



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 04:36 PM UTC

PDB ID : 6TFP / pdb_00006tfp
Title : BTK in complex with LOU064, a potent and highly selective covalent inhibitor
Authors : Scheufler, C.; Hinniger, A.; Gutmann, S.
Deposited on : 2019-11-14
Resolution : 2.00 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

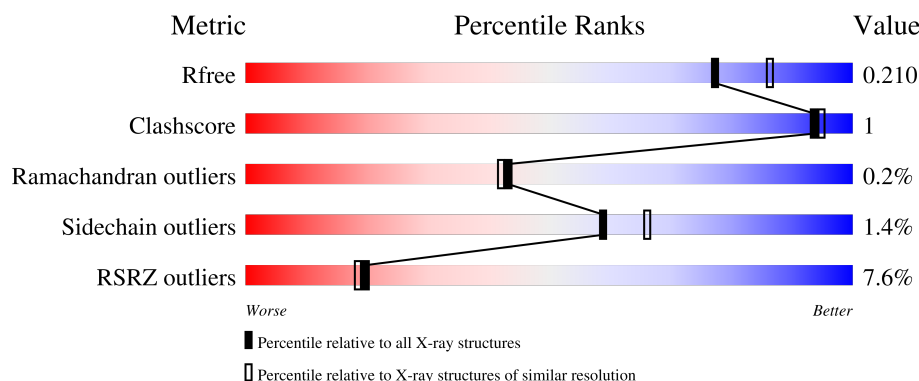
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	276	2% 92% 5% .
1	B	276	3% 92% 7% .
1	C	276	12% 89% 6% .
1	D	276	3% 91% 5% .
1	E	276	17% 89% 6% .

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 11545 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 Tyrosine-protein kinase BTK.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	266	Total	C	N	O	S	0	0	0
			2164	1388	355	402	19			
1	B	275	Total	C	N	O	S	0	0	0
			2223	1426	365	413	19			
1	C	264	Total	C	N	O	S	0	0	0
			2093	1341	346	387	19			
1	D	266	Total	C	N	O	S	0	0	0
			2149	1384	350	396	19			
1	E	264	Total	C	N	O	S	0	0	0
			2076	1332	345	380	19			

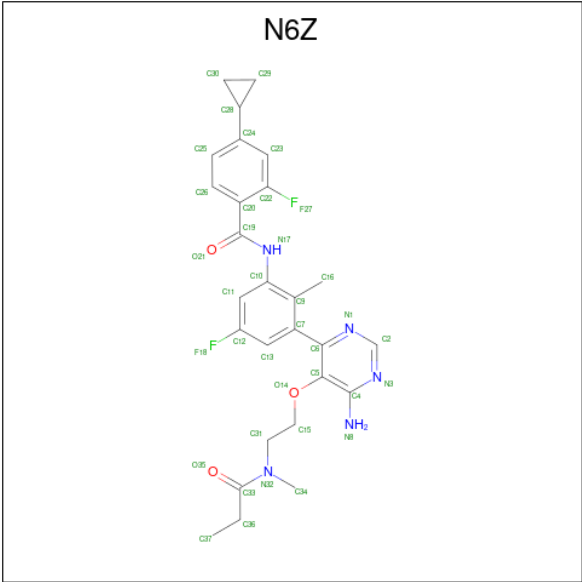
There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	384	GLY	-	expression tag	UNP Q06187
B	384	GLY	-	expression tag	UNP Q06187
C	384	GLY	-	expression tag	UNP Q06187
D	384	GLY	-	expression tag	UNP Q06187
E	384	GLY	-	expression tag	UNP Q06187

- Molecule 2 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Na	0	0
			1	1		
2	C	1	Total	Na	0	0
			1	1		

- Molecule 3 is {N}-[3-[6-azanyl-5-[2-[methyl(propanoyl)amino]ethoxy]pyrimidin-4-yl]-5-fluoranyl-2-methyl-phenyl]-4-cyclopropyl-2-fluoranyl-benzamide (CCD ID: N6Z) (formula: C₂₇H₂₉F₂N₅O₃) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	0	0
			37	27	2	5	3		
3	B	1	Total	C	F	N	O	0	0
			37	27	2	5	3		
3	C	1	Total	C	F	N	O	0	0
			37	27	2	5	3		
3	D	1	Total	C	F	N	O	0	0
			37	27	2	5	3		
3	E	1	Total	C	F	N	O	0	0
			37	27	2	5	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	203	Total	O	0	0
			203	203		
4	B	148	Total	O	0	0
			148	148		
4	C	79	Total	O	0	0
			79	79		
4	D	172	Total	O	0	0
			172	172		
4	E	51	Total	O	0	0
			51	51		

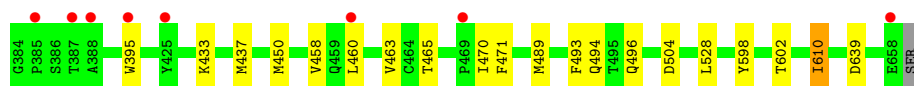
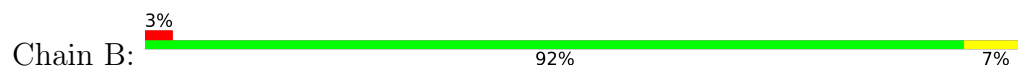
3 Residue-property plots [i](#)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

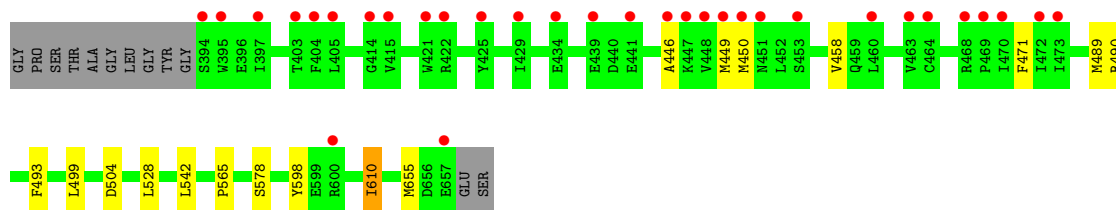
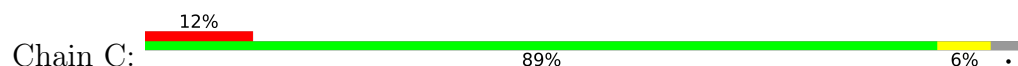
- Molecule 1: Tyrosine-protein kinase BTK



