WORLDWIDE PDB
PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Dec 24, 2025 – 02:25 PM EST

PDB ID	:	9CCA / pdb_00009cca
EMDB ID	:	EMD-45440
Title	:	Cryo-EM structure of a designed pyridoxal phosphate (PLP) synthase fused to a designed circumsporozoite protein antigen from Plasmodium falciparum (CSP-P1-CSP and CSP-P2-CSP)
Authors	:	Shi, D.; Ma, R.; Tang, W.K.; Tolia, N.H.
Deposited on	:	2024-06-21
Resolution	:	2.95 Å(reported)
Based on initial models	:	2ABW, 4ADT

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 2.95 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		6
Ramachandran outliers		0
Sidechain outliers		0.9%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.501

Worse   *Better*

▮ Percentile relative to all EM structures

▯ Percentile relative to EM structures of similar resolution
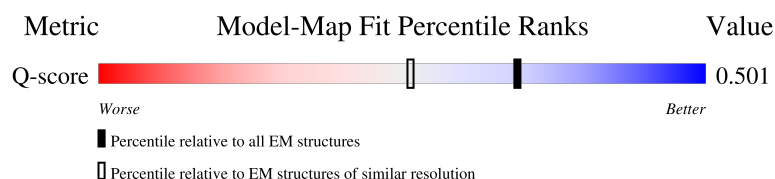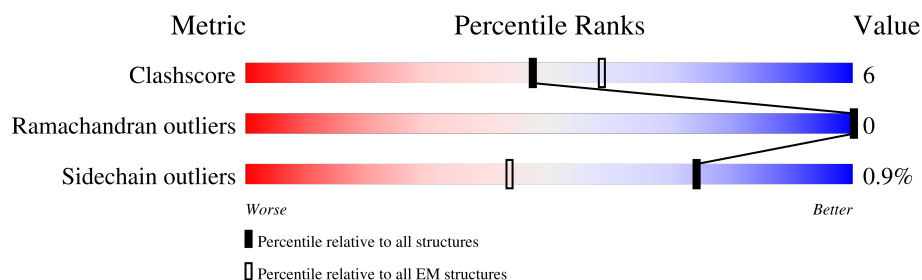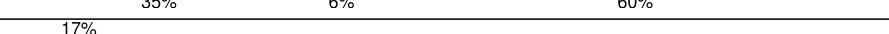
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	13114 (2.45 - 3.45)

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

Mol	Chain	Length	Quality of chain
1	A	537	41% 7% 52%
1	B	537	42% 6% 52%
1	C	537	42% 6% 52%
1	D	537	41% 7% 52%

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Mol	Chain	Length	Quality of chain
1	E	537	42% 5% 52%
1	F	537	41% 7% 52%
1	M	537	41% 7% 52%
1	N	537	41% 7% • 52%
1	O	537	43% 5% 52%
1	P	537	41% 7% 52%
1	Q	537	41% 7% 52%
1	R	537	42% 6% 52%
2	G	454	18% 36% 5% 60%
2	H	454	18% 34% 6% 60%
2	I	454	18% 33% 7% 60%
2	J	454	17% 34% 6% 60%
2	K	454	17% 33% 7% 60%
2	L	454	17% 36% 5% 60%
2	S	454	19% 33% 8% 60%
2	T	454	18% 34% 6% 60%
2	U	454	19% 35% 6% 60%
2	V	454	17% 35% 5% 60%
2	W	454	18% 34% 6% 60%
2	X	454	19% 34% 6% 60%

2   Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 82341 atoms, of which 41664 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 Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	257	Total 3962	C 1231	H 2015	N 335	O 362	S 19	0	0
1	B	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	C	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	D	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	E	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	F	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	M	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	N	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	O	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	P	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	Q	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0
1	R	258	Total 3969	C 1233	H 2018	N 336	O 363	S 19	0	0

There are 288 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP Q7K740
A	2	THR	-	cloning artifact	UNP Q7K740
A	3	GLY	-	cloning artifact	UNP Q7K740
A	112	GLY	-	linker	UNP Q7K740
A	113	GLY	-	linker	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
A	114	SER	-	linker	UNP Q7K740
A	115	GLY	-	cloning artifact	UNP Q7K740
A	116	THR	-	cloning artifact	UNP Q7K740
A	198	ARG	LYS	engineered mutation	UNP C6KT50
A	289	CYS	LYS	engineered mutation	UNP C6KT50
A	293	CYS	SER	engineered mutation	UNP C6KT50
A	417	THR	-	cloning artifact	UNP C6KT50
A	418	GLY	-	cloning artifact	UNP C6KT50
A	527	GLY	-	linker	UNP Q7K740
A	528	GLY	-	linker	UNP Q7K740
A	529	SER	-	linker	UNP Q7K740
A	530	LEU	-	cloning artifact	UNP Q7K740
A	531	GLU	-	cloning artifact	UNP Q7K740
A	532	HIS	-	expression tag	UNP Q7K740
A	533	HIS	-	expression tag	UNP Q7K740
A	534	HIS	-	expression tag	UNP Q7K740
A	535	HIS	-	expression tag	UNP Q7K740
A	536	HIS	-	expression tag	UNP Q7K740
A	537	HIS	-	expression tag	UNP Q7K740
B	1	MET	-	initiating methionine	UNP Q7K740
B	2	THR	-	cloning artifact	UNP Q7K740
B	3	GLY	-	cloning artifact	UNP Q7K740
B	112	GLY	-	linker	UNP Q7K740
B	113	GLY	-	linker	UNP Q7K740
B	114	SER	-	linker	UNP Q7K740
B	115	GLY	-	cloning artifact	UNP Q7K740
B	116	THR	-	cloning artifact	UNP Q7K740
B	198	ARG	LYS	engineered mutation	UNP C6KT50
B	289	CYS	LYS	engineered mutation	UNP C6KT50
B	293	CYS	SER	engineered mutation	UNP C6KT50
B	417	THR	-	cloning artifact	UNP C6KT50
B	418	GLY	-	cloning artifact	UNP C6KT50
B	527	GLY	-	linker	UNP Q7K740
B	528	GLY	-	linker	UNP Q7K740
B	529	SER	-	linker	UNP Q7K740
B	530	LEU	-	cloning artifact	UNP Q7K740
B	531	GLU	-	cloning artifact	UNP Q7K740
B	532	HIS	-	expression tag	UNP Q7K740
B	533	HIS	-	expression tag	UNP Q7K740
B	534	HIS	-	expression tag	UNP Q7K740
B	535	HIS	-	expression tag	UNP Q7K740
B	536	HIS	-	expression tag	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
B	537	HIS	-	expression tag	UNP Q7K740
C	1	MET	-	initiating methionine	UNP Q7K740
C	2	THR	-	cloning artifact	UNP Q7K740
C	3	GLY	-	cloning artifact	UNP Q7K740
C	112	GLY	-	linker	UNP Q7K740
C	113	GLY	-	linker	UNP Q7K740
C	114	SER	-	linker	UNP Q7K740
C	115	GLY	-	cloning artifact	UNP Q7K740
C	116	THR	-	cloning artifact	UNP Q7K740
C	198	ARG	LYS	engineered mutation	UNP C6KT50
C	289	CYS	LYS	engineered mutation	UNP C6KT50
C	293	CYS	SER	engineered mutation	UNP C6KT50
C	417	THR	-	cloning artifact	UNP C6KT50
C	418	GLY	-	cloning artifact	UNP C6KT50
C	527	GLY	-	linker	UNP Q7K740
C	528	GLY	-	linker	UNP Q7K740
C	529	SER	-	linker	UNP Q7K740
C	530	LEU	-	cloning artifact	UNP Q7K740
C	531	GLU	-	cloning artifact	UNP Q7K740
C	532	HIS	-	expression tag	UNP Q7K740
C	533	HIS	-	expression tag	UNP Q7K740
C	534	HIS	-	expression tag	UNP Q7K740
C	535	HIS	-	expression tag	UNP Q7K740
C	536	HIS	-	expression tag	UNP Q7K740
C	537	HIS	-	expression tag	UNP Q7K740
D	1	MET	-	initiating methionine	UNP Q7K740
D	2	THR	-	cloning artifact	UNP Q7K740
D	3	GLY	-	cloning artifact	UNP Q7K740
D	112	GLY	-	linker	UNP Q7K740
D	113	GLY	-	linker	UNP Q7K740
D	114	SER	-	linker	UNP Q7K740
D	115	GLY	-	cloning artifact	UNP Q7K740
D	116	THR	-	cloning artifact	UNP Q7K740
D	198	ARG	LYS	engineered mutation	UNP C6KT50
D	289	CYS	LYS	engineered mutation	UNP C6KT50
D	293	CYS	SER	engineered mutation	UNP C6KT50
D	417	THR	-	cloning artifact	UNP C6KT50
D	418	GLY	-	cloning artifact	UNP C6KT50
D	527	GLY	-	linker	UNP Q7K740
D	528	GLY	-	linker	UNP Q7K740
D	529	SER	-	linker	UNP Q7K740
D	530	LEU	-	cloning artifact	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
D	531	GLU	-	cloning artifact	UNP Q7K740
D	532	HIS	-	expression tag	UNP Q7K740
D	533	HIS	-	expression tag	UNP Q7K740
D	534	HIS	-	expression tag	UNP Q7K740
D	535	HIS	-	expression tag	UNP Q7K740
D	536	HIS	-	expression tag	UNP Q7K740
D	537	HIS	-	expression tag	UNP Q7K740
E	1	MET	-	initiating methionine	UNP Q7K740
E	2	THR	-	cloning artifact	UNP Q7K740
E	3	GLY	-	cloning artifact	UNP Q7K740
E	112	GLY	-	linker	UNP Q7K740
E	113	GLY	-	linker	UNP Q7K740
E	114	SER	-	linker	UNP Q7K740
E	115	GLY	-	cloning artifact	UNP Q7K740
E	116	THR	-	cloning artifact	UNP Q7K740
E	198	ARG	LYS	engineered mutation	UNP C6KT50
E	289	CYS	LYS	engineered mutation	UNP C6KT50
E	293	CYS	SER	engineered mutation	UNP C6KT50
E	417	THR	-	cloning artifact	UNP C6KT50
E	418	GLY	-	cloning artifact	UNP C6KT50
E	527	GLY	-	linker	UNP Q7K740
E	528	GLY	-	linker	UNP Q7K740
E	529	SER	-	linker	UNP Q7K740
E	530	LEU	-	cloning artifact	UNP Q7K740
E	531	GLU	-	cloning artifact	UNP Q7K740
E	532	HIS	-	expression tag	UNP Q7K740
E	533	HIS	-	expression tag	UNP Q7K740
E	534	HIS	-	expression tag	UNP Q7K740
E	535	HIS	-	expression tag	UNP Q7K740
E	536	HIS	-	expression tag	UNP Q7K740
E	537	HIS	-	expression tag	UNP Q7K740
F	1	MET	-	initiating methionine	UNP Q7K740
F	2	THR	-	cloning artifact	UNP Q7K740
F	3	GLY	-	cloning artifact	UNP Q7K740
F	112	GLY	-	linker	UNP Q7K740
F	113	GLY	-	linker	UNP Q7K740
F	114	SER	-	linker	UNP Q7K740
F	115	GLY	-	cloning artifact	UNP Q7K740
F	116	THR	-	cloning artifact	UNP Q7K740
F	198	ARG	LYS	engineered mutation	UNP C6KT50
F	289	CYS	LYS	engineered mutation	UNP C6KT50
F	293	CYS	SER	engineered mutation	UNP C6KT50

