



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 03:08 PM UTC

PDB ID : 1RD8 / pdb_00001rd8
Title : Crystal Structure of the 1918 Human H1 Hemagglutinin Precursor (HA0)
Authors : Stevens, J.; Corper, A.L.; Basler, C.F.; Taubenberger, J.K.; Palese, P.; Wilson, I.A.
Deposited on : 2003-11-05
Resolution : 3.00 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
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

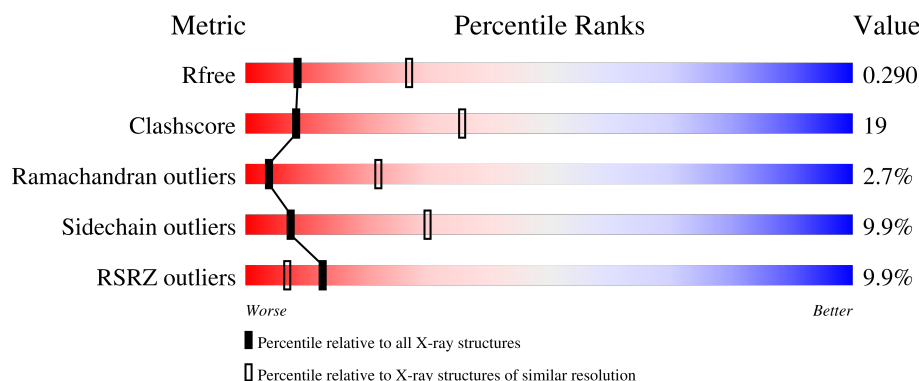
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	335	10% 63% 28% 6% ..
1	C	335	8% 59% 32% 5% ..
1	E	335	9% 62% 29% 7% .
2	B	182	8% 53% 33% 9% ..
2	D	182	10% 58% 26% 10% ..

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Mol	Chain	Length	Quality of chain
2	F	182	
3	G	3	
3	I	3	
4	H	4	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	NAG	A	1	X	-	-	-
5	NAG	A	2	X	-	-	-
5	NAG	B	183	X	-	-	-
5	NAG	C	330	X	-	-	-
5	NAG	E	330	X	-	-	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 12082 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 hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	328	Total	C	N	O	S	23	0	0
			2549	1605	439	494	11			
1	C	328	Total	C	N	O	S	46	0	0
			2549	1605	439	494	11			
1	E	328	Total	C	N	O	S	44	0	0
			2549	1605	439	494	11			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	ALA	-	cloning artifact	GB 4325039
A	4	ASP	-	cloning artifact	GB 4325039
A	5	PRO	-	cloning artifact	GB 4325039
A	6	GLY	-	cloning artifact	GB 4325039
A	7	TYR	-	cloning artifact	GB 4325039
A	8	LEU	-	cloning artifact	GB 4325039
A	9	LEU	-	cloning artifact	GB 4325039
A	10	GLU	-	cloning artifact	GB 4325039
C	3	ALA	-	cloning artifact	GB 4325039
C	4	ASP	-	cloning artifact	GB 4325039
C	5	PRO	-	cloning artifact	GB 4325039
C	6	GLY	-	cloning artifact	GB 4325039
C	7	TYR	-	cloning artifact	GB 4325039
C	8	LEU	-	cloning artifact	GB 4325039
C	9	LEU	-	cloning artifact	GB 4325039
C	10	GLU	-	cloning artifact	GB 4325039
E	3	ALA	-	cloning artifact	GB 4325039
E	4	ASP	-	cloning artifact	GB 4325039
E	5	PRO	-	cloning artifact	GB 4325039
E	6	GLY	-	cloning artifact	GB 4325039
E	7	TYR	-	cloning artifact	GB 4325039
E	8	LEU	-	cloning artifact	GB 4325039
E	9	LEU	-	cloning artifact	GB 4325039

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Chain	Residue	Modelled	Actual	Comment	Reference
E	10	GLU	-	cloning artifact	GB 4325039

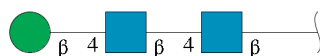
- Molecule 2 is a protein called hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	175	Total	C	N	O	S	16	0	0
			1406	877	241	282	6			
2	D	175	Total	C	N	O	S	29	0	0
			1406	877	241	282	6			
2	F	175	Total	C	N	O	S	35	0	0
			1406	877	241	282	6			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	177	ARG	LYS	cloning artifact	GB 4325039
B	178	SER	-	cloning artifact	GB 4325039
B	179	LEU	-	cloning artifact	GB 4325039
B	180	VAL	-	cloning artifact	GB 4325039
B	181	PRO	-	cloning artifact	GB 4325039
B	182	ARG	-	cloning artifact	GB 4325039
D	177	ARG	LYS	cloning artifact	GB 4325039
D	178	SER	-	cloning artifact	GB 4325039
D	179	LEU	-	cloning artifact	GB 4325039
D	180	VAL	-	cloning artifact	GB 4325039
D	181	PRO	-	cloning artifact	GB 4325039
D	182	ARG	-	cloning artifact	GB 4325039
F	177	ARG	LYS	cloning artifact	GB 4325039
F	178	SER	-	cloning artifact	GB 4325039
F	179	LEU	-	cloning artifact	GB 4325039
F	180	VAL	-	cloning artifact	GB 4325039
F	181	PRO	-	cloning artifact	GB 4325039
F	182	ARG	-	cloning artifact	GB 4325039

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



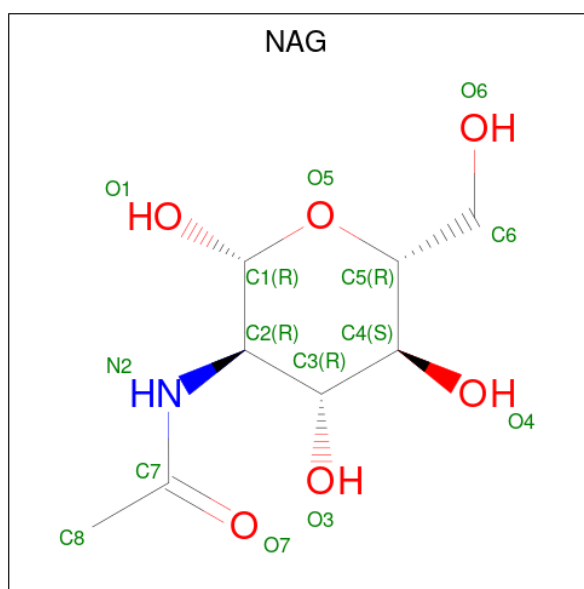
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	G	3	Total	C	N	O	0	0	0
			39	22	2	15			
3	I	3	Total	C	N	O	0	0	0
			39	22	2	15			

- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	H	4	Total	C	N	O	0	0	0
			50	28	2	20			

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



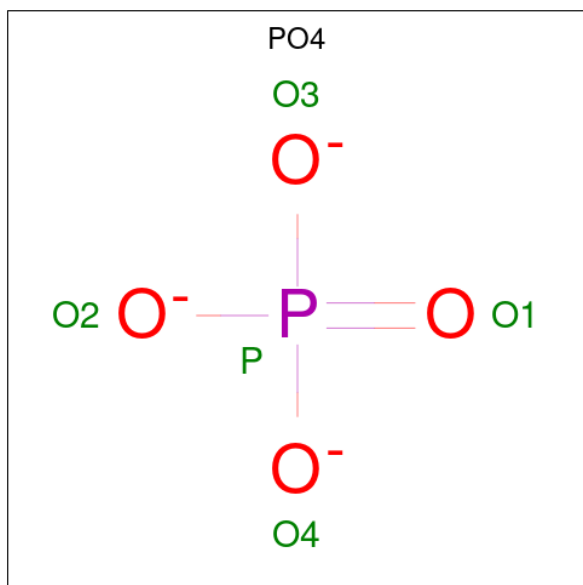
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			14	8	1	5		
5	A	1	Total	C	N	O	0	0
			14	8	1	5		
5	B	1	Total	C	N	O	0	0
			14	8	1	5		

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

- Molecule 6 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).

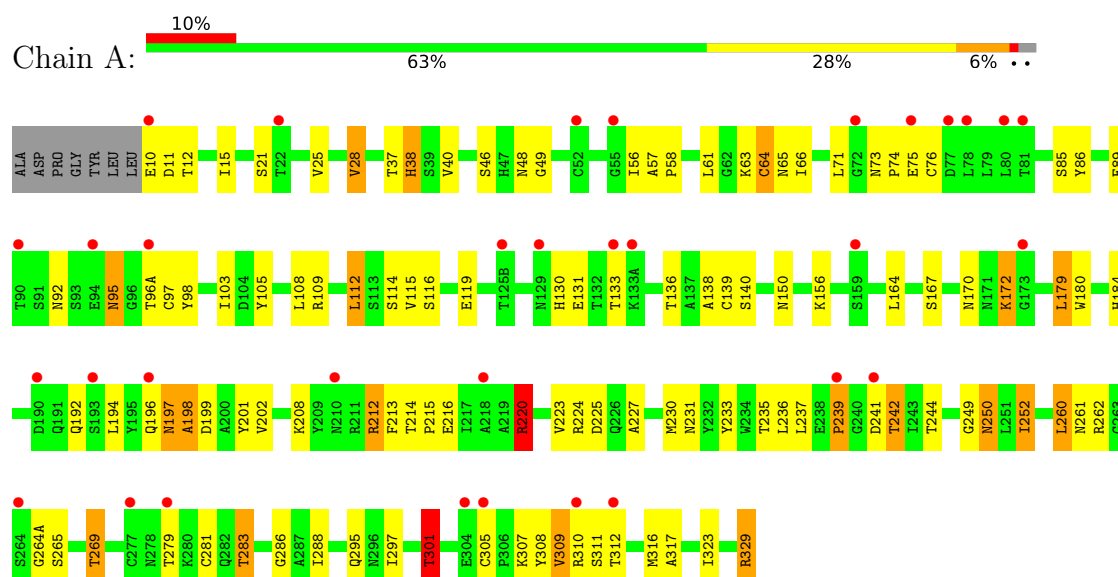


Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total	O P	0	0
			5	4 1		

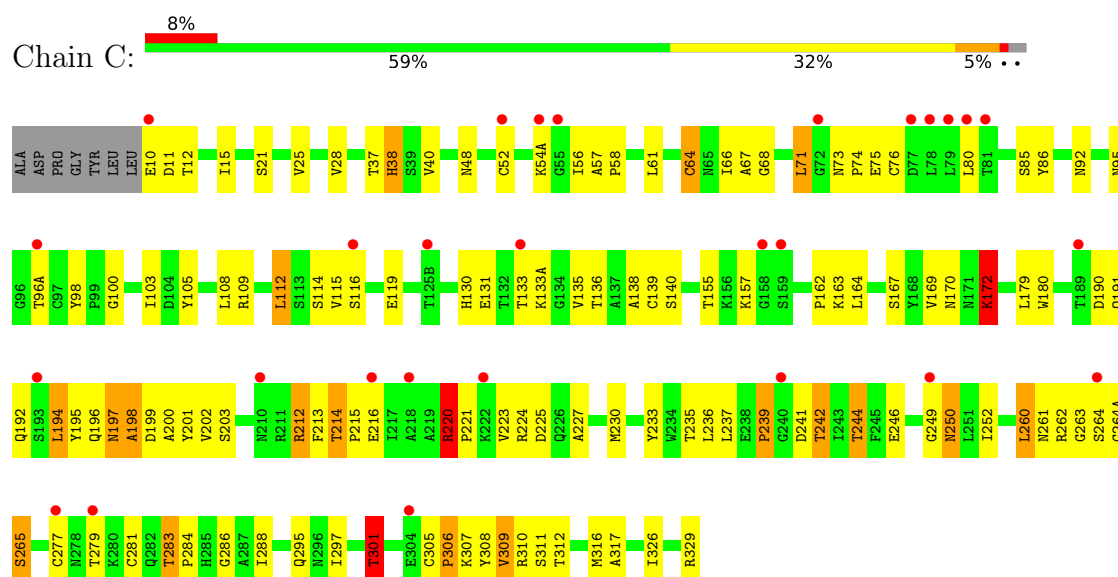
3 Residue-property plots

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.

