



Full wwPDB X-ray Structure Validation Report ⓘ

May 26, 2020 – 07:15 am BST

PDB ID : 2WXL
Title : The crystal structure of the murine class IA PI 3-kinase p110delta in complex with ZSTK474.
Authors : Berndt, A.; Miller, S.; Williams, O.; Lee, D.D.; Houseman, B.T.; Pacold, J.I.; Gorrec, F.; Hon, W.-C.; Liu, Y.; Rommel, C.; Gaillard, P.; Ruckle, T.; Schwarz, M.K.; Shokat, K.M.; Shaw, J.P.; Williams, R.L.
Deposited on : 2009-11-09
Resolution : 1.99 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

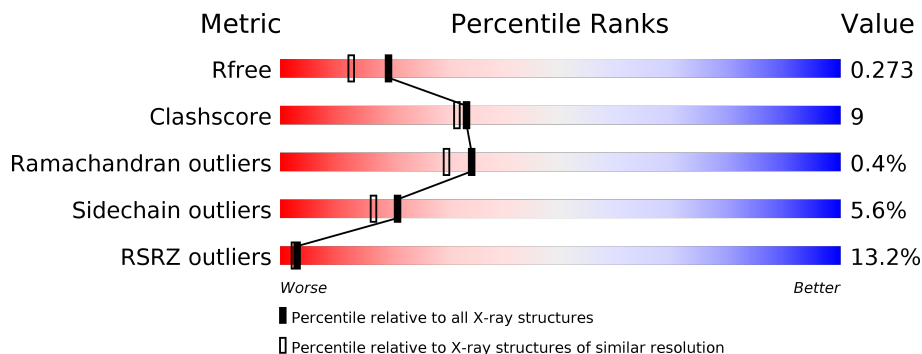
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.99 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}	130704	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (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 on 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	940	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 6944 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.

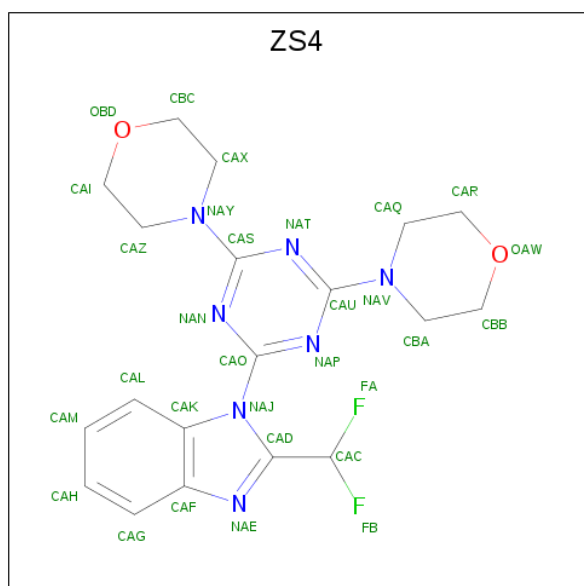
- Molecule 1 is a protein called PHOSPHATIDYLINOSITOL-4,5-BISPHOSPHATE 3-KINASE CATALYTIC SUBUNIT DELTA ISOFORM.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	823	6656	4268	1131	1203	54	0	2	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	105	GLY	-	expression tag	UNP Q3UDT3

- Molecule 2 is 2-(difluoromethyl)-1-(4,6-dimorpholin-4-yl-1,3,5-triazin-2-yl)-1H-benzimidazole (three-letter code: ZS4) (formula: C₁₉H₂₁F₂N₇O₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	F	N	O		
2	A	1	30	19	2	7	2	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	258	Total 258	O 258	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	142.54Å 64.29Å 116.72Å 90.00° 103.42° 90.00°	Depositor
Resolution (Å)	37.85 – 1.99 37.84 – 1.99	Depositor EDS
% Data completeness (in resolution range)	99.5 (37.85-1.99) 99.5 (37.84-1.99)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.66 (at 2.00Å)	Xtrriage
Refinement program	REFMAC 5.5.0046	Depositor
R, R_{free}	0.214 , 0.254 0.239 , 0.273	Depositor DCC
R_{free} test set	2115 reflections (3.02%)	wwPDB-VP
Wilson B-factor (Å ²)	28.2	Xtrriage
Anisotropy	0.382	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 53.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6944	wwPDB-VP
Average B, all atoms (Å ²)	15.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.71% 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: ZS4

