



Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 09:18 AM UTC

PDB ID : 6ZJL / pdb_00006zjl
EMDB ID : EMD-11235
Title : Respiratory complex I from *Thermus thermophilus*, NAD⁺ dataset, major state
Authors : Kaszuba, K.; Tambalo, M.; Gallagher, G.T.; Sazanov, L.A.
Deposited on : 2020-06-29
Resolution : 4.30 Å (reported)
Based on initial model : 6Y11

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:

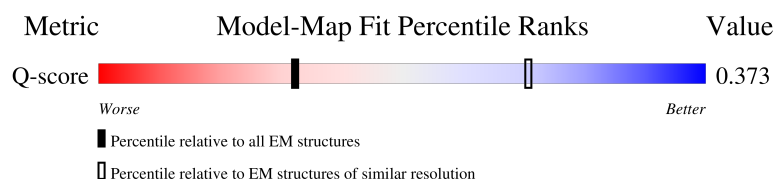
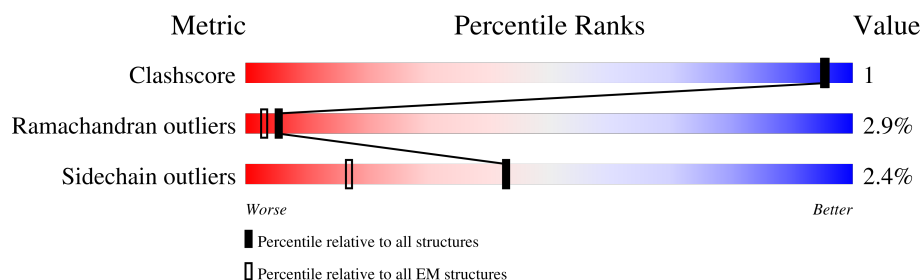
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
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:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.30 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	4585 (3.80 - 4.80)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1	438	28% 83% 15% .
2	2	181	25% 82% 14% ..
3	3	783	24% 79% 17% ..
4	4	409	17% 75% 18% . 6%

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Mol	Chain	Length	Quality of chain
5	5	207	
6	6	181	
7	9	182	
8	7	129	
9	A	119	
10	J	176	
11	K	95	
12	L	606	
13	M	469	
14	N	427	
15	H	365	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
17	FMN	1	502	-	-	X	-

2 Entry composition

There are 18 unique types of molecules in this entry. The entry contains 36057 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 NADH-quinone oxidoreductase subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	437	Total	C	N	O	S	0	0
			3417	2180	595	624	18		

- Molecule 2 is a protein called NADH-quinone oxidoreductase subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	178	Total	C	N	O	S	0	0
			1406	895	238	265	8		

- Molecule 3 is a protein called NADH-quinone oxidoreductase subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	3	754	Total	C	N	O	S	0	0
			5876	3740	1055	1050	31		

- Molecule 4 is a protein called NADH-quinone oxidoreductase subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	4	384	Total	C	N	O	S	0	0
			3067	1975	522	559	11		

- Molecule 5 is a protein called NADH-quinone oxidoreductase subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	5	196	Total	C	N	O	S	0	0
			1607	1043	273	288	3		

- Molecule 6 is a protein called NADH-quinone oxidoreductase subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	6	166	Total	C	N	O	S	0	0
			1289	815	235	226	13		

- Molecule 7 is a protein called NADH-quinone oxidoreductase subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	9	180	Total	C	N	O	S	0	0
			1388	890	232	255	11		

- Molecule 8 is a protein called NADH-quinone oxidoreductase subunit 15.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	7	127	Total	C	N	O	S	0	0
			1031	664	183	181	3		

- Molecule 9 is a protein called NADH-quinone oxidoreductase subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	A	117	Total	C	N	O	S	0	0
			910	624	138	144	4		

- Molecule 10 is a protein called NADH-quinone oxidoreductase subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	160	Total	C	N	O	S	0	0
			1183	806	183	191	3		

- Molecule 11 is a protein called NADH-quinone oxidoreductase subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	95	Total	C	N	O	S	0	0
			703	456	118	126	3		

- Molecule 12 is a protein called NADH-quinone oxidoreductase subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	605	Total	C	N	O	S	0	0
			4604	3089	740	756	19		

- Molecule 13 is a protein called NADH-quinone oxidoreductase subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	467	Total	C	N	O	S	0	0
			3489	2363	546	572	8		

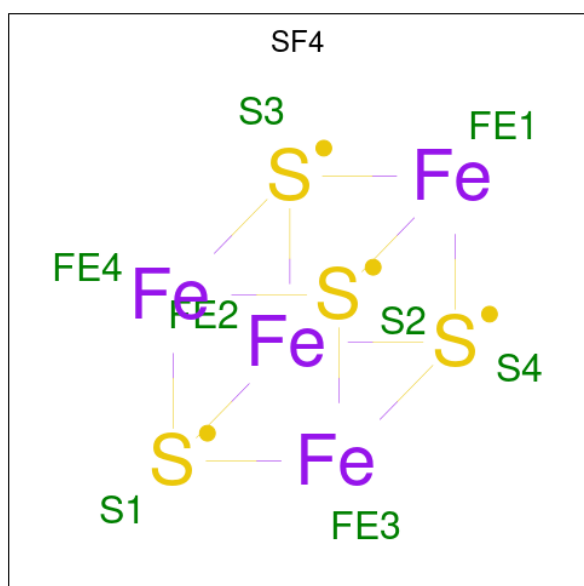
- Molecule 14 is a protein called NADH-quinone oxidoreductase subunit 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	427	Total	C	N	O	S	0	0
			3154	2125	505	518	6		

- Molecule 15 is a protein called NADH-quinone oxidoreductase subunit 8.

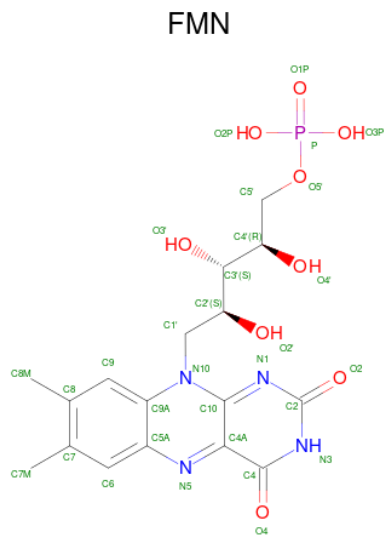
Mol	Chain	Residues	Atoms					AltConf	Trace
15	H	353	Total	C	N	O	S	0	0
			2838	1943	431	457	7		

- Molecule 16 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4).



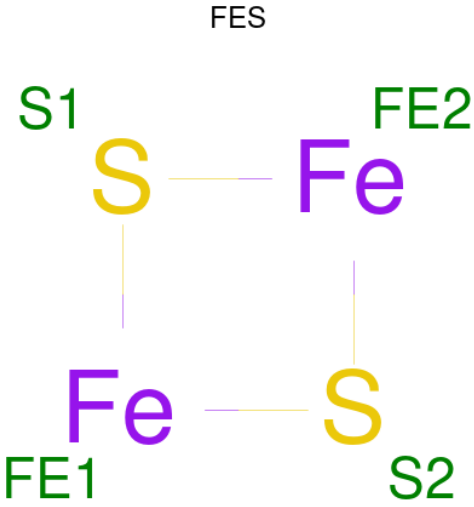
Mol	Chain	Residues	Atoms			AltConf
16	1	1	Total	Fe	S	0
			8	4	4	
16	3	1	Total	Fe	S	0
			8	4	4	
16	3	1	Total	Fe	S	0
			8	4	4	
16	3	1	Total	Fe	S	0
			8	4	4	
16	6	1	Total	Fe	S	0
			8	4	4	
16	9	1	Total	Fe	S	0
			8	4	4	
16	9	1	Total	Fe	S	0
			8	4	4	

- Molecule 17 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $\text{C}_{17}\text{H}_{21}\text{N}_4\text{O}_9\text{P}$).



Mol	Chain	Residues	Atoms					AltConf
17	1	1	Total 31	C 17	N 4	O 9	P 1	0

- Molecule 18 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).

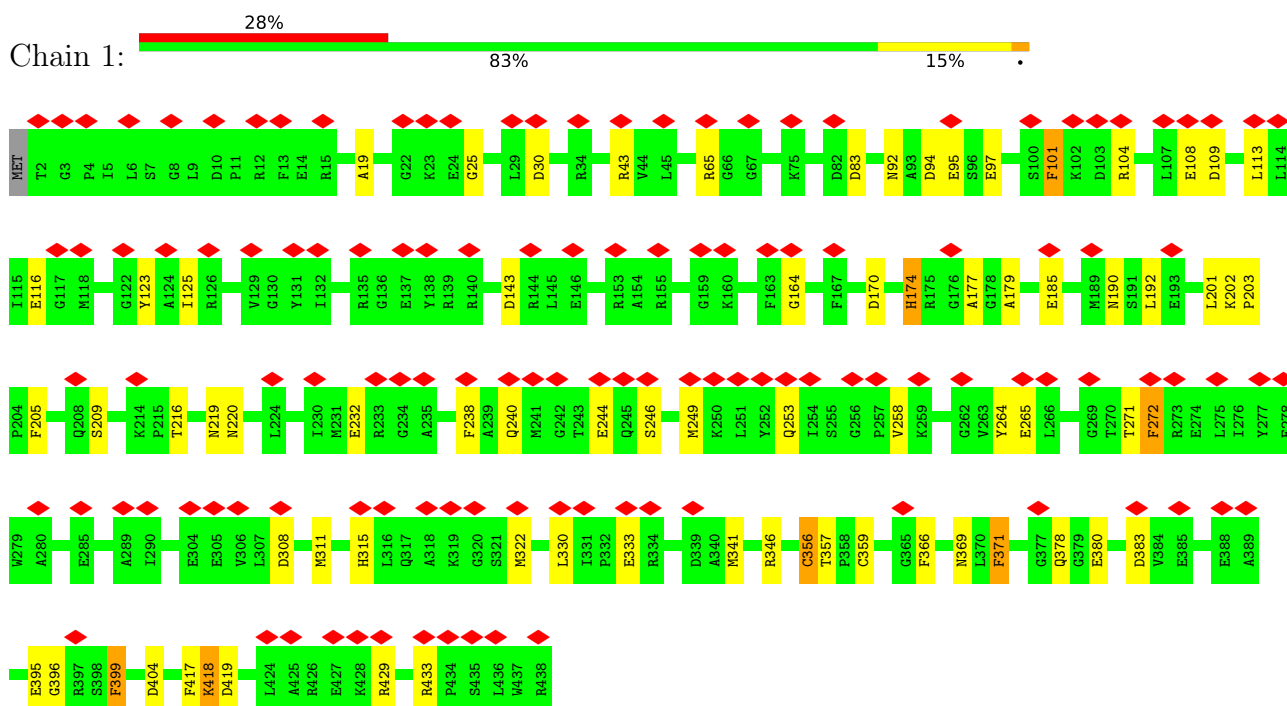


Mol	Chain	Residues	Atoms			AltConf
18	2	1	Total 4	Fe 2	S 2	0
18	3	1	Total 4	Fe 2	S 2	0

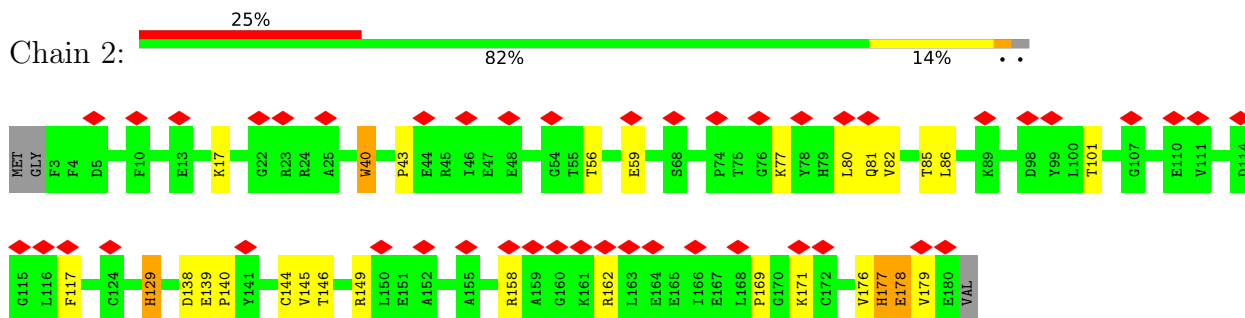
3 Residue-property plots

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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.

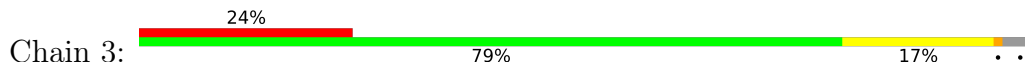
- Molecule 1: NADH-quinone oxidoreductase subunit 1

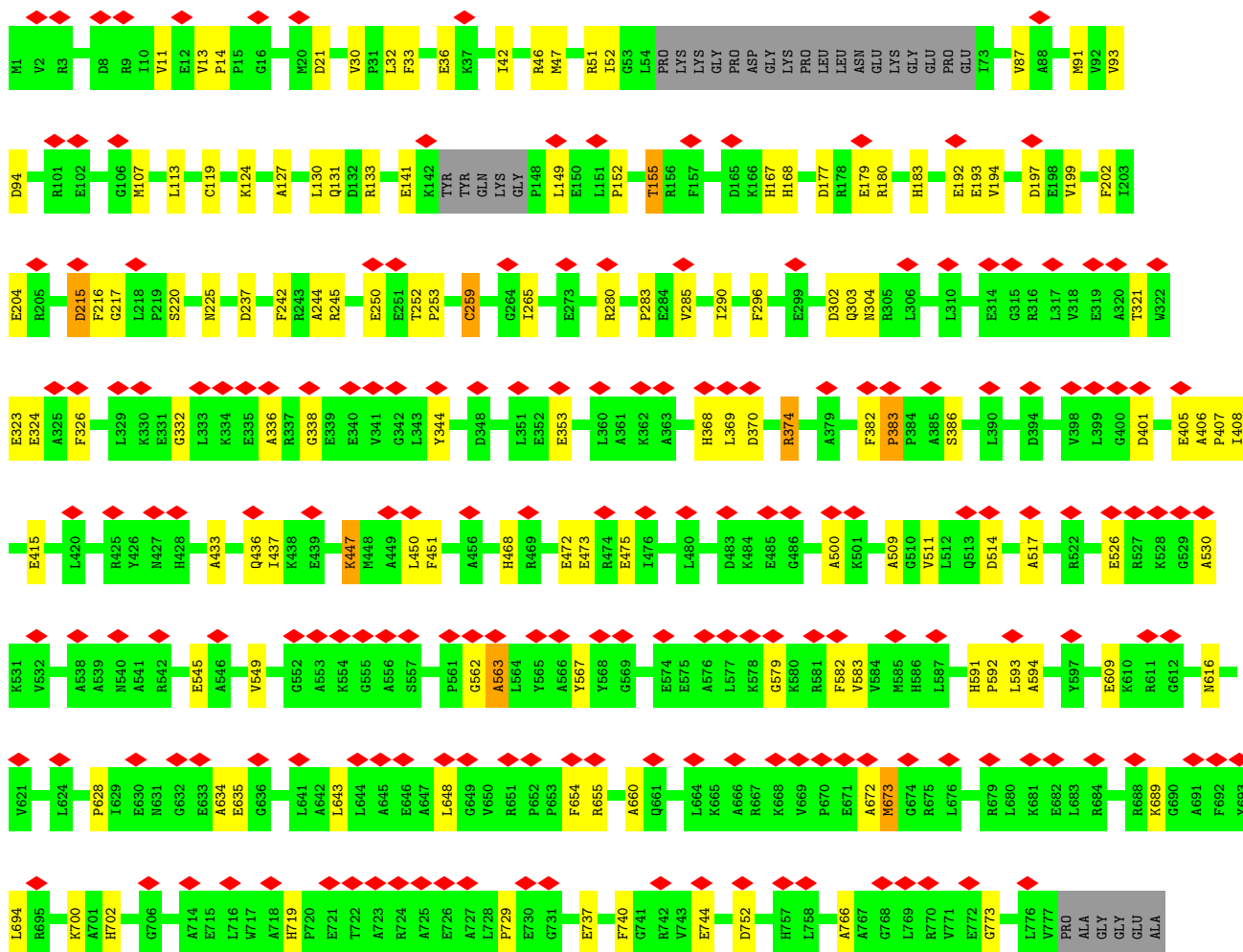


- Molecule 2: NADH-quinone oxidoreductase subunit 2

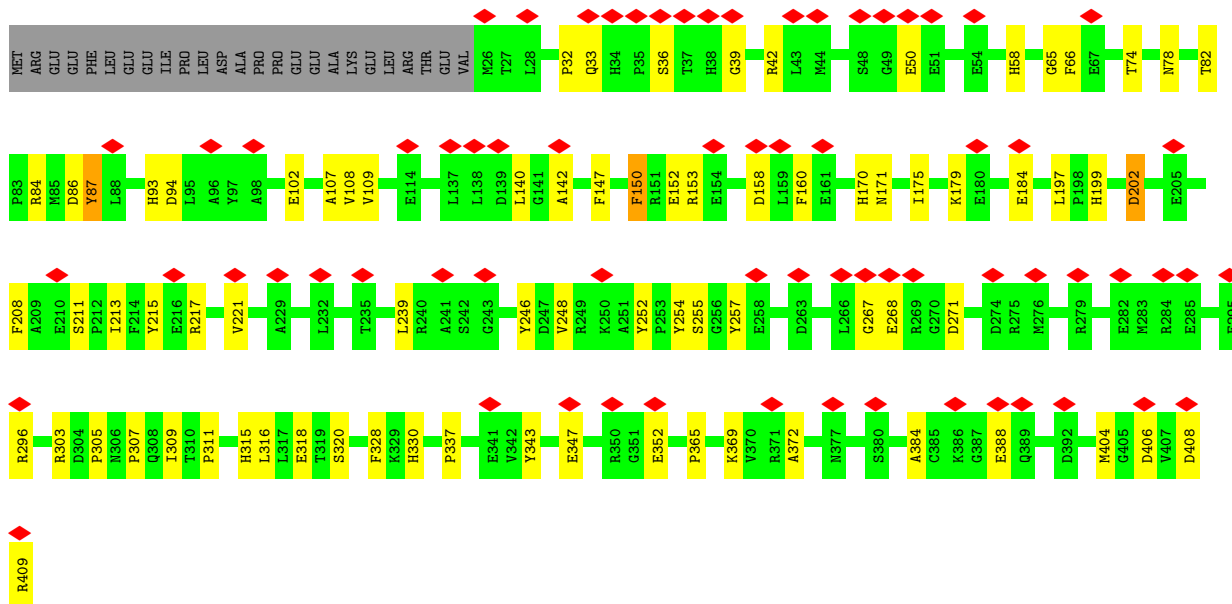
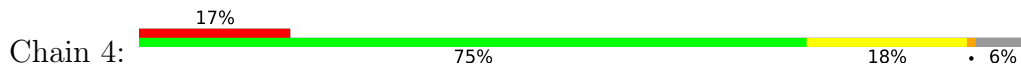


