



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 4, 2026 – 07:36 PM UTC

PDB ID : 5CYR / pdb_00005cyr
Title : Crystal structure of Thosea asigna virus RNA-dependent RNA polymerase (RdRP) complexed with ATP and ssRNA
Authors : Ferrero, D.S.; Buxaderas, M.; Rodriguez, J.F.; Verdaguer, N.
Deposited on : 2015-07-30
Resolution : 3.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4-5-2 with Phenix2.0
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

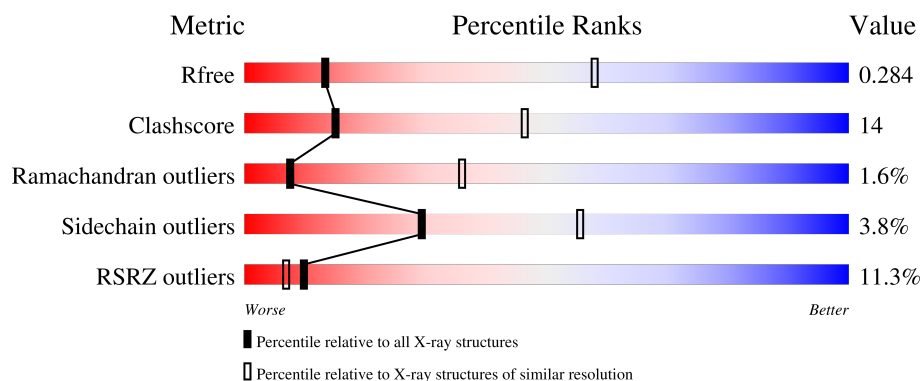
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1085 (3.54-3.46)
Clashscore	190562	1140 (3.54-3.46)
Ramachandran outliers	187476	1113 (3.54-3.46)
Sidechain outliers	187428	1114 (3.54-3.46)
RSRZ outliers	180081	1084 (3.54-3.46)

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 $\leq 5\%$. 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	705	11% 66% 24% • • • 6%
1	B	705	10% 62% 29% • 6%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 10528 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 RNA-dependent RNA polymerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	664	Total	C	N	O	S	43	0	0
			5243	3328	907	982	26			
1	A	662	Total	C	N	O	S	2	0	0
			5223	3314	903	980	26			

There are 62 discrepancies between the modelled and reference sequences:

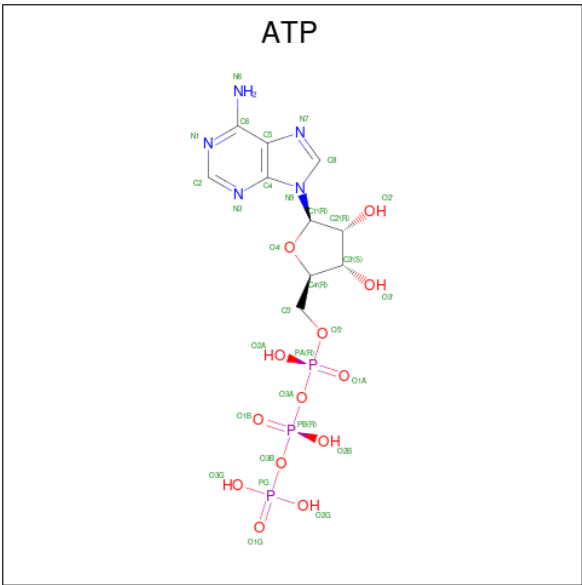
Chain	Residue	Modelled	Actual	Comment	Reference
B	-30	MET	-	initiating methionine	UNP Q6A562
B	-29	SER	-	expression tag	UNP Q6A562
B	-28	TYR	-	expression tag	UNP Q6A562
B	-27	TYR	-	expression tag	UNP Q6A562
B	-26	HIS	-	expression tag	UNP Q6A562
B	-25	HIS	-	expression tag	UNP Q6A562
B	-24	HIS	-	expression tag	UNP Q6A562
B	-23	HIS	-	expression tag	UNP Q6A562
B	-22	HIS	-	expression tag	UNP Q6A562
B	-21	HIS	-	expression tag	UNP Q6A562
B	-20	ASP	-	expression tag	UNP Q6A562
B	-19	TYR	-	expression tag	UNP Q6A562
B	-18	ASP	-	expression tag	UNP Q6A562
B	-17	ILE	-	expression tag	UNP Q6A562
B	-16	PRO	-	expression tag	UNP Q6A562
B	-15	THR	-	expression tag	UNP Q6A562
B	-14	THR	-	expression tag	UNP Q6A562
B	-13	GLU	-	expression tag	UNP Q6A562
B	-12	ASN	-	expression tag	UNP Q6A562
B	-11	LEU	-	expression tag	UNP Q6A562
B	-10	TYR	-	expression tag	UNP Q6A562
B	-9	PHE	-	expression tag	UNP Q6A562
B	-8	GLN	-	expression tag	UNP Q6A562
B	-7	GLY	-	expression tag	UNP Q6A562
B	-6	ALA	-	expression tag	UNP Q6A562

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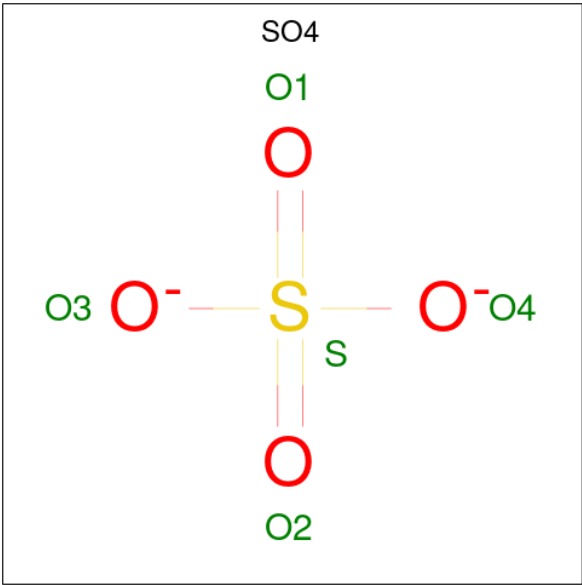
Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	MET	-	expression tag	UNP Q6A562
B	-4	GLY	-	expression tag	UNP Q6A562
B	-3	ALA	-	expression tag	UNP Q6A562
B	-2	MET	-	expression tag	UNP Q6A562
B	-1	GLY	-	expression tag	UNP Q6A562
B	0	ILE	-	expression tag	UNP Q6A562
A	-30	MET	-	initiating methionine	UNP Q6A562
A	-29	SER	-	expression tag	UNP Q6A562
A	-28	TYR	-	expression tag	UNP Q6A562
A	-27	TYR	-	expression tag	UNP Q6A562
A	-26	HIS	-	expression tag	UNP Q6A562
A	-25	HIS	-	expression tag	UNP Q6A562
A	-24	HIS	-	expression tag	UNP Q6A562
A	-23	HIS	-	expression tag	UNP Q6A562
A	-22	HIS	-	expression tag	UNP Q6A562
A	-21	HIS	-	expression tag	UNP Q6A562
A	-20	ASP	-	expression tag	UNP Q6A562
A	-19	TYR	-	expression tag	UNP Q6A562
A	-18	ASP	-	expression tag	UNP Q6A562
A	-17	ILE	-	expression tag	UNP Q6A562
A	-16	PRO	-	expression tag	UNP Q6A562
A	-15	THR	-	expression tag	UNP Q6A562
A	-14	THR	-	expression tag	UNP Q6A562
A	-13	GLU	-	expression tag	UNP Q6A562
A	-12	ASN	-	expression tag	UNP Q6A562
A	-11	LEU	-	expression tag	UNP Q6A562
A	-10	TYR	-	expression tag	UNP Q6A562
A	-9	PHE	-	expression tag	UNP Q6A562
A	-8	GLN	-	expression tag	UNP Q6A562
A	-7	GLY	-	expression tag	UNP Q6A562
A	-6	ALA	-	expression tag	UNP Q6A562
A	-5	MET	-	expression tag	UNP Q6A562
A	-4	GLY	-	expression tag	UNP Q6A562
A	-3	ALA	-	expression tag	UNP Q6A562
A	-2	MET	-	expression tag	UNP Q6A562
A	-1	GLY	-	expression tag	UNP Q6A562
A	0	ILE	-	expression tag	UNP Q6A562