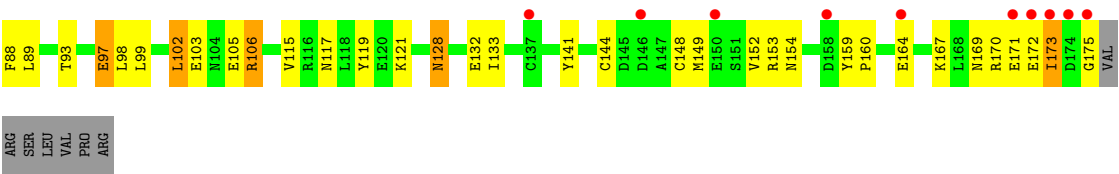
• Molecule 1: hemagglutinin



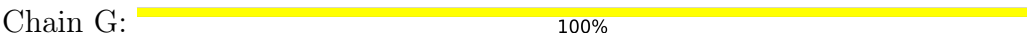
• Molecule 1: hemagglutinin



• Molecule 1: hemagglutinin



● Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



● Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



● Molecule 4: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-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	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	190.53Å 109.95Å 136.24Å 90.00° 108.63° 90.00°	Depositor
Resolution (Å)	49.39 – 3.00 49.39 – 3.00	Depositor EDS
% Data completeness (in resolution range)	100.0 (49.39-3.00) 96.1 (49.39-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.15	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.59 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.270 , 0.295 0.266 , 0.290	Depositor DCC
R_{free} test set	2573 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	39.7	Xtriage
Anisotropy	0.246	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 52.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	12082	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.52% 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: PO4, BMA, MAN, NAG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	1.16	8/2613 (0.3%)	1.15	3/3558 (0.1%)
1	C	1.14	5/2613 (0.2%)	1.18	9/3558 (0.3%)
1	E	1.31	6/2613 (0.2%)	1.17	7/3558 (0.2%)
2	B	1.27	7/1433 (0.5%)	1.26	10/1929 (0.5%)
2	D	1.30	7/1433 (0.5%)	1.37	15/1929 (0.8%)
2	F	1.39	13/1433 (0.9%)	1.37	14/1929 (0.7%)
All	All	1.25	46/12138 (0.4%)	1.23	58/16461 (0.4%)

All (46) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	133(A)	LYS	CG-CD	22.02	2.18	1.52
1	E	63	LYS	CD-CE	-17.66	0.99	1.52
1	E	192	GLN	CA-CB	-12.79	1.33	1.53
1	C	133(A)	LYS	CA-CB	-10.82	1.34	1.53
2	F	9	PHE	CA-CB	-10.05	1.36	1.53
1	E	133(A)	LYS	CA-CB	-9.85	1.36	1.53
1	E	225	ASP	CA-CB	-9.67	1.38	1.53
2	D	66	VAL	CA-C	9.61	1.65	1.52
1	C	192	GLN	CA-CB	-9.06	1.39	1.53
2	F	66	VAL	CA-C	8.76	1.63	1.52
2	B	66	VAL	CA-C	8.63	1.63	1.52
2	D	38	GLN	CA-CB	-8.58	1.39	1.53
2	F	175	GLY	N-CA	-8.28	1.32	1.45
1	A	323	ILE	CA-CB	7.87	1.62	1.53
1	C	54(A)	LYS	CA-CB	-7.22	1.42	1.53
1	E	54(A)	LYS	CA-CB	-6.91	1.42	1.53
2	F	66	VAL	CA-CB	-6.60	1.45	1.54
2	B	10	ILE	CA-CB	6.44	1.63	1.54
1	A	329	ARG	CG-CD	-6.27	1.33	1.52
2	D	67	GLY	CA-C	6.25	1.58	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	38	GLN	CA-CB	-6.25	1.43	1.53
1	A	252	ILE	CA-C	-6.02	1.47	1.53
2	B	66	VAL	CA-CB	-5.91	1.46	1.54
1	A	208	LYS	CG-CD	-5.87	1.34	1.52
2	F	67	GLY	CA-C	5.84	1.58	1.51
2	F	133	ILE	CA-CB	-5.79	1.48	1.54
2	B	115	VAL	C-O	-5.79	1.17	1.24
2	B	67	GLY	CA-C	5.78	1.58	1.51
2	F	27	GLN	C-O	-5.74	1.17	1.23
2	F	115	VAL	C-O	-5.70	1.17	1.24
1	A	305	CYS	C-O	-5.67	1.17	1.24
2	B	39	LYS	CB-CG	-5.52	1.35	1.52
2	F	99	LEU	C-O	-5.39	1.17	1.24
1	A	95	ASN	CA-C	-5.37	1.46	1.52
2	D	10	ILE	CA-CB	5.37	1.61	1.54
1	A	199	ASP	CA-CB	-5.36	1.45	1.53
2	F	10	ILE	CA-CB	5.29	1.61	1.54
2	F	17	MET	SD-CE	-5.28	1.66	1.79
2	F	24	TYR	C-O	-5.25	1.16	1.23
1	C	135	VAL	C-O	-5.20	1.17	1.23
2	F	105	GLU	CG-CD	-5.16	1.39	1.52
1	C	306	PRO	C-O	-5.12	1.17	1.23
2	D	64	THR	CA-CB	5.08	1.61	1.53
1	A	301	THR	CA-C	5.08	1.58	1.52
2	D	149	MET	SD-CE	5.04	1.92	1.79
2	D	53	ASN	C-O	-5.01	1.18	1.24

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	9	PHE	CA-CB-CG	-13.26	100.55	113.80
1	E	63	LYS	CG-CD-CE	9.03	132.08	111.30
2	D	66	VAL	CA-C-N	9.01	132.63	120.92
2	D	66	VAL	C-N-CA	9.01	132.63	120.92
2	D	9	PHE	CB-CG-CD2	-8.50	106.25	120.70
1	E	133(A)	LYS	CB-CA-C	8.06	124.11	109.37
2	D	9	PHE	CB-CG-CD1	7.95	134.22	120.70
2	F	66	VAL	CA-C-N	7.90	131.19	120.92
2	F	66	VAL	C-N-CA	7.90	131.19	120.92
2	B	66	VAL	CA-C-N	7.67	130.89	120.92
2	B	66	VAL	C-N-CA	7.67	130.89	120.92
2	F	66	VAL	N-CA-C	7.53	125.01	109.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	133(A)	LYS	CB-CA-C	7.52	123.12	109.37
2	F	18	ILE	N-CA-C	-7.35	98.00	108.58
2	D	66	VAL	N-CA-C	7.34	124.61	109.34
2	B	66	VAL	N-CA-C	7.23	124.37	109.34
2	F	38	GLN	CB-CG-CD	-7.06	100.60	112.60
2	F	38	GLN	CG-CD-NE2	7.04	126.95	116.40
2	B	18	ILE	N-CA-C	-7.03	98.46	108.58
1	C	133(A)	LYS	N-CA-CB	6.99	122.03	110.85
1	E	133(A)	LYS	N-CA-CB	6.88	121.86	110.85
2	D	61	THR	N-CA-C	-6.75	104.08	112.72
2	B	10	ILE	CB-CA-C	-6.68	100.33	111.29
2	F	61	THR	N-CA-C	-6.57	105.15	113.43
2	D	18	ILE	N-CA-C	-6.39	99.37	108.58
2	B	61	THR	N-CA-C	-6.39	104.54	112.72
1	E	172	LYS	N-CA-C	-6.32	102.38	110.53
2	F	9	PHE	CB-CA-C	6.17	122.05	110.63
1	C	64	CYS	N-CA-C	6.11	118.36	109.07
1	C	71	LEU	N-CA-C	-6.10	102.44	110.43
2	F	10	ILE	CB-CA-C	-6.07	101.33	111.29
1	A	220	ARG	N-CA-C	5.98	115.18	108.25
1	E	301	THR	N-CA-CB	-5.93	101.23	111.55
2	D	10	ILE	CB-CA-C	-5.91	101.60	111.29
1	C	301	THR	N-CA-CB	-5.90	101.42	111.69
2	B	14	TRP	N-CA-C	5.87	118.80	109.65
2	D	12	GLY	N-CA-C	-5.84	108.24	114.67
2	D	64	THR	OG1-CB-CG2	-5.81	97.69	109.30
1	E	64	CYS	N-CA-C	5.80	117.88	109.07
2	F	38	GLN	CG-CD-OE1	-5.79	109.21	120.80
1	C	244	THR	N-CA-C	5.71	117.71	108.34
1	A	64	CYS	N-CA-C	5.70	117.73	109.07
2	F	12	GLY	N-CA-C	-5.58	108.54	114.67
2	B	12	GLY	N-CA-C	-5.51	108.60	114.67
1	A	301	THR	N-CA-CB	-5.49	102.00	111.55
2	B	64	THR	OG1-CB-CG2	-5.47	98.36	109.30
2	F	69	GLU	N-CA-C	5.42	117.92	108.76
1	C	220	ARG	N-CA-C	5.36	113.04	108.22
2	D	14	TRP	N-CA-C	5.30	118.46	108.65
2	D	18	ILE	CA-C-N	-5.27	115.72	122.79
2	D	18	ILE	C-N-CA	-5.27	115.72	122.79
1	E	71	LEU	N-CA-C	-5.25	103.55	110.43
1	C	172	LYS	N-CA-C	-5.19	103.83	110.53
2	F	15	THR	CB-CA-C	-5.17	99.94	109.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	67	GLY	O-C-N	-5.17	118.65	123.87
2	F	133	ILE	N-CA-C	5.13	117.31	111.88
1	C	67	ALA	N-CA-C	5.09	117.22	111.11
2	D	69	GLU	N-CA-C	5.01	117.23	108.76

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	2549	0	2468	93	0
1	C	2549	0	2468	106	0
1	E	2549	0	2470	99	0
2	B	1406	0	1315	82	0
2	D	1406	0	1316	65	0
2	F	1406	0	1316	66	0
3	G	39	0	34	0	0
3	I	39	0	34	5	0
4	H	50	0	43	4	0
5	A	28	0	26	0	0
5	B	14	0	13	2	0
5	C	28	0	26	0	0
5	E	14	0	13	1	0
6	B	5	0	0	0	0
All	All	12082	0	11542	443	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 19.

All (443) 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:E:307:LYS:HZ3	2:F:62:GLN:HG2	1.28	0.96
1:A:307:LYS:HZ3	2:B:62:GLN:HG2	1.27	0.95

