



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 08:38 PM UTC

PDB ID : 1Q9L / pdb_00001q9l
Title : S25-2 Fab Unliganded 2
Authors : Nguyen, H.P.; Seto, N.O.; MacKenzie, C.R.; Brade, L.; Kosma, P.; Brade, H.; Evans, S.V.
Deposited on : 2003-08-25
Resolution : 2.28 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

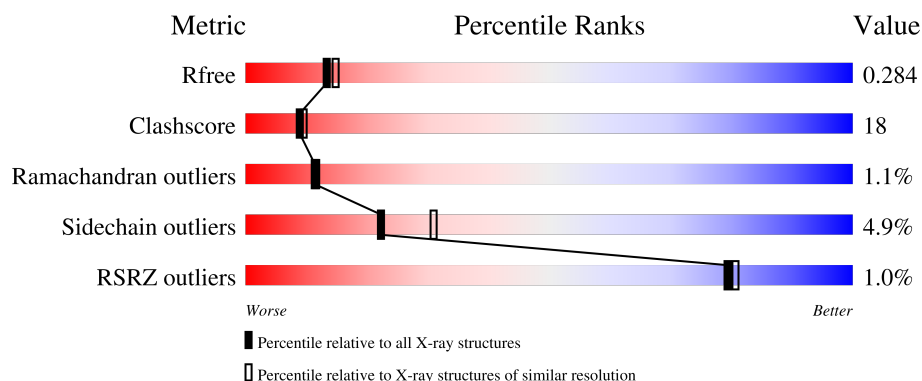
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

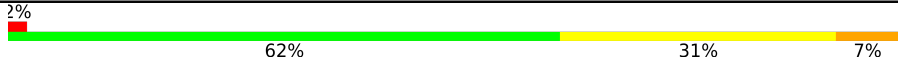
The reported resolution of this entry is 2.28 Å.

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	9078 (2.30-2.26)
Clashscore	190562	9802 (2.30-2.26)
Ramachandran outliers	187476	9690 (2.30-2.26)
Sidechain outliers	187428	9691 (2.30-2.26)
RSRZ outliers	180081	9085 (2.30-2.26)

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	B	222	
1	D	222	
2	A	219	
2	C	219	

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 7207 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 S25-2 Fab (IgG1k) heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	222	Total	C	N	O	S	0	0	0
			1698	1075	283	333	7			
1	D	222	Total	C	N	O	S	0	0	0
			1698	1075	283	333	7			

- Molecule 2 is a protein called S25-2 Fab (IgG1k) light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	219	Total	C	N	O	S	0	0	0
			1701	1056	290	347	8			
2	C	219	Total	C	N	O	S	0	0	0
			1701	1056	290	347	8			

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Mg	0	0
			1	1		
3	D	1	Total	Mg	0	0
			1	1		
3	A	1	Total	Mg	0	0
			1	1		
3	C	4	Total	Mg	0	0
			4	4		

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Zn	0	0
			1	1		
4	C	2	Total	Zn	0	0
			2	2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	94	Total 94	O 94	0	0
5	D	88	Total 88	O 88	0	0
5	A	123	Total 123	O 123	0	0
5	C	94	Total 94	O 94	0	0

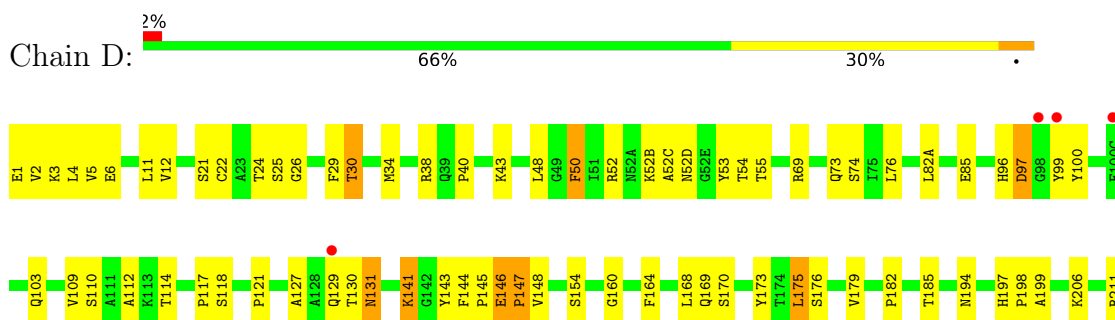
3 Residue-property plots

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.