- Molecule 2 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



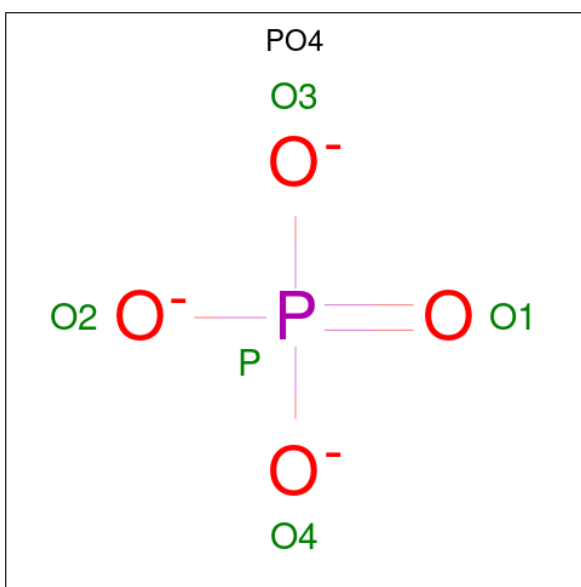
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	B	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	O	P	0	0
			5	4	1		
4	A	1	Total	O	P	0	0
			5	4	1		
4	A	1	Total	O	P	0	0
			5	4	1		
4	A	1	Total	O	P	0	0
			5	4	1		

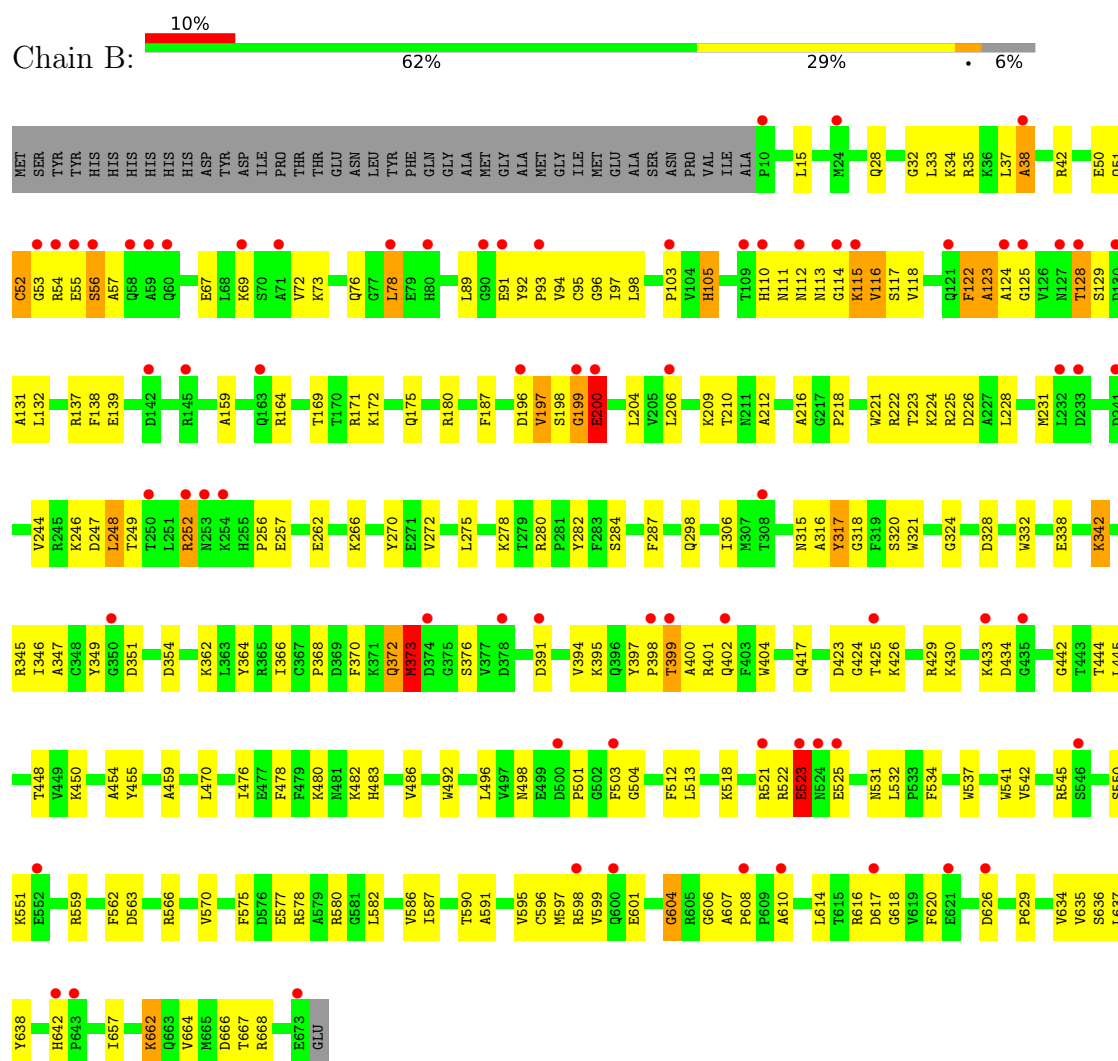
- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

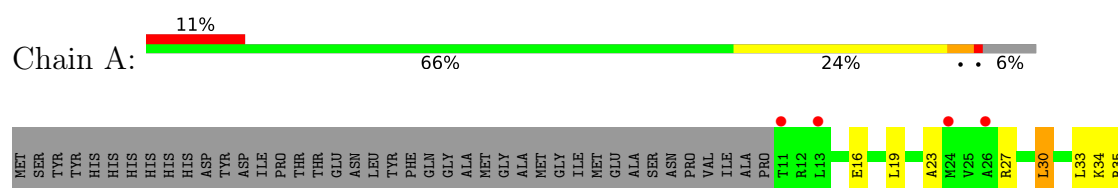
3 Residue-property plots

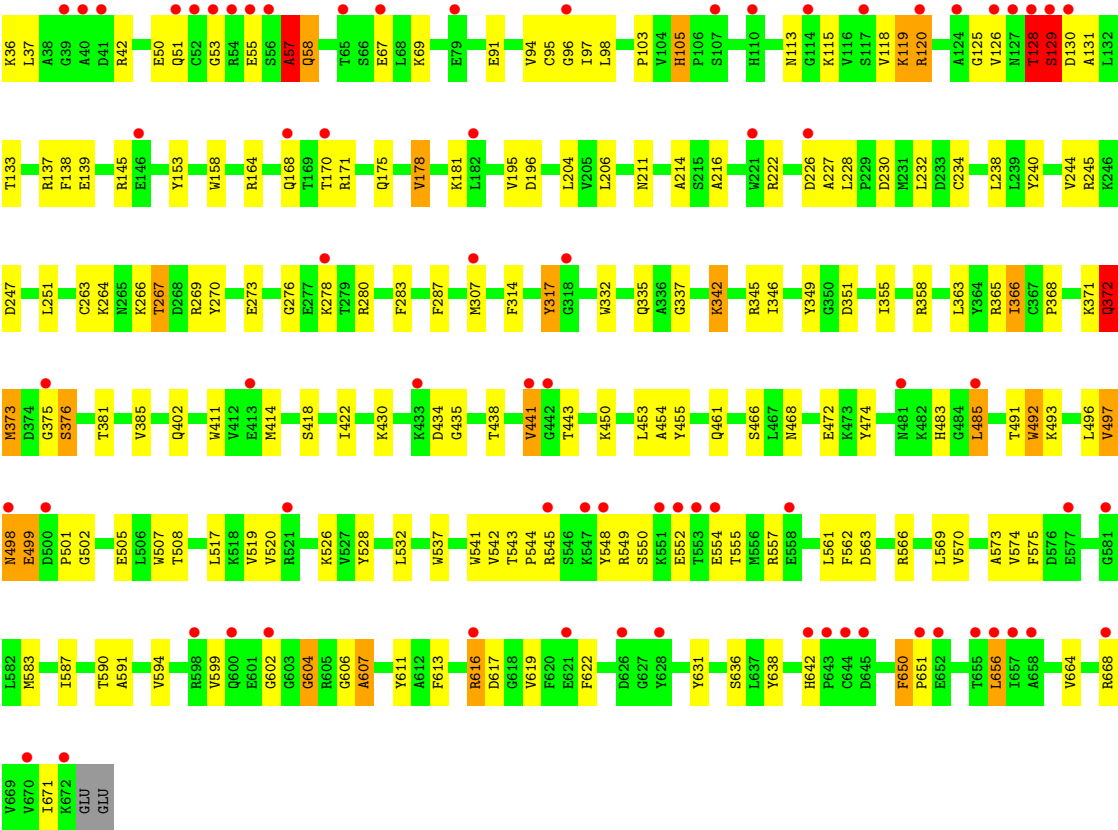
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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



