



Full wwPDB EM Validation Report ⓘ

Jul 16, 2025 – 01:21 PM JST

PDB ID : 8YW0 / pdb_00008yw0
EMDB ID : EMD-39618
Title : Semliki Forest virus viron
Authors : Wang, J.; Zheng, T.; Yang, D.
Deposited on : 2024-03-29
Resolution : 3.55 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

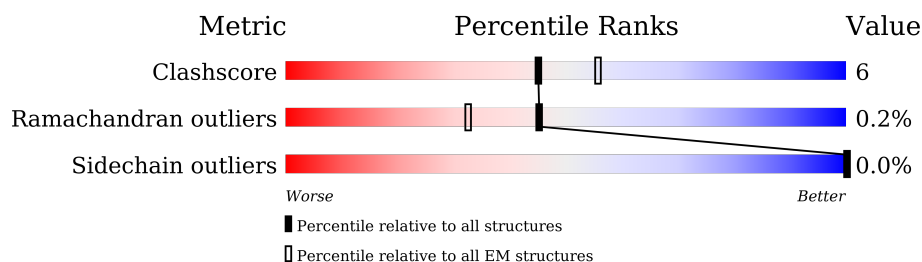
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.55 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.



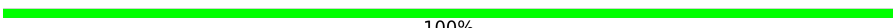
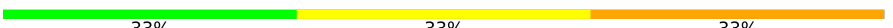
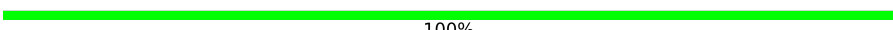
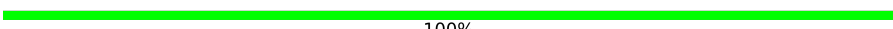
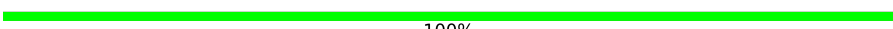
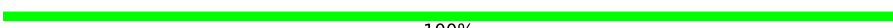
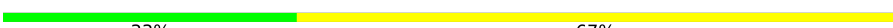
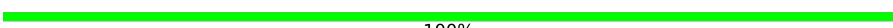
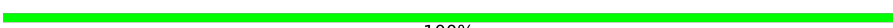
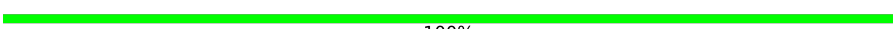
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	438	
1	F	438	
1	G	438	
1	H	438	
2	B	418	
2	I	418	
2	J	418	
2	K	418	
3	C	52	

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Mol	Chain	Length	Quality of chain
3	L	52	 83% 17%
3	M	52	 77% 23%
3	N	52	 79% 21%
4	D	161	 87% 13%
4	O	161	 83% 17%
4	P	161	 85% 15%
4	Q	161	 78% 21% .
5	E	40	 85% 15%
5	R	40	 90% 10%
5	T	40	 92% 8%
6	S	3	 100%
6	U	3	 33% 33% 33%
6	V	3	 100%
6	W	3	 100%
6	X	3	 100%
6	Y	3	 67% 33%
6	Z	3	 100%
6	a	3	 33% 67%
6	b	3	 100%
6	c	3	 100%
6	d	3	 100%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 34264 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Spike glycoprotein E1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	438	Total	C	N	O	S	0	0
			3330	2109	559	637	25		
1	F	438	Total	C	N	O	S	0	0
			3330	2109	559	637	25		
1	G	438	Total	C	N	O	S	0	0
			3330	2109	559	637	25		
1	H	438	Total	C	N	O	S	0	0
			3330	2109	559	637	25		

- Molecule 2 is a protein called Spike glycoprotein E2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	418	Total	C	N	O	S	0	0
			3260	2058	579	598	25		
2	I	418	Total	C	N	O	S	0	0
			3260	2058	579	598	25		
2	J	418	Total	C	N	O	S	0	0
			3260	2058	579	598	25		
2	K	418	Total	C	N	O	S	0	0
			3260	2058	579	598	25		

- Molecule 3 is a protein called Spike glycoprotein E3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	52	Total	C	N	O	S	0	0
			404	252	67	77	8		
3	L	52	Total	C	N	O	S	0	0
			404	252	67	77	8		
3	M	52	Total	C	N	O	S	0	0
			404	252	67	77	8		
3	N	52	Total	C	N	O	S	0	0
			404	252	67	77	8		

- Molecule 4 is a protein called capsid protein, partial.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	161	Total	C	N	O	S	0	0
			1245	779	226	231	9		
4	O	161	Total	C	N	O	S	0	0
			1245	779	226	231	9		
4	P	161	Total	C	N	O	S	0	0
			1245	779	226	231	9		
4	Q	161	Total	C	N	O	S	0	0
			1245	779	226	231	9		

- Molecule 5 is a protein called Very low-density lipoprotein receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	40	Total	C	N	O	S	0	0
			292	170	46	70	6		
5	R	40	Total	C	N	O	S	0	0
			292	170	46	70	6		
5	T	40	Total	C	N	O	S	0	0
			292	170	46	70	6		

- Molecule 6 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				AltConf	Trace
6	S	3	Total	C	N	O	0	0
			39	22	2	15		
6	U	3	Total	C	N	O	0	0
			39	22	2	15		
6	V	3	Total	C	N	O	0	0
			39	22	2	15		
6	W	3	Total	C	N	O	0	0
			39	22	2	15		
6	X	3	Total	C	N	O	0	0
			39	22	2	15		
6	Y	3	Total	C	N	O	0	0
			39	22	2	15		
6	Z	3	Total	C	N	O	0	0
			39	22	2	15		
6	a	3	Total	C	N	O	0	0
			39	22	2	15		

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Mol	Chain	Residues	Atoms				AltConf	Trace
6	b	3	Total	C	N	O	0	0
			39	22	2	15		
6	c	3	Total	C	N	O	0	0
			39	22	2	15		
6	d	3	Total	C	N	O	0	0
			39	22	2	15		

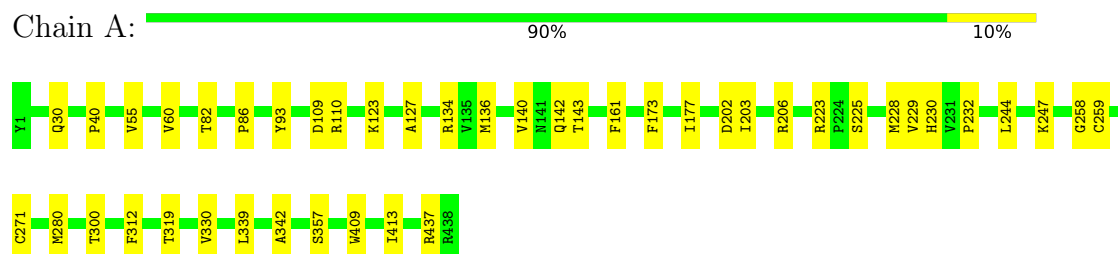
- Molecule 7 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
7	E	1	Total	Ca	0
			1	1	
7	R	1	Total	Ca	0
			1	1	
7	T	1	Total	Ca	0
			1	1	

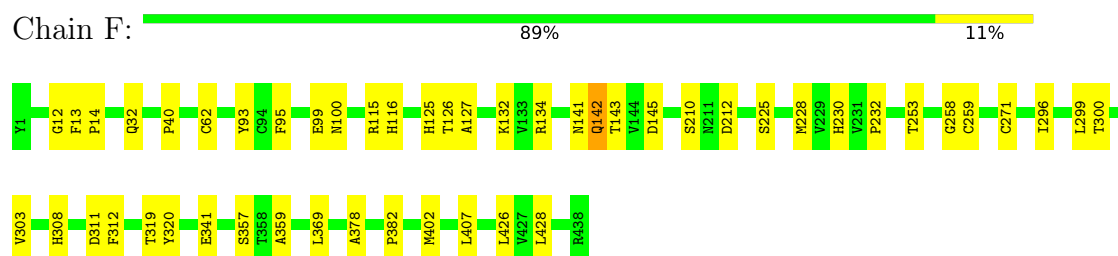
3 Residue-property plots

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. 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. 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.