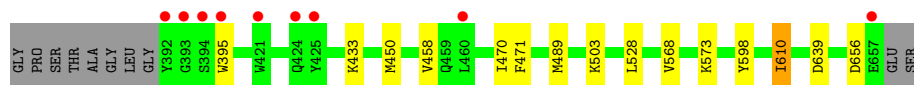
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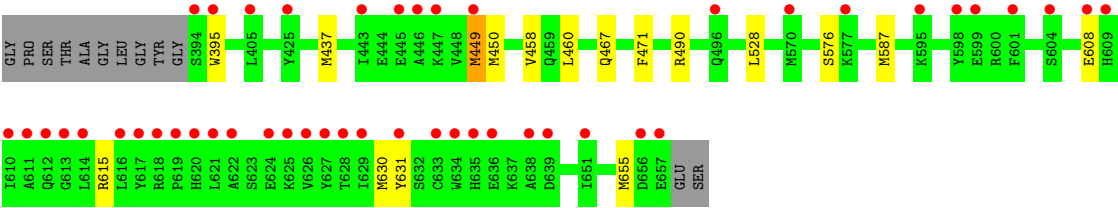


- Molecule 1: Tyrosine-protein kinase BTK



- Molecule 1: Tyrosine-protein kinase BTK





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	206.82Å 86.48Å 160.65Å 90.00° 129.84° 90.00°	Depositor
Resolution (Å)	47.62 – 2.00 47.62 – 2.00	Depositor EDS
% Data completeness (in resolution range)	98.2 (47.62-2.00) 98.2 (47.62-2.00)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.60 (at 2.00Å)	Xtriage
Refinement program	BUSTER 2.11.7	Depositor
R, R_{free}	0.186 , 0.204 0.190 , 0.210	Depositor DCC
R_{free} test set	7214 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	39.8	Xtriage
Anisotropy	0.456	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 51.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.012 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	11545	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.82% of the height of the origin peak. No significant pseudotranslation is detected.*

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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NA, N6Z

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	0.85	0/2215	1.11	3/2988 (0.1%)
1	B	0.87	1/2276 (0.0%)	1.14	4/3071 (0.1%)
1	C	0.81	1/2142 (0.0%)	1.17	4/2895 (0.1%)
1	D	0.89	1/2201 (0.0%)	1.13	2/2972 (0.1%)
1	E	0.79	1/2126 (0.0%)	1.23	3/2879 (0.1%)
All	All	0.84	4/10960 (0.0%)	1.15	16/14805 (0.1%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	437	MET	SD-CE	-6.82	1.62	1.79
1	D	489	MET	SD-CE	-6.75	1.62	1.79
1	E	437	MET	SD-CE	-5.84	1.65	1.79
1	C	450	MET	SD-CE	-5.18	1.66	1.79

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	471	PHE	CA-CB-CG	6.23	120.03	113.80
1	C	471	PHE	CA-CB-CG	6.20	120.00	113.80
1	D	471	PHE	CA-CB-CG	5.97	119.77	113.80
1	A	471	PHE	CA-CB-CG	5.78	119.58	113.80
1	A	542	LEU	CA-C-N	5.38	127.75	120.38
1	A	542	LEU	C-N-CA	5.38	127.75	120.38
1	B	471	PHE	CA-CB-CG	5.33	119.13	113.80
1	C	504	ASP	CA-CB-CG	5.27	117.87	112.60
1	B	504	ASP	CA-CB-CG	5.24	117.84	112.60
1	D	639	ASP	CA-CB-CG	5.18	117.78	112.60
1	E	608	GLU	CA-C-N	5.12	127.40	120.44
1	E	608	GLU	C-N-CA	5.12	127.40	120.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	542	LEU	CA-C-N	5.07	127.32	120.38
1	C	542	LEU	C-N-CA	5.07	127.32	120.38
1	B	639	ASP	CA-CB-CG	5.06	117.66	112.60
1	B	602	THR	N-CA-C	-5.04	104.03	110.53

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	2164	0	2107	4	0
1	B	2223	0	2166	9	0
1	C	2093	0	2001	6	0
1	D	2149	0	2086	4	0
1	E	2076	0	1963	6	0
2	A	1	0	0	0	0
2	C	1	0	0	0	0
3	A	37	0	0	0	0
3	B	37	0	0	0	0
3	C	37	0	0	0	0
3	D	37	0	0	0	0
3	E	37	0	0	0	0
4	A	203	0	0	0	0
4	B	148	0	0	0	0
4	C	79	0	0	0	0
4	D	172	0	0	0	0
4	E	51	0	0	0	0
All	All	11545	0	10323	29	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 1.

All (29) 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:598:TYR:CZ	1:A:610:ILE:HD11	2.39	0.57
1:E:395:TRP:HB3	1:E:450:MET:HE2	1.86	0.56
1:C:489:MET:HB2	1:C:493:PHE:CE2	2.45	0.52
1:B:395:TRP:CH2	1:B:450:MET:HB3	2.48	0.49
1:E:458:VAL:HG21	1:E:528:LEU:HD12	1.96	0.47
1:B:450:MET:HG2	1:B:460:LEU:HG	1.98	0.45
1:E:449:MET:HE3	1:E:449:MET:HB3	1.84	0.45
1:B:494:GLN:HG3	1:B:496:GLN:HG2	1.98	0.45
1:E:450:MET:SD	1:E:460:LEU:HG	2.57	0.45
1:E:615:ARG:HG3	1:E:631:TYR:CE1	2.52	0.45
1:B:450:MET:HE1	1:B:463:VAL:HG13	1.99	0.44
1:B:598:TYR:CZ	1:B:610:ILE:HD11	2.54	0.43
1:C:598:TYR:CZ	1:C:610:ILE:HD11	2.55	0.42
1:D:568:VAL:HG22	1:D:573:LYS:O	2.20	0.42
1:B:395:TRP:CE3	1:B:450:MET:SD	3.12	0.42
1:D:598:TYR:CZ	1:D:610:ILE:HD11	2.54	0.42
1:A:595:LYS:HE2	1:A:595:LYS:HB3	1.70	0.42
1:C:446:ALA:HA	1:C:449:MET:HE3	2.01	0.42
1:D:395:TRP:CE3	1:D:450:MET:HG2	2.55	0.42
1:C:458:VAL:HG21	1:C:528:LEU:HD12	2.01	0.42
1:A:489:MET:HB2	1:A:493:PHE:CE2	2.55	0.41
1:D:458:VAL:HG21	1:D:528:LEU:HD12	2.03	0.41
1:C:499:LEU:HG	1:C:655:MET:HE3	2.02	0.41
1:B:465:THR:HA	1:B:470:ILE:HG22	2.03	0.41
1:E:587:MET:HB3	1:E:630:MET:HE2	2.01	0.41
1:B:458:VAL:HG21	1:B:528:LEU:HD12	2.02	0.41
1:B:489:MET:HB2	1:B:493:PHE:CZ	2.56	0.41
1:A:458:VAL:HG21	1:A:528:LEU:HD12	2.04	0.40
1:C:565:PRO:HG3	1:C:578:SER:HA	2.04	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	264/276 (96%)	257 (97%)	7 (3%)	0	100	100
1	B	273/276 (99%)	266 (97%)	7 (3%)	0	100	100
1	C	262/276 (95%)	253 (97%)	8 (3%)	1 (0%)	30	27
1	D	264/276 (96%)	256 (97%)	8 (3%)	0	100	100
1	E	262/276 (95%)	254 (97%)	7 (3%)	1 (0%)	30	27
All	All	1325/1380 (96%)	1286 (97%)	37 (3%)	2 (0%)	43	42

