



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 08:40 PM UTC

PDB ID : 6IK9 / pdb_00006ik9
Title : HIV-1 reverse transcriptase with Q151M/G112S/D113A/Y115F/F116Y/F160L/I159L:DNA:dGTP ternary complex
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Deposited on : 2018-10-15
Resolution : 2.44 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

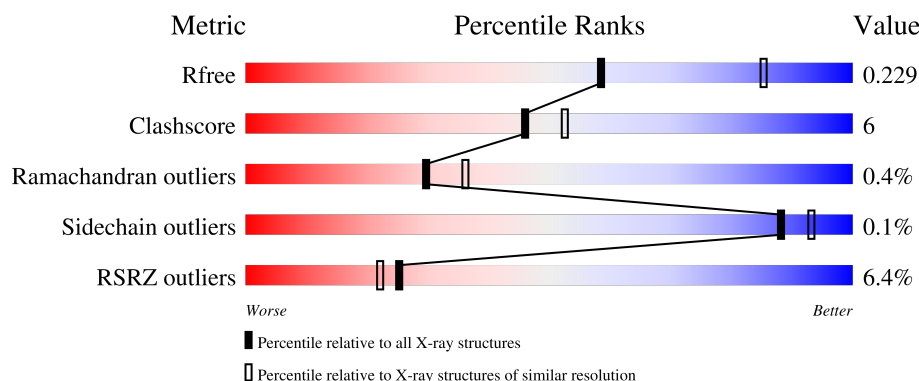
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.44 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	2340 (2.46-2.42)
Clashscore	190562	2400 (2.46-2.42)
Ramachandran outliers	187476	2379 (2.46-2.42)
Sidechain outliers	187428	2379 (2.46-2.42)
RSRZ outliers	180081	2340 (2.46-2.42)

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	557	8% 84% 15% .
1	C	557	3% 89% 10% .
2	B	444	10% 76% 15% 9%
2	D	444	4% 80% 11% 9%
3	E	38	68% 18% 5% 8%

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Mol	Chain	Length	Quality of chain
3	F	38	 A horizontal bar chart showing the quality of chain F. The bar is divided into three segments: green (66%), yellow (29%), and orange (5%). The percentages are labeled below the bar.

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 17566 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 HIV-1 reverse transcriptase p66 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	553	Total	C	N	O	S	0	0	0
			4494	2908	750	828	8			
1	C	553	Total	C	N	O	S	0	0	0
			4494	2908	750	828	8			

There are 22 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	expression tag	UNP D3XFN7
A	0	VAL	-	expression tag	UNP D3XFN7
A	112	SER	GLY	engineered mutation	UNP D3XFN7
A	113	ALA	ASP	engineered mutation	UNP D3XFN7
A	115	PHE	TYR	engineered mutation	UNP D3XFN7
A	116	TYR	PHE	engineered mutation	UNP D3XFN7
A	151	MET	GLN	engineered mutation	UNP D3XFN7
A	159	LEU	ILE	engineered mutation	UNP D3XFN7
A	160	LEU	PHE	engineered mutation	UNP D3XFN7
A	162	SER	CYS	engineered mutation	UNP D3XFN7
A	280	SER	CYS	engineered mutation	UNP D3XFN7
C	-1	MET	-	expression tag	UNP D3XFN7
C	0	VAL	-	expression tag	UNP D3XFN7
C	112	SER	GLY	engineered mutation	UNP D3XFN7
C	113	ALA	ASP	engineered mutation	UNP D3XFN7
C	115	PHE	TYR	engineered mutation	UNP D3XFN7
C	116	TYR	PHE	engineered mutation	UNP D3XFN7
C	151	MET	GLN	engineered mutation	UNP D3XFN7
C	159	LEU	ILE	engineered mutation	UNP D3XFN7
C	160	LEU	PHE	engineered mutation	UNP D3XFN7
C	162	SER	CYS	engineered mutation	UNP D3XFN7
C	280	SER	CYS	engineered mutation	UNP D3XFN7

- Molecule 2 is a protein called HIV-1 reverse transcriptase p51 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	406	Total	C	N	O	S	0	0	0
			3347	2178	557	606	6			
2	D	406	Total	C	N	O	S	0	0	0
			3347	2178	557	606	6			

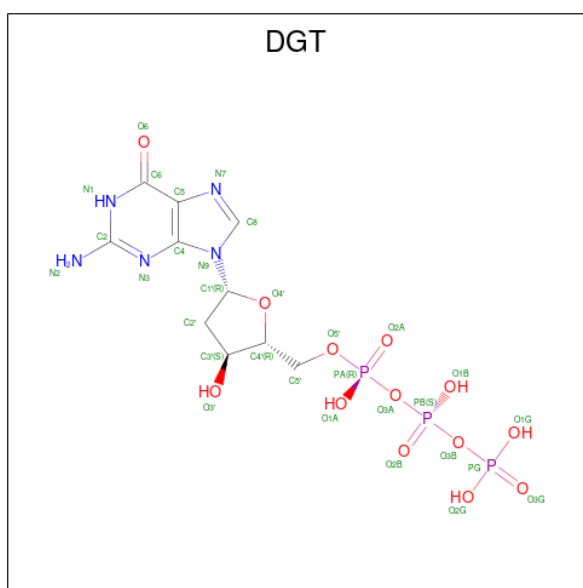
There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-15	MET	-	expression tag	UNP P12497
B	-14	ALA	-	expression tag	UNP P12497
B	-13	HIS	-	expression tag	UNP P12497
B	-12	HIS	-	expression tag	UNP P12497
B	-11	HIS	-	expression tag	UNP P12497
B	-10	HIS	-	expression tag	UNP P12497
B	-9	HIS	-	expression tag	UNP P12497
B	-8	HIS	-	expression tag	UNP P12497
B	-7	ALA	-	expression tag	UNP P12497
B	-6	LEU	-	expression tag	UNP P12497
B	-5	GLU	-	expression tag	UNP P12497
B	-4	VAL	-	expression tag	UNP P12497
B	-3	LEU	-	expression tag	UNP P12497
B	-2	PHE	-	expression tag	UNP P12497
B	-1	GLN	-	expression tag	UNP P12497
B	0	GLY	-	expression tag	UNP P12497
B	162	SER	CYS	engineered mutation	UNP P12497
B	280	SER	CYS	engineered mutation	UNP P12497
D	-15	MET	-	expression tag	UNP P12497
D	-14	ALA	-	expression tag	UNP P12497
D	-13	HIS	-	expression tag	UNP P12497
D	-12	HIS	-	expression tag	UNP P12497
D	-11	HIS	-	expression tag	UNP P12497
D	-10	HIS	-	expression tag	UNP P12497
D	-9	HIS	-	expression tag	UNP P12497
D	-8	HIS	-	expression tag	UNP P12497
D	-7	ALA	-	expression tag	UNP P12497
D	-6	LEU	-	expression tag	UNP P12497
D	-5	GLU	-	expression tag	UNP P12497
D	-4	VAL	-	expression tag	UNP P12497
D	-3	LEU	-	expression tag	UNP P12497
D	-2	PHE	-	expression tag	UNP P12497
D	-1	GLN	-	expression tag	UNP P12497
D	0	GLY	-	expression tag	UNP P12497
D	162	SER	CYS	engineered mutation	UNP P12497
D	280	SER	CYS	engineered mutation	UNP P12497

- Molecule 3 is a DNA chain called DNA/RNA (38-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	35	Total	C	N	O	P	0	0	0
			718	339	128	216	35			
3	F	38	Total	C	N	O	P	0	0	0
			777	369	140	231	37			

- Molecule 4 is 2'-DEOXYGUANOSINE-5'-TRIPHOSPHATE (CCD ID: DGT) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

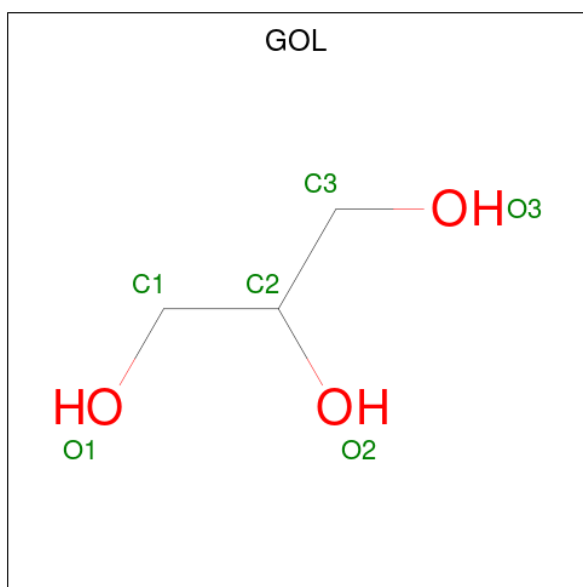


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
4	F	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mg	0	0
			1	1		
5	C	1	Total	Mg	0	0
			1	1		

