



Full wwPDB EM Validation Report ⓘ

Jul 8, 2025 – 03:07 PM JST

PDB ID : 8ZRP / pdb_00008zrp
EMDB ID : EMD-60401
Title : Structure of nico
Authors : Su, J.; Yu, Z.; Zhao, Y.
Deposited on : 2024-06-05
Resolution : 3.32 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
buster-report : 1.1.7 (2018)
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

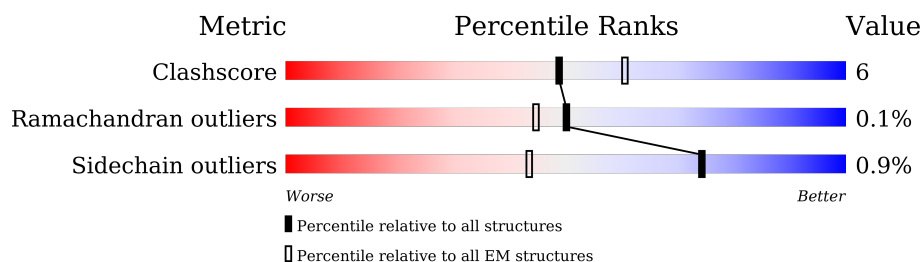
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.32 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.



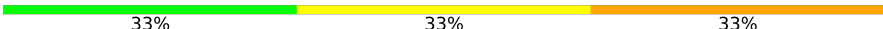
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	501	
1	C	501	
2	B	633	
2	D	633	
2	E	633	
3	F	3	
3	G	3	
3	H	3	
3	I	3	

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Mol	Chain	Length	Quality of chain
3	J	3	 33% 67%
3	K	3	 67% 33%
3	L	3	 33% 33% 33%
3	M	3	 100%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 16042 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 Neuronal acetylcholine receptor subunit alpha-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	383	Total	C	N	O	S	0	0
			3160	2086	493	563	18		
1	C	387	Total	C	N	O	S	0	0
			3197	2112	499	568	18		

There are 118 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	609	GLY	-	linker	UNP Q15825
A	610	SER	-	linker	UNP Q15825
A	611	GLY	-	linker	UNP Q15825
A	612	SER	-	linker	UNP Q15825
A	613	LEU	-	linker	UNP Q15825
A	614	GLU	-	linker	UNP Q15825
A	615	VAL	-	linker	UNP Q15825
A	616	LEU	-	linker	UNP Q15825
A	617	PHE	-	linker	UNP Q15825
A	618	GLN	-	linker	UNP Q15825
A	619	GLY	-	linker	UNP Q15825
A	620	PRO	-	linker	UNP Q15825
A	621	GLY	-	linker	UNP Q15825
A	622	GLY	-	linker	UNP Q15825
A	623	SER	-	linker	UNP Q15825
A	624	GLY	-	linker	UNP Q15825
A	625	SER	-	linker	UNP Q15825
A	626	GLY	-	linker	UNP Q15825
A	627	SER	-	linker	UNP Q15825
A	628	LEU	-	linker	UNP Q15825
A	629	GLU	-	linker	UNP Q15825
A	630	VAL	-	linker	UNP Q15825
A	631	LEU	-	linker	UNP Q15825
A	632	PHE	-	linker	UNP Q15825
A	633	GLN	-	linker	UNP Q15825
A	634	GLY	-	linker	UNP Q15825

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Chain	Residue	Modelled	Actual	Comment	Reference
A	635	PRO	-	linker	UNP Q15825
A	636	GLY	-	linker	UNP Q15825
A	637	GLY	-	linker	UNP Q15825
A	638	SER	-	linker	UNP Q15825
A	652	LEU	VAL	conflict	UNP Q15825
A	653	ALA	GLU	conflict	UNP Q15825
A	655	ILE	VAL	conflict	UNP Q15825
A	656	LEU	ILE	conflict	UNP Q15825
A	658	GLU	SER	conflict	UNP Q15825
A	661	TYR	PHE	conflict	UNP Q15825
A	664	ASN	GLU	conflict	UNP Q15825
A	665	ARG	ASN	conflict	UNP Q15825
A	666	PHE	MET	conflict	UNP Q15825
A	667	ARG	LYS	conflict	UNP Q15825
A	669	GLN	HIS	conflict	UNP Q15825
A	718	SER	-	expression tag	UNP Q15825
A	719	ALA	-	expression tag	UNP Q15825
A	720	SER	-	expression tag	UNP Q15825
A	721	ALA	-	expression tag	UNP Q15825
A	722	SER	-	expression tag	UNP Q15825
A	723	ALA	-	expression tag	UNP Q15825
A	724	SER	-	expression tag	UNP Q15825
A	725	ALA	-	expression tag	UNP Q15825
A	726	SER	-	expression tag	UNP Q15825
A	727	ALA	-	expression tag	UNP Q15825
A	728	HIS	-	expression tag	UNP Q15825
A	729	HIS	-	expression tag	UNP Q15825
A	730	HIS	-	expression tag	UNP Q15825
A	731	HIS	-	expression tag	UNP Q15825
A	732	HIS	-	expression tag	UNP Q15825
A	733	HIS	-	expression tag	UNP Q15825
A	734	HIS	-	expression tag	UNP Q15825
A	735	HIS	-	expression tag	UNP Q15825
C	609	GLY	-	linker	UNP Q15825
C	610	SER	-	linker	UNP Q15825
C	611	GLY	-	linker	UNP Q15825
C	612	SER	-	linker	UNP Q15825
C	613	LEU	-	linker	UNP Q15825
C	614	GLU	-	linker	UNP Q15825
C	615	VAL	-	linker	UNP Q15825
C	616	LEU	-	linker	UNP Q15825
C	617	PHE	-	linker	UNP Q15825

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Chain	Residue	Modelled	Actual	Comment	Reference
C	618	GLN	-	linker	UNP Q15825
C	619	GLY	-	linker	UNP Q15825
C	620	PRO	-	linker	UNP Q15825
C	621	GLY	-	linker	UNP Q15825
C	622	GLY	-	linker	UNP Q15825
C	623	SER	-	linker	UNP Q15825
C	624	GLY	-	linker	UNP Q15825
C	625	SER	-	linker	UNP Q15825
C	626	GLY	-	linker	UNP Q15825
C	627	SER	-	linker	UNP Q15825
C	628	LEU	-	linker	UNP Q15825
C	629	GLU	-	linker	UNP Q15825
C	630	VAL	-	linker	UNP Q15825
C	631	LEU	-	linker	UNP Q15825
C	632	PHE	-	linker	UNP Q15825
C	633	GLN	-	linker	UNP Q15825
C	634	GLY	-	linker	UNP Q15825
C	635	PRO	-	linker	UNP Q15825
C	636	GLY	-	linker	UNP Q15825
C	637	GLY	-	linker	UNP Q15825
C	638	SER	-	linker	UNP Q15825
C	652	LEU	VAL	conflict	UNP Q15825
C	653	ALA	GLU	conflict	UNP Q15825
C	655	ILE	VAL	conflict	UNP Q15825
C	656	LEU	ILE	conflict	UNP Q15825
C	658	GLU	SER	conflict	UNP Q15825
C	661	TYR	PHE	conflict	UNP Q15825
C	664	ASN	GLU	conflict	UNP Q15825
C	665	ARG	ASN	conflict	UNP Q15825
C	666	PHE	MET	conflict	UNP Q15825
C	667	ARG	LYS	conflict	UNP Q15825
C	669	GLN	HIS	conflict	UNP Q15825
C	718	SER	-	expression tag	UNP Q15825
C	719	ALA	-	expression tag	UNP Q15825
C	720	SER	-	expression tag	UNP Q15825
C	721	ALA	-	expression tag	UNP Q15825
C	722	SER	-	expression tag	UNP Q15825
C	723	ALA	-	expression tag	UNP Q15825
C	724	SER	-	expression tag	UNP Q15825
C	725	ALA	-	expression tag	UNP Q15825
C	726	SER	-	expression tag	UNP Q15825
C	727	ALA	-	expression tag	UNP Q15825

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Chain	Residue	Modelled	Actual	Comment	Reference
C	728	HIS	-	expression tag	UNP Q15825
C	729	HIS	-	expression tag	UNP Q15825
C	730	HIS	-	expression tag	UNP Q15825
C	731	HIS	-	expression tag	UNP Q15825
C	732	HIS	-	expression tag	UNP Q15825
C	733	HIS	-	expression tag	UNP Q15825
C	734	HIS	-	expression tag	UNP Q15825
C	735	HIS	-	expression tag	UNP Q15825

- Molecule 2 is a protein called Neuronal acetylcholine receptor subunit beta-4,Soluble cytochrome b562.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	382	Total	C	N	O	S	0	0
			3104	2027	502	555	20		
2	D	383	Total	C	N	O	S	0	0
			3115	2036	503	556	20		
2	E	384	Total	C	N	O	S	0	0
			3125	2044	504	557	20		

There are 243 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	361	GLY	-	linker	UNP P30926
B	362	SER	-	linker	UNP P30926
B	363	GLY	-	linker	UNP P30926
B	364	SER	-	linker	UNP P30926
B	365	LEU	-	linker	UNP P30926
B	366	GLU	-	linker	UNP P30926
B	367	VAL	-	linker	UNP P30926
B	368	LEU	-	linker	UNP P30926
B	369	PHE	-	linker	UNP P30926
B	370	GLN	-	linker	UNP P30926
B	371	GLY	-	linker	UNP P30926
B	372	PRO	-	linker	UNP P30926
B	373	GLY	-	linker	UNP P30926
B	374	GLY	-	linker	UNP P30926
B	375	SER	-	linker	UNP P30926
B	382	TRP	MET	conflict	UNP P0ABE7
B	477	ILE	HIS	conflict	UNP P0ABE7
B	481	LEU	-	linker	UNP P0ABE7
B	482	GLY	-	linker	UNP P0ABE7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	483	SER	-	linker	UNP P0ABE7
B	484	GLY	-	linker	UNP P0ABE7
B	485	SER	-	linker	UNP P0ABE7
B	486	LEU	-	linker	UNP P0ABE7
B	487	GLU	-	linker	UNP P0ABE7
B	488	VAL	-	linker	UNP P0ABE7
B	489	LEU	-	linker	UNP P0ABE7
B	490	PHE	-	linker	UNP P0ABE7
B	491	GLN	-	linker	UNP P0ABE7
B	492	GLY	-	linker	UNP P0ABE7
B	493	PRO	-	linker	UNP P0ABE7
B	494	GLY	-	linker	UNP P0ABE7
B	495	GLY	-	linker	UNP P0ABE7
B	519	PRO	GLN	conflict	UNP P30926
B	521	LEU	VAL	conflict	UNP P30926
B	522	ALA	GLN	conflict	UNP P30926
B	524	ILE	ALA	conflict	UNP P30926
B	527	GLU	GLY	conflict	UNP P30926
B	530	TYR	PHE	conflict	UNP P30926
B	533	ASN	GLN	conflict	UNP P30926
B	534	ARG	HIS	conflict	UNP P30926
B	535	PHE	MET	conflict	UNP P30926
B	536	ARG	LYS	conflict	UNP P30926
B	538	GLN	ASP	conflict	UNP P30926
B	596	SER	-	expression tag	UNP P30926
B	597	ALA	-	expression tag	UNP P30926
B	598	SER	-	expression tag	UNP P30926
B	599	ALA	-	expression tag	UNP P30926
B	600	SER	-	expression tag	UNP P30926
B	601	ALA	-	expression tag	UNP P30926
B	602	SER	-	expression tag	UNP P30926
B	603	ALA	-	expression tag	UNP P30926
B	604	SER	-	expression tag	UNP P30926
B	605	ALA	-	expression tag	UNP P30926
B	606	TRP	-	expression tag	UNP P30926
B	607	SER	-	expression tag	UNP P30926
B	608	HIS	-	expression tag	UNP P30926
B	609	PRO	-	expression tag	UNP P30926
B	610	GLN	-	expression tag	UNP P30926
B	611	PHE	-	expression tag	UNP P30926
B	612	GLU	-	expression tag	UNP P30926
B	613	LYS	-	expression tag	UNP P30926

