



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 07:55 AM UTC

PDB ID : 5K14 / pdb_00005k14
Title : HIV-1 Reverse Transcriptase in complex with a 2,6-difluorophenyl DAPY analog
Authors : Lansdon, E.B.
Deposited on : 2016-05-17
Resolution : 2.40 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

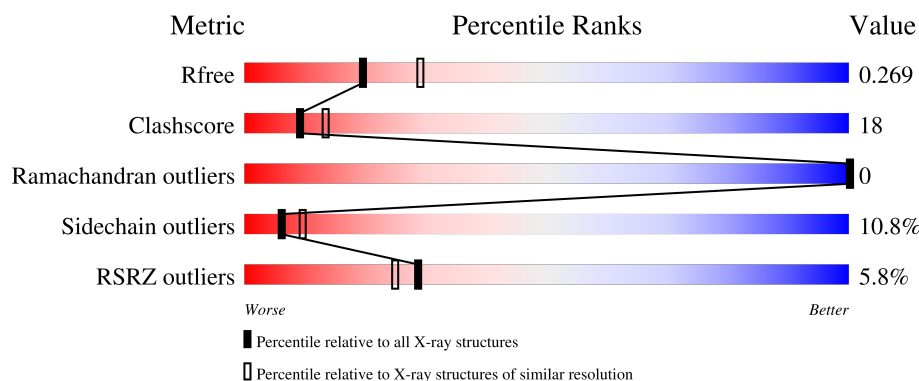
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	560	4% 60% 30% 6% .
2	B	440	7% 53% 31% 7% 9%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7879 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 HIV-1 reverse transcriptase(isolate HXB2).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	536	Total	C	N	O	S	0	0	0
			4371	2831	726	806	8			

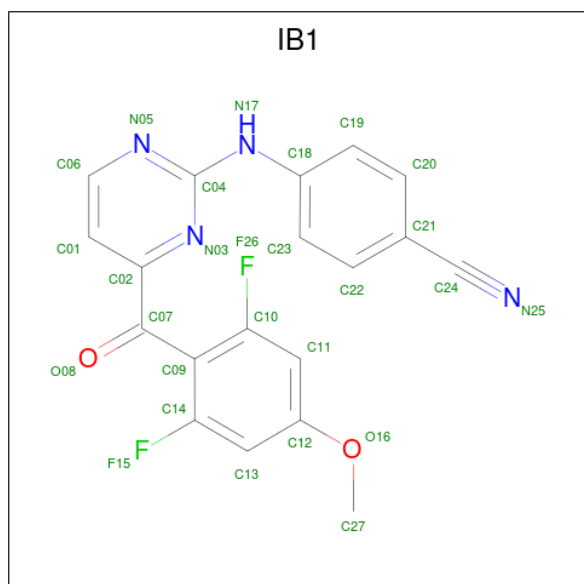
- Molecule 2 is a protein called HIV-1 reverse transcriptase (isolate LW123).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	401	Total	C	N	O	S	0	0	0
			3318	2161	548	603	6			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	360	ALA	THR	conflict	UNP P0C6F2

- Molecule 3 is 4-{[4-(2,6-difluoro-4-methoxybenzene-1-carbonyl)pyrimidin-2-yl]amino}benzo nitrile (CCD ID: IB1) (formula: C₁₉H₁₂F₂N₄O₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	0	0
			27	19	2	4	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	97	Total	O	0	0
			97	97		
4	B	66	Total	O	0	0
			66	66		



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	118.75Å 154.58Å 153.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.27 – 2.40 47.27 – 2.40	Depositor EDS
% Data completeness (in resolution range)	54.9 (47.27-2.40) 88.2 (47.27-2.40)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.09 (at 2.39Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.205 , 0.261 0.216 , 0.269	Depositor DCC
R_{free} test set	2000 reflections (3.89%)	wwPDB-VP
Wilson B-factor (Å ²)	33.0	Xtriage
Anisotropy	0.093	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 41.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	7879	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.55% 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: IB1

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	0.59	0/4485	0.89	9/6096 (0.1%)
2	B	0.57	0/3410	0.90	12/4633 (0.3%)
All	All	0.58	0/7895	0.90	21/10729 (0.2%)

There are no bond length outliers.

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	94	ILE	CA-C-N	-8.06	111.71	119.85
1	A	94	ILE	C-N-CA	-8.06	111.71	119.85
2	B	320	ASP	CA-C-N	7.85	127.56	119.56
2	B	320	ASP	C-N-CA	7.85	127.56	119.56
1	A	224	GLU	CA-C-N	7.20	124.92	119.66
1	A	224	GLU	C-N-CA	7.20	124.92	119.66
2	B	235	HIS	CA-C-N	5.89	126.04	119.32
2	B	235	HIS	C-N-CA	5.89	126.04	119.32
1	A	420	PRO	O-C-N	5.70	123.93	121.31
2	B	175	ASN	CA-C-N	5.60	125.27	119.56
2	B	175	ASN	C-N-CA	5.60	125.27	119.56
1	A	286	THR	N-CA-C	-5.49	101.02	109.76
2	B	250	ASP	N-CA-C	-5.40	107.34	114.04
1	A	117	SER	CA-C-N	-5.38	118.65	123.33
1	A	117	SER	C-N-CA	-5.38	118.65	123.33
2	B	13	LYS	CA-C-N	-5.37	114.26	119.90
2	B	13	LYS	C-N-CA	-5.37	114.26	119.90
2	B	241	VAL	CB-CA-C	-5.32	102.57	111.29
2	B	8	VAL	CA-C-N	5.15	126.28	119.84
2	B	8	VAL	C-N-CA	5.15	126.28	119.84
1	A	167	ILE	N-CA-C	5.08	115.80	110.62

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	4371	0	4415	151	0
2	B	3318	0	3343	134	0
3	A	27	0	0	1	0
4	A	97	0	0	7	0
4	B	66	0	0	7	0
All	All	7879	0	7758	282	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 18.

