wwPDB EM Validation Summary Report

Jan 20, 2026 – 01:45 PM EST

PDB ID	:	9YNE / pdb_00009yne
EMDB ID	:	EMD-73175
Title	:	Motor domain of human dynein-1 in pre-power stroke bound to dynactin-p150glued-CC1B-ICD and LIS1
Authors	:	Yang, J.; Rao, Q.; Chai, P.; Zhang, K.
Deposited on	:	2025-10-10
Resolution	:	8.46 Å(reported)

This is a wwPDB EM Validation Summary 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:

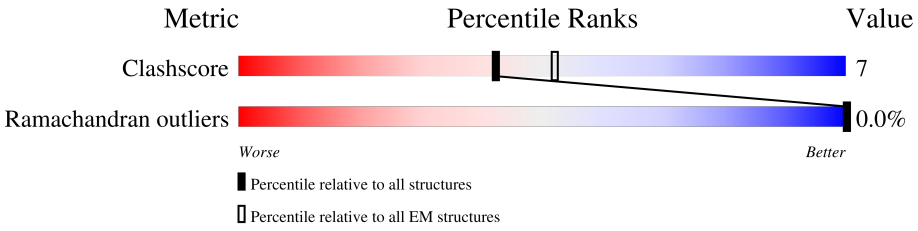
EMDB validation analysis	:	0.0.1.dev129
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

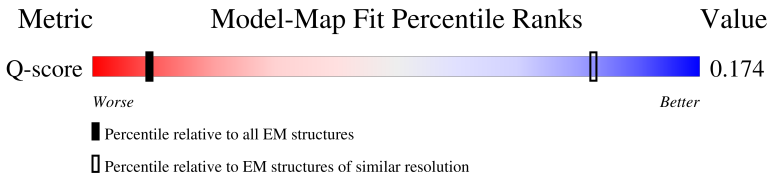
1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 8.46 Å.

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





Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Q-score	-	25397	277 (7.97 - 8.96)

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	4646	65% 5% 30%
2	B	410	78% 20%
2	C	410	6% 85% 13%
3	D	638	5% 95%
3	E	638	5% 95%

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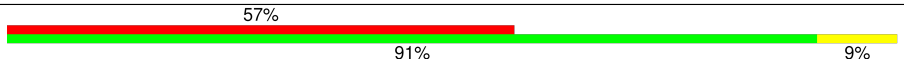
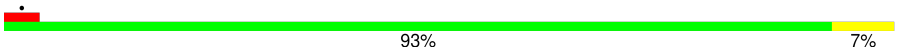
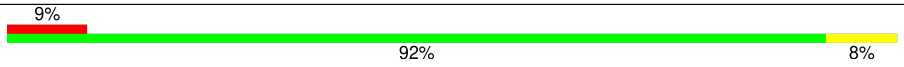
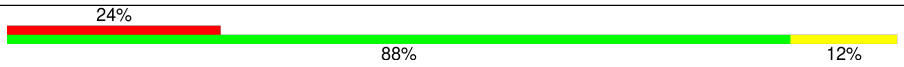
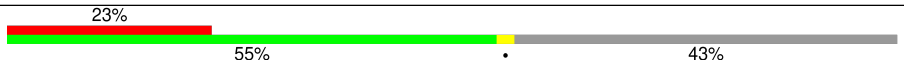
Mol	Chain	Length	Quality of chain
4	F	1281	
4	G	1281	
5	d	89	
5	i	89	
6	k	113	
6	v	113	
7	u	492	

2 Entry composition (i)

There are 10 unique types of molecules in this entry. The entry contains 29128 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 Cytoplasmic dynein 1 heavy chain 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	A	3270	Total 16199	C 9659	N 3270	O 3270	0	0

- Molecule 2 is a protein called Platelet-activating factor acetylhydrolase IB subunit beta.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	B	402	Total 1988	C 1184	N 402	O 402	0	0
2	C	402	Total 1988	C 1184	N 402	O 402	0	0

- Molecule 3 is a protein called Cytoplasmic dynein 1 intermediate chain 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	D	35	Total 175	C 105	N 35	O 35	0	0
3	E	35	Total 175	C 105	N 35	O 35	0	0

- Molecule 4 is a protein called Dynactin subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	F	514	Total 2549	C 1521	N 514	O 514	0	0
4	G	516	Total 2559	C 1527	N 516	O 516	0	0

There are 56 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	118	ARG	LYS	conflict	UNP Q14203
F	124	SER	THR	conflict	UNP Q14203
F	125	ASN	THR	conflict	UNP Q14203

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Chain	Residue	Modelled	Actual	Comment	Reference
F	134	PRO	LEU	conflict	UNP Q14203
F	200	ALA	VAL	conflict	UNP Q14203
F	207	ALA	VAL	conflict	UNP Q14203
F	631	ASP	GLU	conflict	UNP Q14203
F	742	SER	CYS	conflict	UNP Q14203
F	778	SER	THR	conflict	UNP Q14203
F	821	ALA	PRO	conflict	UNP Q14203
F	862	PRO	LEU	conflict	UNP Q14203
F	1048	ILE	LEU	conflict	UNP Q14203
F	1072	GLY	ALA	conflict	UNP Q14203
F	1073	ALA	ILE	conflict	UNP Q14203
F	1080	ILE	SER	conflict	UNP Q14203
F	1113	VAL	ILE	conflict	UNP Q14203
F	1125	ALA	SER	conflict	UNP Q14203
F	1136	LEU	-	insertion	UNP Q14203
F	1137	PRO	-	insertion	UNP Q14203
F	1138	PRO	-	insertion	UNP Q14203
F	1147	ALA	PRO	conflict	UNP Q14203
F	1156	ASN	SER	conflict	UNP Q14203
F	1177	SER	THR	conflict	UNP Q14203
F	1189	LEU	MET	conflict	UNP Q14203
F	1193	THR	ALA	conflict	UNP Q14203
F	1202	ILE	VAL	conflict	UNP Q14203
F	1259	LEU	PHE	conflict	UNP Q14203
F	1277	ASP	SER	conflict	UNP Q14203
G	118	ARG	LYS	conflict	UNP Q14203
G	124	SER	THR	conflict	UNP Q14203
G	125	ASN	THR	conflict	UNP Q14203
G	134	PRO	LEU	conflict	UNP Q14203
G	200	ALA	VAL	conflict	UNP Q14203
G	207	ALA	VAL	conflict	UNP Q14203
G	631	ASP	GLU	conflict	UNP Q14203
G	742	SER	CYS	conflict	UNP Q14203
G	778	SER	THR	conflict	UNP Q14203
G	821	ALA	PRO	conflict	UNP Q14203
G	862	PRO	LEU	conflict	UNP Q14203
G	1048	ILE	LEU	conflict	UNP Q14203
G	1072	GLY	ALA	conflict	UNP Q14203
G	1073	ALA	ILE	conflict	UNP Q14203
G	1080	ILE	SER	conflict	UNP Q14203
G	1113	VAL	ILE	conflict	UNP Q14203
G	1125	ALA	SER	conflict	UNP Q14203

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Chain	Residue	Modelled	Actual	Comment	Reference
G	1136	LEU	-	insertion	UNP Q14203
G	1137	PRO	-	insertion	UNP Q14203
G	1138	PRO	-	insertion	UNP Q14203
G	1147	ALA	PRO	conflict	UNP Q14203
G	1156	ASN	SER	conflict	UNP Q14203
G	1177	SER	THR	conflict	UNP Q14203
G	1189	LEU	MET	conflict	UNP Q14203
G	1193	THR	ALA	conflict	UNP Q14203
G	1202	ILE	VAL	conflict	UNP Q14203
G	1259	LEU	PHE	conflict	UNP Q14203
G	1277	ASP	SER	conflict	UNP Q14203

- Molecule 5 is a protein called Dynein light chain 1, cytoplasmic.

Mol	Chain	Residues	Atoms				AltConf	Trace
5	d	89	Total	C	N	O	0	0
			441	263	89	89		
5	i	89	Total	C	N	O	0	0
			441	263	89	89		

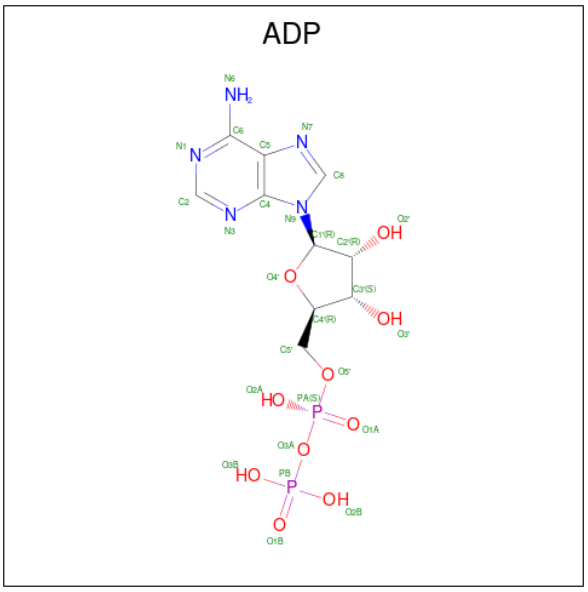
- Molecule 6 is a protein called Dynein light chain Tctex-type 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	k	113	Total	C	N	O	0	0
			558	332	113	113		
6	v	113	Total	C	N	O	0	0
			558	332	113	113		

- Molecule 7 is a protein called Cytoplasmic dynein 1 light intermediate chain 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	u	280	Total	C	N	O	0	0
			1383	823	280	280		

- Molecule 8 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).

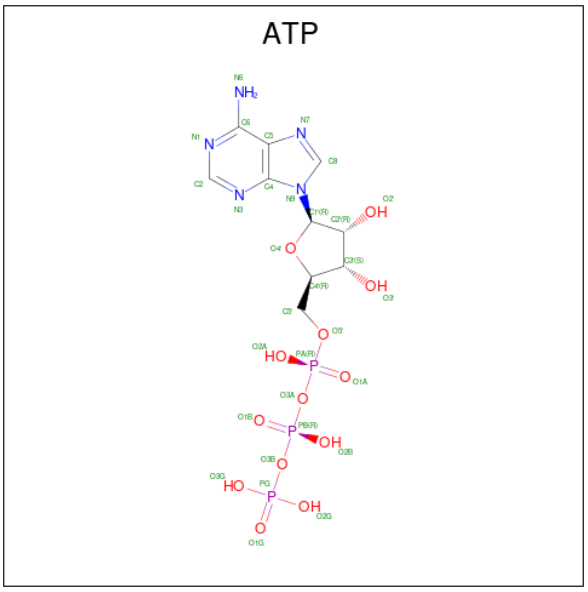


Mol	Chain	Residues	Atoms					AltConf
8	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
8	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
8	A	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 9 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
9	A	2	Total	Mg	0
			2	2	

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



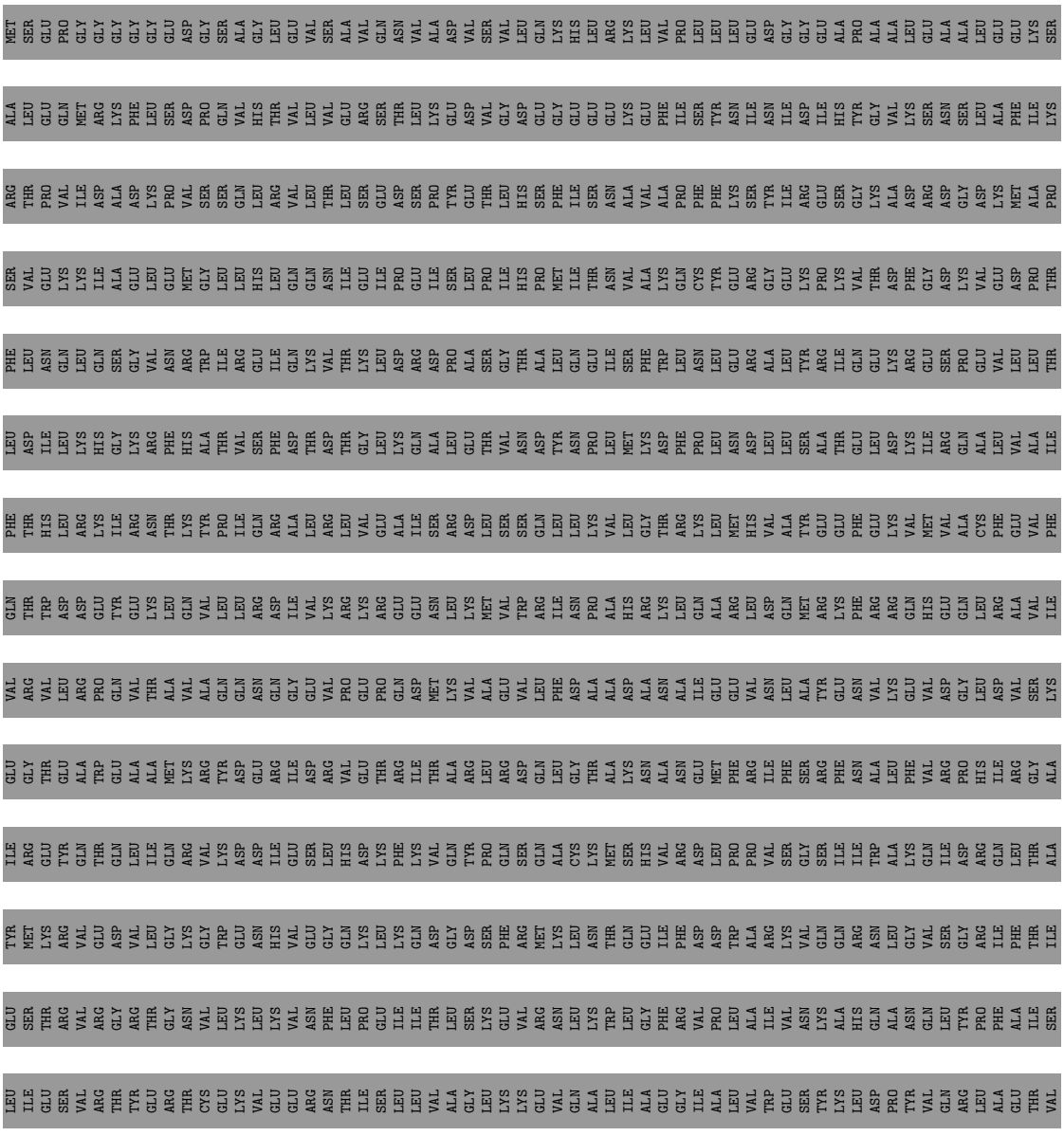
Mol	Chain	Residues	Atoms					AltConf
10	A	1	Total	C	N	O	P	0
			31	10	5	13	3	

