Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2022 – 03:12 pm GMT

PDB ID	:	7QAV
Title	:	Crystal structure of PqsR (MvfR) ligand-binding domain in complex with compound N-((2-(4-cyclopropylphenyl)thiazol-5-yl)methyl)-2-(trifluoromethyl)pyridin-4-amine
Authors	:	Schmelz, S.; Blankenfeldt, W.
Deposited on	:	2021-11-17
Resolution	:	2.65 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:

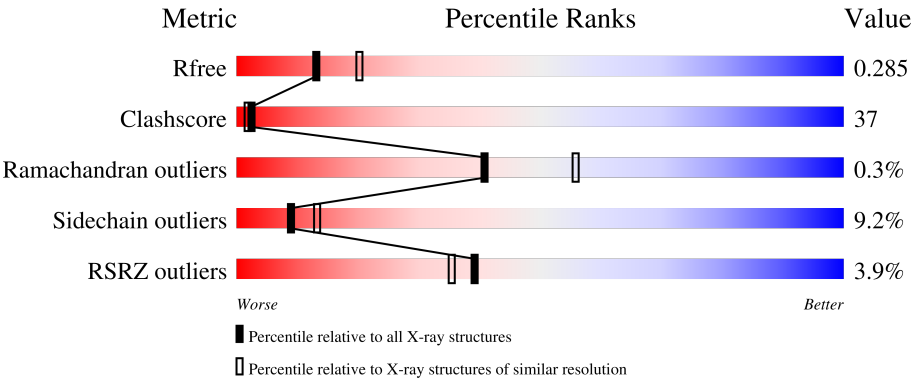
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.31.3
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.65 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	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

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 <=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	332	3% 31% 24% 6% 39%
1	B	332	2% 33% 24% 5% 39%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 6104 atoms, of which 2977 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.

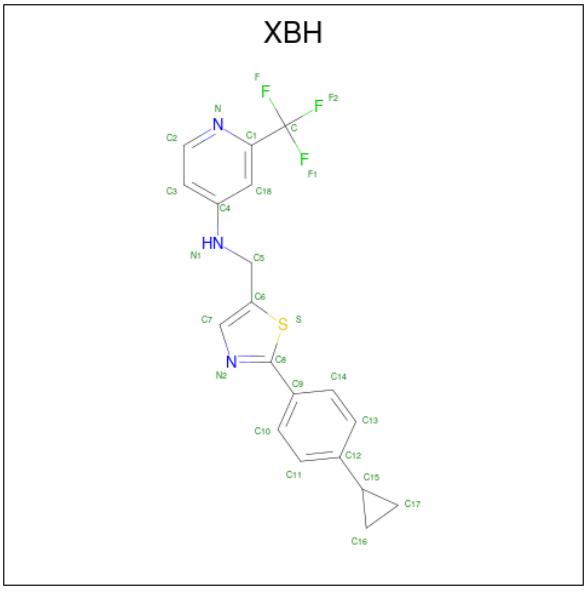
- Molecule 1 is a protein called Multiple virulence factor regulator MvfR.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	203	Total	C	H	N	O	S	0	0	0
			3041	983	1493	258	301	6			
1	B	203	Total	C	H	N	O	S	0	0	0
			2969	964	1452	256	291	6			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	294	GLN	GLU	conflict	UNP Q9I4X0
B	294	GLN	GLU	conflict	UNP Q9I4X0

- Molecule 2 is {N}-[[2-(4-cyclopropylphenyl)-1,3-thiazol-5-yl]methyl]-2-(trifluoromethyl)pyridin-4-amine (three-letter code: XBH) (formula: $C_{19}H_{16}F_3N_3S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	F	H	N	S	0	0
			42	19	3	16	3	1		
2	B	1	Total	C	F	H	N	S	0	0
			42	19	3	16	3	1		

- Molecule 3 is water.

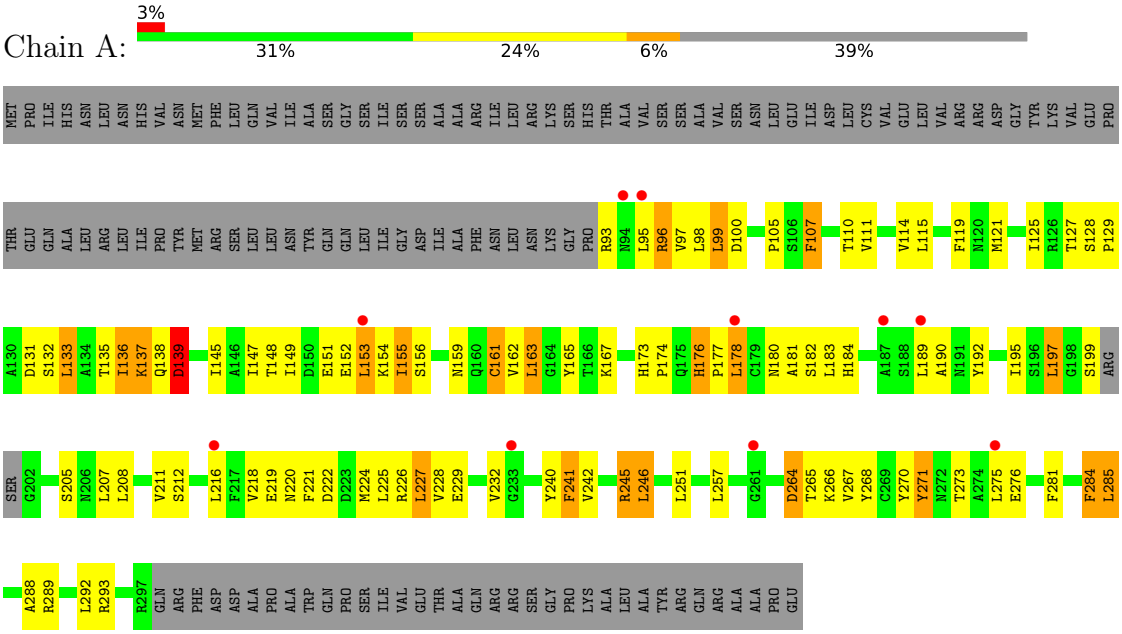
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	7	Total	O	0	0
			7	7		
3	B	3	Total	O	0	0
			3	3		

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.

