



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2017 – 07:09 PM EDT

PDB ID : 5GOZ
Title : Crystal structure of ZIKV NS5 Methyltransferase in complex with GTP and SAH
Authors : Zhang, C.; Jin, T.
Deposited on : unknown
Resolution : 2.05 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20030345
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20030345

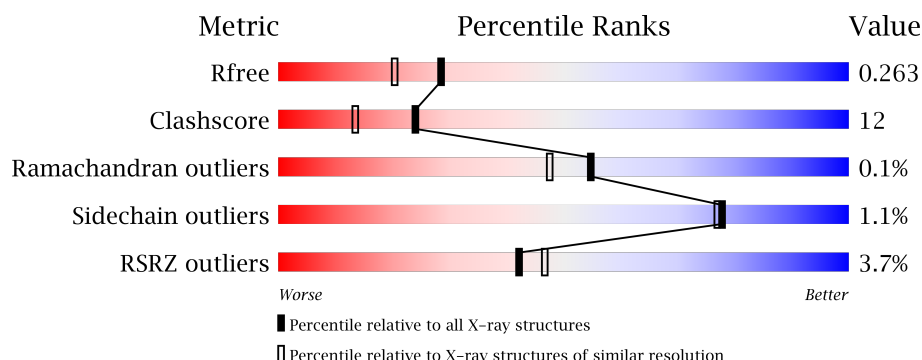
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.05 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}	100719	1316 (2.04-2.04)
Clashscore	112137	1394 (2.04-2.04)
Ramachandran outliers	110173	1383 (2.04-2.04)
Sidechain outliers	110143	1383 (2.04-2.04)
RSRZ outliers	101464	1319 (2.04-2.04)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	269	<div> <div>79%</div> <div>18%</div> <div>.</div> </div>
1	B	269	<div> <div>4%</div> <div>75%</div> <div>22%</div> <div>.</div> </div>
1	C	269	<div> <div>6%</div> <div>68%</div> <div>28%</div> <div>..</div> </div>

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 6543 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-directed RNA polymerase NS5.

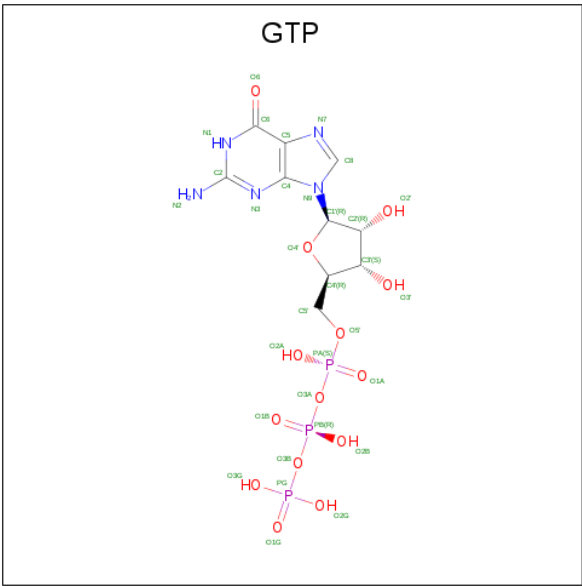
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	262	Total	C	N	O	S	0	2	0
			2057	1285	376	382	14			
1	B	261	Total	C	N	O	S	0	0	0
			2033	1271	368	380	14			
1	C	261	Total	C	N	O	S	0	0	0
			2033	1271	368	380	14			

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	expression tag	UNP H9A910
A	1	SER	-	expression tag	UNP H9A910
A	2	VAL	-	expression tag	UNP H9A910
A	3	ASP	-	expression tag	UNP H9A910
A	266	ALA	-	expression tag	UNP H9A910
A	267	ALA	-	expression tag	UNP H9A910
A	268	SER	-	expression tag	UNP H9A910
B	0	GLY	-	expression tag	UNP H9A910
B	1	SER	-	expression tag	UNP H9A910
B	2	VAL	-	expression tag	UNP H9A910
B	3	ASP	-	expression tag	UNP H9A910
B	266	ALA	-	expression tag	UNP H9A910
B	267	ALA	-	expression tag	UNP H9A910
B	268	SER	-	expression tag	UNP H9A910
C	0	GLY	-	expression tag	UNP H9A910
C	1	SER	-	expression tag	UNP H9A910
C	2	VAL	-	expression tag	UNP H9A910
C	3	ASP	-	expression tag	UNP H9A910
C	266	ALA	-	expression tag	UNP H9A910
C	267	ALA	-	expression tag	UNP H9A910
C	268	SER	-	expression tag	UNP H9A910

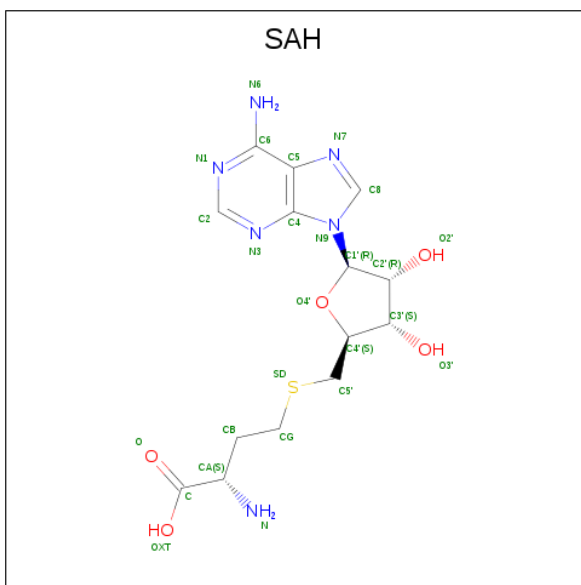
- Molecule 2 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula:

C₁₀H₁₆N₅O₁₄P₃).



