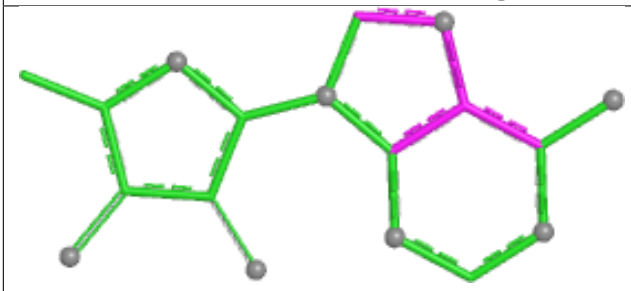


Torsions

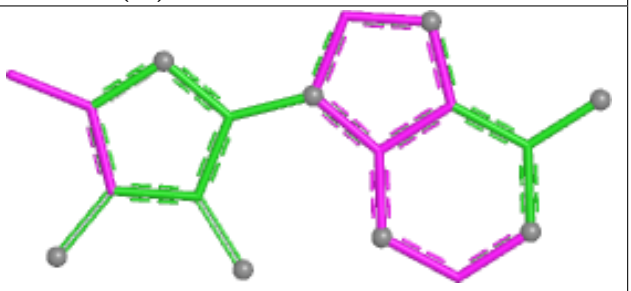


Rings

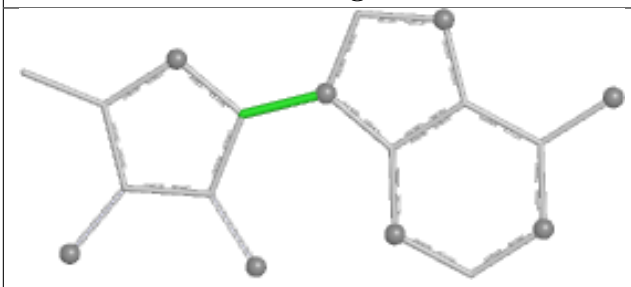
Ligand 5AD C 302 (B)



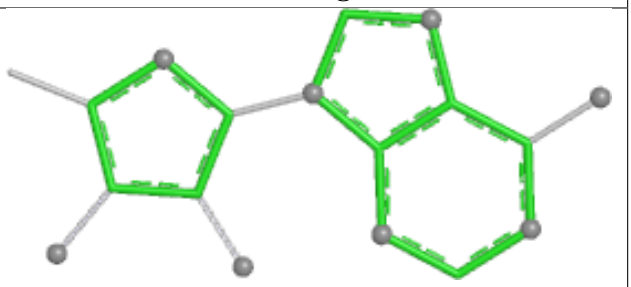
Bond lengths



Bond angles

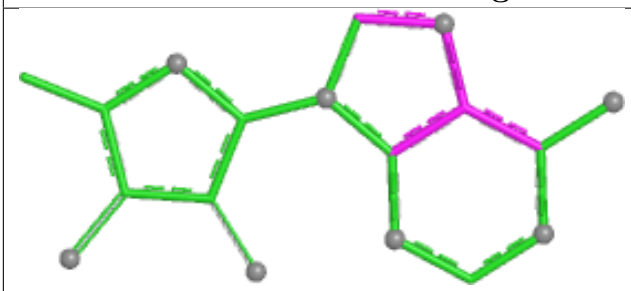


Torsions

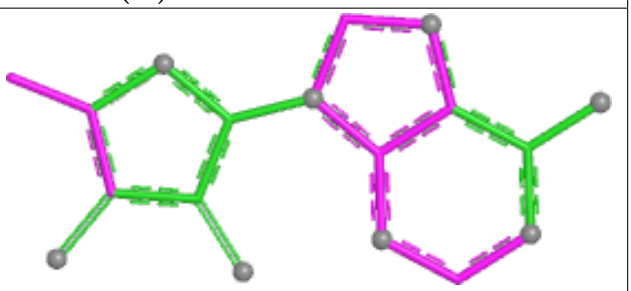


Rings

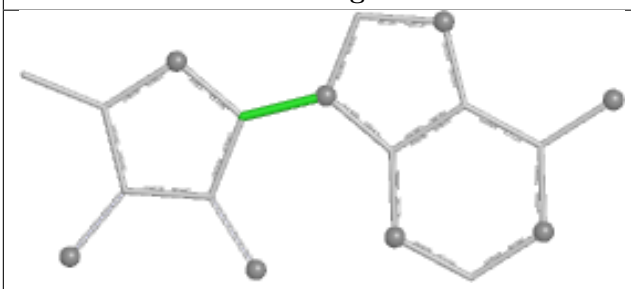
Ligand 5AD A 302 (B)



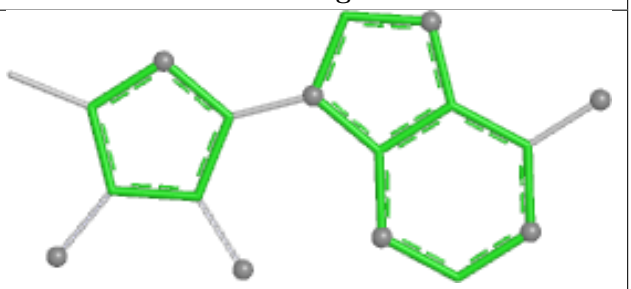
Bond lengths



Bond angles

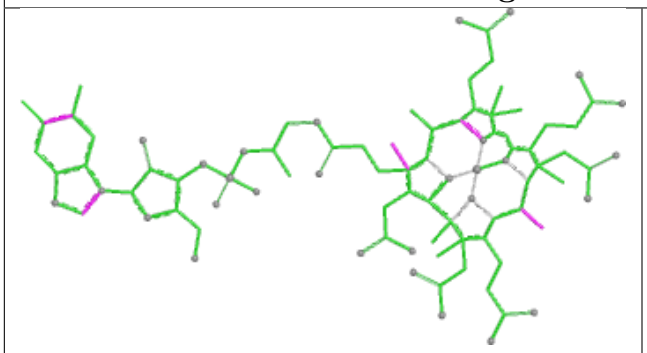


Torsions

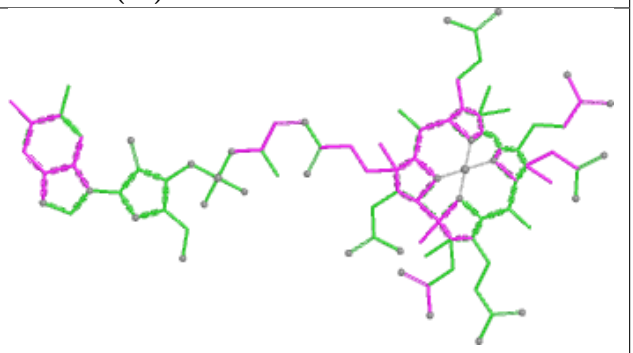


Rings

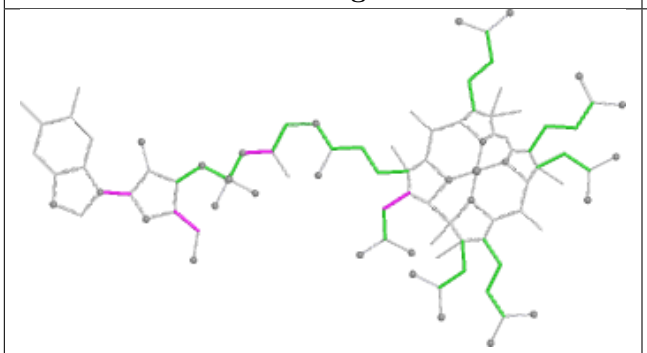
Ligand B12 C 301 (A)