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	0.62	4/6805 (0.1%)	0.67	3/9180 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	382	CYS	CB-SG	8.27	1.96	1.82
1	A	355	CYS	CB-SG	7.50	1.95	1.82
1	A	362	GLU	CD-OE2	5.49	1.31	1.25
1	A	813	TYR	CD1-CE1	5.30	1.47	1.39

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	902	ARG	NE-CZ-NH2	-11.02	114.79	120.30
1	A	902	ARG	NE-CZ-NH1	7.18	123.89	120.30
1	A	634	LEU	CA-CB-CG	5.41	127.75	115.30

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	6656	0	6642	114	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	30	0	21	1	0
3	A	258	0	0	12	0
All	All	6944	0	6663	115	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

All (115) 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:367:SER:HB3	1:A:368:GLU:C	1.70	1.12
1:A:549:LEU:HG	1:A:564:MET:HE1	1.26	1.09
1:A:962[A]:ARG:HH11	1:A:962[A]:ARG:HG2	1.19	1.07
1:A:962[A]:ARG:NH1	1:A:962[A]:ARG:HG2	1.74	0.98
1:A:962[A]:ARG:HH11	1:A:962[A]:ARG:CG	1.75	0.98
1:A:549:LEU:HG	1:A:564:MET:CE	2.02	0.88
1:A:110:LYS:HE3	1:A:114:ASN:HD21	1.38	0.87
1:A:902:ARG:HD3	3:A:2201:HOH:O	1.76	0.85
1:A:328:ILE:O	1:A:371:TRP:O	1.92	0.85
1:A:836:ASN:CG	3:A:2208:HOH:O	2.17	0.82
1:A:246:ARG:NH1	1:A:248:GLU:OE1	2.15	0.80
1:A:553:THR:CG2	1:A:564:MET:HE3	2.16	0.76
1:A:110:LYS:NZ	1:A:144:ARG:HH12	1.88	0.72
1:A:929:ARG:HH22	1:A:1001:SER:HB3	1.56	0.71
1:A:512:ARG:HH11	1:A:512:ARG:HG3	1.54	0.70
1:A:617:GLN:HE21	1:A:984:ALA:HA	1.56	0.70
1:A:821:ARG:HD2	3:A:2193:HOH:O	1.91	0.70
1:A:386:ARG:HG3	1:A:387:MET:HE2	1.73	0.70
1:A:902:ARG:CD	3:A:2201:HOH:O	2.34	0.69
1:A:553:THR:HG21	1:A:564:MET:HE3	1.75	0.67
1:A:512:ARG:O	1:A:516:GLU:HB2	1.97	0.65
1:A:278:HIS:HD2	1:A:280:SER:OG	1.80	0.63
1:A:768:ALA:HB3	1:A:772:GLY:HA3	1.78	0.63
1:A:386:ARG:HG3	1:A:387:MET:CE	2.28	0.63
1:A:806:LEU:HD13	1:A:962[B]:ARG:HD2	1.82	0.62
1:A:367:SER:HB3	1:A:368:GLU:CA	2.29	0.62
1:A:222:ARG:O	1:A:226:THR:HG23	2.00	0.61
1:A:367:SER:HB3	1:A:368:GLU:O	2.00	0.61
1:A:332:LYS:HZ2	1:A:341:LEU:HD21	1.65	0.61
1:A:620:LYS:HE2	1:A:660:VAL:HG11	1.82	0.60
1:A:332:LYS:HZ3	1:A:341:LEU:HD11	1.66	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:245:GLY:HA3	1:A:768:ALA:HB2	1.84	0.60
1:A:123:LYS:NZ	1:A:127:GLU:OE1	2.36	0.59
1:A:836:ASN:HB2	3:A:2208:HOH:O	2.02	0.58
1:A:836:ASN:CB	3:A:2208:HOH:O	2.50	0.58
1:A:895:HIS:H	1:A:898:ASN:HD21	1.51	0.58
1:A:435:GLY:HA2	1:A:475:LEU:O	2.05	0.56
1:A:915:PHE:C	1:A:915:PHE:CD1	2.79	0.56
1:A:328:ILE:HB	1:A:472:VAL:HG23	1.88	0.55
1:A:419:ALA:HB3	1:A:441:MET:HE1	1.87	0.55
1:A:870:ARG:NH2	1:A:874:GLU:OE2	2.40	0.55
1:A:512:ARG:NH1	1:A:534:MET:HG3	2.22	0.55
1:A:319:LEU:HD23	1:A:319:LEU:N	2.22	0.54
1:A:154:ARG:HG2	1:A:154:ARG:HH11	1.72	0.54
1:A:324:SER:HB3	1:A:376:GLU:HG3	1.90	0.54
1:A:841:LYS:HB2	1:A:844:MET:HG3	1.89	0.53
1:A:154:ARG:HD2	1:A:165:TYR:CE2	2.43	0.53
1:A:779:LYS:HG2	3:A:2166:HOH:O	2.08	0.52
1:A:389:ARG:NH1	1:A:455:PRO:O	2.40	0.52
1:A:216:LEU:HD22	1:A:241:LEU:HD11	1.92	0.51
