W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 4, 2024 – 03:05 am GMT

PDB ID	:	4V0U
Title	:	The crystal structure of ternary PP1G-PPP1R15B and G-actin complex
Authors	:	Chen, R.; Yan, Y.; Casado, A.C.; Ron, D.; Read, R.J.
Deposited on	:	2014-09-18
Resolution	:	7.88 Å(reported)

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

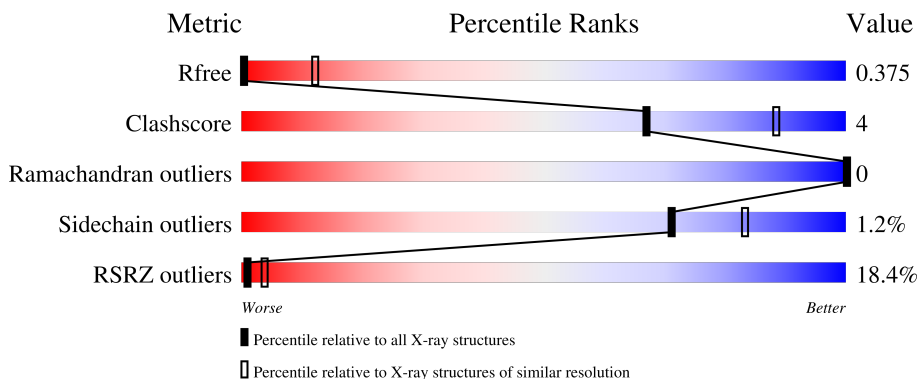|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 7.88 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	Percentile Ranks	Value
Rfree		0.375
Clashscore		4
Ramachandran outliers		0
Sidechain outliers		1.2%
RSRZ outliers		18.4%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	1005 (11.50-3.90)
Clashscore	141614	1070 (11.50-3.90)
Ramachandran outliers	138981	1003 (11.50-3.90)
Sidechain outliers	138945	1003 (11.50-3.86)
RSRZ outliers	127900	1004 (9.50-3.80)

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 <=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	375	11% / 92% / 5% ·
1	B	375	14% / 91% / 6% ·
1	C	375	21% / 92% / 5% ·
1	L	375	25% / 92% / 5% ·
1	M	375	15% / 92% / 5% ·

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Mol	Chain	Length	Quality of chain
2	D	323	9% / 85% / 6% / 9%
2	F	323	23% / 85% / 6% / 9%
2	H	323	21% / 83% / 8% / 9%
2	J	323	15% / 84% / 7% / 9%
2	N	323	18% / 84% / 6% / 9%
3	E	84	% / 20% / 76%
3	G	84	11% / 21% / 76%
3	I	84	10% / 21% / 76%
3	K	84	% / 21% / 76%
3	O	84	5% / 21% / 76%

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	LAB	B	1376	-	-	-	X
4	LAB	C	1376	-	-	-	X
5	ATP	L	1377	-	-	-	X

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 27065 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 ACTIN, ALPHA SKELETAL MUSCLE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	364	Total 2835	C 1796	N 476	O 544	S 19	0	0	0
1	B	364	Total 2835	C 1796	N 476	O 544	S 19	0	0	0
1	C	364	Total 2835	C 1796	N 476	O 544	S 19	0	0	0
1	L	364	Total 2835	C 1796	N 476	O 544	S 19	0	0	0
1	M	364	Total 2835	C 1796	N 476	O 544	S 19	0	0	0

- Molecule 2 is a protein called SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	294	Total 2351	C 1509	N 393	O 432	S 17	0	0	0
2	F	294	Total 2351	C 1509	N 393	O 432	S 17	0	0	0
2	H	294	Total 2351	C 1509	N 393	O 432	S 17	0	0	0
2	J	294	Total 2351	C 1509	N 393	O 432	S 17	0	0	0
2	N	294	Total 2351	C 1509	N 393	O 432	S 17	0	0	0

- Molecule 3 is a protein called PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	E	20	Total 167	C 107	N 25	O 35	0	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	G	20	Total 167	C 107	N 25	O 35	0	0	0
3	I	20	Total 167	C 107	N 25	O 35	0	0	0
3	K	20	Total 167	C 107	N 25	O 35	0	0	0
3	O	20	Total 167	C 107	N 25	O 35	0	0	0

There are 65 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	626	GLY	-	expression tag	UNP Q5SWA1
E	627	ALA	-	expression tag	UNP Q5SWA1
E	628	MET	-	expression tag	UNP Q5SWA1
E	629	ASP	-	expression tag	UNP Q5SWA1
E	630	PRO	-	expression tag	UNP Q5SWA1
E	702	LEU	-	expression tag	UNP Q5SWA1
E	703	GLU	-	expression tag	UNP Q5SWA1
E	704	HIS	-	expression tag	UNP Q5SWA1
E	705	HIS	-	expression tag	UNP Q5SWA1
E	706	HIS	-	expression tag	UNP Q5SWA1
E	707	HIS	-	expression tag	UNP Q5SWA1
E	708	HIS	-	expression tag	UNP Q5SWA1
E	709	HIS	-	expression tag	UNP Q5SWA1
G	626	GLY	-	expression tag	UNP Q5SWA1
G	627	ALA	-	expression tag	UNP Q5SWA1
G	628	MET	-	expression tag	UNP Q5SWA1
G	629	ASP	-	expression tag	UNP Q5SWA1
G	630	PRO	-	expression tag	UNP Q5SWA1
G	702	LEU	-	expression tag	UNP Q5SWA1
G	703	GLU	-	expression tag	UNP Q5SWA1
G	704	HIS	-	expression tag	UNP Q5SWA1
G	705	HIS	-	expression tag	UNP Q5SWA1
G	706	HIS	-	expression tag	UNP Q5SWA1
G	707	HIS	-	expression tag	UNP Q5SWA1
G	708	HIS	-	expression tag	UNP Q5SWA1
G	709	HIS	-	expression tag	UNP Q5SWA1
I	626	GLY	-	expression tag	UNP Q5SWA1
I	627	ALA	-	expression tag	UNP Q5SWA1
I	628	MET	-	expression tag	UNP Q5SWA1
I	629	ASP	-	expression tag	UNP Q5SWA1
I	630	PRO	-	expression tag	UNP Q5SWA1

