Full wwPDB X-ray Structure Validation Report (i)

Jun 7, 2020 – 01:40 am BST

PDB ID	:	6F5V
Title	:	Crystal structure of the prephenate aminotransferase from Arabidopsis thaliana
Authors	:	Cobessi, D.; Robin, A.; Giustini, C.; Graindorge, M.; Matringe, M.
Deposited on	:	2017-12-03
Resolution	:	1.70 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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

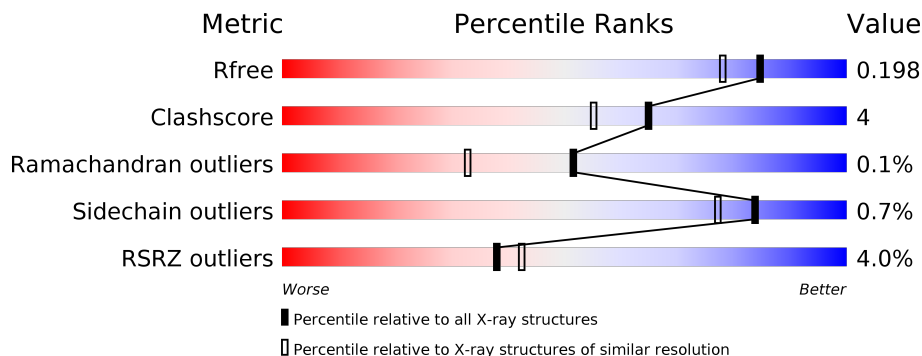|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.70 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		0.198
Clashscore		4
Ramachandran outliers		0.1%
Sidechain outliers		0.7%
RSRZ outliers		4.0%

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	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	475	2% 75% 10% 16%
1	B	475	79% 6% 15%
1	C	475	5% 73% 10% 16%
1	D	475	6% 76% 9% 15%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 13808 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 Bifunctional aspartate aminotransferase and glutamate/aspartate-prephenate aminotransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	401	Total 3146	C 2024	N 516	O 597	S 9	0	21	0
1	B	403	Total 3119	C 2003	N 511	O 594	S 11	0	15	0
1	C	399	Total 3112	C 2001	N 509	O 592	S 10	0	16	0
1	D	403	Total 3098	C 1985	N 514	O 588	S 11	0	8	0

- Molecule 2 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: $C_8H_{10}NO_6P$).

PLP

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 15	C 8	N 1	O 5	P 1	0	0
2	B	1	Total 15	C 8	N 1	O 5	P 1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total 15	C 8	N 1	O 5	P 1	0	0
2	D	1	Total 15	C 8	N 1	O 5	P 1	0	0

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total 1	Na 1	0	0
3	A	1	Total 1	Na 1	0	0

- Molecule 4 is CITRIC ACID (three-letter code: CIT) (formula: $C_6H_8O_7$).
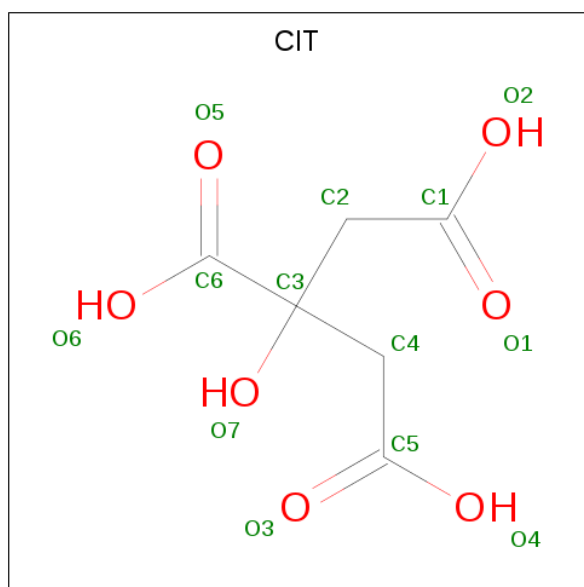
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total 13	C 6	O 7	0	0
4	C	1	Total 13	C 6	O 7	0	0
4	D	1	Total 13	C 6	O 7	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	342	Total 342	O 342	0	0
5	B	365	Total 365	O 365	0	0
5	C	279	Total 279	O 279	0	0
5	D	246	Total 246	O 246	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 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: Bifunctional aspartate aminotransferase and glutamate/aspartate-prephenate aminotransferase

