



Full wwPDB X-ray Structure Validation Report ⓘ

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PDB ID : 7QG1 / pdb_00007qg1
Title : IRAK4 in complex with inhibitor
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Deposited on : 2021-12-07
Resolution : 2.07 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)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

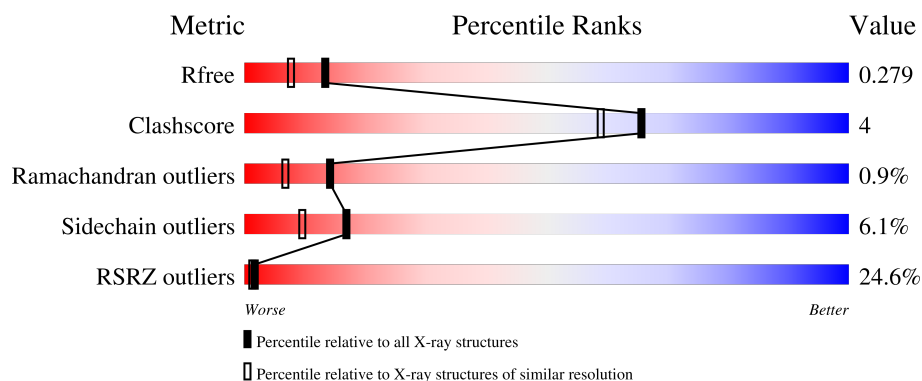
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.07 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3774 (2.08-2.04)
Clashscore	190562	3883 (2.08-2.04)
Ramachandran outliers	187476	3860 (2.08-2.04)
Sidechain outliers	187428	3860 (2.08-2.04)
RSRZ outliers	180081	3775 (2.08-2.04)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	322	21% 68% 13% • 17%
1	B	322	20% 71% 15% • 12%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4657 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 Interleukin-1 receptor-associated kinase 4.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	266	Total	C	N	O	P	S	0	0	0
			2113	1332	356	409	2	14			
1	B	282	Total	C	N	O	P	S	0	0	0
			2229	1398	376	439	2	14			

There are 30 discrepancies between the modelled and reference sequences:

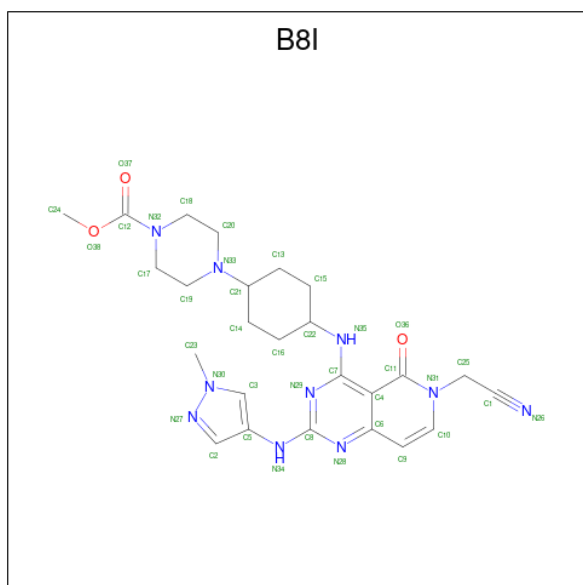
Chain	Residue	Modelled	Actual	Comment	Reference
A	139	MET	-	initiating methionine	UNP Q9NWZ3
A	140	HIS	-	expression tag	UNP Q9NWZ3
A	141	HIS	-	expression tag	UNP Q9NWZ3
A	142	HIS	-	expression tag	UNP Q9NWZ3
A	143	HIS	-	expression tag	UNP Q9NWZ3
A	144	HIS	-	expression tag	UNP Q9NWZ3
A	145	HIS	-	expression tag	UNP Q9NWZ3
A	146	HIS	-	expression tag	UNP Q9NWZ3
A	147	GLU	-	expression tag	UNP Q9NWZ3
A	148	ASN	-	expression tag	UNP Q9NWZ3
A	149	LEU	-	expression tag	UNP Q9NWZ3
A	150	TYR	-	expression tag	UNP Q9NWZ3
A	151	PHE	-	expression tag	UNP Q9NWZ3
A	152	GLN	-	expression tag	UNP Q9NWZ3
A	153	GLY	-	expression tag	UNP Q9NWZ3
B	139	MET	-	initiating methionine	UNP Q9NWZ3
B	140	HIS	-	expression tag	UNP Q9NWZ3
B	141	HIS	-	expression tag	UNP Q9NWZ3
B	142	HIS	-	expression tag	UNP Q9NWZ3
B	143	HIS	-	expression tag	UNP Q9NWZ3
B	144	HIS	-	expression tag	UNP Q9NWZ3
B	145	HIS	-	expression tag	UNP Q9NWZ3
B	146	HIS	-	expression tag	UNP Q9NWZ3
B	147	GLU	-	expression tag	UNP Q9NWZ3
B	148	ASN	-	expression tag	UNP Q9NWZ3

