



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 07:48 AM UTC

PDB ID : 9C3U / pdb_00009c3u
Title : Crystal structure of DNA N6-Adenine Methyltransferase M.BceJIV from Burkholderia cenocepacia in complex with duplex DNA substrate containing GTTTAC as recognition sequence
Authors : Kottur, J.; Quintana-Feliciano, R.; Aggarwal, A.K.
Deposited on : 2024-06-02
Resolution : 2.77 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

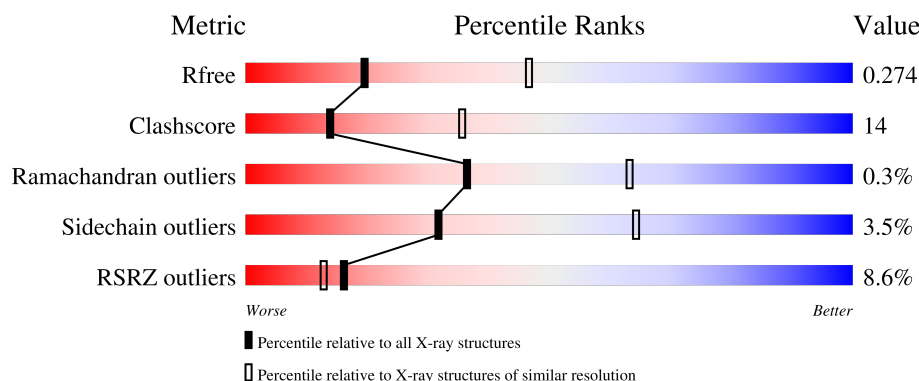
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.77 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.



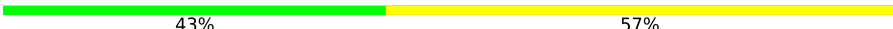
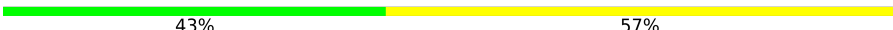
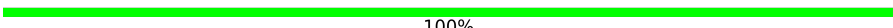
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	5248 (2.80-2.76)
Clashscore	190562	5693 (2.80-2.76)
Ramachandran outliers	187476	5590 (2.80-2.76)
Sidechain outliers	187428	5592 (2.80-2.76)
RSRZ outliers	180081	5251 (2.80-2.76)

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	249	3% 64% 31% .
1	B	249	6% 69% 30% ..
1	C	249	16% 67% 27% ..
1	D	249	13% 65% 29% ...

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Mol	Chain	Length	Quality of chain
2	E	14	 43%57%
2	G	14	 64%36%
2	I	14	 64%36%
2	K	14	 43%57%
3	F	14	 43%57%
3	H	14	 50%50%
3	J	14	 29%71%
3	L	14	 36%64%
4	Q	2	 100%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 9917 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 Methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	248	Total	C	N	O	S	0	1	0
			1968	1254	344	360	10			
1	B	249	Total	C	N	O	S	0	0	0
			1962	1252	341	359	10			
1	C	238	Total	C	N	O	S	0	0	0
			1668	1046	288	325	9			
1	D	238	Total	C	N	O	S	0	0	0
			1765	1120	309	327	9			

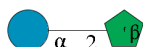
- Molecule 2 is a DNA chain called DNA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	14	Total	C	N	O	P	0	0	0
			281	137	46	85	13			
2	G	14	Total	C	N	O	P	0	0	0
			280	137	46	84	13			
2	I	14	Total	C	N	O	P	0	0	0
			279	136	46	84	13			
2	K	14	Total	C	N	O	P	0	0	0
			280	137	46	84	13			

- Molecule 3 is a DNA chain called DNA2.

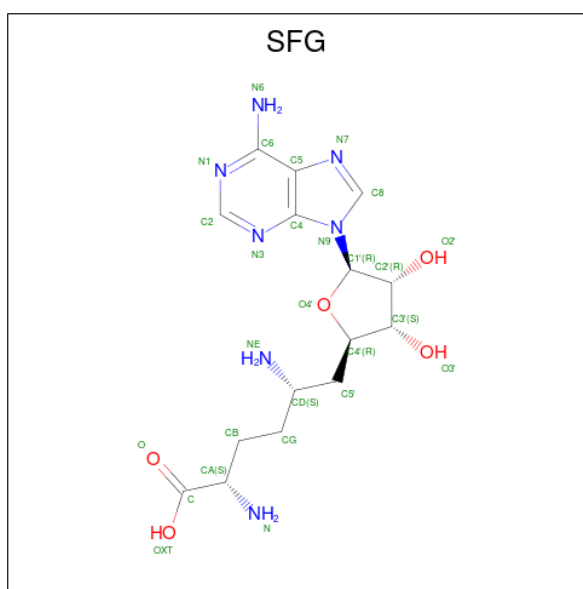
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	F	14	Total	C	N	O	P	0	0	0
			287	138	57	79	13			
3	H	14	Total	C	N	O	P	0	0	0
			286	138	57	78	13			
3	J	14	Total	C	N	O	P	0	0	0
			287	138	57	79	13			
3	L	14	Total	C	N	O	P	0	0	0
			287	138	57	79	13			

- Molecule 4 is an oligosaccharide called beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose.



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
4	Q	2	Total	C	O	0	0	0
			23	12	11			

- Molecule 5 is SINEFUNGIN (CCD ID: SFG) (formula: C₁₅H₂₃N₇O₅) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			27	15	7	5		
5	B	1	Total	C	N	O	0	0
			27	15	7	5		
5	C	1	Total	C	N	O	0	0
			27	15	7	5		
5	D	1	Total	C	N	O	0	0
			27	15	7	5		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	35	Total	O	0	0
			35	35		

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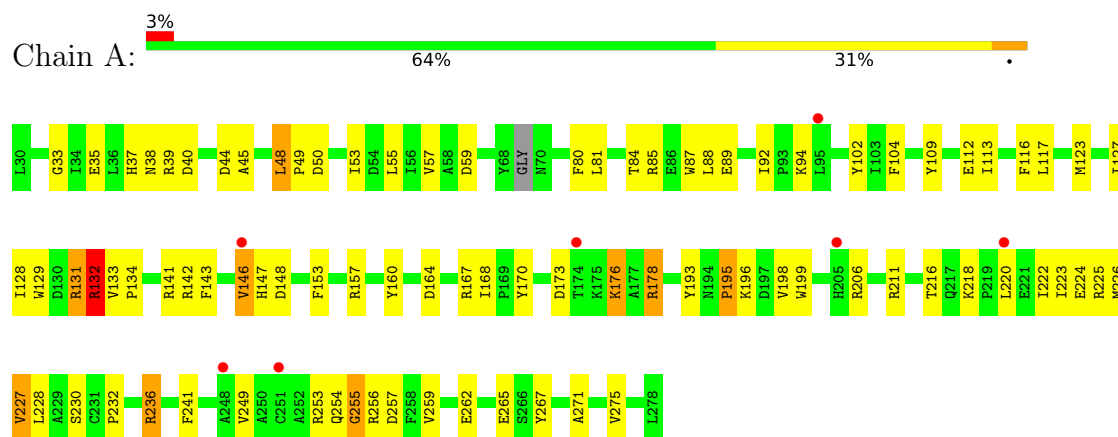
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	27	Total 27	O 27	0	0
6	C	12	Total 12	O 12	0	0
6	D	21	Total 21	O 21	0	0
6	E	9	Total 9	O 9	0	0
6	F	4	Total 4	O 4	0	0
6	G	4	Total 4	O 4	0	0
6	H	13	Total 13	O 13	0	0
6	I	6	Total 6	O 6	0	0
6	J	9	Total 9	O 9	0	0
6	K	8	Total 8	O 8	0	0
6	L	8	Total 8	O 8	0	0

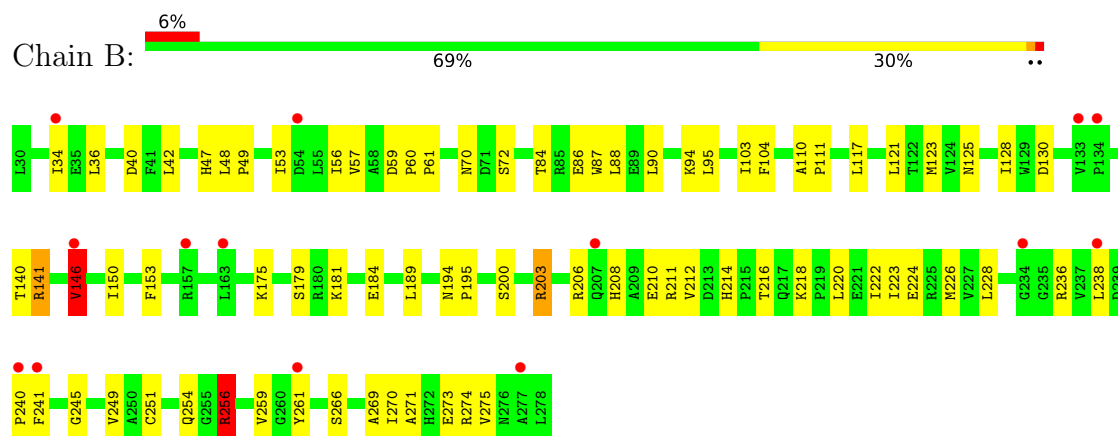
3 Residue-property plots [i](#)

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.

