



Full wwPDB EM Validation Report ⓘ

Jul 9, 2025 – 01:22 PM JST

PDB ID : 8Z6W / pdb_00008z6w
EMDB ID : EMD-39806
Title : Structure of EG.5.1 S trimer with 3 down-RBDs complex with antibody CYFN1006-2.
Authors : Wang, Y.J.; Sun, L.
Deposited on : 2024-04-19
Resolution : 3.04 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**
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

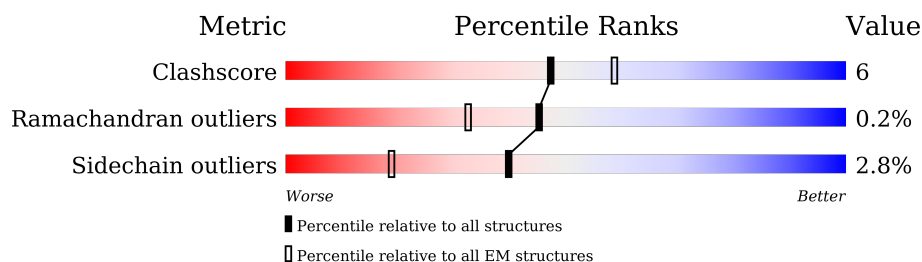
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.04 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	1295	
1	B	1295	
1	C	1295	
2	J	215	
2	K	215	
2	L	215	
3	G	218	
3	H	218	
3	I	218	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 34950 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 Spike glycoprotein,Fibritin,Expression Tag.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	B	1087	Total	C	N	O	S	0	0
			8502	5432	1416	1616	38		
1	A	1087	Total	C	N	O	S	0	0
			8502	5432	1416	1616	38		
1	C	1087	Total	C	N	O	S	0	0
			8502	5432	1416	1616	38		