- Molecule 3: NADH-quinone oxidoreductase subunit 3

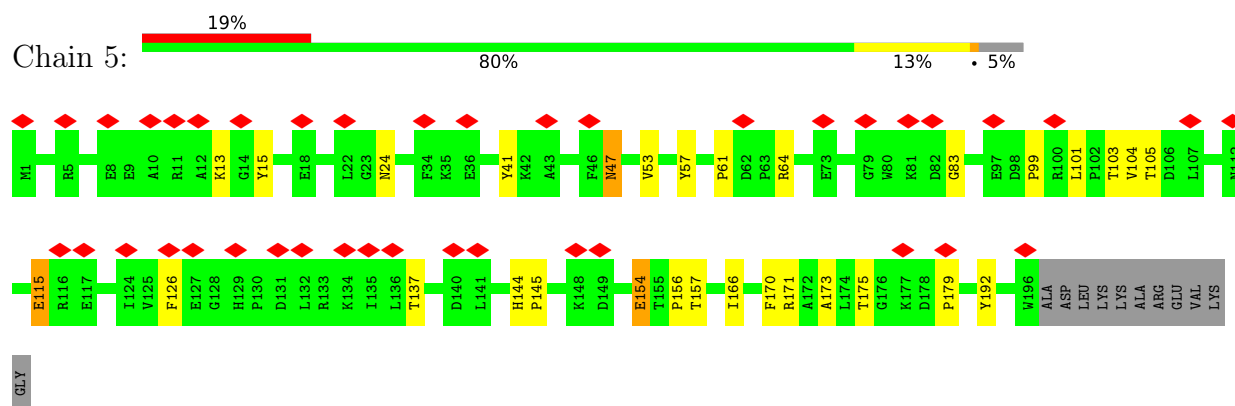




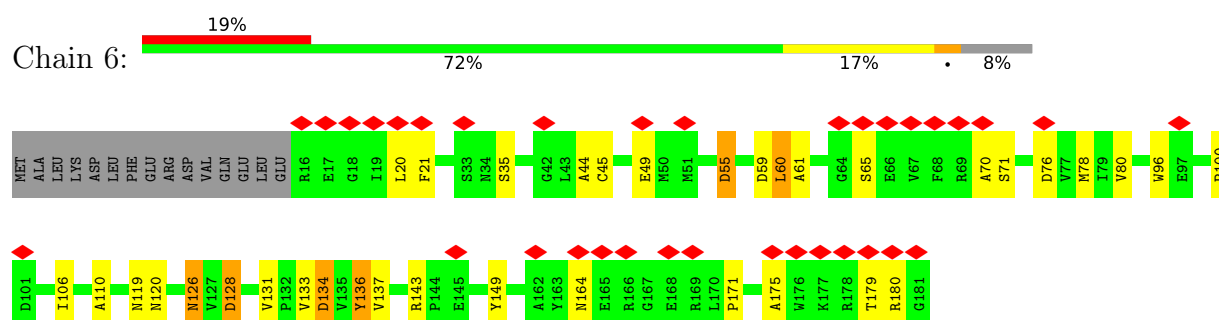
• Molecule 4: NADH-quinone oxidoreductase subunit 4



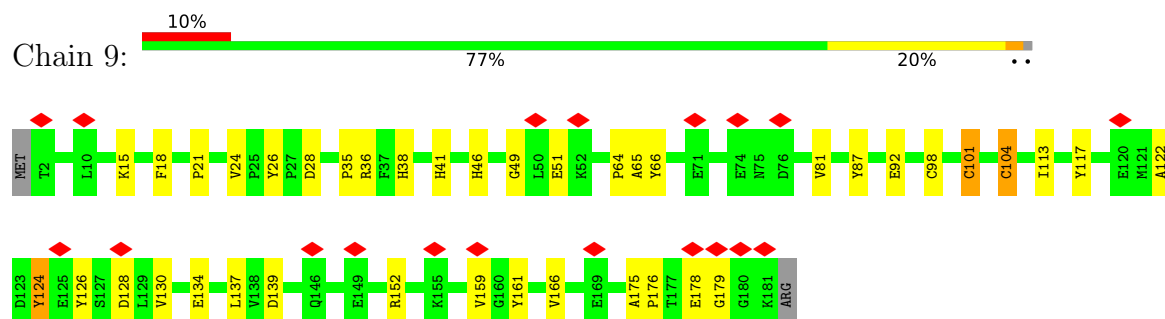
- Molecule 5: NADH-quinone oxidoreductase subunit 5



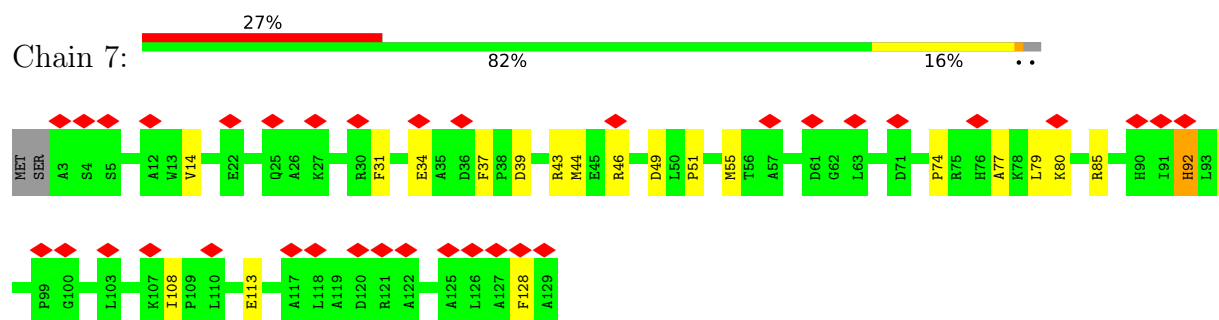
- Molecule 6: NADH-quinone oxidoreductase subunit 6



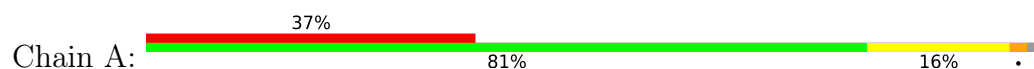
- Molecule 7: NADH-quinone oxidoreductase subunit 9

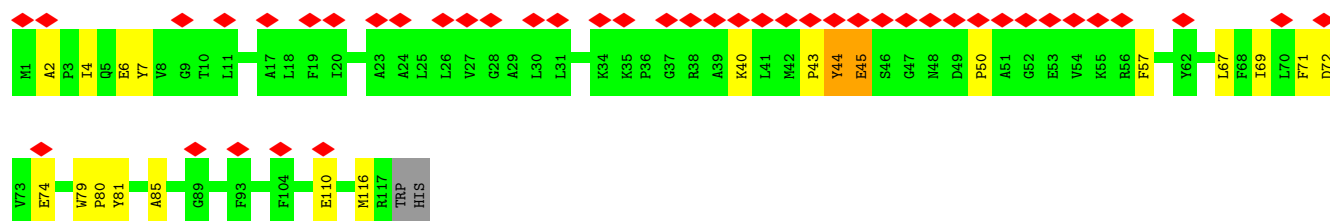


- Molecule 8: NADH-quinone oxidoreductase subunit 15

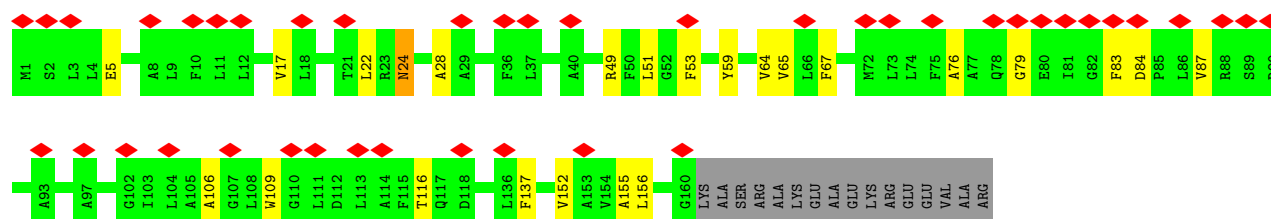
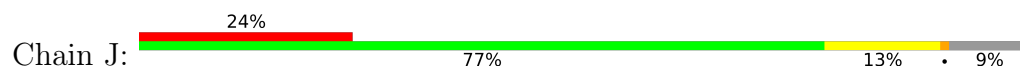


- Molecule 9: NADH-quinone oxidoreductase subunit 7

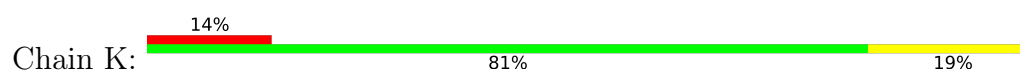




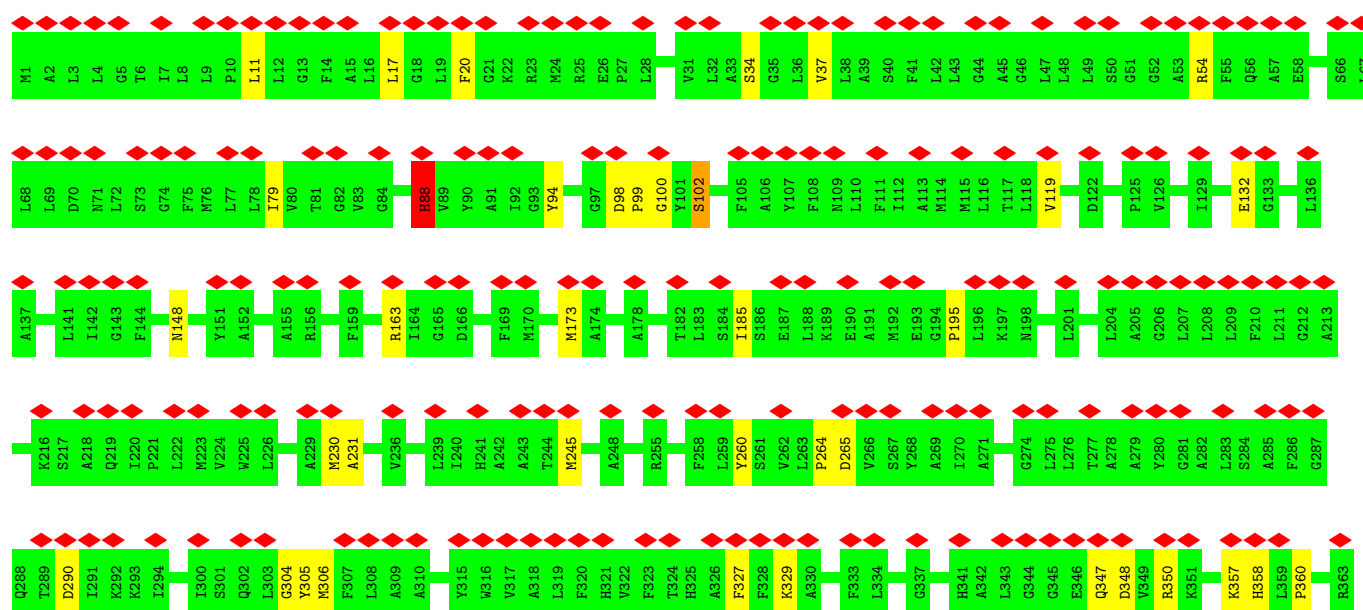
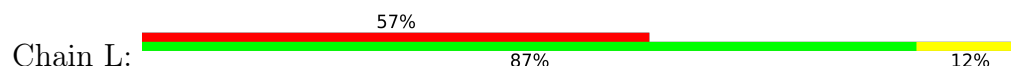
• Molecule 10: NADH-quinone oxidoreductase subunit 10



• Molecule 11: NADH-quinone oxidoreductase subunit 11

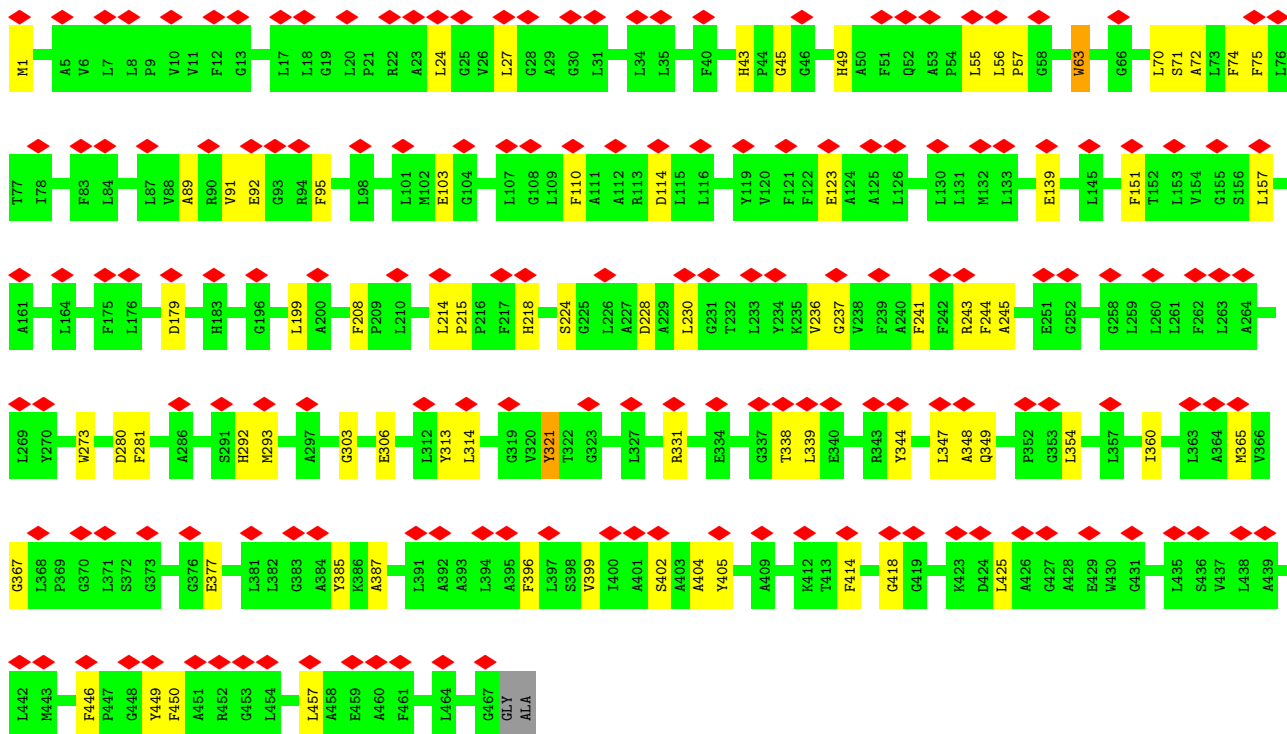
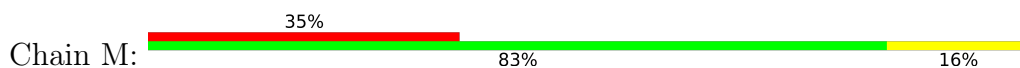


• Molecule 12: NADH-quinone oxidoreductase subunit 12

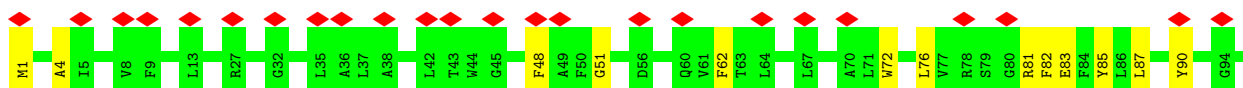
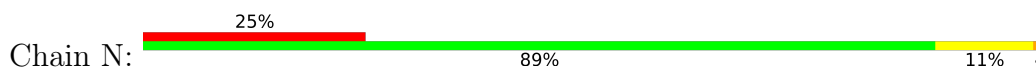