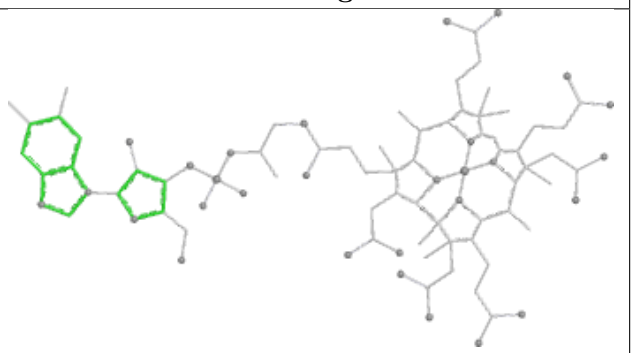
Bond lengths



Bond angles

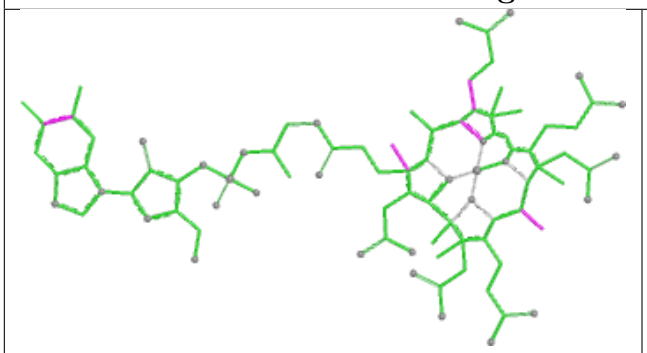


Torsions

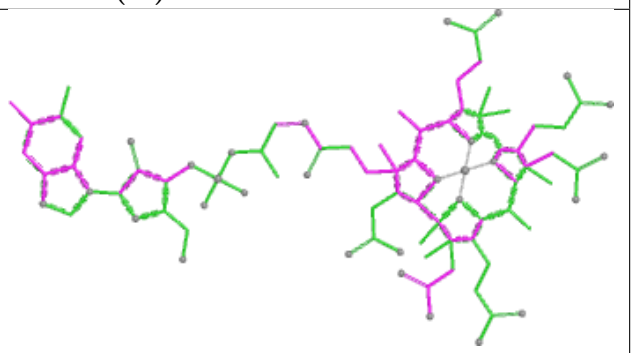


Rings

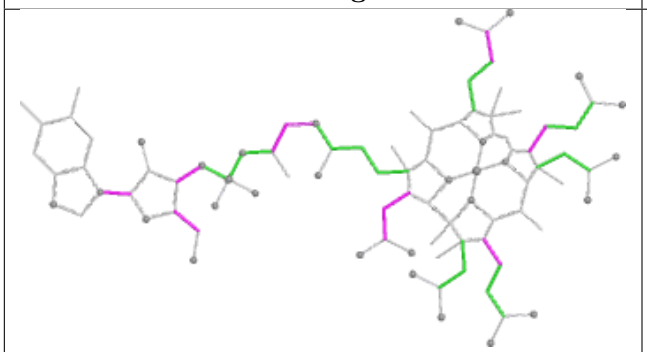
Ligand B12 D 301 (A)