- Molecule 6 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	D	1	Total	C	O	0	0
			6	3	3		
6	D	1	Total	C	O	0	0
			6	3	3		

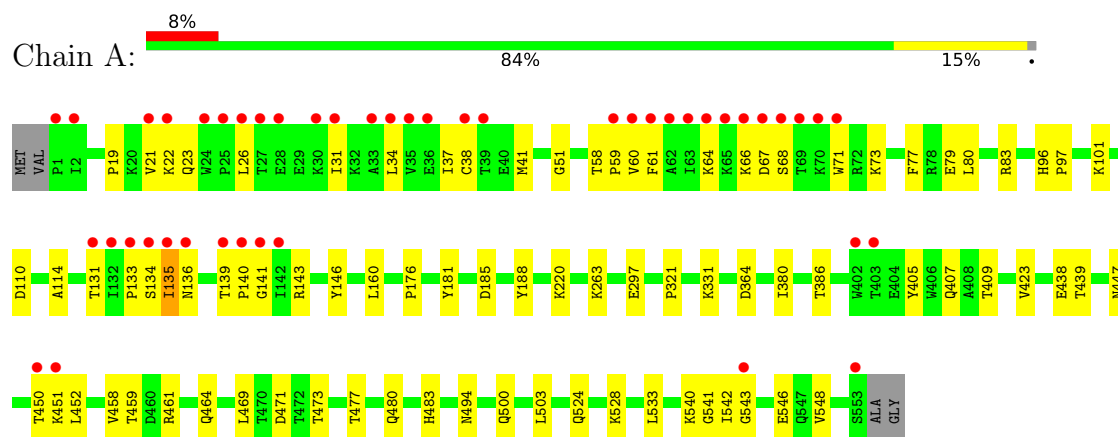
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	71	Total	O	0	0
			71	71		
7	B	48	Total	O	0	0
			48	48		
7	E	21	Total	O	0	0
			21	21		
7	C	75	Total	O	0	0
			75	75		
7	D	68	Total	O	0	0
			68	68		
7	F	18	Total	O	0	0
			18	18		

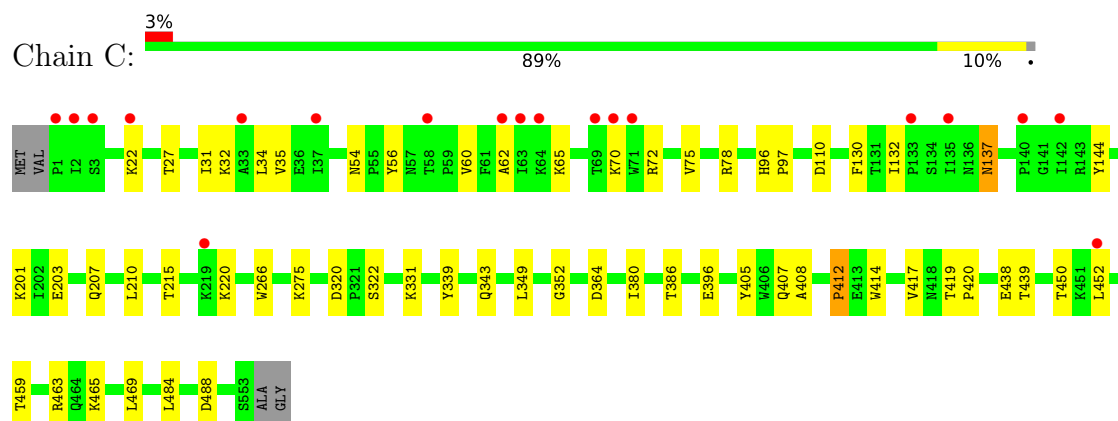
3 Residue-property plots [i](#)

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.

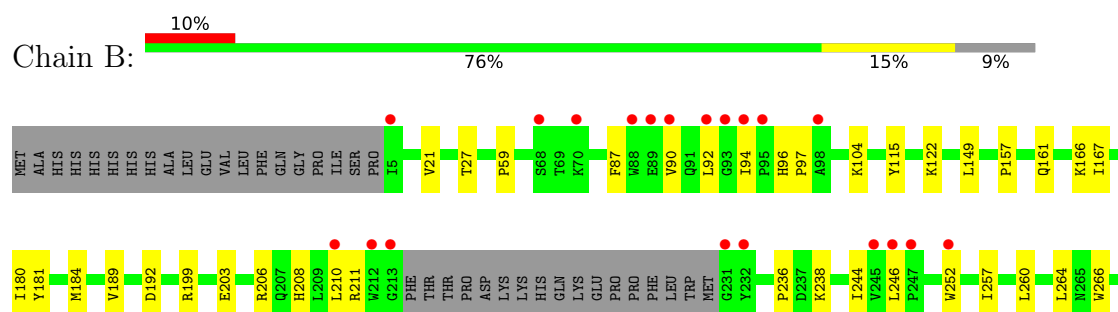
- Molecule 1: HIV-1 reverse transcriptase p66 subunit

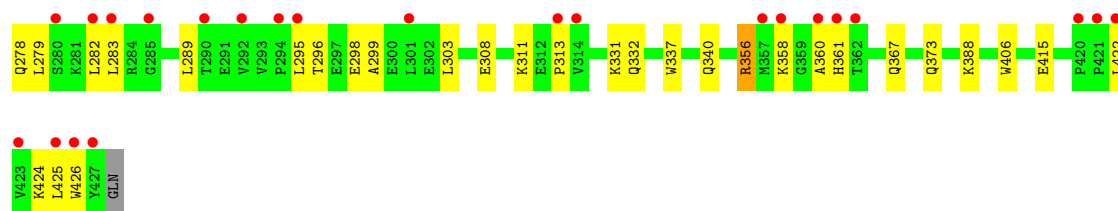


- Molecule 1: HIV-1 reverse transcriptase p66 subunit

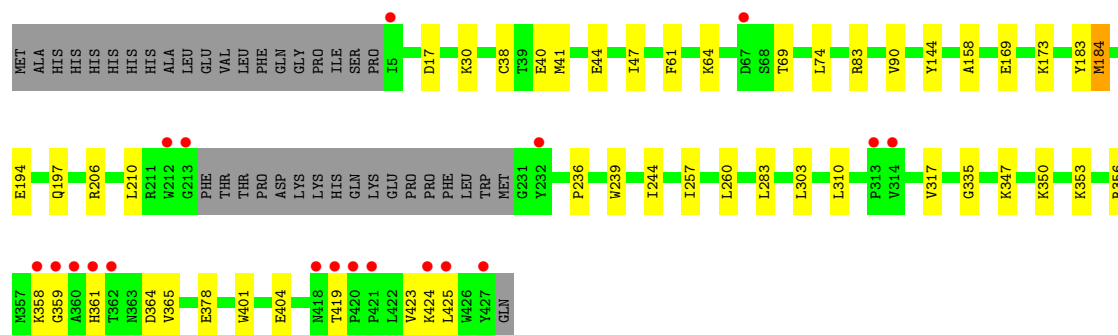
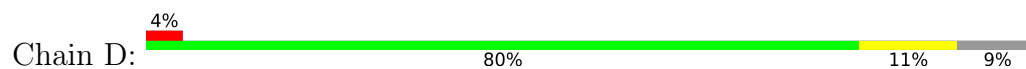


- Molecule 2: HIV-1 reverse transcriptase p51 subunit





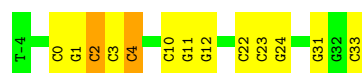
● Molecule 2: HIV-1 reverse transcriptase p51 subunit



● Molecule 3: DNA/RNA (38-MER)



● Molecule 3: DNA/RNA (38-MER)



4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	284.87Å 284.87Å 95.89Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.74 – 2.44 48.74 – 2.44	Depositor EDS
% Data completeness (in resolution range)	99.9 (48.74-2.44) 99.9 (48.74-2.44)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.36 (at 2.42Å)	Xtriage
Refinement program	PHENIX (1.14_3260: ???)	Depositor
R, R_{free}	0.186 , 0.225 0.192 , 0.229	Depositor DCC
R_{free} test set	6463 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	51.9	Xtriage
Anisotropy	0.128	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 56.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.012 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	17566	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.23% 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: MG, GOL, DGT, OMC

