



Full wwPDB X-ray Structure Validation Report ⓘ

May 21, 2025 – 04:14 PM EDT

PDB ID : 7HOP / pdb_00007hop
Title : PanDDA analysis group deposition – Crystal Structure of ZIKV NS2B-NS3 protease in complex with ASAP-0014657-001
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Deposited on : 2024-11-07
Resolution : 1.50 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 Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)

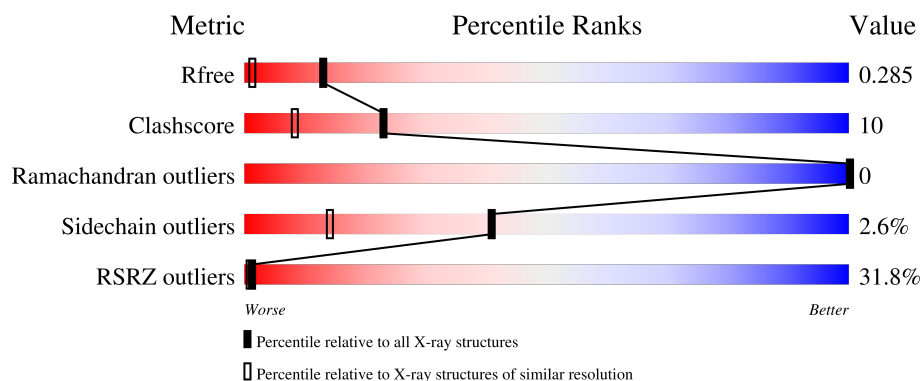
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.50 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}	164625	3717 (1.50-1.50)
Clashscore	180529	4048 (1.50-1.50)
Ramachandran outliers	177936	3970 (1.50-1.50)
Sidechain outliers	177891	3967 (1.50-1.50)
RSRZ outliers	164620	3718 (1.50-1.50)

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	46	
2	B	168	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.43.1

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	DMS	B	203[A]	-	-	-	X
3	DMS	B	203[B]	-	-	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 2923 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 Serine protease subunit NS2B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	39	Total	C	N	O	S	0	2	0
			368	223	56	88	1			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	44	SER	-	expression tag	UNP Q32ZE1
A	45	MET	-	expression tag	UNP Q32ZE1

- Molecule 2 is a protein called Serine protease NS3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	156	Total	C	N	O	S	0	37	0
			2264	1432	382	441	9			

There are 2 discrepancies between the modelled and reference sequences:

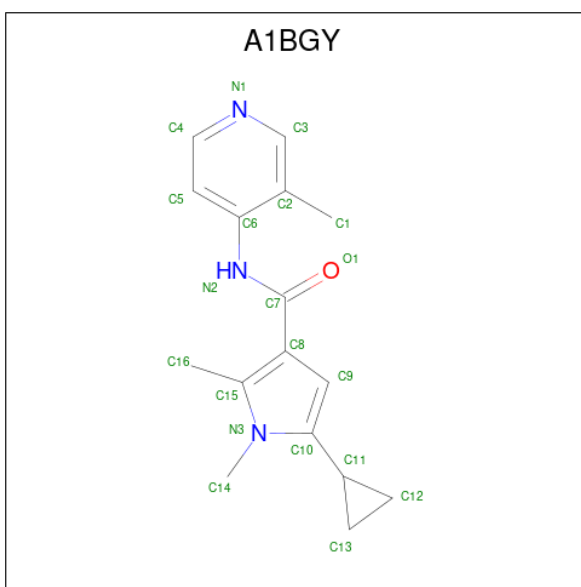
Chain	Residue	Modelled	Actual	Comment	Reference
B	10	MET	-	initiating methionine	UNP Q32ZE1
B	107	LYS	ARG	conflict	UNP Q32ZE1

- Molecule 3 is DIMETHYL SULFOXIDE (CCD ID: DMS) (formula: C₂H₆OS).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O	S	0	1
			12	6	3	3		
3	B	1	Total	C	O	S	0	1
			8	4	2	2		
3	B	1	Total	C	O	S	0	1
			8	4	2	2		
3	B	1	Total	C	O	S	0	1
			8	4	2	2		
3	B	1	Total	C	O	S	0	1
			12	6	3	3		

- Molecule 4 is 5-cyclopropyl-1,2-dimethyl-N-(3-methylpyridin-4-yl)-1H-pyrrole-3-carboxamide (CCD ID: A1BGY) (formula: C₁₆H₁₉N₃O) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	1	Total	C	N	O	0	1
			60	48	9	3		

- Molecule 5 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	O	S	0	1
			15	12	3		
5	B	1	Total	O	S	0	1
			15	12	3		

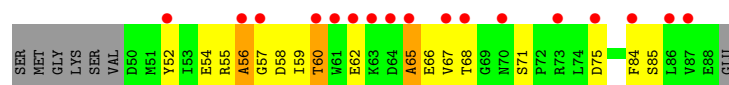
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	25	Total 38	O 38	0	8
6	B	78	Total 115	O 115	0	27

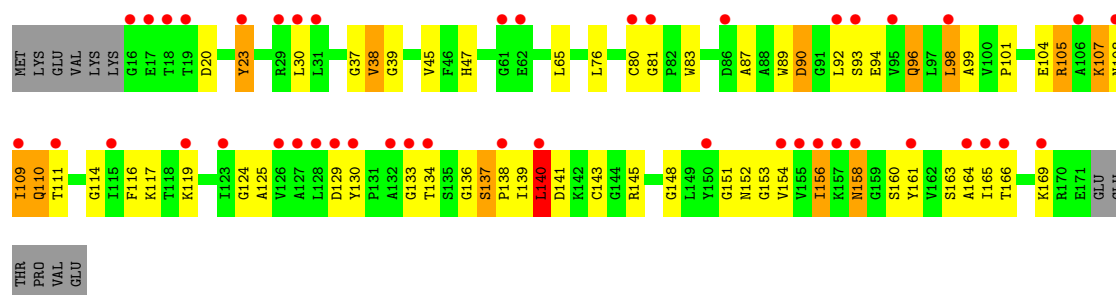
3 Residue-property plots [i](#)

