



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:24 PM UTC

PDB ID : 9Z3B / pdb\_00009z3b  
Title : Structure C-terminal human Mesothelin Peptide bound to MSLNB703 Fab  
Authors : Shaffer, P.L.; Ember, S.  
Deposited on : 2025-11-06  
Resolution : 1.96 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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0  
Xtrriage (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

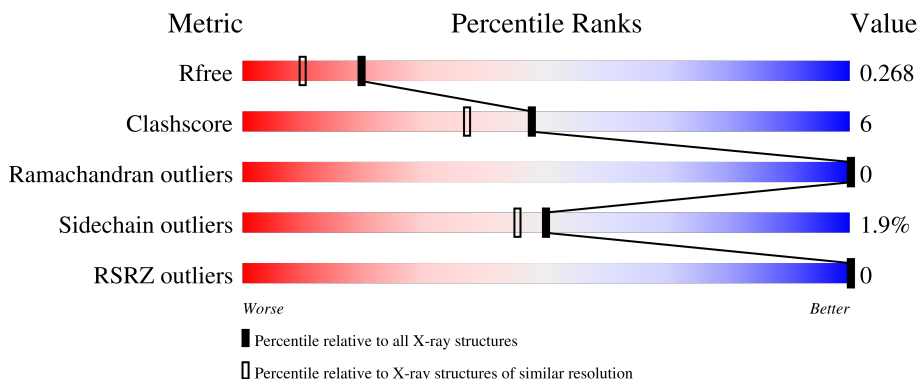
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.96 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.





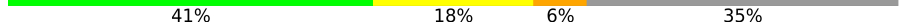
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	3494 (1.96-1.96)
Clashscore	190562	3612 (1.96-1.96)
Ramachandran outliers	187476	3587 (1.96-1.96)
Sidechain outliers	187428	3587 (1.96-1.96)
RSRZ outliers	180081	3495 (1.96-1.96)

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  $\geq 3$ , 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	220	88% 12%
1	C	220	85% 13% .
1	E	220	90% 9% .
1	G	220	85% 12% .
2	B	231	84% 12% .

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Mol	Chain	Length	Quality of chain
2	D	231	 82% 14% ..
2	F	231	 84% 13% .
2	H	231	 81% 16% .
3	I	17	 71% 6% 6% 18%
3	J	17	 47% 35% 18%
3	K	17	 47% 29% 24%
3	L	17	 41% 18% 6% 35%

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 13677 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 MSLNB703 Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	220	Total 1642	C 1032	N 269	O 336	S 5	0	0	0
1	C	218	Total 1628	C 1028	N 268	O 328	S 4	0	1	0
1	E	218	Total 1662	C 1042	N 273	O 343	S 4	0	1	0
1	G	216	Total 1582	C 996	N 257	O 325	S 4	0	1	0

- Molecule 2 is a protein called MSLNB703 Heavy Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	223	Total 1646	C 1035	N 274	O 333	S 4	0	0	0
2	D	226	Total 1649	C 1037	N 276	O 332	S 4	0	0	0
2	F	222	Total 1644	C 1033	N 273	O 334	S 4	0	1	0
2	H	223	Total 1640	C 1033	N 276	O 327	S 4	0	0	0

- Molecule 3 is a protein called Mesothelin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	I	14	Total 107	C 68	N 15	O 23	S 1	0	0	0
3	J	14	Total 100	C 62	N 15	O 22	S 1	0	0	0
3	K	13	Total 100	C 65	N 14	O 20	S 1	0	0	0
3	L	11	Total 72	C 42	N 12	O 17	S 1	0	0	0


- Molecule 4 is water.

