Full wwPDB EM Validation Report ⓘ

Apr 22, 2024 – 12:45 PM JST

PDB ID	:	8KI3
EMDB ID	:	EMD-37251
Title	:	Structure of the human ATP synthase bound to bedaquiline (composite)
Authors	:	Lai, Y.; Zhang, Y.; Gong, H.
Deposited on	:	2023-08-22
Resolution	:	2.89 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:

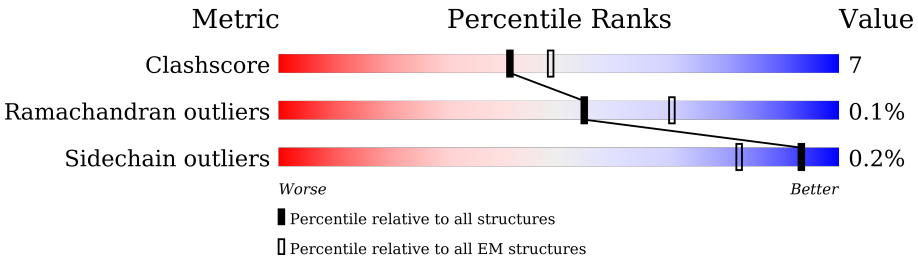
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 2.89 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 <=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	A	510	83% 16%
1	B	510	75% 18% 6%
1	C	510	76% 19% 5%
2	D	482	79% 19%
2	E	482	78% 16% 5%
2	F	482	80% 16%
3	G	273	80% 19%
4	J	81	36% 7% 57%

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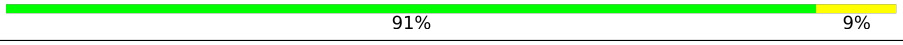
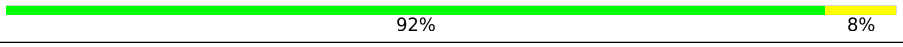
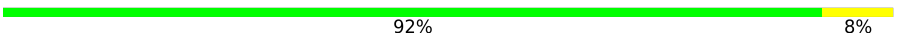
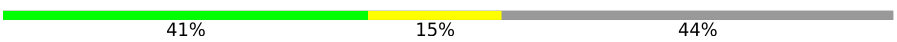
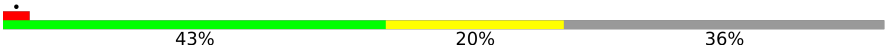
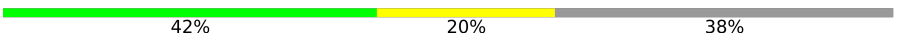
Mol	Chain	Length	Quality of chain
5	O	190	
6	1	75	
6	2	75	
6	3	75	
6	4	75	
6	5	75	
6	6	75	
6	7	75	
6	8	75	
7	H	146	
8	I	51	
9	K	214	
10	M	160	
11	N	226	
12	P	58	
13	Q	68	
14	R	93	
15	S	102	
16	T	69	
17	L	108	

2 Entry composition

There are 21 unique types of molecules in this entry. The entry contains 38662 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 ATP synthase subunit alpha, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	503	Total	C	N	O	S	0	0
			3830	2410	675	732	13		
1	B	477	Total	C	N	O	S	0	0
			3639	2290	645	692	12		
1	C	487	Total	C	N	O	S	0	0
			3714	2338	656	707	13		

- Molecule 2 is a protein called ATP synthase subunit beta, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	470	Total	C	N	O	S	0	0
			3562	2257	604	688	13		
2	E	456	Total	C	N	O	S	0	0
			3458	2192	588	666	12		
2	F	466	Total	C	N	O	S	0	0
			3529	2238	598	680	13		

- Molecule 3 is a protein called ATP synthase subunit gamma, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	271	Total	C	N	O	S	0	0
			2103	1329	359	406	9		

- Molecule 4 is a protein called ATPase inhibitor, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	J	35	Total	C	N	O	0	0
			270	163	54	53		

- Molecule 5 is a protein called ATP synthase subunit O, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	O	187	Total	C	N	O	S	0	0
			1437	909	252	270	6		

- Molecule 6 is a protein called ATP synthase F(0) complex subunit C1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	1	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	2	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	3	75	Total	C	N	O	S	1	0
			542	358	86	94	4		
6	4	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	5	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	6	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	7	75	Total	C	N	O	S	0	0
			534	353	83	94	4		
6	8	75	Total	C	N	O	S	0	0
			534	353	83	94	4		

- Molecule 7 is a protein called ATP synthase subunit delta, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	132	Total	C	N	O	S	0	0
			975	614	164	195	2		

- Molecule 8 is a protein called ATP synthase subunit epsilon, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	45	Total	C	N	O	S	0	0
			354	225	64	64	1		

- Molecule 9 is a protein called ATP synthase F(0) complex subunit B1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	K	198	Total	C	N	O	S	0	0
			1573	1013	270	285	5		

- Molecule 10 is a protein called ATP synthase subunit d, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	M	156	Total	C	N	O	S	0	0
			1259	813	199	243	4		

- Molecule 11 is a protein called ATP synthase subunit a.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	N	223	Total	C	N	O	S	0	0
			1718	1145	273	289	11		

- Molecule 12 is a protein called ATP synthase subunit ATP5MJ, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	P	41	Total	C	N	O	S	0	0
			344	234	53	54	3		

- Molecule 13 is a protein called ATP synthase protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	Q	38	Total	C	N	O	S	0	0
			307	204	47	52	4		

- Molecule 14 is a protein called ATP synthase subunit f, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	R	74	Total	C	N	O	S	0	0
			621	411	104	103	3		

- Molecule 15 is a protein called ATP synthase subunit g, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	S	77	Total	C	N	O	S	0	0
			605	401	96	107	1		

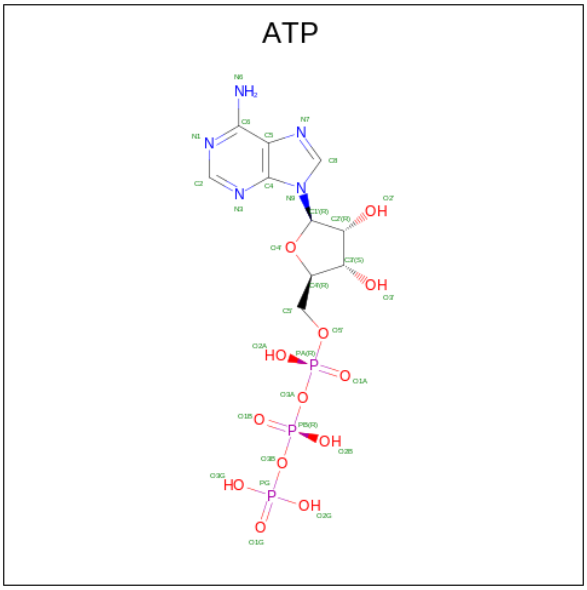
- Molecule 16 is a protein called ATP synthase subunit e, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	T	44	Total	C	N	O	0	0
			346	224	63	59		

- Molecule 17 is a protein called ATP synthase-coupling factor 6, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	L	67	Total	C	N	O	S	0	0
			549	350	91	106	2		

- Molecule 18 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).

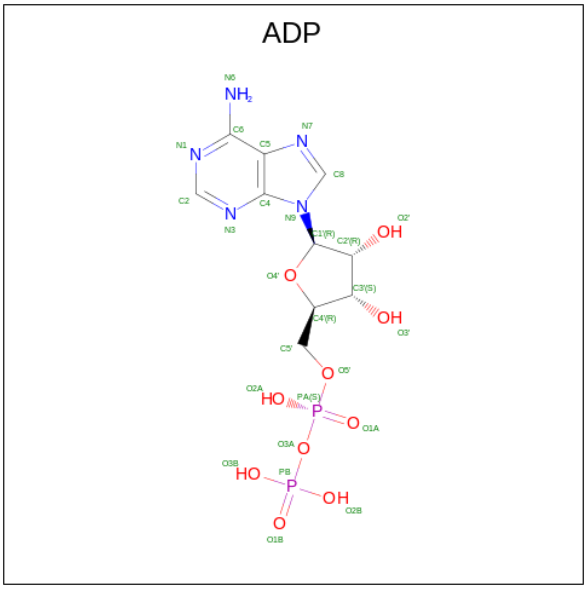


Mol	Chain	Residues	Atoms					AltConf
18	A	1	Total	C	N	O	P	0
			31	10	5	13	3	
18	B	1	Total	C	N	O	P	0
			31	10	5	13	3	
18	C	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 19 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

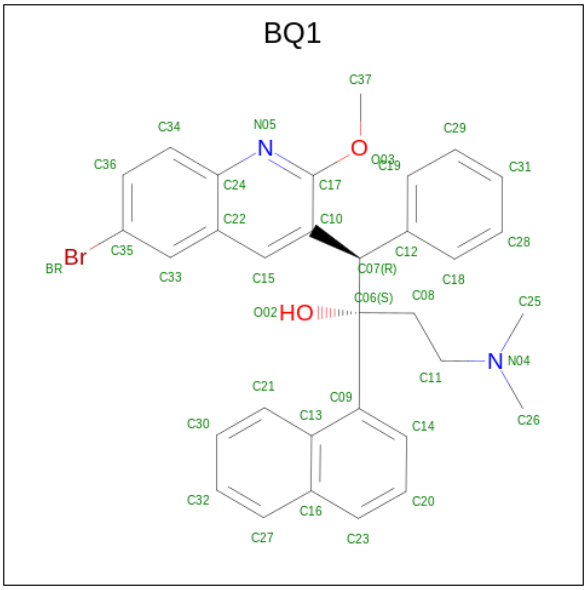
Mol	Chain	Residues	Atoms		AltConf
19	A	1	Total	Mg	0
			1	1	
19	B	1	Total	Mg	0
			1	1	
19	C	1	Total	Mg	0
			1	1	
19	D	1	Total	Mg	0
			1	1	
19	F	1	Total	Mg	0
			1	1	

- Molecule 20 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
20	D	1	Total	C	N	O	P	0
			27	10	5	10	2	
20	F	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 21 is Bedaquiline (three-letter code: BQ1) (formula: $C_{32}H_{31}BrN_2O_2$) (labeled as "Ligand of Interest" by depositor).



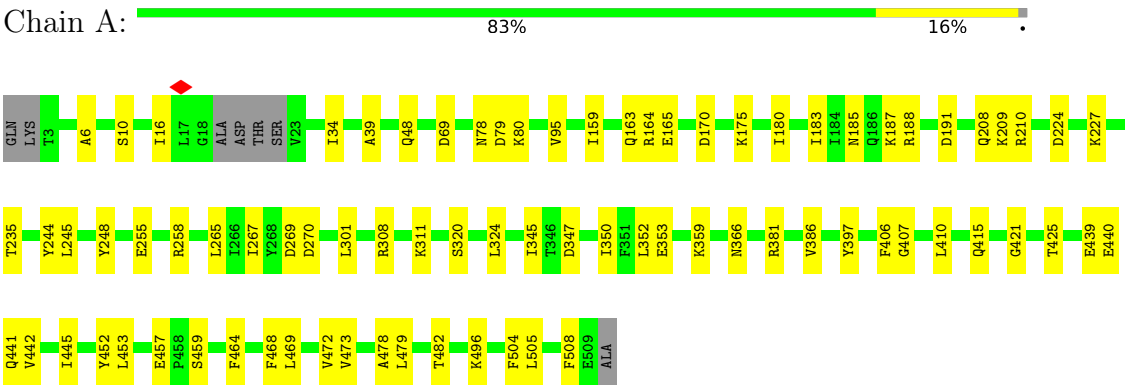
Mol	Chain	Residues	Atoms					AltConf
21	4	1	Total	Br	C	N	O	0
			37	1	32	2	2	

3 Residue-property plots (i)

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.

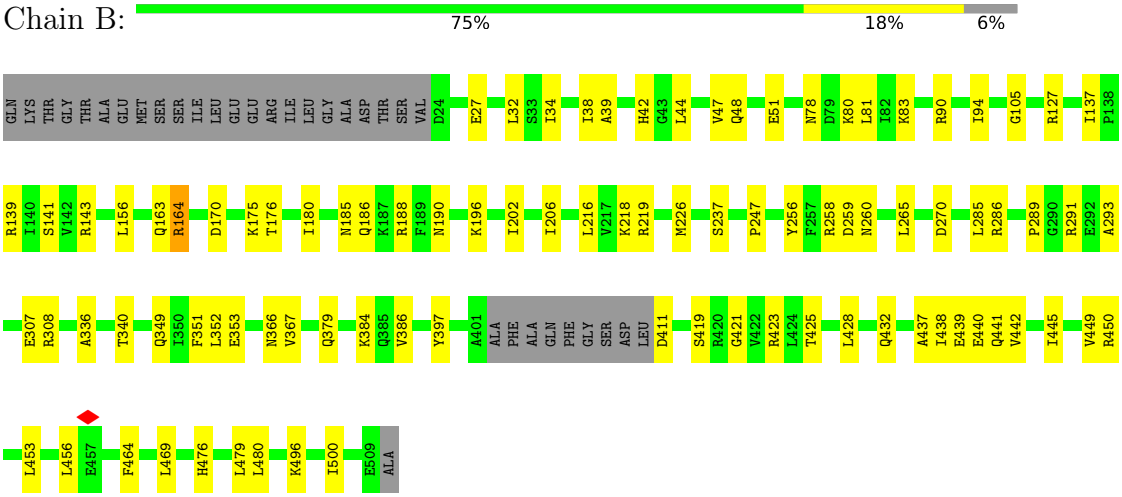
• Molecule 1: ATP synthase subunit alpha, mitochondrial

Chain A:



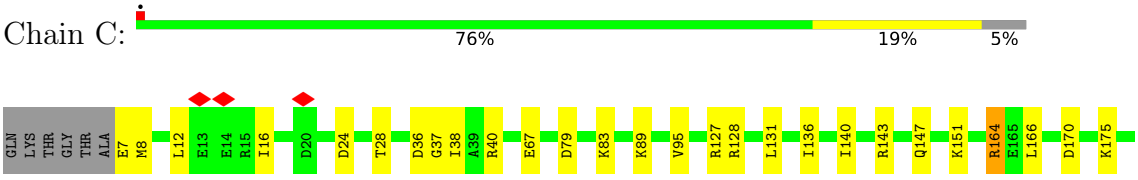
• Molecule 1: ATP synthase subunit alpha, mitochondrial

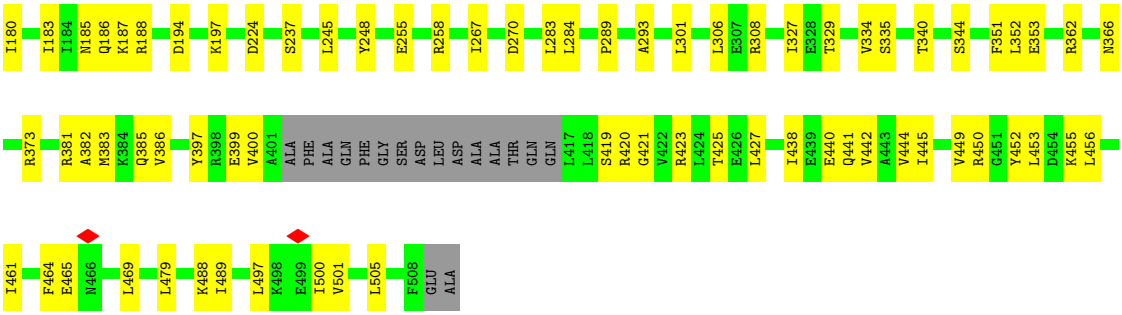
Chain B:



• Molecule 1: ATP synthase subunit alpha, mitochondrial

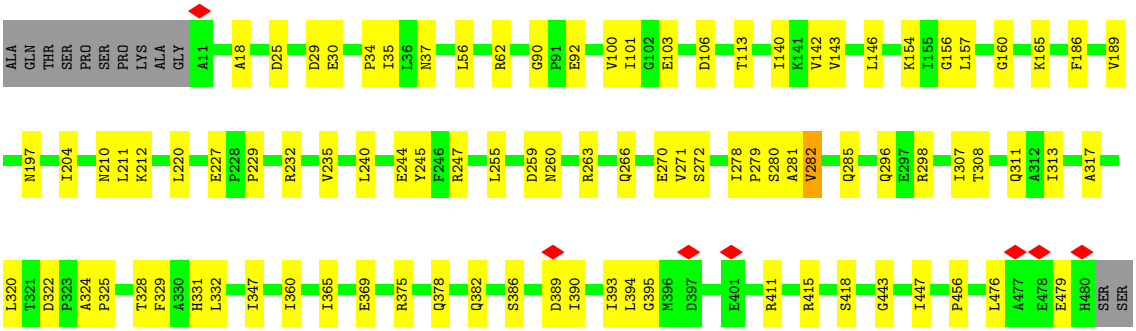
Chain C:





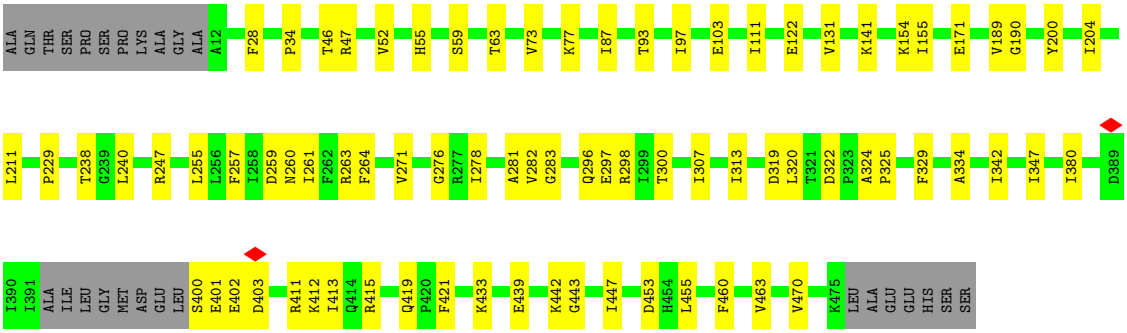
• Molecule 2: ATP synthase subunit beta, mitochondrial