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: Serine protease subunit NS2B



- Molecule 2: Serine protease NS3



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α , β , γ	42.47Å 42.47Å 216.43Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	54.11 – 1.50 54.11 – 1.50	Depositor EDS
% Data completeness (in resolution range)	92.2 (54.11-1.50) 92.2 (54.11-1.50)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.80 (at 1.50Å)	Xtriage
Refinement program	REFMAC 5.8.0267, BUSTER	Depositor
R, R_{free}	0.258 , 0.280 0.263 , 0.285	Depositor DCC
R_{free} test set	1672 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	29.8	Xtriage
Anisotropy	0.392	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 49.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	2923	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.58% 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: A1BGY, DMS, SO4

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	2.62	21/372 (5.6%)	1.47	5/505 (1.0%)
2	B	2.39	112/2324 (4.8%)	1.41	20/3173 (0.6%)
All	All	2.43	133/2696 (4.9%)	1.41	25/3678 (0.7%)

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	1
2	B	0	3
All	All	0	4

All (133) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	65	ALA	C-O	27.89	1.57	1.23
2	B	152[A]	ASN	C-N	17.86	1.59	1.33
2	B	152[B]	ASN	C-N	17.86	1.59	1.33
2	B	152[C]	ASN	C-N	17.86	1.59	1.33
2	B	152[D]	ASN	C-N	17.86	1.59	1.33
2	B	152[E]	ASN	C-N	17.86	1.59	1.33
2	B	148	GLY	C-O	16.78	1.47	1.23
2	B	140	LEU	C-O	14.93	1.42	1.23
2	B	156	ILE	C-O	13.65	1.40	1.23
2	B	39	GLY	C-O	12.70	1.36	1.23
2	B	99	ALA	C-O	12.68	1.39	1.23
2	B	98	LEU	C-O	11.24	1.36	1.23
2	B	138	PRO	N-CD	11.12	1.63	1.47
2	B	116	PHE	C-N	10.68	1.48	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	116	PHE	C-O	10.38	1.36	1.24
2	B	117	LYS	C-O	10.24	1.36	1.24
2	B	137	SER	CA-C	10.11	1.63	1.53
2	B	38	VAL	C-O	10.09	1.34	1.23
2	B	104	GLU	C-O	9.74	1.36	1.23
2	B	108	ASN	C-O	9.70	1.35	1.24
2	B	23[A]	TYR	C-O	9.59	1.36	1.23
2	B	23[B]	TYR	C-O	9.59	1.36	1.23
2	B	23[C]	TYR	C-O	9.59	1.36	1.23
2	B	23[D]	TYR	C-O	9.59	1.36	1.23
2	B	23[E]	TYR	C-O	9.59	1.36	1.23
2	B	151[A]	GLY	C-O	9.01	1.36	1.23
2	B	151[B]	GLY	C-O	9.01	1.36	1.23
2	B	151[C]	GLY	C-O	9.01	1.36	1.23
2	B	151[D]	GLY	C-O	9.01	1.36	1.23
2	B	151[E]	GLY	C-O	9.01	1.36	1.23
1	A	52	TYR	C-O	8.78	1.34	1.23
2	B	152[A]	ASN	CA-C	8.78	1.63	1.52
2	B	152[B]	ASN	CA-C	8.78	1.63	1.52
2	B	152[C]	ASN	CA-C	8.78	1.63	1.52
2	B	152[D]	ASN	CA-C	8.78	1.63	1.52
2	B	152[E]	ASN	CA-C	8.78	1.63	1.52
1	A	54	GLU	C-O	8.58	1.33	1.23
2	B	140	LEU	C-N	8.55	1.47	1.33
2	B	101	PRO	C-N	8.45	1.43	1.33
2	B	111	THR	C-O	8.43	1.34	1.23
2	B	164[A]	ALA	C-O	8.41	1.33	1.23
2	B	164[B]	ALA	C-O	8.41	1.33	1.23
2	B	164[C]	ALA	C-O	8.41	1.33	1.23
2	B	164[D]	ALA	C-O	8.41	1.33	1.23
2	B	164[E]	ALA	C-O	8.41	1.33	1.23
1	A	85	SER	C-O	8.37	1.34	1.23
2	B	151[A]	GLY	C-N	8.25	1.45	1.33
2	B	151[B]	GLY	C-N	8.25	1.45	1.33
2	B	151[C]	GLY	C-N	8.25	1.45	1.33
2	B	151[D]	GLY	C-N	8.25	1.45	1.33
2	B	151[E]	GLY	C-N	8.25	1.45	1.33
2	B	96[A]	GLN	C-O	8.11	1.33	1.24
2	B	96[B]	GLN	C-O	8.11	1.33	1.24
2	B	96[C]	GLN	C-O	8.11	1.33	1.24
2	B	96[D]	GLN	C-O	8.11	1.33	1.24
2	B	96[E]	GLN	C-O	8.11	1.33	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	164[A]	ALA	C-N	7.91	1.44	1.33
2	B	164[B]	ALA	C-N	7.91	1.44	1.33
2	B	164[C]	ALA	C-N	7.91	1.44	1.33
2	B	164[D]	ALA	C-N	7.91	1.44	1.33
2	B	164[E]	ALA	C-N	7.91	1.44	1.33
1	A	54	GLU	C-N	7.89	1.43	1.33
1	A	65	ALA	C-N	7.79	1.43	1.33