All (282) 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:175:ASN:HB3	1:A:178:ILE:HD12	1.26	1.05
1:A:469:LEU:HD21	1:A:480:GLN:HG3	1.36	1.03
1:A:479:LEU:HB3	1:A:517:LEU:HD13	1.41	1.00
1:A:230:MET:HA	1:A:230:MET:HE2	1.49	0.92
2:B:244:ILE:HD13	2:B:266:TRP:HZ3	1.38	0.89
1:A:393:ILE:HB	1:A:423:VAL:HG13	1.57	0.86
1:A:362:THR:HG22	1:A:366:LYS:HE3	1.56	0.85
2:B:362:THR:HG23	2:B:363:ASN:H	1.40	0.85
1:A:175:ASN:OD1	1:A:201:LYS:NZ	2.11	0.84
2:B:241:VAL:O	2:B:243:PRO:HD3	1.80	0.81
1:A:362:THR:HG22	1:A:366:LYS:CE	2.10	0.81
2:B:58:THR:HG23	4:B:527:HOH:O	1.81	0.80
2:B:244:ILE:HD13	2:B:266:TRP:CZ3	2.16	0.80
1:A:139:THR:HB	1:A:140:PRO:HD2	1.65	0.79
1:A:393:ILE:HB	1:A:423:VAL:CG1	2.13	0.78
2:B:163:SER:HA	2:B:166:LYS:HE3	1.66	0.77
2:B:115:TYR:HB3	2:B:149:LEU:HB2	1.66	0.75
1:A:21:VAL:HB	1:A:59:PRO:HD3	1.69	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:197:GLN:NE2	4:A:702:HOH:O	2.23	0.72
2:B:68:SER:HA	2:B:70:LYS:HE3	1.72	0.71
1:A:469:LEU:CD2	1:A:480:GLN:HG3	2.19	0.71
2:B:362:THR:HG22	2:B:367:GLN:HE21	1.55	0.71
1:A:298:GLU:H	1:A:298:GLU:CD	1.98	0.70
1:A:12:LEU:HD21	1:A:127:TYR:CZ	2.27	0.70
1:A:28:GLU:HG2	1:A:135:ILE:HD12	1.74	0.69
1:A:283:LEU:O	1:A:287:LYS:HE2	1.91	0.69
1:A:451:LYS:HB3	1:A:471:ASP:HA	1.75	0.69
2:B:169:GLU:HB3	2:B:170:PRO:HD3	1.75	0.69
1:A:28:GLU:HG2	1:A:135:ILE:HG23	1.73	0.69
1:A:12:LEU:HD21	1:A:127:TYR:CE2	2.29	0.68
1:A:175:ASN:CB	1:A:178:ILE:HD12	2.17	0.68
2:B:167:ILE:HG12	2:B:212:TRP:CD2	2.30	0.67
1:A:399:GLU:HB3	4:A:717:HOH:O	1.95	0.66
2:B:420:PRO:HB2	2:B:423:VAL:HG23	1.77	0.66
1:A:63:ILE:HG23	1:A:74:LEU:HD13	1.78	0.65
1:A:281:LYS:HG2	1:A:284:ARG:NH2	2.13	0.64
1:A:486:LEU:HB3	1:A:524:GLN:CG	2.28	0.64
1:A:246:LEU:HD11	1:A:310:LEU:HD12	1.78	0.63
2:B:248:GLU:OE1	2:B:248:GLU:HA	1.97	0.63
2:B:275:LYS:CE	2:B:277:ARG:HG3	2.29	0.62
2:B:422:LEU:HD13	2:B:425:LEU:HD21	1.80	0.62
1:A:53:GLU:O	1:A:55:PRO:HD3	1.99	0.61
1:A:108:VAL:HG22	1:A:188:TYR:CD2	2.35	0.61
2:B:70:LYS:HD2	2:B:70:LYS:H	1.64	0.61
2:B:281:LYS:HE3	2:B:296:THR:HG21	1.82	0.61
1:A:107:THR:HB	1:A:202:ILE:HD11	1.82	0.61
1:A:333:GLY:O	1:A:334:GLN:HB2	2.00	0.61
2:B:13:LYS:HB2	2:B:16:MET:HE3	1.81	0.61
1:A:406:TRP:HH2	2:B:418:ASN:HD22	1.46	0.61
1:A:401:TRP:HD1	1:A:402:TRP:CD1	2.19	0.61
1:A:104:LYS:HB2	1:A:192:ASP:HA	1.83	0.60
1:A:336:GLN:NE2	4:A:705:HOH:O	2.30	0.60
2:B:92:LEU:HB3	2:B:158:ALA:HB1	1.84	0.60
1:A:107:THR:HB	1:A:202:ILE:CD1	2.32	0.60
1:A:393:ILE:CB	1:A:423:VAL:HG13	2.30	0.60
1:A:479:LEU:HB3	1:A:517:LEU:CD1	2.26	0.60
1:A:486:LEU:HB3	1:A:524:GLN:HG2	1.84	0.60
2:B:330:GLN:NE2	2:B:340:GLN:OE1	2.32	0.60
2:B:362:THR:HG23	2:B:363:ASN:N	2.14	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:30:LYS:HE3	1:A:62:ALA:O	2.01	0.59
2:B:369:THR:HG21	2:B:405:TYR:HB2	1.84	0.59
1:A:368:LEU:HD22	1:A:423:VAL:HG11	1.85	0.59
1:A:195:ILE:HG22	1:A:199:ARG:HD3	1.83	0.59
1:A:230:MET:HA	1:A:230:MET:CE	2.29	0.59
1:A:536:VAL:HG21	1:A:542:ILE:HG21	1.83	0.59
2:B:242:GLN:HG2	2:B:353:LYS:HE2	1.84	0.58
1:A:537:PRO:HB2	1:A:540:LYS:HG3	1.84	0.58
1:A:420:PRO:HA	1:A:421:PRO:C	2.29	0.58
2:B:79:GLU:HG3	2:B:83:ARG:HD2	1.85	0.58
1:A:479:LEU:CB	1:A:517:LEU:HD13	2.24	0.57