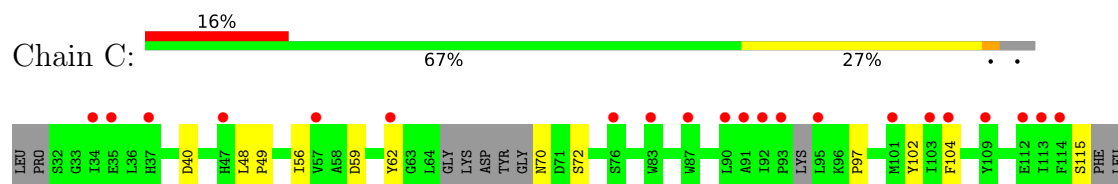
• Molecule 1: Methyltransferase

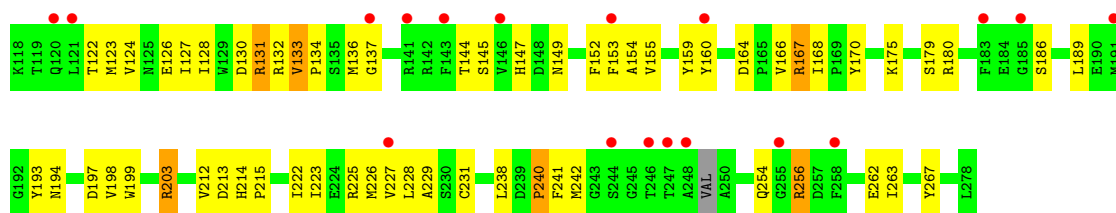


• Molecule 1: Methyltransferase

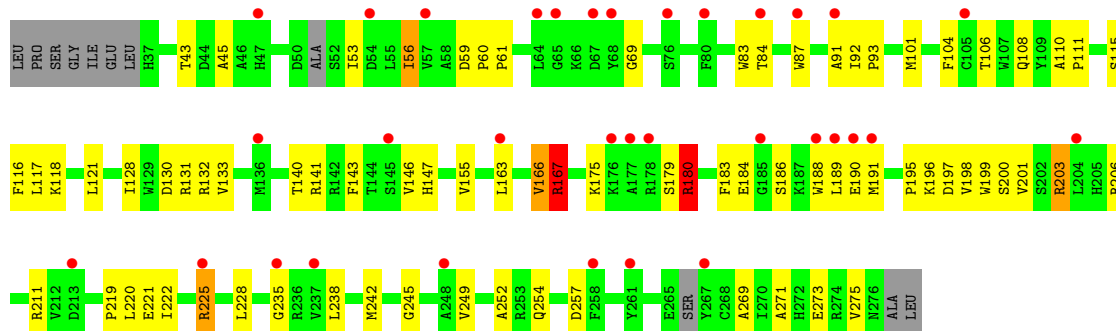


• Molecule 1: Methyltransferase





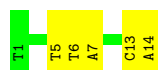
● Molecule 1: Methyltransferase



● Molecule 2: DNA1



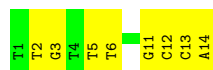
● Molecule 2: DNA1



● Molecule 2: DNA1

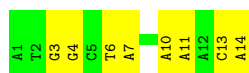


● Molecule 2: DNA1



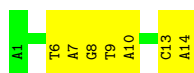
● Molecule 3: DNA2

Chain F:  43% 57%



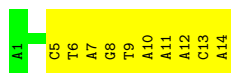
- Molecule 3: DNA2

Chain H:  50% 50%



- Molecule 3: DNA2

Chain J:  29% 71%



- Molecule 3: DNA2

Chain L:  36% 64%



- Molecule 4: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose

Chain Q:  100%



4 Data and refinement statistics

Property	Value	Source
Space group	I 41	Depositor
Cell constants a, b, c, α , β , γ	137.73Å 137.73Å 167.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.76 – 2.77 32.76 – 2.77	Depositor EDS
% Data completeness (in resolution range)	66.0 (32.76-2.77) 65.9 (32.76-2.77)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.59 (at 2.76Å)	Xtriage
Refinement program	PHENIX (1.20rc3_4406: ???)	Depositor
R, R_{free}	0.227 , 0.274 0.240 , 0.274	Depositor DCC
R_{free} test set	1264 reflections (1.42%)	wwPDB-VP
Wilson B-factor (Å ²)	68.9	Xtriage
Anisotropy	0.005	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 79.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.42$, $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	0.057 for -h,k,-l	Xtriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	9917	wwPDB-VP
Average B, all atoms (Å ²)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.03% 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: SFG, FRU, GLC

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	0.44	2/2025 (0.1%)	0.76	7/2749 (0.3%)
1	B	0.35	0/2018	0.57	2/2745 (0.1%)
1	C	0.44	0/1705	0.77	5/2330 (0.2%)
1	D	0.72	0/1812	1.00	1/2473 (0.0%)
2	E	0.23	0/313	0.48	0/481
2	G	0.40	0/312	0.72	0/479
2	I	0.20	0/311	0.43	0/478
2	K	0.46	0/312	0.83	0/479
3	F	0.25	0/323	0.47	0/497
3	H	0.43	0/322	0.80	0/496
3	J	0.24	0/323	0.47	0/497
3	L	0.46	0/323	0.79	0/497
All	All	0.47	2/10099 (0.0%)	0.75	15/14201 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	7
1	B	0	3
1	C	0	4
1	D	0	5
All	All	0	19

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	132[A]	ARG	C-O	5.86	1.31	1.24
1	A	132[B]	ARG	C-O	5.86	1.31	1.24

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	146	VAL	CB-CA-C	14.59	124.34	110.63
1	C	213	ASP	N-CA-CB	-13.35	94.24	110.53
1	C	213	ASP	N-CA-C	9.77	124.28	109.62
1	A	146	VAL	N-CA-C	-8.80	105.35	113.71
1	C	212	VAL	N-CA-C	-8.30	92.08	109.34
1	A	132[A]	ARG	CA-C-O	6.42	129.70	120.51
1	A	132[B]	ARG	CA-C-O	6.42	129.70	120.51
1	A	195	PRO	N-CA-CB	-5.95	97.00	103.25
1	D	69	GLY	N-CA-C	-5.94	107.12	115.32
1	A	255	GLY	N-CA-C	5.75	126.80	113.18
1	A	259	VAL	N-CA-CB	5.43	118.91	111.41
1	C	133	VAL	N-CA-CB	-5.07	104.11	111.21
1	B	140	THR	N-CA-C	-5.05	106.26	114.09
1	B	146	VAL	N-CA-C	-5.03	98.88	109.34
1	C	49	PRO	N-CA-C	5.01	118.24	111.22

There are no chirality outliers.

All (19) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	131	ARG	Sidechain
1	A	132[A]	ARG	Sidechain
1	A	132[B]	ARG	Sidechain
1	A	141	ARG	Sidechain
1	A	157	ARG	Sidechain
1	A	178	ARG	Sidechain
1	A	236	ARG	Sidechain
1	B	141	ARG	Sidechain
1	B	203	ARG	Sidechain
1	B	256	ARG	Sidechain
1	C	131	ARG	Sidechain
1	C	167	ARG	Sidechain
1	C	203	ARG	Sidechain
1	C	256	ARG	Sidechain
1	D	132	ARG	Sidechain
1	D	167	ARG	Sidechain
1	D	180	ARG	Sidechain
1	D	203	ARG	Sidechain
1	D	225	ARG	Sidechain

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	1968	0	1888	65	0
1	B	1962	0	1875	54	1
1	C	1668	0	1397	57	0
1	D	1765	0	1573	56	1
2	E	281	0	162	7	0
2	G	280	0	160	6	0
2	I	279	0	158	3	0
2	K	280	0	160	6	0
3	F	287	0	159	7	0
3	H	286	0	156	5	0
3	J	287	0	159	12	0
3	L	287	0	159	9	0
4	Q	23	0	21	0	0
5	A	27	0	21	3	0
5	B	27	0	21	4	0
5	C	27	0	21	5	0
5	D	27	0	21	3	0
6	A	35	0	0	0	0
6	B	27	0	0	1	0
6	C	12	0	0	0	0
6	D	21	0	0	0	0
6	E	9	0	0	0	0
6	F	4	0	0	0	0
6	G	4	0	0	0	0
6	H	13	0	0	0	0
6	I	6	0	0	0	0
6	J	9	0	0	2	0
6	K	8	0	0	0	0
6	L	8	0	0	0	0
All	All	9917	0	8111	256	1

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 14.