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Chain	Residue	Modelled	Actual	Comment	Reference
F	417	THR	-	cloning artifact	UNP C6KT50
F	418	GLY	-	cloning artifact	UNP C6KT50
F	527	GLY	-	linker	UNP Q7K740
F	528	GLY	-	linker	UNP Q7K740
F	529	SER	-	linker	UNP Q7K740
F	530	LEU	-	cloning artifact	UNP Q7K740
F	531	GLU	-	cloning artifact	UNP Q7K740
F	532	HIS	-	expression tag	UNP Q7K740
F	533	HIS	-	expression tag	UNP Q7K740
F	534	HIS	-	expression tag	UNP Q7K740
F	535	HIS	-	expression tag	UNP Q7K740
F	536	HIS	-	expression tag	UNP Q7K740
F	537	HIS	-	expression tag	UNP Q7K740
M	1	MET	-	initiating methionine	UNP Q7K740
M	2	THR	-	cloning artifact	UNP Q7K740
M	3	GLY	-	cloning artifact	UNP Q7K740
M	112	GLY	-	linker	UNP Q7K740
M	113	GLY	-	linker	UNP Q7K740
M	114	SER	-	linker	UNP Q7K740
M	115	GLY	-	cloning artifact	UNP Q7K740
M	116	THR	-	cloning artifact	UNP Q7K740
M	198	ARG	LYS	engineered mutation	UNP C6KT50
M	289	CYS	LYS	engineered mutation	UNP C6KT50
M	293	CYS	SER	engineered mutation	UNP C6KT50
M	417	THR	-	cloning artifact	UNP C6KT50
M	418	GLY	-	cloning artifact	UNP C6KT50
M	527	GLY	-	linker	UNP Q7K740
M	528	GLY	-	linker	UNP Q7K740
M	529	SER	-	linker	UNP Q7K740
M	530	LEU	-	cloning artifact	UNP Q7K740
M	531	GLU	-	cloning artifact	UNP Q7K740
M	532	HIS	-	expression tag	UNP Q7K740
M	533	HIS	-	expression tag	UNP Q7K740
M	534	HIS	-	expression tag	UNP Q7K740
M	535	HIS	-	expression tag	UNP Q7K740
M	536	HIS	-	expression tag	UNP Q7K740
M	537	HIS	-	expression tag	UNP Q7K740
N	1	MET	-	initiating methionine	UNP Q7K740
N	2	THR	-	cloning artifact	UNP Q7K740
N	3	GLY	-	cloning artifact	UNP Q7K740
N	112	GLY	-	linker	UNP Q7K740
N	113	GLY	-	linker	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
N	114	SER	-	linker	UNP Q7K740
N	115	GLY	-	cloning artifact	UNP Q7K740
N	116	THR	-	cloning artifact	UNP Q7K740
N	198	ARG	LYS	engineered mutation	UNP C6KT50
N	289	CYS	LYS	engineered mutation	UNP C6KT50
N	293	CYS	SER	engineered mutation	UNP C6KT50
N	417	THR	-	cloning artifact	UNP C6KT50
N	418	GLY	-	cloning artifact	UNP C6KT50
N	527	GLY	-	linker	UNP Q7K740
N	528	GLY	-	linker	UNP Q7K740
N	529	SER	-	linker	UNP Q7K740
N	530	LEU	-	cloning artifact	UNP Q7K740
N	531	GLU	-	cloning artifact	UNP Q7K740
N	532	HIS	-	expression tag	UNP Q7K740
N	533	HIS	-	expression tag	UNP Q7K740
N	534	HIS	-	expression tag	UNP Q7K740
N	535	HIS	-	expression tag	UNP Q7K740
N	536	HIS	-	expression tag	UNP Q7K740
N	537	HIS	-	expression tag	UNP Q7K740
O	1	MET	-	initiating methionine	UNP Q7K740
O	2	THR	-	cloning artifact	UNP Q7K740
O	3	GLY	-	cloning artifact	UNP Q7K740
O	112	GLY	-	linker	UNP Q7K740
O	113	GLY	-	linker	UNP Q7K740
O	114	SER	-	linker	UNP Q7K740
O	115	GLY	-	cloning artifact	UNP Q7K740
O	116	THR	-	cloning artifact	UNP Q7K740
O	198	ARG	LYS	engineered mutation	UNP C6KT50
O	289	CYS	LYS	engineered mutation	UNP C6KT50
O	293	CYS	SER	engineered mutation	UNP C6KT50
O	417	THR	-	cloning artifact	UNP C6KT50
O	418	GLY	-	cloning artifact	UNP C6KT50
O	527	GLY	-	linker	UNP Q7K740
O	528	GLY	-	linker	UNP Q7K740
O	529	SER	-	linker	UNP Q7K740
O	530	LEU	-	cloning artifact	UNP Q7K740
O	531	GLU	-	cloning artifact	UNP Q7K740
O	532	HIS	-	expression tag	UNP Q7K740
O	533	HIS	-	expression tag	UNP Q7K740
O	534	HIS	-	expression tag	UNP Q7K740
O	535	HIS	-	expression tag	UNP Q7K740
O	536	HIS	-	expression tag	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
O	537	HIS	-	expression tag	UNP Q7K740
P	1	MET	-	initiating methionine	UNP Q7K740
P	2	THR	-	cloning artifact	UNP Q7K740
P	3	GLY	-	cloning artifact	UNP Q7K740
P	112	GLY	-	linker	UNP Q7K740
P	113	GLY	-	linker	UNP Q7K740
P	114	SER	-	linker	UNP Q7K740
P	115	GLY	-	cloning artifact	UNP Q7K740
P	116	THR	-	cloning artifact	UNP Q7K740
P	198	ARG	LYS	engineered mutation	UNP C6KT50
P	289	CYS	LYS	engineered mutation	UNP C6KT50
P	293	CYS	SER	engineered mutation	UNP C6KT50
P	417	THR	-	cloning artifact	UNP C6KT50
P	418	GLY	-	cloning artifact	UNP C6KT50
P	527	GLY	-	linker	UNP Q7K740
P	528	GLY	-	linker	UNP Q7K740
P	529	SER	-	linker	UNP Q7K740
P	530	LEU	-	cloning artifact	UNP Q7K740
P	531	GLU	-	cloning artifact	UNP Q7K740
P	532	HIS	-	expression tag	UNP Q7K740
P	533	HIS	-	expression tag	UNP Q7K740
P	534	HIS	-	expression tag	UNP Q7K740
P	535	HIS	-	expression tag	UNP Q7K740
P	536	HIS	-	expression tag	UNP Q7K740
P	537	HIS	-	expression tag	UNP Q7K740
Q	1	MET	-	initiating methionine	UNP Q7K740
Q	2	THR	-	cloning artifact	UNP Q7K740
Q	3	GLY	-	cloning artifact	UNP Q7K740
Q	112	GLY	-	linker	UNP Q7K740
Q	113	GLY	-	linker	UNP Q7K740
Q	114	SER	-	linker	UNP Q7K740
Q	115	GLY	-	cloning artifact	UNP Q7K740
Q	116	THR	-	cloning artifact	UNP Q7K740
Q	198	ARG	LYS	engineered mutation	UNP C6KT50
Q	289	CYS	LYS	engineered mutation	UNP C6KT50
Q	293	CYS	SER	engineered mutation	UNP C6KT50
Q	417	THR	-	cloning artifact	UNP C6KT50
Q	418	GLY	-	cloning artifact	UNP C6KT50
Q	527	GLY	-	linker	UNP Q7K740
Q	528	GLY	-	linker	UNP Q7K740
Q	529	SER	-	linker	UNP Q7K740
Q	530	LEU	-	cloning artifact	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
Q	531	GLU	-	cloning artifact	UNP Q7K740
Q	532	HIS	-	expression tag	UNP Q7K740
Q	533	HIS	-	expression tag	UNP Q7K740
Q	534	HIS	-	expression tag	UNP Q7K740
Q	535	HIS	-	expression tag	UNP Q7K740
Q	536	HIS	-	expression tag	UNP Q7K740
Q	537	HIS	-	expression tag	UNP Q7K740
R	1	MET	-	initiating methionine	UNP Q7K740
R	2	THR	-	cloning artifact	UNP Q7K740
R	3	GLY	-	cloning artifact	UNP Q7K740
R	112	GLY	-	linker	UNP Q7K740
R	113	GLY	-	linker	UNP Q7K740
R	114	SER	-	linker	UNP Q7K740
R	115	GLY	-	cloning artifact	UNP Q7K740
R	116	THR	-	cloning artifact	UNP Q7K740
R	198	ARG	LYS	engineered mutation	UNP C6KT50
R	289	CYS	LYS	engineered mutation	UNP C6KT50
R	293	CYS	SER	engineered mutation	UNP C6KT50
R	417	THR	-	cloning artifact	UNP C6KT50
R	418	GLY	-	cloning artifact	UNP C6KT50
R	527	GLY	-	linker	UNP Q7K740
R	528	GLY	-	linker	UNP Q7K740
R	529	SER	-	linker	UNP Q7K740
R	530	LEU	-	cloning artifact	UNP Q7K740
R	531	GLU	-	cloning artifact	UNP Q7K740
R	532	HIS	-	expression tag	UNP Q7K740
R	533	HIS	-	expression tag	UNP Q7K740
R	534	HIS	-	expression tag	UNP Q7K740
R	535	HIS	-	expression tag	UNP Q7K740
R	536	HIS	-	expression tag	UNP Q7K740
R	537	HIS	-	expression tag	UNP Q7K740

- Molecule 2 is a protein called Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	G	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	H	182	Total 2879	C 928	H 1446	N 242	O 254	S 9	0	0
2	I	182	Total 2879	C 928	H 1446	N 242	O 254	S 9	0	0

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Mol	Chain	Residues	Atoms						AltConf	Trace
2	J	182	Total 2879	C 928	H 1446	N 242	O 254	S 9	0	0
2	K	182	Total 2882	C 928	H 1448	N 243	O 254	S 9	0	0
2	L	183	Total 2901	C 934	H 1459	N 244	O 255	S 9	0	0
2	S	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	T	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	U	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	V	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	W	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0
2	X	183	Total 2900	C 934	H 1458	N 244	O 255	S 9	0	0

There are 288 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	1	MET	-	initiating methionine	UNP Q7K740
G	2	THR	-	cloning artifact	UNP Q7K740
G	3	GLY	-	cloning artifact	UNP Q7K740
G	112	GLY	-	linker	UNP Q7K740
G	113	GLY	-	linker	UNP Q7K740
G	114	SER	-	linker	UNP Q7K740
G	115	GLY	-	cloning artifact	UNP Q7K740
G	116	THR	-	cloning artifact	UNP Q7K740
G	179	GLN	ASN	engineered mutation	UNP Q8IIK4
G	242	GLN	ASN	engineered mutation	UNP Q8IIK4
G	310	ASN	HIS	engineered mutation	UNP Q8IIK4
G	334	THR	-	cloning artifact	UNP Q8IIK4
G	335	GLY	-	cloning artifact	UNP Q8IIK4
G	444	GLY	-	linker	UNP Q7K740
G	445	GLY	-	linker	UNP Q7K740
G	446	SER	-	linker	UNP Q7K740
G	447	LEU	-	cloning artifact	UNP Q7K740
G	448	GLU	-	cloning artifact	UNP Q7K740
G	449	HIS	-	expression tag	UNP Q7K740
G	450	HIS	-	expression tag	UNP Q7K740
G	451	HIS	-	expression tag	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
G	452	HIS	-	expression tag	UNP Q7K740
G	453	HIS	-	expression tag	UNP Q7K740
G	454	HIS	-	expression tag	UNP Q7K740
H	1	MET	-	initiating methionine	UNP Q7K740
H	2	THR	-	cloning artifact	UNP Q7K740
H	3	GLY	-	cloning artifact	UNP Q7K740
H	112	GLY	-	linker	UNP Q7K740
H	113	GLY	-	linker	UNP Q7K740
H	114	SER	-	linker	UNP Q7K740
H	115	GLY	-	cloning artifact	UNP Q7K740
H	116	THR	-	cloning artifact	UNP Q7K740
H	179	GLN	ASN	engineered mutation	UNP Q8IIK4
H	242	GLN	ASN	engineered mutation	UNP Q8IIK4
H	310	ASN	HIS	engineered mutation	UNP Q8IIK4
H	334	THR	-	cloning artifact	UNP Q8IIK4
H	335	GLY	-	cloning artifact	UNP Q8IIK4
H	444	GLY	-	linker	UNP Q7K740
H	445	GLY	-	linker	UNP Q7K740
H	446	SER	-	linker	UNP Q7K740
H	447	LEU	-	cloning artifact	UNP Q7K740
H	448	GLU	-	cloning artifact	UNP Q7K740
H	449	HIS	-	expression tag	UNP Q7K740
H	450	HIS	-	expression tag	UNP Q7K740
H	451	HIS	-	expression tag	UNP Q7K740
H	452	HIS	-	expression tag	UNP Q7K740
H	453	HIS	-	expression tag	UNP Q7K740
H	454	HIS	-	expression tag	UNP Q7K740
I	1	MET	-	initiating methionine	UNP Q7K740
I	2	THR	-	cloning artifact	UNP Q7K740
I	3	GLY	-	cloning artifact	UNP Q7K740
I	112	GLY	-	linker	UNP Q7K740
I	113	GLY	-	linker	UNP Q7K740
I	114	SER	-	linker	UNP Q7K740
I	115	GLY	-	cloning artifact	UNP Q7K740
I	116	THR	-	cloning artifact	UNP Q7K740
I	179	GLN	ASN	engineered mutation	UNP Q8IIK4
I	242	GLN	ASN	engineered mutation	UNP Q8IIK4
I	310	ASN	HIS	engineered mutation	UNP Q8IIK4
I	334	THR	-	cloning artifact	UNP Q8IIK4
I	335	GLY	-	cloning artifact	UNP Q8IIK4
I	444	GLY	-	linker	UNP Q7K740
I	445	GLY	-	linker	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
I	446	SER	-	linker	UNP Q7K740
I	447	LEU	-	cloning artifact	UNP Q7K740
I	448	GLU	-	cloning artifact	UNP Q7K740
I	449	HIS	-	expression tag	UNP Q7K740
I	450	HIS	-	expression tag	UNP Q7K740
I	451	HIS	-	expression tag	UNP Q7K740
I	452	HIS	-	expression tag	UNP Q7K740
I	453	HIS	-	expression tag	UNP Q7K740
I	454	HIS	-	expression tag	UNP Q7K740
J	1	MET	-	initiating methionine	UNP Q7K740
J	2	THR	-	cloning artifact	UNP Q7K740
J	3	GLY	-	cloning artifact	UNP Q7K740
J	112	GLY	-	linker	UNP Q7K740
J	113	GLY	-	linker	UNP Q7K740
J	114	SER	-	linker	UNP Q7K740
J	115	GLY	-	cloning artifact	UNP Q7K740
J	116	THR	-	cloning artifact	UNP Q7K740
J	179	GLN	ASN	engineered mutation	UNP Q8IIK4
J	242	GLN	ASN	engineered mutation	UNP Q8IIK4
J	310	ASN	HIS	engineered mutation	UNP Q8IIK4
J	334	THR	-	cloning artifact	UNP Q8IIK4
J	335	GLY	-	cloning artifact	UNP Q8IIK4
J	444	GLY	-	linker	UNP Q7K740
J	445	GLY	-	linker	UNP Q7K740
J	446	SER	-	linker	UNP Q7K740
J	447	LEU	-	cloning artifact	UNP Q7K740
J	448	GLU	-	cloning artifact	UNP Q7K740
J	449	HIS	-	expression tag	UNP Q7K740
J	450	HIS	-	expression tag	UNP Q7K740
J	451	HIS	-	expression tag	UNP Q7K740
J	452	HIS	-	expression tag	UNP Q7K740
J	453	HIS	-	expression tag	UNP Q7K740
J	454	HIS	-	expression tag	UNP Q7K740
K	1	MET	-	initiating methionine	UNP Q7K740
K	2	THR	-	cloning artifact	UNP Q7K740
K	3	GLY	-	cloning artifact	UNP Q7K740
K	112	GLY	-	linker	UNP Q7K740
K	113	GLY	-	linker	UNP Q7K740
K	114	SER	-	linker	UNP Q7K740
K	115	GLY	-	cloning artifact	UNP Q7K740
K	116	THR	-	cloning artifact	UNP Q7K740
K	179	GLN	ASN	engineered mutation	UNP Q8IIK4

