WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jun 15, 2024 – 07:39 PM EDT

PDB ID	:	1R5Z
Title	:	Crystal Structure of Subunit C of V-ATPase
Authors	:	Iwata, M.; Imamura, H.; Stambouli, E.; Ikeda, C.; Tamakoshi, M.; Nagata, K.; Makyio, H.; Hankamer, B.; Barber, J.; Yoshida, M.; Yokoyama, K.; Iwata, S.
Deposited on	:	2003-10-14
Resolution	:	1.95 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

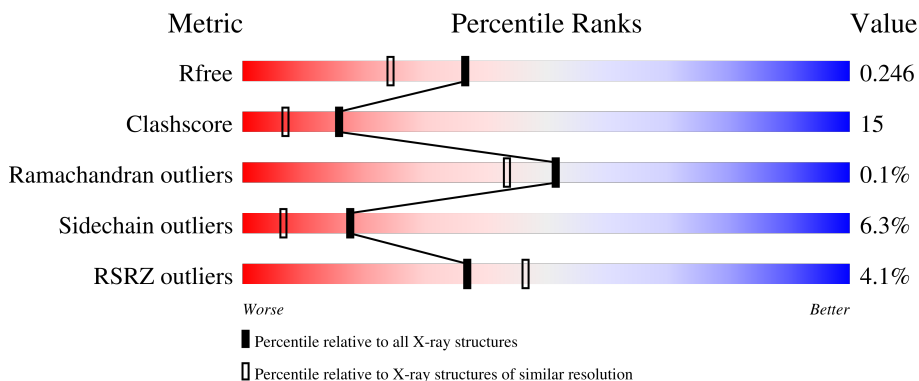|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 1.95 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		0.246
Clashscore		15
Ramachandran outliers		0.1%
Sidechain outliers		6.3%
RSRZ outliers		4.1%

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	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	323	3% / 78% / 20% / ••
1	B	323	3% / 75% / 19% / • ••
1	C	323	6% / 73% / 22% / • ••

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 8179 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 V-type ATP synthase subunit C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	320	Total	C	N	O	S	0	0	0
			2514	1599	460	451	4			
1	B	320	Total	C	N	O	S	0	0	0
			2514	1599	460	451	4			
1	C	320	Total	C	N	O	S	0	0	0
			2514	1599	460	451	4			

- Molecule 2 is water.

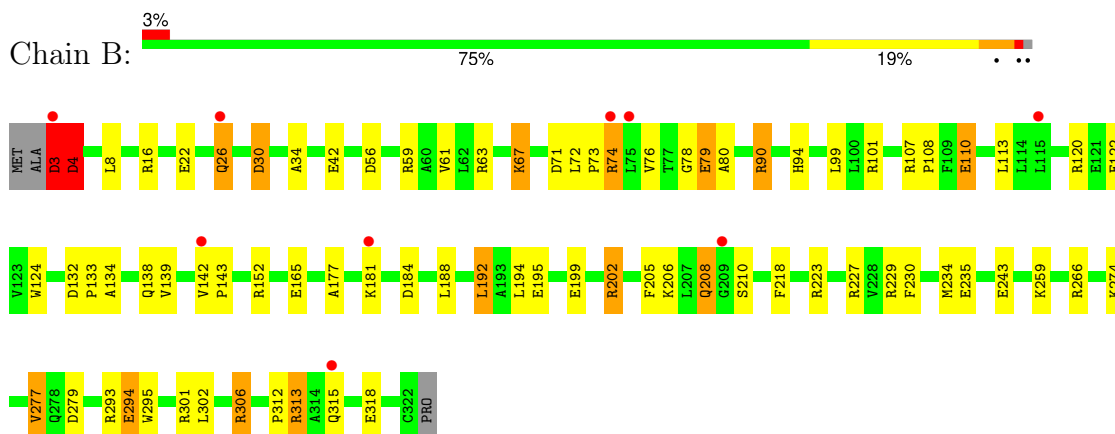| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	237	Total	O	0	0
			237	237		
2	B	217	Total	O	0	0
			217	217		
2	C	183	Total	O	0	0
			183	183		