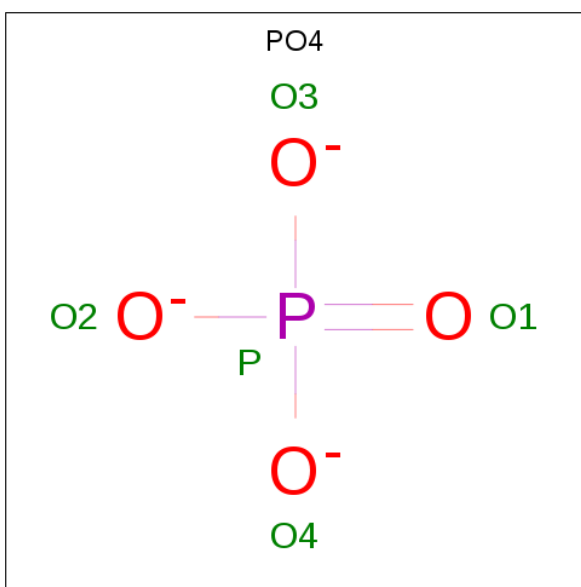
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
2	B	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
2	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
2	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

- Molecule 3 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula: C₁₄H₂₀N₆O₅S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
3	B	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
3	C	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



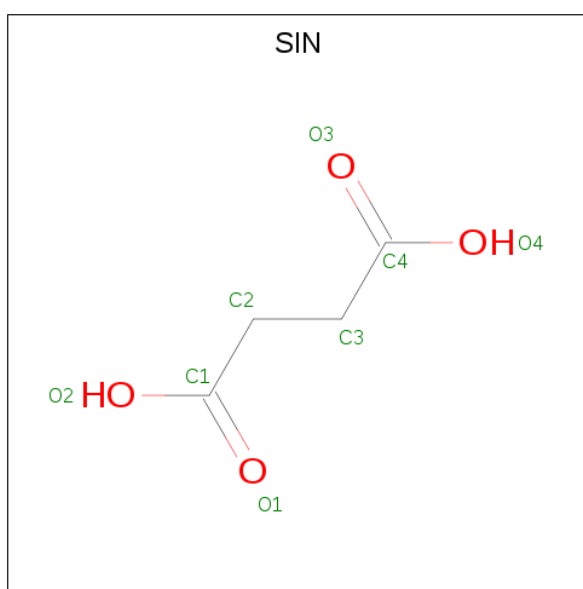
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	P	0	0
			5	4	1		

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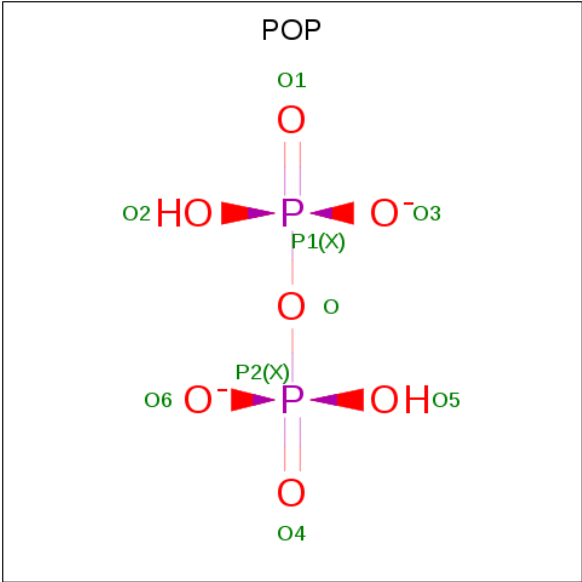
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	P	0	0
			5	4	1		
4	B	1	Total	O	P	0	0
			5	4	1		
4	B	1	Total	O	P	0	0
			5	4	1		
4	C	1	Total	O	P	0	0
			5	4	1		

- Molecule 5 is SUCCINIC ACID (three-letter code: SIN) (formula: C₄H₆O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	C	O	0	0
			8	4	4		
5	B	1	Total	C	O	0	0
			8	4	4		
5	C	1	Total	C	O	0	0
			8	4	4		

- Molecule 6 is PYROPHOSPHATE 2- (three-letter code: POP) (formula: H₂O₇P₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	C	1	Total	O	P	0	0
			9	7	2		

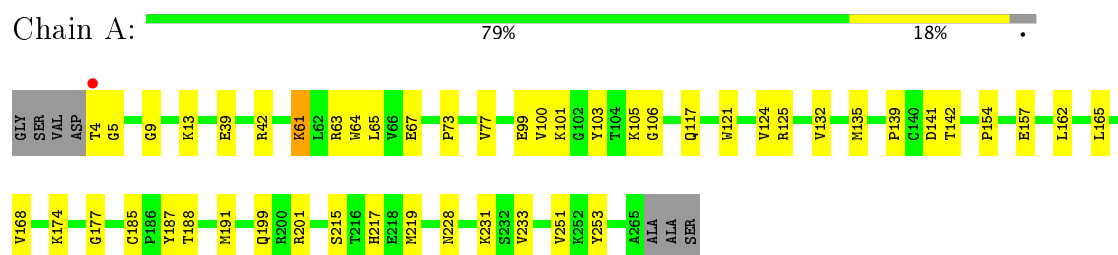
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	70	Total	O	0	0
			70	70		
7	B	54	Total	O	0	0
			54	54		
7	C	32	Total	O	0	0
			32	32		

