



Full wwPDB EM Validation Report ⓘ

Nov 20, 2022 – 07:02 am GMT

PDB ID : 6HE4
EMDB ID : EMD-0209
Title : AAA-ATPase ring of PAN-proteasomes
Authors : Majumder, P.; Rudack, T.; Beck, F.; Baumeister, W.
Deposited on : 2018-08-20
Resolution : 4.85 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 : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

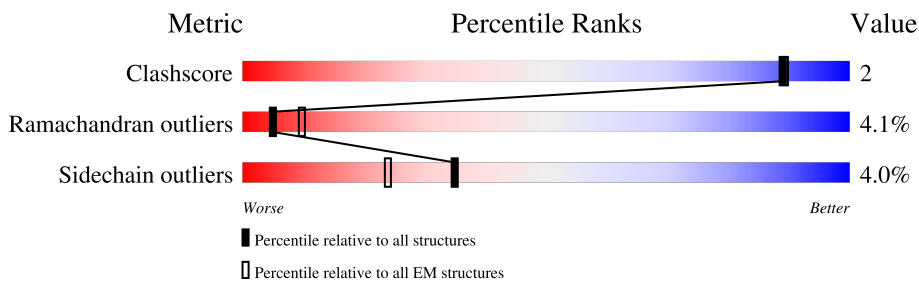
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.85 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	H	267	<div style="display: flex; justify-content: space-between;"> 28% 69% 23% 7% </div>
1	I	267	<div style="display: flex; justify-content: space-between;"> 33% 71% 22% 6% </div>
1	J	267	<div style="display: flex; justify-content: space-between;"> 28% 70% 23% 7% </div>
1	K	267	<div style="display: flex; justify-content: space-between;"> 28% 71% 23% 5% </div>
1	L	267	<div style="display: flex; justify-content: space-between;"> 28% 72% 23% </div>
1	M	267	<div style="display: flex; justify-content: space-between;"> 37% 74% 22% </div>

2 Entry composition [i](#)

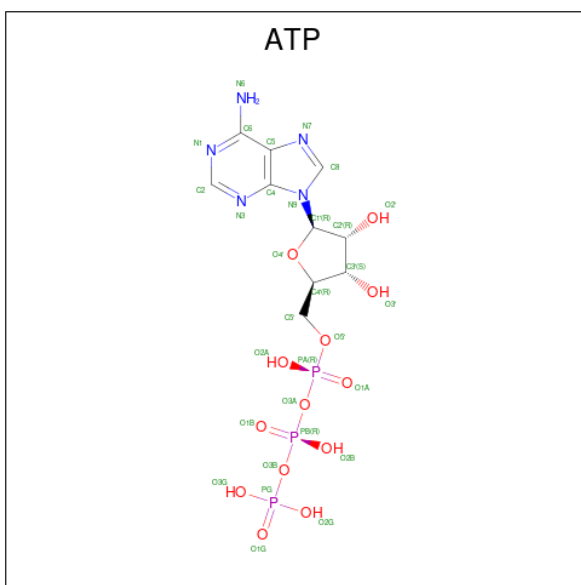
There are 4 unique types of molecules in this entry. The entry contains 12684 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Proteasome-activating nucleotidase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	H	267	Total 2088	C 1332	N 356	O 393	S 7	0	0
1	I	267	Total 2088	C 1332	N 356	O 393	S 7	0	0
1	K	267	Total 2088	C 1332	N 356	O 393	S 7	0	0
1	L	267	Total 2088	C 1332	N 356	O 393	S 7	0	0
1	M	267	Total 2088	C 1332	N 356	O 393	S 7	0	0
1	J	267	Total 2088	C 1332	N 356	O 393	S 7	0	0

- Molecule 2 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

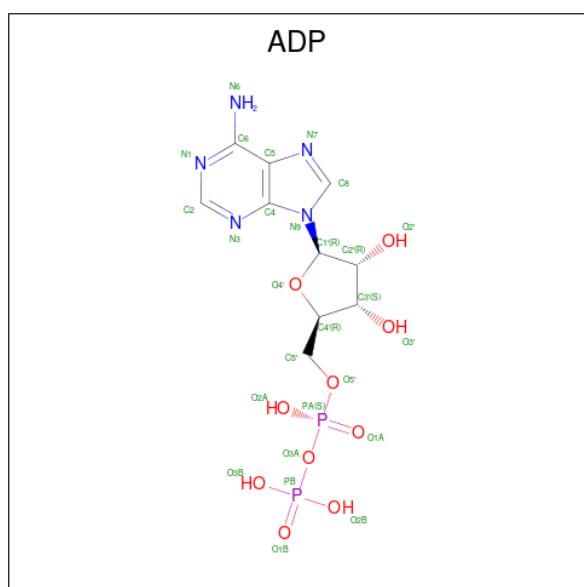


Mol	Chain	Residues	Atoms					AltConf
2	H	1	Total	C	N	O	P	0
			31	10	5	13	3	
2	I	1	Total	C	N	O	P	0
			31	10	5	13	3	
2	K	1	Total	C	N	O	P	0
			31	10	5	13	3	
2	J	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
3	H	1	Total	Mg	0
			1	1	
3	I	1	Total	Mg	0
			1	1	
3	K	1	Total	Mg	0
			1	1	
3	L	1	Total	Mg	0
			1	1	
3	J	1	Total	Mg	0
			1	1	

- Molecule 4 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).

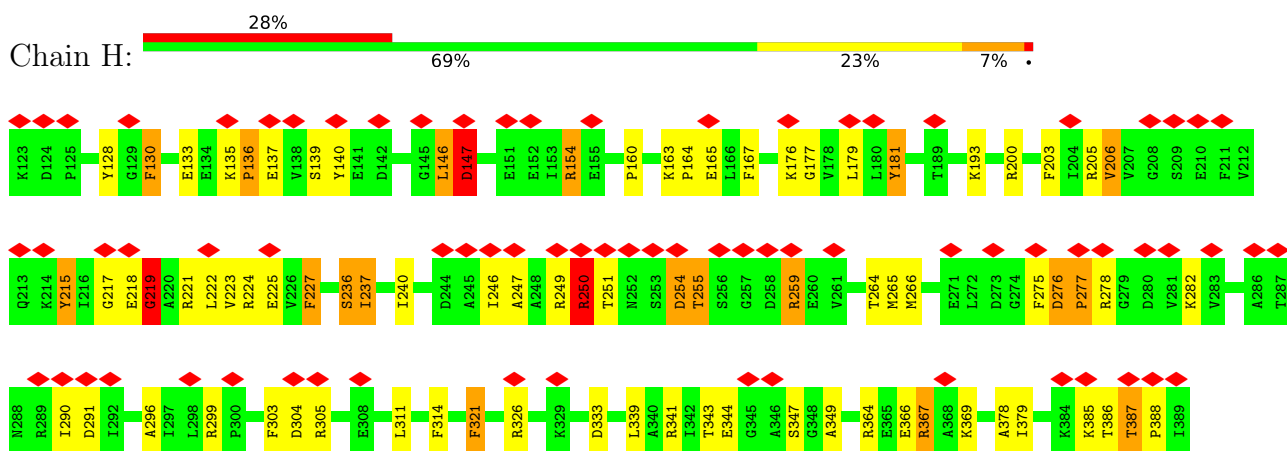


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
4	L	1	27	10	5	10	2	0

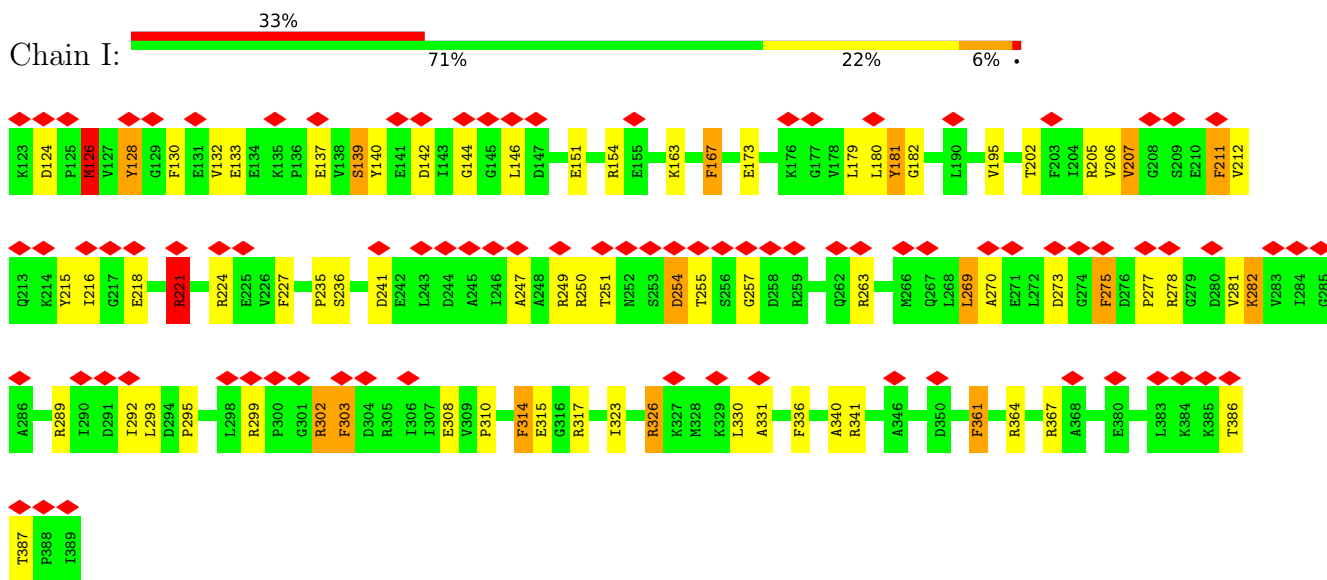
3 Residue-property plots

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: Proteasome-activating nucleotidase

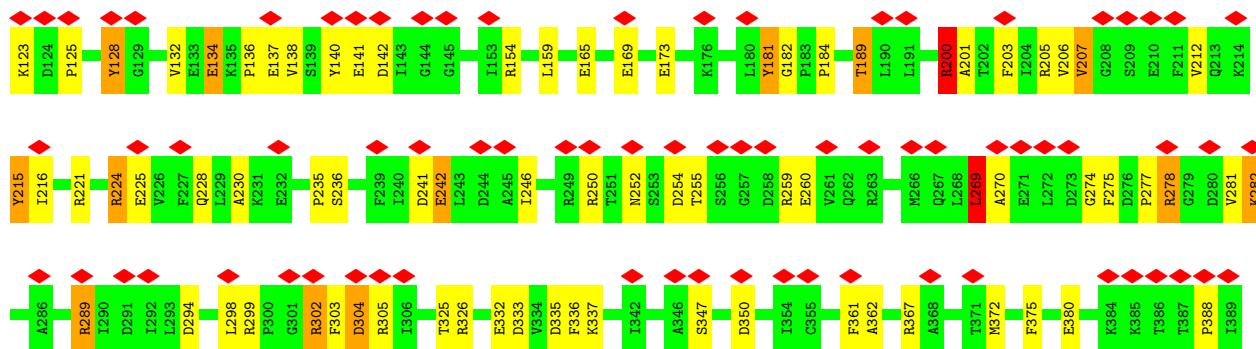


- Molecule 1: Proteasome-activating nucleotidase

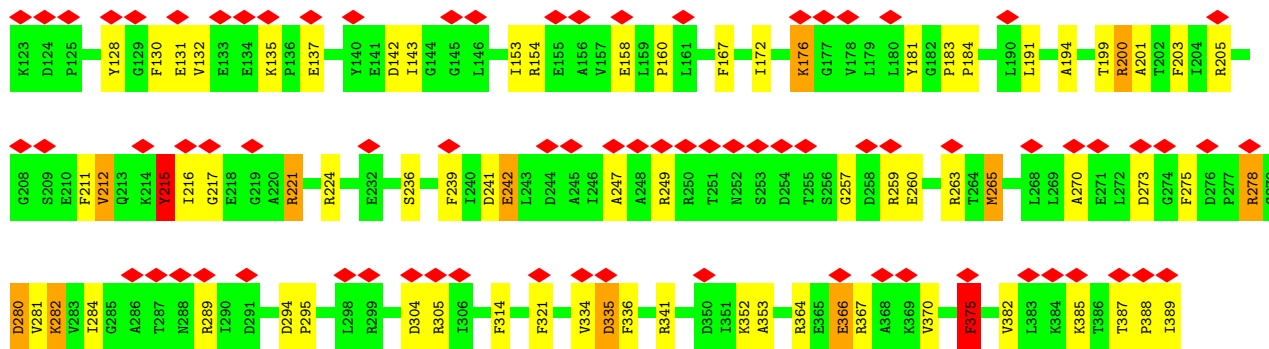


- Molecule 1: Proteasome-activating nucleotidase

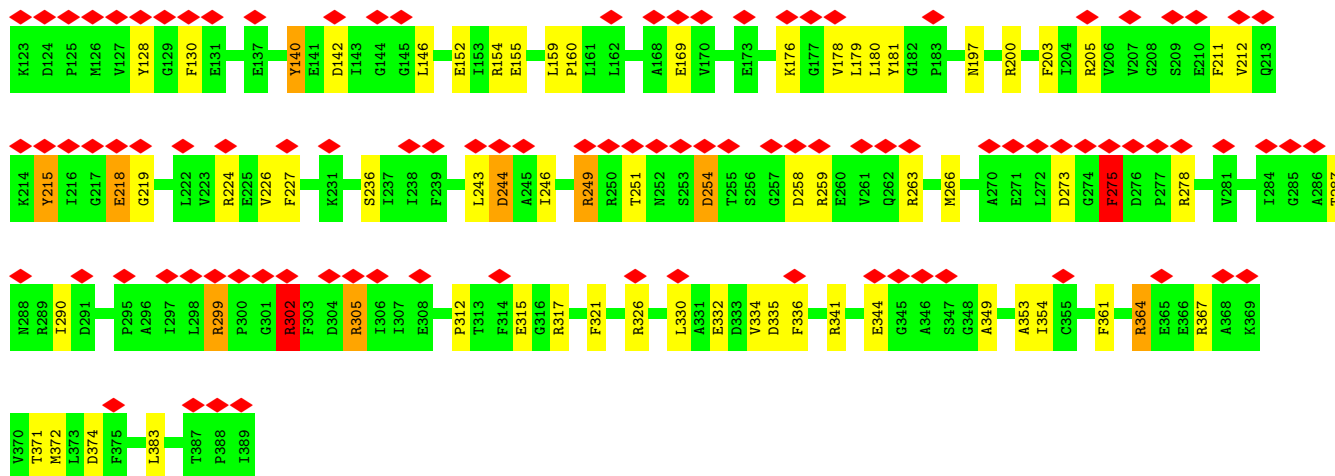
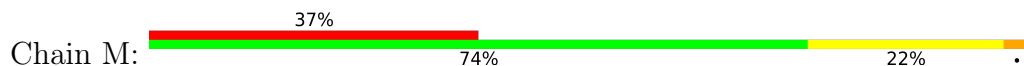