Chain D:



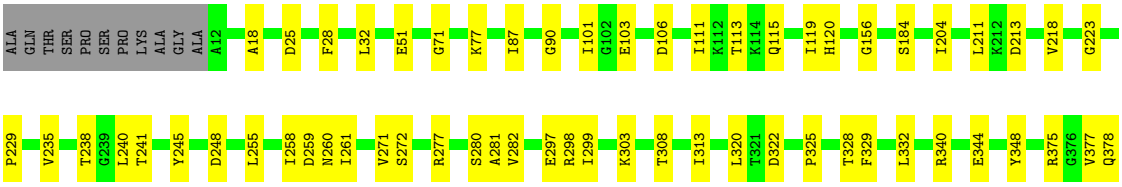
• Molecule 2: ATP synthase subunit beta, mitochondrial

Chain E:



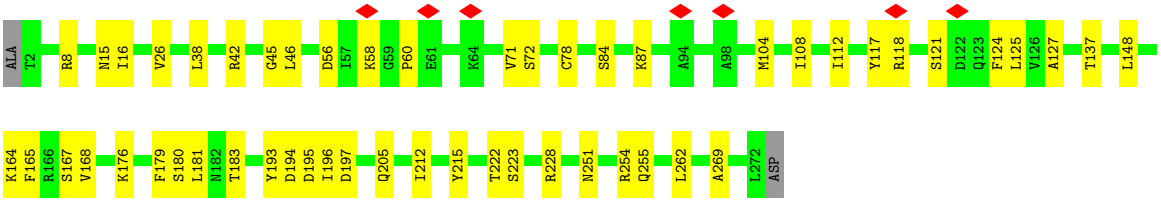
• Molecule 2: ATP synthase subunit beta, mitochondrial

Chain F:



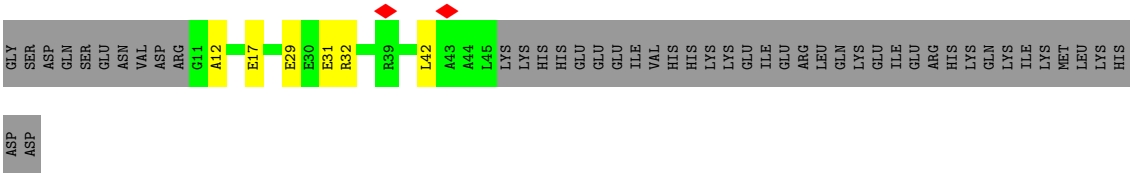
• Molecule 3: ATP synthase subunit gamma, mitochondrial

Chain G:



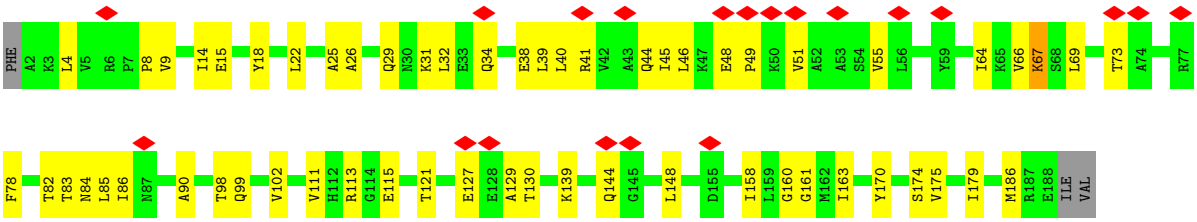
• Molecule 4: ATPase inhibitor, mitochondrial

Chain J:



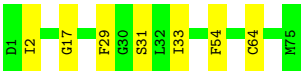
• Molecule 5: ATP synthase subunit O, mitochondrial

Chain O:



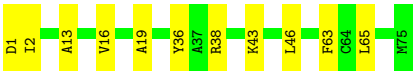
• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 1:



• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 2:



• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 3:

• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

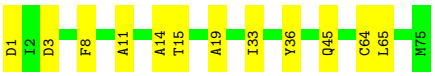
Chain 4:

• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 5:

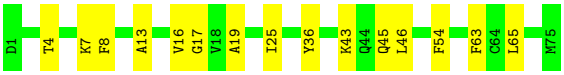
• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 6:



• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 7:

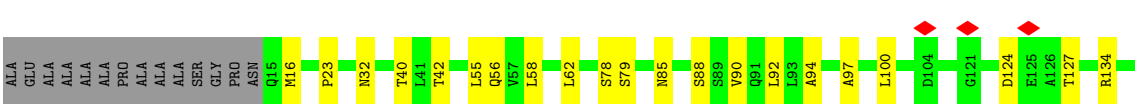


• Molecule 6: ATP synthase F(0) complex subunit C1, mitochondrial

Chain 8:

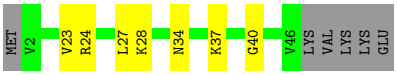
• Molecule 7: ATP synthase subunit delta, mitochondrial

Chain H:



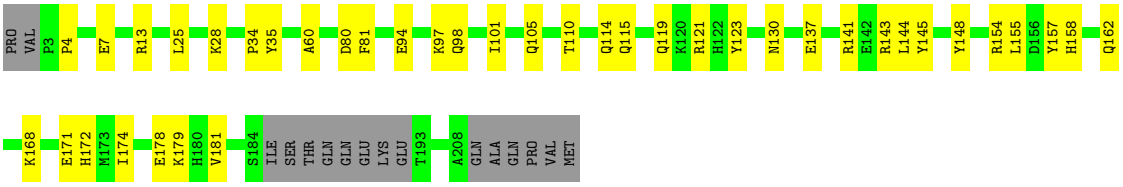
• Molecule 8: ATP synthase subunit epsilon, mitochondrial

Chain I:



• Molecule 9: ATP synthase F(0) complex subunit B1, mitochondrial

Chain K:

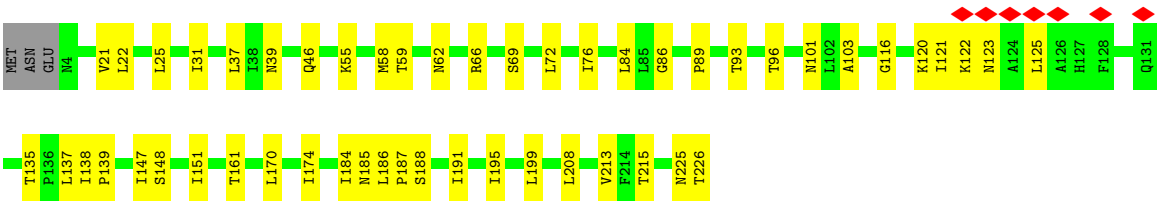


• Molecule 10: ATP synthase subunit d, mitochondrial

Chain M:

• Molecule 11: ATP synthase subunit a

Chain N:

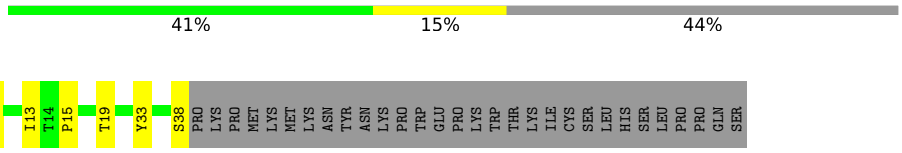


• Molecule 12: ATP synthase subunit ATP5MJ, mitochondrial

Chain P:

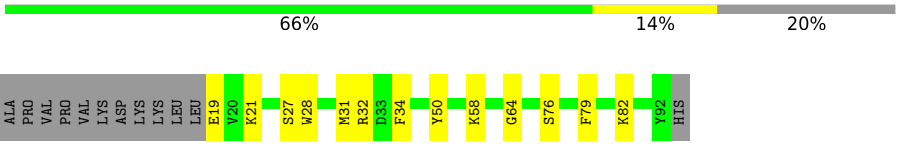
• Molecule 13: ATP synthase protein 8

Chain Q:



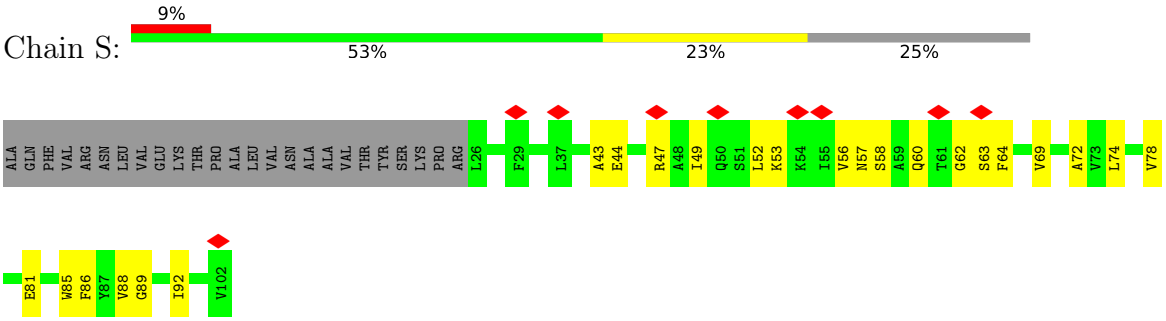
• Molecule 14: ATP synthase subunit f, mitochondrial

Chain R:



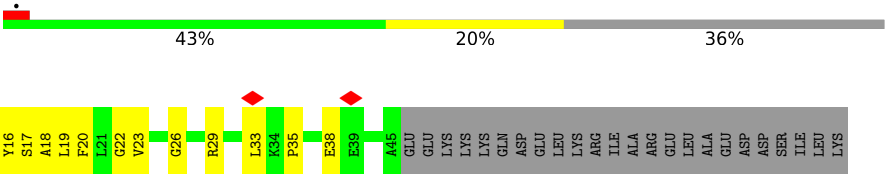
• Molecule 15: ATP synthase subunit g, mitochondrial

Chain S:



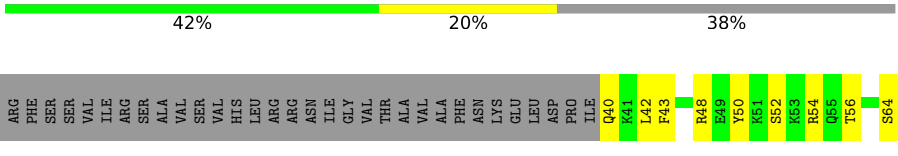
• Molecule 16: ATP synthase subunit e, mitochondrial

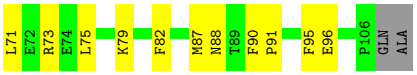
Chain T:



• Molecule 17: ATP synthase-coupling factor 6, mitochondrial

Chain L:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	84037	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 ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	46.208	Depositor
Minimum map value	-27.090	Depositor
Average map value	0.008	Depositor
Map value standard deviation	1.120	Depositor
Recommended contour level	4.0	Depositor
Map size (Å)	373.76, 373.76, 373.76	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.73, 0.73, 0.73	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ATP, BQ1, ADP, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.29	0/3880	0.43	0/5233
1	B	0.30	0/3687	0.44	0/4973
1	C	0.30	0/3762	0.45	0/5073
2	D	0.29	0/3621	0.45	0/4911
2	E	0.30	0/3515	0.44	0/4766
2	F	0.31	0/3587	0.45	0/4865
3	G	0.29	0/2129	0.41	0/2860
4	J	0.27	0/272	0.37	0/359
5	O	0.25	0/1453	0.44	0/1958
6	1	0.31	0/543	0.40	0/732
6	2	0.30	0/543	0.43	0/732
6	3	0.32	0/554	0.43	0/746
6	4	0.32	0/543	0.39	0/732
6	5	0.34	0/543	0.40	0/732
6	6	0.33	0/543	0.42	0/732
6	7	0.35	0/543	0.42	0/732
6	8	0.31	0/543	0.40	0/732
7	H	0.32	0/987	0.49	0/1344
8	I	0.31	0/359	0.41	0/482
9	K	0.30	0/1605	0.39	0/2169
10	M	0.27	0/1291	0.39	0/1755
11	N	0.29	0/1755	0.45	0/2403
12	P	0.31	0/354	0.44	0/478
13	Q	0.31	0/316	0.49	0/435
14	R	0.35	0/640	0.44	0/858
15	S	0.26	0/619	0.41	0/841
16	T	0.25	0/354	0.41	0/480
17	L	0.28	0/560	0.44	0/748
All	All	0.30	0/39101	0.43	0/52861

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3830	0	3928	53	0
1	B	3639	0	3741	62	0
1	C	3714	0	3825	71	0
2	D	3562	0	3608	59	0
2	E	3458	0	3508	58	0
2	F	3529	0	3584	50	0
3	G	2103	0	2174	35	0
4	J	270	0	257	6	0
5	O	1437	0	1536	41	0
6	1	534	0	553	5	0
6	2	534	0	553	10	0
6	3	542	0	566	10	0
6	4	534	0	553	10	0
6	5	534	0	553	4	0
6	6	534	0	553	9	0
6	7	534	0	553	13	0
6	8	534	0	553	6	0
7	H	975	0	979	15	0
8	I	354	0	364	6	0
9	K	1573	0	1552	38	0
10	M	1259	0	1238	32	0
11	N	1718	0	1879	33	0
12	P	344	0	361	3	0
13	Q	307	0	328	10	0
14	R	621	0	618	8	0
15	S	605	0	631	13	0
16	T	346	0	355	8	0
17	L	549	0	533	25	0
18	A	31	0	12	0	0
18	B	31	0	12	1	0
18	C	31	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	A	1	0	0	0	0
19	B	1	0	0	0	0
19	C	1	0	0	0	0
19	D	1	0	0	0	0
19	F	1	0	0	0	0
20	D	27	0	12	1	0
20	F	27	0	12	1	0
21	4	37	0	31	0	0
All	All	38662	0	39527	580	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 7.

