

Full wwPDB EM Validation Report (i)

Apr 15, 2025 – 05:11 PM EDT

PDB ID : 9CQC / pdb 00009cqc

EMDB ID : EMD-45813

Title: The ligation complex like in the NHEJ pathway

Authors : Li, J.; Liu, L.; Gellert, M.; Yang, W.

Deposited on : 2024-07-19

Resolution : 3.40 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 (1)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev117

Mogul : 2022.3.0, CSD as543be (2022)

MolProbity : 4.02b-467 buster-report : 1.1.7 (2018)

Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)

 $MapQ \quad : \quad 1.9.13$

Ideal geometry (proteins) : Engh & Huber (2001) Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

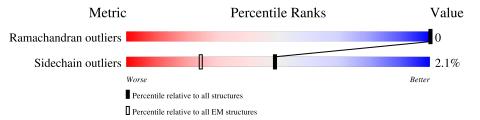
Validation Pipeline (wwPDB-VP) : 2.42

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.40 Å.

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



Metric	Whole archive $(\# \mathrm{Entries})$	${ m EM\ structures} \ (\#{ m Entries})$
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	A	612	81%	• 17%
1	a	612	83%	• 16%
2	В	732	71%	28%
2	b	732	71%	28%
3	С	302	74%	25%
3	c	302	75%	24%
4	D	336	60% 40%	%
4	Е	336	58% • 40°	%
4	d	336	58% • 40°	%

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Mol	Chain	Length		Qualit	y of chain		
4	е	336	5	8%		40%	
5	F	914	28%		72%		
5	f	914	•	91%			• 7%
6	G	218	10%		89%		
6	Н	218	11%		89%		
7	I	68	56	5%		44%	
8	J	68	Ę	59%		41%	
9	K	51		67%		33%	
10	L	50		68%		• 30%	



2 Entry composition (i)

There are 11 unique types of molecules in this entry. The entry contains 39149 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 X-ray repair cross-complementing protein 6.

\mathbf{Mol}	Chain	Residues		\mathbf{At}	oms			AltConf	Trace
1	A	507		C 2617			S 18	0	0
1	a	514	Total 4171	C 2668	N 706	O 779	S 18	1	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference	
A	-2	GLY	-	expression tag	UNP P12956	
A	-1	PRO	-	expression tag	UNP P12956	
A	0	VAL	-	expression tag	UNP P12956	
a	-2	GLY	-	expression tag	UNP P12956	
a	-1	PRO	-	expression tag	UNP P12956	
a	0	VAL	-	expression tag	UNP P12956	

• Molecule 2 is a protein called X-ray repair cross-complementing protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	В	528	Total 4223	C 2703		O 788	S 23	0	0
2	b	526	Total 4211	C 2697		O 784	S 23	0	0

• Molecule 3 is a protein called Non-homologous end-joining factor 1.

Mol	Chain	Residues		\mathbf{At}	AltConf	Trace			
2	С	228	Total	С	N	О	S	0	0
3			1813	1158	303	337	15	0	
2		231	Total	С	N	О	S	0	0
J	C	231	1831	1170	306	340	15	U	U

There are 6 discrepancies between the modelled and reference sequences:



Chain	Residue	Modelled	Actual	Comment	Reference
С	-2	GLY	-	expression tag	UNP Q9H9Q4
С	-1	PRO	-	expression tag	UNP Q9H9Q4
С	0	VAL	-	expression tag	UNP Q9H9Q4
c	-2	GLY	-	expression tag	UNP Q9H9Q4
С	-1	PRO	-	expression tag	UNP Q9H9Q4
c	0	VAL	-	expression tag	UNP Q9H9Q4

• Molecule 4 is a protein called DNA repair protein XRCC4.

Mol	Chain	Residues		Ato	oms		AltConf	Trace	
4	D	201	Total	С	N	О	S	0	0
4	D	201	1628	1031	278	312	7	<u> </u>	U
4	E	201	Total	С	N	О	S	0	0
4	Ľ	201	1628	1031	278	312	7		U
4	d	201	Total	С	N	О	S	0	0
4	u	201	1628	1031	278	312	7	0	U
1	е	201	Total	С	N	О	S	0	0
4	е	201	1628	1031	278	312	7		U

• Molecule 5 is a protein called DNA ligase 4.

Mol	Chain	Residues		A	AltConf	Trace			
5	E	255	Total	С	N	О	S	0	0
5	Г	255	2069	1315	349	392	13	0	U
E	t	852	Total	С	N	О	S	0	0
3	1	892	6845	4358	1172	1270	45	U	U

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-2	GLY	-	expression tag	UNP P49917
F	-1	PRO	-	expression tag	UNP P49917
F	0	VAL	-	expression tag	UNP P49917
f	-2	GLY	_	expression tag	UNP P49917
f	-1	PRO	-	expression tag	UNP P49917
f	0	VAL	-	expression tag	UNP P49917

• Molecule 6 is a protein called Protein PAXX.

