W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

Full wwPDB EM Validation Report (i)

Aug 28, 2024 – 12:50 PM JST

PDB ID	:	8Z4D
EMDB ID	:	EMD-39761
Title	:	Structure of the S-ring region of the Vibrio flagellar MS-ring protein FliF with 34-fold symmetry applied
Authors	:	Takekawa, N.; Nishikino, T.; Kishikawa, J.; Hirose, M.; Kato, T.; Imada, K.; Homma, M.
Deposited on	:	2024-04-17
Resolution	:	3.33 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 (i) 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 (i)) were used in the production of this report:
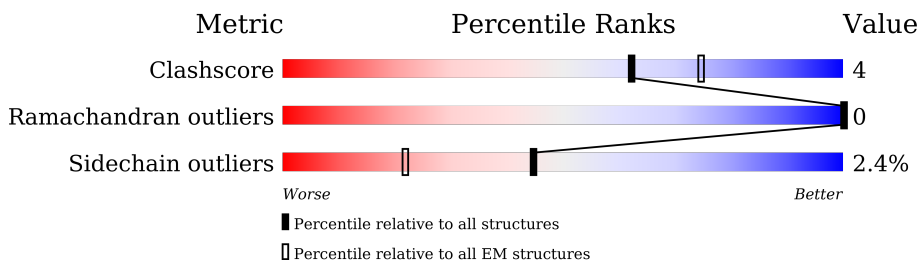
EMDB validation analysis	:	0.0.1.dev112
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.38.2

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.33 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	Percentile Ranks	Value
Clashscore		4
Ramachandran outliers		0
Sidechain outliers		2.4%

Worse   *Better*

∎ Percentile relative to all structures
▯ Percentile relative to all EM structures
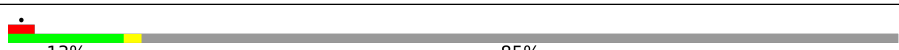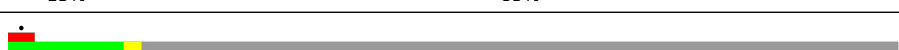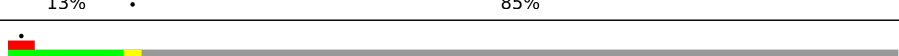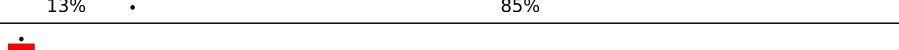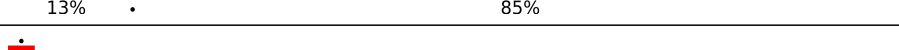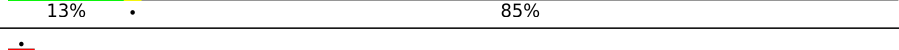
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	1	945	13% · 85%
1	2	945	13% · 85%
1	3	945	13% · 85%
1	4	945	13% · 85%
1	5	945	13% · 85%
1	6	945	13% · 85%
1	7	945	13% · 85%
1	8	945	13% · 85%

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Mol	Chain	Length	Quality of chain
1	9	945	13% 85%
1	A	945	13% 85%
1	B	945	13% 85%
1	C	945	13% 85%
1	D	945	13% 85%
1	E	945	13% 85%
1	F	945	13% 85%
1	G	945	13% 85%
1	H	945	13% 85%
1	I	945	13% 85%
1	J	945	13% 85%
1	K	945	13% 85%
1	L	945	13% 85%
1	M	945	13% 85%
1	N	945	13% 85%
1	O	945	13% 85%
1	P	945	13% 85%
1	Q	945	13% 85%
1	R	945	13% 85%
1	S	945	13% 85%
1	T	945	13% 85%
1	U	945	13% 85%
1	V	945	13% 85%
1	W	945	13% 85%
1	X	945	13% 85%

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Mol	Chain	Length	Quality of chain
1	Y	945	14% 85%

2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 38862 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 Flagellar M-ring protein,Flagellar motor switch protein FliG.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	2	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	3	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	4	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	5	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	6	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	7	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	8	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	9	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	A	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	B	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	C	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	D	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	E	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	F	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	G	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	H	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		

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PROTEIN DATA BANK

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	I	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	J	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	K	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	L	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	M	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	N	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	O	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	P	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	Q	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	R	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	S	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	T	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	U	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	V	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	W	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	X	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		
1	Y	144	Total	C	N	O	S	0	0
			1143	703	208	230	2		

There are 578 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	-15	MET	-	initiating methionine	UNP Q75N27
1	-14	ASN	-	expression tag	UNP Q75N27
1	-13	HIS	-	expression tag	UNP Q75N27
1	-12	LYS	-	expression tag	UNP Q75N27
1	-11	VAL	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
1	-10	HIS	-	expression tag	UNP Q75N27
1	-9	HIS	-	expression tag	UNP Q75N27
1	-8	HIS	-	expression tag	UNP Q75N27
1	-7	HIS	-	expression tag	UNP Q75N27
1	-6	HIS	-	expression tag	UNP Q75N27
1	-5	HIS	-	expression tag	UNP Q75N27
1	-4	ILE	-	expression tag	UNP Q75N27
1	-3	GLU	-	expression tag	UNP Q75N27
1	-2	GLY	-	expression tag	UNP Q75N27
1	-1	ARG	-	expression tag	UNP Q75N27
1	0	HIS	-	expression tag	UNP Q75N27
1	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
2	-15	MET	-	initiating methionine	UNP Q75N27
2	-14	ASN	-	expression tag	UNP Q75N27
2	-13	HIS	-	expression tag	UNP Q75N27
2	-12	LYS	-	expression tag	UNP Q75N27
2	-11	VAL	-	expression tag	UNP Q75N27
2	-10	HIS	-	expression tag	UNP Q75N27
2	-9	HIS	-	expression tag	UNP Q75N27
2	-8	HIS	-	expression tag	UNP Q75N27
2	-7	HIS	-	expression tag	UNP Q75N27
2	-6	HIS	-	expression tag	UNP Q75N27
2	-5	HIS	-	expression tag	UNP Q75N27
2	-4	ILE	-	expression tag	UNP Q75N27
2	-3	GLU	-	expression tag	UNP Q75N27
2	-2	GLY	-	expression tag	UNP Q75N27
2	-1	ARG	-	expression tag	UNP Q75N27
2	0	HIS	-	expression tag	UNP Q75N27
2	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
3	-15	MET	-	initiating methionine	UNP Q75N27
3	-14	ASN	-	expression tag	UNP Q75N27
3	-13	HIS	-	expression tag	UNP Q75N27
3	-12	LYS	-	expression tag	UNP Q75N27
3	-11	VAL	-	expression tag	UNP Q75N27
3	-10	HIS	-	expression tag	UNP Q75N27
3	-9	HIS	-	expression tag	UNP Q75N27
3	-8	HIS	-	expression tag	UNP Q75N27
3	-7	HIS	-	expression tag	UNP Q75N27
3	-6	HIS	-	expression tag	UNP Q75N27
3	-5	HIS	-	expression tag	UNP Q75N27
3	-4	ILE	-	expression tag	UNP Q75N27
3	-3	GLU	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
3	-2	GLY	-	expression tag	UNP Q75N27
3	-1	ARG	-	expression tag	UNP Q75N27
3	0	HIS	-	expression tag	UNP Q75N27
3	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
4	-15	MET	-	initiating methionine	UNP Q75N27
4	-14	ASN	-	expression tag	UNP Q75N27
4	-13	HIS	-	expression tag	UNP Q75N27
4	-12	LYS	-	expression tag	UNP Q75N27
4	-11	VAL	-	expression tag	UNP Q75N27
4	-10	HIS	-	expression tag	UNP Q75N27
4	-9	HIS	-	expression tag	UNP Q75N27
4	-8	HIS	-	expression tag	UNP Q75N27
4	-7	HIS	-	expression tag	UNP Q75N27
4	-6	HIS	-	expression tag	UNP Q75N27
4	-5	HIS	-	expression tag	UNP Q75N27
4	-4	ILE	-	expression tag	UNP Q75N27
4	-3	GLU	-	expression tag	UNP Q75N27
4	-2	GLY	-	expression tag	UNP Q75N27
4	-1	ARG	-	expression tag	UNP Q75N27
4	0	HIS	-	expression tag	UNP Q75N27
4	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
5	-15	MET	-	initiating methionine	UNP Q75N27
5	-14	ASN	-	expression tag	UNP Q75N27
5	-13	HIS	-	expression tag	UNP Q75N27
5	-12	LYS	-	expression tag	UNP Q75N27
5	-11	VAL	-	expression tag	UNP Q75N27
5	-10	HIS	-	expression tag	UNP Q75N27
5	-9	HIS	-	expression tag	UNP Q75N27
5	-8	HIS	-	expression tag	UNP Q75N27
5	-7	HIS	-	expression tag	UNP Q75N27
5	-6	HIS	-	expression tag	UNP Q75N27
5	-5	HIS	-	expression tag	UNP Q75N27
5	-4	ILE	-	expression tag	UNP Q75N27
5	-3	GLU	-	expression tag	UNP Q75N27
5	-2	GLY	-	expression tag	UNP Q75N27
5	-1	ARG	-	expression tag	UNP Q75N27
5	0	HIS	-	expression tag	UNP Q75N27
5	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
6	-15	MET	-	initiating methionine	UNP Q75N27
6	-14	ASN	-	expression tag	UNP Q75N27
6	-13	HIS	-	expression tag	UNP Q75N27
6	-12	LYS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
6	-11	VAL	-	expression tag	UNP Q75N27
6	-10	HIS	-	expression tag	UNP Q75N27
6	-9	HIS	-	expression tag	UNP Q75N27
6	-8	HIS	-	expression tag	UNP Q75N27
6	-7	HIS	-	expression tag	UNP Q75N27
6	-6	HIS	-	expression tag	UNP Q75N27
6	-5	HIS	-	expression tag	UNP Q75N27
6	-4	ILE	-	expression tag	UNP Q75N27
6	-3	GLU	-	expression tag	UNP Q75N27
6	-2	GLY	-	expression tag	UNP Q75N27
6	-1	ARG	-	expression tag	UNP Q75N27
6	0	HIS	-	expression tag	UNP Q75N27
6	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
7	-15	MET	-	initiating methionine	UNP Q75N27
7	-14	ASN	-	expression tag	UNP Q75N27
7	-13	HIS	-	expression tag	UNP Q75N27
7	-12	LYS	-	expression tag	UNP Q75N27
7	-11	VAL	-	expression tag	UNP Q75N27
7	-10	HIS	-	expression tag	UNP Q75N27
7	-9	HIS	-	expression tag	UNP Q75N27
7	-8	HIS	-	expression tag	UNP Q75N27
7	-7	HIS	-	expression tag	UNP Q75N27
7	-6	HIS	-	expression tag	UNP Q75N27
7	-5	HIS	-	expression tag	UNP Q75N27
7	-4	ILE	-	expression tag	UNP Q75N27
7	-3	GLU	-	expression tag	UNP Q75N27
7	-2	GLY	-	expression tag	UNP Q75N27
7	-1	ARG	-	expression tag	UNP Q75N27
7	0	HIS	-	expression tag	UNP Q75N27
7	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
8	-15	MET	-	initiating methionine	UNP Q75N27
8	-14	ASN	-	expression tag	UNP Q75N27
8	-13	HIS	-	expression tag	UNP Q75N27
8	-12	LYS	-	expression tag	UNP Q75N27
8	-11	VAL	-	expression tag	UNP Q75N27
8	-10	HIS	-	expression tag	UNP Q75N27
8	-9	HIS	-	expression tag	UNP Q75N27
8	-8	HIS	-	expression tag	UNP Q75N27
8	-7	HIS	-	expression tag	UNP Q75N27
8	-6	HIS	-	expression tag	UNP Q75N27
8	-5	HIS	-	expression tag	UNP Q75N27
8	-4	ILE	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
8	-3	GLU	-	expression tag	UNP Q75N27
8	-2	GLY	-	expression tag	UNP Q75N27
8	-1	ARG	-	expression tag	UNP Q75N27
8	0	HIS	-	expression tag	UNP Q75N27
8	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
9	-15	MET	-	initiating methionine	UNP Q75N27
9	-14	ASN	-	expression tag	UNP Q75N27
9	-13	HIS	-	expression tag	UNP Q75N27
9	-12	LYS	-	expression tag	UNP Q75N27
9	-11	VAL	-	expression tag	UNP Q75N27
9	-10	HIS	-	expression tag	UNP Q75N27
9	-9	HIS	-	expression tag	UNP Q75N27
9	-8	HIS	-	expression tag	UNP Q75N27
9	-7	HIS	-	expression tag	UNP Q75N27
9	-6	HIS	-	expression tag	UNP Q75N27
9	-5	HIS	-	expression tag	UNP Q75N27
9	-4	ILE	-	expression tag	UNP Q75N27
9	-3	GLU	-	expression tag	UNP Q75N27
9	-2	GLY	-	expression tag	UNP Q75N27
9	-1	ARG	-	expression tag	UNP Q75N27
9	0	HIS	-	expression tag	UNP Q75N27
9	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
A	-15	MET	-	initiating methionine	UNP Q75N27
A	-14	ASN	-	expression tag	UNP Q75N27
A	-13	HIS	-	expression tag	UNP Q75N27
A	-12	LYS	-	expression tag	UNP Q75N27
A	-11	VAL	-	expression tag	UNP Q75N27
A	-10	HIS	-	expression tag	UNP Q75N27
A	-9	HIS	-	expression tag	UNP Q75N27
A	-8	HIS	-	expression tag	UNP Q75N27
A	-7	HIS	-	expression tag	UNP Q75N27
A	-6	HIS	-	expression tag	UNP Q75N27
A	-5	HIS	-	expression tag	UNP Q75N27
A	-4	ILE	-	expression tag	UNP Q75N27
A	-3	GLU	-	expression tag	UNP Q75N27
A	-2	GLY	-	expression tag	UNP Q75N27
A	-1	ARG	-	expression tag	UNP Q75N27
A	0	HIS	-	expression tag	UNP Q75N27
A	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
B	-15	MET	-	initiating methionine	UNP Q75N27
B	-14	ASN	-	expression tag	UNP Q75N27
B	-13	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-12	LYS	-	expression tag	UNP Q75N27
B	-11	VAL	-	expression tag	UNP Q75N27
B	-10	HIS	-	expression tag	UNP Q75N27
B	-9	HIS	-	expression tag	UNP Q75N27
B	-8	HIS	-	expression tag	UNP Q75N27
B	-7	HIS	-	expression tag	UNP Q75N27
B	-6	HIS	-	expression tag	UNP Q75N27
B	-5	HIS	-	expression tag	UNP Q75N27
B	-4	ILE	-	expression tag	UNP Q75N27
B	-3	GLU	-	expression tag	UNP Q75N27
B	-2	GLY	-	expression tag	UNP Q75N27
B	-1	ARG	-	expression tag	UNP Q75N27
B	0	HIS	-	expression tag	UNP Q75N27
B	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
C	-15	MET	-	initiating methionine	UNP Q75N27
C	-14	ASN	-	expression tag	UNP Q75N27
C	-13	HIS	-	expression tag	UNP Q75N27
C	-12	LYS	-	expression tag	UNP Q75N27
C	-11	VAL	-	expression tag	UNP Q75N27
C	-10	HIS	-	expression tag	UNP Q75N27
C	-9	HIS	-	expression tag	UNP Q75N27
C	-8	HIS	-	expression tag	UNP Q75N27
C	-7	HIS	-	expression tag	UNP Q75N27
C	-6	HIS	-	expression tag	UNP Q75N27
C	-5	HIS	-	expression tag	UNP Q75N27
C	-4	ILE	-	expression tag	UNP Q75N27
C	-3	GLU	-	expression tag	UNP Q75N27
C	-2	GLY	-	expression tag	UNP Q75N27
C	-1	ARG	-	expression tag	UNP Q75N27
C	0	HIS	-	expression tag	UNP Q75N27
C	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
D	-15	MET	-	initiating methionine	UNP Q75N27
D	-14	ASN	-	expression tag	UNP Q75N27
D	-13	HIS	-	expression tag	UNP Q75N27
D	-12	LYS	-	expression tag	UNP Q75N27
D	-11	VAL	-	expression tag	UNP Q75N27
D	-10	HIS	-	expression tag	UNP Q75N27
D	-9	HIS	-	expression tag	UNP Q75N27
D	-8	HIS	-	expression tag	UNP Q75N27
D	-7	HIS	-	expression tag	UNP Q75N27
D	-6	HIS	-	expression tag	UNP Q75N27
D	-5	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-4	ILE	-	expression tag	UNP Q75N27
D	-3	GLU	-	expression tag	UNP Q75N27
D	-2	GLY	-	expression tag	UNP Q75N27
D	-1	ARG	-	expression tag	UNP Q75N27
D	0	HIS	-	expression tag	UNP Q75N27
D	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
E	-15	MET	-	initiating methionine	UNP Q75N27
E	-14	ASN	-	expression tag	UNP Q75N27
E	-13	HIS	-	expression tag	UNP Q75N27
E	-12	LYS	-	expression tag	UNP Q75N27
E	-11	VAL	-	expression tag	UNP Q75N27
E	-10	HIS	-	expression tag	UNP Q75N27
E	-9	HIS	-	expression tag	UNP Q75N27
E	-8	HIS	-	expression tag	UNP Q75N27
E	-7	HIS	-	expression tag	UNP Q75N27
E	-6	HIS	-	expression tag	UNP Q75N27
E	-5	HIS	-	expression tag	UNP Q75N27
E	-4	ILE	-	expression tag	UNP Q75N27
E	-3	GLU	-	expression tag	UNP Q75N27
E	-2	GLY	-	expression tag	UNP Q75N27
E	-1	ARG	-	expression tag	UNP Q75N27
E	0	HIS	-	expression tag	UNP Q75N27
E	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
F	-15	MET	-	initiating methionine	UNP Q75N27
F	-14	ASN	-	expression tag	UNP Q75N27
F	-13	HIS	-	expression tag	UNP Q75N27
F	-12	LYS	-	expression tag	UNP Q75N27
F	-11	VAL	-	expression tag	UNP Q75N27
F	-10	HIS	-	expression tag	UNP Q75N27
F	-9	HIS	-	expression tag	UNP Q75N27
F	-8	HIS	-	expression tag	UNP Q75N27
F	-7	HIS	-	expression tag	UNP Q75N27
F	-6	HIS	-	expression tag	UNP Q75N27
F	-5	HIS	-	expression tag	UNP Q75N27
F	-4	ILE	-	expression tag	UNP Q75N27
F	-3	GLU	-	expression tag	UNP Q75N27
F	-2	GLY	-	expression tag	UNP Q75N27
F	-1	ARG	-	expression tag	UNP Q75N27
F	0	HIS	-	expression tag	UNP Q75N27
F	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
G	-15	MET	-	initiating methionine	UNP Q75N27
G	-14	ASN	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-13	HIS	-	expression tag	UNP Q75N27
G	-12	LYS	-	expression tag	UNP Q75N27
G	-11	VAL	-	expression tag	UNP Q75N27
G	-10	HIS	-	expression tag	UNP Q75N27
G	-9	HIS	-	expression tag	UNP Q75N27
G	-8	HIS	-	expression tag	UNP Q75N27
G	-7	HIS	-	expression tag	UNP Q75N27
G	-6	HIS	-	expression tag	UNP Q75N27
G	-5	HIS	-	expression tag	UNP Q75N27
G	-4	ILE	-	expression tag	UNP Q75N27
G	-3	GLU	-	expression tag	UNP Q75N27
G	-2	GLY	-	expression tag	UNP Q75N27
G	-1	ARG	-	expression tag	UNP Q75N27
G	0	HIS	-	expression tag	UNP Q75N27
G	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
H	-15	MET	-	initiating methionine	UNP Q75N27
H	-14	ASN	-	expression tag	UNP Q75N27
H	-13	HIS	-	expression tag	UNP Q75N27
H	-12	LYS	-	expression tag	UNP Q75N27
H	-11	VAL	-	expression tag	UNP Q75N27
H	-10	HIS	-	expression tag	UNP Q75N27
H	-9	HIS	-	expression tag	UNP Q75N27
H	-8	HIS	-	expression tag	UNP Q75N27
H	-7	HIS	-	expression tag	UNP Q75N27
H	-6	HIS	-	expression tag	UNP Q75N27
H	-5	HIS	-	expression tag	UNP Q75N27
H	-4	ILE	-	expression tag	UNP Q75N27
H	-3	GLU	-	expression tag	UNP Q75N27
H	-2	GLY	-	expression tag	UNP Q75N27
H	-1	ARG	-	expression tag	UNP Q75N27
H	0	HIS	-	expression tag	UNP Q75N27
H	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
I	-15	MET	-	initiating methionine	UNP Q75N27
I	-14	ASN	-	expression tag	UNP Q75N27
I	-13	HIS	-	expression tag	UNP Q75N27
I	-12	LYS	-	expression tag	UNP Q75N27
I	-11	VAL	-	expression tag	UNP Q75N27
I	-10	HIS	-	expression tag	UNP Q75N27
I	-9	HIS	-	expression tag	UNP Q75N27
I	-8	HIS	-	expression tag	UNP Q75N27
I	-7	HIS	-	expression tag	UNP Q75N27
I	-6	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
I	-5	HIS	-	expression tag	UNP Q75N27
I	-4	ILE	-	expression tag	UNP Q75N27
I	-3	GLU	-	expression tag	UNP Q75N27
I	-2	GLY	-	expression tag	UNP Q75N27
I	-1	ARG	-	expression tag	UNP Q75N27
I	0	HIS	-	expression tag	UNP Q75N27
I	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
J	-15	MET	-	initiating methionine	UNP Q75N27
J	-14	ASN	-	expression tag	UNP Q75N27
J	-13	HIS	-	expression tag	UNP Q75N27
J	-12	LYS	-	expression tag	UNP Q75N27
J	-11	VAL	-	expression tag	UNP Q75N27
J	-10	HIS	-	expression tag	UNP Q75N27
J	-9	HIS	-	expression tag	UNP Q75N27
J	-8	HIS	-	expression tag	UNP Q75N27
J	-7	HIS	-	expression tag	UNP Q75N27
J	-6	HIS	-	expression tag	UNP Q75N27
J	-5	HIS	-	expression tag	UNP Q75N27
J	-4	ILE	-	expression tag	UNP Q75N27
J	-3	GLU	-	expression tag	UNP Q75N27
J	-2	GLY	-	expression tag	UNP Q75N27
J	-1	ARG	-	expression tag	UNP Q75N27
J	0	HIS	-	expression tag	UNP Q75N27
J	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
K	-15	MET	-	initiating methionine	UNP Q75N27
K	-14	ASN	-	expression tag	UNP Q75N27
K	-13	HIS	-	expression tag	UNP Q75N27
K	-12	LYS	-	expression tag	UNP Q75N27
K	-11	VAL	-	expression tag	UNP Q75N27
K	-10	HIS	-	expression tag	UNP Q75N27
K	-9	HIS	-	expression tag	UNP Q75N27
K	-8	HIS	-	expression tag	UNP Q75N27
K	-7	HIS	-	expression tag	UNP Q75N27
K	-6	HIS	-	expression tag	UNP Q75N27
K	-5	HIS	-	expression tag	UNP Q75N27
K	-4	ILE	-	expression tag	UNP Q75N27
K	-3	GLU	-	expression tag	UNP Q75N27
K	-2	GLY	-	expression tag	UNP Q75N27
K	-1	ARG	-	expression tag	UNP Q75N27
K	0	HIS	-	expression tag	UNP Q75N27
K	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
L	-15	MET	-	initiating methionine	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
L	-14	ASN	-	expression tag	UNP Q75N27
L	-13	HIS	-	expression tag	UNP Q75N27
L	-12	LYS	-	expression tag	UNP Q75N27
L	-11	VAL	-	expression tag	UNP Q75N27
L	-10	HIS	-	expression tag	UNP Q75N27
L	-9	HIS	-	expression tag	UNP Q75N27
L	-8	HIS	-	expression tag	UNP Q75N27
L	-7	HIS	-	expression tag	UNP Q75N27
L	-6	HIS	-	expression tag	UNP Q75N27
L	-5	HIS	-	expression tag	UNP Q75N27
L	-4	ILE	-	expression tag	UNP Q75N27
L	-3	GLU	-	expression tag	UNP Q75N27
L	-2	GLY	-	expression tag	UNP Q75N27
L	-1	ARG	-	expression tag	UNP Q75N27
L	0	HIS	-	expression tag	UNP Q75N27
L	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
M	-15	MET	-	initiating methionine	UNP Q75N27
M	-14	ASN	-	expression tag	UNP Q75N27
M	-13	HIS	-	expression tag	UNP Q75N27
M	-12	LYS	-	expression tag	UNP Q75N27
M	-11	VAL	-	expression tag	UNP Q75N27
M	-10	HIS	-	expression tag	UNP Q75N27
M	-9	HIS	-	expression tag	UNP Q75N27
M	-8	HIS	-	expression tag	UNP Q75N27
M	-7	HIS	-	expression tag	UNP Q75N27
M	-6	HIS	-	expression tag	UNP Q75N27
M	-5	HIS	-	expression tag	UNP Q75N27
M	-4	ILE	-	expression tag	UNP Q75N27
M	-3	GLU	-	expression tag	UNP Q75N27
M	-2	GLY	-	expression tag	UNP Q75N27
M	-1	ARG	-	expression tag	UNP Q75N27
M	0	HIS	-	expression tag	UNP Q75N27
M	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
N	-15	MET	-	initiating methionine	UNP Q75N27
N	-14	ASN	-	expression tag	UNP Q75N27
N	-13	HIS	-	expression tag	UNP Q75N27
N	-12	LYS	-	expression tag	UNP Q75N27
N	-11	VAL	-	expression tag	UNP Q75N27
N	-10	HIS	-	expression tag	UNP Q75N27
N	-9	HIS	-	expression tag	UNP Q75N27
N	-8	HIS	-	expression tag	UNP Q75N27
N	-7	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
N	-6	HIS	-	expression tag	UNP Q75N27
N	-5	HIS	-	expression tag	UNP Q75N27
N	-4	ILE	-	expression tag	UNP Q75N27
N	-3	GLU	-	expression tag	UNP Q75N27
N	-2	GLY	-	expression tag	UNP Q75N27
N	-1	ARG	-	expression tag	UNP Q75N27
N	0	HIS	-	expression tag	UNP Q75N27
N	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
O	-15	MET	-	initiating methionine	UNP Q75N27
O	-14	ASN	-	expression tag	UNP Q75N27
O	-13	HIS	-	expression tag	UNP Q75N27
O	-12	LYS	-	expression tag	UNP Q75N27
O	-11	VAL	-	expression tag	UNP Q75N27
O	-10	HIS	-	expression tag	UNP Q75N27
O	-9	HIS	-	expression tag	UNP Q75N27
O	-8	HIS	-	expression tag	UNP Q75N27
O	-7	HIS	-	expression tag	UNP Q75N27
O	-6	HIS	-	expression tag	UNP Q75N27
O	-5	HIS	-	expression tag	UNP Q75N27
O	-4	ILE	-	expression tag	UNP Q75N27
O	-3	GLU	-	expression tag	UNP Q75N27
O	-2	GLY	-	expression tag	UNP Q75N27
O	-1	ARG	-	expression tag	UNP Q75N27
O	0	HIS	-	expression tag	UNP Q75N27
O	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
P	-15	MET	-	initiating methionine	UNP Q75N27
P	-14	ASN	-	expression tag	UNP Q75N27
P	-13	HIS	-	expression tag	UNP Q75N27
P	-12	LYS	-	expression tag	UNP Q75N27
P	-11	VAL	-	expression tag	UNP Q75N27
P	-10	HIS	-	expression tag	UNP Q75N27
P	-9	HIS	-	expression tag	UNP Q75N27
P	-8	HIS	-	expression tag	UNP Q75N27
P	-7	HIS	-	expression tag	UNP Q75N27
P	-6	HIS	-	expression tag	UNP Q75N27
P	-5	HIS	-	expression tag	UNP Q75N27
P	-4	ILE	-	expression tag	UNP Q75N27
P	-3	GLU	-	expression tag	UNP Q75N27
P	-2	GLY	-	expression tag	UNP Q75N27
P	-1	ARG	-	expression tag	UNP Q75N27
P	0	HIS	-	expression tag	UNP Q75N27
P	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0

