



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 23, 2024 – 01:40 AM EDT

PDB ID : 6DGT
Title : Selective PI3K beta inhibitor bound to PI3K delta
Authors : Somoza, J.; Villasenor, A.; McGrath, M.
Deposited on : 2018-05-18
Resolution : 2.60 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 2.37.1
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) : 2.37.1

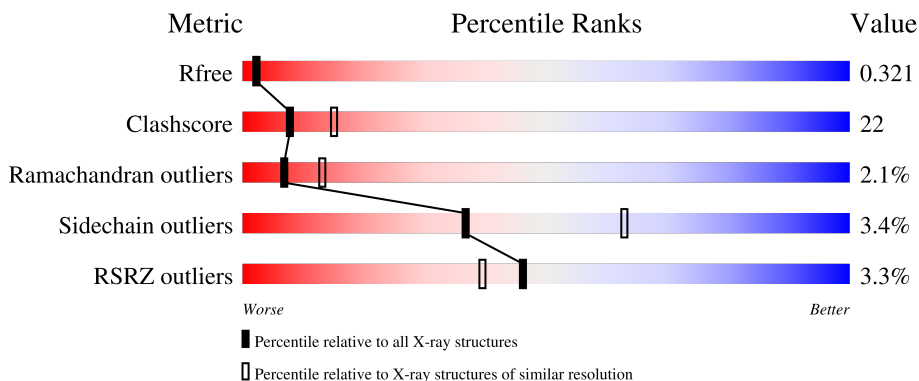
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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	938	

2 Entry composition [i](#)

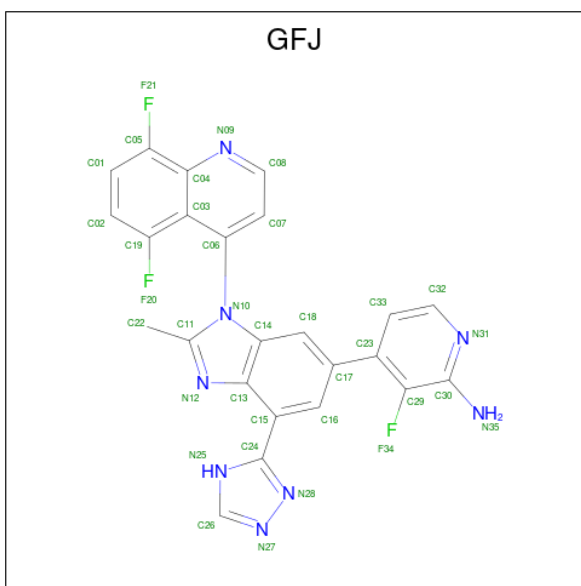
There are 3 unique types of molecules in this entry. The entry contains 6296 atoms, of which 0 are hydrogens and 0 are deuteriums.

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	777	6218	3992	1047	1127	52	0	0	0

- Molecule 2 is 4-[1-(5,8-difluoroquinolin-4-yl)-2-methyl-4-(4H-1,2,4-triazol-3-yl)-1H-benzimidazol-6-yl]-3-fluoropyridin-2-amine (three-letter code: GFJ) (formula: C₂₄H₁₅F₃N₈).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	F	N		
2	A	1	35	24	3	8	0	0

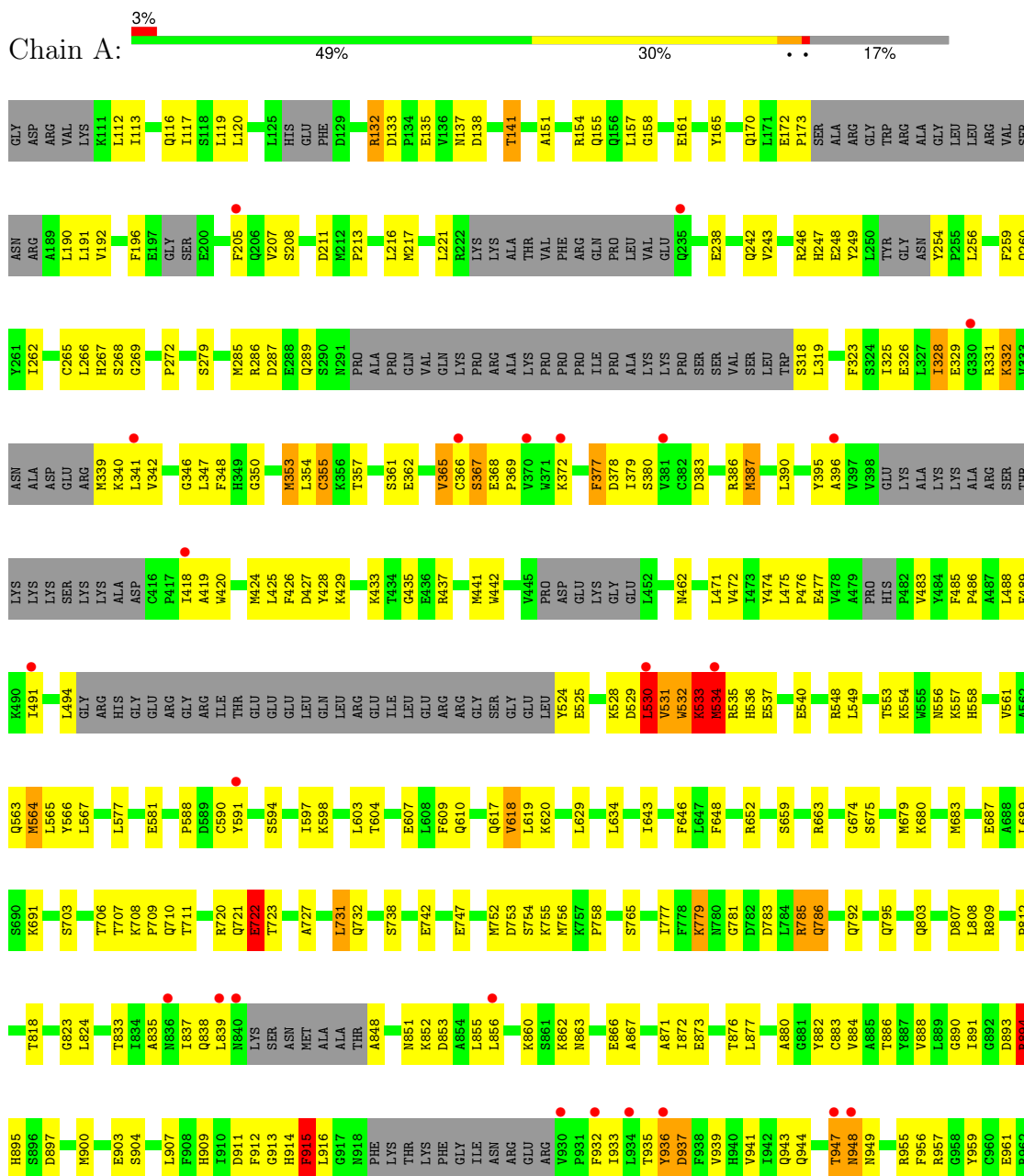
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	43	Total	O	0	0
			43	43		