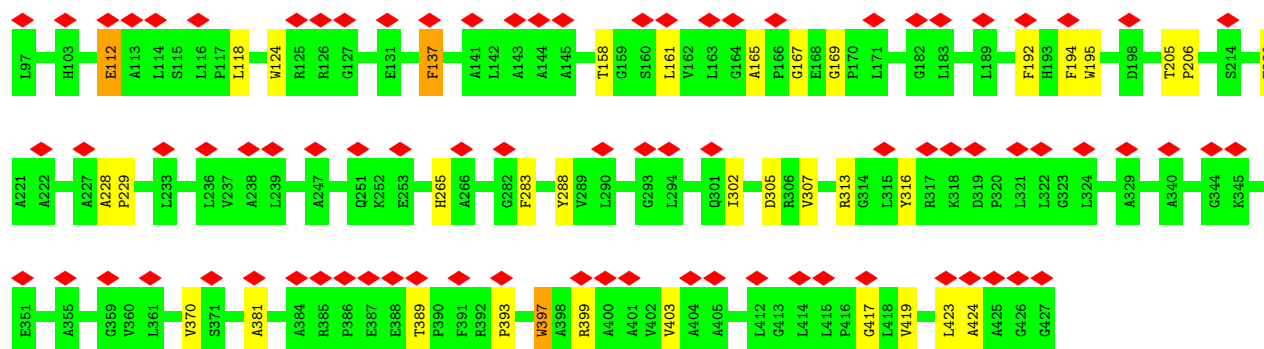


• Molecule 13: NADH-quinone oxidoreductase subunit 13

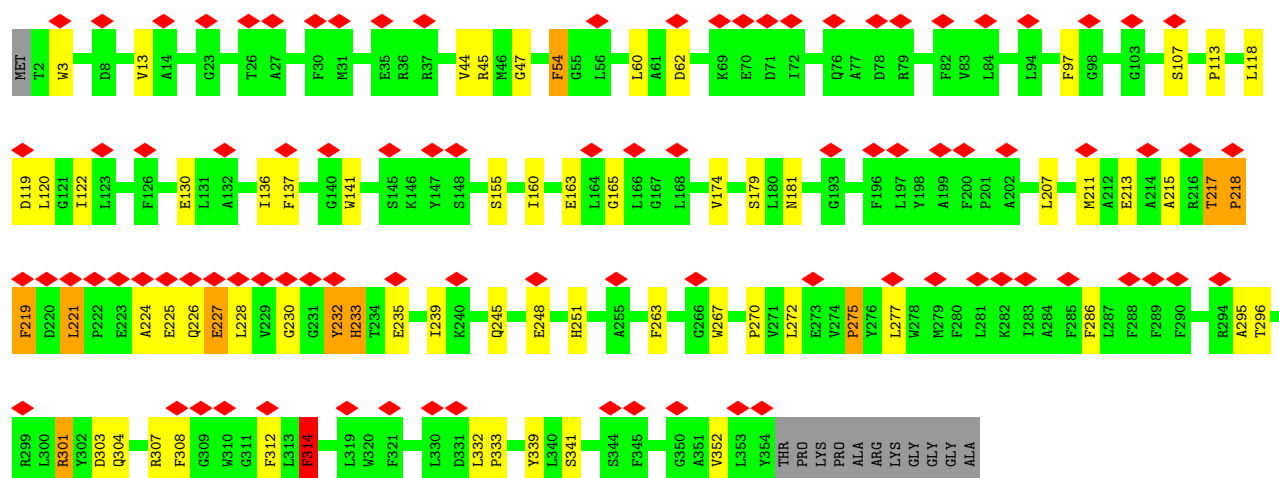
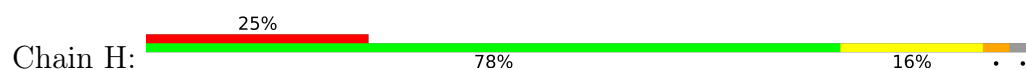


• Molecule 14: NADH-quinone oxidoreductase subunit 14





• Molecule 15: NADH-quinone oxidoreductase subunit 8



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	48000	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 ($e^-/\text{\AA}^2$)	34	Depositor
Minimum defocus (nm)	2500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	1.713	Depositor
Minimum map value	-0.715	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.039	Depositor
Recommended contour level	0.23	Depositor
Map size ($\text{\AA}$)	880.64, 880.64, 880.64	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.72, 1.72, 1.72	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: FES, FMN, 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	1	1.44	9/3506 (0.3%)	1.58	41/4745 (0.9%)
2	2	1.34	1/1439 (0.1%)	1.69	26/1953 (1.3%)
3	3	1.53	22/6014 (0.4%)	1.65	86/8155 (1.1%)
4	4	1.55	14/3150 (0.4%)	1.66	38/4284 (0.9%)
5	5	1.51	3/1656 (0.2%)	1.58	16/2246 (0.7%)
6	6	1.63	10/1319 (0.8%)	1.67	23/1786 (1.3%)
7	9	1.52	3/1423 (0.2%)	1.61	18/1933 (0.9%)
8	7	1.51	1/1059 (0.1%)	1.60	14/1429 (1.0%)
9	A	1.43	5/940 (0.5%)	1.67	14/1280 (1.1%)
10	J	1.35	1/1206 (0.1%)	1.63	19/1649 (1.2%)
11	K	1.51	3/710 (0.4%)	1.63	8/962 (0.8%)
12	L	1.29	2/4741 (0.0%)	1.61	53/6460 (0.8%)
13	M	1.38	7/3591 (0.2%)	1.62	47/4896 (1.0%)
14	N	1.38	3/3238 (0.1%)	1.58	34/4434 (0.8%)
15	H	1.46	11/2935 (0.4%)	1.60	32/4014 (0.8%)
All	All	1.45	95/36927 (0.3%)	1.62	469/50226 (0.9%)

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
1	1	0	6
2	2	0	1
3	3	0	7
4	4	0	10
5	5	0	4
6	6	0	4
7	9	0	8
9	A	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
11	K	0	3
12	L	0	8
13	M	0	8
14	N	0	4
15	H	0	11
All	All	0	75

All (95) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	H	227	GLU	CD-OE2	7.70	1.40	1.25
7	9	92	GLU	CD-OE2	7.66	1.39	1.25
12	L	386	ASP	CG-OD2	7.64	1.39	1.25
9	A	110	GLU	CD-OE2	7.60	1.39	1.25
3	3	415	GLU	CD-OE2	7.57	1.39	1.25
4	4	408	ASP	CG-OD2	7.57	1.39	1.25
3	3	179	GLU	CD-OE2	7.52	1.39	1.25
14	N	112	GLU	CD-OE2	7.50	1.39	1.25
4	4	94	ASP	CG-OD2	7.50	1.39	1.25
3	3	192	GLU	CD-OE2	7.50	1.39	1.25
3	3	36	GLU	CD-OE2	7.49	1.39	1.25
15	H	235	GLU	CD-OE2	7.48	1.39	1.25
3	3	609	GLU	CD-OE2	7.47	1.39	1.25
13	M	114	ASP	CG-OD2	7.47	1.39	1.25
8	7	34	GLU	CD-OE2	7.45	1.39	1.25
15	H	62	ASP	CG-OD2	7.44	1.39	1.25
4	4	347	GLU	CD-OE2	7.43	1.39	1.25
6	6	49	GLU	CD-OE2	7.40	1.39	1.25
11	K	67	GLU	CD-OE2	7.40	1.39	1.25
9	A	74	GLU	CD-OE2	7.39	1.39	1.25
11	K	32	GLU	CD-OE2	7.39	1.39	1.25
1	1	116	GLU	CD-OE2	7.38	1.39	1.25
13	M	377	GLU	CD-OE2	7.38	1.39	1.25
3	3	473	GLU	CD-OE2	7.37	1.39	1.25
4	4	152	GLU	CD-OE2	7.34	1.39	1.25
6	6	55	ASP	CG-OD2	7.33	1.39	1.25
12	L	132	GLU	CD-OE2	7.33	1.39	1.25
3	3	302	ASP	CG-OD2	7.32	1.39	1.25
13	M	92	GLU	CD-OE2	7.32	1.39	1.25
4	4	271	ASP	CG-OD2	7.31	1.39	1.25
4	4	388	GLU	CD-OE2	7.31	1.39	1.25
3	3	237	ASP	CG-OD2	7.30	1.39	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	6	GLU	CD-OE2	7.29	1.39	1.25
15	H	303	ASP	CG-OD2	7.28	1.39	1.25
15	H	130	GLU	CD-OE2	7.27	1.39	1.25
15	H	248	GLU	CD-OE2	7.26	1.39	1.25
15	H	213	GLU	CD-OE2	7.25	1.39	1.25
9	A	72	ASP	CG-OD2	7.22	1.39	1.25
13	M	103	GLU	CD-OE2	7.21	1.39	1.25
1	1	265	GLU	CD-OE2	7.20	1.39	1.25
1	1	108	GLU	CD-OE2	7.20	1.39	1.25
4	4	406	ASP	CG-OD2	7.20	1.39	1.25
1	1	404	ASP	CG-OD2	7.19	1.39	1.25
3	3	370	ASP	CG-OD2	7.19	1.39	1.25
3	3	545	GLU	CD-OE2	7.17	1.39	1.25
1	1	94	ASP	CG-OD2	7.17	1.39	1.25
15	H	163	GLU	CD-OE2	7.17	1.39	1.25
3	3	250	GLU	CD-OE2	7.14	1.39	1.25
3	3	405	GLU	CD-OE2	7.12	1.38	1.25
3	3	401	ASP	CG-OD2	7.11	1.38	1.25
3	3	197	ASP	CG-OD2	7.00	1.38	1.25
4	4	102	GLU	CD-OE2	7.00	1.38	1.25
1	1	95	GLU	CD-OE2	6.99	1.38	1.25
13	M	228	ASP	CG-OD2	6.98	1.38	1.25
5	5	115	GLU	CD-OE2	6.95	1.38	1.25
3	3	193	GLU	CD-OE2	6.91	1.38	1.25
6	6	134	ASP	CG-OD2	6.88	1.38	1.25
9	A	45	GLU	CD-OE2	6.82	1.38	1.25
3	3	21	ASP	CG-OD2	6.80	1.38	1.25
15	H	225	GLU	CD-OE2	6.77	1.38	1.25
2	2	59	GLU	CD-OE2	6.69	1.38	1.25
6	6	59	ASP	CG-OD2	6.68	1.38	1.25
13	M	123	GLU	CD-OE2	6.65	1.38	1.25
1	1	174	HIS	CA-C	-6.24	1.46	1.53
6	6	60	LEU	CA-C	-6.04	1.44	1.52
5	5	166	ILE	CA-C	-6.03	1.48	1.53
3	3	46	ARG	CA-C	-6.01	1.48	1.53
4	4	213	ILE	CA-C	-5.99	1.46	1.52
4	4	307	PRO	CA-C	-5.79	1.47	1.52
5	5	170	PHE	CA-C	-5.72	1.45	1.52
11	K	91	SER	CA-C	-5.66	1.48	1.53
3	3	265	ILE	CA-C	-5.65	1.46	1.52
4	4	147	PHE	CA-C	-5.62	1.45	1.52
7	9	104	CYS	CA-C	-5.61	1.45	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	N	85	TYR	CA-C	-5.59	1.48	1.52
6	6	134	ASP	CA-C	-5.54	1.45	1.52
10	J	49	ARG	CA-C	-5.50	1.46	1.52
3	3	433	ALA	CA-C	-5.43	1.47	1.53
15	H	352	VAL	CA-C	-5.40	1.47	1.52
14	N	307	VAL	CA-C	-5.38	1.49	1.53
3	3	242	PHE	CA-C	-5.36	1.48	1.53
3	3	130	LEU	CA-C	-5.33	1.46	1.52
6	6	44	ALA	CA-C	-5.32	1.45	1.52
1	1	429	ARG	CA-C	-5.21	1.48	1.52
6	6	80	VAL	CA-C	-5.20	1.48	1.53
7	9	51	GLU	CA-C	-5.19	1.46	1.52
1	1	125	ILE	CA-C	-5.16	1.47	1.53
3	3	549	VAL	CA-C	-5.16	1.48	1.53
4	4	320	SER	CA-C	-5.14	1.46	1.52
4	4	140	LEU	CA-C	-5.05	1.46	1.52
13	M	55	LEU	CA-C	-5.04	1.48	1.52
4	4	369	LYS	CA-C	-5.04	1.46	1.52
15	H	207	LEU	CA-C	-5.03	1.46	1.52
6	6	119	ASN	CA-C	-5.01	1.47	1.53
6	6	120	ASN	CA-C	-5.00	1.46	1.52