2:B:72:ARG:NH2	4:B:501:HOH:O	2.37	0.57
1:A:173:LYS:HE2	1:A:173:LYS:O	2.04	0.57
1:A:54:ASN:O	1:A:143:ARG:NH2	2.37	0.57
2:B:312:GLU:HB3	2:B:313:PRO:HD2	1.87	0.56
1:A:139:THR:HB	1:A:140:PRO:CD	2.35	0.56
1:A:536:VAL:HG11	1:A:542:ILE:HB	1.86	0.56
2:B:88:TRP:CZ2	2:B:154:LYS:HD2	2.41	0.56
1:A:379:SER:CB	1:A:387:PRO:HD3	2.36	0.55
1:A:31:ILE:HD13	1:A:133:PRO:O	2.06	0.55
1:A:316:GLY:HA2	4:A:709:HOH:O	2.07	0.55
1:A:392:PRO:O	1:A:423:VAL:HG12	2.07	0.55
1:A:469:LEU:HD21	1:A:480:GLN:CG	2.25	0.55
2:B:64:LYS:HD3	2:B:69:THR:HA	1.89	0.54
2:B:73:LYS:NZ	2:B:146:TYR:OH	2.40	0.54
2:B:214:LEU:HD13	2:B:214:LEU:C	2.33	0.54
2:B:257:ILE:HG22	2:B:283:LEU:HD22	1.88	0.54
2:B:278:GLN:HG3	2:B:298:GLU:HB3	1.90	0.54
2:B:157:PRO:HG3	2:B:184:MET:HA	1.90	0.54
1:A:250:ASP:OD1	4:A:701:HOH:O	2.19	0.54
2:B:246:LEU:HD12	2:B:307:ARG:HG2	1.89	0.54
1:A:200:THR:O	1:A:204:GLU:HG3	2.08	0.54
2:B:185:ASP:OD2	4:B:501:HOH:O	2.18	0.54
1:A:63:ILE:HD13	1:A:74:LEU:HD11	1.90	0.54
1:A:73:LYS:NZ	1:A:146:TYR:OH	2.35	0.53
2:B:245:VAL:HG21	2:B:429:LEU:HA	1.90	0.53
1:A:486:LEU:CB	1:A:524:GLN:HG2	2.39	0.53
1:A:328:GLU:HG2	1:A:390:LYS:HB2	1.90	0.53
2:B:422:LEU:CD1	2:B:425:LEU:HD21	2.37	0.53
2:B:242:GLN:CG	2:B:353:LYS:HE2	2.39	0.53
1:A:242:GLN:HG3	1:A:243:PRO:HD2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:362:THR:HG22	1:A:366:LYS:HE2	1.89	0.53
1:A:179:VAL:HG11	3:A:601:IB1:C02	2.39	0.53
1:A:19:PRO:HG3	1:A:80:LEU:HB2	1.90	0.52
2:B:379:SER:OG	2:B:387:PRO:HD3	2.10	0.52
2:B:399:GLU:HB2	4:B:516:HOH:O	2.08	0.52
2:B:111:VAL:HG11	2:B:187:LEU:HD22	1.92	0.52
2:B:344:GLU:HB2	2:B:347:LYS:HD2	1.92	0.52
2:B:161:GLN:O	2:B:165:THR:HG23	2.09	0.51
2:B:170:PRO:O	2:B:174:GLN:HG3	2.10	0.51
1:A:206:ARG:NH1	1:A:217:PRO:O	2.43	0.51
2:B:275:LYS:NZ	2:B:277:ARG:HG3	2.26	0.51
2:B:253:THR:OG1	2:B:256:ASP:OD2	2.25	0.51
2:B:345:PRO:O	2:B:346:PHE:HB2	2.10	0.51
2:B:278:GLN:O	2:B:281:LYS:HB3	2.11	0.51
1:A:401:TRP:HB2	1:A:425:LEU:HD11	1.93	0.51
1:A:464:GLN:HG2	1:A:465:LYS:N	2.25	0.51
2:B:80:LEU:HD22	2:B:84:THR:CG2	2.41	0.51
2:B:207:GLN:OE1	2:B:211:ARG:NH1	2.42	0.51
2:B:332:GLN:HB2	2:B:336:GLN:O	2.11	0.51
1:A:503:LEU:HD13	1:A:507:GLN:OE1	2.11	0.51
1:A:540:LYS:O	1:A:542:ILE:HD12	2.11	0.51
1:A:540:LYS:HB2	1:A:542:ILE:HD13	1.93	0.51
1:A:542:ILE:HD12	1:A:542:ILE:N	2.27	0.50
2:B:209:LEU:HB3	2:B:214:LEU:HB3	1.92	0.50
1:A:402:TRP:CZ3	1:A:409:THR:HB	2.46	0.50
1:A:406:TRP:CE3	1:A:407:GLN:HG2	2.46	0.50
1:A:169:GLU:HB3	1:A:170:PRO:HD3	1.94	0.50
1:A:520:GLN:O	1:A:523:GLU:HB2	2.12	0.50
2:B:246:LEU:HD22	2:B:260:LEU:HD21	1.94	0.50
2:B:245:VAL:O	2:B:263:LYS:NZ	2.34	0.50
2:B:193:LEU:HB3	2:B:197:GLN:HB2	1.92	0.49
1:A:424:LYS:HD2	1:A:426:TRP:CH2	2.47	0.49
1:A:324:ASP:OD2	1:A:388:LYS:HE2	2.12	0.49
2:B:307:ARG:O	2:B:311:LYS:HG3	2.13	0.49
2:B:205:LEU:HD22	2:B:209:LEU:HD22	1.95	0.49
1:A:275:LYS:NZ	1:A:336:GLN:HE22	2.10	0.49
2:B:21:VAL:HB	2:B:59:PRO:HD3	1.93	0.49
1:A:181:TYR:CE2	1:A:183:TYR:HB2	2.48	0.49
1:A:255:ASN:O	1:A:259:LYS:HG3	2.13	0.49
2:B:270:ILE:O	2:B:272:PRO:HD3	2.12	0.49
1:A:450:THR:O	1:A:451:LYS:HB2	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:270:ILE:HG23	2:B:346:PHE:O	2.12	0.48
