



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 10:25 AM UTC

PDB ID : 5EVJ / pdb_00005evj
Title : X-ray crystal structure of CrArsM, an arsenic (III) S-adenosylmethionine methyltransferase from Chlamydomonas reinhardtii
Authors : Packianathan, C.; Kandavelu, P.; Sankaran, B.; Rosen, B.P.
Deposited on : 2015-11-19
Resolution : 2.40 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 ⓘ 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
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

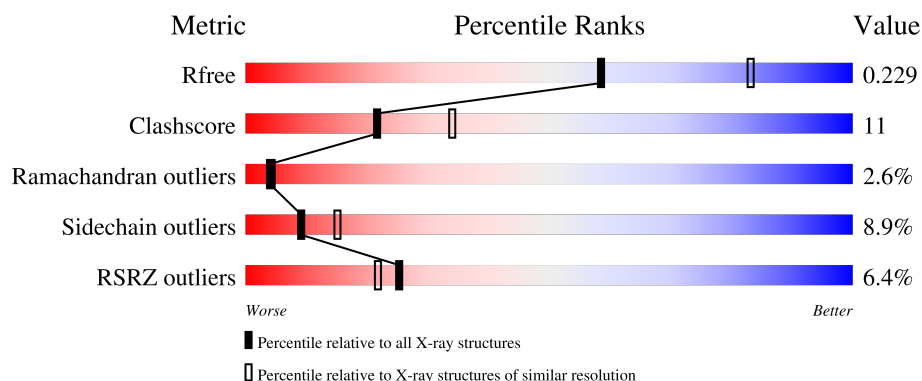
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	387	
1	B	387	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4913 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 Arsenite methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2349	1483	410	448	8			
1	B	301	Total	C	N	O	S	0	0	0
			2318	1464	404	442	8			

There are 46 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	49	ALA	CYS	engineered mutation	UNP K0BVM7
A	72	TRP	TYR	engineered mutation	UNP K0BVM7
A	92	ALA	CYS	engineered mutation	UNP K0BVM7
A	98	ALA	CYS	engineered mutation	UNP K0BVM7
A	132	ALA	CYS	engineered mutation	UNP K0BVM7
A	185	ALA	CYS	engineered mutation	UNP K0BVM7
A	234	ALA	CYS	engineered mutation	UNP K0BVM7
A	247	ALA	CYS	engineered mutation	UNP K0BVM7
A	284	ALA	CYS	engineered mutation	UNP K0BVM7
A	321	ALA	CYS	engineered mutation	UNP K0BVM7
A	332	TYR	TRP	engineered mutation	UNP K0BVM7
A	352	ALA	CYS	engineered mutation	UNP K0BVM7
A	372	ALA	CYS	engineered mutation	UNP K0BVM7
A	378	ALA	CYS	engineered mutation	UNP K0BVM7
A	379	ALA	CYS	engineered mutation	UNP K0BVM7
A	380	LEU	-	expression tag	UNP K0BVM7
A	381	GLU	-	expression tag	UNP K0BVM7
A	382	HIS	-	expression tag	UNP K0BVM7
A	383	HIS	-	expression tag	UNP K0BVM7
A	384	HIS	-	expression tag	UNP K0BVM7
A	385	HIS	-	expression tag	UNP K0BVM7
A	386	HIS	-	expression tag	UNP K0BVM7
A	387	HIS	-	expression tag	UNP K0BVM7
B	49	ALA	CYS	engineered mutation	UNP K0BVM7
B	72	TRP	TYR	engineered mutation	UNP K0BVM7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	92	ALA	CYS	engineered mutation	UNP K0BVM7
B	98	ALA	CYS	engineered mutation	UNP K0BVM7
B	132	ALA	CYS	engineered mutation	UNP K0BVM7
B	185	ALA	CYS	engineered mutation	UNP K0BVM7
B	234	ALA	CYS	engineered mutation	UNP K0BVM7
B	247	ALA	CYS	engineered mutation	UNP K0BVM7
B	284	ALA	CYS	engineered mutation	UNP K0BVM7
B	321	ALA	CYS	engineered mutation	UNP K0BVM7
B	332	TYR	TRP	engineered mutation	UNP K0BVM7
B	352	ALA	CYS	engineered mutation	UNP K0BVM7
B	372	ALA	CYS	engineered mutation	UNP K0BVM7
B	378	ALA	CYS	engineered mutation	UNP K0BVM7
B	379	ALA	CYS	engineered mutation	UNP K0BVM7
B	380	LEU	-	expression tag	UNP K0BVM7
B	381	GLU	-	expression tag	UNP K0BVM7
B	382	HIS	-	expression tag	UNP K0BVM7
B	383	HIS	-	expression tag	UNP K0BVM7
B	384	HIS	-	expression tag	UNP K0BVM7
B	385	HIS	-	expression tag	UNP K0BVM7
B	386	HIS	-	expression tag	UNP K0BVM7
B	387	HIS	-	expression tag	UNP K0BVM7

