



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 11:25 AM UTC

PDB ID : 4TO3 / pdb_00004to3
Title : Structural basis of cellular dNTP regulation, SAMHD1-dGTP-dGTP-dCTP complex
Authors : Ji, X.; Tang, C.; Zhao, Q.; Wang, W.; Xiong, Y.
Deposited on : 2014-06-05
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 ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 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

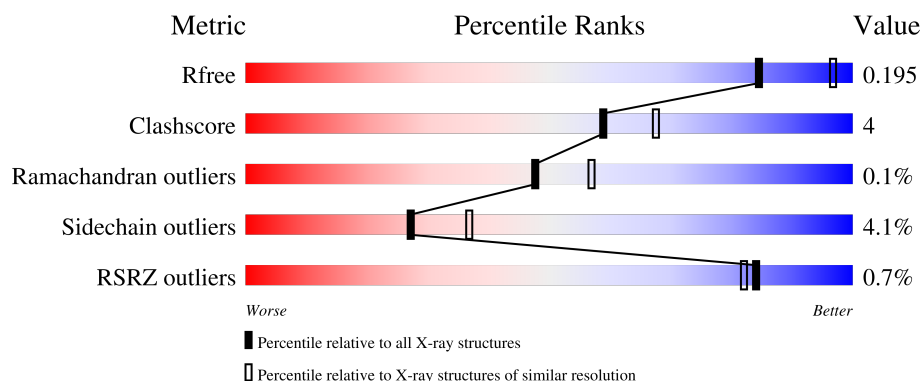
1 Overall quality at a glance

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 $\leq 5\%$. 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	514	% 82% 11% • 6%
1	B	514	% 81% 12% • 6%
1	C	514	% 84% 9% • 6%
1	D	514	% 84% 9% • 6%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 16708 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.

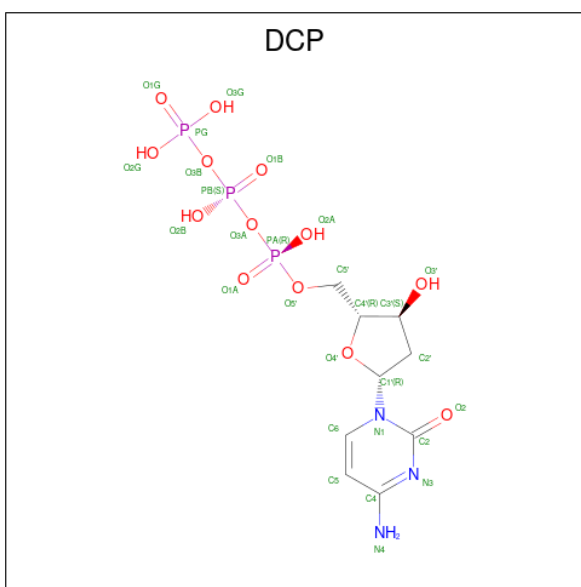
- Molecule 1 is a protein called Deoxynucleoside triphosphate triphosphohydrolase SAMHD1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	481	Total	C	N	O	S	0	3	0
			3963	2537	690	715	21			
1	B	481	Total	C	N	O	S	0	3	0
			3962	2536	689	716	21			
1	C	481	Total	C	N	O	S	0	2	0
			3953	2531	687	714	21			
1	D	481	Total	C	N	O	S	0	4	0
			3972	2542	691	718	21			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	206	ARG	HIS	engineered mutation	UNP Q9Y3Z3
A	207	ASN	ASP	engineered mutation	UNP Q9Y3Z3
B	206	ARG	HIS	engineered mutation	UNP Q9Y3Z3
B	207	ASN	ASP	engineered mutation	UNP Q9Y3Z3
C	206	ARG	HIS	engineered mutation	UNP Q9Y3Z3
C	207	ASN	ASP	engineered mutation	UNP Q9Y3Z3
D	206	ARG	HIS	engineered mutation	UNP Q9Y3Z3
D	207	ASN	ASP	engineered mutation	UNP Q9Y3Z3

- Molecule 2 is 2'-DEOXYCYTIDINE-5'-TRIPHOSPHATE (CCD ID: DCP) (formula: $C_9H_{16}N_3O_{13}P_3$).

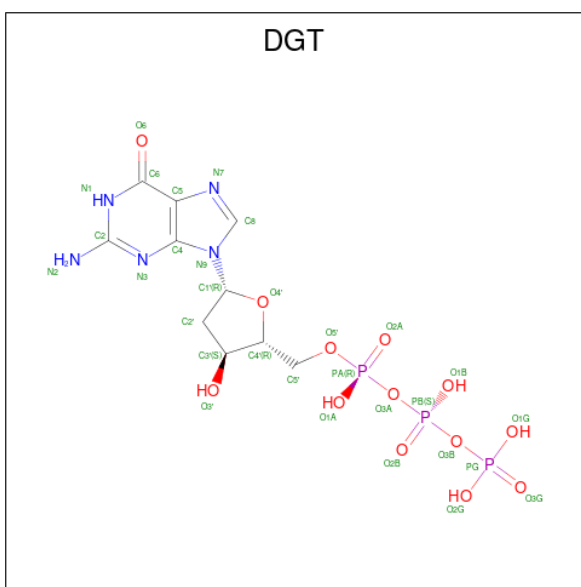


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			28	9	3	13	3		
2	B	1	Total	C	N	O	P	0	0
			28	9	3	13	3		
2	C	1	Total	C	N	O	P	0	0
			28	9	3	13	3		
2	D	1	Total	C	N	O	P	0	0
			28	9	3	13	3		

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	3	Total	Mg	0	0
			3	3		
3	B	1	Total	Mg	0	0
			1	1		
3	C	2	Total	Mg	0	0
			2	2		
3	D	2	Total	Mg	0	0
			2	2		

- Molecule 4 is 2'-DEOXYGUANOSINE-5'-TRIPHOSPHATE (CCD ID: DGT) (formula: C₁₀H₁₆N₅O₁₃P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	A	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	B	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	B	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	B	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	C	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	D	1	Total 31	C 10	N 5	O 13	P 3	0	0
4	D	1	Total 31	C 10	N 5	O 13	P 3	0	0

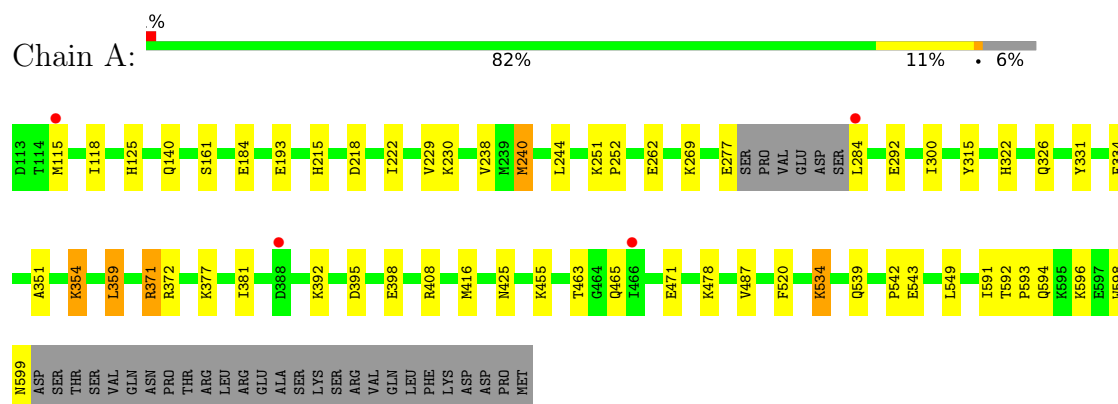
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	110	Total O 110 110	0	0
5	B	130	Total O 130 130	0	0
5	C	91	Total O 91 91	0	0
5	D	159	Total O 159 159	0	0

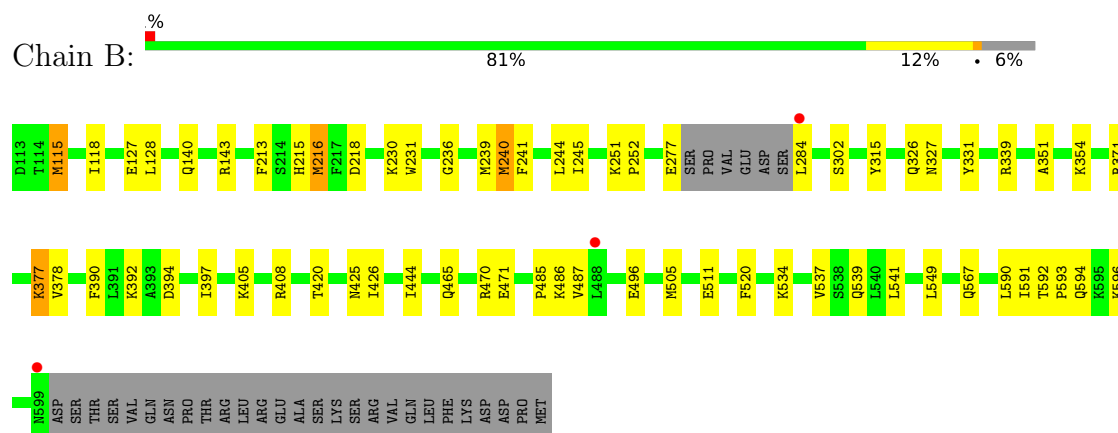
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

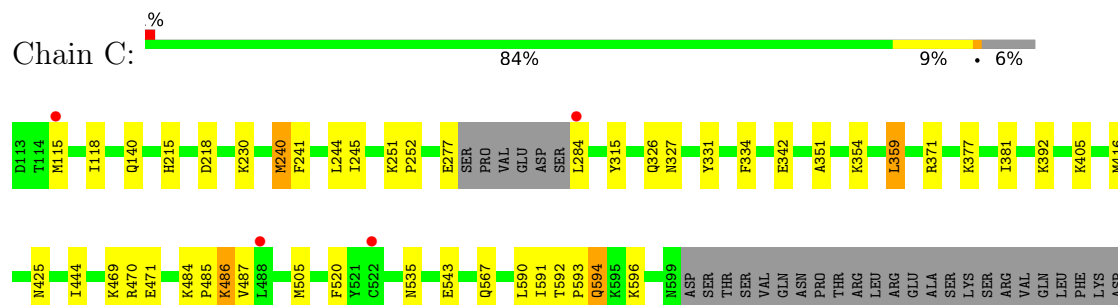
• Molecule 1: Deoxynucleoside triphosphate triphosphohydrolase SAMHD1



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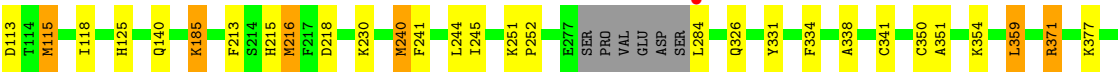
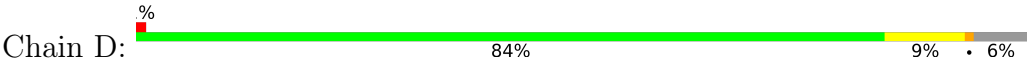


• Molecule 1: Deoxynucleoside triphosphate triphosphohydrolase SAMHD1



ASP
PRO
MET

● Molecule 1: Deoxynucleoside triphosphate triphosphohydrolase SAMHD1



ARG
VAL
GLN
LEU
PHE
LYS
ASP
ASP
PRO
MET

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	86.41Å 146.03Å 98.11Å 90.00° 114.52° 90.00°	Depositor
Resolution (Å)	40.00 – 2.20 40.00 – 2.20	Depositor EDS
% Data completeness (in resolution range)	96.2 (40.00-2.20) 96.8 (40.00-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.02 (at 2.18Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.168 , 0.204 (Not available) , 0.195	Depositor DCC
R_{free} test set	5529 reflections (4.28%)	wwPDB-VP
Wilson B-factor (Å ²)	47.1	Xtriage
Anisotropy	0.387	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 45.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.022 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	16708	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.54% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: DCP, DGT, MG

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	1.02	3/4057 (0.1%)	0.98	6/5476 (0.1%)
1	B	1.01	0/4055	0.96	0/5473
1	C	0.98	0/4046	0.94	0/5461
1	D	1.04	1/4066 (0.0%)	0.97	0/5488
All	All	1.01	4/16224 (0.0%)	0.96	6/21898 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	125	HIS	C-O	-5.60	1.17	1.24
1	A	161	SER	CB-OG	5.45	1.53	1.42
1	A	222	ILE	CA-C	5.23	1.57	1.52
1	A	125	HIS	C-O	-5.11	1.17	1.24

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	392	LYS	CD-CE-NZ	6.12	131.47	111.90
1	A	292	GLU	CA-C-N	5.57	128.52	120.38
1	A	292	GLU	C-N-CA	5.57	128.52	120.38
1	A	392	LYS	CG-CD-CE	-5.32	99.07	111.30
1	A	262	GLU	CB-CA-C	5.13	118.93	110.88
1	A	300	ILE	N-CA-C	5.05	115.33	110.74

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	3963	0	3943	31	0
1	B	3962	0	3944	41	0
1	C	3953	0	3937	29	0
1	D	3972	0	3948	45	0
2	A	28	0	12	1	0
2	B	28	0	12	4	0
2	C	28	0	12	0	0
2	D	28	0	12	1	0
3	A	3	0	0	0	0
3	B	1	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
4	A	62	0	24	0	0
4	B	93	0	36	0	0
4	C	31	0	12	0	0
4	D	62	0	24	0	0
5	A	110	0	0	4	0
5	B	130	0	0	2	0
5	C	91	0	0	1	0
5	D	159	0	0	6	0
All	All	16708	0	15916	141	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 4.

