WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Feb 23, 2026 – 10:06 AM EST

PDB ID	:	9NFS / pdb_00009nfs
Title	:	Structure of J-PKAc chimera in complex with Aplithianine j1
Authors	:	Martinez Fiesco, J.A.; Zhang, P.
Deposited on	:	2025-02-21
Resolution	:	2.45 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:

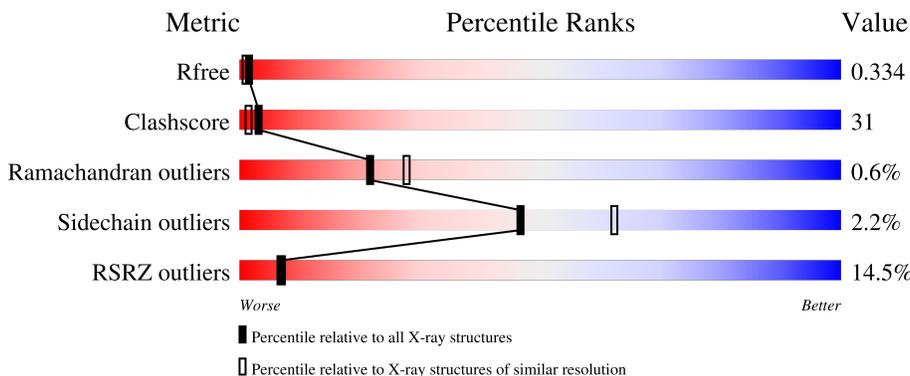|		
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.48.1

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.45 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	Percentile Ranks	Value
Rfree		0.334
Clashscore		31
Ramachandran outliers		0.6%
Sidechain outliers		2.2%
RSRZ outliers		14.5%

Worse *Better*

▮ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1096 (2.46-2.46)
Clashscore	180529	1178 (2.46-2.46)
Ramachandran outliers	177936	1170 (2.46-2.46)
Sidechain outliers	177891	1170 (2.46-2.46)
RSRZ outliers	164620	1096 (2.46-2.46)

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	C	20	25% 70% 15% 10% 5%
1	D	20	40% 30% 40% 30%
2	A	405	12% 55% 44%
2	B	405	15% 49% 51%

2   Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 7060 atoms, of which 26 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 cAMP-dependent protein kinase inhibitor alpha.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	D	20	Total 157	C 94	N 32	O 31	0	0	0
1	C	20	Total 157	C 94	N 32	O 31	0	0	0

- Molecule 2 is a protein called DnaJ homolog subfamily B member 1,cAMP-dependent protein kinase catalytic subunit alpha.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	A	403	Total 3339	C 2154	N 568	O 608	P 1	S 8	4	0	0
2	B	403	Total 3339	C 2154	N 568	O 608	P 1	S 8	4	0	0

- Molecule 3 is (4P)-4-[4-(pyrimidin-4-yl)-3,4-dihydro-2H-1,4-thiazin-6-yl]-1H-pyrrolo[2,3-b]pyridine (CCD ID: A1BX1) (formula: $C_{15}H_{13}N_5S$) (labeled as "Ligand of Interest" by depositor).
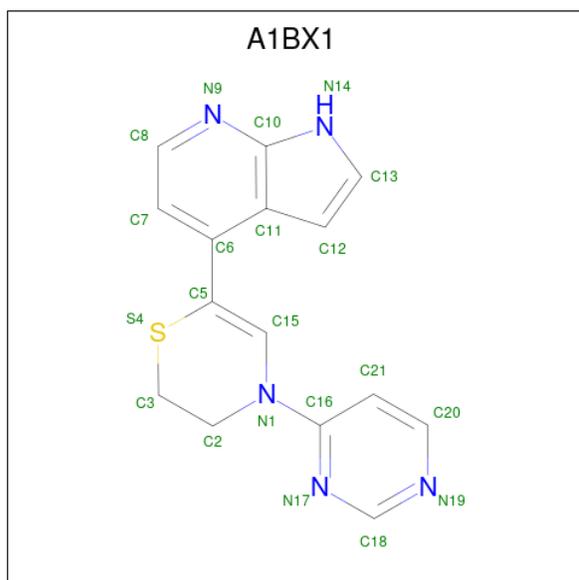
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	H	N	S	0	0
			34	15	13	5	1		
3	B	1	Total	C	H	N	S	0	0
			34	15	13	5	1		

3 Residue-property plots ⓘ
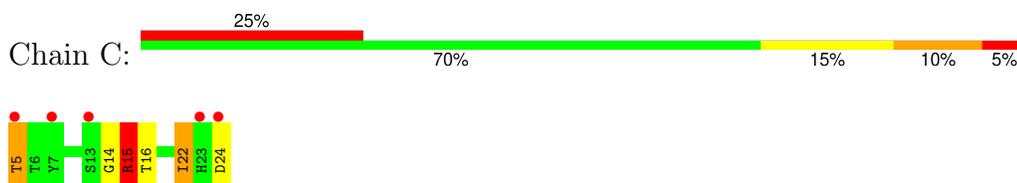
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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.
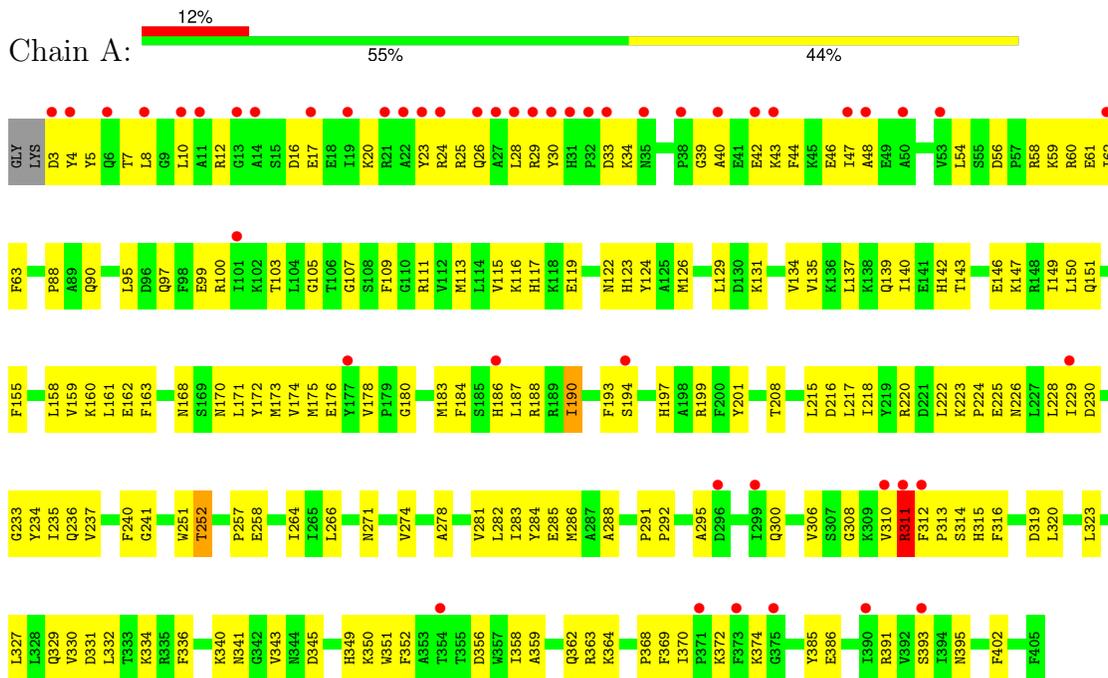
• Molecule 1: cAMP-dependent protein kinase inhibitor alpha

Chain D:

• Molecule 1: cAMP-dependent protein kinase inhibitor alpha

Chain C:

• Molecule 2: DnaJ homolog subfamily B member 1,cAMP-dependent protein kinase catalytic subunit alpha
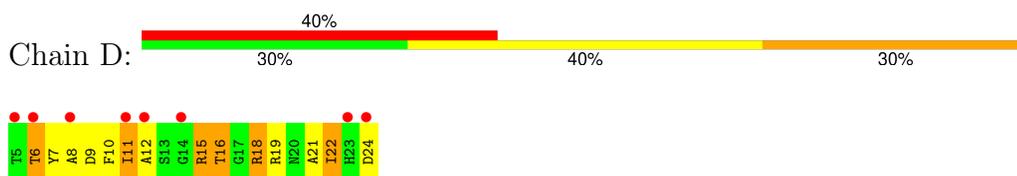
Chain A:

• Molecule 2: DnaJ homolog subfamily B member 1,cAMP-dependent protein kinase catalytic subunit alpha

