



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 08:17 PM UTC

PDB ID : 7MF7 / pdb_00007mf7
Title : Crystal structure of antibody 10E8v4-P100gA Fab
Authors : Kwon, Y.D.; Kwong, P.D.
Deposited on : 2021-04-08
Resolution : 2.00 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

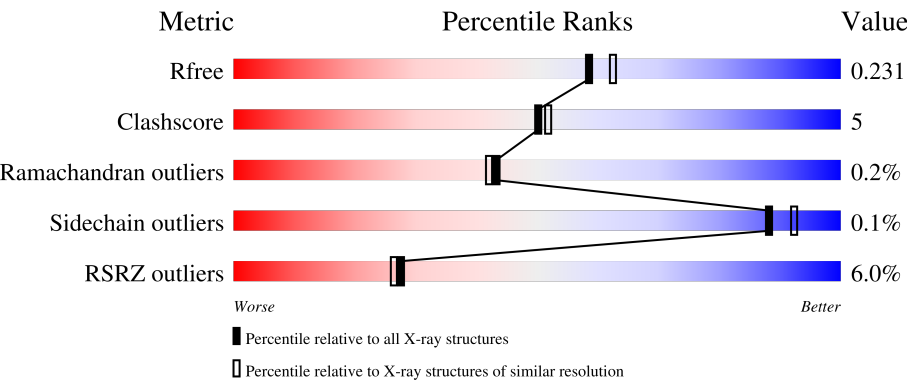
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	233	6% 82% 14% ..
1	C	233	4% 86% 10% .
1	E	233	15% 85% 12% .
1	H	233	5% 88% 8% .
2	B	215	8% 88% 10% .

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Mol	Chain	Length	Quality of chain
2	D	215	2% 87% 10%
2	F	215	3% 91% 7%
2	L	215	2% 85% 13%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 13837 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 Antibody 10E8v4 Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	H	224	Total	C	N	O	S	0	0	0
			1716	1093	285	332	6			
1	A	224	Total	C	N	O	S	0	0	0
			1716	1093	285	332	6			
1	C	224	Total	C	N	O	S	0	0	0
			1716	1093	285	332	6			
1	E	224	Total	C	N	O	S	0	0	0
			1705	1085	282	332	6			

- Molecule 2 is a protein called Antibody 10E8v4 Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	L	210	Total	C	N	O	S	0	0	0
			1579	984	273	318	4			
2	B	210	Total	C	N	O	S	0	0	0
			1573	981	270	318	4			
2	D	210	Total	C	N	O	S	0	0	0
			1579	984	273	318	4			
2	F	210	Total	C	N	O	S	0	0	0
			1579	984	273	318	4			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	H	147	Total	O	0	0
			147	147		
3	L	126	Total	O	0	0
			126	126		
3	A	97	Total	O	0	0
			97	97		
3	B	68	Total	O	0	0
			68	68		

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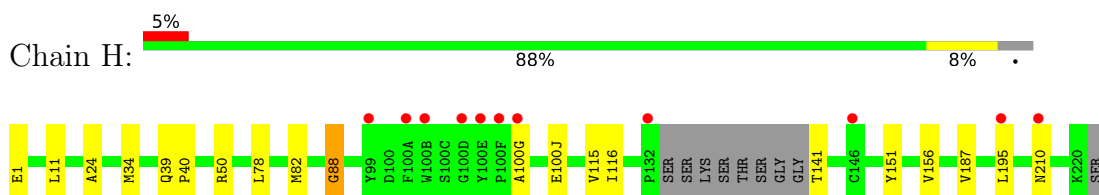
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	55	Total 55	O 55	0	0
3	D	71	Total 71	O 71	0	0
3	E	62	Total 62	O 62	0	0
3	F	48	Total 48	O 48	0	0