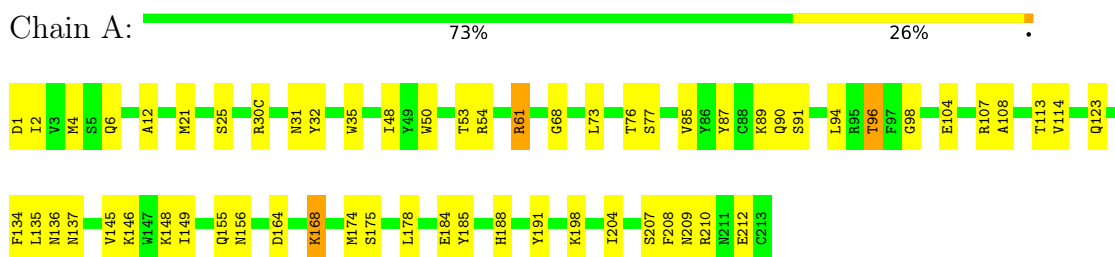
- Molecule 1: S25-2 Fab (IgG1k) heavy chain



- Molecule 1: S25-2 Fab (IgG1k) heavy chain

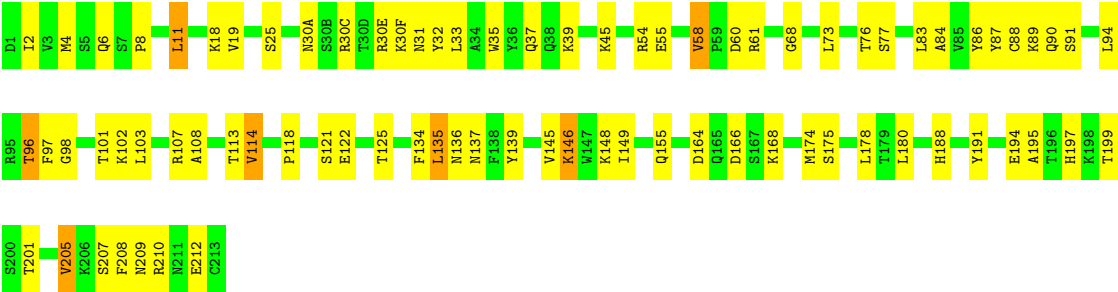


- Molecule 2: S25-2 Fab (IgG1k) light chain



- Molecule 2: S25-2 Fab (IgG1k) light chain





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	84.70Å 96.00Å 114.20Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.85 – 2.28 19.85 – 2.28	Depositor EDS
% Data completeness (in resolution range)	84.9 (19.85-2.28) 84.7 (19.85-2.28)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.70 (at 2.28Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.216 , 0.286 0.216 , 0.284	Depositor DCC
R_{free} test set	3663 reflections (9.63%)	wwPDB-VP
Wilson B-factor (Å ²)	35.7	Xtriage
Anisotropy	0.560	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 35.9	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	0.95	EDS
Total number of atoms	7207	wwPDB-VP
Average B, all atoms (Å ²)	40.0	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 42.27 % 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 2.0894e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

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

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	B	0.58	0/1744	1.03	8/2381 (0.3%)
1	D	0.55	0/1744	0.98	6/2381 (0.3%)
2	A	0.56	0/1736	1.01	7/2351 (0.3%)
2	C	0.56	0/1736	1.01	12/2351 (0.5%)
All	All	0.56	0/6960	1.01	33/9464 (0.3%)

There are no bond length outliers.

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	141	LYS	N-CA-C	7.55	121.72	109.40
2	A	164	ASP	N-CA-C	-7.16	101.60	110.41
1	D	30	THR	N-CA-C	6.97	119.73	111.71
1	D	141	LYS	N-CA-C	6.93	120.19	108.90
2	C	76	THR	N-CA-C	6.69	119.14	111.11
2	A	204	ILE	N-CA-C	-6.52	100.23	108.84
2	C	114	VAL	N-CA-C	6.31	117.01	108.17
2	A	137	ASN	N-CA-C	6.30	119.94	111.24
2	C	201	THR	N-CA-C	-6.30	105.08	112.89
1	B	33	TYR	N-CA-C	-6.09	101.47	110.48
1	B	118	SER	N-CA-C	-6.03	99.42	109.24
2	C	136	ASN	N-CA-C	5.98	119.80	110.17
1	B	100(B)	ARG	N-CA-C	5.92	118.48	109.95
1	D	118	SER	N-CA-C	-5.67	100.00	109.24
1	D	114	THR	N-CA-C	-5.62	101.97	110.28
2	C	137	ASN	N-CA-C	5.61	118.98	111.24
2	A	113	THR	N-CA-C	-5.52	99.73	108.73
1	D	55	THR	N-CA-C	5.45	118.43	109.72
1	B	2	VAL	N-CA-C	-5.44	99.24	107.73
2	C	39	LYS	CA-C-N	-5.40	114.20	119.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	39	LYS	C-N-CA	-5.40	114.20	119.76
1	D	146	GLU	N-CA-C	-5.37	102.33	110.39
2	C	113	THR	N-CA-C	-5.36	99.79	108.41
2	C	164	ASP	N-CA-C	-5.35	102.96	110.50
2	C	58	VAL	CA-C-N	5.32	125.23	119.76
2	C	58	VAL	C-N-CA	5.32	125.23	119.76
1	B	55	THR	N-CA-C	5.27	117.68	109.52
2	A	76	THR	N-CA-C	5.25	117.42	111.11
2	A	85	VAL	N-CA-C	-5.19	100.90	108.17
2	C	205	VAL	N-CA-C	5.19	115.44	108.17
2	A	136	ASN	N-CA-C	5.16	118.22	109.76
1	B	206	LYS	N-CA-C	5.11	116.85	108.52
1	B	146	GLU	N-CA-C	-5.08	102.77	110.39