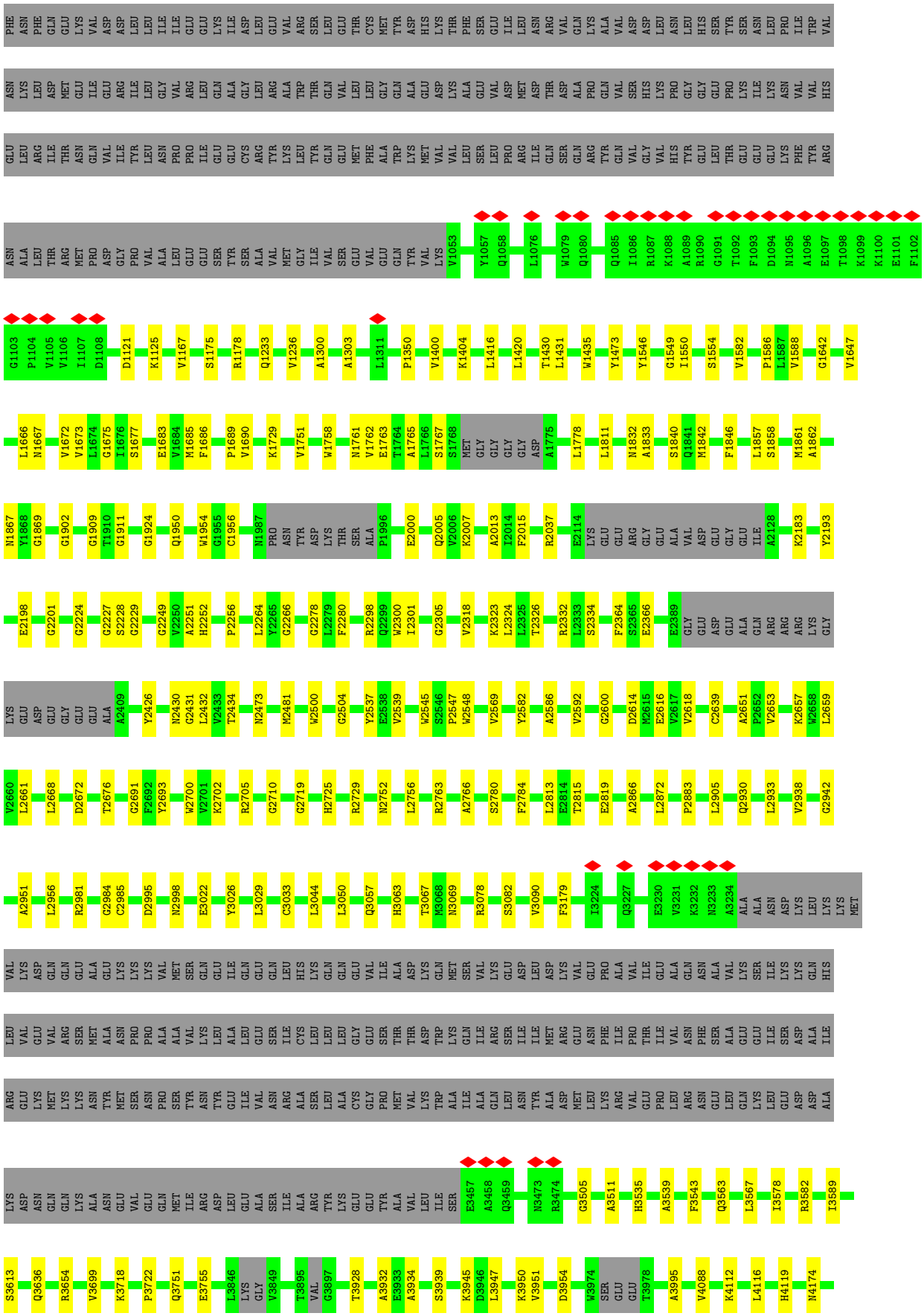
3 Residue-property plots (i)

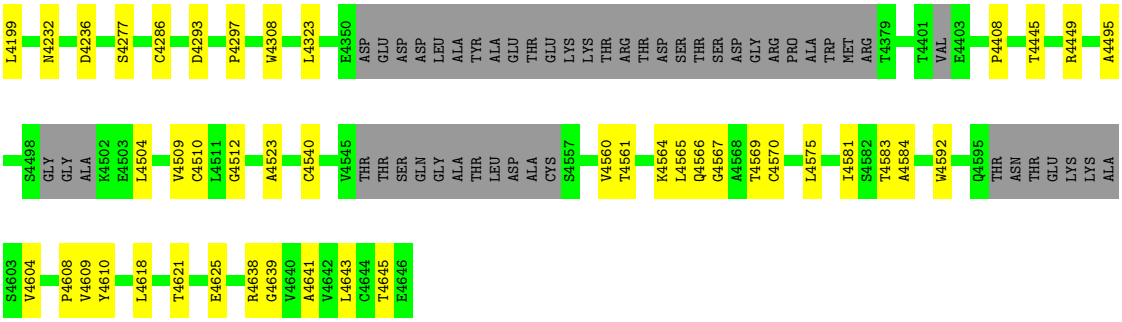
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Cytoplasmic dynein 1 heavy chain 1

Chain A:

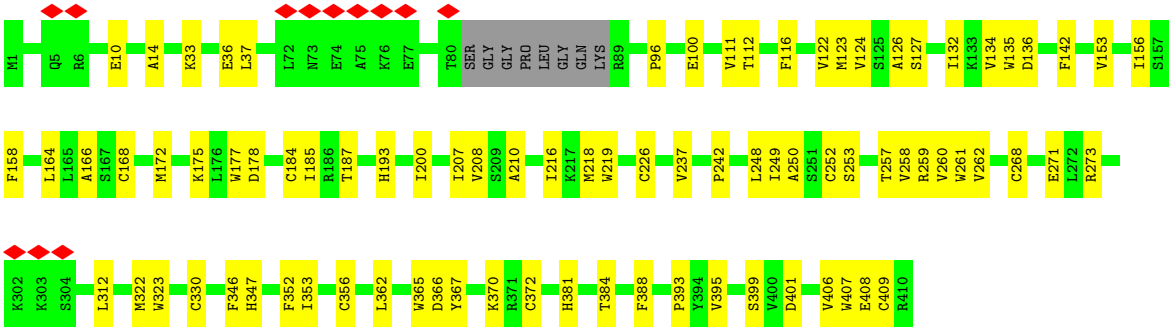






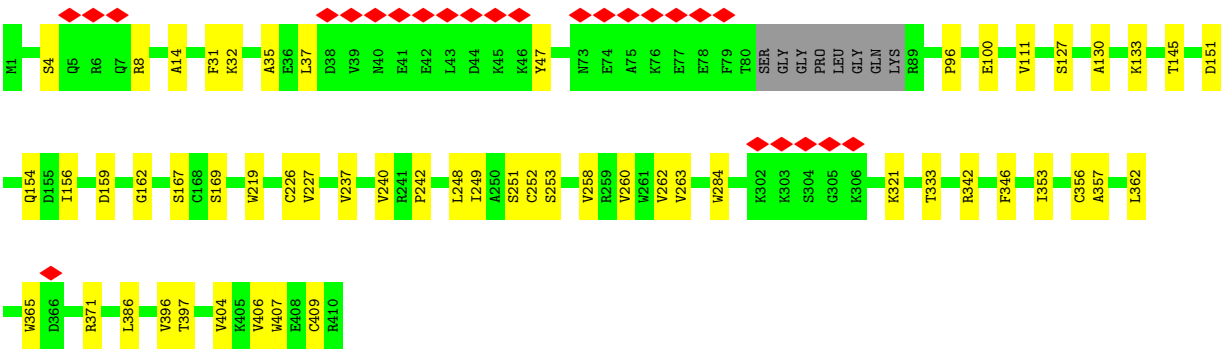
• Molecule 2: Platelet-activating factor acetylhydrolase IB subunit beta

Chain B:



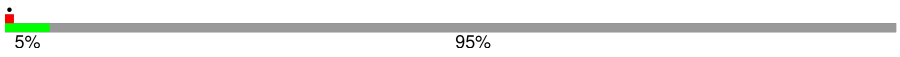
• Molecule 2: Platelet-activating factor acetylhydrolase IB subunit beta

Chain C:



• Molecule 3: Cytoplasmic dynein 1 intermediate chain 2

Chain D:



GLN VAL ASP PHE PRO PRO ARG GLU ILE VAL THR TYR THR LYS GLU THR GLN THR PRO VAL MET ALA GLN PRO LYS GLU GLU GLU GLU ASP ASP ASP VAL VAL ALA PRO LYS PRO PRO ILE GLU PRO GLU GLU GLU LYS THR LEU LYS LYS ASP GLU GLU ASN ASP SER LYS ALA PRO

PRO HIS GLU LEU THR GLU GLU GLU LYS GLN GLN ILE LEU HIS SER GLU GLU GLU PHE LEU SER PHE PHE ASP HIS SER THR ARG ILE VAL GLU ARG ALA LEU SER GLU GLN ILE ASN ILE PHE PHE ASP TYR SER GLY ARG ASP LEU GLU ASP LYS GLU GLY GLU ILE GLN ALA GLY ALA LYS

LEU SER LEU ASN ARG GLN PHE PHE ASP GLU ARG TRP SER LYS HIS ARG VAL VAL SER CYS LEU ASP TRP SER SER GLN TYR PRO GLU LEU VAL ALA SER TYR ASN ASN GLU ASP ALA PRO HIS GLU GLN GLY VAL ALA LEU VAL TRP ASN MET LYS TYR LYS LYS LYS THR THR

PRO GLU TYR VAL PHE HIS CYS GLN SER ALA VAL MET SER ALA THR PHE ALA LYS PHE HIS PRO ASN LEU VAL VAL GLY GLY THR TYR SER GLY GLN ILE VAL LEU TRP ASP ASN ARG SER ASN LYS ARG THR PRO VAL GLN ARG THR PRO LEU SER ALA ALA ALA HIS THR HIS PRO VAL

TYR CYS VAL ASN VAL VAL GLY THR GLN ASN ALA HIS ASN LEU ILE SER ILE SER THR ASP GLY LYS ILE CYS SER TRP SER LEU ASP MET LEU SER HIS PRO GLN ASP SER MET GLU LEU VAL HIS LYS GLN SER LYS ALA VAL ALA PHE SER MET SER PHE PRO VAL GLY ASP VAL

ASN ASN PHE VAL VAL GLY SER GLU GLU GLY SER VAL TYR THR ALA CYS ARG HIS GLY SER LYS ALA GLY ILE SER GLU MET PHE GLU GLY HIS GLN GLY PRO ILE THR GLY ILE HIS CYS HIS ALA ALA VAL GLY ALA VAL ASP PHE SER HIS LEU PHE VAL THR SER SER PHE ASP TRP