1:A:131:THR:HG1	1:A:143:ARG:HG2	1.78	0.48
1:A:350:LYS:NZ	1:A:378:GLU:OE1	2.46	0.48
2:B:350:LYS:HE3	2:B:378:GLU:OE2	2.12	0.48
2:B:13:LYS:HE3	2:B:85:GLN:HB3	1.96	0.48
2:B:116:PHE:CE1	2:B:151:GLN:HG3	2.48	0.48
1:A:90:VAL:C	1:A:91:GLN:HG2	2.38	0.48
1:A:231:GLY:O	1:A:242:GLN:HB2	2.13	0.48
2:B:363:ASN:OD1	2:B:365:VAL:N	2.46	0.48
2:B:268:SER:HB3	2:B:274:ILE:HB	1.94	0.48
2:B:269:GLN:HB3	2:B:346:PHE:HD2	1.79	0.48
1:A:125:ARG:HB3	1:A:146:TYR:O	2.14	0.48
2:B:180:ILE:HG12	2:B:189:VAL:HG13	1.94	0.48
1:A:125:ARG:HD3	1:A:147:ASN:HA	1.96	0.48
2:B:263:LYS:HE3	2:B:426:TRP:O	2.14	0.48
1:A:172:ARG:NH2	1:A:180:ILE:O	2.45	0.47
2:B:275:LYS:HE3	2:B:277:ARG:HG3	1.96	0.47
2:B:287:LYS:NZ	4:B:505:HOH:O	2.46	0.47
2:B:266:TRP:CH2	2:B:427:TYR:CZ	3.02	0.47
1:A:401:TRP:CD1	1:A:402:TRP:CD1	3.02	0.47
2:B:202:ILE:O	2:B:206:ARG:HG2	2.14	0.47
2:B:239:TRP:CZ2	2:B:378:GLU:HG2	2.49	0.47
1:A:363:ASN:HA	1:A:511:ASP:OD1	2.15	0.47
2:B:129:ALA:HA	2:B:144:TYR:O	2.15	0.47
2:B:258:GLN:HA	2:B:283:LEU:HD21	1.97	0.47
1:A:61:PHE:CD1	1:A:61:PHE:N	2.83	0.47
1:A:228:LEU:N	1:A:228:LEU:HD13	2.30	0.47
2:B:303:LEU:HD21	2:B:307:ARG:NH2	2.30	0.47
1:A:255:ASN:HB2	1:A:289:LEU:HG	1.97	0.47
2:B:301:LEU:O	2:B:305:GLU:HG3	2.14	0.47
1:A:411:ILE:HD11	1:A:414:TRP:CD1	2.51	0.46
1:A:122:GLU:HG3	4:A:782:HOH:O	2.14	0.46
2:B:64:LYS:O	2:B:65:LYS:HB3	2.15	0.46
2:B:269:GLN:HB3	2:B:346:PHE:CD2	2.50	0.46
2:B:362:THR:CG2	2:B:367:GLN:HE21	2.27	0.46
2:B:388:LYS:HD2	2:B:413:GLU:HG2	1.97	0.46
1:A:10:VAL:HG22	1:A:124:PHE:CD1	2.51	0.46
1:A:13:LYS:HB2	1:A:16:MET:SD	2.56	0.46
2:B:13:LYS:CB	2:B:16:MET:HE3	2.45	0.46
1:A:376:THR:HG23	1:A:386:THR:HG22	1.97	0.46
1:A:456:GLY:HA2	1:A:484:LEU:HD12	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:167:ILE:O	1:A:170:PRO:HD2	2.16	0.46
1:A:278:GLN:HG3	1:A:298:GLU:HB2	1.97	0.46
2:B:239:TRP:CH2	2:B:378:GLU:HG2	2.51	0.46
1:A:58:THR:HG23	1:A:59:PRO:HD2	1.97	0.45
2:B:303:LEU:HD21	2:B:307:ARG:HH21	1.81	0.45
1:A:246:LEU:HD11	1:A:310:LEU:CD1	2.46	0.45
1:A:298:GLU:CD	1:A:298:GLU:N	2.72	0.45
2:B:281:LYS:CE	2:B:296:THR:HG21	2.46	0.45
2:B:276:VAL:HG12	2:B:276:VAL:O	2.16	0.45
2:B:395:LYS:HG2	4:B:516:HOH:O	2.16	0.45
1:A:542:ILE:O	1:A:543:GLY:C	2.60	0.45
2:B:64:LYS:NZ	2:B:69:THR:HG22	2.32	0.45
1:A:61:PHE:HE1	1:A:76:ASP:HB2	1.82	0.45
2:B:146:TYR:CD2	2:B:150:PRO:HB3	2.52	0.45
1:A:278:GLN:H	1:A:302:GLU:CD	2.25	0.45
1:A:257:ILE:O	1:A:261:VAL:HG23	2.17	0.44
2:B:85:GLN:O	2:B:85:GLN:HG2	2.16	0.44
1:A:126:LYS:HB3	1:A:126:LYS:HE3	1.80	0.44
1:A:175:ASN:N	1:A:176:PRO:HD3	2.32	0.44
2:B:214:LEU:HA	2:B:214:LEU:HD22	1.56	0.44
1:A:26:LEU:HB2	1:A:31:ILE:HG12	1.99	0.44
1:A:402:TRP:CD2	1:A:409:THR:HG21	2.53	0.44
1:A:369:THR:HG21	1:A:402:TRP:CZ2	2.53	0.44
1:A:500:GLN:HG2	2:B:422:LEU:HD23	1.99	0.44
1:A:76:ASP:OD1	1:A:78:ARG:HD2	2.18	0.44
1:A:114:ALA:HB1	1:A:160:PHE:CE1	2.53	0.44
2:B:12:LEU:HD23	2:B:84:THR:HG22	2.00	0.44
2:B:341:ILE:HD11	2:B:375:ILE:HG23	1.99	0.44
1:A:345:PRO:HA	1:A:346:PHE:HA	1.71	0.43
2:B:80:LEU:O	2:B:84:THR:HG23	2.17	0.43
2:B:80:LEU:HD13	2:B:153:TRP:CD1	2.54	0.43
2:B:254:VAL:O	2:B:258:GLN:HG3	2.18	0.43