All (469) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	4	213	ILE	N-CA-C	-9.20	103.90	111.81
14	N	265	HIS	CA-CB-CG	-9.20	104.60	113.80
11	K	36	ASN	CA-CB-CG	-9.14	103.46	112.60
3	3	225	ASN	CA-CB-CG	-9.13	103.47	112.60
4	4	150	PHE	CA-CB-CG	-8.79	105.01	113.80
13	M	414	PHE	CA-CB-CG	-8.76	105.04	113.80
1	1	417	PHE	CA-CB-CG	-8.67	105.13	113.80
14	N	62	PHE	CA-CB-CG	-8.63	105.17	113.80
15	H	286	PHE	CA-CB-CG	-8.63	105.17	113.80
4	4	66	PHE	CA-CB-CG	-8.61	105.19	113.80
13	M	281	PHE	CA-CB-CG	-8.59	105.21	113.80
1	1	371	PHE	CA-CB-CG	-8.54	105.26	113.80
13	M	139	GLU	N-CA-C	-8.41	105.04	114.62
15	H	97	PHE	N-CA-C	-8.41	103.88	114.56
7	9	179	GLY	N-CA-C	-8.38	103.50	112.04
15	H	181	ASN	CA-CB-CG	-8.36	104.24	112.60
13	M	245	ALA	CA-C-N	8.24	125.43	120.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	M	245	ALA	C-N-CA	8.24	125.43	120.24
8	7	94	HIS	CB-CA-C	-7.94	98.63	110.62
4	4	109	VAL	CA-C-O	-7.91	115.83	119.94
3	3	94	ASP	CA-CB-CG	-7.88	104.72	112.60
5	5	24	ASN	CA-CB-CG	-7.84	104.76	112.60
2	2	77	LYS	N-CA-C	-7.73	102.90	113.18
8	7	92	HIS	CA-CB-CG	-7.70	106.10	113.80
3	3	21	ASP	CA-CB-CG	-7.68	104.92	112.60
1	1	272	PHE	CA-CB-CG	-7.55	106.25	113.80
13	M	396	PHE	CA-CB-CG	-7.52	106.28	113.80
1	1	205	PHE	N-CA-C	-7.47	99.72	110.40
1	1	170	ASP	CA-CB-CG	-7.45	105.15	112.60
2	2	129	HIS	N-CA-C	7.39	120.27	111.33
7	9	166	VAL	N-CA-C	-7.31	98.70	108.35
4	4	221	VAL	N-CA-C	7.30	119.00	109.58
7	9	24	VAL	N-CA-C	-7.27	100.95	108.15
6	6	35	SER	N-CA-C	7.23	121.03	112.93
15	H	54	PHE	CA-CB-CG	-7.23	106.57	113.80
6	6	60	LEU	N-CA-CB	7.19	122.65	110.49
3	3	141	GLU	N-CA-C	-7.19	97.17	108.90
9	A	69	ILE	N-CA-CB	7.19	118.96	110.55
15	H	263	PHE	CA-CB-CG	-7.09	106.71	113.80
15	H	314	PHE	CA-CB-CG	-7.04	106.75	113.80
4	4	315	HIS	CA-CB-CG	-7.03	106.77	113.80
4	4	372	ALA	CA-C-N	7.00	126.25	118.97
4	4	372	ALA	C-N-CA	7.00	126.25	118.97
5	5	104	VAL	N-CA-C	-7.00	105.99	112.43
15	H	179	SER	N-CA-C	-6.96	98.84	109.41
13	M	55	LEU	N-CA-C	-6.87	102.92	112.12
3	3	124	LYS	N-CA-C	-6.81	105.00	113.38
1	1	369	ASN	CA-CB-CG	-6.77	105.83	112.60
3	3	215	ASP	CA-CB-CG	-6.77	105.83	112.60
5	5	173	ALA	N-CA-C	-6.77	98.72	108.60
1	1	30	ASP	CA-CB-CG	-6.75	105.85	112.60
12	L	438	ALA	CA-C-N	6.70	127.28	120.38
12	L	438	ALA	C-N-CA	6.70	127.28	120.38
12	L	509	PHE	CA-CB-CG	6.70	120.50	113.80
12	L	98	ASP	CA-C-N	6.68	128.19	119.84
12	L	98	ASP	C-N-CA	6.68	128.19	119.84
3	3	451	PHE	CA-CB-CG	-6.67	107.13	113.80
14	N	167	GLY	N-CA-C	-6.67	102.98	111.72
5	5	144	HIS	CA-CB-CG	-6.67	107.14	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	3	47	MET	N-CA-C	-6.66	106.10	114.56
10	J	109	TRP	N-CA-C	-6.63	105.51	112.93
3	3	202	PHE	CA-CB-CG	-6.60	107.20	113.80
3	3	509	ALA	N-CA-C	-6.60	104.87	113.12
2	2	178	GLU	CA-C-N	6.60	133.84	121.97
2	2	178	GLU	C-N-CA	6.60	133.84	121.97
7	9	124	TYR	N-CA-C	6.57	118.24	111.14
3	3	382	PHE	N-CA-C	-6.56	99.65	108.11
6	6	71	SER	N-CA-C	-6.52	100.30	110.14
1	1	164	GLY	N-CA-C	-6.50	104.87	115.46
1	1	315	HIS	N-CA-C	-6.49	107.22	114.62
15	H	352	VAL	N-CA-C	-6.48	106.65	111.90
1	1	179	ALA	CA-C-N	6.48	129.29	120.54
1	1	179	ALA	C-N-CA	6.48	129.29	120.54
1	1	203	PRO	N-CA-C	6.48	118.61	110.70
12	L	11	LEU	N-CA-C	-6.48	104.06	112.68
3	3	107	MET	N-CA-C	6.46	119.15	111.33
4	4	271	ASP	CA-CB-CG	-6.46	106.14	112.60
13	M	348	ALA	N-CA-C	-6.45	105.54	113.41
13	M	224	SER	N-CA-C	-6.43	105.56	113.41
13	M	91	VAL	N-CA-C	-6.42	99.19	108.17
14	N	76	LEU	N-CA-C	6.39	119.24	111.82
3	3	353	GLU	CA-C-N	6.39	127.03	119.94
3	3	353	GLU	C-N-CA	6.39	127.03	119.94
12	L	511	PHE	N-CA-C	6.38	118.24	111.28
4	4	384	ALA	N-CA-C	6.38	119.05	111.33
15	H	119	ASP	N-CA-C	-6.38	102.98	113.50
10	J	5	GLU	CA-C-N	6.37	127.19	119.99
10	J	5	GLU	C-N-CA	6.37	127.19	119.99
12	L	290	ASP	CA-CB-CG	-6.36	106.24	112.60
9	A	40	LYS	N-CA-C	-6.36	103.87	111.69
3	3	694	LEU	CA-C-N	6.35	129.18	120.67
3	3	694	LEU	C-N-CA	6.35	129.18	120.67
4	4	202	ASP	CA-CB-CG	-6.35	106.25	112.60
6	6	128	ASP	CA-CB-CG	6.35	118.95	112.60
12	L	20	PHE	CA-CB-CG	-6.35	107.45	113.80
3	3	700	LYS	CA-C-N	6.34	130.33	120.82
3	3	700	LYS	C-N-CA	6.34	130.33	120.82
9	A	44	TYR	CA-C-N	6.34	133.64	121.54
9	A	44	TYR	C-N-CA	6.34	133.64	121.54
1	1	190	ASN	CA-CB-CG	-6.32	106.28	112.60
3	3	285	VAL	N-CA-C	-6.32	107.34	113.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	322	MET	N-CA-C	-6.32	99.85	108.38
8	7	128	PHE	N-CA-C	-6.31	105.61	113.55
2	2	146	THR	N-CA-C	-6.29	99.74	109.24
1	1	238	PHE	CA-CB-CG	-6.28	107.52	113.80
6	6	65	SER	CA-C-N	6.28	129.02	120.54
6	6	65	SER	C-N-CA	6.28	129.02	120.54
15	H	120	LEU	N-CA-C	-6.26	97.46	110.80
4	4	147	PHE	CA-CB-CG	-6.25	107.55	113.80
2	2	139	GLU	CA-C-N	6.25	127.65	119.84
2	2	139	GLU	C-N-CA	6.25	127.65	119.84
3	3	216	PHE	CA-CB-CG	-6.25	107.55	113.80
6	6	164	ASN	CA-CB-CG	-6.21	106.39	112.60
14	N	283	PHE	CA-CB-CG	-6.21	107.59	113.80
10	J	106	ALA	CA-C-N	6.20	126.97	120.03
10	J	106	ALA	C-N-CA	6.20	126.97	120.03
1	1	399	PHE	N-CA-C	-6.19	106.04	113.97
3	3	217	GLY	N-CA-C	-6.19	107.33	114.69
3	3	752	ASP	CA-CB-CG	-6.19	106.41	112.60
15	H	277	LEU	N-CA-C	6.18	118.53	111.11
8	7	55	MET	N-CA-C	-6.17	105.40	113.12
15	H	312	PHE	CA-CB-CG	-6.17	107.63	113.80
3	3	321	THR	CA-C-N	6.17	129.04	120.29
3	3	321	THR	C-N-CA	6.17	129.04	120.29
14	N	169	GLY	CA-C-N	6.16	127.54	119.84
14	N	169	GLY	C-N-CA	6.16	127.54	119.84
3	3	472	GLU	CA-C-N	6.15	128.53	120.28
3	3	472	GLU	C-N-CA	6.15	128.53	120.28
2	2	117	PHE	CA-CB-CG	-6.15	107.65	113.80
12	L	514	ARG	N-CA-C	6.14	118.48	111.11
13	M	215	PRO	CA-C-O	-6.13	111.68	120.56
3	3	131	GLN	CB-CG-CD	-6.11	102.22	112.60
12	L	402	PHE	CB-CA-C	-6.11	100.47	110.85
5	5	166	ILE	CA-C-N	6.10	125.58	119.24
5	5	166	ILE	C-N-CA	6.10	125.58	119.24
14	N	161	LEU	N-CA-C	-6.09	105.80	113.72
12	L	88	HIS	CA-CB-CG	-6.09	107.71	113.80
6	6	134	ASP	CA-CB-CG	-6.09	106.51	112.60
3	3	290	ILE	N-CA-C	-6.08	101.40	108.82
8	7	46	ARG	N-CA-C	-6.06	102.14	109.72
13	M	24	LEU	CA-C-N	6.06	126.70	119.98
13	M	24	LEU	C-N-CA	6.06	126.70	119.98
13	M	74	PHE	CA-CB-CG	-6.06	107.74	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	3	406	ALA	CA-C-N	6.04	127.39	119.84
3	3	406	ALA	C-N-CA	6.04	127.39	119.84
5	5	126	PHE	CA-CB-CG	-6.02	107.78	113.80
10	J	87	VAL	CA-C-N	6.02	128.94	120.28
10	J	87	VAL	C-N-CA	6.02	128.94	120.28
12	L	34	SER	CA-C-N	6.02	126.62	119.94
12	L	34	SER	C-N-CA	6.02	126.62	119.94
12	L	459	LEU	N-CA-C	-6.02	97.49	108.02
3	3	382	PHE	CA-C-N	6.01	126.57	120.38
3	3	382	PHE	C-N-CA	6.01	126.57	120.38
3	3	740	PHE	CA-CB-CG	-6.00	107.80	113.80
7	9	175	ALA	CA-C-N	6.00	127.34	119.84
7	9	175	ALA	C-N-CA	6.00	127.34	119.84
12	L	304	GLY	CA-C-N	5.99	128.63	120.54
12	L	304	GLY	C-N-CA	5.99	128.63	120.54
2	2	40	TRP	CA-C-N	5.99	128.68	120.35
2	2	40	TRP	C-N-CA	5.99	128.68	120.35
13	M	75	PHE	CA-CB-CG	-5.99	107.81	113.80
4	4	199	HIS	CA-CB-CG	-5.98	107.82	113.80
9	A	79	TRP	N-CA-CB	5.97	117.46	110.42
14	N	305	ASP	CA-CB-CG	-5.97	106.63	112.60
1	1	83	ASP	N-CA-C	-5.96	107.82	114.62
3	3	563	ALA	N-CA-C	-5.95	99.70	109.40
15	H	307	ARG	CB-CA-C	-5.95	98.58	110.42
12	L	79	ILE	CA-C-N	5.95	128.56	120.77
12	L	79	ILE	C-N-CA	5.95	128.56	120.77
4	4	252	TYR	CB-CA-C	-5.95	103.20	111.41
13	M	95	PHE	N-CA-C	-5.94	105.21	112.88
9	A	71	PHE	CA-CB-CG	-5.93	107.87	113.80
12	L	348	ASP	CA-CB-CG	-5.93	106.67	112.60
15	H	60	LEU	CA-C-N	5.91	128.12	120.44
15	H	60	LEU	C-N-CA	5.91	128.12	120.44
15	H	3	TRP	N-CA-C	-5.90	104.23	113.02
6	6	126	ASN	CA-C-N	5.90	130.29	120.62
6	6	126	ASN	C-N-CA	5.90	130.29	120.62
7	9	117	TYR	N-CA-C	-5.89	107.32	114.75
8	7	37	PHE	CB-CA-C	-5.89	100.21	109.52
10	J	84	ASP	N-CA-C	-5.88	102.92	108.22
13	M	349	GLN	N-CA-C	-5.88	105.92	112.57
3	3	52	ILE	CA-C-N	5.87	126.23	122.18
3	3	52	ILE	C-N-CA	5.87	126.23	122.18
13	M	70	LEU	CA-C-N	5.86	128.45	120.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	M	70	LEU	C-N-CA	5.86	128.45	120.54
14	N	194	PHE	CA-CB-CG	-5.86	107.94	113.80
12	L	444	TRP	N-CA-CB	5.86	115.95	110.39
3	3	773	GLY	N-CA-C	-5.84	104.31	112.13
1	1	418	LYS	CA-C-N	5.83	129.57	120.82
1	1	418	LYS	C-N-CA	5.83	129.57	120.82
2	2	129	HIS	CA-CB-CG	5.82	119.62	113.80
1	1	378	GLN	N-CA-C	-5.79	105.80	112.92
13	M	292	HIS	CA-CB-CG	-5.79	108.02	113.80
13	M	56	LEU	CA-C-N	5.78	127.07	119.84
13	M	56	LEU	C-N-CA	5.78	127.07	119.84
9	A	50	PRO	N-CA-C	-5.76	108.07	114.92
4	4	318	GLU	N-CA-C	-5.75	105.93	113.17
1	1	308	ASP	CA-CB-CG	-5.74	106.86	112.60
3	3	177	ASP	N-CA-C	-5.74	102.03	110.52
12	L	264	PRO	CA-C-N	5.73	128.76	120.79
12	L	264	PRO	C-N-CA	5.73	128.76	120.79
3	3	383	PRO	N-CA-C	5.72	117.68	110.70
1	1	346	ARG	N-CA-C	-5.72	106.13	113.23
10	J	67	PHE	CA-CB-CG	-5.72	108.08	113.80
4	4	50	GLU	N-CA-C	-5.72	107.30	114.56
3	3	591	HIS	CB-CA-C	-5.71	101.17	109.45
8	7	79	LEU	N-CA-C	-5.71	104.55	112.03
7	9	81	VAL	N-CA-C	-5.70	107.43	112.90
15	H	263	PHE	N-CA-C	5.70	119.41	112.23
10	J	51	LEU	CA-C-N	5.69	126.42	119.99
10	J	51	LEU	C-N-CA	5.69	126.42	119.99
3	3	719	HIS	CA-C-N	5.68	126.94	119.84
3	3	719	HIS	C-N-CA	5.68	126.94	119.84
3	3	11	VAL	CA-C-N	5.68	130.81	121.39
3	3	11	VAL	C-N-CA	5.68	130.81	121.39
13	M	446	PHE	CA-CB-CG	-5.67	108.13	113.80
1	1	143	ASP	CA-CB-CG	-5.67	106.93	112.60
12	L	528	SER	CA-C-N	5.66	127.87	120.28
12	L	528	SER	C-N-CA	5.66	127.87	120.28
14	N	124	TRP	N-CA-C	-5.66	104.79	112.26
10	J	24	ASN	CA-CB-CG	-5.65	106.95	112.60
12	L	17	LEU	CA-C-N	5.65	126.22	120.00
12	L	17	LEU	C-N-CA	5.65	126.22	120.00
12	L	595	LEU	CA-C-N	5.64	126.37	119.99
12	L	595	LEU	C-N-CA	5.64	126.37	119.99
15	H	332	LEU	CA-C-N	5.63	126.88	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	H	332	LEU	C-N-CA	5.63	126.88	119.84
4	4	337	PRO	CA-C-O	-5.62	112.40	120.56
13	M	27	LEU	CA-C-N	5.62	126.34	119.99
13	M	27	LEU	C-N-CA	5.62	126.34	119.99
14	N	228	ALA	CA-C-N	5.62	123.76	119.66
14	N	228	ALA	C-N-CA	5.62	123.76	119.66
3	3	42	ILE	N-CA-C	-5.61	97.68	109.34
3	3	514	ASP	CA-C-N	5.60	128.10	120.54
3	3	514	ASP	C-N-CA	5.60	128.10	120.54
5	5	47	ASN	CA-CB-CG	-5.60	107.00	112.60
1	1	113	LEU	CA-C-N	5.60	128.10	120.54
1	1	113	LEU	C-N-CA	5.60	128.10	120.54
12	L	463	HIS	CA-CB-CG	5.59	119.39	113.80
3	3	296	PHE	CA-CB-CG	-5.59	108.21	113.80
4	4	158	ASP	CA-CB-CG	-5.59	107.01	112.60
13	M	354	LEU	N-CA-C	-5.59	105.27	111.36
4	4	78	ASN	CA-CB-CG	-5.58	107.03	112.60
10	J	65	VAL	CB-CA-C	-5.57	104.62	112.14
12	L	358	HIS	N-CA-C	-5.57	105.69	112.88
3	3	594	ALA	N-CA-C	-5.57	106.62	113.41
9	A	43	PRO	CA-C-N	5.56	132.17	121.54
9	A	43	PRO	C-N-CA	5.56	132.17	121.54
12	L	479	GLU	CA-C-N	5.56	128.87	120.75
12	L	479	GLU	C-N-CA	5.56	128.87	120.75
14	N	85	TYR	N-CA-C	-5.56	104.51	112.13
3	3	447	LYS	N-CA-C	-5.56	107.50	114.56
12	L	516	VAL	N-CA-C	-5.55	101.02	108.35
1	1	271	THR	CA-C-N	5.55	127.66	120.44
1	1	271	THR	C-N-CA	5.55	127.66	120.44
14	N	229	PRO	CA-C-O	-5.55	116.90	120.90
14	N	423	LEU	N-CA-C	-5.55	103.91	111.56
2	2	177	HIS	N-CA-C	-5.54	100.91	108.38
13	M	450	PHE	CA-CB-CG	-5.53	108.27	113.80
11	K	89	ASP	N-CA-C	-5.53	105.75	112.88
2	2	82	VAL	CA-C-N	5.53	128.61	120.82
2	2	82	VAL	C-N-CA	5.53	128.61	120.82
10	J	79	GLY	N-CA-C	-5.53	106.17	115.62
7	9	24	VAL	CA-C-O	-5.52	117.13	120.88
14	N	389	THR	CA-C-N	5.52	125.84	119.93
14	N	389	THR	C-N-CA	5.52	125.84	119.93
12	L	102	SER	CA-C-N	5.50	127.59	120.44
12	L	102	SER	C-N-CA	5.50	127.59	120.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	2	17	LYS	N-CA-C	5.50	119.09	112.38
5	5	137	THR	N-CA-C	-5.50	103.14	110.07
6	6	20	LEU	CA-C-N	5.50	132.04	121.54
6	6	20	LEU	C-N-CA	5.50	132.04	121.54
11	K	91	SER	CB-CA-C	-5.50	103.92	111.51
3	3	526	GLU	CA-C-N	5.49	127.58	120.44
3	3	526	GLU	C-N-CA	5.49	127.58	120.44
14	N	370	VAL	N-CA-CB	5.49	116.61	110.51
15	H	13	VAL	N-CA-CB	5.49	116.97	110.55
13	M	347	LEU	N-CA-C	-5.49	106.36	113.16
15	H	341	SER	CA-C-N	5.49	127.89	120.38
15	H	341	SER	C-N-CA	5.49	127.89	120.38
4	4	171	ASN	CA-CB-CG	-5.48	107.12	112.60
12	L	357	LYS	N-CA-C	-5.48	106.36	113.16
1	1	383	ASP	CA-CB-CG	-5.47	107.13	112.60
1	1	97	GLU	N-CA-C	-5.47	102.88	109.83
1	1	366	PHE	CA-C-N	5.47	128.39	120.79
1	1	366	PHE	C-N-CA	5.47	128.39	120.79
13	M	151	PHE	CA-CB-CG	-5.46	108.34	113.80
15	H	308	PHE	CA-CB-CG	-5.46	108.34	113.80
3	3	303	GLN	CA-C-N	5.46	131.97	121.54
3	3	303	GLN	C-N-CA	5.46	131.97	121.54
11	K	28	PHE	CA-CB-CG	-5.46	108.34	113.80
3	3	93	VAL	N-CA-C	-5.46	100.26	108.12
11	K	85	THR	N-CA-C	-5.46	105.84	112.88
10	J	137	PHE	CA-CB-CG	-5.46	108.34	113.80
12	L	327	PHE	CA-CB-CG	-5.45	108.35	113.80
1	1	25	GLY	N-CA-C	-5.45	100.27	113.18
3	3	168	HIS	ND1-CG-CD2	5.44	111.54	106.10
4	4	330	HIS	CA-CB-CG	-5.43	108.36	113.80
5	5	13	LYS	N-CA-C	-5.43	106.32	113.17
13	M	110	PHE	CA-CB-CG	-5.42	108.38	113.80
4	4	352	GLU	N-CA-CB	5.42	118.05	109.71
2	2	40	TRP	N-CA-CB	5.41	119.64	110.49
3	3	673	MET	N-CA-CB	5.41	119.64	110.49
2	2	176	VAL	N-CA-C	-5.41	100.03	108.95
3	3	14	PRO	CA-C-O	-5.41	116.46	120.73
7	9	28	ASP	N-CA-C	-5.40	106.73	113.38
2	2	149	ARG	CA-C-N	5.40	127.78	120.65
2	2	149	ARG	C-N-CA	5.40	127.78	120.65
13	M	367	GLY	N-CA-C	-5.39	105.96	112.48
6	6	180	ARG	N-CA-C	-5.38	108.48	114.62

