



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 29, 2023 – 01:33 PM EDT

PDB ID : 3NC0
Title : Crystal structure of the HIV-1 Rev NES-CRM1-RanGTP nuclear export complex (crystal II)
Authors : Guttler, T.; Madl, T.; Neumann, P.; Deichsel, D.; Corsini, L.; Monecke, T.; Ficner, R.; Sattler, M.; Gorlich, D.
Deposited on : 2010-06-04
Resolution : 2.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35
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) : 2.35

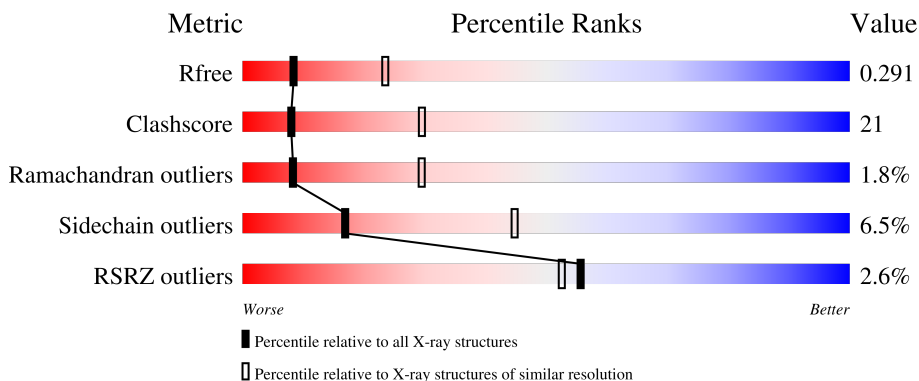
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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	1073	 2% 60% 33% 5%
1	D	1073	 3% 57% 35% 5%
2	B	362	 4% 44% 31% 6% 19%
2	E	362	 4% 45% 31% 5% 19%

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Mol	Chain	Length	Quality of chain
3	C	176	
3	F	176	

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
4	GOL	C	181	-	-	-	X
5	PEG	A	1075	-	-	X	X
5	PEG	A	1077	-	-	-	X
5	PEG	A	1078	-	-	-	X
5	PEG	C	182	-	-	-	X
5	PEG	D	1073	-	-	-	X
5	PEG	D	1074	-	-	-	X
5	PEG	D	1076	-	-	-	X
5	PEG	D	1078	-	-	-	X
5	PEG	L	29	-	-	-	X

2 Entry composition i

There are 9 unique types of molecules in this entry. The entry contains 25190 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-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1038	8394	5387	1411	1543	53	0	0	0
1	D	1041	8414	5401	1413	1547	53	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q6P5F9
A	0	SER	-	expression tag	UNP Q6P5F9
D	-1	GLY	-	expression tag	UNP Q6P5F9
D	0	SER	-	expression tag	UNP Q6P5F9

- Molecule 2 is a protein called Snurportin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	293	2350	1498	405	432	15	0	0	0
2	E	294	2357	1502	406	434	15	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-1	GLY	-	expression tag	UNP O95149
B	0	SER	-	expression tag	UNP O95149
B	1	PRO	-	expression tag	UNP O95149
B	2	VAL	-	expression tag	UNP O95149
B	3	PRO	-	expression tag	UNP O95149
B	4	LEU	-	expression tag	UNP O95149
B	5	GLN	-	expression tag	UNP O95149
B	6	LEU	-	expression tag	UNP O95149

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Chain	Residue	Modelled	Actual	Comment	Reference
B	7	PRO	-	expression tag	UNP O95149
B	8	PRO	-	expression tag	UNP O95149
B	9	LEU	-	expression tag	UNP O95149
B	10	GLU	-	expression tag	UNP O95149
B	11	ARG	-	expression tag	UNP O95149
B	12	LEU	-	expression tag	UNP O95149
B	13	THR	-	expression tag	UNP O95149
B	14	LEU	-	expression tag	UNP O95149
E	-1	GLY	-	expression tag	UNP O95149
E	0	SER	-	expression tag	UNP O95149
E	1	PRO	-	expression tag	UNP O95149
E	2	VAL	-	expression tag	UNP O95149
E	3	PRO	-	expression tag	UNP O95149
E	4	LEU	-	expression tag	UNP O95149
E	5	GLN	-	expression tag	UNP O95149
E	6	LEU	-	expression tag	UNP O95149
E	7	PRO	-	expression tag	UNP O95149
E	8	PRO	-	expression tag	UNP O95149
E	9	LEU	-	expression tag	UNP O95149
E	10	GLU	-	expression tag	UNP O95149
E	11	ARG	-	expression tag	UNP O95149
E	12	LEU	-	expression tag	UNP O95149
E	13	THR	-	expression tag	UNP O95149
E	14	LEU	-	expression tag	UNP O95149

- 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	173	1405	914	246	240	5	0	0	0
3	F	173	1405	914	246	240	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
F	69	LEU	GLN	engineered mutation	UNP P62826

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



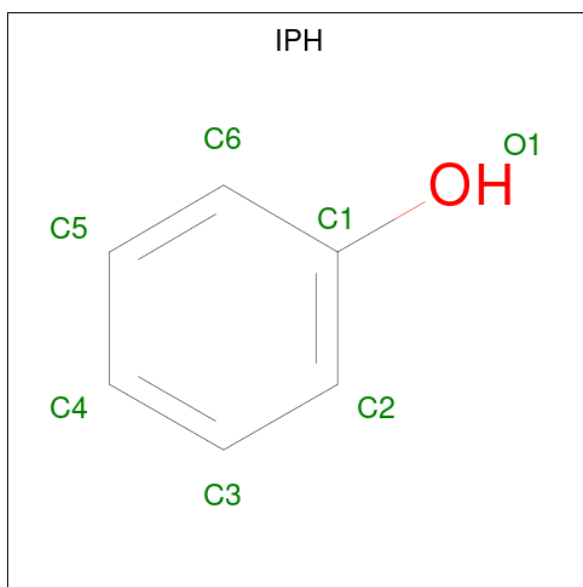
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 12 6 6	0	1
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	C	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	E	1	Total C O 12 6 6	0	1
4	E	1	Total C O 6 3 3	0	0

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C₄H₁₀O₃).



