



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 20, 2023 – 07:50 PM EDT

PDB ID : 2NR6
Title : Crystal structure of the complex of antibody and the allergen Bla g 2
Authors : Li, M.; Gustchina, A.; Wlodawer, A.; Pomes, A.; Wunschmann, S.
Deposited on : 2006-11-01
Resolution : 2.81 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 : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35

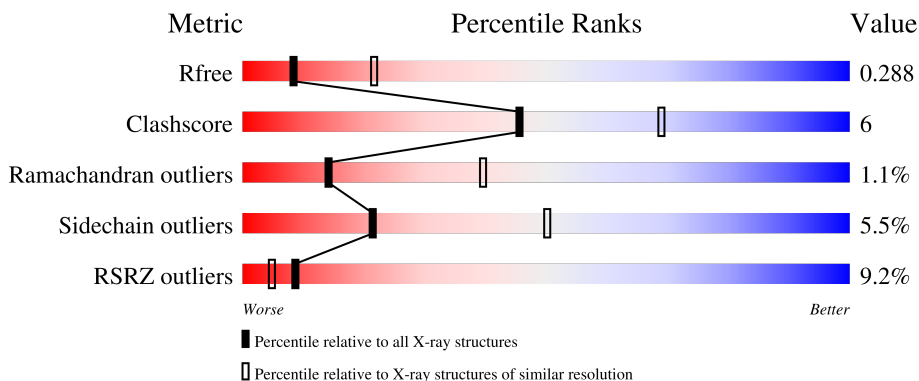
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.81 Å.

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



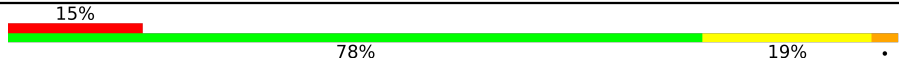

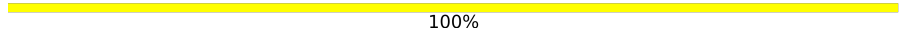
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3617 (2.84-2.80)
Clashscore	141614	4060 (2.84-2.80)
Ramachandran outliers	138981	3978 (2.84-2.80)
Sidechain outliers	138945	3980 (2.84-2.80)
RSRZ outliers	127900	3552 (2.84-2.80)

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	330	 2% 87% 12% .
1	B	330	 2% 83% 16% .
2	C	211	 22% 83% 13% .
2	E	211	 10% 80% 18% .
3	D	213	 10% 81% 16% .

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Mol	Chain	Length	Quality of chain
3	F	213	
4	G	2	
4	H	2	

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 11796 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 Aspartic protease Bla g 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	330	Total	C	N	O	S	0	0	0
			2548	1626	419	491	12			
1	B	330	Total	C	N	O	S	0	0	0
			2548	1626	419	491	12			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-8	GLY	-	expression tag	UNP P54958
A	-7	ALA	-	expression tag	UNP P54958
A	-6	SER	-	expression tag	UNP P54958
A	-5	ILE	-	expression tag	UNP P54958
A	98	GLN	ASN	engineered mutation	UNP P54958
B	-8	GLY	-	expression tag	UNP P54958
B	-7	ALA	-	expression tag	UNP P54958
B	-6	SER	-	expression tag	UNP P54958
B	-5	ILE	-	expression tag	UNP P54958
B	98	GLN	ASN	engineered mutation	UNP P54958

- Molecule 2 is a protein called Antibody light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	211	Total	C	N	O	S	0	0	0
			1641	1025	276	333	7			
2	E	211	Total	C	N	O	S	0	0	0
			1641	1025	276	333	7			

- Molecule 3 is a protein called Antibody heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	213	Total	C	N	O	S	0	0	0
			1611	1017	270	318	6			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	F	213	1611	1017	270	318	6	0	0	0

- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	G	2	28	16	2	10	0	0	0
4	H	2	28	16	2	10	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
5	A	1	14	8	1	5	0	0
5	B	1	14	8	1	5	0	0

- Molecule 6 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total 1	Zn 1	0	0
6	B	1	Total 1	Zn 1	0	0

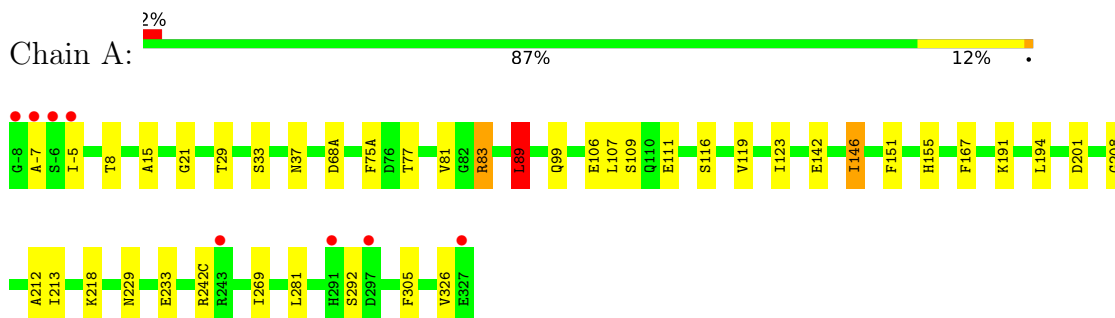
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	32	Total 32	O 32	0	0
7	B	26	Total 26	O 26	0	0
7	C	13	Total 13	O 13	0	0
7	D	19	Total 19	O 19	0	0
7	E	11	Total 11	O 11	0	0
7	F	9	Total 9	O 9	0	0

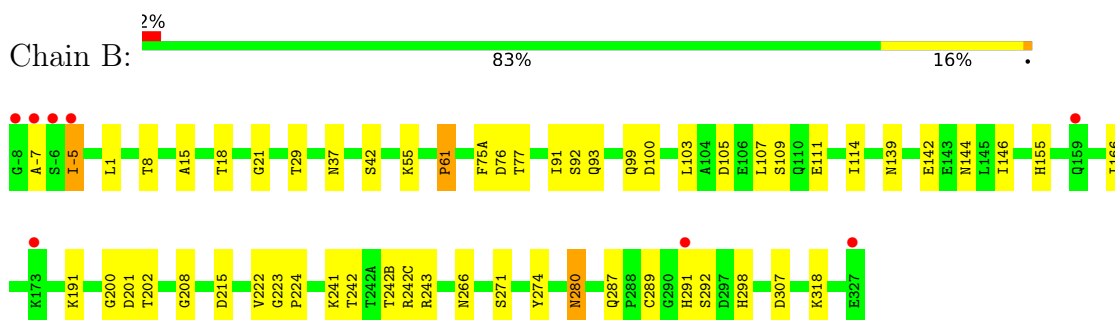
3 Residue-property plots [i](#)

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.