All (141) 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:240:MET:HG2	1:D:416:MET:CE	1.89	1.02
1:D:240:MET:HG2	1:D:416:MET:HE2	1.41	1.01
1:D:240:MET:CG	1:D:416:MET:HE2	1.91	1.00
1:D:240:MET:SD	1:D:416:MET:CE	2.51	0.98
1:D:240:MET:SD	1:D:416:MET:HE2	2.08	0.92
1:D:371:ARG:HH21	1:D:371:ARG:HG3	1.32	0.92
1:B:231:TRP:HZ3	1:B:239:MET:HE1	1.36	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:240:MET:CG	1:D:416:MET:CE	2.54	0.80
1:D:371:ARG:HH21	1:D:371:ARG:CG	1.95	0.80
1:D:467:LYS:HD3	5:D:891:HOH:O	1.82	0.78
1:B:115[A]:MET:HE2	1:B:127:GLU:OE1	1.85	0.77
1:C:140:GLN:HG3	1:C:240:MET:HE1	1.67	0.77
1:D:140:GLN:HG3	1:D:240:MET:HE1	1.65	0.76
1:A:140:GLN:HG3	1:A:240:MET:HE1	1.65	0.76
1:B:140:GLN:HG3	1:B:240:MET:HE1	1.68	0.74
1:B:534:LYS:O	1:B:537:VAL:HG22	1.90	0.72
2:A:701:DCP:N3	5:A:908:HOH:O	2.22	0.71
1:A:140:GLN:CG	1:A:240:MET:HE1	2.20	0.71
1:D:140:GLN:CG	1:D:240:MET:HE1	2.20	0.71
1:D:371:ARG:NH2	5:D:879:HOH:O	2.22	0.70
1:D:240:MET:HG2	1:D:416:MET:HE1	1.73	0.70
1:B:397:ILE:HG21	1:B:426:ILE:HD11	1.73	0.70
1:B:231:TRP:CZ3	1:B:239:MET:HE1	2.25	0.68
1:C:140:GLN:CG	1:C:240:MET:HE1	2.23	0.68
1:B:140:GLN:CG	1:B:240:MET:HE1	2.23	0.68
2:B:701:DCP:N3	5:B:930:HOH:O	2.26	0.67
1:A:331[B]:TYR:C	1:A:331[B]:TYR:CD1	2.73	0.66
1:D:331[B]:TYR:OH	5:D:853:HOH:O	2.14	0.66
1:B:534:LYS:O	1:B:537:VAL:CG2	2.45	0.65
1:D:535:ASN:OD1	1:D:535:ASN:N	2.29	0.65
1:D:331[B]:TYR:C	1:D:331[B]:TYR:CD1	2.76	0.64
1:C:535:ASN:N	1:C:535:ASN:OD1	2.31	0.64
1:D:416:MET:HE1	1:D:419:TYR:HD2	1.62	0.64
1:C:331[A]:TYR:C	1:C:331[A]:TYR:CD1	2.76	0.63
1:B:231:TRP:HZ3	1:B:239:MET:CE	2.11	0.63
1:B:215:HIS:NE2	2:B:701:DCP:O2A	2.32	0.62
1:D:213:PHE:HB2	1:D:216:MET:HG2	1.82	0.61
1:B:331[B]:TYR:C	1:B:331[B]:TYR:CD1	2.78	0.61
1:B:215:HIS:CE1	2:B:701:DCP:O2A	2.54	0.61
1:B:213:PHE:HB2	1:B:216:MET:HG2	1.81	0.60
1:B:327:ASN:O	1:D:326:GLN:HG2	2.03	0.57
1:A:115[B]:MET:C	1:A:115[B]:MET:SD	2.88	0.57
1:C:485:PRO:O	1:C:486:LYS:HB2	2.05	0.57
1:B:425:ASN:ND2	1:C:425:ASN:OD1	2.36	0.57
1:C:392:LYS:HE2	1:C:444:ILE:HD11	1.87	0.57
1:A:326:GLN:HG2	1:C:327:ASN:O	2.04	0.56
1:B:115[A]:MET:HG3	1:B:128:LEU:O	2.05	0.56
1:D:240:MET:SD	1:D:416:MET:HE3	2.45	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:534:LYS:HE3	1:A:542:PRO:O	2.06	0.55
1:C:469:LYS:HD2	1:C:471:GLU:OE2	2.06	0.55
1:A:371:ARG:NH1	1:A:549:LEU:HD21	2.22	0.55
1:D:487:VAL:HG21	1:D:567:GLN:HG3	1.88	0.55
1:B:231:TRP:CZ3	1:B:239:MET:CE	2.88	0.55
1:B:390:PHE:CZ	1:B:426:ILE:CG2	2.90	0.55
1:B:392:LYS:HE2	1:B:444:ILE:HD11	1.89	0.54
1:A:543:GLU:HG3	1:C:543:GLU:HG3	1.90	0.53
2:B:701:DCP:H5	5:B:886:HOH:O	2.08	0.53
1:D:371:ARG:HG2	1:D:505:MET:HE2	1.89	0.53
1:C:244:LEU:C	1:C:244:LEU:HD23	2.34	0.53
1:D:447:GLN:HG3	5:D:933:HOH:O	2.09	0.52
1:D:392:LYS:HE2	1:D:444:ILE:HD11	1.90	0.51
1:A:322:HIS:HE1	5:A:845:HOH:O	1.92	0.51
1:B:591:ILE:O	1:B:594:GLN:HG2	2.10	0.51
1:B:371:ARG:NH2	1:B:549:LEU:HD21	2.26	0.50
1:D:115[A]:MET:C	1:D:115[A]:MET:SD	2.94	0.50
1:B:485:PRO:O	1:B:486:LYS:HB2	2.11	0.49
1:C:371:ARG:HG2	1:C:505:MET:HE3	1.94	0.49
1:A:251:LYS:HB2	1:A:252:PRO:HD3	1.95	0.49
1:B:390:PHE:CZ	1:B:426:ILE:HG23	2.48	0.48
1:A:543:GLU:HG2	1:C:543:GLU:HG2	1.95	0.48
1:C:251:LYS:HB2	1:C:252:PRO:HD3	1.95	0.48
1:A:543:GLU:CG	1:C:543:GLU:CG	2.91	0.48
1:D:244:LEU:C	1:D:244:LEU:HD23	2.38	0.48
1:B:251:LYS:HB2	1:B:252:PRO:HD3	1.96	0.47
1:A:229:VAL:HG12	1:A:230:LYS:N	2.30	0.47
1:A:238:VAL:HG13	1:A:269:LYS:HE2	1.96	0.47
1:A:395:ASP:OD1	1:A:408:ARG:NH1	2.48	0.47
1:D:416:MET:HE3	1:D:416:MET:HA	1.97	0.47
1:A:455:LYS:CE	5:A:886:HOH:O	2.62	0.47
1:B:244:LEU:C	1:B:244:LEU:HD23	2.39	0.47
1:B:213:PHE:CB	1:B:216:MET:HG2	2.45	0.47
1:A:354:LYS:NZ	5:A:901:HOH:O	2.48	0.46
1:C:592:THR:N	1:C:593:PRO:CD	2.78	0.46
1:A:244:LEU:C	1:A:244:LEU:HD23	2.40	0.46
1:B:394:ASP:O	1:B:408:ARG:HD2	2.15	0.46
1:C:351:ALA:O	1:C:520:PHE:HA	2.15	0.46
1:D:251:LYS:HB2	1:D:252:PRO:HD3	1.98	0.46
1:A:398:GLU:O	1:A:398:GLU:HG3	2.16	0.46
1:A:591:ILE:O	1:A:594:GLN:HG2	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:591:ILE:O	1:D:594:GLN:HG2	2.16	0.45
2:D:703:DCP:H5'1	5:D:854:HOH:O	2.16	0.45
1:A:592:THR:N	1:A:593:PRO:CD	2.80	0.45
1:D:351:ALA:O	1:D:520:PHE:HA	2.17	0.45
1:D:416:MET:HE1	1:D:419:TYR:CD2	2.47	0.45
1:C:115[B]:MET:C	1:C:115[B]:MET:SD	3.01	0.44
1:C:484:LYS:HA	1:C:484:LYS:HD2	1.81	0.44
1:B:351:ALA:O	1:B:520:PHE:HA	2.17	0.44
1:D:215:HIS:HA	1:D:218:ASP:OD1	2.17	0.44
1:A:215:HIS:HA	1:A:218:ASP:OD1	2.16	0.44
1:B:115[B]:MET:C	1:B:115[B]:MET:SD	3.01	0.44
1:C:334:PHE:CE2	1:C:359:LEU:HD11	2.52	0.44
1:B:215:HIS:HA	1:B:218:ASP:OD1	2.17	0.44
1:B:487:VAL:HG11	1:B:567:GLN:HG3	1.99	0.44
1:C:416:MET:HA	1:C:416:MET:HE2	2.00	0.44
1:D:213:PHE:CB	1:D:216:MET:HG2	2.45	0.44
1:B:592:THR:N	1:B:593:PRO:CD	2.81	0.43
1:A:351:ALA:O	1:A:520:PHE:HA	2.18	0.43
1:B:371:ARG:HG2	1:B:505:MET:HE2	2.00	0.43
1:A:543:GLU:HG2	1:C:543:GLU:CG	2.49	0.43
1:C:215:HIS:HA	1:C:218:ASP:OD1	2.19	0.43
1:A:372:ARG:HG2	5:C:890:HOH:O	2.19	0.42
1:D:334:PHE:CE2	1:D:359:LEU:HD11	2.53	0.42
1:B:241:PHE:O	1:B:245:ILE:HG12	2.20	0.42
1:C:591:ILE:O	1:C:594:GLN:HG2	2.20	0.42
1:D:185:LYS:HE3	1:D:338:ALA:O	2.20	0.42
1:A:543:GLU:CG	1:C:543:GLU:HG3	2.50	0.42
1:B:534:LYS:O	1:B:537:VAL:HG23	2.20	0.42
1:B:596:LYS:HD2	1:B:596:LYS:HA	1.77	0.42
1:A:334:PHE:CE2	1:A:359:LEU:HD11	2.54	0.41
1:D:371:ARG:NH1	1:D:549:LEU:HD21	2.35	0.41
1:A:416:MET:HE2	1:A:416:MET:HA	2.02	0.41
1:B:377:LYS:HG2	1:B:378:VAL:N	2.35	0.41
1:B:487:VAL:HG23	1:B:590:LEU:HD12	2.02	0.41
1:D:592:THR:N	1:D:593:PRO:CD	2.83	0.41
1:B:143:ARG:HD2	1:B:420:THR:HA	2.01	0.41
1:C:487:VAL:HG11	1:C:567:GLN:HG3	2.02	0.41
1:A:425:ASN:HB2	1:D:428:LEU:HD13	2.02	0.41
1:D:240:MET:CG	1:D:416:MET:HE1	2.38	0.41
1:C:241:PHE:O	1:C:245:ILE:HG12	2.20	0.41
1:B:537:VAL:HG23	1:B:541:LEU:CD1	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:341:CYS:HB2	1:D:350:CYS:SG	2.61	0.41
1:D:381:ILE:HD12	1:D:381:ILE:HA	1.95	0.41
1:D:371:ARG:HG3	1:D:371:ARG:NH2	2.15	0.41
1:A:381:ILE:HD12	1:A:381:ILE:HA	1.90	0.40
1:D:241:PHE:O	1:D:245:ILE:HG12	2.20	0.40
1:D:371:ARG:CG	1:D:371:ARG:NH2	2.66	0.40
1:B:236:GLY:HA2	1:B:239:MET:HE3	2.02	0.40
1:A:598:TRP:O	1:A:599:ASN:HB2	2.22	0.40
1:C:381:ILE:HD12	1:C:381:ILE:HA	1.91	0.40
1:C:487:VAL:HG23	1:C:590:LEU:HD12	2.02	0.40
1:D:447:GLN:CG	5:D:933:HOH:O	2.69	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	480/514 (93%)	473 (98%)	7 (2%)	0	100	100
1	B	480/514 (93%)	470 (98%)	10 (2%)	0	100	100
1	C	479/514 (93%)	471 (98%)	7 (2%)	1 (0%)	43	51
1	D	481/514 (94%)	474 (98%)	7 (2%)	0	100	100
All	All	1920/2056 (93%)	1888 (98%)	31 (2%)	1 (0%)	48	57

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	486	LYS

5.3.2 Protein sidechains ⓘ

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	430/459 (94%)	411 (96%)	19 (4%)	25	34
1	B	430/459 (94%)	409 (95%)	21 (5%)	22	29
1	C	429/459 (94%)	414 (96%)	15 (4%)	32	43
1	D	431/459 (94%)	414 (96%)	17 (4%)	28	39
All	All	1720/1836 (94%)	1648 (96%)	72 (4%)	27	36

All (72) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	118	ILE
1	A	184	GLU
1	A	193	GLU
1	A	240	MET
1	A	277	GLU
1	A	284	LEU
1	A	315	TYR
1	A	354	LYS
1	A	359	LEU
1	A	371	ARG
1	A	377	LYS
1	A	463	THR
1	A	465	GLN
1	A	471	GLU
1	A	478	LYS
1	A	487	VAL
1	A	534	LYS
1	A	539	GLN
1	A	596	LYS
1	B	115[A]	MET
1	B	115[B]	MET
1	B	118	ILE
1	B	216	MET
1	B	230	LYS

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Mol	Chain	Res	Type
1	B	240	MET
1	B	277	GLU
1	B	284	LEU
1	B	302	SER
1	B	315	TYR
1	B	326	GLN
1	B	339	ARG
1	B	354	LYS
1	B	377	LYS
1	B	405	LYS
1	B	465	GLN
1	B	470	ARG
1	B	471	GLU
1	B	496	GLU
1	B	511	GLU
1	B	539	GLN
1	C	118	ILE
1	C	230	LYS
1	C	240	MET
1	C	277	GLU
1	C	284	LEU
1	C	315	TYR
1	C	326	GLN
1	C	342	GLU
1	C	354	LYS
1	C	359	LEU
1	C	377	LYS
1	C	405	LYS
1	C	470	ARG
1	C	594	GLN
1	C	596	LYS
1	D	113	ASP
1	D	115[A]	MET
1	D	115[B]	MET
1	D	118	ILE
1	D	185	LYS
1	D	216	MET
1	D	230	LYS
1	D	240	MET
1	D	284	LEU
1	D	354	LYS
1	D	359	LEU

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Mol	Chain	Res	Type
1	D	371	ARG
1	D	377	LYS
1	D	465	GLN
1	D	470	ARG
1	D	471	GLU
1	D	543	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	149	GLN
1	A	200	GLN
1	A	233	HIS
1	A	243	HIS
1	A	248	ASN
1	A	425	ASN
1	A	517	HIS
1	A	571	GLN
1	A	594	GLN
1	B	149	GLN
1	B	200	GLN
1	B	233	HIS
1	B	248	ASN
1	B	425	ASN
1	B	447	GLN
1	B	452	ASN
1	B	571	GLN
1	C	149	GLN
1	C	200	GLN
1	C	210	HIS
1	C	235	GLN
1	C	243	HIS
1	C	425	ASN
1	C	447	GLN
1	C	452	ASN
1	C	571	GLN
1	C	594	GLN
1	D	149	GLN
1	D	200	GLN
1	D	233	HIS
1	D	243	HIS
1	D	425	ASN

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Mol	Chain	Res	Type
1	D	447	GLN
1	D	452	ASN
1	D	517	HIS
1	D	567	GLN
1	D	571	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 20 ligands modelled in this entry, 8 are monoatomic - leaving 12 for Mogul analysis.