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: Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit delta isoform



A963	A1003
T964	L1004
T965	G1005
	T1007
R969	E1008
	E1009
L973	E1010
	A1011
H976	L1012
L977	K1013
	H1014
R982	F1015
K993	R1016
D994	V1017
I995	K1018
Q996	E1019
Y997	N1020
I998	E1021
K999	A1022
	L1023
	R1024
	E1025
ASN	SER
ARG	TRP
GLN	LYS
	THR
	LYS
	VAL
	ASN
	TRP
	LEU
	ALA
	HIS
	ASN
	VAL
	SER
	LYS
	ASP

4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 1	Depositor
Cell constants a, b, c, α , β , γ	63.52Å 143.50Å 221.26Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.06 – 2.60 40.06 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.5 (40.06-2.60) 90.5 (40.06-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.24 (at 2.61Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155)	Depositor
R, R_{free}	0.231 , 0.318 0.234 , 0.321	Depositor DCC
R_{free} test set	2000 reflections (6.36%)	wwPDB-VP
Wilson B-factor (Å ²)	50.8	Xtrriage
Anisotropy	0.235	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 50.7	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	0.92	EDS
Total number of atoms	6296	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.39% 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: GFJ

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	0.91	7/6348 (0.1%)	1.01	17/8568 (0.2%)

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	4

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	265	CYS	CB-SG	6.73	1.93	1.82
1	A	477	GLU	CD-OE1	-6.13	1.19	1.25
1	A	675	SER	CB-OG	5.38	1.49	1.42
1	A	936	TYR	CD2-CE2	5.18	1.47	1.39
1	A	722	GLU	CB-CG	5.12	1.61	1.52
1	A	477	GLU	CD-OE2	-5.07	1.20	1.25
1	A	531	VAL	CB-CG1	5.02	1.63	1.52

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	534	MET	CA-CB-CG	12.43	134.43	113.30
1	A	907	LEU	CA-CB-CG	6.66	130.61	115.30
1	A	652	ARG	NE-CZ-NH2	-6.61	116.99	120.30
1	A	663	ARG	NE-CZ-NH2	-6.53	117.03	120.30
1	A	564	MET	CG-SD-CE	-6.48	89.83	100.20
1	A	494	LEU	CA-CB-CG	6.22	129.60	115.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	387	MET	CG-SD-CE	6.03	109.85	100.20
1	A	534	MET	CB-CG-SD	5.82	129.85	112.40
1	A	378	ASP	CB-CG-OD2	-5.81	113.07	118.30
1	A	915	PHE	CB-CG-CD1	5.77	124.84	120.80
1	A	119	LEU	CB-CG-CD1	-5.76	101.21	111.00
1	A	619	LEU	CB-CG-CD1	-5.73	101.25	111.00
1	A	533	LYS	N-CA-CB	-5.60	100.52	110.60
1	A	894	ARG	NE-CZ-NH2	5.40	123.00	120.30
1	A	785	ARG	NE-CZ-NH2	-5.35	117.62	120.30
1	A	663	ARG	NE-CZ-NH1	5.29	122.95	120.30
1	A	779	LYS	CD-CE-NZ	-5.29	99.53	111.70

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	530	LEU	Peptide
1	A	532	TRP	Peptide
1	A	534	MET	Mainchain
1	A	754	SER	Peptide

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	6218	0	6165	270	0
2	A	35	0	0	1	0
3	A	43	0	0	5	0
All	All	6296	0	6165	270	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 22.

