



Full wwPDB X-ray Structure Validation Report ⓘ

May 15, 2020 – 09:12 pm BST

PDB ID : 4C0Q
Title : Transportin 3 in complex with Ran(Q69L)GTP
Authors : Maertens, G.; Hare, S.; Cherepanov, P.
Deposited on : 2013-08-06
Resolution : 3.42 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

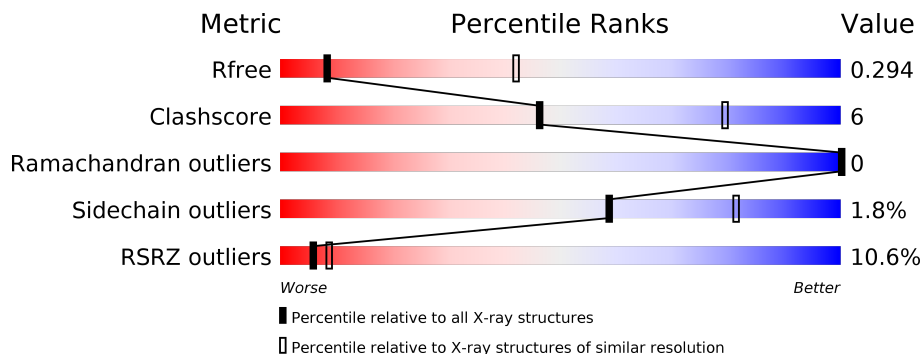
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.42 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}	130704	1486 (3.50-3.34)
Clashscore	141614	1572 (3.50-3.34)
Ramachandran outliers	138981	1534 (3.50-3.34)
Sidechain outliers	138945	1535 (3.50-3.34)
RSRZ outliers	127900	1395 (3.50-3.34)

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 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	923	 5% 79% 15% • 6%
1	B	923	 15% 69% 12% 19%
2	C	215	 6% 59% 19% • 21%
2	D	215	 3% 63% 18% • 19%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 15766 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 TRANSPORTIN-3.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	871	6927	4420	1177	1277	31	22	0	0	0
1	B	749	5979	3838	1007	1088	26	20	0	0	0

- Molecule 2 is a protein called GTP-BINDING NUCLEAR PROTEIN RAN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	169	1376	896	241	235	4	0	0	0
2	D	175	1418	923	247	243	5	0	0	0

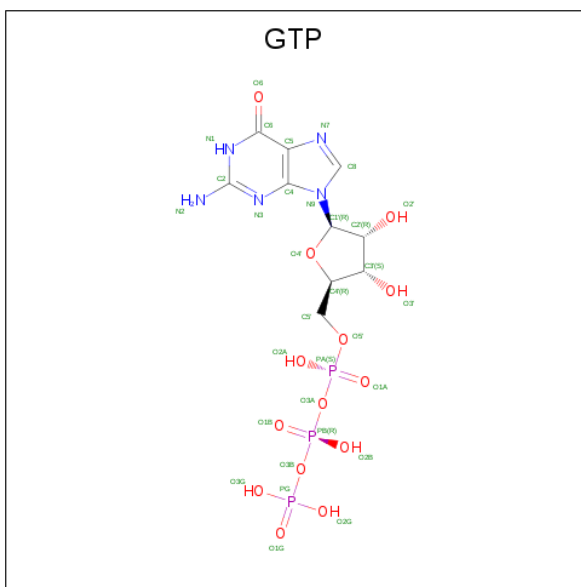
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	69	LEU	GLN	engineered mutation	UNP P62826
D	69	LEU	GLN	engineered mutation	UNP P62826

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	D	1	Total	Mg	0	0
			1	1		
3	C	1	Total	Mg	0	0
			1	1		

- Molecule 4 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).

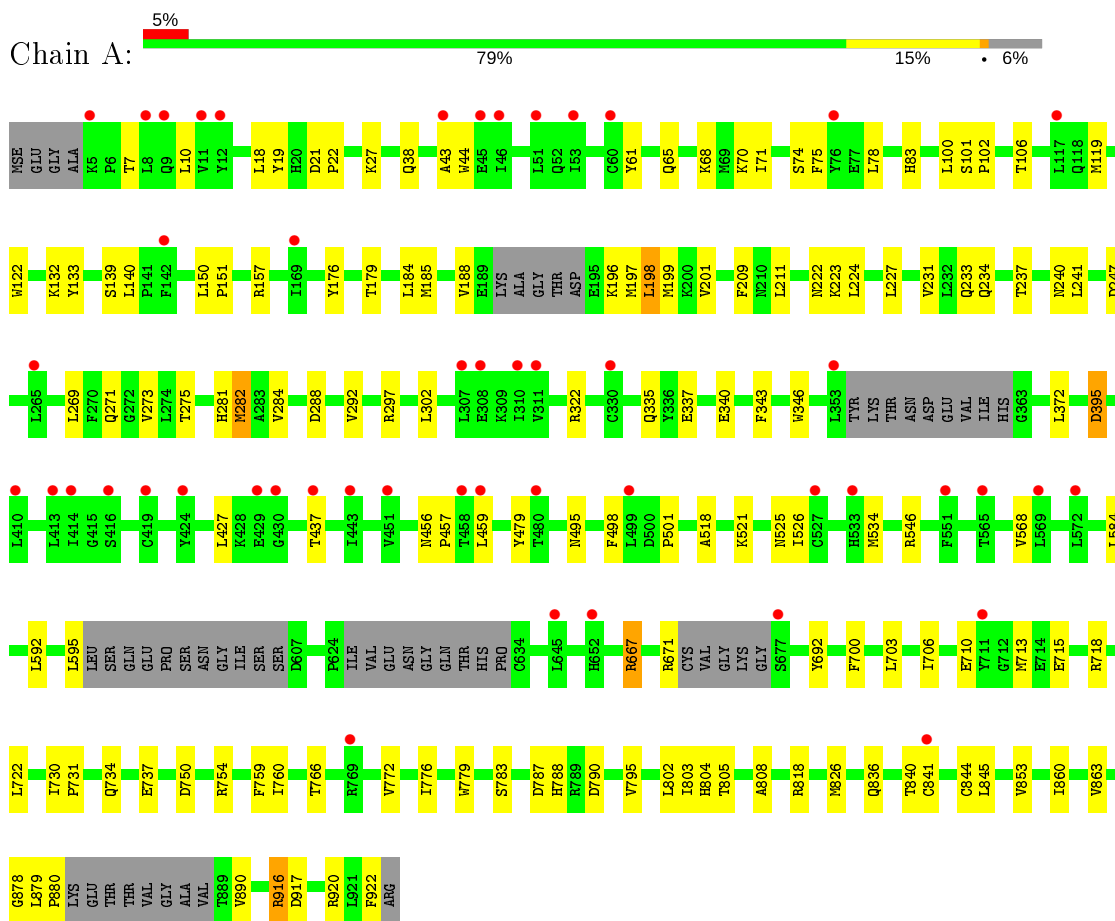


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	C	1	Total	10	5	14	3	0	0
4	D	1	Total	10	5	14	3	0	0

