



wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 21, 2016 – 01:58 PM EST

PDB ID : 5KX5
Title : Crystal structure of tubulin-stathmin-TTL-Compound 11 complex
Authors : Parris, K.
Deposited on : 2016-07-20
Resolution : 2.50 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

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20028442
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20028442

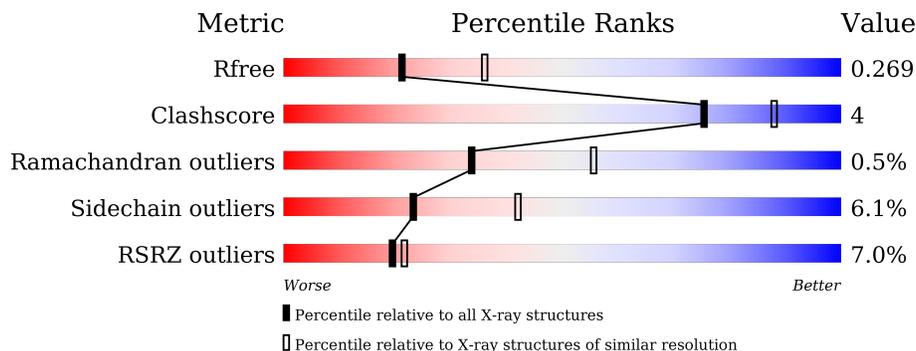
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	451	 6% 84% 12% ..
1	C	451	 % 86% 11% .
2	B	445	 % 80% 15% ..
2	D	445	 8% 80% 14% ..
3	E	143	 8% 67% 17% 15%
4	F	384	 19% 72% 15% . 12%

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	MG	A	502	-	-	-	X
6	MG	C	502	-	-	-	X

2 Entry composition i

There are 11 unique types of molecules in this entry. The entry contains 17802 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 Tubulin alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	441	Total	C	N	O	S	0	0	0
			3445	2179	585	659	22			
1	C	440	Total	C	N	O	S	0	2	0
			3455	2186	589	658	22			

- Molecule 2 is a protein called Tubulin beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	427	Total	C	N	O	S	0	3	0
			3377	2122	578	651	26			
2	D	426	Total	C	N	O	S	0	0	0
			3343	2097	571	650	25			

- Molecule 3 is a protein called Stathmin-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	121	Total	C	N	O	S	0	1	0
			1012	625	185	198	4			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	3	MET	-	initiating methionine	UNP P63043
E	4	ALA	-	expression tag	UNP P63043
E	14	ALA	CYS	conflict	UNP P63043
E	20	TRP	PHE	conflict	UNP P63043

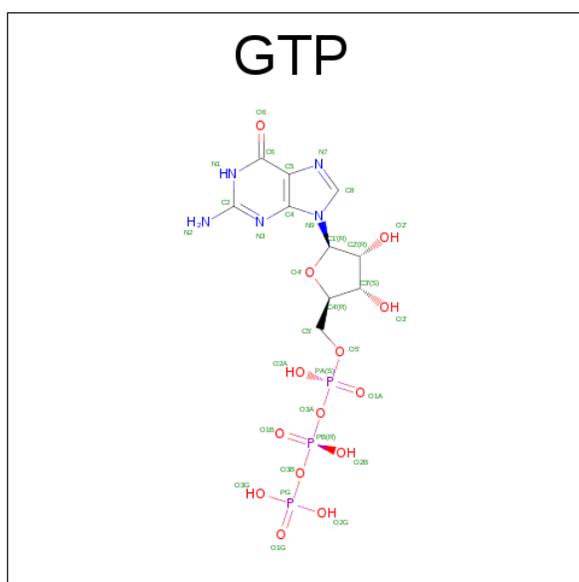
- Molecule 4 is a protein called TTL protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	F	338	Total	C	N	O	S	0	2	0
			2788	1794	474	506	14			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	379	HIS	-	expression tag	UNP E1BQ43
F	380	HIS	-	expression tag	UNP E1BQ43
F	381	HIS	-	expression tag	UNP E1BQ43
F	382	HIS	-	expression tag	UNP E1BQ43
F	383	HIS	-	expression tag	UNP E1BQ43
F	384	HIS	-	expression tag	UNP E1BQ43

