



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:35 PM UTC

PDB ID : 1OF5 / pdb_00001of5
Title : Crystal structure of Mex67-Mtr2
Authors : Fribourg, S.; Conti, E.
Deposited on : 2003-04-08
Resolution : 2.80 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

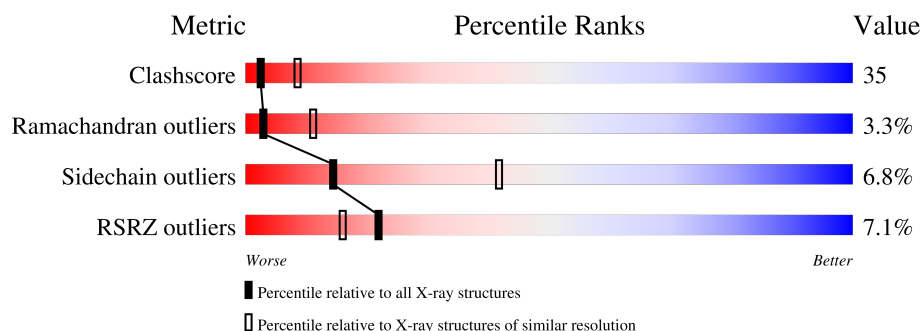
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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))
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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 $\leq 5\%$. 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	221	
2	B	184	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 2253 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 MRNA EXPORT FACTOR MEX67.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	154	Total	C	N	O	S	0	0	0
			1222	775	203	242	2			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	485	ALA	-	expression tag	UNP Q99257
A	486	ALA	-	expression tag	UNP Q99257
A	487	GLY	-	expression tag	UNP Q99257
A	488	SER	-	expression tag	UNP Q99257

- Molecule 2 is a protein called MRNA TRANSPORT REGULATOR MTR2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	128	Total	C	N	O	S	0	0	0
			1027	662	175	185	5			

- Molecule 3 is MERCURY (II) ION (CCD ID: HG) (formula: Hg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Hg	0	0
			1	1		

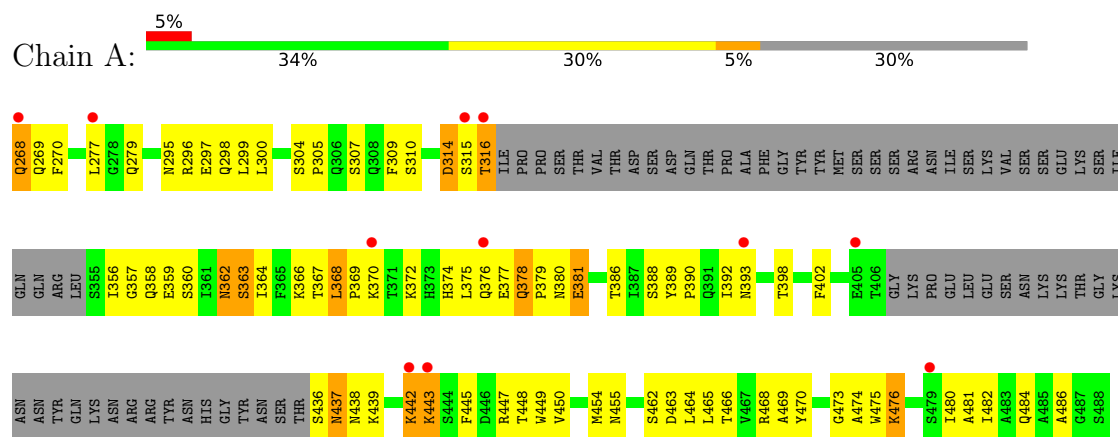
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	O	0	0
			2	2		
4	B	1	Total	O	0	0
			1	1		

