



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 10:29 AM UTC

PDB ID : 1EV7 / pdb_00001ev7
Title : CRYSTAL STRUCTURE OF DNA RESTRICTION ENDONUCLEASE
NAEI
Authors : Huai, Q.; Colandene, J.D.; Chen, Y.; Luo, F.; Zhao, Y.
Deposited on : 2000-04-19
Resolution : 2.38 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

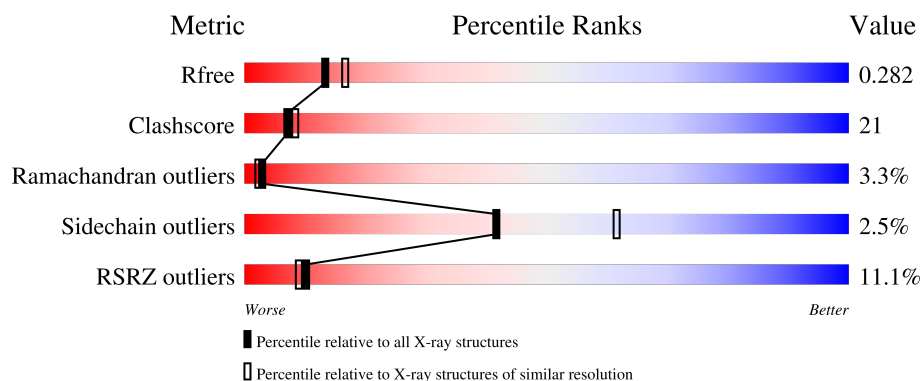
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.38 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	7164 (2.40-2.36)
Clashscore	190562	7722 (2.40-2.36)
Ramachandran outliers	187476	7626 (2.40-2.36)
Sidechain outliers	187428	7627 (2.40-2.36)
RSRZ outliers	180081	7170 (2.40-2.36)

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	317	14% 54% 34% 6% 7%
1	B	317	7% 56% 33% • 8%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4711 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 TYPE IIE RESTRICTION ENDONUCLEASE NAEI.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	295	Total	C	N	O	S	0	0	0
			2318	1449	435	427	7			
1	B	293	Total	C	N	O	S	0	0	0
			2302	1438	432	425	7			

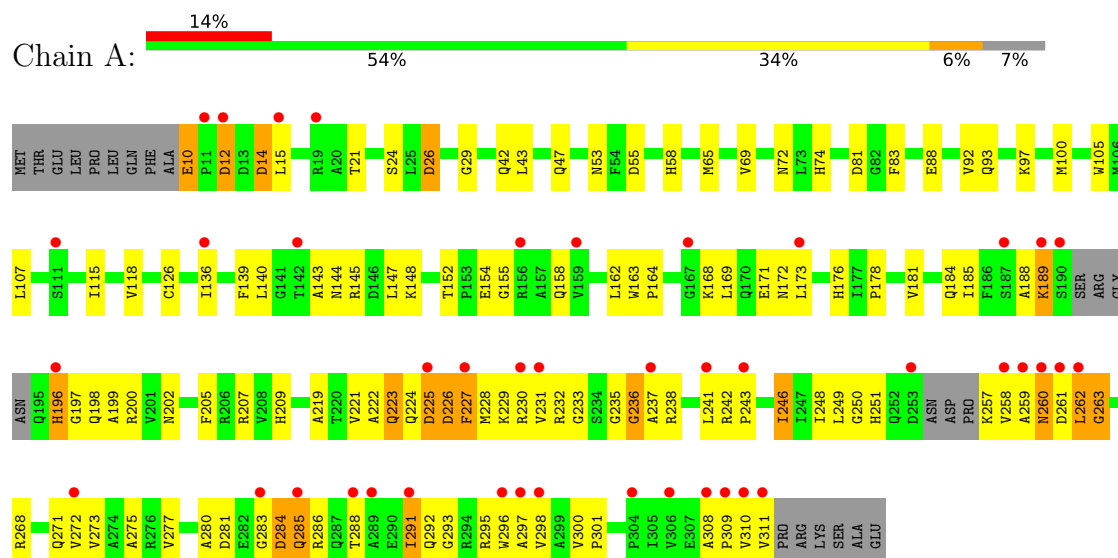
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	26	Total	O	0	0
			26	26		
2	B	65	Total	O	0	0
			65	65		