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Chain	Residue	Modelled	Actual	Comment	Reference
K	242	GLN	ASN	engineered mutation	UNP Q8IIK4
K	310	ASN	HIS	engineered mutation	UNP Q8IIK4
K	334	THR	-	cloning artifact	UNP Q8IIK4
K	335	GLY	-	cloning artifact	UNP Q8IIK4
K	444	GLY	-	linker	UNP Q7K740
K	445	GLY	-	linker	UNP Q7K740
K	446	SER	-	linker	UNP Q7K740
K	447	LEU	-	cloning artifact	UNP Q7K740
K	448	GLU	-	cloning artifact	UNP Q7K740
K	449	HIS	-	expression tag	UNP Q7K740
K	450	HIS	-	expression tag	UNP Q7K740
K	451	HIS	-	expression tag	UNP Q7K740
K	452	HIS	-	expression tag	UNP Q7K740
K	453	HIS	-	expression tag	UNP Q7K740
K	454	HIS	-	expression tag	UNP Q7K740
L	1	MET	-	initiating methionine	UNP Q7K740
L	2	THR	-	cloning artifact	UNP Q7K740
L	3	GLY	-	cloning artifact	UNP Q7K740
L	112	GLY	-	linker	UNP Q7K740
L	113	GLY	-	linker	UNP Q7K740
L	114	SER	-	linker	UNP Q7K740
L	115	GLY	-	cloning artifact	UNP Q7K740
L	116	THR	-	cloning artifact	UNP Q7K740
L	179	GLN	ASN	engineered mutation	UNP Q8IIK4
L	242	GLN	ASN	engineered mutation	UNP Q8IIK4
L	310	ASN	HIS	engineered mutation	UNP Q8IIK4
L	334	THR	-	cloning artifact	UNP Q8IIK4
L	335	GLY	-	cloning artifact	UNP Q8IIK4
L	444	GLY	-	linker	UNP Q7K740
L	445	GLY	-	linker	UNP Q7K740
L	446	SER	-	linker	UNP Q7K740
L	447	LEU	-	cloning artifact	UNP Q7K740
L	448	GLU	-	cloning artifact	UNP Q7K740
L	449	HIS	-	expression tag	UNP Q7K740
L	450	HIS	-	expression tag	UNP Q7K740
L	451	HIS	-	expression tag	UNP Q7K740
L	452	HIS	-	expression tag	UNP Q7K740
L	453	HIS	-	expression tag	UNP Q7K740
L	454	HIS	-	expression tag	UNP Q7K740
S	1	MET	-	initiating methionine	UNP Q7K740
S	2	THR	-	cloning artifact	UNP Q7K740
S	3	GLY	-	cloning artifact	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
S	112	GLY	-	linker	UNP Q7K740
S	113	GLY	-	linker	UNP Q7K740
S	114	SER	-	linker	UNP Q7K740
S	115	GLY	-	cloning artifact	UNP Q7K740
S	116	THR	-	cloning artifact	UNP Q7K740
S	179	GLN	ASN	engineered mutation	UNP Q8IIK4
S	242	GLN	ASN	engineered mutation	UNP Q8IIK4
S	310	ASN	HIS	engineered mutation	UNP Q8IIK4
S	334	THR	-	cloning artifact	UNP Q8IIK4
S	335	GLY	-	cloning artifact	UNP Q8IIK4
S	444	GLY	-	linker	UNP Q7K740
S	445	GLY	-	linker	UNP Q7K740
S	446	SER	-	linker	UNP Q7K740
S	447	LEU	-	cloning artifact	UNP Q7K740
S	448	GLU	-	cloning artifact	UNP Q7K740
S	449	HIS	-	expression tag	UNP Q7K740
S	450	HIS	-	expression tag	UNP Q7K740
S	451	HIS	-	expression tag	UNP Q7K740
S	452	HIS	-	expression tag	UNP Q7K740
S	453	HIS	-	expression tag	UNP Q7K740
S	454	HIS	-	expression tag	UNP Q7K740
T	1	MET	-	initiating methionine	UNP Q7K740
T	2	THR	-	cloning artifact	UNP Q7K740
T	3	GLY	-	cloning artifact	UNP Q7K740
T	112	GLY	-	linker	UNP Q7K740
T	113	GLY	-	linker	UNP Q7K740
T	114	SER	-	linker	UNP Q7K740
T	115	GLY	-	cloning artifact	UNP Q7K740
T	116	THR	-	cloning artifact	UNP Q7K740
T	179	GLN	ASN	engineered mutation	UNP Q8IIK4
T	242	GLN	ASN	engineered mutation	UNP Q8IIK4
T	310	ASN	HIS	engineered mutation	UNP Q8IIK4
T	334	THR	-	cloning artifact	UNP Q8IIK4
T	335	GLY	-	cloning artifact	UNP Q8IIK4
T	444	GLY	-	linker	UNP Q7K740
T	445	GLY	-	linker	UNP Q7K740
T	446	SER	-	linker	UNP Q7K740
T	447	LEU	-	cloning artifact	UNP Q7K740
T	448	GLU	-	cloning artifact	UNP Q7K740
T	449	HIS	-	expression tag	UNP Q7K740
T	450	HIS	-	expression tag	UNP Q7K740
T	451	HIS	-	expression tag	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
T	452	HIS	-	expression tag	UNP Q7K740
T	453	HIS	-	expression tag	UNP Q7K740
T	454	HIS	-	expression tag	UNP Q7K740
U	1	MET	-	initiating methionine	UNP Q7K740
U	2	THR	-	cloning artifact	UNP Q7K740
U	3	GLY	-	cloning artifact	UNP Q7K740
U	112	GLY	-	linker	UNP Q7K740
U	113	GLY	-	linker	UNP Q7K740
U	114	SER	-	linker	UNP Q7K740
U	115	GLY	-	cloning artifact	UNP Q7K740
U	116	THR	-	cloning artifact	UNP Q7K740
U	179	GLN	ASN	engineered mutation	UNP Q8IIK4
U	242	GLN	ASN	engineered mutation	UNP Q8IIK4
U	310	ASN	HIS	engineered mutation	UNP Q8IIK4
U	334	THR	-	cloning artifact	UNP Q8IIK4
U	335	GLY	-	cloning artifact	UNP Q8IIK4
U	444	GLY	-	linker	UNP Q7K740
U	445	GLY	-	linker	UNP Q7K740
U	446	SER	-	linker	UNP Q7K740
U	447	LEU	-	cloning artifact	UNP Q7K740
U	448	GLU	-	cloning artifact	UNP Q7K740
U	449	HIS	-	expression tag	UNP Q7K740
U	450	HIS	-	expression tag	UNP Q7K740
U	451	HIS	-	expression tag	UNP Q7K740
U	452	HIS	-	expression tag	UNP Q7K740
U	453	HIS	-	expression tag	UNP Q7K740
U	454	HIS	-	expression tag	UNP Q7K740
V	1	MET	-	initiating methionine	UNP Q7K740
V	2	THR	-	cloning artifact	UNP Q7K740
V	3	GLY	-	cloning artifact	UNP Q7K740
V	112	GLY	-	linker	UNP Q7K740
V	113	GLY	-	linker	UNP Q7K740
V	114	SER	-	linker	UNP Q7K740
V	115	GLY	-	cloning artifact	UNP Q7K740
V	116	THR	-	cloning artifact	UNP Q7K740
V	179	GLN	ASN	engineered mutation	UNP Q8IIK4
V	242	GLN	ASN	engineered mutation	UNP Q8IIK4
V	310	ASN	HIS	engineered mutation	UNP Q8IIK4
V	334	THR	-	cloning artifact	UNP Q8IIK4
V	335	GLY	-	cloning artifact	UNP Q8IIK4
V	444	GLY	-	linker	UNP Q7K740
V	445	GLY	-	linker	UNP Q7K740

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Chain	Residue	Modelled	Actual	Comment	Reference
V	446	SER	-	linker	UNP Q7K740
V	447	LEU	-	cloning artifact	UNP Q7K740
V	448	GLU	-	cloning artifact	UNP Q7K740
V	449	HIS	-	expression tag	UNP Q7K740
V	450	HIS	-	expression tag	UNP Q7K740
V	451	HIS	-	expression tag	UNP Q7K740
V	452	HIS	-	expression tag	UNP Q7K740
V	453	HIS	-	expression tag	UNP Q7K740
V	454	HIS	-	expression tag	UNP Q7K740
W	1	MET	-	initiating methionine	UNP Q7K740
W	2	THR	-	cloning artifact	UNP Q7K740
W	3	GLY	-	cloning artifact	UNP Q7K740
W	112	GLY	-	linker	UNP Q7K740
W	113	GLY	-	linker	UNP Q7K740
W	114	SER	-	linker	UNP Q7K740
W	115	GLY	-	cloning artifact	UNP Q7K740
W	116	THR	-	cloning artifact	UNP Q7K740
W	179	GLN	ASN	engineered mutation	UNP Q8IIK4
W	242	GLN	ASN	engineered mutation	UNP Q8IIK4
W	310	ASN	HIS	engineered mutation	UNP Q8IIK4
W	334	THR	-	cloning artifact	UNP Q8IIK4
W	335	GLY	-	cloning artifact	UNP Q8IIK4
W	444	GLY	-	linker	UNP Q7K740
W	445	GLY	-	linker	UNP Q7K740
W	446	SER	-	linker	UNP Q7K740
W	447	LEU	-	cloning artifact	UNP Q7K740
W	448	GLU	-	cloning artifact	UNP Q7K740
W	449	HIS	-	expression tag	UNP Q7K740
W	450	HIS	-	expression tag	UNP Q7K740
W	451	HIS	-	expression tag	UNP Q7K740
W	452	HIS	-	expression tag	UNP Q7K740
W	453	HIS	-	expression tag	UNP Q7K740
W	454	HIS	-	expression tag	UNP Q7K740
X	1	MET	-	initiating methionine	UNP Q7K740
X	2	THR	-	cloning artifact	UNP Q7K740
X	3	GLY	-	cloning artifact	UNP Q7K740
X	112	GLY	-	linker	UNP Q7K740
X	113	GLY	-	linker	UNP Q7K740
X	114	SER	-	linker	UNP Q7K740
X	115	GLY	-	cloning artifact	UNP Q7K740
X	116	THR	-	cloning artifact	UNP Q7K740
X	179	GLN	ASN	engineered mutation	UNP Q8IIK4

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Chain	Residue	Modelled	Actual	Comment	Reference
X	242	GLN	ASN	engineered mutation	UNP Q8IIK4
X	310	ASN	HIS	engineered mutation	UNP Q8IIK4
X	334	THR	-	cloning artifact	UNP Q8IIK4
X	335	GLY	-	cloning artifact	UNP Q8IIK4
X	444	GLY	-	linker	UNP Q7K740
X	445	GLY	-	linker	UNP Q7K740
X	446	SER	-	linker	UNP Q7K740
X	447	LEU	-	cloning artifact	UNP Q7K740
X	448	GLU	-	cloning artifact	UNP Q7K740
X	449	HIS	-	expression tag	UNP Q7K740
X	450	HIS	-	expression tag	UNP Q7K740
X	451	HIS	-	expression tag	UNP Q7K740
X	452	HIS	-	expression tag	UNP Q7K740
X	453	HIS	-	expression tag	UNP Q7K740
X	454	HIS	-	expression tag	UNP Q7K740

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: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

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

- Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain C: 42%   6%   52%

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

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

ASP ASP ALA V124 L125 L126 L134 K135 E153 I157 L162 I165 PRO SER GLU LEU ARG ASN LYS GLU G174 D180 P181 S182 K183 V184 E185 K188 V195 R198 L213 K214 I215 D216 S221 M230 H231 H232 I233 V243 I263 R264 I274 L291

F302 V313 V332 D337 M346 D347 G348 V349 G389 LYS ALA MET CYS GLY SER THR ARG VAL ASP SER ILE LYS GLU TYR LEU ASN LYS ILE GLN ASN GLU HIS THR LYS PHE LEU THR PRO GLN THR GLY ASP PRO ASP PRO ASN ALA ASN PRO ASN ALA ASP PRO ASN ALA ASN PRO

