Full wwPDB X-ray Structure Validation Report ⓘ

Oct 26, 2024 – 07:54 AM EDT

PDB ID	:	1NSC
Title	:	INFLUENZA B VIRUS NEURAMINIDASE CAN SYNTHESIZE ITS OWN INHIBITOR
Authors	:	Burmeister, W.P.; Ruigrok, R.W.H.; Cusack, S.
Deposited on	:	1993-05-24
Resolution	:	1.70 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

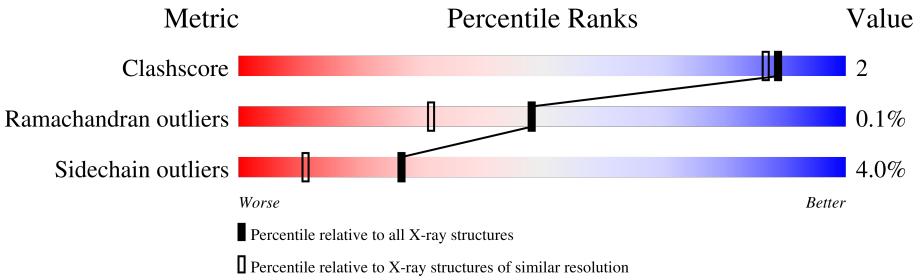
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.70 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))
Clashscore	180529	5671 (1.70-1.70)
Ramachandran outliers	177936	5594 (1.70-1.70)
Sidechain outliers	177891	5594 (1.70-1.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	390	87% 12%
1	B	390	86% 13%

2 Entry composition

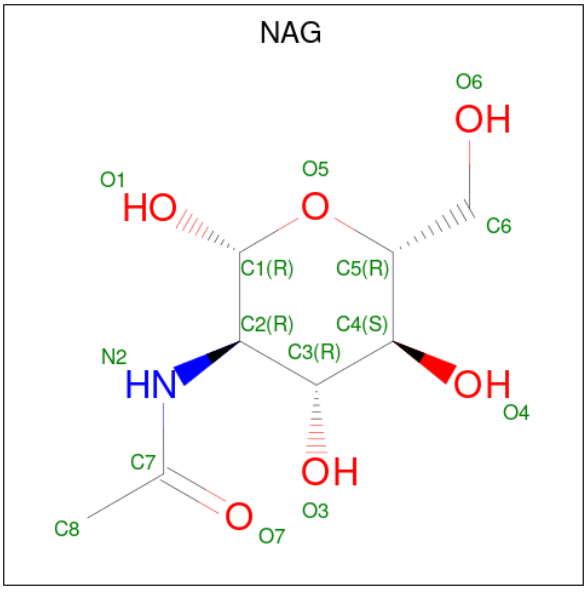
There are 5 unique types of molecules in this entry. The entry contains 9121 atoms, of which 2470 are hydrogens and 0 are deuteriums.

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 NEURAMINIDASE.

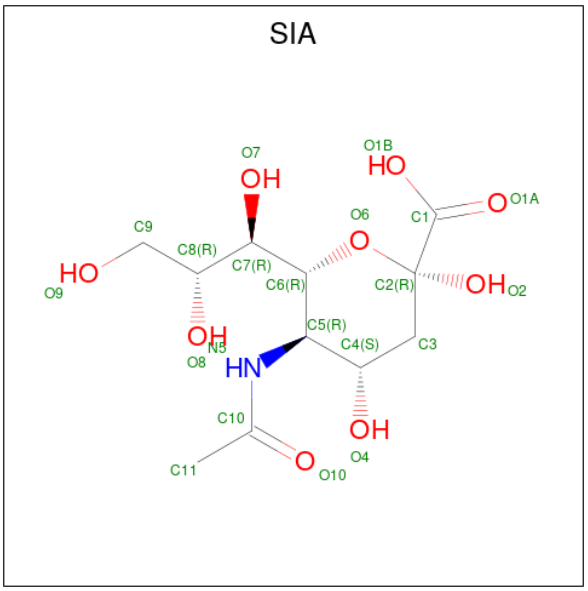
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	390	Total	C	H	N	O	S	5	0	0
			3737	1899	701	533	575	29			
1	B	390	Total	C	H	N	O	S	5	0	0
			3737	1899	701	533	575	29			