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	0.35	1/4611 (0.0%)	0.55	4/6262 (0.1%)
1	C	0.29	1/4611 (0.0%)	0.46	2/6262 (0.0%)
2	B	0.31	1/3441 (0.0%)	0.49	0/4673
2	D	0.34	0/3441	0.44	0/4673
3	E	0.33	0/756	0.50	0/1165
3	F	0.30	0/823	0.47	0/1269
All	All	0.32	3/17683 (0.0%)	0.49	6/24304 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	420	PRO	CA-C	-6.49	1.48	1.51
1	A	176	PRO	C-O	-5.67	1.16	1.24
2	B	184	MET	C-O	-5.43	1.19	1.24

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	68	SER	CA-C-N	-9.17	107.68	122.26
1	A	68	SER	C-N-CA	-9.17	107.68	122.26
1	A	67	ASP	N-CA-C	-7.77	98.38	109.96
1	A	66	LYS	N-CA-C	-7.68	102.91	111.28
1	C	420	PRO	O-C-N	-5.04	118.99	121.31
1	C	137	ASN	N-CA-C	5.03	121.51	110.80

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	4494	0	4558	65	0
1	C	4494	0	4558	37	0
2	B	3347	0	3379	57	0
2	D	3347	0	3379	33	0
3	E	718	0	397	7	0
3	F	777	0	432	10	0
4	A	31	0	12	3	0
4	F	31	0	12	2	0
5	A	1	0	0	0	0
5	C	1	0	0	0	0
6	B	12	0	16	1	0
6	D	12	0	16	0	0
7	A	71	0	0	2	0
7	B	48	0	0	1	0
7	C	75	0	0	0	0
7	D	68	0	0	1	0
7	E	21	0	0	0	0
7	F	18	0	0	1	0
All	All	17566	0	16759	198	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 (198) 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:A:439:THR:HG21	2:B:289:LEU:HD13	1.43	0.98
2:D:356:ARG:NH1	2:D:361:HIS:CG	2.35	0.94
2:D:356:ARG:HH11	2:D:361:HIS:HB2	1.33	0.92
2:B:337:TRP:HE1	2:B:367:GLN:HE21	1.19	0.91
1:A:439:THR:CG2	2:B:289:LEU:HD13	2.01	0.91
1:A:459:THR:HG22	1:A:461:ARG:H	1.36	0.90
1:A:185:ASP:OD2	4:A:601:DGT:H5'A	1.72	0.88
2:D:64:LYS:HD3	2:D:69:THR:HA	1.61	0.82
2:D:356:ARG:NH1	2:D:361:HIS:ND1	2.28	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:356:ARG:NH1	2:D:361:HIS:CB	2.43	0.82
1:A:500:GLN:HB3	2:B:422:LEU:HD21	1.62	0.79
2:D:356:ARG:NH1	2:D:361:HIS:HB2	1.98	0.79
1:A:540:LYS:HB2	1:A:542:ILE:HD11	1.67	0.76
1:A:451:LYS:HB3	1:A:471:ASP:HA	1.67	0.75
1:A:439:THR:HG21	2:B:289:LEU:CD1	2.16	0.75
2:B:246:LEU:HD11	2:B:264:LEU:HD21	1.69	0.74
1:A:31:ILE:HD13	1:A:135:ILE:H	1.54	0.72
1:A:331:LYS:NZ	1:A:364:ASP:OD2	2.24	0.71
2:B:332:GLN:HE22	2:B:424:LYS:HD2	1.57	0.70
1:A:64:LYS:HE2	1:A:71:TRP:CZ2	2.28	0.69
3:F:33:DC:H2'	4:F:701:DGT:H5'	1.75	0.69
2:B:388:LYS:NZ	2:B:415:GLU:OE1	2.25	0.68
3:F:3:DC:H2'	3:F:4:OMC:C6	2.29	0.68
1:A:64:LYS:HE2	1:A:71:TRP:CE2	2.29	0.67
2:B:104:LYS:HG2	2:B:192:ASP:HA	1.77	0.67
2:D:356:ARG:HH12	2:D:361:HIS:CG	2.10	0.67
1:A:494:ASN:HB3	2:B:289:LEU:HD22	1.78	0.66
1:A:73:LYS:NZ	1:A:146:TYR:OH	2.25	0.64
1:C:110:ASP:HB2	1:C:220:LYS:HB3	1.80	0.64
1:A:110:ASP:HB2	1:A:220:LYS:HB3	1.80	0.62
2:B:260:LEU:HD21	2:B:303:LEU:HD13	1.83	0.61
2:D:47:ILE:HD12	2:D:144:TYR:CD2	2.36	0.61
1:C:34:LEU:HD21	1:C:62:ALA:HB2	1.83	0.60
2:D:90:VAL:HG11	2:D:158:ALA:HA	1.83	0.60
1:C:35:VAL:HG12	1:C:132:ILE:HG21	1.83	0.60
1:C:339:TYR:CZ	1:C:352:GLY:HA3	2.36	0.59
1:C:22:LYS:HE3	1:C:22:LYS:HA	1.83	0.59
1:A:22:LYS:HD2	7:A:710:HOH:O	2.02	0.59
1:C:343:GLN:HG3	1:C:349:LEU:HD11	1.84	0.59
2:B:252:TRP:CD1	2:B:295:LEU:HD11	2.38	0.58
1:A:459:THR:HG22	1:A:461:ARG:N	2.13	0.58
1:A:31:ILE:HG21	1:A:134:SER:HA	1.85	0.58
1:A:543:GLY:HA3	2:B:283:LEU:O	2.03	0.58
1:A:458:VAL:HG12	1:A:464:GLN:HG2	1.85	0.57
2:B:244:ILE:HD13	2:B:425:LEU:HD11	1.85	0.57
1:A:21:VAL:HB	1:A:59:PRO:HD3	1.85	0.57
1:C:203:GLU:O	1:C:207:GLN:HG2	2.05	0.57
2:B:424:LYS:HA	2:B:424:LYS:CE	2.33	0.57
2:B:332:GLN:NE2	2:B:424:LYS:HD2	2.21	0.56
1:A:181:TYR:HB2	1:A:188:TYR:HB3	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:297:GLU:OE2	1:C:331:LYS:NZ	2.28	0.56
2:B:87:PHE:HB3	2:B:92:LEU:HB2	1.88	0.56
1:A:64:LYS:CE	1:A:71:TRP:CZ2	2.88	0.56
1:A:459:THR:CG2	1:A:461:ARG:H	2.14	0.55
2:B:337:TRP:HE1	2:B:367:GLN:NE2	1.98	0.55
3:F:1:DG:H2'	3:F:2:OMC:C6	2.42	0.55
1:A:450:THR:HB	1:A:452:LEU:HB2	1.89	0.55
1:C:463:ARG:NH2	1:C:488:ASP:O	2.40	0.54
1:A:139:THR:HG22	1:A:140:PRO:HD2	1.88	0.54
1:C:450:THR:HG23	1:C:452:LEU:H	1.72	0.54
1:A:447:ASN:HB3	1:A:450:THR:OG1	2.08	0.54
3:F:33:DC:C2'	4:F:701:DGT:H5'	2.37	0.54
1:A:19:PRO:HG3	1:A:80:LEU:HB2	1.90	0.54
1:C:22:LYS:HA	1:C:22:LYS:CE	2.37	0.54
3:E:3:DC:H2'	3:E:4:OMC:C6	2.43	0.53
3:E:23:DC:H2''	3:E:24:DG:C8	2.43	0.53
1:A:541:GLY:HA2	1:A:546:GLU:HG2	1.90	0.53
2:B:424:LYS:HA	2:B:424:LYS:HE2	1.90	0.53
1:A:37:ILE:HG22	1:A:41:MET:HE2	1.92	0.52
1:C:396:GLU:CD	1:C:396:GLU:H	2.17	0.52
2:D:365:VAL:HG11	2:D:401:TRP:HB2	1.92	0.52
1:C:27:THR:O	1:C:31:ILE:HG13	2.10	0.52
1:A:503:LEU:HD12	1:A:533:LEU:HG	1.92	0.52
1:C:417:VAL:HG22	1:C:419:THR:HG23	1.92	0.52
1:C:54:ASN:HD21	1:C:56:TYR:HD2	1.57	0.51
1:C:438:GLU:OE1	1:C:463:ARG:HD3	2.10	0.51
1:A:451:LYS:O	1:A:471:ASP:N	2.43	0.51
1:A:101:LYS:HE2	1:A:321:PRO:HG3	1.93	0.51
2:B:282:LEU:HD11	2:B:299:ALA:HB2	1.93	0.51
2:B:246:LEU:HD13	2:B:260:LEU:HD11	1.93	0.50
2:D:356:ARG:CZ	2:D:361:HIS:ND1	2.74	0.50
1:A:364:ASP:HB3	1:A:423:VAL:HG13	1.92	0.50
2:B:97:PRO:HD3	2:B:181:TYR:CD1	2.47	0.50
1:A:31:ILE:CD1	1:A:135:ILE:H	2.21	0.49
2:D:41:MET:HB3	2:D:47:ILE:HG12	1.93	0.49
