



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 11:36 AM UTC

PDB ID : 3V4I / pdb_00003v4i
Title : Crystal structure of HIV-1 reverse transcriptase (RT) with DNA and AZTTP
Authors : Das, K.; Martinez, S.E.; Arnold, E.
Deposited on : 2011-12-15
Resolution : 2.80 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

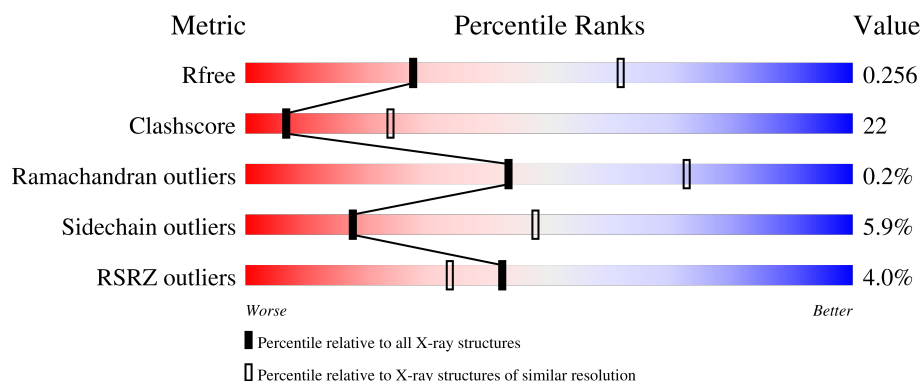
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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	556	4% 54% 41% .
1	C	556	3% 59% 38% .
2	B	428	3% 57% 35% . .
2	D	428	6% 56% 36% 5% .
3	E	27	52% 37% 11%

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Mol	Chain	Length	Quality of chain
3	T	27	
4	F	21	
4	P	21	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 17696 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 P66 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	555	Total	C	N	O	S	0	0	0
			4511	2920	751	832	8			
1	C	555	Total	C	N	O	S	0	0	0
			4511	2920	751	832	8			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	expression tag	UNP P03366
A	0	VAL	-	expression tag	UNP P03366
A	258	CYS	GLN	engineered mutation	UNP P03366
A	280	SER	CYS	engineered mutation	UNP P03366
A	498	ASN	ASP	engineered mutation	UNP P03366
C	-1	MET	-	expression tag	UNP P03366
C	0	VAL	-	expression tag	UNP P03366
C	258	CYS	GLN	engineered mutation	UNP P03366
C	280	SER	CYS	engineered mutation	UNP P03366
C	498	ASN	ASP	engineered mutation	UNP P03366

- Molecule 2 is a protein called HIV-1 Reverse Transcriptase P51 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	412	Total	C	N	O	S	0	0	0
			3400	2212	563	619	6			
2	D	412	Total	C	N	O	S	0	0	0
			3400	2212	563	619	6			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	280	SER	CYS	engineered mutation	UNP P03366
D	280	SER	CYS	engineered mutation	UNP P03366

- Molecule 3 is a DNA chain called DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP*CP*CP*GP*AP*AP*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	T	24	Total	C	N	O	P	0	0	0
			497	234	102	138	23			
3	E	24	Total	C	N	O	P	0	0	0
			497	234	102	138	23			

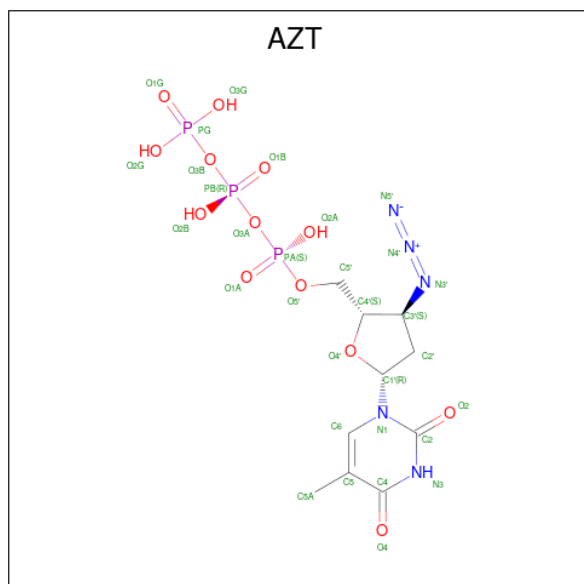
- Molecule 4 is a DNA chain called DNA (5'-D(*AP*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MRG)P*CP*GP*CP*CP*(ATM))-3').

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
4	P	20	Total	C	N	O	P	S	0	0	0
			408	195	72	121	19	1			
4	F	20	Total	C	N	O	P	S	0	0	0
			408	195	72	121	19	1			

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mg	0	0
			1	1		
5	C	1	Total	Mg	0	0
			1	1		

- Molecule 6 is 3'-AZIDO-3'-DEOXYTHYMIDINE-5'-TRIPHOSPHATE (CCD ID: AZT) (formula: C₁₀H₁₆N₅O₁₃P₃).

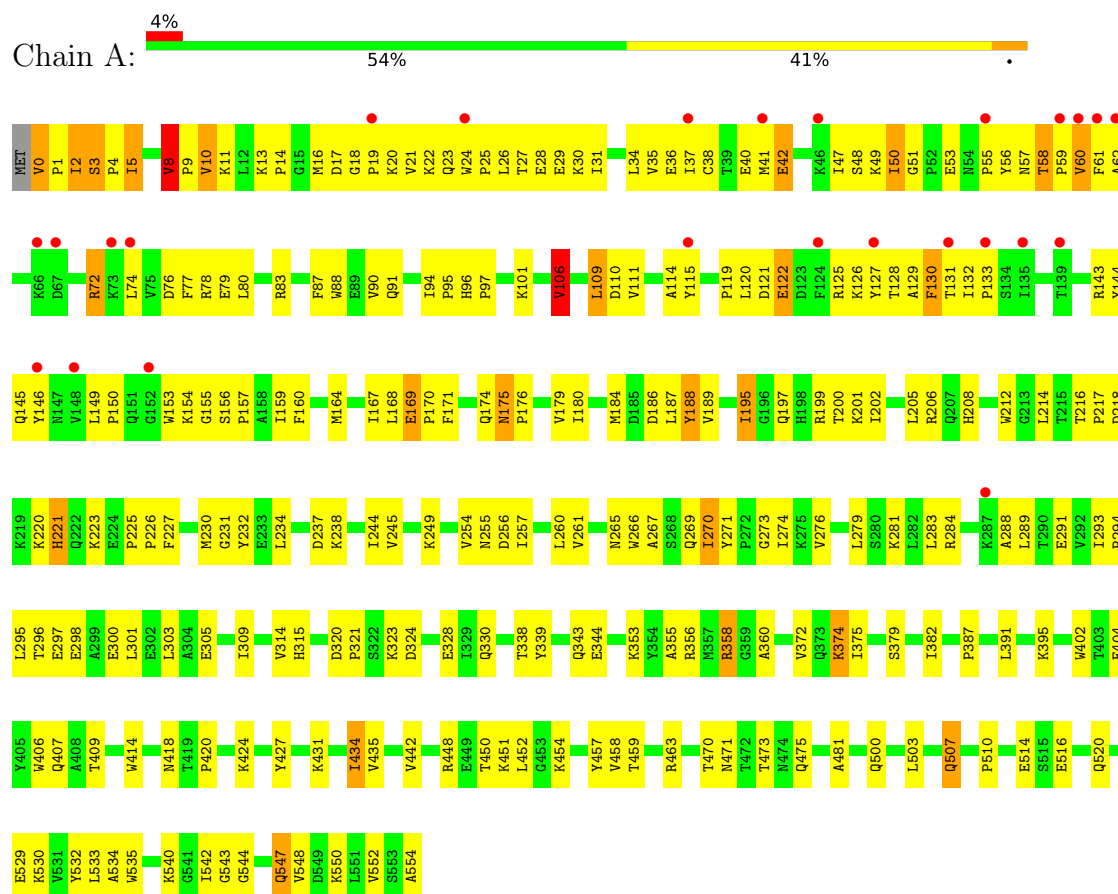


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
6	C	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

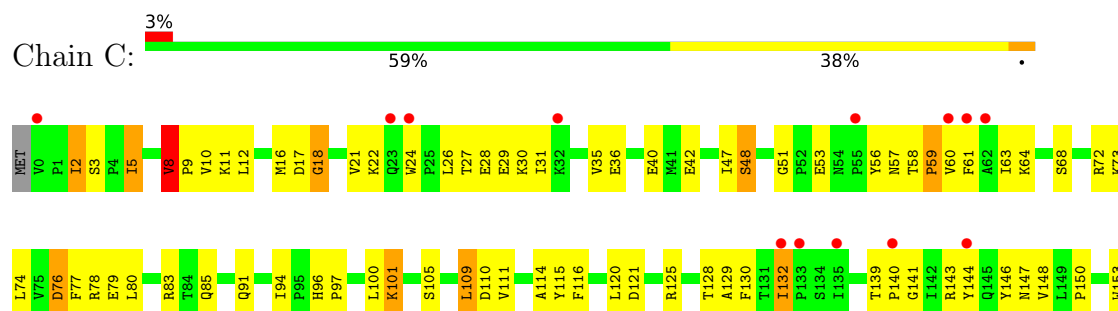
3 Residue-property plots

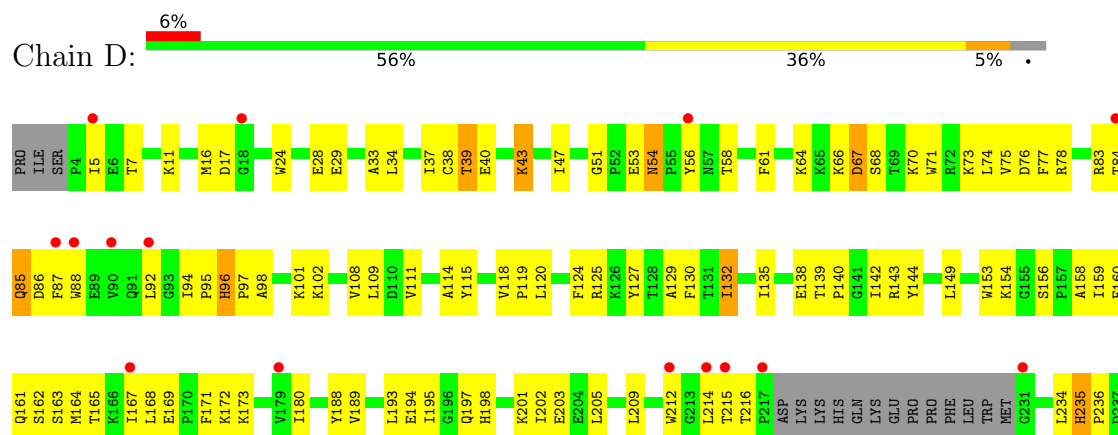
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: HIV-1 Reverse Transcriptase P66 subunit



• Molecule 1: HIV-1 Reverse Transcriptase P66 subunit







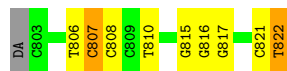
- Molecule 3: DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP*CP*CP*CP*GP*AP*AP*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3')



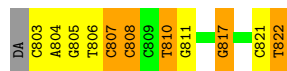
- Molecule 3: DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP*CP*CP*CP*GP*AP*AP*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3')



- Molecule 4: DNA (5'-D(*AP*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(M RG)P*CP*GP*CP*CP*(ATM))-3')



- Molecule 4: DNA (5'-D(*AP*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(M RG)P*CP*GP*CP*CP*(ATM))-3')



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	90.05Å 132.65Å 138.01Å 90.00° 98.12° 90.00°	Depositor
Resolution (Å)	45.54 – 2.80 45.54 – 2.80	Depositor EDS
% Data completeness (in resolution range)	92.3 (45.54-2.80) 92.2 (45.54-2.80)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.10 (at 2.81Å)	Xtriage
Refinement program	PHENIX 1.7.1 _743	Depositor
R, R_{free}	0.229 , 0.262 0.222 , 0.256	Depositor DCC
R_{free} test set	2206 reflections (3.01%)	wwPDB-VP
Wilson B-factor (Å ²)	65.4	Xtriage
Anisotropy	0.370	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 41.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	17696	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.64% 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: AZT, MG, ATM, MRG

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	0.60	0/4629	0.99	17/6290 (0.3%)
1	C	0.58	0/4629	0.99	12/6290 (0.2%)
2	B	0.63	0/3497	1.01	13/4751 (0.3%)
2	D	0.63	0/3497	1.00	19/4751 (0.4%)
3	E	0.35	0/560	0.94	0/864
3	T	0.34	0/560	0.91	0/864
4	F	0.39	0/400	1.10	3/612 (0.5%)
4	P	0.36	0/400	1.11	2/612 (0.3%)
All	All	0.59	0/18172	1.00	66/25034 (0.3%)

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
2	D	0	1

There are no bond length outliers.