- Molecule 2 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Na 1 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	155	Total O 155 155	0	0
3	B	90	Total O 90 90	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	157.88Å 157.88Å 95.45Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	45.58 – 2.40 45.58 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.9 (45.58-2.40) 99.8 (45.58-2.40)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	50.04 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.180 , 0.230 (Not available) , 0.229	Depositor DCC
R_{free} test set	1746 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å ²)	34.2	Xtriage
Anisotropy	0.041	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 43.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.005 for -2/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+4/3*l,-1/3*h+1/3*k+1/3*l 0.000 for -h,1/3*h-1/3*k-4/3*l,-1/3*h-2/3*k+1/3*l 0.000 for -1/3*h+1/3*k+4/3*l,-k,2/3*h+1/3*k+1/3*l 0.000 for -h,2/3*h+1/3*k+4/3*l,1/3*h+2/3*k-1/3*l 0.008 for -1/3*h-2/3*k+4/3*l,-2/3*h-1/3*k-4/3*l,1/3*h-1/3*k-1/3*l 0.000 for 1/3*h+2/3*k-4/3*l,-k,-2/3*h-1/3*k-1/3*l 0.015 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	4913	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.53% 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: NA

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	1.28	6/2402 (0.2%)	1.28	15/3260 (0.5%)
1	B	1.29	5/2370 (0.2%)	1.38	27/3217 (0.8%)
All	All	1.29	11/4772 (0.2%)	1.33	42/6477 (0.6%)

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	1
1	B	0	1
All	All	0	2

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	53	PRO	CA-C	7.93	1.56	1.51
1	B	316	LYS	CA-C	6.02	1.60	1.52
1	B	334	ALA	CA-C	6.02	1.60	1.52
1	A	274	PHE	CA-C	-5.80	1.45	1.52
1	A	87	VAL	N-CA	-5.76	1.39	1.46
1	B	311	ARG	C-O	-5.69	1.17	1.24
1	B	300	HIS	CA-C	5.34	1.59	1.52
1	A	318	MET	C-O	5.15	1.29	1.23
1	A	131	TYR	C-O	5.11	1.29	1.24
1	A	231	ILE	CA-CB	5.09	1.60	1.54
1	B	268	SER	N-CA	-5.06	1.40	1.46

