Full wwPDB X-ray Structure Validation Report (i)

Oct 16, 2023 – 03:53 PM EDT

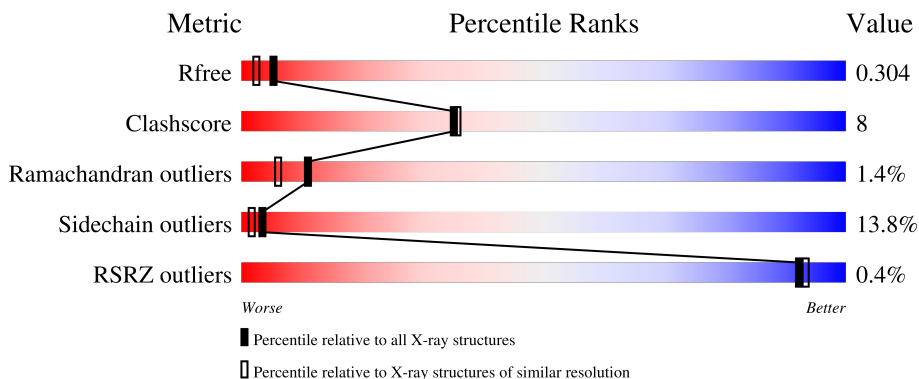|		
PDB ID	:	1YUP
Title	:	Reindeer beta-lactoglobulin
Authors	:	Goldman, A.; Oksanen, E.
Deposited on	:	2005-02-14
Resolution	:	2.10 Å(reported)

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 2.10 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.
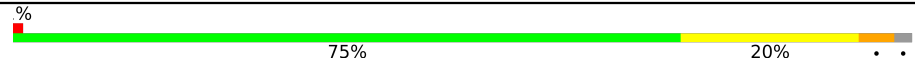
Metric	Percentile Ranks	Value
Rfree		0.304
Clashscore		8
Ramachandran outliers		1.4%
Sidechain outliers		13.8%
RSRZ outliers		0.4%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
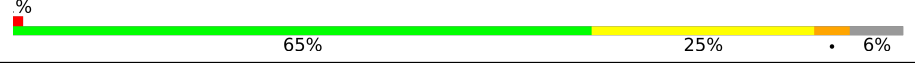
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	162	72% 23% • •
1	B	162	.% 72% 22% • • •
1	C	162	70% 23% 5% •
1	D	162	.% 72% 20% 5% •
1	E	162	67% 26% • 5%

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Mol	Chain	Length	Quality of chain
1	F	162	75% 20%
1	G	162	67% 28%
1	H	162	65% 25% 6%

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 10045 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 beta-lactoglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	162	Total	C	N	O	S	0	1	0
			1241	788	202	241	10			
1	B	158	Total	C	N	O	S	0	0	0
			1191	758	196	227	10			
1	C	160	Total	C	N	O	S	0	1	0
			1220	773	197	240	10			
1	D	158	Total	C	N	O	S	0	1	0
			1216	771	197	238	10			
1	E	154	Total	C	N	O	S	0	1	0
			1189	757	194	229	9			
1	F	159	Total	C	N	O	S	0	1	0
			1220	777	199	234	10			
1	G	160	Total	C	N	O	S	0	1	0
			1238	787	202	239	10			
1	H	152	Total	C	N	O	S	0	1	0
			1169	745	190	225	9			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	68	Total	O	0	0
			68	68		
2	B	32	Total	O	0	0
			32	32		
2	C	49	Total	O	0	0
			49	49		
2	D	33	Total	O	0	0
			33	33		
2	E	45	Total	O	0	0
			45	45		
2	F	42	Total	O	0	0
			42	42		

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WORLDWIDE
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	G	52	Total 52	O 52	0	0
2	H	40	Total 40	O 40	0	0