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Chain	Residue	Modelled	Actual	Comment	Reference
B	614	GLY	-	expression tag	UNP P30926
B	615	GLY	-	expression tag	UNP P30926
B	616	GLY	-	expression tag	UNP P30926
B	617	SER	-	expression tag	UNP P30926
B	618	GLY	-	expression tag	UNP P30926
B	619	GLY	-	expression tag	UNP P30926
B	620	GLY	-	expression tag	UNP P30926
B	621	SER	-	expression tag	UNP P30926
B	622	GLY	-	expression tag	UNP P30926
B	623	GLY	-	expression tag	UNP P30926
B	624	SER	-	expression tag	UNP P30926
B	625	ALA	-	expression tag	UNP P30926
B	626	TRP	-	expression tag	UNP P30926
B	627	SER	-	expression tag	UNP P30926
B	628	HIS	-	expression tag	UNP P30926
B	629	PRO	-	expression tag	UNP P30926
B	630	GLN	-	expression tag	UNP P30926
B	631	PHE	-	expression tag	UNP P30926
B	632	GLU	-	expression tag	UNP P30926
B	633	LYS	-	expression tag	UNP P30926
D	361	GLY	-	linker	UNP P30926
D	362	SER	-	linker	UNP P30926
D	363	GLY	-	linker	UNP P30926
D	364	SER	-	linker	UNP P30926
D	365	LEU	-	linker	UNP P30926
D	366	GLU	-	linker	UNP P30926
D	367	VAL	-	linker	UNP P30926
D	368	LEU	-	linker	UNP P30926
D	369	PHE	-	linker	UNP P30926
D	370	GLN	-	linker	UNP P30926
D	371	GLY	-	linker	UNP P30926
D	372	PRO	-	linker	UNP P30926
D	373	GLY	-	linker	UNP P30926
D	374	GLY	-	linker	UNP P30926
D	375	SER	-	linker	UNP P30926
D	382	TRP	MET	conflict	UNP P0ABE7
D	477	ILE	HIS	conflict	UNP P0ABE7
D	481	LEU	-	linker	UNP P0ABE7
D	482	GLY	-	linker	UNP P0ABE7
D	483	SER	-	linker	UNP P0ABE7
D	484	GLY	-	linker	UNP P0ABE7
D	485	SER	-	linker	UNP P0ABE7

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Chain	Residue	Modelled	Actual	Comment	Reference
D	486	LEU	-	linker	UNP P0ABE7
D	487	GLU	-	linker	UNP P0ABE7
D	488	VAL	-	linker	UNP P0ABE7
D	489	LEU	-	linker	UNP P0ABE7
D	490	PHE	-	linker	UNP P0ABE7
D	491	GLN	-	linker	UNP P0ABE7
D	492	GLY	-	linker	UNP P0ABE7
D	493	PRO	-	linker	UNP P0ABE7
D	494	GLY	-	linker	UNP P0ABE7
D	495	GLY	-	linker	UNP P0ABE7
D	519	PRO	GLN	conflict	UNP P30926
D	521	LEU	VAL	conflict	UNP P30926
D	522	ALA	GLN	conflict	UNP P30926
D	524	ILE	ALA	conflict	UNP P30926
D	527	GLU	GLY	conflict	UNP P30926
D	530	TYR	PHE	conflict	UNP P30926
D	533	ASN	GLN	conflict	UNP P30926
D	534	ARG	HIS	conflict	UNP P30926
D	535	PHE	MET	conflict	UNP P30926
D	536	ARG	LYS	conflict	UNP P30926
D	538	GLN	ASP	conflict	UNP P30926
D	596	SER	-	expression tag	UNP P30926
D	597	ALA	-	expression tag	UNP P30926
D	598	SER	-	expression tag	UNP P30926
D	599	ALA	-	expression tag	UNP P30926
D	600	SER	-	expression tag	UNP P30926
D	601	ALA	-	expression tag	UNP P30926
D	602	SER	-	expression tag	UNP P30926
D	603	ALA	-	expression tag	UNP P30926
D	604	SER	-	expression tag	UNP P30926
D	605	ALA	-	expression tag	UNP P30926
D	606	TRP	-	expression tag	UNP P30926
D	607	SER	-	expression tag	UNP P30926
D	608	HIS	-	expression tag	UNP P30926
D	609	PRO	-	expression tag	UNP P30926
D	610	GLN	-	expression tag	UNP P30926
D	611	PHE	-	expression tag	UNP P30926
D	612	GLU	-	expression tag	UNP P30926
D	613	LYS	-	expression tag	UNP P30926
D	614	GLY	-	expression tag	UNP P30926
D	615	GLY	-	expression tag	UNP P30926
D	616	GLY	-	expression tag	UNP P30926

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Chain	Residue	Modelled	Actual	Comment	Reference
D	617	SER	-	expression tag	UNP P30926
D	618	GLY	-	expression tag	UNP P30926
D	619	GLY	-	expression tag	UNP P30926
D	620	GLY	-	expression tag	UNP P30926
D	621	SER	-	expression tag	UNP P30926
D	622	GLY	-	expression tag	UNP P30926
D	623	GLY	-	expression tag	UNP P30926
D	624	SER	-	expression tag	UNP P30926
D	625	ALA	-	expression tag	UNP P30926
D	626	TRP	-	expression tag	UNP P30926
D	627	SER	-	expression tag	UNP P30926
D	628	HIS	-	expression tag	UNP P30926
D	629	PRO	-	expression tag	UNP P30926
D	630	GLN	-	expression tag	UNP P30926
D	631	PHE	-	expression tag	UNP P30926
D	632	GLU	-	expression tag	UNP P30926
D	633	LYS	-	expression tag	UNP P30926
E	361	GLY	-	linker	UNP P30926
E	362	SER	-	linker	UNP P30926
E	363	GLY	-	linker	UNP P30926
E	364	SER	-	linker	UNP P30926
E	365	LEU	-	linker	UNP P30926
E	366	GLU	-	linker	UNP P30926
E	367	VAL	-	linker	UNP P30926
E	368	LEU	-	linker	UNP P30926
E	369	PHE	-	linker	UNP P30926
E	370	GLN	-	linker	UNP P30926
E	371	GLY	-	linker	UNP P30926
E	372	PRO	-	linker	UNP P30926
E	373	GLY	-	linker	UNP P30926
E	374	GLY	-	linker	UNP P30926
E	375	SER	-	linker	UNP P30926
E	382	TRP	MET	conflict	UNP P0ABE7
E	477	ILE	HIS	conflict	UNP P0ABE7
E	481	LEU	-	linker	UNP P0ABE7
E	482	GLY	-	linker	UNP P0ABE7
E	483	SER	-	linker	UNP P0ABE7
E	484	GLY	-	linker	UNP P0ABE7
E	485	SER	-	linker	UNP P0ABE7
E	486	LEU	-	linker	UNP P0ABE7
E	487	GLU	-	linker	UNP P0ABE7
E	488	VAL	-	linker	UNP P0ABE7

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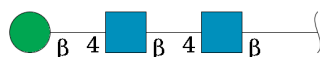
Chain	Residue	Modelled	Actual	Comment	Reference
E	489	LEU	-	linker	UNP P0ABE7
E	490	PHE	-	linker	UNP P0ABE7
E	491	GLN	-	linker	UNP P0ABE7
E	492	GLY	-	linker	UNP P0ABE7
E	493	PRO	-	linker	UNP P0ABE7
E	494	GLY	-	linker	UNP P0ABE7
E	495	GLY	-	linker	UNP P0ABE7
E	519	PRO	GLN	conflict	UNP P30926
E	521	LEU	VAL	conflict	UNP P30926
E	522	ALA	GLN	conflict	UNP P30926
E	524	ILE	ALA	conflict	UNP P30926
E	527	GLU	GLY	conflict	UNP P30926
E	530	TYR	PHE	conflict	UNP P30926
E	533	ASN	GLN	conflict	UNP P30926
E	534	ARG	HIS	conflict	UNP P30926
E	535	PHE	MET	conflict	UNP P30926
E	536	ARG	LYS	conflict	UNP P30926
E	538	GLN	ASP	conflict	UNP P30926
E	596	SER	-	expression tag	UNP P30926
E	597	ALA	-	expression tag	UNP P30926
E	598	SER	-	expression tag	UNP P30926
E	599	ALA	-	expression tag	UNP P30926
E	600	SER	-	expression tag	UNP P30926
E	601	ALA	-	expression tag	UNP P30926
E	602	SER	-	expression tag	UNP P30926
E	603	ALA	-	expression tag	UNP P30926
E	604	SER	-	expression tag	UNP P30926
E	605	ALA	-	expression tag	UNP P30926
E	606	TRP	-	expression tag	UNP P30926
E	607	SER	-	expression tag	UNP P30926
E	608	HIS	-	expression tag	UNP P30926
E	609	PRO	-	expression tag	UNP P30926
E	610	GLN	-	expression tag	UNP P30926
E	611	PHE	-	expression tag	UNP P30926
E	612	GLU	-	expression tag	UNP P30926
E	613	LYS	-	expression tag	UNP P30926
E	614	GLY	-	expression tag	UNP P30926
E	615	GLY	-	expression tag	UNP P30926
E	616	GLY	-	expression tag	UNP P30926
E	617	SER	-	expression tag	UNP P30926
E	618	GLY	-	expression tag	UNP P30926
E	619	GLY	-	expression tag	UNP P30926

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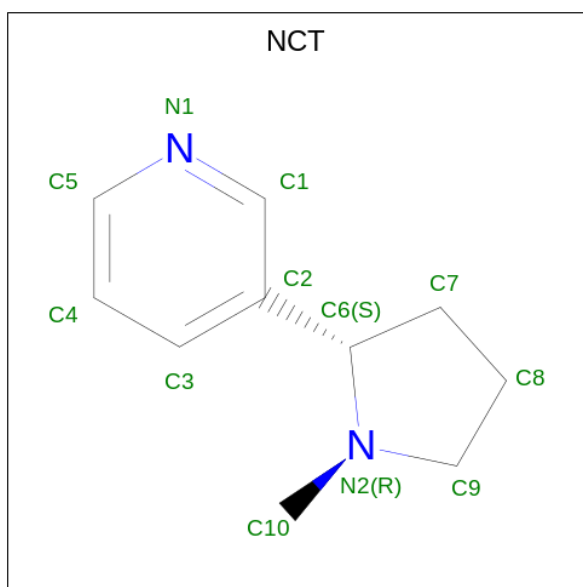
Chain	Residue	Modelled	Actual	Comment	Reference
E	620	GLY	-	expression tag	UNP P30926
E	621	SER	-	expression tag	UNP P30926
E	622	GLY	-	expression tag	UNP P30926
E	623	GLY	-	expression tag	UNP P30926
E	624	SER	-	expression tag	UNP P30926
E	625	ALA	-	expression tag	UNP P30926
E	626	TRP	-	expression tag	UNP P30926
E	627	SER	-	expression tag	UNP P30926
E	628	HIS	-	expression tag	UNP P30926
E	629	PRO	-	expression tag	UNP P30926
E	630	GLN	-	expression tag	UNP P30926
E	631	PHE	-	expression tag	UNP P30926
E	632	GLU	-	expression tag	UNP P30926
E	633	LYS	-	expression tag	UNP P30926

- 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				AltConf	Trace
3	F	3	Total	C	N	O	0	0
			39	22	2	15		
3	G	3	Total	C	N	O	0	0
			39	22	2	15		
3	H	3	Total	C	N	O	0	0
			39	22	2	15		
3	I	3	Total	C	N	O	0	0
			39	22	2	15		
3	J	3	Total	C	N	O	0	0
			39	22	2	15		
3	K	3	Total	C	N	O	0	0
			39	22	2	15		
3	L	3	Total	C	N	O	0	0
			39	22	2	15		
3	M	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 4 is (S)-3-(1-METHYLPYRROLIDIN-2-YL)PYRIDINE (CCD ID: NCT) (formula: C₁₀H₁₄N₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
4	A	1	Total	C	N	0
			12	10	2	
4	C	1	Total	C	N	0
			12	10	2	