• Molecule 1: RNA-dependent RNA polymerase





4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	142.51Å 158.34Å 217.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.60 – 3.50 47.60 – 3.50	Depositor EDS
% Data completeness (in resolution range)	89.5 (47.60-3.50) 89.6 (47.60-3.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.15	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.47 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, R_{free}	0.252 , 0.296 (Not available) , 0.284	Depositor DCC
R_{free} test set	1413 reflections (4.52%)	wwPDB-VP
Wilson B-factor (Å ²)	25.0	Xtriage
Anisotropy	0.306	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 21.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.76	EDS
Total number of atoms	10528	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 23.50 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.6050e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: MG, ATP, PO4, SO4

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.85	5/5341 (0.1%)	0.95	27/7238 (0.4%)
1	B	0.55	2/5363 (0.0%)	0.91	23/7267 (0.3%)
All	All	0.72	7/10704 (0.1%)	0.93	50/14505 (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
1	A	0	2
1	B	0	3
All	All	0	5

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	57	ALA	C-N	38.44	1.87	1.33
1	A	128	THR	C-N	-27.50	0.81	1.33
1	A	497	VAL	C-N	26.25	1.70	1.33
1	B	128	THR	C-N	-25.75	0.98	1.33
1	B	122	PHE	C-N	21.47	1.63	1.33
1	A	129	SER	C-N	-16.53	1.11	1.34
1	A	496	LEU	C-N	-14.63	1.04	1.33

All (50) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	129	SER	O-C-N	-17.22	99.28	121.67
1	B	523	GLU	CB-CA-C	17.06	144.38	110.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	372	GLN	CB-CA-C	-16.09	78.40	110.42
1	A	498	ASN	N-CA-C	-14.44	86.00	108.96
1	B	199	GLY	N-CA-C	-14.29	89.83	112.85
1	B	200	GLU	N-CA-CB	-12.86	91.65	110.17
1	B	373	MET	N-CA-CB	-12.77	91.83	110.47
1	A	373	MET	N-CA-CB	-12.11	91.66	110.30
1	A	129	SER	CA-C-N	11.74	138.16	120.31
1	A	129	SER	C-N-CA	11.74	138.16	120.31
1	A	57	ALA	O-C-N	-11.34	107.50	122.59
1	A	128	THR	O-C-N	11.17	137.45	122.59
1	B	523	GLU	N-CA-C	-11.11	87.14	110.80
1	A	128	THR	CA-C-N	-10.19	102.17	121.63
1	A	128	THR	C-N-CA	-10.19	102.17	121.63
1	A	267	THR	N-CA-C	-10.12	95.12	110.30
1	B	373	MET	N-CA-C	-9.63	101.66	113.41
1	A	57	ALA	CA-C-N	9.18	139.08	121.54
1	A	57	ALA	C-N-CA	9.18	139.08	121.54
1	B	199	GLY	CA-C-N	8.86	134.84	120.94
1	B	199	GLY	C-N-CA	8.86	134.84	120.94
1	B	523	GLU	CA-C-N	7.67	133.96	121.99
1	B	523	GLU	C-N-CA	7.67	133.96	121.99
1	B	247	ASP	N-CA-C	-7.40	98.11	108.54
1	A	498	ASN	CB-CA-C	-7.21	98.17	110.22
1	A	267	THR	CB-CA-C	7.03	119.83	110.06
1	A	373	MET	N-CA-C	-6.58	103.94	112.23
1	B	246	LYS	CB-CA-C	-6.56	97.37	110.42
1	B	342	LYS	CA-C-N	6.43	127.00	120.38
1	B	342	LYS	C-N-CA	6.43	127.00	120.38
1	B	372	GLN	N-CA-C	-6.07	97.86	110.80
1	B	604	GLY	N-CA-C	-5.98	106.78	114.85
1	B	122	PHE	O-C-N	-5.77	113.73	122.61
1	B	248	LEU	N-CA-C	-5.77	106.24	113.28
1	B	105	HIS	CA-C-N	5.46	125.47	119.90
1	B	105	HIS	C-N-CA	5.46	125.47	119.90
1	B	397	TYR	CA-C-N	-5.41	114.09	119.56
1	B	397	TYR	C-N-CA	-5.41	114.09	119.56
1	A	372	GLN	CA-C-N	5.41	129.88	120.68
1	A	372	GLN	C-N-CA	5.41	129.88	120.68
1	A	607	ALA	CA-C-N	5.40	123.55	119.66
1	A	607	ALA	C-N-CA	5.40	123.55	119.66
1	A	650	PHE	CA-C-N	5.37	126.55	119.84
1	A	650	PHE	C-N-CA	5.37	126.55	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	116	VAL	N-CA-C	5.26	117.04	109.51
1	A	604	GLY	N-CA-C	-5.17	108.18	115.32
1	A	276	GLY	N-CA-C	-5.17	107.04	115.46
1	A	499	GLU	N-CA-C	-5.15	105.12	111.40
1	A	105	HIS	CA-C-N	5.11	126.23	119.84
1	A	105	HIS	C-N-CA	5.11	126.23	119.84

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	128	THR	Mainchain
1	A	129	SER	Mainchain
1	B	128	THR	Mainchain
1	B	199	GLY	Peptide
1	B	523	GLU	Peptide

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5223	0	5146	138	2
1	B	5243	0	5181	155	0
2	B	31	0	12	2	0
3	A	5	0	0	0	0
3	B	5	0	0	0	0
4	A	15	0	0	0	0
4	B	5	0	0	1	0
5	A	1	0	0	0	0
All	All	10528	0	10339	285	2

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 14.