All (66) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	18	GLY	CA-C-N	10.74	133.26	119.84
1	C	18	GLY	C-N-CA	10.74	133.26	119.84
1	C	8	VAL	CA-C-N	9.85	129.94	119.90
1	C	8	VAL	C-N-CA	9.85	129.94	119.90
1	A	18	GLY	CA-C-N	9.73	132.00	119.84
1	A	18	GLY	C-N-CA	9.73	132.00	119.84
2	B	96	HIS	CA-C-N	9.68	131.94	119.84
2	B	96	HIS	C-N-CA	9.68	131.94	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	401	TRP	N-CA-C	8.70	124.08	113.38
4	P	807	DC	C4'-C3'-O3'	7.99	121.98	110.00
2	B	54	ASN	CA-C-N	7.92	128.10	119.87
2	B	54	ASN	C-N-CA	7.92	128.10	119.87
2	D	235	HIS	CA-C-N	7.89	129.71	119.84
2	D	235	HIS	C-N-CA	7.89	129.71	119.84
2	B	51	GLY	CA-C-N	7.81	127.52	119.56
2	B	51	GLY	C-N-CA	7.81	127.52	119.56
2	D	51	GLY	CA-C-N	7.68	127.40	119.56
2	D	51	GLY	C-N-CA	7.68	127.40	119.56
4	F	808	DC	C5'-C4'-C3'	-7.63	103.46	114.90
2	B	401	TRP	N-CA-C	7.54	122.65	113.38
1	A	51	GLY	CA-C-N	7.53	127.20	119.82
1	A	51	GLY	C-N-CA	7.53	127.20	119.82
2	B	68	SER	N-CA-C	7.36	119.20	111.03
2	B	90	VAL	N-CA-C	7.32	118.12	110.72
1	A	8	VAL	CA-C-N	7.26	127.31	119.90
1	A	8	VAL	C-N-CA	7.26	127.31	119.90
1	A	0	VAL	CA-C-N	7.25	128.91	119.84
1	A	0	VAL	C-N-CA	7.25	128.91	119.84
1	C	382	ILE	N-CA-C	7.19	117.80	110.82
2	D	284	ARG	N-CA-C	7.19	120.03	111.33
1	C	276	VAL	N-CA-C	7.04	119.66	112.90
2	B	284	ARG	N-CA-C	6.94	119.73	111.33
2	D	54	ASN	CA-C-N	6.94	127.08	119.87
2	D	54	ASN	C-N-CA	6.94	127.08	119.87
2	D	85	GLN	N-CA-C	6.85	119.33	111.11
2	D	96	HIS	CA-C-N	6.62	128.12	119.84
2	D	96	HIS	C-N-CA	6.62	128.12	119.84
2	D	132	ILE	CA-C-N	6.59	126.77	120.31
2	D	132	ILE	C-N-CA	6.59	126.77	120.31
2	B	276	VAL	N-CA-C	6.57	119.33	112.83
1	A	175	ASN	CA-C-N	6.54	126.23	119.56
1	A	175	ASN	C-N-CA	6.54	126.23	119.56
2	D	419	THR	CA-C-N	-6.32	113.87	120.38
2	D	419	THR	C-N-CA	-6.32	113.87	120.38
2	D	423	VAL	N-CA-C	-6.31	102.80	111.89
2	B	382	ILE	N-CA-C	6.27	116.90	110.82
1	C	8	VAL	N-CA-C	6.26	114.30	107.60
2	B	195	ILE	N-CA-C	6.25	116.92	110.36
1	A	382	ILE	N-CA-C	6.24	116.88	110.82
1	A	237	ASP	N-CA-C	5.91	121.22	113.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	106	VAL	N-CA-C	5.87	116.74	108.17
1	C	132	ILE	CA-C-N	5.86	126.19	119.92
1	C	132	ILE	C-N-CA	5.86	126.19	119.92
1	C	225	PRO	O-C-N	5.67	123.92	121.31
4	F	807	DC	C4'-C3'-O3'	5.59	118.38	110.00
4	P	807	DC	O4'-C1'-N1	5.56	116.73	108.40
1	A	58	THR	CA-C-N	5.53	125.84	119.92
1	A	58	THR	C-N-CA	5.53	125.84	119.92
2	D	343	GLN	N-CA-C	-5.50	105.68	112.72
2	D	195	ILE	N-CA-C	5.34	115.97	110.36
1	C	270	ILE	N-CA-C	5.29	119.61	113.42
4	F	810	DT	P-O5'-C5'	-5.26	112.11	120.00
1	A	356	ARG	N-CA-C	5.26	117.93	110.10
2	D	96	HIS	N-CA-C	5.25	117.91	109.15
1	A	50	ILE	N-CA-C	5.19	115.74	108.17
1	C	397	THR	N-CA-C	-5.11	105.40	110.97

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	420	PRO	Peptide

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4511	0	4570	229	0
1	C	4511	0	4570	196	0
2	B	3400	0	3433	150	0
2	D	3400	0	3433	148	0
3	E	497	0	268	13	0
3	T	497	0	268	15	0
4	F	408	0	231	19	0
4	P	408	0	231	12	0
5	A	1	0	0	0	0
5	C	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	A	31	0	12	2	0
6	C	31	0	12	2	0
All	All	17696	0	17028	747	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 22.

