



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 10:45 PM JST

PDB ID : 8K35 / pdb_00008k35
EMDB ID : EMD-36844
Title : Structure of the bacteriophage lambda tail tip complex
Authors : Xiao, H.; Tan, L.; Cheng, L.P.; Liu, H.R.
Deposited on : 2023-07-14
Resolution : 3.44 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

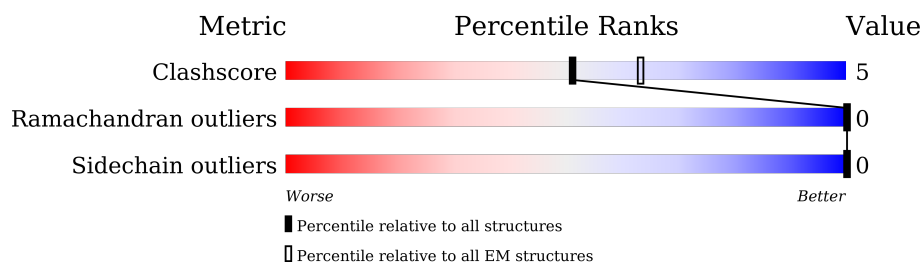
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.44 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.



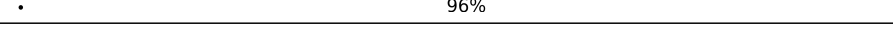
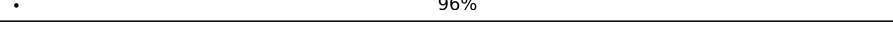
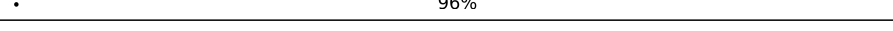
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	1132	64% 11% 25%
1	B	1132	64% 11% 25%
1	I	1132	65% 10% 25%
2	G	232	91% 9%
2	J	232	90% 10%
2	N	232	89% 11%
3	C	109	89% 11%
3	D	109	92% 8%
3	E	109	93% 7%

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Mol	Chain	Length	Quality of chain
3	F	109	 87% 13%
3	H	109	 90% 10%
3	O	109	 87% 13%
4	K	223	 33% 7% 60%
4	Q	223	 36% . 60%
4	x	223	 36% . 60%
5	L	246	 50% 12% 38%
5	R	246	 54% 8% 38%
5	T	246	 54% 9% 38%
5	U	246	 52% 10% 38%
5	V	246	 52% 11% 38%
5	W	246	 52% 10% 38%
6	M	853	 . 96%
6	P	853	 . 96%
6	S	853	 . 96%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 40353 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Tip attachment protein J.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	I	851	Total	C	N	O	S	0	0
			6633	4156	1156	1301	20		
1	A	851	Total	C	N	O	S	0	0
			6633	4156	1156	1301	20		
1	B	851	Total	C	N	O	S	0	0
			6633	4156	1156	1301	20		

- Molecule 2 is a protein called Tail tip protein L.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	J	232	Total	C	N	O	S	0	0
			1801	1117	309	362	13		
2	G	232	Total	C	N	O	S	0	0
			1801	1117	309	362	13		
2	N	232	Total	C	N	O	S	0	0
			1801	1117	309	362	13		

- Molecule 3 is a protein called Tail tip protein M.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	H	109	Total	C	N	O	S	0	0
			884	569	154	157	4		
3	O	109	Total	C	N	O	S	0	0
			884	569	154	157	4		
3	C	109	Total	C	N	O	S	0	0
			884	569	154	157	4		
3	E	109	Total	C	N	O	S	0	0
			884	569	154	157	4		
3	D	109	Total	C	N	O	S	0	0
			884	569	154	157	4		
3	F	109	Total	C	N	O	S	0	0
			884	569	154	157	4		

- Molecule 4 is a protein called Tail tip assembly protein I.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	x	89	Total	C	N	O	S	0	0
			652	403	116	128	5		
4	K	89	Total	C	N	O	S	0	0
			652	403	116	128	5		
4	Q	89	Total	C	N	O	S	0	0
			652	403	116	128	5		

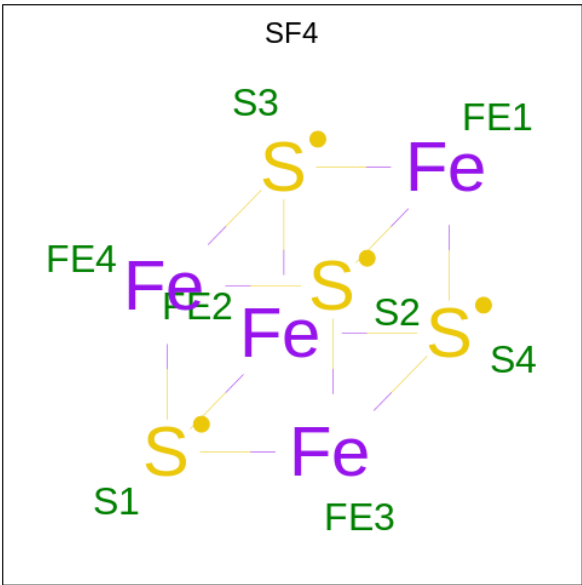
- Molecule 5 is a protein called Tail tube protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	L	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		
5	R	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		
5	T	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		
5	U	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		
5	V	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		
5	W	153	Total	C	N	O	S	0	0
			1174	736	199	236	3		

- Molecule 6 is a protein called Tape measure protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	P	32	Total	C	N	O	S	0	0
			241	149	45	45	2		
6	M	32	Total	C	N	O	S	0	0
			241	149	45	45	2		
6	S	32	Total	C	N	O	S	0	0
			241	149	45	45	2		

- Molecule 7 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe₄S₄).

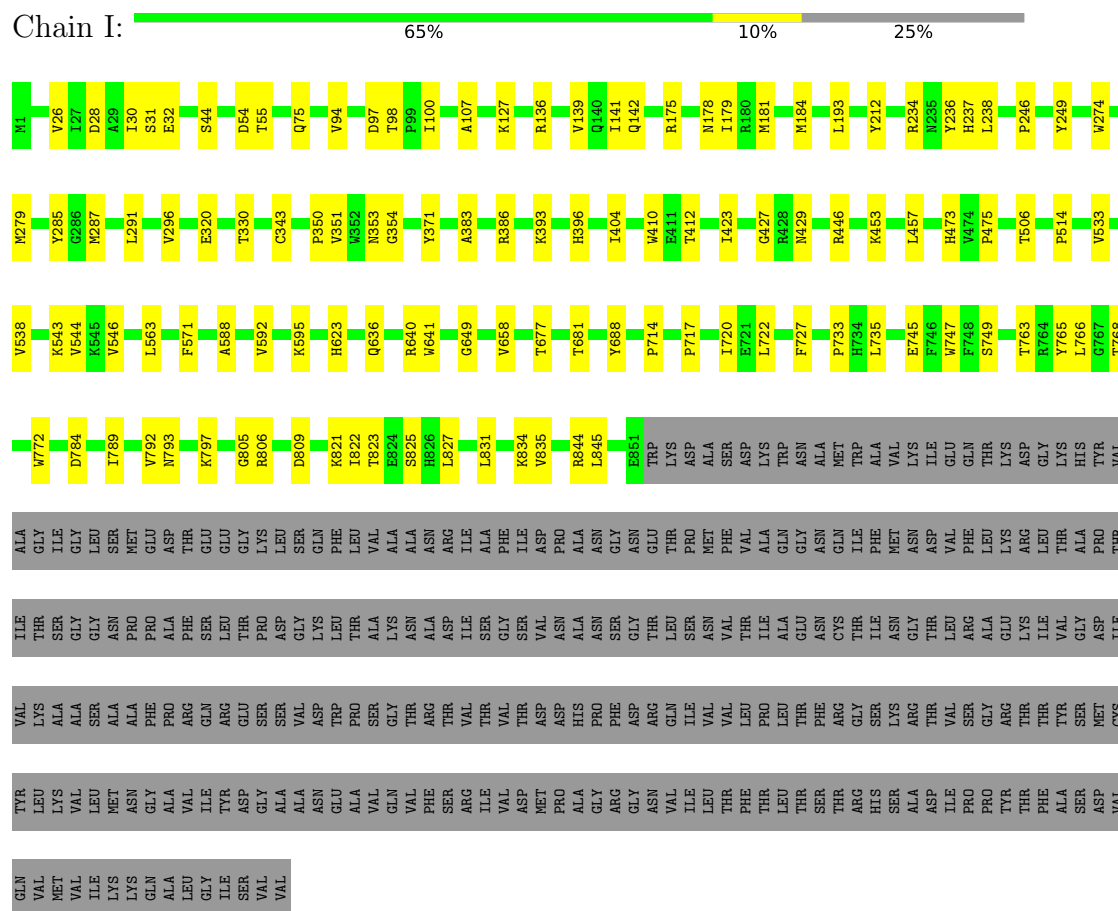


Mol	Chain	Residues	Atoms			AltConf
7	J	1	Total	Fe	S	0
			8	4	4	
7	G	1	Total	Fe	S	0
			8	4	4	
7	N	1	Total	Fe	S	0
			8	4	4	