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Chain D:
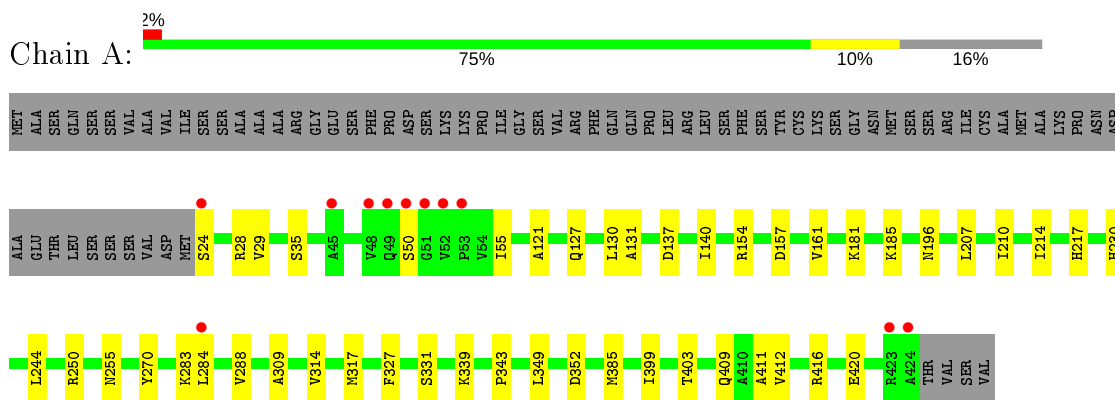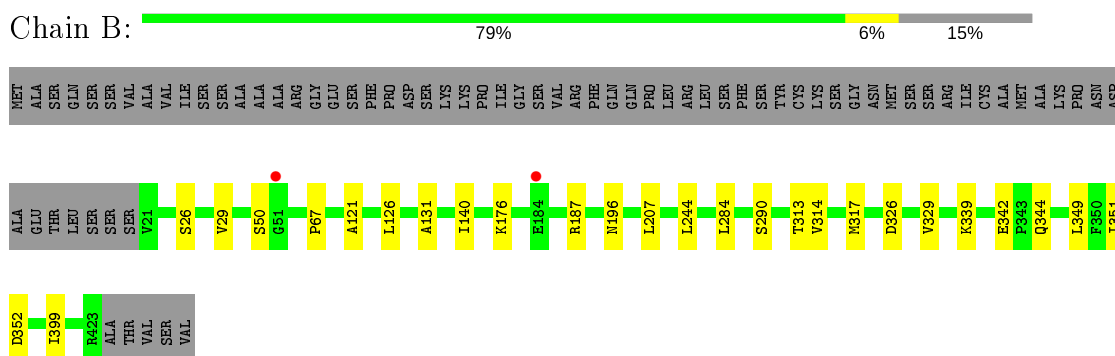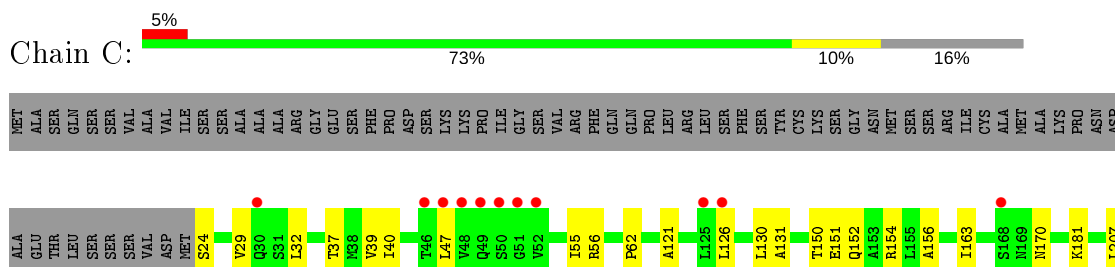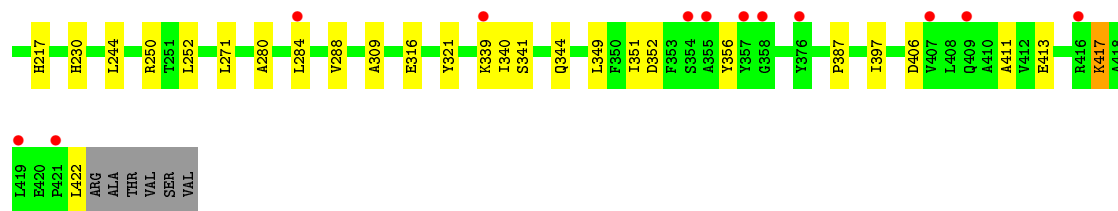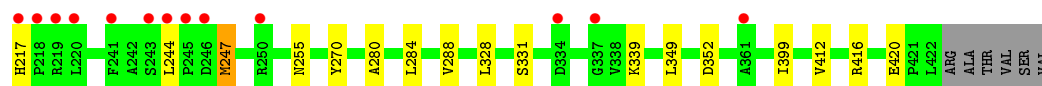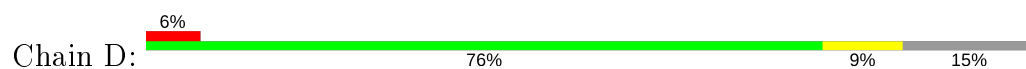
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	58.47Å 73.24Å 103.32Å 92.49° 87.22° 111.05°	Depositor
Resolution (Å)	23.70 – 1.70 48.93 – 1.67	Depositor EDS
% Data completeness (in resolution range)	96.0 (23.70-1.70) 94.7 (48.93-1.67)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	2.26 (at 1.67Å)	Xtriage
Refinement program	PHENIX 1.7.3_928	Depositor
R, R_{free}	0.172 , 0.201 0.170 , 0.198	Depositor DCC
R_{free} test set	8785 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	20.4	Xtriage
Anisotropy	0.453	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 53.1	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.015 for -h,h+k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	13808	wwPDB-VP
Average B, all atoms (Å^2)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.21% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: NA, CIT, PLP