2	B	92	LEU	C-O	7.69	1.33	1.24
2	B	145	ARG	C-O	7.50	1.33	1.23
2	B	94[A]	GLU	C-O	7.33	1.34	1.23
2	B	94[B]	GLU	C-O	7.33	1.34	1.23
2	B	94[C]	GLU	C-O	7.33	1.34	1.23
2	B	94[D]	GLU	C-O	7.33	1.34	1.23
2	B	94[E]	GLU	C-O	7.33	1.34	1.23
2	B	111	THR	CA-C	7.28	1.61	1.52
1	A	65	ALA	CA-C	7.15	1.61	1.52
2	B	94[A]	GLU	C-N	7.05	1.43	1.33
2	B	94[B]	GLU	C-N	7.05	1.43	1.33
2	B	94[C]	GLU	C-N	7.05	1.43	1.33
2	B	94[D]	GLU	C-N	7.05	1.43	1.33
2	B	94[E]	GLU	C-N	7.05	1.43	1.33
1	A	66	GLU	CD-OE1	7.02	1.38	1.25
1	A	58	ASP	C-N	6.99	1.42	1.33
1	A	66	GLU	C-O	6.91	1.32	1.23
2	B	90	ASP	CG-OD2	6.75	1.38	1.25
2	B	109	ILE	C-O	6.72	1.31	1.24
1	A	68	THR	C-O	6.65	1.31	1.23
2	B	138	PRO	CA-C	6.58	1.61	1.52
1	A	58	ASP	C-O	-6.54	1.15	1.23
1	A	71	SER	CB-OG	6.34	1.54	1.42
2	B	166[A]	THR	CA-C	6.33	1.61	1.52
2	B	166[B]	THR	CA-C	6.33	1.61	1.52
2	B	166[C]	THR	CA-C	6.33	1.61	1.52
2	B	166[D]	THR	CA-C	6.33	1.61	1.52
2	B	166[E]	THR	CA-C	6.33	1.61	1.52
2	B	20[A]	ASP	C-O	6.30	1.31	1.23
2	B	20[B]	ASP	C-O	6.30	1.31	1.23
2	B	20[C]	ASP	C-O	6.30	1.31	1.23
2	B	20[D]	ASP	C-O	6.30	1.31	1.23
2	B	20[E]	ASP	C-O	6.30	1.31	1.23
2	B	87	ALA	C-O	6.30	1.31	1.23
2	B	101	PRO	CA-C	6.28	1.58	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	57	GLY	C-O	6.19	1.32	1.23
2	B	81[A]	GLY	C-O	6.00	1.32	1.24
2	B	81[B]	GLY	C-O	6.00	1.32	1.24
2	B	81[C]	GLY	C-O	6.00	1.32	1.24
2	B	81[D]	GLY	C-O	6.00	1.32	1.24
2	B	81[E]	GLY	C-O	6.00	1.32	1.24
2	B	166[A]	THR	C-N	5.82	1.41	1.33
2	B	166[B]	THR	C-N	5.82	1.41	1.33
2	B	166[C]	THR	C-N	5.82	1.41	1.33
2	B	166[D]	THR	C-N	5.82	1.41	1.33
2	B	166[E]	THR	C-N	5.82	1.41	1.33
2	B	139	ILE	C-O	5.81	1.30	1.24
2	B	134[A]	THR	CA-C	5.56	1.60	1.52
2	B	134[B]	THR	CA-C	5.56	1.60	1.52
2	B	134[C]	THR	CA-C	5.56	1.60	1.52
2	B	134[D]	THR	CA-C	5.56	1.60	1.52
2	B	134[E]	THR	CA-C	5.56	1.60	1.52
2	B	119	LYS	C-O	5.54	1.31	1.24
2	B	89	TRP	C-O	5.50	1.30	1.23
2	B	163[A]	SER	C-O	5.35	1.30	1.24
2	B	163[B]	SER	C-O	5.35	1.30	1.24
2	B	163[C]	SER	C-O	5.35	1.30	1.24
2	B	163[D]	SER	C-O	5.35	1.30	1.24
2	B	163[E]	SER	C-O	5.35	1.30	1.24
1	A	60[A]	THR	C-O	5.30	1.30	1.23
1	A	60[B]	THR	C-O	5.30	1.30	1.23
1	A	60[C]	THR	C-O	5.30	1.30	1.23
1	A	60[D]	THR	C-O	5.30	1.30	1.23
1	A	60[E]	THR	C-O	5.30	1.30	1.23
1	A	75	ASP	CA-C	5.29	1.59	1.52
2	B	148	GLY	N-CA	5.09	1.50	1.45
2	B	156	ILE	C-N	5.08	1.40	1.33
1	A	56	ALA	C-O	-5.06	1.17	1.24
2	B	110	GLN	C-N	5.04	1.39	1.33
2	B	105	ARG	C-O	5.00	1.30	1.23

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	137	SER	N-CA-C	-9.88	98.24	109.60
2	B	156	ILE	CA-C-O	-9.32	112.77	121.72
2	B	141	ASP	O-C-N	9.01	133.36	121.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	141	ASP	CA-C-O	-8.28	111.14	121.50
2	B	152[A]	ASN	O-C-N	7.04	131.58	123.27
2	B	152[B]	ASN	O-C-N	7.04	131.58	123.27
2	B	152[C]	ASN	O-C-N	7.04	131.58	123.27
2	B	152[D]	ASN	O-C-N	7.04	131.58	123.27
2	B	152[E]	ASN	O-C-N	7.04	131.58	123.27
2	B	137	SER	CB-CA-C	6.86	120.81	109.56
2	B	38	VAL	CA-C-O	-6.36	115.34	121.63
2	B	164[A]	ALA	CA-C-O	6.21	128.12	121.16
2	B	164[B]	ALA	CA-C-O	6.21	128.12	121.16
2	B	164[C]	ALA	CA-C-O	6.21	128.12	121.16
2	B	164[D]	ALA	CA-C-O	6.21	128.12	121.16
2	B	164[E]	ALA	CA-C-O	6.21	128.12	121.16
2	B	156	ILE	O-C-N	6.05	128.32	122.69
1	A	58	ASP	CA-C-N	-6.03	115.47	122.95
1	A	58	ASP	C-N-CA	-6.03	115.47	122.95
1	A	58	ASP	CA-C-O	5.87	128.22	121.47
1	A	84	PHE	CA-CB-CG	5.73	119.53	113.80
2	B	137	SER	CA-C-O	5.61	125.46	120.02
2	B	90	ASP	CA-CB-CG	5.27	117.87	112.60
2	B	111	THR	OG1-CB-CG2	-5.25	98.79	109.30
1	A	52	TYR	O-C-N	5.18	129.44	123.17