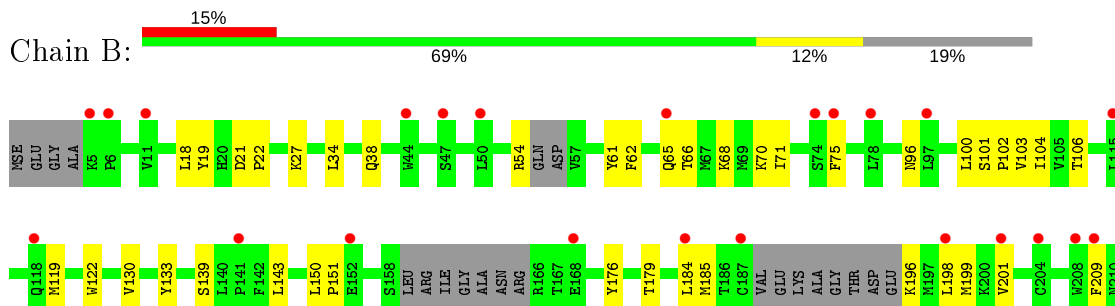
3 Residue-property plots

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: TRANSPORTIN-3



- Molecule 1: TRANSPORTIN-3



S150	M154	E158	L164	A165	R166	I169	G170	D171	E175	F176	V177	ALA	MET	PRO	ALA	LEU	ALA	ALA	PRO	PRO	GLU	V183	V184	M185	D186	F187	A188	LEU	ALA	ALA	GLN	TYR	GLU	HIS	ASP	LEU	GLU	VAL	ALA	GLN	THR	THR	ALA	LEU	PRO	ASP	GLU	ASP	ASP	ASP	LEU
------	------	------	------	------	------	------	------	------	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	79.95Å 93.51Å 104.71Å 78.43° 68.29° 68.28°	Depositor
Resolution (Å)	39.95 – 3.42 39.94 – 3.42	Depositor EDS
% Data completeness (in resolution range)	99.1 (39.95-3.42) 99.2 (39.94-3.42)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.14 (at 3.40Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.268 , 0.290 0.270 , 0.294	Depositor DCC
R_{free} test set	1765 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	135.4	Xtrriage
Anisotropy	0.400	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 55.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	15766	wwPDB-VP
Average B, all atoms (Å ²)	137.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.75% of the height of the origin peak. No significant pseudotranslation is detected.*

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

5.1 Standard geometry

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

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	0.22	0/7040	0.41	0/9520
1	B	0.22	0/6074	0.41	0/8200
2	C	0.23	0/1410	0.41	0/1904
2	D	0.24	0/1452	0.42	0/1961
All	All	0.22	0/15976	0.41	0/21585

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	6927	0	6962	93	0
1	B	5979	0	6006	62	0
2	C	1376	0	1403	29	0
2	D	1418	0	1445	31	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	C	32	0	12	1	0
4	D	32	0	12	2	0
All	All	15766	0	15840	200	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 6.