All (747) 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:D:115:TYR:HD2	2:D:156:SER:HB3	1.15	1.07
2:D:115:TYR:CD2	2:D:156:SER:HB3	1.91	1.05
4:F:807:DC:H2''	4:F:808:DC:H5''	1.39	1.04
2:B:266:TRP:CD1	2:B:425:LEU:HD22	1.91	1.04
1:A:5:ILE:HG22	1:A:212:TRP:HD1	1.22	1.04
1:A:358:ARG:HG3	1:A:358:ARG:HH11	1.24	1.02
1:A:34:LEU:HD21	1:A:132:ILE:HD12	1.36	1.01
2:D:419:THR:HB	2:D:421:PRO:HG3	1.41	1.00
2:B:115:TYR:HD1	2:B:156:SER:HB3	1.30	0.97
1:A:130:PHE:CE2	1:A:144:TYR:HB2	2.00	0.95
4:F:807:DC:H2''	4:F:808:DC:C5'	1.96	0.94
2:B:114:ALA:HB2	2:B:214:LEU:HD22	1.48	0.94
1:C:195:ILE:HD11	1:C:199:ARG:HH21	1.31	0.94
1:A:199:ARG:NH2	1:A:223:LYS:HB2	1.83	0.93
2:B:47:ILE:HD12	2:B:144:TYR:CD1	2.06	0.91
1:C:128:THR:HG21	1:C:146:TYR:HB2	1.51	0.90
1:C:303:LEU:O	1:C:307:ARG:HG3	1.70	0.89
1:A:164:MET:HE3	1:A:168:LEU:HD11	1.56	0.88
1:A:128:THR:HG21	1:A:146:TYR:CD2	2.09	0.87
2:D:47:ILE:HD12	2:D:144:TYR:CD1	2.09	0.87
1:A:5:ILE:HG22	1:A:212:TRP:CD1	2.08	0.87
2:D:143:ARG:HG2	2:D:143:ARG:HH11	1.40	0.87
1:A:184:MET:HE3	1:A:184:MET:HA	1.57	0.86
2:B:278:GLN:HE21	2:B:298:GLU:HB2	1.40	0.86
1:A:155:GLY:O	1:A:159:ILE:HG13	1.75	0.85
2:D:209:LEU:HD22	2:D:214:LEU:HD23	1.59	0.84
1:A:47:ILE:CG1	1:A:144:TYR:HB3	2.08	0.83
2:B:13:LYS:HD2	2:B:85:GLN:HB3	1.59	0.83
2:D:419:THR:O	2:D:421:PRO:HD3	1.78	0.82
1:A:320:ASP:OD2	1:A:323:LYS:HE2	1.79	0.82
1:A:128:THR:HG21	1:A:146:TYR:HD2	1.43	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:516:GLU:O	1:C:520:GLN:HG3	1.80	0.81
1:A:199:ARG:HH22	1:A:223:LYS:HB2	1.38	0.81
2:D:342:TYR:HB3	2:D:348:ASN:HD22	1.46	0.81
1:A:164:MET:HE2	1:A:187:LEU:HD11	1.64	0.80
1:A:261:VAL:HG13	1:A:276:VAL:HG11	1.64	0.79
1:C:199:ARG:NH2	1:C:223:LYS:HB2	1.97	0.79
1:A:58:THR:HG22	1:A:129:ALA:O	1.81	0.79
2:B:336:GLN:HG2	2:B:353:LYS:HD2	1.65	0.79
3:E:704:DG:OP2	3:E:704:DG:N2	2.15	0.78
2:B:180:ILE:HG12	2:B:189:VAL:HG22	1.66	0.78
4:F:807:DC:C2'	4:F:808:DC:H5''	2.13	0.78
2:B:197:GLN:O	2:B:201:LYS:HG2	1.83	0.78
1:A:167:ILE:O	1:A:170:PRO:HD2	1.83	0.78
1:A:358:ARG:HG3	1:A:358:ARG:NH1	1.94	0.78
2:B:278:GLN:NE2	2:B:298:GLU:HB2	1.99	0.78
1:A:223:LYS:O	1:A:225:PRO:HD2	1.84	0.77
1:A:434:ILE:HD13	1:A:530:LYS:HB3	1.66	0.77
4:F:806:DT:H2'	4:F:807:DC:C6	2.20	0.77
1:A:255:ASN:HB2	1:A:289:LEU:HG	1.67	0.77
2:D:428:GLN:HE21	2:D:428:GLN:HA	1.48	0.76
2:D:17:ASP:O	2:D:83:ARG:HD3	1.85	0.76
1:C:447:ASN:HB3	1:C:450:THR:HB	1.67	0.76
2:B:312:GLU:HB3	2:B:313:PRO:HD2	1.68	0.75
1:A:167:ILE:O	1:A:170:PRO:CD	2.35	0.75
1:C:296:THR:HG23	1:C:299:ALA:H	1.50	0.75
1:A:206:ARG:NH2	1:A:216:THR:O	2.20	0.75
4:F:803:DC:H2'	4:F:804:DA:C8	2.22	0.75
1:A:115:TYR:CE2	6:A:823:AZT:H2'1	2.21	0.74
1:C:184:MET:HA	1:C:184:MET:HE3	1.67	0.74
1:A:128:THR:CG2	1:A:146:TYR:HD2	2.00	0.74
2:D:421:PRO:HG2	2:D:423:VAL:HB	1.68	0.74
2:B:120:LEU:HD23	2:B:125:ARG:HG2	1.70	0.74
2:B:298:GLU:CD	2:B:298:GLU:H	1.97	0.73
1:A:516:GLU:O	1:A:520:GLN:HG3	1.88	0.73
2:B:115:TYR:CD1	2:B:156:SER:HB3	2.20	0.73
2:B:266:TRP:CD1	2:B:425:LEU:CD2	2.71	0.73
1:C:261:VAL:HG13	1:C:276:VAL:HG11	1.71	0.72
1:A:47:ILE:HG13	1:A:144:TYR:HB3	1.69	0.72
2:D:168:LEU:HD13	2:D:172:LYS:HE3	1.72	0.72
3:E:722:DA:H2''	3:E:723:DC:H5''	1.71	0.72
2:B:86:ASP:CG	2:B:87:PHE:H	1.96	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:804:DA:H2'	4:F:805:DG:C8	2.25	0.71
1:A:130:PHE:HE2	1:A:144:TYR:HB2	1.49	0.71
1:C:206:ARG:NH2	1:C:216:THR:O	2.22	0.71
2:D:160:PHE:O	2:D:160:PHE:CD2	2.44	0.71
1:A:175:ASN:OD1	1:A:201:LYS:NZ	2.20	0.71
1:C:458:VAL:HG23	1:C:548:VAL:HB	1.73	0.71
1:A:21:VAL:HG23	1:A:59:PRO:HD3	1.72	0.70
1:C:5:ILE:HG22	1:C:212:TRP:HD1	1.55	0.70
1:C:16:MET:HE2	1:C:83:ARG:HD3	1.73	0.70
1:C:22:LYS:HA	1:C:57:ASN:HD22	1.54	0.70
2:D:92:LEU:HB3	2:D:158:ALA:HB1	1.73	0.70
2:D:114:ALA:HB2	2:D:214:LEU:HD13	1.73	0.70
2:D:421:PRO:HB2	2:D:423:VAL:HG23	1.73	0.70
1:A:79:GLU:OE1	1:A:83:ARG:NH2	2.23	0.70
1:A:132:ILE:HG12	1:A:144:TYR:HE2	1.54	0.70
1:C:36:GLU:O	1:C:40:GLU:HG2	1.92	0.70
1:A:114:ALA:HB1	1:A:160:PHE:CZ	2.27	0.70
2:B:195:ILE:O	2:B:199:ARG:HG3	1.91	0.70
1:C:475:GLN:OE1	1:C:475:GLN:N	2.22	0.70
1:C:253:THR:HG22	1:C:292:VAL:HA	1.74	0.69
2:D:287:LYS:NZ	2:D:291:GLU:OE2	2.26	0.69
1:C:293:ILE:HG13	1:C:294:PRO:HD2	1.74	0.69
2:B:41:MET:HE2	2:B:47:ILE:HG12	1.75	0.69
1:A:28:GLU:HA	1:A:31:ILE:HD12	1.74	0.69
2:B:275:LYS:HD2	2:B:277:ARG:HH21	1.58	0.69
2:D:33:ALA:O	2:D:37:ILE:HG12	1.93	0.69
1:A:5:ILE:CG2	1:A:212:TRP:HD1	2.01	0.69
1:C:398:TRP:CZ2	1:C:411:ILE:HG13	2.28	0.69
1:C:5:ILE:CG2	1:C:212:TRP:HD1	2.06	0.68
1:A:132:ILE:HG12	1:A:144:TYR:CE2	2.28	0.68
1:C:199:ARG:HH22	1:C:223:LYS:HB2	1.57	0.68
1:A:296:THR:CG2	1:A:298:GLU:HG2	2.23	0.68
2:B:68:SER:O	2:B:69:THR:HB	1.93	0.68
2:B:167:ILE:HG23	2:B:212:TRP:CD1	2.27	0.68
1:A:293:ILE:HG13	1:A:294:PRO:HD2	1.76	0.68
1:A:184:MET:HG2	4:P:822:ATM:H2'	1.76	0.67
1:C:406:TRP:CZ2	2:D:420:PRO:HG3	2.29	0.67
1:A:47:ILE:HG13	1:A:48:SER:H	1.59	0.67
2:B:86:ASP:CG	2:B:87:PHE:N	2.53	0.67
2:B:113:ASP:HB3	2:B:214:LEU:CD1	2.24	0.67
1:A:458:VAL:HG23	1:A:548:VAL:HB	1.77	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:434:ILE:HD13	1:C:530:LYS:HB3	1.75	0.67
4:F:805:DG:H4'	4:F:806:DT:OP1	1.95	0.67
2:D:312:GLU:HB3	2:D:313:PRO:HD2	1.77	0.67
1:A:120:LEU:HD12	1:A:121:ASP:H	1.59	0.67
1:A:156:SER:HB2	1:A:157:PRO:HD3	1.76	0.67
2:D:425:LEU:HG	2:D:426:TRP:N	2.10	0.66
1:A:60:VAL:HG21	1:A:130:PHE:HD1	1.61	0.66
1:A:418:ASN:O	1:A:420:PRO:HD3	1.96	0.66
4:F:807:DC:H2''	4:F:808:DC:O5'	1.95	0.66
1:A:23:GLN:HG3	1:A:131:THR:HG22	1.78	0.66
1:C:5:ILE:HG22	1:C:212:TRP:CD1	2.31	0.66
1:C:434:ILE:HG13	1:C:494:ASN:OD1	1.96	0.66
2:D:423:VAL:HG13	2:D:426:TRP:HE1	1.61	0.66
1:A:5:ILE:HD11	1:A:119:PRO:HD2	1.78	0.65
2:B:317:VAL:HG12	2:B:347:LYS:HB3	1.78	0.65
2:D:28:GLU:HA	2:D:135:ILE:HD11	1.78	0.65
2:B:53:GLU:HG2	2:B:54:ASN:N	2.10	0.65
1:C:128:THR:CG2	1:C:146:TYR:HD2	2.09	0.65
1:C:418:ASN:O	1:C:420:PRO:HD3	1.96	0.65
1:A:62:ALA:HB1	1:A:72:ARG:O	1.97	0.65
1:A:284:ARG:HB2	3:T:714:DG:OP1	1.97	0.65
3:T:713:DC:H2''	3:T:714:DG:H5'	1.78	0.65
1:A:128:THR:CG2	1:A:146:TYR:CD2	2.78	0.65
2:B:118:VAL:HG12	2:B:119:PRO:O	1.97	0.65
1:C:171:PHE:CE2	1:C:175:ASN:ND2	2.65	0.65
2:D:164:MET:HE3	2:D:168:LEU:HG	1.78	0.65
2:D:374:LYS:O	2:D:378:GLU:HG3	1.97	0.65
1:C:281:LYS:O	1:C:284:ARG:HG2	1.97	0.64
1:A:324:ASP:O	1:A:343:GLN:HG2	1.98	0.64
2:B:5:ILE:HD13	2:B:119:PRO:HD3	1.79	0.64
2:D:332:GLN:HE22	2:D:424:LYS:HA	1.62	0.64
2:D:17:ASP:O	2:D:83:ARG:NH1	2.30	0.64
1:A:305:GLU:O	1:A:309:ILE:HG13	1.97	0.64
2:D:120:LEU:HD23	2:D:125:ARG:HG2	1.80	0.64
2:D:425:LEU:HD12	2:D:425:LEU:O	1.96	0.64
2:D:317:VAL:HG12	2:D:347:LYS:HB3	1.80	0.64
1:A:296:THR:HG22	1:A:298:GLU:HG2	1.80	0.63
1:C:16:MET:HE2	1:C:83:ARG:HH11	1.63	0.63
1:A:97:PRO:HD3	1:A:232:TYR:CE2	2.34	0.63
1:A:169:GLU:N	1:A:170:PRO:CD	2.62	0.63
1:C:110:ASP:OD2	1:C:111:VAL:N	2.31	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:88:TRP:CD1	2:B:143:ARG:NH1	2.67	0.63
1:C:503:LEU:HD22	1:C:535:TRP:HB2	1.80	0.63
2:D:246:LEU:HD11	2:D:264:LEU:HD21	1.80	0.63
2:D:425:LEU:HD12	2:D:425:LEU:C	2.24	0.63
1:A:114:ALA:HB1	1:A:160:PHE:CE2	2.33	0.62
2:B:318:TYR:CE1	1:C:418:ASN:OD1	2.52	0.62
1:A:23:GLN:HG3	1:A:131:THR:CG2	2.29	0.62
2:D:109:LEU:HD13	2:D:216:THR:HG21	1.81	0.62
2:D:53:GLU:HG2	2:D:54:ASN:N	2.13	0.62
2:D:423:VAL:O	2:D:426:TRP:HD1	1.81	0.62
3:T:704:DG:H5''	3:T:704:DG:N3	2.15	0.62
1:A:543:GLY:HA2	2:B:283:LEU:O	1.99	0.62
2:B:101:LYS:O	2:B:236:PRO:HB2	2.00	0.62
1:C:21:VAL:CG2	1:C:59:PRO:HD3	2.30	0.62
2:D:143:ARG:HG2	2:D:143:ARG:NH1	2.11	0.62
4:P:807:DC:H2''	4:P:808:DC:H5''	1.82	0.62
1:A:101:LYS:HZ3	1:A:321:PRO:HG3	1.65	0.62
1:C:128:THR:HG21	1:C:146:TYR:CB	2.29	0.62
1:A:115:TYR:CD2	6:A:823:AZT:H2'1	2.35	0.62
2:B:297:GLU:HB2	2:B:298:GLU:OE2	2.00	0.62
1:C:31:ILE:O	1:C:35:VAL:HG23	1.99	0.62
1:A:23:GLN:NE2	1:A:131:THR:O	2.32	0.61
1:C:254:VAL:HG21	1:C:286:THR:HG21	1.80	0.61
1:A:29:GLU:HG3	1:A:30:LYS:N	2.14	0.61
1:C:2:ILE:HD12	1:C:2:ILE:H	1.65	0.61
1:C:295:LEU:HB3	1:C:300:GLU:OE2	1.99	0.61
1:A:96:HIS:CG	1:A:97:PRO:HD2	2.35	0.61
1:A:249:LYS:HG3	1:A:256:ASP:OD1	2.01	0.61
2:B:115:TYR:H	2:B:115:TYR:HD2	1.47	0.61
1:A:31:ILE:O	1:A:35:VAL:HG23	2.00	0.61
2:B:170:PRO:HB2	2:B:208:HIS:CE1	2.36	0.61
1:A:110:ASP:OD1	1:A:111:VAL:N	2.34	0.61
1:C:271:TYR:CE1	1:C:314:VAL:HG22	2.36	0.61
1:A:503:LEU:HD12	1:A:533:LEU:HD13	1.83	0.60
1:C:164:MET:HE2	1:C:168:LEU:HG	1.83	0.60
2:D:266:TRP:CZ3	2:D:425:LEU:HD21	2.36	0.60
1:C:26:LEU:HD23	1:C:26:LEU:H	1.66	0.60
2:B:419:THR:HG22	2:B:419:THR:O	2.02	0.60
1:A:2:ILE:N	1:A:2:ILE:HD12	2.16	0.60
1:A:10:VAL:O	1:A:11:LYS:HG3	2.00	0.60
2:D:101:LYS:O	2:D:236:PRO:HB2	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:255:ASN:HB2	1:C:289:LEU:HG	1.83	0.60
2:B:318:TYR:HE1	1:C:418:ASN:OD1	1.84	0.60
3:E:723:DC:H4'	3:E:723:DC:OP1	2.00	0.60
1:C:209:LEU:O	1:C:214:LEU:HB2	2.01	0.60
2:B:160:PHE:O	2:B:160:PHE:CD2	2.55	0.60
1:C:111:VAL:HG11	1:C:214:LEU:HD22	1.84	0.60
2:D:114:ALA:HB1	2:D:160:PHE:CZ	2.36	0.60
1:A:254:VAL:HG13	1:A:283:LEU:HD22	1.85	0.59
1:C:450:THR:CG2	1:C:452:LEU:HB2	2.33	0.59
2:D:423:VAL:O	2:D:426:TRP:CD1	2.55	0.59
3:E:723:DC:H5''	3:E:723:DC:H6	1.67	0.59
1:A:500:GLN:HG2	2:B:422:LEU:HD13	1.85	0.59
2:B:266:TRP:NE1	2:B:425:LEU:HD22	2.17	0.59
1:A:281:LYS:O	1:A:284:ARG:HG2	2.03	0.59
1:C:503:LEU:CD1	1:C:533:LEU:HG	2.33	0.59
1:A:53:GLU:O	1:A:55:PRO:HD3	2.02	0.59
1:C:76:ASP:OD2	1:C:76:ASP:C	2.45	0.59
2:D:86:ASP:OD2	2:D:87:PHE:N	2.36	0.59
2:D:332:GLN:CD	2:D:427:TYR:HB3	2.28	0.59
1:A:23:GLN:HE22	1:A:60:VAL:HB	1.68	0.59
1:C:284:ARG:HB2	3:E:714:DG:OP1	2.02	0.59
1:C:293:ILE:CG1	1:C:294:PRO:HD2	2.33	0.59
3:T:703:DG:C2	3:T:704:DG:H1'	2.38	0.58
1:A:29:GLU:HG3	1:A:30:LYS:H	1.68	0.58
1:C:536:VAL:HB	1:C:542:ILE:HD12	1.85	0.58
1:A:406:TRP:CZ2	2:B:420:PRO:HG3	2.38	0.58
1:A:169:GLU:N	1:A:170:PRO:HD3	2.19	0.58
1:C:22:LYS:HA	1:C:57:ASN:ND2	2.18	0.58
1:C:130:PHE:CE2	1:C:144:TYR:HB2	2.38	0.58
1:A:76:ASP:OD2	1:A:76:ASP:C	2.47	0.58
1:C:109:LEU:N	1:C:109:LEU:HD23	2.19	0.58
2:D:66:LYS:O	2:D:67:ASP:HB2	2.03	0.58
2:B:10:VAL:C	2:B:11:LYS:HD2	2.29	0.57
1:A:120:LEU:CD1	1:A:121:ASP:H	2.18	0.57
2:B:115:TYR:O	2:B:149:LEU:HB2	2.03	0.57
2:D:98:ALA:O	2:D:102:LYS:HE3	2.03	0.57
1:C:503:LEU:O	1:C:507:GLN:HB2	2.05	0.57
1:C:543:GLY:HA3	2:D:283:LEU:O	2.05	0.57
2:D:419:THR:HB	2:D:421:PRO:CG	2.24	0.57
1:A:26:LEU:HD11	1:A:30:LYS:HD2	1.87	0.57
2:B:209:LEU:HD22	2:B:214:LEU:HB3	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:395:LYS:HG3	2:B:416:PHE:CE2	2.40	0.57
1:A:128:THR:HG22	1:A:128:THR:O	2.04	0.56
2:D:16:MET:HG2	2:D:83:ARG:HG2	1.87	0.56
4:P:807:DC:H2''	4:P:808:DC:C5'	2.35	0.56
4:P:815:DG:H2''	4:P:816:DG:OP2	2.05	0.56
1:A:128:THR:HG21	1:A:146:TYR:HB2	1.88	0.56
1:A:244:ILE:HD13	1:A:267:ALA:HB2	1.85	0.56
1:C:21:VAL:HG23	1:C:59:PRO:HD3	1.87	0.56
1:C:288:ALA:HB3	1:C:291:GLU:HB2	1.86	0.56
2:B:84:THR:HG22	2:B:87:PHE:HB3	1.88	0.56
4:F:805:DG:H2''	4:F:806:DT:C5'	2.36	0.56
1:A:276:VAL:HG12	1:A:276:VAL:O	2.03	0.56
1:C:398:TRP:CH2	1:C:411:ILE:HG13	2.40	0.56