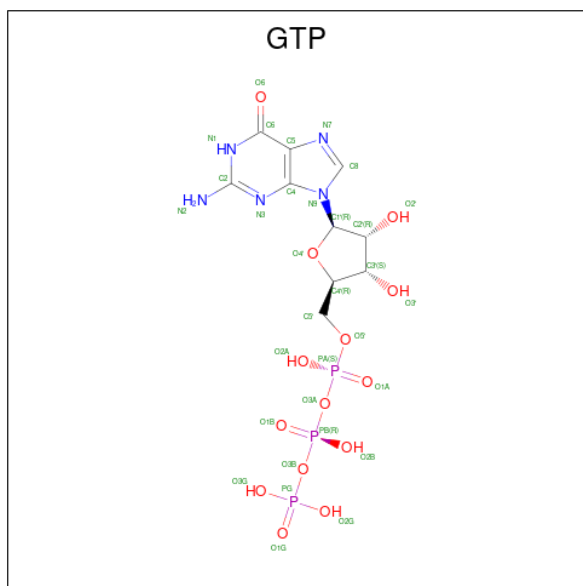
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	A	1	Total C O 7 4 3	0	0
5	C	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	D	1	Total C O 7 4 3	0	0
5	L	1	Total C O 7 4 3	0	0

- Molecule 6 is PHENOL (three-letter code: IPH) (formula: C₆H₆O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	1
			14	12	2		

- Molecule 7 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



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

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

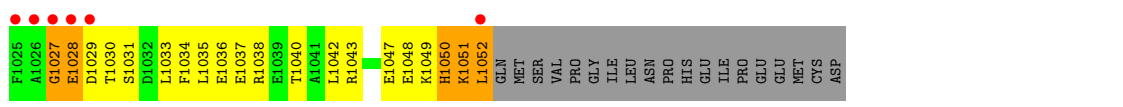
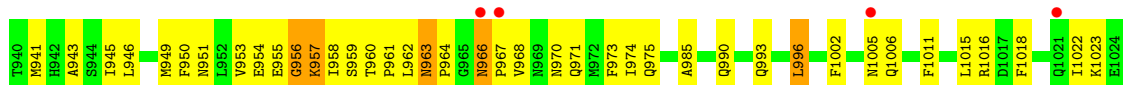
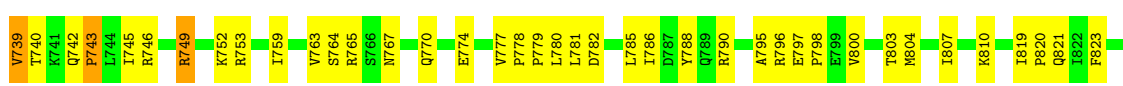
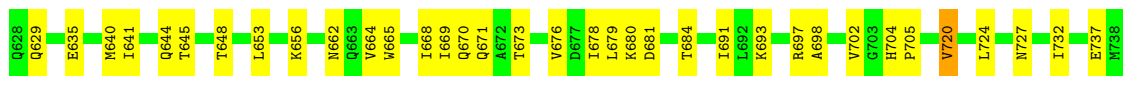
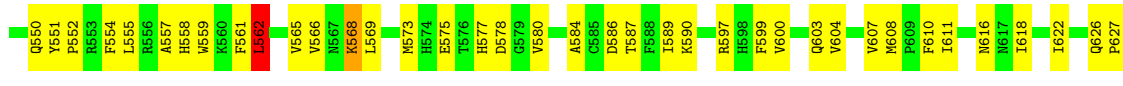
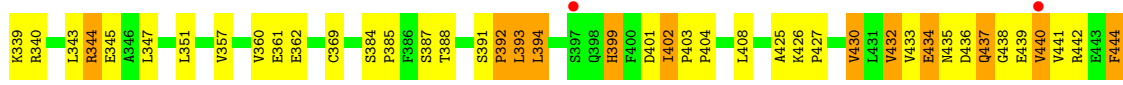
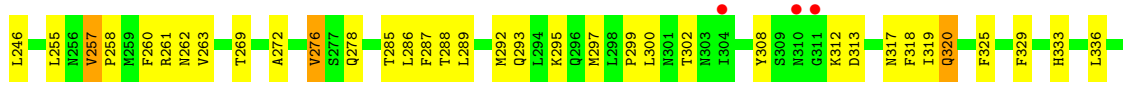
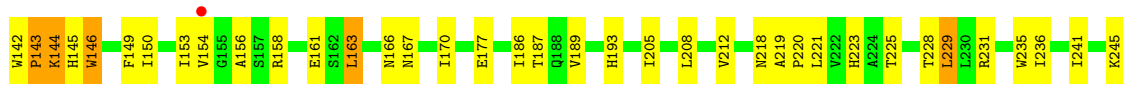
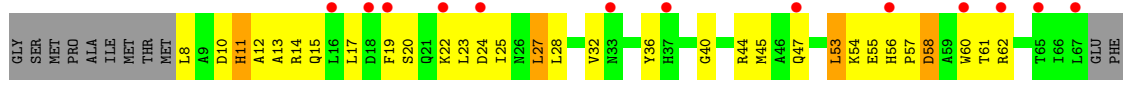
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	C	1	Total 1	Mg 1	0	0
8	F	1	Total 1	Mg 1	0	0

- Molecule 9 is water.

