



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 2, 2024 – 11:15 PM EDT

PDB ID : 3A6P
Title : Crystal structure of Exportin-5:RanGTP:pre-miRNA complex
Authors : Okada, C.; Yamashita, E.; Lee, S.J.; Shibata, S.; Katahira, J.; Nakagawa, A.; Yoneda, Y.; Tsukihara, T.
Deposited on : 2009-09-07
Resolution : 2.92 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 : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

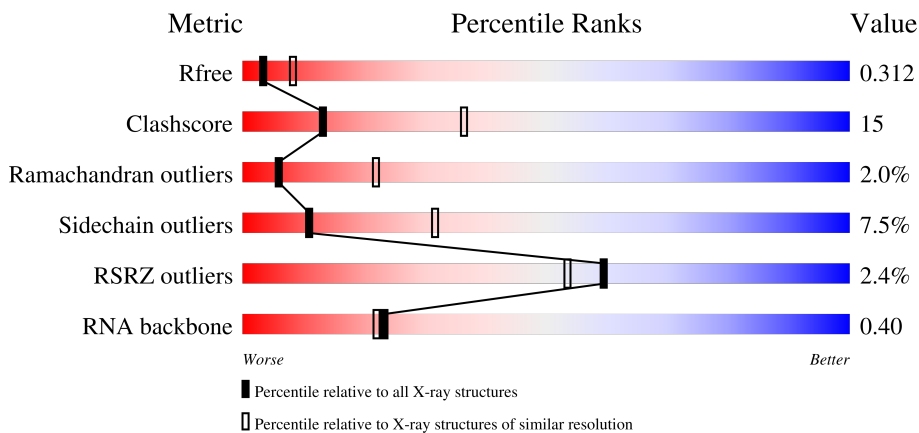
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.92 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2797 (2.94-2.90)
Clashscore	180529	3049 (2.94-2.90)
Ramachandran outliers	177936	2981 (2.94-2.90)
Sidechain outliers	177891	2983 (2.94-2.90)
RSRZ outliers	164620	2799 (2.94-2.90)
RNA backbone	3690	1073 (3.14-2.70)

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	1204	 58% 26% 11% 3%
1	F	1204	 60% 24% 11% 5% 3%
2	B	13	 100%
2	G	13	 92% 8%

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Mol	Chain	Length	Quality of chain
3	C	216	
3	H	216	
4	D	24	
4	I	24	
5	E	24	
5	J	24	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	GTP	C	1177	-	-	X	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 22052 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 Exportin-5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1072	8570	5480	1442	1574	74	0	0	0
1	F	1072	8570	5480	1442	1574	74	0	0	0

- Molecule 2 is a protein called 13-mer peptide.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	B	13	66	39	13	14	0	0	0
2	G	13	66	39	13	14	0	0	0

- Molecule 3 is a protein called GTP-binding nuclear protein Ran.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	170	1386	900	244	238	4	0	0	0
3	H	170	1386	900	244	238	4	0	0	0

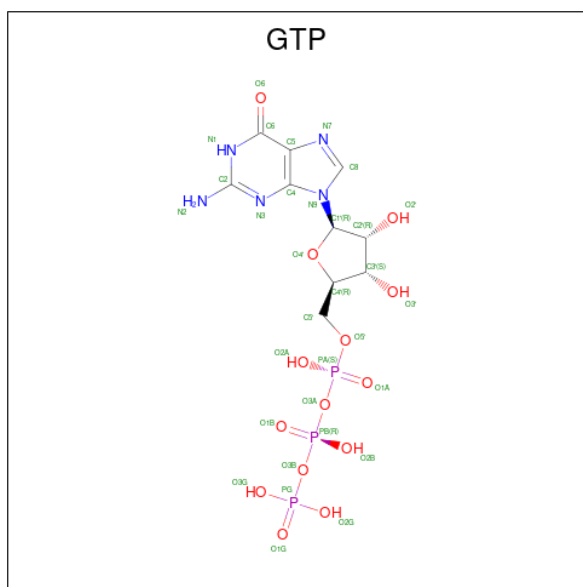
- Molecule 4 is a RNA chain called pre-microRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	D	22	466	211	88	147	20	0	0	0
4	I	22	466	211	88	147	20	0	0	0

- Molecule 5 is a RNA chain called pre-microRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	24	Total	C	N	O	P	0	0	0
			505	226	84	172	23			
5	J	24	Total	C	N	O	P	0	0	0
			505	226	84	172	23			

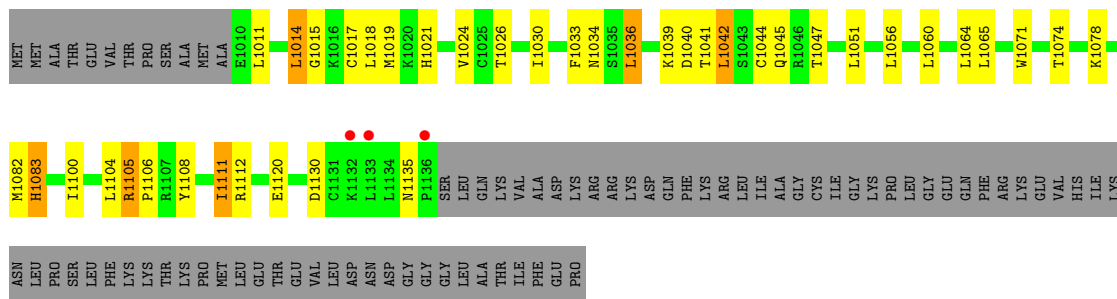
- Molecule 6 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



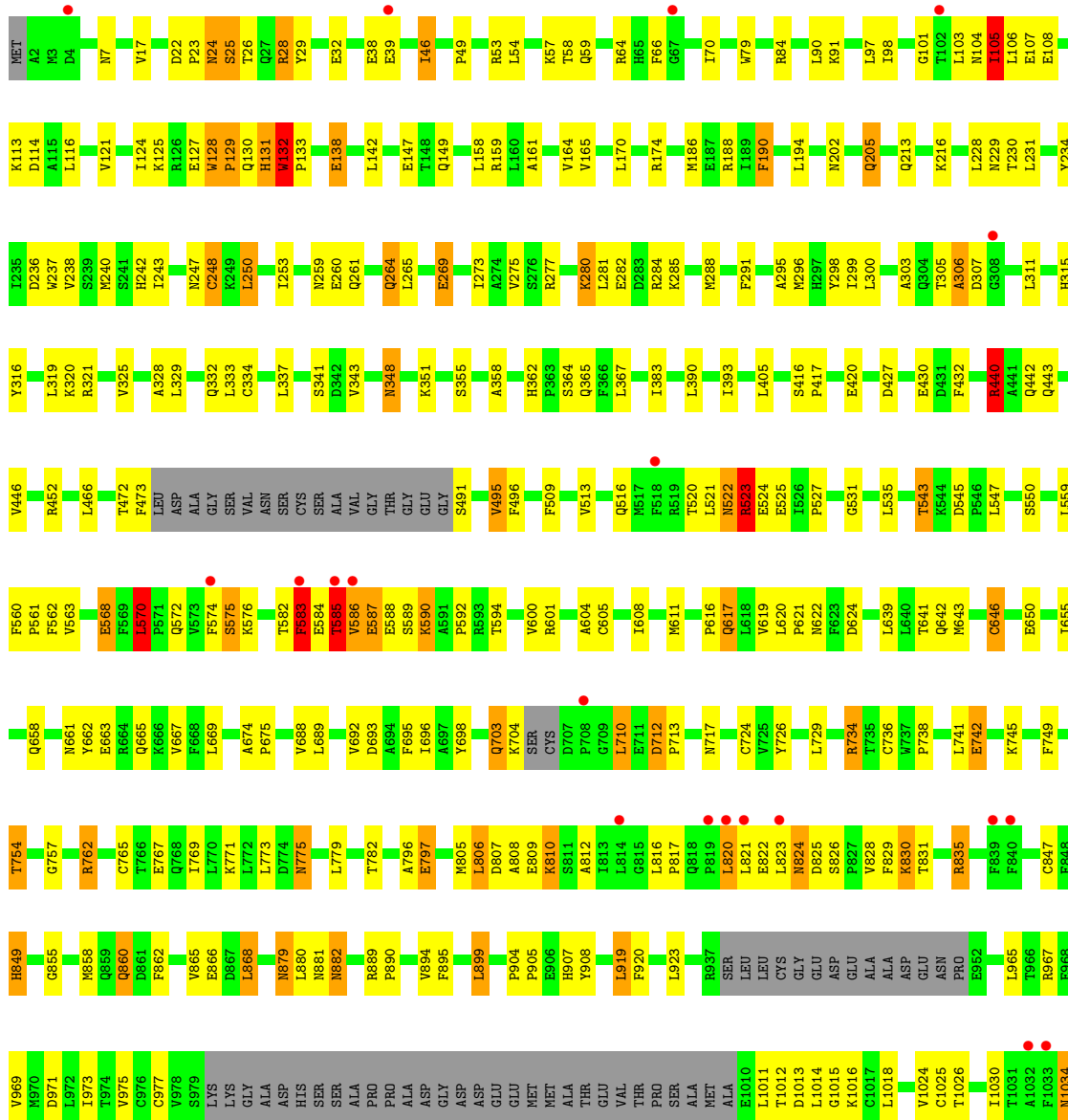
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
6	H	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

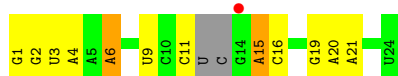
- Molecule 7 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	C	1	Total	Mg	0	0
			1	1		
7	H	1	Total	Mg	0	0
			1	1		

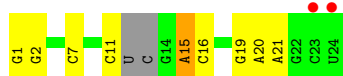


• Molecule 1: Exportin-5





- Molecule 4: pre-microRNA



- Molecule 5: pre-microRNA



- Molecule 5: pre-microRNA



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	71.16Å 304.67Å 89.23Å 90.00° 110.79° 90.00°	Depositor
Resolution (Å)	39.84 – 2.92 39.84 – 2.92	Depositor EDS
% Data completeness (in resolution range)	100.0 (39.84-2.92) 98.1 (39.84-2.92)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.20 (at 2.91Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.247 , 0.312 0.246 , 0.312	Depositor DCC
R_{free} test set	3826 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	69.5	Xtrriage
Anisotropy	0.745	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 65.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.031 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	22052	wwPDB-VP
Average B, all atoms (Å ²)	96.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.10% 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 i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: MG, GTP

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	1.06	12/8738 (0.1%)	1.00	23/11831 (0.2%)
1	F	0.88	8/8738 (0.1%)	0.86	7/11831 (0.1%)
3	C	0.87	0/1421	0.82	0/1918
3	H	0.84	0/1421	0.83	0/1918
4	D	1.25	3/521 (0.6%)	1.76	12/809 (1.5%)
4	I	1.11	0/521	1.68	9/809 (1.1%)
5	E	1.23	2/562 (0.4%)	1.75	17/874 (1.9%)
5	J	1.06	0/562	1.51	6/874 (0.7%)
All	All	0.98	25/22484 (0.1%)	1.03	74/30864 (0.2%)

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	F	0	1

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	237	TRP	CG-CD2	14.20	1.67	1.43
1	A	237	TRP	CZ3-CH2	13.24	1.61	1.40
1	A	165	VAL	CA-CB	9.13	1.74	1.54
1	A	237	TRP	CG-CD1	-8.79	1.24	1.36
4	D	1	G	N9-C8	-8.53	1.31	1.37
1	A	646	CYS	CB-SG	-6.75	1.70	1.82
1	A	132	TRP	CB-CG	6.58	1.62	1.50
1	A	237	TRP	CD2-CE2	-6.42	1.33	1.41
1	F	280	LYS	CE-NZ	6.41	1.65	1.49
1	A	765	CYS	CB-SG	-6.19	1.71	1.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	646	CYS	CB-SG	-5.88	1.72	1.81
4	D	1	G	N7-C5	-5.70	1.35	1.39
4	D	4	A	N7-C5	-5.60	1.35	1.39
1	A	238	VAL	CB-CG1	5.56	1.64	1.52
1	F	605	CYS	CB-SG	-5.38	1.73	1.81
5	E	61	C	C5-C6	-5.34	1.30	1.34
5	E	55	G	C5-C4	-5.32	1.34	1.38
1	F	1025	CYS	CB-SG	-5.23	1.73	1.81
1	A	580	SER	CB-OG	-5.20	1.35	1.42
1	F	585	THR	CA-CB	5.19	1.66	1.53
1	A	237	TRP	CD1-NE1	5.14	1.46	1.38
1	F	724	CYS	CB-SG	-5.07	1.73	1.81
1	A	107	GLU	CG-CD	5.06	1.59	1.51
1	F	334	CYS	CB-SG	-5.01	1.73	1.81
1	F	847	CYS	CB-SG	-5.01	1.73	1.81