1:A:24:TRP:NE1	3:T:703:DG:H1	2.04	0.56
1:A:260:LEU:HD23	1:A:279:LEU:HD22	1.87	0.56
2:B:124:PHE:CD1	2:B:127:TYR:HD2	2.24	0.56
2:B:376:THR:HG23	2:B:386:THR:HG22	1.86	0.56
1:C:203:GLU:OE2	1:C:206:ARG:HD3	2.06	0.56
1:C:448:ARG:O	1:C:451:LYS:NZ	2.38	0.56
2:D:87:PHE:HZ	2:D:159:ILE:HG13	1.68	0.56
2:B:114:ALA:N	2:B:214:LEU:HD13	2.21	0.56
1:C:395:LYS:HD2	1:C:414:TRP:CH2	2.41	0.56
1:C:473:THR:O	1:C:477:THR:HG23	2.05	0.56
2:B:124:PHE:CE2	2:B:153:TRP:CZ2	2.94	0.55
2:D:84:THR:O	2:D:87:PHE:HB3	2.06	0.55
2:B:17:ASP:O	2:B:83:ARG:NH1	2.38	0.55
1:C:202:ILE:HG21	1:C:220:LYS:HZ2	1.71	0.55
1:A:295:LEU:HB3	1:A:300:GLU:HG2	1.88	0.55
2:D:115:TYR:O	2:D:149:LEU:HB2	2.07	0.55
2:D:194:GLU:OE1	2:D:197:GLN:HG2	2.07	0.55
2:D:198:HIS:NE2	2:D:202:ILE:HD11	2.21	0.55
4:P:806:DT:H2'	4:P:807:DC:C6	2.42	0.55
1:A:261:VAL:HG22	1:A:276:VAL:HG13	1.89	0.55
2:B:115:TYR:N	2:B:115:TYR:CD2	2.73	0.55
1:C:317:VAL:HG23	1:C:349:LEU:HD23	1.88	0.55
2:D:425:LEU:C	2:D:425:LEU:CD1	2.80	0.55
1:A:50:ILE:HG12	1:A:143:ARG:O	2.06	0.54
1:A:164:MET:HE3	1:A:168:LEU:CD1	2.35	0.54
2:B:82:LYS:HE2	2:B:413:GLU:OE2	2.06	0.54
2:B:28:GLU:HA	2:B:135:ILE:HD11	1.88	0.54
1:C:407:GLN:OE1	2:D:394:GLN:NE2	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:53:GLU:HG2	2:D:54:ASN:H	1.71	0.54
2:D:421:PRO:HG2	2:D:423:VAL:CB	2.37	0.54
2:B:33:ALA:O	2:B:37:ILE:HG12	2.06	0.54
1:C:139:THR:HG23	1:C:140:PRO:HD2	1.90	0.54
2:B:47:ILE:HD12	2:B:144:TYR:HD1	1.69	0.54
1:C:114:ALA:HB1	1:C:160:PHE:CE1	2.42	0.54
1:C:115:TYR:CD2	6:C:823:AZT:H2'1	2.43	0.54
2:B:323:LYS:O	2:B:385:LYS:NZ	2.41	0.54
2:B:157:PRO:HG3	2:B:184:MET:HA	1.89	0.54
1:C:79:GLU:OE1	1:C:83:ARG:NH2	2.41	0.54
1:C:47:ILE:HG13	1:C:48:SER:H	1.72	0.54
1:C:395:LYS:NZ	1:C:414:TRP:O	2.41	0.54
2:D:142:ILE:HG22	2:D:144:TYR:CE2	2.43	0.54
2:D:266:TRP:HH2	2:D:426:TRP:CZ2	2.26	0.54
3:E:716:DA:H2''	3:E:717:DC:OP2	2.07	0.54
2:D:115:TYR:CE2	2:D:156:SER:HB3	2.43	0.54
1:A:24:TRP:CD1	3:T:703:DG:H1	2.26	0.53
2:D:342:TYR:HB3	2:D:348:ASN:ND2	2.21	0.53
2:B:78:ARG:HD3	2:B:411:ILE:O	2.07	0.53
1:C:223:LYS:O	1:C:225:PRO:HD3	2.09	0.53
2:D:114:ALA:HB2	2:D:214:LEU:CD1	2.39	0.53
2:D:114:ALA:HB2	2:D:214:LEU:HD22	1.90	0.53
1:A:101:LYS:NZ	1:A:321:PRO:HG3	2.22	0.53
1:A:281:LYS:HG2	1:A:284:ARG:NH1	2.24	0.53
1:A:442:VAL:HB	1:A:481:ALA:HB1	1.90	0.53
2:D:164:MET:HE3	2:D:168:LEU:CG	2.38	0.53
1:A:358:ARG:HH11	1:A:358:ARG:CG	2.09	0.53
2:B:198:HIS:NE2	2:B:202:ILE:HD11	2.23	0.53
2:B:109:LEU:HD22	2:B:216:THR:HG21	1.90	0.53
2:B:246:LEU:HD11	2:B:264:LEU:HD21	1.91	0.53
1:C:139:THR:HG22	1:C:141:GLY:H	1.74	0.53
1:A:120:LEU:HD12	1:A:121:ASP:N	2.23	0.53
1:C:282:LEU:HD21	1:C:296:THR:CG2	2.39	0.52
1:C:532:TYR:CE2	1:C:534:ALA:HB2	2.45	0.52
1:A:91:GLN:O	3:T:708:DG:H4'	2.09	0.52
1:A:434:ILE:HD13	1:A:530:LYS:CB	2.38	0.52
4:F:805:DG:H2''	4:F:806:DT:H5''	1.91	0.52
1:C:418:ASN:O	1:C:418:ASN:CG	2.52	0.52
1:A:22:LYS:HA	1:A:57:ASN:ND2	2.25	0.52
1:C:273:GLY:HA2	1:C:338:THR:HG21	1.92	0.52
1:A:208:HIS:O	1:A:212:TRP:HE3	1.93	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:202:ILE:HG21	1:C:220:LYS:NZ	2.25	0.52
1:A:72:ARG:HD3	1:A:74:LEU:HD21	1.91	0.52
1:C:114:ALA:HB1	1:C:160:PHE:CZ	2.45	0.52
2:D:171:PHE:CE2	2:D:205:LEU:HB2	2.44	0.52
1:A:132:ILE:CG1	1:A:144:TYR:HE2	2.22	0.52
1:C:169:GLU:N	1:C:170:PRO:HD2	2.24	0.52
2:D:422:LEU:C	2:D:422:LEU:HD13	2.34	0.52
1:A:542:ILE:HG23	2:B:283:LEU:HD13	1.92	0.52
2:B:428:GLN:HE21	2:B:428:GLN:HA	1.74	0.52
1:A:288:ALA:HB3	1:A:291:GLU:HB2	1.91	0.52
2:D:297:GLU:O	2:D:301:LEU:HG	2.10	0.52
3:T:706:DA:H2'	3:T:707:DG:C8	2.45	0.52
1:A:548:VAL:O	1:A:552:VAL:HG22	2.10	0.52
1:C:242:GLN:HB3	1:C:243:PRO:HD2	1.92	0.52
2:D:354:TYR:HE2	2:D:375:ILE:HG13	1.73	0.52
2:D:422:LEU:O	2:D:425:LEU:HB3	2.09	0.52
1:A:260:LEU:HD21	1:A:303:LEU:HD13	1.91	0.51
2:B:50:ILE:HG13	2:B:51:GLY:N	2.25	0.51
2:B:266:TRP:O	2:B:269:GLN:HG3	2.09	0.51
2:B:282:LEU:HD21	2:B:296:THR:HG23	1.91	0.51
2:B:298:GLU:CD	2:B:298:GLU:N	2.64	0.51
1:C:450:THR:HG21	1:C:452:LEU:HB2	1.92	0.51
3:T:713:DC:H2'	3:T:714:DG:C8	2.45	0.51
2:B:38:CYS:SG	2:B:132:ILE:HD11	2.50	0.51
2:D:257:ILE:O	2:D:261:VAL:HG23	2.10	0.51
2:B:69:THR:O	2:B:69:THR:CG2	2.58	0.51
2:B:86:ASP:OD2	2:B:87:PHE:N	2.43	0.51
2:D:354:TYR:CE2	2:D:375:ILE:HG13	2.45	0.51
3:T:720:DG:H1'	3:T:721:DG:H5'	1.91	0.51
2:B:96:HIS:CD2	2:B:384:GLY:HA3	2.45	0.51
1:C:47:ILE:HD11	1:C:130:PHE:HE2	1.75	0.51
1:A:38:CYS:SG	1:A:132:ILE:HG13	2.51	0.51
1:A:301:LEU:O	1:A:305:GLU:HG2	2.10	0.51
1:A:503:LEU:O	1:A:507:GLN:HB2	2.09	0.51
2:B:87:PHE:HZ	2:B:159:ILE:HG13	1.74	0.51
2:B:113:ASP:HB3	2:B:214:LEU:HD11	1.93	0.51
1:C:195:ILE:O	1:C:199:ARG:HG3	2.10	0.51
1:A:320:ASP:OD2	1:A:323:LYS:CE	2.54	0.51
1:A:122:GLU:OE2	1:A:125:ARG:NH1	2.44	0.51
4:P:807:DC:H1'	4:P:808:DC:H5''	1.93	0.51
2:B:214:LEU:HD12	2:B:215:THR:H	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:100:LEU:HD11	1:C:229:TRP:CZ3	2.46	0.51
2:D:169:GLU:HG2	2:D:173:LYS:HG2	1.93	0.51
4:P:807:DC:C2'	4:P:808:DC:H5''	2.40	0.51
1:A:230:MET:HE3	4:P:821:DC:H4'	1.92	0.50
1:C:153:TRP:CD1	1:C:154:LYS:H	2.29	0.50
3:E:717:DC:H2''	3:E:718:DA:OP2	2.09	0.50
1:A:19:PRO:O	1:A:57:ASN:N	2.43	0.50
1:C:254:VAL:HG13	1:C:283:LEU:HD22	1.92	0.50
2:D:357:MET:O	2:D:360:ALA:HB2	2.11	0.50
2:D:419:THR:CB	2:D:421:PRO:HG3	2.28	0.50
1:A:24:TRP:CZ2	3:T:703:DG:N2	2.78	0.50
1:A:179:VAL:O	1:A:189:VAL:HA	2.11	0.50
1:C:77:PHE:O	1:C:80:LEU:N	2.45	0.50
1:C:109:LEU:HD23	1:C:109:LEU:H	1.75	0.50
2:D:43:LYS:NZ	2:D:43:LYS:HB2	2.27	0.50
2:B:142:ILE:HG22	2:B:144:TYR:CE2	2.46	0.50
1:C:226:PRO:HB2	1:C:233:GLU:HB3	1.93	0.50
1:C:305:GLU:O	1:C:309:ILE:HG13	2.11	0.50
2:D:168:LEU:O	2:D:171:PHE:N	2.43	0.50
1:A:77:PHE:O	1:A:80:LEU:N	2.43	0.50
2:B:84:THR:HG22	2:B:84:THR:O	2.12	0.50
3:T:716:DA:H2''	3:T:717:DC:O5'	2.09	0.50
1:A:16:MET:HE2	1:A:83:ARG:HD3	1.93	0.50
2:B:115:TYR:HD2	2:B:115:TYR:N	2.06	0.50
2:D:161:GLN:O	2:D:165:THR:HG22	2.11	0.50
1:A:37:ILE:HD13	1:A:40:GLU:OE2	2.11	0.50
2:B:53:GLU:HG2	2:B:54:ASN:H	1.74	0.50
2:B:305:GLU:O	2:B:309:ILE:HG13	2.12	0.50
1:C:206:ARG:HG2	1:C:216:THR:OG1	2.12	0.50
4:F:806:DT:H2''	4:F:807:DC:OP1	2.11	0.50
2:D:235:HIS:N	2:D:236:PRO:HD3	2.27	0.50
2:B:28:GLU:HB2	2:B:135:ILE:CD1	2.42	0.50
1:C:24:TRP:CD1	1:C:59:PRO:HB3	2.47	0.50
2:D:422:LEU:C	2:D:424:LYS:N	2.69	0.49
4:P:810:DT:H2'	4:P:810:DT:O5'	2.12	0.49
1:A:532:TYR:CE2	1:A:534:ALA:HB2	2.48	0.49
2:D:332:GLN:OE1	2:D:427:TYR:HB3	2.12	0.49
2:D:369:THR:HG21	2:D:405:TYR:HB2	1.93	0.49
2:D:193:LEU:CD1	2:D:201:LYS:HG3	2.43	0.49
1:A:153:TRP:CD1	1:A:154:LYS:H	2.30	0.49
1:C:406:TRP:CE2	2:D:420:PRO:HG3	2.48	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:124:PHE:CE2	2:D:153:TRP:CZ2	3.00	0.49
2:D:360:ALA:C	2:D:362:THR:H	2.19	0.49
1:A:26:LEU:HD23	1:A:133:PRO:HG2	1.95	0.49
1:A:47:ILE:HG13	1:A:48:SER:N	2.27	0.49
2:B:41:MET:CE	2:B:47:ILE:HG12	2.43	0.49
2:D:96:HIS:HA	2:D:97:PRO:HD2	1.66	0.49
1:A:454:LYS:NZ	1:A:554:ALA:C	2.71	0.49
2:D:235:HIS:O	2:D:238:LYS:HB2	2.13	0.49
1:C:128:THR:HG22	1:C:128:THR:O	2.11	0.49
2:B:365:VAL:HG11	2:B:401:TRP:HB2	1.95	0.48
1:C:2:ILE:HD12	1:C:2:ILE:N	2.26	0.48
2:D:350:LYS:HE2	2:D:378:GLU:OE2	2.13	0.48
4:P:815:DG:OP2	4:P:815:DG:H2'	2.13	0.48
2:B:90:VAL:HG22	1:C:345:PRO:HG2	1.94	0.48
1:C:452:LEU:HD23	1:C:470:THR:HA	1.94	0.48
2:D:68:SER:C	2:D:70:LYS:H	2.20	0.48
4:F:804:DA:H2''	4:F:805:DG:O5'	2.13	0.48
1:A:171:PHE:CD1	1:A:205:LEU:HD12	2.47	0.48
2:B:271:TYR:N	2:B:271:TYR:CD2	2.79	0.48
1:A:238:LYS:HB2	1:A:315:HIS:ND1	2.28	0.48
1:A:503:LEU:HD22	1:A:535:TRP:HB2	1.95	0.48
2:B:177:ASP:OD1	2:B:177:ASP:N	2.42	0.48
1:A:101:LYS:HZ2	1:A:321:PRO:HG2	1.77	0.48
1:A:96:HIS:CD2	1:A:97:PRO:HD2	2.49	0.48
1:A:195:ILE:O	1:A:199:ARG:HG3	2.14	0.48
1:C:185:ASP:OD1	6:C:823:AZT:H5'1	2.13	0.48
1:C:276:VAL:O	1:C:276:VAL:CG1	2.60	0.48
3:E:721:DG:H2''	3:E:722:DA:OP2	2.14	0.48
1:A:109:LEU:HD23	1:A:109:LEU:N	2.29	0.48
2:B:286:THR:HG22	2:B:286:THR:O	2.12	0.48
2:B:312:GLU:HB3	2:B:313:PRO:CD	2.41	0.48
1:A:24:TRP:HA	1:A:24:TRP:CE3	2.49	0.48
2:B:107:THR:HA	2:B:232:TYR:O	2.12	0.48
2:B:124:PHE:HE2	2:B:153:TRP:CZ2	2.31	0.48
1:C:21:VAL:O	1:C:57:ASN:HB3	2.14	0.48
1:C:61:PHE:HE1	1:C:74:LEU:HD12	1.78	0.48
1:C:230:MET:HE3	4:F:821:DC:H4'	1.94	0.48
1:C:282:LEU:HD21	1:C:296:THR:HG22	1.96	0.48
2:D:108:VAL:HG22	2:D:188:TYR:CD1	2.48	0.48
1:A:379:SER:CB	1:A:387:PRO:HD3	2.44	0.48
1:A:434:ILE:CD1	1:A:530:LYS:HB3	2.40	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:101:LYS:NZ	1:C:321:PRO:HG2	2.28	0.48
1:C:442:VAL:HB	1:C:481:ALA:HB1	1.96	0.48
1:C:540:LYS:HA	1:C:540:LYS:HD3	1.67	0.48
2:B:422:LEU:CD2	2:B:422:LEU:H	2.26	0.48
1:C:155:GLY:O	1:C:159:ILE:HG13	2.13	0.48
2:D:265:ASN:O	2:D:268:SER:OG	2.28	0.48
1:A:186:ASP:C	1:A:187:LEU:HD12	2.38	0.47
1:A:374:LYS:C	1:A:374:LYS:HD2	2.38	0.47
2:D:365:VAL:HG11	2:D:401:TRP:HB2	1.96	0.47
1:A:281:LYS:HG2	1:A:284:ARG:CZ	2.44	0.47
1:C:121:ASP:O	1:C:125:ARG:HG3	2.15	0.47
4:F:817:MRG:N3	4:F:817:MRG:H222	2.29	0.47
1:A:150:PRO:HG2	1:A:153:TRP:HB2	1.96	0.47
1:C:181:TYR:CE2	2:D:138:GLU:HG3	2.49	0.47
1:C:307:ARG:O	1:C:311:LYS:HG3	2.13	0.47
2:D:357:MET:SD	2:D:374:LYS:HE2	2.55	0.47
1:A:475:GLN:NE2	1:A:475:GLN:N	2.62	0.47
1:C:298:GLU:HA	1:C:298:GLU:OE1	2.15	0.47
2:D:118:VAL:HG12	2:D:119:PRO:O	2.15	0.47
1:A:2:ILE:HD12	1:A:2:ILE:H	1.79	0.47
1:A:101:LYS:NZ	1:A:321:PRO:CG	2.77	0.47
2:B:336:GLN:CG	2:B:353:LYS:HD2	2.40	0.47
1:C:128:THR:HG21	1:C:146:TYR:CD2	2.49	0.47
2:D:320:ASP:OD1	2:D:320:ASP:C	2.57	0.47
4:F:805:DG:H2''	4:F:806:DT:O5'	2.15	0.47
1:A:110:ASP:OD1	1:A:110:ASP:C	2.55	0.47
1:C:197:GLN:O	1:C:200:THR:HB	2.14	0.47
2:D:39:THR:HG22	2:D:40:GLU:N	2.30	0.47
2:D:180:ILE:HG12	2:D:189:VAL:HG22	1.96	0.47
1:A:271:TYR:CE1	1:A:314:VAL:HG22	2.50	0.47
2:B:66:LYS:O	2:B:67:ASP:HB2	2.15	0.47
2:B:195:ILE:HG22	2:B:199:ARG:NE	2.30	0.47
1:C:195:ILE:HD11	1:C:199:ARG:NH2	2.14	0.47
1:A:56:TYR:O	1:A:129:ALA:HB3	2.15	0.47
1:A:174:GLN:C	1:A:176:PRO:HD3	2.39	0.47
2:D:34:LEU:HD11	2:D:61:PHE:HA	1.97	0.47
2:B:28:GLU:CB	2:B:135:ILE:HD11	2.45	0.46
1:C:253:THR:HG22	1:C:292:VAL:CA	2.42	0.46
1:C:257:ILE:HB	1:C:283:LEU:HD21	1.98	0.46
2:D:167:ILE:HD13	2:D:212:TRP:HB3	1.97	0.46
1:A:184:MET:HA	1:A:184:MET:CE	2.36	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:202:ILE:HG21	1:A:220:LYS:NZ	2.30	0.46
1:A:402:TRP:HB2	1:A:409:THR:HG23	1.97	0.46
1:A:544:GLY:HA2	1:A:547:GLN:HG2	1.97	0.46
1:A:36:GLU:O	1:A:40:GLU:HG3	2.15	0.46
1:A:42:GLU:OE1	1:A:49:LYS:HE3	2.16	0.46
2:B:5:ILE:HG22	2:B:6:GLU:N	2.30	0.46
2:B:308:GLU:O	2:B:311:LYS:HB2	2.16	0.46
1:C:91:GLN:O	3:E:708:DG:H4'	2.15	0.46
1:C:410:TRP:CH2	1:C:412:PRO:HA	2.50	0.46
1:A:244:ILE:CD1	1:A:267:ALA:HB2	2.46	0.46
2:B:79:GLU:OE2	2:B:83:ARG:NH2	2.42	0.46
1:C:301:LEU:O	1:C:305:GLU:HG2	2.15	0.46
2:B:164:MET:HE3	2:B:168:LEU:HG	1.97	0.46
1:A:273:GLY:HA2	1:A:338:THR:HG21	1.96	0.46
1:A:475:GLN:NE2	1:A:475:GLN:H	2.13	0.46
2:B:92:LEU:HB3	2:B:158:ALA:HB1	1.98	0.46
2:B:152:GLY:HA2	2:B:184:MET:HE3	1.97	0.46
1:C:181:TYR:HB2	1:C:188:TYR:HB3	1.97	0.46
