



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 15, 2023 – 08:11 PM EDT

PDB ID : 8G18  
Title : Heterodimer of the GluN1b-GluN2B NMDA receptor amino-terminal domains bound to allosteric inhibitor 93-108  
Authors : Regan, M.C.; Furukawa, H.  
Deposited on : 2023-02-01  
Resolution : 2.85 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

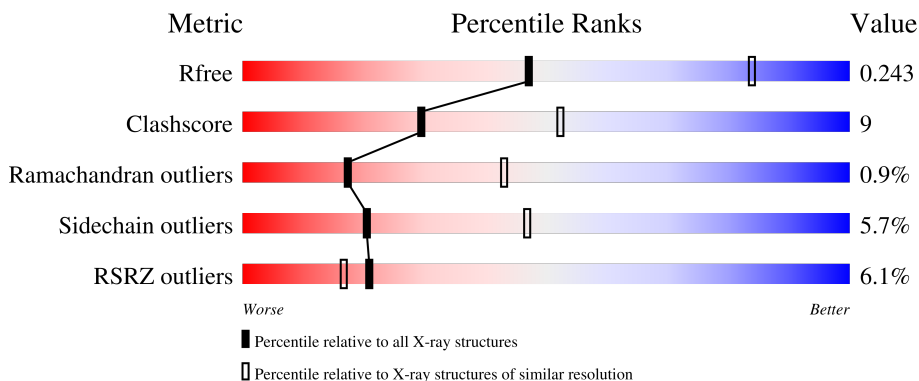
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.85 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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  $\geq 3$ , 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	385	 2% 77% 15% 7%
1	C	385	 8% 66% 25% 7%
2	B	363	 6% 73% 23% 7%
2	D	363	 7% 79% 20% 7%
3	E	5	 20% 80%

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
4	NAG	B	502	X	-	-	-

## 2 Entry composition i

There are 7 unique types of molecules in this entry. The entry contains 11400 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 Glutamate receptor ionotropic, NMDA 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	359	2765	1763	482	509	11	0	0	0
1	C	358	2743	1746	477	509	11	0	0	0

There are 54 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	61	GLN	ASN	conflict	UNP A0A1L8F5J9
A	186	GLY	-	linker	UNP A0A1L8F5J9
A	187	UNK	-	linker	UNP A0A1L8F5J9
A	188	UNK	-	linker	UNP A0A1L8F5J9
A	189	UNK	-	linker	UNP A0A1L8F5J9
A	190	UNK	-	linker	UNP A0A1L8F5J9
A	191	UNK	-	linker	UNP A0A1L8F5J9
A	192	UNK	-	linker	UNP A0A1L8F5J9
A	193	UNK	-	linker	UNP A0A1L8F5J9
A	194	UNK	-	linker	UNP A0A1L8F5J9
A	195	UNK	-	linker	UNP A0A1L8F5J9
A	196	UNK	-	linker	UNP A0A1L8F5J9
A	197	UNK	-	linker	UNP A0A1L8F5J9
A	198	UNK	-	linker	UNP A0A1L8F5J9
A	199	UNK	-	linker	UNP A0A1L8F5J9
A	200	UNK	-	linker	UNP A0A1L8F5J9
A	201	UNK	-	linker	UNP A0A1L8F5J9
A	202	UNK	-	linker	UNP A0A1L8F5J9
A	203	UNK	-	linker	UNP A0A1L8F5J9
A	204	UNK	-	linker	UNP A0A1L8F5J9
A	205	UNK	-	linker	UNP A0A1L8F5J9
A	206	UNK	-	linker	UNP A0A1L8F5J9
A	207	UNK	-	linker	UNP A0A1L8F5J9
A	208	UNK	-	linker	UNP A0A1L8F5J9
A	209	GLY	-	linker	UNP A0A1L8F5J9

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Chain	Residue	Modelled	Actual	Comment	Reference
A	210	PRO	-	linker	UNP A0A1L8F5J9
A	371	GLN	ASN	conflict	UNP A0A1L8F5J9
C	61	GLN	ASN	conflict	UNP A0A1L8F5J9
C	186	GLY	-	linker	UNP A0A1L8F5J9
C	187	UNK	-	linker	UNP A0A1L8F5J9
C	188	UNK	-	linker	UNP A0A1L8F5J9
C	189	UNK	-	linker	UNP A0A1L8F5J9
C	190	UNK	-	linker	UNP A0A1L8F5J9
C	191	UNK	-	linker	UNP A0A1L8F5J9
C	192	UNK	-	linker	UNP A0A1L8F5J9
C	193	UNK	-	linker	UNP A0A1L8F5J9
C	194	UNK	-	linker	UNP A0A1L8F5J9
C	195	UNK	-	linker	UNP A0A1L8F5J9
C	196	UNK	-	linker	UNP A0A1L8F5J9
C	197	UNK	-	linker	UNP A0A1L8F5J9
C	198	UNK	-	linker	UNP A0A1L8F5J9
C	199	UNK	-	linker	UNP A0A1L8F5J9
C	200	UNK	-	linker	UNP A0A1L8F5J9
C	201	UNK	-	linker	UNP A0A1L8F5J9
C	202	UNK	-	linker	UNP A0A1L8F5J9
C	203	UNK	-	linker	UNP A0A1L8F5J9
C	204	UNK	-	linker	UNP A0A1L8F5J9
C	205	UNK	-	linker	UNP A0A1L8F5J9
C	206	UNK	-	linker	UNP A0A1L8F5J9
C	207	UNK	-	linker	UNP A0A1L8F5J9
C	208	UNK	-	linker	UNP A0A1L8F5J9
C	209	GLY	-	linker	UNP A0A1L8F5J9
C	210	PRO	-	linker	UNP A0A1L8F5J9
C	371	GLN	ASN	conflict	UNP A0A1L8F5J9

- Molecule 2 is a protein called Glutamate receptor ionotropic, NMDA 2B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	363	2820	1809	453	542	16	0	0	0
2	D	363	2757	1771	445	525	16	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

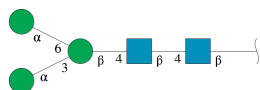
Chain	Residue	Modelled	Actual	Comment	Reference
B	348	ASP	ASN	conflict	UNP Q00960

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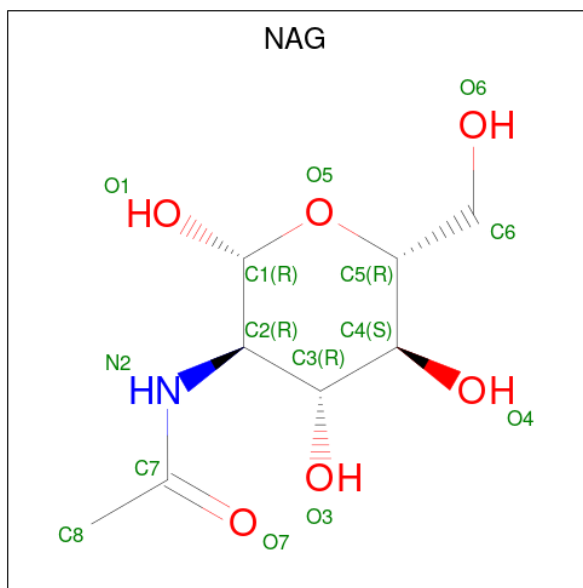
Chain	Residue	Modelled	Actual	Comment	Reference
D	348	ASP	ASN	conflict	UNP Q00960

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]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
			Total	C	N	O			
3	E	5	61	34	2	25	61	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>) (labeled as "Ligand of Interest" by depositor).



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

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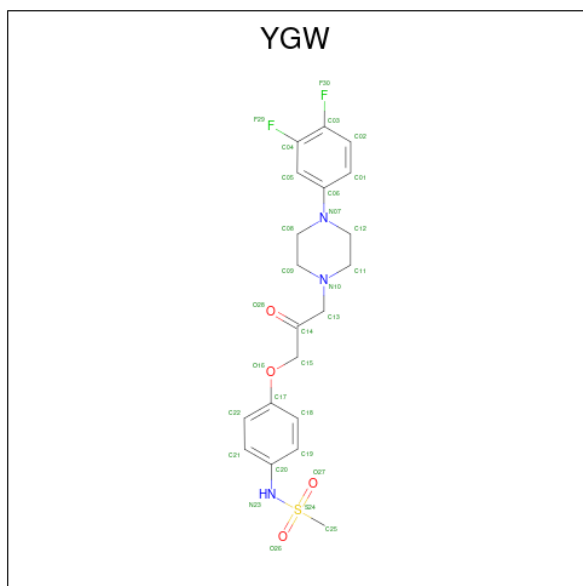
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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	C	1	Total	C	N	O	14	0
			14	8	1	5		
4	D	1	Total	C	N	O	14	0
			14	8	1	5		
4	D	1	Total	C	N	O	14	0
			14	8	1	5		

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 6 is N-(4-{3-[4-(3,4-difluorophenyl)piperazin-1-yl]-2-oxopropoxy}phenyl)methanesulfonamide (three-letter code: YGW) (formula: C<sub>20</sub>H<sub>23</sub>F<sub>2</sub>N<sub>3</sub>O<sub>4</sub>S) (labeled as "Ligand of Interest" by depositor).



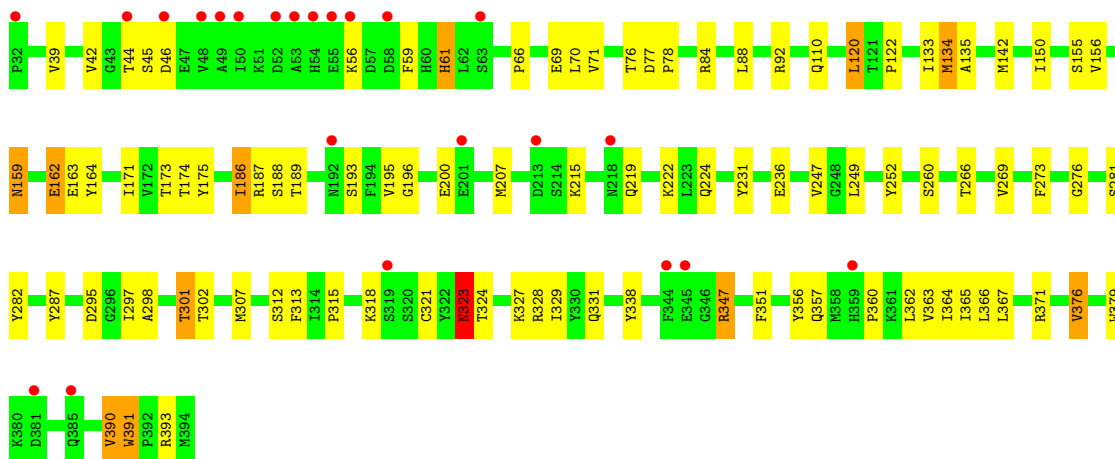
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
6	B	1	Total	C	F	N	O	S	0	0
			30	20	2	3	4	1		
6	D	1	Total	C	F	N	O	S	0	0
			30	20	2	3	4	1		

- Molecule 7 is water.