There are 237 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-6	MET	-	initiating methionine	UNP P0DTC2
B	-5	PRO	-	expression tag	UNP P0DTC2
B	-4	MET	-	expression tag	UNP P0DTC2
B	-3	GLY	-	expression tag	UNP P0DTC2
B	-2	SER	-	expression tag	UNP P0DTC2
B	-1	LEU	-	expression tag	UNP P0DTC2
B	0	GLN	-	expression tag	UNP P0DTC2
B	1	PRO	-	expression tag	UNP P0DTC2
B	2	LEU	-	expression tag	UNP P0DTC2
B	3	ALA	-	expression tag	UNP P0DTC2
B	4	THR	-	expression tag	UNP P0DTC2
B	5	LEU	-	expression tag	UNP P0DTC2
B	6	TYR	-	expression tag	UNP P0DTC2
B	7	LEU	-	expression tag	UNP P0DTC2
B	8	LEU	-	expression tag	UNP P0DTC2
B	9	GLY	-	expression tag	UNP P0DTC2
B	10	MET	-	expression tag	UNP P0DTC2
B	11	LEU	-	expression tag	UNP P0DTC2
B	12	VAL	-	expression tag	UNP P0DTC2
B	13	ALA	-	expression tag	UNP P0DTC2
B	14	SER	-	expression tag	UNP P0DTC2
B	15	VAL	-	expression tag	UNP P0DTC2
B	16	LEU	-	expression tag	UNP P0DTC2
B	17	ALA	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	23	ILE	THR	variant	UNP P0DTC2
B	?	-	LEU	deletion	UNP P0DTC2
B	?	-	PRO	deletion	UNP P0DTC2
B	?	-	PRO	deletion	UNP P0DTC2
B	28	SER	ALA	variant	UNP P0DTC2
B	53	HIS	GLN	variant	UNP P0DTC2
B	84	ALA	VAL	variant	UNP P0DTC2
B	143	ASP	GLY	variant	UNP P0DTC2
B	?	-	TYR	deletion	UNP P0DTC2
B	146	GLN	HIS	variant	UNP P0DTC2
B	183	GLU	GLN	variant	UNP P0DTC2
B	213	GLU	VAL	variant	UNP P0DTC2
B	252	VAL	GLY	variant	UNP P0DTC2
B	339	HIS	GLY	variant	UNP P0DTC2
B	346	THR	ARG	variant	UNP P0DTC2
B	368	ILE	LEU	variant	UNP P0DTC2
B	371	PHE	SER	variant	UNP P0DTC2
B	373	PRO	SER	variant	UNP P0DTC2
B	375	PHE	SER	variant	UNP P0DTC2
B	376	ALA	THR	variant	UNP P0DTC2
B	405	ASN	ASP	variant	UNP P0DTC2
B	408	SER	ARG	variant	UNP P0DTC2
B	417	ASN	LYS	variant	UNP P0DTC2
B	440	LYS	ASN	variant	UNP P0DTC2
B	445	PRO	VAL	variant	UNP P0DTC2
B	446	SER	GLY	variant	UNP P0DTC2
B	456	LEU	PHE	variant	UNP P0DTC2
B	460	LYS	ASN	variant	UNP P0DTC2
B	477	ASN	SER	variant	UNP P0DTC2
B	478	LYS	THR	conflict	UNP P0DTC2
B	484	ALA	GLU	variant	UNP P0DTC2
B	486	PRO	PHE	variant	UNP P0DTC2
B	490	SER	PHE	variant	UNP P0DTC2
B	498	ARG	GLN	variant	UNP P0DTC2
B	501	TYR	ASN	variant	UNP P0DTC2
B	505	HIS	TYR	conflict	UNP P0DTC2
B	614	GLY	ASP	variant	UNP P0DTC2
B	655	TYR	HIS	variant	UNP P0DTC2
B	679	LYS	ASN	variant	UNP P0DTC2
B	681	HIS	PRO	variant	UNP P0DTC2
B	682	GLY	ARG	conflict	UNP P0DTC2
B	683	SER	ARG	conflict	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	685	SER	ARG	conflict	UNP P0DTC2
B	764	LYS	ASN	variant	UNP P0DTC2
B	796	TYR	ASP	variant	UNP P0DTC2
B	817	PRO	PHE	conflict	UNP P0DTC2
B	892	PRO	ALA	conflict	UNP P0DTC2
B	899	PRO	ALA	conflict	UNP P0DTC2
B	942	PRO	ALA	conflict	UNP P0DTC2
B	954	HIS	GLN	variant	UNP P0DTC2
B	969	LYS	ASN	variant	UNP P0DTC2
B	986	PRO	LYS	variant	UNP P0DTC2
B	987	PRO	VAL	variant	UNP P0DTC2
B	1209	GLY	-	linker	UNP P0DTC2
B	1210	SER	-	linker	UNP P0DTC2
A	-6	MET	-	initiating methionine	UNP P0DTC2
A	-5	PRO	-	expression tag	UNP P0DTC2
A	-4	MET	-	expression tag	UNP P0DTC2
A	-3	GLY	-	expression tag	UNP P0DTC2
A	-2	SER	-	expression tag	UNP P0DTC2
A	-1	LEU	-	expression tag	UNP P0DTC2
A	0	GLN	-	expression tag	UNP P0DTC2
A	1	PRO	-	expression tag	UNP P0DTC2
A	2	LEU	-	expression tag	UNP P0DTC2
A	3	ALA	-	expression tag	UNP P0DTC2
A	4	THR	-	expression tag	UNP P0DTC2
A	5	LEU	-	expression tag	UNP P0DTC2
A	6	TYR	-	expression tag	UNP P0DTC2
A	7	LEU	-	expression tag	UNP P0DTC2
A	8	LEU	-	expression tag	UNP P0DTC2
A	9	GLY	-	expression tag	UNP P0DTC2
A	10	MET	-	expression tag	UNP P0DTC2
A	11	LEU	-	expression tag	UNP P0DTC2
A	12	VAL	-	expression tag	UNP P0DTC2
A	13	ALA	-	expression tag	UNP P0DTC2
A	14	SER	-	expression tag	UNP P0DTC2
A	15	VAL	-	expression tag	UNP P0DTC2
A	16	LEU	-	expression tag	UNP P0DTC2
A	17	ALA	-	expression tag	UNP P0DTC2
A	23	ILE	THR	variant	UNP P0DTC2
A	?	-	LEU	deletion	UNP P0DTC2
A	?	-	PRO	deletion	UNP P0DTC2
A	?	-	PRO	deletion	UNP P0DTC2
A	28	SER	ALA	variant	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	53	HIS	GLN	variant	UNP P0DTC2
A	84	ALA	VAL	variant	UNP P0DTC2
A	143	ASP	GLY	variant	UNP P0DTC2
A	?	-	TYR	deletion	UNP P0DTC2
A	146	GLN	HIS	variant	UNP P0DTC2
A	183	GLU	GLN	variant	UNP P0DTC2
A	213	GLU	VAL	variant	UNP P0DTC2
A	252	VAL	GLY	variant	UNP P0DTC2
A	339	HIS	GLY	variant	UNP P0DTC2
A	346	THR	ARG	variant	UNP P0DTC2
A	368	ILE	LEU	variant	UNP P0DTC2
A	371	PHE	SER	variant	UNP P0DTC2
A	373	PRO	SER	variant	UNP P0DTC2
A	375	PHE	SER	variant	UNP P0DTC2
A	376	ALA	THR	variant	UNP P0DTC2
A	405	ASN	ASP	variant	UNP P0DTC2
A	408	SER	ARG	variant	UNP P0DTC2
A	417	ASN	LYS	variant	UNP P0DTC2
A	440	LYS	ASN	variant	UNP P0DTC2
A	445	PRO	VAL	variant	UNP P0DTC2
A	446	SER	GLY	variant	UNP P0DTC2
A	456	LEU	PHE	variant	UNP P0DTC2
A	460	LYS	ASN	variant	UNP P0DTC2
A	477	ASN	SER	variant	UNP P0DTC2
A	478	LYS	THR	conflict	UNP P0DTC2
A	484	ALA	GLU	variant	UNP P0DTC2
A	486	PRO	PHE	variant	UNP P0DTC2
A	490	SER	PHE	variant	UNP P0DTC2
A	498	ARG	GLN	variant	UNP P0DTC2
A	501	TYR	ASN	variant	UNP P0DTC2
A	505	HIS	TYR	conflict	UNP P0DTC2
A	614	GLY	ASP	variant	UNP P0DTC2
A	655	TYR	HIS	variant	UNP P0DTC2
A	679	LYS	ASN	variant	UNP P0DTC2
A	681	HIS	PRO	variant	UNP P0DTC2
A	682	GLY	ARG	conflict	UNP P0DTC2
A	683	SER	ARG	conflict	UNP P0DTC2
A	685	SER	ARG	conflict	UNP P0DTC2
A	764	LYS	ASN	variant	UNP P0DTC2
A	796	TYR	ASP	variant	UNP P0DTC2
A	817	PRO	PHE	conflict	UNP P0DTC2
A	892	PRO	ALA	conflict	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	899	PRO	ALA	conflict	UNP P0DTC2
A	942	PRO	ALA	conflict	UNP P0DTC2
A	954	HIS	GLN	variant	UNP P0DTC2
A	969	LYS	ASN	variant	UNP P0DTC2
A	986	PRO	LYS	variant	UNP P0DTC2
A	987	PRO	VAL	variant	UNP P0DTC2
A	1209	GLY	-	linker	UNP P0DTC2
A	1210	SER	-	linker	UNP P0DTC2
C	-6	MET	-	initiating methionine	UNP P0DTC2
C	-5	PRO	-	expression tag	UNP P0DTC2
C	-4	MET	-	expression tag	UNP P0DTC2
C	-3	GLY	-	expression tag	UNP P0DTC2
C	-2	SER	-	expression tag	UNP P0DTC2
C	-1	LEU	-	expression tag	UNP P0DTC2
C	0	GLN	-	expression tag	UNP P0DTC2
C	1	PRO	-	expression tag	UNP P0DTC2
C	2	LEU	-	expression tag	UNP P0DTC2
C	3	ALA	-	expression tag	UNP P0DTC2
C	4	THR	-	expression tag	UNP P0DTC2
C	5	LEU	-	expression tag	UNP P0DTC2
C	6	TYR	-	expression tag	UNP P0DTC2
C	7	LEU	-	expression tag	UNP P0DTC2
C	8	LEU	-	expression tag	UNP P0DTC2
C	9	GLY	-	expression tag	UNP P0DTC2
C	10	MET	-	expression tag	UNP P0DTC2
C	11	LEU	-	expression tag	UNP P0DTC2
C	12	VAL	-	expression tag	UNP P0DTC2
C	13	ALA	-	expression tag	UNP P0DTC2
C	14	SER	-	expression tag	UNP P0DTC2
C	15	VAL	-	expression tag	UNP P0DTC2
C	16	LEU	-	expression tag	UNP P0DTC2
C	17	ALA	-	expression tag	UNP P0DTC2
C	23	ILE	THR	variant	UNP P0DTC2
C	?	-	LEU	deletion	UNP P0DTC2
C	?	-	PRO	deletion	UNP P0DTC2
C	?	-	PRO	deletion	UNP P0DTC2
C	28	SER	ALA	variant	UNP P0DTC2
C	53	HIS	GLN	variant	UNP P0DTC2
C	84	ALA	VAL	variant	UNP P0DTC2
C	143	ASP	GLY	variant	UNP P0DTC2
C	?	-	TYR	deletion	UNP P0DTC2
C	146	GLN	HIS	variant	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	183	GLU	GLN	variant	UNP P0DTC2
C	213	GLU	VAL	variant	UNP P0DTC2
C	252	VAL	GLY	variant	UNP P0DTC2
C	339	HIS	GLY	variant	UNP P0DTC2
C	346	THR	ARG	variant	UNP P0DTC2
C	368	ILE	LEU	variant	UNP P0DTC2
C	371	PHE	SER	variant	UNP P0DTC2
C	373	PRO	SER	variant	UNP P0DTC2
C	375	PHE	SER	variant	UNP P0DTC2
C	376	ALA	THR	variant	UNP P0DTC2
C	405	ASN	ASP	variant	UNP P0DTC2
C	408	SER	ARG	variant	UNP P0DTC2
C	417	ASN	LYS	variant	UNP P0DTC2
C	440	LYS	ASN	variant	UNP P0DTC2
C	445	PRO	VAL	variant	UNP P0DTC2
C	446	SER	GLY	variant	UNP P0DTC2
C	456	LEU	PHE	variant	UNP P0DTC2
C	460	LYS	ASN	variant	UNP P0DTC2
C	477	ASN	SER	variant	UNP P0DTC2
C	478	LYS	THR	conflict	UNP P0DTC2
C	484	ALA	GLU	variant	UNP P0DTC2
C	486	PRO	PHE	variant	UNP P0DTC2
C	490	SER	PHE	variant	UNP P0DTC2
C	498	ARG	GLN	variant	UNP P0DTC2
C	501	TYR	ASN	variant	UNP P0DTC2
C	505	HIS	TYR	conflict	UNP P0DTC2
C	614	GLY	ASP	variant	UNP P0DTC2
C	655	TYR	HIS	variant	UNP P0DTC2
C	679	LYS	ASN	variant	UNP P0DTC2
C	681	HIS	PRO	variant	UNP P0DTC2
C	682	GLY	ARG	conflict	UNP P0DTC2
C	683	SER	ARG	conflict	UNP P0DTC2
C	685	SER	ARG	conflict	UNP P0DTC2
C	764	LYS	ASN	variant	UNP P0DTC2
C	796	TYR	ASP	variant	UNP P0DTC2
C	817	PRO	PHE	conflict	UNP P0DTC2
C	892	PRO	ALA	conflict	UNP P0DTC2
C	899	PRO	ALA	conflict	UNP P0DTC2
C	942	PRO	ALA	conflict	UNP P0DTC2
C	954	HIS	GLN	variant	UNP P0DTC2
C	969	LYS	ASN	variant	UNP P0DTC2
C	986	PRO	LYS	variant	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
C	987	PRO	VAL	variant	UNP P0DTC2
C	1209	GLY	-	linker	UNP P0DTC2
C	1210	SER	-	linker	UNP P0DTC2

- Molecule 2 is a protein called CYFN1006-2 light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	J	203	Total	C	N	O	S	0	0
			1502	938	251	306	7		
2	K	203	Total	C	N	O	S	0	0
			1502	938	251	306	7		
2	L	203	Total	C	N	O	S	0	0
			1502	938	251	306	7		