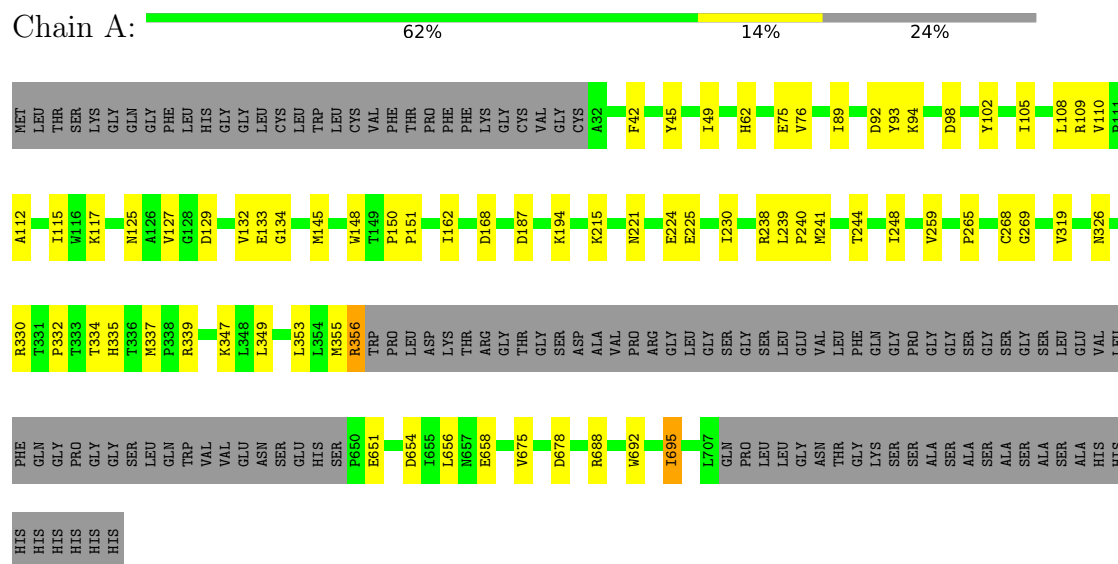
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		AltConf
5	A	2	Total	O	0
			2	2	
5	B	1	Total	O	0
			1	1	
5	C	1	Total	O	0
			1	1	
5	D	1	Total	O	0
			1	1	

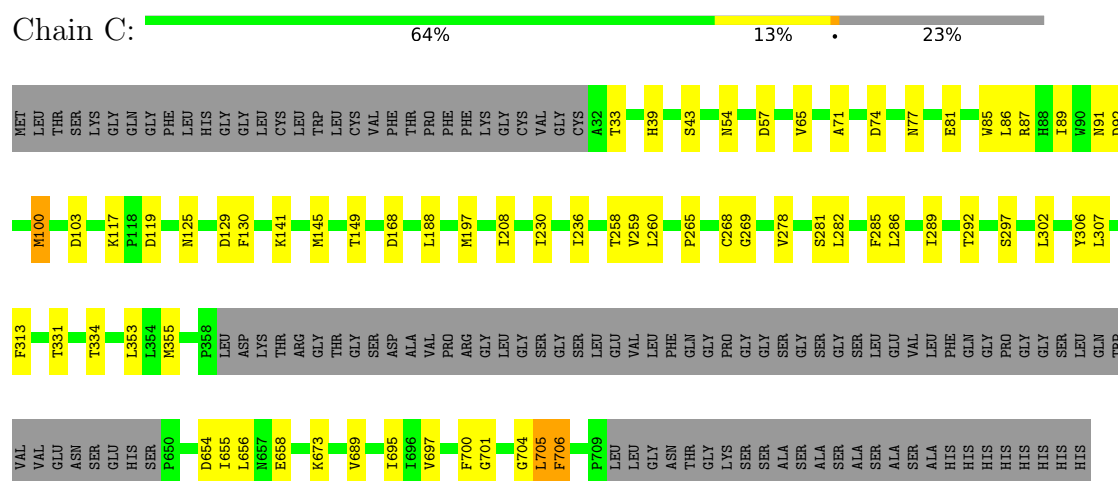
3 Residue-property plots

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: Neuronal acetylcholine receptor subunit alpha-6

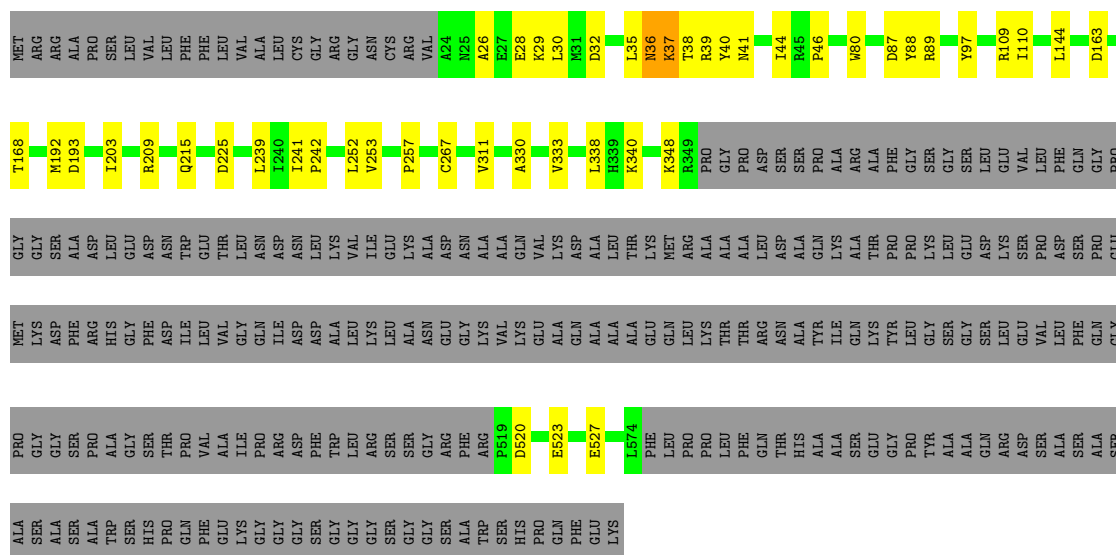


- Molecule 1: Neuronal acetylcholine receptor subunit alpha-6



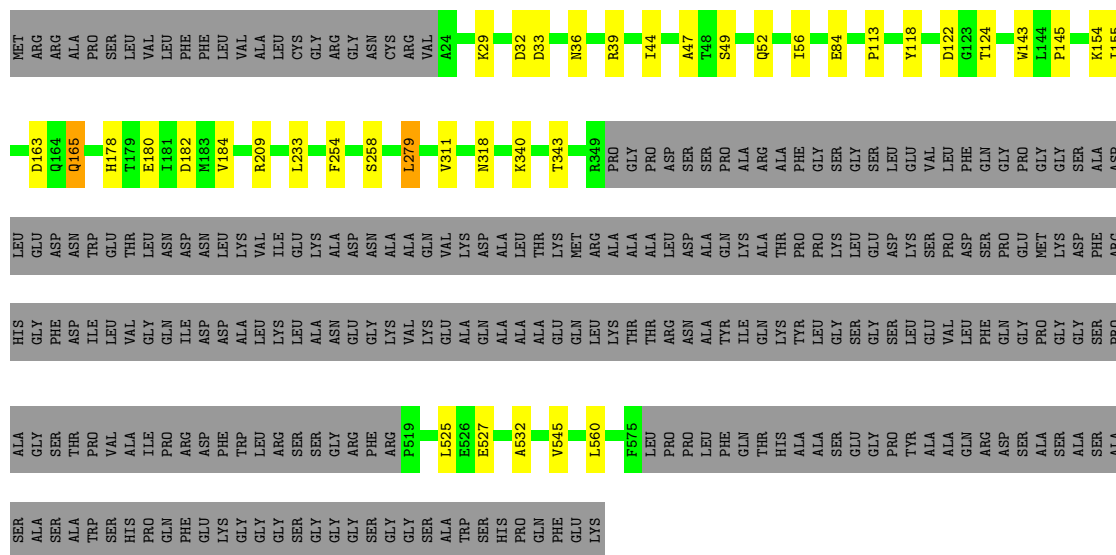
- Molecule 2: Neuronal acetylcholine receptor subunit beta-4, Soluble cytochrome b562





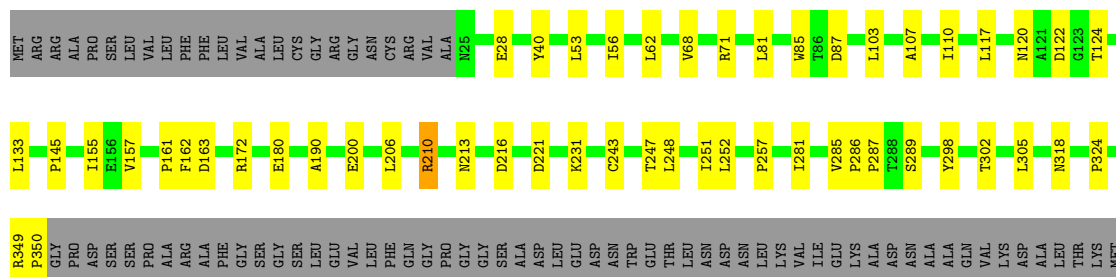
• Molecule 2: Neuronal acetylcholine receptor subunit beta-4, Soluble cytochrome b562

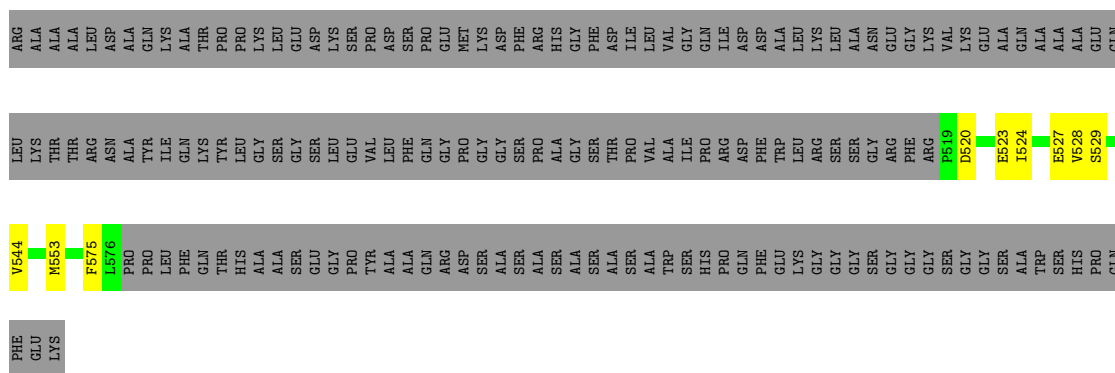
Chain D: 54% 6% 39%



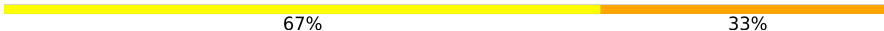
• Molecule 2: Neuronal acetylcholine receptor subunit beta-4, Soluble cytochrome b562

Chain E: 51% 9% 39%



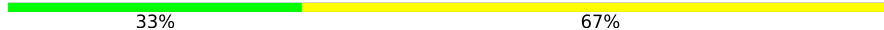


- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  67%

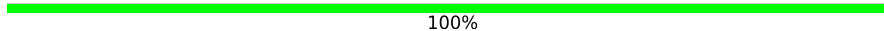


- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  33%



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

Chain H:  100%

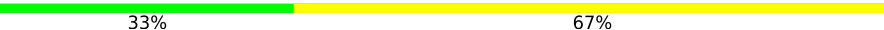


- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  100%



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

Chain J:  33%



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

Chain K:  67% 33%



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

Chain L:  33% 33% 33%



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

Chain M:  100%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	40331	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k 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: NCT, BMA, 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	0.20	0/3249	0.36	0/4434
1	C	0.21	0/3290	0.34	0/4493
2	B	0.13	0/3182	0.27	0/4341
2	D	0.15	0/3194	0.31	0/4357
2	E	0.19	0/3205	0.33	0/4373
All	All	0.18	0/16120	0.32	0/21998