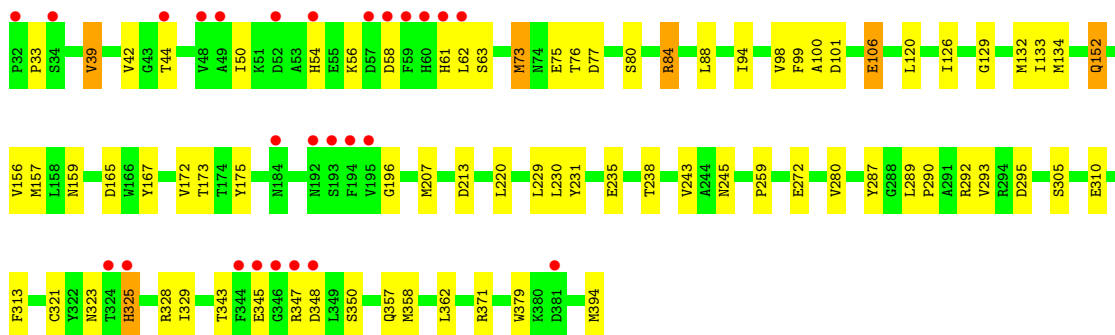
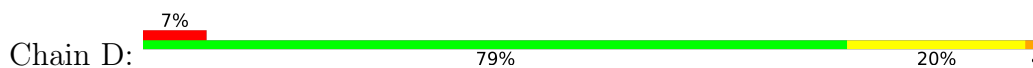
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	36	Total O 36 36	0	0
7	B	21	Total O 21 21	0	0
7	C	18	Total O 18 18	0	0
7	D	19	Total O 19 19	0	0



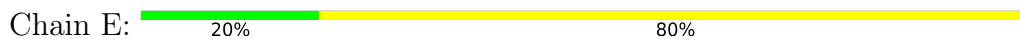




- Molecule 2: Glutamate receptor ionotropic, NMDA 2B



- Molecule 3: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]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, $\alpha$ , $\beta$ , $\gamma$	269.17Å 60.08Å 145.57Å 90.00° 117.02° 90.00°	Depositor
Resolution (Å)	34.37 – 2.85 34.37 – 2.85	Depositor EDS
% Data completeness (in resolution range)	84.0 (34.37-2.85) 84.1 (34.37-2.85)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.03 (at 2.85Å)	Xtrriage
Refinement program	PHENIX 1.20.1-4487	Depositor
R, $R_{free}$	0.174 , 0.246 0.188 , 0.243	Depositor DCC
$R_{free}$ test set	2034 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	51.2	Xtrriage
Anisotropy	0.107	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 73.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	11400	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	56.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.48% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

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

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: YGW, MAN, BMA, NAG, NA

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	0.48	0/2822	0.83	0/3834
1	C	0.41	0/2799	0.73	0/3805
2	B	0.44	0/2883	0.81	1/3929 (0.0%)
2	D	0.38	0/2821	0.75	0/3853
All	All	0.43	0/11325	0.78	1/15421 (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
1	A	0	2

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
2	B	187	ARG	NE-CZ-NH2	-5.50	117.55	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	281	ARG	Sidechain
1	A	398	ARG	Sidechain

## 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	2765	0	2730	32	0
1	C	2743	0	2709	58	3
2	B	2820	0	2683	69	0
2	D	2757	0	2590	52	0
3	E	61	0	52	0	0
4	A	14	0	13	0	0
4	B	28	0	26	0	0
4	C	28	0	26	0	0
4	D	28	0	26	0	0
5	A	1	0	0	0	0
5	C	1	0	0	0	0
6	B	30	0	0	2	0
6	D	30	0	0	3	0
7	A	36	0	0	0	0
7	B	21	0	0	5	3
7	C	18	0	0	3	0
7	D	19	0	0	2	0
All	All	11400	0	10855	207	3

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 9.

