



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 06:36 PM UTC

PDB ID : 1GC3 / pdb_00001gc3
Title : THERMUS THERMOPHILUS ASPARTATE AMINOTRANSFERASE
TETRA MUTANT 2 COMPLEXED WITH TRYPTOPHAN
Authors : Ura, H.; Nakai, T.; Hirotsu, K.; Kuramitsu, S.
Deposited on : 2000-07-18
Resolution : 3.30 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

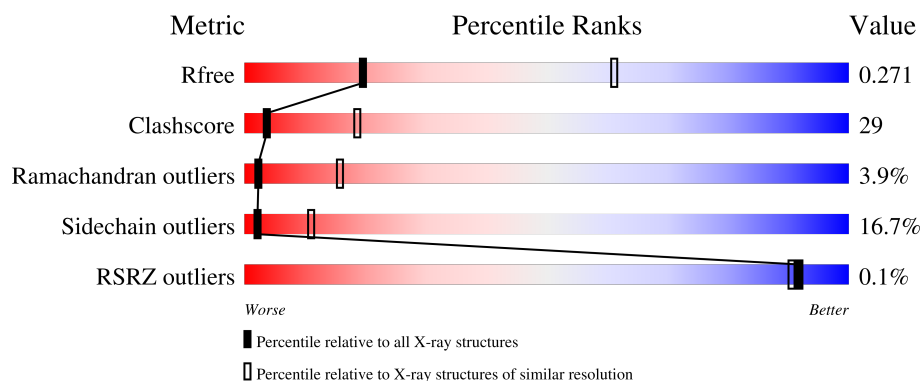
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.30 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}	180053	1169 (3.32-3.28)
Clashscore	190562	1209 (3.32-3.28)
Ramachandran outliers	187476	1188 (3.32-3.28)
Sidechain outliers	187428	1187 (3.32-3.28)
RSRZ outliers	180081	1169 (3.32-3.28)

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	385	42% 35% 18% ..
1	B	385	41% 39% 15% ..
1	C	385	40% 37% 16% 5% .
1	D	385	40% 41% 15% ..
1	E	385	40% 37% 19% ..

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Mol	Chain	Length	Quality of chain
1	F	385	
1	G	385	
1	H	385	

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
2	TRP	A	914	-	-	X	-
2	TRP	C	1414	-	-	X	-
2	TRP	D	1914	-	-	X	-
2	TRP	E	2914	-	-	X	-
2	TRP	G	3414	-	-	X	-
3	PLP	C	1413	-	X	-	-
3	PLP	G	3413	-	X	-	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 23824 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 ASPARTATE AMINOTRANSFERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	B	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	C	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	D	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	E	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	F	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	G	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			
1	H	382	Total	C	N	O	S	0	0	0
			2948	1866	523	551	8			

There are 32 discrepancies between the modelled and reference sequences:

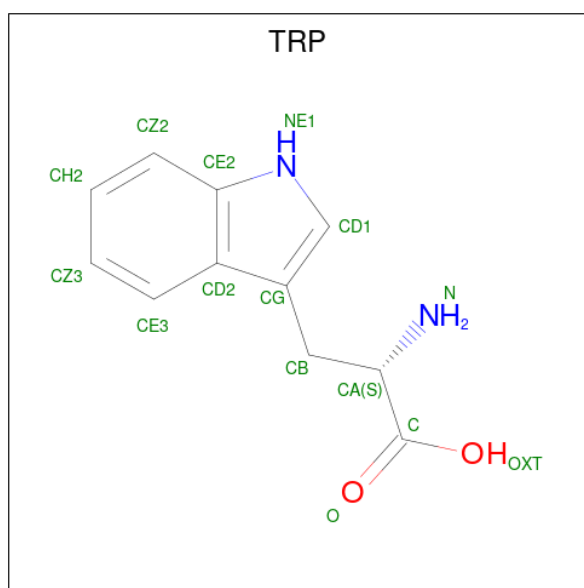
Chain	Residue	Modelled	Actual	Comment	Reference
A	14	ASP	SER	engineered mutation	UNP Q56232
A	16	VAL	THR	engineered mutation	UNP Q56232
A	101	SER	LYS	engineered mutation	UNP Q56232
A	261	ARG	SER	engineered mutation	UNP Q56232
B	514	ASP	SER	engineered mutation	UNP Q56232
B	516	VAL	THR	engineered mutation	UNP Q56232
B	601	SER	LYS	engineered mutation	UNP Q56232
B	761	ARG	SER	engineered mutation	UNP Q56232
C	1014	ASP	SER	engineered mutation	UNP Q56232
C	1016	VAL	THR	engineered mutation	UNP Q56232
C	1101	SER	LYS	engineered mutation	UNP Q56232
C	1261	ARG	SER	engineered mutation	UNP Q56232
D	1514	ASP	SER	engineered mutation	UNP Q56232

