WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

May 19, 2025 – 06:07 PM JST

PDB ID	:	8ZRO / pdb_00008zro
Title	:	Arabidopsis Carboxylesterase CXE15
Authors	:	Arold, S.T.; Hameed, U.F.S.
Deposited on	:	2024-06-05
Resolution	:	3.09 Å(reported)

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

MolProbity	:	4-5-2 with Phenix2.0rc1
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 3.09 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		0.349
Clashscore		24
Ramachandran outliers		0.8%
Sidechain outliers		3.5%
RSRZ outliers		0.5%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
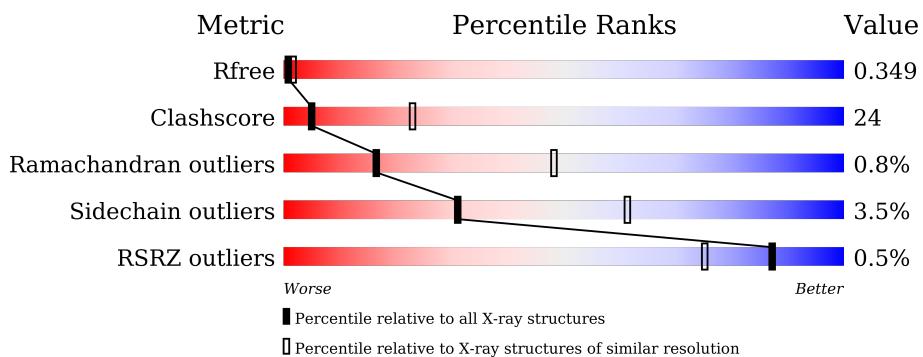
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1351 (3.10-3.10)
Clashscore	180529	1454 (3.10-3.10)
Ramachandran outliers	177936	1391 (3.10-3.10)
Sidechain outliers	177891	1391 (3.10-3.10)
RSRZ outliers	164620	1351 (3.10-3.10)

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	321	60% 33% • 5%
1	B	321	% 54% 33% 5% • 7%

W O R L D W I D E
wwPDB
PROTEIN DATA BANK
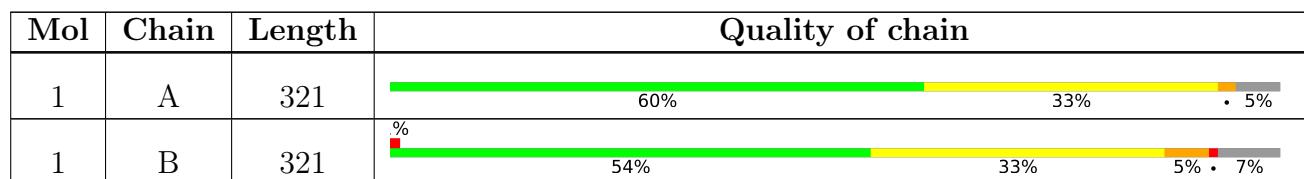
2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 4766 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 Strigolactones hydrolase CXE15.

| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	306	Total	C	N	O	S	0	0	0
			2406	1531	417	449	9			
1	B	299	Total	C	N	O	S	0	0	0
			2360	1505	407	439	9			

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: Strigolactones hydrolase CXE15