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	B	1698	0	1648	72	0
1	D	1698	0	1648	65	0
2	A	1701	0	1649	53	0
2	C	1701	0	1649	69	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	4	0	0	0	0
3	D	1	0	0	0	0
4	A	1	0	0	0	0
4	C	2	0	0	0	0
5	A	123	0	0	3	0
5	B	94	0	0	4	0
5	C	94	0	0	2	0
5	D	88	0	0	4	0
All	All	7207	0	6594	248	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 18.

All (248) 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:113:LYS:H	1:B:113:LYS:HD2	1.04	1.15
2:C:90:GLN:HE21	2:C:96:THR:HG22	1.26	1.00
1:B:83:ARG:HD3	1:B:84:ALA:N	1.78	0.98
1:D:154:SER:H	1:D:194:ASN:HD21	1.00	0.97
1:B:154:SER:H	1:B:194:ASN:HD21	1.10	0.95
2:A:90:GLN:HE21	2:A:96:THR:HG22	1.27	0.95
1:B:43:LYS:HG2	1:B:44:ALA:H	1.31	0.94
1:B:113:LYS:HD2	1:B:113:LYS:N	1.85	0.91
2:A:90:GLN:HE21	2:A:96:THR:CG2	1.84	0.89
1:D:154:SER:H	1:D:194:ASN:ND2	1.74	0.85
1:B:43:LYS:HG2	1:B:44:ALA:N	1.92	0.84
1:B:203:LYS:HB2	1:B:203:LYS:NZ	1.93	0.83
1:B:83:ARG:HD3	1:B:84:ALA:H	1.43	0.81
1:D:52(B):LYS:HG3	1:D:52(C):ALA:H	1.48	0.78
1:B:113:LYS:H	1:B:113:LYS:CD	1.87	0.74
2:C:6:GLN:HE21	2:C:98:GLY:HA3	1.53	0.73
2:C:31:ASN:ND2	2:C:68:GLY:H	1.87	0.72
1:B:154:SER:H	1:B:194:ASN:ND2	1.87	0.71
1:D:52(B):LYS:HG3	1:D:52(C):ALA:N	2.03	0.71
2:A:90:GLN:NE2	2:A:96:THR:HG22	2.04	0.70
2:C:11:LEU:CD2	2:C:103:LEU:HA	2.22	0.69
2:C:31:ASN:HD21	2:C:68:GLY:H	1.38	0.69
1:D:141:LYS:HE3	5:D:555:HOH:O	1.94	0.68
1:D:52:ARG:O	1:D:53:TYR:HA	1.95	0.67
2:C:209:ASN:O	2:C:212:GLU:HG3	1.95	0.66
1:D:12:VAL:HG11	1:D:82(A):LEU:HD13	1.78	0.66
1:B:130:THR:O	1:B:131:ASN:HB2	1.94	0.65
1:B:203:LYS:HB2	1:B:203:LYS:HZ3	1.61	0.65
1:B:136:LEU:HD12	1:B:208:ILE:HG21	1.78	0.64
1:B:43:LYS:CG	1:B:44:ALA:H	2.09	0.64
2:C:166:ASP:OD2	2:C:168:LYS:HG3	1.98	0.64
1:D:185:THR:HG21	5:D:519:HOH:O	1.98	0.64
2:C:194:GLU:HG2	2:C:205:VAL:HG22	1.80	0.64
2:C:145:VAL:HG21	2:C:174:MET:HE1	1.80	0.63
2:C:30(E):ARG:O	2:C:30(F):LYS:HD2	1.98	0.63
1:D:117:PRO:HB3	1:D:143:TYR:HB3	1.80	0.63
2:A:114:VAL:HG22	2:A:135:LEU:CD1	2.29	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:89:LYS:HD3	2:C:97:PHE:CE1	2.35	0.62
1:D:34:MET:HB3	1:D:76:LEU:HD22	1.82	0.61
1:D:182:PRO:O	1:D:185:THR:HB	2.00	0.61
2:A:188:HIS:O	2:A:210:ARG:NH1	2.35	0.60
2:A:30(C):ARG:HH11	2:A:30(C):ARG:HB3	1.67	0.60