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: V-type ATP synthase subunit C
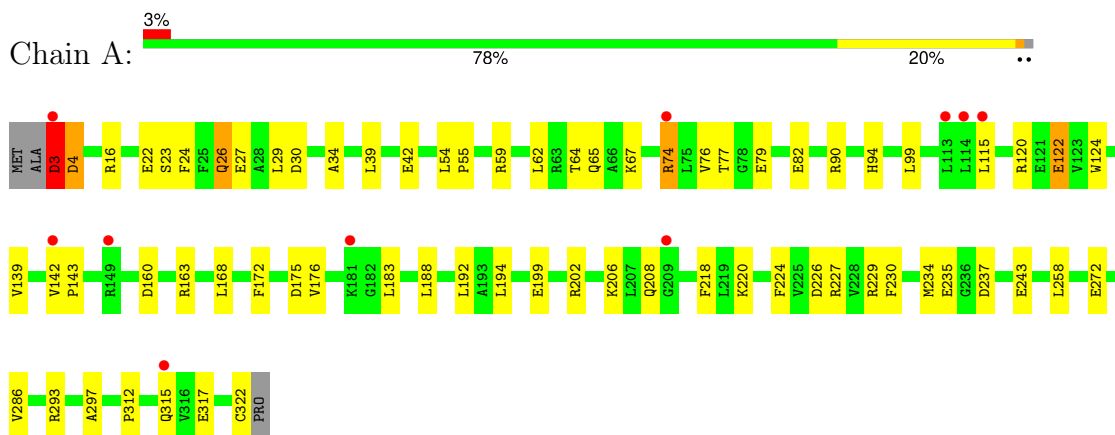
Chain A:

- Molecule 1: V-type ATP synthase subunit C

Chain B:

- Molecule 1: V-type ATP synthase subunit C

Chain C:

R171 V176 A177 A180 K181 G182 L183 L188 R189 D190 Y191 L192 A193 L194 E195 V196 D197 A198 E199 R202 T203 A204 F205 Q208 G209 D215 R223 F224 R227 V228 R229 F230 A231 R232 L233 M234 E235 G236 D237 Y238 A239 V240 E243 L244 D257 L258 K259 R263

E272 K275 G276 V277 Q278 L285 V286 L287 A288 E292 R293 L302 R306 P312 Q315 V316 E317 E318 E319 C322 PRO
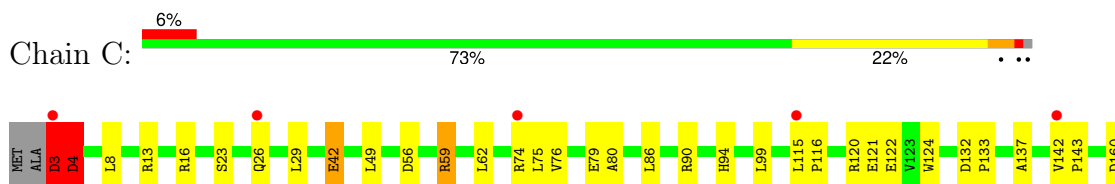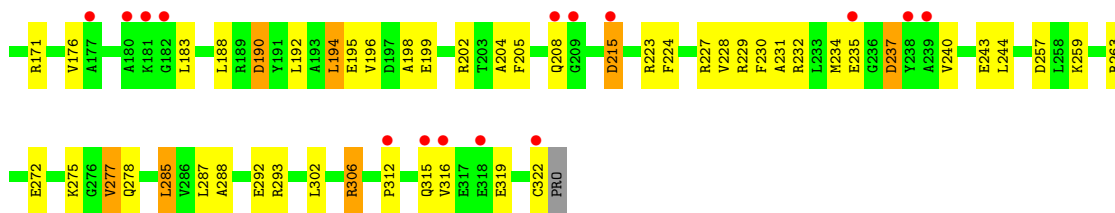
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α, β, γ	118.43Å 118.43Å 152.09Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.00 – 1.95 37.56 – 1.95	Depositor EDS
% Data completeness (in resolution range)	99.7 (40.00-1.95) 99.4 (37.56-1.95)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.50 (at 1.95Å)	Xtriage
Refinement program	REFMAC 5.1.19	Depositor
R, R_{free}	0.191 , 0.249 0.192 , 0.246	Depositor DCC
R_{free} test set	4353 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	28.9	Xtriage
Anisotropy	0.076	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 52.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.029 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	8179	wwPDB-VP
Average B, all atoms (Å^2)	35.0	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 47.91 % 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 9.2787e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	1.22	6/2553 (0.2%)	1.11	12/3447 (0.3%)
1	B	1.14	3/2553 (0.1%)	1.08	10/3447 (0.3%)
1	C	1.11	4/2553 (0.2%)	1.07	11/3447 (0.3%)
All	All	1.16	13/7659 (0.2%)	1.09	33/10341 (0.3%)