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: beta-lactoglobulin
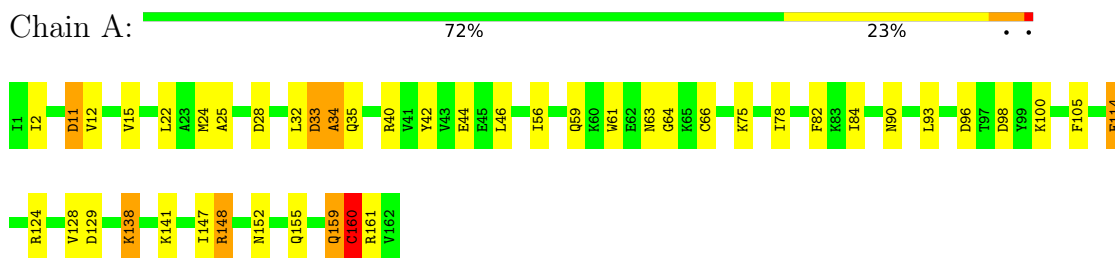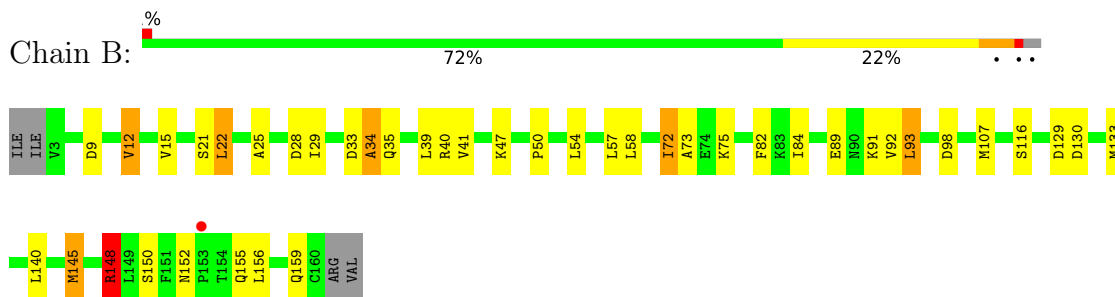
Chain A:

- Molecule 1: beta-lactoglobulin

Chain B:

- Molecule 1: beta-lactoglobulin

Chain C:

- Molecule 1: beta-lactoglobulin

Chain D:

D129 M133 D137 M145 N152 L156 C160 ARG VAL
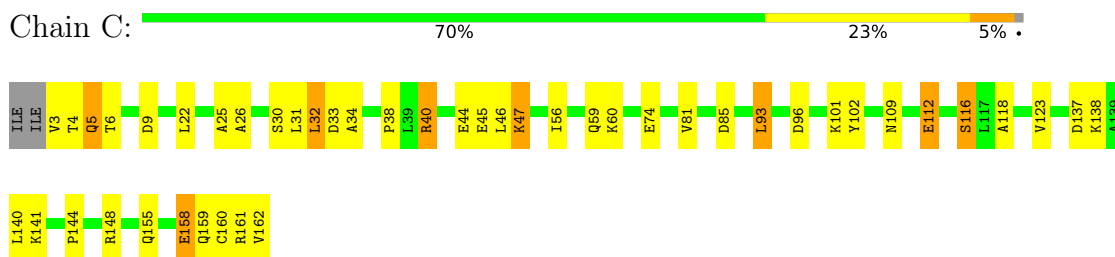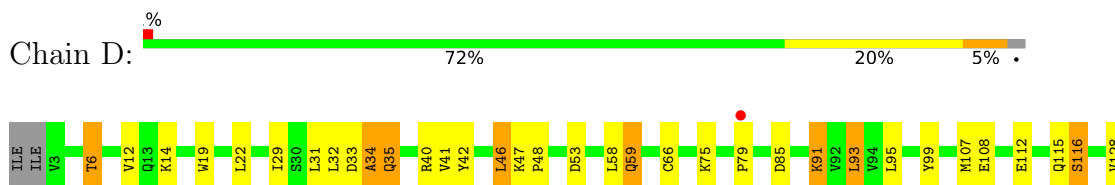
• Molecule 1: beta-lactoglobulin

Chain E:

67% 26% • 5%

ILE ILE VAL THR GLN THR MET LYS D9 L10 D11 V12 L22 A23 M24 S27 S30 L31 L32 D33 A34 Q35 P38 L39 R40 V41 Y42 L46 K47 P50 E55 I56 L57 W61 G64 Q68 K69 K70 I71 I72 K75 V81 F82 K83 L93 D96

T97 D98 F105 C106 M107 E114 L117 D129 L143 R148 N152 Q155 E158 Q159 C160 R161 V162

• Molecule 1: beta-lactoglobulin

Chain F:

%

75% 20% • •

ILE I2 V3 T4 Q5 T6 D9 V12 L22 D28 I29 D33 A34 Q35 R40 V41 Y42 L46 G52 D53 L54 K60 C66 I72 K75 P79 D85 K91 L95 D98 E112 Q115 S116 D129 D130 E131 A132 M133 F136

L140 M145 R148 E157 E158 Q159 C160 ARG VAL

• Molecule 1: beta-lactoglobulin

Chain G:

%

67% 28% • •

ILE ILE V3 T4 Q5 T6 D11 V12 Q13 K14 L22 A23 M24 A25 A26 S27 D28 I29 S30 L31 L32 D33 A34 Q35 S36 A37 P38 L39 E44 E45 L46 K47 P48 I56 Q59 K60 W61 G64 K70 I78 V81 F82 K83 I84 D85 N90 K91 V92 L93

D96 T97 D98 Y99 K100 E127 V128 D129 K141 H146 I147 R148 N152 Q155 Q159 C160 R161 V162

• Molecule 1: beta-lactoglobulin

Chain H:

%

65% 25% • 6%

ILE ILE VAL THR GLN THR MET LYS D9 L10 D11 V12 Q13 K14 V15 S21 L22 A23 M24 D28 I29 D33 A34 Q35 V41 Y42 K47 L58 Q59 K60 W61 E62 N63 K69 I72 A73 E74 K75 P79 F82 K83 I84 N88 E89 N90 K91 V92 L93 V94

L95 D96 Y99 K100 K101 N109 D129 D130 L140 R148 L149 S150 P153 T154 Q155 L156 E157 E158 Q159 C160 ARG VAL
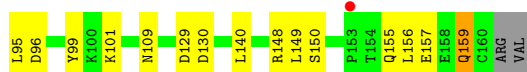
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	52.24Å 94.14Å 64.15Å 90.00° 105.76° 90.00°	Depositor
Resolution (Å)	19.96 – 2.10 19.96 – 2.10	Depositor EDS
% Data completeness (in resolution range)	100.0 (19.96-2.10) 93.0 (19.96-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.25 (at 2.09Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.235 , 0.311 0.236 , 0.304	Depositor DCC
R_{free} test set	3186 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	28.7	Xtriage
Anisotropy	0.355	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 26.5	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.477 for -h,k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	10045	wwPDB-VP
Average B, all atoms (Å^2)	36.0	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 71.55 % 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 2.5742e-06. 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 (i)

5.1 Standard geometry (i)

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	0.64	0/1266	0.89	6/1717 (0.3%)
1	B	0.61	0/1211	0.91	7/1645 (0.4%)
1	C	0.62	0/1245	0.89	4/1692 (0.2%)
1	D	0.62	0/1239	0.86	3/1677 (0.2%)
1	E	0.64	0/1214	0.89	4/1648 (0.2%)
1	F	0.63	0/1244	0.85	5/1686 (0.3%)
1	G	0.65	0/1263	0.91	5/1711 (0.3%)
1	H	0.61	0/1192	0.87	5/1613 (0.3%)
All	All	0.63	0/9874	0.88	39/13389 (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	C	0	1
1	E	0	1
1	G	0	1
All	All	0	4

There are no bond length outliers.

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	85	ASP	CB-CG-OD2	6.98	124.58	118.30
1	B	98	ASP	CB-CG-OD2	6.48	124.13	118.30
1	F	129	ASP	CB-CG-OD2	6.39	124.05	118.30
1	D	129	ASP	CB-CG-OD2	6.38	124.04	118.30
1	G	129	ASP	CB-CG-OD2	6.24	123.91	118.30
1	A	28	ASP	CB-CG-OD2	6.19	123.87	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	G	98	ASP	CB-CG-OD2	6.00	123.70	118.30
1	C	85	ASP	CB-CG-OD2	6.00	123.70	118.30
1	B	28	ASP	CB-CG-OD2	5.95	123.65	118.30
1	G	22	LEU	CA-CB-CG	5.95	128.98	115.30
1	E	9	ASP	CB-CG-OD2	5.91	123.62	118.30
1	F	85	ASP	CB-CG-OD2	5.87	123.59	118.30
1	A	11	ASP	CB-CG-OD2	5.86	123.58	118.30
1	A	96	ASP	CB-CG-OD2	5.86	123.57	118.30
1	H	130	ASP	CB-CG-OD2	5.82	123.53	118.30
1	C	137	ASP	CB-CG-OD2	5.80	123.52	118.30
1	H	28	ASP	CB-CG-OD2	5.75	123.47	118.30
1	C	9	ASP	CB-CG-OD2	5.64	123.38	118.30
1	B	129	ASP	CB-CG-OD2	5.62	123.36	118.30
1	B	40	ARG	NE-CZ-NH2	-5.61	117.50	120.30
1	B	9	ASP	CB-CG-OD2	5.60	123.34	118.30
1	B	148	ARG	NE-CZ-NH1	5.57	123.09	120.30
1	E	98	ASP	CB-CG-OD2	5.57	123.31	118.30
1	G	96	ASP	CB-CG-OD2	5.57	123.31	118.30
1	A	33	ASP	CB-CG-OD2	5.45	123.21	118.30
1	F	98	ASP	CB-CG-OD2	5.45	123.20	118.30
1	E	96	ASP	CB-CG-OD2	5.44	123.20	118.30
1	A	129	ASP	CB-CG-OD2	5.44	123.19	118.30
1	C	40	ARG	NE-CZ-NH1	5.42	123.01	120.30
1	B	130	ASP	CB-CG-OD2	5.39	123.15	118.30
1	D	53	ASP	CB-CG-OD2	5.39	123.15	118.30
1	G	85	ASP	CB-CG-OD2	5.39	123.15	118.30
1	H	129	ASP	CB-CG-OD2	5.37	123.13	118.30
1	E	129	ASP	CB-CG-OD2	5.36	123.12	118.30
1	H	96	ASP	CB-CG-OD2	5.25	123.03	118.30
1	F	53	ASP	CB-CG-OD2	5.12	122.91	118.30
1	F	28	ASP	CB-CG-OD2	5.11	122.90	118.30
1	H	11	ASP	CB-CG-OD2	5.11	122.90	118.30
1	A	98	ASP	CB-CG-OD2	5.02	122.82	118.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	160[B]	CYS	Mainchain
1	C	160[B]	CYS	Mainchain
1	E	160[B]	CYS	Mainchain
1	G	160[B]	CYS	Mainchain