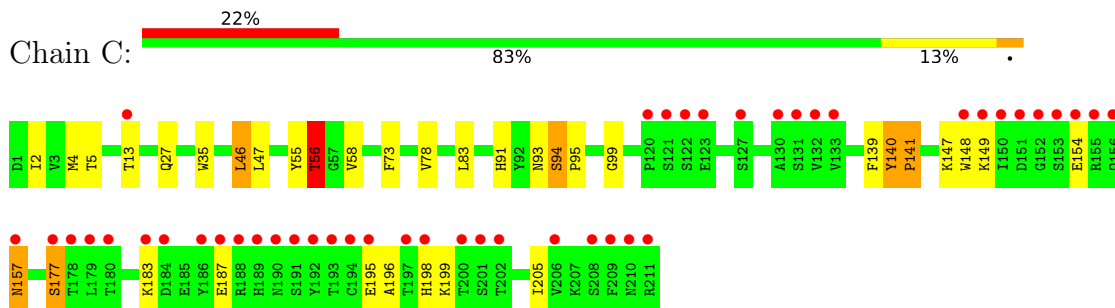
- Molecule 1: Aspartic protease Bla g 2



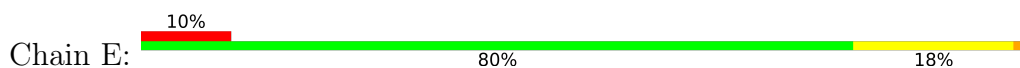
- Molecule 1: Aspartic protease Bla g 2

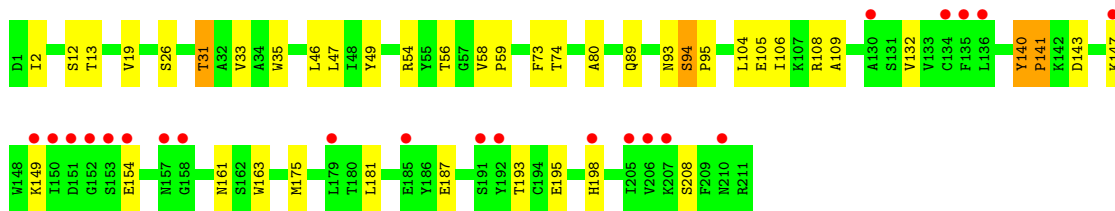


- Molecule 2: Antibody light chain

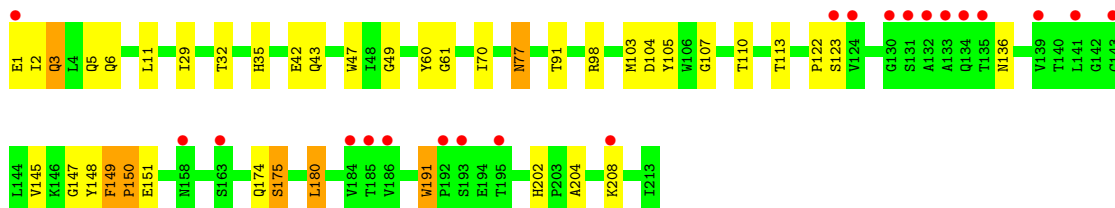
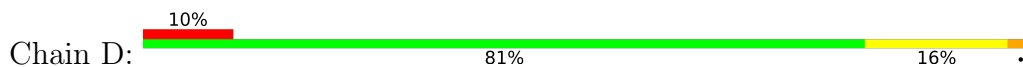


- Molecule 2: Antibody light chain

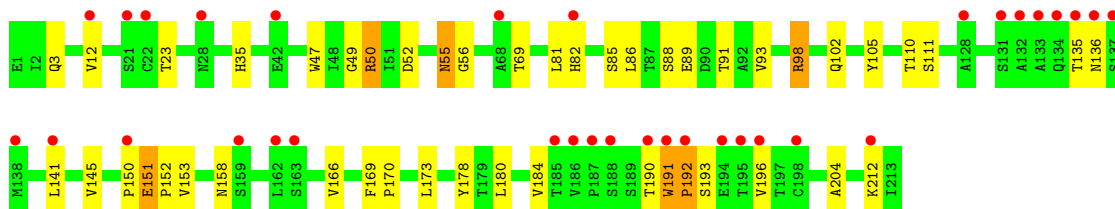
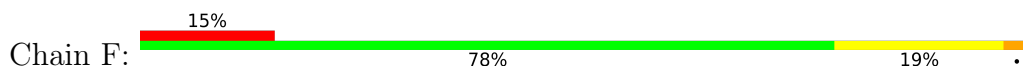




- Molecule 3: Antibody heavy chain



- Molecule 3: Antibody heavy chain



- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	77.00Å 103.19Å 146.33Å 90.00° 94.83° 90.00°	Depositor
Resolution (Å)	50.00 – 2.81 48.69 – 2.81	Depositor EDS
% Data completeness (in resolution range)	92.8 (50.00-2.81) 92.8 (48.69-2.81)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.42 (at 2.81Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.232 , 0.281 0.246 , 0.288	Depositor DCC
R_{free} test set	2610 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	36.4	Xtrriage
Anisotropy	0.801	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 31.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	11796	wwPDB-VP
Average B, all atoms (Å ²)	15.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.96% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, NAG, CSX

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	0.52	6/2598 (0.2%)	0.53	1/3527 (0.0%)
1	B	0.56	7/2598 (0.3%)	0.53	0/3527
2	C	0.33	0/1679	0.53	0/2278
2	E	0.34	0/1679	0.52	0/2278
3	D	0.36	0/1653	0.55	0/2262
3	F	0.33	0/1653	0.52	0/2262
All	All	0.44	13/11860 (0.1%)	0.53	1/16134 (0.0%)

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
2	C	0	1
2	E	0	1
3	D	0	1
3	F	0	1
All	All	0	4

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	146	ILE	C-N	9.61	1.56	1.34
1	B	292	SER	C-N	9.14	1.55	1.34
1	B	21	GLY	C-N	8.80	1.54	1.34
1	B	208	GLY	C-N	8.64	1.53	1.34
1	B	146	ILE	C-N	8.61	1.53	1.34
1	A	292	SER	C-N	7.74	1.51	1.34
1	A	8	THR	C-N	7.56	1.51	1.34
1	A	107	LEU	C-N	7.31	1.50	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	107	LEU	C-N	7.05	1.50	1.34
1	A	208	GLY	C-N	6.90	1.50	1.34
1	B	61	PRO	C-N	6.68	1.49	1.34
1	A	21	GLY	C-N	6.47	1.49	1.34
1	B	8	THR	C-N	6.47	1.49	1.34