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	H	N	O	0	0
			28	8	14	1	5		
2	B	1	Total	C	H	N	O	0	0
			28	8	14	1	5		

- Molecule 3 is N-acetyl-alpha-neuraminic acid (three-letter code: SIA) (formula: $C_{11}H_{19}NO_9$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	H	N	O	0	0
			39	11	18	1	9		
3	B	1	Total	C	H	N	O	0	0
			39	11	18	1	9		

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Ca	0	0
			2	2		
4	B	1	Total	Ca	0	0
			1	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	255	Total	H	O	0	0
			763	508	255		
5	B	251	Total	H	O	0	0
			747	496	251		

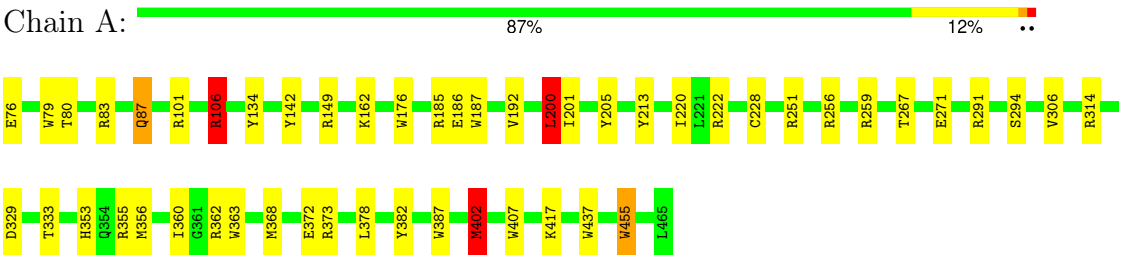
3 Residue-property plots (i)

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.

Note EDS was not executed.

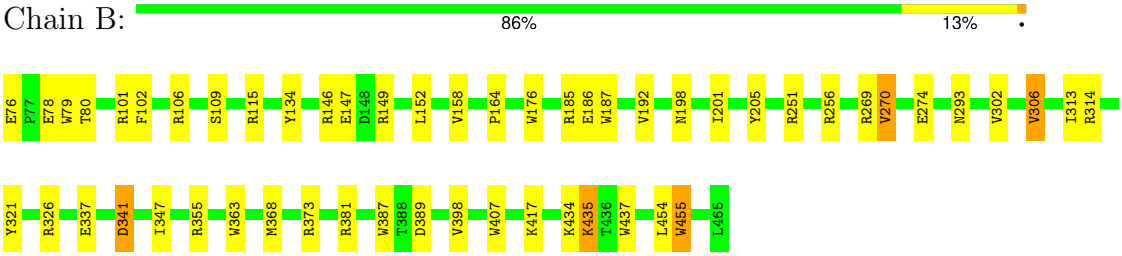
- Molecule 1: NEURAMINIDASE

Chain A:



- Molecule 1: NEURAMINIDASE

Chain B:



4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α, β, γ	88.90Å 88.90Å 222.80Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	(Not available) – 1.70	Depositor
% Data completeness (in resolution range)	(Not available) ((Not available)-1.70)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, R_{free}	0.180 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	9121	wwPDB-VP
Average B, all atoms (Å^2)	12.0	wwPDB-VP

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: SIA, NAG, CA

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	0.83	0/3109	1.48	53/4197 (1.3%)
1	B	0.83	0/3109	1.45	48/4197 (1.1%)
All	All	0.83	0/6218	1.47	101/8394 (1.2%)

There are no bond length outliers.