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Chain	Residue	Modelled	Actual	Comment	Reference
D	1516	VAL	THR	engineered mutation	UNP Q56232
D	1601	SER	LYS	engineered mutation	UNP Q56232
D	1761	ARG	SER	engineered mutation	UNP Q56232
E	2014	ASP	SER	engineered mutation	UNP Q56232
E	2016	VAL	THR	engineered mutation	UNP Q56232
E	2101	SER	LYS	engineered mutation	UNP Q56232
E	2261	ARG	SER	engineered mutation	UNP Q56232
F	2514	ASP	SER	engineered mutation	UNP Q56232
F	2516	VAL	THR	engineered mutation	UNP Q56232
F	2601	SER	LYS	engineered mutation	UNP Q56232
F	2761	ARG	SER	engineered mutation	UNP Q56232
G	3014	ASP	SER	engineered mutation	UNP Q56232
G	3016	VAL	THR	engineered mutation	UNP Q56232
G	3101	SER	LYS	engineered mutation	UNP Q56232
G	3261	ARG	SER	engineered mutation	UNP Q56232
H	3514	ASP	SER	engineered mutation	UNP Q56232
H	3516	VAL	THR	engineered mutation	UNP Q56232
H	3601	SER	LYS	engineered mutation	UNP Q56232
H	3761	ARG	SER	engineered mutation	UNP Q56232

- Molecule 2 is TRYPTOPHAN (CCD ID: TRP) (formula: $C_{11}H_{12}N_2O_2$).



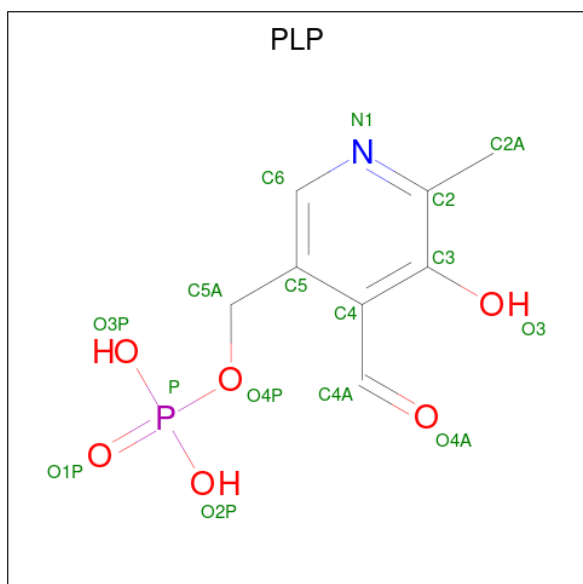
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			15	11	2	2		
2	A	1	Total	C	N	O	0	0
			15	11	2	2		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	C	1	Total	C	N	O	0	0
			15	11	2	2		
2	D	1	Total	C	N	O	0	0
			15	11	2	2		
2	E	1	Total	C	N	O	0	0
			15	11	2	2		
2	E	1	Total	C	N	O	0	0
			15	11	2	2		
2	G	1	Total	C	N	O	0	0
			15	11	2	2		
2	H	1	Total	C	N	O	0	0
			15	11	2	2		

- Molecule 3 is PYRIDOXAL-5'-PHOSPHATE (CCD ID: PLP) (formula: $C_8H_{10}NO_6P$).



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

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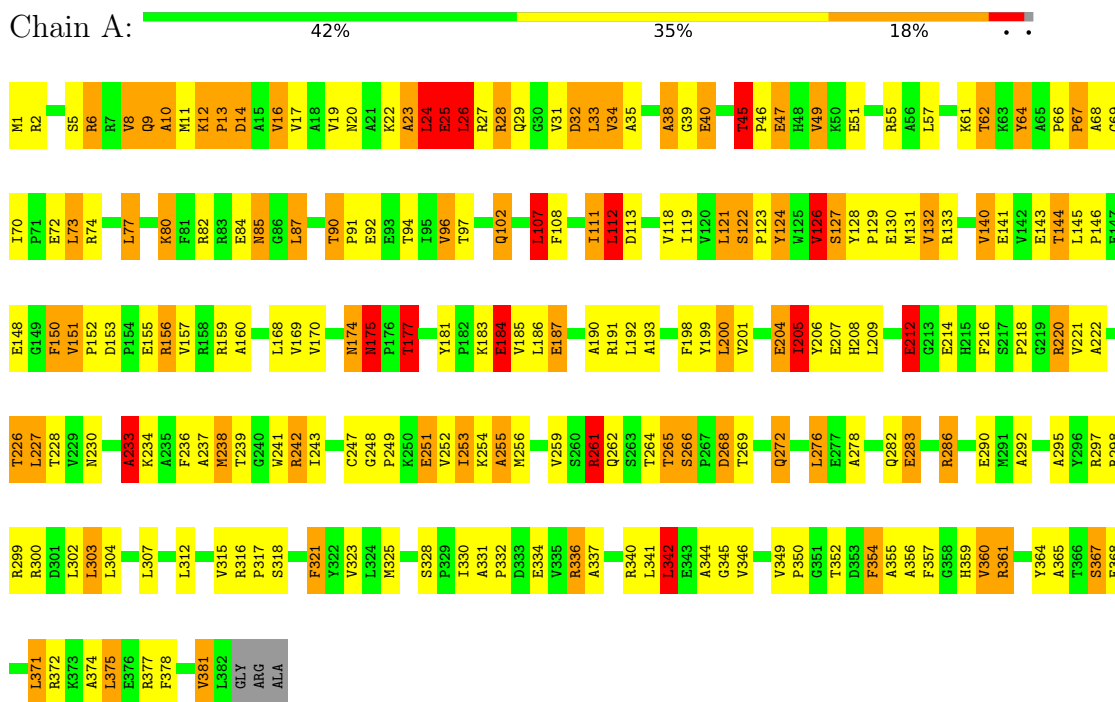
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	F	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	G	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	H	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