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	89	LEU	CA-CB-CG	5.13	127.09	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	140	TYR	Peptide
3	D	149	PHE	Peptide
2	E	140	TYR	Peptide
3	F	191	TRP	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2548	0	2469	15	0
1	B	2548	0	2469	21	0
2	C	1641	0	1573	26	0
2	E	1641	0	1573	30	0
3	D	1611	0	1578	27	0
3	F	1611	0	1578	31	0
4	G	28	0	25	0	0
4	H	28	0	25	0	0
5	A	14	0	13	0	0
5	B	14	0	13	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
7	A	32	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	26	0	0	2	0
7	C	13	0	0	0	0
7	D	19	0	0	5	0
7	E	11	0	0	1	0
7	F	9	0	0	0	0
All	All	11796	0	11316	147	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 (147) 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)
3:F:191:TRP:CD1	3:F:192:PRO:HD3	1.70	1.26
2:E:94:SER:HB2	2:E:95:PRO:HD3	1.46	0.97
3:F:191:TRP:HD1	3:F:192:PRO:HD3	1.12	0.94
3:F:191:TRP:CD1	3:F:192:PRO:CD	2.53	0.91
2:C:141:PRO:HD2	2:C:198:HIS:CE1	2.09	0.88
2:E:141:PRO:HD2	2:E:198:HIS:CE1	2.09	0.86
2:E:147:LYS:HB2	2:E:195:GLU:HB3	1.55	0.86
3:F:191:TRP:HD1	3:F:192:PRO:CD	1.88	0.85
3:D:49:GLY:HA2	7:D:229:HOH:O	1.75	0.85
2:E:94:SER:HB2	2:E:95:PRO:CD	2.09	0.81
2:E:94:SER:CB	2:E:95:PRO:HD3	2.09	0.81
3:F:141:LEU:HD22	3:F:191:TRP:HZ3	1.47	0.80
3:D:35:HIS:HD2	3:D:47:TRP:HE1	1.32	0.76
2:C:141:PRO:CD	2:C:198:HIS:CE1	2.69	0.75
2:E:141:PRO:HD2	2:E:198:HIS:HE1	1.50	0.75
3:F:150:PRO:HG3	3:F:204:ALA:HB3	1.69	0.74
2:C:141:PRO:HD2	2:C:198:HIS:HE1	1.52	0.74
1:A:83:ARG:HD2	7:A:630:HOH:O	1.87	0.73
2:C:94:SER:OG	2:C:95:PRO:HD3	1.87	0.73
2:E:141:PRO:CD	2:E:198:HIS:CE1	2.71	0.73
3:F:35:HIS:HD2	3:F:47:TRP:HE1	1.39	0.70
3:D:104:ASP:HB3	3:D:105:TYR:CD2	2.26	0.70
3:D:29:ILE:H	3:D:77:ASN:HD21	1.39	0.68
3:D:6:GLN:HE21	3:D:107:GLY:HA3	1.60	0.67
3:F:145:VAL:HB	3:F:180:LEU:HD23	1.79	0.64
2:E:94:SER:CB	2:E:95:PRO:CD	2.73	0.63
1:A:89:LEU:HD23	1:A:99:GLN:HG2	1.81	0.63
3:F:141:LEU:HD22	3:F:191:TRP:CZ3	2.31	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:35:HIS:CD2	3:D:47:TRP:HE1	2.17	0.60
3:D:61:GLY:N	7:D:229:HOH:O	2.34	0.60
2:C:140:TYR:CD1	2:C:140:TYR:O	2.55	0.59
2:E:108:ARG:HG2	2:E:109:ALA:N	2.18	0.58
3:D:42:GLU:O	3:D:43:GLN:HG2	2.02	0.58
2:E:141:PRO:HD3	2:E:198:HIS:NE2	2.21	0.56
3:F:93:VAL:HG22	3:F:111:SER:HB3	1.87	0.56
1:B:105:ASP:HA	7:B:620:HOH:O	2.05	0.56
3:F:173:LEU:HD12	3:F:178:TYR:CZ	2.41	0.56
3:D:47:TRP:CZ3	7:D:229:HOH:O	2.53	0.56
2:E:149:LYS:HA	2:E:154:GLU:HA	1.87	0.55
3:D:60:TYR:HA	7:D:229:HOH:O	2.07	0.55
3:D:150:PRO:HG2	3:D:204:ALA:CB	2.36	0.55
3:D:1:GLU:HG3	3:D:3:GLN:HE22	1.70	0.54
3:F:52:ASP:HB3	3:F:55:ASN:HD21	1.72	0.54
3:F:88:SER:O	3:F:91:THR:HG22	2.08	0.54
2:E:80:ALA:HA	2:E:106:ILE:HD11	1.89	0.54
1:B:1:LEU:HD23	1:B:166:ILE:HG21	1.89	0.54
3:F:141:LEU:HD13	3:F:191:TRP:CH2	2.43	0.53
2:C:141:PRO:HG3	2:C:199:LYS:HG2	1.89	0.53
3:D:191:TRP:CG	3:D:191:TRP:O	2.61	0.53
2:E:80:ALA:HA	2:E:106:ILE:CD1	2.39	0.53
3:F:141:LEU:HB2	3:F:184:VAL:HG13	1.91	0.53
1:A:33:SER:HA	1:A:123:ILE:HG13	1.91	0.52
2:C:94:SER:CB	2:C:95:PRO:HD3	2.38	0.52
3:D:149:PHE:O	3:D:149:PHE:CD2	2.63	0.52
3:F:35:HIS:CD2	3:F:50:ARG:HB3	2.45	0.52
1:B:15:ALA:HA	1:B:29:THR:O	2.10	0.51
3:D:35:HIS:HD2	3:D:47:TRP:NE1	2.05	0.51
1:A:29:THR:HG23	1:A:119:VAL:HG12	1.93	0.51
3:D:32:THR:HG21	3:D:98:ARG:HG2	1.91	0.51
3:D:91:THR:HG23	3:D:113:THR:HA	1.93	0.51
1:B:242:THR:C	1:B:242(B):THR:H	2.13	0.50
2:C:139:PHE:HB2	2:C:198:HIS:CE1	2.46	0.50
2:E:49:TYR:CG	3:F:102:GLN:HG2	2.47	0.50
3:D:122:PRO:HA	3:D:148:TYR:HB3	1.93	0.50
2:E:141:PRO:CD	2:E:198:HIS:NE2	2.75	0.50
1:A:146:ILE:HD13	1:A:167:PHE:HB3	1.94	0.50
2:E:108:ARG:HG2	2:E:109:ALA:H	1.77	0.49
2:C:157:ASN:H	2:C:157:ASN:ND2	2.10	0.49