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	I	1	G	O4'-C1'-N9	11.60	117.48	108.20
1	A	237	TRP	CD1-NE1-CE2	10.62	118.56	109.00
4	I	2	G	C5-C6-O6	-10.20	122.48	128.60
1	A	237	TRP	CG-CD1-NE1	-10.03	100.07	110.10
4	D	1	G	C4-C5-N7	-9.08	107.17	110.80
1	A	237	TRP	CD1-CG-CD2	8.98	113.48	106.30
4	I	2	G	N1-C6-O6	8.97	125.28	119.90
1	A	736	CYS	CA-CB-SG	-8.64	98.44	114.00
1	A	237	TRP	CE2-CD2-CE3	8.59	129.01	118.70
1	F	570	LEU	CB-CG-CD1	-8.43	96.67	111.00
1	A	237	TRP	CH2-CZ2-CE2	-8.28	109.12	117.40
1	A	237	TRP	CB-CG-CD1	-8.22	116.31	127.00
1	A	64	ARG	NE-CZ-NH2	-7.50	116.55	120.30
1	A	128	TRP	C-N-CD	7.47	144.09	128.40
5	E	60	C	O4'-C1'-N1	7.45	114.16	108.20
4	D	1	G	N3-C4-C5	-7.40	124.90	128.60
1	F	440	ARG	NE-CZ-NH1	7.38	123.99	120.30
5	E	62	G	C3'-C2'-C1'	7.11	107.19	101.50
1	A	170	LEU	CA-CB-CG	6.93	131.24	115.30
5	E	55	G	N1-C6-O6	-6.91	115.76	119.90
4	I	1	G	C5-C6-N1	6.87	114.93	111.50
1	A	64	ARG	NE-CZ-NH1	6.83	123.71	120.30
5	E	62	G	P-O3'-C3'	6.67	127.70	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	62	G	C4'-C3'-C2'	-6.59	96.01	102.60
1	A	646	CYS	CA-CB-SG	-6.59	102.13	114.00
1	A	237	TRP	CE2-CD2-CG	-6.55	102.06	107.30
5	E	61	C	N3-C4-C5	6.53	124.51	121.90
1	F	646	CYS	CA-CB-SG	-6.50	102.30	114.00
4	D	1	G	O4'-C1'-N9	6.33	113.27	108.20
4	D	1	G	C5-N7-C8	6.31	107.46	104.30
1	A	159	ARG	NE-CZ-NH1	6.30	123.45	120.30
1	A	174	ARG	NE-CZ-NH1	6.28	123.44	120.30
4	I	1	G	N3-C4-C5	-6.21	125.50	128.60
4	I	1	G	C3'-C2'-C1'	-6.18	96.56	101.50
1	F	710	LEU	CA-CB-CG	6.15	129.44	115.30
1	F	669	LEU	CB-CG-CD1	-6.14	100.56	111.00
5	E	54	U	P-O3'-C3'	-6.00	112.50	119.70
5	J	42	C	O4'-C1'-N1	5.98	112.98	108.20
4	D	1	G	C6-N1-C2	-5.96	121.52	125.10
4	D	3	U	C2-N3-C4	-5.96	123.43	127.00
5	E	50	C	N3-C4-C5	5.94	124.28	121.90
5	E	51	G	C8-N9-C4	-5.87	104.05	106.40
4	D	2	G	P-O3'-C3'	5.81	126.67	119.70
5	E	46	C	O4'-C1'-N1	5.78	112.83	108.20
4	I	15	A	O4'-C1'-N9	5.77	112.82	108.20
1	A	821	LEU	CA-CB-CG	5.75	128.51	115.30
4	I	7	C	O4'-C1'-N1	5.73	112.78	108.20
1	A	132	TRP	CA-CB-CG	5.61	124.36	113.70
5	J	62	G	C4'-C3'-C2'	-5.57	97.03	102.60
1	A	237	TRP	CG-CD2-CE3	-5.55	128.90	133.90
5	E	55	G	C5-C6-N1	5.43	114.22	111.50
1	F	816	LEU	CA-CB-CG	5.43	127.78	115.30
1	F	440	ARG	NE-CZ-NH2	-5.42	117.59	120.30
4	D	1	G	N1-C6-O6	-5.41	116.65	119.90
5	E	61	C	P-O3'-C3'	-5.41	113.21	119.70
1	A	710	LEU	CA-CB-CG	5.38	127.67	115.30
5	J	42	C	C6-N1-C2	-5.36	118.16	120.30
1	A	440	ARG	NE-CZ-NH1	5.35	122.97	120.30
4	I	1	G	C2-N3-C4	5.34	114.57	111.90
4	D	1	G	N9-C4-C5	5.29	107.52	105.40
4	D	3	U	O4'-C1'-N1	5.28	112.43	108.20
4	D	15	A	O4'-C1'-N9	5.27	112.41	108.20
5	E	49	U	O4'-C1'-N1	5.24	112.39	108.20
5	E	61	C	C2-N3-C4	-5.22	117.29	119.90
1	A	128	TRP	C-N-CA	-5.19	100.19	122.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	357	LEU	CB-CG-CD1	-5.16	102.23	111.00
5	E	55	G	C6-N1-C2	-5.12	122.03	125.10
5	J	62	G	C3'-C2'-C1'	5.09	105.57	101.50
5	J	59	G	P-O3'-C3'	-5.08	113.61	119.70
4	D	6	A	C2-N3-C4	5.05	113.13	110.60
5	J	57	U	O4'-C1'-N1	5.05	112.24	108.20
5	E	57	U	O4'-C1'-N1	5.04	112.23	108.20
5	E	58	U	N1-C2-O2	5.04	126.33	122.80
1	A	883	ILE	CG1-CB-CG2	-5.01	100.38	111.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	583	PHE	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	8570	0	8664	292	0
1	F	8570	0	8664	267	0
2	B	66	0	15	0	0
2	G	66	0	15	1	0
3	C	1386	0	1408	34	0
3	H	1386	0	1408	40	0
4	D	466	0	242	1	0
4	I	466	0	242	0	0
5	E	505	0	258	5	0
5	J	505	0	258	6	0
6	C	32	0	12	9	0
6	H	32	0	12	7	0
7	C	1	0	0	0	0
7	H	1	0	0	0	0
All	All	22052	0	21198	630	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 15.