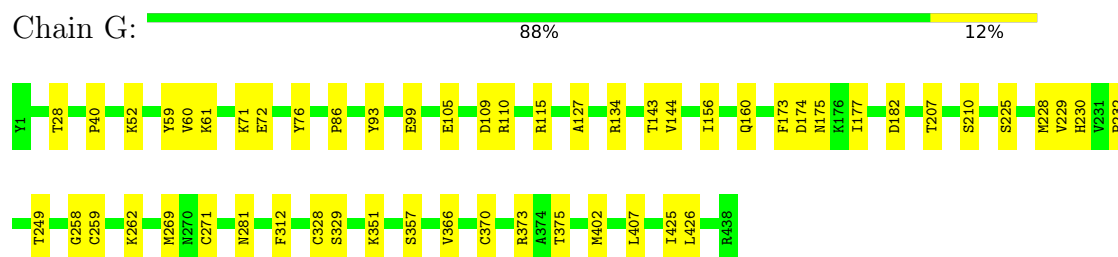
- Molecule 1: Spike glycoprotein E1



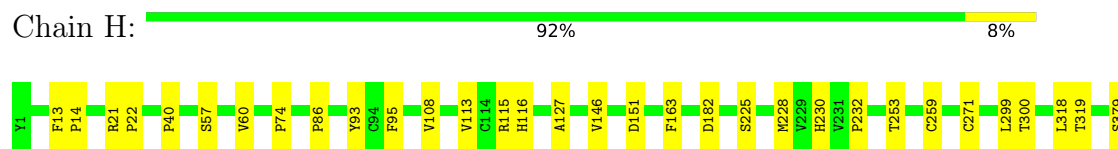
- Molecule 1: Spike glycoprotein E1



- Molecule 1: Spike glycoprotein E1



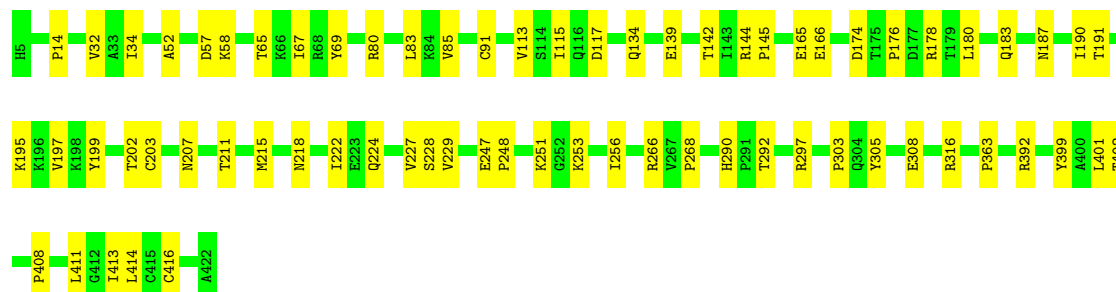
- Molecule 1: Spike glycoprotein E1





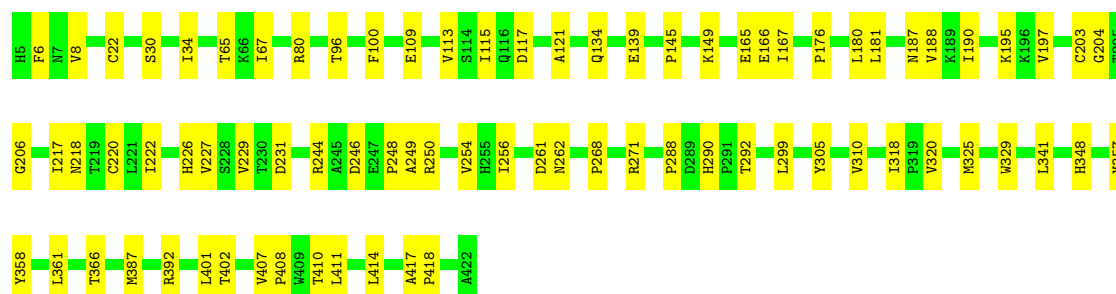
• Molecule 2: Spike glycoprotein E2

Chain B: 83% 17%



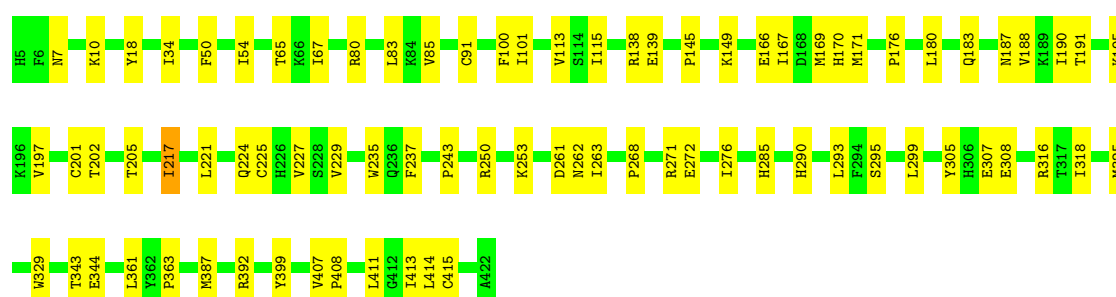
• Molecule 2: Spike glycoprotein E2

Chain I: 81% 19%



• Molecule 2: Spike glycoprotein E2

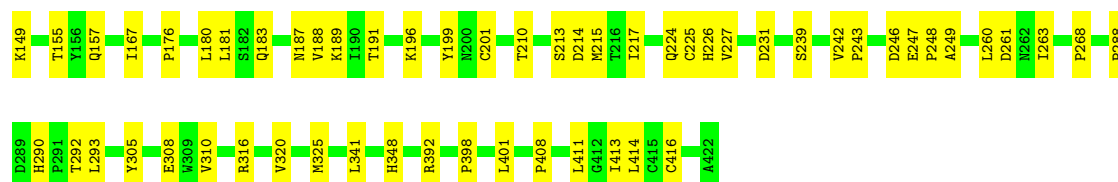
Chain J: 81% 19%



• Molecule 2: Spike glycoprotein E2

Chain K: 78% 22%





- Molecule 3: Spike glycoprotein E3

Chain C: 77% 23%



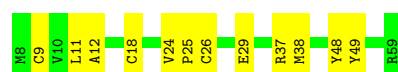
- Molecule 3: Spike glycoprotein E3

Chain L: 83% 17%



- Molecule 3: Spike glycoprotein E3

Chain M: 77% 23%



- Molecule 3: Spike glycoprotein E3

Chain N: 79% 21%



- Molecule 4: capsid protein, partial

Chain D: 87% 13%



- Molecule 4: capsid protein, partial

Chain O: 83% 17%



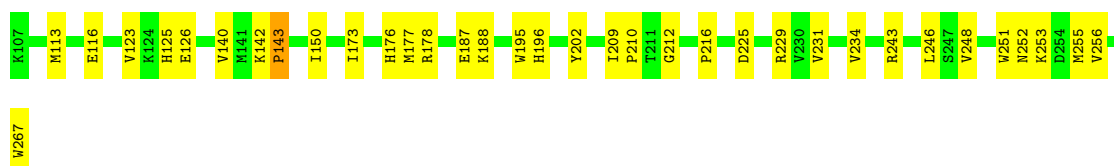
- Molecule 4: capsid protein, partial

Chain P:  85% 15%



- Molecule 4: capsid protein, partial

Chain Q:  78% 21%



- Molecule 5: Very low-density lipoprotein receptor

Chain E:  85% 15%



- Molecule 5: Very low-density lipoprotein receptor

Chain R:  90% 10%



- Molecule 5: Very low-density lipoprotein receptor

Chain T:  92% 8%

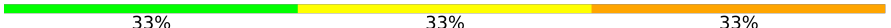


- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S:  100%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U:  33% 33% 33%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain V:  100%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain W:  100%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain X:  100%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Y:  67% 33%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Z:  100%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain a:  33% 67%



- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain b:  100%

HA01
HA02
EM03

- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain c:  100%

HA01
HA02
EM03

- Molecule 6: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain d:  100%

HA01
HA02
EM03

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	28989	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, CA, 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	0.14	0/3416	0.35	0/4660
1	F	0.14	0/3416	0.33	0/4660
1	G	0.12	0/3416	0.30	0/4660
1	H	0.13	0/3416	0.31	0/4660
2	B	0.16	0/3354	0.38	1/4574 (0.0%)
2	I	0.15	0/3354	0.37	0/4574
2	J	0.15	0/3354	0.39	2/4574 (0.0%)
2	K	0.15	0/3354	0.39	0/4574
3	C	0.10	0/413	0.27	0/563
3	L	0.09	0/413	0.31	0/563
3	M	0.08	0/413	0.27	0/563
3	N	0.10	0/413	0.28	0/563
4	D	0.11	0/1273	0.29	0/1714
4	O	0.12	0/1273	0.30	0/1714
4	P	0.10	0/1273	0.27	0/1714
4	Q	0.12	0/1273	0.34	1/1714 (0.1%)
5	E	0.09	0/297	0.34	0/403
5	R	0.11	0/297	0.32	0/403
5	T	0.09	0/297	0.33	0/403
All	All	0.14	0/34715	0.34	4/47253 (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	K	0	1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	363	PRO	CA-N-CD	-6.08	103.49	112.00
2	J	217	ILE	N-CA-C	-5.86	107.10	112.96
4	Q	143	PRO	CA-N-CD	-5.38	104.46	112.00
2	J	363	PRO	CA-N-CD	-5.24	104.66	112.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	K	247	GLU	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	3330	0	3247	27	0
1	F	3330	0	3247	34	0
1	G	3330	0	3248	37	0
1	H	3330	0	3247	24	0
2	B	3260	0	3172	46	0
2	I	3260	0	3172	49	0
2	J	3260	0	3172	55	0
2	K	3260	0	3172	58	0
3	C	404	0	377	8	0
3	L	404	0	377	6	0
3	M	404	0	377	9	0
3	N	404	0	377	6	0
4	D	1245	0	1229	16	0
4	O	1245	0	1229	21	0
4	P	1245	0	1229	16	0
4	Q	1245	0	1229	24	0
5	E	292	0	237	4	0
5	R	292	0	237	3	0
5	T	292	0	237	2	0
6	S	39	0	34	0	0
6	U	39	0	34	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	V	39	0	34	0	0
6	W	39	0	34	0	0
6	X	39	0	34	0	0
6	Y	39	0	34	1	0
6	Z	39	0	34	0	0
6	a	39	0	34	1	0
6	b	39	0	34	0	0
6	c	39	0	34	0	0
6	d	39	0	34	0	0
7	E	1	0	0	0	0
7	R	1	0	0	0	0
7	T	1	0	0	0	0
All	All	34264	0	33186	408	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 (408) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:180:LEU:HD12	2:B:227:VAL:HG11	1.64	0.79
2:K:246:ASP:HB3	2:K:248:PRO:HD2	1.66	0.77
4:Q:140:VAL:HG23	4:Q:173:ILE:HG22	1.66	0.76
4:O:140:VAL:HG23	4:O:173:ILE:HG22	1.68	0.76
2:B:211:THR:HG21	2:B:215:MET:HE2	1.67	0.75
5:R:201:SER:OG	5:R:220:ASP:OD2	2.06	0.74
2:K:392:ARG:HH21	2:K:416:CYS:HA	1.53	0.74
1:A:173:PHE:HB3	1:A:177:ILE:HD11	1.71	0.73
2:J:392:ARG:HG2	2:J:414:LEU:HD12	1.71	0.72
5:E:201:SER:OG	5:E:220:ASP:OD2	2.08	0.71
2:B:203:CYS:SG	2:B:224:GLN:NE2	2.64	0.71
2:J:169:MET:HG3	2:J:235:TRP:HB3	1.73	0.71
1:A:225:SER:HB3	1:A:228:MET:HE2	1.74	0.70
1:F:141:ASN:O	1:F:142:GLN:HB3	1.92	0.70
4:P:140:VAL:HG23	4:P:173:ILE:HG22	1.74	0.69
2:K:180:LEU:HD12	2:K:227:VAL:HG11	1.74	0.69
1:G:173:PHE:HB3	1:G:177:ILE:HD11	1.74	0.68
2:K:138:ARG:HE	2:K:293:LEU:HD23	1.57	0.68
2:B:308:GLU:OE1	2:B:316:ARG:NH1	2.27	0.68
2:K:118:THR:HG23	2:K:119:ARG:HD3	1.75	0.67
2:B:392:ARG:HH21	2:B:416:CYS:HA	1.60	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:261:ASP:OD2	2:I:262:ASN:N	2.28	0.67
5:T:201:SER:OG	5:T:220:ASP:OD2	2.13	0.67
2:J:308:GLU:OE1	2:J:316:ARG:NH1	2.27	0.66
2:J:183:GLN:HG2	2:J:221:LEU:HB3	1.78	0.66
3:M:11:LEU:HD13	3:M:38:MET:HG3	1.76	0.66
2:I:65:THR:O	2:I:80:ARG:N	2.29	0.66
4:D:140:VAL:HG23	4:D:173:ILE:HG22	1.76	0.65
2:J:83:LEU:HB2	2:J:115:ILE:HD12	1.78	0.64
2:K:308:GLU:OE1	2:K:316:ARG:NH1	2.30	0.64
2:B:142:THR:HG21	2:I:109:GLU:HG2	1.78	0.64
1:G:109:ASP:OD1	1:G:110:ARG:N	2.31	0.64
2:K:180:LEU:HB2	2:K:227:VAL:HG21	1.79	0.63
2:B:85:VAL:HG12	2:B:113:VAL:HG12	1.80	0.63
2:I:392:ARG:HG3	2:I:414:LEU:HD21	1.79	0.63
2:J:318:ILE:HD12	2:J:325:MET:HE1	1.82	0.62
4:P:210:PRO:HA	4:P:243:ARG:HE	1.64	0.62
1:F:311:ASP:OD2	1:F:312:PHE:N	2.32	0.62
2:I:166:GLU:OE1	3:L:49:TYR:OH	2.17	0.62
1:A:93:TYR:HB3	2:B:176:PRO:HG3	1.80	0.61
2:J:272:GLU:OE1	2:J:272:GLU:N	2.33	0.61
4:D:188:LYS:HB3	4:D:202:TYR:HE1	1.65	0.61
2:J:85:VAL:HG12	2:J:113:VAL:HG12	1.80	0.61
1:F:253:THR:HG23	2:I:305:TYR:HE1	1.65	0.61
1:H:21:ARG:HG3	1:H:22:PRO:HD2	1.83	0.61
2:B:399:TYR:HE1	4:D:255:MET:HE1	1.64	0.61
1:H:300:THR:OG1	1:H:319:THR:OG1	2.19	0.61
2:B:85:VAL:HG23	2:B:91:CYS:HB2	1.82	0.60
1:G:207:THR:HG22	1:G:210:SER:HB2	1.83	0.60
1:H:259:CYS:HB3	1:H:271:CYS:HA	1.83	0.60
1:G:71:LYS:NZ	1:G:105:GLU:OE2	2.32	0.60
4:Q:188:LYS:NZ	4:Q:251:TRP:O	2.35	0.60
2:K:65:THR:O	2:K:80:ARG:N	2.35	0.59
1:G:259:CYS:HB3	1:G:271:CYS:HA	1.83	0.59
4:O:253:LYS:O	4:O:253:LYS:NZ	2.32	0.59
2:J:65:THR:O	2:J:80:ARG:N	2.36	0.59
2:I:187:ASN:HB3	2:I:218:ASN:HA	1.84	0.59
2:I:318:ILE:HD12	2:I:325:MET:HE1	1.85	0.59
2:I:181:LEU:HB3	2:I:222:ILE:HD11	1.85	0.58
2:K:180:LEU:HD22	2:K:191:THR:HB	1.84	0.58
2:B:165:GLU:HB2	2:B:256:ILE:HG12	1.86	0.58
2:J:408:PRO:HA	2:J:411:LEU:HB3	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:Y:1:NAG:H83	6:Y:1:NAG:H3	1.85	0.58
2:B:197:VAL:HB	2:B:227:VAL:HG13	1.86	0.58
4:Q:188:LYS:HB3	4:Q:202:TYR:HE2	1.68	0.58
1:A:259:CYS:HB3	1:A:271:CYS:HA	1.84	0.58
3:N:38:MET:O	3:N:42:ASN:ND2	2.37	0.58
2:I:250:ARG:HE	3:L:37:ARG:HH12	1.51	0.57
2:J:392:ARG:NH1	2:J:415:CYS:O	2.37	0.57
1:F:259:CYS:HB3	1:F:271:CYS:HA	1.86	0.57
2:J:261:ASP:OD2	2:J:262:ASN:N	2.34	0.57
4:O:209:ILE:HB	4:O:244:THR:HB	1.87	0.57
2:J:85:VAL:HG23	2:J:91:CYS:HB2	1.86	0.57
3:L:11:LEU:HD12	3:L:38:MET:HG3	1.87	0.57
3:M:9:CYS:N	3:M:18:CYS:SG	2.78	0.57
4:O:116:GLU:OE1	4:O:196:HIS:ND1	2.32	0.56
2:B:69:TYR:OH	2:B:117:ASP:OD1	2.22	0.56
2:J:145:PRO:HG3	2:J:268:PRO:HB3	1.85	0.56
4:O:234:VAL:HA	4:O:248:VAL:HG12	1.87	0.56
2:K:413:ILE:HG22	2:K:414:LEU:HD12	1.87	0.56
1:A:82:THR:O	1:A:223:ARG:NH2	2.39	0.56
2:K:401:LEU:HB2	4:Q:256:VAL:HG21	1.88	0.56
2:I:250:ARG:NE	3:L:37:ARG:HH22	2.04	0.56
3:N:9:CYS:N	3:N:18:CYS:SG	2.78	0.56
2:B:166:GLU:OE1	2:B:253:LYS:HE2	2.06	0.56
3:C:9:CYS:N	3:C:18:CYS:SG	2.79	0.55
2:K:34:ILE:HD11	2:K:113:VAL:HG22	1.89	0.55
2:K:408:PRO:HA	2:K:411:LEU:HB3	1.88	0.55
2:I:408:PRO:HA	2:I:411:LEU:HB3	1.89	0.55
3:C:38:MET:O	3:C:42:ASN:ND2	2.40	0.55
1:H:93:TYR:OH	2:K:243:PRO:HG2	2.06	0.55
2:K:398:PRO:HB3	4:Q:255:MET:HE1	1.87	0.55
1:G:93:TYR:HB3	2:J:176:PRO:HG3	1.89	0.55
2:J:7:ASN:O	2:J:10:LYS:NZ	2.37	0.54
4:O:168:LEU:HD13	4:O:249:VAL:HG11	1.88	0.54
2:B:14:PRO:HB3	2:B:52:ALA:HA	1.90	0.54
6:U:2:NAG:H3	6:U:2:NAG:H83	1.87	0.54
1:A:409:TRP:O	1:A:413:ILE:HG12	2.07	0.54
2:B:83:LEU:HB2	2:B:115:ILE:HD12	1.90	0.54
2:I:180:LEU:HD12	2:I:227:VAL:HG11	1.90	0.54
1:F:300:THR:OG1	1:F:319:THR:OG1	2.26	0.54
1:H:60:VAL:HG11	1:H:86:PRO:HG3	1.90	0.54
4:Q:123:VAL:HG12	4:Q:150:ILE:HA	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:413:ILE:HG22	2:B:414:LEU:HD12	1.89	0.53
2:K:85:VAL:HG13	2:K:91:CYS:HB2	1.91	0.53
1:F:95:PHE:HB2	2:I:226:HIS:NE2	2.24	0.53
1:G:115:ARG:HE	6:a:2:NAG:H83	1.74	0.52
1:G:225:SER:H	1:G:230:HIS:HE1	1.57	0.52
1:H:299:LEU:HD11	1:H:318:LEU:HD23	1.91	0.52
1:A:300:THR:HG1	1:A:319:THR:HG1	1.53	0.52
2:I:401:LEU:HB2	4:O:256:VAL:HG21	1.90	0.52
2:J:180:LEU:HD11	2:J:227:VAL:HG11	1.90	0.52
3:C:11:LEU:HD12	3:C:38:MET:HG3	1.91	0.52
1:G:425:ILE:HG12	2:J:387:MET:HE1	1.92	0.52
2:I:244:ARG:HH11	2:I:249:ALA:HB2	1.74	0.52
2:K:57:ASP:OD1	2:K:58:LYS:N	2.33	0.52
4:P:141:MET:HE3	4:P:168:LEU:HD21	1.91	0.52
1:A:330:VAL:HG12	1:A:339:LEU:HD13	1.92	0.52
2:J:100:PHE:HZ	2:J:167:ILE:HD11	1.75	0.52
2:J:180:LEU:HB2	2:J:191:THR:HB	1.92	0.52
2:K:183:GLN:NE2	2:K:187:ASN:O	2.43	0.52
4:Q:210:PRO:HA	4:Q:243:ARG:HE	1.74	0.52
1:H:379:SER:HB3	2:K:348:HIS:CD2	2.45	0.52
2:K:139:GLU:OE1	2:K:290:HIS:NE2	2.35	0.52
2:K:145:PRO:HG3	2:K:268:PRO:HB3	1.91	0.51
2:B:65:THR:O	2:B:80:ARG:N	2.38	0.51
1:F:132:LYS:NZ	1:F:145:ASP:OD1	2.39	0.51
2:I:34:ILE:HD11	2:I:113:VAL:HG22	1.91	0.51
2:J:276:ILE:HD12	2:J:285:HIS:HE2	1.75	0.51
4:Q:234:VAL:HA	4:Q:248:VAL:HG12	1.92	0.51
2:I:341:LEU:HD22	2:I:361:LEU:HD23	1.92	0.51
1:G:262:LYS:HD2	1:G:269:MET:HE2	1.90	0.51
4:O:209:ILE:HD11	4:O:246:LEU:HD11	1.92	0.51
1:A:134:ARG:HG3	1:A:143:THR:HG22	1.91	0.51
1:G:229:VAL:HG11	2:J:243:PRO:HG3	1.93	0.51
1:H:230:HIS:CD2	1:H:232:PRO:HG3	2.46	0.51
2:I:6:PHE:HD2	2:I:8:VAL:HG23	1.75	0.51
2:I:145:PRO:HG3	2:I:268:PRO:HB3	1.93	0.51
4:Q:187:GLU:C	4:Q:188:LYS:HD3	2.36	0.50
2:B:408:PRO:HA	2:B:411:LEU:HB3	1.93	0.50
2:B:202:THR:OG1	2:B:224:GLN:OE1	2.29	0.50
2:I:139:GLU:OE1	2:I:290:HIS:NE2	2.44	0.50
2:I:407:VAL:O	2:I:410:THR:N	2.45	0.50
3:L:9:CYS:N	3:L:18:CYS:SG	2.85	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:225:SER:H	1:G:230:HIS:CE1	2.29	0.50
4:O:202:TYR:HD1	4:O:207:PHE:CE1	2.30	0.50
1:F:12:GLY:HA2	1:F:32:GLN:HE21	1.77	0.50
2:B:247:GLU:HB3	2:B:248:PRO:HD3	1.93	0.49
1:F:210:SER:OG	1:F:212:ASP:OD2	2.29	0.49
4:Q:188:LYS:HB3	4:Q:202:TYR:CE2	2.46	0.49
2:B:139:GLU:OE1	2:B:290:HIS:NE2	2.45	0.49
1:F:225:SER:HB2	1:F:228:MET:HE2	1.92	0.49
4:O:210:PRO:HA	4:O:243:ARG:HE	1.77	0.49
4:P:209:ILE:HG22	4:P:212:GLY:H	1.77	0.49
1:H:253:THR:HG23	2:K:305:TYR:HE1	1.77	0.49
2:I:80:ARG:NH2	2:I:96:THR:OG1	2.37	0.49
4:P:207:PHE:HD2	4:P:248:VAL:HG11	1.78	0.49
1:H:113:VAL:HG22	1:H:116:HIS:HB2	1.93	0.49
2:J:50:PHE:CZ	2:J:101:ILE:HD11	2.47	0.49
1:H:225:SER:H	1:H:230:HIS:CE1	2.30	0.49
2:B:190:ILE:HG21	2:B:197:VAL:HG21	1.93	0.49
2:K:63:ASP:OD1	2:K:64:TYR:N	2.46	0.49
2:J:183:GLN:NE2	2:J:187:ASN:O	2.46	0.49
4:O:195:TRP:CD1	4:O:196:HIS:H	2.31	0.49
2:J:195:LYS:HB3	2:J:229:VAL:HG13	1.95	0.49
4:Q:188:LYS:HD2	4:Q:231:VAL:HG13	1.95	0.48
2:I:67:ILE:HD11	2:I:115:ILE:HD13	1.94	0.48
2:J:188:VAL:HG22	2:J:217:ILE:HG22	1.94	0.48
4:P:189:PRO:O	4:P:193:TYR:OH	2.27	0.48
4:Q:173:ILE:HD11	4:Q:178:ARG:HG2	1.94	0.48
1:A:300:THR:OG1	1:A:319:THR:OG1	2.24	0.48
1:F:428:LEU:HD22	2:I:387:MET:HG3	1.95	0.48
1:G:312:PHE:HA	1:G:357:SER:HB2	1.96	0.48
5:E:223:ASP:OD1	5:E:223:ASP:N	2.46	0.48
4:D:209:ILE:HD11	4:D:246:LEU:HD11	1.96	0.48
1:H:93:TYR:HD1	2:K:176:PRO:HG3	1.79	0.48
1:G:40:PRO:HA	1:G:127:ALA:HA	1.95	0.48
1:H:437:ARG:HA	1:H:437:ARG:HD3	1.75	0.48
2:K:213:SER:OG	2:K:214:ASP:N	2.47	0.48
4:O:209:ILE:HG22	4:O:212:GLY:H	1.79	0.48