All (101) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	402	MET	CA-CB-CG	-12.24	92.48	113.30
1	A	185	ARG	NE-CZ-NH2	-11.61	114.49	120.30
1	A	83	ARG	NE-CZ-NH2	-10.65	114.97	120.30
1	A	251	ARG	NE-CZ-NH2	-9.95	115.33	120.30
1	A	149	ARG	NE-CZ-NH2	-9.70	115.45	120.30
1	A	187	TRP	CD1-CG-CD2	9.12	113.59	106.30
1	B	79	TRP	CD1-CG-CD2	8.87	113.40	106.30
1	B	187	TRP	CD1-CG-CD2	8.78	113.32	106.30
1	B	149	ARG	NE-CZ-NH2	-8.77	115.91	120.30
1	B	381	ARG	NE-CZ-NH1	8.65	124.63	120.30
1	A	176	TRP	CD1-CG-CD2	8.28	112.92	106.30
1	B	387	TRP	CD1-CG-CD2	8.26	112.90	106.30
1	B	314	ARG	NE-CZ-NH2	-8.11	116.25	120.30
1	A	437	TRP	CD1-CG-CD2	7.94	112.65	106.30
1	A	79	TRP	CD1-CG-CD2	7.90	112.62	106.30
1	B	437	TRP	CD1-CG-CD2	7.81	112.55	106.30
1	B	176	TRP	CD1-CG-CD2	7.71	112.47	106.30
1	B	115	ARG	NE-CZ-NH2	-7.64	116.48	120.30
1	A	79	TRP	CE2-CD2-CG	-7.62	101.20	107.30
1	A	162	LYS	C-N-CA	-7.60	102.69	121.70
1	A	387	TRP	CD1-CG-CD2	7.58	112.37	106.30
1	B	251	ARG	NE-CZ-NH2	-7.55	116.53	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	79	TRP	CE2-CD2-CG	-7.51	101.29	107.30
1	A	291	ARG	NE-CZ-NH2	-7.43	116.58	120.30
1	B	187	TRP	CE2-CD2-CG	-7.43	101.35	107.30
1	B	270	VAL	N-CA-CB	-7.35	95.32	111.50
1	B	437	TRP	CE2-CD2-CG	-7.29	101.47	107.30
1	A	200	LEU	CA-CB-CG	7.19	131.85	115.30
1	A	187	TRP	CE2-CD2-CG	-7.17	101.57	107.30
1	A	291	ARG	NE-CZ-NH1	7.11	123.86	120.30
1	B	407	TRP	CD1-CG-CD2	7.03	111.92	106.30
1	B	363	TRP	CD1-CG-CD2	7.03	111.92	106.30
1	A	363	TRP	CE2-CD2-CG	-6.99	101.71	107.30
1	A	355	ARG	NE-CZ-NH2	-6.95	116.83	120.30
1	A	259	ARG	NE-CZ-NH2	-6.83	116.89	120.30
1	B	176	TRP	CE2-CD2-CG	-6.81	101.85	107.30
1	B	256	ARG	NE-CZ-NH2	-6.80	116.90	120.30
1	A	363	TRP	CD1-CG-CD2	6.74	111.69	106.30
1	B	387	TRP	CG-CD1-NE1	-6.71	103.39	110.10
1	A	356	MET	CG-SD-CE	-6.70	89.47	100.20
1	A	101	ARG	NE-CZ-NH2	-6.69	116.95	120.30
1	B	455	TRP	CD1-CG-CD2	6.67	111.64	106.30
1	A	387	TRP	CE2-CD2-CG	-6.65	101.98	107.30
1	A	176	TRP	CE2-CD2-CG	-6.60	102.02	107.30
1	A	407	TRP	CD1-CG-CD2	6.52	111.52	106.30
1	A	149	ARG	NE-CZ-NH1	6.51	123.56	120.30
1	A	314	ARG	NE-CZ-NH2	-6.48	117.06	120.30
1	B	407	TRP	CE2-CD2-CG	-6.35	102.22	107.30
1	B	341	ASP	N-CA-CB	-6.33	99.22	110.60
1	B	363	TRP	CE2-CD2-CG	-6.30	102.26	107.30