All (580) 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)
2:E:283:GLY:HA2	3:G:262:LEU:HD11	1.62	0.81
6:2:38:ARG:HH11	6:3:38[A]:ARG:HH22	1.28	0.78
2:E:283:GLY:CA	3:G:262:LEU:HD11	2.16	0.76
1:B:291:ARG:NH1	2:F:322:ASP:OD1	2.20	0.75
7:H:58:LEU:HD11	7:H:92:LEU:HD11	1.69	0.74
1:B:439:GLU:HG3	1:B:480:LEU:HB3	1.71	0.72
1:C:353:GLU:OE2	1:C:366:ASN:ND2	2.22	0.71
2:F:272:SER:HB2	2:F:277:ARG:HH21	1.55	0.71
5:O:139:LYS:HB2	5:O:148:LEU:HD11	1.73	0.71
2:F:184:SER:HB3	2:F:218:VAL:HG22	1.73	0.70
6:3:65:LEU:HD11	6:4:63:PHE:HB3	1.73	0.70
9:K:130:ASN:HD21	10:M:8:LYS:H	1.38	0.70
1:B:139:ARG:NH2	1:B:307:GLU:O	2.25	0.70
1:B:440:GLU:HB3	1:B:469:LEU:HD11	1.74	0.70
1:B:419:SER:OG	1:B:423:ARG:NH1	2.25	0.69
2:E:283:GLY:HA2	3:G:262:LEU:CD1	2.22	0.69
2:E:240:LEU:HD21	2:E:298:ARG:HB2	1.75	0.69
1:B:286:ARG:NH2	2:E:276:GLY:O	2.27	0.67
9:K:13:ARG:NH2	9:K:35:TYR:OH	2.26	0.67
1:C:185:ASN:OD1	1:C:188:ARG:NH1	2.27	0.67
3:G:38:LEU:HD22	3:G:222:THR:HG21	1.78	0.65
11:N:116:GLY:HA3	11:N:225:ASN:HD22	1.61	0.65
8:I:24:ARG:HA	8:I:27:LEU:HD12	1.77	0.65
1:B:185:ASN:OD1	1:B:188:ARG:NH1	2.31	0.64
1:C:423:ARG:NH2	1:C:456:LEU:O	2.31	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:344:SER:HB3	2:D:263:ARG:HH22	1.62	0.64
2:E:281:ALA:O	2:E:283:GLY:N	2.31	0.64
1:C:381:ARG:HG3	1:C:385:GLN:HE21	1.63	0.63
2:E:380:ILE:HD11	2:E:413:ILE:HG13	1.79	0.63
2:D:255:LEU:HD23	2:D:308:THR:HB	1.81	0.63
1:C:136:ILE:O	2:D:197:ASN:ND2	2.32	0.63
1:C:440:GLU:O	1:C:444:VAL:HG23	1.98	0.63
2:F:425:GLU:OE2	2:F:432:GLY:N	2.31	0.63
5:O:40:LEU:O	5:O:44:GLN:NE2	2.32	0.63
1:A:163:GLN:NE2	1:A:165:GLU:OE2	2.32	0.63
10:M:53:TRP:O	10:M:57:LYS:N	2.28	0.63
6:2:19:ALA:HB2	6:3:17:GLY:HA2	1.81	0.62
1:A:187:LYS:NZ	1:A:191:ASP:OD2	2.31	0.62
1:A:95:VAL:HG11	1:A:245:LEU:HD21	1.79	0.62
1:A:191:ASP:OD1	1:A:227:LYS:NZ	2.33	0.62
2:D:347:ILE:HG23	2:D:418:SER:HB3	1.82	0.62
3:G:8:ARG:NH1	4:J:17:GLU:O	2.32	0.62
7:H:78:SER:HB2	8:I:23:VAL:HG21	1.82	0.62
9:K:143:ARG:NH2	17:L:96:GLU:O	2.31	0.62
10:M:155:GLN:NE2	13:Q:33:TYR:O	2.32	0.62
1:B:186:GLN:O	1:B:190:ASN:ND2	2.23	0.62
5:O:22:LEU:HD23	5:O:39:LEU:HD11	1.82	0.62
7:H:16:MET:O	7:H:32:ASN:ND2	2.32	0.62
9:K:101:ILE:O	9:K:105:GLN:N	2.32	0.62
2:D:210:ASN:ND2	2:D:212:LYS:O	2.33	0.61
9:K:137:GLU:OE1	9:K:141:ARG:NE	2.34	0.61
5:O:22:LEU:HD22	5:O:85:LEU:HD22	1.82	0.61
9:K:141:ARG:NH1	10:M:41:LEU:O	2.33	0.61
1:A:185:ASN:OD1	1:A:188:ARG:NH1	2.33	0.61
2:D:160:GLY:O	2:D:165:LYS:NZ	2.34	0.61
7:H:40:THR:HG22	7:H:42:THR:H	1.66	0.61
15:S:86:PHE:HB2	16:T:18:ALA:HB1	1.83	0.61
1:A:258:ARG:NH1	1:A:308:ARG:O	2.33	0.61
5:O:39:LEU:HB3	5:O:102:VAL:HG23	1.83	0.61
2:D:140:ILE:HB	2:D:143:VAL:HG22	1.83	0.60
2:F:325:PRO:HA	2:F:328:THR:HG22	1.81	0.60
1:B:423:ARG:NH2	1:B:456:LEU:O	2.27	0.60
7:H:124:ASP:HB3	7:H:127:THR:HG22	1.82	0.60
2:E:190:GLY:O	2:E:263:ARG:NH1	2.35	0.60
2:D:389:ASP:OD2	3:G:15:ASN:ND2	2.35	0.60
1:B:78:ASN:ND2	2:E:122:GLU:OE2	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:O:121:THR:HB	5:O:163:ILE:HB	1.83	0.59
16:T:20:PHE:HA	16:T:23:VAL:HG12	1.83	0.59
2:D:411:ARG:O	2:D:415:ARG:HG2	2.02	0.59
17:L:66:GLU:HG3	17:L:69:GLN:HE22	1.67	0.59
1:B:170:ASP:O	1:B:175:LYS:NZ	2.35	0.59
2:E:260:ASN:HB3	2:E:263:ARG:HG3	1.83	0.59
14:R:79:PHE:O	14:R:82:LYS:NZ	2.36	0.59
2:E:401:GLU:HG2	2:E:402:GLU:H	1.67	0.59
1:C:8:MET:O	17:L:54:ARG:NH1	2.36	0.59
1:A:255:GLU:OE1	1:A:258:ARG:NH2	2.35	0.59
1:B:38:ILE:HD13	1:B:285:LEU:HD21	1.84	0.59
7:H:134:ARG:O	7:H:138:ASN:ND2	2.33	0.59
6:2:65:LEU:HD11	6:3:63:PHE:HB3	1.85	0.59
9:K:162:GLN:NE2	10:M:59:ASN:O	2.35	0.59
2:D:390:ILE:HG23	2:D:394:LEU:HD12	1.85	0.58
6:2:1:ASP:OD1	6:2:2:ILE:N	2.36	0.58
3:G:193:TYR:OH	7:H:85:ASN:ND2	2.35	0.58
6:7:19:ALA:HB2	6:8:17:GLY:HA2	1.86	0.58
9:K:158:HIS:HE2	17:L:88:ASN:HA	1.67	0.58
11:N:121:ILE:HG23	11:N:122:LYS:HD3	1.83	0.58
3:G:104:MET:HG2	3:G:125:LEU:HB2	1.85	0.58
3:G:84:SER:HA	3:G:87:LYS:HE3	1.84	0.58
11:N:184:ILE:HG22	11:N:185:ASN:H	1.67	0.58
1:C:237:SER:HB3	2:F:297:GLU:HG3	1.85	0.58
1:B:175:LYS:HG2	1:B:352:LEU:HD12	1.84	0.58
2:D:360:ILE:HB	2:D:365:ILE:HG21	1.85	0.58
2:D:92:GLU:HB2	2:D:113:THR:HG22	1.86	0.58
1:A:440:GLU:HB3	1:A:469:LEU:HD11	1.86	0.57
1:C:444:VAL:HG22	1:C:469:LEU:HD21	1.85	0.57
2:F:411:ARG:O	2:F:415:ARG:HG2	2.04	0.57
1:B:421:GLY:O	1:B:425:THR:HG23	2.04	0.57
2:F:240:LEU:HD11	2:F:299:ILE:HD11	1.87	0.57
6:6:45:GLN:O	6:6:45:GLN:NE2	2.36	0.57
9:K:158:HIS:NE2	17:L:87:MET:O	2.37	0.57
1:C:7:GLU:O	17:L:50:TYR:OH	2.23	0.57
3:G:78:CYS:SG	3:G:228:ARG:NH2	2.77	0.57
1:B:289:PRO:HB2	1:B:293:ALA:HA	1.86	0.57
1:B:397:TYR:CG	1:B:421:GLY:HA3	2.40	0.57
1:C:175:LYS:HG2	1:C:352:LEU:HD12	1.86	0.56
6:7:36:TYR:HE1	6:7:43:LYS:HB2	1.70	0.56
10:M:52:ASP:OD2	10:M:53:TRP:N	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:258:ILE:HG21	2:F:261:ILE:HD13	1.87	0.56
3:G:176:LYS:HB3	3:G:212:ILE:HD11	1.85	0.56
9:K:28:LYS:HD3	15:S:74:LEU:HD22	1.86	0.56
2:E:154:LYS:HG2	2:E:296:GLN:NE2	2.21	0.56
5:O:9:VAL:HB	5:O:111:VAL:HG11	1.87	0.56
9:K:94:GLU:O	9:K:98:GLN:HG2	2.04	0.56
1:C:427:LEU:HD21	1:C:445:ILE:HA	1.88	0.56
2:D:229:PRO:HB2	2:D:271:VAL:HG13	1.88	0.56
6:2:13:ALA:O	6:2:16:VAL:HG12	2.06	0.56
5:O:127:GLU:HB3	5:O:130:THR:HG22	1.88	0.56
5:O:66:VAL:HG22	5:O:90:ALA:HB1	1.88	0.56
6:4:33:ILE:HG23	6:5:46:LEU:HD22	1.87	0.56
2:E:46:THR:HG22	2:E:47:ARG:H	1.71	0.55
1:B:353:GLU:OE2	1:B:366:ASN:ND2	2.39	0.55
1:C:383:MET:HB2	1:C:438:ILE:HD11	1.87	0.55
11:N:76:ILE:HB	11:N:215:THR:HG21	1.88	0.55
2:E:322:ASP:HB3	2:E:325:PRO:HD2	1.88	0.55
17:L:75:LEU:O	17:L:79:LYS:N	2.39	0.55
2:E:401:GLU:HG2	2:E:402:GLU:N	2.21	0.55
9:K:97:LYS:HZ1	10:M:124:LEU:HB2	1.71	0.55
10:M:67:ASP:OD2	10:M:68:ASP:N	2.40	0.55
11:N:174:ILE:HD12	11:N:199:LEU:HD22	1.89	0.55
12:P:39:ARG:HG2	13:Q:6:THR:HB	1.89	0.55
5:O:8:PRO:HG2	5:O:111:VAL:HG13	1.89	0.55
1:A:265:LEU:HD11	1:A:324:LEU:HD12	1.88	0.55
1:C:255:GLU:OE2	1:C:308:ARG:NE	2.34	0.55
14:R:19:GLU:OE1	14:R:21:LYS:NZ	2.37	0.55
5:O:46:LEU:HD12	5:O:98:THR:HG21	1.89	0.55
1:A:79:ASP:HB3	2:D:35:ILE:HD12	1.89	0.54
2:D:227:GLU:O	2:D:232:ARG:NH1	2.40	0.54
1:C:140:ILE:HD13	1:C:143:ARG:HH12	1.71	0.54
2:D:154:LYS:NZ	2:D:296:GLN:O	2.38	0.54
14:R:50:TYR:OH	14:R:64:GLY:O	2.22	0.54
1:C:36:ASP:OD1	2:F:277:ARG:NH1	2.41	0.54
16:T:22:GLY:O	16:T:26:GLY:N	2.33	0.54
1:C:270:ASP:N	1:C:270:ASP:OD1	2.41	0.54
2:D:322:ASP:HB3	2:D:325:PRO:HD2	1.88	0.54
9:K:121:ARG:NH1	10:M:18:ILE:O	2.40	0.54
1:A:10:SER:HA	5:O:4:LEU:HD11	1.89	0.54
5:O:99:GLN:HA	5:O:102:VAL:HG12	1.88	0.54
10:M:21:GLN:HA	10:M:24:LYS:HG2	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:K:168:LYS:HD3	17:L:71:LEU:HD13	1.88	0.54
2:D:325:PRO:HA	2:D:328:THR:HG22	1.90	0.53
5:O:127:GLU:HG3	5:O:129:ALA:H	1.72	0.53
1:C:147:GLN:O	1:C:186:GLN:NE2	2.32	0.53
2:D:189:VAL:HG22	2:D:235:VAL:HG13	1.89	0.53
3:G:197:ASP:OD1	3:G:197:ASP:N	2.41	0.53
16:T:14:GLY:HA2	16:T:17:SER:HB3	1.89	0.53
2:F:18:ALA:HB3	2:F:25:ASP:HB2	1.89	0.53
1:B:156:LEU:HD13	1:B:367:VAL:HG11	1.89	0.53
10:M:158:GLU:OE2	11:N:66:ARG:NH2	2.36	0.53
1:B:432:GLN:HE22	18:B:601:ATP:H2'	1.72	0.53
7:H:16:MET:HE3	7:H:90:VAL:HG21	1.89	0.53
9:K:148:TYR:HE1	10:M:51:ILE:HB	1.74	0.53
1:B:141:SER:OG	1:B:143:ARG:NH2	2.42	0.53
9:K:80:ASP:OD2	9:K:81:PHE:N	2.42	0.52
10:M:119:GLU:HA	10:M:122:LYS:HB2	1.91	0.52
2:F:87:ILE:HG21	2:F:238:THR:HG23	1.91	0.52
6:6:19:ALA:HB2	6:7:17:GLY:HA2	1.90	0.52
2:E:415:ARG:HB2	2:E:460:PHE:HB2	1.90	0.52
2:F:101:ILE:HG13	2:F:103:GLU:HG3	1.91	0.52
2:F:419:GLN:NE2	2:F:433:LYS:O	2.40	0.52
5:O:38:GLU:OE1	5:O:82:THR:OG1	2.25	0.52
1:C:362:ARG:NH2	2:F:375:ARG:HD2	2.25	0.52
1:C:455:LYS:HG3	1:C:456:LEU:HD12	1.92	0.52
15:S:58:SER:HA	15:S:63:SER:HB3	1.92	0.52
2:D:263:ARG:HH11	2:D:266:GLN:HE22	1.56	0.52
2:F:340:ARG:O	2:F:344:GLU:HG2	2.10	0.52
10:M:20:PRO:HG2	10:M:23:GLN:HG2	1.92	0.52
6:1:2:ILE:HG23	6:8:5:ALA:HB2	1.92	0.52
11:N:55:LYS:O	11:N:59:THR:OG1	2.21	0.52
6:3:33:ILE:HG23	6:4:46:LEU:HD22	1.92	0.52
9:K:97:LYS:NZ	10:M:124:LEU:HB2	2.25	0.52
1:A:397:TYR:CG	1:A:421:GLY:HA3	2.45	0.51
1:A:478:ALA:O	1:A:482:THR:HG23	2.10	0.51
5:O:113:ARG:NH1	5:O:115:GLU:OE2	2.41	0.51
2:F:377:VAL:HG13	2:F:413:ILE:HG21	1.92	0.51
2:F:408:SER:OG	2:F:412:LYS:NZ	2.42	0.51
10:M:125:ILE:HD12	10:M:125:ILE:H	1.76	0.51
1:B:496:LYS:O	1:B:500:ILE:HG13	2.09	0.51
11:N:62:ASN:ND2	11:N:226:THR:O	2.40	0.51
11:N:188:SER:O	11:N:191:ILE:HG22	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:4:19:ALA:HB2	6:5:17:GLY:HA2	1.92	0.51
5:O:41:ARG:O	5:O:45:ILE:HG13	2.11	0.51
1:A:170:ASP:O	1:A:175:LYS:NZ	2.41	0.51
1:C:335:SER:O	1:C:335:SER:OG	2.28	0.51
1:C:455:LYS:HD3	1:C:505:LEU:HD21	1.93	0.51
9:K:154:ARG:HE	17:L:91:PRO:HB3	1.76	0.51
10:M:53:TRP:HB3	10:M:57:LYS:HE3	1.93	0.50
5:O:26:ALA:HB3	5:O:32:LEU:HD23	1.92	0.50
5:O:73:THR:HG22	5:O:83:THR:HG22	1.93	0.50
2:D:186:PHE:HB3	2:D:220:LEU:HD23	1.91	0.50
12:P:4:SER:HA	12:P:7:LYS:HB3	1.94	0.50
2:E:229:PRO:HB2	2:E:271:VAL:HG23	1.94	0.50
2:E:52:VAL:HA	2:E:63:THR:HG22	1.92	0.50
5:O:64:ILE:O	5:O:67:LYS:HG3	2.11	0.50
5:O:82:THR:O	5:O:86:ILE:HG13	2.11	0.50
10:M:53:TRP:NE1	10:M:70:GLU:OE1	2.44	0.50
17:L:64:SER:OG	17:L:66:GLU:O	2.29	0.50
1:A:210:ARG:HG2	1:A:235:THR:HG21	1.92	0.50
2:E:400:SER:N	2:E:403:ASP:HB2	2.26	0.50
2:F:255:LEU:HD23	2:F:308:THR:HB	1.93	0.50
1:B:258:ARG:NH1	1:B:308:ARG:O	2.45	0.50
5:O:179:ILE:HG22	17:L:42:LEU:HD11	1.94	0.50
1:C:258:ARG:NH1	1:C:308:ARG:O	2.45	0.50
2:E:439:GLU:HA	2:E:442:LYS:HG2	1.92	0.50
5:O:29:GLN:HB3	5:O:31:LYS:HE2	1.94	0.50
5:O:186:MET:SD	9:K:174:ILE:HG13	2.52	0.50
2:E:411:ARG:O	2:E:415:ARG:HG2	2.11	0.49
1:A:270:ASP:OD1	1:A:270:ASP:N	2.45	0.49
1:B:256:TYR:O	1:B:260:ASN:ND2	2.40	0.49
1:C:12:LEU:HD23	17:L:50:TYR:CD2	2.47	0.49
1:C:83:LYS:NZ	2:F:32:LEU:O	2.45	0.49
2:D:375:ARG:NH1	2:D:378:GLN:OE1	2.42	0.49
11:N:58:MET:HE1	11:N:72:LEU:HD12	1.94	0.49
1:C:400:VAL:HB	4:J:32:ARG:HD3	1.94	0.49
2:E:247:ARG:HD3	2:E:307:ILE:HG13	1.95	0.49
6:1:17:GLY:HA3	6:1:64:CYS:SG	2.53	0.49
2:E:87:ILE:HD13	2:E:238:THR:HG23	1.94	0.49
1:A:452:TYR:HB3	1:A:505:LEU:HD11	1.94	0.49
2:E:419:GLN:NE2	2:E:433:LYS:O	2.43	0.49
2:F:28:PHE:HB2	2:F:32:LEU:HD12	1.94	0.49
6:4:25:ILE:HD12	6:5:60:MET:HG3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:N:120:LYS:HG2	11:N:123:ASN:HB3	1.95	0.49
1:C:382:ALA:HB1	1:C:489:ILE:HG23	1.94	0.49
1:C:444:VAL:CG2	1:C:469:LEU:HD21	2.42	0.49
1:C:453:LEU:HD21	1:C:464:PHE:CE2	2.48	0.48
1:C:479:LEU:HD13	1:C:500:ILE:HD12	1.95	0.48
8:I:34:ASN:HA	8:I:37:LYS:NZ	2.28	0.48
11:N:191:ILE:O	11:N:195:ILE:HG12	2.13	0.48
1:B:83:LYS:HD3	2:E:34:PRO:HG3	1.95	0.48
2:F:229:PRO:HB2	2:F:271:VAL:HG13	1.96	0.48
2:E:204:ILE:HD13	2:E:211:LEU:HD11	1.94	0.48
3:G:117:TYR:O	3:G:121:SER:HB2	2.14	0.48
9:K:171:GLU:O	9:K:174:ILE:HG22	2.14	0.48
1:C:334:VAL:HG11	1:C:351:PHE:HE1	1.78	0.48
2:E:141:LYS:NZ	2:E:463:VAL:O	2.43	0.48
2:F:51:GLU:OE2	2:F:120:HIS:NE2	2.42	0.48
1:C:28:THR:HG22	1:C:89:LYS:HG2	1.95	0.48
9:K:4:PRO:HB3	10:M:129:GLN:HE21	1.78	0.48
9:K:115:GLN:HG2	10:M:104:VAL:HG23	1.95	0.48
1:A:16:ILE:O	5:O:84:ASN:ND2	2.41	0.48
10:M:78:VAL:HG23	17:L:95:PHE:CE2	2.48	0.48
1:B:438:ILE:O	1:B:442:VAL:HG13	2.14	0.48
1:C:420:ARG:NH1	1:C:449:VAL:O	2.47	0.48
2:D:313:ILE:HG21	2:D:328:THR:HG21	1.96	0.48
11:N:121:ILE:O	11:N:125:LEU:HG	2.12	0.48
15:S:78:VAL:HA	15:S:81:GLU:HB3	1.95	0.48
1:A:421:GLY:O	1:A:425:THR:HG23	2.14	0.48
1:B:270:ASP:OD1	1:B:270:ASP:N	2.47	0.48
1:C:164:ARG:NH1	1:C:306:LEU:O	2.46	0.48
1:C:399:GLU:HB3	4:J:31:GLU:OE1	2.14	0.48
5:O:158:ILE:HG13	5:O:160:GLY:H	1.79	0.48
6:6:1:ASP:OD1	6:6:3:ASP:N	2.47	0.48
6:6:8:PHE:CD2	6:7:7:LYS:HG2	2.48	0.48
1:B:127:ARG:NH2	1:B:259:ASP:OD2	2.47	0.47
2:D:324:ALA:HB3	2:D:325:PRO:HD3	1.96	0.47
3:G:71:VAL:HG22	3:G:108:ILE:HD12	1.96	0.47
10:M:141:GLU:OE1	13:Q:38:SER:N	2.47	0.47
1:B:336:ALA:O	1:B:340:THR:OG1	2.26	0.47
1:B:445:ILE:O	1:B:449:VAL:HG22	2.14	0.47
1:C:283:LEU:HD21	1:C:289:PRO:HB3	1.97	0.47
1:C:187:LYS:HE2	1:C:224:ASP:HB3	1.95	0.47
2:D:232:ARG:NH2	2:D:270:GLU:OE1	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:G:180:SER:OG	3:G:181:LEU:N	2.47	0.47
2:D:395:GLY:HA2	4:J:29:GLU:OE2	2.14	0.47
2:E:28:PHE:O	2:E:59:SER:HB3	2.14	0.47
3:G:194:ASP:OD1	3:G:195:ASP:N	2.48	0.47
9:K:123:TYR:HE2	10:M:11:ASP:HB2	1.80	0.47
1:C:289:PRO:HB2	1:C:293:ALA:HA	1.96	0.47
6:2:36:TYR:HE1	6:2:43:LYS:HB2	1.80	0.47
1:C:12:LEU:HD23	17:L:50:TYR:HB3	1.97	0.47
2:F:380:ILE:HG21	2:F:413:ILE:HD12	1.96	0.47
6:7:36:TYR:CE1	6:7:43:LYS:HB2	2.49	0.47
1:C:397:TYR:CG	1:C:421:GLY:HA3	2.49	0.47
2:D:18:ALA:HB3	2:D:25:ASP:HB2	1.97	0.47
2:F:223:GLY:N	2:F:235:VAL:HG21	2.29	0.47
6:2:38:ARG:HE	6:3:38[A]:ARG:NH2	2.13	0.47
10:M:68:ASP:OD1	10:M:69:PHE:N	2.48	0.47
1:A:208:GLN:NE2	1:A:269:ASP:O	2.48	0.46
1:B:476:HIS:CG	1:B:500:ILE:HD13	2.50	0.46
2:E:189:VAL:HG11	2:E:264:PHE:HB2	1.96	0.46
3:G:45:GLY:HA3	3:G:215:TYR:HB2	1.97	0.46
7:H:40:THR:HG23	7:H:56:GLN:HB3	1.97	0.46
9:K:7:GLU:HA	14:R:58:LYS:HG2	1.96	0.46
11:N:21:VAL:HG12	13:Q:15:PRO:HG3	1.96	0.46
1:B:137:ILE:HG13	2:F:106:ASP:HA	1.98	0.46
1:B:206:ILE:HD11	1:B:247:PRO:HG3	1.96	0.46
2:F:111:ILE:HG22	2:F:113:THR:HG23	1.97	0.46
2:F:280:SER:OG	2:F:281:ALA:N	2.48	0.46
2:F:436:PRO:HD2	2:F:439:GLU:HG3	1.98	0.46
6:3:55:ALA:HB3	11:N:213:VAL:HG21	1.97	0.46
10:M:33:TRP:O	10:M:37:LEU:HG	2.15	0.46
15:S:43:ALA:O	15:S:47:ARG:NH1	2.48	0.46
1:A:441:GLN:O	1:A:445:ILE:HG12	2.15	0.46
1:C:427:LEU:HD11	1:C:444:VAL:HG12	1.98	0.46
2:E:247:ARG:NH1	2:E:300:THR:O	2.47	0.46
5:O:161:GLY:HA3	5:O:174:SER:HA	1.98	0.46