Mol	Chain	Residues		Ato	ms	AltConf	Trace		
6	G	23	Total 165	C 105	N 27	O 32	S 1	0	0

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Mol	Chain	Residues		Ato	ms			AltConf	Trace
6	П	24	Total	С	N	О	S	0	0
U	11	24	174	110	28	35	1	0	U

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-13	MET	-	expression tag	UNP Q9BUH6
G	-12	GLY	-	expression tag	UNP Q9BUH6
G	-11	SER	-	expression tag	UNP Q9BUH6
G	-10	SER	-	expression tag	UNP Q9BUH6
G	-9	HIS	-	expression tag	UNP Q9BUH6
G	-8	HIS	-	expression tag	UNP Q9BUH6
G	-7	HIS	-	expression tag	UNP Q9BUH6
G	-6	HIS	-	expression tag	UNP Q9BUH6
G	-5	HIS	-	expression tag	UNP Q9BUH6
G	-4	HIS	-	expression tag	UNP Q9BUH6
G	-3	SER	-	expression tag	UNP Q9BUH6
G	-2	GLN	-	expression tag	UNP Q9BUH6
G	-1	ASP	-	expression tag	UNP Q9BUH6
G	0	PRO	-	expression tag	UNP Q9BUH6
Н	-13	MET	-	expression tag	UNP Q9BUH6
Н	-12	GLY	-	expression tag	UNP Q9BUH6
Н	-11	SER	-	expression tag	UNP Q9BUH6
Н	-10	SER	-	expression tag	UNP Q9BUH6
Н	-9	HIS	-	expression tag	UNP Q9BUH6
Н	-8	HIS	-	expression tag	UNP Q9BUH6
Н	-7	HIS	-	expression tag	UNP Q9BUH6
Н	-6	HIS	-	expression tag	UNP Q9BUH6
Н	-5	HIS	-	expression tag	UNP Q9BUH6
Н	-4	HIS	-	expression tag	UNP Q9BUH6
Н	-3	SER	-	expression tag	UNP Q9BUH6
Н	-2	GLN	-	expression tag	UNP Q9BUH6
Н	-1	ASP	-	expression tag	UNP Q9BUH6
Н	0	PRO	-	expression tag	UNP Q9BUH6

• Molecule 7 is a DNA chain called DNA (38-MER).

Mol	Chain	Residues		A	toms			AltConf	Trace
7	I	38	Total 771	C 370	N 131	O 232	P 38	0	0

• Molecule 8 is a DNA chain called DNA (40-MER).



Mol	Chain	Residues		\mathbf{A}	toms			AltConf	Trace
8	J	40	Total 818	C 391	N 149	O 238	P 40	0	0

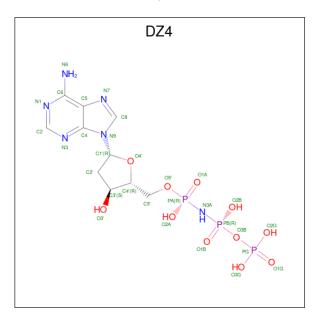
• Molecule 9 is a DNA chain called DNA (34-MER).

Mol	Chain	Residues		A	toms			AltConf	Trace
9	K	34	Total 702	C 335	N 136	O 198	P 33	0	0

• Molecule 10 is a DNA chain called DNA (35-MER).

Mol	Chain	Residues		A	toms			AltConf	Trace
10	L	35	Total 720	C 344	N 127	O 214	P 35	0	0

• Molecule 11 is 2'-deoxy-5'-O-[(R)-hydroxy{[(R)-hydroxy(phosphonooxy)phosphoryl]amin o}phosphoryl]adenosine (CCD ID: DZ4) (formula: $C_{10}H_{17}N_6O_{11}P_3$) (labeled as "Ligand of Interest" by depositor).



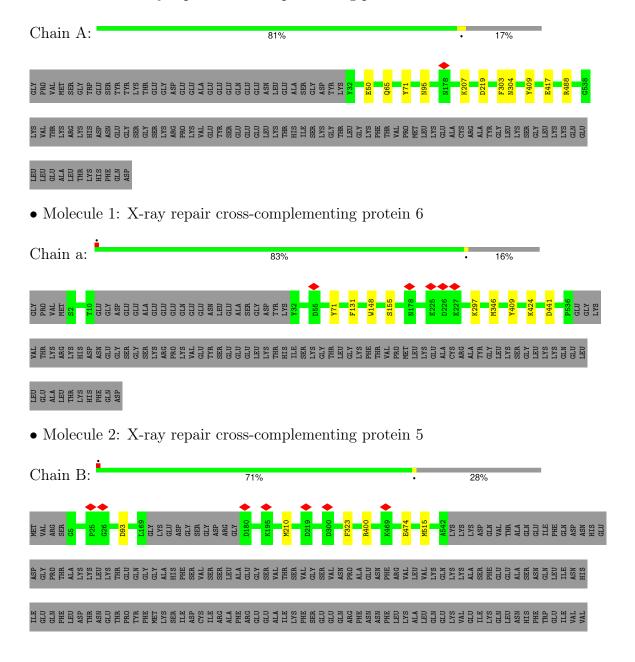
Mol	Chain	Residues		Atoms				AltConf
11	Т	1	Total	С	N	О	Р	0
11	1	1	30	10	6	11	3	0