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	56	ALA	Mainchain
2	B	110	GLN	Mainchain
2	B	140	LEU	Mainchain
2	B	156	ILE	Mainchain

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	368	0	327	12	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	2264	0	2172	52	0
3	A	12	0	18	0	0
3	B	36	0	54	3	0
4	B	60	0	0	0	0
5	B	30	0	0	0	0
6	A	38	0	0	0	0
6	B	115	0	0	4	0
All	All	2923	0	2571	55	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 10.

All (55) 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:65:ALA:O	1:A:67:VAL:HG23	1.89	0.72
2:B:90:ASP:OD2	2:B:93:SER:OG	2.07	0.67
1:A:65:ALA:O	1:A:67:VAL:CG2	2.49	0.60
2:B:143:CYS:SG	6:B:372[B]:HOH:O	2.57	0.60
2:B:37:GLY:HA2	2:B:133[B]:GLY:O	2.07	0.55
2:B:37:GLY:HA2	2:B:133[A]:GLY:O	2.08	0.54
2:B:153:GLY:N	2:B:161[A]:TYR:OH	2.40	0.54
2:B:153:GLY:N	2:B:161[B]:TYR:OH	2.40	0.54
2:B:129[C]:ASP:OD1	2:B:160[C]:SER:OG	2.25	0.53
2:B:129[E]:ASP:OD1	2:B:160[E]:SER:OG	2.25	0.53
1:A:60[A]:THR:OG1	1:A:62[A]:GLU:OE2	2.26	0.53
2:B:65:LEU:HD22	2:B:80[B]:CYS:SG	2.49	0.52
2:B:65:LEU:HD22	2:B:80[A]:CYS:SG	2.49	0.52
1:A:55:ARG:HD2	2:B:23[B]:TYR:OH	2.10	0.52
2:B:158[B]:ASN:N	2:B:158[B]:ASN:OD1	2.43	0.51
2:B:158[A]:ASN:N	2:B:158[A]:ASN:OD1	2.43	0.51
2:B:23[A]:TYR:O	2:B:38:VAL:HG13	2.09	0.51
2:B:23[B]:TYR:O	2:B:38:VAL:HG13	2.09	0.51
1:A:55:ARG:HD2	2:B:23[A]:TYR:OH	2.10	0.51
2:B:105:ARG:NH1	3:B:207[E]:DMS:S	2.84	0.50
2:B:105:ARG:NH1	3:B:207[C]:DMS:S	2.84	0.50
2:B:105:ARG:NH1	3:B:207[D]:DMS:S	2.84	0.50
2:B:114[D]:GLY:O	2:B:125:ALA:N	2.43	0.48
2:B:114[C]:GLY:O	2:B:125:ALA:N	2.43	0.48
2:B:114[E]:GLY:O	2:B:125:ALA:N	2.43	0.48
2:B:169[C]:LYS:HE2	6:B:329[C]:HOH:O	2.11	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:169[D]:LYS:HE2	6:B:329[D]:HOH:O	2.11	0.48
2:B:169[E]:LYS:HE2	6:B:329[E]:HOH:O	2.11	0.48
2:B:65:LEU:HD22	2:B:80[E]:CYS:SG	2.54	0.48
2:B:65:LEU:HD22	2:B:80[C]:CYS:SG	2.54	0.47
2:B:65:LEU:HD22	2:B:80[D]:CYS:SG	2.54	0.47
2:B:76:LEU:HD22	2:B:83:TRP:CH2	2.51	0.46
2:B:107:LYS:HE3	2:B:107:LYS:HB3	1.77	0.45
1:A:55:ARG:HB2	2:B:23[B]:TYR:CE2	2.52	0.45
1:A:55:ARG:HB2	2:B:23[A]:TYR:CE2	2.52	0.44
2:B:45:VAL:HG12	2:B:47[E]:HIS:CE1	2.52	0.44
1:A:59:ILE:HG23	2:B:140:LEU:HD21	1.98	0.44
2:B:109:ILE:HG13	2:B:130[E]:TYR:OH	2.17	0.44
2:B:38:VAL:O	2:B:136[C]:GLY:HA3	2.16	0.44
2:B:38:VAL:O	2:B:136[D]:GLY:HA3	2.16	0.44
2:B:38:VAL:O	2:B:136[E]:GLY:HA3	2.16	0.44
2:B:45:VAL:HG12	2:B:47[C]:HIS:CE1	2.52	0.44
2:B:45:VAL:HG12	2:B:47[D]:HIS:CE1	2.52	0.44
2:B:109:ILE:HG13	2:B:130[C]:TYR:OH	2.17	0.43
2:B:109:ILE:HG13	2:B:130[D]:TYR:OH	2.17	0.43
1:A:65:ALA:HB3	2:B:96[E]:GLN:NE2	2.33	0.43
1:A:65:ALA:HB3	2:B:96[C]:GLN:NE2	2.33	0.43
1:A:65:ALA:HB3	2:B:96[D]:GLN:NE2	2.33	0.43
2:B:124:GLY:HA3	2:B:165[A]:ILE:HD12	2.02	0.41
2:B:124:GLY:HA3	2:B:165[B]:ILE:HD12	2.02	0.41
2:B:98:LEU:O	2:B:137:SER:HB3	2.19	0.41
2:B:158[C]:ASN:OD1	2:B:158[C]:ASN:N	2.51	0.40
2:B:158[E]:ASN:OD1	2:B:158[E]:ASN:N	2.51	0.40
2:B:158[D]:ASN:OD1	2:B:158[D]:ASN:N	2.51	0.40
1:A:55:ARG:HG3	2:B:23[B]:TYR:CE1	2.57	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	45/46 (98%)	45 (100%)	0	0	100	100
2	B	302/168 (180%)	280 (93%)	22 (7%)	0	100	100
All	All	347/214 (162%)	325 (94%)	22 (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	41/39 (105%)	41 (100%)	0	100	100
2	B	238/134 (178%)	230 (97%)	8 (3%)	32	8
All	All	279/173 (161%)	271 (97%)	8 (3%)	41	11