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	3	51	ARG	N-CA-C	-5.37	101.13	109.72
2	2	145	VAL	N-CA-C	-5.36	100.92	108.27
3	3	152	PRO	N-CA-C	-5.36	102.14	112.01
3	3	592	PRO	CA-C-N	5.36	129.26	120.63
3	3	592	PRO	C-N-CA	5.36	129.26	120.63
9	A	2	ALA	O-C-N	-5.36	118.10	121.85
10	J	156	LEU	N-CA-C	5.36	117.20	111.36
3	3	369	LEU	N-CA-CB	5.35	120.23	111.08
4	4	208	PHE	CA-C-N	5.35	127.71	120.38
4	4	208	PHE	C-N-CA	5.35	127.71	120.38
3	3	648	LEU	N-CA-C	-5.34	106.77	113.72
14	N	51	GLY	CA-C-N	5.34	125.67	119.47
14	N	51	GLY	C-N-CA	5.34	125.67	119.47
8	7	74	PRO	CA-C-N	5.34	127.44	120.28
8	7	74	PRO	C-N-CA	5.34	127.44	120.28
2	2	81	GLN	N-CA-C	5.34	117.34	107.73
7	9	18	PHE	CA-CB-CG	-5.33	108.47	113.80
11	K	84	SER	N-CA-C	-5.33	100.62	108.99
8	7	113	GLU	CA-C-N	5.33	127.73	120.54
8	7	113	GLU	C-N-CA	5.33	127.73	120.54
3	3	475	GLU	CB-CA-C	-5.33	101.80	110.85
14	N	158	THR	CA-C-N	5.33	126.80	120.14
14	N	158	THR	C-N-CA	5.33	126.80	120.14
4	4	267	GLY	N-CA-C	-5.32	104.17	112.58
3	3	323	GLU	CA-C-N	5.32	127.94	120.28
3	3	323	GLU	C-N-CA	5.32	127.94	120.28
12	L	37	VAL	CA-C-N	5.31	127.66	120.65
12	L	37	VAL	C-N-CA	5.31	127.66	120.65
6	6	171	PRO	CA-C-N	5.30	124.76	119.24
6	6	171	PRO	C-N-CA	5.30	124.76	119.24
14	N	220	PHE	CA-CB-CG	-5.29	108.50	113.80
5	5	157	THR	N-CA-C	-5.29	101.91	110.32
13	M	313	TYR	CA-C-N	5.29	127.63	120.38
13	M	313	TYR	C-N-CA	5.29	127.63	120.38
3	3	13	VAL	CA-C-N	5.29	123.47	119.66
3	3	13	VAL	C-N-CA	5.29	123.47	119.66
7	9	38	HIS	CA-CB-CG	-5.28	108.52	113.80
9	A	85	ALA	N-CA-C	-5.28	108.60	114.62
3	3	30	VAL	N-CA-CB	5.28	117.68	111.87
3	3	401	ASP	CA-C-N	5.28	124.91	119.05
3	3	401	ASP	C-N-CA	5.28	124.91	119.05
15	H	303	ASP	CB-CA-C	-5.28	102.53	110.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	H	141	TRP	CA-C-N	5.27	127.66	120.54
15	H	141	TRP	C-N-CA	5.27	127.66	120.54
2	2	80	LEU	N-CA-C	5.27	116.83	108.67
1	1	240	GLN	N-CA-C	5.26	119.18	112.34
3	3	33	PHE	CB-CA-C	-5.26	99.95	110.42
7	9	139	ASP	CA-CB-CG	-5.26	107.34	112.60
5	5	171	ARG	N-CA-C	-5.26	100.74	108.99
1	1	395	GLU	CA-C-N	5.25	125.92	119.99
1	1	395	GLU	C-N-CA	5.25	125.92	119.99
6	6	59	ASP	CA-CB-CG	5.25	117.85	112.60
4	4	150	PHE	CA-C-N	5.24	127.62	120.54
4	4	150	PHE	C-N-CA	5.24	127.62	120.54
1	1	404	ASP	CA-CB-CG	-5.24	107.36	112.60
10	J	53	PHE	CA-CB-CG	-5.24	108.56	113.80
12	L	465	LEU	N-CA-C	-5.23	103.07	110.29
2	2	85	THR	CA-C-N	5.23	131.53	121.54
2	2	85	THR	C-N-CA	5.23	131.53	121.54
15	H	155	SER	CB-CA-C	-5.22	102.61	110.92
11	K	45	PHE	CA-CB-CG	-5.22	108.58	113.80
14	N	288	TYR	CA-C-N	5.22	127.14	120.56
14	N	288	TYR	C-N-CA	5.22	127.14	120.56
15	H	47	GLY	CA-C-N	5.21	125.50	119.93
15	H	47	GLY	C-N-CA	5.21	125.50	119.93
12	L	195	PRO	CA-C-N	5.20	128.47	120.82
12	L	195	PRO	C-N-CA	5.20	128.47	120.82
4	4	303	ARG	CA-C-N	5.19	127.63	120.67
4	4	303	ARG	C-N-CA	5.19	127.63	120.67
5	5	179	PRO	N-CA-C	-5.19	108.03	114.68
13	M	157	LEU	CA-C-N	5.19	125.24	119.32
13	M	157	LEU	C-N-CA	5.19	125.24	119.32
13	M	63	TRP	CA-CB-CG	5.18	123.45	113.60
1	1	219	ASN	CA-C-N	5.18	129.98	121.39
1	1	219	ASN	C-N-CA	5.18	129.98	121.39
1	1	356	CYS	CB-CA-C	-5.17	100.99	109.53
14	N	195	TRP	CA-C-N	5.17	126.56	120.09
14	N	195	TRP	C-N-CA	5.17	126.56	120.09
14	N	397	TRP	CA-C-N	5.17	127.63	120.29
14	N	397	TRP	C-N-CA	5.17	127.63	120.29
12	L	148	ASN	N-CA-C	5.16	116.92	109.48
3	3	304	ASN	N-CA-CB	5.16	119.20	110.49
12	L	478	ALA	CA-C-N	5.15	127.19	120.28
12	L	478	ALA	C-N-CA	5.15	127.19	120.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	M	306	GLU	CA-C-N	5.15	125.80	120.03
13	M	306	GLU	C-N-CA	5.15	125.80	120.03
4	4	82	THR	CA-C-O	-5.15	113.11	120.16
13	M	399	VAL	CA-C-N	5.14	127.00	120.72
13	M	399	VAL	C-N-CA	5.14	127.00	120.72
6	6	110	ALA	N-CA-C	5.14	116.96	111.36
9	A	7	TYR	CA-CB-CG	-5.14	104.65	113.90
3	3	332	GLY	N-CA-C	5.14	120.57	113.99
8	7	14	VAL	N-CA-CB	5.14	116.56	110.55
12	L	100	GLY	CA-C-N	5.14	127.93	120.79
12	L	100	GLY	C-N-CA	5.14	127.93	120.79
3	3	719	HIS	CA-C-O	-5.14	114.99	120.23
8	7	94	HIS	ND1-CG-CD2	5.13	111.23	106.10
7	9	46	HIS	CA-C-N	5.13	124.92	119.28
7	9	46	HIS	C-N-CA	5.13	124.92	119.28
1	1	357	THR	CA-C-N	5.12	124.92	119.28
1	1	357	THR	C-N-CA	5.12	124.92	119.28
7	9	49	GLY	N-CA-C	-5.12	108.00	115.63
6	6	106	ILE	N-CA-C	-5.12	101.09	108.87
4	4	107	ALA	CA-C-N	5.11	131.16	121.97
4	4	107	ALA	C-N-CA	5.11	131.16	121.97
11	K	27	VAL	N-CA-CB	5.11	115.98	110.62
7	9	101	CYS	CB-CA-C	-5.11	102.83	110.90
15	H	239	ILE	CA-C-N	5.10	127.12	120.28
15	H	239	ILE	C-N-CA	5.10	127.12	120.28
14	N	192	PHE	N-CA-C	-5.10	105.75	112.94
3	3	252	THR	CA-C-N	5.10	125.38	119.93
3	3	252	THR	C-N-CA	5.10	125.38	119.93
13	M	179	ASP	CA-CB-CG	-5.09	107.51	112.60
15	H	137	PHE	N-CA-CB	5.09	118.06	110.22
3	3	168	HIS	CA-C-N	5.09	125.33	119.83
3	3	168	HIS	C-N-CA	5.09	125.33	119.83
12	L	558	ARG	N-CA-CB	5.09	118.38	109.72
6	6	143	ARG	CA-C-N	5.09	126.20	119.84
6	6	143	ARG	C-N-CA	5.09	126.20	119.84
13	M	244	PHE	CA-CB-CG	-5.08	108.72	113.80
10	J	83	PHE	CA-CB-CG	-5.08	108.72	113.80
3	3	635	GLU	CA-C-N	5.07	125.97	120.44
3	3	635	GLU	C-N-CA	5.07	125.97	120.44
14	N	72	TRP	N-CA-C	5.07	117.21	111.02
2	2	56	THR	CA-C-N	5.07	125.10	119.32
2	2	56	THR	C-N-CA	5.07	125.10	119.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	3	386	SER	N-CA-C	-5.07	101.03	108.99
13	M	237	GLY	CA-C-N	5.07	127.41	120.77
13	M	237	GLY	C-N-CA	5.07	127.41	120.77
5	5	101	LEU	CA-C-N	5.07	125.31	119.83
5	5	101	LEU	C-N-CA	5.07	125.31	119.83
9	A	57	PHE	CA-C-N	5.07	125.06	119.89
9	A	57	PHE	C-N-CA	5.07	125.06	119.89
13	M	49	HIS	ND1-CG-CD2	5.07	111.17	106.10
3	3	579	GLY	N-CA-C	-5.06	107.70	116.01
4	4	170	HIS	ND1-CG-CD2	5.06	111.16	106.10
10	J	17	VAL	N-CA-CB	5.06	116.13	110.51
3	3	436	GLN	N-CA-C	-5.05	106.96	113.02
8	7	31	PHE	N-CA-C	-5.05	101.64	109.72
12	L	119	VAL	N-CA-C	5.05	115.82	110.72
4	4	239	LEU	N-CA-C	-5.05	106.46	113.18
12	L	442	MET	N-CA-C	-5.04	103.84	111.56
12	L	376	LEU	CA-C-N	5.04	126.14	119.84
12	L	376	LEU	C-N-CA	5.04	126.14	119.84
4	4	252	TYR	CA-C-N	5.04	125.32	119.93
4	4	252	TYR	C-N-CA	5.04	125.32	119.93
3	3	702	HIS	ND1-CG-CD2	5.03	111.13	106.10
4	4	307	PRO	N-CA-C	-5.03	108.93	114.92
13	M	241	PHE	CA-CB-CG	-5.03	108.77	113.80
4	4	309	ILE	CB-CA-C	-5.03	105.51	111.65
5	5	47	ASN	N-CA-C	5.02	116.76	111.28
7	9	128	ASP	CA-CB-CG	-5.02	107.58	112.60
13	M	457	LEU	N-CA-CB	5.02	117.50	110.12
14	N	82	PHE	CA-C-N	5.02	127.41	120.29
14	N	82	PHE	C-N-CA	5.02	127.41	120.29
6	6	76	ASP	N-CA-C	5.01	121.48	110.80
6	6	59	ASP	N-CA-C	-5.01	103.78	110.55
6	6	179	THR	N-CA-C	-5.01	102.78	110.14

There are no chirality outliers.

All (75) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	1	104	ARG	Sidechain
1	1	123	TYR	Sidechain
1	1	264	TYR	Sidechain
1	1	371	PHE	Sidechain
1	1	396	GLY	Peptide

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Mol	Chain	Res	Type	Group
1	1	433	ARG	Sidechain
2	2	158	ARG	Sidechain
3	3	180	ARG	Sidechain
3	3	183	HIS	Peptide
3	3	215	ASP	Peptide
3	3	245	ARG	Sidechain
3	3	344	TYR	Sidechain
3	3	374	ARG	Sidechain
3	3	567	TYR	Sidechain
4	4	142	ALA	Peptide
4	4	217	ARG	Sidechain
4	4	254	TYR	Sidechain
4	4	257	TYR	Sidechain
4	4	296	ARG	Sidechain
4	4	343	TYR	Sidechain
4	4	36	SER	Peptide
4	4	409	ARG	Sidechain
4	4	84	ARG	Sidechain
4	4	87	TYR	Sidechain
5	5	15	TYR	Sidechain
5	5	192	TYR	Sidechain
5	5	41	TYR	Sidechain
5	5	47	ASN	Peptide
6	6	100	PRO	Peptide
6	6	136	TYR	Sidechain
6	6	149	TYR	Sidechain
6	6	55	ASP	Peptide
7	9	124	TYR	Sidechain
7	9	126	TYR	Sidechain
7	9	152	ARG	Sidechain
7	9	161	TYR	Sidechain
7	9	21	PRO	Peptide
7	9	26	TYR	Sidechain
7	9	66	TYR	Sidechain
7	9	87	TYR	Sidechain
9	A	81	TYR	Sidechain
15	H	218	PRO	Peptide
15	H	219	PHE	Peptide
15	H	221	LEU	Peptide
15	H	227	GLU	Peptide
15	H	232	TYR	Sidechain
15	H	295	ALA	Peptide

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Mol	Chain	Res	Type	Group
15	H	301	ARG	Sidechain
15	H	314	PHE	Sidechain
15	H	339	TYR	Sidechain
15	H	45	ARG	Sidechain
15	H	54	PHE	Sidechain
11	K	3	TYR	Sidechain
11	K	49	TYR	Sidechain
11	K	50	GLY	Peptide
12	L	163	ARG	Sidechain
12	L	260	TYR	Sidechain
12	L	403	TYR	Sidechain
12	L	462	PRO	Peptide
12	L	536	ARG	Sidechain
12	L	54	ARG	Sidechain
12	L	88	HIS	Sidechain
12	L	94	TYR	Sidechain
13	M	208	PHE	Sidechain
13	M	243	ARG	Sidechain
13	M	321	TYR	Sidechain
13	M	331	ARG	Sidechain
13	M	344	TYR	Sidechain
13	M	385	TYR	Sidechain
13	M	449	TYR	Sidechain
13	M	71	SER	Peptide
14	N	137	PHE	Sidechain
14	N	316	TYR	Sidechain
14	N	399	ARG	Sidechain
14	N	90	TYR	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	1	3417	0	3388	14	0
2	2	1406	0	1373	3	0
3	3	5876	0	5914	10	0
4	4	3067	0	3049	5	0
5	5	1607	0	1574	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	6	1289	0	1298	3	0
7	9	1388	0	1383	2	0
8	7	1031	0	1029	3	0
9	A	910	0	939	0	0
10	J	1183	0	1286	2	0
11	K	703	0	747	3	0
12	L	4604	0	4734	9	0
13	M	3489	0	3606	7	0
14	N	3154	0	3343	6	0
15	H	2838	0	2903	7	0
16	1	8	0	0	0	0
16	3	24	0	0	1	0
16	6	8	0	0	0	0
16	9	16	0	0	0	0
17	1	31	0	19	11	0
18	2	4	0	0	0	0
18	3	4	0	0	0	0
All	All	36057	0	36585	75	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 1.