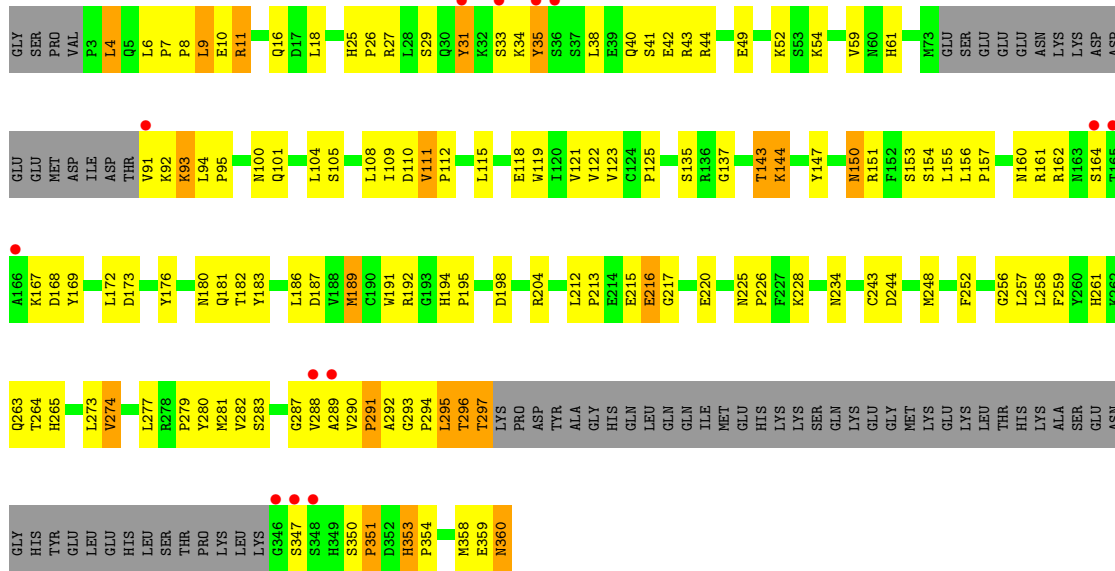
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	230	Total 230	O 230	0	0
9	B	80	Total 80	O 80	0	0
9	C	53	Total 53	O 53	0	0
9	D	183	Total 183	O 183	0	0
9	E	56	Total 56	O 56	0	0
9	F	27	Total 27	O 27	0	0



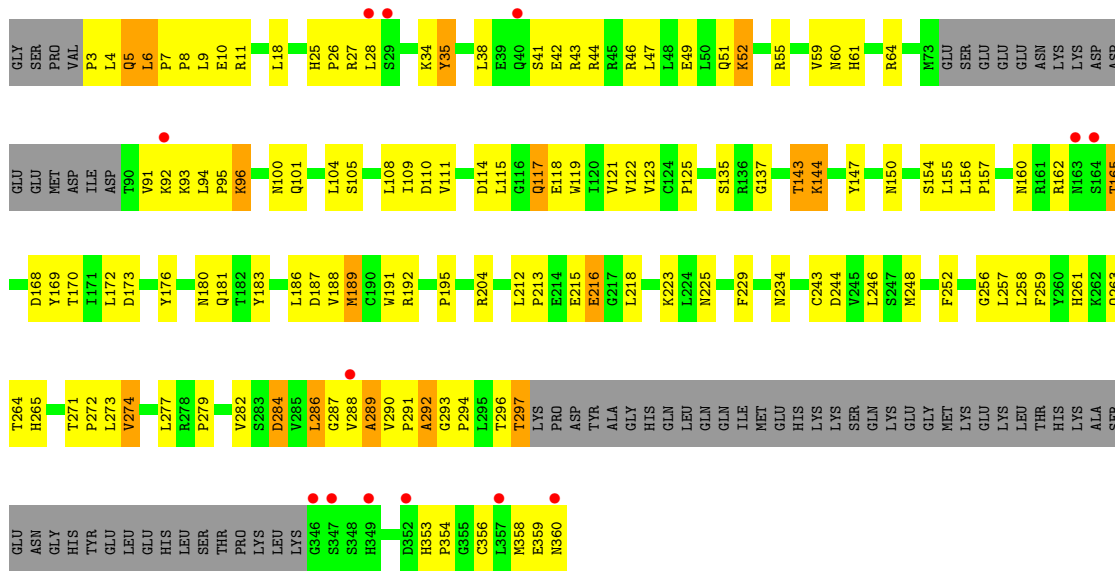
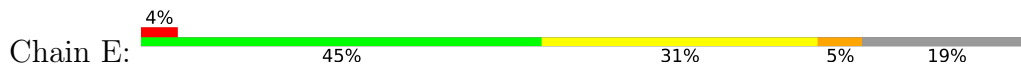
• Molecule 1: Exportin-1