All (630) 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:105:ILE:CG1	1:A:105:ILE:CD1	1.78	1.57
1:A:543:THR:HG22	1:A:545:ASP:H	1.17	1.09
1:F:495:VAL:O	1:F:496:PHE:CD1	2.15	0.99
1:A:168:GLN:HB2	1:A:175:ARG:HD2	1.41	0.99
1:A:545:ASP:OD2	1:A:548:ILE:HG12	1.63	0.99
1:F:905:PRO:HA	1:F:908:TYR:CD1	2.02	0.95
1:A:495:VAL:HG12	1:A:496:PHE:N	1.80	0.93
1:A:697:ALA:HA	1:A:702:ASP:OD1	1.72	0.90
1:F:1035:SER:HA	1:F:1038:TRP:CD1	2.07	0.90
1:A:362:HIS:CD2	1:A:364:SER:H	1.90	0.89
1:A:661:ASN:H	1:A:665:GLN:HE21	1.21	0.88
1:A:405:LEU:HD23	1:A:440:ARG:HD2	1.56	0.85
1:F:236:ASP:HA	1:F:277:ARG:HD2	1.59	0.84
1:A:754:THR:HG22	1:A:756:SER:H	1.41	0.83
1:F:205:GLN:HE21	1:F:205:GLN:HA	1.42	0.83
3:C:123:LYS:HG2	6:C:1177:GTP:C6	2.13	0.83
1:F:79:TRP:HZ3	1:F:90:LEU:HD23	1.42	0.83
1:F:240:MET:HA	1:F:243:ILE:HD13	1.60	0.83
1:A:593:ARG:NH1	1:A:601:ARG:NH1	2.27	0.82
1:A:495:VAL:HG12	1:A:496:PHE:H	1.40	0.82
1:F:1105:ARG:HA	1:F:1111:ILE:HG13	1.61	0.82
1:A:661:ASN:H	1:A:665:GLN:NE2	1.77	0.81
1:F:905:PRO:HA	1:F:908:TYR:CE1	2.16	0.81
1:A:733:LYS:HG3	1:A:853:LYS:HE3	1.64	0.80
1:A:104:ASN:C	1:A:105:ILE:HG13	2.02	0.80
1:F:584:GLU:O	1:F:586:VAL:N	2.16	0.79
1:A:205:GLN:HE21	1:A:205:GLN:HA	1.47	0.79
1:F:305:THR:O	1:F:315:HIS:NE2	2.15	0.79
1:A:168:GLN:HB2	1:A:175:ARG:CD	2.14	0.77
1:A:186:MET:CE	1:A:190:PHE:HD1	1.96	0.77
1:F:521:LEU:HD22	1:F:525:GLU:HB3	1.65	0.77
1:F:583:PHE:HD1	1:F:584:GLU:H	1.32	0.76
1:F:698:TYR:CE2	1:F:717:ASN:HB3	2.20	0.76
1:A:1039:LYS:O	1:A:1039:LYS:HG2	1.86	0.76
1:F:186:MET:CE	1:F:190:PHE:HD1	1.99	0.76
1:A:440:ARG:HG2	1:A:440:ARG:HH11	1.51	0.76
1:F:1018:LEU:HD22	1:F:1024:VAL:HG11	1.68	0.76
1:A:494:SER:HB3	1:A:545:ASP:OD1	1.85	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:977:CYS:HA	1:F:1012:THR:OG1	1.87	0.75
1:A:226:ALA:O	1:A:230:THR:HG22	1.86	0.74
1:A:495:VAL:CG1	1:A:496:PHE:N	2.50	0.74
1:F:281:LEU:HA	1:F:284:ARG:HG3	1.70	0.74
1:F:574:PHE:HE2	1:F:611:MET:CE	2.01	0.74
1:F:105:ILE:HD12	1:F:106:LEU:H	1.52	0.73
1:F:641:THR:HG22	1:F:643:MET:H	1.52	0.73
1:A:543:THR:HG22	1:A:545:ASP:N	1.98	0.73
1:A:186:MET:HE2	1:A:190:PHE:CD1	2.23	0.73
1:A:186:MET:HE2	1:A:190:PHE:HD1	1.54	0.72
1:A:1018:LEU:HD22	1:A:1024:VAL:HG11	1.70	0.72
3:H:117:ILE:HB	3:H:144:LEU:HD22	1.71	0.71
1:F:560:PHE:N	1:F:561:PRO:HD2	2.05	0.71
1:F:1105:ARG:N	1:F:1106:PRO:HD2	2.06	0.71
1:A:835:ARG:HE	1:A:835:ARG:HA	1.55	0.70
1:F:574:PHE:HE2	1:F:611:MET:HE3	1.56	0.70
1:F:570:LEU:HD13	1:F:622:ASN:ND2	2.07	0.69
1:F:440:ARG:HA	1:F:443:GLN:HB3	1.74	0.69
1:A:641:THR:HG22	1:A:644:GLU:H	1.57	0.69
1:F:495:VAL:HG22	1:F:824:ASN:HD21	1.58	0.69
1:A:1047:THR:HG23	1:A:1051:LEU:HD23	1.74	0.69
1:A:27:GLN:HE21	1:A:31:LEU:HD11	1.58	0.69
1:A:336:LEU:HB3	1:A:343:VAL:HG21	1.74	0.69
1:A:616:PRO:HB2	1:A:658:GLN:HG3	1.75	0.68
1:F:821:LEU:HD21	1:F:828:VAL:HG23	1.74	0.68
1:A:202:ASN:O	1:A:205:GLN:HB2	1.94	0.68
1:F:333:LEU:HD11	1:F:337:LEU:HG	1.76	0.67
1:A:164:VAL:HG13	1:A:165:VAL:HG23	1.74	0.67
1:F:383:ILE:N	1:F:383:ILE:HD12	2.09	0.67
1:A:362:HIS:HD2	1:A:364:SER:H	1.43	0.67
1:A:596:ALA:HB2	1:A:823:LEU:HB3	1.77	0.67
1:F:560:PHE:N	1:F:561:PRO:CD	2.59	0.66
1:F:689:LEU:HD22	1:F:779:LEU:HB2	1.78	0.66
1:F:213:GLN:HG2	1:F:216:LYS:HB2	1.78	0.65
1:F:574:PHE:CE2	1:F:611:MET:CE	2.79	0.65
3:C:29:ARG:HG2	3:C:157:PHE:HE2	1.61	0.65
1:F:879:ASN:ND2	1:F:882:ASN:HB2	2.12	0.65
1:F:650:GLU:OE1	1:F:734:ARG:NH1	2.27	0.65
1:F:754:THR:O	1:F:757:GLY:N	2.29	0.65
3:H:123:LYS:HG2	6:H:1177:GTP:C5	2.31	0.65
1:A:62:ILE:HD12	1:A:62:ILE:H	1.60	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:907:HIS:HB3	1:A:910:ALA:HB3	1.79	0.65
1:A:724:CYS:O	1:A:728:ILE:HG13	1.97	0.65
1:A:662:TYR:CE1	1:A:762:ARG:HG2	2.32	0.64
1:A:560:PHE:N	1:A:561:PRO:HD2	2.12	0.64
1:F:97:LEU:HD23	1:F:101:GLY:HA3	1.78	0.64
1:F:186:MET:HE3	1:F:190:PHE:HD1	1.61	0.64
1:F:521:LEU:HD22	1:F:525:GLU:CB	2.27	0.64
1:F:129:PRO:CG	1:F:174:ARG:HH22	2.11	0.64
1:F:1047:THR:HG23	1:F:1051:LEU:HD23	1.80	0.64
3:C:29:ARG:HG2	3:C:157:PHE:CE2	2.32	0.64
1:F:762:ARG:HH11	1:F:762:ARG:HG3	1.63	0.63
1:F:247:ASN:O	1:F:248:CYS:HB2	1.96	0.63
1:A:655:ILE:O	1:A:658:GLN:HB2	1.98	0.63
1:A:835:ARG:HH22	5:E:62:G:H5''	1.63	0.63
1:A:698:TYR:CE2	1:A:717:ASN:HB3	2.33	0.62
1:A:701:THR:HG22	1:A:799:PHE:CB	2.29	0.62
1:F:127:GLU:HB2	1:F:131:HIS:HB2	1.81	0.62
1:A:583:PHE:CE2	1:A:588:GLU:HG3	2.34	0.62
1:F:616:PRO:HB2	1:F:658:GLN:HG3	1.80	0.62
1:F:835:ARG:HE	1:F:835:ARG:HA	1.64	0.62
1:A:128:TRP:O	1:A:129:PRO:C	2.34	0.62
1:A:689:LEU:HD22	1:A:779:LEU:HB2	1.82	0.62
1:F:108:GLU:HB3	1:F:113:LYS:HE3	1.82	0.62
1:F:1074:THR:HG22	1:F:1078:LYS:HE3	1.82	0.62
1:F:164:VAL:HG13	1:F:165:VAL:HG23	1.81	0.62
1:F:619:VAL:HG23	1:F:655:ILE:HD13	1.81	0.62
1:A:707:ASP:HB3	1:A:710:LEU:HB3	1.82	0.61
3:C:117:ILE:HB	3:C:144:LEU:HD22	1.81	0.61
1:F:570:LEU:HD22	1:F:574:PHE:CZ	2.35	0.61
1:F:124:ILE:HG23	1:F:128:TRP:HB2	1.82	0.61
1:A:339:ALA:O	1:A:341:SER:N	2.34	0.61
1:A:440:ARG:HA	1:A:443:GLN:HB3	1.83	0.61
1:A:906:GLU:OE1	1:A:906:GLU:N	2.31	0.61
1:A:754:THR:HB	1:A:758:ASN:H	1.66	0.61
3:C:85:CYS:HB2	3:C:164:LEU:HD22	1.83	0.61
3:C:123:LYS:HG2	6:C:1177:GTP:C5	2.36	0.60
1:A:889:ARG:HB3	1:A:890:PRO:HD3	1.82	0.60
1:F:583:PHE:HD1	1:F:584:GLU:N	2.00	0.60
1:A:701:THR:HG22	1:A:799:PHE:HB2	1.82	0.60
1:F:889:ARG:HB3	1:F:890:PRO:HD3	1.82	0.60
1:A:1018:LEU:HB3	1:A:1024:VAL:HG11	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:162:GLU:OE1	3:C:106:ARG:HD3	2.02	0.60
1:A:313:GLU:O	1:A:317:VAL:HG23	2.01	0.60
1:F:619:VAL:CG2	1:F:655:ILE:HD13	2.31	0.60
1:F:620:LEU:N	1:F:621:PRO:CD	2.64	0.60
3:H:149:ILE:HG22	3:H:156:ASN:HB2	1.82	0.60
1:A:313:GLU:HG3	1:A:424:PHE:CZ	2.37	0.59
1:A:550:SER:HB2	1:A:600:VAL:CG1	2.32	0.59
1:F:26:THR:HG22	1:F:28:ARG:H	1.66	0.59
1:A:593:ARG:NH1	1:A:601:ARG:HH11	1.97	0.59
1:A:754:THR:HG22	1:A:756:SER:N	2.16	0.59
3:H:123:LYS:HG2	6:H:1177:GTP:C6	2.37	0.59
1:A:814:LEU:HD21	1:A:957:LEU:HA	1.84	0.59
1:A:822:GLU:HG3	1:A:824:ASN:H	1.66	0.59
3:C:150:SER:HB3	3:C:153:SER:HB3	1.85	0.59
1:F:1083:HIS:HB3	1:F:1089:CYS:SG	2.43	0.59
1:A:385:SER:HB2	1:A:453:LEU:HD11	1.85	0.58
1:F:1105:ARG:NH1	1:F:1134:LEU:HD11	2.18	0.58
1:F:205:GLN:HA	1:F:205:GLN:NE2	2.16	0.58
3:H:22:GLY:HA2	6:H:1177:GTP:H5''	1.85	0.58
1:A:128:TRP:O	1:A:128:TRP:CD1	2.56	0.58
1:A:597:VAL:O	1:A:601:ARG:HG3	2.03	0.58
1:F:616:PRO:HB2	1:F:658:GLN:CG	2.33	0.58
1:A:641:THR:HB	1:A:644:GLU:CD	2.24	0.57
1:A:711:GLU:O	1:A:713:PRO:HD2	2.04	0.57
1:A:587:GLU:OE2	1:A:590:LYS:HB2	2.04	0.57
3:C:29:ARG:HE	3:C:154:ASN:HD21	1.51	0.57
1:F:362:HIS:CD2	1:F:364:SER:H	2.21	0.57
1:F:509:PHE:O	1:F:513:VAL:HG23	2.05	0.57
1:F:585:THR:O	1:F:586:VAL:C	2.42	0.57
1:A:593:ARG:NH1	1:A:601:ARG:HH12	2.03	0.57
3:C:39:TYR:CD1	6:C:1177:GTP:H5''	2.39	0.57
1:F:738:PRO:HD3	1:F:749:PHE:CE1	2.39	0.57
1:A:619:VAL:HG23	1:A:655:ILE:HG23	1.87	0.57
1:F:260:GLU:O	1:F:264:GLN:HG3	2.04	0.57
1:A:775:ASN:HD22	1:A:775:ASN:H	1.52	0.56
3:C:9:VAL:HG21	3:C:59:ILE:HD12	1.86	0.56
1:F:765:CYS:O	1:F:769:ILE:HG12	2.04	0.56
1:F:828:VAL:HG12	1:F:830:LYS:NZ	2.20	0.56
3:H:9:VAL:O	3:H:10:GLN:HB3	2.04	0.56
1:A:543:THR:HG21	1:A:548:ILE:HB	1.86	0.56
3:C:80:TYR:HB2	3:C:111:VAL:HG11	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:749:PHE:O	1:F:762:ARG:HD3	2.04	0.56
1:A:616:PRO:HA	1:A:619:VAL:HG22	1.87	0.56
1:A:300:LEU:HG	1:A:355:SER:HB2	1.86	0.56
1:A:583:PHE:HD1	1:A:584:GLU:H	1.51	0.56
1:F:452:ARG:HG3	1:F:520:THR:HG21	1.87	0.56
1:A:316:TYR:CE2	1:A:320:LYS:HD2	2.41	0.56
1:F:186:MET:HE3	1:F:190:PHE:CD1	2.38	0.56
1:F:642:GLN:HB2	5:J:63:C:OP2	2.05	0.56
1:A:821:LEU:HD23	1:A:827:PRO:HG2	1.87	0.56
1:F:807:ASP:OD1	1:F:807:ASP:N	2.38	0.56
1:F:495:VAL:HG22	1:F:824:ASN:ND2	2.21	0.56
1:F:543:THR:HG22	1:F:545:ASP:H	1.71	0.56
1:F:495:VAL:C	1:F:496:PHE:CD1	2.79	0.55
1:A:617:GLN:HE21	1:A:618:LEU:H	1.53	0.55
3:C:9:VAL:CG2	3:C:59:ILE:HD12	2.36	0.55
1:F:158:LEU:HD13	1:F:230:THR:HA	1.88	0.55
1:F:586:VAL:O	1:F:587:GLU:HB2	2.06	0.55
1:F:616:PRO:HD2	1:F:617:GLN:OE1	2.05	0.55
1:F:1035:SER:HA	1:F:1038:TRP:NE1	2.22	0.55
1:F:161:ALA:HB2	1:F:234:TYR:CZ	2.41	0.55
1:F:604:ALA:O	1:F:608:ILE:HG12	2.07	0.55
3:H:150:SER:HB3	3:H:153:SER:HB3	1.88	0.55
1:F:472:THR:HG22	1:F:473:PHE:H	1.69	0.55
1:A:624:ASP:N	1:A:624:ASP:OD1	2.36	0.55
1:A:701:THR:HB	1:A:795:MET:HG2	1.89	0.55
1:F:194:LEU:HD11	1:F:253:ILE:HD12	1.87	0.55
1:F:617:GLN:CD	1:F:617:GLN:H	2.10	0.55
1:F:662:TYR:CE1	1:F:762:ARG:HG2	2.41	0.55
3:C:22:GLY:HA2	6:C:1177:GTP:O1A	2.07	0.55
1:F:269:GLU:HG2	1:F:321:ARG:HH11	1.72	0.55
1:F:337:LEU:CD2	1:F:343:VAL:O	2.54	0.55
1:A:236:ASP:HB3	1:A:273:ILE:CG2	2.37	0.55
1:F:860:GLN:CD	1:F:860:GLN:H	2.09	0.55
1:F:333:LEU:CD1	1:F:337:LEU:HG	2.36	0.54
1:A:132:TRP:HH2	1:A:138:GLU:HG2	1.72	0.54
1:A:663:GLU:O	1:A:667:VAL:HG23	2.07	0.54
1:A:128:TRP:CD1	1:A:128:TRP:C	2.79	0.54
1:A:583:PHE:CZ	1:A:588:GLU:HA	2.42	0.54
1:A:791:MET:HA	1:A:794:LYS:HD3	1.90	0.54
1:A:919:LEU:HD22	1:A:923:LEU:HD11	1.90	0.54
1:A:17:VAL:HG23	3:C:75:LEU:HD21	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:213:GLN:HE21	1:A:216:LYS:HD3	1.73	0.54
1:A:288:MET:HA	1:A:288:MET:CE	2.37	0.54
1:A:616:PRO:HB2	1:A:658:GLN:CG	2.37	0.54
1:F:967:ARG:HH21	1:F:1042:LEU:HB2	1.73	0.54
1:F:661:ASN:H	1:F:665:GLN:NE2	2.06	0.54
1:A:765:CYS:O	1:A:769:ILE:HG12	2.07	0.54
1:A:177:ASP:O	1:A:181:THR:OG1	2.25	0.53
1:A:523:ARG:HB3	1:A:523:ARG:HH11	1.74	0.53
