



wwPDB EM Validation Summary Report ⓘ

Mar 8, 2026 – 12:01 PM UTC

PDB ID : 7VNR / pdb_00007vnr
EMDB ID : EMD-32046
Title : Structure of human KCNQ4-ML213 complex in digitonin
Authors : Xu, F.; Zheng, Y.
Deposited on : 2021-10-11
Resolution : 2.80 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:

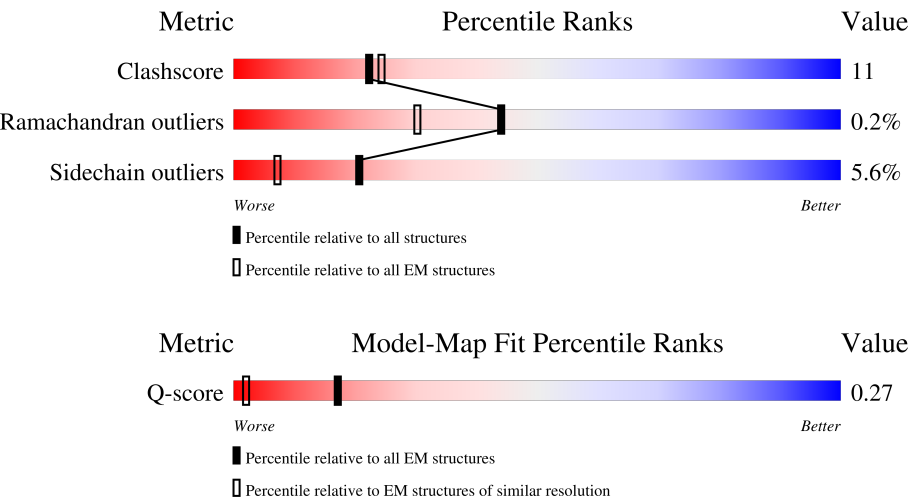
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data 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) : 2.49

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 2.80 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	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	11806 (2.30 - 3.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1049	
1	C	1049	
1	E	1049	
1	G	1049	

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Mol	Chain	Length	Quality of chain
2	B	149	46% 85% 9% 5%
2	D	149	48% 84% 11% 5%
2	F	149	49% 85% 9% 5%
2	H	149	48% 84% 11% 5%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 15435 atoms, of which 92 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 Potassium voltage-gated channel subfamily KQT member 4, Maltodextrin-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	333	Total	C	N	O	S	0	0
			2706	1775	475	444	12		
1	C	333	Total	C	N	O	S	0	0
			2706	1775	475	444	12		
1	E	333	Total	C	N	O	S	0	0
			2706	1775	475	444	12		
1	G	333	Total	C	N	O	S	0	0
			2706	1775	475	444	12		

There are 132 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	MET	-	initiating methionine	UNP P56696
A	-6	ASP	-	expression tag	UNP P56696
A	-5	TYR	-	expression tag	UNP P56696
A	-4	LYS	-	expression tag	UNP P56696
A	-3	ASP	-	expression tag	UNP P56696
A	-2	ASP	-	expression tag	UNP P56696
A	-1	ASP	-	expression tag	UNP P56696
A	0	ASP	-	expression tag	UNP P56696
A	1	LYS	-	expression tag	UNP P56696
A	651	LEU	-	linker	UNP P56696
A	652	GLU	-	linker	UNP P56696
A	653	VAL	-	linker	UNP P56696
A	654	LEU	-	linker	UNP P56696
A	655	PHE	-	linker	UNP P56696
A	656	GLN	-	linker	UNP P56696
A	657	GLY	-	linker	UNP P56696
A	658	PRO	-	linker	UNP P56696
A	659	MET	-	linker	UNP P56696
A	1027	ASN	-	expression tag	UNP A0A140NCD0
A	1028	ALA	-	expression tag	UNP A0A140NCD0
A	1029	ALA	-	expression tag	UNP A0A140NCD0

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1030	ALA	-	expression tag	UNP A0A140NCD0
A	1031	GLU	-	expression tag	UNP A0A140NCD0
A	1032	HIS	-	expression tag	UNP A0A140NCD0
A	1033	HIS	-	expression tag	UNP A0A140NCD0
A	1034	HIS	-	expression tag	UNP A0A140NCD0
A	1035	HIS	-	expression tag	UNP A0A140NCD0
A	1036	HIS	-	expression tag	UNP A0A140NCD0
A	1037	HIS	-	expression tag	UNP A0A140NCD0
A	1038	HIS	-	expression tag	UNP A0A140NCD0
A	1039	HIS	-	expression tag	UNP A0A140NCD0
A	1040	HIS	-	expression tag	UNP A0A140NCD0
A	1041	HIS	-	expression tag	UNP A0A140NCD0
C	-7	MET	-	initiating methionine	UNP P56696
C	-6	ASP	-	expression tag	UNP P56696
C	-5	TYR	-	expression tag	UNP P56696
C	-4	LYS	-	expression tag	UNP P56696
C	-3	ASP	-	expression tag	UNP P56696
C	-2	ASP	-	expression tag	UNP P56696
C	-1	ASP	-	expression tag	UNP P56696
C	0	ASP	-	expression tag	UNP P56696
C	1	LYS	-	expression tag	UNP P56696
C	651	LEU	-	linker	UNP P56696
C	652	GLU	-	linker	UNP P56696
C	653	VAL	-	linker	UNP P56696
C	654	LEU	-	linker	UNP P56696
C	655	PHE	-	linker	UNP P56696
C	656	GLN	-	linker	UNP P56696
C	657	GLY	-	linker	UNP P56696
C	658	PRO	-	linker	UNP P56696
C	659	MET	-	linker	UNP P56696
C	1027	ASN	-	expression tag	UNP A0A140NCD0
C	1028	ALA	-	expression tag	UNP A0A140NCD0
C	1029	ALA	-	expression tag	UNP A0A140NCD0
C	1030	ALA	-	expression tag	UNP A0A140NCD0
C	1031	GLU	-	expression tag	UNP A0A140NCD0
C	1032	HIS	-	expression tag	UNP A0A140NCD0
C	1033	HIS	-	expression tag	UNP A0A140NCD0
C	1034	HIS	-	expression tag	UNP A0A140NCD0
C	1035	HIS	-	expression tag	UNP A0A140NCD0
C	1036	HIS	-	expression tag	UNP A0A140NCD0
C	1037	HIS	-	expression tag	UNP A0A140NCD0
C	1038	HIS	-	expression tag	UNP A0A140NCD0

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1039	HIS	-	expression tag	UNP A0A140NCD0
C	1040	HIS	-	expression tag	UNP A0A140NCD0
C	1041	HIS	-	expression tag	UNP A0A140NCD0
E	-7	MET	-	initiating methionine	UNP P56696
E	-6	ASP	-	expression tag	UNP P56696
E	-5	TYR	-	expression tag	UNP P56696
E	-4	LYS	-	expression tag	UNP P56696
E	-3	ASP	-	expression tag	UNP P56696
E	-2	ASP	-	expression tag	UNP P56696
E	-1	ASP	-	expression tag	UNP P56696
E	0	ASP	-	expression tag	UNP P56696
E	1	LYS	-	expression tag	UNP P56696
E	651	LEU	-	linker	UNP P56696
E	652	GLU	-	linker	UNP P56696
E	653	VAL	-	linker	UNP P56696
E	654	LEU	-	linker	UNP P56696
E	655	PHE	-	linker	UNP P56696
E	656	GLN	-	linker	UNP P56696
E	657	GLY	-	linker	UNP P56696
E	658	PRO	-	linker	UNP P56696
E	659	MET	-	linker	UNP P56696
E	1027	ASN	-	expression tag	UNP A0A140NCD0
E	1028	ALA	-	expression tag	UNP A0A140NCD0
E	1029	ALA	-	expression tag	UNP A0A140NCD0
E	1030	ALA	-	expression tag	UNP A0A140NCD0
E	1031	GLU	-	expression tag	UNP A0A140NCD0
E	1032	HIS	-	expression tag	UNP A0A140NCD0
E	1033	HIS	-	expression tag	UNP A0A140NCD0
E	1034	HIS	-	expression tag	UNP A0A140NCD0
E	1035	HIS	-	expression tag	UNP A0A140NCD0
E	1036	HIS	-	expression tag	UNP A0A140NCD0
E	1037	HIS	-	expression tag	UNP A0A140NCD0
E	1038	HIS	-	expression tag	UNP A0A140NCD0
E	1039	HIS	-	expression tag	UNP A0A140NCD0
E	1040	HIS	-	expression tag	UNP A0A140NCD0
E	1041	HIS	-	expression tag	UNP A0A140NCD0
G	-7	MET	-	initiating methionine	UNP P56696
G	-6	ASP	-	expression tag	UNP P56696
G	-5	TYR	-	expression tag	UNP P56696
G	-4	LYS	-	expression tag	UNP P56696
G	-3	ASP	-	expression tag	UNP P56696
G	-2	ASP	-	expression tag	UNP P56696