1	A	407	TRP	CE2-CD2-CG	-6.26	102.29	107.30
1	B	269	ARG	NE-CZ-NH2	-6.25	117.17	120.30
1	B	269	ARG	NE-CZ-NH1	6.20	123.40	120.30
1	A	256	ARG	NE-CZ-NH1	6.19	123.40	120.30
1	A	455	TRP	CE2-CD2-CG	-6.18	102.35	107.30
1	A	251	ARG	NE-CZ-NH1	6.17	123.39	120.30
1	B	306	VAL	CA-CB-CG2	-6.14	101.68	110.90
1	A	455	TRP	CD1-CG-CD2	6.12	111.20	106.30
1	A	437	TRP	CE2-CD2-CG	-6.12	102.41	107.30
1	A	222	ARG	NE-CZ-NH2	-6.09	117.25	120.30
1	B	101	ARG	NE-CZ-NH2	-5.99	117.31	120.30
1	B	355	ARG	NE-CZ-NH2	-5.96	117.32	120.30
1	B	387	TRP	CE2-CD2-CG	-5.96	102.53	107.30
1	A	373	ARG	NE-CZ-NH2	-5.84	117.38	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	455	TRP	CE2-CD2-CG	-5.84	102.63	107.30
1	B	326	ARG	NE-CZ-NH2	-5.77	117.42	120.30
1	A	187	TRP	CG-CD1-NE1	-5.73	104.37	110.10
1	A	106	ARG	NE-CZ-NH2	-5.72	117.44	120.30
1	B	146	ARG	NE-CZ-NH2	-5.71	117.44	120.30
1	A	176	TRP	CB-CG-CD1	-5.71	119.58	127.00
1	B	79	TRP	CG-CD1-NE1	-5.71	104.39	110.10
1	A	79	TRP	CG-CD2-CE3	5.70	139.03	133.90
1	A	382	TYR	CB-CG-CD1	-5.68	117.59	121.00
1	B	185	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	A	294	SER	N-CA-CB	-5.64	102.04	110.50
1	A	176	TRP	CG-CD1-NE1	-5.56	104.54	110.10
1	A	79	TRP	CB-CG-CD1	-5.54	119.80	127.00
1	A	142	TYR	CB-CG-CD2	-5.50	117.70	121.00
1	A	79	TRP	CG-CD1-NE1	-5.49	104.61	110.10
1	B	321	TYR	CB-CG-CD2	-5.47	117.72	121.00
1	B	256	ARG	NE-CZ-NH1	5.43	123.01	120.30
1	B	176	TRP	CB-CG-CD1	-5.41	119.96	127.00
1	A	185	ARG	NE-CZ-NH1	5.41	123.00	120.30
1	B	434	LYS	CA-CB-CG	5.38	125.22	113.40
1	B	187	TRP	CB-CG-CD1	-5.37	120.02	127.00
1	A	362	ARG	NE-CZ-NH1	5.36	122.98	120.30
1	A	437	TRP	CG-CD1-NE1	-5.36	104.75	110.10
1	B	434	LYS	N-CA-CB	-5.35	100.97	110.60
1	B	187	TRP	CG-CD1-NE1	-5.35	104.75	110.10
1	A	162	LYS	CB-CA-C	-5.33	99.73	110.40
1	B	187	TRP	CG-CD2-CE3	5.31	138.68	133.90
1	A	387	TRP	CG-CD1-NE1	-5.25	104.85	110.10
1	A	372	GLU	OE1-CD-OE2	-5.17	117.10	123.30
1	A	259	ARG	NE-CZ-NH1	5.16	122.88	120.30
1	B	115	ARG	NE-CZ-NH1	5.16	122.88	120.30
1	B	341	ASP	CA-CB-CG	5.14	124.71	113.40
1	A	329	ASP	CB-CG-OD1	5.13	122.92	118.30
1	B	389	ASP	CB-CG-OD1	5.12	122.91	118.30
1	B	79	TRP	CB-CG-CD1	-5.11	120.36	127.00
1	B	270	VAL	CG1-CB-CG2	5.03	118.95	110.90
1	B	270	VAL	CB-CA-C	5.00	120.91	111.40