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	$\# Z > 2$
4	DGT	C	701	3	32,33,33	1.35	4 (12%)	48,52,52	1.74	12 (25%)
4	DGT	D	702	3	32,33,33	1.54	8 (25%)	48,52,52	1.85	10 (20%)
2	DCP	D	703	3	28,29,29	1.77	5 (17%)	41,45,45	1.31	6 (14%)
2	DCP	C	703	3	28,29,29	1.55	4 (14%)	41,45,45	1.18	5 (12%)
2	DCP	B	701	3	28,29,29	1.72	4 (14%)	41,45,45	1.59	7 (17%)
4	DGT	B	703	3	32,33,33	1.80	9 (28%)	48,52,52	1.66	7 (14%)
4	DGT	B	705	3	32,33,33	1.70	7 (21%)	48,52,52	1.50	8 (16%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	DGT	A	703	3	32,33,33	1.45	6 (18%)	48,52,52	1.82	14 (29%)
4	DGT	A	704	3	32,33,33	1.90	6 (18%)	48,52,52	1.75	13 (27%)
4	DGT	B	704	3	32,33,33	1.48	5 (15%)	48,52,52	1.87	12 (25%)
2	DCP	A	701	3	28,29,29	1.64	4 (14%)	41,45,45	1.24	5 (12%)
4	DGT	D	705	3	32,33,33	1.35	7 (21%)	48,52,52	1.63	10 (20%)

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
4	DGT	C	701	3	-	3/22/34/34	0/3/3/3
4	DGT	D	702	3	-	4/22/34/34	0/3/3/3
2	DCP	D	703	3	-	3/22/34/34	0/2/2/2
2	DCP	C	703	3	-	4/22/34/34	0/2/2/2
2	DCP	B	701	3	-	5/22/34/34	0/2/2/2
4	DGT	B	703	3	-	5/22/34/34	0/3/3/3
4	DGT	B	705	3	-	2/22/34/34	0/3/3/3
4	DGT	A	703	3	-	6/22/34/34	0/3/3/3
4	DGT	A	704	3	-	5/22/34/34	0/3/3/3
4	DGT	B	704	3	-	6/22/34/34	0/3/3/3
2	DCP	A	701	3	-	5/22/34/34	0/2/2/2
4	DGT	D	705	3	-	5/22/34/34	0/3/3/3

All (69) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	701	DCP	PB-O3B	6.59	1.66	1.59
2	B	701	DCP	PB-O3B	6.42	1.66	1.59
4	A	704	DGT	PB-O3A	5.83	1.65	1.59
2	D	703	DCP	PB-O3B	5.75	1.65	1.59
4	B	705	DGT	PB-O3B	5.73	1.65	1.59
4	A	704	DGT	PA-O3A	5.35	1.65	1.59
2	C	703	DCP	PB-O3B	4.80	1.64	1.59
4	C	701	DGT	C6-N1	-4.03	1.31	1.38
4	A	703	DGT	C6-N1	-3.95	1.31	1.38
4	A	703	DGT	PA-O3A	3.90	1.63	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	703	DGT	C5-C4	3.76	1.49	1.38
4	B	703	DGT	C6-N1	-3.60	1.32	1.38
4	D	702	DGT	PB-O3B	3.58	1.63	1.59
4	B	703	DGT	PA-O3A	3.57	1.63	1.59
4	B	704	DGT	C5-N7	-3.49	1.32	1.39
4	B	703	DGT	PB-O3B	3.37	1.63	1.59
2	B	701	DCP	C6-C5	3.25	1.42	1.35
2	C	703	DCP	PA-O3A	3.19	1.62	1.59
2	D	703	DCP	PA-O3A	3.13	1.62	1.59
4	A	704	DGT	C5-N7	-3.10	1.32	1.39
4	B	704	DGT	C5-C4	3.08	1.47	1.38
4	A	704	DGT	C5-C4	3.01	1.47	1.38
4	B	705	DGT	C5-C4	3.01	1.47	1.38
4	B	703	DGT	O6-C6	2.98	1.29	1.23
4	B	704	DGT	C4-N9	-2.97	1.30	1.38
4	D	702	DGT	C5-N7	-2.93	1.33	1.39
4	D	705	DGT	C4-N9	-2.92	1.30	1.38
4	A	704	DGT	C6-N1	-2.87	1.33	1.38
4	B	705	DGT	C4-N9	-2.87	1.30	1.38
4	C	701	DGT	C5-C4	2.86	1.46	1.38
4	B	705	DGT	C5-N7	-2.81	1.33	1.39
2	D	703	DCP	C2-N3	-2.70	1.31	1.36
4	D	705	DGT	PB-O1B	-2.68	1.42	1.55
4	D	705	DGT	C5-N7	-2.64	1.33	1.39
4	D	705	DGT	C6-N1	-2.63	1.33	1.38
4	D	702	DGT	C6-N1	-2.53	1.34	1.38
4	A	703	DGT	PB-O3A	2.42	1.62	1.59
4	D	702	DGT	C4-N9	-2.41	1.31	1.38
4	D	702	DGT	C8-N9	-2.40	1.32	1.37
4	B	704	DGT	PB-O3A	2.39	1.62	1.59
4	B	704	DGT	PB-O1B	-2.36	1.44	1.55
4	A	704	DGT	C4-N9	-2.36	1.32	1.38
4	B	703	DGT	C4-N9	-2.34	1.32	1.38
4	B	703	DGT	C5-N7	-2.34	1.34	1.39
4	B	703	DGT	PA-O2A	-2.34	1.42	1.50
4	D	705	DGT	O6-C6	2.32	1.28	1.23
4	B	705	DGT	C8-N7	2.29	1.39	1.32
2	A	701	DCP	PB-O3A	2.26	1.61	1.59
4	A	703	DGT	C4-N9	-2.20	1.32	1.38
2	B	701	DCP	O3'-C3'	2.18	1.47	1.43
4	C	701	DGT	C5-N7	-2.18	1.34	1.39
4	D	702	DGT	PG-O2G	-2.17	1.46	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	703	DGT	PB-O3A	2.16	1.61	1.59
2	A	701	DCP	PA-O3A	2.16	1.61	1.59
2	B	701	DCP	PA-O5'	2.15	1.67	1.59
4	D	702	DGT	PB-O3A	2.14	1.61	1.59
4	B	705	DGT	PG-O2G	-2.13	1.46	1.54
4	A	703	DGT	PB-O3B	-2.11	1.57	1.59
4	D	705	DGT	C5-C4	2.08	1.44	1.38
4	D	702	DGT	PB-O2B	-2.07	1.43	1.50
2	C	703	DCP	O4'-C4'	-2.07	1.40	1.45
4	D	705	DGT	PG-O2G	-2.06	1.47	1.54
4	A	703	DGT	C5-C4	2.06	1.44	1.38
2	A	701	DCP	C6-C5	2.05	1.39	1.35
2	D	703	DCP	C4-N4	2.03	1.38	1.33
2	D	703	DCP	O4'-C1'	2.03	1.46	1.42
2	C	703	DCP	C6-C5	2.02	1.39	1.35
4	C	701	DGT	C8-N7	2.01	1.38	1.32
4	B	705	DGT	O4'-C4'	-2.01	1.40	1.45

All (109) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	703	DGT	C5-C4-N3	-5.92	118.97	128.39
4	B	704	DGT	C5-C4-N3	-5.26	120.03	128.39
4	A	703	DGT	C5-C4-N3	-5.03	120.38	128.39
4	D	702	DGT	C5-C4-N3	-4.88	120.62	128.39
4	B	704	DGT	C2-N3-C4	4.75	120.47	112.30
2	B	701	DCP	O2-C2-N3	-4.70	114.92	122.33
4	D	702	DGT	C2-N3-C4	4.70	120.39	112.30
2	D	703	DCP	O4'-C1'-N1	4.67	116.15	107.86
4	A	703	DGT	N9-C4-N3	4.51	134.97	125.95
4	C	701	DGT	C5-C4-N3	-4.39	121.40	128.39
4	D	705	DGT	C5-C4-N3	-4.34	121.48	128.39
2	B	701	DCP	O3A-PB-O1B	-4.31	97.75	110.70
4	B	704	DGT	O1B-PB-O3A	-4.29	95.69	107.27
4	A	704	DGT	C5-C4-N3	-4.27	121.60	128.39
4	B	703	DGT	N9-C4-N3	4.05	134.05	125.95
4	B	704	DGT	N9-C4-N3	3.93	133.82	125.95
4	B	703	DGT	C2-N3-C4	3.88	118.99	112.30
4	A	704	DGT	C6-C5-N7	3.82	137.25	130.29
4	D	702	DGT	N9-C4-N3	3.80	133.56	125.95
2	B	701	DCP	O4'-C1'-N1	3.69	114.41	107.86
4	B	705	DGT	C5-C4-N3	-3.63	122.61	128.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	704	DGT	O1B-PB-O2B	3.55	128.97	112.44
2	C	703	DCP	O2-C2-N3	-3.54	116.75	122.33
4	C	701	DGT	N9-C4-N3	3.50	132.94	125.95
4	A	704	DGT	O1B-PB-O3A	-3.49	97.84	107.27
4	B	703	DGT	C6-C5-N7	3.41	136.49	130.29
4	C	701	DGT	O1A-PA-O3A	-3.36	98.18	107.27
4	B	703	DGT	C4-C5-N7	-3.36	105.35	110.67
4	D	702	DGT	O6-C6-C5	-3.35	117.68	126.53
2	D	703	DCP	O2-C2-N3	-3.34	117.06	122.33
2	A	701	DCP	O2B-PB-O3A	-3.34	98.26	107.27
4	D	705	DGT	N9-C4-N3	3.32	132.60	125.95
4	A	704	DGT	C2-N3-C4	3.24	117.87	112.30
2	C	703	DCP	O4'-C1'-N1	3.17	113.49	107.86
4	A	703	DGT	O2G-PG-O3B	-3.13	94.14	104.64
4	D	705	DGT	O3B-PG-O3G	-3.12	94.64	111.04
4	D	705	DGT	C2-N3-C4	3.10	117.64	112.30
2	A	701	DCP	O4'-C1'-N1	3.09	113.34	107.86
4	D	705	DGT	O2G-PG-O3G	3.08	122.86	110.83
4	A	703	DGT	C2-N3-C4	3.07	117.58	112.30
4	D	702	DGT	C6-C5-N7	3.06	135.85	130.29
4	B	705	DGT	O6-C6-C5	-3.05	118.48	126.53
4	B	704	DGT	C6-C5-N7	3.02	135.78	130.29
4	C	701	DGT	C2-N3-C4	2.98	117.44	112.30
4	D	702	DGT	O3A-PA-O2A	2.97	119.63	110.70
4	C	701	DGT	O1A-PA-O2A	2.96	126.22	112.44
4	B	705	DGT	N9-C4-N3	2.92	131.80	125.95
4	B	705	DGT	O6-C6-N1	2.92	125.61	120.11
4	A	703	DGT	O1B-PB-O3B	2.91	115.14	107.27
4	D	705	DGT	O2G-PG-O3B	-2.91	94.89	104.64
4	C	701	DGT	O4'-C1'-N9	-2.90	102.72	107.86
4	A	704	DGT	N9-C4-N3	2.89	131.74	125.95
4	B	704	DGT	O2G-PG-O3B	-2.85	95.08	104.64
4	A	703	DGT	C2-N1-C6	-2.84	119.97	125.11
4	B	703	DGT	O2G-PG-O3G	2.81	121.79	110.83
4	A	703	DGT	O1B-PB-O3A	-2.78	99.77	107.27
2	A	701	DCP	O2-C2-N3	-2.73	118.03	122.33
4	B	704	DGT	O2G-PG-O1G	2.72	117.98	107.80
4	A	704	DGT	C4-C5-N7	-2.69	106.41	110.67
4	B	705	DGT	O2G-PG-O1G	2.66	117.77	107.80
4	A	703	DGT	C5-C6-N1	2.65	120.01	113.25
4	D	702	DGT	O4'-C1'-N9	-2.65	103.16	107.86
4	C	701	DGT	O3B-PB-O2B	-2.63	102.78	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	701	DCP	O2A-PA-O1A	2.63	124.67	112.44
2	B	701	DCP	O3G-PG-O2G	2.60	117.57	107.80
4	C	701	DGT	C2'-C1'-N9	2.59	120.30	113.81
4	B	705	DGT	C2-N3-C4	2.59	116.75	112.30
4	A	703	DGT	O2G-PG-O1G	2.57	117.45	107.80
4	D	705	DGT	O6-C6-C5	-2.49	119.96	126.53
4	A	704	DGT	O3A-PA-O2A	2.48	118.17	110.70
4	C	701	DGT	O2G-PG-O1G	2.46	117.02	107.80
4	B	704	DGT	O1B-PB-O2B	2.45	123.85	112.44
2	A	701	DCP	O3G-PG-O2G	2.42	116.89	107.80
4	B	704	DGT	O2G-PG-O3G	2.42	120.25	110.83
4	C	701	DGT	C6-C5-N7	2.41	134.68	130.29
2	C	703	DCP	O3G-PG-O2G	2.41	116.83	107.80
4	D	705	DGT	C2'-C1'-N9	2.40	119.81	113.81
4	A	703	DGT	O6-C6-C5	-2.39	120.21	126.53
2	C	703	DCP	O2-C2-N1	2.35	123.51	118.90
4	B	704	DGT	O3B-PG-O3G	-2.34	98.71	111.04
2	D	703	DCP	O3G-PG-O2G	2.34	116.56	107.80
4	A	703	DGT	C8-N9-C4	2.33	110.40	106.03
4	B	704	DGT	C4-C5-N7	-2.33	106.98	110.67
2	D	703	DCP	O2B-PB-O3B	2.32	113.55	107.27
4	D	702	DGT	O2G-PG-O1G	2.32	116.50	107.80
4	A	703	DGT	C6-C5-N7	2.30	134.48	130.29
2	D	703	DCP	O2-C2-N1	2.26	123.33	118.90
2	C	703	DCP	O2A-PA-O1A	2.26	122.94	112.44
4	D	702	DGT	C5-C6-N1	2.24	118.95	113.25
4	C	701	DGT	C1'-N9-C4	-2.23	119.48	125.50
4	C	701	DGT	O1B-PB-O2B	2.23	122.81	112.44
4	A	703	DGT	N9-C8-N7	-2.17	109.37	113.40
2	D	703	DCP	O2B-PB-O3A	-2.17	101.42	107.27
4	B	705	DGT	O1A-PA-O2A	2.16	122.47	112.44
4	A	704	DGT	O1B-PB-O3B	2.15	113.07	107.27
4	D	705	DGT	O1B-PB-O2B	2.13	122.36	112.44
4	B	704	DGT	O4'-C1'-N9	-2.13	104.08	107.86
2	B	701	DCP	O2-C2-N1	2.13	123.06	118.90
2	A	701	DCP	C5-C6-N1	-2.10	118.42	121.84
4	B	705	DGT	O4'-C1'-N9	-2.10	104.14	107.86
4	D	705	DGT	C6-C5-N7	2.10	134.11	130.29
4	B	703	DGT	O3B-PG-O3G	-2.06	100.22	111.04
4	A	704	DGT	C8-N7-C5	2.05	107.92	104.26
4	A	704	DGT	O1A-PA-O2A	2.05	121.96	112.44
2	B	701	DCP	C5-C6-N1	-2.04	118.52	121.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	703	DGT	O2G-PG-O3G	2.02	118.71	110.83
4	A	704	DGT	O3B-PB-O2B	-2.02	104.64	110.70
4	D	702	DGT	O1A-PA-O3A	-2.01	101.84	107.27
4	A	704	DGT	O4'-C1'-N9	-2.01	104.30	107.86

There are no chirality outliers.