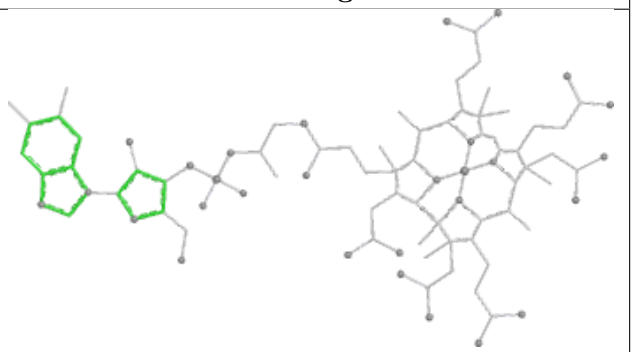
Bond lengths



Bond angles

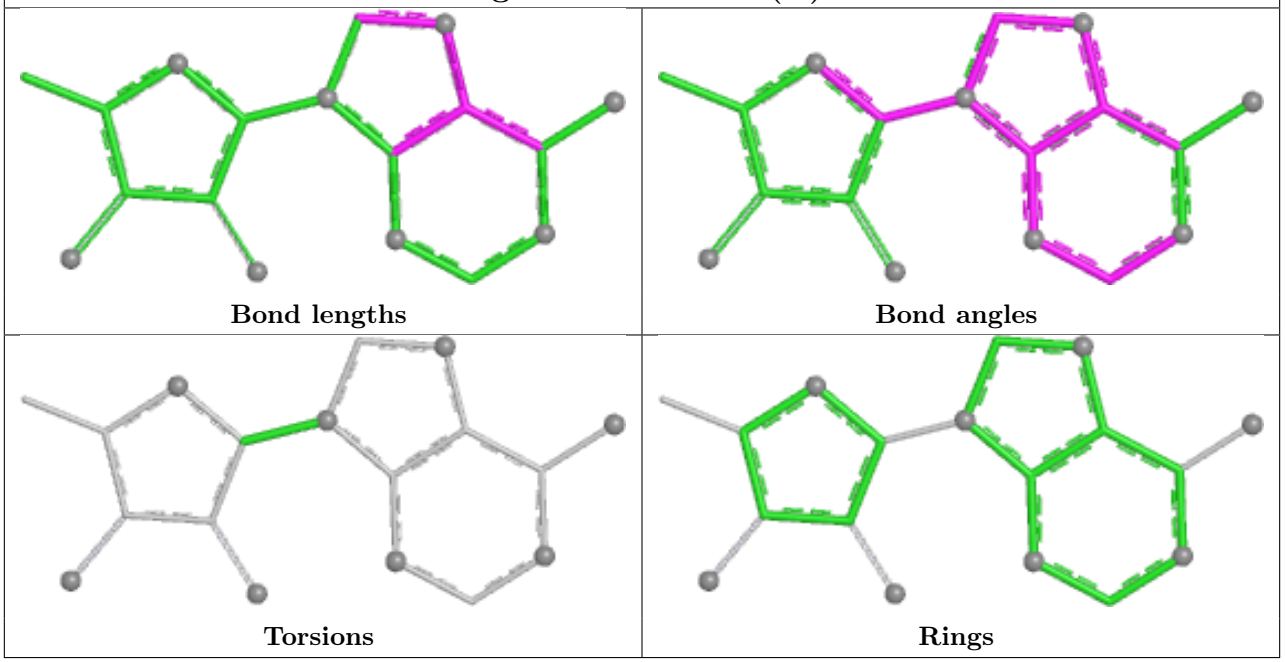


Torsions

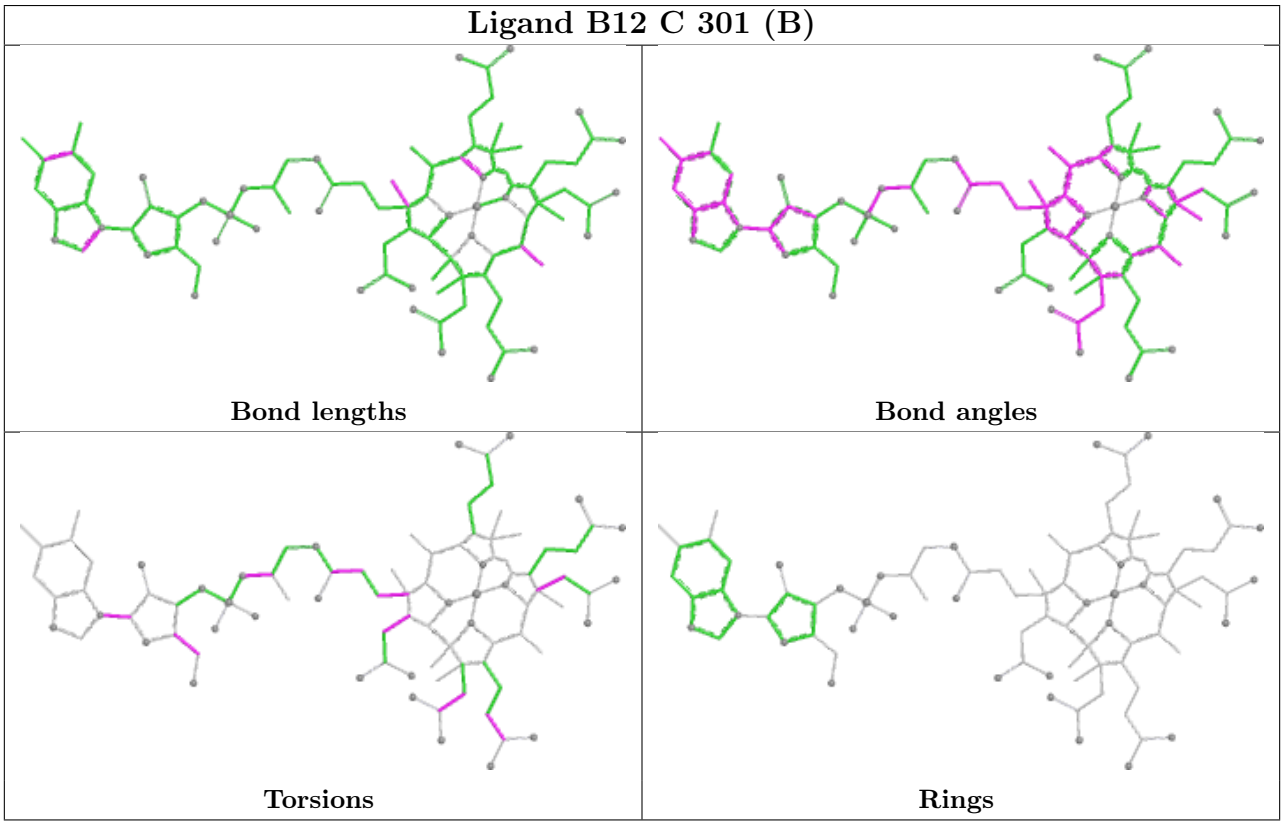


Rings

Ligand 5AD D 302 (A)



Ligand B12 C 301 (B)



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	197/215 (91%)	0.00	3 (1%) 72 69	9, 17, 37, 47	197 (100%)
1	B	196/215 (91%)	0.50	19 (9%) 13 10	10, 17, 35, 57	196 (100%)
1	C	195/215 (90%)	1.59	67 (34%) 1 0	11, 23, 44, 66	195 (100%)
1	D	197/215 (91%)	0.33	9 (4%) 37 34	10, 21, 41, 63	197 (100%)
All	All	785/860 (91%)	0.60	98 (12%) 8 6	9, 19, 40, 66	785 (100%)

All (98) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	128[A]	GLY	6.3
1	C	160[A]	GLY	5.8
1	B	275[A]	TRP	5.7
1	C	174[A]	GLY	4.8
1	C	240[A]	LEU	4.7
1	C	80[A]	PRO	4.6
1	C	228[A]	PRO	4.6
1	D	276[A]	LEU	4.6
1	B	124[A]	LEU	4.4
1	A	275[A]	TRP	4.3
1	C	204[A]	LEU	4.3
1	C	216[A]	ALA	4.3
1	C	236[A]	ALA	4.2
1	C	224[A]	VAL	4.2
1	D	161[A]	PHE	4.2
1	C	81[A]	GLU	4.0
1	C	251[A]	ALA	3.9
1	C	214[A]	LEU	3.8
1	C	209[A]	ALA	3.8
1	B	80[A]	PRO	3.8
1	C	171[A]	THR	3.7

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Mol	Chain	Res	Type	RSRZ
1	D	80[A]	PRO	3.7
1	C	167[A]	VAL	3.6
1	C	203[A]	PRO	3.6
1	B	138[A]	VAL	3.6
1	C	166[A]	PRO	3.5
1	C	249[A]	GLN	3.5
1	C	232[A]	LEU	3.5
1	C	253[A]	PRO	3.5
1	B	132[A]	ALA	3.5
1	D	267[A]	LEU	3.5
1	C	274[A]	LEU	3.3
1	A	131[A]	TRP	3.2
1	B	127[A]	VAL	3.2
1	C	230[A]	ARG	3.2
1	C	215[A]	GLY	3.2
1	C	210[A]	LEU	3.2
1	C	82[A]	ASP	3.1
1	C	245[A]	PHE	3.1
1	C	261[A]	ALA	3.1
1	B	270[A]	LEU	3.1
1	C	246[A]	LEU	3.1
1	C	267[A]	LEU	3.1
1	C	233[A]	PRO	3.0
1	C	237[A]	LEU	3.0
1	B	131[A]	TRP	3.0
1	B	112[A]	PRO	3.0
1	B	92[A]	LEU	2.8
1	B	274[A]	LEU	2.8
1	C	259[A]	LEU	2.8
1	A	132[A]	ALA	2.8
1	C	219[A]	VAL	2.8
1	D	138[A]	VAL	2.8
1	C	217[A]	GLY	2.8
1	C	188[A]	LEU	2.8
1	C	198[A]	LEU	2.8
1	C	163[A]	PRO	2.7
1	C	83[A]	LEU	2.7
1	C	88[A]	LEU	2.7
1	C	156[A]	LEU	2.7
1	C	270[A]	LEU	2.6
1	C	84[A]	GLY	2.6
1	C	225[A]	LEU	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	89[A]	GLU	2.6
1	D	132[A]	ALA	2.6
1	C	239[A]	ASP	2.6
1	C	247[A]	GLY	2.6
1	C	183[A]	LEU	2.6
1	C	229[A]	LEU	2.5
1	B	81[A]	GLU	2.5
1	C	227[A]	GLU	2.5
1	C	110[A]	TRP	2.5
1	C	223[A]	ALA	2.5
1	B	269[A]	GLY	2.4
1	D	275[A]	TRP	2.4
1	C	161[A]	PHE	2.4
1	C	221[A]	LEU	2.4
1	C	218[A]	ALA	2.3
1	B	163[A]	PRO	2.3
1	D	271[A]	ALA	2.3
1	C	208[A]	ARG	2.3
1	C	257[A]	ARG	2.3
1	C	234[A]	ASP	2.3
1	C	231[A]	ALA	2.3
1	B	226[A]	SER	2.3
1	C	124[A]	LEU	2.2
1	C	191[A]	LYS	2.2
1	B	93[A]	ARG	2.2
1	B	94[A]	GLY	2.2
1	C	243[A]	ARG	2.1
1	C	258[A]	ARG	2.1
1	D	81[A]	GLU	2.1
1	C	194[A]	PRO	2.1
1	C	238[A]	LYS	2.1
1	C	264[A]	MET	2.1
1	C	255[A]	GLU	2.0
1	C	176[A]	ARG	2.0
1	C	207[A]	LEU	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 oligosaccharides in this entry.