1:F:742:GLU:OE2	1:F:745:LYS:HE3	2.08	0.53
1:A:897:LYS:HB3	1:A:898:PRO:HD3	1.89	0.53
1:A:407:LYS:HA	1:A:436:PHE:CZ	2.44	0.53
1:F:703:GLN:O	1:F:704:LYS:HG3	2.08	0.53
1:F:1011:LEU:HD13	1:F:1054:PRO:HB2	1.89	0.53
1:A:814:LEU:HD11	1:A:957:LEU:HB2	1.90	0.53
1:F:1018:LEU:HB3	1:F:1024:VAL:HG11	1.89	0.53
1:A:821:LEU:HD21	1:A:828:VAL:HG23	1.90	0.53
1:A:1064:LEU:HD13	1:A:1104:LEU:HD21	1.90	0.53
1:A:234:TYR:O	1:A:238:VAL:HG13	2.09	0.53
1:A:593:ARG:HD2	1:A:597:VAL:HG12	1.91	0.53
1:F:132:TRP:N	1:F:133:PRO:CD	2.72	0.53
1:A:311:LEU:HD21	1:A:424:PHE:CD1	2.44	0.53
1:A:767:GLU:O	1:A:771:LYS:HG3	2.09	0.53
3:C:119:LEU:HD23	3:C:139:HIS:HB3	1.91	0.53
1:F:572:GLN:O	1:F:575:SER:HB2	2.09	0.53
1:F:712:ASP:CB	1:F:713:PRO:CD	2.87	0.53
1:F:895:PHE:O	1:F:899:LEU:HB2	2.09	0.53
1:F:704:LYS:HD2	1:F:797:GLU:OE1	2.09	0.52
1:A:827:PRO:O	1:A:829:PHE:CD1	2.63	0.52
1:F:754:THR:C	1:F:757:GLY:H	2.12	0.52
1:A:97:LEU:HD23	1:A:101:GLY:HA3	1.91	0.52
1:A:165:VAL:HG11	1:A:237:TRP:CD2	2.45	0.52
1:A:440:ARG:HH11	1:A:440:ARG:CG	2.20	0.52
1:F:306:ALA:HA	1:F:319:LEU:HD11	1.90	0.52
1:F:97:LEU:HA	1:F:101:GLY:HA3	1.92	0.52
1:F:416:SER:HB2	1:F:417:PRO:HD2	1.90	0.52
3:H:22:GLY:HA2	6:H:1177:GTP:C5'	2.39	0.52
1:A:584:GLU:O	1:A:586:VAL:HG22	2.09	0.52
1:A:586:VAL:O	1:A:587:GLU:HB2	2.09	0.52
1:A:300:LEU:HD12	1:A:351:LYS:HB3	1.92	0.52
1:A:711:GLU:HG3	1:A:718:ARG:HH22	1.74	0.51
1:A:780:ILE:HD11	1:A:847:CYS:HB3	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:704:LYS:O	1:A:708:PRO:HA	2.11	0.51
1:A:1033:PHE:HA	1:A:1036:LEU:HD22	1.91	0.51
1:F:124:ILE:CG2	1:F:128:TRP:HB2	2.40	0.51
1:F:311:LEU:HD22	1:F:420:GLU:HG3	1.92	0.51
1:F:821:LEU:HD21	1:F:828:VAL:CG2	2.40	0.51
3:C:29:ARG:HE	3:C:154:ASN:ND2	2.08	0.51
1:F:582:THR:O	1:F:601:ARG:NH2	2.44	0.51
1:F:767:GLU:O	1:F:771:LYS:HG3	2.11	0.51
1:F:205:GLN:HE21	1:F:205:GLN:CA	2.16	0.51
1:A:472:THR:HG22	1:A:473:PHE:H	1.74	0.51
1:A:617:GLN:NE2	1:A:618:LEU:H	2.08	0.51
1:A:791:MET:O	1:A:794:LYS:HB2	2.11	0.51
1:A:269:GLU:O	1:A:273:ILE:HG13	2.11	0.51
1:F:440:ARG:HH11	1:F:440:ARG:HG2	1.74	0.51
1:A:577:LEU:HB3	1:A:608:ILE:HD11	1.92	0.51
1:A:618:LEU:O	1:A:621:PRO:HD2	2.11	0.50
1:A:775:ASN:N	1:A:775:ASN:ND2	2.59	0.50
1:F:46:ILE:C	1:F:49:PRO:HD2	2.32	0.50
1:A:745:LYS:HA	1:A:750:VAL:HG12	1.93	0.50
3:H:12:LYS:HD3	3:H:82:GLN:O	2.12	0.50
1:F:570:LEU:CD2	1:F:574:PHE:CZ	2.94	0.50
1:F:1051:LEU:O	1:F:1054:PRO:HD2	2.10	0.50
1:A:90:LEU:O	1:A:94:VAL:HG23	2.12	0.50
1:A:236:ASP:HB3	1:A:273:ILE:HG22	1.94	0.50
3:H:119:LEU:HD23	3:H:139:HIS:HB3	1.94	0.50
1:F:240:MET:HA	1:F:243:ILE:CD1	2.36	0.50
1:F:442:GLN:O	1:F:446:VAL:HG23	2.11	0.50
1:A:694:ALA:O	1:A:697:ALA:HB3	2.12	0.50
1:F:7:ASN:HA	1:F:53:ARG:NH1	2.27	0.50
1:F:574:PHE:CD2	1:F:611:MET:HE1	2.46	0.50
1:F:1101:TYR:O	1:F:1105:ARG:HB2	2.12	0.50
1:A:125:LYS:HB3	1:A:170:LEU:HD21	1.94	0.50
3:C:146:TYR:OH	3:C:148:ASP:HB3	2.12	0.50
1:A:161:ALA:HB2	1:A:234:TYR:CZ	2.47	0.49
1:F:919:LEU:HD22	1:F:923:LEU:HD11	1.93	0.49
3:H:146:TYR:OH	3:H:148:ASP:HB3	2.12	0.49
1:A:164:VAL:CG1	1:A:165:VAL:HG23	2.41	0.49
1:A:67:GLY:HA2	1:A:70:ILE:HD12	1.93	0.49
1:A:121:VAL:HG21	1:A:159:ARG:HB3	1.93	0.49
1:F:383:ILE:N	1:F:383:ILE:CD1	2.75	0.49
1:A:728:ILE:O	1:A:732:VAL:HG23	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:118:VAL:HG11	3:H:160:PRO:HB3	1.93	0.49
1:A:158:LEU:HD13	1:A:230:THR:HA	1.94	0.49
1:A:1014:LEU:HA	1:A:1017:CYS:HB3	1.94	0.49
1:F:234:TYR:O	1:F:238:VAL:HG13	2.13	0.49
1:F:186:MET:HB3	1:F:242:HIS:CE1	2.48	0.49
1:F:1073:PHE:HD1	1:F:1100:ILE:HG21	1.78	0.49
1:A:382:GLU:OE1	1:A:382:GLU:HA	2.12	0.49
3:C:149:ILE:HG22	3:C:156:ASN:HB2	1.95	0.49
3:H:123:LYS:HB3	3:H:126:ILE:HD12	1.95	0.49
1:A:107:GLU:O	1:A:108:GLU:CB	2.61	0.49
1:A:339:ALA:C	1:A:341:SER:H	2.17	0.49
1:A:1033:PHE:HA	1:A:1036:LEU:CD2	2.43	0.49
1:F:321:ARG:O	1:F:325:VAL:HG23	2.13	0.49
1:F:692:VAL:O	1:F:696:ILE:HG12	2.13	0.48
1:F:194:LEU:HD13	1:F:250:LEU:HD23	1.94	0.48
1:F:570:LEU:HD22	1:F:574:PHE:HZ	1.78	0.48
1:A:550:SER:HB2	1:A:600:VAL:HG13	1.95	0.48
1:A:234:TYR:HA	1:A:237:TRP:NE1	2.29	0.48
1:F:495:VAL:O	1:F:496:PHE:HD1	1.85	0.48
1:F:583:PHE:CD1	1:F:584:GLU:N	2.78	0.48
1:F:822:GLU:HB3	1:F:825:ASP:HB2	1.95	0.48
1:F:1108:TYR:HB2	1:F:1111:ILE:HD11	1.95	0.48
1:A:127:GLU:O	1:A:132:TRP:HB2	2.14	0.48
1:A:754:THR:CG2	1:A:755:SER:N	2.76	0.48
1:F:904:PRO:HG2	1:F:907:HIS:HD2	1.79	0.48
1:F:762:ARG:HG3	1:F:762:ARG:NH1	2.27	0.48
1:A:525:GLU:OE1	1:A:525:GLU:N	2.46	0.48
1:A:534:LEU:O	1:A:538:VAL:HG23	2.14	0.48
1:F:104:ASN:HB2	1:F:107:GLU:OE1	2.14	0.48
1:F:264:GLN:NE2	1:F:265:LEU:H	2.12	0.48
1:F:269:GLU:O	1:F:273:ILE:HG13	2.12	0.48
1:F:365:GLN:HG3	1:F:432:PHE:HE1	1.79	0.48
1:F:710:LEU:HG	1:F:712:ASP:OD2	2.14	0.48
1:F:923:LEU:HD13	1:F:969:VAL:HG13	1.96	0.48
1:A:919:LEU:HD22	1:A:923:LEU:CD1	2.44	0.48
1:F:22:ASP:HB3	1:F:25:SER:HB2	1.96	0.48
3:H:17:GLY:O	3:H:68:GLY:HA3	2.13	0.48
1:A:441:ALA:HB2	5:E:57:U:H1'	1.96	0.48
1:A:806:LEU:HA	1:A:837:GLN:HE21	1.78	0.48
1:F:142:LEU:O	1:F:149:GLN:HB3	2.13	0.48
1:F:202:ASN:O	1:F:205:GLN:HB2	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:19:GLY:HA2	6:H:1177:GTP:O1G	2.14	0.48
1:F:1026:THR:HG22	1:F:1030:ILE:HD11	1.96	0.47
1:A:10:CYS:SG	1:A:53:ARG:HD2	2.53	0.47
3:C:12:LYS:HE2	3:C:81:ILE:O	2.14	0.47
3:C:29:ARG:O	3:C:33:GLY:N	2.47	0.47
1:F:754:THR:O	1:F:757:GLY:HA2	2.14	0.47
1:A:1105:ARG:N	1:A:1106:PRO:HD2	2.29	0.47
1:F:806:LEU:O	1:F:810:LYS:HG3	2.15	0.47
1:A:775:ASN:H	1:A:775:ASN:ND2	2.12	0.47
1:A:1108:TYR:HB2	1:A:1111:ILE:HD11	1.95	0.47
3:C:39:TYR:HD1	6:C:1177:GTP:H5''	1.78	0.47
1:F:305:THR:O	1:F:307:ASP:N	2.47	0.47
1:F:522:ASN:O	1:F:524:GLU:N	2.48	0.47
3:H:13:LEU:HD23	3:H:63:VAL:HG22	1.96	0.47
1:A:280:LYS:HE2	1:A:282:GLU:OE2	2.14	0.47
1:A:167:PHE:O	1:A:168:GLN:C	2.52	0.47
1:A:362:HIS:CD2	1:A:364:SER:N	2.72	0.47
1:A:523:ARG:HB3	1:A:523:ARG:NH1	2.29	0.47
1:A:526:ILE:HA	1:A:527:PRO:HD2	1.54	0.47
1:A:1044:CYS:HB3	1:A:1083:HIS:NE2	2.29	0.47
3:C:123:LYS:HB3	3:C:126:ILE:HD12	1.97	0.47
1:F:98:ILE:HG12	1:F:116:LEU:HD11	1.96	0.47
1:F:849:HIS:HA	1:F:894:VAL:HG13	1.96	0.47
3:H:132:LYS:HE2	5:J:49:U:P	2.55	0.47
1:A:891:MET:O	1:A:895:PHE:HB3	2.15	0.47
1:F:550:SER:HB2	1:F:600:VAL:HG12	1.97	0.47
1:F:865:VAL:HB	1:F:868:LEU:HG	1.97	0.47
1:A:62:ILE:H	1:A:62:ILE:CD1	2.26	0.47
1:A:906:GLU:H	1:A:906:GLU:CD	2.18	0.47
1:A:381:HIS:CD2	1:A:383:ILE:H	2.34	0.46
1:A:904:PRO:HA	1:A:905:PRO:HD3	1.69	0.46
1:F:291:PHE:HA	1:F:296:MET:HE3	1.97	0.46
1:F:1105:ARG:N	1:F:1106:PRO:CD	2.77	0.46
1:A:46:ILE:C	1:A:49:PRO:HD2	2.34	0.46
1:A:291:PHE:HA	1:A:296:MET:CE	2.45	0.46
1:A:738:PRO:HD2	1:A:749:PHE:CD1	2.50	0.46
1:A:967:ARG:HH21	1:A:1042:LEU:HB2	1.81	0.46
1:F:574:PHE:CE2	1:F:611:MET:HE1	2.49	0.46
1:F:904:PRO:HG2	1:F:907:HIS:CD2	2.50	0.46
3:H:25:THR:OG1	6:H:1177:GTP:H5'	2.14	0.46
1:A:831:THR:HB	1:A:834:GLU:HB2	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:124:VAL:HG11	3:C:148:ASP:HB2	1.98	0.46
1:A:532:ILE:O	1:A:536:GLN:HG3	2.15	0.46
1:F:563:VAL:HG11	1:F:570:LEU:HG	1.97	0.46
1:F:568:GLU:H	1:F:568:GLU:HG3	1.27	0.46
1:F:663:GLU:O	1:F:667:VAL:HG23	2.16	0.46
1:A:264:GLN:HB2	1:A:318:PHE:CE1	2.50	0.46
1:A:691:ASP:HB3	1:A:694:ALA:HB3	1.98	0.46
1:A:977:CYS:O	1:A:1011:LEU:HA	2.14	0.46
1:A:977:CYS:HB3	1:A:1015:GLY:HA2	1.98	0.46
1:F:495:VAL:C	1:F:496:PHE:HD1	2.18	0.46
1:F:619:VAL:HG21	1:F:655:ILE:CD1	2.45	0.46
1:F:754:THR:O	1:F:757:GLY:CA	2.62	0.46
1:F:1101:TYR:CE2	1:F:1105:ARG:HG3	2.51	0.46
1:A:98:ILE:HG12	1:A:116:LEU:HD11	1.97	0.46
1:F:364:SER:HB3	1:F:367:LEU:HB2	1.97	0.46
3:H:132:LYS:HE2	5:J:49:U:OP1	2.15	0.46
1:A:835:ARG:HH12	5:E:62:G:H5''	1.81	0.46
1:F:348:ASN:HD22	1:F:351:LYS:HD3	1.80	0.46
1:A:143:SER:OG	1:A:150:THR:HG23	2.16	0.46
1:A:390:LEU:O	1:A:393:ILE:HG22	2.16	0.46
1:A:632:GLN:HG2	1:F:639:LEU:CD1	2.46	0.46
1:A:835:ARG:NH2	5:E:62:G:H5''	2.31	0.46
1:F:977:CYS:HA	1:F:1012:THR:HG1	1.78	0.46
1:A:522:ASN:O	1:A:524:GLU:N	2.49	0.46
1:A:543:THR:CG2	1:A:545:ASP:HB3	2.45	0.46
1:F:165:VAL:HG11	1:F:237:TRP:CE2	2.51	0.46
3:H:48:HIS:HA	3:H:49:PRO:HD3	1.79	0.46
1:A:494:SER:HB3	1:A:545:ASP:CG	2.36	0.46
1:A:522:ASN:C	1:A:524:GLU:H	2.19	0.46
1:F:362:HIS:HD2	1:F:364:SER:H	1.63	0.46
1:F:809:GLU:O	1:F:812:ALA:HB3	2.16	0.46
1:F:828:VAL:O	1:F:830:LYS:NZ	2.48	0.46
1:F:889:ARG:HH11	1:F:889:ARG:HG2	1.79	0.46
5:J:55:G:H2'	5:J:56:U:C6	2.51	0.46
1:A:187:GLU:HA	1:A:242:HIS:HD2	1.81	0.45
1:A:754:THR:HG22	1:A:755:SER:N	2.32	0.45
3:H:80:TYR:N	3:H:80:TYR:CD1	2.84	0.45
1:A:495:VAL:HG13	1:A:496:PHE:HD1	1.81	0.45
1:A:593:ARG:HH12	1:A:601:ARG:NH1	2.07	0.45
1:A:593:ARG:HH12	1:A:601:ARG:HH12	1.64	0.45
1:A:94:VAL:O	1:A:97:LEU:HB2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:568:GLU:H	1:A:568:GLU:HG3	1.17	0.45
1:F:1026:THR:HG22	1:F:1030:ILE:CD1	2.47	0.45
1:F:1085:GLN:HE22	3:H:130:LYS:HE2	1.82	0.45
1:A:205:GLN:HE21	1:A:205:GLN:CA	2.19	0.45
1:A:244:THR:HA	1:A:248:CYS:SG	2.56	0.45
1:A:563:VAL:HG11	1:A:570:LEU:HG	1.97	0.45
3:C:118:VAL:HG11	3:C:160:PRO:HB3	1.97	0.45
3:C:19:GLY:HA2	6:C:1177:GTP:O2G	2.17	0.45
1:F:736:CYS:O	1:F:736:CYS:SG	2.75	0.45
3:H:8:GLN:HB3	3:H:58:PRO:O	2.16	0.45
1:A:194:LEU:HD11	1:A:253:ILE:HD12	1.97	0.45
1:A:429:ASP:OD2	1:A:429:ASP:N	2.49	0.45
1:A:509:PHE:O	1:A:513:VAL:HG23	2.17	0.45
1:F:104:ASN:O	1:F:105:ILE:C	2.55	0.45
1:F:620:LEU:N	1:F:621:PRO:HD2	2.32	0.45
1:F:1065:LEU:O	1:F:1068:ALA:HB3	2.16	0.45
1:A:103:LEU:HB2	1:A:108:GLU:HB2	1.98	0.45