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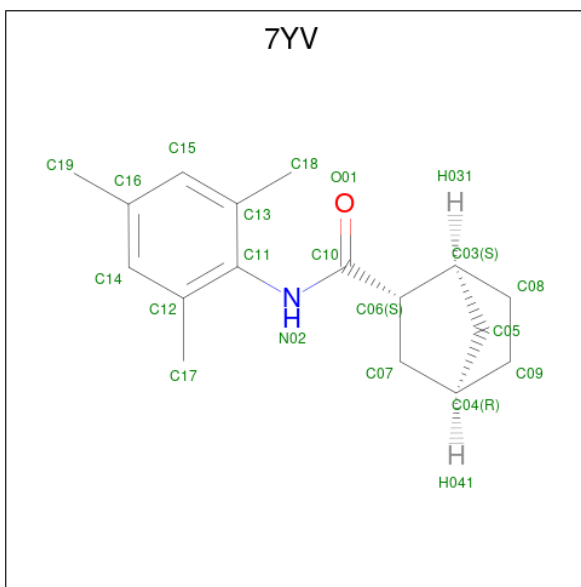
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Chain	Residue	Modelled	Actual	Comment	Reference
G	-1	ASP	-	expression tag	UNP P56696
G	0	ASP	-	expression tag	UNP P56696
G	1	LYS	-	expression tag	UNP P56696
G	651	LEU	-	linker	UNP P56696
G	652	GLU	-	linker	UNP P56696
G	653	VAL	-	linker	UNP P56696
G	654	LEU	-	linker	UNP P56696
G	655	PHE	-	linker	UNP P56696
G	656	GLN	-	linker	UNP P56696
G	657	GLY	-	linker	UNP P56696
G	658	PRO	-	linker	UNP P56696
G	659	MET	-	linker	UNP P56696
G	1027	ASN	-	expression tag	UNP A0A140NCD0
G	1028	ALA	-	expression tag	UNP A0A140NCD0
G	1029	ALA	-	expression tag	UNP A0A140NCD0
G	1030	ALA	-	expression tag	UNP A0A140NCD0
G	1031	GLU	-	expression tag	UNP A0A140NCD0
G	1032	HIS	-	expression tag	UNP A0A140NCD0
G	1033	HIS	-	expression tag	UNP A0A140NCD0
G	1034	HIS	-	expression tag	UNP A0A140NCD0
G	1035	HIS	-	expression tag	UNP A0A140NCD0
G	1036	HIS	-	expression tag	UNP A0A140NCD0
G	1037	HIS	-	expression tag	UNP A0A140NCD0
G	1038	HIS	-	expression tag	UNP A0A140NCD0
G	1039	HIS	-	expression tag	UNP A0A140NCD0
G	1040	HIS	-	expression tag	UNP A0A140NCD0
G	1041	HIS	-	expression tag	UNP A0A140NCD0

- Molecule 2 is a protein called Calmodulin-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	141	Total	C	N	O	S	0	0
			1110	681	179	241	9		
2	D	141	Total	C	N	O	S	0	0
			1110	681	179	241	9		
2	F	141	Total	C	N	O	S	0	0
			1110	681	179	241	9		
2	H	141	Total	C	N	O	S	0	0
			1110	681	179	241	9		

- Molecule 3 is (1S,2S,4R)-N-(2,4,6-trimethylphenyl)bicyclo[2.2.1]heptane-2-carboxamid (CCD ID: 7YV) (formula: C₁₇H₂₃NO).



Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	H	N	O	0
			42	17	23	1	1	
3	C	1	Total	C	H	N	O	0
			42	17	23	1	1	
3	E	1	Total	C	H	N	O	0
			42	17	23	1	1	
3	G	1	Total	C	H	N	O	0
			42	17	23	1	1	

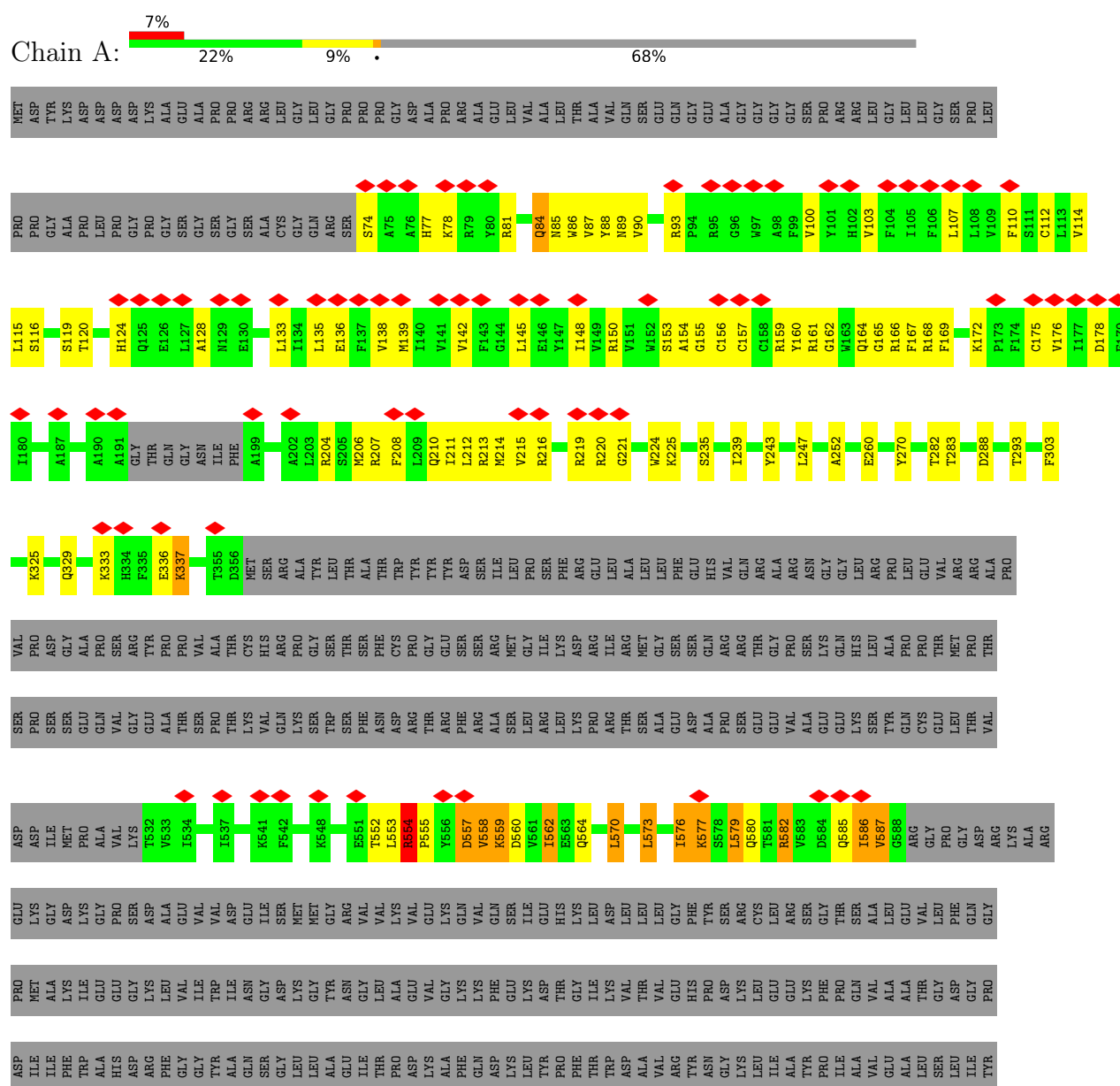
- Molecule 4 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
4	A	3	Total	K	0
			3	3	