5.2 Too-close contacts (i)

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	1241	0	1222	24	1
1	B	1191	0	1165	24	0
1	C	1220	0	1176	18	0
1	D	1216	0	1189	21	0
1	E	1189	0	1175	19	0
1	F	1220	0	1209	14	0
1	G	1238	0	1230	26	0
1	H	1169	0	1156	17	1
2	A	68	0	0	3	0
2	B	32	0	0	3	0
2	C	49	0	0	2	0
2	D	33	0	0	0	0
2	E	45	0	0	6	0
2	F	42	0	0	6	0
2	G	52	0	0	6	0
2	H	40	0	0	0	0
All	All	10045	0	9522	158	1

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 8.

All (158) 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:E:31:LEU:O	1:E:38:PRO:O	1.95	0.84
1:C:31:LEU:O	1:C:38:PRO:O	1.98	0.80
1:G:152:ASN:H	1:G:155:GLN:HE21	1.31	0.77
1:E:42:TYR:OH	2:E:181:HOH:O	2.08	0.72
1:G:31:LEU:HD12	2:G:197:HOH:O	1.89	0.71
1:B:29:ILE:O	1:B:33:ASP:HB2	1.90	0.71
1:E:35:GLN:CD	2:E:181:HOH:O	2.29	0.69
1:A:155:GLN:O	2:A:390:HOH:O	2.09	0.69
1:G:161:ARG:O	2:G:166:HOH:O	2.13	0.67
1:G:152:ASN:H	1:G:155:GLN:NE2	1.94	0.66
1:F:52:GLY:O	2:F:196:HOH:O	2.13	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:59:GLN:HG2	1:D:66:CYS:SG	2.37	0.64
1:G:155:GLN:OE1	1:G:162:VAL:HG12	1.98	0.64
1:B:41:VAL:HB	1:B:58:LEU:HD13	1.80	0.63
1:C:112:GLU:O	1:C:112:GLU:HG2	1.98	0.62
1:E:35:GLN:HE21	1:E:162:VAL:HB	1.64	0.62
1:E:152:ASN:H	1:E:155:GLN:HE21	1.49	0.60
1:B:84:ILE:HD11	1:B:89:GLU:HB2	1.84	0.60
1:B:50:PRO:HA	2:B:262:HOH:O	2.01	0.60
1:C:3:VAL:N	1:G:4:THR:O	2.35	0.59
1:F:40:ARG:NH1	2:F:197:HOH:O	2.34	0.59
1:C:59:GLN:OE1	1:C:159:GLN:HB3	2.04	0.58
1:G:148:ARG:HD2	2:G:200:HOH:O	2.02	0.57
1:E:61:TRP:CZ2	1:E:64:GLY:HA2	2.38	0.57
1:B:91:LYS:NZ	1:G:11:ASP:OD2	2.27	0.57
1:D:108:GLU:OE1	1:E:50:PRO:O	2.23	0.56
1:B:21:SER:H	1:B:159:GLN:HE22	1.54	0.56
1:G:100:LYS:HA	1:G:100:LYS:CE	2.35	0.56
1:A:2:ILE:HD11	1:A:114:GLU:HA	1.87	0.56
1:B:89:GLU:OE1	1:B:116:SER:OG	2.23	0.56
1:B:148:ARG:HD3	2:B:266:HOH:O	2.04	0.56
1:B:12:VAL:O	1:B:15:VAL:HG22	2.06	0.56
1:E:81:VAL:HG22	1:E:93:LEU:HD12	1.88	0.56
1:F:35:GLN:HG3	2:F:188:HOH:O	2.06	0.55
1:F:136:PHE:CZ	1:F:140:LEU:HD11	2.41	0.55
1:D:91:LYS:NZ	1:E:11:ASP:OD2	2.40	0.55
1:D:29:ILE:O	1:D:33:ASP:HB2	2.05	0.55
1:D:133:MET:HA	1:D:133:MET:HE2	1.87	0.55
1:B:21:SER:N	1:B:159:GLN:HE22	2.05	0.55
1:G:81:VAL:HG22	1:G:93:LEU:HD12	1.89	0.54
1:H:84:ILE:HD11	1:H:89:GLU:HB2	1.90	0.54
1:H:21:SER:HB2	1:H:159:GLN:HE22	1.73	0.53