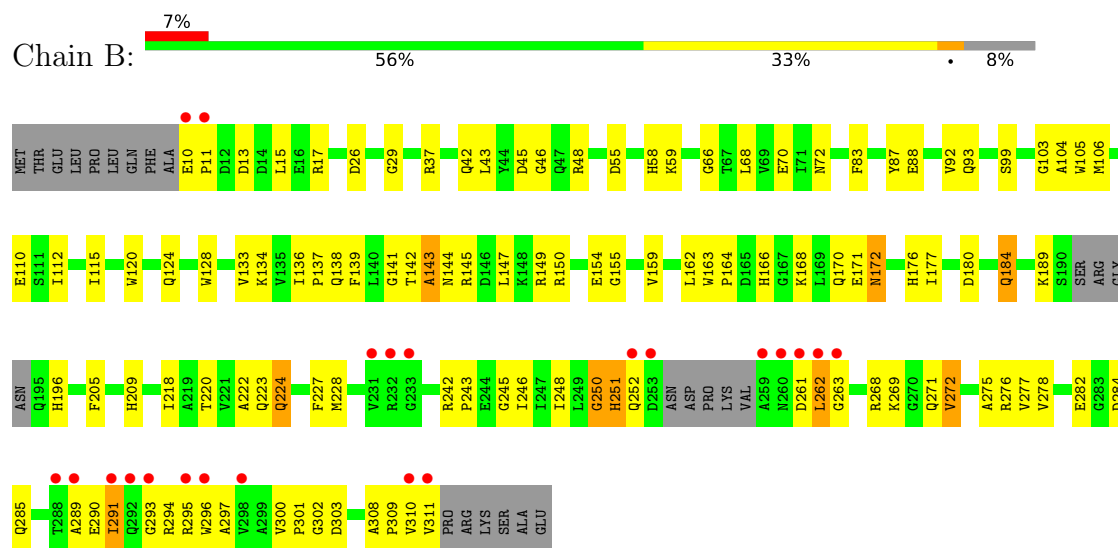
3 Residue-property plots [i](#)

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: TYPE IIE RESTRICTION ENDONUCLEASE NAEI



• Molecule 1: TYPE IIE RESTRICTION ENDONUCLEASE NAEI



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	99.78Å 56.16Å 59.05Å 90.00° 95.92° 90.00°	Depositor
Resolution (Å)	50.00 – 2.38 50.00 – 2.38	Depositor EDS
% Data completeness (in resolution range)	79.2 (50.00-2.38) 90.9 (50.00-2.38)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.88 (at 2.29Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.237 , 0.287 0.235 , 0.282	Depositor DCC
R_{free} test set	2544 reflections (9.89%)	wwPDB-VP
Wilson B-factor (Å ²)	36.5	Xtriage
Anisotropy	0.581	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 42.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	4711	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.30% 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

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	0.41	0/2363	0.96	11/3199 (0.3%)
1	B	0.47	0/2347	0.99	10/3178 (0.3%)
All	All	0.44	0/4710	0.97	21/6377 (0.3%)

There are no bond length outliers.

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	172	ASN	N-CA-C	-7.68	95.06	108.20
1	A	171	GLU	N-CA-C	7.32	121.00	110.10
1	B	13	ASP	N-CA-C	-6.79	103.94	111.82
1	A	231	VAL	N-CA-C	-6.66	106.17	113.43
1	A	26	ASP	CA-C-N	6.42	126.35	119.28
1	A	26	ASP	C-N-CA	6.42	126.35	119.28
1	A	173	LEU	N-CA-C	5.89	117.70	111.28
1	A	176	HIS	N-CA-C	5.78	119.56	111.30
1	A	246	ILE	N-CA-C	5.69	116.40	108.89
1	B	302	GLY	N-CA-C	-5.63	107.25	114.85
1	B	263	GLY	N-CA-C	-5.59	107.47	115.64
1	A	263	GLY	N-CA-C	-5.40	108.19	115.21
1	B	171	GLU	N-CA-C	5.34	118.06	110.10
1	A	12	ASP	N-CA-C	-5.29	106.22	113.30
1	B	55	ASP	N-CA-C	5.27	118.81	112.38
1	B	88	GLU	N-CA-C	-5.15	99.72	108.26
1	A	69	VAL	N-CA-C	-5.10	105.57	110.72
1	B	177	ILE	N-CA-C	-5.09	103.26	109.01
1	B	277	VAL	N-CA-C	5.07	115.78	108.48
1	B	87	TYR	N-CA-C	5.06	117.58	110.14
1	A	172	ASN	N-CA-C	-5.02	99.16	107.99

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	2318	0	2299	109	0
1	B	2302	0	2277	88	0
2	A	26	0	0	1	0
2	B	65	0	0	3	0
All	All	4711	0	4576	192	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 21.

