



Full wwPDB X-ray Structure Validation Report ⓘ

May 17, 2020 – 09:46 am BST

PDB ID : 5TVF
Title : Crystal structure of Trypanosoma brucei AdoMetDC/prozyme heterodimer in complex with inhibitor CGP 40215
Authors : Phillips, M.A.; Volkov, O.A.; Chen, Z.; Tomchick, D.R.
Deposited on : 2016-11-08
Resolution : 2.42 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

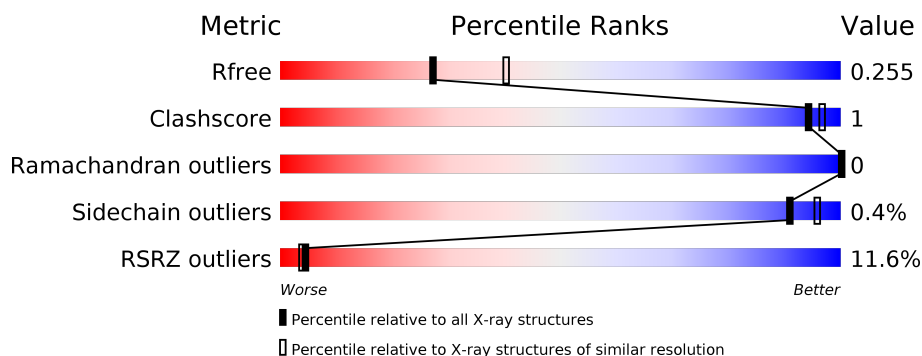
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.42 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4647 (2.44-2.40)
Clashscore	141614	5161 (2.44-2.40)
Ramachandran outliers	138981	5073 (2.44-2.40)
Sidechain outliers	138945	5074 (2.44-2.40)
RSRZ outliers	127900	4543 (2.44-2.40)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	85	<div> <div>13%</div> <div>88%</div> <div>9%</div> </div>
1	C	85	<div> <div>21%</div> <div>92%</div> <div>5%</div> </div>
2	B	285	<div> <div>7%</div> <div>91%</div> <div>5%</div> </div>
2	D	285	<div> <div>7%</div> <div>91%</div> <div>5%</div> <div>5%</div> </div>
3	E	325	<div> <div>14%</div> <div>87%</div> <div>10%</div> </div>
3	F	325	<div> <div>11%</div> <div>88%</div> <div>11%</div> </div>

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
5	CGQ	B	402	-	-	-	X
5	CGQ	D	402	-	-	-	X
6	PUT	B	403	-	-	-	X

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 20528 atoms, of which 9930 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 S-adenosylmethionine decarboxylase beta chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	77	Total	C	H	N	O	S	0	0	0
			1217	391	600	105	117	4			
1	C	81	Total	C	H	N	O	S	0	0	0
			1296	414	640	115	123	4			

- Molecule 2 is a protein called S-adenosylmethionine decarboxylase alpha chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	271	Total	C	H	N	O	S	0	0	0
			4216	1386	2049	354	411	16			
2	D	271	Total	C	H	N	O	S	0	0	0
			4217	1386	2050	354	411	16			

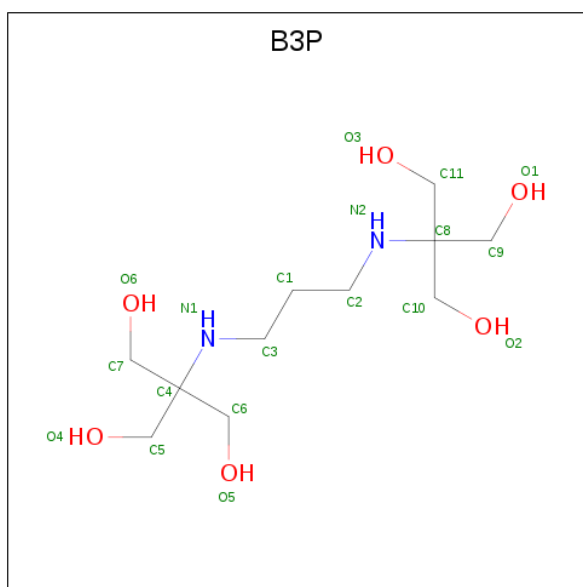
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	86	PYR	-	See Remark 999	UNP Q587A7
D	86	PYR	-	See Remark 999	UNP Q587A7

- Molecule 3 is a protein called S-adenosylmethionine decarboxylase proenzyme-like, putative.

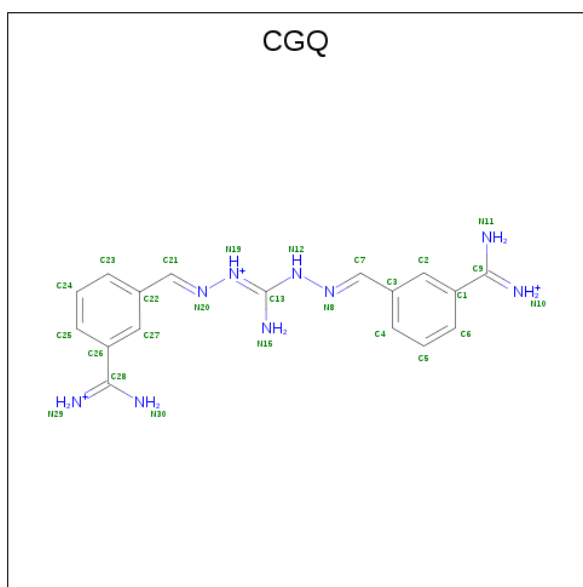
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
3	E	292	Total	C	H	N	O	S	0	0	0
			4548	1455	2233	406	440	14			
3	F	290	Total	C	H	N	O	S	0	0	0
			4522	1448	2220	404	436	14			

- Molecule 4 is 2-[3-(2-HYDROXY-1,1-DIHYDROXYMETHYL-ETHYLAMINO)-PROPYL AMINO]-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: B3P) (formula: C₁₁H₂₆N₂O₆).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	H	N	O	0	0
			45	11	26	2	6		
4	D	1	Total	C	H	N	O	0	0
			45	11	26	2	6		

- Molecule 5 is 3-[C-[N'-(3-CARBAMIMIDOYL-BENZYLIDENIUM)-HYDRAZINO]-[[AMINOMETHYLIDENE]AMINIUM]-IMINOMETHYL]-BENZAMIDINIUM (three-letter code: CGQ) (formula: C₁₇H₂₂N₉).