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	490	ARG
1	E	490	ARG

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	235/246 (96%)	231 (98%)	4 (2%)	53	60
1	B	240/246 (98%)	238 (99%)	2 (1%)	73	80
1	C	220/246 (89%)	219 (100%)	1 (0%)	81	87
1	D	231/246 (94%)	226 (98%)	5 (2%)	45	50
1	E	214/246 (87%)	210 (98%)	4 (2%)	50	56
All	All	1140/1230 (93%)	1124 (99%)	16 (1%)	59	66

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

Mol	Chain	Res	Type
1	A	395	TRP
1	A	447	LYS
1	A	576	SER
1	A	600	ARG
1	B	433	LYS
1	B	610	ILE

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Mol	Chain	Res	Type
1	C	610	ILE
1	D	433	LYS
1	D	470	ILE
1	D	503	LYS
1	D	610	ILE
1	D	656	ASP
1	E	449	MET
1	E	467	GLN
1	E	576	SER
1	E	655	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	491	HIS
1	A	496	GLN
1	A	612	GLN
1	B	459	GLN
1	B	516	GLN
1	B	609	HIS
1	B	612	GLN
1	B	620	HIS
1	C	459	GLN
1	C	516	GLN
1	D	516	GLN
1	D	612	GLN
1	E	491	HIS
1	E	516	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 7 ligands modelled in this entry, 2 are monoatomic - leaving 5 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
3	N6Z	C	702	1	39,40,40	1.24	2 (5%)	53,57,57	2.08	18 (33%)
3	N6Z	A	702	1	39,40,40	1.20	2 (5%)	53,57,57	1.97	14 (26%)
3	N6Z	D	701	1	39,40,40	1.25	2 (5%)	53,57,57	2.14	16 (30%)
3	N6Z	B	701	1	39,40,40	1.24	1 (2%)	53,57,57	2.06	15 (28%)
3	N6Z	E	701	1	39,40,40	1.23	3 (7%)	53,57,57	2.04	15 (28%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	N6Z	C	702	1	-	9/28/30/30	0/4/4/4
3	N6Z	A	702	1	-	3/28/30/30	0/4/4/4
3	N6Z	D	701	1	-	1/28/30/30	0/4/4/4
3	N6Z	B	701	1	-	3/28/30/30	0/4/4/4
3	N6Z	E	701	1	-	3/28/30/30	0/4/4/4

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	701	N6Z	C33-N32	3.18	1.38	1.34
3	C	702	N6Z	C33-N32	3.11	1.38	1.34
3	E	701	N6Z	C33-N32	2.72	1.38	1.34
3	B	701	N6Z	C33-N32	2.64	1.37	1.34
3	E	701	N6Z	C20-C22	2.27	1.41	1.38
3	C	702	N6Z	C7-C9	2.23	1.44	1.40
3	A	702	N6Z	C23-C24	2.20	1.42	1.39
3	D	701	N6Z	C23-C24	2.19	1.42	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	701	N6Z	C23-C24	2.18	1.42	1.39
3	A	702	N6Z	C33-N32	2.01	1.37	1.34

All (78) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	701	N6Z	C37-C36-C33	6.08	123.33	112.69
3	A	702	N6Z	C37-C36-C33	5.97	123.15	112.69
3	E	701	N6Z	C37-C36-C33	5.78	122.82	112.69
3	C	702	N6Z	C37-C36-C33	5.71	122.70	112.69
3	B	701	N6Z	N3-C2-N1	-5.54	120.19	128.58
3	D	701	N6Z	N3-C2-N1	-5.12	120.83	128.58
3	C	702	N6Z	N3-C2-N1	-5.05	120.94	128.58
3	E	701	N6Z	N3-C2-N1	-4.98	121.04	128.58
3	B	701	N6Z	C37-C36-C33	4.81	121.12	112.69
3	A	702	N6Z	N3-C2-N1	-4.76	121.37	128.58
3	B	701	N6Z	C36-C33-N32	4.70	125.04	117.88
3	D	701	N6Z	C36-C33-N32	4.57	124.84	117.88
3	E	701	N6Z	C29-C28-C24	-4.54	115.07	121.28
3	C	702	N6Z	C36-C33-N32	4.31	124.44	117.88
3	A	702	N6Z	C29-C28-C24	-4.21	115.53	121.28
3	B	701	N6Z	C29-C28-C24	-3.93	115.91	121.28
3	C	702	N6Z	C29-C28-C24	-3.92	115.93	121.28
3	D	701	N6Z	C13-C12-C11	-3.73	118.97	123.50
3	D	701	N6Z	O35-C33-C36	-3.67	114.04	121.48
3	B	701	N6Z	O14-C15-C31	-3.64	98.61	107.79
3	E	701	N6Z	C7-C6-N1	3.57	121.53	115.17
3	C	702	N6Z	O35-C33-C36	-3.52	114.34	121.48
3	B	701	N6Z	O35-C33-C36	-3.48	114.43	121.48
3	A	702	N6Z	C36-C33-N32	3.47	123.16	117.88
3	C	702	N6Z	C9-C10-N17	3.46	124.29	119.34
3	E	701	N6Z	C36-C33-N32	3.43	123.11	117.88
3	C	702	N6Z	C13-C12-C11	-3.41	119.36	123.50
3	A	702	N6Z	C7-C6-N1	3.38	121.20	115.17
3	B	701	N6Z	C7-C6-N1	3.37	121.18	115.17
3	D	701	N6Z	C7-C6-N1	3.34	121.12	115.17
3	A	702	N6Z	C13-C12-C11	-3.34	119.44	123.50
3	D	701	N6Z	C29-C28-C24	-3.29	116.78	121.28
3	B	701	N6Z	C23-C22-C20	-3.23	119.91	123.48
3	E	701	N6Z	C13-C12-C11	-3.23	119.58	123.50
3	D	701	N6Z	C23-C22-C20	-3.20	119.94	123.48
3	D	701	N6Z	O14-C15-C31	-3.16	99.81	107.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	701	N6Z	O14-C5-C6	3.16	123.23	115.23
3	E	701	N6Z	C23-C22-C20	-3.15	120.00	123.48
3	C	702	N6Z	O14-C5-C6	3.12	123.13	115.23
3	A	702	N6Z	O14-C5-C6	3.03	122.90	115.23
3	D	701	N6Z	C9-C10-N17	2.98	123.60	119.34
3	E	701	N6Z	O35-C33-C36	-2.97	115.46	121.48
3	C	702	N6Z	C7-C6-N1	2.95	120.42	115.17
3	A	702	N6Z	C23-C22-C20	-2.93	120.24	123.48
3	E	701	N6Z	O14-C5-C6	2.90	122.59	115.23
3	E	701	N6Z	O14-C15-C31	-2.87	100.55	107.79
3	C	702	N6Z	O14-C15-C31	-2.86	100.57	107.79
3	C	702	N6Z	C11-C10-N17	-2.82	114.56	121.95
3	C	702	N6Z	C13-C7-C6	-2.81	114.92	119.16
3	B	701	N6Z	O14-C5-C6	2.77	122.25	115.23
3	B	701	N6Z	C11-C10-N17	-2.73	114.79	121.95
3	D	701	N6Z	C2-N1-C6	2.72	122.08	117.87
3	D	701	N6Z	C11-C10-N17	-2.72	114.82	121.95
3	C	702	N6Z	C23-C22-C20	-2.71	120.48	123.48
3	A	702	N6Z	C26-C20-C22	2.70	119.69	116.70
3	B	701	N6Z	C2-N1-C6	2.70	122.04	117.87
3	B	701	N6Z	C9-C10-N17	2.69	123.19	119.34
3	B	701	N6Z	C13-C12-C11	-2.69	120.23	123.50
3	D	701	N6Z	C26-C20-C22	2.65	119.64	116.70
3	E	701	N6Z	C26-C20-C22	2.63	119.62	116.70
3	E	701	N6Z	C11-C10-N17	-2.62	115.10	121.95
3	E	701	N6Z	C2-N1-C6	2.60	121.89	117.87
3	B	701	N6Z	C26-C20-C22	2.49	119.47	116.70
3	A	702	N6Z	C11-C10-N17	-2.45	115.53	121.95
3	E	701	N6Z	C9-C10-N17	2.32	122.66	119.34
3	D	701	N6Z	C7-C13-C12	2.31	122.15	119.11
3	A	702	N6Z	O35-C33-C36	-2.30	116.81	121.48
3	C	702	N6Z	C2-N1-C6	2.28	121.40	117.87
3	D	701	N6Z	C13-C7-C6	-2.26	115.75	119.16
3	A	702	N6Z	O14-C15-C31	-2.25	102.10	107.79
3	C	702	N6Z	C6-C7-C9	2.19	125.86	121.25
3	A	702	N6Z	C34-N32-C31	2.12	120.13	115.90
3	C	702	N6Z	C26-C20-C22	2.10	119.03	116.70
3	E	701	N6Z	C13-C7-C6	-2.07	116.04	119.16
3	C	702	N6Z	C7-C13-C12	2.05	121.81	119.11
3	C	702	N6Z	C15-O14-C5	2.03	120.30	114.22
3	B	701	N6Z	C7-C13-C12	2.02	121.76	119.11
3	A	702	N6Z	C7-C13-C12	2.00	121.75	119.11

