Full wwPDB X-ray Structure Validation Report ⓘ

Feb 10, 2025 – 02:08 PM JST

PDB ID	:	8KEL
Title	:	Structure of DexA reveal the novel Mechanism of DNA catalysis
Authors	:	Liu, Y.H.; Ma, B.; Kang, Y.; Liu, B.; Li, Y.
Deposited on	:	2023-08-12
Resolution	:	2.88 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:

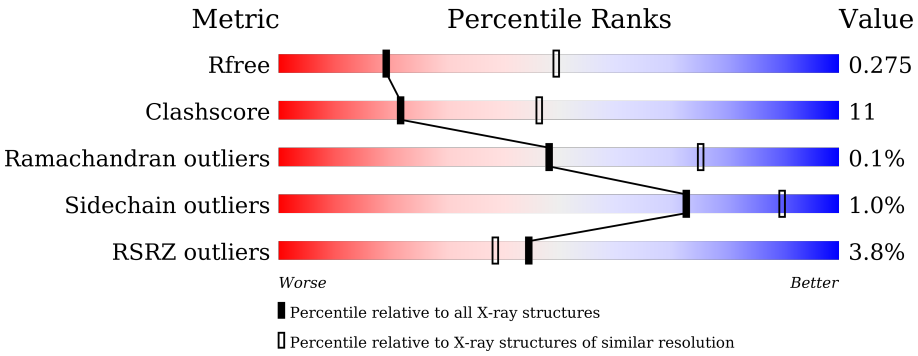
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.88 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}	164625	3316 (2.90-2.86)
Clashscore	180529	3609 (2.90-2.86)
Ramachandran outliers	177936	3529 (2.90-2.86)
Sidechain outliers	177891	3532 (2.90-2.86)
RSRZ outliers	164620	3319 (2.90-2.86)

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	227	80% 16%
1	B	227	2% 81% 16%
1	C	227	5% 62% 24% 13%
1	D	227	7% 66% 26% 7%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 6550 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 Exodeoxyribonuclease.

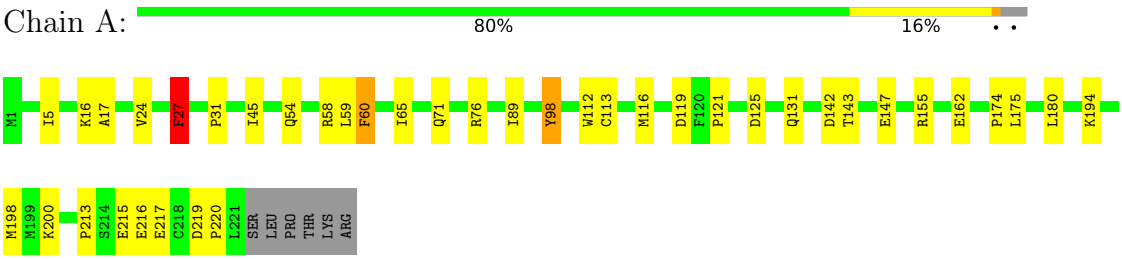
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	221	Total	C	N	O	S	0	0	0
			1721	1093	287	329	12			
1	B	224	Total	C	N	O	S	0	0	0
			1697	1083	286	316	12			
1	C	197	Total	C	N	O	S	0	0	0
			1541	979	261	291	10			
1	D	211	Total	C	N	O	S	0	0	0
			1591	1009	273	300	9			

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.