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Chain	Residue	Modelled	Actual	Comment	Reference
I	702	LEU	-	expression tag	UNP Q5SWA1
I	703	GLU	-	expression tag	UNP Q5SWA1
I	704	HIS	-	expression tag	UNP Q5SWA1
I	705	HIS	-	expression tag	UNP Q5SWA1
I	706	HIS	-	expression tag	UNP Q5SWA1
I	707	HIS	-	expression tag	UNP Q5SWA1
I	708	HIS	-	expression tag	UNP Q5SWA1
I	709	HIS	-	expression tag	UNP Q5SWA1
K	626	GLY	-	expression tag	UNP Q5SWA1
K	627	ALA	-	expression tag	UNP Q5SWA1
K	628	MET	-	expression tag	UNP Q5SWA1
K	629	ASP	-	expression tag	UNP Q5SWA1
K	630	PRO	-	expression tag	UNP Q5SWA1
K	702	LEU	-	expression tag	UNP Q5SWA1
K	703	GLU	-	expression tag	UNP Q5SWA1
K	704	HIS	-	expression tag	UNP Q5SWA1
K	705	HIS	-	expression tag	UNP Q5SWA1
K	706	HIS	-	expression tag	UNP Q5SWA1
K	707	HIS	-	expression tag	UNP Q5SWA1
K	708	HIS	-	expression tag	UNP Q5SWA1
K	709	HIS	-	expression tag	UNP Q5SWA1
O	626	GLY	-	expression tag	UNP Q5SWA1
O	627	ALA	-	expression tag	UNP Q5SWA1
O	628	MET	-	expression tag	UNP Q5SWA1
O	629	ASP	-	expression tag	UNP Q5SWA1
O	630	PRO	-	expression tag	UNP Q5SWA1
O	702	LEU	-	expression tag	UNP Q5SWA1
O	703	GLU	-	expression tag	UNP Q5SWA1
O	704	HIS	-	expression tag	UNP Q5SWA1
O	705	HIS	-	expression tag	UNP Q5SWA1
O	706	HIS	-	expression tag	UNP Q5SWA1
O	707	HIS	-	expression tag	UNP Q5SWA1
O	708	HIS	-	expression tag	UNP Q5SWA1
O	709	HIS	-	expression tag	UNP Q5SWA1

- Molecule 4 is LATRUNCULIN B (three-letter code: LAB) (formula: $C_{20}H_{29}NO_5S$).

LAB
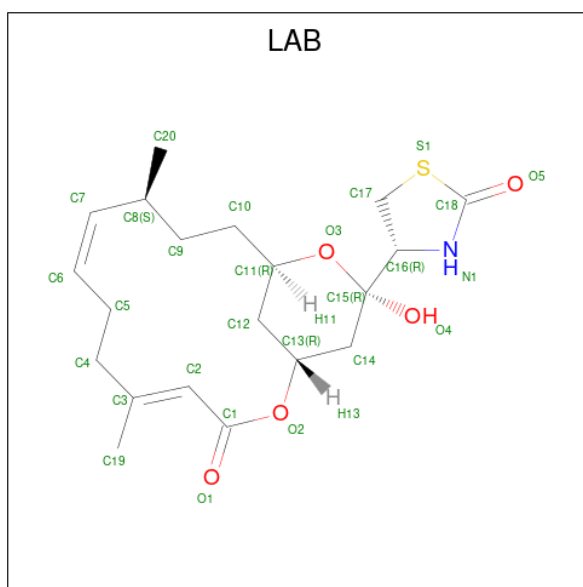
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	S	0	0
			27	20	1	5	1		
4	B	1	Total	C	N	O	S	0	0
			27	20	1	5	1		
4	C	1	Total	C	N	O	S	0	0
			27	20	1	5	1		
4	L	1	Total	C	N	O	S	0	0
			27	20	1	5	1		
4	M	1	Total	C	N	O	S	0	0
			27	20	1	5	1		

- Molecule 5 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	B	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	C	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	L	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	M	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

- Molecule 6 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	D	2	Total	Mn	0	0
			2	2		
6	F	2	Total	Mn	0	0
			2	2		
6	H	2	Total	Mn	0	0
			2	2		
6	J	2	Total	Mn	0	0
			2	2		
6	N	2	Total	Mn	0	0
			2	2		

3   Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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: ACTIN, ALPHA SKELETAL MUSCLE

• Molecule 1: ACTIN, ALPHA SKELETAL MUSCLE

• Molecule 1: ACTIN, ALPHA SKELETAL MUSCLE

V298 M299 S300 T303 T304 M305 Y306 I309 Q314 I329 K336 Y337 S338 A347 W356 I357 E361 A365 G366 I369 F375

• Molecule 1: ACTIN, ALPHA SKELETAL MUSCLE

Chain L:

25%

92% 5%

D1 E2 D3 E4 T5 L8 V9 C10 D11 N12 V17 K18 A19 G20 D25 A26 P27 R37 H40 GLN GLY VAL MET VAL GLY MET GLY GLN LYS ASP S52 I75 I76 M82 E83 K84 I85 W86 T89 F90 Y91 N92 E93 L94 R95 V96 A97 T103 L104 L105 T106

E107 A108 P109 L110 N111 P112 N115 A131 M132 Y133 V134 A135 I136 Q137 A138 V139 L140 S141 T160 H161 N162 V163 P164 Y169 A170 L171 P172 I175 D178 D179 L180 L193 T194 E195 R196 G197 Y198 R206 Y218 A228 S232 E237 K238 S239 Y240 I248 T249

I250 G251 N252 E253 R254 F255 R256 L261 S271 A272 G273 I274 T278 Y294 M299 S300 T303 T304 I309 Q314 I327 K328 I329 A331 K336 Y337 S338 V339 W340 G343 L346 A347 W356 E361 A365 F375

• Molecule 1: ACTIN, ALPHA SKELETAL MUSCLE

Chain M:

15%

92% 5%

D1 E2 D3 T6 A7 L8 V9 C10 D11 N12 F21 A22 D25 V30 H40 GLN GLY VAL MET VAL GLY MET GLY GLN LYS ASP S52 W86 L94 R95 V96 A97 P98 H101 P102 T103 L104 L105 T106 E107 A108 P109 L110 A131 I136 Q137 A138 S141

T149 L153 D154 H161 N162 V163 P164 I165 Y169 A170 L171 P172 H173 A174 I175 R206 Y218 S232 E241 N252 E253 R254 F255 R256 I274 T278 D288 M299 S300 T304 D311 R312 M313 Q314 I329 Y337 S338 L346 A347 W356 E361

Y362 D363 E364 A365 G366 F375

• Molecule 2: SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT

Chain D:

9%

85% 6% 9%

MET ALA ASP ILE ASP LYS L7 L17 E18 V19 R20 G21 L30 C62 L73 F89 L90 R96 C105 L106 L107 V110 L120 L121 R122 G123 N124 H125 E126 C127 R132 I133 Y137 I146 A162 F170 C171 C172 G175 L176 S177 M183 V195