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
1	C	0	1
All	All	0	3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	34	ALA	CA-CB	6.39	1.65	1.52
1	A	224	PHE	CE2-CZ	5.75	1.48	1.37
1	C	137	ALA	CA-CB	5.68	1.64	1.52
1	A	293	ARG	CG-CD	5.67	1.66	1.51
1	A	297	ALA	CA-CB	5.65	1.64	1.52
1	C	196	VAL	CB-CG1	5.58	1.64	1.52
1	B	34	ALA	CA-CB	5.25	1.63	1.52
1	B	294	GLU	CD-OE1	5.24	1.31	1.25
1	C	293	ARG	CG-CD	5.23	1.65	1.51
1	C	198	ALA	CA-CB	5.21	1.63	1.52
1	A	122	GLU	CD-OE1	5.11	1.31	1.25
1	B	61	VAL	CB-CG1	5.10	1.63	1.52
1	A	139	VAL	CB-CG1	5.04	1.63	1.52

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	3	ASP	CB-CG-OD2	9.28	126.65	118.30
1	B	3	ASP	CB-CG-OD2	8.67	126.10	118.30
1	A	3	ASP	CB-CG-OD2	8.53	125.98	118.30
1	A	160	ASP	CB-CG-OD2	7.68	125.21	118.30
1	C	237	ASP	CB-CG-OD2	6.48	124.13	118.30
1	B	56	ASP	CB-CG-OD2	6.37	124.03	118.30
1	B	293	ARG	NE-CZ-NH2	-6.30	117.15	120.30
1	A	286	VAL	CG1-CB-CG2	-6.23	100.93	110.90
1	C	160	ASP	CB-CG-OD2	6.14	123.83	118.30
1	A	4	ASP	CB-CA-C	6.12	122.64	110.40
1	B	293	ARG	NE-CZ-NH1	6.07	123.34	120.30
1	C	257	ASP	CB-CG-OD2	5.98	123.69	118.30
1	A	293	ARG	NE-CZ-NH1	5.97	123.28	120.30
1	A	163	ARG	NE-CZ-NH2	-5.95	117.33	120.30
1	B	184	ASP	CB-CG-OD2	5.87	123.58	118.30
1	C	4	ASP	CB-CA-C	5.81	122.02	110.40
1	C	190	ASP	CB-CG-OD2	5.80	123.52	118.30
1	A	293	ARG	NE-CZ-NH2	-5.65	117.47	120.30
1	B	90	ARG	NE-CZ-NH2	-5.63	117.49	120.30
1	C	194	LEU	CB-CG-CD1	-5.59	101.49	111.00
1	A	168	LEU	CA-CB-CG	5.56	128.09	115.30
1	A	175	ASP	CB-CG-OD2	5.49	123.24	118.30
1	B	71	ASP	CB-CG-OD2	5.30	123.07	118.30
1	A	30	ASP	CB-CG-OD2	5.30	123.07	118.30
1	C	4	ASP	CB-CG-OD2	5.21	122.99	118.30
1	C	215	ASP	CB-CG-OD2	5.21	122.99	118.30
1	B	279	ASP	CB-CG-OD2	5.18	122.97	118.30
1	C	287	LEU	CB-CG-CD1	-5.16	102.23	111.00
1	B	30	ASP	CB-CG-OD2	5.15	122.93	118.30
1	B	4	ASP	CB-CG-OD2	5.07	122.86	118.30
1	A	237	ASP	CB-CG-OD2	5.05	122.85	118.30
1	A	226	ASP	CB-CG-OD2	5.03	122.83	118.30
1	C	49	LEU	CB-CG-CD2	-5.02	102.46	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	3	ASP	Peptide
1	B	3	ASP	Peptide
1	C	3	ASP	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	2514	0	2587	67	0
1	B	2514	0	2587	71	0
1	C	2514	0	2587	85	0
2	A	237	0	0	23	0
2	B	217	0	0	21	0
2	C	183	0	0	21	0
All	All	8179	0	7761	223	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 15.