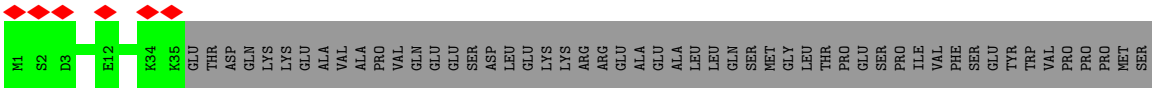
THR VAL LYS LEU TRP THR THR LYS ASN ASN LYS PRO LEU TYR SER PHE GLU GLU ASP ASN ALA ASP TYR VAL TYR ASP VAL MET TRP SER PRO THR HIS PRO ALA GLU LEU PHE ALA CYS VAL ASP GLY MET GLY ARG LEU ASP LEU TRP ALA ARG PHE GLY ARG THR LEU ALA GLU ILE ASN ALA ASN

ILE SER VAL GLU GLY ASN PRO ALA LEU ASN ARG VAL ARG TRP THR HIS SER GLY ARG GLU ILE ALA VAL GLY ASP SER GLU GLY GLN ILE VAL ILE TYR ASP VAL GLY GLU GLN ILE ALA VAL PRO ARG ASN ASP GLU TRP ALA ARG PHE GLY ARG THR LEU ALA GLU ILE ASN ALA ASN

ARG ALA ASP ALA GLU GLU GLU ALA ALA THR ARG ILE PRO ALA

- Molecule 3: Cytoplasmic dynein 1 intermediate chain 2

Chain E: 5% 95%



GLU THR ASP GLN LYS LYS GLU ALA VAL ALA PRO VAL GLN GLU GLU SER ASP LEU GLU LYS LYS ARG GLU ALA GLU ALA LEU LEU GLN SER MET GLY LEU THR PRO GLU SER PRO ILE VAL PHE SER GLU TYR TRP VAL PRO PRO MET SER

PRO SER SER LYS SER VAL SER THR PRO SER GLU ALA GLY SER GLN ASP SER GLY ASP GLY ALA VAL GLY SER ARG THR LEU HIS TRP ASP THR ASP PRO SER VAL LEU GLN LEU HIS SER ASP SER ASP LEU GLY ARG GLY PRO ILE LYS LEU GLY MET ALA LYS ILE THR ARG GLN VAL ASP

PHE PRO PRO ARG GLU ILE VAL THR TYR THR LYS GLU THR GLN THR PRO VAL MET ALA GLN PRO LYS GLU ASP GLU GLU GLU ASP ASP VAL VAL ALA PRO LYS PRO PRO ILE GLU PRO GLU GLU GLU LYS THR LEU LYS LYS ASP GLU GLU GLU ASN ASP SER LYS ALA PRO PRO HIS GLU

LEU THR GLU GLU GLU LYS GLN GLN ILE LEU HIS SER GLU GLU GLN PHE LEU SER SER PHE PHE ASP HIS SER THR ARG ILE VAL GLU ARG ALA LEU SER GLU GLN ILE ASN ILE PHE PHE ASP TYR SER GLY ARG ASP LEU GLU ASP LYS GLU GLY GLU ILE GLN ALA GLY ALA LYS LEU SER LEU

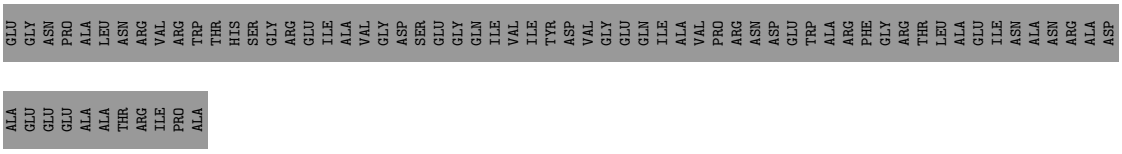
ASN ARG GLN PHE PHE ASP GLU ARG TRP SER LYS HIS ARG VAL VAL SER CYS LEU ASP TRP SER SER GLN TYR PRO GLU LEU LEU VAL ALA SER TYR ASN ASN GLU ASP ALA PRO HIS GLU PRO ASP GLY VAL ALA LEU VAL TRP ASN MET LYS TYR LYS LYS THR THR PRO GLU TYR

VAL PHE HIS CYS GLN SER ALA VAL MET SER ALA THR PHE ALA LYS PHE HIS PRO ASN LEU VAL VAL GLY GLY THR TYR SER GLY GLN ILE VAL LEU TRP ASP ASN ARG SER ASN LYS ARG THR PRO VAL GLN ARG THR PRO LEU SER ALA ALA ALA HIS THR HIS PRO VAL TYR CYS VAL

ASN VAL VAL GLY THR GLN ASN ALA HIS ASN LEU ILE SER ILE SER THR ASP GLY LYS ILE CYS SER TRP SER LEU ASP MET LEU SER HIS PRO GLN ASP SER MET GLU LEU VAL HIS LYS GLN SER LYS ALA VAL ALA VAL THR SER MET SER PHE PRO VAL GLY ASP VAL ASN ASN PHE

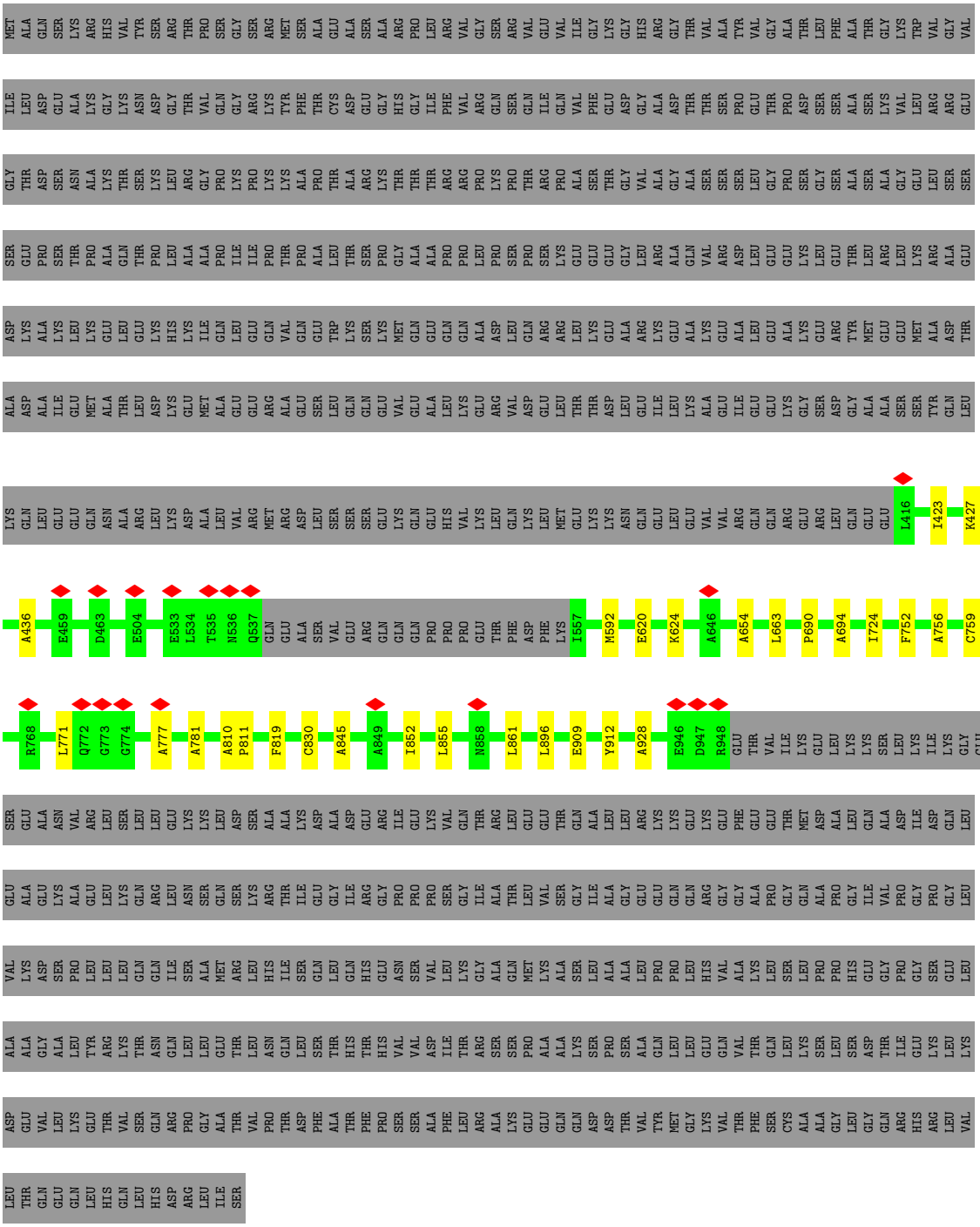
VAL VAL GLY SER GLU GLU GLY SER VAL TYR THR ALA CYS ARG HIS GLY SER LYS ALA GLY ILE SER GLU MET PHE GLU GLY HIS GLN GLY PRO ILE THR GLY ILE HIS CYS HIS ALA ALA VAL GLY ALA VAL ASP PHE SER HIS LEU PHE VAL THR SER SER PHE ASP TRP THR VAL LYS

LEU TRP THR THR LYS ASN ASN LYS PRO LEU TYR SER PHE GLU GLU ASP ASN ALA ASP TYR VAL TYR ASP VAL MET TRP SER PRO THR HIS PRO ALA LEU PHE ALA CYS VAL ASP GLY MET GLY ARG LEU ASP LEU TRP ALA ASN LEU ASN ASN ASP THR GLU VAL PRO THR ALA SER ILE SER VAL



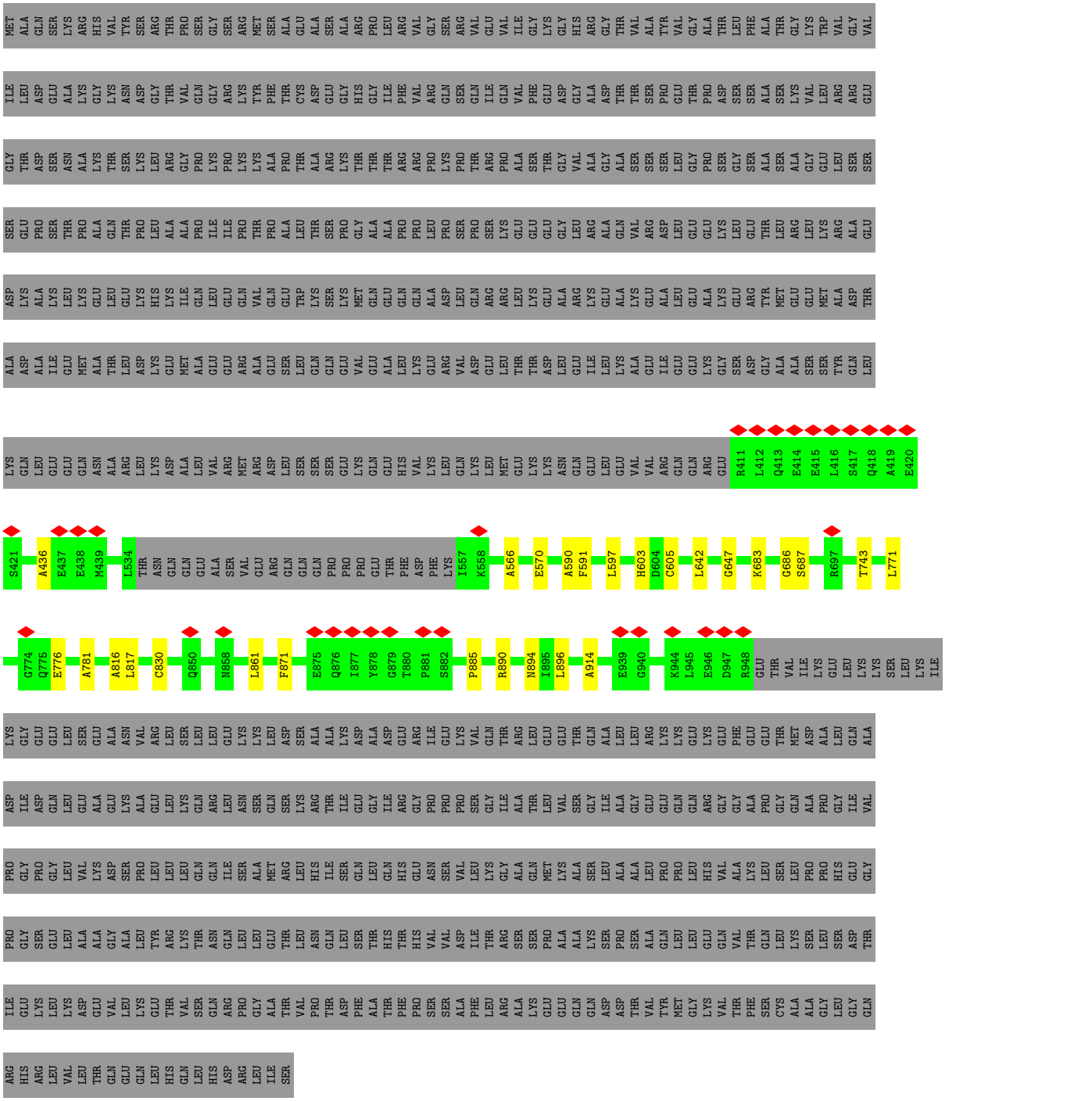
• Molecule 4: Dynactin subunit 1

Chain F:



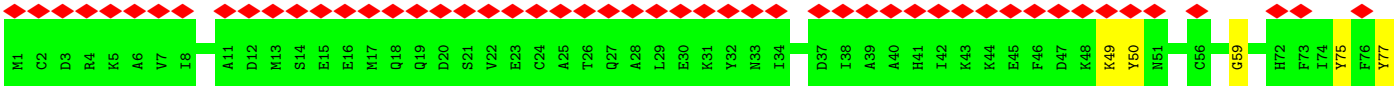
• Molecule 4: Dynactin subunit 1

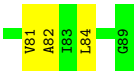
Chain G:



• Molecule 5: Dynein light chain 1, cytoplasmic

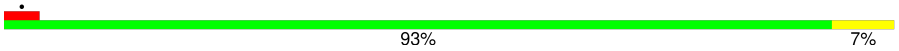
Chain d:

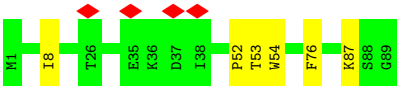




• Molecule 5: Dynein light chain 1, cytoplasmic

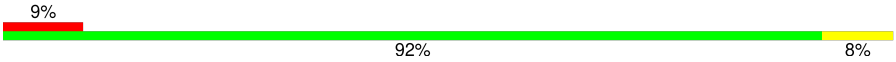
Chain i:

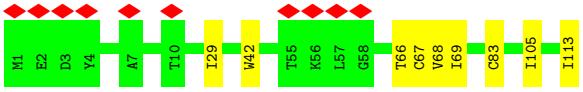




• Molecule 6: Dynein light chain Tctex-type 1

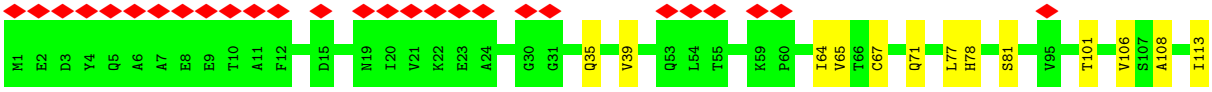
Chain k:





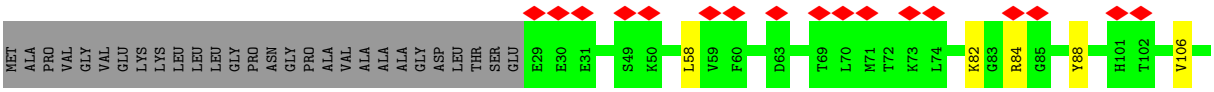
• Molecule 6: Dynein light chain Tctex-type 1

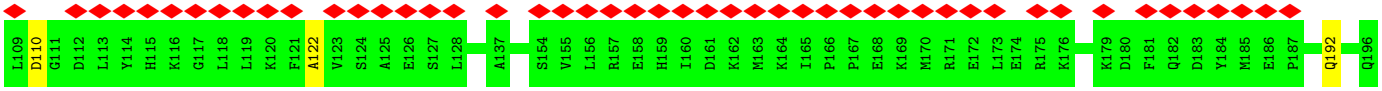
Chain v:

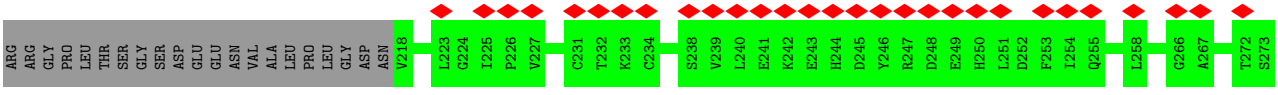


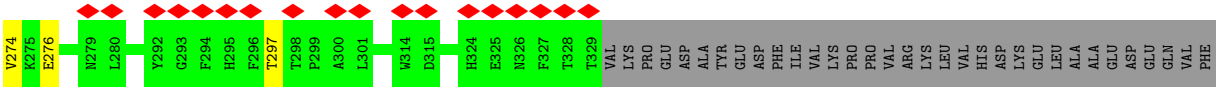
• Molecule 7: Cytoplasmic dynein 1 light intermediate chain 2

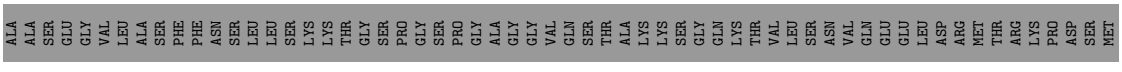
Chain u:












VAL
THR
ASN
SER
SER
THR
GLU
ASN
GLU
ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	52203	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	45000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.101	Depositor
Minimum map value	-0.524	Depositor
Average map value	-0.003	Depositor
Map value standard deviation	0.046	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	520.80005, 520.80005, 520.80005	wwPDB
Map dimensions	200, 200, 200	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.6040003, 2.6040003, 2.6040003	Depositor

5 Model quality

5.1 Standard geometry

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.23	0/16185	0.55	0/22546
2	B	0.25	0/1986	0.61	0/2764
2	C	0.24	0/1986	0.64	2/2764 (0.1%)
3	D	0.21	0/174	0.44	0/242
3	E	0.17	0/174	0.47	0/242
4	F	0.24	0/2547	0.55	0/3550
4	G	0.21	0/2557	0.47	0/3564
5	d	0.24	0/440	0.61	1/612 (0.2%)
5	i	0.24	0/440	0.58	0/612
6	k	0.19	0/557	0.47	0/774
6	v	0.23	0/557	0.53	0/774
7	u	0.25	0/1381	0.66	0/1920
All	All	0.23	0/28984	0.56	3/40364 (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	1
2	C	0	1
4	F	0	1
5	d	0	1
7	u	0	1
All	All	0	5

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	284	TRP	CA-C-N	-9.72	106.66	121.83
2	C	284	TRP	C-N-CA	-9.72	106.66	121.83
5	d	50	TYR	N-CA-C	5.59	117.15	110.44

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1729	LYS	Peptide
2	C	262	VAL	Peptide
4	F	810	ALA	Peptide
5	d	49	LYS	Peptide
7	u	82	LYS	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	16199	0	7147	149	0
2	B	1988	0	878	47	0
2	C	1988	0	878	28	0
3	D	175	0	78	0	0
3	E	175	0	78	0	0
4	F	2549	0	1211	18	0
4	G	2559	0	1215	15	0
5	d	441	0	204	3	0
5	i	441	0	204	3	0
6	k	558	0	261	7	0
6	v	558	0	261	9	0
7	u	1383	0	604	6	0
8	A	81	0	36	6	0
9	A	2	0	0	0	0
10	A	31	0	12	2	0
All	All	29128	0	13067	275	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

The worst 5 of 275 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:3928:THR:O	1:A:3932:ALA:HB2	1.63	0.99
1:A:1840:SER:HA	1:A:1862:ALA:HB2	1.57	0.87
1:A:4610:TYR:HA	1:A:4618:LEU:HA	1.57	0.87
1:A:1549:GLY:HA3	1:A:1642:GLY:HA2	1.55	0.86
1:A:4565:LEU:H	1:A:4583:THR:H	1.22	0.86

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	3242/4646 (70%)	3023 (93%)	218 (7%)	1 (0%)	100	100
2	B	398/410 (97%)	339 (85%)	59 (15%)	0	100	100
2	C	398/410 (97%)	364 (92%)	34 (8%)	0	100	100
3	D	33/638 (5%)	33 (100%)	0	0	100	100
3	E	33/638 (5%)	33 (100%)	0	0	100	100
4	F	510/1281 (40%)	485 (95%)	25 (5%)	0	100	100
4	G	512/1281 (40%)	494 (96%)	18 (4%)	0	100	100
5	d	87/89 (98%)	78 (90%)	9 (10%)	0	100	100
5	i	87/89 (98%)	76 (87%)	11 (13%)	0	100	100
6	k	111/113 (98%)	102 (92%)	9 (8%)	0	100	100
6	v	111/113 (98%)	103 (93%)	8 (7%)	0	100	100
7	u	276/492 (56%)	249 (90%)	27 (10%)	0	100	100
All	All	5798/10200 (57%)	5379 (93%)	418 (7%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1647	VAL

5.3.2 Protein sidechains (i)

There are no protein residues with a non-rotameric sidechain to report in this entry.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	$\#\|Z\| > 2$
8	ADP	A	4801	9	24,29,29	0.91	1 (4%)	29,45,45	1.29	2 (6%)
10	ATP	A	4803	9	28,33,33	0.67	0	34,52,52	1.16	2 (5%)
8	ADP	A	4806	-	24,29,29	0.93	1 (4%)	29,45,45	1.30	3 (10%)
8	ADP	A	4805	-	24,29,29	0.91	0	29,45,45	1.20	2 (6%)

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
8	ADP	A	4801	9	-	4/12/32/32	0/3/3/3
10	ATP	A	4803	9	-	6/18/38/38	0/3/3/3
8	ADP	A	4806	-	-	5/12/32/32	0/3/3/3
8	ADP	A	4805	-	-	4/12/32/32	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	4801	ADP	O4'-C1'	2.24	1.43	1.40
8	A	4806	ADP	PA-O3A	2.01	1.61	1.59

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	A	4803	ATP	C4'-O4'-C1'	-5.53	104.86	109.92
8	A	4801	ADP	N3-C2-N1	-3.94	123.33	128.67
8	A	4805	ADP	N3-C2-N1	-3.60	123.78	128.67
8	A	4806	ADP	N3-C2-N1	-3.47	123.96	128.67
8	A	4806	ADP	C4'-O4'-C1'	2.59	112.30	109.92

There are no chirality outliers.

5 of 19 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	4801	ADP	PA-O3A-PB-O3B
8	A	4805	ADP	C5'-O5'-PA-O3A
8	A	4806	ADP	C5'-O5'-PA-O2A
10	A	4803	ATP	C5'-O5'-PA-O2A
8	A	4806	ADP	C3'-C4'-C5'-O5'

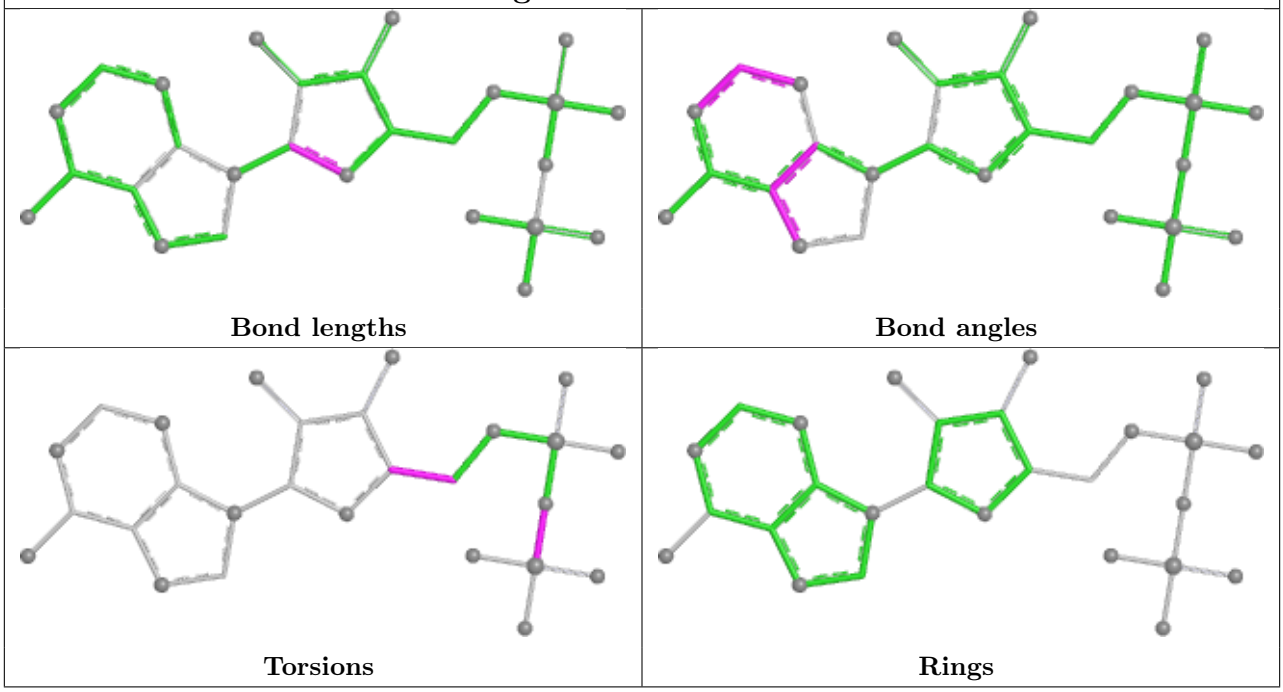
There are no ring outliers.