6.4 Ligands (i)

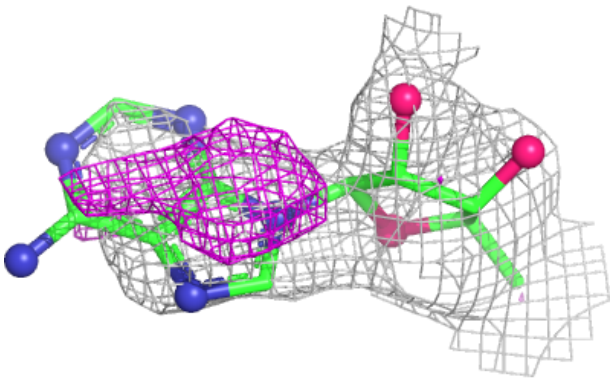
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

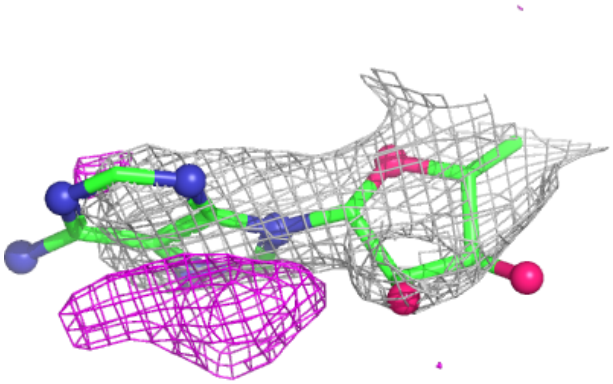
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	5AD	D	302[A]	18/18	0.77	0.13	74,92,102,106	18
3	5AD	D	302[B]	18/18	0.77	0.13	74,89,98,101	18
3	5AD	B	302[A]	18/18	0.81	0.14	65,79,88,90	18
3	5AD	B	302[B]	18/18	0.81	0.14	60,78,90,102	0
2	B12	C	301[A]	91/91	0.87	0.21	31,52,66,82	91
2	B12	C	301[B]	91/91	0.87	0.21	29,49,68,109	0
2	B12	A	301[A]	91/91	0.87	0.10	25,37,51,64	91
2	B12	A	301[B]	91/91	0.87	0.10	24,36,55,76	91
2	B12	B	301[A]	91/91	0.87	0.12	25,49,66,93	91
2	B12	B	301[B]	91/91	0.87	0.12	24,47,66,97	0
3	5AD	C	302[A]	18/18	0.88	0.19	43,52,60,64	18
3	5AD	C	302[B]	18/18	0.88	0.19	37,49,60,64	0
3	5AD	A	302[A]	18/18	0.89	0.10	41,52,65,66	18
3	5AD	A	302[B]	18/18	0.89	0.10	41,52,64,70	18
2	B12	D	301[A]	91/91	0.90	0.12	25,59,76,85	91
2	B12	D	301[B]	91/91	0.90	0.12	23,58,80,101	91

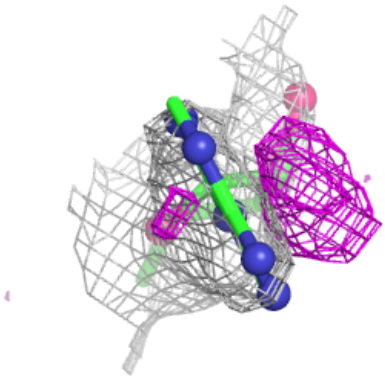
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 5AD D 302 (A):

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

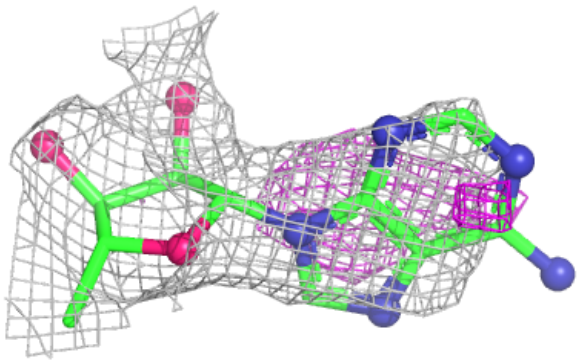


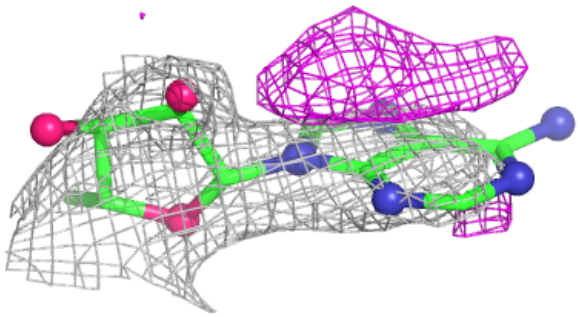


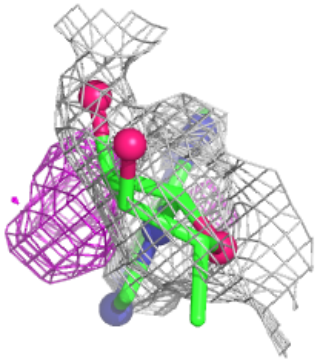


Electron density around 5AD D 302 (B):

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

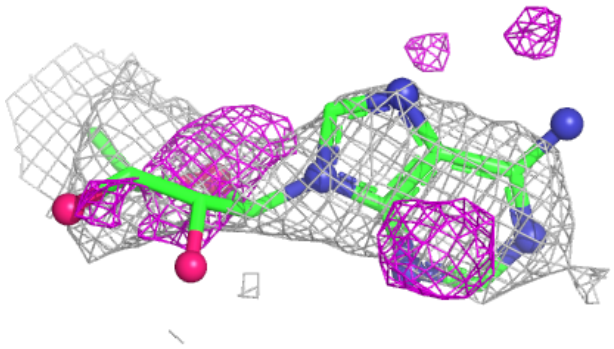


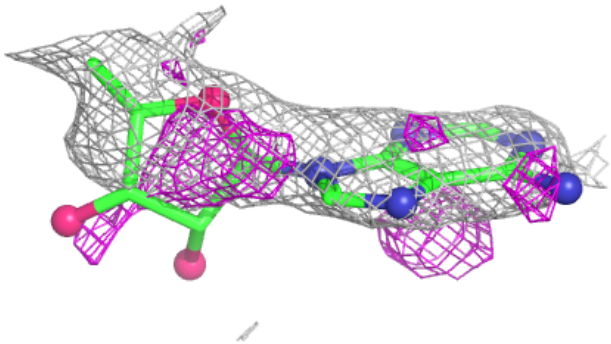


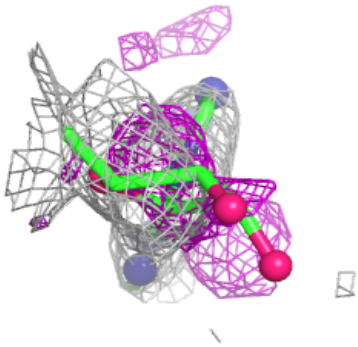


Electron density around 5AD B 302 (A):

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

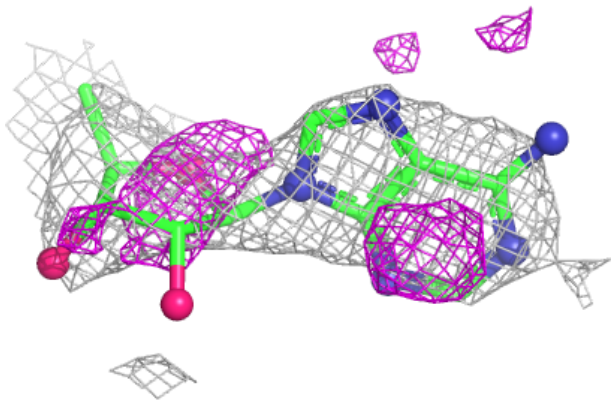


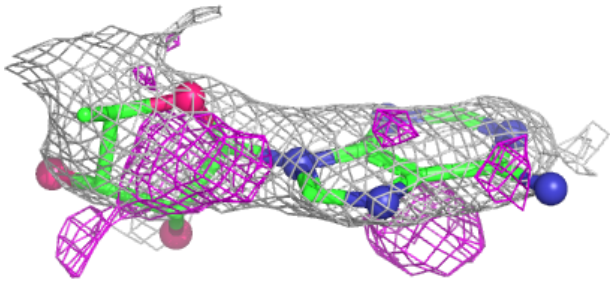


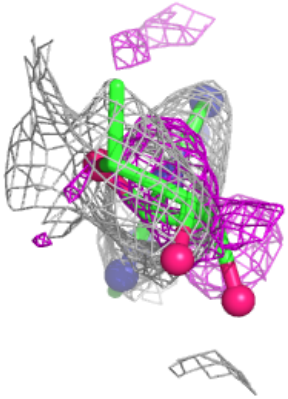


Electron density around 5AD B 302 (B):