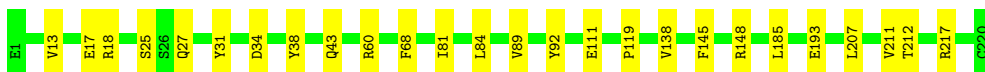
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	35	Total O 35 35	0	0
4	B	30	Total O 30 30	0	0
4	C	26	Total O 26 26	0	0
4	D	24	Total O 24 24	0	0
4	E	23	Total O 23 23	0	0
4	F	25	Total O 25 25	0	0
4	G	9	Total O 9 9	0	0
4	H	31	Total O 31 31	0	0
4	I	1	Total O 1 1	0	0
4	J	1	Total O 1 1	0	0

### 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.

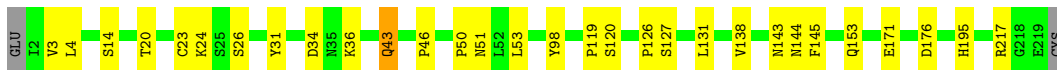
- Molecule 1: MSLNB703 Light Chain

Chain A:  88% 12%




- Molecule 1: MSLNB703 Light Chain

Chain C:  85% 13%




- Molecule 1: MSLNB703 Light Chain

Chain E:  90% 9%




- Molecule 1: MSLNB703 Light Chain

Chain G:  85% 12%



- Molecule 2: MSLNB703 Heavy Chain

Chain B:  84% 12%



HIS  
HIS

- Molecule 2: MSLNB703 Heavy Chain



Chain L: 

ILE	PRO	ASN	GLY	Y586	I587	V588	L589	S592	M593	A596	LEU	SER
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## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	60.15Å 79.74Å 86.77Å 77.18° 89.73° 89.84°	Depositor
Resolution (Å)	44.21 – 1.96 44.21 – 1.96	Depositor EDS
% Data completeness (in resolution range)	75.3 (44.21-1.96) 74.6 (44.21-1.96)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.78 (at 1.97Å)	Xtrriage
Refinement program	PHENIX (1.19.2_4158: ???)	Depositor
R, $R_{free}$	0.227 , 0.278 0.229 , 0.268	Depositor DCC
$R_{free}$ test set	4286 reflections (3.82%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	31.0	Xtrriage
Anisotropy	0.017	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 28.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.237 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	13677	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	35.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.73% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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	0.24	0/1681	0.46	0/2301
1	C	0.26	0/1670	0.52	0/2289
1	E	0.29	0/1710	0.53	0/2335
1	G	0.27	0/1624	0.49	0/2233
2	B	0.26	0/1689	0.48	0/2318
2	D	0.58	0/1692	0.83	3/2326 (0.1%)
2	F	0.24	0/1690	0.47	0/2321
2	H	0.23	0/1683	0.46	0/2310
3	I	0.57	0/107	1.01	0/142
3	J	0.25	0/99	0.54	0/131
3	K	0.20	0/100	0.38	0/134
3	L	0.21	0/71	0.56	0/95
All	All	0.32	0/13816	0.55	3/18935 (0.0%)

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
2	D	0	1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	57	SER	N-CA-C	-9.29	102.76	114.56
2	D	56	ARG	N-CA-C	-5.23	103.07	111.02
2	D	34	ALA	N-CA-C	5.21	116.91	109.14

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	52	ARG	Sidechain

## 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	1642	0	1497	17	0
1	C	1628	0	1483	19	0
1	E	1662	0	1547	13	0
1	G	1582	0	1404	19	0
2	B	1646	0	1553	16	0
2	D	1649	0	1534	24	0
2	F	1644	0	1545	17	0
2	H	1640	0	1544	23	0
3	I	107	0	106	2	0
3	J	100	0	99	9	0
3	K	100	0	101	4	0
3	L	72	0	53	6	0
4	A	35	0	0	1	0
4	B	30	0	0	1	0
4	C	26	0	0	2	0
4	D	24	0	0	1	0
4	E	23	0	0	0	0
4	F	25	0	0	0	0
4	G	9	0	0	1	0
4	H	31	0	0	1	0
4	I	1	0	0	0	0
4	J	1	0	0	0	0
All	All	13677	0	12466	145	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 6.