1:B:280:ASN:C	1:B:280:ASN:HD22	2.15	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:222:VAL:HG22	1:B:287:GLN:HB3	1.95	0.49
2:E:140:TYR:O	2:E:140:TYR:CD1	2.65	0.49
2:C:147:LYS:HB2	2:C:195:GLU:HB3	1.95	0.49
3:D:150:PRO:CG	3:D:204:ALA:CB	2.91	0.49
3:D:150:PRO:HD2	3:D:202:HIS:NE2	2.27	0.49
3:F:69:THR:HB	3:F:82:HIS:HB3	1.95	0.49
1:B:75(A):PHE:HD2	1:B:111:GLU:HB3	1.78	0.48
2:E:163:TRP:CD1	2:E:175:MET:HB3	2.49	0.48
2:C:47:LEU:HA	2:C:58:VAL:HG21	1.95	0.48
2:C:141:PRO:HD3	2:C:198:HIS:NE2	2.28	0.48
3:F:12:VAL:HG11	3:F:86:LEU:HD12	1.96	0.48
1:A:15:ALA:HA	1:A:29:THR:O	2.14	0.47
3:D:174:GLN:O	3:D:175:SER:C	2.52	0.47
1:A:109:SER:HB3	1:A:111:GLU:OE1	2.14	0.47
2:E:33:VAL:HA	2:E:89:GLN:O	2.15	0.47
2:E:13:THR:HG22	2:E:104:LEU:HD11	1.98	0.46
2:C:149:LYS:HA	2:C:154:GLU:HA	1.98	0.46
2:E:193:THR:HG23	2:E:208:SER:HB3	1.98	0.46
1:A:123:ILE:HD12	1:A:151:PHE:CE2	2.51	0.45
2:C:196:ALA:HB3	2:C:205:ILE:HB	1.98	0.45
2:C:141:PRO:HD3	2:C:198:HIS:CE1	2.52	0.45
3:F:191:TRP:O	3:F:193:SER:N	2.50	0.45
3:F:150:PRO:HG3	3:F:204:ALA:CB	2.43	0.45
3:F:151:GLU:N	3:F:152:PRO:CD	2.79	0.45
1:B:155:HIS:O	1:B:307:ASP:HA	2.17	0.45
2:E:35:TRP:CE2	2:E:73:PHE:HB2	2.52	0.45
3:F:141:LEU:CD2	3:F:191:TRP:CZ3	2.99	0.45
3:F:55:ASN:HD22	3:F:56:GLY:N	2.15	0.45
1:B:-5:ILE:HB	1:B:144:ASN:HD21	1.81	0.44
2:C:46:LEU:HD13	2:C:55:TYR:HB2	1.99	0.44
2:C:157:ASN:H	2:C:157:ASN:HD22	1.65	0.44
3:D:150:PRO:HG2	3:D:204:ALA:HB3	1.99	0.44
1:A:75(A):PHE:C	1:A:77:THR:H	2.21	0.44
2:C:148:TRP:HE1	2:C:177:SER:HB3	1.82	0.44
2:E:35:TRP:CD2	2:E:73:PHE:HB2	2.53	0.44
2:E:47:LEU:HA	2:E:58:VAL:HG21	1.99	0.44
3:F:98:ARG:HD2	3:F:105:TYR:HB2	1.99	0.44
1:B:291:HIS:CE1	7:B:623:HOH:O	2.72	0.43
1:B:42:SER:HB3	1:B:103:LEU:HG	2.00	0.43
1:B:109:SER:HB3	1:B:111:GLU:OE1	2.18	0.43
1:B:271:SER:HA	1:B:274:TYR:CE2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:269:ILE:HD11	1:A:305:PHE:HD1	1.84	0.43
1:B:224:PRO:HA	1:B:289:CSX:O	2.19	0.43
2:E:58:VAL:HA	2:E:59:PRO:HD3	1.89	0.43
3:F:158:ASN:HD21	3:F:196:VAL:HA	1.84	0.42
1:B:99:GLN:OE1	1:B:139:ASN:ND2	2.49	0.42
3:F:35:HIS:CD2	3:F:47:TRP:HE1	2.26	0.42
1:A:229:ASN:O	1:A:233:GLU:HG2	2.19	0.42
1:B:191:LYS:HE2	1:B:298:HIS:CE1	2.54	0.42
1:B:223:GLY:O	1:B:289:CSX:N	2.53	0.42
2:E:54:ARG:NH1	7:E:221:HOH:O	2.50	0.42
1:B:18:THR:HG22	1:B:91:ILE:HG12	2.02	0.42
2:E:2:ILE:HD11	2:E:93:ASN:HD22	1.85	0.42
2:C:4:MET:O	2:C:99:GLY:HA2	2.19	0.42
2:E:12:SER:HA	2:E:105:GLU:O	2.20	0.41
3:D:49:GLY:CA	7:D:229:HOH:O	2.49	0.41
3:D:145:VAL:HB	3:D:180:LEU:HD23	2.02	0.41
1:A:81:VAL:HB	1:A:106:GLU:HB2	2.02	0.41
2:C:35:TRP:CD2	2:C:73:PHE:HB2	2.55	0.41
1:B:61:PRO:O	2:E:31:THR:HG21	2.20	0.41
2:C:94:SER:OG	2:C:95:PRO:CD	2.64	0.41
3:D:60:TYR:HE1	3:D:70:ILE:HG13	1.85	0.41
2:C:13:THR:HG21	2:C:78:VAL:HG21	2.02	0.41
2:C:55:TYR:O	2:C:56:THR:C	2.58	0.41
1:A:68(A):ASP:HA	2:C:91:HIS:HB2	2.02	0.41
3:D:122:PRO:O	3:D:123:SER:HB2	2.20	0.41
1:A:191:LYS:HG2	1:A:213:ILE:HB	2.03	0.41
1:B:75(A):PHE:C	1:B:77:THR:H	2.23	0.41
1:B:76:ASP:OD2	1:B:215:ASP:OD2	2.39	0.41
3:F:166:VAL:HG22	3:F:184:VAL:HG23	2.02	0.41
3:D:150:PRO:CG	3:D:204:ALA:HB3	2.51	0.41
2:E:140:TYR:O	2:E:140:TYR:CG	2.74	0.41
3:F:47:TRP:CZ2	3:F:49:GLY:HA2	2.56	0.41
2:C:2:ILE:HD13	2:C:93:ASN:HB2	2.02	0.41
2:C:140:TYR:O	2:C:140:TYR:CG	2.73	0.41
1:A:194:LEU:HD11	1:A:212:ALA:HB2	2.02	0.40
3:F:141:LEU:HD13	3:F:191:TRP:HH2	1.86	0.40
3:F:169:PHE:HA	3:F:170:PRO:HD3	1.98	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	327/330 (99%)	316 (97%)	9 (3%)	2 (1%)	25	54
1	B	327/330 (99%)	308 (94%)	16 (5%)	3 (1%)	17	44
2	C	209/211 (99%)	197 (94%)	9 (4%)	3 (1%)	11	32
2	E	209/211 (99%)	196 (94%)	11 (5%)	2 (1%)	15	42
3	D	211/213 (99%)	196 (93%)	11 (5%)	4 (2%)	8	24
3	F	211/213 (99%)	198 (94%)	11 (5%)	2 (1%)	17	44
All	All	1494/1508 (99%)	1411 (94%)	67 (4%)	16 (1%)	14	39