1:A:129:PRO:HD2	1:A:174:ARG:HH22	1.82	0.45
1:A:457:THR:O	1:A:461:MET:HG3	2.16	0.45
1:A:526:ILE:HG22	1:A:562:PHE:HE2	1.82	0.45
3:C:22:GLY:HA2	6:C:1177:GTP:PA	2.57	0.45
1:A:420:GLU:O	1:A:423:ARG:HB2	2.17	0.45
1:A:495:VAL:HG23	1:A:824:ASN:ND2	2.32	0.45
1:F:291:PHE:HA	1:F:296:MET:CE	2.47	0.45
1:F:295:ALA:O	1:F:299:ILE:HG12	2.17	0.45
1:F:390:LEU:O	1:F:393:ILE:HG22	2.17	0.45
1:F:264:GLN:HG3	1:F:264:GLN:H	1.52	0.45
1:F:547:LEU:HD21	1:F:823:LEU:HD13	1.98	0.45
3:H:124:VAL:HG11	3:H:148:ASP:HB2	1.98	0.45
5:J:58:U:H2'	5:J:59:G:H8	1.82	0.45
1:A:129:PRO:CD	1:A:174:ARG:HH22	2.30	0.44
1:A:560:PHE:N	1:A:561:PRO:CD	2.79	0.44
1:A:1064:LEU:O	1:A:1065:LEU:C	2.54	0.44
1:F:828:VAL:HG12	1:F:830:LYS:HZ3	1.82	0.44
1:F:965:LEU:O	1:F:969:VAL:HG23	2.17	0.44
1:A:593:ARG:HD2	1:A:597:VAL:CG1	2.46	0.44
1:F:54:LEU:O	1:F:64:ARG:HA	2.17	0.44
1:F:129:PRO:HG2	1:F:174:ARG:HH22	1.79	0.44
1:F:1036:LEU:HD22	1:F:1093:LEU:HD21	1.98	0.44
3:H:101:VAL:N	3:H:102:PRO:CD	2.80	0.44
1:A:281:LEU:HD12	1:A:281:LEU:HA	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:618:LEU:HD12	1:A:618:LEU:HA	1.82	0.44
1:A:744:ALA:O	1:A:749:PHE:HB2	2.17	0.44
1:F:125:LYS:HD2	1:F:170:LEU:HD21	1.98	0.44
1:A:1074:THR:HG22	1:A:1078:LYS:HE3	1.98	0.44
1:F:303:ALA:O	1:F:306:ALA:HB3	2.17	0.44
1:F:430:GLU:OE1	1:F:430:GLU:N	2.50	0.44
1:A:194:LEU:HD13	1:A:250:LEU:HD23	1.99	0.44
1:A:521:LEU:HD22	1:A:525:GLU:CB	2.47	0.44
1:A:869:ALA:HA	1:A:915:ILE:HD11	2.00	0.44
1:F:84:ARG:HE	1:F:84:ARG:HB3	1.53	0.44
1:F:588:GLU:HB2	1:F:589:SER:H	1.50	0.44
5:J:58:U:C2	5:J:59:G:C8	3.06	0.44
1:F:186:MET:O	1:F:190:PHE:HB2	2.18	0.44
1:F:855:GLY:HA2	1:F:862:PHE:HD2	1.82	0.44
1:A:186:MET:CE	1:A:190:PHE:CD1	2.84	0.44
1:A:916:LEU:HD23	1:A:916:LEU:HA	1.87	0.44
1:F:858:MET:HB2	1:F:862:PHE:HB2	2.00	0.44
1:F:1070:THR:O	1:F:1074:THR:OG1	2.34	0.44
1:A:105:ILE:CD1	1:A:105:ILE:CB	2.86	0.43
1:A:442:GLN:O	1:A:446:VAL:HG23	2.18	0.43
1:A:651:ALA:O	1:A:655:ILE:HG13	2.18	0.43
1:F:91:LYS:HE3	1:F:132:TRP:CH2	2.53	0.43
1:F:592:PRO:HG3	1:F:829:PHE:HE1	1.83	0.43
1:F:865:VAL:O	1:F:866:GLU:C	2.56	0.43
1:F:889:ARG:HB3	1:F:890:PRO:CD	2.45	0.43
1:A:526:ILE:O	1:A:528:VAL:N	2.50	0.43
3:H:150:SER:CB	3:H:153:SER:HB3	2.48	0.43
1:A:632:GLN:HG2	1:F:639:LEU:HD11	2.00	0.43
1:A:1056:LEU:HA	1:A:1056:LEU:HD23	1.74	0.43
1:F:128:TRP:O	1:F:129:PRO:C	2.56	0.43
1:F:1105:ARG:HG2	1:F:1111:ILE:HG13	2.00	0.43
3:H:85:CYS:HB2	3:H:164:LEU:HD22	2.00	0.43
1:A:913:SER:HB3	1:A:914:PRO:CD	2.48	0.43
1:F:775:ASN:HD22	1:F:775:ASN:H	1.65	0.43
1:F:1108:TYR:O	1:F:1111:ILE:HG12	2.18	0.43
1:A:313:GLU:HG3	1:A:424:PHE:HZ	1.80	0.43
1:A:430:GLU:OE1	1:A:430:GLU:N	2.50	0.43
1:A:550:SER:HB2	1:A:600:VAL:HG12	1.99	0.43
1:A:563:VAL:CG1	1:A:570:LEU:HG	2.49	0.43
1:F:259:ASN:ND2	1:F:298:TYR:HD2	2.17	0.43
3:C:30:HIS:CE1	3:C:157:PHE:O	2.71	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:362:HIS:CD2	1:F:367:LEU:HD12	2.54	0.43
1:F:452:ARG:HG3	1:F:520:THR:CG2	2.48	0.43
1:F:1030:ILE:O	1:F:1034:ASN:HB2	2.19	0.43
1:A:596:ALA:HB2	1:A:823:LEU:CB	2.46	0.43
3:C:110:ARG:HD3	3:C:110:ARG:HA	1.85	0.43
3:H:29:ARG:O	3:H:33:GLY:HA2	2.19	0.43
1:A:162:GLU:HB3	1:A:167:PHE:CE1	2.54	0.43
1:A:387:ASP:HA	1:A:388:PRO:HD3	1.84	0.43
1:F:1015:GLY:O	1:F:1016:LYS:C	2.56	0.43
1:F:1105:ARG:HH11	1:F:1134:LEU:HD11	1.82	0.43
3:H:80:TYR:HB2	3:H:111:VAL:HG11	1.99	0.43
1:A:447:MET:O	1:A:450:ALA:HB3	2.18	0.43
1:F:522:ASN:O	1:F:523:ARG:C	2.57	0.43
1:F:570:LEU:HD13	1:F:622:ASN:HD21	1.83	0.43
1:F:807:ASP:HA	1:F:810:LYS:HD3	2.00	0.43
1:A:186:MET:O	1:A:190:PHE:HB2	2.19	0.43
1:F:121:VAL:HG21	1:F:159:ARG:HB3	2.01	0.43
1:F:1135:ASN:HB2	1:F:1136:PRO:HD3	2.01	0.43
1:A:291:PHE:HA	1:A:296:MET:HE1	1.99	0.42
1:A:856:PRO:HB3	1:A:902:PHE:CD2	2.53	0.42
1:F:661:ASN:H	1:F:665:GLN:HE21	1.65	0.42
1:F:1101:TYR:CZ	1:F:1105:ARG:HG3	2.54	0.42
1:F:17:VAL:HG23	3:H:75:LEU:HD21	1.99	0.42
1:F:574:PHE:CE2	1:F:611:MET:HE3	2.43	0.42
1:F:920:PHE:CE2	1:F:973:ILE:HG12	2.55	0.42
3:H:24:THR:N	6:H:1177:GTP:O1A	2.52	0.42
1:F:689:LEU:O	1:F:782:THR:OG1	2.30	0.42
1:A:27:GLN:HE21	1:A:31:LEU:CD1	2.30	0.42
1:A:1112:ARG:HD2	1:A:1130:ASP:OD2	2.20	0.42
1:F:587:GLU:HG2	1:F:590:LYS:HB2	2.01	0.42
1:F:821:LEU:HD11	1:F:828:VAL:CG2	2.50	0.42
1:A:5:GLN:HG2	1:A:6:VAL:N	2.35	0.42
1:A:1019:MET:C	1:A:1021:HIS:H	2.23	0.42
1:A:1100:ILE:O	1:A:1104:LEU:HB2	2.20	0.42
1:F:452:ARG:HB2	1:F:516:GLN:NE2	2.34	0.42
3:H:45:VAL:HG22	3:H:46:GLU:N	2.34	0.42
1:A:22:ASP:HB3	1:A:25:SER:HB3	2.02	0.42
1:A:236:ASP:HB3	1:A:273:ILE:HG21	2.01	0.42
1:A:710:LEU:HG	1:A:712:ASP:OD2	2.19	0.42
1:F:585:THR:O	1:F:587:GLU:N	2.53	0.42
1:F:703:GLN:H	1:F:796:ALA:HB3	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:1036:LEU:O	1:F:1083:HIS:NE2	2.52	0.42
3:H:106:ARG:O	3:H:110:ARG:HB2	2.20	0.42
1:A:165:VAL:HG21	1:A:237:TRP:CH2	2.54	0.42
1:A:658:GLN:C	1:A:660:LYS:N	2.73	0.42
1:A:821:LEU:HD21	1:A:828:VAL:CG2	2.50	0.42
1:F:355:SER:O	1:F:358:ALA:HB3	2.20	0.42
3:H:92:VAL:HG22	3:H:122:ASN:O	2.20	0.42
1:A:405:LEU:CD2	1:A:440:ARG:HD2	2.40	0.42
1:A:741:LEU:HD11	1:A:759:PRO:HG3	2.02	0.42
1:F:132:TRP:HH2	1:F:138:GLU:HG2	1.85	0.42
1:F:228:LEU:O	1:F:229:ASN:C	2.57	0.42
1:F:316:TYR:CE2	1:F:320:LYS:HD2	2.54	0.42
1:F:835:ARG:HA	1:F:835:ARG:NE	2.33	0.42
3:H:126:ILE:O	3:H:127:LYS:C	2.58	0.42
1:A:197:LEU:HD13	1:A:227:ALA:HB3	2.01	0.42
1:A:244:THR:O	1:A:245:ALA:C	2.58	0.42
1:F:288:MET:HA	1:F:288:MET:CE	2.50	0.42
1:F:646:CYS:SG	1:F:726:TYR:HB3	2.60	0.42
1:F:729:LEU:HD23	1:F:729:LEU:O	2.19	0.42
1:A:13:LEU:HD23	1:A:36:PHE:HE2	1.84	0.41
1:A:132:TRP:N	1:A:133:PRO:CD	2.83	0.41
1:A:472:THR:HG22	1:A:473:PHE:N	2.34	0.41
1:A:962:VAL:O	1:A:966:THR:OG1	2.34	0.41
3:H:12:LYS:HD3	3:H:83:ALA:HA	2.02	0.41
1:A:65:HIS:CD2	1:A:111:HIS:HD2	2.37	0.41
1:A:665:GLN:H	1:A:665:GLN:HG3	1.66	0.41
1:A:835:ARG:HA	1:A:835:ARG:NE	2.28	0.41
1:A:1030:ILE:HA	1:A:1071:TRP:HH2	1.84	0.41
1:A:563:VAL:H	1:A:563:VAL:HG23	1.63	0.41
1:A:745:LYS:HA	1:A:750:VAL:CG1	2.50	0.41
1:A:901:LEU:HD21	1:A:975:VAL:HG12	2.02	0.41
3:C:39:TYR:HE1	6:C:1177:GTP:O3B	2.02	0.41
1:F:164:VAL:CG1	1:F:165:VAL:HG23	2.48	0.41
1:F:303:ALA:O	1:F:306:ALA:CB	2.68	0.41
1:F:806:LEU:HD12	1:F:808:ALA:HB3	2.02	0.41
1:A:57:LYS:H	1:A:57:LYS:HG2	1.58	0.41
1:A:127:GLU:HB2	1:A:131:HIS:HB2	2.02	0.41
1:A:545:ASP:HA	1:A:546:PRO:HD3	1.87	0.41
1:A:738:PRO:CD	1:A:749:PHE:CE1	3.03	0.41
3:C:138:PHE:CZ	3:C:142:LYS:HG3	2.55	0.41
5:E:40:G:N3	5:E:40:G:H2'	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:328:ALA:O	1:F:332:GLN:HG2	2.21	0.41
1:F:1062:GLY:O	1:F:1063:THR:C	2.59	0.41
1:F:1111:ILE:HG12	1:F:1111:ILE:H	1.62	0.41
3:H:9:VAL:CG2	3:H:59:ILE:HD12	2.51	0.41
3:H:125:ASP:HB3	3:H:153:SER:HB2	2.01	0.41
1:A:604:ALA:O	1:A:608:ILE:HG12	2.21	0.41
1:A:711:GLU:HG2	1:A:714:CYS:HB2	2.02	0.41
1:A:877:PHE:HB3	1:A:880:LEU:HD11	2.02	0.41
1:A:913:SER:HB3	1:A:914:PRO:HD3	2.02	0.41
1:F:66:PHE:CE2	1:F:70:ILE:HD11	2.56	0.41
1:F:165:VAL:HG11	1:F:237:TRP:CD2	2.55	0.41
3:H:9:VAL:HG21	3:H:59:ILE:HD12	2.02	0.41
3:H:110:ARG:HA	3:H:110:ARG:HD3	1.83	0.41
1:A:280:LYS:HB3	1:A:283:ASP:OD1	2.21	0.41
1:A:836:MET:O	1:A:839:PHE:HB3	2.21	0.41
3:C:23:LYS:NZ	6:C:1177:GTP:O2G	2.44	0.41
1:F:282:GLU:HA	1:F:285:LYS:HE3	2.02	0.41
1:F:674:ALA:N	1:F:675:PRO:CD	2.83	0.41
1:A:799:PHE:HA	1:A:833:LEU:HD13	2.03	0.41
1:F:559:LEU:C	1:F:561:PRO:HD2	2.40	0.41
1:A:201:VAL:O	1:A:205:GLN:HG2	2.21	0.41
1:A:291:PHE:O	1:A:348:ASN:HB2	2.21	0.41
1:A:337:LEU:HA	1:A:337:LEU:HD12	1.83	0.41
1:A:362:HIS:CD2	1:A:367:LEU:HD12	2.56	0.41
1:A:402:MET:SD	1:A:461:MET:HE2	2.61	0.41
1:A:584:GLU:O	1:A:586:VAL:N	2.54	0.41
1:A:698:TYR:CD2	1:A:717:ASN:HB3	2.56	0.41
1:F:114:ASP:OD1	1:F:159:ARG:NH1	2.53	0.41
1:F:236:ASP:OD1	1:F:236:ASP:N	2.52	0.41
1:F:616:PRO:CB	1:F:658:GLN:HG3	2.47	0.41
1:F:688:VAL:O	1:F:695:PHE:HB2	2.21	0.41
1:F:1026:THR:O	1:F:1030:ILE:HG13	2.21	0.41
1:A:380:ARG:CZ	4:D:9:U:H4'	2.50	0.41
1:A:877:PHE:CZ	1:A:895:PHE:HE2	2.39	0.41
1:F:26:THR:HB	1:F:29:TYR:CD1	2.56	0.41
1:F:655:ILE:HD13	1:F:655:ILE:HG21	1.76	0.41
1:A:190:PHE:HE1	1:A:234:TYR:HB3	1.87	0.40
1:A:313:GLU:OE2	3:C:167:LYS:NZ	2.54	0.40
1:A:851:LEU:HD23	1:A:851:LEU:HA	1.91	0.40
1:F:550:SER:HB2	1:F:600:VAL:CG1	2.51	0.40
1:A:168:GLN:O	1:A:168:GLN:HG3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:205:GLN:HA	1:A:205:GLN:NE2	2.26	0.40
1:A:897:LYS:HB3	1:A:898:PRO:CD	2.51	0.40
1:A:1018:LEU:HB3	1:A:1024:VAL:CG1	2.51	0.40
1:F:1121:ILE:HD12	2:G:1315:UNK:O	2.21	0.40
1:F:24:ASN:OD1	1:F:24:ASN:N	2.53	0.40
1:A:1026:THR:HG22	1:A:1030:ILE:HD11	2.02	0.40
3:C:101:VAL:N	3:C:102:PRO:CD	2.84	0.40
1:F:7:ASN:HA	1:F:53:ARG:HH12	1.86	0.40
1:F:128:TRP:O	1:F:130:GLN:N	2.55	0.40
1:F:971:ASP:O	1:F:975:VAL:HG23	2.21	0.40
1:A:97:LEU:HD23	1:A:97:LEU:HA	1.81	0.40
1:A:124:ILE:HD13	1:A:124:ILE:HG21	1.91	0.40
1:A:517:MET:CG	1:A:521:LEU:HD12	2.50	0.40
1:A:879:ASN:OD1	1:A:882:ASN:ND2	2.53	0.40
1:F:337:LEU:HD21	1:F:343:VAL:O	2.21	0.40
1:F:531:GLY:HA3	1:F:562:PHE:CE2	2.57	0.40
1:F:1056:LEU:HD23	1:F:1056:LEU:HA	1.82	0.40
1:F:1064:LEU:HB2	1:F:1108:TYR:OH	2.21	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	1062/1204 (88%)	965 (91%)	73 (7%)	24 (2%)	5	19
1	F	1062/1204 (88%)	948 (89%)	92 (9%)	22 (2%)	5	21
3	C	168/216 (78%)	154 (92%)	11 (6%)	3 (2%)	7	24
3	H	168/216 (78%)	152 (90%)	15 (9%)	1 (1%)	22	51
All	All	2460/2840 (87%)	2219 (90%)	191 (8%)	50 (2%)	6	22

