Full wwPDB EM Validation Report

Nov 19, 2022 – 11:53 PM EST

PDB ID	:	3IZM
EMDB ID	:	EMD-5249
Title	:	Mm-cpn wildtype with ATP
Authors	:	Douglas, N.R.; Reissmann, S.; Zhang, J.; Chen, B.; Jakana, J.; Kumar, R.; Chiu, W.; Frydman, J.
Deposited on	:	2010-10-30
Resolution	:	7.20 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

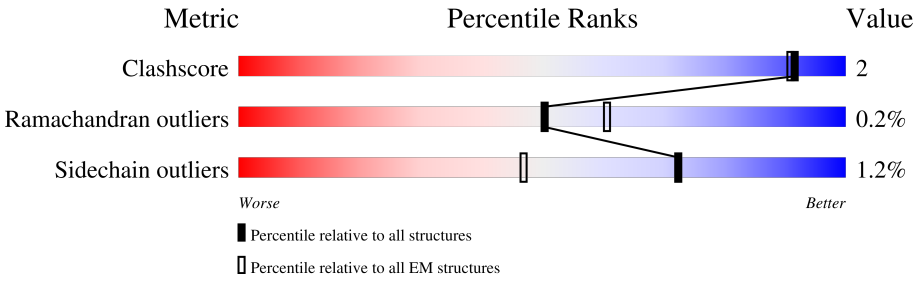
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

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 7.20 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	513	70% 95%
1	B	513	70% 95%
1	C	513	70% 95%
1	D	513	70% 96%
1	E	513	70% 95%
1	F	513	70% 96%
1	G	513	70% 95%
1	H	513	70% 95%

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Mol	Chain	Length	Quality of chain
1	I	513	70% 95%
1	J	513	70% 95%
1	K	513	70% 95%
1	L	513	70% 95%
1	M	513	70% 95%
1	N	513	70% 96%
1	O	513	70% 95%
1	P	513	70% 96%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 61632 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 Chaperonin.

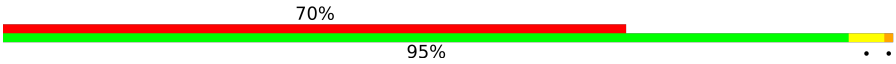
Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	B	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	C	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	D	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	E	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	F	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	G	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	H	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	I	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	J	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	K	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	L	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	M	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	N	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	O	513	Total 3852	C 2391	N 664	O 772	S 25	0	0
1	P	513	Total 3852	C 2391	N 664	O 772	S 25	0	0

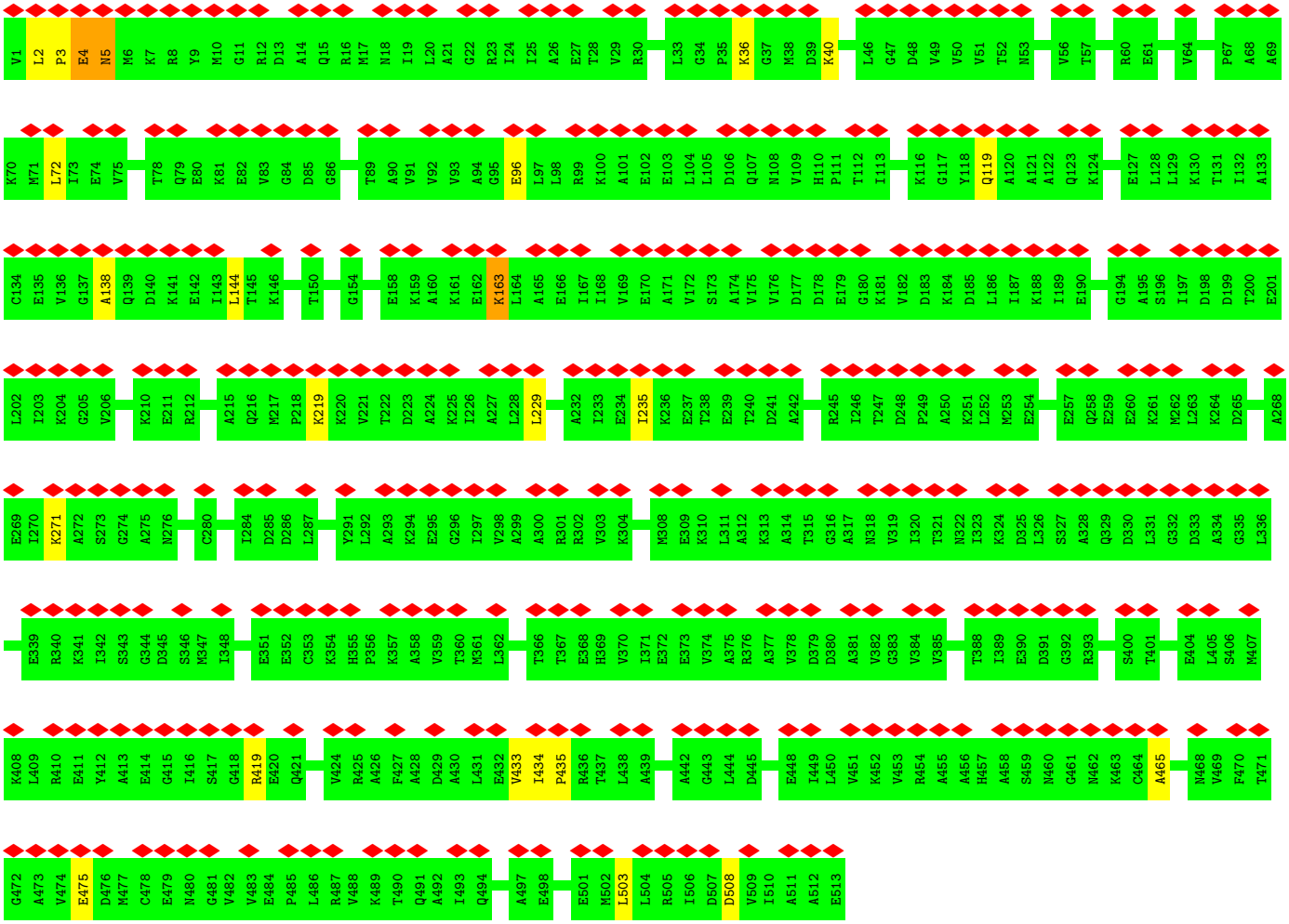
3 Residue-property plots (i)

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: Chaperonin

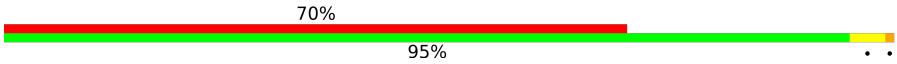
Chain A:

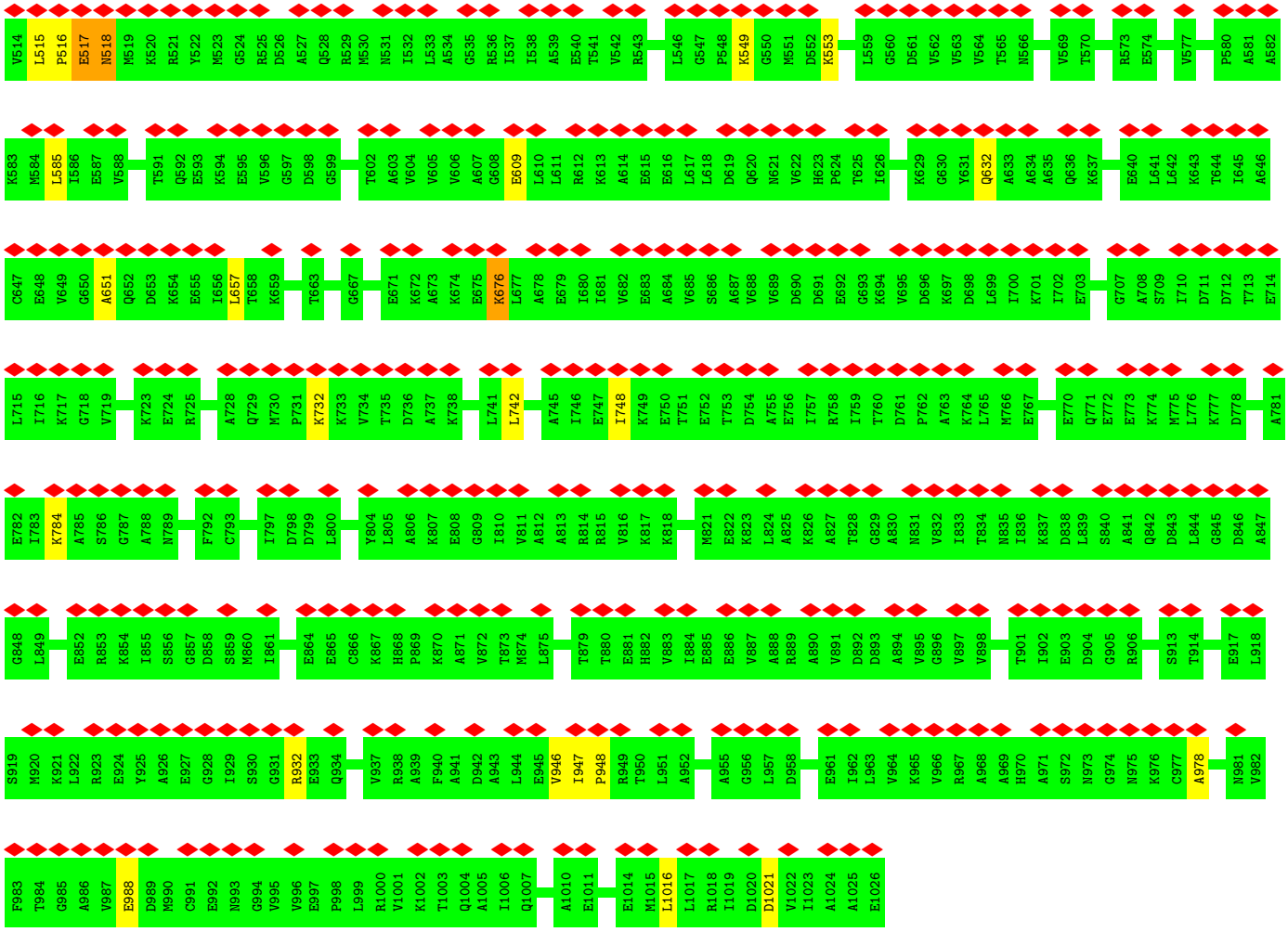




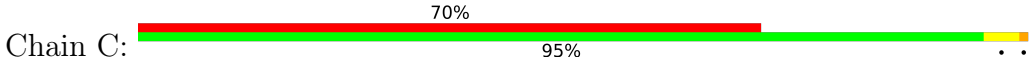
- Molecule 1: Chaperonin

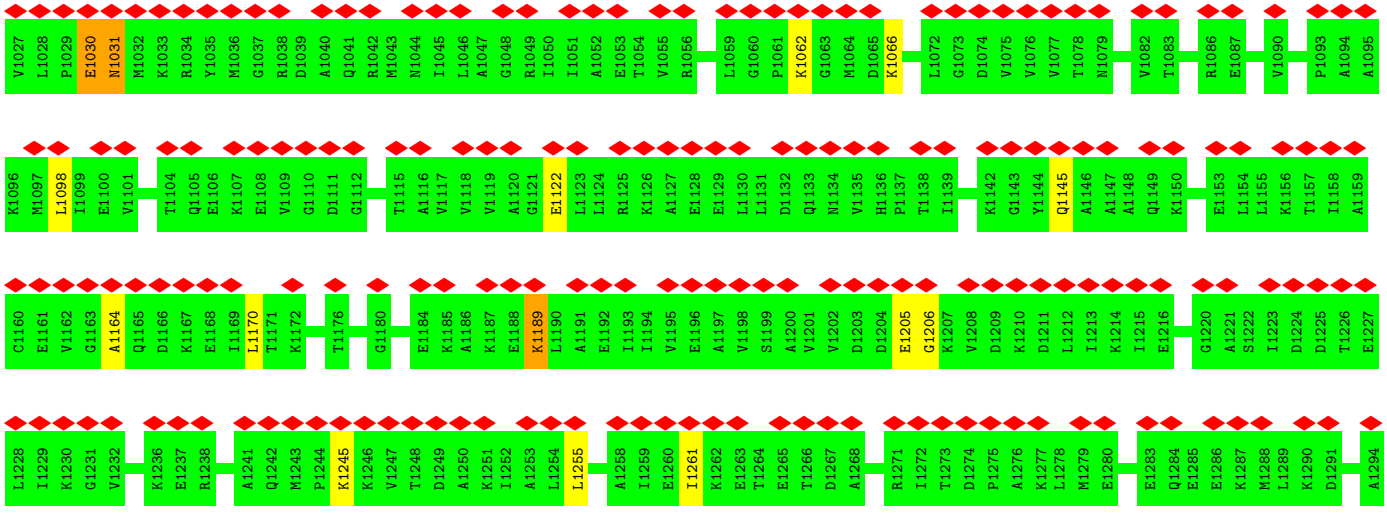
Chain B:

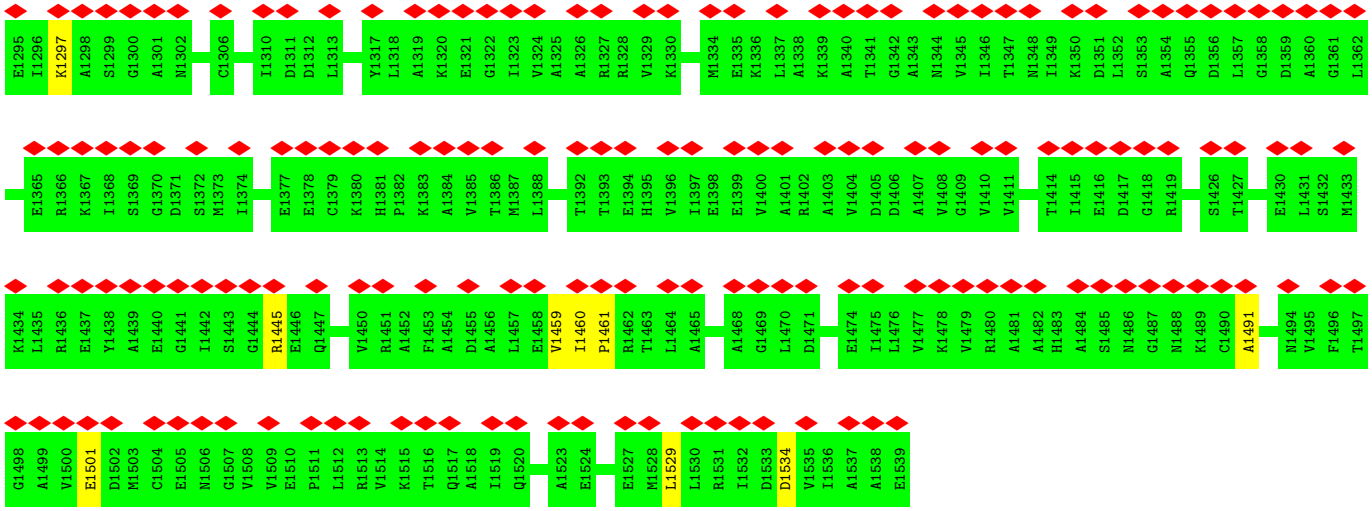




• Molecule 1: Chaperonin

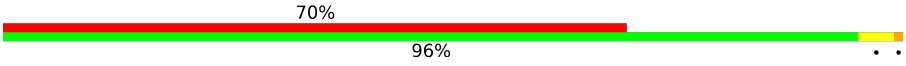


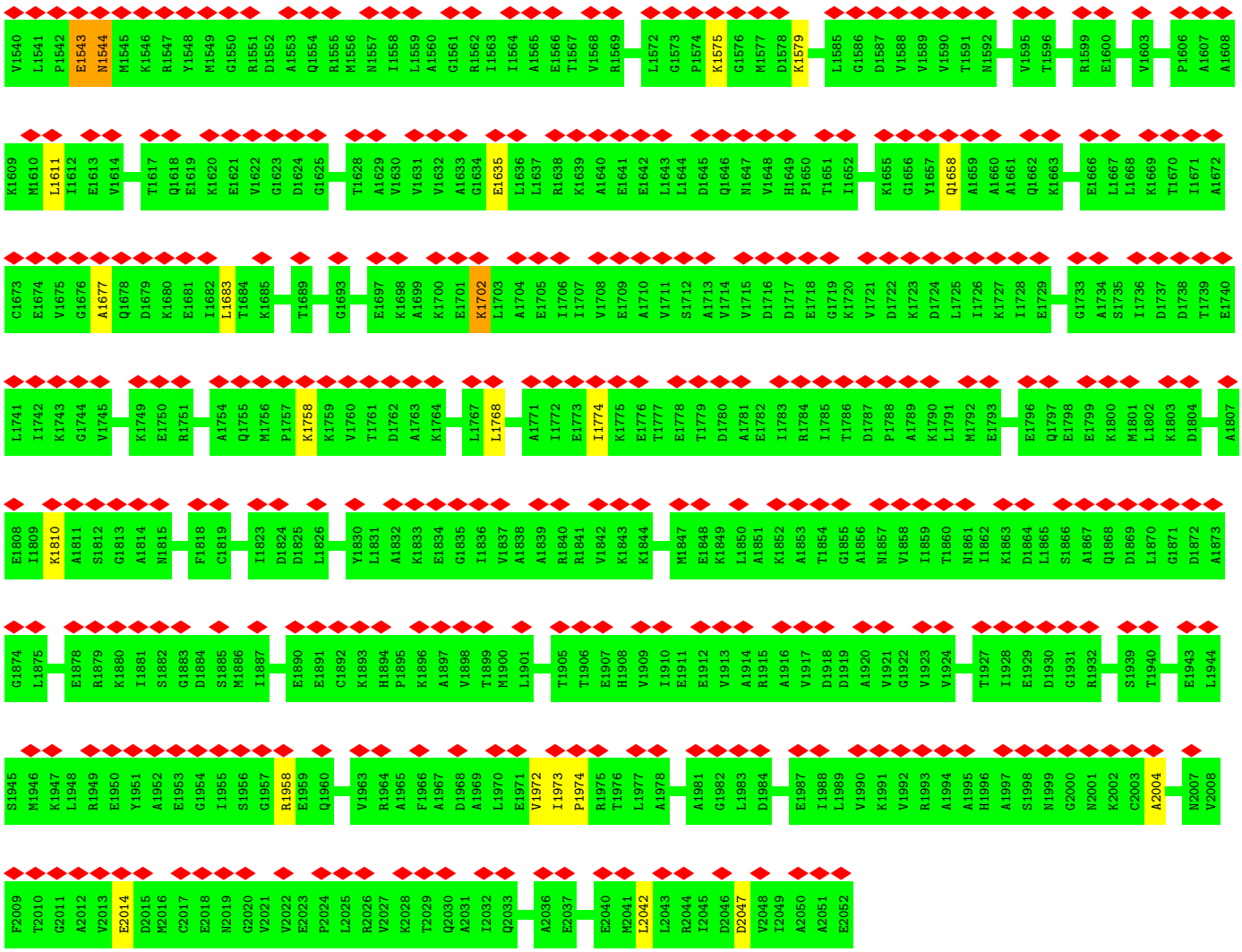




- Molecule 1: Chaperonin

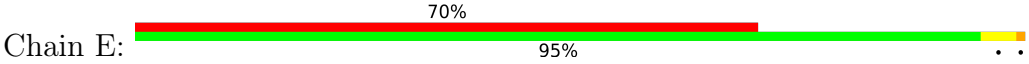
Chain D:

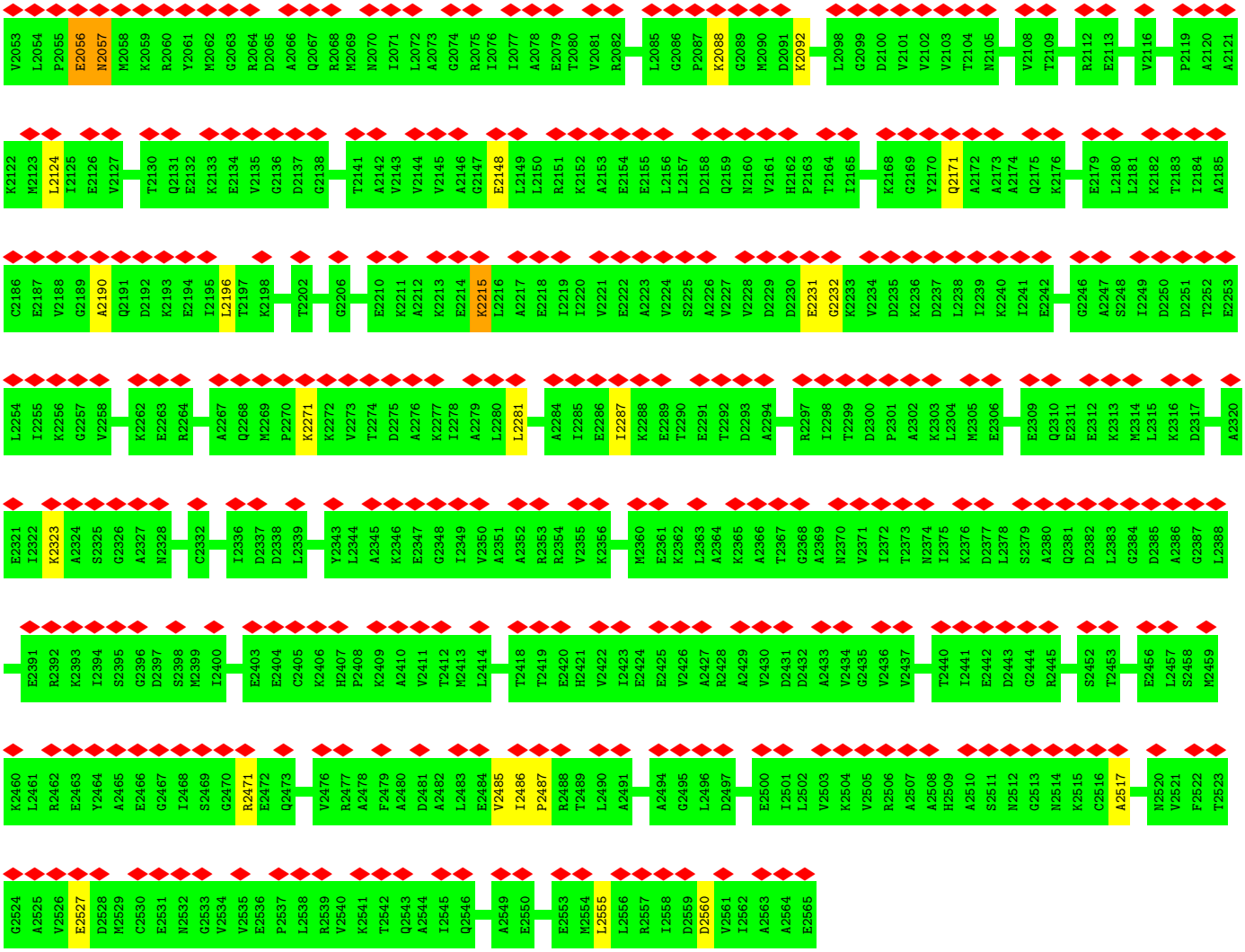




• Molecule 1: Chaperonin

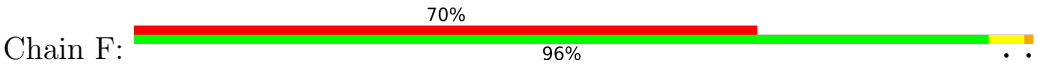
Chain E:

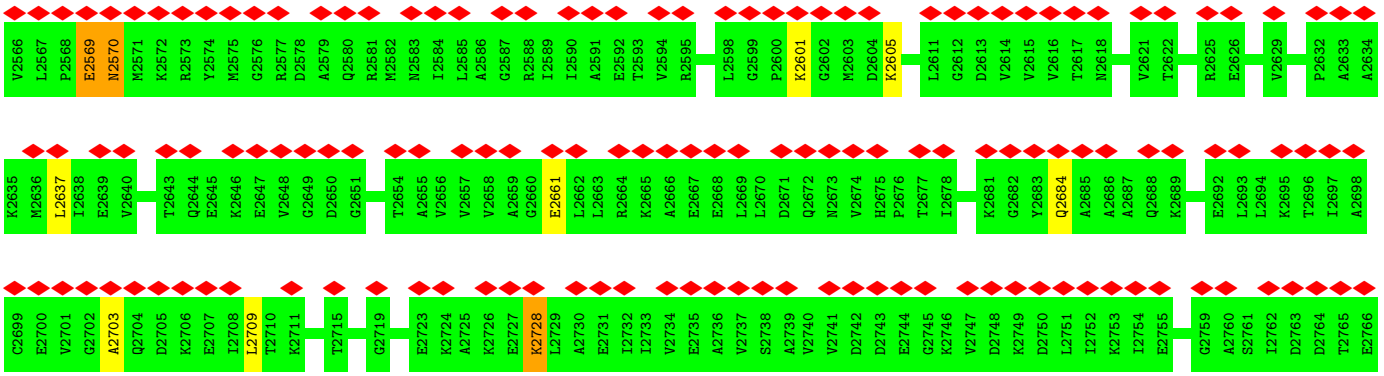


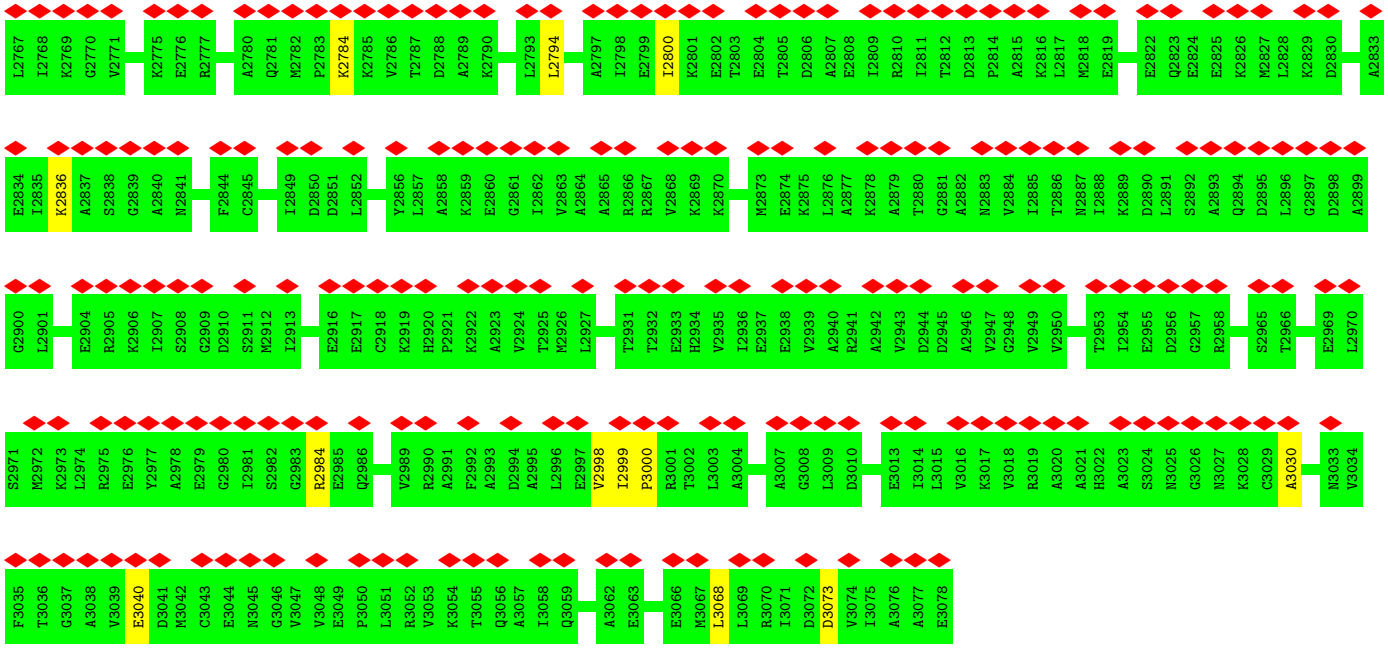


• Molecule 1: Chaperonin

Chain F:

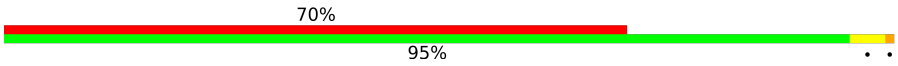


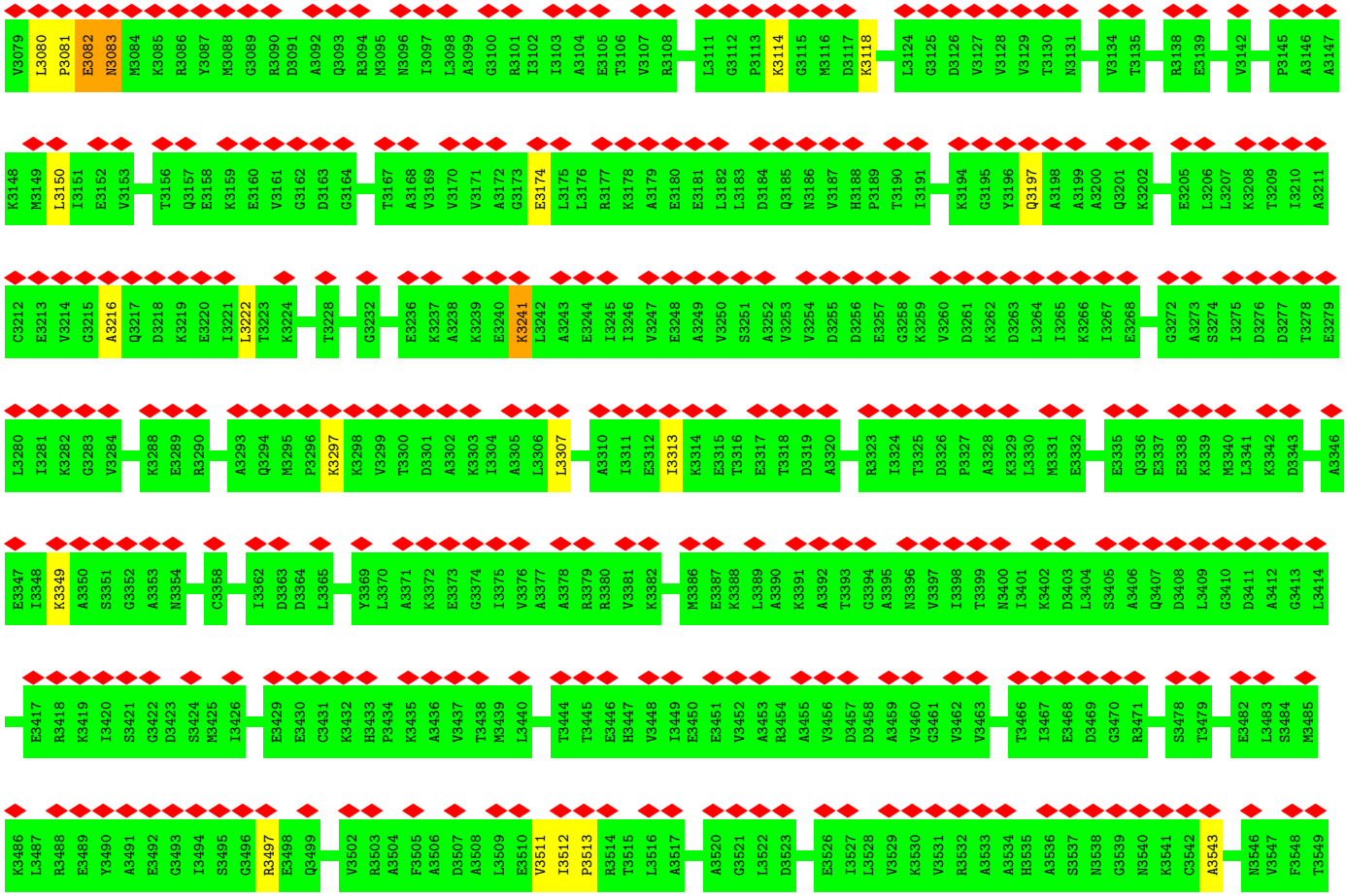


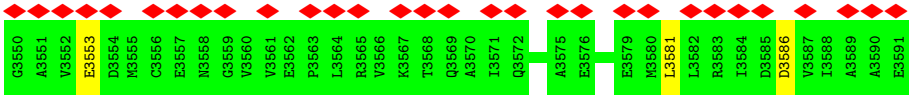


• Molecule 1: Chaperonin

Chain G:







• Molecule 1: Chaperonin

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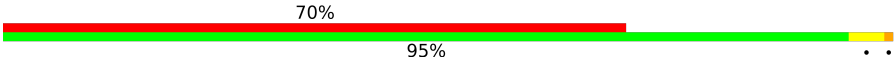
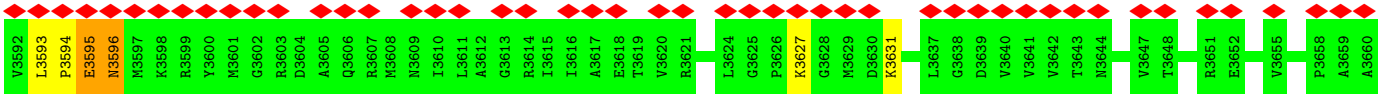
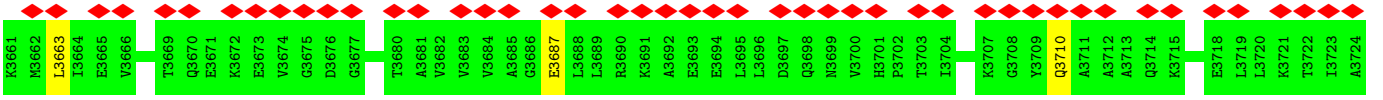
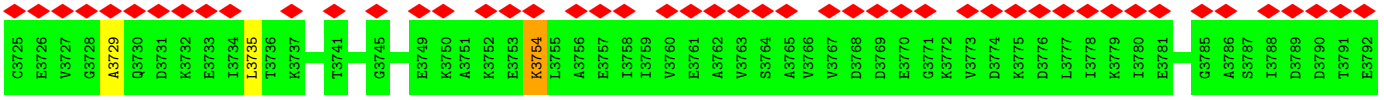
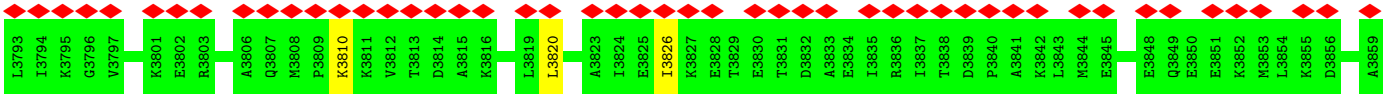
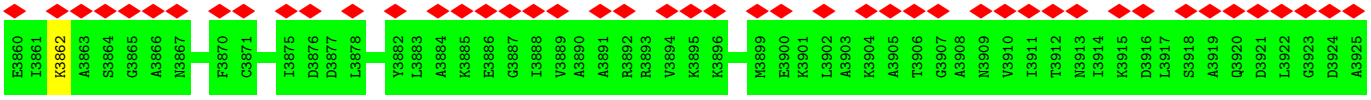


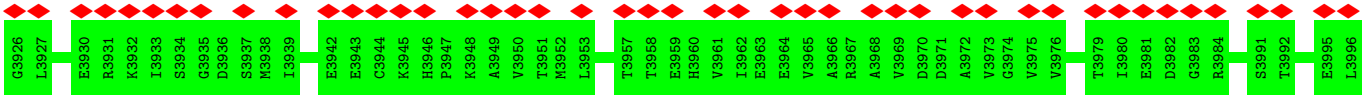


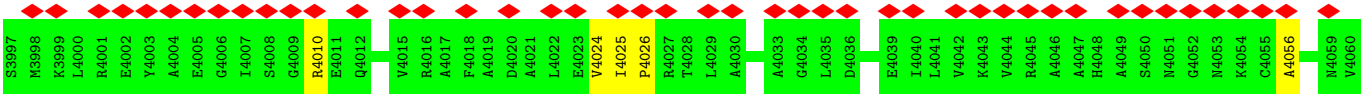


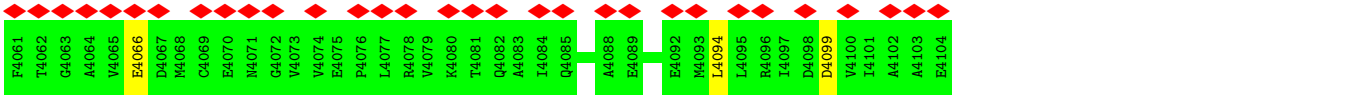


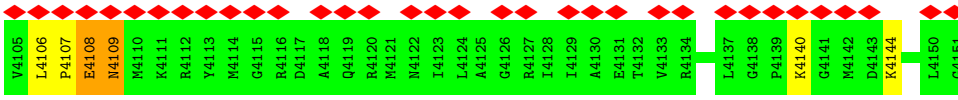






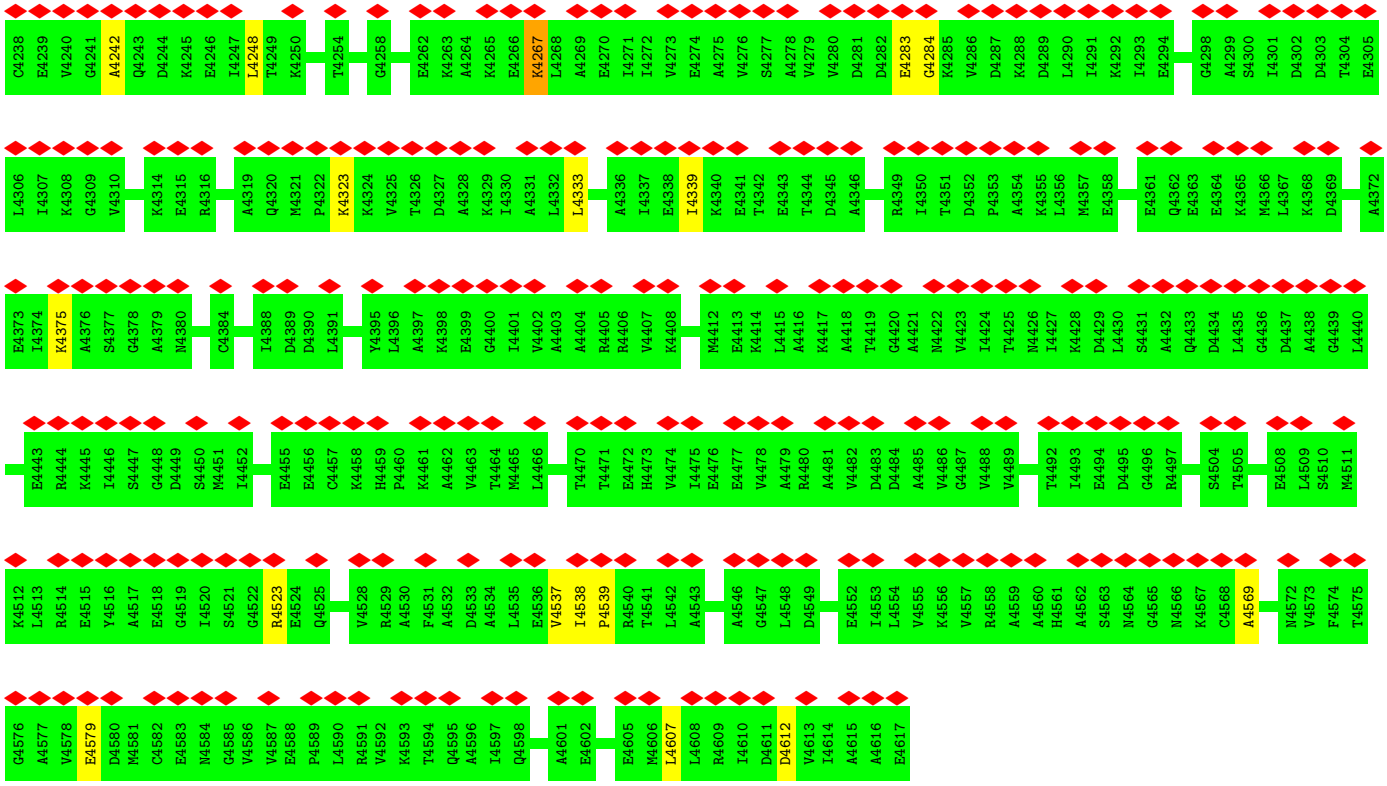






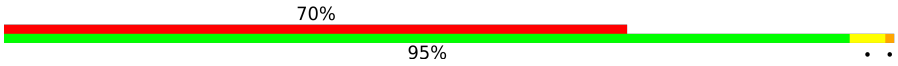
• Molecule 1: Chaperonin

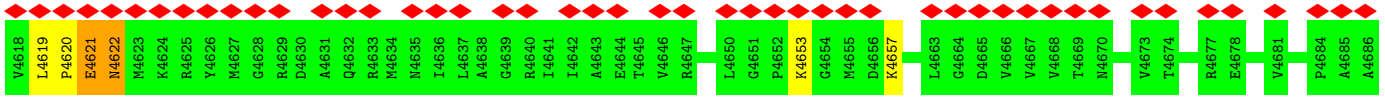
Chain I:

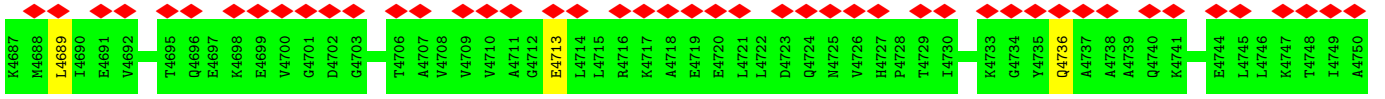


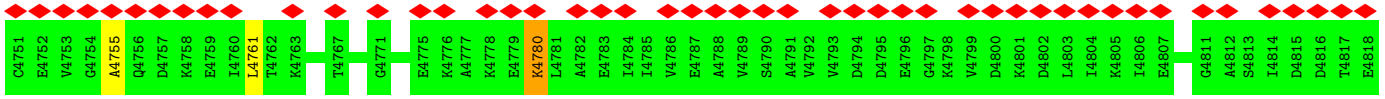
• Molecule 1: Chaperonin

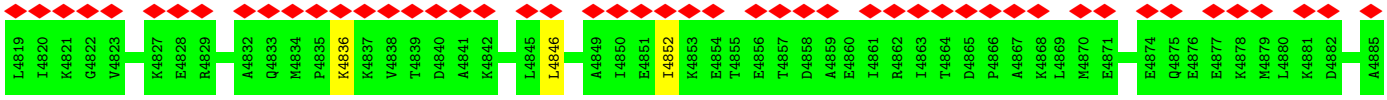
Chain J:

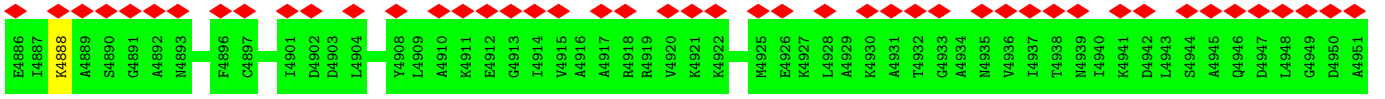


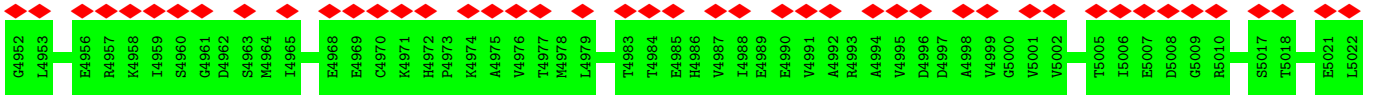


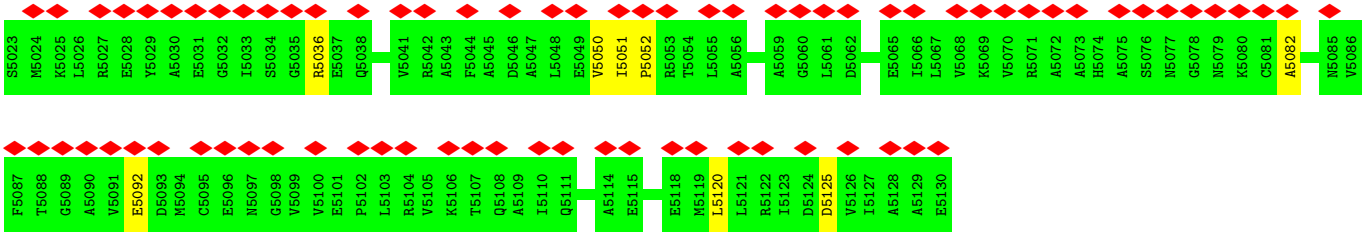






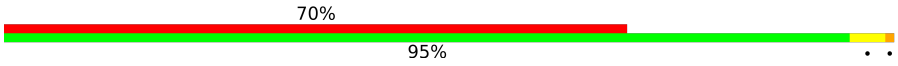


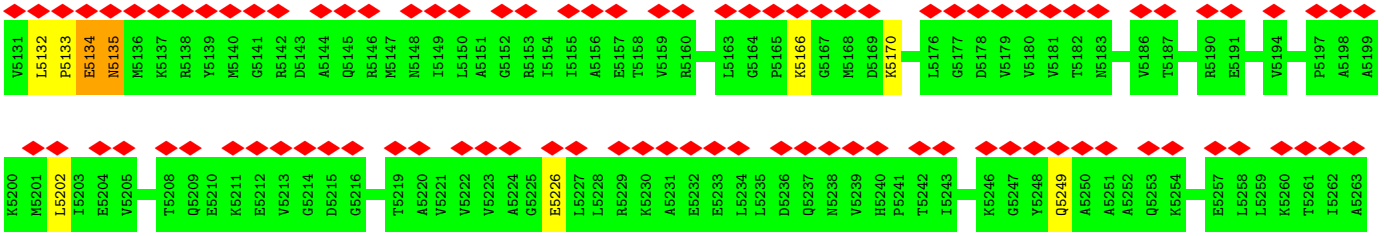




• Molecule 1: Chaperonin

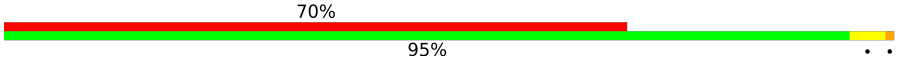
Chain K:

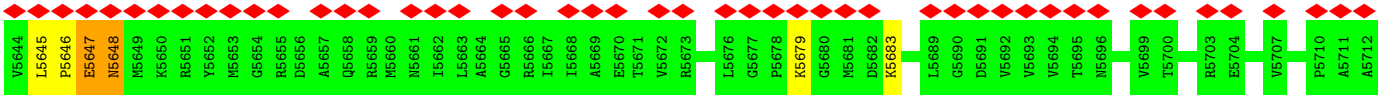


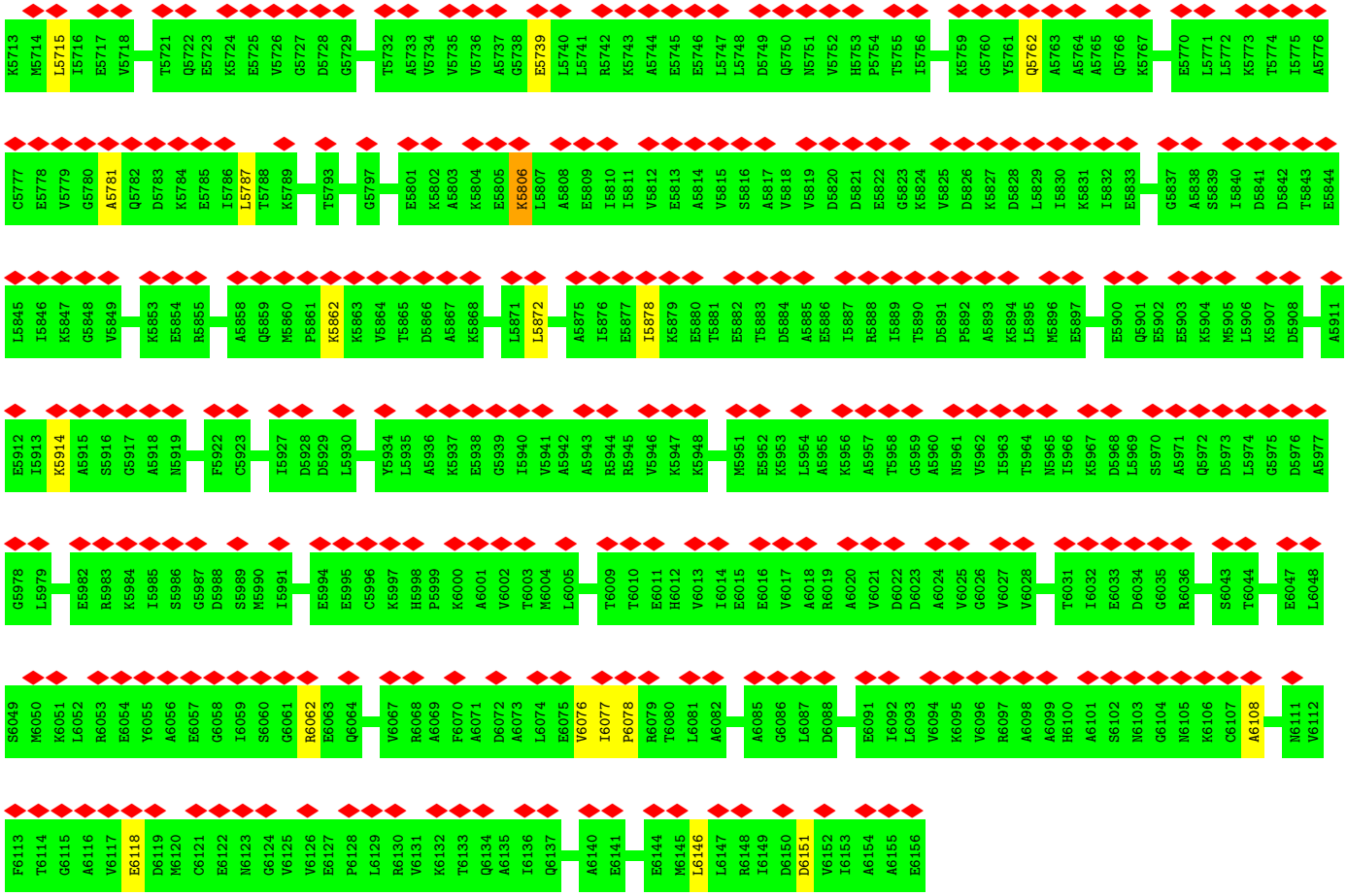


• Molecule 1: Chaperonin

Chain L:

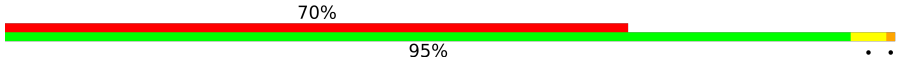


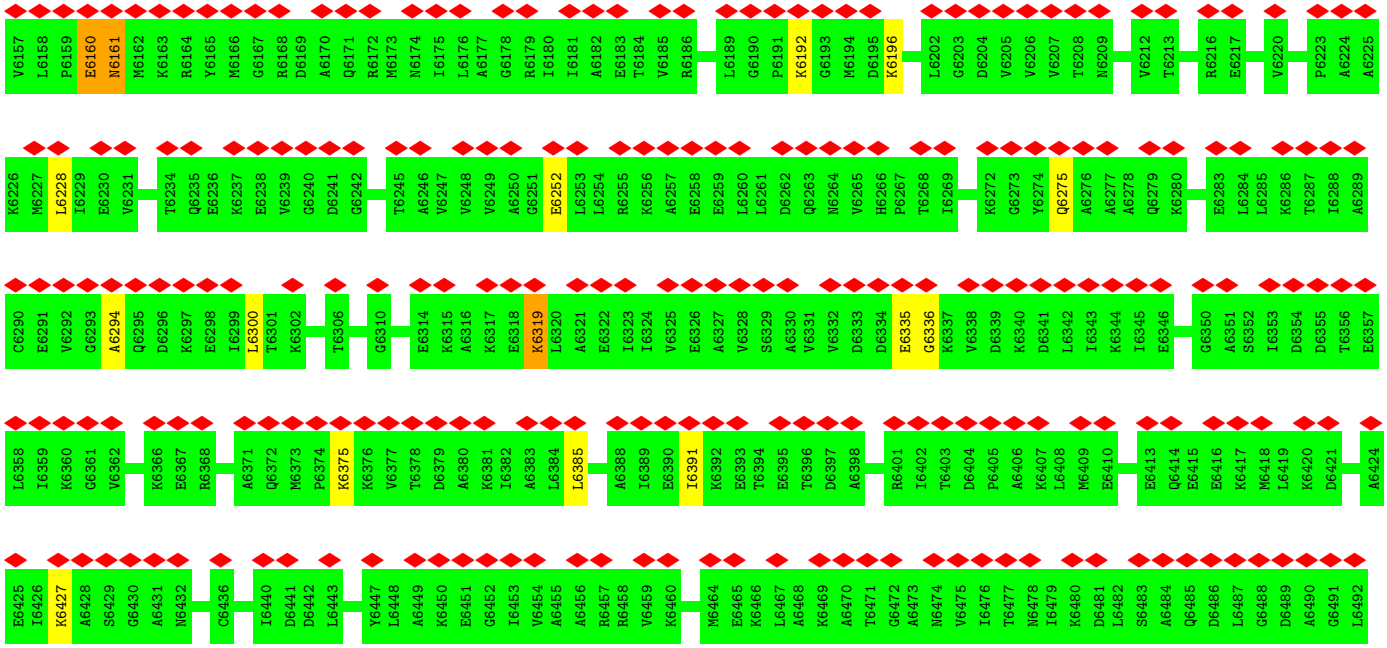


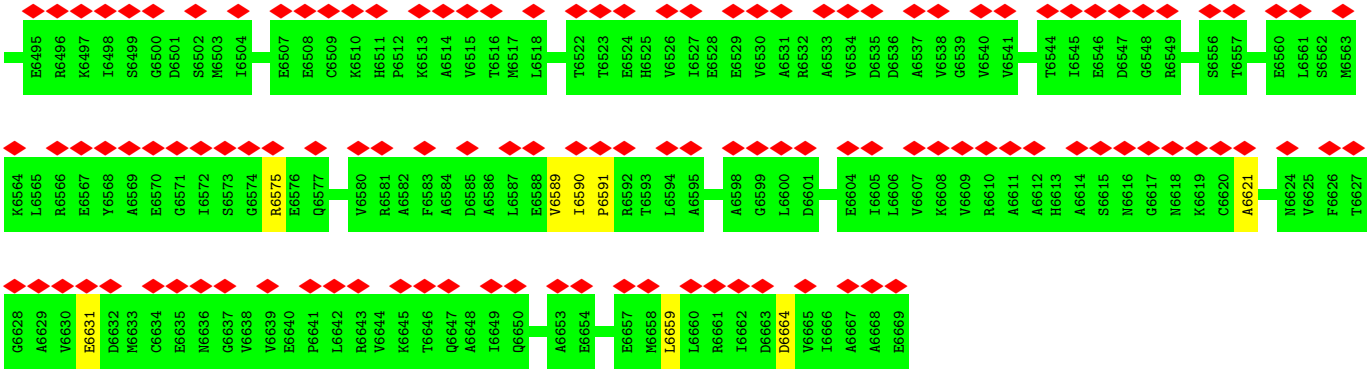


• Molecule 1: Chaperonin

Chain M:

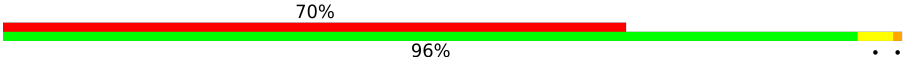


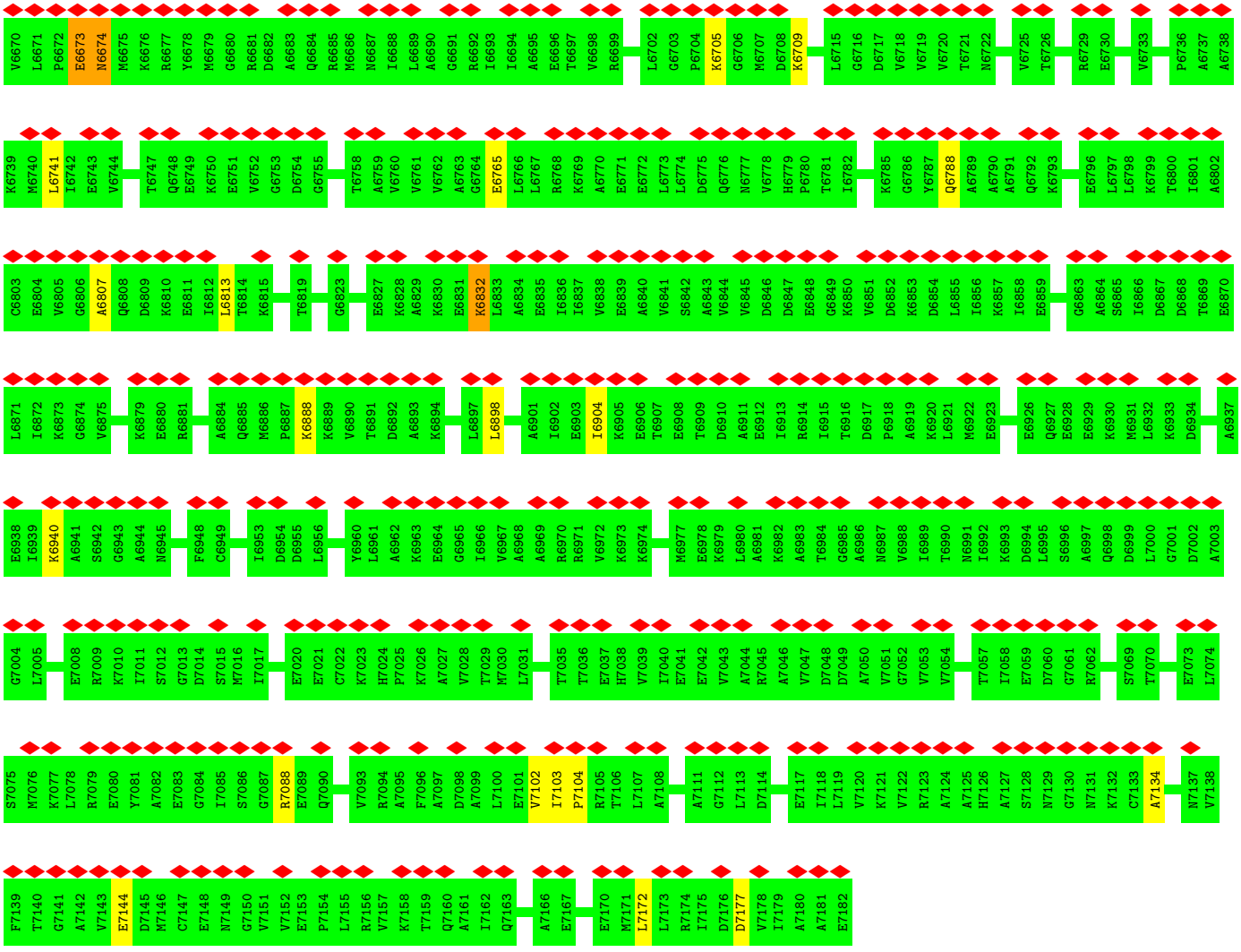




• Molecule 1: Chaperonin

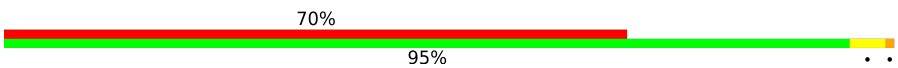
Chain N:

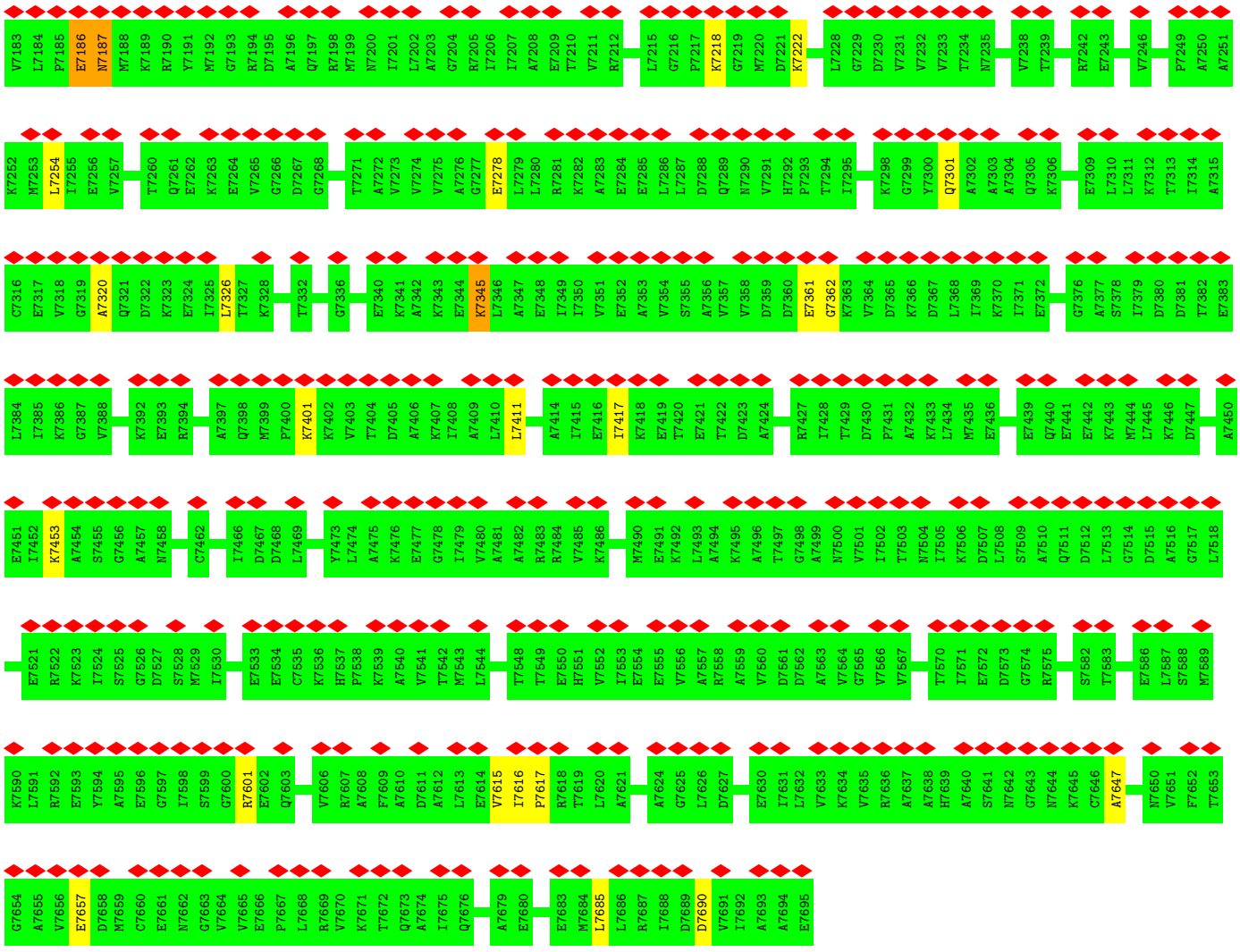




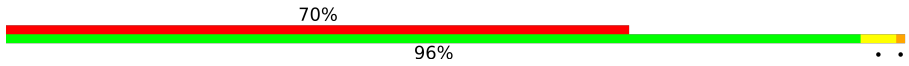
• Molecule 1: Chaperonin

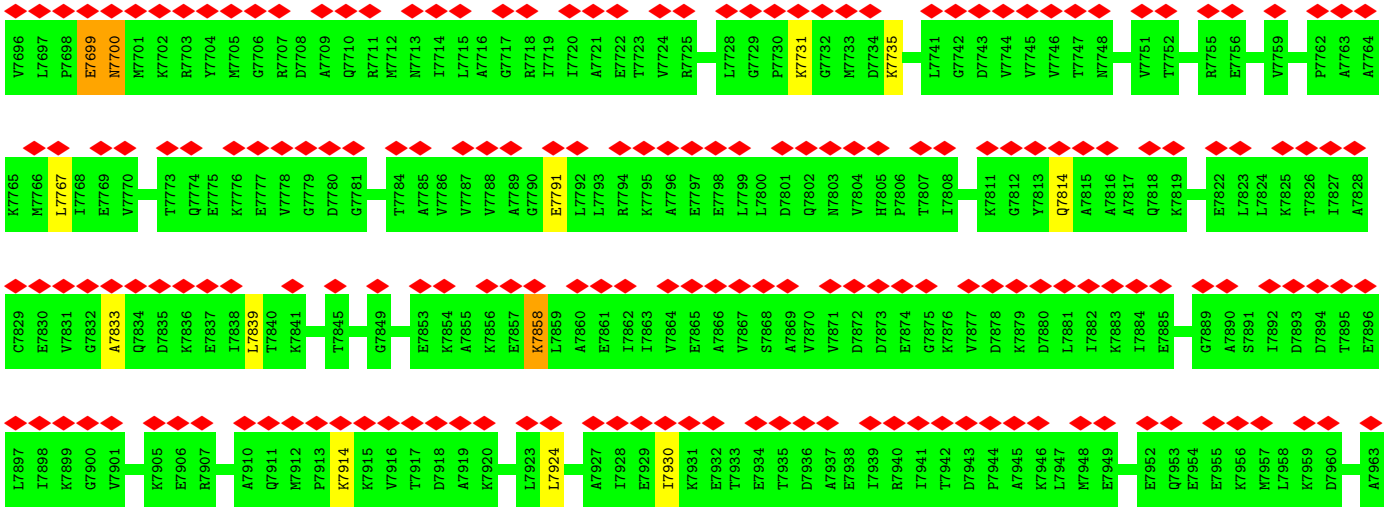
Chain O:

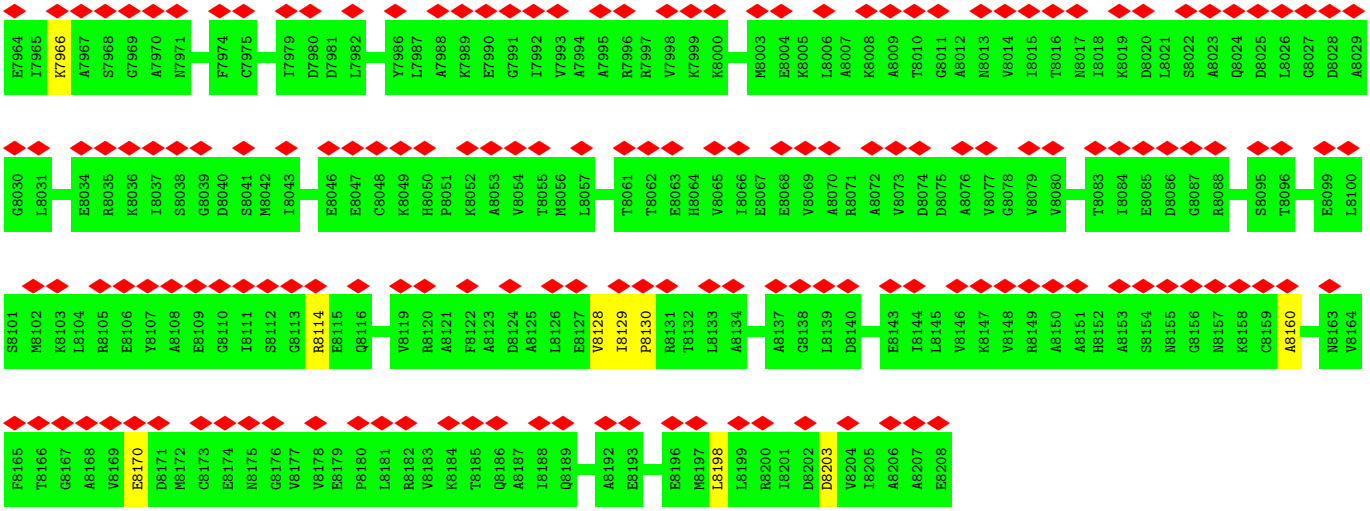




• Molecule 1: Chaperonin






E7964 I7965 K7966 A7967 S7968 G7969 A7970 N7971
F7974 C7975
I7979 D7980 D7981 L7982
Y7986 L7987 A7988 K7989 E7990 G7991 I7992 V7993 A7994 A7995 R7996 R7997 V7998 K7999 K8000
M8003 E8004 K8005 L8006 A8007 K8008 A8009 T8010 G8011 A8012 N8013 V8014 I8015 T8016 N8017 I8018 K8019 D8020 L8021 S8022 A8023 Q8024 D8025 L8026 G8027 D8028 A8029
G8030 L8031
E8034 R8035 K8036 I8037 S8038 G8039 D8040 S8041 M8042 I8043
E8046 E8047 C8048 K8049 H8050 P8051 K8052 A8053 V8054 T8055 M8056 L8057
T8061 T8062 E8063 H8064 V8065 I8066 E8067 E8068 V8069 A8070 R8071 A8072 V8073 D8074 D8075 A8076 V8077 G8078 V8079 V8080
T8083 I8084 E8085 D8086 G8087 R8088
S8095 T8096
E8099 L8100
S8101 M8102 K8103 L8104 R8105 E8106 Y8107 A8108 E8109 G8110 I8111 S8112 G8113 R8114 E8115 Q8116
V8119 R8120 A8121 F8122 A8123 D8124 A8125 L8126 E8127 V8128 I8129 P8130 R8131 T8132 L8133 A8134
A8137 G8138 L8139 D8140
E8143 I8144 L8145 V8146 K8147 V8148 R8149 A8150 A8151 H8152 A8153 S8154 N8155 G8156 N8157 K8158 C8159 A8160
N8163 V8164
F8165 T8166 G8167 A8168 V8169 E8170
D8171 M8172 C8173 E8174 N8175 G8176 V8177 V8178 E8179 P8180 L8181 R8182 V8183 K8184 T8185 Q8186 A8187 I8188 Q8189
A8192 E8193
E8196 M8197 L8198 L8199 R8200 I8201 D8202 D8203 V8204 I8205 A8206 A8207 E8208

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, D8	Depositor
Number of particles used	Not provided	
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	Not provided	
Microscope	JEOL 3200FSC	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	Not provided	
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN ULTRASCAN 4000 (4k x 4k)	Depositor
Maximum map value	11.011	Depositor
Minimum map value	-5.521	Depositor
Average map value	0.004	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	4.15	Depositor
Map size (Å)	255.36002, 255.36002, 255.36002	wwPDB
Map dimensions	192, 192, 192	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.33, 1.33, 1.33	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	B	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	C	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	D	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	E	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	F	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	G	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	H	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	I	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	J	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	K	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	L	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	M	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	N	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	O	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
1	P	0.88	2/3875 (0.1%)	0.78	2/5214 (0.0%)
All	All	0.88	32/62000 (0.1%)	0.78	32/83424 (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	A	0	3
1	B	0	3
1	C	0	3
1	D	0	3
1	E	0	3
1	F	0	3
1	G	0	3
1	H	0	3
1	I	0	3

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Mol	Chain	#Chirality outliers	#Planarity outliers
1	J	0	3
1	K	0	3
1	L	0	3
1	M	0	3
1	N	0	3
1	O	0	3
1	P	0	3
All	All	0	48

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	6160	GLU	C-O	-5.76	1.12	1.23
1	O	7186	GLU	C-O	-5.75	1.12	1.23
1	A	4	GLU	C-O	-5.72	1.12	1.23
1	C	1030	GLU	C-O	-5.72	1.12	1.23
1	E	2056	GLU	C-O	-5.72	1.12	1.23
1	G	3082	GLU	C-O	-5.72	1.12	1.23
1	K	5134	GLU	C-O	-5.72	1.12	1.23
1	B	517	GLU	C-O	-5.72	1.12	1.23
1	D	1543	GLU	C-O	-5.72	1.12	1.23
1	F	2569	GLU	C-O	-5.72	1.12	1.23
1	H	3595	GLU	C-O	-5.72	1.12	1.23
1	J	4621	GLU	C-O	-5.72	1.12	1.23
1	L	5647	GLU	C-O	-5.72	1.12	1.23
1	N	6673	GLU	C-O	-5.72	1.12	1.23
1	P	7699	GLU	C-O	-5.72	1.12	1.23
1	I	4108	GLU	C-O	-5.71	1.12	1.23
1	A	4	GLU	C-N	5.45	1.46	1.34
1	C	1030	GLU	C-N	5.45	1.46	1.34
1	E	2056	GLU	C-N	5.45	1.46	1.34
1	G	3082	GLU	C-N	5.45	1.46	1.34
1	N	6673	GLU	C-N	5.43	1.46	1.34
1	P	7699	GLU	C-N	5.43	1.46	1.34
1	B	517	GLU	C-N	5.41	1.46	1.34
1	D	1543	GLU	C-N	5.41	1.46	1.34
1	F	2569	GLU	C-N	5.41	1.46	1.34
1	H	3595	GLU	C-N	5.41	1.46	1.34
1	I	4108	GLU	C-N	5.40	1.46	1.34
1	J	4621	GLU	C-N	5.40	1.46	1.34
1	K	5134	GLU	C-N	5.40	1.46	1.34
1	L	5647	GLU	C-N	5.40	1.46	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	6160	GLU	C-N	5.40	1.46	1.34
1	O	7186	GLU	C-N	5.40	1.46	1.34

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	229	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	C	1255	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	E	2281	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	G	3307	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	I	4333	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	K	5359	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	M	6385	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	O	7411	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	B	742	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	D	1768	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	F	2794	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	H	3820	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	N	6898	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	P	7924	LEU	CB-CG-CD2	-5.20	102.16	111.00
1	J	4846	LEU	CB-CG-CD2	-5.19	102.18	111.00
1	L	5872	LEU	CB-CG-CD2	-5.19	102.18	111.00
1	B	978	ALA	CB-CA-C	5.11	117.77	110.10
1	D	2004	ALA	CB-CA-C	5.11	117.77	110.10
1	F	3030	ALA	CB-CA-C	5.11	117.77	110.10
1	H	4056	ALA	CB-CA-C	5.11	117.77	110.10
1	A	465	ALA	CB-CA-C	5.11	117.76	110.10
1	C	1491	ALA	CB-CA-C	5.11	117.76	110.10
1	E	2517	ALA	CB-CA-C	5.11	117.76	110.10
1	G	3543	ALA	CB-CA-C	5.11	117.76	110.10
1	K	5595	ALA	CB-CA-C	5.11	117.76	110.10
1	M	6621	ALA	CB-CA-C	5.10	117.75	110.10
1	N	7134	ALA	CB-CA-C	5.09	117.74	110.10
1	P	8160	ALA	CB-CA-C	5.09	117.74	110.10
1	J	5082	ALA	CB-CA-C	5.08	117.73	110.10
1	L	6108	ALA	CB-CA-C	5.08	117.73	110.10
1	I	4569	ALA	CB-CA-C	5.07	117.70	110.10
1	O	7647	ALA	CB-CA-C	5.06	117.69	110.10

There are no chirality outliers.

All (48) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	119	GLN	Mainchain
1	A	138	ALA	Mainchain
1	A	475	GLU	Mainchain
1	B	632	GLN	Mainchain
1	B	651	ALA	Mainchain
1	B	988	GLU	Mainchain
1	C	1145	GLN	Mainchain
1	C	1164	ALA	Mainchain
1	C	1501	GLU	Mainchain
1	D	1658	GLN	Mainchain
1	D	1677	ALA	Mainchain
1	D	2014	GLU	Mainchain
1	E	2171	GLN	Mainchain
1	E	2190	ALA	Mainchain
1	E	2527	GLU	Mainchain
1	F	2684	GLN	Mainchain
1	F	2703	ALA	Mainchain
1	F	3040	GLU	Mainchain
1	G	3197	GLN	Mainchain
1	G	3216	ALA	Mainchain
1	G	3553	GLU	Mainchain
1	H	3710	GLN	Mainchain
1	H	3729	ALA	Mainchain
1	H	4066	GLU	Mainchain
1	I	4223	GLN	Mainchain
1	I	4242	ALA	Mainchain
1	I	4579	GLU	Mainchain
1	J	4736	GLN	Mainchain
1	J	4755	ALA	Mainchain
1	J	5092	GLU	Mainchain
1	K	5249	GLN	Mainchain
1	K	5268	ALA	Mainchain
1	K	5605	GLU	Mainchain
1	L	5762	GLN	Mainchain
1	L	5781	ALA	Mainchain
1	L	6118	GLU	Mainchain
1	M	6275	GLN	Mainchain
1	M	6294	ALA	Mainchain
1	M	6631	GLU	Mainchain
1	N	6788	GLN	Mainchain
1	N	6807	ALA	Mainchain
1	N	7144	GLU	Mainchain
1	O	7301	GLN	Mainchain

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Mol	Chain	Res	Type	Group
1	O	7320	ALA	Mainchain
1	O	7657	GLU	Mainchain
1	P	7814	GLN	Mainchain
1	P	7833	ALA	Mainchain
1	P	8170	GLU	Mainchain