All (207) 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:61:HIS:HA	7:B:610:HOH:O	1.63	0.97
2:D:343:THR:HG22	2:D:348:ASP:HA	1.55	0.86
2:D:61:HIS:HA	7:D:604:HOH:O	1.77	0.84
1:A:270:VAL:CG1	1:A:274:GLU:HB2	2.08	0.84
2:B:323:ASN:O	2:B:323:ASN:ND2	2.12	0.82
2:B:159:ASN:N	2:B:159:ASN:HD22	1.75	0.82
1:C:270:VAL:CG1	1:C:274:GLU:HB2	2.11	0.81
1:C:270:VAL:HG11	1:C:274:GLU:HB2	1.61	0.81
2:B:163:GLU:O	7:B:601:HOH:O	1.99	0.80
1:C:275:ILE:HD13	1:C:289:GLY:HA3	1.63	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:62:LEU:HA	7:D:602:HOH:O	1.85	0.77
1:A:157:LEU:HD23	1:A:158:PHE:CE2	2.21	0.76
2:B:66:PRO:HD3	2:B:301:THR:HG21	1.69	0.75
2:B:173:THR:HG22	2:B:231:TYR:HB3	1.71	0.73
1:C:270:VAL:HG21	1:C:287:ILE:HD11	1.70	0.73
2:D:207:MET:H	6:D:503:YGW:C25	2.01	0.73
2:B:159:ASN:HD22	2:B:159:ASN:H	1.34	0.72
2:D:295:ASP:OD2	2:D:347:ARG:NH1	2.22	0.72
1:A:68:ARG:HG3	1:A:68:ARG:HH11	1.54	0.72
2:B:120:LEU:O	2:B:318:LYS:HE3	1.90	0.72
1:C:227:ALA:HB3	7:C:607:HOH:O	1.91	0.71
2:B:297:ILE:O	2:B:301:THR:OG1	2.08	0.71
2:B:327:LYS:O	2:B:331:GLN:NE2	2.26	0.68
1:C:34:SER:OG	1:C:298:GLU:OE1	2.08	0.66
1:A:285:ASP:OD1	1:A:380:ARG:HG2	1.95	0.66
1:A:270:VAL:HG13	1:A:274:GLU:HB2	1.78	0.65
2:B:351:PHE:HD1	2:B:356:TYR:O	1.80	0.65
2:D:280:VAL:HG11	2:D:362:LEU:HD13	1.80	0.64
1:C:224:ASN:ND2	7:C:601:HOH:O	2.26	0.63
2:B:56:LYS:CB	2:B:59:PHE:CB	2.76	0.63
1:C:165:LEU:HD22	1:C:180:LEU:HD23	1.80	0.62
2:D:289:LEU:HB3	2:D:290:PRO:HD3	1.80	0.62
1:C:305:ALA:O	1:C:309:VAL:HG23	1.99	0.62
1:C:378:GLN:HG2	1:C:401:ILE:HG12	1.81	0.62
2:B:175:TYR:HD2	6:B:503:YGW:C25	2.13	0.61
1:A:167:VAL:O	1:A:217:GLN:HA	2.00	0.61
2:B:42:VAL:HG11	2:B:76:THR:CG2	2.32	0.60
1:C:289:GLY:O	1:C:290:LEU:HD23	2.02	0.59
2:D:272:GLU:N	2:D:272:GLU:OE1	2.35	0.59
2:B:135:ALA:HB2	2:B:150:ILE:HD11	1.84	0.59
2:B:247:VAL:HG23	2:B:249:LEU:HD12	1.85	0.59
1:C:344:ARG:HH11	1:C:344:ARG:HG3	1.65	0.59
2:B:329:ILE:O	2:D:313:PHE:HA	2.04	0.58
1:C:58:ILE:HD11	1:C:314:HIS:ND1	2.18	0.57
1:C:149:LEU:HD23	1:C:183:LEU:HD11	1.86	0.57
2:B:364:ILE:HD13	2:B:364:ILE:N	2.19	0.57
2:D:100:ALA:HB2	2:D:126:ILE:HD11	1.84	0.57
1:C:381:LYS:O	1:C:383:VAL:HG23	2.05	0.57
1:C:42:PHE:HE2	1:C:63:THR:O	1.88	0.56
2:D:175:TYR:HB2	6:D:503:YGW:O27	2.06	0.56
2:B:174:THR:HG21	2:B:236:GLU:OE1	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:46:VAL:HG21	1:C:62:ALA:HB2	1.87	0.56
2:B:200:GLU:OE1	2:B:224:GLN:HB2	2.06	0.56
1:C:157:LEU:HD23	1:C:158:PHE:CE1	2.41	0.56
2:B:390:VAL:HA	7:B:603:HOH:O	2.05	0.55
2:B:159:ASN:OD1	2:B:379:TRP:CZ3	2.59	0.55
2:D:173:THR:HG22	2:D:231:TYR:HB3	1.87	0.55
1:C:138:LEU:HD12	1:C:138:LEU:N	2.22	0.55
2:B:39:VAL:HB	2:B:70:LEU:HD23	1.89	0.55
1:C:72:ILE:HD12	2:D:321:CYS:HB2	1.89	0.55
1:A:68:ARG:HG3	1:A:68:ARG:NH1	2.20	0.55
2:B:318:LYS:HD2	2:B:331:GLN:OE1	2.06	0.55
2:B:159:ASN:H	2:B:159:ASN:ND2	2.04	0.54
2:D:152:GLN:HE21	2:D:152:GLN:HA	1.71	0.54
1:A:157:LEU:HD23	1:A:158:PHE:CD2	2.42	0.54
1:C:247:ASP:O	1:C:250:THR:HB	2.08	0.54
2:B:164:TYR:CZ	2:B:391:TRP:HZ3	2.26	0.54
2:B:164:TYR:CE1	2:B:391:TRP:CE3	2.95	0.53
2:B:247:VAL:CG2	2:B:249:LEU:HD12	2.38	0.53
1:C:304:ASP:OD2	1:C:356:THR:OG1	2.20	0.53
2:B:298:ALA:O	2:B:302:THR:HG23	2.09	0.52
1:A:250:THR:HG22	1:A:254:LYS:HE3	1.92	0.52
1:A:375:MET:HB3	1:A:382:LEU:HD22	1.92	0.52
1:C:387:ILE:O	1:C:387:ILE:HG13	2.11	0.51
1:A:166:ILE:HD12	1:A:240:ILE:CG2	2.41	0.51
1:C:28:ASN:ND2	1:C:85:SER:O	2.35	0.51
1:C:130:ASP:OD1	1:C:132:SER:HB2	2.11	0.51
1:A:96:PRO:O	1:A:97:ALA:C	2.50	0.50
2:B:159:ASN:OD1	2:B:379:TRP:HZ3	1.94	0.50
2:B:252:TYR:CE1	2:B:393:ARG:HD2	2.46	0.50
1:C:261:MET:HA	1:C:266:TYR:CE2	2.47	0.50
2:D:99:PHE:O	2:D:126:ILE:HG12	2.11	0.50
1:C:264:ALA:HA	1:C:403:PRO:O	2.11	0.49
1:C:311:GLN:NE2	1:C:350:LYS:O	2.41	0.49
2:D:280:VAL:CG1	2:D:362:LEU:HD13	2.41	0.49
2:D:39:VAL:HG13	2:D:98:VAL:HB	1.95	0.49
2:B:207:MET:HB2	6:B:503:YGW:O26	2.12	0.49
2:B:69:GLU:CB	2:B:92:ARG:NH2	2.76	0.49
2:B:282:TYR:HH	2:B:287:TYR:HD2	1.60	0.49
2:B:366:LEU:HB3	2:B:376:VAL:HG21	1.94	0.49
1:C:152:PHE:CZ	1:C:156:ARG:HD2	2.48	0.49
2:B:276:GLY:HA2	2:B:366:LEU:HD11	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:343:THR:HG22	2:D:348:ASP:CA	2.35	0.49
1:A:241:ILE:HA	1:A:269:LEU:O	2.13	0.48
2:D:152:GLN:O	2:D:156:VAL:HG23	2.13	0.48
1:A:149:LEU:HD23	1:A:183:LEU:HD11	1.95	0.48
1:C:184:LEU:HD22	1:C:210:PRO:O	2.14	0.48
2:D:213:ASP:N	2:D:213:ASP:OD1	2.46	0.48
2:B:215:LYS:O	2:B:219:GLN:HG3	2.13	0.48
2:B:122:PRO:HA	2:B:142:MET:O	2.14	0.47
1:C:222:THR:HB	1:C:225:LEU:HD21	1.95	0.47
1:C:153:GLU:OE2	1:C:156:ARG:NH1	2.47	0.47
1:A:57:LYS:HG2	1:A:58:ILE:HG23	1.96	0.47
2:D:84:ARG:O	2:D:88:LEU:HG	2.14	0.47
2:B:307:MET:CE	2:B:315:PRO:HD3	2.45	0.47
2:D:207:MET:N	6:D:503:YGW:C25	2.72	0.47
1:A:33:LEU:O	1:A:66:THR:HA	2.14	0.47
2:B:164:TYR:CE1	2:B:391:TRP:CZ3	3.03	0.47
2:B:307:MET:HB2	2:B:338:TYR:CD2	2.50	0.47
1:C:155:MET:HE1	1:C:210:PRO:HB2	1.97	0.47
1:C:92:VAL:CG2	1:C:107:ILE:HG21	2.45	0.47
1:A:356:THR:OG1	1:A:367:ARG:NH2	2.48	0.47
2:D:167:TYR:HB3	2:D:196:GLY:O	2.15	0.46
2:D:39:VAL:HG11	2:D:293:VAL:HG13	1.97	0.46
2:B:171:ILE:HD11	2:B:186:ILE:HG21	1.97	0.46
2:B:307:MET:SD	2:B:315:PRO:HD3	2.55	0.46
1:A:39:GLU:HG2	1:A:64:SER:OG	2.16	0.46
1:C:218:PHE:HB3	1:C:228:LEU:CD1	2.46	0.46
1:A:177:GLN:OE1	1:A:217:GLN:NE2	2.48	0.46
2:D:50:ILE:HG21	2:D:293:VAL:HG11	1.97	0.46
2:D:235:GLU:O	2:D:238:THR:OG1	2.33	0.46
1:C:124:ARG:O	1:C:143:PRO:HA	2.16	0.45
2:D:325:HIS:ND1	2:D:325:HIS:N	2.60	0.45
1:C:261:MET:O	1:C:266:TYR:CD2	2.69	0.45
2:D:362:LEU:HB2	2:D:379:TRP:HB3	1.99	0.45
2:D:88:LEU:O	2:D:94:ILE:CD1	2.65	0.45
2:B:66:PRO:CD	2:B:301:THR:HG21	2.43	0.45
2:B:164:TYR:CE1	2:B:391:TRP:HE3	2.34	0.45
1:C:37:LYS:HE3	1:C:41:ILE:HD11	1.99	0.45
1:C:105:THR:N	1:C:106:PRO:CD	2.80	0.45
1:A:104:PRO:HA	1:A:107:ILE:HD12	1.98	0.45
2:D:159:ASN:OD1	2:D:379:TRP:CZ3	2.69	0.45
1:A:270:VAL:HG11	1:A:274:GLU:HB2	1.93	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:58:ILE:HD11	1:C:314:HIS:CE1	2.52	0.44
1:C:166:ILE:C	1:C:167:VAL:HG23	2.38	0.44
2:D:42:VAL:HG11	2:D:76:THR:HG23	1.98	0.44
2:D:73:MET:HG3	2:D:84:ARG:CD	2.47	0.44
1:C:344:ARG:HG3	1:C:344:ARG:NH1	2.32	0.44
2:B:318:LYS:CE	7:B:608:HOH:O	2.66	0.44
2:D:73:MET:HG3	2:D:84:ARG:HD3	1.98	0.44
1:A:218:PHE:HB3	1:A:228:LEU:CD1	2.47	0.44
1:A:42:PHE:CE2	1:A:62:ALA:HB1	2.52	0.44
1:A:226:THR:HG22	1:A:259:LEU:HD21	2.00	0.44
2:B:287:TYR:OH	2:B:295:ASP:OD2	2.14	0.44
2:B:318:LYS:HE2	7:B:608:HOH:O	2.16	0.44
1:A:27:VAL:HG13	1:A:88:TYR:CD1	2.52	0.44
1:A:302:ILE:O	1:A:306:VAL:HG23	2.17	0.44
2:B:321:CYS:HA	2:B:324:THR:CG2	2.48	0.44
2:D:347:ARG:CB	2:D:347:ARG:HH21	2.31	0.44
2:D:159:ASN:OD1	2:D:379:TRP:HZ3	2.00	0.44
1:C:69:PRO:HG2	1:C:73:GLN:NE2	2.32	0.44
2:D:54:HIS:C	2:D:56:LYS:N	2.70	0.44
2:B:323:ASN:ND2	2:B:323:ASN:C	2.71	0.44
2:D:156:VAL:HG21	2:D:362:LEU:HD12	2.00	0.44
2:B:71:VAL:HG21	2:B:88:LEU:HD11	1.99	0.43
2:B:222:LYS:HE2	2:B:222:LYS:HB3	1.76	0.43
1:C:259:LEU:HD23	1:C:259:LEU:N	2.34	0.43
2:D:220:LEU:HD12	2:D:243:VAL:HG12	2.01	0.43
2:B:164:TYR:CD2	2:B:164:TYR:N	2.85	0.43
2:B:193:SER:O	2:B:195:VAL:O	2.36	0.43
2:B:110:GLN:HA	2:B:134:MET:HE2	2.00	0.43
1:C:124:ARG:NH1	7:C:604:HOH:O	2.52	0.43
1:A:402:TRP:HD1	1:A:406:GLU:CB	2.31	0.43
2:B:269:VAL:HG11	2:B:367:LEU:HD11	2.01	0.43
2:B:186:ILE:O	2:B:189:THR:N	2.48	0.43
1:C:165:LEU:HG	1:C:167:VAL:HG23	2.01	0.42
1:C:244:ALA:O	1:C:274:GLU:HG3	2.18	0.42
2:B:360:PRO:HG2	2:B:362:LEU:HD21	2.02	0.42
1:C:171:HIS:HD1	1:C:171:HIS:C	2.22	0.42
2:D:33:PRO:HD2	2:D:63:SER:O	2.20	0.42
2:D:287:TYR:CE2	2:D:292:ARG:HG2	2.54	0.42
2:D:88:LEU:O	2:D:94:ILE:HD13	2.19	0.42
1:A:293:ILE:O	1:A:294:ASN:HB2	2.20	0.42
2:D:172:VAL:O	2:D:230:LEU:HA	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:23:ASP:N	1:C:24:PRO:CD	2.83	0.42
1:C:293:ILE:O	1:C:294:ASN:HB2	2.19	0.42
2:D:230:LEU:O	2:D:259:PRO:HD3	2.19	0.42
2:B:273:PHE:O	2:B:371:ARG:NH1	2.47	0.42
2:B:313:PHE:HA	2:D:329:ILE:O	2.18	0.42
1:C:308:VAL:HG21	1:C:359:ILE:HG21	2.01	0.42
2:D:101:ASP:OD1	2:D:129:GLY:N	2.50	0.42
2:B:77:ASP:HB2	2:B:78:PRO:HD2	2.01	0.41
2:B:195:VAL:HG12	2:B:196:GLY:N	2.35	0.41
1:C:63:THR:O	1:C:64:SER:HB3	2.20	0.41
1:A:400:ILE:HG21	1:A:402:TRP:CZ2	2.55	0.41
2:B:376:VAL:HG12	2:B:376:VAL:O	2.20	0.41
2:D:106:GLU:HB3	2:D:132:MET:SD	2.60	0.41
2:B:162:GLU:O	2:B:163:GLU:C	2.58	0.41
1:C:67:HIS:HE1	1:C:93:SER:OG	2.03	0.41
2:D:165:ASP:HA	2:D:167:TYR:CZ	2.54	0.41
2:B:363:VAL:HG12	2:B:365:ILE:HG23	2.02	0.41
2:B:39:VAL:HB	2:B:70:LEU:CD2	2.51	0.41
1:A:338:THR:O	1:A:338:THR:HG22	2.20	0.41
1:A:339:GLY:N	1:A:340:PRO:CD	2.83	0.41
1:A:226:THR:CG2	1:A:259:LEU:HD21	2.51	0.41
2:B:347:ARG:HB3	2:B:347:ARG:NH1	2.35	0.41
1:C:103:THR:HB	1:C:104:PRO:HD2	2.03	0.41
1:C:331:GLY:HA2	2:D:75:GLU:OE1	2.20	0.41
2:D:50:ILE:CG2	2:D:293:VAL:HG11	2.51	0.41
2:D:77:ASP:OD2	2:D:80:SER:OG	2.26	0.41
1:C:96:PRO:HA	1:C:97:ALA:HA	1.84	0.41
1:C:226:THR:HG23	1:C:255:SER:HB3	2.04	0.40
1:C:310:ALA:O	1:C:311:GLN:C	2.59	0.40
2:D:157:MET:HE3	2:D:229:LEU:HD22	2.03	0.40
2:B:156:VAL:HG21	2:B:362:LEU:HD12	2.03	0.40
2:B:379:TRP:CD1	2:B:379:TRP:C	2.94	0.40
2:D:371:ARG:HA	2:D:371:ARG:HD2	1.97	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:380:ARG:NE	7:B:601:HOH:O[4_7410]	2.08	0.12
1:C:380:ARG:NH2	7:B:601:HOH:O[4_7410]	2.18	0.02
1:C:380:ARG:CB	7:B:603:HOH:O[4_7410]	2.19	0.01