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	3036	701	2923	9	0
1	B	3036	701	2923	13	0
2	A	14	14	13	0	0
2	B	14	14	13	0	0
3	A	21	18	18	0	0
3	B	21	18	18	0	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
5	A	255	508	0	1	0
5	B	251	496	0	3	0
All	All	6651	2470	5908	21	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 2.

All (21) 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:192:VAL:HG22	1:A:201:ILE:HD13	1.76	0.67
1:B:78:GLU:HB2	5:B:707:HOH:O	2.04	0.58
1:A:200:LEU:HG	1:B:454:LEU:HD12	1.89	0.54
1:B:192:VAL:HG22	1:B:201:ILE:HD13	1.89	0.54
1:B:302:VAL:HG22	1:B:313:ILE:HG12	1.95	0.48
1:B:435:LYS:HE3	5:B:651:HOH:O	2.14	0.46
1:B:158:VAL:HG11	1:B:164:PRO:HA	1.97	0.45
1:A:368:MET:HB3	1:A:402:MET:HG3	1.99	0.44
1:A:106:ARG:HD2	5:A:499:HOH:O	2.18	0.44
1:B:186:GLU:HB3	1:B:205:TYR:CZ	2.53	0.44
1:A:76:GLU:OE1	1:A:76:GLU:N	2.52	0.43
1:A:87:GLN:O	1:A:87:GLN:HG2	2.18	0.43
1:B:368:MET:HE1	1:B:398:VAL:HG13	2.01	0.43
1:A:186:GLU:HB3	1:A:205:TYR:CZ	2.54	0.42
1:A:353:HIS:HD2	1:A:360:ILE:HD11	1.84	0.42
1:B:274:GLU:OE2	1:B:293:ASN:HB2	2.19	0.42
1:B:102:PHE:O	1:B:109:SER:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:201:ILE:HB	1:A:213:TYR:HB3	2.01	0.42
1:B:417:LYS:HB3	1:B:417:LYS:HE2	1.75	0.42
1:B:347:ILE:HD12	1:B:373:ARG:HG2	2.01	0.41
1:B:80:THR:HG21	5:B:674:HOH:O	2.19	0.41

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 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	388/390 (100%)	375 (97%)	12 (3%)	1 (0%)	37 23
1	B	388/390 (100%)	377 (97%)	11 (3%)	0	100 100
All	All	776/780 (100%)	752 (97%)	23 (3%)	1 (0%)	48 32

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	220	ILE

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	324/324 (100%)	310 (96%)	14 (4%)	25 10

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	324/324 (100%)	312 (96%)	12 (4%)	29 13
All	All	648/648 (100%)	622 (96%)	26 (4%)	27 11

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	80	THR
1	A	87	GLN
1	A	106	ARG
1	A	134	TYR
1	A	200	LEU
1	A	228	CYS
1	A	267	THR
1	A	271	GLU
1	A	306	VAL
1	A	333	THR
1	A	378	LEU
1	A	402	MET
1	A	417	LYS
1	A	455	TRP
1	B	76	GLU
1	B	106	ARG
1	B	134	TYR
1	B	147	GLU
1	B	152	LEU
1	B	198	ASN
1	B	270	VAL
1	B	306	VAL
1	B	337	GLU
1	B	341	ASP
1	B	435	LYS
1	B	455	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	87	GLN
1	A	133	HIS
1	A	168	ASN
1	A	339	ASN
1	B	108	ASN