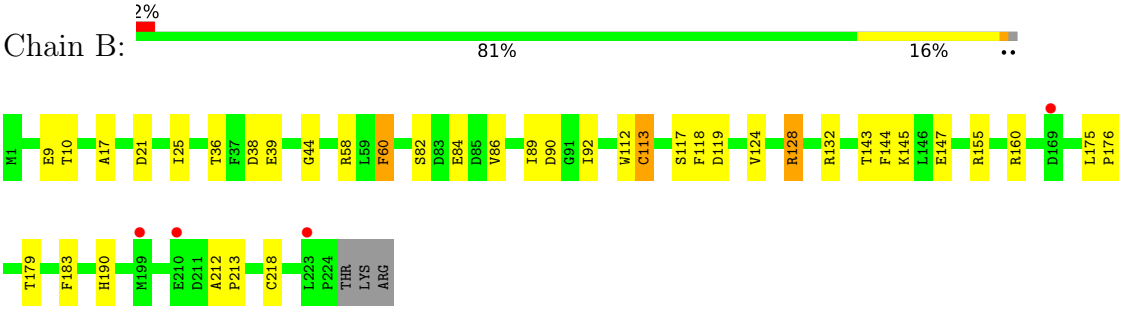
• Molecule 1: Exodeoxyribonuclease

Chain A:



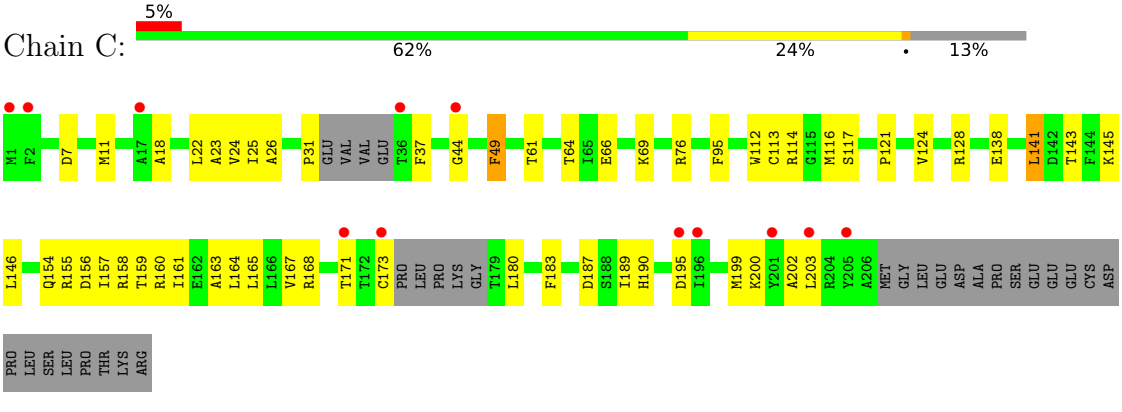
• Molecule 1: Exodeoxyribonuclease

Chain B:



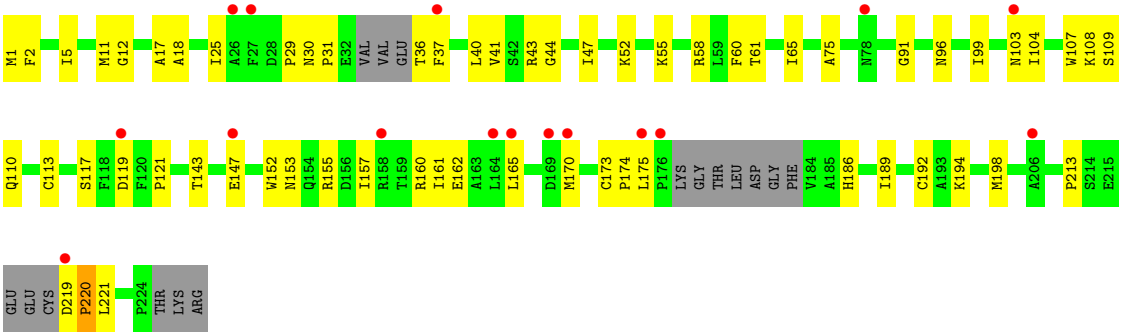
• Molecule 1: Exodeoxyribonuclease

Chain C:



• Molecule 1: Exodeoxyribonuclease

Chain D:


M1 F2 I5 M11 G12 A17 A18 I25 A26 F27 D28 P29 N30 P31 E32 VAL VAL GLU T36 F37 L40 V41 S42 R43 G44 I47 K52 K55 R58 L59 F60 T61 I65 A75 N78 G91 N96 I99 N103 I104 W107 K108 S109
Q110 C113 S117 F118 D119 F120 P121 T143 E147 W152 N153 Q154 R155 D156 I157 R158 T159 R160 I161 E162 A163 L164 L165 D169 M170 C173 P174 L175 P176 LYS GLY THR LEU ASP GLY PHE V184 A185 H186 I189 C192 A193 K194 M198 A206 P213 S214 E215
GLU GLU CYS D219 P220 L221 P224 THR LYS ARG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	84.55Å 76.28Å 108.01Å 90.00° 93.36° 90.00°	Depositor
Resolution (Å)	35.94 – 2.88 35.94 – 2.88	Depositor EDS
% Data completeness (in resolution range)	96.0 (35.94-2.88) 96.0 (35.94-2.88)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.27 (at 2.86Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487, PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.223 , 0.276 0.224 , 0.275	Depositor DCC
R_{free} test set	1487 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å^2)	72.1	Xtriage
Anisotropy	0.464	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 65.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	6550	wwPDB-VP
Average B, all atoms (Å^2)	83.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.84% of the height of the origin peak. No significant pseudotranslation is detected.*

[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	0.52	0/1760	0.76	2/2392 (0.1%)
1	B	0.46	1/1737 (0.1%)	0.66	0/2362
1	C	0.38	0/1572	0.64	1/2129 (0.0%)
1	D	0.43	0/1625	0.63	0/2206
All	All	0.45	1/6694 (0.0%)	0.68	3/9089 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	113	CYS	CB-SG	-5.56	1.72	1.81

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	27	PHE	CB-CG-CD1	7.33	125.93	120.80
1	A	27	PHE	CB-CG-CD2	-7.15	115.80	120.80
1	C	141	LEU	CB-CG-CD2	-5.11	102.32	111.00