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	353/385 (92%)	329 (93%)	22 (6%)	2 (1%)	25	53
1	C	352/385 (91%)	319 (91%)	31 (9%)	2 (1%)	25	53
2	B	361/363 (99%)	312 (86%)	44 (12%)	5 (1%)	11	31
2	D	361/363 (99%)	317 (88%)	40 (11%)	4 (1%)	14	38
All	All	1427/1496 (95%)	1277 (90%)	137 (10%)	13 (1%)	17	43

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	46	ASP
2	D	44	THR
2	D	323	ASN
1	A	405	GLY
1	A	406	GLU
1	C	405	GLY
2	B	120	LEU
2	B	323	ASN
2	B	186	ILE
2	D	120	LEU
2	D	345	GLU
2	B	376	VAL
1	C	167	VAL

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	289/309 (94%)	276 (96%)	13 (4%)	27	57
1	C	290/309 (94%)	275 (95%)	15 (5%)	23	51
2	B	300/326 (92%)	279 (93%)	21 (7%)	15	37
2	D	286/326 (88%)	269 (94%)	17 (6%)	19	45
All	All	1165/1270 (92%)	1099 (94%)	66 (6%)	20	47

All (66) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	68	ARG
1	A	119	ILE
1	A	135	LEU
1	A	220	PRO
1	A	226	THR
1	A	238	ARG
1	A	285	ASP
1	A	358	ARG
1	A	363	GLU
1	A	367	ARG
1	A	391	SER
1	A	392	TYR
1	A	401	ILE
2	B	44	THR
2	B	45	SER
2	B	61	HIS
2	B	84	ARG
2	B	133	ILE
2	B	134	MET
2	B	155	SER
2	B	159	ASN
2	B	162	GLU
2	B	188	SER
2	B	260	SER
2	B	266	THR
2	B	281	SER
2	B	301	THR
2	B	312	SER
2	B	323	ASN
2	B	328	ARG
2	B	347	ARG
2	B	357	GLN
2	B	390	VAL

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Mol	Chain	Res	Type
2	B	391	TRP
1	C	68	ARG
1	C	102	LEU
1	C	135	LEU
1	C	136	SER
1	C	153	GLU
1	C	226	THR
1	C	258	MET
1	C	318	GLU
1	C	363	GLU
1	C	367	ARG
1	C	373	SER
1	C	376	ASN
1	C	380	ARG
1	C	391	SER
1	C	396	ASN
2	D	39	VAL
2	D	58	ASP
2	D	73	MET
2	D	84	ARG
2	D	106	GLU
2	D	133	ILE
2	D	134	MET
2	D	152	GLN
2	D	245	ASN
2	D	305	SER
2	D	310	GLU
2	D	325	HIS
2	D	328	ARG
2	D	350	SER
2	D	357	GLN
2	D	358	MET
2	D	394	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	67	HIS
1	A	73	GLN
1	A	177	GLN
1	A	217	GLN
2	B	159	ASN

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Mol	Chain	Res	Type
2	B	192	ASN
2	B	245	ASN
2	B	385	GLN
1	C	67	HIS
1	C	73	GLN
1	C	146	HIS
1	C	314	HIS
2	D	159	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

5 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	E	1	3	14,14,15	0.47	0	17,19,21	0.84	1 (5%)
3	NAG	E	2	3	14,14,15	0.32	0	17,19,21	1.10	2 (11%)
3	BMA	E	3	3	11,11,12	0.34	0	15,15,17	0.90	0
3	MAN	E	4	3	11,11,12	0.51	0	15,15,17	1.99	4 (26%)
3	MAN	E	5	3	11,11,12	0.51	0	15,15,17	1.01	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	E	1	3	-	0/6/23/26	0/1/1/1
3	NAG	E	2	3	-	0/6/23/26	0/1/1/1
3	BMA	E	3	3	-	0/2/19/22	0/1/1/1
3	MAN	E	4	3	-	0/2/19/22	0/1/1/1
3	MAN	E	5	3	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	4	MAN	C1-C2-C3	5.99	117.03	109.67
3	E	4	MAN	C2-C3-C4	3.19	116.41	110.89
3	E	5	MAN	O5-C5-C6	2.34	110.87	107.20
3	E	2	NAG	C1-C2-N2	-2.26	106.62	110.49
3	E	1	NAG	O4-C4-C3	-2.17	105.33	110.35
3	E	2	NAG	C2-N2-C7	2.16	125.98	122.90
3	E	4	MAN	C3-C4-C5	2.15	114.08	110.24
3	E	4	MAN	O5-C5-C6	2.08	110.47	107.20

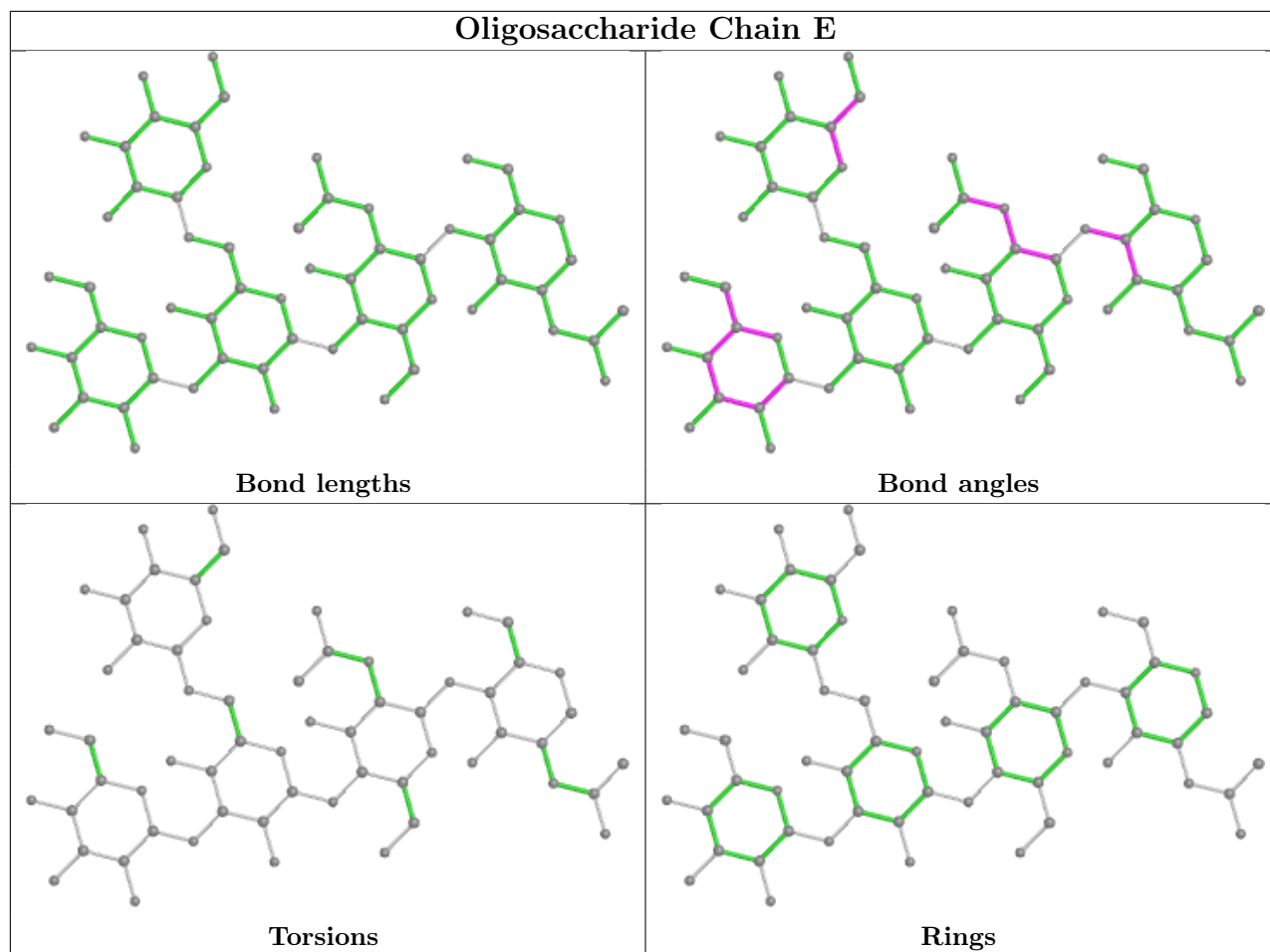
There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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



## 5.6 Ligand geometry [i](#)

Of 11 ligands modelled in this entry, 2 are monoatomic - leaving 9 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
4	NAG	C	502	1	14,14,15	0.55	0	17,19,21	1.39	4 (23%)
4	NAG	B	502	2	14,14,15	0.42	0	17,19,21	2.41	5 (29%)
4	NAG	B	501	2	14,14,15	0.50	0	17,19,21	1.08	2 (11%)
6	YGW	D	503	-	31,32,32	3.34	9 (29%)	42,45,45	5.45	14 (33%)
6	YGW	B	503	-	31,32,32	3.32	7 (22%)	42,45,45	5.38	11 (26%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	C	501	1	14,14,15	0.45	0	17,19,21	0.69	0
4	NAG	A	501	1	14,14,15	0.75	1 (7%)	17,19,21	1.54	4 (23%)
4	NAG	D	501	-	14,14,15	0.52	0	17,19,21	1.17	1 (5%)
4	NAG	D	502	-	14,14,15	0.29	0	17,19,21	2.37	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
4	NAG	C	502	1	-	4/6/23/26	0/1/1/1
4	NAG	B	502	2	1/1/5/7	4/6/23/26	0/1/1/1
4	NAG	B	501	2	-	0/6/23/26	0/1/1/1
6	YGW	D	503	-	-	8/18/28/28	0/3/3/3
6	YGW	B	503	-	-	4/18/28/28	0/3/3/3
4	NAG	C	501	1	-	0/6/23/26	0/1/1/1
4	NAG	A	501	1	-	2/6/23/26	0/1/1/1
4	NAG	D	501	-	-	4/6/23/26	0/1/1/1
4	NAG	D	502	-	-	3/6/23/26	0/1/1/1