All (223) 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:229:ARG:NH1	1:A:243:GLU:OE1	1.77	1.17
1:B:142:VAL:HG23	1:B:143:PRO:CD	1.75	1.14
1:B:142:VAL:HG23	1:B:143:PRO:HD3	1.11	1.09
1:A:94:HIS:HB2	2:A:529:HOH:O	1.51	1.08
1:B:165:GLU:HG2	2:B:523:HOH:O	1.51	1.08
1:C:120:ARG:NH1	1:C:122:GLU:OE2	1.94	1.00
1:B:142:VAL:HG21	2:B:467:HOH:O	1.61	0.99
1:B:110:GLU:H	1:B:110:GLU:CD	1.65	0.99
1:C:188:LEU:O	1:C:192:LEU:HD13	1.66	0.94
1:C:278:GLN:HG2	2:C:473:HOH:O	1.67	0.92
1:A:172:PHE:CE2	1:A:176:VAL:HG21	2.06	0.90
1:B:94:HIS:HB2	2:B:477:HOH:O	1.73	0.89
1:B:59:ARG:HG2	2:B:524:HOH:O	1.74	0.88
1:B:3:ASP:OD1	1:B:79:GLU:HG2	1.73	0.87
1:A:99:LEU:HB3	2:A:547:HOH:O	1.76	0.86
1:A:142:VAL:CG2	2:A:514:HOH:O	2.24	0.86
1:A:322:CYS:HB2	2:A:546:HOH:O	1.76	0.85
1:A:188:LEU:O	1:A:192:LEU:HD13	1.78	0.84
1:A:23:SER:O	1:A:27:GLU:HG3	1.77	0.84
1:B:120:ARG:HD2	1:B:122:GLU:OE2	1.78	0.83
1:A:3:ASP:HB2	1:A:79:GLU:HB3	1.60	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:VAL:HG23	1:A:143:PRO:HD3	1.59	0.82
1:C:259:LYS:HE3	1:C:319:GLU:OE2	1.78	0.82
1:A:322:CYS:SG	2:A:546:HOH:O	2.37	0.82
1:C:275:LYS:HD2	2:C:493:HOH:O	1.79	0.82
1:B:108:PRO:HB2	1:B:110:GLU:OE1	1.79	0.82
1:C:302:LEU:HG	2:C:395:HOH:O	1.79	0.82
1:B:110:GLU:OE1	1:B:110:GLU:N	2.13	0.81
1:B:313:ARG:HH11	1:B:313:ARG:HG3	1.44	0.81
1:C:171:ARG:HD3	2:C:487:HOH:O	1.80	0.81
1:C:188:LEU:CD1	1:C:192:LEU:HD11	2.10	0.81
1:A:23:SER:HA	1:A:26:GLN:HG3	1.63	0.81
1:A:23:SER:HA	1:A:26:GLN:CG	2.12	0.80
1:C:259:LYS:CE	1:C:319:GLU:OE2	2.30	0.79
1:C:120:ARG:HH12	1:C:122:GLU:HG3	1.50	0.77
1:A:322:CYS:CB	2:A:546:HOH:O	2.32	0.76
1:B:99:LEU:CD1	1:B:124:TRP:CE3	2.68	0.76
1:A:322:CYS:C	2:A:545:HOH:O	2.23	0.76
1:C:42:GLU:HG3	2:C:355:HOH:O	1.87	0.75
1:B:63:ARG:HD3	2:B:432:HOH:O	1.87	0.73
1:B:142:VAL:CG2	2:B:467:HOH:O	2.26	0.73
1:A:77:THR:HG23	2:A:479:HOH:O	1.88	0.73
1:B:142:VAL:CG2	1:B:143:PRO:CD	2.62	0.73
1:C:142:VAL:CG2	1:C:143:PRO:HD3	2.18	0.72
1:C:142:VAL:HG23	1:C:143:PRO:HD3	1.71	0.72
1:C:205:PHE:O	1:C:208:GLN:HG2	1.88	0.72
1:C:59:ARG:HD3	2:C:426:HOH:O	1.88	0.72
1:B:294:GLU:OE1	2:B:508:HOH:O	2.07	0.72
1:B:218:PHE:CE2	1:B:227:ARG:HG2	2.25	0.71
1:C:229:ARG:NH1	1:C:243:GLU:OE1	2.23	0.71
1:A:59:ARG:NH1	2:A:399:HOH:O	2.24	0.70
1:B:188:LEU:HG	1:B:192:LEU:HD22	1.73	0.70
1:B:139:VAL:O	1:B:142:VAL:HG22	1.91	0.70
1:C:120:ARG:NH1	1:C:122:GLU:CG	2.55	0.69
1:C:3:ASP:OD2	1:C:4:ASP:HA	1.92	0.69
1:C:120:ARG:NH1	1:C:122:GLU:HG3	2.08	0.68