• Molecule 1: Strigolactones hydrolase CXE15
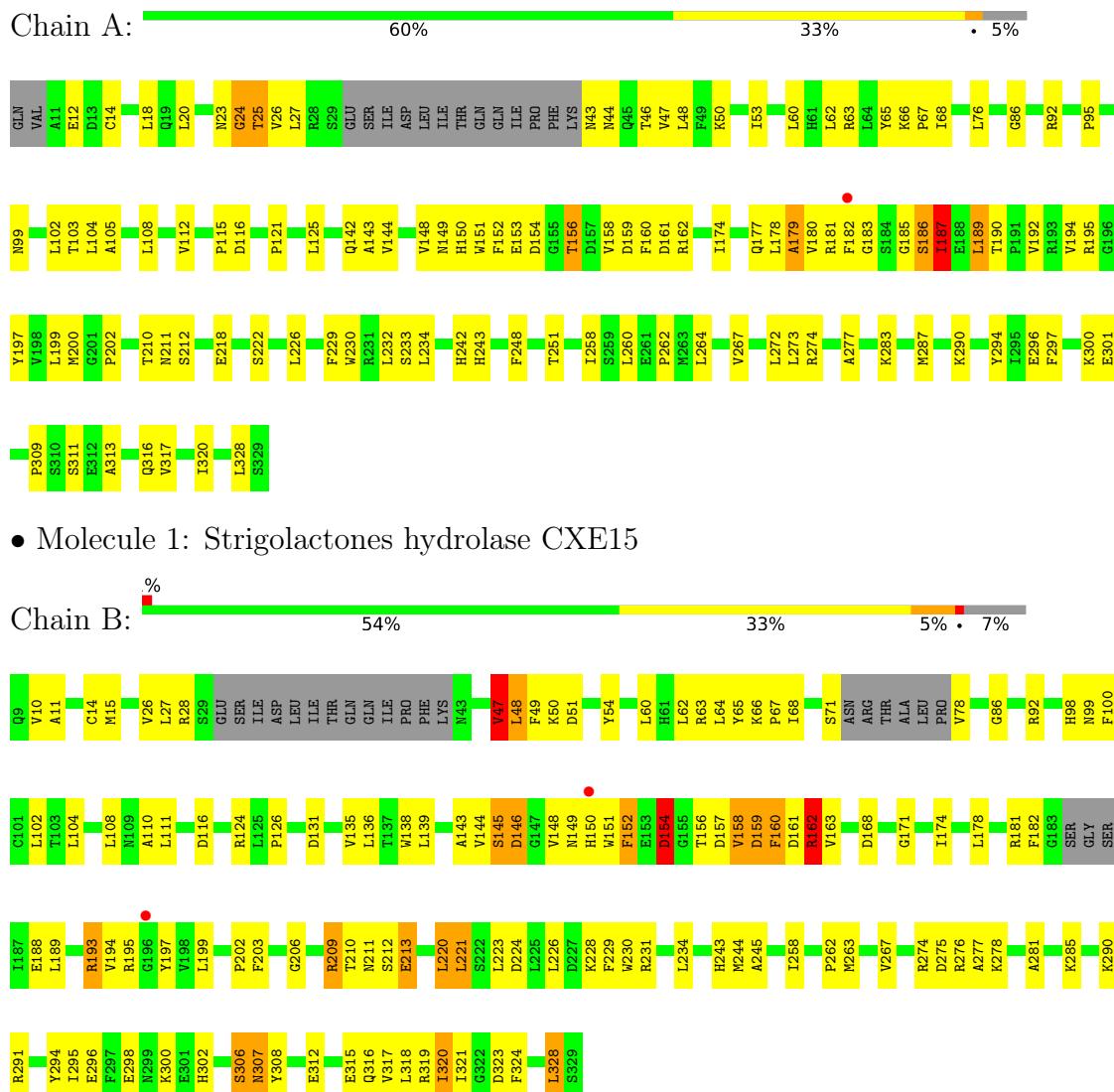
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	99.40Å 99.40Å 114.16Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.70 – 3.09 49.70 – 3.09	Depositor EDS
% Data completeness (in resolution range)	70.2 (49.70-3.09) 70.2 (49.70-3.09)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.31 (at 3.07Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.278 , 0.339 0.283 , 0.349	Depositor DCC
R_{free} test set	1245 reflections (10.00%)	wwPDB-VP
Wilson B-factor (Å^2)	93.6	Xtriage
Anisotropy	0.276	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 36.9	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.037 for -h,-k,l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	4766	wwPDB-VP
Average B, all atoms (Å^2)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.82% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

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

5 Model quality ⓘ

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	0.37	0/2469	0.87	15/3348 (0.4%)
1	B	0.43	0/2420	1.15	18/3278 (0.5%)
All	All	0.40	0/4889	1.02	33/6626 (0.5%)

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	B	0	4

There are no bond length outliers.