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Chain	Residue	Modelled	Actual	Comment	Reference
Q	-15	MET	-	initiating methionine	UNP Q75N27
Q	-14	ASN	-	expression tag	UNP Q75N27
Q	-13	HIS	-	expression tag	UNP Q75N27
Q	-12	LYS	-	expression tag	UNP Q75N27
Q	-11	VAL	-	expression tag	UNP Q75N27
Q	-10	HIS	-	expression tag	UNP Q75N27
Q	-9	HIS	-	expression tag	UNP Q75N27
Q	-8	HIS	-	expression tag	UNP Q75N27
Q	-7	HIS	-	expression tag	UNP Q75N27
Q	-6	HIS	-	expression tag	UNP Q75N27
Q	-5	HIS	-	expression tag	UNP Q75N27
Q	-4	ILE	-	expression tag	UNP Q75N27
Q	-3	GLU	-	expression tag	UNP Q75N27
Q	-2	GLY	-	expression tag	UNP Q75N27
Q	-1	ARG	-	expression tag	UNP Q75N27
Q	0	HIS	-	expression tag	UNP Q75N27
Q	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
R	-15	MET	-	initiating methionine	UNP Q75N27
R	-14	ASN	-	expression tag	UNP Q75N27
R	-13	HIS	-	expression tag	UNP Q75N27
R	-12	LYS	-	expression tag	UNP Q75N27
R	-11	VAL	-	expression tag	UNP Q75N27
R	-10	HIS	-	expression tag	UNP Q75N27
R	-9	HIS	-	expression tag	UNP Q75N27
R	-8	HIS	-	expression tag	UNP Q75N27
R	-7	HIS	-	expression tag	UNP Q75N27
R	-6	HIS	-	expression tag	UNP Q75N27
R	-5	HIS	-	expression tag	UNP Q75N27
R	-4	ILE	-	expression tag	UNP Q75N27
R	-3	GLU	-	expression tag	UNP Q75N27
R	-2	GLY	-	expression tag	UNP Q75N27
R	-1	ARG	-	expression tag	UNP Q75N27
R	0	HIS	-	expression tag	UNP Q75N27
R	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
S	-15	MET	-	initiating methionine	UNP Q75N27
S	-14	ASN	-	expression tag	UNP Q75N27
S	-13	HIS	-	expression tag	UNP Q75N27
S	-12	LYS	-	expression tag	UNP Q75N27
S	-11	VAL	-	expression tag	UNP Q75N27
S	-10	HIS	-	expression tag	UNP Q75N27
S	-9	HIS	-	expression tag	UNP Q75N27
S	-8	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
S	-7	HIS	-	expression tag	UNP Q75N27
S	-6	HIS	-	expression tag	UNP Q75N27
S	-5	HIS	-	expression tag	UNP Q75N27
S	-4	ILE	-	expression tag	UNP Q75N27
S	-3	GLU	-	expression tag	UNP Q75N27
S	-2	GLY	-	expression tag	UNP Q75N27
S	-1	ARG	-	expression tag	UNP Q75N27
S	0	HIS	-	expression tag	UNP Q75N27
S	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
T	-15	MET	-	initiating methionine	UNP Q75N27
T	-14	ASN	-	expression tag	UNP Q75N27
T	-13	HIS	-	expression tag	UNP Q75N27
T	-12	LYS	-	expression tag	UNP Q75N27
T	-11	VAL	-	expression tag	UNP Q75N27
T	-10	HIS	-	expression tag	UNP Q75N27
T	-9	HIS	-	expression tag	UNP Q75N27
T	-8	HIS	-	expression tag	UNP Q75N27
T	-7	HIS	-	expression tag	UNP Q75N27
T	-6	HIS	-	expression tag	UNP Q75N27
T	-5	HIS	-	expression tag	UNP Q75N27
T	-4	ILE	-	expression tag	UNP Q75N27
T	-3	GLU	-	expression tag	UNP Q75N27
T	-2	GLY	-	expression tag	UNP Q75N27
T	-1	ARG	-	expression tag	UNP Q75N27
T	0	HIS	-	expression tag	UNP Q75N27
T	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
U	-15	MET	-	initiating methionine	UNP Q75N27
U	-14	ASN	-	expression tag	UNP Q75N27
U	-13	HIS	-	expression tag	UNP Q75N27
U	-12	LYS	-	expression tag	UNP Q75N27
U	-11	VAL	-	expression tag	UNP Q75N27
U	-10	HIS	-	expression tag	UNP Q75N27
U	-9	HIS	-	expression tag	UNP Q75N27
U	-8	HIS	-	expression tag	UNP Q75N27
U	-7	HIS	-	expression tag	UNP Q75N27
U	-6	HIS	-	expression tag	UNP Q75N27
U	-5	HIS	-	expression tag	UNP Q75N27
U	-4	ILE	-	expression tag	UNP Q75N27
U	-3	GLU	-	expression tag	UNP Q75N27
U	-2	GLY	-	expression tag	UNP Q75N27
U	-1	ARG	-	expression tag	UNP Q75N27
U	0	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
U	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
V	-15	MET	-	initiating methionine	UNP Q75N27
V	-14	ASN	-	expression tag	UNP Q75N27
V	-13	HIS	-	expression tag	UNP Q75N27
V	-12	LYS	-	expression tag	UNP Q75N27
V	-11	VAL	-	expression tag	UNP Q75N27
V	-10	HIS	-	expression tag	UNP Q75N27
V	-9	HIS	-	expression tag	UNP Q75N27
V	-8	HIS	-	expression tag	UNP Q75N27
V	-7	HIS	-	expression tag	UNP Q75N27
V	-6	HIS	-	expression tag	UNP Q75N27
V	-5	HIS	-	expression tag	UNP Q75N27
V	-4	ILE	-	expression tag	UNP Q75N27
V	-3	GLU	-	expression tag	UNP Q75N27
V	-2	GLY	-	expression tag	UNP Q75N27
V	-1	ARG	-	expression tag	UNP Q75N27
V	0	HIS	-	expression tag	UNP Q75N27
V	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
W	-15	MET	-	initiating methionine	UNP Q75N27
W	-14	ASN	-	expression tag	UNP Q75N27
W	-13	HIS	-	expression tag	UNP Q75N27
W	-12	LYS	-	expression tag	UNP Q75N27
W	-11	VAL	-	expression tag	UNP Q75N27
W	-10	HIS	-	expression tag	UNP Q75N27
W	-9	HIS	-	expression tag	UNP Q75N27
W	-8	HIS	-	expression tag	UNP Q75N27
W	-7	HIS	-	expression tag	UNP Q75N27
W	-6	HIS	-	expression tag	UNP Q75N27
W	-5	HIS	-	expression tag	UNP Q75N27
W	-4	ILE	-	expression tag	UNP Q75N27
W	-3	GLU	-	expression tag	UNP Q75N27
W	-2	GLY	-	expression tag	UNP Q75N27
W	-1	ARG	-	expression tag	UNP Q75N27
W	0	HIS	-	expression tag	UNP Q75N27
W	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
X	-15	MET	-	initiating methionine	UNP Q75N27
X	-14	ASN	-	expression tag	UNP Q75N27
X	-13	HIS	-	expression tag	UNP Q75N27
X	-12	LYS	-	expression tag	UNP Q75N27
X	-11	VAL	-	expression tag	UNP Q75N27
X	-10	HIS	-	expression tag	UNP Q75N27
X	-9	HIS	-	expression tag	UNP Q75N27

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Chain	Residue	Modelled	Actual	Comment	Reference
X	-8	HIS	-	expression tag	UNP Q75N27
X	-7	HIS	-	expression tag	UNP Q75N27
X	-6	HIS	-	expression tag	UNP Q75N27
X	-5	HIS	-	expression tag	UNP Q75N27
X	-4	ILE	-	expression tag	UNP Q75N27
X	-3	GLU	-	expression tag	UNP Q75N27
X	-2	GLY	-	expression tag	UNP Q75N27
X	-1	ARG	-	expression tag	UNP Q75N27
X	0	HIS	-	expression tag	UNP Q75N27
X	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0
Y	-15	MET	-	initiating methionine	UNP Q75N27
Y	-14	ASN	-	expression tag	UNP Q75N27
Y	-13	HIS	-	expression tag	UNP Q75N27
Y	-12	LYS	-	expression tag	UNP Q75N27
Y	-11	VAL	-	expression tag	UNP Q75N27
Y	-10	HIS	-	expression tag	UNP Q75N27
Y	-9	HIS	-	expression tag	UNP Q75N27
Y	-8	HIS	-	expression tag	UNP Q75N27
Y	-7	HIS	-	expression tag	UNP Q75N27
Y	-6	HIS	-	expression tag	UNP Q75N27
Y	-5	HIS	-	expression tag	UNP Q75N27
Y	-4	ILE	-	expression tag	UNP Q75N27
Y	-3	GLU	-	expression tag	UNP Q75N27
Y	-2	GLY	-	expression tag	UNP Q75N27
Y	-1	ARG	-	expression tag	UNP Q75N27
Y	0	HIS	-	expression tag	UNP Q75N27
Y	792	SER	GLY	engineered mutation	UNP A0A0T7EAG0

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: Flagellar M-ring protein,Flagellar motor switch protein FliG

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

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

VAL GLU ALA ALA GLN LYS ILE GLU ILE ALA ARG MET ASP ALA GLY LEU LEU MET SER GLY ALA ASP GLU PHE LEU

● Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 2:   13%   85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP THR ASP GLN HIS GLY ARG LEU LEU SER SER GLN ASP PRO A255 S256 A257 A258 R259 R260 K261 E262 Q263 E264 R267 S268 Q269 R274 E275 K276 I277 D278 Y287 I296 D299 F300 D311 P312

N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN SER V367 S371 E376 Q387 T395 V396 S397 V398 D402 ARG

ARG GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO M418 S419 E420 S421 G432 D437 Q438 G439 R440 G441 D442 L443 V446 K450 F451 A452 GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA

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

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

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

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

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

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

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

VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ASP ALA GLY GLU LEU MET LEU SER GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 3:

13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP GLN HIS GLY ARG LEU LEU SER SER GLY SER GLN ASP PRO **A255** **S256** **A257** **A258** **R259** **R260** **K261** **E262** **Q263** **E264** **R267** **S268** **Q269** **E270** **Q271** **R274** **E275** **K276** **I277** **D278** **L285** **G286** **Y287** **D295** **I296**