1:E:148:ARG:HD2	2:F:193:HOH:O	2.09	0.53
1:A:128:VAL:HG13	1:A:128:VAL:O	2.09	0.53
1:H:41:VAL:HB	1:H:58:LEU:HD13	1.91	0.52
1:G:61:TRP:CH2	1:G:64:GLY:O	2.63	0.52
1:A:152:ASN:H	1:A:155:GLN:HE21	1.57	0.52
1:G:84:ILE:O	1:G:90:ASN:HA	2.10	0.52
1:B:25:ALA:HB1	1:B:145:MET:HG2	1.93	0.51
1:D:33:ASP:O	1:D:34:ALA:CB	2.58	0.51
1:A:35:GLN:HE21	1:A:35:GLN:HA	1.75	0.51
1:F:53:ASP:CG	2:F:205:HOH:O	2.50	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:200:HOH:O	1:F:148:ARG:HD2	2.10	0.50
1:B:39:LEU:HD11	1:B:89:GLU:OE2	2.11	0.50
1:B:22:LEU:HD23	1:B:156:LEU:HD11	1.93	0.50
1:D:112:GLU:O	1:D:116:SER:HB2	2.11	0.50
1:E:152:ASN:H	1:E:155:GLN:NE2	2.10	0.49
1:B:33:ASP:O	1:B:34:ALA:CB	2.59	0.49
1:F:33:ASP:O	1:F:34:ALA:HB3	2.11	0.49
1:C:81:VAL:HG22	1:C:93:LEU:HD12	1.95	0.49
1:E:38:PRO:O	1:E:39:LEU:HB2	2.13	0.49
1:G:12:VAL:HG12	1:G:48:PRO:HB3	1.95	0.49
1:D:112:GLU:HG3	1:D:115:GLN:HB2	1.95	0.49
1:C:112:GLU:O	1:C:112:GLU:CG	2.61	0.48
1:D:93:LEU:HD22	1:D:93:LEU:N	2.27	0.48
1:H:42:TYR:HB3	1:H:159:GLN:NE2	2.28	0.48
1:E:159:GLN:O	2:E:183:HOH:O	2.20	0.48
1:G:146:HIS:CD2	2:G:213:HOH:O	2.65	0.48
1:C:45:GLU:OE2	1:C:47:LYS:HD3	2.13	0.48
1:A:25:ALA:HA	1:A:147:ILE:O	2.14	0.48
1:G:33:ASP:O	1:G:34:ALA:HB3	2.13	0.48
1:C:96:ASP:OD2	1:C:102:TYR:OH	2.22	0.48
1:A:35:GLN:HA	1:A:35:GLN:NE2	2.29	0.48
1:F:33:ASP:O	1:F:34:ALA:CB	2.62	0.48
1:F:29:ILE:O	1:F:33:ASP:HB2	2.13	0.47
1:E:12:VAL:HG23	2:E:178:HOH:O	2.13	0.47
1:G:29:ILE:O	1:G:33:ASP:HB2	2.14	0.47
1:A:44:GLU:OE2	1:A:59:GLN:CD	2.53	0.47
1:H:12:VAL:O	1:H:15:VAL:HG22	2.15	0.47
1:C:60:LYS:HE2	2:C:209:HOH:O	2.13	0.47
1:G:38:PRO:O	1:G:39:LEU:CB	2.63	0.47
1:G:100:LYS:HA	1:G:100:LYS:HE2	1.96	0.47
1:D:133:MET:HA	1:D:133:MET:CE	2.45	0.47
1:A:78:ILE:O	2:A:448:HOH:O	2.20	0.46
1:H:73:ALA:HB1	1:H:82:PHE:CB	2.45	0.46
1:D:35:GLN:NE2	1:D:42:TYR:OH	2.48	0.46
1:B:72:ILE:N	1:B:72:ILE:HD13	2.31	0.46
1:F:6:THR:HB	2:F:216:HOH:O	2.15	0.46
1:C:144:PRO:HB3	2:G:196:HOH:O	2.15	0.46
1:H:22:LEU:HA	1:H:156:LEU:HD21	1.97	0.45
1:H:33:ASP:O	1:H:34:ALA:CB	2.64	0.45
1:A:152:ASN:H	1:A:155:GLN:NE2	2.13	0.45
1:E:117:LEU:HD21	1:E:143:LEU:HD22	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:61:TRP:CH2	1:A:64:GLY:O	2.70	0.45
1:C:148:ARG:HD2	2:C:204:HOH:O	2.16	0.45
1:G:152:ASN:N	1:G:155:GLN:HE21	2.08	0.45
1:D:152:ASN:O	1:D:156:LEU:HG	2.17	0.45