D203 L204 E218 I244 C245 R246 V250 S268 A269 P270 N271 F276 D277 M282 K297 E300 LYS LYS LYS PRO ASN ALA THR ARG PRO VAL THR PRO PRO ARG GLY MET ILE THR LYS GLN ALA LYS LYS

• Molecule 2: SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT
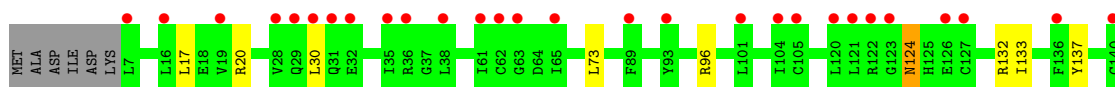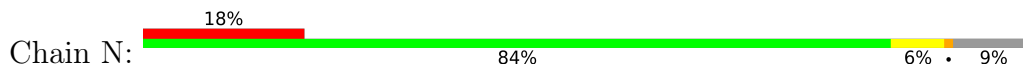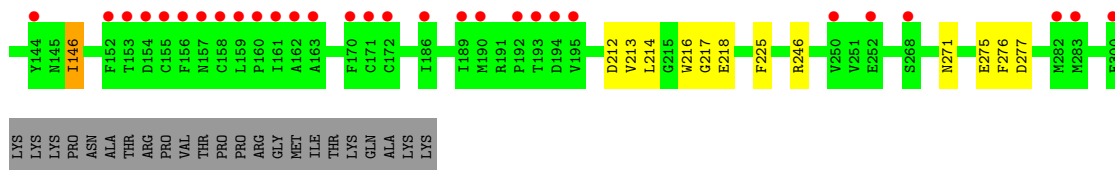
Chain F:

23%

85% 6% 9%

• Molecule 2: SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT

Chain H:

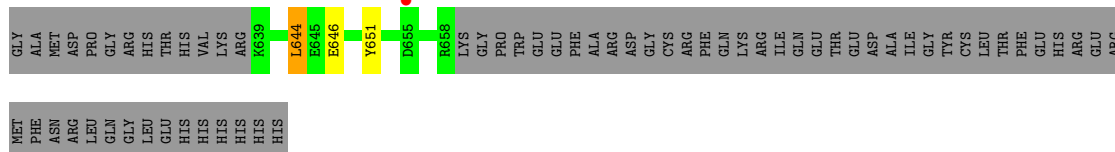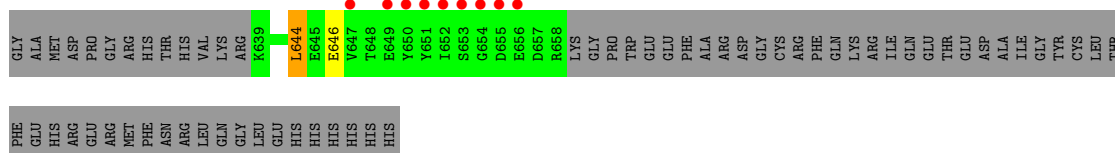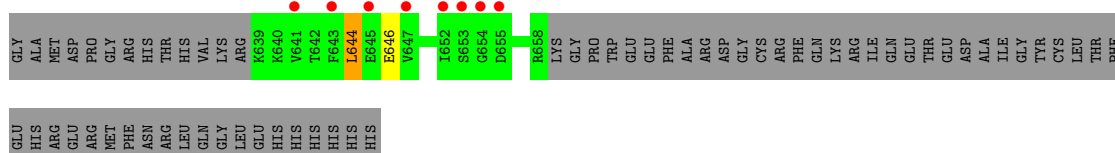• Molecule 2: SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT

Chain J:

• Molecule 2: SERINE/THREONINE-PROTEIN PHOSPHATASE PP1-GAMMA CATALYTIC SUBUNIT

Chain N:
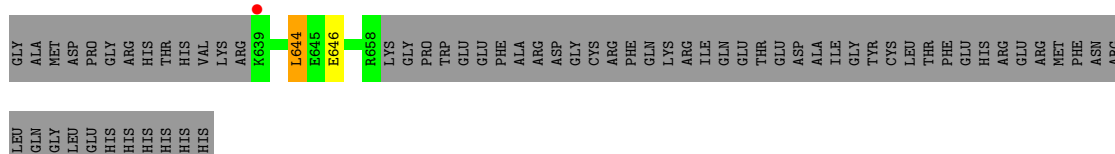
• Molecule 3: PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B

Chain E:

• Molecule 3: PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B

Chain G:

• Molecule 3: PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B

Chain I:

• Molecule 3: PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B

Chain K:

• Molecule 3: PROTEIN PHOSPHATASE 1 REGULATORY SUBUNIT 15B

Chain O:

GLY ALA MET ASP PRO GLY ARG HIS THR HIS VAL LYS ARG K639 K640 V641 T642 F643 L644 E645 E646 V647 R658 LYS GLY PRO TRP GLU GLU PHE ALA ARG ASP GLY CYS ARG PHE GLN LYS ARG ILE GLN GLU THR GLU ASP ALA ILE GLY TYR CYS LEU THR PHE GLU HIS ARG GLU ARG

MET PHE ASN ARG LEU GLN GLY LEU GLU HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	103.91Å 149.93Å 318.72Å 90.00° 91.03° 90.00°	Depositor
Resolution (Å)	82.79 – 7.88 82.79 – 7.88	Depositor EDS
% Data completeness (in resolution range)	97.7 (82.79-7.88) 97.8 (82.79-7.88)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.47 (at 8.41Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.370 , 0.400 0.354 , 0.375	Depositor DCC
R_{free} test set	290 reflections (5.37%)	wwPDB-VP
Wilson B-factor (Å^2)	356.7	Xtriage
Anisotropy	0.289	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 456.4	EDS
L-test for twinning[2]	$< |L| > = 0.43, < L^2 > = 0.25$	Xtriage
Estimated twinning fraction	0.058 for -h,-k,l	Xtriage
F_o,F_c correlation	0.68	EDS
Total number of atoms	27065	wwPDB-VP
Average B, all atoms (Å^2)	394.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.75% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: LAB, ATP, MN

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	0.47	0/2896	0.60	0/3927
1	B	0.47	0/2896	0.60	0/3927
1	C	0.46	0/2896	0.60	0/3927
1	L	0.47	0/2896	0.60	0/3927
1	M	0.47	0/2896	0.60	0/3927
2	D	0.29	0/2404	0.52	0/3250
2	F	0.30	0/2404	0.52	1/3250 (0.0%)
2	H	0.29	0/2404	0.52	0/3250
2	J	0.29	0/2404	0.52	0/3250
2	N	0.29	0/2404	0.52	1/3250 (0.0%)
3	E	0.37	0/169	0.59	0/226
3	G	0.31	0/169	0.56	0/226
3	I	0.32	0/169	0.56	0/226
3	K	0.31	0/169	0.55	0/226
3	O	0.31	0/169	0.56	0/226
All	All	0.39	0/27345	0.57	2/37015 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	N	146	ILE	CB-CA-C	-5.50	100.59	111.60
2	F	146	ILE	CB-CA-C	-5.34	100.93	111.60