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

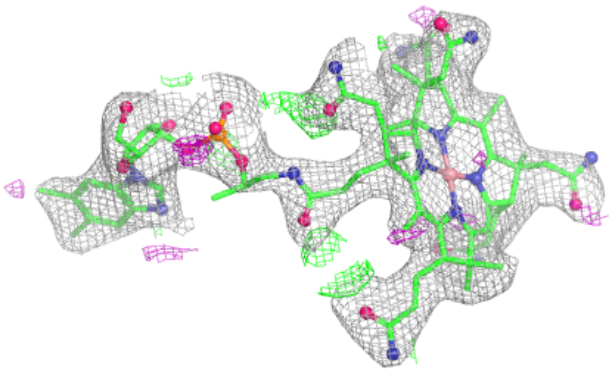


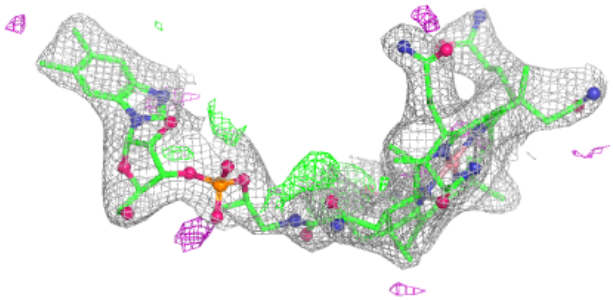


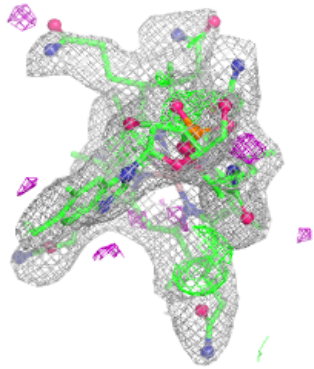


Electron density around B12 C 301 (A):

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

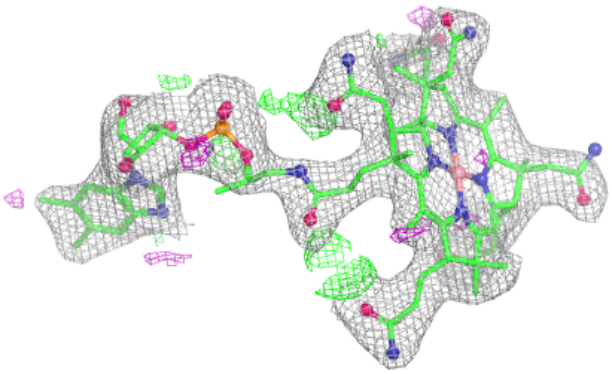


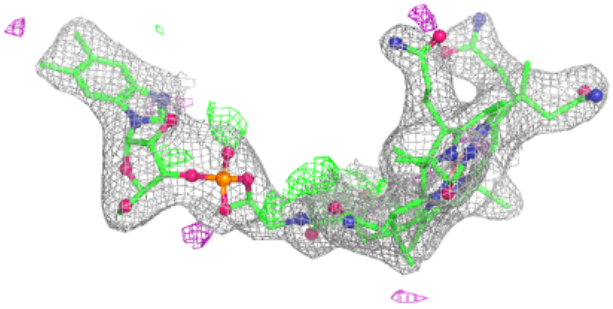




Electron density around B12 C 301 (B):

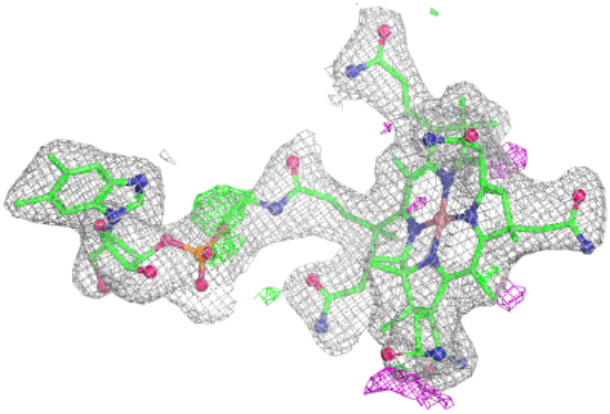
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

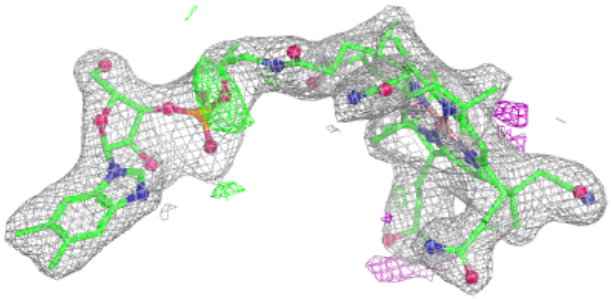


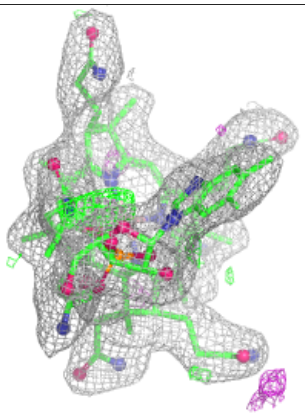


Electron density around B12 A 301 (A):

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

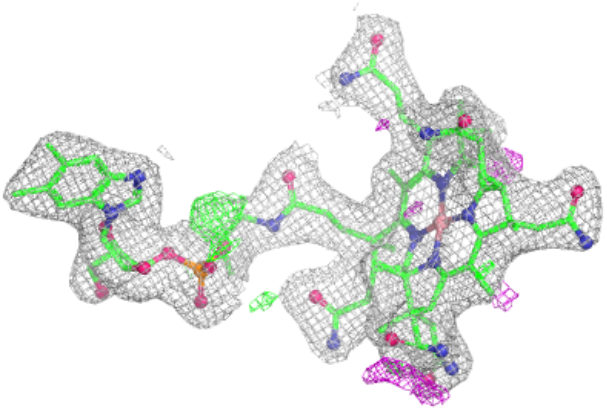


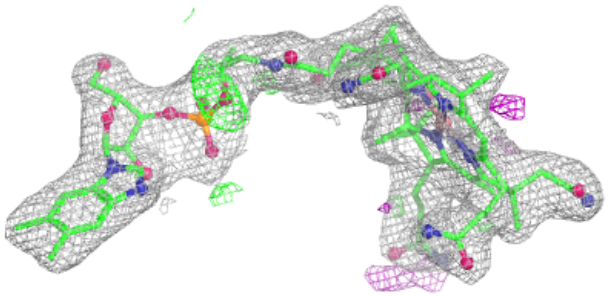


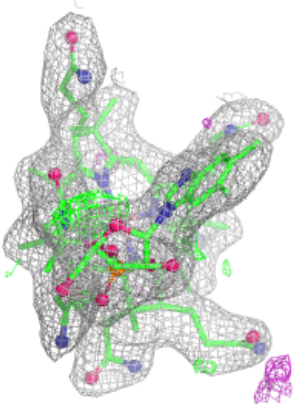


Electron density around B12 A 301 (B):