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:307:LYS:HZ3	2:D:62:GLN:HG2	1.30	0.95
2:B:106:ARG:HD3	2:F:106:ARG:HH12	1.34	0.90
2:B:106:ARG:HH12	2:D:106:ARG:HD3	1.36	0.89
1:A:307:LYS:HZ3	2:B:62:GLN:CG	1.85	0.88
2:D:106:ARG:HH12	2:F:106:ARG:HD3	1.37	0.88
2:B:117:ASN:HD21	2:B:121:LYS:HE2	1.37	0.88
1:A:15:ILE:HD11	2:B:119:TYR:HB2	1.55	0.88
1:A:250:ASN:N	1:A:250:ASN:HD22	1.72	0.87
2:F:117:ASN:HD21	2:F:121:LYS:HE2	1.40	0.87
1:E:307:LYS:HZ3	2:F:62:GLN:CG	1.90	0.84
1:C:250:ASN:N	1:C:250:ASN:HD22	1.77	0.83
1:E:15:ILE:HD11	2:F:119:TYR:HB2	1.59	0.83
1:E:250:ASN:HD22	1:E:250:ASN:N	1.79	0.81
2:D:117:ASN:HD21	2:D:121:LYS:HE2	1.46	0.81
2:B:61:THR:O	2:B:62:GLN:O	2.00	0.80
1:A:156:LYS:NZ	1:A:192:GLN:O	2.15	0.80
1:E:37:THR:O	1:E:38:HIS:HB2	1.81	0.80
1:C:15:ILE:HD11	2:D:119:TYR:HB2	1.65	0.79
2:B:117:ASN:ND2	2:B:121:LYS:HE2	1.98	0.78
1:A:310:ARG:NE	2:F:61:THR:HG22	2.00	0.77
1:E:316:MET:HE1	2:F:55:VAL:HG21	1.67	0.77
2:F:61:THR:O	2:F:62:GLN:O	2.03	0.76
2:D:117:ASN:ND2	2:D:121:LYS:HE2	2.02	0.75
2:B:61:THR:HG22	1:C:310:ARG:NE	2.01	0.75
1:A:316:MET:HE1	2:B:55:VAL:HG21	1.67	0.75
1:A:37:THR:O	1:A:38:HIS:HB2	1.87	0.74
1:C:307:LYS:HZ3	2:D:62:GLN:CG	2.00	0.74
2:F:51:LYS:HE2	2:F:103:GLU:HG3	1.70	0.74
2:F:117:ASN:ND2	2:F:121:LYS:HE2	2.02	0.73
2:D:61:THR:HG22	1:E:310:ARG:NE	2.02	0.73
2:F:61:THR:O	2:F:62:GLN:C	2.31	0.72
1:C:37:THR:O	1:C:38:HIS:HB2	1.88	0.72
1:C:316:MET:HE1	2:D:55:VAL:HG21	1.71	0.72
2:F:18:ILE:HD13	2:F:45:ILE:HG12	1.72	0.72
2:B:61:THR:O	2:B:62:GLN:C	2.33	0.71
2:F:63:PHE:N	2:F:63:PHE:CD1	2.58	0.71
2:F:169:ASN:O	2:F:173:ILE:HB	1.91	0.71
2:F:26:HIS:HB2	2:F:149:MET:HE3	1.73	0.70
2:B:65:ALA:C	2:B:66:VAL:HG13	2.17	0.69
2:B:18:ILE:HD13	2:B:45:ILE:HG12	1.73	0.69
2:B:63:PHE:CD1	2:B:63:PHE:N	2.57	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:18:ILE:HD13	2:D:45:ILE:HG12	1.75	0.68
2:D:51:LYS:HE2	2:D:103:GLU:HG3	1.74	0.68
1:C:64:CYS:HB3	1:C:95:ASN:HB2	1.76	0.68
2:F:59:MET:O	2:F:61:THR:N	2.27	0.68
2:D:65:ALA:C	2:D:66:VAL:HG13	2.19	0.68
1:C:249:GLY:C	1:C:250:ASN:HD22	2.01	0.68
2:D:63:PHE:N	2:D:63:PHE:CD1	2.61	0.67
2:F:45:ILE:O	2:F:49:THR:HG23	1.94	0.67
2:F:59:MET:O	2:F:60:ASN:C	2.37	0.67
2:D:17:MET:HG3	2:D:49:THR:HG22	1.77	0.67
2:B:167:LYS:O	2:B:171:GLU:HG3	1.94	0.67
2:F:167:LYS:O	2:F:171:GLU:HG3	1.95	0.67
2:B:51:LYS:HE2	2:B:103:GLU:HG3	1.76	0.66
2:F:65:ALA:C	2:F:66:VAL:HG13	2.19	0.66
2:F:17:MET:HG3	2:F:49:THR:HG22	1.78	0.66
1:E:98:TYR:CD1	1:E:230:MET:HG2	2.31	0.66
2:D:63:PHE:CE1	2:F:86:ASP:HB3	2.31	0.65
1:C:167:SER:HB3	1:C:244:THR:CB	2.28	0.64
1:E:130:HIS:CE1	1:E:164:LEU:HB3	2.33	0.63
2:D:159:TYR:HB3	2:D:160:PRO:HD3	1.79	0.63
2:F:159:TYR:HB3	2:F:160:PRO:HD3	1.80	0.63
2:B:26:HIS:HB2	2:B:149:MET:HE3	1.81	0.63
2:B:59:MET:O	2:B:61:THR:N	2.32	0.63
1:A:98:TYR:CD1	1:A:230:MET:HG2	2.33	0.63
2:D:59:MET:O	2:D:61:THR:N	2.32	0.63
2:B:159:TYR:HB3	2:B:160:PRO:HD3	1.79	0.63
1:E:309:VAL:HG22	2:F:93:THR:HA	1.80	0.62
2:D:169:ASN:O	2:D:173:ILE:HB	2.00	0.62
1:E:279:THR:HG22	1:E:281:CYS:H	1.63	0.62
1:A:156:LYS:CD	1:A:196:GLN:HB2	2.30	0.62
2:D:58:LYS:HD2	2:F:97:GLU:HG2	1.82	0.62
2:B:17:MET:HG3	2:B:49:THR:HG22	1.79	0.62
2:B:86:ASP:HB3	2:F:63:PHE:CE1	2.33	0.62
2:B:53:ASN:O	2:B:57:GLU:HG2	2.00	0.62
2:D:45:ILE:O	2:D:49:THR:HG23	2.00	0.62
2:D:53:ASN:O	2:D:57:GLU:HG2	2.00	0.62
1:A:249:GLY:C	1:A:250:ASN:HD22	2.07	0.62
1:C:167:SER:HB3	1:C:244:THR:HB	1.80	0.61
2:D:167:LYS:O	2:D:171:GLU:HG3	2.00	0.61
2:B:63:PHE:CE1	2:D:86:ASP:HB3	2.34	0.61
1:A:130:HIS:CE1	1:A:164:LEU:HB3	2.34	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:130:HIS:CE1	1:C:164:LEU:HB3	2.35	0.61
1:E:131:GLU:OE2	1:E:133:THR:HB	2.00	0.61
1:E:133:THR:O	1:E:133(A):LYS:HD3	2.00	0.61
1:E:75:GLU:HG2	3:I:1:NAG:H82	1.81	0.61
1:E:167:SER:HB3	1:E:244:THR:HB	1.82	0.61
1:A:283:THR:HG21	1:A:297:ILE:CG2	2.31	0.61
2:D:26:HIS:HB2	2:D:149:MET:HE3	1.82	0.61
1:A:241:ASP:OD1	1:A:242:THR:N	2.34	0.60
1:C:309:VAL:HG22	2:D:93:THR:HA	1.84	0.60
2:B:106:ARG:HH12	2:D:106:ARG:CD	2.11	0.60
1:A:279:THR:HG22	1:A:281:CYS:H	1.66	0.60
2:F:53:ASN:O	2:F:57:GLU:HG2	2.01	0.60
1:E:283:THR:HB	1:E:286:GLY:O	2.00	0.60
1:C:279:THR:HG22	1:C:281:CYS:H	1.66	0.60
1:E:249:GLY:C	1:E:250:ASN:HD22	2.10	0.60
2:B:106:ARG:CD	2:F:106:ARG:HH12	2.09	0.59
2:D:17:MET:HA	2:D:17:MET:HE2	1.84	0.59
1:A:156:LYS:HD3	1:A:196:GLN:HB2	1.84	0.59
2:B:45:ILE:O	2:B:49:THR:HG23	2.02	0.59
2:B:97:GLU:HG2	2:F:58:LYS:HD2	1.83	0.59
1:C:131:GLU:OE2	1:C:133:THR:HB	2.03	0.59
1:E:167:SER:HB3	1:E:244:THR:CB	2.32	0.59
1:E:283:THR:HG21	1:E:297:ILE:HG21	1.85	0.59
2:D:59:MET:O	2:D:60:ASN:C	2.45	0.59
1:E:283:THR:HG21	1:E:297:ILE:CG2	2.33	0.59
1:A:309:VAL:HG22	2:B:93:THR:HA	1.83	0.59
2:B:44:ALA:O	2:B:48:ILE:HG12	2.03	0.59
2:B:169:ASN:O	2:B:173:ILE:HB	2.03	0.59
1:A:180:TRP:HZ3	1:A:235:THR:HG22	1.67	0.59
1:A:131:GLU:OE2	1:A:133:THR:HB	2.03	0.58
2:D:61:THR:O	2:D:62:GLN:O	2.21	0.58
1:A:196:GLN:O	1:A:196:GLN:HG3	2.03	0.58
1:C:98:TYR:CD1	1:C:230:MET:HG2	2.39	0.58
1:A:167:SER:HB3	1:A:244:THR:HB	1.85	0.58
2:D:106:ARG:HH12	2:F:106:ARG:CD	2.12	0.58
1:E:180:TRP:HZ3	1:E:235:THR:HG22	1.68	0.58
1:A:64:CYS:HB3	1:A:95:ASN:HB2	1.86	0.58
1:C:196:GLN:HG3	1:C:196:GLN:O	2.04	0.57
1:A:15:ILE:CD1	2:B:119:TYR:HB2	2.31	0.57
1:C:64:CYS:HB2	1:C:95:ASN:O	2.05	0.57
1:C:61:LEU:HD11	1:C:66:ILE:HD13	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:61:THR:O	2:D:62:GLN:C	2.46	0.57
1:A:167:SER:HB3	1:A:244:THR:CB	2.35	0.57
1:C:180:TRP:HZ3	1:C:235:THR:HG22	1.69	0.57
2:D:44:ALA:O	2:D:48:ILE:HG12	2.05	0.57
1:A:309:VAL:CG2	2:B:93:THR:HA	2.36	0.56
2:B:154:ASN:ND2	5:B:183:NAG:O7	2.39	0.56
1:C:15:ILE:HD12	1:C:15:ILE:C	2.31	0.56
1:A:283:THR:HG21	1:A:297:ILE:HG21	1.88	0.56
2:D:63:PHE:CZ	2:F:86:ASP:HB3	2.41	0.56
1:E:213:PHE:HE1	1:E:233:TYR:CE2	2.23	0.56
1:C:213:PHE:HE1	1:C:233:TYR:CE2	2.23	0.56
1:E:116:SER:HB3	1:E:261:ASN:HB2	1.87	0.56
1:A:105:TYR:CZ	1:A:109:ARG:HD2	2.41	0.55
2:B:59:MET:O	2:B:60:ASN:C	2.48	0.55
2:B:58:LYS:HD2	2:D:97:GLU:HG2	1.88	0.55
1:E:191:GLN:HE22	1:E:250:ASN:HD21	1.55	0.55
1:E:64:CYS:HB3	1:E:95:ASN:HB2	1.88	0.55
1:E:197:ASN:O	1:E:198:ALA:C	2.49	0.55
5:E:330:NAG:O3	5:E:330:NAG:H83	2.06	0.55
2:F:17:MET:HA	2:F:17:MET:HE2	1.88	0.55
1:C:283:THR:HG21	1:C:297:ILE:CG2	2.35	0.55
1:E:15:ILE:HD12	1:E:15:ILE:C	2.31	0.55
2:B:17:MET:HE2	2:B:17:MET:HA	1.88	0.55
2:D:18:ILE:HD11	2:D:48:ILE:HG13	1.88	0.55
1:E:61:LEU:HD11	1:E:66:ILE:HD13	1.88	0.55
2:B:119:TYR:OH	2:B:132:GLU:OE1	2.15	0.54
1:E:309:VAL:CG2	2:F:93:THR:HA	2.37	0.54
1:A:213:PHE:HE1	1:A:233:TYR:CE2	2.26	0.54
1:A:310:ARG:NH2	2:F:61:THR:HB	2.22	0.54
1:C:279:THR:HG21	1:C:281:CYS:O	2.08	0.54
1:A:15:ILE:C	1:A:15:ILE:HD12	2.32	0.54
1:A:215:PRO:HB3	1:A:250:ASN:OD1	2.07	0.54
1:C:40:VAL:CG1	2:D:17:MET:HE1	2.38	0.54
1:C:164:LEU:C	1:C:164:LEU:HD12	2.33	0.54
1:A:184:HIS:HE2	1:A:231:ASN:ND2	2.04	0.54
1:E:196:GLN:HG3	1:E:196:GLN:O	2.08	0.54
2:F:21:TRP:CD2	2:F:36:ALA:HB2	2.42	0.54
2:B:18:ILE:HD11	2:B:48:ILE:HG13	1.90	0.54
1:E:97:CYS:O	1:E:224:ARG:HD3	2.08	0.54
1:E:114:SER:HB3	1:E:265:SER:HB2	1.90	0.54
2:F:44:ALA:O	2:F:48:ILE:HG12	2.07	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:329:ARG:O	2:F:121:LYS:NZ	2.41	0.53
1:C:309:VAL:CG2	2:D:93:THR:HA	2.38	0.53
2:B:63:PHE:CZ	2:D:86:ASP:HB3	2.43	0.53
1:C:114:SER:HB3	1:C:265:SER:HB2	1.90	0.53
2:F:119:TYR:OH	2:F:132:GLU:OE1	2.19	0.53
1:E:25:VAL:HG21	1:E:317:ALA:HB2	1.90	0.53
1:C:281:CYS:SG	1:C:288:ILE:HD11	2.48	0.53
1:A:65:ASN:C	1:A:65:ASN:OD1	2.51	0.53
2:B:66:VAL:HG23	2:B:67:GLY:N	2.24	0.53
1:A:115:VAL:HG13	1:A:260:LEU:HD23	1.91	0.52
2:B:26:HIS:HB2	2:B:149:MET:CE	2.40	0.52
1:E:115:VAL:CG1	1:E:260:LEU:HB2	2.40	0.52
1:C:25:VAL:HG21	1:C:317:ALA:HB2	1.92	0.52
1:E:115:VAL:HG13	1:E:260:LEU:HD23	1.90	0.52
1:A:116:SER:HB3	1:A:261:ASN:HB2	1.91	0.52
1:E:73:ASN:O	1:E:76:CYS:HB2	2.10	0.52
2:F:63:PHE:HD1	2:F:63:PHE:H	1.57	0.52
1:E:40:VAL:CG1	2:F:17:MET:HE1	2.40	0.51
2:B:65:ALA:C	2:B:66:VAL:CG1	2.83	0.51
2:B:121:LYS:NZ	1:C:329:ARG:O	2.43	0.51
2:D:26:HIS:HB2	2:D:149:MET:CE	2.40	0.51
2:F:18:ILE:HD11	2:F:48:ILE:HG13	1.93	0.51
2:D:63:PHE:HD1	2:D:63:PHE:H	1.59	0.51
1:E:164:LEU:HD12	1:E:164:LEU:C	2.36	0.51
1:A:197:ASN:O	1:A:198:ALA:C	2.53	0.51
1:E:180:TRP:CZ3	1:E:235:THR:HG22	2.46	0.51
2:B:86:ASP:HB3	2:F:63:PHE:CZ	2.46	0.51
1:C:115:VAL:CG1	1:C:260:LEU:HB2	2.40	0.51
1:E:241:ASP:OD1	1:E:242:THR:N	2.44	0.51
1:E:215:PRO:HB3	1:E:250:ASN:OD1	2.11	0.50
1:C:215:PRO:HB3	1:C:250:ASN:OD1	2.12	0.50
1:E:224:ARG:NH2	3:I:1:NAG:O3	2.45	0.50
2:B:63:PHE:HD1	2:B:63:PHE:H	1.58	0.50
2:B:150:GLU:HG2	5:B:183:NAG:H62	1.94	0.50
1:C:73:ASN:OD1	1:C:74:PRO:HD2	2.11	0.50
1:C:236:LEU:HD13	1:C:262:ARG:NH1	2.27	0.50
1:E:223:VAL:HG12	1:E:224:ARG:HG3	1.93	0.50
1:E:52:CYS:HB3	1:E:277:CYS:O	2.12	0.50
1:A:115:VAL:CG1	1:A:260:LEU:HB2	2.41	0.50
1:A:180:TRP:CZ3	1:A:235:THR:HG22	2.46	0.50
2:F:26:HIS:HB2	2:F:149:MET:CE	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:64:CYS:HB2	1:E:95:ASN:O	2.11	0.50
1:A:114:SER:HB3	1:A:265:SER:HB2	1.94	0.49
1:E:167:SER:CB	1:E:244:THR:HB	2.42	0.49
1:C:250:ASN:N	1:C:250:ASN:ND2	2.48	0.49
2:F:28:ASN:HD22	2:F:28:ASN:C	2.20	0.49
1:C:116:SER:HB3	1:C:261:ASN:HB2	1.93	0.49
1:C:170:ASN:O	1:C:239:PRO:O	2.30	0.49
1:C:283:THR:HG21	1:C:297:ILE:HG21	1.93	0.49
2:F:66:VAL:HG23	2:F:67:GLY:N	2.27	0.49
1:C:73:ASN:O	1:C:76:CYS:HB2	2.12	0.49
3:I:1:NAG:H61	3:I:2:NAG:H82	1.94	0.48
1:A:242:THR:O	1:C:221:PRO:HG2	2.13	0.48
2:D:61:THR:HB	1:E:310:ARG:NH2	2.28	0.48
1:E:105:TYR:CZ	1:E:109:ARG:HD2	2.48	0.48
1:C:164:LEU:O	1:C:246:GLU:HA	2.12	0.48
1:C:197:ASN:O	1:C:198:ALA:C	2.56	0.48
1:C:213:PHE:CE1	1:C:233:TYR:CZ	3.02	0.48
1:E:220:ARG:HG3	1:E:227:ALA:O	2.14	0.48
1:C:167:SER:CB	1:C:244:THR:HB	2.42	0.48