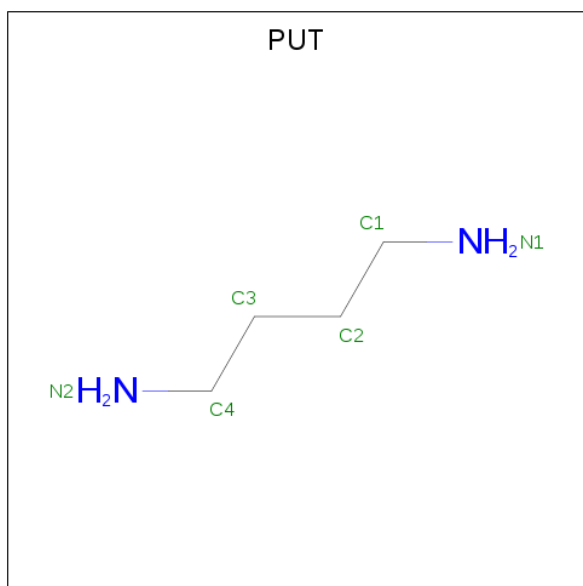
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	B	1	Total	C	H	N	0	0
			45	17	19	9		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	D	1	Total	C	H	N	0	0
			45	17	19	9		

- Molecule 6 is 1,4-DIAMINOBUTANE (three-letter code: PUT) (formula: C₄H₁₂N₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	B	1	Total	C	H	N	0	0
			18	4	12	2		
6	D	1	Total	C	H	N	0	0
			18	4	12	2		
6	E	1	Total	C	H	N	0	0
			18	4	12	2		
6	F	1	Total	C	H	N	0	0
			18	4	12	2		

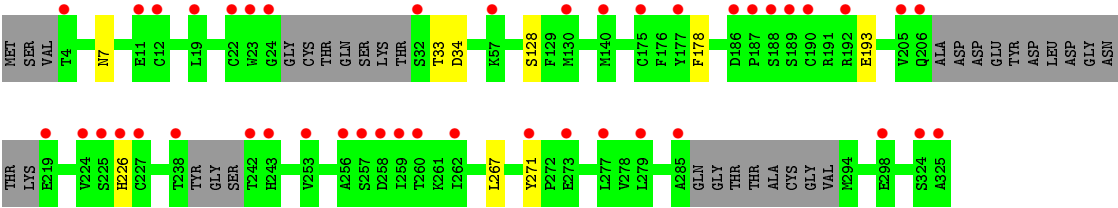
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	11	Total	O	0	0
			11	11		
7	B	59	Total	O	0	0
			59	59		
7	C	9	Total	O	0	0
			9	9		
7	D	42	Total	O	0	0
			42	42		

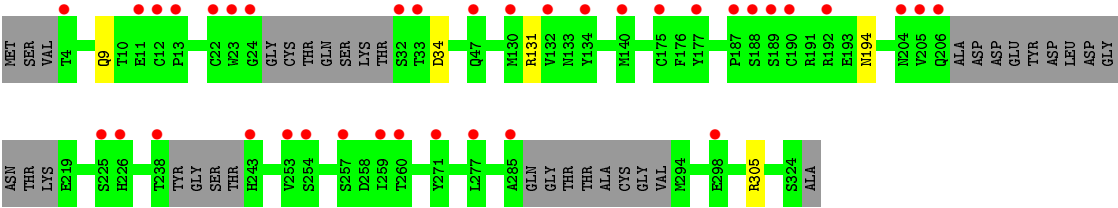
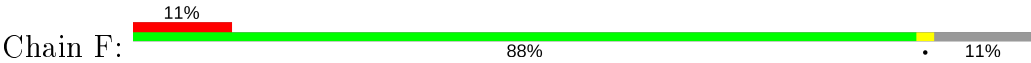
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	E	67	Total	O	0	0
			67	67		
7	F	72	Total	O	0	0
			72	72		



● Molecule 3: S-adenosylmethionine decarboxylase proenzyme-like, putative



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	81.13Å 96.31Å 98.48Å 90.00° 102.22° 90.00°	Depositor
Resolution (Å)	32.38 – 2.42 32.38 – 2.42	Depositor EDS
% Data completeness (in resolution range)	98.6 (32.38-2.42) 98.6 (32.38-2.42)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.87 (at 2.42Å)	Xtriage
Refinement program	PHENIX (1.10.1 _2155: ???)	Depositor
R, R_{free}	0.217 , 0.255 0.218 , 0.255	Depositor DCC
R_{free} test set	1674 reflections (3.00%)	wwPDB-VP
Wilson B-factor (Å ²)	30.3	Xtriage
Anisotropy	0.151	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 50.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	20528	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 11.39% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PUT, CGQ, PYR, B3P

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	0.25	0/629	0.40	0/847
1	C	0.23	0/670	0.41	0/902
2	B	0.25	0/2229	0.43	0/3038
2	D	0.25	0/2229	0.42	0/3038
3	E	0.25	0/2364	0.43	0/3199
3	F	0.25	0/2351	0.43	0/3182
All	All	0.25	0/10472	0.43	0/14206

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	617	600	600	3	0
1	C	656	640	640	3	0
2	B	2167	2049	2050	10	0
2	D	2167	2050	2050	9	0
3	E	2315	2233	2232	6	0
3	F	2302	2220	2220	4	0
4	B	19	26	26	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	19	26	26	0	0
5	B	26	19	22	0	0
5	D	26	19	22	0	0
6	B	6	12	12	3	0
6	D	6	12	12	2	0
6	E	6	12	12	1	0
6	F	6	12	12	0	0
7	A	11	0	0	0	0
7	B	59	0	0	1	0
7	C	9	0	0	0	0
7	D	42	0	0	0	0
7	E	67	0	0	0	0
7	F	72	0	0	0	0
All	All	10598	9930	9936	27	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 1.