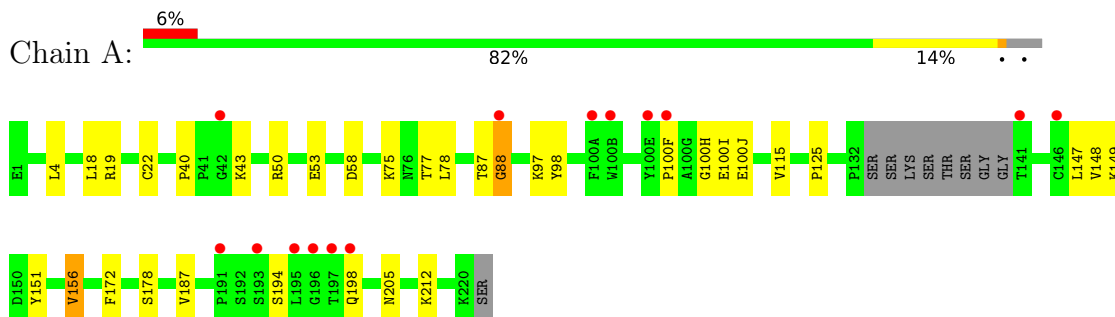
3 Residue-property plots [i](#)

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.

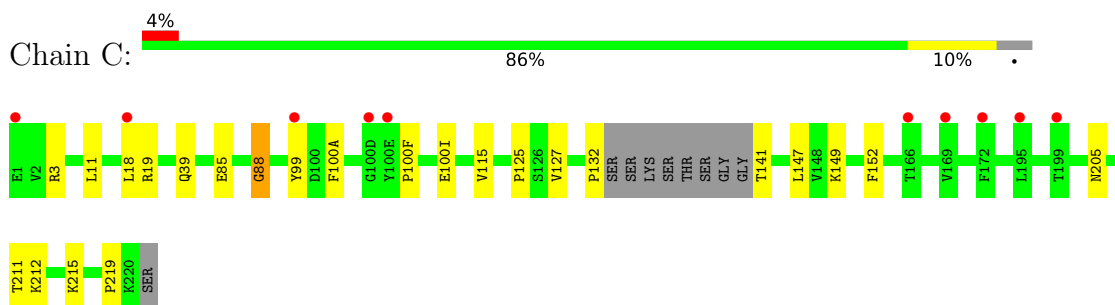
- Molecule 1: Antibody 10E8v4 Fab heavy chain



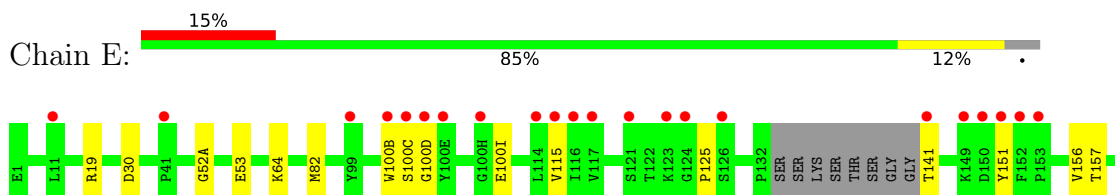
- Molecule 1: Antibody 10E8v4 Fab heavy chain

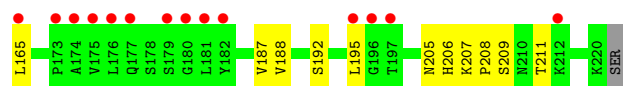


- Molecule 1: Antibody 10E8v4 Fab heavy chain

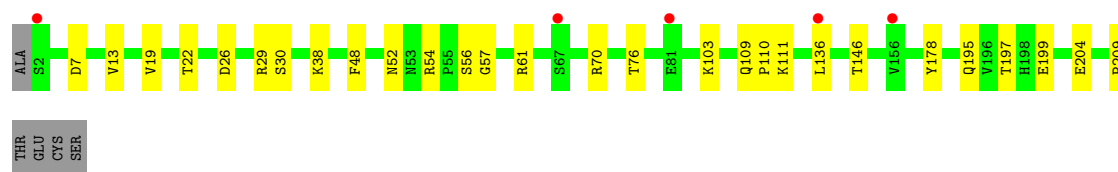
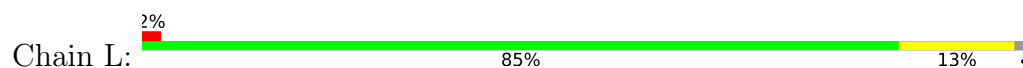