All (145) 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)
3:J:588:VAL:HG11	3:J:594:GLN:HG2	1.60	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:31:TYR:OH	3:J:594:GLN:NE2	2.16	0.79
2:D:102:ARG:HG3	3:J:589:LEU:HD13	1.64	0.79
2:F:152:LYS:NZ	2:F:180:GLN:OE1	2.20	0.73
1:G:121:VAL:HG21	1:G:202:VAL:HG11	1.73	0.70
2:B:160:THR:OG1	2:B:208:ASN:OD1	2.09	0.70
2:H:72:THR:HB	2:H:85:GLN:HB2	1.75	0.69
2:B:52:ARG:NH2	3:I:590:ASP:OD2	2.25	0.69
2:F:30:SER:HB2	2:F:55:TYR:HD2	1.57	0.68
1:G:163:GLY:O	4:G:301:HOH:O	2.12	0.67
1:E:126:PRO:HD3	1:E:138:VAL:HG22	1.77	0.67
2:F:49:TRP:HZ2	2:F:52:ARG:HG2	1.61	0.65
1:A:17:GLU:CD	1:A:18:ARG:H	2.05	0.63
2:B:87:ASN:ND2	4:B:302:HOH:O	2.31	0.63
2:F:102:ARG:HD2	3:K:589:LEU:HD13	1.81	0.63
2:D:85:GLN:OE1	2:H:21:THR:CG2	2.48	0.62
2:D:104:TYR:CD2	3:J:587:LEU:HD22	2.35	0.62
2:B:197:SER:HB2	2:B:201:GLN:HG2	1.82	0.61
1:G:8:PRO:HG2	1:G:11:LEU:HG	1.84	0.60
2:F:94:THR:HG23	2:F:119:THR:HA	1.82	0.60
1:E:215:PHE:HB3	2:F:138:LYS:HG2	1.83	0.59
1:G:144:ASN:ND2	1:G:176:ASP:OD2	2.35	0.59
1:A:89:VAL:HG23	1:A:111:GLU:HA	1.84	0.59
1:C:3:VAL:HG22	1:C:26:SER:HB3	1.85	0.59
1:C:126:PRO:HD3	1:C:138:VAL:HG22	1.85	0.59
2:D:87:ASN:ND2	4:D:303:HOH:O	2.36	0.58
2:H:87:ASN:ND2	4:H:303:HOH:O	2.37	0.58
1:A:138:VAL:HG13	1:A:185:LEU:HB3	1.86	0.58
2:F:56:ARG:C	2:F:58:LYS:H	2.12	0.57
3:L:588:VAL:HA	3:L:593:MET:HE3	1.87	0.57
1:A:43:GLN:HG3	1:A:92:TYR:CE2	2.40	0.56
1:C:144:ASN:ND2	1:C:176:ASP:OD2	2.39	0.56
1:E:15:LEU:HD12	1:E:15:LEU:H	1.70	0.56
2:D:85:GLN:OE1	2:H:21:THR:HG21	2.05	0.56
2:F:30:SER:HB2	2:F:55:TYR:CD2	2.39	0.56
2:D:54:TYR:CD1	3:J:593:MET:HE3	2.41	0.55
3:L:589:LEU:H	3:L:593:MET:CE	2.19	0.55
2:F:54:TYR:CE2	3:K:593:MET:HE2	2.42	0.54
2:B:91:PRO:HA	2:B:120:VAL:HB	1.88	0.54
1:G:100:THR:HG22	3:L:592:SER:OG	2.08	0.54
1:G:43:GLN:HB2	1:G:53:LEU:HD11	1.89	0.53
2:B:12:VAL:HG21	2:B:18:LEU:HD13	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:25:SER:OG	1:A:27:GLN:O	2.25	0.53
2:H:20:LEU:HD12	2:H:84:LEU:HD23	1.91	0.52
1:A:13:VAL:HG13	1:A:17:GLU:HB3	1.92	0.52
1:C:43[A]:GLN:HB2	1:C:53:LEU:HD11	1.93	0.51
1:G:126:PRO:HD3	1:G:138:VAL:HG22	1.93	0.51
1:A:34:ASP:OD2	1:A:38:TYR:OH	2.24	0.51
1:E:143:ASN:HD22	2:F:192:THR:HG21	1.75	0.51
2:D:20:LEU:HD12	2:D:84:LEU:HD23	1.91	0.51
1:C:127:SER:O	1:C:131:LEU:HD22	2.11	0.51
2:D:54:TYR:CE1	2:D:60:TYR:HB2	2.47	0.50
2:H:13:LYS:H	2:H:16:GLN:HE21	1.59	0.50
2:H:151:VAL:HG11	2:H:159:VAL:HG11	1.94	0.50
1:E:60[A]:ARG:HG2	1:E:64:VAL:HB	1.94	0.50
1:E:60[B]:ARG:HG2	1:E:64:VAL:HB	1.94	0.50
2:D:54:TYR:CE1	3:J:593:MET:HE3	2.47	0.50