11:N:138:ILE:N	11:N:139:PRO:HD2	2.30	0.46
1:B:453:LEU:HD11	1:B:464:PHE:HE1	1.81	0.46
3:G:124:PHE:HE2	3:G:127:ALA:HB2	1.81	0.46
1:C:419:SER:O	1:C:423:ARG:HD3	2.15	0.46
1:C:465:GLU:O	1:C:469:LEU:HD23	2.16	0.46
2:E:412:LYS:HZ1	2:E:453:ASP:HA	1.80	0.46
5:O:69:LEU:O	5:O:73:THR:OG1	2.21	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:7:13:ALA:O	6:7:16:VAL:HG12	2.15	0.46
15:S:62:GLY:HA2	15:S:64:PHE:CE1	2.51	0.46
1:A:244:TYR:HE1	1:A:301:LEU:HD13	1.81	0.46
2:E:171:GLU:HG2	2:E:421:PHE:CD1	2.50	0.46
1:A:468:PHE:O	1:A:472:VAL:HG23	2.16	0.46
9:K:110:THR:O	9:K:114:GLN:HG2	2.16	0.46
1:A:34:ILE:HD13	1:A:39:ALA:HB2	1.97	0.46
1:A:504:PHE:O	1:A:508:PHE:N	2.48	0.46
2:E:97:ILE:HD11	2:E:200:TYR:CD2	2.51	0.46
2:F:213:ASP:N	2:F:213:ASP:OD1	2.49	0.46
6:7:4:THR:HA	6:7:7:LYS:HE2	1.98	0.46
9:K:172:HIS:CE1	17:L:64:SER:HA	2.50	0.46
15:S:44:GLU:HB2	16:T:9:PRO:HB3	1.97	0.46
1:A:406:PHE:HB3	3:G:26:VAL:HG21	1.98	0.45
2:E:259:ASP:HA	2:E:260:ASN:HA	1.65	0.45
15:S:53:LYS:HA	15:S:56:VAL:HG12	1.98	0.45
1:B:34:ILE:HD13	1:B:39:ALA:HB2	1.98	0.45
1:B:379:GLN:HB3	1:B:384:LYS:HG3	1.99	0.45
6:2:63:PHE:HE1	11:N:147:ILE:HG21	1.81	0.45
1:B:163:GLN:HG2	1:B:164:ARG:H	1.80	0.45
2:E:324:ALA:HB3	2:E:325:PRO:HD3	1.96	0.45
3:G:164:LYS:NZ	3:G:215:TYR:OH	2.45	0.45
5:O:22:LEU:HD12	5:O:25:ALA:HB3	1.98	0.45
2:F:156:GLY:HA3	2:F:332:LEU:HD13	1.99	0.45
11:N:84:LEU:HD11	11:N:208:LEU:HD21	1.98	0.45
2:F:259:ASP:HA	2:F:260:ASN:HA	1.67	0.45
8:I:34:ASN:HA	8:I:37:LYS:HZ3	1.82	0.45
1:A:16:ILE:HD13	5:O:22:LEU:HD13	1.98	0.45
1:A:457:GLU:OE2	1:A:459:SER:HB2	2.17	0.45
1:B:180:ILE:HD11	1:B:216:LEU:HD11	1.99	0.45
2:D:247:ARG:HD3	2:D:307:ILE:HG13	1.98	0.45
6:4:63:PHE:CE1	11:N:170:LEU:HD22	2.52	0.45
2:D:156:GLY:HA3	2:D:332:LEU:HD13	1.99	0.45
11:N:93:THR:HG23	11:N:96:THR:HG23	1.99	0.45
1:A:175:LYS:HG2	1:A:352:LEU:HD12	1.98	0.45
1:A:479:LEU:HD13	1:A:496:LYS:HE2	1.97	0.45
2:F:424:ALA:O	2:F:428:THR:HG22	2.17	0.45
3:G:42:ARG:O	3:G:46:LEU:HB2	2.16	0.45
17:L:40:GLN:HB3	17:L:43:PHE:HB2	1.99	0.45
1:A:469:LEU:O	1:A:473:VAL:HG23	2.17	0.45
2:E:93:THR:HG22	2:E:111:ILE:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:94:ALA:HB3	7:H:97:ALA:HB2	1.99	0.45
14:R:76:SER:HA	14:R:79:PHE:CE1	2.51	0.45
1:A:78:ASN:HD22	1:A:80:LYS:HE3	1.82	0.45
1:B:349:GLN:HG3	1:B:351:PHE:CE2	2.52	0.45
1:C:95:VAL:HG11	1:C:245:LEU:HD21	1.99	0.45
2:F:204:ILE:HD13	2:F:211:LEU:HD11	1.98	0.45
1:C:166:LEU:HD11	1:C:327:ILE:HG12	1.99	0.44
15:S:85:TRP:HA	15:S:88:VAL:HG12	2.00	0.44
1:B:479:LEU:HD22	1:B:496:LYS:HG2	2.00	0.44
2:E:319:ASP:OD2	3:G:255:GLN:NE2	2.45	0.44
6:3:58:GLU:HG3	6:4:60:MET:SD	2.57	0.44
9:K:145:TYR:OH	10:M:45:PRO:HD2	2.17	0.44
13:Q:6:THR:HA	13:Q:9:TRP:CD1	2.52	0.44
16:T:29:ARG:HE	16:T:33:LEU:HD11	1.81	0.44
17:L:48:ARG:O	17:L:52:SER:N	2.38	0.44
1:B:206:ILE:CD1	1:B:247:PRO:HG3	2.48	0.44
1:B:476:HIS:CD2	1:B:500:ILE:HD13	2.53	0.44
2:D:259:ASP:HA	2:D:260:ASN:HA	1.59	0.44
7:H:88:SER:O	7:H:88:SER:OG	2.31	0.44
1:A:209:LYS:HD2	2:D:331:HIS:HA	2.00	0.44
1:C:340:THR:HG21	2:D:317:ALA:HB2	1.98	0.44
2:E:261:ILE:HG21	2:E:313:ILE:HD13	1.99	0.44
9:K:143:ARG:CZ	17:L:95:PHE:HB3	2.47	0.44
14:R:27:SER:O	14:R:31:MET:HG3	2.17	0.44
1:A:248:TYR:OH	1:A:301:LEU:HD12	2.17	0.44
1:C:128:ARG:HB2	1:C:131:LEU:HG	1.99	0.44
2:D:100:VAL:HG13	2:D:101:ILE:HG23	1.99	0.44
5:O:31:LYS:HB3	5:O:34:GLN:HE21	1.82	0.44
6:6:33:ILE:HG23	6:7:46:LEU:HD22	1.98	0.44
2:E:46:THR:HG22	2:E:47:ARG:N	2.33	0.44
9:K:157:TYR:HA	17:L:82:PHE:HE2	1.83	0.44
11:N:21:VAL:HG23	11:N:22:LEU:HD12	1.98	0.44
13:Q:9:TRP:O	13:Q:13:ILE:HG12	2.18	0.44
1:C:170:ASP:OD1	1:C:329:THR:OG1	2.30	0.44
1:C:194:ASP:OD2	1:C:197:LYS:HG3	2.17	0.44
1:C:248:TYR:OH	1:C:301:LEU:O	2.36	0.44
2:D:476:LEU:HA	2:D:479:GLU:HG2	1.99	0.44
3:G:72:SER:HB2	3:G:112:ILE:HB	1.99	0.44
9:K:60:ALA:HA	11:N:89:PRO:HG3	2.00	0.44
1:A:48:GLN:HG2	2:E:73:VAL:HG22	2.00	0.44
1:A:183:ILE:HD11	1:A:267:ILE:HD13	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:240:LEU:HD21	2:D:298:ARG:HB2	2.00	0.44
1:B:202:ILE:N	1:B:265:LEU:O	2.51	0.44
1:B:218:LYS:HB2	2:E:131:VAL:HB	1.99	0.44
1:C:24:ASP:OD1	1:C:24:ASP:N	2.51	0.44
15:S:57:ASN:HA	15:S:60:GLN:HG2	1.98	0.44
2:D:90:GLY:HA2	2:D:245:TYR:CE1	2.53	0.43
6:4:4:THR:HA	6:4:7:LYS:HE2	1.99	0.43
7:H:23:PRO:HD3	7:H:94:ALA:O	2.17	0.43
9:K:154:ARG:HD2	17:L:91:PRO:HD3	2.00	0.43
11:N:86:GLY:HA3	11:N:93:THR:HB	2.00	0.43
1:A:439:GLU:HA	1:A:442:VAL:HG12	2.00	0.43
2:E:281:ALA:C	2:E:283:GLY:H	2.21	0.43
1:C:170:ASP:O	1:C:175:LYS:NZ	2.51	0.43
3:G:251:ASN:HA	3:G:254:ARG:HG2	2.01	0.43
10:M:53:TRP:O	10:M:57:LYS:HG2	2.18	0.43
15:S:49:ILE:HA	15:S:52:LEU:HB3	1.99	0.43
1:A:407:GLY:O	1:A:415:GLN:NE2	2.42	0.43
1:B:48:GLN:HB3	2:F:71:GLY:HA2	2.01	0.43
2:D:106:ASP:OD1	2:D:106:ASP:N	2.49	0.43
2:E:154:LYS:HG2	2:E:296:GLN:HE22	1.82	0.43
2:E:412:LYS:NZ	2:E:453:ASP:HA	2.34	0.43
2:F:90:GLY:HA2	2:F:245:TYR:CE2	2.53	0.43
11:N:135:THR:O	11:N:137:LEU:N	2.52	0.43
15:S:89:GLY:HA2	15:S:92:ILE:HG22	1.99	0.43
1:A:255:GLU:OE2	1:A:308:ARG:NE	2.46	0.43
1:B:437:ALA:O	1:B:441:GLN:HG3	2.19	0.43
2:D:244:GLU:OE2	2:D:298:ARG:NH2	2.42	0.43
1:A:187:LYS:HE2	1:A:224:ASP:HB3	2.00	0.43
1:B:176:THR:O	1:B:180:ILE:HG12	2.19	0.43
2:D:101:ILE:HG13	2:D:103:GLU:HG3	2.00	0.43
2:D:320:LEU:HD22	2:D:329:PHE:HZ	1.84	0.43
3:G:60:PRO:HD3	3:G:183:THR:OG1	2.19	0.43
5:O:22:LEU:HD12	5:O:22:LEU:HA	1.82	0.43
9:K:172:HIS:NE2	17:L:64:SER:HA	2.34	0.43
1:B:450:ARG:HA	1:B:450:ARG:HD3	1.80	0.43
1:C:38:ILE:HG13	1:C:284:LEU:HB3	2.01	0.43
9:K:119:GLN:O	9:K:119:GLN:NE2	2.52	0.43
1:A:453:LEU:HD21	1:A:464:PHE:CE1	2.54	0.43
1:C:386:VAL:HG11	1:C:445:ILE:HG13	2.00	0.43
2:D:56:LEU:HD11	2:D:62:ARG:HB2	2.00	0.43
6:7:25:ILE:HD13	6:7:54:PHE:CE1	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:32:LEU:HD11	1:B:42:HIS:HB2	2.00	0.43
1:C:37:GLY:N	1:C:79:ASP:OD2	2.49	0.43
1:C:127:ARG:NH2	1:C:255:GLU:OE1	2.48	0.43
1:C:151:LYS:HA	1:C:441:GLN:OE1	2.18	0.43
1:C:373:ARG:NH2	20:D:501:ADP:O3B	2.38	0.43
2:D:278:ILE:HG23	3:G:269:ALA:HB2	2.00	0.43
2:D:369:GLU:CD	2:D:369:GLU:H	2.23	0.43
2:F:87:ILE:HD13	2:F:238:THR:HG23	2.01	0.43
2:F:375:ARG:NH1	2:F:378:GLN:OE1	2.51	0.43
6:2:38:ARG:NH1	6:3:38[A]:ARG:HH22	2.07	0.43
2:E:443:GLY:O	2:E:447:ILE:HG13	2.18	0.42
3:G:56:ASP:OD2	3:G:58:LYS:HE2	2.19	0.42
6:6:11:ALA:O	6:6:15:THR:HG23	2.18	0.42
9:K:25:LEU:HD23	9:K:34:PRO:HG3	2.01	0.42
9:K:144:LEU:HD23	9:K:144:LEU:HA	1.84	0.42
1:A:407:GLY:HA2	1:A:410:LEU:HD12	2.01	0.42
2:D:34:PRO:HD2	2:D:37:ASN:ND2	2.33	0.42
2:D:443:GLY:O	2:D:447:ILE:HG13	2.19	0.42
1:B:34:ILE:HG22	2:E:55:HIS:HB2	2.02	0.42
2:D:29:ASP:OD2	2:D:30:GLU:HG2	2.19	0.42
2:E:255:LEU:HD13	2:E:257:PHE:CZ	2.55	0.42
5:O:73:THR:HG23	5:O:78:PHE:HD2	1.84	0.42
11:N:148:SER:HA	11:N:151:ILE:HG22	2.01	0.42
1:A:353:GLU:HG3	1:A:366:ASN:HB2	2.01	0.42
2:D:278:ILE:HG23	2:D:279:PRO:HD2	2.01	0.42
11:N:116:GLY:HA3	11:N:225:ASN:ND2	2.31	0.42
2:D:280:SER:OG	2:D:281:ALA:N	2.52	0.42
6:3:74:ALA:HB2	13:Q:1:MET:HB2	2.01	0.42
13:Q:5:ASN:OD1	13:Q:7:THR:OG1	2.32	0.42
1:B:411:ASP:N	1:B:411:ASP:OD1	2.53	0.42
2:D:240:LEU:HD23	2:D:244:GLU:HG3	2.01	0.42
5:O:51:VAL:O	5:O:55:VAL:HG22	2.20	0.42
6:6:65:LEU:HD11	6:7:63:PHE:HB3	2.00	0.42
1:A:164:ARG:NH1	1:A:345:ILE:O	2.52	0.42
1:C:423:ARG:HG3	1:C:461:ILE:HD11	2.01	0.42
2:F:407:VAL:O	2:F:411:ARG:HG3	2.19	0.42
5:O:14:ILE:O	5:O:18:TYR:HD2	2.03	0.42
5:O:48:GLU:CD	5:O:49:PRO:HD2	2.40	0.42
6:8:17:GLY:HA3	6:8:64:CYS:SG	2.59	0.42
10:M:147:LYS:HB3	10:M:147:LYS:HE2	1.83	0.42
1:A:453:LEU:HD23	1:A:453:LEU:HA	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:16:ILE:HD13	1:C:16:ILE:HA	1.85	0.42
2:D:393:ILE:HD12	3:G:16:ILE:HG23	2.01	0.42
2:E:87:ILE:HG21	2:E:238:THR:HG23	2.01	0.42
6:4:7:LYS:O	6:4:11:ALA:N	2.38	0.42
1:C:180:ILE:HD13	1:C:180:ILE:HA	1.90	0.42
2:E:155:ILE:HG13	2:E:334:ALA:HB3	2.01	0.42
1:B:80:LYS:HG3	1:B:81:LEU:HD22	2.02	0.41
2:D:142:VAL:HG23	2:D:146:LEU:HD12	2.02	0.41
2:D:154:LYS:HZ3	2:D:296:GLN:HB3	1.84	0.41
2:F:303:LYS:HE2	2:F:303:LYS:HB3	1.84	0.41
2:F:320:LEU:HD22	2:F:329:PHE:HZ	1.85	0.41
3:G:179:PHE:O	3:G:205:GLN:NE2	2.53	0.41
5:O:73:THR:HG21	5:O:83:THR:HA	2.01	0.41
6:8:1:ASP:OD1	6:8:1:ASP:N	2.53	0.41
11:N:186:LEU:N	11:N:187:PRO:HD2	2.35	0.41
1:B:51:GLU:HA	1:B:94:ILE:HA	2.02	0.41
1:B:441:GLN:O	1:B:445:ILE:HG12	2.20	0.41
1:C:450:ARG:HB2	1:C:452:TYR:CE2	2.55	0.41
3:G:165:PHE:HB2	3:G:223:SER:HB2	2.02	0.41
5:O:175:VAL:O	5:O:179:ILE:HG23	2.21	0.41
6:5:66:MET:O	6:5:70:LEU:HG	2.20	0.41
7:H:62:LEU:HD21	7:H:100:LEU:HD11	2.02	0.41
11:N:103:ALA:HB2	13:Q:13:ILE:HD12	2.03	0.41
12:P:3:GLN:O	12:P:4:SER:HB3	2.20	0.41
14:R:19:GLU:HA	14:R:28:TRP:CZ2	2.55	0.41
1:C:440:GLU:HB3	1:C:469:LEU:HD11	2.02	0.41
2:F:248:ASP:O	17:L:73:ARG:NH2	2.53	0.41
10:M:21:GLN:OE1	10:M:21:GLN:N	2.48	0.41
2:D:157:LEU:N	2:D:311:GLN:O	2.53	0.41
2:E:320:LEU:HD22	2:E:329:PHE:HE2	1.85	0.41
2:F:115:GLN:OE1	2:F:115:GLN:N	2.53	0.41
5:O:144:GLN:H	5:O:144:GLN:CD	2.23	0.41
8:I:28:LYS:HE2	8:I:28:LYS:HB3	1.79	0.41
11:N:25:LEU:HD23	13:Q:19:THR:OG1	2.20	0.41
16:T:35:PRO:O	16:T:38:GLU:HG2	2.20	0.41
1:B:105:GLY:HA2	1:B:226:MET:O	2.20	0.41
1:B:286:ARG:HA	2:E:278:ILE:HD12	2.03	0.41
1:B:428:LEU:HA	1:B:428:LEU:HD23	1.83	0.41
2:E:77:LYS:HA	2:E:77:LYS:HD3	1.80	0.41
2:F:384:TYR:O	2:F:388:GLN:HG2	2.20	0.41
3:G:196:ILE:HD11	7:H:55:LEU:HG	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:1:31:SER:HB2	6:8:34:ILE:HG13	2.02	0.41
1:A:164:ARG:NH2	1:A:347:ASP:OD1	2.53	0.41
1:A:381:ARG:HA	1:A:381:ARG:HD2	1.80	0.41
1:A:386:VAL:HG12	1:A:445:ILE:HG22	2.02	0.41
1:B:439:GLU:HG2	1:B:440:GLU:N	2.36	0.41
2:D:204:ILE:HD13	2:D:211:LEU:HD11	2.02	0.41
2:E:47:ARG:HD3	2:E:103:GLU:OE2	2.20	0.41
2:E:455:LEU:HD11	2:E:470:VAL:HG12	2.03	0.41
2:F:313:ILE:HG21	2:F:328:THR:HG21	2.01	0.41
6:6:14:ALA:O	6:6:64:CYS:HB3	2.21	0.41
6:6:36:TYR:OH	6:7:45:GLN:HG2	2.20	0.41
10:M:135:LEU:HD22	11:N:37:LEU:HD21	2.03	0.41
1:A:180:ILE:HD13	1:A:180:ILE:HA	1.84	0.41
1:B:27:GLU:HG3	1:B:90:ARG:HD3	2.03	0.41
2:F:77:LYS:HA	2:F:77:LYS:HD3	1.75	0.41
5:O:15:GLU:CD	5:O:15:GLU:H	2.23	0.41
6:1:29:PHE:HE2	6:1:54:PHE:HB2	1.85	0.41
6:7:8:PHE:CD2	6:8:7:LYS:HG2	2.56	0.41
10:M:51:ILE:HD12	10:M:51:ILE:HA	1.95	0.41
11:N:101:ASN:ND2	11:N:161:THR:OG1	2.36	0.41
1:B:44:LEU:HB3	1:B:47:VAL:HB	2.03	0.41
1:C:28:THR:HG21	5:O:170:TYR:CD1	2.55	0.41
1:C:497:LEU:O	1:C:501:VAL:HG12	2.21	0.41
2:F:348:TYR:HB3	20:F:501:ADP:C6	2.56	0.41
3:G:148:LEU:HD23	3:G:148:LEU:HA	1.92	0.41
1:B:237:SER:HB3	2:E:297:GLU:HG3	2.02	0.41
1:C:381:ARG:HG2	1:C:488:LYS:HE2	2.02	0.41
2:F:119:ILE:O	2:F:298:ARG:NH2	2.54	0.41
2:F:402:GLU:OE1	3:G:118:ARG:NH2	2.54	0.41
6:7:65:LEU:HD23	6:7:65:LEU:HA	1.89	0.41
16:T:16:TYR:HA	16:T:19:LEU:HB3	2.03	0.41
1:A:6:ALA:HB3	1:A:69:ASP:HB2	2.02	0.41
2:E:342:ILE:HG22	2:E:347:ILE:HB	2.02	0.41
1:A:311:LYS:HD2	1:A:320:SER:HB3	2.03	0.40
2:E:281:ALA:C	2:E:283:GLY:N	2.74	0.40
2:F:87:ILE:HD11	2:F:241:THR:HB	2.03	0.40
3:G:167:SER:OG	3:G:168:VAL:N	2.54	0.40
6:4:17:GLY:HA3	6:4:64:CYS:SG	2.61	0.40
7:H:79:SER:O	7:H:94:ALA:HA	2.21	0.40
15:S:69:VAL:HA	15:S:72:ALA:HB3	2.03	0.40
17:L:90:PHE:CG	17:L:91:PRO:HD2	2.55	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:183:ILE:HD11	1:C:267:ILE:HD13	2.03	0.40
1:C:421:GLY:O	1:C:425:THR:HG23	2.21	0.40
2:D:282:VAL:HG12	2:D:282:VAL:O	2.20	0.40
1:A:159:ILE:HD11	1:A:350:ILE:HD11	2.04	0.40
1:B:386:VAL:HG12	1:B:445:ILE:HG22	2.04	0.40
1:C:442:VAL:HA	1:C:445:ILE:HG12	2.03	0.40
2:D:272:SER:HB2	2:D:285:GLN:HB3	2.03	0.40
2:D:386:SER:HA	4:J:12:ALA:HB1	2.03	0.40
2:D:456:PRO:HG3	4:J:42:LEU:HD21	2.03	0.40
6:1:33:ILE:HG23	6:2:46:LEU:HD22	2.02	0.40
9:K:178:GLU:HA	9:K:181:VAL:HG12	2.04	0.40
11:N:31:ILE:HA	11:N:46:GLN:HE22	1.86	0.40
17:L:42:LEU:HD13	17:L:42:LEU:HA	1.88	0.40
1:C:40:ARG:NH1	1:C:67:GLU:OE1	2.47	0.40
2:E:433:LYS:HA	2:E:433:LYS:HD3	1.98	0.40
1:A:359:LYS:HG3	2:D:382:GLN:HG2	2.03	0.40
1:B:219:ARG:HA	1:B:219:ARG:HD3	1.92	0.40
3:G:137:THR:OG1	8:I:40:GLY:O	2.36	0.40
9:K:143:ARG:NE	17:L:95:PHE:HB3	2.37	0.40
9:K:155:LEU:HD23	9:K:155:LEU:HA	1.96	0.40
10:M:152:TRP:O	11:N:69:SER:OG	2.39	0.40
14:R:32:ARG:HB2	14:R:34:PHE:CE1	2.57	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	499/510 (98%)	494 (99%)	5 (1%)	0	100	100
1	B	473/510 (93%)	458 (97%)	15 (3%)	0	100	100
1	C	483/510 (95%)	470 (97%)	13 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	468/482 (97%)	446 (95%)	21 (4%)	1 (0%)	47	78
2	E	452/482 (94%)	437 (97%)	14 (3%)	1 (0%)	47	78
2	F	464/482 (96%)	451 (97%)	12 (3%)	1 (0%)	47	78
3	G	269/273 (98%)	264 (98%)	5 (2%)	0	100	100
4	J	33/81 (41%)	33 (100%)	0	0	100	100
5	O	185/190 (97%)	184 (100%)	1 (0%)	0	100	100
6	1	73/75 (97%)	73 (100%)	0	0	100	100
6	2	73/75 (97%)	71 (97%)	2 (3%)	0	100	100
6	3	74/75 (99%)	74 (100%)	0	0	100	100
6	4	73/75 (97%)	70 (96%)	3 (4%)	0	100	100
6	5	73/75 (97%)	71 (97%)	2 (3%)	0	100	100
6	6	73/75 (97%)	71 (97%)	2 (3%)	0	100	100
6	7	73/75 (97%)	72 (99%)	1 (1%)	0	100	100
6	8	73/75 (97%)	72 (99%)	1 (1%)	0	100	100
7	H	130/146 (89%)	127 (98%)	3 (2%)	0	100	100
8	I	43/51 (84%)	43 (100%)	0	0	100	100
9	K	194/214 (91%)	188 (97%)	6 (3%)	0	100	100
10	M	154/160 (96%)	149 (97%)	5 (3%)	0	100	100
11	N	221/226 (98%)	210 (95%)	11 (5%)	0	100	100
12	P	39/58 (67%)	37 (95%)	2 (5%)	0	100	100
13	Q	36/68 (53%)	34 (94%)	2 (6%)	0	100	100
14	R	72/93 (77%)	68 (94%)	4 (6%)	0	100	100
15	S	75/102 (74%)	71 (95%)	4 (5%)	0	100	100
16	T	42/69 (61%)	42 (100%)	0	0	100	100
17	L	65/108 (60%)	57 (88%)	8 (12%)	0	100	100
All	All	4982/5415 (92%)	4837 (97%)	142 (3%)	3 (0%)	54	82

