



Full wwPDB EM Validation Report ⓘ

Oct 16, 2024 – 12:30 AM JST

PDB ID : 8K13
EMDB ID : EMD-36785
Title : SID1 transmembrane family member 1
Authors : Guo, H.; Qi, C.; Lu, Y.; Yang, H.; Zhu, Y.; Sun, F.; Ji, X.
Deposited on : 2023-07-10
Resolution : 3.33 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 : 4.02b-467
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) : 2.39

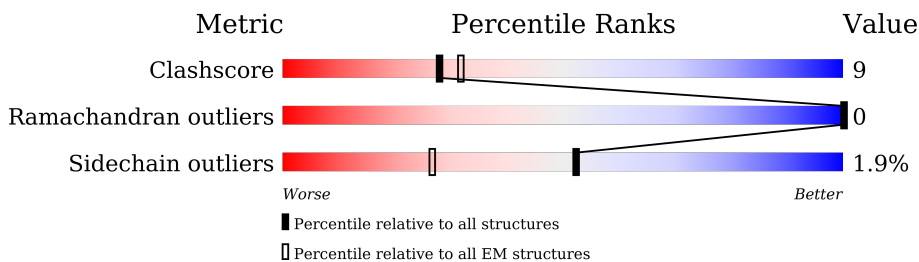
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY



The reported resolution of this entry is 3.33 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	803	
1	B	803	

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 9078 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 SID1 transmembrane family member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	559	4497	2978	709	783	27	0	0
1	B	559	4497	2978	709	783	27	0	0

There are 164 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	4	MET	-	initiating methionine	UNP Q9NXL6
A	5	LYS	-	expression tag	UNP Q9NXL6
A	6	ALA	-	expression tag	UNP Q9NXL6
A	7	ASN	-	expression tag	UNP Q9NXL6
A	8	LEU	-	expression tag	UNP Q9NXL6
A	9	LEU	-	expression tag	UNP Q9NXL6
A	10	VAL	-	expression tag	UNP Q9NXL6
A	11	LEU	-	expression tag	UNP Q9NXL6
A	12	LEU	-	expression tag	UNP Q9NXL6
A	13	CYS	-	expression tag	UNP Q9NXL6
A	14	ALA	-	expression tag	UNP Q9NXL6
A	15	LEU	-	expression tag	UNP Q9NXL6
A	16	ALA	-	expression tag	UNP Q9NXL6
A	17	ALA	-	expression tag	UNP Q9NXL6
A	18	ALA	-	expression tag	UNP Q9NXL6
A	19	ASP	-	expression tag	UNP Q9NXL6
A	20	ALA	-	expression tag	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	ASN	deletion	UNP Q9NXL6
A	?	-	TYR	deletion	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	THR	deletion	UNP Q9NXL6
A	?	-	ILE	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	GLU	deletion	UNP Q9NXL6

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	PRO	deletion	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	ARG	deletion	UNP Q9NXL6
A	?	-	GLN	deletion	UNP Q9NXL6
A	?	-	MET	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	PRO	deletion	UNP Q9NXL6
A	?	-	PRO	deletion	UNP Q9NXL6
A	?	-	GLY	deletion	UNP Q9NXL6
A	?	-	GLN	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	THR	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	VAL	deletion	UNP Q9NXL6
A	?	-	GLU	deletion	UNP Q9NXL6
A	?	-	GLU	deletion	UNP Q9NXL6
A	?	-	SER	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	PHE	deletion	UNP Q9NXL6
A	?	-	ASP	deletion	UNP Q9NXL6
A	?	-	THR	deletion	UNP Q9NXL6
A	?	-	MET	deletion	UNP Q9NXL6
A	828	ASP	-	expression tag	UNP Q9NXL6
A	829	TYR	-	expression tag	UNP Q9NXL6
A	830	LYS	-	expression tag	UNP Q9NXL6
A	831	ASP	-	expression tag	UNP Q9NXL6
A	832	HIS	-	expression tag	UNP Q9NXL6
A	833	ASP	-	expression tag	UNP Q9NXL6
A	834	GLY	-	expression tag	UNP Q9NXL6
A	835	ASP	-	expression tag	UNP Q9NXL6

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Chain	Residue	Modelled	Actual	Comment	Reference
A	836	TYR	-	expression tag	UNP Q9NXL6
A	837	LYS	-	expression tag	UNP Q9NXL6
A	838	ASP	-	expression tag	UNP Q9NXL6
A	839	HIS	-	expression tag	UNP Q9NXL6
A	840	ASP	-	expression tag	UNP Q9NXL6
A	841	ILE	-	expression tag	UNP Q9NXL6
A	842	ASP	-	expression tag	UNP Q9NXL6
A	843	TYR	-	expression tag	UNP Q9NXL6
A	844	LYS	-	expression tag	UNP Q9NXL6
A	845	ASP	-	expression tag	UNP Q9NXL6
A	846	ASP	-	expression tag	UNP Q9NXL6
A	847	ASP	-	expression tag	UNP Q9NXL6
A	848	ASP	-	expression tag	UNP Q9NXL6
A	849	LYS	-	expression tag	UNP Q9NXL6
B	4	MET	-	initiating methionine	UNP Q9NXL6
B	5	LYS	-	expression tag	UNP Q9NXL6
B	6	ALA	-	expression tag	UNP Q9NXL6
B	7	ASN	-	expression tag	UNP Q9NXL6
B	8	LEU	-	expression tag	UNP Q9NXL6
B	9	LEU	-	expression tag	UNP Q9NXL6
B	10	VAL	-	expression tag	UNP Q9NXL6
B	11	LEU	-	expression tag	UNP Q9NXL6
B	12	LEU	-	expression tag	UNP Q9NXL6
B	13	CYS	-	expression tag	UNP Q9NXL6
B	14	ALA	-	expression tag	UNP Q9NXL6
B	15	LEU	-	expression tag	UNP Q9NXL6
B	16	ALA	-	expression tag	UNP Q9NXL6
B	17	ALA	-	expression tag	UNP Q9NXL6
B	18	ALA	-	expression tag	UNP Q9NXL6
B	19	ASP	-	expression tag	UNP Q9NXL6
B	20	ALA	-	expression tag	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	ASN	deletion	UNP Q9NXL6
B	?	-	TYR	deletion	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	THR	deletion	UNP Q9NXL6
B	?	-	ILE	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	GLU	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6