• Molecule 1: Proteasome-activating nucleotidase

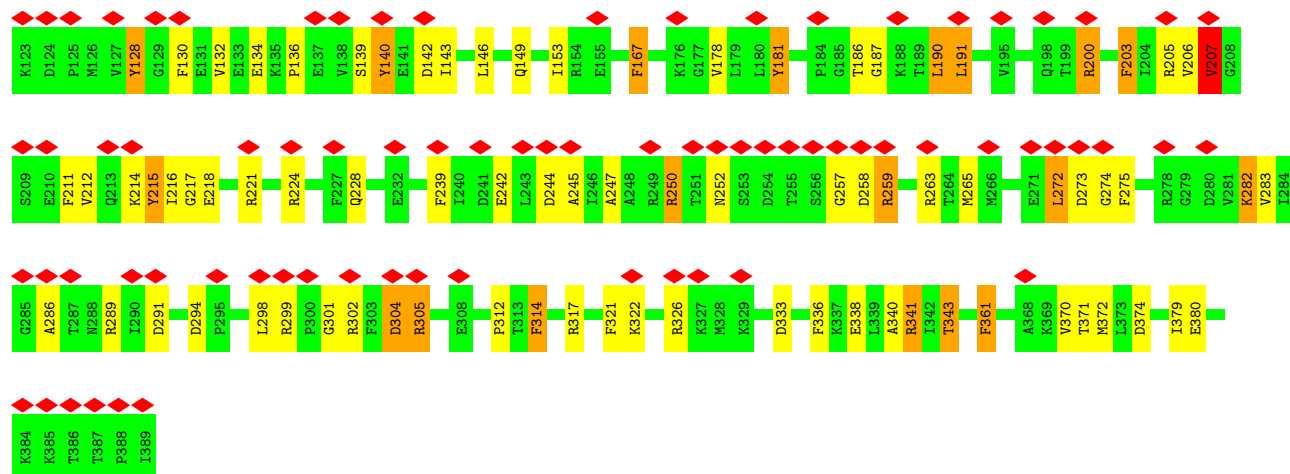


• Molecule 1: Proteasome-activating nucleotidase



• Molecule 1: Proteasome-activating nucleotidase





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	82207	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 ($e^-/\text{\AA}^2$)	30	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.106	Depositor
Minimum map value	-0.075	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.022	Depositor
Map size (Å)	514.56, 514.56, 514.56	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality i

5.1 Standard geometry i

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

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	H	1.74	23/2120 (1.1%)	2.02	55/2859 (1.9%)
1	I	1.71	19/2120 (0.9%)	2.03	51/2859 (1.8%)
1	J	1.73	21/2120 (1.0%)	2.00	52/2859 (1.8%)
1	K	1.76	22/2120 (1.0%)	2.02	60/2859 (2.1%)
1	L	1.70	17/2120 (0.8%)	1.95	46/2859 (1.6%)
1	M	1.68	16/2120 (0.8%)	1.97	61/2859 (2.1%)
All	All	1.72	118/12720 (0.9%)	2.00	325/17154 (1.9%)

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	H	0	20
1	I	0	12
1	J	0	10
1	K	0	12
1	L	0	11
1	M	0	9
All	All	0	74

All (118) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	152	GLU	CG-CD	8.85	1.65	1.51
1	J	302	ARG	CZ-NH2	8.58	1.44	1.33
1	I	224	ARG	CZ-NH2	8.25	1.43	1.33
1	H	250	ARG	CD-NE	7.49	1.59	1.46
1	L	364	ARG	CD-NE	7.44	1.59	1.46
1	I	218	GLU	CD-OE1	7.34	1.33	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	224	ARG	CZ-NH2	7.34	1.42	1.33
1	L	353	ALA	N-CA	-7.26	1.31	1.46
1	K	140	TYR	CZ-OH	7.25	1.50	1.37
1	H	299	ARG	CZ-NH1	7.24	1.42	1.33
1	L	259	ARG	NE-CZ	6.97	1.42	1.33
1	J	326	ARG	CZ-NH2	6.84	1.42	1.33
1	H	341	ARG	CZ-NH2	6.75	1.41	1.33
1	M	140	TYR	CG-CD2	6.71	1.47	1.39
1	H	347	SER	CA-CB	6.68	1.62	1.52
1	M	181	TYR	CG-CD2	6.66	1.47	1.39
1	L	242	GLU	CG-CD	6.62	1.61	1.51
1	J	259	ARG	CZ-NH2	6.60	1.41	1.33
1	H	278	ARG	CZ-NH2	6.58	1.41	1.33
1	K	215	TYR	CE2-CZ	6.53	1.47	1.38
1	H	177	GLY	CA-C	-6.46	1.41	1.51
1	J	140	TYR	CG-CD2	6.37	1.47	1.39
1	J	314	PHE	CG-CD2	6.33	1.48	1.38
1	H	344	GLU	CB-CG	6.33	1.64	1.52
1	L	221	ARG	NE-CZ	6.32	1.41	1.33
1	M	154	ARG	CZ-NH2	6.30	1.41	1.33
1	M	215	TYR	CE2-CZ	6.27	1.46	1.38
1	J	317	ARG	NE-CZ	6.27	1.41	1.33
1	J	128	TYR	CE2-CZ	6.22	1.46	1.38
1	J	274	GLY	CA-C	-6.21	1.42	1.51
1	K	125	PRO	N-CD	-6.16	1.39	1.47
1	I	367	ARG	CZ-NH2	6.12	1.41	1.33
1	L	305	ARG	NE-CZ	6.11	1.41	1.33
1	K	225	GLU	CG-CD	6.11	1.61	1.51
1	M	259	ARG	NE-CZ	6.09	1.41	1.33
1	M	299	ARG	CZ-NH2	6.08	1.41	1.33
1	H	278	ARG	NE-CZ	6.08	1.41	1.33
1	M	249	ARG	CZ-NH1	6.06	1.41	1.33
1	H	364	ARG	CD-NE	6.01	1.56	1.46
1	I	182	GLY	CA-C	-6.00	1.42	1.51
1	K	332	GLU	CD-OE2	5.99	1.32	1.25
1	L	305	ARG	CD-NE	5.98	1.56	1.46
1	K	141	GLU	CG-CD	5.92	1.60	1.51
1	K	260	GLU	CG-CD	5.91	1.60	1.51
1	I	263	ARG	NE-CZ	5.84	1.40	1.33
1	J	218	GLU	N-CA	-5.83	1.34	1.46
1	K	132	VAL	C-N	5.82	1.47	1.34
1	K	250	ARG	CD-NE	5.79	1.56	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	236	SER	CB-OG	-5.77	1.34	1.42
1	H	305	ARG	NE-CZ	5.76	1.40	1.33
1	I	133	GLU	CD-OE1	5.73	1.31	1.25
1	L	184	PRO	CA-CB	-5.72	1.42	1.53
1	M	259	ARG	CZ-NH2	5.71	1.40	1.33
1	K	305	ARG	CD-NE	5.71	1.56	1.46
1	M	154	ARG	NE-CZ	5.69	1.40	1.33
1	J	250	ARG	CZ-NH1	5.68	1.40	1.33
1	L	236	SER	CA-CB	5.68	1.61	1.52
1	J	181	TYR	CG-CD2	5.67	1.46	1.39
1	H	224	ARG	CZ-NH2	5.66	1.40	1.33
1	K	205	ARG	CZ-NH2	5.66	1.40	1.33
1	H	225	GLU	CG-CD	5.65	1.60	1.51
1	J	317	ARG	CD-NE	5.64	1.56	1.46
1	K	224	ARG	CD-NE	5.63	1.56	1.46
1	I	317	ARG	NE-CZ	5.62	1.40	1.33
1	J	221	ARG	CZ-NH2	5.61	1.40	1.33
1	K	182	GLY	N-CA	-5.53	1.37	1.46
1	H	206	VAL	CA-C	-5.53	1.38	1.52
1	K	235	PRO	CA-C	-5.52	1.41	1.52
1	K	289	ARG	NE-CZ	5.51	1.40	1.33
1	H	341	ARG	NE-CZ	5.51	1.40	1.33
1	I	215	TYR	CE1-CZ	5.51	1.45	1.38
1	I	302	ARG	CD-NE	5.49	1.55	1.46
1	L	257	GLY	N-CA	5.44	1.54	1.46
1	K	203	PHE	CG-CD2	5.43	1.47	1.38
1	I	326	ARG	NE-CZ	5.43	1.40	1.33
1	H	128	TYR	CZ-OH	5.40	1.47	1.37
1	K	347	SER	CA-CB	5.37	1.61	1.52
1	J	200	ARG	NE-CZ	5.34	1.40	1.33
1	H	130	PHE	CE2-CZ	5.34	1.47	1.37
1	K	337	LYS	CA-CB	5.33	1.65	1.53
1	J	128	TYR	CG-CD2	5.32	1.46	1.39
1	I	361	PHE	CD1-CE1	5.31	1.49	1.39
1	L	128	TYR	CG-CD2	5.30	1.46	1.39
1	I	278	ARG	NE-CZ	5.30	1.40	1.33
1	M	344	GLU	CD-OE2	5.30	1.31	1.25
1	J	200	ARG	CZ-NH1	5.30	1.40	1.33
1	M	341	ARG	CD-NE	5.29	1.55	1.46
1	K	154	ARG	CD-NE	5.28	1.55	1.46
1	J	380	GLU	CB-CG	5.28	1.62	1.52
1	M	155	GLU	CD-OE1	5.26	1.31	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	J	140	TYR	CE1-CZ	5.26	1.45	1.38
1	H	277	PRO	N-CA	-5.26	1.38	1.47
1	L	211	PHE	CE2-CZ	5.24	1.47	1.37
1	K	242	GLU	CB-CG	5.22	1.62	1.52
1	L	275	PHE	CG-CD1	5.22	1.46	1.38
1	I	235	PRO	CA-C	-5.21	1.42	1.52
1	L	260	GLU	CD-OE2	-5.21	1.20	1.25
1	H	249	ARG	NE-CZ	5.20	1.39	1.33
1	I	315	GLU	CD-OE2	5.20	1.31	1.25
1	J	215	TYR	CG-CD2	5.20	1.46	1.39
1	I	211	PHE	CG-CD1	5.19	1.46	1.38
1	M	263	ARG	CZ-NH1	5.18	1.39	1.33
1	H	224	ARG	NE-CZ	5.16	1.39	1.33
1	H	160	PRO	CA-C	-5.15	1.42	1.52
1	H	266	MET	CA-CB	5.13	1.65	1.53
1	L	364	ARG	CZ-NH1	5.12	1.39	1.33
1	J	218	GLU	C-N	5.12	1.42	1.33
1	H	181	TYR	CA-C	-5.11	1.39	1.52
1	H	326	ARG	NE-CZ	5.11	1.39	1.33
1	M	278	ARG	NE-CZ	5.11	1.39	1.33
1	K	184	PRO	CA-C	-5.11	1.42	1.52
1	K	154	ARG	CZ-NH2	5.09	1.39	1.33
1	L	137	GLU	CD-OE1	5.09	1.31	1.25
1	L	280	ASP	CA-CB	5.05	1.65	1.53
1	I	173	GLU	CD-OE2	5.05	1.31	1.25
1	I	132	VAL	CB-CG1	5.04	1.63	1.52
1	J	305	ARG	CZ-NH1	5.04	1.39	1.33
1	I	163	LYS	CA-C	-5.02	1.39	1.52