All (200) 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:671:ARG:NH1	1:A:710:GLU:OE2	2.09	0.85
1:A:917:ASP:OD1	2:D:56:ARG:NH2	2.11	0.84
1:A:68:LYS:NZ	2:C:77:ASP:OD2	2.21	0.74
1:A:196:LYS:HA	1:A:199:MSE:HE2	1.70	0.73
2:C:142:LYS:HA	2:C:142:LYS:NZ	2.03	0.73
1:A:184:LEU:HG	1:A:201:VAL:HG13	1.72	0.72
2:D:142:LYS:HA	2:D:142:LYS:NZ	2.06	0.71
1:A:427:LEU:HD11	1:A:437:THR:HA	1.72	0.70
1:B:184:LEU:HG	1:B:201:VAL:HG13	1.74	0.69
1:B:68:LYS:NZ	2:D:77:ASP:OD2	2.25	0.69
1:B:340:GLU:OE1	1:B:402:ARG:NH2	2.26	0.66
2:C:29:ARG:NH2	2:C:33:GLY:O	2.27	0.66
1:A:273:VAL:HG11	1:A:302:LEU:HD13	1.77	0.66
1:A:157:ARG:NH1	2:C:103:ASN:OD1	2.27	0.65
1:B:427:LEU:HD11	1:B:437:THR:HA	1.79	0.64
1:A:826:MSE:HE1	1:A:860:ILE:HG23	1.79	0.63
1:A:826:MSE:HG3	1:A:863:VAL:HG11	1.82	0.61
2:D:56:ARG:NH1	2:D:171:ASP:OD2	2.34	0.60
2:D:91:ASP:HB3	2:D:94:SER:HB3	1.84	0.60
2:D:29:ARG:NH1	2:D:154:ASN:OD1	2.35	0.59
2:D:70:GLU:OE2	2:D:76:ARG:NH2	2.34	0.59
1:A:140:LEU:HB3	1:A:197:MSE:HE1	1.85	0.58
1:B:281:HIS:HA	1:B:284:VAL:HG12	1.84	0.58
1:B:133:TYR:HB3	1:B:139:SER:HB3	1.85	0.58
2:D:166:ARG:NH2	2:D:175:GLU:OE2	2.36	0.58
1:B:263:LEU:HD22	1:B:267:MSE:HE3	1.85	0.57
1:A:788:HIS:CE1	1:A:790:ASP:HB2	2.39	0.57
1:A:456:ASN:ND2	1:A:495:ASN:OD1	2.38	0.57
1:A:151:PRO:HB3	1:A:211:LEU:HD22	1.87	0.57
1:A:734:GLN:O	1:A:737:GLU:HG2	2.04	0.57
1:B:734:GLN:O	1:B:737:GLU:HG2	2.04	0.57
1:A:788:HIS:HE1	1:A:790:ASP:HB2	1.70	0.56
2:C:142:LYS:HZ2	2:C:142:LYS:HA	1.70	0.56
1:A:133:TYR:HB3	1:A:139:SER:HB3	1.88	0.55
2:C:92:VAL:HG21	2:C:124:VAL:HG12	1.89	0.55
1:B:38:GLN:HG2	1:B:66:THR:HG23	1.89	0.54
1:A:521:LYS:O	1:A:525:ASN:ND2	2.40	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:GLN:OE1	2:C:75:LEU:HD23	2.08	0.54
1:A:667:ARG:HD3	1:A:706:ILE:HD13	1.90	0.54
2:D:29:ARG:NH2	2:D:33:GLY:O	2.38	0.54
1:A:427:LEU:HD21	1:A:437:THR:HG23	1.91	0.53
1:B:38:GLN:O	1:B:70:LYS:HE3	2.09	0.53
1:B:836:GLN:O	1:B:840:THR:HG23	2.08	0.53
1:A:760:ILE:HG12	1:A:802:LEU:HA	1.90	0.53
2:C:146:TYR:OH	2:C:148:ASP:OD1	2.17	0.53
1:A:176:TYR:O	1:A:179:THR:OG1	2.26	0.52
1:B:822:ILE:O	1:B:826:MSE:HG2	2.09	0.52
1:B:235:ASP:OD2	1:B:286:ARG:NH2	2.42	0.52
2:C:36:GLU:HG3	2:C:38:LYS:HG3	1.91	0.52
1:B:185:MSE:HE3	1:B:223:LYS:HD3	1.90	0.52
1:B:289:LEU:HA	1:B:292:VAL:HG12	1.90	0.52
1:A:395:ASP:N	1:A:395:ASP:OD1	2.42	0.52
2:D:142:LYS:HZ2	2:D:142:LYS:HA	1.75	0.52
1:B:18:LEU:O	1:B:27:LYS:HD2	2.10	0.51
2:D:142:LYS:HA	2:D:142:LYS:HZ3	1.74	0.51
1:A:269:LEU:O	1:A:273:VAL:HG12	2.10	0.51
1:A:836:GLN:O	1:A:840:THR:HG23	2.10	0.51
1:A:713:MSE:SE	1:A:713:MSE:H	2.44	0.51
1:B:119:MSE:SE	1:B:122:TRP:HB2	2.60	0.51
1:A:7:THR:HG22	1:A:10:LEU:HB2	1.93	0.50
2:D:142:LYS:O	2:D:143:ASN:HB3	2.11	0.50
2:C:142:LYS:HA	2:C:142:LYS:HZ1	1.74	0.50
1:B:463:LEU:HD11	1:B:502:VAL:HG22	1.94	0.50
1:B:151:PRO:HB3	1:B:211:LEU:HD22	1.93	0.50
1:A:44:TRP:CE2	1:A:70:LYS:HD2	2.47	0.50
1:B:826:MSE:HG3	1:B:863:VAL:HG11	1.92	0.50
1:B:788:HIS:CE1	1:B:790:ASP:HB2	2.47	0.49
2:D:36:GLU:HG3	2:D:38:LYS:HG3	1.94	0.49
1:A:750:ASP:O	1:A:754:ARG:HG3	2.12	0.49
1:A:715:GLU:HG3	1:A:718:ARG:HD2	1.95	0.49
1:B:269:LEU:O	1:B:273:VAL:HG12	2.13	0.49
2:C:142:LYS:O	2:C:143:ASN:HB3	2.13	0.49
1:A:119:MSE:SE	1:A:122:TRP:HB2	2.63	0.49
1:A:233:GLN:NE2	1:A:275:THR:OG1	2.45	0.49
1:A:43:ALA:HB3	1:A:70:LYS:HE3	1.95	0.49
1:A:805:THR:O	1:A:818:ARG:NH1	2.45	0.49
2:D:95:ARG:NE	2:D:95:ARG:H	2.10	0.49
1:A:730:ILE:HB	1:A:731:PRO:HD3	1.95	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:81:ILE:HG22	2:C:82:GLN:HG3	1.95	0.48
1:A:783:SER:HB3	1:A:795:VAL:HG21	1.94	0.48
1:B:730:ILE:HB	1:B:731:PRO:HD3	1.94	0.48
1:B:395:ASP:OD1	1:B:395:ASP:N	2.46	0.48
1:B:61:TYR:CD2	2:D:81:ILE:HD11	2.48	0.48
1:B:176:TYR:O	1:B:179:THR:OG1	2.29	0.48
1:A:7:THR:HG23	1:A:10:LEU:H	1.79	0.47
1:B:282:MSE:HA	1:B:282:MSE:HE2	1.95	0.47
1:A:44:TRP:CZ2	1:A:78:LEU:HD21	2.49	0.47
1:A:916:ARG:O	1:A:920:ARG:HD3	2.14	0.47
1:B:335:GLN:HG3	1:B:337:GLU:OE1	2.14	0.47
1:A:282:MSE:HE2	1:A:282:MSE:HA	1.96	0.47
1:A:150:LEU:HB3	1:A:151:PRO:HD3	1.97	0.47
1:B:417:MSE:HE1	1:B:459:LEU:HD11	1.97	0.47
1:B:61:TYR:HE2	2:D:78:GLY:HA2	1.79	0.47
1:A:83:HIS:HB3	1:A:119:MSE:HE2	1.97	0.47
1:A:19:TYR:CZ	2:C:81:ILE:HD12	2.50	0.47
2:D:169:ILE:HD12	2:D:185:MET:HE1	1.97	0.47
1:A:18:LEU:O	1:A:27:LYS:HD2	2.15	0.46
2:C:95:ARG:HD3	2:C:130:LYS:HE3	1.96	0.46
1:A:247:ASP:OD1	1:A:297:ARG:NH2	2.38	0.46
1:B:826:MSE:HE1	1:B:860:ILE:HG23	1.97	0.46
2:C:166:ARG:NH2	2:C:175:GLU:OE2	2.48	0.46
2:D:30:HIS:HE1	2:D:158:GLU:HG2	1.79	0.46
1:A:102:PRO:O	1:A:106:THR:HG23	2.15	0.46
2:D:50:LEU:HD12	2:D:63:VAL:HG21	1.97	0.46
1:A:271:GLN:O	1:A:275:THR:HG23	2.15	0.46
1:A:70:LYS:HD3	1:A:74:SER:HB2	1.98	0.46