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

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

- Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain D: 41%   7%   52%

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

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

ASP ASP ALA V124 L125 L126 W130 G136 A148 E153 M160 V161 L162 I165 PRO SER GLU LEU ARG ASN LYS GLU G174 D180 P181 S182 K183 K188 V191 V195 R198 F204 Q208 M217 I218 D219 E220 S221 M230 H231 V243 I263 R264
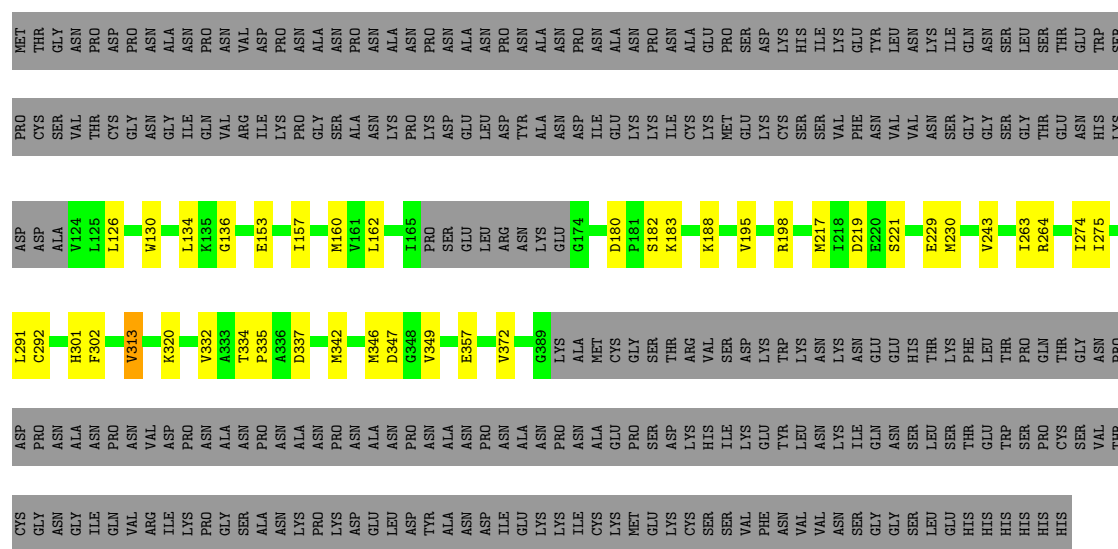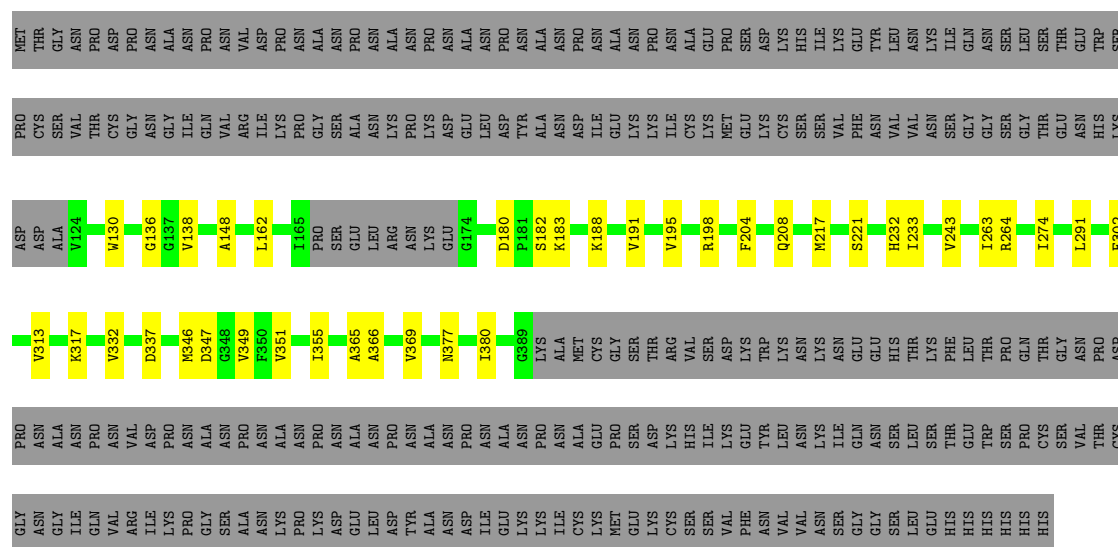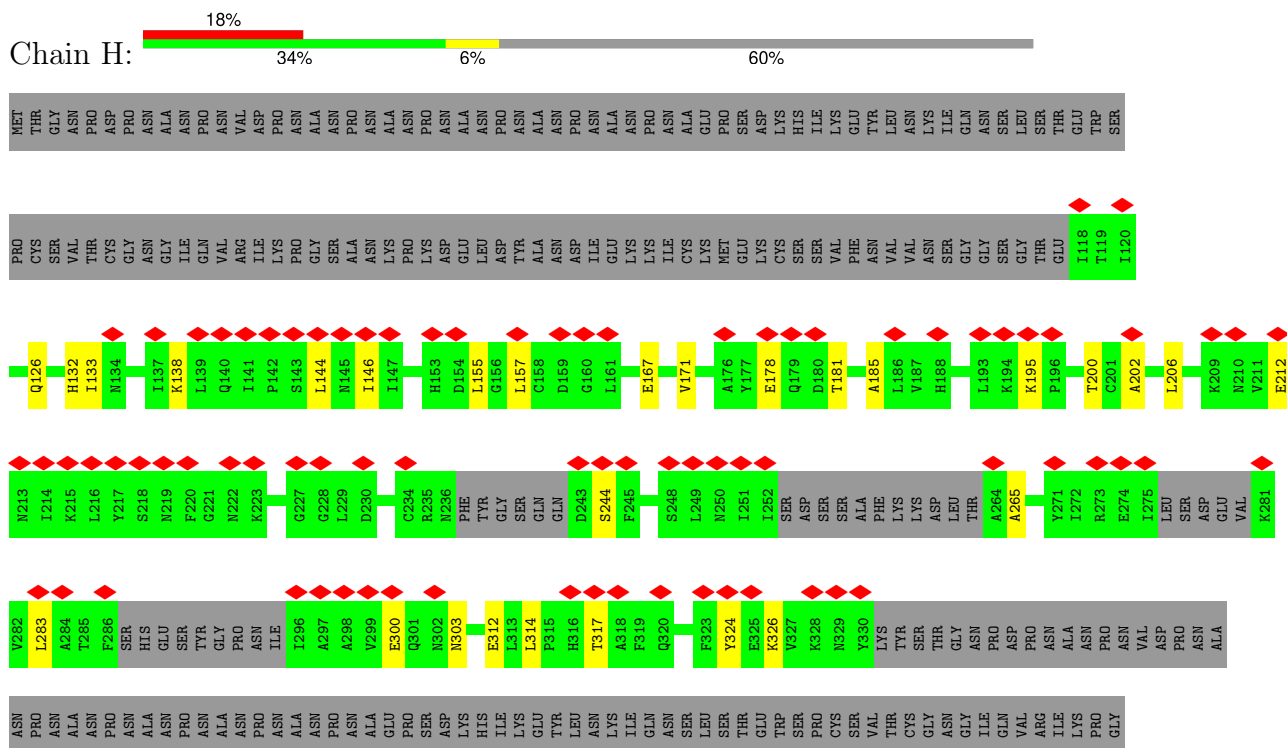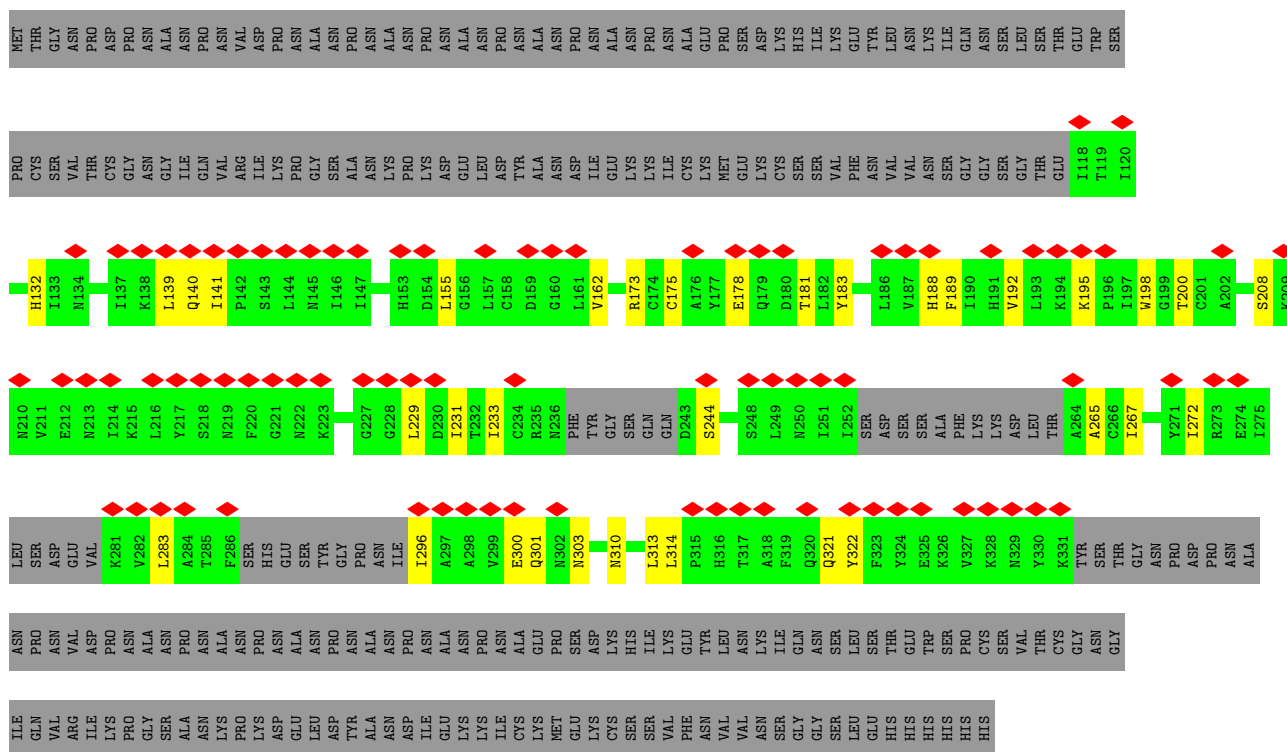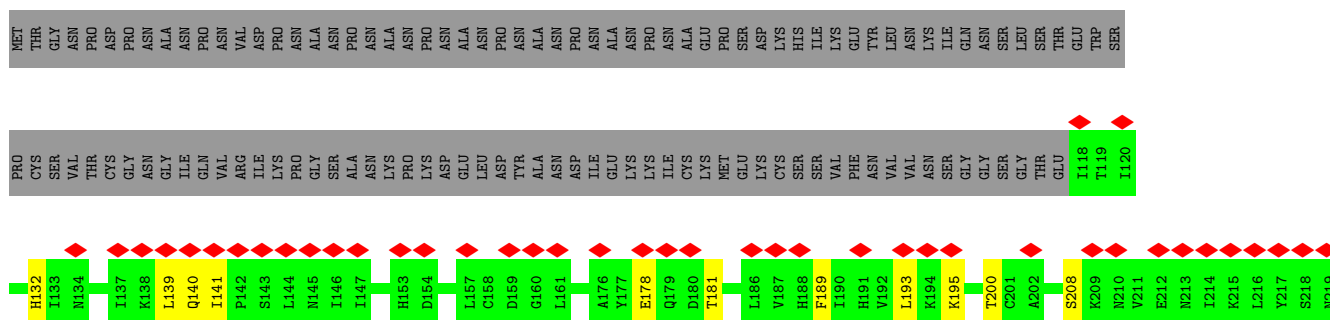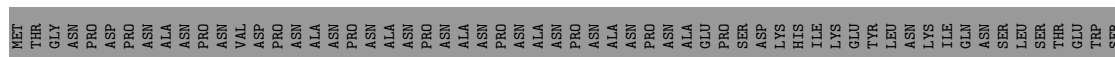
I274 L291 C292 H301 V313 V332 D337 M340 D347 G348 V349 F350 V351 I355 M386 G389 LYS ALA MET CYS GLY SER THR ARG VAL ASP SER LYS TRP LYS ASN LYS ASN GLU GLU HIS THR LYS PHE LEU THR PRO GLN THR GLY ASP PRO ASP PRO ASN ALA ASN PRO ASN ALA ASP PRO ASP PRO

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

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

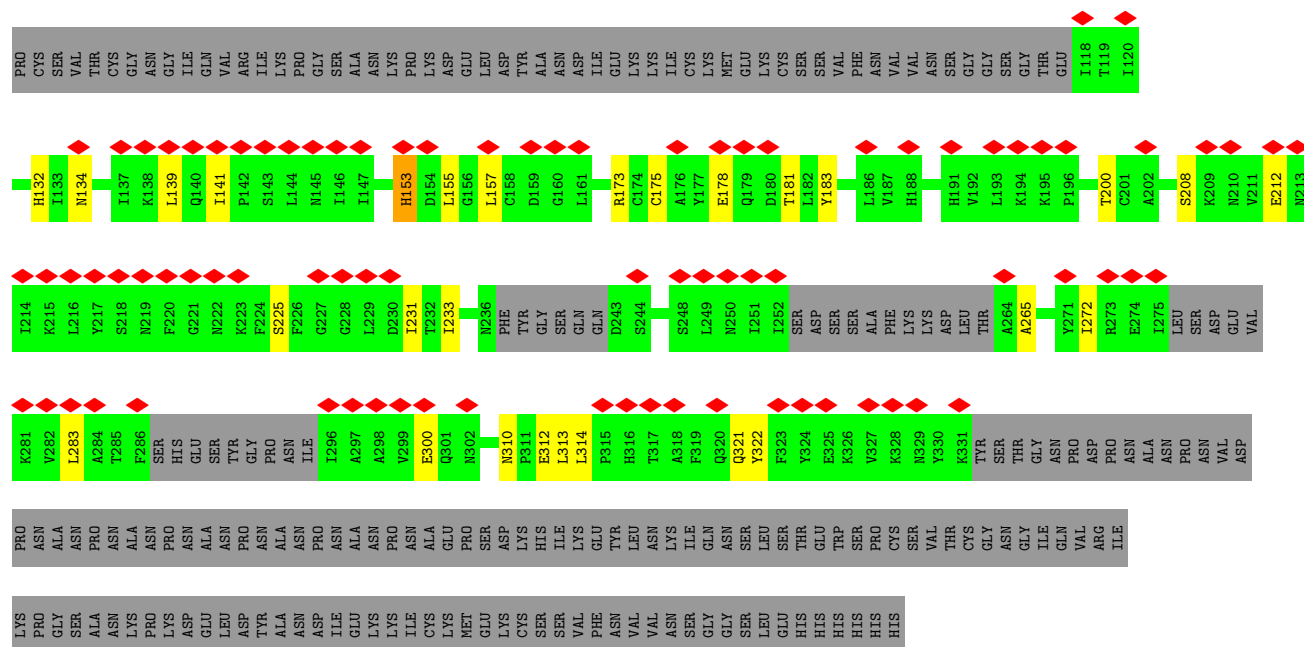- Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain E: 42%   5%   52%

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

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

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain F: 41%   7%   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain M: 41%   7%   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain N:

41%   7% •   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain O:

43%   5%   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain P:

41%   7%   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain Q:

41%   7%   52%

• Molecule 1: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit Pdx1

Chain R:

42%   6%   52%

WORLDWIDE
wwPDB
PROTEIN DATA BANK

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain G:

18%

36%   5%   60%

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ILE LYS ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL VAL ASN SER GLY SER GLY THR GLU **I118 T119 I120**

L123 **H132 I133 N134** **I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147** **H153 D154** **L157** **G160 L161** **R173** **A176 Y177 E178 Q179 D180** **L186 V187 H188** **H191 V192 L193 K194 K195** **T200 C201 A202** **S208 K209 N210 V211 E212 N213 I214 K215 L216 Y217 S218**

N219 F220 G221 N222 K223 F224 S225 F226 G227 G228 L229 D230 I231 I232 I233 **C234 R235 N236** PHE TYR GLY SER GLN GLN **D243 S244** **S248 L249 N250 I251 I252** SER ASP SER ALA PHE LYS LYS ASP LEU THR **A264 A265** **Y271 I272 R273 E274 I275** LEU SER ASP GLU VAL **K281 V282 L283 A284**