All (75) 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)
1:1:92:ASN:OD1	17:1:502:FMN:C2	1.88	1.20
1:1:220:ASN:HB2	17:1:502:FMN:O2P	1.51	1.10
1:1:65:ARG:N	17:1:502:FMN:O1P	1.94	0.98
1:1:92:ASN:OD1	17:1:502:FMN:O2	1.91	0.88
1:1:220:ASN:CB	17:1:502:FMN:O2P	2.26	0.83
1:1:92:ASN:OD1	17:1:502:FMN:N3	2.17	0.77
4:4:42:ARG:HH21	4:4:58:HIS:CD2	2.17	0.62
6:6:78:MET:HE1	6:6:96:TRP:HA	1.81	0.61
12:L:380:SER:HB3	12:L:456:ALA:HB3	1.82	0.61
12:L:433:HIS:H	12:L:433:HIS:CD2	2.21	0.58
15:H:219:PHE:C	15:H:221:LEU:H	2.12	0.57
13:M:425:LEU:HD23	13:M:425:LEU:H	1.70	0.57
12:L:479:GLU:H	12:L:479:GLU:CD	2.14	0.56
13:M:43:HIS:CD2	13:M:45:GLY:H	2.23	0.55
17:1:502:FMN:H2'	17:1:502:FMN:N1	2.21	0.55
13:M:214:LEU:HD11	13:M:218:HIS:CE1	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:2:101:THR:HG22	8:7:108:ILE:HD11	1.89	0.54
3:3:167:HIS:CD2	3:3:167:HIS:O	2.62	0.53
1:1:356:CYS:SG	1:1:399:PHE:HB3	2.49	0.52
15:H:301:ARG:HE	15:H:304:GLN:HE21	1.56	0.52
8:7:85:ARG:HE	8:7:92:HIS:CE1	2.28	0.52
1:1:101:PHE:H	1:1:253:GLN:HE21	1.57	0.52
3:3:654:PHE:CE2	3:3:660:ALA:HB2	2.45	0.51
1:1:43:ARG:HH22	1:1:232:GLU:HA	1.75	0.51
12:L:380:SER:CB	12:L:456:ALA:HB3	2.41	0.50
1:1:220:ASN:ND2	17:1:502:FMN:O2	2.45	0.49
12:L:413:THR:HA	12:L:416:TYR:CE2	2.49	0.48
6:6:133:VAL:HG12	6:6:134:ASP:N	2.29	0.48
12:L:463:HIS:H	12:L:463:HIS:CD2	2.32	0.48
17:1:502:FMN:O2P	17:1:502:FMN:O4'	2.16	0.47
3:3:259:CYS:HB3	16:3:803:SF4:S3	2.55	0.47
4:4:86:ASP:HB2	4:4:93:HIS:CE1	2.50	0.47
15:H:211:MET:O	15:H:215:ALA:HB3	2.15	0.46
3:3:511:VAL:HG13	3:3:517:ALA:HB1	1.98	0.46
13:M:214:LEU:HD11	13:M:218:HIS:HE1	1.81	0.46
11:K:39:ASN:HD21	11:K:60:VAL:HB	1.81	0.46
3:3:87:VAL:HA	3:3:91:MET:HE1	1.98	0.46
5:5:57:TYR:CD1	5:5:64:ARG:HG3	2.51	0.46
7:9:41:HIS:CD2	7:9:113:ILE:HD11	2.51	0.46
17:1:502:FMN:H9	17:1:502:FMN:H1'1	1.77	0.45
7:9:134:GLU:CD	7:9:134:GLU:H	2.23	0.45
11:K:71:GLY:HA3	14:N:137:PHE:CZ	2.51	0.45
14:N:313:ARG:HG2	14:N:381:ALA:HB1	1.98	0.45
6:6:133:VAL:HG11	6:6:136:TYR:CE1	2.52	0.45
8:7:108:ILE:H	8:7:108:ILE:HD12	1.81	0.44
10:J:155:ALA:HB2	14:N:83:GLU:HG2	1.99	0.44
15:H:224:ALA:HA	15:H:230:GLY:H	1.81	0.44
3:3:468:HIS:CD2	3:3:468:HIS:H	2.35	0.44
4:4:39:GLY:HA2	4:4:404:MET:HE3	2.00	0.44
3:3:326:PHE:CE1	3:3:643:LEU:HD22	2.53	0.43
3:3:253:PRO:HB3	3:3:280:ARG:HH11	1.83	0.43
4:4:42:ARG:HH21	4:4:58:HIS:CG	2.35	0.43
14:N:1:MET:HB2	14:N:4:ALA:H	1.83	0.43
12:L:432:HIS:HD2	12:L:434:HIS:CE1	2.37	0.43
13:M:338:THR:HG22	13:M:339:LEU:H	1.84	0.42
1:1:185:GLU:HB3	17:1:502:FMN:O2'	2.19	0.42
1:1:258:VAL:HB	1:1:330:LEU:HD12	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:5:103:THR:HB	5:5:105:THR:H	1.85	0.42
15:H:296:THR:HG22	15:H:296:THR:O	2.19	0.42
1:1:272:PHE:CZ	1:1:311:MET:HG2	2.54	0.42
10:J:152:VAL:HG22	14:N:87:LEU:HD22	2.01	0.42
3:3:119:CYS:HB3	4:4:328:PHE:CD1	2.55	0.42
1:1:174:HIS:CD2	1:1:192:LEU:HD22	2.55	0.41
12:L:464:PRO:HG2	12:L:491:TRP:CZ2	2.55	0.41
11:K:34:MET:O	11:K:37:ALA:HB3	2.21	0.41
14:N:205:THR:HB	14:N:206:PRO:HD3	2.03	0.41
15:H:122:ILE:HD13	15:H:174:VAL:HG21	2.02	0.41
15:H:165:GLY:HA3	15:H:314:PHE:CE1	2.55	0.41
3:3:368:HIS:CE1	3:3:563:ALA:HB2	2.56	0.41
2:2:177:HIS:CG	2:2:178:GLU:H	2.39	0.41
13:M:402:SER:HA	13:M:405:TYR:CE2	2.55	0.41
2:2:171:LYS:O	2:2:177:HIS:CE1	2.73	0.41
12:L:88:HIS:O	12:L:88:HIS:CD2	2.73	0.41
5:5:154:GLU:CD	5:5:154:GLU:H	2.28	0.41
13:M:321:TYR:CE1	13:M:365:MET:HA	2.56	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	1	435/438 (99%)	377 (87%)	50 (12%)	8 (2%)	6	33
2	2	176/181 (97%)	154 (88%)	14 (8%)	8 (4%)	2	17
3	3	748/783 (96%)	640 (86%)	81 (11%)	27 (4%)	2	20
4	4	382/409 (93%)	328 (86%)	42 (11%)	12 (3%)	3	22
5	5	194/207 (94%)	173 (89%)	16 (8%)	5 (3%)	4	25
6	6	164/181 (91%)	140 (85%)	17 (10%)	7 (4%)	2	17

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	9	178/182 (98%)	152 (85%)	17 (10%)	9 (5%)	1	15
8	7	125/129 (97%)	112 (90%)	8 (6%)	5 (4%)	2	18
9	A	115/119 (97%)	102 (89%)	11 (10%)	2 (2%)	7	35
10	J	158/176 (90%)	138 (87%)	15 (10%)	5 (3%)	3	21
11	K	93/95 (98%)	82 (88%)	11 (12%)	0	100	100
12	L	603/606 (100%)	547 (91%)	42 (7%)	14 (2%)	5	28
13	M	465/469 (99%)	412 (89%)	44 (10%)	9 (2%)	6	32
14	N	425/427 (100%)	380 (89%)	39 (9%)	6 (1%)	9	39
15	H	351/365 (96%)	302 (86%)	34 (10%)	15 (4%)	2	17
All	All	4612/4767 (97%)	4039 (88%)	441 (10%)	132 (3%)	5	23

All (132) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	1	19	ALA
1	1	177	ALA
2	2	138	ASP
2	2	179	VAL
3	3	149	LEU
3	3	220	SER
3	3	244	ALA
3	3	336	ALA
3	3	374	ARG
3	3	616	ASN
3	3	628	PRO
3	3	655	ARG
3	3	673	MET
3	3	766	ALA
4	4	316	LEU
6	6	21	PHE
6	6	60	LEU
6	6	61	ALA
6	6	70	ALA
6	6	175	ALA
7	9	64	PRO
7	9	98	CYS
9	A	45	GLU
12	L	435	PRO
12	L	436	HIS

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Mol	Chain	Res	Type
13	M	72	ALA
14	N	165	ALA
15	H	217	THR
15	H	218	PRO
2	2	162	ARG
3	3	500	ALA
3	3	689	LYS
3	3	729	PRO
4	4	108	VAL
4	4	211	SER
4	4	255	SER
5	5	83	GLY
5	5	99	PRO
6	6	128	ASP
7	9	36	ARG
7	9	65	ALA
7	9	122	ALA
7	9	137	LEU
7	9	176	PRO
10	J	22	LEU
10	J	76	ALA
12	L	99	PRO
13	M	89	ALA
15	H	233	HIS
15	H	267	TRP
1	1	209	SER
1	1	246	SER
2	2	40	TRP
2	2	86	LEU
2	2	140	PRO
3	3	155	THR
3	3	283	PRO
3	3	530	ALA
3	3	634	ALA
4	4	74	THR
4	4	175	ILE
4	4	305	PRO
6	6	126	ASN
8	7	44	MET
8	7	77	ALA
9	A	44	TYR
10	J	116	THR

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Mol	Chain	Res	Type
12	L	231	ALA
12	L	399	GLY
12	L	478	ALA
12	L	519	ALA
13	M	303	GLY
13	M	418	GLY
15	H	118	LEU
15	H	272	LEU
15	H	275	PRO
1	1	101	PHE
1	1	201	LEU
2	2	144	CYS
3	3	32	LEU
3	3	562	GLY
3	3	593	LEU
4	4	33	GLN
5	5	61	PRO
7	9	35	PRO
7	9	178	GLU
8	7	39	ASP
8	7	80	LYS
10	J	24	ASN
12	L	245	MET
12	L	347	GLN
12	L	350	ARG
13	M	387	ALA
13	M	404	ALA
14	N	393	PRO
14	N	417	GLY
14	N	424	ALA
15	H	113	PRO
15	H	333	PRO
3	3	127	ALA
3	3	194	VAL
3	3	204	GLU
3	3	407	PRO
3	3	672	ALA
4	4	65	GLY
4	4	246	TYR
4	4	365	PRO
12	L	102	SER
12	L	440	PRO

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Mol	Chain	Res	Type
14	N	397	TRP
15	H	107	SER
15	H	226	GLN
15	H	232	TYR
15	H	270	PRO
1	1	418	LYS
5	5	145	PRO
5	5	175	THR
10	J	28	ALA
12	L	360	PRO
14	N	302	ILE
15	H	44	VAL
3	3	199	VAL
13	M	57	PRO
1	1	202	LYS
2	2	169	PRO
3	3	338	GLY
4	4	32	PRO
13	M	236	VAL
12	L	185	ILE
13	M	360	ILE
15	H	136	ILE
8	7	51	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	1	355/356 (100%)	346 (98%)	9 (2%)	42	62
2	2	150/152 (99%)	148 (99%)	2 (1%)	61	72
3	3	607/628 (97%)	593 (98%)	14 (2%)	44	64
4	4	332/355 (94%)	320 (96%)	12 (4%)	31	52
5	5	167/175 (95%)	163 (98%)	4 (2%)	43	63
6	6	135/149 (91%)	132 (98%)	3 (2%)	45	64

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	9	148/150 (99%)	143 (97%)	5 (3%)	32	54
8	7	104/106 (98%)	102 (98%)	2 (2%)	50	66
9	A	90/92 (98%)	86 (96%)	4 (4%)	25	47
10	J	118/130 (91%)	116 (98%)	2 (2%)	53	67
11	K	71/71 (100%)	71 (100%)	0	100	100
12	L	453/454 (100%)	442 (98%)	11 (2%)	43	63
13	M	332/332 (100%)	324 (98%)	8 (2%)	43	63
14	N	302/302 (100%)	296 (98%)	6 (2%)	48	66
15	H	293/300 (98%)	286 (98%)	7 (2%)	43	63
All	All	3657/3752 (98%)	3568 (98%)	89 (2%)	43	63

All (89) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1	109	ASP
1	1	216	THR
1	1	244	GLU
1	1	249	MET
1	1	333	GLU
1	1	341	MET
1	1	359	CYS
1	1	380	GLU
1	1	419	ASP
2	2	43	PRO
2	2	129	HIS
3	3	113	LEU
3	3	133	ARG
3	3	155	THR
3	3	259	CYS
3	3	324	GLU
3	3	383	PRO
3	3	408	ILE
3	3	437	ILE
3	3	447	LYS
3	3	450	LEU
3	3	582	PHE
3	3	583	VAL
3	3	737	GLU
3	3	744	GLU

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Mol	Chain	Res	Type
4	4	87	TYR
4	4	150	PHE
4	4	153	ARG
4	4	160	PHE
4	4	179	LYS
4	4	184	GLU
4	4	197	LEU
4	4	202	ASP
4	4	215	TYR
4	4	248	VAL
4	4	268	GLU
4	4	311	PRO
5	5	53	VAL
5	5	115	GLU
5	5	154	GLU
5	5	156	PRO
6	6	45	CYS
6	6	131	VAL
6	6	137	VAL
7	9	15	LYS
7	9	101	CYS
7	9	104	CYS
7	9	130	VAL
7	9	159	VAL
8	7	43	ARG
8	7	49	ASP
9	A	4	ILE
9	A	67	LEU
9	A	80	PRO
9	A	116	MET
10	J	59	TYR
10	J	64	VAL
12	L	173	MET
12	L	230	MET
12	L	265	ASP
12	L	305	TYR
12	L	306	MET
12	L	329	LYS
12	L	447	HIS
12	L	463	HIS
12	L	477	LEU
12	L	479	GLU

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Mol	Chain	Res	Type
12	L	483	HIS
13	M	1	MET
13	M	63	TRP
13	M	199	LEU
13	M	230	LEU
13	M	273	TRP
13	M	280	ASP
13	M	293	MET
13	M	314	LEU
14	N	48	PHE
14	N	81	ARG
14	N	112	GLU
14	N	118	LEU
14	N	403	VAL
14	N	419	VAL
15	H	160	ILE
15	H	217	THR
15	H	228	LEU
15	H	233	HIS
15	H	245	GLN
15	H	251	HIS
15	H	275	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (74) such sidechains are listed below:

Mol	Chain	Res	Type
1	1	87	HIS
1	1	174	HIS
1	1	198	ASN
1	1	208	GLN
1	1	219	ASN
1	1	253	GLN
1	1	315	HIS
1	1	343	ASN
1	1	350	HIS
2	2	120	GLN
2	2	129	HIS
2	2	135	GLN
2	2	174	HIS
3	3	25	HIS
3	3	38	HIS
3	3	104	GLN

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Mol	Chain	Res	Type
3	3	114	ASN
3	3	163	HIS
3	3	167	HIS
3	3	183	HIS
3	3	298	HIS
3	3	347	HIS
3	3	368	HIS
3	3	410	HIS
3	3	436	GLN
3	3	468	HIS
3	3	591	HIS
3	3	661	GLN
3	3	749	HIS
4	4	34	HIS
4	4	58	HIS
4	4	63	HIS
4	4	72	HIS
4	4	93	HIS
4	4	166	GLN
4	4	379	GLN
5	5	20	ASN
5	5	112	ASN
6	6	34	ASN
6	6	58	ASN
6	6	153	GLN
7	9	41	HIS
7	9	46	HIS
8	7	90	HIS
8	7	92	HIS
10	J	55	GLN
11	K	39	ASN
12	L	150	GLN
12	L	219	GLN
12	L	321	HIS
12	L	361	GLN
12	L	432	HIS
12	L	433	HIS
12	L	434	HIS
12	L	436	HIS
12	L	447	HIS
12	L	463	HIS
12	L	483	HIS

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Mol	Chain	Res	Type
12	L	484	HIS
13	M	49	HIS
13	M	183	HIS
13	M	211	HIS
13	M	218	HIS
13	M	292	HIS
13	M	349	GLN
14	N	193	HIS
14	N	245	ASN
14	N	301	GLN
15	H	58	GLN
15	H	76	GLN
15	H	117	ASN
15	H	183	ASN
15	H	187	ASN
15	H	304	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](#)

10 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
17	FMN	1	502	-	33,33,33	1.46	4 (12%)	48,50,50	1.21	6 (12%)
16	SF4	3	802	3	0,12,12	-	-	-		
16	SF4	1	501	1	0,12,12	-	-	-		
16	SF4	3	803	3	0,12,12	-	-	-		
16	SF4	6	201	6	0,12,12	-	-	-		
16	SF4	9	202	7	0,12,12	-	-	-		
16	SF4	9	201	7	0,12,12	-	-	-		
16	SF4	3	801	3	0,12,12	-	-	-		
18	FES	2	201	2	0,4,4	-	-	-		
18	FES	3	804	3	0,4,4	-	-	-		

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
17	FMN	1	502	-	-	8/18/18/18	0/3/3/3
16	SF4	3	802	3	-	-	0/6/5/5
16	SF4	1	501	1	-	-	0/6/5/5
16	SF4	3	803	3	-	-	0/6/5/5
16	SF4	6	201	6	-	-	0/6/5/5
16	SF4	9	202	7	-	-	0/6/5/5
16	SF4	9	201	7	-	-	0/6/5/5
16	SF4	3	801	3	-	-	0/6/5/5
18	FES	2	201	2	-	-	0/1/1/1
18	FES	3	804	3	-	-	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	1	502	FMN	C9A-C5A	5.26	1.49	1.41
17	1	502	FMN	C8-C7	3.44	1.49	1.40
17	1	502	FMN	C4-N3	-2.45	1.34	1.38
17	1	502	FMN	C4A-N5	2.28	1.35	1.30

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	1	502	FMN	C4-C4A-N5	2.83	122.12	118.21
17	1	502	FMN	C4A-C10-N1	-2.46	118.57	124.59
17	1	502	FMN	O4-C4-C4A	-2.18	120.78	126.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	1	502	FMN	C10-N1-C2	2.12	121.43	116.85
17	1	502	FMN	C4A-C10-N10	2.09	119.47	116.48
17	1	502	FMN	C4A-C4-N3	2.03	118.43	113.25

There are no chirality outliers.