1:C:285:GLY:HA2	3:E:714:DG:H5''	1.98	0.46
2:D:266:TRP:CH2	2:D:425:LEU:HD21	2.51	0.46
4:F:810:DT:H2''	4:F:811:DG:C8	2.51	0.46
1:A:120:LEU:CG	1:A:121:ASP:H	2.27	0.46
2:D:84:THR:O	2:D:84:THR:HG22	2.15	0.46
1:A:58:THR:HG23	1:A:130:PHE:HB3	1.97	0.46
1:A:448:ARG:O	1:A:451:LYS:NZ	2.42	0.46
2:B:154:LYS:HG2	2:B:184:MET:SD	2.55	0.46
2:B:170:PRO:O	2:B:174:GLN:HG3	2.16	0.46
1:A:257:ILE:HB	1:A:283:LEU:HD21	1.98	0.46
1:C:97:PRO:HD3	1:C:232:TYR:CE2	2.50	0.46
2:B:90:VAL:CG2	1:C:345:PRO:HG2	2.45	0.46
1:C:245:VAL:O	1:C:263:LYS:NZ	2.49	0.46
1:C:329:ILE:O	1:C:392:PRO:HD3	2.16	0.46
2:D:298:GLU:CD	2:D:298:GLU:H	2.24	0.46
4:P:807:DC:C1'	4:P:808:DC:H5''	2.46	0.46
1:A:221:HIS:HD2	1:A:227:PHE:HA	1.81	0.45
1:C:450:THR:HG22	1:C:452:LEU:HB2	1.98	0.45
1:A:121:ASP:O	1:A:122:GLU:C	2.57	0.45
1:C:295:LEU:HD13	1:C:300:GLU:OE1	2.16	0.45
1:C:225:PRO:HA	1:C:226:PRO:C	2.41	0.45
2:D:111:VAL:HG23	2:D:115:TYR:HE1	1.81	0.45
1:A:110:ASP:OD1	1:A:111:VAL:O	2.33	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:281:LYS:NZ	2:B:284:ARG:HH12	2.14	0.45
1:A:270:ILE:HD12	1:A:270:ILE:HA	1.77	0.45
1:C:8:VAL:HA	1:C:9:PRO:HD2	1.59	0.45
2:D:271:TYR:N	2:D:271:TYR:CD2	2.84	0.45
2:D:319:TYR:CZ	2:D:321:PRO:HA	2.52	0.45
2:D:380:ILE:O	2:D:384:GLY:HA2	2.17	0.45
1:A:31:ILE:HD13	1:A:133:PRO:HB2	1.98	0.45
1:A:115:TYR:HB3	1:A:149:LEU:O	2.16	0.45
1:C:178:ILE:CD1	1:C:191:SER:HB3	2.47	0.45
1:C:184:MET:HG2	4:F:822:ATM:H2'	1.98	0.45
2:D:163:SER:O	2:D:167:ILE:HG13	2.16	0.45
2:D:266:TRP:CE3	2:D:425:LEU:CD2	3.00	0.45
2:D:94:ILE:HG23	2:D:95:PRO:HD2	1.99	0.45
1:A:87:PHE:HD1	2:B:52:PRO:O	2.00	0.45
1:A:457:TYR:HA	1:A:548:VAL:HG21	1.99	0.45
2:B:162:SER:O	2:B:165:THR:HG22	2.17	0.45
1:C:128:THR:CG2	1:C:146:TYR:CD2	2.95	0.45
1:A:115:TYR:OH	1:A:157:PRO:HG3	2.15	0.45
1:A:355:ALA:HB3	3:T:712:DC:OP2	2.16	0.45
1:A:395:LYS:HD2	1:A:414:TRP:CH2	2.52	0.45
1:A:500:GLN:HG2	2:B:422:LEU:CD1	2.47	0.45
1:C:17:ASP:O	1:C:83:ARG:HD2	2.16	0.45
1:C:96:HIS:CG	1:C:97:PRO:HD2	2.52	0.45
1:C:110:ASP:OD2	1:C:110:ASP:C	2.60	0.45
2:D:236:PRO:HA	2:D:239:TRP:CD2	2.52	0.45
2:D:266:TRP:CE3	2:D:425:LEU:HD22	2.52	0.44
1:A:3:SER:HA	1:A:4:PRO:HD3	1.91	0.44
2:B:379:SER:CB	2:B:387:PRO:HD3	2.47	0.44
1:A:16:MET:HE2	1:A:83:ARG:HG2	2.00	0.44
1:A:77:PHE:O	1:A:78:ARG:C	2.60	0.44
2:B:39:THR:HG22	2:B:40:GLU:N	2.32	0.44
1:C:178:ILE:HD13	1:C:191:SER:HB3	1.99	0.44
2:D:74:LEU:HD12	2:D:75:VAL:N	2.32	0.44
1:A:61:PHE:CE1	1:A:74:LEU:HB2	2.53	0.44
2:B:273:GLY:HA3	2:B:309:ILE:HD13	2.00	0.44
1:C:553:SER:O	1:C:554:ALA:C	2.59	0.44
1:A:47:ILE:HG12	1:A:144:TYR:HB3	1.93	0.44
1:A:111:VAL:HG11	1:A:214:LEU:HD22	1.99	0.44
1:A:121:ASP:O	1:A:125:ARG:HG3	2.18	0.44
1:C:63:ILE:HG12	1:C:74:LEU:HD11	2.00	0.44
2:D:64:LYS:HE3	2:D:71:TRP:CZ2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:226:PRO:HA	1:A:234:LEU:O	2.17	0.44
2:B:11:LYS:HD2	2:B:11:LYS:N	2.32	0.44
2:B:420:PRO:HA	2:B:421:PRO:HD3	1.81	0.44
1:C:276:VAL:O	1:C:276:VAL:HG12	2.18	0.44
1:A:24:TRP:HE3	1:A:25:PRO:HD2	1.83	0.44
1:A:34:LEU:CD2	1:A:132:ILE:HD12	2.27	0.44
1:A:542:ILE:O	1:A:543:GLY:C	2.61	0.44
2:B:87:PHE:CD2	2:B:87:PHE:C	2.96	0.44
2:D:85:GLN:HA	2:D:88:TRP:CE2	2.53	0.44
1:A:427:TYR:OH	1:A:510:PRO:HD2	2.18	0.44
2:B:162:SER:HA	2:B:165:THR:HG22	2.00	0.44
1:C:77:PHE:O	1:C:78:ARG:C	2.60	0.44
1:C:223:LYS:O	1:C:225:PRO:CD	2.66	0.44
1:C:470:THR:HG22	1:C:471:ASN:HB3	2.00	0.44
1:A:106:VAL:O	1:A:227:PHE:CZ	2.70	0.43
1:A:130:PHE:CD2	1:A:130:PHE:N	2.85	0.43
1:C:94:ILE:HD12	3:E:709:DC:H1'	2.00	0.43
1:A:452:LEU:HD23	1:A:470:THR:HA	2.00	0.43
2:B:281:LYS:HG2	2:B:284:ARG:HH11	1.83	0.43
1:C:164:MET:HE2	1:C:168:LEU:CD1	2.48	0.43
2:D:38:CYS:SG	2:D:132:ILE:HD11	2.58	0.43
2:D:87:PHE:CD2	2:D:87:PHE:C	2.96	0.43
2:D:167:ILE:HG12	2:D:212:TRP:CE3	2.53	0.43
1:A:8:VAL:O	1:A:8:VAL:HG12	2.19	0.43
1:A:60:VAL:HG21	1:A:130:PHE:CD1	2.47	0.43
1:A:296:THR:HG22	1:A:297:GLU:N	2.33	0.43
1:C:51:GLY:C	1:C:53:GLU:H	2.26	0.43
1:C:450:THR:CG2	1:C:452:LEU:HD12	2.48	0.43
2:D:203:GLU:HA	2:D:203:GLU:OE1	2.18	0.43
1:A:265:ASN:OD1	1:A:353:LYS:CE	2.66	0.43
2:B:94:ILE:HG23	2:B:95:PRO:HD2	2.01	0.43
1:C:235:HIS:HB3	1:C:236:PRO:CD	2.49	0.43
2:D:139:THR:HG22	2:D:140:PRO:N	2.34	0.43
1:A:145:GLN:O	1:A:145:GLN:HG3	2.16	0.43
1:A:451:LYS:O	1:A:471:ASN:N	2.52	0.43
2:B:216:THR:O	2:B:217:PRO:C	2.61	0.43
1:C:277:ARG:HD2	1:C:281:LYS:HE3	2.00	0.43
4:F:804:DA:C2'	4:F:805:DG:C8	2.99	0.43
1:A:344:GLU:OE1	1:A:344:GLU:HA	2.18	0.43
2:B:58:THR:CG2	2:B:75:VAL:HG12	2.48	0.43
2:B:58:THR:HG21	2:B:75:VAL:HG12	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:72:ARG:HG3	1:C:74:LEU:HD21	2.01	0.43
1:C:365:VAL:HG11	1:C:401:TRP:CG	2.54	0.43
2:D:77:PHE:O	2:D:78:ARG:C	2.62	0.43
1:A:164:MET:CE	1:A:168:LEU:HD11	2.39	0.43
1:C:150:PRO:HG2	1:C:153:TRP:HB2	2.00	0.43
2:D:376:THR:HG23	2:D:386:THR:HG22	2.00	0.43
1:C:5:ILE:CG2	1:C:212:TRP:CD1	2.93	0.43
1:C:11:LYS:HD2	1:C:11:LYS:N	2.33	0.43
1:C:379:SER:CB	1:C:387:PRO:HD3	2.49	0.43
2:D:78:ARG:HD3	2:D:411:ILE:O	2.18	0.43
2:D:197:GLN:O	2:D:201:LYS:HG2	2.18	0.43
1:A:126:LYS:HG3	1:A:127:TYR:N	2.34	0.43
1:A:418:ASN:O	1:A:418:ASN:CG	2.62	0.43
2:B:34:LEU:HD23	2:B:34:LEU:HA	1.86	0.43
2:D:332:GLN:NE2	2:D:424:LYS:HA	2.32	0.43
2:B:47:ILE:HD12	2:B:144:TYR:CE1	2.49	0.43
2:B:47:ILE:HG22	2:B:146:TYR:HA	2.00	0.43
2:B:100:LEU:O	2:B:100:LEU:HD12	2.19	0.43
1:C:27:THR:HB	1:C:30:LYS:HG3	2.00	0.43
1:C:47:ILE:HD11	1:C:130:PHE:CE2	2.52	0.43
2:D:275:LYS:HA	2:D:275:LYS:HD3	1.86	0.43
2:D:421:PRO:HG2	2:D:423:VAL:CG2	2.49	0.43
2:B:104:LYS:HE2	2:B:104:LYS:HB3	1.80	0.42
1:C:221:HIS:ND1	1:C:221:HIS:N	2.67	0.42
1:C:56:TYR:O	1:C:143:ARG:NH2	2.52	0.42
1:C:61:PHE:CE1	1:C:74:LEU:HD12	2.54	0.42
1:C:116:PHE:O	1:C:148:VAL:HG11	2.18	0.42
1:A:27:THR:O	1:A:31:ILE:HG13	2.19	0.42
1:A:457:TYR:CD1	1:A:457:TYR:C	2.97	0.42
2:B:167:ILE:HG12	2:B:212:TRP:CD2	2.55	0.42
2:B:334:GLN:OE1	2:B:334:GLN:HA	2.19	0.42
1:C:61:PHE:CE1	1:C:74:LEU:HB2	2.55	0.42
1:C:324:ASP:O	1:C:343:GLN:HG2	2.19	0.42
1:C:364:ASP:HB3	1:C:423:VAL:HG13	2.00	0.42
2:D:115:TYR:HD1	2:D:115:TYR:H	1.65	0.42
2:D:249:LYS:HB3	2:D:249:LYS:HE3	1.78	0.42
1:A:61:PHE:HE1	1:A:74:LEU:HD12	1.83	0.42
2:B:21:VAL:HB	2:B:59:PRO:HD3	2.01	0.42
1:C:85:GLN:NE2	2:D:53:GLU:O	2.53	0.42
1:C:261:VAL:CG1	1:C:276:VAL:HG11	2.47	0.42
2:D:24:TRP:HZ2	2:D:61:PHE:CD2	2.38	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:58:THR:HG23	2:D:76:ASP:O	2.20	0.42
1:A:454:LYS:HZ1	1:A:554:ALA:C	2.27	0.42
2:B:164:MET:HG3	2:B:168:LEU:CD1	2.49	0.42
1:C:10:VAL:C	1:C:11:LYS:HD2	2.44	0.42
1:C:73:LYS:NZ	1:C:130:PHE:CZ	2.82	0.42
1:A:406:TRP:CD1	1:A:407:GLN:HG3	2.55	0.42
2:B:28:GLU:HB2	2:B:135:ILE:HD11	2.00	0.42
2:B:336:GLN:HE21	2:B:336:GLN:HB2	1.44	0.42
1:C:457:TYR:C	1:C:457:TYR:CD1	2.98	0.42
2:D:254:VAL:HG13	2:D:283:LEU:HD22	2.02	0.42
3:T:714:DG:O5'	3:T:714:DG:H2'	2.20	0.42
2:B:320:ASP:OD1	2:B:320:ASP:C	2.63	0.42
1:C:332:GLN:OE1	1:C:338:THR:HG23	2.20	0.42
1:C:420:PRO:HA	1:C:421:PRO:C	2.43	0.42
2:D:214:LEU:HD12	2:D:215:THR:N	2.35	0.42
1:A:21:VAL:O	1:A:57:ASN:ND2	2.52	0.42
1:C:139:THR:CG2	1:C:140:PRO:HD2	2.50	0.42
1:C:223:LYS:O	1:C:223:LYS:HG2	2.19	0.42
2:D:85:GLN:HG3	2:D:88:TRP:CH2	2.55	0.42
2:D:88:TRP:CZ2	2:D:154:LYS:HD3	2.55	0.42
1:A:13:LYS:O	1:A:14:PRO:C	2.63	0.42
1:A:296:THR:HG21	1:A:298:GLU:HG2	1.98	0.42
1:A:540:LYS:HD3	1:A:540:LYS:HA	1.54	0.42
2:B:317:VAL:HG23	2:B:317:VAL:O	2.20	0.42
1:A:435:VAL:HA	2:B:290:THR:HG21	2.02	0.41
1:C:16:MET:CE	1:C:83:ARG:HH11	2.30	0.41
1:A:457:TYR:HE1	1:A:463:ARG:HG2	1.85	0.41
2:B:209:LEU:CD2	2:B:214:LEU:HD23	2.50	0.41
1:A:180:ILE:HA	1:A:188:TYR:O	2.20	0.41
1:A:199:ARG:NH2	1:A:223:LYS:CB	2.70	0.41
1:A:266:TRP:O	1:A:269:GLN:HG2	2.21	0.41
1:A:404:GLU:HA	1:A:404:GLU:OE1	2.20	0.41
2:B:374:LYS:O	2:B:378:GLU:HG3	2.20	0.41
1:C:164:MET:HE1	1:C:209:LEU:CD2	2.50	0.41
2:B:163:SER:O	2:B:167:ILE:HG13	2.19	0.41
1:C:17:ASP:CG	1:C:18:GLY:H	2.27	0.41
2:D:7:THR:HG22	2:D:119:PRO:HB2	2.02	0.41
2:D:11:LYS:HD2	2:D:11:LYS:HA	1.87	0.41
2:D:360:ALA:C	2:D:362:THR:N	2.79	0.41
3:T:711:DC:H2'	3:T:712:DC:C6	2.54	0.41
1:A:266:TRP:CE3	1:A:269:GLN:NE2	2.88	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:339:TYR:CD2	1:A:375:ILE:HD11	2.56	0.41
2:B:207:GLN:O	2:B:210:LEU:N	2.53	0.41
1:C:250:ASP:CG	1:C:251:SER:H	2.29	0.41
1:A:197:GLN:O	1:A:200:THR:HB	2.20	0.41
1:A:276:VAL:O	1:A:276:VAL:CG1	2.68	0.41
2:D:422:LEU:C	2:D:422:LEU:CD1	2.94	0.41
1:A:132:ILE:HA	1:A:133:PRO:HD3	1.76	0.41
1:C:12:LEU:HB3	1:C:83:ARG:O	2.20	0.41
1:C:516:GLU:OE1	1:C:516:GLU:HA	2.19	0.41
1:A:328:GLU:HG2	1:A:330:GLN:NE2	2.35	0.41
1:A:328:GLU:HG2	1:A:330:GLN:HE22	1.86	0.41
1:C:374:LYS:HD2	1:C:374:LYS:C	2.46	0.41
2:D:56:TYR:O	2:D:129:ALA:HB3	2.21	0.41
2:D:73:LYS:NZ	2:D:130:PHE:CE2	2.89	0.41
2:D:238:LYS:HD3	2:D:238:LYS:HA	1.87	0.41
2:D:317:VAL:HG23	2:D:317:VAL:O	2.21	0.41
3:E:717:DC:C2'	3:E:718:DA:OP2	2.68	0.41
1:A:20:LYS:HA	1:A:57:ASN:H	1.86	0.41
2:B:124:PHE:CD1	2:B:127:TYR:CD2	3.07	0.41
2:B:275:LYS:HA	2:B:275:LYS:HD3	1.87	0.41
2:B:301:LEU:HD23	2:B:301:LEU:HA	1.93	0.41
1:C:156:SER:HB2	1:C:157:PRO:HD3	2.02	0.41
1:C:463:ARG:HG2	1:C:464:GLN:N	2.35	0.41
1:A:8:VAL:HA	1:A:9:PRO:HD2	1.69	0.41
1:A:106:VAL:O	1:A:227:PHE:CE1	2.74	0.41
1:A:360:ALA:HA	1:A:514:GLU:CD	2.46	0.41
1:C:27:THR:CG2	1:C:29:GLU:HG2	2.51	0.41
1:C:129:ALA:HA	1:C:144:TYR:O	2.20	0.41
1:C:270:ILE:HD12	1:C:270:ILE:O	2.20	0.41
1:C:467:VAL:HA	1:C:468:PRO:HD3	1.95	0.41
2:D:124:PHE:CD1	2:D:127:TYR:HD2	2.39	0.41
1:A:265:ASN:OD1	1:A:353:LYS:HE3	2.21	0.40
2:B:111:VAL:HG23	2:B:115:TYR:HE2	1.85	0.40
1:C:323:LYS:HE2	1:C:344:GLU:OE2	2.21	0.40
1:A:218:ASP:C	1:A:220:LYS:N	2.78	0.40
2:B:422:LEU:N	2:B:422:LEU:HD23	2.36	0.40
1:C:64:LYS:HE2	1:C:68:SER:O	2.22	0.40
2:D:423:VAL:HG13	2:D:426:TRP:NE1	2.30	0.40
1:A:0:VAL:HA	1:A:1:PRO:HD3	1.86	0.40
1:A:48:SER:O	1:A:144:TYR:HA	2.22	0.40
1:A:94:ILE:HA	1:A:95:PRO:HD3	1.94	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:120:LEU:O	2:B:121:ASP:C	2.64	0.40
2:B:164:MET:HG3	2:B:168:LEU:HD12	2.02	0.40
1:C:42:GLU:N	1:C:47:ILE:HG22	2.37	0.40
2:D:428:GLN:HA	2:D:428:GLN:NE2	2.26	0.40
1:A:88:TRP:CD1	2:B:143:ARG:HH11	2.36	0.40
2:B:47:ILE:CD1	2:B:144:TYR:CD1	2.93	0.40
2:B:122:GLU:O	2:B:122:GLU:HG3	2.21	0.40
2:B:266:TRP:NE1	2:B:425:LEU:CD2	2.84	0.40
4:F:803:DC:H2'	4:F:804:DA:N7	2.36	0.40
1:A:231:GLY:N	4:P:821:DC:H5''	2.37	0.40
2:B:46:LYS:HE2	2:B:116:PHE:HB3	2.04	0.40
2:B:118:VAL:O	2:B:148:VAL:HB	2.21	0.40
1:C:17:ASP:CG	1:C:18:GLY:N	2.80	0.40
1:C:60:VAL:HG22	1:C:61:PHE:N	2.37	0.40
1:C:94:ILE:CD1	3:E:709:DC:H1'	2.51	0.40
1:C:120:LEU:HG	1:C:121:ASP:H	1.85	0.40
1:C:450:THR:HG21	1:C:452:LEU:HD12	2.03	0.40
2:D:75:VAL:HG11	2:D:77:PHE:CZ	2.57	0.40
2:D:109:LEU:HD23	2:D:109:LEU:HA	1.88	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	553/556 (100%)	524 (95%)	27 (5%)	2 (0%)	30	60
1	C	553/556 (100%)	521 (94%)	30 (5%)	2 (0%)	30	60
2	B	408/428 (95%)	387 (95%)	21 (5%)	0	100	100
2	D	408/428 (95%)	384 (94%)	24 (6%)	0	100	100
All	All	1922/1968 (98%)	1816 (94%)	102 (5%)	4 (0%)	43	72