D299 **F300** **D311** **P312** **N313** **R318** **N327** ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ALA SER ILE PRO GLN ASP VAL ALA ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN SER **V367** **S371** **E376** **Q387** **T395** **V396** **S397**

V398 **D402** ARG ARG GLN VAL ASN PRO ASP THR GLY VAL THR THR TYR THR PRO ALA **M418** **S419** **E420** **S421** **G432** **D437** **Q438** **G439** **R440** **L443** **V446** **K450** **F451** **A452** GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG

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

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

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

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

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

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

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

VAL ALA ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLY GLU LEU MET LEU SER GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 4:

13% 85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 5:

13%   85%

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

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

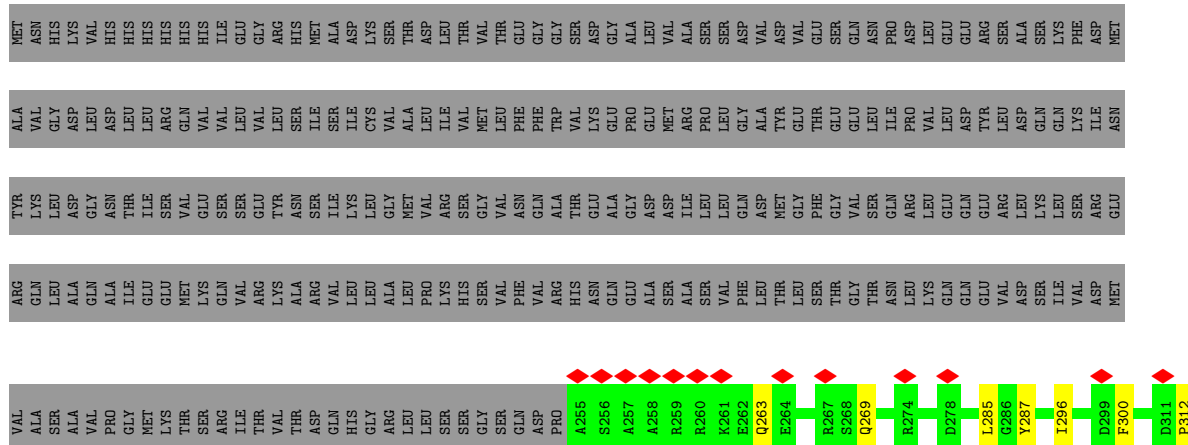VAL ALA SER VAL PRO GLY MET LYS SER THR SER ARG ILE THR VAL ASP GLN HIS GLY ARG LEU SER LEU SER GLY SER GLN ASP PRO **A255** **S256** **A257** **A258** **R259** **R260** **K261** **E262** **Q263** **E264** ILE PRO GLN **R267** **S268** **Q269** **E270** **Q271** MET GLY SER **R274** **E275** **K276** **I277** **D278** THR GLY **L285** **G286** **Y287** ASN **I296** LYS GLN GLU **D299**

F300 **D311** **P312** **N313** **R318** **N327** ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER **V367** **S371** GLU **E376** **Q387** **T395** **V396** **S397** **V398**

D402 ARG ARG GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO **M418** **S419** **E420** **S421** **G432** **D437** **Q438** **G439** **L443** **V446** **K450** **F451** **A452** GLU PRO GLU ALA GLU GLN LEU GLU GLY PRO ILE TRP GLY HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE

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

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

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

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

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

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

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

ASP VAL GLU ALA GLN GLU LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLY GLU GLU LEU MET LEU SER GLY GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 6:　　　13%　　　85%

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

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

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

ARG GLN LEU GLN ALA GLN ILE GLU GLU MET LYS GLN VAL ARG LYS ARG VAL ALA ARG VAL LEU LEU ALA LEU PRO HIS SER VAL PHE VAL ARG HIS ASN GLN GLU ALA GLU SER ALA VAL PHE LEU THR LEU SER THR GLY THR ASN LEU LYS GLN GLU GLU VAL ASP SER ILE VAL ASP MET
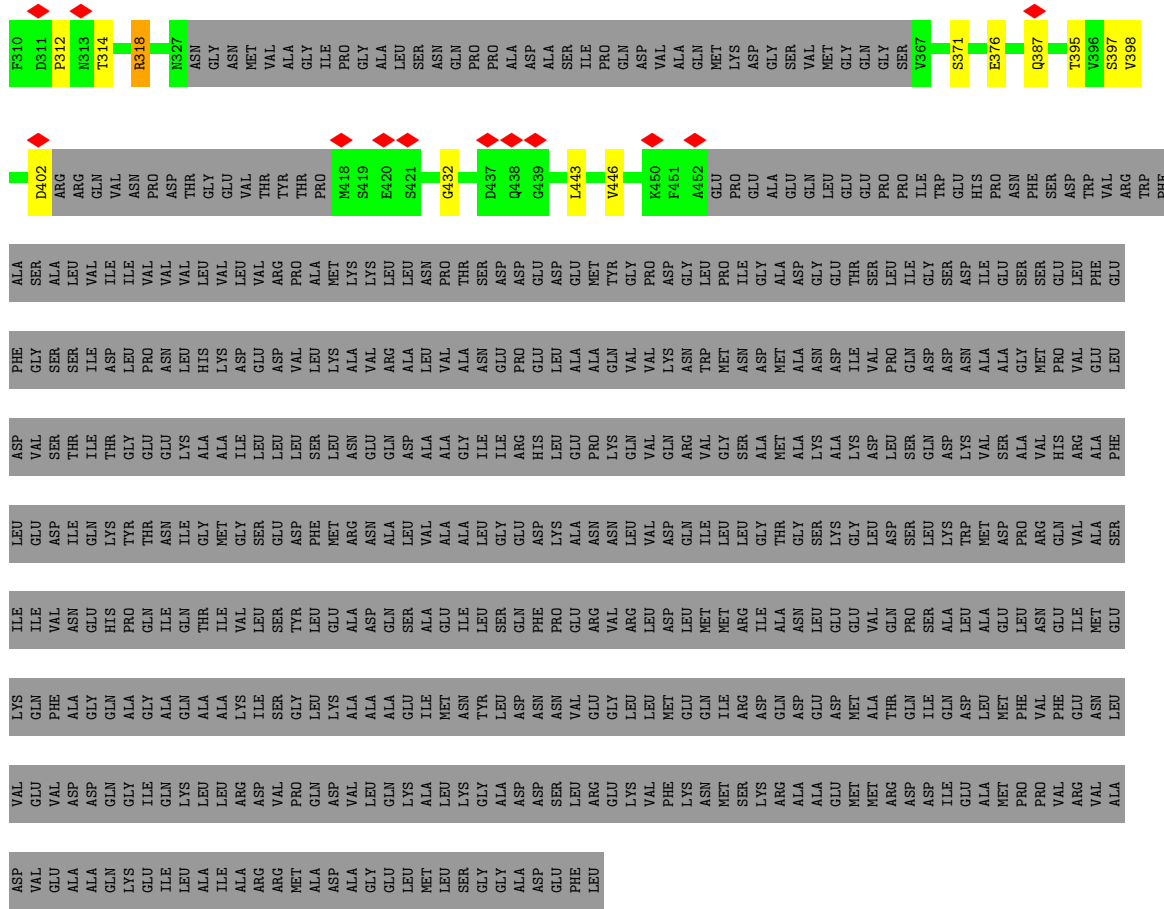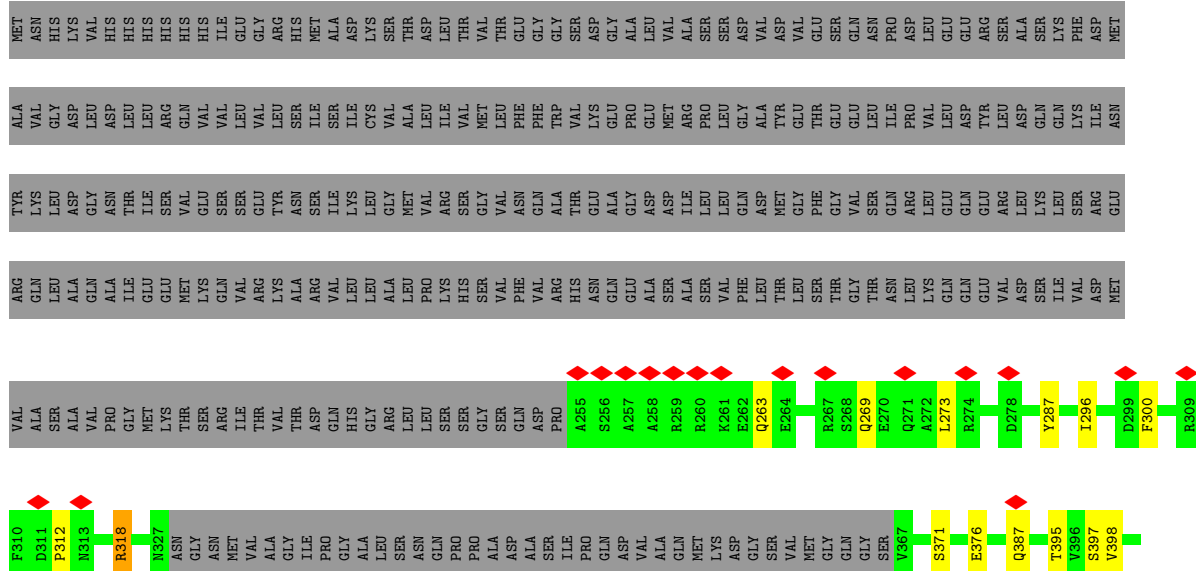
• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 7: 13% 85%

N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER V367 S371 E376 Q387 T395 V396 S397 V398 D402 ARG

ARG GLN VAL ASN PRO ASP THR GLY GLU VAL VAL THR TYR THR PRO M418 S419 E420 S421 G432 D437 Q438 G439 L443 V446 K450 F451 A452 GLU PRO GLU ALA GLU LEU GLU GLU PRO PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA SER ALA

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

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

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

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

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

ALA GLY GLN GLY ALA GLY ALA GLN ALA ALA LYS ILE SER LEU GLY LYS ALA ALA ALA GLU ILE MET TYR LEU ASP ASN SER VAL GLU GLY LEU LEU MET MET ALA THR GLN ILE GLN ASP LEU MET ET PHE VAL PHE GLU ASN LEU VAL GLU VAL

ASP ASP GLN GLY ILE GLN GLY LYS LEU LEU LEU ARG ASP VAL PRO GLN GLN ASP VAL LEU LEU GLN LYS ALA LEU GLY ALA ASP SER SER LEU ARG GLU LYS VAL ASN MET SER LYS ARG ALA ALA GLU MET MET ARG ASP ASP ILE GLU GLU ALA MET PRO PRO VAL ARG VAL ALA ASP VAL GLU

ALA ALA GLN LYS GLU ILE LEU LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLY GLU LEU MET LEU SER GLY LEU ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 8: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL THR THR ASP GLN HIS GLY ARG LEU SER SER GLY GLN ASP A255 S256 A257 A258 R259 R260 K261 E262 Q263 E264 R267 S268 Q269 E270 Q271 R274 D278 Y287 I296 D299 F300 D311 P312

N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER V367 S371 E376 Q387 T395 V396 S397 V398 D402 ARG

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain 9: 13% 85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