1:D:103:GLN:H	1:D:103:GLN:CD	2.08	0.60
2:C:54:ARG:HG2	2:C:58:VAL:HB	1.84	0.60
2:C:55:GLU:O	2:C:58:VAL:HG23	2.02	0.60
1:B:175:LEU:C	1:B:175:LEU:HD12	2.27	0.59
1:B:133:MET:HE2	1:B:181:VAL:C	2.28	0.59
2:A:30(C):ARG:HB3	2:A:30(C):ARG:NH1	2.17	0.59
2:C:11:LEU:HD23	2:C:103:LEU:HA	1.84	0.59
1:D:175:LEU:HD12	1:D:175:LEU:C	2.26	0.59
1:D:52(B):LYS:HB2	1:D:52(B):LYS:NZ	2.18	0.59
2:A:145:VAL:HG21	2:A:174:MET:HE1	1.84	0.59
2:C:121:SER:O	2:C:125:THR:HG23	2.03	0.58
2:C:6:GLN:HE21	2:C:98:GLY:CA	2.17	0.58
1:D:40:PRO:HB2	1:D:43:LYS:HG3	1.86	0.57
1:B:62:LYS:O	1:B:62:LYS:HG3	2.05	0.57
2:A:145:VAL:CG2	2:A:174:MET:HE1	2.34	0.57
2:C:146:LYS:HD2	2:C:148:LYS:HE3	1.87	0.57
1:D:160:GLY:O	1:D:179:VAL:HA	2.04	0.57
1:B:103:GLN:CD	1:B:103:GLN:H	2.13	0.57
1:B:127:ALA:HB2	2:A:212:GLU:OE2	2.05	0.57
1:D:11:LEU:HD21	1:D:112:ALA:O	2.05	0.57
2:A:32:TYR:HB3	2:A:91:SER:HB2	1.86	0.57
1:D:52(B):LYS:HB2	1:D:52(B):LYS:HZ2	1.70	0.56
2:A:61:ARG:O	2:A:61:ARG:HG2	2.06	0.56
1:D:30:THR:HG23	1:D:52(B):LYS:HB3	1.88	0.56
1:B:4:LEU:HD23	1:B:24:THR:HG22	1.86	0.56
1:D:50:PHE:CD1	1:D:50:PHE:C	2.84	0.56
1:B:12:VAL:HG11	1:B:82(A):LEU:HD13	1.88	0.55
2:A:90:GLN:NE2	2:A:96:THR:CG2	2.62	0.55
1:B:203:LYS:HB2	1:B:203:LYS:HZ2	1.72	0.55
1:D:50:PHE:C	1:D:50:PHE:HD1	2.14	0.55
1:B:83:ARG:CD	1:B:84:ALA:H	2.18	0.54
2:C:11:LEU:HD23	2:C:11:LEU:O	2.07	0.54
1:B:80:MET:HE1	1:B:107:VAL:HG21	1.90	0.54
1:B:171:ASP:OD1	1:D:1:GLU:HB2	2.08	0.54
1:B:51:ILE:HD13	1:B:52:ARG:N	2.23	0.53
1:D:6:GLU:H	1:D:103:GLN:HE22	1.55	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:145:VAL:HG21	2:A:174:MET:CE	2.37	0.53
1:B:152:TRP:CH2	1:B:208:ILE:HD11	2.43	0.53
2:C:61:ARG:HD3	2:C:77:SER:O	2.08	0.53
2:C:188:HIS:CE1	5:C:697:HOH:O	2.60	0.53
1:B:117:PRO:HB3	1:B:143:TYR:HB3	1.91	0.53
1:D:130:THR:O	1:D:131:ASN:HB2	2.08	0.53
2:C:166:ASP:CG	2:C:168:LYS:HZ2	2.16	0.53
2:A:107:ARG:HG3	2:A:108:ALA:O	2.09	0.53
2:C:30(F):LYS:HE2	5:C:365:HOH:O	2.08	0.53
1:B:48:LEU:HD22	1:B:61:VAL:HG11	1.91	0.53
1:D:30:THR:HG23	1:D:53:TYR:OH	2.09	0.53
2:C:135:LEU:HD22	2:C:135:LEU:N	2.24	0.53
2:C:208:PHE:HA	2:C:212:GLU:OE1	2.09	0.53
1:D:96:HIS:ND1	1:D:97:ASP:N	2.56	0.52
2:A:134:PHE:C	2:A:135:LEU:HD22	2.34	0.52
2:C:107:ARG:NH1	2:C:108:ALA:O	2.41	0.52
1:B:62:LYS:HA	5:B:584:HOH:O	2.08	0.52