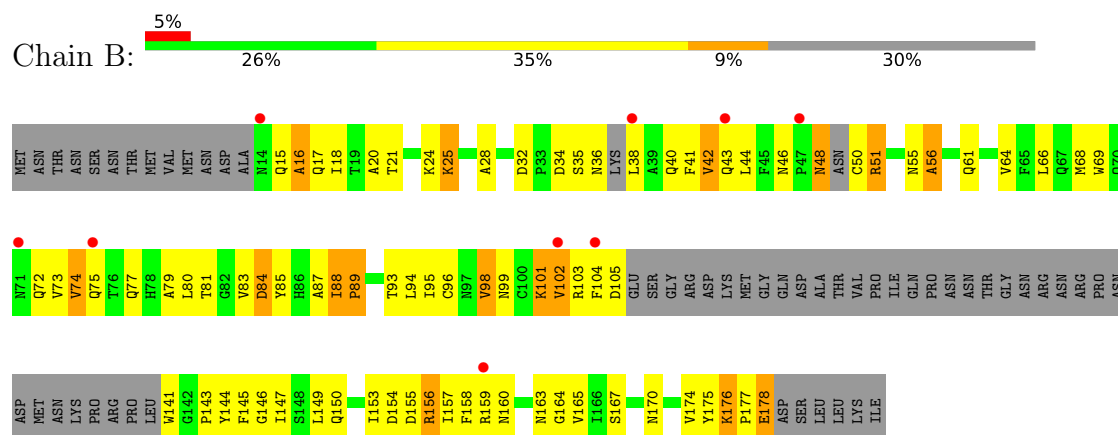
3 Residue-property plots [i](#)

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: MRNA EXPORT FACTOR MEX67



• Molecule 2: MRNA TRANSPORT REGULATOR MTR2



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	48.82Å 83.71Å 85.52Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.80 30.00 – 2.80	Depositor EDS
% Data completeness (in resolution range)	100.0 (30.00-2.80) 95.5 (30.00-2.80)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.51 (at 2.80Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.242 , 0.262 0.242 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	58.8	Xtriage
Anisotropy	0.305	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 59.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.006 for -h,l,k	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	2253	wwPDB-VP
Average B, all atoms (Å ²)	54.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.25% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HG

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	0.53	0/1248	1.09	12/1692 (0.7%)
2	B	0.53	0/1052	1.18	12/1430 (0.8%)
All	All	0.53	0/2300	1.13	24/3122 (0.8%)

There are no bond length outliers.

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	88	ILE	CA-C-N	11.82	134.62	119.84
2	B	88	ILE	C-N-CA	11.82	134.62	119.84
1	A	315	SER	CA-C-N	8.87	137.66	121.70
1	A	315	SER	C-N-CA	8.87	137.66	121.70
1	A	269	GLN	N-CA-C	-8.73	102.54	113.01
1	A	368	LEU	CA-C-N	8.25	128.31	119.89
1	A	368	LEU	C-N-CA	8.25	128.31	119.89
1	A	437	ASN	N-CA-C	-6.39	105.77	112.93
1	A	316	THR	N-CA-C	-6.22	93.59	111.00
2	B	50	CYS	N-CA-C	6.17	119.28	109.65
2	B	101	LYS	N-CA-C	-5.98	100.25	109.52
2	B	88	ILE	N-CA-C	5.51	113.33	107.76
2	B	32	ASP	CA-C-N	5.46	124.97	119.19
2	B	32	ASP	C-N-CA	5.46	124.97	119.19
2	B	176	LYS	CA-C-N	5.36	126.54	119.84
2	B	176	LYS	C-N-CA	5.36	126.54	119.84
1	A	314	ASP	CA-C-O	5.31	126.22	120.43
2	B	98	VAL	N-CA-C	5.17	117.13	109.17
2	B	46	ASN	CA-C-N	5.12	126.24	119.84
2	B	46	ASN	C-N-CA	5.12	126.24	119.84
1	A	378	GLN	CA-C-N	5.08	126.19	119.84
1	A	378	GLN	C-N-CA	5.08	126.19	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	389	TYR	CA-C-N	5.04	126.13	119.84
1	A	389	TYR	C-N-CA	5.04	126.13	119.84

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	1222	0	1172	70	0
2	B	1027	0	992	87	0
3	A	1	0	0	0	0
4	A	2	0	0	0	0
4	B	1	0	0	1	0
All	All	2253	0	2164	153	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 35.