3 Residue-property plots (i)

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

• Molecule 1: X-ray repair cross-complementing protein 6

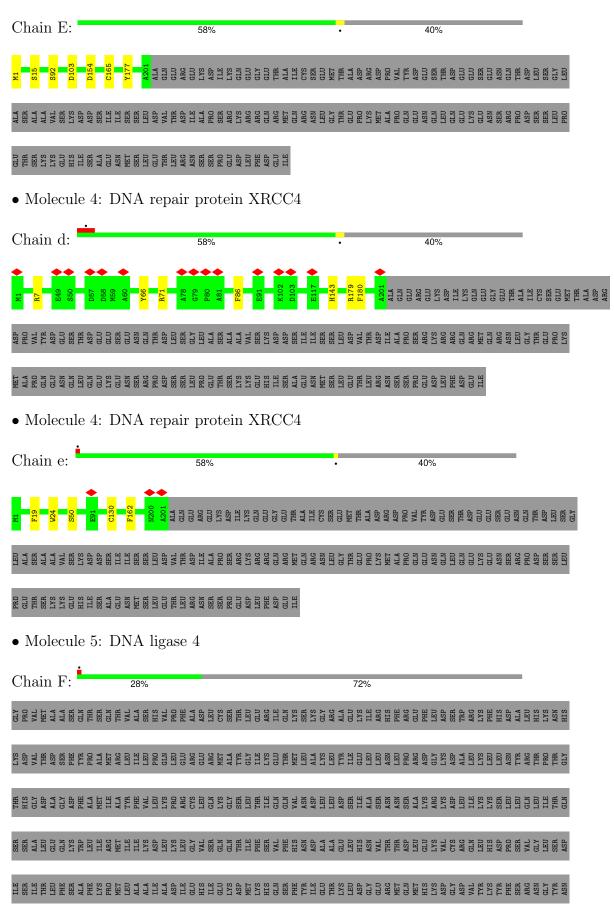




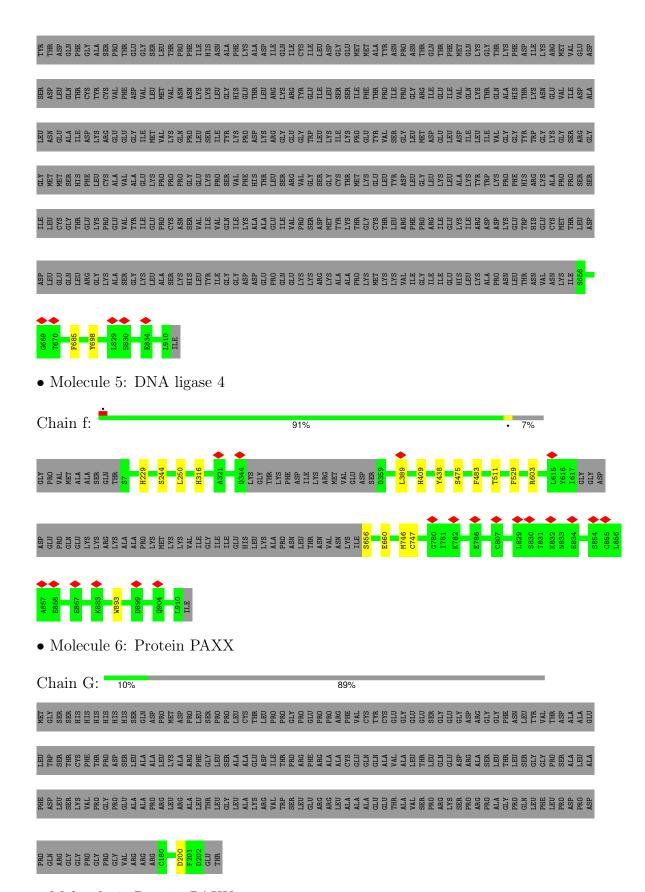
GGING • Molecule 2: X-ray repair cross-complementing protein 5 Chain b: • Molecule 3: Non-homologous end-joining factor 1 Chain C: • Molecule 3: Non-homologous end-joining factor 1 Chain c: • Molecule 4: DNA repair protein XRCC4 Chain D:

• Molecule 4: DNA repair protein XRCC4



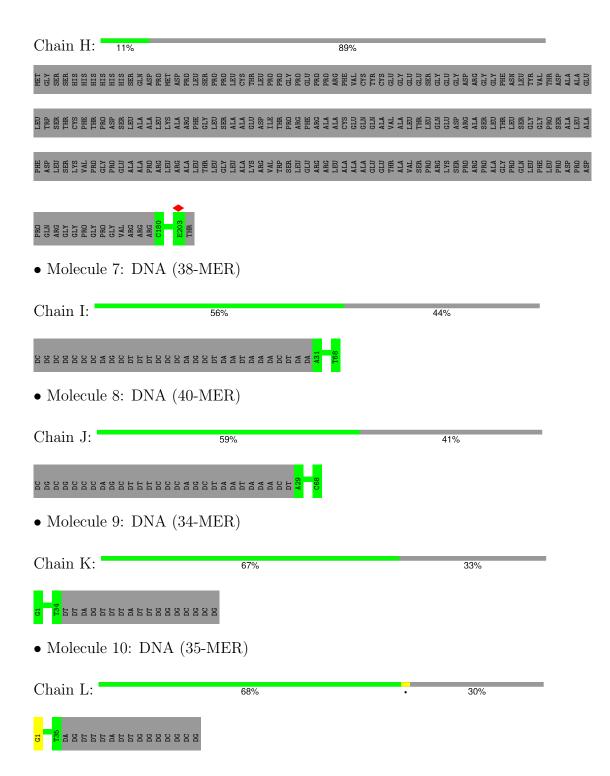






• Molecule 6: Protein PAXX







4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	133163	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE	Depositor
	CORRECTION	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	54.4	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	53.241	Depositor
Minimum map value	-21.078	Depositor
Average map value	0.004	Depositor
Map value standard deviation	1.326	Depositor
Recommended contour level	8	Depositor
Map size (Å)	426.496, 426.496, 426.496	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.833, 0.833, 0.833	Depositor



5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: $\mathrm{DZ}4$

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	Bo	nd lengths	Bond	angles
IVIOI	Chain	RMSZ	# Z > 5	RMSZ	# Z > 5
1	A	0.24	0/4175	0.47	0/5626
1	a	0.24	0/4255	0.47	0/5733
2	В	0.24	0/4310	0.45	0/5816
2	b	0.24	0/4298	0.45	0/5800
3	С	0.25	0/1850	0.46	0/2510
3	С	0.25	0/1869	0.47	0/2536
4	D	0.25	0/1657	0.45	0/2228
4	Е	0.25	0/1657	0.48	0/2228
4	d	0.25	0/1657	0.47	0/2228
4	е	0.25	0/1657	0.47	0/2228
5	F	0.24	0/2118	0.45	0/2862
5	f	0.24	0/6995	0.46	0/9433
6	G	0.25	0/169	0.36	0/226
6	Н	0.25	0/178	0.36	0/238
7	I	0.50	0/861	0.95	0/1325
8	J	0.51	0/917	0.92	0/1412
9	K	0.52	0/790	0.89	0/1219
10	L	0.64	1/806 (0.1%)	0.97	0/1241
All	All	0.28	1/40219 (0.0%)	0.52	0/54889

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	\mathbf{Z}	$\operatorname{Observed}(\operatorname{\AA})$	$\operatorname{Ideal}(\check{\mathbf{A}})$
10	L	1	DG	OP3-P	-10.20	1.49	1.61

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.



5.2 Too-close contacts (i)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
1	A	505/612 (82%)	491 (97%)	14 (3%)	0	100	100
1	a	511/612 (84%)	504 (99%)	7 (1%)	0	100	100
2	В	524/732 (72%)	519 (99%)	5 (1%)	0	100	100
2	b	522/732 (71%)	513 (98%)	9 (2%)	0	100	100
3	С	$226/302 \ (75\%)$	220 (97%)	6 (3%)	0	100	100
3	c	229/302~(76%)	221 (96%)	8 (4%)	0	100	100
4	D	199/336 (59%)	194 (98%)	5 (2%)	0	100	100
4	E	199/336 (59%)	195 (98%)	4 (2%)	0	100	100
4	d	199/336 (59%)	188 (94%)	11 (6%)	0	100	100
4	e	199/336 (59%)	197 (99%)	2 (1%)	0	100	100
5	F	253/914 (28%)	247 (98%)	6 (2%)	0	100	100
5	f	846/914 (93%)	820 (97%)	26 (3%)	0	100	100
6	G	21/218 (10%)	21 (100%)	0	0	100	100
6	Н	22/218 (10%)	22 (100%)	0	0	100	100
All	All	4455/6900 (65%)	4352 (98%)	103 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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



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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	460/550 (84%)	449 (98%)	11 (2%)	44 66
1	a	468/550~(85%)	459 (98%)	9 (2%)	52 71
2	В	475/649 (73%)	469 (99%)	6 (1%)	65 78
2	b	474/649 (73%)	466 (98%)	8 (2%)	56 74
3	\mathbf{C}	202/264~(76%)	196 (97%)	6 (3%)	36 61
3	c	204/264 (77%)	201 (98%)	3 (2%)	60 76
4	D	180/303 (59%)	179 (99%)	1 (1%)	84 90
4	E	180/303 (59%)	173 (96%)	7 (4%)	27 53
4	d	180/303 (59%)	173 (96%)	7 (4%)	27 53
4	e	180/303 (59%)	175 (97%)	5 (3%)	38 62
5	F	231/810 (28%)	229 (99%)	2 (1%)	75 86
5	f	758/810 (94%)	741 (98%)	17 (2%)	47 68
6	G	18/173 (10%)	17 (94%)	1 (6%)	17 43
6	Н	19/173 (11%)	19 (100%)	0	100 100
All	All	4029/6104 (66%)	3946 (98%)	83 (2%)	49 69

All (83) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	50	GLU
1	A	65	GLN
1	A	71	TYR
1	A	95	ASN
1	A	207	LYS
1	A	219	ASP
1	A	303	PHE
1	A	304	ASN
1	A	409	TYR
1	A	417	GLU
1	A	488	ARG
2	В	93	ASP
2	В	210	MET
2	В	323	PHE
2	В	400	ARG
2	В	474	GLU