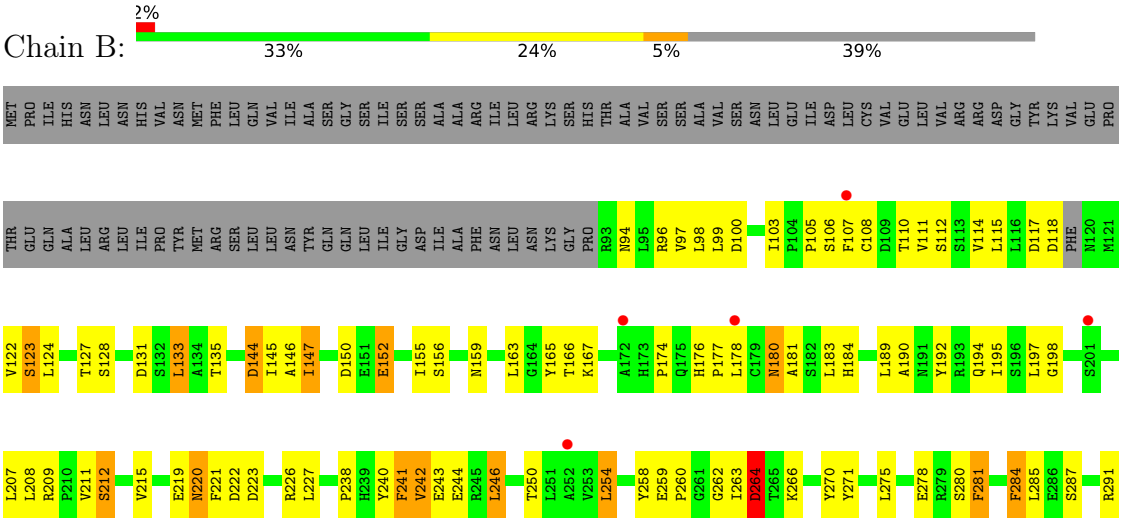
• Molecule 1: Multiple virulence factor regulator MvfR

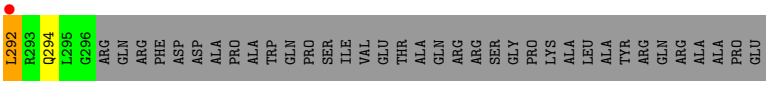
Chain A:



• Molecule 1: Multiple virulence factor regulator MvfR

Chain B:




L292
R293
Q294
L295
G296
ARG
GLN
ARG
PHE
ASP
ASP
ALA
PRO
ALA
TRP
GLN
PRO
SER
ILE
VAL
GLU
THR
ALA
GLN
ARG
ARG
SER
GLY
PRO
LYS
ALA
LEU
ALA
TYR
ARG
GLN
ARG
ALA
ALA
PRO
GLU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	108.73Å 121.15Å 112.11Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	53.29 – 2.65 80.92 – 2.65	Depositor EDS
% Data completeness (in resolution range)	48.5 (53.29-2.65) 45.0 (80.92-2.65)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.39 (at 2.65Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.248 , 0.287 0.247 , 0.285	Depositor DCC
R_{free} test set	512 reflections (4.82%)	wwPDB-VP
Wilson B-factor (Å^2)	48.5	Xtriage
Anisotropy	0.245	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.85	EDS
Total number of atoms	6104	wwPDB-VP
Average B, all atoms (Å^2)	68.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.96% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: XBH

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	0.64	1/1576 (0.1%)	1.23	18/2147 (0.8%)
1	B	0.62	0/1544	1.27	12/2105 (0.6%)
All	All	0.63	1/3120 (0.0%)	1.25	30/4252 (0.7%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	226	ARG	CB-CG	5.74	1.68	1.52