All (153) 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:388:SER:OG	2:B:51:ARG:HD3	1.80	0.81
2:B:101:LYS:HA	2:B:145:PHE:O	1.82	0.79
2:B:80:LEU:HD21	2:B:83:VAL:HG21	1.67	0.76
2:B:69:TRP:CE3	2:B:73:VAL:HG21	2.20	0.75
2:B:87:ALA:O	2:B:89:PRO:HD3	1.89	0.73
2:B:93:THR:HG22	2:B:154:ASP:HA	1.73	0.70
1:A:443:LYS:HE3	1:A:443:LYS:HA	1.74	0.70
2:B:21:THR:O	2:B:25:LYS:HD2	1.93	0.69
2:B:176:LYS:HB2	2:B:177:PRO:HD2	1.75	0.69
1:A:309:PHE:HD1	1:A:463:ASP:HB3	1.56	0.68
1:A:377:GLU:C	1:A:379:PRO:HD3	2.17	0.68
2:B:34:ASP:C	2:B:36:ASN:H	2.03	0.67
1:A:375:LEU:HD11	1:A:482:ILE:HD11	1.76	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:74:VAL:HG11	2:B:104:PHE:HB3	1.76	0.66
1:A:447:ARG:HD3	1:A:449:TRP:CZ2	2.31	0.66
2:B:74:VAL:HG12	2:B:104:PHE:HD2	1.61	0.64
1:A:297:GLU:O	1:A:300:LEU:HD23	1.97	0.64
2:B:38:LEU:O	2:B:42:VAL:HG23	2.00	0.62
2:B:143:PRO:HB2	2:B:177:PRO:HG3	1.83	0.61
1:A:277:LEU:HD22	1:A:279:GLN:NE2	2.14	0.61
2:B:25:LYS:HE3	2:B:25:LYS:HA	1.82	0.61
2:B:42:VAL:HG22	2:B:66:LEU:HD12	1.82	0.61
2:B:69:TRP:HA	2:B:73:VAL:HG23	1.83	0.61
2:B:105:ASP:C	2:B:141:TRP:N	2.60	0.60
1:A:380:ASN:HD22	1:A:480:ILE:HG23	1.67	0.60
2:B:103:ARG:CZ	2:B:141:TRP:HB3	2.31	0.60
1:A:442:LYS:HE3	1:A:442:LYS:N	2.17	0.59
2:B:143:PRO:HB2	2:B:177:PRO:CG	2.32	0.59
1:A:442:LYS:HD2	1:A:470:TYR:HB3	1.84	0.59
2:B:74:VAL:HG13	2:B:75:GLN:N	2.18	0.59
2:B:103:ARG:NE	2:B:141:TRP:HB3	2.18	0.59
1:A:316:THR:HG21	1:A:469:ALA:HB3	1.86	0.58
1:A:360:SER:O	1:A:363:SER:HB3	2.02	0.58
1:A:442:LYS:HD2	1:A:470:TYR:CB	2.33	0.58
2:B:102:VAL:HG23	2:B:147:ILE:HD13	1.85	0.58
1:A:300:LEU:HD22	1:A:300:LEU:N	2.19	0.58
2:B:156:ARG:NH1	2:B:165:VAL:HG12	2.19	0.58
1:A:370:LYS:HD2	1:A:370:LYS:H	1.69	0.57
1:A:480:ILE:O	1:A:481:ALA:HB2	2.03	0.57
1:A:380:ASN:ND2	1:A:480:ILE:HG23	2.18	0.57
1:A:362:ASN:C	1:A:362:ASN:HD22	2.12	0.57
1:A:454:MET:HG2	1:A:455:ASN:ND2	2.20	0.57
1:A:359:GLU:OE1	1:A:359:GLU:HA	2.05	0.56
2:B:74:VAL:HG13	2:B:75:GLN:O	2.06	0.56
2:B:154:ASP:HB2	2:B:165:VAL:HG12	1.86	0.56
2:B:156:ARG:NH2	2:B:163:ASN:O	2.38	0.56
1:A:398:THR:OG1	1:A:448:THR:HG23	2.06	0.56
2:B:73:VAL:HG12	2:B:74:VAL:N	2.21	0.56
1:A:442:LYS:HE3	1:A:442:LYS:H	1.72	0.55
1:A:473:GLY:C	1:A:475:TRP:H	2.15	0.55