There are no chirality outliers.

All (19) torsion outliers are listed below:

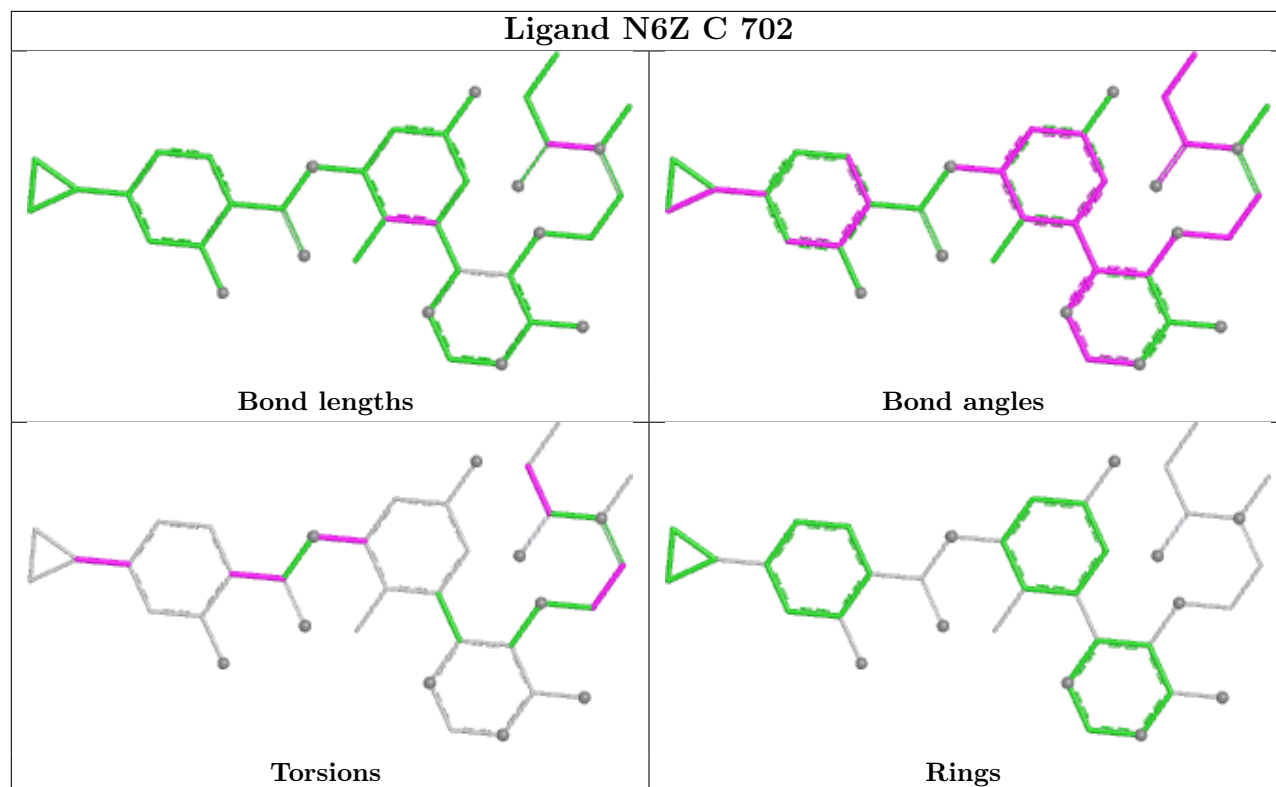
Mol	Chain	Res	Type	Atoms
3	C	702	N6Z	C23-C24-C28-C29
3	C	702	N6Z	C11-C10-N17-C19
3	C	702	N6Z	C9-C10-N17-C19
3	A	702	N6Z	C23-C24-C28-C29
3	C	702	N6Z	C23-C24-C28-C30
3	C	702	N6Z	C25-C24-C28-C29
3	B	701	N6Z	C11-C10-N17-C19
3	A	702	N6Z	C11-C10-N17-C19
3	C	702	N6Z	O14-C15-C31-N32
3	C	702	N6Z	N32-C33-C36-C37
3	E	701	N6Z	N32-C33-C36-C37
3	C	702	N6Z	N17-C19-C20-C22
3	B	701	N6Z	C9-C10-N17-C19
3	C	702	N6Z	O35-C33-C36-C37
3	B	701	N6Z	C23-C24-C28-C29
3	E	701	N6Z	C11-C10-N17-C19
3	A	702	N6Z	O14-C15-C31-N32
3	D	701	N6Z	C11-C10-N17-C19
3	E	701	N6Z	O35-C33-C36-C37

There are no ring outliers.