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	264	ASP	CB-CG-OD2	18.73	135.16	118.30
1	B	264	ASP	CB-CG-OD1	-14.56	105.20	118.30
1	B	246	LEU	CB-CG-CD2	-8.13	97.17	111.00
1	A	226	ARG	CG-CD-NE	-8.03	94.94	111.80
1	B	241	PHE	CB-CG-CD1	-7.67	115.43	120.80
1	A	136	ILE	CG1-CB-CG2	-7.28	95.39	111.40
1	A	226	ARG	CB-CG-CD	-7.22	92.83	111.60
1	B	163	LEU	CB-CG-CD2	7.08	123.03	111.00
1	B	133	LEU	CB-CG-CD2	6.88	122.69	111.00
1	A	107	PHE	CB-CG-CD2	-6.58	116.20	120.80
1	B	147	ILE	CG1-CB-CG2	-6.50	97.11	111.40
1	B	241	PHE	CB-CG-CD2	6.26	125.18	120.80
1	A	99	LEU	CB-CG-CD1	6.12	121.40	111.00
1	A	107	PHE	CB-CG-CD1	6.05	125.04	120.80
1	A	155	ILE	CG1-CB-CG2	-5.96	98.28	111.40
1	A	285	LEU	CB-CG-CD2	-5.92	100.94	111.00
1	B	219	GLU	CB-CA-C	-5.84	98.71	110.40
1	B	292	LEU	CA-CB-CG	5.79	128.63	115.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	178	LEU	CA-CB-CG	5.74	128.50	115.30
1	A	163	LEU	CB-CG-CD2	-5.72	101.27	111.00
1	B	246	LEU	CB-CG-CD1	5.58	120.49	111.00
1	A	99	LEU	CB-CG-CD2	-5.58	101.51	111.00
1	A	271	TYR	CB-CG-CD1	-5.54	117.68	121.00
1	A	197	LEU	CB-CG-CD1	-5.52	101.61	111.00
1	A	137	LYS	CG-CD-CE	-5.36	95.82	111.90
1	B	220	ASN	N-CA-CB	-5.32	101.03	110.60
1	A	133	LEU	CB-CG-CD2	-5.26	102.05	111.00
1	A	139	ASP	N-CA-CB	-5.22	101.20	110.60
1	A	226	ARG	CD-NE-CZ	5.15	130.81	123.60
1	A	227	LEU	CB-CG-CD2	5.09	119.66	111.00

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	1548	1493	1493	108	0
1	B	1517	1452	1450	120	0
2	A	26	16	0	0	0
2	B	26	16	0	2	0
3	A	7	0	0	2	0
3	B	3	0	0	2	0
All	All	3127	2977	2943	227	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 37.

All (227) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:178:LEU:HD13	1:B:189:LEU:HD22	1.38	1.02
1:A:190:ALA:O	3:A:501:HOH:O	1.85	0.95