2:B:392:ARG:HG3	2:B:414:LEU:HD23	1.96	0.48
1:G:182:ASP:OD2	1:G:182:ASP:N	2.46	0.48
4:O:176:HIS:CE1	4:O:177:MET:HG3	2.49	0.48
2:K:196:LYS:HD3	2:K:231:ASP:HB2	1.96	0.47
2:B:251:LYS:HA	2:B:251:LYS:HD3	1.66	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:308:HIS:HB2	1:F:359:ALA:HA	1.96	0.47
3:C:11:LEU:HB2	3:C:16:PHE:HE1	1.79	0.47
4:O:196:HIS:HD2	4:O:197:HIS:CD2	2.32	0.47
4:P:196:HIS:CD2	4:P:197:HIS:CE1	3.03	0.47
2:B:67:ILE:HD13	2:B:115:ILE:HD13	1.96	0.47
4:D:186:HIS:O	4:D:188:LYS:NZ	2.48	0.47
2:B:195:LYS:HB3	2:B:229:VAL:HG13	1.96	0.47
4:D:173:ILE:HD11	4:D:178:ARG:HG2	1.96	0.47
2:J:399:TYR:CE2	4:P:255:MET:HE1	2.49	0.47
4:D:209:ILE:HG22	4:D:212:GLY:H	1.79	0.47
2:J:149:LYS:HB3	2:J:149:LYS:HE2	1.62	0.47
2:K:181:LEU:HD21	2:K:225:CYS:HB2	1.97	0.47
1:F:230:HIS:CD2	1:F:232:PRO:HG3	2.51	0.46
4:Q:210:PRO:HA	4:Q:243:ARG:NE	2.29	0.46
1:F:225:SER:H	1:F:230:HIS:CE1	2.33	0.46
1:F:382:PRO:HG3	2:I:357:TYR:HE1	1.80	0.46
2:I:134:GLN:HA	2:I:134:GLN:OE1	2.16	0.46
1:F:40:PRO:HA	1:F:127:ALA:HA	1.97	0.46
2:I:149:LYS:HB3	2:I:149:LYS:HE2	1.67	0.46
2:K:138:ARG:NE	2:K:293:LEU:HD23	2.26	0.46
1:F:93:TYR:HB3	2:I:176:PRO:HG3	1.97	0.46
2:K:14:PRO:HB3	2:K:52:ALA:HA	1.98	0.46
2:B:134:GLN:OE1	2:B:134:GLN:HA	2.16	0.46
2:J:253:LYS:HG2	3:M:48:TYR:CE2	2.51	0.46
1:A:258:GLY:HA2	2:B:297:ARG:HH12	1.80	0.46
1:F:259:CYS:HB3	1:F:271:CYS:CA	2.45	0.46
2:I:288:PRO:HG3	2:I:310:VAL:HG12	1.98	0.46
2:B:199:TYR:CE1	2:B:215:MET:HE1	2.50	0.46
2:K:155:THR:O	2:K:260:LEU:HD12	2.16	0.46
2:B:303:PRO:HG2	2:B:305:TYR:CE1	2.51	0.45
1:F:341:GLU:N	1:F:341:GLU:OE1	2.49	0.45
1:G:71:LYS:NZ	1:G:76:TYR:OH	2.48	0.45
2:K:196:LYS:NZ	2:K:210:THR:HG21	2.31	0.45
1:G:249:THR:HG22	2:J:305:TYR:CE2	2.51	0.45
2:B:187:ASN:HB3	2:B:218:ASN:HA	1.96	0.45
2:J:170:HIS:ND1	2:J:171:MET:O	2.46	0.45
2:K:76:GLU:HG2	2:K:77:ASN:H	1.82	0.45
2:K:157:GLN:HE21	2:K:261:ASP:HB3	1.81	0.45
4:Q:209:ILE:HG22	4:Q:212:GLY:H	1.81	0.45
1:G:60:VAL:HG11	1:G:86:PRO:HG2	1.99	0.45
1:H:228:MET:HE1	2:K:18:TYR:CE2	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:253:LYS:HG2	3:M:48:TYR:HE2	1.82	0.45
2:K:290:HIS:O	2:K:292:THR:HG23	2.17	0.45
4:Q:125:HIS:ND1	4:Q:126:GLU:OE1	2.50	0.45
2:K:112:GLN:HB3	2:K:126:ARG:HB3	1.98	0.45
3:N:11:LEU:HD12	3:N:38:MET:HG3	1.98	0.45
4:O:173:ILE:HD11	4:O:178:ARG:HG2	1.99	0.45
1:F:402:MET:HA	1:F:407:LEU:HD12	1.99	0.45
1:G:144:VAL:HG21	1:G:156:ILE:HD11	1.98	0.45
1:F:259:CYS:HB2	1:F:271:CYS:HB2	1.89	0.45
1:F:426:LEU:HD23	1:F:426:LEU:HA	1.87	0.45
2:I:190:ILE:HG21	2:I:197:VAL:HG21	1.99	0.45
2:K:189:LYS:NZ	2:K:214:ASP:HB3	2.32	0.45
4:O:125:HIS:ND1	4:O:126:GLU:OE1	2.50	0.45
5:E:202:THR:HG23	5:E:220:ASP:OD2	2.17	0.45
1:F:299:LEU:HD12	1:F:320:TYR:HB3	1.98	0.45
1:A:230:HIS:CD2	1:A:232:PRO:HG3	2.51	0.44
1:G:28:THR:OG1	1:G:329:SER:HB3	2.17	0.44
1:G:373:ARG:HG3	1:G:373:ARG:HH11	1.82	0.44
2:I:204:GLY:C	2:I:206:GLY:H	2.25	0.44
2:J:250:ARG:NH2	3:M:37:ARG:HH21	2.14	0.44
4:Q:113:MET:HA	4:Q:116:GLU:HB2	1.99	0.44
2:I:165:GLU:HB2	2:I:256:ILE:HG12	1.99	0.44
2:I:246:ASP:N	2:I:246:ASP:OD1	2.47	0.44
1:G:134:ARG:HG3	1:G:143:THR:HG22	2.00	0.44
1:G:402:MET:HA	1:G:407:LEU:HD12	1.99	0.44
2:J:180:LEU:HD21	2:J:227:VAL:HG11	1.98	0.44
4:Q:216:PRO:HA	4:Q:267:TRP:HB3	1.99	0.44
2:J:138:ARG:CZ	2:J:293:LEU:HD23	2.47	0.44
3:N:8:MET:SD	3:N:8:MET:N	2.91	0.44
4:Q:142:LYS:HG2	4:Q:143:PRO:CD	2.47	0.44
1:A:40:PRO:HA	1:A:127:ALA:HA	2.00	0.44
1:A:123:LYS:NZ	1:H:151:ASP:OD2	2.45	0.44
4:O:140:VAL:HG21	4:O:155:LEU:HD22	2.00	0.44
2:B:402:THR:HG22	4:D:251:TRP:HD1	1.82	0.44
3:C:10:VAL:HG13	3:C:45:ARG:HH12	1.83	0.44
2:I:203:CYS:HB2	2:I:220:CYS:HB3	1.88	0.44
2:J:343:THR:OG1	2:J:344:GLU:N	2.50	0.44
6:U:1:NAG:H61	6:U:2:NAG:H82	1.99	0.44
1:A:86:PRO:HB3	1:A:229:VAL:HG22	1.99	0.44
2:B:174:ASP:HB2	2:B:228:SER:HB3	1.98	0.44
2:I:271:ARG:O	2:I:329:TRP:NE1	2.49	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:343:THR:HB	2:J:361:LEU:HD12	1.99	0.44
2:J:399:TYR:HE1	2:J:407:VAL:HG23	1.83	0.44
5:E:207:PRO:HD2	5:E:210:TRP:CE3	2.53	0.44
1:A:312:PHE:HA	1:A:357:SER:HB3	1.98	0.44
1:H:95:PHE:HB2	2:K:226:HIS:CE1	2.53	0.44
2:I:8:VAL:HG11	2:I:254:VAL:HG13	1.99	0.44
2:J:205:THR:OG1	2:J:217:ILE:HD11	2.17	0.44
2:J:413:ILE:HG22	2:J:414:LEU:HD22	2.00	0.44
1:F:303:VAL:HG11	1:F:378:ALA:HB2	2.00	0.44
1:H:93:TYR:CD1	2:K:176:PRO:HG3	2.52	0.44
4:Q:195:TRP:CD1	4:Q:196:HIS:H	2.35	0.44
4:D:122:GLU:OE2	4:D:124:LYS:NZ	2.51	0.43
1:G:59:TYR:CE2	1:G:61:LYS:HB2	2.53	0.43
2:I:117:ASP:N	2:I:121:ALA:O	2.50	0.43
2:J:308:GLU:CD	2:J:316:ARG:HH12	2.25	0.43
4:D:188:LYS:HB3	4:D:202:TYR:CE1	2.49	0.43
1:G:160:GLN:HB2	1:G:281:ASN:HB3	2.00	0.43
1:H:40:PRO:HA	1:H:127:ALA:HA	2.01	0.43
2:I:417:ALA:HB3	2:I:418:PRO:HD3	2.00	0.43
3:C:8:MET:N	3:C:8:MET:SD	2.91	0.43
2:K:341:LEU:HD23	2:K:341:LEU:HA	1.90	0.43
2:B:290:HIS:O	2:B:292:THR:HG23	2.17	0.43
2:B:399:TYR:CE1	4:D:255:MET:HE1	2.50	0.43
1:F:115:ARG:HH21	1:F:116:HIS:HE2	1.66	0.43
1:H:57:SER:OG	2:K:239:SER:O	2.28	0.43
2:I:188:VAL:HG22	2:I:217:ILE:HG22	2.00	0.43
2:J:271:ARG:O	2:J:329:TRP:NE1	2.51	0.43
2:J:295:SER:HB3	2:J:307:GLU:HG3	1.99	0.43
2:J:316:ARG:HA	2:J:316:ARG:HD3	1.84	0.43
2:B:180:LEU:HD22	2:B:191:THR:HB	2.01	0.43
1:F:62:CYS:HB2	1:F:100:ASN:OD1	2.19	0.43
1:G:72:GLU:O	1:G:72:GLU:HG2	2.18	0.43
2:J:201:CYS:HB2	2:J:225:CYS:HA	2.00	0.43
2:K:56:ILE:HG21	2:K:68:ARG:HH21	1.84	0.43
2:K:80:ARG:NH2	2:K:96:THR:OG1	2.48	0.43
1:A:161:PHE:CE1	1:A:280:MET:HG2	2.53	0.43
2:B:34:ILE:HD11	2:B:113:VAL:HG22	1.99	0.43
4:D:253:LYS:HA	4:D:253:LYS:HD2	1.86	0.43
2:J:197:VAL:HB	2:J:227:VAL:HG13	1.99	0.43
2:K:72:GLY:O	2:K:73:HIS:ND1	2.52	0.43
2:K:100:PHE:HZ	2:K:167:ILE:HD11	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:99:GLU:OE2	1:F:99:GLU:N	2.52	0.43
1:H:115:ARG:HG3	1:H:116:HIS:CD2	2.54	0.43
1:H:146:VAL:HG11	1:H:163:PHE:CD1	2.54	0.43
2:I:22:CYS:SG	2:I:30:SER:OG	2.72	0.43
3:M:24:VAL:HA	3:M:25:PRO:HA	1.86	0.43
3:N:26:CYS:HB3	3:N:29:GLU:HB2	1.99	0.43
2:K:288:PRO:HG3	2:K:310:VAL:HG12	2.00	0.43
2:K:293:LEU:HD12	2:K:308:GLU:O	2.18	0.43
4:Q:176:HIS:NE2	4:Q:177:MET:HE1	2.33	0.43
2:B:401:LEU:HB2	4:D:256:VAL:HG21	2.01	0.43
1:G:228:MET:HE1	2:J:18:TYR:CE2	2.53	0.43
2:I:100:PHE:HZ	2:I:167:ILE:HD11	1.83	0.43
4:P:196:HIS:HD2	4:P:197:HIS:CE1	2.37	0.43
1:F:230:HIS:NE2	1:F:232:PRO:HG3	2.34	0.42
2:J:139:GLU:OE1	2:J:290:HIS:NE2	2.52	0.42
2:K:69:TYR:OH	2:K:117:ASP:OD1	2.21	0.42
2:K:242:VAL:HA	2:K:243:PRO:HD3	1.87	0.42
4:D:120:ILE:HG23	4:D:132:TYR:HB3	2.01	0.42
1:F:13:PHE:HA	1:F:14:PRO:HD3	1.91	0.42
2:K:201:CYS:HA	2:K:224:GLN:HG3	2.02	0.42
1:G:72:GLU:OE1	1:G:72:GLU:N	2.46	0.42
1:G:351:LYS:HE3	1:G:351:LYS:HB3	1.78	0.42
1:H:13:PHE:HA	1:H:14:PRO:HD3	1.91	0.42
2:I:290:HIS:O	2:I:292:THR:HG23	2.19	0.42
4:Q:209:ILE:HD11	4:Q:246:LEU:HD11	2.02	0.42
1:A:136:MET:HA	1:A:140:VAL:O	2.20	0.42
1:F:134:ARG:HG3	1:F:143:THR:HG22	2.01	0.42
2:K:47:LYS:HA	2:K:101:ILE:O	2.20	0.42
5:T:223:ASP:OD1	5:T:223:ASP:N	2.50	0.42
1:A:244:LEU:HD23	1:A:244:LEU:HA	1.91	0.42
1:G:426:LEU:HD23	1:G:426:LEU:HA	1.87	0.42
2:K:87:THR:HG21	2:K:105:CYS:HB3	2.01	0.42
2:K:199:TYR:CE1	2:K:215:MET:HE1	2.54	0.42
4:O:141:MET:SD	4:O:251:TRP:HZ2	2.43	0.42
1:A:244:LEU:O	1:A:247:LYS:NZ	2.51	0.42
2:B:203:CYS:O	2:B:207:ASN:ND2	2.52	0.42
4:D:219:SER:OG	4:D:267:TRP:O	2.36	0.42
1:F:312:PHE:HA	1:F:357:SER:HB2	2.01	0.42
5:R:223:ASP:OD1	5:R:223:ASP:N	2.53	0.42
1:A:60:VAL:HG11	1:A:86:PRO:HG2	2.02	0.42
2:B:145:PRO:HG3	2:B:268:PRO:HB3	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:125:HIS:ND1	1:F:126:THR:HG22	2.35	0.42
1:G:230:HIS:CD2	1:G:232:PRO:HG3	2.55	0.42
2:I:402:THR:HG22	4:O:251:TRP:HD1	1.85	0.42
3:N:27:CYS:O	3:N:35:THR:OG1	2.38	0.42
4:O:207:PHE:HB2	4:O:246:LEU:HB2	2.01	0.42
4:P:225:ASP:N	4:P:229:ARG:O	2.46	0.42
2:B:178:ARG:NH2	2:B:222:ILE:O	2.45	0.41
1:G:328:CYS:HB3	1:G:370:CYS:H	1.85	0.41
3:M:26:CYS:HB3	3:M:29:GLU:HB2	2.02	0.41
1:G:366:VAL:HG22	1:G:375:THR:HG22	2.02	0.41
1:H:182:ASP:N	1:H:182:ASP:OD1	2.53	0.41
2:I:248:PRO:HG2	2:I:250:ARG:HH12	1.85	0.41
4:P:132:TYR:HE2	4:P:221:ARG:NH2	2.18	0.41
4:P:210:PRO:HA	4:P:243:ARG:NE	2.33	0.41
4:Q:225:ASP:N	4:Q:229:ARG:O	2.51	0.41
1:A:202:ASP:OD1	1:A:203:ILE:N	2.53	0.41
1:H:74:PRO:HG2	1:H:108:VAL:O	2.20	0.41
2:I:320:VAL:HG23	2:I:325:MET:HG3	2.02	0.41
2:J:34:ILE:HD11	2:J:113:VAL:HG22	2.01	0.41
2:J:190:ILE:HG21	2:J:197:VAL:HG21	2.01	0.41
2:K:188:VAL:HG22	2:K:217:ILE:HG22	2.02	0.41
1:G:52:LYS:HE2	1:G:52:LYS:HB3	1.85	0.41
2:J:166:GLU:OE1	3:M:49:TYR:OH	2.38	0.41
4:O:176:HIS:ND1	4:O:177:MET:HG3	2.34	0.41
1:G:258:GLY:HA3	2:J:299:LEU:HB2	2.02	0.41
2:B:183:GLN:HB2	2:B:222:ILE:HG23	2.01	0.41
4:D:210:PRO:HA	4:D:243:ARG:NE	2.36	0.41
2:I:358:TYR:O	2:I:366:THR:OG1	2.33	0.41
2:K:189:LYS:HD2	2:K:189:LYS:HA	1.91	0.41
4:P:124:LYS:HD3	4:P:124:LYS:HA	1.76	0.41
1:A:206:ARG:HA	1:A:206:ARG:HD3	1.83	0.41
1:F:258:GLY:HA3	2:I:299:LEU:HB2	2.02	0.41
2:I:195:LYS:HD2	2:I:229:VAL:HG21	2.03	0.41
2:K:149:LYS:HB3	2:K:149:LYS:HE2	1.66	0.41
3:M:38:MET:HE2	3:M:38:MET:HB3	1.84	0.41
5:R:202:THR:HG23	5:R:220:ASP:OD2	2.20	0.41
2:B:32:VAL:HG12	2:B:32:VAL:O	2.21	0.41
1:G:174:ASP:OD2	1:G:175:ASN:N	2.48	0.41
4:P:176:HIS:CE1	4:P:177:MET:HG3	2.56	0.41
4:Q:252:ASN:OD1	4:Q:253:LYS:N	2.48	0.41
1:A:437:ARG:HD3	1:A:437:ARG:HA	1.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:11:LEU:O	3:C:13:ASN:N	2.54	0.41
4:Q:252:ASN:CG	4:Q:253:LYS:H	2.28	0.41
1:A:55:VAL:HG13	1:A:55:VAL:O	2.22	0.40
2:J:167:ILE:HG23	2:J:237:PHE:HE2	1.86	0.40
2:J:202:THR:H	2:J:224:GLN:HG3	1.85	0.40
1:A:30:GLN:HE21	1:A:342:ALA:HB2	1.86	0.40
2:B:144:ARG:HH12	2:B:266:ARG:HH21	1.69	0.40
1:G:99:GLU:H	1:G:99:GLU:CD	2.29	0.40
3:L:53:GLN:O	3:L:57:THR:OG1	2.30	0.40
4:P:183:LYS:HD2	4:P:229:ARG:HG2	2.03	0.40
1:A:109:ASP:OD1	1:A:110:ARG:N	2.55	0.40
2:B:57:ASP:CG	2:B:58:LYS:H	2.29	0.40
2:J:54:ILE:HG22	2:J:67:ILE:HB	2.03	0.40
2:K:320:VAL:HG12	2:K:325:MET:CG	2.52	0.40
3:C:37:ARG:HA	3:C:37:ARG:HD2	1.90	0.40
1:F:296:ILE:HG21	1:F:369:LEU:HD23	2.04	0.40
2:K:32:VAL:HG12	2:K:32:VAL:O	2.21	0.40
4:P:161:LYS:HE2	4:P:161:LYS:HB2	1.82	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 PDB entries followed by that with respect to all EM entries.