1:D:30:THR:HG22	1:D:52(B):LYS:HG2	1.91	0.52
1:B:96:HIS:ND1	1:B:97:ASP:N	2.49	0.52
2:C:90:GLN:HE21	2:C:96:THR:CG2	2.09	0.52
1:B:11:LEU:HD21	1:B:112:ALA:O	2.10	0.52
1:D:52:ARG:HD2	1:D:54:THR:OG1	2.09	0.52
2:A:155:GLN:HE21	2:A:155:GLN:C	2.17	0.52
2:C:145:VAL:CG2	2:C:174:MET:HE1	2.40	0.52
2:A:48:ILE:HG23	2:A:53:THR:O	2.10	0.52
1:B:50:PHE:C	1:B:50:PHE:HD1	2.18	0.52
1:D:145:PRO:HD2	1:D:199:ALA:CB	2.40	0.52
2:A:209:ASN:HB3	2:A:212:GLU:HG3	1.91	0.52
1:B:34:MET:HB3	1:B:76:LEU:HD22	1.91	0.51
2:A:31:ASN:HD21	2:A:68:GLY:H	1.59	0.51
1:B:1:GLU:HA	1:B:1:GLU:OE1	2.09	0.51
2:C:145:VAL:HG21	2:C:174:MET:CE	2.39	0.51
1:B:145:PRO:HD2	1:B:199:ALA:CB	2.40	0.51
2:A:31:ASN:ND2	2:A:68:GLY:H	2.08	0.51
2:C:6:GLN:HE22	2:C:87:TYR:HA	1.75	0.51
1:B:111:ALA:CB	1:D:26:GLY:HA2	2.40	0.51
2:A:61:ARG:HG3	2:A:77:SER:H	1.74	0.51
2:C:135:LEU:CD1	2:C:195:ALA:HB2	2.41	0.51
1:B:83:ARG:HH11	1:B:84:ALA:H	1.59	0.51
2:A:155:GLN:C	2:A:155:GLN:NE2	2.68	0.51
1:B:145:PRO:O	1:B:197:HIS:HE1	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:135:LEU:N	2:C:135:LEU:CD2	2.74	0.50
2:A:114:VAL:HG22	2:A:135:LEU:HD13	1.93	0.50
2:A:149:ILE:HD11	2:A:178:LEU:HD21	1.94	0.50
2:C:54:ARG:NH2	2:C:60:ASP:HA	2.26	0.50
2:C:107:ARG:HG3	2:C:108:ALA:O	2.12	0.50
2:A:146:LYS:HD2	2:A:148:LYS:HE3	1.92	0.50
2:A:6:GLN:HE21	2:A:98:GLY:HA3	1.75	0.50
1:D:4:LEU:HD22	1:D:24:THR:HG22	1.93	0.50
1:B:136:LEU:HB3	1:B:208:ILE:HD13	1.93	0.49
1:B:50:PHE:C	1:B:50:PHE:CD1	2.88	0.49
1:B:51:ILE:HG12	1:B:55:THR:HG22	1.93	0.49
1:D:5:VAL:O	1:D:22:CYS:HA	2.13	0.49
2:A:168:LYS:NZ	5:A:701:HOH:O	2.44	0.49
1:D:145:PRO:O	1:D:197:HIS:HE1	1.95	0.49
2:C:2:ILE:O	2:C:96:THR:HG21	2.13	0.49
2:C:8:PRO:O	2:C:101:THR:HG23	2.12	0.49
1:B:130:THR:O	1:B:130:THR:HG23	2.12	0.48
2:C:11:LEU:HD23	2:C:11:LEU:C	2.38	0.48
1:B:69:ARG:HE	1:B:71:ASN:HD21	1.61	0.48
2:C:191:TYR:O	2:C:207:SER:HB2	2.14	0.48
2:C:11:LEU:HD22	2:C:102:LYS:O	2.14	0.48
1:B:2:VAL:HG13	1:B:27:PHE:HD1	1.78	0.48
2:A:4:MET:SD	2:A:25:SER:HB3	2.54	0.47
2:C:107:ARG:HG2	2:C:139:TYR:CD2	2.49	0.47
1:B:83:ARG:NH1	1:B:84:ALA:H	2.12	0.47
1:D:73:GLN:O	1:D:74:SER:HB3	2.14	0.47
1:D:85:GLU:N	1:D:85:GLU:CD	2.72	0.47
1:D:211:ARG:NH1	2:C:118:PRO:HD2	2.30	0.47
1:D:1:GLU:HG2	1:D:2:VAL:HG23	1.96	0.47
2:C:6:GLN:NE2	2:C:88:CYS:H	2.12	0.47
