wwPDB EM Validation Summary Report

Jun 25, 2025 – 12:50 am BST

PDB ID	:	9FMU / pdb_00009fmu
EMDB ID	:	EMD-50570
Title	:	Cryo-EM structure of human CD163 SRCR1-9 in complex with haptoglobin-hemoglobin
Authors	:	Andersen, C.B.F.; Kollman, J.M.
Deposited on	:	2024-06-07
Resolution	:	4.46 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

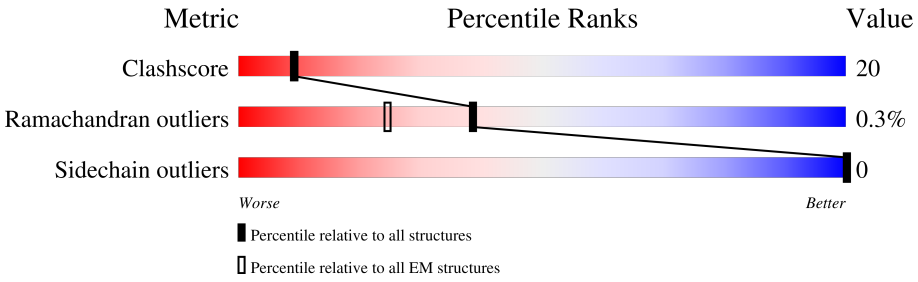
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 4.46 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	142	13% 65% 35%
2	B	147	31% 51% 48%
3	C	347	15% 43% 31% 27%
4	D	1036	38% 44% 27% 29%
4	E	1036	48% 41% 21% 38%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 14763 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 Hemopressin.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	141	Total	C	N	O	S	0	0
			1069	685	187	194	3		

- Molecule 2 is a protein called Spinorphin.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	146	Total	C	N	O	S	0	0
			1123	724	195	201	3		

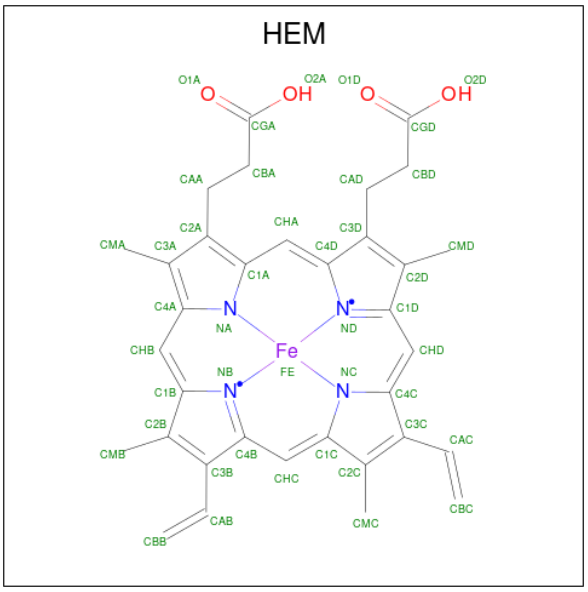
- Molecule 3 is a protein called Isoform 2 of Haptoglobin.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	254	Total	C	N	O	S	0	0
			1982	1265	334	373	10		

- Molecule 4 is a protein called Scavenger receptor cysteine-rich type 1 protein M130.

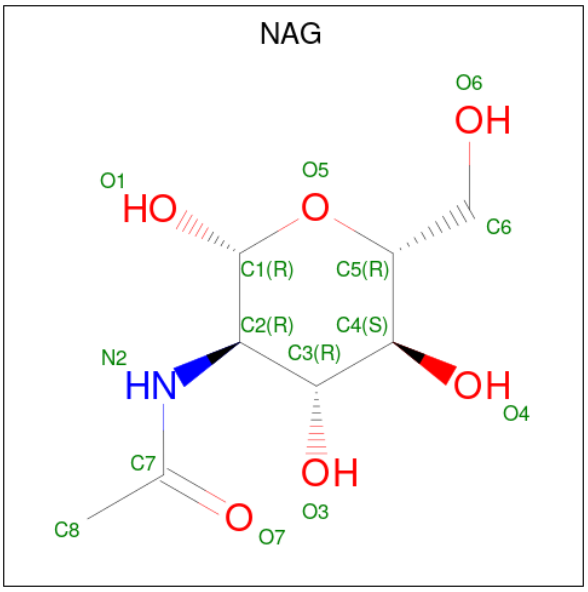
Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	738	Total	C	N	O	S	0	0
			5585	3433	1009	1081	62		
4	E	640	Total	C	N	O	S	0	0
			4845	2977	880	935	53		

- Molecule 5 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
5	A	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
5	B	1	Total	C	Fe	N	O	0
			43	34	1	4	4	

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
6	C	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
6	C	1	Total	C	N	O	0
			14	8	1	5	
6	D	1	Total	C	N	O	0
			14	8	1	5	
6	D	1	Total	C	N	O	0
			14	8	1	5	
6	E	1	Total	C	N	O	0
			14	8	1	5	

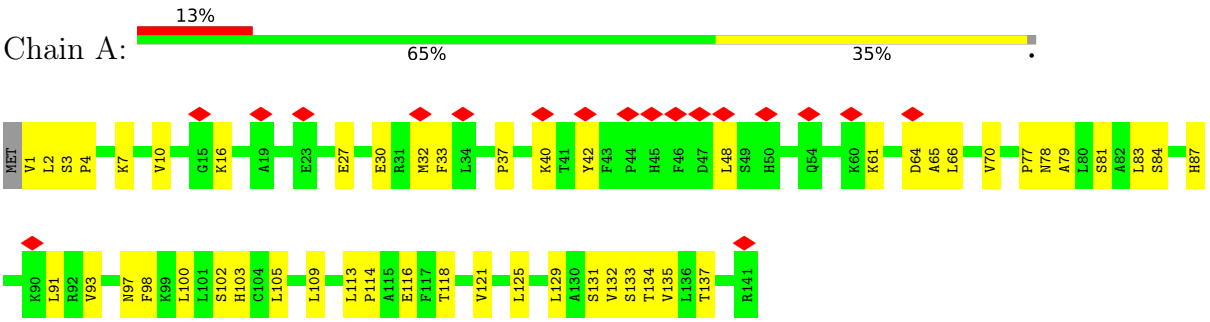
- Molecule 7 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
7	D	2	Total	Ca	0
			2	2	
7	E	1	Total	Ca	0
			1	1	

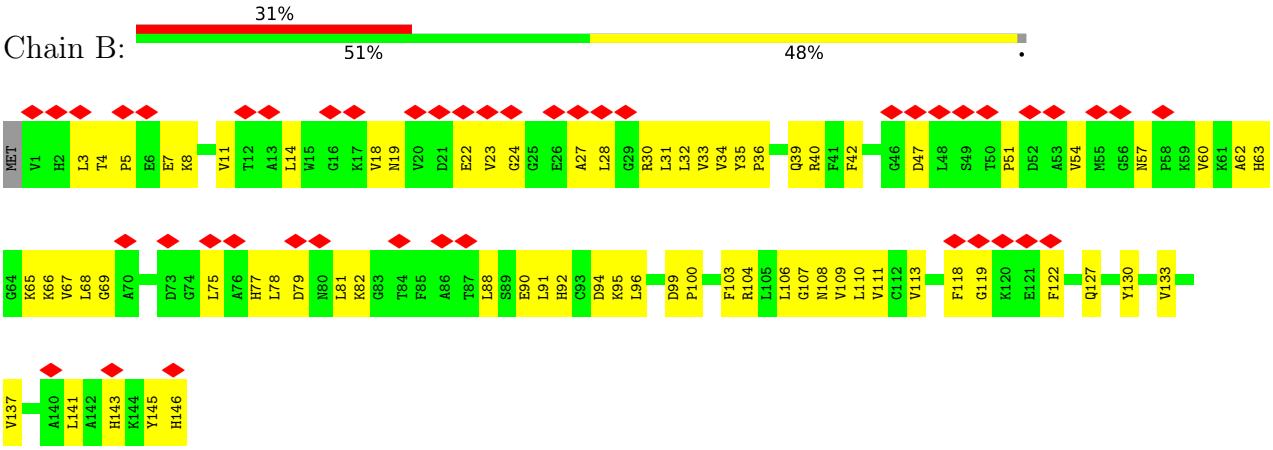
3 Residue-property plots (i)

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.