All (285) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:THR:C	1:A:129:SER:CA	1.81	1.50
1:A:497:VAL:C	1:A:498:ASN:N	1.70	1.50
1:A:128:THR:CA	1:A:129:SER:N	1.81	1.43
1:A:57:ALA:C	1:A:58:GLN:N	1.87	1.33
1:B:50:GLU:OE2	1:B:52:CYS:O	1.66	1.12
1:A:50:GLU:C	1:A:51:GLN:N	2.12	1.07
1:A:128:THR:O	1:A:129:SER:N	1.90	1.01
1:A:120:ARG:HG2	1:A:158:TRP:CZ2	1.96	1.00
1:B:398:PRO:O	1:B:400:ALA:N	1.95	1.00
1:B:164:ARG:HG2	1:B:372:GLN:NE2	1.77	0.98
1:B:164:ARG:HG2	1:B:372:GLN:HE22	1.25	0.96
1:B:50:GLU:HG3	1:B:137:ARG:O	1.68	0.94
1:A:372:GLN:O	1:A:372:GLN:HG3	1.68	0.92
1:B:398:PRO:C	1:B:400:ALA:H	1.78	0.92
1:A:128:THR:O	1:A:129:SER:CA	2.17	0.91
1:A:128:THR:C	1:A:129:SER:N	0.80	0.90
1:A:128:THR:O	1:A:129:SER:HA	1.72	0.89
1:A:128:THR:C	1:A:129:SER:HA	1.97	0.89
1:B:33:LEU:O	1:B:37:LEU:HB2	1.76	0.85
1:B:53:GLY:HA2	1:B:137:ARG:HG3	1.59	0.84
1:B:399:THR:O	1:A:668:ARG:HG3	1.78	0.83
1:B:282:TYR:OH	4:B:703:PO4:O3	1.97	0.83
1:A:372:GLN:O	1:A:372:GLN:CG	2.07	0.79
1:B:124:ALA:N	1:B:125:GLY:HA3	1.97	0.79
1:B:93:PRO:HA	1:B:115:LYS:HB3	1.65	0.78
1:A:355:ILE:HB	1:A:366:ILE:HG13	1.65	0.78
1:A:332:TRP:HA	1:A:335:GLN:HE21	1.50	0.75
1:B:54:ARG:O	1:B:56:SER:N	2.17	0.74
1:B:278:LYS:NZ	2:B:701:ATP:O1G	2.21	0.74
1:A:566:ARG:HH22	1:A:606:GLY:HA3	1.52	0.73
1:A:128:THR:CB	1:A:129:SER:N	2.52	0.72
1:B:34:LYS:O	1:B:38:ALA:HB2	1.90	0.71
1:B:601:GLU:O	1:B:604:GLY:N	2.22	0.71
1:B:198:SER:HB2	1:B:399:THR:HG23	1.72	0.71
1:B:175:GLN:NE2	1:B:434:ASP:OD1	2.24	0.70
1:A:443:THR:O	1:A:443:THR:HG22	1.89	0.69
1:A:120:ARG:NH1	1:A:422:ILE:O	2.26	0.69
1:A:351:ASP:HB3	1:A:373:MET:HG2	1.75	0.68
1:B:91:GLU:OE1	1:B:426:LYS:HA	1.94	0.68
1:A:206:LEU:HD11	1:A:232:LEU:HD21	1.75	0.67
1:B:559:ARG:HD3	1:B:597:MET:HE2	1.76	0.66
1:A:120:ARG:HG2	1:A:158:TRP:HZ2	1.52	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:120:ARG:NH2	1:A:264:LYS:HA	2.10	0.66
1:B:231:MET:HG3	1:B:287:PHE:HD2	1.61	0.65
1:B:394:VAL:O	1:B:398:PRO:HB3	1.96	0.65
1:B:480:LYS:HE2	1:B:486:VAL:HG13	1.79	0.65
1:B:197:VAL:HA	1:B:204:LEU:HD21	1.79	0.65
1:A:363:LEU:HD23	1:A:499:GLU:HG2	1.79	0.65
1:A:358:ARG:NH2	1:A:499:GLU:OE2	2.24	0.65
1:B:42:ARG:NH2	1:B:587:ILE:O	2.31	0.64
1:A:119:LYS:O	1:A:120:ARG:HD2	1.98	0.64
1:B:616:ARG:HA	1:B:618:GLY:N	2.13	0.63
1:A:94:VAL:HG13	1:A:105:HIS:HD2	1.64	0.62
1:B:391:ASP:HA	1:B:394:VAL:HG22	1.79	0.62
1:A:450:LYS:HE2	1:A:485:LEU:HD13	1.80	0.62
1:B:206:LEU:HB3	1:A:16:GLU:HB3	1.82	0.61
1:A:454:ALA:HA	1:A:483:HIS:CD2	2.35	0.61
1:B:94:VAL:HG23	1:B:115:LYS:HA	1.82	0.61
1:B:417:GLN:HB2	1:B:433:LYS:HE2	1.82	0.61
1:A:570:VAL:O	1:A:638:TYR:OH	2.18	0.61
1:B:52:CYS:HB3	1:B:57:ALA:HB2	1.83	0.60
1:B:69:LYS:NZ	1:B:73:LYS:HB2	2.17	0.60
1:B:169:THR:HG22	1:B:430:LYS:HE2	1.83	0.60
1:A:507:TRP:HB2	1:A:517:LEU:HD22	1.84	0.60
1:B:249:THR:HA	1:B:252:ARG:HG2	1.84	0.60
1:B:596:CYS:HA	1:B:626:ASP:HB3	1.84	0.59
1:A:461:GLN:O	1:A:466:SER:OG	2.21	0.59
1:B:111:ASN:HB3	1:B:116:VAL:HA	1.84	0.59
1:B:398:PRO:C	1:B:400:ALA:N	2.47	0.59
1:B:616:ARG:HA	1:B:617:ASP:C	2.28	0.59
1:A:491:THR:O	1:A:493:LYS:N	2.36	0.58
1:B:563:ASP:HB3	1:B:607:ALA:HB3	1.85	0.58
1:A:131:ALA:O	1:A:541:TRP:NE1	2.37	0.58
1:A:175:GLN:NE2	1:A:434:ASP:OD1	2.36	0.58
1:B:76:GLN:NE2	1:B:122:PHE:O	2.34	0.58
1:A:636:SER:OG	1:A:642:HIS:O	2.21	0.58
1:B:338:GLU:H	1:B:342:LYS:HZ2	1.50	0.58
1:A:91:GLU:HB3	1:A:115:LYS:HG2	1.84	0.57
1:B:222:ARG:NH1	1:B:226:ASP:O	2.37	0.57
1:B:351:ASP:HB3	1:B:373:MET:HG2	1.86	0.57
1:A:472:GLU:HB2	1:A:492:TRP:HB3	1.84	0.57
1:B:433:LYS:HA	1:B:433:LYS:CE	2.35	0.56
1:A:501:PRO:O	1:A:526:LYS:NZ	2.37	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:570:VAL:HG21	1:A:622:PHE:HE1	1.71	0.56
1:A:128:THR:C	1:A:129:SER:CB	2.74	0.56
1:B:15:LEU:HD22	1:A:228:LEU:HD13	1.88	0.56
1:B:112:ASN:OD1	1:B:113:ASN:N	2.37	0.56
1:B:566:ARG:HG3	1:B:629:PRO:HD3	1.88	0.55
1:B:598:ARG:NH1	1:B:599:VAL:O	2.40	0.55
1:A:552:GLU:HG3	1:A:557:ARG:HE	1.72	0.55
1:B:53:GLY:O	1:B:57:ALA:N	2.38	0.55
1:A:368:PRO:HA	1:A:491:THR:HB	1.87	0.54
1:A:563:ASP:HB3	1:A:607:ALA:HB3	1.88	0.54
1:A:245:ARG:HG3	1:A:247:ASP:HB2	1.88	0.54
1:A:517:LEU:HD21	1:A:528:TYR:HD2	1.72	0.54
1:B:376:SER:O	1:B:450:LYS:NZ	2.40	0.54