All (27) 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)
2:D:146:MET:SD	6:D:403:PUT:N1	2.72	0.63
2:D:132:ASN:HB2	6:D:403:PUT:HN21	1.68	0.58
1:A:40:ARG:HG3	2:B:124:GLU:HB3	1.85	0.58
2:B:340:GLU:OE1	3:F:305:ARG:NH1	2.38	0.56
1:A:40:ARG:HH11	2:B:182:VAL:HG22	1.73	0.53
2:D:86:PYR:H32	2:D:262:HIS:CE1	2.44	0.53
2:B:188:ASP:N	2:B:188:ASP:OD1	2.42	0.51
2:B:275:GLU:OE1	7:B:501:HOH:O	2.20	0.50
1:C:19:ARG:NH2	2:D:170:SER:OG	2.43	0.50
3:E:7:ASN:OD1	3:F:9:GLN:NE2	2.45	0.49
3:F:34:ASP:OD1	3:F:131:ARG:NH2	2.43	0.48
3:E:267:LEU:O	3:E:271:TYR:N	2.45	0.47
1:C:78:ILE:HD11	2:D:89:PHE:CD1	2.50	0.46
2:D:218:GLU:OE1	2:D:218:GLU:N	2.41	0.46
3:E:226:HIS:O	3:E:226:HIS:ND1	2.49	0.45
1:C:79:ARG:HB2	2:D:90:VAL:HB	1.98	0.44
3:F:194:ASN:OD1	3:F:194:ASN:N	2.52	0.43
2:B:94:ARG:NH2	4:B:401:B3P:O5	2.51	0.43
2:D:234:ASP:OD1	2:D:235:SER:N	2.52	0.42
2:D:188:ASP:N	2:D:188:ASP:OD1	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:33:THR:HG22	3:E:34:ASP:N	2.34	0.42
2:B:172:HIS:NE2	6:B:403:PUT:N1	2.68	0.41
3:E:193:GLU:HB3	6:E:401:PUT:HN22	1.86	0.41
3:E:128:SER:HA	3:E:178:PHE:O	2.20	0.41
1:A:78:ILE:HD11	2:B:89:PHE:CD1	2.55	0.41
2:B:133:TYR:CD2	6:B:403:PUT:H32	2.57	0.40
2:B:136:PRO:HB3	6:B:403:PUT:H31	2.03	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	73/85 (86%)	70 (96%)	3 (4%)	0	100	100
1	C	79/85 (93%)	76 (96%)	3 (4%)	0	100	100
2	B	268/285 (94%)	258 (96%)	10 (4%)	0	100	100
2	D	268/285 (94%)	259 (97%)	9 (3%)	0	100	100
3	E	282/325 (87%)	274 (97%)	8 (3%)	0	100	100
3	F	280/325 (86%)	274 (98%)	6 (2%)	0	100	100
All	All	1250/1390 (90%)	1211 (97%)	39 (3%)	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	68/76 (90%)	68 (100%)	0	100	100
1	C	72/76 (95%)	72 (100%)	0	100	100
2	B	243/251 (97%)	241 (99%)	2 (1%)	81	91
2	D	243/251 (97%)	241 (99%)	2 (1%)	81	91
3	E	255/281 (91%)	255 (100%)	0	100	100
3	F	254/281 (90%)	254 (100%)	0	100	100
All	All	1135/1216 (93%)	1131 (100%)	4 (0%)	91	96

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	156	HIS
2	B	239	HIS
2	D	156	HIS
2	D	239	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
3	E	44	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry

8 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
6	PUT	D	403	-	5,5,5	0.25	0	4,4,4	0.46	0
6	PUT	B	403	-	5,5,5	0.26	0	4,4,4	0.56	0
5	CGQ	D	402	-	27,27,27	2.39	13 (48%)	27,35,35	1.19	1 (3%)
5	CGQ	B	402	-	27,27,27	2.38	13 (48%)	27,35,35	1.26	5 (18%)
6	PUT	E	401	-	5,5,5	0.23	0	4,4,4	0.56	0
6	PUT	F	401	-	5,5,5	0.22	0	4,4,4	0.53	0
4	B3P	D	401	-	18,18,18	2.88	5 (27%)	21,23,23	1.38	4 (19%)
4	B3P	B	401	-	18,18,18	2.52	4 (22%)	21,23,23	1.58	7 (33%)

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
6	PUT	D	403	-	-	2/3/3/3	-
6	PUT	B	403	-	-	0/3/3/3	-
5	CGQ	D	402	-	-	8/19/20/20	0/2/2/2
5	CGQ	B	402	-	-	8/19/20/20	0/2/2/2
6	PUT	E	401	-	-	0/3/3/3	-
6	PUT	F	401	-	-	2/3/3/3	-
4	B3P	D	401	-	-	6/28/28/28	-
4	B3P	B	401	-	-	4/28/28/28	-