1:D:31:LEU:HD11	1:D:115:GLN:O	2.16	0.44
1:G:38:PRO:O	1:G:39:LEU:HB2	2.17	0.44
1:H:33:ASP:O	1:H:34:ALA:HB2	2.17	0.44
1:H:88:ASN:O	1:H:109:ASN:ND2	2.45	0.44
1:A:12:VAL:HB	2:A:449:HOH:O	2.18	0.44
1:F:112:GLU:HG3	1:F:115:GLN:HB2	1.98	0.44
1:H:84:ILE:O	1:H:90:ASN:HA	2.18	0.44
1:A:33:ASP:O	1:A:34:ALA:HB3	2.17	0.44
1:B:93:LEU:HD22	1:B:93:LEU:N	2.33	0.43
1:D:6:THR:HB	2:E:182:HOH:O	2.18	0.43
1:E:57:LEU:HD13	1:E:68:GLN:HE22	1.83	0.43
1:A:33:ASP:OD1	1:A:33:ASP:C	2.55	0.43
1:B:152:ASN:O	1:B:156:LEU:HG	2.18	0.43
1:G:78:ILE:HB	1:G:81:VAL:HB	2.00	0.43
1:A:148:ARG:HD3	1:B:148:ARG:HD2	1.99	0.43
1:H:72:ILE:HD13	1:H:72:ILE:N	2.32	0.43
1:A:66:CYS:SG	1:A:159:GLN:O	2.76	0.43
1:E:27:SER:OG	1:E:114:GLU:O	2.33	0.43
1:B:12:VAL:HG23	2:B:273:HOH:O	2.19	0.43
1:C:44:GLU:CG	1:C:59:GLN:HE21	2.32	0.43
1:D:41:VAL:HB	1:D:58:LEU:HD13	2.01	0.43
1:D:59:GLN:CG	1:D:66:CYS:SG	3.07	0.43
1:D:12:VAL:HG12	1:D:48:PRO:HB3	2.00	0.42
1:G:44:GLU:OE2	1:G:59:GLN:NE2	2.51	0.42
1:B:73:ALA:HB1	1:B:82:PHE:CB	2.49	0.42
1:E:38:PRO:O	1:E:39:LEU:CB	2.66	0.42
1:F:112:GLU:O	1:F:116:SER:HB2	2.19	0.42
1:C:155:GLN:HG2	1:C:162:VAL:HA	2.00	0.42
1:H:73:ALA:HB1	1:H:82:PHE:HB3	2.02	0.42
1:H:155:GLN:O	1:H:159:GLN:N	2.53	0.42
1:G:35:GLN:HE21	1:G:35:GLN:HA	1.85	0.42
1:H:29:ILE:O	1:H:33:ASP:HB3	2.20	0.42
1:H:93:LEU:HD22	1:H:93:LEU:N	2.35	0.42
1:A:12:VAL:O	1:A:15:VAL:HG22	2.20	0.42
1:C:26:ALA:HB2	1:C:32:LEU:HD22	2.02	0.42
1:D:14:LYS:HB3	1:D:99:TYR:CD1	2.55	0.42
1:H:14:LYS:HB3	1:H:99:TYR:CD1	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:100:LYS:O	1:A:124:ARG:HG3	2.20	0.41
1:C:158:GLU:HG3	1:C:161:ARG:NH1	2.35	0.41
1:D:19:TRP:CD1	1:D:46:LEU:HD22	2.55	0.41
1:A:138:LYS:N	1:A:138:LYS:HD3	2.36	0.41
1:G:26:ALA:HB1	2:G:197:HOH:O	2.20	0.41
1:A:12:VAL:HG21	1:A:82:PHE:HZ	1.85	0.41
1:F:12:VAL:HG13	1:F:54:LEU:HD13	2.01	0.41
1:B:152:ASN:HB2	1:B:155:GLN:H	1.86	0.41
1:C:101:LYS:O	1:C:123:VAL:HA	2.21	0.41
1:B:21:SER:H	1:B:159:GLN:NE2	2.18	0.41
1:G:33:ASP:O	1:G:34:ALA:CB	2.68	0.41
1:A:33:ASP:O	1:A:34:ALA:CB	2.68	0.41
1:B:92:VAL:C	1:B:93:LEU:HD22	2.42	0.41
1:G:14:LYS:HB2	1:G:99:TYR:CD1	2.56	0.41
1:C:109:ASN:H	1:C:116:SER:HB3	1.86	0.40
1:E:47:LYS:HB2	1:E:55:GLU:HB3	2.03	0.40
1:B:25:ALA:HB1	1:B:145:MET:CG	2.51	0.40
1:C:25:ALA:O	1:C:118:ALA:HA	2.21	0.40
1:A:84:ILE:O	1:A:90:ASN:HA	2.21	0.40