All (325) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	250	ARG	NE-CZ-NH1	16.29	128.44	120.30
1	I	367	ARG	NE-CZ-NH2	-16.18	112.21	120.30
1	J	341	ARG	NE-CZ-NH2	-15.94	112.33	120.30
1	K	224	ARG	NE-CZ-NH1	-15.64	112.48	120.30
1	I	367	ARG	NE-CZ-NH1	15.47	128.03	120.30
1	L	367	ARG	NE-CZ-NH1	14.66	127.63	120.30
1	K	205	ARG	NE-CZ-NH2	-14.60	113.00	120.30
1	K	361	PHE	CB-CG-CD1	14.56	130.99	120.80
1	H	314	PHE	CB-CG-CD2	-14.45	110.68	120.80
1	M	259	ARG	NE-CZ-NH2	-13.75	113.42	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	317	ARG	NE-CZ-NH2	-13.44	113.58	120.30
1	I	341	ARG	NE-CZ-NH2	-13.33	113.63	120.30
1	J	130	PHE	CB-CG-CD2	-12.40	112.12	120.80
1	H	341	ARG	NE-CZ-NH1	11.77	126.19	120.30
1	M	299	ARG	NE-CZ-NH1	11.77	126.18	120.30
1	L	367	ARG	NE-CZ-NH2	-11.74	114.43	120.30
1	L	215	TYR	CB-CG-CD2	-11.65	114.01	121.00
1	I	130	PHE	CB-CG-CD1	11.54	128.88	120.80
1	H	314	PHE	CB-CG-CD1	11.49	128.84	120.80
1	J	326	ARG	NE-CZ-NH1	11.32	125.96	120.30
1	I	154	ARG	NE-CZ-NH1	11.31	125.96	120.30
1	K	326	ARG	NE-CZ-NH1	11.30	125.95	120.30
1	I	221	ARG	NE-CZ-NH1	11.27	125.94	120.30
1	I	130	PHE	CB-CG-CD2	-11.24	112.93	120.80
1	K	200	ARG	NE-CZ-NH2	-11.22	114.69	120.30
1	L	205	ARG	NE-CZ-NH1	-11.21	114.69	120.30
1	H	181	TYR	CB-CG-CD2	-11.13	114.32	121.00
1	I	241	ASP	CB-CG-OD1	11.13	128.32	118.30
1	J	372	MET	CG-SD-CE	-11.10	82.45	100.20
1	K	154	ARG	NE-CZ-NH1	10.92	125.76	120.30
1	I	215	TYR	CB-CG-CD2	-10.88	114.47	121.00
1	L	314	PHE	CB-CG-CD1	-10.73	113.29	120.80
1	M	128	TYR	CB-CG-CD2	-10.73	114.56	121.00
1	J	302	ARG	NE-CZ-NH1	10.65	125.62	120.30
1	K	205	ARG	NE-CZ-NH1	10.64	125.62	120.30
1	J	128	TYR	CB-CG-CD2	-10.61	114.63	121.00
1	M	227	PHE	CB-CG-CD1	-10.60	113.38	120.80
1	I	140	TYR	CB-CG-CD2	-10.53	114.68	121.00
1	K	336	PHE	CB-CG-CD2	-10.50	113.45	120.80
1	K	200	ARG	NE-CZ-NH1	10.49	125.54	120.30
1	I	326	ARG	NE-CZ-NH2	-10.43	115.08	120.30
1	I	249	ARG	NE-CZ-NH1	-10.24	115.18	120.30
1	J	128	TYR	CB-CG-CD1	10.20	127.12	121.00
1	L	215	TYR	CB-CG-CD1	10.19	127.11	121.00
1	M	224	ARG	NE-CZ-NH2	-10.17	115.22	120.30
1	H	221	ARG	NE-CZ-NH2	-10.13	115.24	120.30
1	I	205	ARG	NE-CZ-NH2	-10.08	115.26	120.30
1	H	250	ARG	NE-CZ-NH2	-10.04	115.28	120.30
1	H	221	ARG	NE-CZ-NH1	9.65	125.13	120.30
1	M	336	PHE	CB-CG-CD2	9.58	127.51	120.80
1	I	140	TYR	CB-CG-CD1	9.57	126.74	121.00
1	M	364	ARG	NE-CZ-NH1	9.55	125.08	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	J	224	ARG	NE-CZ-NH2	9.53	125.07	120.30
1	M	224	ARG	NE-CZ-NH1	9.51	125.05	120.30
1	J	259	ARG	NE-CZ-NH1	9.46	125.03	120.30
1	M	130	PHE	CB-CG-CD2	-9.39	114.23	120.80
1	I	361	PHE	CB-CG-CD2	-9.21	114.35	120.80
1	I	215	TYR	CB-CG-CD1	9.11	126.47	121.00
1	L	128	TYR	CB-CG-CD1	-9.10	115.54	121.00
1	H	326	ARG	NE-CZ-NH1	9.06	124.83	120.30
1	I	154	ARG	NE-CZ-NH2	-9.01	115.80	120.30
1	J	167	PHE	CB-CG-CD1	-8.89	114.57	120.80
1	M	305	ARG	NE-CZ-NH2	8.88	124.74	120.30
1	J	314	PHE	CB-CG-CD2	8.88	127.02	120.80
1	M	140	TYR	CB-CG-CD2	-8.87	115.68	121.00
1	K	275	PHE	CB-CG-CD2	-8.86	114.60	120.80
1	J	259	ARG	NE-CZ-NH2	-8.86	115.87	120.30
1	M	259	ARG	NE-CZ-NH1	8.77	124.69	120.30
1	L	364	ARG	NE-CZ-NH1	-8.71	115.95	120.30
1	K	302	ARG	N-CA-CB	8.68	126.22	110.60
1	L	375	PHE	CB-CG-CD1	8.63	126.84	120.80
1	K	275	PHE	CB-CG-CD1	8.61	126.83	120.80
1	K	241	ASP	CB-CG-OD2	-8.52	110.63	118.30
1	H	326	ARG	NE-CZ-NH2	-8.50	116.05	120.30
1	H	167	PHE	CB-CG-CD2	-8.49	114.86	120.80
1	M	263	ARG	NE-CZ-NH1	8.49	124.55	120.30
1	K	375	PHE	CB-CG-CD1	8.31	126.61	120.80
1	I	361	PHE	CB-CG-CD1	8.30	126.61	120.80
1	H	181	TYR	CB-CG-CD1	8.26	125.95	121.00
1	L	289	ARG	NE-CZ-NH2	-8.15	116.22	120.30
1	M	317	ARG	NH1-CZ-NH2	8.11	128.32	119.40
1	H	140	TYR	CB-CG-CD1	8.10	125.86	121.00
1	H	367	ARG	NE-CZ-NH2	-8.09	116.25	120.30
1	H	203	PHE	CB-CG-CD2	8.08	126.46	120.80
1	H	305	ARG	CA-C-O	8.05	137.02	120.10
1	I	341	ARG	NE-CZ-NH1	8.00	124.30	120.30
1	K	335	ASP	CB-CG-OD2	-8.00	111.10	118.30
1	J	361	PHE	CB-CG-CD1	7.95	126.37	120.80
1	M	205	ARG	NE-CZ-NH2	7.95	124.27	120.30
1	H	147	ASP	CB-CG-OD2	7.95	125.45	118.30
1	H	341	ARG	NE-CZ-NH2	-7.92	116.34	120.30
1	H	140	TYR	CZ-CE2-CD2	-7.88	112.71	119.80
1	L	128	TYR	CB-CG-CD2	7.83	125.70	121.00
1	I	224	ARG	NE-CZ-NH2	-7.75	116.42	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	247	ALA	N-CA-CB	7.74	120.93	110.10
1	K	221	ARG	NE-CZ-NH2	-7.73	116.43	120.30
1	K	224	ARG	NE-CZ-NH2	7.71	124.15	120.30
1	I	314	PHE	CB-CG-CD1	7.65	126.16	120.80
1	J	275	PHE	CB-CG-CD2	-7.51	115.54	120.80
1	M	341	ARG	NE-CZ-NH2	-7.49	116.55	120.30
1	K	278	ARG	NE-CZ-NH1	7.47	124.03	120.30
1	J	215	TYR	CB-CG-CD1	-7.46	116.52	121.00
1	L	224	ARG	NE-CZ-NH1	7.42	124.01	120.30
1	L	278	ARG	NE-CZ-NH2	-7.40	116.60	120.30
1	L	194	ALA	CB-CA-C	-7.39	99.01	110.10
1	J	304	ASP	N-CA-CB	7.38	123.89	110.60
1	H	224	ARG	NE-CZ-NH2	-7.37	116.62	120.30
1	J	282	LYS	N-CA-CB	7.31	123.77	110.60
1	J	340	ALA	N-CA-CB	7.30	120.33	110.10
1	L	281	VAL	C-N-CA	7.26	139.86	121.70
1	I	314	PHE	CB-CG-CD2	-7.26	115.72	120.80
1	K	181	TYR	CB-CG-CD2	-7.24	116.66	121.00
1	M	128	TYR	CB-CG-CD1	7.23	125.34	121.00
1	M	364	ARG	NE-CZ-NH2	-7.22	116.69	120.30
1	K	241	ASP	CB-CG-OD1	7.21	124.79	118.30
1	K	242	GLU	N-CA-CB	7.18	123.52	110.60
1	L	305	ARG	NE-CZ-NH1	-7.12	116.74	120.30
1	H	321	PHE	CB-CG-CD2	-7.11	115.82	120.80
1	L	203	PHE	CB-CG-CD1	-7.08	115.84	120.80
1	I	211	PHE	CB-CG-CD2	-7.08	115.84	120.80
1	H	130	PHE	CB-CG-CD2	-7.08	115.85	120.80
1	M	205	ARG	NH1-CZ-NH2	-7.02	111.67	119.40
1	K	289	ARG	NE-CZ-NH2	-7.02	116.79	120.30
1	K	304	ASP	CB-CA-C	-7.01	96.38	110.40
1	J	205	ARG	NE-CZ-NH2	-6.94	116.83	120.30
1	M	205	ARG	NE-CZ-NH1	6.94	123.77	120.30
1	L	336	PHE	CB-CG-CD2	-6.93	115.95	120.80
1	I	299	ARG	NE-CZ-NH2	6.93	123.77	120.30
1	J	317	ARG	NE-CZ-NH2	6.89	123.75	120.30
1	M	226	VAL	CA-CB-CG2	6.84	121.16	110.90
1	M	215	TYR	CB-CG-CD1	-6.80	116.92	121.00
1	K	326	ARG	NE-CZ-NH2	-6.79	116.91	120.30
1	M	335	ASP	CB-CG-OD1	-6.76	112.21	118.30
1	J	258	ASP	CB-CG-OD1	6.76	124.38	118.30
1	K	361	PHE	CB-CG-CD2	-6.71	116.11	120.80
1	H	140	TYR	CG-CD2-CE2	6.70	126.66	121.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	142	ASP	CB-CG-OD2	6.70	124.33	118.30
1	J	203	PHE	CB-CG-CD2	-6.67	116.13	120.80
1	H	215	TYR	CG-CD2-CE2	-6.66	115.97	121.30
1	L	366	GLU	N-CA-CB	6.66	122.58	110.60
1	M	180	LEU	CB-CG-CD1	6.64	122.29	111.00
1	L	181	TYR	CB-CG-CD2	-6.63	117.02	121.00
1	L	364	ARG	NH1-CZ-NH2	6.62	126.68	119.40
1	M	140	TYR	CB-CG-CD1	6.62	124.97	121.00
1	M	226	VAL	CA-CB-CG1	-6.60	100.99	110.90
1	J	275	PHE	CB-CG-CD1	6.58	125.41	120.80
1	I	273	ASP	CB-CG-OD1	-6.57	112.39	118.30
1	J	314	PHE	CB-CG-CD1	-6.56	116.21	120.80
1	H	219	GLY	N-CA-C	-6.55	96.73	113.10
1	K	269	LEU	CB-CA-C	-6.53	97.79	110.20
1	K	189	THR	C-N-CA	6.53	138.02	121.70
1	K	294	ASP	CB-CG-OD2	-6.50	112.45	118.30
1	I	151	GLU	N-CA-CB	6.49	122.28	110.60
1	M	200	ARG	NE-CZ-NH1	6.49	123.55	120.30
1	L	282	LYS	N-CA-CB	6.48	122.26	110.60
1	L	270	ALA	N-CA-CB	6.48	119.17	110.10
1	M	275	PHE	CB-CG-CD2	6.45	125.31	120.80
1	I	263	ARG	NE-CZ-NH2	-6.44	117.08	120.30
1	J	321	PHE	CB-CG-CD2	-6.42	116.30	120.80
1	K	380	GLU	OE1-CD-OE2	6.40	130.98	123.30
1	L	205	ARG	NE-CZ-NH2	6.39	123.50	120.30
1	M	244	ASP	CB-CG-OD2	-6.38	112.56	118.30
1	L	160	PRO	N-CD-CG	6.36	112.73	103.20
1	M	266	MET	CG-SD-CE	6.35	110.36	100.20
1	I	302	ARG	NE-CZ-NH1	-6.34	117.13	120.30
1	K	142	ASP	CB-CG-OD1	-6.29	112.64	118.30
1	H	227	PHE	CB-CG-CD1	6.27	125.19	120.80
1	K	303	PHE	N-CA-CB	6.25	121.84	110.60
1	L	364	ARG	NE-CZ-NH2	-6.24	117.18	120.30
1	M	367	ARG	NE-CZ-NH1	-6.22	117.19	120.30
1	K	138	VAL	CG1-CB-CG2	-6.21	100.96	110.90
1	M	321	PHE	CB-CG-CD2	-6.21	116.45	120.80
1	M	305	ARG	NE-CZ-NH1	-6.20	117.20	120.30
1	J	205	ARG	NE-CZ-NH1	6.20	123.40	120.30
1	J	140	TYR	CB-CG-CD1	6.20	124.72	121.00
1	M	203	PHE	N-CA-CB	6.18	121.73	110.60
1	I	144	GLY	N-CA-C	-6.18	97.65	113.10
1	M	361	PHE	CB-CG-CD2	6.18	125.12	120.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	124	ASP	CB-CG-OD2	-6.17	112.75	118.30
1	I	167	PHE	CB-CG-CD2	-6.16	116.49	120.80
1	J	257	GLY	O-C-N	-6.16	112.85	122.70
1	I	336	PHE	CB-CG-CD1	-6.14	116.50	120.80
1	M	215	TYR	N-CA-C	-6.14	94.43	111.00
1	J	130	PHE	CB-CG-CD1	6.13	125.09	120.80
1	J	343	THR	CA-CB-CG2	-6.13	103.82	112.40
1	I	181	TYR	CB-CG-CD1	-6.12	117.33	121.00
1	J	298	LEU	CB-CG-CD1	-6.12	100.60	111.00
1	L	215	TYR	CG-CD1-CE1	-6.08	116.43	121.30
1	L	224	ARG	CD-NE-CZ	6.07	132.09	123.60
1	J	146	LEU	N-CA-CB	6.06	122.53	110.40
1	L	375	PHE	CB-CG-CD2	-6.06	116.56	120.80
1	H	224	ARG	NE-CZ-NH1	6.02	123.31	120.30
1	I	207	VAL	N-CA-C	-6.02	94.75	111.00
1	H	146	LEU	CB-CG-CD2	-6.01	100.78	111.00
1	H	254	ASP	CB-CG-OD1	-5.95	112.95	118.30
1	H	247	ALA	O-C-N	-5.93	113.21	122.70
1	K	142	ASP	CB-CG-OD2	5.90	123.61	118.30
1	I	303	PHE	CB-CG-CD2	-5.89	116.68	120.80
1	M	305	ARG	N-CA-CB	5.84	121.11	110.60
1	I	289	ARG	NE-CZ-NH2	-5.83	117.38	120.30
1	J	187	GLY	N-CA-C	-5.82	98.54	113.10
1	M	130	PHE	CB-CG-CD1	5.82	124.88	120.80
1	J	312	PRO	N-CD-CG	5.81	111.92	103.20
1	L	200	ARG	CB-CA-C	5.79	121.98	110.40
1	K	269	LEU	N-CA-C	5.78	126.61	111.00
1	H	139	SER	N-CA-CB	-5.78	101.83	110.50
1	J	224	ARG	NE-CZ-NH1	-5.77	117.41	120.30
1	H	236	SER	CA-C-N	5.75	129.86	117.20
1	I	251	THR	O-C-N	-5.75	113.49	122.70
1	L	154	ARG	NE-CZ-NH1	5.74	123.17	120.30
1	K	350	ASP	CB-CG-OD2	-5.74	113.14	118.30
1	M	302	ARG	NE-CZ-NH1	5.74	123.17	120.30
1	K	361	PHE	CG-CD1-CE1	5.73	127.10	120.80
1	L	212	VAL	N-CA-CB	5.71	124.06	111.50
1	I	340	ALA	CB-CA-C	-5.70	101.55	110.10
1	I	180	LEU	CB-CG-CD1	5.70	120.69	111.00
1	L	167	PHE	CB-CG-CD2	-5.70	116.81	120.80
1	H	203	PHE	CB-CG-CD1	-5.69	116.82	120.80
1	K	362	ALA	N-CA-CB	5.69	118.07	110.10
1	H	366	GLU	N-CA-CB	5.69	120.84	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	302	ARG	N-CA-C	-5.68	95.65	111.00
1	K	254	ASP	CB-CG-OD2	5.68	123.41	118.30
1	K	299	ARG	NE-CZ-NH2	-5.68	117.46	120.30
1	H	259	ARG	NE-CZ-NH1	-5.67	117.46	120.30
1	H	147	ASP	CB-CG-OD1	-5.65	113.21	118.30
1	M	258	ASP	CB-CG-OD2	-5.65	113.22	118.30
1	J	142	ASP	CB-CG-OD2	-5.64	113.22	118.30
1	M	236	SER	N-CA-CB	5.64	118.96	110.50
1	I	275	PHE	CB-CG-CD1	5.63	124.74	120.80
1	K	375	PHE	CB-CG-CD2	-5.63	116.86	120.80
1	K	230	ALA	N-CA-CB	5.62	117.97	110.10
1	H	205	ARG	NE-CZ-NH2	5.62	123.11	120.30
1	K	335	ASP	CB-CG-OD1	5.59	123.33	118.30
1	K	325	THR	C-N-CA	5.59	135.67	121.70
1	M	335	ASP	CB-CG-OD2	5.58	123.32	118.30
1	M	275	PHE	CB-CG-CD1	-5.57	116.90	120.80
1	J	370	VAL	CA-CB-CG1	-5.57	102.55	110.90
1	L	260	GLU	OE1-CD-OE2	5.55	129.96	123.30
1	L	341	ARG	NE-CZ-NH2	-5.53	117.53	120.30
1	K	259	ARG	NE-CZ-NH1	5.53	123.06	120.30
1	H	215	TYR	CB-CG-CD2	-5.53	117.68	121.00
1	H	349	ALA	CB-CA-C	-5.53	101.81	110.10
1	K	207	VAL	N-CA-C	-5.51	96.13	111.00
1	H	378	ALA	N-CA-CB	5.50	117.81	110.10
1	H	146	LEU	C-N-CA	5.49	135.43	121.70
1	I	281	VAL	C-N-CA	5.49	135.41	121.70
1	L	335	ASP	CB-CG-OD2	-5.48	113.37	118.30
1	K	173	GLU	CB-CA-C	-5.46	99.48	110.40
1	M	336	PHE	CB-CG-CD1	-5.45	116.99	120.80
1	J	299	ARG	NE-CZ-NH1	-5.44	117.58	120.30
1	K	372	MET	CG-SD-CE	-5.44	91.49	100.20
1	J	298	LEU	CB-CG-CD2	5.44	120.25	111.00
1	I	195	VAL	CG1-CB-CG2	5.44	119.60	110.90
1	M	251	THR	O-C-N	5.42	131.38	122.70
1	I	128	TYR	CA-C-N	-5.42	105.36	116.20
1	K	228	GLN	CA-CB-CG	5.41	125.31	113.40
1	L	259	ARG	NE-CZ-NH1	-5.39	117.60	120.30
1	H	133	GLU	OE1-CD-OE2	5.39	129.77	123.30
1	I	361	PHE	N-CA-CB	5.39	120.30	110.60
1	M	169	GLU	CB-CA-C	-5.38	99.64	110.40
1	M	273	ASP	CB-CG-OD2	5.37	123.13	118.30
1	L	314	PHE	CB-CG-CD2	5.37	124.56	120.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	167	PHE	CB-CG-CD1	5.36	124.55	120.80
1	M	349	ALA	N-CA-CB	5.36	117.60	110.10
1	M	142	ASP	CB-CG-OD2	-5.35	113.48	118.30
1	J	239	PHE	N-CA-CB	5.35	120.23	110.60
1	H	176	LYS	N-CA-CB	5.34	120.22	110.60
1	L	281	VAL	N-CA-C	-5.34	96.58	111.00
1	J	139	SER	N-CA-CB	5.34	118.51	110.50
1	I	139	SER	N-CA-C	-5.34	96.59	111.00
1	J	215	TYR	CB-CG-CD2	5.32	124.19	121.00
1	J	322	LYS	CB-CA-C	-5.32	99.76	110.40
1	K	128	TYR	CB-CG-CD1	-5.32	117.81	121.00
1	M	374	ASP	CB-CG-OD2	-5.31	113.52	118.30
1	I	236	SER	N-CA-CB	5.31	118.46	110.50
1	H	255	THR	N-CA-CB	5.30	120.37	110.30
1	J	211	PHE	CA-CB-CG	-5.30	101.18	113.90
1	H	164	PRO	C-N-CA	5.29	134.94	121.70
1	M	254	ASP	CB-CG-OD1	5.28	123.06	118.30
1	M	146	LEU	N-CA-C	-5.28	96.75	111.00
1	K	134	GLU	N-CA-CB	5.28	120.10	110.60
1	K	215	TYR	CB-CA-C	-5.27	99.86	110.40
1	H	343	THR	CA-CB-CG2	-5.27	105.03	112.40
1	M	211	PHE	CB-CG-CD1	5.26	124.48	120.80
1	I	126	MET	CG-SD-CE	-5.25	91.80	100.20
1	L	142	ASP	CB-CG-OD1	-5.24	113.58	118.30
1	M	315	GLU	OE1-CD-OE2	5.24	129.59	123.30
1	K	207	VAL	N-CA-CB	5.23	123.01	111.50
1	H	154	ARG	NE-CZ-NH1	-5.22	117.69	120.30
1	J	228	GLN	N-CA-CB	5.22	119.99	110.60
1	H	305	ARG	O-C-N	-5.19	114.40	122.70
1	I	254	ASP	CB-CG-OD1	5.19	122.97	118.30
1	M	353	ALA	CB-CA-C	-5.18	102.32	110.10
1	H	249	ARG	NE-CZ-NH2	5.18	122.89	120.30
1	L	201	ALA	N-CA-CB	5.17	117.34	110.10
1	H	343	THR	N-CA-CB	5.17	120.12	110.30
1	H	369	LYS	CB-CA-C	-5.17	100.06	110.40
1	L	294	ASP	CB-CG-OD2	5.17	122.95	118.30
1	L	382	VAL	CA-CB-CG2	-5.17	103.14	110.90
1	K	123	LYS	CB-CA-C	-5.17	100.06	110.40
1	M	140	TYR	CG-CD2-CE2	-5.16	117.17	121.30
1	M	259	ARG	CD-NE-CZ	-5.15	116.38	123.60
1	J	326	ARG	NE-CZ-NH2	-5.14	117.73	120.30
1	J	361	PHE	CG-CD1-CE1	5.13	126.44	120.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	217	GLY	O-C-N	-5.12	114.51	122.70
1	J	149	GLN	N-CA-CB	5.10	119.79	110.60
1	M	197	ASN	CA-CB-CG	5.10	124.61	113.40
1	J	140	TYR	CB-CG-CD2	-5.09	117.95	121.00
1	J	245	ALA	N-CA-CB	5.09	117.22	110.10
1	H	130	PHE	CB-CG-CD1	5.08	124.36	120.80
1	L	172	ILE	CA-CB-CG2	-5.08	100.74	110.90
1	J	211	PHE	CB-CG-CD2	5.08	124.35	120.80
1	H	265	MET	CA-CB-CG	5.07	121.92	113.30
1	I	282	LYS	N-CA-CB	5.07	119.72	110.60
1	K	274	GLY	N-CA-C	-5.07	100.43	113.10
1	J	361	PHE	CD1-CG-CD2	-5.07	111.72	118.30
1	M	142	ASP	CB-CG-OD1	5.05	122.85	118.30
1	K	367	ARG	NE-CZ-NH1	5.05	122.82	120.30
1	K	169	GLU	N-CA-CB	5.04	119.67	110.60
1	M	302	ARG	N-CA-C	-5.02	97.44	111.00
1	K	136	PRO	N-CA-CB	5.02	109.33	103.30
1	K	181	TYR	CB-CG-CD1	5.02	124.01	121.00
1	I	181	TYR	CB-CG-CD2	5.02	124.01	121.00
1	H	347	SER	N-CA-CB	5.01	118.01	110.50
1	K	333	ASP	CB-CG-OD1	-5.00	113.80	118.30