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	51	ALA	CA-C-N	10.53	131.23	120.38
1	B	51	ALA	C-N-CA	10.53	131.23	120.38
1	A	296	THR	CA-C-N	-8.74	116.30	122.59
1	A	296	THR	C-N-CA	-8.74	116.30	122.59
1	B	76	ASN	CA-C-N	7.18	128.82	119.84
1	B	76	ASN	C-N-CA	7.18	128.82	119.84
1	A	354	GLY	CA-C-N	7.13	128.75	119.84
1	A	354	GLY	C-N-CA	7.13	128.75	119.84
1	B	326	SER	N-CA-C	-6.78	103.35	111.69
1	B	52	PRO	N-CA-C	6.65	118.82	110.70
1	B	82	ILE	N-CA-C	6.53	118.43	112.29
1	B	206	LEU	CA-C-N	6.35	126.36	119.89
1	B	206	LEU	C-N-CA	6.35	126.36	119.89
1	B	234	ALA	N-CA-C	-6.02	104.80	111.36
1	A	51	ALA	CA-C-N	5.92	126.47	120.38
1	A	51	ALA	C-N-CA	5.92	126.47	120.38
1	A	328	VAL	N-CA-C	-5.86	106.56	113.42
1	B	295	GLY	N-CA-C	5.75	126.81	113.18
1	B	77	PRO	CA-C-N	-5.71	117.08	123.02
1	B	77	PRO	C-N-CA	-5.71	117.08	123.02
1	A	76	ASN	CA-C-N	5.69	126.95	119.84
1	A	76	ASN	C-N-CA	5.69	126.95	119.84
1	A	268	SER	N-CA-C	-5.58	99.63	108.73
1	B	153	LEU	N-CA-C	-5.48	105.32	112.23
1	B	327	MET	N-CA-C	5.48	118.01	111.71
1	B	241	ASP	CA-C-N	5.44	125.75	119.93
1	B	241	ASP	C-N-CA	5.44	125.75	119.93
1	B	334	ALA	N-CA-C	5.43	121.81	109.81
1	B	336	HIS	N-CA-C	5.36	118.93	112.93
1	B	220	CYS	N-CA-C	-5.33	106.47	112.87
1	B	268	SER	N-CA-C	-5.25	99.97	108.52
1	A	53	PRO	CA-C-N	5.24	124.69	119.24
1	A	53	PRO	C-N-CA	5.24	124.69	119.24
1	B	115	ASP	N-CA-C	5.20	117.29	109.23
1	B	297	ILE	N-CA-C	5.15	112.65	107.55
1	A	170	CYS	CB-CA-C	-5.14	104.97	111.86
1	B	78	ILE	CA-C-N	-5.13	115.29	120.31
1	B	78	ILE	C-N-CA	-5.13	115.29	120.31
1	A	327	MET	N-CA-C	5.10	117.57	111.71
1	A	330	GLU	N-CA-C	-5.06	106.25	114.09
1	B	143	MET	N-CA-C	5.05	117.36	110.55
1	B	219	GLU	N-CA-C	5.01	121.48	110.80

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	214	PRO	Peptide
1	B	257	LEU	Peptide

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	2349	0	2289	39	0
1	B	2318	0	2256	60	0
2	A	1	0	0	0	0
3	A	155	0	0	5	0
3	B	90	0	0	3	0
All	All	4913	0	4545	99	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 11.