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Chain	Residue	Modelled	Actual	Comment	Reference
B	149	LEU	-	expression tag	UNP Q9NWZ3
B	150	TYR	-	expression tag	UNP Q9NWZ3
B	151	PHE	-	expression tag	UNP Q9NWZ3
B	152	GLN	-	expression tag	UNP Q9NWZ3
B	153	GLY	-	expression tag	UNP Q9NWZ3

- Molecule 2 is methyl 4-[4-[[6-(cyanomethyl)-2-[(1-methylpyrazol-4-yl)amino]-5-oxidanylidene-pyrido[4,3-d]pyrimidin-4-yl]amino]cyclohexyl]piperazine-1-carboxylate (CCD ID: B8I) (formula: C₂₅H₃₂N₁₀O₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			38	25	10	3		
2	B	1	Total	C	N	O	0	0
			38	25	10	3		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	115	Total	O	0	0
			115	115		
3	B	124	Total	O	0	0
			124	124		

4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	87.74Å 109.42Å 142.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	86.75 – 2.07 86.75 – 2.07	Depositor EDS
% Data completeness (in resolution range)	99.5 (86.75-2.07) 99.5 (86.75-2.07)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.62 (at 2.07Å)	Xtrriage
Refinement program	BUSTER 2.11.6	Depositor
R, R_{free}	0.247 , 0.285 0.243 , 0.279	Depositor DCC
R_{free} test set	2118 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	47.2	Xtrriage
Anisotropy	0.534	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 83.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	4657	wwPDB-VP
Average B, all atoms (Å ²)	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 20.42 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.7248e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: TPO, SEP, B8I

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	0.84	0/2126	1.31	4/2860 (0.1%)
1	B	0.92	2/2244 (0.1%)	1.32	8/3021 (0.3%)
All	All	0.88	2/4370 (0.0%)	1.32	12/5881 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	265	MET	SD-CE	-9.50	1.55	1.79
1	B	262	TYR	CA-C	-6.28	1.44	1.52

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	168	PHE	CA-CB-CG	6.45	120.25	113.80
1	B	181	ASP	CA-CB-CG	6.10	118.70	112.60
1	B	193	GLY	N-CA-C	6.05	118.12	110.38
1	A	181	ASP	CA-CB-CG	6.02	118.62	112.60
1	B	263	VAL	N-CA-C	-5.64	101.44	108.89
1	A	230	PHE	CA-CB-CG	5.58	119.38	113.80
1	B	450	VAL	CA-C-N	5.23	127.29	120.28
1	B	450	VAL	C-N-CA	5.23	127.29	120.28
1	B	369	ASP	CA-CB-CG	5.08	117.69	112.60
1	A	243	GLU	CB-CG-CD	5.08	121.23	112.60
1	A	446	ASP	CA-CB-CG	5.02	117.62	112.60
1	B	192	MET	N-CA-C	-5.00	106.87	113.12

There are no chirality outliers.

There are no planarity outliers.

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	2113	0	2084	13	0
1	B	2229	0	2191	21	0
2	A	38	0	0	0	0
2	B	38	0	0	1	0
3	A	115	0	0	0	0
3	B	124	0	0	1	0
All	All	4657	0	4275	33	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 4.