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Potassium voltage-gated channel subfamily KQT member 4, Maltodextrin-binding protein

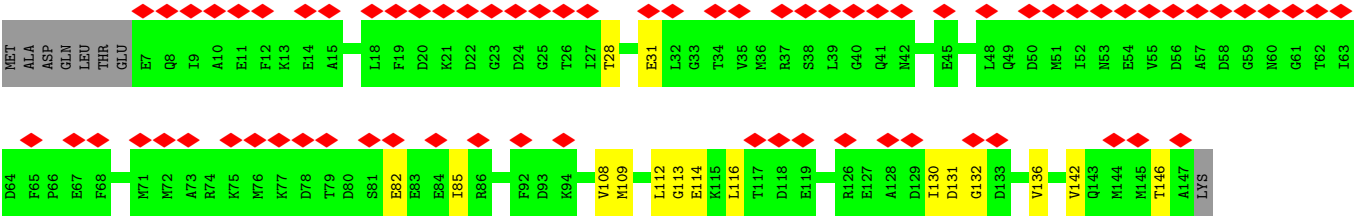


GLY	ASP	GLY	GLY	PRO	ASP	ILE	PHE	TRP	ALA	HIS	ARG	PHE	GLY	TYR	GLY	LEU	ALA	GLU	ILE	THR	PRO	ASP	LYS	ALA	PHE	GLN	ASP	LVS	LEU	TYR	PRO	PHE	THR	THR	ASP	ASN	GLY	LYS	LEU	VAL	ARG	TYR	ASN	ALA	THR	VAL	GLU	ALA	FEU
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ALA	LEU	TRP	LYS	VAL
ALA	GLU	ALA	TYR	GLY
SER	ALA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

- Molecule 1: Potassium voltage-gated channel subfamily KQT member 4, Maltodextrin-binding protein

[illegible]



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	126225	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	16.8	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.507	Depositor
Minimum map value	-0.252	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.052	Depositor
Map size ($\text{\AA}$)	262.4, 262.4, 262.4	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.82, 0.82, 0.82	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: K, 7YV

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	0.45	0/2773	0.63	2/3749 (0.1%)
1	C	0.45	0/2773	0.64	1/3749 (0.0%)
1	E	0.45	0/2773	0.62	0/3749
1	G	0.47	0/2773	0.65	4/3749 (0.1%)
2	B	0.33	0/1122	0.50	0/1506
2	D	0.33	0/1122	0.50	0/1506
2	F	0.33	0/1122	0.50	0/1506
2	H	0.33	0/1122	0.50	0/1506
All	All	0.42	0/15580	0.60	7/21020 (0.0%)

There are no bond length outliers.

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	554	ARG	CA-C-N	-5.27	114.66	119.82
1	G	554	ARG	C-N-CA	-5.27	114.66	119.82
1	A	559	LYS	N-CA-C	-5.27	105.71	111.82
1	A	554	ARG	N-CA-C	5.18	121.26	109.81
1	C	554	ARG	N-CA-C	5.14	121.18	109.81

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	2706	0	2772	82	0
1	C	2706	0	2772	81	0
1	E	2706	0	2772	79	0
1	G	2706	0	2772	90	0
2	B	1110	0	1039	7	0
2	D	1110	0	1039	10	0
2	F	1110	0	1039	7	0
2	H	1110	0	1039	11	0
3	A	19	23	0	0	0
3	C	19	23	0	0	0
3	E	19	23	0	0	0
3	G	19	23	0	0	0
4	A	3	0	0	0	0
All	All	15343	92	15244	347	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 11.

The worst 5 of 347 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:G:342:ALA:HB2	1:G:549:PHE:HE1	1.33	0.93
1:G:342:ALA:HB2	1:G:549:PHE:CE1	2.15	0.81
1:E:124:HIS:HA	1:E:128:ALA:HB3	1.67	0.77
1:C:124:HIS:HA	1:C:128:ALA:HB3	1.67	0.77
1:G:124:HIS:HA	1:G:128:ALA:HB3	1.67	0.75

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	327/1049 (31%)	299 (91%)	27 (8%)	1 (0%)	36	66
1	C	327/1049 (31%)	299 (91%)	27 (8%)	1 (0%)	36	66
1	E	327/1049 (31%)	300 (92%)	26 (8%)	1 (0%)	36	66
1	G	327/1049 (31%)	299 (91%)	27 (8%)	1 (0%)	36	66
2	B	139/149 (93%)	136 (98%)	3 (2%)	0	100	100
2	D	139/149 (93%)	136 (98%)	3 (2%)	0	100	100
2	F	139/149 (93%)	136 (98%)	3 (2%)	0	100	100
2	H	139/149 (93%)	136 (98%)	3 (2%)	0	100	100
All	All	1864/4792 (39%)	1741 (93%)	119 (6%)	4 (0%)	44	72

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	554	ARG
1	G	554	ARG
1	A	554	ARG
1	E	554	ARG

5.3.2 Protein sidechains ⓘ

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	282/860 (33%)	261 (93%)	21 (7%)	13	37
1	C	282/860 (33%)	258 (92%)	24 (8%)	10	31
1	E	282/860 (33%)	259 (92%)	23 (8%)	10	33
1	G	282/860 (33%)	260 (92%)	22 (8%)	11	35
2	B	120/127 (94%)	120 (100%)	0	100	100
2	D	120/127 (94%)	120 (100%)	0	100	100
2	F	120/127 (94%)	120 (100%)	0	100	100
2	H	120/127 (94%)	120 (100%)	0	100	100
All	All	1608/3948 (41%)	1518 (94%)	90 (6%)	21	50

5 of 90 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	561	VAL
1	G	337	LYS
1	E	570	LEU
1	E	582	ARG
1	G	553	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 16 such sidechains are listed below:

Mol	Chain	Res	Type
2	H	111	ASN
2	F	137	ASN
2	B	111	ASN
2	F	111	ASN
1	G	569	HIS

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 7 ligands modelled in this entry, 3 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
3	7YV	A	1101	-	21,21,21	3.56	13 (61%)	28,31,31	2.78	13 (46%)
3	7YV	C	1101	-	21,21,21	3.56	13 (61%)	28,31,31	2.77	13 (46%)
3	7YV	E	1101	-	21,21,21	3.55	13 (61%)	28,31,31	2.79	13 (46%)
3	7YV	G	1101	-	21,21,21	3.55	13 (61%)	28,31,31	2.78	13 (46%)

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
3	7YV	A	1101	-	-	3/8/25/25	0/4/3/3
3	7YV	C	1101	-	-	3/8/25/25	0/4/3/3
3	7YV	E	1101	-	-	3/8/25/25	0/4/3/3
3	7YV	G	1101	-	-	3/8/25/25	0/4/3/3

The worst 5 of 52 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1101	7YV	C05-C03	-8.76	1.30	1.53
3	C	1101	7YV	C05-C03	-8.76	1.30	1.53
3	A	1101	7YV	C05-C03	-8.76	1.30	1.53
3	G	1101	7YV	C05-C03	-8.72	1.31	1.53
3	A	1101	7YV	C05-C04	-5.11	1.30	1.52

The worst 5 of 52 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	1101	7YV	C09-C08-C03	-6.62	92.63	103.50
3	A	1101	7YV	C09-C08-C03	-6.60	92.66	103.50
3	C	1101	7YV	C09-C08-C03	-6.60	92.66	103.50
3	G	1101	7YV	C09-C08-C03	-6.57	92.71	103.50
3	E	1101	7YV	C13-C15-C16	-5.50	116.90	122.13

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1101	7YV	C07-C06-C10-O01
3	C	1101	7YV	C07-C06-C10-O01

Continued on next page...