All (256) 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:K:12:DC:H2''	2:K:13:DC:H5'	1.61	0.81
3:J:6:DT:H2'	3:J:7:DA:C8	2.18	0.78
1:C:134:PRO:HG3	1:D:196:LYS:HD3	1.65	0.76
1:C:228:LEU:HA	1:C:256:ARG:NH1	2.02	0.75
1:A:128:ILE:HB	1:A:198:VAL:HG12	1.69	0.74
1:C:228:LEU:HA	1:C:256:ARG:HH12	1.53	0.73
3:H:13:DC:H2'	3:H:14:DA:C8	2.25	0.71
1:A:223:ILE:HA	1:A:226:MET:HE2	1.72	0.70
3:F:13:DC:H2'	3:F:14:DA:C8	2.27	0.69
1:B:228:LEU:HD23	1:B:256:ARG:HH22	1.57	0.68
2:E:10:DA:H2''	2:E:11:DG:C8	2.27	0.68
2:K:5:DT:H2''	2:K:6:DT:C5	2.30	0.66
3:F:3:DG:H2''	3:F:4:DG:C8	2.31	0.66
3:L:2:DT:H2'	3:L:3:DG:C8	2.31	0.66
1:A:228:LEU:HD21	1:A:254:GLN:HG3	1.77	0.66
1:D:130:ASP:HB3	1:D:200:SER:HA	1.78	0.65
1:C:122:THR:HG22	1:C:154:ALA:O	1.98	0.64
2:K:2:DT:H2'	2:K:3:DG:C8	2.33	0.64
3:H:6:DT:H2'	3:H:7:DA:C8	2.33	0.63
1:B:88:LEU:HD22	1:B:117:LEU:HD21	1.81	0.61
2:I:9:DT:H2''	2:I:10:DA:C8	2.35	0.61
1:B:181:LYS:HA	1:B:184:GLU:HG3	1.83	0.61
1:B:179:SER:HA	1:B:189:LEU:HD11	1.83	0.60
1:D:219:PRO:HD2	1:D:222:ILE:HD11	1.82	0.60
1:D:92:ILE:HB	1:D:93:PRO:HD3	1.83	0.60
2:G:5:DT:H2''	2:G:6:DT:C5	2.37	0.60
1:D:101:MET:HE1	1:D:117:LEU:HD21	1.84	0.59
1:C:40:ASP:OD1	5:C:301:SFG:N6	2.27	0.59
2:K:11:DG:H2'	2:K:12:DC:C6	2.37	0.59
1:C:134:PRO:HG3	1:D:196:LYS:CD	2.32	0.59
1:B:48:LEU:HB3	1:B:94:LYS:HE2	1.85	0.59
1:C:102:TYR:CD2	1:C:226:MET:HE2	2.37	0.59
1:C:166:VAL:HG11	1:C:229:ALA:HB2	1.84	0.59
1:B:84:THR:HA	1:B:87:TRP:CD1	2.38	0.58
1:B:212:VAL:HG11	1:B:274:ARG:HD2	1.86	0.58
1:B:42:LEU:H	1:B:42:LEU:HD12	1.67	0.58
1:B:53:ILE:HD12	1:B:238:LEU:HB2	1.85	0.58
1:D:59:ASP:OD2	5:D:301:SFG:N	2.36	0.58
1:A:102:TYR:CE2	1:A:226:MET:HB3	2.39	0.58
1:A:53:ILE:HD13	1:A:236:ARG:HB3	1.86	0.58
1:D:115:SER:HA	1:D:118:LYS:HD3	1.86	0.57
1:A:38:ASN:ND2	1:A:265:GLU:HA	2.20	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:301:SFG:HNE2	2:G:7:DA:N6	2.03	0.57
1:A:55:LEU:HD13	1:A:230:SER:HB2	1.87	0.57
1:D:252:ALA:C	1:D:254:GLN:H	2.12	0.57
3:L:6:DT:H2'	3:L:7:DA:C8	2.39	0.57
1:A:40:ASP:OD1	5:A:301:SFG:N6	2.37	0.57
1:A:131:ARG:HG3	1:A:146:VAL:O	2.05	0.57
1:B:271:ALA:O	1:B:275:VAL:HG23	2.05	0.57
1:C:154:ALA:HB1	1:C:159:TYR:HB3	1.87	0.57
1:D:186:SER:HA	6:J:103:HOH:O	2.05	0.57
1:A:131:ARG:NH1	1:A:148:ASP:OD1	2.38	0.56
1:D:166:VAL:HG12	1:D:195:PRO:HG2	1.86	0.56
1:B:130:ASP:HB3	1:B:200:SER:HA	1.87	0.56
1:A:128:ILE:HG12	1:B:128:ILE:HG13	1.87	0.56
1:A:222:ILE:O	1:A:226:MET:HG3	2.05	0.56
1:D:271:ALA:O	1:D:275:VAL:HG22	2.06	0.56
1:C:194:ASN:HD21	1:D:143:PHE:HA	1.71	0.55
1:C:222:ILE:O	1:C:226:MET:HG3	2.06	0.55
1:D:53:ILE:HG21	1:D:238:LEU:HB3	1.88	0.55
3:F:6:DT:H2''	3:F:7:DA:O5'	2.07	0.55
1:A:167:ARG:NH2	3:H:9:DT:OP2	2.39	0.55
1:B:254:GLN:HB3	1:B:256:ARG:HH21	1.72	0.55
1:D:252:ALA:O	1:D:254:GLN:N	2.39	0.54
1:C:123:MET:HG2	1:C:153:PHE:CE2	2.42	0.53
1:D:179:SER:HA	1:D:189:LEU:HD21	1.91	0.53
3:J:12:DA:H2'	3:J:13:DC:C6	2.43	0.53
1:C:126:GLU:OE2	1:C:128:ILE:HD11	2.10	0.52
1:A:199:TRP:CE3	1:A:222:ILE:HG23	2.44	0.52
1:A:131:ARG:O	1:A:133:VAL:N	2.33	0.52
1:D:228:LEU:HD21	1:D:254:GLN:HG3	1.92	0.52
1:D:269:ALA:O	1:D:273:GLU:HG3	2.09	0.52
1:A:170:TYR:OH	3:H:10:DA:H3'	2.10	0.52
1:A:84:THR:HA	1:A:87:TRP:CD1	2.44	0.52
1:B:70:ASN:OD1	1:B:72:SER:OG	2.19	0.52
1:A:109:TYR:O	1:A:113:ILE:HG13	2.09	0.52
1:C:254:GLN:O	1:C:256:ARG:NH2	2.43	0.52
1:A:88:LEU:HD13	1:A:117:LEU:HD21	1.92	0.52
1:A:220:LEU:O	1:A:224:GLU:HB2	2.09	0.52
1:D:131:ARG:O	1:D:133:VAL:N	2.44	0.52
1:D:91:ALA:O	1:D:92:ILE:C	2.53	0.51
1:C:241:PHE:HB3	5:C:301:SFG:O4'	2.11	0.51
1:A:112:GLU:OE1	1:A:112:GLU:N	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:84:THR:HA	1:D:87:TRP:CD1	2.46	0.51
1:A:241:PHE:HB3	5:A:301:SFG:O4'	2.11	0.51
1:D:206:ARG:HA	1:D:211:ARG:HG2	1.92	0.51
1:B:245:GLY:O	1:B:249:VAL:HG23	2.11	0.50
1:B:146:VAL:HG13	1:B:146:VAL:O	2.11	0.50
3:L:3:DG:H2''	3:L:4:DG:C8	2.46	0.50
1:A:271:ALA:O	1:A:275:VAL:HG23	2.11	0.50
1:B:241:PHE:HB3	5:B:301:SFG:O4'	2.11	0.50
1:C:179:SER:HA	1:C:189:LEU:HD21	1.93	0.50
1:A:123:MET:HG3	1:A:153:PHE:CE2	2.47	0.50
1:B:218:LYS:NZ	2:G:7:DA:N7	2.47	0.50
1:C:97:PRO:HA	1:C:155:VAL:HG11	1.94	0.50
1:D:61:PRO:HD2	1:D:83:TRP:HH2	1.76	0.50
1:A:142:ARG:HD2	2:E:10:DA:OP1	2.12	0.50
1:B:254:GLN:HB3	1:B:256:ARG:NH2	2.26	0.49
1:B:216:THR:O	1:B:216:THR:OG1	2.28	0.49
3:J:5:DC:H2'	3:J:6:DT:C6	2.47	0.49
1:A:85:ARG:HG2	1:A:116:PHE:CZ	2.48	0.49
1:B:222:ILE:O	1:B:226:MET:HG3	2.11	0.49
1:A:80:PHE:O	1:A:84:THR:OG1	2.26	0.49
1:A:143:PHE:H	1:B:125:ASN:ND2	2.11	0.49
1:B:269:ALA:O	1:B:273:GLU:HG3	2.12	0.49
2:E:5:DT:H2''	2:E:6:DT:C5	2.48	0.49
1:C:147:HIS:HB3	1:D:198:VAL:CG2	2.42	0.49
1:C:180:ARG:HG2	1:C:180:ARG:HH11	1.78	0.49
1:D:110:ALA:O	1:D:111:PRO:C	2.55	0.49
3:H:8:DG:H2'	3:H:9:DT:C6	2.48	0.49
1:A:57:VAL:HG13	1:A:226:MET:HE1	1.95	0.48
1:C:214:HIS:O	1:C:215:PRO:C	2.56	0.48
1:D:242:MET:C	5:D:301:SFG:HB2	2.38	0.48
1:B:220:LEU:O	1:B:224:GLU:HB2	2.13	0.48
1:C:214:HIS:CE1	5:C:301:SFG:HD	2.49	0.48
2:I:1:DT:H2'	2:I:2:DT:H71	1.95	0.48
1:A:35:GLU:HG2	1:A:37:HIS:CE1	2.49	0.48
1:B:49:PRO:HD2	1:B:236:ARG:HH22	1.79	0.48
1:A:216:THR:HB	2:E:7:DA:C8	2.49	0.48
1:B:86:GLU:O	1:B:90:LEU:HG	2.12	0.48
1:A:206:ARG:HA	1:A:211:ARG:HG2	1.95	0.48
1:B:57:VAL:HG11	1:B:223:ILE:HG23	1.95	0.48
1:C:124:VAL:HB	1:C:152:PHE:CD2	2.49	0.48
1:B:266:SER:O	1:B:270:ILE:HD12	2.13	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:56:ILE:HG12	1:C:238:LEU:HB3	1.96	0.47
2:E:9:DT:H2''	2:E:10:DA:C8	2.49	0.47
3:F:6:DT:H4'	3:F:7:DA:OP1	2.12	0.47
1:D:116:PHE:CD2	1:D:117:LEU:HD12	2.49	0.47