- Molecule 1: Antibody 10E8v4 Fab heavy chain

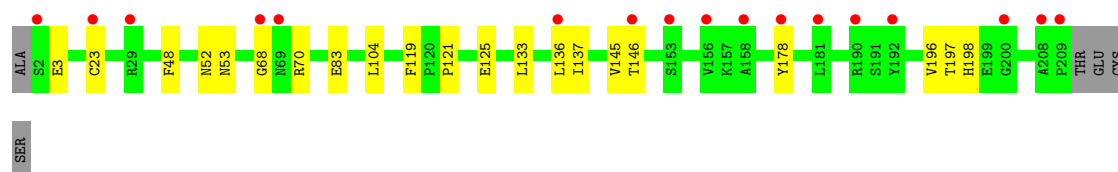
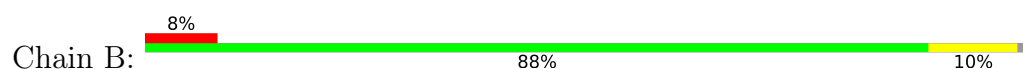




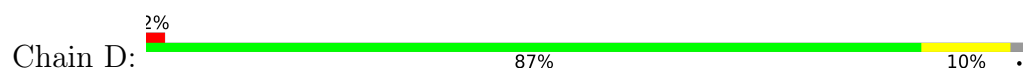
- Molecule 2: Antibody 10E8v4 Fab light chain



- Molecule 2: Antibody 10E8v4 Fab light chain



- Molecule 2: Antibody 10E8v4 Fab light chain



- Molecule 2: Antibody 10E8v4 Fab light chain



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	220.22Å 43.55Å 226.46Å 90.00° 115.31° 90.00°	Depositor
Resolution (Å)	36.47 – 2.00 36.47 – 2.00	Depositor EDS
% Data completeness (in resolution range)	95.9 (36.47-2.00) 96.2 (36.47-2.00)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.07 (at 2.00Å)	Xtriage
Refinement program	PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.203 , 0.231 0.204 , 0.231	Depositor DCC
R_{free} test set	2008 reflections (1.50%)	wwPDB-VP
Wilson B-factor (Å ²)	41.0	Xtriage
Anisotropy	0.029	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 37.0	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	0.96	EDS
Total number of atoms	13837	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% 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 [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	0.31	0/1764	0.54	0/2403
1	C	0.22	0/1764	0.46	0/2403
1	E	0.33	0/1753	0.55	0/2392
1	H	0.53	1/1764 (0.1%)	0.77	0/2403
2	B	0.47	0/1609	0.68	0/2191
2	D	0.20	0/1615	0.41	0/2198
2	F	0.21	0/1615	0.42	0/2198
2	L	0.31	0/1615	0.51	0/2198
All	All	0.34	1/13499 (0.0%)	0.56	0/18386

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	H	40	PRO	C-O	-5.15	1.20	1.24

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	1716	0	1652	27	0
1	C	1716	0	1652	19	0
1	E	1705	0	1621	26	0
1	H	1716	0	1652	13	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1573	0	1534	15	0
2	D	1579	0	1545	18	0
2	F	1579	0	1545	12	0
2	L	1579	0	1545	24	1
3	A	97	0	0	6	0
3	B	68	0	0	3	0
3	C	55	0	0	1	0
3	D	71	0	0	3	0
3	E	62	0	0	6	0
3	F	48	0	0	1	0
3	H	147	0	0	2	0
3	L	126	0	0	11	0
All	All	13837	0	12746	137	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 5.