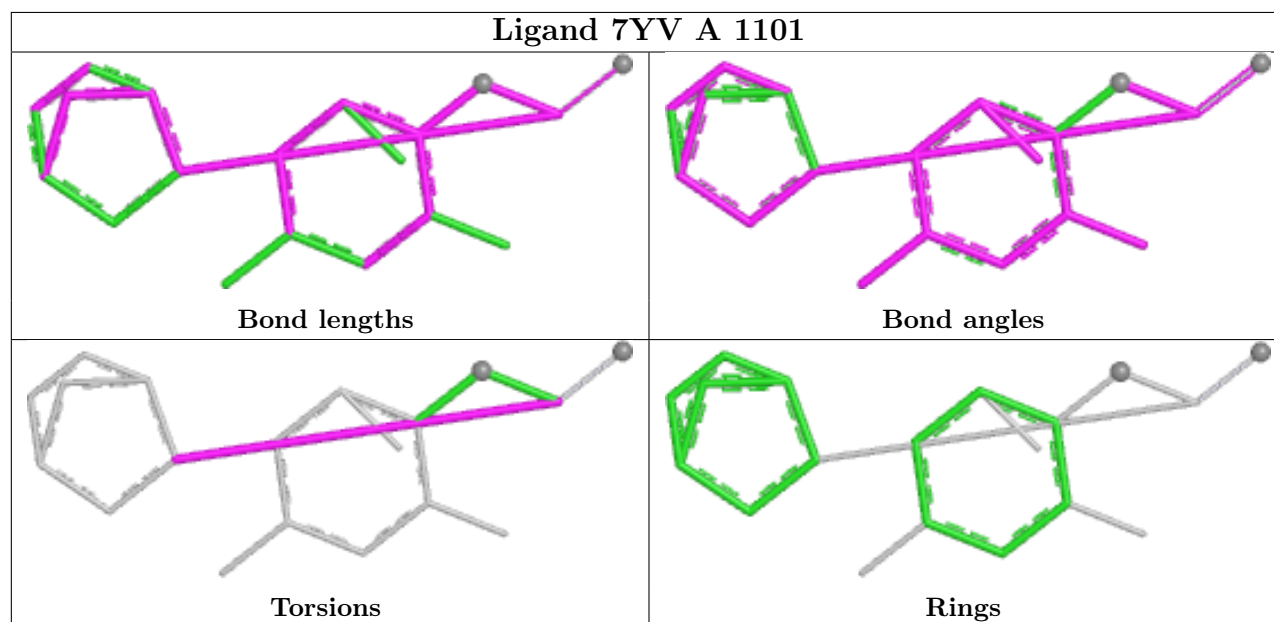
Continued from previous page...

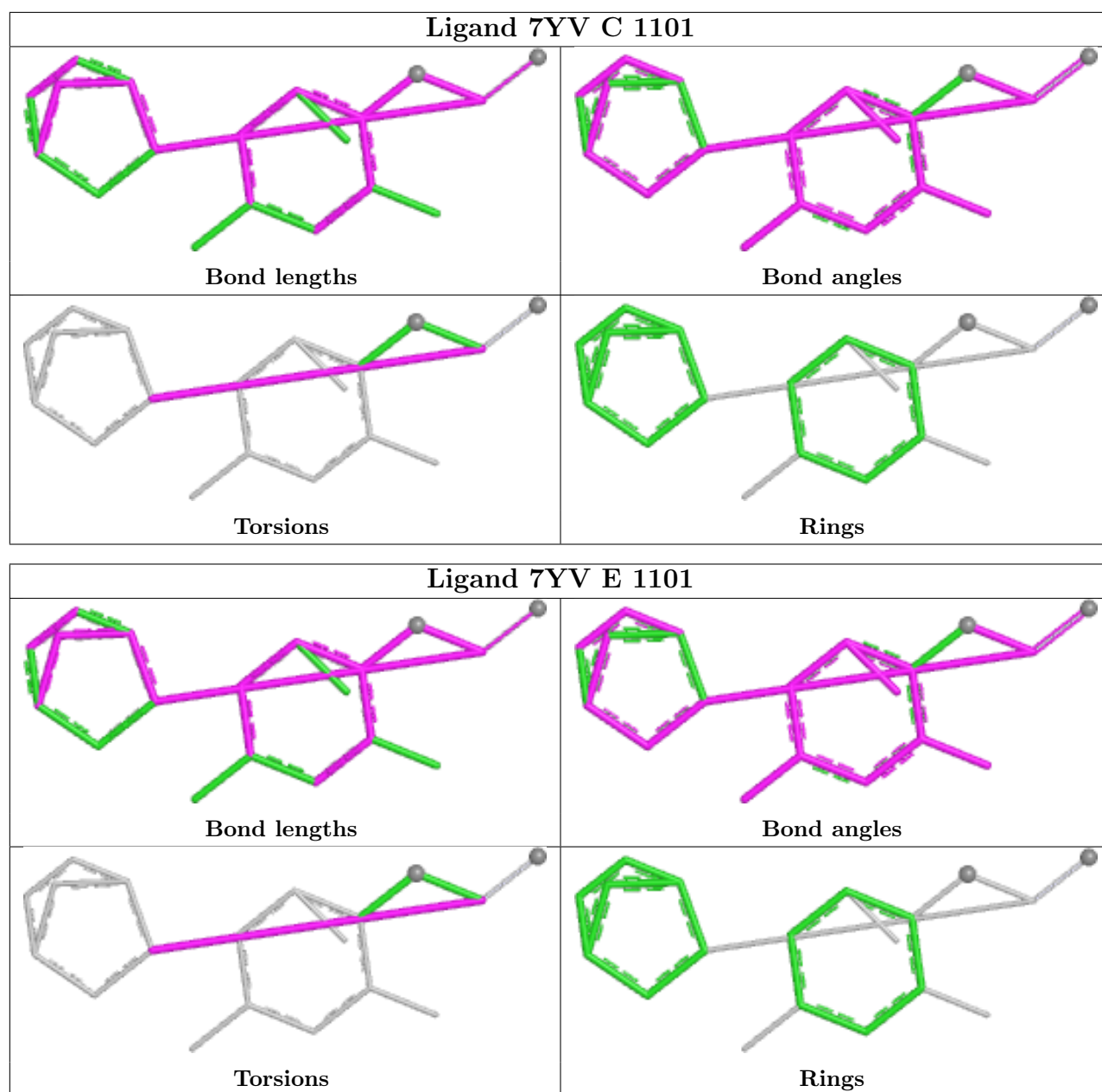
Mol	Chain	Res	Type	Atoms
3	E	1101	7YV	C07-C06-C10-O01
3	G	1101	7YV	C07-C06-C10-O01
3	A	1101	7YV	C07-C06-C10-N02