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	401	B3P	C7-C4	7.39	1.62	1.53
4	B	401	B3P	C11-C8	7.26	1.62	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	401	B3P	C11-C8	7.15	1.62	1.53
4	B	401	B3P	C7-C4	5.67	1.60	1.53
5	B	402	CGQ	C13-N15	4.77	1.45	1.34
5	D	402	CGQ	C13-N15	4.75	1.45	1.34
5	D	402	CGQ	C28-N29	4.18	1.46	1.28
5	D	402	CGQ	C9-N10	4.12	1.45	1.28
5	B	402	CGQ	C9-N10	4.08	1.45	1.28
5	B	402	CGQ	C28-N29	4.07	1.45	1.28
5	D	402	CGQ	C13-N12	3.61	1.45	1.35
5	B	402	CGQ	C13-N12	3.51	1.45	1.35
4	D	401	B3P	C6-C4	3.49	1.57	1.53
5	B	402	CGQ	C13-N19	-3.45	1.25	1.33
5	D	402	CGQ	C13-N19	-3.41	1.25	1.33
5	D	402	CGQ	C1-C9	3.38	1.53	1.47
5	D	402	CGQ	C26-C28	3.30	1.53	1.47
5	B	402	CGQ	C28-N30	-3.27	1.25	1.33
5	B	402	CGQ	C9-N11	-3.24	1.25	1.33
5	B	402	CGQ	C1-C9	3.21	1.53	1.47
4	D	401	B3P	C3-N1	3.20	1.50	1.46
5	B	402	CGQ	C26-C28	3.18	1.53	1.47
5	D	402	CGQ	C28-N30	-3.16	1.25	1.33
5	D	402	CGQ	C9-N11	-3.15	1.25	1.33
5	D	402	CGQ	C22-C21	2.91	1.53	1.47
5	B	402	CGQ	C22-C21	2.85	1.53	1.47
5	D	402	CGQ	C3-C7	2.79	1.53	1.47
5	B	402	CGQ	C3-C7	2.78	1.53	1.47
4	D	401	B3P	C10-C8	2.69	1.56	1.53
5	D	402	CGQ	N12-N8	2.67	1.41	1.38
5	B	402	CGQ	N12-N8	2.67	1.41	1.38
4	B	401	B3P	C6-C4	2.67	1.56	1.53
4	B	401	B3P	C10-C8	2.52	1.56	1.53
5	B	402	CGQ	C7-N8	-2.36	1.25	1.28
5	D	402	CGQ	C7-N8	-2.14	1.25	1.28

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	402	CGQ	C21-N20-N19	4.01	119.71	113.03
5	B	402	CGQ	C7-N8-N12	2.74	120.78	115.96
4	B	401	B3P	C3-N1-C4	-2.67	112.30	116.08
4	B	401	B3P	O2-C10-C8	-2.45	106.67	111.63
4	B	401	B3P	C2-N2-C8	-2.45	112.61	116.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	402	CGQ	C13-N12-N8	2.43	123.52	118.69
4	B	401	B3P	O5-C6-C4	-2.33	106.92	111.63
4	D	401	B3P	O5-C6-C4	-2.31	106.95	111.63
5	B	402	CGQ	C3-C2-C1	-2.17	119.41	121.13
4	D	401	B3P	O2-C10-C8	-2.15	107.29	111.63
4	B	401	B3P	O4-C5-C4	-2.13	107.33	111.63
4	D	401	B3P	O4-C5-C4	-2.09	107.40	111.63
4	B	401	B3P	O1-C9-C8	-2.07	107.45	111.63
5	B	402	CGQ	C21-N20-N19	2.06	116.47	113.03
4	B	401	B3P	O6-C7-C4	-2.06	107.47	111.63
5	B	402	CGQ	C22-C27-C26	-2.04	119.52	121.13
4	D	401	B3P	O1-C9-C8	-2.00	107.58	111.63

There are no chirality outliers.

All (30) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	402	CGQ	C13-N12-N8-C7
5	D	402	CGQ	C13-N19-N20-C21
5	D	402	CGQ	N20-C21-C22-C27
5	D	402	CGQ	C25-C26-C28-N30
5	D	402	CGQ	C27-C26-C28-N30
5	B	402	CGQ	C2-C3-C7-N8
5	B	402	CGQ	C4-C3-C7-N8
5	B	402	CGQ	C13-N12-N8-C7
5	B	402	CGQ	C13-N19-N20-C21
5	B	402	CGQ	N20-C21-C22-C27
4	B	401	B3P	O2-C10-C8-N2
4	B	401	B3P	O2-C10-C8-C9
4	B	401	B3P	O2-C10-C8-C11
5	D	402	CGQ	C4-C3-C7-N8
5	D	402	CGQ	N20-C21-C22-C23
5	B	402	CGQ	N20-C21-C22-C23
5	D	402	CGQ	C2-C3-C7-N8
4	B	401	B3P	C2-C1-C3-N1
4	D	401	B3P	C1-C3-N1-C4
6	D	403	PUT	C1-C2-C3-C4
6	F	401	PUT	C2-C3-C4-N2
4	D	401	B3P	O2-C10-C8-C9
5	B	402	CGQ	C27-C26-C28-N29
6	D	403	PUT	C2-C3-C4-N2
4	D	401	B3P	C6-C4-C5-O4