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	30	LEU
2	B	107	LYS
2	B	154	VAL
2	B	158[A]	ASN
2	B	158[B]	ASN
2	B	158[C]	ASN
2	B	158[D]	ASN
2	B	158[E]	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	74	GLN
2	B	108	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

21 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	$\# Z > 2$
3	DMS	B	201[A]	-	3,3,3	0.25	0	3,3,3	0.10	0
3	DMS	B	202[B]	-	3,3,3	0.23	0	3,3,3	0.10	0
5	SO4	B	206[C]	-	4,4,4	0.34	0	6,6,6	0.07	0
3	DMS	B	207[C]	-	3,3,3	0.20	0	3,3,3	0.12	0
3	DMS	B	203[B]	-	3,3,3	0.21	0	3,3,3	0.10	0
5	SO4	B	206[E]	-	4,4,4	0.34	0	6,6,6	0.07	0
5	SO4	B	206[D]	-	4,4,4	0.34	0	6,6,6	0.07	0
3	DMS	B	207[E]	-	3,3,3	0.20	0	3,3,3	0.12	0
3	DMS	B	202[A]	-	3,3,3	0.23	0	3,3,3	0.10	0
3	DMS	B	207[D]	-	3,3,3	0.20	0	3,3,3	0.12	0
3	DMS	A	101[C]	-	3,3,3	0.23	0	3,3,3	0.10	0
5	SO4	B	205[C]	-	4,4,4	0.33	0	6,6,6	0.10	0
3	DMS	B	203[A]	-	3,3,3	0.20	0	3,3,3	0.10	0
3	DMS	B	201[B]	-	3,3,3	0.26	0	3,3,3	0.10	0
4	A1BGY	B	204[C]	-	20,22,22	0.83	1 (5%)	25,32,32	1.06	2 (8%)
3	DMS	A	101[E]	-	3,3,3	0.23	0	3,3,3	0.10	0
5	SO4	B	205[E]	-	4,4,4	0.33	0	6,6,6	0.10	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	DMS	A	101[D]	-	3,3,3	0.23	0	3,3,3	0.10	0
5	SO4	B	205[D]	-	4,4,4	0.34	0	6,6,6	0.10	0
4	A1BGY	B	204[E]	-	20,22,22	0.83	1 (5%)	25,32,32	1.06	2 (8%)
4	A1BGY	B	204[D]	-	20,22,22	0.82	1 (5%)	25,32,32	1.06	2 (8%)

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
4	A1BGY	B	204[E]	-	-	1/10/14/14	0/3/3/3
4	A1BGY	B	204[D]	-	-	1/10/14/14	0/3/3/3
4	A1BGY	B	204[C]	-	-	1/10/14/14	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	204[C]	A1BGY	C15-N3	2.67	1.42	1.39
4	B	204[E]	A1BGY	C15-N3	2.67	1.42	1.39
4	B	204[D]	A1BGY	C15-N3	2.61	1.42	1.39

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	204[D]	A1BGY	C9-C10-N3	2.41	108.63	105.65
4	B	204[C]	A1BGY	C9-C10-N3	2.38	108.59	105.65
4	B	204[E]	A1BGY	C9-C10-N3	2.38	108.59	105.65
4	B	204[D]	A1BGY	C14-N3-C15	2.25	126.29	124.09
4	B	204[C]	A1BGY	C14-N3-C15	2.19	126.24	124.09
4	B	204[E]	A1BGY	C14-N3-C15	2.19	126.24	124.09

There are no chirality outliers.

All (3) torsion outliers are listed below:

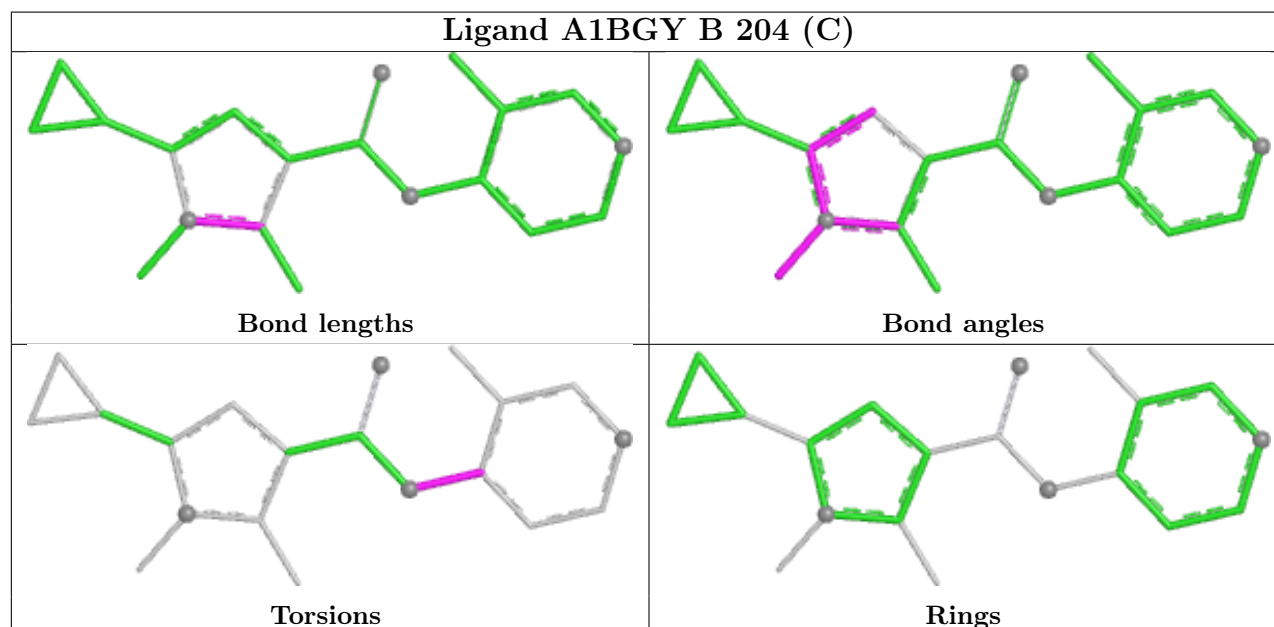
Mol	Chain	Res	Type	Atoms
4	B	204[C]	A1BGY	C2-C6-N2-C7
4	B	204[D]	A1BGY	C2-C6-N2-C7
4	B	204[E]	A1BGY	C2-C6-N2-C7