1:A:468:ARG:NH2	2:B:174:VAL:HB	2.24	0.53
1:A:473:GLY:O	1:A:476:LYS:HG3	2.09	0.53
2:B:103:ARG:CZ	2:B:141:TRP:CB	2.87	0.53
1:A:362:ASN:C	1:A:362:ASN:ND2	2.68	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:372:LYS:HE3	1:A:374:HIS:CE1	2.45	0.52
2:B:25:LYS:HD2	2:B:25:LYS:H	1.73	0.52
2:B:25:LYS:O	2:B:28:ALA:HB3	2.10	0.52
2:B:103:ARG:CG	2:B:144:TYR:CE2	2.93	0.51
2:B:145:PHE:CD2	2:B:176:LYS:HB3	2.46	0.51
2:B:149:LEU:HD12	2:B:170:ASN:O	2.10	0.51
1:A:356:ILE:HG22	1:A:357:GLY:N	2.25	0.51
2:B:25:LYS:HD2	2:B:25:LYS:N	2.25	0.51
2:B:159:ARG:NE	2:B:159:ARG:HA	2.25	0.51
1:A:381:GLU:HG2	1:A:402:PHE:CE2	2.46	0.51
2:B:176:LYS:HB2	2:B:177:PRO:CD	2.40	0.51
2:B:101:LYS:HB2	2:B:101:LYS:NZ	2.24	0.51
1:A:268:GLN:C	1:A:270:PHE:H	2.18	0.50
1:A:443:LYS:HE2	1:A:468:ARG:O	2.11	0.50
2:B:34:ASP:C	2:B:36:ASN:N	2.68	0.50
2:B:146:GLY:HA3	2:B:175:TYR:CE2	2.46	0.50
1:A:464:LEU:HD22	2:B:84:ASP:HB3	1.93	0.50
1:A:356:ILE:O	1:A:360:SER:HB2	2.11	0.49
1:A:465:LEU:HD12	1:A:466:THR:N	2.27	0.49
2:B:103:ARG:HG2	2:B:144:TYR:CD2	2.48	0.49
1:A:277:LEU:HB2	1:A:279:GLN:HE21	1.78	0.48
2:B:74:VAL:CG1	2:B:104:PHE:HD2	2.26	0.48
2:B:102:VAL:CG2	2:B:147:ILE:HD13	2.43	0.48
2:B:34:ASP:OD2	2:B:36:ASN:HB3	2.13	0.48
1:A:268:GLN:N	1:A:268:GLN:NE2	2.61	0.48
2:B:40:GLN:OE1	2:B:40:GLN:N	2.39	0.48
2:B:153:ILE:HA	2:B:165:VAL:O	2.14	0.48
2:B:79:ALA:O	2:B:81:THR:HG23	2.14	0.48
1:A:436:SER:C	1:A:438:ASN:H	2.20	0.48
1:A:450:VAL:HG11	2:B:88:ILE:CD1	2.43	0.47
1:A:370:LYS:HD2	1:A:370:LYS:N	2.28	0.47
2:B:34:ASP:O	2:B:36:ASN:N	2.47	0.47
2:B:177:PRO:O	2:B:178:GLU:C	2.58	0.47
1:A:268:GLN:C	1:A:270:PHE:N	2.67	0.46
1:A:437:ASN:ND2	1:A:439:LYS:HD2	2.31	0.46
2:B:44:LEU:C	2:B:164:GLY:HA2	2.40	0.46
1:A:314:ASP:O	1:A:316:THR:N	2.49	0.46
2:B:43:GLN:O	2:B:164:GLY:N	2.47	0.46
2:B:157:ILE:HG23	2:B:165:VAL:HG11	1.98	0.46
1:A:450:VAL:HB	1:A:462:SER:HB3	1.96	0.46
2:B:77:GLN:NE2	2:B:103:ARG:HD3	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:300:LEU:N	1:A:300:LEU:CD2	2.78	0.45
1:A:465:LEU:HD12	1:A:466:THR:H	1.81	0.45
2:B:20:ALA:O	2:B:24:LYS:HG3	2.15	0.45
1:A:378:GLN:N	1:A:379:PRO:HD3	2.32	0.45
1:A:386:THR:O	1:A:486:ALA:HA	2.17	0.45
2:B:68:MET:O	2:B:72:GLN:N	2.48	0.45