All (270) 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:707:THR:HG22	1:A:709:PRO:HD2	1.44	0.96
1:A:355:CYS:SG	1:A:379:ILE:HD11	2.05	0.95
1:A:326:GLU:OE1	1:A:372:LYS:NZ	2.00	0.93
1:A:947:THR:O	1:A:948:ASN:ND2	2.05	0.88
1:A:172:GLU:HG3	1:A:173:PRO:HD3	1.56	0.87
1:A:286:ARG:HG2	1:A:286:ARG:HH11	1.39	0.86
1:A:707:THR:CG2	1:A:709:PRO:HD2	2.05	0.85
1:A:390:LEU:HB2	1:A:425:LEU:HD21	1.58	0.85
1:A:138:ASP:OD2	1:A:428:TYR:OH	1.95	0.84
1:A:286:ARG:NH1	1:A:287:ASP:OD1	2.11	0.83
1:A:533:LYS:HD3	1:A:534:MET:H	1.45	0.81
1:A:367:SER:HB3	1:A:368:GLU:C	2.01	0.81
1:A:387:MET:HE3	1:A:590:CYS:HB3	1.63	0.81
1:A:172:GLU:CG	1:A:173:PRO:HD3	2.12	0.80
1:A:435:GLY:H	1:A:475:LEU:HB2	1.47	0.79
1:A:1014:HIS:O	1:A:1017:VAL:HG22	1.81	0.79
1:A:524:TYR:N	1:A:528:LYS:HZ2	1.81	0.79
1:A:786:GLN:NE2	1:A:914:HIS:O	2.15	0.78
1:A:835:ALA:O	1:A:839:LEU:HD13	1.85	0.76
1:A:961:GLU:HB3	1:A:1012:LEU:HD11	1.67	0.76
1:A:386:ARG:O	1:A:386:ARG:NH1	2.16	0.75
1:A:383:ASP:HB3	1:A:556:ASN:O	1.87	0.75
1:A:530:LEU:HA	1:A:533:LYS:HB2	1.67	0.75
1:A:707:THR:HG22	1:A:709:PRO:CD	2.16	0.75
1:A:192:VAL:HG23	1:A:272:PRO:HB2	1.69	0.74
1:A:524:TYR:N	1:A:528:LYS:NZ	2.36	0.74
1:A:530:LEU:HG	1:A:533:LYS:HG3	1.68	0.74
1:A:706:THR:CG2	1:A:710:GLN:HB2	2.17	0.74
1:A:112:LEU:O	1:A:116:GLN:HG3	1.88	0.73
1:A:419:ALA:HB1	1:A:441:MET:HB3	1.70	0.72
1:A:533:LYS:CD	1:A:534:MET:H	2.03	0.71
1:A:328:ILE:HB	1:A:472:VAL:HG13	1.72	0.71
1:A:703:SER:HA	1:A:711:THR:HG21	1.73	0.71
1:A:383:ASP:OD2	1:A:558:HIS:ND1	2.22	0.70
1:A:533:LYS:HD3	1:A:534:MET:N	2.07	0.69
1:A:706:THR:HG23	1:A:710:GLN:HB2	1.73	0.69
1:A:873:GLU:OE2	1:A:955:ARG:NH2	2.25	0.69
1:A:350:GLY:CA	1:A:588:PRO:HG3	2.23	0.68
1:A:893:ASP:HA	3:A:1203:HOH:O	1.94	0.68
1:A:366:CYS:O	1:A:367:SER:OG	2.07	0.68
1:A:489:GLU:OE2	1:A:489:GLU:N	2.27	0.68
1:A:722:GLU:OE1	3:A:1202:HOH:O	2.10	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:ARG:NH1	1:A:248:GLU:OE1	2.28	0.67
1:A:872:ILE:O	1:A:876:THR:OG1	2.09	0.67
1:A:533:LYS:CG	1:A:534:MET:H	2.07	0.67
1:A:435:GLY:O	1:A:475:LEU:N	2.19	0.67
1:A:424:MET:O	1:A:433:LYS:HE2	1.95	0.67
1:A:437:ARG:NH2	3:A:1201:HOH:O	2.08	0.67
1:A:838:GLN:NE2	1:A:937:ASP:OD2	2.28	0.67
1:A:961:GLU:O	1:A:965:THR:HG23	1.95	0.66
1:A:532:TRP:CE2	1:A:535:ARG:HD2	2.30	0.66
1:A:286:ARG:HG2	1:A:286:ARG:NH1	2.04	0.66
1:A:319:LEU:HD11	1:A:483:VAL:HG21	1.78	0.65
1:A:679:MET:HG2	1:A:683:MET:CE	2.27	0.65
1:A:707:THR:HB	1:A:710:GLN:HG3	1.79	0.64
1:A:367:SER:HB3	1:A:369:PRO:N	2.13	0.63
1:A:532:TRP:O	1:A:535:ARG:HG3	1.97	0.63
1:A:350:GLY:N	1:A:588:PRO:HG3	2.14	0.63
1:A:955:ARG:NE	1:A:959:TYR:OH	2.32	0.63
1:A:722:GLU:HG3	1:A:723:THR:H	1.63	0.63
1:A:285:MET:O	1:A:289:GLN:HG3	1.99	0.62
1:A:528:LYS:H	1:A:528:LYS:HD2	1.64	0.61
1:A:531:VAL:HA	1:A:533:LYS:HD2	1.82	0.61
1:A:891:ILE:HG22	1:A:894:ARG:HD2	1.83	0.61
1:A:912:PHE:O	1:A:914:HIS:N	2.32	0.60
1:A:207:VAL:HG11	1:A:216:LEU:HD13	1.82	0.60
1:A:530:LEU:HA	1:A:533:LYS:CB	2.31	0.59
1:A:158:GLY:N	1:A:161:GLU:OE2	2.29	0.59