4 monomers are involved in 8 short contacts:

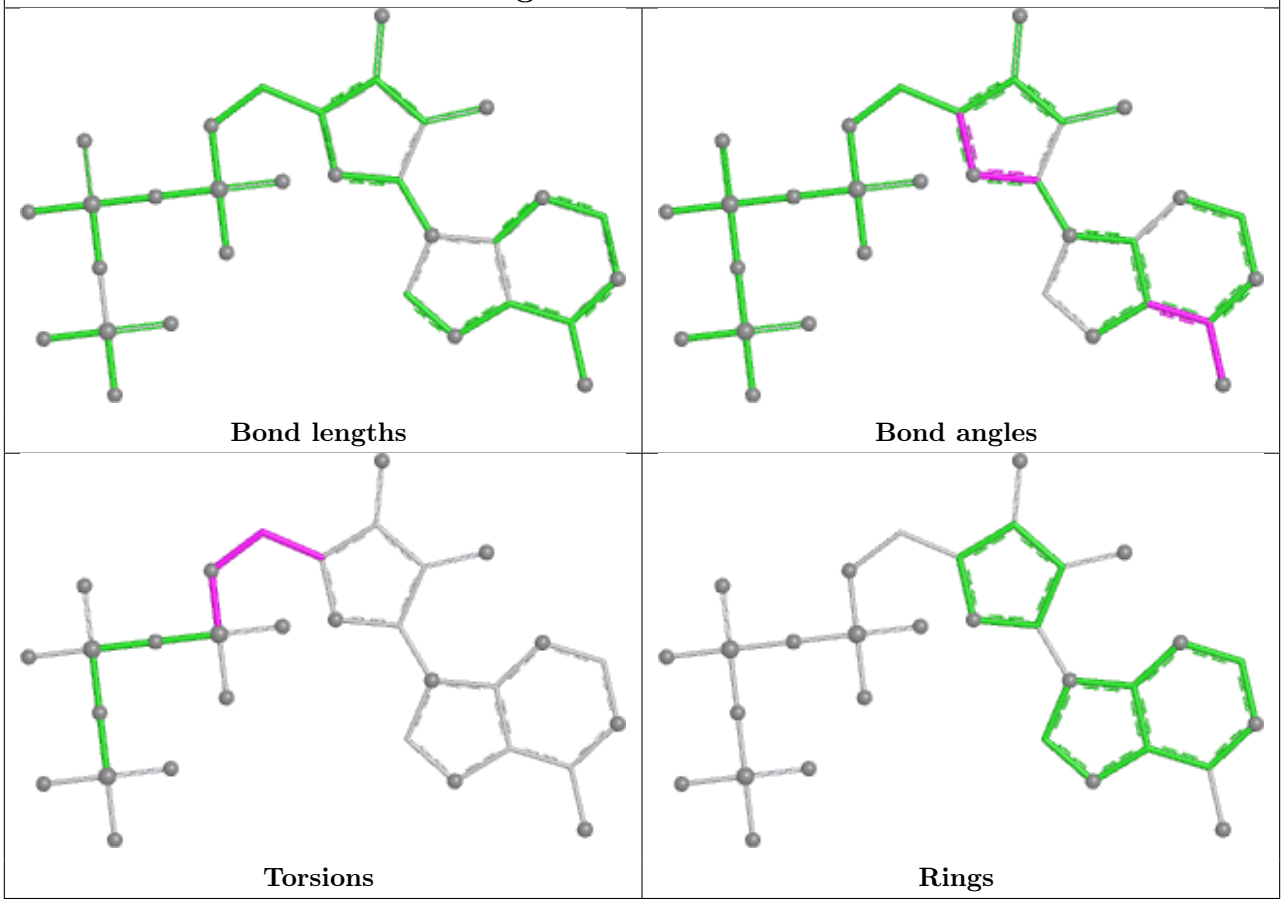
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	4801	ADP	2	0
10	A	4803	ATP	2	0
8	A	4806	ADP	1	0
8	A	4805	ADP	3	0

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.

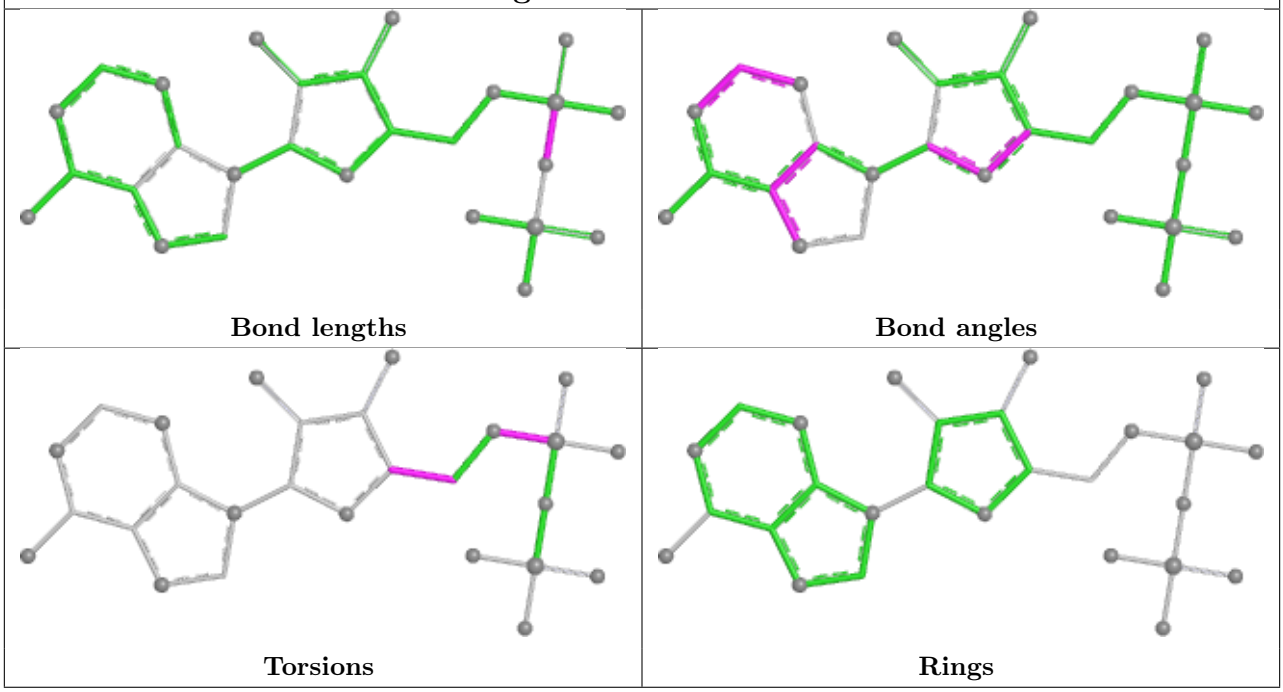
Ligand ADP A 4801



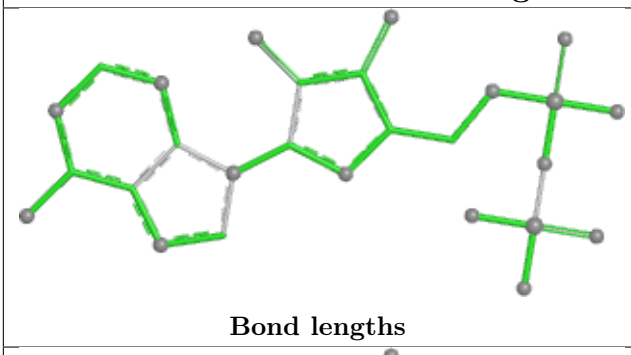
Ligand ATP A 4803



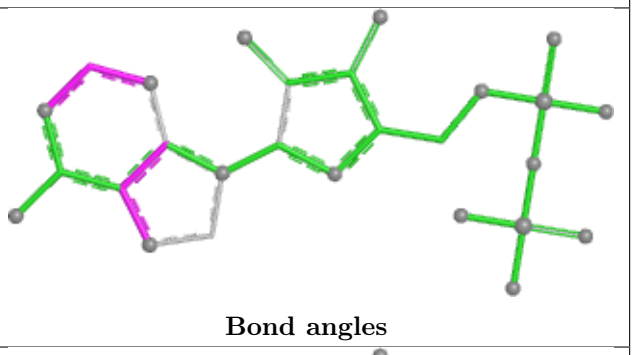
Ligand ADP A 4806



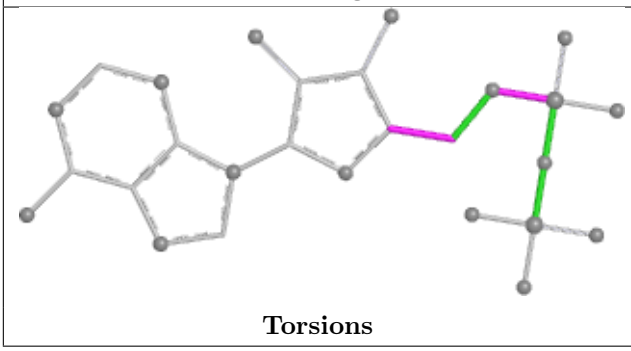
Ligand ADP A 4805



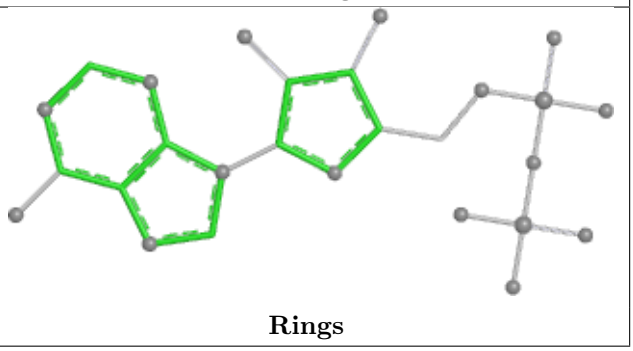
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

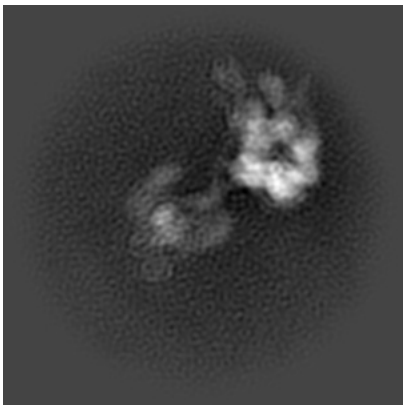
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-73175. These allow visual inspection of the internal detail of the map and identification of artifacts.