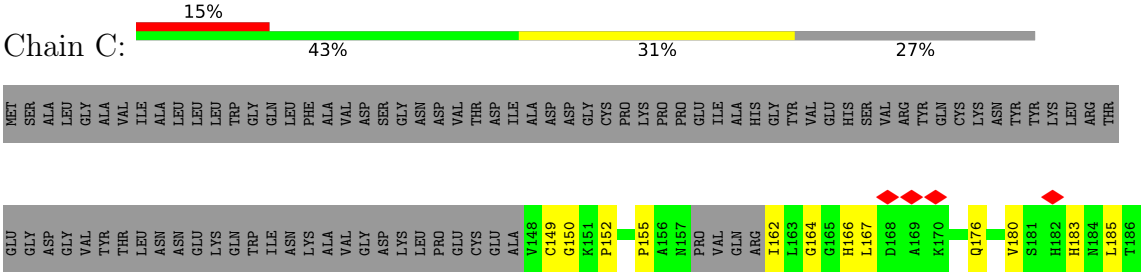
• Molecule 1: Hemopressin

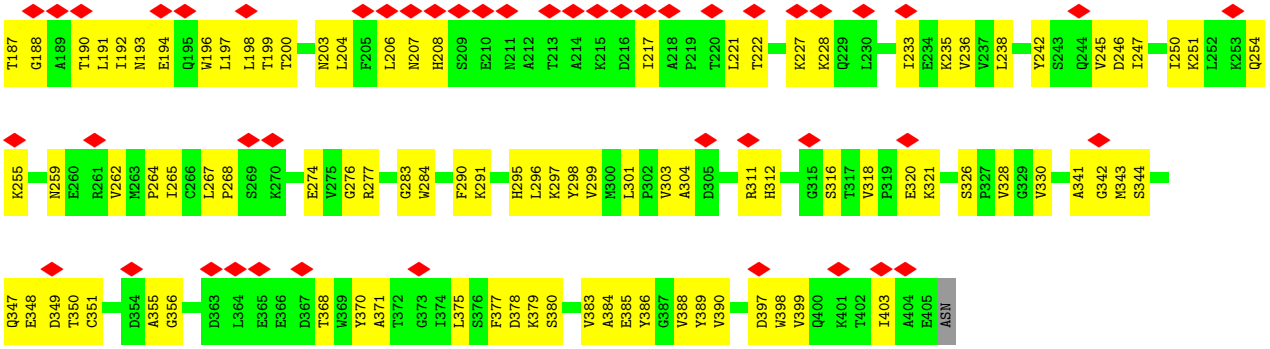


• Molecule 2: Spinorphin



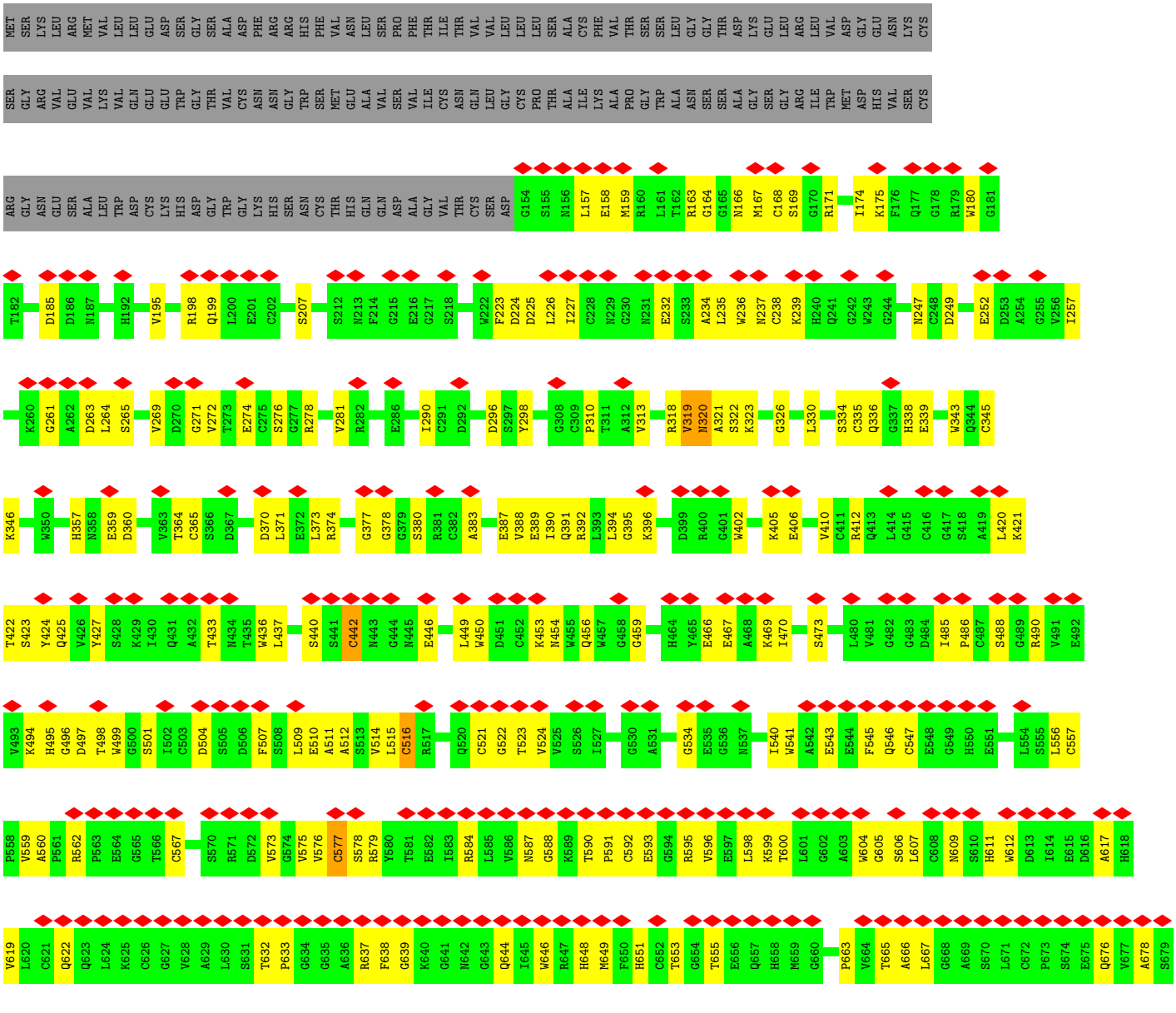
• Molecule 3: Isoform 2 of Haptoglobin

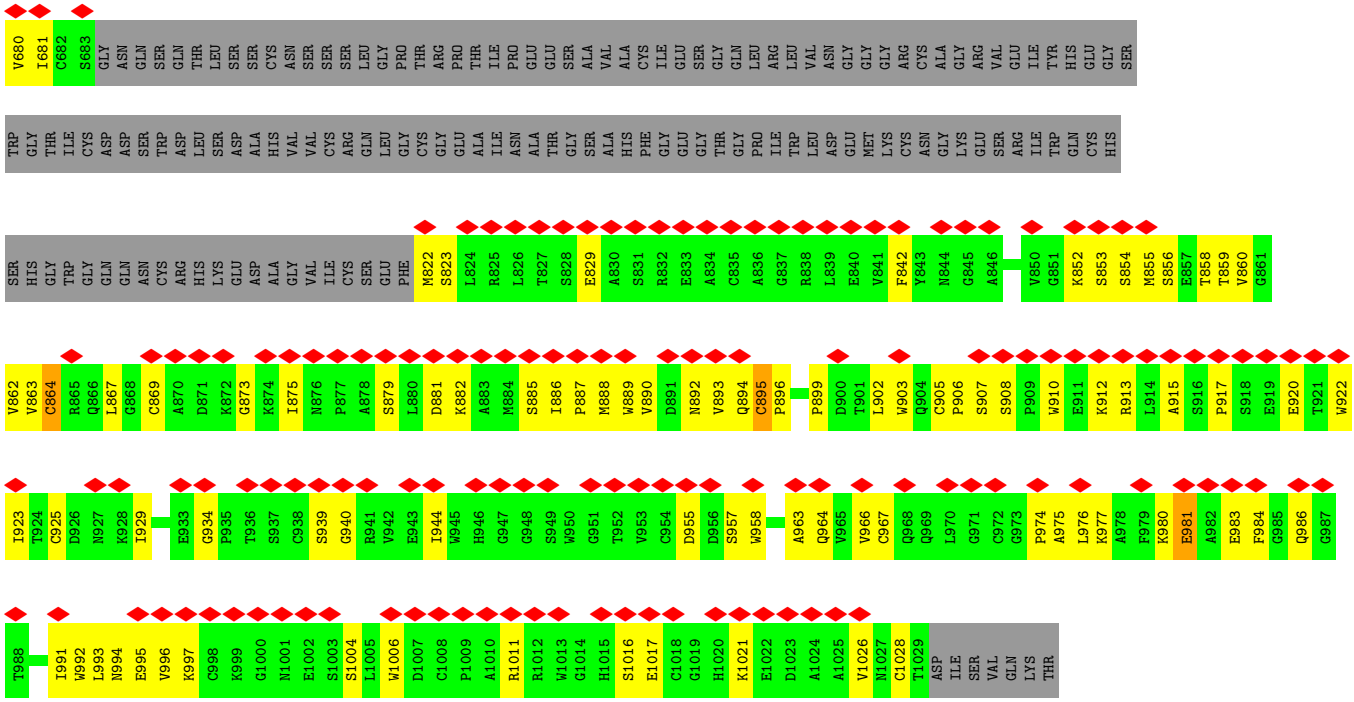




• Molecule 4: Scavenger receptor cysteine-rich type 1 protein M130

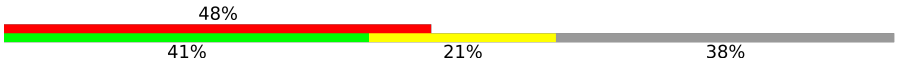
Chain D:

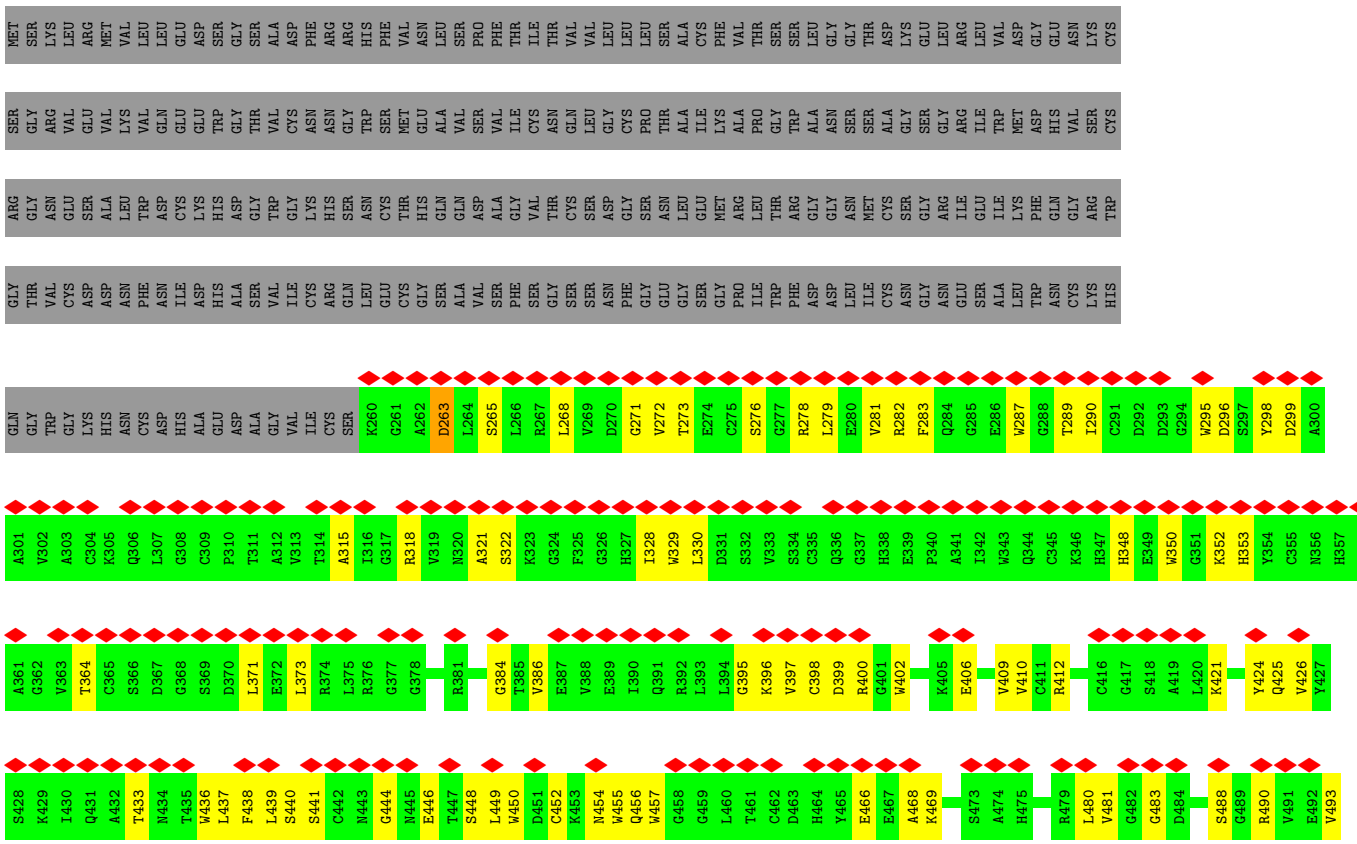


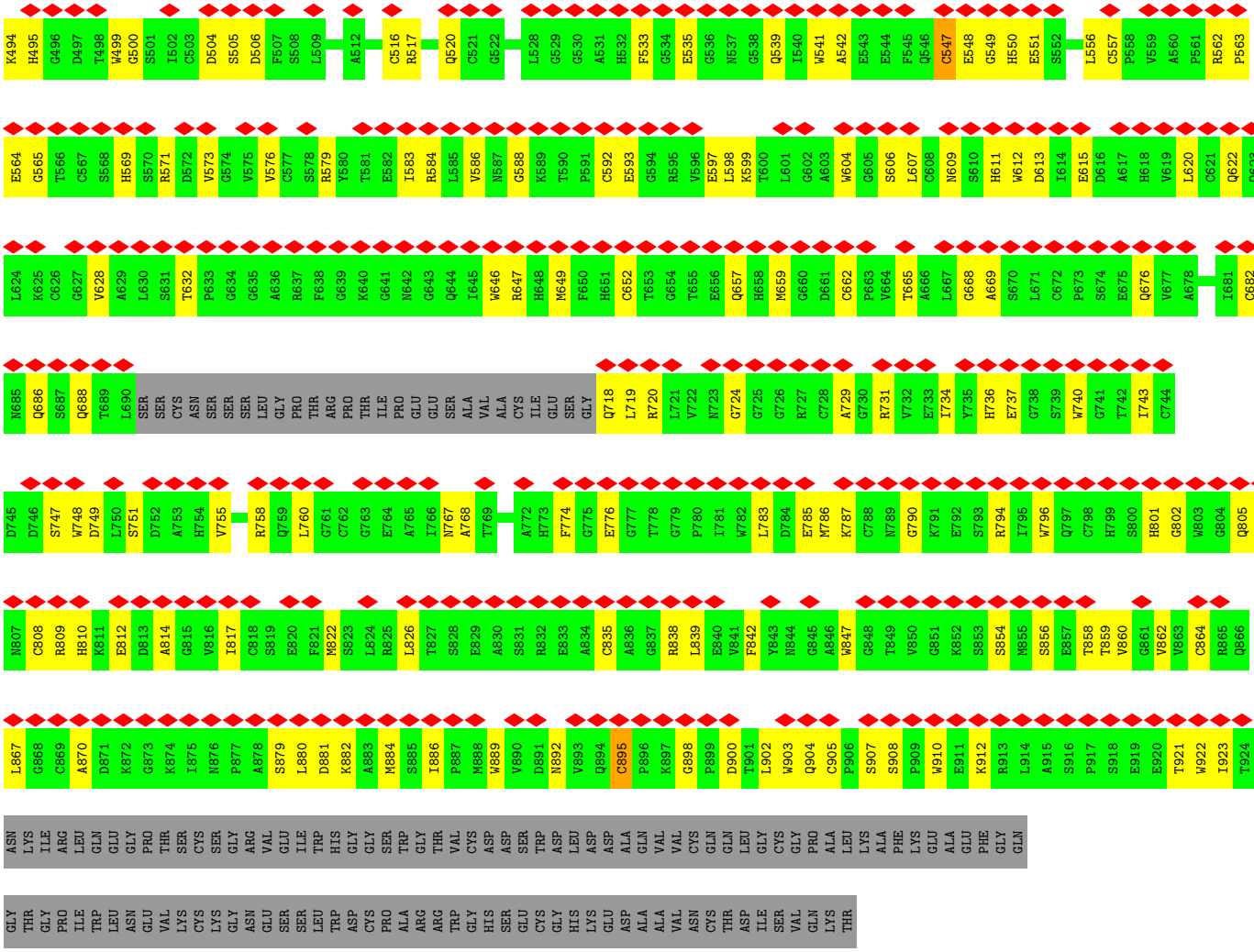


• Molecule 4: Scavenger receptor cysteine-rich type 1 protein M130

Chain E:






K494 H495 G496 D497 T498 W499 G500 S501 I502 C503 D504 S505 D506 F507 S508 L509 A512 C516 R517 Q520 C521 G522 L528 G529 G530 A531 H532 F533 G534 E535 G536 N537 G538 Q539 I540 W541 A542 E543 E544 F545 Q546 C547 E548 G549 H550 E551 S552 L556 C557 P558 V559 A560 P561 R562 P563
E564 G565 T566 C567 S568 H569 S570 R571 D572 V573 G574 V575 V576 C577 S578 R579 Y580 T581 E582 I583 R584 L585 V586 N587 G588 K589 T590 P591 C592 E593 G594 R595 V596 E597 L598 K599 T600 L601 G602 A603 W604 G605 S606 L607 C608 N609 S610 H611 W612 D613 I614 E615 D616 A617 H618 V619 L620 C621 Q622 Q623
L624 K625 C626 G627 V628 A629 L630 S631 T632 P633 G634 G635 A636 R637 F638 G639 K640 G641 N642 G643 Q644 I645 W646 R647 H648 M649 F650 H651 C652 T653 G654 T655 E656 Q657 H658 M659 G660 D661 C662 P663 V664 T665 A666 L667 G668 A669 S670 L671 C672 P673 S674 E675 Q676 V677 A678 I681 C682 S683 G684
N685 Q686 S687 Q688 T689 L690 SER SER CYS ASN SER SER SER LEU GLY PRO THR ARG PRO THR ILE PRO GLU GLU SER ALA VAL ALA CYS ILE GLU SER GLY Q718 L719 R720 L721 V722 N723 G724 G725 G726 R727 C728 A729 G730 R731 V732 E733 I734 Y735 H736 E737 G738 S739 W740 G741 T742 I743 C744
D745 D746 S747 W748 D749 L750 S751 D752 A753 H754 V755 R758 Q759 L760 G761 C762 G763 E764 A765 I766 N767 A768 T769 A772 H773 F774 G775 E776 G777 T778 G779 P780 I781 W782 L783 D784 E785 M786 K787 C788 N789 G790 K791 E792 S793 R794 I795 W796 Q797 C798 H799 S800 H801 G802 W803 G804 Q805 Q806
N807 C808 R809 H810 K811 E812 D813 A814 G815 V816 I817 C818 S819 E820 F821 M822 S823 L824 R825 L826 T827 S828 E829 A830 S831 R832 E833 A834 C835 A836 G837 R838 L839 E840 V841 F842 Y843 N844 G845 A846 W847 G848 T849 V850 G851 K852 S853 S854 M855 S856 E857 T858 T859 V860 G861 V862 V863 C864 R865 Q866
L867 G868 C869 A870 D871 K872 G873 K874 I875 N876 P877 A878 S879 L880 D881 K882 A883 M884 S885 I886 P887 M888 W889 V890 D891 N892 V893 Q894 C895 P896 K897 G898 P899 D900 T901 L902 W903 Q904 C905 P906 S907 S908 P909 W910 E911 K912 R913 L914 A915 S916 P917 S918 E919 E920 T921 W922 I923 T924 C925 D926
ASN LYS ILE ARG LEU GLN GLU GLY PRO THR SER CYS SER GLY ARG VAL GLU ILE TRP HIS GLY GLY SER TRP GLY THR VAL CYS ASP ASP SER TRP ASP LEU ASP ASP ALA GLN VAL VAL CYS GLN GLN LEU GLY CYS GLY PRO ALA LEU LYS ALA PHE LYS GLU ALA GLU PHE GLY GLN
GLY THR GLY PRO ILE TRP LEU ASN GLU VAL LYS CYS LYS GLY ASN GLU SER SER LEU TRP ASP CYS PRO ALA ARG ARG TRP GLY HIS SER GLU CYS GLY HIS LYS GLU ASP ALA ALA VAL ASN CYS THR ASP ILE SER VAL GLN LYS THR

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	38511	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	90	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	3.315	Depositor
Minimum map value	-1.605	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.088	Depositor
Recommended contour level	1	Depositor
Map size (Å)	339.19998, 339.19998, 339.19998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CA, HEM, NAG

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	0.24	0/1097	0.71	0/1491
2	B	0.30	0/1153	0.75	0/1566
3	C	0.25	0/2029	0.64	1/2756 (0.0%)
4	D	0.23	0/5714	0.74	13/7740 (0.2%)
4	E	0.21	0/4955	0.68	4/6712 (0.1%)
All	All	0.23	0/14948	0.71	18/20265 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
4	D	0	1

There are no bond length outliers.

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	557	CYS	CA-CB-SG	9.18	135.51	114.40
4	E	547	CYS	CA-CB-SG	7.73	132.19	114.40
4	D	547	CYS	CA-CB-SG	7.62	131.94	114.40
4	D	516	CYS	CA-CB-SG	6.69	129.79	114.40
4	D	547	CYS	CB-CA-C	6.19	120.92	109.54

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	D	442	CYS	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1069	0	1072	41	0
2	B	1123	0	1118	68	0
3	C	1982	0	1955	87	0
4	D	5585	0	5214	218	0
4	E	4845	0	4541	173	0
5	A	43	0	30	6	0
5	B	43	0	30	5	0
6	C	28	0	26	0	0
6	D	28	0	26	2	0
6	E	14	0	13	0	0
7	D	2	0	0	0	0
7	E	1	0	0	0	0
All	All	14763	0	14025	578	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 20.

The worst 5 of 578 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)
4:D:590:THR:HG22	4:D:593:GLU:HG2	1.50	0.93
4:D:986:GLN:HE22	4:D:1021:LYS:HA	1.33	0.92
4:D:421:LYS:HG2	4:D:423:SER:H	1.40	0.85
3:C:349:ASP:OD1	3:C:350:THR:N	2.12	0.82
1:A:102:SER:HB2	1:A:129:LEU:HD13	1.62	0.82

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	139/142 (98%)	129 (93%)	10 (7%)	0	100	100
2	B	144/147 (98%)	139 (96%)	5 (4%)	0	100	100
3	C	250/347 (72%)	234 (94%)	16 (6%)	0	100	100
4	D	734/1036 (71%)	704 (96%)	27 (4%)	3 (0%)	30	68
4	E	636/1036 (61%)	609 (96%)	24 (4%)	3 (0%)	25	64
All	All	1903/2708 (70%)	1815 (95%)	82 (4%)	6 (0%)	38	72

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	686	GLN
4	D	263	ASP
4	D	320	ASN
4	D	422	THR
4	E	263	ASP

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	113/114 (99%)	113 (100%)	0	100	100
2	B	118/119 (99%)	118 (100%)	0	100	100
3	C	217/294 (74%)	217 (100%)	0	100	100
4	D	602/849 (71%)	602 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	E	521/849 (61%)	521 (100%)	0	100	100
All	All	1571/2225 (71%)	1571 (100%)	0	100	100

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

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

Mol	Chain	Res	Type
4	D	876	ASN
4	E	347	HIS
4	D	986	GLN
4	E	539	GLN
4	D	231	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 10 ligands modelled in this entry, 3 are monoatomic - leaving 7 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
6	NAG	D	2003	4	14,14,15	0.74	0	17,19,21	0.91	0
5	HEM	B	201	2	41,50,50	1.51	6 (14%)	45,82,82	1.42	7 (15%)
5	HEM	A	201	1	41,50,50	1.45	3 (7%)	45,82,82	1.16	3 (6%)
6	NAG	C	1001	3	14,14,15	0.76	0	17,19,21	0.80	0
6	NAG	C	1002	3	14,14,15	0.75	0	17,19,21	0.77	0
6	NAG	D	2004	4	14,14,15	0.67	0	17,19,21	1.11	2 (11%)
6	NAG	E	1102	4	14,14,15	0.79	0	17,19,21	0.75	0

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
6	NAG	D	2003	4	-	2/6/23/26	0/1/1/1
5	HEM	B	201	2	-	3/12/54/54	-
5	HEM	A	201	1	-	3/12/54/54	-
6	NAG	C	1001	3	-	0/6/23/26	0/1/1/1
6	NAG	C	1002	3	-	0/6/23/26	0/1/1/1
6	NAG	D	2004	4	-	2/6/23/26	0/1/1/1
6	NAG	E	1102	4	-	2/6/23/26	0/1/1/1

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	201	HEM	C3C-C2C	-4.12	1.34	1.40
5	A	201	HEM	C3C-C2C	-4.06	1.34	1.40
5	A	201	HEM	C3C-CAC	3.74	1.55	1.47
5	B	201	HEM	C3C-CAC	3.73	1.55	1.47
5	A	201	HEM	CAB-C3B	2.89	1.55	1.47