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Mol	Chain	Res	Type				
2	В	515	MET				
3	С	1	MET				
3	С	97	CYS				
3	С	99	CYS				
3	С	167	TYR				
3	С	202	CYS				
3	B C C C C C D	206	ASP				
4		58	ASP				
4	Е	1	MET				
4	Е	15	SER				
4	Е	92	SER				
4	Е	103	ASP				
4	Е	154	ASP				
4	Е	165	ASP CYS				
4	Е	177	TYR PHE				
5	F	685	PHE				
5	F	698	TYR ASP				
6	G	200	ASP				
1	a	71	TYR				
1	a	131	PHE				
1	a	148	TRP				
1	a	155	SER				
1	a	297	LYS				
1	a	346	MET				
1	a	409	TYR				
1	a	424	LYS				
1	a	441	ASP				
2	b	14	MET				
2	b	89	ASP				
2	b	107	PHE				
2	b	131	HIS				
2	b	192	PHE				
2 2	b	226	SER				
2	b	307	LYS				
3	b	416	TYR				
	С	18	LEU				
3	С	140	MET				
3	c	152	GLU				
4	d	7	ARG				
4	d	66	TYR				
4	d	71	ARG				
4	d	86	PHE				

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Mol	Chain	$ hootnote{Res}$	Type
4	d	143	HIS
4	d	179	ARG
4	d	180	PHE
4	е	19	PHE
4	е	24	TRP
4	е	50	SER
4	е	130	CYS
4	е	162	PHE
5	f	229	HIS
5	f	244	SER
5	f	250	LEU
5	f	316	HIS
5	f	389	LEU
5	f	409	HIS
5	f	438	TYR
5	f	475	SER
5	f	483	PHE
5	f	511	THR
5	f	529	PHE
5	f	603	ARG
5	f	656	SER
5	f	660	GLU
5	f	746	MET
5	f	747	CYS
5	f	893	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	b	527	GLN
3	С	168	GLN
5	f	848	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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



5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with |Z| > 2 is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	B	ond leng	gths	В	ond ang	les
IVIOI	туре	Chain	nes	Lilik	Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z >2
11	DZ4	I	101	-	28,32,32	3.41	14 (50%)	33,50,50	1.63	3 (9%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	DZ4	I	101	-	-	7/15/34/34	0/3/3/3

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$\operatorname{Observed}(\operatorname{\AA})$	Ideal(A)
11	I	101	DZ4	C2'-C3'	-8.21	1.32	1.52
11	I	101	DZ4	O4'-C4'	-6.87	1.29	1.45
11	I	101	DZ4	O4'-C1'	6.53	1.57	1.42
11	I	101	DZ4	PB-O3B	6.25	1.66	1.59
11	I	101	DZ4	C1'-N9	-5.09	1.35	1.49
11	I	101	DZ4	C3'-C4'	3.92	1.63	1.53
11	I	101	DZ4	C6-N6	3.55	1.46	1.34
11	I	101	DZ4	PB-N3A	3.44	1.72	1.63
11	I	101	DZ4	PB-O1B	3.17	1.51	1.46
11	I	101	DZ4	PA-N3A	3.15	1.71	1.63
11	I	101	DZ4	PA-O1A	3.12	1.50	1.46
11	I	101	DZ4	C2-N3	2.96	1.36	1.32
11	I	101	DZ4	PA-O2A	-2.26	1.50	1.56

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Mol	Chain	Res	Type	Atoms	\mathbf{Z}	Observed(A)	$\operatorname{Ideal}(ext{\AA})$
11	I	101	DZ4	PB-O2B	-2.13	1.51	1.56

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	\mathbf{Z}	$Observed(^o)$	$\operatorname{Ideal}({}^{o})$
11	I	101	DZ4	N3-C2-N1	-6.23	120.21	128.67
11	I	101	DZ4	C5-C6-N6	3.28	125.31	120.31
11	I	101	DZ4	C2'-C3'-C4'	2.47	107.82	102.80

There are no chirality outliers.

All (7) torsion outliers are listed below:

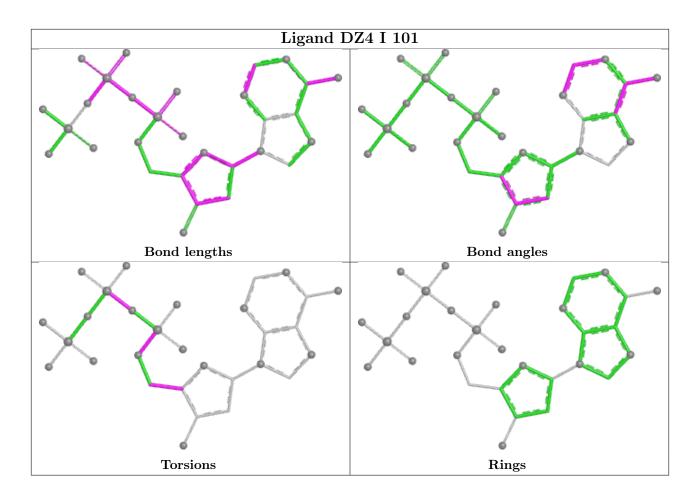
Mol	Chain	Res	Type	Atoms
11	I	101	DZ4	C5'-O5'-PA-O2A
11	I	101	DZ4	PA-N3A-PB-O1B
11	I	101	DZ4	PA-N3A-PB-O3B
11	I	101	DZ4	C3'-C4'-C5'-O5'
11	I	101	DZ4	O4'-C4'-C5'-O5'
11	I	101	DZ4	C5'-O5'-PA-O1A
11	I	101	DZ4	C5'-O5'-PA-N3A

There are no ring outliers.

