Full wwPDB EM Validation Report ⓘ

Dec 10, 2022 – 08:16 pm GMT

PDB ID	:	6R10
EMDB ID	:	EMD-4703
Title	:	Thermus thermophilus V/A-type ATPase/synthase, rotational state 1R
Authors	:	Zhou, L.; Sazanov, L.
Deposited on	:	2019-03-13
Resolution	:	4.30 Å(reported)
Based on initial models	:	5Y5Y, 5Y5X

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:

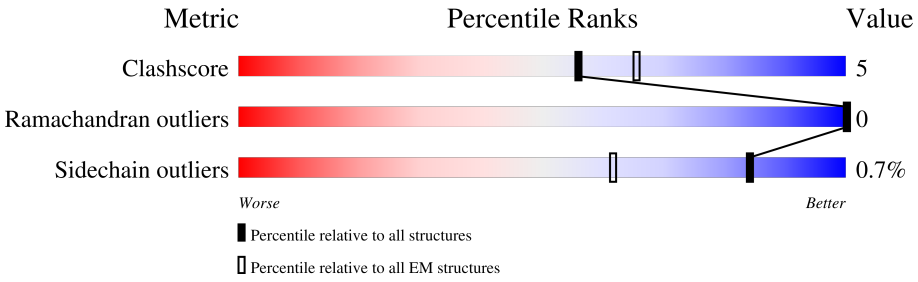
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

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 4.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
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	578	85% 15%
1	B	578	81% 18%
1	C	578	80% 20%
2	D	478	83% 13%
2	E	478	80% 16%
2	F	478	78% 17%
3	G	223	79% 13% 7%
4	H	104	6% 77% 22%

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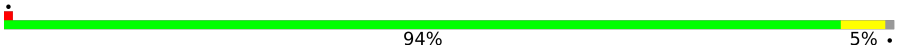
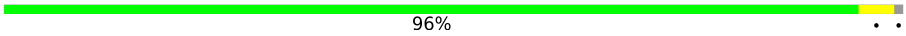
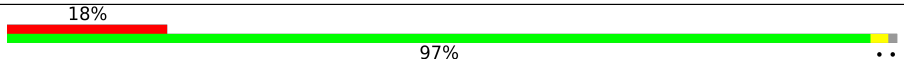
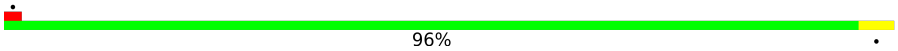
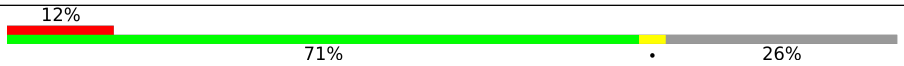
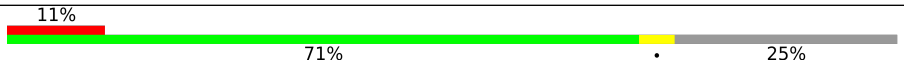
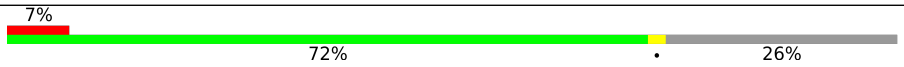
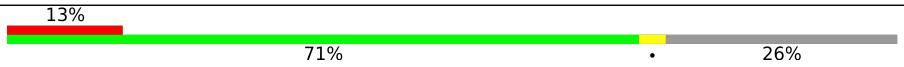
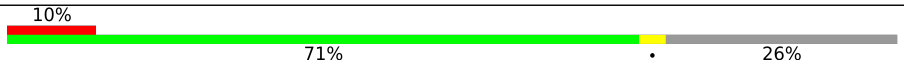
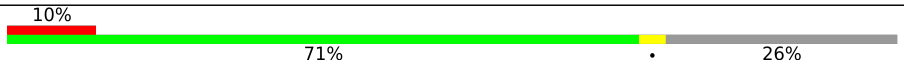
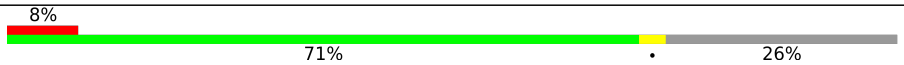
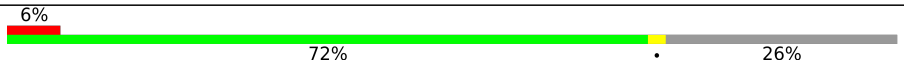
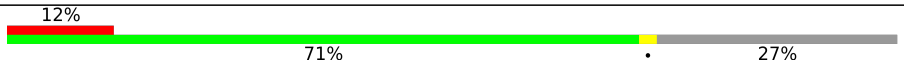
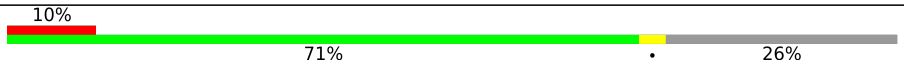
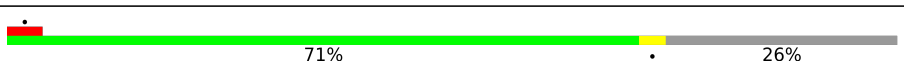
Mol	Chain	Length	Quality of chain
5	I	120	
5	K	120	
6	J	188	
6	L	188	
7	M	323	
8	N	652	
9	O	99	
9	P	99	
9	Q	99	
9	R	99	
9	S	99	
9	T	99	
9	U	99	
9	V	99	
9	W	99	
9	X	99	
9	Y	99	
9	Z	99	

2 Entry composition (i)

There are 11 unique types of molecules in this entry. The entry contains 38522 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 V-type ATP synthase alpha chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	577	Total	C	N	O	S	0	0
			4472	2854	762	834	22		
1	B	577	Total	C	N	O	S	0	0
			4472	2854	762	834	22		
1	C	577	Total	C	N	O	S	0	0
			4472	2854	762	834	22		

- Molecule 2 is a protein called V-type ATP synthase beta chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	460	Total	C	N	O	S	0	0
			3600	2280	623	687	10		
2	E	460	Total	C	N	O	S	0	0
			3600	2280	623	687	10		
2	F	460	Total	C	N	O	S	0	0
			3600	2280	623	687	10		

- Molecule 3 is a protein called V-type ATP synthase subunit D.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	207	Total	C	N	O	S	0	0
			1628	1026	304	296	2		

- Molecule 4 is a protein called V-type ATP synthase subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	H	104	Total	C	N	O	S	0	0
			792	501	136	152	3		

- Molecule 5 is a protein called V-type ATP synthase, subunit (VAPC-THERM).

Mol	Chain	Residues	Atoms				AltConf	Trace
5	I	103	Total 511	C 306	N 103	O 102	0	0
5	K	99	Total 494	C 297	N 99	O 98	0	0

- Molecule 6 is a protein called V-type ATP synthase subunit E.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	J	186	Total 922	C 551	N 186	O 185	0	0
6	L	187	Total 926	C 553	N 187	O 186	0	0

- Molecule 7 is a protein called V-type ATP synthase subunit C.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	M	320	Total 1575	C 935	N 320	O 320	0	0

- Molecule 8 is a protein called V-type ATP synthase subunit I.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	N	649	Total 3190	C 1892	N 649	O 649	0	0

- Molecule 9 is a protein called V-type ATP synthase, subunit K.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	O	73	Total 351	C 205	N 73	O 73	0	0
9	P	73	Total 351	C 205	N 73	O 73	0	0
9	Q	74	Total 356	C 208	N 74	O 74	0	0
9	R	73	Total 351	C 205	N 73	O 73	0	0
9	S	73	Total 351	C 205	N 73	O 73	0	0
9	T	73	Total 351	C 205	N 73	O 73	0	0
9	U	73	Total 351	C 205	N 73	O 73	0	0

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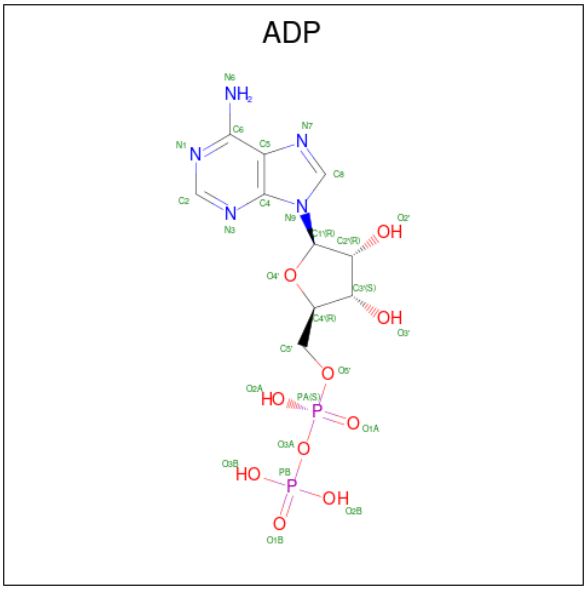
Mol	Chain	Residues	Atoms				AltConf	Trace
9	V	73	Total 351	C 205	N 73	O 73	0	0
9	W	73	Total 351	C 205	N 73	O 73	0	0
9	X	72	Total 347	C 203	N 72	O 72	0	0
9	Y	73	Total 351	C 205	N 73	O 73	0	0
9	Z	73	Total 351	C 205	N 73	O 73	0	0

- Molecule 10 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
10	A	1	Total 1	Mg 1	0

- Molecule 11 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



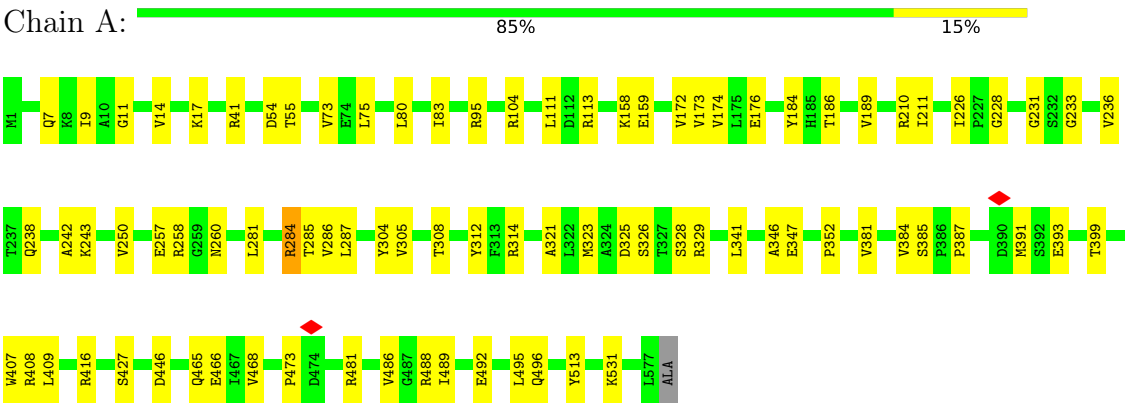
Mol	Chain	Residues	Atoms					AltConf
11	A	1	Total 27	C 10	N 5	O 10	P 2	0
11	F	1	Total 27	C 10	N 5	O 10	P 2	0

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.

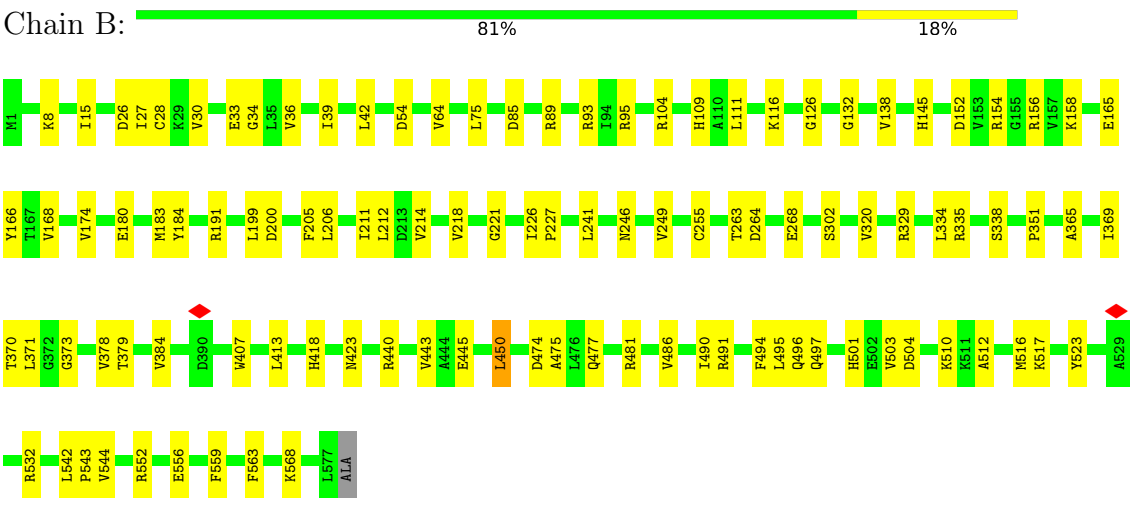
• Molecule 1: V-type ATP synthase alpha chain

Chain A:



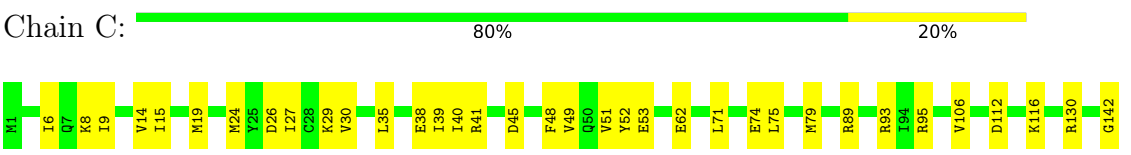
• Molecule 1: V-type ATP synthase alpha chain

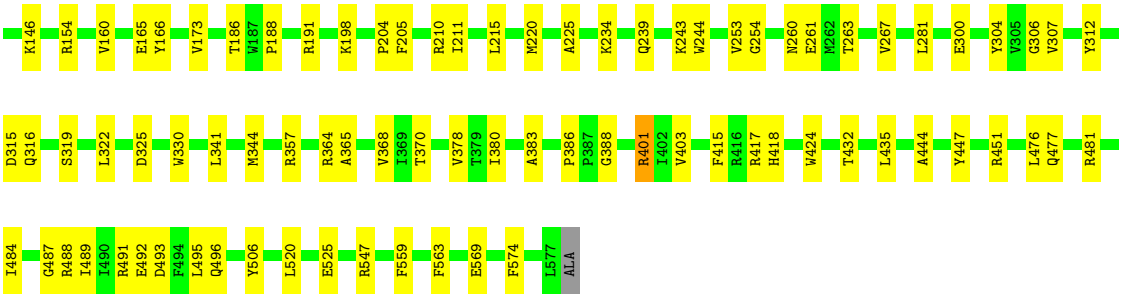
Chain B:



• Molecule 1: V-type ATP synthase alpha chain

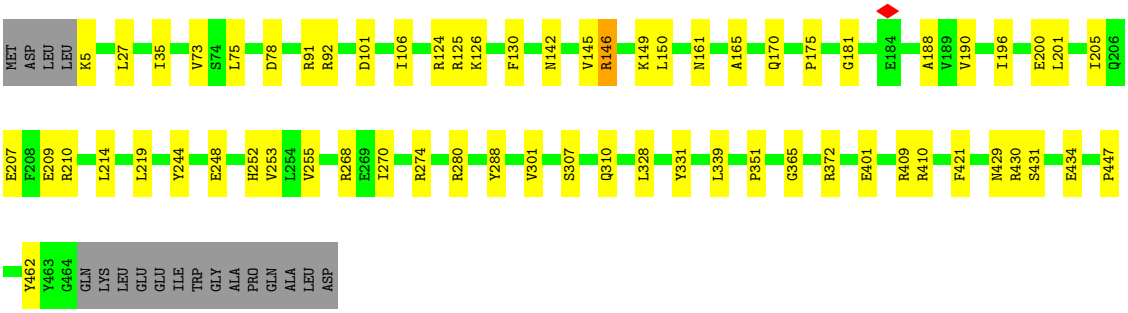
Chain C:





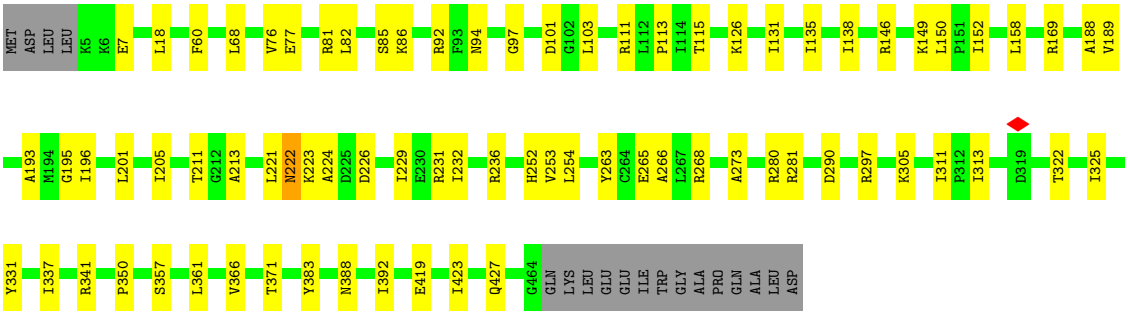
• Molecule 2: V-type ATP synthase beta chain

Chain D:



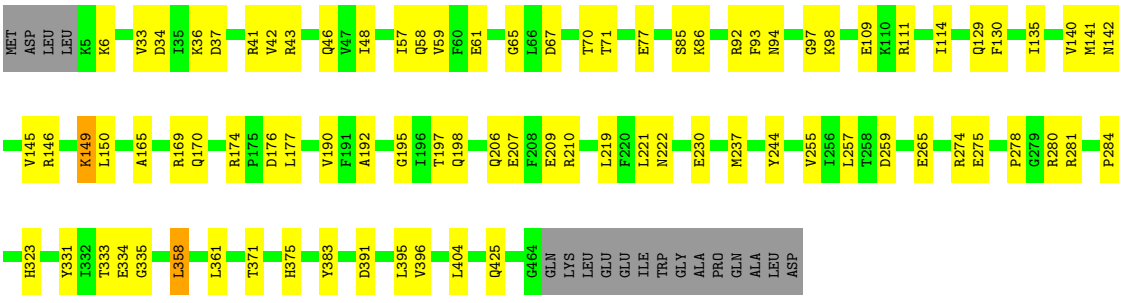
• Molecule 2: V-type ATP synthase beta chain

Chain E:



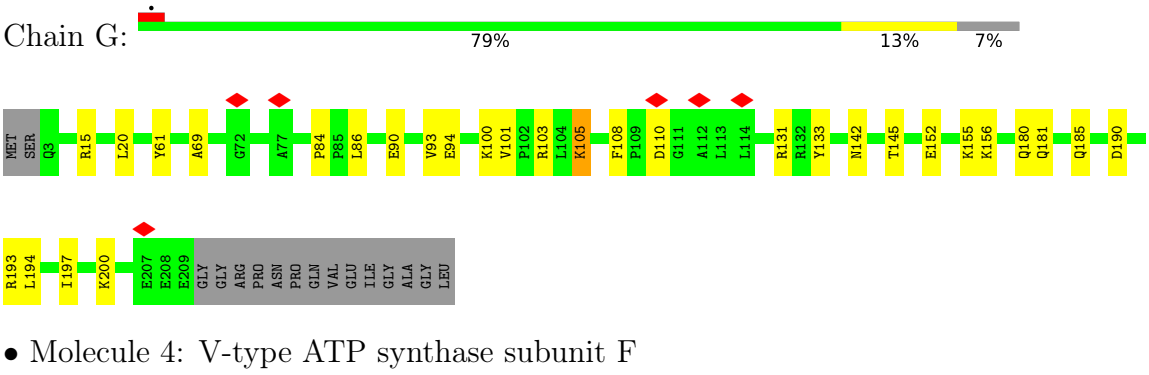
• Molecule 2: V-type ATP synthase beta chain

Chain F:



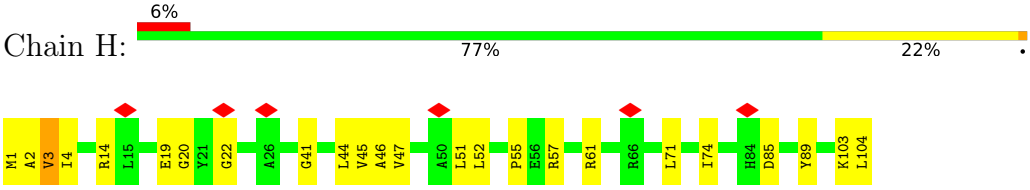
• Molecule 3: V-type ATP synthase subunit D

Chain G:



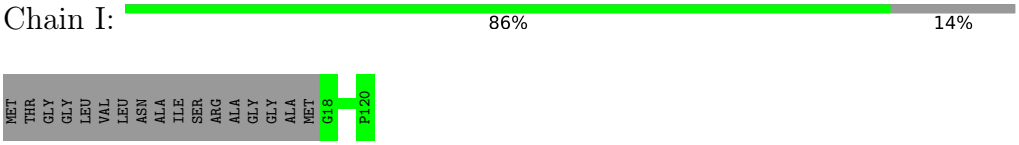
• Molecule 4: V-type ATP synthase subunit F

Chain H:



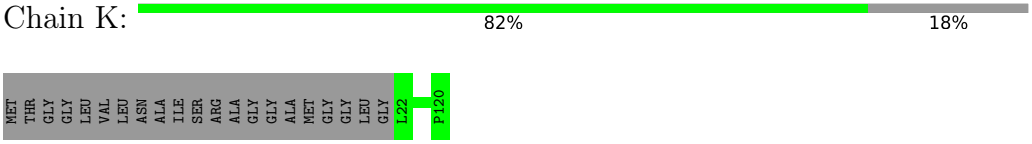
• Molecule 5: V-type ATP synthase, subunit (VAPC-THERM)

Chain I:



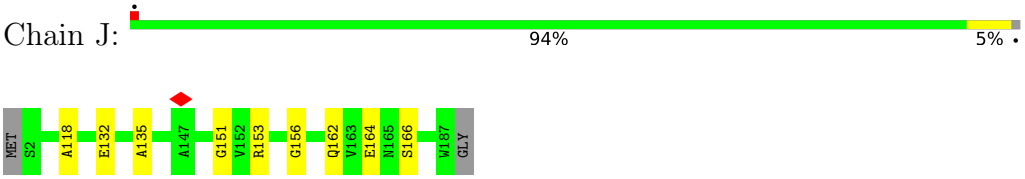
• Molecule 5: V-type ATP synthase, subunit (VAPC-THERM)

Chain K:



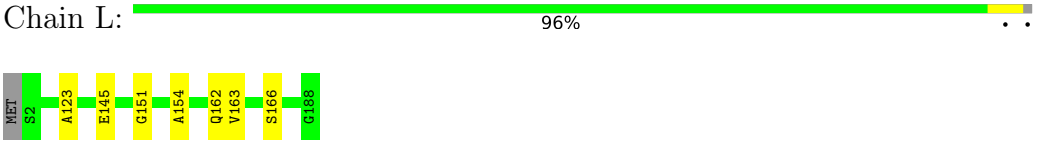
• Molecule 6: V-type ATP synthase subunit E

Chain J:



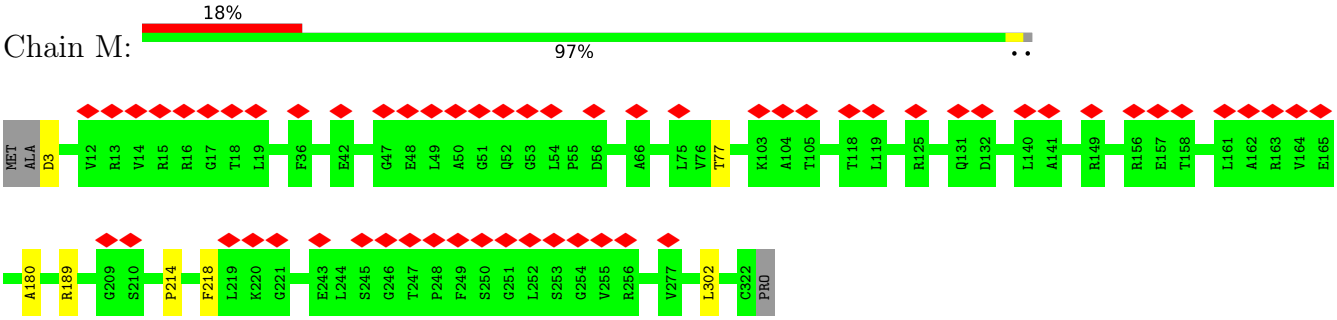
• Molecule 6: V-type ATP synthase subunit E

Chain L:



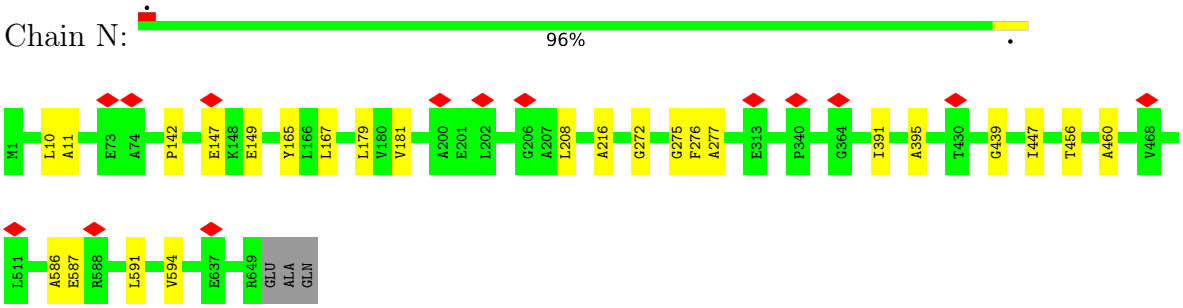
• Molecule 7: V-type ATP synthase subunit C

Chain M:



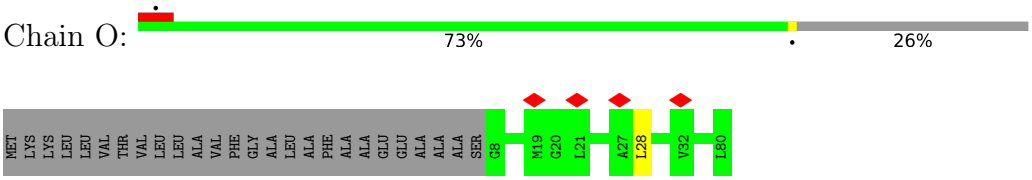
• Molecule 8: V-type ATP synthase subunit I