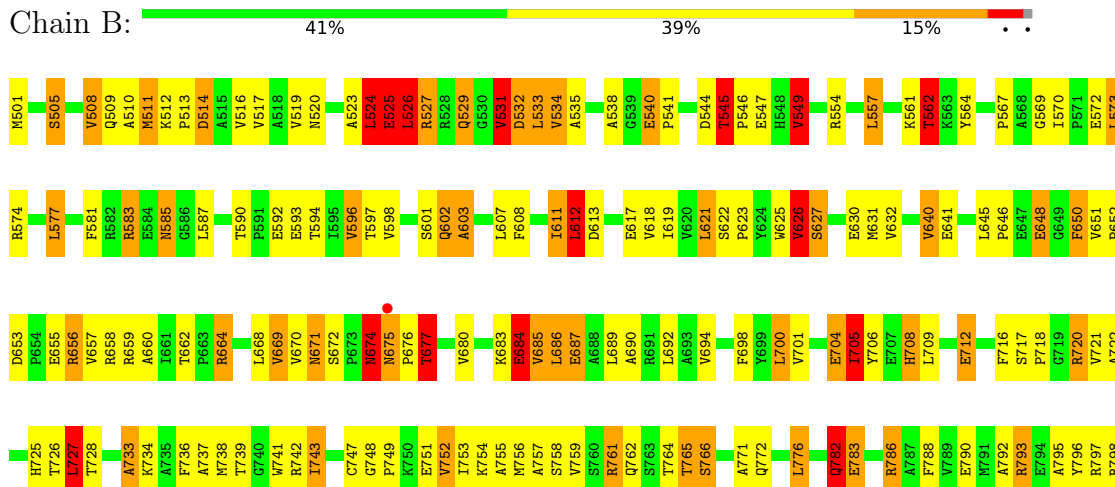
3 Residue-property plots

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: ASPARTATE AMINOTRANSFERASE