1:A:108:VAL:HG23	1:A:227:PHE:CE1	2.54	0.43
2:B:275:LYS:HA	2:B:275:LYS:HD2	1.61	0.43
1:A:29:GLU:HG3	1:A:30:LYS:N	2.34	0.43
2:B:298:GLU:O	2:B:301:LEU:HB3	2.19	0.43
1:A:107:THR:CB	1:A:202:ILE:CD1	2.95	0.43
2:B:193:LEU:HD12	2:B:198:HIS:HA	2.01	0.43
1:A:466:VAL:HG23	1:A:466:VAL:O	2.19	0.43
1:A:542:ILE:N	1:A:542:ILE:CD1	2.81	0.43
2:B:13:LYS:CB	2:B:16:MET:CE	2.97	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:94:ILE:HG12	2:B:161:GLN:CG	2.49	0.43
2:B:79:GLU:OE1	2:B:83:ARG:NH1	2.48	0.43
2:B:80:LEU:HD22	2:B:84:THR:HG21	2.01	0.43
2:B:270:ILE:HG12	2:B:346:PHE:O	2.19	0.43
2:B:292:VAL:O	2:B:293:ILE:HD13	2.19	0.43
2:B:37:ILE:O	2:B:41:MET:HG3	2.18	0.42
1:A:94:ILE:HD13	1:A:94:ILE:HA	1.67	0.42
1:A:88:TRP:HA	1:A:88:TRP:CE3	2.54	0.42
1:A:277:ARG:NH1	1:A:334:GLN:HG2	2.34	0.42
1:A:8:VAL:HA	1:A:9:PRO:HD3	1.84	0.42
1:A:125:ARG:O	1:A:128:THR:OG1	2.29	0.42
2:B:60:VAL:C	2:B:61:PHE:CD1	2.97	0.42
2:B:58:THR:HA	2:B:59:PRO:HD3	1.89	0.42
1:A:454:LYS:HD3	1:A:468:THR:HG22	2.02	0.42
2:B:80:LEU:HD22	2:B:84:THR:HG23	2.02	0.42
2:B:244:ILE:HG22	2:B:263:LYS:CE	2.49	0.42
2:B:65:LYS:O	2:B:68:SER:HB3	2.19	0.42
1:A:216:THR:HB	1:A:217:PRO:HD2	2.02	0.42
2:B:108:VAL:HB	2:B:232:TYR:HB3	2.01	0.41
1:A:28:GLU:HG2	1:A:135:ILE:CD1	2.46	0.41
1:A:486:LEU:HD13	1:A:524:GLN:HB3	2.03	0.41
2:B:244:ILE:CG2	2:B:263:LYS:HE3	2.50	0.41
1:A:402:TRP:CE3	1:A:409:THR:HB	2.55	0.41
1:A:411:ILE:O	1:A:411:ILE:HG13	2.19	0.41
2:B:113:ASP:HB2	2:B:214:LEU:HD22	2.02	0.41
1:A:254:VAL:HG21	1:A:287:LYS:HB2	2.03	0.41
1:A:279:LEU:HD23	1:A:279:LEU:HA	1.87	0.41
1:A:178:ILE:HD11	1:A:201:LYS:HG2	2.02	0.41
2:B:33:ALA:O	2:B:37:ILE:HG13	2.20	0.41
1:A:63:ILE:HG23	1:A:74:LEU:CD1	2.46	0.41
1:A:177:ASP:HB2	4:A:745:HOH:O	2.21	0.41
1:A:231:GLY:HA2	1:A:242:GLN:NE2	2.36	0.41
1:A:339:TYR:CZ	1:A:352:GLY:HA3	2.55	0.41
1:A:405:TYR:CE2	1:A:407:GLN:HG3	2.56	0.41
2:B:56:TYR:O	2:B:57:ASN:HB2	2.21	0.41
2:B:363:ASN:OD1	2:B:363:ASN:C	2.63	0.41
2:B:422:LEU:HD12	2:B:425:LEU:HD11	2.03	0.41
1:A:131:THR:OG1	1:A:143:ARG:HG2	2.20	0.40
1:A:457:TYR:CD1	1:A:457:TYR:C	2.98	0.40
2:B:283:LEU:HD12	2:B:283:LEU:HA	1.73	0.40
1:A:31:ILE:O	1:A:35:VAL:HG23	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:50:ILE:HD12	1:A:54:ASN:HB3	2.03	0.40
1:A:357:MET:HE2	1:A:512:GLN:HG3	2.02	0.40
1:A:433:PRO:HB2	2:B:290:THR:HG22	2.03	0.40
2:B:90:VAL:HG22	2:B:91:GLN:N	2.36	0.40
2:B:151:GLN:HB3	2:B:185:ASP:OD2	2.21	0.40
2:B:281:LYS:HD3	2:B:282:LEU:HD23	2.04	0.40
2:B:425:LEU:HD12	2:B:426:TRP:CD1	2.56	0.40
1:A:308:GLU:OE2	1:A:311:LYS:NZ	2.52	0.40
2:B:250:ASP:OD1	2:B:251:SER:N	2.54	0.40
2:B:303:LEU:C	2:B:303:LEU:HD23	2.46	0.40
1:A:539:HIS:C	1:A:541:GLY:H	2.28	0.40
2:B:266:TRP:CZ2	2:B:427:TYR:OH	2.71	0.40
2:B:295:LEU:HB2	2:B:300:GLU:CD	2.47	0.40
1:A:260:LEU:O	1:A:264:LEU:HD22	2.22	0.40
2:B:259:LYS:HB2	2:B:259:LYS:HE3	1.93	0.40
2:B:349:LEU:HD23	2:B:349:LEU:HA	1.90	0.40
2:B:355:ALA:HB3	4:B:548:HOH:O	2.22	0.40
2:B:396:GLU:OE2	2:B:396:GLU:N	2.42	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	530/560 (95%)	503 (95%)	27 (5%)	0	100	100
2	B	393/440 (89%)	366 (93%)	27 (7%)	0	100	100
All	All	923/1000 (92%)	869 (94%)	54 (6%)	0	100	100