Chain N:



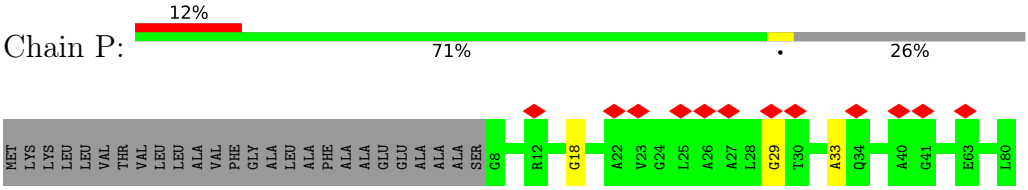
• Molecule 9: V-type ATP synthase, subunit K

Chain O:



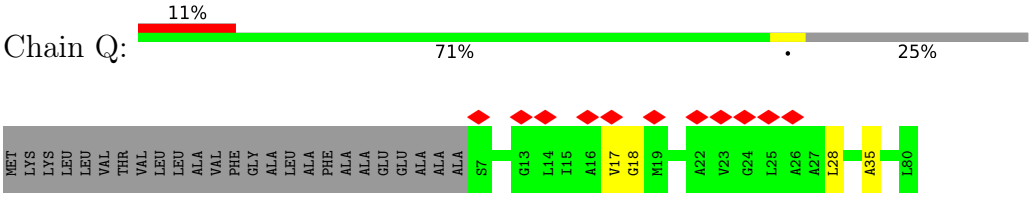
• Molecule 9: V-type ATP synthase, subunit K

Chain P:



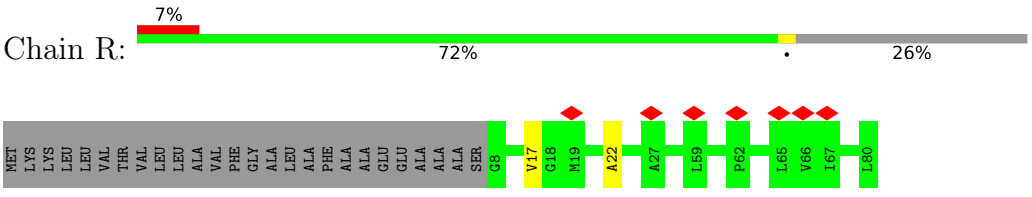
• Molecule 9: V-type ATP synthase, subunit K

Chain Q:



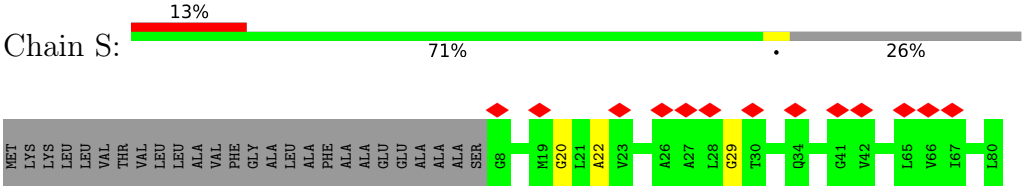
• Molecule 9: V-type ATP synthase, subunit K

Chain R:



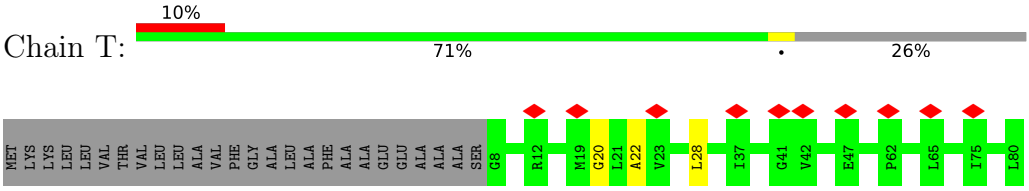
• Molecule 9: V-type ATP synthase, subunit K

Chain S:



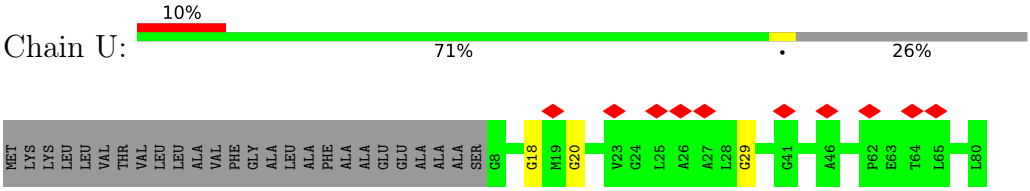
• Molecule 9: V-type ATP synthase, subunit K

Chain T:



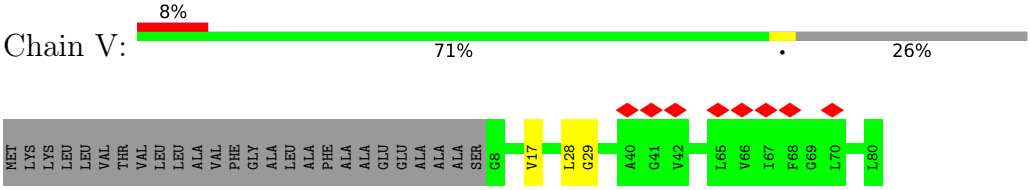
• Molecule 9: V-type ATP synthase, subunit K

Chain U:



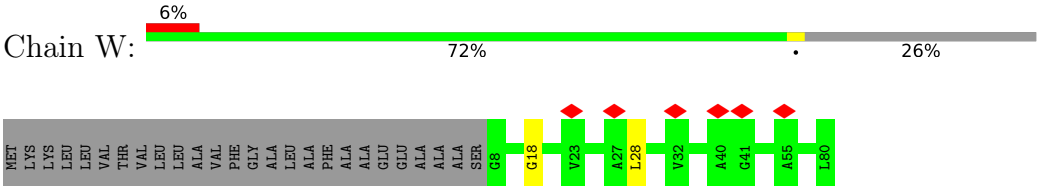
• Molecule 9: V-type ATP synthase, subunit K

Chain V:



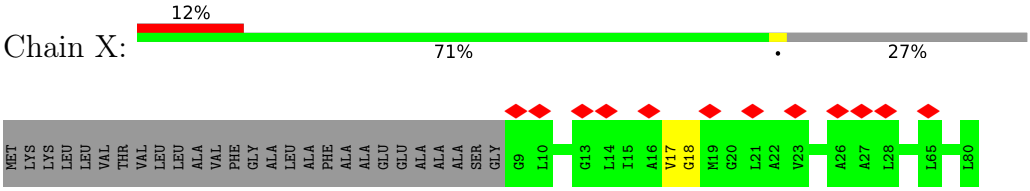
• Molecule 9: V-type ATP synthase, subunit K

Chain W:



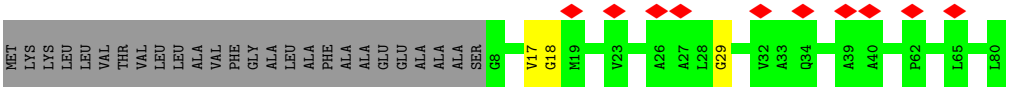
• Molecule 9: V-type ATP synthase, subunit K

Chain X:

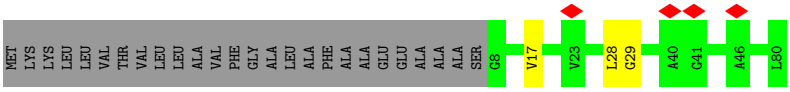


• Molecule 9: V-type ATP synthase, subunit K

Chain Y:



• Molecule 9: V-type ATP synthase, subunit K



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	15571	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)	500	Depositor
Maximum defocus (nm)	1780	Depositor
Magnification	129032	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.175	Depositor
Minimum map value	-0.076	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.0215	Depositor
Map size (Å)	143.22, 143.22, 251.72	wwPDB
Map dimensions	232, 132, 132	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.085, 1.085, 1.085	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, 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	A	0.42	0/4568	0.60	0/6198
1	B	0.39	0/4568	0.62	3/6198 (0.0%)
1	C	0.42	0/4568	0.61	0/6198
2	D	0.42	0/3667	0.62	2/4965 (0.0%)
2	E	0.39	0/3667	0.64	2/4965 (0.0%)
2	F	0.42	0/3667	0.65	5/4965 (0.1%)
3	G	0.36	0/1648	0.61	0/2217
4	H	0.31	0/803	0.65	0/1084
5	I	0.24	0/510	0.26	0/711
5	K	0.26	0/493	0.28	0/689
6	J	0.25	0/921	0.37	0/1283
6	L	0.26	0/925	0.38	0/1288
7	M	0.24	0/1574	0.38	0/2187
8	N	0.25	0/3189	0.44	0/4430
9	O	0.25	0/350	0.37	0/480
9	P	0.25	0/350	0.34	0/480
9	Q	0.25	0/355	0.37	0/487
9	R	0.25	0/350	0.37	0/480
9	S	0.25	0/350	0.36	0/480
9	T	0.25	0/350	0.36	0/480
9	U	0.24	0/350	0.35	0/480
9	V	0.25	0/350	0.34	0/480
9	W	0.25	0/350	0.36	0/480
9	X	0.24	0/346	0.35	0/475
9	Y	0.25	0/350	0.35	0/480
9	Z	0.25	0/350	0.37	0/480
All	All	0.36	0/38969	0.56	12/53140 (0.0%)