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	3852	0	3996	13	0
1	B	3852	0	3993	13	0
1	C	3852	0	3993	13	0
1	D	3852	0	3993	12	0
1	E	3852	0	3993	13	0
1	F	3852	0	3993	12	0
1	G	3852	0	3993	13	0
1	H	3852	0	3993	13	0
1	I	3852	0	3993	14	0
1	J	3852	0	3993	13	0
1	K	3852	0	3993	13	0
1	L	3852	0	3993	13	0
1	M	3852	0	3993	13	0
1	N	3852	0	3993	12	0
1	O	3852	0	3993	13	0
1	P	3852	0	3993	12	0
All	All	61632	0	63891	189	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (189) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:GLU:O	1:A:5:ASN:HB2	1.96	0.65
1:B:517:GLU:O	1:B:518:ASN:HB2	1.96	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:5134:GLU:O	1:K:5135:ASN:HB2	1.96	0.65
1:L:5647:GLU:O	1:L:5648:ASN:HB2	1.96	0.65
1:C:1030:GLU:O	1:C:1031:ASN:HB2	1.96	0.65
1:H:3595:GLU:O	1:H:3596:ASN:HB2	1.96	0.65
1:J:4621:GLU:O	1:J:4622:ASN:HB2	1.96	0.65
1:D:1543:GLU:O	1:D:1544:ASN:HB2	1.96	0.64
1:M:6160:GLU:O	1:M:6161:ASN:HB2	1.96	0.64
1:N:6673:GLU:O	1:N:6674:ASN:HB2	1.96	0.64
1:I:4108:GLU:O	1:I:4109:ASN:HB2	1.96	0.64
1:G:3082:GLU:O	1:G:3083:ASN:HB2	1.96	0.64
1:P:7699:GLU:O	1:P:7700:ASN:HB2	1.96	0.64
1:F:2569:GLU:O	1:F:2570:ASN:HB2	1.96	0.64
1:O:7186:GLU:O	1:O:7187:ASN:HB2	1.96	0.64
1:E:2056:GLU:O	1:E:2057:ASN:HB2	1.96	0.64
1:E:2287:ILE:H	1:E:2287:ILE:HD12	1.65	0.62
1:O:7417:ILE:H	1:O:7417:ILE:HD12	1.65	0.62
1:C:1261:ILE:HD12	1:C:1261:ILE:H	1.65	0.61
1:M:6391:ILE:H	1:M:6391:ILE:HD12	1.65	0.61
1:G:3313:ILE:H	1:G:3313:ILE:HD12	1.65	0.61
1:I:4339:ILE:HD12	1:I:4339:ILE:H	1.65	0.61
1:N:6904:ILE:H	1:N:6904:ILE:HD12	1.65	0.60
1:J:5051:ILE:HB	1:J:5052:PRO:HD3	1.83	0.60
1:K:5564:ILE:HB	1:K:5565:PRO:HD3	1.84	0.60
1:A:434:ILE:HB	1:A:435:PRO:HD3	1.84	0.60
1:H:4025:ILE:HB	1:H:4026:PRO:HD3	1.84	0.60
1:D:1774:ILE:H	1:D:1774:ILE:HD12	1.65	0.60
1:L:6077:ILE:HB	1:L:6078:PRO:HD3	1.83	0.60
1:B:947:ILE:HB	1:B:948:PRO:HD3	1.84	0.60
1:M:6590:ILE:HB	1:M:6591:PRO:HD3	1.84	0.60
1:D:1973:ILE:HB	1:D:1974:PRO:HD3	1.84	0.60
1:E:2486:ILE:HB	1:E:2487:PRO:HD3	1.84	0.60
1:O:7616:ILE:HB	1:O:7617:PRO:HD3	1.84	0.60
1:F:2800:ILE:H	1:F:2800:ILE:HD12	1.65	0.60
1:F:2999:ILE:HB	1:F:3000:PRO:HD3	1.84	0.60
1:C:1460:ILE:HB	1:C:1461:PRO:HD3	1.84	0.60
1:A:235:ILE:H	1:A:235:ILE:HD12	1.65	0.60
1:J:4852:ILE:H	1:J:4852:ILE:HD12	1.65	0.60
1:N:7103:ILE:HB	1:N:7104:PRO:HD3	1.84	0.60
1:P:8129:ILE:HB	1:P:8130:PRO:HD3	1.84	0.60
1:G:3512:ILE:HB	1:G:3513:PRO:HD3	1.84	0.60
1:K:5365:ILE:HD12	1:K:5365:ILE:H	1.65	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:P:7930:ILE:HD12	1:P:7930:ILE:H	1.65	0.60
1:H:3826:ILE:HD12	1:H:3826:ILE:H	1.65	0.59
1:I:4538:ILE:HB	1:I:4539:PRO:HD3	1.84	0.59
1:L:5878:ILE:HD12	1:L:5878:ILE:H	1.65	0.59
1:B:748:ILE:HD12	1:B:748:ILE:H	1.65	0.59
1:A:163:LYS:HE3	1:A:163:LYS:HA	1.90	0.54
1:K:5293:LYS:HE3	1:K:5293:LYS:HA	1.90	0.54
1:I:4267:LYS:HA	1:I:4267:LYS:HE3	1.90	0.54
1:F:2728:LYS:HA	1:F:2728:LYS:HE3	1.90	0.54
1:G:3241:LYS:HA	1:G:3241:LYS:HE3	1.90	0.54
1:C:1189:LYS:HE3	1:C:1189:LYS:HA	1.90	0.54
1:M:6319:LYS:HA	1:M:6319:LYS:HE3	1.90	0.53
1:P:7858:LYS:HE3	1:P:7858:LYS:HA	1.90	0.53
1:H:3754:LYS:HA	1:H:3754:LYS:HE3	1.90	0.53
1:J:4780:LYS:HA	1:J:4780:LYS:HE3	1.90	0.53
1:L:5806:LYS:HE3	1:L:5806:LYS:HA	1.90	0.53
1:B:676:LYS:HA	1:B:676:LYS:HE3	1.90	0.53
1:E:2215:LYS:HA	1:E:2215:LYS:HE3	1.90	0.53
1:O:7345:LYS:HE3	1:O:7345:LYS:HA	1.90	0.53
1:E:2555:LEU:C	1:E:2555:LEU:HD23	2.30	0.53
1:O:7685:LEU:C	1:O:7685:LEU:HD23	2.30	0.53
1:C:1529:LEU:C	1:C:1529:LEU:HD23	2.30	0.52
1:D:2042:LEU:C	1:D:2042:LEU:HD23	2.29	0.52
1:M:6659:LEU:C	1:M:6659:LEU:HD23	2.30	0.52
1:N:7172:LEU:C	1:N:7172:LEU:HD23	2.29	0.52
1:L:6146:LEU:C	1:L:6146:LEU:HD23	2.29	0.52
1:B:1016:LEU:C	1:B:1016:LEU:HD23	2.29	0.52
1:G:3581:LEU:HD23	1:G:3581:LEU:C	2.30	0.52
1:I:4607:LEU:HD23	1:I:4607:LEU:C	2.30	0.52
1:D:1702:LYS:HE3	1:D:1702:LYS:HA	1.90	0.52
1:F:3068:LEU:C	1:F:3068:LEU:HD23	2.29	0.52
1:P:8198:LEU:HD23	1:P:8198:LEU:C	2.29	0.52
1:N:6832:LYS:HE3	1:N:6832:LYS:HA	1.90	0.52
1:J:5120:LEU:C	1:J:5120:LEU:HD23	2.29	0.51
1:H:4094:LEU:C	1:H:4094:LEU:HD23	2.29	0.51
1:K:5633:LEU:C	1:K:5633:LEU:HD23	2.30	0.51
1:A:503:LEU:C	1:A:503:LEU:HD23	2.30	0.51
1:G:3082:GLU:O	1:G:3083:ASN:CB	2.60	0.50
1:I:4108:GLU:O	1:I:4109:ASN:CB	2.60	0.50
1:F:2569:GLU:O	1:F:2570:ASN:CB	2.60	0.49
1:H:3826:ILE:HD12	1:H:3826:ILE:N	2.27	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:4852:ILE:HD12	1:J:4852:ILE:N	2.27	0.49
1:J:4621:GLU:O	1:J:4622:ASN:CB	2.60	0.49
1:P:7699:GLU:O	1:P:7700:ASN:CB	2.60	0.49
1:H:3595:GLU:O	1:H:3596:ASN:CB	2.60	0.49
1:C:1030:GLU:O	1:C:1031:ASN:CB	2.60	0.49
1:M:6160:GLU:O	1:M:6161:ASN:CB	2.60	0.49
1:B:517:GLU:O	1:B:518:ASN:CB	2.60	0.49
1:B:748:ILE:HD12	1:B:748:ILE:N	2.27	0.49
1:L:5878:ILE:HD12	1:L:5878:ILE:N	2.27	0.49
1:L:5647:GLU:O	1:L:5648:ASN:CB	2.60	0.49
1:N:6673:GLU:O	1:N:6674:ASN:CB	2.60	0.49
1:D:1543:GLU:O	1:D:1544:ASN:CB	2.60	0.49
1:E:2056:GLU:O	1:E:2057:ASN:CB	2.60	0.49
1:I:4339:ILE:HD12	1:I:4339:ILE:N	2.27	0.49
1:G:3313:ILE:HD12	1:G:3313:ILE:N	2.27	0.49
1:K:5134:GLU:O	1:K:5135:ASN:CB	2.60	0.49
1:A:4:GLU:O	1:A:5:ASN:CB	2.60	0.48
1:O:7186:GLU:O	1:O:7187:ASN:CB	2.60	0.48
1:A:235:ILE:HD12	1:A:235:ILE:N	2.27	0.48
1:C:1261:ILE:HD12	1:C:1261:ILE:N	2.27	0.48
1:M:6391:ILE:HD12	1:M:6391:ILE:N	2.27	0.48
1:K:5365:ILE:HD12	1:K:5365:ILE:N	2.27	0.48
1:N:6904:ILE:HD12	1:N:6904:ILE:N	2.27	0.48
1:D:1774:ILE:HD12	1:D:1774:ILE:N	2.27	0.48
1:E:2287:ILE:HD12	1:E:2287:ILE:N	2.27	0.48
1:F:2800:ILE:HD12	1:F:2800:ILE:N	2.27	0.48
1:O:7417:ILE:HD12	1:O:7417:ILE:N	2.27	0.48
1:P:7930:ILE:HD12	1:P:7930:ILE:N	2.27	0.47
1:D:2047:ASP:HB3	1:E:2092:LYS:HD2	1.98	0.45
1:O:7690:ASP:HB3	1:P:7735:LYS:HD2	1.98	0.45
1:E:2560:ASP:HB3	1:F:2605:LYS:HD2	1.98	0.45
1:M:6664:ASP:HB3	1:N:6709:LYS:HD2	1.98	0.45
1:C:1534:ASP:HB3	1:D:1579:LYS:HD2	1.98	0.45
1:N:7177:ASP:HB3	1:O:7222:LYS:HD2	1.99	0.45
1:F:3073:ASP:HB3	1:G:3118:LYS:HD2	1.98	0.45
1:B:1021:ASP:HB3	1:C:1066:LYS:HD2	1.98	0.45
1:I:4144:LYS:HD2	1:P:8203:ASP:HB3	1.99	0.44
1:I:4612:ASP:HB3	1:J:4657:LYS:HD2	1.98	0.44
1:L:6151:ASP:HB3	1:M:6196:LYS:HD2	1.99	0.44
1:G:3586:ASP:HB3	1:H:3631:LYS:HD2	1.98	0.44
1:K:5638:ASP:HB3	1:L:5683:LYS:HD2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:LYS:HD2	1:H:4099:ASP:HB3	1.98	0.44
1:A:508:ASP:HB3	1:B:553:LYS:HD2	1.98	0.43
1:M:6335:GLU:HA	1:M:6336:GLY:HA3	1.81	0.43
1:J:5125:ASP:HB3	1:K:5170:LYS:HD2	1.99	0.43
1:C:1205:GLU:HA	1:C:1206:GLY:HA3	1.81	0.43
1:F:2836:LYS:O	1:F:2836:LYS:HD3	2.19	0.43
1:P:7966:LYS:O	1:P:7966:LYS:HD3	2.19	0.43
1:B:609:GLU:HG2	1:B:946:VAL:HB	2.01	0.43
1:E:2323:LYS:O	1:E:2323:LYS:HD3	2.19	0.43
1:F:2661:GLU:HG2	1:F:2998:VAL:HB	2.01	0.43
1:N:6940:LYS:O	1:N:6940:LYS:HD3	2.19	0.43
1:O:7453:LYS:O	1:O:7453:LYS:HD3	2.19	0.43
1:P:7791:GLU:HG2	1:P:8128:VAL:HB	2.01	0.43
1:D:1635:GLU:HG2	1:D:1972:VAL:HB	2.01	0.43
1:D:1810:LYS:O	1:D:1810:LYS:HD3	2.19	0.43
1:L:5739:GLU:HG2	1:L:6076:VAL:HB	2.01	0.43
1:N:6765:GLU:HG2	1:N:7102:VAL:HB	2.01	0.43
1:G:3349:LYS:O	1:G:3349:LYS:HD3	2.19	0.42
1:I:4375:LYS:O	1:I:4375:LYS:HD3	2.19	0.42
1:J:4619:LEU:HA	1:J:4620:PRO:HD3	1.91	0.42
1:L:5862:LYS:HA	1:L:5862:LYS:HE2	2.02	0.42
1:A:219:LYS:HA	1:A:219:LYS:HE2	2.02	0.42
1:H:3593:LEU:HA	1:H:3594:PRO:HD3	1.91	0.42
1:H:3687:GLU:HG2	1:H:4024:VAL:HB	2.01	0.42
1:H:3862:LYS:O	1:H:3862:LYS:HD3	2.19	0.42
1:J:4713:GLU:HG2	1:J:5050:VAL:HB	2.01	0.42
1:K:5349:LYS:HE2	1:K:5349:LYS:HA	2.02	0.42
1:A:2:LEU:HA	1:A:3:PRO:HD3	1.91	0.42
1:A:271:LYS:O	1:A:271:LYS:HD3	2.19	0.42
1:C:1297:LYS:O	1:C:1297:LYS:HD3	2.19	0.42
1:J:4888:LYS:O	1:J:4888:LYS:HD3	2.19	0.42
1:K:5132:LEU:HA	1:K:5133:PRO:HD3	1.91	0.42
1:K:5401:LYS:O	1:K:5401:LYS:HD3	2.19	0.42
1:M:6427:LYS:O	1:M:6427:LYS:HD3	2.19	0.42
1:M:6252:GLU:HG2	1:M:6589:VAL:HB	2.01	0.42
1:B:732:LYS:HA	1:B:732:LYS:HE2	2.02	0.42
1:C:1122:GLU:HG2	1:C:1459:VAL:HB	2.01	0.42
1:C:1245:LYS:HE2	1:C:1245:LYS:HA	2.02	0.42
1:N:6888:LYS:HE2	1:N:6888:LYS:HA	2.02	0.42
1:M:6375:LYS:HA	1:M:6375:LYS:HE2	2.02	0.42
1:O:7361:GLU:HA	1:O:7362:GLY:HA3	1.81	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:96:GLU:HG2	1:A:433:VAL:HB	2.01	0.42
1:D:1758:LYS:HA	1:D:1758:LYS:HE2	2.02	0.42
1:J:4836:LYS:HA	1:J:4836:LYS:HE2	2.02	0.42
1:K:5226:GLU:HG2	1:K:5563:VAL:HB	2.01	0.42
1:O:7278:GLU:HG2	1:O:7615:VAL:HB	2.01	0.42
1:B:784:LYS:O	1:B:784:LYS:HD3	2.19	0.42
1:H:3810:LYS:HA	1:H:3810:LYS:HE2	2.02	0.42
1:E:2148:GLU:HG2	1:E:2485:VAL:HB	2.01	0.41
1:L:5914:LYS:O	1:L:5914:LYS:HD3	2.19	0.41
1:I:4200:GLU:HG2	1:I:4537:VAL:HB	2.01	0.41
1:E:2231:GLU:HA	1:E:2232:GLY:HA3	1.81	0.41
1:E:2271:LYS:HE2	1:E:2271:LYS:HA	2.02	0.41
1:O:7401:LYS:HE2	1:O:7401:LYS:HA	2.02	0.41
1:G:3174:GLU:HG2	1:G:3511:VAL:HB	2.01	0.41
1:I:4323:LYS:HA	1:I:4323:LYS:HE2	2.02	0.41
1:G:3297:LYS:HA	1:G:3297:LYS:HE2	2.02	0.41
1:P:7914:LYS:HA	1:P:7914:LYS:HE2	2.02	0.41
1:G:3080:LEU:HA	1:G:3081:PRO:HD3	1.91	0.41
1:I:4106:LEU:HA	1:I:4107:PRO:HD3	1.91	0.41
1:F:2784:LYS:HA	1:F:2784:LYS:HE2	2.02	0.41
1:B:515:LEU:HA	1:B:516:PRO:HD3	1.91	0.40
1:I:4283:GLU:HA	1:I:4284:GLY:HA3	1.81	0.40
1:L:5645:LEU:HA	1:L:5646:PRO:HD3	1.91	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	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47 81
1	B	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47 81