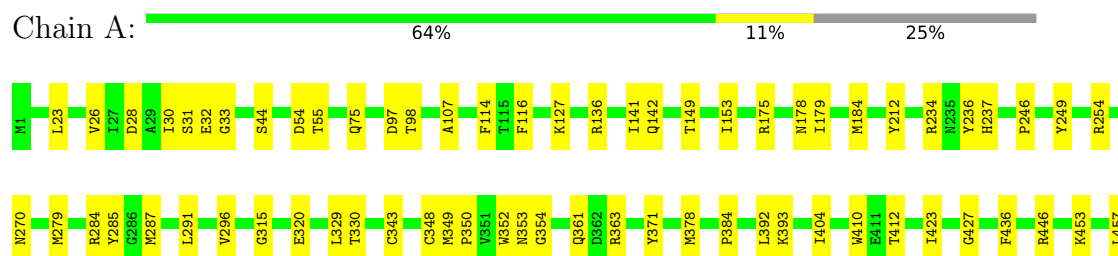
3 Residue-property plots

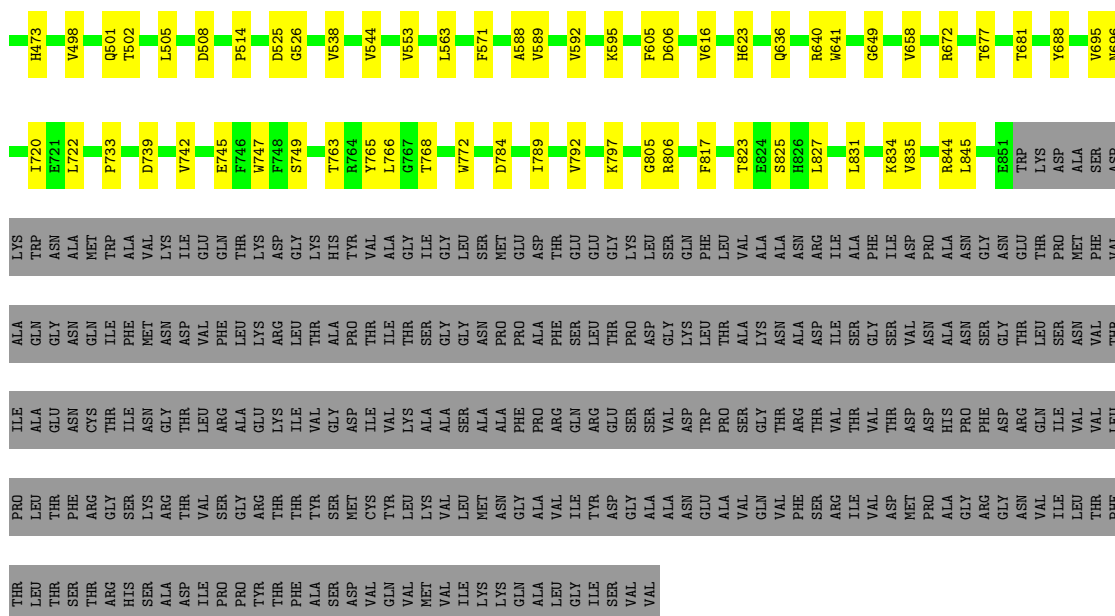
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. 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: Tip attachment protein J

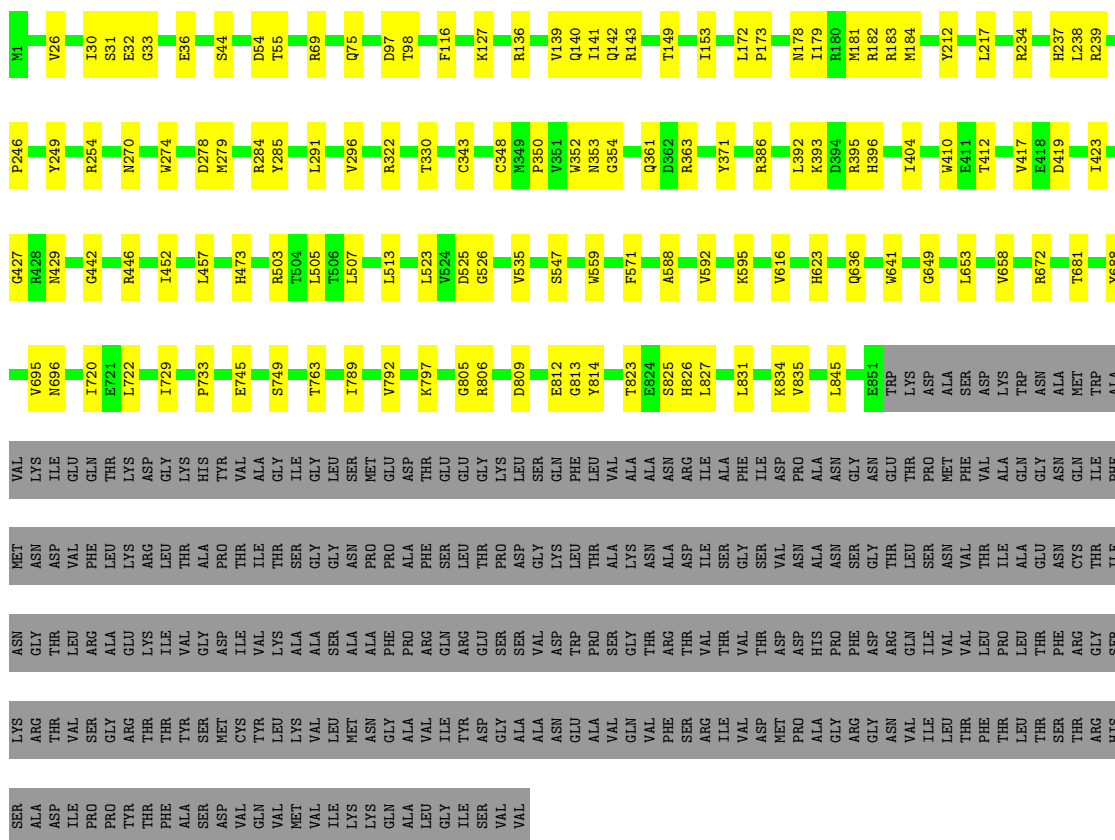


• Molecule 1: Tip attachment protein J

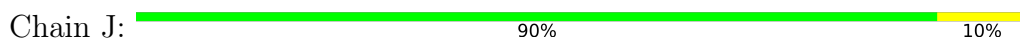




- Molecule 1: Tip attachment protein J



- Molecule 2: Tail tip protein L

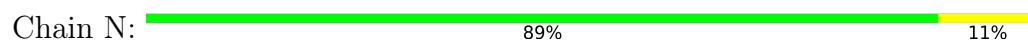




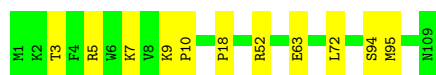
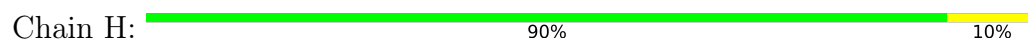
- Molecule 2: Tail tip protein L



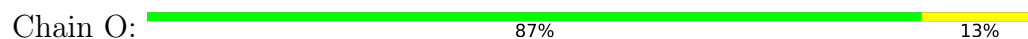
- Molecule 2: Tail tip protein L



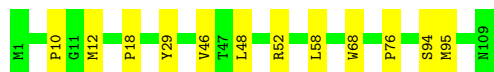
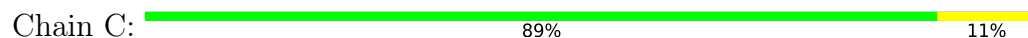
- Molecule 3: Tail tip protein M