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	503	YGW	O27-S24	13.51	1.67	1.43
6	D	503	YGW	O27-S24	13.01	1.66	1.43
6	D	503	YGW	S24-N23	8.41	1.74	1.63
6	B	503	YGW	C13-N10	-7.89	1.30	1.47
6	B	503	YGW	S24-N23	7.16	1.72	1.63
6	D	503	YGW	C13-N10	-7.05	1.31	1.47
6	B	503	YGW	C11-N10	-3.38	1.37	1.46
6	D	503	YGW	C11-N10	-3.13	1.38	1.46
6	D	503	YGW	C06-N07	3.04	1.47	1.38
6	D	503	YGW	C15-C14	2.76	1.55	1.50
6	D	503	YGW	C09-N10	-2.58	1.39	1.46
6	B	503	YGW	C25-S24	2.45	1.81	1.75
6	D	503	YGW	C25-S24	2.42	1.81	1.75
6	D	503	YGW	O26-S24	2.32	1.47	1.43
4	A	501	NAG	O5-C1	-2.26	1.40	1.43
6	B	503	YGW	C09-N10	-2.18	1.40	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	503	YGW	C05-C06	-2.02	1.36	1.39

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	503	YGW	C25-S24-N23	28.43	139.05	106.63
6	D	503	YGW	C25-S24-N23	24.07	134.08	106.63
6	D	503	YGW	O27-S24-C25	-20.26	75.74	108.28
6	B	503	YGW	O27-S24-C25	-15.90	82.75	108.28
6	D	503	YGW	O27-S24-N23	-9.10	88.54	107.10
4	D	502	NAG	C1-O5-C5	7.86	122.84	112.19
4	B	502	NAG	C1-O5-C5	7.55	122.42	112.19
6	D	503	YGW	O27-S24-O26	-7.44	108.16	118.85
6	B	503	YGW	O27-S24-N23	-7.36	92.08	107.10
6	B	503	YGW	O27-S24-O26	-5.06	111.57	118.85
4	D	502	NAG	O5-C1-C2	4.61	118.57	111.29
6	D	503	YGW	C15-O16-C17	4.08	124.85	117.67
4	D	501	NAG	C1-O5-C5	4.03	117.65	112.19
6	D	503	YGW	O26-S24-N23	3.99	115.24	107.10
4	B	502	NAG	C3-C4-C5	3.49	116.47	110.24
4	B	501	NAG	O5-C1-C2	-3.24	106.18	111.29
4	A	501	NAG	C1-O5-C5	3.07	116.35	112.19
4	B	502	NAG	O5-C5-C4	3.07	118.29	110.83
6	D	503	YGW	C08-N07-C06	3.04	126.31	118.09
6	D	503	YGW	C13-N10-C09	2.96	115.69	111.09
6	B	503	YGW	C12-N07-C08	2.94	118.00	111.52
6	D	503	YGW	C09-C08-N07	2.94	116.40	110.70
6	B	503	YGW	C01-C06-N07	-2.91	117.37	121.38
4	C	502	NAG	O3-C3-C2	-2.79	103.69	109.47
6	D	503	YGW	C22-C21-C20	-2.61	117.29	120.30
6	B	503	YGW	O26-S24-N23	2.55	112.29	107.10
6	B	503	YGW	O28-C14-C15	-2.54	116.57	120.57
6	D	503	YGW	C05-C06-N07	-2.52	118.62	121.33
4	C	502	NAG	O6-C6-C5	-2.52	102.65	111.29
6	B	503	YGW	C15-O16-C17	-2.51	113.25	117.67
4	A	501	NAG	C3-C4-C5	2.51	114.72	110.24
4	C	502	NAG	C3-C4-C5	2.42	114.56	110.24
4	B	502	NAG	C2-N2-C7	2.37	126.28	122.90
6	B	503	YGW	C11-C12-N07	2.36	115.29	110.70
4	A	501	NAG	O3-C3-C4	-2.21	105.24	110.35
6	B	503	YGW	C08-N07-C06	2.17	123.96	118.09
6	D	503	YGW	C21-C20-C19	2.16	121.98	119.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	502	NAG	C8-C7-N2	2.14	119.73	116.10
6	D	503	YGW	F29-C04-C03	2.12	123.58	118.43
4	B	501	NAG	O5-C5-C6	2.10	110.49	107.20
4	A	501	NAG	C6-C5-C4	-2.09	108.10	113.00
6	D	503	YGW	C19-C20-N23	-2.09	115.58	120.09
4	C	502	NAG	O5-C1-C2	-2.00	108.13	111.29

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	B	502	NAG	C1

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	503	YGW	C20-N23-S24-O26
6	D	503	YGW	N10-C13-C14-C15
6	D	503	YGW	N10-C13-C14-O28
6	D	503	YGW	C20-N23-S24-O27
4	B	502	NAG	O5-C5-C6-O6
4	D	501	NAG	C4-C5-C6-O6
4	B	502	NAG	C4-C5-C6-O6
4	A	501	NAG	C4-C5-C6-O6
4	B	502	NAG	C8-C7-N2-C2
4	B	502	NAG	O7-C7-N2-C2
4	C	502	NAG	C8-C7-N2-C2
4	C	502	NAG	O7-C7-N2-C2
4	D	502	NAG	C8-C7-N2-C2
4	D	502	NAG	O7-C7-N2-C2
4	D	501	NAG	O5-C5-C6-O6
4	A	501	NAG	O5-C5-C6-O6
6	D	503	YGW	C22-C17-O16-C15
6	D	503	YGW	C18-C17-O16-C15
6	D	503	YGW	C20-N23-S24-C25
6	D	503	YGW	C20-N23-S24-O26
4	C	502	NAG	C4-C5-C6-O6
6	B	503	YGW	C20-N23-S24-O27
4	D	501	NAG	C1-C2-N2-C7
4	D	502	NAG	C4-C5-C6-O6
6	D	503	YGW	O28-C14-C15-O16
4	C	502	NAG	O5-C5-C6-O6
6	B	503	YGW	O28-C14-C15-O16

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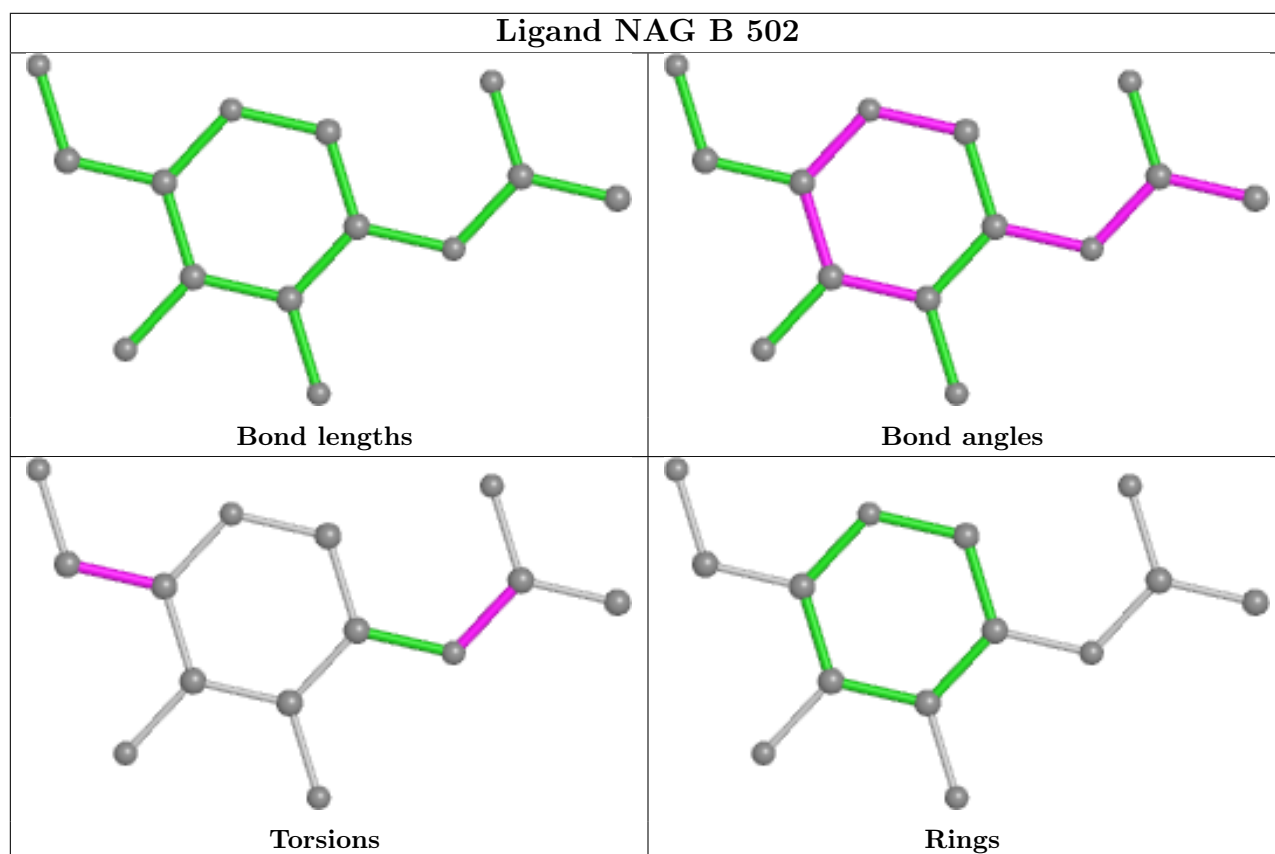
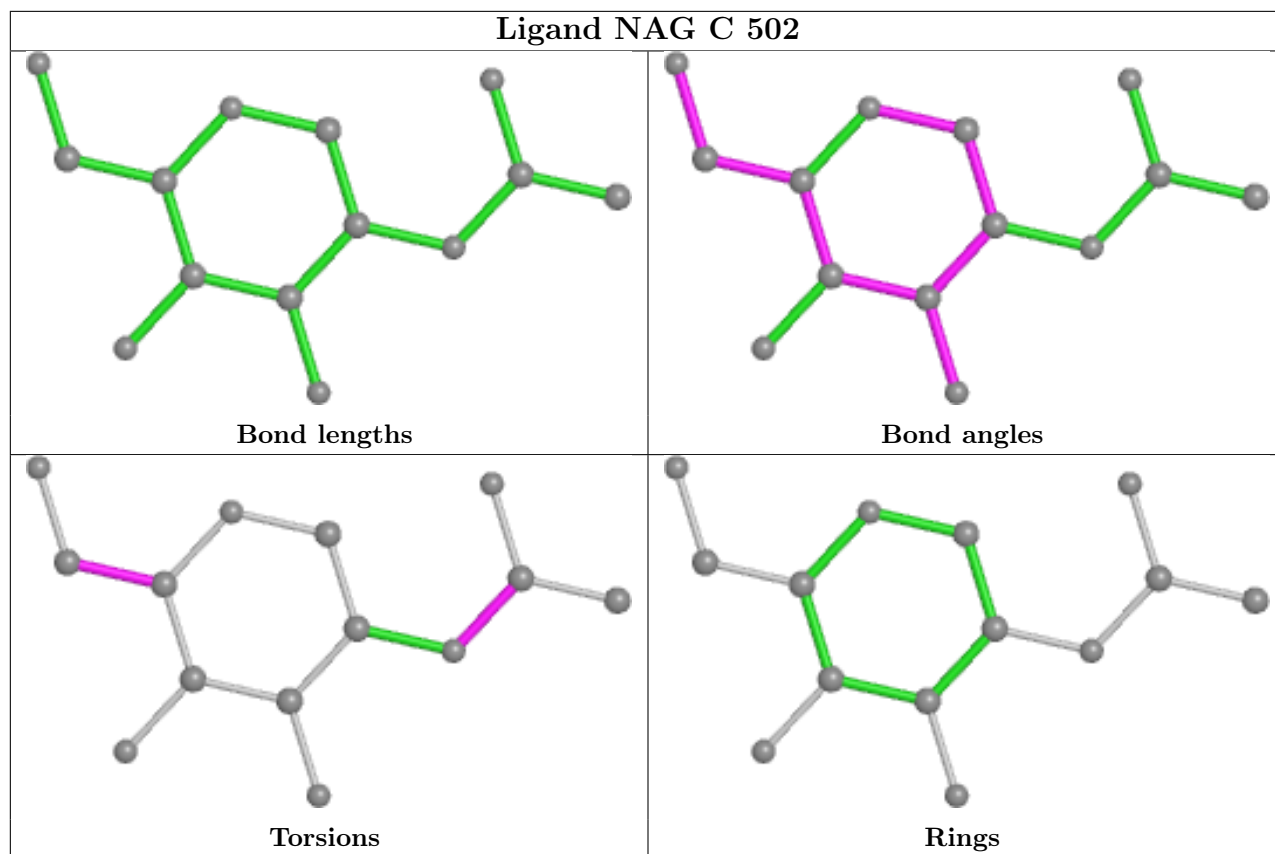
Mol	Chain	Res	Type	Atoms
4	D	501	NAG	C3-C2-N2-C7
6	B	503	YGW	N10-C13-C14-O28