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	94	SER
2	E	94	SER
1	A	-7	ALA
1	B	92	SER
3	D	150	PRO
3	F	192	PRO
2	C	56	THR
3	D	147	GLY
2	E	141	PRO
3	F	85	SER
2	C	141	PRO
3	D	191	TRP
1	B	-7	ALA
1	A	326	VAL
1	B	200	GLY
3	D	175	SER

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	281/281 (100%)	270 (96%)	11 (4%)	32	64
1	B	281/281 (100%)	266 (95%)	15 (5%)	22	52
2	C	187/187 (100%)	178 (95%)	9 (5%)	25	56
2	E	187/187 (100%)	176 (94%)	11 (6%)	19	47
3	D	182/182 (100%)	171 (94%)	11 (6%)	19	47
3	F	182/182 (100%)	168 (92%)	14 (8%)	13	34
All	All	1300/1300 (100%)	1229 (94%)	71 (6%)	21	50

All (71) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	-5	ILE
1	A	37	ASN
1	A	83	ARG
1	A	89	LEU
1	A	116	SER
1	A	142	GLU
1	A	155	HIS
1	A	201	ASP
1	A	218	LYS
1	A	242(C)	ARG
1	A	281	LEU
1	B	-5	ILE
1	B	37	ASN
1	B	55	LYS
1	B	93	GLN
1	B	100	ASP
1	B	114	ILE
1	B	142	GLU
1	B	201	ASP
1	B	202	THR
1	B	241	LYS
1	B	242(C)	ARG

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Mol	Chain	Res	Type
1	B	243	ARG
1	B	266	ASN
1	B	280	ASN
1	B	318	LYS
2	C	5	THR
2	C	27	GLN
2	C	46	LEU
2	C	56	THR
2	C	83	LEU
2	C	157	ASN
2	C	177	SER
2	C	183	LYS
2	C	187	GLU
3	D	2	ILE
3	D	3	GLN
3	D	5	GLN
3	D	11	LEU
3	D	77	ASN
3	D	103	MET
3	D	110	THR
3	D	136	ASN
3	D	151	GLU
3	D	180	LEU
3	D	208	LYS
2	E	19	VAL
2	E	26	SER
2	E	31	THR
2	E	46	LEU
2	E	56	THR
2	E	74	THR
2	E	132	VAL
2	E	143	ASP
2	E	161	ASN
2	E	181	LEU
2	E	187	GLU
3	F	3	GLN
3	F	23	THR
3	F	50	ARG
3	F	55	ASN
3	F	81	LEU
3	F	89	GLU
3	F	98	ARG

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Mol	Chain	Res	Type
3	F	110	THR
3	F	135	THR
3	F	136	ASN
3	F	151	GLU
3	F	153	VAL
3	F	190	THR
3	F	212	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	HIS
1	A	26	ASN
1	A	37	ASN
1	A	98	GLN
1	A	211	GLN
1	A	229	ASN
1	A	232	ASN
1	B	26	ASN
1	B	72	GLN
1	B	144	ASN
1	B	159	GLN
1	B	229	ASN
1	B	232	ASN
1	B	266	ASN
1	B	280	ASN
1	B	291	HIS
2	C	27	GLN
2	C	198	HIS
3	D	3	GLN
3	D	6	GLN
3	D	35	HIS
3	D	77	ASN
3	D	136	ASN
2	E	89	GLN
2	E	138	ASN
2	E	198	HIS
3	F	3	GLN
3	F	35	HIS
3	F	55	ASN
3	F	57	ASN
3	F	174	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

2 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
1	CSX	A	289	1	3,6,7	0.73	0	1,6,8	0.81	0
1	CSX	B	289	1	3,6,7	0.75	0	1,6,8	1.37	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
1	CSX	A	289	1	-	0/1/5/7	-
1	CSX	B	289	1	-	0/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	289	CSX	2	0

5.5 Carbohydrates i

4 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	NAG	G	1	4,1	14,14,15	0.55	0	17,19,21	0.96	0
4	NAG	G	2	4	14,14,15	0.51	0	17,19,21	1.13	2 (11%)
4	NAG	H	1	4,1	14,14,15	0.53	0	17,19,21	0.98	1 (5%)
4	NAG	H	2	4	14,14,15	0.58	0	17,19,21	0.91	1 (5%)

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	NAG	G	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	G	2	4	-	0/6/23/26	0/1/1/1
4	NAG	H	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	H	2	4	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	2	NAG	O5-C5-C6	2.86	111.69	107.20
4	G	2	NAG	O5-C5-C6	2.72	111.46	107.20
4	G	2	NAG	C4-C3-C2	2.34	114.45	111.02
4	H	1	NAG	C1-O5-C5	2.05	114.97	112.19

There are no chirality outliers.

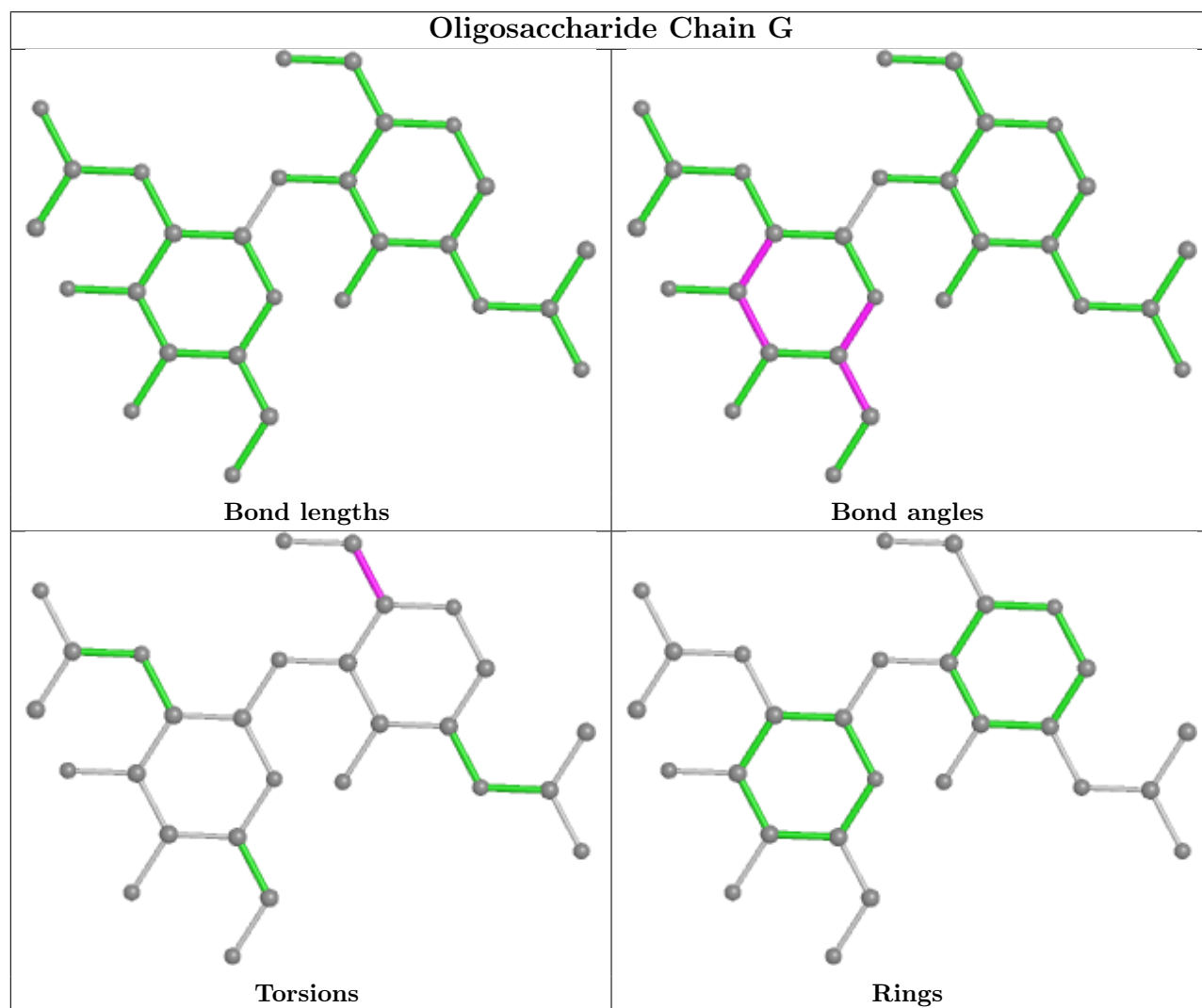
All (3) torsion outliers are listed below:

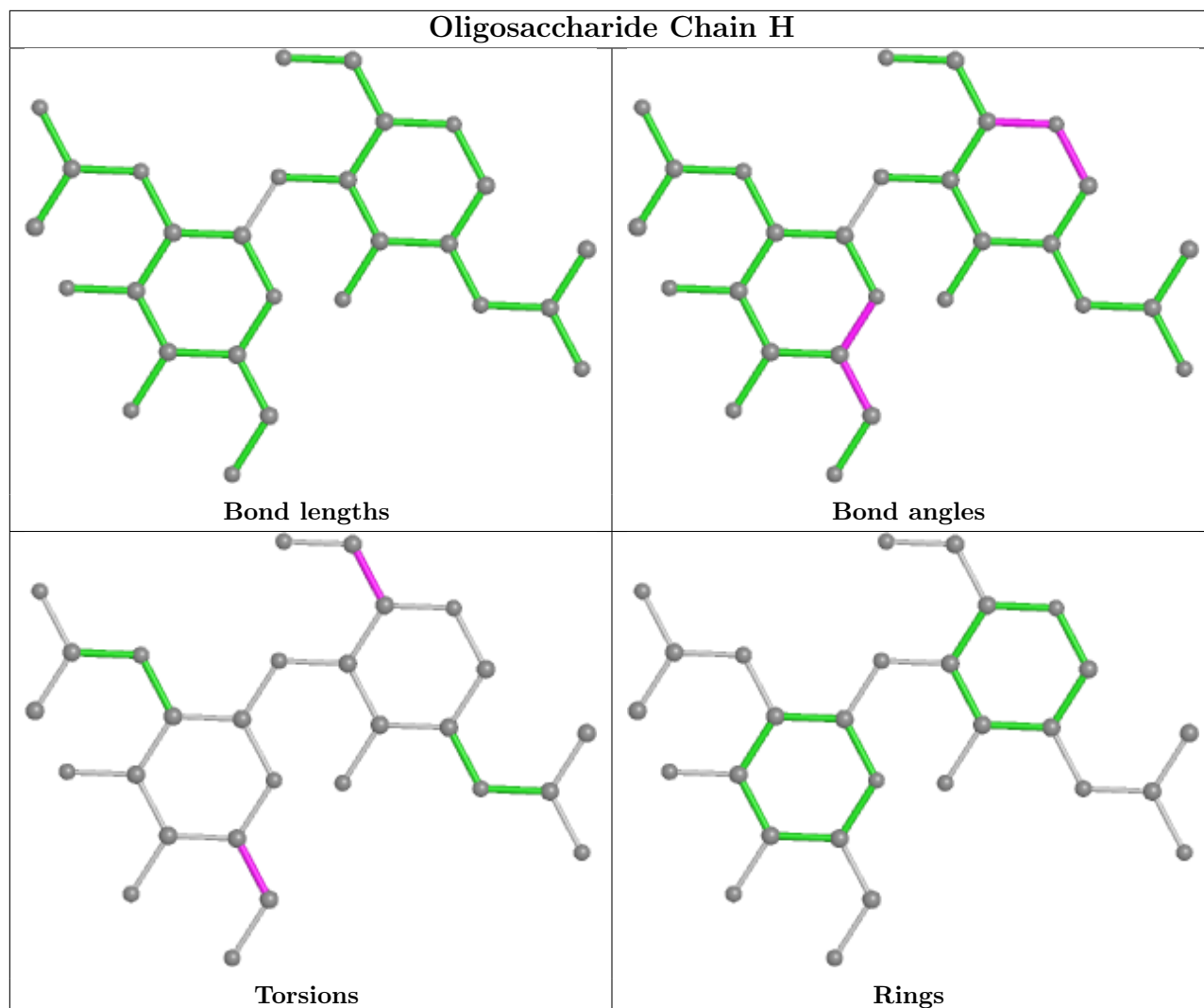
Mol	Chain	Res	Type	Atoms
4	H	1	NAG	C4-C5-C6-O6
4	H	2	NAG	C4-C5-C6-O6
4	G	1	NAG	C4-C5-C6-O6

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](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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$
5	NAG	B	601	1	14,14,15	0.51	0	17,19,21	1.15	1 (5%)
5	NAG	A	601	1	14,14,15	0.52	0	17,19,21	0.71	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
5	NAG	B	601	1	-	2/6/23/26	0/1/1/1
5	NAG	A	601	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	601	NAG	O4-C4-C5	3.40	117.74	109.30

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	601	NAG	C8-C7-N2-C2
5	B	601	NAG	O7-C7-N2-C2
5	A	601	NAG	C8-C7-N2-C2
5	A	601	NAG	O7-C7-N2-C2

There are no ring outliers.

No monomer is involved in short contacts.