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	145	SER	N-CA-C	-28.32	73.15	110.53
1	B	307	ASN	N-CA-C	-18.96	80.92	108.60
1	B	159	ASP	N-CA-C	-16.45	86.29	110.64
1	A	179	ALA	N-CA-C	-15.03	87.57	109.96
1	B	306	SER	CB-CA-C	-11.62	87.30	110.42
1	B	160	PHE	N-CA-C	10.70	126.00	111.24
1	B	307	ASN	N-CA-CB	10.12	127.05	111.46
1	A	190	THR	N-CA-C	-10.06	96.43	110.31
1	A	25	THR	N-CA-CB	9.10	125.87	110.49
1	B	145	SER	CB-CA-C	8.93	127.99	109.68
1	B	159	ASP	CB-CA-C	-8.55	99.29	109.80
1	A	186	SER	O-C-N	8.13	130.41	121.87
1	A	189	LEU	N-CA-C	-8.11	94.45	108.56
1	A	44	ASN	N-CA-C	-7.53	104.09	113.28
1	B	221	LEU	N-CA-CB	7.44	122.45	110.77
1	A	24	GLY	N-CA-C	-7.43	95.56	113.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	146	ASP	N-CA-C	-7.43	97.58	109.39
1	A	187	ILE	CA-C-N	-7.16	110.50	121.66
1	A	187	ILE	C-N-CA	-7.16	110.50	121.66
1	B	220	LEU	CB-CA-C	-7.12	96.26	110.42
1	A	179	ALA	CA-C-N	6.68	129.22	120.60
1	A	179	ALA	C-N-CA	6.68	129.22	120.60
1	B	158	VAL	N-CA-C	6.42	122.69	109.34
1	A	179	ALA	CB-CA-C	5.91	118.68	110.16
1	A	143	ALA	N-CA-C	-5.79	103.80	111.96
1	B	11	ALA	N-CA-C	-5.36	104.99	112.45
1	B	159	ASP	N-CA-CB	5.36	117.45	109.19
1	A	150	HIS	N-CA-C	-5.36	106.01	112.54
1	B	220	LEU	N-CA-C	5.30	122.09	110.80
1	B	211	ASN	N-CA-C	-5.19	106.28	113.18
1	B	146	ASP	N-CA-CB	-5.14	102.83	110.60
1	A	186	SER	CA-C-O	-5.10	112.37	119.16
1	B	154	ASP	N-CA-C	-5.09	98.75	108.17

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	162	ARG	Sidechain
1	B	193	ARG	Sidechain
1	B	209	ARG	Sidechain
1	B	319	ARG	Sidechain

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	2406	0	2322	101	0
1	B	2360	0	2275	130	0
All	All	4766	0	4597	229	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 24.