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	0.34	0/3265	0.54	0/4429
1	B	0.34	0/3223	0.53	0/4375
1	C	0.29	0/3219	0.49	0/4368
1	D	0.29	0/3181	0.49	0/4316
All	All	0.32	0/12888	0.51	0/17488

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	3146	0	3256	34	0
1	B	3119	0	3205	21	0
1	C	3112	0	3203	36	0
1	D	3098	0	3176	31	0
2	A	15	0	6	2	0
2	B	15	0	6	2	0
2	C	15	0	6	1	0
2	D	15	0	6	2	0
3	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	1	0	0	0	0
4	B	13	0	5	0	0
4	C	13	0	5	0	0
4	D	13	0	5	0	0
5	A	342	0	0	6	0
5	B	365	0	0	4	0
5	C	279	0	0	5	0
5	D	246	0	0	0	0
All	All	13808	0	12879	104	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.

All (104) 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:C:340:ILE:HG12	1:C:351[B]:ILE:HD12	1.61	0.83
1:C:131:ALA:HA	1:D:29:VAL:HG21	1.73	0.70
1:C:151:GLU:OE1	1:C:154[A]:ARG:NH1	2.24	0.70
1:D:46:THR:O	1:D:50:SER:N	2.24	0.69
1:A:29[A]:VAL:HG21	1:B:131:ALA:HA	1.74	0.69
1:C:207:LEU:HB3	1:C:244:LEU:HD11	1.74	0.69
1:A:131:ALA:HA	1:B:29[B]:VAL:HG11	1.75	0.68
1:A:284[B]:LEU:HD21	1:B:29[B]:VAL:HG12	1.75	0.68
1:D:207:LEU:HB3	1:D:244:LEU:HD11	1.76	0.67
1:A:29[A]:VAL:HG22	1:B:284[A]:LEU:HD21	1.77	0.66
1:B:339:LYS:HB2	1:B:352:ASP:HB3	1.76	0.66
1:C:349:LEU:HB3	1:C:351[B]:ILE:HD11	1.79	0.65
1:B:344[B]:GLN:NE2	5:B:603:HOH:O	2.31	0.64
1:A:154[A]:ARG:NH2	5:A:601:HOH:O	2.30	0.63
1:C:344:GLN:NE2	5:C:601:HOH:O	2.30	0.62
1:A:121:ALA:HB3	2:A:501:PLP:H5A1	1.81	0.62
1:D:47:LEU:HA	1:D:50:SER:HB3	1.81	0.62
1:C:24:SER:O	1:D:187:ARG:NH2	2.32	0.61
1:C:154[A]:ARG:NH2	5:C:609:HOH:O	2.34	0.59
1:A:283:LYS:NZ	5:A:605:HOH:O	2.36	0.58
1:A:314:VAL:HA	1:A:317:MET:HE2	1.85	0.58
1:B:121:ALA:HB3	2:B:501:PLP:H5A1	1.86	0.57
1:C:29[B]:VAL:HG11	1:D:131:ALA:HA	1.86	0.57
1:C:29[A]:VAL:HG21	1:D:131:ALA:HA	1.87	0.56
1:C:284[B]:LEU:HD21	1:D:29:VAL:HG22	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:283:LYS:NZ	5:A:606:HOH:O	2.39	0.55