- Molecule 3: Tail tip protein M



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- Molecule 3: Tail tip protein M



- Molecule 3: Tail tip protein M





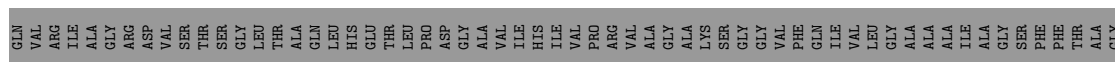
• Molecule 3: Tail tip protein M

Chain F: 87% 13%



• Molecule 4: Tail tip assembly protein I

Chain x: 36% 60%



• Molecule 4: Tail tip assembly protein I

Chain K: 33% 7% 60%



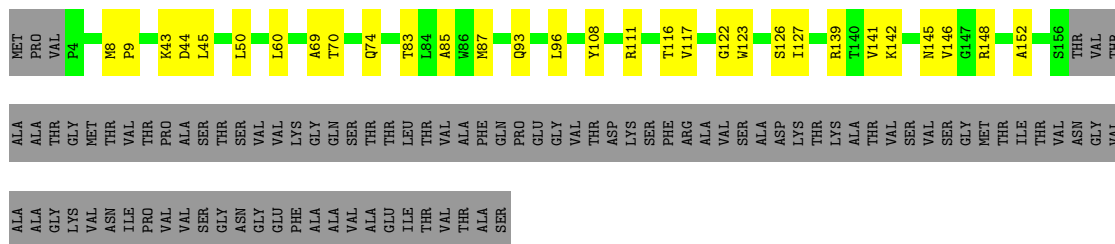
• Molecule 4: Tail tip assembly protein I

Chain Q: 36% 60%

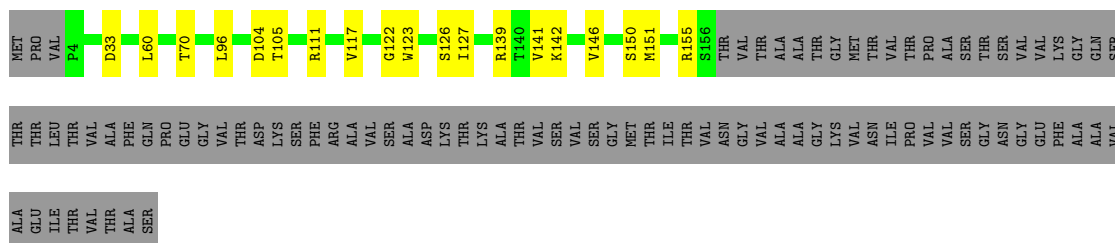


• Molecule 5: Tail tube protein

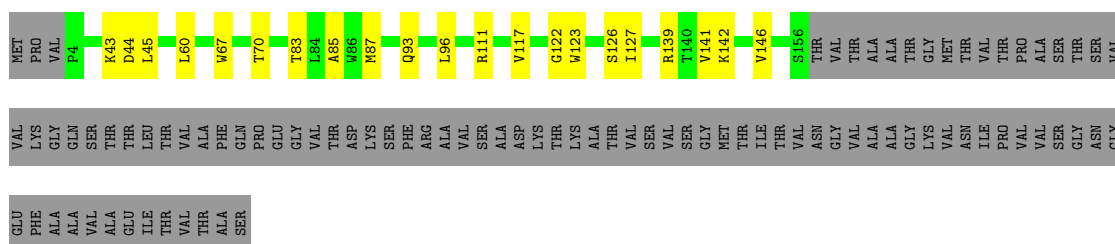
Chain L: 50% 12% 38%



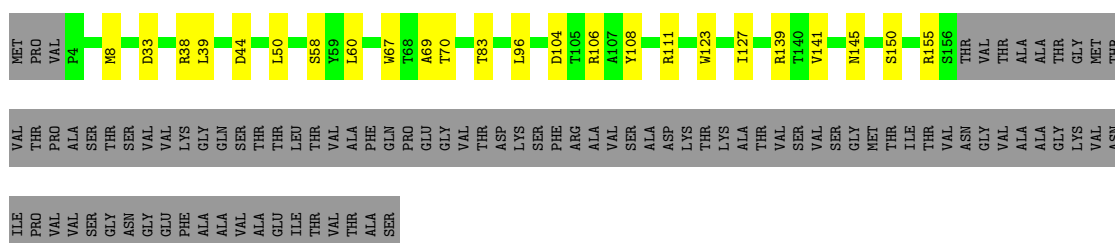
- Molecule 5: Tail tube protein



- Molecule 5: Tail tube protein



- Molecule 5: Tail tube protein



- Molecule 5: Tail tube protein



GLY	GLY	TYR	VAL	GLY	THR	GLY	PRO	GLY	SER	MET	ALA	ASP	SER	ARG	GLN	ALA	ALA	SER	ASN	GLY	THR	PHE	GLU	GLN	ASN	ASN	HIS	VAL	VAL	ILE	ASN	ASN	ASP	ASN	GLY	THR	ASN	GLY	GLN	R618	Y827	A830	R843	S849	GLY	GLY	GLY	GLY	ASP
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- Molecule 6: Tape measure protein

Chain M: 96%

GLY THR ALA ALA ILE GLN ALA ALA ALA LYS PHE HIS PHE ALA THR THR GLY GLY LYS TYR GLU PRO ARG GLY PHE VAL PHE THR THR LYS GLU ALA ILE VAL HIS ARG GLY PHE VAL ASN ILE LEU TYR ARG GLY VAL GLY ASN MET ARG GLY TYR ALA THR

GLY	GLY	THR	VAL	GLY	THR	PRO	GLY	GLY	SER	MET	ALA	ASP	ARG	SER	GLN	ALA	SER	GLY	THR	PHE	GLU	GLN	ASN	ASN	HIS	VAL	VAL	ILE	ASN	ASN	ASP	GLY	THR	ASN	GLY	GLN	I818	R843	S849	GLY	GLY	ARG
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- Molecule 6: Tape measure protein

Chain S: 96%

MET	ALA	GLU	PRO	VAL	GLY	ASP	LEU	VAL	VAL	VAL	ASP	LEU	SER	LEU	ASP	ALA	ALA	ARG	PHE	ASP	GLU	GLN	MET	ALA	ARG	VAL	ARG	ARG	HIS	ARG	PHE	SER	GLY	GLY	THR	GLU	SER	ASP	ALA	LYS	LYS	THR	ALA	ALA	VAL	VAL	GLU	GLN	SER	SER	LEU	SER	ARG	GLN	LEU	ALA	ALA	GLN	LYS	ALA	GLY	THR
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	54385	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	32	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: SF4

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	0.21	0/6775	0.37	0/9223
1	B	0.19	0/6775	0.37	1/9223 (0.0%)
1	I	0.18	0/6775	0.36	0/9223
2	G	0.26	0/1836	0.41	1/2487 (0.0%)
2	J	0.26	0/1836	0.39	0/2487
2	N	0.26	0/1836	0.41	0/2487
3	C	0.17	0/909	0.33	0/1231
3	D	0.18	0/909	0.34	0/1231
3	E	0.17	0/909	0.30	0/1231
3	F	0.18	0/909	0.30	0/1231
3	H	0.17	0/909	0.33	0/1231
3	O	0.18	0/909	0.29	0/1231
4	K	0.20	0/658	0.42	0/888
4	Q	0.19	0/658	0.39	0/888
4	x	0.19	0/658	0.39	0/888
5	L	0.14	0/1203	0.31	0/1639
5	R	0.14	0/1203	0.32	0/1639
5	T	0.32	0/1203	0.40	0/1639
5	U	0.14	0/1203	0.33	0/1639
5	V	0.14	0/1203	0.33	0/1639
5	W	0.14	0/1203	0.31	0/1639
6	M	0.18	0/243	0.29	0/323
6	P	0.18	0/243	0.29	0/323
6	S	0.18	0/243	0.31	0/323
All	All	0.20	0/41208	0.36	2/55983 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	92	ALA	N-CA-C	5.97	117.87	111.36
1	B	172	LEU	N-CA-C	5.75	116.65	109.57

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	6633	0	6479	90	0
1	B	6633	0	6479	88	0
1	I	6633	0	6479	77	0
2	G	1801	0	1715	19	0
2	J	1801	0	1715	19	0
2	N	1801	0	1715	19	0
3	C	884	0	881	9	0
3	D	884	0	881	6	0
3	E	884	0	881	7	0
3	F	884	0	881	10	0
3	H	884	0	881	10	0
3	O	884	0	881	10	0
4	K	652	0	661	14	0
4	Q	652	0	661	8	0
4	x	652	0	661	8	0
5	L	1174	0	1122	22	0
5	R	1174	0	1122	14	0
5	T	1174	0	1122	15	0
5	U	1174	0	1122	18	0
5	V	1174	0	1122	25	0
5	W	1174	0	1122	20	0
6	M	241	0	243	1	0
6	P	241	0	243	3	0
6	S	241	0	243	4	0
7	G	8	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	J	8	0	0	1	0
7	N	8	0	0	1	0
All	All	40353	0	39312	418	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 5.