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	122	GLU
1	C	217	PRO
1	A	217	PRO
1	C	59	PRO

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	495/497 (100%)	460 (93%)	35 (7%)	13	39
1	C	495/497 (100%)	471 (95%)	24 (5%)	23	56
2	B	374/390 (96%)	352 (94%)	22 (6%)	18	48
2	D	374/390 (96%)	353 (94%)	21 (6%)	19	50
All	All	1738/1774 (98%)	1636 (94%)	102 (6%)	18	48

All (102) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ILE
1	A	3	SER
1	A	5	ILE
1	A	8	VAL
1	A	10	VAL
1	A	17	ASP
1	A	41	MET
1	A	42	GLU
1	A	60	VAL
1	A	72	ARG
1	A	90	VAL
1	A	106	VAL
1	A	109	LEU
1	A	130	PHE
1	A	169	GLU
1	A	188	TYR

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Mol	Chain	Res	Type
1	A	195	ILE
1	A	221	HIS
1	A	245	VAL
1	A	270	ILE
1	A	274	ILE
1	A	358	ARG
1	A	372	VAL
1	A	374	LYS
1	A	391	LEU
1	A	424	LYS
1	A	431	LYS
1	A	434	ILE
1	A	450	THR
1	A	459	THR
1	A	473	THR
1	A	507	GLN
1	A	529	GLU
1	A	547	GLN
1	A	550	LYS
2	B	35	VAL
2	B	39	THR
2	B	53	GLU
2	B	69	THR
2	B	90	VAL
2	B	92	LEU
2	B	115	TYR
2	B	189	VAL
2	B	209	LEU
2	B	234	LEU
2	B	240	THR
2	B	245	VAL
2	B	249	LYS
2	B	250	ASP
2	B	269	GLN
2	B	280	SER
2	B	326	ILE
2	B	336	GLN
2	B	347	LYS
2	B	394	GLN
2	B	424	LYS
2	B	428	GLN
1	C	2	ILE