Chain B:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	50.60Å 59.27Å 90.82Å 89.87° 86.31° 89.77°	Depositor
Resolution (Å)	45.37 – 2.45 45.37 – 2.45	Depositor EDS
% Data completeness (in resolution range)	93.6 (45.37-2.45) 93.7 (45.37-2.45)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.03 (at 2.45Å)	Xtriage
Refinement program	PHENIX 1.21.1_5286	Depositor
R, R_{free}	0.279 , 0.334 0.279 , 0.334	Depositor DCC
R_{free} test set	2016 reflections (5.19%)	wwPDB-VP
Wilson B-factor (Å^2)	51.6	Xtriage
Anisotropy	0.269	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 50.9	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.016 for -h,k,-l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	7060	wwPDB-VP
Average B, all atoms (Å^2)	62.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.96% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: TPO, A1BX1

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	C	0.93	0/159	1.24	0/212
1	D	0.96	0/159	1.45	0/212
2	A	0.45	0/3412	0.64	0/4593
2	B	0.42	0/3412	0.60	0/4593
All	All	0.47	0/7142	0.67	0/9610

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	C	0	1
1	D	0	1
2	A	0	1
All	All	0	3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	A	311	ARG	Sidechain
1	C	15	ARG	Sidechain
1	D	19	ARG	Sidechain

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	C	157	0	146	3	0
1	D	157	0	146	32	0
2	A	3339	0	3303	164	0
2	B	3339	0	3303	249	0
3	A	21	13	0	1	0
3	B	21	13	0	1	0
All	All	7034	26	6898	425	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 31.