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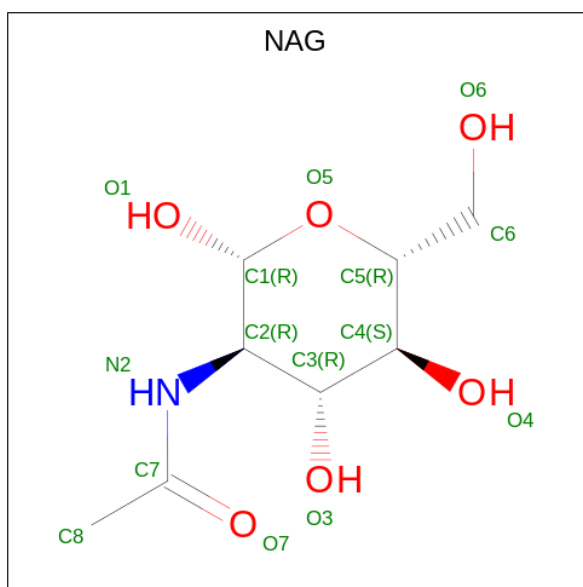
Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	PRO	deletion	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	ARG	deletion	UNP Q9NXL6
B	?	-	GLN	deletion	UNP Q9NXL6
B	?	-	MET	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	PRO	deletion	UNP Q9NXL6
B	?	-	PRO	deletion	UNP Q9NXL6
B	?	-	GLY	deletion	UNP Q9NXL6
B	?	-	GLN	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	THR	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	VAL	deletion	UNP Q9NXL6
B	?	-	GLU	deletion	UNP Q9NXL6
B	?	-	GLU	deletion	UNP Q9NXL6
B	?	-	SER	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	PHE	deletion	UNP Q9NXL6
B	?	-	ASP	deletion	UNP Q9NXL6
B	?	-	THR	deletion	UNP Q9NXL6
B	?	-	MET	deletion	UNP Q9NXL6
B	828	ASP	-	expression tag	UNP Q9NXL6
B	829	TYR	-	expression tag	UNP Q9NXL6
B	830	LYS	-	expression tag	UNP Q9NXL6
B	831	ASP	-	expression tag	UNP Q9NXL6
B	832	HIS	-	expression tag	UNP Q9NXL6
B	833	ASP	-	expression tag	UNP Q9NXL6
B	834	GLY	-	expression tag	UNP Q9NXL6
B	835	ASP	-	expression tag	UNP Q9NXL6
B	836	TYR	-	expression tag	UNP Q9NXL6
B	837	LYS	-	expression tag	UNP Q9NXL6

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Chain	Residue	Modelled	Actual	Comment	Reference
B	838	ASP	-	expression tag	UNP Q9NXL6
B	839	HIS	-	expression tag	UNP Q9NXL6
B	840	ASP	-	expression tag	UNP Q9NXL6
B	841	ILE	-	expression tag	UNP Q9NXL6
B	842	ASP	-	expression tag	UNP Q9NXL6
B	843	TYR	-	expression tag	UNP Q9NXL6
B	844	LYS	-	expression tag	UNP Q9NXL6
B	845	ASP	-	expression tag	UNP Q9NXL6
B	846	ASP	-	expression tag	UNP Q9NXL6
B	847	ASP	-	expression tag	UNP Q9NXL6
B	848	ASP	-	expression tag	UNP Q9NXL6
B	849	LYS	-	expression tag	UNP Q9NXL6

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆) (labeled as "Ligand of Interest" by depositor).



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

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

V96	N219	V469	HIS	ALA	I783	LEU	I869	LEU	I145	Q170	Q171	Q177	Q183	Q184	Q186	Q187	Q188	Q189	L190	Y191	K195	E207	P211	V217	Q218
V97	I220	T473	PRO	MET	L784	THR	W695	THR	F146	L170	L171	L172	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
R98	Q99	Y481	ILE	PHE	F788	LEU	Y712	LEU	F147	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q100	GLY	N482	THR	ALA	D789	ASP	Y716	ASP	F148	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
V103	ASN	F483	THR	THR	D790	THR	I724	LEU	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
L104	ASP	L484	ALA	ALA	D791	ASP	L725	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
S105	VAL	C485	ILE	CYS	H791	ASP	A726	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
W106	GLN	A486	GLN	GLN	D792	ASP	F727	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q107	ALA	H487	ALA	ALA	I793	ASP	I728	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
V108	HIS	A487	GLN	GLN	I797	ASP	I729	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q117	PRO	F495	CYS	CYS	L797	ASP	I730	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
E124	ALA	N496	SER	SER	T800	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
S126	ALA	N497	PRO	PRO	A801	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
R127	SER	N501	LEU	LEU	F806	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
T128	THR	L506	VAL	VAL	I861	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
L129	GLU	F509	ILE	ILE	W695	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q142	ILE	L510	THR	THR	Y712	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
I145	GLU	F511	LEU	LEU	I716	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
F146	ASP	R524	GLY	GLY	Y724	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
V147	LYS	ALA	VAL	VAL	L725	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
V149	ASN	LEU	VAL	VAL	A726	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
M152	PRO	GLU	GLY	GLY	F727	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
A153	ARG	LYS	LYS	LYS	I729	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
P154	ASP	ASP	ASP	ASP	I730	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Y159	MET	PHE	TRP	TRP	N731	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
L162	PHE	ALA	ALA	ALA	S736	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q170	LEU	VAL	VAL	VAL	GLU	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
L171	LEU	GLU	GLU	GLU	LYS	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
S182	SER	TYR	TYR	TYR	VAL	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
P183	ARG	GLN	GLN	GLN	F743	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q186	LYS	ILE	ILE	ILE	C746	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q187	ASP	TYR	TYR	TYR	T750	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Y188	ARG	MET	MET	MET	M753	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
F189	VAL	V564	GLY	GLY	M754	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
L190	SER	D574	ARG	ARG	W754	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Y191	LYS	L584	PHE	PHE	L765	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
K195	ARG	C585	ILE	ILE	T771	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
E207	SER	M586	LEU	LEU	F772	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
P211	ASP	LYS	GLY	GLY	A773	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
V217	SER	LEU	ILE	ILE	E774	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
Q218	PHE	TYR	PHE	PHE	S775	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
	GLY	THR	ARG	ARG	R776	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218
	SER	ARG	ALA	ALA	N779	ASP	I731	ASP	F149	L171	L172	L173	P183	P184	P186	P187	P188	P189	L190	Y191	K195	E207	P211	V217	Q218

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	149089	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 ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

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: 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	0.27	0/4620	0.46	0/6284
1	B	0.26	0/4620	0.45	0/6284
All	All	0.27	0/9240	0.45	0/12568

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	4497	0	4444	89	0
1	B	4497	0	4444	86	0
2	A	42	0	39	0	0
2	B	42	0	39	0	0
All	All	9078	0	8966	170	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 9.