The worst 5 of 12 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	201	HEM	CMB-C2B-C1B	2.93	129.50	125.04
5	B	201	HEM	CAD-CBD-CGD	-2.62	107.97	113.60
5	B	201	HEM	C1B-NB-C4B	2.61	107.77	105.07
5	B	201	HEM	CMC-C2C-C3C	2.56	129.47	124.68
6	D	2004	NAG	O5-C1-C2	-2.49	107.36	111.29

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

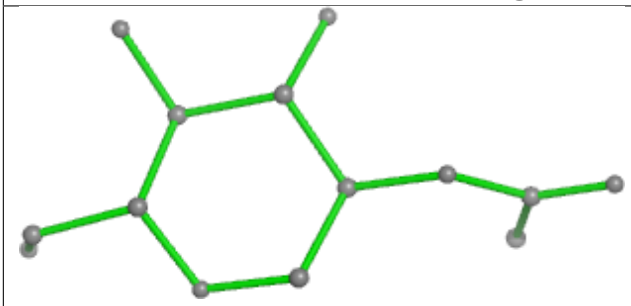
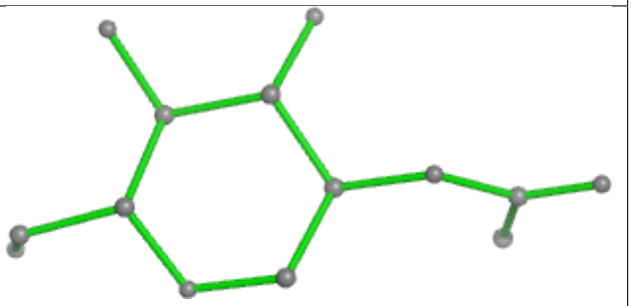
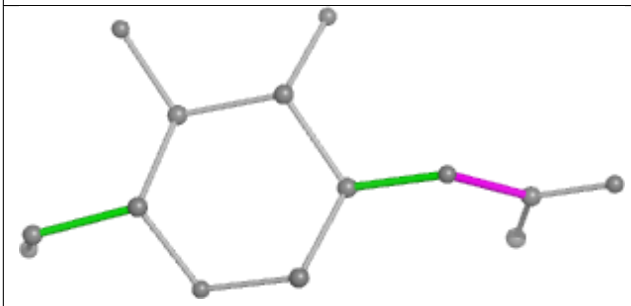
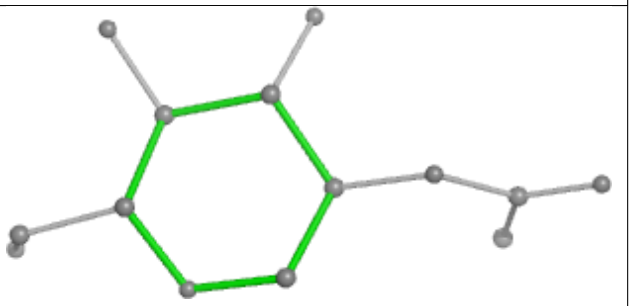
Mol	Chain	Res	Type	Atoms
6	D	2003	NAG	C8-C7-N2-C2
6	D	2003	NAG	O7-C7-N2-C2
6	D	2004	NAG	C8-C7-N2-C2
6	D	2004	NAG	O7-C7-N2-C2
6	E	1102	NAG	C8-C7-N2-C2

There are no ring outliers.

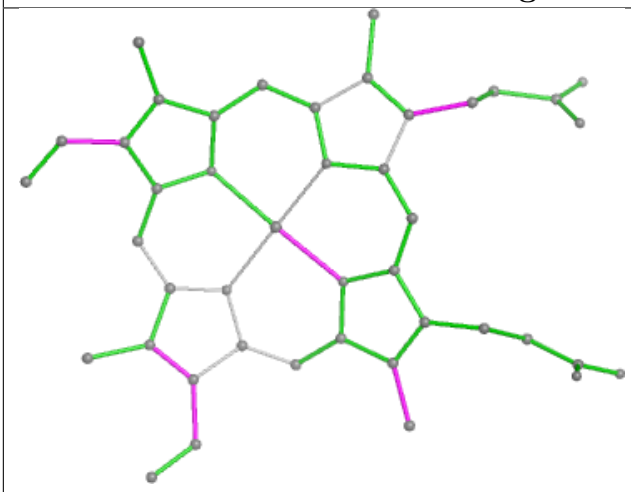
3 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	201	HEM	5	0
5	A	201	HEM	6	0
6	D	2004	NAG	2	0

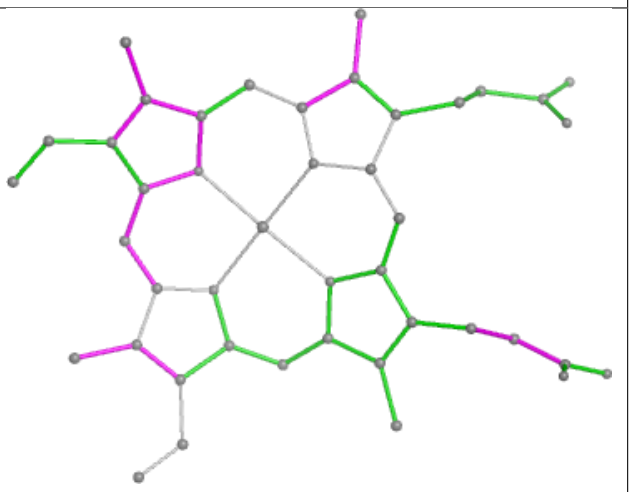
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