1:A:388:SER:C	1:A:390:PRO:HD3	2.42	0.45
1:A:442:LYS:H	1:A:442:LYS:CE	2.29	0.45
1:A:304:SER:HB2	1:A:305:PRO:HD2	1.99	0.45
2:B:96:CYS:O	2:B:150:GLN:HA	2.16	0.45
1:A:364:ILE:O	1:A:364:ILE:HG12	2.17	0.44
1:A:375:LEU:CD1	1:A:482:ILE:HD11	2.45	0.44
2:B:104:PHE:O	2:B:105:ASP:CG	2.60	0.44
1:A:372:LYS:HE3	1:A:374:HIS:NE2	2.32	0.44
2:B:85:TYR:HA	2:B:95:ILE:O	2.17	0.44
2:B:41:PHE:CD1	2:B:44:LEU:HD12	2.53	0.44
2:B:143:PRO:CB	2:B:177:PRO:HG3	2.48	0.44
1:A:368:LEU:HA	1:A:369:PRO:HD3	1.74	0.44
1:A:295:ASN:CG	1:A:298:GLN:HG3	2.44	0.43
2:B:160:ASN:O	2:B:160:ASN:OD1	2.36	0.43
1:A:296:ARG:O	1:A:299:LEU:HB2	2.18	0.43
2:B:98:VAL:CG1	2:B:99:ASN:N	2.81	0.43
2:B:105:ASP:C	2:B:141:TRP:CA	2.91	0.43
1:A:307:SER:O	1:A:356:ILE:HG23	2.19	0.43
1:A:454:MET:HG2	1:A:455:ASN:N	2.34	0.43
1:A:362:ASN:O	1:A:366:LYS:HG3	2.18	0.43
2:B:101:LYS:HB2	2:B:101:LYS:HZ2	1.83	0.43
2:B:155:ASP:O	2:B:157:ILE:N	2.52	0.43
1:A:310:SER:HB2	1:A:464:LEU:HD23	1.99	0.43
2:B:41:PHE:HD1	2:B:44:LEU:HD12	1.84	0.43
1:A:277:LEU:HD12	1:A:277:LEU:N	2.34	0.43
2:B:154:ASP:HB3	2:B:156:ARG:HG3	2.00	0.43
2:B:40:GLN:H	2:B:40:GLN:CD	2.26	0.42
2:B:15:GLN:O	2:B:16:ALA:C	2.62	0.42
2:B:77:GLN:OE1	2:B:141:TRP:NE1	2.52	0.42
1:A:364:ILE:O	1:A:367:THR:HB	2.19	0.42
1:A:300:LEU:CD2	1:A:300:LEU:H	2.33	0.42
1:A:392:ILE:O	1:A:393:ASN:C	2.61	0.42
1:A:277:LEU:HB2	1:A:279:GLN:NE2	2.34	0.42
1:A:379:PRO:HB2	1:A:481:ALA:HA	2.01	0.42
2:B:21:THR:O	2:B:24:LYS:HB2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:277:LEU:HD12	1:A:277:LEU:H	1.85	0.42
2:B:73:VAL:HG12	2:B:74:VAL:H	1.84	0.42
2:B:21:THR:HG22	2:B:25:LYS:HD3	2.01	0.41
2:B:55:ASN:O	2:B:56:ALA:HB3	2.20	0.41
2:B:143:PRO:HB2	2:B:177:PRO:HG2	2.02	0.41
2:B:146:GLY:C	2:B:147:ILE:HD12	2.45	0.41
2:B:17:GLN:O	2:B:18:ILE:C	2.63	0.41
2:B:68:MET:HE3	2:B:68:MET:HB3	1.96	0.41
1:A:375:LEU:HD13	1:A:375:LEU:C	2.46	0.41
1:A:445:PHE:CD1	1:A:445:PHE:C	2.99	0.41
2:B:61:GLN:HB2	2:B:64:VAL:HG23	2.03	0.41
2:B:80:LEU:HD12	2:B:80:LEU:HA	1.92	0.41
2:B:96:CYS:HB3	4:B:2001:HOH:O	2.20	0.41
2:B:155:ASP:O	2:B:158:PHE:N	2.46	0.40
2:B:43:GLN:NE2	2:B:163:ASN:OD1	2.54	0.40
2:B:66:LEU:HD23	2:B:66:LEU:HA	1.88	0.40
2:B:48:ASN:ND2	2:B:51:ARG:NH2	2.70	0.40