No monomer is involved in short contacts.

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





5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.



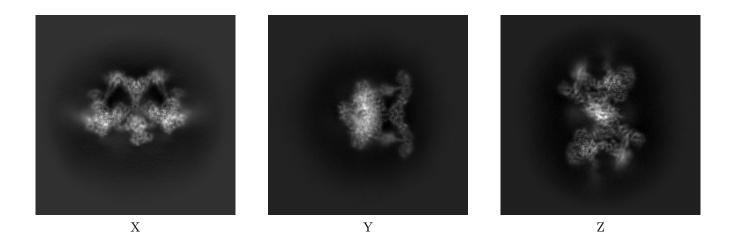
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-45813. These allow visual inspection of the internal detail of the map and identification of artifacts.

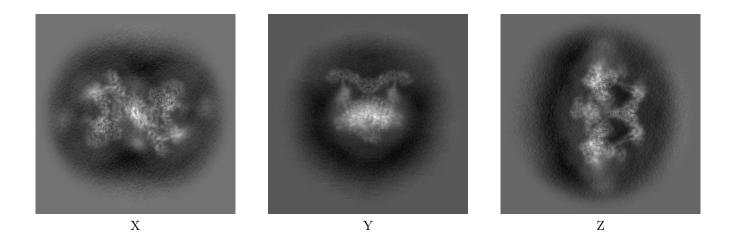
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

6.1.1 Primary map



6.1.2 Raw map



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

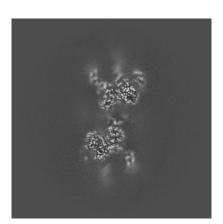


6.2 Central slices (i)

6.2.1 Primary map





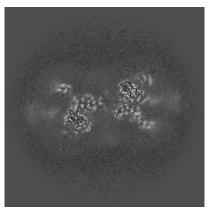


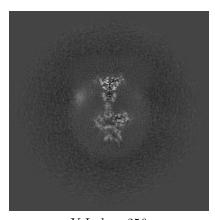
X Index: 256

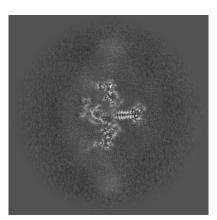
Y Index: 256

Z Index: 256

6.2.2 Raw map







X Index: 256

Y Index: 256

Z Index: 256

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



6.3 Largest variance slices (i)

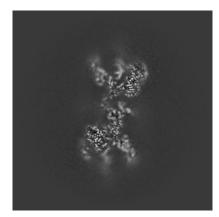
6.3.1 Primary map





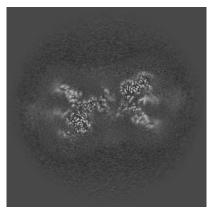


Y Index: 252

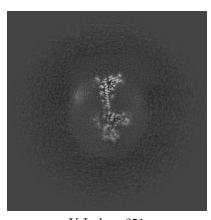


Z Index: 248

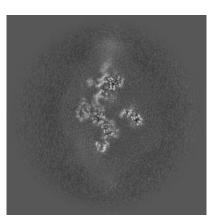
6.3.2 Raw map



X Index: 249



Y Index: 251



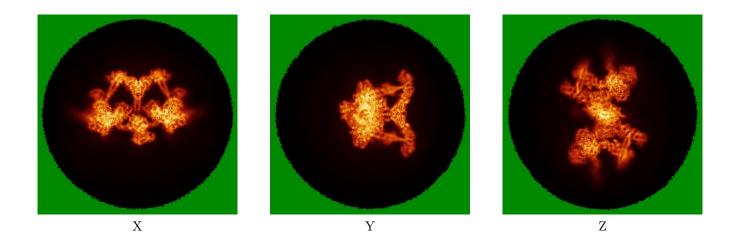
Z Index: 272

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

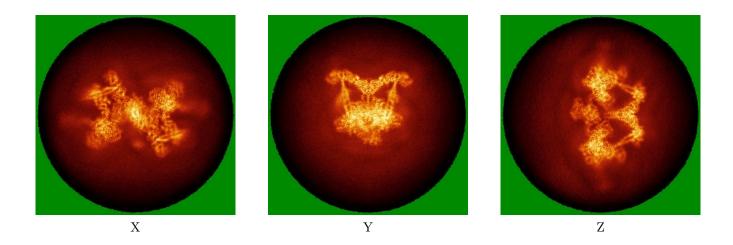


6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



6.4.2 Raw map



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



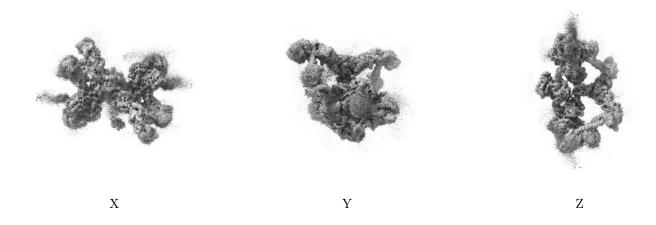
6.5 Orthogonal surface views (i)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 8.0. 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