There are no chirality outliers.

All (74) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	H	137	GLU	Peptide
1	H	154	ARG	Sidechain
1	H	200	ARG	Sidechain
1	H	215	TYR	Peptide,Sidechain
1	H	217	GLY	Peptide
1	H	218	GLU	Peptide
1	H	219	GLY	Mainchain
1	H	227	PHE	Sidechain
1	H	236	SER	Peptide
1	H	240	ILE	Peptide
1	H	250	ARG	Sidechain
1	H	254	ASP	Peptide
1	H	259	ARG	Sidechain
1	H	276	ASP	Peptide
1	H	303	PHE	Sidechain
1	H	311	LEU	Peptide

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Mol	Chain	Res	Type	Group
1	H	321	PHE	Sidechain
1	H	367	ARG	Sidechain
1	H	387	THR	Peptide
1	I	128	TYR	Sidechain
1	I	137	GLU	Peptide
1	I	167	PHE	Sidechain
1	I	181	TYR	Peptide
1	I	211	PHE	Sidechain
1	I	221	ARG	Sidechain
1	I	254	ASP	Peptide
1	I	269	LEU	Peptide
1	I	302	ARG	Sidechain
1	I	303	PHE	Peptide
1	I	314	PHE	Sidechain
1	I	387	THR	Peptide
1	J	140	TYR	Sidechain
1	J	167	PHE	Sidechain
1	J	181	TYR	Sidechain
1	J	186	THR	Peptide
1	J	207	VAL	Peptide
1	J	215	TYR	Peptide
1	J	305	ARG	Sidechain
1	J	314	PHE	Sidechain
1	J	336	PHE	Sidechain
1	J	361	PHE	Sidechain
1	K	128	TYR	Sidechain
1	K	181	TYR	Sidechain
1	K	201	ALA	Peptide
1	K	215	TYR	Peptide,Sidechain,Mainchain
1	K	224	ARG	Sidechain
1	K	269	LEU	Peptide,Mainchain
1	K	277	PRO	Peptide
1	K	289	ARG	Sidechain
1	K	302	ARG	Sidechain
1	L	130	PHE	Sidechain
1	L	131	GLU	Peptide
1	L	200	ARG	Sidechain
1	L	215	TYR	Peptide
1	L	221	ARG	Sidechain
1	L	249	ARG	Sidechain
1	L	263	ARG	Sidechain
1	L	278	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	L	375	PHE	Sidechain
1	L	385	LYS	Peptide
1	L	387	THR	Peptide
1	M	140	TYR	Sidechain
1	M	218	GLU	Peptide
1	M	249	ARG	Sidechain
1	M	254	ASP	Peptide
1	M	275	PHE	Sidechain
1	M	302	ARG	Sidechain
1	M	326	ARG	Sidechain
1	M	364	ARG	Sidechain
1	M	371	THR	Peptide

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	H	2088	0	2159	12	0
1	I	2088	0	2159	7	0
1	J	2088	0	2159	11	0
1	K	2088	0	2159	3	0
1	L	2088	0	2159	8	0
1	M	2088	0	2159	7	0
2	H	31	0	12	0	0
2	I	31	0	12	0	0
2	J	31	0	12	0	0
2	K	31	0	12	0	0
3	H	1	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
3	K	1	0	0	0	0
3	L	1	0	0	0	0
4	L	27	0	12	0	0
All	All	12684	0	13014	45	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 2.