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

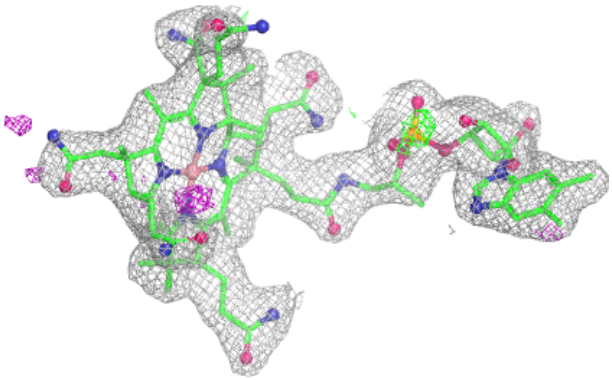


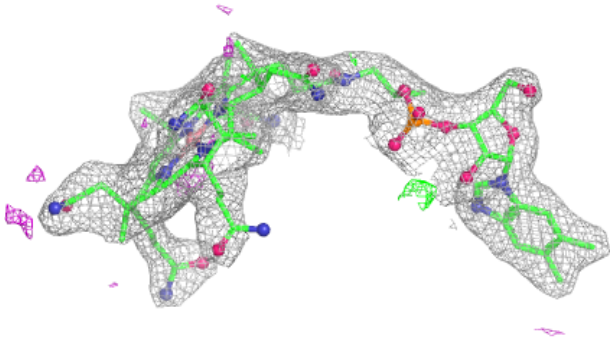


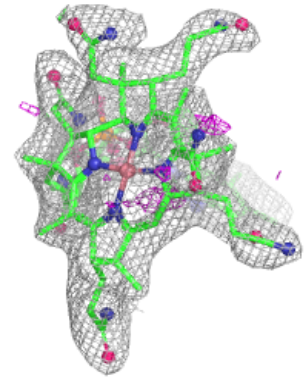


Electron density around B12 B 301 (A):

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

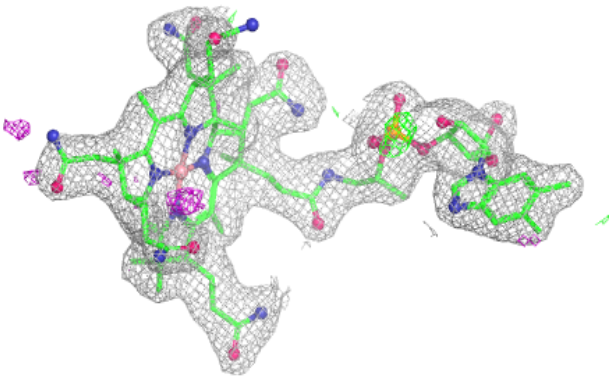


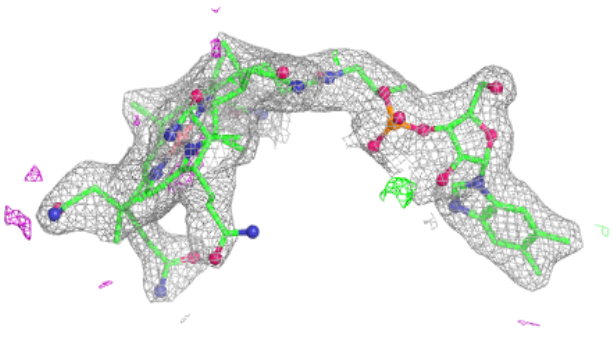


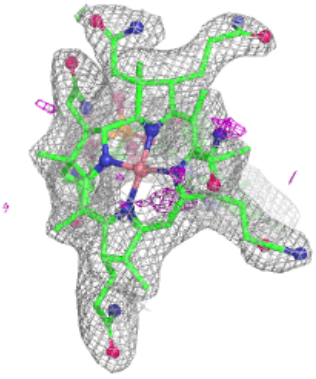


Electron density around B12 B 301 (B):