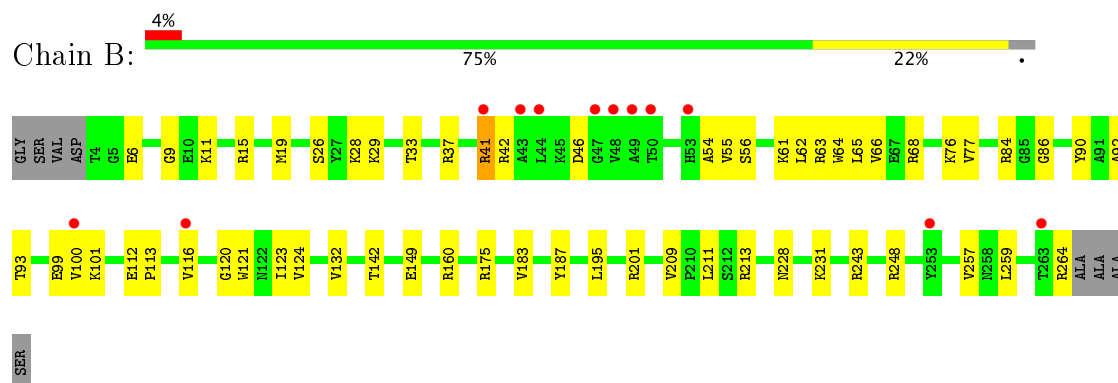
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

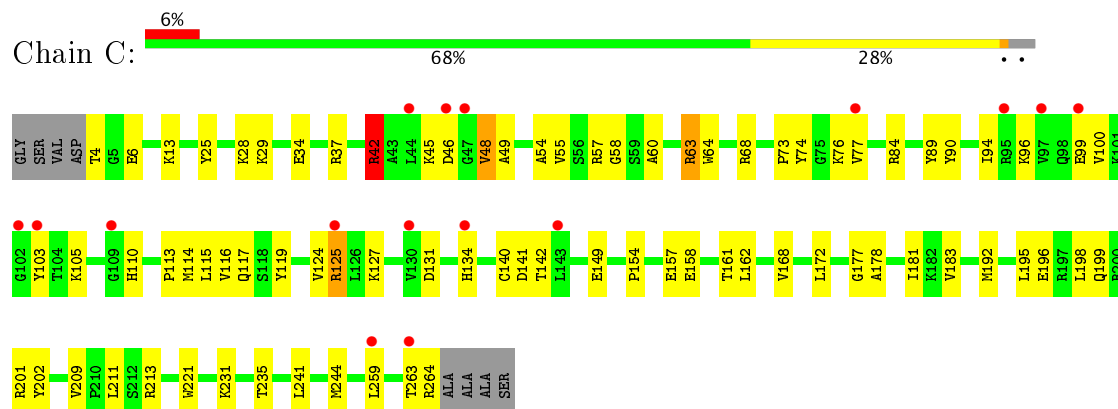
• Molecule 1: RNA-directed RNA polymerase NS5



• Molecule 1: RNA-directed RNA polymerase NS5



• Molecule 1: RNA-directed RNA polymerase NS5



4 Data and refinement statistics

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	123.79Å 123.79Å 120.14Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.52 – 2.05 40.52 – 2.05	Depositor EDS
% Data completeness (in resolution range)	99.8 (40.52-2.05) 99.8 (40.52-2.05)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.18 (at 2.05Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.236 , 0.263 0.236 , 0.263	Depositor DCC
R_{free} test set	1992 reflections (3.05%)	DCC
Wilson B-factor (Å ²)	43.2	Xtriage
Anisotropy	0.092	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 29.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	0.396 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6543	wwPDB-VP
Average B, all atoms (Å ²)	56.0	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 46.61 % 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 1.1172e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹ Intensities estimated from amplitudes.

² Theoretical 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, PO4, SAH, SIN, POP

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	0.28	0/2100	0.43	0/2829
1	B	0.31	0/2073	0.51	0/2793
1	C	0.33	0/2073	0.53	1/2793 (0.0%)
All	All	0.31	0/6246	0.49	1/8415 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	42	ARG	NE-CZ-NH2	6.08	123.34	120.30

There are no chirality outliers.

There are no planarity outliers.

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	2057	0	2066	34	0
1	B	2033	0	2034	52	0
1	C	2033	0	2036	73	0
2	A	32	0	12	1	0
2	B	32	0	12	1	0
2	C	64	0	24	4	0
3	A	26	0	19	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	26	0	19	1	0
3	C	26	0	19	1	0
4	A	10	0	0	0	0
4	B	10	0	0	0	0
4	C	5	0	0	1	0
5	B	16	0	8	1	0
5	C	8	0	4	2	0
6	C	9	0	0	0	0
7	A	70	0	0	2	0
7	B	54	0	0	1	0
7	C	32	0	0	1	0
All	All	6543	0	6253	158	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 12.