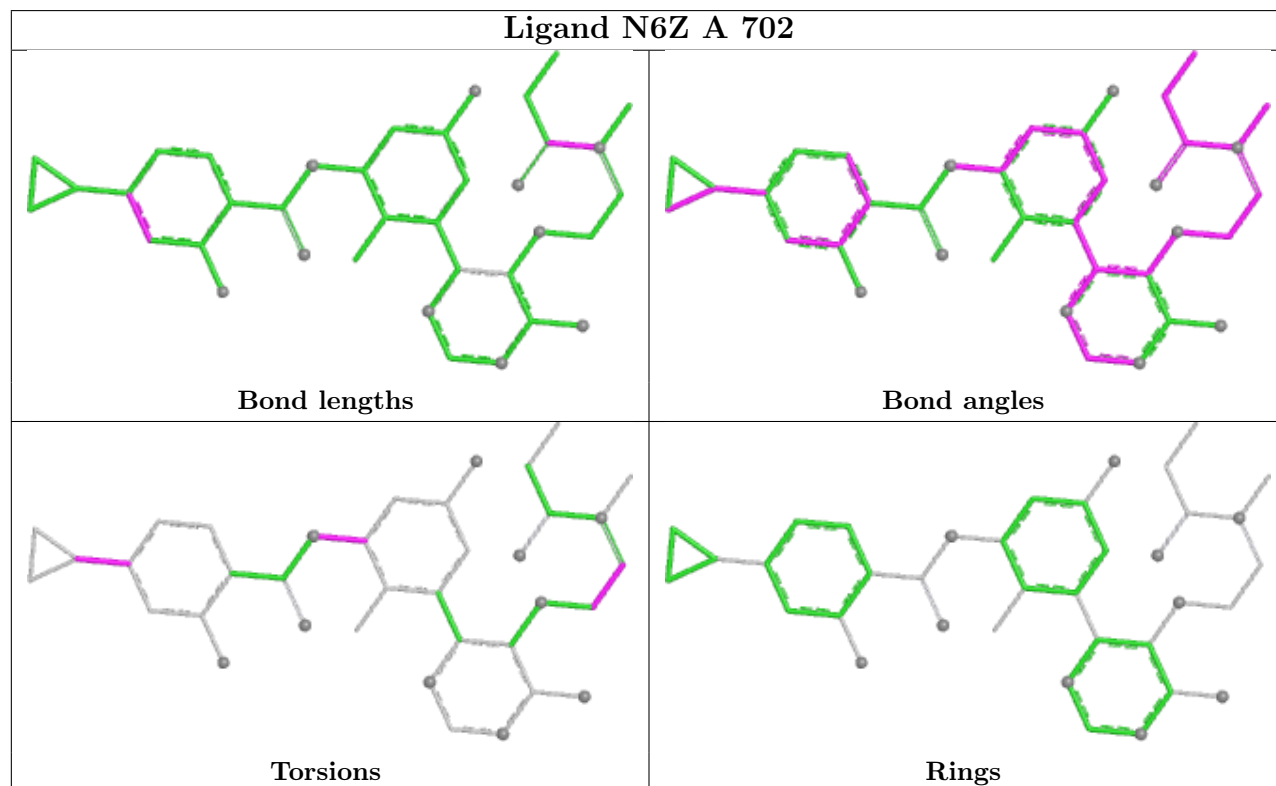
No monomer is involved in short contacts.

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.