All (425) 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)
2:B:187:LEU:HD13	2:B:193:PHE:CE2	1.71	1.25
1:D:15:ARG:HG3	2:B:294:PHE:HB2	1.30	1.11
2:B:187:LEU:CD1	2:B:193:PHE:CE2	2.38	1.06
2:B:26:GLN:HA	2:B:29:ARG:HD3	1.37	1.02
2:B:193:PHE:CD1	2:B:197:HIS:CE1	2.53	0.96
2:B:187:LEU:HD13	2:B:193:PHE:HE2	1.13	0.96
2:A:135:VAL:HG22	2:A:140:ILE:HD11	1.48	0.92
2:A:28:LEU:HD11	2:A:34:LYS:HG3	1.52	0.92
2:B:193:PHE:HD1	2:B:197:HIS:CE1	1.89	0.90
2:B:193:PHE:HD1	2:B:197:HIS:ND1	1.70	0.89
2:B:218:ILE:HG22	2:B:220:ARG:HG3	1.53	0.88
2:B:30:TYR:CE2	2:B:43:LYS:HG2	2.10	0.87
2:B:30:TYR:HB3	2:B:40:ALA:O	1.74	0.86
2:B:41:GLU:HA	2:B:44:PHE:CB	2.05	0.86
2:B:130:ASP:HB3	2:B:133:LYS:HE2	1.58	0.86
2:B:32:PRO:HG3	2:B:41:GLU:OE2	1.75	0.85
2:A:131:LYS:HG2	2:A:402:PHE:CE2	2.11	0.85
2:A:319:ASP:CG	2:A:350:LYS:HG3	2.04	0.82
2:B:187:LEU:HD13	2:B:193:PHE:CD2	2.14	0.82
2:A:100:ARG:HA	2:A:115:VAL:HG12	1.62	0.81
2:B:130:ASP:HB3	2:B:133:LYS:HG2	1.62	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:218:ILE:HG22	2:A:220:ARG:HG3	1.64	0.80
2:B:171:LEU:HD11	2:B:402:PHE:CE1	2.16	0.79
2:A:20:LYS:HE2	2:A:24:ARG:HH22	1.43	0.79
2:B:329:GLN:HG2	2:B:334:LYS:HB2	1.63	0.79
2:B:194:SER:OG	2:B:197:HIS:HB2	1.82	0.79
1:D:10:PHE:HE1	1:D:15:ARG:HB2	1.47	0.78
2:A:223:LYS:HE3	2:A:225:GLU:HB2	1.65	0.78
2:B:20:LYS:HE2	2:B:24:ARG:NH1	1.99	0.78
1:D:18:ARG:HG3	2:B:225:GLU:HG2	1.67	0.77
2:B:299:ILE:HD12	2:B:299:ILE:H	1.50	0.77
2:A:30:TYR:CZ	2:A:43:LYS:HG2	2.18	0.76
2:B:321:LYS:O	2:B:325:ARG:HG3	1.85	0.76
2:B:101:ILE:HG22	2:B:102:LYS:HG2	1.67	0.76
1:D:8:ALA:HA	1:D:11:ILE:HD13	1.67	0.76
2:B:67:GLY:O	2:B:71:LYS:HG3	1.84	0.76
2:B:193:PHE:CD1	2:B:197:HIS:ND1	2.54	0.76
2:A:222:LEU:HD11	2:A:282:LEU:HD22	1.67	0.75
2:B:8:LEU:HD12	2:B:54:LEU:HD12	1.69	0.75
2:B:41:GLU:HA	2:B:44:PHE:HB3	1.67	0.74
2:B:20:LYS:HE2	2:B:24:ARG:CZ	2.18	0.74
2:B:19:ILE:HG22	2:B:51:TYR:CE1	2.23	0.73
2:B:100:ARG:HH22	2:B:390:ILE:HG21	1.53	0.73
2:B:31:HIS:CD2	2:B:33:ASP:HB2	2.23	0.73
2:A:142:HIS:HB3	2:A:241:GLY:O	1.87	0.73
2:A:308:GLY:HA3	2:A:330:VAL:HG21	1.68	0.73
2:B:263:GLU:CD	2:B:332:LEU:HD21	2.13	0.73
2:B:319:ASP:OD1	2:B:350:LYS:HD2	1.89	0.73
2:B:130:ASP:CB	2:B:133:LYS:HE2	2.18	0.73
1:D:21:ALA:HB1	2:B:242:PHE:HE2	1.54	0.72
2:B:30:TYR:CZ	2:B:43:LYS:HG2	2.24	0.72
1:C:5:THR:HG21	2:B:189:ARG:HA	1.71	0.72
2:A:131:LYS:HG2	2:A:402:PHE:CD2	2.25	0.72
2:B:20:LYS:HD3	2:B:51:TYR:OH	1.89	0.72
2:A:391:ARG:HH21	2:A:393:SER:CB	2.03	0.71
2:A:158:LEU:HD21	2:A:208:THR:CG2	2.21	0.71
1:D:6:THR:HG23	2:B:311:ARG:HH22	1.54	0.71
2:B:359:ALA:HB1	2:B:364:LYS:HB2	1.72	0.71
2:A:146:GLU:HG3	2:A:240:PHE:C	2.15	0.71
2:B:41:GLU:HA	2:B:44:PHE:HB2	1.73	0.71
2:B:126:MET:HG3	2:B:174:VAL:HG22	1.73	0.70
2:A:116:LYS:HE2	2:A:123:HIS:CE1	2.26	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:103:THR:OG1	2:A:111:ARG:NH1	2.22	0.70
2:B:100:ARG:HG2	2:B:100:ARG:HH11	1.55	0.70
2:B:126:MET:CE	2:B:128:ILE:HD11	2.22	0.69
1:D:10:PHE:CD2	2:B:290:TYR:HB3	2.27	0.69
1:D:15:ARG:HD2	2:B:295:ALA:H	1.57	0.68
2:B:25:ARG:HH11	2:B:25:ARG:HG2	1.56	0.68
2:B:29:ARG:HB2	2:B:29:ARG:NH1	2.09	0.68
2:A:105:GLY:HA2	2:A:385:TYR:CZ	2.29	0.67
2:A:372:LYS:HE3	2:A:374:LYS:HE2	1.77	0.67
2:B:187:LEU:CD1	2:B:193:PHE:HE2	1.89	0.67
1:D:18:ARG:CG	2:B:225:GLU:HG2	2.25	0.67
2:B:126:MET:HE3	2:B:128:ILE:HG12	1.76	0.67
2:A:135:VAL:CG2	2:A:140:ILE:HD11	2.23	0.66
2:A:116:LYS:HA	2:A:122:ASN:O	1.95	0.65
1:D:21:ALA:HB1	2:B:242:PHE:CE2	2.32	0.65
1:D:10:PHE:CE1	1:D:15:ARG:HB2	2.31	0.65
2:B:200:PHE:CD2	2:B:368:PRO:HD2	2.32	0.65
2:A:3:ASP:OD1	2:A:5:TYR:N	2.26	0.65
2:B:187:LEU:CD1	2:B:193:PHE:CD2	2.74	0.64
2:B:157:PHE:CE1	2:B:234:TYR:HD2	2.16	0.64
2:B:356:ASP:OD2	2:B:359:ALA:HB3	1.96	0.64
2:A:391:ARG:NH2	2:A:393:SER:OG	2.30	0.64
2:A:56:ASP:HB3	2:A:59:LYS:HB2	1.80	0.64
2:B:401:GLU:N	2:B:401:GLU:OE1	2.31	0.64
2:A:134:VAL:HG11	2:A:143:THR:HG21	1.80	0.63
2:B:324:LEU:HD23	2:B:324:LEU:N	2.12	0.63
1:C:22:ILE:HG12	2:A:257:PRO:HD3	1.80	0.63
2:A:356:ASP:HB3	2:A:359:ALA:HB3	1.81	0.63
2:B:228:LEU:O	2:B:235:ILE:HA	1.99	0.63
2:B:32:PRO:O	2:B:36:LYS:HE2	1.98	0.62
2:A:56:ASP:OD1	2:A:58:ARG:HG3	1.99	0.62
2:A:313:PRO:HD2	2:A:316:PHE:CD2	2.34	0.62
2:A:20:LYS:HE2	2:A:24:ARG:NH2	2.14	0.62
2:A:266:LEU:HD11	2:A:306:VAL:HG11	1.80	0.62
2:B:187:LEU:HD12	2:B:193:PHE:CE2	2.30	0.62
2:B:135:VAL:HG23	2:B:140:ILE:HD11	1.81	0.62
2:A:391:ARG:HH21	2:A:393:SER:HA	1.65	0.61
2:B:171:LEU:HD11	2:B:402:PHE:CD1	2.35	0.61
2:A:97:GLN:OE1	2:A:117:HIS:NE2	2.27	0.61
2:B:319:ASP:OD2	2:B:350:LYS:HB2	2.01	0.61
2:A:281:VAL:HG13	2:A:292:PRO:HD2	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:37:GLU:HB3	2:B:38:PRO:HD2	1.83	0.61
2:A:60:ARG:O	2:A:63:PHE:N	2.34	0.60
2:B:30:TYR:CD1	2:B:40:ALA:HA	2.36	0.60
2:B:100:ARG:HH22	2:B:390:ILE:CG2	2.13	0.60
2:A:26:GLN:HB2	2:A:47:ILE:HG21	1.82	0.60
2:B:218:ILE:HG22	2:B:220:ARG:CG	2.29	0.60
2:A:111:ARG:HD2	2:A:113:MET:HE3	1.83	0.60
2:B:200:PHE:HZ	2:B:234:TYR:CE1	2.20	0.59
2:A:26:GLN:O	2:A:47:ILE:HD13	2.01	0.59
2:A:163:PHE:HD2	2:A:174:VAL:HG11	1.66	0.59
2:A:168:ASN:HB3	2:A:395:ASN:O	2.01	0.59
2:A:329:GLN:HG2	2:A:334:LYS:HB2	1.84	0.59
1:D:22:ILE:HG12	2:B:257:PRO:HD3	1.83	0.59
2:B:299:ILE:HD12	2:B:299:ILE:N	2.16	0.59
2:B:393:SER:C	2:B:395:ASN:H	2.09	0.59
2:B:114:LEU:HD22	2:B:379:THR:CG2	2.32	0.59
2:A:8:LEU:HB2	2:A:10:LEU:HD12	1.84	0.59
2:B:168:ASN:HB3	2:B:395:ASN:O	2.03	0.59
2:B:125:ALA:HB2	2:B:177:TYR:HD1	1.67	0.59
2:A:288:ALA:HB2	2:A:313:PRO:HG2	1.85	0.59
2:A:228:LEU:O	2:A:235:ILE:HA	2.03	0.58
2:B:8:LEU:HD12	2:B:54:LEU:CD1	2.32	0.58
2:B:218:ILE:CG2	2:B:220:ARG:HG3	2.31	0.58
2:B:394:ILE:O	2:B:394:ILE:HG22	2.02	0.58
2:B:19:ILE:HG22	2:B:51:TYR:CD1	2.39	0.58
2:B:29:ARG:HB2	2:B:29:ARG:HH11	1.67	0.58
2:B:126:MET:HE3	2:B:128:ILE:CG1	2.34	0.57
2:B:281:VAL:HG13	2:B:292:PRO:HD2	1.86	0.57
1:D:15:ARG:HD3	2:B:258:GLU:OE2	2.03	0.57
2:A:99:GLU:O	2:A:115:VAL:HA	2.05	0.57
2:B:56:ASP:OD2	2:B:59:LYS:HD2	2.04	0.57
2:B:20:LYS:HD3	2:B:51:TYR:CZ	2.38	0.57
2:A:4:TYR:O	2:A:54:LEU:HD22	2.04	0.57
2:A:171:LEU:HD11	2:A:402:PHE:CD1	2.40	0.56
2:B:56:ASP:HB3	2:B:59:LYS:HD2	1.86	0.56
2:B:369:PHE:C	2:B:370:ILE:HD12	2.30	0.56
2:A:218:ILE:CG2	2:A:220:ARG:HG3	2.35	0.56
2:B:101:ILE:HG22	2:B:102:LYS:N	2.19	0.56
2:B:341:ASN:HB2	2:B:345:ASP:OD1	2.05	0.56