There are no Ramachandran outliers to report.

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	479/500 (96%)	428 (89%)	51 (11%)	6	10
2	B	365/400 (91%)	325 (89%)	40 (11%)	6	9
All	All	844/900 (94%)	753 (89%)	91 (11%)	6	9

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	VAL
1	A	24	TRP
1	A	31	ILE
1	A	39	THR
1	A	61	PHE
1	A	63	ILE
1	A	64	LYS
1	A	94	ILE
1	A	105	SER
1	A	107	THR
1	A	120	LEU
1	A	137	ASN
1	A	151	GLN
1	A	161	GLN
1	A	166	LYS
1	A	173	LYS
1	A	179	VAL
1	A	193	LEU
1	A	197	GLN
1	A	201	LYS
1	A	202	ILE
1	A	209	LEU
1	A	210	LEU
1	A	228	LEU
1	A	234	LEU
1	A	242	GLN
1	A	244	ILE

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Mol	Chain	Res	Type
1	A	264	LEU
1	A	282	LEU
1	A	283	LEU
1	A	284	ARG
1	A	287	LYS
1	A	298	GLU
1	A	301	LEU
1	A	303	LEU
1	A	307	ARG
1	A	357	MET
1	A	362	THR
1	A	423	VAL
1	A	448	ARG
1	A	449	GLU
1	A	468	THR
1	A	479	LEU
1	A	484	LEU
1	A	503	LEU
1	A	507	GLN
1	A	517	LEU
1	A	524	GLN
1	A	533	LEU
1	A	536	VAL
1	A	542	ILE
2	B	11	LYS
2	B	13	LYS
2	B	16	MET
2	B	29	GLU
2	B	40	GLU
2	B	58	THR
2	B	69	THR
2	B	70	LYS
2	B	80	LEU
2	B	90	VAL
2	B	92	LEU
2	B	161	GLN
2	B	165	THR
2	B	175	ASN
2	B	187	LEU
2	B	205	LEU
2	B	209	LEU
2	B	214	LEU