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



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

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	
6	B	2	Total	Mg	0	0
			2	2		
6	A	1	Total	Mg	0	0
			1	1		
6	D	2	Total	Mg	0	0
			2	2		

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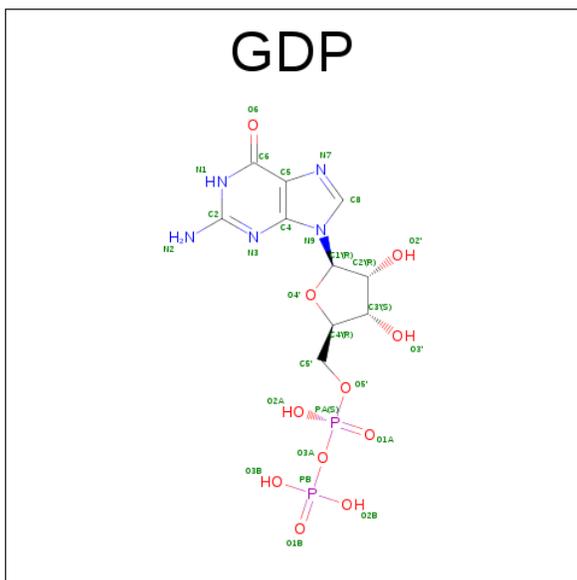
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total Mg 1 1	0	0

- Molecule 7 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total Ca 1 1	0	0
7	A	1	Total Ca 1 1	0	0
7	C	1	Total Ca 1 1	0	0
7	E	1	Total Ca 1 1	0	0

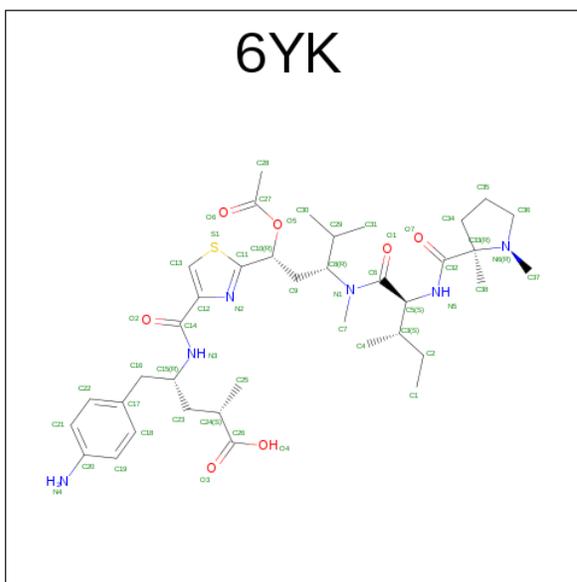
- Molecule 8 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C N O P 28 10 5 11 2	0	0
8	D	1	Total C N O P 28 10 5 11 2	0	0