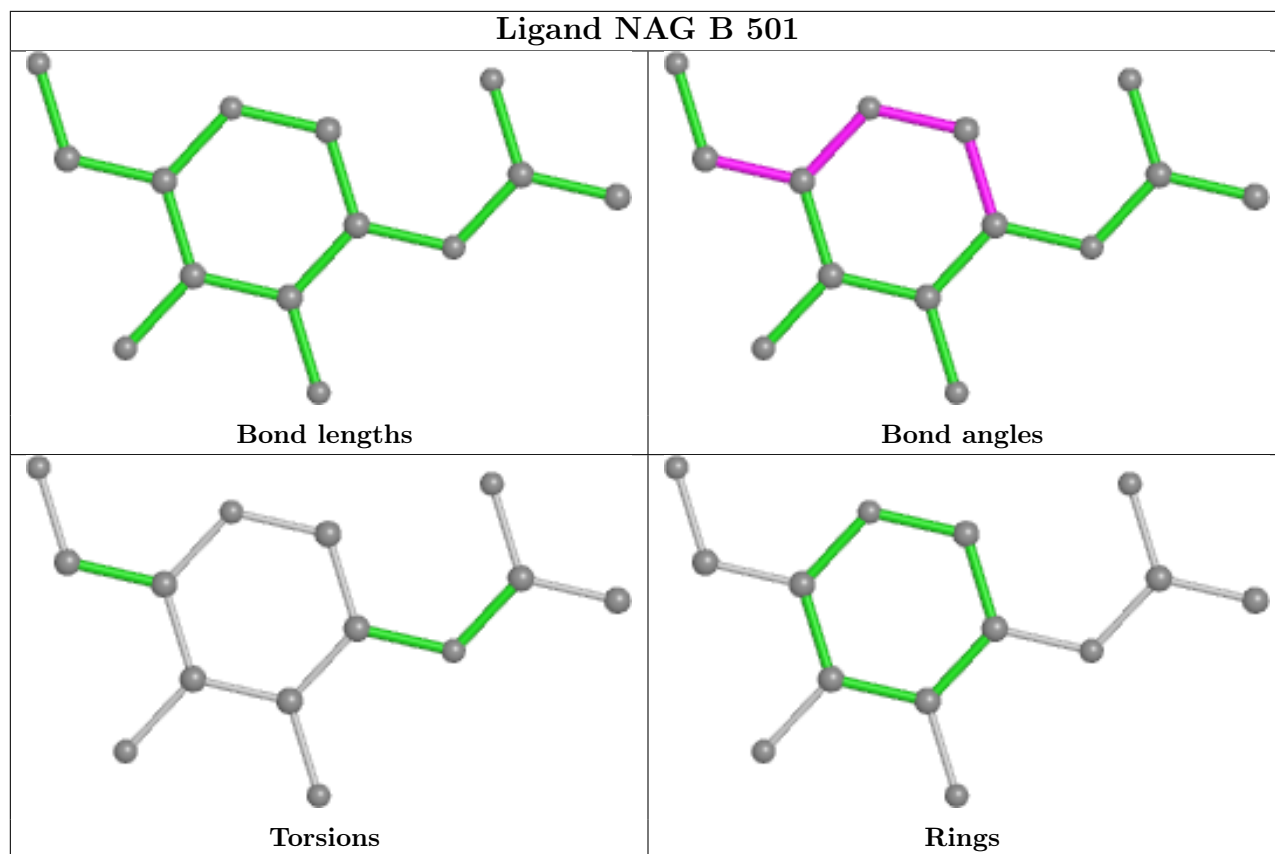
There are no ring outliers.

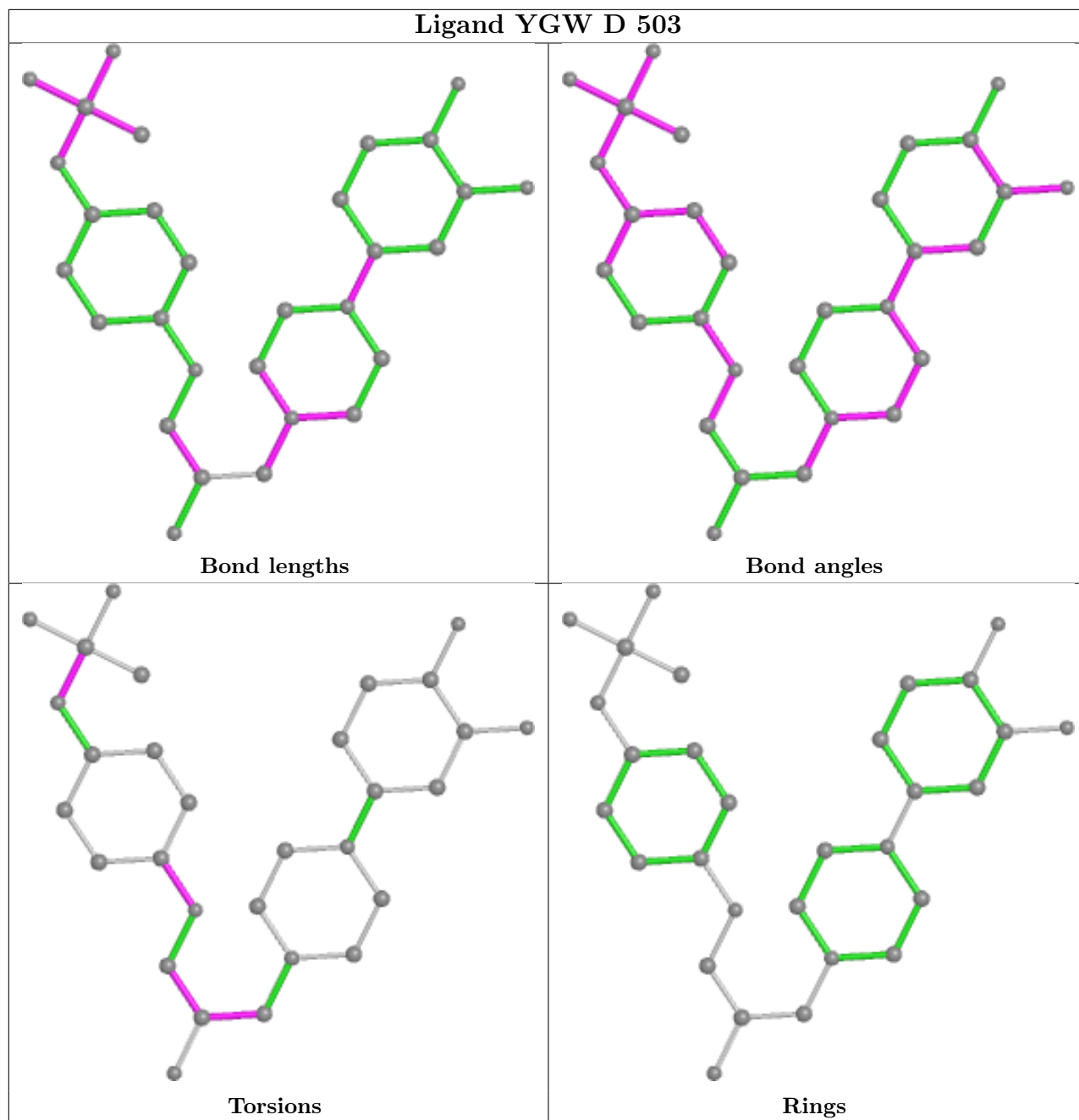
2 monomers are involved in 5 short contacts:

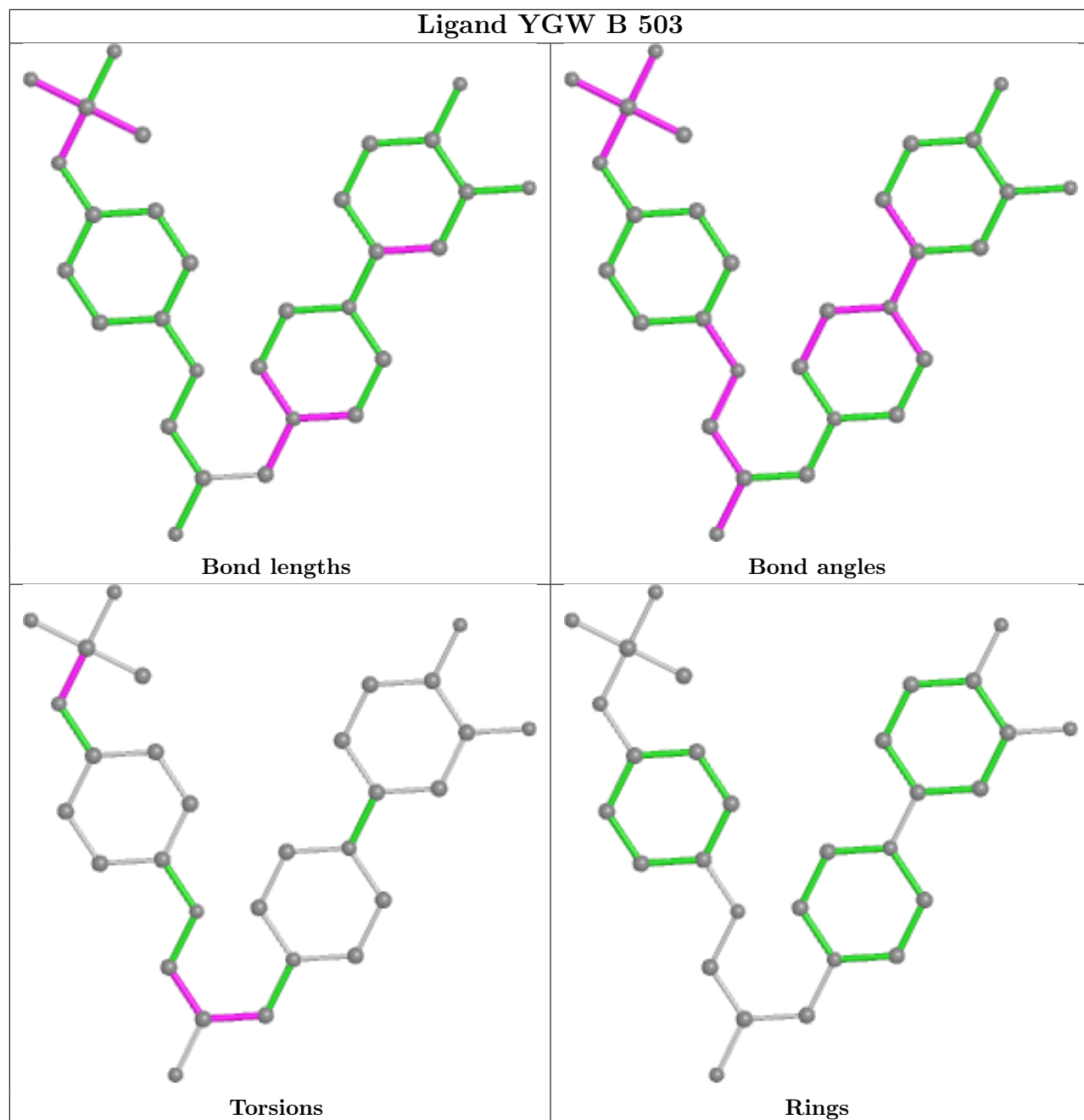
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	D	503	YGW	3	0
6	B	503	YGW	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

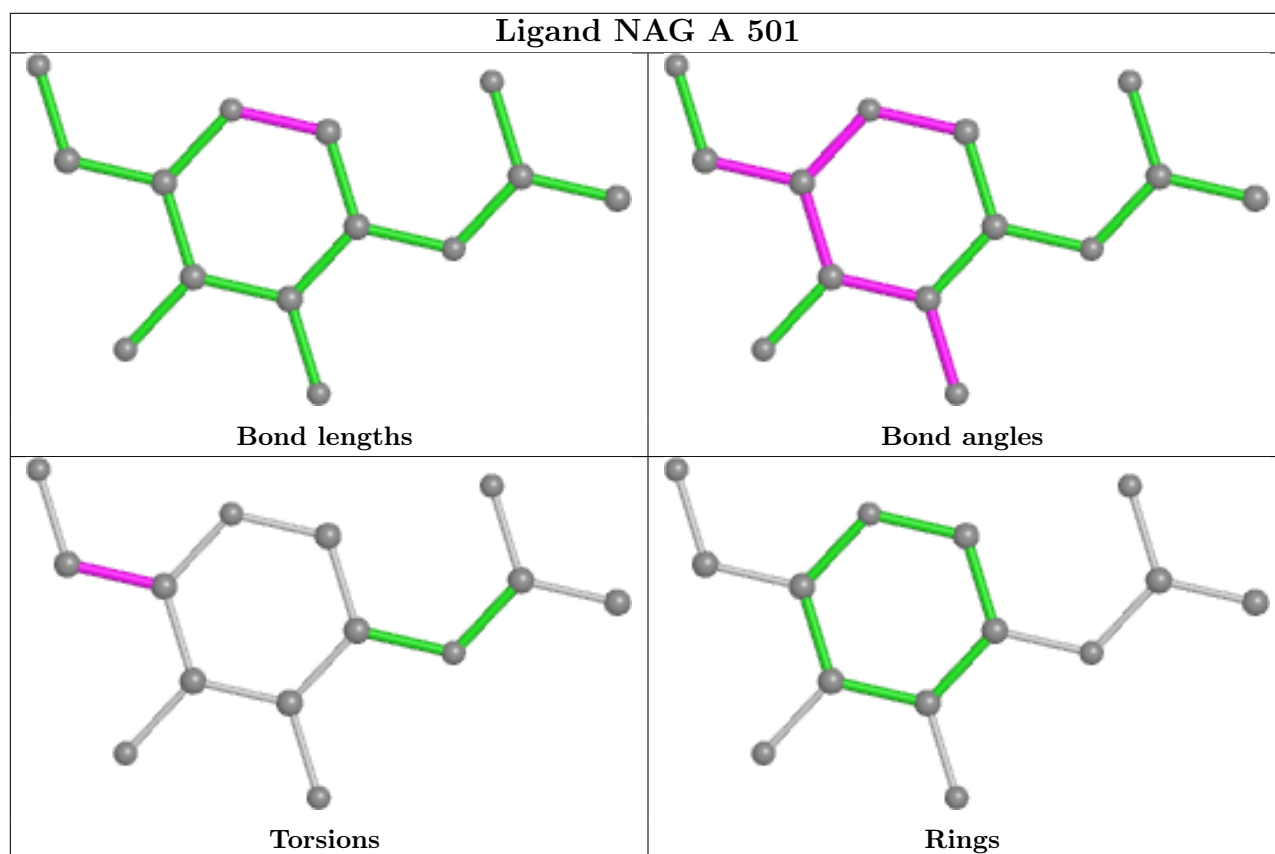
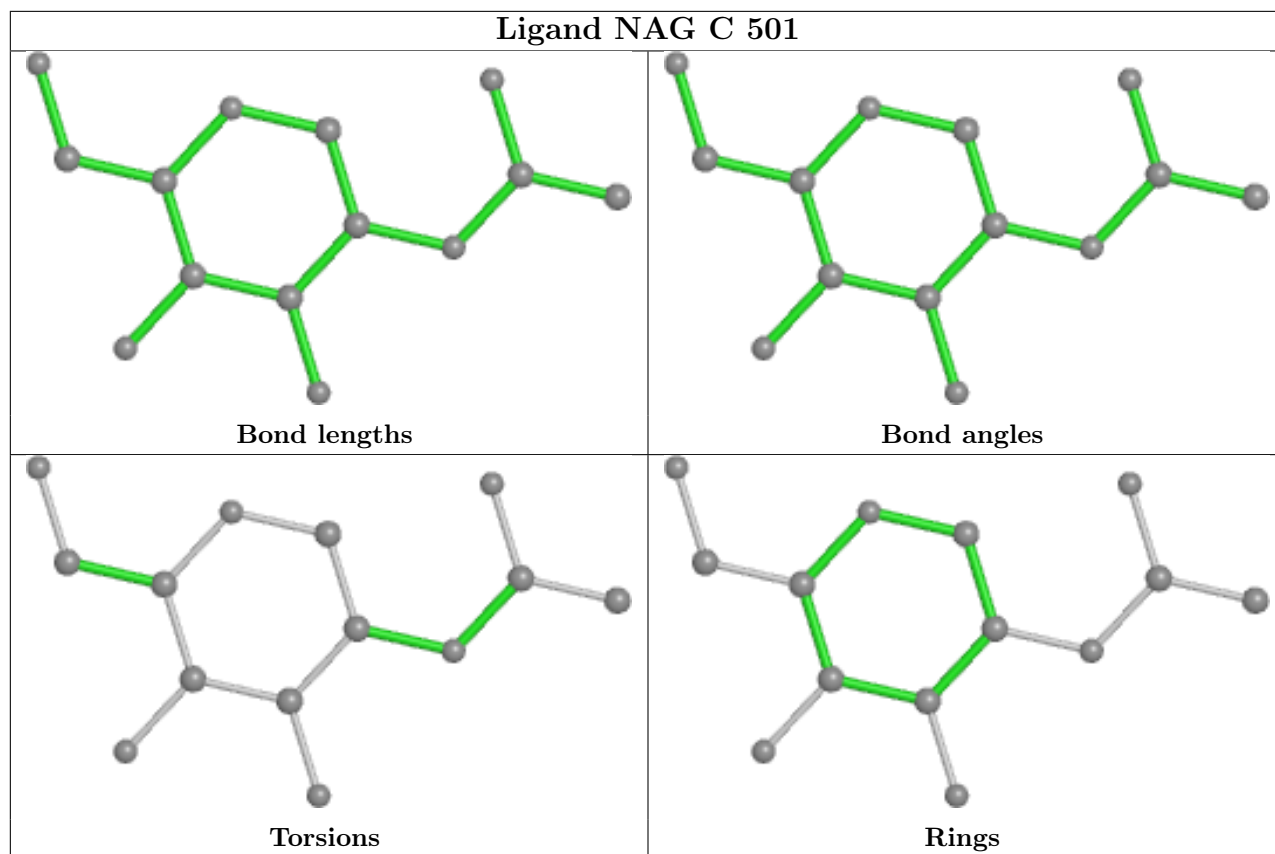