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:108:CYS:O	1:B:112:SER:OG	1.89	0.91
1:A:276:GLU:O	3:A:502:HOH:O	1.86	0.91
1:A:99:LEU:HD23	1:A:147:ILE:HB	1.50	0.90
1:A:288:ALA:O	1:A:292:LEU:HD12	1.75	0.87
1:B:167:LYS:NZ	1:B:264:ASP:OD1	2.08	0.85
1:A:195:ILE:HG22	1:A:224:MET:HG3	1.60	0.83
1:A:178:LEU:HD22	1:A:189:LEU:HD22	1.61	0.82
1:B:178:LEU:HD21	1:B:192:TYR:CG	2.15	0.82
1:B:281:PHE:CE2	1:B:285:LEU:HD11	2.19	0.78
1:A:97:VAL:HG21	1:A:115:LEU:HD21	1.66	0.77
1:A:152:GLU:HG2	1:A:155:ILE:HD11	1.67	0.77
1:B:105:PRO:HD3	1:B:240:TYR:CD2	2.21	0.76
1:A:162:VAL:HG21	1:A:266:LYS:HD3	1.68	0.75
1:A:195:ILE:HD13	1:A:216:LEU:HB3	1.69	0.75
1:B:152:GLU:HB3	1:B:155:ILE:HD11	1.69	0.75
1:B:220:ASN:OD1	1:B:222:ASP:N	2.19	0.75
1:B:281:PHE:CD2	1:B:285:LEU:HD11	2.23	0.74
1:B:167:LYS:NZ	3:B:501:HOH:O	2.21	0.74
1:B:220:ASN:OD1	1:B:221:PHE:N	2.21	0.73
1:B:131:ASP:O	1:B:135:THR:OG1	2.07	0.72
1:A:176:HIS:ND1	1:A:177:PRO:HD2	2.04	0.72
1:A:99:LEU:HD21	1:A:147:ILE:HD13	1.71	0.72
1:A:129:PRO:HA	1:A:132:SER:HB3	1.72	0.70
1:A:100:ASP:HA	1:A:127:THR:O	1.92	0.69
1:A:96:ARG:HH21	1:A:125:ILE:HD11	1.57	0.69
1:A:176:HIS:CD2	1:A:178:LEU:HD12	2.28	0.68
1:B:99:LEU:HD12	1:B:99:LEU:N	2.09	0.68
1:B:223:ASP:O	1:B:227:LEU:HD13	1.93	0.68
1:B:197:LEU:HD23	1:B:198:GLY:N	2.09	0.67
1:B:180:ASN:OD1	1:B:181:ALA:N	2.27	0.67
1:B:103:ILE:CD1	1:B:147:ILE:HG22	2.24	0.67
1:B:128:SER:OG	1:B:197:LEU:HD21	1.96	0.66
1:B:178:LEU:HD13	1:B:189:LEU:CD2	2.20	0.66
1:A:178:LEU:HD22	1:A:189:LEU:CD2	2.26	0.65
1:B:122:VAL:O	1:B:124:LEU:CD2	2.45	0.64
1:A:111:VAL:O	1:A:115:LEU:HD13	1.97	0.64
1:A:152:GLU:HG2	1:A:155:ILE:CD1	2.28	0.64
1:A:178:LEU:HD23	1:A:192:TYR:CD2	2.33	0.63
1:A:111:VAL:O	1:A:114:VAL:HG22	1.98	0.63
1:B:281:PHE:O	1:B:285:LEU:HD12	1.99	0.63
1:A:114:VAL:HG23	1:A:284:PHE:CD1	2.34	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:165:TYR:HD2	1:B:264:ASP:HB3	1.64	0.62
1:A:115:LEU:HD12	1:A:284:PHE:CD1	2.35	0.62
1:B:114:VAL:HG11	1:B:287:SER:OG	1.98	0.62
1:B:176:HIS:ND1	1:B:177:PRO:HD2	2.14	0.62
1:B:243:GLU:HG3	1:B:244:GLU:N	2.15	0.62
1:A:154:LYS:C	1:A:155:ILE:HD12	2.20	0.62
1:A:155:ILE:HD12	1:A:155:ILE:N	2.15	0.62
1:A:131:ASP:OD1	1:A:199:SER:HB2	1.99	0.62
1:A:153:LEU:HD23	1:A:153:LEU:H	1.65	0.61
1:B:103:ILE:HD11	1:B:147:ILE:HG22	1.81	0.61
1:B:285:LEU:HD12	1:B:285:LEU:H	1.66	0.61
1:A:288:ALA:C	1:A:292:LEU:HD12	2.19	0.61
1:A:98:LEU:HD21	1:A:132:SER:HB2	1.83	0.61
1:A:242:VAL:HG23	1:A:246:LEU:HD13	1.84	0.60
1:A:220:ASN:OD1	1:A:222:ASP:N	2.35	0.60
1:A:114:VAL:HG23	1:A:284:PHE:HD1	1.67	0.60
1:A:173:HIS:ND1	1:A:174:PRO:HD2	2.17	0.59
1:B:146:ALA:C	1:B:147:ILE:HD12	2.22	0.59
1:A:151:GLU:HG3	1:A:268:TYR:HE2	1.68	0.59
1:A:97:VAL:HG21	1:A:115:LEU:CD2	2.31	0.59
1:B:122:VAL:O	1:B:124:LEU:HD22	2.02	0.59
1:B:97:VAL:HG12	1:B:99:LEU:HD12	1.85	0.58
1:B:99:LEU:HD12	1:B:99:LEU:H	1.67	0.58
1:B:287:SER:O	1:B:291:ARG:NE	2.36	0.58
1:A:195:ILE:HG21	1:A:224:MET:HA	1.85	0.58
1:B:133:LEU:HD13	1:B:152:GLU:HB2	1.84	0.58
1:A:177:PRO:O	1:A:180:ASN:OD1	2.22	0.58
1:B:111:VAL:O	1:B:114:VAL:N	2.37	0.58
1:A:162:VAL:CG2	1:A:266:LYS:HD3	2.33	0.57
1:B:287:SER:O	1:B:291:ARG:HG2	2.03	0.57
1:A:131:ASP:O	1:A:135:THR:OG1	2.18	0.57
1:B:197:LEU:HD23	1:B:198:GLY:H	1.67	0.57
1:B:176:HIS:CE1	1:B:177:PRO:HD2	2.39	0.57
1:A:271:TYR:HB3	1:A:281:PHE:CZ	2.40	0.57
1:A:227:LEU:O	1:A:232:VAL:HG23	2.05	0.57