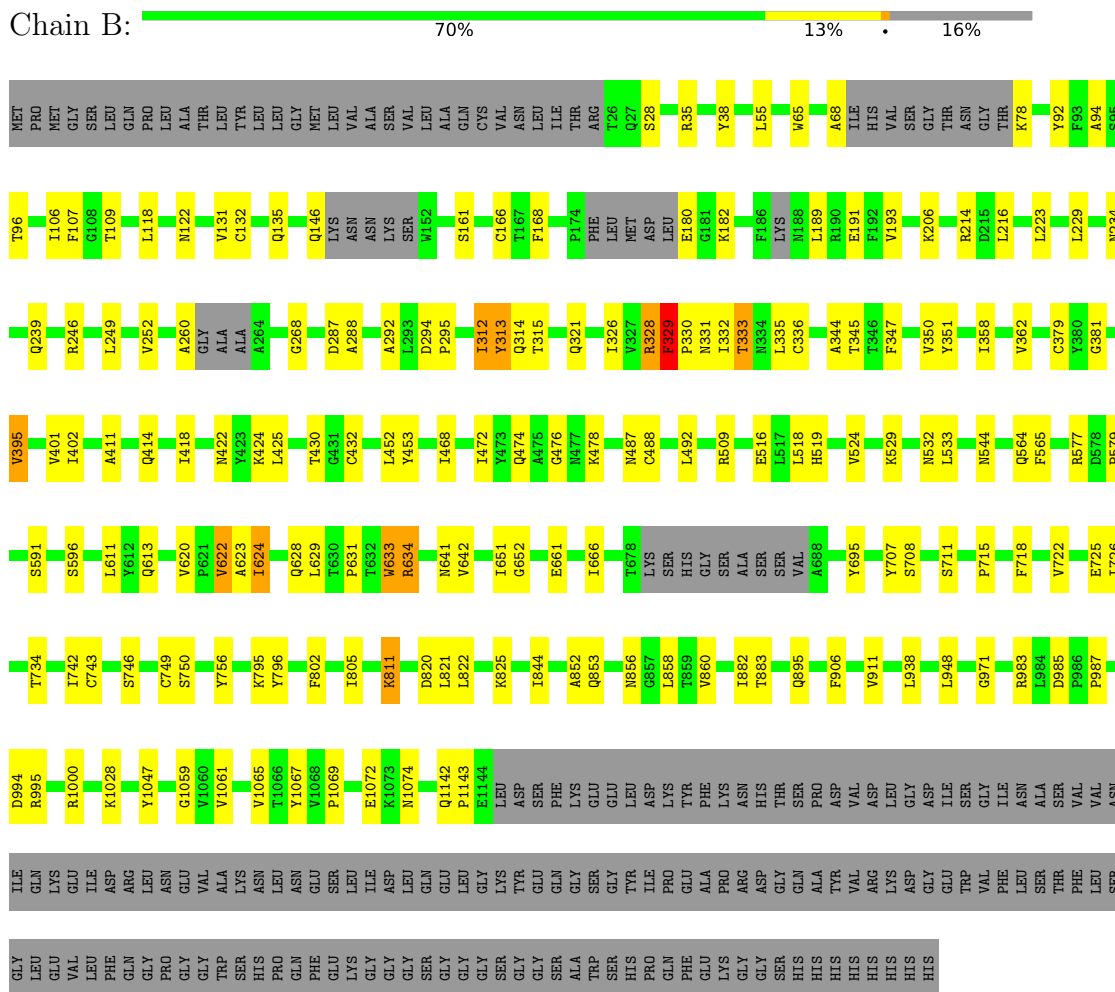
- Molecule 3 is a protein called CYFN1006-2 heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	218	Total	C	N	O	S	0	0
			1646	1050	268	320	8		
3	H	218	Total	C	N	O	S	0	0
			1646	1050	268	320	8		
3	I	218	Total	C	N	O	S	0	0
			1646	1050	268	320	8		

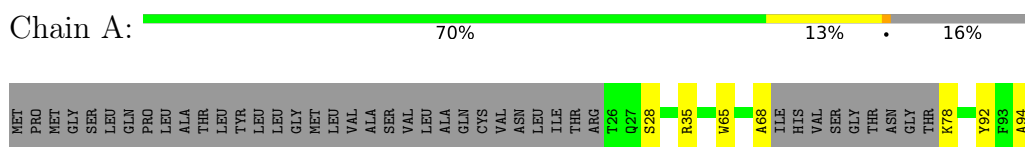
3 Residue-property plots

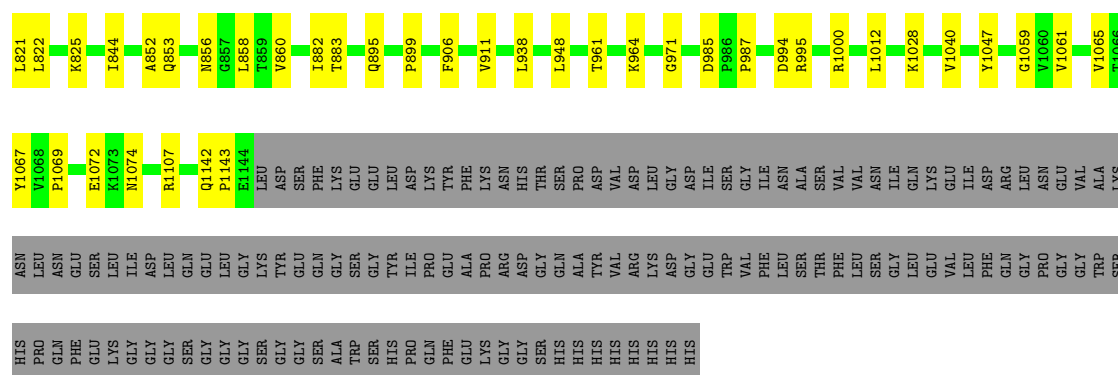
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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



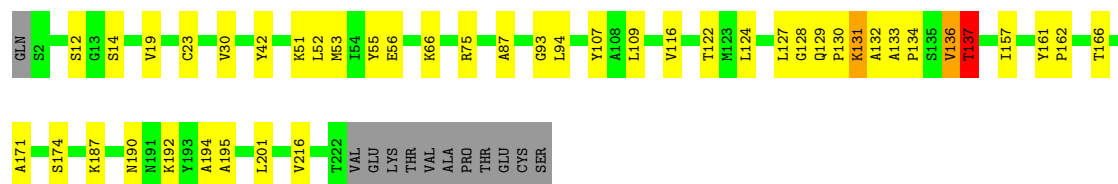
- Molecule 1: Spike glycoprotein,Fibritin,Expression Tag





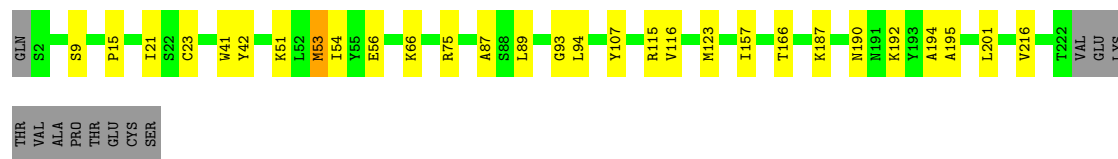
• Molecule 2: CYFN1006-2 light chain

Chain J: 74% 19% 6%



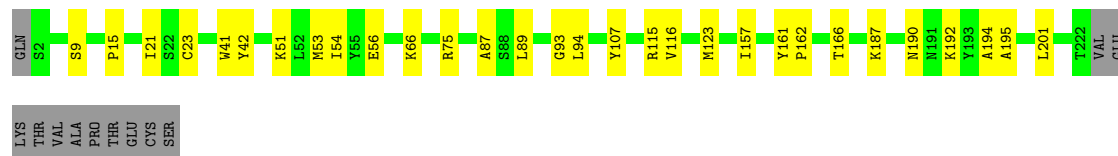
• Molecule 2: CYFN1006-2 light chain

Chain K: 81% 13% 6%



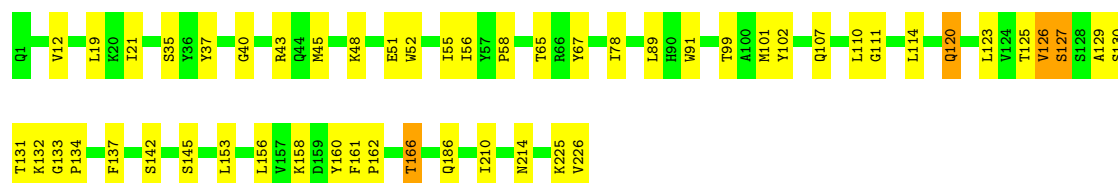
• Molecule 2: CYFN1006-2 light chain

Chain L: 80% 14% 6%

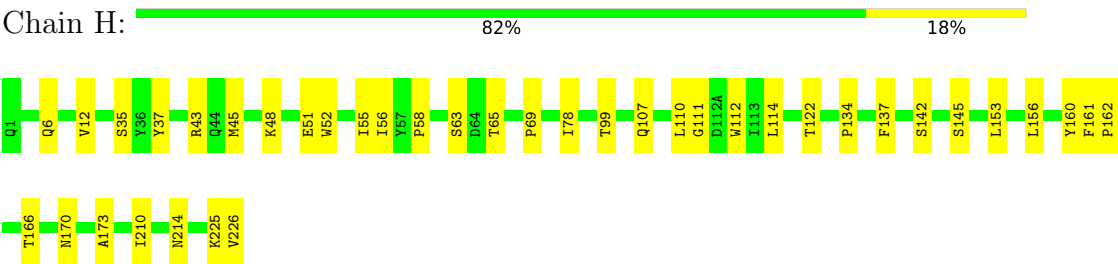


• Molecule 3: CYFN1006-2 heavy chain

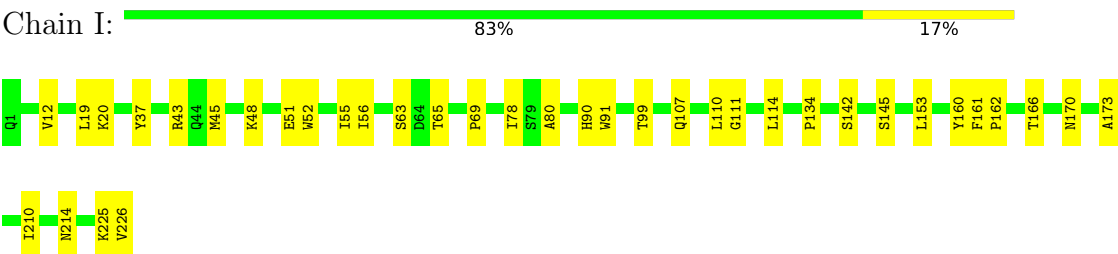
Chain G: 76% 22% 6%



● Molecule 3: CYFN1006-2 heavy chain



● Molecule 3: CYFN1006-2 heavy chain



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	244940	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