All (53) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701	DCP	C5'-O5'-PA-O1A
2	B	701	DCP	C5'-O5'-PA-O1A
2	C	703	DCP	PB-O3A-PA-O5'
4	A	704	DGT	PB-O3B-PG-O1G
2	D	703	DCP	C4'-C5'-O5'-PA
2	A	701	DCP	C4'-C5'-O5'-PA
2	B	701	DCP	C4'-C5'-O5'-PA
2	C	703	DCP	C4'-C5'-O5'-PA
2	A	701	DCP	PB-O3A-PA-O5'
2	B	701	DCP	PB-O3A-PA-O5'
2	D	703	DCP	PB-O3A-PA-O5'
4	A	704	DGT	PB-O3B-PG-O2G
2	B	701	DCP	C3'-C4'-C5'-O5'
4	A	703	DGT	PB-O3A-PA-O2A
4	B	703	DGT	PG-O3B-PB-O2B
4	B	704	DGT	PG-O3B-PB-O2B
4	B	705	DGT	PG-O3B-PB-O1B
4	C	701	DGT	PG-O3B-PB-O1B
4	D	702	DGT	PG-O3B-PB-O1B
4	D	705	DGT	PG-O3B-PB-O2B
2	B	701	DCP	O4'-C4'-C5'-O5'
2	A	701	DCP	C5'-O5'-PA-O3A
4	A	703	DGT	C2'-C1'-N9-C8
4	B	703	DGT	C4'-C5'-O5'-PA
4	A	703	DGT	C4'-C5'-O5'-PA
4	B	704	DGT	C4'-C5'-O5'-PA
4	A	703	DGT	C2'-C1'-N9-C4
4	B	704	DGT	C2'-C1'-N9-C4
2	C	703	DCP	C3'-C4'-C5'-O5'
4	B	703	DGT	C2'-C1'-N9-C8
4	C	701	DGT	PB-O3A-PA-O2A
4	D	702	DGT	PB-O3A-PA-O2A
4	D	705	DGT	PB-O3B-PG-O2G

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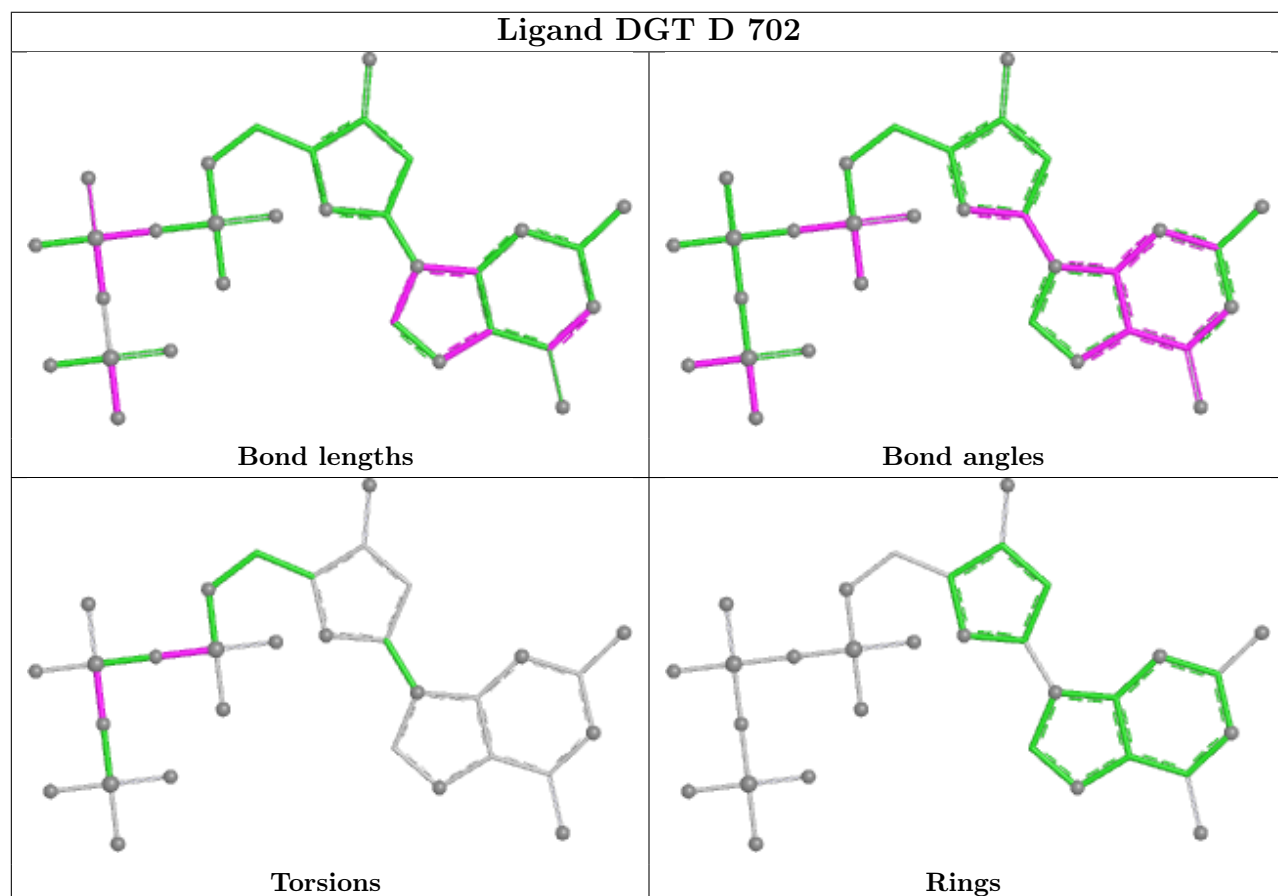
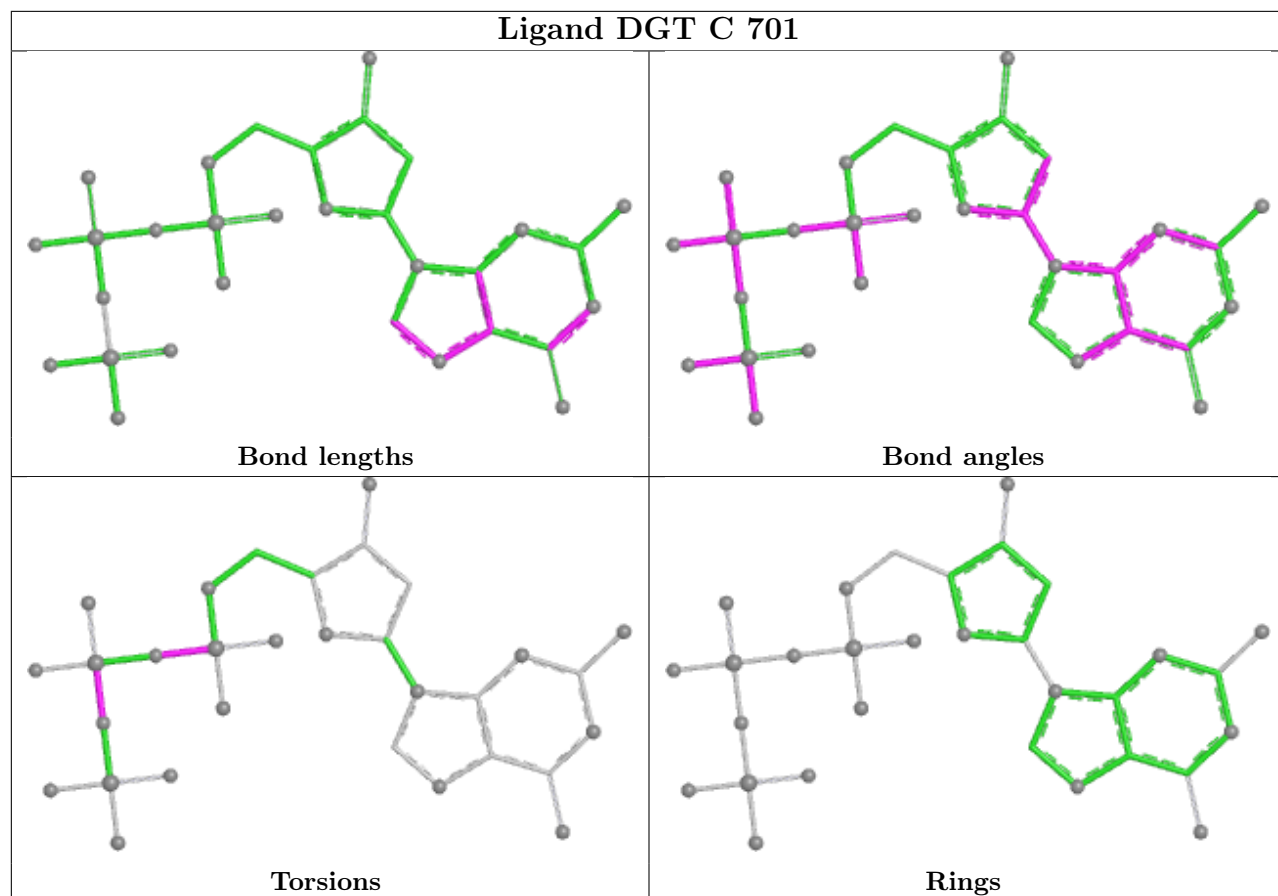
Mol	Chain	Res	Type	Atoms
4	D	705	DGT	C4'-C5'-O5'-PA
2	A	701	DCP	C3'-C4'-C5'-O5'
4	B	704	DGT	C2'-C1'-N9-C8
4	A	704	DGT	PG-O3B-PB-O1B
4	A	704	DGT	PG-O3B-PB-O2B
4	B	703	DGT	PB-O3A-PA-O2A
4	B	705	DGT	PG-O3B-PB-O2B
4	C	701	DGT	PG-O3B-PB-O2B
4	D	702	DGT	PG-O3B-PB-O2B
4	D	705	DGT	PG-O3B-PB-O1B
2	C	703	DCP	PG-O3B-PB-O1B
4	A	703	DGT	PG-O3B-PB-O1B
4	A	703	DGT	PB-O3A-PA-O1A
4	A	704	DGT	PB-O3A-PA-O1A
4	B	703	DGT	PB-O3A-PA-O1A
4	B	704	DGT	PG-O3B-PB-O1B
4	B	704	DGT	PB-O3A-PA-O1A
4	D	702	DGT	PB-O3A-PA-O1A
4	D	705	DGT	PB-O3A-PA-O1A
2	D	703	DCP	C3'-C4'-C5'-O5'