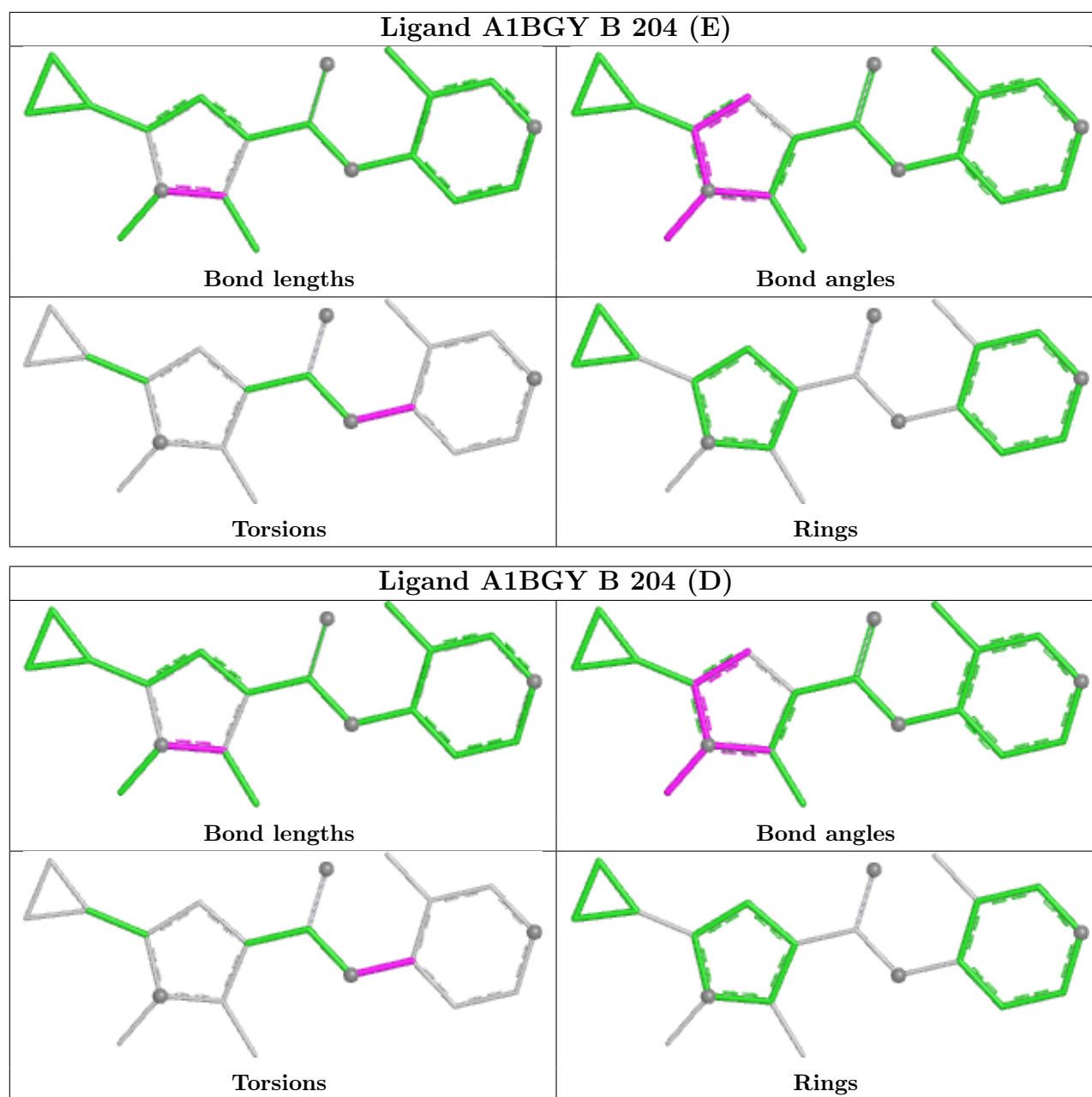
There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	207[C]	DMS	1	0
3	B	207[E]	DMS	1	0
3	B	207[D]	DMS	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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	152[A]:ASN	C	153:GLY	N	1.61
1	B	152[B]:ASN	C	153:GLY	N	1.61

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	39/46 (84%)	2.00	17 (43%)	1 0	11, 51, 77, 84	2 (5%)
2	B	156/168 (92%)	1.51	45 (28%)	1 1	6, 36, 57, 75	37 (23%)
All	All	195/214 (91%)	1.61	62 (31%)	1 1	6, 40, 63, 84	39 (20%)