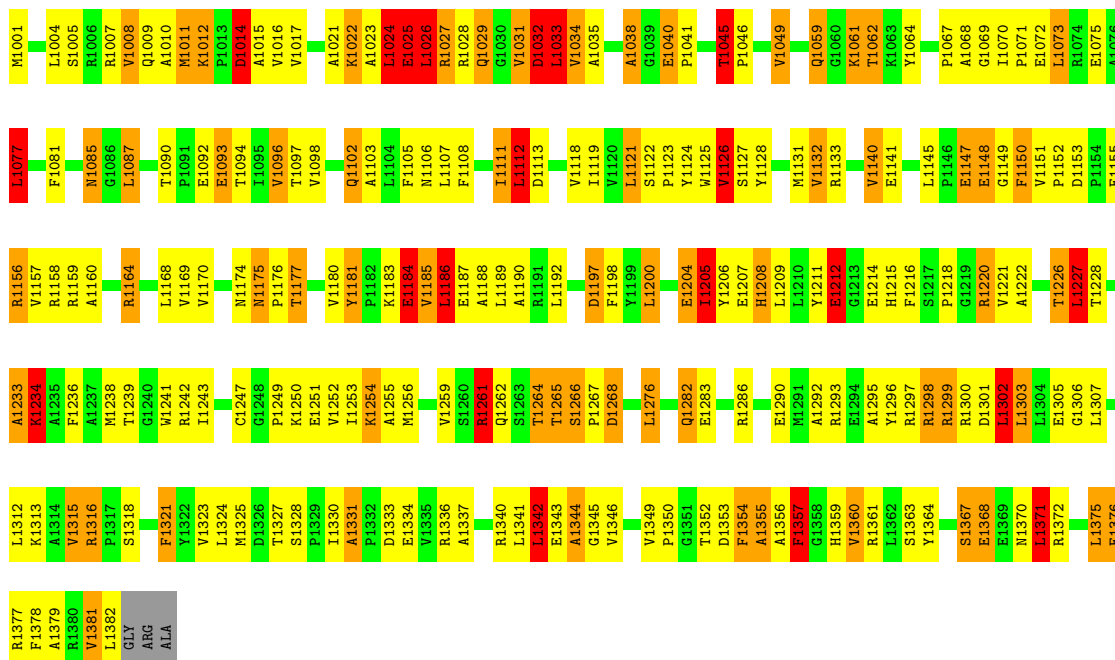


• Molecule 1: ASPARTATE AMINOTRANSFERASE

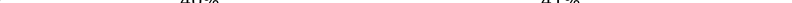


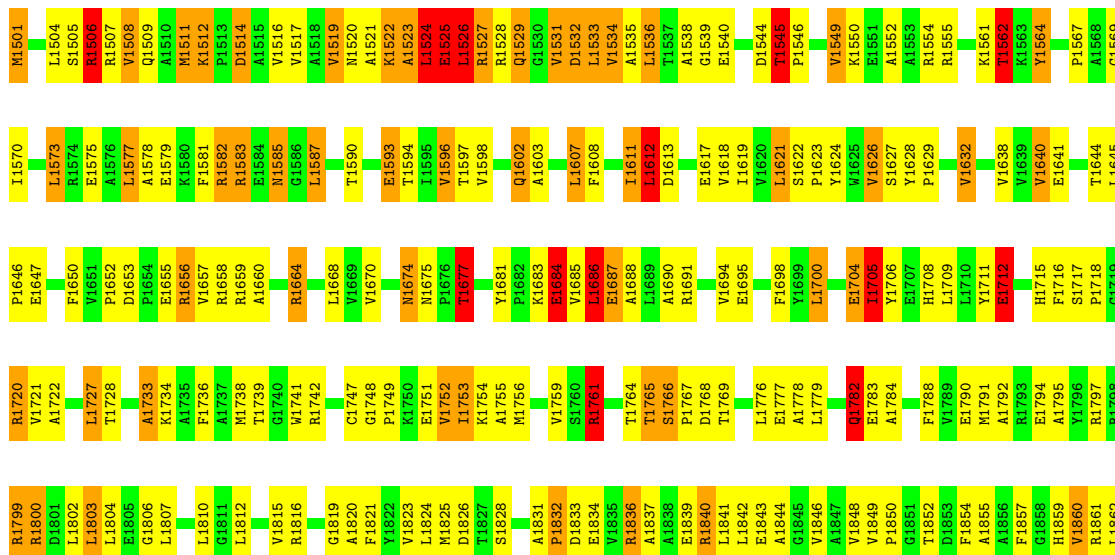
- Molecule 1: ASPARTATE AMINOTRANSFERASE