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	2835	0	2787	46	4
1	B	2835	0	2787	22	5
1	C	2835	0	2787	24	0
1	L	2835	0	2787	19	2
1	M	2835	0	2787	14	0
2	D	2351	0	2304	16	4
2	F	2351	0	2303	65	0
2	H	2351	0	2304	51	0
2	J	2351	0	2304	29	2
2	N	2351	0	2304	28	0
3	E	167	0	157	4	5
3	G	167	0	157	1	0
3	I	167	0	157	1	0
3	K	167	0	157	1	0
3	O	167	0	157	1	0
4	A	27	0	29	1	0
4	B	27	0	29	1	0
4	C	27	0	29	1	0
4	L	27	0	29	1	0
4	M	27	0	29	1	0
5	A	31	0	12	0	0
5	B	31	0	12	0	0
5	C	31	0	12	0	0
5	L	31	0	12	0	0
5	M	31	0	12	0	0
6	D	2	0	0	0	0
6	F	2	0	0	0	0
6	H	2	0	0	0	0
6	J	2	0	0	0	0
6	N	2	0	0	0	0
All	All	27065	0	26444	210	11

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 210 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:1:ASP:HB3	2:F:146:ILE:CG1	1.49	1.43
1:A:1:ASP:HB3	2:F:146:ILE:CD1	1.50	1.40
1:A:1:ASP:CB	2:F:146:ILE:CD1	2.02	1.35
1:A:1:ASP:CB	2:F:146:ILE:HD11	1.55	1.35
2:F:198:GLN:NE2	1:M:232:SER:O	1.61	1.33

The worst 5 of 11 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:80:ASP:OD1	2:D:18:GLU:OE2[2_756]	1.24	0.96
2:J:137:TYR:OH	1:L:1:ASP:OD1[2_655]	1.30	0.90
1:B:72:GLU:OE2	3:E:646:GLU:OE1[4_756]	1.33	0.87
1:A:80:ASP:CG	2:D:18:GLU:OE2[2_756]	1.50	0.70
1:B:72:GLU:OE2	3:E:646:GLU:CD[4_756]	1.65	0.55

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	360/375 (96%)	353 (98%)	7 (2%)	0	100	100
1	B	360/375 (96%)	353 (98%)	7 (2%)	0	100	100
1	C	360/375 (96%)	353 (98%)	7 (2%)	0	100	100
1	L	360/375 (96%)	353 (98%)	7 (2%)	0	100	100
1	M	360/375 (96%)	353 (98%)	7 (2%)	0	100	100
2	D	292/323 (90%)	281 (96%)	11 (4%)	0	100	100
2	F	292/323 (90%)	281 (96%)	11 (4%)	0	100	100
2	H	292/323 (90%)	281 (96%)	11 (4%)	0	100	100
2	J	292/323 (90%)	281 (96%)	11 (4%)	0	100	100
2	N	292/323 (90%)	281 (96%)	11 (4%)	0	100	100

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WORLDWIDE
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	E	18/84 (21%)	18 (100%)	0	0	100	100
3	G	18/84 (21%)	18 (100%)	0	0	100	100
3	I	18/84 (21%)	18 (100%)	0	0	100	100
3	K	18/84 (21%)	18 (100%)	0	0	100	100
3	O	18/84 (21%)	18 (100%)	0	0	100	100
All	All	3350/3910 (86%)	3260 (97%)	90 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	305/318 (96%)	304 (100%)	1 (0%)	92	95
1	B	305/318 (96%)	304 (100%)	1 (0%)	92	95
1	C	305/318 (96%)	304 (100%)	1 (0%)	92	95
1	L	305/318 (96%)	304 (100%)	1 (0%)	92	95
1	M	305/318 (96%)	304 (100%)	1 (0%)	92	95
2	D	255/285 (90%)	250 (98%)	5 (2%)	55	74
2	F	255/285 (90%)	250 (98%)	5 (2%)	55	74
2	H	255/285 (90%)	250 (98%)	5 (2%)	55	74
2	J	255/285 (90%)	250 (98%)	5 (2%)	55	74
2	N	255/285 (90%)	250 (98%)	5 (2%)	55	74
3	E	18/74 (24%)	17 (94%)	1 (6%)	21	46
3	G	18/74 (24%)	17 (94%)	1 (6%)	21	46
3	I	18/74 (24%)	17 (94%)	1 (6%)	21	46
3	K	18/74 (24%)	17 (94%)	1 (6%)	21	46
3	O	18/74 (24%)	17 (94%)	1 (6%)	21	46
All	All	2890/3385 (85%)	2855 (99%)	35 (1%)	71	83

5 of 35 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	252	ASN
2	N	30	LEU
2	N	246	ARG
2	F	246	ARG
2	F	124	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 21 such sidechains are listed below:

Mol	Chain	Res	Type
1	L	88	HIS
1	M	59	GLN
1	M	280	ASN
1	M	88	HIS
1	L	280	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 20 ligands modelled in this entry, 10 are monoatomic - leaving 10 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	ATP	C	1377	-	26,33,33	1.43	3 (11%)	31,52,52	1.25	1 (3%)
5	ATP	M	1377	-	26,33,33	1.42	3 (11%)	31,52,52	1.25	1 (3%)
4	LAB	A	1376	-	28,29,29	4.53	8 (28%)	30,41,41	4.07	9 (30%)
5	ATP	B	1377	-	26,33,33	1.44	3 (11%)	31,52,52	1.24	1 (3%)
4	LAB	L	1376	-	28,29,29	4.54	8 (28%)	30,41,41	4.07	9 (30%)
5	ATP	L	1377	-	26,33,33	1.43	3 (11%)	31,52,52	1.24	1 (3%)
4	LAB	B	1376	-	28,29,29	4.52	8 (28%)	30,41,41	4.07	9 (30%)
4	LAB	C	1376	-	28,29,29	4.54	8 (28%)	30,41,41	4.06	9 (30%)
5	ATP	A	1377	-	26,33,33	1.43	3 (11%)	31,52,52	1.24	1 (3%)
4	LAB	M	1376	-	28,29,29	4.54	8 (28%)	30,41,41	4.07	9 (30%)