1:A:110:LYS:HE3	1:A:114:ASN:ND2	2.19	0.51
1:A:329:GLU:HB2	1:A:369:PRO:O	2.11	0.51
1:A:617:GLN:NE2	1:A:984:ALA:HA	2.23	0.51
1:A:553:THR:CG2	1:A:564:MET:CE	2.88	0.50
1:A:371:TRP:O	1:A:372:LYS:HG3	2.10	0.50
1:A:914:HIS:HB3	1:A:918:ASN:O	2.12	0.50
1:A:786:GLN:HE22	1:A:988:GLU:HB2	1.77	0.50
1:A:929:ARG:HH22	1:A:1001:SER:CB	2.22	0.49
1:A:154:ARG:NH2	1:A:674:GLY:O	2.46	0.49
1:A:838:GLN:NE2	1:A:937:ASP:OD2	2.45	0.49
1:A:895:HIS:H	1:A:898:ASN:ND2	2.11	0.49
1:A:343:VAL:H	1:A:360:SER:HB3	1.78	0.49
1:A:915:PHE:HD1	1:A:915:PHE:C	2.16	0.48
1:A:241:LEU:HD13	1:A:274:LEU:HD13	1.95	0.48
1:A:366:CYS:O	1:A:367:SER:HB2	2.13	0.48
1:A:982:ARG:NH2	1:A:991:CYS:HA	2.29	0.47
1:A:715:MET:O	1:A:719:MET:HG3	2.15	0.47
1:A:617:GLN:HE21	1:A:984:ALA:CA	2.27	0.47
1:A:693:LYS:HE2	1:A:780:ASN:ND2	2.29	0.47
1:A:588:PRO:HD2	3:A:2077:HOH:O	2.14	0.47
1:A:597:ILE:HG22	1:A:601:ARG:NH2	2.30	0.47
1:A:332:LYS:NZ	1:A:341:LEU:HD11	2.29	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:247:HIS:O	1:A:738:SER:HB2	2.15	0.46
1:A:561:VAL:O	1:A:565:LEU:HD13	2.15	0.46
1:A:154:ARG:HD2	1:A:165:TYR:CZ	2.51	0.46
1:A:553:THR:HG22	1:A:564:MET:CE	2.46	0.46
1:A:913:GLY:N	3:A:2232:HOH:O	2.49	0.46
1:A:289:GLN:HG2	1:A:677:HIS:CD2	2.51	0.45
1:A:332:LYS:HZ1	1:A:334:ASN:HB3	1.82	0.45
1:A:328:ILE:HD11	1:A:474:TYR:HB2	1.97	0.45
1:A:907:LEU:C	1:A:907:LEU:HD23	2.38	0.45
2:A:1500:ZS4:NAN	2:A:1500:ZS4:CAC	2.80	0.44
1:A:691:LYS:HG3	1:A:727:ALA:CB	2.47	0.44
1:A:512:ARG:HG3	1:A:512:ARG:NH1	2.29	0.44
1:A:583:LEU:HD11	1:A:600:LEU:HD11	2.00	0.44
1:A:334:ASN:CG	1:A:335:ALA:H	2.21	0.44
1:A:334:ASN:HD22	1:A:365:VAL:HG22	1.83	0.44
1:A:834:ILE:O	1:A:838:GLN:HG3	2.18	0.44
1:A:859:LEU:HD21	1:A:901:ILE:HD11	1.98	0.44
1:A:350:GLY:HA3	1:A:588:PRO:HG3	2.00	0.43
1:A:603:LEU:HD22	1:A:607:GLU:HB3	2.00	0.43
1:A:477:GLU:HG2	1:A:477:GLU:H	1.53	0.43
1:A:419:ALA:HB3	1:A:441:MET:CE	2.48	0.43
1:A:537:GLU:HG3	3:A:2067:HOH:O	2.19	0.43
1:A:334:ASN:CG	1:A:335:ALA:N	2.72	0.43
1:A:902:ARG:HD2	3:A:2201:HOH:O	2.11	0.43
1:A:912:PHE:HA	3:A:2232:HOH:O	2.18	0.43
1:A:982:ARG:HH21	1:A:991:CYS:HA	1.83	0.43
1:A:516:GLU:C	1:A:517:ARG:HG2	2.39	0.42
1:A:343:VAL:H	1:A:360:SER:CB	2.32	0.42
1:A:139:PHE:CE2	1:A:666:LEU:HB3	2.54	0.42
1:A:866:GLU:HG2	1:A:866:GLU:H	1.36	0.42
1:A:693:LYS:HE2	1:A:780:ASN:HD21	1.84	0.42
1:A:846:ALA:HA	1:A:857:ASN:HB3	2.01	0.42
1:A:679:MET:O	1:A:683:MET:HG3	2.20	0.42
1:A:331:ARG:O	1:A:469:ALA:HA	2.19	0.41
1:A:789:LEU:HD23	1:A:915:PHE:CE2	2.56	0.41
1:A:288:GLU:HG2	1:A:289:GLN:HG3	2.02	0.41
1:A:325:ILE:HG22	1:A:475:LEU:HD12	2.03	0.41
1:A:271:THR:O	1:A:273:HIS:HD2	2.03	0.40
1:A:616:VAL:O	1:A:619:LEU:HB2	2.21	0.40
1:A:710:GLN:O	1:A:714:MET:HG2	2.21	0.40
1:A:696:ASN:HD22	1:A:778:PHE:HD2	1.69	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:367:SER:HB3	1:A:369:PRO:N	2.30	0.40
1:A:116:GLN:HB3	1:A:683:MET:SD	2.62	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	803/940 (85%)	777 (97%)	23 (3%)	3 (0%)	34 30