All (158) 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:B:175:ARG:HH12	1:B:201:ARG:NH1	1.30	1.25
1:B:175:ARG:NH1	1:B:201:ARG:NH1	2.08	1.01
1:C:96:LYS:HZ2	5:C:304:SIN:C4	1.86	0.88
1:B:175:ARG:HH12	1:B:201:ARG:HH11	1.21	0.84
1:C:76:LYS:HG3	1:C:140:CYS:HA	1.62	0.81
1:C:42:ARG:HH12	1:C:46:ASP:N	1.80	0.80
1:A:99:GLU:OE2	1:A:125:ARG:NH1	2.14	0.80
1:A:4:THR:HG22	1:A:5:GLY:H	1.47	0.77
1:B:175:ARG:NH1	1:B:201:ARG:HH12	1.81	0.74
1:C:37:ARG:NH1	1:C:54:ALA:O	2.19	0.74
1:C:100:VAL:HB	1:C:124:VAL:HG22	1.69	0.73
1:C:13:LYS:NZ	2:C:301:GTP:O3'	2.23	0.71
1:C:99:GLU:HG3	1:C:125:ARG:HH22	1.55	0.69
1:B:175:ARG:NH2	1:B:201:ARG:HH12	1.92	0.68
1:A:63:ARG:O	1:A:67:GLU:HG2	1.94	0.68
1:B:64:TRP:HE3	1:B:65:LEU:HD22	1.57	0.68
1:B:175:ARG:HH22	1:B:201:ARG:HH22	1.43	0.67
1:C:84:ARG:HD3	1:C:114:MET:SD	2.34	0.67
1:B:175:ARG:CZ	1:B:201:ARG:HH12	2.10	0.64
1:B:175:ARG:HH22	1:B:201:ARG:HH12	1.45	0.64
1:C:63:ARG:HD2	1:C:64:TRP:N	2.12	0.63
1:C:99:GLU:CG	1:C:125:ARG:HH22	2.12	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:60:ALA:O	1:C:63:ARG:NE	2.32	0.62
1:B:228:ASN:HB3	1:B:231:LYS:HB3	1.82	0.61
1:C:89:TYR:HE2	1:C:116:VAL:HG22	1.65	0.61
1:B:175:ARG:HH22	1:B:201:ARG:NH2	1.98	0.61
1:B:92:ALA:HB1	1:B:120:GLY:O	2.00	0.61
1:A:13:LYS:HG2	1:A:154:PRO:HG3	1.83	0.61
1:C:84:ARG:HA	1:C:113:PRO:HA	1.82	0.61
1:B:175:ARG:HH22	1:B:201:ARG:NH1	2.00	0.60
1:A:139:PRO:HA	1:A:174:LYS:HB3	1.84	0.60
1:C:42:ARG:NH1	1:C:46:ASP:N	2.47	0.60
1:B:77:VAL:HB	1:B:100:VAL:HG22	1.83	0.59
1:C:172:LEU:HB2	1:C:202:TYR:HE2	1.68	0.59
1:C:131:ASP:HB3	1:C:134:HIS:CE1	2.37	0.59
1:C:42:ARG:CZ	1:C:45:LYS:HB3	2.33	0.59
1:C:96:LYS:NZ	5:C:304:SIN:O3	2.34	0.58
1:B:42:ARG:O	1:B:46:ASP:HB3	2.04	0.58
1:B:175:ARG:CZ	1:B:201:ARG:NH1	2.67	0.57
1:C:77:VAL:HG23	1:C:142:THR:OG1	2.05	0.57
1:B:259:LEU:H	1:B:259:LEU:HD12	1.69	0.57
1:C:89:TYR:CE2	1:C:116:VAL:HG22	2.39	0.57
1:C:76:LYS:HG2	1:C:141:ASP:HB2	1.88	0.56
1:C:213:ARG:NH1	4:C:306:PO4:O2	2.38	0.56
1:A:201:ARG:NH2	5:B:304:SIN:H21	2.21	0.55
1:B:15:ARG:NH2	7:B:409:HOH:O	2.36	0.55
1:A:73:PRO:HA	1:A:142:THR:HG21	1.89	0.54
1:C:231:LYS:O	1:C:235:THR:HG22	2.06	0.54
1:C:158:GLU:O	1:C:162:LEU:HD22	2.08	0.54
1:C:49:ALA:HB1	1:C:117:GLN:N	2.23	0.54
1:C:49:ALA:HB1	1:C:117:GLN:H	1.73	0.53
1:A:99:GLU:CD	1:A:125:ARG:HH12	2.11	0.53
1:C:13:LYS:HG2	1:C:154:PRO:HG3	1.89	0.53
1:C:42:ARG:HH12	1:C:46:ASP:CA	2.20	0.53
1:C:76:LYS:CG	1:C:141:ASP:H	2.21	0.53
1:A:199:GLN:NE2	7:A:401:HOH:O	2.19	0.53
1:C:28:LYS:HE3	2:C:301:GTP:O3G	2.09	0.53
1:C:77:VAL:HG12	1:C:99:GLU:O	2.09	0.53
1:A:61:LYS:NZ	7:A:413:HOH:O	2.39	0.52
1:C:55:VAL:O	1:C:84:ARG:NH2	2.43	0.52
1:B:121:TRP:O	1:B:124:VAL:N	2.30	0.52
1:B:248:ARG:N	1:B:248:ARG:HD2	2.24	0.52
1:C:42:ARG:NH2	1:C:45:LYS:HB3	2.25	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:90:TYR:O	1:B:93:THR:OG1	2.20	0.51
1:C:168:VAL:HG11	1:C:181:ILE:HG12	1.93	0.51
1:C:37:ARG:HD2	1:C:57:ARG:HG2	1.92	0.51
1:A:39:GLU:HA	1:A:42:ARG:HE	1.76	0.51
1:A:39:GLU:HA	1:A:42:ARG:NE	2.27	0.50
1:A:100:VAL:HB	1:A:124:VAL:HG22	1.93	0.50
1:B:77:VAL:HG22	1:B:142:THR:HB	1.94	0.49
1:A:228:ASN:HB3	1:A:231:LYS:HB3	1.94	0.49
1:B:28:LYS:HD2	1:B:213:ARG:NH1	2.28	0.49
1:B:19:MET:O	2:B:301:GTP:N2	2.44	0.49
1:C:142:THR:HA	1:C:178:ALA:O	2.13	0.49
1:C:264:ARG:HA	1:C:264:ARG:HD2	1.63	0.49
1:B:26:SER:HB2	1:B:248:ARG:HG2	1.96	0.48
1:C:46:ASP:HB3	1:C:48:VAL:HG23	1.94	0.48
1:C:74:TYR:HB2	1:C:96:LYS:HG2	1.95	0.48