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



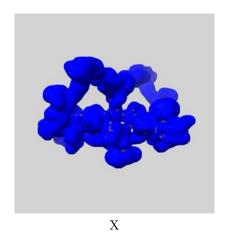
6.6 Mask visualisation (i)

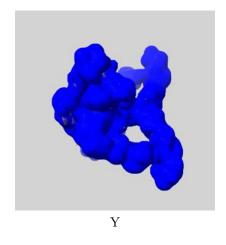
This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

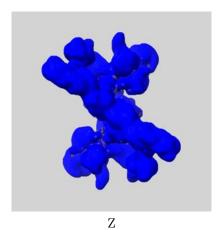
A mask typically either:

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

6.6.1 emd_45813_msk_1.map (i)



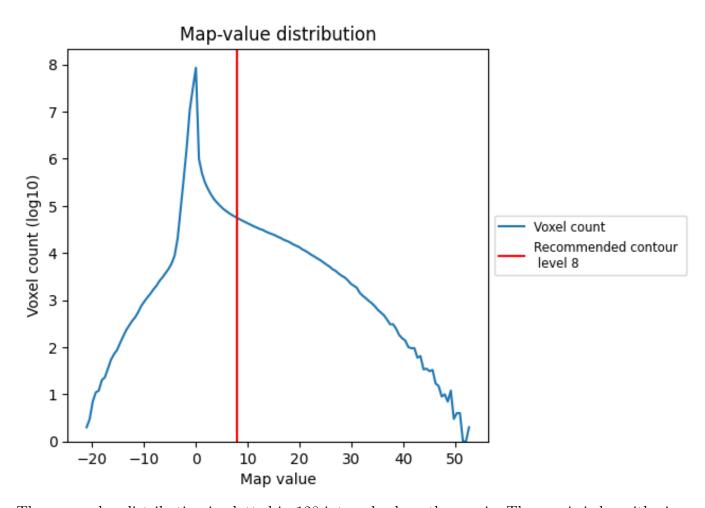




7 Map analysis (i)

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

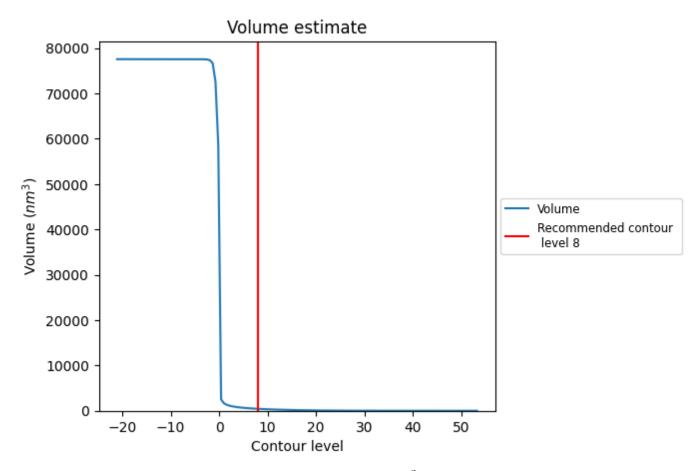
7.1 Map-value distribution (i)



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



7.2 Volume estimate (i)

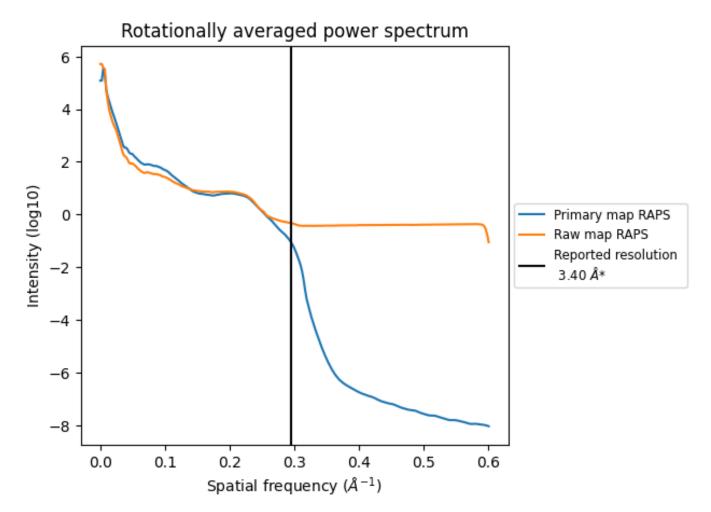


The volume at the recommended contour level is $435~\mathrm{nm}^3$; this corresponds to an approximate mass of $393~\mathrm{kDa}$.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.