1:A:533:LYS:HD3	1:A:534:MET:HB2	1.84	0.59
1:A:529:ASP:O	1:A:533:LYS:HB2	2.03	0.59
1:A:957:ARG:NH2	1:A:1020:ASN:OD1	2.36	0.59
1:A:594:SER:O	1:A:598:LYS:HG2	2.03	0.59
1:A:387:MET:CE	1:A:590:CYS:HB3	2.33	0.58
1:A:213:PRO:O	1:A:217:MET:HG3	2.03	0.57
1:A:347:LEU:CD2	1:A:390:LEU:HG	2.34	0.57
1:A:331:ARG:C	1:A:332:LYS:HD2	2.25	0.57
1:A:151:ALA:HB2	1:A:674:GLY:O	2.05	0.57
1:A:679:MET:HG2	1:A:683:MET:HE2	1.85	0.57
1:A:208:SER:HB3	1:A:211:ASP:OD2	2.05	0.57
1:A:435:GLY:N	1:A:475:LEU:HB2	2.20	0.56
1:A:530:LEU:HA	1:A:533:LYS:HG3	1.86	0.56
1:A:525:GLU:HA	1:A:528:LYS:HD3	1.88	0.56
1:A:549:LEU:HG	1:A:564:MET:HE1	1.88	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:706:THR:HG22	1:A:707:THR:O	2.06	0.55
1:A:915:PHE:HD1	1:A:915:PHE:C	2.09	0.55
1:A:996:GLN:HE22	1:A:999:LYS:HD3	1.72	0.55
1:A:318:SER:O	1:A:319:LEU:HD23	2.06	0.54
1:A:323:PHE:HD2	1:A:377:PHE:CD1	2.25	0.54
1:A:426:PHE:CE2	1:A:485:PHE:HB2	2.43	0.54
1:A:866:GLU:HG2	1:A:867:ALA:N	2.23	0.54
1:A:915:PHE:C	1:A:915:PHE:CD1	2.80	0.54
1:A:173:PRO:HB3	1:A:803:GLN:OE1	2.08	0.54
1:A:1023:LEU:HD12	1:A:1023:LEU:O	2.07	0.54
1:A:617:GLN:OE1	1:A:620:LYS:NZ	2.37	0.54
1:A:856:LEU:O	1:A:860:LYS:HG3	2.07	0.54
1:A:238:GLU:OE2	1:A:279:SER:OG	2.23	0.54
1:A:154:ARG:O	1:A:157:LEU:HG	2.07	0.53
1:A:916:LEU:HD22	1:A:997:TYR:HB3	1.90	0.53
1:A:353:MET:HE3	1:A:357:THR:HG22	1.89	0.53
1:A:340:LYS:HB3	1:A:362:GLU:HB3	1.89	0.53
1:A:530:LEU:CA	1:A:533:LYS:HG3	2.39	0.53
1:A:530:LEU:O	1:A:533:LYS:HE2	2.09	0.52
1:A:549:LEU:HG	1:A:564:MET:CE	2.39	0.52
1:A:783:ASP:OD2	1:A:785:ARG:HD3	2.09	0.52
1:A:691:LYS:HG3	1:A:727:ALA:CB	2.40	0.52
1:A:969:ARG:HH12	1:A:1008:GLU:CD	2.12	0.52
1:A:396:ALA:HB2	1:A:418:ILE:HD11	1.90	0.52
1:A:886:THR:OG1	1:A:933:ILE:HD11	2.09	0.52
1:A:533:LYS:HG2	1:A:534:MET:H	1.75	0.52
1:A:1016:ARG:O	1:A:1020:ASN:ND2	2.39	0.52
1:A:329:GLU:O	1:A:472:VAL:HG12	2.10	0.52
1:A:679:MET:HG2	1:A:683:MET:HE3	1.92	0.51
1:A:795:GLN:NE2	1:A:812:PRO:HG3	2.25	0.51
1:A:427:ASP:OD1	1:A:429:LYS:N	2.39	0.51
1:A:365:VAL:HG12	1:A:366:CYS:N	2.26	0.51
1:A:603:LEU:HD22	1:A:607:GLU:HB3	1.93	0.51
1:A:325:ILE:HA	1:A:476:PRO:HD2	1.93	0.51
1:A:339:MET:C	1:A:365:VAL:HG23	2.31	0.51
1:A:346:GLY:C	1:A:347:LEU:HD23	2.31	0.51
1:A:807:ASP:OD1	1:A:809:ARG:N	2.34	0.51
1:A:339:MET:O	1:A:365:VAL:HG23	2.09	0.50
1:A:1006:LYS:HD3	1:A:1006:LYS:N	2.26	0.50
1:A:818:THR:OG1	1:A:823:GLY:HA2	2.10	0.50
1:A:882:TYR:O	1:A:886:THR:HG23	2.12	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:488:LEU:HD13	1:A:591:TYR:CZ	2.46	0.50
1:A:536:HIS:O	1:A:540:GLU:HG3	2.11	0.50
1:A:268:SER:O	1:A:268:SER:OG	2.30	0.50
1:A:609:PHE:HE1	1:A:646:PHE:CD2	2.30	0.49
1:A:937:ASP:O	1:A:941:VAL:HG23	2.11	0.49
1:A:534:MET:HB3	1:A:537:GLU:HB2	1.94	0.49
1:A:577:LEU:HD11	1:A:973:LEU:HA	1.93	0.49
1:A:758:PRO:HB3	1:A:779:LYS:HG2	1.95	0.49
1:A:137:ASN:O	1:A:141:THR:HG23	2.12	0.49
1:A:213:PRO:HD3	1:A:254:TYR:O	2.13	0.49
1:A:341:LEU:CD1	1:A:369:PRO:HG3	2.43	0.49
1:A:618:VAL:HG12	1:A:629:LEU:CD2	2.43	0.49