All (192) 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:250:GLY:HA2	1:B:272:VAL:HG23	1.36	1.06
1:A:188:ALA:HB1	1:A:199:ALA:HB3	1.48	0.93
1:B:10:GLU:HG2	1:B:11:PRO:HD2	1.49	0.93
1:B:184:GLN:HE21	1:B:184:GLN:HA	1.33	0.91
1:A:139:PHE:HB3	1:A:155:GLY:HA3	1.51	0.91
1:B:83:PHE:H	1:B:93:GLN:HE22	1.20	0.90
1:A:262:LEU:HD22	1:A:298:VAL:HG23	1.53	0.89
1:A:250:GLY:H	1:A:257:LYS:HD3	1.34	0.89
1:B:83:PHE:H	1:B:93:GLN:NE2	1.72	0.87
1:A:198:GLN:HE21	1:A:202:ASN:ND2	1.71	0.86
1:A:198:GLN:HE21	1:A:202:ASN:HD21	1.23	0.85
1:B:268:ARG:H	1:B:271:GLN:HE21	1.25	0.83
1:A:227:PHE:HD1	1:A:228:MET:H	1.24	0.81
1:B:144:ASN:ND2	1:B:145:ARG:H	1.78	0.80
1:A:288:THR:OG1	1:A:295:ARG:HG3	1.86	0.75
1:A:14:ASP:HB3	1:A:92:VAL:HG21	1.70	0.74
1:A:262:LEU:HD21	1:A:297:ALA:HA	1.70	0.73
1:B:296:TRP:CZ2	1:B:309:PRO:HG3	2.24	0.72
1:A:83:PHE:H	1:A:93:GLN:HE22	1.39	0.71
1:B:11:PRO:HB3	1:B:134:LYS:HE3	1.73	0.69
1:A:277:VAL:HG12	1:A:298:VAL:HA	1.74	0.68
1:A:42:GLN:HE22	1:A:72:ASN:HD21	1.40	0.68
1:B:11:PRO:CB	1:B:134:LYS:HD2	2.25	0.66