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	367	SER
1	A	365	VAL
1	A	769	GLY

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	731/827 (88%)	689 (94%)	42 (6%)	20 16

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	111	LYS
1	A	188	ARG
1	A	190	LEU
1	A	228	PHE
1	A	270	LEU
1	A	317	TRP
1	A	319	LEU
1	A	332	LYS
1	A	340	LYS
1	A	352	GLU
1	A	358	VAL
1	A	374	ARG
1	A	398	VAL
1	A	423	LEU
1	A	437	ARG
1	A	475	LEU
1	A	477	GLU
1	A	511	LEU
1	A	512	ARG
1	A	514	ILE
1	A	517	ARG
1	A	523	LEU
1	A	553	THR
1	A	557	LYS
1	A	559	GLU
1	A	563	GLN
1	A	601	ARG
1	A	634	LEU
1	A	726	GLU
1	A	743	GLU
1	A	786	GLN
1	A	866	GLU
1	A	898	ASN
1	A	915	PHE
1	A	930	VAL
1	A	935	THR
1	A	962[A]	ARG
1	A	962[B]	ARG
1	A	986	LEU
1	A	993	LYS
1	A	1004	LEU
1	A	1027	TRP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such

sidechains are listed below:

Mol	Chain	Res	Type
1	A	116	GLN
1	A	273	HIS
1	A	278	HIS
1	A	334	ASN
1	A	431	GLN
1	A	563	GLN
1	A	617	GLN
1	A	780	ASN
1	A	786	GLN
1	A	838	GLN
1	A	898	ASN
1	A	906	GLN
1	A	918	ASN
1	A	943	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

1 ligand is 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	ZS4	A	1500	-	32,34,34	1.45	4 (12%)	36,48,48	2.54	13 (36%)

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	ZS4	A	1500	-	-	0/8/32/32	0/5/5/5

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1500	ZS4	CAK-NAJ	-4.96	1.32	1.39
2	A	1500	ZS4	CAU-NAV	2.48	1.40	1.35
2	A	1500	ZS4	CAD-NAJ	-2.41	1.33	1.37
2	A	1500	ZS4	CAS-NAY	2.13	1.39	1.35