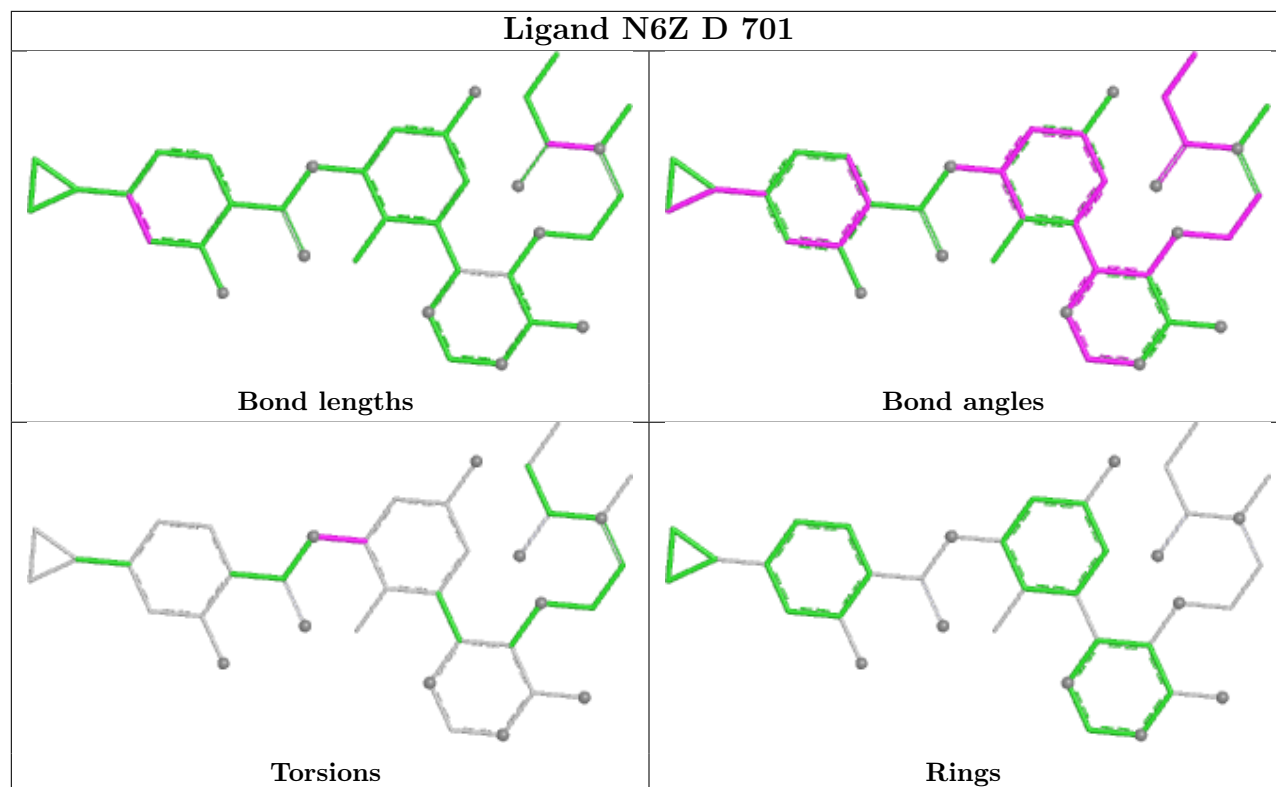
Ligand N6Z C 702



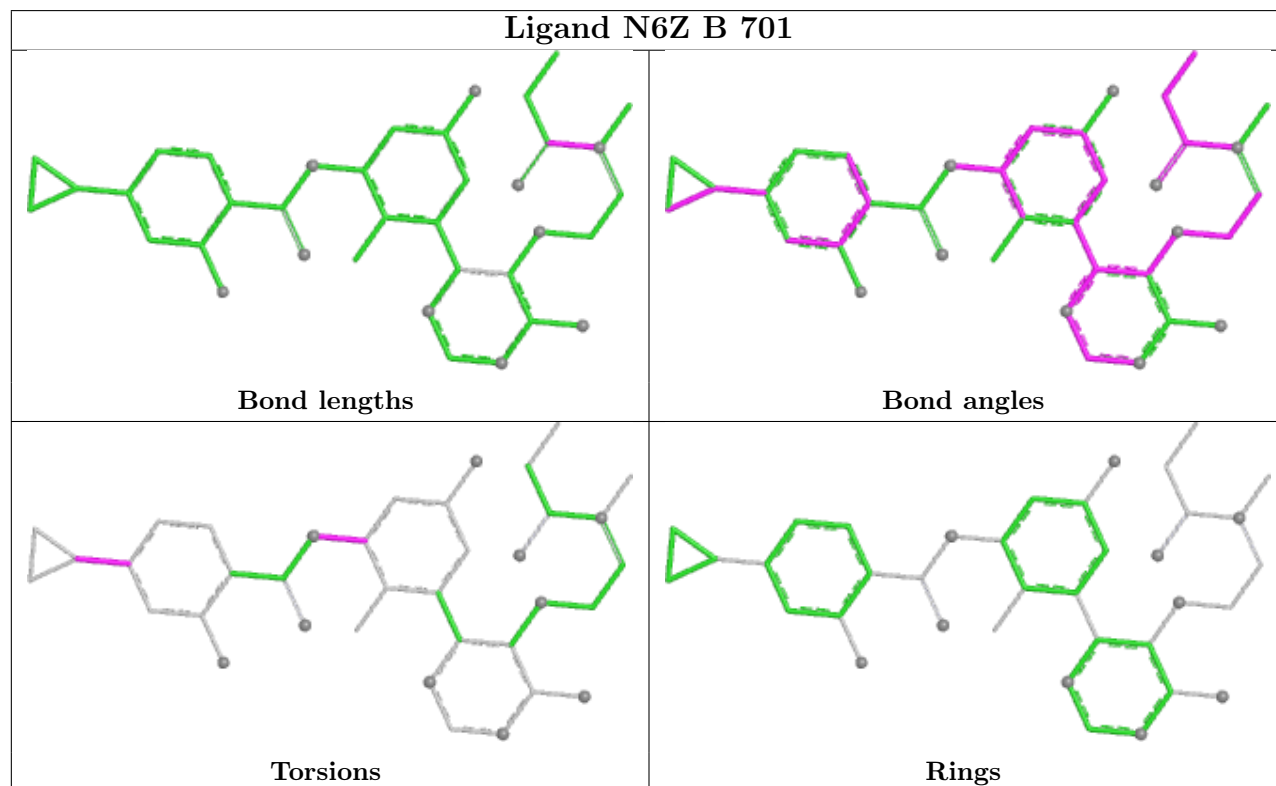
Ligand N6Z A 702

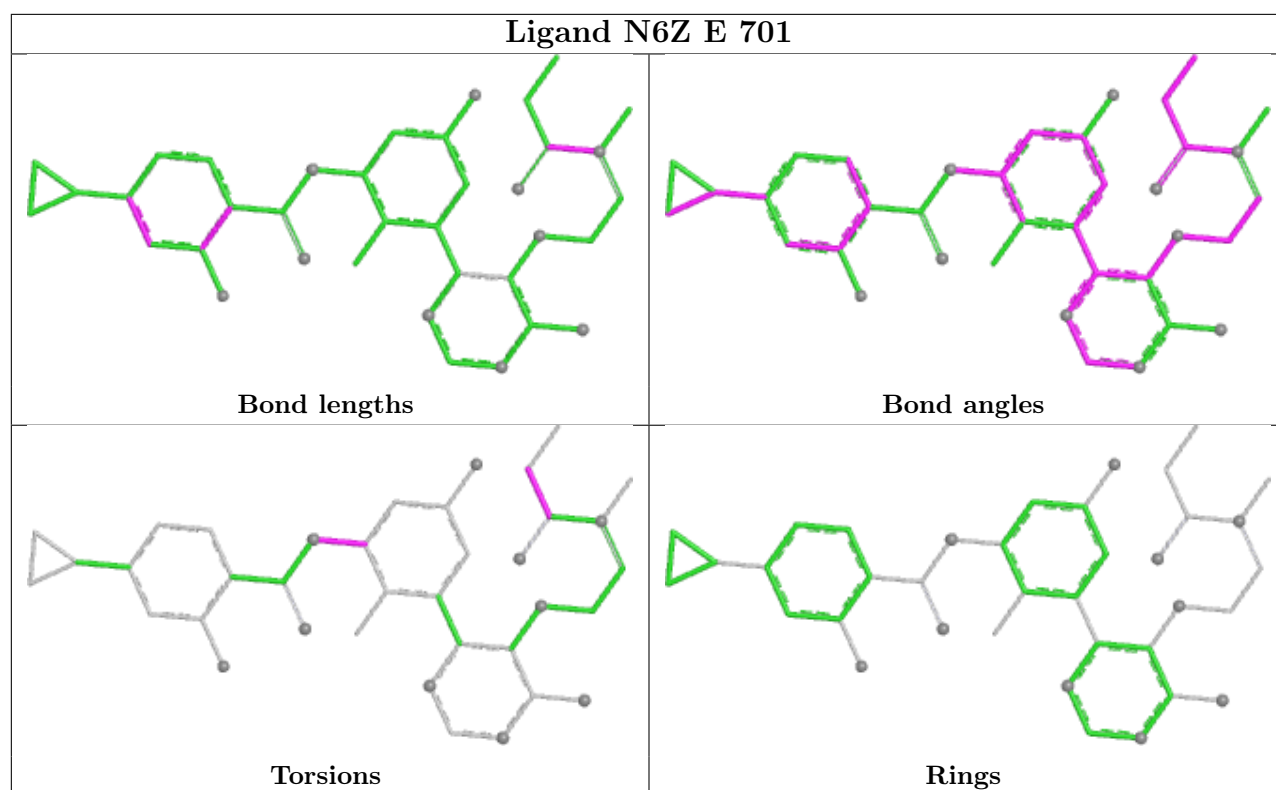


Ligand N6Z D 701



Ligand N6Z B 701





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	266/276 (96%)	-0.15	6 (2%) 61 60	28, 40, 72, 99	0
1	B	275/276 (99%)	0.01	8 (2%) 53 52	36, 46, 68, 110	0
1	C	264/276 (95%)	0.61	32 (12%) 8 8	35, 66, 132, 157	0
1	D	266/276 (96%)	0.09	9 (3%) 48 47	29, 46, 94, 115	0
1	E	264/276 (95%)	1.01	47 (17%) 4 3	42, 78, 124, 152	0
All	All	1335/1380 (96%)	0.31	102 (7%) 20 18	28, 52, 111, 157	0