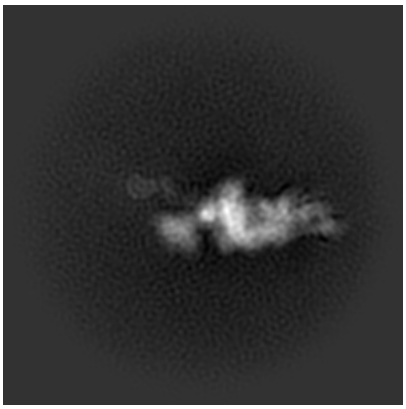
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

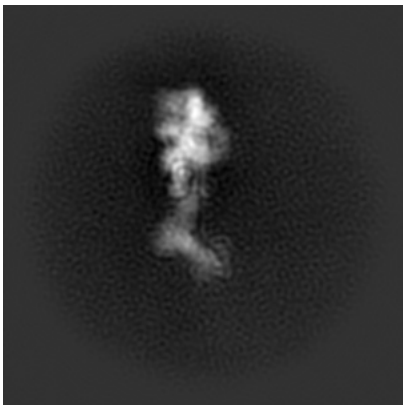
6.1.1 Primary map



X

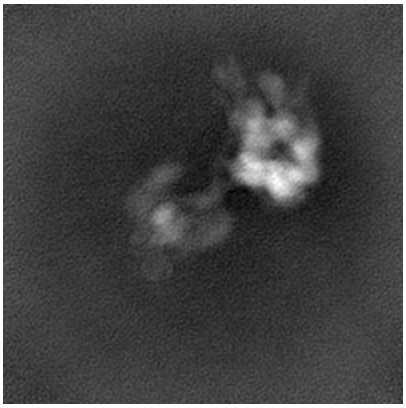


Y

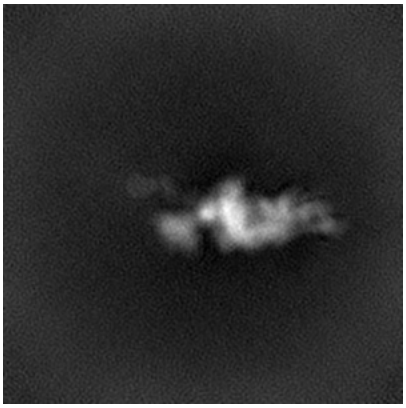


Z

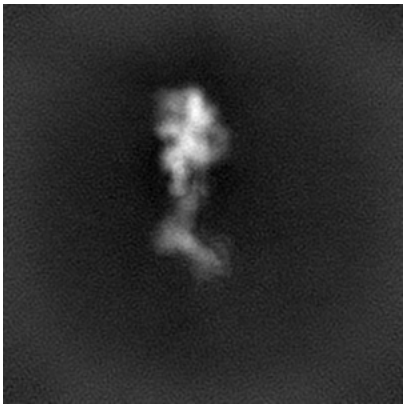
6.1.2 Raw map



X



Y

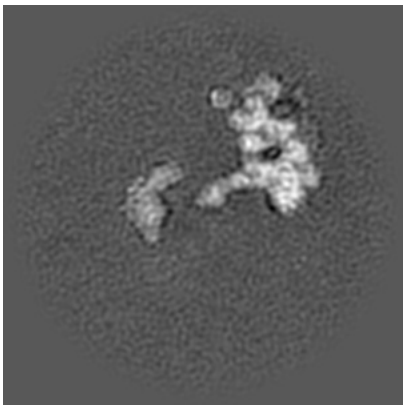


Z

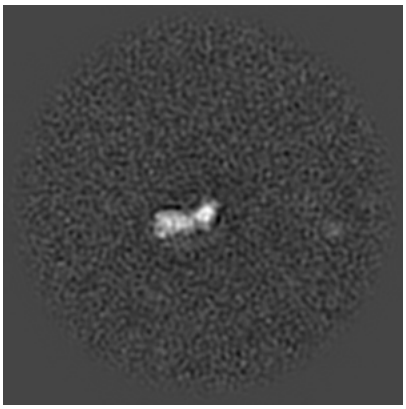
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

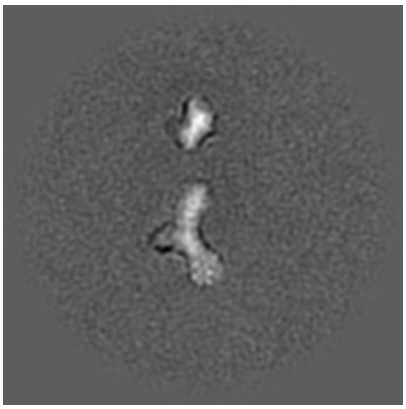
6.2.1 Primary map



X Index: 100

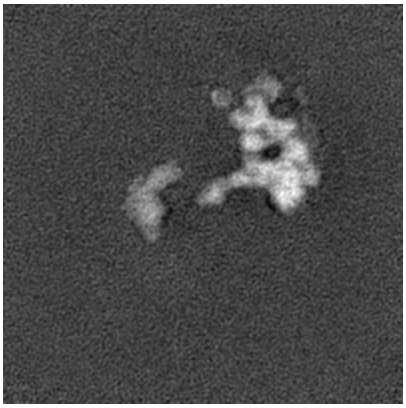


Y Index: 100



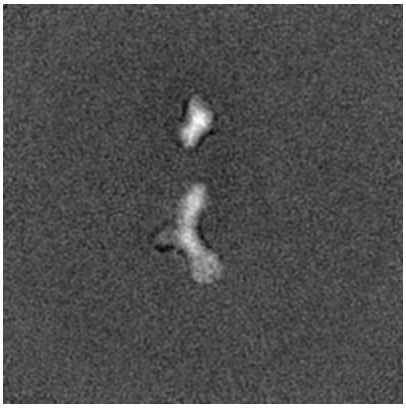
Z Index: 100

6.2.2 Raw map



X Index: 100

Y Index: 100

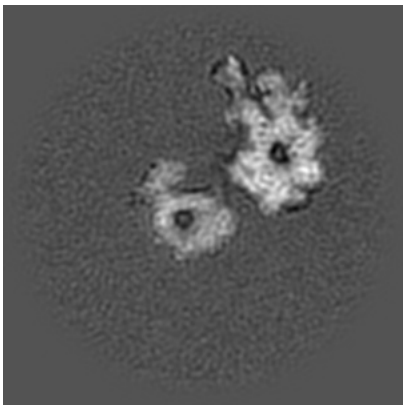


Z Index: 100

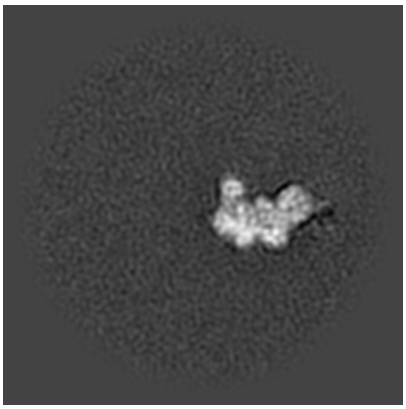
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

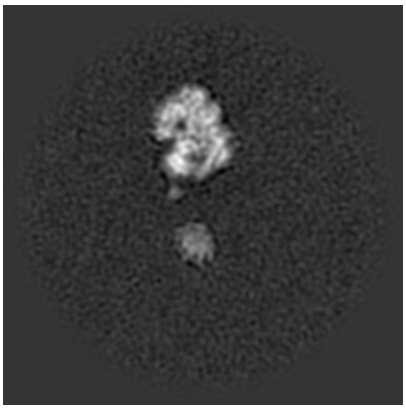
6.3.1 Primary map



X Index: 92

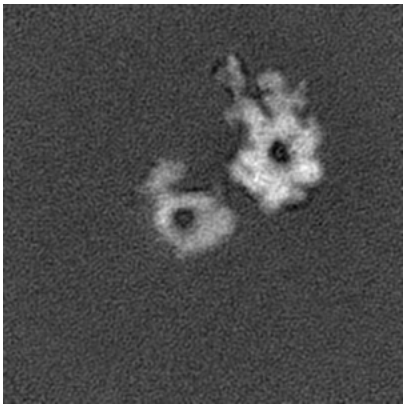


Y Index: 126

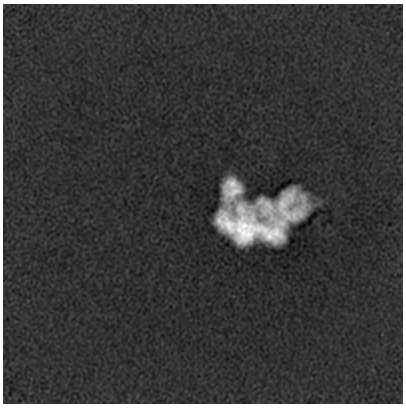


Z Index: 114

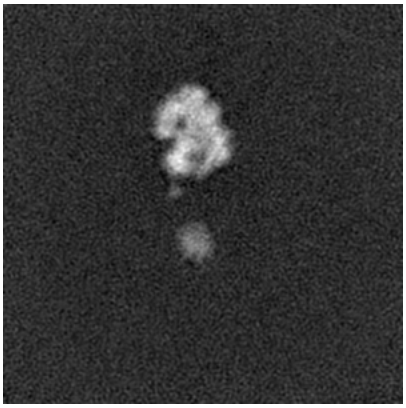
6.3.2 Raw map



X Index: 92



Y Index: 125

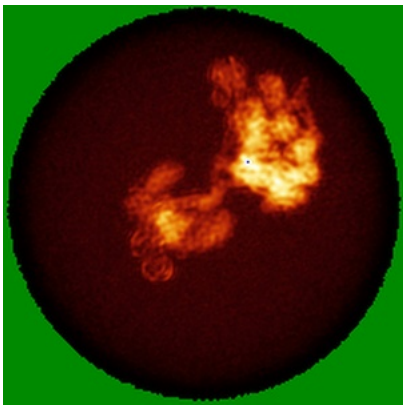


Z Index: 114

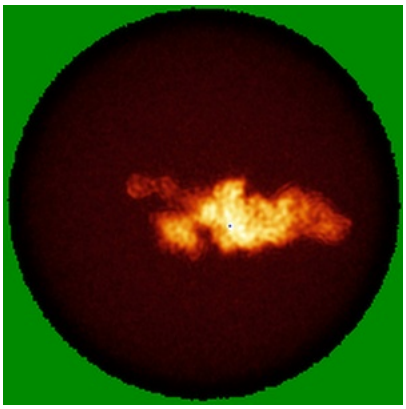
The images above show the largest variance slices of the map in three orthogonal directions.

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

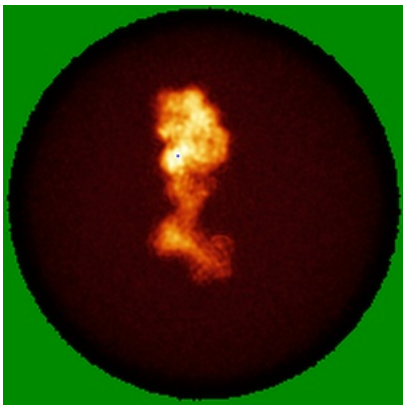
6.4.1 Primary map



X

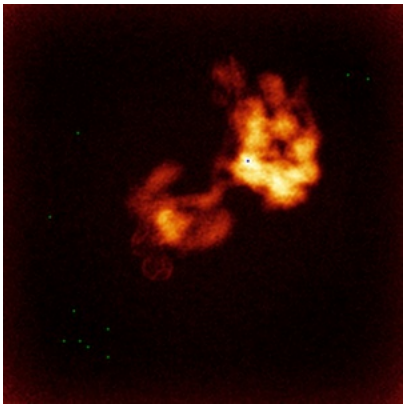


Y

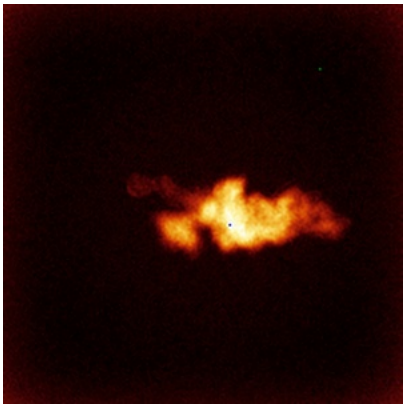


Z

6.4.2 Raw map



X



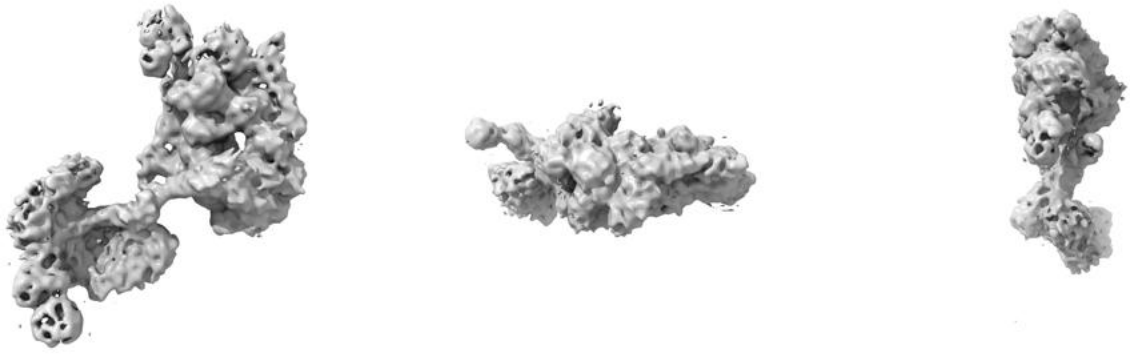
Y

Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

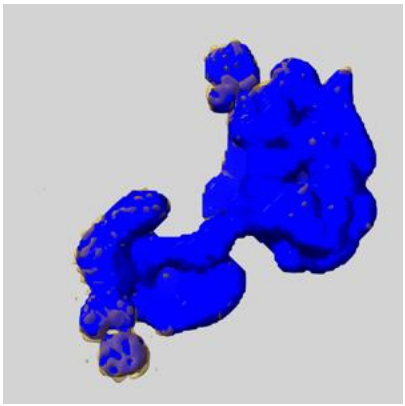
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

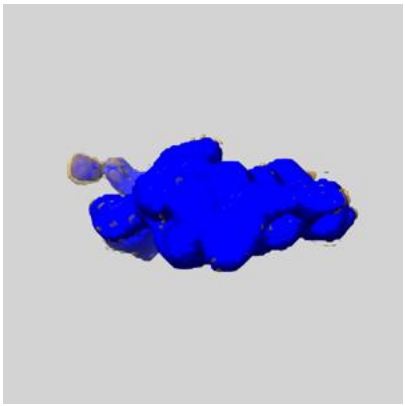
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