All (62) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	169[A]	LYS	8.4
2	B	18[A]	THR	5.7
2	B	16	GLY	4.8
1	A	67	VAL	4.4
1	A	84	PHE	4.1
2	B	161[A]	TYR	4.1
1	A	56	ALA	3.8
2	B	128[A]	LEU	3.8
2	B	126[A]	VAL	3.7
2	B	23[A]	TYR	3.6
1	A	62[A]	GLU	3.6
2	B	17	GLU	3.6
1	A	65	ALA	3.6
2	B	31	LEU	3.4
1	A	87	VAL	3.4
2	B	156	ILE	3.2
2	B	86	ASP	3.1
2	B	164[A]	ALA	3.0
2	B	61	GLY	3.0
1	A	61	TRP	2.9
1	A	73	ARG	2.8
1	A	52	TYR	2.8
2	B	129[A]	ASP	2.8
2	B	158[A]	ASN	2.8

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Mol	Chain	Res	Type	RSRZ
2	B	133[A]	GLY	2.7
2	B	154	VAL	2.6
2	B	81[A]	GLY	2.6
1	A	60[A]	THR	2.6
2	B	134[A]	THR	2.5
2	B	166[A]	THR	2.5
2	B	80[A]	CYS	2.5
1	A	57	GLY	2.5
1	A	68	THR	2.5
2	B	111	THR	2.5
1	A	70	ASN	2.5
2	B	123	ILE	2.5
2	B	115[A]	ILE	2.4
2	B	130[A]	TYR	2.4
2	B	95[A]	VAL	2.4
2	B	127[A]	ALA	2.4
2	B	132[A]	ALA	2.3
2	B	29	ARG	2.3
2	B	19	THR	2.3
2	B	150	TYR	2.3
2	B	108	ASN	2.3
2	B	138	PRO	2.3
2	B	140	LEU	2.3
1	A	63	LYS	2.2
1	A	64	ASP	2.2
2	B	98	LEU	2.2
1	A	86	LEU	2.2
2	B	109	ILE	2.2
1	A	75	ASP	2.1
2	B	119	LYS	2.1
2	B	92	LEU	2.1
2	B	93	SER	2.1
2	B	106	ALA	2.1
2	B	157	LYS	2.0
2	B	30	LEU	2.0
2	B	165[A]	ILE	2.0
2	B	155	VAL	2.0
2	B	62	GLU	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](#)

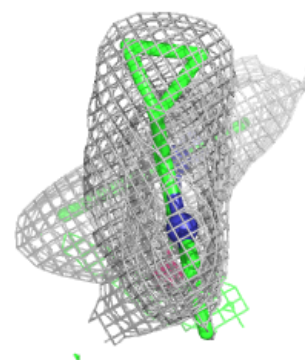
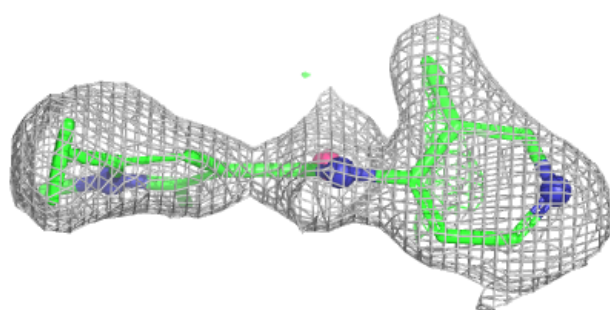
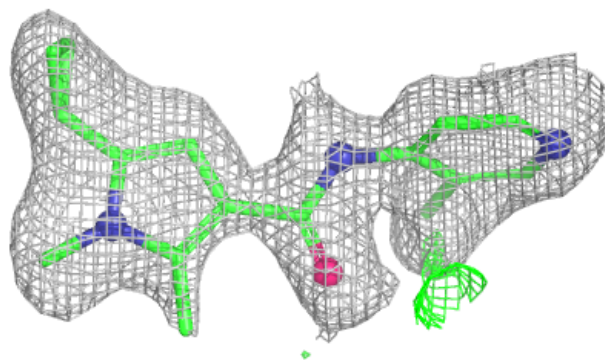
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	DMS	A	101[C]	4/4	0.47	0.30	90,90,91,91	4
3	DMS	A	101[D]	4/4	0.47	0.30	90,90,91,91	4
3	DMS	A	101[E]	4/4	0.47	0.30	90,90,91,91	4
3	DMS	B	202[A]	4/4	0.55	0.24	127,127,127,128	4
3	DMS	B	202[B]	4/4	0.55	0.24	127,127,127,128	4
3	DMS	B	207[C]	4/4	0.61	0.29	106,106,106,107	4
3	DMS	B	207[D]	4/4	0.61	0.29	106,106,106,107	4
3	DMS	B	207[E]	4/4	0.61	0.29	106,106,106,107	4
5	SO4	B	205[C]	5/5	0.64	0.17	65,65,66,66	5
5	SO4	B	205[D]	5/5	0.64	0.17	65,65,66,66	5
5	SO4	B	205[E]	5/5	0.64	0.17	65,65,66,66	5
3	DMS	B	203[A]	4/4	0.70	0.40	118,119,119,120	4
3	DMS	B	203[B]	4/4	0.70	0.40	118,119,119,120	4
5	SO4	B	206[C]	5/5	0.78	0.16	106,106,106,107	5
5	SO4	B	206[D]	5/5	0.78	0.16	106,106,106,107	5
5	SO4	B	206[E]	5/5	0.78	0.16	106,106,106,107	5
4	A1BGY	B	204[C]	20/20	0.86	0.15	35,37,39,39	20
4	A1BGY	B	204[D]	20/20	0.86	0.15	35,37,39,39	20
4	A1BGY	B	204[E]	20/20	0.86	0.15	35,37,39,39	20
3	DMS	B	201[A]	4/4	0.93	0.11	58,58,59,60	4
3	DMS	B	201[B]	4/4	0.93	0.11	58,58,59,60	4