All (418) 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:I:54:ASP:OD1	1:I:55:THR:N	2.08	0.86
1:A:404:ILE:HD11	4:K:196:MET:HE2	1.64	0.80
1:I:745:GLU:HG2	1:I:768:THR:HG22	1.70	0.74
1:A:745:GLU:HG2	1:A:768:THR:HG22	1.70	0.73
2:N:212:CYS:HB2	7:N:301:SF4:S1	2.30	0.71
1:A:834:LYS:HE3	1:B:835:VAL:HA	1.73	0.70
3:O:12:MET:HE1	3:O:76:PRO:HD2	1.74	0.70
5:R:122:GLY:HA2	5:R:146:VAL:HG12	1.73	0.69
4:Q:168:ASP:HB3	4:Q:171:LYS:HB2	1.75	0.67
1:I:386:ARG:NH1	2:N:142:GLU:OE2	2.28	0.67
5:U:38:ARG:NH1	5:U:39:LEU:O	2.28	0.66
5:U:44:ASP:HB2	5:U:83:THR:HG22	1.76	0.66
1:B:142:GLN:NE2	1:B:178:ASN:OD1	2.28	0.66
1:I:538:VAL:HG12	1:I:544:VAL:HG12	1.76	0.66
1:I:142:GLN:NE2	1:I:178:ASN:OD1	2.28	0.66
5:L:96:LEU:HD21	5:L:141:VAL:HG21	1.78	0.66
3:D:10:PRO:HA	5:T:60:LEU:HD11	1.78	0.65
1:A:44:SER:HB2	1:A:237:HIS:HB3	1.77	0.65
1:A:127:LYS:NZ	1:A:745:GLU:OE2	2.29	0.65
1:I:834:LYS:HE3	1:A:835:VAL:HA	1.77	0.65
1:B:658:VAL:HG22	1:B:688:TYR:HE2	1.62	0.65
1:A:142:GLN:NE2	1:A:178:ASN:OD1	2.29	0.65
1:I:320:GLU:OE2	1:I:446:ARG:NH2	2.30	0.64
5:R:33:ASP:OD1	5:R:111:ARG:NH1	2.29	0.64
1:B:44:SER:HB2	1:B:237:HIS:HB3	1.79	0.64
1:I:127:LYS:NZ	1:I:745:GLU:OE2	2.30	0.64
1:B:136:ARG:HD2	1:B:184:MET:HB2	1.79	0.64
2:J:212:CYS:HB2	7:J:301:SF4:S1	2.38	0.63
5:W:122:GLY:HA2	5:W:146:VAL:HG12	1.80	0.63
3:D:1:MET:HE1	3:D:83:LYS:HE2	1.81	0.63
3:C:10:PRO:HA	5:L:60:LEU:HD11	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:68:TRP:O	3:E:32:ARG:NH1	2.32	0.62
1:B:75:GLN:NE2	1:B:212:TYR:O	2.32	0.62
5:L:44:ASP:OD1	5:L:45:LEU:N	2.33	0.62
3:D:3:THR:OG1	3:D:5:ARG:NH1	2.32	0.62
5:W:33:ASP:OD1	5:W:111:ARG:NH1	2.32	0.62
1:I:75:GLN:NE2	1:I:212:TYR:O	2.33	0.61
1:A:733:PRO:HG3	1:A:789:ILE:HD13	1.82	0.61
5:T:44:ASP:OD2	5:T:45:LEU:N	2.33	0.61
1:A:823:THR:HG23	1:A:825:SER:H	1.65	0.61
3:H:7:LYS:HE3	5:V:61:ASP:HB2	1.83	0.61
3:H:10:PRO:HA	5:V:60:LEU:HD11	1.82	0.61
5:L:70:THR:HG23	5:R:123:TRP:HE1	1.66	0.61
1:A:75:GLN:NE2	1:A:212:TYR:O	2.34	0.60
1:A:404:ILE:HG22	1:A:412:THR:HG22	1.82	0.60
1:A:410:TRP:HB2	4:K:179:LEU:HD11	1.82	0.60
5:T:96:LEU:HD21	5:T:141:VAL:HG21	1.82	0.60
1:I:141:ILE:HG12	1:I:179:ILE:HG22	1.83	0.60
1:I:291:LEU:HD21	1:I:296:VAL:HG23	1.83	0.60
5:U:150:SER:OG	5:U:155:ARG:NH2	2.34	0.60
1:B:141:ILE:HG12	1:B:179:ILE:HG22	1.83	0.60
5:R:127:ILE:HG23	5:R:139:ARG:HD2	1.83	0.60
2:G:37:PHE:HB3	2:G:56:TYR:HD2	1.67	0.60
2:N:22:VAL:HG22	2:N:107:LYS:HG2	1.83	0.60
5:U:127:ILE:HG23	5:U:139:ARG:HD2	1.84	0.60
4:K:168:ASP:HB3	4:K:171:LYS:HB2	1.82	0.60
5:V:70:THR:HG23	5:W:123:TRP:HE1	1.66	0.60
1:A:720:ILE:HG12	1:A:789:ILE:HD12	1.85	0.59
1:B:827:LEU:HD23	1:B:831:LEU:HD23	1.84	0.59
1:I:136:ARG:HD3	1:I:184:MET:HB2	1.82	0.59
1:B:291:LEU:HD21	1:B:296:VAL:HG23	1.85	0.59
5:U:96:LEU:HD21	5:U:141:VAL:HG21	1.85	0.59
1:A:792:VAL:HG23	1:A:797:LYS:HG2	1.86	0.58
1:B:410:TRP:HB2	4:Q:179:LEU:HD11	1.84	0.58
4:K:189:LEU:HD12	4:K:190:PRO:HD2	1.85	0.58
1:I:404:ILE:HD11	4:x:196:MET:HE2	1.86	0.58
1:B:246:PRO:HG2	1:B:249:TYR:HB2	1.85	0.58
4:x:168:ASP:HB3	4:x:171:LYS:HB3	1.84	0.58
1:A:136:ARG:HD2	1:A:184:MET:HB2	1.85	0.57
1:I:823:THR:HG23	1:I:825:SER:H	1.69	0.57
1:I:827:LEU:HG	1:I:831:LEU:HD23	1.86	0.57
1:B:386:ARG:NH1	2:J:142:GLU:OE2	2.36	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:649:GLY:HA2	4:K:207:ILE:HD12	1.86	0.57
1:B:149:THR:O	4:Q:217:GLN:NE2	2.38	0.57
3:C:12:MET:HE1	3:C:76:PRO:HD2	1.87	0.57
1:B:371:TYR:OH	1:B:473:HIS:NE2	2.34	0.57
1:I:792:VAL:HG12	1:I:797:LYS:HG2	1.87	0.57
1:A:361:GLN:OE1	1:A:363:ARG:NH1	2.38	0.57
5:W:127:ILE:HG23	5:W:139:ARG:HD2	1.87	0.57
1:I:371:TYR:OH	1:I:473:HIS:NE2	2.26	0.56
5:V:151:MET:HE3	5:V:151:MET:HA	1.88	0.56
5:W:108:TYR:OH	5:W:145:ASN:OD1	2.23	0.56
1:A:287:MET:HE1	2:N:158:THR:HG22	1.87	0.56
3:E:10:PRO:HA	5:W:60:LEU:HD11	1.88	0.56
1:A:107:ALA:O	1:A:175:ARG:NE	2.31	0.56
1:A:636:GLN:HG2	1:A:681:THR:HG22	1.88	0.56
1:B:127:LYS:NZ	1:B:745:GLU:OE2	2.38	0.56
1:I:410:TRP:HB2	4:x:179:LEU:HD11	1.87	0.56
1:A:827:LEU:HG	1:A:831:LEU:HD23	1.87	0.56
1:B:658:VAL:HG22	1:B:688:TYR:CE2	2.41	0.55
3:E:9:LYS:HB2	3:E:47:THR:HG23	1.88	0.55
1:A:97:ASP:OD1	1:A:98:THR:N	2.40	0.55
3:H:52:ARG:NH1	3:H:95:MET:O	2.39	0.55
1:B:330:THR:HA	4:Q:190:PRO:HB3	1.89	0.55
5:V:118:ASP:OD1	5:W:129:LYS:NZ	2.39	0.55
3:O:10:PRO:HA	5:U:60:LEU:HD11	1.88	0.55
1:I:571:PHE:HB3	1:I:588:ALA:HB1	1.89	0.54
1:I:835:VAL:HA	1:B:834:LYS:NZ	2.23	0.54
2:G:212:CYS:HB2	7:G:301:SF4:S1	2.47	0.54
1:B:525:ASP:OD2	1:B:526:GLY:N	2.40	0.54
1:B:792:VAL:HG23	1:B:797:LYS:HG2	1.90	0.54
1:I:727:PHE:HE2	1:B:814:TYR:HD2	1.56	0.54
1:B:54:ASP:OD2	1:B:55:THR:N	2.34	0.54
1:I:30:ILE:HG21	1:I:238:LEU:HD22	1.89	0.54
1:A:291:LEU:HD21	1:A:296:VAL:HG23	1.88	0.54
1:B:722:LEU:HD13	1:B:805:GLY:HA3	1.89	0.54
1:I:640:ARG:HG2	1:I:677:THR:HG22	1.90	0.53
2:N:33:GLY:HA3	2:N:95:MET:HE2	1.89	0.53
1:B:636:GLN:HG2	1:B:681:THR:HG22	1.91	0.53
5:U:8:MET:HE3	5:U:8:MET:HA	1.90	0.53
5:V:44:ASP:OD2	5:V:45:LEU:N	2.41	0.53
1:I:722:LEU:HD13	1:I:805:GLY:HA3	1.90	0.53
1:B:457:LEU:HD23	1:B:592:VAL:HG11	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:R:150:SER:OG	5:R:155:ARG:NH2	2.42	0.53
1:A:141:ILE:HG12	1:A:179:ILE:HG22	1.91	0.53
1:B:279:MET:HG2	2:G:163:PHE:CE1	2.44	0.53
1:B:361:GLN:OE1	1:B:363:ARG:NH1	2.42	0.53
2:G:51:TRP:HB3	2:G:56:TYR:HE1	1.74	0.53
5:U:33:ASP:OD1	5:U:111:ARG:NH1	2.41	0.53
1:I:351:VAL:HG21	1:I:475:PRO:HG2	1.90	0.52
3:D:52:ARG:NH1	3:D:95:MET:O	2.42	0.52
1:A:378:MET:HE2	1:A:384:PRO:HG3	1.92	0.52
1:I:94:VAL:HG22	1:I:100:ILE:HD12	1.92	0.52
1:A:501:GLN:HG3	1:A:502:THR:HG23	1.92	0.52
1:B:720:ILE:HG12	1:B:789:ILE:HD12	1.92	0.52
5:L:108:TYR:OH	5:L:145:ASN:OD1	2.24	0.52
1:I:44:SER:HB2	1:I:237:HIS:HB3	1.90	0.51
1:B:26:VAL:HG11	1:B:234:ARG:CZ	2.40	0.51
1:B:749:SER:HB3	1:B:763:THR:HG22	1.92	0.51
2:G:37:PHE:HB3	2:G:56:TYR:CD2	2.45	0.51
5:T:85:ALA:O	5:T:93:GLN:NE2	2.43	0.51
1:A:525:ASP:OD1	1:A:526:GLY:N	2.42	0.51
1:B:30:ILE:HG21	1:B:238:LEU:HD22	1.92	0.51
5:T:111:ARG:HG3	5:T:117:VAL:HG12	1.92	0.51
1:I:353:ASN:OD1	1:I:354:GLY:N	2.37	0.51
1:A:371:TYR:OH	1:A:473:HIS:NE2	2.33	0.51
1:A:649:GLY:HA2	4:Q:207:ILE:HD12	1.92	0.51
2:J:91:MET:HB3	2:J:98:LEU:HD11	1.91	0.51
1:A:320:GLU:OE2	1:A:446:ARG:NH2	2.43	0.51