1:B:9:GLY:HA3	1:B:187:TYR:HB2	1.94	0.48
1:B:37:ARG:NH2	1:B:54:ALA:HB3	2.29	0.48
1:C:73:PRO:HA	1:C:142:THR:HG21	1.96	0.48
1:A:101:LYS:HE3	1:A:103:TYR:OH	2.14	0.47
1:A:4:THR:HG22	1:A:5:GLY:N	2.24	0.47
1:B:55:VAL:HG12	1:B:86:GLY:HA2	1.96	0.47
1:B:99:GLU:HA	1:B:123:ILE:HB	1.97	0.47
1:C:201:ARG:C	1:C:202:TYR:HD1	2.17	0.47
1:C:29:LYS:HE3	1:C:213:ARG:NH1	2.30	0.47
1:B:46:ASP:OD2	1:B:46:ASP:C	2.53	0.47
1:C:90:TYR:HD1	1:C:259:LEU:HD11	1.80	0.47
1:B:37:ARG:O	1:B:41:ARG:HD2	2.15	0.47
1:B:56:SER:HB3	1:B:84:ARG:HD2	1.97	0.47
1:C:241:LEU:HD23	1:C:244:MET:HE1	1.96	0.47
1:B:149:GLU:HG3	1:B:160:ARG:NH2	2.31	0.46
1:A:105:LYS:HG2	1:A:106:GLY:O	2.15	0.46
1:B:175:ARG:HH22	1:B:201:ARG:CZ	2.27	0.46
1:B:62:LEU:O	1:B:66:VAL:HG23	2.15	0.46
1:C:263:THR:O	1:C:264:ARG:HB2	2.16	0.46
1:C:28:LYS:HE3	2:C:301:GTP:PG	2.56	0.46
1:C:28:LYS:HG3	1:C:29:LYS:HG3	1.98	0.46
1:B:183:VAL:HG11	1:B:195:LEU:HD11	1.98	0.46
1:A:77:VAL:HG22	1:A:142:THR:OG1	2.15	0.46
1:A:132:VAL:HG13	3:A:302:SAH:H2	1.99	0.45
1:A:188:THR:OG1	1:A:191:MET:HG2	2.17	0.45
1:C:89:TYR:OH	1:C:115:LEU:HA	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:121:TRP:N	1:B:121:TRP:CD1	2.79	0.45
1:A:141:ASP:O	1:A:177:GLY:N	2.48	0.45
1:B:6:GLU:HG2	1:B:11:LYS:HG3	1.98	0.45
1:C:4:THR:N	1:C:6:GLU:OE1	2.50	0.45
1:C:141:ASP:O	1:C:177:GLY:N	2.50	0.44
1:C:58:GLY:HA3	3:C:303:SAH:O	2.16	0.44
1:C:172:LEU:HD13	1:C:202:TYR:HD2	1.82	0.44
1:C:149:GLU:OE2	2:C:302:GTP:O3G	2.36	0.44
1:C:172:LEU:HB2	1:C:202:TYR:CE2	2.51	0.44
1:C:119:TYR:OH	1:C:264:ARG:HG2	2.18	0.44
1:C:34:GLU:HG3	1:C:57:ARG:HH12	1.83	0.44
1:A:219:MET:HE1	1:A:233:VAL:HG22	1.99	0.44
1:A:162:LEU:HB3	1:B:68:ARG:O	2.18	0.44
1:A:165:LEU:HA	1:A:168:VAL:HG22	1.99	0.43
1:B:264:ARG:HB3	1:B:264:ARG:HE	1.59	0.43
1:C:76:LYS:HG3	1:C:141:ASP:H	1.83	0.43
1:C:192:MET:O	1:C:196:GLU:HG3	2.18	0.43
1:A:9:GLY:HA3	1:A:187:TYR:HB2	2.01	0.43
1:C:76:LYS:HG2	1:C:141:ASP:H	1.82	0.43
1:C:209:VAL:HG12	1:C:211:LEU:H	1.83	0.43
1:B:175:ARG:HA	1:B:175:ARG:HD2	1.68	0.43
1:C:68:ARG:NH1	7:C:406:HOH:O	2.40	0.43
1:B:55:VAL:HG23	1:B:116:VAL:HG21	2.02	0.42
1:B:175:ARG:NH2	1:B:201:ARG:NH1	2.57	0.42
1:C:183:VAL:HG11	1:C:195:LEU:HD11	2.01	0.42
1:C:25:TYR:HA	1:C:28:LYS:HD2	2.00	0.42
1:C:73:PRO:HG2	1:C:94:ILE:HD12	2.00	0.42
1:B:33:THR:O	1:B:211:LEU:HA	2.19	0.42
1:C:42:ARG:NH1	1:C:46:ASP:CB	2.83	0.42
1:A:157:GLU:HB3	1:A:185:CYS:HB2	2.02	0.42
1:B:11:LYS:HE2	1:B:11:LYS:HB3	1.68	0.42
1:B:63:ARG:NE	1:B:257:VAL:HB	2.34	0.42
1:A:132:VAL:HG12	1:A:135:MET:HE2	2.02	0.42
1:A:217:HIS:O	1:A:217:HIS:ND1	2.51	0.42
1:B:132:VAL:HG13	3:B:302:SAH:H2	2.02	0.41
1:C:105:LYS:HD3	1:C:110:HIS:CD2	2.55	0.41
1:A:99:GLU:CG	1:A:125:ARG:HH12	2.33	0.41
1:A:64:TRP:CZ3	1:A:65:LEU:HD23	2.56	0.41
1:C:157:GLU:O	1:C:161:THR:OG1	2.33	0.41
1:C:162:LEU:HD22	1:C:162:LEU:H	1.85	0.41
1:A:215:SER:OG	2:A:301:GTP:O2B	2.23	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:61:LYS:HG3	1:B:209:VAL:HG11	2.01	0.41
1:B:29:LYS:HG2	1:B:213:ARG:HG2	2.02	0.41
1:C:201:ARG:HG2	1:C:202:TYR:CE1	2.55	0.41
1:B:76:LYS:NZ	1:B:101:LYS:HD3	2.36	0.41
1:A:77:VAL:HB	1:A:100:VAL:HG22	2.03	0.41
1:A:251:VAL:HB	1:A:253:TYR:CZ	2.56	0.41
1:B:175:ARG:HH11	1:B:175:ARG:HD3	1.63	0.41
1:C:42:ARG:HE	1:C:42:ARG:C	2.25	0.41
1:A:117:GLN:HB3	1:A:121:TRP:CD1	2.56	0.40
1:B:112:GLU:OE1	1:B:113:PRO:HD2	2.21	0.40
1:C:198:LEU:HB3	1:C:221:TRP:CH2	2.56	0.40
1:C:37:ARG:NH1	1:C:54:ALA:C	2.73	0.40
1:C:103:TYR:CE1	1:C:127:LYS:HE2	2.56	0.40

