



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 01:17 PM UTC

PDB ID : 1A4Q / pdb_00001a4q
Title : INFLUENZA VIRUS B/BEIJING/1/87 NEURAMINIDASE COMPLEXED
WITH DIHYDROPYRAN-PHENETHYL-PROPYL-CARBOXAMIDE
Authors : Cleasby, A.; Singh, O.; Skarzynski, T.; Wonacott, A.J.
Deposited on : 1998-01-30
Resolution : 1.90 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

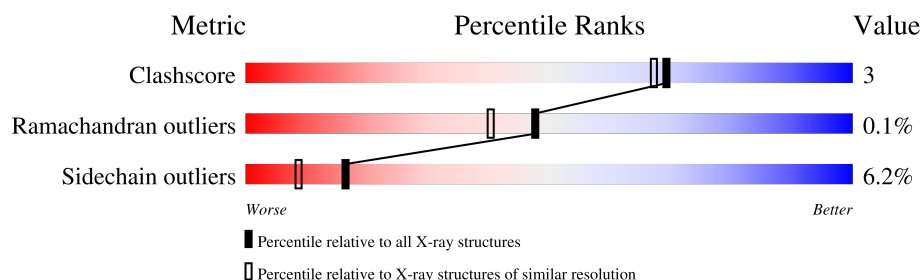
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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	190562	8410 (1.90-1.90)
Ramachandran outliers	187476	8333 (1.90-1.90)
Sidechain outliers	187428	8333 (1.90-1.90)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	390	 84% 13% •
1	B	390	 85% 13% ••

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 6656 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called NEURAMINIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	390	Total	C	N	O	S	0	0	0
			3036	1899	533	575	29			
1	B	390	Total	C	N	O	S	0	0	0
			3036	1899	533	575	29			

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

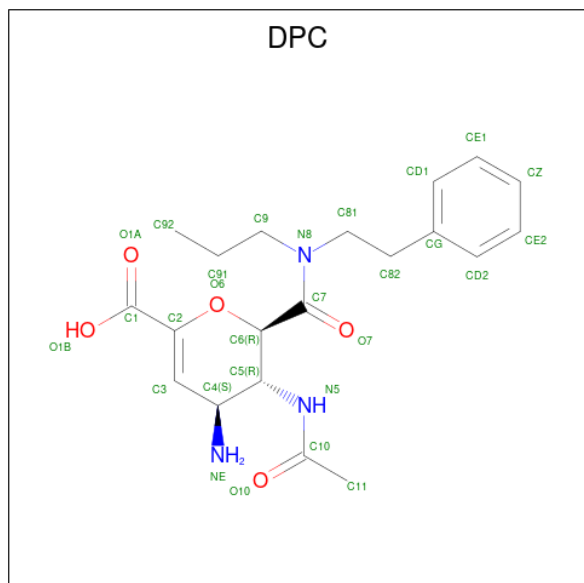


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

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

- Molecule 4 is 5-ACETYLAMINO-4-AMINO-6-(PHENETHYL-PROPYL-CARBAM OYL)-5,6-DIHYDRO-4H-PYRAN-2-CARBOXYLIC ACID (CCD ID: DPC) (formula: $C_{20}H_{27}N_3O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O 28 20 3 5	0	0
4	B	1	Total C N O 28 20 3 5	0	0

- Molecule 5 is water.

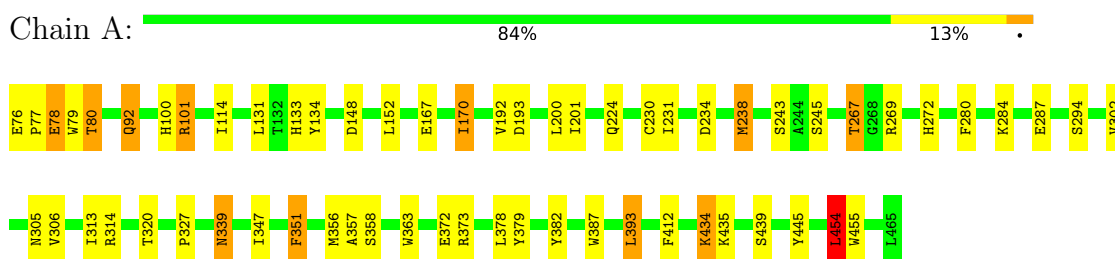
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	258	Total O 258 258	0	0
5	B	239	Total O 239 239	0	0