All (50) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	108	GLU
1	A	211	THR
1	A	245	ALA
1	A	340	ASP
1	A	712	ASP
3	C	127	LYS
1	F	128	TRP
1	F	306	ALA
1	F	523	ARG
1	F	585	THR
1	F	712	ASP
3	H	127	LYS
1	A	100	ASN
1	A	168	GLN
1	A	495	VAL
1	A	523	ARG
1	A	527	PRO
1	A	587	GLU
1	A	1060	LEU
1	A	1120	GLU
1	F	103	LEU
1	F	805	MET
1	F	1083	HIS
1	A	585	THR
1	A	616	PRO
1	A	831	THR
1	A	886	TYR
1	A	1083	HIS
3	C	10	GLN
1	F	248	CYS
1	F	586	VAL
1	F	587	GLU
1	F	594	THR
1	F	820	LEU
1	F	1135	ASN
1	A	348	ASN
1	A	588	GLU
1	A	1135	ASN
3	C	8	GLN
1	F	105	ILE
1	A	105	ILE
1	A	241	SER
1	F	132	TRP

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Mol	Chain	Res	Type
1	A	827	PRO
1	F	23	PRO
1	F	46	ILE
1	F	129	PRO
1	F	527	PRO
1	F	817	PRO
1	F	495	VAL