1:A:841:CYS:SG	1:A:853:VAL:HG11	2.55	0.46
1:B:196:LYS:HA	1:B:199:MSE:HE2	1.97	0.46
2:D:81:ILE:HG22	2:D:82:GLN:HG3	1.98	0.46
2:D:137:VAL:HG13	2:D:140:ARG:CZ	2.46	0.46
2:D:124:VAL:HG22	2:D:150:SER:HB2	1.98	0.46
1:A:715:GLU:HA	1:A:718:ARG:HG3	1.97	0.45
1:A:456:ASN:N	1:A:457:PRO:HD2	2.31	0.45
1:B:38:GLN:OE1	2:D:75:LEU:HD23	2.16	0.45
2:C:84:GLN:HB3	2:C:168:LEU:HD11	1.99	0.45
1:A:526:ILE:HG22	1:A:534:MSE:HE1	1.99	0.45
2:C:30:HIS:HE1	2:C:158:GLU:HG2	1.82	0.45
2:C:85:CYS:HB3	2:C:168:LEU:HD21	1.99	0.45
1:A:61:TYR:CD2	2:C:81:ILE:HD11	2.53	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:150:LEU:HB3	1:B:151:PRO:HD3	1.99	0.44
1:A:692:TYR:HD1	1:A:700:PHE:HD2	1.66	0.44
1:B:788:HIS:HE1	1:B:790:ASP:HB2	1.82	0.44
1:B:101:SER:HB3	1:B:104:ILE:HD13	1.98	0.44
1:A:71:ILE:O	1:A:75:PHE:HB2	2.17	0.44
1:A:890:VAL:HG21	1:A:922:PHE:CZ	2.53	0.44
1:B:102:PRO:O	1:B:106:THR:HG23	2.17	0.44
1:B:280:TYR:CE1	1:B:292:VAL:HG23	2.52	0.44
1:A:346:TRP:CD2	1:A:372:LEU:HD22	2.52	0.44
1:A:234:GLN:HB2	1:A:237:THR:HG23	2.00	0.44
1:B:750:ASP:O	1:B:754:ARG:HG3	2.18	0.44
2:C:15:LEU:HB3	2:C:65:ASP:HA	2.00	0.44
1:A:185:MSE:HE3	1:A:223:LYS:HD3	1.98	0.44
1:A:787:ASP:HA	1:A:845:LEU:HD22	2.00	0.44
1:B:685:VAL:HG13	1:B:724:MSE:SE	2.68	0.44
1:B:19:TYR:CZ	2:D:81:ILE:HD12	2.53	0.44
1:A:703:LEU:HA	1:A:706:ILE:HD12	2.00	0.43
1:B:234:GLN:HB2	1:B:237:THR:HG23	1.99	0.43
2:C:151:ALA:N	4:C:1179:GTP:O6	2.51	0.43
1:B:267:MSE:HG2	1:B:318:LEU:HD21	1.99	0.43
1:A:132:LYS:HD3	1:A:133:TYR:CE2	2.53	0.43
1:A:281:HIS:HA	1:A:284:VAL:HG12	2.00	0.43
1:A:44:TRP:NE1	1:A:70:LYS:HD2	2.34	0.43
2:C:91:ASP:HB3	2:C:94:SER:HB3	1.99	0.43
1:B:100:LEU:HG	1:B:101:SER:H	1.84	0.43
1:A:479:TYR:CE1	1:A:518:ALA:HB2	2.54	0.43
1:A:227:LEU:O	1:A:231:VAL:HG13	2.18	0.43
1:B:498:PHE:C	1:B:501:PRO:HD2	2.39	0.43
2:C:137:VAL:HG13	2:C:140:ARG:CZ	2.48	0.43
2:C:75:LEU:HD12	2:C:79:TYR:CE1	2.53	0.43
2:C:80:TYR:HB2	2:C:111:VAL:HG11	2.01	0.43
2:D:123:LYS:HG2	4:D:1190:GTP:C5	2.54	0.43
1:A:197:MSE:O	1:A:201:VAL:HG23	2.19	0.42
1:B:271:GLN:O	1:B:275:THR:HG23	2.18	0.42
1:B:34:LEU:HD22	1:B:62:PHE:CZ	2.54	0.42
1:A:288:ASP:O	1:A:292:VAL:HG13	2.19	0.42
1:A:667:ARG:O	1:A:671:ARG:HG2	2.19	0.42
1:B:246:SER:OG	1:B:294:ASN:HB3	2.19	0.42
1:A:21:ASP:HA	1:A:22:PRO:HD3	1.88	0.42
1:B:772:VAL:O	1:B:776:ILE:HG13	2.20	0.42
1:A:199:MSE:SE	1:A:240:ASN:HB3	2.69	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:534:MSE:HG2	1:A:568:VAL:HG11	2.00	0.42
1:A:804:HIS:CD2	1:A:808:ALA:HB2	2.54	0.42
1:A:772:VAL:O	1:A:776:ILE:HG12	2.19	0.42
1:B:273:VAL:HG11	1:B:302:LEU:HD13	2.01	0.42
2:D:123:LYS:HE2	4:D:1190:GTP:C8	2.54	0.42
1:B:247:ASP:OD1	1:B:297:ARG:NH2	2.35	0.42
1:B:313:THR:O	1:B:313:THR:OG1	2.32	0.42
1:A:198:LEU:HB3	1:A:241:LEU:HD13	2.02	0.42
1:A:592:LEU:HA	1:A:595:LEU:HD12	2.02	0.42
1:A:803:ILE:HD13	1:A:860:ILE:HG12	2.01	0.42
1:B:303:CYS:SG	1:B:323:THR:HB	2.59	0.42
1:A:878:GLY:O	1:A:879:LEU:HD12	2.20	0.42
1:B:54:ARG:NH1	1:B:96:ASN:HB3	2.35	0.41
2:D:85:CYS:HB2	2:D:164:LEU:HD22	2.01	0.41
1:A:840:THR:HA	1:A:844:CYS:HB2	2.01	0.41
1:A:335:GLN:HG3	1:A:337:GLU:OE1	2.20	0.41
1:A:61:TYR:HE2	2:C:78:GLY:HA2	1.83	0.41
1:A:322:ARG:HD2	1:A:322:ARG:HA	1.90	0.41
1:A:779:TRP:O	1:A:783:SER:N	2.53	0.41
1:B:103:VAL:HG23	2:D:111:VAL:HA	2.03	0.41
1:A:100:LEU:HG	1:A:101:SER:H	1.86	0.41
1:B:71:ILE:O	1:B:75:PHE:HB2	2.21	0.41
1:A:879:LEU:HA	1:A:880:PRO:HD3	1.84	0.41
1:B:840:THR:HB	1:B:845:LEU:HG	2.03	0.41
1:A:157:ARG:NH2	2:C:99:LYS:HE3	2.35	0.41
1:A:188:VAL:HG12	1:A:198:LEU:HD12	2.02	0.41
2:C:54:THR:HG22	2:C:176:PHE:CD1	2.56	0.41
2:D:76:ARG:HB2	2:D:77:ASP:H	1.70	0.41
1:A:222:ASN:OD1	1:A:224:LEU:HB2	2.21	0.41
1:A:340:GLU:HA	1:A:343:PHE:CD1	2.56	0.41
1:A:498:PHE:C	1:A:501:PRO:HD2	2.40	0.40
1:B:916:ARG:O	1:B:920:ARG:HD3	2.21	0.40
2:C:129:ARG:NE	2:C:131:VAL:O	2.52	0.40
1:B:130:VAL:HA	1:B:143:LEU:HD21	2.04	0.40
1:B:865:ARG:N	1:B:866:PRO:HD2	2.37	0.40
1:A:722:LEU:HD22	1:A:766:THR:HG22	2.03	0.40
1:B:21:ASP:HA	1:B:22:PRO:HD3	1.88	0.40
2:D:92:VAL:HG21	2:D:124:VAL:HG12	2.03	0.40
1:B:344:ASN:HB2	2:D:140:ARG:HH11	1.87	0.40
1:A:805:THR:HG22	1:A:818:ARG:HD2	2.03	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	857/923 (93%)	834 (97%)	23 (3%)	0	100	100
1	B	717/923 (78%)	701 (98%)	16 (2%)	0	100	100
2	C	167/215 (78%)	163 (98%)	4 (2%)	0	100	100
2	D	171/215 (80%)	166 (97%)	5 (3%)	0	100	100
All	All	1912/2276 (84%)	1864 (98%)	48 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	779/798 (98%)	768 (99%)	11 (1%)	67	85
1	B	671/798 (84%)	661 (98%)	10 (2%)	65	83
2	C	149/184 (81%)	144 (97%)	5 (3%)	37	68
2	D	154/184 (84%)	148 (96%)	6 (4%)	32	64
All	All	1753/1964 (89%)	1721 (98%)	32 (2%)	59	81