2:A:183:MET:HE2	2:A:201:TYR:CD2	2.41	0.56
2:B:193:PHE:CE1	2:B:197:HIS:CE1	2.94	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:321:LYS:HB3	2:B:325:ARG:NH1	2.20	0.56
2:B:103:THR:H	2:B:387:GLU:CD	2.14	0.56
2:A:199:ARG:HG3	2:A:351:TRP:CZ3	2.40	0.55
2:B:202:ALA:O	2:B:206:VAL:HG23	2.05	0.55
2:A:117:HIS:CE1	2:A:119:GLU:HB2	2.42	0.55
2:B:76:LYS:HE3	2:B:79:GLU:OE2	2.06	0.55
2:B:352:PHE:O	2:B:355:THR:HB	2.06	0.55
2:A:319:ASP:OD1	2:A:350:LYS:HG3	2.07	0.55
2:B:100:ARG:HH12	2:B:390:ILE:HG21	1.72	0.55
2:B:329:GLN:CG	2:B:334:LYS:HB2	2.36	0.55
2:A:197:HIS:CD2	2:A:368:PRO:HG2	2.42	0.55
2:A:391:ARG:HH21	2:A:393:SER:CA	2.20	0.54
2:A:107:GLY:HA3	2:A:109:PHE:CE1	2.42	0.54
1:D:22:ILE:CG1	2:B:257:PRO:HD3	2.37	0.54
1:D:6:THR:CG2	2:B:311:ARG:HH22	2.20	0.54
2:B:130:ASP:HB3	2:B:133:LYS:CG	2.35	0.54
1:D:18:ARG:HD2	2:B:184:PHE:CD2	2.42	0.54
2:B:159:VAL:HG11	3:B:501:A1BX1:C13	2.38	0.54
2:B:25:ARG:HG2	2:B:25:ARG:NH1	2.21	0.54
2:A:140:ILE:O	2:A:143:THR:HG22	2.07	0.54
2:A:28:LEU:CD1	2:A:34:LYS:HG3	2.29	0.53
2:A:30:TYR:CE2	2:A:43:LYS:HG2	2.43	0.53
2:A:285:GLU:HG3	2:A:285:GLU:O	2.07	0.53
2:B:20:LYS:O	2:B:23:TYR:HB3	2.09	0.53
2:A:39:GLY:O	2:A:43:LYS:HB2	2.09	0.53
2:B:181:GLY:HA2	2:B:382:PHE:CZ	2.44	0.53
2:A:42:GLU:O	2:A:46:GLU:HG3	2.09	0.53
1:D:11:ILE:HG12	1:D:12:ALA:N	2.23	0.53
2:B:102:LYS:HD2	2:B:379:THR:OG1	2.09	0.53
2:A:160:LYS:HD3	2:A:176:GLU:OE1	2.09	0.53
2:A:218:ILE:HG22	2:A:220:ARG:CG	2.36	0.53
2:A:158:LEU:HD21	2:A:208:THR:HG21	1.90	0.52
2:B:8:LEU:CD2	2:B:47:ILE:HG23	2.40	0.52
2:B:50:ALA:O	2:B:54:LEU:HD12	2.09	0.52
2:B:131:LYS:HE2	2:B:167:ASP:O	2.10	0.52
2:B:169:SER:OG	2:B:397:LYS:HE2	2.09	0.52
2:B:377:GLY:O	2:B:379:THR:HG23	2.10	0.52
2:B:223:LYS:HE3	2:B:225:GLU:HB2	1.91	0.52
2:B:85:TRP:CH2	2:B:148:ARG:HD3	2.45	0.52
1:D:24:ASP:HB3	2:B:253:LEU:O	2.10	0.51
2:A:178:VAL:HG13	2:A:230:ASP:HA	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:7:THR:HG22	2:B:47:ILE:HG13	1.92	0.51
2:A:159:VAL:HG22	2:A:175:MET:HB3	1.92	0.51
2:B:195:GLU:N	2:B:196:PRO:HD2	2.25	0.51
1:D:11:ILE:HA	1:D:16:THR:HG21	1.91	0.51
1:D:7:TYR:O	1:D:11:ILE:HG23	2.11	0.51
2:A:97:GLN:HG2	2:A:117:HIS:NE2	2.25	0.51
2:B:192:ARG:HD2	2:B:288:ALA:HA	1.92	0.51
2:B:230:ASP:O	2:B:233:GLY:N	2.44	0.51
2:B:105:GLY:HA2	2:B:385:TYR:CZ	2.46	0.51
2:B:142:HIS:HB3	2:B:241:GLY:O	2.10	0.51
2:B:187:LEU:HD21	2:B:285:GLU:HG2	1.93	0.51
2:B:109:PHE:O	2:B:133:LYS:HE3	2.10	0.50
2:A:111:ARG:CD	2:A:113:MET:HE3	2.42	0.50
2:B:100:ARG:NH2	2:B:390:ILE:HG21	2.22	0.50
2:A:313:PRO:HD2	2:A:316:PHE:CE2	2.46	0.50
2:B:117:HIS:O	2:B:121:GLY:N	2.40	0.50
2:B:126:MET:HE3	2:B:128:ILE:CD1	2.42	0.50
2:A:197:HIS:HD2	2:A:368:PRO:HG2	1.77	0.50
2:A:285:GLU:O	2:A:285:GLU:CG	2.59	0.50
2:B:8:LEU:CD1	2:B:54:LEU:HD12	2.40	0.50
2:A:230:ASP:OD2	2:A:363:ARG:NH2	2.42	0.50
2:B:203:ALA:HA	2:B:357:TRP:CH2	2.47	0.50
2:A:60:ARG:O	2:A:61:GLU:C	2.55	0.49
2:A:163:PHE:HB2	2:A:174:VAL:HB	1.94	0.49
2:B:98:PHE:CE1	2:B:117:HIS:HD2	2.30	0.49
2:B:157:PHE:CE1	2:B:234:TYR:CD2	2.99	0.49
2:B:393:SER:C	2:B:395:ASN:N	2.70	0.49
2:A:139:GLN:O	2:A:143:THR:HG22	2.11	0.49
2:A:282:LEU:HG	2:A:286:MET:HE2	1.94	0.49
2:A:184:PHE:HB2	2:A:224:PRO:HB2	1.95	0.49
2:B:43:LYS:O	2:B:47:ILE:HD12	2.12	0.49
2:A:7:THR:O	2:A:7:THR:HG22	2.11	0.49
2:A:372:LYS:HE3	2:A:374:LYS:CE	2.42	0.49
2:B:100:ARG:HG2	2:B:100:ARG:NH1	2.18	0.49
2:B:224:PRO:HD3	2:B:259:TYR:OH	2.13	0.49
2:B:32:PRO:HB3	2:B:36:LYS:HZ3	1.77	0.49
2:A:95:LEU:C	2:A:95:LEU:HD23	2.38	0.48
2:B:8:LEU:HD11	2:B:50:ALA:O	2.12	0.48
2:A:88:PRO:HA	2:A:151:GLN:OE1	2.13	0.48
2:A:329:GLN:CG	2:A:334:LYS:HB2	2.43	0.48
2:B:276:TRP:CE3	2:B:276:TRP:HA	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:299:ILE:H	2:B:299:ILE:CD1	2.20	0.48
2:B:130:ASP:HB3	2:B:133:LYS:CE	2.35	0.48
2:B:359:ALA:HA	2:B:362:GLN:HB2	1.93	0.48
1:C:14:GLY:O	1:C:16:THR:N	2.43	0.48
2:A:161:LEU:CD1	2:A:173:MET:HB3	2.44	0.48
2:B:7:THR:HG21	2:B:46:GLU:O	2.14	0.48
2:B:112:VAL:HA	2:B:126:MET:O	2.14	0.48
1:D:22:ILE:HD11	2:B:260:LEU:HD11	1.96	0.48
2:A:264:ILE:CG1	2:A:274:VAL:HG11	2.43	0.48
2:B:26:GLN:HA	2:B:29:ARG:CD	2.26	0.48
2:B:129:LEU:HD22	2:B:143:THR:CG2	2.43	0.48
2:A:159:VAL:HG12	2:A:237:VAL:O	2.13	0.48
2:B:20:LYS:O	2:B:24:ARG:HG3	2.14	0.48
2:A:12:ARG:O	2:A:12:ARG:HG3	2.14	0.48
2:A:116:LYS:HE2	2:A:123:HIS:NE2	2.29	0.48
1:D:8:ALA:HA	1:D:11:ILE:HG23	1.95	0.48
2:B:15:SER:OG	2:B:16:ASP:N	2.46	0.48
2:B:97:GLN:C	2:B:118:LYS:HD2	2.39	0.48
2:B:194:SER:OG	2:B:197:HIS:CB	2.56	0.47
2:B:203:ALA:O	2:B:357:TRP:HZ3	1.96	0.47
2:B:263:GLU:HG3	2:B:270:TYR:HB3	1.96	0.47
2:A:16:ASP:OD1	2:A:17:GLU:N	2.48	0.47
2:A:59:LYS:O	2:A:62:ILE:HG13	2.13	0.47
2:B:99:GLU:O	2:B:115:VAL:HA	2.14	0.47
2:B:16:ASP:HA	2:B:19:ILE:HG13	1.96	0.47
2:A:129:LEU:HB2	2:A:171:LEU:HB2	1.96	0.47
2:A:149:ILE:HD13	2:A:217:LEU:HD22	1.96	0.47
2:B:229:ILE:HA	2:B:234:TYR:O	2.15	0.47
2:B:206:VAL:HG22	2:B:279:LEU:HD21	1.97	0.47
1:D:18:ARG:HG3	2:B:225:GLU:CG	2.42	0.47
2:A:25:ARG:O	2:A:29:ARG:HG3	2.15	0.47
2:B:229:ILE:CG2	2:B:233:GLY:HA2	2.45	0.47
2:A:283:ILE:CG2	2:A:320:LEU:HD11	2.44	0.47
2:A:370:ILE:HD12	2:A:370:ILE:N	2.29	0.47
2:B:146:GLU:O	2:B:150:LEU:HB2	2.15	0.47
2:B:147:LYS:NZ	2:B:405:PHE:OXT	2.31	0.47
2:B:199:ARG:HG3	2:B:352:PHE:CE1	2.50	0.47
2:B:228:LEU:HB2	2:B:236:GLN:HB2	1.97	0.47
2:A:187:LEU:HA	2:A:193:PHE:CE1	2.50	0.46
2:B:245:ARG:NH2	2:B:247:LYS:HZ1	2.12	0.46
2:B:20:LYS:HE2	2:B:24:ARG:NH2	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:161:LEU:HD11	2:A:173:MET:HB3	1.97	0.46
2:A:349:HIS:O	2:A:352:PHE:N	2.44	0.46
2:B:8:LEU:HD11	2:B:50:ALA:C	2.40	0.46
2:B:56:ASP:CB	2:B:59:LYS:HD2	2.44	0.46
2:B:279:LEU:O	2:B:280:GLY:C	2.57	0.46
2:A:271:ASN:OD1	2:A:271:ASN:C	2.58	0.46
2:A:343:VAL:HG22	2:A:343:VAL:O	2.16	0.46
2:B:146:GLU:HG3	2:B:240:PHE:HB2	1.98	0.46
2:B:151:GLN:HB3	2:B:161:LEU:HD23	1.97	0.46
2:B:16:ASP:N	2:B:16:ASP:OD1	2.45	0.46
2:B:19:ILE:HG22	2:B:51:TYR:HE1	1.78	0.46
2:A:319:ASP:HB3	2:A:351:TRP:HB2	1.98	0.46
2:B:213:HIS:ND1	2:B:272:LYS:HD2	2.30	0.46
2:B:341:ASN:CB	2:B:345:ASP:OD1	2.64	0.46
2:B:23:TYR:HB2	2:B:51:TYR:CD1	2.51	0.46
2:A:223:LYS:HE2	2:A:226:ASN:ND2	2.31	0.46
2:B:155:PHE:CE2	2:B:208:THR:HA	2.51	0.46
2:B:356:ASP:OD2	2:B:359:ALA:CB	2.63	0.46
2:A:170:ASN:HB2	2:A:172:TYR:CE2	2.52	0.45
2:B:166:LYS:NZ	2:B:402:PHE:O	2.42	0.45