There are no symmetry-related clashes.

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	148/221 (67%)	126 (85%)	18 (12%)	4 (3%)	4	15
2	B	122/184 (66%)	96 (79%)	21 (17%)	5 (4%)	2	8
All	All	270/405 (67%)	222 (82%)	39 (14%)	9 (3%)	3	11

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	35	SER

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Mol	Chain	Res	Type
2	B	156	ARG
1	A	358	GLN
2	B	16	ALA
2	B	56	ALA
1	A	363	SER
1	A	474	ALA
1	A	476	LYS
2	B	48	ASN

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	138/200 (69%)	131 (95%)	7 (5%)	21	54
2	B	112/163 (69%)	102 (91%)	10 (9%)	9	29
All	All	250/363 (69%)	233 (93%)	17 (7%)	14	42

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	268	GLN
1	A	362	ASN
1	A	376	GLN
1	A	381	GLU
1	A	442	LYS
1	A	443	LYS
1	A	484	GLN
2	B	25	LYS
2	B	42	VAL
2	B	51	ARG
2	B	74	VAL
2	B	84	ASP
2	B	89	PRO
2	B	94	LEU
2	B	102	VAL

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Mol	Chain	Res	Type
2	B	167	SER
2	B	178	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	268	GLN
1	A	279	GLN
1	A	362	ASN
1	A	376	GLN
1	A	378	GLN
1	A	380	ASN
1	A	393	ASN
2	B	43	GLN
2	B	48	ASN
2	B	71	ASN
2	B	160	ASN
2	B	172	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	154/221 (69%)	0.50	11 (7%) 22 16	31, 52, 74, 82	0
2	B	128/184 (69%)	0.60	9 (7%) 22 16	31, 59, 78, 89	0
All	All	282/405 (69%)	0.55	20 (7%) 22 16	31, 55, 76, 89	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	268	GLN	3.9
1	A	376	GLN	3.8
2	B	159	ARG	3.8
1	A	443	LYS	3.4
2	B	75	GLN	2.9
2	B	71	ASN	2.7
1	A	316	THR	2.7
1	A	479	SER	2.6
1	A	393	ASN	2.6
2	B	47	PRO	2.5
1	A	315	SER	2.4
2	B	14	ASN	2.3
2	B	104	PHE	2.2
2	B	38	LEU	2.2
1	A	277	LEU	2.2
2	B	102	VAL	2.1
1	A	405	GLU	2.1
1	A	442	LYS	2.1
1	A	370	LYS	2.0
2	B	43	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($\text{\AA}^2$)	Q<0.9
3	HG	A	1	1/1	0.99	0.07	83,83,83,83	0

6.5 Other polymers [i](#)

There are no such residues in this entry.