All (99) 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:B:300:HIS:HA	1:B:302:HIS:CE1	1.99	0.97
1:A:214:PRO:O	1:A:215:VAL:HG22	1.68	0.93
1:B:105:VAL:HG13	1:B:109:GLY:HA3	1.51	0.92
1:B:105:VAL:CG1	1:B:109:GLY:HA3	2.00	0.90
1:A:214:PRO:O	1:A:217:LEU:HD22	1.71	0.90
1:B:300:HIS:HA	1:B:302:HIS:HE1	1.37	0.90
1:A:318:MET:HE2	3:A:611:HOH:O	1.79	0.80
1:A:72:TRP:HZ2	1:A:219:GLU:HB2	1.48	0.75
1:A:215:VAL:CG2	1:A:217:LEU:HD13	2.20	0.72
1:A:258:ARG:NH2	1:A:262:GLY:O	2.26	0.68
1:B:214:PRO:C	1:B:216:LEU:H	2.01	0.68
1:B:215:VAL:HG13	1:B:217:LEU:H	1.59	0.67
1:A:174:LEU:HD12	1:A:174:LEU:N	2.09	0.67
1:B:143:MET:HE2	1:B:145:PHE:CZ	2.28	0.67
1:A:219:GLU:HG3	1:A:220:CYS:SG	2.35	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:ARG:CA	1:B:261:VAL:HG13	2.24	0.67
1:B:302:HIS:CG	1:B:303:ALA:H	2.13	0.66
1:B:99:TYR:CD1	1:B:143:MET:HE1	2.30	0.65
1:B:302:HIS:ND1	1:B:302:HIS:N	2.45	0.64
1:B:115:ASP:HB3	1:B:121:LEU:HD13	1.79	0.63
1:A:152:TYR:HA	1:A:180:ARG:HH21	1.64	0.63
1:B:105:VAL:CG1	1:B:109:GLY:CA	2.76	0.62
1:A:178:LYS:NZ	1:A:225:LEU:HG	2.14	0.62
1:B:147:GLN:HG3	3:B:483:HOH:O	1.98	0.62
1:B:257:LEU:O	1:B:258:ARG:HB2	1.99	0.62
1:B:65:THR:O	1:B:69:GLU:HG2	1.98	0.62
1:B:165:LEU:HD23	1:B:167:ILE:HG23	1.81	0.61
1:B:53:PRO:HB2	1:B:54:PRO:CD	2.31	0.61
1:B:213:HIS:O	1:B:215:VAL:N	2.32	0.60
1:B:214:PRO:O	1:B:216:LEU:N	2.35	0.59
1:B:297:ILE:HG13	1:B:336:HIS:ND1	2.17	0.59
1:A:178:LYS:HZ2	1:A:225:LEU:HG	1.67	0.58
1:B:293:TYR:HB2	1:B:312:PHE:HB3	1.85	0.58
1:B:214:PRO:HB2	1:B:219:GLU:OE2	2.03	0.58
1:A:72:TRP:CZ2	1:A:219:GLU:HB2	2.36	0.57
1:B:143:MET:HE2	1:B:145:PHE:HZ	1.70	0.57
1:B:136:LEU:HD23	1:B:138:TYR:CE2	2.39	0.56
1:B:297:ILE:O	1:B:300:HIS:HB2	2.05	0.56
1:A:66:GLU:OE1	1:A:127:HIS:CE1	2.58	0.56
1:A:235:ARG:HD2	3:A:548:HOH:O	2.06	0.55
1:A:217:LEU:HG	1:A:257:LEU:HD11	1.90	0.54
1:B:56:VAL:O	1:B:60:LEU:HB2	2.07	0.54
1:B:213:HIS:C	1:B:215:VAL:H	2.14	0.54
1:B:258:ARG:H	1:B:261:VAL:CG1	2.23	0.52
1:B:219:GLU:C	1:B:221:LEU:H	2.17	0.52
1:A:214:PRO:HB2	1:A:217:LEU:HB2	1.92	0.51
1:B:297:ILE:CG1	1:B:336:HIS:ND1	2.74	0.51
1:B:315:ASN:O	1:B:317:PRO:HD3	2.10	0.51
1:B:63:VAL:O	1:B:68:LYS:HE2	2.11	0.51
1:A:219:GLU:O	1:A:220:CYS:HB3	2.10	0.51
1:B:258:ARG:HA	1:B:261:VAL:HG13	1.90	0.51