All (137) 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)
2:L:70:ARG:HD2	3:L:304:HOH:O	1.50	1.11
2:L:56:SER:HA	3:L:301:HOH:O	1.52	1.08
2:L:70:ARG:CD	3:L:304:HOH:O	2.07	0.98
2:L:209:PRO:O	3:L:302:HOH:O	1.82	0.96
2:L:57:GLY:N	3:L:301:HOH:O	1.81	0.93
1:A:53:GLU:OE2	3:A:301:HOH:O	1.92	0.86
1:C:205:ASN:HD22	1:C:212:LYS:HE3	1.41	0.84
2:L:54:ARG:NE	3:L:303:HOH:O	1.87	0.84
2:L:54:ARG:NH2	3:L:303:HOH:O	2.05	0.83
2:D:178:TYR:OH	3:D:302:HOH:O	1.94	0.82
1:C:141:THR:N	3:C:301:HOH:O	2.14	0.80
1:E:64:LYS:NZ	3:E:302:HOH:O	2.15	0.80
1:A:194:SER:HB2	1:A:198:GLN:HG2	1.67	0.77
2:F:182:THR:HG23	2:F:185:GLN:HE21	1.49	0.76
1:H:1:GLU:N	3:H:301:HOH:O	2.17	0.76
1:A:100(H):GLY:O	3:A:302:HOH:O	2.05	0.72
1:C:3:ARG:HH11	1:C:3:ARG:HG3	1.55	0.72
1:A:97:LYS:HB3	1:C:100(A):PHE:CZ	2.26	0.70
1:H:141:THR:N	3:H:302:HOH:O	2.25	0.70
1:E:206:HIS:ND1	1:E:209:SER:OG	2.22	0.69
1:E:187:VAL:HG21	2:F:136:LEU:HD22	1.73	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:56:SER:CA	3:L:301:HOH:O	2.15	0.67
1:A:4:LEU:O	3:A:303:HOH:O	2.13	0.66
1:E:30:ASP:OD1	3:E:301:HOH:O	2.14	0.65
2:L:195:GLN:NE2	2:L:204:GLU:OE2	2.30	0.65
1:E:100(C):SER:N	3:E:303:HOH:O	2.29	0.65
2:L:26:ASP:O	2:L:29:ARG:HG3	1.97	0.64
1:H:187:VAL:HG21	2:L:136:LEU:HD22	1.80	0.64
2:L:195:GLN:HG3	2:L:204:GLU:HG3	1.80	0.63
1:C:125:PRO:HD2	1:C:211:THR:HG21	1.82	0.61
2:D:93:LYS:HG3	2:D:95(A):SER:HB2	1.83	0.60
1:E:141:THR:N	3:E:306:HOH:O	2.34	0.60
1:E:125:PRO:HD2	1:E:211:THR:HG21	1.85	0.59
2:D:133:LEU:HD12	2:D:179:LEU:HD23	1.83	0.58
1:C:3:ARG:HG3	1:C:3:ARG:NH1	2.16	0.58
2:D:52:ASN:HB2	2:F:70:ARG:HD3	1.85	0.58
2:L:48:PHE:HZ	2:L:52:ASN:HD22	1.51	0.56
1:A:187:VAL:HB	2:B:136:LEU:HD13	1.87	0.56
1:E:52(A):GLY:N	1:E:53:GLU:OE1	2.39	0.56
2:F:37:GLN:HB2	2:F:47:LEU:HD11	1.88	0.56
2:L:103:LYS:HE2	3:L:408:HOH:O	2.06	0.55
1:C:100(I):GLU:OE2	2:D:32:TYR:HB2	2.06	0.55
2:F:150:LYS:NZ	2:F:204:GLU:OE1	2.37	0.55
1:A:98:TYR:HD2	1:A:100(I):GLU:OE2	1.89	0.55
1:C:88:GLY:HA2	1:C:115:VAL:O	2.06	0.55
1:H:88:GLY:HA2	1:H:115:VAL:O	2.07	0.55
1:A:18:LEU:HD12	1:A:19:ARG:H	1.70	0.55
1:E:100(I):GLU:H	1:E:100(I):GLU:CD	2.14	0.55
2:B:53:ASN:ND2	3:B:307:HOH:O	2.39	0.55
1:A:50:ARG:HD3	1:A:100(J):GLU:OE1	2.06	0.54
2:B:119:PHE:HE2	2:B:136:LEU:HD12	1.72	0.54
2:D:111:LYS:HB3	2:D:111:LYS:NZ	2.22	0.54
2:B:145:VAL:HG12	2:B:198:HIS:HB2	1.89	0.54
2:B:83:GLU:HG3	2:B:104:LEU:O	2.08	0.54
1:E:100(B):TRP:N	3:E:303:HOH:O	2.40	0.53
1:E:19:ARG:HG3	1:E:19:ARG:HH11	1.72	0.53
1:E:82:MET:HE1	1:E:115:VAL:HG11	1.91	0.53
1:E:206:HIS:NE2	1:E:208:PRO:HG2	2.24	0.52
1:A:147:LEU:HG	1:A:149:LYS:HG3	1.92	0.52
2:B:48:PHE:CZ	2:B:52:ASN:HA	2.45	0.51
1:E:125:PRO:HD2	1:E:211:THR:CG2	2.39	0.51
1:A:149:LYS:HE2	2:B:125:GLU:OE2	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:109:GLN:NE2	3:F:301:HOH:O	2.36	0.51
2:D:167:LYS:HE2	2:D:171:ASN:OD1	2.10	0.50
2:B:68:GLY:N	3:B:305:HOH:O	2.44	0.50
2:L:109:GLN:HB2	2:L:110:PRO:HD2	1.93	0.50
1:H:50:ARG:HD3	1:H:100(J):GLU:OE1	2.11	0.50
1:A:178:SER:N	3:A:304:HOH:O	2.20	0.50
1:C:39:GLN:OE1	2:D:38:LYS:HE3	2.11	0.50