1:C:68:GLY:O	1:C:71:LEU:O	2.31	0.48
1:C:115:VAL:HG13	1:C:260:LEU:HD23	1.95	0.48
1:E:52:CYS:HB2	1:E:279:THR:OG1	2.14	0.48
1:A:28:VAL:HG11	2:B:102:LEU:HD13	1.94	0.48
2:B:148:CYS:O	2:B:152:VAL:HG23	2.14	0.48
1:E:100:GLY:HA3	1:E:230:MET:O	2.14	0.48
1:E:164:LEU:O	1:E:246:GLU:HA	2.14	0.48
1:E:250:ASN:N	1:E:250:ASN:ND2	2.51	0.48
1:C:119:GLU:OE2	1:C:172:LYS:NZ	2.42	0.48
1:C:191:GLN:HE22	1:C:250:ASN:HD21	1.61	0.48
2:D:16:GLY:O	2:D:17:MET:HB2	2.13	0.48
2:D:121:LYS:NZ	1:E:329:ARG:O	2.47	0.48
1:E:170:ASN:O	1:E:239:PRO:O	2.32	0.48
1:E:201:TYR:CD2	1:E:212:ARG:NE	2.82	0.48
2:B:61:THR:HB	1:C:310:ARG:NH2	2.28	0.47
1:C:73:ASN:OD1	1:C:74:PRO:N	2.47	0.47
2:D:26:HIS:C	2:D:26:HIS:CD2	2.92	0.47
2:F:65:ALA:C	2:F:66:VAL:CG1	2.85	0.47
1:A:105:TYR:CE2	1:A:109:ARG:HD2	2.49	0.47
2:F:18:ILE:HD13	2:F:45:ILE:HA	1.95	0.47
2:F:26:HIS:C	2:F:26:HIS:CD2	2.91	0.47
1:A:25:VAL:HG21	1:A:317:ALA:HB2	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:220:ARG:HG3	1:C:227:ALA:O	2.14	0.47
1:E:195:TYR:CD2	1:E:250:ASN:ND2	2.82	0.47
1:A:40:VAL:CG1	2:B:17:MET:HE1	2.43	0.47
2:B:61:THR:HG22	1:C:310:ARG:HE	1.77	0.47
1:C:180:TRP:CZ3	1:C:235:THR:HG22	2.49	0.47
1:C:310:ARG:O	1:C:310:ARG:HG3	2.14	0.47
1:E:15:ILE:CD1	2:F:119:TYR:HB2	2.37	0.47
1:C:52:CYS:HB2	1:C:279:THR:OG1	2.15	0.47
1:E:41:ASN:HB2	1:E:315:ARG:NH1	2.29	0.47
1:A:56:ILE:HB	1:A:85:SER:OG	2.15	0.47
1:E:58:PRO:HB3	1:E:86:TYR:CE1	2.50	0.47
1:E:184:HIS:HE2	1:E:231:ASN:ND2	2.13	0.47
1:E:213:PHE:CE1	1:E:233:TYR:CZ	3.03	0.47
1:C:61:LEU:HB3	1:C:64:CYS:O	2.15	0.46
1:A:252:ILE:HD12	1:A:252:ILE:N	2.29	0.46
1:A:307:LYS:NZ	2:B:62:GLN:HG2	2.13	0.46
2:D:61:THR:HG22	1:E:310:ARG:HE	1.79	0.46
1:A:21:SER:CB	1:A:37:THR:HA	2.45	0.46
1:A:64:CYS:HB2	1:A:95:ASN:O	2.15	0.46
1:E:56:ILE:HB	1:E:85:SER:OG	2.15	0.46
1:E:136:THR:HG23	1:E:139:CYS:H	1.80	0.46
1:E:279:THR:HG22	1:E:281:CYS:N	2.30	0.46
2:D:65:ALA:C	2:D:66:VAL:CG1	2.87	0.46
1:E:309:VAL:HG13	1:E:311:SER:H	1.81	0.46
1:A:236:LEU:HD13	1:A:262:ARG:NH1	2.31	0.46
2:F:24:TYR:CD1	2:F:153:ARG:HG2	2.50	0.46
2:B:26:HIS:CD2	2:B:33:GLY:N	2.83	0.46
1:A:61:LEU:HD11	1:A:66:ILE:HD13	1.97	0.46
1:C:28:VAL:HG11	2:D:102:LEU:HD13	1.97	0.46
1:C:56:ILE:HB	1:C:85:SER:OG	2.15	0.46
1:C:279:THR:HG22	1:C:281:CYS:N	2.29	0.46
1:E:236:LEU:HD13	1:E:262:ARG:NH1	2.31	0.46
1:A:61:LEU:HB3	1:A:64:CYS:O	2.16	0.46
1:A:223:VAL:HG12	1:A:224:ARG:HG3	1.98	0.46
1:C:242:THR:O	1:E:221:PRO:HG2	2.15	0.46
2:D:24:TYR:CD1	2:D:153:ARG:HG2	2.51	0.46
2:D:7:ALA:O	2:D:8:GLY:C	2.59	0.45
1:C:249:GLY:C	1:C:250:ASN:ND2	2.72	0.45
1:E:28:VAL:HG11	2:F:102:LEU:HD13	1.99	0.45
1:C:201:TYR:CD2	1:C:212:ARG:NE	2.84	0.45
4:H:2:NAG:C3	4:H:3:BMA:H2	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:249:GLY:C	1:A:250:ASN:ND2	2.74	0.45
1:A:279:THR:HG22	1:A:281:CYS:N	2.32	0.45
1:A:295:GLN:HE21	1:A:297:ILE:H	1.64	0.45
2:F:148:CYS:O	2:F:152:VAL:HG23	2.15	0.45
2:B:17:MET:HG3	2:B:49:THR:CG2	2.47	0.45
1:C:301:THR:HG23	1:C:305:CYS:SG	2.57	0.45
1:A:201:TYR:CD2	1:A:212:ARG:NE	2.85	0.45
1:A:310:ARG:NE	2:F:61:THR:CG2	2.77	0.45
1:E:283:THR:HG23	1:E:284:PRO:HD2	1.98	0.45
1:A:309:VAL:HG13	1:A:311:SER:H	1.81	0.45
1:C:100:GLY:HA3	1:C:230:MET:O	2.17	0.45
1:E:179:LEU:N	1:E:179:LEU:HD12	2.32	0.45
1:A:46:SER:N	1:A:297:ILE:HD11	2.32	0.45
1:A:73:ASN:O	1:A:76:CYS:HB2	2.16	0.45
2:B:24:TYR:CD1	2:B:153:ARG:HG2	2.52	0.45
2:B:66:VAL:HG23	2:B:67:GLY:H	1.81	0.45
1:E:40:VAL:HG23	1:E:40:VAL:O	2.16	0.45
4:H:2:NAG:O3	4:H:3:BMA:H2	2.17	0.44
1:A:136:THR:HG23	1:A:139:CYS:H	1.82	0.44
2:B:16:GLY:O	2:B:17:MET:HB2	2.18	0.44
1:C:197:ASN:HB3	1:C:200:ALA:HB2	2.00	0.44
1:E:95:ASN:ND2	3:I:1:NAG:C7	2.80	0.44
1:A:11:ASP:OD2	2:B:144:CYS:N	2.48	0.44
1:A:202:VAL:HB	1:A:213:PHE:HB2	2.00	0.44
2:B:5:ALA:O	2:B:6:ILE:C	2.61	0.44
1:C:11:ASP:OD2	2:D:144:CYS:N	2.50	0.44
1:C:213:PHE:HE1	1:C:233:TYR:CZ	2.35	0.44
1:C:283:THR:HG23	1:C:284:PRO:HD2	1.99	0.44
1:E:58:PRO:HB3	1:E:86:TYR:CZ	2.52	0.44
2:F:18:ILE:CD1	2:F:45:ILE:HA	2.48	0.44
2:B:26:HIS:CD2	2:B:26:HIS:C	2.96	0.44
2:B:87:GLY:HA3	2:F:88:PHE:CZ	2.53	0.44
1:C:105:TYR:CZ	1:C:109:ARG:HD2	2.52	0.44
2:D:93:THR:O	2:D:97:GLU:HB2	2.17	0.44
1:E:279:THR:HG21	1:E:281:CYS:O	2.17	0.44
1:E:328:SER:O	1:E:329:ARG:C	2.60	0.44
2:B:6:ILE:O	2:B:8:GLY:N	2.48	0.44
2:B:18:ILE:HD13	2:B:45:ILE:HA	1.99	0.44
1:C:40:VAL:HG23	1:C:40:VAL:O	2.18	0.44
1:E:11:ASP:OD2	2:F:144:CYS:N	2.50	0.44
1:C:73:ASN:OD1	1:C:74:PRO:CD	2.66	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:197:ASN:O	1:C:199:ASP:N	2.50	0.44
1:E:298:HIS:ND1	1:E:299:PRO:HD2	2.32	0.44
2:B:66:VAL:CG2	2:B:67:GLY:H	2.30	0.43
1:C:73:ASN:OD1	1:C:73:ASN:C	2.59	0.43
1:C:103:ILE:HD13	1:C:103:ILE:N	2.32	0.43
2:B:175:GLY:HA2	2:F:171:GLU:HG2	2.00	0.43
1:E:85:SER:HB2	1:E:86:TYR:HD1	1.82	0.43
2:D:28:ASN:C	2:D:28:ASN:HD22	2.25	0.43
1:C:309:VAL:HG13	1:C:311:SER:H	1.82	0.43
2:D:164:GLU:CD	2:D:164:GLU:N	2.77	0.43
2:B:24:TYR:CD1	2:B:24:TYR:N	2.84	0.43
1:A:85:SER:HB2	1:A:86:TYR:HD1	1.82	0.43
1:A:97:CYS:O	1:A:224:ARG:HD3	2.19	0.43
2:D:18:ILE:HD13	2:D:45:ILE:HA	1.99	0.43
2:D:148:CYS:O	2:D:152:VAL:HG23	2.19	0.43
1:A:71:LEU:C	1:A:150:ASN:HD22	2.26	0.43
1:E:252:ILE:N	1:E:252:ILE:HD12	2.33	0.43
1:A:74:PRO:O	1:A:75:GLU:C	2.61	0.43
2:B:28:ASN:C	2:B:28:ASN:HD22	2.27	0.43
2:D:21:TRP:CD2	2:D:36:ALA:HB2	2.54	0.43
1:E:158:GLY:O	1:E:159:SER:C	2.62	0.43
2:F:51:LYS:CE	2:F:103:GLU:HG3	2.47	0.43
1:A:119:GLU:OE2	1:A:172:LYS:NZ	2.47	0.43
1:A:170:ASN:O	1:A:239:PRO:O	2.37	0.43
1:C:223:VAL:HG12	1:C:224:ARG:HG3	2.00	0.43
1:C:283:THR:HB	1:C:286:GLY:O	2.17	0.43
2:D:164:GLU:CD	2:D:164:GLU:H	2.26	0.43
1:C:179:LEU:N	1:C:179:LEU:HD12	2.34	0.42
1:C:214:THR:HG22	1:C:215:PRO:HD2	2.00	0.42
1:C:252:ILE:N	1:C:252:ILE:HD12	2.33	0.42
1:A:15:ILE:HG12	2:B:119:TYR:HA	2.00	0.42
1:E:197:ASN:HB3	1:E:200:ALA:HB2	2.00	0.42
2:F:16:GLY:O	2:F:17:MET:HB2	2.19	0.42
2:F:66:VAL:HG23	2:F:67:GLY:H	1.85	0.42
1:A:179:LEU:N	1:A:179:LEU:HD12	2.35	0.42
1:E:214:THR:HG22	1:E:215:PRO:HD2	2.00	0.42
1:A:89:GLU:O	1:A:269:THR:HA	2.19	0.42
1:A:310:ARG:HG3	1:A:310:ARG:O	2.18	0.42
1:C:202:VAL:HB	1:C:213:PHE:HB2	2.01	0.42
2:D:51:LYS:CE	2:D:103:GLU:HG3	2.47	0.42
1:A:301:THR:O	2:B:66:VAL:HA	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:108:LEU:HG	1:C:112:LEU:HD22	2.02	0.42
1:C:195:TYR:CD2	1:C:250:ASN:ND2	2.88	0.42
1:A:233:TYR:N	1:A:233:TYR:CD1	2.87	0.42
1:C:75:GLU:HG2	4:H:1:NAG:H82	2.02	0.42
1:C:136:THR:HG23	1:C:139:CYS:H	1.84	0.42
1:A:283:THR:HB	1:A:286:GLY:O	2.20	0.42
2:B:17:MET:CG	2:B:49:THR:HG22	2.48	0.42
2:D:17:MET:HG3	2:D:49:THR:CG2	2.46	0.42
1:A:281:CYS:SG	1:A:288:ILE:HD11	2.59	0.42
2:B:171:GLU:HG2	2:D:175:GLY:HA2	2.00	0.42
1:C:169:VAL:O	1:C:169:VAL:HG12	2.19	0.42
1:C:295:GLN:HE21	1:C:297:ILE:H	1.68	0.42
1:E:54(A):LYS:O	1:E:56:ILE:HG12	2.20	0.42
1:A:21:SER:HB3	1:A:37:THR:HA	2.02	0.42
1:A:213:PHE:CE1	1:A:233:TYR:CZ	3.08	0.42
1:C:15:ILE:CD1	2:D:119:TYR:HB2	2.42	0.42
1:C:162:PRO:O	1:C:163:LYS:C	2.63	0.42
1:E:162:PRO:O	1:E:163:LYS:C	2.63	0.42
1:E:213:PHE:HE1	1:E:233:TYR:CZ	2.37	0.42
2:B:158:ASP:OD2	2:B:161:LYS:HB2	2.20	0.41
1:C:138:ALA:O	1:C:224:ARG:NH1	2.53	0.41
1:C:241:ASP:OD1	1:C:242:THR:N	2.53	0.41
1:E:95:ASN:HD22	3:I:1:NAG:C7	2.33	0.41
1:E:108:LEU:HG	1:E:112:LEU:HD22	2.01	0.41
1:C:85:SER:HB2	1:C:86:TYR:HD1	1.85	0.41
1:E:308:TYR:CD2	2:F:89:LEU:HD13	2.55	0.41
1:A:164:LEU:C	1:A:164:LEU:HD12	2.45	0.41
1:A:220:ARG:HG3	1:A:227:ALA:O	2.20	0.41
2:B:117:ASN:HD21	2:B:121:LYS:CE	2.20	0.41
1:A:108:LEU:HG	1:A:112:LEU:HD22	2.02	0.41
2:B:51:LYS:CE	2:B:103:GLU:HG3	2.49	0.41
2:B:127:LYS:HD3	2:D:133:ILE:HA	2.02	0.41
1:E:310:ARG:O	1:E:310:ARG:HG3	2.19	0.41
2:F:66:VAL:CG2	2:F:67:GLY:H	2.33	0.41
1:A:57:ALA:HB1	1:A:58:PRO:HD2	2.03	0.41
1:A:58:PRO:HB3	1:A:86:TYR:CE1	2.55	0.41
2:B:21:TRP:CD2	2:B:36:ALA:HB2	2.55	0.41
2:B:59:MET:HE1	2:B:92:TRP:CZ3	2.55	0.41
2:B:158:ASP:OD1	2:B:160:PRO:HD2	2.21	0.41
2:D:61:THR:CG2	1:E:310:ARG:NE	2.80	0.41
1:C:95:ASN:ND2	4:H:1:NAG:C7	2.84	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:21:SER:CB	1:E:37:THR:HA	2.51	0.41
1:A:48:ASN:OD1	1:A:49:GLY:N	2.54	0.41
1:A:138:ALA:O	1:A:224:ARG:NH1	2.53	0.41
2:B:88:PHE:CZ	2:D:87:GLY:HA3	2.56	0.41
1:C:203:SER:OG	1:C:246:GLU:HB3	2.21	0.41
1:C:21:SER:CB	1:C:37:THR:HA	2.50	0.41
1:C:48:ASN:OD1	1:C:48:ASN:C	2.64	0.41
1:C:155:THR:HG23	1:C:194:LEU:O	2.21	0.41
1:C:263:GLY:O	1:C:264:SER:C	2.63	0.41
1:E:61:LEU:HB3	1:E:64:CYS:O	2.21	0.41
1:E:169:VAL:HG12	1:E:169:VAL:O	2.21	0.41
2:F:35:ALA:HB3	2:F:153:ARG:HD2	2.02	0.41
2:F:141:TYR:CZ	2:F:170:ARG:HG3	2.56	0.41
2:B:99:LEU:O	2:B:103:GLU:HB2	2.21	0.41
1:E:89:GLU:O	1:E:269:THR:HA	2.21	0.41
1:A:308:TYR:CD2	2:B:89:LEU:HD13	2.56	0.40
1:C:308:TYR:CD2	2:D:89:LEU:HD13	2.56	0.40
1:E:151:LEU:HB3	1:E:252:ILE:HG22	2.03	0.40
1:E:202:VAL:HB	1:E:213:PHE:HB2	2.03	0.40
1:A:103:ILE:N	1:A:103:ILE:HD13	2.36	0.40
1:C:131:GLU:HB2	1:C:157:LYS:HA	2.03	0.40
1:C:295:GLN:HB3	1:C:306:PRO:HB2	2.03	0.40
1:A:216:GLU:O	1:A:220:ARG:NH2	2.55	0.40
1:A:310:ARG:HE	2:F:61:THR:CG2	2.35	0.40
1:C:190:ASP:O	1:C:191:GLN:C	2.64	0.40
1:C:58:PRO:HB3	1:C:86:TYR:CE1	2.57	0.40
1:C:216:GLU:O	1:C:220:ARG:NH2	2.54	0.40
1:A:156:LYS:HD2	1:A:196:GLN:HB2	2.02	0.40
2:B:131:LYS:HD2	2:B:174:ASP:OD2	2.21	0.40
1:C:57:ALA:HB1	1:C:58:PRO:HD2	2.02	0.40
1:E:155:THR:HG23	1:E:194:LEU:O	2.22	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	326/335 (97%)	290 (89%)	33 (10%)	3 (1%)	14	48
1	C	326/335 (97%)	292 (90%)	31 (10%)	3 (1%)	14	48
1	E	326/335 (97%)	291 (89%)	32 (10%)	3 (1%)	14	48
2	B	173/182 (95%)	151 (87%)	12 (7%)	10 (6%)	1	8
2	D	173/182 (95%)	151 (87%)	11 (6%)	11 (6%)	1	6
2	F	173/182 (95%)	151 (87%)	12 (7%)	10 (6%)	1	8
All	All	1497/1551 (96%)	1326 (89%)	131 (9%)	40 (3%)	4	22