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	ATP	C	1377	-	-	1/18/38/38	0/3/3/3
5	ATP	M	1377	-	-	1/18/38/38	0/3/3/3
4	LAB	A	1376	-	-	6/21/49/49	0/2/3/3
5	ATP	B	1377	-	-	1/18/38/38	0/3/3/3
4	LAB	L	1376	-	-	6/21/49/49	0/2/3/3
5	ATP	L	1377	-	-	1/18/38/38	0/3/3/3
4	LAB	B	1376	-	-	6/21/49/49	0/2/3/3
4	LAB	C	1376	-	-	6/21/49/49	0/2/3/3
5	ATP	A	1377	-	-	1/18/38/38	0/3/3/3
4	LAB	M	1376	-	-	6/21/49/49	0/2/3/3

The worst 5 of 55 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	L	1376	LAB	C18-N1	13.21	1.51	1.34
4	M	1376	LAB	C18-N1	13.20	1.51	1.34
4	A	1376	LAB	C18-N1	13.18	1.51	1.34
4	C	1376	LAB	C18-N1	13.18	1.51	1.34
4	B	1376	LAB	C18-N1	13.01	1.51	1.34

The worst 5 of 50 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	L	1376	LAB	O5-C18-N1	-19.17	105.88	126.81
4	B	1376	LAB	O5-C18-N1	-19.14	105.91	126.81
4	A	1376	LAB	O5-C18-N1	-19.13	105.92	126.81
4	M	1376	LAB	O5-C18-N1	-19.12	105.93	126.81
4	C	1376	LAB	O5-C18-N1	-19.11	105.94	126.81

There are no chirality outliers.

5 of 35 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1376	LAB	O3-C15-C16-C17
4	A	1376	LAB	C5-C6-C7-C8
4	A	1376	LAB	C1-C2-C3-C4
4	B	1376	LAB	O3-C15-C16-C17
4	B	1376	LAB	C5-C6-C7-C8

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1376	LAB	1	0
4	L	1376	LAB	1	0
4	B	1376	LAB	1	0
4	C	1376	LAB	1	0
4	M	1376	LAB	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 then 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.

Ligand ATP C 1377

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP M 1377

Bond lengths

Bond angles

Torsions

Rings

Ligand LAB A 1376

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP B 1377

Bond lengths

Bond angles

Torsions

Rings

Ligand LAB L 1376

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP L 1377

Bond lengths

Bond angles

Torsions

Rings

Ligand LAB B 1376

Bond lengths

Bond angles

Torsions

Rings

Ligand LAB C 1376

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP A 1377

Bond lengths

Bond angles

Torsions

Rings

Ligand LAB M 1376

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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(Å²)	Q<0.9
1	A	364/375 (97%)	0.86	43 (11%)	4	8	237, 303, 352, 385	0
1	B	364/375 (97%)	1.00	51 (14%)	2	6	252, 327, 380, 404	0
1	C	364/375 (97%)	1.26	77 (21%)	0	3	356, 410, 453, 502	0
1	L	364/375 (97%)	1.44	95 (26%)	0	2	403, 490, 565, 619	0
1	M	364/375 (97%)	0.99	57 (15%)	2	5	454, 521, 589, 621	0
2	D	294/323 (91%)	0.75	29 (9%)	7	10	232, 291, 334, 368	0
2	F	294/323 (91%)	1.28	75 (25%)	0	2	303, 364, 419, 450	0
2	H	294/323 (91%)	1.23	68 (23%)	0	2	311, 382, 436, 457	0
2	J	294/323 (91%)	0.93	48 (16%)	1	4	303, 367, 432, 478	0
2	N	294/323 (91%)	1.07	57 (19%)	1	3	285, 372, 419, 450	0
3	E	20/84 (23%)	0.76	1 (5%)	28	28	446, 573, 869, 969	0
3	G	20/84 (23%)	2.15	9 (45%)	0	1	497, 563, 717, 732	0
3	I	20/84 (23%)	1.86	8 (40%)	0	1	583, 761, 1000, 1000	0
3	K	20/84 (23%)	0.80	1 (5%)	28	28	471, 544, 652, 721	0
3	O	20/84 (23%)	0.77	4 (20%)	1	3	644, 682, 763, 789	0
All	All	3390/3910 (86%)	1.09	623 (18%)	1	4	232, 377, 559, 1000	0

The worst 5 of 623 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	109	PRO	14.5
1	L	108	ALA	12.1
2	N	194	ASP	11.0
1	C	10	CYS	9.8
2	D	172	CYS	9.4