3 Residue-property plots [i](#)

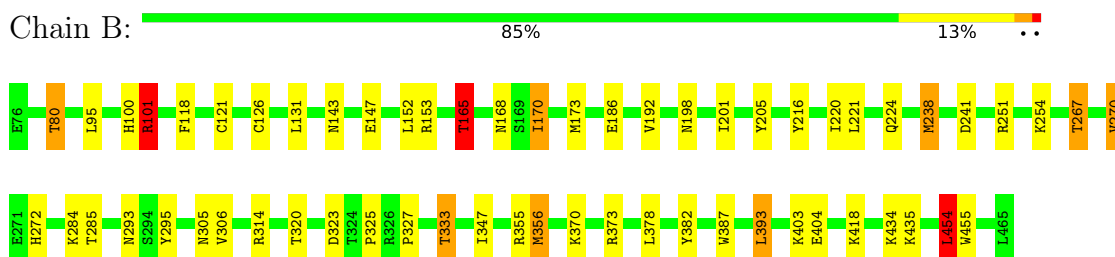
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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



• Molecule 1: NEURAMINIDASE



4 Data and refinement statistics

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	88.30Å 88.30Å 221.10Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	34.00 – 1.90	Depositor
% Data completeness (in resolution range)	(Not available) (34.00-1.90)	Depositor
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.8	Depositor
R, R_{free}	0.201 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	6656	wwPDB-VP
Average B, all atoms (Å ²)	13.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, CA, DPC

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	0.88	0/3109	1.53	23/4197 (0.5%)
1	B	0.88	0/3109	1.60	40/4197 (1.0%)
All	All	0.88	0/6218	1.56	63/8394 (0.8%)

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	1

There are no bond length outliers.

All (63) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	270	VAL	N-CA-CB	-14.01	93.65	112.28
1	B	165	THR	N-CA-CB	-11.73	93.22	110.70
1	B	153	ARG	NE-CZ-NH2	-10.99	109.31	119.20
1	A	238	MET	CG-SD-CE	10.63	124.29	100.90
1	B	101	ARG	NE-CZ-NH2	-10.19	110.03	119.20
1	B	170	ILE	CB-CA-C	-9.97	94.91	110.95
1	B	224	GLN	N-CA-C	9.79	121.95	111.28
1	A	224	GLN	N-CA-C	9.69	121.44	111.07
1	A	101	ARG	NE-CZ-NH2	-9.39	110.75	119.20
1	B	355	ARG	NE-CZ-NH2	-9.15	110.97	119.20
1	B	238	MET	CG-SD-CE	8.59	119.80	100.90
1	B	267	THR	N-CA-CB	-8.39	97.60	111.20
1	A	267	THR	N-CA-CB	-8.33	97.05	111.55
1	B	434	LYS	CA-CB-CG	8.30	130.70	114.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	270	VAL	CB-CA-C	8.22	122.30	111.85
1	B	355	ARG	NE-CZ-NH1	7.88	129.38	121.50
1	B	101	ARG	NE-CZ-NH1	7.88	129.38	121.50
1	B	153	ARG	NE-CZ-NH1	7.88	129.38	121.50