Chain C: 40% 37% 16% 5%



- Molecule 1: ASPARTATE AMINOTRANSFERASE

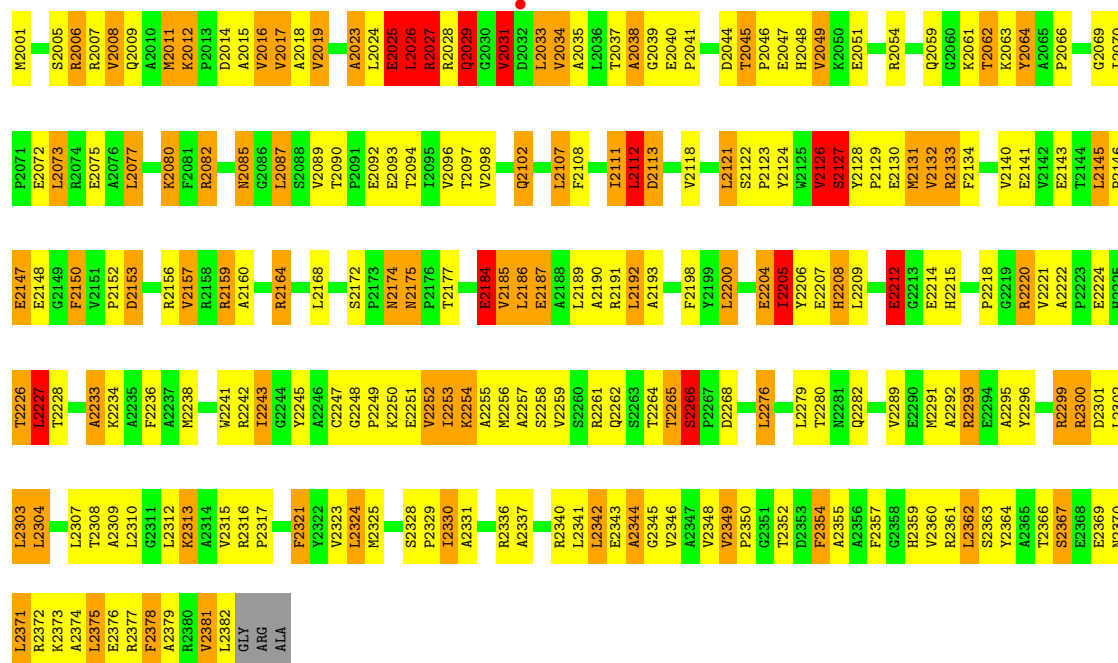
Chain D:  40% 41% 15% 4%





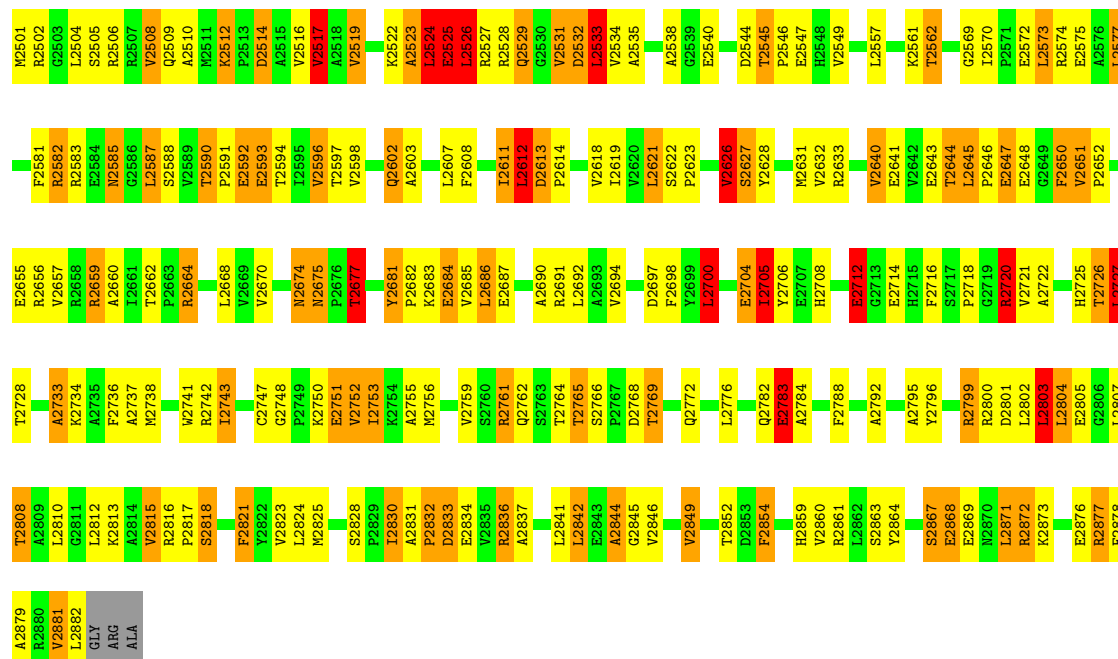
● Molecule 1: ASPARTATE AMINOTRANSFERASE

Chain E: 40% 37% 19% . .



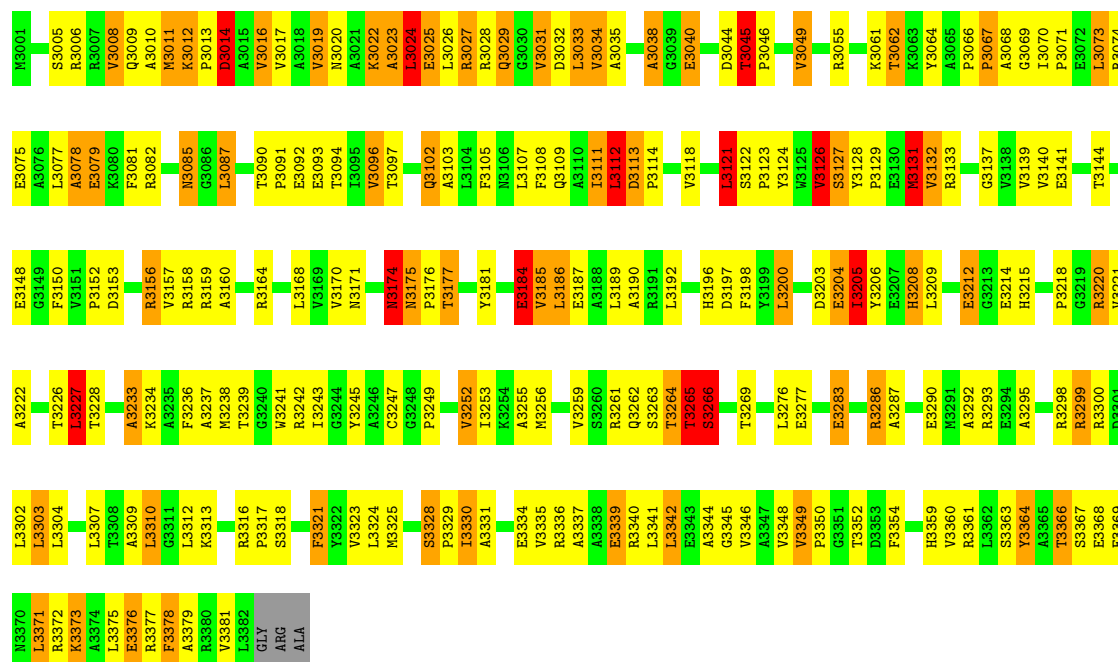
● Molecule 1: ASPARTATE AMINOTRANSFERASE

Chain F: 44% 34% 17% . .