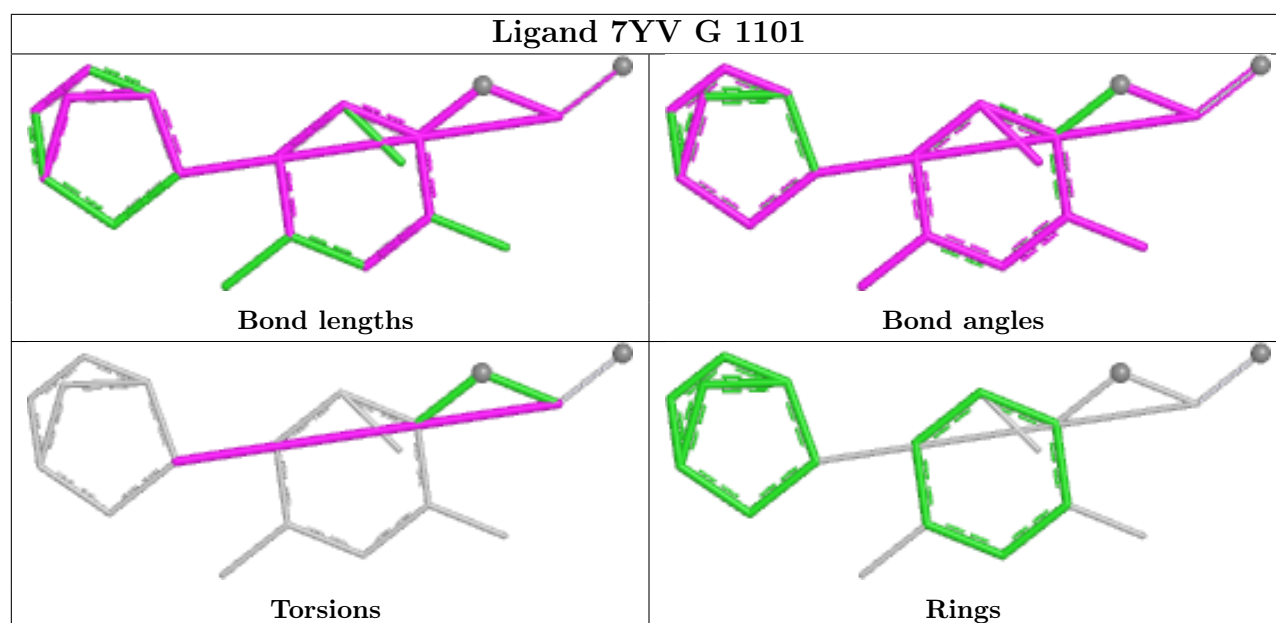
There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

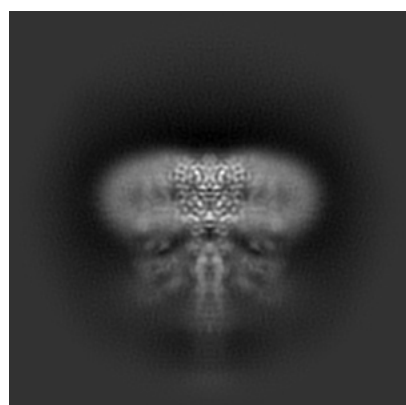
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-32046. These allow visual inspection of the internal detail of the map and identification of artifacts.

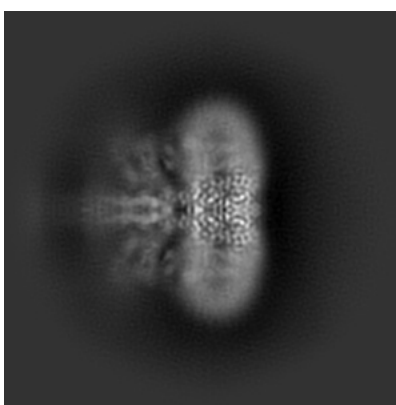
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

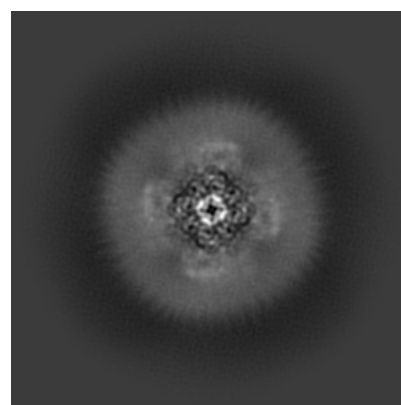
6.1.1 Primary map



X



Y

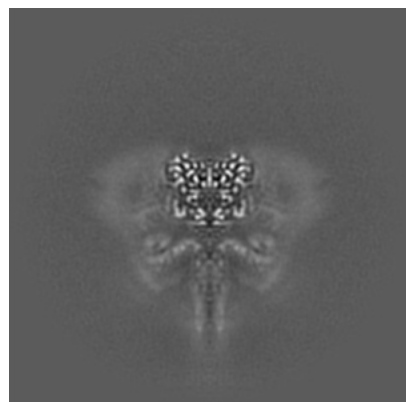


Z

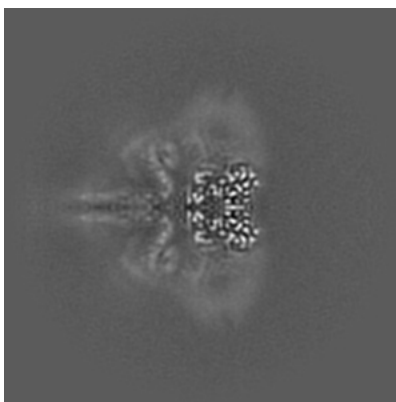
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

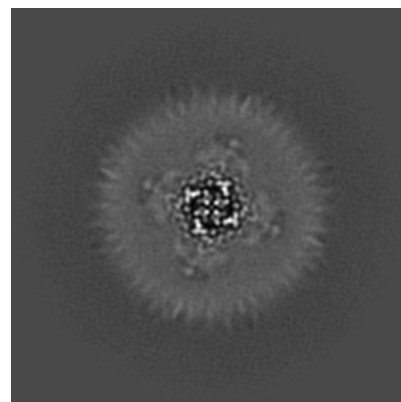
6.2.1 Primary map



X Index: 160



Y Index: 160

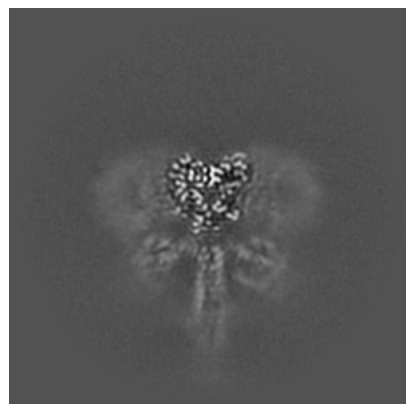


Z Index: 160

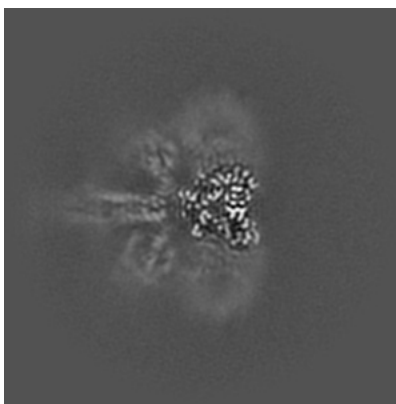
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

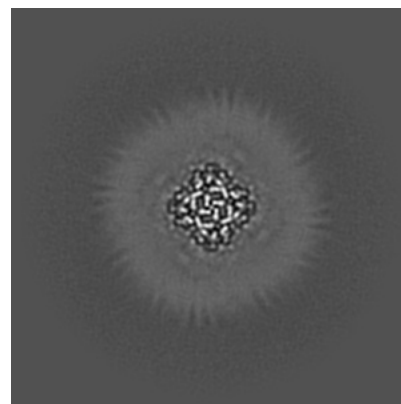
6.3.1 Primary map



X Index: 156



Y Index: 156



Z Index: 189

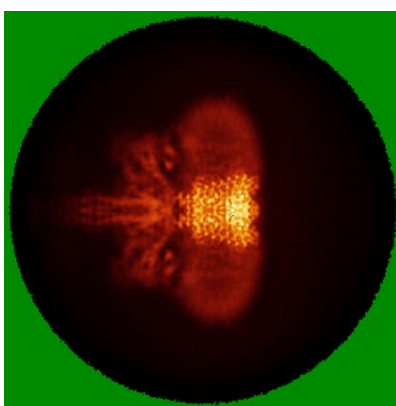
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