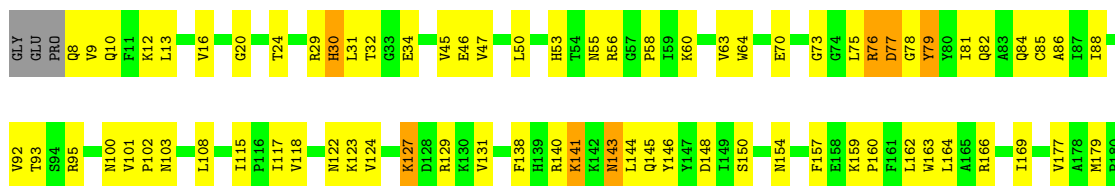
• Molecule 2: Snurportin-1



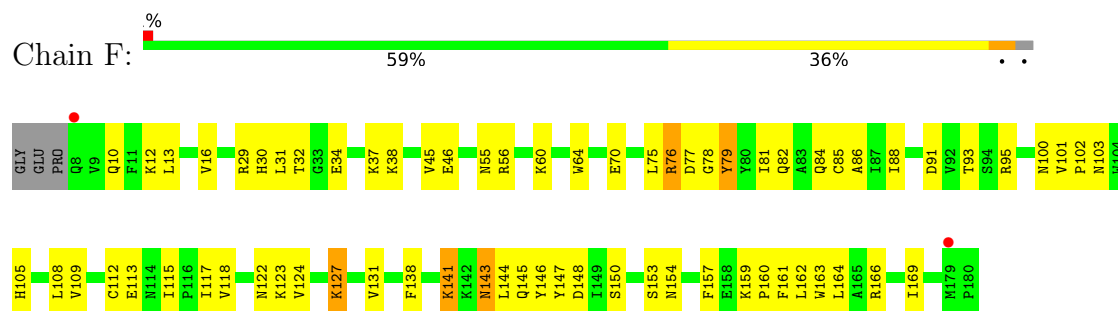
• Molecule 2: Snurportin-1



• Molecule 3: GTP-binding nuclear protein Ran



- Molecule 3: GTP-binding nuclear protein Ran



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	73.26Å 225.90Å 163.98Å 90.00° 100.75° 90.00°	Depositor
Resolution (Å)	39.05 – 2.90 39.05 – 2.90	Depositor EDS
% Data completeness (in resolution range)	95.5 (39.05-2.90) 85.6 (39.05-2.90)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.94 (at 2.90Å)	Xtrriage
Refinement program	PHENIX 1.6.1_357	Depositor
R, R_{free}	0.242 , 0.295 0.240 , 0.291	Depositor DCC
R_{free} test set	5517 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	40.1	Xtrriage
Anisotropy	0.438	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 31.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.25$	Xtrriage
Estimated twinning fraction	0.136 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	25190	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.61% 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: GOL, PEG, IPH, 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	0.25	0/8566	0.42	1/11604 (0.0%)
1	D	0.24	0/8586	0.43	3/11632 (0.0%)
2	B	0.24	0/2415	0.46	0/3278
2	E	0.24	0/2422	0.46	0/3288
3	C	0.32	1/1440 (0.1%)	0.45	0/1945
3	F	0.31	1/1440 (0.1%)	0.44	0/1945
All	All	0.25	2/24869 (0.0%)	0.44	4/33692 (0.0%)

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	D	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	78	GLY	C-N	8.01	1.52	1.34
3	F	78	GLY	C-N	6.95	1.50	1.34

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	562	LEU	CA-CB-CG	5.39	127.71	115.30
1	D	158	ARG	NE-CZ-NH2	-5.39	117.61	120.30
1	A	158	ARG	NE-CZ-NH1	-5.37	117.62	120.30
1	D	158	ARG	NE-CZ-NH1	5.17	122.89	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	119	CYS	Mainchain

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	8394	0	8460	344	0
1	D	8414	0	8483	356	0
2	B	2350	0	2307	115	0
2	E	2357	0	2314	105	0
3	C	1405	0	1432	82	0
3	F	1405	0	1434	74	0
4	A	30	0	40	1	0
4	B	6	0	8	1	0
4	C	6	0	8	0	0
4	D	12	0	16	1	0
4	E	18	0	24	1	0
5	A	28	0	40	14	0
5	C	7	0	10	3	0
5	D	42	0	60	9	0
5	L	7	0	10	0	0
6	B	14	0	12	0	0
7	C	32	0	12	3	0
7	F	32	0	12	1	0
8	C	1	0	0	0	0
8	F	1	0	0	0	0
9	A	230	0	0	12	0
9	B	80	0	0	2	0
9	C	53	0	0	5	0
9	D	183	0	0	9	0
9	E	56	0	0	3	0
9	F	27	0	0	2	0
All	All	25190	0	24682	1055	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 21.