T285 F286 SER HIS GLU SER TYR GLY PRO ASN ILE **I296 A297 A298 V299** **E300 Q301 N302 N303** **N310** P311 **E312 L313 L314** **P315 H316 T317** **Q320 Q321 Y322 F323 Y324 E325** **K328 N329 Y330 K331** TYR SER THR GLY ASN ASP PRO ALA ASN ASN VAL ASP PRO ASN ALA ASN PRO

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain H:

18%

34%   6%   60%

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ILE LYS ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL VAL ASN SER GLY SER GLY THR GLU **I118 T119 I120**

Q126 **H132 I133 N134** **I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147** **H153 D154 L155 G156 L157 C158 D159 G160 L161** **E167** **V171** **A176 Y177 E178 Q179 D180 T181** **A185 L186 V187 H188** **L193 K194 K195 P196** **T200 C201 A202** **L206** **K209 N210 V211 E212**

N213 I214 K215 L216 Y217 S218 N219 F220 G221 N222 K223 **G227 G228 L229 D230** **C234 R235 N236** PHE TYR GLY SER GLN GLN **D243 S244 F245** **S248 L249 N250 I251 I252** SER ASP SER ALA PHE LYS LYS ASP LEU THR **A264 A265** **Y271 I272 R273 E274 I275** LEU SER ASP GLU VAL **K281**

V282 L283 A284 T285 F286 SER HIS GLU SER TYR GLY PRO ASN ILE **I296 A297 A298 V299** **E300 Q301 N302 N303** **E312 L313 L314** **P315 H316 T317 A318 F319** **Q320** **F323 Y324 E325 K326 V327 K328 N329 Y330** LYS TYR SER THR GLY ASN ASP PRO ALA ASN ALA ASN PRO ASN ALA

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain I:

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain J:

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain K:

17%

33%   7%   60%

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL VAL ASN SER GLY LYS SER GLY THR GLU ILE T119 I120

Q126 N134 I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147 H153 D154 L155 G156 L157 C158 D159 G160 L161 R173 A176 Y177 E178 Q179 D180 T181 L186 V187 H188 F189 I190 H191 V192 L193 K194 K195 T200 C201 C204 I205 S208 V211 E212 N213 I214 K215

L216 Y217 S218 N219 F220 G221 N222 K223 F224 S225 F226 G227 G228 L229 D230 I231 T232 N236 PHE TYR GLY SER GLN GLN D243 S244 F245 S248 L249 N250 I251 I252 SER ASP SER ALA PHE LYS ASP LEU THR A264 A265 Y271 I272 R273 E274 I275 LEU SER ASP GLU VAL K281 V282

L283 A284 T285 F286 SER HIS GLU SER TYR GLY PRO ASN ILE I296 A297 A298 V299 E300 Q301 N302 N303 N310 P311 E312 L313 L314 P315 H316 T317 A318 F319 Q320 Q321 Y322 F323 Y324 V327 K328 N329 Y330 K331 TYR SER THR GLY ASN SER PRO ASP PRO ASN ALA ASN PRO ASN VAL ASP PRO ASN

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain L:

17%

36%   5%   60%

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL VAL ASN SER GLY LYS SER GLY THR GLU I118 T119 I120

Q126 H132 I133 N134 I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147 H153 D154 L155 G156 L157 G160 L161 A176 Y177 E178 Q179 D180 T181 L186 V187 H188 H191 V192 L193 K194 K195 P196 T200 C201 A202 K209 N210 N213 I214 K215 L216 Y217 S218 N219

F220 G221 N222 K223 G227 G228 L229 D230 I231 T232 N236 PHE TYR GLY SER GLN GLN D243 S244 S248 L249 N250 I251 I252 SER ASP SER ALA PHE LYS ASP LEU THR A264 A265 Y271 I272 R273 E274 I275 LEU SER ASP GLU VAL K281 V282 L283 A284 T285 F286 SER HIS GLU

SER TYR GLY PRO ASN ILE **I296 A297 A298 V299 E300 Q301 N302** N310 **L313 L314** P315 H316 T317 **Q320 Q321 Y322 F323 Y324 E325** K328 N329 Y330 K331 TYR SER THR ASN PRO ASP PRO ASN ALA ASN PRO ASN VAL ASP ASN ALA ASN PRO ASN ALA ASN

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain S:

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL ASN SER GLY GLY SER GLY THR GLU **I118 T119 I120**

H132 I133 N134 **I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147** H153 D154 L155 G156 **L157 C158 D159 G160 L161 V162** R173 **C174 C175 A176 Y177 E178 Q179 D180 T181 L182 Y183** L186 V187 H188 F189 I190 H191 V192 L193 K194 **K195 P196 I197 W198 G199 T200 C201 A202** S208 K209

N210 V211 E212 N213 I214 K215 L216 Y217 S218 N219 F220 G221 N222 K223 G227 G228 **L229 D230 I231 I232 I233** C234 R235 N236 PHE TYR GLY SER GLN GLN D243 S244 S248 L249 N250 I251 I252 SER ASP SER SER ALA PHE LYS LYS ASP LEU THR A264 A265 C266 I267 Y271 I272 R273 E274 I275

LEU SER ASP GLU VAL **K281 V282 L283 A284 T285 F286** SER HIS GLU SER TYR GLY PRO ASN ILE **I296 A297 A298 V299 E300 Q301 N302** N303 N310 **L313 L314** P315 H316 T317 A318 F319 **Q320 Q321 Y322 F323 Y324 E325 K326 V327 K328 N329 Y330 K331** TYR SER THR ASN PRO ASP PRO ASN ALA

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

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

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain T:

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

PRO CYS SER VAL THR CYS GLY ASN GLY ILE GLN VAL ARG ILE LYS PRO GLY SER ALA ASN LYS PRO LYS ASP GLU LEU ASP TYR ALA ASN ASP ILE GLU LYS LYS ILE CYS LYS MET GLU LYS CYS SER SER VAL PHE ASN VAL ASN SER GLY GLY SER GLY THR GLU **I118 T119 I120**

H132 I133 N134 **I137 K138 L139 Q140 I141 P142 S143 L144 N145 I146 I147** H153 D154 **L157 C158 D159 G160 L161** A176 Y177 E178 Q179 D180 T181 L186 V187 H188 F189 I190 H191 V192 L193 K194 K195 T200 C201 A202 S208 K209 N210 V211 E212 N213 I214 K215 L216 Y217 S218 N219

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain W:

18%
34% 6% 60%

• Molecule 2: Circumsporozoite protein,Pyridoxal 5'-phosphate synthase subunit PDX2

Chain X:

19%
34% 6% 60%

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	251050	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/Å^2)$	53.8	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	29.141	Depositor
Minimum map value	-18.289	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	1.76	Depositor
Map size (Å)	270.336, 270.336, 270.336	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.056, 1.056, 1.056	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	A	0.23	0/1971	0.28	0/2653
1	B	0.22	0/1975	0.27	0/2658
1	C	0.22	0/1975	0.27	0/2658
1	D	0.22	0/1975	0.28	0/2658
1	E	0.22	0/1975	0.28	0/2658
1	F	0.22	0/1975	0.28	0/2658
1	M	0.22	0/1975	0.29	0/2658
1	N	0.22	0/1975	0.28	0/2658
1	O	0.22	0/1975	0.28	0/2658
1	P	0.22	0/1975	0.28	0/2658
1	Q	0.22	0/1975	0.28	0/2658
1	R	0.22	0/1975	0.28	0/2658
2	G	0.08	0/1470	0.23	0/1988
2	H	0.08	0/1461	0.23	0/1977
2	I	0.08	0/1461	0.24	0/1977
2	J	0.09	0/1461	0.24	0/1977
2	K	0.10	0/1462	0.25	0/1977
2	L	0.09	0/1470	0.23	0/1988
2	S	0.10	0/1470	0.26	0/1988
2	T	0.09	0/1470	0.23	0/1988
2	U	0.09	0/1470	0.23	0/1988
2	V	0.08	0/1470	0.22	0/1988
2	W	0.09	0/1470	0.25	0/1988
2	X	0.09	0/1470	0.24	0/1988
All	All	0.18	0/41301	0.26	0/55703

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	A	1947	2015	2015	24	0
1	B	1951	2018	2018	22	0
1	C	1951	2018	2018	21	0
1	D	1951	2018	2018	23	0
1	E	1951	2018	2018	22	0
1	F	1951	2018	2018	27	0
1	M	1951	2018	2018	27	0
1	N	1951	2018	2018	23	0
1	O	1951	2018	2018	16	0
1	P	1951	2018	2018	32	0
1	Q	1951	2018	2018	26	0
1	R	1951	2018	2018	16	0
2	G	1442	1458	1455	14	0
2	H	1433	1446	1442	18	0
2	I	1433	1446	1442	22	0
2	J	1433	1446	1440	20	0
2	K	1434	1448	1444	27	0
2	L	1442	1459	1455	15	0
2	S	1442	1458	1455	26	0
2	T	1442	1458	1455	16	0
2	U	1442	1458	1455	19	0
2	V	1442	1458	1455	15	0
2	W	1442	1458	1455	18	0
2	X	1442	1458	1455	21	0
All	All	40677	41664	41621	476	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 6.

The worst 5 of 476 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:O:180:ASP:OD2	1:O:182:SER:OG	1.83	0.96
1:B:180:ASP:OD2	1:B:182:SER:OG	1.85	0.93
1:P:134:LEU:HD23	1:P:262:MET:HE1	1.59	0.84

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:134:LEU:HD23	1:E:262:MET:HE1	1.60	0.84
1:N:180:ASP:OD1	1:N:182:SER:OG	1.96	0.83

There are no symmetry-related clashes.

5.3　Torsion angles ⓘ

5.3.1　Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	253/537 (47%)	242 (96%)	11 (4%)	0	100	100
1	B	254/537 (47%)	246 (97%)	8 (3%)	0	100	100
1	C	254/537 (47%)	246 (97%)	8 (3%)	0	100	100
1	D	254/537 (47%)	244 (96%)	10 (4%)	0	100	100
1	E	254/537 (47%)	243 (96%)	11 (4%)	0	100	100
1	F	254/537 (47%)	243 (96%)	11 (4%)	0	100	100
1	M	254/537 (47%)	243 (96%)	11 (4%)	0	100	100
1	N	254/537 (47%)	243 (96%)	11 (4%)	0	100	100
1	O	254/537 (47%)	245 (96%)	9 (4%)	0	100	100
1	P	254/537 (47%)	244 (96%)	10 (4%)	0	100	100
1	Q	254/537 (47%)	241 (95%)	13 (5%)	0	100	100
1	R	254/537 (47%)	240 (94%)	14 (6%)	0	100	100
2	G	173/454 (38%)	167 (96%)	6 (4%)	0	100	100
2	H	172/454 (38%)	166 (96%)	6 (4%)	0	100	100
2	I	172/454 (38%)	162 (94%)	10 (6%)	0	100	100
2	J	172/454 (38%)	164 (95%)	8 (5%)	0	100	100
2	K	172/454 (38%)	160 (93%)	12 (7%)	0	100	100
2	L	173/454 (38%)	167 (96%)	6 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	S	173/454 (38%)	165 (95%)	8 (5%)	0	100	100
2	T	173/454 (38%)	167 (96%)	6 (4%)	0	100	100
2	U	173/454 (38%)	164 (95%)	9 (5%)	0	100	100
2	V	173/454 (38%)	164 (95%)	9 (5%)	0	100	100
2	W	173/454 (38%)	166 (96%)	7 (4%)	0	100	100
2	X	173/454 (38%)	165 (95%)	8 (5%)	0	100	100
All	All	5119/11892 (43%)	4897 (96%)	222 (4%)	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	A	215/460 (47%)	214 (100%)	1 (0%)	86	93
1	B	215/460 (47%)	213 (99%)	2 (1%)	75	86
1	C	215/460 (47%)	212 (99%)	3 (1%)	62	79
1	D	215/460 (47%)	211 (98%)	4 (2%)	52	73
1	E	215/460 (47%)	213 (99%)	2 (1%)	75	86
1	F	215/460 (47%)	213 (99%)	2 (1%)	75	86
1	M	215/460 (47%)	214 (100%)	1 (0%)	86	93
1	N	215/460 (47%)	208 (97%)	7 (3%)	33	58
1	O	215/460 (47%)	212 (99%)	3 (1%)	62	79
1	P	215/460 (47%)	214 (100%)	1 (0%)	86	93
1	Q	215/460 (47%)	214 (100%)	1 (0%)	86	93
1	R	215/460 (47%)	209 (97%)	6 (3%)	38	63
2	G	160/398 (40%)	159 (99%)	1 (1%)	84	91
2	H	159/398 (40%)	159 (100%)	0	100	100
2	I	159/398 (40%)	159 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	J	159/398 (40%)	159 (100%)	0	100	100
2	K	159/398 (40%)	159 (100%)	0	100	100
2	L	160/398 (40%)	160 (100%)	0	100	100
2	S	160/398 (40%)	159 (99%)	1 (1%)	84	91
2	T	160/398 (40%)	159 (99%)	1 (1%)	84	91
2	U	160/398 (40%)	160 (100%)	0	100	100
2	V	160/398 (40%)	159 (99%)	1 (1%)	84	91
2	W	160/398 (40%)	159 (99%)	1 (1%)	84	91
2	X	160/398 (40%)	158 (99%)	2 (1%)	65	80
All	All	4496/10296 (44%)	4456 (99%)	40 (1%)	74	86

5 of 40 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	R	186	GLU
2	T	296	ILE
1	R	215	ILE
1	R	291	LEU
2	W	296	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 27 such sidechains are listed below:

Mol	Chain	Res	Type
2	L	310	ASN
1	P	128	HIS
2	W	213	ASN
1	N	301	HIS
1	P	194	ASN

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-45440. 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 ⓘ
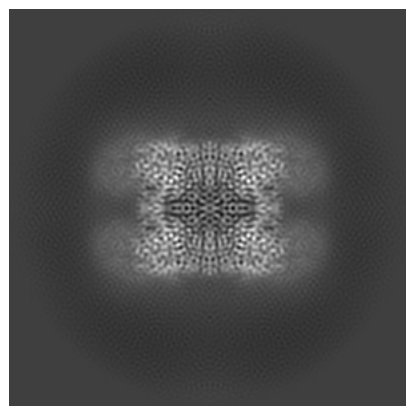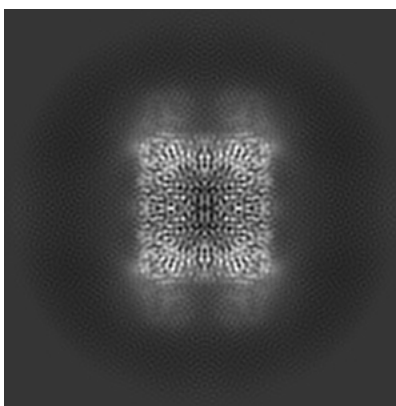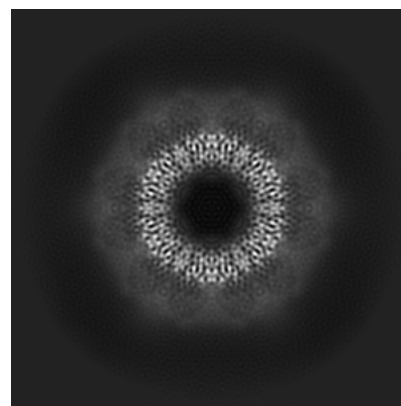
6.1.1 Primary map

| X | Y | Z |

6.1.2 Raw map

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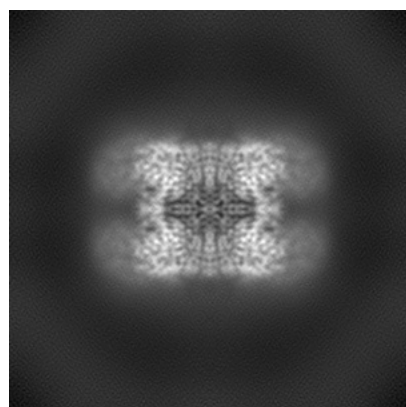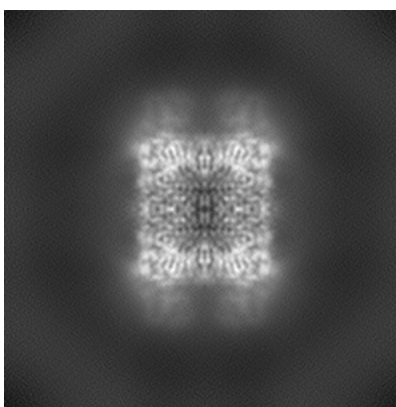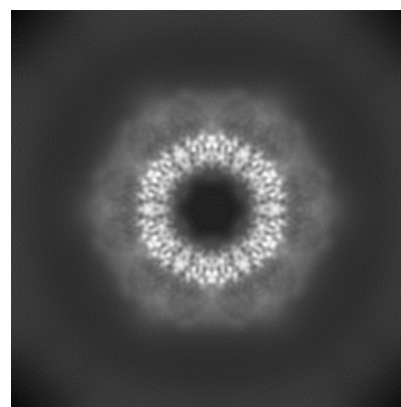
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
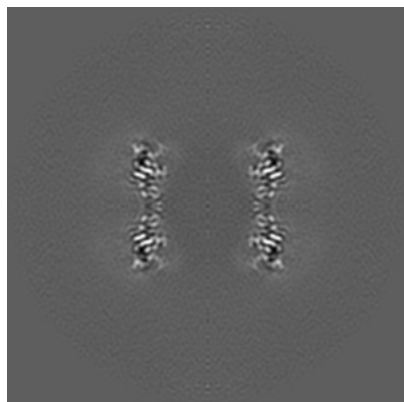
6.2.1   Primary map
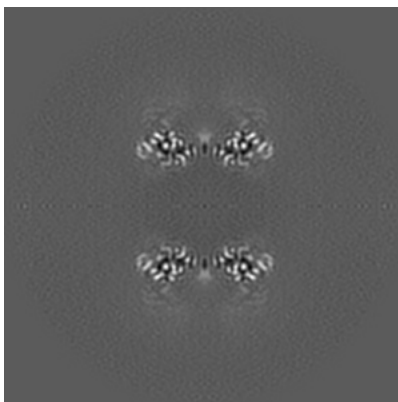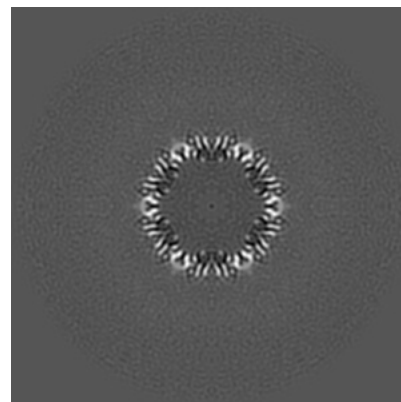
X Index: 128   Y Index: 128   Z Index: 128

6.2.2   Raw map
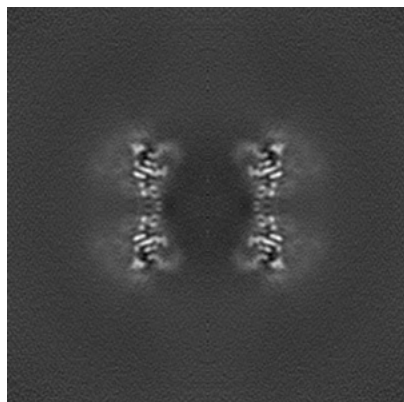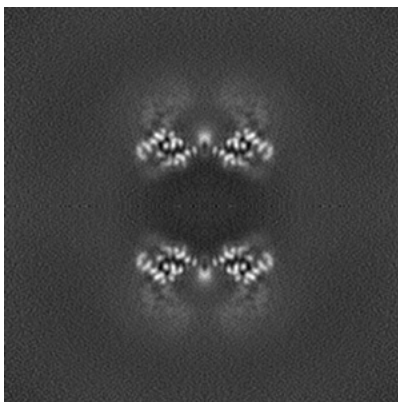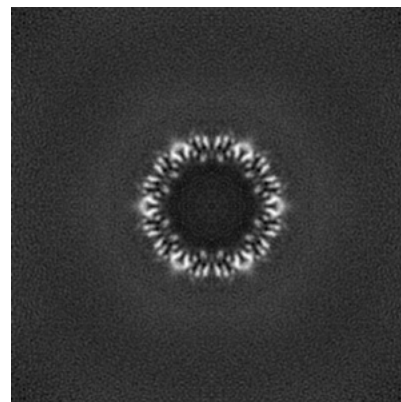
X Index: 128   Y Index: 128   Z Index: 128

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

6.3   Largest variance slices ⓘ
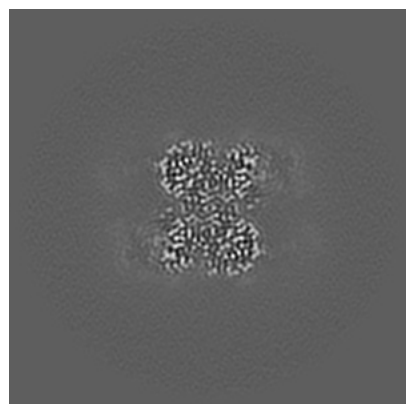
6.3.1   Primary map
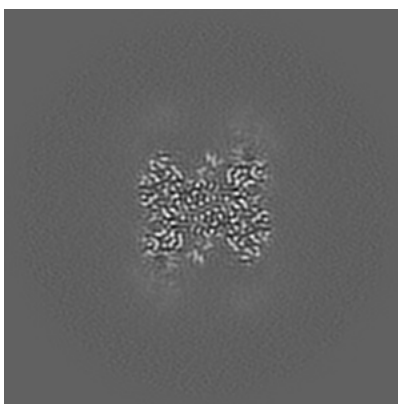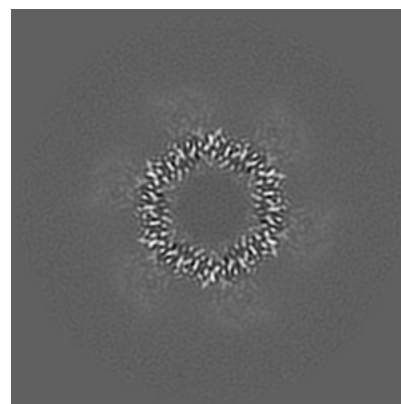
| X Index: 92 | Y Index: 93 | Z Index: 108 |

6.3.2   Raw map
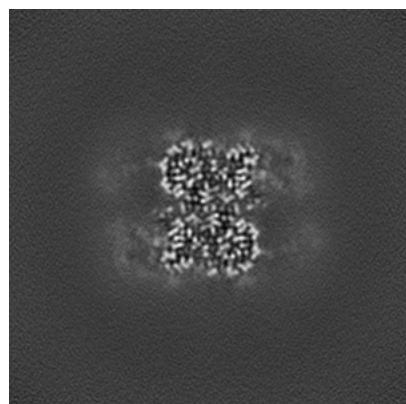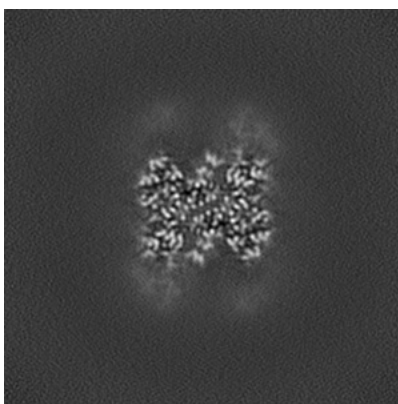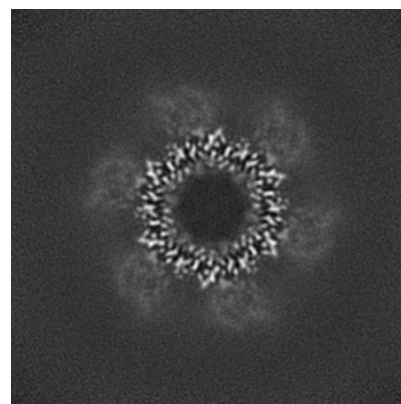
| X Index: 92 | Y Index: 93 | Z Index: 108 |

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
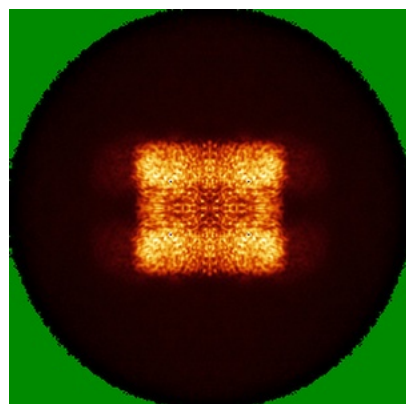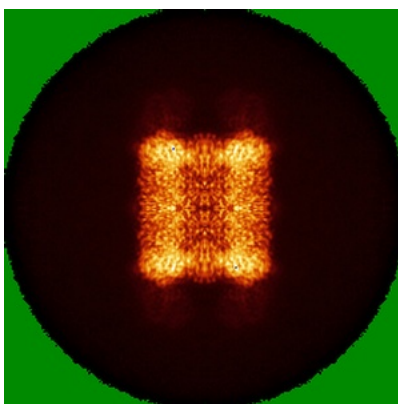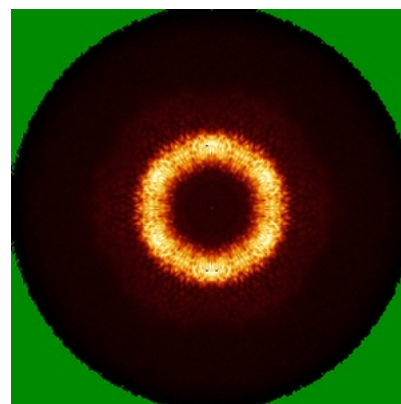
X Y Z