1:A:135:GLU:HG3	1:A:428:TYR:CG	2.48	0.48
1:A:531:VAL:CA	1:A:533:LYS:HD2	2.43	0.48
1:A:331:ARG:HA	1:A:368:GLU:HA	1.96	0.48
1:A:932:PHE:HD1	1:A:1022:ALA:HB3	1.77	0.48
1:A:1012:LEU:CD2	1:A:1016:ARG:CZ	2.91	0.48
1:A:173:PRO:HB2	1:A:803:GLN:HG2	1.95	0.48
1:A:205:PHE:CD1	1:A:205:PHE:N	2.79	0.48
1:A:561:VAL:O	1:A:565:LEU:HB2	2.13	0.48
1:A:1004:LEU:HD23	1:A:1004:LEU:HA	1.69	0.48
1:A:947:THR:C	1:A:948:ASN:HD22	2.09	0.48
1:A:848:ALA:HB1	1:A:853:ASP:HB2	1.95	0.48
1:A:116:GLN:HB3	1:A:683:MET:CE	2.44	0.48
1:A:689:LEU:HD21	1:A:824:LEU:HD11	1.94	0.48
1:A:943:GLN:OE1	1:A:949:ASN:N	2.33	0.48
1:A:742:GLU:HG3	1:A:765:SER:HB2	1.95	0.47
1:A:969:ARG:NH1	1:A:1008:GLU:OE1	2.45	0.47
1:A:154:ARG:HD3	1:A:165:TYR:CE2	2.49	0.47
1:A:441:MET:CE	1:A:471:LEU:HB2	2.44	0.47
1:A:420:TRP:CE2	1:A:442:TRP:HB2	2.50	0.47
1:A:113:ILE:O	1:A:117:ILE:HG13	2.14	0.47
1:A:488:LEU:O	1:A:491:ILE:HG22	2.15	0.47
1:A:173:PRO:CB	1:A:803:GLN:HG2	2.45	0.47
1:A:221:LEU:HD23	1:A:221:LEU:HA	1.64	0.47
1:A:489:GLU:N	1:A:489:GLU:CD	2.67	0.47
1:A:286:ARG:HH11	1:A:286:ARG:CG	2.19	0.47
1:A:533:LYS:CG	1:A:534:MET:N	2.76	0.47
1:A:937:ASP:OD1	1:A:937:ASP:N	2.37	0.47
1:A:151:ALA:O	1:A:155:GLN:HG2	2.15	0.46
1:A:731:LEU:HD12	1:A:732:GLN:O	2.15	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:833:THR:HG22	1:A:900:MET:HG2	1.97	0.46
1:A:993:LYS:N	1:A:993:LYS:HD3	2.31	0.46
1:A:256:LEU:HA	1:A:259:PHE:HD2	1.81	0.46
1:A:863:ASN:ND2	1:A:871:ALA:HB2	2.31	0.46
1:A:346:GLY:O	1:A:347:LEU:HD23	2.15	0.46
1:A:535:ARG:HB3	1:A:567:LEU:HD11	1.98	0.46
1:A:756:MET:HG3	1:A:781:GLY:HA3	1.96	0.46
1:A:837:ILE:HG21	1:A:855:LEU:HD12	1.97	0.46
1:A:783:ASP:OD1	1:A:785:ARG:HD3	2.16	0.46
1:A:329:GLU:HG2	1:A:472:VAL:CG1	2.46	0.46
1:A:862:LYS:HD3	1:A:903:GLU:HG2	1.97	0.46
1:A:553:THR:OG1	1:A:564:MET:HE2	2.16	0.46
1:A:366:CYS:O	1:A:367:SER:CB	2.63	0.46
1:A:914:HIS:O	1:A:915:PHE:CG	2.69	0.46
1:A:721:GLN:HB3	1:A:722:GLU:HG3	1.97	0.45
1:A:895:HIS:CE1	1:A:897:ASP:HB2	2.50	0.45
1:A:286:ARG:CZ	1:A:287:ASP:OD1	2.64	0.45
1:A:379:ILE:HG22	1:A:380:SER:O	2.16	0.45
1:A:442:TRP:CZ2	1:A:462:ASN:HA	2.51	0.45
1:A:554:LYS:HG3	1:A:557:LYS:NZ	2.31	0.45
1:A:982:ARG:HD2	1:A:995:ILE:HD12	1.98	0.45
1:A:534:MET:HG3	1:A:537:GLU:HG2	1.98	0.45
1:A:355:CYS:HB3	1:A:379:ILE:HG13	1.99	0.45
1:A:643:ILE:HG23	1:A:643:ILE:HD12	1.78	0.45
1:A:1012:LEU:HD23	1:A:1016:ARG:CZ	2.47	0.45
1:A:157:LEU:HB3	1:A:161:GLU:HB2	1.99	0.44
1:A:880:ALA:O	1:A:884:VAL:HG23	2.16	0.44
1:A:886:THR:HG21	1:A:909:HIS:CE1	2.52	0.44
1:A:957:ARG:O	1:A:957:ARG:HG2	2.16	0.44
1:A:532:TRP:O	1:A:535:ARG:CG	2.65	0.44
1:A:893:ASP:OD1	3:A:1203:HOH:O	2.21	0.44
1:A:196:PHE:HZ	1:A:221:LEU:HD23	1.83	0.44
1:A:347:LEU:HD23	1:A:347:LEU:N	2.31	0.44
1:A:531:VAL:C	1:A:533:LYS:HB3	2.37	0.44
1:A:563:GLN:O	1:A:566:TYR:HB3	2.17	0.44
1:A:1007:THR:CG2	1:A:1010:GLU:H	2.30	0.44
1:A:890:GLY:O	1:A:915:PHE:HA	2.18	0.44
1:A:1021:GLU:O	1:A:1024:ARG:HG2	2.17	0.44
1:A:530:LEU:HG	1:A:533:LYS:HE2	1.98	0.44
1:A:884:VAL:O	1:A:888:VAL:HG23	2.17	0.44
