Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 01:58 PM UTC

PDB ID	:	3OEO / pdb_00003oeo
Title	:	The crystal structure E. coli Spy
Authors	:	Kwon, E.; Kim, D.Y.; Gross, C.A.; Gross, J.D.; Kim, K.K.
Deposited on	:	2010-08-13
Resolution	:	2.70 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:

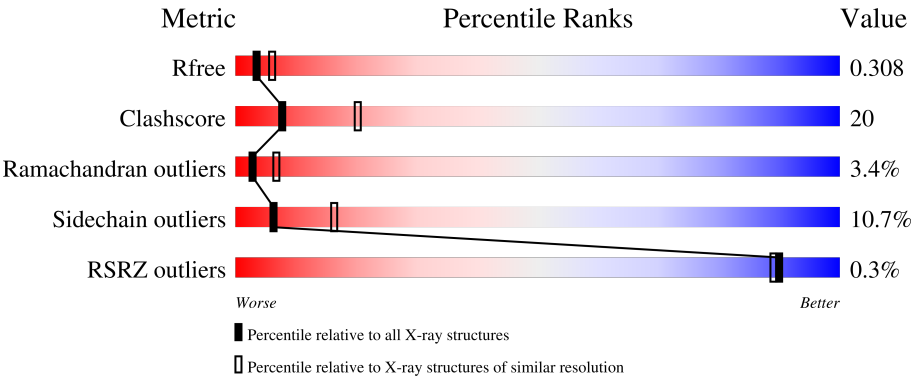
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.70 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	3538 (2.70-2.70)
Clashscore	190562	3843 (2.70-2.70)
Ramachandran outliers	187476	3778 (2.70-2.70)
Sidechain outliers	187428	3778 (2.70-2.70)
RSRZ outliers	180081	3538 (2.70-2.70)

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	138	34% 27% 5% 34%
1	B	138	38% 22% 6% 34%
1	C	138	40% 23% 34%
1	D	138	30% 27% 9% 34%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	CD	B	7	-	-	X	-

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 3126 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 Spheroplast protein Y.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	91	Total	C	N	O	S	0	0	0
			754	464	140	144	6			
1	B	91	Total	C	N	O	S	0	0	0
			754	464	140	144	6			
1	C	91	Total	C	N	O	S	0	0	0
			754	464	140	144	6			
1	D	91	Total	C	N	O	S	0	0	0
			754	464	140	144	6			

- Molecule 2 is CADMIUM ION (CCD ID: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	6	Total	Cd	0	0
			6	6		
2	B	5	Total	Cd	0	0
			5	5		
2	C	7	Total	Cd	0	0
			7	7		
2	D	4	Total	Cd	0	0
			4	4		

- Molecule 3 is water.

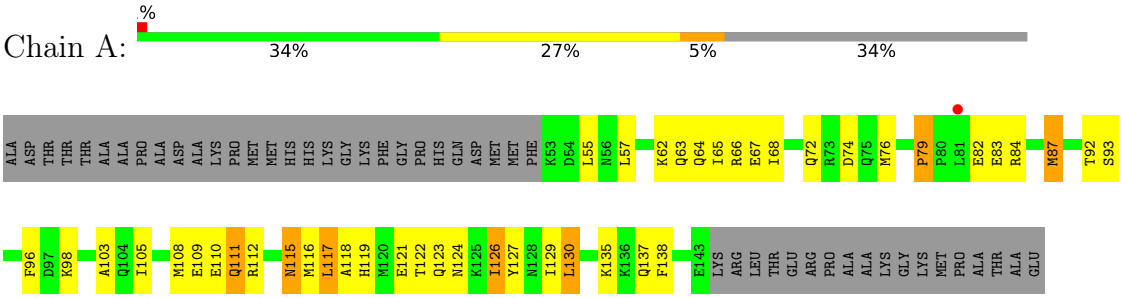
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	18	Total	O	0	0
			18	18		
3	B	22	Total	O	0	0
			22	22		
3	C	26	Total	O	0	0
			26	26		
3	D	22	Total	O	0	0
			22	22		

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.