1:A:281:PHE:CE1	1:A:285:LEU:HD22	2.40	0.56
1:B:107:PHE:C	1:B:107:PHE:CD1	2.80	0.55
1:A:114:VAL:CG2	1:A:284:PHE:CD1	2.90	0.55
1:B:107:PHE:CZ	1:B:111:VAL:HG11	2.41	0.55
1:A:114:VAL:CG2	1:A:284:PHE:HD1	2.20	0.55
1:A:161:CYS:SG	1:A:271:TYR:CE2	2.99	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:176:HIS:CG	1:B:177:PRO:HD2	2.42	0.55
1:B:281:PHE:CD2	1:B:285:LEU:CD1	2.90	0.55
1:B:194:GLN:HB3	1:B:215:VAL:HG23	1.89	0.54
1:A:93:ARG:O	1:A:121:MET:HB2	2.08	0.54
1:B:165:TYR:CD2	1:B:264:ASP:HB3	2.42	0.53
1:A:195:ILE:CG2	1:A:224:MET:HG3	2.35	0.53
1:B:96:ARG:HG2	1:B:123:SER:HB2	1.89	0.53
1:B:266:LYS:NZ	3:B:502:HOH:O	2.41	0.53
1:B:107:PHE:CE2	1:B:292:LEU:HD21	2.44	0.53
1:A:225:LEU:HD11	1:A:242:VAL:HG12	1.91	0.53
1:B:207:LEU:HD23	1:B:208:LEU:HD21	1.91	0.53
1:B:97:VAL:HA	1:B:145:ILE:O	2.09	0.53
1:A:153:LEU:HG	1:A:154:LYS:H	1.74	0.52
1:B:281:PHE:O	1:B:285:LEU:CD1	2.58	0.52
1:A:161:CYS:HG	1:A:271:TYR:HE2	1.54	0.52
1:A:271:TYR:HB3	1:A:281:PHE:CE2	2.45	0.52
1:A:285:LEU:HG	1:A:289:ARG:HH21	1.74	0.52
1:B:176:HIS:CE1	1:B:178:LEU:HG	2.44	0.52
1:B:98:LEU:HD21	1:B:127:THR:OG1	2.10	0.52
1:A:208:LEU:N	1:A:208:LEU:HD23	2.25	0.52
1:A:152:GLU:CG	1:A:155:ILE:HD11	2.39	0.51
1:A:178:LEU:CD2	1:A:192:TYR:CD2	2.93	0.51
1:B:275:LEU:HB3	1:B:281:PHE:CD1	2.45	0.51
1:B:103:ILE:HD13	1:B:147:ILE:HG22	1.92	0.51
1:B:220:ASN:OD1	1:B:222:ASP:OD1	2.28	0.51
1:B:176:HIS:ND1	1:B:177:PRO:CD	2.74	0.51
1:A:183:LEU:HD11	1:A:257:LEU:HD13	1.92	0.51
1:B:167:LYS:CE	1:B:264:ASP:OD1	2.59	0.50
1:B:207:LEU:HD23	1:B:208:LEU:CD2	2.42	0.50
1:B:254:LEU:HD12	1:B:254:LEU:N	2.27	0.50
1:A:181:ALA:O	1:A:182:SER:HB2	2.12	0.50
1:B:176:HIS:ND1	1:B:177:PRO:N	2.60	0.50
1:B:189:LEU:HD12	2:B:401:XBH:C16	2.42	0.50
1:A:115:LEU:HD12	1:A:284:PHE:CE1	2.46	0.49
1:B:114:VAL:HG21	1:B:287:SER:HB2	1.94	0.49
1:B:97:VAL:HG12	1:B:99:LEU:CD1	2.40	0.49
1:B:99:LEU:N	1:B:99:LEU:CD1	2.76	0.49
1:B:159:ASN:HB2	1:B:271:TYR:CE1	2.47	0.49
1:B:287:SER:HB2	1:B:291:ARG:NH2	2.28	0.49
1:A:176:HIS:ND1	1:A:177:PRO:CD	2.75	0.49
1:B:167:LYS:HD2	1:B:262:GLY:HA3	1.95	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:115:LEU:CD1	1:A:284:PHE:CE1	2.95	0.49
1:A:148:THR:OG1	1:A:149:ILE:N	2.46	0.48
1:A:167:LYS:NZ	1:A:264:ASP:OD1	2.37	0.48
1:A:207:LEU:C	1:A:208:LEU:HD23	2.34	0.48
1:A:151:GLU:HG3	1:A:268:TYR:CE2	2.47	0.48
1:B:145:ILE:HG22	1:B:147:ILE:CD1	2.44	0.48
1:B:254:LEU:HD12	1:B:254:LEU:H	1.79	0.48
1:B:271:TYR:CG	1:B:281:PHE:CE1	3.02	0.48
1:B:271:TYR:CG	1:B:281:PHE:HE1	2.31	0.48
1:A:97:VAL:HG22	1:A:145:ILE:HB	1.95	0.48
1:A:110:THR:O	1:A:114:VAL:HG13	2.14	0.47
1:A:211:VAL:O	1:A:211:VAL:CG1	2.61	0.47
1:A:161:CYS:SG	1:A:271:TYR:HE2	2.36	0.47
1:B:243:GLU:HG3	1:B:244:GLU:H	1.79	0.47
1:B:117:ASP:O	1:B:118:ASP:CB	2.61	0.47
1:B:211:VAL:O	1:B:211:VAL:CG1	2.63	0.47
1:B:99:LEU:H	1:B:99:LEU:CD1	2.28	0.47
1:B:287:SER:HB2	1:B:291:ARG:HH21	1.79	0.47
1:A:165:TYR:OH	1:B:264:ASP:HB2	2.15	0.47
1:B:174:PRO:HD3	1:B:250:THR:O	2.14	0.47
1:B:240:TYR:CZ	1:B:241:PHE:HE1	2.33	0.47
1:B:281:PHE:CE2	1:B:285:LEU:CD1	2.97	0.47
1:A:132:SER:OG	1:A:133:LEU:N	2.48	0.47
1:A:195:ILE:HD12	1:A:227:LEU:HD13	1.96	0.46
1:B:107:PHE:CE2	1:B:111:VAL:HG11	2.49	0.46
1:B:242:VAL:O	1:B:246:LEU:HG	2.15	0.46
1:B:285:LEU:HD12	1:B:285:LEU:N	2.30	0.46
1:A:225:LEU:HD12	1:A:241:PHE:HD2	1.81	0.46
1:B:107:PHE:CD2	1:B:292:LEU:HD22	2.51	0.46
1:A:195:ILE:CD1	1:A:216:LEU:HD23	2.46	0.46