2:A:308:GLY:CA	2:A:330:VAL:HG21	2.42	0.45
2:B:100:ARG:HH12	2:B:390:ILE:CG2	2.28	0.45
2:A:332:LEU:C	2:A:332:LEU:HD12	2.41	0.45
2:B:225:GLU:OE1	2:B:225:GLU:N	2.42	0.45
2:B:251:TRP:O	2:B:252:TPO:C	2.63	0.45
2:A:308:GLY:HA3	2:A:330:VAL:CG2	2.40	0.45
2:B:32:PRO:HB3	2:B:36:LYS:NZ	2.31	0.45
2:B:231:GLN:C	2:B:233:GLY:H	2.25	0.45
2:B:259:TYR:CE2	2:B:281:VAL:HG12	2.52	0.45
2:A:162:GLU:N	2:A:174:VAL:O	2.45	0.45
2:A:329:GLN:HG2	2:A:334:LYS:C	2.42	0.45
2:B:297:GLN:HB2	2:B:300:GLN:HG3	1.99	0.45
2:B:394:ILE:O	2:B:394:ILE:CG2	2.65	0.45
2:A:115:VAL:HG11	2:A:126:MET:HE3	1.98	0.45
2:A:331:ASP:OD1	2:A:331:ASP:C	2.59	0.45
2:B:137:LEU:O	2:B:139:GLN:HG2	2.17	0.45
2:A:155:PHE:HB3	2:A:158:LEU:HG	1.99	0.45
2:B:316:PHE:CG	2:B:320:LEU:HD22	2.52	0.45
2:A:184:PHE:CG	2:A:225:GLU:HG3	2.52	0.44
2:A:188:ARG:HG2	2:A:188:ARG:HH11	1.81	0.44
2:B:90:GLN:HB3	2:B:147:LYS:NZ	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:15:ARG:H	1:D:15:ARG:HG2	1.42	0.44
2:A:159:VAL:HG21	3:A:501:A1BX1:C13	2.48	0.44
2:B:386:GLU:O	2:B:386:GLU:HG2	2.16	0.44
2:A:190:ILE:HD12	2:A:193:PHE:HE1	1.83	0.44
2:B:100:ARG:HA	2:B:115:VAL:HG12	1.99	0.44
2:B:170:ASN:HD22	2:B:390:ILE:HD11	1.81	0.44
1:D:6:THR:HG23	2:B:311:ARG:NH2	2.29	0.44
2:B:114:LEU:HD22	2:B:379:THR:HG22	1.99	0.44
2:B:124:TYR:HB3	2:B:174:VAL:HG13	1.98	0.44
2:B:126:MET:HG3	2:B:174:VAL:CG2	2.45	0.44
2:B:227:LEU:O	2:B:228:LEU:HD23	2.18	0.44
2:B:258:GLU:HG2	2:B:291:PRO:HG3	2.00	0.44
1:D:6:THR:HA	1:D:9:ASP:OD2	2.18	0.44
2:A:258:GLU:N	2:A:258:GLU:OE1	2.51	0.44
2:B:7:THR:CG2	2:B:47:ILE:HG13	2.48	0.44
2:B:20:LYS:HG3	2:B:24:ARG:NH2	2.33	0.44
2:B:200:PHE:CZ	2:B:234:TYR:CE1	3.05	0.44
2:B:355:THR:HG21	2:B:357:TRP:CE2	2.53	0.44
2:A:187:LEU:HD13	2:A:193:PHE:CZ	2.53	0.44
2:A:358:ILE:O	2:A:362:GLN:HG3	2.18	0.44
2:A:391:ARG:NH2	2:A:393:SER:HA	2.30	0.44
2:B:35:ASN:ND2	2:B:40:ALA:HB2	2.33	0.44
2:A:20:LYS:HG2	2:A:24:ARG:NH2	2.32	0.44
2:A:137:LEU:O	2:A:139:GLN:HG2	2.18	0.44
2:A:284:TYR:CD2	2:A:292:PRO:HB3	2.53	0.44
2:B:132:GLN:O	2:B:135:VAL:HG12	2.18	0.44
2:B:362:GLN:O	2:B:363:ARG:HB2	2.18	0.44
2:A:8:LEU:CD2	2:A:47:ILE:HG23	2.47	0.43
2:A:147:LYS:HB2	2:A:173:MET:HE2	1.99	0.43
2:A:313:PRO:O	2:A:316:PHE:HB2	2.18	0.43
1:D:10:PHE:CE2	1:D:16:THR:HG22	2.53	0.43
2:A:199:ARG:HG3	2:A:351:TRP:CH2	2.53	0.43
2:B:20:LYS:HA	2:B:51:TYR:CE1	2.53	0.43
2:B:76:LYS:HD2	2:B:76:LYS:HA	1.65	0.43
2:A:222:LEU:HD23	2:A:278:ALA:C	2.43	0.43
2:B:187:LEU:CD2	2:B:285:GLU:HG2	2.48	0.43
2:A:180:GLY:HA3	2:A:229:ILE:O	2.19	0.43
2:B:5:TYR:CE1	2:B:54:LEU:HD22	2.53	0.43
2:B:316:PHE:CD2	2:B:320:LEU:CD2	3.02	0.43
2:A:264:ILE:HG13	2:A:274:VAL:HG11	2.00	0.43
1:D:22:ILE:O	2:B:254:CYS:HA	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:3:ASP:OD1	2:A:3:ASP:C	2.61	0.43
2:B:101:ILE:HD12	2:B:101:ILE:N	2.34	0.43
2:A:8:LEU:CB	2:A:10:LEU:HD12	2.49	0.43
2:A:97:GLN:CD	2:A:117:HIS:HE2	2.24	0.43
2:B:86:GLU:C	2:B:88:PRO:HD3	2.44	0.43
2:B:129:LEU:HD22	2:B:143:THR:HG21	2.00	0.43
2:B:158:LEU:HD22	2:B:240:PHE:HZ	1.84	0.43
2:B:154:ASN:HA	2:B:160:LYS:NZ	2.34	0.43
2:B:203:ALA:HB1	2:B:357:TRP:CZ3	2.54	0.43
2:B:102:LYS:HD2	2:B:379:THR:HG21	2.01	0.42
2:B:218:ILE:CG2	2:B:220:ARG:CG	2.94	0.42
2:B:334:LYS:HB3	2:B:334:LYS:HE2	1.75	0.42
2:A:8:LEU:HD23	2:A:47:ILE:HG23	2.01	0.42
2:A:215:LEU:O	2:A:216:ASP:HB2	2.19	0.42
2:A:194:SER:OG	2:A:197:HIS:HB2	2.19	0.42
2:B:112:VAL:HG22	2:B:127:LYS:HA	2.01	0.42
2:B:227:LEU:HD13	2:B:235:ILE:HD13	2.01	0.42
2:B:292:PRO:O	2:B:293:PHE:CD1	2.72	0.42
1:D:15:ARG:HG3	2:B:294:PHE:CB	2.23	0.42
2:A:323:LEU:HG	2:A:327:LEU:HD12	2.00	0.42
2:A:251:TRP:O	2:A:252:TPO:C	2.68	0.42
2:A:314:SER:C	2:A:316:PHE:H	2.27	0.42
2:A:7:THR:O	2:A:7:THR:CG2	2.67	0.42
2:A:40:ALA:O	2:A:44:PHE:HB2	2.20	0.42
2:A:178:VAL:HG21	2:A:236:GLN:HG3	2.00	0.42
2:A:341:ASN:HB2	2:A:345:ASP:CG	2.44	0.42
2:A:341:ASN:HB2	2:A:345:ASP:OD1	2.19	0.42
2:A:386:GLU:O	2:A:386:GLU:OE1	2.37	0.42
2:B:110:GLY:HA3	2:B:128:ILE:O	2.19	0.42
2:A:283:ILE:HA	2:A:286:MET:HE3	2.01	0.42
2:A:284:TYR:CE2	2:A:292:PRO:HB3	2.54	0.42
2:A:369:PHE:C	2:A:370:ILE:HD12	2.45	0.42
2:B:187:LEU:HD21	2:B:285:GLU:O	2.19	0.42
2:B:263:GLU:OE2	2:B:332:LEU:HD21	2.20	0.42
2:A:186:HIS:ND1	2:A:369:PHE:HE2	2.17	0.41
2:A:218:ILE:CG2	2:A:220:ARG:CG	2.98	0.41
2:A:285:GLU:OE1	2:A:291:PRO:HB3	2.19	0.41
2:B:31:HIS:HD2	2:B:33:ASP:HB2	1.78	0.41
2:B:100:ARG:C	2:B:101:ILE:HD12	2.45	0.41
2:B:284:TYR:CD1	2:B:292:PRO:HD3	2.55	0.41
1:D:22:ILE:H	1:D:22:ILE:HG13	1.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:42:GLU:O	2:B:46:GLU:HG3	2.21	0.41
2:B:316:PHE:CD2	2:B:320:LEU:HD22	2.56	0.41
2:A:222:LEU:O	2:A:223:LYS:HB3	2.20	0.41
2:B:229:ILE:HG22	2:B:233:GLY:HA2	2.02	0.41
2:B:131:LYS:HG3	2:B:169:SER:O	2.21	0.41
2:A:362:GLN:OE1	2:A:364:LYS:HD2	2.20	0.41
2:B:157:PHE:HE1	2:B:234:TYR:CD2	2.39	0.41
2:B:164:SER:C	2:B:165:PHE:CD1	2.99	0.41
2:A:28:LEU:HD11	2:A:34:LYS:CG	2.36	0.41
2:A:97:GLN:HG2	2:A:117:HIS:CD2	2.54	0.41
2:A:178:VAL:CG1	2:A:230:ASP:HA	2.50	0.41
2:A:295:ALA:CB	2:A:300:GLN:HB3	2.49	0.41
2:A:229:ILE:HG23	2:A:233:GLY:HA2	2.02	0.41
2:A:23:TYR:HE1	2:A:48:ALA:HA	1.85	0.41
2:A:115:VAL:HG22	2:A:124:TYR:O	2.21	0.41
2:A:266:LEU:CD1	2:A:306:VAL:HG11	2.48	0.41
2:A:311:ARG:H	2:A:311:ARG:HG2	1.52	0.41
2:B:3:ASP:OD1	2:B:3:ASP:C	2.63	0.41
2:B:114:LEU:HD22	2:B:379:THR:HG21	2.01	0.41
2:B:263:GLU:CG	2:B:270:TYR:HB3	2.50	0.41
2:B:271:ASN:C	2:B:271:ASN:OD1	2.64	0.41
2:A:288:ALA:CB	2:A:313:PRO:HG2	2.50	0.41
2:B:169:SER:HA	2:B:397:LYS:CE	2.50	0.41
1:D:21:ALA:HA	2:B:255:GLY:O	2.21	0.40
2:B:31:HIS:ND1	2:B:32:PRO:HD2	2.36	0.40
2:B:295:ALA:O	2:B:296:ASP:C	2.64	0.40
2:B:5:TYR:O	2:B:9:GLY:N	2.54	0.40
2:B:244:LYS:HD3	2:B:246:VAL:HG22	2.04	0.40
1:D:21:ALA:CB	2:B:242:PHE:HE2	2.29	0.40
2:A:234:TYR:CE2	2:A:363:ARG:HA	2.57	0.40
2:B:257:PRO:HB2	2:B:301:ILE:HD12	2.03	0.40
2:A:340:LYS:HE2	2:A:340:LYS:HA	2.04	0.40
2:B:63:PHE:O	2:B:66:TYR:HD2	2.05	0.40
2:B:150:LEU:HD12	2:B:150:LEU:HA	1.76	0.40
2:B:227:LEU:HA	2:B:227:LEU:HD23	1.74	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	C	18/20 (90%)	17 (94%)	0	1 (6%)	1	0
1	D	18/20 (90%)	18 (100%)	0	0	100	100
2	A	400/405 (99%)	363 (91%)	34 (8%)	3 (1%)	16	21
2	B	400/405 (99%)	349 (87%)	50 (12%)	1 (0%)	37	45
All	All	836/850 (98%)	747 (89%)	84 (10%)	5 (1%)	22	28