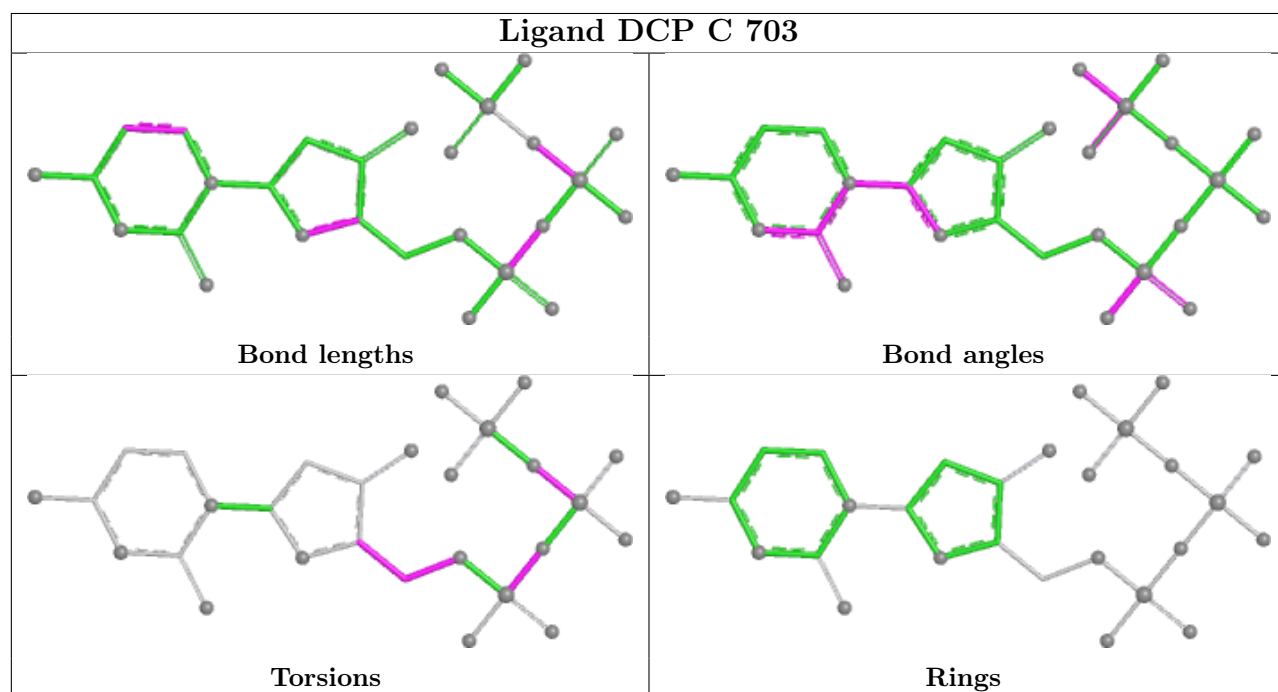
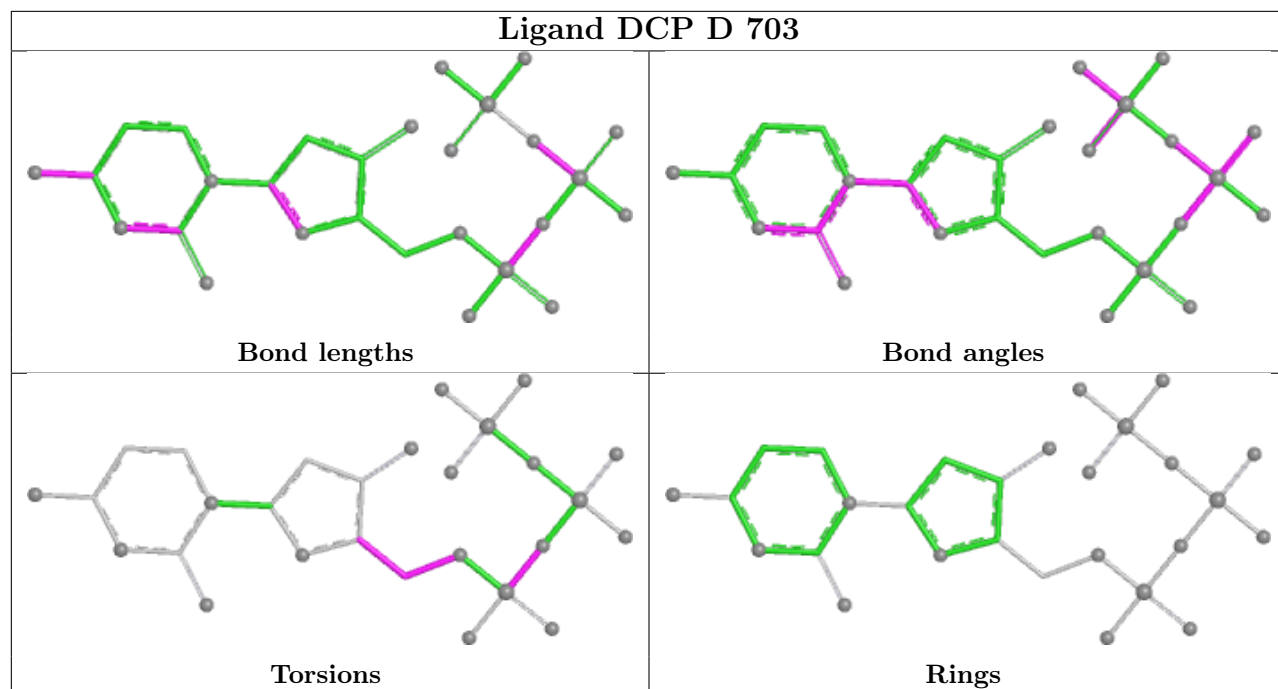
There are no ring outliers.

3 monomers are involved in 6 short contacts:

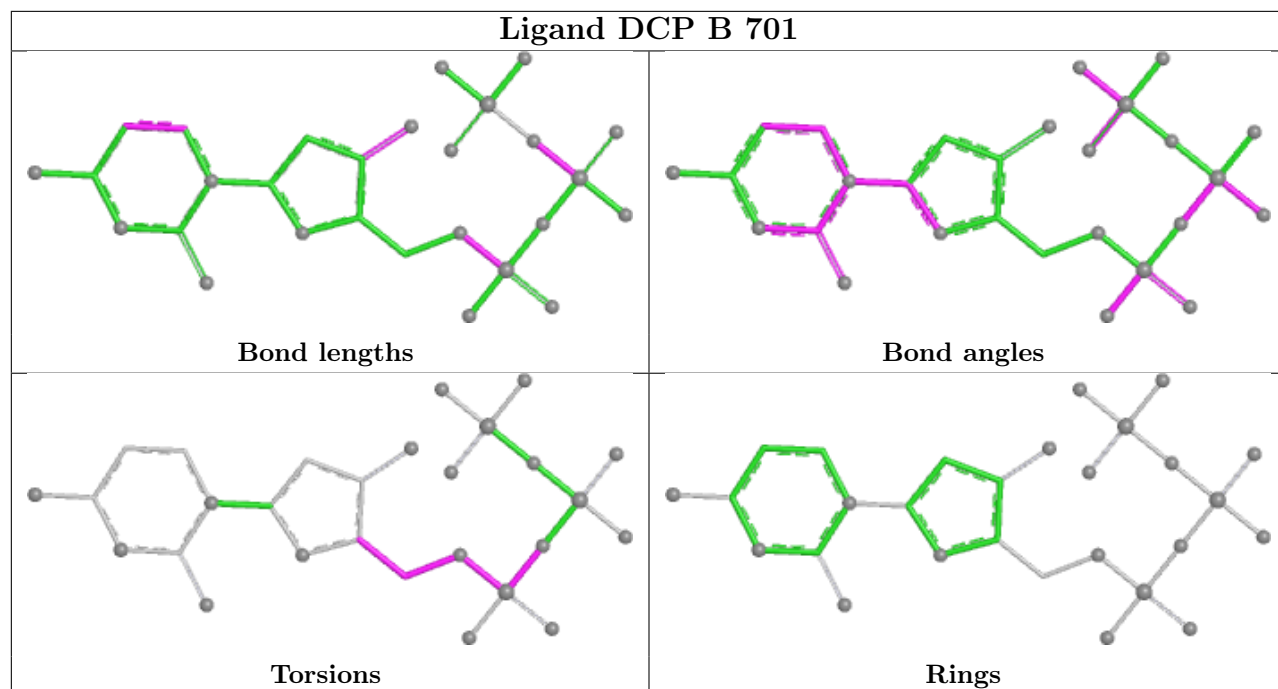
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	703	DCP	1	0
2	B	701	DCP	4	0
2	A	701	DCP	1	0

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.

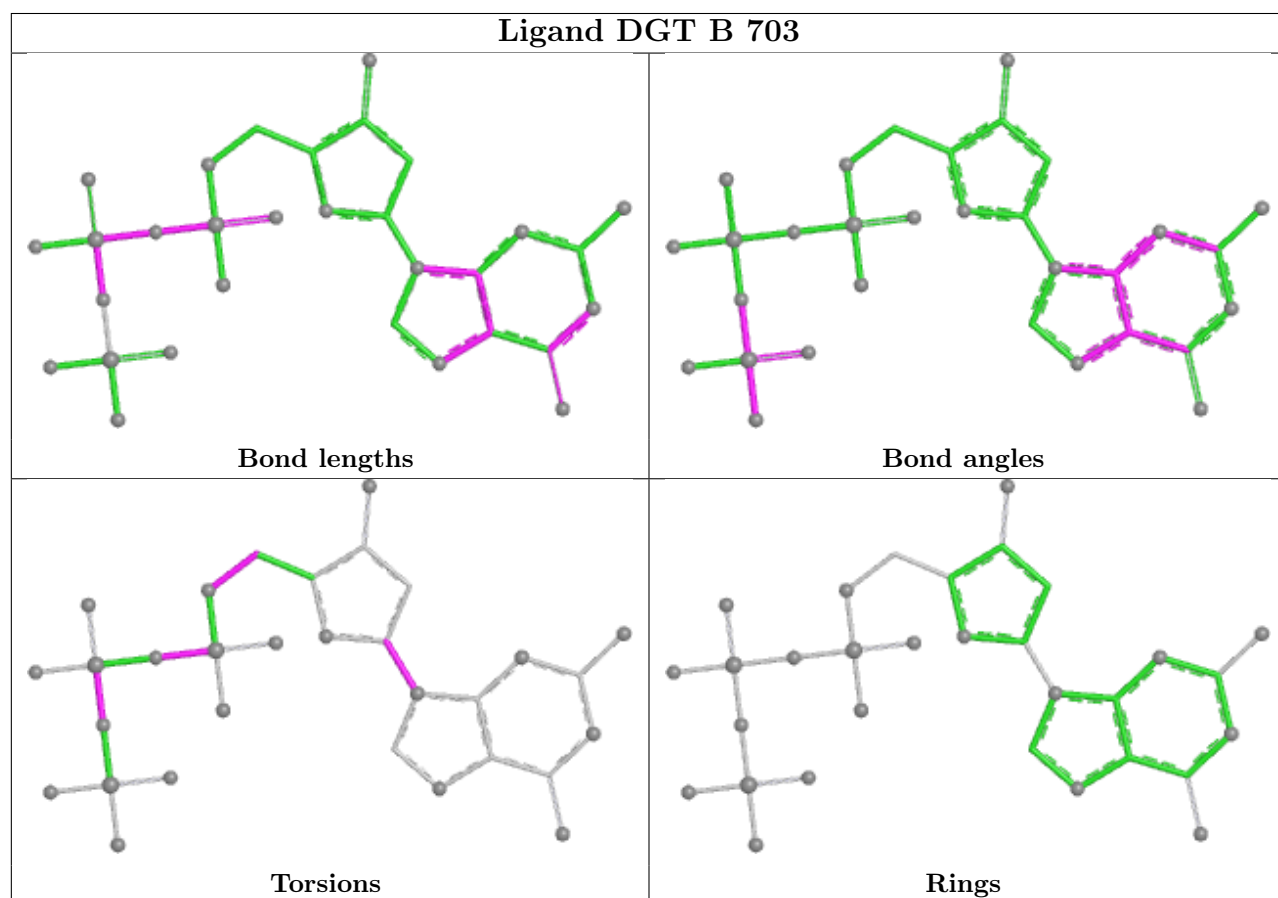


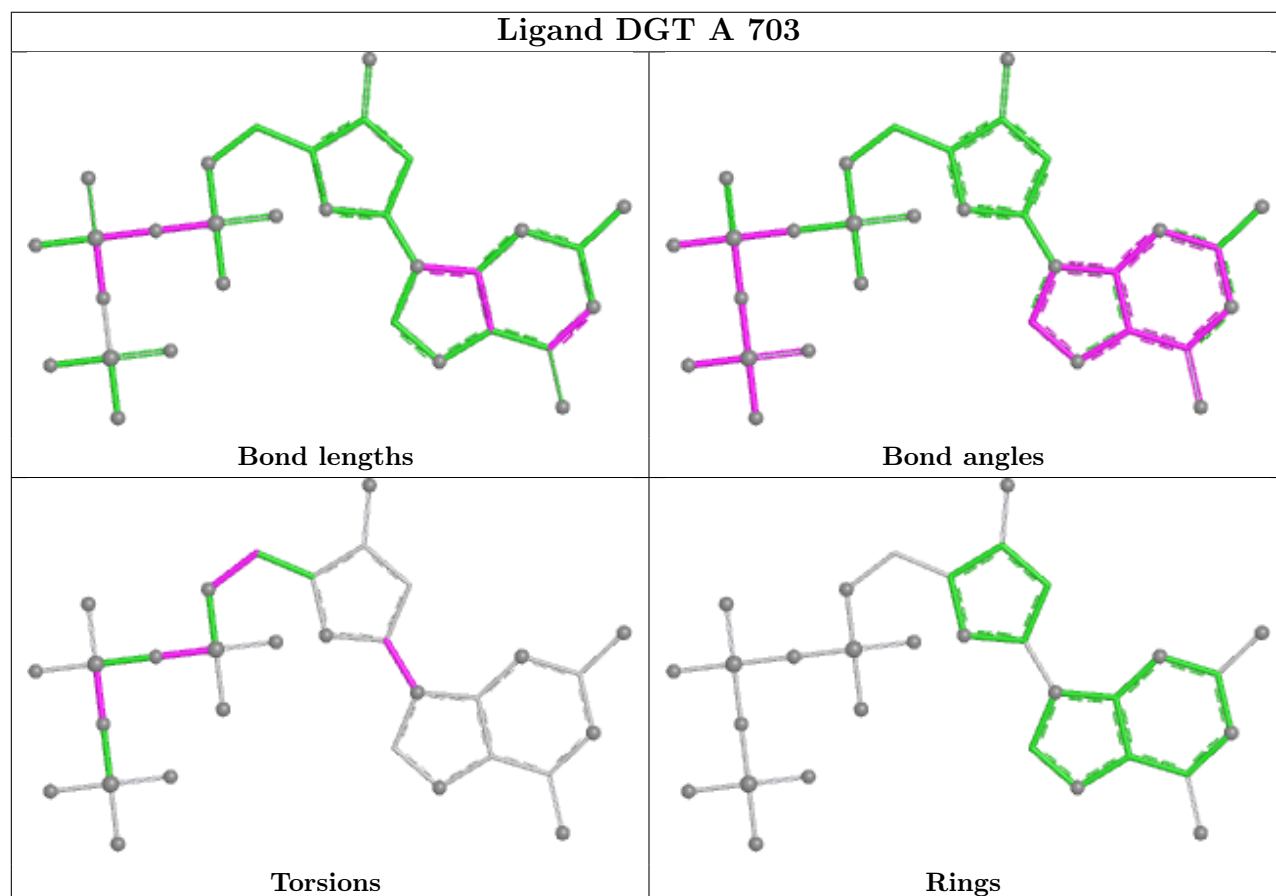
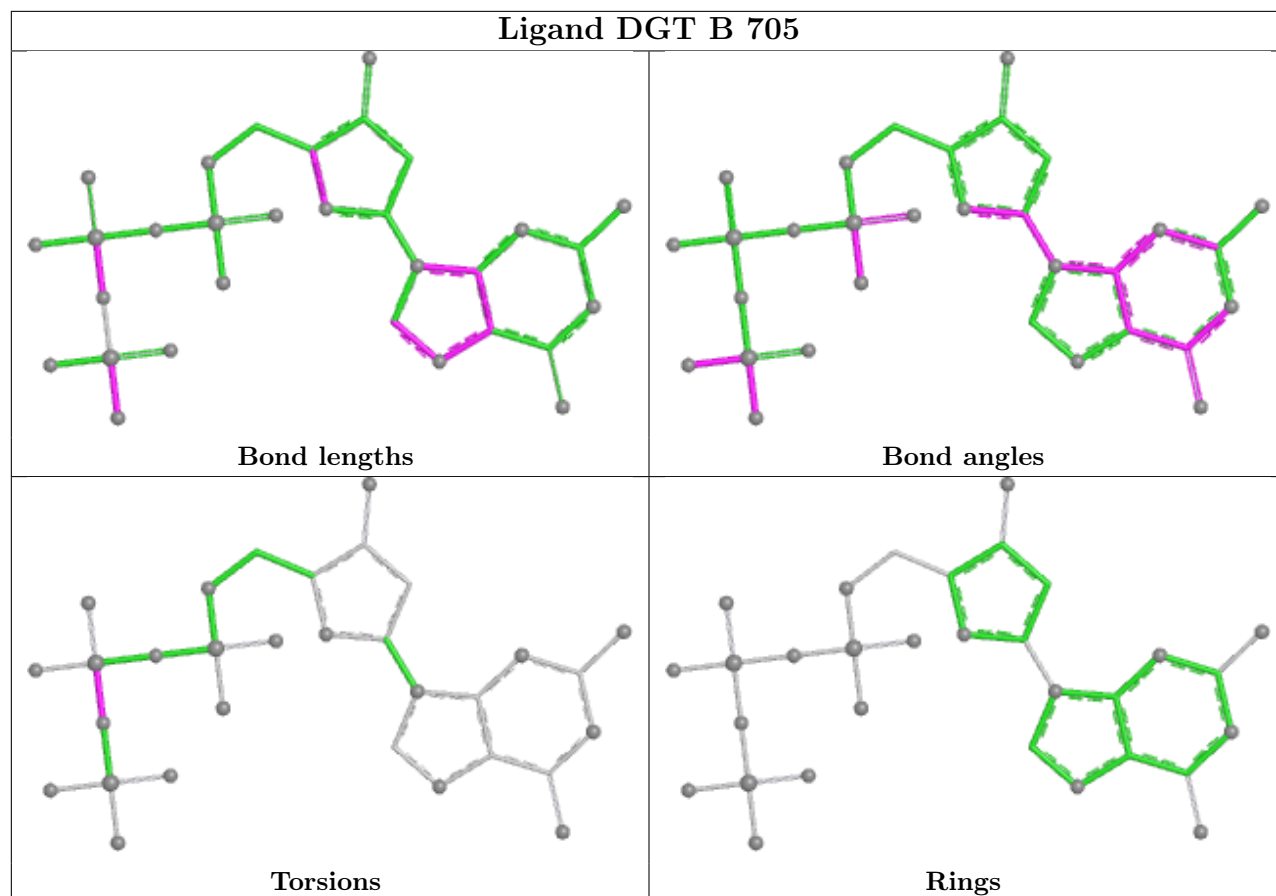