1:B:313:ARG:HG3	1:B:313:ARG:NH1	2.03	0.67
1:A:172:PHE:CZ	1:A:176:VAL:HG21	2.30	0.66
1:C:3:ASP:HB2	1:C:80:ALA:H	1.60	0.65
1:C:99:LEU:CD1	1:C:124:TRP:CE3	2.80	0.65
1:C:94:HIS:ND1	2:C:370:HOH:O	2.30	0.65
1:C:223:ARG:HD2	2:C:407:HOH:O	1.96	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:22:GLU:O	1:B:26:GLN:HG3	1.97	0.64
1:A:312:PRO:HG2	1:A:315:GLN:HB2	1.80	0.64
1:A:229:ARG:HH11	1:A:229:ARG:HG2	1.63	0.63
1:B:63:ARG:O	1:B:67:LYS:HG2	1.98	0.62
1:A:208:GLN:HG3	2:A:555:HOH:O	2.00	0.61
1:C:275:LYS:CD	2:C:493:HOH:O	2.45	0.61
1:C:312:PRO:HD2	1:C:315:GLN:OE1	2.00	0.61
1:A:120:ARG:NH1	1:A:122:GLU:HG3	2.16	0.61
1:B:99:LEU:CD1	1:B:124:TRP:HE3	2.13	0.60
1:A:227:ARG:NH1	2:A:515:HOH:O	2.28	0.60
1:B:122:GLU:HB2	2:B:479:HOH:O	1.99	0.60
1:B:229:ARG:CG	1:B:229:ARG:HH11	2.13	0.60
1:A:172:PHE:CE2	1:A:176:VAL:CG2	2.85	0.59
1:C:3:ASP:HB2	1:C:80:ALA:N	2.17	0.59
1:C:263:ARG:NE	1:C:319:GLU:OE1	2.33	0.59
1:B:229:ARG:HH11	1:B:229:ARG:HG2	1.68	0.59
1:A:142:VAL:CG2	1:A:143:PRO:HD3	2.29	0.58
1:C:188:LEU:O	1:C:192:LEU:CD1	2.46	0.58
1:A:99:LEU:HD22	2:A:547:HOH:O	2.04	0.58
1:A:79:GLU:HG3	1:A:183:LEU:HD22	1.85	0.58
1:A:27:GLU:HB3	2:A:530:HOH:O	2.04	0.58
1:C:188:LEU:HG	1:C:192:LEU:CD1	2.33	0.58
1:A:172:PHE:CZ	1:A:176:VAL:CG2	2.86	0.57
1:C:142:VAL:CG2	2:C:345:HOH:O	2.52	0.57
1:C:120:ARG:NH1	1:C:122:GLU:CD	2.58	0.57
1:C:199:GLU:OE1	1:C:202:ARG:NH1	2.37	0.57
1:B:3:ASP:OD2	1:B:3:ASP:C	2.43	0.57
1:B:229:ARG:NH1	1:B:243:GLU:OE1	2.37	0.57
1:C:13:ARG:HD2	2:C:457:HOH:O	2.04	0.57
1:C:188:LEU:CD1	1:C:192:LEU:CD1	2.81	0.57
1:A:3:ASP:CB	1:A:79:GLU:HB3	2.34	0.56
1:B:3:ASP:OD2	1:B:4:ASP:HA	2.05	0.56
1:C:237:ASP:O	1:C:240:VAL:HG23	2.06	0.56
1:B:99:LEU:HD13	1:B:124:TRP:HE3	1.71	0.55
1:C:3:ASP:OD2	1:C:4:ASP:CA	2.54	0.55
1:A:79:GLU:HB2	2:A:533:HOH:O	2.06	0.55
1:B:3:ASP:HB2	1:B:80:ALA:H	1.72	0.55
1:C:59:ARG:CZ	2:C:359:HOH:O	2.53	0.55
1:A:59:ARG:NH1	2:A:523:HOH:O	2.39	0.55
1:B:208:GLN:HG3	2:B:525:HOH:O	2.07	0.55
1:B:230:PHE:CZ	1:B:234:MET:HE3	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:142:VAL:HG22	2:C:345:HOH:O	2.06	0.55
1:C:194:LEU:HD12	1:C:272:GLU:CG	2.37	0.55
1:C:223:ARG:HD3	1:C:224:PHE:CZ	2.43	0.54
1:C:29:LEU:O	1:C:306:ARG:NH1	2.40	0.54
1:C:115:LEU:HB3	1:C:116:PRO:HD2	1.89	0.54
1:C:230:PHE:CZ	1:C:234:MET:HE3	2.42	0.54
1:A:120:ARG:HH11	1:A:122:GLU:CG	2.21	0.54
1:B:59:ARG:HD3	2:B:524:HOH:O	2.07	0.54
1:A:94:HIS:CG	1:A:115:LEU:HD12	2.42	0.53
1:C:188:LEU:HD11	1:C:192:LEU:HD11	1.85	0.53