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	15	ARG
2	A	190	ILE
2	B	376	PRO
2	A	315	HIS
2	A	312	PHE

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	C	15/15 (100%)	11 (73%)	4 (27%)	0	0
1	D	15/15 (100%)	9 (60%)	6 (40%)	0	0
2	A	352/353 (100%)	346 (98%)	6 (2%)	56	70
2	B	352/353 (100%)	352 (100%)	0	100	100
All	All	734/736 (100%)	718 (98%)	16 (2%)	47	62

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	6	THR
1	D	11	ILE
1	D	15	ARG
1	D	16	THR
1	D	18	ARG
1	D	22	ILE
1	C	5	THR
1	C	15	ARG
1	C	22	ILE
1	C	24	ASP
2	A	33	ASP
2	A	90	GLN
2	A	150	LEU
2	A	310	VAL
2	A	311	ARG
2	A	336	PHE

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

Mol	Chain	Res	Type
2	A	94	HIS
2	A	122	ASN
2	B	90	GLN
2	B	142	HIS
2	B	226	ASN
2	B	236	GLN
2	B	315	HIS

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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	TPO	B	252	2	8,10,11	0.67	0	10,14,16	1.21	2 (20%)
2	TPO	A	252	2	8,10,11	0.67	0	10,14,16	1.20	1 (10%)

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	TPO	B	252	2	-	0/9/11/13	-
2	TPO	A	252	2	-	0/9/11/13	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	252	TPO	O-C-CA	-2.50	118.35	124.77
2	B	252	TPO	O-C-CA	-2.44	118.49	124.77
2	B	252	TPO	P-OG1-CB	-2.10	117.61	123.33

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	252	TPO	1	0
2	A	252	TPO	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

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	#$|Z| > 2$
3	A1BX1	B	501	-	21,24,24	0.69	1 (4%)	19,33,33	0.49	0
3	A1BX1	A	501	-	21,24,24	0.67	0	19,33,33	0.48	0

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	A1BX1	B	501	-	-	2/6/18/18	0/4/4/4
3	A1BX1	A	501	-	-	0/6/18/18	0/4/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	501	A1BX1	C10-N9	-2.09	1.34	1.37

There are no bond angle outliers.

There are no chirality outliers.

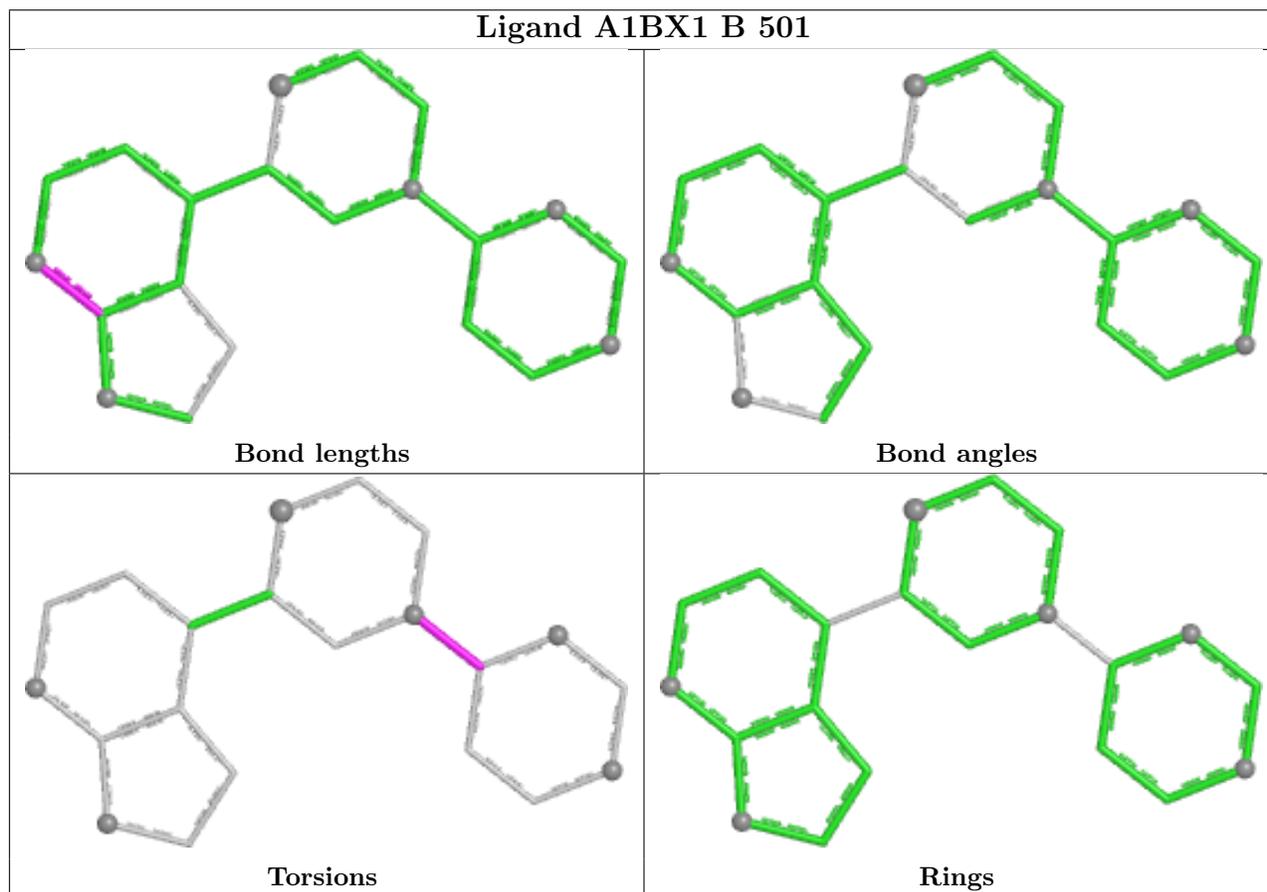All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	501	A1BX1	N17-C16-N1-C2
3	B	501	A1BX1	C21-C16-N1-C2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	501	A1BX1	1	0
3	A	501	A1BX1	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 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 A1BX1 B 501