1:A:973:LEU:O	1:A:977:LEU:HG	2.18	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:581:GLU:HB2	1:A:976:HIS:CD2	2.53	0.44
1:A:1013:LYS:O	1:A:1017:VAL:HG13	2.18	0.43
1:A:120:LEU:HD21	1:A:648:PHE:CE1	2.52	0.43
1:A:969:ARG:NH1	1:A:1008:GLU:OE2	2.51	0.43
1:A:259:PHE:O	1:A:262:ILE:N	2.49	0.43
1:A:808:LEU:HA	1:A:877:LEU:HB3	1.99	0.43
1:A:1009:GLU:O	1:A:1013:LYS:HG2	2.19	0.43
1:A:347:LEU:HD21	1:A:390:LEU:HG	1.99	0.43
1:A:354:LEU:HB3	1:A:556:ASN:HB3	2.00	0.43
1:A:680:LYS:HA	1:A:683:MET:HE3	2.00	0.43
1:A:752:MET:SD	2:A:1101:GFJ:C08	3.07	0.43
1:A:824:LEU:HD23	1:A:824:LEU:HA	1.82	0.43
1:A:133:ASP:C	1:A:133:ASP:OD1	2.57	0.43
1:A:170:GLN:O	3:A:1204:HOH:O	2.21	0.43
1:A:554:LYS:HG3	1:A:557:LYS:HZ3	1.83	0.43
1:A:172:GLU:OE1	1:A:173:PRO:HD3	2.19	0.43
1:A:706:THR:CG2	1:A:707:THR:N	2.82	0.43
1:A:525:GLU:HA	1:A:528:LYS:CD	2.49	0.43
1:A:1010:GLU:HA	1:A:1013:LYS:HE3	2.00	0.43
1:A:530:LEU:HA	1:A:533:LYS:CG	2.47	0.43
1:A:708:LYS:HD3	1:A:753:ASP:HB2	2.01	0.43
1:A:852:LYS:HD3	1:A:936:TYR:HE2	1.84	0.43
1:A:871:ALA:HA	1:A:904:SER:O	2.19	0.42
1:A:683:MET:O	1:A:687:GLU:HG3	2.19	0.42
1:A:807:ASP:OD1	1:A:807:ASP:C	2.55	0.42
1:A:939:VAL:O	1:A:943:GLN:HG3	2.19	0.42
1:A:348:PHE:HA	1:A:353:MET:HA	2.02	0.42
1:A:530:LEU:HG	1:A:533:LYS:CE	2.49	0.42
1:A:856:LEU:HA	1:A:856:LEU:HD12	1.63	0.42
1:A:856:LEU:HD13	1:A:941:VAL:HG13	2.02	0.42
1:A:944:GLN:HE21	1:A:944:GLN:HB2	1.62	0.42
1:A:340:LYS:HD2	1:A:362:GLU:O	2.18	0.42
1:A:353:MET:CE	1:A:357:THR:HG22	2.50	0.42
1:A:783:ASP:CG	1:A:785:ARG:HD3	2.40	0.42
1:A:634:LEU:HD23	1:A:634:LEU:HA	1.83	0.42
1:A:777:ILE:HG21	1:A:777:ILE:HD13	1.84	0.42
1:A:955:ARG:HG3	1:A:956:PHE:N	2.35	0.42
1:A:996:GLN:NE2	1:A:999:LYS:HD3	2.35	0.42
1:A:342:VAL:HG11	1:A:395:TYR:OH	2.20	0.41
1:A:610:GLN:O	1:A:792:GLN:NE2	2.53	0.41
1:A:247:HIS:HB2	1:A:738:SER:HA	2.02	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:329:GLU:HB2	1:A:369:PRO:O	2.19	0.41
1:A:474:TYR:O	1:A:476:PRO:HD3	2.20	0.41
1:A:485:PHE:CD2	1:A:486:PRO:HD2	2.55	0.41
1:A:533:LYS:CD	1:A:534:MET:N	2.74	0.41
1:A:720:ARG:NH2	1:A:747:GLU:OE2	2.54	0.41
1:A:191:LEU:O	1:A:272:PRO:HD2	2.21	0.41
1:A:883:CYS:HB3	1:A:932:PHE:CE2	2.56	0.41
1:A:530:LEU:HG	1:A:533:LYS:HZ3	1.86	0.41
1:A:722:GLU:OE1	1:A:723:THR:HG23	2.21	0.41
1:A:1007:THR:HG22	1:A:1010:GLU:CB	2.51	0.41
1:A:884:VAL:HG21	1:A:963:ALA:HB3	2.02	0.41
1:A:377:PHE:HB2	1:A:379:ILE:CD1	2.51	0.41
1:A:433:LYS:O	1:A:475:LEU:HD13	2.21	0.41
1:A:242:GLN:HB2	1:A:249:TYR:CE2	2.56	0.41
1:A:323:PHE:HD2	1:A:377:PHE:HD1	1.66	0.41
1:A:643:ILE:HA	1:A:643:ILE:HD13	1.88	0.41
1:A:604:THR:HG23	1:A:607:GLU:OE1	2.19	0.40
1:A:1010:GLU:HA	1:A:1013:LYS:HG2	2.03	0.40
1:A:597:ILE:HD11	1:A:629:LEU:HD13	2.03	0.40
1:A:242:GLN:HG2	1:A:243:VAL:N	2.36	0.40
1:A:597:ILE:HD13	1:A:597:ILE:HA	1.84	0.40
1:A:1018:LYS:O	1:A:1021:GLU:HB3	2.22	0.40
1:A:707:THR:O	1:A:711:THR:HG23	2.21	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	749/938 (80%)	683 (91%)	50 (7%)	16 (2%)	7 13