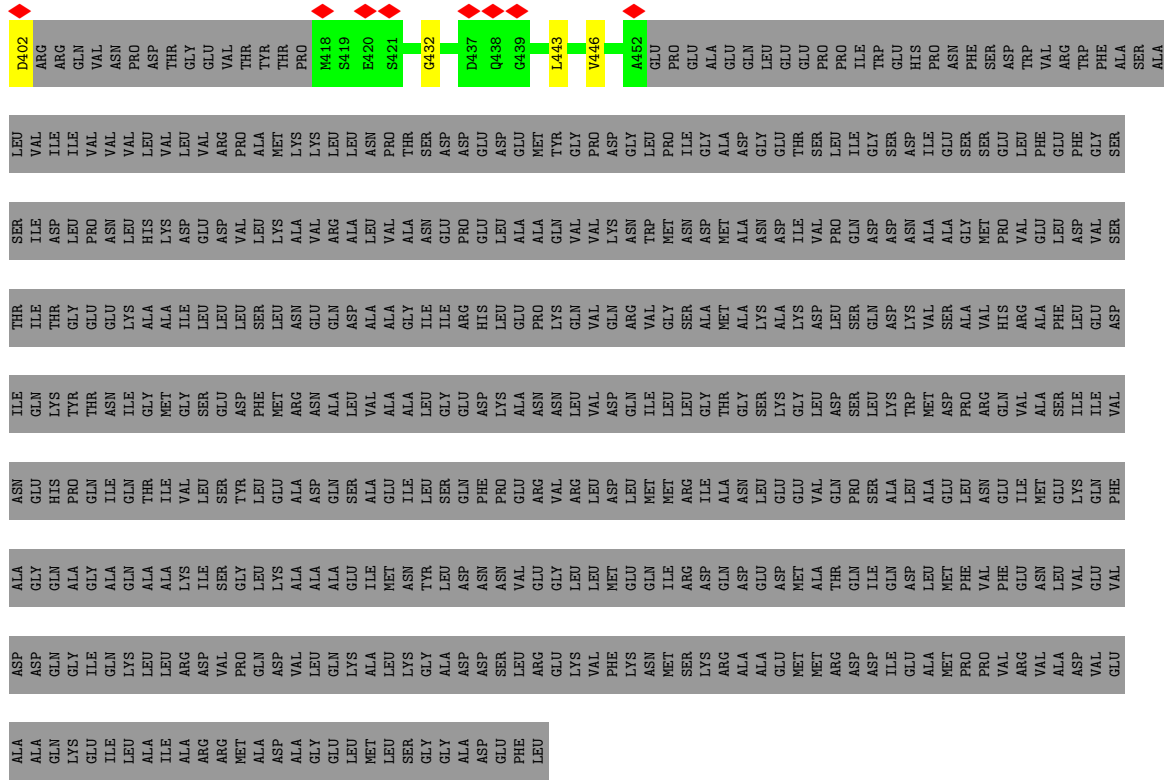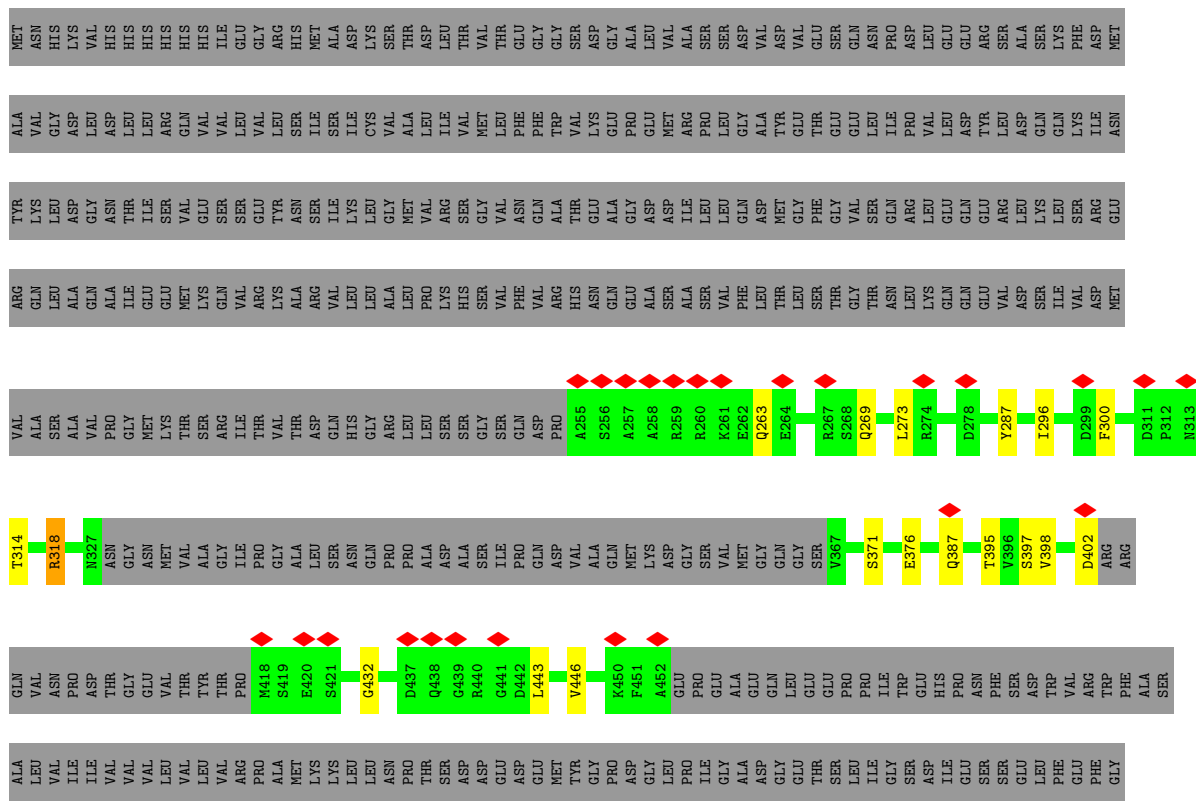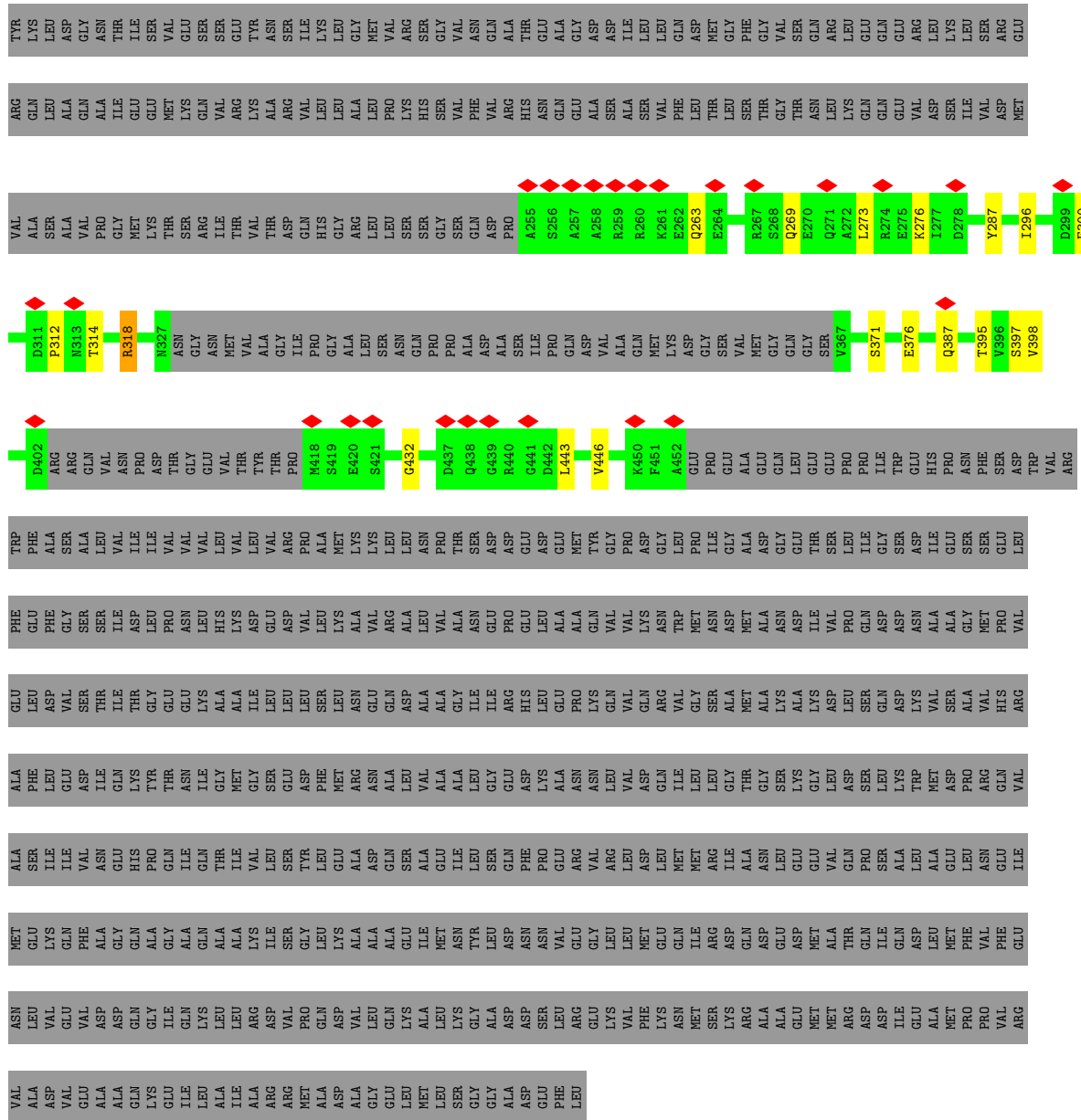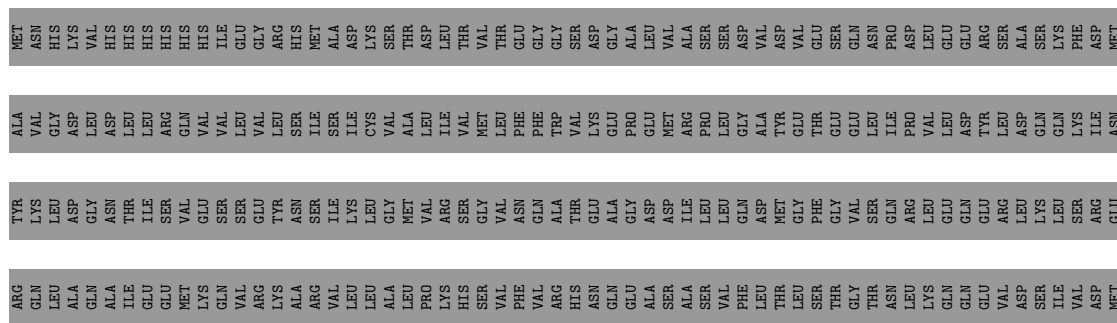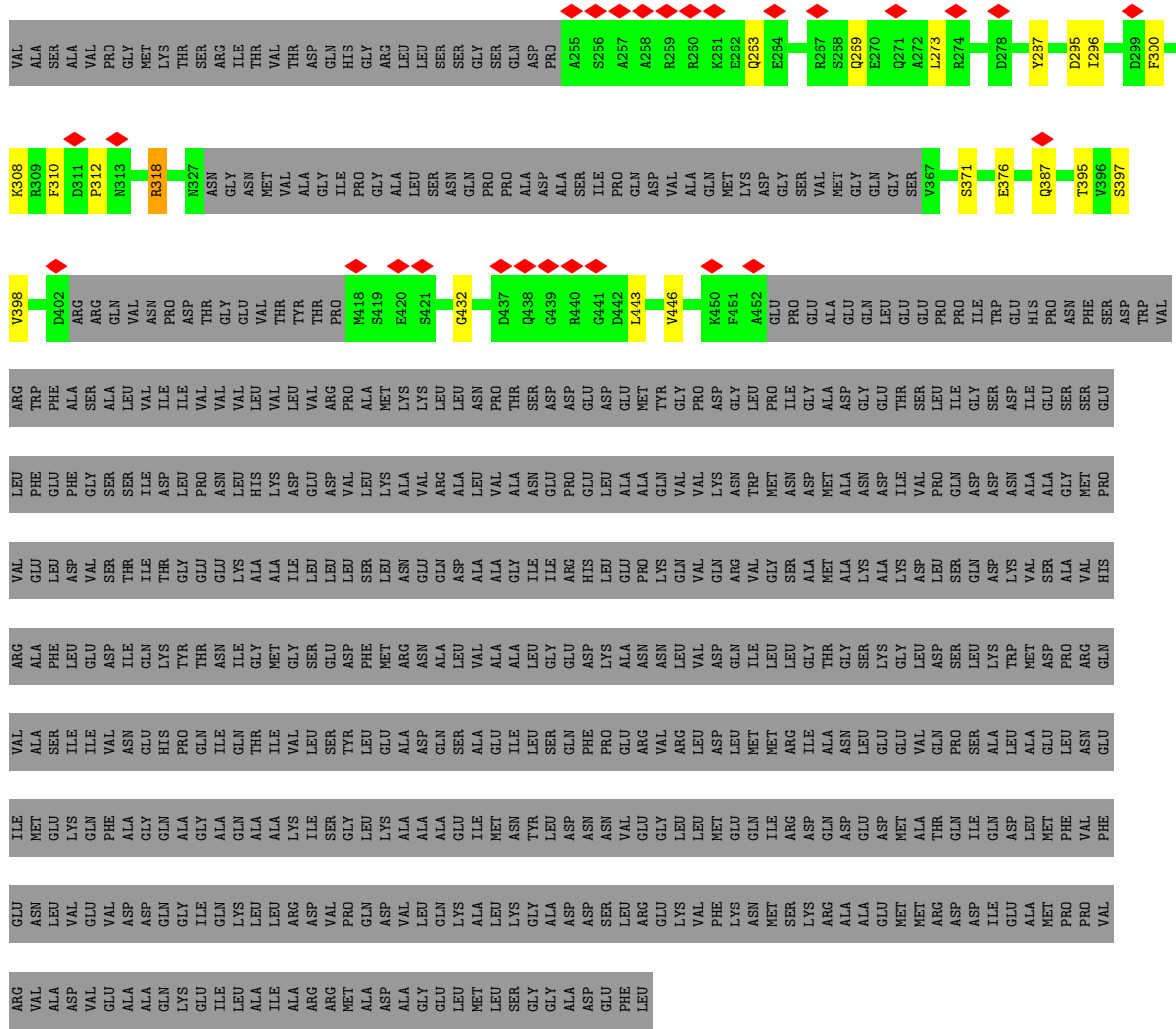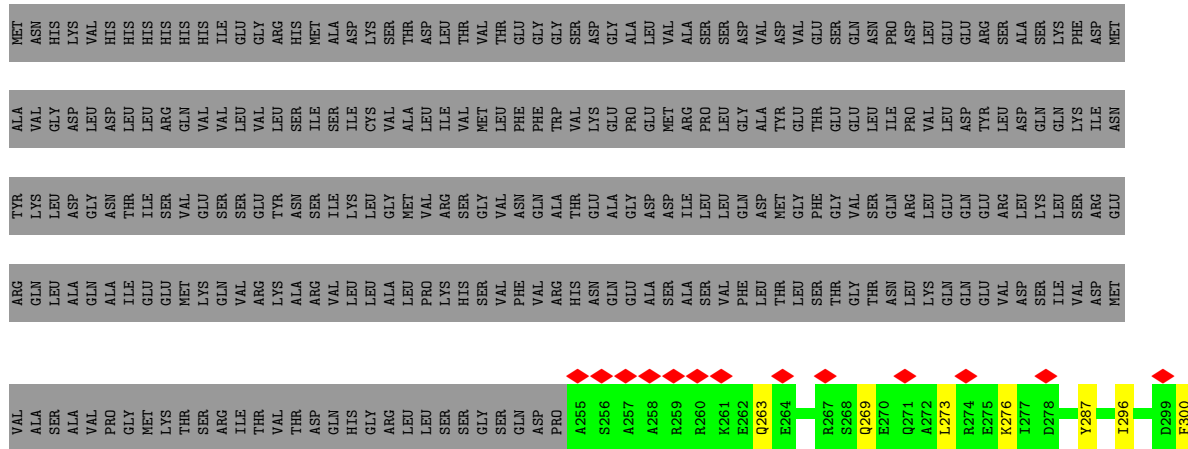Chain A: 13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain B: 13%   85%

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

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

VAL GLU ALA ALA ALA LYS GLU ILE LEU ILE ALA ARG MET ASP ALA GLY GLU LEU MET LEU SER GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain C: 13%   85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL THR ASP THR GLN HIS GLY ARG LEU LEU SER SER GLY SER GLN ASP PRO ◆A255 ◆S256 ◆A257 ◆A258 ◆R259 ◆R260 K261 E262 Q263 E264 ◆R267 S268 Q269 E270 Q271 ◆R274 E275 K276 I277 D278 Y287 I296 ◆D299 F300

◆D311 ◆P312 N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER V367 S371 E376 Q387 T395 V396 S397 V398

◆D402 ARG ARG GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO ◆M418 ◆S419 ◆E420 ◆S421 G432 ◆D437 ◆Q438 ◆G439 R440 ◆G441 D442 L443 V446 ◆K450 F451 ◆A452 GLU PRO GLY ALA GLU GLN LEU GLU GLU PRO PRO ILE TRP GLU PRO ASN PHE SER ASP TRP VAL ARG TRP

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

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

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

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

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

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

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

ALA ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG MET ALA ASP ALA GLY GLU LEU MET SER GLY GLY ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain D: 13%   85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL THR ASP GLN HIS GLY ARG LEU LEU SER SER GLY SER GLN ASP PRO **A255** **S256** **A257** **A258** **R259** **R260** **K261** **E262** **Q263** **E264** **R267** **S268** **Q269** **E270** **Q271** **A272** **L273** **R274** **D278** **Y287** **I296** **D299** **F300** **D311**

P312 **N313** **T314** **R318** **N327** ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER **V367** **S371** **E376** **Q387** **T395** **V396** **S397** **V398** **D402**

ARG ARG GLN VAL ASN PRO ASP THR GLY VAL GLU VAL THR TYR THR PRO **M418** **S419** **E420** **S421** **G432** **D437** **Q438** **G439** **R440** **G441** **D442** **L443** **V446** **K450** **F451** **A452** GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE

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

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

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

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

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

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

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

ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG MET ALA ASP ALA GLY GLU LEU MET SER GLY GLY ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain E: 13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain F:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain G:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain H:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain I: 13% • 85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain J:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain K:

13% 85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain L: 13% 85%

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

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

VAL GLU ALA ALA GLN LYS ILE GLU ILE ALA ARG MET ASP ALA GLY GLU LEU MET LEU SER GLY ALA GLU PHE LEU

● Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain M: 13%   85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL THR ASP GLN HIS GLY ARG LEU LEU SER GLY SER GLN ASP **A255 S256 A257 A258 R259 R260 K261 E262 Q263 E264 R267 S268 Q269 E270 Q271 R274 D278 L285 G286 Y287 I296 D299 F300**

D311 P312 N313 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO ALA ASP SER ALA SER ILE PRO GLN ASP VAL ALA GLN GLN MET LYS ASP GLY SER VAL MET GLY GLN SER **V367** GLU **S371** GLU **E376** GLU GLY ARG GLU LEU LYS **Q387** LEU GLN GLU GLU VAL ASP **T395 V396 S397 V398** **D402**

ARG ARG GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO **M418 S419 E420 S421 G432 D437 Q438 G439 L443 V446 K450 F451 A452** GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA SER

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

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

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

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

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

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

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

GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLY GLU LEU MET SER GLY GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain N: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP GLN HIS GLY ARG LEU LEU SER SER GLY SER GLN ASP PRO **A255** **S256** **A257** **A258** **R259** **R260** **K261** **E262** Q263 **E264** **R267** S268 Q269 **E270** Q271 **R274** **D278** L285 G286 Y287 I296 **D299** **F300**

K308 **R309** **F310** **D311** P312 **N313** T314 **R318** **N327** ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLY SER **V367** S371 **E376** **Q387** **T395** **V396**

S397 **V398** **D402** ARG ARG GLN VAL ASN VAL ASP ASP THR GLY GLU VAL THR TYR THR PRO **M418** **S419** **E420** **S421** G432 **D437** **Q438** **G439** L443 V446 **K450** **F451** **A452** GLU PRO GLU ALA GLU GLN GLU LEU GLU GLU PRO PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG

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

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

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

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

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

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

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

VAL ALA ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLY GLU LEU MET SER GLY GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain O: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP GLN HIS GLY ARG LEU SER SER GLY SER ASP PRO A255 S256 A257 A258 R259 R260 K261 E262 Q263 E264 R267 S268 Q269 L273 R274 D278 Y287 I296 D299 F300 D311 P312 N313

T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP SER ALA SER ILE PRO GLN ASP VAL ALA GLN LYS MET LYS ASP SER GLY SER VAL MET GLY LEU GLY SER V367 S371 E376 Q387 T395 V396 S397 V398 D402 ARG ARG

GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO M418 S419 E420 S421 G432 D437 Q438 G439 L443 V446 K450 F451 A452 GLU PRO GLU ALA GLU GLN LEU GLU GLU GLU PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA SER ALA LEU

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

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

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

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

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

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

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

ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG MET ALA ASP ALA GLY GLU LEU MET LEU SER GLY GLY ALA ASP PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain P:

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain Q:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain R:

13%   85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain T:　13%　　　　　　　85%

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain U:

13%　　　　　　　　　　　　　　85%

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

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

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

ASN LEU VAL GLU VAL ASP GLN GLY GLN LYS ILE LEU GLU LEU ARG ASP VAL PRO GLN ASP VAL GLN LYS ALA LEU LYS GLY ALA ASP SER ER SER LEU ARG GLU LYS VAL PHE ASN MET SER ARG ALA ALA GLU MET MET ARG ASP ILE GLU ALA MET PRO VAL ARG

VAL ALA ASP GLU VAL GLN ALA GLN GLY LYS GLU ILE LEU ILE ALA ILE ALA ARG ARG MET ALA ASP ALA GLU GLY LEU MET LEU LEU SER GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain V: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP ASP GLN HIS GLY ARG LEU LEU SER SER GLN ASP PRO A255 S256 A257 A258 R259 R260 K261 E262 Q263 E264 R267 S268 Q269 E270 Q271 R274 D278 Y287 I296 D299 F300 D311 P312

N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER V367 S371 E376 Q387 T395 V396 S397 V398 D402 ARG

ARG GLN VAL VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO M418 S419 E420 S421 G432 D437 Q438 G439 R440 G441 D442 L443 V446 K450 F451 A452 GLU PRO GLU ALA GLU GLN GLU LEU GLU GLU PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA

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

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

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

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

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

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

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

VAL GLU ALA ALA GLN LYS ILE LEU ILE ALA ARG MET ASP ALA GLY GLU LEU MET LEU SER GLY ALA GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain W: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP THR GLN HIS GLY ARG LEU LEU SER GLY SER GLN ASP **PRO** **A255** **S256** **A257** **A258** **R259** **R260** **K261** **E262** **Q263** **E264** **R267** **S268** **Q269** **E270** **Q271** **R274** **D278** **Y287** **I296** **D299** **F300** **K308** **R309**

F310 **D311** **P312** **N313** **T314** **R318** **N327** ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP SER ALA SER ILE PRO GLN ASP VAL VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER **V367** **S371** **E376** **Q387** **T395** **V396** **S397** **V398**

D402 ARG ARG GLN VAL ASN PRO ASP THR GLY GLU VAL THR TYR THR PRO **M418** **S419** **E420** **S421** **E422** **I423** **G432** **D437** **Q438** **G439** **R440** **L443** **V446** **K450** **F451** **A452** GLU PRO GLU ALA GLU GLN LEU GLU GLY PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL

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

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

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

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

ILE MET GLU LYS GLN PHE ALA GLY GLN ALA GLY ALA GLN ALA ALA LYS ILE LEU SER GLY LEU LYS ALA ALA GLU ILE MET ASN TYR LEU ASP ALA ASN GLN GLY ILE LEU ASP MET ASN ILE GLN ASP LEU MET GLU PHE VAL PHE

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

ARG VAL ALA ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG ARG MET ALA ASP ALA GLU GLU LEU MET LEU SER GLY GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain X: 13% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP GLN HIS GLY ARG LEU SER SER GLY SER ASP GLN PRO 🔶A255 🔶S256 🔶A257 🔶A258 🔶R259 🔶R260 🔶K261 🔶E262 Q263 🔶E264 🔶R267 S268 Q269 E270 🔶Q271 A272 L273 🔶R274 🔶D278 Y287 I296 🔶D299 F300 K308

🔶R309 F310 🔶D311 P312 🔶N313 T314 🔶R318 🔶N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO ALA ASP ALA SER ILE PRO GLN ASP PRO VAL THR GLY VAL VAL THR THR PRO 🔶V367 S371 E376 🔶Q387 T395 V396 S397

V398 🔶D402 ARG ARG GLN VAL ASN PRO ASP THR GLY VAL THR THR TYR THR PRO 🔶M418 🔶S419 🔶E420 🔶S421 G432 🔶D437 🔶Q438 🔶G439 R440 🔶G441 D442 L443 🔶V446 🔶K450 F451 A452 GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO PRO ILE TRP GLU HIS GLU ASP ASN PHE SER ASP TRP VAL

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

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

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

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

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

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

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

ARG VAL ALA ASP VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG MET ALA ASP ALA GLY GLU MET LEU SER GLY GLY ALA ASP GLU PHE LEU

• Molecule 1: Flagellar M-ring protein,Flagellar motor switch protein FliG

Chain Y: 14% 85%

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

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

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

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

VAL ALA SER ALA VAL PRO GLY MET LYS THR SER ARG ILE THR VAL ASP GLN GLN HIS GLY ARG LEU LEU SER SER GLY SER GLN ASP PRO 🔶A255 🔶S256 🔶A257 🔶A258 🔶R259 🔶R260 🔶K261 E262 Q263 🔶E264 🔶R267 S268 Q269 🔶E270 🔶Q271 🔶R274 🔶D278 Y287 I296 🔶D299 F300 🔶R309 F310

🔶D311 🔶P312 N313 T314 R318 N327 ASN GLY ASN MET VAL ALA GLY ILE PRO GLY ALA LEU SER ASN GLN PRO PRO ALA ASP ALA SER ILE PRO GLN ASP VAL ALA GLN MET LYS ASP GLY SER VAL MET GLY GLN GLY SER V367 S371 E376 🔶Q387 T395 V396 S397 V398

🔶D402 ARG ARG GLN VAL ASN ASP ASP THR GLY GLU VAL THR TYR THR PRO 🔶M418 🔶S419 🔶E420 🔶S421 G432 🔶D437 🔶Q438 🔶G439 L443 V446 🔶K450 🔶F451 A452 GLU PRO GLU ALA GLU GLN LEU GLU GLU PRO PRO ILE TRP GLU HIS PRO ASN PHE SER ASP TRP VAL ARG TRP PHE ALA

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

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

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

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

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

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

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

VAL GLU ALA ALA GLN LYS GLU ILE LEU ALA ILE ALA ARG MET LEU ALA ASP ALA GLY GLU LEU MET LEU SER GLY GLY ALA ASP GLU PHE LEU