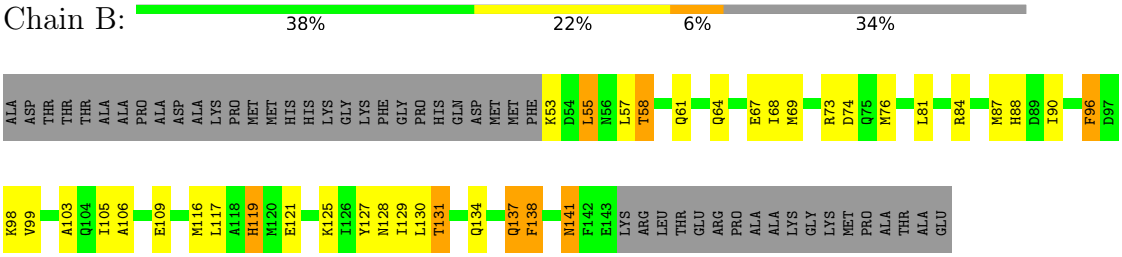
• Molecule 1: Spheroplast protein Y

Chain A:



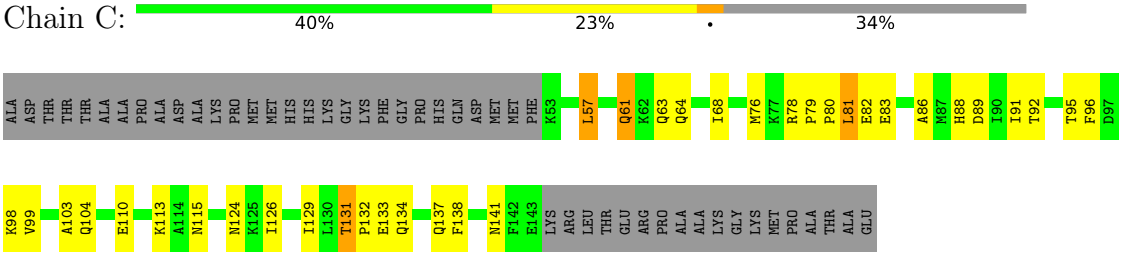
• Molecule 1: Spheroplast protein Y

Chain B:



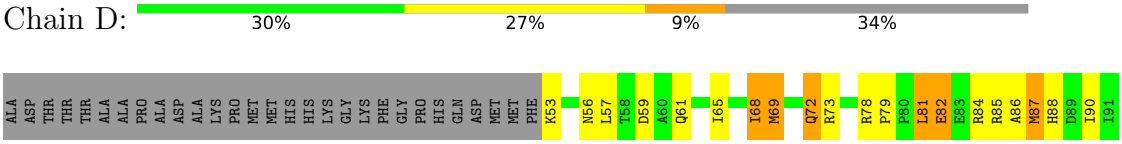
• Molecule 1: Spheroplast protein Y

Chain C:



• Molecule 1: Spheroplast protein Y

Chain D:



T92
S93
D97
K98
V99
K100
A101
E102
A103
Q104
I105
A106
K107
M108
E109
E110
Q111
R112
L117
T122
K125
I126
Y127
N128
I129
L130
T131
P132
E133
Q134
K135
F138
M139
E143
LYS
ARG
LEU
THR
GLU
ARG
PRO
ALA
ALA
LYS
GLY
LYS
MET
PRO
ALA
THR
ALA
GLU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, α, β, γ	69.19Å 69.19Å 126.35Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	20.00 – 2.70 20.00 – 2.70	Depositor EDS
% Data completeness (in resolution range)	98.2 (20.00-2.70) 98.3 (20.00-2.70)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.17 (at 2.71Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.252 , 0.300 0.262 , 0.308	Depositor DCC
R_{free} test set	931 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å^2)	65.5	Xtriage
Anisotropy	0.217	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.20 , 33.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.469 for -h,-k,l 0.477 for h,-h-k,-l 0.477 for -k,-h,-l	Xtriage
Reported twinning fraction	0.263 for H, K, L 0.250 for -H, H+K, -L 0.237 for -h,-k,l 0.250 for -H-K, K, -L	Depositor
Outliers	0 of 18264 reflections	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	3126	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 10.34% 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