1:C:39:VAL:HG13	1:C:40:ILE:HD12	1.88	0.55
1:D:121:ALA:HB3	2:D:501:PLP:H5A1	1.89	0.55
1:A:140[B]:ILE:HD11	5:A:608:HOH:O	2.06	0.54
1:B:140[B]:ILE:HD11	5:B:615:HOH:O	2.07	0.54
1:A:339:LYS:HB2	1:A:352:ASP:HB3	1.89	0.53
1:B:351:ILE:HD12	1:B:399:ILE:HD12	1.89	0.53
1:C:339:LYS:HB2	1:C:352:ASP:HB3	1.91	0.52
1:A:331[A]:SER:HB3	1:A:412:VAL:HG11	1.90	0.52
1:C:217:HIS:O	1:C:250:ARG:NH2	2.42	0.52
1:A:24:SER:O	1:B:187:ARG:NH2	2.43	0.52
1:D:331:SER:HB3	1:D:412:VAL:HG11	1.92	0.52
1:B:26:SER:OG	1:B:29[B]:VAL:HG13	2.11	0.51
1:D:255:ASN:HB3	1:D:270:TYR:CZ	2.45	0.51
1:C:417:LYS:HE2	1:C:417:LYS:HA	1.92	0.51
1:B:349:LEU:HD13	1:B:351:ILE:HD11	1.93	0.51
1:A:210:ILE:O	1:A:214[B]:ILE:HG12	2.10	0.51
1:C:55:ILE:HG21	1:C:411:ALA:HB2	1.93	0.51
1:B:207:LEU:HB3	1:B:244:LEU:HD11	1.92	0.50
1:D:179:GLU:HA	1:D:182:LEU:HD12	1.93	0.50
1:A:288:VAL:HA	1:B:126:LEU:HD22	1.93	0.50
1:A:207:LEU:HB3	1:A:244:LEU:HD11	1.93	0.50
1:B:326:ASP:HA	5:B:614:HOH:O	2.11	0.50
1:C:56:ARG:NH2	5:C:614:HOH:O	2.39	0.50
1:A:230:HIS:CE1	1:A:309:ALA:HA	2.46	0.49
1:A:385:MET:SD	1:A:399:ILE:HG12	2.52	0.49
1:D:339:LYS:HB2	1:D:352:ASP:HB3	1.94	0.49
1:D:210:ILE:O	1:D:214:ILE:HG12	2.12	0.49
1:B:314:VAL:HA	1:B:317:MET:HE2	1.93	0.49
5:C:602:HOH:O	1:D:23:MET:HE2	2.13	0.49
1:A:331[B]:SER:HB2	1:A:412:VAL:HG11	1.94	0.49
1:C:29[A]:VAL:HG11	1:D:280:ALA:HB1	1.94	0.49
1:D:48:VAL:HG21	1:D:56:ARG:HH21	1.77	0.49
1:C:121:ALA:HB3	2:C:501:PLP:H5A1	1.94	0.49
1:A:217:HIS:O	1:A:250:ARG:NH2	2.44	0.49
1:A:140[B]:ILE:HD13	1:A:161:VAL:HB	1.96	0.48
1:C:170[B]:ASN:OD1	1:C:341:SER:OG	2.32	0.48
1:C:252:LEU:HB3	1:C:271:LEU:HD11	1.95	0.48
1:A:196:ASN:HB3	2:A:501:PLP:H2A1	1.96	0.47
1:A:28:ARG:NH1	1:A:157:ASP:OD2	2.47	0.47
1:D:196:ASN:HB3	2:D:501:PLP:H2A1	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:211:ALA:HA	1:D:247:MET:HE2	1.96	0.47