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:268:ARG:H	1:B:271:GLN:NE2	1.94	0.65
1:B:83:PHE:N	1:B:93:GLN:HE22	1.92	0.65
1:B:251:HIS:ND1	1:B:269:LYS:HA	2.11	0.65
1:B:189:LYS:HG3	1:B:196:HIS:CE1	2.33	0.64
1:A:308:ALA:HB1	1:A:309:PRO:HD2	1.78	0.64
1:A:242:ARG:N	1:A:243:PRO:HD2	2.13	0.64
1:B:262:LEU:HD23	1:B:262:LEU:N	2.13	0.64
1:B:10:GLU:CG	1:B:11:PRO:HD2	2.26	0.63
1:A:257:LYS:NZ	1:A:311:VAL:HG11	2.14	0.63
1:B:42:GLN:HE22	1:B:72:ASN:HD21	1.46	0.62
1:A:188:ALA:HB1	1:A:199:ALA:CB	2.26	0.62
1:B:205:PHE:O	1:B:209:HIS:HE1	1.82	0.62
1:A:15:LEU:O	1:A:15:LEU:HD23	1.99	0.62
1:B:184:GLN:HA	1:B:184:GLN:NE2	2.08	0.61
1:A:144:ASN:HB3	1:A:148:LYS:H	1.66	0.61
1:A:261:ASP:C	1:A:263:GLY:H	2.08	0.61
1:A:198:GLN:HE22	1:A:237:ALA:HB2	1.64	0.60
1:B:43:LEU:HD13	1:B:68:LEU:HD12	1.82	0.60
1:A:144:ASN:HB2	1:A:148:LYS:O	2.02	0.59
1:B:11:PRO:HB2	1:B:134:LYS:HD2	1.83	0.59
1:B:103:GLY:HA2	1:B:105:TRP:CZ3	2.37	0.58
1:B:262:LEU:HD23	1:B:262:LEU:H	1.68	0.58
1:A:280:ALA:HB1	1:A:284:ASP:CG	2.27	0.58
1:B:144:ASN:ND2	1:B:145:ARG:N	2.50	0.57
1:A:105:TRP:CE2	1:A:118:VAL:HB	2.39	0.57
1:B:296:TRP:CH2	1:B:309:PRO:HG3	2.39	0.57
1:A:178:PRO:HB2	1:A:181:VAL:HG23	1.87	0.57
1:A:198:GLN:OE1	1:A:230:ARG:HB3	2.04	0.57
1:A:257:LYS:CE	1:A:311:VAL:HG11	2.35	0.57
1:A:26:ASP:OD2	1:A:29:GLY:HA2	2.03	0.57
1:A:196:HIS:N	1:A:196:HIS:CD2	2.73	0.57
1:A:196:HIS:CD2	1:A:196:HIS:H	2.20	0.56
1:B:245:GLY:HA2	1:B:308:ALA:HB2	1.87	0.56
1:B:300:VAL:HG13	1:B:301:PRO:HD2	1.88	0.56
1:A:300:VAL:HG13	1:A:301:PRO:HD2	1.88	0.56
1:A:257:LYS:HE2	1:A:311:VAL:HG11	1.88	0.55
1:A:147:LEU:HG	1:B:147:LEU:HG	1.89	0.55
1:A:311:VAL:O	1:A:311:VAL:HG22	2.06	0.55
1:A:259:ALA:O	1:A:261:ASP:N	2.39	0.55
1:A:58:HIS:HD2	2:B:374:HOH:O	1.89	0.55
1:B:242:ARG:N	1:B:243:PRO:HD2	2.22	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:268:ARG:H	1:A:271:GLN:HE21	1.54	0.54
1:A:136:ILE:HB	1:A:139:PHE:CE1	2.43	0.54
1:A:163:TRP:N	1:A:164:PRO:HD3	2.23	0.54
1:A:154:GLU:O	1:A:158:GLN:HG3	2.08	0.54
1:A:188:ALA:CB	1:A:199:ALA:HB3	2.31	0.54
1:A:238:ARG:HH12	1:A:257:LYS:NZ	2.06	0.53
1:B:106:MET:SD	1:B:150:ARG:HB3	2.49	0.53
1:A:21:THR:O	1:A:24:SER:HB3	2.09	0.53
1:A:81:ASP:HB3	1:B:59:LYS:HB2	1.90	0.53
1:B:224:GLN:O	1:B:227:PHE:HB3	2.08	0.53
1:B:15:LEU:HA	1:B:115:ILE:HD13	1.90	0.53
1:B:218:ILE:HD12	1:B:228:MET:HE1	1.92	0.52
1:A:139:PHE:C	1:A:152:THR:HG23	2.33	0.52
1:A:224:GLN:NE2	1:A:230:ARG:HH12	2.07	0.52
1:A:311:VAL:O	1:A:311:VAL:HG13	2.08	0.52
1:B:251:HIS:O	1:B:252:GLN:HB3	2.10	0.52