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	C	0	2
4	H	0	1
All	All	0	3

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	152	ASP	CB-CG-OD1	7.92	125.43	118.30
2	D	106	ILE	C-N-CA	6.49	137.91	121.70
2	D	150	LEU	CA-CB-CG	6.13	129.40	115.30
2	E	361	LEU	C-N-CA	5.61	135.72	121.70
2	F	150	LEU	CA-CB-CG	5.43	127.79	115.30
2	E	150	LEU	CA-CB-CG	5.38	127.67	115.30
2	F	361	LEU	CA-CB-CG	5.38	127.67	115.30
1	B	241	LEU	CA-CB-CG	5.22	127.31	115.30
1	B	28	CYS	CA-CB-SG	5.10	123.17	114.00
2	F	358	LEU	CA-CB-CG	5.07	126.97	115.30
2	F	371	THR	C-N-CA	5.05	134.33	121.70
2	F	259	ASP	CB-CG-OD1	5.04	122.83	118.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	142	GLY	Peptide
1	C	477	GLN	Peptide
4	H	3	VAL	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	A	4472	0	4491	51	0
1	B	4472	0	4491	62	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	4472	0	4491	70	0
2	D	3600	0	3627	39	0
2	E	3600	0	3627	48	0
2	F	3600	0	3627	49	0
3	G	1628	0	1707	21	0
4	H	792	0	803	17	0
5	I	511	0	279	0	0
5	K	494	0	268	0	0
6	J	922	0	488	6	0
6	L	926	0	491	4	0
7	M	1575	0	775	4	0
8	N	3190	0	1547	13	0
9	O	351	0	194	1	0
9	P	351	0	194	3	0
9	Q	356	0	196	4	0
9	R	351	0	194	2	0
9	S	351	0	194	3	0
9	T	351	0	194	3	0
9	U	351	0	194	3	0
9	V	351	0	194	3	0
9	W	351	0	194	2	0
9	X	347	0	191	2	0
9	Y	351	0	194	3	0
9	Z	351	0	194	3	0
10	A	1	0	0	0	0
11	A	27	0	12	3	0
11	F	27	0	12	0	0
All	All	38522	0	33063	372	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (372) 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:193:ALA:O	2:E:222:ASN:HB2	1.66	0.93
2:F:36:LYS:O	2:F:71:THR:HA	1.67	0.93
1:B:116:LYS:HA	1:B:166:TYR:O	1.74	0.85
4:H:85:ASP:O	4:H:89:TYR:HB2	1.87	0.74
1:B:450:LEU:HD22	1:B:516:MET:HG2	1.68	0.74
1:B:75:LEU:O	1:B:184:TYR:HA	1.88	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:G:94:GLU:HB2	3:G:101:VAL:O	1.88	0.73
1:B:512:ALA:O	1:B:516:MET:HB2	1.88	0.73
1:B:227:PRO:HA	1:B:384:VAL:O	1.91	0.71
1:C:40:ILE:O	1:C:48:PHE:HB3	1.90	0.71
2:E:82:LEU:O	2:E:111:ARG:HA	1.92	0.69
8:N:167:LEU:HA	8:N:179:LEU:O	1.92	0.68
1:B:8:LYS:HD3	1:B:15:ILE:HD12	1.78	0.65
1:C:476:LEU:HD22	1:C:481:ARG:HD2	1.78	0.65
1:C:26:ASP:HB2	1:C:39:ILE:HD12	1.78	0.65
2:E:76:VAL:HG12	2:E:77:GLU:HG2	1.78	0.65
2:D:165:ALA:HB1	2:D:207:GLU:HG2	1.79	0.64
1:A:258:ARG:NH2	2:F:331:TYR:O	2.31	0.63
2:D:161:ASN:ND2	2:D:200:GLU:OE1	2.32	0.62
8:N:586:ALA:HB1	8:N:594:VAL:HA	1.80	0.62
1:B:496:GLN:HB3	1:B:552:ARG:HH12	1.64	0.62
2:F:41:ARG:NH2	2:F:42:VAL:O	2.33	0.61
1:A:54:ASP:O	1:A:104:ARG:NH1	2.34	0.61
1:C:388:GLY:HA3	2:E:322:THR:HG23	1.83	0.60
2:E:169:ARG:NH1	2:E:427:GLN:OE1	2.35	0.60
1:B:206:LEU:HB2	1:B:246:ASN:HB2	1.83	0.60
1:C:89:ARG:NH1	1:C:106:VAL:O	2.35	0.60
2:D:372:ARG:NH2	2:D:462:TYR:OH	2.34	0.59
2:E:158:LEU:HD21	2:E:341:ARG:HG2	1.83	0.59
9:X:18:GLY:HA3	9:Y:17:VAL:HA	1.83	0.59
1:B:93:ARG:NH1	1:B:109:HIS:O	2.36	0.59
1:C:53:GLU:OE2	1:C:89:ARG:NH2	2.36	0.59
1:B:8:LYS:HB3	1:B:15:ILE:HB	1.85	0.59
1:C:386:PRO:O	2:E:331:TYR:OH	2.21	0.59
1:C:24:MET:HB2	2:F:65:GLY:H	1.68	0.58
1:C:315:ASP:HA	1:C:370:THR:HG21	1.84	0.58
1:A:473:PRO:O	1:A:481:ARG:NH1	2.36	0.58
1:C:489:ILE:O	1:C:493:ASP:HB3	2.03	0.58
1:A:250:VAL:O	1:A:285:THR:HA	2.02	0.58
4:H:1:MET:N	4:H:41:GLY:O	2.36	0.58
9:U:18:GLY:HA3	9:V:17:VAL:HA	1.84	0.58
1:B:443:VAL:O	1:B:510:LYS:NZ	2.37	0.58
1:C:198:LYS:HG2	1:C:368:VAL:HG12	1.83	0.58
2:D:27:LEU:HD23	2:D:75:LEU:HD12	1.86	0.57
1:A:159:GLU:HG2	1:A:174:VAL:HB	1.86	0.57
4:H:1:MET:HA	4:H:44:LEU:HB3	1.87	0.57
1:B:221:GLY:H	1:B:379:THR:HB	1.70	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:P:18:GLY:HA3	9:Q:17:VAL:HA	1.87	0.56
1:C:417:ARG:NH2	2:E:357:SER:O	2.37	0.56
2:F:278:PRO:HA	2:F:284:PRO:HA	1.87	0.56
1:A:416:ARG:NH2	2:F:391:ASP:OD2	2.38	0.56
2:E:188:ALA:HB3	2:E:253:VAL:HG22	1.88	0.56
2:E:193:ALA:HB3	2:E:221:LEU:HA	1.87	0.56
1:C:225:ALA:HB2	1:C:403:VAL:HG11	1.87	0.55
2:E:211:THR:HG23	2:E:213:ALA:H	1.70	0.55
9:Q:18:GLY:HA3	9:R:17:VAL:HA	1.87	0.55
2:E:419:GLU:HA	2:E:423:ILE:HD12	1.89	0.55
2:D:170:GLN:NE2	2:D:429:ASN:OD1	2.39	0.55
1:A:172:VAL:HG23	1:A:173:VAL:HG23	1.88	0.55
2:D:92:ARG:HG2	2:D:219:LEU:HD12	1.90	0.54
2:D:35:ILE:HG12	2:D:73:VAL:HG12	1.87	0.54
3:G:15:ARG:HH21	3:G:180:GLN:HE21	1.55	0.54
1:C:39:ILE:HG12	1:C:49:VAL:HG22	1.90	0.54
1:A:189:VAL:HB	1:A:304:TYR:HB3	1.89	0.54
1:B:138:VAL:O	1:B:145:HIS:HB3	2.08	0.54
6:J:118:ALA:HA	6:J:156:GLY:HA2	1.88	0.54
8:N:391:ILE:O	8:N:395:ALA:N	2.40	0.54
1:A:9:ILE:HG12	1:A:14:VAL:HG22	1.90	0.54
1:C:75:LEU:HA	1:C:79:MET:HE3	1.90	0.54
2:D:190:VAL:HB	2:D:255:VAL:HG22	1.89	0.54
1:C:488:ARG:O	1:C:492:GLU:HB2	2.07	0.54
1:C:300:GLU:HG3	1:C:330:TRP:HE1	1.73	0.53
9:S:22:ALA:HB2	9:T:20:GLY:HA2	1.90	0.53
1:B:268:GLU:OE2	2:D:126:LYS:NZ	2.41	0.53
2:D:401:GLU:O	2:D:409:ARG:NH2	2.41	0.53
1:A:347:GLU:OE1	2:D:268:ARG:NH1	2.41	0.53
1:C:75:LEU:HD13	1:C:312:TYR:HB2	1.90	0.53
2:D:196:ILE:HD11	2:D:201:LEU:HD12	1.91	0.53
2:D:244:TYR:O	2:D:248:GLU:HB2	2.09	0.53
2:E:196:ILE:HD12	2:E:201:LEU:HB2	1.90	0.53
4:H:85:ASP:O	4:H:89:TYR:CB	2.55	0.53
9:Y:18:GLY:HA3	9:Z:17:VAL:HA	1.91	0.53
1:A:211:ILE:HD12	1:A:495:LEU:HD22	1.90	0.53
1:B:211:ILE:HD12	1:B:495:LEU:HD22	1.90	0.53
1:B:211:ILE:HG23	1:B:212:LEU:HG	1.90	0.53
1:A:41:ARG:NH2	1:A:341:LEU:O	2.38	0.53
2:D:339:LEU:HD22	2:D:351:PRO:HG2	1.89	0.53
1:A:242:ALA:O	1:A:284:ARG:NH1	2.38	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:496:GLN:O	1:B:552:ARG:NH1	2.41	0.53
1:C:300:GLU:OE2	1:C:357:ARG:NH1	2.42	0.53
2:D:92:ARG:HH11	2:D:205:ILE:HG21	1.74	0.53
1:A:73:VAL:O	1:A:186:THR:HA	2.09	0.53
1:C:418:HIS:NE2	1:C:495:LEU:O	2.42	0.53
1:C:365:ALA:HA	1:C:378:VAL:HG13	1.90	0.52
2:E:195:GLY:HA2	2:E:224:ALA:HB2	1.91	0.52
2:F:142:ASN:ND2	2:F:383:TYR:OH	2.41	0.52
1:A:465:GLN:HA	1:A:468:VAL:HG12	1.91	0.52
1:B:542:LEU:HD12	1:B:543:PRO:HD2	1.91	0.52
1:A:75:LEU:O	1:A:184:TYR:HA	2.09	0.52
2:F:149:LYS:O	2:F:333:THR:OG1	2.27	0.52
2:E:60:PHE:HB3	2:E:229:ILE:HG21	1.92	0.52
1:A:236:VAL:HG21	11:A:602:ADP:H2'	1.91	0.52
1:B:126:GLY:O	1:B:156:ARG:NH1	2.43	0.52
2:F:169:ARG:HG3	2:F:170:GLN:HG2	1.92	0.52
1:C:9:ILE:HG12	1:C:14:VAL:HG22	1.91	0.52
1:A:111:LEU:O	1:A:113:ARG:NH2	2.43	0.52
2:E:280:ARG:O	3:G:185:GLN:NE2	2.42	0.52
1:A:260:ASN:ND2	2:F:334:GLU:OE2	2.41	0.51
1:B:413:LEU:HB3	1:B:418:HIS:HB3	1.93	0.51
1:C:489:ILE:O	1:C:493:ASP:CB	2.58	0.51
3:G:190:ASP:OD1	3:G:193:ARG:NH1	2.43	0.51
1:A:83:ILE:HA	1:A:287:LEU:O	2.09	0.51
1:A:250:VAL:HB	1:A:285:THR:HG22	1.92	0.51
2:F:219:LEU:HD23	2:F:221:LEU:HD21	1.92	0.51
1:B:264:ASP:O	1:B:268:GLU:HB2	2.11	0.51
2:F:59:VAL:HG12	2:F:61:GLU:H	1.75	0.51
3:G:94:GLU:OE2	3:G:103:ARG:NH2	2.43	0.51
1:A:384:VAL:HG21	1:A:399:THR:HG21	1.91	0.51
2:F:37:ASP:HA	2:F:71:THR:HG22	1.93	0.51
2:F:6:LYS:HA	6:L:163:VAL:HA	1.93	0.51
1:B:30:VAL:O	1:B:34:GLY:HA2	2.10	0.51
1:C:211:ILE:HG13	1:C:215:LEU:HD12	1.93	0.51
1:C:253:VAL:HG21	1:C:306:GLY:HA3	1.93	0.51
2:E:236:ARG:NH2	2:E:290:ASP:OD1	2.44	0.51
2:F:165:ALA:HB1	2:F:207:GLU:HG2	1.92	0.51
2:F:222:ASN:HD21	2:F:230:GLU:HG3	1.75	0.51
8:N:11:ALA:HA	8:N:276:PHE:O	2.11	0.51
1:C:432:THR:HB	1:C:451:ARG:HH22	1.76	0.50
2:E:281:ARG:NH1	3:G:181:GLN:OE1	2.44	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:132:GLU:O	6:J:135:ALA:HB3	2.10	0.50
2:D:125:ARG:NH2	2:D:301:VAL:O	2.45	0.50
1:B:199:LEU:HD11	1:B:369:ILE:HG23	1.93	0.50
3:G:93:VAL:O	3:G:103:ARG:NH2	2.45	0.50
1:B:30:VAL:HA	1:B:64:VAL:HG22	1.94	0.50
2:F:195:GLY:N	2:F:222:ASN:O	2.38	0.50
2:F:197:THR:OG1	2:F:198:GLN:N	2.45	0.50
2:F:94:ASN:OD1	2:F:98:LYS:N	2.45	0.49
2:E:152:ILE:HB	2:E:313:ILE:HG12	1.94	0.49
7:M:3:ASP:N	7:M:77:THR:O	2.45	0.49
1:C:27:ILE:HD11	1:C:71:LEU:HD13	1.93	0.49
2:F:48:ILE:HD12	2:F:274:ARG:HD2	1.93	0.49
2:F:207:GLU:OE2	2:F:210:ARG:NH2	2.46	0.49
1:B:486:VAL:HG21	1:B:523:TYR:HD1	1.78	0.49
1:C:322:LEU:HD22	1:C:380:ILE:HG12	1.94	0.49
2:F:109:GLU:OE1	2:F:244:TYR:OH	2.30	0.49
1:A:231:GLY:N	11:A:602:ADP:O2B	2.46	0.49
1:B:93:ARG:NH1	1:B:111:LEU:O	2.46	0.49
1:C:74:GLU:HG2	1:C:186:THR:HG22	1.95	0.49
1:A:75:LEU:HD13	1:A:312:TYR:HB2	1.95	0.48
1:C:116:LYS:HA	1:C:166:TYR:O	2.12	0.48
1:C:160:VAL:HG22	1:C:173:VAL:HG22	1.95	0.48
6:J:151:GLY:HA3	6:J:166:SER:HA	1.95	0.48
3:G:61:TYR:OH	3:G:133:TYR:OH	2.29	0.48
3:G:69:ALA:HB1	7:M:302:LEU:HA	1.95	0.48
1:C:415:PHE:O	2:E:383:TYR:OH	2.31	0.48
1:B:116:LYS:HB3	1:B:165:GLU:HG2	1.94	0.48
2:D:91:ARG:NE	2:D:101:ASP:OD2	2.42	0.48
2:F:93:PHE:HB3	2:F:97:GLY:HA2	1.95	0.48
2:E:265:GLU:HA	2:E:268:ARG:HG2	1.95	0.48
1:B:329:ARG:NH2	2:D:331:TYR:O	2.37	0.48
2:F:190:VAL:HB	2:F:255:VAL:HG22	1.96	0.48
8:N:165:TYR:HA	8:N:181:VAL:O	2.14	0.48
1:A:328:SER:OG	1:A:329:ARG:NH2	2.46	0.48
1:C:525:GLU:HG2	1:C:574:PHE:HD2	1.79	0.48
1:B:517:LYS:HD2	1:B:563:PHE:HZ	1.77	0.47
2:D:431:SER:OG	2:D:434:GLU:OE1	2.25	0.47
2:F:396:VAL:HG22	2:F:404:LEU:HD21	1.96	0.47
2:E:231:ARG:HD2	2:E:266:ALA:HB2	1.95	0.47
2:F:135:ILE:HA	2:F:425:GLN:HE22	1.79	0.47
8:N:10:LEU:O	8:N:277:ALA:HA	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:ARG:HD3	1:A:341:LEU:HD22	1.96	0.47
1:C:444:ALA:HB3	1:C:447:TYR:HB2	1.96	0.47
2:F:140:VAL:O	2:F:375:HIS:NE2	2.47	0.47
4:H:14:ARG:NE	4:H:19:GLU:OE2	2.47	0.47
6:J:153:ARG:HA	6:J:164:GLU:HA	1.95	0.47
1:A:391:MET:N	1:A:391:MET:SD	2.88	0.47
2:E:196:ILE:HD11	2:E:223:LYS:H	1.79	0.47
1:A:408:ARG:N	1:A:427:SER:OG	2.42	0.47
1:B:475:ALA:HB1	4:H:104:LEU:HA	1.97	0.47
1:C:210:ARG:HH21	1:C:496:GLN:H	1.62	0.47
2:E:92:ARG:HD3	2:E:205:ILE:HD11	1.96	0.47
8:N:272:GLY:N	8:N:275:GLY:O	2.42	0.47
1:B:54:ASP:OD1	1:B:54:ASP:N	2.48	0.47