1:A:160:TYR:CD2	1:A:232:PRO:HD3	2.49	0.47
1:C:170:TYR:OH	3:L:10:DA:H3'	2.15	0.47
5:D:301:SFG:H8	5:D:301:SFG:H2'	1.82	0.47
1:C:104:PHE:HE1	1:C:226:MET:HE1	1.80	0.47
1:A:88:LEU:O	1:A:92:ILE:HG13	2.14	0.47
1:B:123:MET:HG3	1:B:153:PHE:CE2	2.50	0.47
1:C:199:TRP:CH2	1:C:225:ARG:HG2	2.50	0.47
1:D:167:ARG:NH2	3:J:9:DT:OP1	2.48	0.47
1:A:38:ASN:HD21	1:A:265:GLU:HA	1.80	0.46
1:B:59:ASP:HB3	5:B:301:SFG:HN2	1.80	0.46
1:A:45:ALA:O	1:A:94:LYS:HE3	2.15	0.46
1:B:236:ARG:NH1	1:B:259:VAL:HG11	2.30	0.46
1:A:253:ARG:C	1:A:255:GLY:H	2.24	0.46
1:B:104:PHE:CE1	1:B:226:MET:HE1	2.50	0.46
1:C:197:ASP:OD2	1:D:147:HIS:CE1	2.68	0.46
1:D:180:ARG:HG2	2:I:4:DT:H71	1.98	0.46
3:L:5:DC:H2'	3:L:6:DT:H71	1.97	0.46
1:A:198:VAL:HG22	1:B:146:VAL:HG13	1.97	0.46
1:A:143:PHE:HA	1:B:194:ASN:HD21	1.81	0.46
1:C:175:LYS:HE2	1:C:175:LYS:HB2	1.66	0.46
1:D:106:THR:C	1:D:108:GLN:N	2.74	0.46
1:D:235:GLY:O	1:D:257:ASP:N	2.47	0.46
1:C:70:ASN:OD1	1:C:72:SER:OG	2.17	0.45
1:A:128:ILE:HG23	1:A:147:HIS:HB2	1.97	0.45
1:A:173:ASP:O	1:A:176:LYS:HG3	2.17	0.45
1:A:131:ARG:C	1:A:133:VAL:H	2.21	0.45
1:B:206:ARG:HA	1:B:211:ARG:HG2	1.98	0.45
1:C:102:TYR:CE1	1:C:226:MET:HB3	2.51	0.45
1:A:262:GLU:HG2	1:A:267:TYR:HB2	1.98	0.45
1:D:43:THR:C	1:D:45:ALA:H	2.24	0.45
1:C:127:ILE:C	1:C:128:ILE:HD13	2.41	0.45
1:C:197:ASP:OD2	1:D:147:HIS:ND1	2.50	0.45
3:L:2:DT:H4'	3:L:3:DG:OP1	2.16	0.45
1:B:60:PRO:HA	1:B:241:PHE:CD2	2.52	0.44
1:C:136:MET:HE1	6:J:101:HOH:O	2.17	0.44
1:B:214:HIS:CE1	5:B:301:SFG:HB1	2.52	0.44
1:D:186:SER:HB3	1:D:188:TRP:CD1	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:240:PRO:O	1:B:261:TYR:HB2	2.17	0.44
2:E:5:DT:H2''	2:E:6:DT:C4	2.52	0.44
1:A:164:ASP:HA	1:A:167:ARG:HD2	1.99	0.44
1:A:168:ILE:HD12	1:A:193:TYR:CE2	2.52	0.44
1:C:231:CYS:SG	1:C:256:ARG:HG2	2.57	0.44
1:A:173:ASP:O	1:A:176:LYS:NZ	2.51	0.44
2:E:3:DG:H1'	2:E:4:DT:H5'	1.99	0.44
3:F:6:DT:H2'	3:F:7:DA:C8	2.51	0.44
1:B:94:LYS:HA	1:B:94:LYS:HD2	1.87	0.44
3:F:10:DA:H1'	3:F:11:DA:H5'	2.00	0.44
1:A:199:TRP:HE3	1:A:222:ILE:HG23	1.83	0.44
1:A:227:VAL:HG13	1:A:256:ARG:HD3	2.00	0.44
1:C:164:ASP:HA	1:C:167:ARG:HD2	2.00	0.44
1:B:48:LEU:HD12	1:B:48:LEU:HA	1.88	0.43
1:C:147:HIS:HE2	1:C:149:ASN:HD21	1.66	0.43
1:D:201:VAL:HG21	1:D:222:ILE:HG23	1.99	0.43
3:J:12:DA:H2'	3:J:13:DC:H6	1.82	0.43
1:C:198:VAL:HG23	1:D:146:VAL:HG13	2.00	0.43
1:D:84:THR:HA	1:D:87:TRP:NE1	2.33	0.43
1:A:59:ASP:HB3	5:A:301:SFG:HN2	1.82	0.43
1:B:60:PRO:O	2:G:7:DA:N6	2.51	0.43
1:B:175:LYS:N	6:B:402:HOH:O	2.51	0.43
1:D:183:PHE:O	1:D:184:GLU:C	2.60	0.43
1:C:127:ILE:HG21	1:C:199:TRP:CE2	2.54	0.43
1:D:56:ILE:HB	1:D:101:MET:HG2	2.00	0.43
1:D:196:LYS:O	1:D:199:TRP:NE1	2.51	0.43
1:D:252:ALA:C	1:D:254:GLN:N	2.77	0.43
1:A:102:TYR:CD2	1:A:226:MET:HB3	2.54	0.43
1:B:251:CYS:HB3	1:B:256:ARG:O	2.19	0.43
1:C:126:GLU:OE2	1:D:147:HIS:NE2	2.51	0.42
1:C:137:GLY:O	3:J:8:DG:N2	2.40	0.42
1:B:208:HIS:CD2	1:B:210:GLU:HB3	2.54	0.42
1:D:59:ASP:HA	1:D:104:PHE:HB2	2.01	0.42
1:A:59:ASP:OD2	1:A:218:LYS:HE2	2.19	0.42
1:B:34:ILE:HG22	1:B:36:LEU:CD1	2.50	0.42
2:G:13:DC:H2''	2:G:14:DA:C8	2.55	0.42
1:A:59:ASP:HA	1:A:104:PHE:HB2	2.02	0.42
1:A:143:PHE:CD1	1:B:195:PRO:HG2	2.55	0.42
1:C:145:SER:HA	1:D:197:ASP:OD2	2.19	0.42
1:C:164:ASP:HA	1:C:167:ARG:HG3	2.02	0.42
1:D:140:THR:O	1:D:140:THR:OG1	2.35	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:L:13:DC:H2'	3:L:14:DA:C8	2.54	0.42
1:B:47:HIS:C	1:B:47:HIS:CD2	2.97	0.41
1:A:133:VAL:HA	1:A:134:PRO:HD3	1.92	0.41
1:B:34:ILE:HG22	1:B:36:LEU:HD11	2.03	0.41
5:C:301:SFG:H8	5:C:301:SFG:H2'	1.73	0.41
1:D:121:LEU:HD12	1:D:155:VAL:HA	2.02	0.41
1:D:220:LEU:O	1:D:221:GLU:C	2.63	0.41
1:A:143:PHE:N	1:B:125:ASN:HD21	2.18	0.41
1:B:56:ILE:HG13	1:B:95:LEU:HD21	2.01	0.41
1:C:59:ASP:OD2	5:C:301:SFG:HB2	2.20	0.41
1:C:136:MET:HE3	3:J:10:DA:C6	2.55	0.41
3:J:11:DA:H1'	3:J:12:DA:O4'	2.20	0.41
1:C:144:THR:HG21	3:J:10:DA:OP1	2.19	0.41
1:D:60:PRO:O	1:D:61:PRO:C	2.62	0.41
1:B:103:ILE:O	1:B:150:ILE:HA	2.20	0.41
1:C:180:ARG:HG2	1:C:180:ARG:NH1	2.35	0.41
3:J:13:DC:H2'	3:J:14:DA:C8	2.55	0.41
1:A:195:PRO:HB3	1:A:225:ARG:NH1	2.35	0.41
1:C:168:ILE:HB	1:C:193:TYR:CE1	2.55	0.41
1:D:163:LEU:O	1:D:167:ARG:HG3	2.20	0.41
1:A:33:GLY:HA3	1:A:257:ASP:OD1	2.20	0.41
1:A:48:LEU:HA	1:A:49:PRO:HD3	1.98	0.41
1:A:129:TRP:CD2	1:A:131:ARG:HG2	2.56	0.41
1:A:196:LYS:HB3	1:B:146:VAL:CG1	2.50	0.41
1:C:62:TYR:CE1	1:C:104:PHE:HB3	2.56	0.41
1:C:130:ASP:C	1:C:132:ARG:H	2.28	0.41
1:D:222:ILE:O	1:D:225:ARG:HB2	2.20	0.41
1:D:245:GLY:O	1:D:249:VAL:HG23	2.20	0.41
3:L:3:DG:H2''	3:L:4:DG:H8	1.85	0.41
1:D:106:THR:C	1:D:108:GLN:H	2.29	0.41
1:B:110:ALA:N	1:B:111:PRO:HD2	2.37	0.40
1:C:159:TYR:O	1:D:141:ARG:NH2	2.54	0.40
1:C:159:TYR:O	1:D:141:ARG:NH1	2.54	0.40
1:C:223:ILE:HD13	1:C:223:ILE:HA	1.98	0.40
1:C:223:ILE:O	1:C:227:VAL:HG23	2.21	0.40
1:A:254:GLN:O	1:A:256:ARG:NH1	2.53	0.40
1:B:61:PRO:HA	2:G:7:DA:N1	2.36	0.40
1:C:238:LEU:HD22	1:C:240:PRO:HD3	2.03	0.40
1:C:128:ILE:HG13	1:D:128:ILE:HG21	2.02	0.40
1:C:160:TYR:CE2	1:C:231:CYS:N	2.89	0.40
1:A:39:ARG:HB3	1:A:44:ASP:OD2	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:85:ARG:O	1:A:89:GLU:HG3	2.21	0.40
1:A:50:ASP:HA	1:A:94:LYS:HA	2.02	0.40
1:A:249:VAL:O	1:A:253:ARG:HG2	2.22	0.40
1:C:262:GLU:OE2	1:C:267:TYR:HB2	2.21	0.40
3:J:7:DA:H1'	3:J:8:DG:H5'	2.04	0.40
3:J:10:DA:C2	3:J:11:DA:C2	3.10	0.40
2:K:5:DT:C4	3:L:10:DA:N6	2.89	0.40
2:K:13:DC:H2''	2:K:14:DA:C8	2.57	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:40:ASP:N	1:D:190:GLU:OE2[2_545]	1.93	0.27