1:C:127:VAL:O	1:C:215:LYS:HE3	2.13	0.49
1:E:187:VAL:HG21	2:F:136:LEU:CD2	2.43	0.49
2:L:111:LYS:HD2	2:L:199:GLU:HG3	1.95	0.49
2:F:182:THR:OG1	2:F:185:GLN:HG3	2.12	0.48
1:A:22:CYS:HB3	1:A:78:LEU:HB3	1.94	0.48
2:D:24:ARG:HE	2:D:70:ARG:HG2	1.78	0.48
2:D:39:LYS:NZ	3:D:301:HOH:O	1.83	0.48
2:D:116:VAL:O	2:D:205:LYS:HE3	2.15	0.47
1:A:88:GLY:HA2	1:A:115:VAL:O	2.13	0.47
1:H:34:MET:HB3	1:H:78:LEU:HD22	1.96	0.47
2:D:38:LYS:HD3	2:D:44:PRO:HG3	1.97	0.47
1:A:50:ARG:NH2	1:A:58:ASP:OD2	2.43	0.47
1:C:18:LEU:HD12	1:C:19:ARG:H	1.80	0.47
2:B:178:TYR:OH	3:B:303:HOH:O	2.20	0.46
1:E:100(C):SER:O	3:E:303:HOH:O	2.20	0.46
1:C:205:ASN:ND2	1:C:212:LYS:HE3	2.20	0.46
2:L:178:TYR:OH	3:L:306:HOH:O	2.19	0.46
1:E:157:THR:HB	1:E:205:ASN:HB2	1.97	0.46
1:A:18:LEU:HD12	1:A:19:ARG:N	2.30	0.46
2:F:38:LYS:HD3	2:F:44:PRO:HG3	1.97	0.46
1:C:147:LEU:HG	1:C:149:LYS:HG2	1.98	0.46
2:F:14:ALA:HB3	2:F:17:GLN:HG3	1.98	0.46
1:A:100(F):PRO:HG3	1:C:100(F):PRO:HD3	1.97	0.46
1:H:82:MET:HE1	1:H:115:VAL:HG11	1.97	0.45
2:D:184:GLU:OE1	2:D:184:GLU:N	2.45	0.45
2:L:61:ARG:HB2	2:L:76:THR:O	2.16	0.45
1:E:192:SER:HA	1:E:195:LEU:HD13	1.97	0.45
2:B:121:PRO:HD3	2:B:133:LEU:HD23	1.98	0.45
1:C:205:ASN:HD22	1:C:212:LYS:CE	2.21	0.45
1:A:148:VAL:HG11	1:A:156:VAL:HG11	1.98	0.45
1:H:11:LEU:HD12	1:H:116:ILE:HB	1.99	0.45
2:D:29:ARG:NH1	1:E:100(D):GLY:HA3	2.32	0.44
2:D:37:GLN:HB2	2:D:47:LEU:HD11	1.98	0.44
1:A:40:PRO:HB2	1:A:43:LYS:HG3	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:195:LEU:HD23	1:H:195:LEU:HA	1.69	0.44
1:A:58:ASP:OD1	3:A:305:HOH:O	2.21	0.44
1:H:39:GLN:OE1	2:L:38:LYS:HE3	2.18	0.43
1:A:125:PRO:HB3	1:A:151:TYR:HB3	2.00	0.43
1:C:11:LEU:HD21	1:C:152:PHE:HZ	1.83	0.43
2:B:137:ILE:HG12	2:B:196:VAL:HG21	2.00	0.43
1:A:172:PHE:CE1	2:B:136:LEU:HD22	2.53	0.43
2:D:29:ARG:HH12	1:E:100(D):GLY:HA3	1.83	0.43
1:A:205:ASN:HD22	1:A:212:LYS:HG3	1.83	0.43
2:D:127:GLN:HG2	3:D:347:HOH:O	2.18	0.42
2:L:146:THR:OG1	2:L:197:THR:HB	2.20	0.42
2:B:23:CYS:O	2:B:70:ARG:HA	2.20	0.42
2:L:13:VAL:HB	2:L:19:VAL:HB	2.00	0.42
1:A:87:THR:HA	1:A:88:GLY:HA2	1.91	0.42
1:A:100(H):GLY:C	3:A:302:HOH:O	2.57	0.42
2:D:29:ARG:HH12	1:E:100(D):GLY:H	1.67	0.42
1:E:100(I):GLU:OE2	2:F:32:TYR:HD2	2.02	0.42
1:C:85:GLU:H	1:C:85:GLU:CD	2.28	0.41
2:B:146:THR:OG1	2:B:197:THR:HB	2.20	0.41
1:A:75:LYS:O	1:A:77:THR:HG23	2.20	0.41
1:H:100(G):ALA:HB1	2:L:30:SER:O	2.20	0.41
2:B:3:GLU:OE1	2:B:3:GLU:N	2.51	0.41
1:E:207:LYS:N	1:E:208:PRO:HD2	2.36	0.41
2:L:22:THR:HG23	2:L:70:ARG:HG3	2.03	0.41
2:L:7:ASP:N	3:L:305:HOH:O	2.15	0.41
1:C:215:LYS:HB2	1:C:215:LYS:HE2	1.63	0.41
1:E:165:LEU:HD21	1:E:188:VAL:HG21	2.03	0.41
1:H:210:ASN:O	1:H:210:ASN:CG	2.63	0.41
2:F:195:GLN:HG2	2:F:204:GLU:HB2	2.03	0.40
1:H:151:TYR:CE2	1:H:156:VAL:HG13	2.55	0.40
1:A:194:SER:HB2	1:A:198:GLN:CG	2.44	0.40
1:C:132:PRO:HG2	1:C:219:PRO:HB3	2.03	0.40
1:E:19:ARG:HG3	1:E:19:ARG:NH1	2.35	0.40
1:E:151:TYR:CE1	1:E:156:VAL:HG13	2.57	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:H:24:ALA:O	2:L:29:ARG:NH2[1_565]	2.17	0.03