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Mol	Chain	Res	Type
1	B	133	HIS
1	B	168	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 7 ligands modelled in this entry, 3 are monoatomic - leaving 4 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	$\#\|Z\| > 2$
2	NAG	A	466	1	14,14,15	0.64	0	17,19,21	1.65	5 (29%)
3	SIA	A	467	-	21,21,21	0.93	1 (4%)	24,31,31	4.28	9 (37%)
3	SIA	B	467	-	21,21,21	1.06	1 (4%)	24,31,31	4.11	8 (33%)
2	NAG	B	466	1	14,14,15	0.63	0	17,19,21	1.70	4 (23%)

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	A	466	1	-	2/6/23/26	0/1/1/1
3	SIA	A	467	-	-	1/20/38/38	0/1/1/1
3	SIA	B	467	-	-	1/20/38/38	0/1/1/1
2	NAG	B	466	1	-	1/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	467	SIA	O2-C2	2.66	1.43	1.39
3	B	467	SIA	C4-C5	2.60	1.55	1.53

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	467	SIA	O2-C2-O6	-10.32	83.51	109.51
3	A	467	SIA	O2-C2-C1	-10.08	89.44	110.73
3	B	467	SIA	O2-C2-C1	-9.78	90.08	110.73
3	B	467	SIA	O2-C2-O6	-9.58	85.37	109.51
3	A	467	SIA	O2-C2-C3	8.41	122.18	109.44
3	B	467	SIA	C3-C2-C1	8.12	127.92	112.84
3	A	467	SIA	C3-C2-C1	7.67	127.08	112.84
3	B	467	SIA	O2-C2-C3	7.56	120.90	109.44
3	B	467	SIA	O1A-C1-C2	-7.36	111.57	123.85
3	A	467	SIA	O1A-C1-C2	-7.33	111.63	123.85
2	B	466	NAG	C1-O5-C5	4.18	117.79	112.19
2	A	466	NAG	C8-C7-N2	3.64	122.16	116.12
2	B	466	NAG	C8-C7-N2	3.61	122.11	116.12
2	A	466	NAG	C1-O5-C5	3.28	116.58	112.19
3	A	467	SIA	C5-N5-C10	3.25	130.73	123.11
3	B	467	SIA	C4-C5-N5	-3.15	104.24	110.44
3	A	467	SIA	C4-C5-N5	-2.87	104.78	110.44
3	A	467	SIA	O1B-C1-O1A	-2.73	115.11	123.86
3	B	467	SIA	O1B-C1-O1A	-2.51	115.83	123.86
3	B	467	SIA	C5-N5-C10	2.42	128.77	123.11
2	A	466	NAG	O7-C7-N2	-2.21	118.07	121.98
2	A	466	NAG	C1-C2-N2	-2.14	107.07	110.43
2	A	466	NAG	C2-N2-C7	2.12	125.73	122.90
3	A	467	SIA	O8-C8-C7	-2.09	104.35	109.25
2	B	466	NAG	C1-C2-N2	-2.09	107.14	110.43
2	B	466	NAG	C2-N2-C7	2.08	125.68	122.90

There are no chirality outliers.

All (5) torsion outliers are listed below:

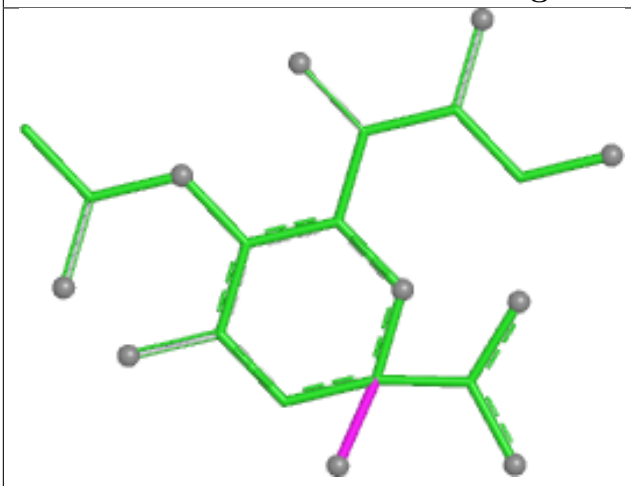
Mol	Chain	Res	Type	Atoms
2	A	466	NAG	O5-C5-C6-O6
2	A	466	NAG	C4-C5-C6-O6
2	B	466	NAG	O5-C5-C6-O6
3	A	467	SIA	O1B-C1-C2-O6
3	B	467	SIA	O1B-C1-C2-O6

There are no ring outliers.