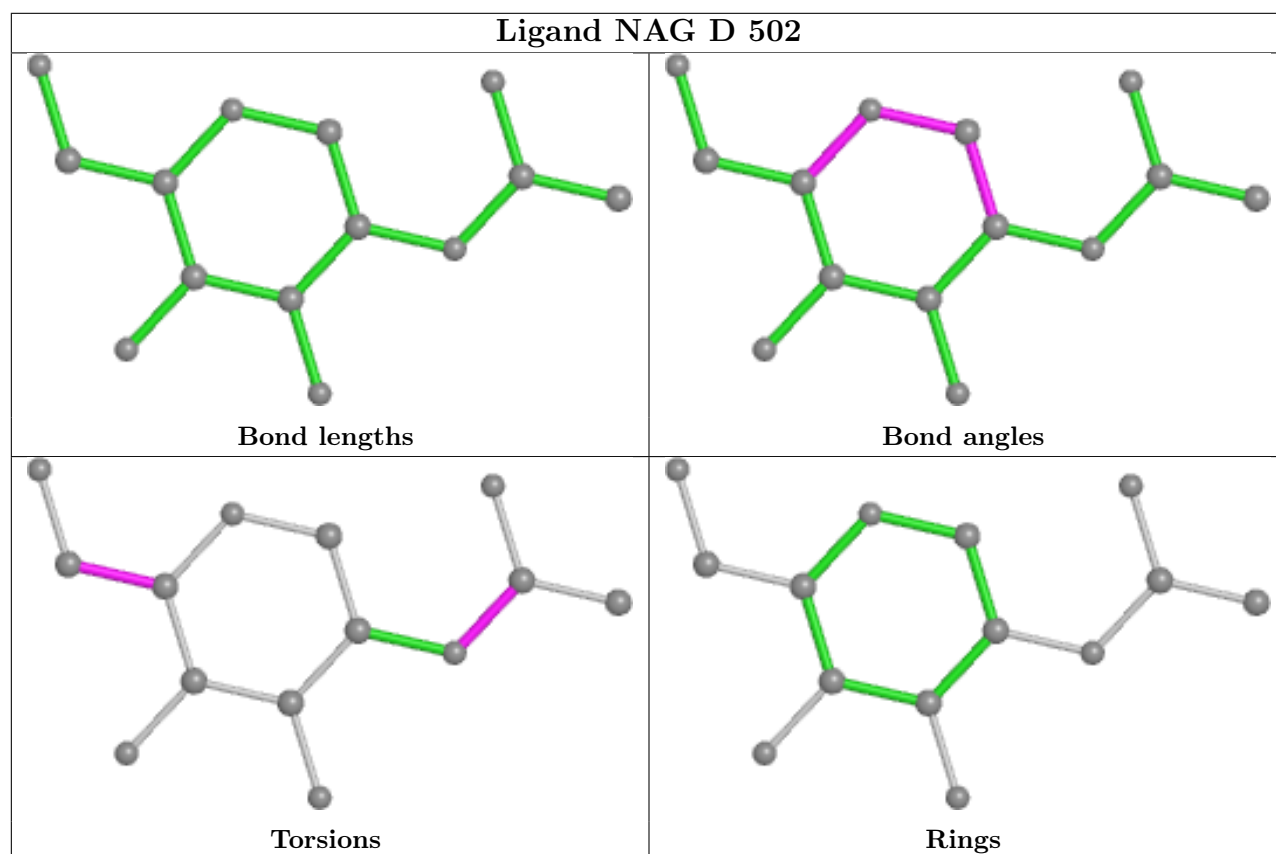
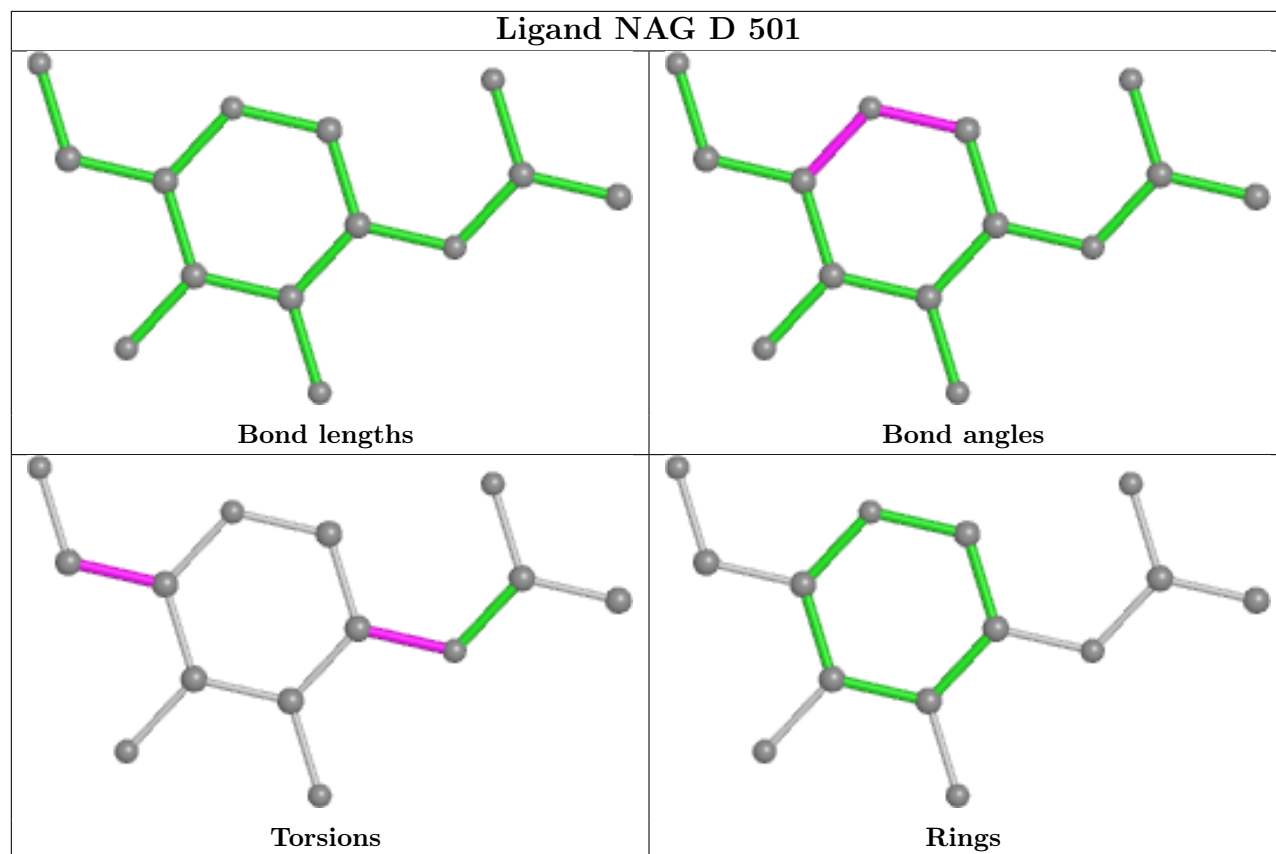












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	359/385 (93%)	-0.22	9 (2%) 57 54	16, 37, 82, 112	0
1	C	358/385 (92%)	0.26	30 (8%) 11 7	31, 62, 102, 124	0
2	B	363/363 (100%)	0.25	23 (6%) 20 15	17, 53, 99, 134	0
2	D	363/363 (100%)	0.25	26 (7%) 15 11	32, 60, 110, 147	0
All	All	1443/1496 (96%)	0.14	88 (6%) 21 17	16, 54, 101, 147	0

All (88) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	48	VAL	6.0
1	C	101	HIS	5.9
2	B	58	ASP	5.4
1	C	353	ASP	4.9
2	D	192	ASN	4.9
2	D	344	PHE	4.7
2	B	48	VAL	4.6
1	C	265	GLY	4.6
2	D	58	ASP	4.5
2	B	55	GLU	4.5
1	A	407	THR	4.5
2	D	57	ASP	4.4
2	D	44	THR	4.3
2	D	49	ALA	4.1
2	B	52	ASP	4.0
2	D	194	PHE	4.0
2	B	44	THR	4.0
2	D	60	HIS	4.0
1	C	222	THR	3.8
2	D	193	SER	3.8
2	B	49	ALA	3.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	158	PHE	3.7
1	C	259	LEU	3.7
1	A	236	GLU	3.7
2	D	54	HIS	3.7
2	D	381	ASP	3.6
1	C	264	ALA	3.6
1	C	260	ASP	3.5
2	B	54	HIS	3.5
1	A	23	ASP	3.5
1	C	258	MET	3.4
1	C	223	LYS	3.4
2	B	381	ASP	3.4
2	B	46	ASP	3.3
1	C	257	ALA	3.3
1	C	406	GLU	3.2
1	C	397	ASP	3.1
1	A	209	GLY	3.1
2	D	325	HIS	3.1
1	C	23	ASP	3.1
1	C	157	LEU	3.0
1	C	266	TYR	3.0
2	B	218	ASN	3.0
1	C	97	ALA	3.0
1	C	220	PRO	3.0
1	C	224	ASN	3.0
1	C	221	GLY	2.9
2	D	345	GLU	2.9
1	C	321	ASN	2.8
2	D	324	THR	2.8
2	D	346	GLY	2.8
1	C	73	GLN	2.8
2	B	345	GLU	2.8
1	C	219	GLU	2.8
2	D	347	ARG	2.7
2	D	195	VAL	2.7
2	B	385	GLN	2.6
2	D	52	ASP	2.6
2	B	50	ILE	2.6
1	A	97	ALA	2.6
1	A	222	THR	2.5
2	B	213	ASP	2.5
2	B	32	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
2	B	201	GLU	2.5
2	B	319	SER	2.5
2	D	348	ASP	2.5
2	B	53	ALA	2.5
1	C	318	GLU	2.4
2	D	62	LEU	2.4
2	B	344	PHE	2.4
2	B	56	LYS	2.3
1	A	397	ASP	2.3
1	C	226	THR	2.3
2	D	32	PRO	2.3
1	C	394	ILE	2.3
2	B	192	ASN	2.3
2	B	63	SER	2.3
2	B	359	HIS	2.3
2	D	61	HIS	2.2
1	C	358	ARG	2.2
1	A	56	ARG	2.2
1	C	238	ARG	2.2
1	C	395	GLN	2.2
2	D	59	PHE	2.1
2	D	34	SER	2.1
1	C	404	GLY	2.1
1	A	237	ALA	2.1
2	D	184	ASN	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](#)

SUGAR-RSR INFOmissingINFO

## 6.4 Ligands [i](#)

LIGAND-RSR INFOmissingINFO

## 6.5 Other polymers [i](#)

There are no such residues in this entry.