All (170) 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:A:558:LEU:HD21	1:A:574:ASP:HA	1.57	0.86
1:A:644:SER:HG	1:A:724:TYR:HH	1.34	0.75
1:B:239:SER:O	1:B:776:ARG:NH1	2.21	0.73
1:A:239:SER:O	1:A:776:ARG:NH1	2.21	0.73
1:B:129:LEU:HD12	1:B:145:ILE:HD13	1.70	0.73
1:A:129:LEU:HD12	1:A:145:ILE:HD13	1.71	0.70
1:A:97:VAL:HG12	1:A:147:VAL:HG22	1.74	0.70
1:B:97:VAL:HG12	1:B:147:VAL:HG22	1.75	0.69
1:A:784:LEU:HB3	1:A:788:PHE:HB2	1.77	0.67
1:B:558:LEU:HD21	1:B:574:ASP:HA	1.79	0.65
1:A:217:VAL:HG22	1:A:260:VAL:HG22	1.78	0.65
1:A:51:VAL:HG22	1:A:162:LEU:HB2	1.78	0.64
1:B:784:LEU:HB3	1:B:788:PHE:HB2	1.80	0.63
1:B:51:VAL:HG22	1:B:162:LEU:HB2	1.79	0.63
1:B:96:VAL:HG23	1:B:105:SER:HB3	1.82	0.62
1:A:58:LEU:HD11	1:A:154:PRO:HA	1.82	0.61
1:A:99:GLN:HE22	1:A:130:CYS:HB3	1.66	0.61
1:A:190:LEU:HD13	1:A:220:ILE:HD11	1.83	0.60
1:B:207:GLU:O	1:B:242:LYS:NZ	2.34	0.59
1:B:217:VAL:HG22	1:B:260:VAL:HG22	1.84	0.59
1:A:727:PHE:O	1:A:731:MET:HG2	2.03	0.59
1:A:207:GLU:O	1:A:242:LYS:NZ	2.35	0.59
1:B:79:ARG:NH2	1:B:186:PRO:O	2.36	0.58
1:A:96:VAL:HG23	1:A:105:SER:HB3	1.86	0.58
1:A:275:PHE:HE1	1:A:283:GLN:HE22	1.52	0.58
1:B:501:ASN:OD1	1:B:559:SER:OG	2.22	0.58
1:B:266:PRO:O	1:B:289:ARG:NH2	2.37	0.57
1:B:275:PHE:HE1	1:B:283:GLN:HE22	1.52	0.57
1:A:456:ALA:O	1:A:460:ILE:HG12	2.05	0.57
1:A:94:LEU:HD13	1:B:103:VAL:HG23	1.86	0.56
1:A:632:PHE:HZ	1:A:712:TYR:CE2	2.24	0.56
1:B:67:ASN:HD21	1:B:142:GLN:HG3	1.70	0.56
1:A:266:PRO:O	1:A:289:ARG:NH2	2.39	0.55
1:B:190:LEU:HD13	1:B:220:ILE:HD11	1.88	0.55
1:A:56:VAL:O	1:A:156:GLY:CA	2.55	0.55
1:B:753:MET:N	1:B:753:MET:SD	2.80	0.55
1:A:482:ASN:HB2	1:A:765:LEU:HD13	1.90	0.54
1:A:128:THR:HB	1:A:188:TYR:CE1	2.42	0.54
1:B:481:TYR:OH	1:B:564:VAL:O	2.24	0.54
1:B:75:VAL:HG21	1:B:190:LEU:HD23	1.88	0.54
1:B:482:ASN:HB2	1:B:765:LEU:HD13	1.89	0.54
1:A:783:ILE:HG22	1:A:789:ASP:HA	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:686:LEU:HD22	1:A:727:PHE:HE2	1.73	0.54
1:A:75:VAL:HG21	1:A:190:LEU:HD23	1.90	0.53
1:B:128:THR:HB	1:B:188:TYR:CE1	2.43	0.53
1:B:456:ALA:O	1:B:460:ILE:HG12	2.08	0.53
1:A:67:ASN:HD21	1:A:142:GLN:HG3	1.72	0.53
1:A:56:VAL:O	1:A:156:GLY:HA2	2.09	0.53
1:B:783:ILE:HG22	1:B:789:ASP:HA	1.91	0.53
1:A:693:VAL:O	1:A:696:SER:OG	2.23	0.53
1:B:496:ASN:ND2	1:B:497:ASN:OD1	2.42	0.52
1:A:496:ASN:ND2	1:A:497:ASN:OD1	2.41	0.52
1:B:241:THR:HG23	1:B:773:ALA:HB1	1.91	0.52
1:A:712:TYR:CE2	1:A:716:ILE:HD11	2.45	0.52
1:A:753:MET:SD	1:A:753:MET:N	2.81	0.51
1:A:182:SER:HB3	1:A:185:GLN:HB2	1.91	0.51
1:B:211:PRO:HB3	1:B:289:ARG:NE	2.26	0.51
1:A:79:ARG:NH1	1:A:187:GLN:OE1	2.37	0.51
1:B:730:ILE:HG13	1:B:731:MET:SD	2.50	0.51
1:B:321:TYR:HE2	1:B:506:LEU:HD22	1.75	0.51
1:A:241:THR:HG23	1:A:773:ALA:HB1	1.92	0.50
1:B:182:SER:HB3	1:B:185:GLN:HB2	1.93	0.50
1:A:190:LEU:HD11	1:A:257:GLN:HB2	1.93	0.50
1:A:312:PHE:O	1:A:316:ILE:HG23	2.11	0.50
1:B:152:MET:HE3	1:B:152:MET:HA	1.92	0.50
1:A:124:GLU:O	1:A:184:SER:OG	2.23	0.50
1:A:103:VAL:HG23	1:B:94:LEU:HD13	1.93	0.50
1:B:58:LEU:H	1:B:58:LEU:HD12	1.76	0.49
1:A:79:ARG:NH2	1:A:186:PRO:O	2.46	0.49
1:B:47:ASP:OD1	1:B:52:TYR:OH	2.22	0.49
1:A:219:ASN:ND2	1:A:221:MET:HG2	2.28	0.49
1:B:79:ARG:NH1	1:B:187:GLN:OE1	2.32	0.49
1:A:116:TYR:O	1:A:117:GLN:HG2	2.13	0.49
1:A:726:ALA:O	1:A:730:ILE:HG12	2.13	0.48
1:A:149:VAL:HG11	1:A:159:TYR:CZ	2.48	0.48
1:B:771:THR:OG1	1:B:774:GLU:OE1	2.31	0.48
1:B:790:ASP:HA	1:B:793:ILE:HD12	1.95	0.48
1:A:211:PRO:HB3	1:A:289:ARG:NE	2.27	0.48
1:B:637:VAL:HG13	1:B:695:TRP:HE1	1.79	0.48
1:A:749:ALA:O	1:A:753:MET:HG2	2.14	0.48
1:B:632:PHE:HZ	1:B:712:TYR:CE2	2.31	0.48
1:A:761:PHE:HB2	1:A:794:TRP:CE3	2.49	0.48
1:A:255:GLY:O	1:A:257:GLN:HG2	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:776:ARG:HG2	1:B:779:ASN:HD21	1.79	0.47
1:A:301:ILE:HB	1:A:305:VAL:HG11	1.96	0.47
1:B:255:GLY:O	1:B:257:GLN:HG2	2.14	0.47