1:A:243:ARG:HD2	1:A:307:ASP:OD2	2.11	0.50
1:B:219:GLU:C	1:B:221:LEU:N	2.68	0.50
1:A:196:HIS:HE1	3:A:632:HOH:O	1.95	0.50
1:B:258:ARG:H	1:B:261:VAL:HG11	1.75	0.50
1:A:355:PRO:O	1:A:356:LYS:HG2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:215:VAL:C	1:B:217:LEU:H	2.18	0.50
1:B:211:ARG:CZ	1:B:211:ARG:HB2	2.41	0.49
1:A:215:VAL:HG22	1:A:217:LEU:HD13	1.94	0.49
1:B:302:HIS:CG	1:B:303:ALA:N	2.81	0.49
1:B:255:ALA:O	1:B:257:LEU:N	2.46	0.48
1:A:173:ASN:HB2	3:A:552:HOH:O	2.13	0.48
1:B:64:PRO:HD3	1:B:131:TYR:HD1	1.78	0.48
1:A:194:GLU:OE2	1:A:196:HIS:HD2	1.97	0.48
1:A:173:ASN:HA	1:A:178:LYS:HE3	1.97	0.47
1:B:178:LYS:HE3	1:B:225:LEU:HD13	1.95	0.47
1:A:66:GLU:OE1	1:A:127:HIS:HE1	1.97	0.47
1:A:214:PRO:HG3	1:A:222:ALA:CB	2.46	0.46
1:B:60:LEU:O	1:B:68:LYS:NZ	2.44	0.46
1:A:154:ASP:OD1	1:A:154:ASP:N	2.49	0.45
1:B:59:ALA:HB2	1:B:103:LYS:HG2	1.98	0.45
1:B:180:ARG:NH1	3:B:406:HOH:O	2.45	0.45
1:B:64:PRO:HD3	1:B:131:TYR:CD1	2.52	0.44
1:B:295:GLY:O	1:B:301:SER:HA	2.18	0.44
1:A:214:PRO:O	1:A:215:VAL:CG2	2.54	0.44
1:A:267:TYR:N	1:A:267:TYR:CD1	2.85	0.44
1:B:178:LYS:HE3	1:B:225:LEU:CD1	2.48	0.43
1:B:336:HIS:CD2	1:B:336:HIS:N	2.87	0.43
1:A:152:TYR:HA	1:A:180:ARG:NH2	2.31	0.43
1:B:63:VAL:O	1:B:64:PRO:C	2.62	0.43
1:A:104:LEU:HD13	3:A:559:HOH:O	2.18	0.42
1:A:95:GLY:O	1:A:96:ARG:C	2.62	0.42
1:B:285:GLU:OE1	1:B:346:HIS:HE1	2.02	0.42
1:B:133:ARG:NH2	1:B:139:GLY:HA2	2.34	0.42
1:B:323:ASN:HB2	3:B:433:HOH:O	2.20	0.42
1:B:129:ASP:O	1:B:130:ALA:C	2.62	0.42
1:B:132:ALA:O	1:B:136:LEU:HB2	2.21	0.41
1:A:194:GLU:OE2	1:A:196:HIS:CD2	2.73	0.41
1:A:295:GLY:O	1:A:301:SER:HA	2.20	0.41
1:A:118:PRO:HD3	1:A:147:GLN:OE1	2.20	0.41
1:A:226:TYR:O	1:A:227:ASN:C	2.63	0.41
1:B:104:LEU:HD13	1:B:104:LEU:HA	1.64	0.41
1:B:263:GLU:CD	1:B:263:GLU:N	2.79	0.41
1:B:293:TYR:CE2	1:B:295:GLY:HA2	2.56	0.41
1:A:215:VAL:HG23	1:A:217:LEU:H	1.85	0.40
1:B:116:MET:SD	1:B:149:GLU:HG3	2.62	0.40
1:A:323:ASN:O	1:A:327:MET:HG3	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:105:VAL:HG11	1:B:109:GLY:C	2.47	0.40
1:A:179:ALA:HB2	1:A:233:LEU:HD11	2.03	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	304/387 (79%)	280 (92%)	16 (5%)	8 (3%)	4	4
1	B	272/387 (70%)	237 (87%)	28 (10%)	7 (3%)	4	4
All	All	576/774 (74%)	517 (90%)	44 (8%)	15 (3%)	4	4