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Mol	Chain	Res	Type
2	B	234	LEU
2	B	238	LYS
2	B	245	VAL
2	B	248	GLU
2	B	260	LEU
2	B	265	ASN
2	B	279	LEU
2	B	282	LEU
2	B	283	LEU
2	B	292	VAL
2	B	295	LEU
2	B	300	GLU
2	B	310	LEU
2	B	311	LYS
2	B	334	GLN
2	B	340	GLN
2	B	363	ASN
2	B	368	LEU
2	B	369	THR
2	B	407	GLN
2	B	422	LEU
2	B	425	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	242	GLN
1	A	336	GLN
1	A	500	GLN
1	A	509	GLN
1	A	520	GLN
2	B	137	ASN
2	B	147	ASN

5.3.3 RNA ⓘ

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 oligosaccharides 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	$\# Z > 2$
3	IB1	A	601	-	29,29,29	0.92	0	39,40,40	1.36	5 (12%)

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	IB1	A	601	-	-	0/16/16/16	0/3/3/3

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	601	IB1	N05-C04-N03	-3.57	122.97	126.42
3	A	601	IB1	C06-C01-C02	-3.23	115.03	117.02
3	A	601	IB1	C11-C10-C09	-2.92	121.17	123.96
3	A	601	IB1	C02-N03-C04	2.44	118.72	116.87
3	A	601	IB1	C14-C09-C10	2.06	118.47	114.93

There are no chirality outliers.

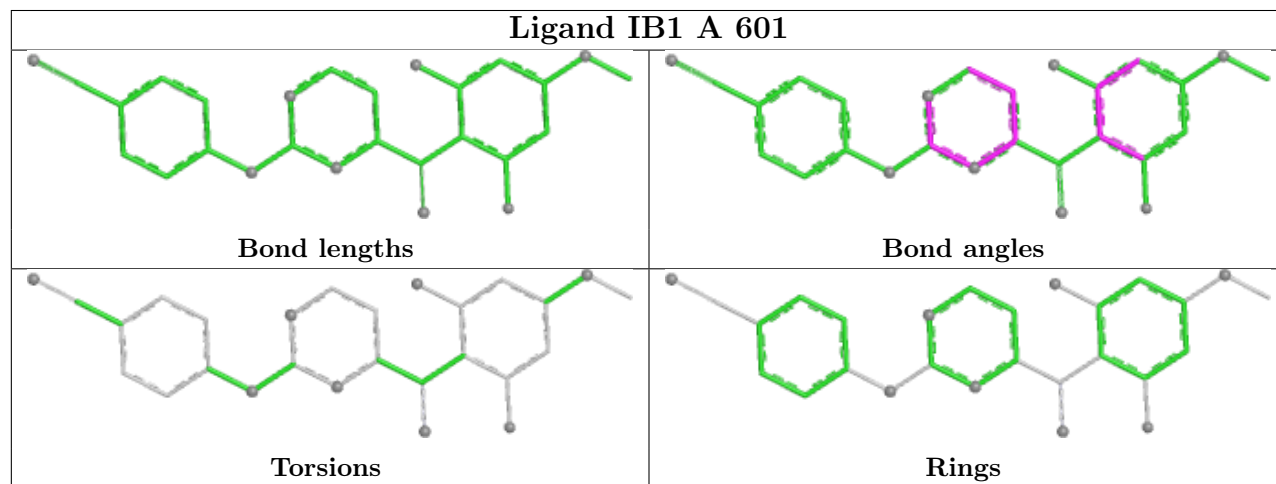
There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	601	IB1	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	536/560 (95%)	0.13	23 (4%)	40 36	15, 34, 59, 83	0
2	B	401/440 (91%)	0.28	31 (7%)	19 16	16, 34, 71, 95	0
All	All	937/1000 (93%)	0.19	54 (5%)	29 25	15, 34, 66, 95	0

All (54) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	295	LEU	5.7
1	A	286	THR	4.6
2	B	61	PHE	4.1
2	B	421	PRO	3.7
1	A	24	TRP	3.5
2	B	266	TRP	3.5
2	B	242	GLN	3.4
2	B	428	GLN	3.3
1	A	539	HIS	3.3
1	A	68	SER	3.3
2	B	356	ARG	3.1
2	B	425	LEU	3.0
1	A	51	GLY	3.0
2	B	68	SER	3.0
2	B	245	VAL	2.9
2	B	429	LEU	2.9
1	A	69	THR	2.8
1	A	543	GLY	2.8
1	A	357	MET	2.8
2	B	284	ARG	2.7
2	B	232	TYR	2.7
2	B	241	VAL	2.7
2	B	69	THR	2.7
1	A	195	ILE	2.7