5.3.2 Protein sidechains [i](#)

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	967/1073 (90%)	895 (93%)	72 (7%)	11	32
1	F	967/1073 (90%)	885 (92%)	82 (8%)	8	26
3	C	150/185 (81%)	143 (95%)	7 (5%)	22	53
3	H	150/185 (81%)	144 (96%)	6 (4%)	27	59
All	All	2234/2516 (89%)	2067 (92%)	167 (8%)	11	32

All (167) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	ASN
1	A	26	THR
1	A	28	ARG
1	A	38	GLU
1	A	39	GLU
1	A	46	ILE
1	A	57	LYS
1	A	59	GLN
1	A	105	ILE
1	A	130	GLN
1	A	132	TRP
1	A	138	GLU
1	A	147	GLU
1	A	159	ARG

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Mol	Chain	Res	Type
1	A	169	THR
1	A	188	ARG
1	A	190	PHE
1	A	205	GLN
1	A	236	ASP
1	A	250	LEU
1	A	261	GLN
1	A	275	VAL
1	A	278	LYS
1	A	284	ARG
1	A	300	LEU
1	A	329	LEU
1	A	341	SER
1	A	415	ASP
1	A	433	ASN
1	A	440	ARG
1	A	442	GLN
1	A	466	LEU
1	A	520	THR
1	A	535	LEU
1	A	568	GLU
1	A	576	LYS
1	A	583	PHE
1	A	600	VAL
1	A	624	ASP
1	A	641	THR
1	A	701	THR
1	A	711	GLU
1	A	712	ASP
1	A	736	CYS
1	A	756	SER
1	A	762	ARG
1	A	773	LEU
1	A	775	ASN
1	A	784	ASN
1	A	792	LEU
1	A	825	ASP
1	A	835	ARG
1	A	849	HIS
1	A	860	GLN
1	A	868	LEU
1	A	870	THR

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Mol	Chain	Res	Type
1	A	881	ASN
1	A	899	LEU
1	A	906	GLU
1	A	907	HIS
1	A	919	LEU
1	A	924	HIS
1	A	1014	LEU
1	A	1034	ASN
1	A	1036	LEU
1	A	1040	ASP
1	A	1041	THR
1	A	1042	LEU
1	A	1045	GLN
1	A	1082	MET
1	A	1105	ARG
1	A	1111	ILE
3	C	60	LYS
3	C	69	GLN
3	C	76	ARG
3	C	84	GLN
3	C	112	CYS
3	C	141	LYS
3	C	166	ARG
1	F	24	ASN
1	F	25	SER
1	F	28	ARG
1	F	32	GLU
1	F	38	GLU
1	F	39	GLU
1	F	57	LYS
1	F	58	THR
1	F	59	GLN
1	F	105	ILE
1	F	131	HIS
1	F	132	TRP
1	F	138	GLU
1	F	147	GLU
1	F	188	ARG
1	F	190	PHE
1	F	205	GLN
1	F	231	LEU
1	F	250	LEU

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Mol	Chain	Res	Type
1	F	261	GLN
1	F	264	GLN
1	F	269	GLU
1	F	275	VAL
1	F	280	LYS
1	F	300	LEU
1	F	329	LEU
1	F	341	SER
1	F	348	ASN
1	F	405	LEU
1	F	427	ASP
1	F	440	ARG
1	F	466	LEU
1	F	491	SER
1	F	522	ASN
1	F	523	ARG
1	F	535	LEU
1	F	543	THR
1	F	568	GLU
1	F	570	LEU
1	F	575	SER
1	F	576	LYS
1	F	583	PHE
1	F	590	LYS
1	F	617	GLN
1	F	624	ASP
1	F	693	ASP
1	F	703	GLN
1	F	734	ARG
1	F	741	LEU
1	F	742	GLU
1	F	754	THR
1	F	762	ARG
1	F	773	LEU
1	F	775	ASN
1	F	797	GLU
1	F	806	LEU
1	F	810	LYS
1	F	820	LEU
1	F	824	ASN
1	F	826	SER
1	F	830	LYS

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Mol	Chain	Res	Type
1	F	831	THR
1	F	835	ARG
1	F	849	HIS
1	F	860	GLN
1	F	868	LEU
1	F	879	ASN
1	F	880	LEU
1	F	881	ASN
1	F	882	ASN
1	F	899	LEU
1	F	919	LEU
1	F	1013	ASP
1	F	1014	LEU
1	F	1034	ASN
1	F	1041	THR
1	F	1042	LEU
1	F	1045	GLN
1	F	1085	GLN
1	F	1105	ARG
1	F	1111	ILE
1	F	1123	LYS
3	H	60	LYS
3	H	69	GLN
3	H	76	ARG
3	H	84	GLN
3	H	110	ARG
3	H	141	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (71) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	27	GLN
1	A	65	HIS
1	A	69	GLN
1	A	73	HIS
1	A	80	ASN
1	A	111	HIS
1	A	130	GLN
1	A	149	GLN
1	A	168	GLN
1	A	173	GLN
1	A	179	GLN

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Mol	Chain	Res	Type
1	A	202	ASN
1	A	205	GLN
1	A	213	GLN
1	A	242	HIS
1	A	362	HIS
1	A	381	HIS
1	A	442	GLN
1	A	469	GLN
1	A	617	GLN
1	A	636	ASN
1	A	657	ASN
1	A	665	GLN
1	A	703	GLN
1	A	775	ASN
1	A	784	ASN
1	A	837	GLN
1	A	879	ASN
1	A	882	ASN
1	A	907	HIS
1	A	935	ASN
1	A	1021	HIS
1	A	1058	GLN
3	C	30	HIS
3	C	143	ASN
3	C	156	ASN
3	C	173	ASN
1	F	65	HIS
1	F	111	HIS
1	F	149	GLN
1	F	173	GLN
1	F	179	GLN
1	F	185	ASN
1	F	200	ASN
1	F	202	ASN
1	F	205	GLN
1	F	242	HIS
1	F	247	ASN
1	F	259	ASN
1	F	264	GLN
1	F	362	HIS
1	F	442	GLN
1	F	469	GLN

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Mol	Chain	Res	Type
1	F	516	GLN
1	F	622	ASN
1	F	628	ASN
1	F	636	ASN
1	F	657	ASN
1	F	665	GLN
1	F	775	ASN
1	F	784	ASN
1	F	837	GLN
1	F	860	GLN
1	F	879	ASN
1	F	907	HIS
1	F	935	ASN
1	F	1045	GLN
1	F	1058	GLN
1	F	1085	GLN
3	H	143	ASN
3	H	156	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
4	D	20/24 (83%)	7 (35%)	0
4	I	20/24 (83%)	6 (30%)	0
5	E	23/24 (95%)	4 (17%)	0
5	J	23/24 (95%)	3 (13%)	0
All	All	86/96 (89%)	20 (23%)	0

All (20) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
4	D	6	A
4	D	11	C
4	D	15	A
4	D	16	C
4	D	19	G
4	D	20	A
4	D	21	A
5	E	41	G
5	E	44	U
5	E	47	A

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Mol	Chain	Res	Type
5	E	62	G
4	I	11	C
4	I	15	A
4	I	16	C
4	I	19	G
4	I	20	A
4	I	21	A
5	J	41	G
5	J	47	A
5	J	62	G

There are no RNA pucker outliers to report.

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

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 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	GTP	H	1177	7	29,34,34	1.31	2 (6%)	35,54,54	1.94	9 (25%)
6	GTP	C	1177	7	29,34,34	1.05	2 (6%)	35,54,54	1.55	7 (20%)

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	GTP	H	1177	7	-	2/18/38/38	0/3/3/3
6	GTP	C	1177	7	-	1/18/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	H	1177	GTP	C5-C6	-4.28	1.39	1.47
6	H	1177	GTP	PB-O3B	3.38	1.63	1.59
6	C	1177	GTP	C2-N3	2.94	1.40	1.33
6	C	1177	GTP	C5-C6	-2.93	1.41	1.47

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	H	1177	GTP	O4'-C1'-N9	5.07	115.47	108.75
6	H	1177	GTP	O2G-PG-O3B	4.46	119.59	104.64
6	C	1177	GTP	C8-N7-C5	3.54	108.58	102.55
6	H	1177	GTP	C8-N7-C5	3.52	108.55	102.55
6	H	1177	GTP	O2A-PA-O3A	3.12	115.69	107.27
6	C	1177	GTP	O3G-PG-O2G	3.03	119.17	107.80
6	C	1177	GTP	C4'-O4'-C1'	2.80	112.49	109.92
6	H	1177	GTP	C5'-C4'-C3'	-2.57	105.96	115.21
6	C	1177	GTP	O4'-C1'-N9	-2.55	105.36	108.75
6	C	1177	GTP	C5-C6-N1	2.53	118.90	114.07
6	C	1177	GTP	C2-N1-C6	-2.45	120.62	125.11
6	H	1177	GTP	C5-C6-N1	2.39	118.63	114.07
6	H	1177	GTP	C2-N1-C6	-2.33	120.85	125.11
6	C	1177	GTP	O3'-C3'-C4'	-2.30	104.47	111.08
6	H	1177	GTP	O3B-PG-O1G	-2.21	99.42	111.04
6	H	1177	GTP	O3G-PG-O1G	2.16	119.26	110.83

There are no chirality outliers.

All (3) torsion outliers are listed below:

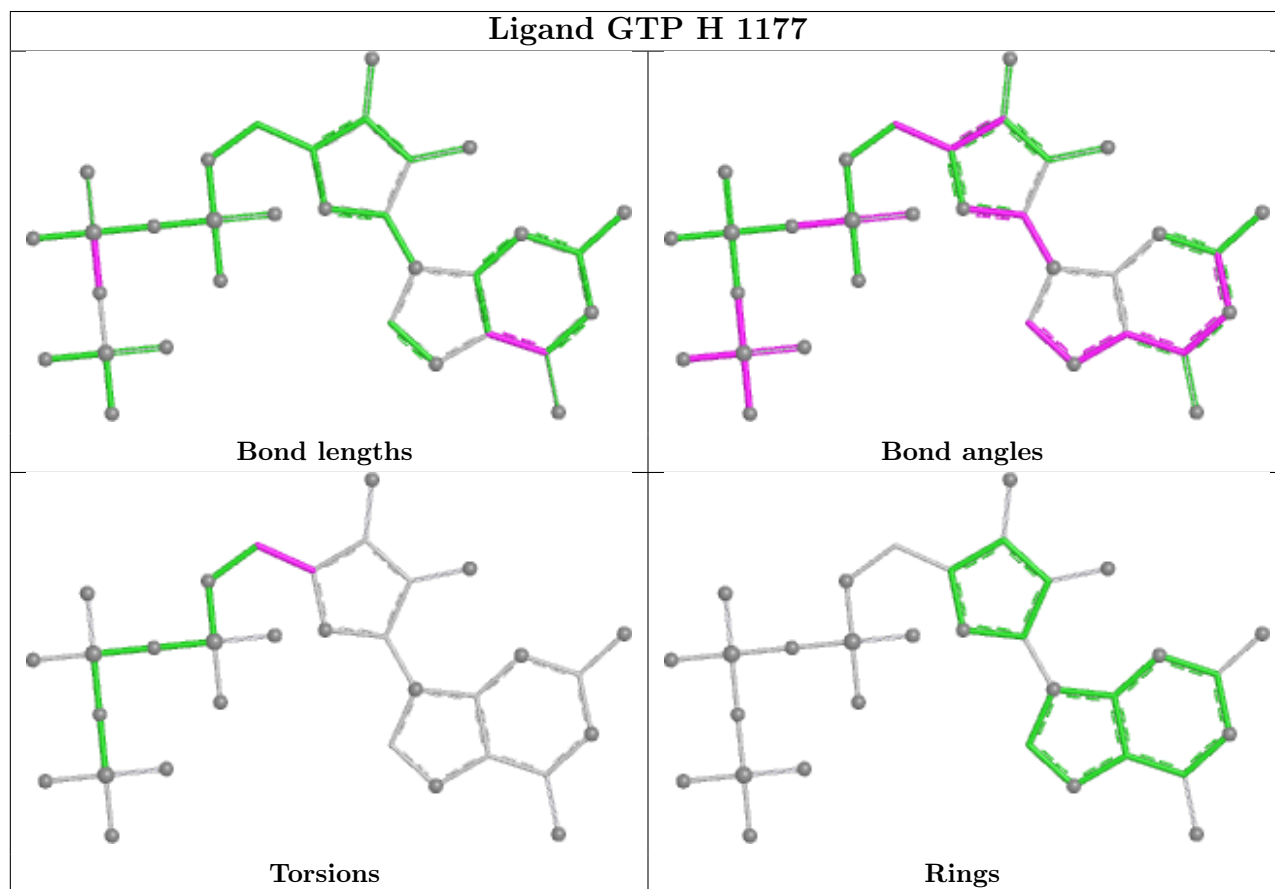
Mol	Chain	Res	Type	Atoms
6	H	1177	GTP	C3'-C4'-C5'-O5'
6	H	1177	GTP	O4'-C4'-C5'-O5'
6	C	1177	GTP	PA-O3A-PB-O1B