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
2	E	0	1
All	All	0	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	109	ARG	Sidechain
1	A	356	ARG	Sidechain
2	E	210	ARG	Sidechain

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3160	0	3153	46	0
1	C	3197	0	3185	48	0
2	B	3104	0	3156	33	0
2	D	3115	0	3165	27	0
2	E	3125	0	3178	38	0
3	F	39	0	34	1	0
3	G	39	0	34	1	0
3	H	39	0	34	0	0
3	I	39	0	34	0	0
3	J	39	0	34	1	0
3	K	39	0	34	1	0
3	L	39	0	34	1	0
3	M	39	0	34	0	0
4	A	12	0	14	0	0
4	C	12	0	14	0	0
5	A	2	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
All	All	16042	0	16137	179	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 (179) 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:C:281:SER:O	1:C:285:PHE:CD2	2.10	1.05
2:B:32:ASP:O	2:B:36:ASN:HB2	1.56	1.04
1:C:281:SER:O	1:C:285:PHE:HD2	1.46	0.93
1:A:334:THR:HG1	1:A:335:HIS:HD1	1.18	0.87
2:D:279:LEU:C	2:D:279:LEU:HD13	2.03	0.84
2:D:279:LEU:HD13	2:D:279:LEU:O	1.92	0.69
2:D:122:ASP:OD1	2:D:124:THR:OG1	2.10	0.69
1:C:286:LEU:HG	1:C:307:LEU:HD23	1.76	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:331:THR:HG1	1:C:334:THR:HG1	1.38	0.67
2:D:209:ARG:NH1	3:K:2:NAG:O3	2.28	0.67
2:E:71:ARG:HA	2:E:286:PRO:HG3	1.76	0.66
2:B:168:THR:HG22	2:B:225:ASP:HB3	1.77	0.65
1:A:62:HIS:HB2	1:A:89:ILE:HG23	1.79	0.65
1:C:208:ILE:HG12	1:C:236:ILE:HG22	1.81	0.63
2:D:279:LEU:C	2:D:279:LEU:CD1	2.71	0.63
1:C:281:SER:HB3	1:C:285:PHE:HE2	1.64	0.62
1:C:265:PRO:HG2	1:C:268:CYS:HB3	1.83	0.61
2:B:46:PRO:HG3	2:B:89:ARG:HH21	1.66	0.60
2:B:80:TRP:HB3	2:B:144:LEU:HD21	1.84	0.59
1:A:353:LEU:HD22	1:A:692:TRP:CD1	2.38	0.59
2:D:155:ILE:HD13	2:D:165:GLN:HG2	1.84	0.58
1:A:98:ASP:OD1	1:A:98:ASP:N	2.38	0.57
1:C:655:ILE:HG13	2:D:525:LEU:HD13	1.86	0.57
2:E:247:THR:HG21	2:E:298:TYR:HE2	1.69	0.57
1:C:285:PHE:O	1:C:289:ILE:HG22	2.05	0.56
1:A:241:MET:HB2	2:E:289:SER:HB2	1.88	0.55
2:E:56:ILE:HD13	2:E:85:TRP:HB3	1.89	0.55
1:A:129:ASP:OD1	1:A:129:ASP:N	2.35	0.55
2:B:163:ASP:N	2:B:163:ASP:OD1	2.40	0.55
2:E:53:LEU:HD12	2:E:53:LEU:H	1.71	0.55
1:C:87:ARG:HG2	1:C:149:THR:HG23	1.89	0.55
1:A:244:THR:HA	1:A:248:ILE:HD12	1.89	0.55
2:E:107:ALA:HA	2:E:133:LEU:HD13	1.88	0.55
2:E:247:THR:HG22	2:E:302:THR:HG21	1.88	0.54
1:C:168:ASP:OD1	1:C:168:ASP:N	2.39	0.54
1:A:187:ASP:OD1	1:A:187:ASP:N	2.41	0.54
1:A:654:ASP:O	1:A:658:GLU:HG2	2.08	0.54
2:B:40:TYR:HE2	2:B:110:ILE:HA	1.73	0.53
1:C:259:VAL:HG21	1:C:695:ILE:HG13	1.90	0.53
1:C:125:ASN:ND2	1:C:129:ASP:O	2.41	0.53
1:A:265:PRO:HG3	2:E:318:ASN:HA	1.90	0.53
2:B:311:VAL:HG22	1:C:260:LEU:HD11	1.89	0.53
1:A:162:ILE:O	1:A:162:ILE:HG22	2.08	0.53
1:A:355:MET:O	1:A:356:ARG:C	2.51	0.53
2:B:36:ASN:O	2:B:38:THR:N	2.42	0.53
1:C:39:HIS:O	1:C:43:SER:OG	2.24	0.53
1:C:258:THR:HG22	1:C:278:VAL:HG11	1.91	0.53
2:E:62:LEU:HD12	2:E:206:LEU:HD11	1.91	0.53
2:B:30:LEU:HD13	2:B:97:TYR:HD2	1.72	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:30:LEU:HD13	2:B:97:TYR:CD2	2.44	0.53
2:E:285:VAL:O	2:E:287:PRO:HD3	2.10	0.52
1:C:353:LEU:HD11	1:C:689:VAL:HG23	1.92	0.52
1:A:651:GLU:OE2	1:A:651:GLU:N	2.37	0.52
1:C:74:ASP:OD2	1:C:77:ASN:ND2	2.43	0.52
1:C:313:PHE:CE2	1:C:697:VAL:HG11	2.46	0.51
2:E:117:LEU:HD23	2:E:120:ASN:HB3	1.92	0.51
1:C:71:ALA:HB3	1:C:81:GLU:HG2	1.92	0.51
1:A:221:ASN:HD22	2:B:193:ASP:HB3	1.76	0.51
2:D:143:TRP:CE2	2:D:145:PRO:HG3	2.46	0.51
1:C:54:ASN:ND2	1:C:57:ASP:OD2	2.43	0.51
2:E:200:GLU:HA	2:E:231:LYS:HD2	1.93	0.51
1:A:339:ARG:O	1:A:339:ARG:HD3	2.11	0.50
2:B:239:LEU:O	2:B:241:ILE:N	2.44	0.49
1:A:45:TYR:HE2	1:A:115:ILE:HA	1.77	0.49
2:B:36:ASN:O	2:B:39:ARG:N	2.30	0.49
2:E:172:ARG:HG3	2:E:221:ASP:HB3	1.94	0.48
1:C:281:SER:C	1:C:285:PHE:CD2	2.90	0.48
1:C:119:ASP:OD1	1:C:119:ASP:N	2.42	0.48
1:C:297:SER:HB2	2:D:233:LEU:HB3	1.96	0.48
2:E:68:VAL:HG12	2:E:68:VAL:O	2.13	0.48
1:A:133:GLU:HG3	1:A:134:GLY:H	1.79	0.48
2:B:41:ASN:OD1	2:B:44:ILE:HG13	2.14	0.48
2:E:163:ASP:OD1	2:E:163:ASP:N	2.47	0.48
2:D:527:GLU:OE2	2:E:529:SER:OG	2.22	0.48
1:C:306:TYR:HD1	1:C:705:LEU:HB2	1.79	0.48
2:B:39:ARG:NH1	2:B:39:ARG:HA	2.29	0.47
2:B:330:ALA:HB3	2:B:333:VAL:HG23	1.96	0.47
2:D:311:VAL:HG22	2:E:252:LEU:HD11	1.95	0.47
1:A:224:GLU:CD	1:A:225:GLU:H	2.22	0.47
1:C:281:SER:C	1:C:285:PHE:HD2	2.19	0.47
1:A:148:TRP:CE2	1:A:150:PRO:HG3	2.50	0.47
1:A:319:VAL:HG22	2:B:252:LEU:HD11	1.97	0.47
2:E:190:ALA:HB3	2:E:206:LEU:HD13	1.96	0.47
2:B:253:VAL:HG21	2:B:267:CYS:SG	2.54	0.47
1:A:112:ALA:HB1	1:A:117:LYS:HD3	1.97	0.47
1:A:337:MET:HE1	1:A:678:ASP:HB3	1.96	0.46
2:E:81:LEU:O	2:E:145:PRO:HD2	2.16	0.46
2:E:523:GLU:O	2:E:527:GLU:HG2	2.15	0.46
1:C:85:TRP:HE3	1:C:149:THR:HG22	1.80	0.46
2:B:215:GLN:HG2	2:B:215:GLN:O	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:254:PHE:HB2	2:D:560:LEU:HD13	1.98	0.46
2:B:209:ARG:NH2	2:B:225:ASP:OD2	2.49	0.46
2:D:340:LYS:O	2:D:343:THR:OG1	2.32	0.46
1:C:289:ILE:HA	1:C:292:THR:HG22	1.98	0.46
1:A:45:TYR:HD1	1:A:94:LYS:HD2	1.81	0.45
3:G:1:NAG:O3	3:G:2:NAG:N2	2.50	0.45
1:C:33:THR:HG21	1:C:103:ASP:H	1.81	0.45
2:D:163:ASP:OD1	2:D:163:ASP:N	2.49	0.45
1:A:145:MET:HE3	1:A:145:MET:HB3	1.88	0.45
1:C:355:MET:O	1:C:355:MET:HG3	2.17	0.45
2:E:324:PRO:HB3	2:E:544:VAL:HG11	1.98	0.45
2:E:122:ASP:HB2	2:E:124:THR:HG23	2.00	0.44
1:C:197:MET:HE3	1:C:197:MET:HB2	1.85	0.44
1:A:168:ASP:OD1	1:A:168:ASP:N	2.50	0.44
2:E:103:LEU:HD23	2:E:103:LEU:HA	1.87	0.44
2:B:192:MET:HE1	2:B:203:ILE:HG21	1.99	0.44
1:C:117:LYS:HE3	1:C:117:LYS:HB2	1.69	0.44
1:C:268:CYS:SG	1:C:269:GLY:N	2.91	0.44
3:F:1:NAG:O3	3:F:2:NAG:H83	2.17	0.44
2:D:44:ILE:HD12	2:E:28:GLU:HG2	1.98	0.44
1:A:194:LYS:HB2	1:A:194:LYS:HE2	1.83	0.44
1:C:91:ASN:OD1	1:C:92:ASP:N	2.49	0.43
1:C:129:ASP:OD1	1:C:130:PHE:N	2.47	0.43
2:B:523:GLU:O	2:B:527:GLU:HG2	2.17	0.43
2:E:213:ASN:OD1	2:E:216:ASP:N	2.46	0.43
2:D:258:SER:O	2:D:258:SER:OG	2.36	0.43
2:D:182:ASP:O	2:D:184:VAL:HG13	2.18	0.43
1:A:49:ILE:HG13	2:B:28:GLU:HG2	2.00	0.43
1:A:259:VAL:HG21	1:A:695:ILE:HG13	2.01	0.43
1:C:706:PHE:HD1	1:C:706:PHE:HA	1.76	0.43
2:D:33:ASP:N	2:D:33:ASP:OD1	2.51	0.43
2:E:155:ILE:HG22	2:E:157:VAL:HG13	2.01	0.43
1:A:656:LEU:HD22	2:E:520:ASP:HB3	2.00	0.43
1:C:141:LYS:HD2	1:C:145:MET:HB2	2.00	0.43
1:A:75:GLU:OE2	1:A:238:ARG:NH1	2.48	0.43
2:E:243:CYS:O	2:E:247:THR:HG23	2.19	0.43
1:A:102:TYR:O	1:A:105:ILE:HG13	2.19	0.42
1:A:215:LYS:HG3	1:A:230:ILE:HG12	2.00	0.42
1:A:332:PRO:HB3	1:A:675:VAL:HG11	2.00	0.42
2:E:40:TYR:OH	2:E:87:ASP:OD2	2.34	0.42
1:A:150:PRO:HA	1:A:151:PRO:HD3	1.96	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:688:ARG:HA	1:A:688:ARG:HD2	1.83	0.42
2:D:84:GLU:OE2	3:J:2:NAG:O6	2.36	0.42
2:E:281:ILE:HD13	2:E:281:ILE:HA	1.86	0.42
1:C:673:LYS:HA	1:C:673:LYS:HD2	1.71	0.42
1:C:654:ASP:O	1:C:658:GLU:HG2	2.19	0.42
2:B:338:LEU:HD23	2:B:338:LEU:HA	1.93	0.42
2:B:340:LYS:HD3	2:B:340:LYS:HA	1.86	0.42
1:C:700:PHE:O	1:C:701:GLY:C	2.63	0.42
3:L:2:NAG:H4	3:L:3:BMA:H2	1.86	0.42
1:C:87:ARG:HH22	1:C:89:ILE:HD11	1.85	0.41
2:D:36:ASN:O	2:D:39:ARG:HD2	2.19	0.41
1:A:42:PHE:CE2	1:A:110:VAL:HG21	2.55	0.41
2:B:348:LYS:HD3	2:B:348:LYS:HA	1.81	0.41
1:A:326:ASN:HA	2:B:257:PRO:HG3	2.03	0.41
2:B:35:LEU:HD12	2:B:109:ARG:NH2	2.35	0.41
1:C:282:LEU:HD23	1:C:282:LEU:HA	1.92	0.41
2:D:56:ILE:HD12	2:D:113:PRO:HG3	2.01	0.41
2:E:349:ARG:HD2	2:E:350:PRO:HD2	2.02	0.41
1:A:92:ASP:OD1	1:A:93:TYR:N	2.49	0.41
1:C:188:LEU:HD23	1:C:230:ILE:HG13	2.03	0.41
2:D:47:ALA:HB1	2:D:52:GLN:HB3	2.03	0.41
1:A:349:LEU:HD12	1:A:349:LEU:HA	1.87	0.41
2:D:49:SER:HB3	2:D:52:GLN:HB2	2.02	0.41
2:B:520:ASP:HB3	1:C:656:LEU:HD22	2.02	0.41
2:E:248:LEU:O	2:E:251:ILE:HG22	2.20	0.41
2:B:241:ILE:HB	2:B:242:PRO:HD3	2.03	0.41
2:E:161:PRO:HB2	2:E:162:PHE:CD1	2.56	0.41
1:A:268:CYS:SG	1:A:269:GLY:N	2.93	0.41
2:B:26:ALA:HA	2:B:29:LYS:HE3	2.02	0.41
2:B:37:LYS:O	2:B:39:ARG:HG2	2.21	0.41
1:C:65:VAL:HG12	1:C:86:LEU:HD23	2.02	0.41
1:C:658:GLU:OE1	2:D:532:ALA:CB	2.69	0.41
2:E:110:ILE:HD13	2:E:133:LEU:HD22	2.02	0.41
1:A:330:ARG:HD3	1:A:335:HIS:CG	2.56	0.41
2:D:29:LYS:HB2	2:D:29:LYS:HE2	1.76	0.41
1:A:132:VAL:HG23	1:A:133:GLU:N	2.35	0.40
2:B:87:ASP:OD1	2:B:88:TYR:N	2.51	0.40
1:C:100:MET:N	1:C:100:MET:SD	2.94	0.40
1:C:302:LEU:HD23	1:C:302:LEU:HA	1.90	0.40
2:D:178:HIS:C	2:D:180:GLU:H	2.27	0.40
2:E:305:LEU:HD23	2:E:305:LEU:HA	1.93	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:524:ILE:O	2:E:528:VAL:HG23	2.20	0.40
1:A:108:LEU:HD12	1:A:108:LEU:HA	1.87	0.40
1:A:239:LEU:HA	1:A:240:PRO:HD3	1.92	0.40
1:A:125:ASN:ND2	1:A:127:VAL:O	2.54	0.40
1:A:347:LYS:HB3	1:A:347:LYS:HE3	1.73	0.40
2:D:318:ASN:HA	2:E:257:PRO:HG3	2.02	0.40
2:E:247:THR:HG21	2:E:298:TYR:CE2	2.54	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	379/501 (76%)	358 (94%)	21 (6%)	0	100	100
1	C	383/501 (76%)	367 (96%)	15 (4%)	1 (0%)	37	67
2	B	378/633 (60%)	350 (93%)	27 (7%)	1 (0%)	37	67
2	D	379/633 (60%)	352 (93%)	27 (7%)	0	100	100
2	E	380/633 (60%)	354 (93%)	26 (7%)	0	100	100
All	All	1899/2901 (66%)	1781 (94%)	116 (6%)	2 (0%)	50	77