There are no symmetry-related clashes.

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	262/269 (97%)	254 (97%)	8 (3%)	0	100	100
1	B	259/269 (96%)	244 (94%)	15 (6%)	0	100	100
1	C	259/269 (96%)	245 (95%)	13 (5%)	1 (0%)	38	27
All	All	780/807 (97%)	743 (95%)	36 (5%)	1 (0%)	55	47

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	48	VAL

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	219/221 (99%)	218 (100%)	1 (0%)	91	91
1	B	217/221 (98%)	215 (99%)	2 (1%)	82	82
1	C	217/221 (98%)	213 (98%)	4 (2%)	64	60
All	All	653/663 (98%)	646 (99%)	7 (1%)	78	77

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	61	LYS
1	B	41	ARG
1	B	243	ARG
1	C	42	ARG
1	C	63	ARG
1	C	125	ARG
1	C	199	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	17	ASN
1	B	98	GLN
1	B	217	HIS
1	C	217	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

16 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	GTP	A	301	-	27,34,34	4.34	15 (55%)	27,54,54	3.93	8 (29%)
3	SAH	A	302	-	20,28,28	1.14	2 (10%)	20,40,40	2.48	2 (10%)
4	PO4	A	303	-	4,4,4	0.76	0	6,6,6	0.39	0
4	PO4	A	304	-	4,4,4	0.75	0	6,6,6	0.38	0
2	GTP	B	301	-	27,34,34	4.37	15 (55%)	27,54,54	3.98	7 (25%)
3	SAH	B	302	-	20,28,28	1.17	2 (10%)	20,40,40	2.56	2 (10%)
5	SIN	B	303	-	1,7,7	0.10	0	2,8,8	1.86	1 (50%)
5	SIN	B	304	-	1,7,7	0.17	0	2,8,8	3.45	1 (50%)
4	PO4	B	305	1	4,4,4	0.74	0	6,6,6	0.41	0
4	PO4	B	306	-	4,4,4	0.76	0	6,6,6	0.42	0
2	GTP	C	301	-	27,34,34	4.14	15 (55%)	27,54,54	3.50	10 (37%)
2	GTP	C	302	-	27,34,34	4.31	15 (55%)	27,54,54	4.81	7 (25%)
3	SAH	C	303	-	20,28,28	1.15	2 (10%)	20,40,40	2.44	2 (10%)
5	SIN	C	304	-	1,7,7	0.10	0	2,8,8	1.79	0
6	POP	C	305	-	8,8,8	0.72	0	8,13,13	0.42	0
4	PO4	C	306	-	4,4,4	0.78	0	6,6,6	0.38	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	GTP	A	301	-	-	0/18/38/38	0/3/3/3
3	SAH	A	302	-	-	0/7/31/31	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PO4	A	303	-	-	0/0/0/0	0/0/0/0
4	PO4	A	304	-	-	0/0/0/0	0/0/0/0
2	GTP	B	301	-	-	0/18/38/38	0/3/3/3
3	SAH	B	302	-	-	0/7/31/31	0/3/3/3
5	SIN	B	303	-	-	0/1/5/5	0/0/0/0
5	SIN	B	304	-	-	0/1/5/5	0/0/0/0
4	PO4	B	305	1	-	0/0/0/0	0/0/0/0
4	PO4	B	306	-	-	0/0/0/0	0/0/0/0
2	GTP	C	301	-	-	0/18/38/38	0/3/3/3
2	GTP	C	302	-	-	0/18/38/38	0/3/3/3
3	SAH	C	303	-	-	0/7/31/31	0/3/3/3
5	SIN	C	304	-	-	0/1/5/5	0/0/0/0
6	POP	C	305	-	-	0/6/6/6	0/0/0/0
4	PO4	C	306	-	-	0/0/0/0	0/0/0/0