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	65	GLN
1	A	198	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	209	PHE
1	A	282	MSE
1	A	395	ASP
1	A	459	LEU
1	A	546	ARG
1	A	584	LEU
1	A	667	ARG
1	A	759	PHE
1	A	916	ARG
1	B	65	GLN
1	B	198	LEU
1	B	209	PHE
1	B	395	ASP
1	B	584	LEU
1	B	667	ARG
1	B	759	PHE
1	B	837	LEU
1	B	893	LYS
1	B	916	ARG
2	C	38	LYS
2	C	93	THR
2	C	95	ARG
2	C	139	HIS
2	C	141	LYS
2	D	38	LYS
2	D	93	THR
2	D	95	ARG
2	D	139	HIS
2	D	141	LYS
2	D	186	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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 carbohydrates 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
4	GTP	D	1190	3	26,34,34	0.98	1 (3%)	33,54,54	2.01	7 (21%)
4	GTP	C	1179	3	26,34,34	0.96	1 (3%)	33,54,54	1.93	7 (21%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GTP	D	1190	3	-	3/18/38/38	0/3/3/3
4	GTP	C	1179	3	-	1/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	1190	GTP	C6-N1	3.01	1.38	1.33
4	C	1179	GTP	C6-N1	2.99	1.38	1.33