1:A:119:PRO:HB3	1:A:145:PHE:HB3	1.93	0.49
1:A:193:GLU:OE2	1:A:217:ARG:HD2	2.12	0.49
1:C:4:LEU:HD12	1:C:23:CYS:SG	2.52	0.49
1:G:215:PHE:HB3	2:H:138:LYS:HG3	1.94	0.49
2:D:144:THR:HG23	2:D:192:THR:HG23	1.94	0.49
2:B:72:THR:OG1	2:B:85:GLN:HB3	2.12	0.48
2:D:7:SER:HB3	2:D:21:THR:HG23	1.95	0.48
2:B:151:VAL:HG11	2:B:159:VAL:HG11	1.94	0.48
2:B:38:TRP:HD1	2:B:73:ILE:HD13	1.79	0.48
2:F:91:PRO:HA	2:F:120:VAL:HB	1.96	0.48
2:D:101:ARG:O	2:D:109:PHE:HA	2.13	0.48
2:F:54:TYR:CD2	3:K:593:MET:HE2	2.49	0.48
2:H:34:ALA:O	2:H:56:ARG:NH2	2.46	0.48
2:H:13:LYS:H	2:H:16:GLN:NE2	2.12	0.48
2:B:54:TYR:CD1	3:I:593:MET:HE2	2.49	0.48
1:E:53:LEU:O	1:E:54:ILE:HD13	2.13	0.47
1:E:95:GLN:HG2	1:E:96:GLN:N	2.29	0.47
1:G:89:VAL:CG1	1:G:112:ILE:HG12	2.45	0.47
3:K:591:LEU:O	3:K:595:GLU:HG3	2.13	0.47
1:G:157:ASP:OD2	1:G:195:HIS:HB3	2.15	0.47
2:H:40:ARG:HD3	2:H:50:LEU:HD11	1.97	0.46
2:B:153:ASP:OD1	2:B:180:GLN:NE2	2.45	0.46
2:H:148:GLY:HA2	2:H:163:TRP:CH2	2.49	0.46
1:A:217:ARG:HH11	1:A:217:ARG:HG2	1.81	0.46
1:E:34:ASP:OD2	1:E:36:LYS:HB2	2.15	0.46
2:H:49:TRP:HZ2	2:H:52:ARG:HG2	1.79	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:50:PRO:HG2	2:D:112:TRP:CH2	2.51	0.46
2:D:94:THR:HG23	2:D:119:THR:HA	1.98	0.46
1:A:43:GLN:HG3	1:A:92:TYR:CZ	2.51	0.46
1:G:35:ASN:O	1:G:35:ASN:CG	2.59	0.46
2:D:148:GLY:HA2	2:D:163:TRP:CH2	2.51	0.45
1:E:66:ASP:N	1:E:66:ASP:OD1	2.49	0.45
1:G:113:LYS:HA	1:G:146:TYR:OH	2.15	0.45
1:E:17:GLU:HA	1:E:17:GLU:OE1	2.15	0.45
2:H:102:ARG:NH2	3:L:589:LEU:O	2.49	0.45
3:L:593:MET:O	3:L:593:MET:HG2	2.16	0.45
1:G:215:PHE:HA	2:H:138:LYS:HE3	1.99	0.45
3:J:588:VAL:HG13	3:J:593:MET:HG2	1.98	0.45
1:G:89:VAL:HG11	1:G:112:ILE:HG12	1.99	0.44
1:G:96:GLN:NE2	1:G:103:THR:H	2.15	0.44
2:D:56:ARG:HD3	2:D:56:ARG:HA	1.58	0.44
2:B:187:LEU:HD12	2:B:187:LEU:C	2.43	0.44
1:C:24:LYS:HD3	1:C:24:LYS:HA	1.76	0.44
2:D:74:ASN:HA	2:D:75:PRO:HD3	1.89	0.44
2:D:82:PHE:HZ	2:D:99:CYS:HB2	1.83	0.44
1:A:217:ARG:HG2	1:A:217:ARG:NH1	2.32	0.44
2:F:179:LEU:HB2	2:H:194:PRO:HD3	1.98	0.44
2:H:36:TRP:CZ3	2:H:101:ARG:HB2	2.52	0.44
1:C:34:ASP:HB3	1:C:36:LYS:HD2	2.00	0.44
2:D:27:ASP:OD1	2:D:28:SER:N	2.46	0.44
3:L:589:LEU:H	3:L:593:MET:HE1	1.82	0.43
1:C:98:TYR:CE2	3:J:591:LEU:HD23	2.53	0.43
1:A:148:ARG:NH2	4:A:304:HOH:O	2.40	0.43
1:A:60:ARG:NH2	1:A:68:PHE:O	2.47	0.43
1:G:43:GLN:HG3	1:G:92:TYR:CE2	2.53	0.43
1:A:31:TYR:HB3	1:A:34:ASP:OD1	2.18	0.43
2:D:6:GLU:HG3	2:D:99:CYS:SG	2.57	0.43
2:D:82:PHE:CZ	2:D:99:CYS:HB2	2.53	0.43
1:G:60:ARG:NH1	1:G:64:VAL:O	2.51	0.43