1:B:107:PHE:CE2	1:B:292:LEU:CD2	2.99	0.46
1:A:136:ILE:HG13	1:A:137:LYS:N	2.30	0.45
1:A:159:ASN:HB3	1:A:271:TYR:CZ	2.52	0.45
1:B:110:THR:HG21	1:B:291:ARG:HD2	1.98	0.45
1:A:107:PHE:CE1	1:A:267:VAL:HG11	2.51	0.45
1:B:97:VAL:HG21	1:B:115:LEU:HD21	1.98	0.45
1:B:114:VAL:HG21	1:B:287:SER:CB	2.46	0.45
1:B:195:ILE:HD13	1:B:195:ILE:N	2.32	0.45
1:B:98:LEU:HD23	1:B:99:LEU:O	2.17	0.45
1:A:178:LEU:O	1:A:184:HIS:CD2	2.70	0.45
1:B:284:PHE:CD1	1:B:284:PHE:C	2.89	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:97:VAL:HA	1:A:145:ILE:O	2.17	0.44
1:A:99:LEU:CD2	1:A:147:ILE:HB	2.34	0.44
1:A:115:LEU:O	1:A:119:PHE:N	2.50	0.44
1:A:242:VAL:HG23	1:A:246:LEU:CD1	2.47	0.44
1:B:271:TYR:CD2	1:B:281:PHE:HZ	2.35	0.44
1:B:144:ASP:OD1	1:B:144:ASP:N	2.51	0.44
1:A:99:LEU:CD2	1:A:147:ILE:HD13	2.44	0.44
1:A:138:GLN:O	1:A:139:ASP:HB3	2.16	0.44
1:B:221:PHE:CE1	1:B:238:PRO:HD3	2.53	0.44
1:A:159:ASN:O	1:A:270:TYR:HA	2.17	0.43
1:A:221:PHE:HB3	1:A:241:PHE:CE2	2.54	0.43
1:B:183:LEU:O	1:B:184:HIS:CG	2.71	0.43
1:B:100:ASP:OD1	1:B:100:ASP:C	2.55	0.43
1:B:159:ASN:O	1:B:270:TYR:HA	2.18	0.43
1:B:287:SER:CB	1:B:291:ARG:HH21	2.32	0.43
1:A:161:CYS:SG	1:A:271:TYR:CD2	3.12	0.43
1:A:132:SER:O	1:A:136:ILE:HG23	2.17	0.43
1:B:194:GLN:OE1	1:B:211:VAL:N	2.50	0.43
1:B:220:ASN:ND2	1:B:222:ASP:OD1	2.50	0.43
1:A:105:PRO:HD3	1:A:240:TYR:CG	2.53	0.43
1:B:271:TYR:CD2	1:B:281:PHE:CZ	3.06	0.43
1:B:259:GLU:OE1	1:B:263:ILE:HG23	2.18	0.43
1:A:195:ILE:HD12	1:A:227:LEU:CD1	2.49	0.43
1:A:228:VAL:HG12	1:A:251:LEU:HD21	1.99	0.43
1:B:165:TYR:CE1	1:B:266:LYS:HG2	2.54	0.43
1:A:229:GLU:OE2	1:A:245:ARG:HD3	2.18	0.43
1:A:153:LEU:HG	1:A:154:LYS:N	2.34	0.42
1:B:111:VAL:O	1:B:115:LEU:HD12	2.20	0.42
1:A:163:LEU:HD23	1:A:163:LEU:O	2.20	0.42
1:B:209:ARG:HE	1:B:209:ARG:HB2	1.65	0.42
1:A:178:LEU:O	1:A:184:HIS:NE2	2.52	0.42
1:A:218:VAL:CG1	1:A:219:GLU:N	2.83	0.42
1:B:103:ILE:HD11	1:B:147:ILE:O	2.20	0.42
1:A:131:ASP:OD1	1:A:131:ASP:N	2.53	0.42
1:B:111:VAL:O	1:B:112:SER:C	2.58	0.42
1:B:111:VAL:CG2	1:B:112:SER:N	2.83	0.42
1:A:95:LEU:HD12	1:A:275:LEU:HD21	2.02	0.42
1:A:152:GLU:CB	1:A:155:ILE:HD11	2.50	0.42
1:B:103:ILE:CD1	1:B:147:ILE:O	2.67	0.42
1:A:159:ASN:HB2	1:A:271:TYR:CE1	2.55	0.41
1:B:291:ARG:O	1:B:294:GLN:HB2	2.20	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:107:PHE:CD2	1:B:292:LEU:CD2	3.03	0.41
1:A:225:LEU:CD1	1:A:241:PHE:HD2	2.33	0.41
1:A:219:GLU:OE2	1:A:219:GLU:HA	2.21	0.41
1:B:221:PHE:HB3	1:B:241:PHE:CE2	2.55	0.41
1:A:128:SER:HB2	1:A:197:LEU:HD21	2.03	0.41
1:A:288:ALA:O	1:A:289:ARG:C	2.59	0.41
1:A:95:LEU:CD1	1:A:275:LEU:HD21	2.51	0.41
1:B:147:ILE:HD12	1:B:147:ILE:N	2.36	0.41
1:B:176:HIS:HE1	1:B:192:TYR:CD2	2.39	0.41
1:B:133:LEU:HD12	1:B:150:ASP:HB3	2.03	0.41
1:B:166:THR:O	1:B:264:ASP:HA	2.21	0.41
1:B:258:TYR:HB2	2:B:401:XBH:C17	2.51	0.41
1:A:139:ASP:OD1	1:A:139:ASP:O	2.38	0.40
1:A:265:THR:HG22	1:A:266:LYS:O	2.21	0.40
1:A:293:ARG:HH11	1:A:293:ARG:HD2	1.71	0.40
1:B:98:LEU:HD23	1:B:98:LEU:O	2.21	0.40
1:B:105:PRO:HD3	1:B:240:TYR:CE2	2.55	0.40
1:A:100:ASP:OD1	1:A:100:ASP:C	2.60	0.40
1:B:190:ALA:HA	1:B:212:SER:OG	2.21	0.40
1:B:240:TYR:CZ	1:B:241:PHE:CE1	3.08	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	199/332 (60%)	193 (97%)	5 (2%)	1 (0%)	29 43
1	B	199/332 (60%)	186 (94%)	13 (6%)	0	100 100
All	All	398/664 (60%)	379 (95%)	18 (4%)	1 (0%)	41 56