All (8) torsion outliers are listed below:

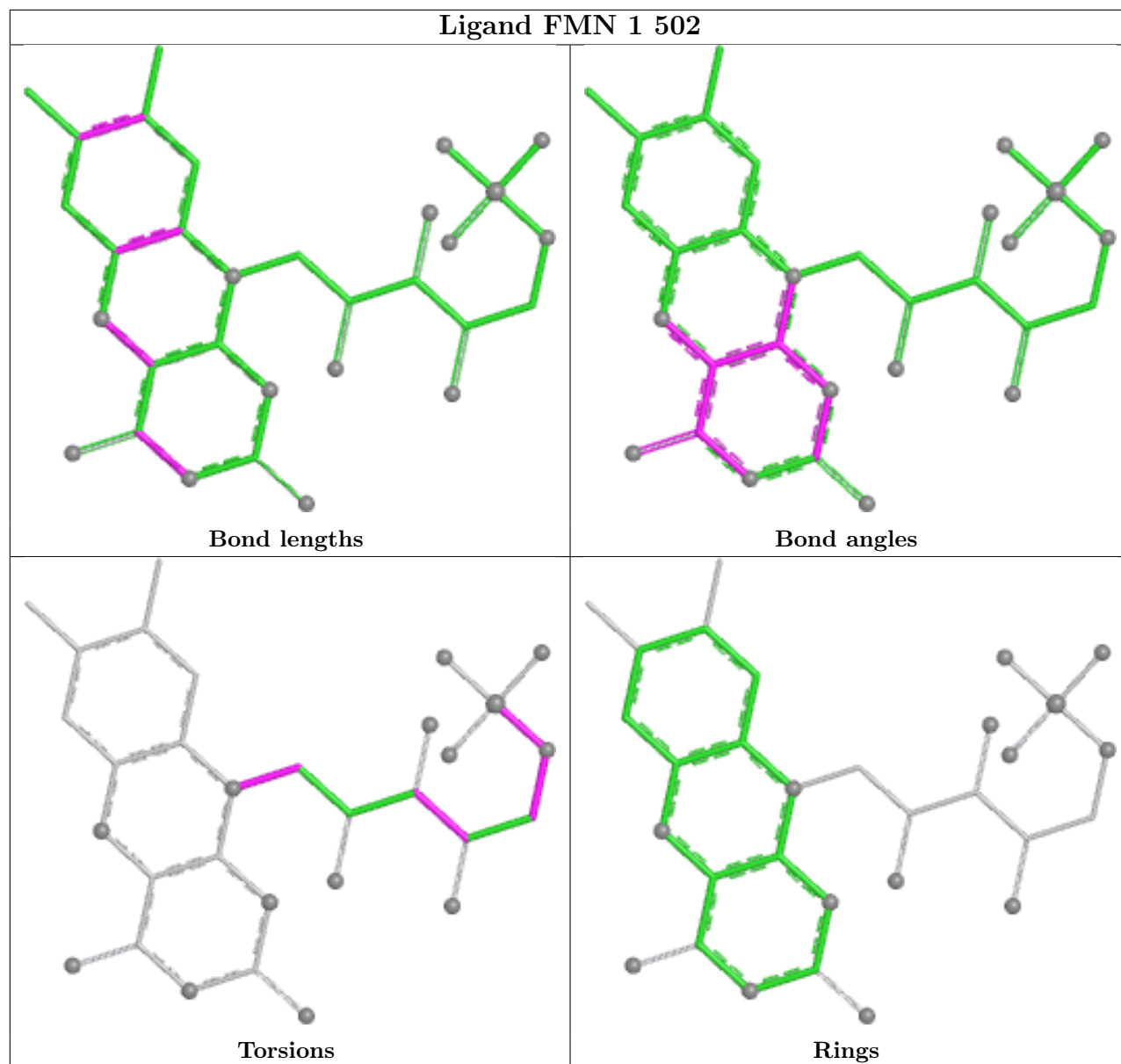
Mol	Chain	Res	Type	Atoms
17	1	502	FMN	C5'-O5'-P-O3P
17	1	502	FMN	C4'-C5'-O5'-P
17	1	502	FMN	C5'-O5'-P-O2P
17	1	502	FMN	C2'-C1'-N10-C10
17	1	502	FMN	C5'-O5'-P-O1P
17	1	502	FMN	C2'-C3'-C4'-O4'
17	1	502	FMN	O3'-C3'-C4'-C5'
17	1	502	FMN	O3'-C3'-C4'-O4'

There are no ring outliers.

2 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	1	502	FMN	11	0
16	3	803	SF4	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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.

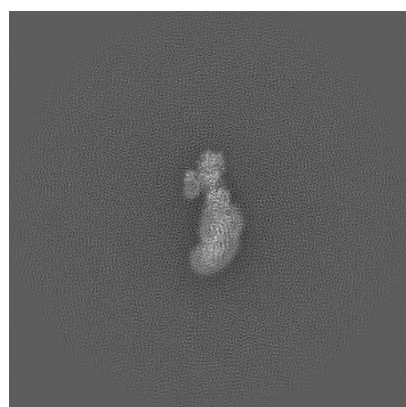
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11235. These allow visual inspection of the internal detail of the map and identification of artifacts.

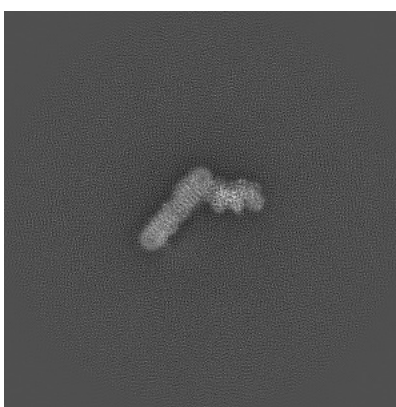
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

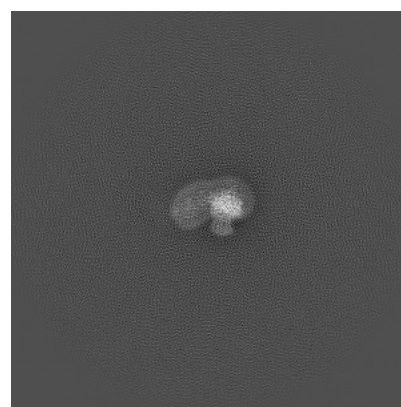
6.1.1 Primary map



X



Y



Z

The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

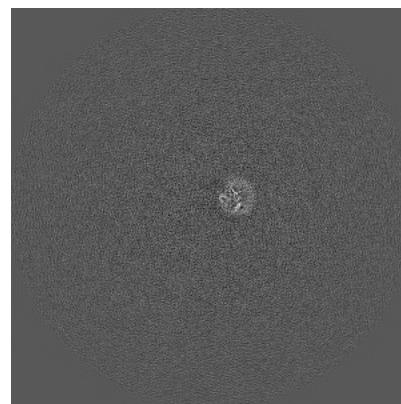
6.2.1 Primary map



X Index: 256



Y Index: 256



Z Index: 256

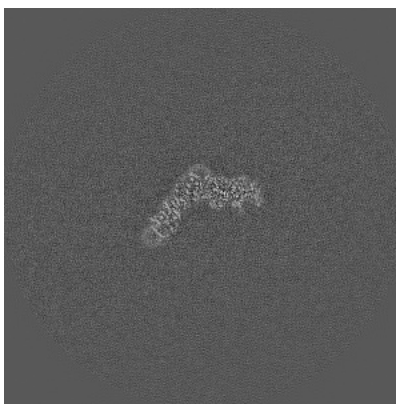
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

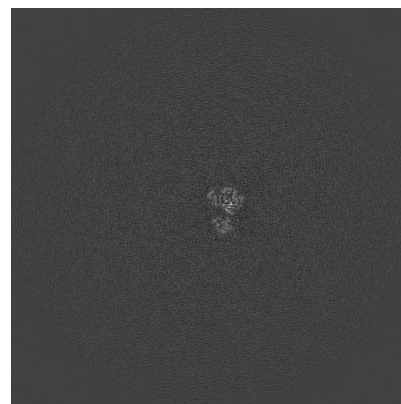
6.3.1 Primary map



X Index: 278



Y Index: 264

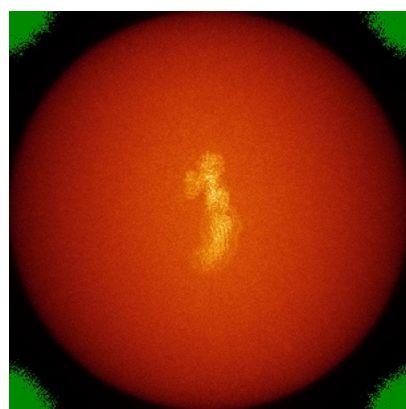


Z Index: 279

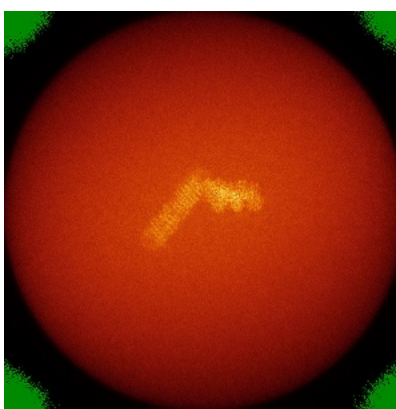
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

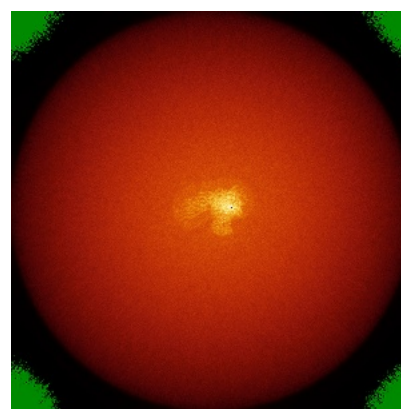
6.4.1 Primary map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views

This section was not generated.

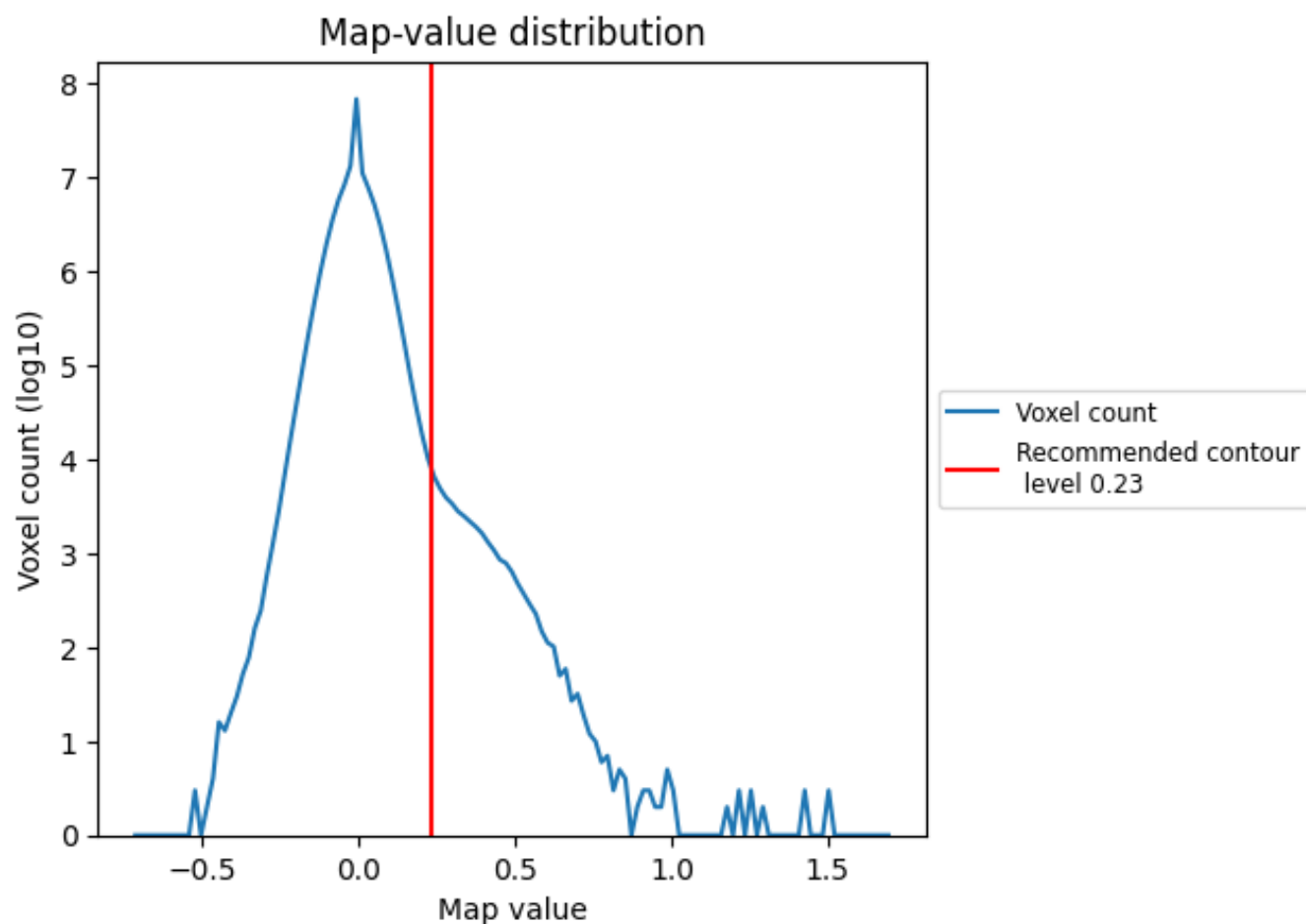
6.6 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

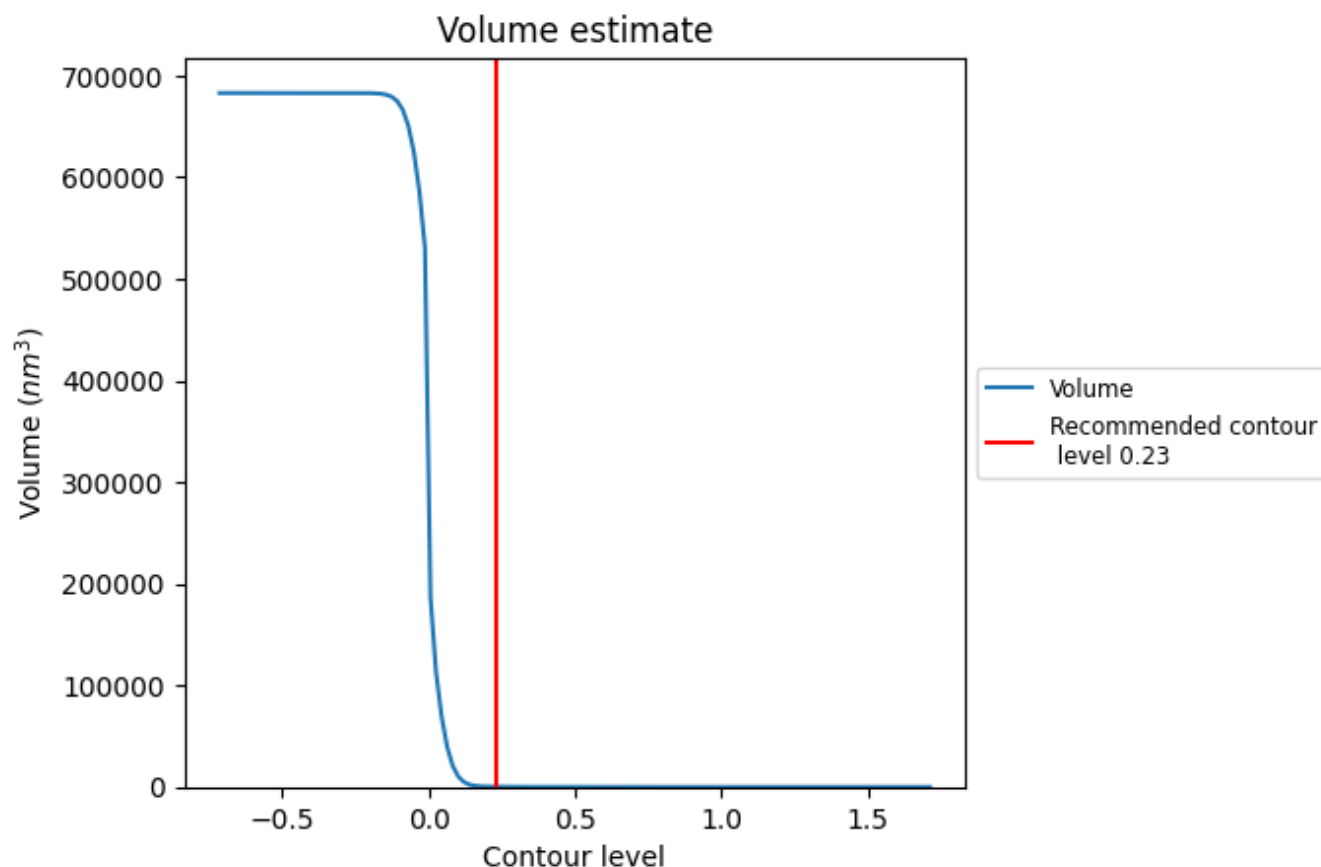
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