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	1721	0	1624	36	0
1	B	1697	0	1583	27	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1541	0	1469	36	0
1	D	1591	0	1466	42	0
All	All	6550	0	6142	134	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 (134) 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:D:36:THR:HG1	1:D:219:ASP:N	1.61	0.98
1:A:213:PRO:HG2	1:A:216:GLU:HG3	1.63	0.79
1:A:131:GLN:NE2	1:A:142:ASP:O	2.15	0.79
1:A:71:GLN:O	1:A:76:ARG:NH2	2.16	0.78
1:C:25:ILE:HG12	1:C:44:GLY:HA3	1.68	0.73
1:C:114:ARG:NH2	1:C:195:ASP:OD1	2.24	0.71
1:D:25:ILE:HD11	1:D:189:ILE:HG23	1.72	0.71
1:C:154:GLN:OE1	1:D:117:SER:OG	2.08	0.69
1:D:113:CYS:SG	1:D:119:ASP:HB2	2.32	0.68
1:D:40:LEU:HD23	1:D:43:ARG:HD2	1.75	0.67
1:C:145:LYS:HG3	1:C:146:LEU:HD12	1.77	0.66
1:A:217:GLU:HG3	1:A:219:ASP:H	1.61	0.66
1:A:217:GLU:O	1:A:220:PRO:HD2	1.96	0.65
1:D:161:ILE:HG23	1:D:165:LEU:HD13	1.79	0.63
1:D:25:ILE:HG12	1:D:44:GLY:HA3	1.81	0.63
1:D:117:SER:O	1:D:121:PRO:HG2	1.98	0.63
1:B:25:ILE:HG12	1:B:44:GLY:HA3	1.80	0.63
1:B:124:VAL:HG12	1:B:128:ARG:HE	1.61	0.63
1:C:11:MET:HB2	1:C:18:ALA:HB3	1.80	0.63
1:C:168:ARG:NH2	1:D:108:LYS:O	2.31	0.63
1:C:31:PRO:HA	1:C:200:LYS:HD2	1.81	0.63
1:A:27:PHE:C	1:A:27:PHE:HD1	2.03	0.62
1:D:173:CYS:HB3	1:D:198:MET:HB3	1.81	0.62
1:A:174:PRO:HB3	1:A:216:GLU:HG2	1.83	0.61
1:C:128:ARG:HG2	1:C:143:THR:HG21	1.82	0.60
1:D:52:LYS:HG3	1:D:55:LYS:HZ3	1.67	0.59
1:D:12:GLY:HA2	1:D:61:THR:HB	1.85	0.59
1:A:27:PHE:C	1:A:27:PHE:CD1	2.76	0.59
1:A:175:LEU:H	1:A:220:PRO:HG2	1.68	0.58
1:C:128:ARG:HD3	1:C:141:LEU:HD23	1.84	0.58
1:C:161:ILE:HD13	1:C:164:LEU:HD12	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:25:ILE:HD12	1:D:192:CYS:HB2	1.86	0.58
1:A:113:CYS:SG	1:A:116:MET:HA	2.43	0.57
1:B:82:SER:OG	1:B:84:GLU:HG2	2.04	0.57
1:D:219:ASP:O	1:D:221:LEU:N	2.38	0.57
1:D:96:ASN:HA	1:D:99:ILE:HG22	1.86	0.57
1:C:66:GLU:HA	1:C:69:LYS:HE2	1.86	0.56
1:B:112:TRP:HH2	1:B:160:ARG:HD3	1.70	0.56
1:A:45:ILE:HG12	1:A:98:TYR:CD2	2.41	0.55
1:D:5:ILE:HD11	1:D:157:ILE:HD11	1.88	0.55
1:B:113:CYS:SG	1:B:119:ASP:HB2	2.47	0.55
1:B:144:PHE:HD2	1:B:145:LYS:HD3	1.72	0.55
1:A:215:GLU:O	1:A:215:GLU:HG2	2.07	0.54
1:B:213:PRO:HB2	1:B:218:CYS:HB3	1.88	0.54
1:B:39:GLU:OE1	1:B:39:GLU:N	2.33	0.54
1:D:107:TRP:O	1:D:153:ASN:ND2	2.42	0.53
1:A:112:TRP:CZ3	1:A:155:ARG:HB3	2.43	0.53
1:C:163:ALA:HB2	1:D:160:ARG:HD2	1.91	0.53
1:D:11:MET:CE	1:D:65:ILE:HG12	2.39	0.53
1:D:52:LYS:HG3	1:D:55:LYS:NZ	2.25	0.52
1:A:60:PHE:HB3	1:A:65:ILE:HD11	1.91	0.52
1:C:61:THR:HB	1:C:64:THR:OG1	2.10	0.52
1:A:17:ALA:O	1:A:58:ARG:NH2	2.40	0.52
1:A:180:LEU:HD12	1:A:220:PRO:HD3	1.92	0.52
1:B:143:THR:O	1:B:147:GLU:HG3	2.10	0.52
1:C:25:ILE:HG22	1:C:26:ALA:O	2.10	0.51
1:D:194:LYS:O	1:D:198:MET:HG3	2.09	0.51
1:A:54:GLN:HB3	1:A:58:ARG:CG	2.41	0.51
1:A:194:LYS:HG2	1:A:198:MET:HE2	1.93	0.50
1:A:215:GLU:N	1:A:215:GLU:OE1	2.45	0.50
1:B:36:THR:HB	1:B:39:GLU:OE1	2.12	0.50
1:C:160:ARG:O	1:C:164:LEU:HG	2.12	0.50
1:C:138:GLU:HA	1:C:141:LEU:HD13	1.93	0.50
1:D:143:THR:O	1:D:147:GLU:HG3	2.12	0.49
1:A:16:LYS:NZ	1:A:125:ASP:OD2	2.35	0.49
1:D:161:ILE:HG22	1:D:170:MET:O	2.12	0.49
1:A:143:THR:O	1:A:147:GLU:HG3	2.13	0.49