3:F:22:DC:OP1	7:F:801:HOH:O	2.20	0.49
1:C:78:ARG:HE	3:F:0:DC:H5''	1.77	0.49
1:A:438:GLU:OE2	1:A:459:THR:HG21	2.12	0.49
1:C:380:ILE:HD11	1:C:386:THR:HG23	1.93	0.49
1:A:23:GLN:OE1	1:A:60:VAL:HG12	2.12	0.49
2:B:208:HIS:O	2:B:211:ARG:HB2	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:94:ILE:HD11	2:B:157:PRO:HB2	1.95	0.49
1:C:331:LYS:NZ	1:C:364:ASP:OD1	2.45	0.49
2:D:257:ILE:HB	2:D:283:LEU:HD21	1.95	0.49
2:D:169:GLU:HG3	2:D:173:LYS:HD2	1.94	0.49
2:B:122:LYS:HD3	7:B:820:HOH:O	2.13	0.48
4:A:601:DGT:H5'	3:E:33:DC:C2'	2.43	0.48
3:E:1:DG:H2'	3:E:2:OMC:C6	2.47	0.48
2:B:94:ILE:HA	2:B:161:GLN:HE22	1.79	0.48
2:B:356:ARG:HB2	2:B:361:HIS:CD2	2.48	0.48
2:D:350:LYS:NZ	2:D:378:GLU:OE2	2.46	0.48
2:B:257:ILE:HG22	2:B:283:LEU:HD11	1.95	0.48
1:C:60:VAL:HG12	1:C:75:VAL:HG22	1.95	0.48
1:C:210:LEU:HD13	1:C:215:THR:HG22	1.96	0.48
2:B:266:TRP:NE1	2:B:425:LEU:HD22	2.29	0.48
1:C:32:LYS:HA	1:C:35:VAL:HG22	1.95	0.48
1:A:23:GLN:OE1	1:A:59:PRO:HA	2.14	0.47
1:C:275:LYS:HB2	1:C:275:LYS:HE2	1.58	0.47
2:D:183:TYR:CE2	2:D:184:MET:HG3	2.50	0.47
1:A:500:GLN:H	1:A:500:GLN:CD	2.23	0.47
2:B:167:ILE:O	2:B:208:HIS:NE2	2.43	0.47
2:B:356:ARG:HG3	2:B:361:HIS:CE1	2.50	0.47
1:C:320:ASP:OD2	1:C:322:SER:HB3	2.14	0.47
2:D:38:CYS:HA	2:D:41:MET:HB2	1.97	0.47
2:B:21:VAL:HB	2:B:59:PRO:HD3	1.97	0.47
2:B:199:ARG:O	2:B:203:GLU:HG2	2.15	0.47
4:A:601:DGT:H5'	3:E:33:DC:H2'	1.96	0.46
2:B:279:LEU:HA	2:B:282:LEU:HD13	1.98	0.46
2:B:90:VAL:HG23	2:B:92:LEU:HD12	1.97	0.46
1:A:405:TYR:CE2	1:A:407:GLN:HB2	2.50	0.46
2:B:87:PHE:HA	2:B:90:VAL:HG22	1.98	0.46
1:C:405:TYR:CE2	1:C:407:GLN:HB2	2.51	0.46
2:D:419:THR:N	7:D:708:HOH:O	2.40	0.46
2:B:425:LEU:HD23	2:B:426:TRP:CE2	2.51	0.46
2:B:308:GLU:HA	2:B:311:LYS:HB2	1.97	0.45
2:B:266:TRP:CD1	2:B:425:LEU:HD22	2.50	0.45
1:A:26:LEU:HD11	1:A:61:PHE:HA	1.99	0.45
2:B:296:THR:HB	2:B:298:GLU:OE1	2.16	0.45
3:F:10:DC:H2''	3:F:11:DG:C8	2.51	0.45
1:A:483:HIS:ND1	1:A:524:GLN:OE1	2.50	0.45
2:D:61:PHE:CZ	2:D:74:LEU:HD23	2.51	0.45
1:C:452:LEU:HG	1:C:469:LEU:O	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:206:ARG:O	2:B:210:LEU:HG	2.17	0.44
2:D:40:GLU:O	2:D:44:GLU:HG3	2.18	0.44
3:F:11:DG:H2"	3:F:12:DG:OP2	2.16	0.44
2:D:30:LYS:NZ	2:D:404:GLU:OE1	2.43	0.44
1:A:34:LEU:O	1:A:38:CYS:N	2.46	0.44
2:D:206:ARG:O	2:D:210:LEU:HG	2.16	0.44
2:D:244:ILE:HB	2:D:310:LEU:HD22	1.99	0.44
1:C:408:ALA:HB1	2:D:364:ASP:HB3	1.99	0.44
1:A:380:ILE:HD11	1:A:386:THR:HG23	2.00	0.43
3:E:10:DC:H2"	3:E:11:DG:C8	2.53	0.43
1:A:51:GLY:O	1:A:143:ARG:NH1	2.51	0.43
2:B:180:ILE:HG12	2:B:189:VAL:HG22	2.00	0.43
2:B:236:PRO:C	2:B:238:LYS:H	2.26	0.43
2:B:373:GLN:HG3	2:B:406:TRP:CZ3	2.53	0.43
2:D:335:GLY:HA3	2:D:356:ARG:HG2	1.99	0.43
1:A:131:THR:CG2	1:A:141:GLY:HA3	2.48	0.43
2:B:331:LYS:HB2	2:B:337:TRP:CZ3	2.53	0.43
2:B:332:GLN:OE1	2:B:424:LYS:HD2	2.17	0.43
2:B:356:ARG:HG3	2:B:361:HIS:NE2	2.34	0.43
1:C:31:ILE:O	1:C:35:VAL:HG13	2.18	0.43
2:D:317:VAL:HG22	2:D:347:LYS:HB3	2.00	0.43
1:A:473:THR:O	1:A:477:THR:HG23	2.19	0.43
1:A:542:ILE:H	1:A:542:ILE:HD12	1.83	0.43
1:C:412:PRO:O	1:C:414:TRP:HD1	2.01	0.43
1:A:96:HIS:CG	1:A:97:PRO:HD2	2.54	0.43
1:A:458:VAL:HG22	1:A:548:VAL:HB	2.01	0.43
2:B:337:TRP:NE1	2:B:367:GLN:HE21	2.01	0.43
2:D:17:ASP:O	2:D:83:ARG:HD3	2.18	0.43
1:A:380:ILE:HD12	2:B:27:THR:HG22	2.01	0.42
1:A:469:LEU:HD21	1:A:480:GLN:HG2	2.00	0.42
2:D:358:LYS:HD3	2:D:359:GLY:H	1.84	0.42
3:F:23:DC:H2"	3:F:24:DG:C8	2.55	0.42
1:A:524:GLN:O	1:A:528:LYS:HG2	2.19	0.42
1:C:96:HIS:CG	1:C:97:PRO:HD2	2.55	0.42
2:B:278:GLN:NE2	2:B:298:GLU:HB3	2.35	0.42
1:A:135:ILE:HG22	1:A:136:ASN:N	2.33	0.42
2:B:166:LYS:HD3	2:B:166:LYS:HA	1.85	0.42
1:A:263:LYS:NZ	7:A:712:HOH:O	2.52	0.42
1:C:201:LYS:HD3	1:C:201:LYS:HA	1.91	0.42
2:B:358:LYS:HE2	2:B:360:ALA:HB3	2.00	0.42
2:D:423:VAL:C	2:D:425:LEU:H	2.27	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:206:ARG:NH2	2:B:206:ARG:HB3	2.34	0.42
3:E:4:OMC:HM23	3:E:4:OMC:H1'	1.89	0.42
1:A:37:ILE:O	1:A:41:MET:N	2.47	0.41
1:A:79:GLU:OE1	1:A:83:ARG:NE	2.50	0.41
2:B:115:TYR:HB3	2:B:149:LEU:HB2	2.02	0.41
1:A:22:LYS:O	1:A:59:PRO:HG3	2.20	0.41
1:A:114:ALA:HB1	1:A:160:LEU:HD21	2.01	0.41
2:B:96:HIS:HA	2:B:97:PRO:HD3	1.95	0.41
1:A:23:GLN:HE22	1:A:60:VAL:H	1.67	0.41
1:A:58:THR:HG21	1:A:77:PHE:CD1	2.56	0.41
1:A:409:THR:HB	6:B:701:GOL:H32	2.02	0.41
1:C:130:PHE:CZ	1:C:144:TYR:HB2	2.55	0.41
2:D:236:PRO:HA	2:D:239:TRP:CD2	2.55	0.41
2:D:194:GLU:HB2	2:D:197:GLN:HE21	1.86	0.41
2:D:260:LEU:HD21	2:D:303:LEU:HD11	2.02	0.41
1:A:500:GLN:H	1:A:500:GLN:NE2	2.18	0.41
1:C:439:THR:O	1:C:459:THR:HA	2.21	0.41
2:B:340:GLN:HG2	2:B:426:TRP:CZ2	2.55	0.41
1:C:70:LYS:HB3	1:C:70:LYS:HE3	1.84	0.41
1:C:266:TRP:CE2	3:F:31:DG:H4'	2.56	0.41
1:C:465:LYS:HD3	1:C:484:LEU:HD11	2.01	0.41
2:B:308:GLU:OE1	2:B:311:LYS:HD2	2.21	0.40
1:C:65:LYS:HD2	1:C:72:ARG:HB2	2.03	0.40
1:A:452:LEU:HD23	1:A:452:LEU:HA	1.96	0.40
2:D:353:LYS:HB3	2:D:353:LYS:HZ2	1.86	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	551/557 (99%)	532 (97%)	17 (3%)	2 (0%)	30 36