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	329/330 (99%)	0.04	8 (2%) 59 49	15, 15, 15, 15	0
1	B	329/330 (99%)	0.11	8 (2%) 59 49	15, 15, 15, 15	0
2	C	211/211 (100%)	0.94	46 (21%) 0 0	15, 15, 15, 15	0
2	E	211/211 (100%)	0.63	22 (10%) 6 3	15, 15, 15, 15	0
3	D	213/213 (100%)	0.56	21 (9%) 7 4	15, 15, 15, 15	0
3	F	213/213 (100%)	0.97	33 (15%) 2 1	15, 15, 15, 15	0
All	All	1506/1508 (99%)	0.47	138 (9%) 9 5	15, 15, 15, 15	0

All (138) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	-7	ALA	7.0
3	F	191	TRP	6.8
3	F	135	THR	6.3
1	A	-8	GLY	6.1
1	A	-6	SER	5.9
1	B	-8	GLY	5.9
3	F	133	ALA	5.8
3	D	135	THR	5.5
3	F	136	ASN	5.5
1	A	-7	ALA	5.3
3	D	130	GLY	5.1
3	F	132	ALA	5.1
2	C	192	TYR	5.1
2	C	150	ILE	5.0
1	B	-5	ILE	4.9
2	E	191	SER	4.7
1	B	-6	SER	4.6
2	C	187	GLU	4.6
1	B	291	HIS	4.4

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Mol	Chain	Res	Type	RSRZ
2	C	151	ASP	4.4
1	A	-5	ILE	4.4
2	C	157	ASN	4.1
2	C	197	THR	4.1
2	C	184	ASP	4.1
3	F	186	VAL	4.1
2	C	191	SER	4.1
2	C	210	ASN	4.0
2	C	156	GLN	3.9
1	A	327	GLU	3.8
3	F	141	LEU	3.8
2	C	153	SER	3.7
3	D	124	VAL	3.7
3	D	132	ALA	3.7
2	C	201	SER	3.6
2	C	188	ARG	3.6
2	E	149	LYS	3.5
3	D	192	PRO	3.5
2	C	122	SER	3.5
2	C	183	LYS	3.4
2	C	193	THR	3.4
2	C	149	LYS	3.3
3	F	138	MET	3.3
3	D	131	SER	3.3
3	D	186	VAL	3.3
3	F	195	THR	3.3
2	C	190	ASN	3.2
3	F	190	THR	3.2
2	C	211	ARG	3.2
2	E	150	ILE	3.2
2	C	178	THR	3.2
1	B	159	GLN	3.2
3	F	196	VAL	3.1
2	E	179	LEU	3.1
2	E	153	SER	3.1
2	C	130	ALA	3.1
2	C	186	TYR	3.1
2	C	155	ARG	3.1
3	D	163	SER	3.0
2	E	198	HIS	3.0
3	F	159	SER	3.0
3	F	185	THR	3.0

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Mol	Chain	Res	Type	RSRZ
2	C	148	TRP	2.9
2	E	135	PHE	2.9
1	B	327	GLU	2.9
3	F	198	CYS	2.8
2	E	152	GLY	2.8
3	D	134	GLN	2.8
3	F	128	ALA	2.8
2	C	198	HIS	2.8
3	D	133	ALA	2.8
3	F	68	ALA	2.8
2	C	180	THR	2.8
3	D	185	THR	2.8
3	D	208	LYS	2.7
3	F	212	LYS	2.7
2	C	127	SER	2.7
2	C	200	THR	2.7
2	E	147	LYS	2.7
3	F	188	SER	2.7
3	D	1	GLU	2.7
3	F	192	PRO	2.7
3	F	194	GLU	2.6
1	A	297	ASP	2.6
2	E	151	ASP	2.6
2	E	157	ASN	2.6
3	D	141	LEU	2.6
3	D	193	SER	2.6
2	C	120	PRO	2.6
1	A	243	ARG	2.6
2	E	154	GLU	2.5
1	A	291	HIS	2.5
2	C	152	GLY	2.5
2	C	189	HIS	2.5
3	F	134	GLN	2.5
2	E	210	ASN	2.5
2	C	177	SER	2.5
3	F	82	HIS	2.5
3	F	42	GLU	2.5
2	C	132	VAL	2.5
2	C	208	SER	2.5
3	F	187	PRO	2.4
2	C	194	CYS	2.4
2	C	131	SER	2.4

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Mol	Chain	Res	Type	RSRZ
3	D	195	THR	2.4
2	E	207	LYS	2.4
3	F	150	PRO	2.3
2	E	134	CYS	2.3
2	C	121	SER	2.3
2	C	209	PHE	2.3
3	D	158	ASN	2.3
3	F	131	SER	2.3
2	C	202	THR	2.3
2	C	206	VAL	2.3
2	C	179	LEU	2.2
2	C	195	GLU	2.2
3	F	137	SER	2.2
3	D	139	VAL	2.2
3	F	12	VAL	2.2
2	C	13	THR	2.2
2	E	185	GLU	2.2
2	E	158	GLY	2.1
2	E	205	ILE	2.1
2	E	192	TYR	2.1
3	F	163	SER	2.1
3	F	22	CYS	2.1
3	D	184	VAL	2.1
2	C	123	GLU	2.1
2	E	130	ALA	2.1
2	C	133	VAL	2.1
3	F	21	SER	2.0
3	F	162	LEU	2.0
2	E	136	LEU	2.0
1	B	173	LYS	2.0
2	C	154	GLU	2.0
2	E	206	VAL	2.0
3	D	143	CYS	2.0
3	D	123	SER	2.0
3	F	28	ASN	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.