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	267	HIS
1	A	367	SER
1	A	722	GLU
1	A	755	LYS
1	A	947	THR
1	A	132	ARG
1	A	260	GLN
1	A	328	ILE
1	A	365	VAL
1	A	911	ASP
1	A	1024	ARG
1	A	266	LEU
1	A	355	CYS
1	A	1003	ALA
1	A	269	GLY
1	A	913	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	678/826 (82%)	655 (97%)	23 (3%)	37 63

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	132	ARG
1	A	141	THR
1	A	190	LEU
1	A	332	LYS
1	A	353	MET
1	A	361	SER
1	A	377	PHE
1	A	530	LEU
1	A	533	LYS
1	A	534	MET
1	A	548	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	618	VAL
1	A	659	SER
1	A	731	LEU
1	A	786	GLN
1	A	851	ASN
1	A	894	ARG
1	A	915	PHE
1	A	935	THR
1	A	937	ASP
1	A	948	ASN
1	A	993	LYS
1	A	1012	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	344	GLN
1	A	795	GLN
1	A	940	HIS
1	A	944	GLN
1	A	976	HIS

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 monosaccharides 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	GFJ	A	1101	-	37,40,40	1.69	9 (24%)	43,60,60	3.48	17 (39%)

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	GFJ	A	1101	-	-	4/12/12/12	0/6/6/6

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1101	GFJ	C06-N10	-5.09	1.39	1.45
2	A	1101	GFJ	C04-N09	-2.95	1.33	1.37
2	A	1101	GFJ	C30-C29	-2.78	1.37	1.40
2	A	1101	GFJ	C15-C13	-2.63	1.38	1.43
2	A	1101	GFJ	C23-C17	-2.54	1.44	1.49
2	A	1101	GFJ	C01-C05	2.31	1.39	1.36
2	A	1101	GFJ	C11-N10	2.13	1.40	1.37
2	A	1101	GFJ	C05-C04	-2.09	1.40	1.41
2	A	1101	GFJ	C30-N35	2.04	1.39	1.34

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1101	GFJ	F21-C05-C04	13.61	123.02	117.37
2	A	1101	GFJ	C26-N25-C24	10.07	105.32	101.63
2	A	1101	GFJ	N25-C24-N28	-6.91	108.99	114.72
2	A	1101	GFJ	C17-C18-C14	-6.15	115.41	121.81
2	A	1101	GFJ	C29-C30-N35	-6.01	116.85	121.32
2	A	1101	GFJ	C18-C14-C13	5.23	125.50	120.55
2	A	1101	GFJ	C07-C06-C03	3.09	123.90	119.64
2	A	1101	GFJ	C08-N09-C04	2.73	120.52	117.31

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1101	GFJ	C05-C04-N09	2.63	121.64	119.39
2	A	1101	GFJ	C08-C07-C06	-2.48	112.68	118.01
2	A	1101	GFJ	F20-C19-C03	2.22	120.48	118.46
2	A	1101	GFJ	F21-C05-C01	-2.14	115.00	118.49
2	A	1101	GFJ	C01-C05-C04	-2.09	121.97	123.17
2	A	1101	GFJ	C24-C15-C13	-2.06	120.92	123.35
2	A	1101	GFJ	C14-C13-N12	2.05	112.37	107.99
2	A	1101	GFJ	F20-C19-C02	-2.03	115.17	118.49
2	A	1101	GFJ	N35-C30-N31	2.00	122.84	118.38

There are no chirality outliers.

All (4) torsion outliers are listed below:

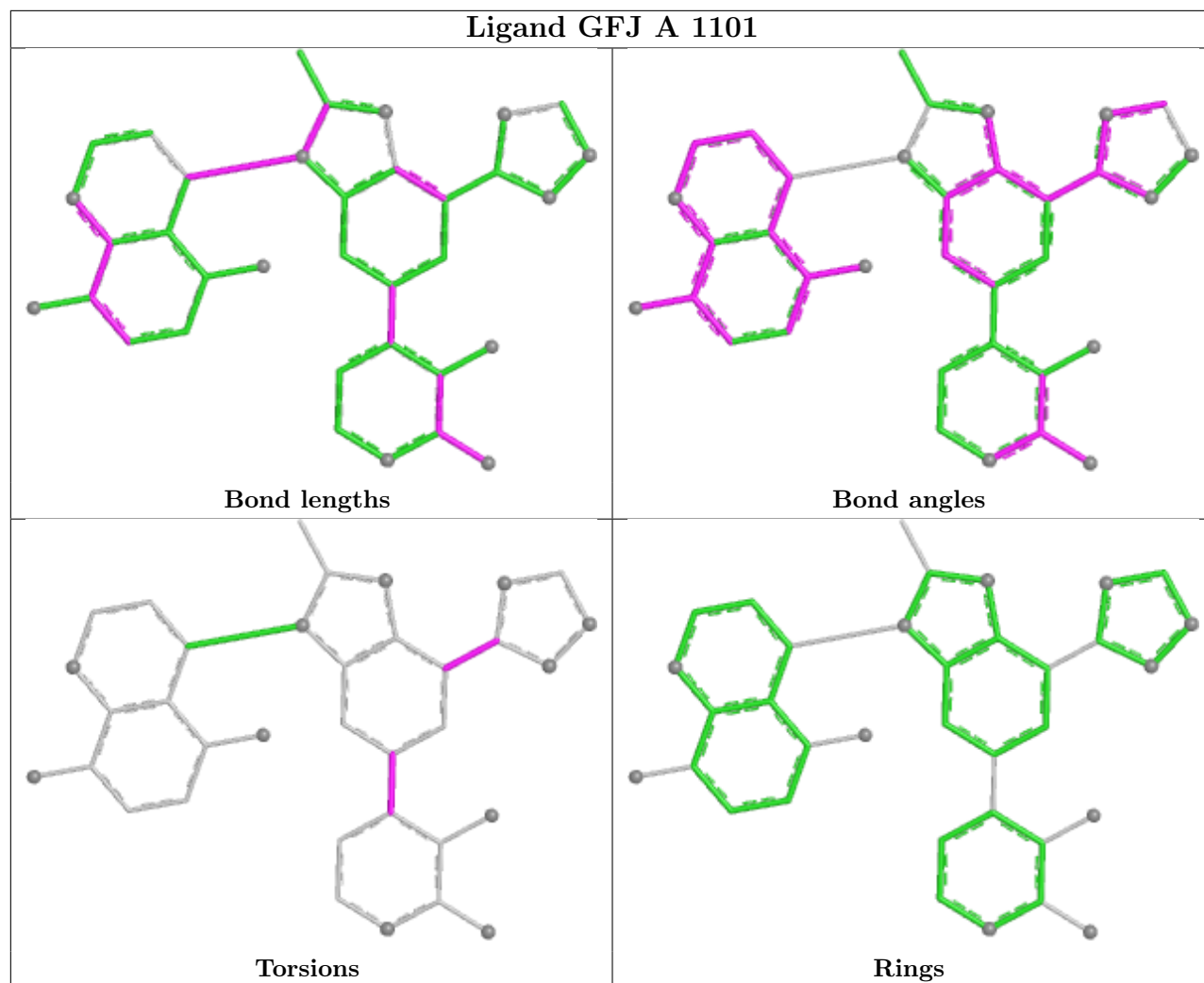
Mol	Chain	Res	Type	Atoms
2	A	1101	GFJ	C16-C15-C24-N25
2	A	1101	GFJ	C16-C17-C23-C33
2	A	1101	GFJ	C18-C17-C23-C33
2	A	1101	GFJ	C16-C15-C24-N28