All (33) 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:284:SER:H	1:A:287:MET:HE3	1.23	1.01
1:A:391:ARG:HA	1:B:390:HIS:HB3	1.60	0.82
1:A:390:HIS:HB3	1:B:391:ARG:HA	1.71	0.73
1:B:265:MET:HE1	1:B:326:LYS:HG3	1.74	0.70
1:A:237:MET:HE3	1:A:262:TYR:HE2	1.60	0.67
1:B:265:MET:CE	1:B:326:LYS:HG3	2.25	0.66
1:B:205:VAL:HG23	3:B:650:HOH:O	1.96	0.66
1:B:246:VAL:HG11	1:B:318:LEU:HD12	1.80	0.62
1:A:246:VAL:HG11	1:A:318:LEU:HD12	1.83	0.59
1:B:302:LEU:HD11	1:B:330:PHE:HE1	1.75	0.52
1:B:227:LYS:HG2	1:B:258:LEU:HD11	1.93	0.51
1:B:252:SER:HB3	1:B:259:CYS:HB2	1.93	0.51
1:B:173:LEU:HA	1:B:176:VAL:HG22	1.94	0.49
1:A:266:PRO:HD2	1:A:320:ASP:HA	1.94	0.49
1:A:205:VAL:O	1:A:206:ASN:HB2	2.14	0.47
1:B:169:SER:H	1:B:172:GLU:CD	2.23	0.46
1:B:176:VAL:HG11	1:B:205:VAL:HG22	1.97	0.46
1:B:265:MET:HE1	1:B:320:ASP:HB3	1.99	0.45
1:B:288:ARG:HB3	1:B:380:ILE:HG23	1.98	0.45
1:B:172:GLU:O	1:B:176:VAL:HG13	2.17	0.45
2:B:501:B8I:N29	2:B:501:B8I:C2	2.79	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:215:LEU:HD22	1:A:230:PHE:HB3	1.98	0.44
1:B:168:PHE:HE1	1:B:250:GLY:HA3	1.82	0.44
1:A:300:ASN:HA	1:A:447:ILE:HG21	2.00	0.44
1:B:215:LEU:HD23	1:B:226:LEU:HG	2.01	0.43
1:A:288:ARG:HB3	1:A:380:ILE:HG23	2.00	0.43
1:B:300:ASN:HA	1:B:447:ILE:HG21	2.01	0.42
1:A:381:ILE:HG21	1:A:410:ILE:HD11	2.00	0.42
1:B:213:LYS:O	1:B:259:CYS:HA	2.19	0.42
1:B:381:ILE:HG21	1:B:410:ILE:HD11	2.01	0.42
1:A:183:ARG:O	1:A:189:GLY:HA3	2.19	0.42
1:B:170:PHE:HB2	1:B:257:ASP:HB3	2.02	0.42
1:A:415:ASP:HB3	1:A:418:MET:HE2	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	254/322 (79%)	244 (96%)	7 (3%)	3 (1%)	10	4
1	B	274/322 (85%)	260 (95%)	12 (4%)	2 (1%)	18	10
All	All	528/644 (82%)	504 (96%)	19 (4%)	5 (1%)	14	7

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	206	ASN
1	A	196	GLY
1	A	208	THR
1	B	196	GLY
1	B	181	ASP

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 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	231/280 (82%)	215 (93%)	16 (7%)	14	7
1	B	244/280 (87%)	231 (95%)	13 (5%)	20	13
All	All	475/560 (85%)	446 (94%)	29 (6%)	17	9

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	176	VAL
1	A	185	ILE
1	A	199	VAL
1	A	200	VAL
1	A	207	ASN
1	A	229	GLN
1	A	231	ASP
1	A	233	GLU
1	A	235	LYS
1	A	239	LYS
1	A	243	GLU
1	A	329	ASP
1	A	344	MET
1	A	408	LYS
1	A	419	ASN
1	A	455	GLN
1	B	192	MET
1	B	206	ASN
1	B	209	THR
1	B	225	GLU
1	B	243	GLU
1	B	256	ASP
1	B	329	ASP
1	B	336	SER
1	B	344	MET
1	B	408	LYS
1	B	419	ASN

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Mol	Chain	Res	Type
1	B	440	LYS
1	B	455	GLN

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	419	ASN
1	A	452	GLN
1	B	175	ASN
1	B	206	ASN
1	B	229	GLN
1	B	306	HIS
1	B	419	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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	$\# Z > 2$
1	TPO	B	345	1	8,10,11	1.32	1 (12%)	10,14,16	1.30	1 (10%)
1	SEP	A	346	1	8,9,10	0.93	0	7,12,14	1.18	1 (14%)
1	TPO	A	345	1	8,10,11	1.33	1 (12%)	10,14,16	1.35	1 (10%)
1	SEP	B	346	1	8,9,10	0.80	0	7,12,14	1.39	1 (14%)

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
1	TPO	B	345	1	-	4/9/11/13	-
1	SEP	A	346	1	-	0/6/8/10	-
1	TPO	A	345	1	-	4/9/11/13	-
1	SEP	B	346	1	-	0/6/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	345	TPO	CB-CA	2.46	1.59	1.53
1	A	345	TPO	CB-CA	2.28	1.58	1.53