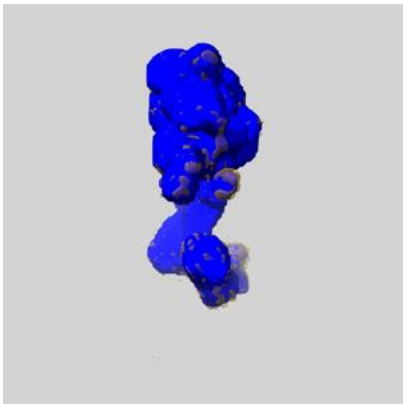
6.6.1 emd_73175_msk_1.map (i)



X



Y

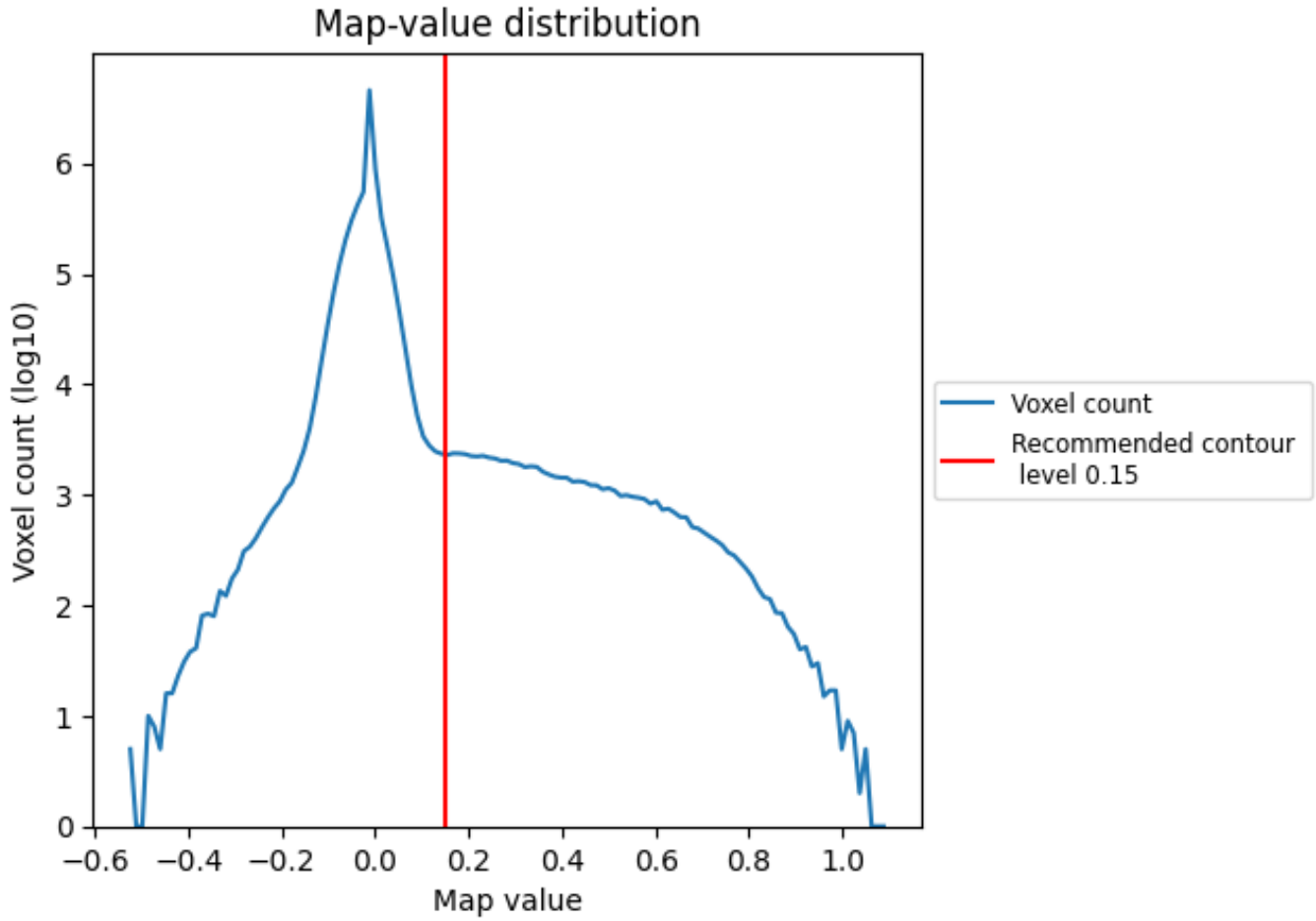


Z

7 Map analysis

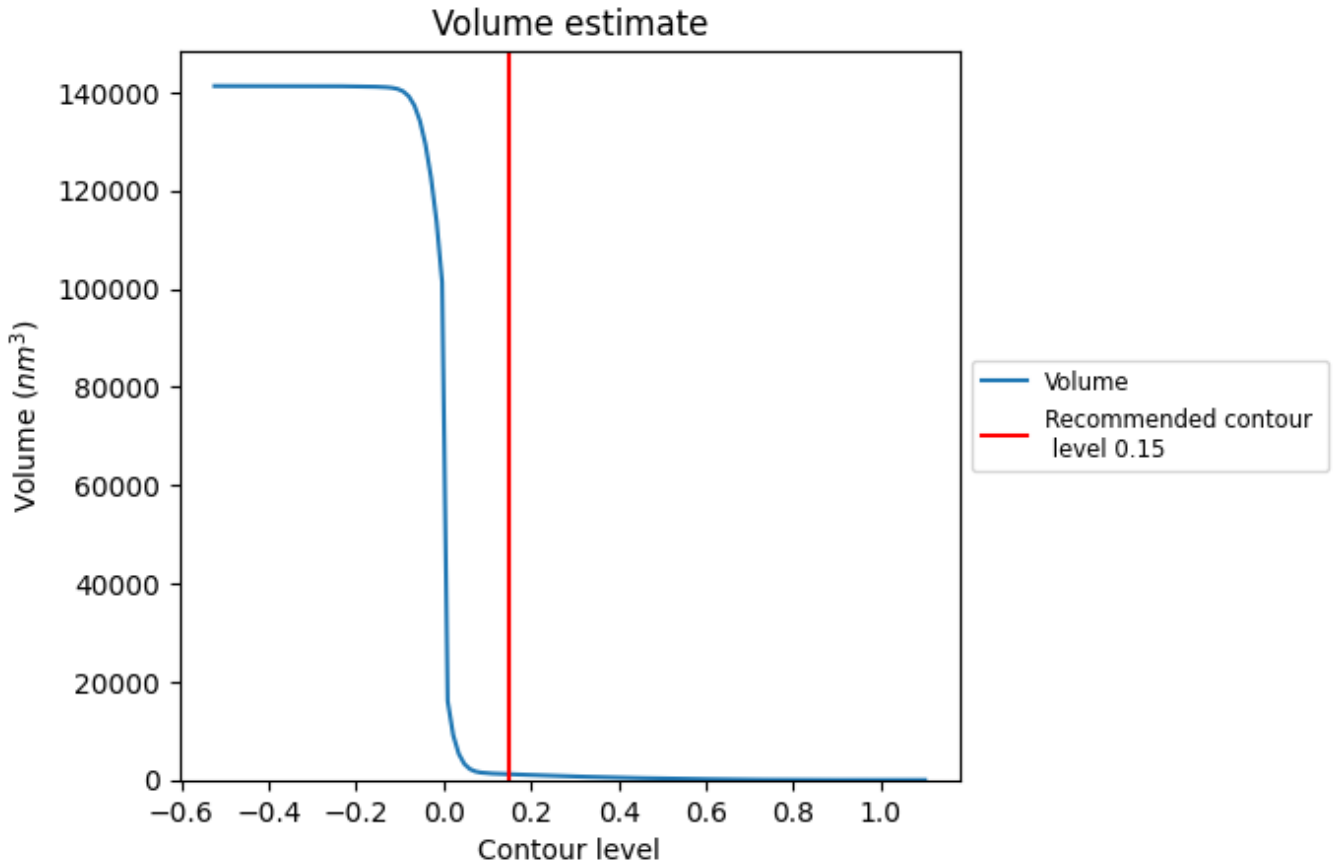
This section contains the results of statistical analysis of the map.

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.

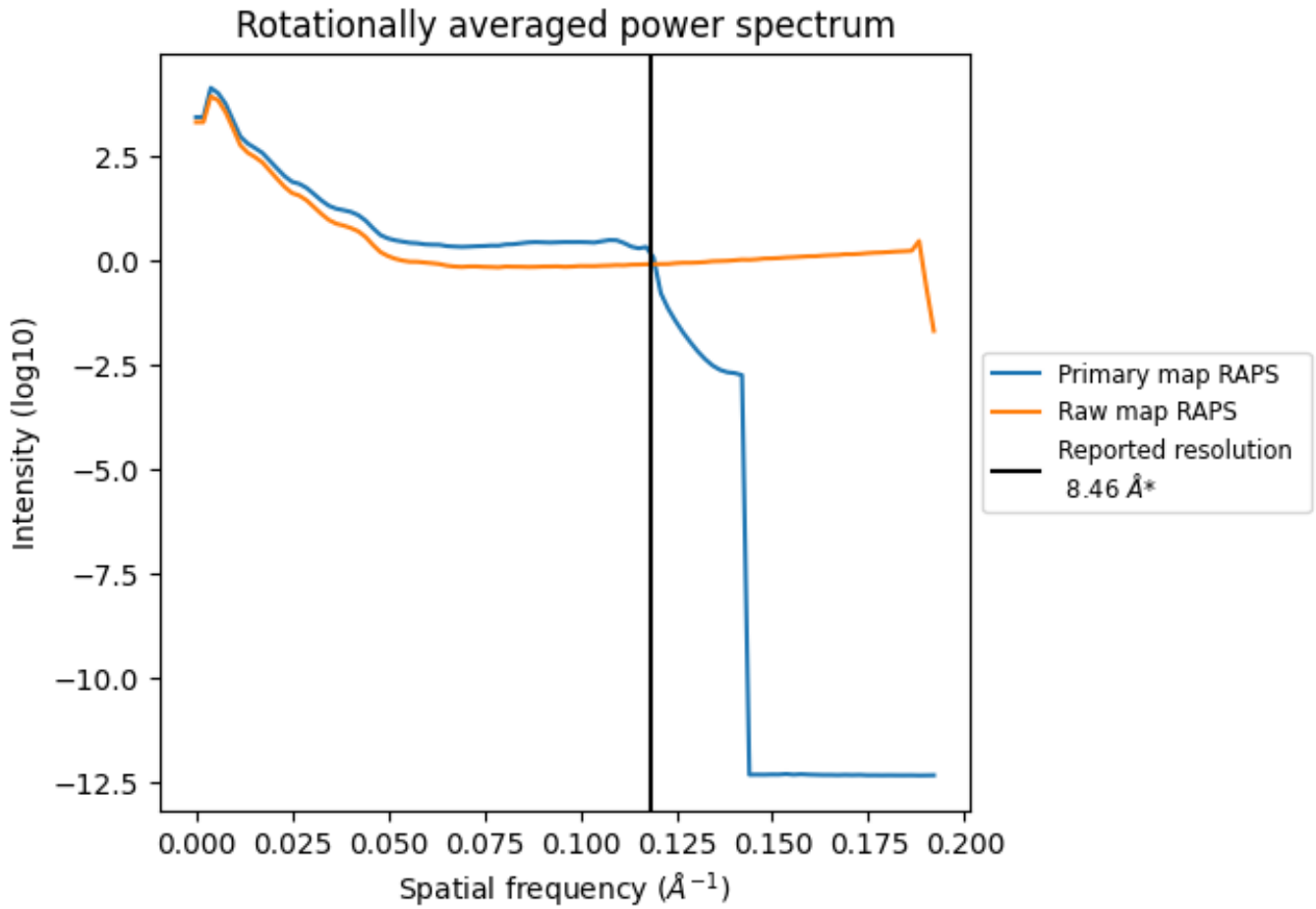
7.2 Volume estimate (i)



The volume at the recommended contour level is 1173 nm^3; this corresponds to an approximate mass of 1059 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)