1:B:171:ARG:NH1	1:B:372:GLN:O	2.41	0.54
1:B:577:GLU:OE1	1:B:580:ARG:NH2	2.41	0.54
1:B:566:ARG:HH22	1:B:606:GLY:HA3	1.73	0.54
1:B:216:ALA:HB1	1:B:287:PHE:HB2	1.90	0.54
1:B:280:ARG:NH1	2:B:701:ATP:O1G	2.40	0.53
1:B:347:ALA:HB3	1:B:354:ASP:HB3	1.89	0.53
1:B:545:ARG:HH22	1:B:610:ALA:HB1	1.71	0.53
1:A:616:ARG:HG2	1:A:617:ASP:N	2.23	0.53
1:B:433:LYS:HA	1:B:433:LYS:HE3	1.91	0.53
1:A:430:LYS:NZ	1:A:435:GLY:O	2.31	0.53
1:B:105:HIS:NE2	1:B:110:HIS:O	2.37	0.52
1:A:497:VAL:C	1:A:498:ASN:CA	2.75	0.52
1:A:590:THR:HG22	1:A:594:VAL:HG23	1.91	0.52
1:B:198:SER:CB	1:B:399:THR:HG23	2.39	0.52
1:A:569:LEU:HD11	1:A:583:MET:HB2	1.92	0.52
1:B:566:ARG:NH2	1:B:606:GLY:HA3	2.25	0.52
1:A:98:LEU:HA	1:A:103:PRO:HA	1.91	0.52
1:B:98:LEU:HA	1:B:103:PRO:HA	1.91	0.52
1:A:128:THR:HA	1:A:129:SER:N	2.09	0.52
1:A:519:VAL:HG13	1:A:526:LYS:HB2	1.91	0.52
1:A:376:SER:HB3	1:A:485:LEU:HD12	1.91	0.52
1:B:32:GLY:HA2	1:B:35:ARG:HE	1.75	0.52
1:A:120:ARG:HH21	1:A:264:LYS:HA	1.75	0.52
1:B:634:VAL:HA	1:B:637:LEU:HD12	1.91	0.51
1:A:51:GLN:HG3	1:A:139:GLU:C	2.36	0.51
1:A:548:TYR:CE2	1:A:550:SER:HA	2.45	0.51
1:B:321:TRP:HZ2	1:B:513:LEU:HB2	1.76	0.51
1:A:128:THR:HG22	1:A:129:SER:N	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:PHE:HD1	1:B:315:ASN:HD22	1.59	0.51
1:B:417:GLN:OE1	1:B:433:LYS:HD3	2.10	0.51
1:A:118:VAL:HG22	1:A:119:LYS:N	2.26	0.51
1:A:499:GLU:O	1:A:501:PRO:HD3	2.11	0.51
1:B:366:ILE:HG22	1:B:368:PRO:HD3	1.93	0.50
1:B:575:PHE:HE1	1:B:635:VAL:HG22	1.77	0.50
1:B:317:TYR:CE1	1:B:444:THR:HG21	2.47	0.50
1:B:532:LEU:HB2	1:B:537:TRP:CE2	2.46	0.50
1:B:50:GLU:HG2	1:B:51:GLN:N	2.27	0.50
1:B:209:LYS:O	1:B:298:GLN:NE2	2.45	0.50
1:A:36:LYS:O	1:A:656:LEU:HD11	2.11	0.50
1:A:67:GLU:OE1	1:A:145:ARG:NH2	2.44	0.50
1:A:269:ARG:HG3	1:A:543:THR:HG21	1.94	0.50
1:A:153:TYR:HE2	1:A:545:ARG:HE	1.59	0.49
1:B:131:ALA:O	1:B:541:TRP:NE1	2.44	0.49
1:A:128:THR:CG2	1:A:129:SER:N	2.74	0.49
1:B:636:SER:OG	1:B:642:HIS:O	2.30	0.49
1:A:120:ARG:HD3	1:A:422:ILE:O	2.12	0.49
1:A:542:VAL:O	1:A:544:PRO:HD3	2.13	0.49
1:B:417:GLN:HG2	1:B:429:ARG:HG2	1.95	0.49
1:A:168:GLN:HA	1:A:375:GLY:HA3	1.95	0.49
1:A:363:LEU:CD2	1:A:499:GLU:HG2	2.42	0.49
1:B:95:CYS:HB3	1:B:97:ILE:H	1.78	0.49
1:B:266:LYS:O	1:B:270:TYR:OH	2.23	0.49
1:B:346:ILE:HD11	1:B:459:ALA:HB2	1.95	0.48
1:A:95:CYS:SG	1:A:97:ILE:HG13	2.53	0.48
1:B:53:GLY:O	1:B:57:ALA:HB3	2.13	0.48
1:A:337:GLY:HA2	1:A:342:LYS:HZ2	1.78	0.48
1:B:248:LEU:O	1:B:252:ARG:HD2	2.13	0.48
1:A:443:THR:O	1:A:443:THR:CG2	2.59	0.48
1:B:570:VAL:O	1:B:638:TYR:OH	2.28	0.48
1:A:222:ARG:NH1	1:A:226:ASP:O	2.45	0.48
1:A:365:ARG:NH1	1:A:508:THR:OG1	2.46	0.48
1:B:417:GLN:CD	1:B:433:LYS:HD3	2.39	0.48
1:B:666:ASP:OD1	1:B:667:THR:N	2.46	0.48
1:A:164:ARG:CZ	1:A:278:LYS:HE3	2.44	0.48
1:A:562:PHE:HE2	1:A:587:ILE:HG23	1.79	0.48
1:B:262:GLU:HB3	1:B:284:SER:HB3	1.94	0.48
1:B:50:GLU:HA	1:B:138:PHE:HA	1.95	0.48
1:B:498:ASN:ND2	1:B:501:PRO:HA	2.29	0.47
1:A:130:ASP:HA	1:A:133:THR:HB	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:370:PHE:HB2	1:B:373:MET:HB2	1.96	0.47
1:A:94:VAL:HG13	1:A:105:HIS:CD2	2.47	0.47
1:A:216:ALA:HB1	1:A:287:PHE:HB2	1.95	0.47
1:A:617:ASP:C	1:A:619:VAL:H	2.22	0.47
1:A:541:TRP:HB2	1:A:583:MET:HE1	1.97	0.47
1:A:611:TYR:CE2	1:A:613:PHE:HB2	2.49	0.47
1:B:315:ASN:OD1	1:B:317:TYR:N	2.47	0.47
1:B:324:GLY:O	1:B:328:ASP:N	2.43	0.47
1:A:381:THR:O	1:A:385:VAL:HG23	2.14	0.47
1:B:224:LYS:HD3	1:B:287:PHE:HE1	1.80	0.47
1:B:210:THR:OG1	1:B:224:LYS:NZ	2.43	0.47
1:B:316:ALA:O	1:B:318:GLY:N	2.48	0.47
1:A:599:VAL:O	1:A:604:GLY:HA2	2.15	0.47
1:B:197:VAL:HG13	1:B:404:TRP:NE1	2.30	0.46
1:A:414:MET:HA	1:A:418:SER:HB2	1.97	0.46
1:B:198:SER:CB	1:B:399:THR:CG2	2.93	0.46
1:B:454:ALA:HA	1:B:483:HIS:CE1	2.50	0.46
1:A:178:VAL:HB	1:A:453:LEU:HD21	1.97	0.46
1:B:398:PRO:O	1:B:401:ARG:N	2.48	0.46
1:B:117:SER:OG	1:B:118:VAL:N	2.46	0.46
1:A:34:LYS:HG3	1:A:35:ARG:N	2.31	0.46
1:A:557:ARG:O	1:A:561:LEU:HG	2.16	0.46
1:A:574:VAL:HG21	1:A:631:TYR:HA	1.98	0.46
1:A:569:LEU:HD12	1:A:573:ALA:HB3	1.97	0.46
1:B:72:VAL:O	1:B:76:GLN:N	2.44	0.46
1:B:270:TYR:HE1	1:B:280:ARG:HG3	1.81	0.46
1:B:124:ALA:N	1:B:125:GLY:CA	2.75	0.46