2:D:175:PRO:HB2	2:D:181:GLY:HA3	1.95	0.47
2:E:85:SER:OG	2:E:86:LYS:N	2.47	0.47
2:E:94:ASN:HB3	2:E:97:GLY:H	1.80	0.47
1:A:11:GLY:O	1:A:55:THR:OG1	2.31	0.47
1:C:267:VAL:HG11	2:E:126:LYS:HE2	1.97	0.47
2:D:92:ARG:HH21	2:D:101:ASP:HA	1.79	0.47
2:D:270:ILE:HG22	2:D:274:ARG:HE	1.80	0.47
1:A:488:ARG:NH1	1:A:492:GLU:OE1	2.49	0.46
1:B:85:ASP:OD1	1:B:89:ARG:N	2.43	0.46
1:B:132:GLY:HA3	1:B:371:LEU:HB2	1.96	0.46
2:F:34:ASP:HA	2:F:43:ARG:O	2.15	0.46
1:A:466:GLU:HG3	3:G:20:LEU:HD21	1.98	0.46
1:B:27:ILE:HG23	1:B:36:VAL:HG13	1.97	0.46
1:C:547:ARG:NH1	1:C:569:GLU:OE2	2.48	0.46
2:D:149:LYS:HA	2:D:310:GLN:O	2.15	0.46
2:F:46:GLN:HB3	2:F:58:GLN:HE21	1.80	0.46
2:F:92:ARG:HG2	2:F:219:LEU:HB2	1.98	0.46
4:H:4:ILE:HG22	4:H:22:GLY:HA2	1.97	0.46
2:E:366:VAL:HG12	2:E:371:THR:HG21	1.98	0.46
1:B:174:VAL:HG22	1:B:180:GLU:HG2	1.96	0.46
1:C:304:TYR:HA	1:C:307:VAL:HG12	1.98	0.46
1:A:250:VAL:HG22	1:A:321:ALA:HB3	1.98	0.46
2:D:142:ASN:N	2:D:142:ASN:OD1	2.49	0.46
1:A:228:GLY:HA3	1:A:409:LEU:HD12	1.97	0.46
1:C:41:ARG:NH1	1:C:341:LEU:O	2.49	0.46
4:H:3:VAL:HG22	4:H:20:GLY:HA3	1.97	0.46
7:M:180:ALA:HB1	7:M:189:ARG:HA	1.97	0.46
8:N:142:PRO:HA	8:N:179:LEU:HA	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:305:VAL:HA	1:A:308:THR:HG22	1.98	0.46
1:C:254:GLY:HA2	1:C:325:ASP:HB3	1.97	0.45
1:B:249:VAL:O	1:B:320:VAL:HA	2.16	0.45
1:C:204:PRO:HB3	1:C:435:LEU:HD13	1.98	0.45
1:B:338:SER:HB2	1:B:351:PRO:HG3	1.98	0.45
1:B:365:ALA:HA	1:B:378:VAL:HG13	1.98	0.45
1:A:243:LYS:HA	1:A:281:LEU:HD21	1.98	0.45
1:B:497:GLN:NE2	1:B:504:ASP:O	2.50	0.45
2:D:75:LEU:HD21	2:D:78:ASP:HB3	1.97	0.45
2:F:129:GLN:OE1	2:F:146:ARG:NH1	2.45	0.45
9:P:29:GLY:HA3	9:Q:28:LEU:HA	1.97	0.45
1:C:8:LYS:HB3	1:C:15:ILE:HG23	1.98	0.45
2:D:145:VAL:HG11	2:D:365:GLY:HA3	1.97	0.45
2:E:252:HIS:NE2	2:E:305:LYS:O	2.50	0.45
1:B:263:THR:OG1	2:D:124:ARG:O	2.27	0.45
2:D:288:TYR:HD1	2:D:328:LEU:HD22	1.82	0.45
1:C:130:ARG:HA	1:C:154:ARG:HG2	1.99	0.45
9:S:29:GLY:HA3	9:T:28:LEU:HA	1.99	0.45
1:B:200:ASP:OD1	1:B:200:ASP:N	2.50	0.45
1:B:542:LEU:HG	1:B:544:VAL:H	1.82	0.45
1:C:243:LYS:HA	1:C:281:LEU:HD21	1.99	0.45
2:D:421:PHE:O	2:D:430:ARG:NH2	2.44	0.45
1:A:233:GLY:N	11:A:602:ADP:O1B	2.50	0.44
2:D:146:ARG:HB3	2:D:307:SER:HB2	1.99	0.44
2:D:252:HIS:ND1	2:D:307:SER:OG	2.44	0.44
1:B:33:GLU:OE1	1:B:104:ARG:NH1	2.50	0.44
1:B:491:ARG:HA	1:B:495:LEU:HD12	1.99	0.44
1:C:559:PHE:O	1:C:563:PHE:HB2	2.17	0.44
2:E:131:ILE:HG23	2:E:146:ARG:HB2	1.99	0.44
2:E:135:ILE:HD12	2:E:350:PRO:HG3	1.98	0.44
2:E:189:VAL:HA	2:E:254:LEU:O	2.17	0.44
2:E:254:LEU:HD11	2:E:311:ILE:HD12	1.98	0.44
9:Y:29:GLY:HA3	9:Z:28:LEU:HA	1.98	0.44
1:C:211:ILE:HB	1:C:495:LEU:HD22	2.00	0.44
2:E:7:GLU:N	6:J:162:GLN:O	2.46	0.44
1:A:257:GLU:OE2	1:A:326:SER:OG	2.24	0.44
2:F:192:ALA:HB3	2:F:257:LEU:HD23	1.99	0.44
1:C:424:TRP:HH2	1:C:491:ARG:HD3	1.82	0.44
1:C:30:VAL:HG11	1:C:51:VAL:HG12	1.98	0.44
6:L:154:ALA:O	6:L:162:GLN:HA	2.17	0.44
1:A:329:ARG:NH2	1:A:385:SER:OG	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:140:VAL:HA	2:F:375:HIS:HE2	1.83	0.44
3:G:142:ASN:HA	3:G:145:THR:HG22	2.00	0.44
9:P:33:ALA:HA	9:Q:35:ALA:HB2	1.99	0.44
6:L:123:ALA:O	6:L:145:GLU:N	2.46	0.44
1:B:26:ASP:HB2	1:B:39:ILE:HD12	1.99	0.43
1:C:38:GLU:O	1:C:49:VAL:HA	2.18	0.43
1:C:146:LYS:O	1:C:316:GLN:NE2	2.51	0.43
2:E:224:ALA:HB1	2:E:231:ARG:HH21	1.83	0.43
1:B:440:ARG:NH1	1:B:445:GLU:O	2.51	0.43
2:F:130:PHE:HA	2:F:145:VAL:HG12	2.00	0.43
1:A:238:GLN:HE22	1:A:325:ASP:HB3	1.83	0.43
1:B:335:ARG:NH2	2:D:280:ARG:HD2	2.32	0.43
4:H:3:VAL:HG12	4:H:46:ALA:HB3	1.99	0.43
1:B:370:THR:OG1	1:B:373:GLY:N	2.51	0.43
3:G:194:LEU:HA	3:G:197:ILE:HG22	1.99	0.43
1:A:80:LEU:HD23	1:A:286:VAL:HG23	2.01	0.43
9:W:18:GLY:HA3	9:X:17:VAL:HA	1.99	0.43
1:A:486:VAL:HA	1:A:489:ILE:HG12	2.01	0.43
2:E:115:THR:O	2:E:297:ARG:NH1	2.51	0.43
2:F:281:ARG:HH11	2:F:323:HIS:CD2	2.37	0.43
1:B:501:HIS:CE1	1:B:503:VAL:HG12	2.54	0.43
9:O:28:LEU:HA	9:Z:29:GLY:HA3	2.00	0.43
2:D:188:ALA:HB3	2:D:253:VAL:HG22	2.01	0.43
2:F:33:VAL:HG21	2:F:57:ILE:HG12	2.01	0.43
3:G:94:GLU:HG2	3:G:103:ARG:HH21	1.84	0.43
1:A:473:PRO:HD3	2:F:395:LEU:HD21	2.01	0.43
2:F:77:GLU:OE2	2:F:111:ARG:NH2	2.52	0.43
1:B:226:ILE:HG22	1:B:407:TRP:HB2	2.00	0.43
1:B:474:ASP:O	1:B:481:ARG:NH1	2.52	0.43
1:C:344:MET:HG3	2:F:275:GLU:HA	2.00	0.43
1:B:477:GLN:HE21	4:H:103:LYS:N	2.17	0.42
1:C:234:LYS:HD2	1:C:383:ALA:HB1	1.99	0.42
1:C:424:TRP:CH2	1:C:491:ARG:HD3	2.54	0.42
4:H:57:ARG:O	4:H:61:ARG:HB2	2.18	0.42
1:B:168:VAL:HG23	1:B:183:MET:HB2	2.01	0.42
1:B:214:VAL:HG11	1:B:494:PHE:HZ	1.84	0.42
1:B:490:ILE:HD13	1:B:490:ILE:HA	1.90	0.42
2:D:207:GLU:OE2	2:D:210:ARG:NH2	2.51	0.42
2:E:138:ILE:HG12	2:E:337:ILE:HD13	2.01	0.42
8:N:439:GLY:N	8:N:447:ILE:O	2.52	0.42
1:C:19:MET:N	1:C:45:ASP:O	2.51	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:188:PRO:HG2	1:C:191:ARG:HH12	1.84	0.42
1:C:481:ARG:HA	1:C:484:ILE:HD12	2.01	0.42
1:C:520:LEU:HD23	1:C:520:LEU:HA	1.86	0.42
2:E:205:ILE:HD13	2:E:205:ILE:HA	1.88	0.42
4:H:47:VAL:O	4:H:74:ILE:N	2.52	0.42
4:H:51:LEU:HG	4:H:52:LEU:HD12	2.02	0.42
2:E:7:GLU:O	6:J:162:GLN:N	2.52	0.42
2:F:174:ARG:HH22	2:F:177:LEU:HD22	1.84	0.42
3:G:108:PHE:O	3:G:131:ARG:NH2	2.53	0.42
4:H:2:ALA:O	4:H:45:VAL:HA	2.18	0.42
1:A:446:ASP:OD1	1:A:513:TYR:OH	2.26	0.42
1:C:29:LYS:HA	1:C:35:LEU:O	2.18	0.42
1:C:93:ARG:HH21	1:C:112:ASP:HB2	1.83	0.42
2:F:85:SER:OG	2:F:86:LYS:N	2.53	0.42
4:H:4:ILE:HG13	4:H:47:VAL:HG22	2.01	0.42
1:B:168:VAL:HG22	1:B:184:TYR:HD1	1.85	0.42
2:E:81:ARG:HA	2:E:113:PRO:HA	2.02	0.42
3:G:90:GLU:OE2	3:G:105:LYS:NZ	2.35	0.42
1:B:30:VAL:O	1:B:34:GLY:CA	2.67	0.42
3:G:156:LYS:HE2	3:G:156:LYS:HB3	1.92	0.42
3:G:197:ILE:HG13	3:G:200:LYS:HD2	2.01	0.42
1:C:220:MET:SD	1:C:319:SER:OG	2.77	0.42
2:E:388:ASN:O	2:E:392:ILE:HB	2.20	0.42
4:H:55:PRO:HB2	4:H:71:LEU:HB3	2.02	0.42
1:B:556:GLU:HA	1:B:559:PHE:HB2	2.01	0.41
2:F:206:GLN:HA	2:F:209:GLU:HG2	2.02	0.41
3:G:152:GLU:HA	3:G:155:LYS:HG2	2.01	0.41
9:U:29:GLY:HA3	9:V:28:LEU:HA	2.02	0.41
2:F:67:ASP:OD1	2:F:70:THR:OG1	2.28	0.41
7:M:214:PRO:O	7:M:218:PHE:N	2.51	0.41
1:C:6:ILE:HD12	1:C:62:GLU:HB2	2.02	0.41
3:G:93:VAL:HG22	3:G:100:LYS:HZ1	1.85	0.41
4:H:45:VAL:HB	4:H:71:LEU:HD23	2.02	0.41
8:N:208:LEU:HA	8:N:216:ALA:HB1	2.02	0.41
9:V:29:GLY:HA3	9:W:28:LEU:HA	2.02	0.41
1:A:7:GLN:HB2	1:A:17:LYS:HB2	2.02	0.41
1:B:205:PHE:HB3	1:B:218:VAL:HG13	2.02	0.41
1:C:244:TRP:HB3	1:C:506:TYR:HD1	1.85	0.41
2:D:209:GLU:HG2	2:D:214:LEU:HG	2.03	0.41
2:E:101:ASP:HB3	2:E:103:LEU:HD13	2.02	0.41
1:A:210:ARG:NH2	1:A:496:GLN:O	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:255:CYS:HG	1:B:302:SER:HG	1.62	0.41
2:E:229:ILE:HA	2:E:232:ILE:HG22	2.01	0.41
1:A:158:LYS:HD3	1:A:176:GLU:HA	2.02	0.41
1:A:393:GLU:OE2	2:F:280:ARG:NH1	2.53	0.41
2:F:114:ILE:HD11	2:F:237:MET:HB2	2.02	0.41
1:A:323:MET:HG3	1:A:381:VAL:HB	2.02	0.41
1:B:42:LEU:HB3	2:E:68:LEU:HD11	2.02	0.41
1:C:260:ASN:HA	1:C:263:THR:HG22	2.02	0.41
2:D:130:PHE:HA	2:D:145:VAL:HA	2.01	0.41
2:E:226:ASP:OD1	2:E:226:ASP:N	2.53	0.41
1:C:116:LYS:HE3	1:C:165:GLU:HG3	2.02	0.41
2:F:140:VAL:HG12	2:F:141:MET:HG3	2.02	0.41
2:F:335:GLY:HA2	2:F:358:LEU:O	2.20	0.41
8:N:456:THR:O	8:N:460:ALA:N	2.49	0.41
9:T:22:ALA:HB2	9:U:20:GLY:HA2	2.03	0.41
1:A:226:ILE:HD12	1:A:407:TRP:HE3	1.86	0.41
1:C:191:ARG:N	1:C:364:ARG:HH12	2.19	0.41
1:C:401:ARG:NH1	2:F:265:GLU:OE2	2.38	0.41
2:D:188:ALA:O	2:D:253:VAL:HA	2.21	0.41
2:D:190:VAL:O	2:D:255:VAL:HA	2.20	0.41
1:A:387:PRO:HD2	1:A:393:GLU:HG3	2.03	0.40
1:C:487:GLY:O	1:C:491:ARG:HG2	2.21	0.40
1:A:346:ALA:HB2	1:A:352:PRO:HB3	2.04	0.40
1:C:239:GLN:NE2	1:C:261:GLU:OE1	2.55	0.40
8:N:587:GLU:HA	8:N:591:LEU:HA	2.03	0.40
1:C:205:PHE:HB2	1:C:220:MET:HA	2.01	0.40
2:E:18:LEU:HD11	2:E:273:ALA:HB1	2.04	0.40
6:L:151:GLY:HA3	6:L:166:SER:HA	2.02	0.40
8:N:147:GLU:O	8:N:149:GLU:N	2.50	0.40
1:B:334:LEU:HG	1:B:351:PRO:HG2	2.03	0.40
2:E:263:TYR:OH	2:E:290:ASP:OD2	2.29	0.40
2:F:176:ASP:OD1	2:F:176:ASP:N	2.54	0.40
3:G:110:ASP:HB2	3:G:131:ARG:HH22	1.86	0.40
1:C:38:GLU:OE1	1:C:52:TYR:OH	2.30	0.40
2:D:410:ARG:HD3	2:D:447:PRO:HD3	2.03	0.40
2:E:325:ILE:HD13	2:E:325:ILE:HA	1.82	0.40
3:G:84:PRO:HG2	3:G:86:LEU:HD12	2.04	0.40
9:R:22:ALA:HB2	9:S:20:GLY:HA2	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	A	575/578 (100%)	532 (92%)	43 (8%)	0	100	100
1	B	575/578 (100%)	519 (90%)	56 (10%)	0	100	100
1	C	575/578 (100%)	521 (91%)	54 (9%)	0	100	100
2	D	458/478 (96%)	423 (92%)	35 (8%)	0	100	100
2	E	458/478 (96%)	409 (89%)	49 (11%)	0	100	100
2	F	458/478 (96%)	414 (90%)	44 (10%)	0	100	100
3	G	205/223 (92%)	189 (92%)	16 (8%)	0	100	100
4	H	102/104 (98%)	84 (82%)	18 (18%)	0	100	100
5	I	101/120 (84%)	99 (98%)	2 (2%)	0	100	100
5	K	97/120 (81%)	96 (99%)	1 (1%)	0	100	100
6	J	184/188 (98%)	179 (97%)	5 (3%)	0	100	100
6	L	185/188 (98%)	171 (92%)	14 (8%)	0	100	100
7	M	318/323 (98%)	304 (96%)	14 (4%)	0	100	100
8	N	647/652 (99%)	580 (90%)	67 (10%)	0	100	100
9	O	71/99 (72%)	69 (97%)	2 (3%)	0	100	100
9	P	71/99 (72%)	69 (97%)	2 (3%)	0	100	100
9	Q	72/99 (73%)	70 (97%)	2 (3%)	0	100	100
9	R	71/99 (72%)	70 (99%)	1 (1%)	0	100	100
9	S	71/99 (72%)	69 (97%)	2 (3%)	0	100	100
9	T	71/99 (72%)	67 (94%)	4 (6%)	0	100	100
9	U	71/99 (72%)	68 (96%)	3 (4%)	0	100	100
9	V	71/99 (72%)	69 (97%)	2 (3%)	0	100	100
9	W	71/99 (72%)	69 (97%)	2 (3%)	0	100	100
9	X	70/99 (71%)	69 (99%)	1 (1%)	0	100	100
9	Y	71/99 (72%)	70 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	Z	71/99 (72%)	70 (99%)	1 (1%)	0	100	100
All	All	5790/6274 (92%)	5349 (92%)	441 (8%)	0	100	100