1	B	333	THR	N-CA-CB	-7.47	99.07	110.42
1	B	165	THR	CB-CA-C	7.23	123.22	110.36
1	B	295	TYR	N-CA-C	7.17	122.70	113.88
1	A	92	GLN	OE1-CD-NE2	-7.07	115.53	122.60
1	A	170	ILE	CB-CA-C	-7.07	100.07	110.81
1	A	243	SER	N-CA-C	6.99	120.44	109.96
1	A	101	ARG	NE-CZ-NH1	6.91	128.41	121.50
1	B	224	GLN	CG-CD-NE2	6.89	126.73	116.40
1	B	147	GLU	CB-CG-CD	-6.81	101.02	112.60
1	A	351	PHE	CA-CB-CG	6.38	120.18	113.80
1	B	101	ARG	CB-CG-CD	-6.36	96.67	111.30
1	B	100	HIS	CA-CB-CG	-6.21	107.59	113.80
1	A	80	THR	CA-CB-OG1	-6.20	100.30	109.60
1	B	434	LYS	N-CA-CB	-6.20	99.79	110.32
1	A	148	ASP	N-CA-C	5.91	117.53	111.14
1	A	193	ASP	CA-CB-CG	5.91	118.50	112.60
1	B	147	GLU	CA-CB-CG	5.90	125.91	114.10
1	B	173	MET	CG-SD-CE	-5.86	88.01	100.90
1	A	454	LEU	N-CA-CB	-5.83	102.84	110.59
1	B	153	ARG	CD-NE-CZ	5.74	132.43	124.40
1	B	224	GLN	OE1-CD-NE2	-5.72	116.88	122.60
1	A	412	PHE	CA-CB-CG	5.68	119.48	113.80
1	B	454	LEU	N-CA-C	5.68	120.34	113.41
1	B	143	ASN	OD1-CG-ND2	-5.67	116.94	122.60
1	B	285	THR	N-CA-C	5.66	117.62	108.34
1	A	358	SER	N-CA-CB	-5.54	102.39	110.47
1	A	100	HIS	CA-CB-CG	-5.53	108.27	113.80
1	A	435	LYS	CB-CG-CD	5.53	124.01	111.30
1	B	241	ASP	CA-CB-CG	5.44	118.04	112.60
1	A	267	THR	CB-CA-C	5.43	120.91	109.79
1	B	170	ILE	N-CA-CB	5.32	124.38	111.81
1	B	323	ASP	N-CA-C	5.28	117.34	110.53
1	B	118	PHE	CA-CB-CG	5.22	119.02	113.80
1	B	418	LYS	CA-CB-CG	5.21	124.52	114.10
1	A	357	ALA	O-C-N	5.19	127.62	122.12
1	B	356	MET	CG-SD-CE	-5.18	89.51	100.90
1	B	254	LYS	N-CA-C	-5.16	100.10	108.52
1	B	80	THR	CA-CB-OG1	-5.16	101.86	109.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	92	GLN	CG-CD-NE2	5.12	124.08	116.40
1	A	80	THR	N-CA-CB	-5.11	102.08	110.41
1	B	305	ASN	OD1-CG-ND2	-5.05	117.55	122.60
1	B	404	GLU	CA-C-N	5.04	125.28	119.83
1	B	404	GLU	C-N-CA	5.04	125.28	119.83
1	A	339	ASN	CB-CG-ND2	5.04	123.96	116.40
1	A	339	ASN	OD1-CG-ND2	-5.02	117.58	122.60