1:B:230:PHE:CZ	1:B:234:MET:CE	2.91	0.53
1:C:188:LEU:HG	1:C:192:LEU:HD11	1.91	0.53
1:B:266:ARG:HD2	1:B:295:TRP:CZ3	2.44	0.53
1:C:272:GLU:OE1	2:C:492:HOH:O	2.19	0.52
1:A:99:LEU:CB	2:A:547:HOH:O	2.47	0.52
1:B:8:LEU:HD11	1:B:72:LEU:HD22	1.90	0.52
1:C:322:CYS:C	2:C:483:HOH:O	2.47	0.52
1:C:288:ALA:O	1:C:292:GLU:HG3	2.10	0.52
1:A:99:LEU:CD1	1:A:124:TRP:CE3	2.93	0.51
1:C:188:LEU:HD12	1:C:192:LEU:CD1	2.40	0.51
1:C:79:GLU:HG3	1:C:183:LEU:HD22	1.91	0.51
1:C:99:LEU:CD1	1:C:124:TRP:HE3	2.23	0.51
1:C:142:VAL:HG22	1:C:143:PRO:HD3	1.91	0.51
1:C:188:LEU:CG	1:C:192:LEU:HD11	2.40	0.51
1:A:120:ARG:NH1	1:A:122:GLU:CG	2.73	0.51
1:B:74:ARG:HG3	1:B:74:ARG:O	2.10	0.51
1:C:120:ARG:HH11	1:C:122:GLU:CD	2.05	0.51
1:A:220:LYS:CD	1:A:227:ARG:HH22	2.23	0.50
1:B:266:ARG:HD3	2:B:509:HOH:O	2.09	0.50
1:C:204:ALA:HB2	1:C:230:PHE:CD1	2.45	0.50
1:A:23:SER:O	1:A:27:GLU:CG	2.56	0.50
1:C:59:ARG:NE	2:C:359:HOH:O	2.43	0.50
1:C:8:LEU:HD13	1:C:75:LEU:HB2	1.93	0.50
1:C:79:GLU:HB2	2:C:484:HOH:O	2.10	0.50
1:C:132:ASP:HB2	1:C:133:PRO:HD2	1.94	0.50
1:A:220:LYS:HD2	1:A:227:ARG:HH22	1.76	0.50
1:C:16:ARG:HD3	2:C:474:HOH:O	2.11	0.49
1:C:94:HIS:CE1	2:C:370:HOH:O	2.66	0.49
1:B:78:GLY:C	2:B:533:HOH:O	2.51	0.49
1:B:3:ASP:HB3	2:B:419:HOH:O	2.13	0.49
1:B:134:ALA:O	1:B:138:GLN:HG3	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:59:ARG:NH1	2:C:360:HOH:O	2.45	0.48
1:A:54:LEU:HB3	1:A:55:PRO:HD3	1.94	0.48
1:C:194:LEU:HD12	1:C:272:GLU:CD	2.33	0.48
1:C:215:ASP:HB2	2:C:444:HOH:O	2.13	0.48
1:C:142:VAL:CG2	1:C:143:PRO:CD	2.90	0.48
1:A:22:GLU:O	1:A:26:GLN:HG2	2.13	0.48
1:A:29:LEU:HD11	1:A:317:GLU:HG3	1.96	0.47
1:B:142:VAL:HG23	1:B:143:PRO:HD2	1.84	0.47
1:A:42:GLU:CG	2:A:371:HOH:O	2.61	0.47
1:A:59:ARG:CZ	2:A:523:HOH:O	2.61	0.47
1:B:113:LEU:HD13	1:B:301:ARG:HD3	1.95	0.47
1:A:312:PRO:HD2	1:A:315:GLN:OE1	2.14	0.47
1:B:72:LEU:N	1:B:73:PRO:CD	2.78	0.47
1:C:277:VAL:O	1:C:285:LEU:HD13	2.16	0.46
1:A:94:HIS:CD2	1:A:115:LEU:HD12	2.50	0.46
1:B:205:PHE:O	1:B:208:GLN:NE2	2.49	0.46
1:A:82:GLU:HG2	2:A:548:HOH:O	2.15	0.46
1:A:208:GLN:HA	1:A:234:MET:O	2.16	0.46
1:B:79:GLU:N	2:B:533:HOH:O	2.47	0.46
1:B:306:ARG:HD3	2:B:337:HOH:O	2.16	0.46
1:B:63:ARG:HD2	2:B:502:HOH:O	2.15	0.46
1:B:110:GLU:CD	1:B:110:GLU:N	2.45	0.46
1:C:23:SER:HA	1:C:26:GLN:CG	2.46	0.45
1:B:274:LYS:O	1:B:277:VAL:HG22	2.16	0.45
1:C:223:ARG:HD3	1:C:224:PHE:CE2	2.50	0.45
1:B:313:ARG:HH11	1:B:313:ARG:CG	2.17	0.45
1:C:208:GLN:HA	1:C:234:MET:O	2.16	0.45