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	436/438 (100%)	416 (95%)	19 (4%)	1 (0%)	44	74
1	F	436/438 (100%)	413 (95%)	22 (5%)	1 (0%)	44	74
1	G	436/438 (100%)	415 (95%)	21 (5%)	0	100	100
1	H	436/438 (100%)	413 (95%)	23 (5%)	0	100	100
2	B	416/418 (100%)	375 (90%)	41 (10%)	0	100	100
2	I	416/418 (100%)	370 (89%)	45 (11%)	1 (0%)	44	74

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	J	416/418 (100%)	376 (90%)	39 (9%)	1 (0%)	44	74
2	K	416/418 (100%)	370 (89%)	44 (11%)	2 (0%)	25	59
3	C	50/52 (96%)	48 (96%)	1 (2%)	1 (2%)	6	34
3	L	50/52 (96%)	48 (96%)	1 (2%)	1 (2%)	6	34
3	M	50/52 (96%)	47 (94%)	2 (4%)	1 (2%)	6	34
3	N	50/52 (96%)	48 (96%)	1 (2%)	1 (2%)	6	34
4	D	159/161 (99%)	155 (98%)	4 (2%)	0	100	100
4	O	159/161 (99%)	157 (99%)	2 (1%)	0	100	100
4	P	159/161 (99%)	157 (99%)	2 (1%)	0	100	100
4	Q	159/161 (99%)	156 (98%)	3 (2%)	0	100	100
5	E	38/40 (95%)	38 (100%)	0	0	100	100
5	R	38/40 (95%)	38 (100%)	0	0	100	100
5	T	38/40 (95%)	38 (100%)	0	0	100	100
All	All	4358/4396 (99%)	4078 (94%)	270 (6%)	10 (0%)	45	74

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	142	GLN
1	F	142	GLN
2	J	263	ILE
2	K	263	ILE
3	C	12	ALA
3	M	12	ALA
3	L	12	ALA
3	N	12	ALA
2	I	231	ASP
2	K	249	ALA

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 PDB entries followed by that with respect to all EM entries.

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	372/372 (100%)	372 (100%)	0	100	100
1	F	372/372 (100%)	372 (100%)	0	100	100
1	G	372/372 (100%)	372 (100%)	0	100	100
1	H	372/372 (100%)	372 (100%)	0	100	100
2	B	356/356 (100%)	356 (100%)	0	100	100
2	I	356/356 (100%)	355 (100%)	1 (0%)	91	96
2	J	356/356 (100%)	356 (100%)	0	100	100
2	K	356/356 (100%)	356 (100%)	0	100	100
3	C	45/45 (100%)	45 (100%)	0	100	100
3	L	45/45 (100%)	45 (100%)	0	100	100
3	M	45/45 (100%)	45 (100%)	0	100	100
3	N	45/45 (100%)	45 (100%)	0	100	100
4	D	132/132 (100%)	132 (100%)	0	100	100
4	O	132/132 (100%)	132 (100%)	0	100	100
4	P	132/132 (100%)	132 (100%)	0	100	100
4	Q	132/132 (100%)	132 (100%)	0	100	100
5	E	36/36 (100%)	36 (100%)	0	100	100
5	R	36/36 (100%)	36 (100%)	0	100	100
5	T	36/36 (100%)	36 (100%)	0	100	100
All	All	3728/3728 (100%)	3727 (100%)	1 (0%)	100	100

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

Mol	Chain	Res	Type
2	I	348	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	30	GLN
1	A	331	HIS
2	B	62	HIS
2	B	184	GLN
4	D	186	HIS
1	F	32	GLN

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Mol	Chain	Res	Type
1	F	43	ASN
1	F	152	HIS
1	F	230	HIS
1	G	3	HIS
1	G	230	HIS
1	G	235	GLN
1	G	340	GLN
1	G	355	HIS
1	H	18	HIS
1	H	152	HIS
1	H	340	GLN
2	I	130	HIS
2	J	62	HIS
2	J	277	HIS
2	J	306	HIS
2	K	120	ASN
2	K	131	HIS
2	K	232	HIS
2	K	340	GLN
2	K	348	HIS
2	K	352	HIS
3	L	13	ASN
3	M	13	ASN
3	N	13	ASN
4	O	197	HIS
4	P	194	ASN
4	P	196	HIS
4	Q	192	HIS
4	Q	194	ASN
4	Q	196	HIS

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 ⓘ

33 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	$\# Z > 2$
6	NAG	S	1	1,6	14,14,15	0.26	0	17,19,21	0.47	0
6	NAG	S	2	6	14,14,15	0.22	0	17,19,21	0.39	0
6	BMA	S	3	6	11,11,12	0.61	0	15,15,17	0.79	0
6	NAG	U	1	2,6	14,14,15	0.22	0	17,19,21	0.51	0
6	NAG	U	2	6	14,14,15	0.39	0	17,19,21	1.27	2 (11%)
6	BMA	U	3	6	11,11,12	0.54	0	15,15,17	0.81	0
6	NAG	V	1	2,6	14,14,15	0.21	0	17,19,21	0.39	0
6	NAG	V	2	6	14,14,15	0.24	0	17,19,21	0.46	0
6	BMA	V	3	6	11,11,12	0.60	0	15,15,17	0.75	0
6	NAG	W	1	1,6	14,14,15	0.22	0	17,19,21	0.56	0
6	NAG	W	2	6	14,14,15	0.22	0	17,19,21	0.40	0
6	BMA	W	3	6	11,11,12	0.60	0	15,15,17	0.77	0
6	NAG	X	1	1,6	14,14,15	0.23	0	17,19,21	0.51	0
6	NAG	X	2	6	14,14,15	0.25	0	17,19,21	0.43	0
6	BMA	X	3	6	11,11,12	0.61	0	15,15,17	0.74	0
6	NAG	Y	1	2,6	14,14,15	0.43	0	17,19,21	1.24	1 (5%)
6	NAG	Y	2	6	14,14,15	0.21	0	17,19,21	0.46	0
6	BMA	Y	3	6	11,11,12	0.59	0	15,15,17	0.72	0
6	NAG	Z	1	2,6	14,14,15	0.19	0	17,19,21	0.41	0
6	NAG	Z	2	6	14,14,15	0.19	0	17,19,21	0.42	0
6	BMA	Z	3	6	11,11,12	0.60	0	15,15,17	0.70	0
6	NAG	a	1	2,6	14,14,15	0.57	1 (7%)	17,19,21	0.72	0
6	NAG	a	2	6	14,14,15	0.24	0	17,19,21	0.60	0
6	BMA	a	3	6	11,11,12	0.59	0	15,15,17	0.93	0
6	NAG	b	1	2,6	14,14,15	0.19	0	17,19,21	0.57	0
6	NAG	b	2	6	14,14,15	0.20	0	17,19,21	0.43	0
6	BMA	b	3	6	11,11,12	0.58	0	15,15,17	0.71	0
6	NAG	c	1	2,6	14,14,15	0.23	0	17,19,21	0.48	0
6	NAG	c	2	6	14,14,15	0.19	0	17,19,21	0.40	0
6	BMA	c	3	6	11,11,12	0.60	0	15,15,17	0.80	0
6	NAG	d	1	2,6	14,14,15	0.18	0	17,19,21	0.44	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	NAG	d	2	6	14,14,15	0.20	0	17,19,21	0.45	0
6	BMA	d	3	6	11,11,12	0.61	0	15,15,17	0.81	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	S	1	1,6	-	0/6/23/26	0/1/1/1
6	NAG	S	2	6	-	0/6/23/26	0/1/1/1
6	BMA	S	3	6	-	1/2/19/22	0/1/1/1
6	NAG	U	1	2,6	-	4/6/23/26	0/1/1/1
6	NAG	U	2	6	-	4/6/23/26	0/1/1/1
6	BMA	U	3	6	-	1/2/19/22	0/1/1/1
6	NAG	V	1	2,6	-	2/6/23/26	0/1/1/1
6	NAG	V	2	6	-	2/6/23/26	0/1/1/1
6	BMA	V	3	6	-	0/2/19/22	0/1/1/1
6	NAG	W	1	1,6	-	0/6/23/26	0/1/1/1
6	NAG	W	2	6	-	2/6/23/26	0/1/1/1
6	BMA	W	3	6	-	1/2/19/22	0/1/1/1
6	NAG	X	1	1,6	-	0/6/23/26	0/1/1/1
6	NAG	X	2	6	-	4/6/23/26	0/1/1/1
6	BMA	X	3	6	-	1/2/19/22	0/1/1/1
6	NAG	Y	1	2,6	-	5/6/23/26	0/1/1/1
6	NAG	Y	2	6	-	2/6/23/26	0/1/1/1
6	BMA	Y	3	6	-	0/2/19/22	0/1/1/1
6	NAG	Z	1	2,6	-	0/6/23/26	0/1/1/1
6	NAG	Z	2	6	-	2/6/23/26	0/1/1/1
6	BMA	Z	3	6	-	1/2/19/22	0/1/1/1
6	NAG	a	1	2,6	-	3/6/23/26	0/1/1/1
6	NAG	a	2	6	-	0/6/23/26	0/1/1/1
6	BMA	a	3	6	-	1/2/19/22	0/1/1/1
6	NAG	b	1	2,6	-	3/6/23/26	0/1/1/1
6	NAG	b	2	6	-	1/6/23/26	0/1/1/1
6	BMA	b	3	6	-	0/2/19/22	0/1/1/1
6	NAG	c	1	2,6	-	3/6/23/26	0/1/1/1
6	NAG	c	2	6	-	1/6/23/26	0/1/1/1
6	BMA	c	3	6	-	0/2/19/22	0/1/1/1
6	NAG	d	1	2,6	-	4/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	d	2	6	-	3/6/23/26	0/1/1/1
6	BMA	d	3	6	-	1/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	a	1	NAG	O5-C1	-2.01	1.40	1.43

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	U	2	NAG	C2-N2-C7	4.35	129.10	122.90
6	Y	1	NAG	C2-N2-C7	4.26	128.97	122.90
6	U	2	NAG	C1-C2-N2	2.08	114.04	110.49

There are no chirality outliers.