The worst 5 of 1055 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:386:PHE:CZ	5:A:1075:PEG:H21	1.75	1.22
1:D:53:LEU:HG	1:D:54:LYS:H	1.17	1.08
3:C:76:ARG:HD2	5:C:182:PEG:H21	1.39	1.04
1:A:386:PHE:CZ	5:A:1075:PEG:H31	1.97	0.98
1:D:119:CYS:C	1:D:121:GLU:H	1.63	0.98

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	1034/1073 (96%)	919 (89%)	95 (9%)	20 (2%)	8	28
1	D	1037/1073 (97%)	918 (88%)	103 (10%)	16 (2%)	10	34
2	B	287/362 (79%)	239 (83%)	39 (14%)	9 (3%)	4	16
2	E	288/362 (80%)	247 (86%)	35 (12%)	6 (2%)	7	26
3	C	171/176 (97%)	158 (92%)	12 (7%)	1 (1%)	25	58
3	F	171/176 (97%)	157 (92%)	13 (8%)	1 (1%)	25	58
All	All	2988/3222 (93%)	2638 (88%)	297 (10%)	53 (2%)	8	29

5 of 53 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	123	GLU
1	A	1029	ASP
1	A	1035	LEU
2	B	29	SER
2	B	216	GLU

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	942/973 (97%)	886 (94%)	56 (6%)	19	49
1	D	944/973 (97%)	880 (93%)	64 (7%)	16	42
2	B	264/327 (81%)	245 (93%)	19 (7%)	14	39
2	E	265/327 (81%)	246 (93%)	19 (7%)	14	39
3	C	152/154 (99%)	141 (93%)	11 (7%)	14	39
3	F	152/154 (99%)	143 (94%)	9 (6%)	19	49
All	All	2719/2908 (94%)	2541 (94%)	178 (6%)	17	45

5 of 178 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	434	GLU
1	D	963	ASN
1	D	444	PHE
1	D	648	THR
2	E	5	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 104 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	140	GLN
1	D	493	ASN
3	F	105	HIS
1	D	167	ASN
1	D	320	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 30 ligands modelled in this entry, 2 are monoatomic - leaving 28 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	GOL	A	1074	-	5,5,5	0.37	0	5,5,5	0.33	0
5	PEG	D	1075	-	6,6,6	0.55	0	5,5,5	0.35	0
4	GOL	E	361[B]	-	5,5,5	0.37	0	5,5,5	0.29	0
5	PEG	C	182	-	6,6,6	0.59	0	5,5,5	0.40	0
4	GOL	A	1079	-	5,5,5	0.37	0	5,5,5	0.29	0
4	GOL	A	1072[B]	-	5,5,5	0.36	0	5,5,5	0.28	0
5	PEG	A	1075	-	6,6,6	0.46	0	5,5,5	0.58	0
5	PEG	D	1074	-	6,6,6	0.59	0	5,5,5	0.47	0
4	GOL	E	361[A]	-	5,5,5	0.39	0	5,5,5	0.31	0
5	PEG	L	29	-	6,6,6	0.38	0	5,5,5	0.80	0
4	GOL	A	1072[A]	-	5,5,5	0.37	0	5,5,5	0.25	0
4	GOL	B	362	-	5,5,5	0.35	0	5,5,5	0.34	0
5	PEG	D	1073	-	6,6,6	0.56	0	5,5,5	0.35	0
7	GTP	C	217	8	26,34,34	1.12	2 (7%)	32,54,54	1.48	5 (15%)
6	IPH	B	361[B]	-	7,7,7	0.40	0	8,8,8	0.31	0
6	IPH	B	361[A]	-	7,7,7	0.43	0	8,8,8	0.26	0
5	PEG	D	1078	-	6,6,6	0.55	0	5,5,5	0.50	0
5	PEG	A	1077	-	6,6,6	0.57	0	5,5,5	0.33	0
5	PEG	D	1077	-	6,6,6	0.58	0	5,5,5	0.37	0
4	GOL	D	1072	-	5,5,5	0.34	0	5,5,5	0.27	0
5	PEG	A	1076	-	6,6,6	0.60	0	5,5,5	0.37	0
4	GOL	E	362	-	5,5,5	0.38	0	5,5,5	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	GOL	A	1073	-	5,5,5	0.37	0	5,5,5	0.37	0
5	PEG	D	1076	-	6,6,6	0.52	0	5,5,5	0.42	0
4	GOL	C	181	-	5,5,5	0.41	0	5,5,5	0.26	0
5	PEG	A	1078	-	6,6,6	0.54	0	5,5,5	0.58	0
7	GTP	F	217	8	26,34,34	1.09	2 (7%)	32,54,54	1.59	7 (21%)
4	GOL	D	1079	-	5,5,5	0.37	0	5,5,5	0.27	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
4	GOL	A	1074	-	-	4/4/4/4	-
5	PEG	D	1075	-	-	0/4/4/4	-
4	GOL	E	361[B]	-	-	2/4/4/4	-
5	PEG	C	182	-	-	0/4/4/4	-
4	GOL	A	1079	-	-	2/4/4/4	-
4	GOL	A	1072[B]	-	-	2/4/4/4	-
5	PEG	A	1075	-	-	0/4/4/4	-
5	PEG	D	1074	-	-	1/4/4/4	-
4	GOL	E	361[A]	-	-	2/4/4/4	-
5	PEG	L	29	-	-	0/4/4/4	-
4	GOL	A	1072[A]	-	-	2/4/4/4	-
4	GOL	B	362	-	-	2/4/4/4	-
5	PEG	D	1073	-	-	1/4/4/4	-
7	GTP	C	217	8	-	2/18/38/38	0/3/3/3
6	IPH	B	361[B]	-	-	-	0/1/1/1
6	IPH	B	361[A]	-	-	-	0/1/1/1
5	PEG	D	1078	-	-	0/4/4/4	-
5	PEG	A	1077	-	-	2/4/4/4	-
5	PEG	D	1077	-	-	0/4/4/4	-
4	GOL	D	1072	-	-	4/4/4/4	-
5	PEG	A	1076	-	-	1/4/4/4	-
4	GOL	E	362	-	-	0/4/4/4	-
4	GOL	A	1073	-	-	0/4/4/4	-
5	PEG	D	1076	-	-	0/4/4/4	-
4	GOL	C	181	-	-	2/4/4/4	-
5	PEG	A	1078	-	-	0/4/4/4	-
7	GTP	F	217	8	-	2/18/38/38	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	D	1079	-	-	2/4/4/4	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	C	217	GTP	C5-C6	-3.81	1.39	1.47
7	F	217	GTP	C5-C6	-3.70	1.39	1.47
7	F	217	GTP	C2-N3	2.16	1.38	1.33
7	C	217	GTP	C2-N3	2.06	1.38	1.33