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C34	Depositor
Number of particles used	43546	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	49.7	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	1700	Depositor
Magnification	64000	Depositor
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	1.398	Depositor
Minimum map value	-0.702	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.032	Depositor
Recommended contour level	0.45	Depositor
Map size (Å)	684.0, 684.0, 684.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.14, 1.14, 1.14	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	1	0.24	0/1153	0.52	0/1550
1	2	0.24	0/1153	0.52	0/1550
1	3	0.24	0/1153	0.52	0/1550
1	4	0.24	0/1153	0.52	0/1550
1	5	0.24	0/1153	0.52	0/1550
1	6	0.24	0/1153	0.52	0/1550
1	7	0.24	0/1153	0.52	0/1550
1	8	0.24	0/1153	0.52	0/1550
1	9	0.24	0/1153	0.52	0/1550
1	A	0.24	0/1153	0.52	0/1550
1	B	0.24	0/1153	0.52	0/1550
1	C	0.24	0/1153	0.52	0/1550
1	D	0.24	0/1153	0.52	0/1550
1	E	0.24	0/1153	0.52	0/1550
1	F	0.24	0/1153	0.52	0/1550
1	G	0.24	0/1153	0.52	0/1550
1	H	0.24	0/1153	0.52	0/1550
1	I	0.24	0/1153	0.52	0/1550
1	J	0.24	0/1153	0.52	0/1550
1	K	0.24	0/1153	0.52	0/1550
1	L	0.24	0/1153	0.52	0/1550
1	M	0.24	0/1153	0.52	0/1550
1	N	0.24	0/1153	0.52	0/1550
1	O	0.24	0/1153	0.52	0/1550
1	P	0.24	0/1153	0.52	0/1550
1	Q	0.24	0/1153	0.52	0/1550
1	R	0.24	0/1153	0.52	0/1550
1	S	0.24	0/1153	0.52	0/1550
1	T	0.24	0/1153	0.52	0/1550
1	U	0.24	0/1153	0.52	0/1550
1	V	0.24	0/1153	0.52	0/1550
1	W	0.24	0/1153	0.52	0/1550
1	X	0.24	0/1153	0.52	0/1550
1	Y	0.24	0/1153	0.52	0/1550

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
All	All	0.24	0/39202	0.52	0/52700

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	1	1143	0	1135	13	0
1	2	1143	0	1135	13	0
1	3	1143	0	1135	14	0
1	4	1143	0	1135	14	0
1	5	1143	0	1135	13	0
1	6	1143	0	1135	13	0
1	7	1143	0	1135	13	0
1	8	1143	0	1135	12	0
1	9	1143	0	1135	14	0
1	A	1143	0	1135	14	0
1	B	1143	0	1135	12	0
1	C	1143	0	1135	14	0
1	D	1143	0	1135	14	0
1	E	1143	0	1135	14	0
1	F	1143	0	1135	13	0
1	G	1143	0	1135	14	0
1	H	1143	0	1135	14	0
1	I	1143	0	1135	13	0
1	J	1143	0	1135	13	0
1	K	1143	0	1135	14	0
1	L	1143	0	1135	13	0
1	M	1143	0	1135	13	0
1	N	1143	0	1135	14	0
1	O	1143	0	1135	14	0
1	P	1143	0	1135	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	Q	1143	0	1135	14	0
1	R	1143	0	1135	14	0
1	S	1143	0	1135	13	0
1	T	1143	0	1135	12	0
1	U	1143	0	1135	13	0
1	V	1143	0	1135	12	0
1	W	1143	0	1135	13	0
1	X	1143	0	1135	14	0
1	Y	1143	0	1135	11	0
All	All	38862	0	38590	315	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 4.

All (315) 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)
1:4:395:THR:HG22	1:4:443:LEU:HB3	1.83	0.61
1:2:395:THR:HG22	1:2:443:LEU:HB3	1.83	0.61
1:8:395:THR:HG22	1:8:443:LEU:HB3	1.83	0.61
1:1:395:THR:HG22	1:1:443:LEU:HB3	1.83	0.61
1:5:395:THR:HG22	1:5:443:LEU:HB3	1.83	0.61
1:6:395:THR:HG22	1:6:443:LEU:HB3	1.83	0.61
1:A:395:THR:HG22	1:A:443:LEU:HB3	1.83	0.61
1:Y:395:THR:HG22	1:Y:443:LEU:HB3	1.83	0.61
1:7:395:THR:HG22	1:7:443:LEU:HB3	1.83	0.61
1:9:395:THR:HG22	1:9:443:LEU:HB3	1.83	0.61
1:C:395:THR:HG22	1:C:443:LEU:HB3	1.83	0.61
1:3:395:THR:HG22	1:3:443:LEU:HB3	1.83	0.60
1:W:395:THR:HG22	1:W:443:LEU:HB3	1.83	0.60
1:B:395:THR:HG22	1:B:443:LEU:HB3	1.83	0.60
1:D:395:THR:HG22	1:D:443:LEU:HB3	1.83	0.60
1:U:395:THR:HG22	1:U:443:LEU:HB3	1.83	0.60
1:X:395:THR:HG22	1:X:443:LEU:HB3	1.83	0.60
1:E:395:THR:HG22	1:E:443:LEU:HB3	1.83	0.60
1:F:395:THR:HG22	1:F:443:LEU:HB3	1.83	0.60
1:S:395:THR:HG22	1:S:443:LEU:HB3	1.83	0.60
1:V:395:THR:HG22	1:V:443:LEU:HB3	1.83	0.60
1:H:395:THR:HG22	1:H:443:LEU:HB3	1.83	0.60
1:G:395:THR:HG22	1:G:443:LEU:HB3	1.83	0.60
1:Q:395:THR:HG22	1:Q:443:LEU:HB3	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:395:THR:HG22	1:T:443:LEU:HB3	1.83	0.60
1:J:395:THR:HG22	1:J:443:LEU:HB3	1.83	0.59
1:R:395:THR:HG22	1:R:443:LEU:HB3	1.83	0.59
1:N:395:THR:HG22	1:N:443:LEU:HB3	1.83	0.59
1:I:395:THR:HG22	1:I:443:LEU:HB3	1.83	0.59
1:O:395:THR:HG22	1:O:443:LEU:HB3	1.83	0.59
1:P:395:THR:HG22	1:P:443:LEU:HB3	1.83	0.59
1:L:395:THR:HG22	1:L:443:LEU:HB3	1.83	0.59
1:M:395:THR:HG22	1:M:443:LEU:HB3	1.83	0.59
1:K:395:THR:HG22	1:K:443:LEU:HB3	1.83	0.59
1:S:269:GLN:NE2	1:T:263:GLN:OE1	2.37	0.54
1:Q:269:GLN:NE2	1:R:263:GLN:OE1	2.37	0.54
1:N:269:GLN:NE2	1:O:263:GLN:OE1	2.37	0.53
1:T:269:GLN:NE2	1:U:263:GLN:OE1	2.38	0.53
1:O:269:GLN:NE2	1:P:263:GLN:OE1	2.38	0.52
1:R:269:GLN:NE2	1:S:263:GLN:OE1	2.37	0.52
1:U:269:GLN:NE2	1:V:263:GLN:OE1	2.37	0.52
1:M:269:GLN:NE2	1:N:263:GLN:OE1	2.39	0.52
1:X:269:GLN:NE2	1:Y:263:GLN:OE1	2.37	0.52
1:J:269:GLN:NE2	1:K:263:GLN:OE1	2.37	0.52
1:V:269:GLN:NE2	1:W:263:GLN:OE1	2.39	0.52
1:L:269:GLN:NE2	1:M:263:GLN:OE1	2.38	0.52
1:P:269:GLN:NE2	1:Q:263:GLN:OE1	2.39	0.52
1:1:269:GLN:NE2	1:2:263:GLN:OE1	2.37	0.51
1:K:269:GLN:NE2	1:L:263:GLN:OE1	2.39	0.51
1:I:269:GLN:NE2	1:J:263:GLN:OE1	2.38	0.51
1:W:269:GLN:NE2	1:X:263:GLN:OE1	2.39	0.50
1:G:269:GLN:NE2	1:H:263:GLN:OE1	2.38	0.50
1:2:269:GLN:NE2	1:3:263:GLN:OE1	2.38	0.50
1:H:269:GLN:NE2	1:I:263:GLN:OE1	2.39	0.50
1:3:269:GLN:NE2	1:4:263:GLN:OE1	2.39	0.49
1:F:269:GLN:NE2	1:G:263:GLN:OE1	2.39	0.49
1:E:269:GLN:NE2	1:F:263:GLN:OE1	2.38	0.49
1:4:269:GLN:NE2	1:5:263:GLN:OE1	2.38	0.49
1:1:269:GLN:HB3	1:1:296:ILE:HD13	1.95	0.48
1:D:269:GLN:NE2	1:E:263:GLN:OE1	2.38	0.48
1:O:269:GLN:HB3	1:O:296:ILE:HD13	1.95	0.48
1:4:269:GLN:HB3	1:4:296:ILE:HD13	1.95	0.48
1:B:269:GLN:NE2	1:C:263:GLN:OE1	2.38	0.48
1:J:269:GLN:HB3	1:J:296:ILE:HD13	1.95	0.48
1:L:269:GLN:HB3	1:L:296:ILE:HD13	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:W:269:GLN:HB3	1:W:296:ILE:HD13	1.95	0.48
1:G:269:GLN:HB3	1:G:296:ILE:HD13	1.95	0.48
1:R:269:GLN:HB3	1:R:296:ILE:HD13	1.96	0.48
1:7:269:GLN:HB3	1:7:296:ILE:HD13	1.95	0.48
1:I:269:GLN:HB3	1:I:296:ILE:HD13	1.95	0.48
1:M:269:GLN:HB3	1:M:296:ILE:HD13	1.95	0.48
1:U:269:GLN:HB3	1:U:296:ILE:HD13	1.95	0.48
1:3:269:GLN:HB3	1:3:296:ILE:HD13	1.96	0.48
1:6:269:GLN:HB3	1:6:296:ILE:HD13	1.95	0.48
1:T:269:GLN:HB3	1:T:296:ILE:HD13	1.95	0.48
1:7:269:GLN:NE2	1:8:263:GLN:OE1	2.38	0.48
1:A:269:GLN:HB3	1:A:296:ILE:HD13	1.95	0.48
1:D:269:GLN:HB3	1:D:296:ILE:HD13	1.96	0.48
1:F:269:GLN:HB3	1:F:296:ILE:HD13	1.95	0.48
1:Y:269:GLN:HB3	1:Y:296:ILE:HD13	1.95	0.48
1:9:269:GLN:HB3	1:9:296:ILE:HD13	1.96	0.48
1:C:269:GLN:HB3	1:C:296:ILE:HD13	1.95	0.48
1:M:432:GLY:HA3	1:N:397:SER:HB3	1.96	0.48
1:T:432:GLY:HA3	1:U:397:SER:HB3	1.96	0.48
1:6:269:GLN:NE2	1:7:263:GLN:OE1	2.38	0.48
1:Q:269:GLN:HB3	1:Q:296:ILE:HD13	1.95	0.48
1:X:269:GLN:HB3	1:X:296:ILE:HD13	1.95	0.48
1:9:269:GLN:NE2	1:A:263:GLN:OE1	2.38	0.48
1:9:432:GLY:HA3	1:A:397:SER:HB3	1.95	0.48
1:P:269:GLN:HB3	1:P:296:ILE:HD13	1.95	0.48
1:A:269:GLN:NE2	1:B:263:GLN:OE1	2.38	0.47
1:2:269:GLN:HB3	1:2:296:ILE:HD13	1.95	0.47
1:5:269:GLN:NE2	1:6:263:GLN:OE1	2.39	0.47
1:G:432:GLY:HA3	1:H:397:SER:HB3	1.96	0.47
1:Q:432:GLY:HA3	1:R:397:SER:HB3	1.96	0.47
1:N:269:GLN:HB3	1:N:296:ILE:HD13	1.95	0.47
1:H:269:GLN:HB3	1:H:296:ILE:HD13	1.95	0.47
1:S:432:GLY:HA3	1:T:397:SER:HB3	1.96	0.47
1:V:269:GLN:HB3	1:V:296:ILE:HD13	1.96	0.47
1:I:432:GLY:HA3	1:J:397:SER:HB3	1.96	0.47
1:5:269:GLN:HB3	1:5:296:ILE:HD13	1.95	0.47
1:B:432:GLY:HA3	1:C:397:SER:HB3	1.96	0.47
1:V:432:GLY:HA3	1:W:397:SER:HB3	1.97	0.47
1:3:432:GLY:HA3	1:4:397:SER:HB3	1.96	0.47
1:B:269:GLN:HB3	1:B:296:ILE:HD13	1.95	0.47
1:C:269:GLN:NE2	1:D:263:GLN:OE1	2.39	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:269:GLN:HB3	1:E:296:ILE:HD13	1.95	0.47
1:F:432:GLY:HA3	1:G:397:SER:HB3	1.96	0.47
1:K:269:GLN:HB3	1:K:296:ILE:HD13	1.96	0.47
1:S:269:GLN:HB3	1:S:296:ILE:HD13	1.95	0.47
1:8:269:GLN:HB3	1:8:296:ILE:HD13	1.95	0.47
1:8:269:GLN:NE2	1:9:263:GLN:OE1	2.39	0.47
1:K:432:GLY:HA3	1:L:397:SER:HB3	1.97	0.47
1:W:432:GLY:HA3	1:X:397:SER:HB3	1.97	0.47
1:1:397:SER:HB3	1:Y:432:GLY:HA3	1.97	0.47
1:O:432:GLY:HA3	1:P:397:SER:HB3	1.96	0.47
1:P:432:GLY:HA3	1:Q:397:SER:HB3	1.97	0.47
1:C:432:GLY:HA3	1:D:397:SER:HB3	1.96	0.47
1:E:432:GLY:HA3	1:F:397:SER:HB3	1.97	0.47
1:J:432:GLY:HA3	1:K:397:SER:HB3	1.97	0.46
1:5:432:GLY:HA3	1:6:397:SER:HB3	1.96	0.46
1:K:398:VAL:HB	1:K:446:VAL:HG22	1.98	0.46
1:N:398:VAL:HB	1:N:446:VAL:HG22	1.98	0.46
1:N:432:GLY:HA3	1:O:397:SER:HB3	1.98	0.46
1:P:398:VAL:HB	1:P:446:VAL:HG22	1.98	0.46
1:I:398:VAL:HB	1:I:446:VAL:HG22	1.98	0.46
1:J:398:VAL:HB	1:J:446:VAL:HG22	1.98	0.46
1:M:398:VAL:HB	1:M:446:VAL:HG22	1.98	0.46
1:R:398:VAL:HB	1:R:446:VAL:HG22	1.98	0.46
1:S:398:VAL:HB	1:S:446:VAL:HG22	1.98	0.46
1:T:398:VAL:HB	1:T:446:VAL:HG22	1.98	0.46
1:G:398:VAL:HB	1:G:446:VAL:HG22	1.98	0.46
1:H:398:VAL:HB	1:H:446:VAL:HG22	1.98	0.46
1:H:432:GLY:HA3	1:I:397:SER:HB3	1.98	0.46
1:L:398:VAL:HB	1:L:446:VAL:HG22	1.98	0.46
1:O:398:VAL:HB	1:O:446:VAL:HG22	1.98	0.46
1:Q:398:VAL:HB	1:Q:446:VAL:HG22	1.98	0.46
1:U:398:VAL:HB	1:U:446:VAL:HG22	1.98	0.46
1:V:398:VAL:HB	1:V:446:VAL:HG22	1.98	0.46
1:X:432:GLY:HA3	1:Y:397:SER:HB3	1.96	0.46
1:D:432:GLY:HA3	1:E:397:SER:HB3	1.97	0.46
1:F:398:VAL:HB	1:F:446:VAL:HG22	1.98	0.46
1:W:398:VAL:HB	1:W:446:VAL:HG22	1.98	0.46
1:6:398:VAL:HB	1:6:446:VAL:HG22	1.98	0.46
1:8:398:VAL:HB	1:8:446:VAL:HG22	1.98	0.46
1:B:398:VAL:HB	1:B:446:VAL:HG22	1.98	0.46
1:C:398:VAL:HB	1:C:446:VAL:HG22	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:398:VAL:HB	1:E:446:VAL:HG22	1.98	0.46
1:X:398:VAL:HB	1:X:446:VAL:HG22	1.98	0.46
1:8:432:GLY:HA3	1:9:397:SER:HB3	1.97	0.46
1:A:398:VAL:HB	1:A:446:VAL:HG22	1.98	0.46
1:Y:398:VAL:HB	1:Y:446:VAL:HG22	1.98	0.46
1:1:398:VAL:HB	1:1:446:VAL:HG22	1.98	0.46
1:2:398:VAL:HB	1:2:446:VAL:HG22	1.98	0.46
1:3:398:VAL:HB	1:3:446:VAL:HG22	1.98	0.46
1:4:398:VAL:HB	1:4:446:VAL:HG22	1.98	0.46
1:5:398:VAL:HB	1:5:446:VAL:HG22	1.98	0.46
1:7:398:VAL:HB	1:7:446:VAL:HG22	1.98	0.46
1:9:398:VAL:HB	1:9:446:VAL:HG22	1.98	0.46
1:D:398:VAL:HB	1:D:446:VAL:HG22	1.98	0.46
1:1:263:GLN:OE1	1:Y:269:GLN:NE2	2.44	0.45
1:6:432:GLY:HA3	1:7:397:SER:HB3	1.97	0.45
1:U:432:GLY:HA3	1:V:397:SER:HB3	1.97	0.45
1:1:432:GLY:HA3	1:2:397:SER:HB3	1.98	0.45
1:L:432:GLY:HA3	1:M:397:SER:HB3	1.98	0.45
1:7:432:GLY:HA3	1:8:397:SER:HB3	1.97	0.45
1:R:432:GLY:HA3	1:S:397:SER:HB3	1.98	0.45
1:2:432:GLY:HA3	1:3:397:SER:HB3	1.97	0.45
1:4:432:GLY:HA3	1:5:397:SER:HB3	1.97	0.45
1:1:387:GLN:HG3	1:2:300:PHE:HB2	1.98	0.45
1:D:273:LEU:HD12	1:D:273:LEU:HA	1.89	0.44
1:A:432:GLY:HA3	1:B:397:SER:HB3	1.98	0.44
1:F:387:GLN:HG3	1:G:300:PHE:HB2	2.00	0.44
1:9:387:GLN:HG3	1:A:300:PHE:HB2	2.00	0.44
1:P:273:LEU:HD12	1:P:273:LEU:HA	1.89	0.44
1:I:273:LEU:HD12	1:I:273:LEU:HA	1.89	0.44
1:M:387:GLN:HG3	1:N:300:PHE:HB2	2.00	0.44
1:G:387:GLN:HG3	1:H:300:PHE:HB2	2.00	0.44
1:Q:387:GLN:HG3	1:R:300:PHE:HB2	2.00	0.44
1:P:276:LYS:NZ	1:Q:295:ASP:OD1	2.35	0.44
1:9:276:LYS:NZ	1:A:295:ASP:OD1	2.36	0.44
1:X:387:GLN:HG3	1:Y:300:PHE:HB2	2.00	0.44
1:4:387:GLN:HG3	1:5:300:PHE:HB2	2.00	0.43
1:4:273:LEU:HD12	1:4:273:LEU:HA	1.89	0.43
1:N:387:GLN:HG3	1:O:300:PHE:HB2	2.00	0.43
1:6:387:GLN:HG3	1:7:300:PHE:HB2	2.00	0.43
1:R:387:GLN:HG3	1:S:300:PHE:HB2	2.01	0.43
1:T:387:GLN:HG3	1:U:300:PHE:HB2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:387:GLN:HG3	1:C:300:PHE:HB2	2.01	0.43
1:E:273:LEU:HD12	1:E:273:LEU:HA	1.89	0.43
1:L:387:GLN:HG3	1:M:300:PHE:HB2	2.01	0.43
1:S:387:GLN:HG3	1:T:300:PHE:HB2	2.01	0.43
1:W:387:GLN:HG3	1:X:300:PHE:HB2	2.01	0.43
1:A:387:GLN:HG3	1:B:300:PHE:HB2	2.01	0.43
1:G:276:LYS:NZ	1:H:295:ASP:OD1	2.36	0.43
1:I:387:GLN:HG3	1:J:300:PHE:HB2	2.00	0.43
1:8:387:GLN:HG3	1:9:300:PHE:HB2	2.00	0.43
1:A:314:THR:HG23	1:B:312:PRO:HG3	2.01	0.43
1:3:387:GLN:HG3	1:4:300:PHE:HB2	2.00	0.43
1:5:387:GLN:HG3	1:6:300:PHE:HB2	2.01	0.43
1:C:387:GLN:HG3	1:D:300:PHE:HB2	2.00	0.43
1:J:314:THR:HG23	1:K:312:PRO:HG3	2.01	0.43
1:K:387:GLN:HG3	1:L:300:PHE:HB2	2.01	0.43
1:Q:273:LEU:HD12	1:Q:273:LEU:HA	1.89	0.43
1:J:273:LEU:HD12	1:J:273:LEU:HA	1.89	0.42
1:9:273:LEU:HD12	1:9:273:LEU:HA	1.89	0.42
1:X:273:LEU:HD12	1:X:273:LEU:HA	1.89	0.42
1:Y:318:ARG:NH1	1:Y:376:GLU:OE1	2.52	0.42
1:1:318:ARG:NH1	1:1:376:GLU:OE1	2.52	0.42
1:2:387:GLN:HG3	1:3:300:PHE:HB2	2.00	0.42
1:C:318:ARG:NH1	1:C:376:GLU:OE1	2.52	0.42
1:D:314:THR:HG23	1:E:312:PRO:HG3	2.01	0.42
1:D:387:GLN:HG3	1:E:300:PHE:HB2	2.01	0.42
1:E:387:GLN:HG3	1:F:300:PHE:HB2	2.01	0.42
1:H:387:GLN:HG3	1:I:300:PHE:HB2	2.01	0.42
1:P:387:GLN:HG3	1:Q:300:PHE:HB2	2.00	0.42
1:U:318:ARG:NH1	1:U:376:GLU:OE1	2.52	0.42
1:X:318:ARG:NH1	1:X:376:GLU:OE1	2.52	0.42
1:D:318:ARG:NH1	1:D:376:GLU:OE1	2.52	0.42
1:H:314:THR:HG23	1:I:312:PRO:HG3	2.01	0.42
1:L:314:THR:HG23	1:M:312:PRO:HG3	2.01	0.42
1:O:318:ARG:NH1	1:O:376:GLU:OE1	2.52	0.42
1:P:318:ARG:NH1	1:P:376:GLU:OE1	2.52	0.42
1:S:318:ARG:NH1	1:S:376:GLU:OE1	2.52	0.42
1:T:318:ARG:NH1	1:T:376:GLU:OE1	2.52	0.42
1:V:318:ARG:NH1	1:V:376:GLU:OE1	2.52	0.42
1:W:318:ARG:NH1	1:W:376:GLU:OE1	2.52	0.42
1:6:314:THR:HG23	1:7:312:PRO:HG3	2.01	0.42
1:B:318:ARG:NH1	1:B:376:GLU:OE1	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:Q:318:ARG:NH1	1:Q:376:GLU:OE1	2.52	0.42
1:R:318:ARG:NH1	1:R:376:GLU:OE1	2.52	0.42
1:2:318:ARG:NH1	1:2:376:GLU:OE1	2.52	0.42
1:5:276:LYS:NZ	1:6:295:ASP:OD1	2.37	0.42
1:A:318:ARG:NH1	1:A:376:GLU:OE1	2.52	0.42
1:E:318:ARG:NH1	1:E:376:GLU:OE1	2.52	0.42
1:F:318:ARG:NH1	1:F:376:GLU:OE1	2.52	0.42
1:J:387:GLN:HG3	1:K:300:PHE:HB2	2.01	0.42
1:N:318:ARG:NH1	1:N:376:GLU:OE1	2.52	0.42
1:V:387:GLN:HG3	1:W:300:PHE:HB2	2.01	0.42
1:E:314:THR:HG23	1:F:312:PRO:HG3	2.02	0.42
1:O:387:GLN:HG3	1:P:300:PHE:HB2	2.01	0.42
1:4:314:THR:HG23	1:5:312:PRO:HG3	2.01	0.42
1:8:314:THR:HG23	1:9:312:PRO:HG3	2.01	0.42
1:9:318:ARG:NH1	1:9:376:GLU:OE1	2.52	0.42
1:G:318:ARG:NH1	1:G:376:GLU:OE1	2.52	0.42
1:H:318:ARG:NH1	1:H:376:GLU:OE1	2.52	0.42
1:M:318:ARG:NH1	1:M:376:GLU:OE1	2.52	0.42
1:3:318:ARG:NH1	1:3:376:GLU:OE1	2.52	0.42
1:8:318:ARG:NH1	1:8:376:GLU:OE1	2.52	0.42
1:2:276:LYS:NZ	1:3:295:ASP:OD1	2.36	0.42
1:I:318:ARG:NH1	1:I:376:GLU:OE1	2.52	0.42
1:K:314:THR:HG23	1:L:312:PRO:HG3	2.02	0.42
1:U:314:THR:HG23	1:V:312:PRO:HG3	2.01	0.42
1:3:276:LYS:NZ	1:4:295:ASP:OD1	2.36	0.41
1:7:318:ARG:NH1	1:7:376:GLU:OE1	2.52	0.41
1:J:318:ARG:NH1	1:J:376:GLU:OE1	2.52	0.41
1:L:318:ARG:NH1	1:L:376:GLU:OE1	2.52	0.41
1:O:314:THR:HG23	1:P:312:PRO:HG3	2.01	0.41
1:4:318:ARG:NH1	1:4:376:GLU:OE1	2.52	0.41
1:6:318:ARG:NH1	1:6:376:GLU:OE1	2.52	0.41
1:2:314:THR:HG23	1:3:312:PRO:HG3	2.01	0.41
1:5:318:ARG:NH1	1:5:376:GLU:OE1	2.52	0.41
1:K:273:LEU:HD12	1:K:273:LEU:HA	1.89	0.41
1:V:314:THR:HG23	1:W:312:PRO:HG3	2.02	0.41
1:D:402:ASP:OD1	1:D:402:ASP:N	2.54	0.41
1:F:314:THR:HG23	1:G:312:PRO:HG3	2.03	0.41
1:G:314:THR:HG23	1:H:312:PRO:HG3	2.02	0.41
1:H:402:ASP:OD1	1:H:402:ASP:N	2.54	0.41
1:K:318:ARG:NH1	1:K:376:GLU:OE1	2.52	0.41
1:R:314:THR:HG23	1:S:312:PRO:HG3	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:312:PRO:HG3	1:Y:314:THR:HG23	2.01	0.41
1:C:402:ASP:OD1	1:C:402:ASP:N	2.54	0.41
1:E:402:ASP:OD1	1:E:402:ASP:N	2.54	0.41
1:F:402:ASP:OD1	1:F:402:ASP:N	2.54	0.41
1:G:402:ASP:OD1	1:G:402:ASP:N	2.54	0.41
1:I:402:ASP:OD1	1:I:402:ASP:N	2.54	0.41
1:J:402:ASP:OD1	1:J:402:ASP:N	2.54	0.41
1:N:314:THR:HG23	1:O:312:PRO:HG3	2.01	0.41
1:7:387:GLN:HG3	1:8:300:PHE:HB2	2.01	0.41
1:K:402:ASP:OD1	1:K:402:ASP:N	2.54	0.41
1:L:402:ASP:OD1	1:L:402:ASP:N	2.54	0.41
1:N:285:LEU:HD23	1:N:285:LEU:HA	1.94	0.41
1:P:314:THR:HG23	1:Q:312:PRO:HG3	2.01	0.41
1:R:276:LYS:NZ	1:S:295:ASP:OD1	2.36	0.41
1:U:387:GLN:HG3	1:V:300:PHE:HB2	2.01	0.41
1:M:402:ASP:OD1	1:M:402:ASP:N	2.54	0.41
1:X:314:THR:HG23	1:Y:312:PRO:HG3	2.02	0.41
1:B:314:THR:HG23	1:C:312:PRO:HG3	2.02	0.41
1:N:402:ASP:OD1	1:N:402:ASP:N	2.54	0.41
1:W:308:LYS:HZ2	1:W:310:PHE:HE1	1.69	0.41
1:1:308:LYS:HZ2	1:1:310:PHE:HE1	1.69	0.41
1:5:285:LEU:HD23	1:5:285:LEU:HA	1.94	0.41
1:M:285:LEU:HD23	1:M:285:LEU:HA	1.94	0.41
1:O:402:ASP:OD1	1:O:402:ASP:N	2.54	0.41
1:S:314:THR:HG23	1:T:312:PRO:HG3	2.02	0.41
1:W:314:THR:HG23	1:X:312:PRO:HG3	2.02	0.41
1:X:308:LYS:HZ2	1:X:310:PHE:HE1	1.69	0.41
1:7:285:LEU:HD23	1:7:285:LEU:HA	1.94	0.41
1:Q:308:LYS:HZ2	1:Q:310:PHE:HE1	1.69	0.41
1:R:273:LEU:HD12	1:R:273:LEU:HA	1.89	0.41
1:3:285:LEU:HD23	1:3:285:LEU:HA	1.94	0.40
1:7:314:THR:HG23	1:8:312:PRO:HG3	2.01	0.40
1:C:314:THR:HG23	1:D:312:PRO:HG3	2.02	0.40
1:T:314:THR:HG23	1:U:312:PRO:HG3	2.02	0.40
1:4:285:LEU:HD23	1:4:285:LEU:HA	1.94	0.40
1:6:273:LEU:HD12	1:6:273:LEU:HA	1.89	0.40
1:N:308:LYS:HZ2	1:N:310:PHE:HE1	1.70	0.40
1:9:314:THR:HG23	1:A:312:PRO:HG3	2.03	0.40
1:1:285:LEU:HD23	1:1:285:LEU:HA	1.94	0.40
1:1:314:THR:HG23	1:2:312:PRO:HG3	2.02	0.40
1:C:276:LYS:HB2	1:C:276:LYS:HE2	1.98	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:O:273:LEU:HD12	1:O:273:LEU:HA	1.89	0.40
1:R:308:LYS:HZ2	1:R:310:PHE:HE1	1.69	0.40
1:U:308:LYS:HZ2	1:U:310:PHE:HE1	1.69	0.40
1:A:285:LEU:HD23	1:A:285:LEU:HA	1.94	0.40