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	345	TPO	O2P-P-OG1	2.83	116.89	105.85
1	B	345	TPO	O2P-P-OG1	2.74	116.51	105.85
1	B	346	SEP	OG-CB-CA	2.42	110.50	108.14
1	A	346	SEP	OG-CB-CA	2.12	110.20	108.14

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	345	TPO	N-CA-CB-OG1
1	A	345	TPO	O-C-CA-CB
1	B	345	TPO	N-CA-CB-OG1
1	B	345	TPO	O-C-CA-CB
1	A	345	TPO	CB-OG1-P-O1P
1	B	345	TPO	CB-OG1-P-O1P
1	A	345	TPO	CB-OG1-P-O2P
1	B	345	TPO	CB-OG1-P-O2P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

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
2	B8I	A	501	-	40,42,42	1.22	3 (7%)	48,59,59	1.66	9 (18%)
2	B8I	B	501	-	40,42,42	1.26	3 (7%)	48,59,59	1.82	12 (25%)

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	B8I	A	501	-	-	10/20/41/41	0/5/5/5
2	B8I	B	501	-	-	5/20/41/41	0/5/5/5

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	B8I	C25-N31	-4.66	1.43	1.47
2	A	501	B8I	C7-N35	4.04	1.41	1.35
2	B	501	B8I	C7-N35	3.57	1.40	1.35
2	A	501	B8I	C25-N31	-3.37	1.45	1.47
2	A	501	B8I	C3-N30	2.53	1.37	1.34
2	B	501	B8I	C12-N32	2.18	1.39	1.35

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501	B8I	C7-N35-C22	-4.82	116.04	124.18
2	B	501	B8I	C23-N30-C3	-4.45	123.47	127.94
2	A	501	B8I	C7-N35-C22	-4.29	116.94	124.18
2	A	501	B8I	C3-N30-N27	4.12	114.43	112.08
2	B	501	B8I	C24-O38-C12	-3.76	111.06	115.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501	B8I	C15-C22-N35	-3.45	105.22	110.77
2	A	501	B8I	C23-N30-C3	-3.34	124.58	127.94
2	B	501	B8I	C23-N30-N27	3.28	122.66	120.03
2	A	501	B8I	C18-N32-C17	3.26	119.33	112.68
2	A	501	B8I	O36-C11-N31	3.22	124.61	120.77
2	B	501	B8I	O36-C11-N31	3.13	124.51	120.77
2	B	501	B8I	C3-N30-N27	3.10	113.85	112.08
2	A	501	B8I	C2-N27-N30	-3.10	102.70	104.41
2	A	501	B8I	C24-O38-C12	-2.93	112.00	115.29
2	B	501	B8I	C18-N32-C17	2.77	118.32	112.68
2	B	501	B8I	C14-C16-C22	-2.56	108.69	111.49
2	B	501	B8I	C25-N31-C10	-2.38	116.35	119.71
2	A	501	B8I	C25-N31-C10	-2.35	116.39	119.71
2	B	501	B8I	O36-C11-C4	-2.16	119.70	124.19
2	A	501	B8I	O36-C11-C4	-2.06	119.91	124.19
2	B	501	B8I	C2-C5-N34	2.03	131.36	125.55

There are no chirality outliers.

All (15) torsion outliers are listed below:

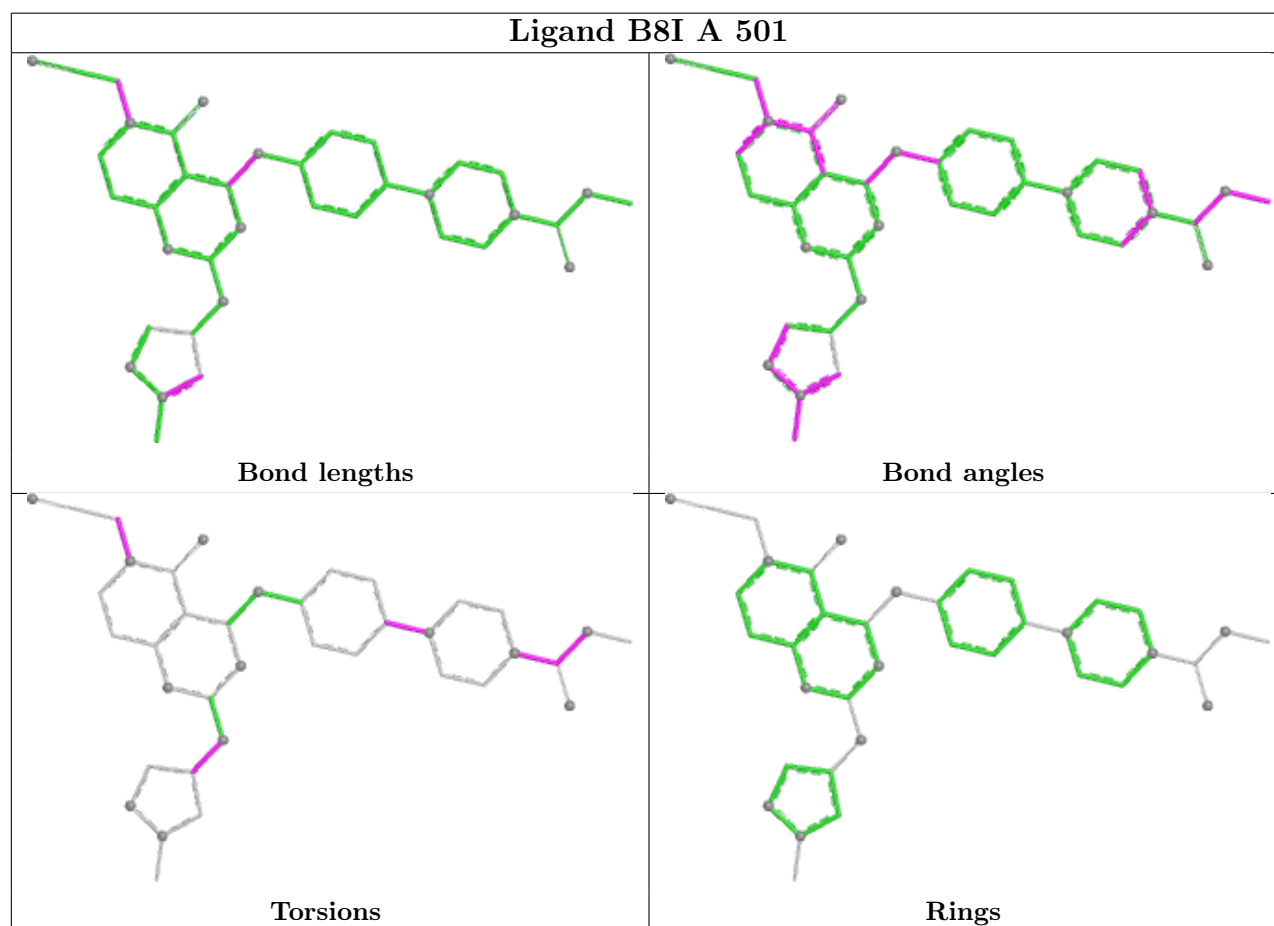
Mol	Chain	Res	Type	Atoms
2	A	501	B8I	O37-C12-N32-C17
2	A	501	B8I	O37-C12-N32-C18
2	A	501	B8I	O38-C12-N32-C17
2	A	501	B8I	O38-C12-N32-C18
2	A	501	B8I	N32-C12-O38-C24
2	A	501	B8I	O37-C12-O38-C24
2	A	501	B8I	C3-C5-N34-C8
2	A	501	B8I	C1-C25-N31-C10
2	B	501	B8I	N32-C12-O38-C24
2	B	501	B8I	O37-C12-O38-C24
2	B	501	B8I	C3-C5-N34-C8
2	B	501	B8I	C1-C25-N31-C10
2	A	501	B8I	C1-C25-N31-C11
2	B	501	B8I	C1-C25-N31-C11
2	A	501	B8I	C14-C21-N33-C20