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	215	VAL
1	A	217	LEU
1	A	219	GLU
1	A	220	CYS
1	B	215	VAL
1	B	227	ASN
1	B	315	ASN
1	A	72	TRP
1	A	211	ARG
1	B	54	PRO
1	B	209	SER
1	A	253	HIS
1	B	139	GLY
1	A	355	PRO
1	B	214	PRO

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	244/301 (81%)	224 (92%)	20 (8%)	10	18
1	B	241/301 (80%)	218 (90%)	23 (10%)	8	13
All	All	485/602 (81%)	442 (91%)	43 (9%)	9	15

All (43) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	60	LEU
1	A	96	ARG
1	A	134	ASP
1	A	146	ILE
1	A	147	GLN
1	A	170	CYS
1	A	180	ARG
1	A	182	LEU
1	A	206	LEU
1	A	208	GLN
1	A	209	SER
1	A	213	HIS
1	A	216	LEU
1	A	217	LEU
1	A	227	ASN
1	A	237	VAL
1	A	256	GLU
1	A	257	LEU
1	A	258	ARG
1	A	273	LEU
1	B	63	VAL
1	B	65	THR
1	B	104	LEU
1	B	105	VAL
1	B	110	SER
1	B	120	GLN
1	B	121	LEU

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Mol	Chain	Res	Type
1	B	140	LYS
1	B	147	GLN
1	B	165	LEU
1	B	170	CYS
1	B	171	VAL
1	B	202	VAL
1	B	208	GLN
1	B	212	SER
1	B	225	LEU
1	B	237	VAL
1	B	261	VAL
1	B	273	LEU
1	B	294	LYS
1	B	296	THR
1	B	302	HIS
1	B	339	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	76	ASN
1	A	127	HIS
1	A	196	HIS
1	A	251	GLN
1	A	279	GLN
1	A	309	HIS
1	A	315	ASN
1	A	346	HIS
1	B	196	HIS
1	B	309	HIS
1	B	346	HIS

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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

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(Å ²)	Q<0.9
1	A	306/387 (79%)	-0.31	16 (5%) 33 29	17, 31, 90, 147	0
1	B	301/387 (77%)	0.19	23 (7%) 20 16	17, 39, 111, 144	0
All	All	607/774 (78%)	-0.06	39 (6%) 25 22	17, 34, 101, 147	0

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	216	LEU	5.6
1	A	72	TRP	5.1
1	A	217	LEU	5.0
1	B	217	LEU	4.7
1	B	72	TRP	4.6
1	A	215	VAL	4.5
1	B	253	HIS	4.4
1	B	216	LEU	4.2
1	B	215	VAL	4.0
1	B	252	ILE	3.8
1	A	253	HIS	3.3
1	B	303	ALA	3.2
1	B	258	ARG	3.2
1	A	218	GLY	3.1
1	B	257	LEU	3.1
1	B	214	PRO	3.1
1	B	213	HIS	3.0
1	B	211	ARG	3.0
1	A	220	CYS	2.9
1	A	51	ALA	2.9
1	A	212	SER	2.9
1	B	220	CYS	2.8
1	B	51	ALA	2.8
1	A	214	PRO	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	210	VAL	2.6
1	B	54	PRO	2.6
1	A	221	LEU	2.6
1	B	218	GLY	2.6
1	A	252	ILE	2.4
1	A	213	HIS	2.4
1	B	116	MET	2.4
1	A	211	ARG	2.4
1	B	261	VAL	2.3
1	B	61	ALA	2.3
1	A	356	LYS	2.3
1	B	256	GLU	2.2
1	B	55	ALA	2.2
1	B	219	GLU	2.1
1	A	251	GLN	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 oligosaccharides 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
2	NA	A	401	1/1	0.97	0.07	28,28,28,28	0

6.5 Other polymers [i](#)

There are no such residues in this entry.