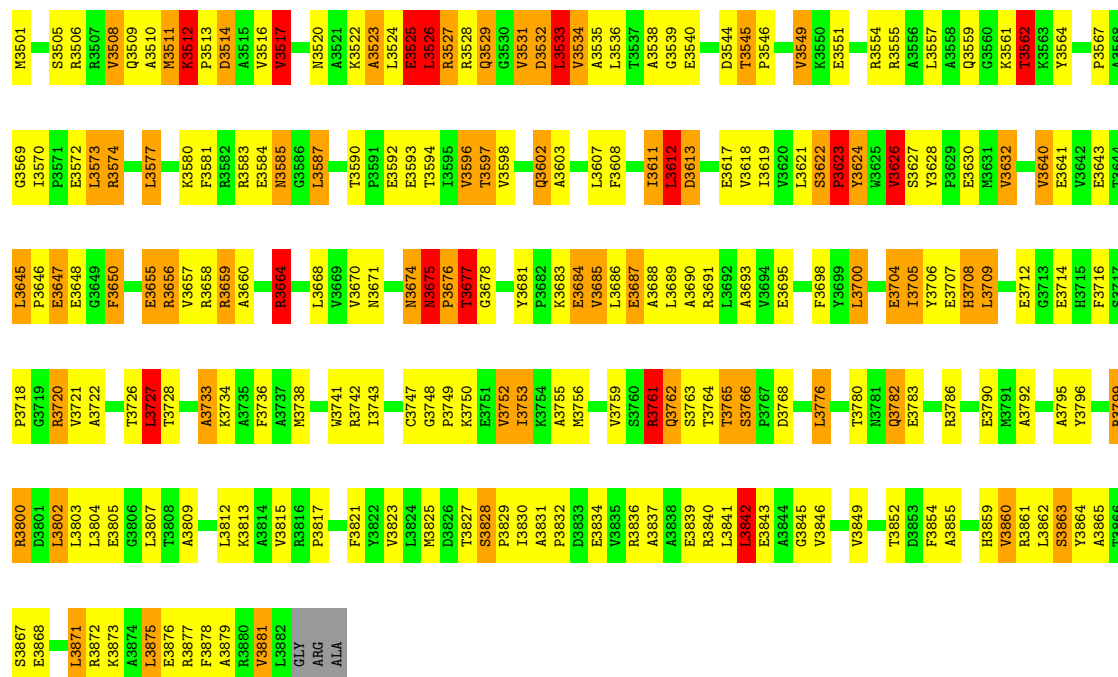
• Molecule 1: ASPARTATE AMINOTRANSFERASE

Chain G: 



• Molecule 1: ASPARTATE AMINOTRANSFERASE

Chain H: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	81.50Å 98.40Å 187.00Å 90.00° 91.53° 90.00°	Depositor
Resolution (Å)	8.00 – 3.30 8.00 – 3.30	Depositor EDS
% Data completeness (in resolution range)	96.0 (8.00-3.30) 88.1 (8.00-3.30)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.36 (at 3.33Å)	Xtriage
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.203 , 0.282 0.196 , 0.271	Depositor DCC
R_{free} test set	4282 reflections (10.07%)	wwPDB-VP
Wilson B-factor (Å ²)	50.2	Xtriage
Anisotropy	0.323	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 80.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.39$, $\langle L^2 \rangle = 0.22$	Xtriage
Estimated twinning fraction	0.049 for h,-k,-l	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	23824	wwPDB-VP
Average B, all atoms (Å ²)	18.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 32.65 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.0780e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.61	3/3009 (0.1%)	1.63	107/4092 (2.6%)
1	B	0.54	1/3009 (0.0%)	1.67	92/4092 (2.2%)
1	C	0.59	3/3009 (0.1%)	1.67	106/4092 (2.6%)
1	D	0.56	2/3009 (0.1%)	1.63	100/4092 (2.4%)
1	E	0.57	0/3009	1.59	90/4092 (2.2%)
1	F	0.53	0/3009	1.61	97/4092 (2.4%)
1	G	0.54	0/3009	1.56	98/4092 (2.4%)
1	H	0.56	2/3009 (0.1%)	1.56	92/4092 (2.2%)
All	All	0.56	11/24072 (0.0%)	1.62	782/32736 (2.4%)

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	A	0	2
1	C	0	1
1	D	0	1
1	E	0	1
1	H	0	1
All	All	0	6

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	261	ARG	NE-CZ	8.59	1.42	1.33
1	C	1261	ARG	CG-CD	-8.52	1.26	1.52
1	A	67	PRO	CA-CB	-8.17	1.41	1.53
1	C	1023	ALA	CA-C	8.16	1.56	1.52
1	D	1761	ARG	NE-CZ	6.56	1.40	1.33

The worst 5 of 782 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	675	ASN	CA-C-N	-25.16	93.55	120.47
1	B	675	ASN	C-N-CA	-25.16	93.55	120.47
1	F	2526	LEU	N-CA-C	-22.98	81.33	112.12
1	E	2255	ALA	N-CA-C	-21.91	84.67	111.40
1	B	755	ALA	N-CA-C	-20.04	86.95	111.40

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	261	ARG	Sidechain
1	A	64	TYR	Sidechain
1	C	1261	ARG	Sidechain
1	D	1761	ARG	Sidechain
1	E	2064	TYR	Sidechain

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	2948	0	2965	168	0
1	B	2948	0	2962	210	0
1	C	2948	0	2962	192	0
1	D	2948	0	2962	176	0
1	E	2948	0	2962	200	0
1	F	2948	0	2962	147	0
1	G	2948	0	2962	184	0
1	H	2948	0	2962	184	0
2	A	30	0	18	10	0
2	C	15	0	9	8	0
2	D	15	0	9	11	0
2	E	30	0	18	14	0
2	G	15	0	9	6	0
2	H	15	0	9	1	0
3	A	15	0	6	1	0
3	B	15	0	7	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	15	0	6	5	0
3	D	15	0	6	1	0
3	E	15	0	7	1	0
3	F	15	0	7	0	0
3	G	15	0	6	1	0
3	H	15	0	6	1	0
All	All	23824	0	23822	1381	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 29.