2:J:22:VAL:HG22	2:J:107:LYS:HG2	1.93	0.51
1:A:616:VAL:O	1:A:696:ASN:ND2	2.44	0.51
1:I:97:ASP:OD1	1:I:98:THR:N	2.44	0.51
5:V:85:ALA:O	5:V:93:GLN:NE2	2.43	0.51
1:I:28:ASP:OD2	1:I:236:TYR:OH	2.28	0.50
1:B:823:THR:HG23	1:B:825:SER:H	1.76	0.50
5:T:127:ILE:HG23	5:T:139:ARG:HD2	1.93	0.50
1:B:254:ARG:HH22	1:B:270:ASN:HB2	1.76	0.50
5:U:108:TYR:OH	5:U:145:ASN:OD1	2.24	0.50
1:I:749:SER:HB3	1:I:763:THR:HG22	1.93	0.50
3:O:68:TRP:H	3:O:68:TRP:CD1	2.29	0.50
1:I:26:VAL:HG11	1:I:234:ARG:CZ	2.42	0.50
1:I:287:MET:HE1	2:J:158:THR:HG22	1.94	0.50
1:A:722:LEU:HD13	1:A:805:GLY:HA3	1.93	0.50
1:B:410:TRP:CD1	4:Q:197:ARG:HD3	2.46	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:W:96:LEU:HD21	5:W:141:VAL:HG21	1.93	0.50
1:I:720:ILE:HG12	1:I:789:ILE:HD12	1.93	0.50
3:F:10:PRO:HA	5:R:60:LEU:HD11	1.94	0.50
1:B:649:GLY:HA2	4:x:207:ILE:HD12	1.92	0.50
2:N:168:MET:HE2	4:K:201:ARG:HD2	1.94	0.50
1:I:733:PRO:HG3	1:I:789:ILE:HD13	1.94	0.49
1:I:822:ILE:HD12	1:B:826:HIS:HB3	1.94	0.49
1:B:140:GLN:HE21	1:B:149:THR:HG22	1.77	0.49
5:W:111:ARG:HG3	5:W:117:VAL:HG12	1.94	0.49
5:W:104:ASP:OD1	5:W:105:THR:N	2.44	0.49
5:T:70:THR:HG23	5:U:123:TRP:HE1	1.76	0.49
1:A:623:HIS:O	1:A:641:TRP:HA	2.13	0.49
5:V:148:ARG:HG2	5:V:148:ARG:HH11	1.77	0.49
1:A:26:VAL:HG11	1:A:234:ARG:CZ	2.41	0.49
1:A:330:THR:HA	4:K:190:PRO:HB3	1.93	0.49
1:B:116:PHE:CE2	1:B:153:ILE:HG21	2.47	0.49
2:N:10:ASN:O	2:N:14:ARG:HG3	2.12	0.49
1:A:353:ASN:OD1	1:A:354:GLY:N	2.41	0.49
1:B:97:ASP:OD1	1:B:98:THR:N	2.45	0.49
3:F:68:TRP:H	3:F:68:TRP:CD1	2.31	0.49
1:I:506:THR:HG22	1:I:543:LYS:HG2	1.95	0.49
1:I:806:ARG:NH1	1:I:809:ASP:OD2	2.46	0.49
5:V:127:ILE:HG23	5:V:139:ARG:HD2	1.93	0.49
2:J:76:ARG:HG3	6:S:843:ARG:HH12	1.78	0.48
5:L:127:ILE:HG23	5:L:139:ARG:HD2	1.93	0.48
5:R:104:ASP:OD1	5:R:105:THR:N	2.45	0.48
1:I:714:PRO:HB3	1:I:793:ASN:ND2	2.28	0.48
5:T:67:TRP:HH2	5:U:50:LEU:HD23	1.78	0.48
1:A:457:LEU:HD23	1:A:592:VAL:HG11	1.95	0.48
3:O:43:THR:HG22	3:O:105:GLU:HG2	1.95	0.48
3:E:68:TRP:H	3:E:68:TRP:CD1	2.32	0.48
1:A:343:CYS:SG	1:A:350:PRO:HG3	2.53	0.48
1:A:410:TRP:CD1	4:K:197:ARG:HD3	2.48	0.48
5:U:67:TRP:HH2	5:V:50:LEU:HD23	1.79	0.48
5:V:108:TYR:OH	5:V:145:ASN:OD1	2.22	0.48
1:I:457:LEU:HD23	1:I:592:VAL:HG11	1.96	0.48
5:U:70:THR:HG23	5:V:123:TRP:HE1	1.79	0.48
1:A:739:ASP:O	1:A:742:VAL:HG22	2.14	0.48
1:I:246:PRO:HG2	1:I:249:TYR:HB2	1.95	0.48
3:O:78:GLU:OE2	3:O:80:ARG:NH2	2.43	0.48
3:O:3:THR:HG22	3:O:72:LEU:HB2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:82:SER:HB3	3:F:23:VAL:HG11	1.95	0.47
1:A:747:TRP:CH2	1:A:765:TYR:HB2	2.50	0.47
1:B:393:LYS:HD3	2:J:159:ASP:HB2	1.96	0.47
5:T:126:SER:HB3	5:T:142:LYS:HB3	1.96	0.47
1:A:28:ASP:OD2	1:A:236:TYR:OH	2.26	0.47
1:A:749:SER:HB3	1:A:763:THR:HG22	1.95	0.47
1:B:623:HIS:O	1:B:641:TRP:HA	2.14	0.47
1:A:844:ARG:HH21	1:B:845:LEU:HD22	1.80	0.47
2:N:146:VAL:HG22	3:E:21:ARG:HD2	1.95	0.47
3:H:94:SER:OG	3:H:95:MET:N	2.48	0.47
1:I:107:ALA:O	1:I:175:ARG:NE	2.37	0.47
1:A:33:GLY:HA2	1:A:284:ARG:HH21	1.80	0.47
3:H:3:THR:OG1	3:H:5:ARG:NH1	2.47	0.47
3:O:95:MET:HE2	3:O:95:MET:HB2	1.77	0.47
5:V:97:LEU:O	5:V:101:ASN:ND2	2.32	0.47
1:I:279:MET:HG2	2:J:163:PHE:CE1	2.50	0.47
1:I:139:VAL:HG22	1:I:181:MET:HG3	1.96	0.47
1:I:514:PRO:HG3	1:I:563:LEU:HD22	1.97	0.47
1:I:623:HIS:O	1:I:641:TRP:HA	2.13	0.47
1:A:234:ARG:NH2	4:K:181:ASN:HD22	2.13	0.47
1:A:640:ARG:HG2	1:A:677:THR:HG22	1.96	0.47
3:C:12:MET:HG3	3:C:46:VAL:HG12	1.96	0.47
1:B:396:HIS:HA	1:B:429:ASN:HB2	1.97	0.47
1:I:330:THR:HA	4:x:190:PRO:HB3	1.96	0.46
1:A:498:VAL:HG12	1:A:505:LEU:HD22	1.96	0.46
1:B:353:ASN:OD1	1:B:354:GLY:N	2.43	0.46
1:B:183:ARG:O	1:B:184:MET:HE2	2.16	0.46
1:A:116:PHE:CZ	1:A:153:ILE:HD13	2.50	0.46
2:N:76:ARG:HG3	6:P:843:ARG:HH12	1.80	0.46
5:L:8:MET:HG2	5:L:9:PRO:HD2	1.96	0.46
1:A:498:VAL:HG11	1:A:553:VAL:HG23	1.98	0.46
1:A:571:PHE:HB3	1:A:588:ALA:HB1	1.98	0.46
1:B:722:LEU:HD23	1:B:722:LEU:HA	1.80	0.46
1:I:31:SER:OG	1:I:32:GLU:N	2.49	0.46
1:I:343:CYS:SG	1:I:350:PRO:HG3	2.55	0.46
1:A:31:SER:OG	1:A:32:GLU:N	2.46	0.46
5:L:146:VAL:HG23	5:W:69:ALA:HA	1.97	0.46
5:L:50:LEU:HD23	5:W:67:TRP:HH2	1.81	0.46
1:A:54:ASP:OD2	1:A:55:THR:N	2.41	0.46
2:N:82:SER:HB3	3:E:23:VAL:HG11	1.97	0.46
3:F:22:LYS:HB2	3:F:22:LYS:HE3	1.64	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:L:126:SER:HB3	5:L:142:LYS:HB3	1.98	0.46
1:B:31:SER:OG	1:B:32:GLU:N	2.48	0.46
2:J:211:GLY:O	2:J:215:ARG:NH1	2.39	0.46
1:A:834:LYS:HZ2	1:B:834:LYS:HG2	1.81	0.45
1:I:234:ARG:NH2	4:x:181:ASN:HD22	2.14	0.45
1:I:844:ARG:HH21	1:A:845:LEU:HD22	1.81	0.45
5:V:87:MET:H	5:V:93:GLN:HE22	1.63	0.45
1:I:821:LYS:N	1:I:821:LYS:HD3	2.32	0.45
5:U:123:TRP:H	5:U:123:TRP:CD1	2.34	0.45
1:A:23:LEU:HB2	4:K:210:ALA:HB2	1.99	0.45
1:B:234:ARG:NH2	4:Q:181:ASN:HD22	2.14	0.45
1:A:279:MET:HG2	2:N:163:PHE:CE1	2.52	0.45
2:G:34:GLU:N	2:G:34:GLU:OE2	2.49	0.45
3:C:48:LEU:HD11	3:C:58:LEU:HD11	1.99	0.45
1:B:672:ARG:HH22	1:B:695:VAL:HG21	1.82	0.45
2:J:34:GLU:N	2:J:34:GLU:OE2	2.50	0.45
1:I:835:VAL:HA	1:B:834:LYS:HZ2	1.82	0.45
2:J:52:GLN:N	2:J:114:ASP:OD2	2.50	0.45
5:U:104:ASP:OD2	5:U:106:ARG:NH1	2.49	0.45
1:A:423:ILE:HA	1:A:427:GLY:O	2.17	0.45
1:I:246:PRO:HD3	1:I:274:TRP:CE2	2.53	0.44
1:B:182:ARG:HG3	1:B:184:MET:HE3	1.98	0.44
1:B:404:ILE:HG22	1:B:412:THR:HG22	1.99	0.44
3:F:3:THR:HG22	3:F:72:LEU:HB2	1.98	0.44
5:T:43:LYS:HB2	5:T:83:THR:HG23	1.99	0.44
1:B:352:TRP:CZ2	2:G:155:PRO:HD2	2.53	0.44
1:B:513:LEU:HD21	1:B:535:VAL:HG11	2.00	0.44
5:L:123:TRP:H	5:L:123:TRP:CD1	2.36	0.44
1:A:831:LEU:HD21	1:B:827:LEU:HD21	1.99	0.44
1:B:653:LEU:HD13	1:B:672:ARG:HH11	1.82	0.44
3:H:63:GLU:HG3	3:O:40:ASN:HD22	1.83	0.44
1:A:291:LEU:HD21	1:A:296:VAL:CG2	2.47	0.44
3:O:87:ALA:O	3:D:18:PRO:HD2	2.16	0.44
3:F:9:LYS:HB2	3:F:47:THR:HG23	2.00	0.44
1:A:246:PRO:HG2	1:A:249:TYR:HB2	1.99	0.44
1:B:417:VAL:HG12	1:B:452:ILE:HD12	2.00	0.44
1:B:507:LEU:HD22	1:B:559:TRP:CE2	2.52	0.44
2:G:44:GLU:OE1	2:G:119:VAL:HG12	2.18	0.44
1:I:658:VAL:HG22	1:I:688:TYR:CE1	2.52	0.44
3:H:95:MET:HE2	5:U:58:SER:OG	2.18	0.44
3:D:94:SER:OG	3:D:95:MET:N	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:32:GLU:OE2	1:I:285:TYR:HB3	2.18	0.43
1:B:343:CYS:SG	1:B:350:PRO:HG3	2.57	0.43