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Mol	Chain	Res	Type	RSRZ
2	B	15	GLY	2.6
2	B	346	PHE	2.6
2	B	24	TRP	2.6
2	B	283	LEU	2.6
1	A	53	GLU	2.5
1	A	541	GLY	2.5
2	B	296	THR	2.5
1	A	52	PRO	2.4
1	A	426	TRP	2.4
2	B	285	GLY	2.4
2	B	336	GLN	2.4
1	A	542	ILE	2.3
1	A	63	ILE	2.3
1	A	61	PHE	2.3
2	B	116	PHE	2.3
2	B	240	THR	2.3
1	A	287	LYS	2.3
2	B	250	ASP	2.2
1	A	173	LYS	2.2
2	B	275	LYS	2.2
2	B	334	GLN	2.2
1	A	70	LYS	2.2
2	B	427	TYR	2.2
1	A	399	GLU	2.1
2	B	14	PRO	2.1
1	A	91	GLN	2.1
1	A	446	ALA	2.1
1	A	356	ARG	2.0
2	B	281	LYS	2.0
2	B	215	THR	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](#)

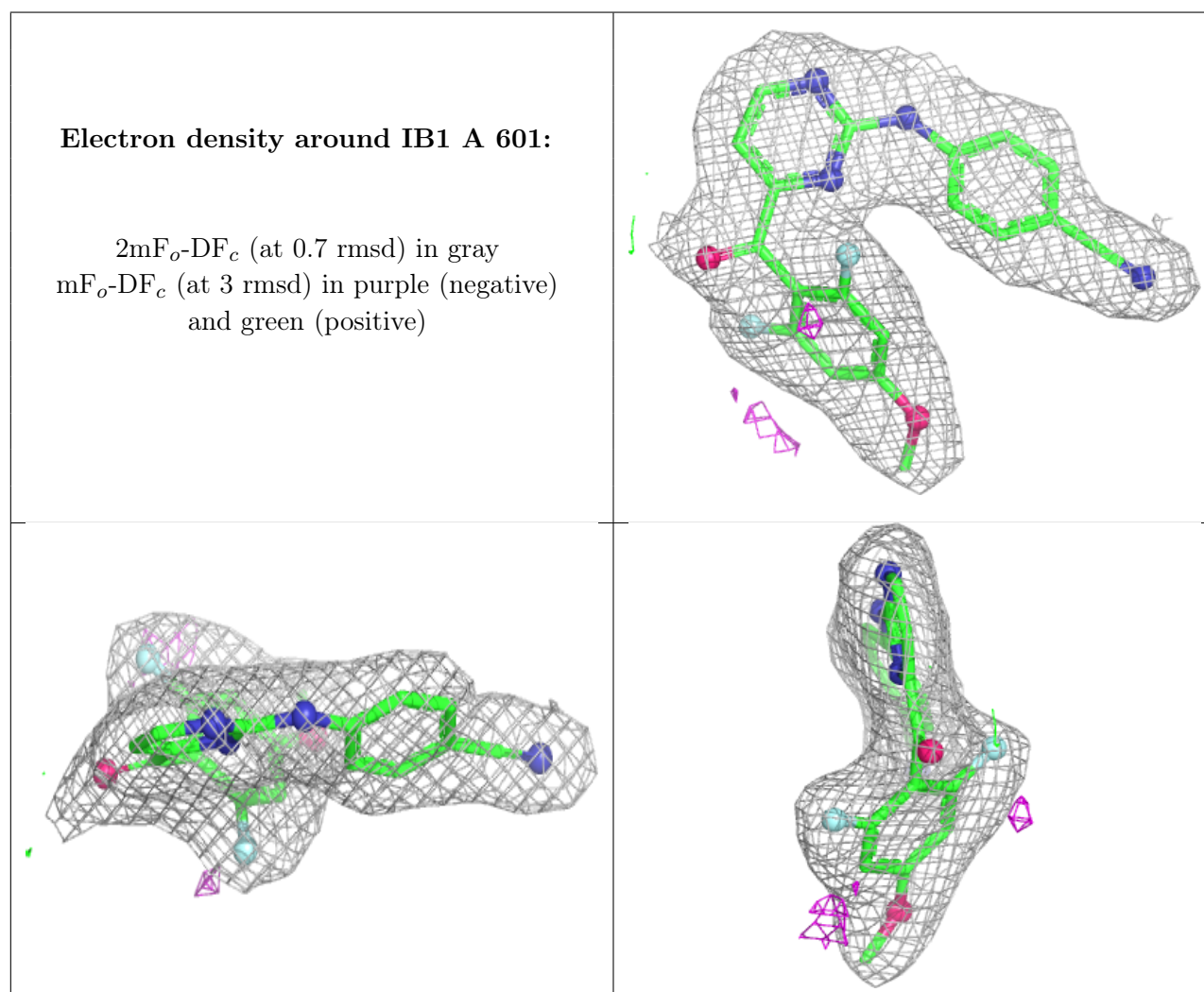
There are no oligosaccharides in this entry.

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
3	IB1	A	601	27/27	0.96	0.07	17,22,29,29	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.