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	0.11	0/8707	0.31	0/11856
1	B	0.19	3/8707 (0.0%)	0.35	2/11856 (0.0%)
1	C	0.17	1/8707 (0.0%)	0.36	5/11856 (0.0%)
2	J	0.21	0/1540	0.54	3/2101 (0.1%)
2	K	0.12	0/1540	0.30	0/2101
2	L	0.12	0/1540	0.30	0/2101
3	G	0.20	0/1691	0.45	2/2302 (0.1%)
3	H	0.11	0/1691	0.29	0/2302
3	I	0.11	0/1691	0.29	0/2302
All	All	0.16	4/35814 (0.0%)	0.35	12/48777 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	328	ARG	CA-C	-6.79	1.44	1.52
1	B	329	PHE	C-O	-5.97	1.17	1.24
1	B	329	PHE	N-CA	-5.23	1.41	1.46
1	C	336	CYS	C-N	5.01	1.39	1.33

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	333	THR	N-CA-C	10.64	123.42	108.74
1	C	336	CYS	N-CA-C	8.62	122.00	108.55
3	G	133	GLY	CA-C-N	-7.37	112.41	119.85
3	G	133	GLY	C-N-CA	-7.37	112.41	119.85
1	B	335	LEU	N-CA-C	7.02	119.38	110.33
2	J	132	ALA	N-CA-C	6.71	117.13	108.34
1	C	333	THR	N-CA-C	6.60	118.80	108.96
2	J	133	ALA	N-CA-C	6.59	120.16	109.15
2	J	128	GLY	N-CA-C	6.03	123.48	112.27
1	C	331	ASN	N-CA-C	5.91	123.38	110.80
1	C	330	PRO	CA-C-O	-5.55	115.45	121.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	526	GLY	N-CA-C	5.39	123.34	112.34