All (66) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	GTP	C2'-C3'	-10.96	1.24	1.53
2	B	301	GTP	C2'-C3'	-10.91	1.24	1.53
2	C	301	GTP	C2'-C3'	-10.86	1.24	1.53
2	C	302	GTP	C2'-C3'	-10.74	1.25	1.53
2	A	301	GTP	O4'-C4'	-6.46	1.30	1.45
2	C	301	GTP	O4'-C4'	-6.41	1.30	1.45
2	B	301	GTP	O4'-C4'	-6.37	1.30	1.45
2	C	302	GTP	O4'-C4'	-6.31	1.30	1.45
2	C	301	GTP	O6-C6	-2.57	1.18	1.24
2	B	301	GTP	O6-C6	-2.33	1.18	1.24
2	A	301	GTP	O6-C6	-2.23	1.18	1.24
2	C	301	GTP	C5-C4	-2.21	1.35	1.40
2	C	302	GTP	O6-C6	-2.16	1.19	1.24
2	A	301	GTP	C2-N3	2.04	1.45	1.35
2	B	301	GTP	C2-N3	2.14	1.46	1.35
2	B	301	GTP	O3'-C3'	2.19	1.48	1.43
2	C	302	GTP	O3'-C3'	2.22	1.48	1.43
2	A	301	GTP	O3'-C3'	2.22	1.48	1.43
2	C	302	GTP	C2-N3	2.25	1.46	1.35
2	C	301	GTP	O3'-C3'	2.31	1.48	1.43
3	B	302	SAH	C2-N1	2.34	1.38	1.33
3	A	302	SAH	C2-N1	2.35	1.38	1.33
3	C	303	SAH	C2-N1	2.39	1.38	1.33
2	C	301	GTP	PG-O3B	2.87	1.64	1.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301	GTP	O2'-C2'	3.13	1.50	1.43
2	B	301	GTP	O2'-C2'	3.16	1.50	1.43
2	A	301	GTP	PG-O3B	3.17	1.65	1.60
2	A	301	GTP	O2'-C2'	3.17	1.50	1.43
2	B	301	GTP	PG-O3B	3.23	1.65	1.60
2	C	302	GTP	PG-O3B	3.25	1.65	1.60
2	C	302	GTP	O2'-C2'	3.33	1.50	1.43
3	B	302	SAH	C2-N3	3.61	1.38	1.32
3	A	302	SAH	C2-N3	3.63	1.38	1.32
3	C	303	SAH	C2-N3	3.75	1.38	1.32
2	C	301	GTP	C2'-C1'	4.37	1.60	1.53
2	C	302	GTP	C2'-C1'	4.56	1.60	1.53
2	A	301	GTP	C2'-C1'	4.61	1.61	1.53
2	C	301	GTP	C2-N1	4.64	1.43	1.35
2	B	301	GTP	C2'-C1'	4.79	1.61	1.53
2	C	301	GTP	C2-N2	4.97	1.44	1.34
2	A	301	GTP	C2-N1	5.05	1.44	1.35
2	C	302	GTP	C2-N1	5.10	1.44	1.35
2	B	301	GTP	C2-N1	5.17	1.44	1.35
2	A	301	GTP	C3'-C4'	5.25	1.66	1.53
2	B	301	GTP	C3'-C4'	5.25	1.66	1.53
2	C	301	GTP	C6-N1	5.31	1.42	1.33
2	C	301	GTP	C3'-C4'	5.37	1.67	1.53
2	A	301	GTP	C2-N2	5.51	1.45	1.34
2	C	302	GTP	C3'-C4'	5.53	1.67	1.53
2	B	301	GTP	C2-N2	5.59	1.45	1.34
2	C	302	GTP	C2-N2	5.59	1.45	1.34
2	C	302	GTP	C6-N1	5.62	1.43	1.33
2	B	301	GTP	C6-N1	5.66	1.43	1.33
2	A	301	GTP	C6-N1	5.84	1.43	1.33
2	C	302	GTP	C6-C5	6.44	1.53	1.41
2	B	301	GTP	C6-C5	6.48	1.53	1.41
2	C	301	GTP	C6-C5	6.52	1.53	1.41
2	C	301	GTP	O4'-C1'	6.69	1.50	1.41
2	A	301	GTP	C6-C5	6.70	1.54	1.41
2	C	302	GTP	O4'-C1'	6.98	1.50	1.41
2	C	301	GTP	C4-N3	7.03	1.47	1.35
2	A	301	GTP	O4'-C1'	7.20	1.51	1.41
2	B	301	GTP	O4'-C1'	7.41	1.51	1.41
2	A	301	GTP	C4-N3	8.17	1.49	1.35
2	C	302	GTP	C4-N3	8.51	1.49	1.35
2	B	301	GTP	C4-N3	8.51	1.49	1.35