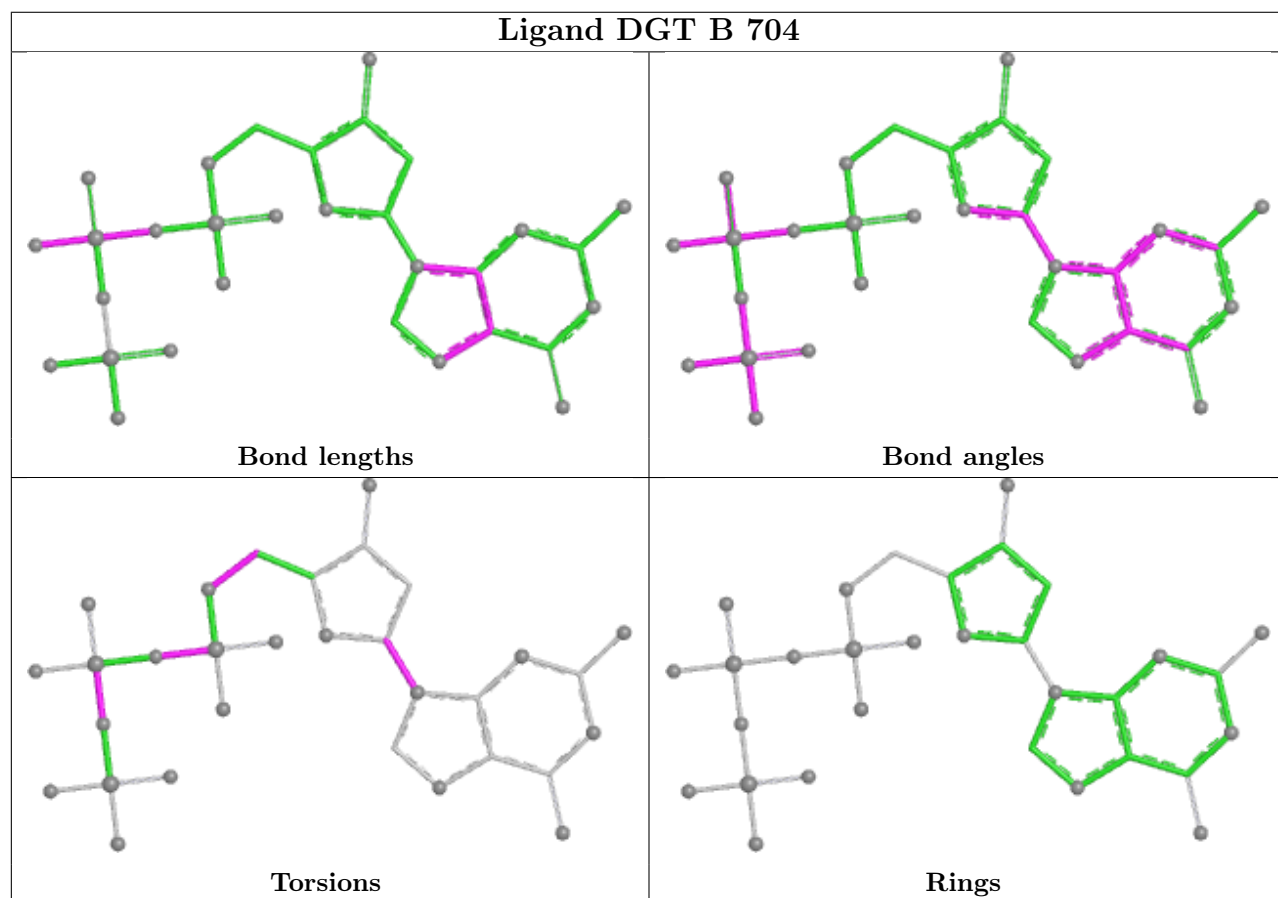
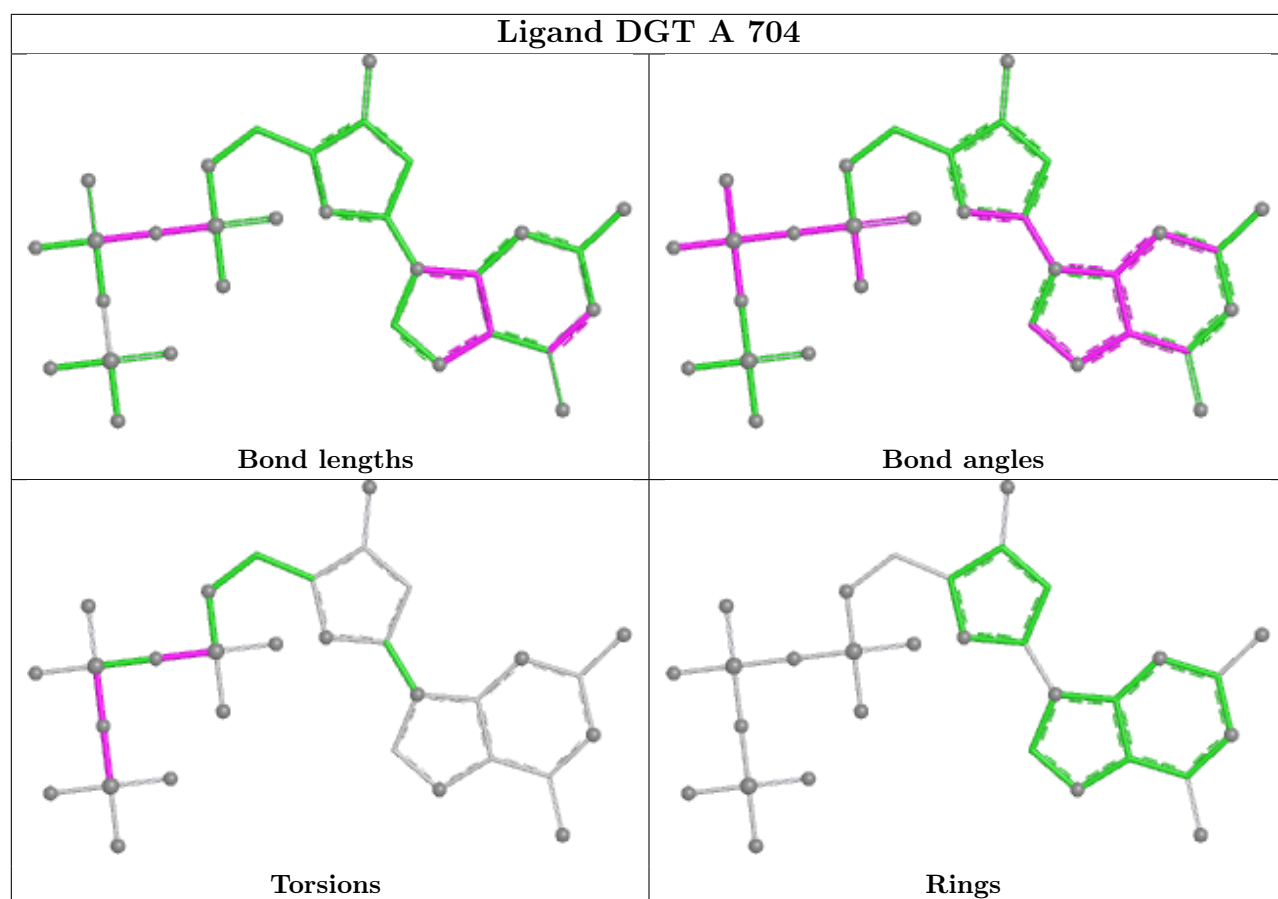
Ligand DCP B 701

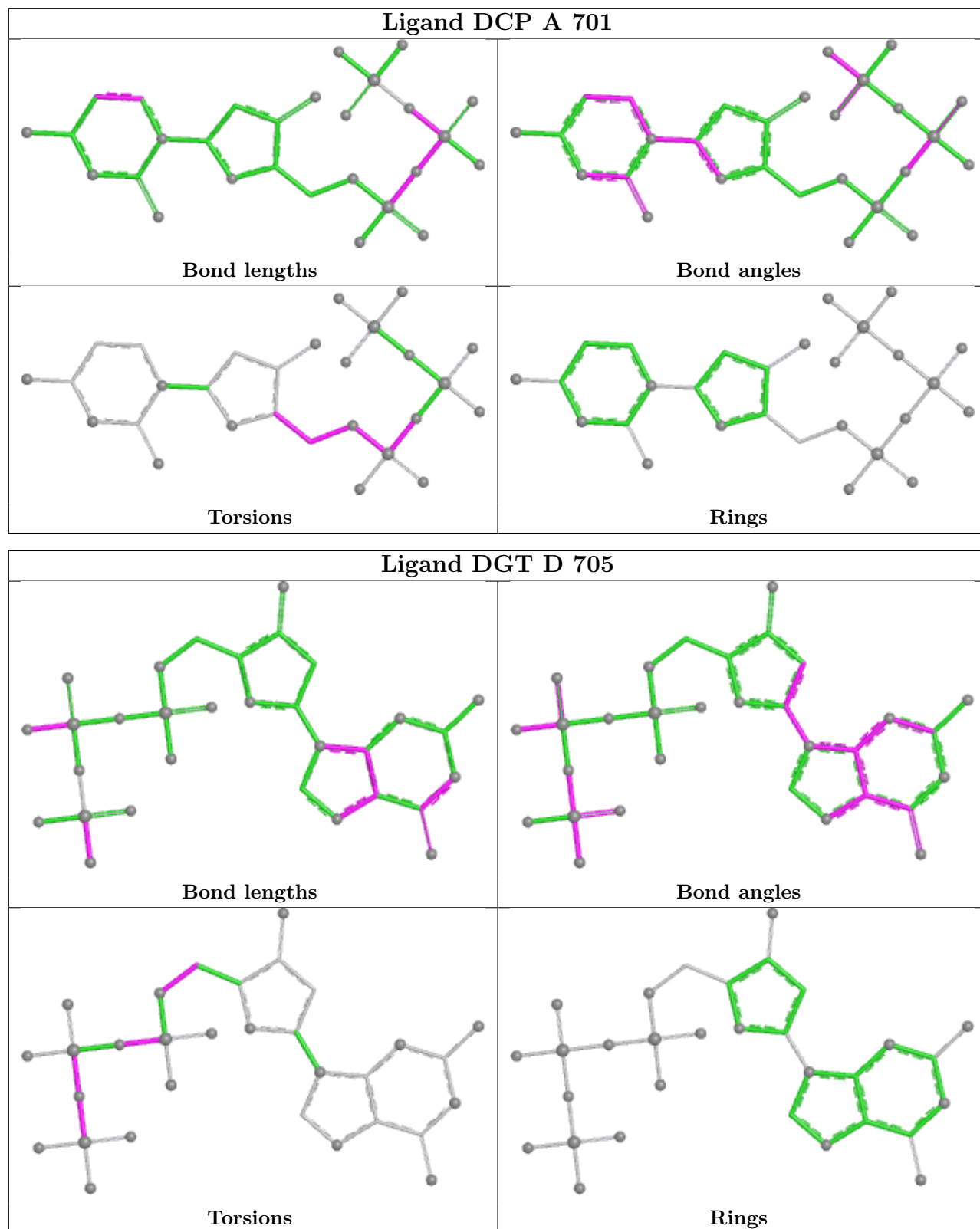


Ligand DGT B 703









5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	481/514 (93%)	-0.04	4 (0%) 82 80	21, 55, 92, 132	3 (0%)
1	B	481/514 (93%)	-0.09	3 (0%) 85 83	19, 54, 88, 121	3 (0%)
1	C	481/514 (93%)	-0.03	4 (0%) 82 80	21, 58, 88, 117	2 (0%)
1	D	481/514 (93%)	-0.22	3 (0%) 85 83	18, 47, 80, 115	4 (0%)
All	All	1924/2056 (93%)	-0.09	14 (0%) 84 82	18, 53, 88, 132	12 (0%)