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1500	ZS4	NAP-CAO-NAJ	7.28	121.31	115.24
2	A	1500	ZS4	CAO-NAP-CAU	5.16	121.27	113.55
2	A	1500	ZS4	CBC-OB-CAI	4.50	124.92	109.89
2	A	1500	ZS4	NAN-CAO-NAJ	4.26	118.79	115.24
2	A	1500	ZS4	CAX-NAY-CAZ	4.12	120.61	111.52
2	A	1500	ZS4	NAT-CAU-NAP	-4.08	119.58	126.31
2	A	1500	ZS4	CAS-NAT-CAU	3.73	119.14	113.55
2	A	1500	ZS4	CAO-NAN-CAS	3.55	118.86	113.55
2	A	1500	ZS4	NAP-CAU-NAV	3.42	121.33	117.11
2	A	1500	ZS4	NAN-CAS-NAT	-3.05	121.27	126.31
2	A	1500	ZS4	CBA-NAV-CAQ	2.47	116.98	111.52
2	A	1500	ZS4	NAN-CAS-NAY	2.45	120.14	117.11
2	A	1500	ZS4	OB-CAI-CAZ	2.13	116.48	111.80

There are no chirality outliers.

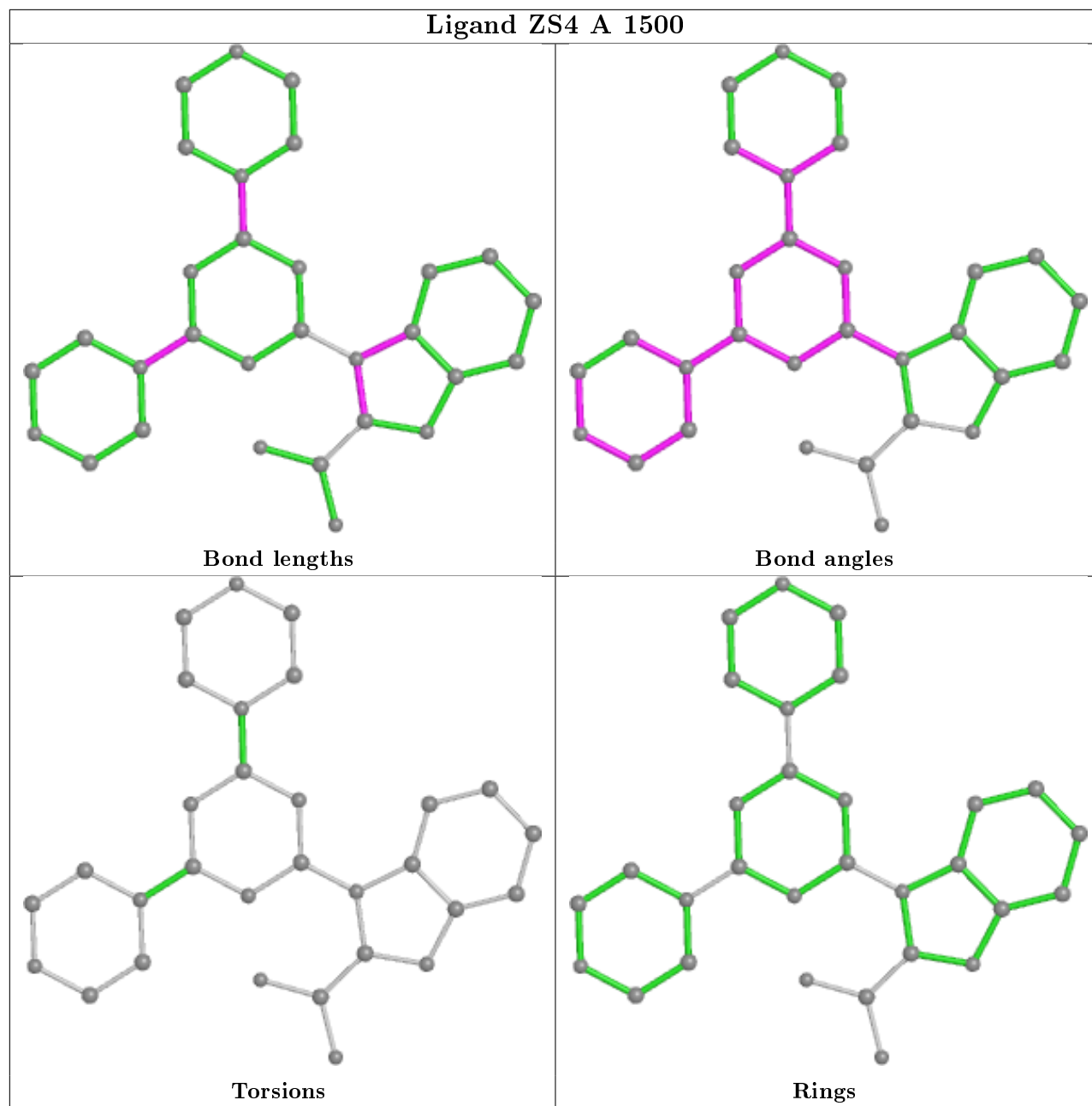
There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1500	ZS4	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	823/940 (87%)	0.87	109 (13%) 3 2	2, 14, 28, 49	0