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	1190	GTP	N3-C2-N1	-5.23	120.24	127.22
4	C	1179	GTP	N3-C2-N1	-5.18	120.31	127.22
4	D	1190	GTP	PA-O3A-PB	-4.83	116.27	132.83
4	C	1179	GTP	C2-N3-C4	4.38	120.36	115.36

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	1190	GTP	C2-N3-C4	4.28	120.25	115.36
4	C	1179	GTP	PA-O3A-PB	-4.06	118.90	132.83
4	D	1190	GTP	PB-O3B-PG	-4.02	119.02	132.83
4	C	1179	GTP	PB-O3B-PG	-3.92	119.37	132.83
4	C	1179	GTP	C3'-C2'-C1'	3.24	105.85	100.98
4	D	1190	GTP	C3'-C2'-C1'	3.20	105.80	100.98
4	D	1190	GTP	C5-C6-N1	-2.82	119.58	123.43
4	C	1179	GTP	C5-C6-N1	-2.74	119.69	123.43
4	D	1190	GTP	C6-N1-C2	2.45	119.82	115.93
4	C	1179	GTP	C6-N1-C2	2.36	119.67	115.93

There are no chirality outliers.

All (4) torsion outliers are listed below:

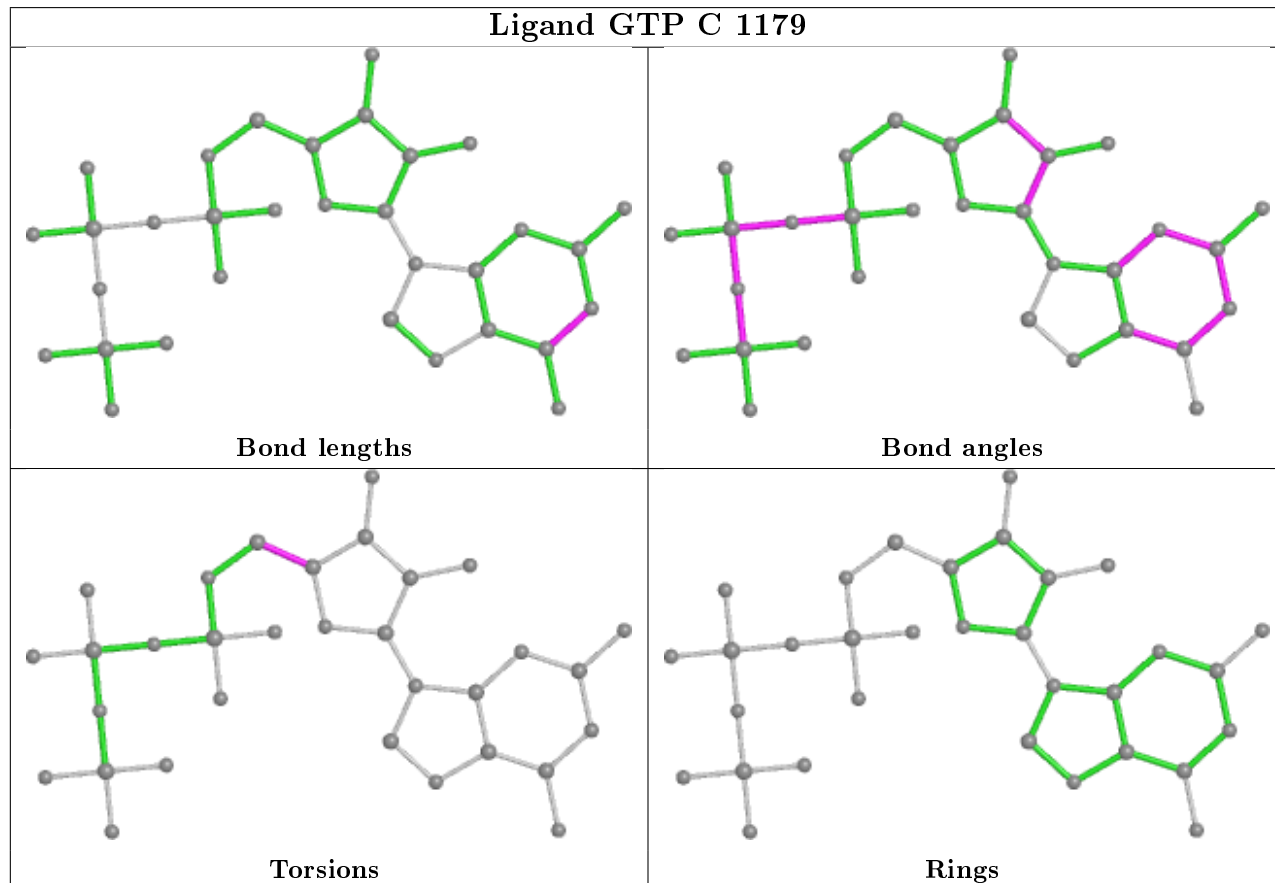
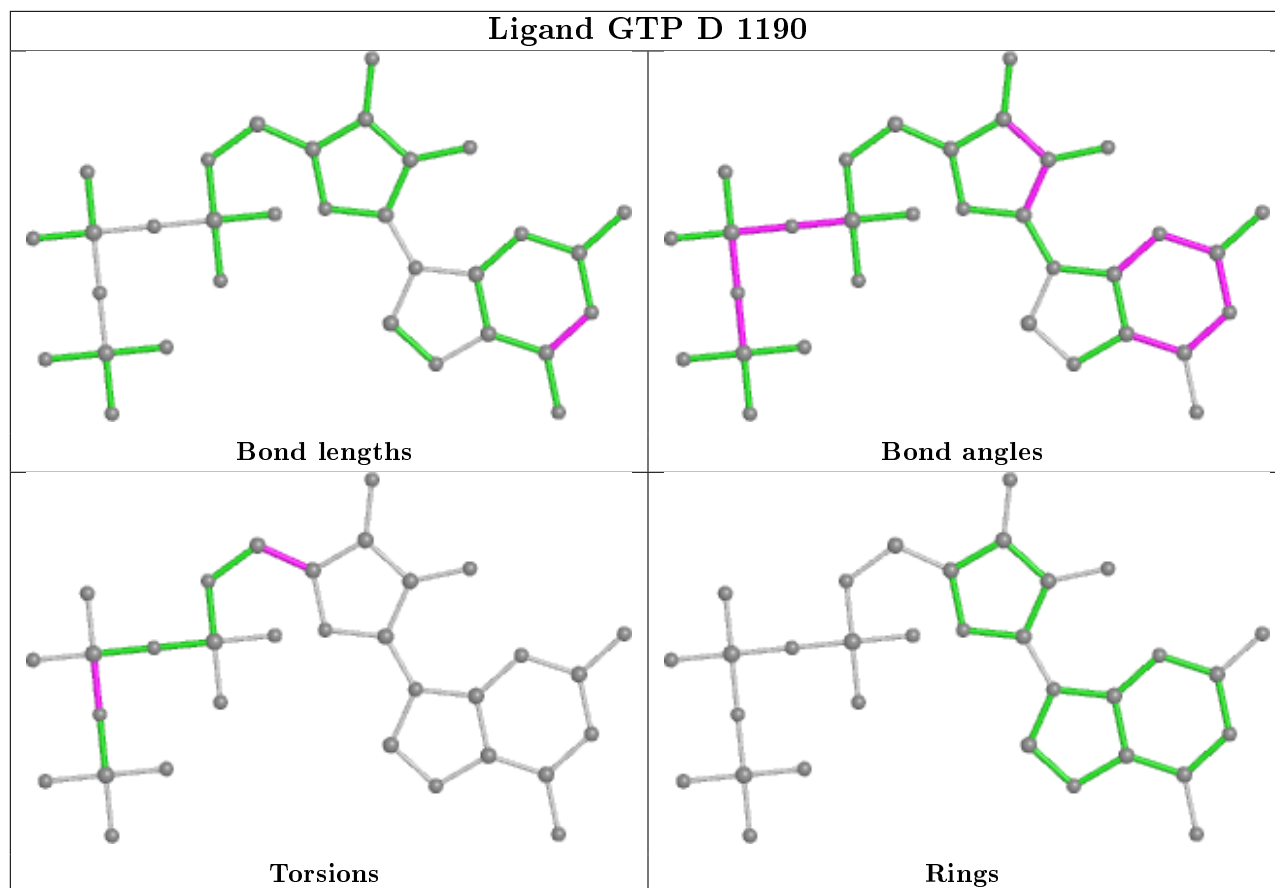
Mol	Chain	Res	Type	Atoms
4	D	1190	GTP	PG-O3B-PB-O2B
4	D	1190	GTP	PG-O3B-PB-O1B
4	D	1190	GTP	O4'-C4'-C5'-O5'
4	C	1179	GTP	O4'-C4'-C5'-O5'