7.3 Rotationally averaged power spectrum (i)



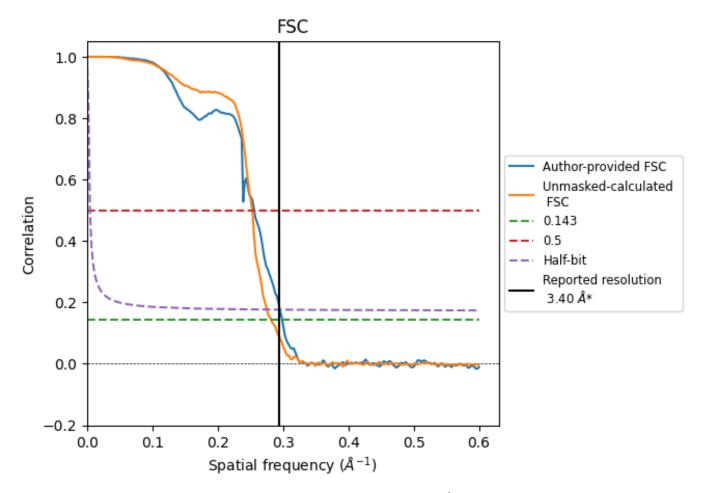
^{*}Reported resolution corresponds to spatial frequency of 0.294 $\rm \mathring{A}^{-1}$



8 Fourier-Shell correlation (i)

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 (i)



*Reported resolution corresponds to spatial frequency of 0.294 $\rm \mathring{A}^{-1}$



8.2 Resolution estimates (i)

Resolution estimate (Å)	Estim	ation	criterion (FSC cut-off)
resolution estimate (A)	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.35	3.91	3.39
Unmasked-calculated*	3.54	3.95	3.63

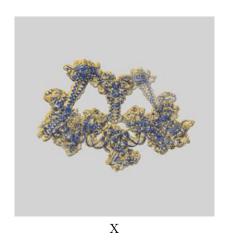
^{*}Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

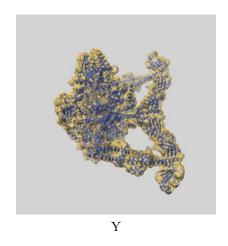


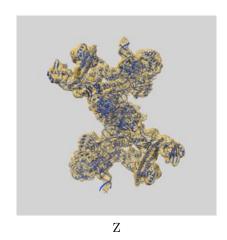
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-45813 and PDB model 9CQC. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay (i)



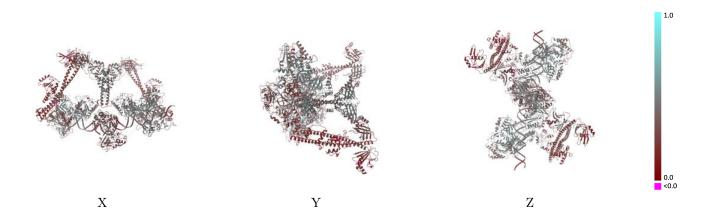




The images above show the 3D surface view of the map at the recommended contour level 8.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

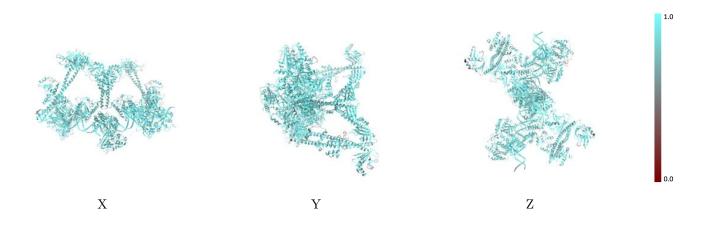


9.2 Q-score mapped to coordinate model (i)



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

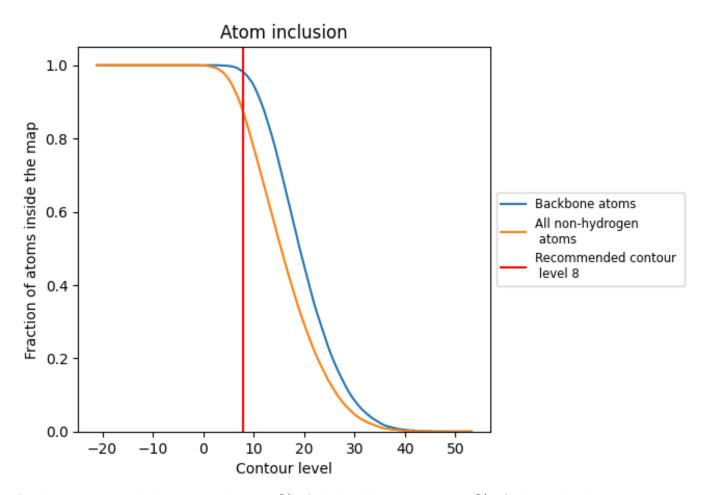
9.3 Atom inclusion mapped to coordinate model (i)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (8).



9.4 Atom inclusion (i)



At the recommended contour level, 98% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.



9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8700	0.3880
A	0.8950	0.4770
В	0.8790	0.4660
С	0.9070	0.4330
D	0.8300	0.2700
Е	0.8850	0.3290
F	0.8570	0.2650
G	0.8730	0.5070
Н	0.8330	0.4610
I	0.9380	0.3490
J	0.9170	0.3640
K	0.9500	0.3580
L	0.9440	0.3680
a	0.8890	0.4670
b	0.8870	0.4600
С	0.8890	0.4360
d	0.7760	0.2210
e	0.8310	0.2790
f	0.8220	0.3240