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	245/249 (98%)	231 (94%)	12 (5%)	2 (1%)	16	40
1	B	247/249 (99%)	231 (94%)	15 (6%)	1 (0%)	30	57
1	C	228/249 (92%)	206 (90%)	21 (9%)	1 (0%)	30	57
1	D	232/249 (93%)	200 (86%)	32 (14%)	0	100	100
All	All	952/996 (96%)	868 (91%)	80 (8%)	4 (0%)	36	57

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	132[A]	ARG
1	A	132[B]	ARG

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Mol	Chain	Res	Type
1	B	146	VAL
1	C	48	LEU

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	205/213 (96%)	199 (97%)	6 (3%)	37	70
1	B	204/213 (96%)	200 (98%)	4 (2%)	48	77
1	C	143/213 (67%)	135 (94%)	8 (6%)	19	46
1	D	164/213 (77%)	157 (96%)	7 (4%)	26	57
All	All	716/852 (84%)	691 (96%)	25 (4%)	32	64

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	LEU
1	A	81	LEU
1	A	127	ILE
1	A	176	LYS
1	A	178	ARG
1	A	227	VAL
1	B	121	LEU
1	B	141	ARG
1	B	203	ARG
1	B	256	ARG
1	C	115	SER
1	C	131	ARG
1	C	133	VAL
1	C	186	SER
1	C	203	ARG
1	C	240	PRO
1	C	242	MET
1	C	263	ILE
1	D	56	ILE

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Mol	Chain	Res	Type
1	D	166	VAL
1	D	167	ARG
1	D	175	LYS
1	D	180	ARG
1	D	191	MET
1	D	203	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	147	HIS
1	A	149	ASN
1	B	37	HIS
1	B	47	HIS
1	B	208	HIS
1	B	276	ASN
1	C	38	ASN
1	C	149	ASN
1	D	70	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 ⓘ

2 monosaccharides 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
4	GLC	Q	1	4	11,11,12	0.61	0	15,15,17	0.52	0
4	FRU	Q	2	4	11,12,12	0.55	0	10,18,18	0.81	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
4	GLC	Q	1	4	-	2/2/19/22	0/1/1/1
4	FRU	Q	2	4	-	2/5/24/24	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

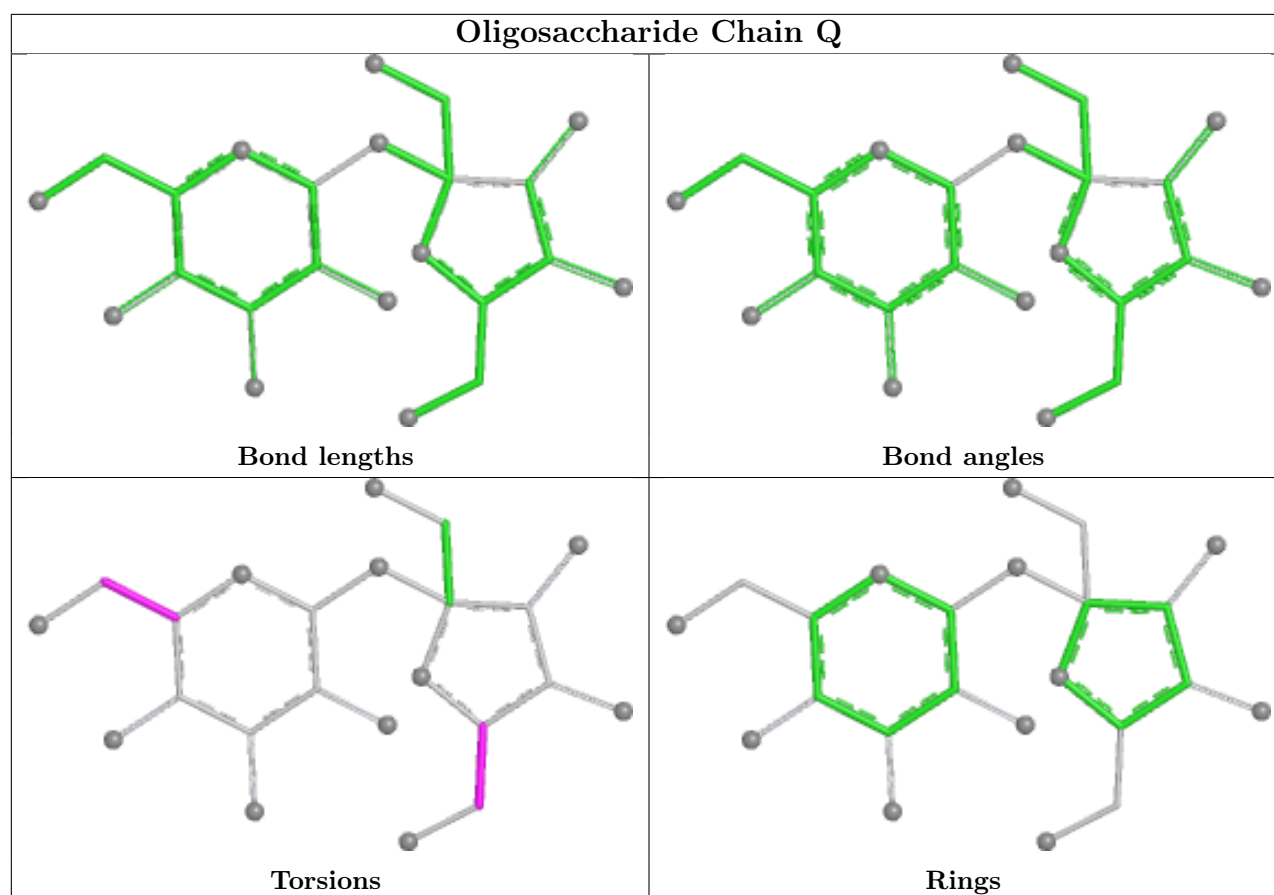
All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	Q	2	FRU	C4-C5-C6-O6
4	Q	1	GLC	O5-C5-C6-O6
4	Q	2	FRU	O5-C5-C6-O6
4	Q	1	GLC	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



5.6 Ligand geometry [i](#)

4 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	$\# Z > 2$
5	SFG	A	301	-	28,29,29	2.91	9 (32%)	34,42,42	2.21	11 (32%)
5	SFG	D	301	-	28,29,29	2.91	9 (32%)	34,42,42	2.25	13 (38%)
5	SFG	B	301	-	28,29,29	2.90	9 (32%)	34,42,42	2.23	10 (29%)
5	SFG	C	301	-	28,29,29	2.90	9 (32%)	34,42,42	2.28	11 (32%)

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
5	SFG	A	301	-	-	4/17/33/33	0/3/3/3
5	SFG	D	301	-	-	7/17/33/33	0/3/3/3
5	SFG	B	301	-	-	10/17/33/33	0/3/3/3
5	SFG	C	301	-	-	6/17/33/33	0/3/3/3