1:C:280:ALA:HB1	1:D:29:VAL:HG11	1.96	0.47
1:C:356:TYR:HD2	1:C:422:LEU:HB2	1.80	0.46
1:C:29[B]:VAL:HG12	1:D:284[B]:LEU:HD21	1.97	0.46
1:A:343:PRO:HG3	1:A:349:LEU:CD2	2.46	0.46
1:C:288:VAL:HA	1:D:126:LEU:HD22	1.96	0.46
1:C:150:THR:O	1:C:154[B]:ARG:HG3	2.16	0.45
1:C:62:PRO:HB3	1:C:321:TYR:OH	2.17	0.45
1:B:196:ASN:HB3	2:B:501:PLP:H2A1	1.97	0.45
1:A:127:GLN:HG2	1:A:284[A]:LEU:HD23	2.00	0.44
1:C:387:PRO:HA	1:C:397:ILE:HD13	2.00	0.43
1:C:163:ILE:HG12	1:C:181:LYS:HE3	2.00	0.43
1:D:416:ARG:O	1:D:420:GLU:HG3	2.18	0.43
1:A:131:ALA:HA	1:B:29[A]:VAL:HG21	1.99	0.43
1:A:55:ILE:HG21	1:A:411:ALA:HB2	2.00	0.43
1:C:130:LEU:HD23	1:C:156:ALA:HB2	1.99	0.43
1:A:416:ARG:O	1:A:420[A]:GLU:HG3	2.18	0.43
1:A:255:ASN:HB3	1:A:270:TYR:CZ	2.54	0.43
1:B:176:LYS:NZ	5:B:613:HOH:O	2.41	0.43
1:A:327:PHE:CZ	1:A:409:GLN:HG2	2.54	0.43
1:D:163:ILE:HG12	1:D:181:LYS:HD2	2.01	0.42
1:D:182:LEU:HD13	1:D:217:HIS:CE1	2.53	0.42
1:C:230:HIS:CE1	1:C:309:ALA:HA	2.54	0.42
1:C:37:THR:HG23	5:C:759:HOH:O	2.18	0.42
1:B:329:VAL:HG11	1:B:342:GLU:OE1	2.19	0.42
1:D:328:LEU:HB3	1:D:349:LEU:HD11	2.02	0.42
1:A:130:LEU:HD12	1:A:284[A]:LEU:HD21	2.01	0.41
1:C:126:LEU:HD22	1:D:288:VAL:HA	2.02	0.41
1:A:137:ASP:HA	1:A:185[B]:LYS:HE3	2.03	0.41
1:A:403[B]:THR:HG23	5:A:751:HOH:O	2.19	0.41
1:D:57:LEU:HD13	1:D:399:ILE:HG23	2.02	0.41
1:D:130:LEU:HD23	1:D:156:ALA:HB2	2.03	0.41
1:C:32:LEU:HD11	1:D:284[B]:LEU:HD23	2.03	0.40
1:A:181:LYS:HE2	5:A:620:HOH:O	2.21	0.40
1:B:67:PRO:HB3	1:B:313:THR:HG21	2.03	0.40
1:C:126:LEU:HD13	1:C:152:GLN:HG2	2.04	0.40
1:D:179:GLU:HG3	1:D:213:ILE:HD13	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	420/475 (88%)	412 (98%)	8 (2%)	0	100	100
1	B	416/475 (88%)	406 (98%)	9 (2%)	1 (0%)	47	30
1	C	413/475 (87%)	406 (98%)	7 (2%)	0	100	100
1	D	409/475 (86%)	402 (98%)	7 (2%)	0	100	100
All	All	1658/1900 (87%)	1626 (98%)	31 (2%)	1 (0%)	51	33