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Mol	Chain	Res	Type
1	C	3	SER
1	C	5	ILE
1	C	8	VAL
1	C	28	GLU
1	C	48	SER
1	C	58	THR
1	C	76	ASP
1	C	101	LYS
1	C	105	SER
1	C	109	LEU
1	C	132	ILE
1	C	147	ASN
1	C	188	TYR
1	C	218	ASP
1	C	221	HIS
1	C	224	GLU
1	C	263	LYS
1	C	270	ILE
1	C	277	ARG
1	C	324	ASP
1	C	374	LYS
1	C	434	ILE
1	C	547	GLN
2	D	5	ILE
2	D	29	GLU
2	D	39	THR
2	D	43	LYS
2	D	67	ASP
2	D	162	SER
2	D	234	LEU
2	D	245	VAL
2	D	248	GLU
2	D	251	SER
2	D	257	ILE
2	D	322	SER
2	D	326	ILE
2	D	336	GLN
2	D	343	GLN
2	D	357	MET
2	D	369	THR
2	D	394	GLN
2	D	422	LEU

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Mol	Chain	Res	Type
2	D	425	LEU
2	D	428	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	A	57	ASN
1	A	85	GLN
1	A	136	ASN
1	A	207	GLN
1	A	407	GLN
1	A	474	ASN
1	A	507	GLN
1	A	509	GLN
1	A	520	GLN
2	B	96	HIS
2	B	137	ASN
2	B	151	GLN
2	B	208	HIS
2	B	278	GLN
2	B	394	GLN
1	C	23	GLN
1	C	57	ASN
1	C	222	GLN
1	C	407	GLN
1	C	509	GLN
1	C	520	GLN
1	C	524	GLN
2	D	96	HIS
2	D	137	ASN
2	D	278	GLN
2	D	336	GLN
2	D	348	ASN
2	D	394	GLN
2	D	407	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 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
4	ATM	P	822	3,4	20,23,24	1.25	2 (10%)	26,32,35	2.55	11 (42%)
4	ATM	F	822	3,4	20,23,24	1.21	2 (10%)	26,32,35	2.51	9 (34%)
4	MRG	F	817	3,1,4	25,28,29	2.59	8 (32%)	32,39,42	2.00	11 (34%)
4	MRG	P	817	3,1,4	25,28,29	2.70	8 (32%)	32,39,42	1.99	12 (37%)

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	ATM	P	822	3,4	-	0/10/24/25	0/2/2/2
4	ATM	F	822	3,4	-	1/10/24/25	0/2/2/2
4	MRG	F	817	3,1,4	-	3/12/26/27	0/3/3/3
4	MRG	P	817	3,1,4	-	3/12/26/27	0/3/3/3

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	P	817	MRG	C2-N2	6.97	1.49	1.34
4	F	817	MRG	C2-N2	6.72	1.48	1.34
4	P	817	MRG	C2-N3	6.50	1.44	1.32
4	F	817	MRG	C2-N3	6.39	1.44	1.32
4	P	817	MRG	C4-N3	5.14	1.46	1.34
4	F	817	MRG	C4-N3	4.79	1.45	1.34
4	P	817	MRG	C2-N1	4.36	1.43	1.36
4	F	817	MRG	C2-N1	3.77	1.42	1.36
4	P	817	MRG	C2'-C3'	-3.41	1.44	1.52
4	F	817	MRG	C2'-C3'	-3.40	1.44	1.52
4	P	822	ATM	C6-C5	3.19	1.39	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	822	ATM	C6-C5	3.06	1.39	1.34
4	P	822	ATM	C4-C5	-2.87	1.40	1.44
4	F	822	ATM	C4-C5	-2.82	1.40	1.44
4	P	817	MRG	O3'-C3'	-2.68	1.37	1.43
4	P	817	MRG	O4'-C4'	-2.65	1.39	1.45
4	F	817	MRG	O4'-C4'	-2.61	1.39	1.45
4	F	817	MRG	O3'-C3'	-2.52	1.38	1.43
4	P	817	MRG	O5'-C5'	-2.03	1.38	1.44
4	F	817	MRG	O5'-C5'	-2.02	1.38	1.44

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	822	ATM	C4-N3-C2	-6.32	119.06	127.34
4	P	822	ATM	C4-N3-C2	-6.16	119.26	127.34
4	F	817	MRG	C2-N3-C4	5.92	119.41	112.00
4	F	822	ATM	C5-C4-N3	5.80	120.36	115.32
4	P	817	MRG	C2-N3-C4	5.56	118.95	112.00
4	P	822	ATM	C5-C4-N3	5.41	120.03	115.32
4	F	817	MRG	C5-C4-N3	-4.88	120.62	128.39
4	P	817	MRG	C5-C4-N3	-4.71	120.89	128.39
4	F	822	ATM	N3-C2-N1	4.67	120.97	114.89
4	P	822	ATM	O4-C4-C5	-4.57	119.69	124.92
4	P	822	ATM	N3-C2-N1	4.17	120.33	114.89
4	F	822	ATM	O4-C4-C5	-3.84	120.52	124.92
4	P	822	ATM	O2-C2-N1	-3.73	117.94	122.80
4	F	822	ATM	C5-C6-N1	-3.66	119.34	123.31
4	P	822	ATM	C5-C6-N1	-3.29	119.74	123.31
4	P	817	MRG	N9-C4-N3	3.21	132.38	125.95
4	F	817	MRG	N9-C4-N3	3.18	132.32	125.95
4	F	817	MRG	C2-N1-C6	-2.86	121.09	124.55
4	P	817	MRG	C22-C21-N2	2.77	119.97	112.20
4	F	822	ATM	C5'-C4'-C3'	-2.75	106.10	114.27
4	F	822	ATM	C6-C5-C4	2.73	120.27	118.02
4	P	822	ATM	C6-C5-C4	2.70	120.25	118.02
4	P	817	MRG	N2-C2-N3	2.62	123.80	120.19
4	F	822	ATM	O2-C2-N1	-2.57	119.45	122.80
4	P	822	ATM	C3'-N3'-N4'	2.49	123.43	115.76
4	F	822	ATM	C5A-C5-C6	-2.48	119.50	122.85
4	P	817	MRG	C2-N1-C6	-2.43	121.61	124.55
4	F	817	MRG	O4'-C1'-N9	2.43	112.17	107.86
4	P	822	ATM	C5A-C5-C6	-2.36	119.65	122.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	P	817	MRG	O4'-C1'-N9	2.35	112.04	107.86
4	F	817	MRG	C5-C6-N1	2.30	119.10	113.25
4	P	822	ATM	C4'-C3'-N3'	-2.29	105.29	111.57
4	P	817	MRG	N1-C2-N3	-2.28	119.84	123.68
4	F	817	MRG	N2-C2-N3	2.25	123.28	120.19
4	F	817	MRG	N1-C2-N3	-2.23	119.92	123.68
4	P	822	ATM	C5'-C4'-C3'	-2.19	107.78	114.27
4	F	817	MRG	C22-C21-N2	2.18	118.31	112.20
4	P	817	MRG	C21-N2-C2	2.17	127.44	123.36
4	F	817	MRG	N9-C8-N7	-2.11	109.49	113.40
4	P	817	MRG	C5-C6-N1	2.09	118.58	113.25
4	F	817	MRG	O6-C6-C5	-2.09	121.01	126.53
4	P	817	MRG	N9-C8-N7	-2.02	109.65	113.40
4	P	817	MRG	O6-C6-C5	-2.02	121.21	126.53

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	P	817	MRG	C22-C21-N2-C2
4	P	817	MRG	N2-C21-C22-C23
4	P	817	MRG	C21-C22-C23-S24
4	F	817	MRG	C22-C21-N2-C2
4	F	817	MRG	N2-C21-C22-C23
4	F	822	ATM	C3'-N3'-N4'-N5'
4	F	817	MRG	C21-C22-C23-S24

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	P	822	ATM	1	0
4	F	822	ATM	1	0
4	F	817	MRG	1	0

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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
6	AZT	A	823	5	31,32,32	2.78	7 (22%)	44,49,49	2.09	13 (29%)
6	AZT	C	823	5	31,32,32	2.78	7 (22%)	44,49,49	2.04	13 (29%)

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
6	AZT	A	823	5	-	7/25/37/37	0/2/2/2
6	AZT	C	823	5	-	10/25/37/37	0/2/2/2

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	823	AZT	O4-C4	9.73	1.42	1.23
6	A	823	AZT	O4-C4	9.55	1.41	1.23
6	A	823	AZT	O2-C2	8.73	1.38	1.23
6	C	823	AZT	O2-C2	8.68	1.38	1.23
6	A	823	AZT	C6-C5	4.93	1.42	1.34
6	C	823	AZT	C6-C5	4.61	1.42	1.34
6	A	823	AZT	C2-N3	3.03	1.43	1.38
6	A	823	AZT	C4-N3	2.98	1.44	1.38
6	C	823	AZT	C4-N3	2.93	1.44	1.38
6	C	823	AZT	C2-N3	2.85	1.42	1.38
6	C	823	AZT	C2-N1	2.81	1.42	1.38
6	A	823	AZT	C6-N1	2.76	1.42	1.38
6	C	823	AZT	C6-N1	2.69	1.42	1.38
6	A	823	AZT	C2-N1	2.52	1.42	1.38

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	823	AZT	C4-N3-C2	-6.00	119.47	127.34
6	C	823	AZT	C4-N3-C2	-5.84	119.69	127.34
6	A	823	AZT	C5-C4-N3	4.87	119.56	115.32
6	C	823	AZT	C5-C4-N3	4.76	119.46	115.32
6	A	823	AZT	N3-C2-N1	4.13	120.26	114.89
6	C	823	AZT	N3-C2-N1	4.10	120.22	114.89
6	A	823	AZT	O4-C4-C5	-4.06	120.27	124.92
6	C	823	AZT	O4-C4-C5	-3.87	120.48	124.92
6	A	823	AZT	C5-C6-N1	-3.37	119.65	123.31
6	C	823	AZT	O2G-PG-O3B	3.16	115.23	104.64
6	A	823	AZT	O2G-PG-O3B	3.03	114.81	104.64
6	A	823	AZT	C6-C5-C4	2.93	120.44	118.02
6	A	823	AZT	O2B-PB-O3A	2.88	115.05	107.27
6	C	823	AZT	C5-C6-N1	-2.86	120.20	123.31
6	A	823	AZT	O2-C2-N1	-2.84	119.10	122.80
6	C	823	AZT	C5A-C5-C6	-2.83	119.02	122.85
6	C	823	AZT	C6-C5-C4	2.82	120.34	118.02
6	C	823	AZT	O2A-PA-O1A	-2.73	99.75	112.44
6	A	823	AZT	C3'-C2'-C1'	2.67	106.07	103.21
6	C	823	AZT	O2B-PB-O1B	-2.47	100.94	112.44
6	A	823	AZT	O3G-PG-O3B	2.46	112.88	104.64
6	C	823	AZT	O3G-PG-O3B	2.42	112.77	104.64
6	A	823	AZT	C5A-C5-C6	-2.32	119.71	122.85
6	C	823	AZT	O2B-PB-O3A	2.31	113.51	107.27
6	C	823	AZT	O2-C2-N1	-2.25	119.86	122.80
6	A	823	AZT	O2A-PA-O1A	-2.12	102.59	112.44

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	823	AZT	C5'-O5'-PA-O1A
6	A	823	AZT	C5'-O5'-PA-O3A
6	C	823	AZT	PB-O3A-PA-O5'
6	C	823	AZT	C5'-O5'-PA-O3A
6	A	823	AZT	C2'-C3'-N3'-N4'
6	C	823	AZT	C4'-C3'-N3'-N4'
6	A	823	AZT	PB-O3A-PA-O5'
6	C	823	AZT	PA-O3A-PB-O2B
6	A	823	AZT	C5'-O5'-PA-O2A
6	C	823	AZT	C5'-O5'-PA-O2A