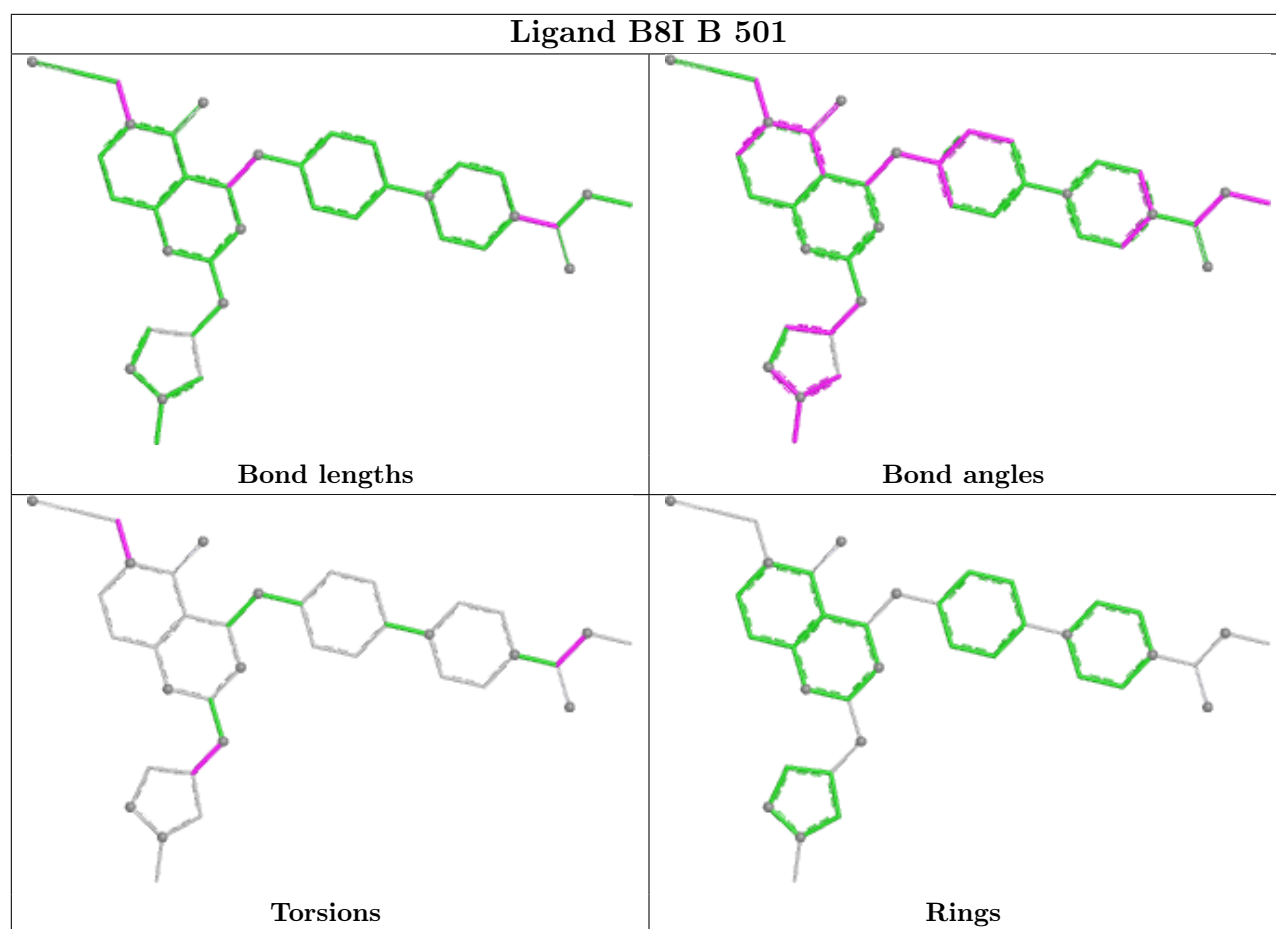
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	B8I	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 all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	264/322 (81%)	1.29	68 (25%)  	34, 59, 160, 170	0
1	B	280/322 (86%)	1.25	66 (23%)  	33, 59, 97, 129	0
All	All	544/644 (84%)	1.27	134 (24%)  	33, 59, 140, 170	0

All (134) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	168	PHE	7.6
1	A	173	LEU	6.5
1	B	170	PHE	5.6
1	A	185	ILE	5.6
1	A	168	PHE	5.6
1	B	257	ASP	5.6
1	A	180	PHE	5.4
1	A	170	PHE	5.4
1	B	259	CYS	5.3
1	A	192	MET	5.0
1	A	250	GLY	5.0
1	B	226	LEU	5.0
1	A	236	VAL	4.8
1	B	258	LEU	4.7
1	A	248	LEU	4.7
1	B	173	LEU	4.7
1	B	250	GLY	4.6
1	A	212	VAL	4.6
1	A	171	TYR	4.6
1	A	176	VAL	4.6
1	A	260	LEU	4.6
1	A	165	PHE	4.6
1	B	230	PHE	4.5
1	B	188	GLY	4.5