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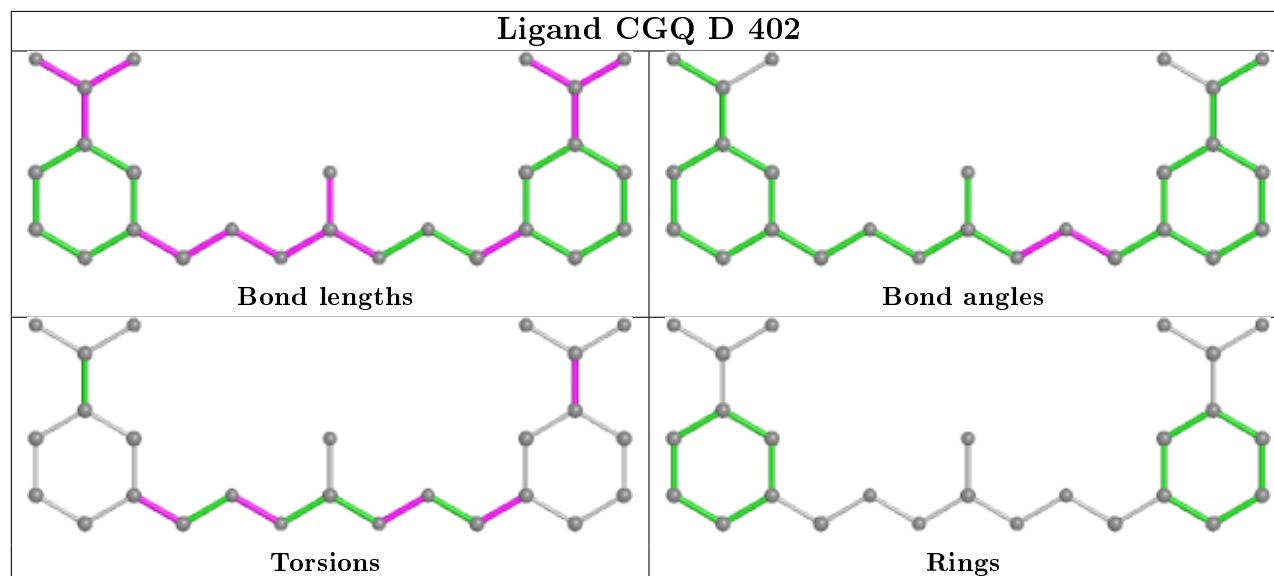
Mol	Chain	Res	Type	Atoms
6	F	401	PUT	N1-C1-C2-C3
4	D	401	B3P	C1-C2-N2-C8
4	D	401	B3P	C2-C1-C3-N1
4	D	401	B3P	O2-C10-C8-N2
5	B	402	CGQ	C6-C1-C9-N10