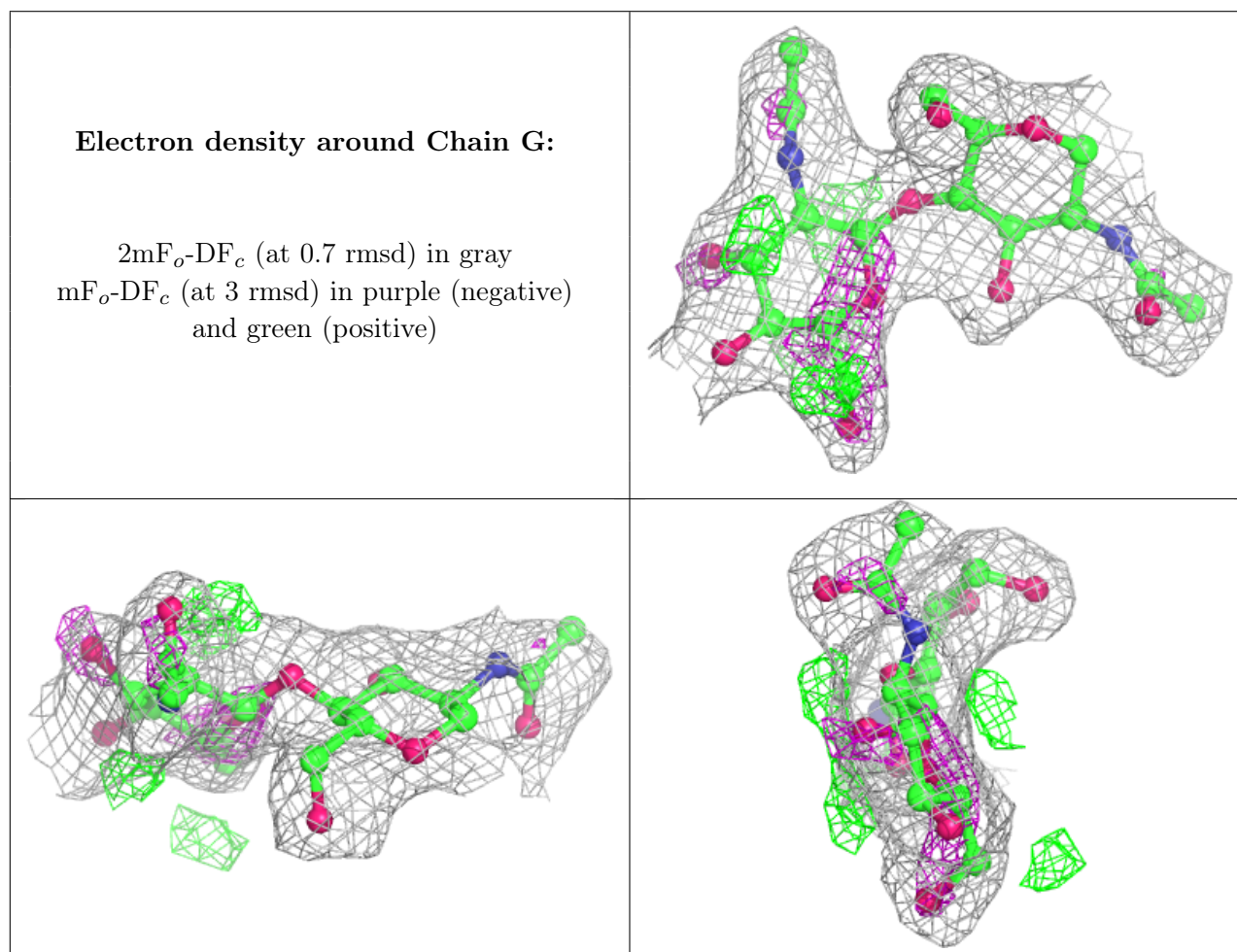
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
1	CSX	B	289	7/8	0.87	0.39	15,15,15,15	0
1	CSX	A	289	7/8	0.90	0.31	15,15,15,15	0

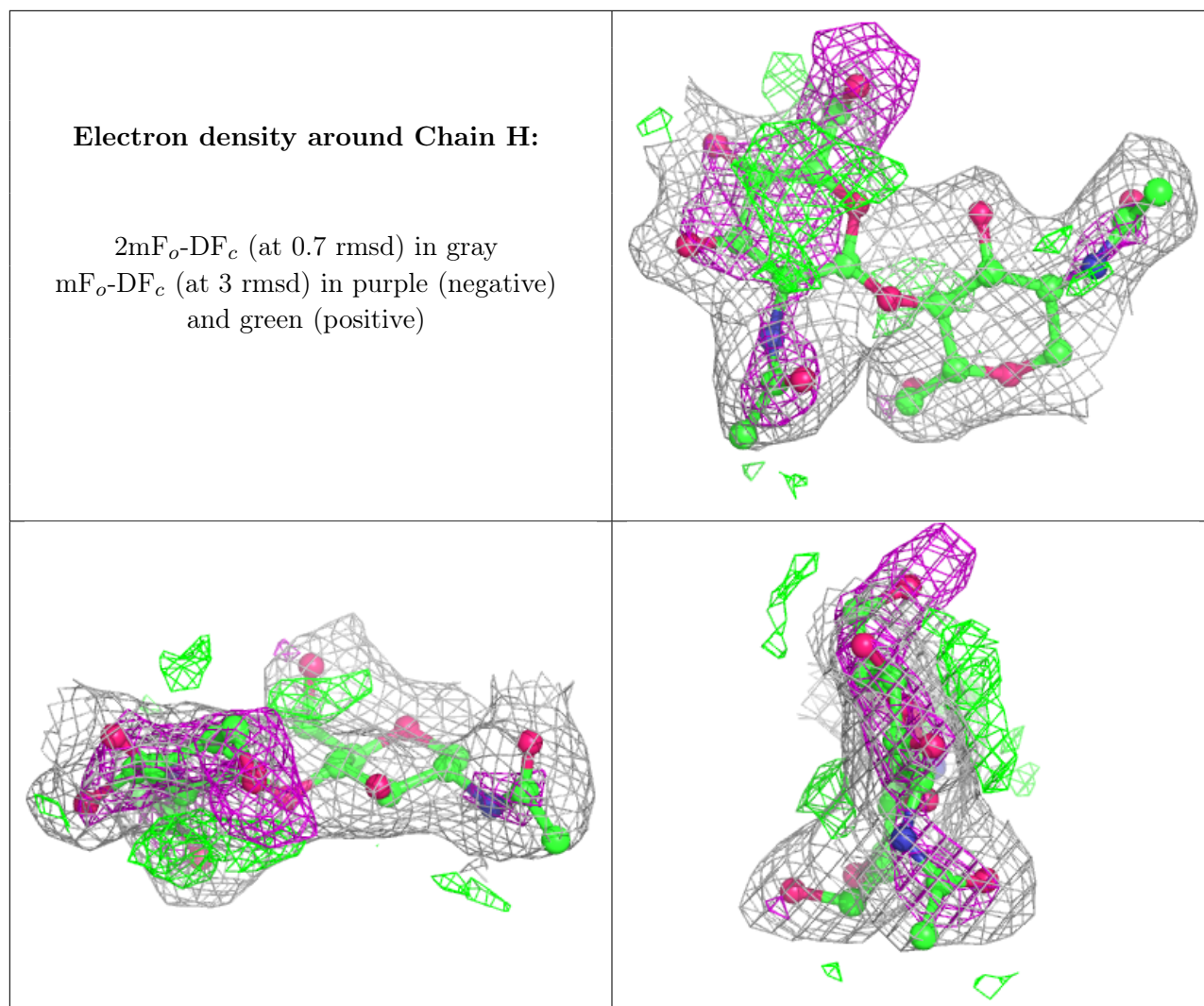
6.3 Carbohydrates [i](#)

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(\AA^2)	Q<0.9
4	NAG	H	2	14/15	0.85	0.30	15,15,15,15	0
4	NAG	G	2	14/15	0.93	0.26	15,15,15,15	0
4	NAG	H	1	14/15	0.94	0.12	15,15,15,15	0
4	NAG	G	1	14/15	0.95	0.16	15,15,15,15	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	NAG	B	601	14/15	0.90	0.20	15,15,15,15	0
5	NAG	A	601	14/15	0.92	0.23	15,15,15,15	13
6	ZN	A	602	1/1	0.99	0.07	15,15,15,15	0
6	ZN	B	602	1/1	1.00	0.07	15,15,15,15	0

6.5 Other polymers [i](#)

There are no such residues in this entry.