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

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	0.51	0/762	0.91	1/1015 (0.1%)
1	B	0.50	0/762	0.91	0/1015
1	C	0.50	0/762	0.89	2/1015 (0.2%)
1	D	0.51	0/762	0.91	2/1015 (0.2%)
All	All	0.51	0/3048	0.90	5/4060 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	131	THR	CA-C-N	6.13	127.50	119.84
1	C	131	THR	C-N-CA	6.13	127.50	119.84
1	A	79	PRO	N-CA-C	5.71	117.67	110.70
1	D	82	GLU	N-CA-C	-5.05	106.97	113.23
1	D	105	ILE	CB-CA-C	-5.02	105.46	112.04

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	754	0	763	34	0
1	B	754	0	763	29	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	754	0	763	25	0
1	D	754	0	763	47	1
2	A	6	0	0	0	0
2	B	5	0	0	0	3
2	C	7	0	0	0	0
2	D	4	0	0	0	0
3	A	18	0	0	1	0
3	B	22	0	0	1	0
3	C	26	0	0	2	2
3	D	22	0	0	2	0
All	All	3126	0	3052	122	3

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 20.

All (122) 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:65:ILE:O	1:D:69:MET:HB2	1.58	1.03
1:C:78:ARG:HB3	1:C:79:PRO:HD2	1.48	0.95
1:A:57:LEU:HD11	1:A:62:LYS:HG3	1.49	0.95
1:D:127:TYR:HE1	1:D:139:ASN:HD21	1.19	0.91
1:D:84:ARG:HA	1:D:87:MET:SD	2.17	0.84
1:D:65:ILE:O	1:D:69:MET:CB	2.27	0.82
1:D:90:ILE:HG12	1:D:100:LYS:HD3	1.62	0.81
1:D:106:ALA:O	3:D:178:HOH:O	1.97	0.81
1:D:85:ARG:HA	1:D:88:HIS:NE2	1.97	0.80
1:A:121:GLU:HG2	1:C:96:PHE:CE2	2.17	0.80
1:A:124:ASN:ND2	1:C:91:ILE:O	2.16	0.78
1:B:99:VAL:HG13	3:B:3:HOH:O	1.84	0.75
1:C:78:ARG:HB3	1:C:79:PRO:CD	2.14	0.75
1:B:96:PHE:CZ	1:B:98:LYS:HG3	2.24	0.71
1:B:69:MET:HA	1:B:73:ARG:HB2	1.72	0.71
1:C:57:LEU:HD12	1:C:61:GLN:HB2	1.72	0.70
1:D:135:LYS:O	1:D:139:ASN:ND2	2.25	0.69
1:A:92:THR:HG22	1:C:138:PHE:HE2	1.58	0.69
1:B:131:THR:HG23	1:B:134:GLN:HB2	1.78	0.65
1:A:76:MET:SD	1:A:118:ALA:CB	2.86	0.63
1:A:92:THR:HG22	1:C:138:PHE:CE2	2.33	0.63
1:A:57:LEU:CD1	1:A:62:LYS:HG3	2.27	0.63
1:D:86:ALA:O	1:D:90:ILE:HG13	1.97	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:63:GLN:HG3	3:C:176:HOH:O	1.99	0.63
1:A:76:MET:SD	1:A:118:ALA:HB1	2.39	0.62
1:A:103:ALA:HB2	1:D:103:ALA:HB2	1.81	0.62