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	1190	GTP	2	0
4	C	1179	GTP	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 [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	849/923 (91%)	0.49	49 (5%) 23 24	59, 130, 186, 206	0
1	B	729/923 (78%)	0.96	137 (18%) 1 2	92, 172, 210, 232	0
2	C	169/215 (78%)	0.66	12 (7%) 16 19	62, 104, 148, 158	0
2	D	175/215 (81%)	0.40	6 (3%) 45 44	65, 89, 119, 134	0
All	All	1922/2276 (84%)	0.67	204 (10%) 6 9	59, 139, 200, 232	0

All (204) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	662	CYS	6.9
1	B	431	ASN	6.3
1	B	765	VAL	5.9
1	B	670	VAL	5.3
1	B	863	VAL	5.2
2	C	161	PHE	5.1
1	B	918	PHE	5.1
1	B	702	TYR	5.1
1	B	414	ILE	4.8
1	B	47	SER	4.8
1	B	615	LEU	4.7
1	B	269	LEU	4.6
1	B	459	LEU	4.6
1	B	215	ASP	4.6
1	B	751	ASP	4.5
1	B	648	THR	4.5
1	A	11	VAL	4.5
1	B	842	CYS	4.4
1	B	310	ILE	4.4
1	B	498	PHE	4.4
1	B	318	LEU	4.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	458	THR	4.3
1	A	310	ILE	4.3
1	B	322	ARG	4.2
1	B	306	PHE	4.2
1	B	44	TRP	4.1
1	B	658	ILE	4.1
1	B	184	LEU	4.1
1	B	365	PHE	4.1
2	C	158	GLU	4.1
1	B	410	LEU	4.0
1	B	828	GLN	4.0
1	A	419	CYS	4.0
1	B	804	HIS	4.0
1	B	802	LEU	3.9
1	A	652	HIS	3.9
1	B	860	ILE	3.9
1	B	5	LYS	3.9
1	B	824	GLN	3.8
1	B	78	LEU	3.8
1	A	430	GLY	3.7
1	B	308	GLU	3.7
1	B	806	GLY	3.7
1	B	843	PHE	3.7
1	B	75	PHE	3.6
1	A	572	LEU	3.6
1	B	315	GLY	3.6
1	A	459	LEU	3.6
1	B	411	ILE	3.5
1	B	777	LEU	3.5
2	C	169	ILE	3.4
1	B	822	ILE	3.4
1	B	838	LEU	3.4
1	B	666	LEU	3.4
1	B	786	LEU	3.4
1	B	647	GLU	3.4
1	A	769	ARG	3.4
1	A	8	LEU	3.3
1	B	799	LEU	3.3
1	B	320	ASP	3.3
1	B	324	LEU	3.3
2	C	162	LEU	3.3
1	B	752	LEU	3.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	621	HIS	3.2
1	B	485	VAL	3.2
2	C	59	ILE	3.2
1	A	60	CYS	3.2
1	B	487	GLU	3.2
1	B	645	LEU	3.2
1	B	187	CYS	3.2
1	A	5	LYS	3.1
2	C	165	ALA	3.1
1	B	216	SER	3.1
1	A	410	LEU	3.1
1	B	11	VAL	3.1
1	B	323	THR	3.1
1	B	864	ASP	3.1
1	B	265	LEU	3.0
1	B	608	PRO	3.0
1	B	168	GLU	3.0
1	B	759	PHE	2.9
1	A	53	ILE	2.9
1	B	65	GLN	2.9
1	B	97	LEU	2.9
1	B	592	LEU	2.9
1	B	725	LEU	2.9
1	A	533	HIS	2.9
1	A	46	ILE	2.8
1	B	346	TRP	2.8
1	A	414	ILE	2.8
1	B	669	ALA	2.8
1	B	834	VAL	2.8
1	B	6	PRO	2.8
1	B	141	PRO	2.8
1	B	700	PHE	2.8
1	B	204	CYS	2.8
2	C	112	CYS	2.8
1	B	413	LEU	2.7
1	B	837	LEU	2.7
1	B	201	VAL	2.7
1	B	152	GLU	2.7
1	B	74	SER	2.7
1	B	581	LEU	2.7
1	A	565	THR	2.7
1	A	311	VAL	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	711	TYR	2.7
1	B	259	VAL	2.7
1	A	413	LEU	2.6
1	B	321	LEU	2.6
1	B	427	LEU	2.6
1	A	43	ALA	2.6
1	B	468	ARG	2.6
1	B	757	THR	2.6
1	B	248	CYS	2.6
1	B	353	LEU	2.6
1	A	142	PHE	2.6
1	B	479	TYR	2.5
1	A	330	CYS	2.5
1	A	429	GLU	2.5
1	B	380	CYS	2.5
1	B	462	VAL	2.5
1	B	649	LEU	2.5
2	C	58	PRO	2.5
1	B	407	VAL	2.5
1	B	208	TRP	2.4
1	B	657	ARG	2.4
1	A	9	GLN	2.4
1	B	115	LEU	2.4
1	A	12	TYR	2.4
1	B	773	VAL	2.4
2	D	84	GLN	2.4
1	B	515	LEU	2.4
1	B	409	ASP	2.4
1	B	821	LEU	2.4
2	D	142	LYS	2.4
1	B	198	LEU	2.4
1	B	829	LEU	2.4
1	B	652	HIS	2.4
1	B	618	ILE	2.3
1	A	265	LEU	2.3
1	A	443	ILE	2.3
1	B	408	LYS	2.3
1	A	308	GLU	2.3
1	A	353	LEU	2.3
2	D	35	PHE	2.3
1	B	270	PHE	2.3
1	A	458	THR	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	645	LEU	2.3
1	A	169	ILE	2.3
1	A	424	TYR	2.3
1	B	442	PHE	2.3
1	B	801	ASP	2.3
1	A	45	GLU	2.3
1	B	872	LEU	2.3
1	A	307	LEU	2.3
1	B	406	LEU	2.3
2	C	87	ILE	2.3
1	B	349	LEU	2.3
1	B	728	LEU	2.3
1	B	651	LYS	2.2
1	B	526	ILE	2.2
2	C	116	PRO	2.2
1	A	499	LEU	2.2
1	B	383	GLU	2.2
1	B	224	LEU	2.2
1	B	805	THR	2.2
1	B	430	GLY	2.2
1	B	643	PRO	2.2
2	D	95	ARG	2.2
1	B	246	SER	2.2
1	B	307	LEU	2.2
1	B	795	VAL	2.2
1	B	594	LYS	2.2
1	B	761	GLN	2.2
1	B	798	PHE	2.1
1	A	527	CYS	2.1
1	B	244	ALA	2.1
1	B	654	ALA	2.1
1	A	677	SER	2.1
1	B	118	GLN	2.1
1	B	287	GLU	2.1
1	B	390	PRO	2.1
2	C	141	LYS	2.1
1	B	319	GLY	2.1
1	A	51	LEU	2.1
1	B	209	PHE	2.1
1	A	117	LEU	2.1
1	A	551	PHE	2.1
1	B	756	ALA	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	416	SER	2.1
1	B	50	LEU	2.1
2	D	103	ASN	2.1
1	A	841	CYS	2.1
1	B	780	ALA	2.1
1	B	243	GLU	2.1
1	B	400	ARG	2.1
1	A	437	THR	2.1
2	C	113	GLU	2.1
1	B	309	LYS	2.0
1	A	451	VAL	2.0
1	A	76	TYR	2.0
2	D	79	TYR	2.0
1	A	480	THR	2.0
1	A	569	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 carbohydrates in this entry.