1:B:139:GLU:OE1	1:B:578:ARG:NH2	2.47	0.46
1:A:346:ILE:HD12	1:A:455:TYR:HB3	1.98	0.46
1:A:468:ASN:HB2	1:A:474:TYR:CD2	2.50	0.46
1:B:223:THR:OG1	1:B:226:ASP:OD2	2.34	0.46
1:B:587:ILE:O	1:B:590:THR:HG22	2.16	0.46
1:A:230:ASP:O	1:A:234:CYS:HB3	2.15	0.46
1:B:200:GLU:O	1:B:204:LEU:HB2	2.16	0.45
1:B:320:SER:HB2	1:B:614:LEU:O	2.16	0.45
1:B:399:THR:OG1	1:A:668:ARG:HD2	2.17	0.45
1:A:222:ARG:HG3	1:A:227:ALA:HB2	1.98	0.45
1:A:283:PHE:N	1:A:438:THR:O	2.38	0.45
1:A:314:PHE:CE2	1:A:346:ILE:HD11	2.51	0.45
1:A:346:ILE:HG22	1:A:355:ILE:HG23	1.99	0.45
1:B:139:GLU:HG3	1:B:534:PHE:HZ	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:372:GLN:HA	1:B:372:GLN:OE1	2.16	0.45
1:B:362:LYS:HB2	1:B:364:TYR:CE1	2.51	0.45
1:B:95:CYS:HB3	1:B:97:ILE:HD12	1.99	0.45
1:B:212:ALA:HB1	1:B:225:ARG:HG3	1.98	0.45
1:B:218:PRO:HG3	1:B:221:TRP:CH2	2.51	0.45
1:B:249:THR:HA	1:B:252:ARG:CG	2.46	0.45
1:B:423:ASP:OD1	1:B:424:GLY:N	2.49	0.45
1:A:591:ALA:HB3	1:A:594:VAL:HG22	1.99	0.45
1:A:317:TYR:HA	1:A:349:TYR:CD1	2.52	0.44
1:B:244:VAL:HA	1:A:671:ILE:HG22	1.98	0.44
1:B:570:VAL:HG11	1:B:620:PHE:CE2	2.53	0.44
1:A:222:ARG:HH22	1:A:230:ASP:CG	2.26	0.44
1:B:54:ARG:C	1:B:56:SER:N	2.74	0.44
1:B:518:LYS:HD2	1:B:531:ASN:ND2	2.33	0.44
1:A:270:TYR:HE1	1:A:280:ARG:HG3	1.83	0.44
1:B:198:SER:HB2	1:B:399:THR:CG2	2.43	0.43
1:A:171:ARG:HG3	1:A:375:GLY:O	2.18	0.43
1:A:332:TRP:NE1	1:A:345:ARG:HD2	2.33	0.43
1:A:532:LEU:HB2	1:A:537:TRP:CE2	2.53	0.43
1:B:442:GLY:O	1:B:445:LEU:N	2.47	0.43
1:B:562:PHE:CD2	1:B:590:THR:HG21	2.53	0.43
1:B:354:ASP:HB2	1:B:512:PHE:CD1	2.53	0.43
1:B:545:ARG:NH2	1:B:610:ALA:HB1	2.32	0.43
1:A:520:VAL:HG11	1:A:575:PHE:CD1	2.54	0.43
1:B:346:ILE:HG21	1:B:455:TYR:HB3	2.00	0.43
1:B:399:THR:O	1:A:668:ARG:CG	2.59	0.43
1:A:30:LEU:HA	1:A:33:LEU:HB2	2.00	0.43
1:B:95:CYS:HA	1:B:96:GLY:HA3	1.65	0.43
1:B:442:GLY:C	1:B:444:THR:N	2.76	0.43
1:B:521:ARG:HG2	1:B:522:ARG:N	2.34	0.43
1:A:69:LYS:HB3	1:A:69:LYS:HE3	1.76	0.43
1:A:430:LYS:HB3	1:A:430:LYS:HE2	1.78	0.43
1:A:23:ALA:O	1:A:27:ARG:HG3	2.19	0.43
1:A:238:LEU:HD21	1:A:251:LEU:HD11	1.99	0.43
1:B:113:ASN:O	1:B:115:LYS:N	2.52	0.43
1:B:218:PRO:HB3	1:B:257:GLU:HG2	2.00	0.43
1:B:228:LEU:HD21	1:A:19:LEU:HG	2.01	0.43
1:B:534:PHE:CD2	1:B:578:ARG:HB3	2.54	0.43
1:A:211:ASN:OD1	1:A:214:ALA:N	2.51	0.43
1:B:139:GLU:HG2	1:B:582:LEU:HD13	2.00	0.42
1:B:607:ALA:HA	1:B:608:PRO:HD3	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:371:LYS:O	1:A:372:GLN:C	2.62	0.42
1:B:249:THR:C	1:B:252:ARG:HG2	2.44	0.42
1:B:444:THR:O	1:B:448:THR:OG1	2.28	0.42
1:A:42:ARG:NH2	1:A:587:ILE:O	2.52	0.42
1:B:332:TRP:CE2	1:B:345:ARG:HD2	2.55	0.42
1:B:15:LEU:HD21	1:A:287:PHE:HZ	1.84	0.42
1:B:76:GLN:OE1	1:B:123:ALA:O	2.38	0.42
1:A:137:ARG:HG2	1:A:138:PHE:CD2	2.55	0.42
1:B:504:GLY:HA2	1:B:518:LYS:HE2	2.02	0.42
1:B:470:LEU:O	1:B:492:TRP:NE1	2.48	0.42
1:B:662:LYS:HE3	1:B:662:LYS:HB2	1.74	0.42
1:A:266:LYS:O	1:A:267:THR:C	2.61	0.42
1:A:240:TYR:O	1:A:244:VAL:HG23	2.18	0.42
1:B:132:LEU:HD13	1:B:542:VAL:HG13	2.01	0.42
1:A:599:VAL:HG11	1:A:606:GLY:HA2	2.01	0.42
1:B:78:LEU:HD11	1:B:159:ALA:H	1.84	0.41
1:B:92:TYR:CD2	1:B:256:PRO:HB2	2.54	0.41
1:B:591:ALA:O	1:B:595:VAL:HG23	2.20	0.41
1:A:33:LEU:O	1:A:37:LEU:HB2	2.21	0.41
1:A:263:CYS:HB2	1:A:283:PHE:CE2	2.56	0.41
1:A:502:GLY:H	1:A:505:GLU:CD	2.29	0.41
1:A:204:LEU:HD23	1:A:204:LEU:HA	1.91	0.41
1:B:180:ARG:NH1	1:B:391:ASP:OD2	2.54	0.41
1:A:264:LYS:HE2	1:A:264:LYS:HB3	1.85	0.41
1:A:307:MET:HE2	1:A:307:MET:HB3	1.82	0.41
1:A:549:ARG:HB3	1:A:552:GLU:HB3	2.03	0.41
1:B:117:SER:HA	1:B:425:THR:HA	2.03	0.41
1:B:218:PRO:HG3	1:B:221:TRP:CZ2	2.55	0.41
1:B:272:VAL:HA	1:B:275:LEU:HG	2.01	0.41
1:B:317:TYR:HA	1:B:349:TYR:CE1	2.55	0.41
1:B:503:PHE:CD2	1:B:521:ARG:HB2	2.56	0.41
1:A:51:GLN:HG3	1:A:139:GLU:O	2.21	0.41
1:A:411:TRP:NE1	1:A:441:VAL:O	2.42	0.41
1:A:650:PHE:HA	1:A:651:PRO:HD3	1.86	0.41
1:B:110:HIS:HA	1:B:111:ASN:O	2.21	0.40
1:A:499:GLU:O	1:A:501:PRO:CD	2.70	0.40
1:B:478:PHE:O	1:B:482:LYS:HB2	2.21	0.40
1:A:95:CYS:HA	1:A:96:GLY:HA3	1.75	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:GLY:N	1:A:55:GLU:OE1[2_555]	1.93	0.27
1:A:53:GLY:CA	1:A:55:GLU:OE1[2_555]	2.11	0.09