All (40) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	198	ALA
2	B	10	ILE
2	B	60	ASN
2	B	62	GLN
2	B	66	VAL
1	C	198	ALA
2	D	10	ILE
2	D	60	ASN
2	D	62	GLN
2	D	66	VAL
1	E	198	ALA
2	F	10	ILE
2	F	60	ASN
2	F	62	GLN
2	F	66	VAL
2	B	6	ILE
2	B	7	ALA
2	B	13	GLY
2	D	7	ALA
2	D	13	GLY
2	F	7	ALA
2	F	13	GLY
1	A	38	HIS
2	B	59	MET
2	B	128	ASN
1	C	38	HIS
2	D	59	MET

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Mol	Chain	Res	Type
2	D	128	ASN
1	E	38	HIS
2	F	59	MET
2	F	128	ASN
2	B	17	MET
2	D	6	ILE
2	D	17	MET
2	F	6	ILE
2	F	17	MET
1	A	264(A)	GLY
1	C	264(A)	GLY
2	D	146	ASP
1	E	264(A)	GLY

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	284/289 (98%)	258 (91%)	26 (9%)	8	33
1	C	284/289 (98%)	258 (91%)	26 (9%)	8	33
1	E	284/289 (98%)	261 (92%)	23 (8%)	11	38
2	B	149/156 (96%)	132 (89%)	17 (11%)	5	24
2	D	149/156 (96%)	131 (88%)	18 (12%)	5	21
2	F	149/156 (96%)	131 (88%)	18 (12%)	5	21
All	All	1299/1335 (97%)	1171 (90%)	128 (10%)	7	30

All (128) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	GLU
1	A	12	THR
1	A	28	VAL
1	A	63	LYS
1	A	92	ASN

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Mol	Chain	Res	Type
1	A	96(A)	THR
1	A	112	LEU
1	A	140	SER
1	A	172	LYS
1	A	179	LEU
1	A	194	LEU
1	A	197	ASN
1	A	212	ARG
1	A	214	THR
1	A	220	ARG
1	A	225	ASP
1	A	237	LEU
1	A	239	PRO
1	A	242	THR
1	A	250	ASN
1	A	260	LEU
1	A	269	THR
1	A	283	THR
1	A	301	THR
1	A	309	VAL
1	A	312	THR
2	B	19	ASP
2	B	27	GLN
2	B	28	ASN
2	B	48	ILE
2	B	61	THR
2	B	62	GLN
2	B	63	PHE
2	B	68	LYS
2	B	97	GLU
2	B	98	LEU
2	B	102	LEU
2	B	106	ARG
2	B	128	ASN
2	B	154	ASN
2	B	164	GLU
2	B	172	GLU
2	B	173	ILE
1	C	10	GLU
1	C	12	THR
1	C	80	LEU
1	C	92	ASN