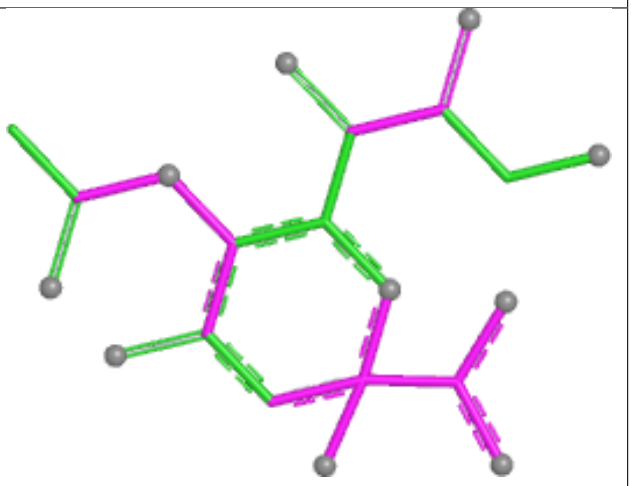
No monomer is involved in short contacts.

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 then 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.

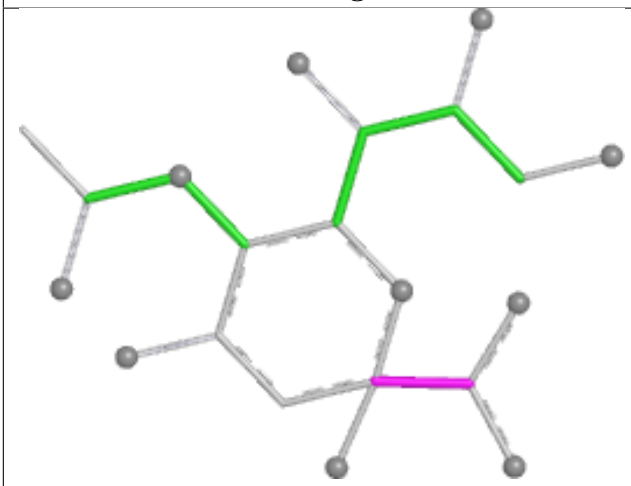
Ligand SIA A 467



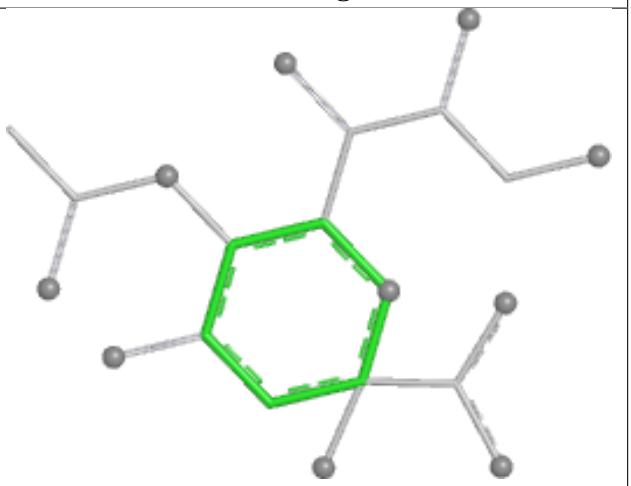