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	50	SER

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	346/390 (89%)	344 (99%)	2 (1%)	86	80
1	B	342/390 (88%)	341 (100%)	1 (0%)	92	89
1	C	341/390 (87%)	336 (98%)	5 (2%)	65	51
1	D	337/390 (86%)	335 (99%)	2 (1%)	86	80
All	All	1366/1560 (88%)	1356 (99%)	10 (1%)	84	77

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	SER
1	A	50	SER
1	B	290	SER
1	C	47	LEU
1	C	316	GLU
1	C	406[A]	ASP
1	C	406[B]	ASP
1	C	417	LYS
1	D	157	ASP
1	D	247	MET

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

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 carbohydrates in this entry.

5.6   Ligand geometry ⓘ

Of 9 ligands modelled in this entry, 2 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	#$|Z| > 2$
4	CIT	C	502	-	3,12,12	1.19	0	3,17,17	1.62	1 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	PLP	D	501	1	15,15,16	1.79	2 (13%)	20,22,23	1.74	2 (10%)
2	PLP	A	501	1	15,15,16	1.69	1 (6%)	20,22,23	1.70	4 (20%)
4	CIT	B	503	-	3,12,12	1.27	0	3,17,17	2.08	2 (66%)
2	PLP	C	501	1	15,15,16	1.77	2 (13%)	20,22,23	1.67	4 (20%)
2	PLP	B	501	1	15,15,16	1.84	2 (13%)	20,22,23	1.72	4 (20%)
4	CIT	D	502	-	3,12,12	1.27	0	3,17,17	2.62	2 (66%)

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	CIT	C	502	-	-	1/6/16/16	-
2	PLP	D	501	1	-	5/6/6/8	0/1/1/1
2	PLP	A	501	1	-	5/6/6/8	0/1/1/1
4	CIT	B	503	-	-	1/6/16/16	-
2	PLP	C	501	1	-	3/6/6/8	0/1/1/1
2	PLP	B	501	1	-	5/6/6/8	0/1/1/1
4	CIT	D	502	-	-	4/6/16/16	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	PLP	O3-C3	-5.70	1.23	1.37
2	D	501	PLP	O3-C3	-5.67	1.23	1.37
2	B	501	PLP	O3-C3	-5.67	1.23	1.37
2	A	501	PLP	O3-C3	-5.42	1.24	1.37
2	D	501	PLP	C2-N1	2.42	1.38	1.33
2	B	501	PLP	C2-N1	2.37	1.38	1.33
2	C	501	PLP	C2-N1	2.36	1.38	1.33

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	501	PLP	O4P-C5A-C5	6.24	121.25	109.35
2	B	501	PLP	O4P-C5A-C5	4.51	117.95	109.35
2	A	501	PLP	O4P-C5A-C5	4.37	117.67	109.35
2	C	501	PLP	O4P-C5A-C5	4.09	117.15	109.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	PLP	C6-C5-C4	3.93	121.25	118.16
4	D	502	CIT	C3-C2-C1	-3.80	108.90	114.98
2	B	501	PLP	C6-C5-C4	3.78	121.14	118.16
2	C	501	PLP	C6-C5-C4	3.06	120.56	118.16
4	B	503	CIT	C4-C3-C2	2.80	116.81	109.33
2	C	501	PLP	C4A-C4-C5	-2.69	118.17	120.94
4	C	502	CIT	C4-C3-C2	2.68	116.49	109.33
2	D	501	PLP	C6-C5-C4	2.61	120.22	118.16
2	C	501	PLP	C5-C6-N1	-2.54	119.58	123.82
2	A	501	PLP	O3P-P-O2P	2.53	117.30	107.64
2	B	501	PLP	O2P-P-O4P	-2.50	100.08	106.73
2	B	501	PLP	C5-C6-N1	-2.32	119.96	123.82
2	A	501	PLP	C5-C6-N1	-2.31	119.97	123.82
4	B	503	CIT	C3-C2-C1	-2.25	111.38	114.98
4	D	502	CIT	C4-C3-C2	2.18	115.15	109.33

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	501	PLP	C5A-O4P-P-O1P
2	C	501	PLP	C5A-O4P-P-O2P
2	C	501	PLP	C5A-O4P-P-O3P
2	D	501	PLP	C4-C5-C5A-O4P
2	D	501	PLP	C5A-O4P-P-O1P
2	D	501	PLP	C5A-O4P-P-O2P
2	D	501	PLP	C5A-O4P-P-O3P
2	A	501	PLP	C4-C5-C5A-O4P
2	A	501	PLP	C5A-O4P-P-O1P
2	A	501	PLP	C5A-O4P-P-O2P
2	A	501	PLP	C5A-O4P-P-O3P
2	B	501	PLP	C4-C5-C5A-O4P
2	B	501	PLP	C6-C5-C5A-O4P
2	B	501	PLP	C5A-O4P-P-O2P
2	B	501	PLP	C5A-O4P-P-O3P
4	D	502	CIT	C1-C2-C3-C6
4	D	502	CIT	C1-C2-C3-C4
2	D	501	PLP	C6-C5-C5A-O4P
2	A	501	PLP	C6-C5-C5A-O4P
4	C	502	CIT	O7-C3-C4-C5
4	D	502	CIT	C1-C2-C3-O7
4	D	502	CIT	O7-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
4	B	503	CIT	O7-C3-C4-C5
2	B	501	PLP	C5A-O4P-P-O1P