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Mol	Chain	Res	Type
1	C	96(A)	THR
1	C	112	LEU
1	C	140	SER
1	C	172	LYS
1	C	194	LEU
1	C	197	ASN
1	C	212	ARG
1	C	214	THR
1	C	220	ARG
1	C	225	ASP
1	C	237	LEU
1	C	239	PRO
1	C	242	THR
1	C	250	ASN
1	C	260	LEU
1	C	265	SER
1	C	277	CYS
1	C	283	THR
1	C	301	THR
1	C	309	VAL
1	C	312	THR
1	C	326	ILE
2	D	19	ASP
2	D	26	HIS
2	D	27	GLN
2	D	28	ASN
2	D	48	ILE
2	D	61	THR
2	D	62	GLN
2	D	63	PHE
2	D	68	LYS
2	D	97	GLU
2	D	98	LEU
2	D	102	LEU
2	D	106	ARG
2	D	128	ASN
2	D	154	ASN
2	D	164	GLU
2	D	172	GLU
2	D	173	ILE
1	E	10	GLU
1	E	12	THR

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Mol	Chain	Res	Type
1	E	63	LYS
1	E	92	ASN
1	E	112	LEU
1	E	140	SER
1	E	172	LYS
1	E	194	LEU
1	E	197	ASN
1	E	212	ARG
1	E	214	THR
1	E	220	ARG
1	E	225	ASP
1	E	237	LEU
1	E	239	PRO
1	E	242	THR
1	E	250	ASN
1	E	260	LEU
1	E	265	SER
1	E	283	THR
1	E	301	THR
1	E	309	VAL
1	E	312	THR
2	F	19	ASP
2	F	26	HIS
2	F	27	GLN
2	F	28	ASN
2	F	48	ILE
2	F	61	THR
2	F	62	GLN
2	F	63	PHE
2	F	68	LYS
2	F	97	GLU
2	F	98	LEU
2	F	102	LEU
2	F	106	ARG
2	F	128	ASN
2	F	154	ASN
2	F	164	GLU
2	F	172	GLU
2	F	173	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (53) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	47	HIS
1	A	129	ASN
1	A	150	ASN
1	A	191	GLN
1	A	226	GLN
1	A	231	ASN
1	A	250	ASN
1	A	275	HIS
1	A	295	GLN
2	B	27	GLN
2	B	28	ASN
2	B	30	GLN
2	B	62	GLN
2	B	117	ASN
2	B	128	ASN
1	C	18	HIS
1	C	47	HIS
1	C	60	GLN
1	C	129	ASN
1	C	150	ASN
1	C	191	GLN
1	C	226	GLN
1	C	231	ASN
1	C	250	ASN
1	C	261	ASN
1	C	275	HIS
1	C	295	GLN
1	C	322	ASN
2	D	27	GLN
2	D	28	ASN
2	D	30	GLN
2	D	62	GLN
2	D	117	ASN
2	D	125	GLN
2	D	128	ASN
1	E	18	HIS
1	E	47	HIS
1	E	129	ASN
1	E	150	ASN
1	E	191	GLN
1	E	226	GLN
1	E	231	ASN
1	E	250	ASN

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Mol	Chain	Res	Type
1	E	275	HIS
1	E	295	GLN
2	F	27	GLN
2	F	28	ASN
2	F	30	GLN
2	F	50	ASN
2	F	62	GLN
2	F	117	ASN
2	F	125	GLN
2	F	128	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 ⓘ

10 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	$\# Z > 2$
3	NAG	G	1	3,1	14,14,15	0.81	0	17,19,21	2.44	8 (47%)
3	NAG	G	2	3	14,14,15	0.65	0	17,19,21	1.50	4 (23%)
3	BMA	G	3	3	11,11,12	0.63	0	15,15,17	1.25	2 (13%)
4	NAG	H	1	4,1	14,14,15	0.74	0	17,19,21	1.49	3 (17%)
4	NAG	H	2	4	14,14,15	0.93	0	17,19,21	2.21	6 (35%)
4	BMA	H	3	4	11,11,12	0.75	0	15,15,17	1.76	4 (26%)
4	MAN	H	4	4	11,11,12	0.74	0	15,15,17	1.95	4 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	I	1	3,1	14,14,15	0.71	0	17,19,21	1.69	4 (23%)
3	NAG	I	2	3	14,14,15	0.76	0	17,19,21	2.09	7 (41%)
3	BMA	I	3	3	11,11,12	0.91	0	15,15,17	1.23	1 (6%)

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	NAG	G	1	3,1	-	1/6/23/26	0/1/1/1
3	NAG	G	2	3	-	3/6/23/26	0/1/1/1
3	BMA	G	3	3	-	2/2/19/22	0/1/1/1
4	NAG	H	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	H	2	4	-	5/6/23/26	0/1/1/1
4	BMA	H	3	4	-	2/2/19/22	0/1/1/1
4	MAN	H	4	4	-	2/2/19/22	0/1/1/1
3	NAG	I	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	I	2	3	-	2/6/23/26	0/1/1/1
3	BMA	I	3	3	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	1	NAG	C1-O5-C5	5.13	119.06	112.19
4	H	4	MAN	C1-O5-C5	4.93	118.79	112.19
3	G	1	NAG	O7-C7-C8	-4.84	113.43	122.05
4	H	2	NAG	C4-C3-C2	4.62	117.79	111.02
3	I	2	NAG	O5-C1-C2	-4.01	105.09	111.29
4	H	2	NAG	C1-O5-C5	3.87	117.38	112.19
3	G	1	NAG	O7-C7-N2	3.78	128.65	121.98
4	H	2	NAG	O3-C3-C4	-3.70	101.65	110.38
4	H	3	BMA	C3-C4-C5	3.63	116.82	110.23
3	I	2	NAG	C1-C2-N2	-3.58	104.80	110.43
3	G	3	BMA	O5-C5-C4	-3.48	102.36	110.83
4	H	1	NAG	O5-C1-C2	-3.43	105.99	111.29
3	I	1	NAG	O7-C7-N2	3.37	127.93	121.98
3	I	2	NAG	C2-N2-C7	-3.32	118.45	122.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	1	NAG	C4-C3-C2	3.14	115.62	111.02
4	H	3	BMA	O5-C1-C2	-3.01	103.60	110.79
4	H	4	MAN	O5-C5-C6	2.87	113.25	107.66
3	I	1	NAG	O4-C4-C5	2.84	116.31	109.32
4	H	3	BMA	O3-C3-C2	-2.83	104.28	110.05
3	I	2	NAG	O5-C5-C6	2.83	113.17	107.66
4	H	2	NAG	O4-C4-C5	2.76	116.12	109.32
3	G	3	BMA	O5-C5-C6	2.73	112.98	107.66
3	I	2	NAG	C4-C3-C2	2.68	114.94	111.02
3	G	2	NAG	C4-C3-C2	2.68	114.94	111.02
3	I	2	NAG	O5-C5-C4	-2.67	104.33	110.83
4	H	3	BMA	O5-C5-C6	2.63	112.78	107.66
4	H	4	MAN	C1-C2-C3	2.62	113.47	109.64
4	H	4	MAN	C3-C4-C5	2.57	114.90	110.23
3	G	2	NAG	O5-C5-C4	-2.56	104.61	110.83
3	G	2	NAG	O5-C5-C6	2.52	112.56	107.66
4	H	1	NAG	O7-C7-C8	-2.51	117.58	122.05
4	H	2	NAG	O7-C7-C8	-2.48	117.64	122.05
4	H	2	NAG	C2-N2-C7	2.48	126.22	122.90
3	G	2	NAG	O7-C7-C8	-2.47	117.65	122.05
3	I	3	BMA	O2-C2-C1	2.36	114.63	109.22
3	G	1	NAG	C1-C2-N2	2.33	114.10	110.43
3	I	2	NAG	O4-C4-C3	2.29	115.78	110.38
3	I	1	NAG	C4-C3-C2	2.22	114.28	111.02
3	G	1	NAG	O5-C1-C2	-2.11	108.03	111.29
4	H	1	NAG	O7-C7-N2	2.10	125.69	121.98
3	G	1	NAG	C2-N2-C7	2.06	125.66	122.90
3	I	1	NAG	C8-C7-N2	-2.02	112.77	116.12
3	G	1	NAG	O3-C3-C4	-2.01	105.63	110.38

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	2	NAG	C3-C2-N2-C7
3	G	2	NAG	C8-C7-N2-C2
3	G	2	NAG	O7-C7-N2-C2
4	H	2	NAG	C3-C2-N2-C7
4	H	2	NAG	C8-C7-N2-C2
4	H	2	NAG	O7-C7-N2-C2
3	I	2	NAG	C8-C7-N2-C2
3	I	2	NAG	O7-C7-N2-C2

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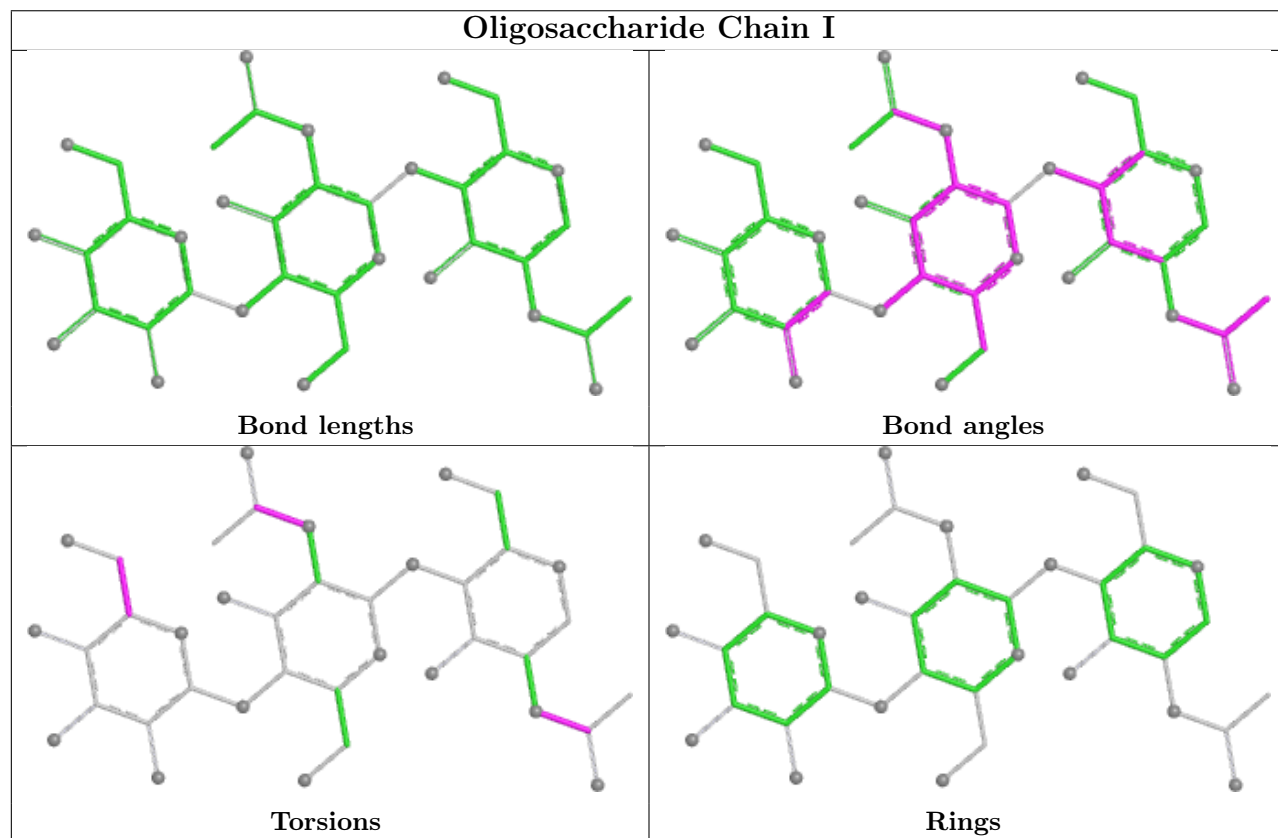
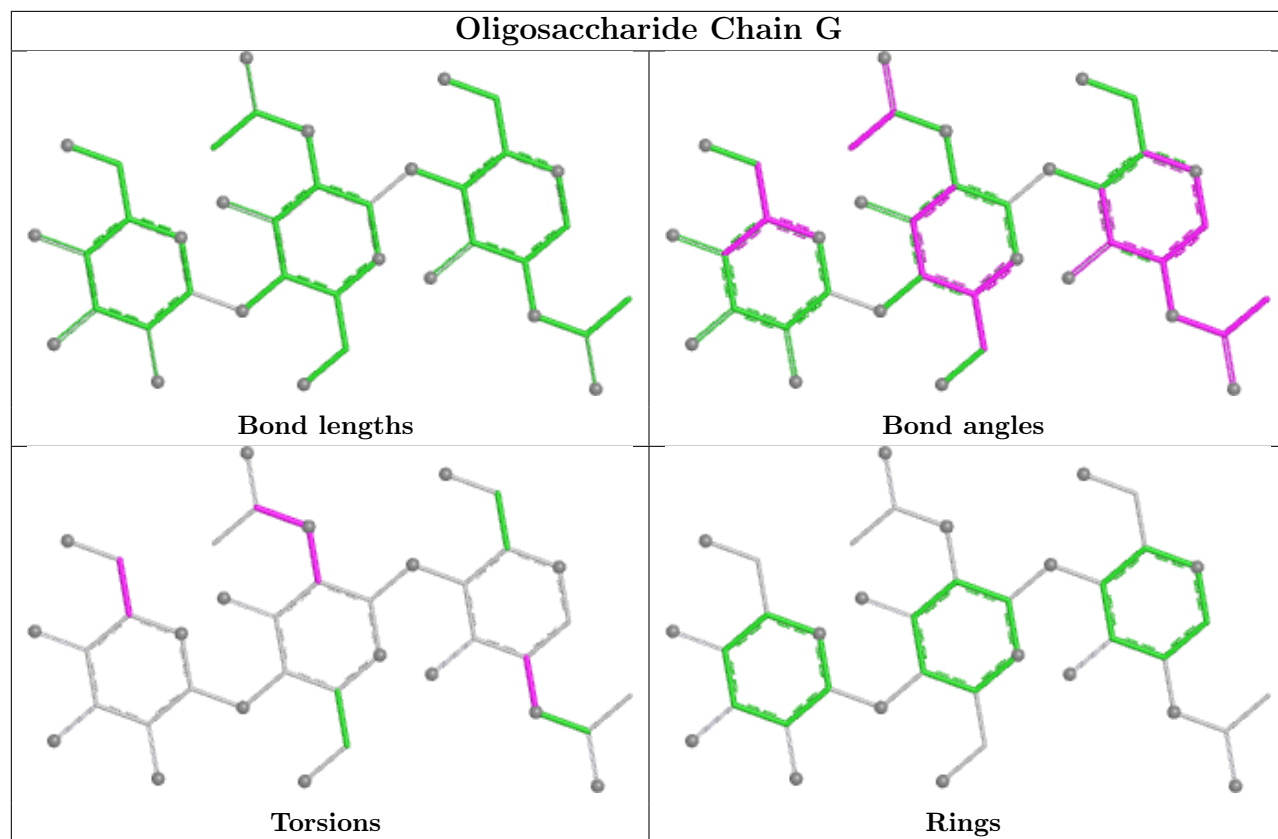
Mol	Chain	Res	Type	Atoms
4	H	4	MAN	O5-C5-C6-O6
3	G	3	BMA	O5-C5-C6-O6
4	H	2	NAG	O5-C5-C6-O6
3	G	3	BMA	C4-C5-C6-O6
4	H	2	NAG	C4-C5-C6-O6
4	H	4	MAN	C4-C5-C6-O6
3	I	3	BMA	O5-C5-C6-O6
4	H	1	NAG	O5-C5-C6-O6
4	H	1	NAG	C4-C5-C6-O6
4	H	3	BMA	C4-C5-C6-O6
3	I	3	BMA	C4-C5-C6-O6
3	I	1	NAG	C8-C7-N2-C2
4	H	3	BMA	O5-C5-C6-O6
3	G	1	NAG	C1-C2-N2-C7
3	I	1	NAG	O7-C7-N2-C2