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	282	VAL
2	D	282	VAL
2	F	282	VAL

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	A	407/412 (99%)	407 (100%)	0	100 100
1	B	387/412 (94%)	385 (100%)	2 (0%)	88 96
1	C	397/412 (96%)	396 (100%)	1 (0%)	92 98
2	D	379/388 (98%)	379 (100%)	0	100 100
2	E	369/388 (95%)	369 (100%)	0	100 100
2	F	376/388 (97%)	376 (100%)	0	100 100
3	G	228/229 (100%)	228 (100%)	0	100 100
4	J	23/68 (34%)	23 (100%)	0	100 100
5	O	162/165 (98%)	161 (99%)	1 (1%)	86 96
6	1	51/51 (100%)	51 (100%)	0	100 100
6	2	51/51 (100%)	51 (100%)	0	100 100
6	3	52/51 (102%)	52 (100%)	0	100 100
6	4	51/51 (100%)	51 (100%)	0	100 100
6	5	51/51 (100%)	50 (98%)	1 (2%)	55 82
6	6	51/51 (100%)	51 (100%)	0	100 100
6	7	51/51 (100%)	51 (100%)	0	100 100
6	8	51/51 (100%)	51 (100%)	0	100 100
7	H	103/108 (95%)	103 (100%)	0	100 100
8	I	36/42 (86%)	36 (100%)	0	100 100
9	K	160/187 (86%)	159 (99%)	1 (1%)	86 96
10	M	135/139 (97%)	135 (100%)	0	100 100
11	N	196/199 (98%)	195 (100%)	1 (0%)	88 96
12	P	36/48 (75%)	36 (100%)	0	100 100
13	Q	38/68 (56%)	38 (100%)	0	100 100
14	R	65/82 (79%)	65 (100%)	0	100 100
15	S	64/85 (75%)	64 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
16	T	34/58 (59%)	34 (100%)	0	100 100
17	L	60/98 (61%)	59 (98%)	1 (2%)	60 86
All	All	4064/4384 (93%)	4056 (100%)	8 (0%)	93 98

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	164	ARG
1	B	196	LYS
1	C	164	ARG
5	O	67	LYS
6	5	54	PHE
9	K	179	LYS
11	N	39	ASN
17	L	56	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	396	GLN
1	A	503	ASN
1	B	432	GLN
1	C	42	HIS
1	C	208	GLN
1	C	385	GLN
1	C	477	GLN
2	D	115	GLN
2	D	180	HIS
2	D	210	ASN
2	D	266	GLN
2	D	458	GLN
2	E	388	GLN
2	F	180	HIS
2	F	249	GLN
4	J	37	GLN
5	O	34	GLN
5	O	44	GLN
5	O	99	GLN
5	O	146	GLN
6	4	45	GLN

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Mol	Chain	Res	Type
7	H	32	ASN
7	H	85	ASN
7	H	132	GLN
8	I	7	GLN
8	I	17	GLN
8	I	34	ASN
9	K	88	GLN
9	K	115	GLN
9	K	119	GLN
9	K	130	ASN
10	M	74	ASN
10	M	136	ASN
11	N	46	GLN
11	N	47	GLN
11	N	61	HIS
11	N	163	ASN
11	N	225	ASN
15	S	57	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 11 ligands modelled in this entry, 5 are monoatomic - leaving 6 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	$\#\|Z\| > 2$
20	ADP	F	501	19	24,29,29	2.32	8 (33%)	29,45,45	1.70	6 (20%)
18	ATP	B	601	19	26,33,33	2.22	6 (23%)	31,52,52	1.82	7 (22%)
21	BQ1	4	101	-	39,41,41	1.05	2 (5%)	50,59,59	1.24	6 (12%)
18	ATP	C	601	19	26,33,33	2.22	6 (23%)	31,52,52	1.61	7 (22%)
18	ATP	A	601	19	26,33,33	2.21	6 (23%)	31,52,52	1.67	7 (22%)
20	ADP	D	501	19	24,29,29	2.36	8 (33%)	29,45,45	1.62	5 (17%)

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
20	ADP	F	501	19	-	8/12/32/32	0/3/3/3
18	ATP	B	601	19	-	3/18/38/38	0/3/3/3
21	BQ1	4	101	-	-	8/28/28/28	0/5/5/5
18	ATP	C	601	19	-	7/18/38/38	0/3/3/3
18	ATP	A	601	19	-	2/18/38/38	0/3/3/3
20	ADP	D	501	19	-	6/12/32/32	0/3/3/3

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
18	B	601	ATP	O4'-C1'	7.72	1.51	1.41
18	C	601	ATP	O4'-C1'	7.65	1.51	1.41
18	A	601	ATP	O4'-C1'	7.58	1.51	1.41
20	D	501	ADP	O4'-C1'	6.67	1.50	1.41
20	F	501	ADP	O4'-C1'	6.46	1.50	1.41
20	D	501	ADP	C6-N6	4.49	1.50	1.34
20	F	501	ADP	C6-N6	4.49	1.50	1.34
18	C	601	ATP	C2'-C1'	-4.30	1.47	1.53
18	A	601	ATP	C2'-C1'	-4.27	1.47	1.53
18	B	601	ATP	C2'-C1'	-4.21	1.47	1.53
20	D	501	ADP	C2'-C1'	-4.06	1.47	1.53
20	F	501	ADP	C2'-C1'	-4.06	1.47	1.53
20	D	501	ADP	O4'-C4'	3.48	1.52	1.45
18	A	601	ATP	C6-N6	3.44	1.46	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
20	F	501	ADP	O4'-C4'	3.43	1.52	1.45
18	B	601	ATP	C6-N6	3.43	1.46	1.34
18	C	601	ATP	C6-N6	3.41	1.46	1.34
21	4	101	BQ1	O03-C17	3.30	1.40	1.35
18	C	601	ATP	C2'-C3'	-3.10	1.44	1.53
18	A	601	ATP	C2'-C3'	-3.08	1.44	1.53
18	B	601	ATP	C2'-C3'	-3.07	1.44	1.53
20	D	501	ADP	C2'-C3'	-2.72	1.45	1.53
20	F	501	ADP	C2'-C3'	-2.66	1.46	1.53
20	D	501	ADP	C3'-C4'	-2.52	1.46	1.53
20	F	501	ADP	C3'-C4'	-2.46	1.46	1.53
18	A	601	ATP	O4'-C4'	2.46	1.50	1.45
18	C	601	ATP	O4'-C4'	2.43	1.50	1.45
18	B	601	ATP	O4'-C4'	2.33	1.50	1.45
18	C	601	ATP	C4-N3	-2.25	1.32	1.35
20	D	501	ADP	PA-O5'	2.25	1.68	1.59
20	F	501	ADP	PA-O5'	2.24	1.68	1.59
18	A	601	ATP	C4-N3	-2.23	1.32	1.35
18	B	601	ATP	C4-N3	-2.21	1.32	1.35
20	F	501	ADP	C6-C5	-2.10	1.35	1.43
21	4	101	BQ1	BR-C35	2.04	1.94	1.90
20	D	501	ADP	C6-C5	-2.02	1.35	1.43