1:B:30:ASP:OD1	1:B:313:ARG:NE	2.39	0.45
1:B:229:ARG:CG	1:B:229:ARG:NH1	2.79	0.45
1:A:229:ARG:HH11	1:A:229:ARG:CG	2.27	0.45
1:C:23:SER:HA	1:C:26:GLN:HG2	1.99	0.45
1:B:113:LEU:HD23	2:B:538:HOH:O	2.17	0.44
1:B:223:ARG:NH1	2:B:438:HOH:O	2.51	0.44
1:B:312:PRO:HG2	1:B:315:GLN:HB2	2.00	0.44
1:C:194:LEU:HD12	1:C:272:GLU:HG2	1.98	0.44
1:A:142:VAL:HG21	2:A:514:HOH:O	2.04	0.43
1:C:99:LEU:HD12	1:C:124:TRP:CE3	2.53	0.43
1:C:204:ALA:HB2	1:C:230:PHE:CE1	2.53	0.43
1:C:259:LYS:HE2	1:C:263:ARG:HH21	1.83	0.43
1:B:72:LEU:N	1:B:73:PRO:HD3	2.34	0.43
1:C:56:ASP:HA	1:C:59:ARG:NH1	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:3:ASP:O	1:B:4:ASP:HB3	2.19	0.43
1:B:142:VAL:CG2	1:B:143:PRO:HD2	2.46	0.43
1:A:188:LEU:CD1	1:A:192:LEU:HD11	2.49	0.43
1:B:206:LYS:HD3	2:B:472:HOH:O	2.18	0.43
1:C:188:LEU:CG	1:C:192:LEU:CD1	2.97	0.43
1:C:188:LEU:HG	1:C:192:LEU:HD13	1.99	0.43
1:B:132:ASP:HB2	1:B:133:PRO:HD2	2.01	0.43
1:B:16:ARG:HH11	1:B:16:ARG:HD3	1.67	0.42
1:C:312:PRO:CD	1:C:315:GLN:OE1	2.67	0.42
1:C:231:ALA:O	1:C:235:GLU:HG2	2.19	0.42
1:A:229:ARG:NH1	1:A:229:ARG:HG2	2.34	0.42
1:A:194:LEU:HD12	1:A:272:GLU:CG	2.50	0.42
1:C:3:ASP:OD2	1:C:3:ASP:C	2.58	0.42
1:A:24:PHE:CE1	1:A:39:LEU:HG	2.55	0.42
1:A:235:GLU:HG3	2:A:527:HOH:O	2.20	0.42
1:B:101:ARG:NE	1:B:165:GLU:OE2	2.50	0.42
1:C:86:LEU:HD22	1:C:176:VAL:HG22	2.01	0.42
1:C:244:LEU:HD23	1:C:244:LEU:HA	1.82	0.42
1:A:74:ARG:O	1:A:74:ARG:HG3	2.20	0.42
1:A:227:ARG:HG3	2:A:409:HOH:O	2.18	0.42
1:A:199:GLU:OE1	1:A:202:ARG:NH1	2.53	0.41
1:B:59:ARG:CD	2:B:524:HOH:O	2.67	0.41
1:B:199:GLU:OE1	1:B:202:ARG:NH1	2.51	0.41
1:A:39:LEU:O	1:A:42:GLU:HG2	2.20	0.41
1:C:132:ASP:HB2	1:C:133:PRO:CD	2.50	0.41
1:A:16:ARG:HH11	1:A:16:ARG:HD3	1.63	0.41
1:B:107:ARG:HA	1:B:108:PRO:HD3	1.93	0.41
1:B:177:ALA:HB3	2:B:520:HOH:O	2.20	0.41
1:C:228:VAL:O	1:C:232:ARG:HG3	2.21	0.41
1:C:142:VAL:HG23	1:C:143:PRO:CD	2.46	0.41
1:A:208:GLN:HB2	2:A:555:HOH:O	2.20	0.41
1:A:230:PHE:CZ	1:A:234:MET:CE	3.03	0.41
1:A:23:SER:HA	1:A:26:GLN:HG2	1.97	0.41
1:A:206:LYS:HE3	1:A:258:LEU:HD21	2.03	0.40
1:B:192:LEU:HD12	1:B:192:LEU:HA	1.82	0.40
1:B:99:LEU:HD11	1:B:124:TRP:CE3	2.55	0.40
1:A:218:PHE:CE2	1:A:227:ARG:HG2	2.56	0.40
1:A:64:THR:HA	1:A:67:LYS:HD3	2.03	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	318/323 (98%)	314 (99%)	4 (1%)	0	100	100
1	B	318/323 (98%)	312 (98%)	5 (2%)	1 (0%)	41	30
1	C	318/323 (98%)	311 (98%)	7 (2%)	0	100	100
All	All	954/969 (98%)	937 (98%)	16 (2%)	1 (0%)	51	43