All (229) 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:182:PHE:CE1	1:B:188:GLU:OE1	1.78	1.34
1:B:158:VAL:HG11	1:B:161:ASP:CB	1.72	1.20
1:B:182:PHE:CD1	1:B:188:GLU:OE1	1.96	1.17
1:B:158:VAL:CG1	1:B:161:ASP:N	2.11	1.14
1:B:158:VAL:HG12	1:B:158:VAL:O	1.45	1.13
1:B:158:VAL:HG11	1:B:161:ASP:HB2	1.12	1.10
1:B:158:VAL:CG1	1:B:161:ASP:CA	2.36	1.03
1:B:193:ARG:CZ	1:B:195:ARG:NH2	2.22	1.01
1:B:158:VAL:HG11	1:B:161:ASP:CA	1.91	1.00
1:A:189:LEU:O	1:A:192:VAL:O	1.80	1.00
1:A:248:PHE:CZ	1:A:283:LYS:HD3	2.00	0.97
1:B:156:THR:OG1	1:B:159:ASP:OD1	1.83	0.96
1:B:182:PHE:HE1	1:B:188:GLU:OE1	1.40	0.94
1:B:181:ARG:NH2	1:B:188:GLU:OE2	1.99	0.93
1:B:158:VAL:HG12	1:B:161:ASP:N	1.83	0.91
1:A:248:PHE:CE1	1:A:283:LYS:HD3	2.05	0.91
1:A:121:PRO:HB3	1:A:232:LEU:HD12	1.52	0.89
1:B:158:VAL:CG1	1:B:158:VAL:O	2.18	0.89
1:A:148:VAL:HG22	1:A:160:PHE:HE2	1.38	0.88
1:B:158:VAL:O	1:B:159:ASP:C	2.17	0.86
1:B:158:VAL:HG12	1:B:161:ASP:H	1.35	0.86
1:B:67:PRO:O	1:B:68:ILE:HG22	1.78	0.84
1:B:193:ARG:NE	1:B:195:ARG:NH2	2.24	0.84
1:B:193:ARG:HE	1:B:195:ARG:NH2	1.77	0.82
1:B:306:SER:OG	1:B:306:SER:O	1.83	0.81
1:A:121:PRO:CB	1:A:232:LEU:HD12	2.14	0.78
1:B:193:ARG:NH1	1:B:195:ARG:NH2	2.32	0.77
1:A:160:PHE:HB3	1:A:192:VAL:HG12	1.67	0.77
1:A:76:LEU:HD13	1:A:156:THR:HG23	1.67	0.76
1:A:148:VAL:CG2	1:A:160:PHE:HE2	1.99	0.76
1:B:193:ARG:HE	1:B:195:ARG:CZ	1.98	0.75
1:B:193:ARG:CZ	1:B:195:ARG:HH21	2.01	0.74
1:B:71:SER:C	1:B:156:THR:HG21	2.13	0.73
1:B:148:VAL:CG1	1:B:150:HIS:CD2	2.72	0.72
1:B:158:VAL:CG1	1:B:161:ASP:HB2	2.06	0.72
1:B:158:VAL:HG13	1:B:161:ASP:CA	2.19	0.72
1:A:177:GLN:O	1:A:178:LEU:HB3	1.91	0.71
1:A:248:PHE:CE2	1:A:283:LYS:HD3	2.25	0.70
1:B:158:VAL:HG13	1:B:161:ASP:N	2.04	0.70
1:B:148:VAL:HG12	1:B:150:HIS:CD2	2.27	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:121:PRO:CG	1:A:232:LEU:HD12	2.21	0.70
1:B:67:PRO:O	1:B:68:ILE:CG2	2.38	0.70
1:B:162:ARG:HB3	1:B:195:ARG:HD2	1.73	0.69
1:B:144:VAL:C	1:B:145:SER:O	2.19	0.69
1:B:267:VAL:HG11	1:B:274:ARG:HA	1.73	0.69
1:B:158:VAL:CG1	1:B:161:ASP:HA	2.22	0.69
1:B:158:VAL:O	1:B:160:PHE:N	2.26	0.69
1:B:64:LEU:HD12	1:B:111:LEU:HD11	1.73	0.68
1:A:148:VAL:HG22	1:A:160:PHE:CE2	2.24	0.68
1:A:121:PRO:HB3	1:A:232:LEU:CD1	2.24	0.68
1:A:24:GLY:O	1:A:25:THR:HG23	1.93	0.68
1:B:66:LYS:NZ	1:B:154:ASP:O	2.28	0.67
1:B:212:SER:HB3	1:B:274:ARG:HG2	1.77	0.67
1:A:248:PHE:CD1	1:A:283:LYS:NZ	2.57	0.66
1:A:283:LYS:HG2	1:A:287:MET:HE3	1.77	0.66
1:B:65:TYR:O	1:B:111:LEU:HA	1.96	0.65