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	220/233 (94%)	215 (98%)	4 (2%)	1 (0%)	24	21
1	C	220/233 (94%)	217 (99%)	2 (1%)	1 (0%)	24	21
1	E	220/233 (94%)	218 (99%)	2 (1%)	0	100	100
1	H	220/233 (94%)	216 (98%)	3 (1%)	1 (0%)	24	21
2	B	208/215 (97%)	203 (98%)	5 (2%)	0	100	100
2	D	208/215 (97%)	202 (97%)	6 (3%)	0	100	100
2	F	208/215 (97%)	202 (97%)	6 (3%)	0	100	100
2	L	208/215 (97%)	204 (98%)	4 (2%)	0	100	100
All	All	1712/1792 (96%)	1677 (98%)	32 (2%)	3 (0%)	43	42

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	88	GLY
1	A	88	GLY
1	C	88	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	188/195 (96%)	187 (100%)	1 (0%)	81	87
1	C	188/195 (96%)	187 (100%)	1 (0%)	81	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	185/195 (95%)	185 (100%)	0	100	100
1	H	188/195 (96%)	188 (100%)	0	100	100
2	B	175/180 (97%)	175 (100%)	0	100	100
2	D	176/180 (98%)	176 (100%)	0	100	100
2	F	176/180 (98%)	176 (100%)	0	100	100
2	L	176/180 (98%)	176 (100%)	0	100	100
All	All	1452/1500 (97%)	1450 (100%)	2 (0%)	88	92