1:A:765:LEU:HD21	1:A:791:HIS:HB2	1.97	0.47
1:A:771:THR:OG1	1:A:774:GLU:OE1	2.32	0.47
1:B:765:LEU:HD21	1:B:791:HIS:HB2	1.97	0.47
1:B:712:TYR:CE2	1:B:716:ILE:HD11	2.49	0.47
1:A:456:ALA:O	1:A:459:VAL:HG22	2.15	0.47
1:B:225:TYR:O	1:B:231:VAL:HG23	2.15	0.47
1:B:219:ASN:ND2	1:B:221:MET:HG2	2.30	0.46
1:A:506:LEU:HD23	1:A:506:LEU:HA	1.76	0.46
1:B:245:ALA:HB3	1:B:483:PHE:HB3	1.96	0.46
1:B:58:LEU:HD11	1:B:154:PRO:HA	1.98	0.46
1:B:511:PHE:CZ	1:B:806:PHE:HB3	2.50	0.46
1:B:644:SER:OG	1:B:724:TYR:OH	2.23	0.46
1:B:195:LYS:HB3	1:B:195:LYS:HE2	1.71	0.46
1:A:152:MET:SD	1:B:100:GLN:HA	2.56	0.45
1:A:311:LEU:O	1:A:315:PHE:HB2	2.16	0.45
1:A:47:ASP:OD1	1:A:52:TYR:OH	2.22	0.45
1:B:727:PHE:O	1:B:731:MET:HG2	2.15	0.45
1:A:203:LYS:HD3	1:A:484:LEU:HD22	1.98	0.45
1:B:124:GLU:O	1:B:184:SER:OG	2.21	0.45
1:A:225:TYR:O	1:A:231:VAL:HG23	2.17	0.45
1:A:484:LEU:HD13	1:A:781:GLU:HG2	1.98	0.45
1:A:637:VAL:HG13	1:A:695:TRP:HE1	1.81	0.45
1:B:725:LEU:HD12	1:B:725:LEU:HA	1.80	0.45
1:B:98:ARG:HB3	1:B:146:PHE:HB2	1.98	0.45
1:B:456:ALA:O	1:B:459:VAL:HG22	2.16	0.45
1:A:171:LEU:HD12	1:A:297:ILE:HD11	1.99	0.44
1:A:693:VAL:O	1:A:697:PHE:HD2	2.00	0.44
1:A:725:LEU:HD12	1:A:725:LEU:HA	1.83	0.44
1:B:302:LYS:HA	1:B:302:LYS:HD3	1.73	0.44
1:B:487:HIS:O	1:B:495:PHE:N	2.44	0.44
1:A:107:GLN:N	1:A:107:GLN:OE1	2.48	0.44
1:A:225:TYR:HD1	1:A:230:ASN:HD21	1.61	0.44
1:B:632:PHE:HZ	1:B:712:TYR:CD2	2.35	0.44
1:A:97:VAL:HG21	1:A:129:LEU:HD21	2.00	0.44
1:B:47:ASP:OD1	1:B:47:ASP:N	2.51	0.44
1:A:504:HIS:ND1	1:A:799:ALA:HB2	2.33	0.43
1:B:225:TYR:HD1	1:B:230:ASN:HD21	1.64	0.43
1:A:746:CYS:O	1:A:750:THR:OG1	2.35	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:730:ILE:HG13	1:A:731:MET:SD	2.59	0.43
1:B:726:ALA:HA	1:B:729:ILE:HD12	2.00	0.43
1:A:47:ASP:OD1	1:A:47:ASP:N	2.51	0.43
1:A:749:ALA:O	1:A:753:MET:HE2	2.19	0.43
1:A:254:PRO:HG3	1:B:117:GLN:NE2	2.34	0.43
1:A:90:ASN:O	1:B:100:GLN:NE2	2.51	0.43
1:A:202:ILE:O	1:A:245:ALA:HA	2.18	0.43
1:B:126:SER:O	1:B:186:PRO:HD2	2.19	0.43
1:B:149:VAL:HG11	1:B:159:TYR:CZ	2.54	0.43
1:B:171:LEU:HD12	1:B:297:ILE:HD11	2.00	0.43
1:A:191:TYR:HD2	1:A:258:PHE:CZ	2.36	0.42
1:A:195:LYS:HB3	1:A:195:LYS:HE2	1.71	0.42
1:B:286:ASN:HD21	1:B:289:ARG:NH1	2.17	0.42
1:B:506:LEU:HD23	1:B:506:LEU:HA	1.84	0.42
1:B:283:GLN:OE1	1:B:285:TRP:NE1	2.37	0.42
1:B:765:LEU:HD21	1:B:791:HIS:H	1.83	0.42
1:A:507:LEU:HD23	1:A:507:LEU:HA	1.87	0.42
1:B:311:LEU:HD23	1:B:311:LEU:HA	1.87	0.42
1:B:746:CYS:O	1:B:750:THR:OG1	2.38	0.42
1:A:228:ASP:OD1	1:A:228:ASP:N	2.53	0.42
1:A:684:MET:N	1:A:684:MET:SD	2.93	0.42
1:B:191:TYR:HD2	1:B:258:PHE:CZ	2.38	0.42
1:B:469:VAL:O	1:B:473:THR:OG1	2.22	0.42
1:B:797:LEU:HA	1:B:800:THR:HG22	2.02	0.42
1:A:776:ARG:HG2	1:A:779:ASN:HD21	1.84	0.42
1:B:584:LEU:HD12	1:B:584:LEU:HA	1.85	0.42
1:B:228:ASP:N	1:B:228:ASP:OD1	2.53	0.41
1:B:107:GLN:OE1	1:B:107:GLN:N	2.50	0.41
1:B:220:ILE:HD12	1:B:257:GLN:HG3	2.03	0.41
1:B:754:TRP:CE2	1:B:801:ALA:HB1	2.54	0.41
1:A:797:LEU:HD13	1:A:797:LEU:HA	1.87	0.41
1:A:548:MET:HE3	1:A:806:PHE:HB3	2.03	0.41
1:A:686:LEU:HD22	1:A:727:PHE:CE2	2.54	0.41
1:B:448:ILE:HD12	1:B:448:ILE:HA	1.98	0.41
1:B:104:LEU:HD12	1:B:104:LEU:HA	1.87	0.40
1:B:170:GLN:HA	1:B:190:LEU:O	2.21	0.40
1:A:191:TYR:HE2	1:A:200:VAL:HG11	1.86	0.40
1:A:79:ARG:HD2	1:A:79:ARG:HA	1.82	0.40
1:A:178:HIS:CE1	1:A:294:GLU:HB2	2.57	0.40
1:B:731:MET:SD	1:B:731:MET:N	2.95	0.40
1:A:58:LEU:H	1:A:58:LEU:HD12	1.86	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:514:ILE:HG13	1:A:515:VAL:N	2.37	0.40
1:B:84:SER:HB3	1:B:108:VAL:HG12	2.03	0.40
1:A:683:ARG:O	1:A:686:LEU:HG	2.22	0.40
1:A:711:SER:HB2	1:A:761:PHE:HZ	1.86	0.40
1:B:485:CYS:SG	1:B:789:ASP:HB3	2.61	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	547/803 (68%)	534 (98%)	13 (2%)	0	100	100
1	B	547/803 (68%)	536 (98%)	11 (2%)	0	100	100
All	All	1094/1606 (68%)	1070 (98%)	24 (2%)	0	100	100