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	D	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	E	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	F	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	G	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	H	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	I	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	J	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	K	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	L	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	M	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	N	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	O	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
1	P	511/513 (100%)	497 (97%)	13 (2%)	1 (0%)	47	81
All	All	8176/8208 (100%)	7952 (97%)	208 (2%)	16 (0%)	50	81

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	B	518	ASN
1	C	1031	ASN
1	D	1544	ASN
1	E	2057	ASN
1	F	2570	ASN
1	G	3083	ASN
1	H	3596	ASN
1	I	4109	ASN
1	J	4622	ASN
1	K	5135	ASN
1	L	5648	ASN
1	M	6161	ASN
1	N	6674	ASN
1	O	7187	ASN
1	P	7700	ASN

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	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	B	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	C	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	D	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	E	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	F	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	G	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	H	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	I	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	J	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	K	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	L	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	M	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	N	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	O	414/414 (100%)	409 (99%)	5 (1%)	71	83
1	P	414/414 (100%)	409 (99%)	5 (1%)	71	83
All	All	6624/6624 (100%)	6544 (99%)	80 (1%)	72	83

All (80) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	LYS
1	A	72	LEU
1	A	144	LEU
1	A	163	LYS
1	A	419	ARG
1	B	549	LYS
1	B	585	LEU
1	B	657	LEU

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Mol	Chain	Res	Type
1	B	676	LYS
1	B	932	ARG
1	C	1062	LYS
1	C	1098	LEU
1	C	1170	LEU
1	C	1189	LYS
1	C	1445	ARG
1	D	1575	LYS
1	D	1611	LEU
1	D	1683	LEU
1	D	1702	LYS
1	D	1958	ARG
1	E	2088	LYS
1	E	2124	LEU
1	E	2196	LEU
1	E	2215	LYS
1	E	2471	ARG
1	F	2601	LYS
1	F	2637	LEU
1	F	2709	LEU
1	F	2728	LYS
1	F	2984	ARG
1	G	3114	LYS
1	G	3150	LEU
1	G	3222	LEU
1	G	3241	LYS
1	G	3497	ARG
1	H	3627	LYS
1	H	3663	LEU
1	H	3735	LEU
1	H	3754	LYS
1	H	4010	ARG
1	I	4140	LYS
1	I	4176	LEU
1	I	4248	LEU
1	I	4267	LYS
1	I	4523	ARG
1	J	4653	LYS
1	J	4689	LEU
1	J	4761	LEU
1	J	4780	LYS
1	J	5036	ARG

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Mol	Chain	Res	Type
1	K	5166	LYS
1	K	5202	LEU
1	K	5274	LEU
1	K	5293	LYS
1	K	5549	ARG
1	L	5679	LYS
1	L	5715	LEU
1	L	5787	LEU
1	L	5806	LYS
1	L	6062	ARG
1	M	6192	LYS
1	M	6228	LEU
1	M	6300	LEU
1	M	6319	LYS
1	M	6575	ARG
1	N	6705	LYS
1	N	6741	LEU
1	N	6813	LEU
1	N	6832	LYS
1	N	7088	ARG
1	O	7218	LYS
1	O	7254	LEU
1	O	7326	LEU
1	O	7345	LYS
1	O	7601	ARG
1	P	7731	LYS
1	P	7767	LEU
1	P	7839	LEU
1	P	7858	LYS
1	P	8114	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
1	A	79	GLN
1	B	531	ASN
1	B	592	GLN
1	C	1044	ASN
1	C	1105	GLN
1	D	1557	ASN
1	D	1618	GLN

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Mol	Chain	Res	Type
1	E	2070	ASN
1	E	2131	GLN
1	F	2583	ASN
1	F	2644	GLN
1	G	3096	ASN
1	G	3157	GLN
1	H	3609	ASN
1	H	3670	GLN
1	I	4122	ASN
1	I	4183	GLN
1	J	4635	ASN
1	J	4696	GLN
1	J	4907	HIS
1	K	5148	ASN
1	K	5209	GLN
1	L	5661	ASN
1	L	5722	GLN
1	M	6174	ASN
1	M	6235	GLN
1	N	6687	ASN
1	N	6748	GLN
1	O	7200	ASN
1	O	7261	GLN
1	P	7713	ASN
1	P	7774	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)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

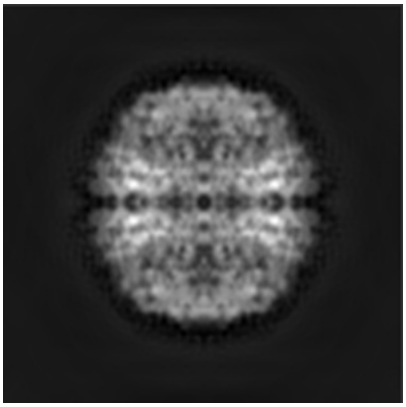
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-5249. These allow visual inspection of the internal detail of the map and identification of artifacts.

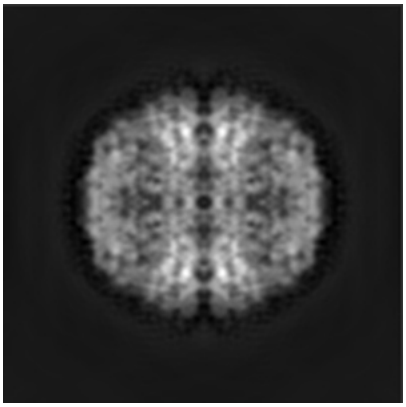
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

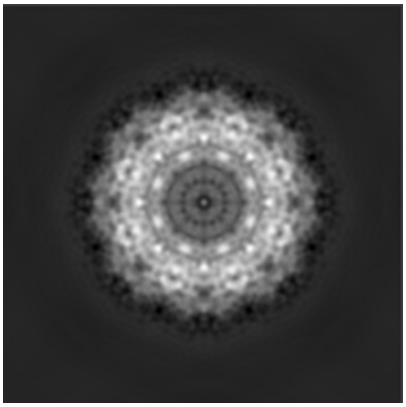
6.1.1 Primary map



X



Y

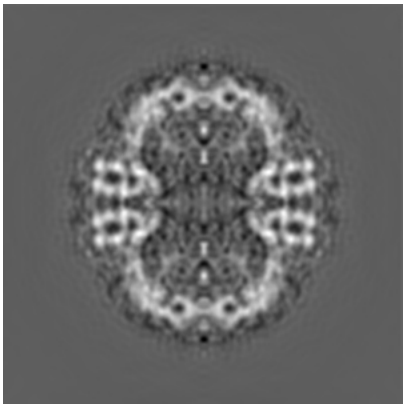


Z

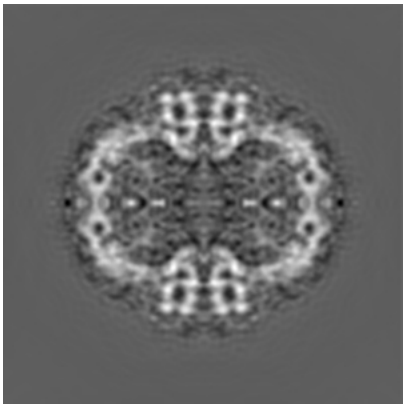
The images above show the map projected in three orthogonal directions.

6.2 Central slices

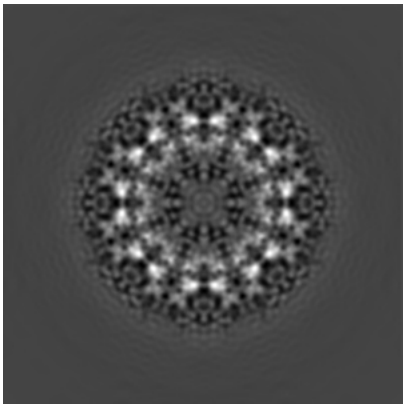
6.2.1 Primary map



X Index: 96



Y Index: 96

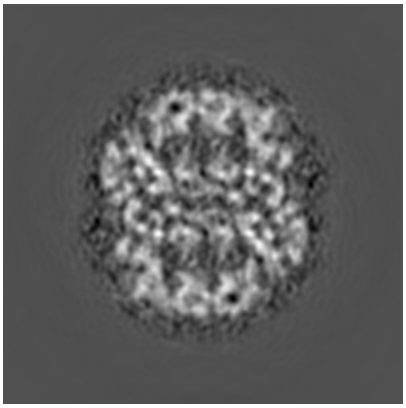


Z Index: 96

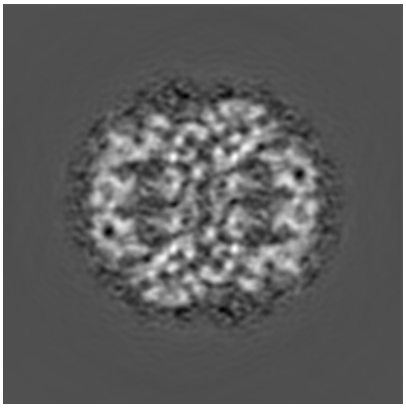
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

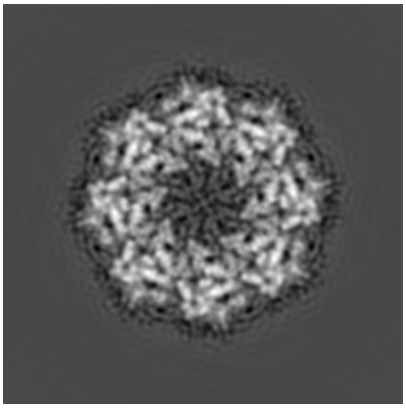
6.3.1 Primary map



X Index: 74



Y Index: 74

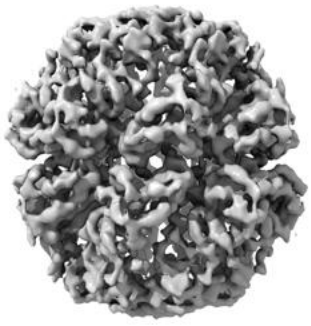


Z Index: 104

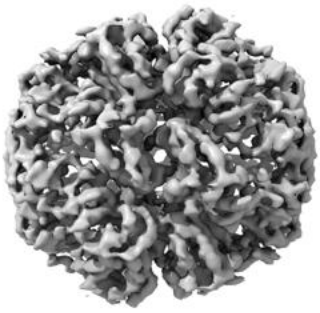
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

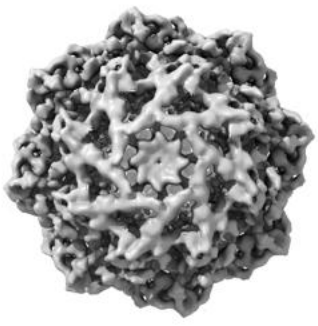
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

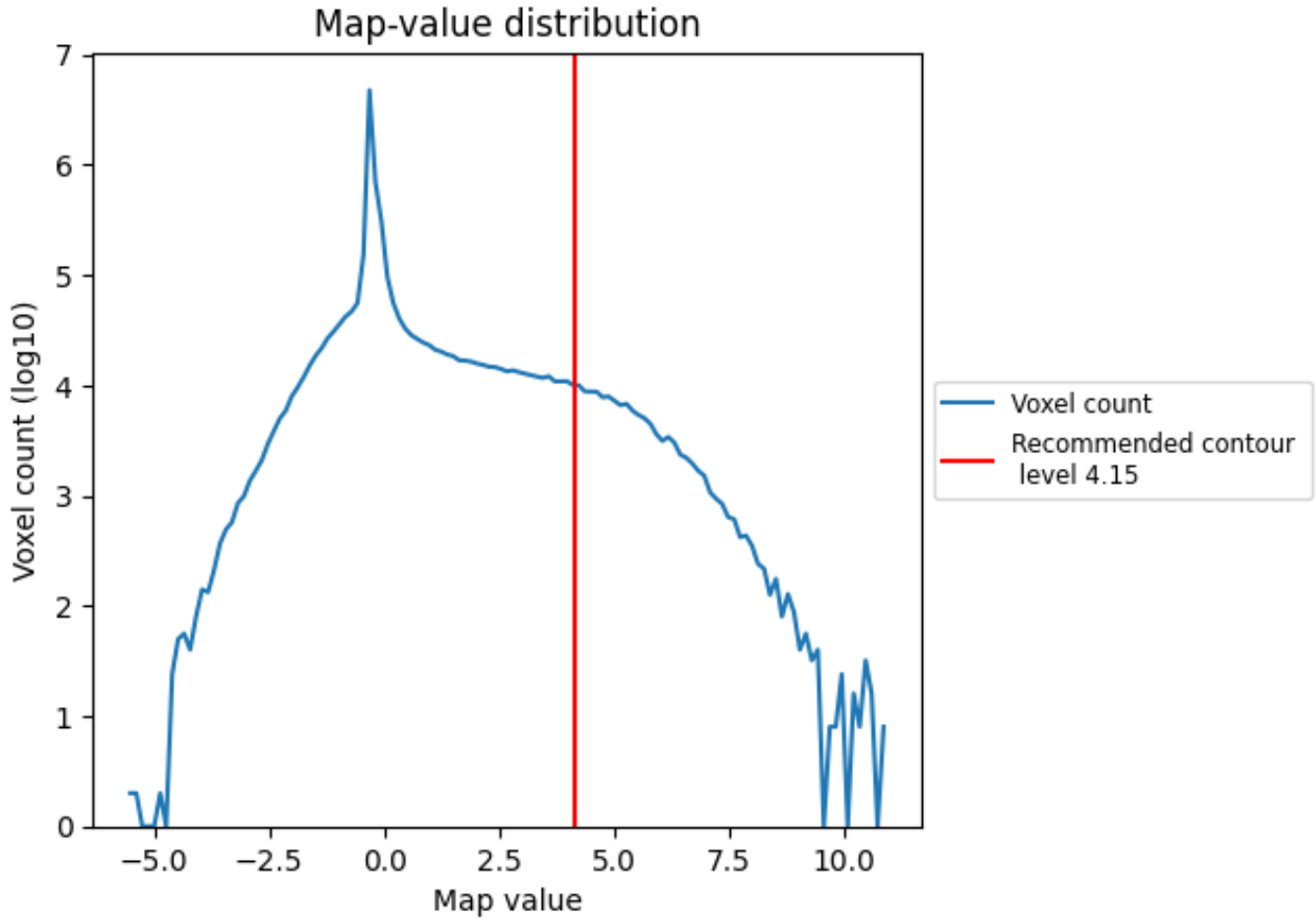
6.5 Mask visualisation (i)