1:A:47:GLN:NE2	1:A:225:ASP:HB3	2.25	0.52
1:A:260:ASN:C	1:A:262:LEU:H	2.17	0.52
1:B:26:ASP:OD2	1:B:29:GLY:HA2	2.09	0.51
1:A:272:VAL:HG22	1:A:273:VAL:N	2.26	0.51
1:B:11:PRO:HB3	1:B:134:LYS:CE	2.39	0.51
1:A:53:ASN:HD21	1:A:55:ASP:HB2	1.76	0.51
1:B:10:GLU:HG2	1:B:11:PRO:CD	2.34	0.51
1:B:136:ILE:HG22	1:B:138:GLN:H	1.76	0.50
1:A:238:ARG:NH1	1:A:257:LYS:NZ	2.60	0.50
1:A:242:ARG:N	1:A:243:PRO:CD	2.75	0.50
1:A:74:HIS:CE1	1:B:58:HIS:HB3	2.47	0.49
1:A:197:GLY:HA3	1:A:230:ARG:HH12	1.76	0.49
1:B:250:GLY:C	1:B:252:GLN:H	2.20	0.49
1:B:37:ARG:CD	1:B:170:GLN:HB3	2.42	0.49
1:B:245:GLY:C	1:B:308:ALA:HB2	2.37	0.49
1:A:105:TRP:CZ2	1:A:118:VAL:HB	2.47	0.49
1:A:140:LEU:N	1:A:152:THR:HG23	2.28	0.49
1:B:282:GLU:HG3	1:B:295:ARG:NH1	2.27	0.49
1:B:104:ALA:HB1	2:B:344:HOH:O	2.12	0.48
1:A:136:ILE:HB	1:A:139:PHE:CD1	2.48	0.48
1:A:200:ARG:HB3	1:A:221:VAL:HG13	1.96	0.48
1:B:15:LEU:C	1:B:15:LEU:HD23	2.39	0.48
1:A:257:LYS:HZ3	1:A:311:VAL:HG11	1.77	0.48
1:A:200:ARG:HB3	1:A:221:VAL:CG1	2.44	0.47
1:B:124:GLN:O	1:B:176:HIS:HE1	1.97	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:LEU:HD11	1:B:147:LEU:HD21	1.96	0.47
1:A:235:GLY:O	1:A:236:GLY:O	2.33	0.47
1:A:184:GLN:OE1	1:A:207:ARG:HD2	2.15	0.47
1:B:144:ASN:HD22	1:B:145:ARG:H	1.59	0.47
1:B:168:LYS:H	1:B:168:LYS:HG2	1.56	0.47
1:A:241:LEU:HB3	1:A:246:ILE:HB	1.97	0.46
1:A:251:HIS:HB2	1:A:268:ARG:O	2.15	0.46
1:B:251:HIS:O	1:B:251:HIS:CG	2.68	0.46
1:A:43:LEU:HD12	1:A:65:MET:HE2	1.97	0.46
1:A:97:LYS:HG3	1:A:107:LEU:HD23	1.97	0.46
1:A:249:LEU:HD13	1:A:260:ASN:HB2	1.97	0.46
1:B:205:PHE:O	1:B:209:HIS:CE1	2.67	0.46
1:B:246:ILE:HA	1:B:275:ALA:O	2.16	0.46
1:B:245:GLY:CA	1:B:308:ALA:HB2	2.46	0.46
1:A:310:VAL:HG22	1:A:311:VAL:N	2.31	0.45
1:A:14:ASP:HB3	1:A:92:VAL:CG2	2.45	0.45
1:B:128:TRP:O	1:B:166:HIS:CE1	2.68	0.45
1:B:300:VAL:CG1	1:B:301:PRO:HD2	2.46	0.45
1:A:219:ALA:HB2	1:A:227:PHE:CD2	2.52	0.45
1:A:126:CYS:O	1:A:168:LYS:HB2	2.16	0.45
1:A:197:GLY:HA3	1:A:230:ARG:NH1	2.32	0.45
1:A:205:PHE:O	1:A:209:HIS:NE2	2.47	0.45
1:A:222:ALA:O	1:A:223:GLN:C	2.59	0.45
1:A:226:ASP:O	1:A:229:LYS:HB3	2.17	0.45
1:A:280:ALA:HB1	1:A:284:ASP:OD2	2.17	0.45
1:B:92:VAL:HG11	1:B:115:ILE:HD12	1.99	0.45
1:B:163:TRP:N	1:B:164:PRO:HD3	2.32	0.45
1:B:251:HIS:CE1	1:B:269:LYS:HA	2.52	0.45
1:A:197:GLY:HA2	1:A:200:ARG:NH2	2.32	0.44
1:B:248:ILE:HG22	1:B:272:VAL:CG2	2.47	0.44
1:A:181:VAL:O	1:A:185:ILE:HG13	2.17	0.44
1:A:10:GLU:OE2	1:A:12:ASP:HB2	2.17	0.44
1:B:11:PRO:CB	1:B:134:LYS:CD	2.94	0.44
1:B:251:HIS:HD1	1:B:269:LYS:HA	1.80	0.44