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	139	ASP

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	167/288 (58%)	154 (92%)	13 (8%)	12 20
1	B	158/288 (55%)	141 (89%)	17 (11%)	6 9
All	All	325/576 (56%)	295 (91%)	30 (9%)	9 13

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	96	ARG
1	A	153	LEU
1	A	156	SER
1	A	161	CYS
1	A	176	HIS
1	A	205	SER
1	A	212	SER
1	A	241	PHE
1	A	245	ARG
1	A	246	LEU
1	A	264	ASP
1	A	273	THR
1	A	284	PHE
1	B	94	ASN
1	B	106	SER
1	B	123	SER
1	B	144	ASP
1	B	152	GLU
1	B	156	SER
1	B	180	ASN
1	B	212	SER
1	B	226	ARG
1	B	242	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	254	LEU
1	B	260	PRO
1	B	264	ASP
1	B	278	GLU
1	B	280	SER
1	B	281	PHE
1	B	284	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	160	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 monosaccharides 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	XBH	A	401	-	28,29,29	0.62	1 (3%)	31,42,42	0.83	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	XBH	B	401	-	28,29,29	0.46	0	31,42,42	0.63	1 (3%)

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	XBH	A	401	-	-	0/17/21/21	0/4/4/4
2	XBH	B	401	-	-	4/17/21/21	0/4/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	XBH	C7-N2	2.02	1.39	1.36

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	401	XBH	C7-C6-S	-3.94	108.08	112.00
2	B	401	XBH	C7-C6-S	-2.94	109.07	112.00

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	401	XBH	C11-C12-C15-C16
2	B	401	XBH	C11-C12-C15-C17
2	B	401	XBH	C13-C12-C15-C16
2	B	401	XBH	C13-C12-C15-C17

There are no ring outliers.

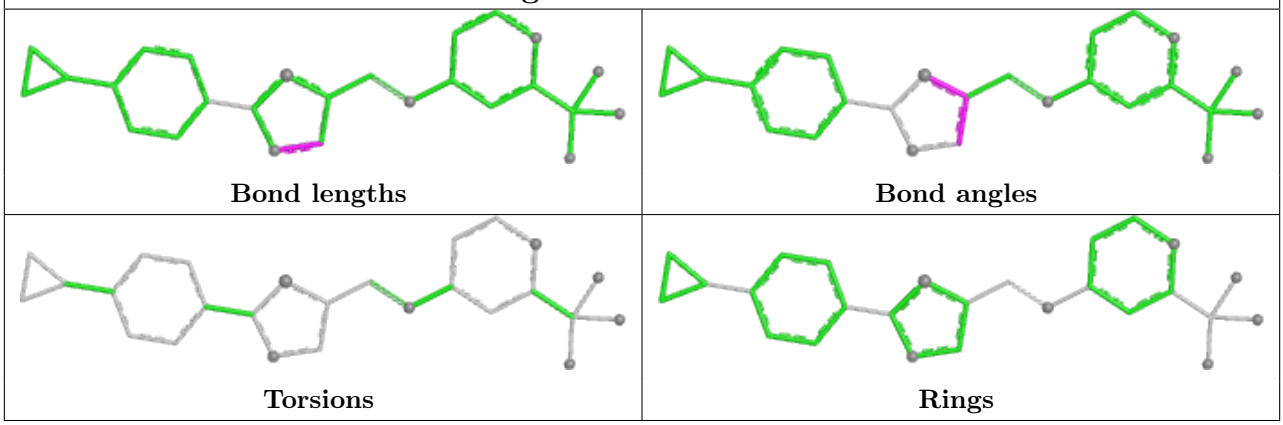
1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	401	XBH	2	0

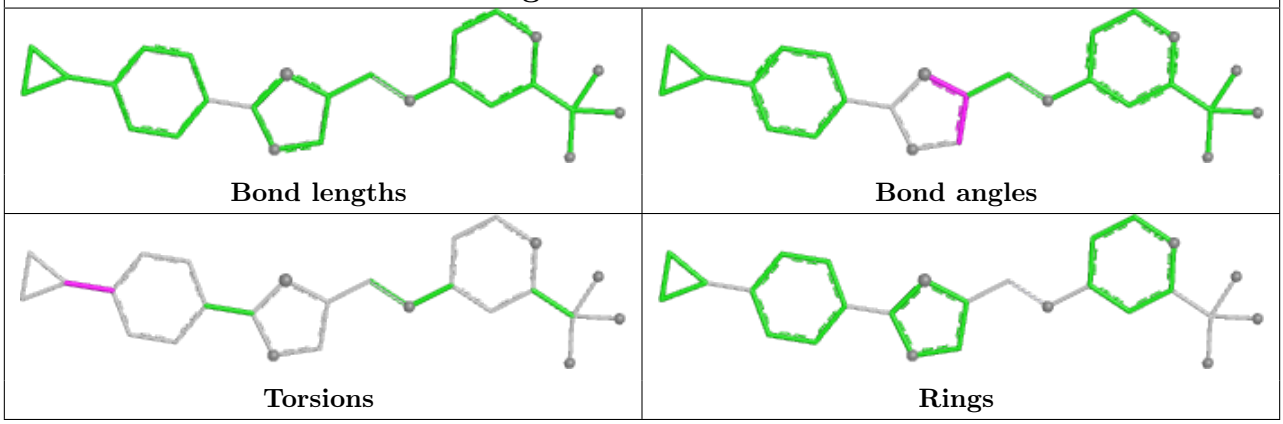
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

also be included. For torsion angles, if less then 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 XBH A 401



Ligand XBH B 401



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, 95^{th} 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	203/332 (61%)	0.51	10 (4%) 29 26	27, 57, 89, 112	0
1	B	203/332 (61%)	0.46	6 (2%) 50 47	34, 66, 108, 139	0
All	All	406/664 (61%)	0.49	16 (3%) 39 35	27, 62, 100, 139	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	94	ASN	5.2
1	B	201	SER	4.7
1	A	275	LEU	3.8
1	A	153	LEU	2.9
1	A	95	LEU	2.8
1	B	252	ALA	2.8
1	B	178	LEU	2.7
1	A	178	LEU	2.6
1	B	292	LEU	2.5
1	A	233	GLY	2.5
1	B	172	ALA	2.4
1	A	261	GLY	2.4
1	A	187	ALA	2.2
1	A	216	LEU	2.1
1	B	107	PHE	2.1
1	A	189	LEU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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)