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	551/557 (99%)	533 (97%)	16 (3%)	2 (0%)	30	36
2	B	402/444 (90%)	382 (95%)	18 (4%)	2 (0%)	24	29
2	D	402/444 (90%)	387 (96%)	14 (4%)	1 (0%)	43	53
All	All	1906/2002 (95%)	1834 (96%)	65 (3%)	7 (0%)	30	36

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	137	ASN
1	A	135	ILE
2	B	356	ARG
2	B	313	PRO
2	D	424	LYS
1	A	133	PRO
1	C	412	PRO

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	492/494 (100%)	492 (100%)	0	100	100
1	C	492/494 (100%)	492 (100%)	0	100	100
2	B	365/400 (91%)	365 (100%)	0	100	100
2	D	365/400 (91%)	364 (100%)	1 (0%)	86	91
All	All	1714/1788 (96%)	1713 (100%)	1 (0%)	88	93

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	184	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	91	GLN
1	A	137	ASN
1	A	207	GLN
1	A	235	HIS
1	A	373	GLN
1	A	474	ASN
1	A	500	GLN
1	A	507	GLN
2	B	147	ASN
2	B	151	GLN
2	B	161	GLN
2	B	174	GLN
2	B	182	GLN
2	B	278	GLN
2	B	367	GLN
2	B	394	GLN
2	B	418	ASN
1	C	54	ASN
1	C	91	GLN
1	C	278	GLN
1	C	407	GLN
1	C	464	GLN
1	C	539	HIS
1	C	545	ASN
1	C	547	GLN
2	D	147	ASN
2	D	182	GLN
2	D	197	GLN
2	D	255	ASN
2	D	394	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	OMC	E	2	3	19,22,23	2.81	8 (42%)	25,31,34	0.85	1 (4%)
3	OMC	E	4	3	19,22,23	2.91	8 (42%)	25,31,34	0.66	0
3	OMC	F	2	3	19,22,23	2.90	8 (42%)	25,31,34	0.82	0
3	OMC	F	4	3	19,22,23	3.07	8 (42%)	25,31,34	0.73	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OMC	E	2	3	-	1/9/27/28	0/2/2/2
3	OMC	E	4	3	-	0/9/27/28	0/2/2/2
3	OMC	F	2	3	-	0/9/27/28	0/2/2/2
3	OMC	F	4	3	-	0/9/27/28	0/2/2/2

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	4	OMC	C2-N3	6.59	1.49	1.36
3	E	4	OMC	C2-N3	6.28	1.48	1.36
3	F	4	OMC	C6-C5	6.07	1.49	1.35
3	F	2	OMC	C2-N3	5.95	1.48	1.36
3	E	4	OMC	C6-C5	5.87	1.48	1.35
3	F	2	OMC	C6-C5	5.84	1.48	1.35
3	F	4	OMC	C4-N3	5.47	1.45	1.34
3	E	2	OMC	C6-C5	5.46	1.47	1.35
3	E	2	OMC	C2-N3	5.12	1.46	1.36
3	F	2	OMC	C4-N4	4.90	1.45	1.33
3	E	2	OMC	C4-N3	4.88	1.44	1.34
3	F	2	OMC	C4-N3	4.86	1.44	1.34
3	F	4	OMC	C4-N4	4.84	1.45	1.33
3	E	2	OMC	C4-N4	4.80	1.45	1.33
3	E	4	OMC	C4-N4	4.72	1.45	1.33
3	E	4	OMC	C4-N3	4.66	1.43	1.34
3	E	4	OMC	C2-N1	4.57	1.49	1.40
3	F	4	OMC	C2-N1	4.43	1.49	1.40
3	E	2	OMC	C2-N1	4.42	1.49	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	2	OMC	C2-N1	4.29	1.49	1.40
3	F	4	OMC	C6-N1	3.35	1.46	1.38
3	E	4	OMC	C6-N1	3.32	1.46	1.38
3	F	2	OMC	C6-N1	3.25	1.45	1.38
3	E	2	OMC	C6-N1	3.17	1.45	1.38
3	E	2	OMC	O2-C2	-3.10	1.17	1.23
3	F	4	OMC	O2-C2	-2.76	1.18	1.23
3	F	2	OMC	O2-C2	-2.61	1.18	1.23
3	E	2	OMC	C5-C4	2.48	1.48	1.42
3	F	2	OMC	C5-C4	2.44	1.48	1.42
3	F	4	OMC	C5-C4	2.31	1.48	1.42
3	E	4	OMC	C5-C4	2.30	1.48	1.42
3	E	4	OMC	O2-C2	-2.09	1.19	1.23

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	2	OMC	O2-C2-N3	-2.13	118.98	122.33

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	E	2	OMC	C1'-C2'-O2'-CM2

There are no ring outliers.

4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	2	OMC	1	0
3	E	4	OMC	2	0
3	F	2	OMC	1	0
3	F	4	OMC	1	0

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 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
6	GOL	B	701	-	5,5,5	1.11	0	5,5,5	1.11	1 (20%)
6	GOL	D	601	-	5,5,5	1.31	0	5,5,5	1.04	0
4	DGT	F	701	5	32,33,33	3.23	16 (50%)	48,52,52	2.34	14 (29%)
4	DGT	A	601	5	32,33,33	3.38	17 (53%)	48,52,52	2.23	11 (22%)
6	GOL	D	602	-	5,5,5	1.12	0	5,5,5	1.05	0
6	GOL	B	702	-	5,5,5	1.32	0	5,5,5	0.97	0

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	GOL	B	701	-	-	2/4/4/4	-
6	GOL	D	601	-	-	4/4/4/4	-
4	DGT	F	701	5	-	8/22/34/34	0/3/3/3
4	DGT	A	601	5	-	3/22/34/34	0/3/3/3
6	GOL	D	602	-	-	0/4/4/4	-
6	GOL	B	702	-	-	3/4/4/4	-