1:A:393:LYS:HD3	2:G:159:ASP:HB2	2.00	0.43
1:A:784:ASP:OD1	1:A:806:ARG:HD3	2.17	0.43
5:V:55:TYR:O	5:V:70:THR:OG1	2.24	0.43
1:I:291:LEU:HD21	1:I:296:VAL:CG2	2.47	0.43
4:Q:196:MET:HB2	4:Q:196:MET:HE3	1.78	0.43
1:I:396:HIS:HA	1:I:429:ASN:HB2	2.00	0.43
1:B:392:LEU:HD13	2:J:99:VAL:HG12	1.99	0.43
1:B:423:ILE:HA	1:B:427:GLY:O	2.18	0.43
1:B:733:PRO:HG3	1:B:789:ILE:HD13	1.99	0.43
5:L:122:GLY:HA2	5:L:146:VAL:HG12	2.00	0.43
5:R:111:ARG:HG3	5:R:117:VAL:HG12	2.01	0.43
1:B:36:GLU:OE2	1:B:239:ARG:NE	2.46	0.43
1:I:636:GLN:HG2	1:I:681:THR:HG22	2.00	0.43
1:I:845:LEU:HB2	1:A:845:LEU:HD11	1.99	0.43
1:B:33:GLY:HA2	1:B:284:ARG:HH21	1.83	0.43
1:B:291:LEU:HD21	1:B:296:VAL:CG2	2.47	0.43
1:B:806:ARG:NH1	1:B:809:ASP:OD2	2.52	0.43
3:H:9:LYS:HG3	3:H:10:PRO:HD2	2.01	0.43
5:V:148:ARG:HG2	5:V:148:ARG:NH1	2.34	0.43
5:W:85:ALA:O	5:W:93:GLN:NE2	2.46	0.43
1:I:533:VAL:HG11	1:I:546:VAL:HB	2.01	0.43
1:B:616:VAL:O	1:B:696:ASN:ND2	2.52	0.43
2:N:43:ASN:HD21	2:N:47:GLU:HB2	1.84	0.43
3:H:18:PRO:HD2	3:E:87:ALA:O	2.18	0.43
1:A:32:GLU:OE2	1:A:285:TYR:HB3	2.18	0.43
1:B:395:ARG:O	1:B:429:ASN:ND2	2.37	0.43
2:J:76:ARG:HG3	6:S:843:ARG:NH1	2.34	0.43
5:R:126:SER:HB3	5:R:142:LYS:HB3	1.99	0.43
2:J:163:PHE:HB3	2:J:164:PRO:HD3	2.01	0.43
5:W:123:TRP:CD1	5:W:123:TRP:H	2.36	0.43
1:A:392:LEU:HD13	2:G:99:VAL:HG12	2.01	0.43
5:L:74:GLN:HG2	5:W:68:THR:HG22	2.01	0.42
1:A:315:GLY:HA3	1:A:605:PHE:CD2	2.55	0.42
1:A:766:LEU:HD23	1:A:772:TRP:NE1	2.34	0.42
1:B:457:LEU:HD22	1:B:595:LYS:HB3	2.02	0.42
2:J:43:ASN:HD21	2:J:47:GLU:HB2	1.84	0.42
5:L:44:ASP:HB3	5:L:83:THR:HG22	2.00	0.42
5:T:44:ASP:HB3	5:T:83:THR:HG22	2.00	0.42
1:I:193:LEU:HD12	1:I:193:LEU:HA	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:383:ALA:HB1	2:N:144:SER:HB2	2.02	0.42
1:I:453:LYS:HA	1:I:453:LYS:HD3	1.82	0.42
1:I:717:PRO:HA	1:I:735:LEU:HD23	2.00	0.42
1:A:30:ILE:HA	4:K:200:SER:OG	2.19	0.42
2:G:178:ARG:NH2	2:G:203:ASP:OD2	2.42	0.42
5:V:67:TRP:HH2	5:W:50:LEU:HD23	1.84	0.42
1:B:116:PHE:CZ	1:B:153:ILE:HD13	2.54	0.42
1:B:246:PRO:HD3	1:B:274:TRP:CE2	2.55	0.42
5:L:87:MET:H	5:L:93:GLN:NE2	2.17	0.42
5:R:96:LEU:HD21	5:R:141:VAL:HG21	2.01	0.42
5:T:87:MET:H	5:T:93:GLN:NE2	2.17	0.42
5:V:87:MET:HE3	5:V:87:MET:HB2	1.90	0.42
1:I:766:LEU:HD23	1:I:772:TRP:NE1	2.34	0.42
1:A:658:VAL:HG22	1:A:688:TYR:CE1	2.54	0.42
5:L:69:ALA:HA	5:R:146:VAL:HG23	2.02	0.42
1:I:722:LEU:HD23	1:I:722:LEU:HA	1.90	0.42
1:A:116:PHE:CZ	1:A:153:ILE:HG21	2.55	0.42
1:A:606:ASP:OD2	2:G:210:SER:OG	2.27	0.42
1:B:503:ARG:NH2	1:B:547:SER:O	2.49	0.42
3:C:94:SER:OG	3:C:95:MET:N	2.52	0.42
1:I:410:TRP:CD1	4:x:197:ARG:HD3	2.55	0.42
1:B:571:PHE:HB3	1:B:588:ALA:HB1	2.02	0.42
2:N:27:ASP:HB3	2:N:102:THR:HB	2.00	0.42
5:R:151:MET:HE3	5:R:151:MET:HA	2.02	0.42
5:V:87:MET:H	5:V:93:GLN:NE2	2.17	0.42
1:I:404:ILE:HG22	1:I:412:THR:HG22	2.02	0.42
1:B:831:LEU:HD12	1:B:831:LEU:HA	1.85	0.42
2:G:224:PHE:HB2	2:G:227:ILE:HD11	2.01	0.42
5:V:43:LYS:HB2	5:V:83:THR:HG23	2.00	0.42
1:I:747:TRP:CH2	1:I:765:TYR:HB2	2.55	0.42
1:A:392:LEU:HB2	2:G:99:VAL:CG1	2.50	0.42
1:A:453:LYS:HD3	1:A:453:LYS:HA	1.78	0.42
1:A:672:ARG:HH22	1:A:695:VAL:HG21	1.84	0.42
1:B:442:GLY:O	1:B:446:ARG:HG3	2.20	0.42
2:J:82:SER:HB3	3:O:23:VAL:HG11	2.02	0.42
5:R:123:TRP:CD1	5:R:123:TRP:H	2.38	0.42
1:A:352:TRP:CZ2	2:N:155:PRO:HD2	2.54	0.42
1:B:343:CYS:HB3	1:B:348:CYS:O	2.20	0.42
2:N:37:PHE:HB3	2:N:56:TYR:CD2	2.55	0.42
1:B:278:ASP:OD2	1:B:285:TYR:OH	2.38	0.41
5:L:116:THR:HB	5:L:152:ALA:HB1	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:423:ILE:HA	1:I:427:GLY:O	2.20	0.41
1:A:349:MET:HE2	1:A:349:MET:HB2	1.88	0.41
6:P:827:TYR:HB2	6:S:829:MET:HE1	2.02	0.41
1:A:508:ASP:OD1	3:C:29:TYR:OH	2.25	0.41
2:N:163:PHE:HB3	2:N:164:PRO:HD3	2.03	0.41
1:B:69:ARG:HB2	1:B:217:LEU:HD23	2.02	0.41
1:B:419:ASP:O	1:B:423:ILE:HG13	2.21	0.41
5:L:85:ALA:O	5:L:93:GLN:NE2	2.52	0.41
5:V:111:ARG:HG3	5:V:117:VAL:HG12	2.02	0.41
5:V:123:TRP:CD1	5:V:123:TRP:H	2.37	0.41
1:A:514:PRO:HG3	1:A:563:LEU:HD22	2.02	0.41
1:B:139:VAL:HG22	1:B:181:MET:HG3	2.01	0.41
3:H:3:THR:HG22	3:H:72:LEU:HB2	2.03	0.41
5:L:148:ARG:NH1	5:W:67:TRP:HE1	2.19	0.41
1:A:149:THR:O	4:K:217:GLN:NE2	2.54	0.41
1:A:412:THR:HG21	4:K:174:THR:HG23	2.02	0.41
2:N:9:LEU:O	2:N:13:THR:HG23	2.21	0.41
1:I:784:ASP:OD1	1:I:806:ARG:HD3	2.21	0.41
1:A:817:PHE:HE2	1:B:814:TYR:HD1	1.68	0.41
1:B:812:GLU:HG2	1:B:813:GLY:N	2.35	0.41
2:J:230:LEU:HD11	4:x:204:SER:HA	2.03	0.41
5:R:70:THR:HG23	5:T:123:TRP:HE1	1.85	0.41
5:U:67:TRP:CH2	5:V:50:LEU:HD23	2.56	0.41
5:U:69:ALA:HA	5:V:146:VAL:HG23	2.02	0.41
1:A:457:LEU:HD22	1:A:595:LYS:HB3	2.02	0.41
3:F:94:SER:OG	3:F:95:MET:N	2.54	0.41
5:L:50:LEU:HD23	5:W:67:TRP:CH2	2.56	0.41
1:I:404:ILE:HD12	1:I:410:TRP:HE3	1.86	0.41
1:I:457:LEU:HD22	1:I:595:LYS:HB3	2.03	0.41
1:A:254:ARG:HH22	1:A:270:ASN:HB2	1.86	0.41
1:A:538:VAL:HG22	1:A:544:VAL:HG12	2.02	0.41
1:A:834:LYS:NZ	1:B:834:LYS:HG2	2.35	0.41
1:B:143:ARG:HG2	1:B:173:PRO:HG3	2.02	0.41
2:G:163:PHE:HB3	2:G:164:PRO:HD3	2.03	0.41
3:C:52:ARG:NH1	3:C:95:MET:O	2.54	0.41
5:W:126:SER:HB3	5:W:142:LYS:HB3	2.02	0.41
1:A:33:GLY:HA2	1:A:284:ARG:NH2	2.34	0.41
1:A:114:PHE:CE2	1:A:179:ILE:HD12	2.56	0.41
2:J:37:PHE:HB3	2:J:56:TYR:CD2	2.56	0.41
2:G:30:GLU:OE1	2:G:30:GLU:HA	2.21	0.41
1:A:329:LEU:HD21	1:A:436:PHE:HZ	1.86	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:322:ARG:HA	1:B:446:ARG:HH21	1.86	0.40
1:B:729:ILE:HD12	1:B:729:ILE:HA	1.92	0.40
2:J:91:MET:CB	2:J:98:LEU:HD11	2.51	0.40
5:L:43:LYS:HB2	5:L:83:THR:HG23	2.02	0.40
1:I:393:LYS:HD3	2:N:159:ASP:HB2	2.03	0.40
1:B:505:LEU:HD11	1:B:523:LEU:HD11	2.03	0.40
2:G:76:ARG:HG3	6:M:843:ARG:NH1	2.36	0.40
3:C:18:PRO:HD2	3:F:87:ALA:O	2.22	0.40
5:T:122:GLY:HA2	5:T:146:VAL:HG12	2.03	0.40
5:V:70:THR:H	5:W:146:VAL:HG23	1.86	0.40
6:P:830:ALA:HB1	6:S:830:ALA:HA	2.03	0.40
1:I:831:LEU:HD12	1:I:831:LEU:HA	1.87	0.40
1:A:589:VAL:HG11	4:K:155:LEU:HD21	2.03	0.40
2:G:146:VAL:HG22	3:F:21:ARG:HD2	2.03	0.40
5:T:123:TRP:CD1	5:T:123:TRP:H	2.39	0.40
1:A:343:CYS:HB3	1:A:348:CYS:O	2.22	0.40
3:F:43:THR:HG22	3:F:105:GLU:HG2	2.03	0.40
5:L:111:ARG:HG3	5:L:117:VAL:HG12	2.02	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 PDB entries followed by that with respect to all EM entries.