6.4.2 Raw map

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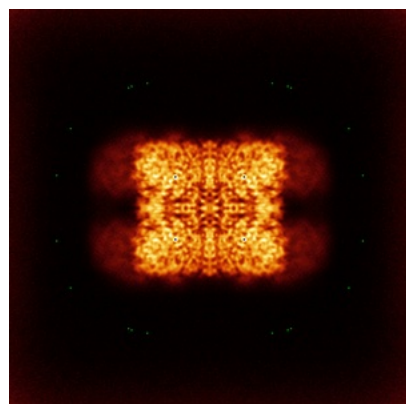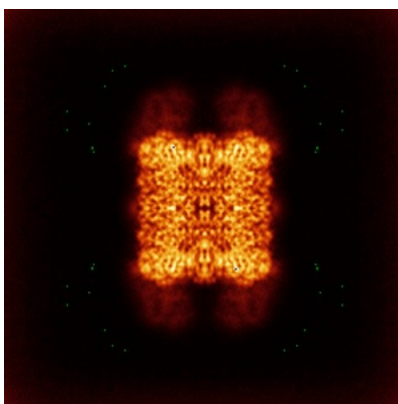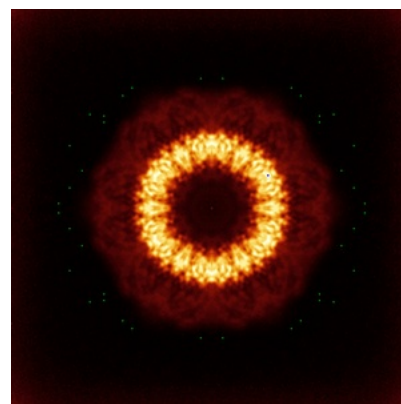
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z
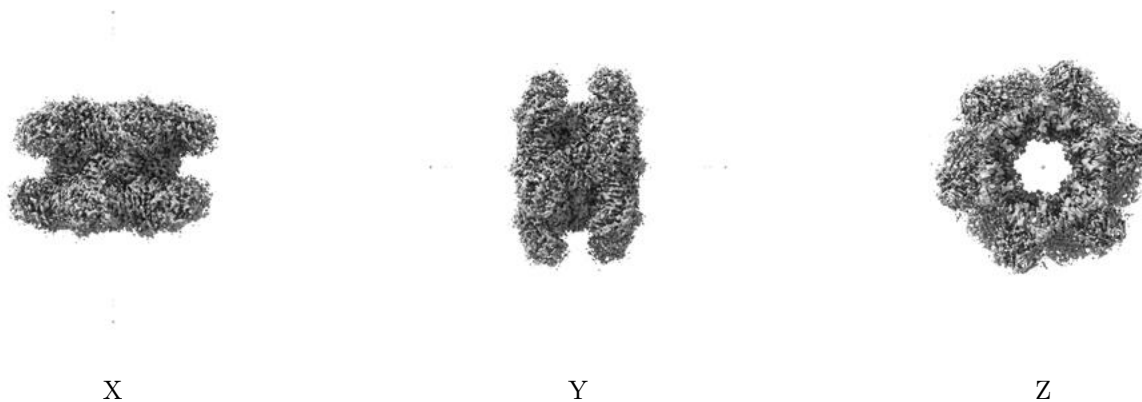
The images above show the 3D surface view of the map at the recommended contour level 1.76. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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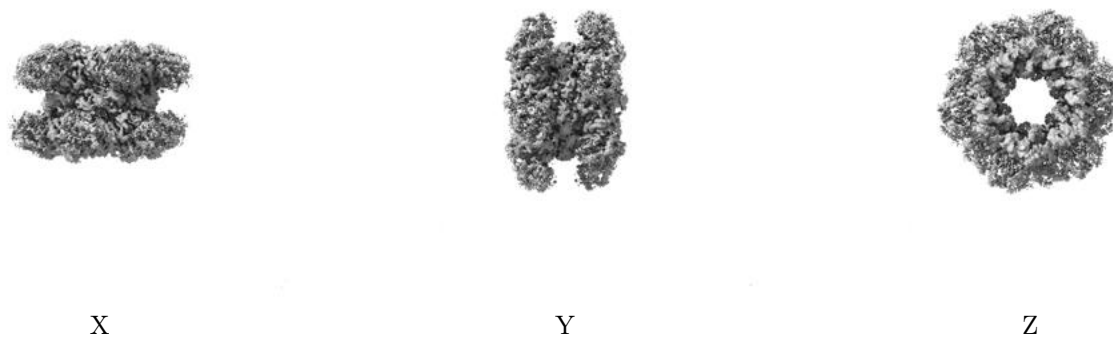
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation (i)

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

7 Map analysis (i)

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

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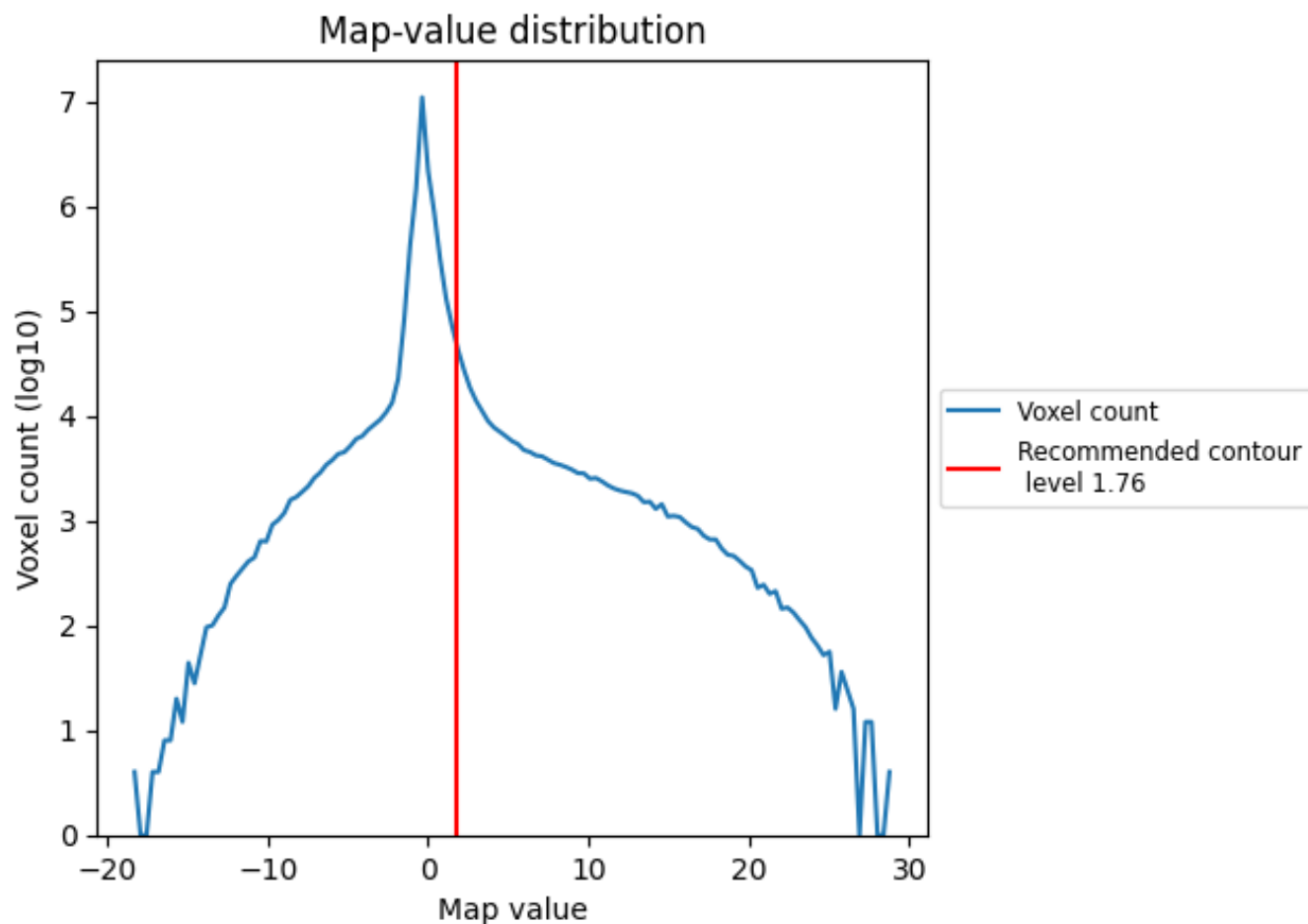
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
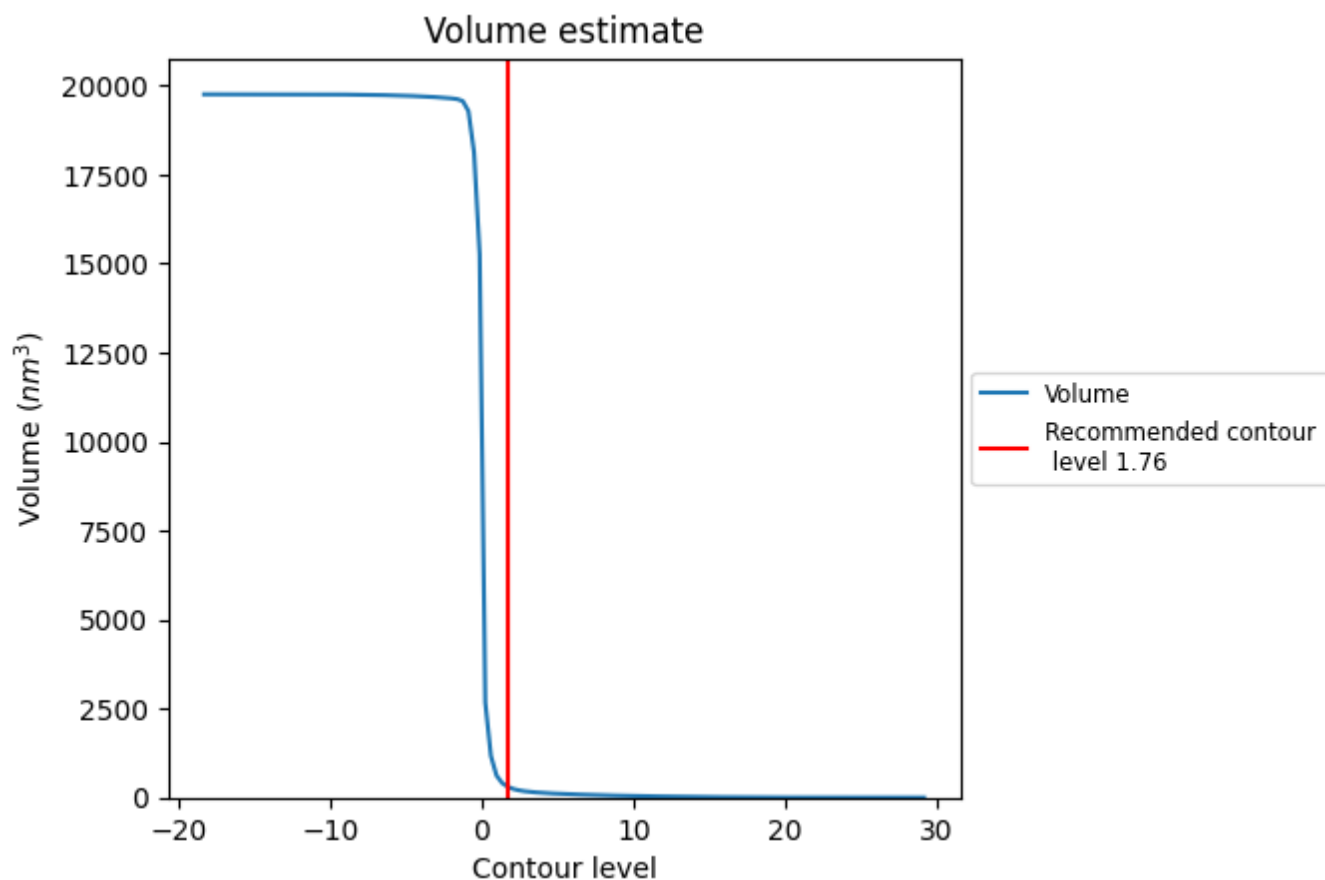
The volume at the recommended contour level is 296 nm^3; this corresponds to an approximate mass of 268 kDa.

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 ⓘ
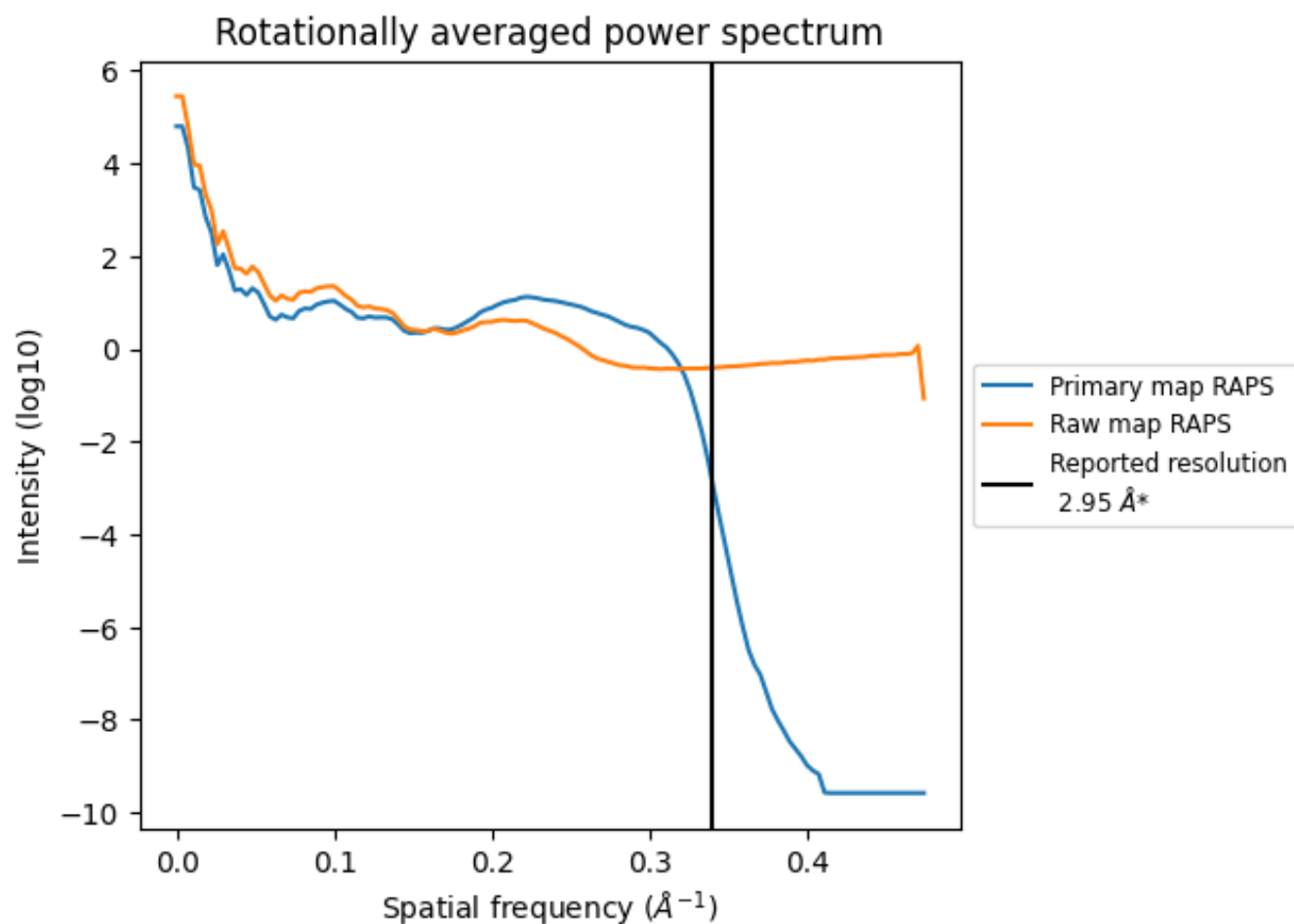
*Reported resolution corresponds to spatial frequency of 0.339 Å^{-1}