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	445	TYR	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	3036	0	2923	27	0
1	B	3036	0	2923	18	0
2	A	14	0	13	0	0
2	B	14	0	13	0	0
3	A	1	0	0	0	0
3	B	2	0	0	0	0
4	A	28	0	26	0	0
4	B	28	0	26	0	0
5	A	258	0	0	2	0
5	B	239	0	0	2	0
All	All	6656	0	5924	42	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 3.

All (42) 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:B:192:VAL:HG22	1:B:201:ILE:HD13	1.58	0.85
1:A:192:VAL:HG22	1:A:201:ILE:HD13	1.59	0.82
1:B:165:THR:HG22	1:B:168:ASN:HB2	1.66	0.77
1:B:165:THR:HG22	1:B:168:ASN:H	1.65	0.61
1:A:170:ILE:HD12	5:B:662:HOH:O	2.02	0.58
1:A:356:MET:HE1	1:A:382:TYR:CE1	2.40	0.56
1:B:201:ILE:HG12	1:B:221:LEU:HD21	1.90	0.54
1:A:320:THR:HB	1:A:393:LEU:HD22	1.90	0.54
1:A:434:LYS:HE3	1:A:434:LYS:H	1.73	0.53
1:A:134:TYR:O	1:B:101:ARG:HD3	2.09	0.53
1:A:272:HIS:HB2	5:A:676:HOH:O	2.08	0.52
1:A:356:MET:HE1	1:A:382:TYR:HE1	1.75	0.51
1:B:216:TYR:CZ	1:B:251:ARG:HD3	2.47	0.51
1:A:284:LYS:HE3	1:A:305:ASN:HD21	1.77	0.49
1:B:192:VAL:CG2	1:B:201:ILE:HD13	2.37	0.48
1:B:314:ARG:HB2	1:B:387:TRP:CD1	2.48	0.48
1:A:314:ARG:HB2	1:A:387:TRP:CD1	2.49	0.48
1:A:200:LEU:HB2	1:B:454:LEU:HD23	1.96	0.47
1:A:269:ARG:HH21	1:A:339:ASN:HD21	1.63	0.47
1:A:351:PHE:HA	1:A:363:TRP:O	2.14	0.46
1:A:379:TYR:HB3	1:A:393:LEU:HB3	1.98	0.46
1:A:302:VAL:HG22	1:A:313:ILE:HG12	1.99	0.45
1:B:356:MET:HE1	1:B:382:TYR:CE1	2.52	0.45
1:B:320:THR:HB	1:B:393:LEU:HD22	1.98	0.45
1:A:92:GLN:HE22	1:A:454:LEU:H	1.63	0.45
1:B:347:ILE:HD12	1:B:373:ARG:HG2	1.98	0.45
1:A:167:GLU:OE2	1:B:165:THR:HG21	2.17	0.45
1:A:347:ILE:HD12	1:A:373:ARG:HG2	1.99	0.44
1:B:165:THR:CG2	1:B:168:ASN:H	2.29	0.44
1:A:133:HIS:HE1	5:A:703:HOH:O	2.01	0.43
1:B:325:PRO:HA	1:B:370:LYS:O	2.19	0.42
1:A:231:ILE:HB	1:A:280:PHE:CZ	2.53	0.42
1:A:287:GLU:HA	1:A:302:VAL:O	2.19	0.42
1:A:78:GLU:HG2	1:A:79:TRP:O	2.19	0.42
1:A:114:ILE:O	1:A:439:SER:HA	2.20	0.42
1:A:170:ILE:HG23	5:B:662:HOH:O	2.20	0.41
1:B:121:CYS:HA	1:B:126:CYS:HA	2.01	0.41
1:B:186:GLU:HB3	1:B:205:TYR:CZ	2.54	0.41
1:B:272:HIS:CD2	1:B:293:ASN:H	2.39	0.41
1:A:92:GLN:NE2	1:A:454:LEU:H	2.18	0.40
1:A:434:LYS:H	1:A:434:LYS:CE	2.34	0.40
1:A:230:CYS:HA	1:A:234:ASP:O	2.22	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 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%)	374 (96%)	14 (4%)	0	100	100
1	B	388/390 (100%)	376 (97%)	11 (3%)	1 (0%)	36	29
All	All	776/780 (100%)	750 (97%)	25 (3%)	1 (0%)	48	40

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	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%)	305 (94%)	19 (6%)	18	10
1	B	324/324 (100%)	303 (94%)	21 (6%)	15	8
All	All	648/648 (100%)	608 (94%)	40 (6%)	16	9

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	76	GLU
1	A	77	PRO

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Mol	Chain	Res	Type
1	A	78	GLU
1	A	80	THR
1	A	101	ARG
1	A	131	LEU
1	A	152	LEU
1	A	238	MET
1	A	245	SER
1	A	267	THR
1	A	294	SER
1	A	306	VAL
1	A	327	PRO
1	A	372	GLU
1	A	378	LEU
1	A	393	LEU
1	A	434	LYS
1	A	454	LEU
1	A	455	TRP
1	B	80	THR
1	B	95	LEU
1	B	101	ARG
1	B	131	LEU
1	B	152	LEU
1	B	165	THR
1	B	170	ILE
1	B	198	ASN
1	B	238	MET
1	B	267	THR
1	B	270	VAL
1	B	284	LYS
1	B	306	VAL
1	B	327	PRO
1	B	333	THR
1	B	378	LEU
1	B	393	LEU
1	B	403	LYS
1	B	435	LYS
1	B	454	LEU
1	B	455	TRP

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	92	GLN
1	A	133	HIS
1	A	168	ASN
1	A	218	ASN
1	A	229	ASN
1	A	339	ASN
1	B	108	ASN
1	B	133	HIS
1	B	143	ASN
1	B	168	ASN
1	B	218	ASN
1	B	229	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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	1	1	14,14,15	0.97	0	17,19,21	1.77	4 (23%)
2	NAG	B	1	1	14,14,15	0.97	0	17,19,21	1.03	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	DPC	A	466	-	29,29,29	2.86	3 (10%)	30,39,39	1.44	4 (13%)
4	DPC	B	466	-	29,29,29	1.20	2 (6%)	30,39,39	1.27	3 (10%)