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	849/1132 (75%)	822 (97%)	27 (3%)	0	100	100
1	B	849/1132 (75%)	821 (97%)	28 (3%)	0	100	100
1	I	849/1132 (75%)	822 (97%)	27 (3%)	0	100	100
2	G	230/232 (99%)	223 (97%)	7 (3%)	0	100	100
2	J	230/232 (99%)	223 (97%)	7 (3%)	0	100	100
2	N	230/232 (99%)	222 (96%)	8 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C	107/109 (98%)	105 (98%)	2 (2%)	0	100	100
3	D	107/109 (98%)	104 (97%)	3 (3%)	0	100	100
3	E	107/109 (98%)	106 (99%)	1 (1%)	0	100	100
3	F	107/109 (98%)	107 (100%)	0	0	100	100
3	H	107/109 (98%)	105 (98%)	2 (2%)	0	100	100
3	O	107/109 (98%)	107 (100%)	0	0	100	100
4	K	87/223 (39%)	86 (99%)	1 (1%)	0	100	100
4	Q	87/223 (39%)	86 (99%)	1 (1%)	0	100	100
4	x	87/223 (39%)	87 (100%)	0	0	100	100
5	L	151/246 (61%)	146 (97%)	5 (3%)	0	100	100
5	R	151/246 (61%)	148 (98%)	3 (2%)	0	100	100
5	T	151/246 (61%)	146 (97%)	5 (3%)	0	100	100
5	U	151/246 (61%)	148 (98%)	3 (2%)	0	100	100
5	V	151/246 (61%)	147 (97%)	4 (3%)	0	100	100
5	W	151/246 (61%)	147 (97%)	4 (3%)	0	100	100
6	M	30/853 (4%)	30 (100%)	0	0	100	100
6	P	30/853 (4%)	30 (100%)	0	0	100	100
6	S	30/853 (4%)	30 (100%)	0	0	100	100
All	All	5136/9450 (54%)	4998 (97%)	138 (3%)	0	100	100