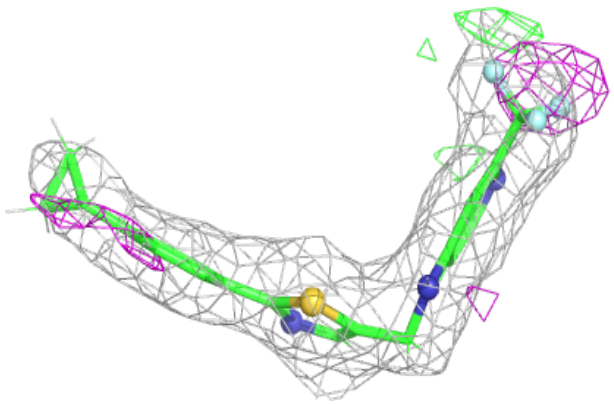
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

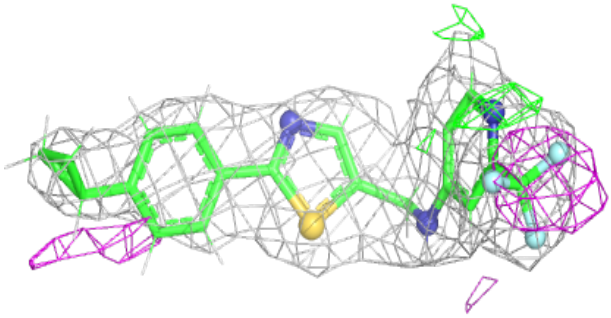
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	XBH	A	401	26/26	0.93	0.27	30,56,79,95	0
2	XBH	B	401	26/26	0.94	0.28	29,48,86,90	0

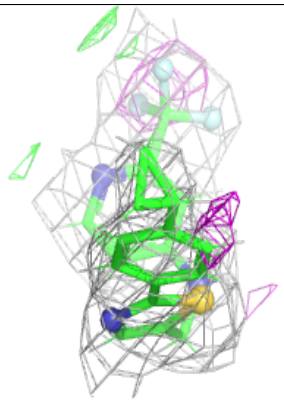
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around XBH A 401:

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

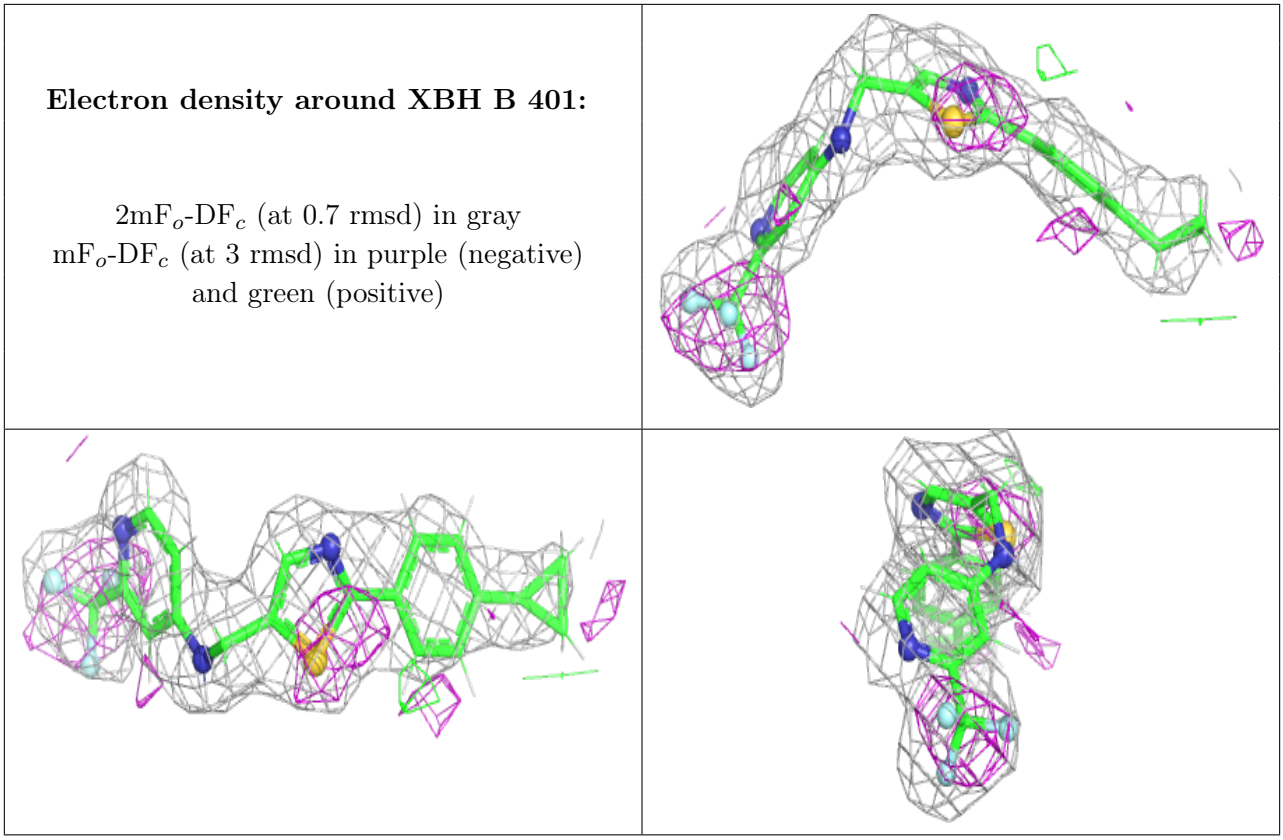






Electron density around XBH B 401:

$2mF_o$-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.