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

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

6.3 Carbohydrates ⓘ

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
6	MN	H	1302	1/1	0.60	0.16	230,230,230,230	0
6	MN	D	1302	1/1	0.66	0.19	165,165,165,165	0
6	MN	J	1302	1/1	0.66	0.17	197,197,197,197	0
6	MN	J	1301	1/1	0.68	0.19	200,200,200,200	0
6	MN	H	1301	1/1	0.69	0.20	234,234,234,234	0
4	LAB	C	1376	27/27	0.69	0.67	253,258,268,271	0
5	ATP	L	1377	31/31	0.71	0.43	290,306,327,332	0
6	MN	F	1302	1/1	0.72	0.24	203,203,203,203	0
6	MN	N	1301	1/1	0.73	0.15	213,213,213,213	0
5	ATP	M	1377	31/31	0.74	0.27	334,341,360,361	0
4	LAB	B	1376	27/27	0.74	0.73	165,173,181,186	0
6	MN	N	1302	1/1	0.75	0.17	213,213,213,213	0
6	MN	D	1301	1/1	0.76	0.27	166,166,166,166	0
6	MN	F	1301	1/1	0.77	0.21	207,207,207,207	0
4	LAB	L	1376	27/27	0.81	0.57	303,322,330,334	0
5	ATP	B	1377	31/31	0.81	0.45	155,160,163,164	0
5	ATP	A	1377	31/31	0.82	0.46	135,137,142,143	0
4	LAB	M	1376	27/27	0.82	0.37	321,332,340,340	0
5	ATP	C	1377	31/31	0.84	0.57	242,246,249,250	0
4	LAB	A	1376	27/27	0.88	0.65	139,142,147,149	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 LAB C 1376:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
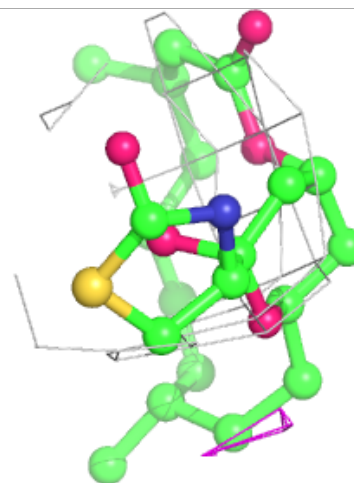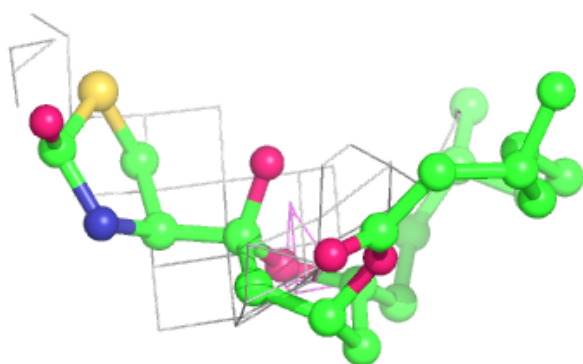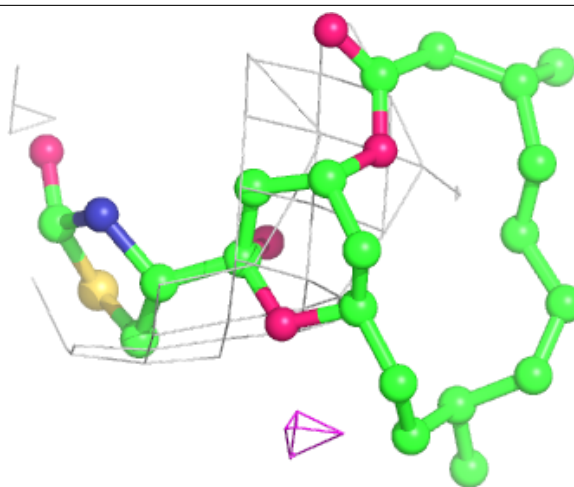
Electron density around ATP L 1377:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