Ligand NAG D 2003	
 Bond lengths	 Bond angles
 Torsions	 Rings

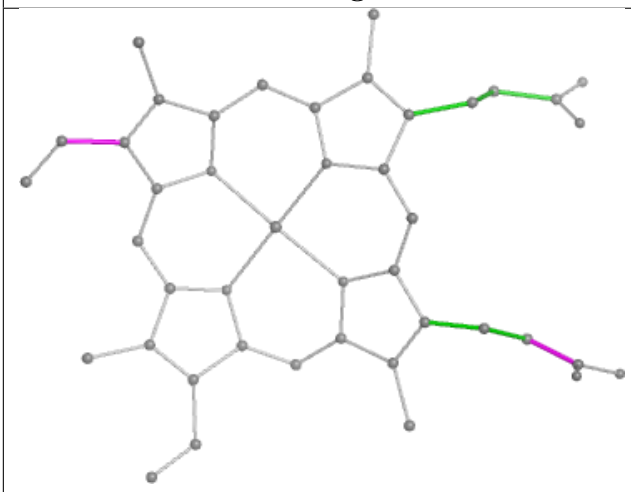
Ligand HEM B 201



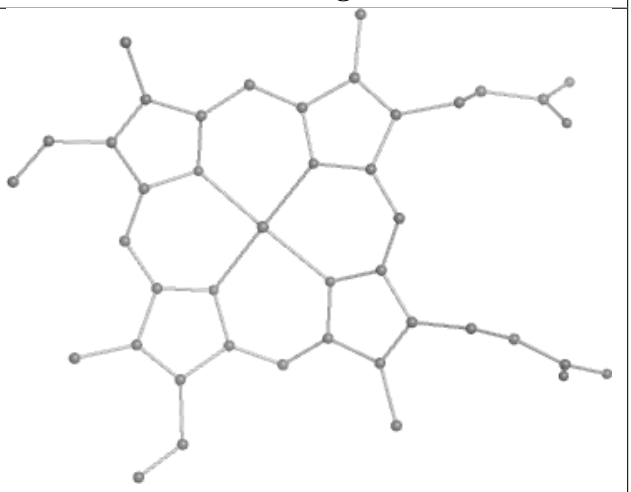
Bond lengths



Bond angles

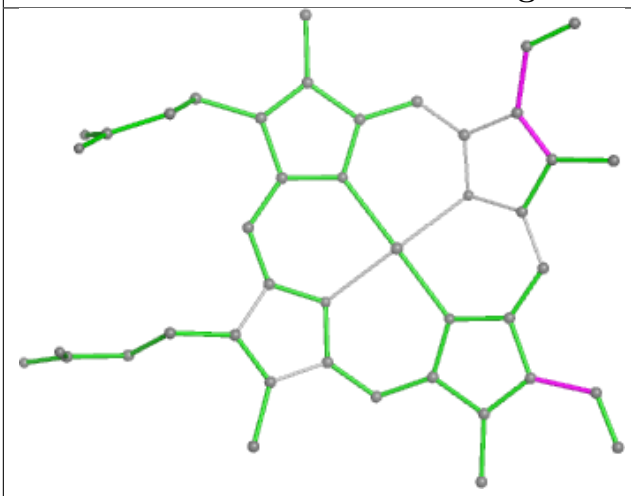


Torsions

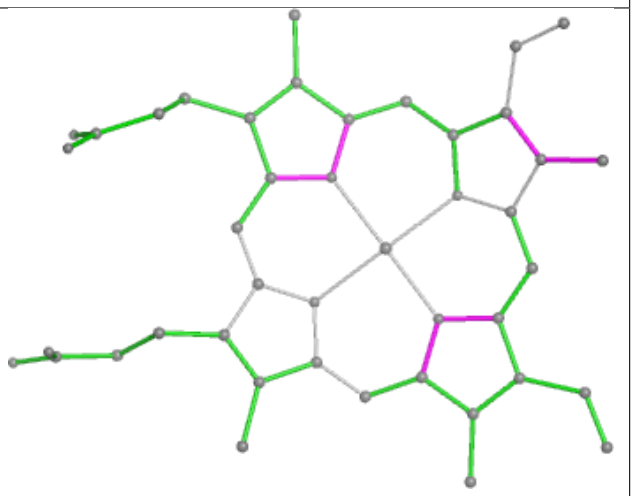


Rings

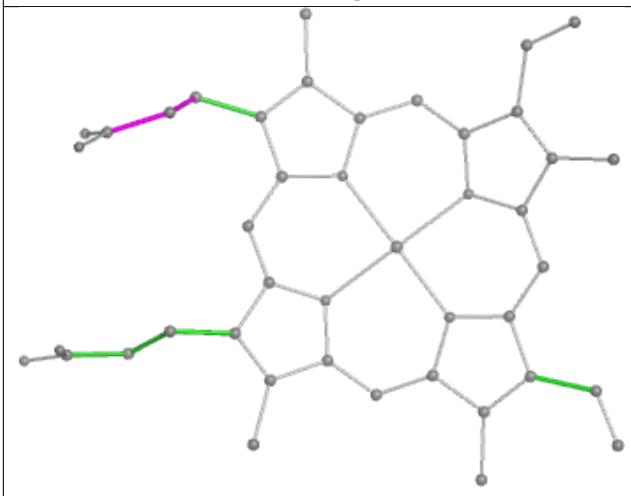
Ligand HEM A 201



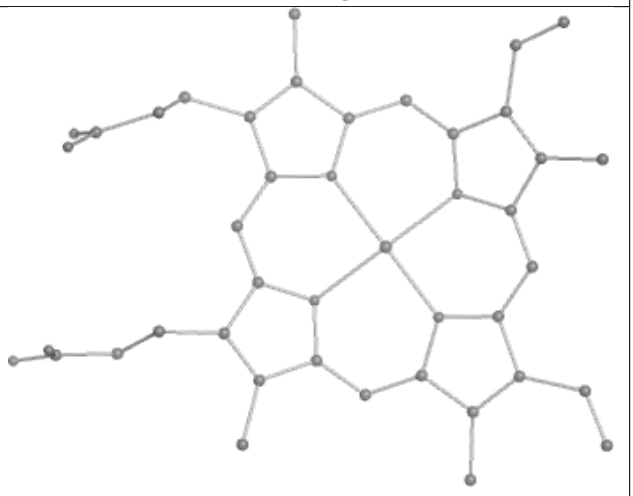
Bond lengths



Bond angles

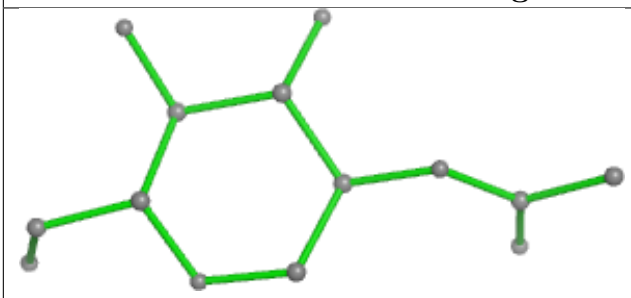


Torsions

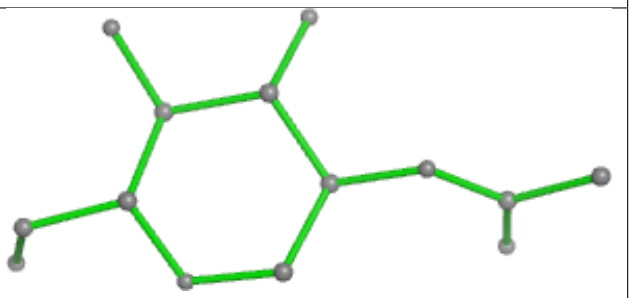


Rings

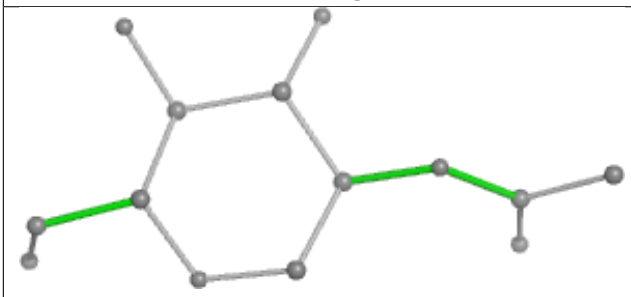
Ligand NAG C 1001



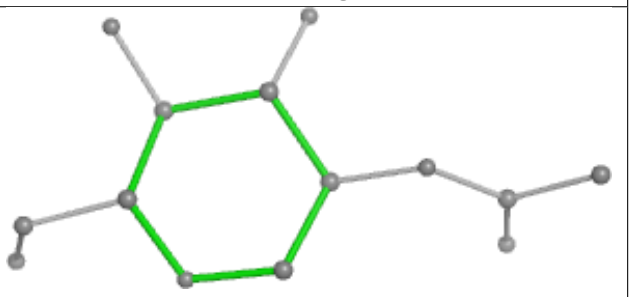
Bond lengths



Bond angles

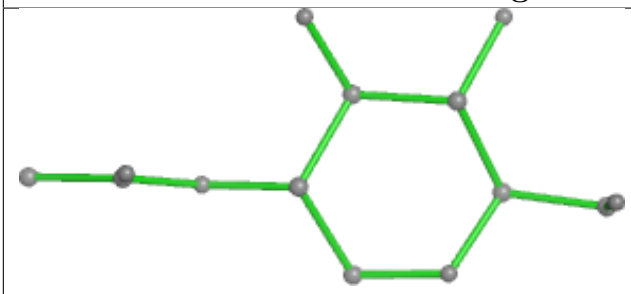