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Mol	Chain	Res	Type	RSRZ
1	B	251	PHE	4.4
1	A	174	LYS	4.3
1	A	252	SER	4.1
1	B	192	MET	4.1
1	A	251	PHE	4.0
1	B	176	VAL	4.0
1	A	193	GLY	3.9
1	A	230	PHE	3.8
1	A	175	ASN	3.8
1	A	205	VAL	3.7
1	A	177	THR	3.7
1	A	199	VAL	3.7
1	A	179	ASN	3.7
1	B	167	SER	3.6
1	B	234	ILE	3.6
1	B	201	TYR	3.6
1	B	252	SER	3.5
1	A	201	TYR	3.5
1	A	190	ASN	3.5
1	B	180	PHE	3.5
1	A	211	ALA	3.5
1	A	189	GLY	3.5
1	B	189	GLY	3.5
1	A	167	SER	3.5
1	B	260	LEU	3.4
1	A	172	GLU	3.4
1	A	259	CYS	3.4
1	A	200	VAL	3.4
1	A	238	ALA	3.4
1	B	205	VAL	3.3
1	B	216	ALA	3.3
1	A	169	SER	3.3
1	B	203	GLY	3.3
1	B	200	VAL	3.3
1	A	261	VAL	3.3
1	B	344	MET	3.2
1	A	262	TYR	3.2
1	B	171	TYR	3.2
1	A	343	VAL	3.1
1	B	197	PHE	3.1
1	A	249	LEU	3.1
1	B	177	THR	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	178	ASN	3.0
1	A	234	ILE	3.0
1	B	179	ASN	3.0
1	A	439	GLU	2.9
1	A	203	GLY	2.9
1	B	212	VAL	2.9
1	A	166	HIS	2.9
1	A	332	LEU	2.9
1	B	215	LEU	2.9
1	A	204	TYR	2.9
1	A	183	ARG	2.8
1	B	195	GLY	2.8
1	B	211	ALA	2.8
1	B	335	ALA	2.8
1	A	215	LEU	2.8
1	B	223	THR	2.8
1	B	190	ASN	2.8
1	B	169	SER	2.8
1	B	165	PHE	2.7
1	B	458	THR	2.7
1	A	330	PHE	2.7
1	A	210	VAL	2.6
1	B	174	LYS	2.6
1	A	207	ASN	2.6
1	A	209	THR	2.6
1	B	175	ASN	2.6
1	A	246	VAL	2.6
1	B	199	VAL	2.6
1	B	229	GLN	2.6
1	B	255	GLY	2.6
1	A	240	CYS	2.5
1	A	206	ASN	2.5
1	B	183	ARG	2.5
1	B	364	ILE	2.4
1	A	344	MET	2.4
1	B	420	ASP	2.4
1	B	214	LYS	2.4
1	A	233	GLU	2.4
1	B	361	ARG	2.4
1	A	229	GLN	2.3
1	B	236	VAL	2.3
1	A	350	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	254	ASP	2.3
1	B	164	ARG	2.3
1	B	348	ILE	2.3
1	B	172	GLU	2.3
1	B	204	TYR	2.3
1	B	256	ASP	2.3
1	B	263	VAL	2.3
1	B	330	PHE	2.2
1	A	410	ILE	2.2
1	A	208	THR	2.2
1	B	393	PRO	2.2
1	A	178	ASN	2.2
1	A	191	LYS	2.2
1	A	333	ALA	2.2
1	A	202	LYS	2.2
1	A	195	GLY	2.2
1	B	187	VAL	2.1
1	A	213	LYS	2.1
1	B	249	LEU	2.1
1	B	308	ILE	2.1
1	A	335	ALA	2.1
1	B	360	LEU	2.0
1	B	227	LYS	2.0
1	B	185	ILE	2.0
1	A	197	PHE	2.0
1	A	356	ALA	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	SEP	A	346	10/11	0.57	0.15	100,103,107,108	0
1	SEP	B	346	10/11	0.57	0.11	111,113,117,117	0
1	TPO	B	345	11/12	0.76	0.13	111,113,114,114	0
1	TPO	A	345	11/12	0.88	0.11	92,93,99,100	0