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	b	1	NAG	O5-C5-C6-O6
6	X	2	NAG	O5-C5-C6-O6
6	a	1	NAG	O5-C5-C6-O6
6	Y	1	NAG	O5-C5-C6-O6
6	Y	2	NAG	O5-C5-C6-O6
6	b	1	NAG	C4-C5-C6-O6
6	X	2	NAG	C4-C5-C6-O6
6	Y	1	NAG	C4-C5-C6-O6
6	U	1	NAG	C8-C7-N2-C2
6	U	1	NAG	O7-C7-N2-C2
6	U	2	NAG	C8-C7-N2-C2
6	U	2	NAG	O7-C7-N2-C2
6	X	2	NAG	C8-C7-N2-C2
6	X	2	NAG	O7-C7-N2-C2
6	Y	1	NAG	C8-C7-N2-C2
6	Y	1	NAG	O7-C7-N2-C2
6	Z	2	NAG	C8-C7-N2-C2
6	Z	2	NAG	O7-C7-N2-C2
6	c	1	NAG	C8-C7-N2-C2
6	c	1	NAG	O7-C7-N2-C2
6	d	1	NAG	C8-C7-N2-C2
6	d	1	NAG	O7-C7-N2-C2

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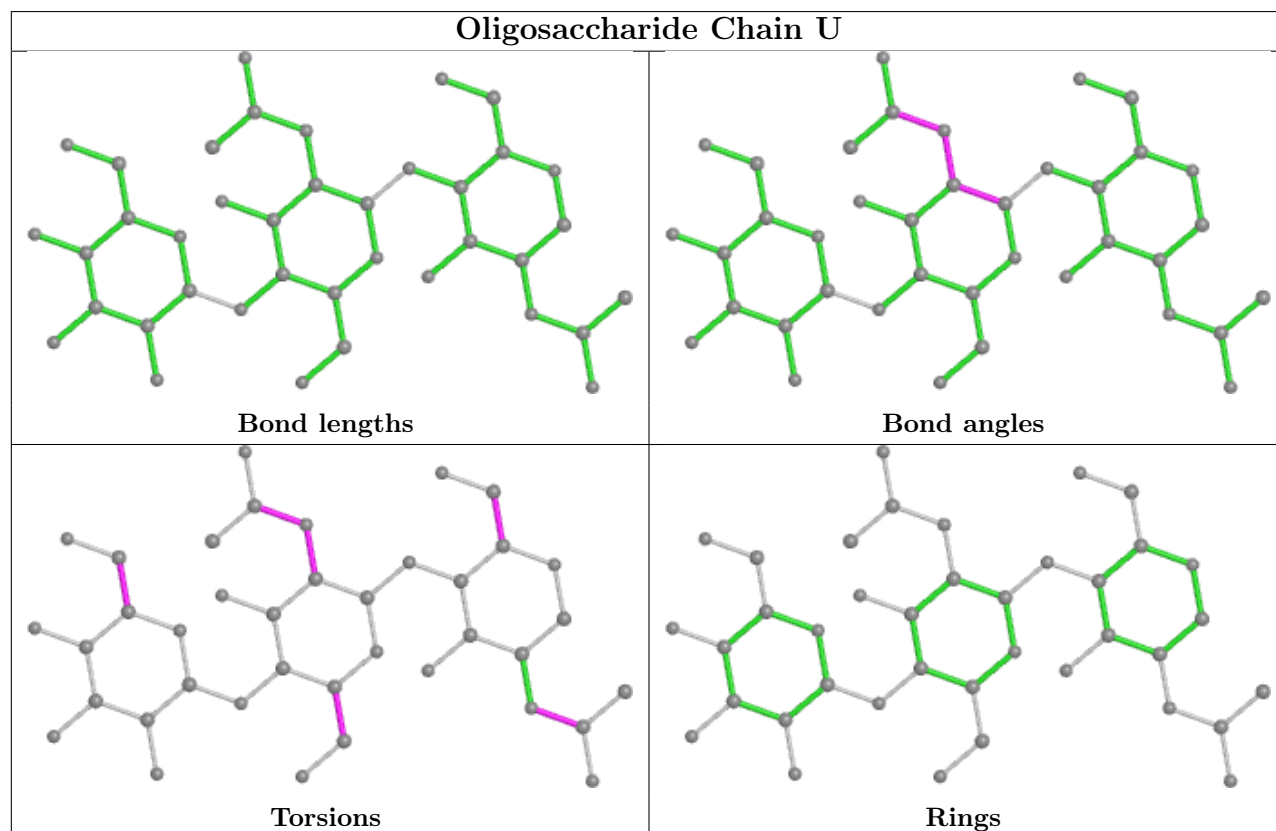
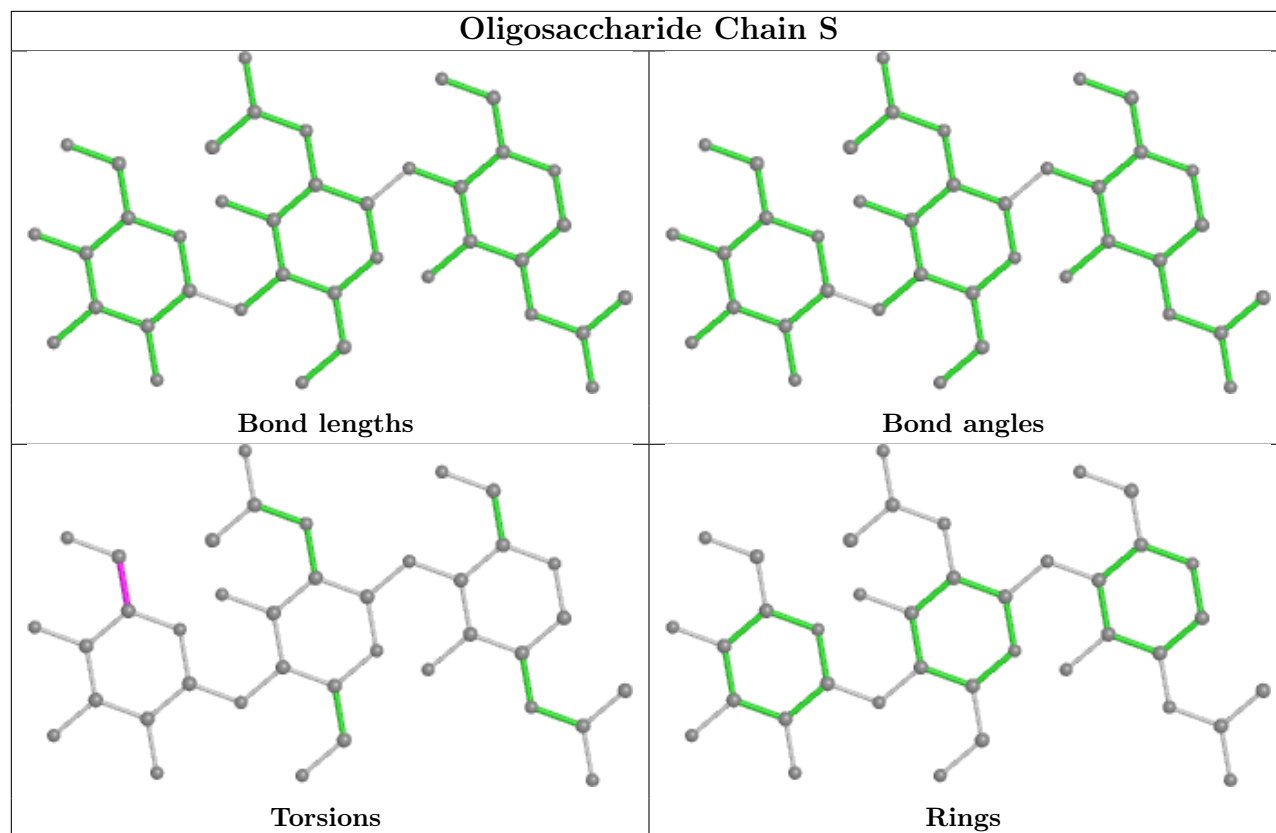
Mol	Chain	Res	Type	Atoms
6	d	2	NAG	C8-C7-N2-C2
6	d	2	NAG	O7-C7-N2-C2
6	a	1	NAG	C4-C5-C6-O6
6	d	1	NAG	O5-C5-C6-O6
6	V	1	NAG	O5-C5-C6-O6
6	Y	2	NAG	C4-C5-C6-O6
6	U	3	BMA	O5-C5-C6-O6
6	V	2	NAG	C4-C5-C6-O6
6	b	2	NAG	O5-C5-C6-O6
6	a	3	BMA	O5-C5-C6-O6
6	c	1	NAG	O5-C5-C6-O6
6	c	2	NAG	O5-C5-C6-O6
6	d	2	NAG	O5-C5-C6-O6
6	X	3	BMA	O5-C5-C6-O6
6	S	3	BMA	O5-C5-C6-O6
6	Z	3	BMA	O5-C5-C6-O6
6	W	3	BMA	O5-C5-C6-O6
6	U	2	NAG	O5-C5-C6-O6
6	V	2	NAG	O5-C5-C6-O6
6	V	1	NAG	C4-C5-C6-O6
6	d	1	NAG	C4-C5-C6-O6
6	W	2	NAG	C4-C5-C6-O6
6	a	1	NAG	C3-C2-N2-C7
6	b	1	NAG	C3-C2-N2-C7
6	W	2	NAG	O5-C5-C6-O6
6	U	1	NAG	C4-C5-C6-O6
6	U	2	NAG	C3-C2-N2-C7
6	Y	1	NAG	C3-C2-N2-C7
6	d	3	BMA	O5-C5-C6-O6
6	U	1	NAG	O5-C5-C6-O6

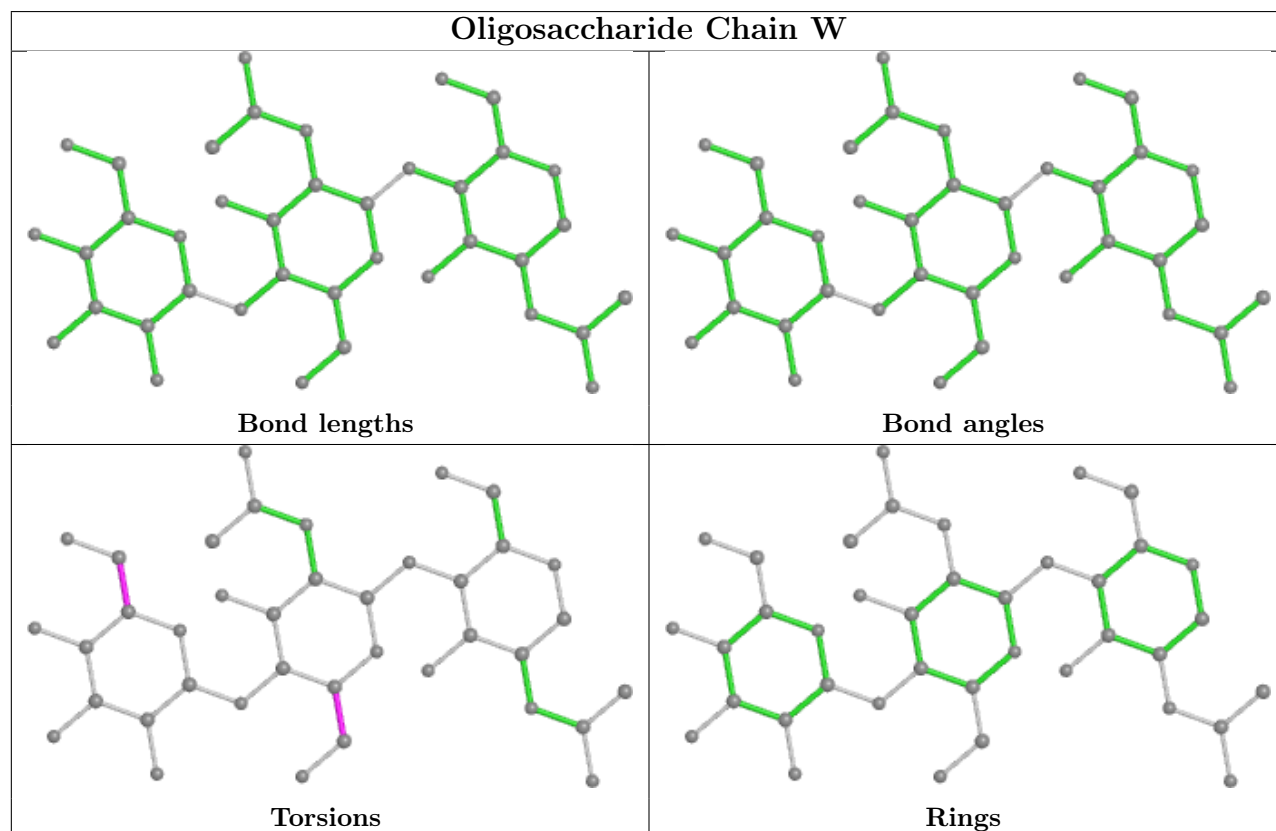
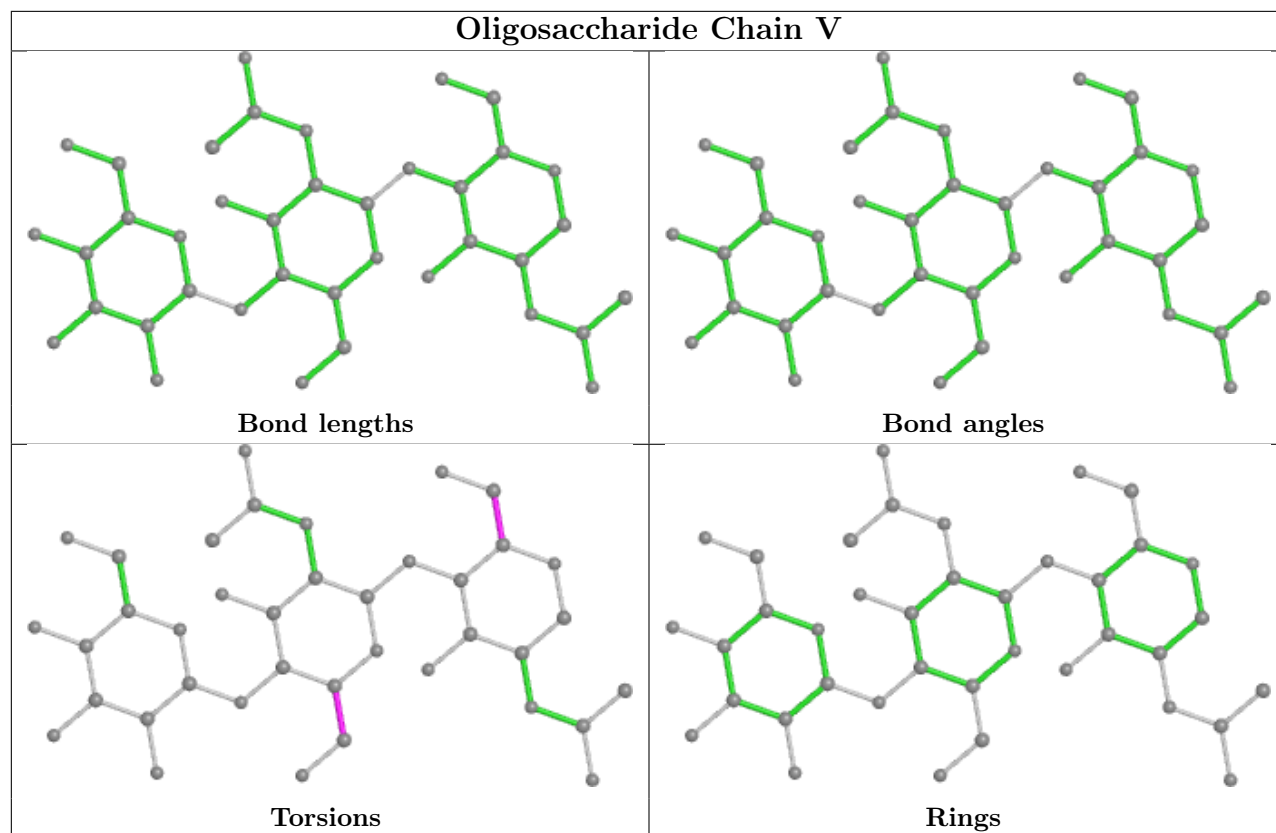
There are no ring outliers.