The worst 5 of 1381 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:C:1414:TRP:CZ3	1:D:1564:TYR:HB3	1.83	1.14
1:A:67:PRO:HB3	1:A:261:ARG:HG3	1.26	1.14
1:G:3261:ARG:CZ	1:H:3517:VAL:HG21	1.78	1.13
1:A:67:PRO:HG2	1:A:68:ALA:N	1.61	1.12
1:G:3067:PRO:HG3	1:G:3261:ARG:NH1	1.66	1.10

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	380/385 (99%)	332 (87%)	36 (10%)	12 (3%)	3	19
1	B	380/385 (99%)	322 (85%)	42 (11%)	16 (4%)	2	14
1	C	380/385 (99%)	321 (84%)	41 (11%)	18 (5%)	2	12
1	D	380/385 (99%)	322 (85%)	41 (11%)	17 (4%)	2	13
1	E	380/385 (99%)	323 (85%)	42 (11%)	15 (4%)	2	16

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	F	380/385 (99%)	321 (84%)	45 (12%)	14 (4%)	2	17
1	G	380/385 (99%)	325 (86%)	41 (11%)	14 (4%)	2	17
1	H	380/385 (99%)	323 (85%)	43 (11%)	14 (4%)	2	17
All	All	3040/3080 (99%)	2589 (85%)	331 (11%)	120 (4%)	2	16

5 of 120 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	24	LEU
1	A	25	GLU
1	A	26	LEU
1	A	205	ILE
1	A	266	SER

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	305/306 (100%)	255 (84%)	50 (16%)	2	11
1	B	305/306 (100%)	256 (84%)	49 (16%)	2	12
1	C	305/306 (100%)	254 (83%)	51 (17%)	2	11
1	D	305/306 (100%)	260 (85%)	45 (15%)	3	13
1	E	305/306 (100%)	245 (80%)	60 (20%)	1	6
1	F	305/306 (100%)	246 (81%)	59 (19%)	1	6
1	G	305/306 (100%)	257 (84%)	48 (16%)	2	12
1	H	305/306 (100%)	262 (86%)	43 (14%)	3	14
All	All	2440/2448 (100%)	2035 (83%)	405 (17%)	2	11

5 of 405 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	2214	GLU

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Mol	Chain	Res	Type
1	F	2677	THR
1	H	3815	VAL
1	E	2265	THR
1	F	2519	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	3009	GLN
1	H	3674	ASN
1	G	3171	ASN
1	G	3215	HIS
1	H	3870	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

16 ligands are modelled in this entry.

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
2	TRP	A	414	3	15,16,16	1.12	1 (6%)	18,22,22	0.62	0
2	TRP	A	914	3	15,16,16	1.85	4 (26%)	18,22,22	1.81	3 (16%)
2	TRP	C	1414	3	15,16,16	1.67	3 (20%)	18,22,22	2.42	4 (22%)
2	TRP	E	2914	3	15,16,16	3.58	5 (33%)	18,22,22	1.68	5 (27%)
2	TRP	G	3414	3	15,16,16	1.48	2 (13%)	18,22,22	2.01	3 (16%)
3	PLP	A	413	2	15,15,16	2.41	5 (33%)	21,22,23	2.26	7 (33%)
2	TRP	D	1914	3	15,16,16	2.13	4 (26%)	18,22,22	1.07	1 (5%)
2	TRP	E	2414	3	15,16,16	1.51	3 (20%)	18,22,22	2.31	4 (22%)
3	PLP	B	913	2	15,15,16	4.47	7 (46%)	21,22,23	2.34	8 (38%)
3	PLP	E	2413	2	15,15,16	1.87	5 (33%)	21,22,23	5.54	9 (42%)
3	PLP	G	3413	2	15,15,16	3.64	6 (40%)	21,22,23	3.17	11 (52%)
3	PLP	F	2913	2	15,15,16	3.48	5 (33%)	21,22,23	1.60	5 (23%)
3	PLP	H	3913	2	15,15,16	4.30	8 (53%)	21,22,23	1.53	4 (19%)
2	TRP	H	3914	3	15,16,16	2.14	1 (6%)	18,22,22	0.83	1 (5%)
3	PLP	C	1413	2	15,15,16	2.12	8 (53%)	21,22,23	5.81	11 (52%)
3	PLP	D	1913	2	15,15,16	3.52	7 (46%)	21,22,23	3.43	6 (28%)