1:A:199:LEU:HB3	1:A:202:PRO:HG3	1.78	0.65
1:B:182:PHE:HD1	1:B:188:GLU:OE1	1.74	0.65
1:B:158:VAL:HG13	1:B:161:ASP:HA	1.78	0.65
1:A:181:ARG:NH2	1:A:186:SER:OG	2.31	0.64
1:B:110:ALA:HA	1:B:160:PHE:CZ	2.33	0.63
1:B:143:ALA:O	1:B:145:SER:O	2.15	0.63
1:A:248:PHE:CD1	1:A:283:LYS:HD3	2.34	0.63
1:A:121:PRO:HG3	1:A:232:LEU:HD12	1.79	0.63
1:A:66:LYS:HE2	1:A:156:THR:HG21	1.82	0.62
1:B:148:VAL:HG11	1:B:150:HIS:CD2	2.35	0.62
1:A:187:ILE:O	1:A:189:LEU:HD22	1.99	0.62
1:B:98:HIS:O	1:B:102:LEU:HD12	1.99	0.62
1:B:136:LEU:HD11	1:B:178:LEU:HD13	1.81	0.61
1:A:125:LEU:HD11	1:A:233:SER:HB2	1.82	0.61
1:A:48:LEU:HD12	1:A:68:ILE:HG22	1.83	0.61
1:A:262:PRO:HG2	1:A:328:LEU:HD11	1.83	0.60
1:A:159:ASP:OD2	1:A:162:ARG:NH1	2.33	0.60
1:B:98:HIS:HD2	1:B:102:LEU:HD11	1.65	0.60
1:B:203:PHE:HE1	1:B:226:LEU:HD12	1.67	0.60
1:B:210:THR:OG1	1:B:275:ASP:OD2	2.20	0.60
1:B:148:VAL:HG11	1:B:150:HIS:NE2	2.17	0.59
1:B:312:GLU:O	1:B:316:GLN:HG2	2.02	0.59
1:A:267:VAL:HG11	1:A:274:ARG:HA	1.85	0.59
1:B:171:GLY:HA2	1:B:174:ILE:HD13	1.83	0.59
1:B:234:LEU:HD21	1:B:245:ALA:HB2	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:298:GLU:O	1:B:300:LYS:HD2	2.04	0.58
1:B:243:HIS:O	1:B:244:MET:HB2	2.02	0.58
1:B:323:ASP:OD1	1:B:324:PHE:N	2.35	0.58
1:B:193:ARG:NH1	1:B:195:ARG:HH22	2.01	0.58
1:A:174:ILE:O	1:A:177:GLN:O	2.23	0.57
1:B:54:TYR:CD2	1:B:62:LEU:HD23	2.39	0.57
1:A:180:VAL:HG13	1:A:181:ARG:N	2.18	0.57
1:A:47:VAL:HG22	1:A:67:PRO:HA	1.86	0.57
1:B:110:ALA:HA	1:B:160:PHE:HZ	1.70	0.57
1:B:315:GLU:HA	1:B:318:LEU:HD12	1.87	0.57
1:A:294:TYR:OH	1:A:296:GLU:OE2	2.23	0.56
1:A:185:GLY:O	1:A:186:SER:OG	2.21	0.56
1:A:65:TYR:HB2	1:A:112:VAL:HB	1.86	0.56
1:B:158:VAL:CG1	1:B:161:ASP:H	1.91	0.56
1:A:180:VAL:HG22	1:A:186:SER:HA	1.88	0.56
1:A:264:LEU:HD11	1:A:320:ILE:HG22	1.88	0.56
1:B:100:PHE:O	1:B:104:LEU:HD12	2.06	0.56
1:B:104:LEU:O	1:B:108:LEU:HB2	2.06	0.56
1:A:242:HIS:HE1	1:A:243:HIS:CE1	2.25	0.55
1:B:295:ILE:HD12	1:B:320:ILE:HD12	1.88	0.55
1:A:316:GLN:O	1:A:320:ILE:HD12	2.07	0.55
1:B:210:THR:OG1	1:B:275:ASP:CG	2.50	0.55
1:B:138:TRP:HE3	1:B:139:LEU:HD22	1.72	0.55
1:A:48:LEU:CD1	1:A:68:ILE:HG22	2.37	0.55
1:B:111:LEU:H	1:B:160:PHE:HZ	1.55	0.54
1:B:203:PHE:CE1	1:B:226:LEU:HD12	2.41	0.54
1:B:78:VAL:HG22	1:B:163:VAL:CG1	2.38	0.54
1:A:186:SER:O	1:A:187:ILE:C	2.50	0.54
1:A:23:ASN:O	1:A:24:GLY:C	2.51	0.53
1:A:179:ALA:O	1:A:183:GLY:N	2.40	0.53
1:A:47:VAL:HG21	1:A:105:ALA:HB3	1.91	0.53
1:B:78:VAL:HA	1:B:160:PHE:HE1	1.74	0.53
1:B:174:ILE:HD12	1:B:174:ILE:H	1.74	0.53