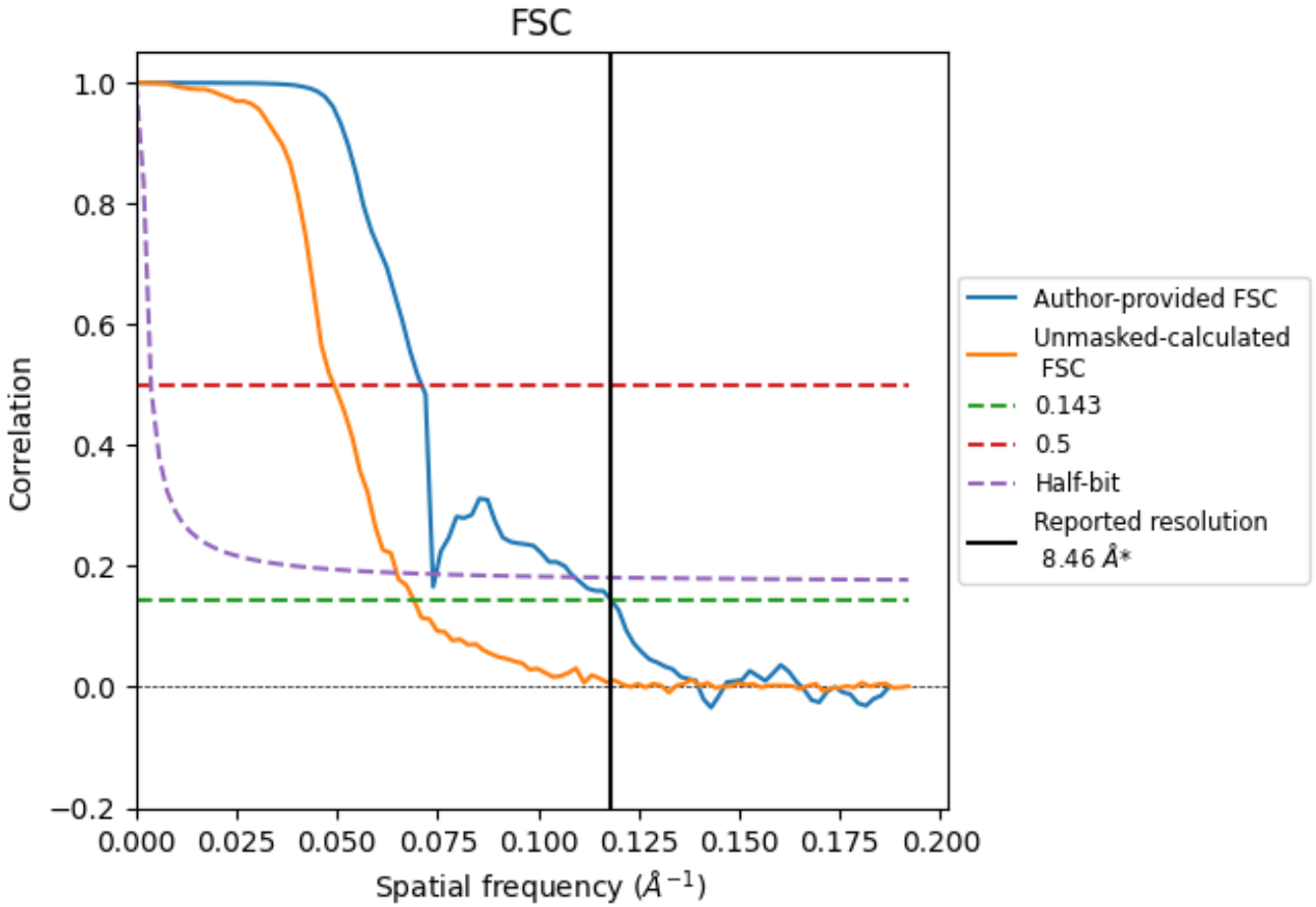


*Reported resolution corresponds to spatial frequency of 0.118 $Å^{-1}$

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 0.118 Å^{-1}

8.2 Resolution estimates (i)

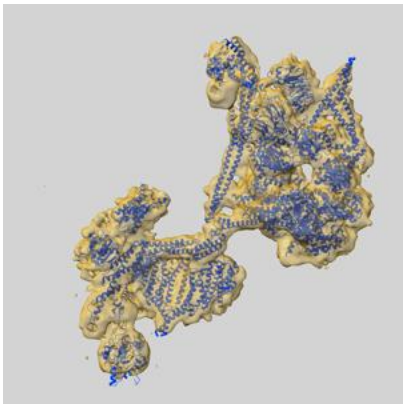
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	8.46	-	-
Author-provided FSC curve	8.46	14.08	13.55
Unmasked-calculated*	14.45	20.33	15.43

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 14.45 differs from the reported value 8.46 by more than 10 %

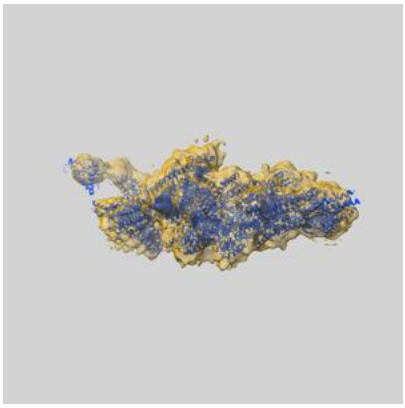
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-73175 and PDB model 9YNE. Per-residue inclusion information can be found in section 3 on page 9.

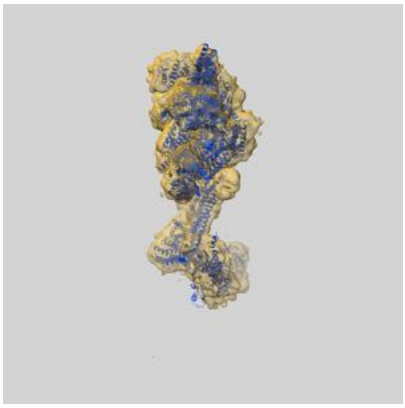
9.1 Map-model overlay



X



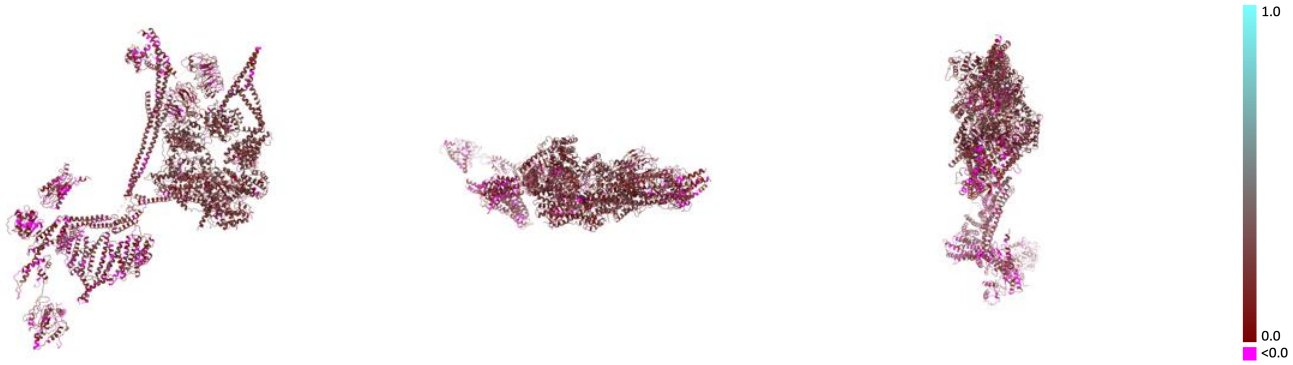
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.15 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.

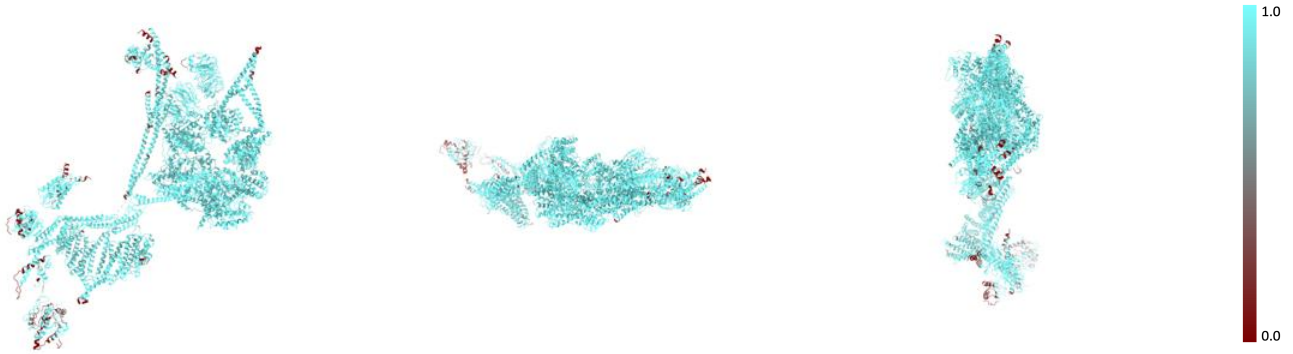
9.2 Q-score mapped to coordinate model (i)



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.

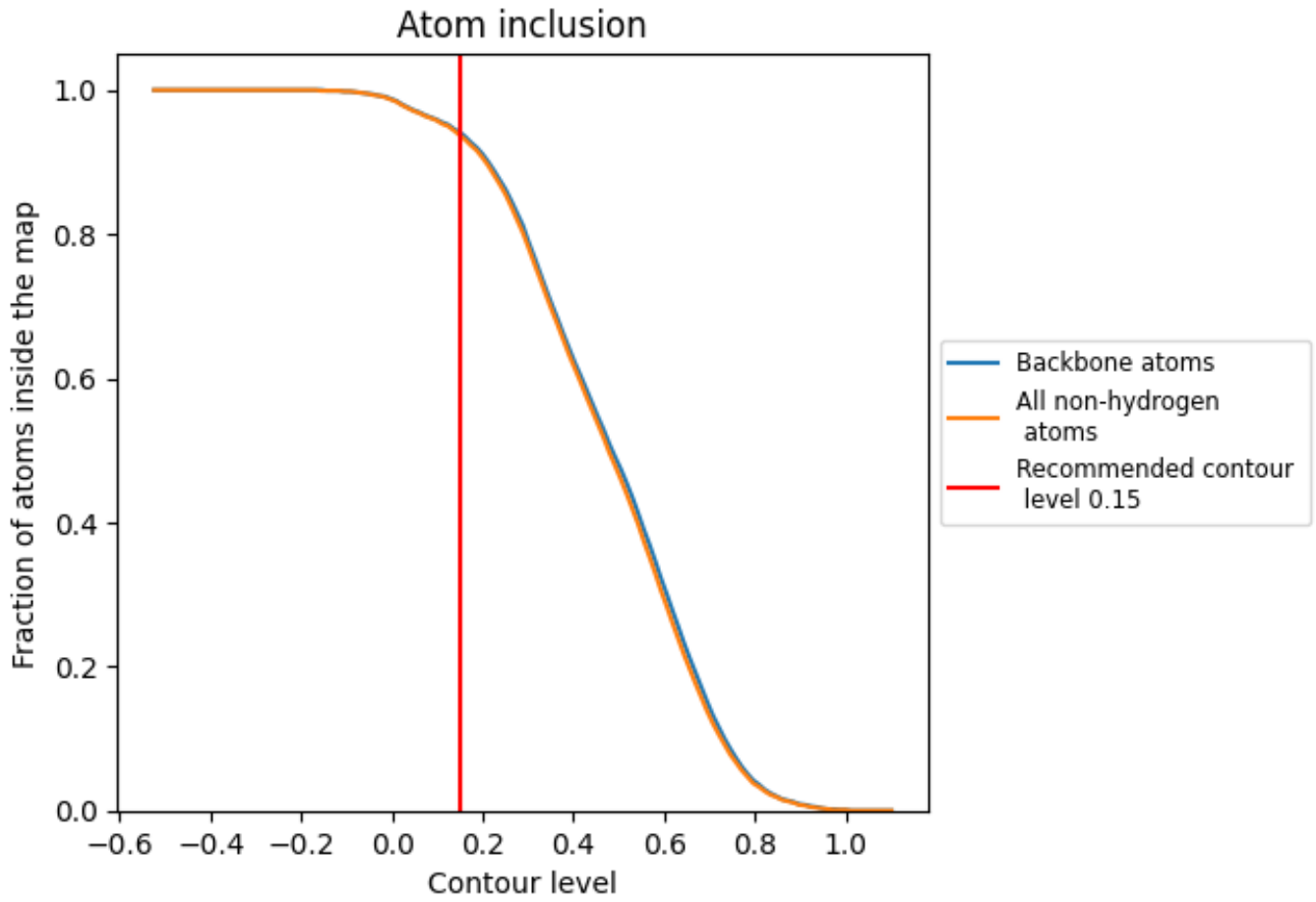
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.15).

9.4 Atom inclusion (i)



At the recommended contour level, 94% of all backbone atoms, 94% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9370	0.1740
A	0.9860	0.2050
B	0.9660	0.1600
C	0.9240	0.1600
D	0.7260	0.2290
E	0.8460	0.1840
F	0.9610	0.1200
G	0.9310	0.1180
d	0.4170	0.1100
i	0.9320	0.0530
k	0.9160	0.1060
u	0.5990	0.1350
v	0.7560	0.1340