Bond lengths

Bond angles

Torsions

Rings

Ligand A1BX1 A 501

Bond lengths

Bond angles

Torsions

Rings
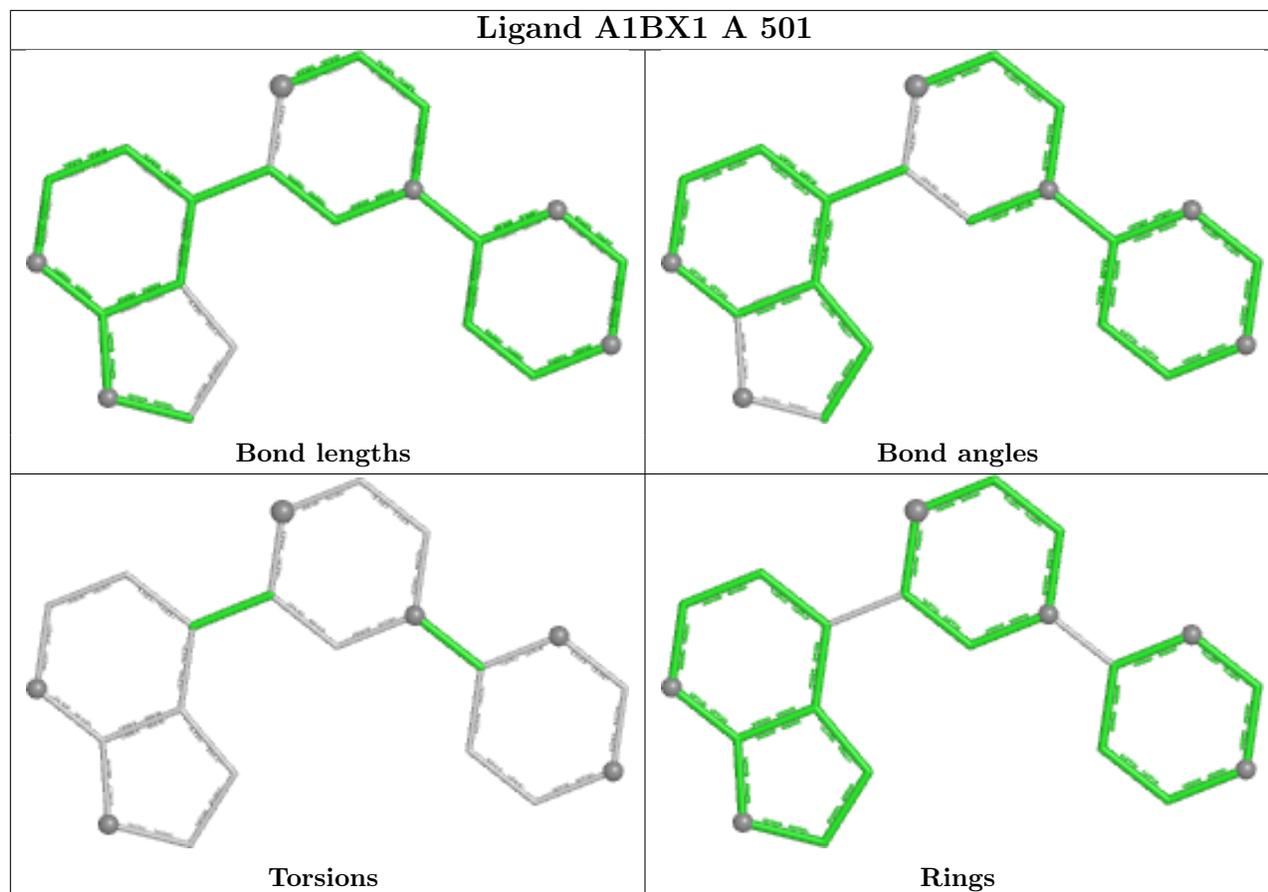
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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(Å²)	Q<0.9
1	C	20/20 (100%)	1.73	5 (25%)	2	2	23, 39, 75, 112	0
1	D	20/20 (100%)	1.93	8 (40%)	1	0	23, 39, 75, 112	0
2	A	402/405 (99%)	0.76	48 (11%)	10	10	17, 56, 123, 142	1 (0%)
2	B	402/405 (99%)	0.94	61 (15%)	6	6	17, 60, 121, 142	1 (0%)
All	All	844/850 (99%)	0.89	122 (14%)	7	7	17, 57, 122, 142	2 (0%)

All (122) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	194	SER	7.9
2	B	27	ALA	7.1
2	B	44	PHE	6.4
1	C	24	ASP	6.3
2	B	39	GLY	5.8
2	A	22	ALA	5.7
2	B	26	GLN	5.7
2	A	32	PRO	5.7
2	B	194	SER	5.6
2	A	26	GLN	5.3
2	A	30	TYR	5.0
2	A	50	ALA	4.9
2	B	22	ALA	4.8
2	B	38	PRO	4.7
2	A	27	ALA	4.5
2	B	374	LYS	4.4
2	B	28	LEU	4.3
2	A	23	TYR	4.3
2	B	373	PHE	4.1
1	D	5	THR	4.0
2	B	375	GLY	4.0

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Mol	Chain	Res	Type	RSRZ
2	B	47	ILE	4.0
2	B	29	ARG	3.8
2	B	23	TYR	3.7
2	A	31	HIS	3.7
2	A	28	LEU	3.7
2	B	8	LEU	3.7
1	C	7	TYR	3.5
2	A	11	ALA	3.5
2	A	29	ARG	3.4
2	B	40	ALA	3.3
2	A	8	LEU	3.3
2	B	193	PHE	3.3
2	B	19	ILE	3.2
1	D	12	ALA	3.2
2	B	7	THR	3.2
2	B	181	GLY	3.1
2	A	373	PHE	3.1
1	D	23	HIS	3.1
2	B	4	TYR	3.1
2	A	40	ALA	3.0
2	B	358	ILE	3.0
2	A	371	PRO	3.0
2	B	37	GLU	3.0
1	C	13	SER	2.9
1	D	24	ASP	2.9
2	B	232	GLN	2.9
2	B	11	ALA	2.9
2	B	50	ALA	2.9
2	B	10	LEU	2.9
2	A	375	GLY	2.9
2	A	33	ASP	2.9
2	B	360	ILE	2.8
2	A	4	TYR	2.8
2	A	310	VAL	2.8
2	B	12	ARG	2.8
2	A	43	LYS	2.8
2	A	10	LEU	2.8
2	B	184	PHE	2.8
2	B	30	TYR	2.8
1	C	23	HIS	2.8
2	B	43	LYS	2.8
2	B	3	ASP	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	8	ALA	2.7
1	D	14	GLY	2.7
2	A	17	GLU	2.7
1	D	6	THR	2.7
2	B	348	ASN	2.7
2	B	45	LYS	2.6
2	A	101	ILE	2.6
2	B	6	GLN	2.6
2	B	51	TYR	2.6
2	B	34	LYS	2.6
1	C	5	THR	2.6
2	B	17	GLU	2.6
2	B	231	GLN	2.6
2	A	3	ASP	2.6
2	B	369	PHE	2.6
1	D	11	ILE	2.5
2	A	42	GLU	2.5
2	A	62	ILE	2.5
2	B	368	PRO	2.5
2	B	229	ILE	2.5
2	B	35	ASN	2.5
2	A	21	ARG	2.4
2	B	31	HIS	2.4
2	A	229	ILE	2.4
2	B	21	ARG	2.4
2	A	14	ALA	2.4
2	A	13	GLY	2.4
2	A	53	VAL	2.3
2	B	190	ILE	2.3
2	B	186	HIS	2.3
2	B	159	VAL	2.3
2	A	19	ILE	2.3
2	B	48	ALA	2.3
2	B	5	TYR	2.3
2	A	6	GLN	2.3
2	B	377	GLY	2.3
2	B	196	PRO	2.3
2	B	314	SER	2.2
2	A	312	PHE	2.2
2	A	38	PRO	2.2
2	A	186	HIS	2.2
2	A	354	THR	2.2

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Mol	Chain	Res	Type	RSRZ
2	B	109	PHE	2.2
2	A	296	ASP	2.2
2	A	35	ASN	2.2
2	B	296	ASP	2.2
2	B	295	ALA	2.2
2	A	47	ILE	2.2
2	A	24	ARG	2.1
2	A	311	ARG	2.1
2	A	393	SER	2.1
2	B	9	GLY	2.1
2	A	177	TYR	2.1
2	B	195	GLU	2.1
2	A	299	ILE	2.1
2	A	390	ILE	2.1
2	A	48	ALA	2.1
2	B	310	VAL	2.0
2	B	49	GLU	2.0

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

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.