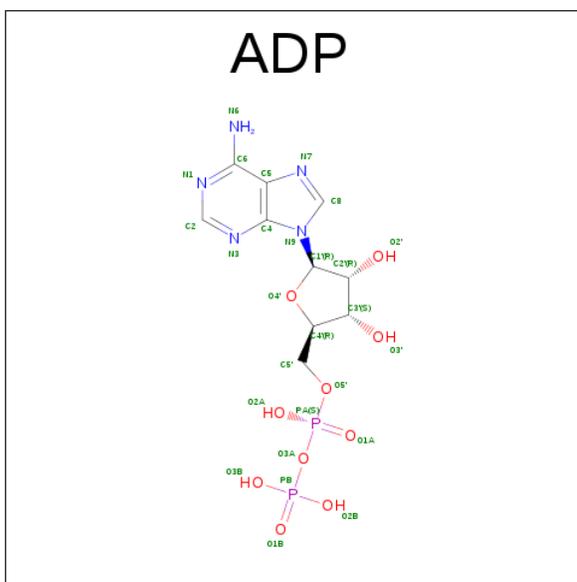
- Molecule 9 is (2 {S},4 {R})-4-[[2-[(1 {R},3 {R})-1-acetyloxy-3-[(2 {S},3 {S})-2-[(2 {R})-1,2-dimethylpyrrolidin-2-yl]carbonylamino]-3-methyl-pentanoyl]-methyl-amino]-4-methyl-pentyl]-1,3-thiazol-4-yl]carbonylamino]-5-(4-aminophenyl)-2-methyl-pentanoic acid (three-letter

code: 6YK) (formula: C₃₈H₅₃N₆O₇S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
9	B	1	52	38	6	7	1	0	0
9	D	1	52	38	6	7	1	0	0

- Molecule 10 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
10	F	1	27	10	5	10	2	0	0

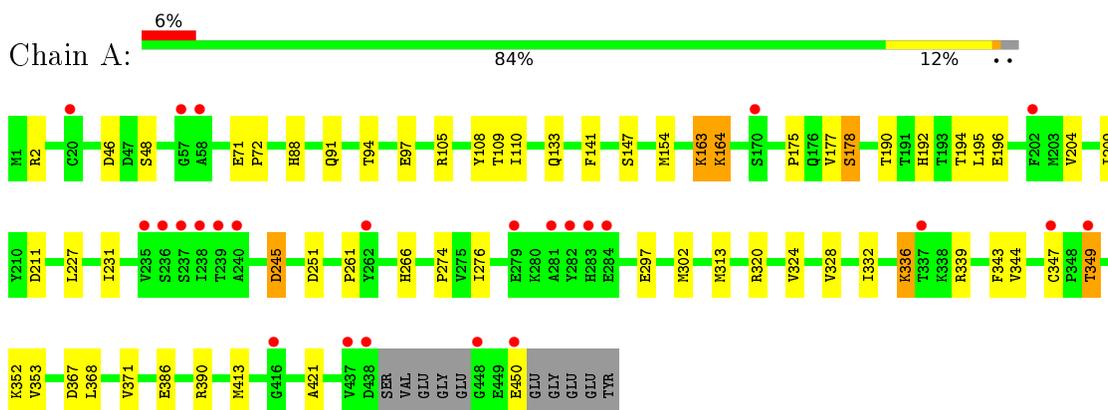
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	22	Total 22	O 22	0	0
11	B	33	Total 33	O 33	0	0
11	C	41	Total 41	O 41	0	0
11	D	7	Total 7	O 7	0	0
11	E	4	Total 4	O 4	0	0
11	F	14	Total 14	O 14	0	0

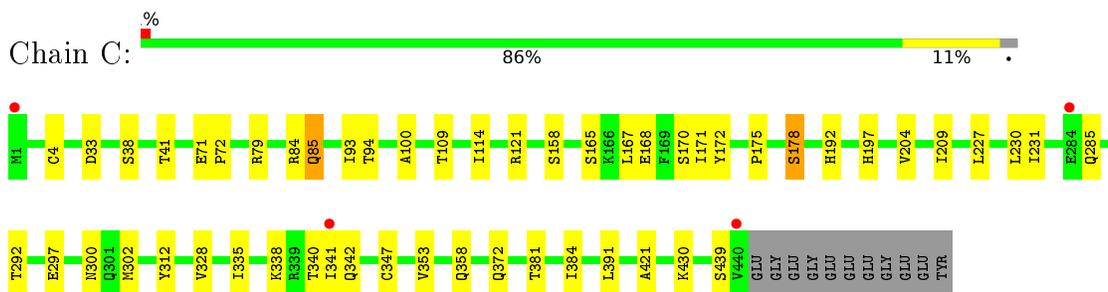
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