6.4 Ligands [i](#)

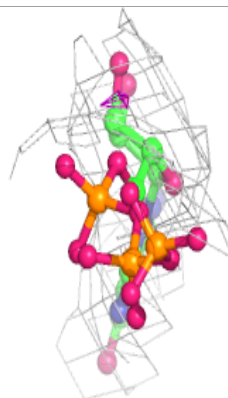
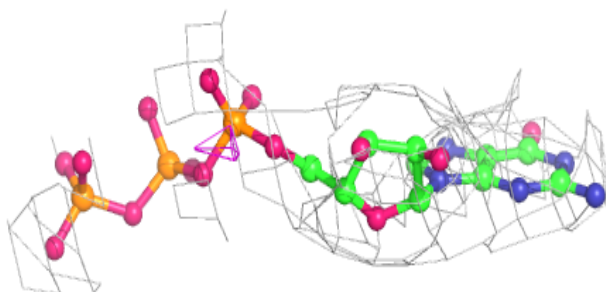
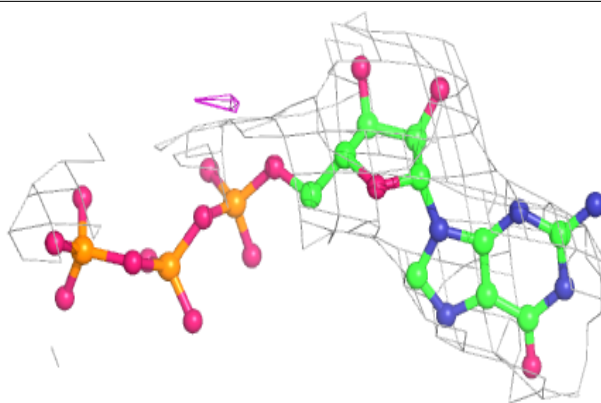
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	MG	C	1178	1/1	0.89	0.39	76,76,76,76	0
4	GTP	D	1190	32/32	0.93	0.24	63,73,86,87	0
4	GTP	C	1179	32/32	0.94	0.27	66,80,93,95	0
3	MG	D	1189	1/1	0.95	0.20	68,68,68,68	0

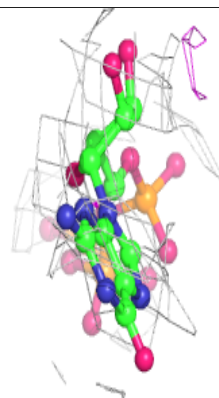
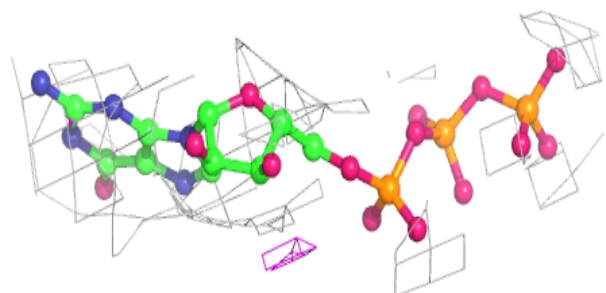
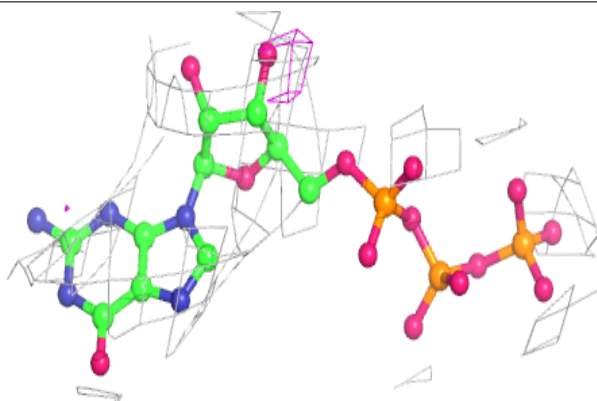
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around GTP D 1190:

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

**Electron density around GTP C 1179:**

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



6.5 Other polymers

There are no such residues in this entry.