All (109) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	366	CYS	7.7
1	A	846	ALA	7.6
1	A	514	ILE	7.6
1	A	919	PHE	6.4
1	A	445	VAL	6.4
1	A	334	ASN	6.3
1	A	363	VAL	6.0
1	A	330	GLY	5.7
1	A	488	LEU	5.6
1	A	228	PHE	5.5
1	A	341	LEU	5.3
1	A	205	PHE	5.2
1	A	847	THR	5.1
1	A	395	TYR	4.9
1	A	370	VAL	4.7
1	A	317	TRP	4.4
1	A	416	CYS	4.2
1	A	522	GLU	4.2
1	A	839	LEU	4.0
1	A	367	SER	3.9
1	A	364	ASN	3.8
1	A	467	SER	3.7
1	A	616	VAL	3.7
1	A	340	LYS	3.7
1	A	1027	TRP	3.7
1	A	377	PHE	3.7
1	A	466	GLU	3.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	397	VAL	3.6
1	A	619	LEU	3.6
1	A	365	VAL	3.6
1	A	542	PHE	3.6
1	A	515	LEU	3.5
1	A	329	GLU	3.4
1	A	371	TRP	3.4
1	A	613	LEU	3.4
1	A	396	ALA	3.3
1	A	512	ARG	3.3
1	A	612	LEU	3.3
1	A	529	ASP	3.3
1	A	398	VAL	3.2
1	A	230	GLN	3.2
1	A	615	LEU	3.1
1	A	841	LYS	3.1
1	A	203	PHE	3.1
1	A	472	VAL	3.1
1	A	651	LEU	3.1
1	A	191	LEU	3.1
1	A	322	PRO	3.0
1	A	493	GLU	3.0
1	A	372	LYS	3.0
1	A	332	LYS	3.0
1	A	936	TYR	3.0
1	A	735	LEU	2.9
1	A	342	VAL	2.9
1	A	459	VAL	2.8
1	A	816	LEU	2.8
1	A	643	ILE	2.8
1	A	491	ILE	2.8
1	A	843	ASN	2.8
1	A	187	ASN	2.8
1	A	633	LEU	2.7
1	A	537	GLU	2.7
1	A	609	PHE	2.7
1	A	325	ILE	2.6
1	A	375	LEU	2.6
1	A	189	ALA	2.6
1	A	198	GLY	2.6
1	A	647	LEU	2.5
1	A	225	ALA	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	993	LYS	2.5
1	A	323	PHE	2.5
1	A	824	LEU	2.5
1	A	845	ALA	2.4
1	A	840	ASN	2.4
1	A	227	VAL	2.4
1	A	418	ILE	2.4
1	A	358	VAL	2.4
1	A	253	ASN	2.4
1	A	815	CYS	2.4
1	A	648	PHE	2.3
1	A	109	VAL	2.3
1	A	776	ILE	2.3
1	A	368	GLU	2.3
1	A	517	ARG	2.3
1	A	333	VAL	2.3
1	A	112	LEU	2.3
1	A	327	LEU	2.3
1	A	566	TYR	2.2
1	A	354	LEU	2.2
1	A	484	TYR	2.2
1	A	465	THR	2.2
1	A	328	ILE	2.1
1	A	458	THR	2.1
1	A	513	GLU	2.1
1	A	335	ALA	2.1
1	A	649	TRP	2.1
1	A	483	VAL	2.1
1	A	316	LEU	2.1
1	A	625	LEU	2.1
1	A	374	ARG	2.1
1	A	1024	ARG	2.1
1	A	530	LEU	2.1
1	A	794	ILE	2.1
1	A	417	PRO	2.0
1	A	229	ARG	2.0
1	A	913	GLY	2.0
1	A	200	GLU	2.0
1	A	569	CYS	2.0
1	A	540	GLU	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](#)