There are no Ramachandran outliers to report.

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 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	495/712 (70%)	485 (98%)	10 (2%)	50	72
1	B	495/712 (70%)	486 (98%)	9 (2%)	54	74
All	All	990/1424 (70%)	971 (98%)	19 (2%)	52	72

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	111	LEU
1	A	144	LEU
1	A	155	LEU
1	A	315	PHE
1	A	445	PHE
1	A	496	ASN
1	A	501	ASN
1	A	542	PHE
1	A	561	CYS
1	A	792	ASP
1	B	58	LEU
1	B	315	PHE
1	B	496	ASN
1	B	501	ASN
1	B	509	PHE
1	B	542	PHE
1	B	559	SER
1	B	727	PHE
1	B	792	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	62	ASN
1	A	99	GLN
1	A	113	GLN
1	A	219	ASN
1	B	113	GLN
1	B	117	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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
2	NAG	B	903	1	14,14,15	0.24	0	17,19,21	0.46	0
2	NAG	A	902	1	14,14,15	0.24	0	17,19,21	0.42	0
2	NAG	A	901	1	14,14,15	0.25	0	17,19,21	0.53	0
2	NAG	A	903	1	14,14,15	0.22	0	17,19,21	0.48	0
2	NAG	B	902	1	14,14,15	0.23	0	17,19,21	0.44	0
2	NAG	B	901	1	14,14,15	0.24	0	17,19,21	0.53	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
2	NAG	B	903	1	-	2/6/23/26	0/1/1/1
2	NAG	A	902	1	-	2/6/23/26	0/1/1/1
2	NAG	A	901	1	-	2/6/23/26	0/1/1/1
2	NAG	A	903	1	-	2/6/23/26	0/1/1/1
2	NAG	B	902	1	-	2/6/23/26	0/1/1/1
2	NAG	B	901	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