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	301	SFG	O4'-C1'	8.66	1.62	1.42
5	C	301	SFG	O4'-C1'	8.66	1.62	1.42
5	A	301	SFG	O4'-C1'	8.54	1.61	1.42
5	B	301	SFG	O4'-C1'	8.49	1.61	1.42
5	B	301	SFG	C2'-C1'	-7.22	1.30	1.53
5	D	301	SFG	C2'-C1'	-7.18	1.30	1.53
5	A	301	SFG	C2'-C1'	-7.18	1.30	1.53
5	C	301	SFG	C2'-C1'	-7.05	1.31	1.53
5	B	301	SFG	O4'-C4'	-6.33	1.30	1.45
5	A	301	SFG	O4'-C4'	-6.31	1.31	1.45
5	C	301	SFG	O4'-C4'	-6.25	1.31	1.45
5	D	301	SFG	O4'-C4'	-6.22	1.31	1.45
5	A	301	SFG	C6-N6	4.47	1.45	1.34
5	C	301	SFG	C6-N6	4.47	1.45	1.34
5	D	301	SFG	C6-N6	4.45	1.45	1.34
5	B	301	SFG	C6-N6	4.41	1.45	1.34
5	B	301	SFG	C5-C4	-2.91	1.33	1.39
5	D	301	SFG	C5-C4	-2.87	1.34	1.39
5	C	301	SFG	C5-C4	-2.82	1.34	1.39
5	D	301	SFG	O2'-C2'	2.80	1.49	1.43
5	A	301	SFG	O3'-C3'	-2.80	1.36	1.43
5	A	301	SFG	C5-C4	-2.80	1.34	1.39
5	C	301	SFG	O2'-C2'	2.77	1.49	1.43
5	A	301	SFG	O2'-C2'	2.75	1.49	1.43
5	C	301	SFG	O3'-C3'	-2.75	1.36	1.43
5	D	301	SFG	O3'-C3'	-2.74	1.36	1.43
5	B	301	SFG	O3'-C3'	-2.73	1.36	1.43
5	B	301	SFG	O2'-C2'	2.72	1.49	1.43
5	C	301	SFG	C5-N7	-2.66	1.34	1.39
5	A	301	SFG	C5-N7	-2.63	1.34	1.39
5	D	301	SFG	C5-N7	-2.54	1.34	1.39
5	B	301	SFG	C5-N7	-2.50	1.34	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	301	SFG	C8-N9	-2.30	1.33	1.37
5	B	301	SFG	C8-N9	-2.17	1.33	1.37
5	D	301	SFG	C8-N9	-2.14	1.33	1.37
5	C	301	SFG	C8-N9	-2.09	1.34	1.37

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	301	SFG	N3-C2-N1	-5.68	119.99	128.58
5	A	301	SFG	N3-C2-N1	-5.62	120.07	128.58
5	C	301	SFG	N3-C2-N1	-5.54	120.20	128.58
5	D	301	SFG	N3-C2-N1	-5.50	120.26	128.58
5	C	301	SFG	C5-C4-N3	-5.26	119.47	126.72
5	A	301	SFG	C5-C4-N3	-5.01	119.81	126.72
5	D	301	SFG	C5-C4-N3	-5.00	119.83	126.72
5	B	301	SFG	C5-C4-N3	-4.92	119.94	126.72
5	D	301	SFG	N6-C6-N1	-4.58	108.18	118.38
5	A	301	SFG	N6-C6-N1	-4.54	108.26	118.38
5	C	301	SFG	N6-C6-N1	-4.53	108.28	118.38
5	B	301	SFG	N6-C6-N1	-4.53	108.28	118.38
5	B	301	SFG	N9-C8-N7	-4.16	108.03	113.94
5	D	301	SFG	N9-C8-N7	-4.13	108.07	113.94
5	C	301	SFG	N9-C8-N7	-3.89	108.42	113.94
5	A	301	SFG	N9-C8-N7	-3.85	108.48	113.94
5	C	301	SFG	C2-N3-C4	3.47	120.30	111.83
5	A	301	SFG	C5-C6-N6	3.47	131.87	123.29
5	B	301	SFG	C2-N3-C4	3.40	120.14	111.83
5	A	301	SFG	C2-N3-C4	3.39	120.10	111.83
5	D	301	SFG	C5-C6-N6	3.39	131.67	123.29
5	B	301	SFG	C5-C6-N6	3.37	131.63	123.29
5	C	301	SFG	C5-C6-N6	3.35	131.58	123.29
5	D	301	SFG	C2-N3-C4	3.35	120.00	111.83
5	C	301	SFG	N3-C4-N9	3.16	132.55	127.17
5	C	301	SFG	C3'-C2'-C1'	3.11	107.35	101.46
5	D	301	SFG	N3-C4-N9	3.01	132.29	127.17
5	B	301	SFG	N3-C4-N9	2.96	132.20	127.17
5	A	301	SFG	N3-C4-N9	2.95	132.19	127.17
5	D	301	SFG	C5-N7-C8	2.90	108.01	103.45
5	B	301	SFG	C5-N7-C8	2.85	107.93	103.45
5	C	301	SFG	C5-N7-C8	2.82	107.88	103.45
5	A	301	SFG	C5-N7-C8	2.78	107.81	103.45
5	B	301	SFG	C4-N9-C8	2.29	108.14	105.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	301	SFG	C4-C5-N7	-2.28	107.98	110.58
5	D	301	SFG	C4-C5-N7	-2.26	108.00	110.58
5	D	301	SFG	C3'-C2'-C1'	2.25	105.72	101.46
5	B	301	SFG	C4-C5-N7	-2.22	108.04	110.58
5	D	301	SFG	C4-N9-C8	2.20	108.05	105.74
5	C	301	SFG	C6-C5-C4	2.18	120.16	117.18
5	C	301	SFG	C4-C5-N7	-2.18	108.09	110.58
5	A	301	SFG	C6-C5-C4	2.10	120.05	117.18
5	D	301	SFG	OXT-C-O	-2.09	119.34	124.08
5	D	301	SFG	C6-C5-C4	2.02	119.94	117.18
5	A	301	SFG	C5-C4-N9	2.00	108.00	105.81

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	301	SFG	C-CA-CB-CG
5	D	301	SFG	CA-CB-CG-CD
5	D	301	SFG	OXT-C-CA-N
5	C	301	SFG	C2'-C1'-N9-C8
5	D	301	SFG	C2'-C1'-N9-C8
5	A	301	SFG	C2'-C1'-N9-C8
5	B	301	SFG	C2'-C1'-N9-C8
5	B	301	SFG	C4'-C5'-CD-CG
5	A	301	SFG	C2'-C1'-N9-C4
5	C	301	SFG	C2'-C1'-N9-C4
5	D	301	SFG	C2'-C1'-N9-C4
5	A	301	SFG	O-C-CA-N
5	B	301	SFG	C2'-C1'-N9-C4
5	C	301	SFG	O-C-CA-N
5	B	301	SFG	O-C-CA-CB
5	D	301	SFG	O-C-CA-CB
5	A	301	SFG	O4'-C1'-N9-C8
5	B	301	SFG	O4'-C1'-N9-C8
5	C	301	SFG	O4'-C1'-N9-C8
5	B	301	SFG	OXT-C-CA-CB
5	B	301	SFG	C-CA-CB-CG
5	D	301	SFG	OXT-C-CA-CB
5	B	301	SFG	OXT-C-CA-N
5	D	301	SFG	O4'-C1'-N9-C8
5	B	301	SFG	C4'-C5'-CD-NE
5	C	301	SFG	C4'-C5'-CD-NE

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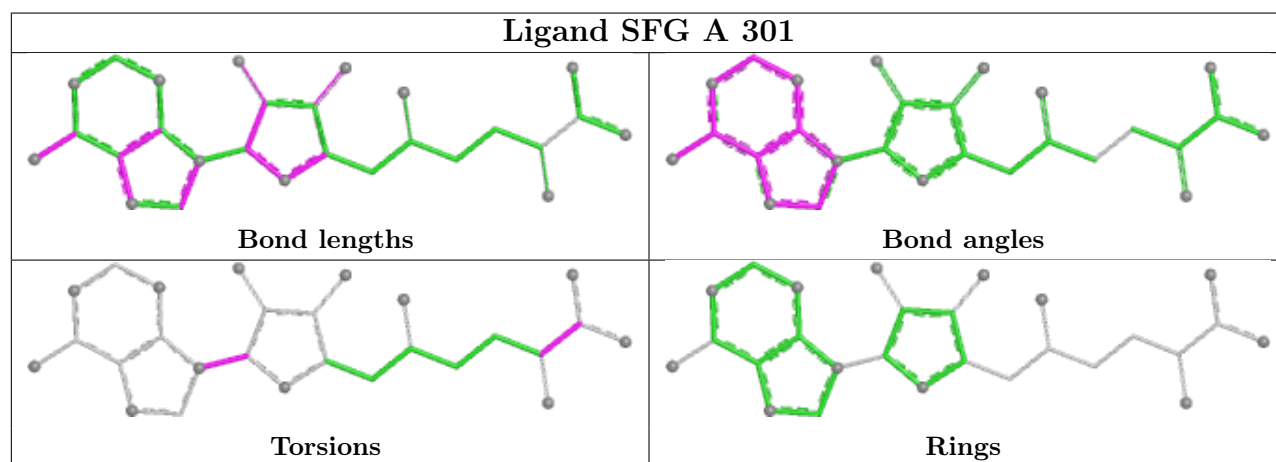
Mol	Chain	Res	Type	Atoms
5	B	301	SFG	O-C-CA-N