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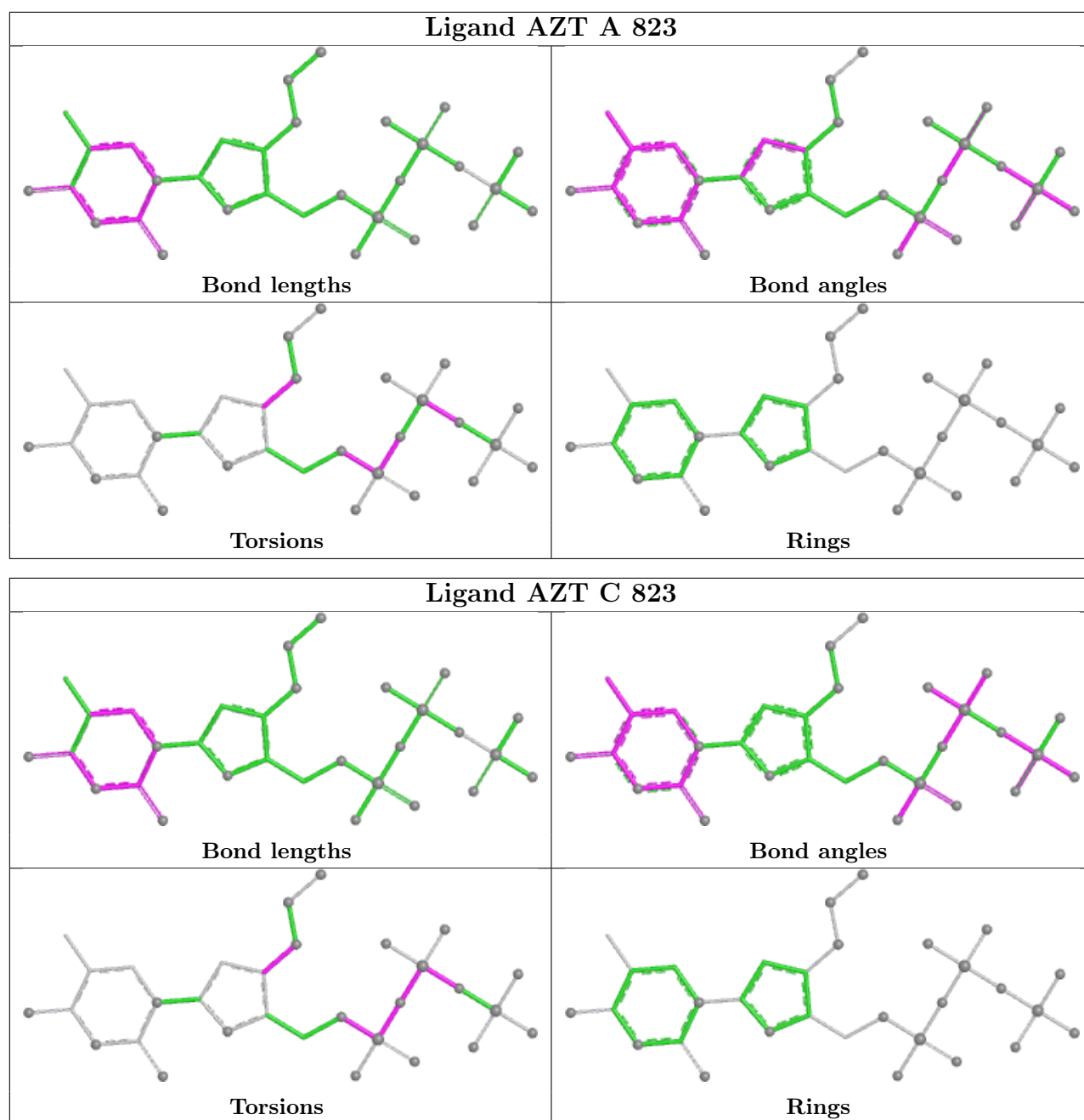
Mol	Chain	Res	Type	Atoms
6	A	823	AZT	C4'-C3'-N3'-N4'
6	C	823	AZT	PG-O3B-PB-O1B
6	C	823	AZT	PG-O3B-PB-O3A
6	C	823	AZT	PA-O3A-PB-O1B
6	C	823	AZT	PG-O3B-PB-O2B
6	C	823	AZT	C2'-C3'-N3'-N4'
6	A	823	AZT	PG-O3B-PB-O1B

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	823	AZT	2	0
6	C	823	AZT	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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	555/556 (99%)	0.15	25 (4%) 38 30	20, 62, 118, 137	0
1	C	555/556 (99%)	0.10	15 (2%) 56 46	21, 62, 117, 137	0
2	B	412/428 (96%)	0.02	14 (3%) 48 39	21, 51, 109, 122	0
2	D	412/428 (96%)	0.16	25 (6%) 27 20	25, 54, 113, 127	0
3	E	24/27 (88%)	-0.01	0 100 100	42, 86, 136, 149	0
3	T	24/27 (88%)	0.20	1 (4%) 40 32	40, 80, 137, 146	0
4	F	18/21 (85%)	-0.22	0 100 100	42, 72, 129, 129	0
4	P	18/21 (85%)	-0.17	0 100 100	42, 69, 130, 131	0
All	All	2018/2064 (97%)	0.11	80 (3%) 42 33	20, 57, 117, 149	0

All (80) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	422	LEU	5.8
2	B	214	LEU	5.3
2	D	423	VAL	4.7
1	A	133	PRO	4.3
2	D	358	ARG	4.2
2	D	360	ALA	4.1
2	B	212	TRP	3.9
1	C	24	TRP	3.9
2	B	90	VAL	3.8
2	D	354	TYR	3.8
2	B	217	PRO	3.7
1	A	74	LEU	3.6
1	A	131	THR	3.6
1	A	67	ASP	3.5
2	B	86	ASP	3.5
1	A	61	PHE	3.4

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Mol	Chain	Res	Type	RSRZ
1	A	60	VAL	3.3
1	A	62	ALA	3.2
2	B	232	TYR	3.1
1	A	55	PRO	3.1
1	A	148	VAL	3.1
1	A	59	PRO	3.0
2	D	214	LEU	3.0
2	D	87	PHE	3.0
2	B	88	TRP	2.9
1	A	66	LYS	2.8
1	A	135	ILE	2.8
2	D	90	VAL	2.8
1	A	73	LYS	2.8
2	D	92	LEU	2.7
2	B	213	GLY	2.7
2	D	428	GLN	2.7
1	A	24	TRP	2.7
2	B	152	GLY	2.6
2	D	215	THR	2.6
1	A	115	TYR	2.6
2	D	56	TYR	2.6
2	D	231	GLY	2.6
1	C	0	VAL	2.6
2	D	212	TRP	2.6
2	D	425	LEU	2.5
1	A	152	GLY	2.5
1	A	127	TYR	2.5
1	C	135	ILE	2.5
2	D	361	HIS	2.5
1	A	146	TYR	2.5
1	C	144	TYR	2.5
2	B	215	THR	2.4
1	A	139	THR	2.4
2	B	5	ILE	2.4
1	C	23	GLN	2.4
2	D	88	TRP	2.4
2	D	84	THR	2.3
2	D	217	PRO	2.3
2	B	423	VAL	2.3
1	A	124	PHE	2.3
1	C	132	ILE	2.3
1	C	61	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
2	D	18	GLY	2.3
2	B	193	LEU	2.2
2	D	424	LYS	2.2
1	C	133	PRO	2.2
3	T	725	DG	2.2
1	A	19	PRO	2.2
1	C	32	LYS	2.2
1	A	41	MET	2.2
1	C	287	LYS	2.2
1	C	55	PRO	2.1
1	C	140	PRO	2.1
1	A	37	ILE	2.1
1	C	60	VAL	2.1
2	D	357	MET	2.1
2	D	5	ILE	2.1
2	B	231	GLY	2.1
2	D	179	VAL	2.1
1	C	62	ALA	2.0
1	C	288	ALA	2.0
1	A	46	LYS	2.0
1	A	287	LYS	2.0
2	D	167	ILE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
4	MRG	P	817	26/27	0.86	0.12	58,74,93,106	0
4	ATM	P	822	22/23	0.86	0.11	56,63,78,82	0
4	MRG	F	817	26/27	0.87	0.10	66,81,99,115	0
4	ATM	F	822	22/23	0.91	0.12	55,64,81,83	0

6.3 Carbohydrates [i](#)

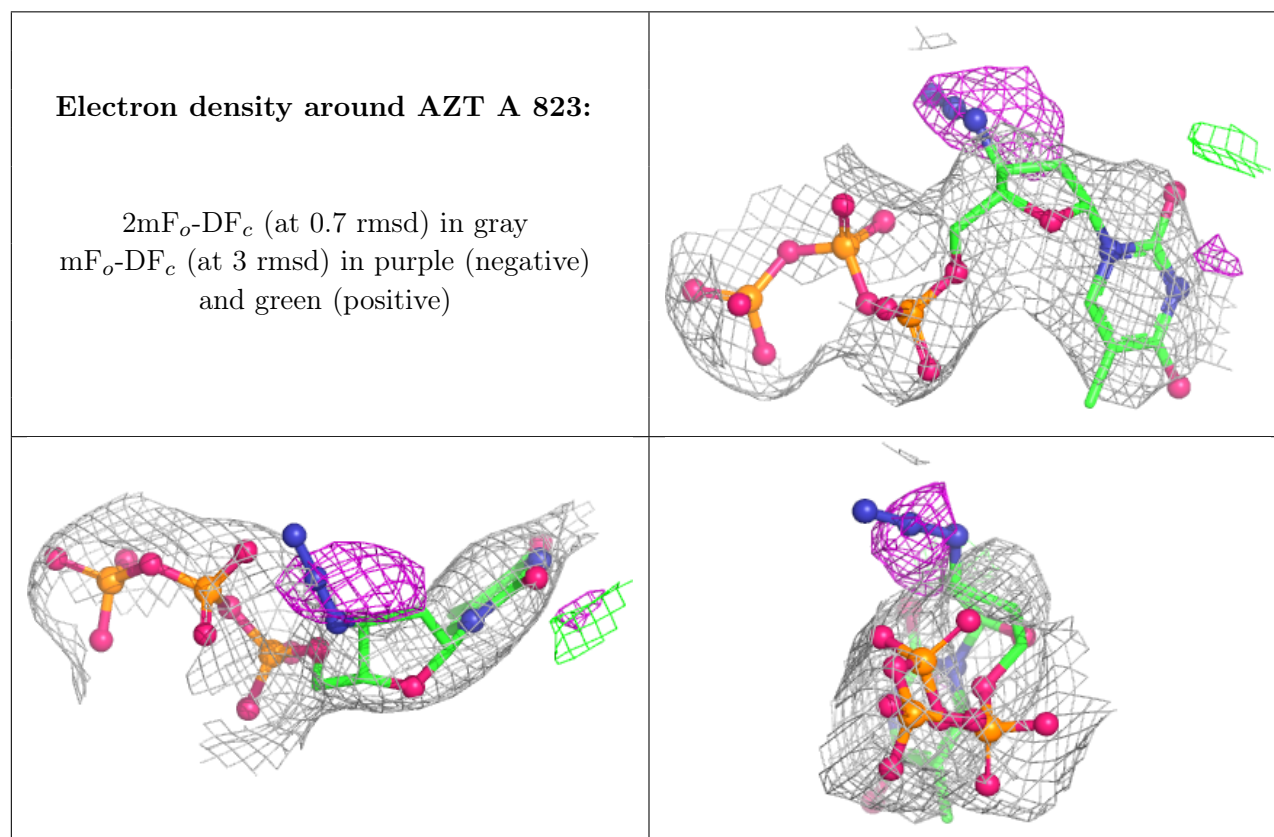
There are no oligosaccharides in this entry.

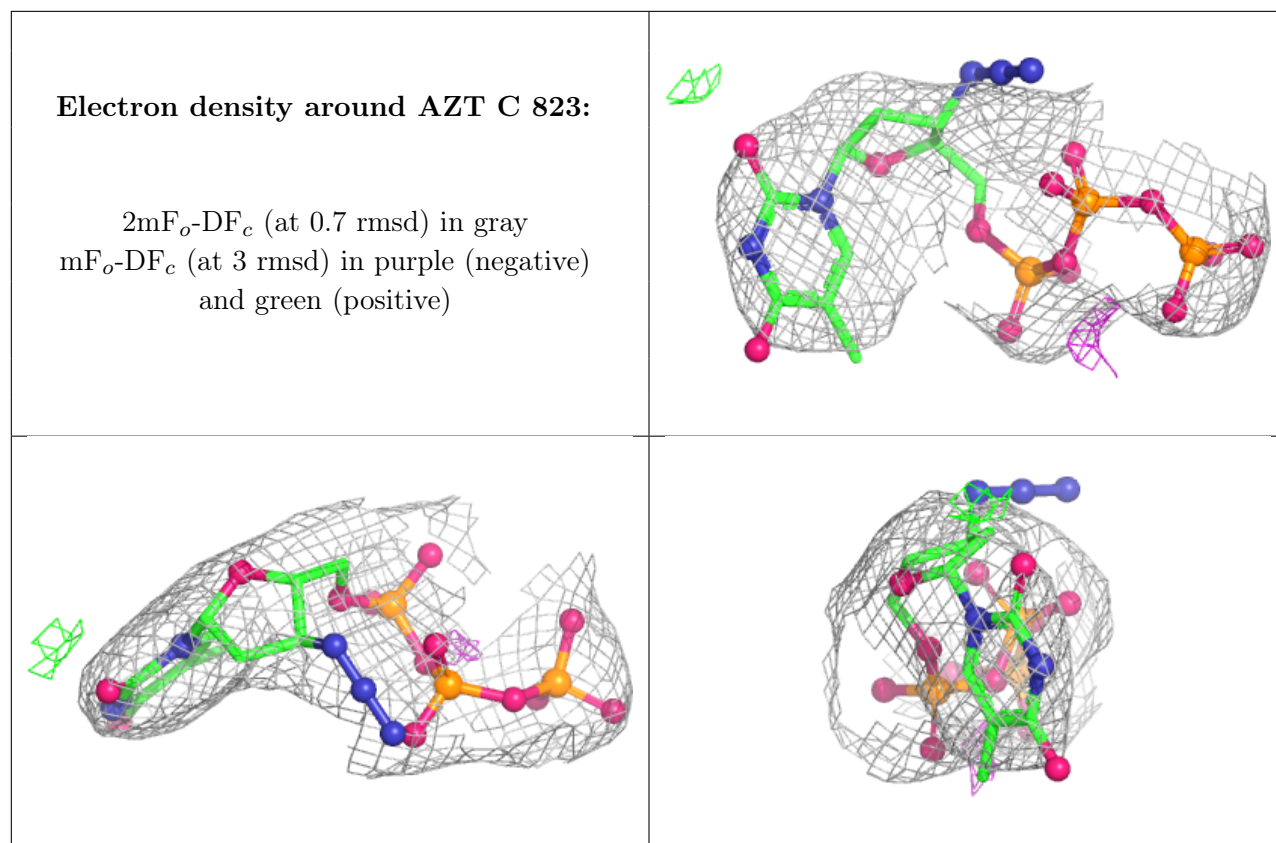
6.4 Ligands [i](#)

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(Å ²)	Q<0.9
6	AZT	A	823	31/31	0.89	0.10	72,90,106,109	0
6	AZT	C	823	31/31	0.91	0.09	69,85,104,111	0
5	MG	C	600	1/1	0.97	0.08	82,82,82,82	0
5	MG	A	600	1/1	0.98	0.04	87,87,87,87	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.