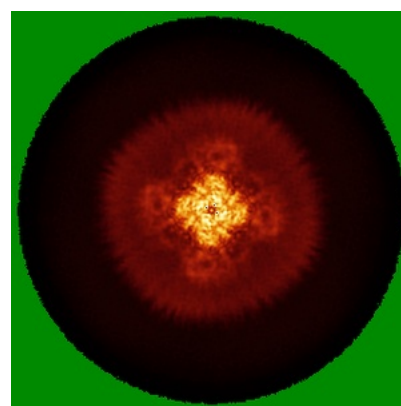
6.4.1 Primary map



X



Y

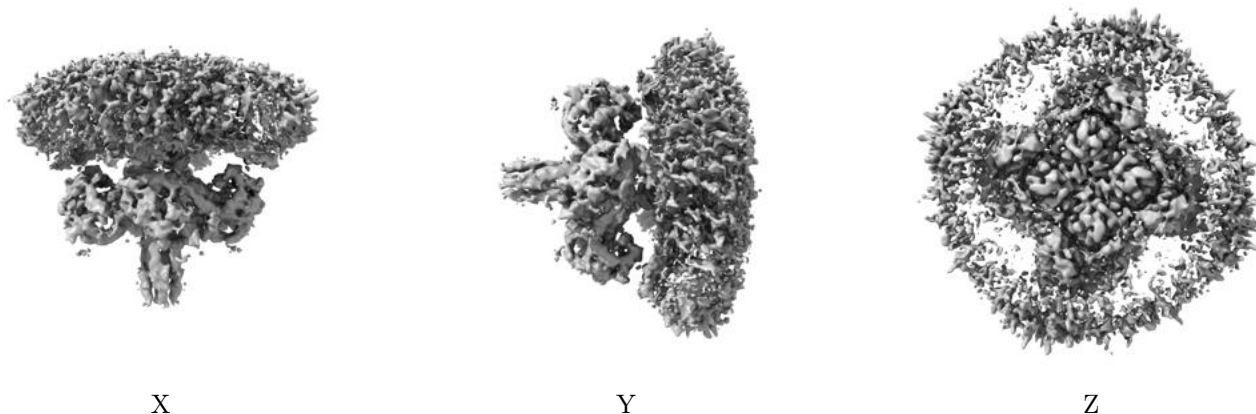


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.052. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

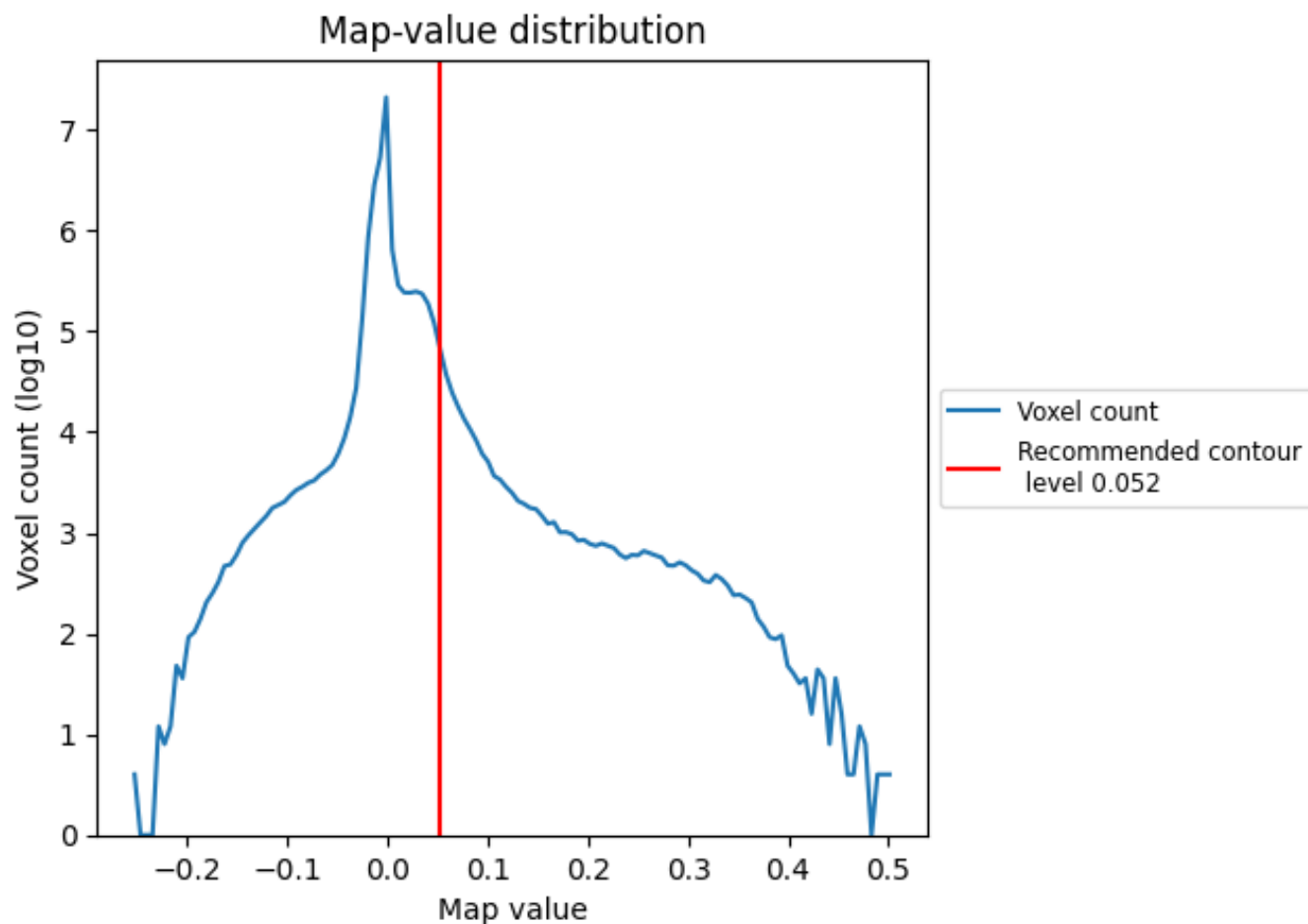
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