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	1	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	2	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	3	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	4	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	5	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	6	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	7	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	8	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	9	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	A	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	B	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	C	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	D	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	E	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	F	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	G	138/945 (15%)	137 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	I	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	J	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	K	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	L	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	M	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	N	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	O	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	P	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	Q	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	R	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	S	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	T	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	U	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	V	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	W	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	X	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
1	Y	138/945 (15%)	137 (99%)	1 (1%)	0	100	100
All	All	4692/32130 (15%)	4658 (99%)	34 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	1	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	2	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	3	125/802 (16%)	122 (98%)	3 (2%)	44	68

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	4	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	5	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	6	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	7	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	8	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	9	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	A	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	B	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	C	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	D	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	E	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	F	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	G	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	H	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	I	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	J	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	K	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	L	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	M	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	N	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	O	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	P	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	Q	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	R	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	S	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	T	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	U	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	V	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	W	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	X	125/802 (16%)	122 (98%)	3 (2%)	44	68
1	Y	125/802 (16%)	122 (98%)	3 (2%)	44	68

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	4250/27268 (16%)	4148 (98%)	102 (2%)	45 68

All (102) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1	287	TYR
1	1	318	ARG
1	1	371	SER
1	2	287	TYR
1	2	318	ARG
1	2	371	SER
1	3	287	TYR
1	3	318	ARG
1	3	371	SER
1	4	287	TYR
1	4	318	ARG
1	4	371	SER
1	5	287	TYR
1	5	318	ARG
1	5	371	SER
1	6	287	TYR
1	6	318	ARG
1	6	371	SER
1	7	287	TYR
1	7	318	ARG
1	7	371	SER
1	8	287	TYR
1	8	318	ARG
1	8	371	SER
1	9	287	TYR
1	9	318	ARG
1	9	371	SER
1	A	287	TYR
1	A	318	ARG
1	A	371	SER
1	B	287	TYR
1	B	318	ARG
1	B	371	SER
1	C	287	TYR
1	C	318	ARG
1	C	371	SER
1	D	287	TYR

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Mol	Chain	Res	Type
1	D	318	ARG
1	D	371	SER
1	E	287	TYR
1	E	318	ARG
1	E	371	SER
1	F	287	TYR
1	F	318	ARG
1	F	371	SER
1	G	287	TYR
1	G	318	ARG
1	G	371	SER
1	H	287	TYR
1	H	318	ARG
1	H	371	SER
1	I	287	TYR
1	I	318	ARG
1	I	371	SER
1	J	287	TYR
1	J	318	ARG
1	J	371	SER
1	K	287	TYR
1	K	318	ARG
1	K	371	SER
1	L	287	TYR
1	L	318	ARG
1	L	371	SER
1	M	287	TYR
1	M	318	ARG
1	M	371	SER
1	N	287	TYR
1	N	318	ARG
1	N	371	SER
1	O	287	TYR
1	O	318	ARG
1	O	371	SER
1	P	287	TYR
1	P	318	ARG
1	P	371	SER
1	Q	287	TYR
1	Q	318	ARG
1	Q	371	SER
1	R	287	TYR

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Mol	Chain	Res	Type
1	R	318	ARG
1	R	371	SER
1	S	287	TYR
1	S	318	ARG
1	S	371	SER
1	T	287	TYR
1	T	318	ARG
1	T	371	SER
1	U	287	TYR
1	U	318	ARG
1	U	371	SER
1	V	287	TYR
1	V	318	ARG
1	V	371	SER
1	W	287	TYR
1	W	318	ARG
1	W	371	SER
1	X	287	TYR
1	X	318	ARG
1	X	371	SER
1	Y	287	TYR
1	Y	318	ARG
1	Y	371	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-39761. 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 ⓘ
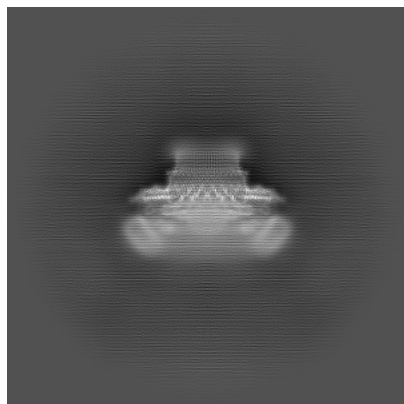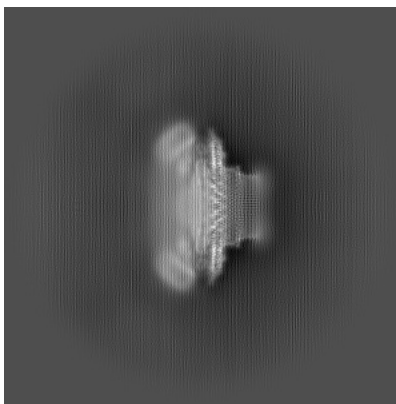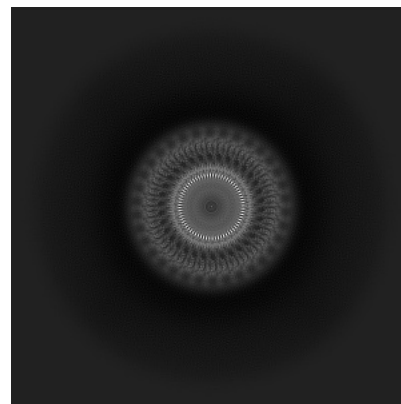
6.1.1 Primary map

| X | Y | Z |

6.1.2 Raw map

| X | Y | Z |
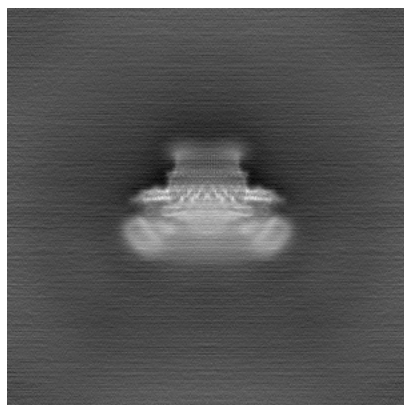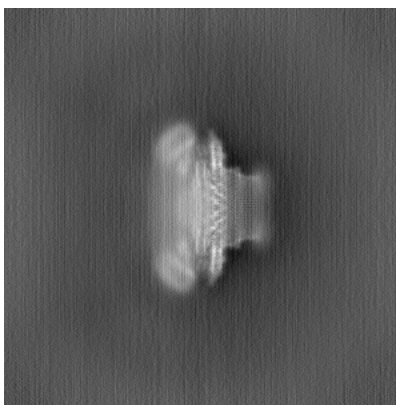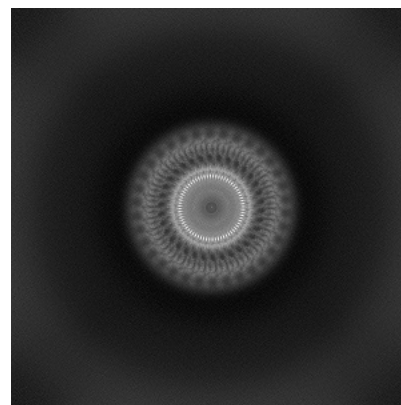
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
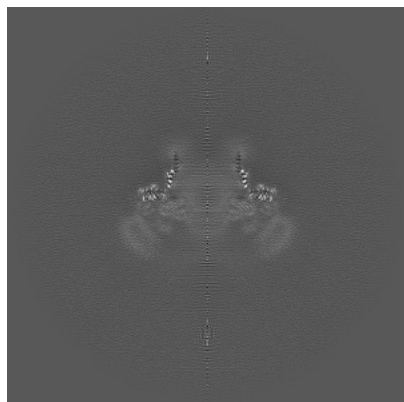
6.2.1 Primary map
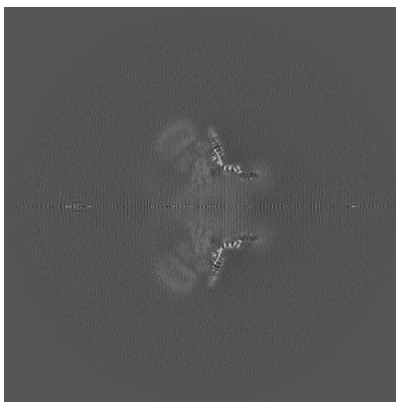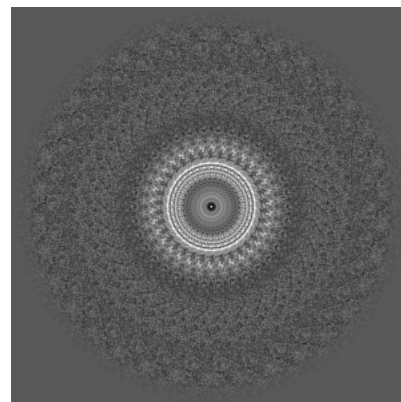
| X Index: 300 | Y Index: 300 | Z Index: 300 |