There are no Ramachandran outliers to report.

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 PDB entries followed by that with respect to all EM entries.

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	726/958 (76%)	726 (100%)	0	100	100
1	B	726/958 (76%)	726 (100%)	0	100	100
1	I	726/958 (76%)	726 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	198/198 (100%)	198 (100%)	0	100	100
2	J	198/198 (100%)	198 (100%)	0	100	100
2	N	198/198 (100%)	198 (100%)	0	100	100
3	C	96/96 (100%)	96 (100%)	0	100	100
3	D	96/96 (100%)	96 (100%)	0	100	100
3	E	96/96 (100%)	96 (100%)	0	100	100
3	F	96/96 (100%)	96 (100%)	0	100	100
3	H	96/96 (100%)	96 (100%)	0	100	100
3	O	96/96 (100%)	96 (100%)	0	100	100
4	K	71/162 (44%)	71 (100%)	0	100	100
4	Q	71/162 (44%)	71 (100%)	0	100	100
4	x	71/162 (44%)	71 (100%)	0	100	100
5	L	124/196 (63%)	124 (100%)	0	100	100
5	R	124/196 (63%)	124 (100%)	0	100	100
5	T	124/196 (63%)	124 (100%)	0	100	100
5	U	124/196 (63%)	124 (100%)	0	100	100
5	V	124/196 (63%)	124 (100%)	0	100	100
5	W	124/196 (63%)	124 (100%)	0	100	100
6	M	23/648 (4%)	23 (100%)	0	100	100
6	P	23/648 (4%)	23 (100%)	0	100	100
6	S	23/648 (4%)	23 (100%)	0	100	100
All	All	4374/7650 (57%)	4374 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	I	48	ASN
1	I	221	GLN
1	I	250	ASN
1	I	396	HIS
1	A	48	ASN
1	A	248	ASN

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Mol	Chain	Res	Type
1	A	591	HIS
1	A	604	HIS
1	A	793	ASN
1	A	841	ASN
1	B	48	ASN
1	B	140	GLN
1	B	396	HIS
1	B	529	ASN
1	B	591	HIS
1	B	793	ASN
2	J	217	ASN
2	N	2	GLN
3	O	40	ASN
3	O	109	ASN
3	E	109	ASN
3	F	109	ASN
4	K	181	ASN
4	Q	165	GLN
4	Q	181	ASN
5	L	101	ASN
5	R	5	ASN
5	U	74	GLN
5	U	101	ASN
5	V	91	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](#)

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
7	SF4	G	301	2	0,12,12	-	-	-		
7	SF4	N	301	2	0,12,12	-	-	-		
7	SF4	J	301	2	0,12,12	-	-	-		

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	SF4	G	301	2	-	-	0/6/5/5
7	SF4	N	301	2	-	-	0/6/5/5
7	SF4	J	301	2	-	-	0/6/5/5

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.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	G	301	SF4	1	0
7	N	301	SF4	1	0
7	J	301	SF4	1	0

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.