Bond lengths



Bond angles

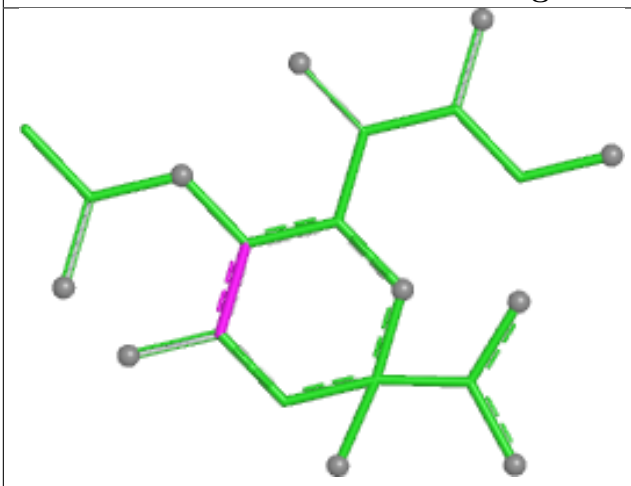


Torsions

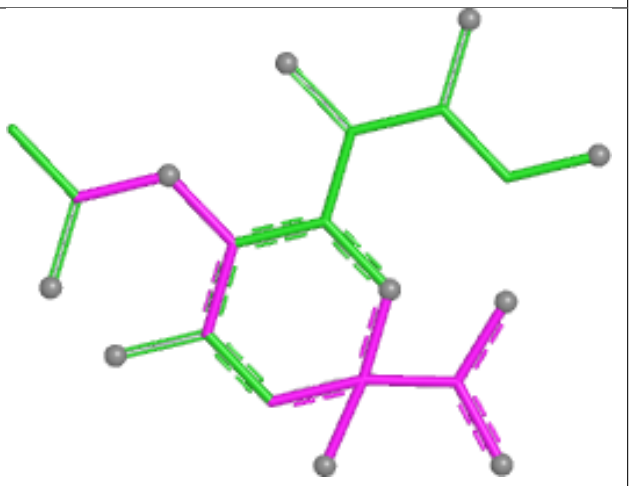


Rings

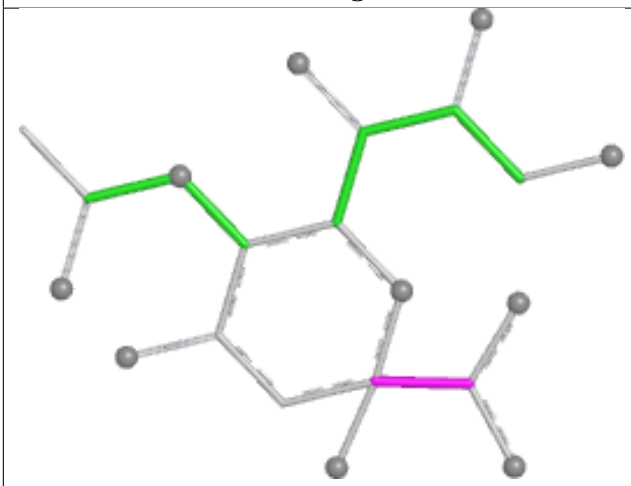
Ligand SIA B 467



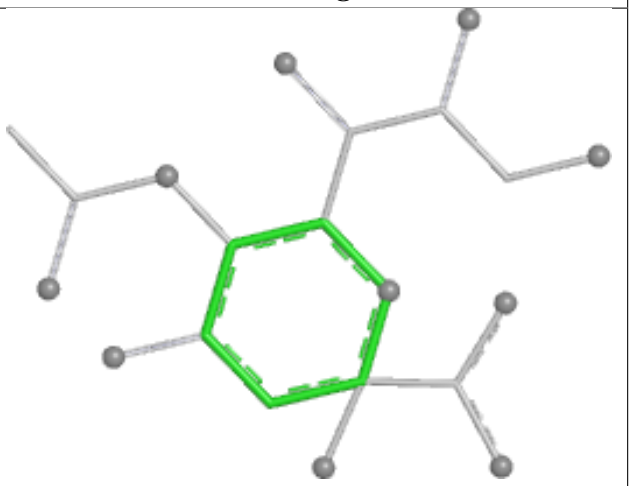
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.