All (102) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	395	TRP	7.1
1	E	614	LEU	6.5
1	E	657	GLU	5.7
1	E	610	ILE	5.5
1	B	658	GLU	5.4
1	E	611	ALA	5.2
1	D	657	GLU	5.1
1	C	395	TRP	5.0
1	E	613	GLY	4.9
1	C	460	LEU	4.9
1	D	392	TYR	4.8
1	E	618	ARG	4.7
1	E	620	HIS	4.6
1	C	394	SER	4.6
1	C	397	ILE	4.5
1	C	447	LYS	4.4
1	E	639	ASP	4.4
1	E	612	GLN	4.3
1	E	616	LEU	4.2
1	D	394	SER	4.2

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Mol	Chain	Res	Type	RSRZ
1	E	627	TYR	4.2
1	E	626	VAL	4.2
1	A	395	TRP	4.2
1	E	608	GLU	4.1
1	C	404	PHE	4.1
1	E	609	HIS	4.0
1	A	393	GLY	3.6
1	E	635	HIS	3.6
1	E	631	TYR	3.6
1	B	425	TYR	3.5
1	E	651	ILE	3.4
1	E	394	SER	3.4
1	C	448	VAL	3.4
1	E	601	PHE	3.4
1	C	470	ILE	3.3
1	C	450	MET	3.2
1	D	460	LEU	3.1
1	E	629	ILE	3.1
1	B	385	PRO	3.1
1	E	633	CYS	3.1
1	C	421	TRP	3.0
1	E	634	TRP	2.9
1	C	441	GLU	2.9
1	E	621	LEU	2.9
1	C	429	ILE	2.9
1	E	598	TYR	2.9
1	A	460	LEU	2.9
1	B	460	LEU	2.9
1	D	393	GLY	2.9
1	E	619	PRO	2.9
1	E	617	TYR	2.8
1	E	604	SER	2.8
1	C	449	MET	2.8
1	E	449	MET	2.7
1	E	622	ALA	2.7
1	B	387	THR	2.7
1	C	434	GLU	2.6
1	D	421	TRP	2.6
1	A	658	GLU	2.6
1	C	464	CYS	2.6
1	C	451	ASN	2.6
1	C	468	ARG	2.6

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Mol	Chain	Res	Type	RSRZ
1	E	445	GLU	2.5
1	E	425	TYR	2.5
1	E	628	THR	2.5
1	E	624	GLU	2.5
1	C	657	GLU	2.5
1	C	403	THR	2.5
1	C	446	ALA	2.5
1	E	638	ALA	2.5
1	E	636	GLU	2.4
1	E	447	LYS	2.4
1	E	595	LYS	2.4
1	B	469	PRO	2.4
1	C	439	GLU	2.3
1	B	395	TRP	2.3
1	C	600	ARG	2.3
1	E	405	LEU	2.3
1	A	424	GLN	2.2
1	C	414	GLY	2.2
1	C	453	SER	2.2
1	E	577	LYS	2.2
1	C	472	ILE	2.2
1	C	473	ILE	2.2
1	C	415	VAL	2.2
1	B	388	ALA	2.2
1	C	405	LEU	2.2
1	C	425	TYR	2.2
1	E	625	LYS	2.2
1	E	656	ASP	2.2
1	A	656	ASP	2.1
1	E	395	TRP	2.1
1	D	424	GLN	2.1
1	E	443	ILE	2.1
1	C	463	VAL	2.1
1	C	469	PRO	2.1
1	C	422	ARG	2.1
1	E	599	GLU	2.1
1	E	446	ALA	2.1
1	E	570	MET	2.0
1	E	496	GLN	2.0
1	D	425	TYR	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

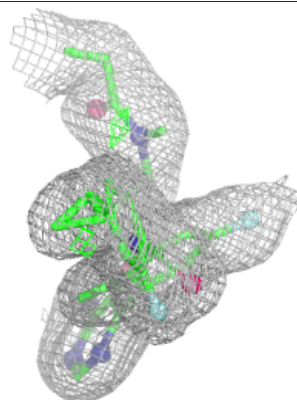
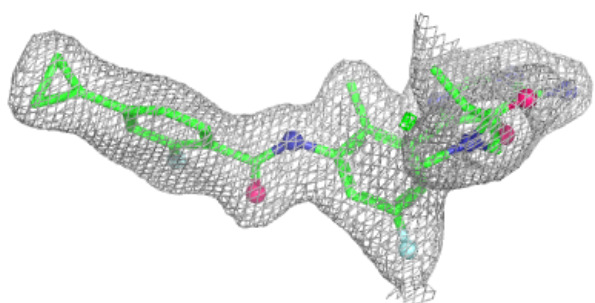
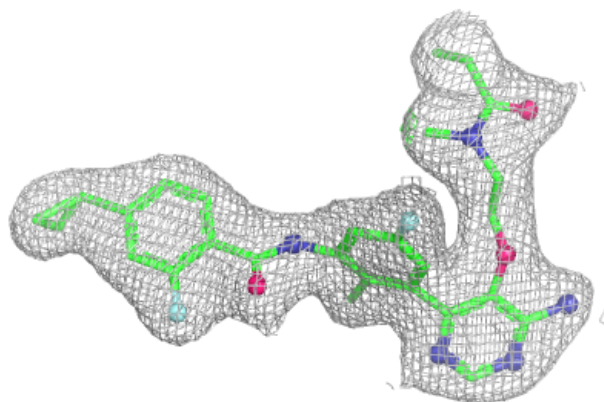
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	NA	C	701	1/1	0.96	0.04	48,48,48,48	0
3	N6Z	A	702	37/37	0.96	0.06	33,40,43,44	0
3	N6Z	C	702	37/37	0.96	0.07	56,69,76,77	0
3	N6Z	B	701	37/37	0.97	0.06	34,41,47,47	0
3	N6Z	D	701	37/37	0.97	0.07	40,44,48,50	0
3	N6Z	E	701	37/37	0.97	0.06	39,44,48,49	0
2	NA	A	701	1/1	0.98	0.03	37,37,37,37	0