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	8502	0	8290	100	0
1	B	8502	0	8290	87	0
1	C	8502	0	8290	112	0
2	J	1502	0	1445	24	0
2	K	1502	0	1445	15	0
2	L	1502	0	1445	15	0
3	G	1646	0	1615	30	0
3	H	1646	0	1615	22	0
3	I	1646	0	1615	20	0
All	All	34950	0	34050	402	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 (402) 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:G:126:VAL:CG2	3:G:127:SER:H	1.58	1.09
3:G:126:VAL:HG23	3:G:127:SER:N	1.58	1.06
3:G:126:VAL:HG23	3:G:127:SER:H	0.73	0.90
1:B:478:LYS:HE3	1:B:487:ASN:HD21	1.54	0.72
1:C:336:CYS:HB2	1:C:362:VAL:H	1.54	0.72
1:A:564:GLN:HG3	1:A:577:ARG:HB3	1.71	0.71
1:A:478:LYS:HE3	1:A:487:ASN:HD21	1.54	0.70
3:I:37:TYR:HA	3:I:107:GLN:HE21	1.57	0.69
1:B:564:GLN:HG3	1:B:577:ARG:HB3	1.73	0.69
1:A:544:ASN:ND2	1:A:564:GLN:OE1	2.26	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:478:LYS:HE3	1:C:487:ASN:HD21	1.58	0.67
3:G:131:THR:HA	3:G:161:PHE:HB3	1.77	0.67
2:J:131:LYS:HA	2:J:161:TYR:HB3	1.76	0.67
3:G:37:TYR:HA	3:G:107:GLN:HE21	1.60	0.66
1:A:345:THR:O	1:A:509:ARG:NH1	2.27	0.66
1:A:328:ARG:HG3	1:A:542:ASN:HB3	1.77	0.65
1:C:132:CYS:SG	1:C:166:CYS:N	2.69	0.65
3:H:56:ILE:HG22	3:H:65:THR:HG22	1.79	0.65
1:B:345:THR:O	1:B:509:ARG:NH1	2.28	0.64
3:H:37:TYR:HA	3:H:107:GLN:HE21	1.62	0.64
1:A:132:CYS:SG	1:A:166:CYS:N	2.71	0.63
1:B:132:CYS:SG	1:B:166:CYS:N	2.70	0.63
3:I:56:ILE:HG22	3:I:65:THR:HG22	1.79	0.63
1:C:345:THR:O	1:C:509:ARG:NH1	2.32	0.63
1:B:107:PHE:HB2	1:B:118:LEU:HB3	1.81	0.62
1:A:1047:TYR:HB2	1:A:1067:TYR:HB3	1.82	0.62
3:G:56:ILE:HG22	3:G:65:THR:HG22	1.79	0.62
1:B:312:ILE:HD12	1:B:313:TYR:H	1.64	0.62
1:A:107:PHE:HB2	1:A:118:LEU:HB3	1.81	0.62
2:J:51:LYS:HE3	2:J:53:MET:HE3	1.80	0.62
1:C:350:VAL:HG11	1:C:418:ILE:HD12	1.82	0.62
1:B:544:ASN:ND2	1:B:564:GLN:OE1	2.32	0.62
1:A:312:ILE:HD12	1:A:313:TYR:H	1.64	0.62
2:J:190:ASN:OD1	2:J:192:LYS:NZ	2.33	0.62
1:C:312:ILE:HD12	1:C:313:TYR:H	1.65	0.61
1:C:544:ASN:ND2	1:C:564:GLN:OE1	2.34	0.61
1:B:329:PHE:O	1:B:579:PRO:HG2	2.00	0.61
1:C:107:PHE:HB2	1:C:118:LEU:HB3	1.81	0.61
1:B:1047:TYR:HB2	1:B:1067:TYR:HB3	1.83	0.61
1:B:131:VAL:HB	1:B:168:PHE:HB3	1.83	0.60
2:L:190:ASN:OD1	2:L:192:LYS:NZ	2.32	0.60
1:C:725:GLU:OE2	1:C:1028:LYS:NZ	2.34	0.60
1:A:742:ILE:O	1:A:1000:ARG:NH2	2.34	0.60
1:A:385:THR:HG1	1:C:415:THR:HG1	1.45	0.60
2:K:23:CYS:HB3	2:K:87:ALA:HB3	1.82	0.60
1:B:350:VAL:HG11	1:B:418:ILE:HD12	1.82	0.59
1:A:350:VAL:HG11	1:A:418:ILE:HD12	1.84	0.59
1:A:94:ALA:HB1	1:A:189:LEU:HD11	1.84	0.59
2:L:51:LYS:HE3	2:L:53:MET:HE3	1.83	0.59
1:C:339:HIS:O	1:C:343:ASN:N	2.33	0.59
1:B:725:GLU:OE2	1:B:1028:LYS:NZ	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:142:SER:HG	3:H:145:SER:HG	1.51	0.59
2:L:157:ILE:HB	2:L:195:ALA:HB3	1.85	0.59
1:C:1047:TYR:HB2	1:C:1067:TYR:HB3	1.84	0.59
1:B:94:ALA:HB1	1:B:189:LEU:HD11	1.85	0.58
2:J:187:LYS:HG2	2:J:194:ALA:HB2	1.86	0.58
1:C:742:ILE:O	1:C:1000:ARG:NH2	2.37	0.58
1:A:624:ILE:HB	1:A:628:GLN:HB2	1.86	0.58
1:A:726:ILE:HG12	1:A:1061:VAL:HG22	1.85	0.58
1:B:742:ILE:O	1:B:1000:ARG:NH2	2.37	0.57
1:A:361:CYS:H	1:A:524:VAL:HG12	1.69	0.57
1:A:524:VAL:HG23	1:A:525:CYS:H	1.69	0.57
2:L:23:CYS:HB3	2:L:87:ALA:HB3	1.85	0.57
1:C:122:ASN:ND2	1:C:180:GLU:O	2.37	0.57
1:B:28:SER:HB2	1:B:65:TRP:HB3	1.84	0.57
1:B:624:ILE:HB	1:B:628:GLN:HB2	1.86	0.57
1:B:452:LEU:HD13	1:B:492:LEU:HB3	1.86	0.57
2:J:157:ILE:HB	2:J:195:ALA:HB3	1.86	0.57
1:A:401:VAL:HG22	1:A:509:ARG:HG2	1.87	0.57
2:K:21:ILE:HD12	2:K:89:LEU:HD23	1.86	0.57
2:K:75:ARG:NH1	2:K:93:GLY:O	2.38	0.57
1:C:641:ASN:HB3	1:C:652:GLY:H	1.70	0.57
1:C:68:ALA:HA	1:C:78:LYS:HA	1.87	0.57
1:B:122:ASN:ND2	1:B:180:GLU:O	2.38	0.57
1:B:852:ALA:O	1:B:856:ASN:ND2	2.38	0.57
3:G:153:LEU:HD23	3:G:226:VAL:HG13	1.86	0.56
1:C:28:SER:HB2	1:C:65:TRP:HB3	1.86	0.56
1:C:361:CYS:SG	1:C:362:VAL:N	2.79	0.56
1:A:330:PRO:HD2	1:A:530:SER:HA	1.87	0.56
2:K:157:ILE:HB	2:K:195:ALA:HB3	1.86	0.56
1:C:452:LEU:HD13	1:C:492:LEU:HB3	1.85	0.56
2:J:75:ARG:NH1	2:J:93:GLY:O	2.38	0.56
3:G:126:VAL:CG2	3:G:127:SER:N	2.33	0.56
1:A:295:PRO:HG3	1:A:634:ARG:HD2	1.87	0.56
1:C:94:ALA:HB1	1:C:189:LEU:HD11	1.88	0.56
1:B:381:GLY:HA3	1:B:430:THR:HG23	1.87	0.55
3:G:45:MET:HB2	3:G:48:LYS:HB2	1.86	0.55
3:H:153:LEU:HD23	3:H:226:VAL:HG13	1.88	0.55
2:L:75:ARG:NH1	2:L:93:GLY:O	2.39	0.55
3:I:153:LEU:HD23	3:I:226:VAL:HG13	1.88	0.55
1:A:452:LEU:HD13	1:A:492:LEU:HB3	1.88	0.55
1:A:321:GLN:HE21	1:A:591:SER:H	1.54	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:206:LYS:HB2	1:B:223:LEU:HA	1.89	0.55
1:B:68:ALA:HA	1:B:78:LYS:HA	1.88	0.54
1:A:28:SER:HB2	1:A:65:TRP:HB3	1.88	0.54
2:K:190:ASN:OD1	2:K:192:LYS:NZ	2.31	0.54
1:A:852:ALA:O	1:A:856:ASN:ND2	2.39	0.54
2:K:51:LYS:HE3	2:K:53:MET:HE3	1.89	0.54
3:H:45:MET:HB2	3:H:48:LYS:HB2	1.90	0.54
3:H:63:SER:HB2	1:C:500:THR:HG21	1.89	0.54
1:C:624:ILE:HB	1:C:628:GLN:HB2	1.88	0.54
3:H:56:ILE:HD13	3:H:78:ILE:HG22	1.89	0.54
1:C:292:ALA:HB1	1:C:633:TRP:HB2	1.89	0.54
1:A:725:GLU:OE2	1:A:1028:LYS:NZ	2.36	0.54
3:H:35:SER:HA	3:H:58:PRO:HB2	1.90	0.54
1:A:756:TYR:OH	1:A:994:ASP:OD1	2.25	0.54
1:A:122:ASN:ND2	1:A:180:GLU:O	2.41	0.53
1:B:642:VAL:HG12	1:B:651:ILE:HG12	1.90	0.53
1:A:641:ASN:HB3	1:A:652:GLY:H	1.73	0.53
3:I:142:SER:HG	3:I:145:SER:HG	1.53	0.53
1:B:295:PRO:HG3	1:B:634:ARG:HD2	1.89	0.53
3:G:111:GLY:HA3	3:G:114:LEU:HD22	1.91	0.53
3:I:52:TRP:HE1	3:I:55:ILE:HG23	1.73	0.53
2:L:187:LYS:HG2	2:L:194:ALA:HB2	1.91	0.53
1:C:358:ILE:HB	1:C:395:VAL:HG13	1.91	0.53
1:A:763:LEU:HD22	1:A:1008:VAL:HG21	1.89	0.53
2:L:56:GLU:O	2:L:66:LYS:N	2.35	0.53
3:I:45:MET:HB2	3:I:48:LYS:HB2	1.91	0.53
1:C:852:ALA:O	1:C:856:ASN:ND2	2.41	0.53
1:B:1074:ASN:OD1	1:C:895:GLN:NE2	2.42	0.52
1:A:206:LYS:HB2	1:A:223:LEU:HA	1.89	0.52
3:G:142:SER:HG	3:G:145:SER:HG	1.52	0.52
2:J:23:CYS:HB3	2:J:87:ALA:HB3	1.90	0.52
1:C:131:VAL:HB	1:C:168:PHE:HB3	1.92	0.52
1:B:726:ILE:HG12	1:B:1061:VAL:HG22	1.92	0.52
1:A:294:ASP:OD1	1:A:294:ASP:N	2.43	0.52
2:J:129:GLN:HG2	2:J:130:PRO:HD2	1.92	0.52
1:B:722:VAL:HG22	1:B:1065:VAL:HG22	1.91	0.52
3:G:210:ILE:HA	3:G:225:LYS:HA	1.92	0.52