There are no Ramachandran outliers to report.

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	468/468 (100%)	464 (99%)	4 (1%)	78	88
1	B	468/468 (100%)	460 (98%)	8 (2%)	60	78
1	C	468/468 (100%)	466 (100%)	2 (0%)	91	94
2	D	386/401 (96%)	384 (100%)	2 (0%)	88	93
2	E	386/401 (96%)	384 (100%)	2 (0%)	88	93
2	F	386/401 (96%)	385 (100%)	1 (0%)	92	95
3	G	165/176 (94%)	164 (99%)	1 (1%)	86	92
4	H	80/80 (100%)	80 (100%)	0	100	100
All	All	2807/2863 (98%)	2787 (99%)	20 (1%)	84	90

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	95	ARG
1	A	284	ARG
1	A	314	ARG
1	A	531	LYS
1	B	95	ARG
1	B	154	ARG
1	B	158	LYS
1	B	191	ARG
1	B	423	ASN
1	B	450	LEU

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Mol	Chain	Res	Type
1	B	532	ARG
1	B	568	LYS
1	C	95	ARG
1	C	401	ARG
2	D	5	LYS
2	D	146	ARG
2	E	149	LYS
2	E	222	ASN
2	F	149	LYS
3	G	105	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	316	GLN
1	B	477	GLN
1	C	238	GLN
1	C	283	HIS
1	C	316	GLN
1	C	459	GLN
2	D	161	ASN
2	D	249	HIS
2	E	129	GLN
2	E	170	GLN
2	F	425	GLN
2	F	429	ASN
3	G	17	GLN
3	G	180	GLN
3	G	185	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 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 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	$\#\|Z\| > 2$
11	ADP	F	501	-	24,29,29	0.95	1 (4%)	29,45,45	1.39	4 (13%)
11	ADP	A	602	10	24,29,29	0.93	1 (4%)	29,45,45	1.51	4 (13%)

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
11	ADP	F	501	-	-	5/12/32/32	0/3/3/3
11	ADP	A	602	10	-	7/12/32/32	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	F	501	ADP	C5-C4	2.48	1.47	1.40
11	A	602	ADP	C5-C4	2.35	1.47	1.40

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	A	602	ADP	PA-O3A-PB	-3.77	119.90	132.83
11	F	501	ADP	C3'-C2'-C1'	3.36	106.04	100.98
11	A	602	ADP	N3-C2-N1	-3.36	123.43	128.68
11	F	501	ADP	N3-C2-N1	-3.01	123.97	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	A	602	ADP	C3'-C2'-C1'	2.90	105.35	100.98
11	A	602	ADP	C4-C5-N7	-2.56	106.73	109.40
11	F	501	ADP	C4-C5-N7	-2.26	107.05	109.40
11	F	501	ADP	PA-O3A-PB	-2.23	125.19	132.83

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	A	602	ADP	PA-O3A-PB-O3B
11	A	602	ADP	C5'-O5'-PA-O2A
11	A	602	ADP	C5'-O5'-PA-O3A
11	F	501	ADP	C5'-O5'-PA-O1A
11	F	501	ADP	C5'-O5'-PA-O2A
11	A	602	ADP	O4'-C4'-C5'-O5'
11	A	602	ADP	C3'-C4'-C5'-O5'
11	F	501	ADP	PB-O3A-PA-O5'
11	A	602	ADP	C5'-O5'-PA-O1A
11	A	602	ADP	PA-O3A-PB-O2B
11	F	501	ADP	C5'-O5'-PA-O3A
11	F	501	ADP	O4'-C4'-C5'-O5'

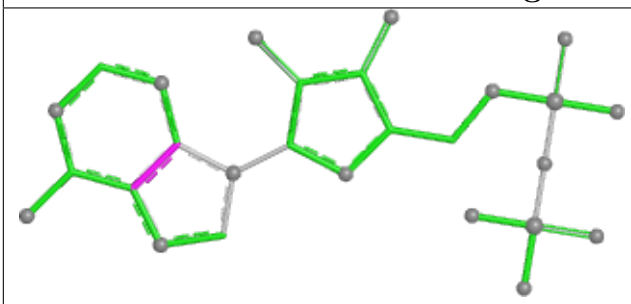
There are no ring outliers.

1 monomer is involved in 3 short contacts:

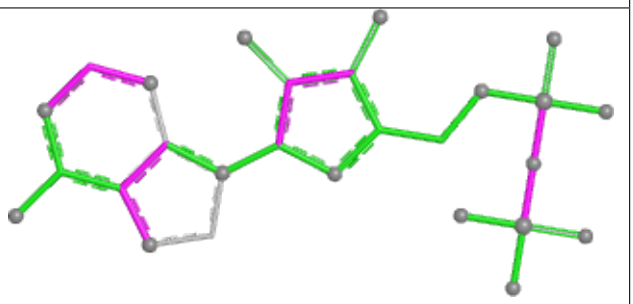
Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	A	602	ADP	3	0

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.

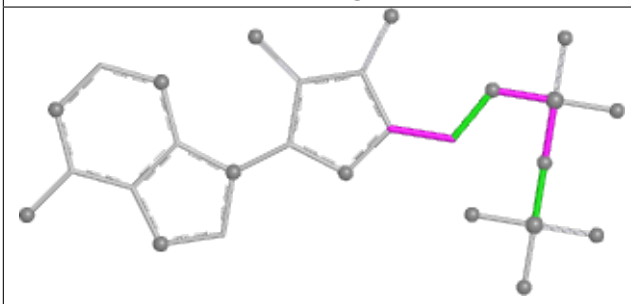
Ligand ADP F 501



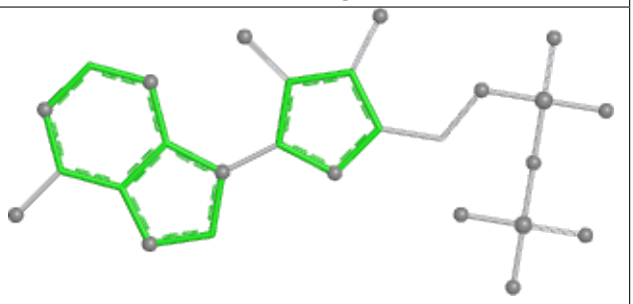
Bond lengths



Bond angles

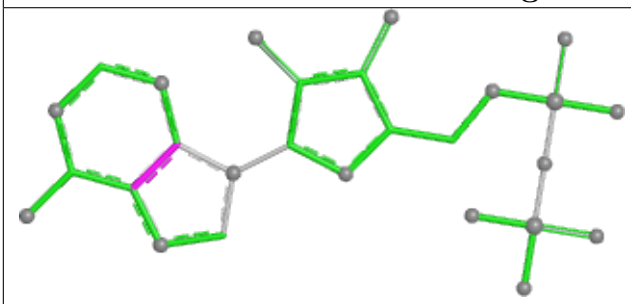


Torsions

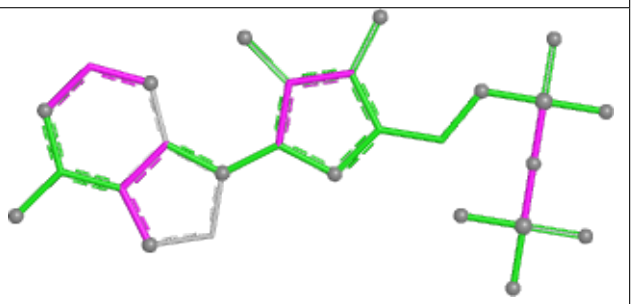


Rings

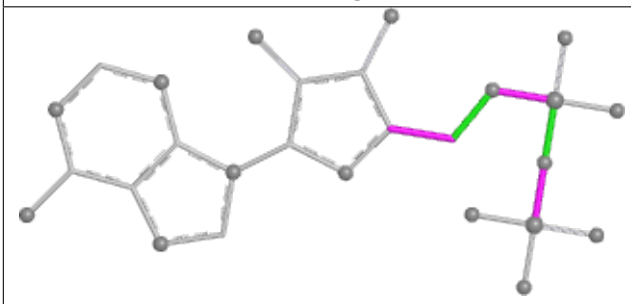
Ligand ADP A 602



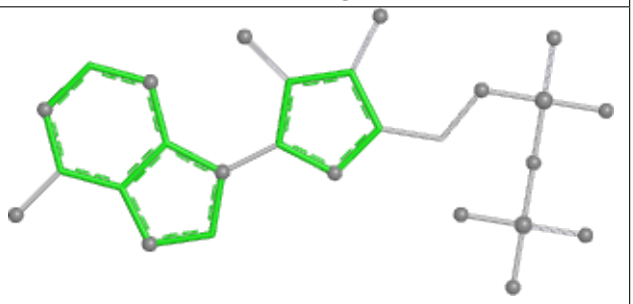
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

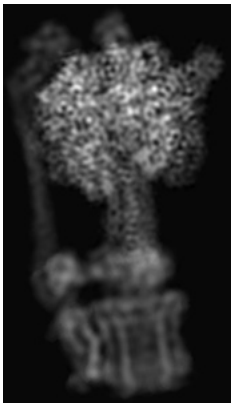
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-4703. These allow visual inspection of the internal detail of the map and identification of artifacts.