1:B:221:LEU:HD21	1:B:302:HIS:CD2	2.44	0.52
1:B:78:VAL:HG22	1:B:163:VAL:HG12	1.90	0.52
1:A:283:LYS:HE2	1:A:287:MET:CE	2.39	0.52
1:B:199:LEU:HB3	1:B:202:PRO:HG3	1.90	0.52
1:A:153:GLU:O	1:A:154:ASP:C	2.53	0.52
1:B:193:ARG:NE	1:B:195:ARG:CZ	2.67	0.51
1:A:210:THR:O	1:A:212:SER:N	2.44	0.51
1:B:221:LEU:HD21	1:B:302:HIS:HD2	1.74	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:ILE:O	1:B:290:LYS:NZ	2.43	0.51
1:A:230:TRP:O	1:A:234:LEU:HD12	2.11	0.50
1:A:142:GLN:HB3	1:A:151:TRP:HZ2	1.77	0.50
1:B:136:LEU:HD13	1:B:182:PHE:HE2	1.78	0.49
1:B:148:VAL:O	1:B:149:ASN:C	2.55	0.49
1:A:177:GLN:O	1:A:178:LEU:CB	2.59	0.49
1:A:179:ALA:HA	1:A:197:TYR:CZ	2.47	0.49
1:A:226:LEU:HD22	1:A:273:LEU:HD11	1.93	0.49
1:A:267:VAL:HG21	1:A:277:ALA:HB3	1.94	0.49
1:A:66:LYS:HD2	1:A:152:PHE:HB2	1.95	0.49
1:B:48:LEU:HD23	1:B:68:ILE:HB	1.96	0.48
1:B:78:VAL:HA	1:B:160:PHE:CE1	2.48	0.48
1:A:243:HIS:HB3	1:A:251:THR:HG23	1.96	0.47
1:A:187:ILE:O	1:A:189:LEU:N	2.47	0.47
1:B:160:PHE:O	1:B:161:ASP:C	2.58	0.47
1:B:220:LEU:HB3	1:B:221:LEU:HD12	1.97	0.47
1:B:294:TYR:OH	1:B:296:GLU:HG3	2.15	0.47
1:B:194:VAL:HG21	1:B:197:TYR:CZ	2.49	0.47
1:A:290:LYS:N	1:A:290:LYS:HD2	2.30	0.47
1:A:260:LEU:H	1:A:290:LYS:HE3	1.80	0.46
1:B:224:ASP:O	1:B:228:LYS:HG3	2.15	0.46
1:B:230:TRP:O	1:B:234:LEU:HD12	2.15	0.46
1:A:179:ALA:O	1:A:182:PHE:N	2.48	0.46
1:B:64:LEU:HB3	1:B:152:PHE:HZ	1.81	0.46
1:A:177:GLN:HG3	1:A:182:PHE:HE1	1.80	0.46
1:B:162:ARG:HB3	1:B:195:ARG:CD	2.42	0.46
1:A:180:VAL:CG1	1:A:181:ARG:N	2.79	0.46
1:A:248:PHE:CE1	1:A:283:LYS:CD	2.89	0.46
1:B:324:PHE:O	1:B:328:LEU:HB2	2.14	0.46
1:A:14:CYS:HB2	1:A:18:LEU:HB3	1.96	0.46
1:A:63:ARG:HD2	1:A:65:TYR:OH	2.16	0.46
1:A:92:ARG:NH1	1:A:116:ASP:OD2	2.42	0.46
1:B:131:ASP:O	1:B:135:VAL:HG23	2.16	0.46
1:A:63:ARG:HD2	1:A:65:TYR:CZ	2.51	0.46
1:A:181:ARG:C	1:A:183:GLY:N	2.73	0.45
1:A:297:PHE:HB3	1:A:300:LYS:HG3	1.99	0.45
1:A:180:VAL:O	1:A:186:SER:HA	2.16	0.45
1:B:306:SER:O	1:B:307:ASN:OD1	2.34	0.45
1:A:27:LEU:HD12	1:B:50:LYS:HD3	1.98	0.45
1:A:148:VAL:HA	1:A:151:TRP:CH2	2.51	0.45
1:A:242:HIS:CE1	1:A:243:HIS:CE1	3.05	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:54:TYR:OH	1:B:60:LEU:HD23	2.16	0.45
1:B:278:LYS:HG3	1:B:294:TYR:CZ	2.51	0.45
1:A:218:GLU:HG3	1:A:272:LEU:CD1	2.47	0.45
1:A:218:GLU:HG3	1:A:272:LEU:HD12	1.99	0.45
1:A:12:GLU:OE1	1:A:12:GLU:HA	2.17	0.45
1:B:267:VAL:HG21	1:B:277:ALA:HB3	1.98	0.45
1:A:248:PHE:CD2	1:A:283:LYS:HD3	2.52	0.44
1:A:309:PRO:C	1:A:311:SER:H	2.25	0.44
1:B:281:ALA:O	1:B:285:LYS:HG2	2.18	0.44