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
18	B	601	ATP	C3'-C2'-C1'	5.01	108.52	100.98
20	F	501	ADP	C3'-C2'-C1'	4.50	107.75	100.98
18	C	601	ATP	N3-C2-N1	-4.15	122.19	128.68
18	B	601	ATP	N3-C2-N1	-4.14	122.21	128.68
20	D	501	ADP	N3-C2-N1	-4.13	122.23	128.68
18	A	601	ATP	N3-C2-N1	-4.07	122.31	128.68
20	D	501	ADP	C3'-C2'-C1'	4.05	107.08	100.98
20	F	501	ADP	N3-C2-N1	-4.05	122.35	128.68
18	C	601	ATP	C3'-C2'-C1'	3.88	106.82	100.98
18	A	601	ATP	C3'-C2'-C1'	3.86	106.79	100.98
21	4	101	BQ1	C10-C17-N05	-3.84	121.93	125.70
18	A	601	ATP	C4-C5-N7	-3.76	105.48	109.40
18	B	601	ATP	C4-C5-N7	-3.74	105.50	109.40
18	C	601	ATP	C4-C5-N7	-3.73	105.51	109.40
20	D	501	ADP	C4-C5-N7	-3.70	105.55	109.40
20	F	501	ADP	C4-C5-N7	-3.66	105.59	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	4	101	BQ1	C14-C09-C06	-3.47	115.45	120.35
21	4	101	BQ1	C37-O03-C17	-3.41	113.84	117.21
18	B	601	ATP	C2'-C3'-C4'	3.05	108.56	102.64
18	B	601	ATP	PB-O3B-PG	-2.92	122.80	132.83
21	4	101	BQ1	O03-C17-C10	2.75	119.27	115.03
20	F	501	ADP	PA-O3A-PB	-2.74	123.41	132.83
18	A	601	ATP	PA-O3A-PB	-2.67	123.67	132.83
18	A	601	ATP	PB-O3B-PG	-2.61	123.88	132.83
18	B	601	ATP	PA-O3A-PB	-2.59	123.94	132.83
20	D	501	ADP	C1'-N9-C4	-2.52	122.21	126.64
20	F	501	ADP	C2'-C3'-C4'	2.51	107.51	102.64
18	A	601	ATP	C2'-C3'-C4'	2.49	107.48	102.64
20	D	501	ADP	PA-O3A-PB	-2.32	124.85	132.83
18	C	601	ATP	C1'-N9-C4	-2.31	122.58	126.64
18	C	601	ATP	PA-O3A-PB	-2.27	125.03	132.83
20	F	501	ADP	C1'-N9-C4	-2.25	122.69	126.64
18	C	601	ATP	C2'-C3'-C4'	2.19	106.90	102.64
18	A	601	ATP	C1'-N9-C4	-2.18	122.80	126.64
18	C	601	ATP	PB-O3B-PG	-2.18	125.34	132.83
21	4	101	BQ1	C17-N05-C24	2.10	121.06	116.41
18	B	601	ATP	C1'-N9-C4	-2.06	123.02	126.64
21	4	101	BQ1	C22-C24-N05	-2.01	119.28	122.26

There are no chirality outliers.

All (34) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
18	A	601	ATP	PB-O3B-PG-O2G
18	A	601	ATP	PB-O3B-PG-O3G
18	B	601	ATP	PB-O3B-PG-O3G
18	C	601	ATP	C5'-O5'-PA-O1A
18	C	601	ATP	C5'-O5'-PA-O3A
18	C	601	ATP	O4'-C4'-C5'-O5'
20	D	501	ADP	C5'-O5'-PA-O1A
20	D	501	ADP	C5'-O5'-PA-O2A
20	D	501	ADP	C5'-O5'-PA-O3A
20	F	501	ADP	PA-O3A-PB-O3B
20	F	501	ADP	C5'-O5'-PA-O1A
20	F	501	ADP	C5'-O5'-PA-O2A
20	F	501	ADP	C5'-O5'-PA-O3A
21	4	101	BQ1	N05-C17-O03-C37
21	4	101	BQ1	C10-C17-O03-C37

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Mol	Chain	Res	Type	Atoms
21	4	101	BQ1	C09-C06-C08-C11
20	D	501	ADP	O4'-C4'-C5'-O5'
21	4	101	BQ1	C08-C11-N04-C25
18	C	601	ATP	C3'-C4'-C5'-O5'
20	D	501	ADP	C3'-C4'-C5'-O5'
20	F	501	ADP	O4'-C4'-C5'-O5'
20	F	501	ADP	C3'-C4'-C5'-O5'
21	4	101	BQ1	C08-C11-N04-C26
21	4	101	BQ1	C07-C06-C08-C11
20	F	501	ADP	PA-O3A-PB-O2B
21	4	101	BQ1	O02-C06-C08-C11
21	4	101	BQ1	C06-C08-C11-N04
18	C	601	ATP	PG-O3B-PB-O1B
18	B	601	ATP	PB-O3B-PG-O1G
20	F	501	ADP	PA-O3A-PB-O1B
18	B	601	ATP	PB-O3B-PG-O2G
20	D	501	ADP	PA-O3A-PB-O2B
18	C	601	ATP	PA-O3A-PB-O2B
18	C	601	ATP	PB-O3A-PA-O2A

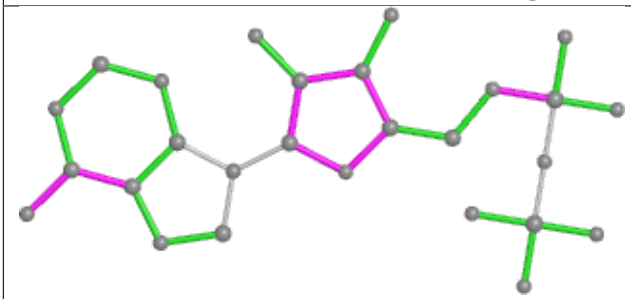
There are no ring outliers.

3 monomers are involved in 3 short contacts:

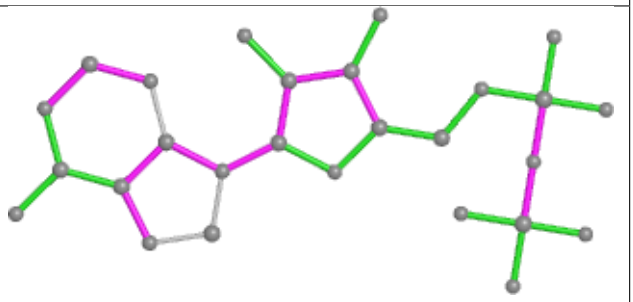
Mol	Chain	Res	Type	Clashes	Symm-Clashes
20	F	501	ADP	1	0
18	B	601	ATP	1	0
20	D	501	ADP	1	0

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 then 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.