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	658/705 (93%)	600 (91%)	46 (7%)	12 (2%)	6	34
1	B	662/705 (94%)	585 (88%)	68 (10%)	9 (1%)	9	38
All	All	1320/1410 (94%)	1185 (90%)	114 (9%)	21 (2%)	7	36

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	38	ALA
1	B	123	ALA
1	B	317	TYR
1	B	399	THR
1	B	550	SER
1	A	58	GLN
1	A	376	SER
1	B	114	GLY
1	B	196	ASP
1	A	113	ASN
1	A	196	ASP
1	A	492	TRP
1	A	602	GLY
1	B	55	GLU
1	A	125	GLY
1	A	317	TYR
1	A	372	GLN
1	A	441	VAL
1	B	252	ARG

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Mol	Chain	Res	Type
1	A	119	LYS
1	A	57	ALA

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	557/598 (93%)	540 (97%)	17 (3%)	35	59
1	B	560/598 (94%)	535 (96%)	25 (4%)	24	50
All	All	1117/1196 (93%)	1075 (96%)	42 (4%)	29	55

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	28	GLN
1	B	52	CYS
1	B	56	SER
1	B	67	GLU
1	B	78	LEU
1	B	89	LEU
1	B	115	LYS
1	B	129	SER
1	B	172	LYS
1	B	197	VAL
1	B	200	GLU
1	B	306	ILE
1	B	373	MET
1	B	395	LYS
1	B	402	GLN
1	B	476	ILE
1	B	496	LEU
1	B	523	GLU
1	B	525	GLU
1	B	551	LYS
1	B	586	VAL

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Mol	Chain	Res	Type
1	B	657	ILE
1	B	662	LYS
1	B	664	VAL
1	B	668	ARG
1	A	30	LEU
1	A	120	ARG
1	A	126	VAL
1	A	170	THR
1	A	178	VAL
1	A	181	LYS
1	A	195	VAL
1	A	273	GLU
1	A	342	LYS
1	A	366	ILE
1	A	402	GLN
1	A	485	LEU
1	A	554	GLU
1	A	555	THR
1	A	616	ARG
1	A	656	LEU
1	A	664	VAL

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

Mol	Chain	Res	Type
1	B	76	GLN
1	B	211	ASN
1	B	468	ASN
1	B	516	GLN
1	B	600	GLN
1	A	168	GLN
1	A	372	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 1 is monoatomic - leaving 7 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	$\# Z > 2$
4	PO4	A	705	-	4,4,4	0.96	0	6,6,6	0.49	0
3	SO4	B	702	-	4,4,4	0.24	0	6,6,6	0.07	0
4	PO4	A	703	-	4,4,4	0.98	0	6,6,6	0.46	0
2	ATP	B	701	-	32,33,33	1.46	6 (18%)	48,52,52	1.77	9 (18%)
4	PO4	B	703	-	4,4,4	1.03	0	6,6,6	0.46	0
3	SO4	A	702	-	4,4,4	0.23	0	6,6,6	0.06	0
4	PO4	A	704	-	4,4,4	0.99	0	6,6,6	0.51	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
2	ATP	B	701	-	-	3/22/38/38	0/3/3/3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	701	ATP	C5-C4	4.85	1.47	1.39
2	B	701	ATP	C5-C6	2.85	1.48	1.41
2	B	701	ATP	C8-N7	2.34	1.36	1.31
2	B	701	ATP	PB-O3B	2.33	1.62	1.59
2	B	701	ATP	C5-N7	-2.15	1.35	1.39
2	B	701	ATP	PA-O3A	2.01	1.61	1.59

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	701	ATP	C5-C4-N3	-6.00	118.45	126.72
2	B	701	ATP	N3-C4-N9	4.76	135.26	127.17
2	B	701	ATP	C2-N3-C4	3.77	121.04	111.83
2	B	701	ATP	C4-C5-N7	-3.49	106.59	110.58
2	B	701	ATP	N3-C2-N1	-3.23	123.69	128.58
2	B	701	ATP	C5-N7-C8	2.56	107.48	103.45
2	B	701	ATP	C4-N9-C8	2.48	108.34	105.74
2	B	701	ATP	C3'-C2'-C1'	2.38	105.96	101.46
2	B	701	ATP	C6-C5-N7	2.03	136.00	132.09

There are no chirality outliers.

All (3) torsion outliers are listed below:

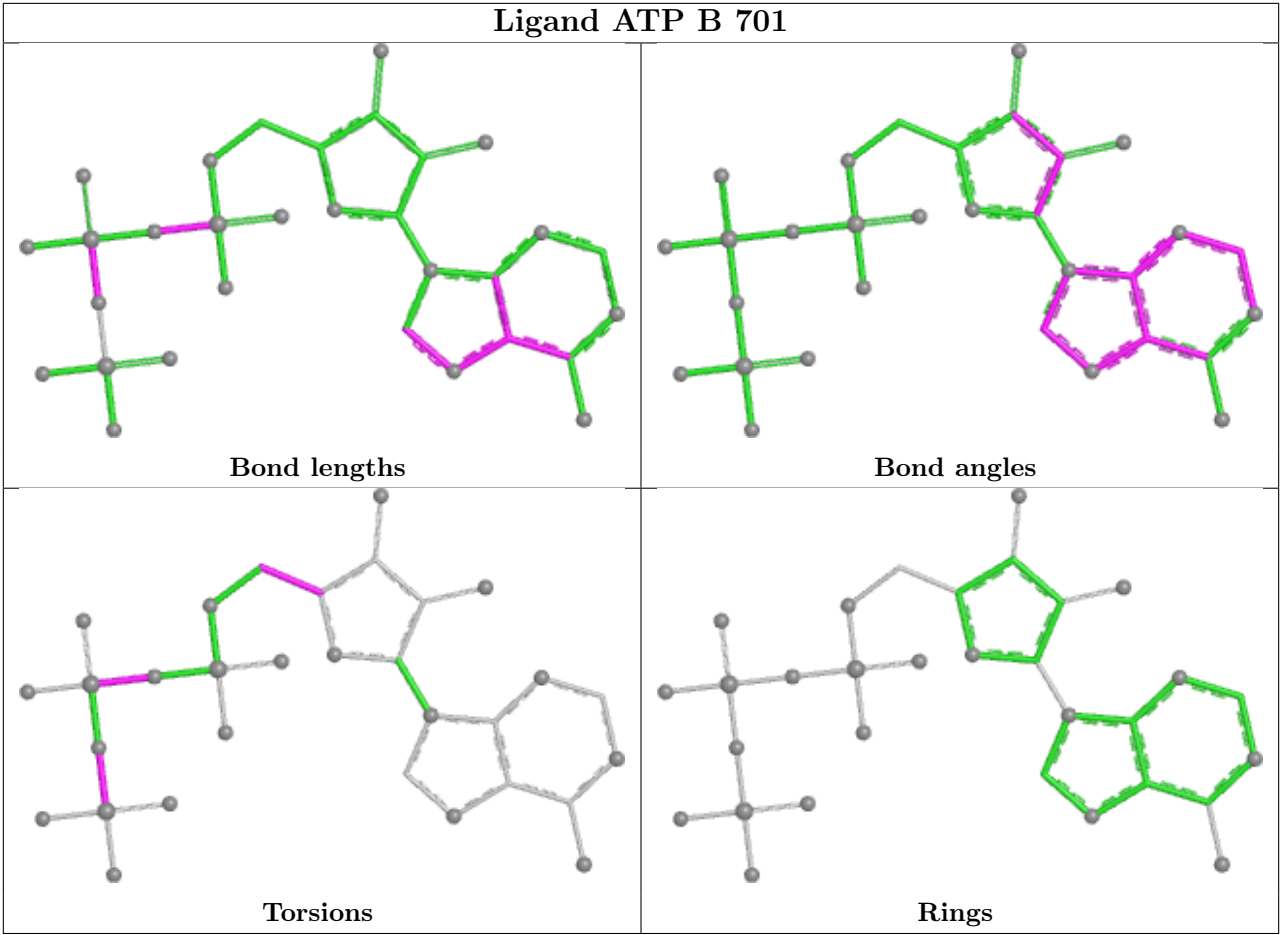
Mol	Chain	Res	Type	Atoms
2	B	701	ATP	PB-O3B-PG-O3G
2	B	701	ATP	PA-O3A-PB-O2B
2	B	701	ATP	O4'-C4'-C5'-O5'