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

7 Map analysis

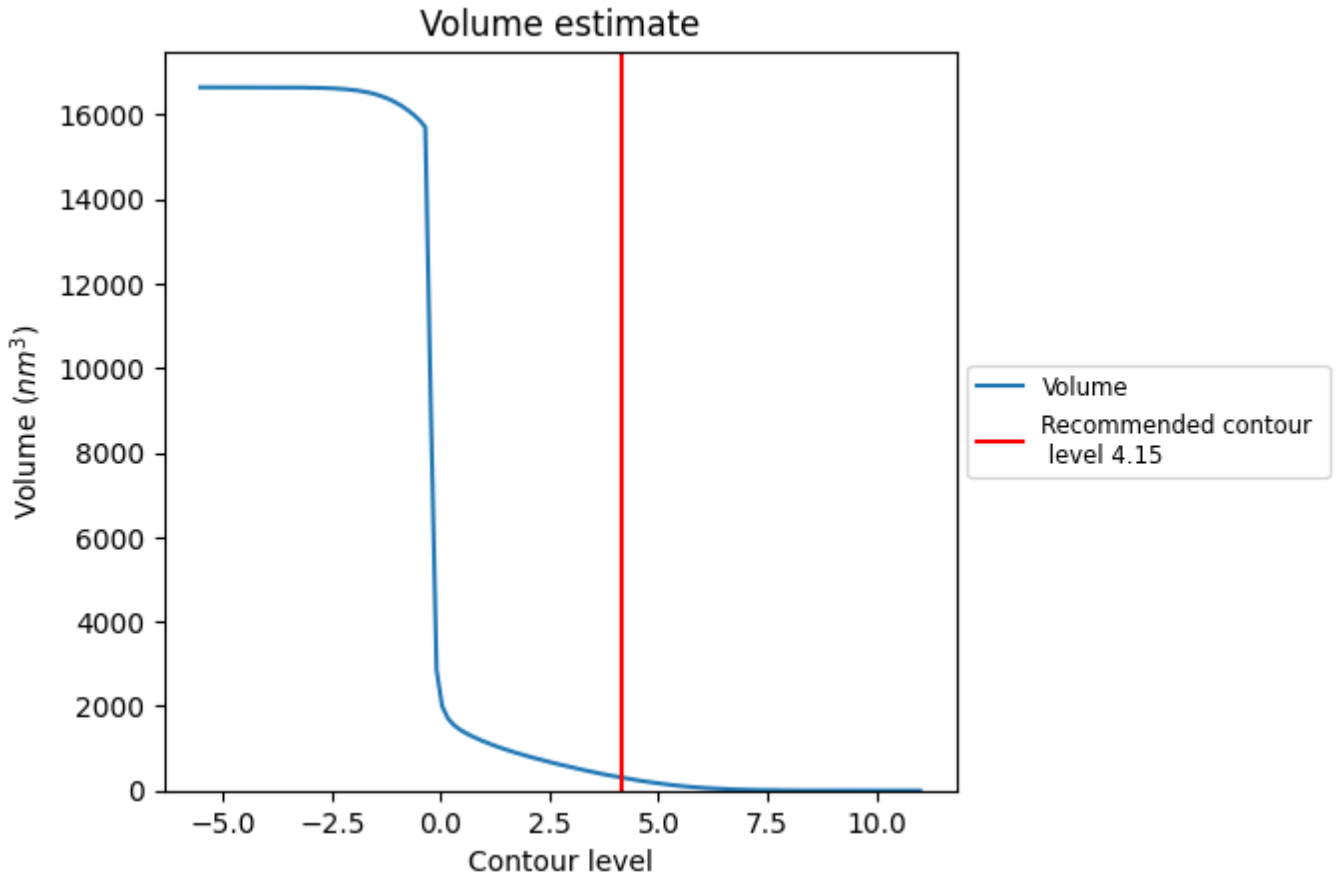
This section contains the results of statistical analysis of the map.

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.

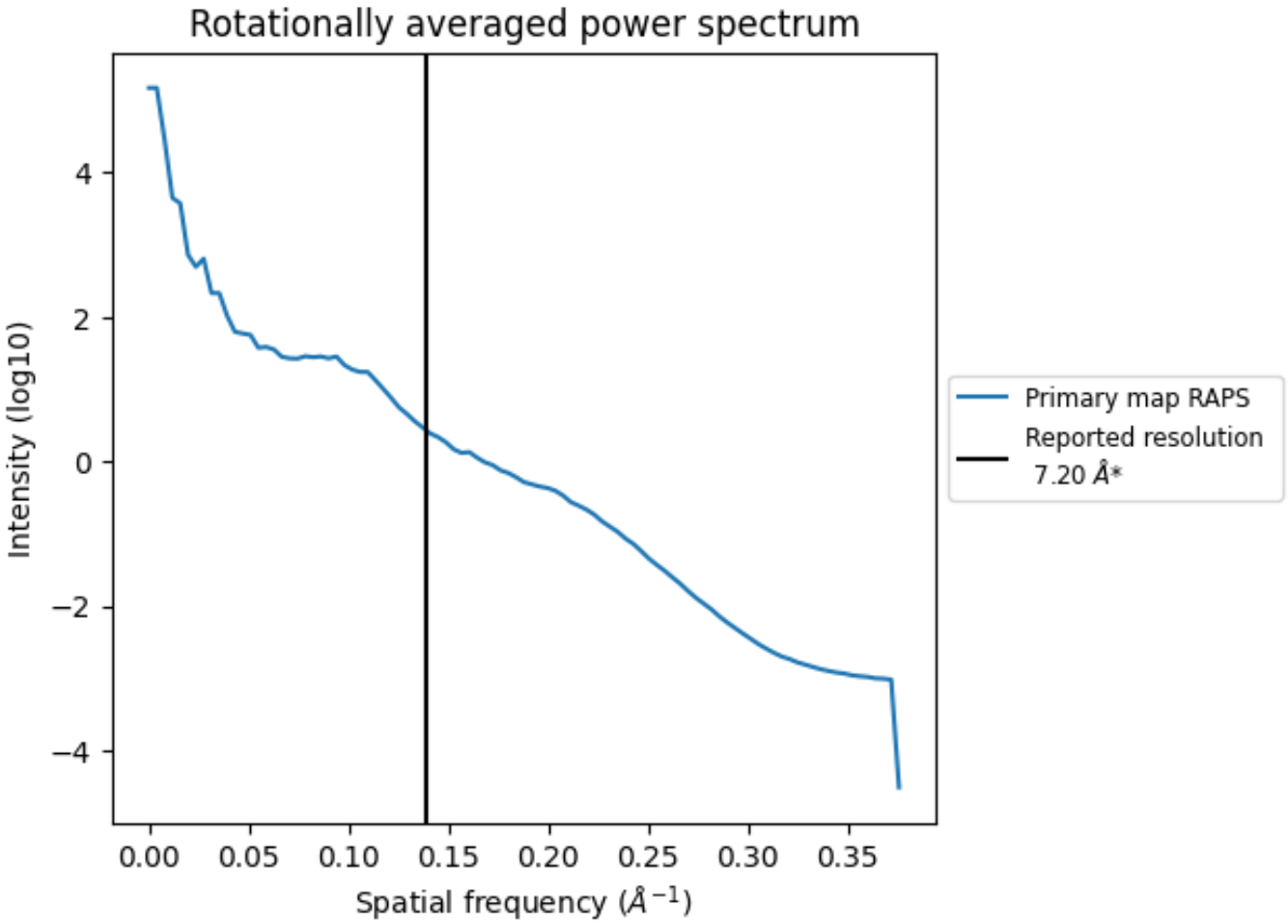
7.2 Volume estimate



The volume at the recommended contour level is 307 nm^3; this corresponds to an approximate mass of 278 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 0.139 Å^{-1}

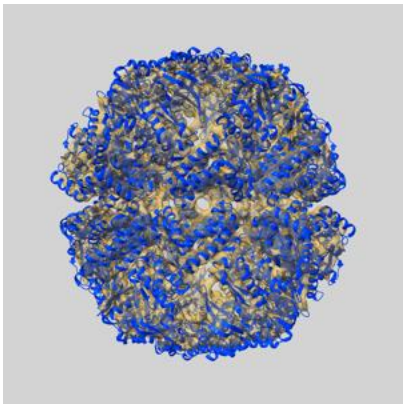
8 Fourier-Shell correlation (i)

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

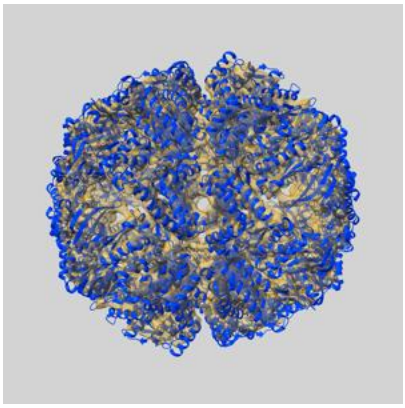
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-5249 and PDB model 3IZM. Per-residue inclusion information can be found in section 3 on page 5.

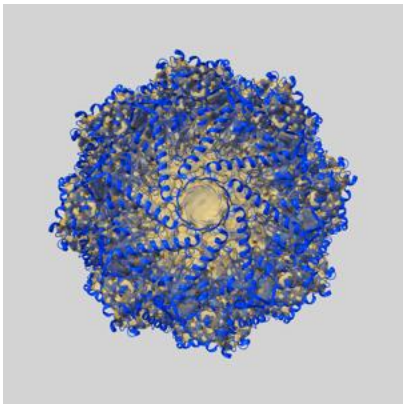
9.1 Map-model overlay



X



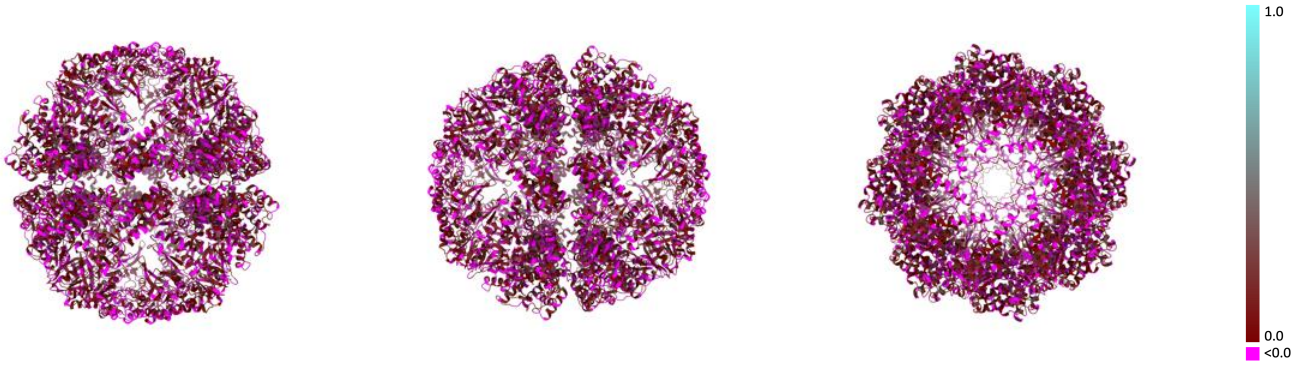
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.15 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.

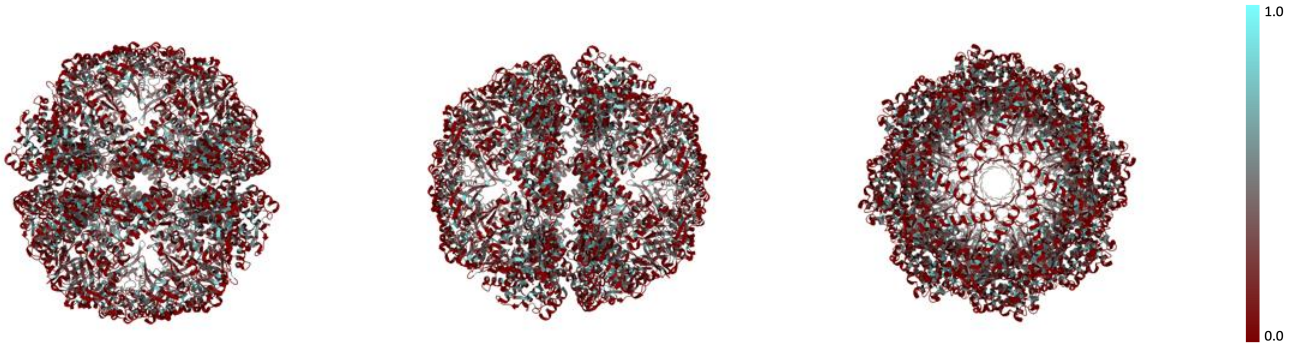
9.2 Q-score mapped to coordinate model (i)



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.

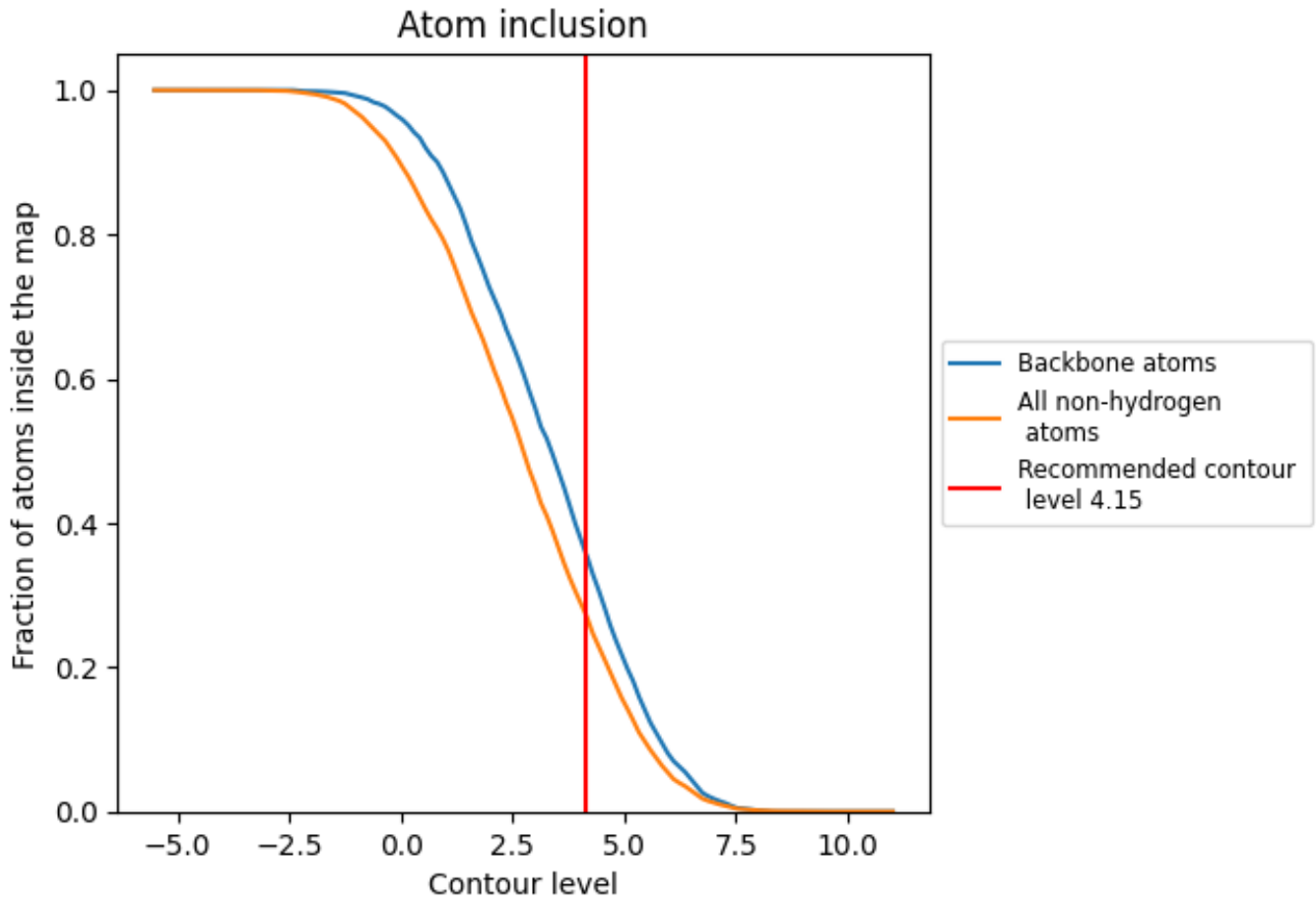
9.3 Atom inclusion mapped to coordinate model (i)



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 (4.15).

9.4 Atom inclusion (i)



At the recommended contour level, 36% of all backbone atoms, 27% 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 (4.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.2712	0.0630
A	0.2723	0.0630
B	0.2697	0.0650
C	0.2723	0.0660
D	0.2700	0.0670
E	0.2723	0.0660
F	0.2700	0.0650
G	0.2726	0.0630
H	0.2700	0.0620
I	0.2723	0.0600
J	0.2702	0.0610
K	0.2723	0.0600
L	0.2702	0.0620
M	0.2723	0.0610
N	0.2702	0.0610
O	0.2726	0.0610
P	0.2702	0.0610