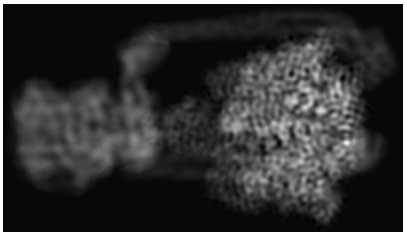
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

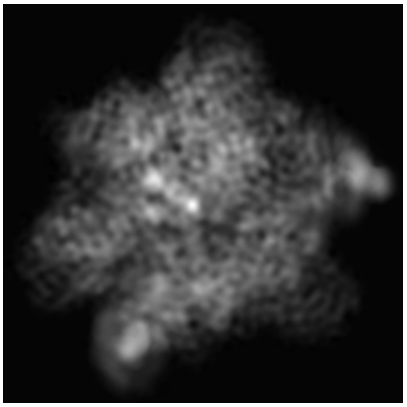
6.1.1 Primary map



X



Y

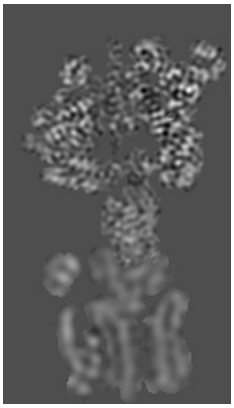


Z

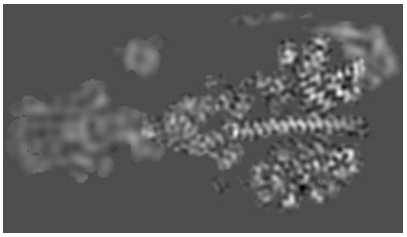
The images above show the map projected in three orthogonal directions.

6.2 Central slices

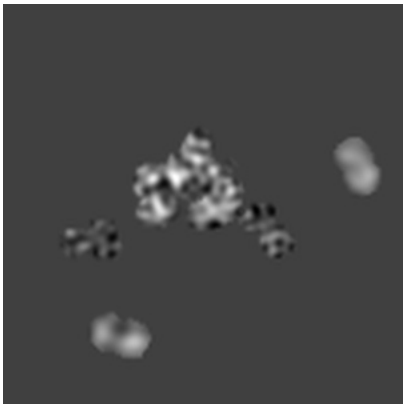
6.2.1 Primary map



X Index: 66



Y Index: 66



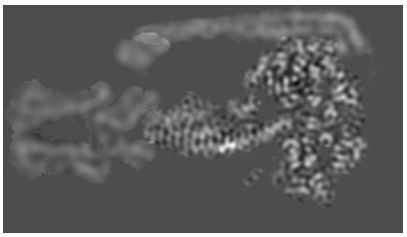
Z Index: 116

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

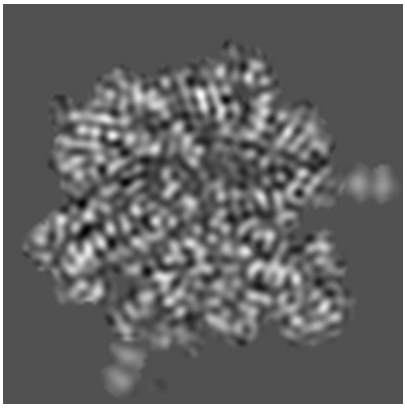
6.3 Largest variance slices (i)

6.3.1 Primary map

X Index: 60



Y Index: 75



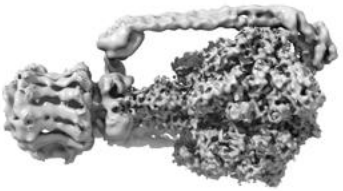
Z Index: 174

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

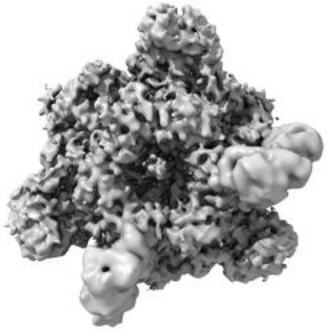
6.4 Orthogonal surface views (i)

6.4.1 Primary map

X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0215. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

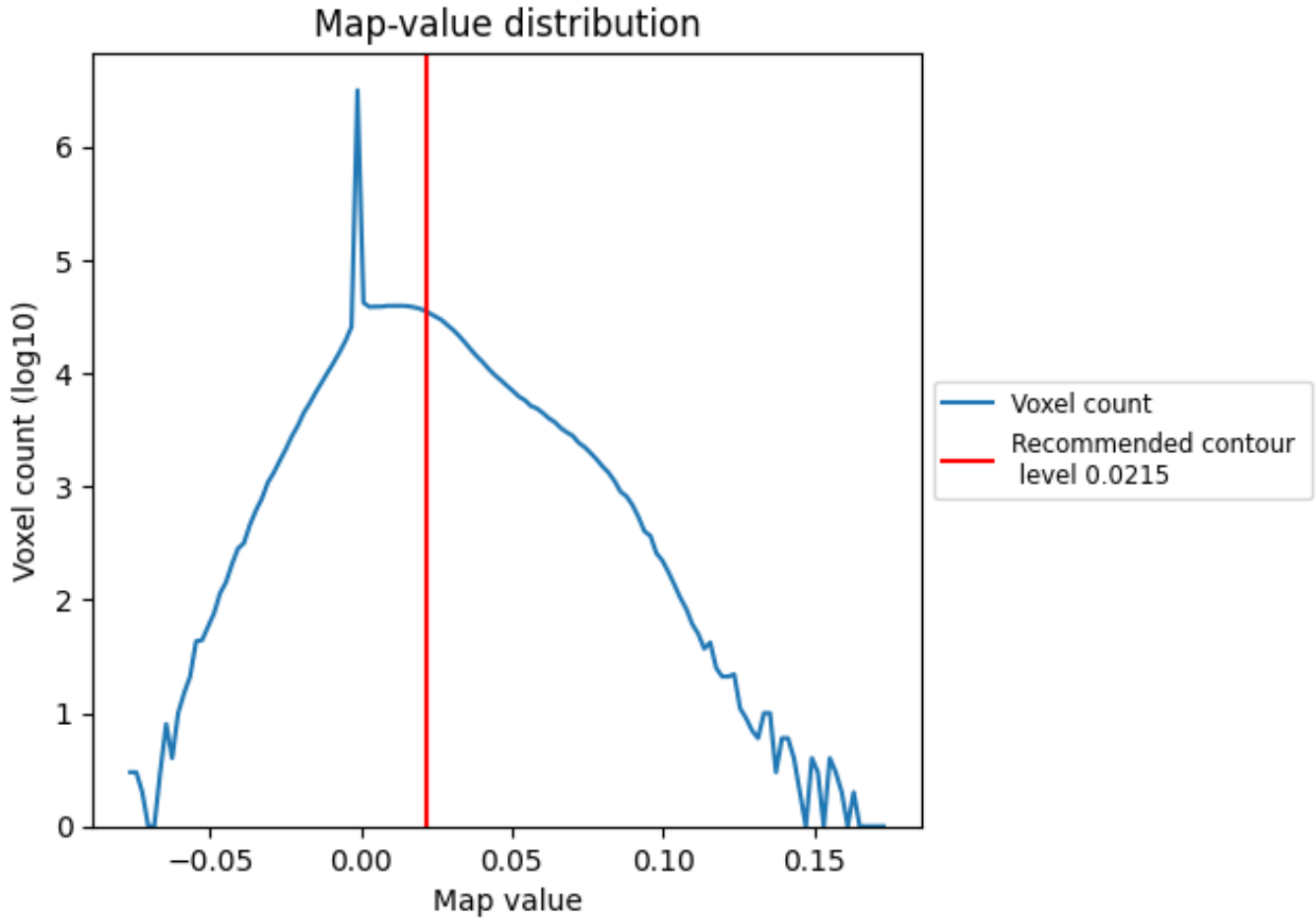
6.5 Mask visualisation (i)

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

7 Map analysis

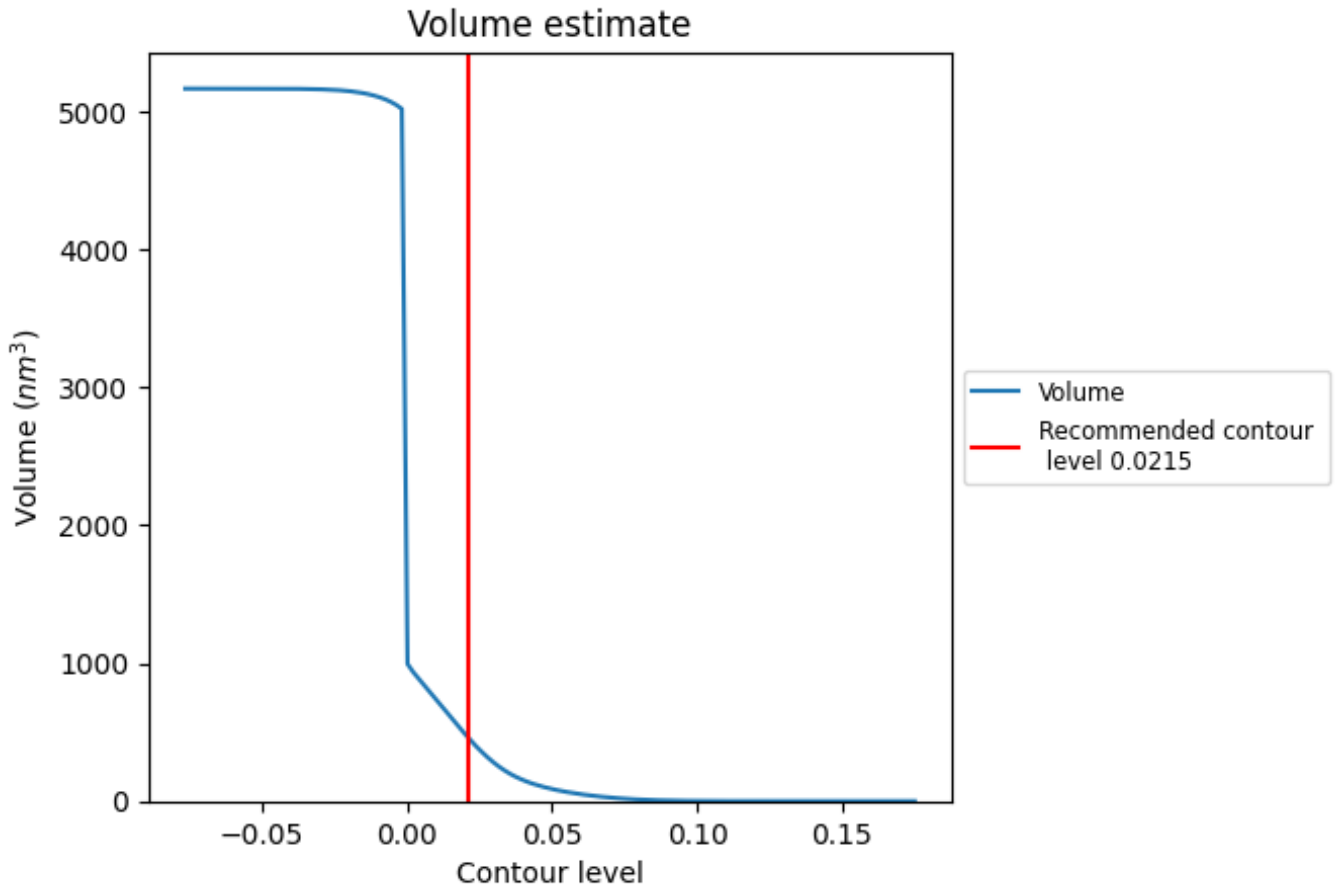
This section contains the results of statistical analysis of the map.

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 453 nm^3; this corresponds to an approximate mass of 409 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.