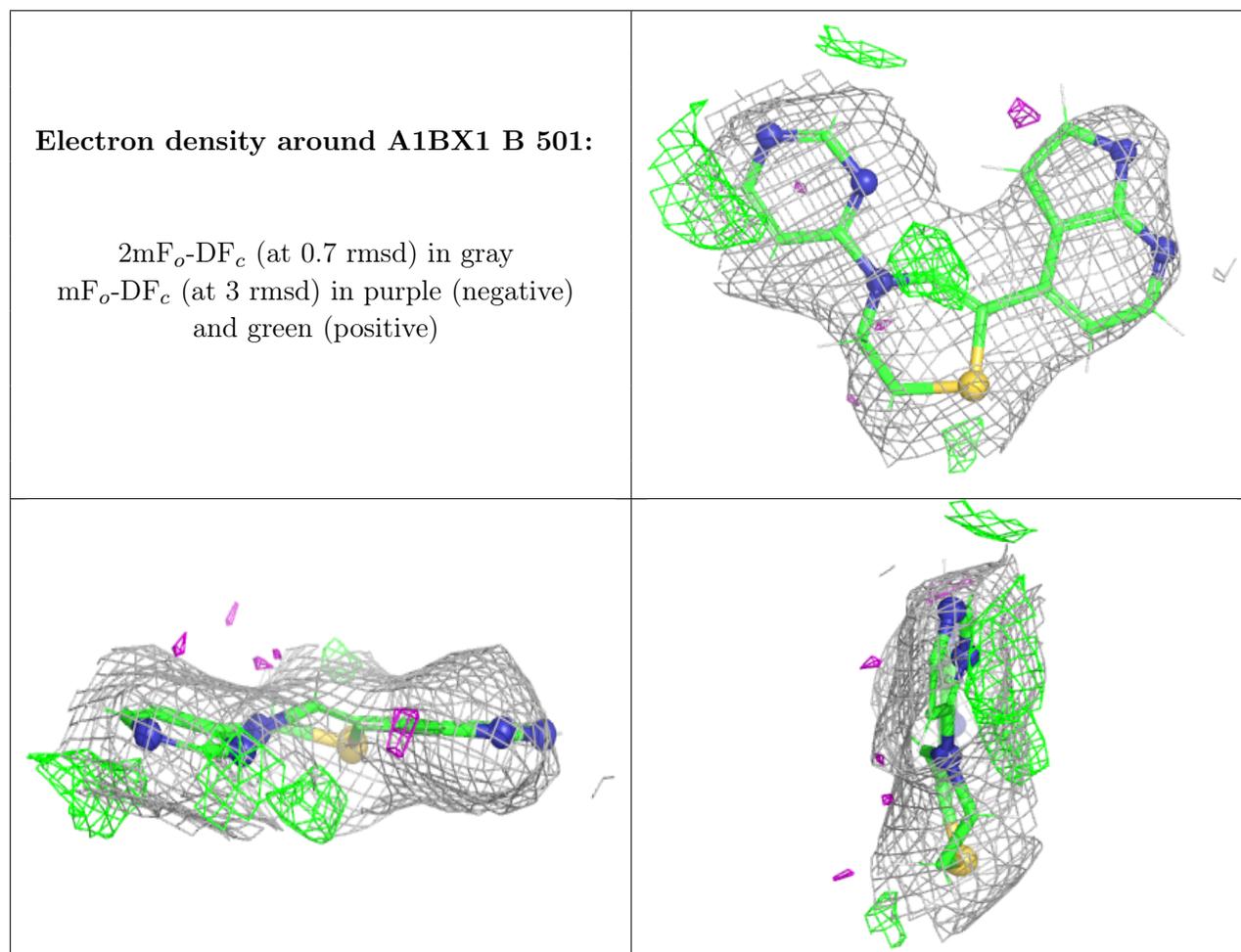| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	TPO	B	252	11/12	0.85	0.18	20,20,20,20	0
2	TPO	A	252	11/12	0.89	0.17	20,20,20,20	0

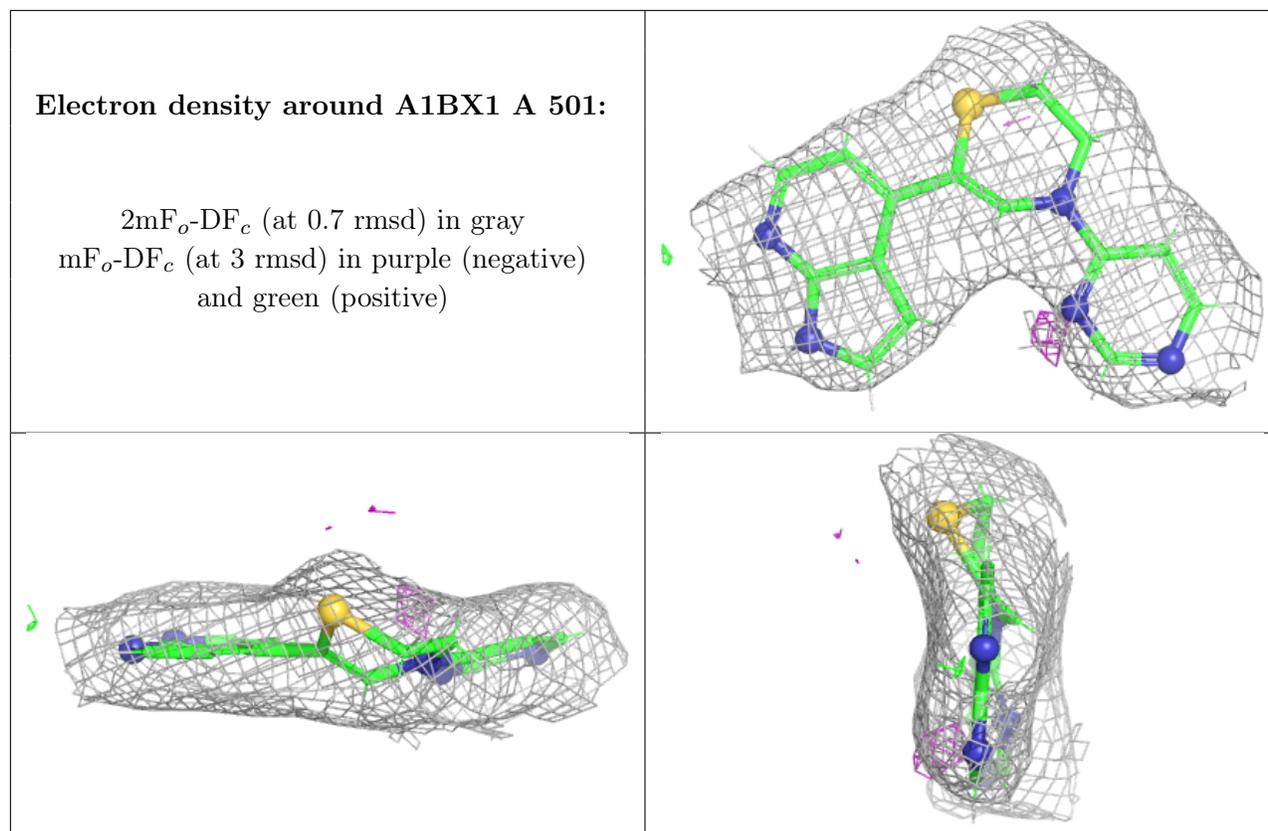## 6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

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.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	A1BX1	B	501	21/21	0.79	0.17	53,65,80,84	0
3	A1BX1	A	501	21/21	0.88	0.12	42,51,62,68	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 A1BX1 B 501:

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

Electron density around A1BX1 A 501:

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

6.5 Other polymers (i)

There are no such residues in this entry.