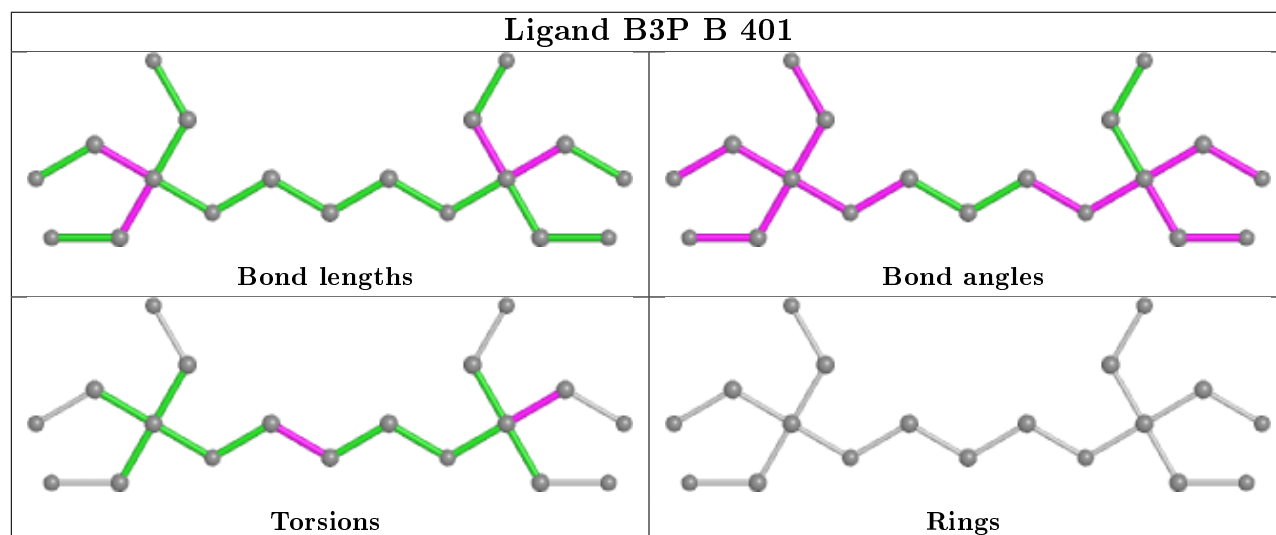
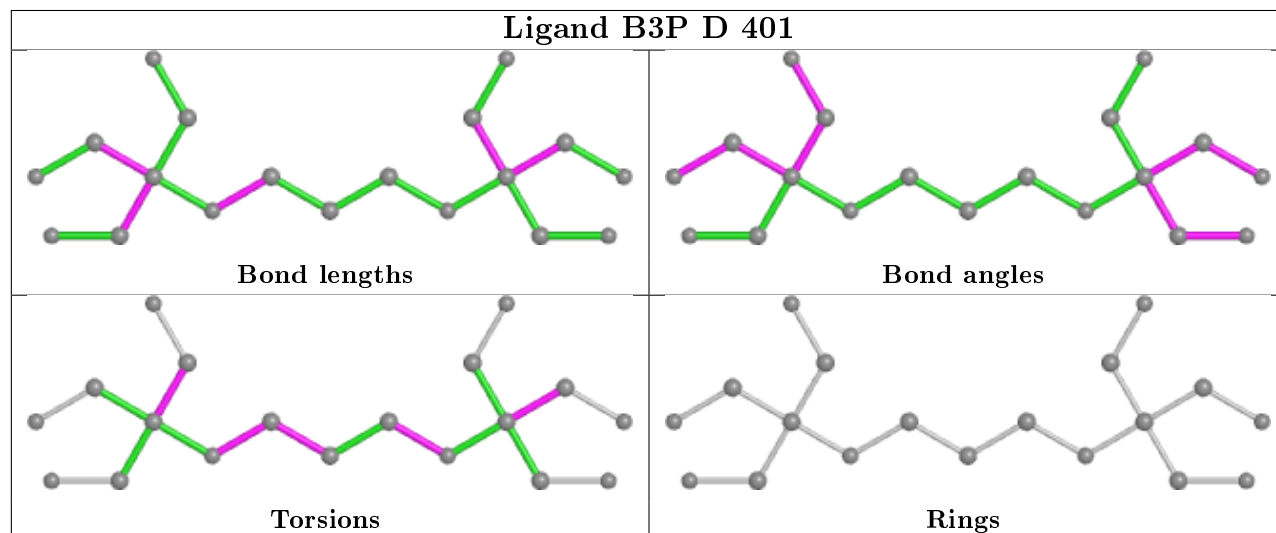
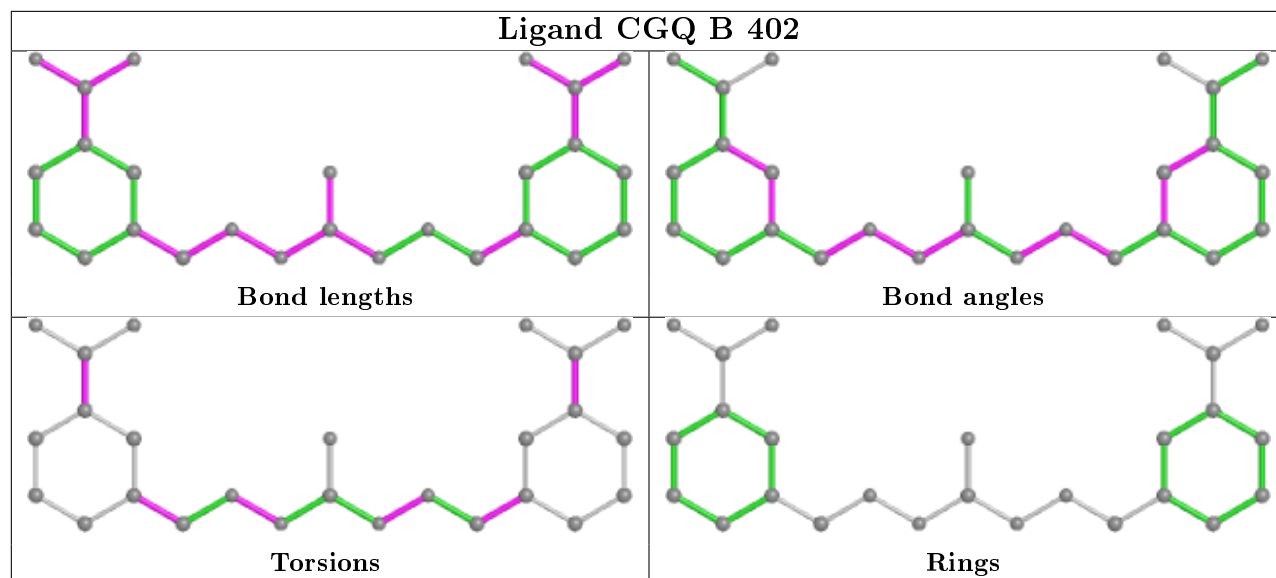
There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	D	403	PUT	2	0
6	B	403	PUT	3	0
6	E	401	PUT	1	0
4	B	401	B3P	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	77/85 (90%)	0.81	11 (14%) 2 2	18, 44, 84, 92	0
1	C	81/85 (95%)	1.09	18 (22%) 0 0	21, 51, 89, 126	0
2	B	270/285 (94%)	0.50	19 (7%) 16 14	13, 36, 64, 96	0
2	D	270/285 (94%)	0.59	20 (7%) 14 13	18, 39, 71, 109	0
3	E	292/325 (89%)	0.88	44 (15%) 2 1	15, 38, 83, 113	0
3	F	290/325 (89%)	0.67	37 (12%) 3 3	10, 32, 78, 103	0
All	All	1280/1390 (92%)	0.70	149 (11%) 4 4	10, 38, 79, 126	0

All (149) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	E	190	CYS	8.5
3	F	189	SER	6.4
3	E	259	ILE	5.8
1	C	25	GLU	5.4
3	E	206	GLN	5.4
2	D	279	CYS	5.3
3	E	187	PRO	5.2
3	F	134	TYR	5.2
3	E	189	SER	5.1
3	E	4	THR	4.9
1	C	85	GLU	4.7
3	F	4	THR	4.5
1	A	22	PRO	4.5
3	E	298	GLU	4.4
1	C	24	HIS	4.3
3	E	257	SER	4.3
3	E	22	CYS	4.1
2	B	210	ASP	4.1
1	C	23	LYS	4.1

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Mol	Chain	Res	Type	RSRZ
3	E	256	ALA	4.1
1	C	41	VAL	4.0
3	F	23	TRP	4.0
3	F	22	CYS	4.0
3	F	238	THR	3.9
3	F	32	SER	3.9
2	D	182	VAL	3.8
2	B	356	ALA	3.7
1	C	22	PRO	3.7
3	E	260	THR	3.7
1	A	40	ARG	3.6
3	F	24	GLY	3.6
3	F	298	GLU	3.6
3	E	324	SER	3.5
3	F	226	HIS	3.4
3	F	13	PRO	3.3
3	F	190	CYS	3.3
2	D	281	LEU	3.3
3	E	325	ALA	3.2
2	B	230	GLU	3.2
2	D	120	CYS	3.2
3	E	186	ASP	3.2
3	F	204	ASN	3.2
3	F	259	ILE	3.2
3	F	130	MET	3.2
1	C	76	GLU	3.2
2	D	356	ALA	3.2
1	A	85	GLU	3.1
2	B	201	ARG	3.1
3	E	253	VAL	3.1
3	E	140	MET	3.1
3	F	187	PRO	3.1
3	F	254	SER	3.1
1	A	59	GLN	3.0
3	F	257	SER	3.0
3	E	225	SER	3.0
1	C	47	VAL	2.9
1	C	45	THR	2.9
2	B	183	GLN	2.9
3	E	285	ALA	2.9
3	F	205	VAL	2.9
1	C	74	PHE	2.9