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	1	1	-	2/6/23/26	0/1/1/1
2	NAG	B	1	1	-	0/6/23/26	0/1/1/1
4	DPC	A	466	-	-	1/23/40/40	0/2/2/2
4	DPC	B	466	-	-	0/23/40/40	0/2/2/2

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	466	DPC	O7-C7	-14.01	0.97	1.22
4	B	466	DPC	O6-C6	-3.79	1.40	1.46
4	A	466	DPC	O6-C6	-3.59	1.40	1.46
4	A	466	DPC	O1B-C1	-2.85	1.22	1.30
4	B	466	DPC	O1B-C1	-2.75	1.23	1.30

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	466	DPC	O7-C7-N8	4.28	126.72	121.61
2	A	1	NAG	C2-N2-C7	4.09	128.38	122.90
4	B	466	DPC	O1B-C1-C2	3.86	122.81	114.06
4	A	466	DPC	O1B-C1-C2	3.11	121.12	114.06
2	A	1	NAG	C1-C2-N2	-2.99	105.72	110.43
4	A	466	DPC	O7-C7-C6	-2.99	112.58	119.74
2	A	1	NAG	O3-C3-C2	2.64	114.88	109.40
2	A	1	NAG	C1-O5-C5	2.36	115.35	112.19
4	B	466	DPC	O6-C2-C3	-2.29	122.06	124.62
4	A	466	DPC	O6-C2-C1	2.09	116.19	112.02
4	B	466	DPC	O6-C2-C1	2.02	116.05	112.02
2	B	1	NAG	C1-O5-C5	2.00	114.87	112.19

There are no chirality outliers.

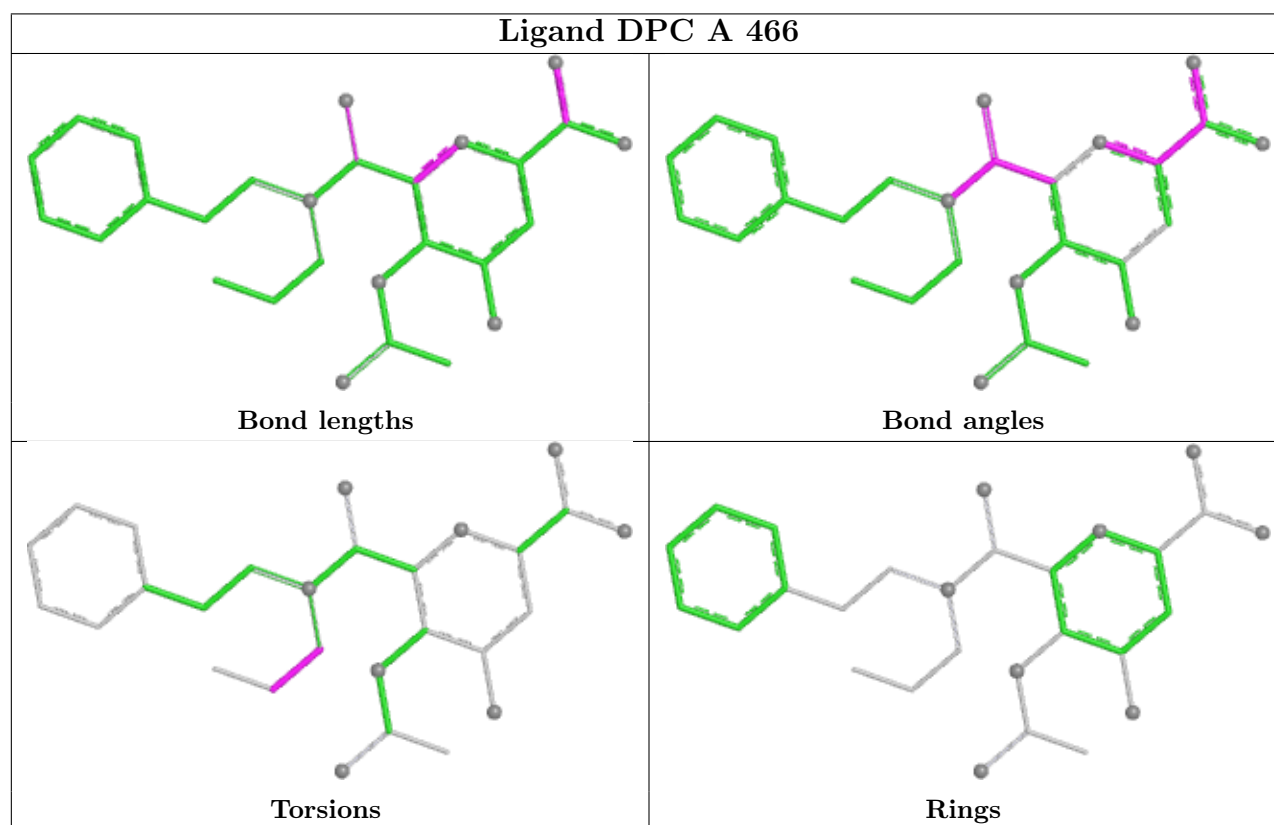
All (3) torsion outliers are listed below:

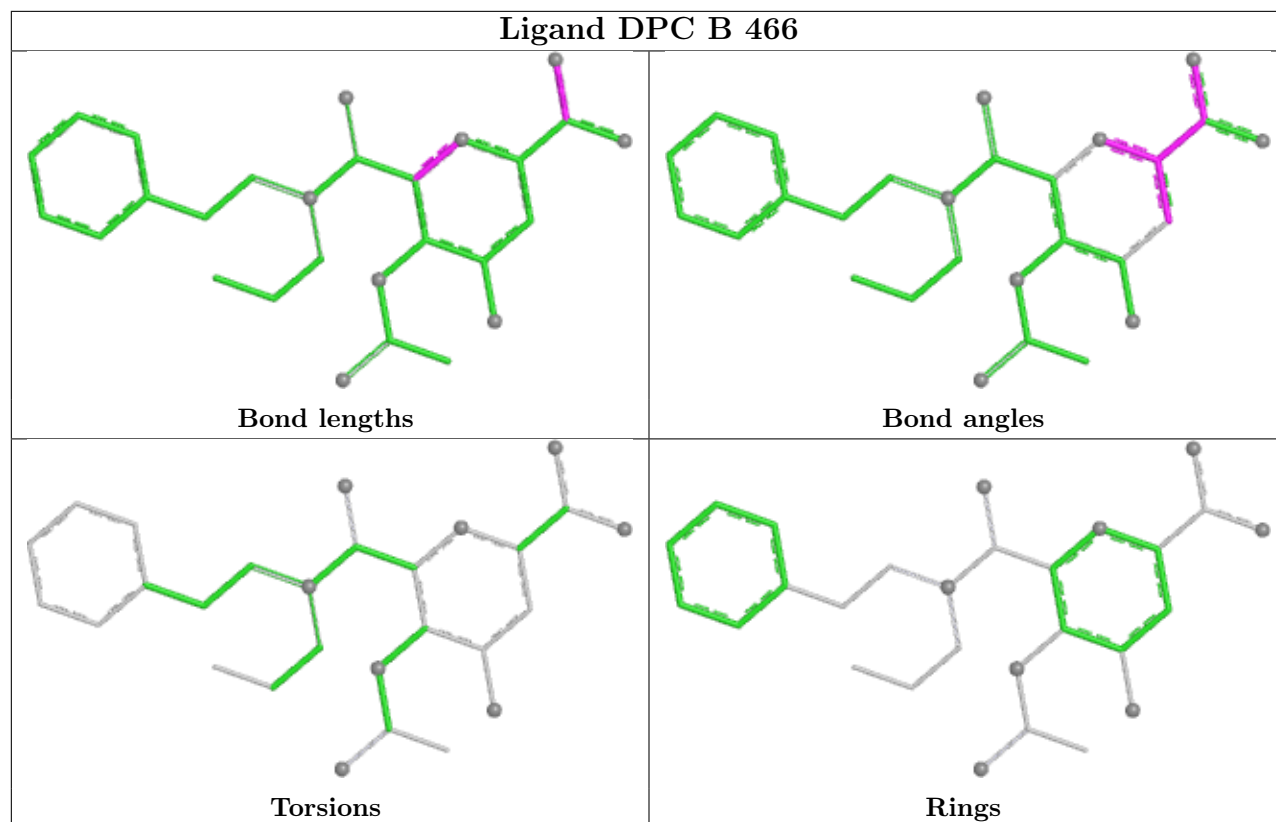
Mol	Chain	Res	Type	Atoms
2	A	1	NAG	C8-C7-N2-C2
2	A	1	NAG	O7-C7-N2-C2
4	A	466	DPC	N8-C9-C91-C92

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.

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.