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	37	LYS
1	C	704	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 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	359/450 (80%)	357 (99%)	2 (1%)	84	90
1	C	363/450 (81%)	360 (99%)	3 (1%)	79	87
2	B	357/548 (65%)	356 (100%)	1 (0%)	91	94
2	D	358/548 (65%)	352 (98%)	6 (2%)	56	75
2	E	360/548 (66%)	356 (99%)	4 (1%)	70	82
All	All	1797/2544 (71%)	1781 (99%)	16 (1%)	74	85

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	76	VAL
1	A	695	ILE
2	B	36	ASN
1	C	100	MET
1	C	705	LEU
1	C	706	PHE
2	D	32	ASP
2	D	118	TYR
2	D	154	LYS
2	D	165	GLN
2	D	279	LEU
2	D	545	VAL
2	E	180	GLU
2	E	210	ARG
2	E	553	MET
2	E	575	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	46	ASN
1	A	78	GLN

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Mol	Chain	Res	Type
1	A	221	ASN
1	A	669	GLN
2	B	132	ASN
2	B	339	HIS
1	C	77	ASN
1	C	169	HIS
1	C	216	HIS
2	D	64	GLN
2	E	339	HIS
2	E	538	GLN

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 ⓘ

24 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	F	1	3,1	14,14,15	0.66	1 (7%)	17,19,21	0.70	0
3	NAG	F	2	3	14,14,15	0.31	0	17,19,21	0.40	0
3	BMA	F	3	3	11,11,12	1.07	1 (9%)	15,15,17	1.56	2 (13%)
3	NAG	G	1	3,2	14,14,15	0.27	0	17,19,21	0.47	0
3	NAG	G	2	3	14,14,15	0.45	0	17,19,21	0.50	0
3	BMA	G	3	3	11,11,12	0.61	0	15,15,17	0.74	0
3	NAG	H	1	3,2	14,14,15	0.38	0	17,19,21	0.37	0
3	NAG	H	2	3	14,14,15	0.31	0	17,19,21	0.37	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	BMA	H	3	3	11,11,12	0.57	0	15,15,17	0.72	0
3	NAG	I	1	3,1	14,14,15	0.49	0	17,19,21	0.45	0
3	NAG	I	2	3	14,14,15	0.28	0	17,19,21	0.37	0
3	BMA	I	3	3	11,11,12	0.78	0	15,15,17	0.90	0
3	NAG	J	1	3,2	14,14,15	0.46	0	17,19,21	0.78	1 (5%)
3	NAG	J	2	3	14,14,15	0.41	0	17,19,21	0.36	0
3	BMA	J	3	3	11,11,12	0.63	0	15,15,17	0.69	0
3	NAG	K	1	3,2	14,14,15	0.30	0	17,19,21	0.58	0
3	NAG	K	2	3	14,14,15	0.73	1 (7%)	17,19,21	1.30	1 (5%)
3	BMA	K	3	3	11,11,12	0.56	0	15,15,17	0.70	0
3	NAG	L	1	3,2	14,14,15	0.38	0	17,19,21	0.37	0
3	NAG	L	2	3	14,14,15	0.45	0	17,19,21	0.97	2 (11%)
3	BMA	L	3	3	11,11,12	0.63	0	15,15,17	0.75	0
3	NAG	M	1	3,2	14,14,15	0.20	0	17,19,21	0.42	0
3	NAG	M	2	3	14,14,15	0.23	0	17,19,21	0.52	0
3	BMA	M	3	3	11,11,12	0.58	0	15,15,17	0.84	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
3	NAG	F	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	F	2	3	-	2/6/23/26	0/1/1/1
3	BMA	F	3	3	-	1/2/19/22	0/1/1/1
3	NAG	G	1	3,2	-	2/6/23/26	0/1/1/1
3	NAG	G	2	3	-	3/6/23/26	0/1/1/1
3	BMA	G	3	3	-	0/2/19/22	0/1/1/1
3	NAG	H	1	3,2	-	2/6/23/26	0/1/1/1
3	NAG	H	2	3	-	1/6/23/26	0/1/1/1
3	BMA	H	3	3	-	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	-	1/2/19/22	0/1/1/1
3	NAG	J	1	3,2	-	2/6/23/26	0/1/1/1
3	NAG	J	2	3	-	2/6/23/26	0/1/1/1
3	BMA	J	3	3	-	0/2/19/22	0/1/1/1
3	NAG	K	1	3,2	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	K	2	3	-	2/6/23/26	0/1/1/1
3	BMA	K	3	3	-	1/2/19/22	0/1/1/1
3	NAG	L	1	3,2	-	2/6/23/26	0/1/1/1
3	NAG	L	2	3	-	2/6/23/26	0/1/1/1
3	BMA	L	3	3	-	1/2/19/22	0/1/1/1
3	NAG	M	1	3,2	-	4/6/23/26	0/1/1/1
3	NAG	M	2	3	-	3/6/23/26	0/1/1/1
3	BMA	M	3	3	-	2/2/19/22	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	K	2	NAG	O5-C1	2.48	1.47	1.43
3	F	1	NAG	O5-C1	-2.34	1.40	1.43
3	F	3	BMA	C1-C2	2.21	1.57	1.52

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	K	2	NAG	C1-O5-C5	4.99	118.95	112.19
3	F	3	BMA	C1-O5-C5	4.55	118.36	112.19
3	L	2	NAG	C1-O5-C5	2.60	115.71	112.19
3	L	2	NAG	C3-C4-C5	2.28	114.31	110.24
3	J	1	NAG	C1-O5-C5	2.05	114.97	112.19
3	F	3	BMA	O5-C5-C6	2.00	110.34	107.20

There are no chirality outliers.

All (43) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	I	1	NAG	O5-C5-C6-O6
3	K	1	NAG	O5-C5-C6-O6
3	J	1	NAG	O5-C5-C6-O6
3	L	2	NAG	O5-C5-C6-O6
3	I	1	NAG	C4-C5-C6-O6
3	K	2	NAG	O5-C5-C6-O6
3	K	1	NAG	C4-C5-C6-O6
3	J	2	NAG	C4-C5-C6-O6
3	F	2	NAG	C8-C7-N2-C2
3	F	2	NAG	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
3	M	1	NAG	C8-C7-N2-C2
3	M	1	NAG	O7-C7-N2-C2
3	K	2	NAG	C4-C5-C6-O6
3	J	2	NAG	O5-C5-C6-O6
3	H	1	NAG	O5-C5-C6-O6
3	G	1	NAG	O5-C5-C6-O6
3	F	1	NAG	O5-C5-C6-O6
3	F	1	NAG	C4-C5-C6-O6
3	H	2	NAG	O5-C5-C6-O6
3	L	2	NAG	C4-C5-C6-O6
3	L	1	NAG	O5-C5-C6-O6
3	M	1	NAG	O5-C5-C6-O6
3	H	3	BMA	C4-C5-C6-O6
3	F	3	BMA	O5-C5-C6-O6
3	H	1	NAG	C4-C5-C6-O6
3	I	3	BMA	O5-C5-C6-O6
3	L	3	BMA	O5-C5-C6-O6
3	I	2	NAG	C4-C5-C6-O6
3	H	3	BMA	O5-C5-C6-O6
3	M	2	NAG	C4-C5-C6-O6
3	J	1	NAG	C4-C5-C6-O6
3	L	1	NAG	C4-C5-C6-O6
3	G	2	NAG	C4-C5-C6-O6
3	M	3	BMA	O5-C5-C6-O6
3	K	3	BMA	C4-C5-C6-O6
3	M	3	BMA	C4-C5-C6-O6
3	G	2	NAG	C3-C2-N2-C7
3	M	2	NAG	C3-C2-N2-C7
3	M	2	NAG	O5-C5-C6-O6
3	G	1	NAG	C4-C5-C6-O6
3	I	2	NAG	O5-C5-C6-O6
3	G	2	NAG	O5-C5-C6-O6
3	M	1	NAG	C4-C5-C6-O6

There are no ring outliers.