There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	501	PLP	2	0
2	A	501	PLP	2	0
2	C	501	PLP	1	0
2	B	501	PLP	2	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	401/475 (84%)	0.01	11 (2%)	54	58	10, 22, 47, 65	0
1	B	403/475 (84%)	-0.15	2 (0%)	91	92	14, 24, 42, 73	0
1	C	399/475 (84%)	0.34	23 (5%)	23	25	16, 33, 59, 72	0
1	D	403/475 (84%)	0.21	28 (6%)	16	19	20, 34, 56, 66	0
All	All	1606/1900 (84%)	0.10	64 (3%)	38	42	10, 28, 55, 73	0

All (64) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	50	SER	7.7
1	A	51	GLY	7.4
1	A	48	VAL	6.7
1	A	50	SER	6.3
1	A	52	VAL	5.6
1	C	52	VAL	5.5
1	A	424	ALA	4.9
1	C	51	GLY	4.9
1	B	51	GLY	4.6
1	D	51	GLY	4.6
1	A	49	GLN	4.2
1	C	358	GLY	4.2
1	D	184	GLU	4.0
1	D	216	LYS	4.0
1	D	46	THR	3.9
1	D	244	LEU	3.8
1	C	47	LEU	3.8
1	A	53	PRO	3.6
1	D	179	GLU	3.3
1	C	416	ARG	3.2
1	C	421	PRO	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	243	SER	3.1
1	D	245	PRO	3.0
1	D	215	ALA	3.0
1	D	214	ILE	3.0
1	D	217	HIS	2.9
1	D	212	ARG	2.8
1	C	339	LYS	2.8
1	C	126	LEU	2.8
1	D	218	PRO	2.8
1	A	45	ALA	2.8
1	D	176	LYS	2.7
1	C	357	TYR	2.6
1	C	168	SER	2.6
1	D	205	SER	2.5
1	D	219	ARG	2.5
1	D	182	LEU	2.5
1	C	407	VAL	2.4
1	D	337	GLY	2.4
1	C	49	GLN	2.3
1	D	48	VAL	2.3
1	D	361	ALA	2.3
1	D	334	ASP	2.3
1	D	20	SER	2.3
1	B	184	GLU	2.2
1	C	48	VAL	2.2
1	C	46	THR	2.2
1	D	250	ARG	2.2
1	D	246	ASP	2.2
1	A	423	ARG	2.2
1	C	355	ALA	2.2
1	A	24	SER	2.2
1	C	354	SER	2.1
1	C	409[A]	GLN	2.1
1	D	210	ILE	2.1
1	C	30	GLN	2.1
1	C	284[A]	LEU	2.1
1	C	376	TYR	2.1
1	D	220	LEU	2.1
1	A	284[A]	LEU	2.0
1	C	125	LEU	2.0
1	C	419	LEU	2.0
1	D	167	ILE	2.0

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Mol	Chain	Res	Type	RSRZ
1	D	241	PHE	2.0

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

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

6.3 Carbohydrates (i)

There are no carbohydrates in this entry.

6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
4	CIT	C	502	13/13	0.85	0.14	27,43,49,53	13
4	CIT	D	502	13/13	0.87	0.13	26,48,58,58	13
3	NA	B	502	1/1	0.88	0.18	50,50,50,50	0
4	CIT	B	503	13/13	0.89	0.12	20,28,43,44	13
3	NA	A	502	1/1	0.90	0.20	57,57,57,57	0
2	PLP	D	501	15/16	0.96	0.09	23,27,37,40	0
2	PLP	C	501	15/16	0.97	0.11	21,26,33,36	0
2	PLP	B	501	15/16	0.98	0.09	13,17,25,33	0
2	PLP	A	501	15/16	0.98	0.11	12,15,22,27	0

6.5 Other polymers (i)

There are no such residues in this entry.