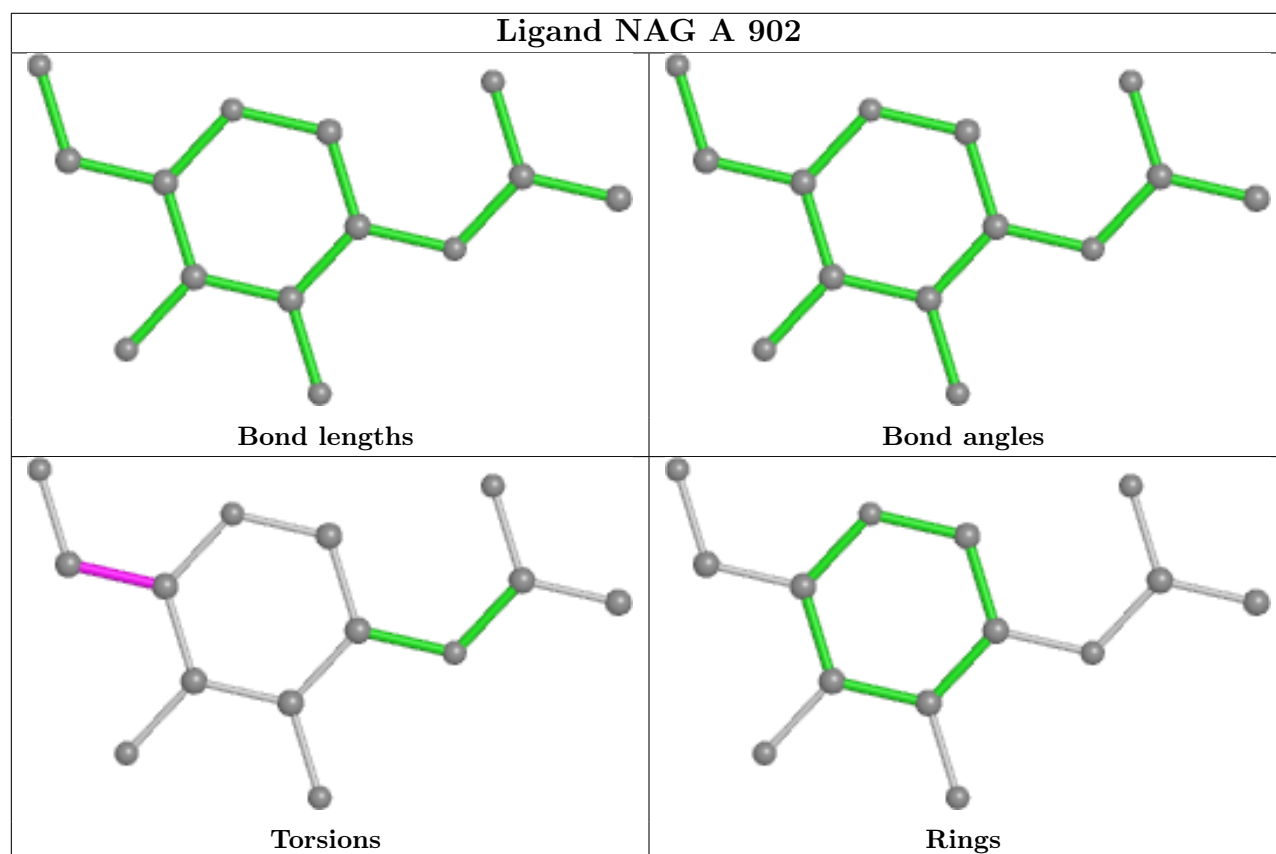
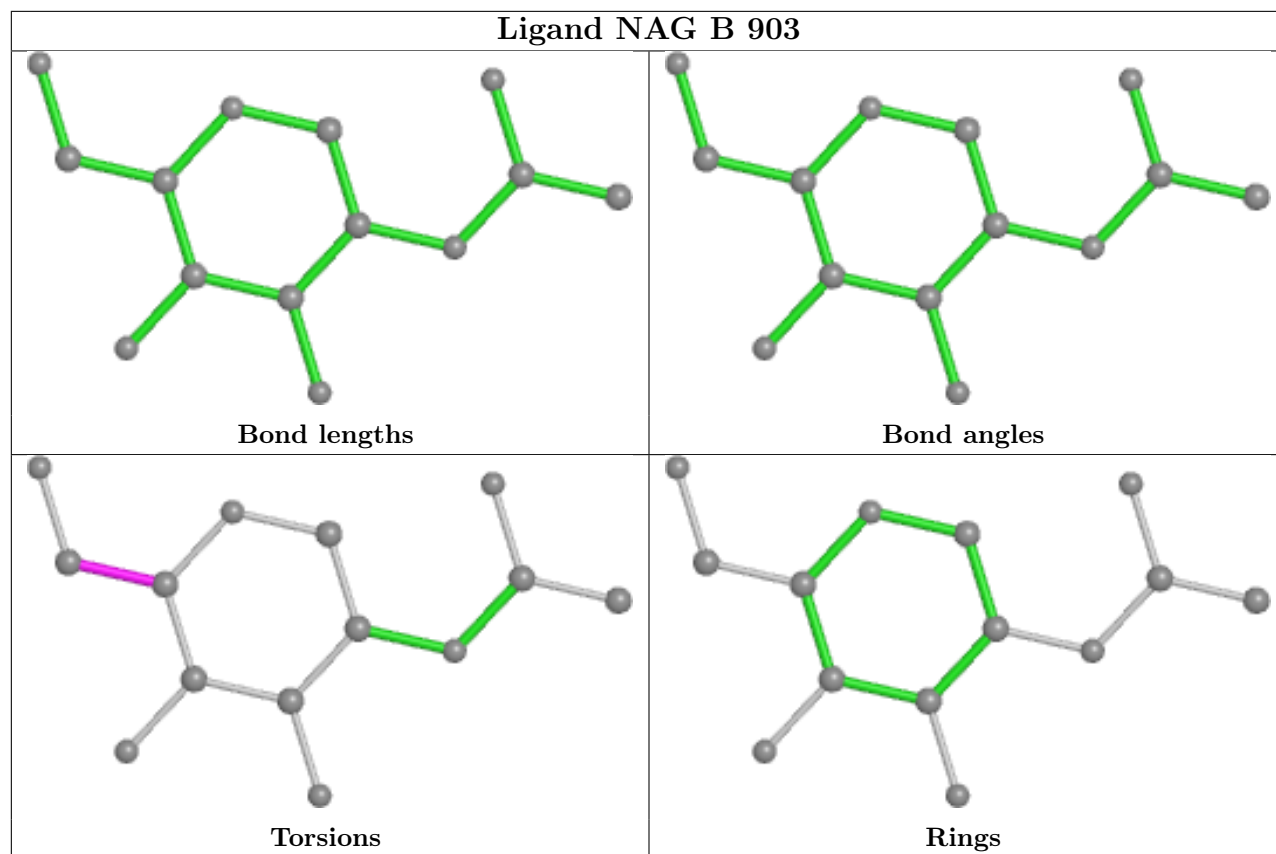
All (12) torsion outliers are listed below:

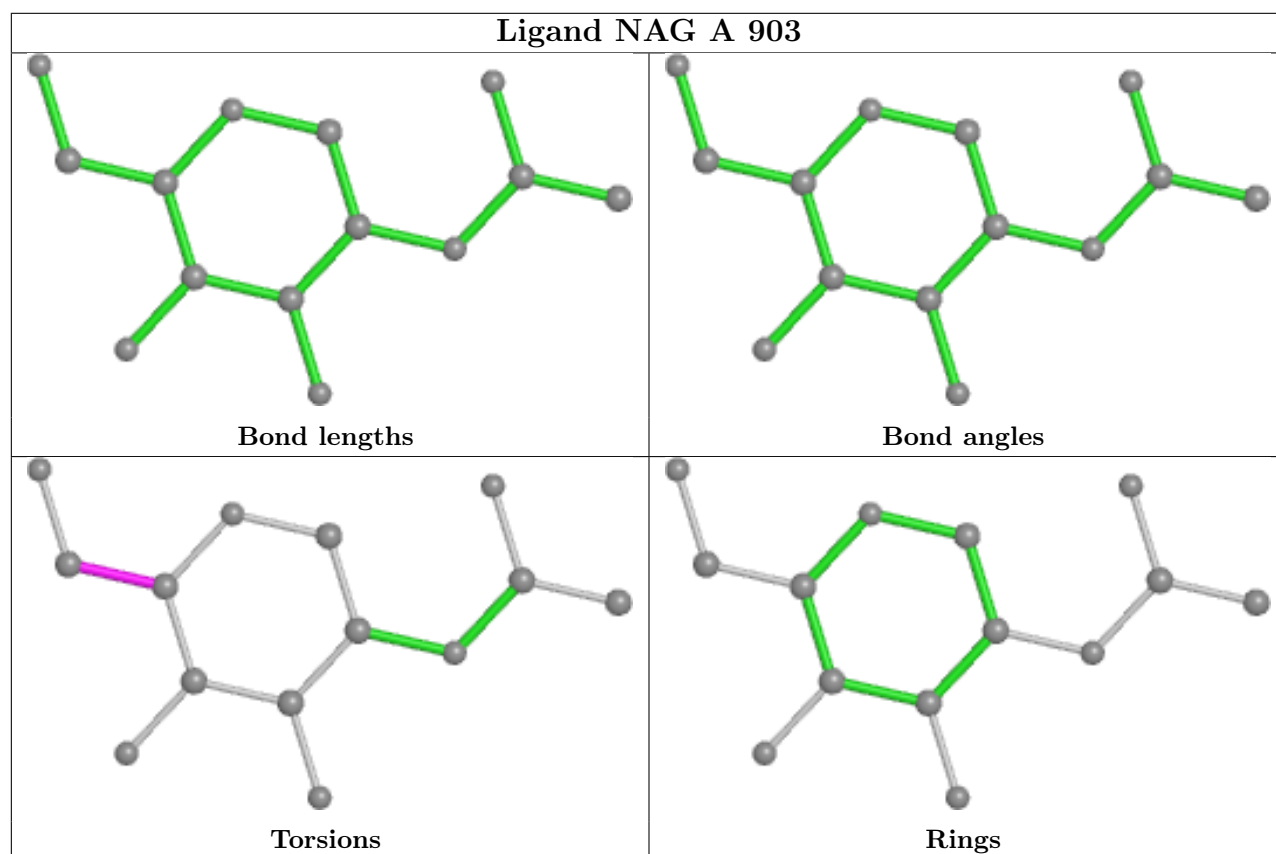
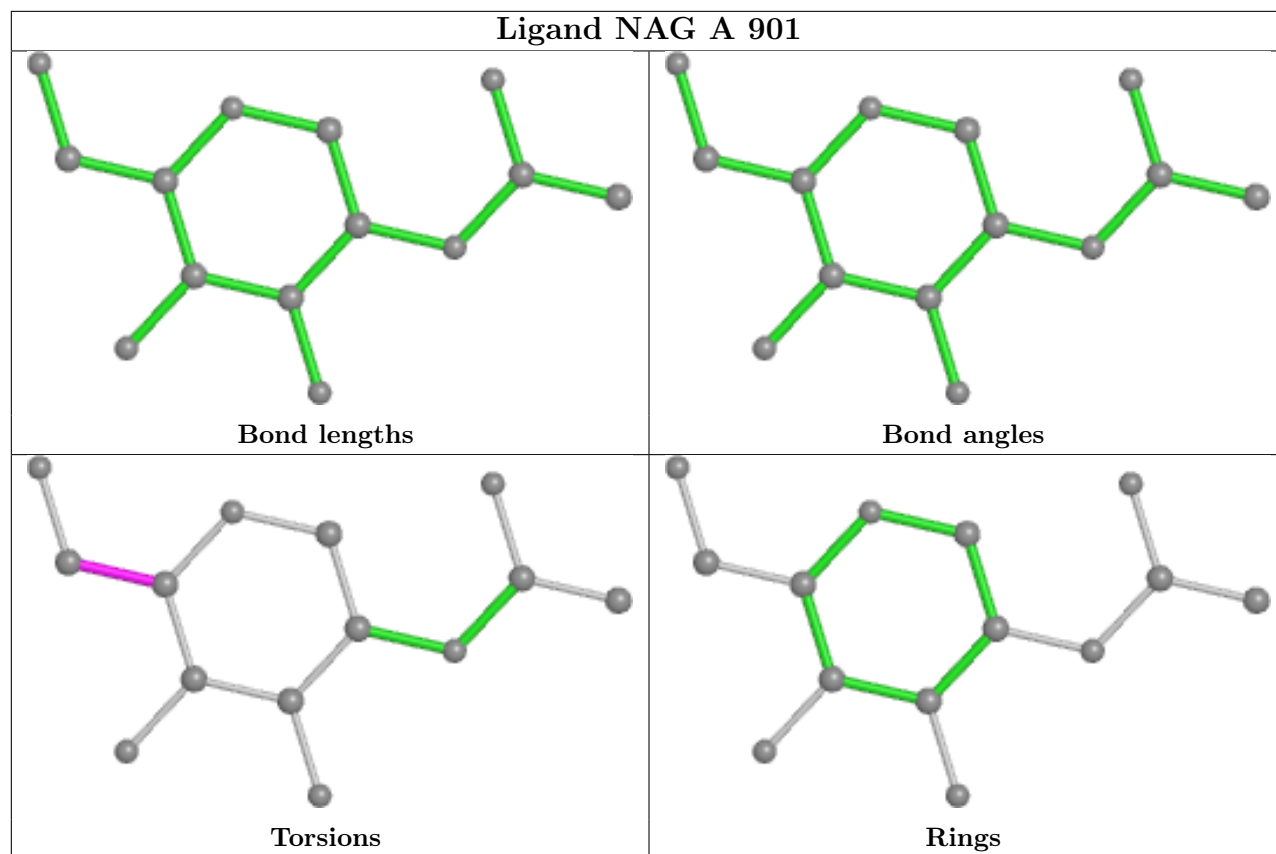
Mol	Chain	Res	Type	Atoms
2	A	901	NAG	O5-C5-C6-O6
2	B	901	NAG	O5-C5-C6-O6
2	B	902	NAG	O5-C5-C6-O6
2	A	902	NAG	O5-C5-C6-O6
2	A	901	NAG	C4-C5-C6-O6
2	B	901	NAG	C4-C5-C6-O6
2	A	902	NAG	C4-C5-C6-O6
2	B	902	NAG	C4-C5-C6-O6
2	B	903	NAG	O5-C5-C6-O6
2	A	903	NAG	O5-C5-C6-O6
2	B	903	NAG	C4-C5-C6-O6
2	A	903	NAG	C4-C5-C6-O6