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	156	VAL
1	C	99	TYR

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

Mol	Chain	Res	Type
1	H	31	ASN
1	H	105	GLN
2	L	52	ASN
2	L	109	GLN
1	A	31	ASN
1	A	76	ASN
1	A	82(B)	ASN
1	A	101	GLN
1	A	177	GLN
1	A	205	ASN
2	B	17	GLN
2	B	53	ASN
2	B	79	GLN
2	B	198	HIS
1	C	82(B)	ASN
1	C	101	GLN
1	C	205	ASN
2	D	53	ASN
2	D	109	GLN
2	D	129	ASN
1	E	31	ASN
1	E	101	GLN

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Mol	Chain	Res	Type
2	F	109	GLN
2	F	185	GLN

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](#)

There are no ligands in this entry.

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, 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	224/233 (96%)	0.56	14 (6%) 26 24	31, 46, 71, 82	0
1	C	224/233 (96%)	0.62	10 (4%) 38 37	33, 54, 79, 88	0
1	E	224/233 (96%)	0.95	36 (16%) 4 4	33, 58, 84, 95	0
1	H	224/233 (96%)	0.31	11 (4%) 35 34	25, 40, 63, 104	0
2	B	210/215 (97%)	0.75	17 (8%) 18 17	32, 52, 75, 95	0
2	D	210/215 (97%)	0.57	5 (2%) 59 59	36, 54, 82, 101	0
2	F	210/215 (97%)	0.68	7 (3%) 49 48	32, 57, 84, 100	0
2	L	210/215 (97%)	0.18	5 (2%) 59 59	25, 42, 66, 83	0
All	All	1736/1792 (96%)	0.58	105 (6%) 27 26	25, 50, 79, 104	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	100(A)	PHE	4.8
1	E	176	LEU	4.7
2	B	29	ARG	4.4
1	E	175	VAL	4.3
1	H	100(B)	TRP	4.1
1	A	196	GLY	4.0
1	A	195	LEU	3.9
1	H	100(E)	TYR	3.9
1	C	100(E)	TYR	3.9
1	C	169	VAL	3.6
1	E	100(C)	SER	3.6
2	L	2	SER	3.6
1	H	146	CYS	3.4
2	B	158	ALA	3.3
1	A	100(E)	TYR	3.3
1	E	11	LEU	3.2