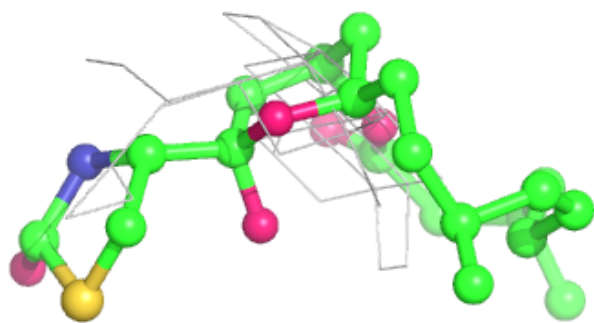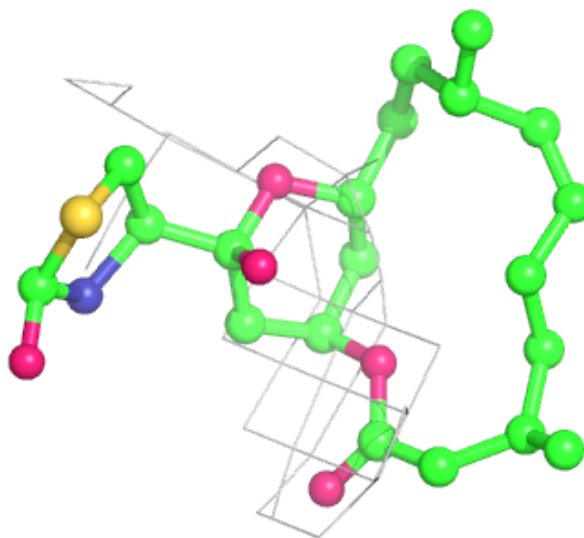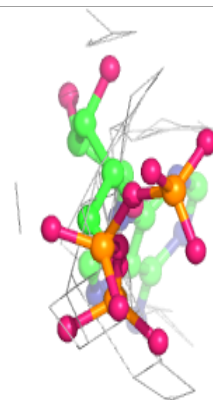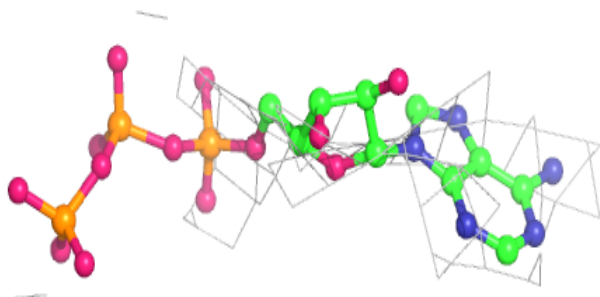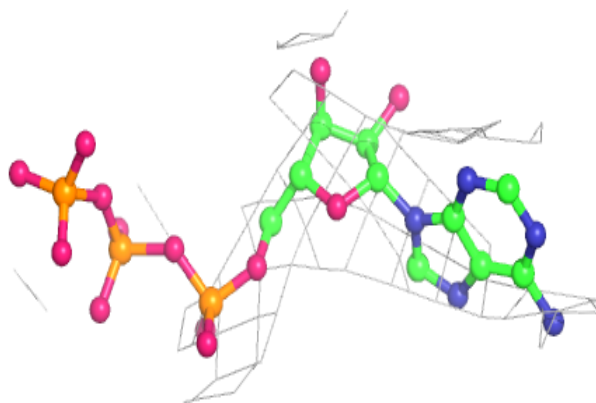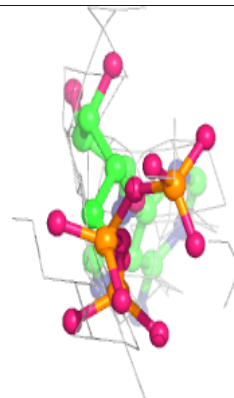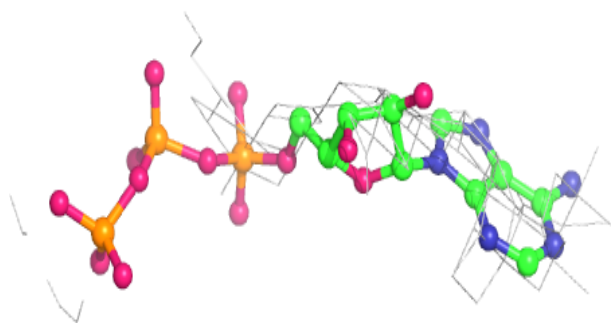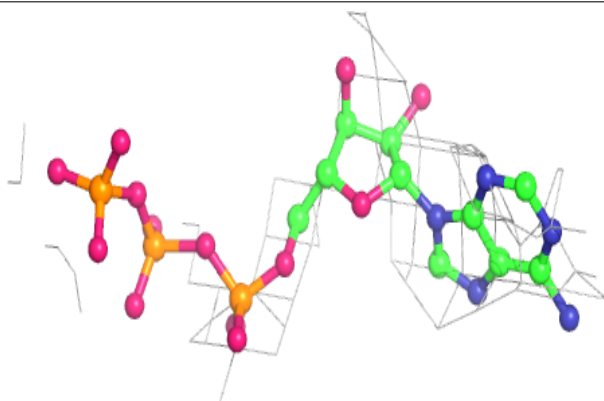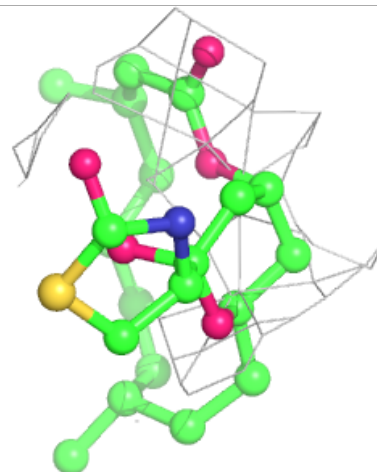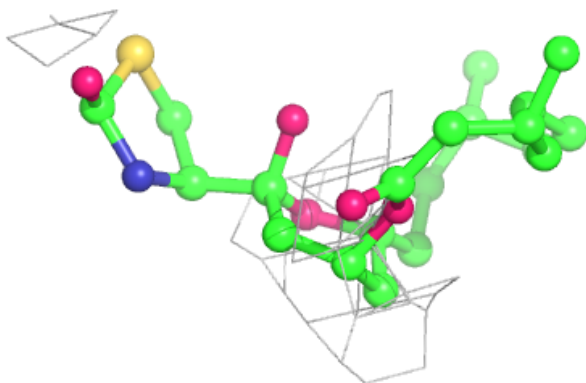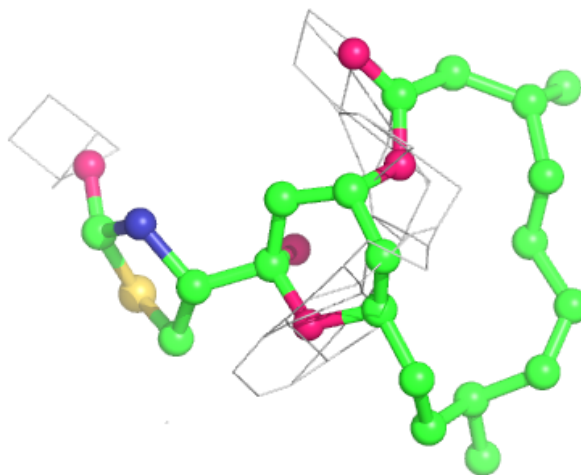$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
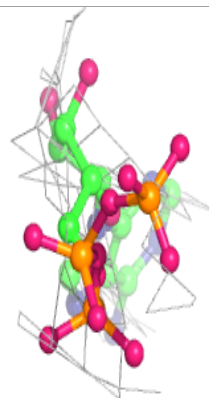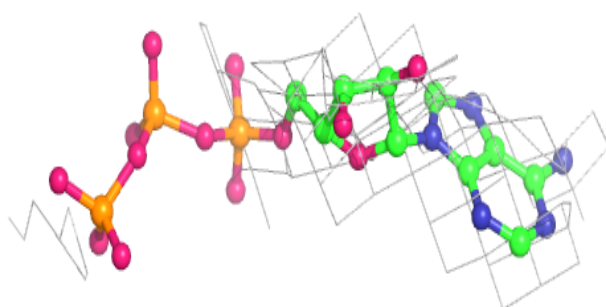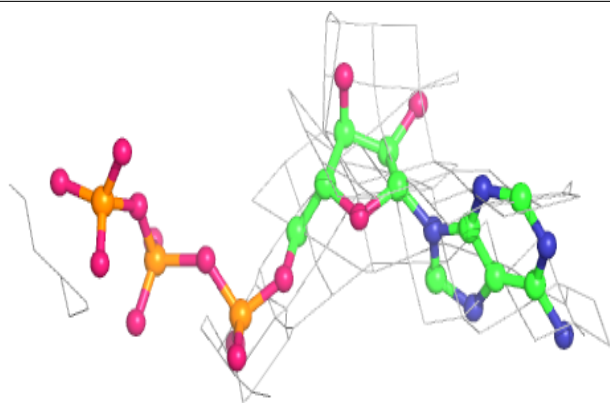
Electron density around ATP M 1377:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
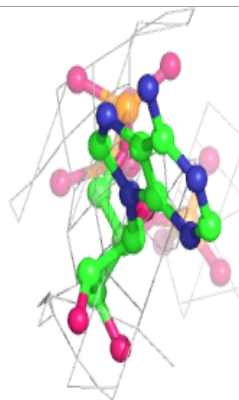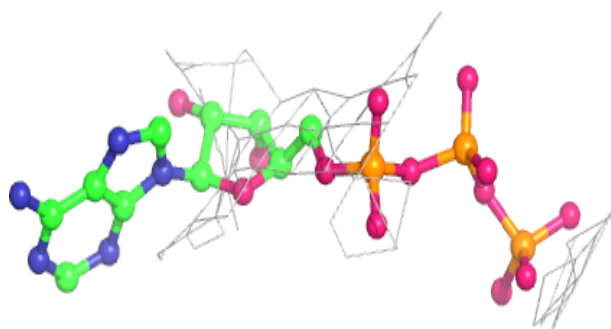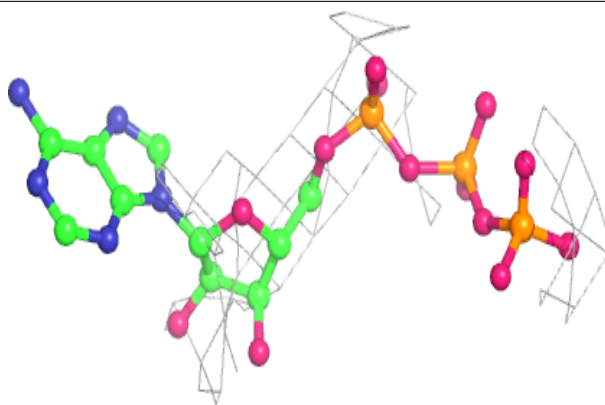$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
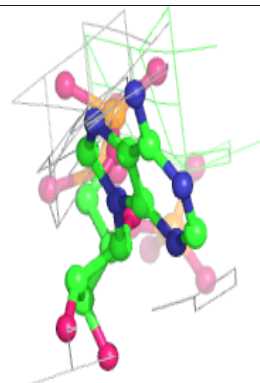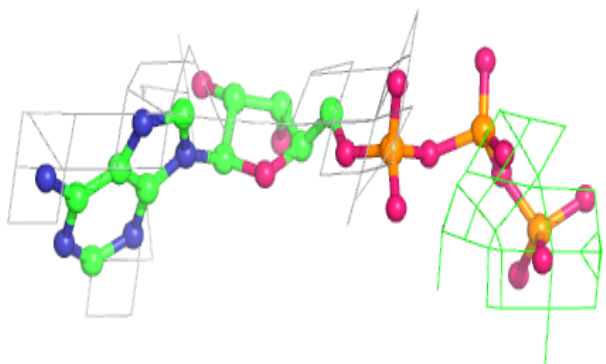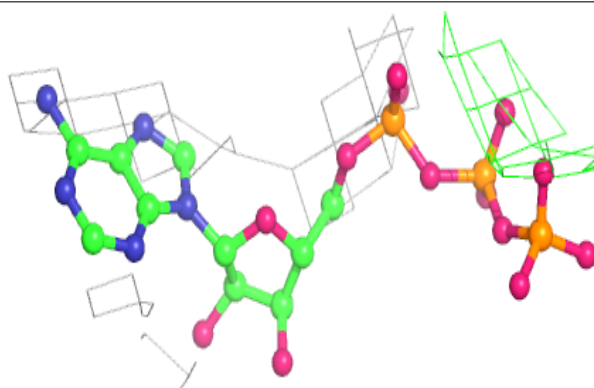
Electron density around LAB B 1376:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
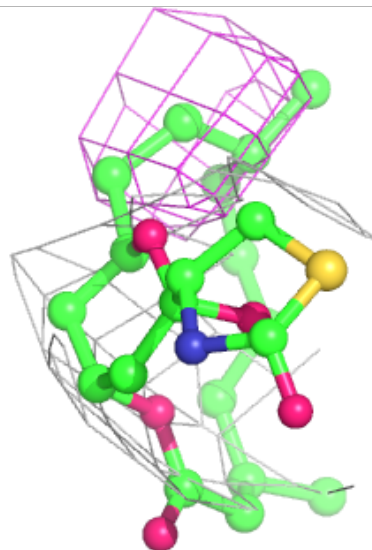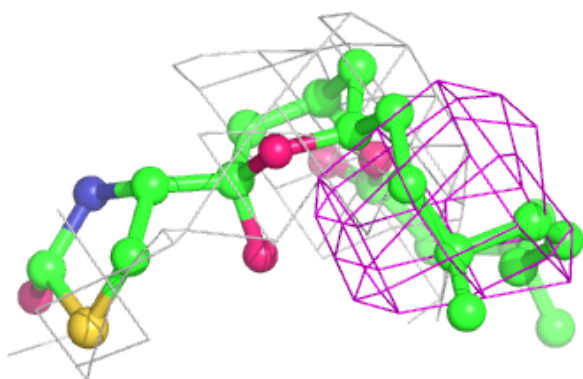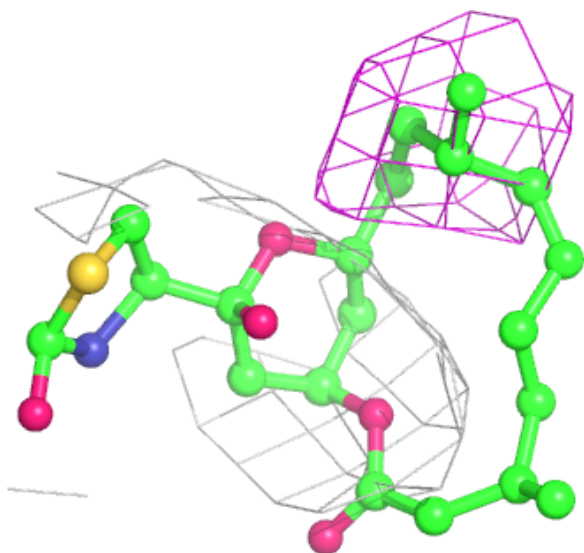
Electron density around LAB L 1376:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
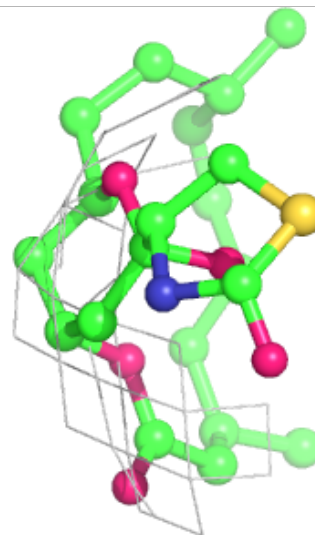
Electron density around ATP B 1377:

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

Electron density around ATP A 1377:

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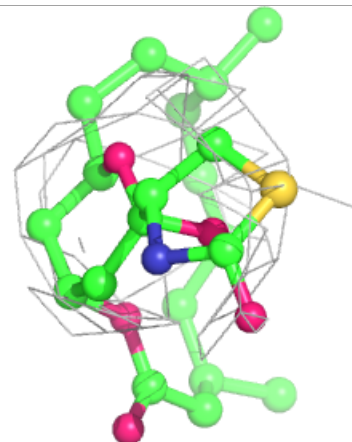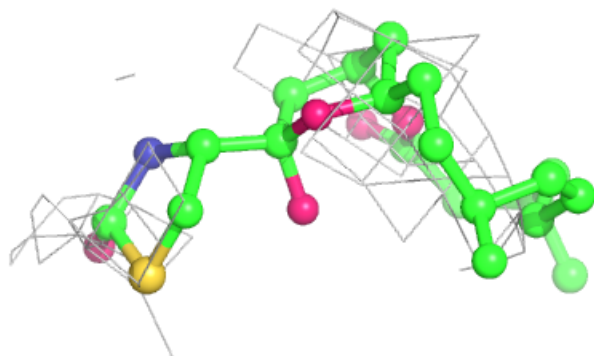$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
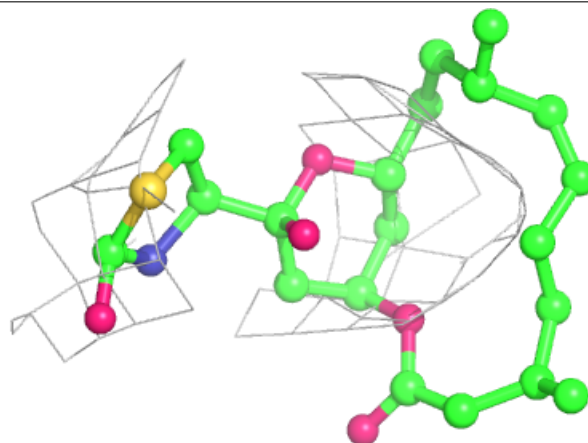and green (positive)

Electron density around LAB M 1376:

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

Electron density around ATP C 1377:

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

Electron density around LAB A 1376:

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

6.5 Other polymers (i)

There are no such residues in this entry.