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	701	ATP	2	0
4	B	703	PO4	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	6
1	B	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	50:GLU	C	51:GLN	N	2.12
1	A	57:ALA	C	58:GLN	N	1.87
1	A	497:VAL	C	498:ASN	N	1.70
1	B	122:PHE	C	123:ALA	N	1.63

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	129:SER	C	130:ASP	N	1.11
1	A	496:LEU	C	497:VAL	N	1.04
1	B	128:THR	C	129:SER	N	0.98
1	A	128:THR	C	129:SER	N	0.80

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	662/705 (93%)	1.09	77 (11%) 9 6	11, 32, 56, 83	0
1	B	659/705 (93%)	1.10	72 (10%) 10 7	15, 30, 51, 77	0
All	All	1321/1410 (93%)	1.10	149 (11%) 10 7	11, 31, 54, 83	0

All (149) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	10	PRO	7.3
1	A	672	LYS	4.8
1	A	547	LYS	4.1
1	A	96	GLY	4.1
1	B	58	GLN	4.0
1	B	56	SER	4.0
1	A	645	ASP	3.9
1	B	55	GLU	3.9
1	B	128	THR	3.9
1	B	525	GLU	3.8
1	B	127	ASN	3.8
1	A	600	GLN	3.7
1	B	253	ASN	3.7
1	B	124	ALA	3.7
1	A	56	SER	3.7
1	B	600	GLN	3.6
1	A	55	GLU	3.6
1	A	375	GLY	3.6
1	A	548	TYR	3.6
1	B	53	GLY	3.6
1	A	51	GLN	3.6
1	B	91	GLU	3.5
1	A	146	GLU	3.5
1	B	130	ASP	3.5

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Mol	Chain	Res	Type	RSRZ
1	A	126	VAL	3.5
1	A	127	ASN	3.4
1	B	54	ARG	3.4
1	B	90	GLY	3.3
1	B	125	GLY	3.3
1	B	109	THR	3.2
1	B	60	GLN	3.2
1	A	552	GLU	3.2
1	A	655	THR	3.2
1	A	41	ASP	3.1
1	A	226	ASP	3.1
1	B	110	HIS	3.1
1	B	391	ASP	3.1
1	A	53	GLY	3.0
1	B	24	MET	3.0
1	B	643	PRO	3.0
1	B	621	GLU	3.0
1	B	145	ARG	3.0
1	A	39	GLY	2.9
1	A	642	HIS	2.9
1	A	670	VAL	2.9
1	A	433	LYS	2.9
1	A	120	ARG	2.8
1	B	610	ALA	2.7
1	A	114	GLY	2.7
1	A	644	CYS	2.7
1	B	80	HIS	2.6
1	B	254	LYS	2.6
1	B	399	THR	2.6
1	B	398	PRO	2.6
1	B	350	GLY	2.6
1	A	658	ALA	2.6
1	A	11	THR	2.6
1	B	115	LYS	2.6
1	B	142	ASP	2.6
1	A	558	GLU	2.6
1	A	551	LYS	2.6
1	B	199	GLY	2.6
1	B	196	ASP	2.6
1	B	93	PRO	2.6
1	A	24	MET	2.6
1	A	628	TYR	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	577	GLU	2.5
1	A	643	PRO	2.5
1	B	69	LYS	2.5
1	B	232	LEU	2.5
1	A	413	GLU	2.5
1	B	250	THR	2.5
1	A	40	ALA	2.5
1	B	521	ARG	2.4
1	A	130	ASP	2.4
1	B	552	GLU	2.4
1	B	642	HIS	2.4
1	A	554	GLU	2.4
1	B	71	ALA	2.4
1	A	616	ARG	2.4
1	B	433	LYS	2.4
1	A	318	GLY	2.4
1	A	602	GLY	2.4
1	A	65	THR	2.4
1	A	485	LEU	2.4
1	B	374	ASP	2.4
1	A	668	ARG	2.4
1	B	524	ASN	2.4
1	A	651	PRO	2.4
1	A	545	ARG	2.3
1	B	523	GLU	2.3
1	A	442	GLY	2.3
1	A	626	ASP	2.3
1	B	114	GLY	2.3
1	B	112	ASN	2.3
1	B	308	THR	2.3
1	B	425	THR	2.3
1	A	498	ASN	2.3
1	B	503	PHE	2.3
1	A	221	TRP	2.3
1	B	673	GLU	2.3
1	A	129	SER	2.3
1	B	617	ASP	2.2
1	A	170	THR	2.2
1	A	107	SER	2.2
1	A	67	GLU	2.2
1	A	52	CYS	2.2
1	A	182	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	656	LEU	2.2
1	A	124	ALA	2.2
1	A	481	ASN	2.2
1	B	121	GLN	2.2
1	B	103	PRO	2.2
1	B	200	GLU	2.2
1	B	233	ASP	2.2
1	B	206	LEU	2.2
1	A	54	ARG	2.2
1	B	78	LEU	2.2
1	B	608	PRO	2.1
1	A	553	THR	2.1
1	B	241	ASP	2.1
1	B	59	ALA	2.1
1	A	657	ILE	2.1
1	B	626	ASP	2.1
1	B	435	GLY	2.1
1	A	581	GLY	2.1
1	A	13	LEU	2.1
1	A	652	GLU	2.1
1	B	252	ARG	2.1
1	A	521	ARG	2.1
1	A	441	VAL	2.1
1	A	79	GLU	2.1
1	A	128	THR	2.1
1	A	621	GLU	2.1
1	A	26	ALA	2.1
1	A	278	LYS	2.1
1	B	378	ASP	2.1
1	A	500	ASP	2.1
1	B	38	ALA	2.1
1	B	163	GLN	2.1
1	B	402	GLN	2.0
1	A	110	HIS	2.0
1	B	546	SER	2.0
1	A	168	GLN	2.0
1	A	307	MET	2.0
1	B	598	ARG	2.0
1	A	598	ARG	2.0
1	B	500	ASP	2.0
1	A	117	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

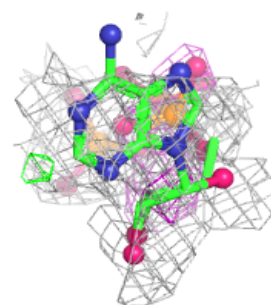
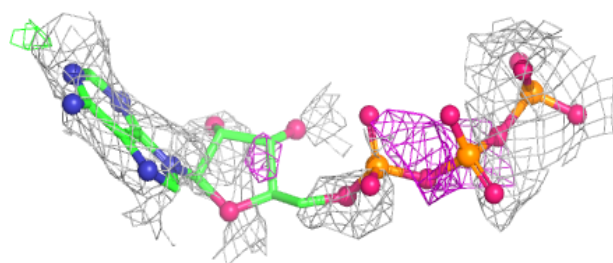
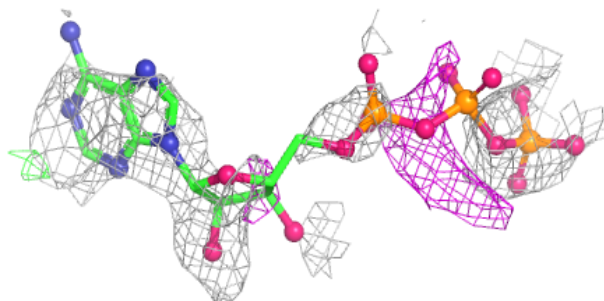
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	ATP	B	701	31/31	0.58	0.22	48,79,158,168	0
4	PO4	A	705	5/5	0.76	0.18	39,42,49,53	0
4	PO4	A	703	5/5	0.82	0.18	38,39,40,44	0
3	SO4	A	702	5/5	0.83	0.21	31,32,36,36	0
5	MG	A	701	1/1	0.84	0.26	18,18,18,18	0
3	SO4	B	702	5/5	0.88	0.19	36,36,43,45	0
4	PO4	B	703	5/5	0.92	0.13	37,38,41,43	0
4	PO4	A	704	5/5	0.93	0.12	31,32,33,34	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 ATP B 701:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.