6.2.2 Raw map
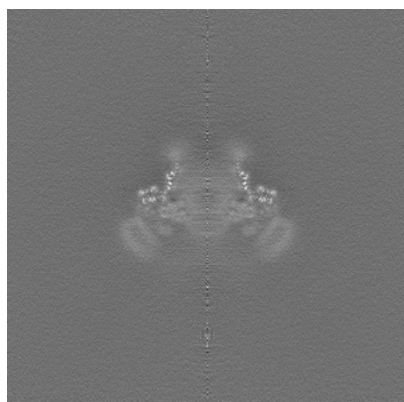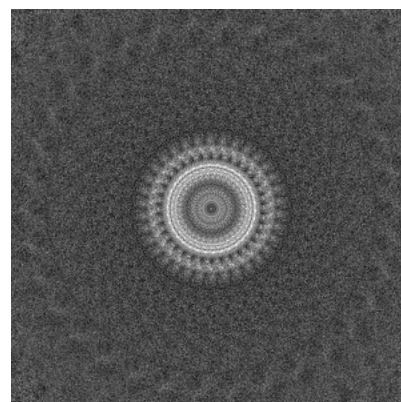
| X Index: 300 | Y Index: 300 | Z Index: 300 |

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

6.3   Largest variance slices   ⓘ

6.3.1   Primary map
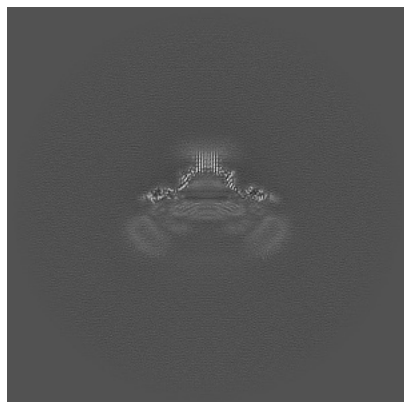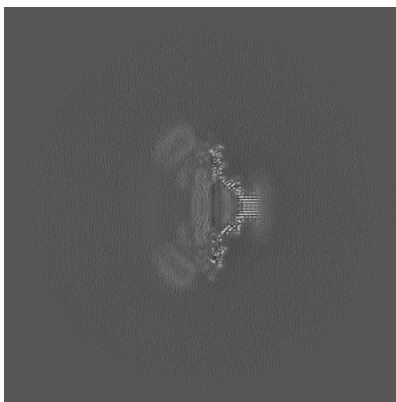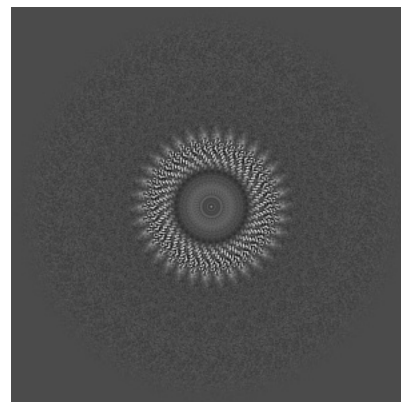
X Index: 346   Y Index: 254   Z Index: 315

6.3.2   Raw map
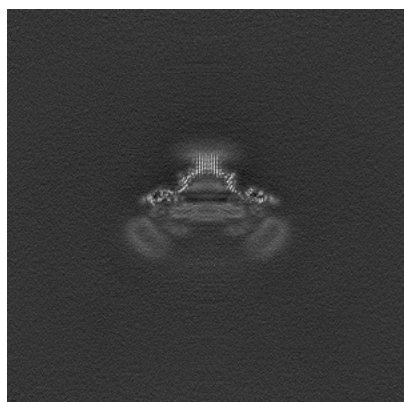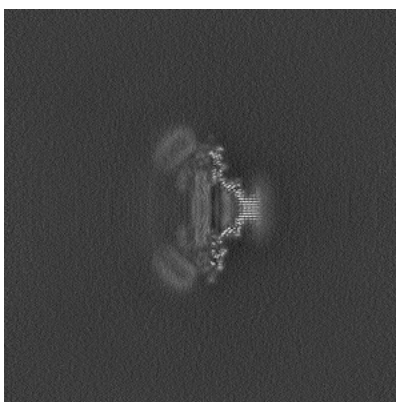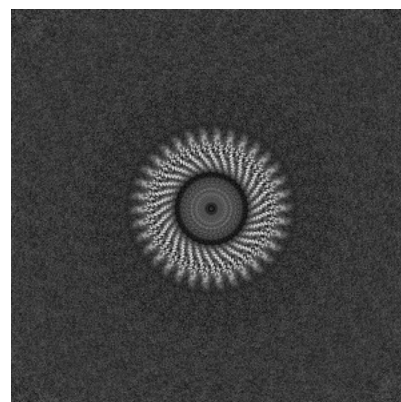
X Index: 346   Y Index: 254   Z Index: 314

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

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

6.4.1 Primary map
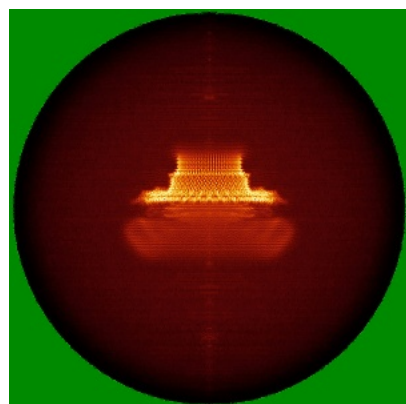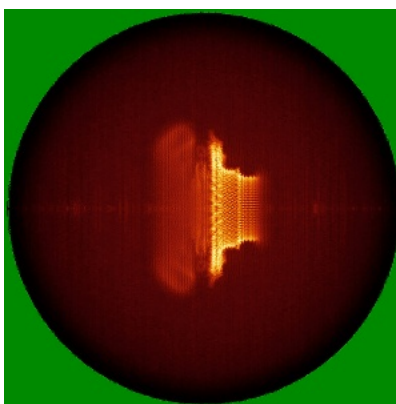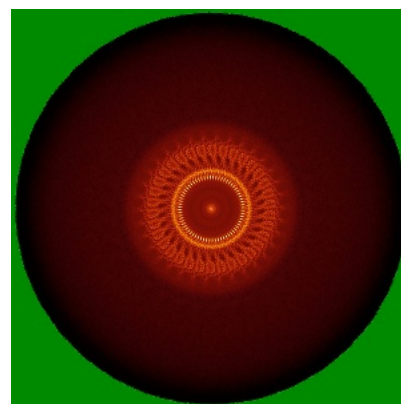
X   Y   Z

6.4.2 Raw map

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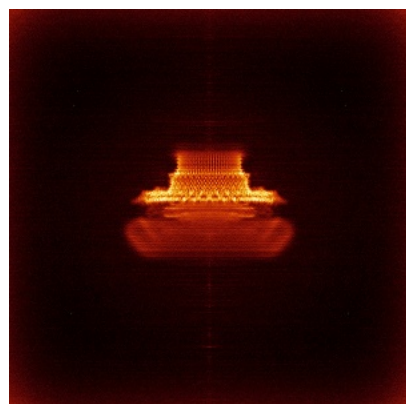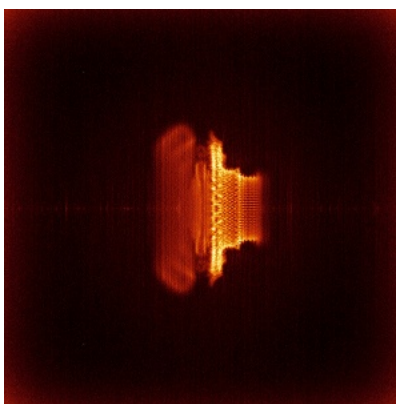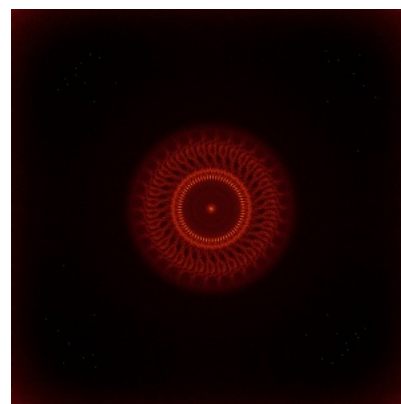
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

| X | Y | Z |
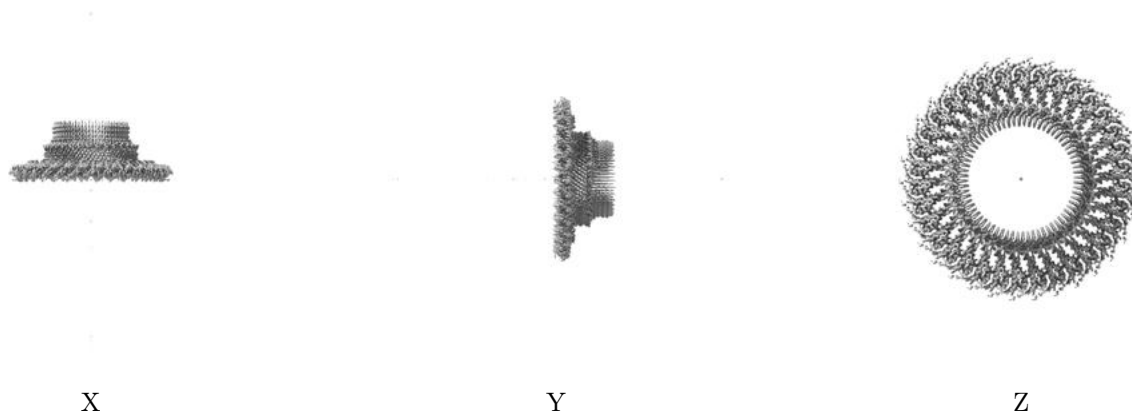
The images above show the 3D surface view of the map at the recommended contour level 0.45. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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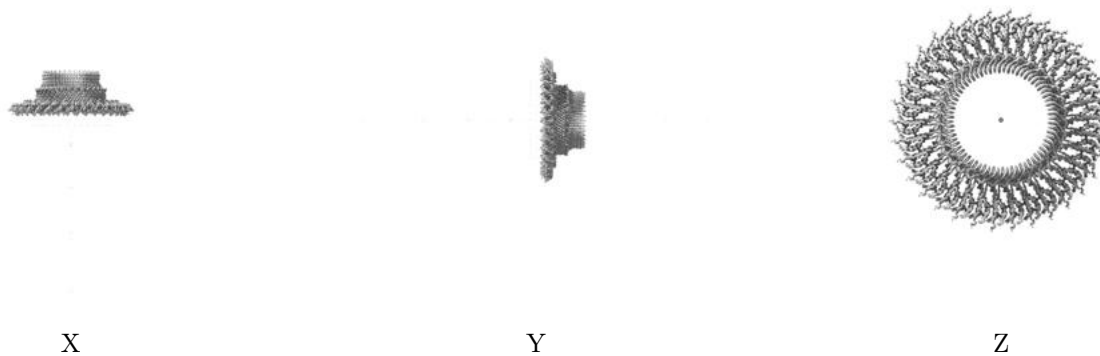
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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_39761_msk_1.map ⓘ
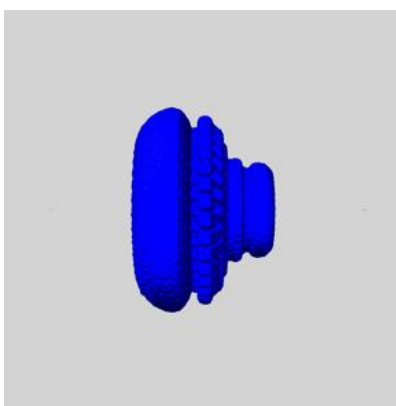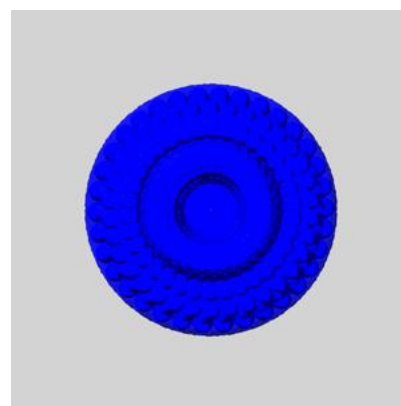
X   Y   Z

7 Map analysis (i)

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

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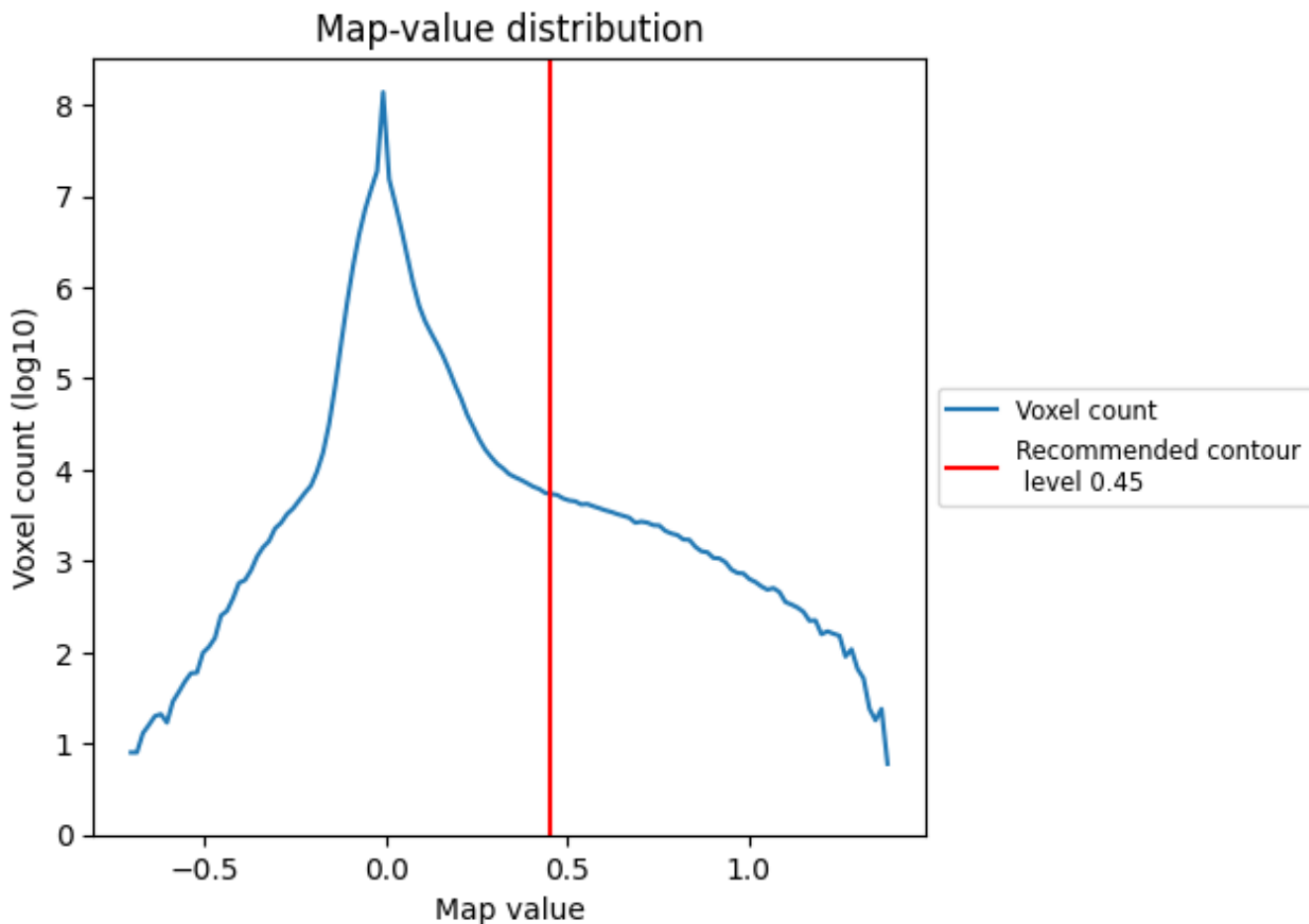
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
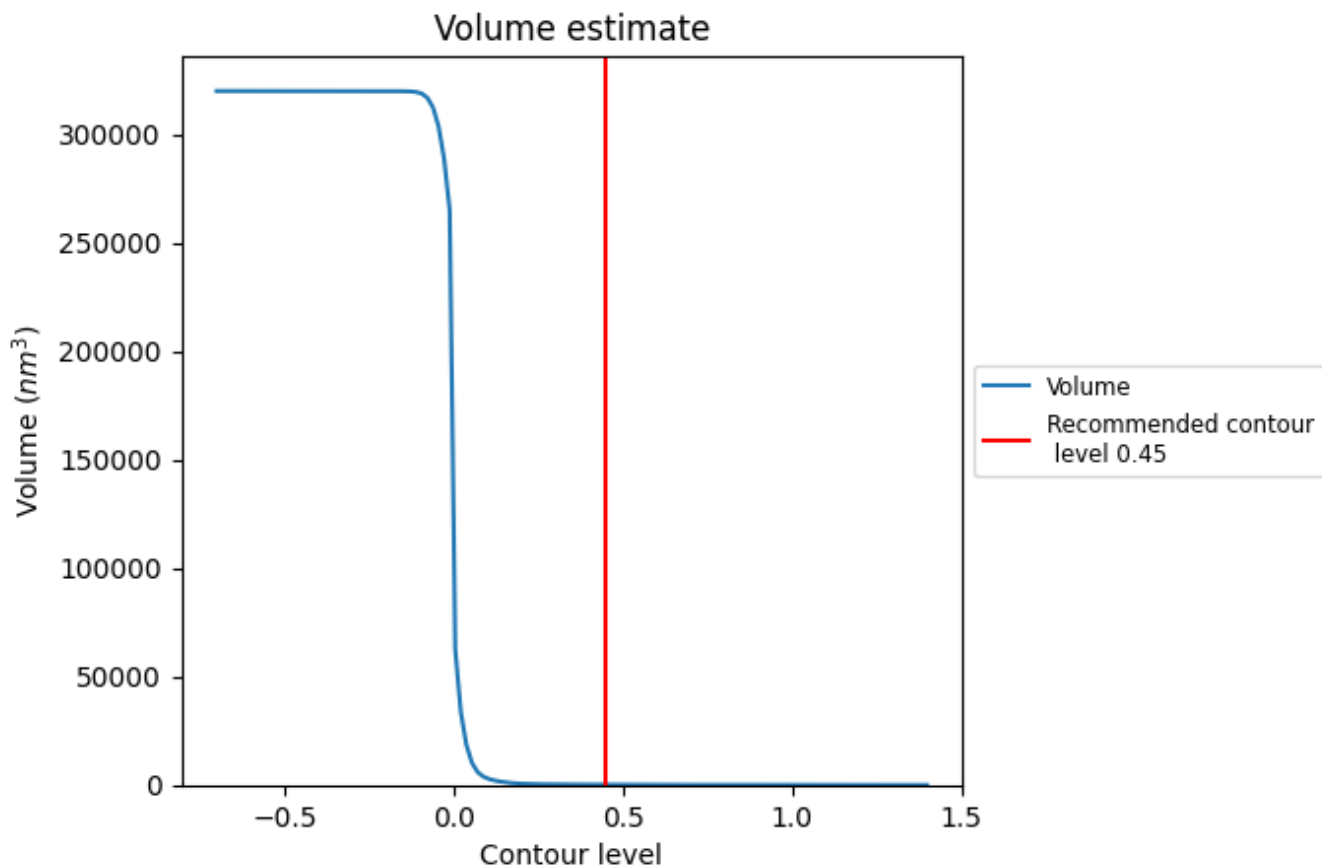
The volume at the recommended contour level is 144 nm³; this corresponds to an approximate mass of 130 kDa.