All (33) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	701	DGT	C2'-C3'	-8.75	1.30	1.52
4	A	601	DGT	C2'-C3'	-7.92	1.32	1.52
4	A	601	DGT	C4-N3	6.37	1.48	1.34
4	F	701	DGT	O4'-C1'	-6.33	1.28	1.42
4	A	601	DGT	O4'-C4'	5.56	1.57	1.45
4	A	601	DGT	PB-O3A	5.21	1.65	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	601	DGT	O4'-C1'	-5.18	1.30	1.42
4	A	601	DGT	C2-N3	5.14	1.45	1.33
4	F	701	DGT	C4-N3	5.12	1.46	1.34
4	F	701	DGT	C5-N7	-5.01	1.29	1.39
4	A	601	DGT	PA-O3A	4.78	1.64	1.59
4	A	601	DGT	C2-N2	4.48	1.44	1.34
4	F	701	DGT	O4'-C4'	4.46	1.54	1.45
4	F	701	DGT	O6-C6	-4.40	1.15	1.23
4	F	701	DGT	C2-N3	4.32	1.43	1.33
4	A	601	DGT	C2'-C1'	4.28	1.64	1.52
4	A	601	DGT	PB-O3B	4.17	1.64	1.59
4	F	701	DGT	C5'-C4'	-3.95	1.39	1.51
4	A	601	DGT	C5'-C4'	-3.86	1.39	1.51
4	F	701	DGT	C2'-C1'	3.33	1.61	1.52
4	F	701	DGT	C2-N2	3.22	1.41	1.34
4	F	701	DGT	C4-N9	-3.18	1.30	1.38
4	A	601	DGT	O3'-C3'	2.96	1.49	1.43
4	A	601	DGT	C5-N7	-2.93	1.33	1.39
4	F	701	DGT	C8-N9	-2.89	1.31	1.37
4	A	601	DGT	O6-C6	-2.78	1.18	1.23
4	F	701	DGT	C1'-N9	-2.68	1.41	1.48
4	A	601	DGT	C5-C6	2.45	1.53	1.44
4	A	601	DGT	C2-N1	2.39	1.43	1.37
4	F	701	DGT	C5-C4	-2.37	1.31	1.38
4	F	701	DGT	PA-O1A	-2.18	1.45	1.55
4	A	601	DGT	C6-N1	2.05	1.42	1.38
4	F	701	DGT	PG-O1G	-2.01	1.47	1.54

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	601	DGT	C1'-N9-C8	7.48	144.68	127.91
4	A	601	DGT	C1'-N9-C4	-6.76	107.26	125.50
4	F	701	DGT	C5-C4-N3	-6.59	117.91	128.39
4	F	701	DGT	C1'-N9-C8	5.90	141.16	127.91
4	F	701	DGT	C1'-N9-C4	-5.65	110.25	125.50
4	A	601	DGT	C5-C4-N3	-5.48	119.68	128.39
4	F	701	DGT	C2-N3-C4	4.84	120.63	112.30
4	A	601	DGT	C2-N3-C4	4.76	120.50	112.30
4	F	701	DGT	N9-C4-N3	4.61	135.17	125.95
4	F	701	DGT	C2-N1-C6	-4.48	116.99	125.11
4	A	601	DGT	C2-N1-C6	-3.27	119.17	125.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	701	DGT	C5-C6-N1	3.25	121.52	113.25
4	A	601	DGT	N9-C4-N3	3.07	132.09	125.95
4	F	701	DGT	N9-C8-N7	-3.06	107.73	113.40
4	A	601	DGT	N9-C8-N7	-3.06	107.73	113.40
4	F	701	DGT	O6-C6-C5	-3.05	118.49	126.53
4	F	701	DGT	O2G-PG-O3B	2.81	114.08	104.64
4	A	601	DGT	C5-C6-N1	2.81	120.40	113.25
4	F	701	DGT	O1G-PG-O3B	2.27	112.25	104.64
4	A	601	DGT	C8-N7-C5	2.25	108.27	104.26
4	A	601	DGT	C3'-C2'-C1'	2.20	107.99	102.60
4	A	601	DGT	O6-C6-C5	-2.19	120.76	126.53
4	F	701	DGT	O2G-PG-O3G	-2.13	102.52	110.83
4	F	701	DGT	C3'-C2'-C1'	2.13	107.81	102.60
6	B	701	GOL	C3-C2-C1	-2.12	104.03	111.80
4	F	701	DGT	O1A-PA-O5'	2.11	117.11	107.57

There are no chirality outliers.

All (20) torsion outliers are listed below:

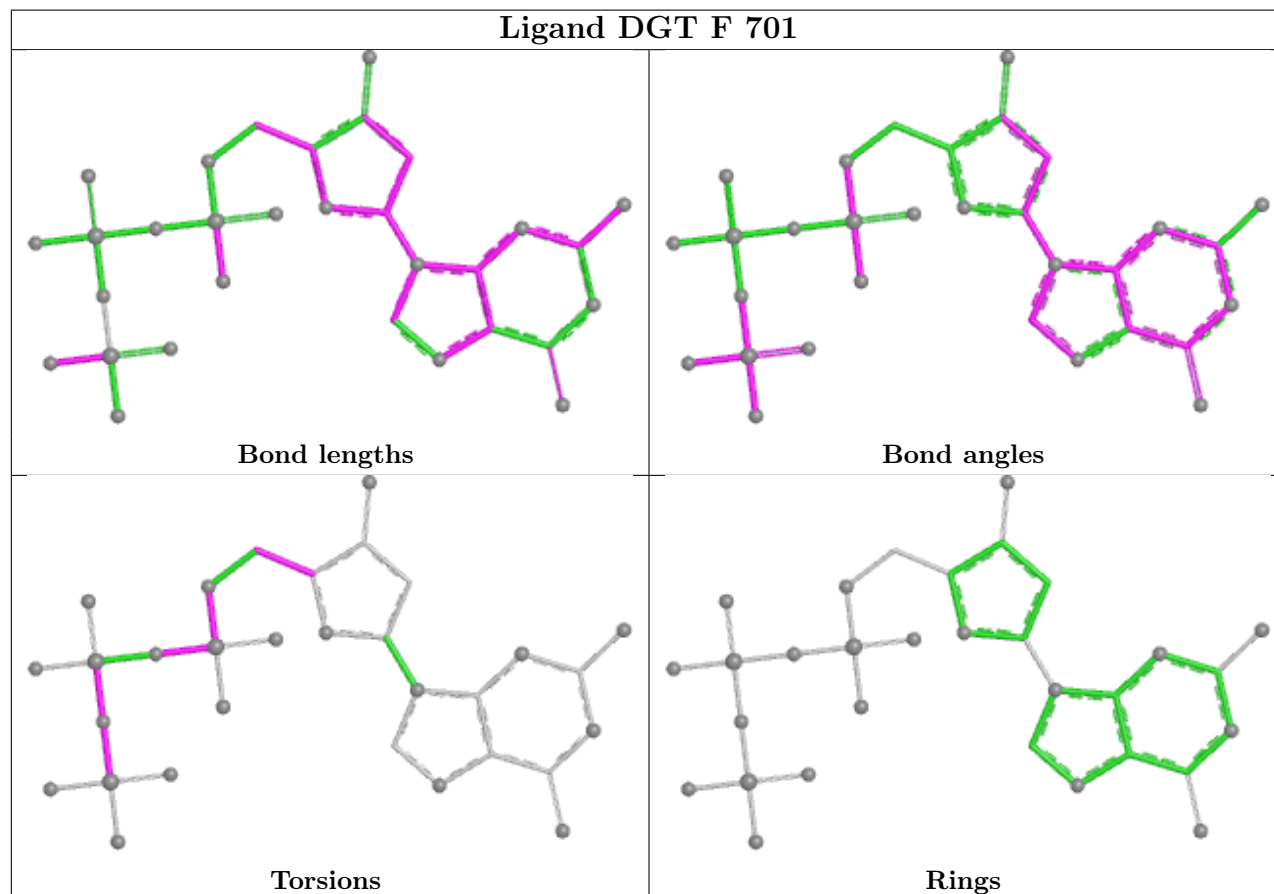
Mol	Chain	Res	Type	Atoms
4	F	701	DGT	C5'-O5'-PA-O3A
4	F	701	DGT	C5'-O5'-PA-O1A
4	F	701	DGT	C5'-O5'-PA-O2A
6	B	701	GOL	C1-C2-C3-O3
6	D	601	GOL	O1-C1-C2-C3
6	B	702	GOL	O2-C2-C3-O3
4	F	701	DGT	O4'-C4'-C5'-O5'
4	F	701	DGT	C3'-C4'-C5'-O5'
6	B	702	GOL	O1-C1-C2-C3
6	B	702	GOL	C1-C2-C3-O3
6	D	601	GOL	C1-C2-C3-O3
6	D	601	GOL	O1-C1-C2-O2
4	F	701	DGT	PB-O3B-PG-O3G
6	B	701	GOL	O2-C2-C3-O3
6	D	601	GOL	O2-C2-C3-O3
4	A	601	DGT	PB-O3A-PA-O5'
4	F	701	DGT	PB-O3A-PA-O5'
4	A	601	DGT	O4'-C4'-C5'-O5'
4	A	601	DGT	C3'-C4'-C5'-O5'
4	F	701	DGT	PG-O3B-PB-O1B