1:B:424:LYS:NZ	1:B:425:LEU:O	2.41	0.51
1:A:361:CYS:N	1:A:524:VAL:HG12	2.25	0.51
1:B:853:GLN:HB2	1:B:858:LEU:HB2	1.93	0.51
1:A:68:ALA:HA	1:A:78:LYS:HA	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:895:GLN:NE2	1:A:1074:ASN:OD1	2.43	0.51
2:J:12:SER:OG	2:J:127:LEU:HA	2.11	0.51
3:I:210:ILE:HA	3:I:225:LYS:HA	1.92	0.51
1:C:726:ILE:HG12	1:C:1061:VAL:HG22	1.93	0.51
1:B:321:GLN:HE21	1:B:591:SER:H	1.58	0.51
1:C:295:PRO:HG3	1:C:634:ARG:HD2	1.90	0.51
1:B:294:ASP:N	1:B:294:ASP:OD1	2.44	0.51
1:A:358:ILE:HB	1:A:395:VAL:HG13	1.93	0.51
1:A:424:LYS:NZ	1:A:425:LEU:O	2.38	0.51
1:A:983:ARG:HA	1:C:390:LEU:HD11	1.92	0.51
3:G:56:ILE:HD13	3:G:78:ILE:HG22	1.92	0.51
2:L:107:TYR:HB3	2:L:116:VAL:HG12	1.93	0.51
1:C:206:LYS:HB2	1:C:223:LEU:HA	1.92	0.50
1:A:1116:THR:OG1	1:A:1118:ASP:OD1	2.24	0.50
3:G:101:MET:CE	3:G:123:LEU:HB2	2.40	0.50
1:B:641:ASN:HB3	1:B:652:GLY:H	1.76	0.50
2:J:14:SER:HB3	2:J:127:LEU:HD12	1.93	0.50
1:C:634:ARG:O	1:C:634:ARG:NE	2.41	0.50
1:A:722:VAL:HG22	1:A:1065:VAL:HG22	1.93	0.50
3:I:56:ILE:HD12	3:I:80:ALA:HB2	1.93	0.50
1:C:722:VAL:HG22	1:C:1065:VAL:HG22	1.92	0.50
3:I:56:ILE:HD13	3:I:78:ILE:HG22	1.93	0.50
1:A:895:GLN:NE2	1:C:1074:ASN:OD1	2.45	0.50
1:C:294:ASP:OD1	1:C:294:ASP:N	2.44	0.50
1:B:971:GLY:O	1:B:995:ARG:NH2	2.43	0.50
1:B:983:ARG:HA	1:A:390:LEU:HD11	1.92	0.50
1:A:131:VAL:HB	1:A:168:PHE:HB3	1.94	0.50
1:A:373:PRO:HB3	1:C:504:GLY:HA3	1.94	0.50
1:A:109:THR:OG1	1:A:234:ASN:O	2.28	0.49
1:A:642:VAL:HG12	1:A:651:ILE:HG12	1.94	0.49
3:H:134:PRO:HB3	3:H:160:TYR:HB3	1.94	0.49
1:A:501:TYR:HE1	3:I:63:SER:HB2	1.78	0.49
1:B:401:VAL:HG22	1:B:509:ARG:HG2	1.95	0.49
1:A:381:GLY:HA3	1:A:430:THR:HG23	1.94	0.49
1:A:983:ARG:HB3	1:C:382:VAL:HG12	1.95	0.49
1:B:715:PRO:HA	1:B:1072:GLU:HA	1.93	0.49
2:K:187:LYS:HG2	2:K:194:ALA:HB2	1.95	0.49
2:J:171:ALA:O	2:J:174:SER:OG	2.24	0.49
3:H:210:ILE:HA	3:H:225:LYS:HA	1.95	0.49
1:A:361:CYS:SG	1:A:362:VAL:N	2.86	0.49
1:B:811:LYS:NZ	1:B:820:ASP:OD2	2.40	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:42:TYR:OH	3:G:114:LEU:O	2.30	0.48
2:L:9:SER:HA	2:L:123:MET:H	1.78	0.48
3:I:166:THR:HG23	3:I:214:ASN:HB2	1.94	0.48
1:C:715:PRO:HA	1:C:1072:GLU:HA	1.95	0.48
3:G:134:PRO:HB3	3:G:160:TYR:HB3	1.95	0.48
1:C:344:ALA:O	1:C:509:ARG:NH2	2.46	0.48
1:C:92:TYR:N	1:C:268:GLY:O	2.42	0.48
1:A:715:PRO:HA	1:A:1072:GLU:HA	1.94	0.48
1:B:718:PHE:HA	1:B:1069:PRO:HA	1.96	0.48
2:J:134:PRO:HB2	2:J:216:VAL:HG11	1.95	0.48
3:I:134:PRO:HB3	3:I:160:TYR:HB3	1.96	0.48
2:J:52:LEU:HD11	2:J:55:TYR:HB3	1.96	0.48
3:G:166:THR:HG23	3:G:214:ASN:HB2	1.96	0.48
1:C:853:GLN:HB2	1:C:858:LEU:HB2	1.96	0.48
1:B:756:TYR:OH	1:B:994:ASP:OD1	2.29	0.48
1:A:734:THR:HG22	1:A:860:VAL:HG22	1.96	0.48
2:K:41:TRP:HB2	2:K:54:ILE:HB	1.96	0.47
1:C:564:GLN:HG3	1:C:577:ARG:HB3	1.94	0.47
1:A:634:ARG:O	1:A:634:ARG:NE	2.42	0.47
1:B:344:ALA:HB3	1:B:347:PHE:HE1	1.80	0.47
1:C:424:LYS:NZ	1:C:425:LEU:O	2.45	0.47
1:A:35:ARG:HD2	1:A:216:LEU:HD13	1.96	0.47
2:L:21:ILE:HD12	2:L:89:LEU:HD23	1.96	0.47
1:B:35:ARG:NH2	1:B:191:GLU:OE2	2.48	0.47
1:B:292:ALA:HB1	1:B:633:TRP:HB2	1.97	0.47
1:A:246:ARG:HG3	1:A:260:ALA:HB3	1.96	0.47
1:A:287:ASP:OD1	1:A:288:ALA:N	2.47	0.47
2:J:107:TYR:HB3	2:J:116:VAL:HG12	1.96	0.47
2:K:15:PRO:HA	2:K:94:LEU:HB2	1.96	0.47
1:C:361:CYS:H	1:C:524:VAL:HG22	1.79	0.47
1:C:661:GLU:O	1:C:695:TYR:OH	2.33	0.47
2:K:9:SER:HA	2:K:123:MET:H	1.80	0.47
2:L:115:ARG:HH21	3:I:69:PRO:HD3	1.79	0.47
1:A:661:GLU:O	1:A:695:TYR:OH	2.33	0.47
1:B:358:ILE:HB	1:B:395:VAL:HG13	1.97	0.47
1:B:476:GLY:HA3	1:B:487:ASN:HB2	1.96	0.47
1:A:501:TYR:HB3	1:A:505:HIS:HB2	1.95	0.47
1:A:909:ILE:HD13	1:A:1049:LEU:HD21	1.97	0.47
3:H:166:THR:HG23	3:H:214:ASN:HB2	1.97	0.47
1:C:756:TYR:OH	1:C:994:ASP:OD1	2.31	0.47
1:B:109:THR:OG1	1:B:234:ASN:O	2.29	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:802:PHE:HD1	1:A:805:ILE:HD11	1.78	0.46
1:B:287:ASP:OD1	1:B:288:ALA:N	2.47	0.46
1:A:457:ARG:NH1	1:A:467:ASP:OD2	2.43	0.46
1:C:109:THR:OG1	1:C:234:ASN:O	2.31	0.46
1:C:642:VAL:HG12	1:C:651:ILE:HG12	1.97	0.46
1:C:770:ILE:HD11	1:C:1012:LEU:HD23	1.98	0.46
1:C:795:LYS:HG2	1:C:796:TYR:H	1.81	0.46
1:A:529:LYS:HB2	1:A:529:LYS:HE2	1.43	0.46
1:A:901:GLN:O	1:A:905:ARG:HG2	2.15	0.46
3:G:43:ARG:O	3:G:51:GLU:N	2.44	0.46
3:H:6:GLN:NE2	3:H:122:THR:OG1	2.48	0.46
1:A:795:LYS:HG2	1:A:796:TYR:H	1.81	0.46
1:B:596:SER:OG	1:B:613:GLN:NE2	2.48	0.46
1:A:476:GLY:HA3	1:A:487:ASN:HB2	1.96	0.46
1:C:521:PRO:HG3	1:C:564:GLN:HB2	1.98	0.46
1:A:195:LYS:HD2	1:A:202:LYS:HD2	1.97	0.46
1:A:708:SER:HB3	1:A:711:SER:HB3	1.97	0.46
1:A:902:MET:HE3	1:A:1049:LEU:HD13	1.96	0.46
1:A:962:LEU:HD11	1:A:1004:LEU:HD23	1.98	0.46
3:H:52:TRP:HE1	3:H:55:ILE:HG23	1.81	0.46
1:C:287:ASP:OD1	1:C:288:ALA:N	2.47	0.46
1:C:708:SER:HB3	1:C:711:SER:HB3	1.98	0.46
1:A:903:ALA:HB2	1:A:916:LEU:HD22	1.97	0.46
2:K:115:ARG:HH21	3:H:69:PRO:HD3	1.81	0.46
3:I:111:GLY:HA3	3:I:114:LEU:HD22	1.97	0.46
1:C:971:GLY:O	1:C:995:ARG:NH2	2.45	0.46
1:B:312:ILE:H	1:B:312:ILE:HG13	1.43	0.46
1:B:708:SER:HB3	1:B:711:SER:HB3	1.98	0.46
1:B:707:TYR:HB3	1:C:792:PRO:HG3	1.98	0.46
3:I:19:LEU:O	3:I:91:TRP:N	2.42	0.46
1:B:92:TYR:N	1:B:268:GLY:O	2.42	0.45
1:A:379:CYS:HA	1:A:432:CYS:HA	1.99	0.45
3:H:43:ARG:O	3:H:51:GLU:N	2.44	0.45
1:B:35:ARG:HD2	1:B:216:LEU:HD13	1.97	0.45
1:C:811:LYS:NZ	1:C:820:ASP:OD2	2.39	0.45
2:J:56:GLU:O	2:J:66:LYS:N	2.37	0.45
1:C:882:ILE:HG13	1:C:883:THR:HG23	1.98	0.45
3:H:170:ASN:HB2	3:H:173:ALA:HB3	1.97	0.45
1:C:319:ARG:N	1:C:593:GLY:O	2.44	0.45
1:B:38:TYR:OH	1:B:55:LEU:O	2.29	0.45
2:L:41:TRP:HB2	2:L:54:ILE:HB	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:401:VAL:HG22	1:C:509:ARG:HG2	1.99	0.45
1:C:476:GLY:HA3	1:C:487:ASN:HB2	1.98	0.45
3:I:20:LYS:HB2	3:I:90:HIS:HD2	1.81	0.45
1:C:948:LEU:HD21	1:C:1059:GLY:HA3	1.99	0.45
1:B:246:ARG:HG3	1:B:260:ALA:HB3	1.98	0.45
1:A:351:TYR:HD2	1:A:468:ILE:HA	1.82	0.45
1:C:337:PRO:HD2	1:C:361:CYS:HB2	1.99	0.45
1:C:474:GLN:HA	1:C:488:CYS:HB3	1.99	0.45
1:B:795:LYS:HG2	1:B:796:TYR:H	1.81	0.44
1:A:344:ALA:HB3	1:A:347:PHE:HE1	1.81	0.44
2:K:56:GLU:O	2:K:66:LYS:N	2.33	0.44