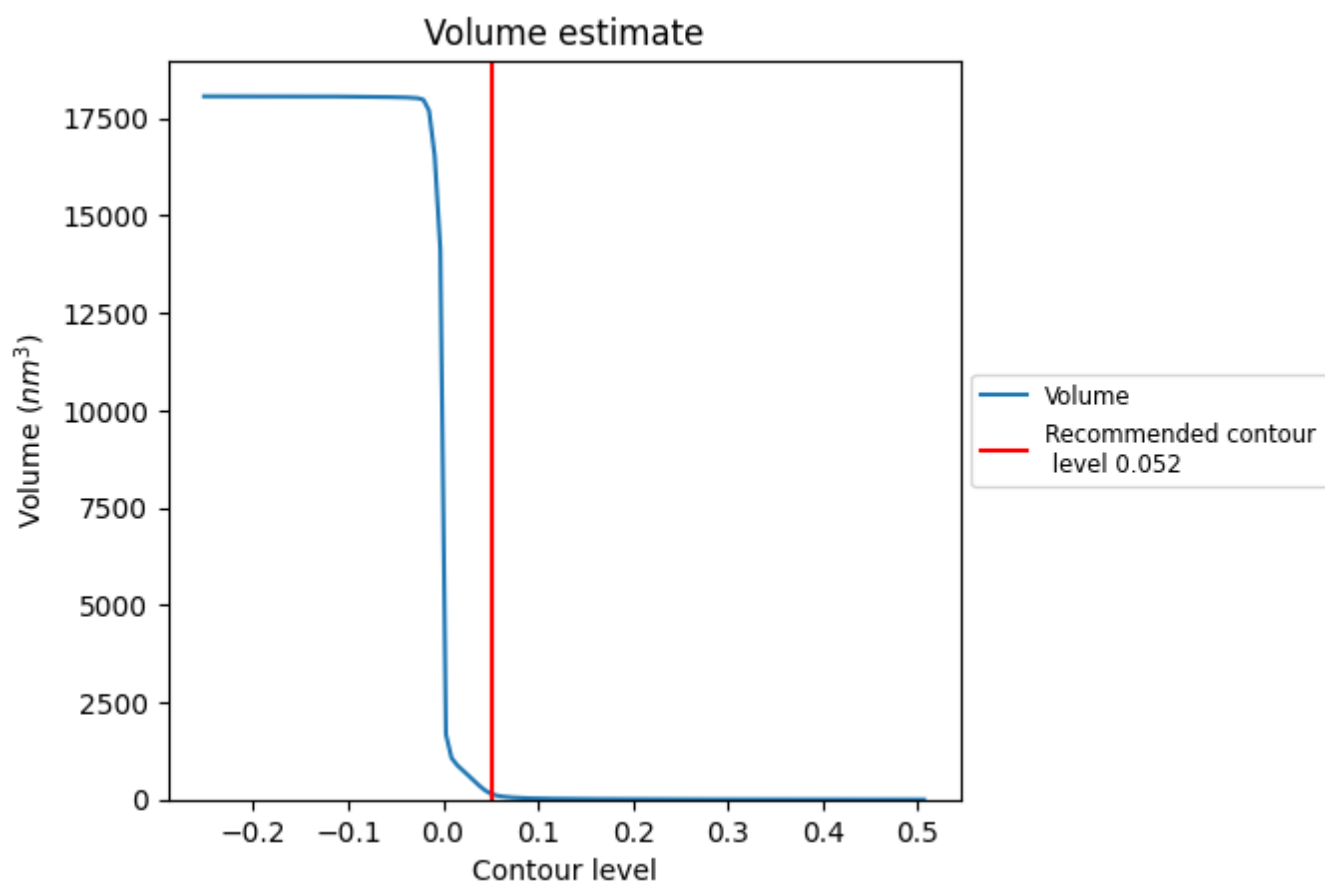
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

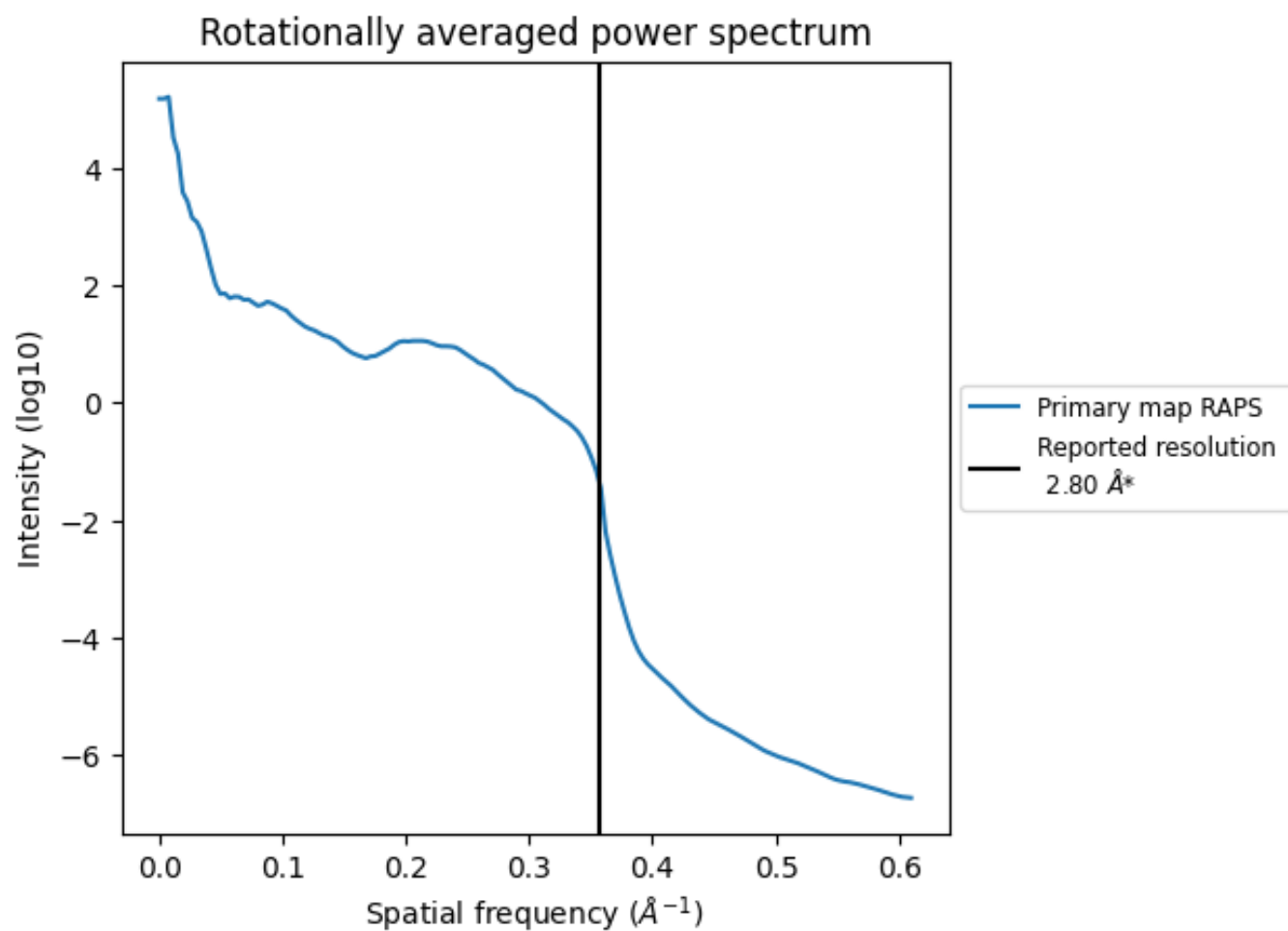
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 139 nm³; this corresponds to an approximate mass of 126 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

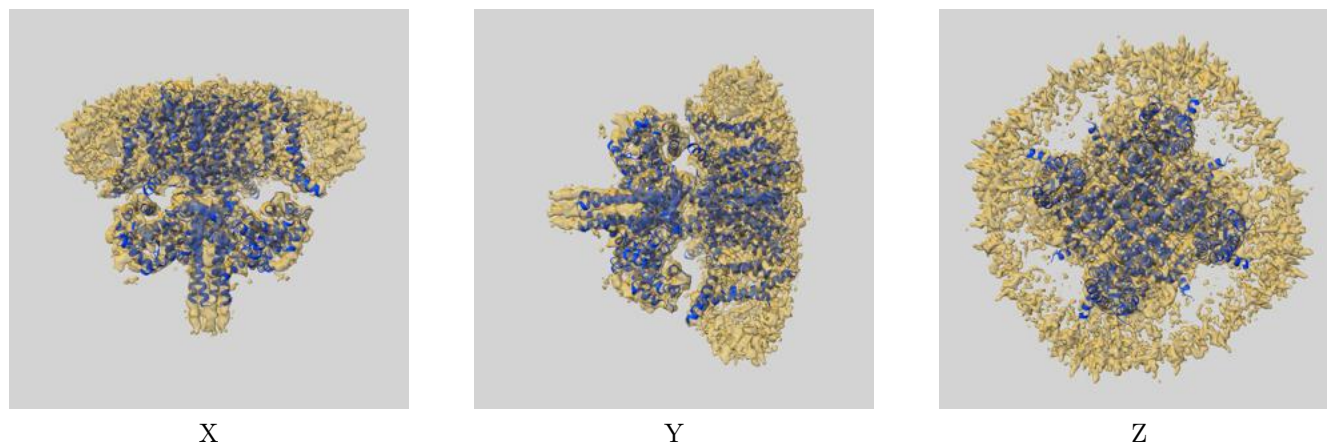
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