1:D:88:HIS:O	1:D:92:THR:HG23	2.01	0.61
1:B:58:THR:HG22	1:B:61:GLN:HB2	1.82	0.61
1:D:104:GLN:HE22	1:D:107:LYS:HD2	1.66	0.60
1:D:61:GLN:OE1	1:D:130:LEU:HA	2.01	0.59
1:D:104:GLN:NE2	1:D:104:GLN:HA	2.17	0.59
1:D:139:ASN:HD22	1:D:139:ASN:N	2.00	0.59
1:B:116:MET:HE1	1:D:112:ARG:NE	2.17	0.59
1:D:104:GLN:HA	1:D:104:GLN:HE21	1.67	0.59
1:B:57:LEU:O	1:B:61:GLN:HB3	2.05	0.57
1:B:98:LYS:HG2	1:D:117:LEU:HD11	1.87	0.56
1:B:68:ILE:HG21	1:B:125:LYS:HD2	1.87	0.55
1:D:127:TYR:HE1	1:D:139:ASN:ND2	1.96	0.55
1:C:131:THR:HB	1:C:132:PRO:HD2	1.88	0.54
1:B:68:ILE:CG2	1:B:125:LYS:HD2	2.38	0.54
1:D:131:THR:OG1	1:D:133:GLU:HG2	2.07	0.53
1:B:138:PHE:O	1:B:141:ASN:HB3	2.09	0.53
1:A:64:GLN:HB3	1:A:129:ILE:HD13	1.91	0.52
1:D:53:LYS:HE2	1:D:138:PHE:HE1	1.75	0.52
1:D:88:HIS:O	1:D:92:THR:N	2.43	0.52
1:D:81:LEU:HA	1:D:84:ARG:HB2	1.93	0.51
1:D:68:ILE:O	1:D:72:GLN:HG3	2.11	0.51
1:D:139:ASN:HD22	1:D:139:ASN:H	1.58	0.51
1:A:57:LEU:HD23	1:A:57:LEU:H	1.76	0.51
1:D:56:ASN:HB3	3:D:175:HOH:O	2.11	0.51
1:D:72:GLN:HB2	1:D:122:THR:HG21	1.92	0.50
1:A:109:GLU:HG3	1:A:110:GLU:N	2.27	0.50
1:D:69:MET:O	1:D:73:ARG:HB2	2.11	0.49
1:A:111:GLN:HG3	1:A:112:ARG:N	2.28	0.49
1:A:124:ASN:O	1:A:127:TYR:HB3	2.13	0.49
1:D:85:ARG:HA	1:D:88:HIS:CE1	2.48	0.49
1:B:76:MET:HE1	1:B:119:HIS:HD2	1.78	0.48
1:A:115:ASN:O	1:A:116:MET:C	2.55	0.48
1:C:57:LEU:H	1:C:57:LEU:HD23	1.78	0.48
1:B:127:TYR:C	1:B:129:ILE:H	2.22	0.48
1:B:64:GLN:O	1:B:67:GLU:HG2	2.13	0.48
1:B:128:ASN:ND2	1:D:93:SER:O	2.40	0.48
1:A:123:GLN:HA	1:A:126:ILE:CG2	2.44	0.48
3:A:163:HOH:O	1:D:107:LYS:HE2	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:55:LEU:HD22	1:A:137:GLN:HB3	1.96	0.47
1:C:115:ASN:HD22	1:C:115:ASN:N	2.12	0.47
1:A:96:PHE:CE2	1:A:98:LYS:HG3	2.49	0.47
1:C:86:ALA:HA	1:C:89:ASP:HB2	1.95	0.47
1:D:98:LYS:O	1:D:100:LYS:N	2.48	0.47
1:C:64:GLN:HA	3:C:176:HOH:O	2.14	0.47
1:A:76:MET:SD	1:A:118:ALA:HB2	2.55	0.46
1:A:127:TYR:O	1:A:130:LEU:HB2	2.14	0.46
1:D:78:ARG:HB3	1:D:79:PRO:HD3	1.96	0.46
1:A:68:ILE:HD11	1:A:129:ILE:HD11	1.98	0.46
1:C:79:PRO:HA	1:C:80:PRO:HD3	1.75	0.45
1:C:83:GLU:HB3	1:C:104:GLN:HE22	1.80	0.45