8 monomers are involved in 5 short contacts:

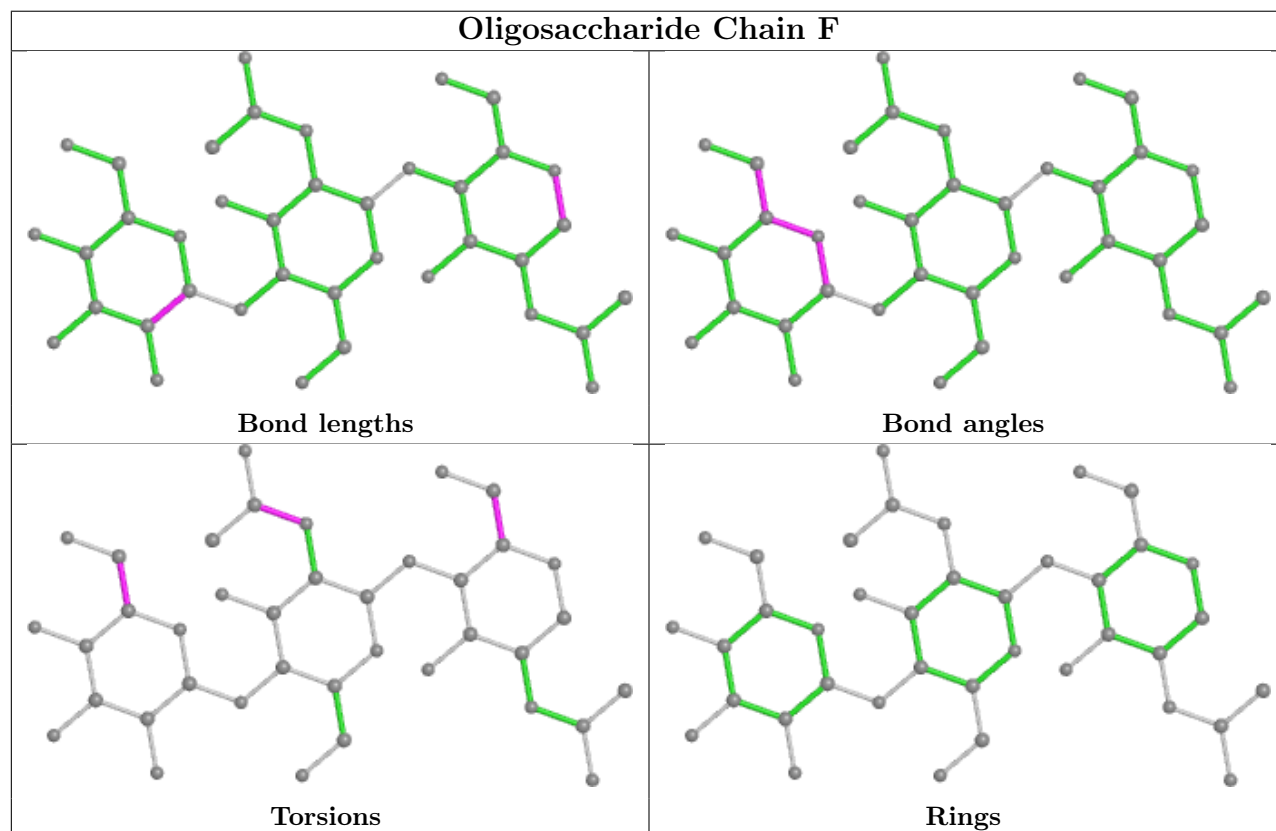
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	L	2	NAG	1	0
3	F	1	NAG	1	0
3	G	1	NAG	1	0
3	F	2	NAG	1	0