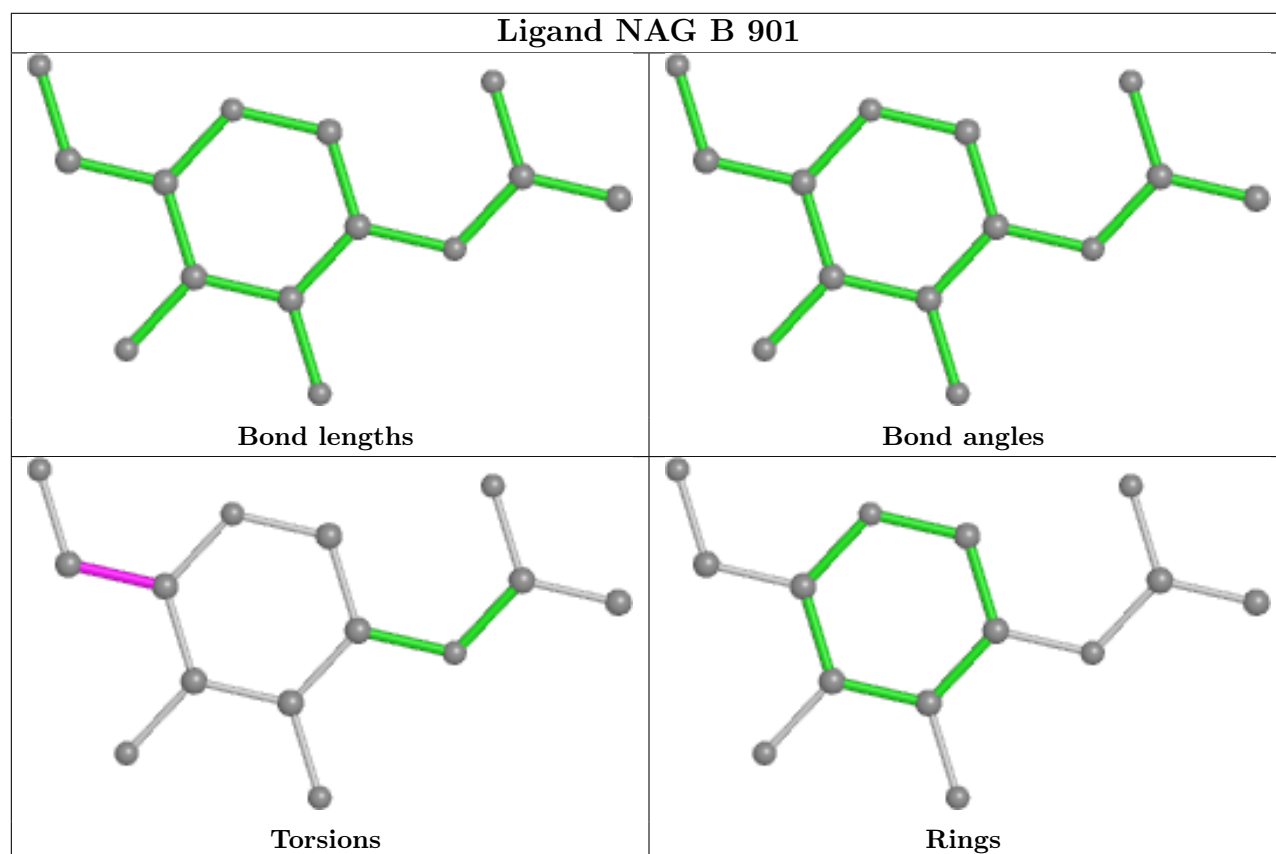
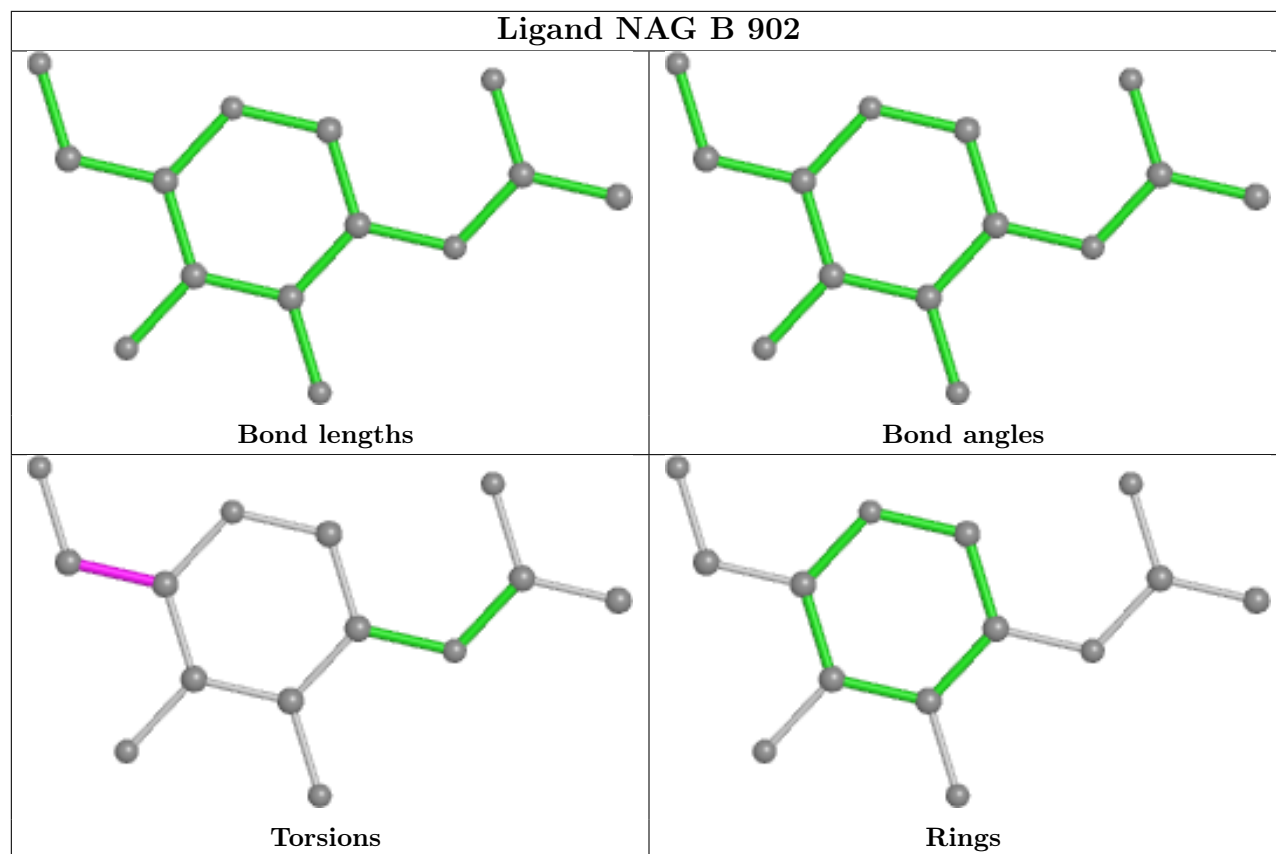
There are no ring outliers.

No monomer is involved in short contacts.

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