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Mol	Chain	Res	Type	RSRZ
2	D	201	ARG	2.9
3	E	175	CYS	2.9
1	A	21	ASP	2.9
3	F	33	THR	2.8
2	D	267	GLU	2.8
3	F	175	CYS	2.8
2	B	211	LYS	2.8
1	A	5	LYS	2.7
2	D	292	ARG	2.7
3	E	226	HIS	2.7
2	D	185	SER	2.7
3	E	271	TYR	2.7
2	B	184	PRO	2.7
2	B	129	MET	2.7
2	B	212	MET	2.7
3	E	12	CYS	2.6
3	F	243	HIS	2.6
3	F	132	VAL	2.6
3	F	206	GLN	2.5
2	D	230	GLU	2.5
3	E	242	THR	2.5
1	A	43	ASP	2.5
3	E	11	GLU	2.5
3	E	130	MET	2.5
1	C	21	ASP	2.5
3	F	140	MET	2.5
1	C	5	LYS	2.5
3	E	277	LEU	2.5
3	F	277	LEU	2.5
1	C	26	ARG	2.5
3	E	23	TRP	2.5
2	B	273	SER	2.5
3	F	192	ARG	2.5
2	B	234	ASP	2.5
2	B	186	CYS	2.4
2	D	181	VAL	2.4
3	E	205	VAL	2.4
3	F	11	GLU	2.4
3	F	253	VAL	2.4
2	D	318	GLY	2.4
2	B	193	SER	2.4
3	F	177	TYR	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	42	VAL	2.4
3	E	238	THR	2.4
3	E	188	SER	2.4
1	C	68	HIS	2.3
2	D	140	LYS	2.3
2	D	186	CYS	2.3
2	D	98	ILE	2.3
3	F	225	SER	2.3
1	C	40	ARG	2.3
3	E	192	ARG	2.3
2	D	129	MET	2.3
3	E	219	GLU	2.3
3	E	19	LEU	2.3
3	E	243	HIS	2.3
1	A	41	VAL	2.3
2	D	183	GLN	2.3
2	B	224	GLU	2.3
1	A	74	PHE	2.2
1	C	66	CYS	2.2
3	F	188	SER	2.2
2	D	316	HIS	2.2
3	E	258	ASP	2.2
1	A	60	LYS	2.2
1	C	70	VAL	2.2
3	F	260	THR	2.2
3	F	285	ALA	2.2
3	F	12	CYS	2.2
2	B	182	VAL	2.1
2	D	184	PRO	2.1
3	F	47	GLN	2.1
2	B	208	TYR	2.1
3	E	57	LYS	2.1
2	D	310	ALA	2.1
3	E	224	VAL	2.1
2	B	260	THR	2.1
3	F	271	TYR	2.1
3	E	262	ILE	2.1
3	E	24	GLY	2.1
3	E	32	SER	2.0
3	E	177	TYR	2.0
1	A	66	CYS	2.0
2	B	279	CYS	2.0

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Mol	Chain	Res	Type	RSRZ
3	E	227	CYS	2.0
2	B	245	PRO	2.0
3	E	279	LEU	2.0
3	E	273	GLU	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 carbohydrates in this entry.

6.4 Ligands [i](#)

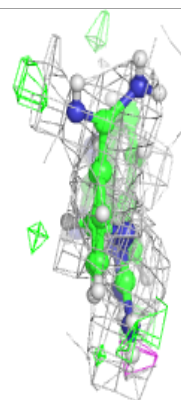
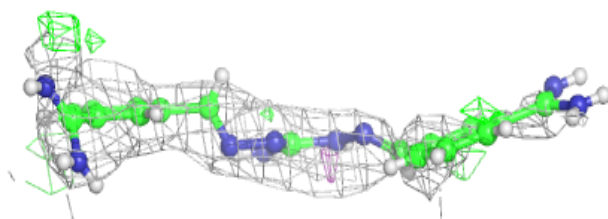
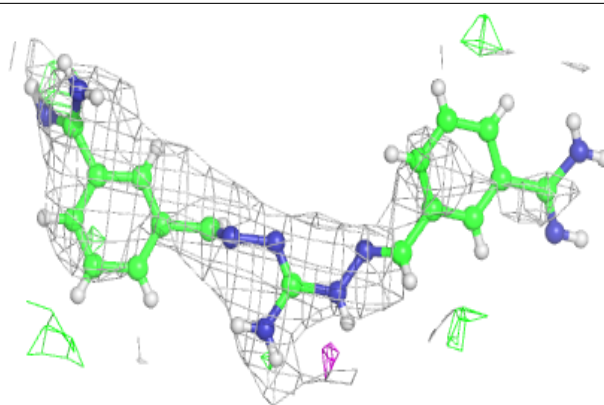
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	CGQ	D	402	26/26	0.35	0.50	77,86,103,104	0
5	CGQ	B	402	26/26	0.60	0.41	62,68,82,83	0
6	PUT	B	403	6/6	0.71	0.49	69,83,84,84	0
4	B3P	D	401	19/19	0.72	0.29	65,78,86,91	0
6	PUT	D	403	6/6	0.81	0.39	46,55,56,56	0
4	B3P	B	401	19/19	0.83	0.21	33,41,50,51	0
6	PUT	F	401	6/6	0.87	0.23	22,26,29,29	0
6	PUT	E	401	6/6	0.89	0.20	25,30,32,32	0