All (1) 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:A:11:ASP:OD2	1:H:91:LYS:NZ[1_545]	2.15	0.05

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	161/162 (99%)	145 (90%)	12 (8%)	4 (2%)	5	2

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	156/162 (96%)	143 (92%)	12 (8%)	1 (1%)	25	21
1	C	159/162 (98%)	145 (91%)	11 (7%)	3 (2%)	8	3
1	D	156/162 (96%)	139 (89%)	15 (10%)	2 (1%)	12	7
1	E	153/162 (94%)	141 (92%)	11 (7%)	1 (1%)	22	18
1	F	157/162 (97%)	146 (93%)	8 (5%)	3 (2%)	8	3
1	G	159/162 (98%)	147 (92%)	10 (6%)	2 (1%)	12	7
1	H	150/162 (93%)	133 (89%)	14 (9%)	3 (2%)	7	3
All	All	1251/1296 (96%)	1139 (91%)	93 (7%)	19 (2%)	11	5

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	34	ALA
1	B	34	ALA
1	C	34	ALA
1	D	34	ALA
1	E	34	ALA
1	H	34	ALA
1	A	159	GLN
1	A	160[A]	CYS
1	A	160[B]	CYS
1	G	34	ALA
1	C	5	GLN
1	F	34	ALA
1	F	159	GLN
1	H	159	GLN
1	C	4	THR
1	F	9	ASP
1	G	159	GLN
1	H	79	PRO
1	D	79	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	134/143 (94%)	117 (87%)	17 (13%)	4	2	
1	B	125/143 (87%)	110 (88%)	15 (12%)	5	2	
1	C	130/143 (91%)	112 (86%)	18 (14%)	3	2	
1	D	131/143 (92%)	112 (86%)	19 (14%)	3	1	
1	E	129/143 (90%)	112 (87%)	17 (13%)	4	2	
1	F	132/143 (92%)	112 (85%)	20 (15%)	3	1	
1	G	135/143 (94%)	114 (84%)	21 (16%)	2	1	
1	H	126/143 (88%)	107 (85%)	19 (15%)	3	1	
All	All	1042/1144 (91%)	896 (86%)	146 (14%)	3	1	

All (146) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	LEU
1	A	24	MET
1	A	32	LEU
1	A	40	ARG
1	A	46	LEU
1	A	56	ILE
1	A	63	ASN
1	A	75	LYS
1	A	93	LEU
1	A	105	PHE
1	A	114	GLU
1	A	138	LYS
1	A	141	LYS
1	A	148	ARG
1	A	160[A]	CYS
1	A	160[B]	CYS
1	A	161	ARG
1	B	12	VAL
1	B	22	LEU
1	B	35	GLN
1	B	47	LYS
1	B	54	LEU
1	B	57	LEU
1	B	72	ILE
1	B	75	LYS
1	B	93	LEU
1	B	107	MET