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	284	LEU	5.1
1	D	284	LEU	3.6
1	A	115[A]	MET	3.2
1	C	284	LEU	3.2
1	A	466	ILE	3.0
1	D	491	VAL	2.7
1	B	488	LEU	2.5
1	B	284	LEU	2.5
1	C	488	LEU	2.4
1	A	388	ASP	2.3
1	D	467	LYS	2.3
1	B	599	ASN	2.1
1	C	522	CYS	2.1
1	C	115[A]	MET	2.1

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 ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

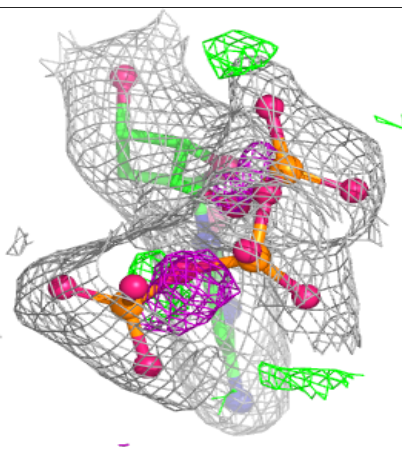
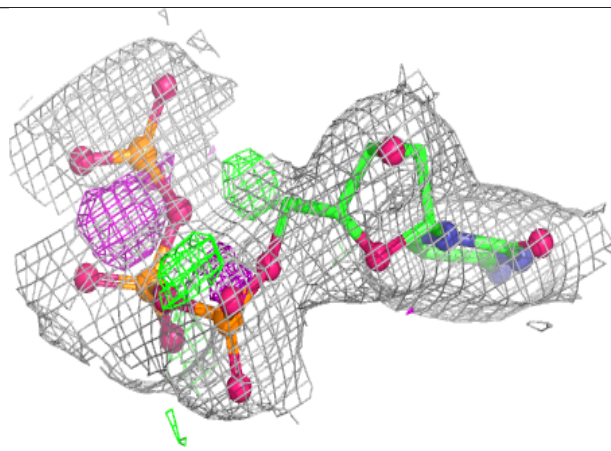
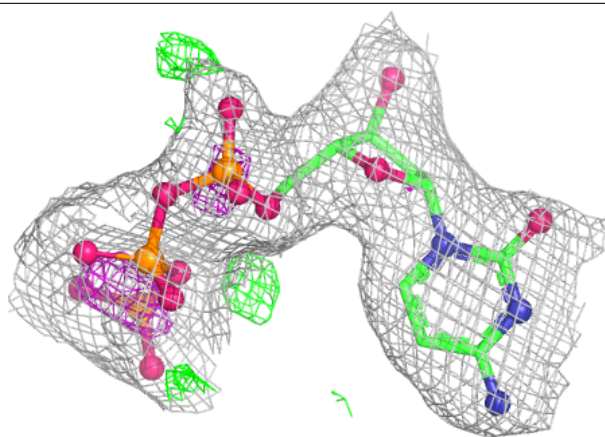
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MG	C	704	1/1	0.87	0.08	85,85,85,85	0
3	MG	A	702	1/1	0.89	0.08	112,112,112,112	0
2	DCP	A	701	28/28	0.92	0.08	39,51,84,89	0
2	DCP	C	703	28/28	0.92	0.09	41,55,80,85	0
2	DCP	B	701	28/28	0.93	0.08	32,49,77,78	0
2	DCP	D	703	28/28	0.93	0.08	32,41,69,76	0
3	MG	B	702	1/1	0.96	0.11	80,80,80,80	0
3	MG	D	704	1/1	0.96	0.09	81,81,81,81	0
4	DGT	A	703	31/31	0.98	0.04	33,36,42,46	0
4	DGT	A	704	31/31	0.98	0.04	31,36,43,46	0
4	DGT	B	703	31/31	0.98	0.04	35,39,45,50	0
4	DGT	B	704	31/31	0.98	0.04	37,41,46,49	0
4	DGT	C	701	31/31	0.98	0.04	30,35,42,44	0
3	MG	A	706	1/1	0.99	0.04	33,33,33,33	0
3	MG	D	701	1/1	0.99	0.03	38,38,38,38	0
3	MG	A	705	1/1	0.99	0.03	43,43,43,43	0
4	DGT	B	705	31/31	0.99	0.04	30,34,40,41	0
3	MG	C	702	1/1	0.99	0.04	44,44,44,44	0
4	DGT	D	702	31/31	0.99	0.04	32,37,41,44	0
4	DGT	D	705	31/31	0.99	0.04	28,33,39,43	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.

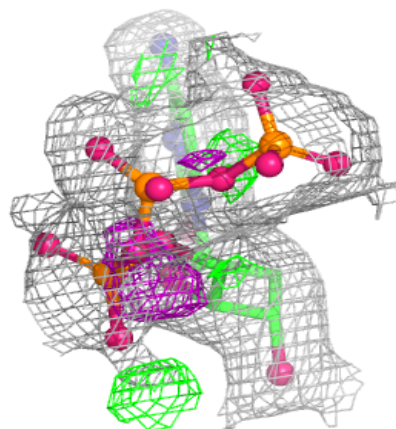
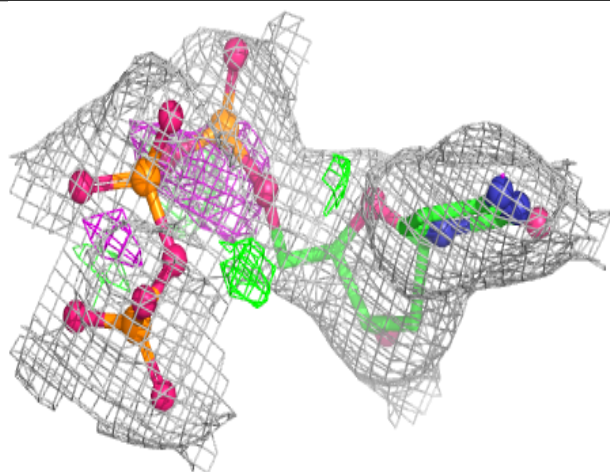
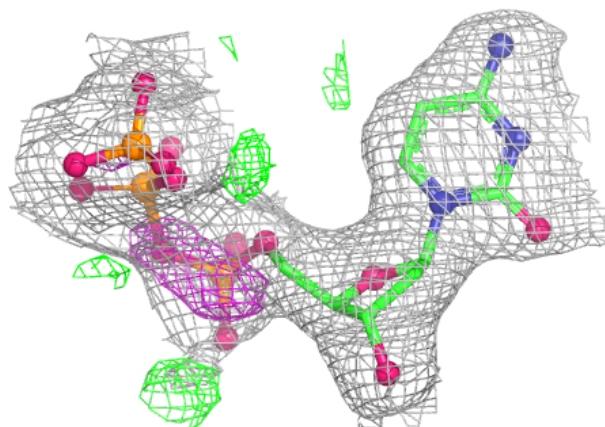
Electron density around DCP A 701:

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



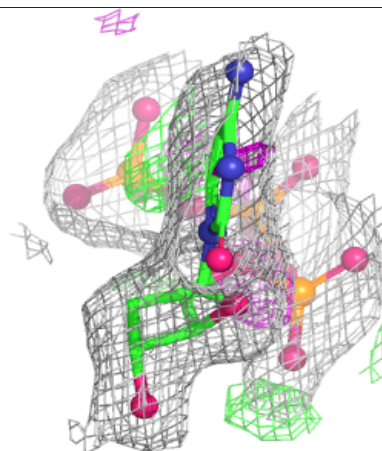
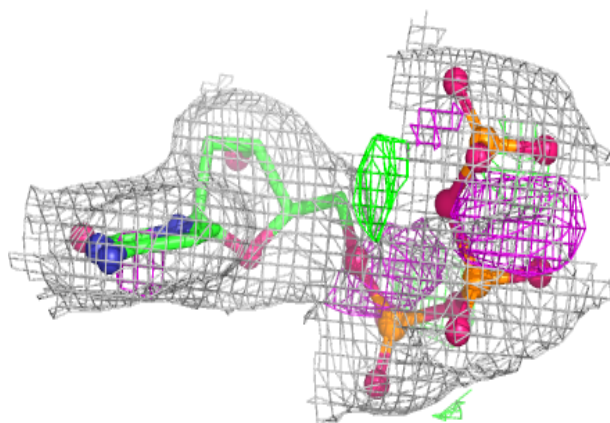
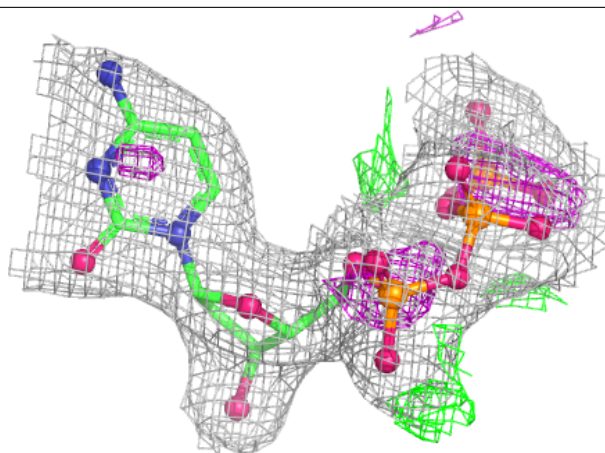
Electron density around DCP C 703:

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



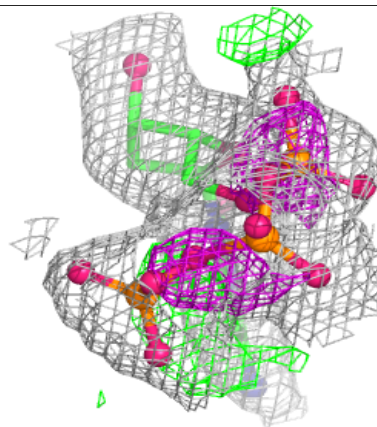
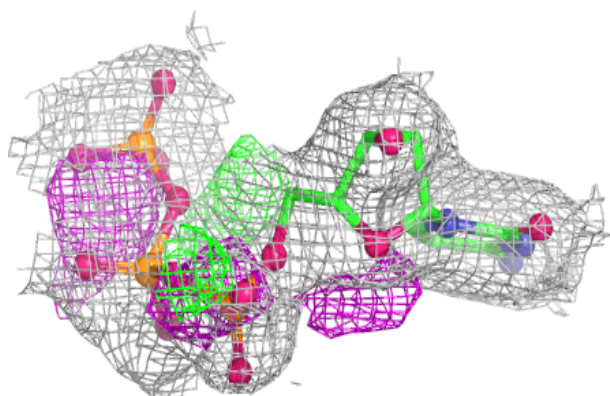
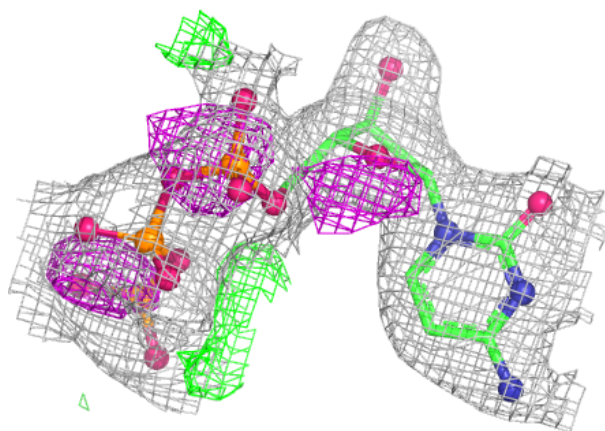
Electron density around DCP B 701:

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

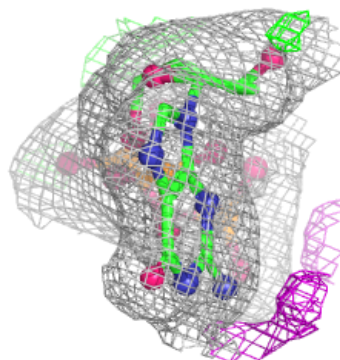
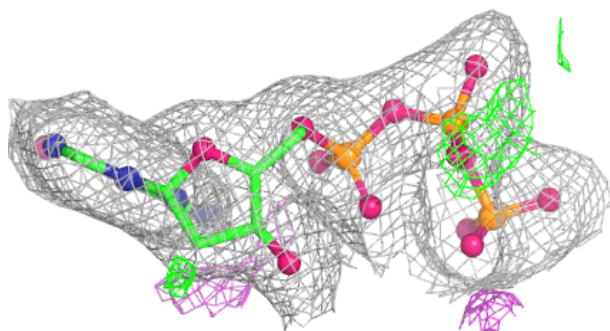
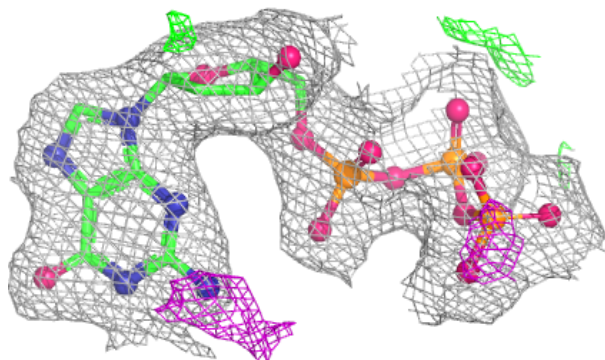


Electron density around DCP D 703:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