1:C:113:CYS:SG	1:C:116:MET:HA	2.52	0.49
1:A:113:CYS:SG	1:A:119:ASP:HB2	2.51	0.49
1:B:60:PHE:N	1:B:60:PHE:CD1	2.80	0.49
1:C:165:LEU:O	1:C:167:VAL:HG23	2.13	0.48
1:A:98:TYR:C	1:A:98:TYR:HD1	2.17	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:161:ILE:HD11	1:C:199:MET:HA	1.96	0.48
1:D:104:ILE:HG23	1:D:109:SER:CB	2.44	0.48
1:D:11:MET:HE3	1:D:65:ILE:HG12	1.96	0.47
1:D:36:THR:OG1	1:D:219:ASP:N	2.38	0.47
1:C:158:ARG:HB2	1:C:171:THR:HG22	1.97	0.47
1:D:2:PHE:HA	1:D:29:PRO:HD3	1.97	0.47
1:D:75:ALA:HB2	1:D:186:HIS:ND1	2.30	0.47
1:C:37:PHE:CG	1:C:180:LEU:HG	2.50	0.47
1:D:11:MET:HB2	1:D:18:ALA:HB3	1.97	0.47
1:D:17:ALA:O	1:D:58:ARG:NH2	2.46	0.47
1:C:156:ASP:HB3	1:C:159:THR:HB	1.97	0.46
1:B:128:ARG:HH11	1:B:132:ARG:HH22	1.63	0.46
1:A:98:TYR:C	1:A:98:TYR:CD1	2.89	0.46
1:B:9:GLU:HB2	1:B:21:ASP:OD1	2.16	0.46
1:C:112:TRP:HH2	1:C:160:ARG:HD3	1.80	0.46
1:B:112:TRP:CH2	1:B:160:ARG:HD3	2.50	0.45
1:A:162:GLU:OE1	1:B:155:ARG:NE	2.44	0.45
1:C:23:ALA:HB1	1:C:189:ILE:HD13	1.98	0.45
1:D:37:PHE:CE2	1:D:41:VAL:HG21	2.52	0.45
1:D:152:TRP:O	1:D:155:ARG:NH1	2.31	0.45
1:C:114:ARG:HA	1:C:157:ILE:HB	1.99	0.45
1:B:176:PRO:O	1:B:179:THR:HG22	2.17	0.45
1:B:17:ALA:O	1:B:58:ARG:NH2	2.46	0.44
1:A:174:PRO:HA	1:A:220:PRO:HB3	1.99	0.44
1:C:31:PRO:HG3	1:C:203:LEU:HD23	2.00	0.44
1:A:31:PRO:HA	1:A:200:LYS:HD2	1.99	0.44
1:D:175:LEU:O	1:D:220:PRO:HG3	2.18	0.44
1:C:124:VAL:O	1:C:128:ARG:HG3	2.17	0.44
1:D:161:ILE:O	1:D:165:LEU:HB2	2.17	0.44
1:D:47:ILE:HG21	1:D:91:GLY:HA2	2.00	0.43
1:B:183:PHE:CE1	1:B:190:HIS:HB3	2.52	0.43
1:A:60:PHE:CD1	1:A:60:PHE:N	2.86	0.43
1:C:117:SER:O	1:C:121:PRO:HG2	2.18	0.43
1:C:187:ASP:HB3	1:C:190:HIS:HB2	2.00	0.43
1:A:98:TYR:HD1	1:A:98:TYR:O	2.01	0.43
1:C:24:VAL:HG21	1:C:95:PHE:CD1	2.54	0.43
1:C:183:PHE:CE1	1:C:190:HIS:HB3	2.54	0.43
1:C:49:PHE:CD1	1:C:49:PHE:N	2.86	0.42
1:A:175:LEU:HD12	1:A:180:LEU:HD11	2.01	0.42
1:D:30:ASN:OD1	1:D:31:PRO:HD2	2.18	0.42
1:D:47:ILE:HG21	1:D:91:GLY:CA	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:174:PRO:HB2	1:D:213:PRO:HG2	2.01	0.42
1:A:16:LYS:O	1:A:59:LEU:N	2.48	0.42
1:A:5:ILE:O	1:A:24:VAL:HA	2.19	0.42
1:A:89:ILE:HD13	1:A:89:ILE:HA	1.89	0.42
1:B:89:ILE:H	1:B:89:ILE:HD12	1.85	0.42
1:C:173:CYS:SG	1:C:202:ALA:HB2	2.60	0.42
1:A:174:PRO:CB	1:A:216:GLU:HG2	2.49	0.42
1:A:121:PRO:HD3	1:B:117:SER:HB2	2.02	0.41
1:C:155:ARG:HE	1:D:162:GLU:CD	2.23	0.41
1:C:76:ARG:CZ	1:C:76:ARG:HB2	2.48	0.41
1:A:162:GLU:OE1	1:B:155:ARG:NH2	2.48	0.41
1:B:86:VAL:HB	1:B:90:ASP:HB2	2.03	0.41
1:D:1:MET:HA	1:D:103:ASN:O	2.20	0.41
1:D:110:GLN:HA	1:D:153:ASN:HB3	2.03	0.41
1:B:175:LEU:O	1:B:213:PRO:HG2	2.20	0.41
1:B:10:THR:OG1	1:B:118:PHE:HZ	2.04	0.41
1:C:7:ASP:O	1:C:22:LEU:HD12	2.21	0.40
1:B:212:ALA:HA	1:B:213:PRO:HD3	1.93	0.40
1:B:36:THR:HG22	1:B:38:ASP:H	1.87	0.40
1:B:89:ILE:O	1:B:92:ILE:HG22	2.22	0.40
1:D:173:CYS:HB3	1:D:198:MET:CB	2.49	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	219/227 (96%)	213 (97%)	6 (3%)	0	100	100
1	B	222/227 (98%)	211 (95%)	11 (5%)	0	100	100
1	C	191/227 (84%)	182 (95%)	9 (5%)	0	100	100
1	D	203/227 (89%)	194 (96%)	8 (4%)	1 (0%)	25	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	835/908 (92%)	800 (96%)	34 (4%)	1 (0%)	48 75