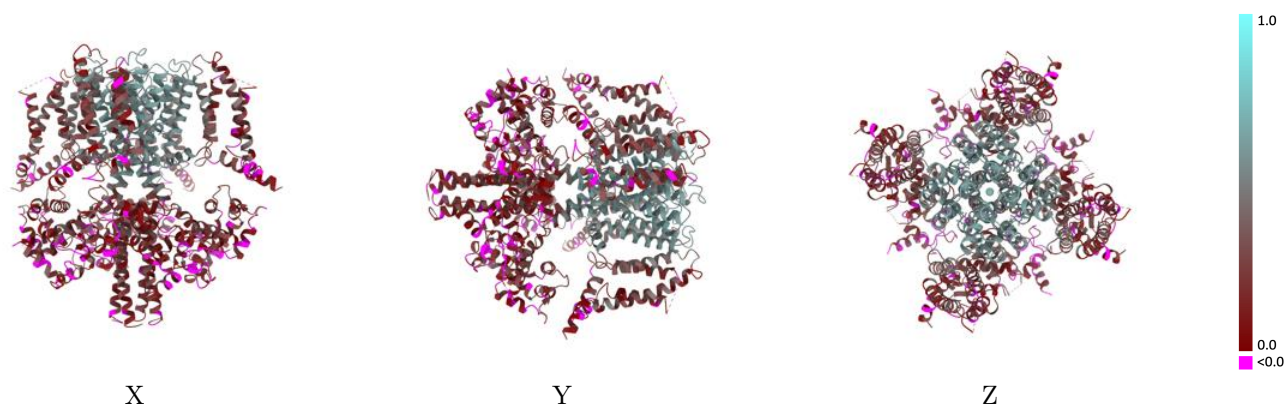
This section contains information regarding the fit between EMDB map EMD-32046 and PDB model 7VNR. Per-residue inclusion information can be found in [section 3](#) on [page 9](#).

9.1 Map-model overlay [i](#)



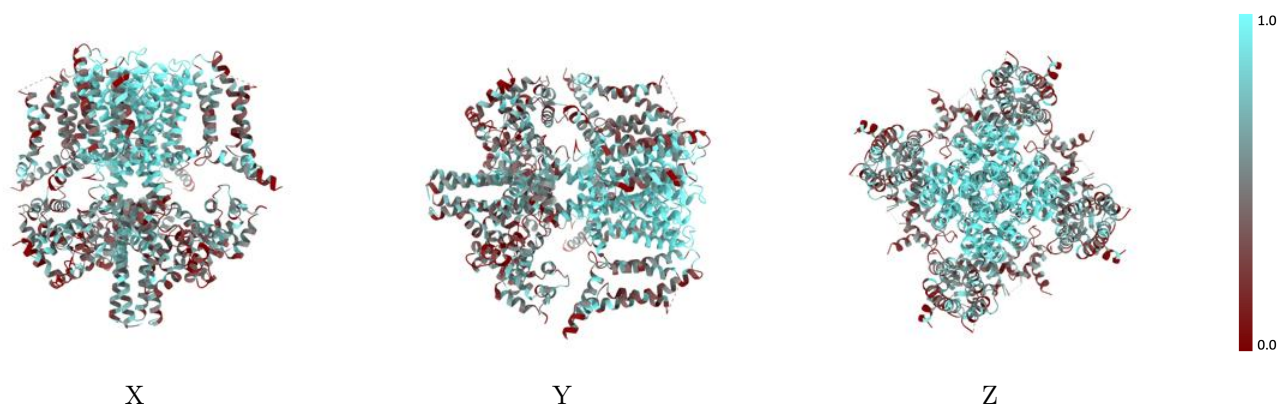
The images above show the 3D surface view of the map at the recommended contour level 0.052 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



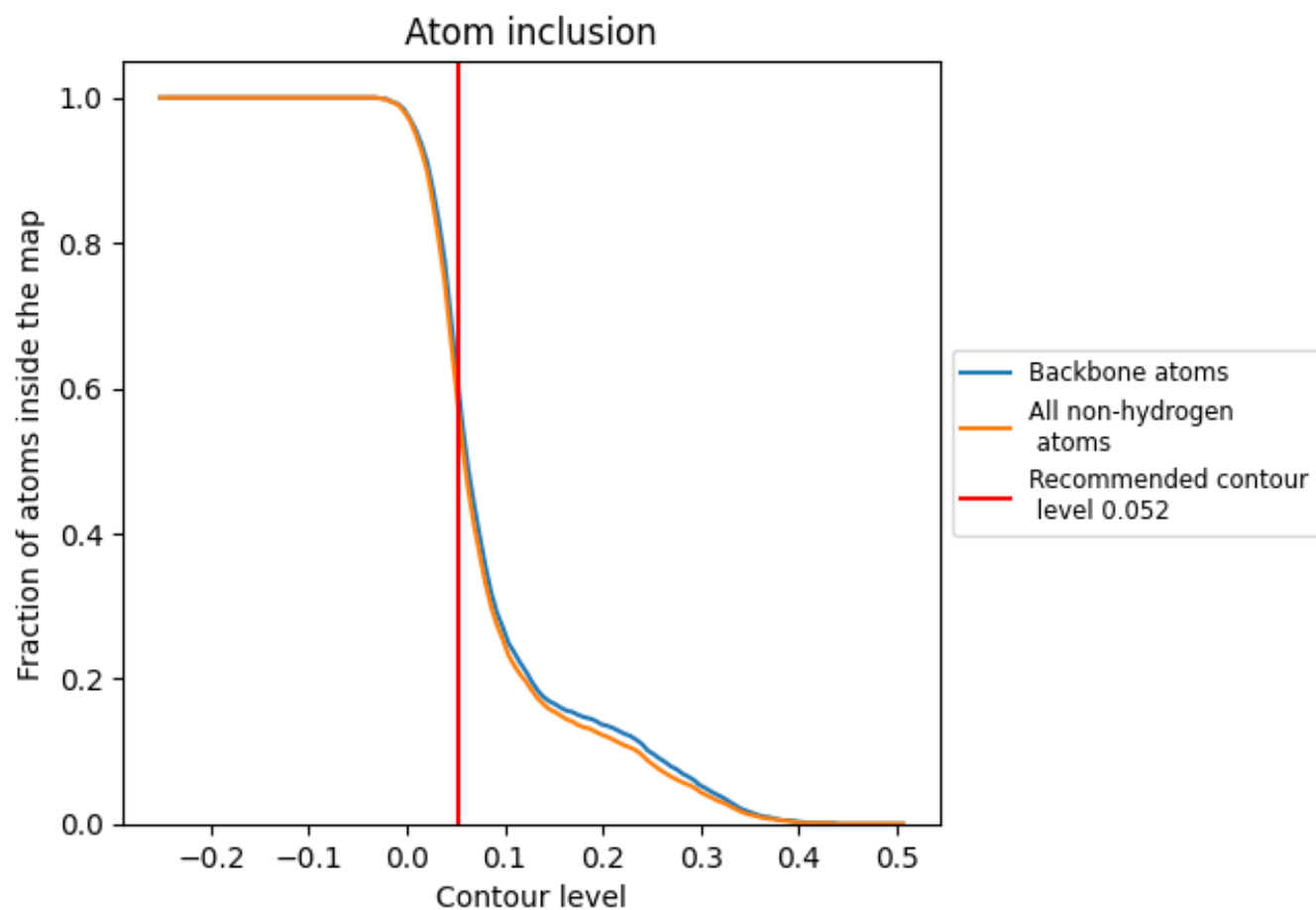
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.052).

9.4 Atom inclusion [i](#)



At the recommended contour level, 61% of all backbone atoms, 58% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.052) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5780	0.2700
A	0.6580	0.3280
B	0.4110	0.1350
C	0.6560	0.3270
D	0.4010	0.1260
E	0.6570	0.3260
F	0.3920	0.1300
G	0.6590	0.3260
H	0.4020	0.1360

1.0

0.0

<0.0