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

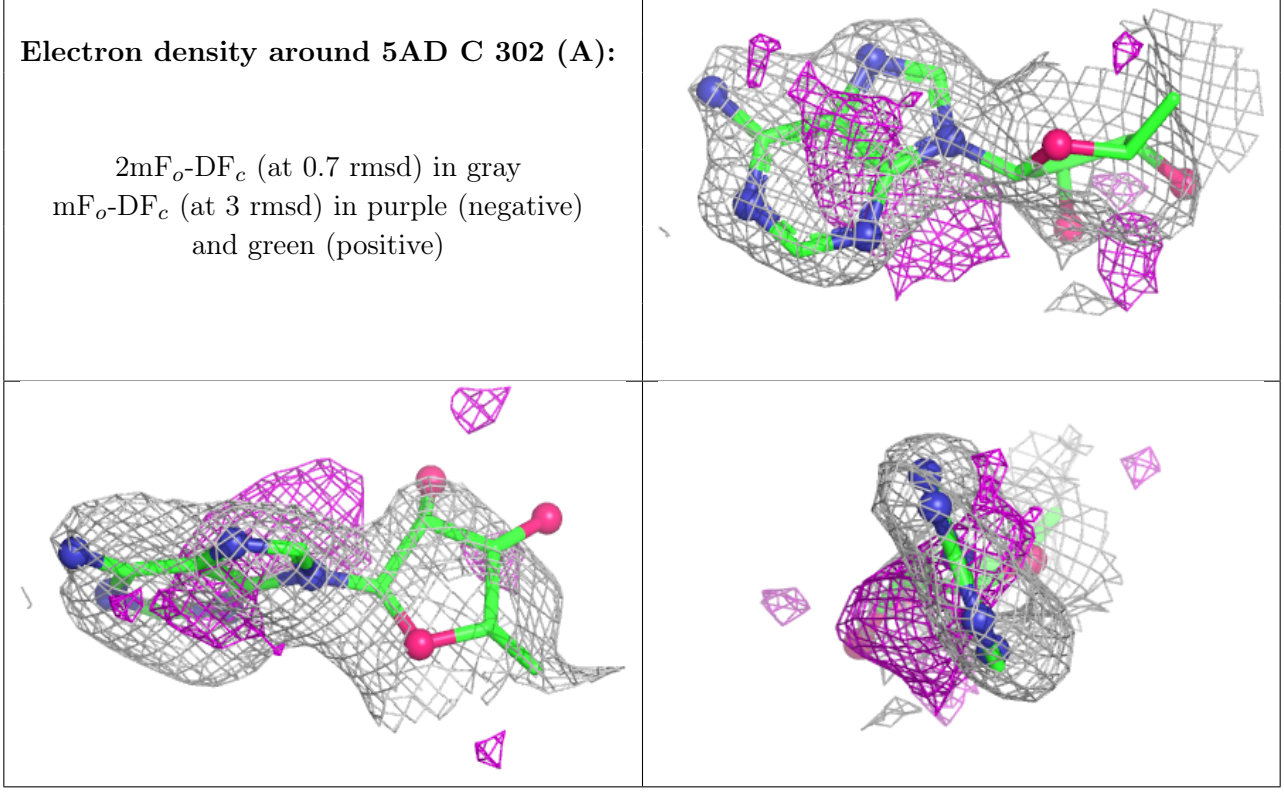






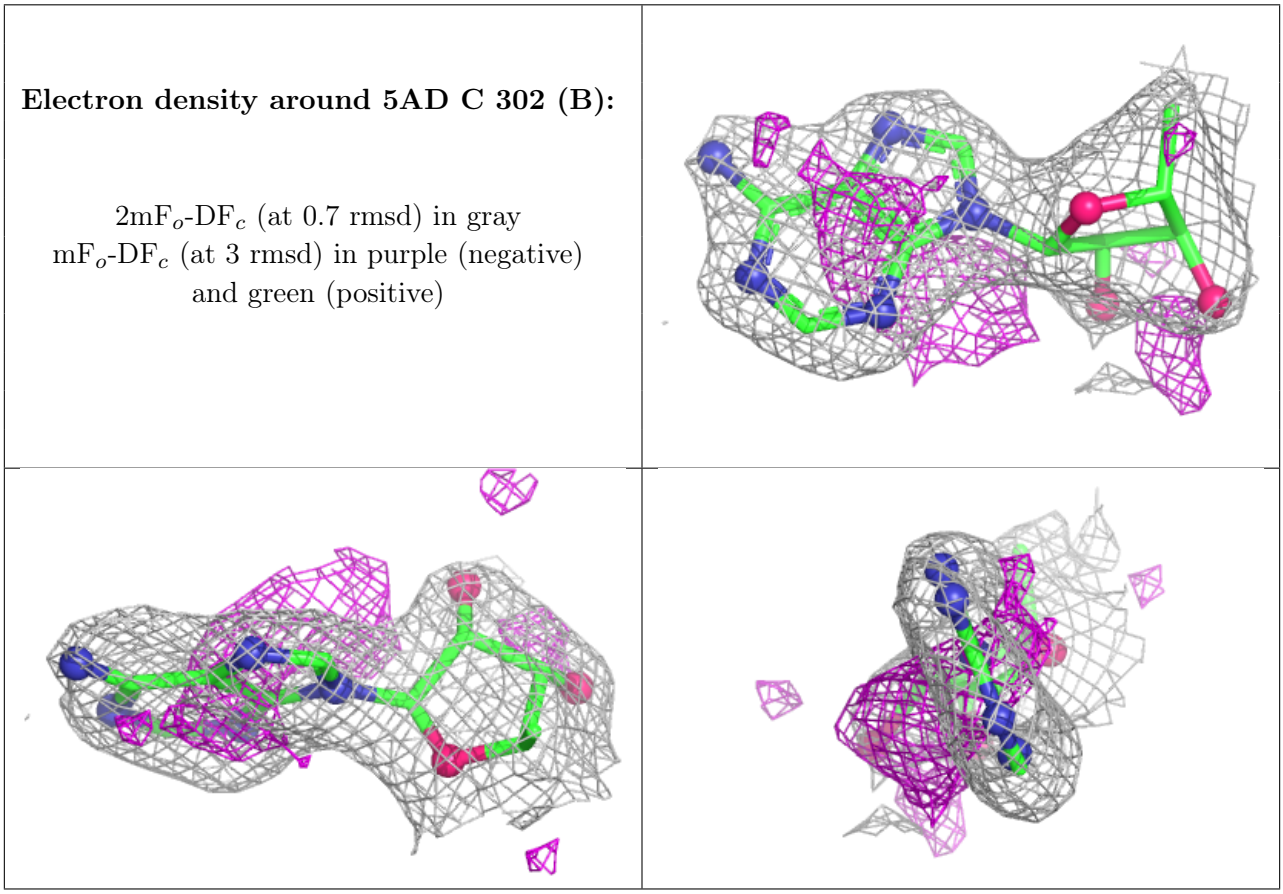
Electron density around 5AD C 302 (A):

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



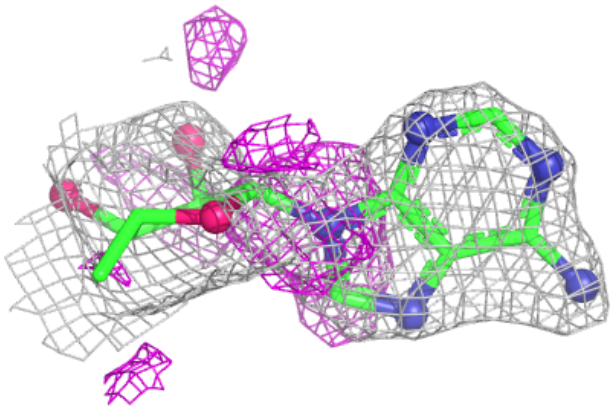
Electron density around 5AD C 302 (B):

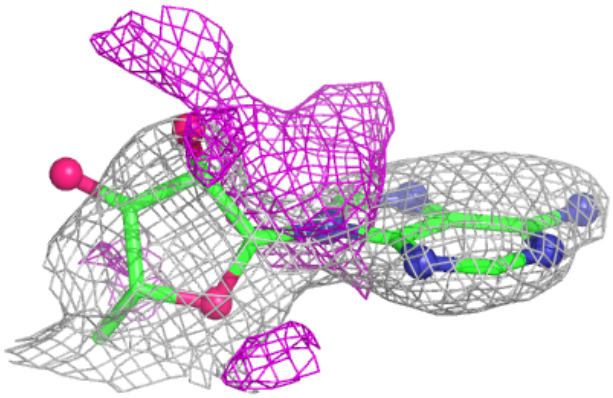
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

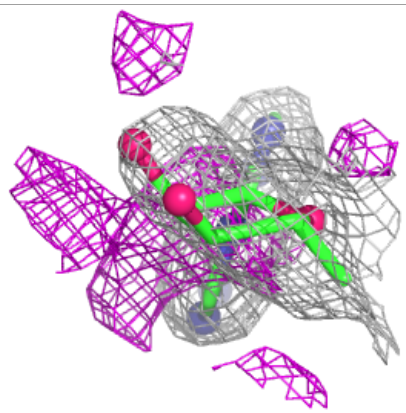


Electron density around 5AD A 302 (A):