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	F	217	GTP	PB-O3B-PG	-3.75	119.94	132.83
7	C	217	GTP	PB-O3B-PG	-3.42	121.08	132.83
7	F	217	GTP	C8-N7-C5	3.19	109.06	102.99
7	C	217	GTP	C5-C6-N1	3.11	119.45	113.95
7	C	217	GTP	PA-O3A-PB	-3.10	122.18	132.83

There are no chirality outliers.

5 of 33 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1072[A]	GOL	O1-C1-C2-C3
4	A	1072[B]	GOL	O1-C1-C2-C3
4	A	1074	GOL	O1-C1-C2-C3
4	A	1079	GOL	O1-C1-C2-C3
4	B	362	GOL	O1-C1-C2-O2

There are no ring outliers.

13 monomers are involved in 34 short contacts:

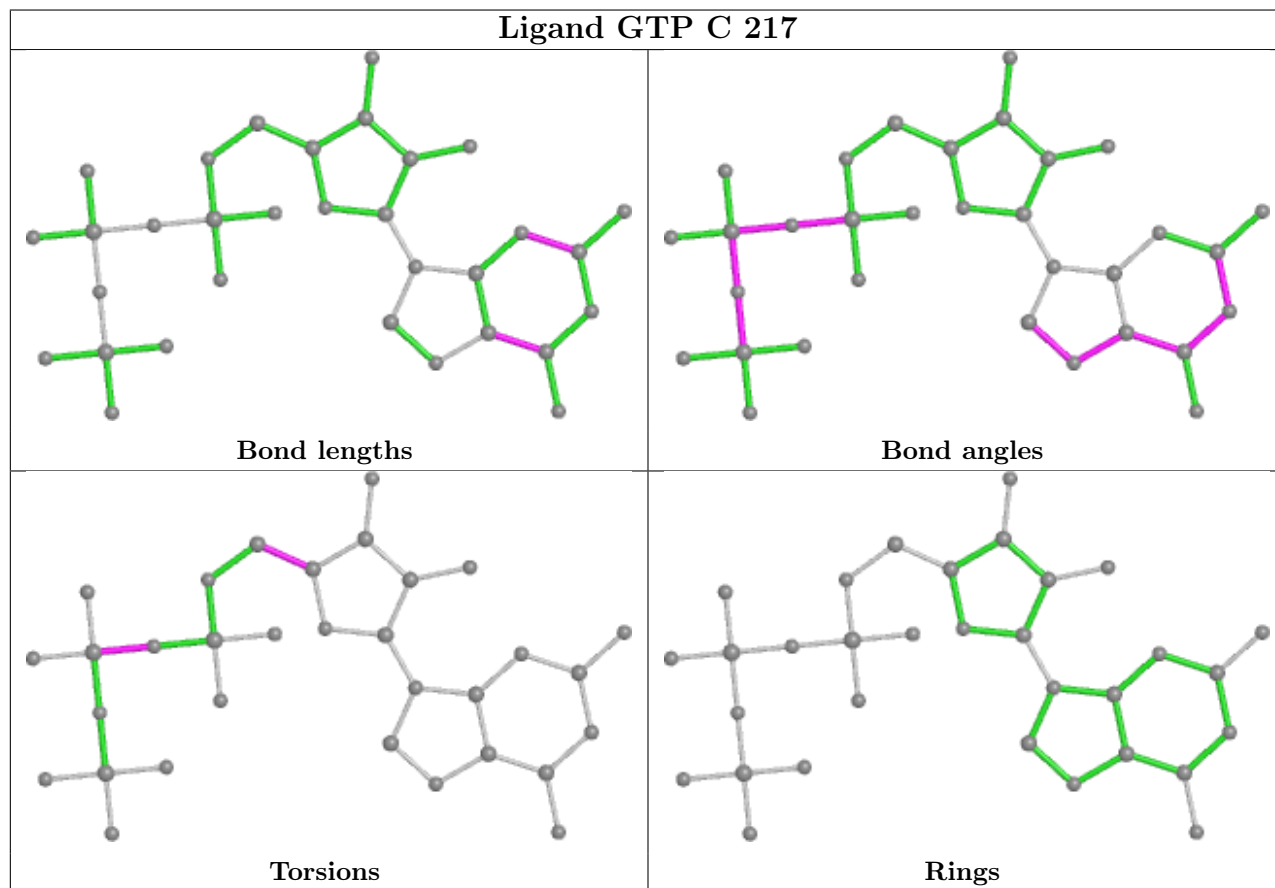
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	1075	PEG	2	0
5	C	182	PEG	3	0
5	A	1075	PEG	12	0
5	D	1074	PEG	3	0
4	B	362	GOL	1	0
7	C	217	GTP	3	0
5	A	1077	PEG	2	0
5	D	1077	PEG	1	0