Torsions

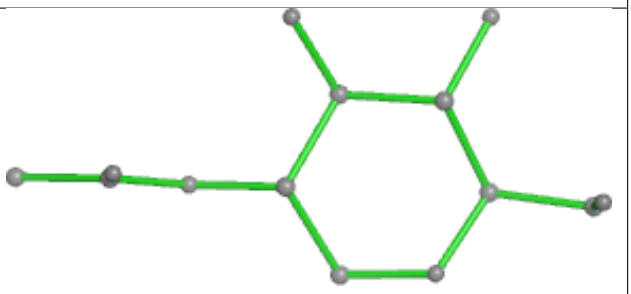


Rings

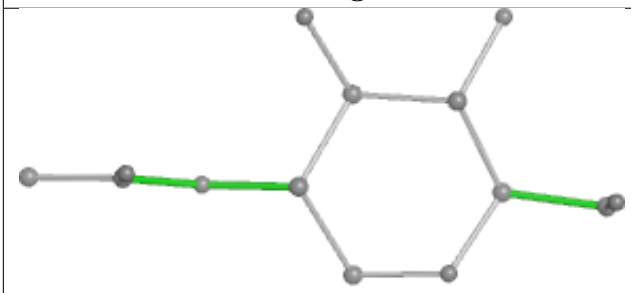
Ligand NAG C 1002



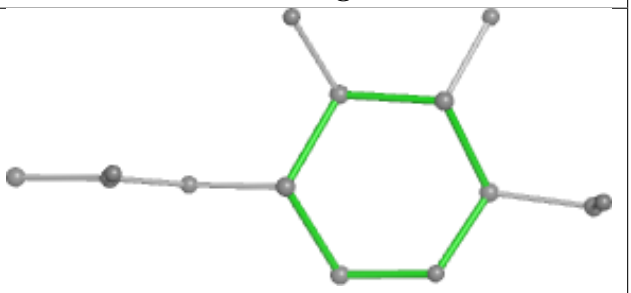
Bond lengths



Bond angles

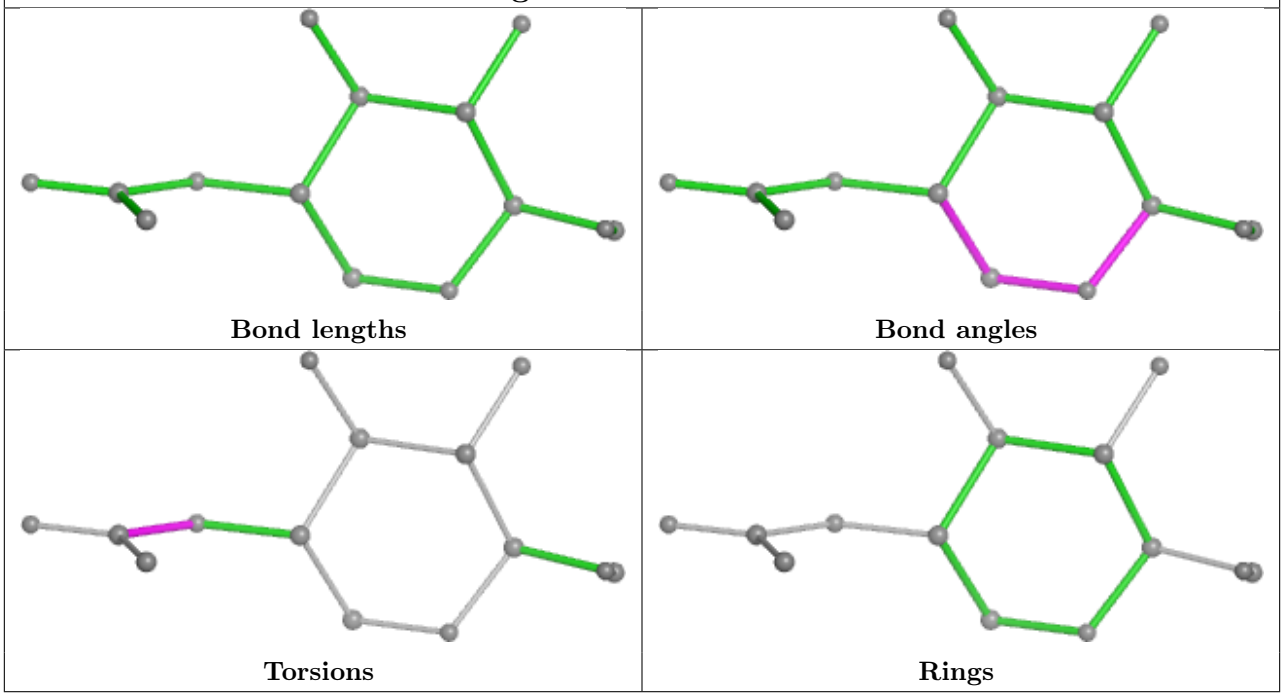


Torsions

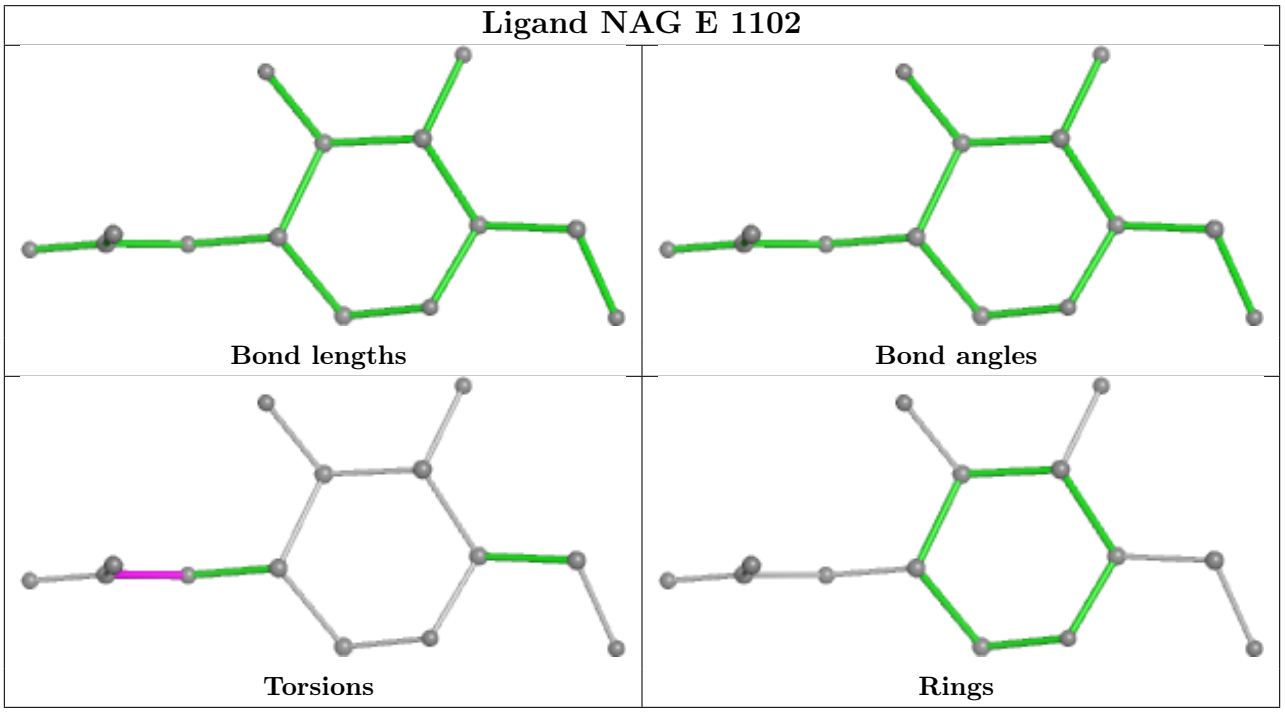


Rings

Ligand NAG D 2004



Ligand NAG E 1102



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

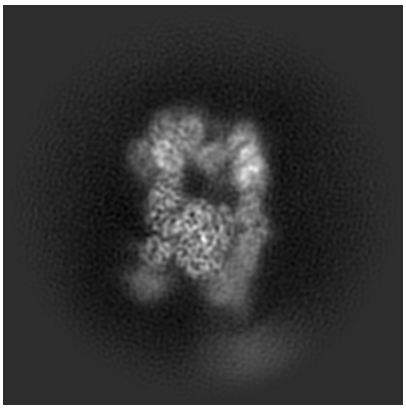
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-50570. These allow visual inspection of the internal detail of the map and identification of artifacts.

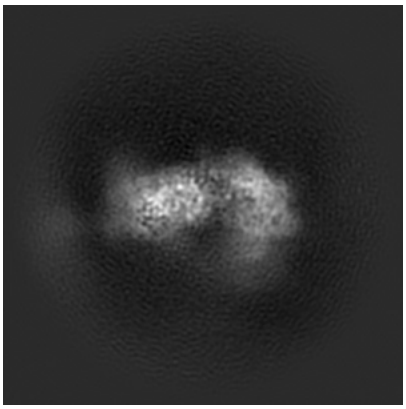
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