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 ⓘ
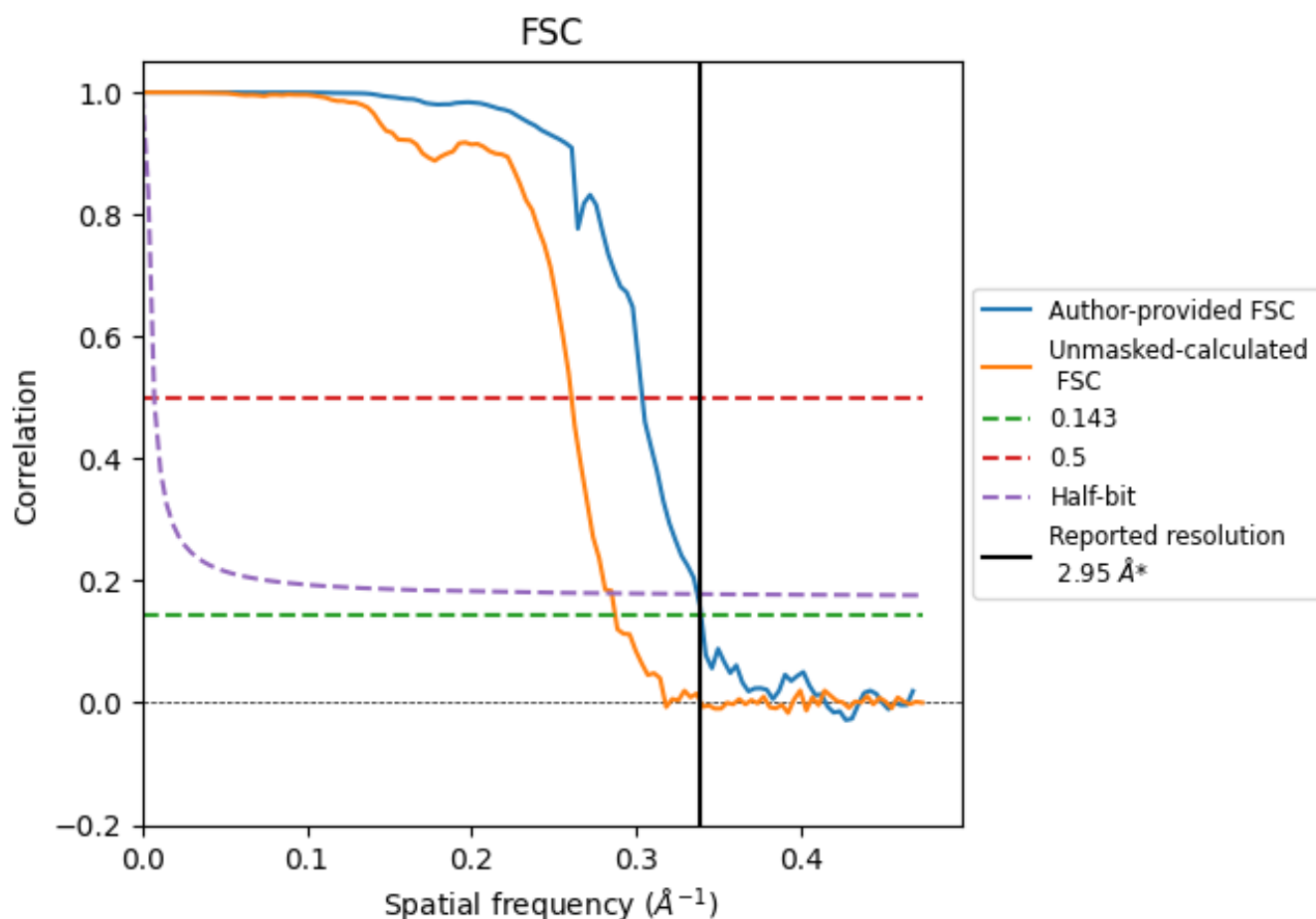
*Reported resolution corresponds to spatial frequency of 0.339 $\mathring{A}^{-1}$

8.2   Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.95	-	-
Author-provided FSC curve	2.95	3.29	2.97
Unmasked-calculated*	3.48	3.84	3.51

*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 3.48 differs from the reported value 2.95 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-45440 and PDB model 9CCA. Per-residue inclusion information can be found in section 3 on page 20.

9.1 Map-model overlay ⓘ

| X | Y | Z |
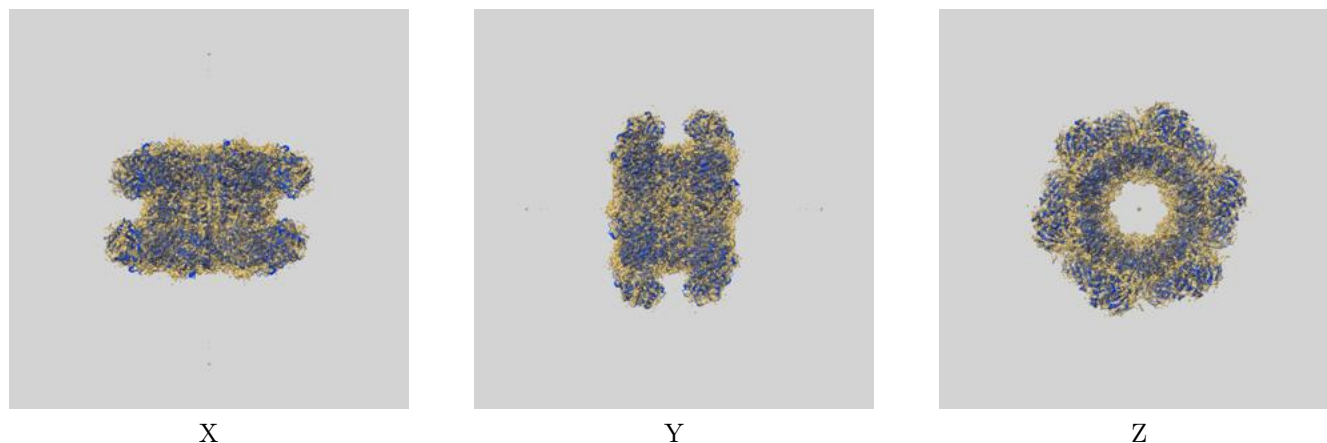
The images above show the 3D surface view of the map at the recommended contour level 1.76 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ
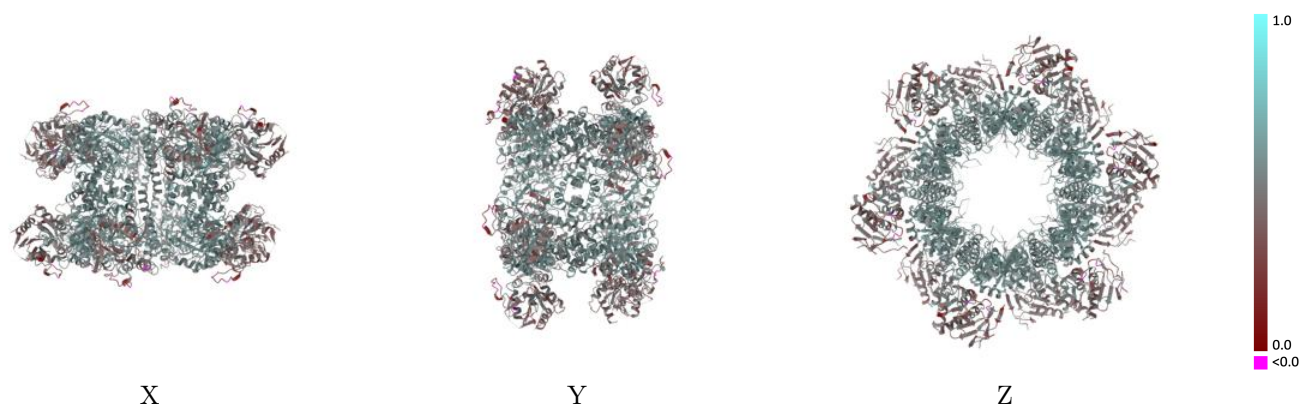
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 ⓘ
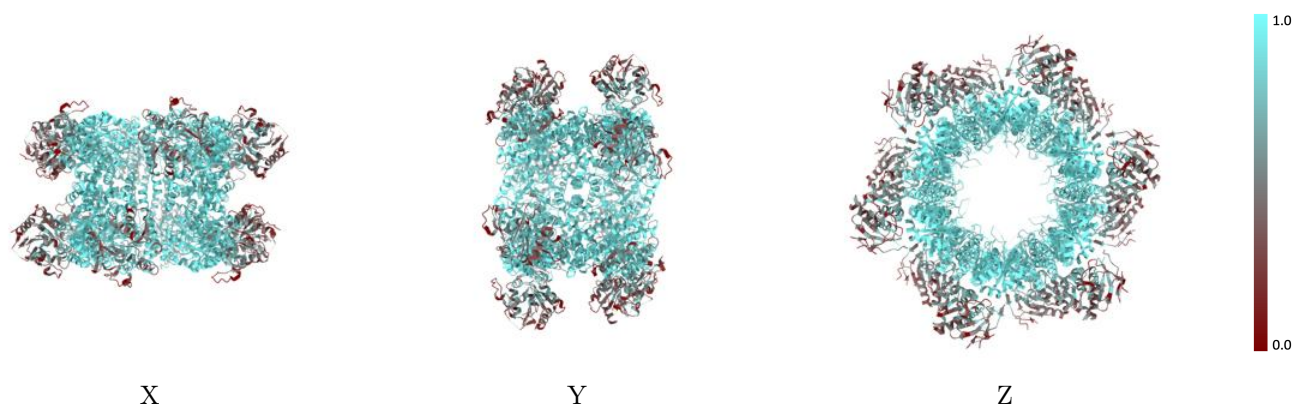
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1.76).

9.4   Atom inclusion ⓘ
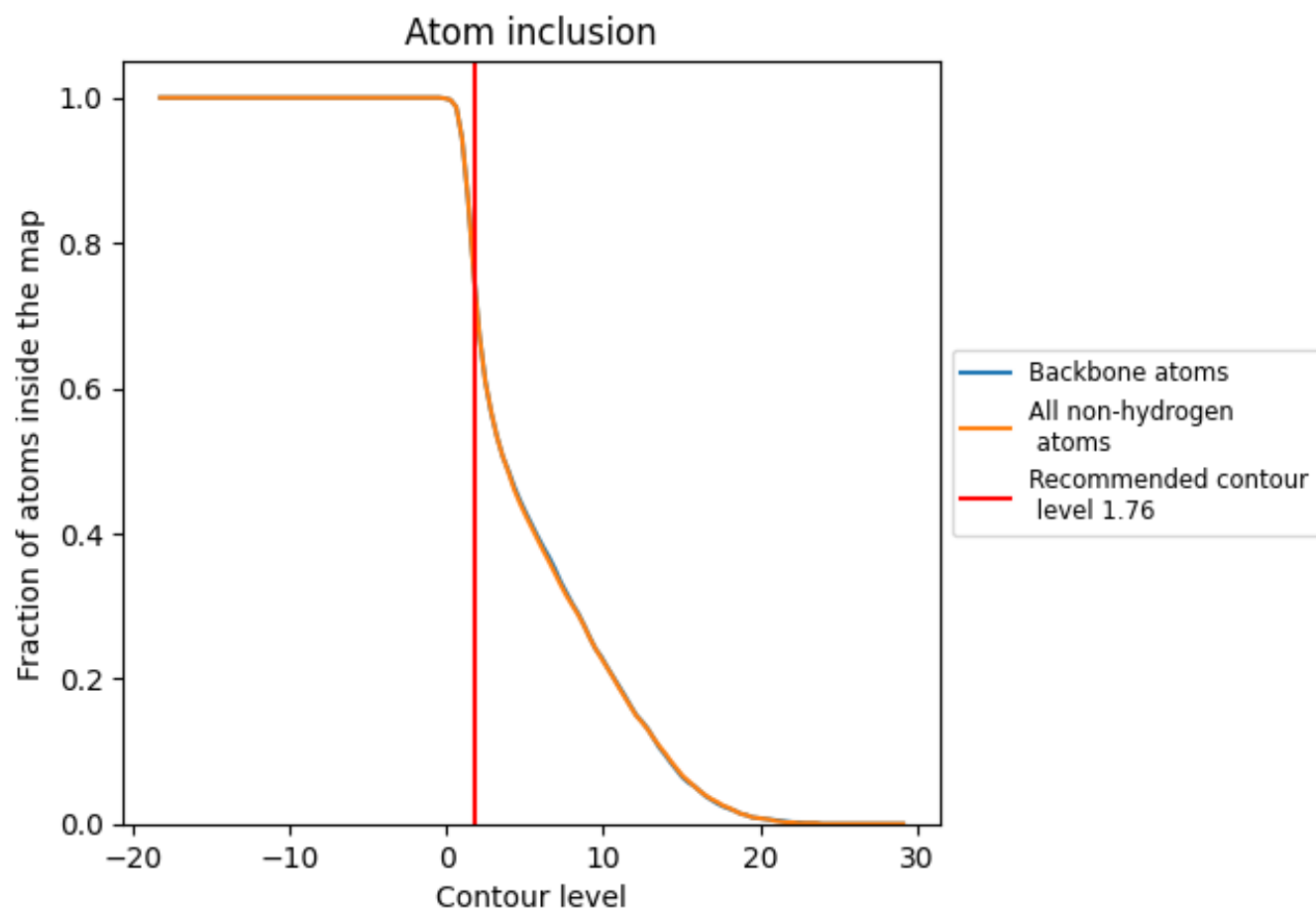
At the recommended contour level, 75% of all backbone atoms, 75% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (1.76) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7480	0.5010
A	0.9640	0.5700
B	0.9650	0.5720
C	0.9640	0.5700
D	0.9670	0.5690
E	0.9660	0.5690
F	0.9690	0.5720
G	0.4470	0.4110
H	0.4530	0.4060
I	0.4480	0.4060
J	0.4590	0.4120
K	0.4590	0.4150
L	0.4560	0.4050
M	0.9650	0.5720
N	0.9630	0.5700
O	0.9620	0.5690
P	0.9660	0.5700
Q	0.9650	0.5710
R	0.9640	0.5720
S	0.4420	0.3990
T	0.4470	0.4080
U	0.4460	0.4050
V	0.4460	0.4040
W	0.4470	0.4010
X	0.4420	0.4010

1.0

0.0
<0.0