1:B:290:GLU:HG2	1:B:291:ILE:N	2.32	0.44
1:A:53:ASN:HD22	1:A:55:ASP:H	1.65	0.44
1:B:142:THR:HG22	1:B:143:ALA:N	2.32	0.44
1:A:53:ASN:ND2	1:A:55:ASP:H	2.16	0.44
1:B:290:GLU:HG3	1:B:294:ARG:O	2.18	0.44
1:A:300:VAL:O	1:A:301:PRO:C	2.61	0.43
1:A:188:ALA:O	1:A:189:LYS:HB3	2.18	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:296:TRP:CZ2	1:A:309:PRO:HD3	2.53	0.43
1:B:262:LEU:CD1	1:B:297:ALA:HA	2.48	0.43
1:A:248:ILE:HG22	1:A:272:VAL:CG2	2.49	0.43
1:B:310:VAL:O	1:B:311:VAL:HB	2.17	0.43
1:A:284:ASP:O	1:A:286:ARG:N	2.52	0.43
1:B:162:LEU:HB3	1:B:163:TRP:CE3	2.54	0.43
1:B:222:ALA:O	1:B:223:GLN:HB2	2.18	0.43
1:B:99:SER:O	1:B:120:TRP:HA	2.18	0.43
1:A:291:ILE:HG22	1:A:292:GLN:N	2.33	0.43
1:B:141:GLY:O	1:B:149:ARG:NH1	2.50	0.43
1:B:154:GLU:HB2	2:B:330:HOH:O	2.19	0.43
1:A:14:ASP:HB2	1:A:115:ILE:HD11	2.00	0.43
1:A:144:ASN:ND2	1:A:145:ARG:H	2.17	0.42
1:A:168:LYS:HA	2:A:323:HOH:O	2.20	0.42
1:B:278:VAL:HG21	1:B:303:ASP:OD1	2.18	0.42
1:A:162:LEU:O	1:A:163:TRP:C	2.62	0.42
1:B:45:ASP:CG	1:B:48:ARG:HE	2.28	0.42
1:A:232:ARG:HG2	1:A:233:GLY:N	2.34	0.42
1:A:126:CYS:O	1:A:169:LEU:N	2.51	0.42
1:B:276:ARG:NH2	1:B:303:ASP:O	2.51	0.42
1:A:224:GLN:O	1:A:226:ASP:N	2.52	0.42
1:A:283:GLY:O	1:A:284:ASP:C	2.63	0.42
1:B:43:LEU:HD13	1:B:68:LEU:CD1	2.48	0.42
1:A:248:ILE:CG2	1:A:272:VAL:HG21	2.50	0.41
1:A:238:ARG:HH12	1:A:257:LYS:HE3	1.84	0.41
1:B:66:GLY:O	1:B:70:GLU:HG3	2.20	0.41
1:B:262:LEU:N	1:B:262:LEU:CD2	2.83	0.41
1:A:308:ALA:HB1	1:A:309:PRO:CD	2.49	0.41
1:B:172:ASN:O	1:B:176:HIS:HD2	2.03	0.41
1:A:248:ILE:HG22	1:A:272:VAL:HG21	2.02	0.41
1:B:133:VAL:HB	1:B:159:VAL:HG22	2.02	0.41
1:A:238:ARG:HH12	1:A:257:LYS:CE	2.33	0.41
1:A:147:LEU:HG	1:B:147:LEU:CG	2.50	0.41
1:A:284:ASP:O	1:A:285:GLN:C	2.64	0.41
1:B:139:PHE:HB3	1:B:155:GLY:CA	2.51	0.41
1:A:198:GLN:O	1:A:202:ASN:ND2	2.54	0.41
1:A:100:MET:HB3	1:A:100:MET:HE3	1.85	0.41
1:B:284:ASP:O	1:B:285:GLN:C	2.65	0.41
1:A:246:ILE:HA	1:A:275:ALA:O	2.21	0.40
1:A:188:ALA:O	1:A:189:LYS:CB	2.69	0.40
1:B:46:GLY:HA3	1:B:220:THR:OG1	2.21	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:250:GLY:O	1:B:252:GLN:N	2.54	0.40
1:B:262:LEU:HD12	1:B:297:ALA:HA	2.03	0.40
1:A:251:HIS:O	1:A:258:VAL:HG23	2.22	0.40
1:B:112:ILE:CG2	1:B:137:PRO:HD3	2.51	0.40
1:B:262:LEU:HB3	1:B:289:ALA:HB2	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	289/317 (91%)	248 (86%)	28 (10%)	13 (4%)	2	1
1	B	287/317 (90%)	268 (93%)	13 (4%)	6 (2%)	5	6
All	All	576/634 (91%)	516 (90%)	41 (7%)	19 (3%)	3	2