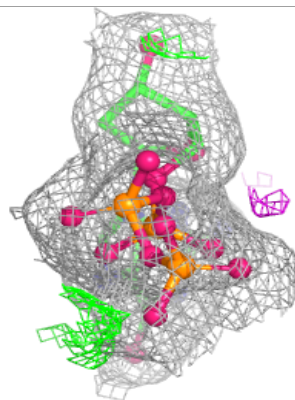
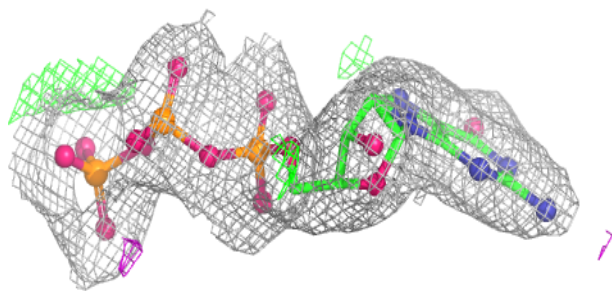
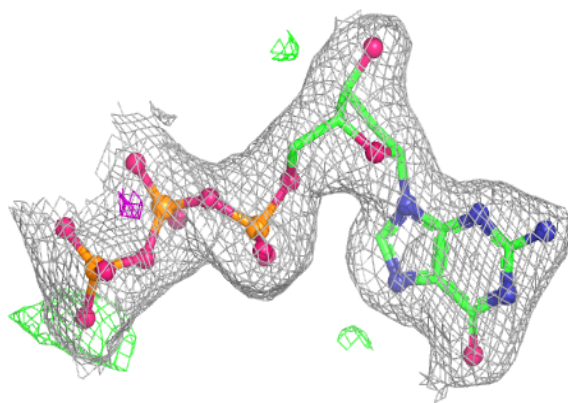
**Electron density around DGT A 703:**

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

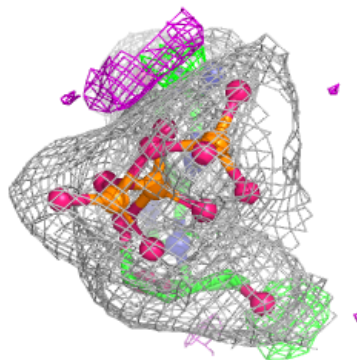
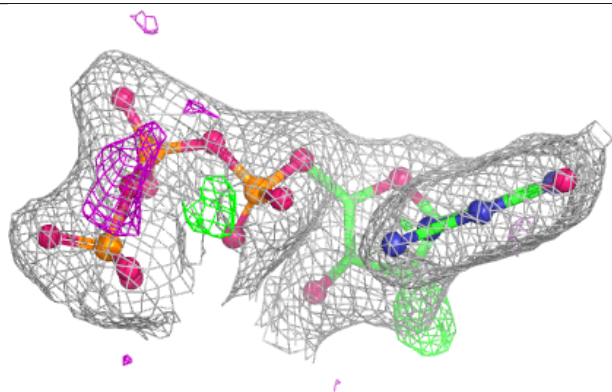
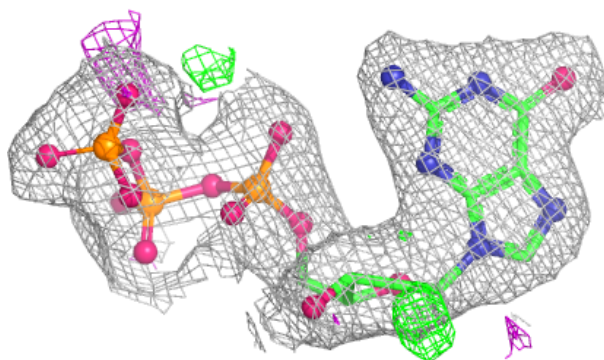


Electron density around DGT A 704:

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

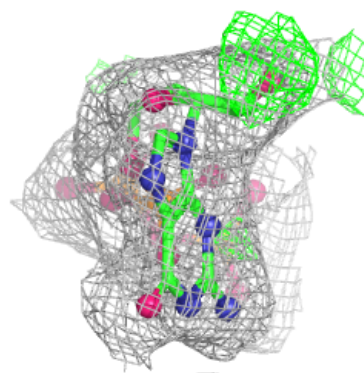
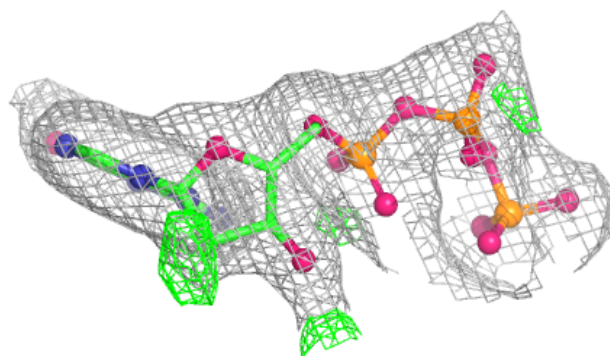
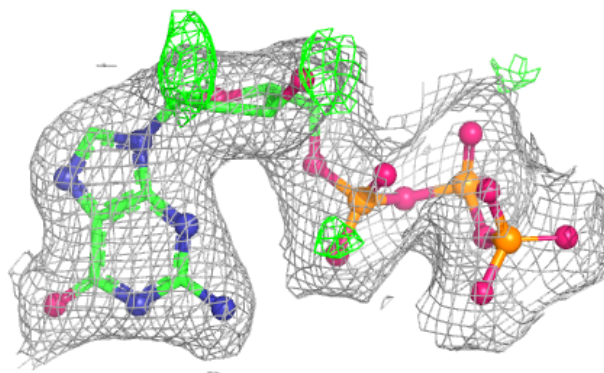
**Electron density around DGT B 703:**

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

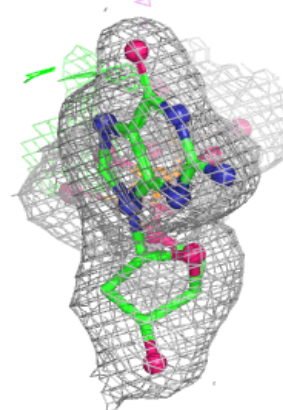
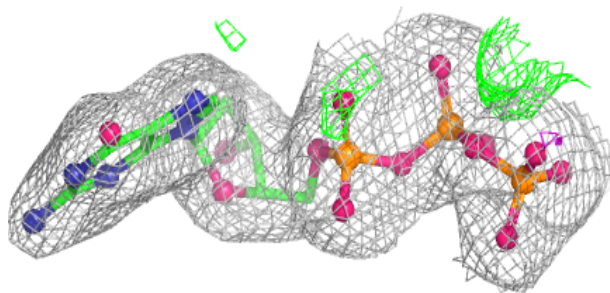
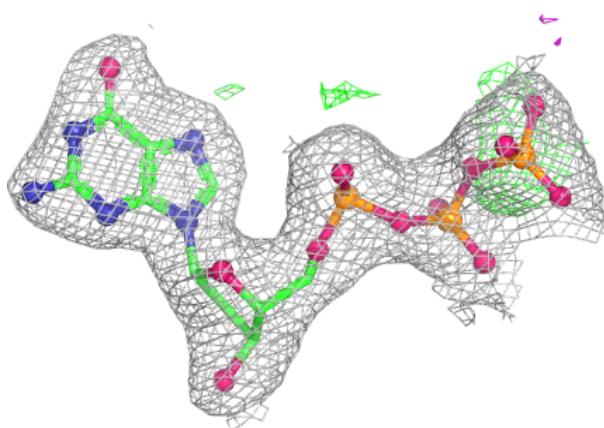


Electron density around DGT B 704:

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

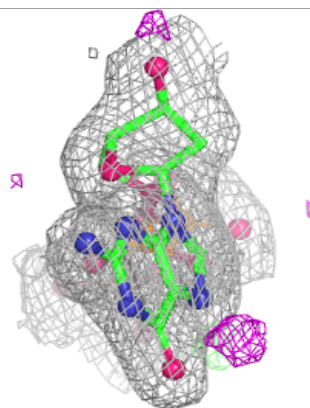
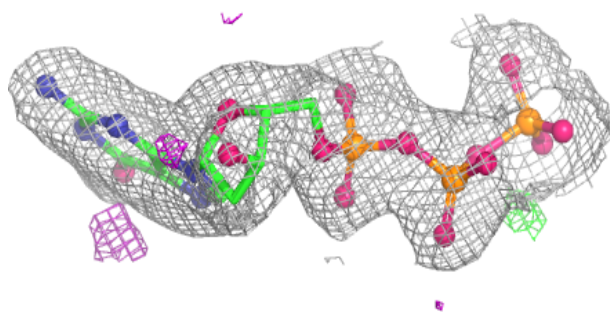
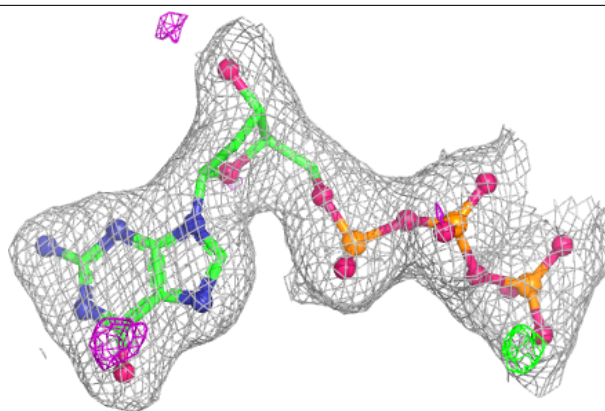
**Electron density around DGT C 701:**

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

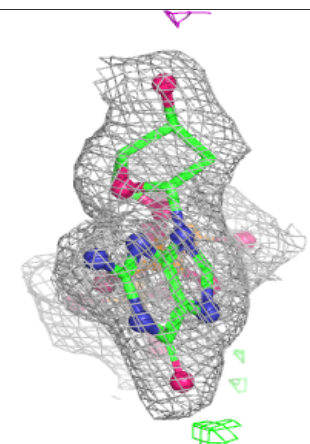
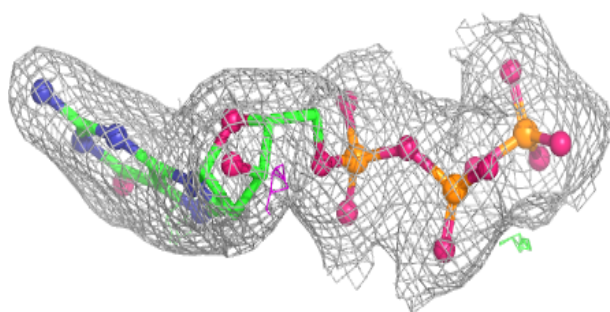
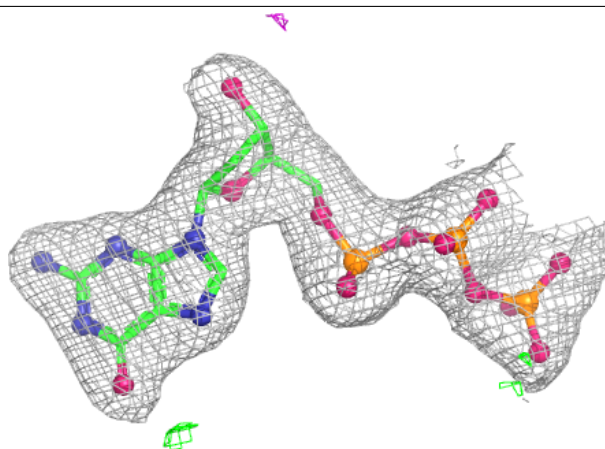


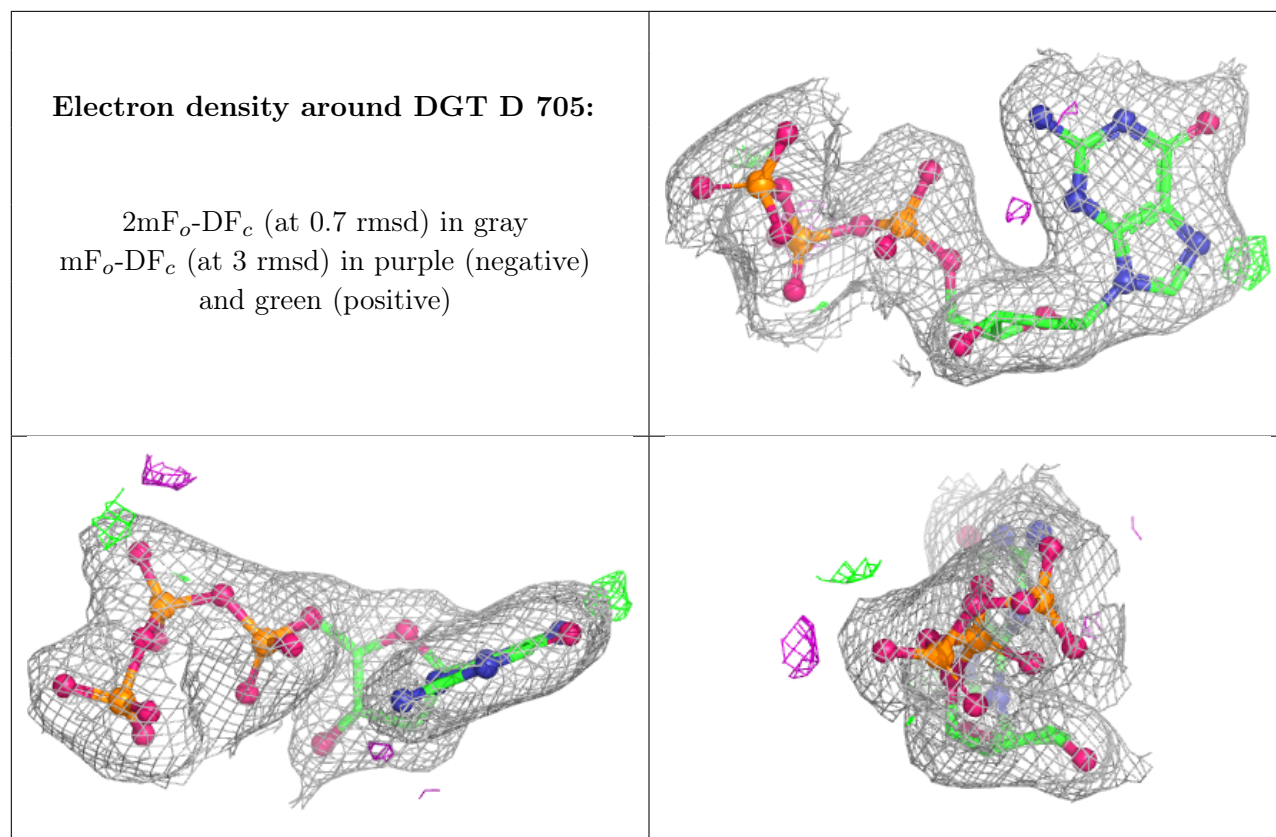
Electron density around DGT B 705:

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

**Electron density around DGT D 702:**

$2mF_o - DF_c$ (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.