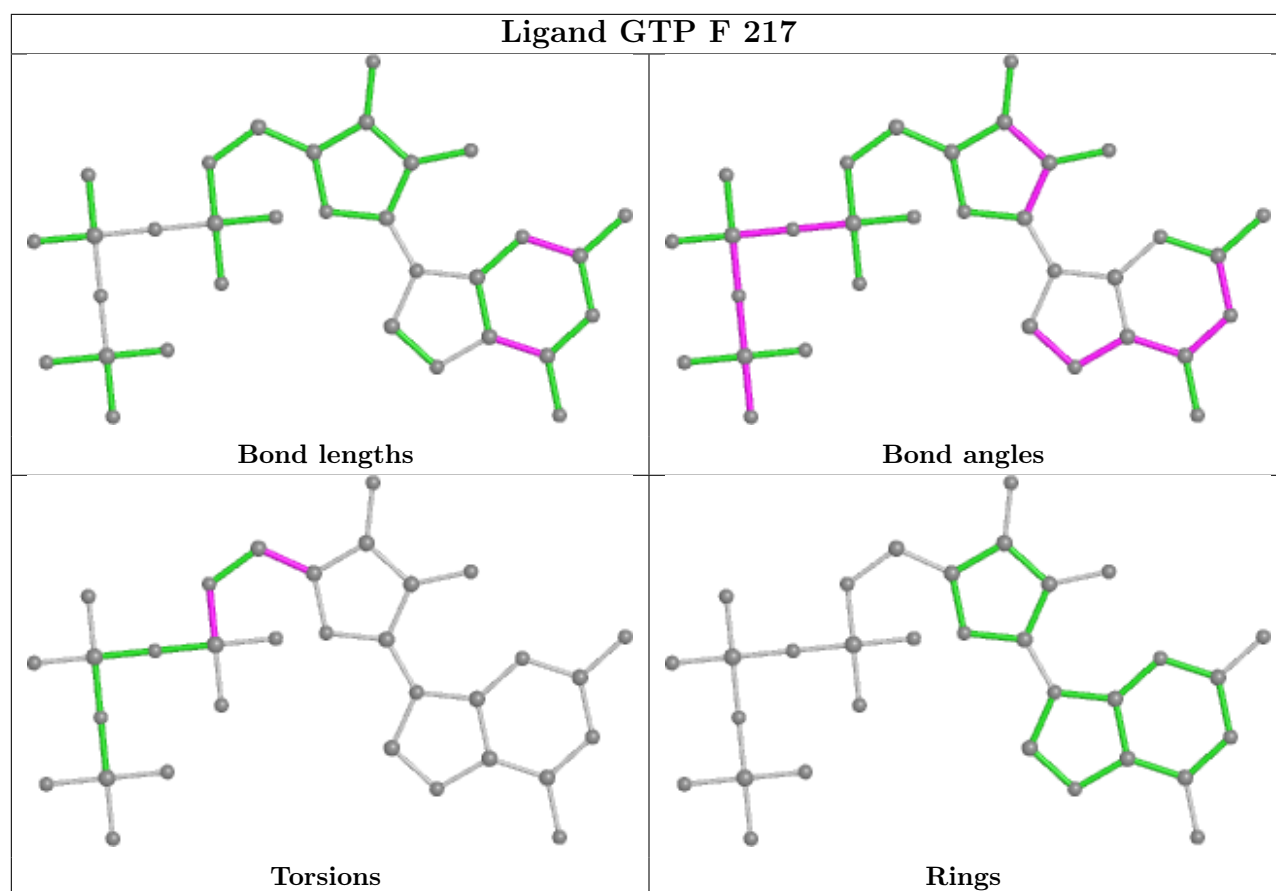
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	362	GOL	1	0
4	A	1073	GOL	1	0
5	D	1076	PEG	3	0
7	F	217	GTP	1	0
4	D	1079	GOL	1	0

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 [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	1038/1073 (96%)	-0.04	21 (2%) 65 63	10, 47, 101, 138	0
1	D	1041/1073 (97%)	0.02	29 (2%) 53 49	10, 47, 103, 163	0
2	B	293/362 (80%)	0.09	13 (4%) 34 30	15, 43, 104, 134	0
2	E	294/362 (81%)	0.06	13 (4%) 34 30	13, 43, 107, 145	0
3	C	173/176 (98%)	-0.15	0 100 100	17, 39, 79, 107	0
3	F	173/176 (98%)	-0.11	2 (1%) 79 79	18, 39, 80, 118	0
All	All	3012/3222 (93%)	-0.01	78 (2%) 56 52	10, 45, 101, 163	0

The worst 5 of 78 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	19	PHE	10.9
1	D	967	PRO	8.6
2	B	91	VAL	6.9
1	A	966	ASN	5.7
1	D	37	HIS	5.7