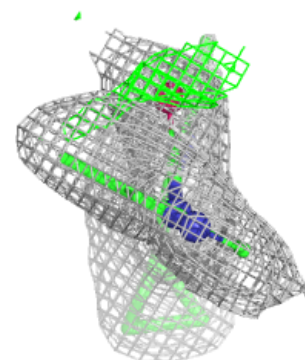
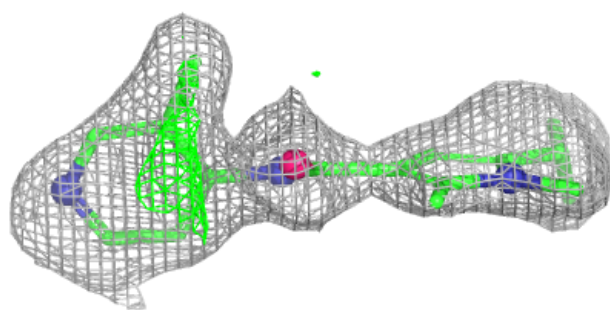
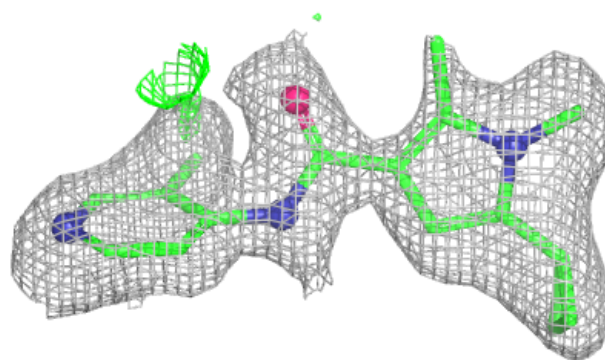
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

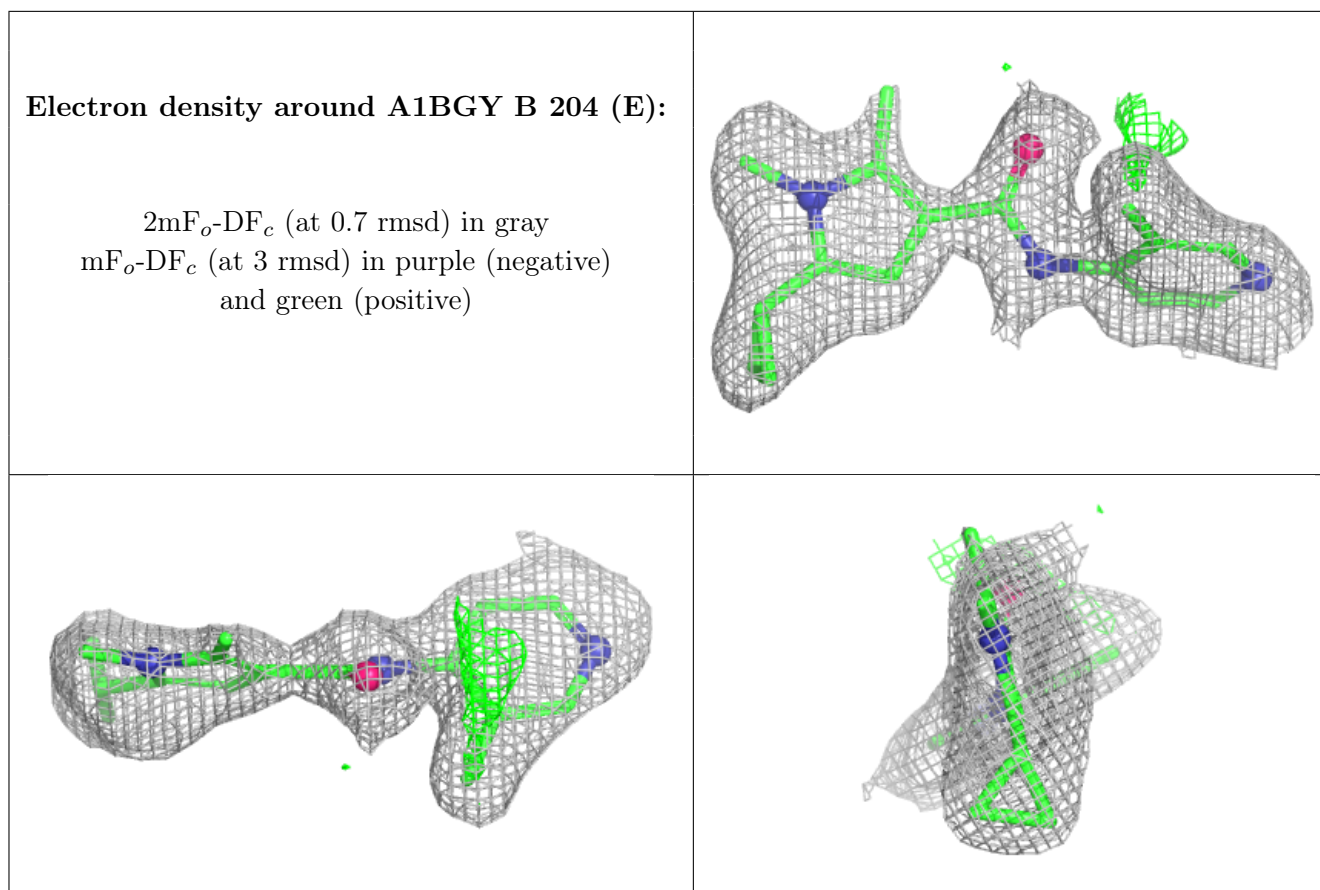
Electron density around A1BGY B 204 (C):

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

**Electron density around A1BGY B 204 (D):**

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





6.5 Other polymers ⓘ

There are no such residues in this entry.