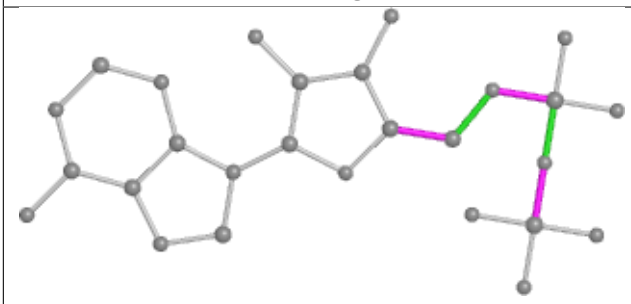
Ligand ADP F 501



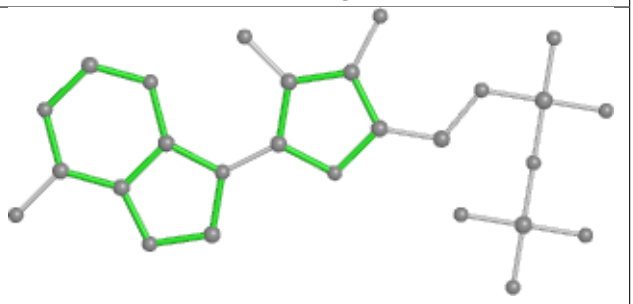
Bond lengths



Bond angles

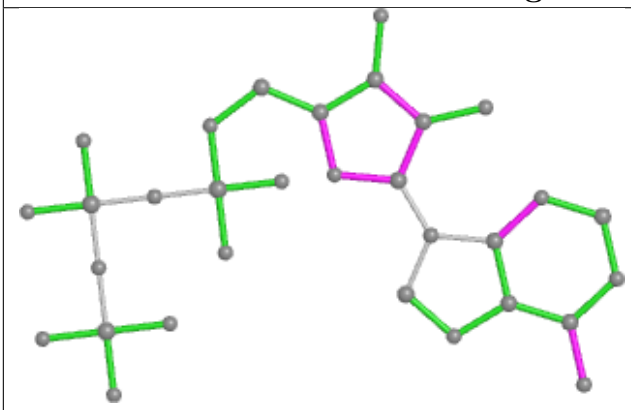


Torsions

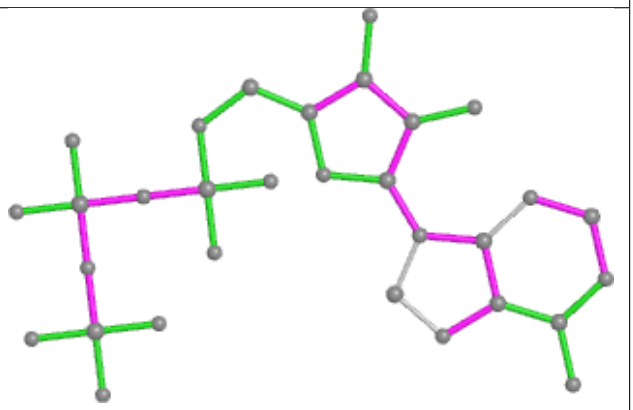


Rings

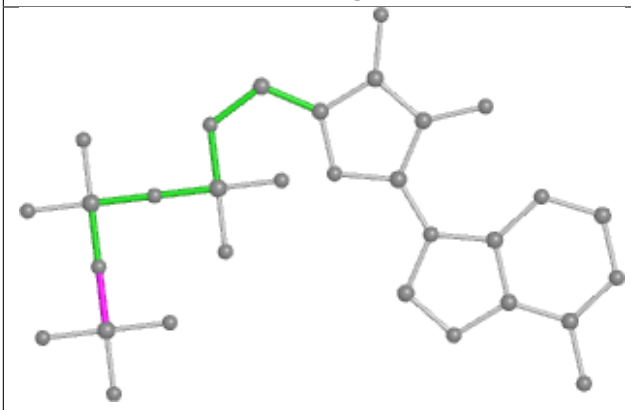
Ligand ATP B 601



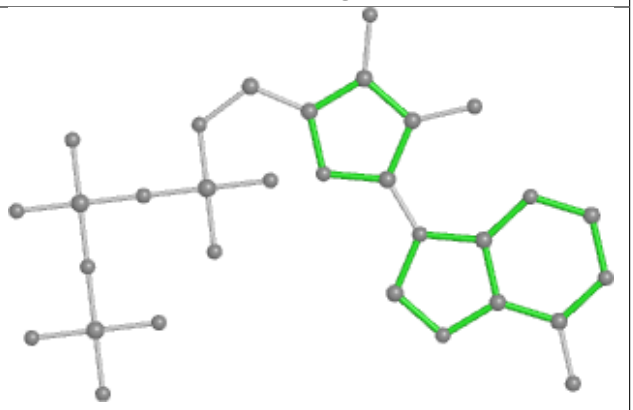
Bond lengths



Bond angles

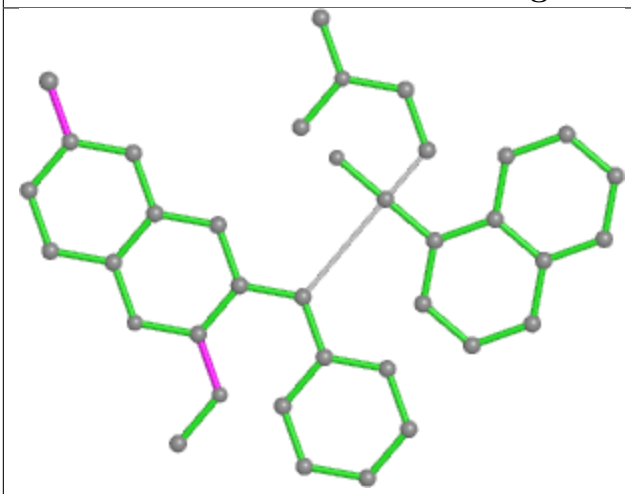


Torsions

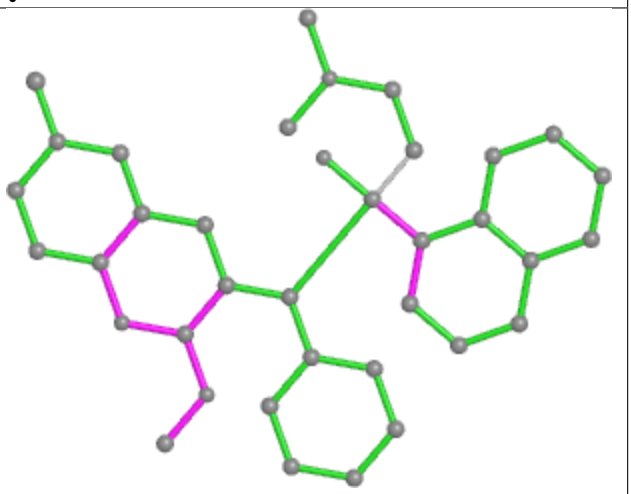


Rings

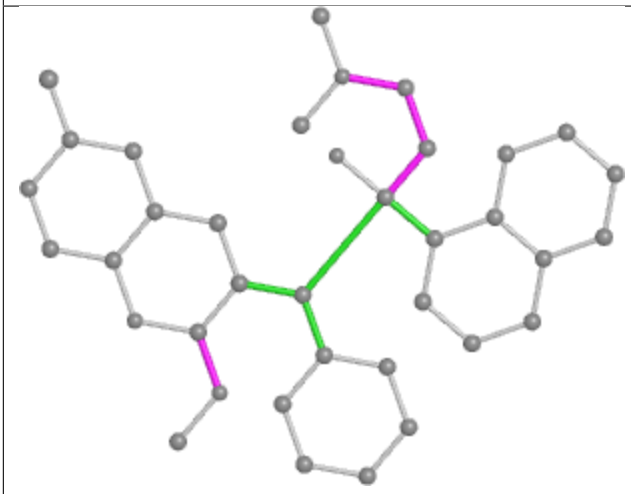
Ligand BQ1 4 101



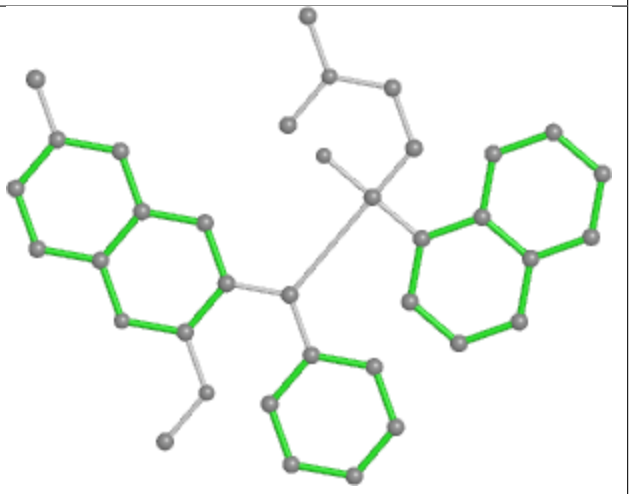
Bond lengths



Bond angles

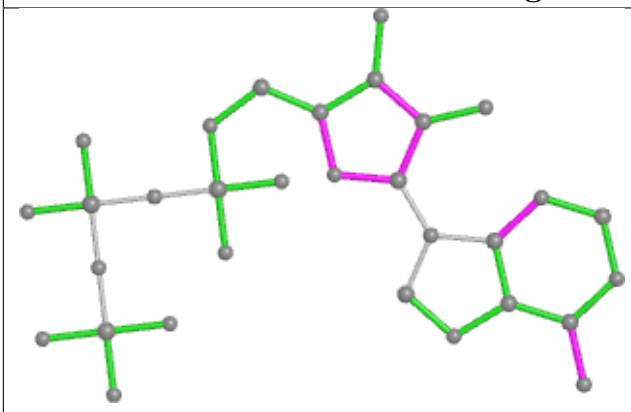


Torsions

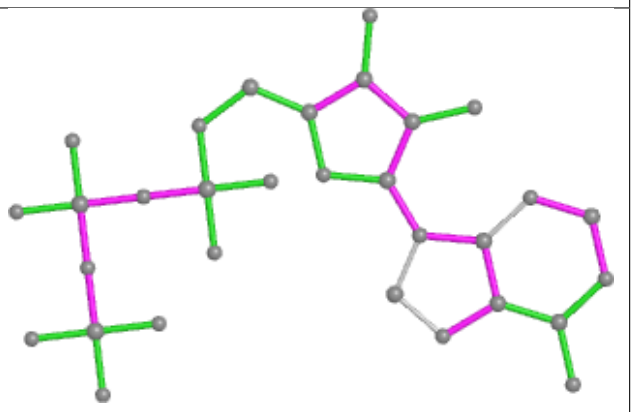


Rings

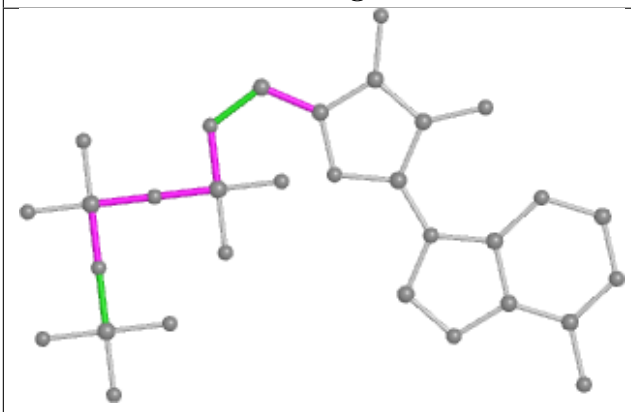
Ligand ATP C 601



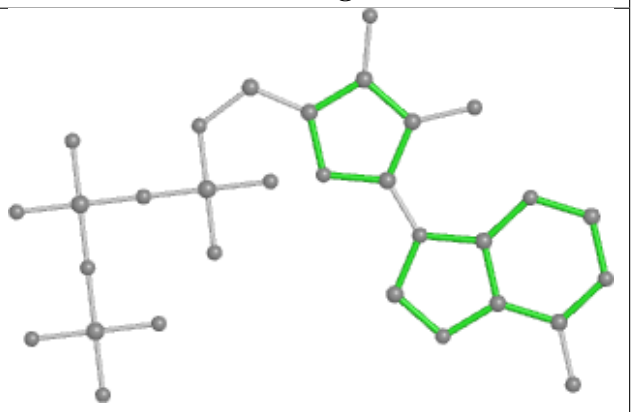
Bond lengths



Bond angles

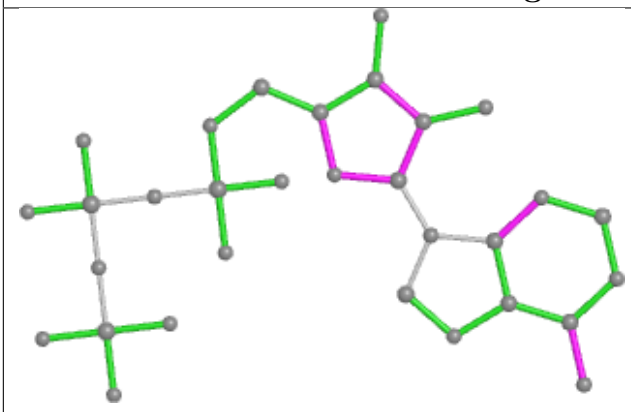


Torsions

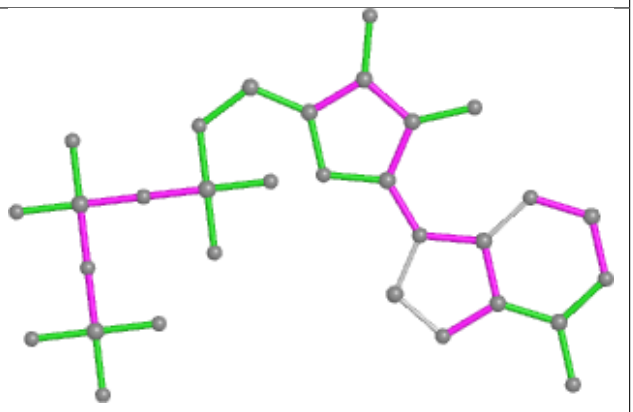


Rings

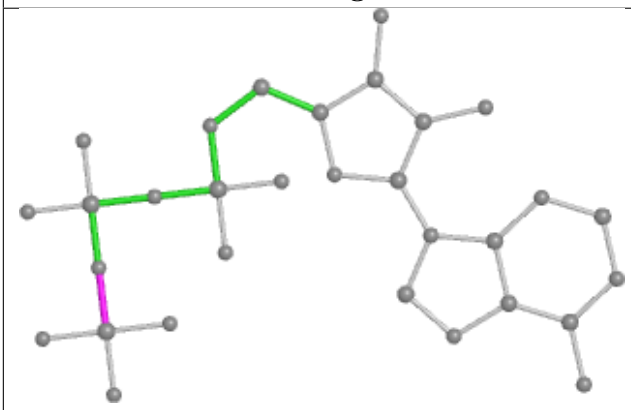
Ligand ATP A 601



Bond lengths



Bond angles



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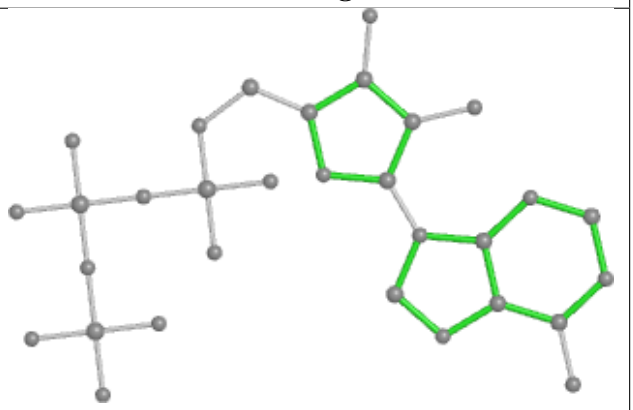
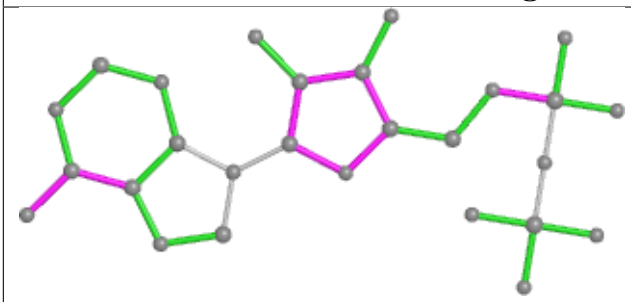
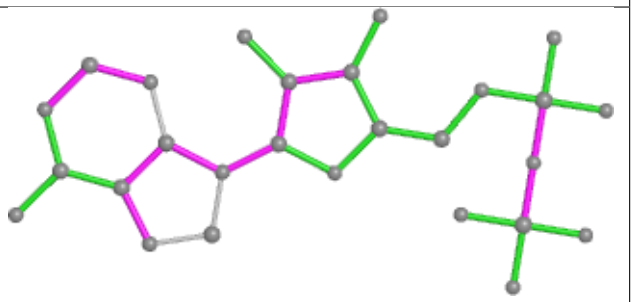


Rings

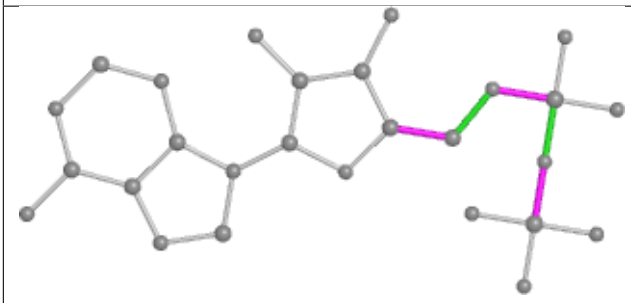
Ligand ADP D 501



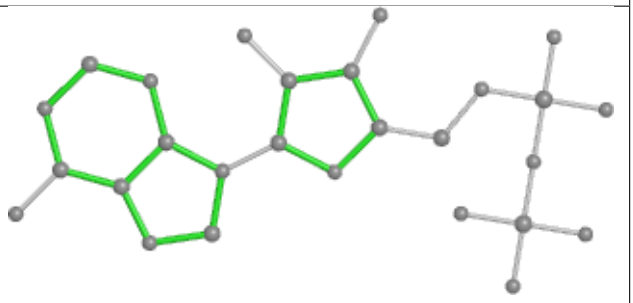
Bond lengths



Bond angles



Torsions



Rings

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.

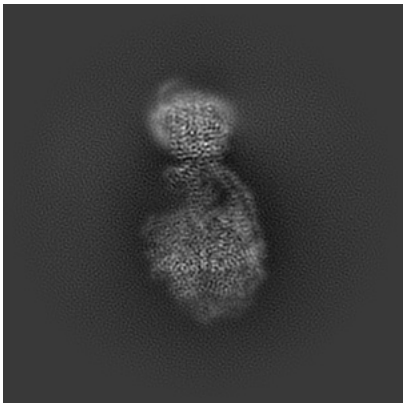
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-37251. These allow visual inspection of the internal detail of the map and identification of artifacts.

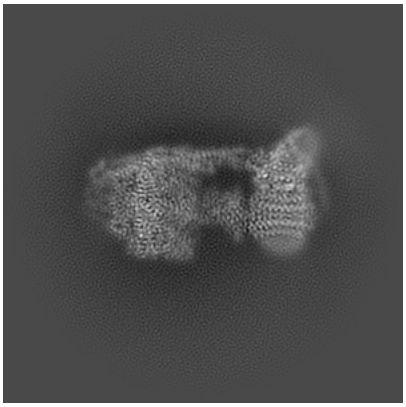
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

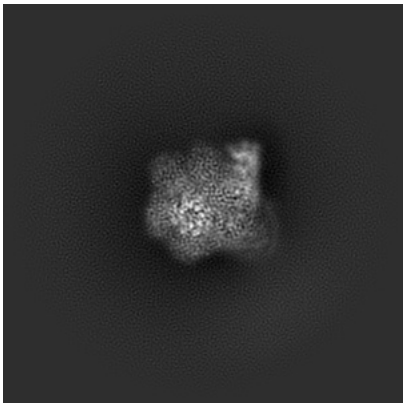
6.1.1 Primary map



X



Y

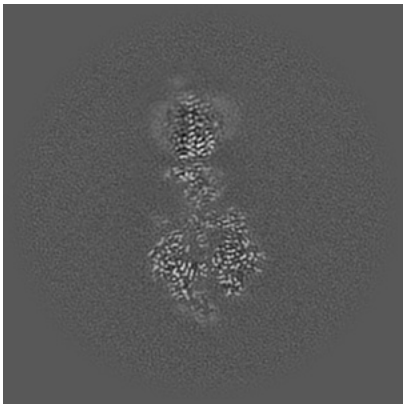


Z

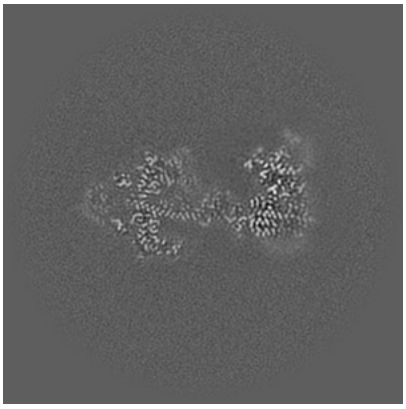
The images above show the map projected in three orthogonal directions.

6.2 Central slices

6.2.1 Primary map



X Index: 256



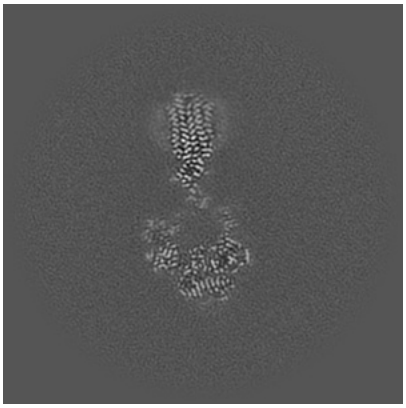
Y Index: 256

Z Index: 256

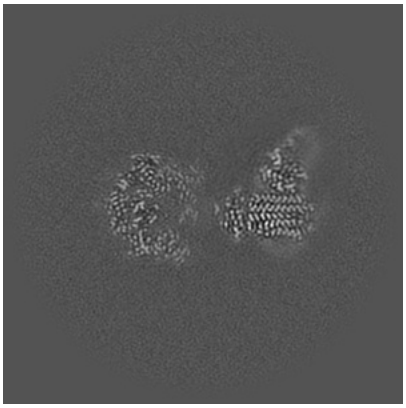
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

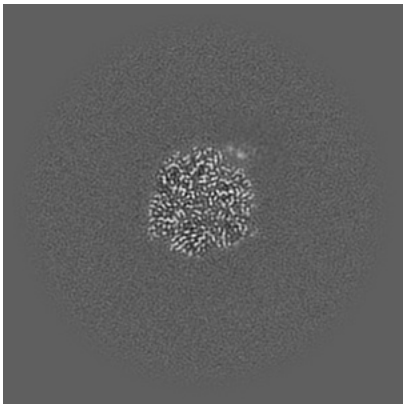
6.3.1 Primary map



X Index: 230



Y Index: 231

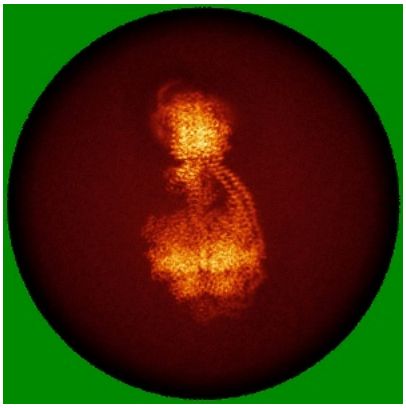


Z Index: 181

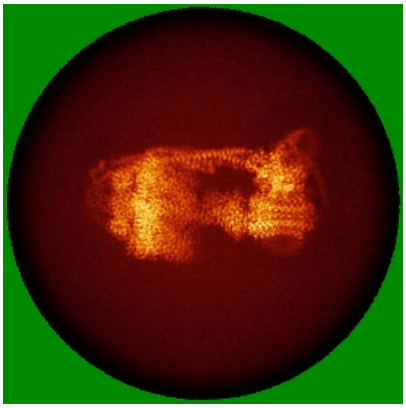
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

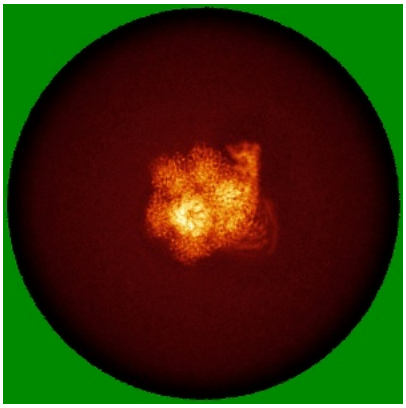
6.4.1 Primary map



X



Y

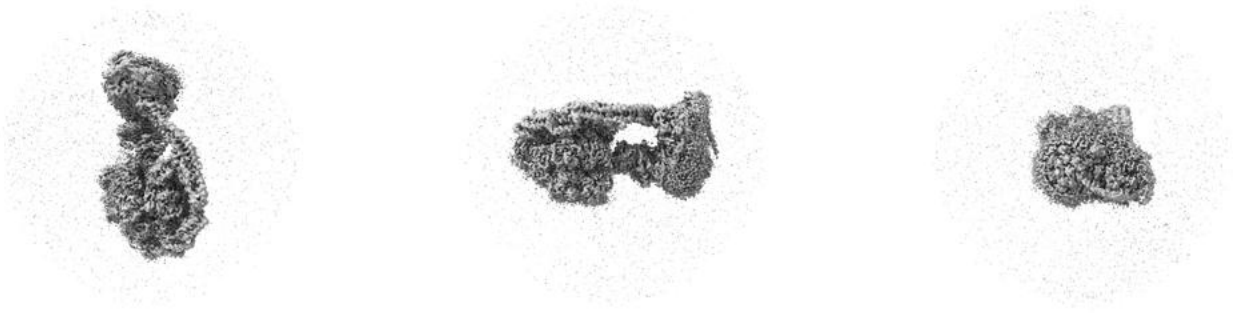


Z

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 (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 4.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

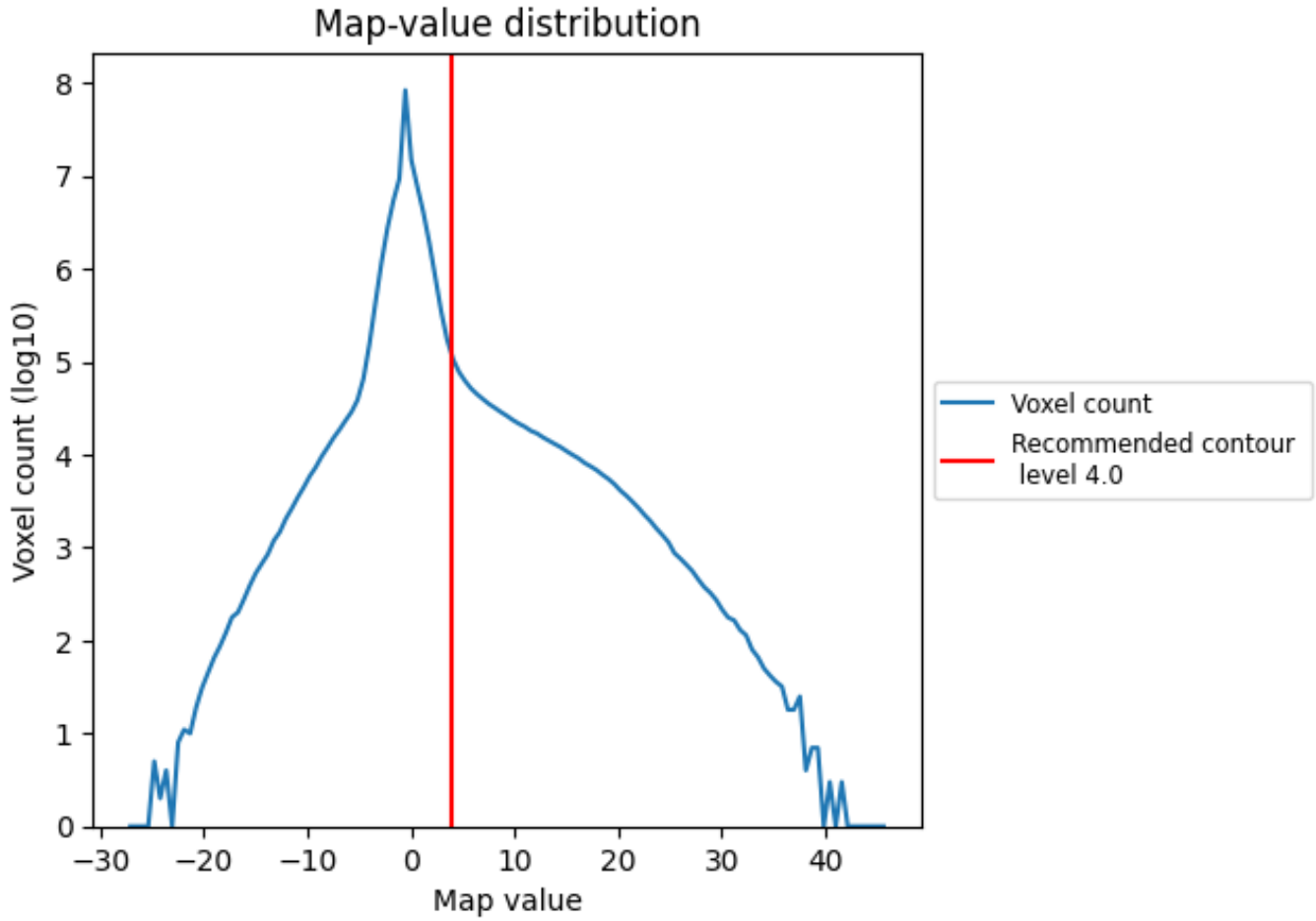
6.6 Mask visualisation (i)