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　ⓘ
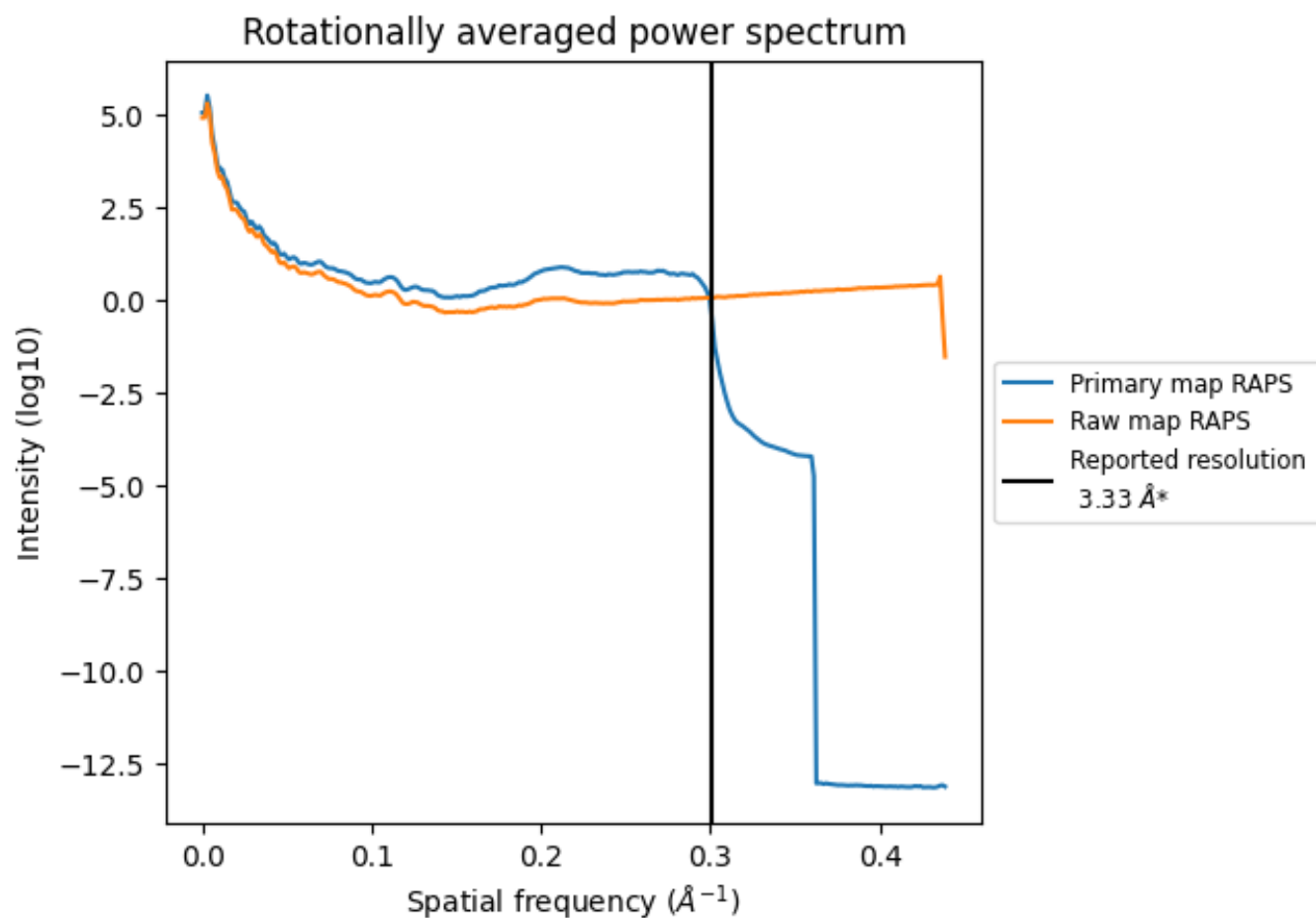
*Reported resolution corresponds to spatial frequency of 0.300 Å^{-1}

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 ⓘ
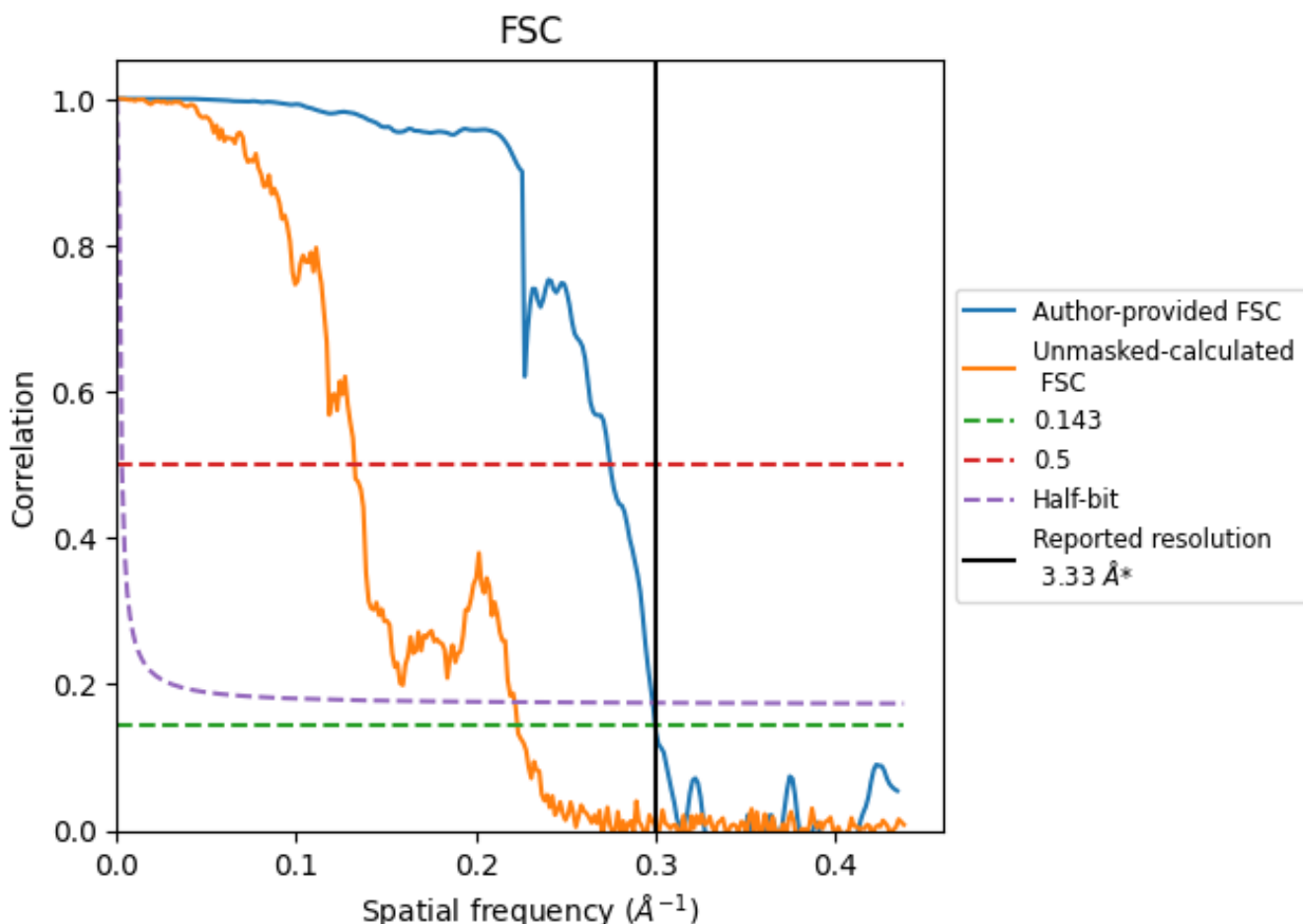
*Reported resolution corresponds to spatial frequency of 0.300 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.33	-	-
Author-provided FSC curve	3.33	3.64	3.35
Unmasked-calculated*	4.48	7.55	4.51

*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 4.48 differs from the reported value 3.33 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-39761 and PDB model 8Z4D. Per-residue inclusion information can be found in section 3 on page 21.

9.1 Map-model overlay ⓘ

X	Y	Z
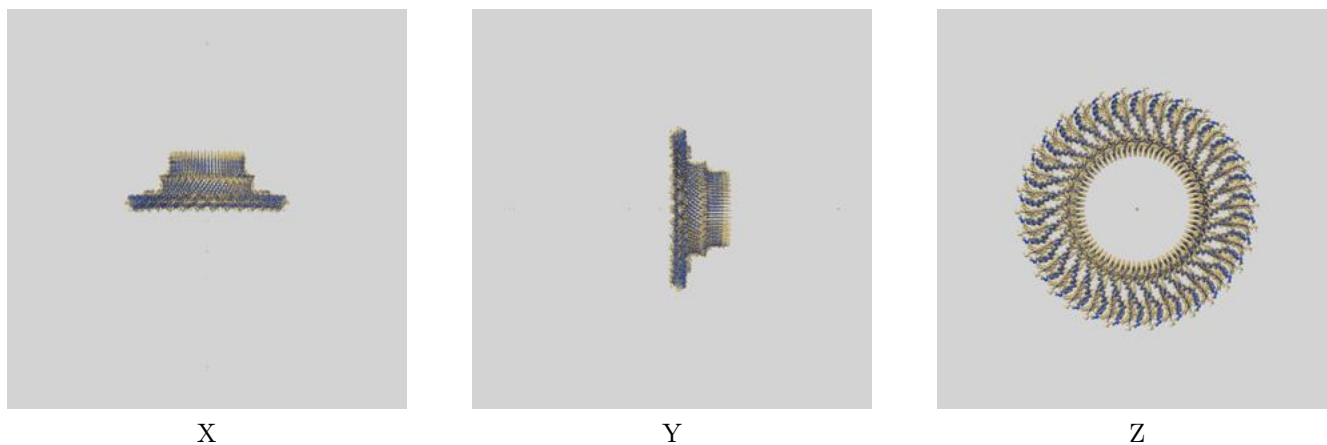
The images above show the 3D surface view of the map at the recommended contour level 0.45 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

X

Y

Z
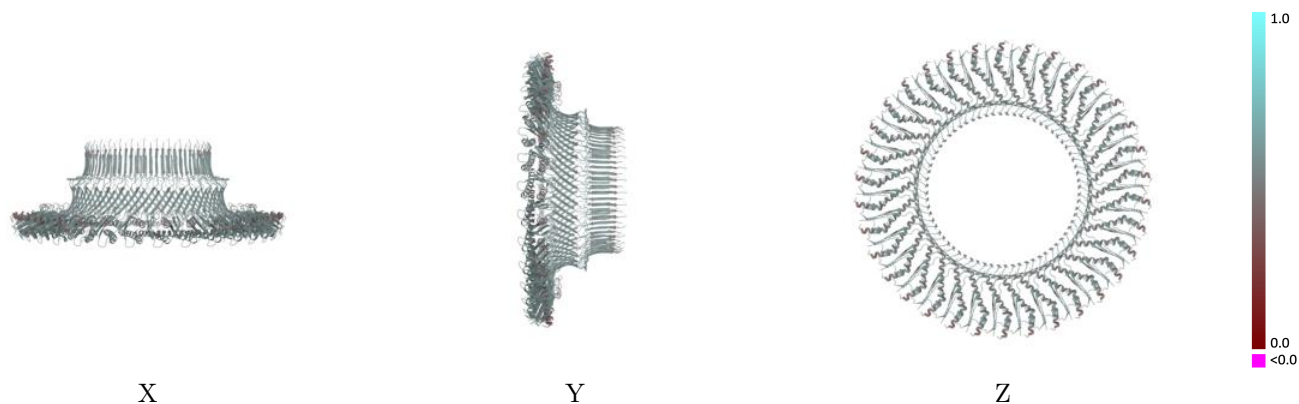
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 ⓘ

X

Y

Z
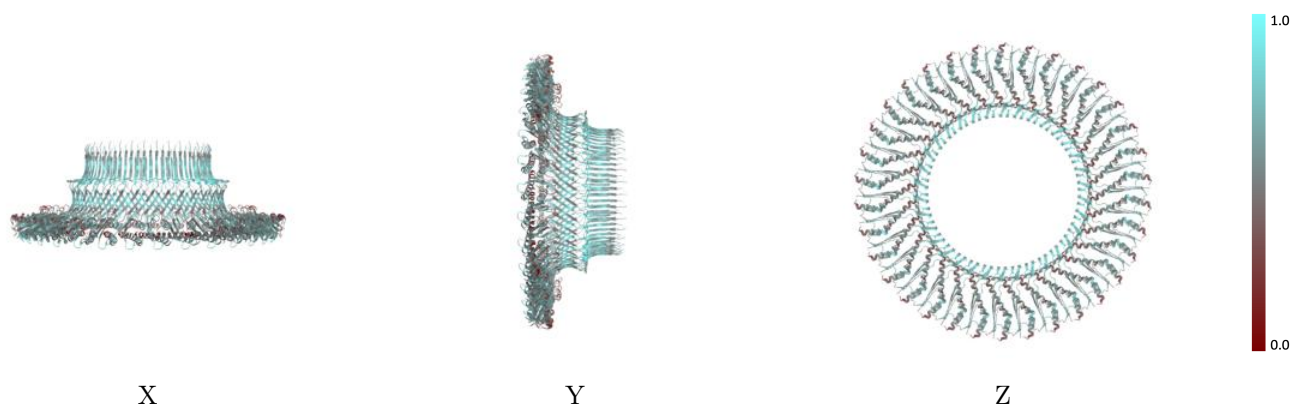
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.45).

9.4 Atom inclusion ⓘ
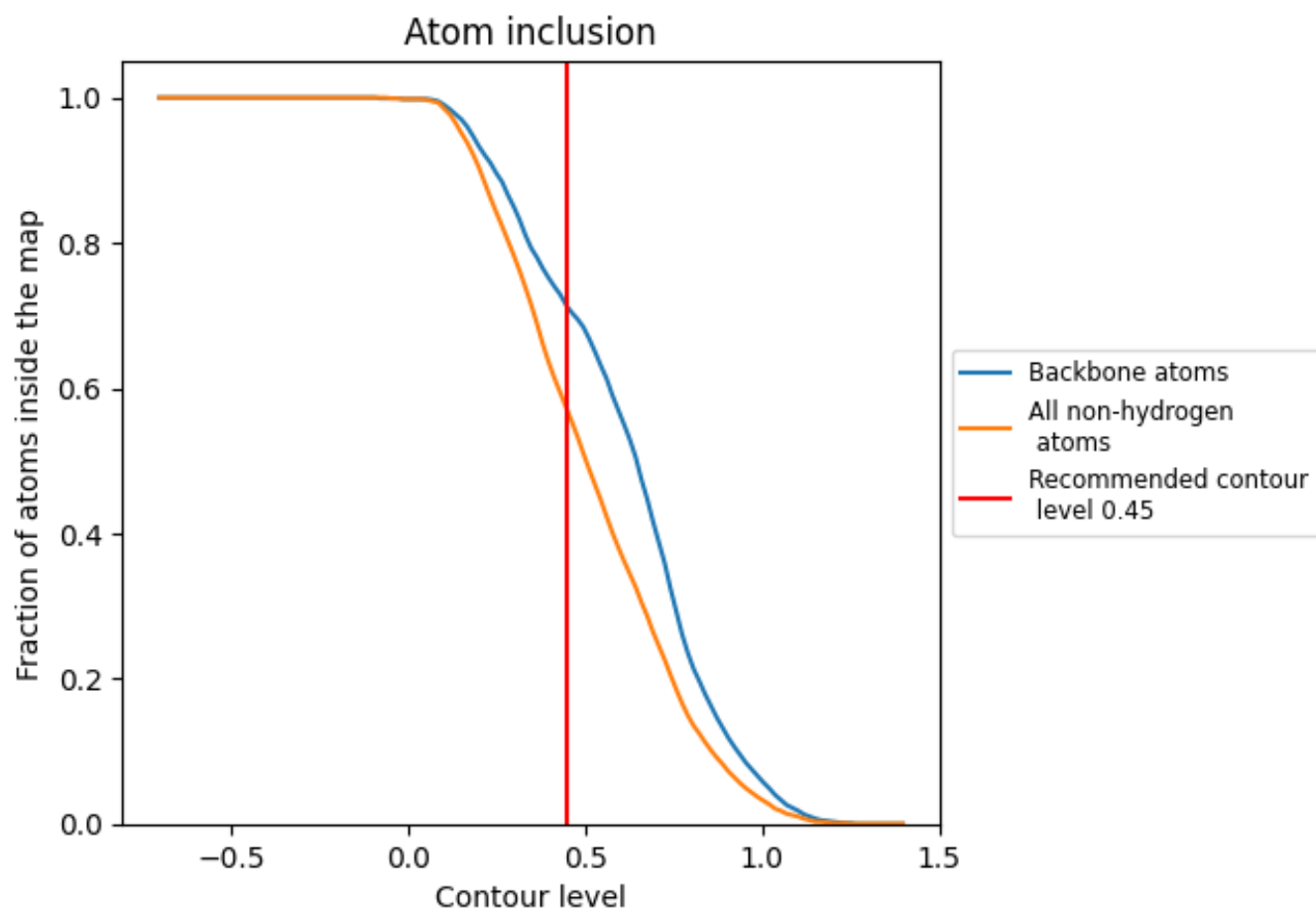
At the recommended contour level, 71% of all backbone atoms, 57% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.45) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5690	0.5290
1	0.5680	0.5300
2	0.5720	0.5310
3	0.5630	0.5300
4	0.5660	0.5290
5	0.5630	0.5290
6	0.5680	0.5290
7	0.5730	0.5290
8	0.5700	0.5280
9	0.5700	0.5250
A	0.5730	0.5270
B	0.5710	0.5260
C	0.5730	0.5270
D	0.5660	0.5280
E	0.5700	0.5300
F	0.5710	0.5290
G	0.5670	0.5290
H	0.5660	0.5270
I	0.5720	0.5280
J	0.5720	0.5290
K	0.5630	0.5310
L	0.5640	0.5290
M	0.5640	0.5290
N	0.5680	0.5300
O	0.5750	0.5300
P	0.5700	0.5280
Q	0.5710	0.5270
R	0.5730	0.5300
S	0.5720	0.5290
T	0.5740	0.5290
U	0.5660	0.5300
V	0.5690	0.5300
W	0.5710	0.5290
X	0.5650	0.5290
Y	0.5680	0.5290

1.0

0.0
<0.0