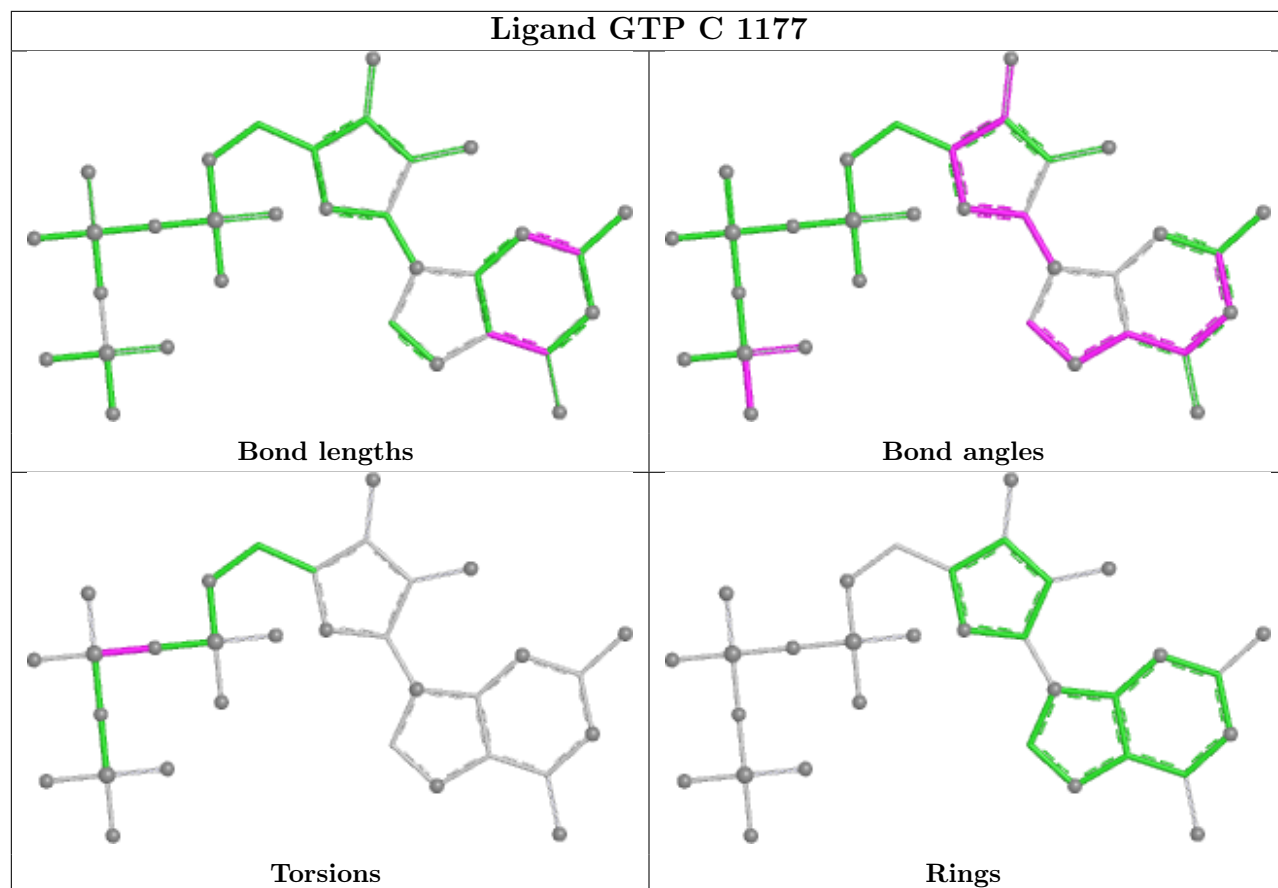
There are no ring outliers.

2 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	H	1177	GTP	7	0
6	C	1177	GTP	9	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	1072/1204 (89%)	-0.03	10 (0%) 81 76	32, 76, 127, 156	0
1	F	1072/1204 (89%)	0.24	38 (3%) 47 41	59, 94, 143, 162	0
2	B	0/13	-	-	-	-
2	G	0/13	-	-	-	-
3	C	170/216 (78%)	0.38	6 (3%) 47 41	59, 90, 115, 127	0
3	H	170/216 (78%)	0.34	2 (1%) 76 71	64, 88, 111, 122	0
4	D	22/24 (91%)	0.24	1 (4%) 39 33	62, 126, 220, 227	0
4	I	22/24 (91%)	1.04	2 (9%) 16 14	71, 191, 259, 263	0
5	E	24/24 (100%)	0.41	0 100 100	78, 118, 205, 210	0
5	J	24/24 (100%)	1.12	4 (16%) 5 5	121, 170, 256, 271	0
All	All	2576/2962 (86%)	0.16	63 (2%) 59 53	32, 86, 141, 271	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	823	LEU	5.0
3	H	7	PRO	4.5
3	C	7	PRO	3.3
1	F	1072	LEU	3.2
1	F	585	THR	3.1
1	F	1073	PHE	3.1
1	F	819	PRO	3.1
1	F	820	LEU	3.0
4	D	14	G	3.0
1	F	1065	LEU	2.9
1	F	586	VAL	2.9
3	C	35	PHE	2.8
1	F	4	ASP	2.8
1	F	1032	ALA	2.8

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Mol	Chain	Res	Type	RSRZ
1	F	1049	SER	2.7
1	F	1033	PHE	2.7
5	J	62	G	2.7
1	A	828	VAL	2.6
3	C	34	GLU	2.6
1	F	821	LEU	2.6
1	F	1077	LEU	2.6
1	A	1132	LYS	2.5
1	A	1136	PRO	2.5
3	H	78	GLY	2.5
4	I	24	U	2.5
1	F	708	PRO	2.4
1	F	1076	VAL	2.4
1	F	1125	SER	2.4
1	F	39	GLU	2.4
1	A	821	LEU	2.4
4	I	23	C	2.4
1	F	1100	ILE	2.4
1	F	1132	LYS	2.3
1	F	574	PHE	2.3
3	C	32	THR	2.3
1	F	308	GLY	2.3
5	J	41	G	2.3
1	F	102	THR	2.3
1	A	586	VAL	2.3
1	F	1084	GLY	2.3
5	J	40	G	2.3
1	A	583	PHE	2.2
1	F	1090	MET	2.2
1	A	308	GLY	2.2
1	A	105	ILE	2.2
1	F	839	PHE	2.2
1	F	1036	LEU	2.2
1	F	1133	LEU	2.2
1	F	518	PHE	2.1
1	F	1136	PRO	2.1
3	C	31	LEU	2.1
1	F	1068	ALA	2.1
5	J	63	C	2.1
1	F	583	PHE	2.1
1	F	1124	ASP	2.1
1	F	1119	PRO	2.0

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Mol	Chain	Res	Type	RSRZ
1	F	840	PHE	2.0
3	C	46	GLU	2.0
1	A	31	LEU	2.0
1	A	1133	LEU	2.0
1	F	67	GLY	2.0
1	F	814	LEU	2.0
1	F	1051	LEU	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 monosaccharides in this entry.

6.4 Ligands [i](#)

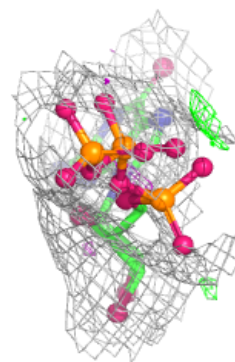
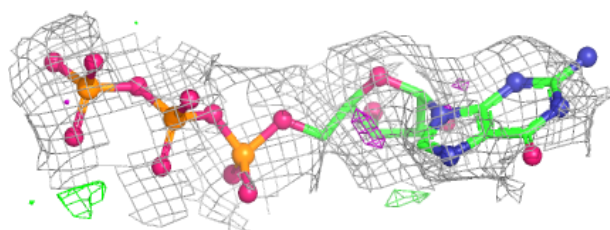
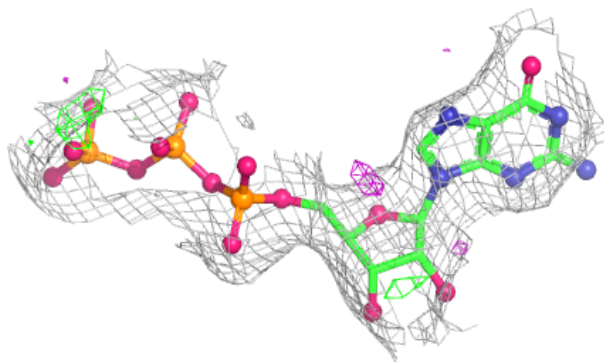
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
6	GTP	H	1177	32/32	0.90	0.09	92,100,112,115	0
6	GTP	C	1177	32/32	0.91	0.08	96,101,105,106	0
7	MG	H	1178	1/1	0.94	0.11	74,74,74,74	0
7	MG	C	1178	1/1	0.96	0.08	85,85,85,85	0

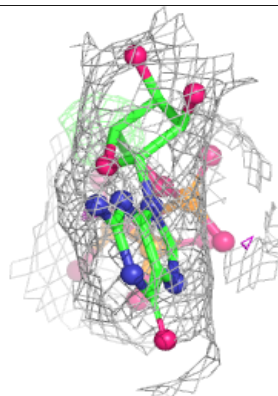
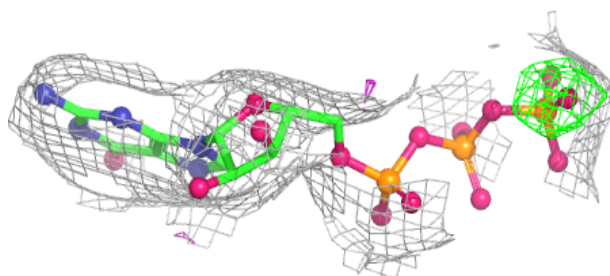
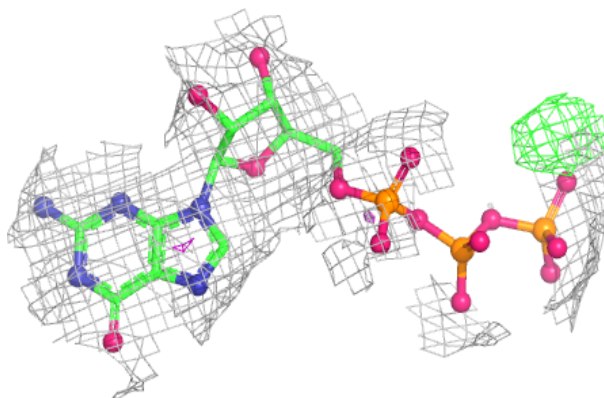
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around GTP H 1177:

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

**Electron density around GTP C 1177:**

$2mF_o-DF_c$ (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.