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	226	ASP
1	A	236	GLY
1	A	260	ASN
1	A	143	ALA
1	A	189	LYS
1	A	223	GLN
1	A	225	ASP
1	A	285	GLN
1	B	251	HIS
1	A	262	LEU
1	A	281	ASP
1	A	284	ASP
1	B	143	ALA

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	261	ASP
1	B	250	GLY
1	B	291	ILE
1	A	293	GLY
1	A	291	ILE
1	B	293	GLY

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	244/263 (93%)	239 (98%)	5 (2%)	48	68
1	B	242/263 (92%)	235 (97%)	7 (3%)	37	57
All	All	486/526 (92%)	474 (98%)	12 (2%)	42	61

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	GLU
1	A	14	ASP
1	A	88	GLU
1	A	196	HIS
1	A	227	PHE
1	B	17	ARG
1	B	110	GLU
1	B	180	ASP
1	B	184	GLN
1	B	224	GLN
1	B	262	LEU
1	B	272	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	GLN
1	A	47	GLN
1	A	53	ASN
1	A	58	HIS
1	A	93	GLN
1	A	124	GLN
1	A	138	GLN
1	A	144	ASN
1	A	170	GLN
1	A	196	HIS
1	A	198	GLN
1	A	271	GLN
1	B	42	GLN
1	B	53	ASN
1	B	93	GLN
1	B	124	GLN
1	B	125	GLN
1	B	144	ASN
1	B	176	HIS
1	B	184	GLN
1	B	195	GLN
1	B	209	HIS
1	B	271	GLN
1	B	285	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 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	295/317 (93%)	0.94	43 (14%) 6 5	24, 56, 93, 103	0
1	B	293/317 (92%)	0.42	22 (7%) 20 19	20, 36, 79, 94	0
All	All	588/634 (92%)	0.68	65 (11%) 10 9	20, 45, 86, 103	0

All (65) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	190	SER	4.9
1	B	259	ALA	4.9
1	A	291	ILE	4.6
1	A	311	VAL	4.4
1	B	11	PRO	4.4
1	B	260	ASN	4.3
1	B	311	VAL	4.2
1	A	289	ALA	4.1
1	A	231	VAL	4.1
1	A	11	PRO	4.0
1	A	260	ASN	3.9
1	B	261	ASP	3.7
1	A	227	PHE	3.6
1	A	262	LEU	3.6
1	B	310	VAL	3.2
1	A	283	GLY	3.0
1	A	237	ALA	3.0
1	A	259	ALA	3.0
1	B	262	LEU	3.0
1	A	12	ASP	2.9
1	A	173	LEU	2.9
1	B	296	TRP	2.9
1	A	253	ASP	2.9
1	A	288	THR	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	293	GLY	2.8
1	B	10	GLU	2.7
1	A	111	SER	2.7
1	B	263	GLY	2.7
1	A	310	VAL	2.6
1	A	258	VAL	2.6
1	A	285	GLN	2.6
1	A	241	LEU	2.6
1	A	296	TRP	2.6
1	B	253	ASP	2.6
1	A	167	GLY	2.6
1	A	15	LEU	2.5
1	B	232	ARG	2.5
1	B	298	VAL	2.5
1	A	225	ASP	2.5
1	A	297	ALA	2.5
1	A	308	ALA	2.5
1	A	309	PRO	2.5
1	B	292	GLN	2.5
1	A	142	THR	2.4
1	A	298	VAL	2.4
1	B	231	VAL	2.4
1	B	291	ILE	2.4
1	B	288	THR	2.3
1	A	306	VAL	2.3
1	A	243	PRO	2.3
1	A	159	VAL	2.3
1	A	196	HIS	2.3
1	A	230	ARG	2.3
1	A	272	VAL	2.3
1	B	233	GLY	2.3
1	B	295	ARG	2.3
1	B	289	ALA	2.2
1	A	261	ASP	2.2
1	A	136	ILE	2.2
1	A	156	ARG	2.2
1	A	19	ARG	2.1
1	A	304	PRO	2.1
1	A	187	SER	2.1
1	B	252	GLN	2.0
1	A	189	LYS	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.