1:B:98:HIS:CD2	1:B:102:LEU:HD11	2.47	0.44
1:B:168:ASP:O	1:B:171:GLY:N	2.49	0.44
1:A:53:ILE:HD12	1:A:60:LEU:O	2.17	0.44
1:B:14:CYS:SG	1:B:15:MET:HE2	2.58	0.44
1:A:151:TRP:HH2	1:A:160:PHE:HZ	1.65	0.44
1:A:222:SER:O	1:A:226:LEU:HD12	2.18	0.44
1:B:51:ASP:OD1	1:B:63:ARG:NE	2.47	0.44
1:B:206:GLY:HA3	1:B:276:ARG:HH22	1.83	0.44
1:A:161:ASP:CG	1:A:195:ARG:HH21	2.25	0.43
1:A:181:ARG:C	1:A:183:GLY:H	2.25	0.43
1:B:110:ALA:HA	1:B:160:PHE:CE2	2.53	0.43
1:B:228:LYS:HG2	1:B:231:ARG:NH2	2.32	0.43
1:A:149:ASN:OD1	1:A:154:ASP:O	2.36	0.43
1:A:104:LEU:O	1:A:108:LEU:HB2	2.18	0.43
1:A:180:VAL:HG22	1:A:186:SER:CA	2.48	0.43
1:A:99:ASN:HA	1:A:102:LEU:HD12	2.00	0.43
1:A:50:LYS:HB2	1:B:28:ARG:O	2.19	0.43
1:B:15:MET:HE3	1:B:15:MET:HB2	1.96	0.43
1:B:67:PRO:HG3	1:B:110:ALA:N	2.34	0.43
1:B:149:ASN:C	1:B:151:TRP:H	2.26	0.43
1:B:262:PRO:HA	1:B:291:ARG:O	2.18	0.43
1:A:194:VAL:HG11	1:A:197:TYR:OH	2.18	0.43
1:B:328:LEU:HD12	1:B:328:LEU:HA	1.83	0.43
1:B:188:GLU:O	1:B:189:LEU:C	2.62	0.43
1:A:24:GLY:O	1:A:25:THR:CG2	2.65	0.43
1:B:156:THR:O	1:B:157:ASP:C	2.62	0.43
1:B:86:GLY:HA3	1:B:229:PHE:CD2	2.54	0.42
1:B:92:ARG:NH1	1:B:116:ASP:OD2	2.51	0.42
1:B:158:VAL:C	1:B:159:ASP:O	2.50	0.42
1:A:177:GLN:HA	1:A:182:PHE:HD1	1.84	0.42
1:B:47:VAL:HA	1:B:68:ILE:HG22	2.02	0.42
1:A:200:MET:HE1	1:A:317:VAL:HG11	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:78:VAL:N	1:B:163:VAL:HG12	2.35	0.42
1:A:148:VAL:HG13	1:A:158:VAL:CG2	2.50	0.41
1:B:181:ARG:O	1:B:181:ARG:NH1	2.42	0.41
1:B:126:PRO:HB3	1:B:244:MET:SD	2.60	0.41
1:B:111:LEU:N	1:B:160:PHE:HZ	2.18	0.41
1:B:163:VAL:HG23	1:B:194:VAL:HA	2.02	0.41
1:B:317:VAL:O	1:B:320:ILE:HG12	2.19	0.41
1:B:110:ALA:CA	1:B:160:PHE:HZ	2.32	0.41
1:A:43:ASN:OD1	1:A:43:ASN:O	2.38	0.41
1:A:62:LEU:HA	1:A:115:PRO:HA	2.02	0.41
1:A:181:ARG:HG3	1:A:258:ILE:HB	2.02	0.41
1:A:248:PHE:CD1	1:A:283:LYS:CE	3.04	0.41
1:B:307:ASN:O	1:B:308:TYR:C	2.63	0.41
1:B:71:SER:O	1:B:156:THR:HG21	2.21	0.41
1:B:124:ARG:NH1	1:B:234:LEU:O	2.54	0.41
1:A:99:ASN:O	1:A:103:THR:HG23	2.20	0.41
1:A:202:PRO:O	1:A:273:LEU:HD23	2.22	0.40
1:B:197:TYR:HB2	1:B:263:MET:HG2	2.03	0.40
1:A:20:LEU:HD23	1:A:26:VAL:HG22	2.02	0.40
1:A:313:ALA:O	1:A:317:VAL:HG23	2.22	0.40
1:A:86:GLY:HA3	1:A:229:PHE:CD2	2.57	0.40
1:B:99:ASN:HA	1:B:102:LEU:CD1	2.52	0.40
1:B:149:ASN:C	1:B:151:TRP:N	2.79	0.40
1:B:213:GLU:HB3	1:B:223:LEU:HD23	2.03	0.40
1:A:218:GLU:OE2	1:A:301:GLU:HA	2.21	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	302/321 (94%)	278 (92%)	21 (7%)	3 (1%)	13	42