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
2	TRP	A	414	3	-	7/8/8/8	0/2/2/2
2	TRP	A	914	3	-	3/8/8/8	0/2/2/2
2	TRP	C	1414	3	-	7/8/8/8	0/2/2/2
2	TRP	E	2914	3	-	0/8/8/8	0/2/2/2
2	TRP	G	3414	3	-	4/8/8/8	0/2/2/2
3	PLP	A	413	2	-	0/6/6/8	0/1/1/1
2	TRP	D	1914	3	-	4/8/8/8	0/2/2/2
2	TRP	E	2414	3	-	2/8/8/8	0/2/2/2
3	PLP	B	913	2	-	1/6/6/8	0/1/1/1
3	PLP	E	2413	2	-	2/6/6/8	0/1/1/1
3	PLP	G	3413	2	-	1/6/6/8	0/1/1/1
3	PLP	F	2913	2	-	3/6/6/8	0/1/1/1
3	PLP	H	3913	2	-	0/6/6/8	0/1/1/1
2	TRP	H	3914	3	-	6/8/8/8	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PLP	C	1413	2	-	1/6/6/8	0/1/1/1
3	PLP	D	1913	2	-	0/6/6/8	0/1/1/1

The worst 5 of 74 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	913	PLP	C5-C4	14.06	1.56	1.40
3	H	3913	PLP	C4A-C4	10.82	1.73	1.51
3	D	1913	PLP	C5-C4	10.34	1.52	1.40
3	H	3913	PLP	C5-C4	10.24	1.52	1.40
3	G	3413	PLP	C5-C4	9.83	1.51	1.40

The worst 5 of 82 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	2413	PLP	C4A-C4-C5	-23.79	96.42	120.94
3	C	1413	PLP	C6-C5-C4	15.63	130.91	118.10
3	C	1413	PLP	C4A-C4-C5	-14.79	105.69	120.94
3	C	1413	PLP	C4A-C4-C3	10.51	138.06	120.52
3	D	1913	PLP	C3-C4-C5	-8.98	107.81	118.59

There are no chirality outliers.

5 of 41 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	414	TRP	N-CA-CB-CG
2	C	1414	TRP	N-CA-CB-CG
2	D	1914	TRP	N-CA-CB-CG
2	D	1914	TRP	C-CA-CB-CG
2	G	3414	TRP	N-CA-CB-CG

There are no ring outliers.

15 monomers are involved in 63 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	414	TRP	2	0
2	A	914	TRP	8	0
2	C	1414	TRP	8	0
2	E	2914	TRP	11	0
2	G	3414	TRP	6	0
3	A	413	PLP	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	1914	TRP	11	0
2	E	2414	TRP	3	0
3	B	913	PLP	3	0
3	E	2413	PLP	1	0
3	G	3413	PLP	1	0
3	H	3913	PLP	1	0
2	H	3914	TRP	1	0
3	C	1413	PLP	5	0
3	D	1913	PLP	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	382/385 (99%)	-0.55	0 100 100	3, 17, 38, 57	0
1	B	382/385 (99%)	-0.58	1 (0%) 90 82	3, 18, 40, 66	0
1	C	382/385 (99%)	-0.58	0 100 100	2, 17, 38, 50	0
1	D	382/385 (99%)	-0.59	0 100 100	2, 16, 33, 50	0
1	E	382/385 (99%)	-0.62	1 (0%) 90 82	2, 16, 37, 53	0
1	F	382/385 (99%)	-0.61	0 100 100	2, 15, 33, 56	0
1	G	382/385 (99%)	-0.60	0 100 100	3, 15, 34, 54	0
1	H	382/385 (99%)	-0.60	0 100 100	3, 17, 37, 60	0
All	All	3056/3080 (99%)	-0.59	2 (0%) 92 90	2, 16, 37, 66	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	675	ASN	2.6
1	E	2032	ASP	2.3

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 oligosaccharides 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($\text{\AA}^2$)	Q<0.9
2	TRP	G	3414	15/15	0.39	0.27	32,53,59,59	0
2	TRP	E	2914	15/15	0.59	0.27	29,61,76,77	0
2	TRP	D	1914	15/15	0.66	0.20	32,43,59,61	0
2	TRP	C	1414	15/15	0.67	0.23	41,64,68,70	0
2	TRP	E	2414	15/15	0.75	0.18	21,50,56,57	0
2	TRP	A	914	15/15	0.77	0.26	26,59,74,75	0
2	TRP	A	414	15/15	0.77	0.16	35,41,47,49	0
2	TRP	H	3914	15/15	0.80	0.14	23,43,48,49	0
3	PLP	C	1413	15/16	0.92	0.09	8,18,24,34	0
3	PLP	E	2413	15/16	0.93	0.10	2,7,23,33	0
3	PLP	D	1913	15/16	0.94	0.08	2,14,19,26	0
3	PLP	A	413	15/16	0.94	0.09	8,24,34,40	0
3	PLP	H	3913	15/16	0.95	0.07	7,17,27,30	0
3	PLP	F	2913	15/16	0.96	0.07	2,5,16,21	0
3	PLP	G	3413	15/16	0.97	0.06	2,5,17,27	0
3	PLP	B	913	15/16	0.98	0.04	2,7,13,20	0

6.5 Other polymers

There are no such residues in this entry.