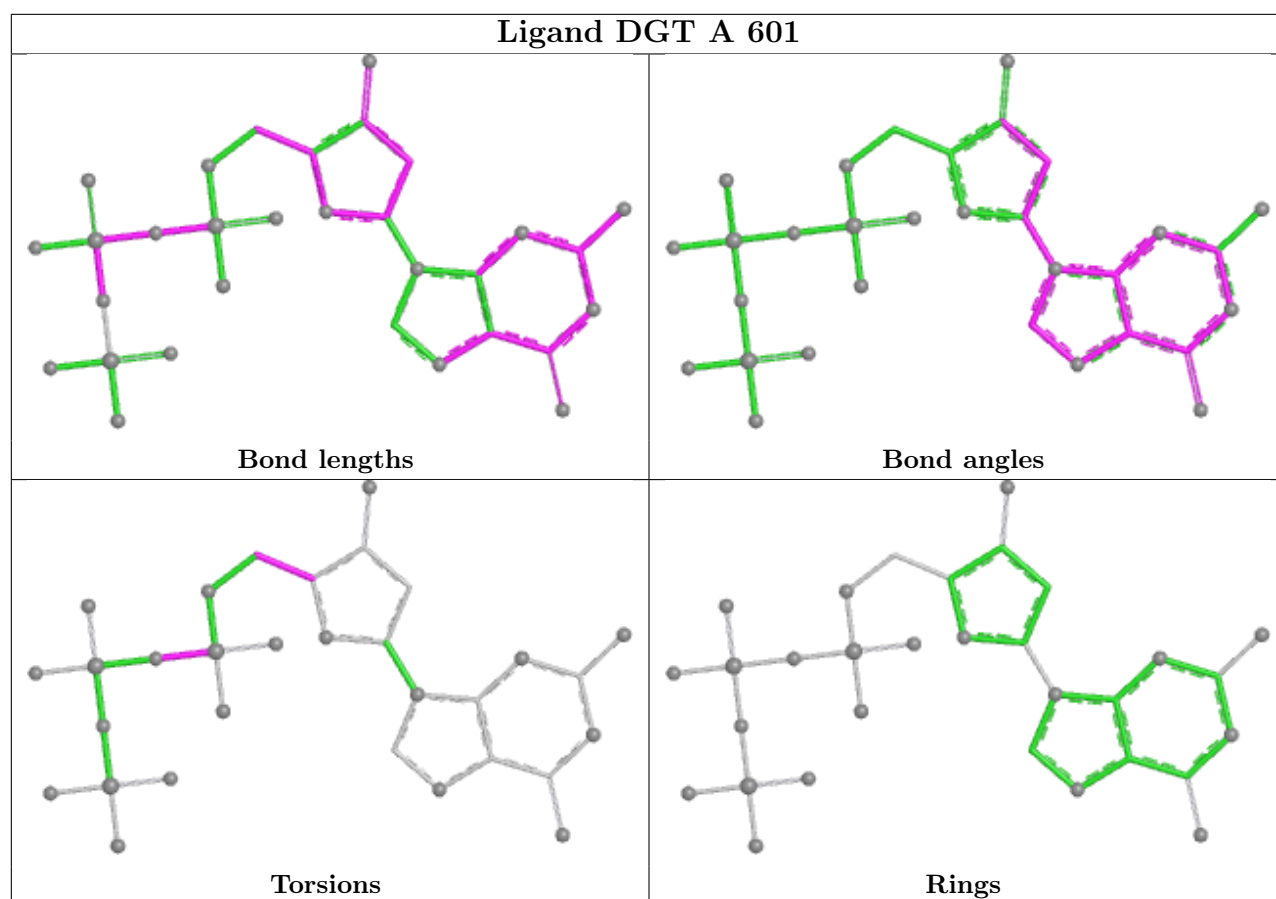
There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	701	GOL	1	0
4	F	701	DGT	2	0
4	A	601	DGT	3	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	553/557 (99%)	0.28	46 (8%)	17	14	33, 60, 109, 164	0
1	C	553/557 (99%)	0.15	19 (3%)	48	46	35, 63, 113, 157	0
2	B	406/444 (91%)	0.48	43 (10%)	11	8	36, 73, 135, 177	0
2	D	406/444 (91%)	0.04	19 (4%)	36	33	33, 57, 98, 157	0
3	E	33/38 (86%)	-0.54	0	100	100	37, 58, 91, 128	0
3	F	36/38 (94%)	-0.17	0	100	100	40, 68, 121, 153	0
All	All	1987/2078 (95%)	0.21	127 (6%)	25	22	33, 62, 119, 177	0

All (127) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	62	ALA	6.6
1	A	133	PRO	6.1
2	D	427	TYR	5.7
1	A	135	ILE	5.7
2	D	232	TYR	5.7
2	B	425	LEU	5.5
1	A	132	ILE	5.3
1	C	135	ILE	5.1
2	B	313	PRO	5.1
2	D	360	ALA	5.1
1	A	140	PRO	5.0
1	A	33	ALA	4.9
2	B	423	VAL	4.8
2	B	360	ALA	4.5
1	A	69	THR	4.4
2	B	92	LEU	4.2
2	D	425	LEU	4.2
2	B	94	ILE	4.2
2	B	88	TRP	4.1

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Mol	Chain	Res	Type	RSRZ
2	D	213	GLY	4.0
1	A	1	PRO	4.0
1	C	2	ILE	4.0
2	D	420	PRO	3.9
2	B	213	GLY	3.8
1	A	30	LYS	3.8
1	A	141	GLY	3.8
2	D	212	TRP	3.7
2	B	212	TRP	3.6
2	B	231	GLY	3.6
2	D	361	HIS	3.6
2	B	301	LEU	3.5
1	C	1	PRO	3.5
1	A	31	ILE	3.4
1	A	142	ILE	3.4
1	A	28	GLU	3.4
2	D	424	LYS	3.4
2	B	421	PRO	3.3
2	B	422	LEU	3.3
2	B	90	VAL	3.3
1	A	67	ASP	3.2
1	C	22	LYS	3.2
1	A	68	SER	3.2
1	A	63	ILE	3.2
2	B	420	PRO	3.1
1	A	27	THR	3.1
2	B	362	THR	3.1
1	C	69	THR	3.0
2	B	232	TYR	3.0
1	C	70	LYS	3.0
2	B	93	GLY	3.0
1	A	24	TRP	3.0
2	B	95	PRO	3.0
1	C	452	LEU	3.0
2	D	5	ILE	3.0
1	A	25	PRO	3.0
2	B	427	TYR	3.0
1	A	34	LEU	3.0
1	A	553	SER	2.9
1	A	70	LYS	2.9
2	B	280	SER	2.9
2	B	5	ILE	2.9

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Mol	Chain	Res	Type	RSRZ
2	B	361	HIS	2.9
1	A	35	VAL	2.9
1	A	61	PHE	2.8
1	A	543	GLY	2.8
2	B	285	GLY	2.8
1	C	62	ALA	2.8
1	C	219	LYS	2.8
1	A	131	THR	2.8
2	D	362	THR	2.8
1	A	36	GLU	2.8
2	D	421	PRO	2.7
1	A	402	TRP	2.7
2	B	68	SER	2.7
1	A	60	VAL	2.7
1	A	139	THR	2.7
1	A	64	LYS	2.6
2	D	359	GLY	2.6
1	C	133	PRO	2.6
2	B	358	LYS	2.6
1	A	21	VAL	2.6
2	B	292	VAL	2.6
2	D	358	LYS	2.6
2	B	294	PRO	2.6
1	A	450	THR	2.6
2	B	290	THR	2.5
1	A	26	LEU	2.5
1	A	134	SER	2.5
2	B	245	VAL	2.5
1	A	2	ILE	2.5
1	A	71	TRP	2.5
1	C	63	ILE	2.4
1	C	140	PRO	2.3
2	D	313	PRO	2.3
1	C	142	ILE	2.3
2	B	282	LEU	2.3
2	B	295	LEU	2.3
2	D	419	THR	2.3
1	C	33	ALA	2.2
2	B	98	ALA	2.2
1	A	39	THR	2.2
1	C	58	THR	2.2
2	B	247	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	38	CYS	2.2
2	B	246	LEU	2.2
1	A	65	LYS	2.2
2	B	210	LEU	2.2
2	D	314	VAL	2.2
2	D	67	ASP	2.2
1	A	403	THR	2.1
1	A	66	LYS	2.1
1	C	64	LYS	2.1
1	A	59	PRO	2.1
1	C	71	TRP	2.1
2	D	418	ASN	2.1
2	B	314	VAL	2.1
2	B	283	LEU	2.1
2	B	70	LYS	2.1
1	A	136	ASN	2.0
2	B	89	GLU	2.0
1	A	451	LYS	2.0
2	B	357	MET	2.0
1	A	22	LYS	2.0
1	C	37	ILE	2.0
2	B	252	TRP	2.0
2	B	426	TRP	2.0
1	C	3	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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(Å ²)	Q<0.9
3	OMC	F	2	21/22	0.96	0.08	49,53,62,70	0
3	OMC	E	2	21/22	0.97	0.07	31,40,44,58	0
3	OMC	F	4	21/22	0.97	0.06	34,40,46,53	0
3	OMC	E	4	21/22	0.98	0.06	27,39,43,48	0