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

7 Map analysis

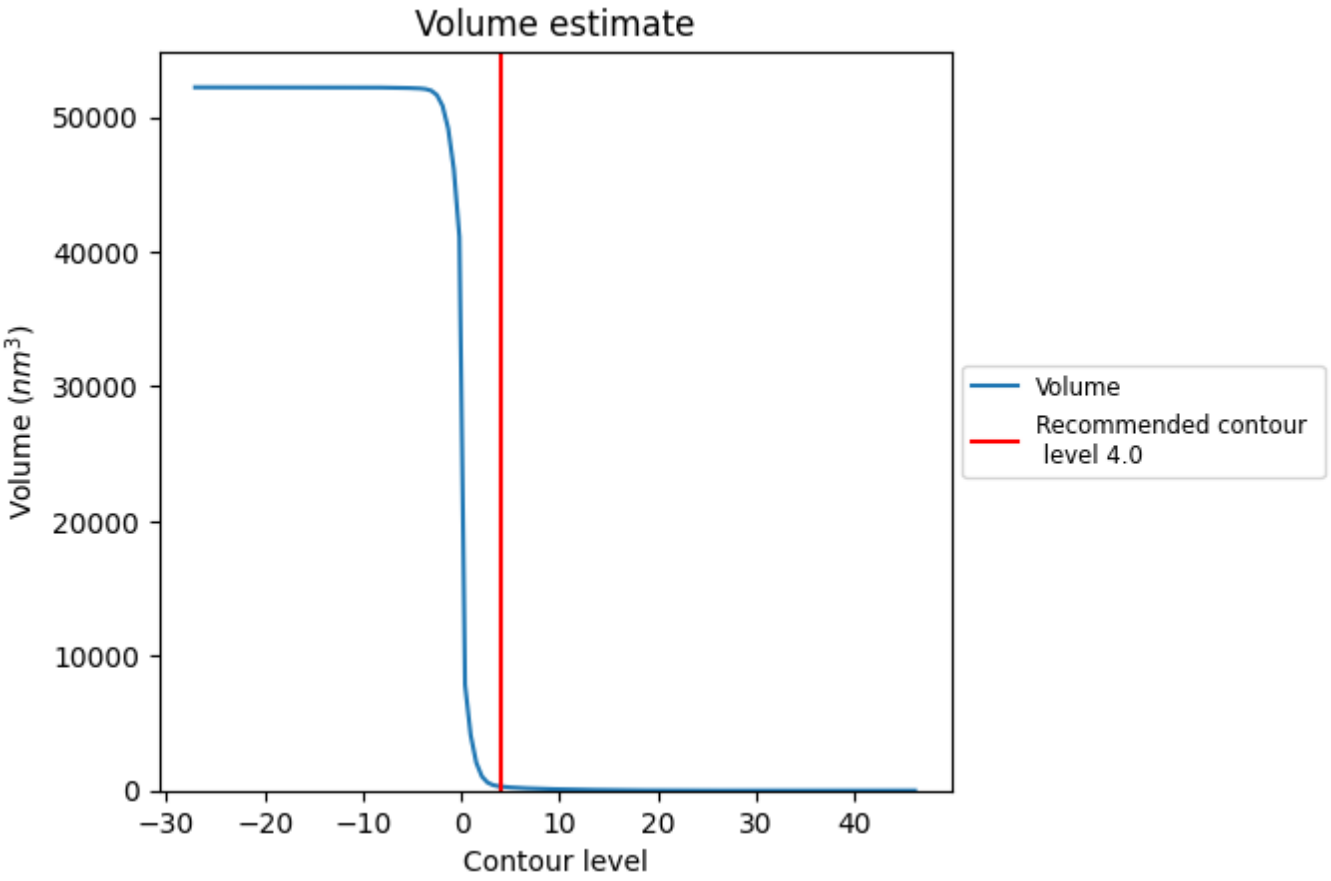
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

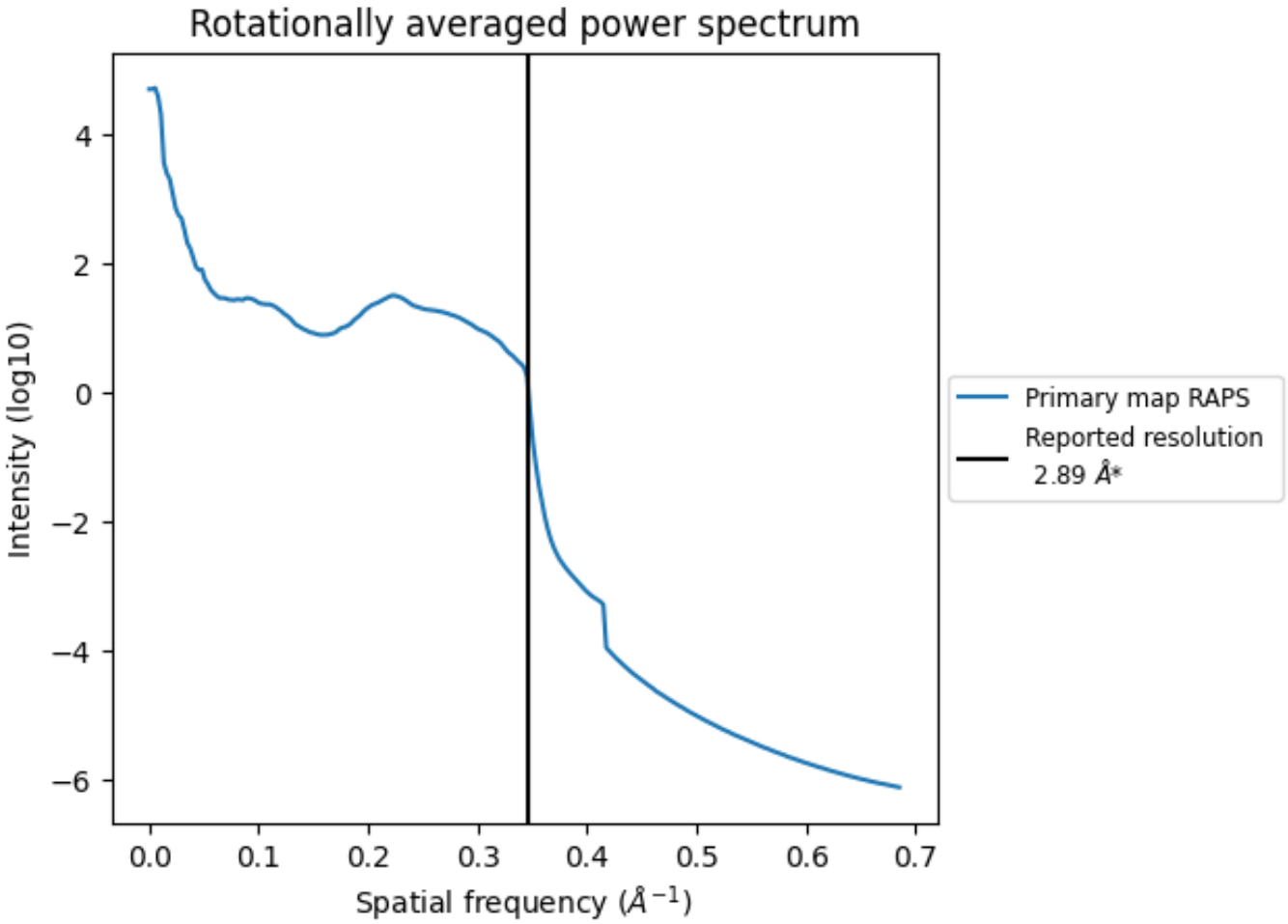
7.2 Volume estimate



The volume at the recommended contour level is 303 nm^3; this corresponds to an approximate mass of 274 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 0.346 Å^{-1}

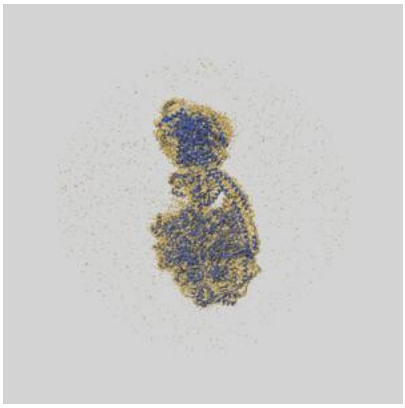
8 Fourier-Shell correlation (i)

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

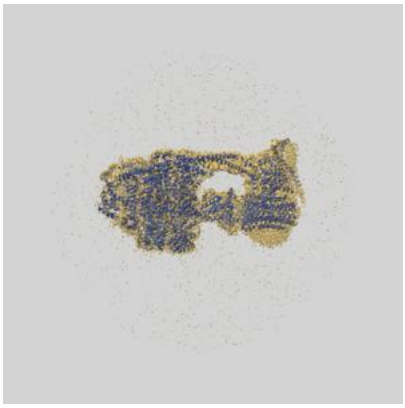
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-37251 and PDB model 8KI3. Per-residue inclusion information can be found in section 3 on page 10.

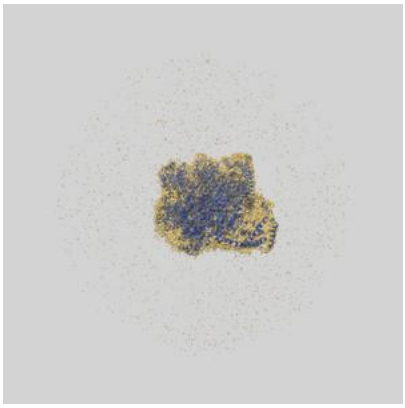
9.1 Map-model overlay



X



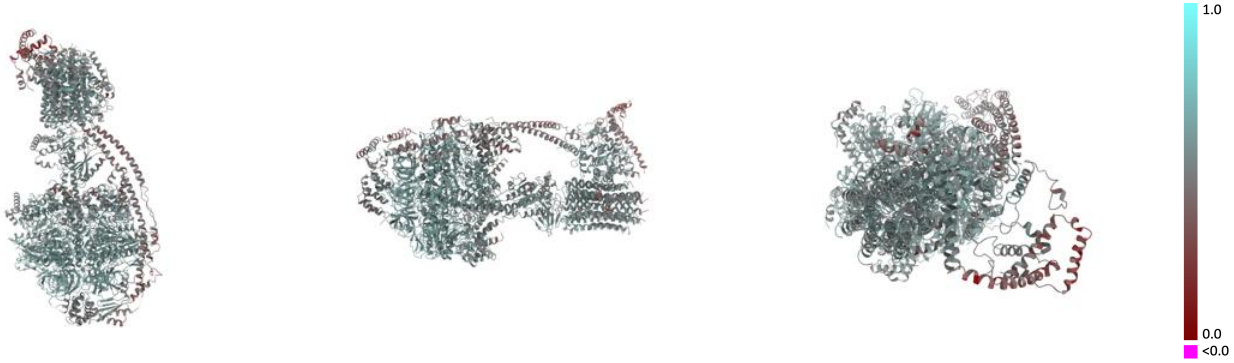
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.0 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.

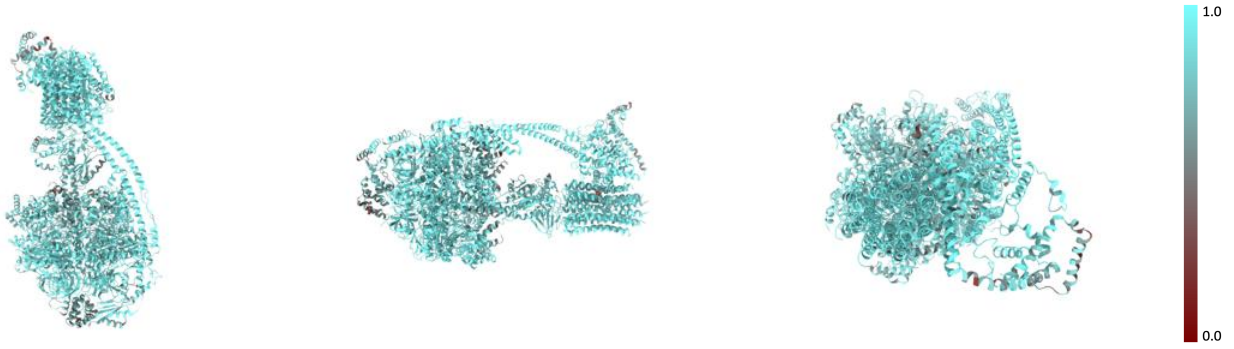
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

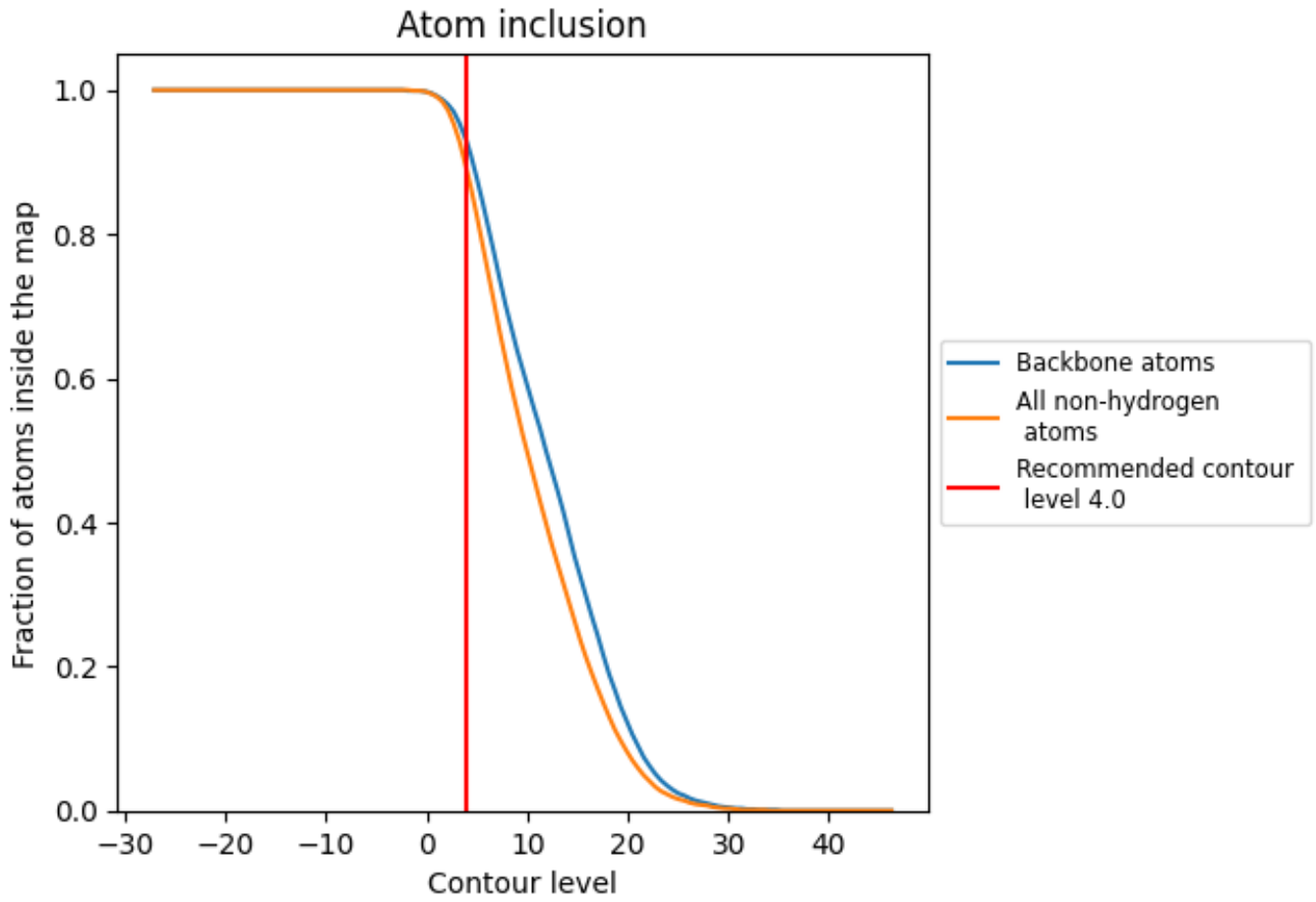
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (4.0).

9.4 Atom inclusion (i)



At the recommended contour level, 93% of all backbone atoms, 89% 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 (4.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8880	0.5470
1	0.9110	0.5350
2	0.9210	0.5450
3	0.9260	0.5460
4	0.9150	0.5440
5	0.9280	0.5490
6	0.9470	0.5440
7	0.9340	0.5430
8	0.9130	0.5400
A	0.9040	0.5820
B	0.9150	0.5840
C	0.8810	0.5660
D	0.8850	0.5750
E	0.9110	0.5840
F	0.9220	0.5920
G	0.8310	0.5350
H	0.8840	0.5390
I	0.8920	0.5290
J	0.6870	0.5210
K	0.9240	0.4750
L	0.8470	0.3920
M	0.9280	0.4480
N	0.8980	0.5280
O	0.6870	0.4920
P	0.8810	0.4940
Q	0.9340	0.5520
R	0.9100	0.5040
S	0.7160	0.3440
T	0.7380	0.3390