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1101	GFJ	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	777/938 (82%)	0.05	26 (3%) 46 39	39, 62, 84, 104	1 (0%)

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	836	ASN	4.8
1	A	839	LEU	4.3
1	A	366	CYS	4.1
1	A	947	THR	3.8
1	A	341	LEU	3.3
1	A	330	GLY	3.2
1	A	396	ALA	3.1
1	A	1006	LYS	2.9
1	A	934	LEU	2.9
1	A	856	LEU	2.8
1	A	840	ASN	2.8
1	A	370	VAL	2.8
1	A	948	ASN	2.8
1	A	932	PHE	2.7
1	A	491	ILE	2.7
1	A	591	TYR	2.6
1	A	930	VAL	2.4
1	A	1005	GLY	2.3
1	A	235	GLN	2.3
1	A	418	ILE	2.3
1	A	534	MET	2.2
1	A	372	LYS	2.1
1	A	936	TYR	2.1
1	A	205	PHE	2.1
1	A	530	LEU	2.0
1	A	381	VAL	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](#)

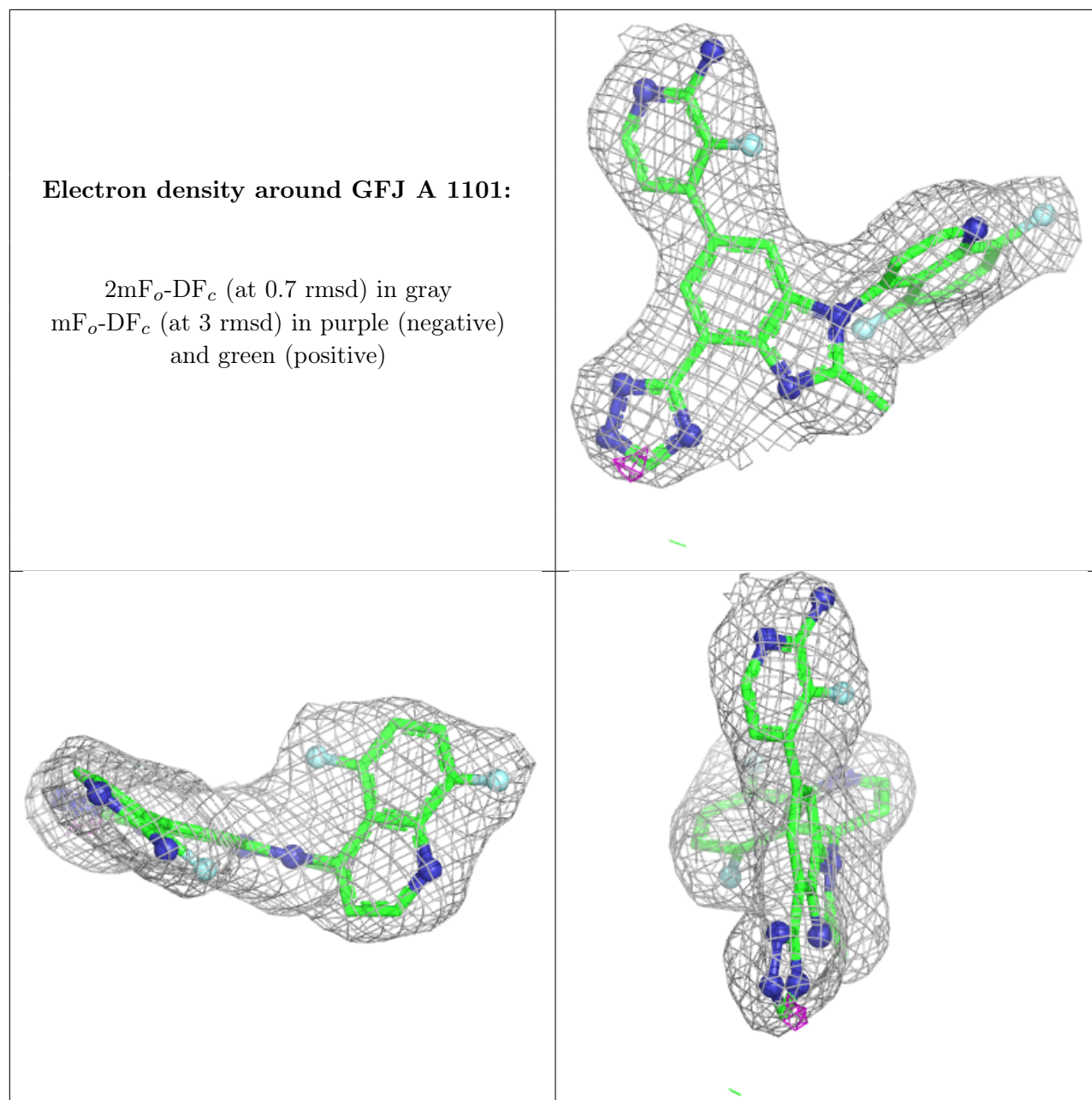
There are no monosaccharides in this entry.

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	GFJ	A	1101	35/35	0.96	0.15	47,52,58,60	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.