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

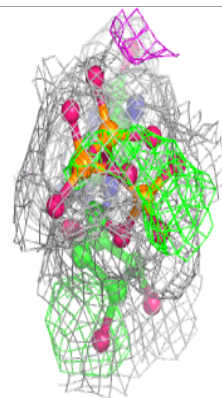
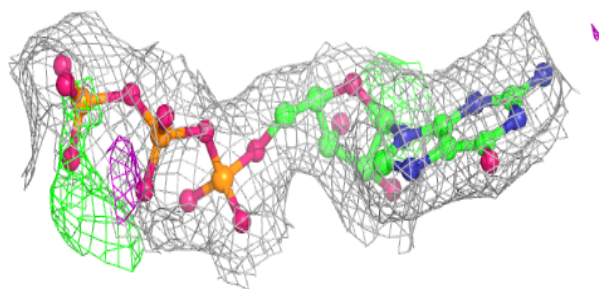
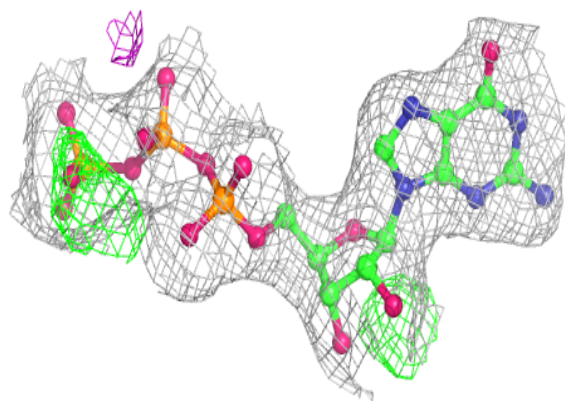
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	PEG	A	1075	7/7	0.51	0.45	84,88,95,101	7
5	PEG	A	1077	7/7	0.56	0.49	44,63,83,84	7
8	MG	F	218	1/1	0.59	0.18	35,35,35,35	0
6	IPH	B	361[A]	7/7	0.66	0.28	14,46,57,57	7
6	IPH	B	361[B]	7/7	0.66	0.28	43,54,55,56	7
5	PEG	L	29	7/7	0.66	0.40	41,69,79,79	7
5	PEG	A	1078	7/7	0.69	0.51	49,62,74,77	7
5	PEG	C	182	7/7	0.75	0.41	55,60,68,72	7
5	PEG	D	1073	7/7	0.75	0.48	47,51,60,68	7
4	GOL	C	181	6/6	0.76	0.44	48,50,59,63	6
4	GOL	A	1074	6/6	0.77	0.40	41,55,66,71	6
4	GOL	D	1079	6/6	0.77	0.37	42,66,72,73	6
4	GOL	E	362	6/6	0.77	0.32	51,59,61,62	6
5	PEG	D	1076	7/7	0.78	0.47	50,70,96,100	7
5	PEG	D	1077	7/7	0.78	0.35	59,76,82,91	7
5	PEG	D	1074	7/7	0.78	0.42	36,49,54,61	7
5	PEG	A	1076	7/7	0.79	0.34	47,59,73,76	7
5	PEG	D	1078	7/7	0.80	0.41	52,65,72,74	7
4	GOL	B	362	6/6	0.83	0.34	59,67,72,73	6
4	GOL	D	1072	6/6	0.84	0.39	45,61,70,77	6
5	PEG	D	1075	7/7	0.85	0.38	46,54,69,75	7
4	GOL	A	1073	6/6	0.86	0.44	37,54,56,59	6
4	GOL	A	1079	6/6	0.86	0.41	56,72,75,79	6
4	GOL	A	1072[B]	6/6	0.89	0.13	14,18,51,51	6
8	MG	C	218	1/1	0.89	0.18	54,54,54,54	0
4	GOL	A	1072[A]	6/6	0.89	0.13	3,27,51,51	6
4	GOL	E	361[B]	6/6	0.91	0.19	18,40,57,60	6
4	GOL	E	361[A]	6/6	0.91	0.19	18,46,56,59	6
7	GTP	C	217	32/32	0.97	0.17	9,21,46,53	1
7	GTP	F	217	32/32	0.97	0.18	5,27,48,65	0

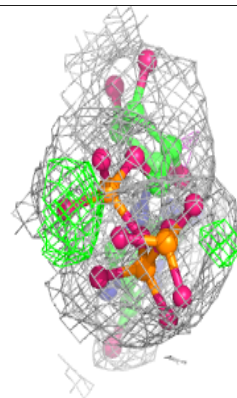
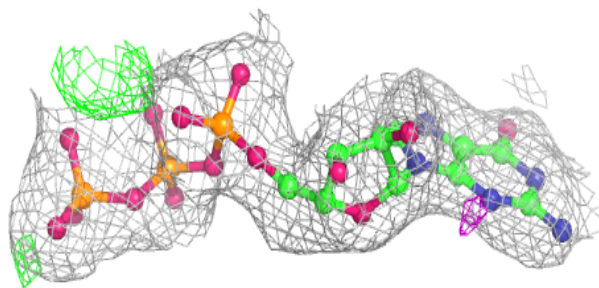
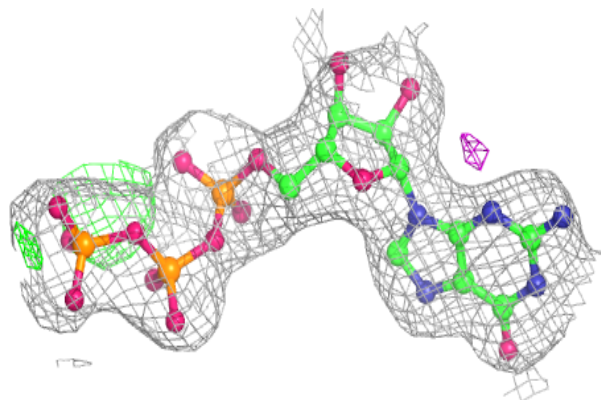
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around GTP C 217:

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

**Electron density around GTP F 217:**

$2mF_o-DF_c$ (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.