All (45) 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:H:146:LEU:H	1:H:147:ASP:HA	1.61	0.64
1:H:339:LEU:HD22	1:H:379:ILE:CD1	2.30	0.61
1:I:323:ILE:HD13	1:I:326:ARG:HH21	1.72	0.55
1:I:257:GLY:HA3	1:J:216:ILE:HG21	1.90	0.53
1:L:176:LYS:H	1:L:304:ASP:HB2	1.73	0.53
1:K:236:SER:O	1:K:281:VAL:HG12	2.10	0.52
1:M:354:ILE:HD11	1:M:383:LEU:HB2	1.91	0.52
1:J:272:LEU:HG	1:J:283:VAL:HG21	1.92	0.52
1:I:361:PHE:HA	1:I:364:ARG:HE	1.75	0.51
1:H:219:GLY:H	1:H:222:LEU:H	1.58	0.51
1:H:339:LEU:HD22	1:H:379:ILE:HD12	1.92	0.51
1:H:339:LEU:HD22	1:H:379:ILE:HD11	1.92	0.51
1:H:193:LYS:HG2	1:I:275:PHE:CE1	2.46	0.51
1:M:179:LEU:HD13	1:M:243:LEU:HD12	1.93	0.50
1:H:251:THR:HG23	1:L:215:TYR:CE2	2.46	0.49
1:L:370:VAL:HG12	1:L:375:PHE:CZ	2.48	0.49
1:H:237:ILE:HD13	1:H:282:LYS:HB2	1.95	0.48
1:L:389:ILE:HD12	1:L:389:ILE:H	1.79	0.48
1:J:242:GLU:H	1:J:286:ALA:HB3	1.78	0.48
1:H:386:THR:HG22	1:H:387:THR:H	1.79	0.47
1:H:181:TYR:CZ	1:H:290:ILE:HG22	2.50	0.47
1:K:206:VAL:HG22	1:K:207:VAL:H	1.81	0.46
1:H:130:PHE:CZ	1:H:206:VAL:HG23	2.51	0.46
1:L:158:GLU:HG3	1:L:199:THR:HG22	1.98	0.46
1:J:289:ARG:HE	1:J:291:ASP:HB2	1.81	0.46
1:L:153:ILE:HD12	1:L:191:LEU:HD22	1.98	0.45
1:M:178:VAL:HG23	1:M:305:ARG:HG3	1.98	0.45
1:M:334:VAL:HA	1:M:372:MET:HB2	1.98	0.45
1:L:239:PHE:CE2	1:L:241:ASP:HB2	2.52	0.45
1:K:281:VAL:HA	1:K:282:LYS:HB2	1.98	0.45
1:M:159:LEU:HB3	1:M:160:PRO:HD3	1.98	0.45
1:J:153:ILE:HD11	1:J:191:LEU:HD23	1.98	0.44
1:I:139:SER:H	1:I:142:ASP:HB2	1.83	0.43
1:I:206:VAL:HG22	1:I:207:VAL:H	1.84	0.43
1:M:287:THR:HG21	1:M:290:ILE:HG23	2.00	0.43
1:J:206:VAL:HG22	1:J:207:VAL:H	1.84	0.42
1:J:343:THR:HG22	1:J:379:ILE:HG23	2.01	0.42
1:J:132:VAL:HG13	1:J:203:PHE:H	1.85	0.42
1:M:299:ARG:HE	1:M:302:ARG:CZ	2.34	0.41
1:I:308:GLU:O	1:I:310:PRO:HD3	2.21	0.41
1:J:338:GLU:HA	1:J:341:ARG:HE	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:217:GLY:HA2	1:J:263:ARG:HH22	1.86	0.41
1:H:223:VAL:HG21	1:H:264:THR:HG22	2.03	0.40
1:J:371:THR:O	1:J:374:ASP:HB2	2.21	0.40
1:L:247:ALA:HA	1:L:265:MET:HE2	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	H	265/267 (99%)	240 (91%)	14 (5%)	11 (4%)	3	25
1	I	265/267 (99%)	234 (88%)	18 (7%)	13 (5%)	2	22
1	J	265/267 (99%)	227 (86%)	26 (10%)	12 (4%)	2	24
1	K	265/267 (99%)	240 (91%)	15 (6%)	10 (4%)	3	26
1	L	265/267 (99%)	239 (90%)	12 (4%)	14 (5%)	2	21
1	M	265/267 (99%)	243 (92%)	17 (6%)	5 (2%)	8	40
All	All	1590/1602 (99%)	1423 (90%)	102 (6%)	65 (4%)	5	25

All (65) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	163	LYS
1	H	237	ILE
1	H	246	ILE
1	H	255	THR
1	I	255	THR
1	I	270	ALA
1	I	292	ILE
1	I	331	ALA

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Mol	Chain	Res	Type
1	K	134	GLU
1	K	216	ILE
1	K	269	LEU
1	L	212	VAL
1	L	216	ILE
1	L	282	LYS
1	L	388	PRO
1	M	212	VAL
1	M	244	ASP
1	J	128	TYR
1	J	190	LEU
1	J	191	LEU
1	H	388	PRO
1	I	126	MET
1	I	212	VAL
1	I	221	ARG
1	I	269	LEU
1	K	212	VAL
1	K	270	ALA
1	K	278	ARG
1	L	132	VAL
1	L	273	ASP
1	L	280	ASP
1	L	335	ASP
1	M	246	ILE
1	M	330	LEU
1	J	304	ASP
1	H	296	ALA
1	H	333	ASP
1	I	146	LEU
1	I	282	LYS
1	K	388	PRO
1	L	242	GLU
1	L	366	GLU
1	J	214	LYS
1	J	273	ASP
1	J	282	LYS
1	J	301	GLY
1	H	135	LYS
1	I	202	THR
1	I	277	PRO
1	I	330	LEU

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Mol	Chain	Res	Type
1	K	282	LYS
1	L	135	LYS
1	L	334	VAL
1	J	247	ALA
1	K	200	ARG
1	L	284	ILE
1	J	212	VAL
1	H	219	GLY
1	M	219	GLY
1	J	143	ILE
1	H	136	PRO
1	L	183	PRO
1	J	136	PRO
1	K	246	ILE
1	H	277	PRO

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	H	223/223 (100%)	213 (96%)	10 (4%)	27	53
1	I	223/223 (100%)	215 (96%)	8 (4%)	35	59
1	J	223/223 (100%)	210 (94%)	13 (6%)	20	47
1	K	223/223 (100%)	213 (96%)	10 (4%)	27	53
1	L	223/223 (100%)	217 (97%)	6 (3%)	44	66
1	M	223/223 (100%)	217 (97%)	6 (3%)	44	66
All	All	1338/1338 (100%)	1285 (96%)	53 (4%)	35	56

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	136	PRO
1	H	147	ASP
1	H	165	GLU

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Mol	Chain	Res	Type
1	H	179	LEU
1	H	250	ARG
1	H	275	PHE
1	H	276	ASP
1	H	291	ASP
1	H	304	ASP
1	H	385	LYS
1	I	126	MET
1	I	179	LEU
1	I	216	ILE
1	I	227	PHE
1	I	250	ARG
1	I	293	LEU
1	I	295	PRO
1	I	386	THR
1	K	137	GLU
1	K	159	LEU
1	K	165	GLU
1	K	189	THR
1	K	200	ARG
1	K	242	GLU
1	K	252	ASN
1	K	255	THR
1	K	298	LEU
1	K	304	ASP
1	L	143	ILE
1	L	176	LYS
1	L	265	MET
1	L	295	PRO
1	L	321	PHE
1	L	352	LYS
1	M	176	LYS
1	M	215	TYR
1	M	218	GLU
1	M	275	PHE
1	M	312	PRO
1	M	332	GLU
1	J	134	GLU
1	J	178	VAL
1	J	190	LEU
1	J	200	ARG
1	J	207	VAL

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Mol	Chain	Res	Type
1	J	244	ASP
1	J	250	ARG
1	J	252	ASN
1	J	259	ARG
1	J	265	MET
1	J	272	LEU
1	J	294	ASP
1	J	333	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	H	267	GLN
1	H	324	HIS
1	L	213	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 5 are monoatomic - leaving 5 for Mogul analysis.

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
2	ATP	H	401	3	26,33,33	1.45	3 (11%)	31,52,52	2.18	7 (22%)
2	ATP	I	401	3	26,33,33	1.36	3 (11%)	31,52,52	1.94	6 (19%)
2	ATP	J	401	3	26,33,33	1.27	5 (19%)	31,52,52	2.13	7 (22%)
4	ADP	L	401	3	24,29,29	1.08	1 (4%)	29,45,45	1.53	4 (13%)
2	ATP	K	401	3	26,33,33	1.65	3 (11%)	31,52,52	2.40	8 (25%)

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
2	ATP	H	401	3	-	6/18/38/38	0/3/3/3
2	ATP	I	401	3	-	1/18/38/38	0/3/3/3
2	ATP	J	401	3	-	7/18/38/38	0/3/3/3
4	ADP	L	401	3	-	5/12/32/32	0/3/3/3
2	ATP	K	401	3	-	5/18/38/38	0/3/3/3

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	K	401	ATP	C4-N3	-5.78	1.27	1.35
2	H	401	ATP	O4'-C1'	4.47	1.47	1.41
2	I	401	ATP	C2-N3	3.88	1.38	1.32
2	H	401	ATP	C8-N7	-3.29	1.28	1.34
2	K	401	ATP	C8-N7	-3.23	1.28	1.34
2	I	401	ATP	O4'-C1'	3.18	1.45	1.41
4	L	401	ADP	C8-N7	-2.51	1.30	1.34
2	J	401	ATP	C2'-C3'	-2.46	1.46	1.53
2	K	401	ATP	C2'-C1'	-2.32	1.50	1.53
2	I	401	ATP	PG-O2G	-2.26	1.46	1.54
2	H	401	ATP	O4'-C4'	2.26	1.50	1.45
2	J	401	ATP	C8-N7	-2.25	1.30	1.34
2	J	401	ATP	O4'-C1'	2.25	1.44	1.41
2	J	401	ATP	PG-O1G	2.15	1.57	1.50
2	J	401	ATP	C5-C4	-2.14	1.35	1.40

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	K	401	ATP	PA-O3A-PB	7.59	158.87	132.83
2	H	401	ATP	PA-O3A-PB	7.46	158.43	132.83
2	I	401	ATP	PB-O3B-PG	7.35	158.05	132.83
2	J	401	ATP	PB-O3B-PG	7.19	157.49	132.83
2	H	401	ATP	PB-O3B-PG	6.81	156.19	132.83
2	K	401	ATP	PB-O3B-PG	6.10	153.76	132.83
2	J	401	ATP	PA-O3A-PB	5.58	151.97	132.83
4	L	401	ADP	PA-O3A-PB	4.37	147.81	132.83
2	K	401	ATP	C5-C6-N1	-4.27	110.68	120.35
2	J	401	ATP	N6-C6-N1	3.96	126.78	118.57
2	K	401	ATP	N6-C6-N1	3.77	126.41	118.57
2	I	401	ATP	N6-C6-N1	3.10	125.00	118.57
4	L	401	ADP	N6-C6-N1	3.03	124.86	118.57
2	K	401	ATP	O4'-C1'-C2'	3.02	111.35	106.93
2	H	401	ATP	C1'-N9-C4	2.81	131.59	126.64
2	I	401	ATP	O3G-PG-O2G	2.73	118.06	107.64
2	I	401	ATP	C5-C6-N1	-2.72	114.19	120.35
2	H	401	ATP	C5-C6-N1	-2.63	114.39	120.35
2	J	401	ATP	C5-C6-N6	-2.59	116.41	120.35
4	L	401	ADP	C5-C6-N1	-2.57	114.53	120.35
2	J	401	ATP	C5'-C4'-C3'	2.55	124.72	115.18
2	H	401	ATP	N6-C6-N1	2.50	123.77	118.57
2	J	401	ATP	C5-C6-N1	-2.26	115.23	120.35
2	K	401	ATP	C2-N1-C6	2.18	122.49	118.75
2	I	401	ATP	O2G-PG-O3B	-2.16	97.41	104.64
2	I	401	ATP	O2G-PG-O1G	2.14	119.08	110.68
2	J	401	ATP	O3'-C3'-C4'	-2.12	104.91	111.05
2	K	401	ATP	O5'-C5'-C4'	2.12	116.29	108.99
2	H	401	ATP	O4'-C1'-C2'	2.08	109.97	106.93
4	L	401	ADP	O2B-PB-O3A	2.07	111.59	104.64
2	K	401	ATP	O3'-C3'-C2'	2.03	118.40	111.82
2	H	401	ATP	O2B-PB-O1B	2.01	122.17	112.24

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	H	401	ATP	PB-O3A-PA-O5'
2	H	401	ATP	C5'-O5'-PA-O1A
2	H	401	ATP	C5'-O5'-PA-O3A
2	H	401	ATP	C4'-C5'-O5'-PA
2	K	401	ATP	C5'-O5'-PA-O1A
2	J	401	ATP	C5'-O5'-PA-O3A