2:C:18:LYS:HG2	2:C:19:VAL:N	2.28	0.47
1:B:57:TYR:HE1	1:B:67:ILE:HG13	1.80	0.47
2:A:61:ARG:HE	2:A:61:ARG:HB3	1.32	0.47
2:A:135:LEU:HD22	2:A:135:LEU:N	2.30	0.47
2:A:174:MET:HG2	2:A:175:SER:N	2.30	0.46
2:A:54:ARG:HB2	5:A:642:HOH:O	2.14	0.46
2:A:135:LEU:HD13	2:A:135:LEU:HA	1.78	0.46
2:C:149:ILE:HD11	2:C:178:LEU:HD21	1.96	0.46
2:C:178:LEU:HD11	2:C:180:LEU:HD21	1.96	0.46
1:D:164:PHE:CG	2:C:175:SER:HB2	2.51	0.46
1:D:52(B):LYS:CG	1:D:52(C):ALA:N	2.74	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:31:ASN:O	2:A:50:TRP:HA	2.16	0.46
1:D:29:PHE:O	1:D:69:ARG:NH2	2.48	0.46
1:B:2:VAL:HG13	1:B:27:PHE:CD1	2.51	0.46
1:D:52(B):LYS:NZ	1:D:52(B):LYS:CB	2.79	0.45
1:D:129:GLN:HG2	1:D:130:THR:H	1.81	0.45
1:D:3:LYS:HD3	5:D:431:HOH:O	2.15	0.45
2:A:89:LYS:NZ	5:A:679:HOH:O	2.50	0.45
1:D:169:GLN:O	1:D:170:SER:HB2	2.16	0.45
1:B:81:ASN:O	1:B:82:THR:C	2.58	0.45
2:A:30(C):ARG:HH11	2:A:30(C):ARG:CB	2.27	0.45
2:C:135:LEU:HD12	2:C:195:ALA:HB2	1.98	0.45
1:B:175:LEU:C	1:B:175:LEU:CD1	2.90	0.45
2:C:30(E):ARG:C	2:C:30(F):LYS:HD2	2.41	0.45
2:C:30(A):ASN:OD1	2:C:30(C):ARG:HB3	2.17	0.45
1:B:152:TRP:CZ3	1:B:208:ILE:HD11	2.51	0.45
2:C:166:ASP:OD2	2:C:168:LYS:NZ	2.49	0.45
1:D:175:LEU:C	1:D:175:LEU:CD1	2.90	0.45
2:A:35:TRP:CE2	2:A:73:LEU:HB2	2.52	0.45
2:A:90:GLN:HE21	2:A:96:THR:HG23	1.74	0.45
2:A:168:LYS:NZ	2:A:168:LYS:HB2	2.32	0.45
2:C:30(A):ASN:HB2	2:C:32:TYR:HE1	1.82	0.45
1:D:146:GLU:HB3	1:D:147:PRO:HA	1.98	0.45
2:A:107:ARG:HG3	2:A:108:ALA:N	2.32	0.45
2:A:185:TYR:HA	2:A:191:TYR:OH	2.17	0.45
2:A:61:ARG:HD3	2:A:77:SER:O	2.17	0.44
1:D:168:LEU:HB2	1:D:173:TYR:CE1	2.53	0.44
2:C:139:TYR:O	2:C:197:HIS:HE1	2.02	0.43
1:B:197:HIS:HD2	1:B:200:SER:OG	2.01	0.43
1:D:6:GLU:HA	1:D:21:SER:O	2.18	0.43
1:B:97:ASP:C	1:B:99:TYR:N	2.77	0.43
1:B:169:GLN:O	1:B:170:SER:HB2	2.18	0.43
2:C:107:ARG:HG3	2:C:107:ARG:HH11	1.83	0.43
1:B:164:PHE:CG	2:A:175:SER:HB2	2.54	0.43
1:D:154:SER:N	1:D:194:ASN:ND2	2.56	0.43
1:B:178:SER:HB3	2:A:134:PHE:CE2	2.53	0.43
1:D:144:PHE:CG	1:D:145:PRO:HA	2.54	0.43
2:A:6:GLN:HE22	2:A:87:TYR:HA	1.84	0.43
2:C:4:MET:SD	2:C:25:SER:HB3	2.59	0.43
2:C:134:PHE:C	2:C:135:LEU:HD22	2.43	0.43
1:B:3:LYS:HG2	1:B:25:SER:OG	2.19	0.43
1:B:171:ASP:CG	1:D:1:GLU:HB2	2.44	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:12:ALA:HA	2:A:104:GLU:O	2.19	0.43