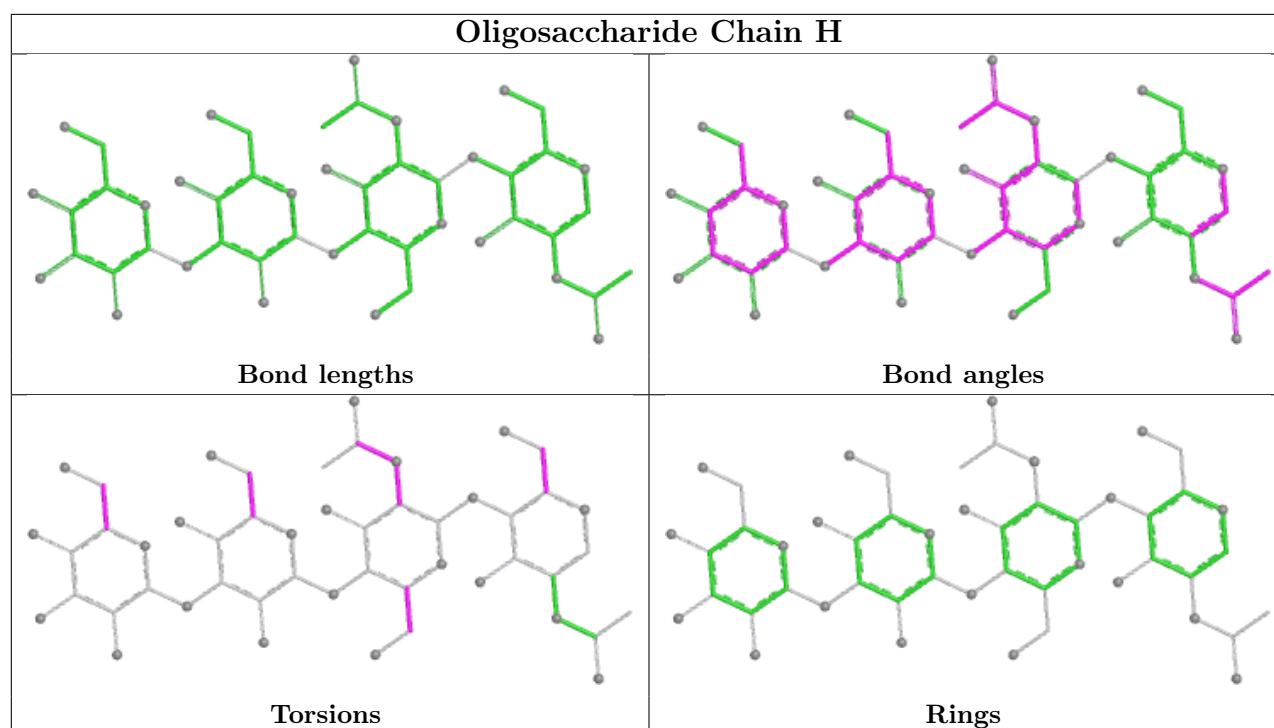
There are no ring outliers.

5 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	I	1	NAG	5	0
4	H	1	NAG	2	0
4	H	2	NAG	2	0
4	H	3	BMA	2	0
3	I	2	NAG	1	0

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





5.6 Ligand geometry [i](#)

7 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
6	PO4	B	301	-	4,4,4	1.07	0	6,6,6	0.53	0
5	NAG	B	183	2	14,14,15	0.56	0	17,19,21	1.53	4 (23%)
5	NAG	A	1	1	14,14,15	1.08	1 (7%)	17,19,21	2.03	6 (35%)
5	NAG	C	330	1	14,14,15	1.09	1 (7%)	17,19,21	2.00	6 (35%)
5	NAG	A	2	1	14,14,15	0.57	0	17,19,21	1.60	3 (17%)
5	NAG	E	330	1	14,14,15	1.49	3 (21%)	17,19,21	2.59	7 (41%)
5	NAG	C	335	1	14,14,15	0.74	0	17,19,21	1.28	2 (11%)

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	183	2	1/1/5/7	3/6/23/26	0/1/1/1
5	NAG	A	1	1	1/1/5/7	2/6/23/26	0/1/1/1
5	NAG	C	330	1	1/1/5/7	4/6/23/26	0/1/1/1
5	NAG	A	2	1	1/1/5/7	4/6/23/26	0/1/1/1
5	NAG	E	330	1	1/1/5/7	4/6/23/26	0/1/1/1
5	NAG	C	335	1	-	2/6/23/26	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	330	NAG	C1-C2	3.44	1.57	1.52
5	A	1	NAG	C1-C2	3.10	1.56	1.52
5	E	330	NAG	C1-C2	2.98	1.56	1.52
5	E	330	NAG	C3-C2	2.52	1.57	1.52
5	E	330	NAG	C2-N2	2.29	1.50	1.46

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	2	NAG	C1-O5-C5	5.23	119.20	112.19
5	E	330	NAG	O5-C1-C2	-4.89	103.72	111.29
5	E	330	NAG	C2-N2-C7	4.74	129.25	122.90
5	A	1	NAG	C1-C2-N2	4.32	117.23	110.43
5	E	330	NAG	O3-C3-C2	4.27	118.28	109.40
5	E	330	NAG	C4-C3-C2	-3.44	105.98	111.02
5	B	183	NAG	C3-C4-C5	3.27	116.16	110.23
5	E	330	NAG	O3-C3-C4	3.21	117.95	110.38
5	C	330	NAG	C1-C2-N2	3.17	115.42	110.43
5	C	330	NAG	O5-C5-C4	-3.08	103.33	110.83
5	A	1	NAG	C1-O5-C5	3.08	116.31	112.19
5	A	1	NAG	O5-C1-C2	-3.07	106.53	111.29
5	C	335	NAG	O5-C5-C4	-3.06	103.38	110.83
5	C	330	NAG	C3-C4-C5	-2.89	104.99	110.23
5	A	1	NAG	O3-C3-C2	2.80	115.23	109.40
5	E	330	NAG	C3-C4-C5	2.72	115.16	110.23
5	B	183	NAG	O4-C4-C3	-2.61	104.23	110.38
5	C	330	NAG	O5-C1-C2	2.59	115.31	111.29
5	B	183	NAG	C4-C3-C2	2.57	114.79	111.02
5	C	330	NAG	C2-N2-C7	-2.47	119.59	122.90
5	C	335	NAG	O5-C5-C6	2.44	112.41	107.66

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1	NAG	O7-C7-C8	-2.36	117.86	122.05
5	A	2	NAG	O5-C1-C2	-2.21	107.86	111.29
5	E	330	NAG	O5-C5-C6	-2.21	103.36	107.66
5	B	183	NAG	C8-C7-N2	2.20	119.77	116.12
5	A	1	NAG	C4-C3-C2	-2.20	107.79	111.02
5	A	2	NAG	O5-C5-C6	2.15	111.85	107.66
5	C	330	NAG	O5-C5-C6	2.13	111.81	107.66

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	A	1	NAG	C1
5	A	2	NAG	C1
5	B	183	NAG	C1
5	C	330	NAG	C1
5	E	330	NAG	C1

All (19) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	2	NAG	C8-C7-N2-C2
5	A	2	NAG	O7-C7-N2-C2
5	B	183	NAG	C1-C2-N2-C7
5	C	330	NAG	C8-C7-N2-C2
5	C	330	NAG	O7-C7-N2-C2
5	C	335	NAG	C8-C7-N2-C2
5	C	335	NAG	O7-C7-N2-C2
5	E	330	NAG	C8-C7-N2-C2
5	E	330	NAG	O7-C7-N2-C2
5	A	1	NAG	O5-C5-C6-O6
5	B	183	NAG	C4-C5-C6-O6
5	A	1	NAG	C4-C5-C6-O6
5	C	330	NAG	C4-C5-C6-O6
5	B	183	NAG	O5-C5-C6-O6
5	C	330	NAG	O5-C5-C6-O6
5	A	2	NAG	C4-C5-C6-O6
5	A	2	NAG	O5-C5-C6-O6
5	E	330	NAG	O5-C5-C6-O6
5	E	330	NAG	C3-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	183	NAG	2	0
5	E	330	NAG	1	0

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	328/335 (97%)	0.70	33 (10%)	12 7	24, 42, 65, 83	6 (1%)
1	C	328/335 (97%)	0.71	28 (8%)	16 8	23, 41, 64, 83	13 (3%)
1	E	328/335 (97%)	0.70	30 (9%)	15 8	21, 41, 64, 83	14 (4%)
2	B	175/182 (96%)	0.43	15 (8%)	16 8	17, 36, 82, 108	4 (2%)
2	D	175/182 (96%)	0.55	18 (10%)	12 6	17, 36, 77, 104	7 (4%)
2	F	175/182 (96%)	0.72	26 (14%)	5 3	20, 36, 76, 104	10 (5%)
All	All	1509/1551 (97%)	0.66	150 (9%)	13 7	17, 40, 66, 108	54 (3%)

All (150) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	11	GLU	5.3
2	F	175	GLY	5.2
2	F	13	GLY	5.1
2	D	7	ALA	5.1
2	F	10	ILE	5.0
2	B	11	GLU	5.0
2	F	9	PHE	4.8
2	D	10	ILE	4.7
1	A	77	ASP	4.6
1	E	116	SER	4.6
2	F	171	GLU	4.5
1	E	264	SER	4.5
2	D	175	GLY	4.4
2	F	7	ALA	4.3
2	B	10	ILE	4.3
2	F	11	GLU	4.3
2	D	15	THR	4.2
1	C	264	SER	4.2
2	B	9	PHE	4.2