1:C:43[B]:GLN:HB2	1:C:53:LEU:HD11	2.01	0.43
1:C:143:ASN:HD21	2:D:173:HIS:HD2	1.67	0.43
2:H:153:ASP:OD1	2:H:180:GLN:NE2	2.47	0.43
1:C:46:PRO:HG2	1:C:171:GLU:HG3	2.00	0.42
2:D:104:TYR:CE2	3:J:587:LEU:HD22	2.54	0.42
1:A:81:ILE:HG21	1:A:84:LEU:HD12	2.01	0.42
1:A:207:LEU:HD13	1:A:211:VAL:HG23	2.00	0.42
2:B:63:TYR:HB2	2:B:68:LYS:HG3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:HIS:O	1:C:217:ARG:NH1	2.53	0.42
2:F:4:LEU:HD22	2:F:24:ILE:HG12	2.01	0.42
1:E:36:LYS:HD2	1:E:56:TRP:CD2	2.55	0.41
1:E:130:GLN:HG3	2:F:131:PHE:CE2	2.55	0.41
1:C:31:TYR:HD1	1:C:31:TYR:HA	1.73	0.41
2:H:38:TRP:C	2:H:39:ILE:HG13	2.45	0.41
2:F:20:LEU:HD12	2:F:84:LEU:HD23	2.02	0.41
2:H:219:LYS:HE2	2:H:221:GLU:OE1	2.19	0.41
1:C:153:GLN:HG3	4:C:319:HOH:O	2.19	0.41
2:F:100:ALA:HB1	2:F:109:PHE:HB3	2.02	0.41
2:H:14:PRO:O	2:H:15:SER:OG	2.30	0.41
2:H:52:ARG:HD2	2:H:62:ASP:OD2	2.21	0.41
1:G:96:GLN:NE2	1:G:101:PRO:O	2.53	0.41
2:B:38:TRP:C	2:B:39:ILE:HG13	2.46	0.41
2:B:14:PRO:O	2:B:15:SER:OG	2.31	0.41
2:D:52:ARG:HD3	2:D:62:ASP:OD2	2.21	0.41
2:B:153:ASP:HA	2:B:184:LEU:HB3	2.03	0.41
1:C:51:ASN:ND2	4:C:304:HOH:O	2.54	0.40
1:C:119:PRO:HB3	1:C:145:PHE:HB3	2.02	0.40
1:G:112:ILE:HB	1:G:177:SER:HB3	2.03	0.40
2:H:94:THR:HG23	2:H:119:THR:HA	2.03	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	218/220 (99%)	214 (98%)	4 (2%)	0	100	100
1	C	217/220 (99%)	211 (97%)	6 (3%)	0	100	100
1	E	217/220 (99%)	210 (97%)	7 (3%)	0	100	100
1	G	215/220 (98%)	208 (97%)	7 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	221/231 (96%)	216 (98%)	5 (2%)	0	100	100
2	D	224/231 (97%)	219 (98%)	5 (2%)	0	100	100
2	F	221/231 (96%)	214 (97%)	7 (3%)	0	100	100
2	H	221/231 (96%)	215 (97%)	6 (3%)	0	100	100
3	I	12/17 (71%)	11 (92%)	1 (8%)	0	100	100
3	J	12/17 (71%)	12 (100%)	0	0	100	100
3	K	11/17 (65%)	11 (100%)	0	0	100	100
3	L	9/17 (53%)	8 (89%)	1 (11%)	0	100	100
All	All	1798/1872 (96%)	1749 (97%)	49 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 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	174/195 (89%)	173 (99%)	1 (1%)	78	79
1	C	170/195 (87%)	165 (97%)	5 (3%)	37	29
1	E	185/195 (95%)	183 (99%)	2 (1%)	65	64
1	G	164/195 (84%)	162 (99%)	2 (1%)	63	61
2	B	183/202 (91%)	181 (99%)	2 (1%)	65	64
2	D	179/202 (89%)	174 (97%)	5 (3%)	38	30
2	F	183/202 (91%)	178 (97%)	5 (3%)	39	32
2	H	179/202 (89%)	176 (98%)	3 (2%)	53	49
3	I	12/15 (80%)	11 (92%)	1 (8%)	10	3
3	J	11/15 (73%)	11 (100%)	0	100	100
3	K	11/15 (73%)	10 (91%)	1 (9%)	9	2
3	L	6/15 (40%)	5 (83%)	1 (17%)	2	0
All	All	1457/1648 (88%)	1429 (98%)	28 (2%)	50	45