6.3 Carbohydrates [i](#)

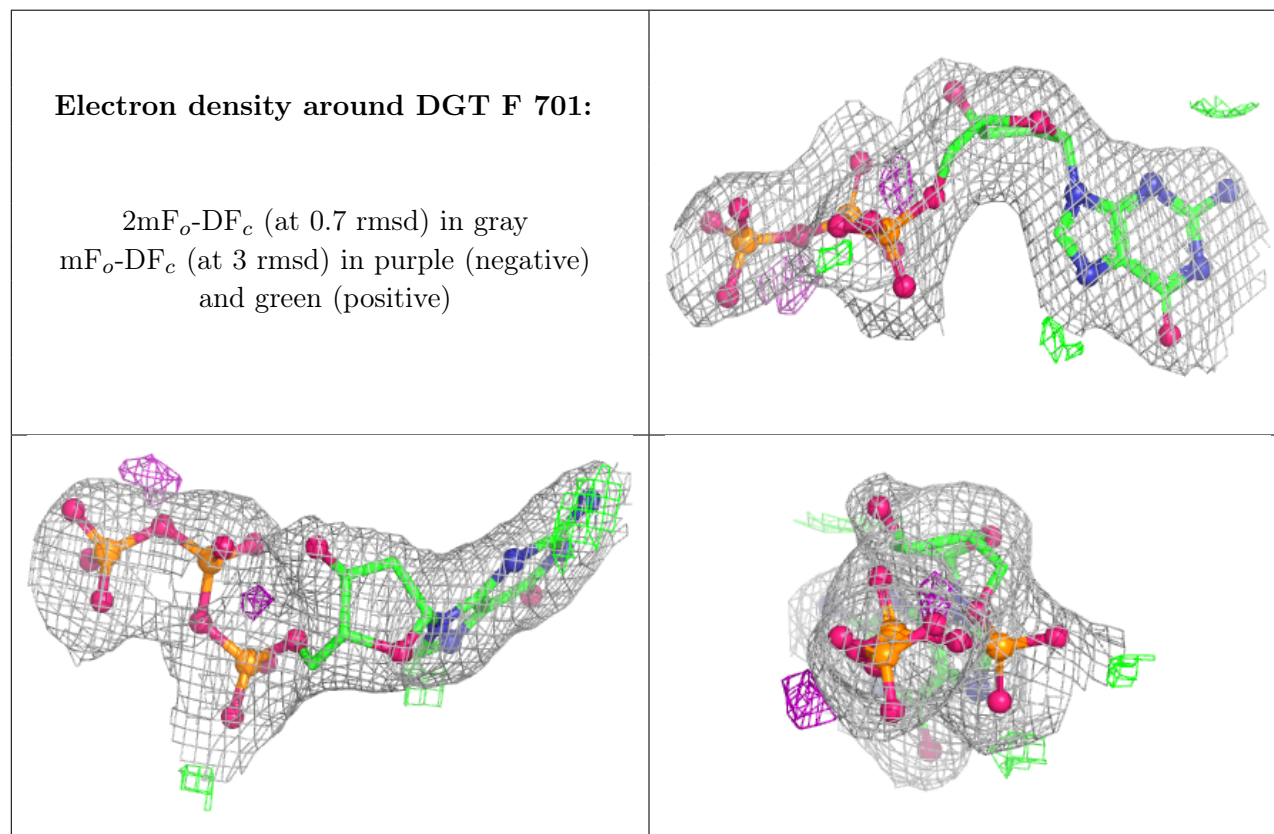
There are no oligosaccharides in this entry.

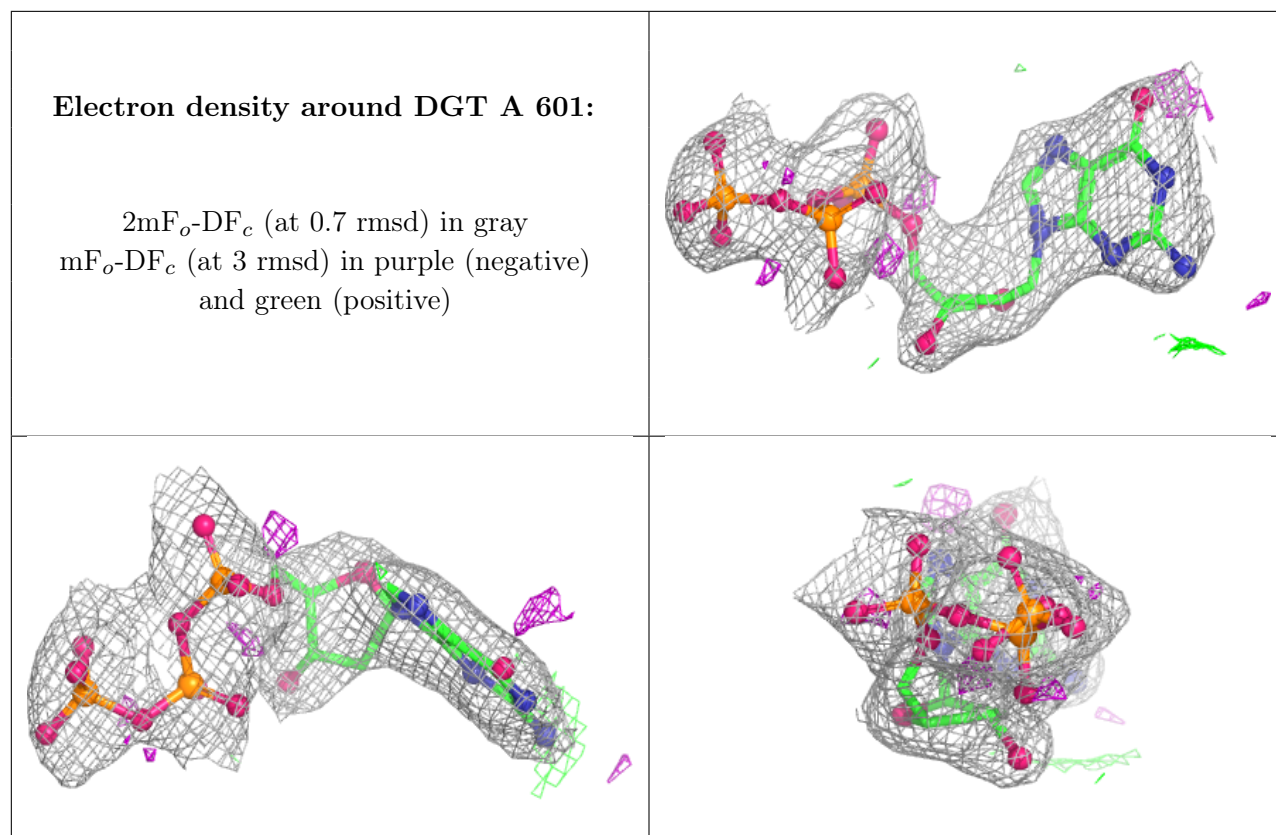
6.4 Ligands

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
5	MG	C	601	1/1	0.81	0.15	97,97,97,97	0
4	DGT	F	701	31/31	0.90	0.10	59,80,115,118	0
5	MG	A	602	1/1	0.92	0.10	60,60,60,60	1
4	DGT	A	601	31/31	0.92	0.10	57,80,119,120	0
6	GOL	B	701	6/6	0.92	0.16	65,71,73,74	0
6	GOL	D	601	6/6	0.94	0.15	52,61,62,63	0
6	GOL	B	702	6/6	0.95	0.12	46,57,62,75	0
6	GOL	D	602	6/6	0.96	0.10	40,52,55,57	0

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





6.5 Other polymers [i](#)

There are no such residues in this entry.