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Mol	Chain	Res	Type	RSRZ
2	B	7	ALA	4.2
2	D	9	PHE	4.1
1	E	159	SER	4.0
1	A	159	SER	4.0
1	C	55	GLY	3.9
2	D	13	GLY	3.9
1	C	116	SER	3.8
1	C	133	THR	3.7
2	D	61	THR	3.7
2	F	15	THR	3.7
1	E	77	ASP	3.7
2	F	61	THR	3.6
1	A	264	SER	3.6
2	F	150	GLU	3.5
1	A	52	CYS	3.5
1	E	139	CYS	3.5
2	B	61	THR	3.5
2	B	15	THR	3.4
1	C	159	SER	3.4
2	D	150	GLU	3.4
1	E	158	GLY	3.4
1	C	193	SER	3.4
1	E	239	PRO	3.3
1	E	171	ASN	3.3
1	C	240	GLY	3.3
1	A	277	CYS	3.3
1	C	218	ALA	3.3
2	F	14	TRP	3.2
1	C	78	LEU	3.2
2	D	12	GLY	3.1
2	F	12	GLY	3.1
2	D	164	GLU	3.1
1	A	81	THR	3.1
2	B	12	GLY	3.1
1	E	277	CYS	3.1
1	E	55	GLY	3.1
1	C	52	CYS	3.0
2	D	172	GLU	3.0
1	A	133(A)	LYS	3.0
1	E	133	THR	3.0
1	A	241	ASP	2.9
1	A	78	LEU	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	94	GLU	2.9
1	A	55	GLY	2.9
2	D	14	TRP	2.9
2	F	60	ASN	2.8
1	E	52	CYS	2.8
1	A	304	GLU	2.8
2	F	8	GLY	2.8
2	F	174	ASP	2.8
1	A	279	THR	2.8
2	D	8	GLY	2.7
1	C	216	GLU	2.7
2	B	13	GLY	2.7
1	A	96(A)	THR	2.7
2	F	62	GLN	2.7
1	C	77	ASP	2.6
1	A	10	GLU	2.6
1	E	141	TYR	2.6
1	E	240	GLY	2.6
2	B	175	GLY	2.6
2	D	171	GLU	2.6
1	E	189	THR	2.5
1	A	80	LEU	2.5
2	F	158	ASP	2.5
1	E	78	LEU	2.5
1	C	158	GLY	2.5
1	C	277	CYS	2.5
2	F	67	GLY	2.5
1	C	80	LEU	2.5
1	E	283	THR	2.5
1	C	72	GLY	2.5
1	E	79	LEU	2.4
2	D	62	GLN	2.4
1	C	279	THR	2.4
1	E	304	GLU	2.4
1	A	173	GLY	2.4
2	B	16	GLY	2.4
1	C	79	LEU	2.4
1	C	210	ASN	2.4
1	C	222	LYS	2.4
1	A	72	GLY	2.3
2	F	137	CYS	2.3
2	B	14	TRP	2.3

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Mol	Chain	Res	Type	RSRZ
2	F	63	PHE	2.3
1	A	75	GLU	2.3
2	F	65	ALA	2.3
1	A	312	THR	2.3
1	E	279	THR	2.3
1	C	189	THR	2.3
1	A	193	SER	2.3
2	B	62	GLN	2.3
2	F	4	GLY	2.2
1	A	22	THR	2.2
1	C	125(B)	THR	2.2
1	C	10	GLU	2.2
1	C	304	GLU	2.2
2	F	164	GLU	2.2
1	A	133	THR	2.2
1	E	305	CYS	2.2
2	B	150	GLU	2.2
2	F	172	GLU	2.2
1	C	81	THR	2.2
1	E	90	THR	2.2
1	A	90	THR	2.2
1	A	218	ALA	2.2
2	B	171	GLU	2.2
1	E	208	LYS	2.2
1	A	305	CYS	2.2
1	E	14	CYS	2.2
1	E	145	SER	2.1
1	A	190	ASP	2.1
2	F	146	ASP	2.1
1	A	196	GLN	2.1
1	A	239	PRO	2.1
1	E	10	GLU	2.1
1	C	96(A)	THR	2.1
1	A	210	ASN	2.1
1	C	54(A)	LYS	2.1
1	A	310	ARG	2.1
2	D	29	GLU	2.1
1	A	129	ASN	2.0
1	A	125(B)	THR	2.0
1	E	81	THR	2.0
1	E	96(A)	THR	2.0
1	C	249	GLY	2.0

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Mol	Chain	Res	Type	RSRZ
1	E	54(A)	LYS	2.0
1	E	265	SER	2.0
2	B	8	GLY	2.0
2	D	144	CYS	2.0
2	F	173	ILE	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](#)

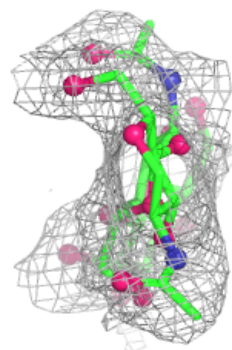
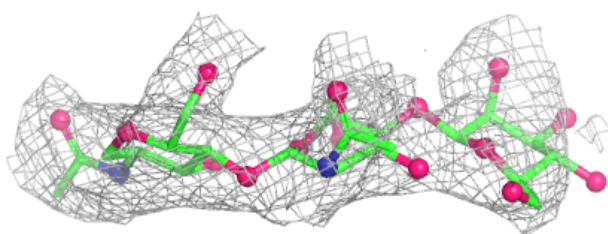
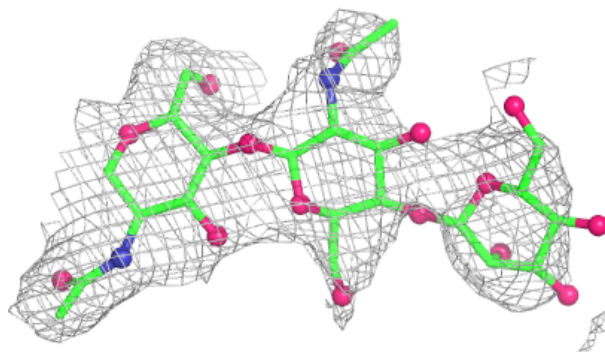
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	MAN	H	4	11/12	0.42	0.26	93,95,98,99	0
4	BMA	H	3	11/12	0.47	0.19	78,81,85,89	0
3	BMA	G	3	11/12	0.51	0.19	91,96,97,98	0
3	BMA	I	3	11/12	0.61	0.20	83,85,89,89	0
4	NAG	H	2	14/15	0.64	0.25	76,84,88,89	0
3	NAG	G	2	14/15	0.73	0.19	71,77,82,89	0
3	NAG	I	2	14/15	0.80	0.17	64,70,73,79	0
3	NAG	G	1	14/15	0.88	0.14	44,45,53,62	0
3	NAG	I	1	14/15	0.91	0.12	41,47,53,56	0
4	NAG	H	1	14/15	0.93	0.12	45,48,54,65	0

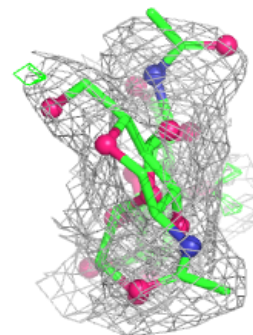
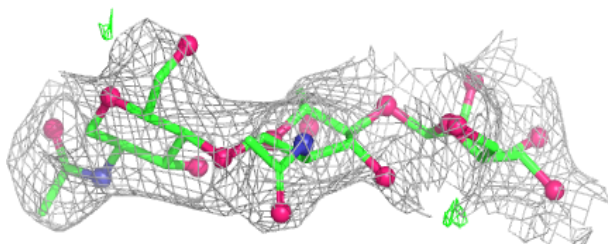
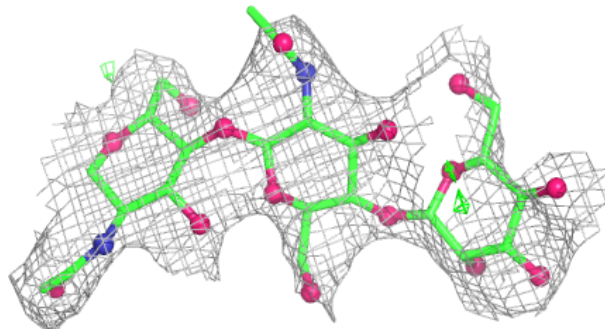
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

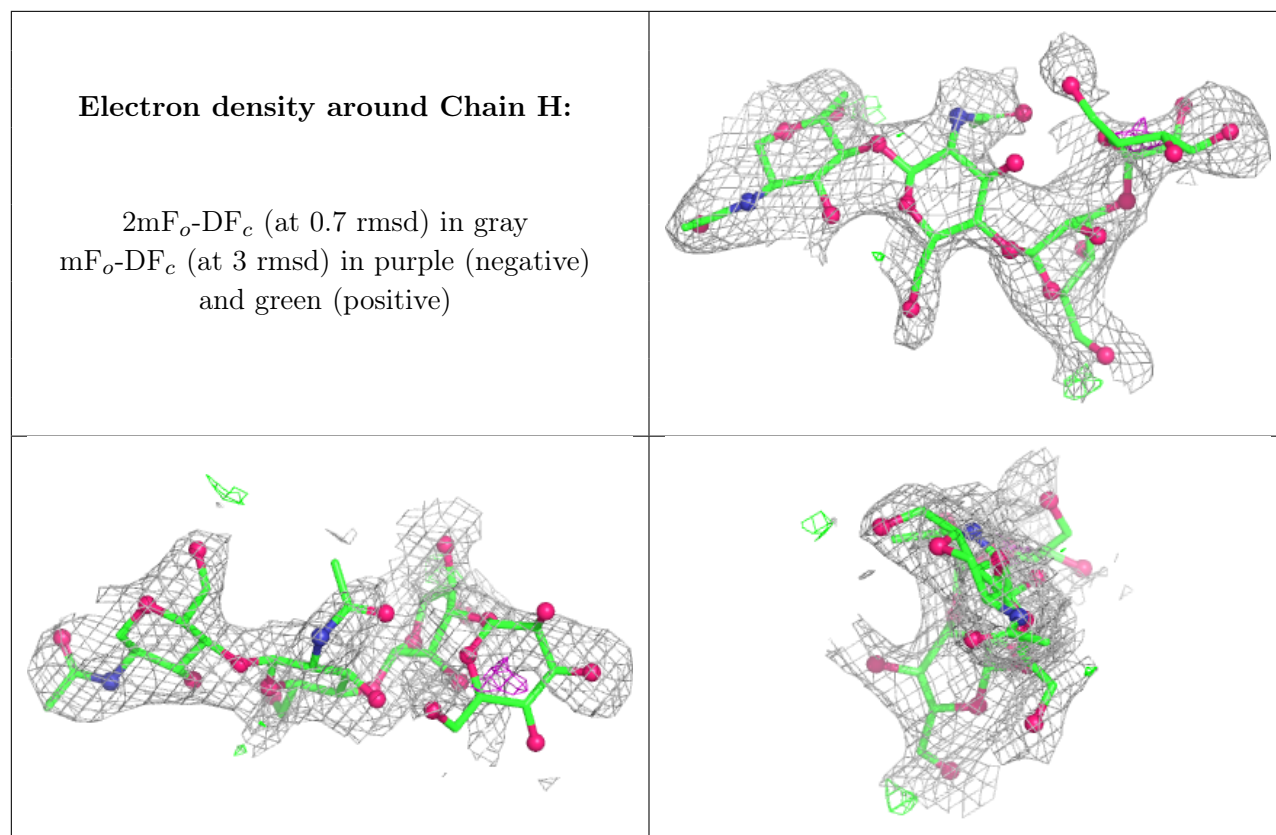
Electron density around Chain G:

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

**Electron density around Chain I:**

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





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	C	335	14/15	0.50	0.29	90,95,95,96	0
5	NAG	E	330	14/15	0.50	0.24	63,66,70,71	0
5	NAG	B	183	14/15	0.63	0.23	74,82,84,86	0
5	NAG	A	2	14/15	0.64	0.23	70,78,79,81	0
5	NAG	C	330	14/15	0.65	0.21	71,76,78,78	0
5	NAG	A	1	14/15	0.71	0.20	71,75,78,78	0
6	PO4	B	301	5/5	0.89	0.12	61,62,63,64	0

6.5 Other polymers [i](#)

There are no such residues in this entry.