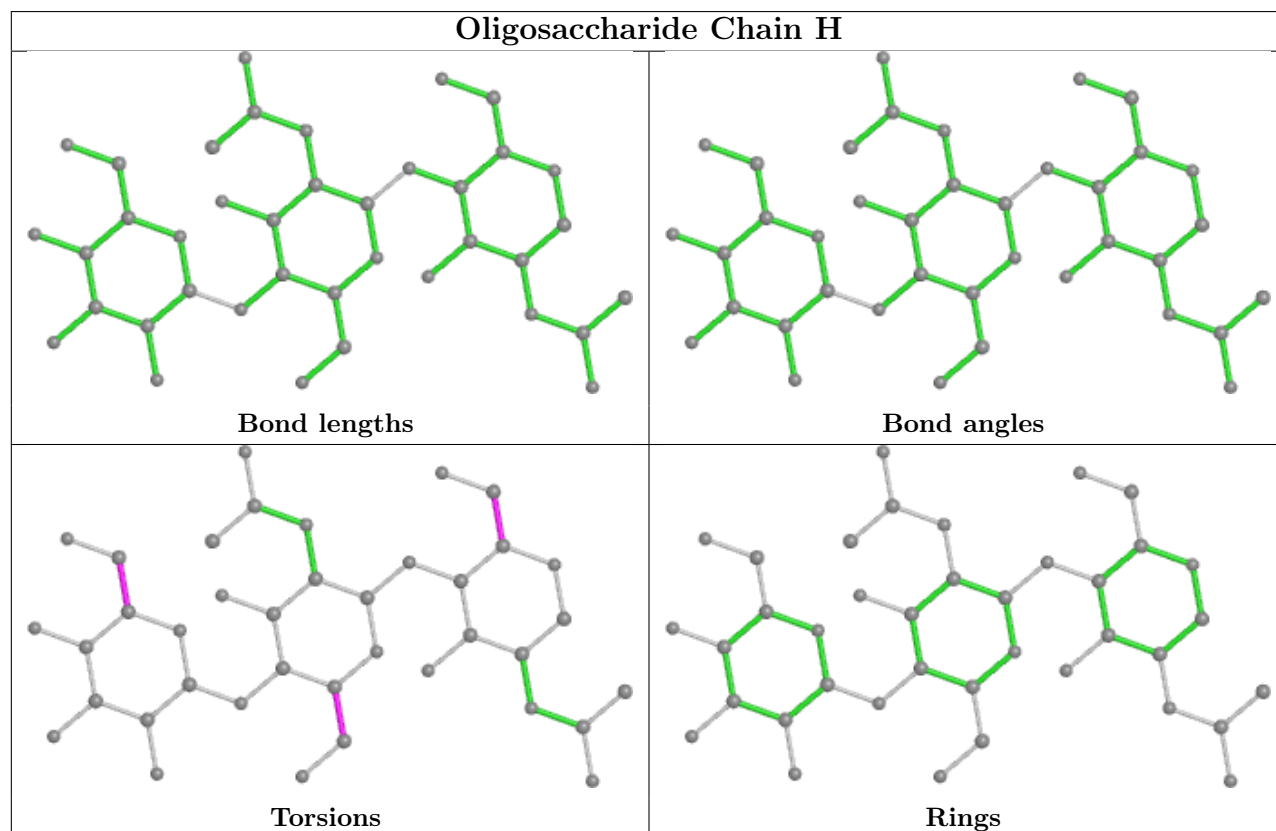
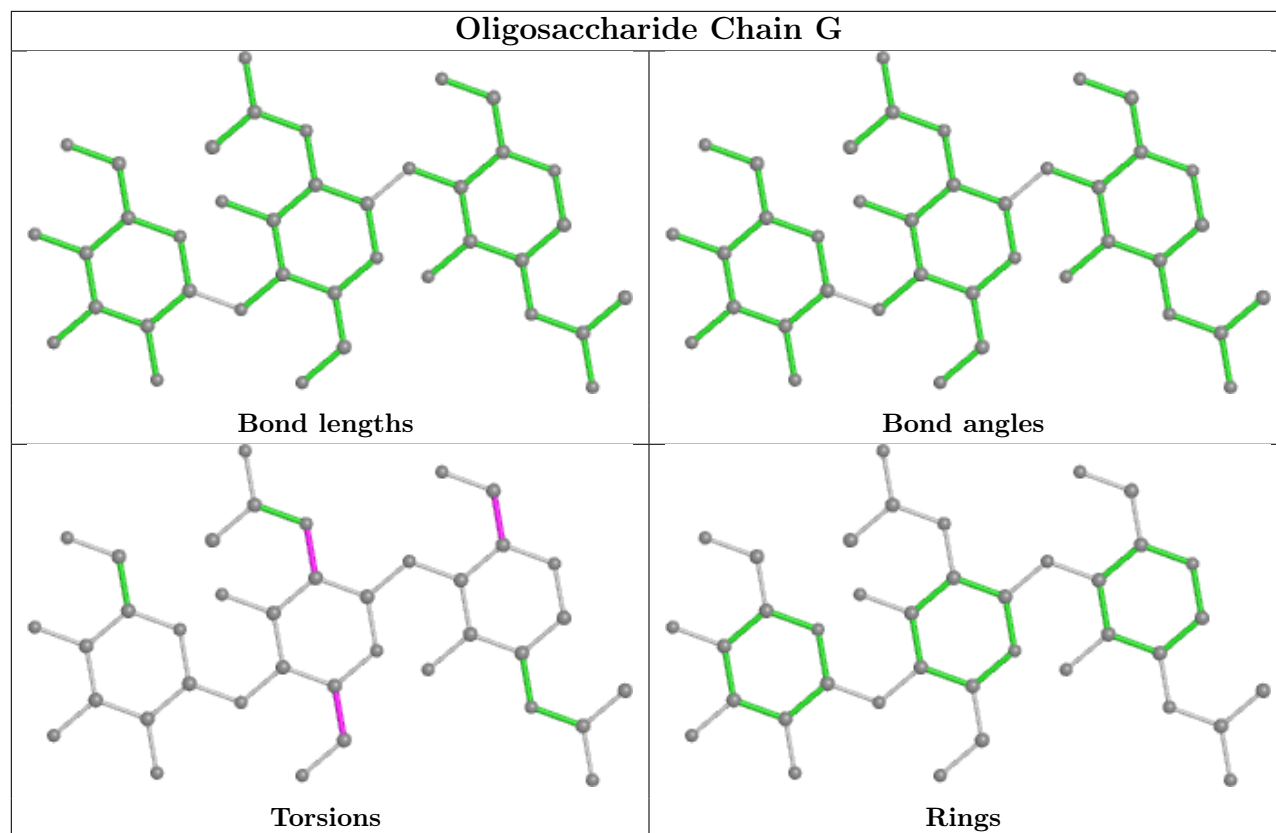
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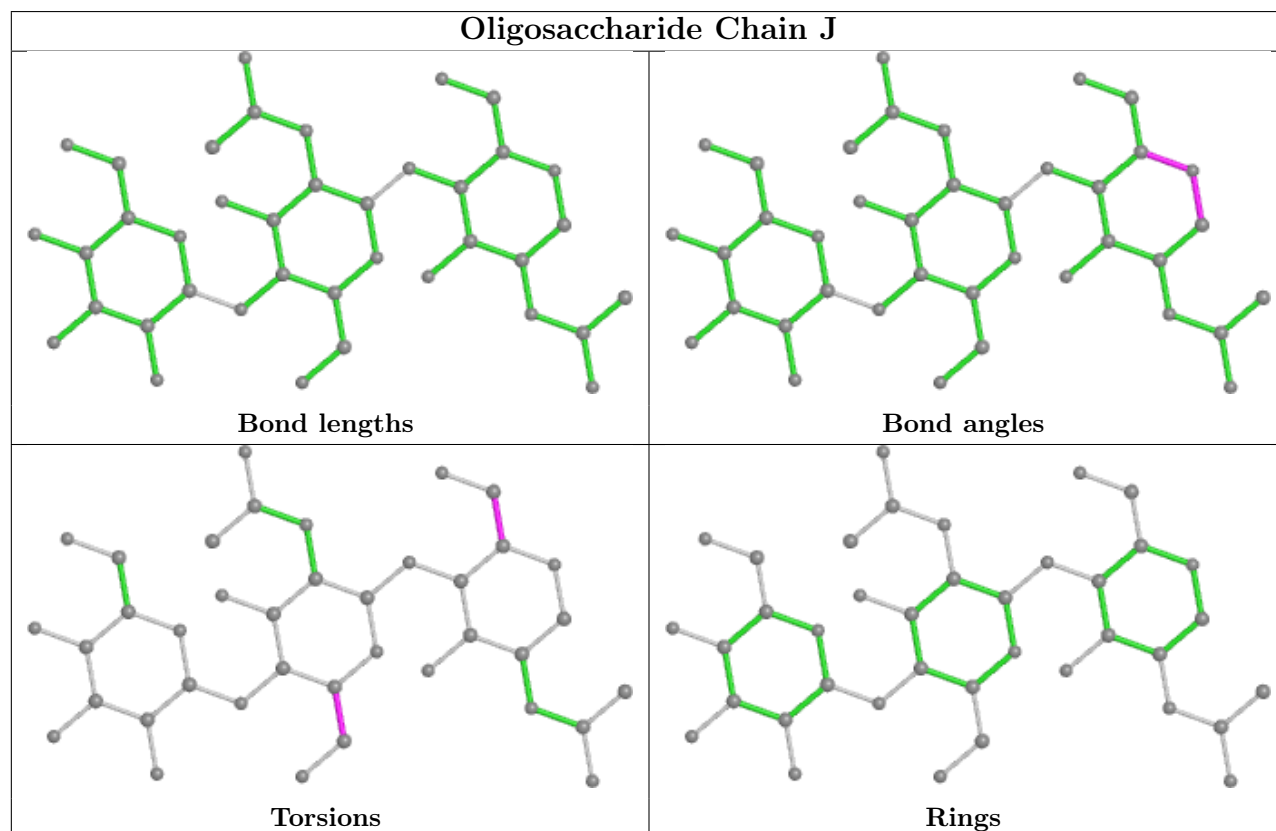
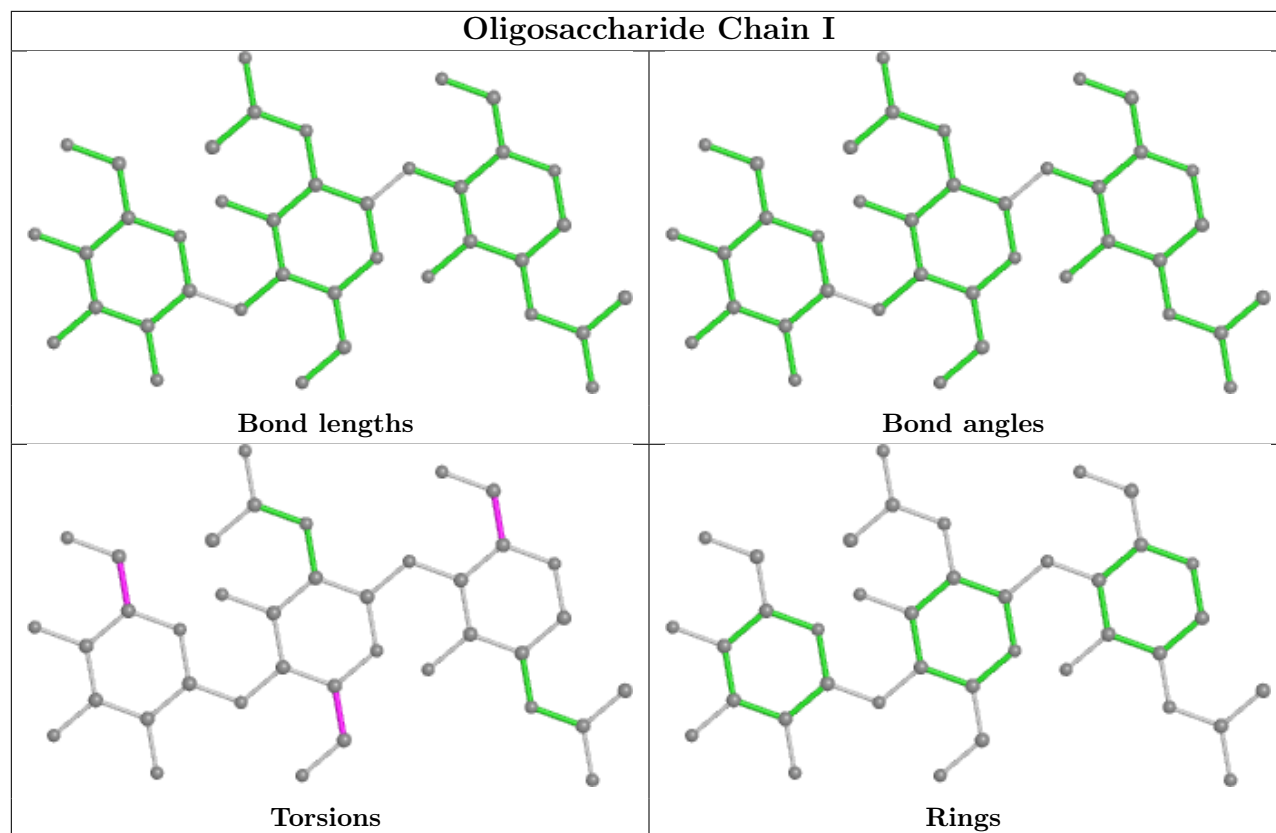
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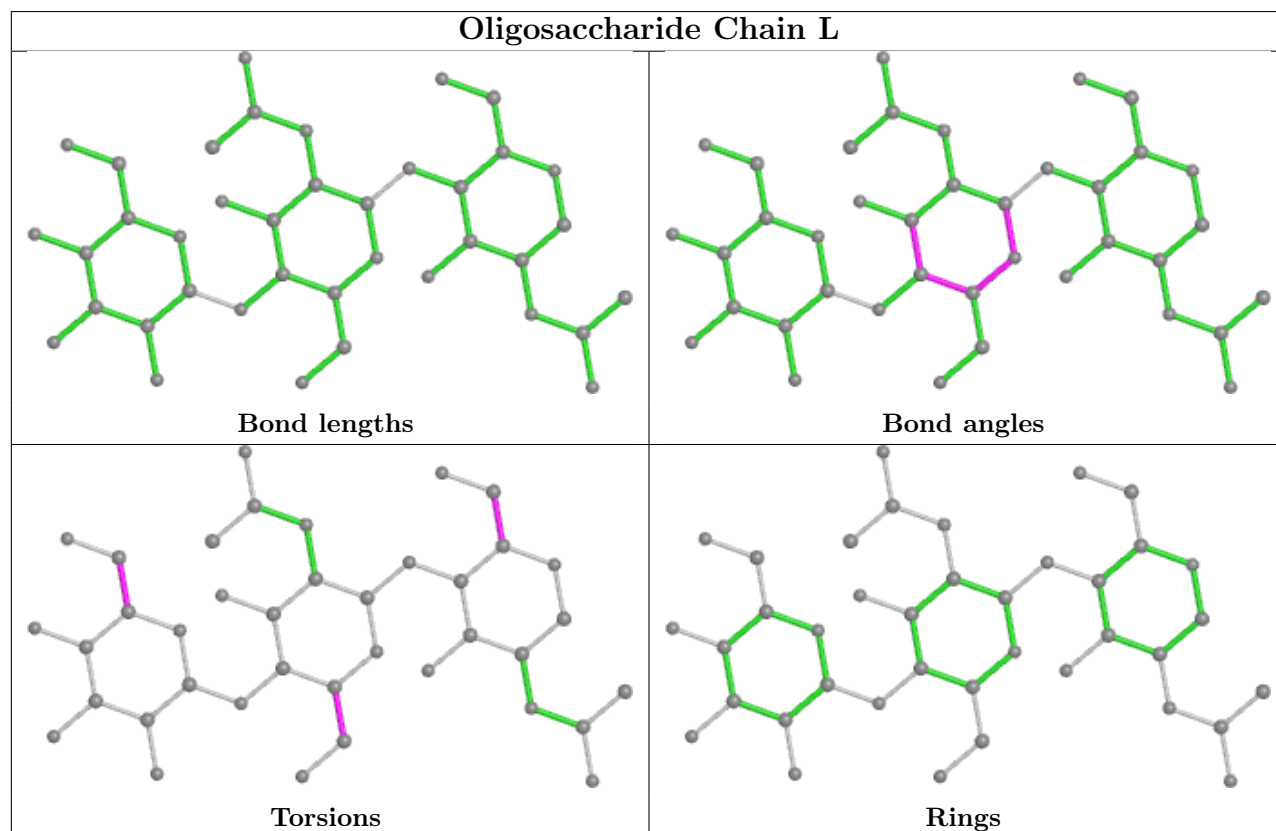
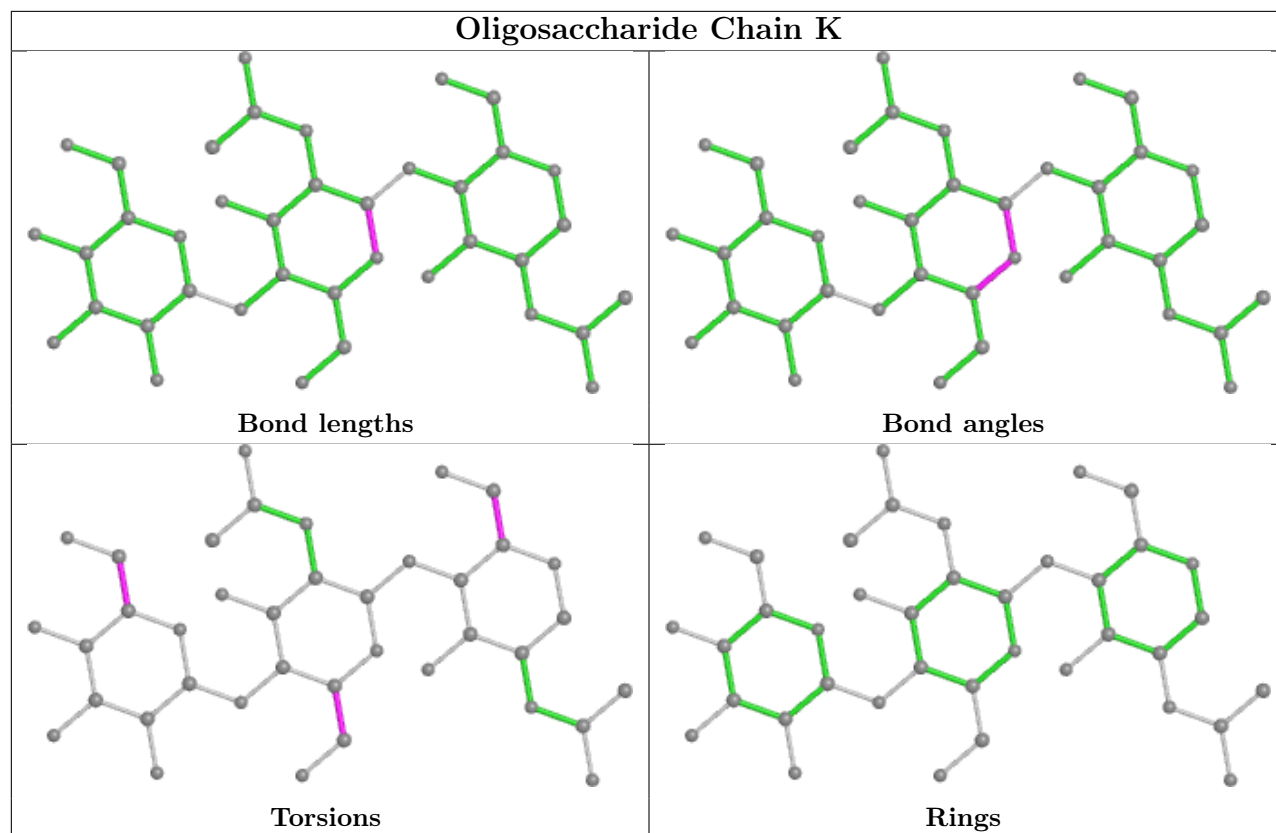
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	J	2	NAG	1	0
3	G	2	NAG	1	0
3	K	2	NAG	1	0
3	L	3	BMA	1	0