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	210	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	254/256 (99%)	246 (97%)	8 (3%)	40	28
1	B	254/256 (99%)	230 (91%)	24 (9%)	8	2
1	C	254/256 (99%)	238 (94%)	16 (6%)	18	7
All	All	762/768 (99%)	714 (94%)	48 (6%)	18	7

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ASP
1	A	4	ASP

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Mol	Chain	Res	Type
1	A	26	GLN
1	A	62	LEU
1	A	65	GLN
1	A	74	ARG
1	A	76	VAL
1	A	90	ARG
1	B	3	ASP
1	B	4	ASP
1	B	26	GLN
1	B	42	GLU
1	B	67	LYS
1	B	74	ARG
1	B	76	VAL
1	B	79	GLU
1	B	90	ARG
1	B	110	GLU
1	B	152	ARG
1	B	181	LYS
1	B	192	LEU
1	B	194	LEU
1	B	195	GLU
1	B	202	ARG
1	B	208	GLN
1	B	235	GLU
1	B	259	LYS
1	B	277	VAL
1	B	302	LEU
1	B	306	ARG
1	B	313	ARG
1	B	318	GLU
1	C	3	ASP
1	C	4	ASP
1	C	42	GLU
1	C	59	ARG
1	C	62	LEU
1	C	74	ARG
1	C	76	VAL
1	C	90	ARG
1	C	121	GLU
1	C	190	ASP
1	C	195	GLU
1	C	227	ARG

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Mol	Chain	Res	Type
1	C	277	VAL
1	C	285	LEU
1	C	306	ARG
1	C	316	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	65	GLN
1	A	94	HIS
1	B	26	GLN
1	B	65	GLN
1	B	94	HIS
1	C	65	GLN
1	C	208	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

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	320/323 (99%)	0.06	10 (3%) 49	58	18, 28, 47, 57	0
1	B	320/323 (99%)	0.07	9 (2%) 53	62	22, 32, 51, 65	0
1	C	320/323 (99%)	0.31	20 (6%) 20	28	22, 34, 61, 70	0
All	All	960/969 (99%)	0.15	39 (4%) 37	46	18, 31, 56, 70	0

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	209	GLY	5.5
1	A	209	GLY	4.7
1	C	209	GLY	4.7
1	C	181	LYS	4.3
1	C	315	GLN	4.0
1	B	3	ASP	3.8
1	C	312	PRO	3.8
1	B	74	ARG	3.7
1	C	235	GLU	3.6
1	A	3	ASP	3.5
1	C	318	GLU	3.3
1	C	238	TYR	3.2
1	B	315	GLN	3.1
1	C	177	ALA	2.9
1	C	115	LEU	2.8
1	A	115	LEU	2.7
1	A	142	VAL	2.6
1	C	3	ASP	2.6
1	A	181	LYS	2.5
1	B	115	LEU	2.5
1	A	74	ARG	2.5
1	C	239	ALA	2.5
1	B	181	LYS	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	322	CYS	2.4
1	C	142	VAL	2.3
1	A	113	LEU	2.3
1	C	215	ASP	2.3
1	C	180	ALA	2.2
1	C	74	ARG	2.2
1	B	142	VAL	2.2
1	C	316	VAL	2.2
1	A	114	LEU	2.1
1	C	208	GLN	2.1
1	C	182	GLY	2.1
1	B	26	GLN	2.1
1	C	26	GLN	2.1
1	B	75	LEU	2.1
1	A	149	ARG	2.0
1	A	315	GLN	2.0

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.