1:A:121:GLU:HG2	1:C:96:PHE:CZ	2.51	0.45
1:A:127:TYR:O	1:A:135:LYS:HE2	2.16	0.45
1:B:117:LEU:HD21	1:D:98:LYS:HE3	1.98	0.45
1:D:57:LEU:HD23	1:D:57:LEU:H	1.82	0.45
1:D:90:ILE:HG21	1:D:101:ALA:HB2	1.99	0.45
1:D:108:MET:HB3	1:D:112:ARG:HE	1.83	0.44
1:B:61:GLN:NE2	1:B:130:LEU:HA	2.33	0.44
1:B:96:PHE:HZ	1:B:98:LYS:HG3	1.77	0.44
1:D:105:ILE:H	1:D:105:ILE:HG13	1.59	0.44
1:C:68:ILE:HG21	1:C:126:ILE:HG13	1.99	0.43
1:C:76:MET:HE3	1:C:78:ARG:NH2	2.33	0.43
1:D:104:GLN:NE2	1:D:107:LYS:HD2	2.32	0.43
1:B:87:MET:O	1:B:88:HIS:C	2.62	0.43
1:B:116:MET:HE1	1:D:112:ARG:CZ	2.49	0.43
1:C:138:PHE:HA	1:C:141:ASN:HD22	1.83	0.43
1:A:68:ILE:CD1	1:A:129:ILE:HD11	2.49	0.43
1:A:96:PHE:HB2	1:C:124:ASN:CG	2.44	0.43
1:C:81:LEU:HD12	1:C:82:GLU:H	1.84	0.43
1:A:72:GLN:OE1	1:A:119:HIS:NE2	2.52	0.42
1:B:81:LEU:HA	1:B:84:ARG:HD2	2.00	0.42
1:D:109:GLU:HG3	1:D:110:GLU:N	2.33	0.42
1:B:69:MET:HG2	1:B:73:ARG:HD2	2.00	0.42
1:A:62:LYS:HA	1:A:65:ILE:HD12	2.01	0.42
1:D:122:THR:O	1:D:126:ILE:HD12	2.19	0.42
1:A:67:GLU:HG2	1:A:68:ILE:HG13	2.02	0.42
1:B:106:ALA:O	1:B:109:GLU:HB2	2.20	0.42
1:D:108:MET:HE2	1:D:112:ARG:NH2	2.35	0.42
1:B:127:TYR:HD1	1:B:128:ASN:ND2	2.18	0.41
1:C:110:GLU:O	1:C:113:LYS:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:63:GLN:O	1:A:66:ARG:HB3	2.20	0.41
1:B:57:LEU:O	1:B:58:THR:C	2.63	0.41
1:B:137:GLN:H	1:B:137:GLN:HG2	1.68	0.41
1:C:98:LYS:O	1:C:99:VAL:C	2.63	0.41
1:A:84:ARG:HA	1:A:87:MET:SD	2.60	0.41
1:A:122:THR:O	1:A:126:ILE:HG22	2.20	0.41
1:D:68:ILE:HD13	1:D:125:LYS:HB3	2.01	0.41
1:B:55:LEU:HD22	1:B:134:GLN:HG3	2.03	0.41
1:A:82:GLU:HG3	1:A:83:GLU:OE1	2.21	0.41
1:B:58:THR:HG23	1:B:61:GLN:H	1.86	0.41
1:D:82:GLU:HA	1:D:85:ARG:NH2	2.35	0.41
1:D:139:ASN:ND2	1:D:139:ASN:N	2.66	0.41
1:D:98:LYS:O	1:D:99:VAL:C	2.63	0.41
1:A:108:MET:HA	1:A:111:GLN:HG2	2.03	0.41
1:C:88:HIS:O	1:C:92:THR:HG23	2.22	0.40
1:A:55:LEU:HD11	1:A:138:PHE:HB2	2.04	0.40
1:B:103:ALA:HB2	1:C:103:ALA:HB2	2.03	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:97:ASP:OD1	2:B:8:CD:CD[2_554]	1.98	0.22
2:B:7:CD:CD	3:C:168:HOH:O[1_565]	2.07	0.13
2:B:7:CD:CD	3:C:170:HOH:O[1_565]	2.07	0.13