2:K:107:TYR:HB3	2:K:116:VAL:HG12	1.98	0.44
1:C:246:ARG:HG3	1:C:260:ALA:HB3	1.97	0.44
1:C:351:TYR:HD2	1:C:468:ILE:HA	1.82	0.44
1:B:624:ILE:HG21	1:B:629:LEU:HD22	1.98	0.44
1:B:948:LEU:HD21	1:B:1059:GLY:HA3	1.99	0.44
3:H:37:TYR:HD1	3:H:107:GLN:HG3	1.83	0.44
2:L:42:TYR:OH	3:I:114:LEU:O	2.33	0.44
1:C:985:ASP:OD1	1:C:985:ASP:N	2.48	0.44
1:A:457:ARG:NH2	1:A:459:SER:O	2.42	0.44
1:B:882:ILE:HG13	1:B:883:THR:HG23	1.99	0.44
3:G:52:TRP:HE1	3:G:55:ILE:HG23	1.83	0.44
2:J:134:PRO:CB	2:J:216:VAL:HG11	2.48	0.44
1:C:734:THR:HG22	1:C:860:VAL:HG22	2.00	0.44
1:C:334:ASN:HB2	1:C:335:LEU:H	1.49	0.44
1:C:822:LEU:HD21	1:C:938:LEU:HD13	2.00	0.44
1:A:411:ALA:HB3	1:A:414:GLN:HG3	1.99	0.44
3:G:21:ILE:HD11	3:G:89:LEU:HD23	1.98	0.44
1:C:369:TYR:OH	1:C:384:PRO:O	2.35	0.44
1:C:1028:LYS:HE3	1:C:1028:LYS:HB2	1.86	0.44
1:A:116:GLN:HE21	1:C:468:ILE:HD11	1.82	0.44
1:A:135:GLN:HB3	1:A:161:SER:HB2	2.00	0.44
1:A:193:VAL:HG23	1:A:223:LEU:HD22	1.98	0.44
1:B:96:THR:OG1	1:B:214:ARG:NH1	2.51	0.43
1:C:620:VAL:HG13	1:C:623:ALA:HB3	2.00	0.43
1:C:746:SER:HB3	1:C:749:CYS:HB3	2.00	0.43
1:B:351:TYR:HD2	1:B:468:ILE:HA	1.83	0.43
1:C:645:THR:OG1	1:C:648:GLY:O	2.32	0.43
1:B:422:ASN:ND2	1:B:453:TYR:O	2.49	0.43
1:B:802:PHE:HD1	1:B:805:ILE:HD11	1.83	0.43
1:C:326:ILE:HG22	1:C:540:ASN:HB2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:106:ILE:HD11	1:A:239:GLN:HB3	1.99	0.43
3:G:35:SER:HA	3:G:58:PRO:HB2	2.00	0.43
1:C:106:ILE:HD11	1:C:239:GLN:HB3	1.99	0.43
1:C:985:ASP:HB2	1:C:987:PRO:HD2	2.00	0.43
1:B:193:VAL:HG23	1:B:223:LEU:HD22	2.00	0.43
1:A:985:ASP:OD1	1:C:383:SER:OG	2.35	0.43
1:C:422:ASN:ND2	1:C:453:TYR:O	2.46	0.43
1:A:770:ILE:O	1:A:774:GLN:HG2	2.19	0.43
3:I:170:ASN:HB2	3:I:173:ALA:HB3	2.01	0.43
1:C:472:ILE:HG22	1:C:488:CYS:HB2	1.99	0.43
1:C:718:PHE:HA	1:C:1069:PRO:HA	2.00	0.43
1:B:516:GLU:HG3	1:B:518:LEU:HG	1.98	0.43
1:B:661:GLU:O	1:B:695:TYR:OH	2.33	0.43
2:K:42:TYR:OH	3:H:114:LEU:O	2.36	0.43
1:C:314:GLN:OE1	1:C:315:THR:N	2.50	0.43
1:A:532:ASN:OD1	1:A:533:LEU:N	2.52	0.43
1:A:1035:GLY:HA3	1:C:1040:VAL:HG21	2.01	0.43
1:C:596:SER:OG	1:C:613:GLN:NE2	2.52	0.42
2:K:157:ILE:HD13	2:K:216:VAL:HG13	2.01	0.42
3:H:161:PHE:HB3	3:H:162:PRO:HD3	2.01	0.42
1:C:457:ARG:NH2	1:C:459:SER:O	2.41	0.42
1:C:529:LYS:HD3	1:C:529:LYS:HA	1.62	0.42
1:C:906:PHE:HB3	1:C:911:VAL:HB	2.01	0.42
1:C:135:GLN:HB3	1:C:161:SER:HB2	2.00	0.42
1:B:411:ALA:HB3	1:B:414:GLN:HG3	2.01	0.42
1:B:532:ASN:OD1	1:B:533:LEU:N	2.52	0.42
1:A:92:TYR:N	1:A:268:GLY:O	2.43	0.42
1:A:821:LEU:O	1:A:825:LYS:HG2	2.19	0.42
3:G:67:TYR:HE1	3:G:78:ILE:HG13	1.85	0.42
3:I:161:PHE:HB3	3:I:162:PRO:HD3	2.00	0.42
1:B:314:GLN:OE1	1:B:315:THR:N	2.51	0.42
1:B:821:LEU:O	1:B:825:LYS:HG2	2.19	0.42
1:A:718:PHE:HA	1:A:1069:PRO:HA	2.02	0.42
1:C:411:ALA:HB3	1:C:414:GLN:HG3	2.01	0.42
1:B:906:PHE:HB3	1:B:911:VAL:HB	2.01	0.42
1:C:110:THR:OG1	1:C:112:ASP:OD1	2.26	0.42
1:C:127:VAL:HG12	1:C:173:GLN:H	1.84	0.42
1:A:850:ILE:HG22	1:A:854:LYS:HE2	2.01	0.42
2:L:15:PRO:HA	2:L:94:LEU:HB2	2.02	0.42
1:B:734:THR:HG22	1:B:860:VAL:HG22	2.02	0.42
1:A:292:ALA:HB1	1:A:633:TRP:HB2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:G:19:LEU:O	3:G:91:TRP:N	2.45	0.42
3:G:137:PHE:O	3:G:156:LEU:N	2.42	0.42
1:C:798:GLY:HA3	1:C:899:PRO:HG3	2.02	0.42
1:B:106:ILE:HD11	1:B:239:GLN:HB3	2.01	0.41
1:A:311:GLY:N	1:A:599:THR:O	2.50	0.41
2:J:109:LEU:HD22	1:C:340:GLU:HA	2.02	0.41
1:A:622:VAL:HG13	1:A:623:ALA:H	1.85	0.41
2:J:161:TYR:HB3	2:J:162:PRO:HD3	2.02	0.41
1:B:629:LEU:HG	1:B:631:PRO:HD2	2.02	0.41
1:A:743:CYS:SG	1:A:750:SER:N	2.93	0.41
1:A:773:GLU:OE2	1:A:1019:ARG:HD3	2.20	0.41
3:I:43:ARG:O	3:I:51:GLU:N	2.45	0.41
1:C:1142:GLN:HB2	1:C:1143:PRO:HD3	2.03	0.41
1:B:746:SER:HB3	1:B:749:CYS:HB3	2.02	0.41
1:B:822:LEU:HD21	1:B:938:LEU:HD13	2.01	0.41
2:J:19:VAL:HG13	2:J:94:LEU:HD11	2.03	0.41
1:C:322:PRO:HD3	1:C:629:LEU:HB3	2.02	0.41
1:B:379:CYS:HA	1:B:432:CYS:HA	2.03	0.41
1:B:620:VAL:HG13	1:B:623:ALA:HB3	2.01	0.41
1:A:319:ARG:N	1:A:593:GLY:O	2.43	0.41
3:G:161:PHE:HB3	3:G:162:PRO:HD3	2.01	0.41
1:C:374:PHE:HD1	1:C:436:TRP:HB3	1.85	0.41
1:C:622:VAL:HG13	1:C:623:ALA:H	1.85	0.41
1:C:821:LEU:O	1:C:825:LYS:HG2	2.20	0.41
1:B:622:VAL:HG13	1:B:623:ALA:H	1.85	0.41
3:H:137:PHE:O	3:H:156:LEU:N	2.40	0.41
1:C:123:ASN:OD1	1:C:124:ALA:N	2.45	0.41
1:C:180:GLU:HG2	1:C:226:LEU:HD21	2.03	0.41
1:B:135:GLN:HB3	1:B:161:SER:HB2	2.01	0.41
1:A:158:ARG:HH21	1:A:252:VAL:HG22	1.85	0.41
2:J:53:MET:HA	2:J:53:MET:HE2	2.02	0.41
1:B:472:ILE:HG22	1:B:488:CYS:HB2	2.02	0.41
3:G:158:LYS:NZ	3:G:186:GLN:OE1	2.53	0.41
1:B:611:LEU:HD22	1:B:666:ILE:HG23	2.02	0.41
1:A:418:ILE:HA	1:A:422:ASN:HD22	1.85	0.41
1:A:971:GLY:O	1:A:995:ARG:NH2	2.53	0.41
2:J:131:LYS:H	2:J:131:LYS:HG2	1.55	0.41
3:G:43:ARG:HE	3:G:102:TYR:HE1	1.68	0.41
3:G:120:GLN:H	3:G:120:GLN:HG3	1.73	0.41
3:H:112:TRP:H	3:H:112:TRP:CD1	2.39	0.41
1:C:158:ARG:HH21	1:C:252:VAL:HG22	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:351:TYR:CE1	1:C:452:LEU:HB2	2.56	0.41
1:B:474:GLN:HA	1:B:488:CYS:HB3	2.02	0.41
1:A:792:PRO:HG3	1:C:707:TYR:HB3	2.03	0.41
1:A:822:LEU:HD22	1:A:945:LEU:HD21	2.02	0.41
2:J:136:VAL:O	2:J:137:THR:C	2.63	0.41
1:C:35:ARG:NH2	1:C:191:GLU:OE2	2.54	0.41
1:A:312:ILE:H	1:A:312:ILE:HG13	1.44	0.40
1:C:170:TYR:CE2	1:C:172:SER:HB2	2.56	0.40
3:G:40:GLY:HA3	3:G:55:ILE:HG22	2.03	0.40
2:L:161:TYR:HB3	2:L:162:PRO:HD3	2.03	0.40
1:C:534:VAL:HB	1:C:537:LYS:HD2	2.04	0.40
1:C:961:THR:HA	1:C:964:LYS:HE2	2.03	0.40
1:B:519:HIS:HB3	1:B:565:PHE:CD1	2.57	0.40
1:B:1142:GLN:HB2	1:B:1143:PRO:HD3	2.02	0.40
1:A:904:TYR:CE1	1:C:1107:ARG:HD2	2.56	0.40
1:A:906:PHE:HA	1:A:909:ILE:HG12	2.03	0.40
2:J:30:VAL:HG11	1:C:341:VAL:HG23	2.03	0.40
3:H:111:GLY:HA3	3:H:114:LEU:HD22	2.04	0.40
1:C:273:ARG:NH1	1:C:290:ASP:OD2	2.48	0.40
1:C:743:CYS:SG	1:C:750:SER:N	2.95	0.40
1:B:743:CYS:SG	1:B:750:SER:N	2.95	0.40
1:B:985:ASP:HB2	1:B:987:PRO:HD2	2.03	0.40
3:G:37:TYR:HD1	3:G:107:GLN:HG3	1.86	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	1073/1295 (83%)	1026 (96%)	47 (4%)	0	100	100
1	B	1073/1295 (83%)	1032 (96%)	40 (4%)	1 (0%)	48	79