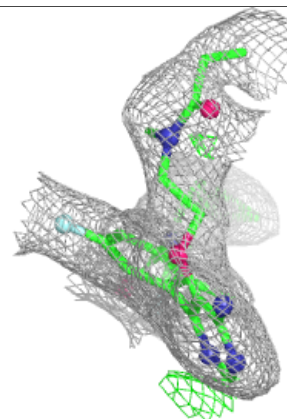
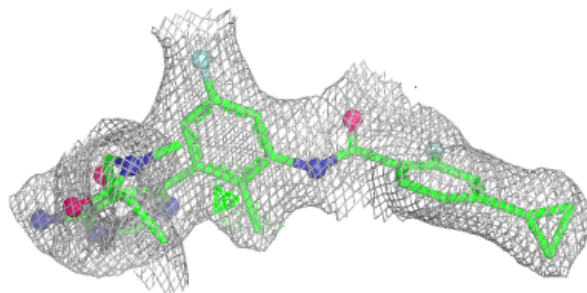
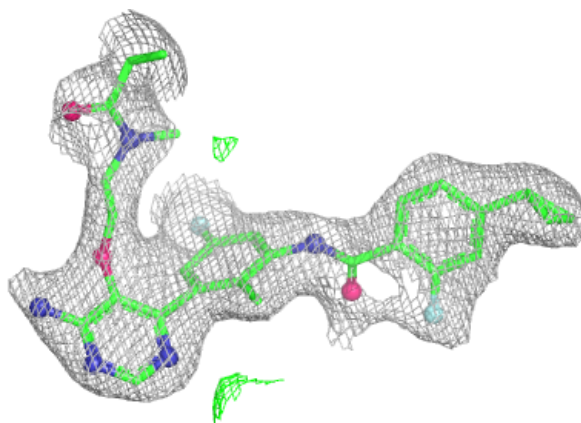
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around N6Z A 702:

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

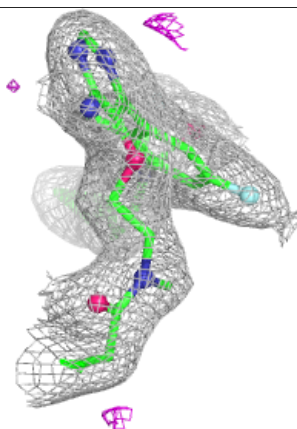
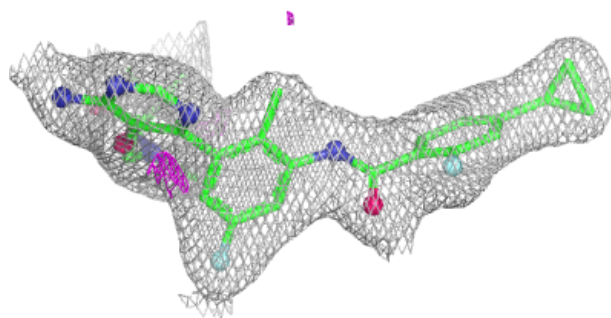
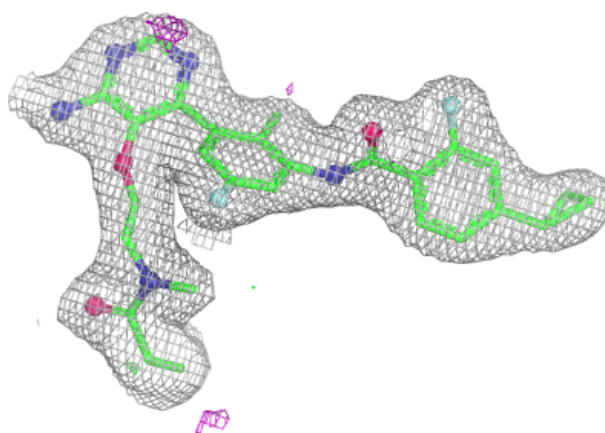
**Electron density around N6Z C 702:**

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



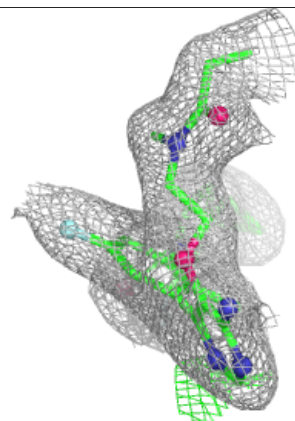
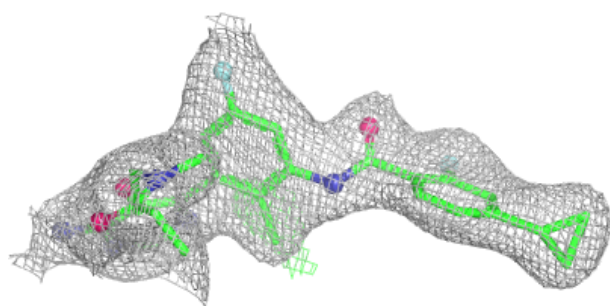
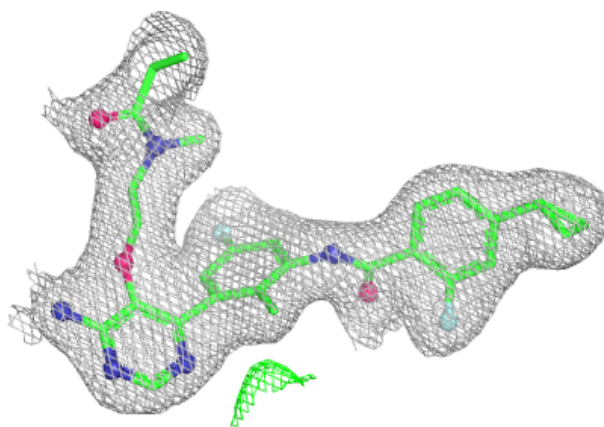
Electron density around N6Z B 701:

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

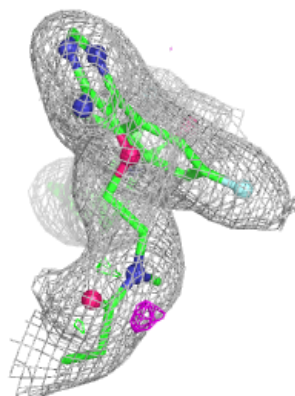
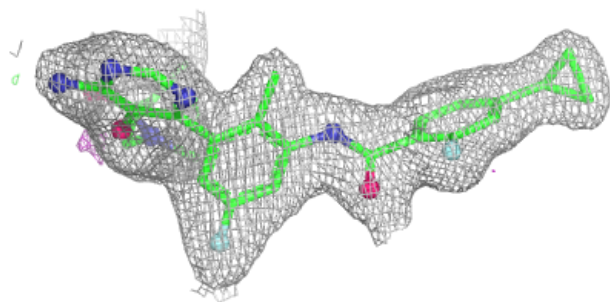
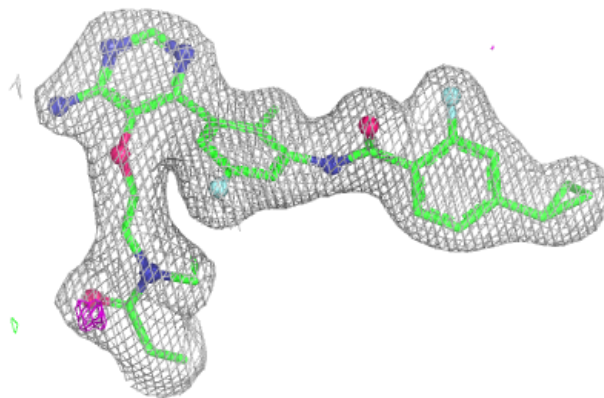


Electron density around N6Z D 701:

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

**Electron density around N6Z E 701:**

$2mF_o-DF_c$ (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.