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Mol	Chain	Res	Type
1	B	133	MET
1	B	140	LEU
1	B	145	MET
1	B	148	ARG
1	B	150	SER
1	C	5	GLN
1	C	6	THR
1	C	22	LEU
1	C	30	SER
1	C	32	LEU
1	C	33	ASP
1	C	40	ARG
1	C	46	LEU
1	C	47	LYS
1	C	56	ILE
1	C	74	GLU
1	C	93	LEU
1	C	112	GLU
1	C	116	SER
1	C	138	LYS
1	C	140	LEU
1	C	141	LYS
1	C	158	GLU
1	D	6	THR
1	D	22	LEU
1	D	32	LEU
1	D	35	GLN
1	D	40	ARG
1	D	46	LEU
1	D	47	LYS
1	D	59	GLN
1	D	75	LYS
1	D	91	LYS
1	D	93	LEU
1	D	95	LEU
1	D	107	MET
1	D	116	SER
1	D	128	VAL
1	D	137	ASP
1	D	145	MET
1	D	160[A]	CYS
1	D	160[B]	CYS

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Mol	Chain	Res	Type
1	E	22	LEU
1	E	24	MET
1	E	30	SER
1	E	32	LEU
1	E	40	ARG
1	E	46	LEU
1	E	56	ILE
1	E	68	GLN
1	E	70	LYS
1	E	72	ILE
1	E	75	LYS
1	E	83	LYS
1	E	93	LEU
1	E	105	PHE
1	E	107	MET
1	E	148	ARG
1	E	158	GLU
1	F	3	VAL
1	F	5	GLN
1	F	6	THR
1	F	22	LEU
1	F	35	GLN
1	F	46	LEU
1	F	60	LYS
1	F	66	CYS
1	F	72	ILE
1	F	75	LYS
1	F	91	LYS
1	F	95	LEU
1	F	115	GLN
1	F	116	SER
1	F	131	GLU
1	F	133	MET
1	F	145	MET
1	F	157	GLU
1	F	160[A]	CYS
1	F	160[B]	CYS
1	G	5	GLN
1	G	6	THR
1	G	22	LEU
1	G	24	MET
1	G	28	ASP

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Mol	Chain	Res	Type
1	G	30	SER
1	G	32	LEU
1	G	36	SER
1	G	46	LEU
1	G	56	ILE
1	G	60	LYS
1	G	70	LYS
1	G	78	ILE
1	G	83	LYS
1	G	91	LYS
1	G	93	LEU
1	G	100	LYS
1	G	127	GLU
1	G	141	LYS
1	G	148	ARG
1	G	159	GLN
1	H	12	VAL
1	H	22	LEU
1	H	24	MET
1	H	35	GLN
1	H	47	LYS
1	H	60	LYS
1	H	61	TRP
1	H	63	ASN
1	H	69	LYS
1	H	72	ILE
1	H	75	LYS
1	H	93	LEU
1	H	95	LEU
1	H	101	LYS
1	H	140	LEU
1	H	148	ARG
1	H	149	LEU
1	H	150	SER
1	H	157	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	35	GLN
1	A	155	GLN
1	B	152	ASN

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Mol	Chain	Res	Type
1	B	159	GLN
1	C	115	GLN
1	D	35	GLN
1	D	115	GLN
1	D	146	HIS
1	E	88	ASN
1	E	155	GLN
1	F	5	GLN
1	F	155	GLN
1	G	35	GLN
1	G	59	GLN
1	G	88	ASN
1	G	155	GLN
1	H	35	GLN
1	H	159	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 ⓘ

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(Å²)	Q<0.9
1	A	162/162 (100%)	-0.22	0	100	100	14, 35, 50, 55	0
1	B	158/162 (97%)	-0.15	1 (0%)	89	91	25, 35, 53, 56	0
1	C	160/162 (98%)	-0.20	0	100	100	21, 34, 53, 61	0
1	D	158/162 (97%)	-0.17	1 (0%)	89	91	24, 35, 51, 56	0
1	E	154/162 (95%)	-0.21	0	100	100	18, 33, 48, 59	0
1	F	159/162 (98%)	-0.15	1 (0%)	89	91	24, 35, 51, 57	0
1	G	160/162 (98%)	-0.17	1 (0%)	89	91	17, 35, 49, 57	0
1	H	152/162 (93%)	-0.18	1 (0%)	87	89	24, 36, 53, 57	0
All	All	1263/1296 (97%)	-0.18	5 (0%)	92	93	14, 35, 52, 61	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	79	PRO	2.3
1	F	79	PRO	2.2
1	H	153	PRO	2.1
1	B	153	PRO	2.1
1	G	33	ASP	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.