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	302	SAH	N3-C2-N1	-10.04	120.11	128.86
3	A	302	SAH	N3-C2-N1	-9.91	120.23	128.86
2	C	302	GTP	C4'-O4'-C1'	-9.86	99.28	109.77
3	C	303	SAH	N3-C2-N1	-9.76	120.36	128.86
2	A	301	GTP	C4'-O4'-C1'	-6.79	102.54	109.77
2	B	301	GTP	C4'-O4'-C1'	-6.26	103.11	109.77
2	C	301	GTP	C4'-O4'-C1'	-5.79	103.60	109.77
2	B	301	GTP	N3-C2-N1	-5.33	119.67	127.46
2	A	301	GTP	N3-C2-N1	-5.31	119.70	127.46
2	C	302	GTP	N3-C2-N1	-4.95	120.22	127.46
5	B	304	SIN	C2-C3-C4	-4.81	104.44	112.66
2	C	301	GTP	N3-C2-N1	-4.11	121.45	127.46
3	B	302	SAH	C5'-SD-CG	-3.89	90.50	102.29
3	A	302	SAH	C5'-SD-CG	-3.75	90.92	102.29
3	C	303	SAH	C5'-SD-CG	-3.14	92.77	102.29
2	C	301	GTP	C4-C5-N7	-2.75	106.75	109.41
2	C	302	GTP	C5-C6-N1	-2.64	119.72	123.48
2	C	301	GTP	C6-C5-C4	-2.58	118.28	120.84
2	C	301	GTP	C5-C6-N1	-2.52	119.90	123.48
2	A	301	GTP	C5-C6-N1	-2.47	119.96	123.48
2	B	301	GTP	C5-C6-N1	-2.34	120.15	123.48
2	A	301	GTP	C4-C5-N7	-2.11	107.37	109.41
5	B	303	SIN	C3-C2-C1	-2.06	109.14	112.66
2	C	301	GTP	C6-N1-C2	2.16	119.16	116.06
2	B	301	GTP	N2-C2-N1	2.17	120.71	117.24
2	C	302	GTP	C2'-C3'-C4'	2.24	106.97	102.62
2	C	301	GTP	C2'-C3'-C4'	2.32	107.14	102.62
2	A	301	GTP	N2-C2-N1	2.49	121.22	117.24
2	C	302	GTP	C6-N1-C2	2.56	119.74	116.06
2	C	301	GTP	C2-N3-C4	2.64	118.24	115.16
2	B	301	GTP	C6-N1-C2	2.67	119.89	116.06
2	A	301	GTP	C6-N1-C2	2.77	120.04	116.06
2	C	301	GTP	O2B-PB-O1B	3.92	132.57	112.28
2	C	302	GTP	C2-N3-C4	4.08	119.92	115.16
2	A	301	GTP	C2-N3-C4	4.15	120.01	115.16
2	B	301	GTP	C2-N3-C4	4.26	120.13	115.16
2	C	301	GTP	C1'-N9-C4	14.58	151.82	126.64
2	A	301	GTP	C1'-N9-C4	16.95	155.91	126.64
2	B	301	GTP	C1'-N9-C4	17.64	157.11	126.64
2	C	302	GTP	C1'-N9-C4	21.41	163.63	126.64

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

10 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	GTP	1	0
3	A	302	SAH	1	0
2	B	301	GTP	1	0
3	B	302	SAH	1	0
5	B	304	SIN	1	0
2	C	301	GTP	3	0
2	C	302	GTP	1	0
3	C	303	SAH	1	0
5	C	304	SIN	2	0
4	C	306	PO4	1	0

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	262/269 (97%)	0.20	1 (0%) 92 93	29, 46, 68, 94	0
1	B	261/269 (97%)	0.61	12 (4%) 33 36	32, 54, 94, 129	0
1	C	261/269 (97%)	0.69	16 (6%) 22 24	35, 61, 84, 111	0
All	All	784/807 (97%)	0.50	29 (3%) 42 47	29, 52, 83, 129	0

All (29) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	44	LEU	11.0
1	B	48	VAL	9.3
1	B	43	ALA	7.7
1	B	116	VAL	6.4
1	C	44	LEU	6.3
1	C	47	GLY	5.8
1	B	49	ALA	4.8
1	B	47	GLY	4.0
1	B	253	TYR	3.7
1	C	103	TYR	3.5
1	C	143	LEU	3.2
1	C	134	HIS	3.1
1	C	109	GLY	3.0
1	C	97	VAL	3.0
1	C	46	ASP	2.8
1	C	95	ARG	2.7
1	C	259	LEU	2.7
1	B	53	HIS	2.6
1	A	4	THR	2.6
1	B	41	ARG	2.5
1	B	263	THR	2.5
1	B	50	THR	2.4
1	C	125	ARG	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	263	THR	2.3
1	C	99	GLU	2.3
1	B	100	VAL	2.2
1	C	77	VAL	2.1
1	C	102	GLY	2.1
1	C	130	VAL	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å ²)	Q<0.9
2	GTP	B	301	32/32	0.88	0.15	1.05	36,42,101,106	0
2	GTP	C	302	32/32	0.74	0.18	0.85	73,99,133,135	0
2	GTP	C	301	32/32	0.87	0.17	0.63	46,62,145,148	0
6	POP	C	305	9/9	0.91	0.15	0.44	92,94,95,96	0
2	GTP	A	301	32/32	0.91	0.13	0.16	36,45,103,108	0
3	SAH	C	303	26/26	0.83	0.16	-0.14	51,77,79,80	0
3	SAH	B	302	26/26	0.88	0.15	-0.22	58,63,75,84	0
3	SAH	A	302	26/26	0.92	0.13	-0.46	48,55,65,74	0
4	PO4	B	306	5/5	0.94	0.12	-0.84	75,77,80,81	0
4	PO4	A	303	5/5	0.96	0.09	-2.48	64,65,66,66	0
4	PO4	B	305	5/5	0.65	0.15	-	81,93,95,96	0
4	PO4	C	306	5/5	0.88	0.09	-	96,97,97,97	0
4	PO4	A	304	5/5	0.90	0.12	-	90,91,92,92	0
5	SIN	B	303	8/8	0.76	0.17	-	75,78,79,79	0
5	SIN	C	304	8/8	0.59	0.30	-	82,83,86,86	0
5	SIN	B	304	8/8	0.55	0.28	-	73,78,82,84	0

6.5 Other polymers [i](#)

There are no such residues in this entry.