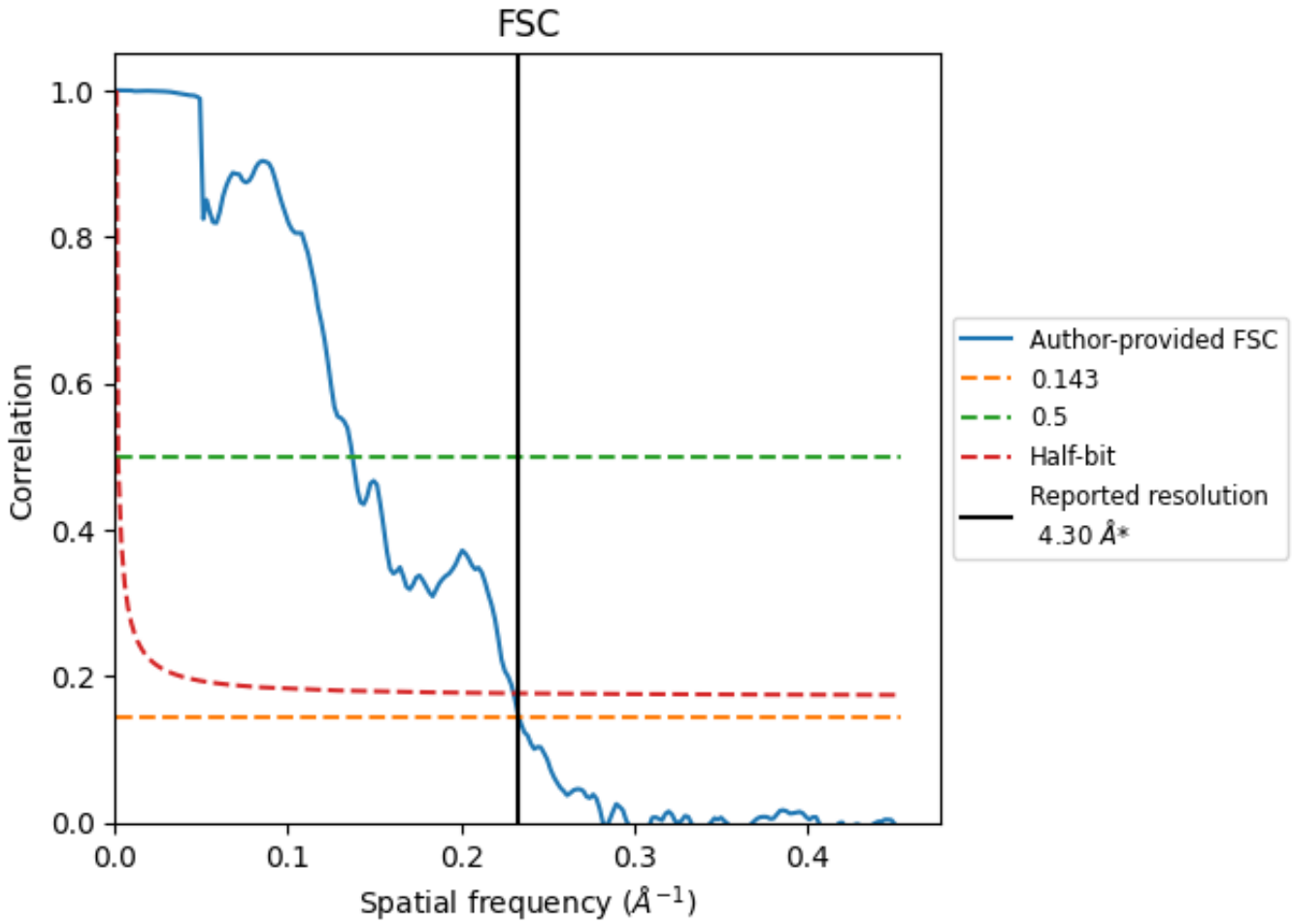
7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.233 Å^{-1}

8.2 Resolution estimates (i)

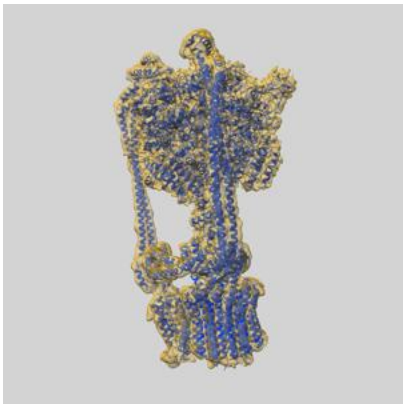
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.30	-	-
Author-provided FSC curve	4.28	7.28	4.34
Unmasked-calculated*	-	-	-

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

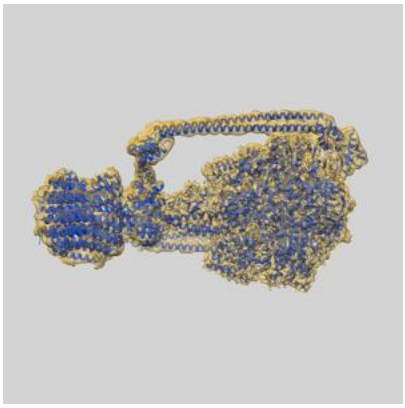
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-4703 and PDB model 6R10. Per-residue inclusion information can be found in section 3 on page 7.

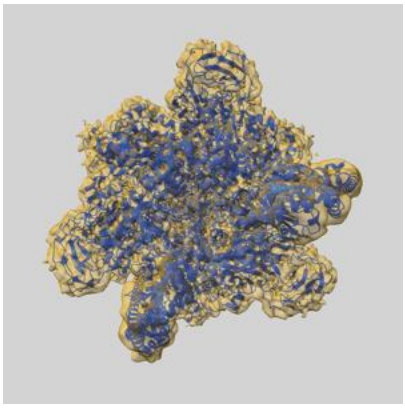
9.1 Map-model overlay



X



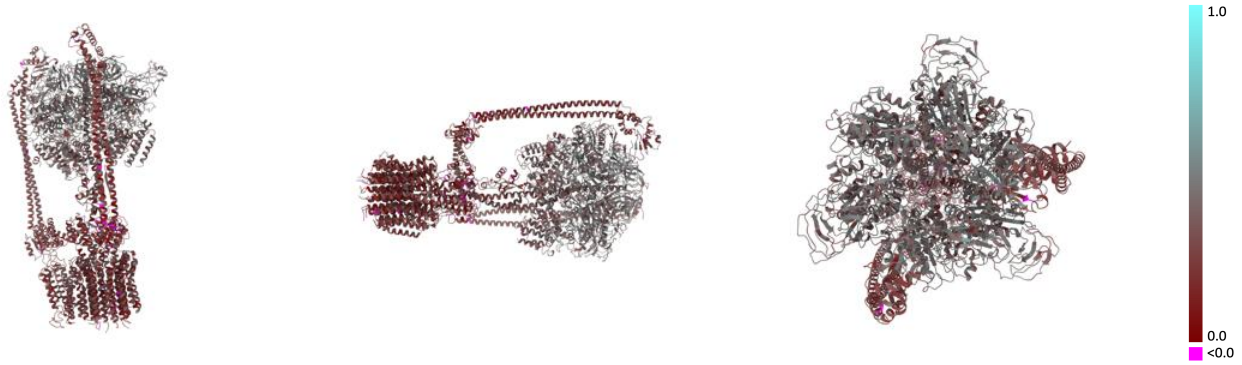
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0215 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.

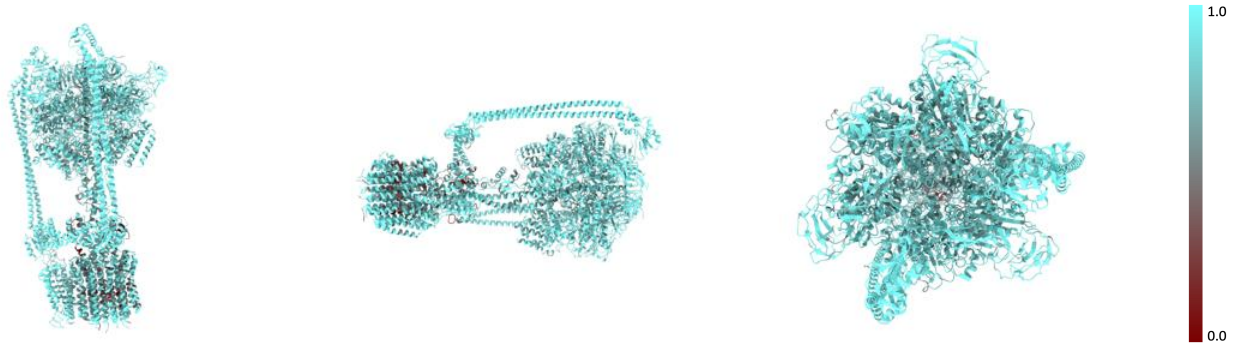
9.2 Q-score mapped to coordinate model (i)



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.

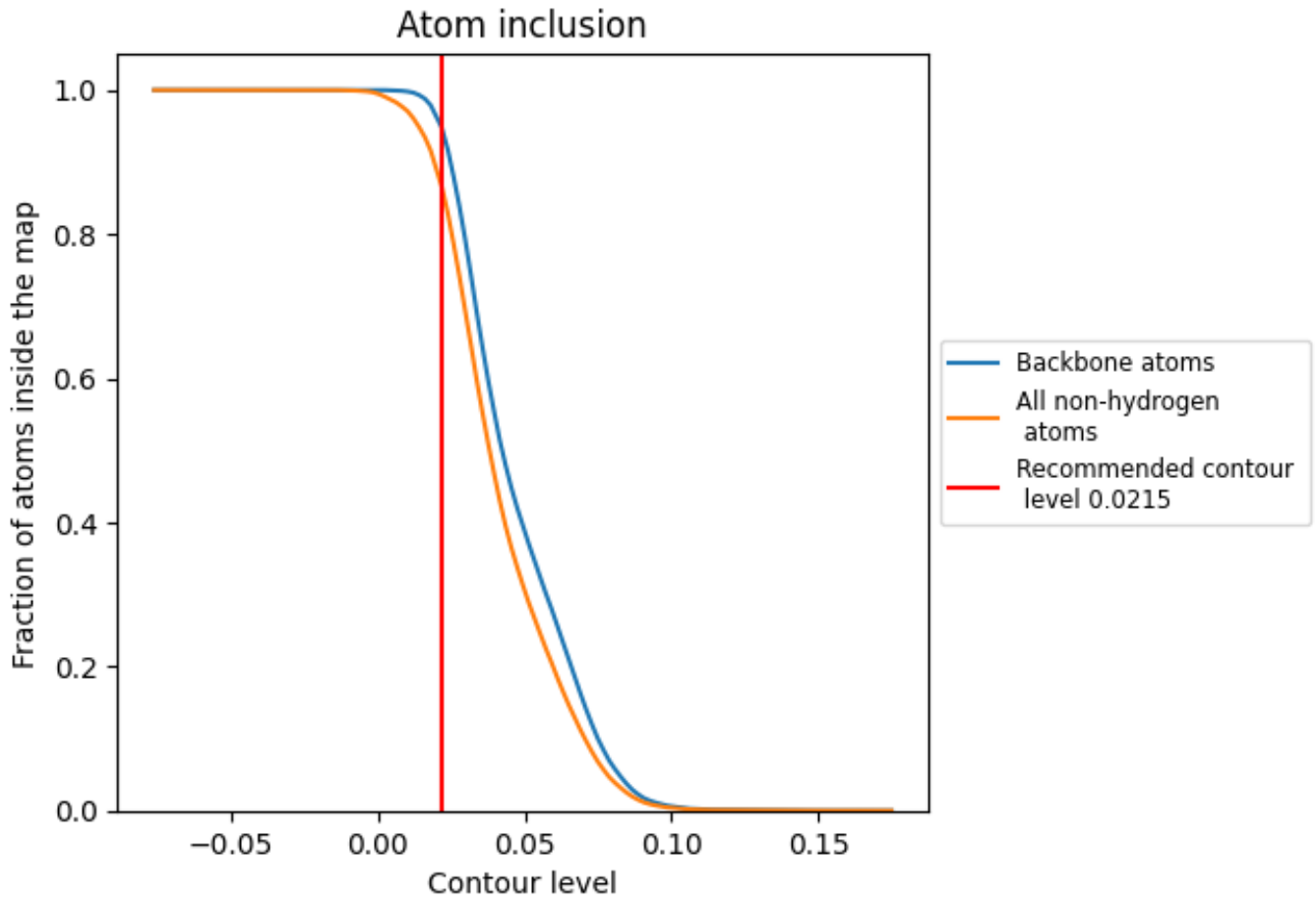
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0215).

9.4 Atom inclusion (i)



At the recommended contour level, 95% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.0215) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8695	0.3600
A	0.8894	0.4290
B	0.8779	0.4140
C	0.8750	0.4160
D	0.8854	0.4260
E	0.8660	0.4170
F	0.8586	0.4190
G	0.8165	0.3330
H	0.7684	0.2890
I	0.9746	0.2510
J	0.9816	0.2760
K	0.9717	0.2400
L	0.9784	0.2730
M	0.7479	0.2110
N	0.9351	0.2580
O	0.8262	0.2530
P	0.7692	0.2370
Q	0.7781	0.2090
R	0.8091	0.2420
S	0.7977	0.2160
T	0.8120	0.2300
U	0.7721	0.2230
V	0.7977	0.2350
W	0.8148	0.2550
X	0.7291	0.2170
Y	0.7949	0.2350
Z	0.8319	0.2500