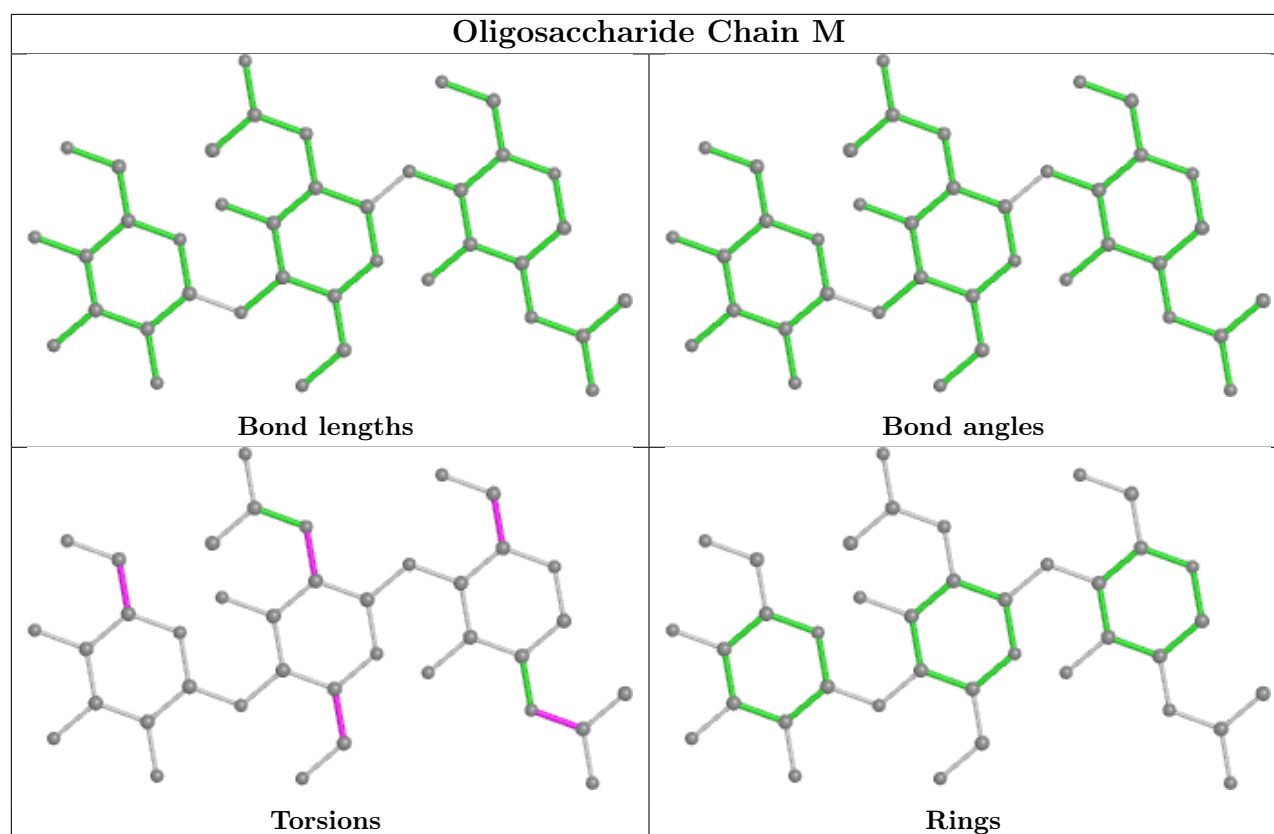
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











5.6 Ligand geometry [i](#)

2 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	$\# Z > 2$
4	NCT	A	801	-	13,13,13	0.52	0	17,17,17	0.45	0
4	NCT	C	801	-	13,13,13	0.53	0	17,17,17	0.44	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NCT	A	801	-	-	0/4/14/14	0/2/2/2
4	NCT	C	801	-	-	0/4/14/14	0/2/2/2

There are no bond length outliers.

There are no bond angle outliers.

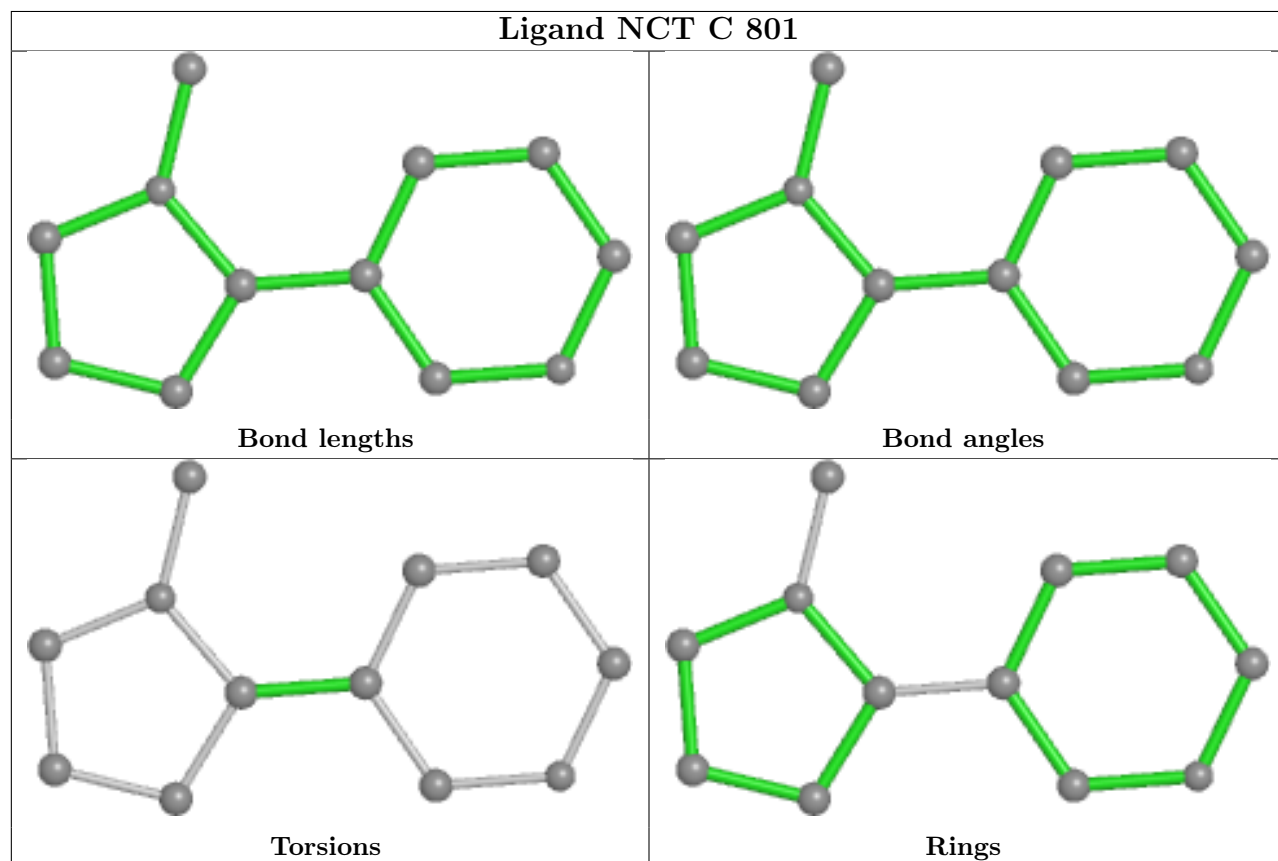
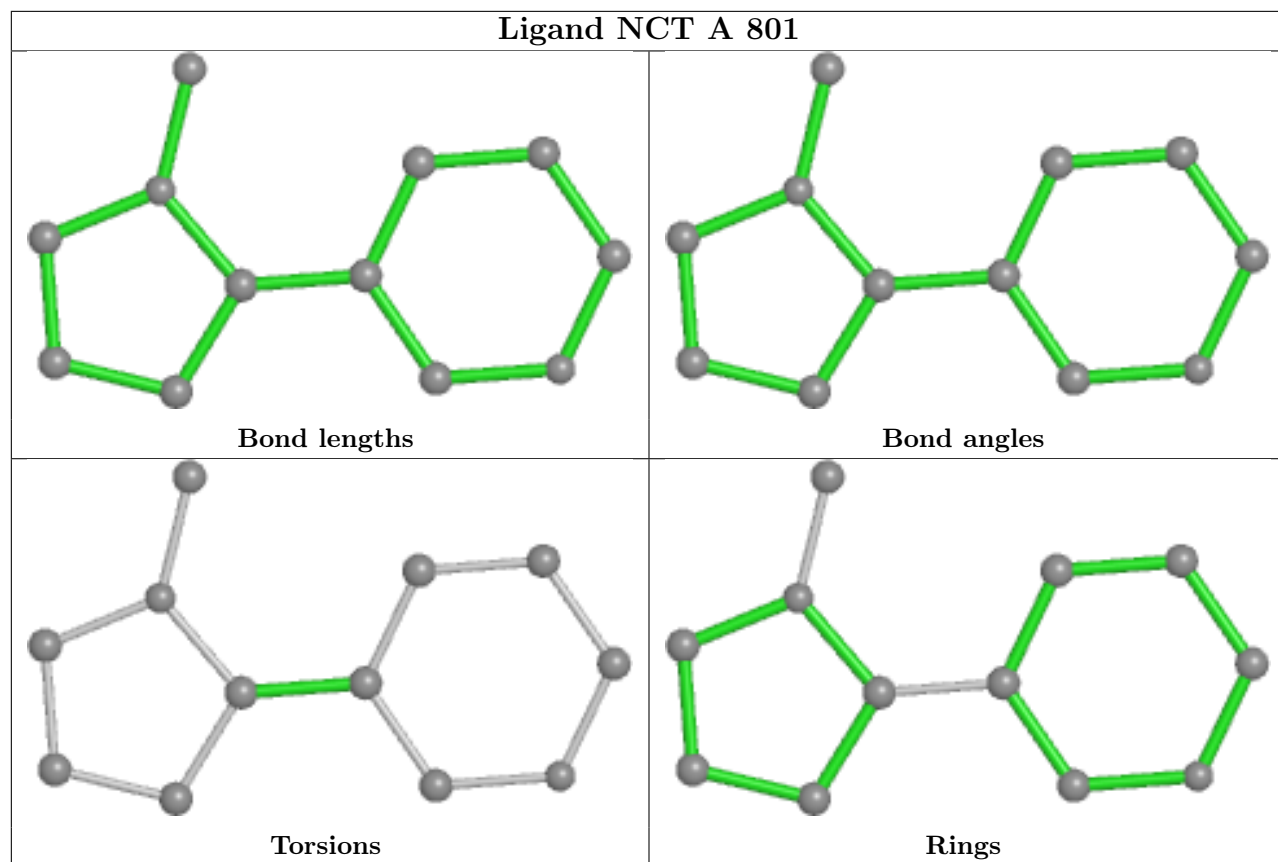
There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.