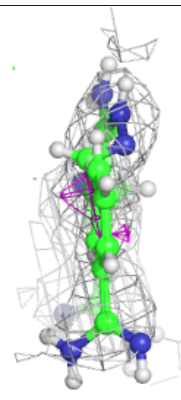
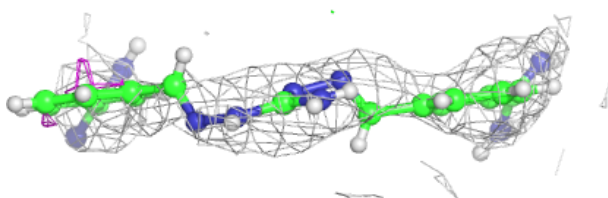
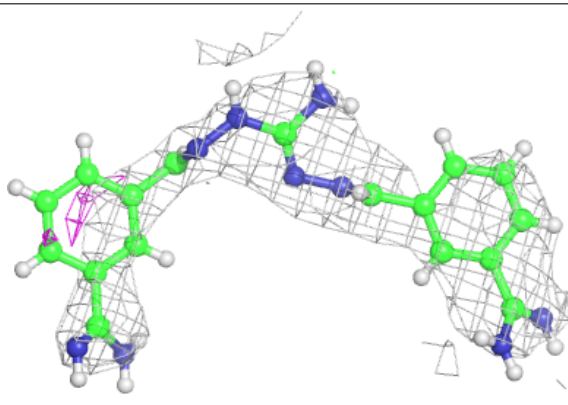
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around CGQ D 402:

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

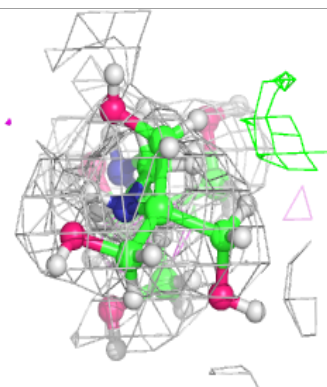
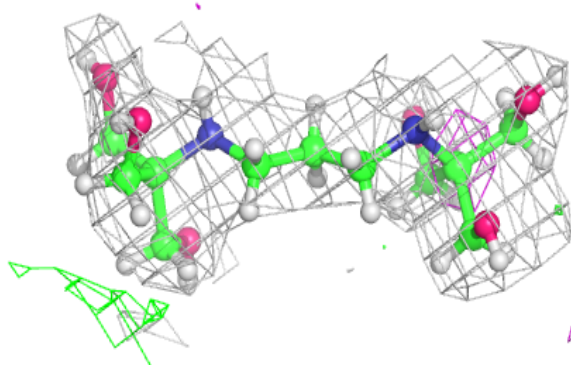
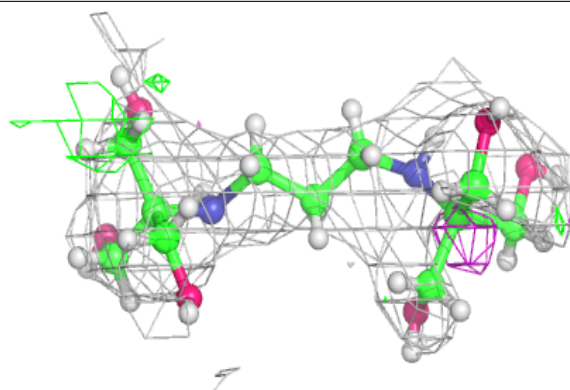
**Electron density around CGQ B 402:**

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

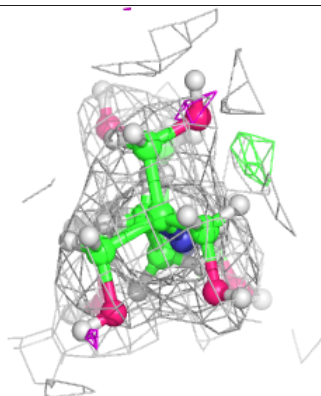
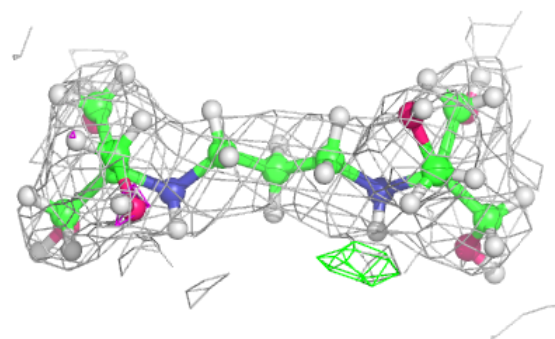
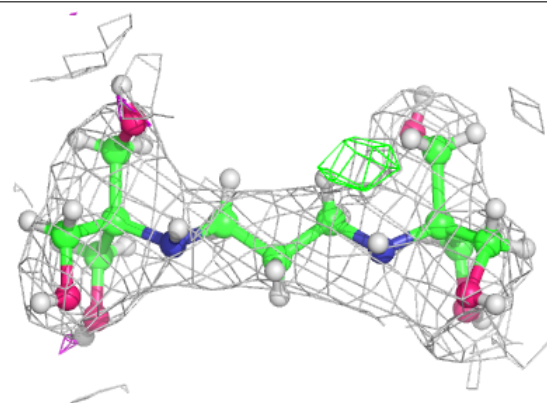


Electron density around B3P D 401:

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

**Electron density around B3P B 401:**

$2mF_o-DF_c$ (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.