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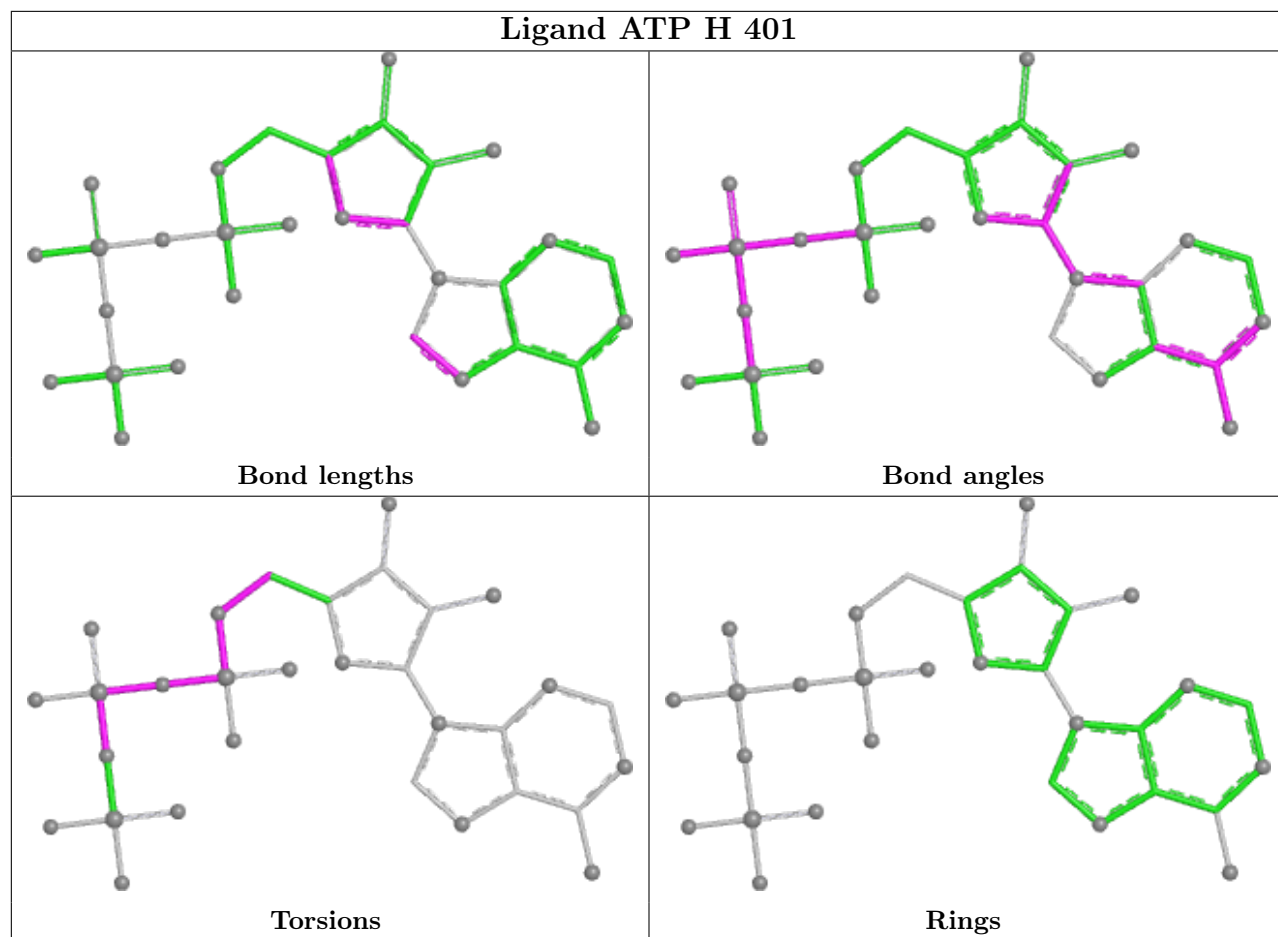
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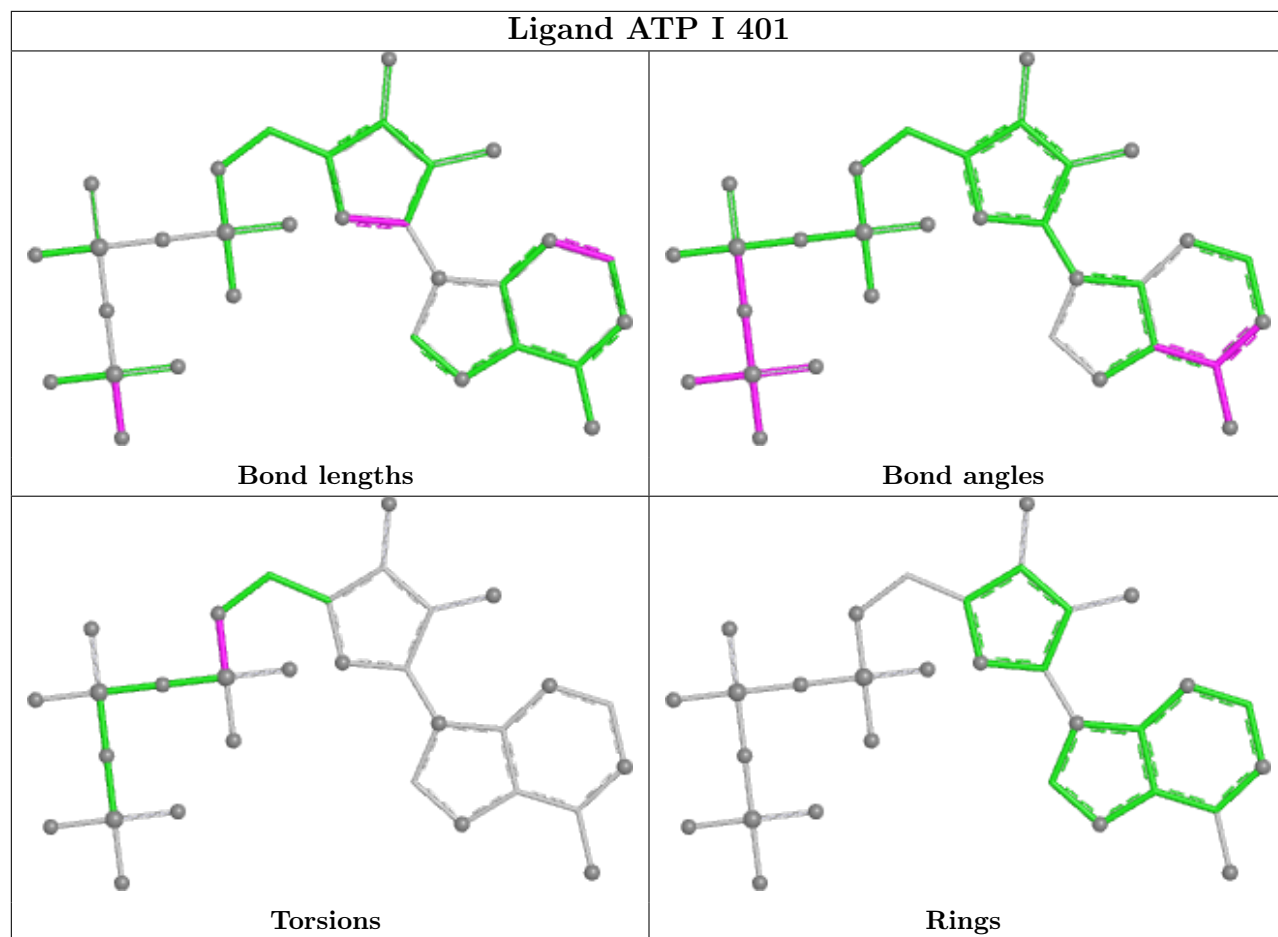
Mol	Chain	Res	Type	Atoms
4	L	401	ADP	C5'-O5'-PA-O1A
4	L	401	ADP	C5'-O5'-PA-O2A
2	J	401	ATP	C3'-C4'-C5'-O5'
2	J	401	ATP	O4'-C4'-C5'-O5'
2	K	401	ATP	C4'-C5'-O5'-PA
2	J	401	ATP	C4'-C5'-O5'-PA
2	I	401	ATP	C5'-O5'-PA-O3A
2	K	401	ATP	PA-O3A-PB-O2B
2	J	401	ATP	C5'-O5'-PA-O1A
2	K	401	ATP	PA-O3A-PB-O1B
2	J	401	ATP	PG-O3B-PB-O2B
2	J	401	ATP	PA-O3A-PB-O2B
4	L	401	ADP	C4'-C5'-O5'-PA
4	L	401	ADP	C3'-C4'-C5'-O5'
2	K	401	ATP	C5'-O5'-PA-O3A
4	L	401	ADP	C5'-O5'-PA-O3A
2	H	401	ATP	PG-O3B-PB-O1B
2	H	401	ATP	PA-O3A-PB-O1B

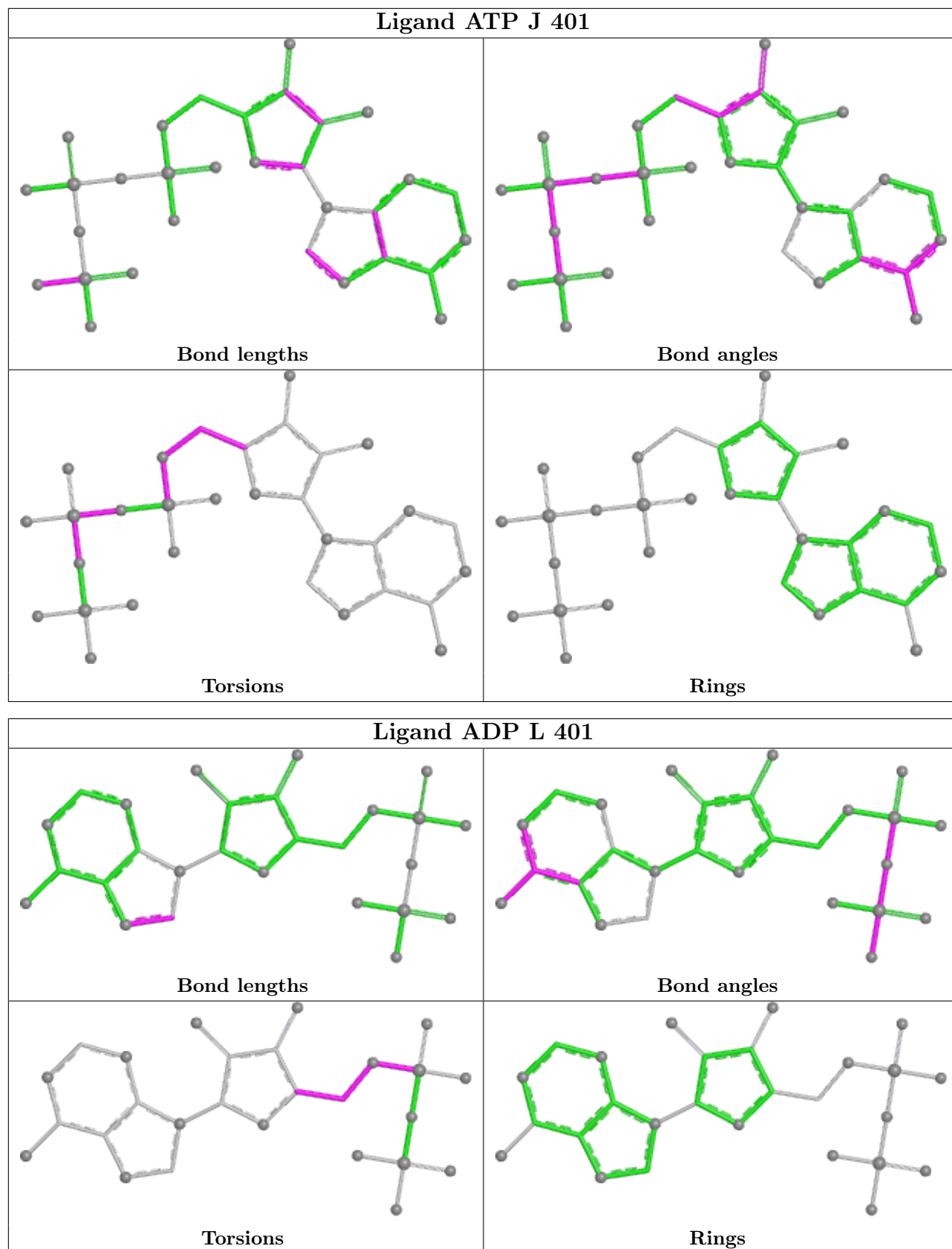
There are no ring outliers.