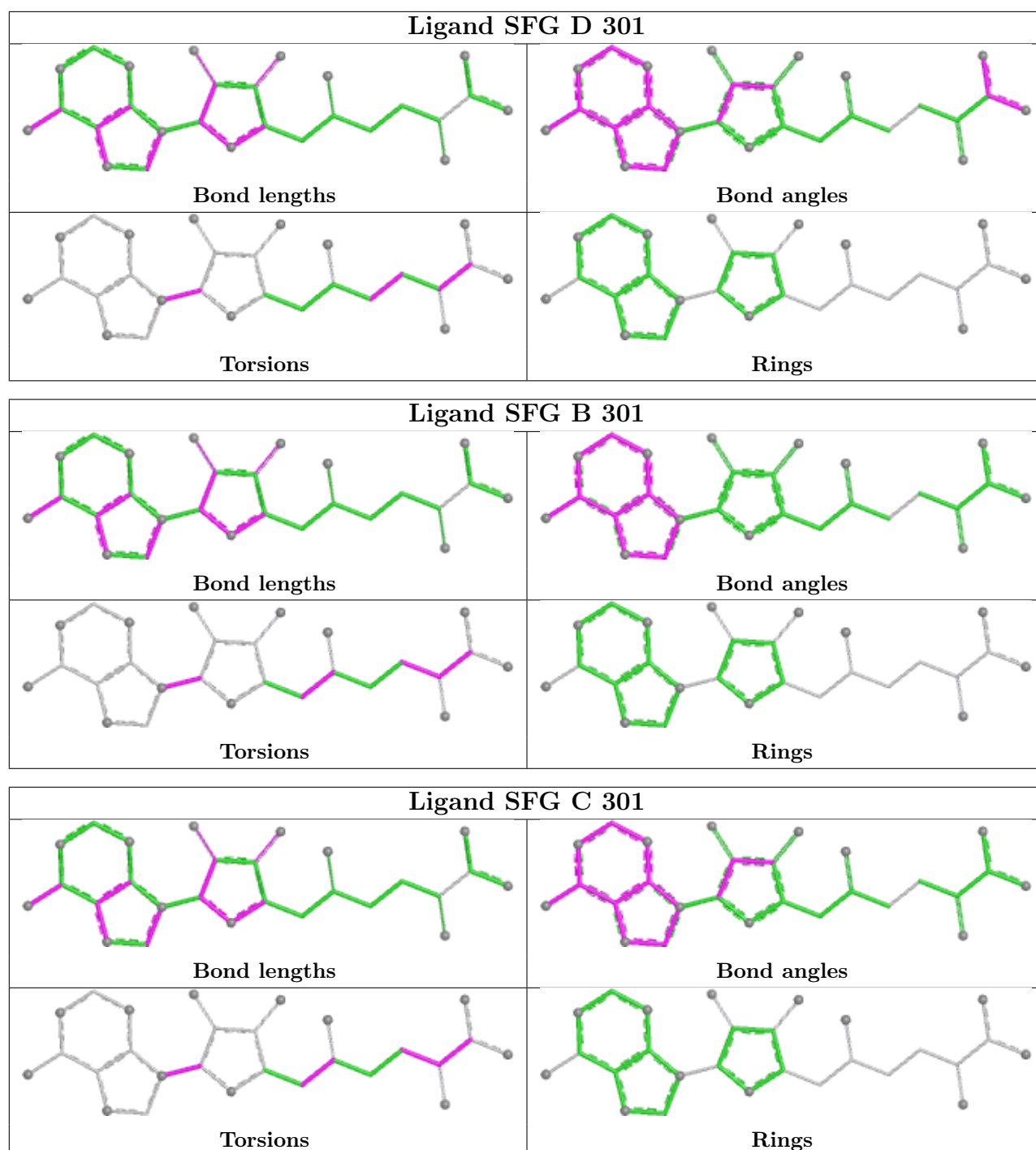
There are no ring outliers.

4 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	301	SFG	3	0
5	D	301	SFG	3	0
5	B	301	SFG	4	0
5	C	301	SFG	5	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	248/249 (99%)	0.44	7 (2%) 55 47	30, 56, 85, 123	1 (0%)
1	B	249/249 (100%)	0.59	14 (5%) 30 25	33, 54, 83, 138	0
1	C	238/249 (95%)	1.13	39 (16%) 4 4	59, 100, 163, 202	0
1	D	238/249 (95%)	1.08	33 (13%) 6 5	60, 95, 142, 252	0
2	E	14/14 (100%)	-0.16	0 100 100	43, 59, 75, 84	0
2	G	14/14 (100%)	-0.02	0 100 100	44, 59, 96, 97	0
2	I	14/14 (100%)	0.74	0 100 100	90, 105, 123, 127	0
2	K	14/14 (100%)	0.13	0 100 100	80, 89, 112, 115	0
3	F	14/14 (100%)	0.07	0 100 100	46, 59, 91, 102	0
3	H	14/14 (100%)	0.21	0 100 100	45, 72, 92, 94	0
3	J	14/14 (100%)	0.57	0 100 100	85, 102, 113, 114	0
3	L	14/14 (100%)	0.15	0 100 100	67, 83, 102, 103	0
All	All	1085/1108 (97%)	0.74	93 (8%) 16 13	30, 74, 134, 252	1 (0%)

All (93) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	185	GLY	6.2
1	D	177	ALA	5.3
1	C	95	LEU	5.2
1	C	92	ILE	4.9
1	C	91	ALA	4.8
1	C	101	MET	4.1
1	D	67	ASP	4.1
1	D	248	ALA	4.0
1	C	109	TYR	4.0
1	C	244	SER	3.9
1	D	258	PHE	3.8

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Mol	Chain	Res	Type	RSRZ
1	C	246	THR	3.7
1	D	190	GLU	3.7
1	B	163	LEU	3.7
1	C	57	VAL	3.7
1	C	121	LEU	3.6
1	D	267	TYR	3.6
1	C	227	VAL	3.6
1	C	112	GLU	3.4
1	D	237	VAL	3.4
1	C	191	MET	3.3
1	A	248	ALA	3.3
1	D	54	ASP	3.3
1	C	185	GLY	3.2
1	C	34	ILE	3.2
1	C	114	PHE	3.2
1	D	47	HIS	3.2
1	D	204	LEU	3.2
1	D	91	ALA	3.2
1	D	163	LEU	3.1
1	C	35	GLU	3.1
1	A	251	CYS	3.1
1	C	87	TRP	3.1
1	C	248	ALA	3.1
1	C	160	TYR	3.1
1	B	54	ASP	3.1
1	C	113	ILE	3.1
1	D	76	SER	3.1
1	D	189	LEU	3.0
1	D	191	MET	3.0
1	B	133	VAL	3.0
1	D	105	CYS	2.9
1	B	261	TYR	2.9
1	C	62	TYR	2.9
1	C	143	PHE	2.9
1	D	84	THR	2.9
1	D	188	TRP	2.8
1	A	95	LEU	2.8
1	C	76	SER	2.7
1	D	87	TRP	2.7
1	D	68	TYR	2.7
1	C	90	LEU	2.7
1	C	83	TRP	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	255	GLY	2.6
1	C	93	PRO	2.6
1	D	65	GLY	2.5
1	C	141	ARG	2.5
1	B	277	ALA	2.5
1	D	235	GLY	2.4
1	D	178	ARG	2.4
1	B	207	GLN	2.4
1	D	225	ARG	2.4
1	D	261	TYR	2.4
1	C	137	GLY	2.3
1	D	57	VAL	2.3
1	C	183	PHE	2.3
1	C	258	PHE	2.3
1	B	134	PRO	2.3
1	B	157	ARG	2.3
1	B	234	GLY	2.3
1	A	174	THR	2.3
1	B	240	PRO	2.3
1	D	145	SER	2.2
1	A	146	VAL	2.2
1	D	176	LYS	2.2
1	D	136	MET	2.2
1	C	103	ILE	2.2
1	C	153	PHE	2.2
1	C	120	GLN	2.2
1	D	213	ASP	2.2
1	B	146	VAL	2.2
1	C	47	HIS	2.2
1	B	241	PHE	2.2
1	A	220	LEU	2.1
1	C	104	PHE	2.1
1	C	37	HIS	2.1
1	A	205	HIS	2.1
1	D	64	LEU	2.1
1	D	80	PHE	2.1
1	C	247	THR	2.0
1	B	238	LEU	2.0
1	B	34	ILE	2.0
1	C	146	VAL	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