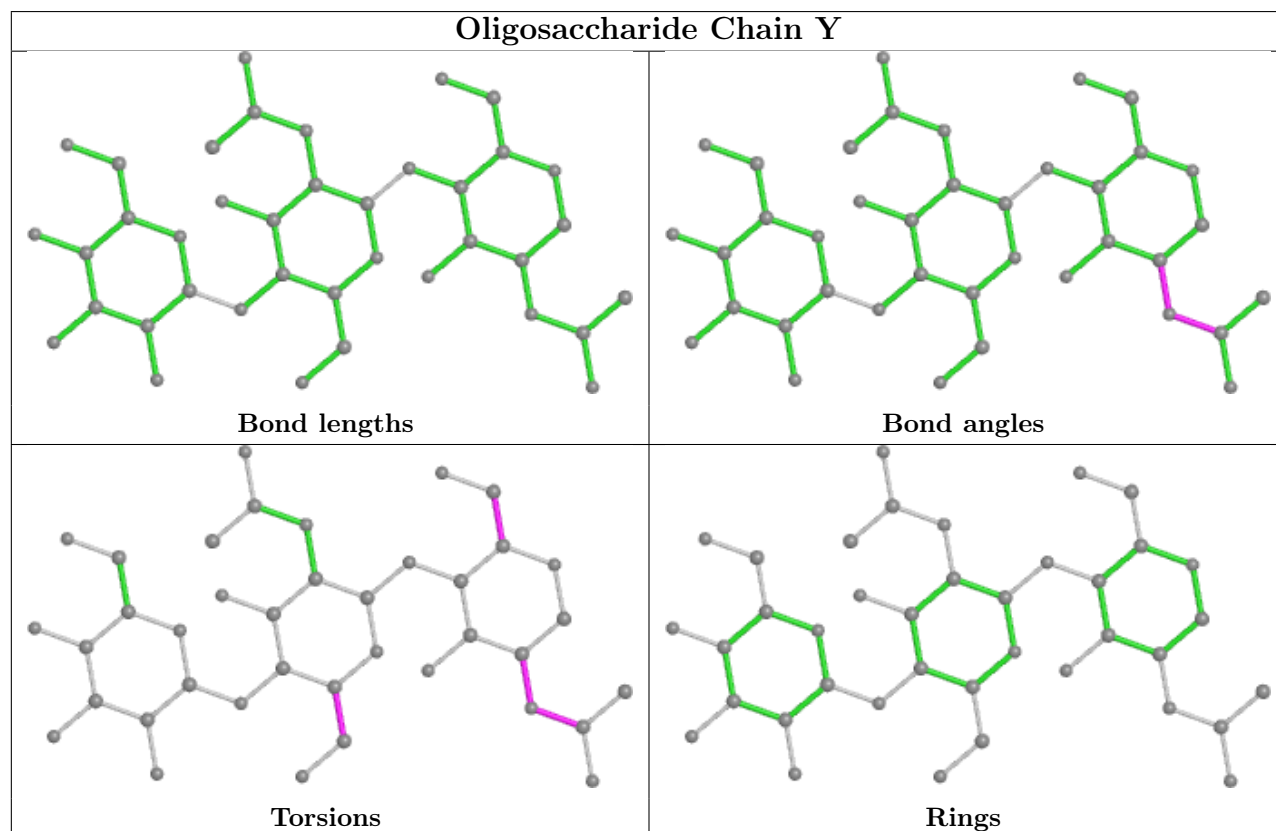
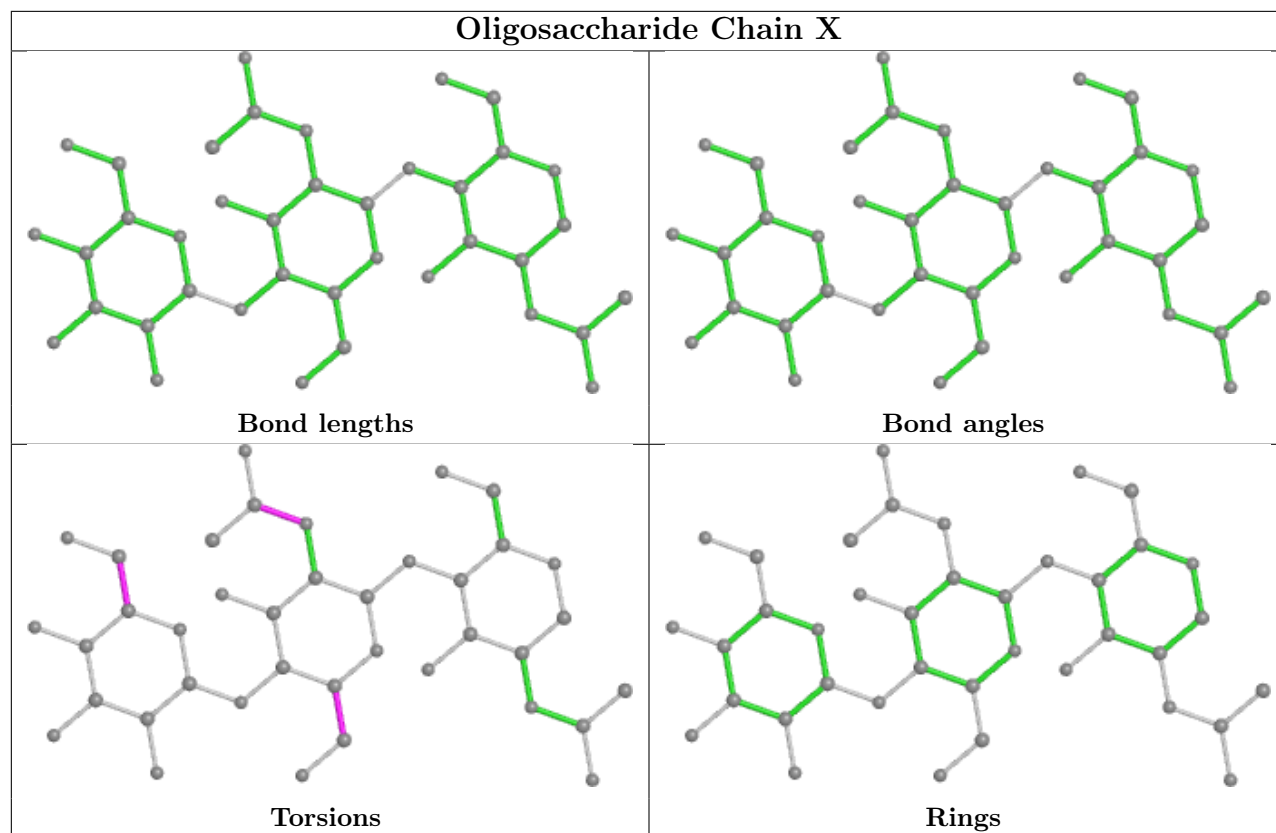
4 monomers are involved in 4 short contacts:

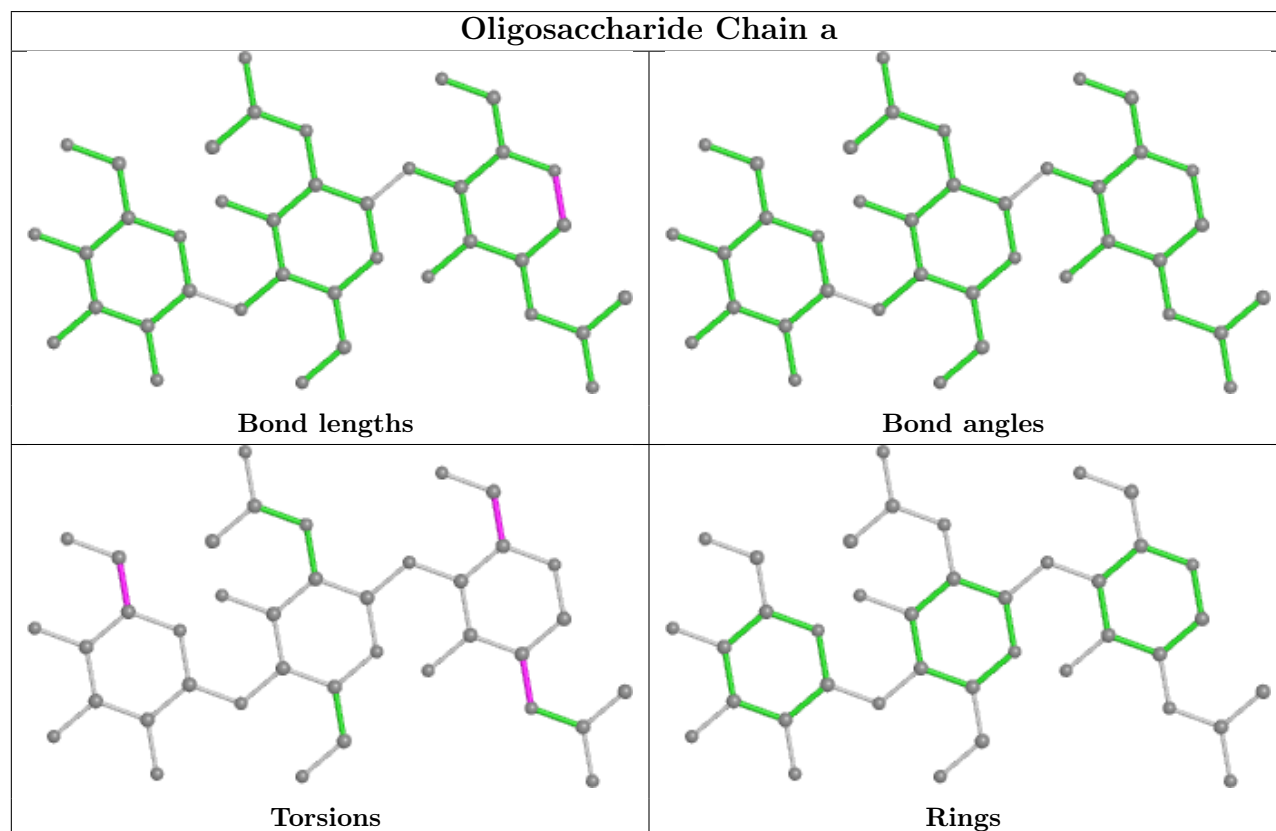
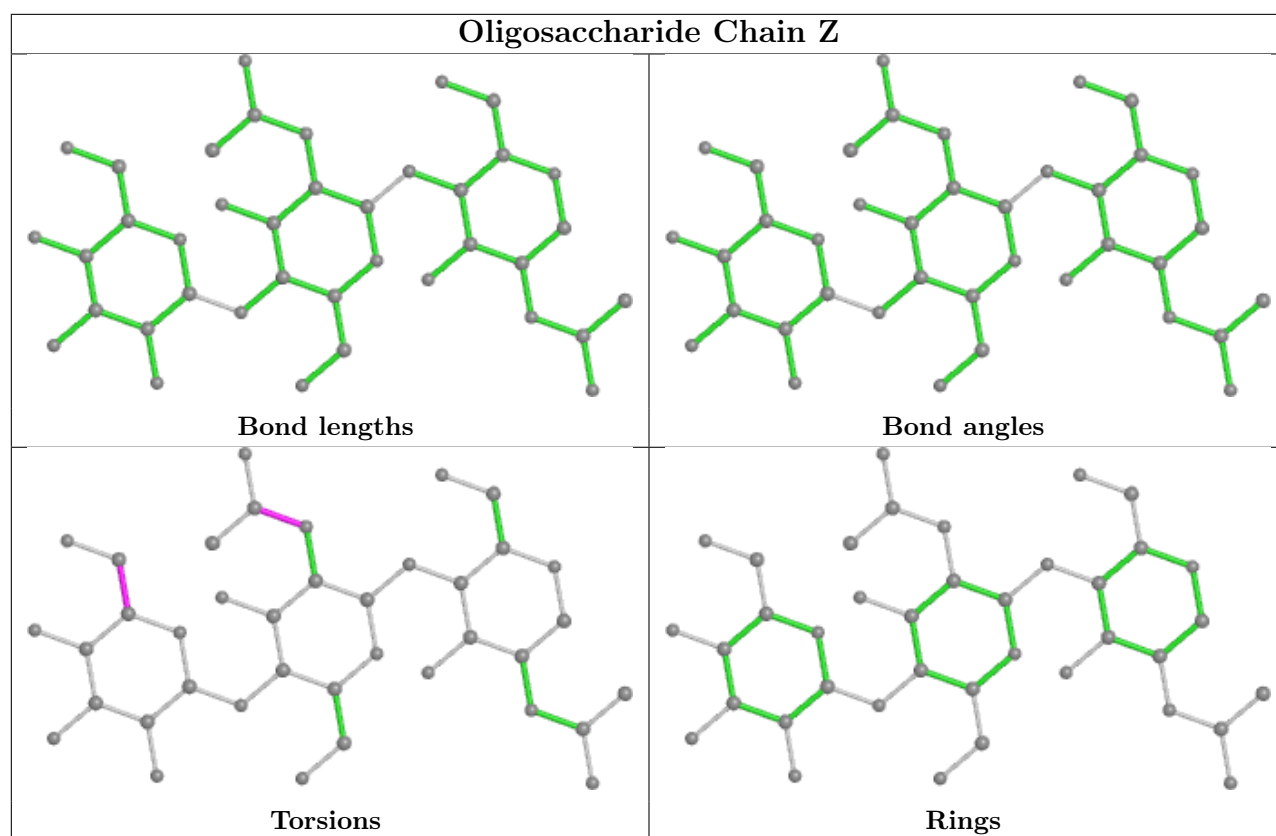
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	a	2	NAG	1	0
6	U	1	NAG	1	0
6	Y	1	NAG	1	0
6	U	2	NAG	2	0