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Mol	Chain	Res	Type	RSRZ
1	E	152	PHE	3.2
1	E	100(H)	GLY	3.2
2	F	107	LEU	3.2
1	E	177	GLN	3.0
1	C	1	GLU	3.0
1	A	197	THR	3.0
1	H	100(F)	PRO	3.0
1	E	141	THR	2.9
1	E	179	SER	2.9
1	H	195	LEU	2.9
2	B	136	LEU	2.9
1	A	100(B)	TRP	2.9
1	E	212	LYS	2.8
1	E	114	LEU	2.8
1	A	141	THR	2.8
1	H	99	TYR	2.7
2	B	2	SER	2.7
2	F	186	TRP	2.7
1	E	195	LEU	2.6
1	E	99	TYR	2.6
2	B	192	TYR	2.6
2	B	178	TYR	2.5
1	E	174	ALA	2.5
1	E	124	GLY	2.5
2	B	156	VAL	2.5
2	B	69	ASN	2.5
1	E	173	PRO	2.5
1	E	117	VAL	2.5
2	D	209	PRO	2.5
1	A	42	GLY	2.5
2	F	158	ALA	2.4
2	D	169	SER	2.4
2	F	56	SER	2.4
2	B	190	ARG	2.4
1	E	180	GLY	2.4
1	E	153	PRO	2.4
2	B	209	PRO	2.4
1	C	18	LEU	2.4
2	B	153	SER	2.4
2	B	23	CYS	2.4
1	C	172	PHE	2.3
2	L	156	VAL	2.3

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Mol	Chain	Res	Type	RSRZ
2	F	2	SER	2.3
2	F	192	TYR	2.3
1	H	210	ASN	2.3
1	E	196	GLY	2.3
1	E	150	ASP	2.3
1	A	193	SER	2.3
2	D	158	ALA	2.3
1	E	100(B)	TRP	2.3
1	E	121	SER	2.3
1	H	100(G)	ALA	2.3
1	A	100(A)	PHE	2.2
1	A	191	PRO	2.2
2	B	181	LEU	2.2
1	C	166	THR	2.2
1	E	115	VAL	2.2
2	F	200	GLY	2.2
1	E	181	LEU	2.2
1	H	132	PRO	2.2
1	E	41	PRO	2.2
1	E	165	LEU	2.2
1	E	126	SER	2.2
1	E	100(E)	TYR	2.2
1	E	116	ILE	2.1
1	H	100(D)	GLY	2.1
1	A	198	GLN	2.1
2	B	208	ALA	2.1
1	E	149	LYS	2.1
1	E	151	TYR	2.1
1	E	100(D)	GLY	2.1
1	E	123	LYS	2.1
2	D	171	ASN	2.1
1	A	100(F)	PRO	2.1
1	C	195	LEU	2.1
2	L	67	SER	2.1
1	A	88	GLY	2.1
1	C	100(D)	GLY	2.1
2	B	200	GLY	2.1
1	E	197	THR	2.0
2	B	146	THR	2.0
1	C	99	TYR	2.0
1	E	182	TYR	2.0
2	B	68	GLY	2.0

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Mol	Chain	Res	Type	RSRZ
2	L	81	GLU	2.0
2	D	156	VAL	2.0
2	L	136	LEU	2.0
1	A	146	CYS	2.0
1	C	199	THR	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.