1:D:198:PRO:O	1:D:199:ALA:C	2.62	0.42
1:D:50:PHE:HD1	1:D:50:PHE:O	2.02	0.42
2:C:83:LEU:O	2:C:84:ALA:HB2	2.20	0.42
1:D:38:ARG:HG2	1:D:48:LEU:HD21	2.02	0.42
1:D:52(B):LYS:C	1:D:52(D):ASN:N	2.77	0.42
2:C:188:HIS:O	2:C:210:ARG:HD3	2.20	0.42
1:B:4:LEU:CD2	1:B:24:THR:HG22	2.49	0.42
1:D:121:PRO:HD3	1:D:206:LYS:HG2	2.01	0.42
1:D:1:GLU:N	5:D:431:HOH:O	2.53	0.42
1:D:164:PHE:CD2	2:C:175:SER:HB2	2.55	0.42
2:C:32:TYR:HB3	2:C:91:SER:OG	2.19	0.42
1:D:12:VAL:O	1:D:109:VAL:HA	2.19	0.42
1:D:154:SER:N	1:D:194:ASN:HD21	1.85	0.42
2:C:197:HIS:C	2:C:199:THR:N	2.78	0.41
1:B:130:THR:O	1:B:131:ASN:CB	2.67	0.41
2:A:191:TYR:O	2:A:207:SER:HB2	2.20	0.41
2:A:208:PHE:HA	2:A:212:GLU:OE1	2.19	0.41
2:C:148:LYS:C	2:C:149:ILE:HD12	2.44	0.41
2:C:197:HIS:C	2:C:199:THR:H	2.28	0.41
1:B:36:TRP:CE2	1:B:78:LEU:HB2	2.56	0.41
1:B:162:HIS:CE1	5:B:303:HOH:O	2.73	0.41
1:B:164:PHE:HA	1:B:165:PRO:HD3	1.88	0.41
2:C:35:TRP:CE2	2:C:73:LEU:HB2	2.55	0.41
1:B:43:LYS:HG3	5:B:700:HOH:O	2.18	0.41
2:C:149:ILE:HD11	2:C:178:LEU:CD2	2.51	0.41
1:B:64:ARG:HG3	1:B:82:THR:HG23	2.03	0.41
1:B:136:LEU:HD22	1:B:136:LEU:N	2.35	0.41
1:D:168:LEU:HD13	1:D:168:LEU:C	2.45	0.41
1:D:175:LEU:HD12	1:D:176:SER:N	2.36	0.41
1:B:118:SER:HA	5:B:370:HOH:O	2.20	0.41
1:D:175:LEU:CD1	1:D:176:SER:N	2.84	0.41
1:B:111:ALA:HB3	1:D:26:GLY:HA2	2.01	0.41
1:B:134:VAL:HG13	1:B:136:LEU:HD21	2.02	0.41
2:A:2:ILE:O	2:A:96:THR:HG21	2.20	0.41
2:C:90:GLN:HG3	2:C:96:THR:HG23	2.02	0.41
1:B:22:CYS:HB3	1:B:76:LEU:HB3	2.03	0.41
1:B:120:TYR:CE2	2:A:123:GLN:HG3	2.56	0.41
1:B:168:LEU:HD23	1:B:173:TYR:CE1	2.55	0.41
2:A:90:GLN:CG	2:A:96:THR:HG23	2.51	0.41
2:A:21:MET:SD	2:A:73:LEU:HD23	2.61	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:37:GLN:HG3	2:C:86:TYR:CE1	2.56	0.40
2:C:114:VAL:HG22	2:C:135:LEU:HD13	2.03	0.40
1:D:22:CYS:HB3	1:D:76:LEU:HB3	2.03	0.40
2:C:11:LEU:HD22	2:C:11:LEU:H	1.85	0.40
2:C:33:LEU:HD13	2:C:33:LEU:C	2.47	0.40
2:C:191:TYR:O	2:C:207:SER:CB	2.69	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	B	220/222 (99%)	204 (93%)	13 (6%)	3 (1%)	9	8
1	D	220/222 (99%)	202 (92%)	12 (6%)	6 (3%)	4	2
2	A	217/219 (99%)	207 (95%)	9 (4%)	1 (0%)	24	29
2	C	217/219 (99%)	203 (94%)	14 (6%)	0	100	100
All	All	874/882 (99%)	816 (93%)	48 (6%)	10 (1%)	11	11