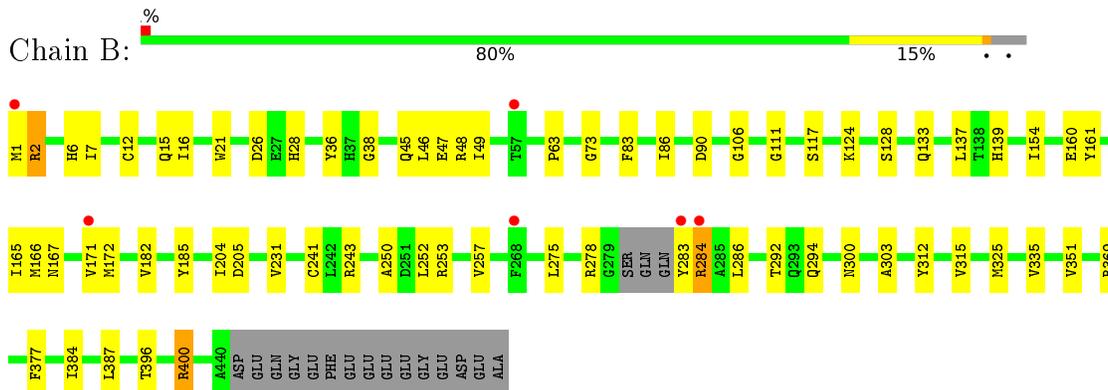
- Molecule 1: Tubulin alpha chain



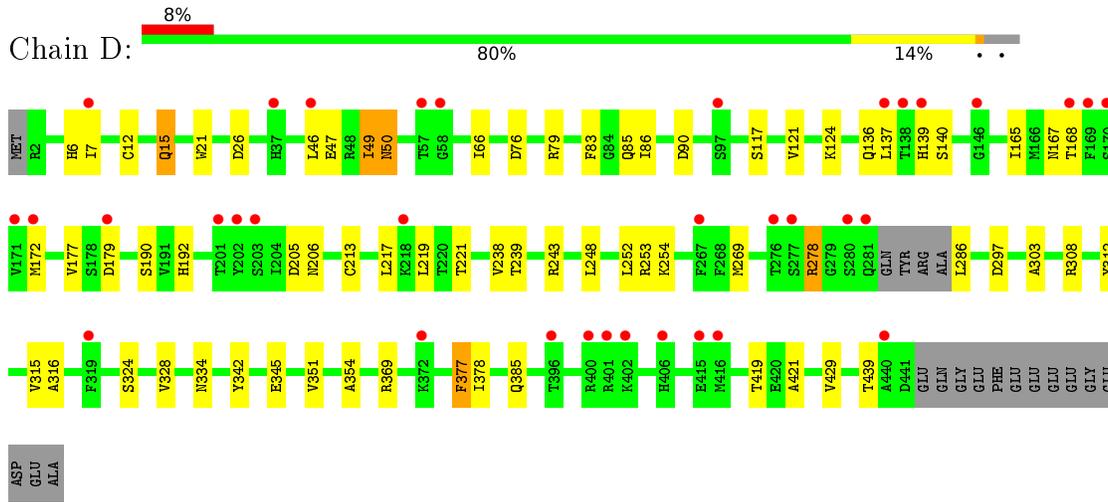
- Molecule 1: Tubulin alpha chain



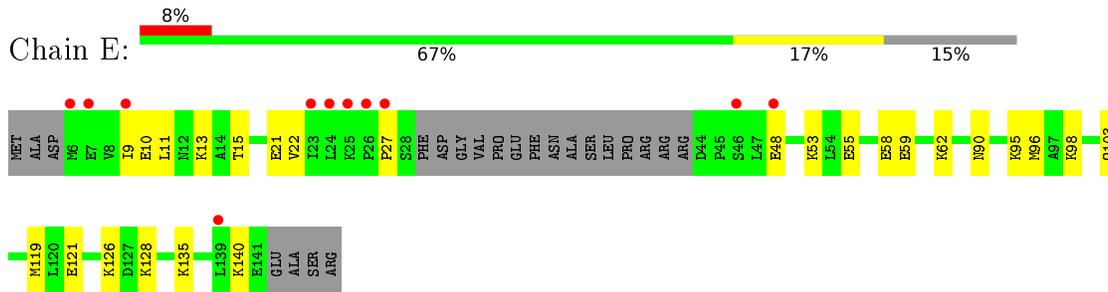
- Molecule 2: Tubulin beta chain



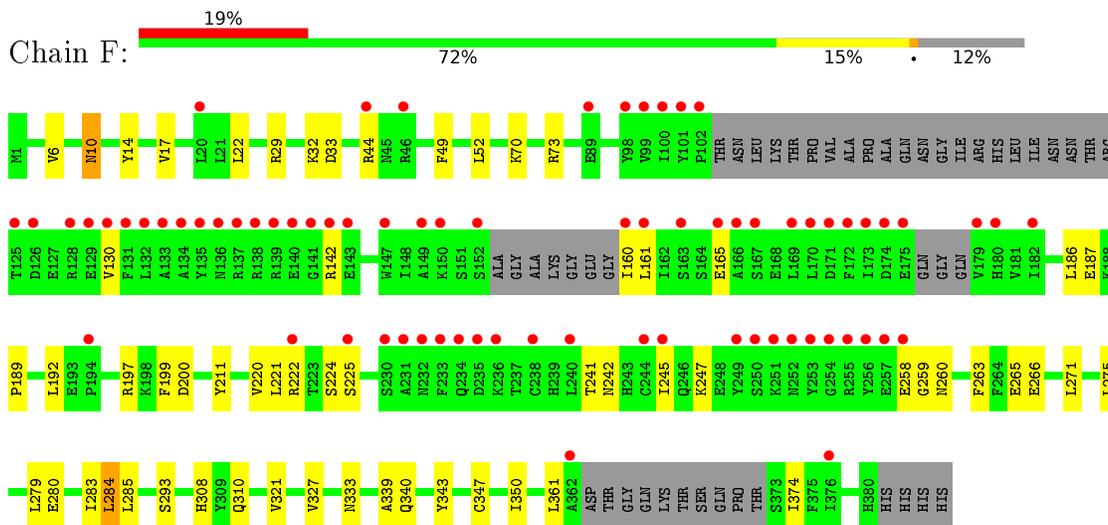
- Molecule 2: Tubulin beta chain



• Molecule 3: Stathmin-4



• Molecule 4: TTL protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	104.79Å 153.90Å 185.20Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.47 – 2.50 36.66 – 2.50	Depositor EDS
% Data completeness (in resolution range)	97.2 (38.47-2.50) 97.3 (36.66-2.50)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.14 (at 2.51Å)	Xtrriage
Refinement program	BUSTER-TNT	Depositor
R, R_{free}	0.197 , 0.251 0.214 , 0.269	Depositor DCC
R_{free} test set	5070 reflections (5.28%)	DCC
Wilson B-factor (Å ²)	54.8	Xtrriage
Anisotropy	0.233	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 52.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	17802	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.56% 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: GDP, MG, ADP, CA, GTP, 6YK

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	0.52	0/3522	0.72	0/4779
1	C	0.54	0/3534	0.73	0/4800
2	B	0.54	0/3457	0.73	0/4681
2	D	0.50	0/3416	0.69	0/4627
3	E	0.52	0/1022	0.70	0/1358
4	F	0.49	0/2857	0.70	0/3859
All	All	0.52	0/17808	0.71	0/24104