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	1073/1295 (83%)	1019 (95%)	52 (5%)	2 (0%)	44	74
2	J	201/215 (94%)	189 (94%)	11 (6%)	1 (0%)	25	58
2	K	201/215 (94%)	192 (96%)	9 (4%)	0	100	100
2	L	201/215 (94%)	192 (96%)	9 (4%)	0	100	100
3	G	216/218 (99%)	205 (95%)	8 (4%)	3 (1%)	9	34
3	H	216/218 (99%)	208 (96%)	8 (4%)	0	100	100
3	I	216/218 (99%)	208 (96%)	8 (4%)	0	100	100
All	All	4470/5184 (86%)	4271 (96%)	192 (4%)	7 (0%)	45	74

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	J	137	THR
1	C	331	ASN
3	G	126	VAL
3	G	127	SER
1	C	526	GLY
3	G	129	ALA
1	B	330	PRO

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	948/1118 (85%)	923 (97%)	25 (3%)	41	69
1	B	948/1118 (85%)	923 (97%)	25 (3%)	41	69
1	C	948/1118 (85%)	916 (97%)	32 (3%)	32	63
2	J	168/179 (94%)	161 (96%)	7 (4%)	25	56
2	K	168/179 (94%)	165 (98%)	3 (2%)	54	77
2	L	168/179 (94%)	166 (99%)	2 (1%)	67	84
3	G	184/184 (100%)	176 (96%)	8 (4%)	25	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	H	184/184 (100%)	181 (98%)	3 (2%)	58	79
3	I	184/184 (100%)	181 (98%)	3 (2%)	58	79
All	All	3900/4443 (88%)	3792 (97%)	108 (3%)	40	67

All (108) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	146	GLN
1	B	182	LYS
1	B	229	LEU
1	B	249	LEU
1	B	252	VAL
1	B	312	ILE
1	B	313	TYR
1	B	326	ILE
1	B	328	ARG
1	B	329	PHE
1	B	331	ASN
1	B	332	ILE
1	B	333	THR
1	B	336	CYS
1	B	362	VAL
1	B	395	VAL
1	B	402	ILE
1	B	524	VAL
1	B	529	LYS
1	B	622	VAL
1	B	624	ILE
1	B	633	TRP
1	B	634	ARG
1	B	811	LYS
1	B	844	ILE
1	A	146	GLN
1	A	182	LYS
1	A	229	LEU
1	A	249	LEU
1	A	252	VAL
1	A	312	ILE
1	A	313	TYR
1	A	326	ILE
1	A	329	PHE

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Mol	Chain	Res	Type
1	A	336	CYS
1	A	361	CYS
1	A	395	VAL
1	A	402	ILE
1	A	489	TYR
1	A	528	LYS
1	A	529	LYS
1	A	530	SER
1	A	595	VAL
1	A	622	VAL
1	A	624	ILE
1	A	633	TRP
1	A	634	ARG
1	A	738	CYS
1	A	811	LYS
1	A	844	ILE
2	J	122	THR
2	J	124	LEU
2	J	131	LYS
2	J	136	VAL
2	J	137	THR
2	J	166	THR
2	J	201	LEU
3	G	12	VAL
3	G	99	THR
3	G	110	LEU
3	G	120	GLN
3	G	125	THR
3	G	130	SER
3	G	132	LYS
3	G	166	THR
2	K	53	MET
2	K	166	THR
2	K	201	LEU
3	H	12	VAL
3	H	99	THR
3	H	110	LEU
2	L	166	THR
2	L	201	LEU
3	I	12	VAL
3	I	99	THR
3	I	110	LEU

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Mol	Chain	Res	Type
1	C	146	GLN
1	C	182	LYS
1	C	229	LEU
1	C	249	LEU
1	C	252	VAL
1	C	312	ILE
1	C	313	TYR
1	C	320	VAL
1	C	323	THR
1	C	328	ARG
1	C	332	ILE
1	C	334	ASN
1	C	335	LEU
1	C	350	VAL
1	C	361	CYS
1	C	362	VAL
1	C	395	VAL
1	C	402	ILE
1	C	503	VAL
1	C	517	LEU
1	C	525	CYS
1	C	528	LYS
1	C	529	LYS
1	C	531	THR
1	C	595	VAL
1	C	622	VAL
1	C	624	ILE
1	C	633	TRP
1	C	634	ARG
1	C	638	THR
1	C	811	LYS
1	C	844	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (82) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	27	GLN
1	B	88	ASN
1	B	122	ASN
1	B	185	ASN
1	B	321	GLN
1	B	394	ASN

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Mol	Chain	Res	Type
1	B	414	GLN
1	B	487	ASN
1	B	493	GLN
1	B	544	ASN
1	B	564	GLN
1	B	607	GLN
1	B	613	GLN
1	B	677	GLN
1	B	762	GLN
1	B	836	GLN
1	B	955	ASN
1	B	957	GLN
1	B	965	GLN
1	B	1005	GLN
1	B	1011	GLN
1	A	27	GLN
1	A	88	ASN
1	A	116	GLN
1	A	122	ASN
1	A	185	ASN
1	A	321	GLN
1	A	414	GLN
1	A	439	ASN
1	A	487	ASN
1	A	493	GLN
1	A	519	HIS
1	A	607	GLN
1	A	613	GLN
1	A	677	GLN
1	A	690	GLN
1	A	762	GLN
1	A	836	GLN
1	A	901	GLN
1	A	955	ASN
1	A	957	GLN
1	A	965	GLN
1	A	1002	GLN
1	A	1011	GLN
2	J	218	HIS
3	G	72	GLN
3	G	75	GLN
3	G	120	GLN

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Mol	Chain	Res	Type
3	H	72	GLN
3	H	75	GLN
3	H	107	GLN
3	H	120	GLN
2	L	95	GLN
2	L	218	HIS
3	I	72	GLN
3	I	75	GLN
3	I	90	HIS
3	I	107	GLN
3	I	120	GLN
1	C	27	GLN
1	C	88	ASN
1	C	122	ASN
1	C	185	ASN
1	C	321	GLN
1	C	331	ASN
1	C	394	ASN
1	C	414	GLN
1	C	487	ASN
1	C	493	GLN
1	C	536	ASN
1	C	544	ASN
1	C	564	GLN
1	C	607	GLN
1	C	613	GLN
1	C	677	GLN
1	C	690	GLN
1	C	762	GLN
1	C	836	GLN
1	C	955	ASN
1	C	957	GLN
1	C	965	GLN
1	C	1011	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [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.