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	127	ALA
1	B	131	ASN
1	D	97	ASP
1	D	99	TYR
1	B	170	SER
1	D	25	SER
1	D	100	TYR
1	D	127	ALA
1	D	131	ASN

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Mol	Chain	Res	Type
2	A	198	LYS

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	B	190/190 (100%)	172 (90%)	18 (10%)	8	9
1	D	190/190 (100%)	185 (97%)	5 (3%)	40	56
2	A	195/195 (100%)	188 (96%)	7 (4%)	31	44
2	C	195/195 (100%)	187 (96%)	8 (4%)	27	38
All	All	770/770 (100%)	732 (95%)	38 (5%)	22	31

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1	GLU
1	B	17	SER
1	B	20	LEU
1	B	28	THR
1	B	50	PHE
1	B	51	ILE
1	B	82	THR
1	B	82(A)	LEU
1	B	83	ARG
1	B	113	LYS
1	B	145	PRO
1	B	147	PRO
1	B	148	VAL
1	B	157	LEU
1	B	175	LEU
1	B	188	SER
1	B	203	LYS
1	B	209	VAL
1	D	50	PHE
1	D	110	SER

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Mol	Chain	Res	Type
1	D	147	PRO
1	D	148	VAL
1	D	175	LEU
2	A	1	ASP
2	A	61	ARG
2	A	94	LEU
2	A	96	THR
2	A	156	ASN
2	A	168	LYS
2	A	184	GLU
2	C	11	LEU
2	C	45	LYS
2	C	94	LEU
2	C	96	THR
2	C	122	GLU
2	C	135	LEU
2	C	146	LYS
2	C	155	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	39	GLN
1	B	71	ASN
1	B	194	ASN
1	B	197	HIS
1	D	39	GLN
1	D	71	ASN
1	D	169	GLN
1	D	194	ASN
1	D	197	HIS
2	A	6	GLN
2	A	31	ASN
2	A	38	GLN
2	A	42	GLN
2	A	90	GLN
2	A	93	ASN
2	A	155	GLN
2	A	160	ASN
2	A	165	GLN
2	C	6	GLN
2	C	31	ASN

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Mol	Chain	Res	Type
2	C	38	GLN
2	C	42	GLN
2	C	79	GLN
2	C	165	GLN
2	C	197	HIS

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 10 ligands modelled in this entry, 10 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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	B	222/222 (100%)	-0.03	5 (2%) 61 63	24, 39, 72, 98	0
1	D	222/222 (100%)	-0.07	4 (1%) 67 69	24, 37, 70, 100	0
2	A	219/219 (100%)	-0.25	0 100 100	21, 36, 54, 64	0
2	C	219/219 (100%)	-0.18	0 100 100	25, 37, 54, 62	0
All	All	882/882 (100%)	-0.13	9 (1%) 79 81	21, 38, 60, 100	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	99	TYR	3.3
1	B	100	TYR	3.0
1	D	100(C)	PHE	2.7
1	B	128	ALA	2.7
1	D	98	GLY	2.6
1	D	129	GLN	2.4
1	B	100(C)	PHE	2.3
1	B	131	ASN	2.1
1	B	127	ALA	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](#)

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, 95th 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($\text{\AA}^2$)	Q<0.9
3	MG	C	217	1/1	0.91	0.11	29,29,29,29	0
3	MG	C	218	1/1	0.95	0.04	37,37,37,37	0
3	MG	A	215	1/1	0.97	0.07	37,37,37,37	0
3	MG	B	212	1/1	0.97	0.04	27,27,27,27	0
3	MG	D	212	1/1	0.97	0.07	24,24,24,24	0
3	MG	C	219	1/1	0.98	0.04	28,28,28,28	0
4	ZN	A	214	1/1	0.98	0.03	55,55,55,55	0
4	ZN	C	214	1/1	0.98	0.04	61,61,61,61	0
4	ZN	C	215	1/1	0.98	0.04	55,55,55,55	0
3	MG	C	216	1/1	0.99	0.03	19,19,19,19	0

6.5 Other polymers [i](#)

There are no such residues in this entry.