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	291/321 (91%)	261 (90%)	28 (10%)	2 (1%)	19	51
All	All	593/642 (92%)	539 (91%)	49 (8%)	5 (1%)	16	48

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	187	ILE
1	A	211	ASN
1	B	47	VAL
1	B	26	VAL
1	A	95	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	260/275 (94%)	256 (98%)	4 (2%)	60	80
1	B	255/275 (93%)	241 (94%)	14 (6%)	18	47
All	All	515/550 (94%)	497 (96%)	18 (4%)	31	61

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	46	THR
1	A	144	VAL
1	A	156	THR
1	A	187	ILE
1	B	10	VAL
1	B	27	LEU
1	B	47	VAL
1	B	48	LEU
1	B	49	PHE
1	B	146	ASP
1	B	152	PHE

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Mol	Chain	Res	Type
1	B	154	ASP
1	B	162	ARG
1	B	209	ARG
1	B	213	GLU
1	B	320	ILE
1	B	321	ILE
1	B	328	LEU

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	109	ASN
1	A	123	HIS
1	A	243	HIS
1	A	327	ASN
1	B	59	ASN
1	B	150	HIS
1	B	243	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 ⓘ

There are no oligosaccharides 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 ⓘ

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	306/321 (95%)	-0.29	1 (0%)	90	81	47, 81, 101, 125	0
1	B	299/321 (93%)	-0.19	2 (0%)	84	70	53, 87, 119, 155	0
All	All	605/642 (94%)	-0.24	3 (0%)	87	75	47, 84, 113, 155	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	182	PHE	3.2
1	B	196	GLY	2.6
1	B	150	HIS	2.2

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.