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	89/138 (64%)	72 (81%)	13 (15%)	4 (4%)	2 4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	89/138 (64%)	71 (80%)	14 (16%)	4 (4%)	2 4
1	C	89/138 (64%)	74 (83%)	15 (17%)	0	100 100
1	D	89/138 (64%)	75 (84%)	10 (11%)	4 (4%)	2 4
All	All	356/552 (64%)	292 (82%)	52 (15%)	12 (3%)	3 7

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	58	THR
1	D	99	VAL
1	A	74	ASP
1	B	121	GLU
1	D	81	LEU
1	A	117	LEU
1	D	102	GLU
1	A	105	ILE
1	B	55	LEU
1	D	59	ASP
1	A	79	PRO
1	B	105	ILE

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	82/117 (70%)	75 (92%)	7 (8%)	10 25
1	B	82/117 (70%)	73 (89%)	9 (11%)	6 15
1	C	82/117 (70%)	74 (90%)	8 (10%)	7 19
1	D	82/117 (70%)	71 (87%)	11 (13%)	4 9
All	All	328/468 (70%)	293 (89%)	35 (11%)	6 16

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	87	MET
1	A	93	SER
1	A	111	GLN
1	A	115	ASN
1	A	117	LEU
1	A	126	ILE
1	A	130	LEU
1	B	53	LYS
1	B	74	ASP
1	B	90	ILE
1	B	96	PHE
1	B	119	HIS
1	B	131	THR
1	B	137	GLN
1	B	138	PHE
1	B	141	ASN
1	C	57	LEU
1	C	61	GLN
1	C	81	LEU
1	C	95	THR
1	C	129	ILE
1	C	133	GLU
1	C	134	GLN
1	C	137	GLN
1	D	68	ILE
1	D	69	MET
1	D	72	GLN
1	D	87	MET
1	D	93	SER
1	D	122	THR
1	D	126	ILE
1	D	129	ILE
1	D	130	LEU
1	D	139	ASN
1	D	143	GLU

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	64	GLN
1	A	88	HIS
1	A	137	GLN
1	A	141	ASN

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Mol	Chain	Res	Type
1	B	72	GLN
1	B	75	GLN
1	B	104	GLN
1	B	124	ASN
1	B	137	GLN
1	C	72	GLN
1	C	104	GLN
1	C	115	ASN
1	C	128	ASN
1	C	137	GLN
1	C	139	ASN
1	C	141	ASN
1	D	75	GLN
1	D	104	GLN
1	D	123	GLN
1	D	124	ASN
1	D	128	ASN
1	D	134	GLN
1	D	137	GLN
1	D	139	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 22 ligands modelled in this entry, 22 are 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, 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	91/138 (65%)	-0.43	1 (1%) 78 76	53, 87, 109, 113	0
1	B	91/138 (65%)	-0.44	0 100 100	54, 83, 113, 125	0
1	C	91/138 (65%)	-0.45	0 100 100	60, 86, 106, 111	0
1	D	91/138 (65%)	-0.54	0 100 100	51, 81, 107, 110	0
All	All	364/552 (65%)	-0.47	1 (0%) 90 89	51, 86, 109, 125	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	81	LEU	2.3

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 oligosaccharides in this entry.

6.4 Ligands

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, 95^{th} 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(Å^2)	Q<0.9
2	CD	C	11	1/1	0.94	0.09	120,120,120,120	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CD	B	12	1/1	0.96	0.03	168,168,168,168	0
2	CD	A	23	1/1	0.96	0.04	102,102,102,102	0
2	CD	A	14	1/1	0.97	0.05	137,137,137,137	0
2	CD	C	162	1/1	0.97	0.09	42,42,42,42	0
2	CD	D	16	1/1	0.97	0.09	89,89,89,89	0
2	CD	C	9	1/1	0.98	0.04	77,77,77,77	0
2	CD	B	8	1/1	0.98	0.06	46,46,46,46	0
2	CD	A	162	1/1	0.98	0.05	91,91,91,91	0
2	CD	D	13	1/1	0.98	0.07	112,112,112,112	0
2	CD	B	15	1/1	0.98	0.06	109,109,109,109	0
2	CD	D	162	1/1	0.98	0.11	77,77,77,77	0
2	CD	A	22	1/1	0.99	0.04	94,94,94,94	0
2	CD	C	17	1/1	0.99	0.07	87,87,87,87	0
2	CD	C	19	1/1	0.99	0.04	69,69,69,69	0
2	CD	C	20	1/1	0.99	0.02	99,99,99,99	0
2	CD	C	21	1/1	0.99	0.03	106,106,106,106	0
2	CD	A	5	1/1	0.99	0.09	68,68,68,68	0
2	CD	D	10	1/1	0.99	0.04	66,66,66,66	0
2	CD	A	18	1/1	0.99	0.06	76,76,76,76	0
2	CD	B	162	1/1	0.99	0.03	70,70,70,70	0
2	CD	B	7	1/1	0.99	0.07	51,51,51,51	0

6.5 Other polymers (i)

There are no such residues in this entry.