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3445	0	3349	29	0
1	C	3455	0	3364	23	0
2	B	3377	0	3265	34	0
2	D	3343	0	3216	31	0
3	E	1012	0	1025	5	0
4	F	2788	0	2768	20	0
5	A	32	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	C	32	0	12	0	0
6	A	1	0	0	0	0
6	B	2	0	0	0	0
6	C	1	0	0	0	0
6	D	2	0	0	0	0
7	A	1	0	0	0	0
7	B	1	0	0	0	0
7	C	1	0	0	0	0
7	E	1	0	0	0	0
8	B	28	0	12	1	0
8	D	28	0	12	0	0
9	B	52	0	0	1	0
9	D	52	0	0	1	0
10	F	27	0	12	0	0
11	A	22	0	0	0	0
11	B	33	0	0	0	0
11	C	41	0	0	0	0
11	D	7	0	0	0	0
11	E	4	0	0	0	0
11	F	14	0	0	0	0
All	All	17802	0	17047	136	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 4.

The worst 5 of 136 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)
2:B:28:HIS:CE1	2:B:243:ARG:HH11	2.12	0.67
1:A:97:GLU:HG3	2:B:1:MET:HG2	1.76	0.67
2:B:15:GLN:HG2	9:B:504:6YK:C19	2.25	0.66
1:A:195:LEU:HD12	1:A:266:HIS:HE1	1.60	0.66
2:B:28:HIS:HE1	2:B:243:ARG:HH11	1.44	0.66

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	437/451 (97%)	415 (95%)	20 (5%)	2 (0%)	34	55
1	C	440/451 (98%)	428 (97%)	11 (2%)	1 (0%)	52	75
2	B	426/445 (96%)	413 (97%)	9 (2%)	4 (1%)	21	37
2	D	422/445 (95%)	399 (94%)	22 (5%)	1 (0%)	52	75
3	E	118/143 (82%)	113 (96%)	3 (2%)	2 (2%)	11	19
4	F	330/384 (86%)	310 (94%)	19 (6%)	1 (0%)	46	68
All	All	2173/2319 (94%)	2078 (96%)	84 (4%)	11 (0%)	34	55

5 of 11 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	2	ARG
2	B	73	GLY
3	E	10	GLU
1	C	109	THR
3	E	27	PRO

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	370/378 (98%)	351 (95%)	19 (5%)	29	52
1	C	372/378 (98%)	352 (95%)	20 (5%)	27	49
2	B	371/383 (97%)	358 (96%)	13 (4%)	43	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	D	368/383 (96%)	345 (94%)	23 (6%)	22	40
3	E	109/126 (86%)	92 (84%)	17 (16%)	3	6
4	F	308/342 (90%)	283 (92%)	25 (8%)	15	27
All	All	1898/1990 (95%)	1781 (94%)	117 (6%)	23	41

5 of 117 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	15	GLN
2	D	221	THR
4	F	247	LYS
2	D	47	GLU
2	D	117	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 17 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	101	ASN
1	C	197	HIS
3	E	115	HIS
1	C	85	GLN
4	F	45	ASN

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

Of 17 ligands modelled in this entry, 10 are monoatomic - leaving 7 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	GTP	A	501	6	26,34,34	0.98	1 (3%)	29,54,54	2.39	5 (17%)
8	GDP	B	501	-	24,30,30	0.90	1 (4%)	26,47,47	2.50	4 (15%)
9	6YK	B	504	-	48,54,54	1.06	1 (2%)	51,77,77	0.53	0
5	GTP	C	501	6	26,34,34	0.94	2 (7%)	29,54,54	2.51	6 (20%)
8	GDP	D	501	6	24,30,30	0.91	1 (4%)	26,47,47	2.55	4 (15%)
9	6YK	D	504	-	48,54,54	1.13	1 (2%)	51,77,77	0.72	1 (1%)
10	ADP	F	401	-	24,29,29	0.69	0	23,45,45	0.63	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
5	GTP	A	501	6	-	0/18/38/38	0/3/3/3
8	GDP	B	501	-	-	0/12/32/32	0/3/3/3
9	6YK	B	504	-	-	0/52/77/77	0/3/3/3
5	GTP	C	501	6	-	0/18/38/38	0/3/3/3
8	GDP	D	501	6	-	0/12/32/32	0/3/3/3
9	6YK	D	504	-	-	0/52/77/77	0/3/3/3
10	ADP	F	401	-	-	0/12/32/32	0/3/3/3