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	212	THR
2	B	161	VAL
2	B	221	GLU
1	C	14	SER
1	C	20	THR
1	C	43[A]	GLN
1	C	43[B]	GLN
1	C	120	SER
2	D	32	ASN
2	D	37	ASN
2	D	139	SER
2	D	144	THR
2	D	159	VAL
1	E	103	THR
1	E	208	SER
2	F	7	SER
2	F	31	SER
2	F	78	SER
2	F	90	THR
2	F	126	LYS
1	G	103	THR
1	G	203	THR
2	H	25	SER
2	H	78	SER
2	H	144	THR
3	I	590	ASP
3	K	590	ASP
3	L	588	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	51	ASN
1	C	51	ASN
1	C	143	ASN
1	C	153	GLN
1	C	161	GLN
2	D	16	GLN
2	D	81	GLN
1	E	153	GLN
1	E	161	GLN

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Mol	Chain	Res	Type
1	E	205	GLN
2	F	201	GLN
2	F	208	ASN
1	G	43	GLN
2	H	16	GLN
2	H	87	ASN
3	J	594	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 [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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	220/220 (100%)	-1.05	0 100 100	17, 33, 50, 86	0
1	C	218/220 (99%)	-1.04	0 100 100	18, 35, 49, 68	1 (0%)
1	E	218/220 (99%)	-1.05	0 100 100	22, 35, 47, 68	1 (0%)
1	G	216/220 (98%)	-0.91	0 100 100	25, 46, 70, 83	1 (0%)
2	B	223/231 (96%)	-1.10	0 100 100	18, 27, 42, 60	0
2	D	226/231 (97%)	-1.07	0 100 100	18, 28, 47, 77	0
2	F	222/231 (96%)	-1.07	0 100 100	18, 32, 45, 64	1 (0%)
2	H	223/231 (96%)	-1.00	0 100 100	21, 33, 61, 77	0
3	I	14/17 (82%)	-0.67	0 100 100	40, 49, 81, 82	0
3	J	14/17 (82%)	-0.77	0 100 100	43, 52, 63, 67	0
3	K	13/17 (76%)	-0.93	0 100 100	41, 43, 54, 63	0
3	L	11/17 (64%)	-0.56	0 100 100	59, 65, 72, 87	0
All	All	1818/1872 (97%)	-1.03	0 100 100	17, 34, 58, 87	4 (0%)

There are no RSRZ outliers to report.

### 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

There are no ligands in this entry.

## 6.5 Other polymers

There are no such residues in this entry.