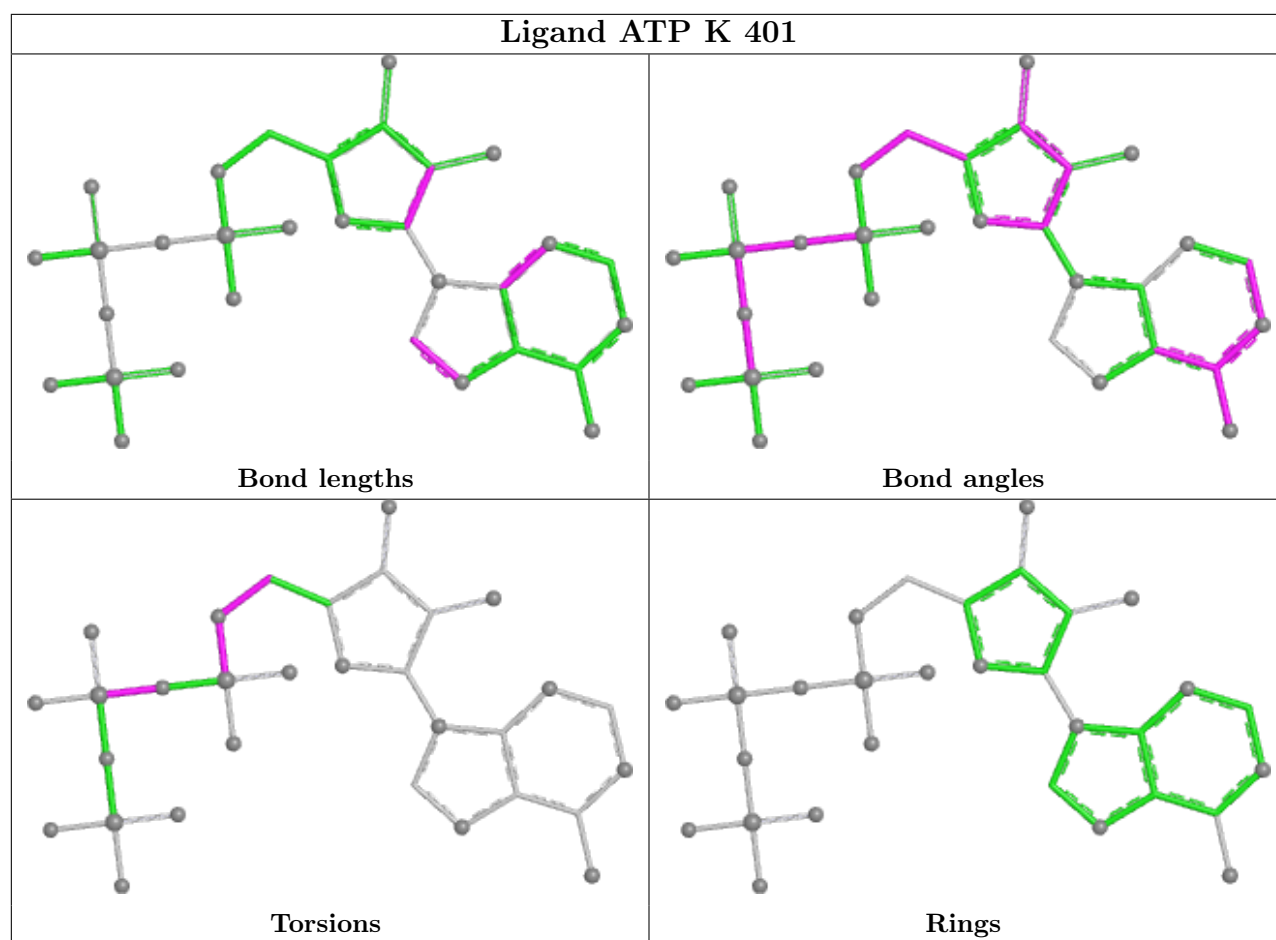
No monomer is involved in short contacts.

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.

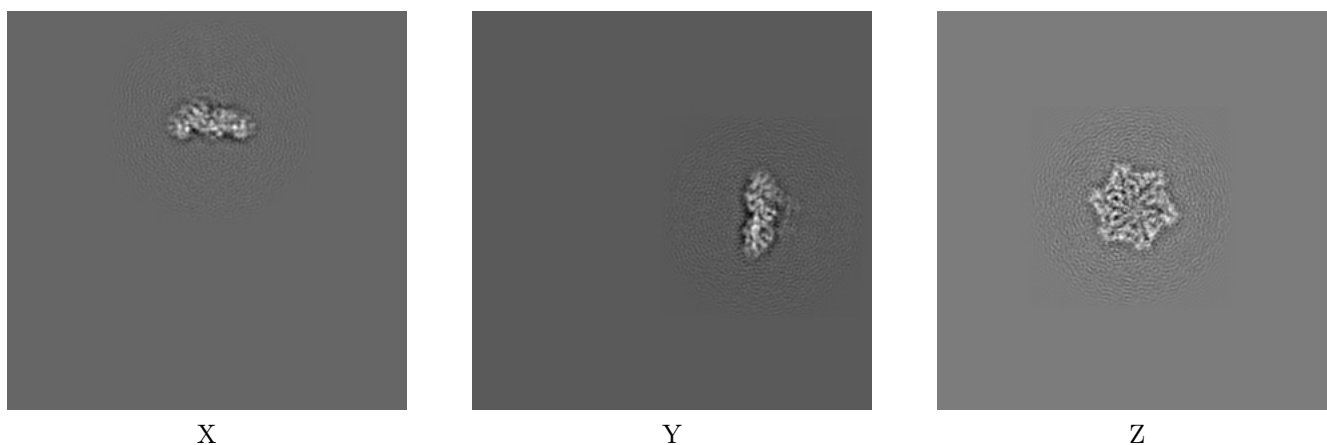
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0209. 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](#)

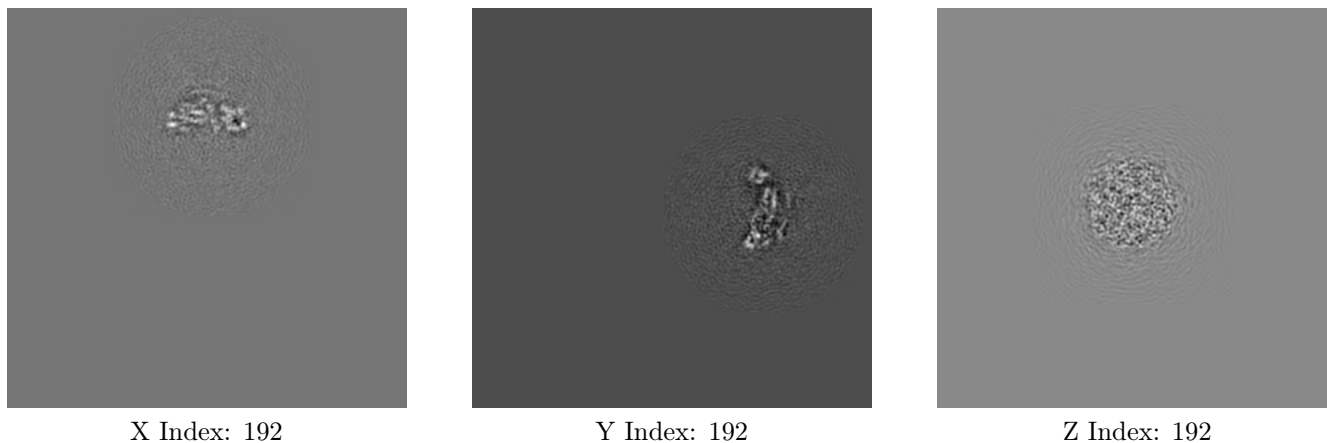
6.1.1 Primary map



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

6.2 Central slices [i](#)

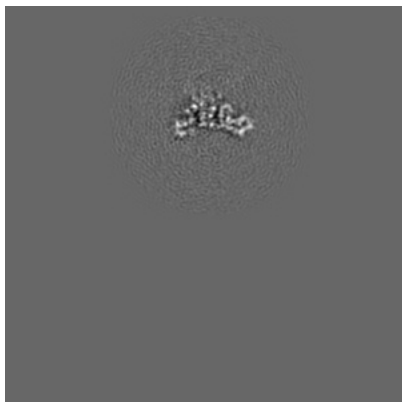
6.2.1 Primary map



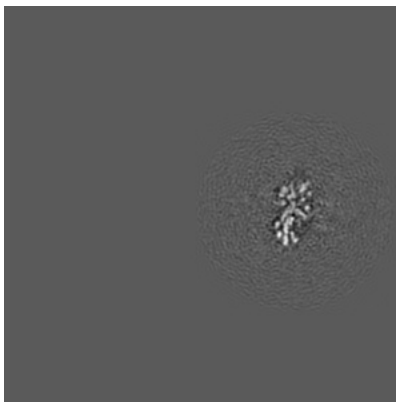
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

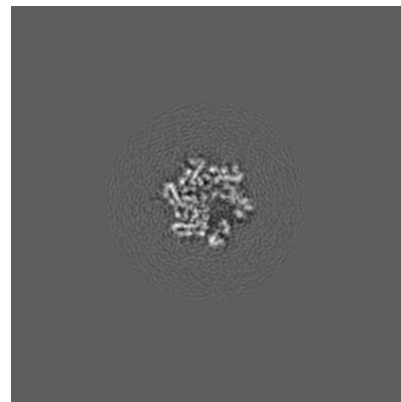
6.3.1 Primary map



X Index: 172



Y Index: 172



Z Index: 271

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

6.4 Orthogonal surface views [i](#)

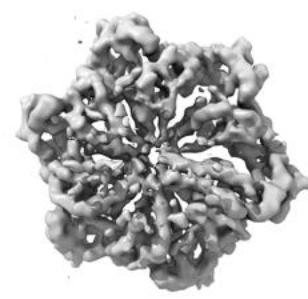
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.022. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

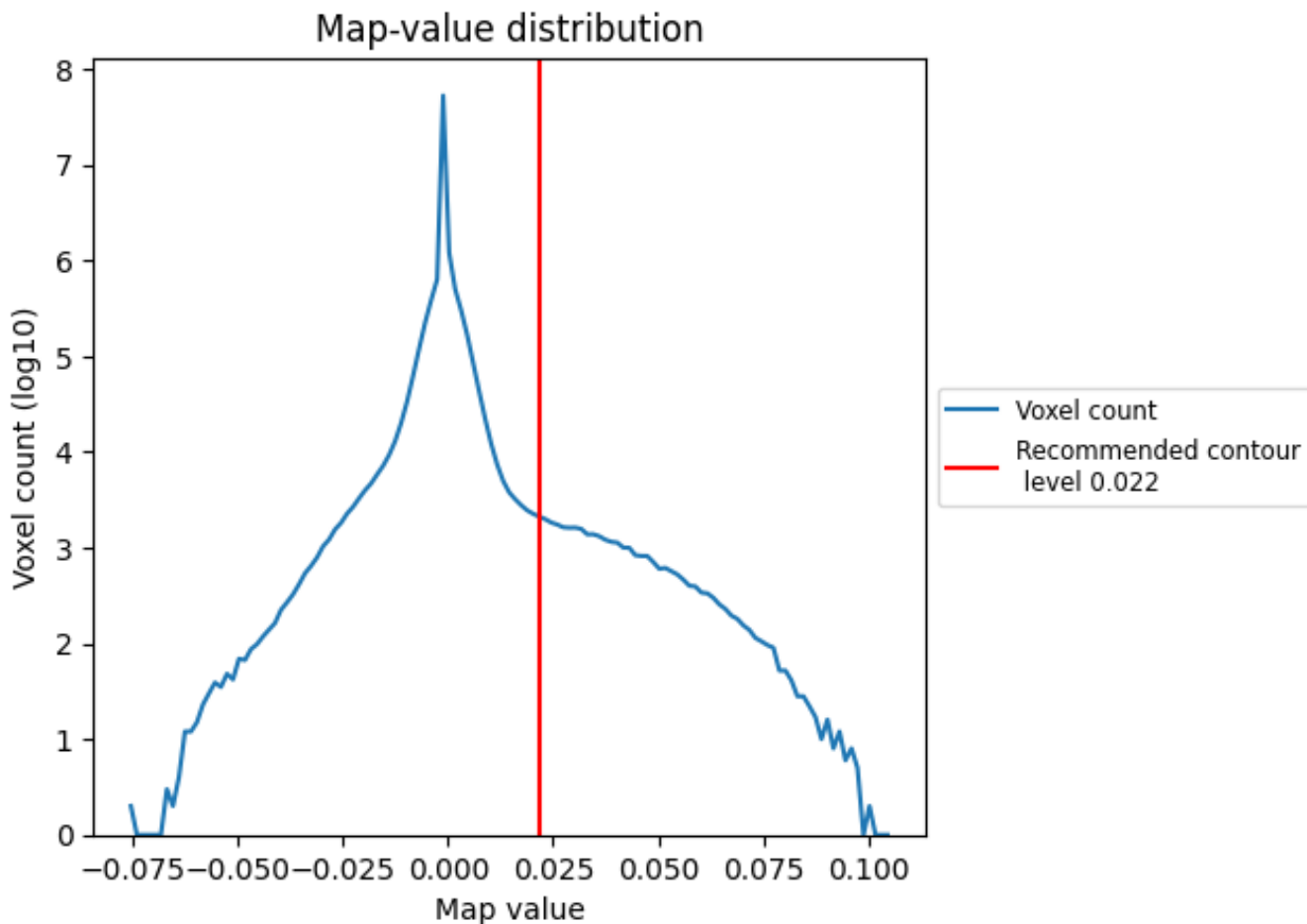
6.5 Mask visualisation

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

7 Map analysis [i](#)

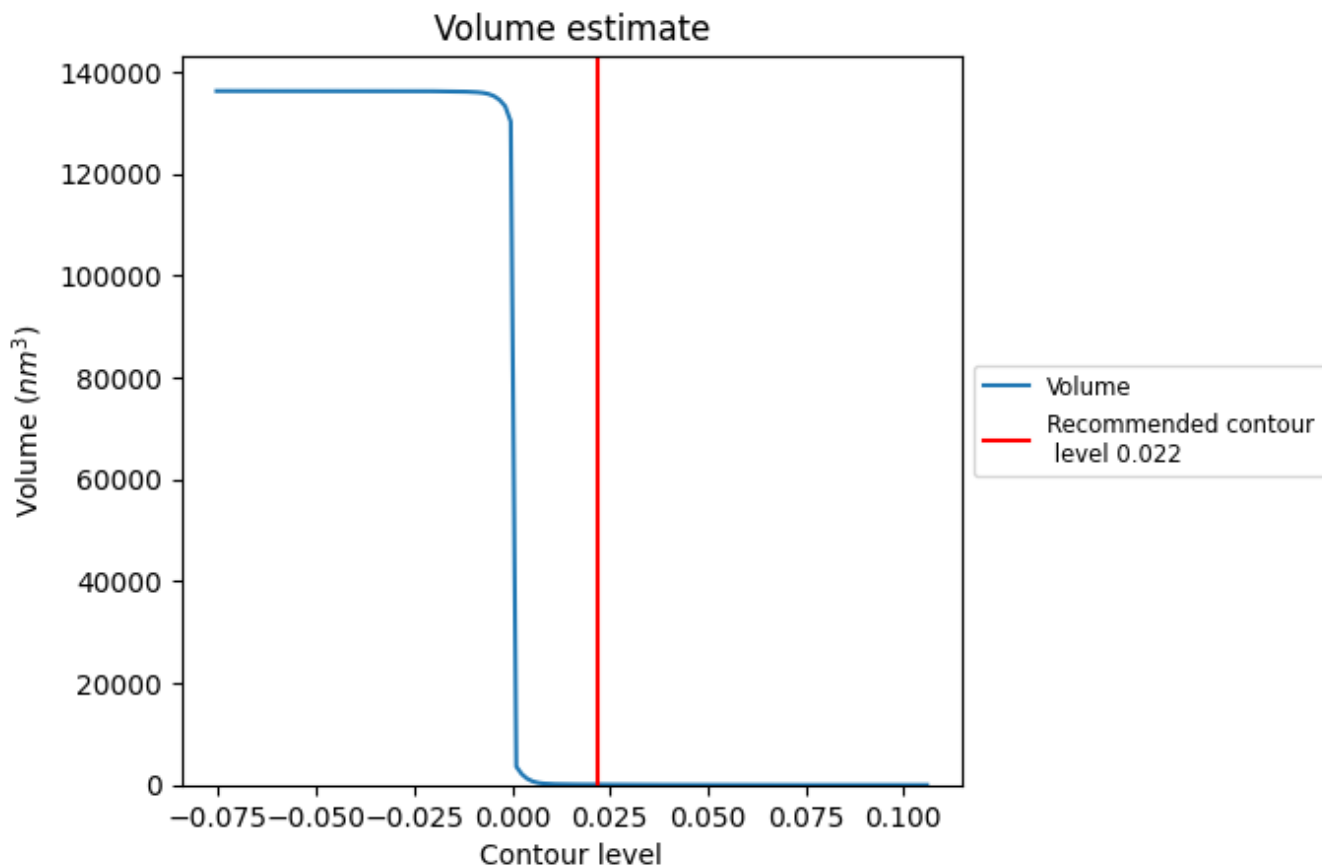
This section contains the results of statistical analysis of the map.