6.3 Carbohydrates [i](#)

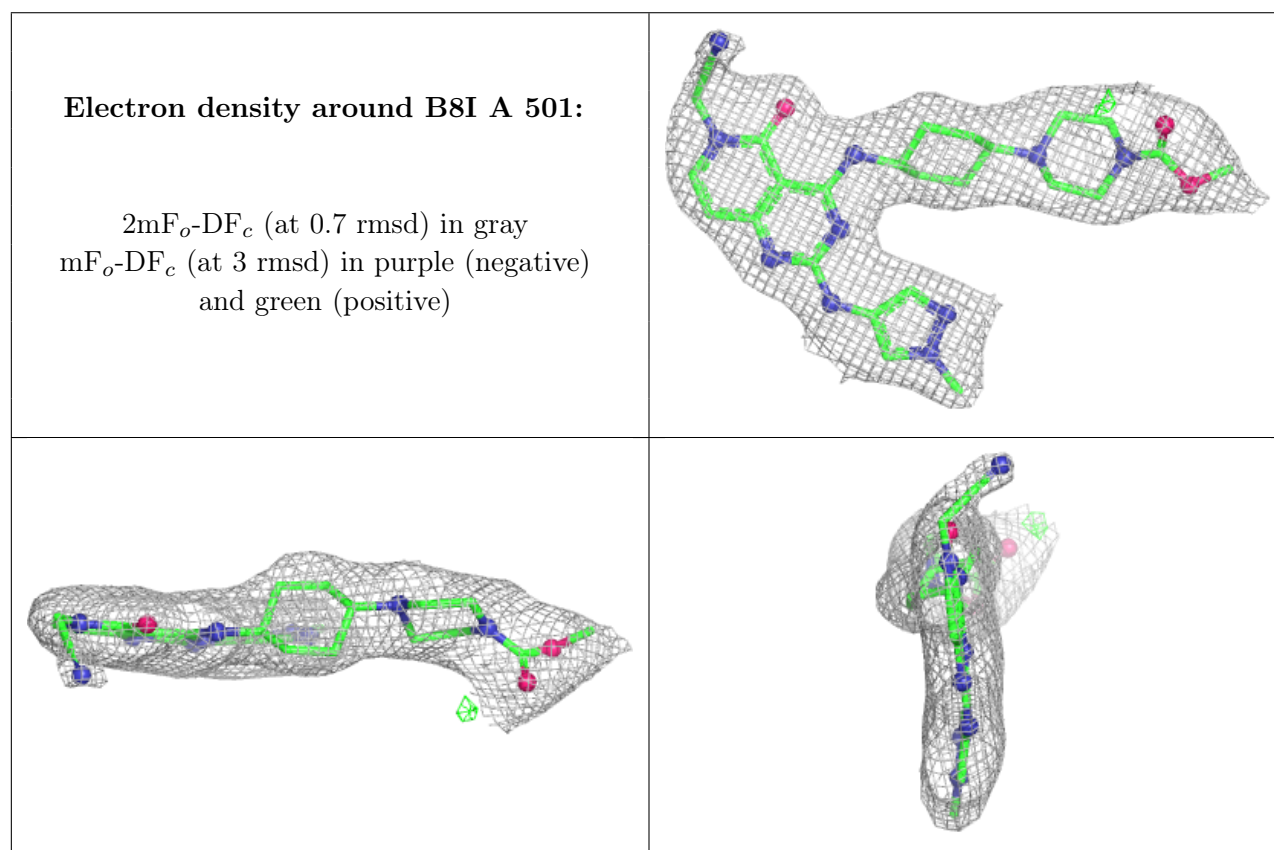
There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

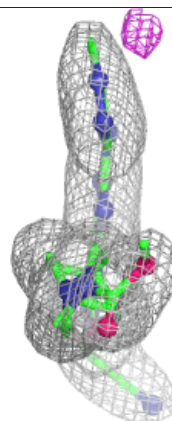
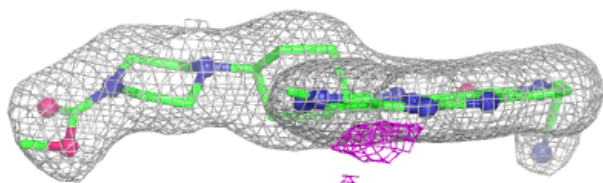
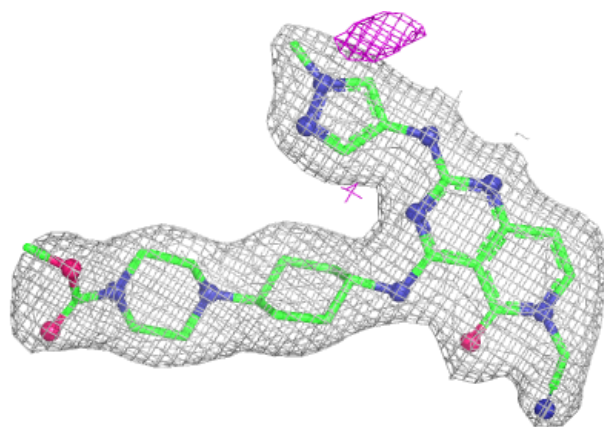
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	B8I	A	501	38/38	0.93	0.09	40,49,71,74	0
2	B8I	B	501	38/38	0.95	0.08	30,39,67,69	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



Electron density around B8I B 501:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.