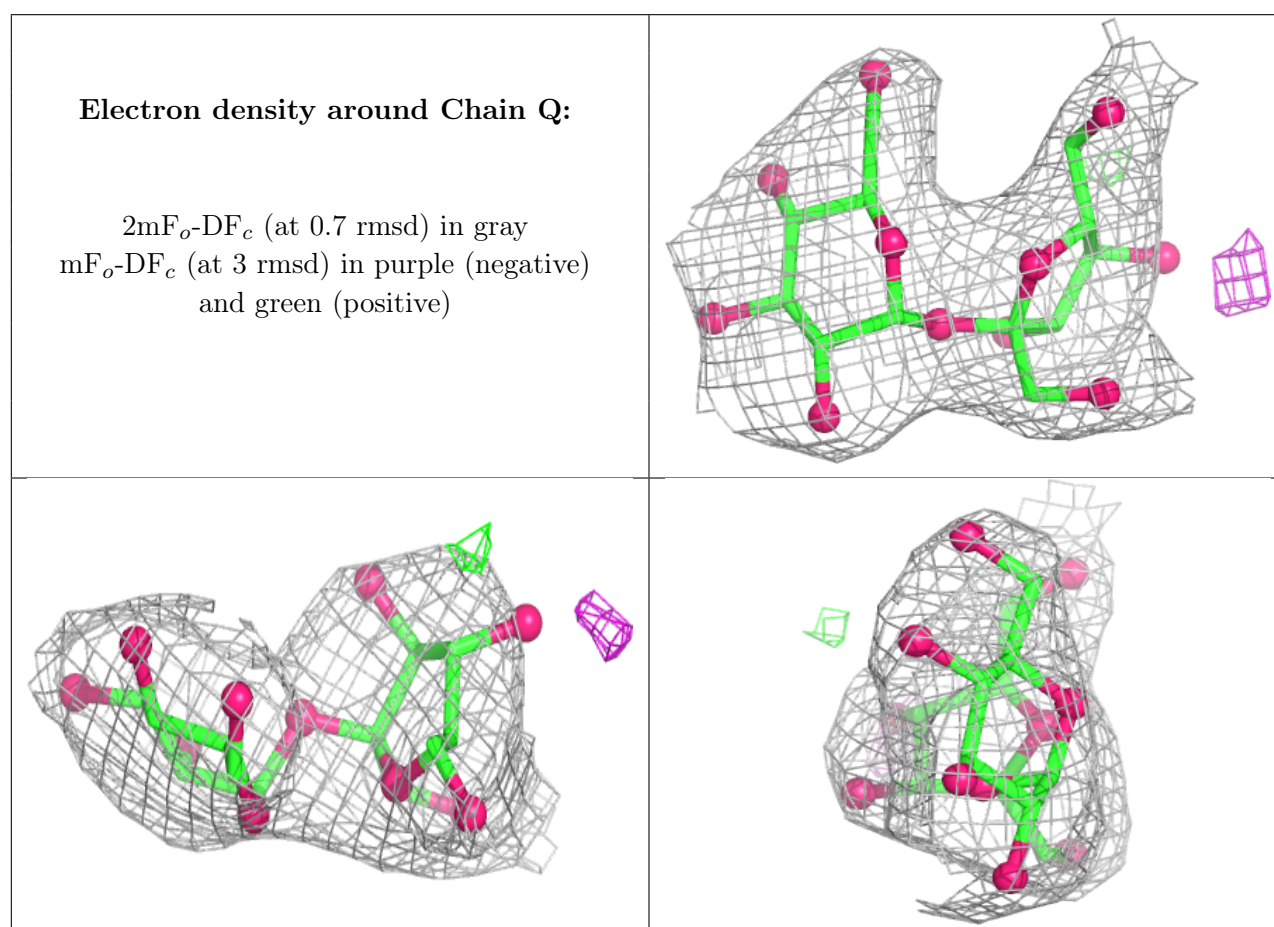
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

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($\text{\AA}^2$)	Q<0.9
4	GLC	Q	1	11/12	-	-	57,70,82,83	0
4	FRU	Q	2	12/12	-	-	49,63,76,79	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



6.4 Ligands [i](#)

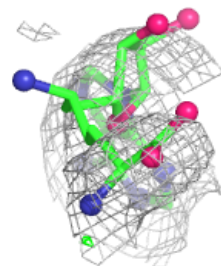
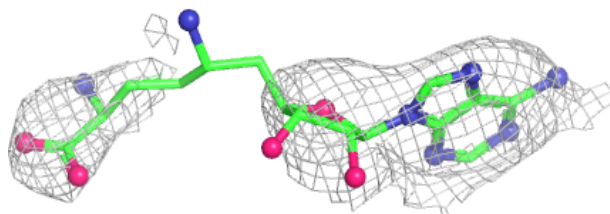
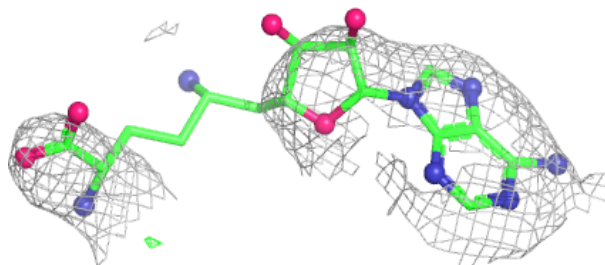
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	SFG	C	301	27/27	0.77	0.11	100,119,125,136	0
5	SFG	D	301	27/27	0.77	0.11	82,104,121,123	0
5	SFG	B	301	27/27	0.87	0.10	34,60,67,72	0
5	SFG	A	301	27/27	0.91	0.09	48,55,64,71	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.

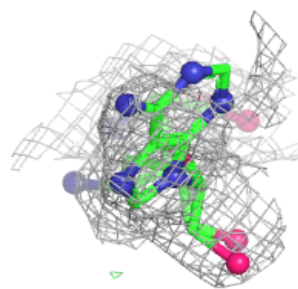
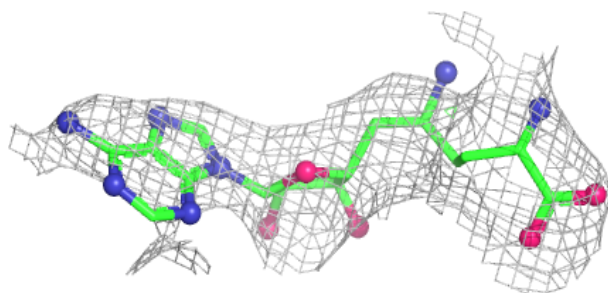
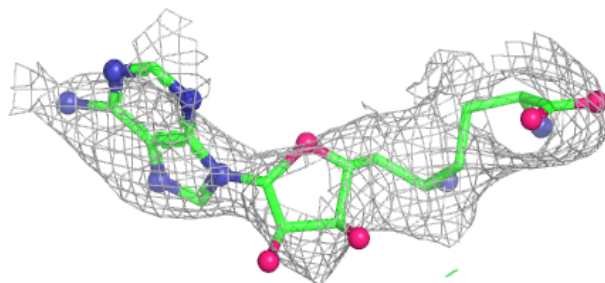
Electron density around SFG C 301:

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

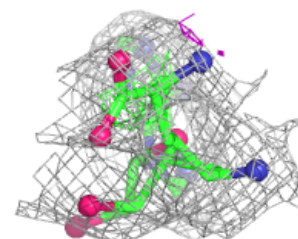
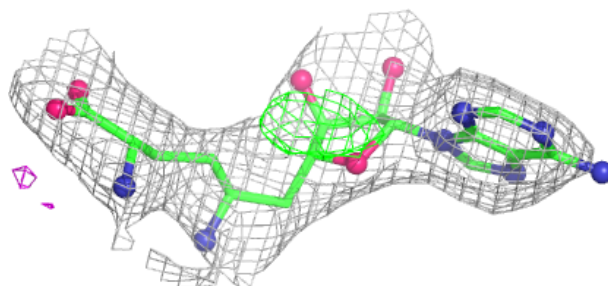
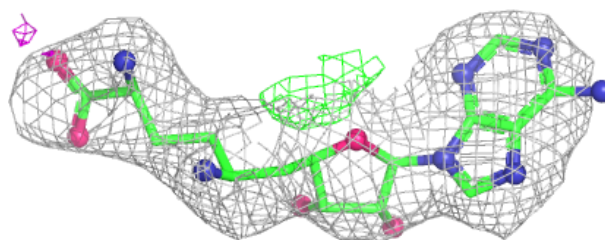


Electron density around SFG D 301:

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

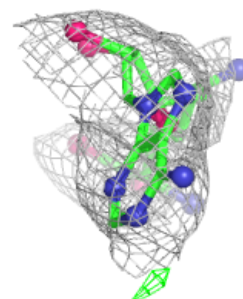
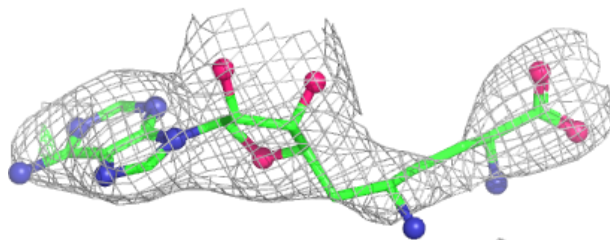
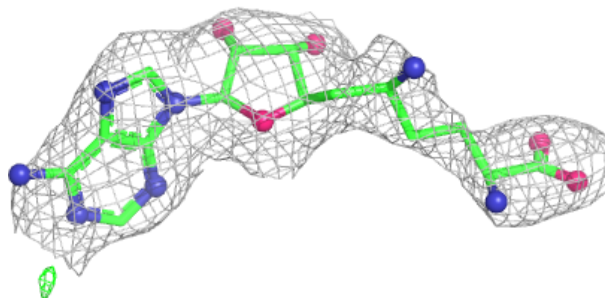
**Electron density around SFG B 301:**

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



Electron density around SFG A 301:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.