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

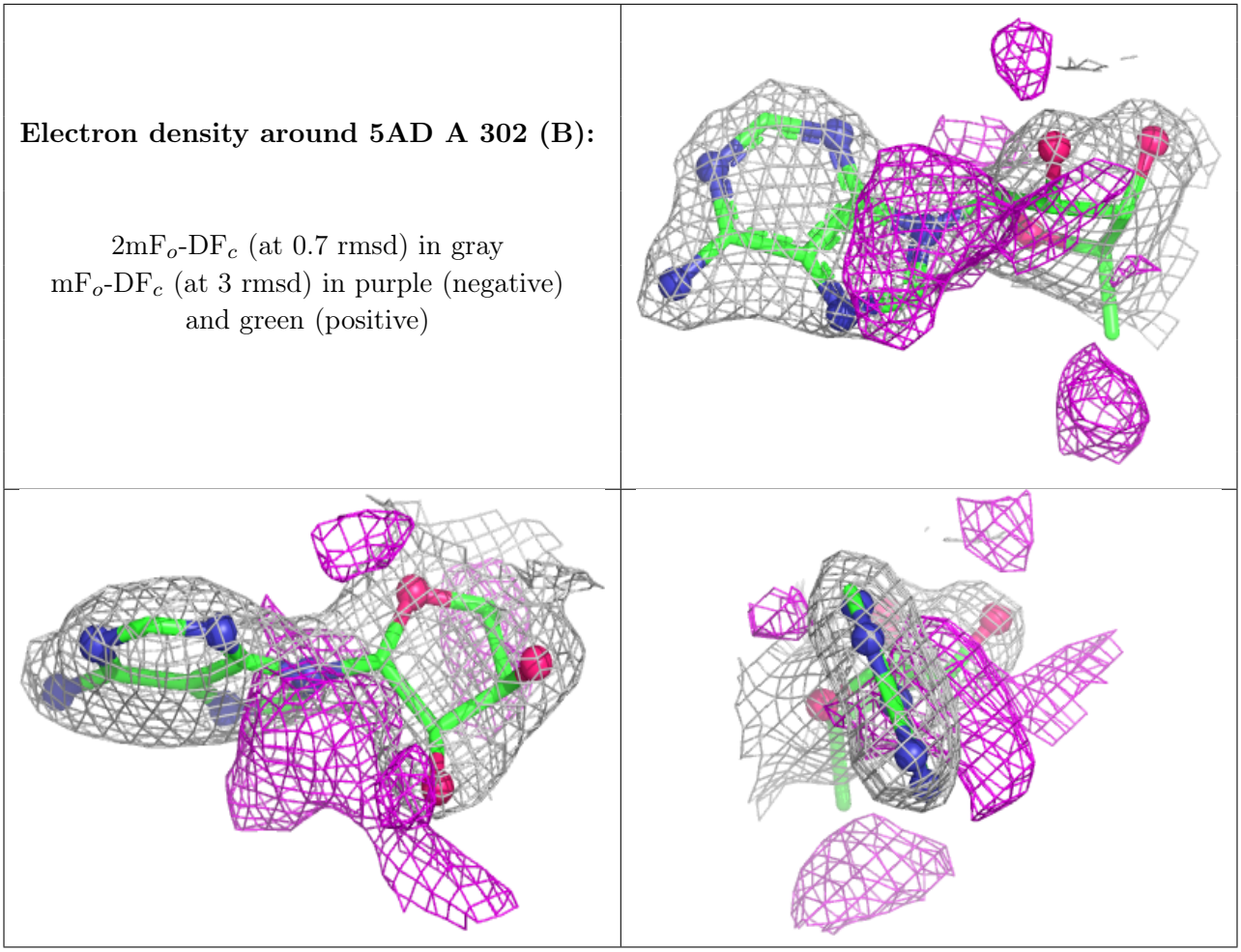






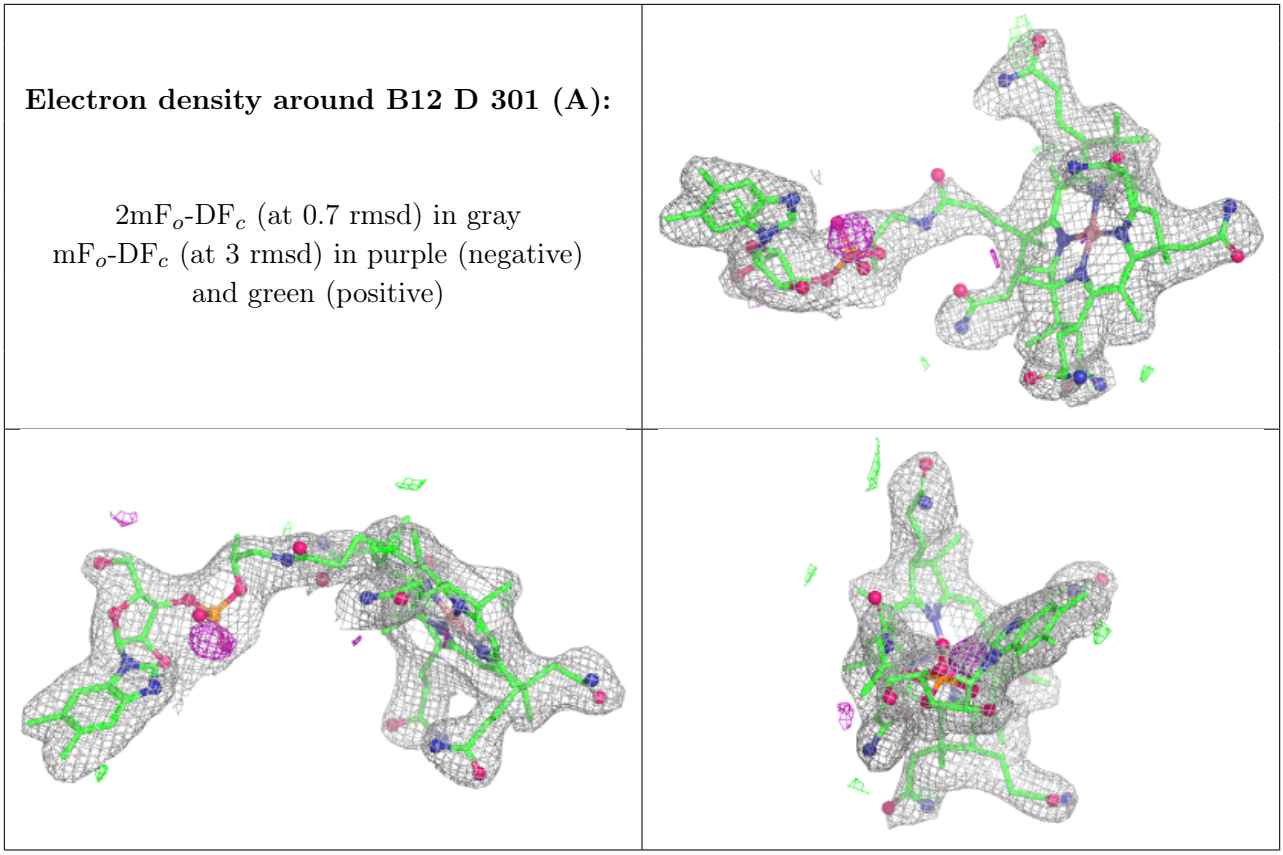
Electron density around 5AD A 302 (B):

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



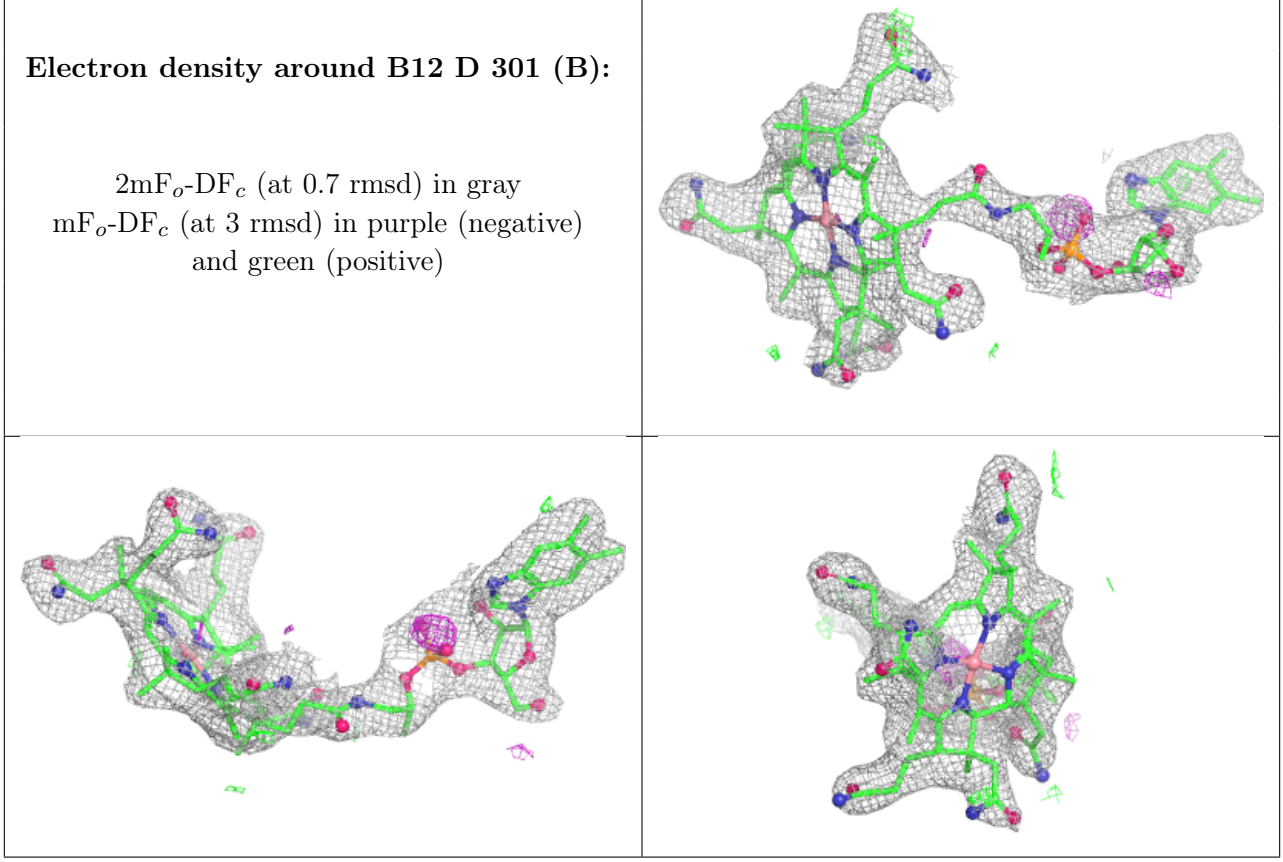
Electron density around B12 D 301 (A):

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



Electron density around B12 D 301 (B):

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



6.5 Other polymers (i)

There are no such residues in this entry.