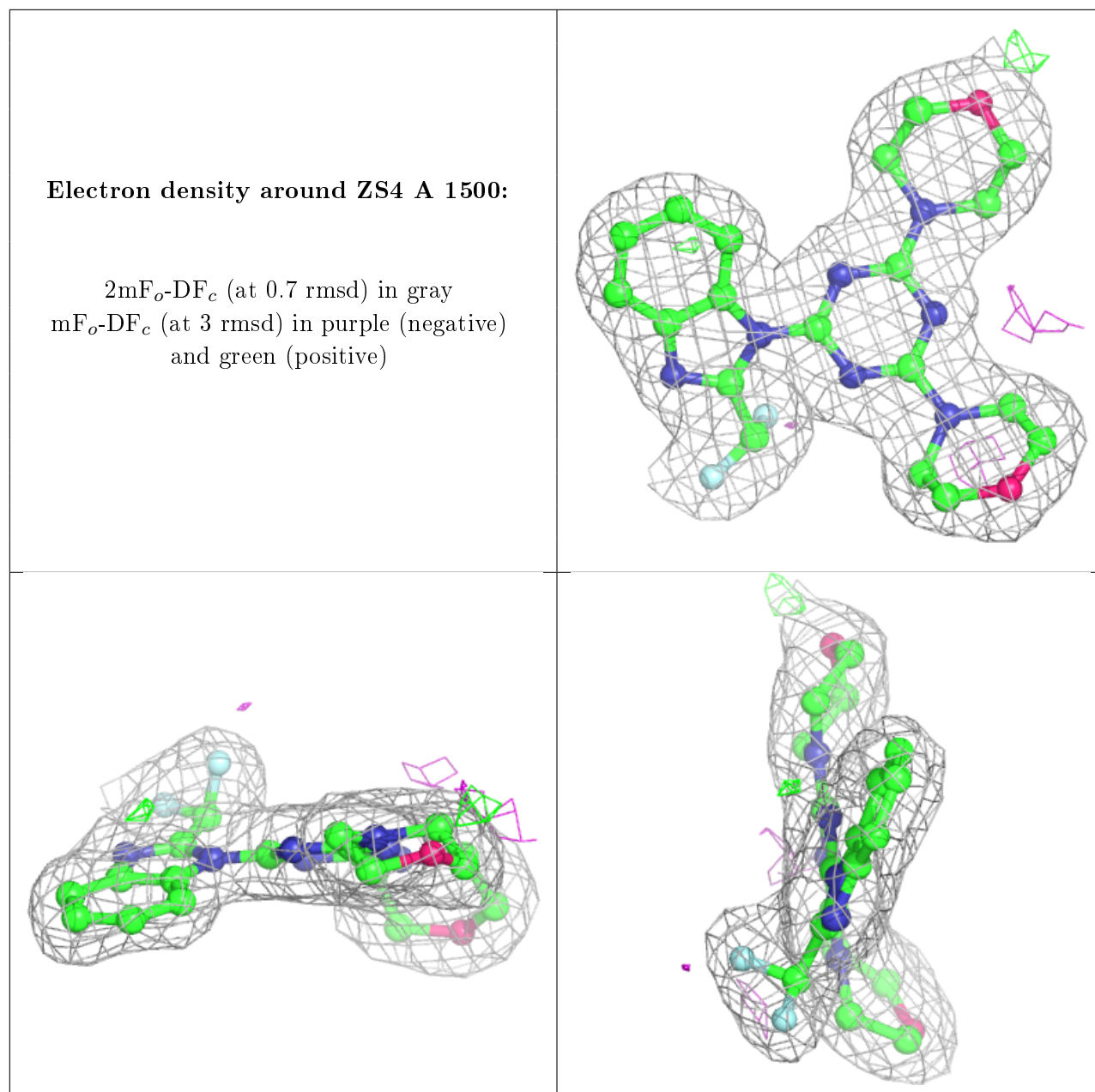
There are no carbohydrates in this entry.

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(\AA^2)	Q<0.9
2	ZS4	A	1500	30/30	0.96	0.12	19,26,34,40	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.