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	220	PRO

5.3.2 Protein sidechains (i)

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	181/202 (90%)	178 (98%)	3 (2%)	56 81
1	B	171/202 (85%)	169 (99%)	2 (1%)	67 87
1	C	163/202 (81%)	162 (99%)	1 (1%)	84 94
1	D	159/202 (79%)	158 (99%)	1 (1%)	84 94
All	All	674/808 (83%)	667 (99%)	7 (1%)	73 90

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	PHE
1	A	60	PHE
1	A	98	TYR
1	B	60	PHE
1	B	128	ARG
1	C	49	PHE
1	D	60	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

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, 95^{th} 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	221/227 (97%)	-0.09	0 100 100	45, 62, 93, 113	0
1	B	224/227 (98%)	0.11	4 (1%) 67 62	48, 75, 115, 138	0
1	C	197/227 (86%)	0.49	12 (6%) 28 24	60, 96, 132, 154	0
1	D	211/227 (92%)	0.58	16 (7%) 21 18	57, 98, 138, 161	0
All	All	853/908 (93%)	0.26	32 (3%) 44 39	45, 79, 129, 161	0

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	26	ALA	4.1
1	D	176	PRO	3.5
1	D	158	ARG	3.4
1	D	219	ASP	3.2
1	B	223	LEU	2.9
1	D	169	ASP	2.8
1	D	27	PHE	2.7
1	C	196	ILE	2.7
1	C	173	CYS	2.7
1	D	119	ASP	2.6
1	C	201	TYR	2.6
1	C	195	ASP	2.5
1	D	37	PHE	2.5
1	D	103	ASN	2.4
1	C	36	THR	2.4
1	C	171	THR	2.4
1	D	170	MET	2.4
1	C	1	MET	2.4
1	D	175	LEU	2.3
1	D	165	LEU	2.3
1	C	2	PHE	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	203	LEU	2.3
1	B	169	ASP	2.2
1	D	206	ALA	2.2
1	D	78	ASN	2.2
1	B	199	MET	2.2
1	B	210	GLU	2.2
1	C	205	TYR	2.1
1	C	17	ALA	2.1
1	D	147	GLU	2.1
1	C	44	GLY	2.0
1	D	164	LEU	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 monosaccharides 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.