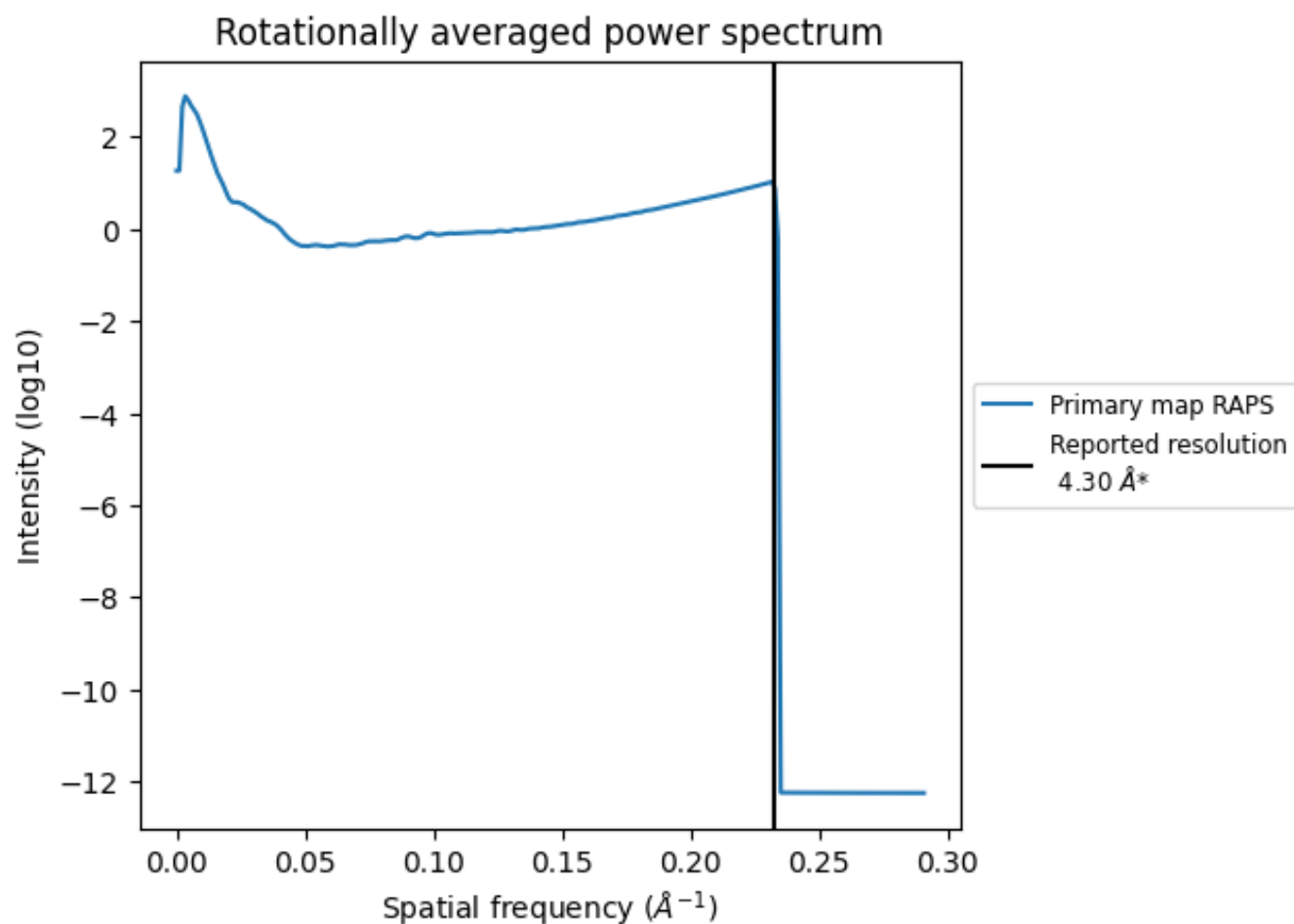
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 216 nm³; this corresponds to an approximate mass of 195 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

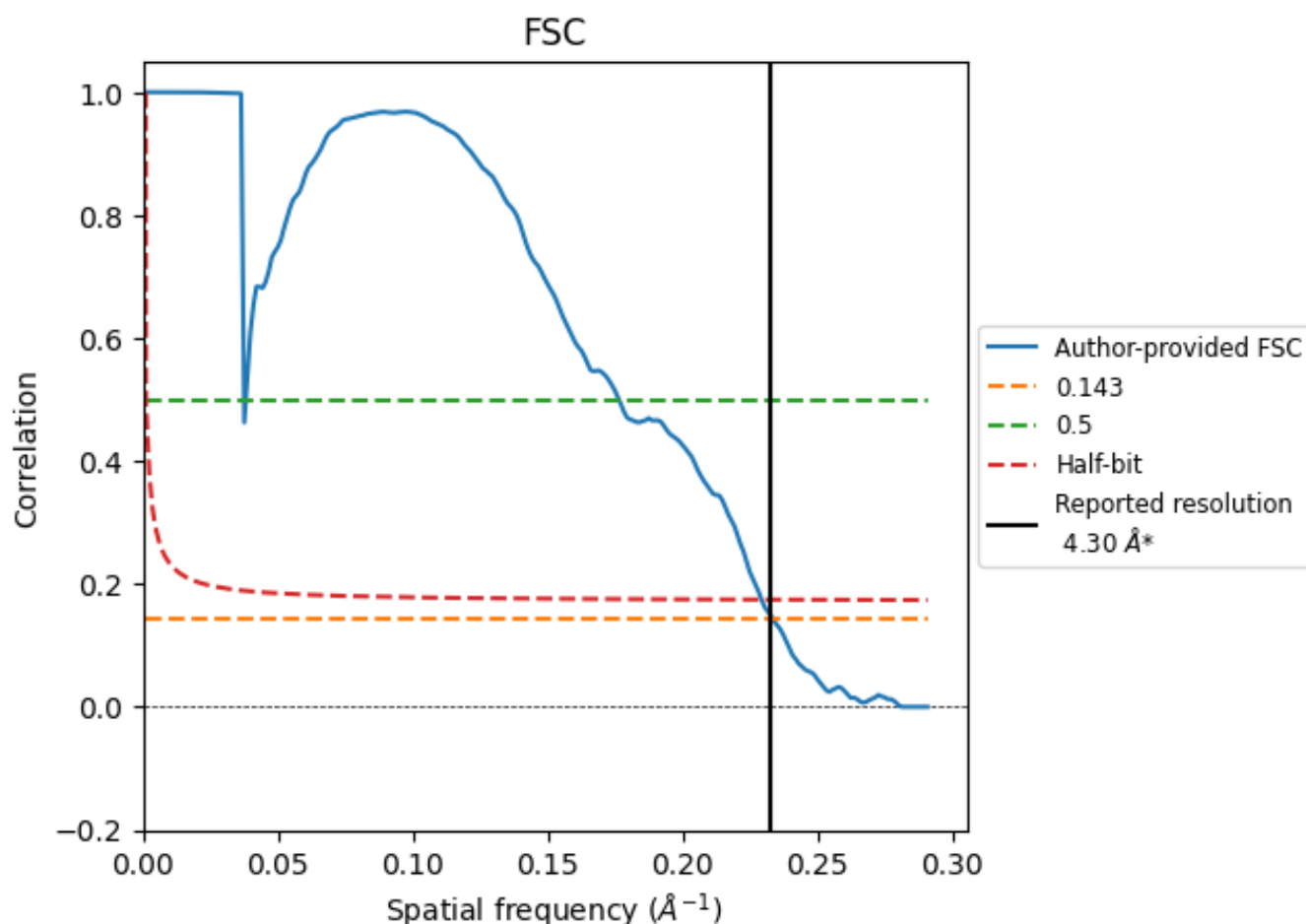


*Reported resolution corresponds to spatial frequency of 0.233 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.233 Å⁻¹

8.2 Resolution estimates [i](#)

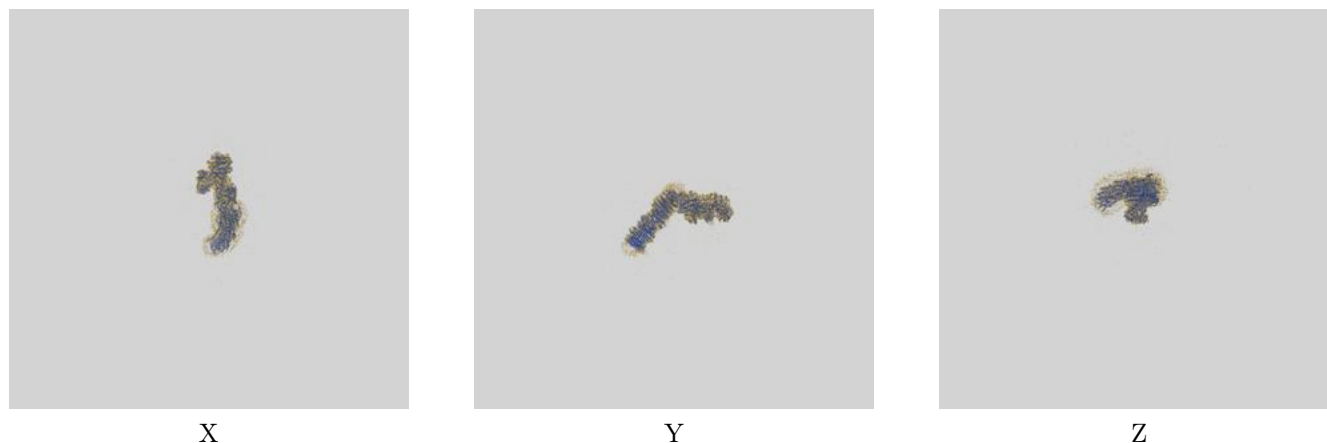
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.30	-	-
Author-provided FSC curve	4.28	26.74	4.36
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

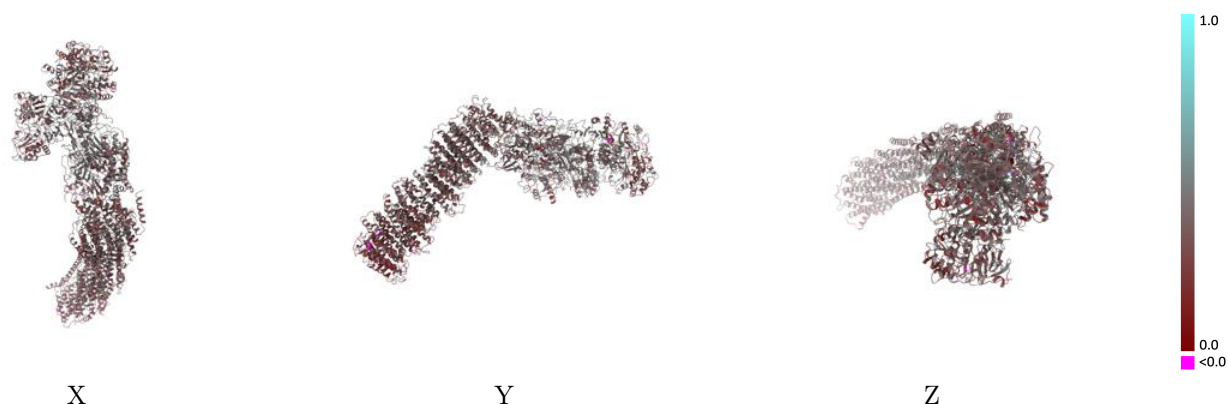
This section contains information regarding the fit between EMDB map EMD-11235 and PDB model 6ZJL. Per-residue inclusion information can be found in [section 3](#) on [page 8](#).

9.1 Map-model overlay [i](#)



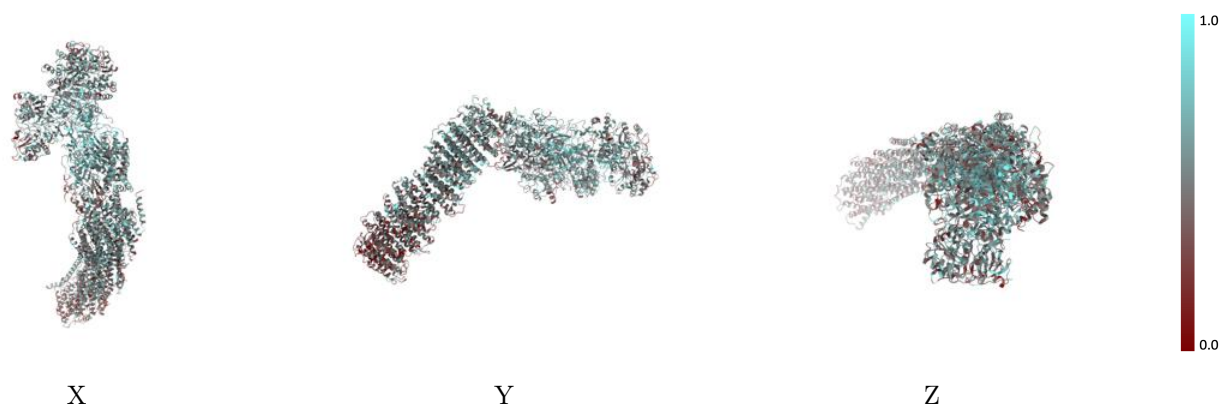
The images above show the 3D surface view of the map at the recommended contour level 0.23 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



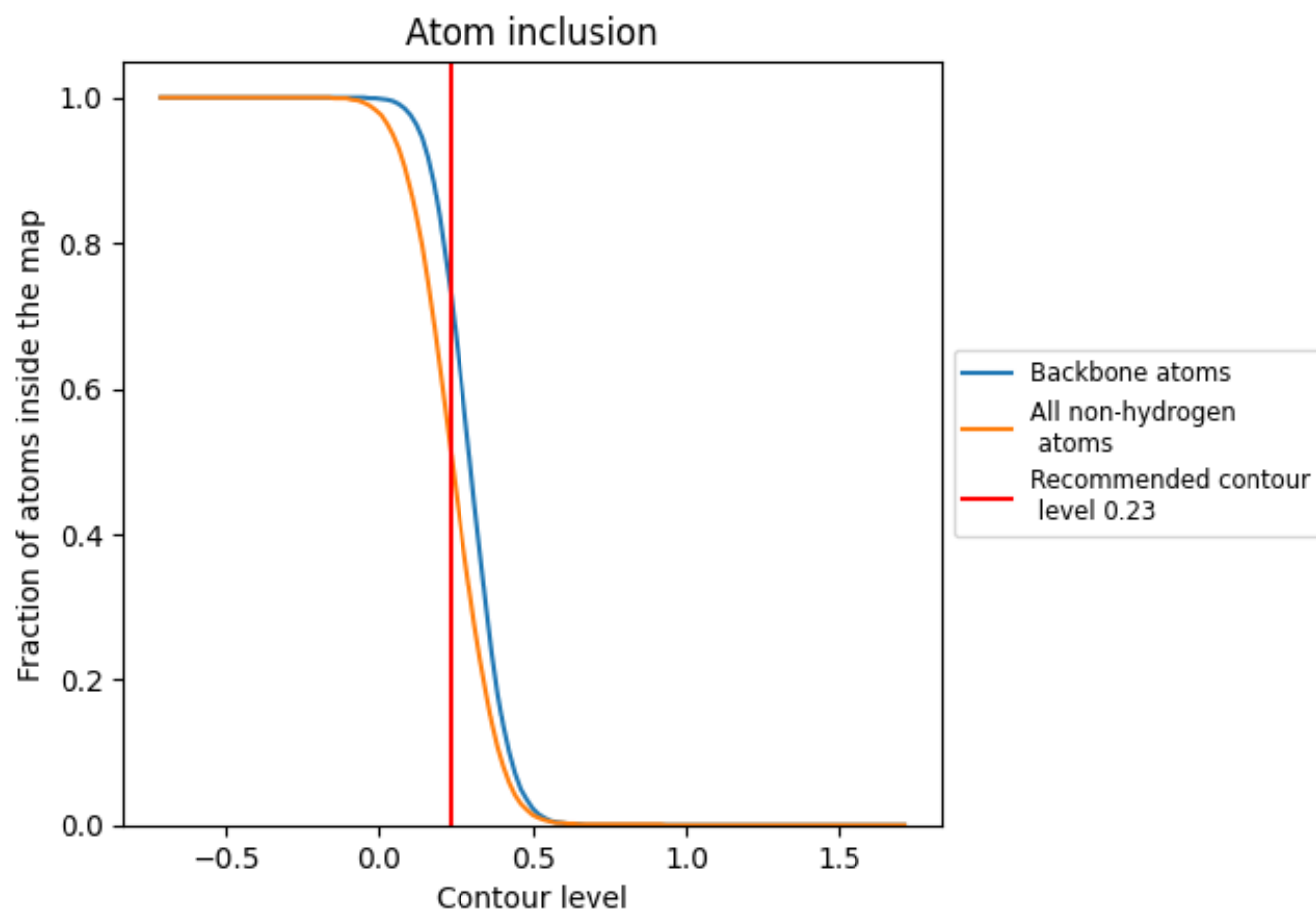
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.23).

9.4 Atom inclusion ⓘ



At the recommended contour level, 74% of all backbone atoms, 52% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.23) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5200	0.3730
1	0.5280	0.3690
2	0.5340	0.3800
3	0.5510	0.3880
4	0.5920	0.4160
5	0.5690	0.4060
6	0.5840	0.4100
7	0.5240	0.3910
9	0.6560	0.4300
A	0.4560	0.3670
H	0.5260	0.3700
J	0.5250	0.3820
K	0.5410	0.3720
L	0.3690	0.2950
M	0.4820	0.3490
N	0.5350	0.3820

1.0

0.0

<0.0