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.

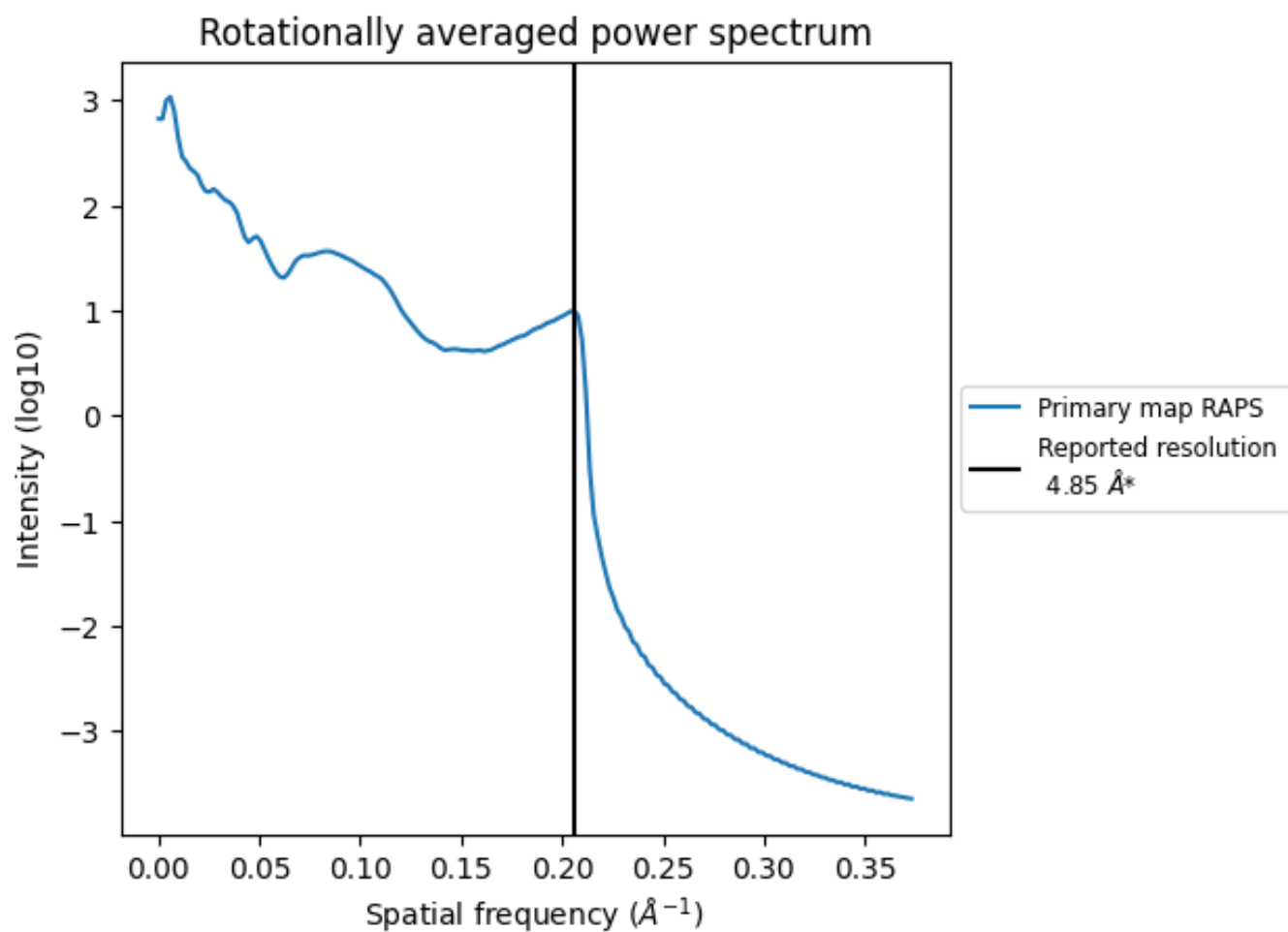
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 79 nm³; this corresponds to an approximate mass of 71 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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.206\AA^{-1}

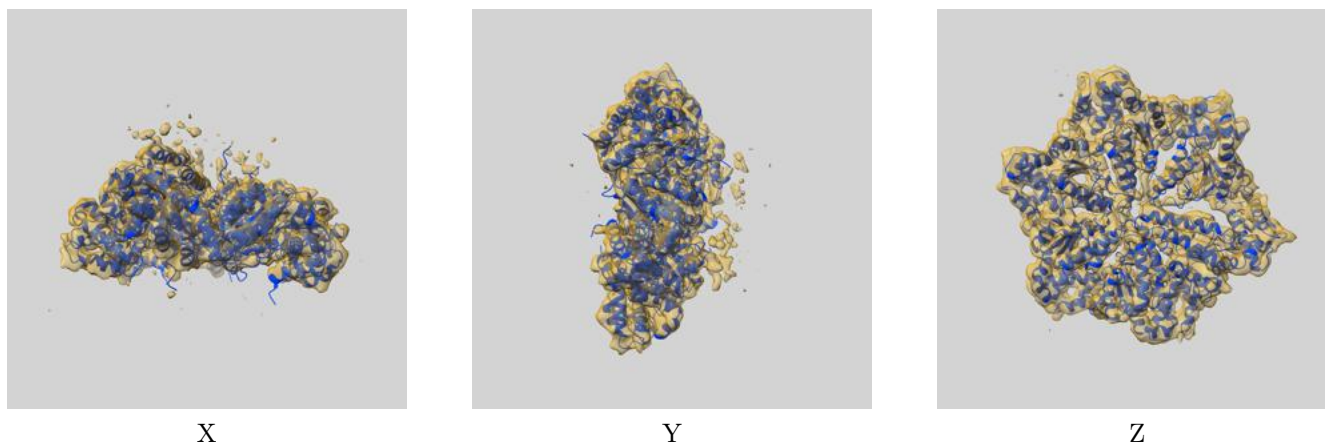
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-0209 and PDB model 6HE4. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



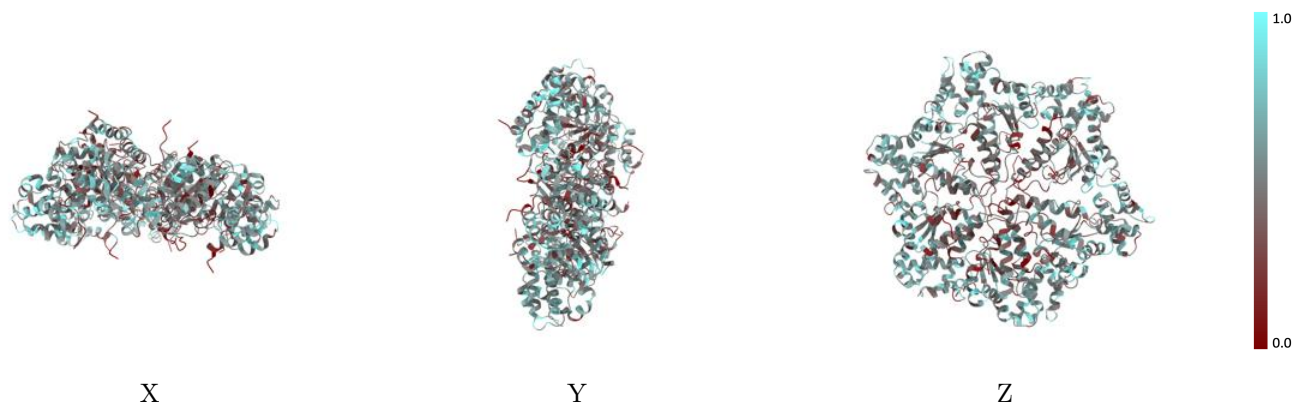
The images above show the 3D surface view of the map at the recommended contour level 0.022 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



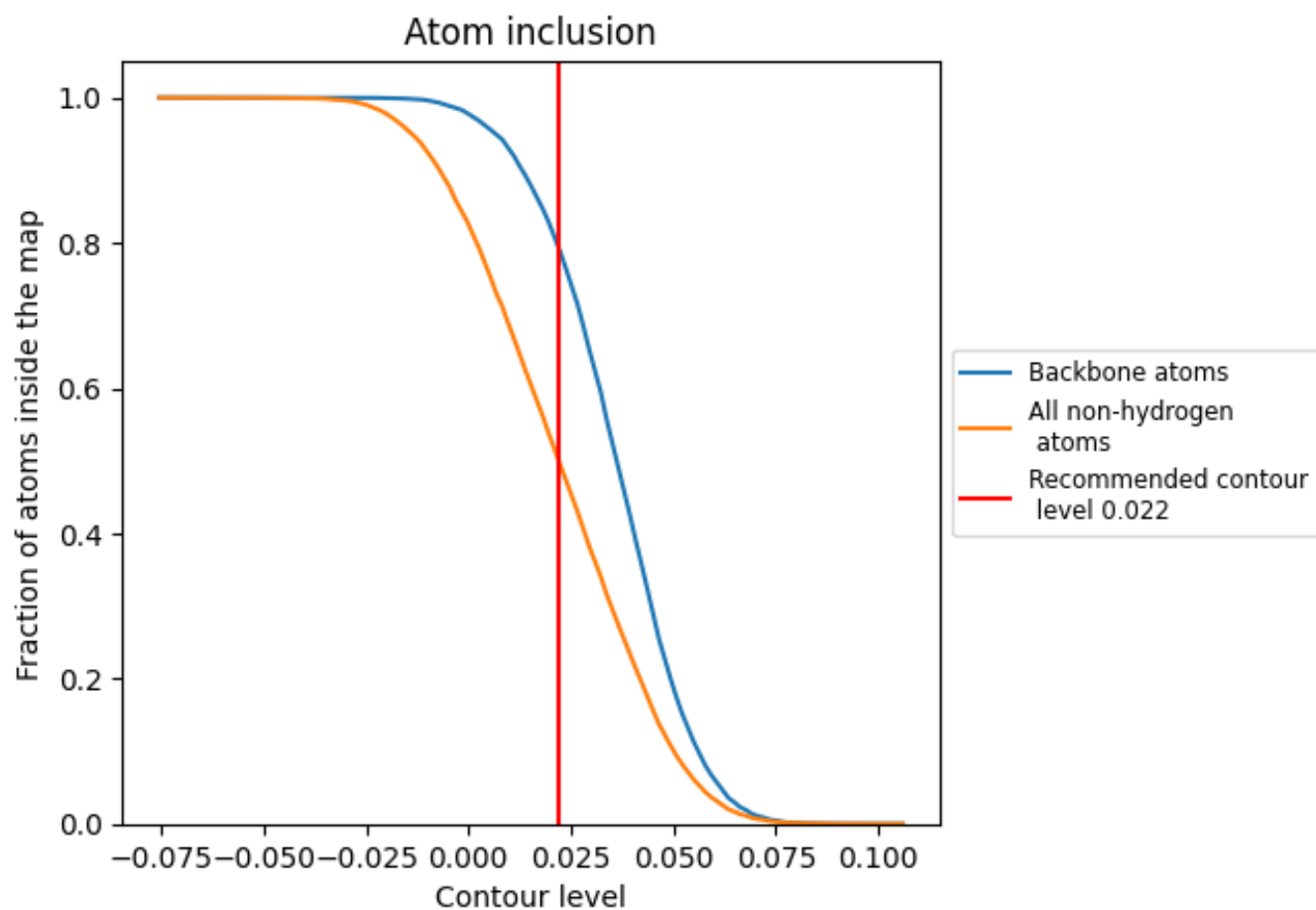
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.022).

9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 50% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.022) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5003	0.1820
H	0.5077	0.1880
I	0.4995	0.1760
J	0.5043	0.1780
K	0.5144	0.1870
L	0.5121	0.1960
M	0.4633	0.1670