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	501	GTP	C6-C5	2.12	1.45	1.41
8	B	501	GDP	C6-N1	2.90	1.38	1.33
5	C	501	GTP	C6-N1	3.11	1.38	1.33
8	D	501	GDP	C6-N1	3.16	1.38	1.33
5	A	501	GTP	C6-N1	3.36	1.39	1.33

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	D	501	GDP	C5-C6-N1	-8.77	112.06	123.52
5	C	501	GTP	C5-C6-N1	-8.70	112.15	123.52
8	B	501	GDP	C5-C6-N1	-8.38	112.56	123.52
5	A	501	GTP	C5-C6-N1	-8.38	112.57	123.52
8	D	501	GDP	N3-C2-N1	-3.10	123.33	127.56

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	B	501	GDP	1	0
9	B	504	6YK	1	0
9	D	504	6YK	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [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	441/451 (97%)	0.23	25 (5%) 27 31	38, 61, 92, 146	0
1	C	440/451 (97%)	-0.11	4 (0%) 85 88	35, 51, 76, 106	0
2	B	427/445 (95%)	0.03	6 (1%) 78 80	34, 52, 86, 101	2 (0%)
2	D	426/445 (95%)	0.51	35 (8%) 14 15	48, 73, 97, 126	5 (1%)
3	E	121/143 (84%)	0.45	11 (9%) 11 12	43, 71, 99, 112	0
4	F	338/384 (88%)	1.00	73 (21%) 1 1	50, 84, 142, 164	0
All	All	2193/2319 (94%)	0.31	154 (7%) 19 22	34, 63, 106, 164	7 (0%)

The worst 5 of 154 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	F	166	ALA	10.7
1	A	282	TYR	7.6
4	F	170	LEU	7.2
1	A	281	ALA	7.1
4	F	234	GLN	7.0

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

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

6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å ²)	Q<0.9
6	MG	C	502	1/1	0.96	0.34	10.05	47,47,47,47	0
6	MG	A	502	1/1	0.85	0.33	9.16	50,50,50,50	0
9	6YK	D	504	52/52	0.84	0.32	1.75	86,102,117,119	0
9	6YK	B	504	52/52	0.96	0.15	0.77	35,49,65,76	0
8	GDP	B	501	28/28	0.98	0.20	0.20	31,40,43,47	0
5	GTP	A	501	32/32	0.97	0.17	0.08	40,47,51,53	0
5	GTP	C	501	32/32	0.98	0.16	0.00	37,44,49,54	0
7	CA	E	201	1/1	0.92	0.17	0.00	113,113,113,113	0
10	ADP	F	401	27/27	0.87	0.21	-0.65	91,103,121,122	0
8	GDP	D	501	28/28	0.96	0.16	-0.69	58,62,67,74	0
7	CA	B	503	1/1	0.83	0.12	-1.14	101,101,101,101	0
7	CA	A	503	1/1	0.96	0.07	-2.71	94,94,94,94	0
7	CA	C	503	1/1	0.97	0.05	-3.91	71,71,71,71	0
6	MG	B	502	1/1	0.68	0.41	-	57,57,57,57	0
6	MG	B	505	1/1	0.87	0.15	-	78,78,78,78	0
6	MG	D	503	1/1	0.72	0.13	-	61,61,61,61	0
6	MG	D	502	1/1	0.91	0.12	-	65,65,65,65	0

6.5 Other polymers [i](#)

There are no such residues in this entry.