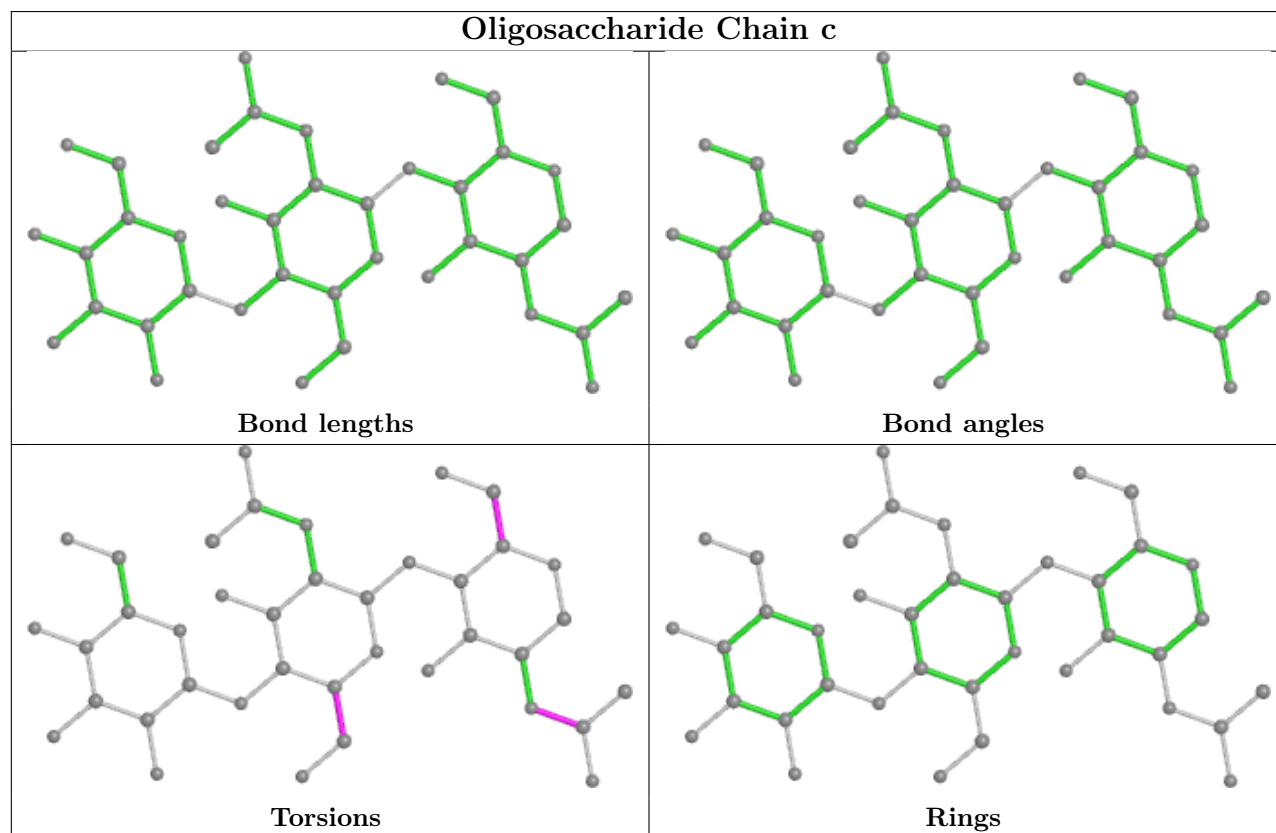
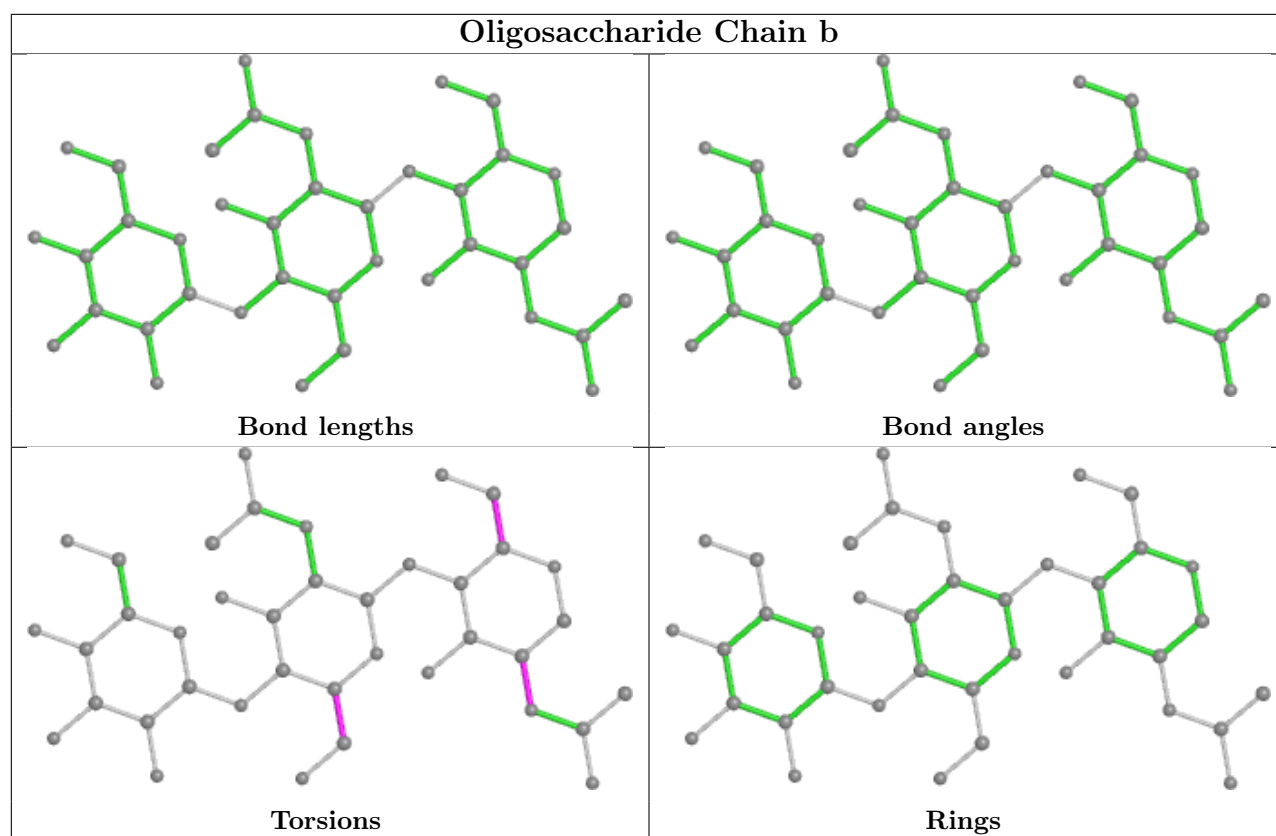
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

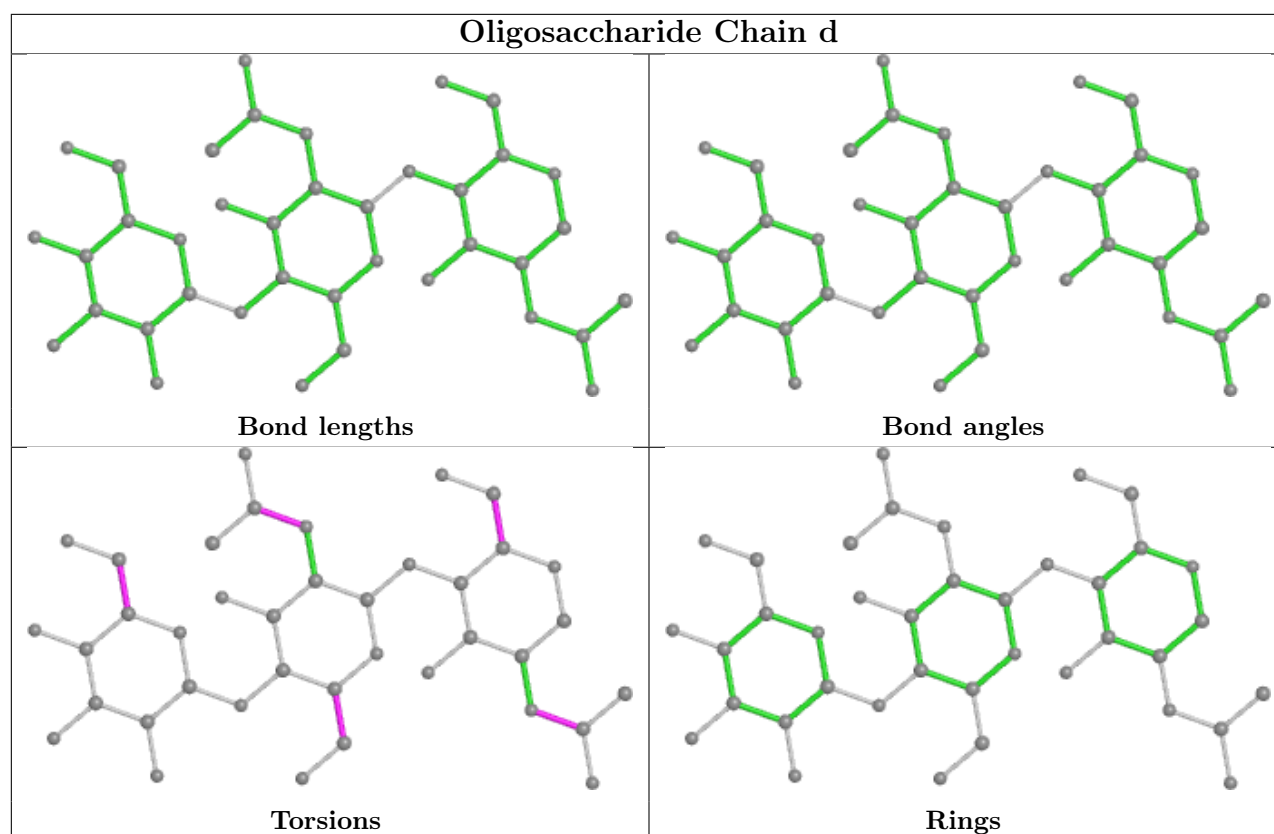












5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

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.

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.