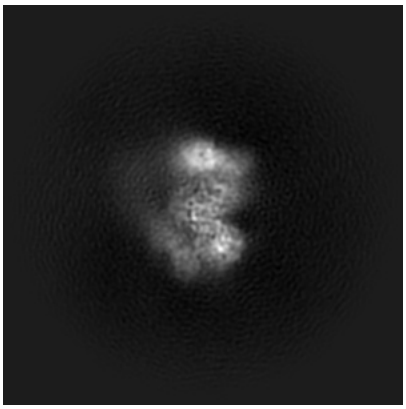
6.1.1 Primary map



X

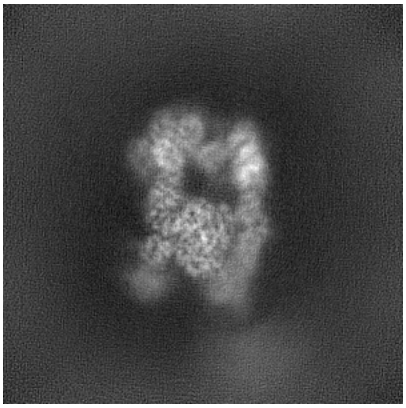


Y

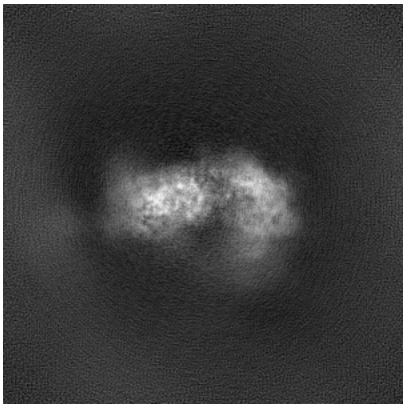


Z

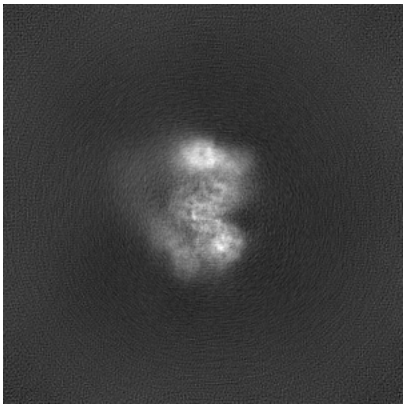
6.1.2 Raw map



X



Y

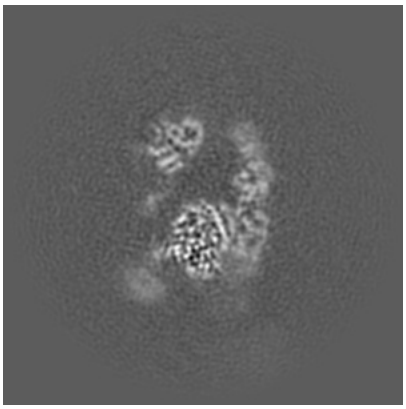


Z

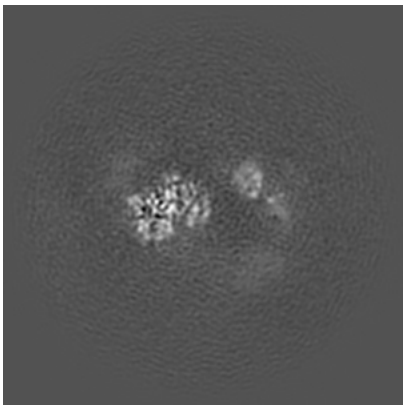
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

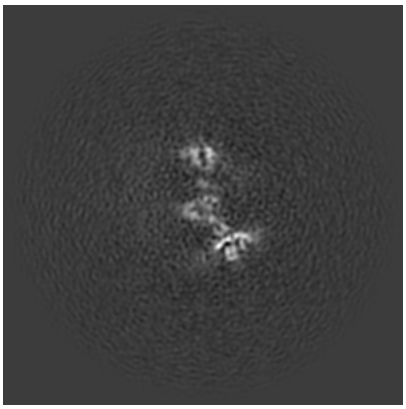
6.2.1 Primary map



X Index: 160

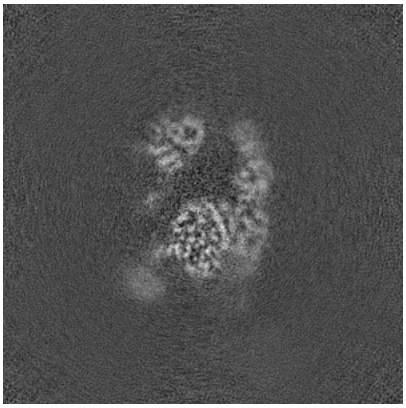


Y Index: 160

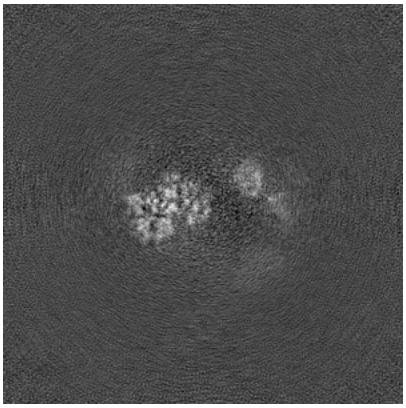


Z Index: 160

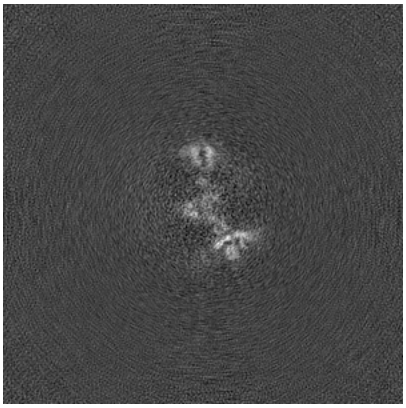
6.2.2 Raw map



X Index: 160



Y Index: 160

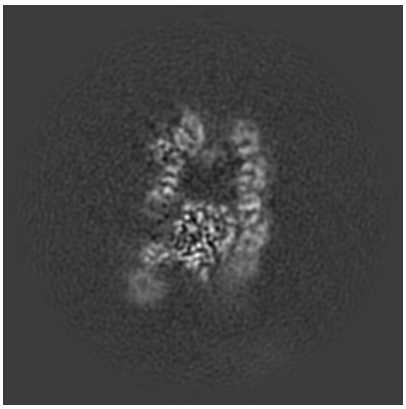


Z Index: 160

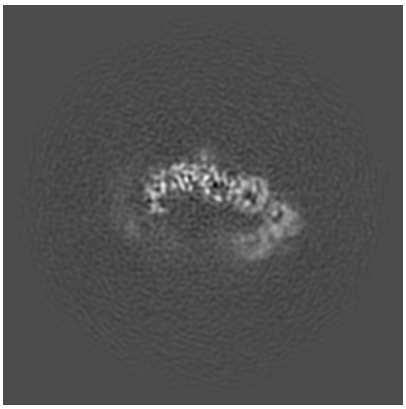
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

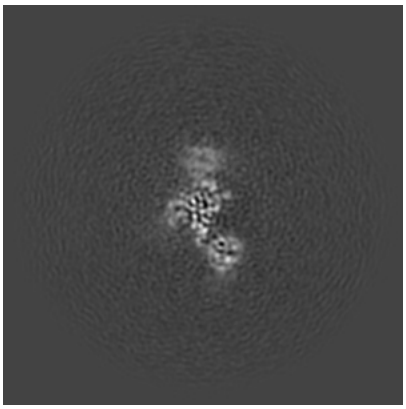
6.3.1 Primary map



X Index: 165

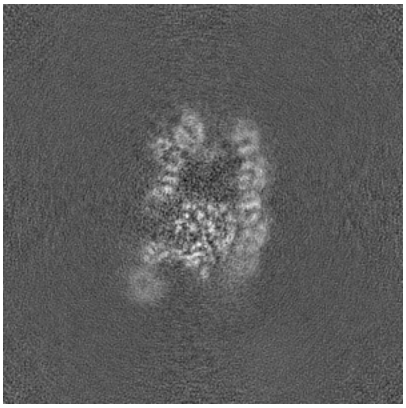


Y Index: 131

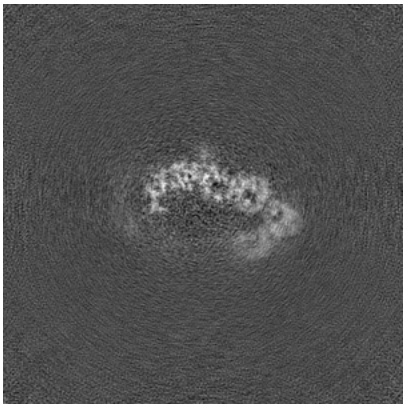


Z Index: 126

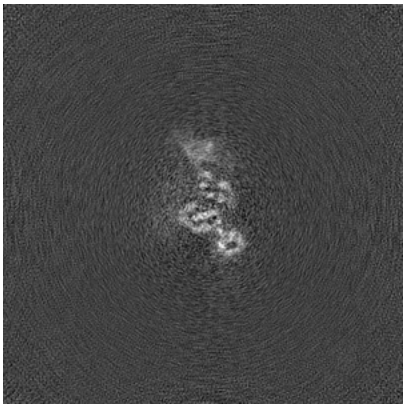
6.3.2 Raw map



X Index: 165



Y Index: 131

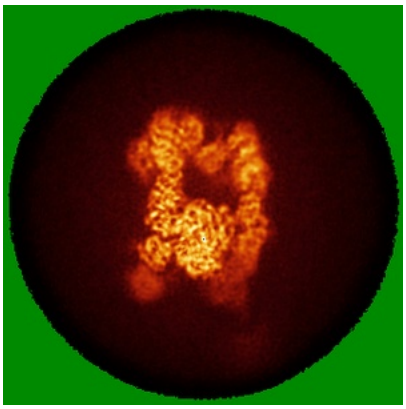


Z Index: 140

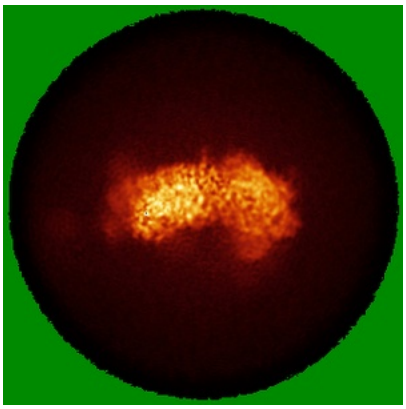
The images above show the largest variance slices of the map in three orthogonal directions.

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

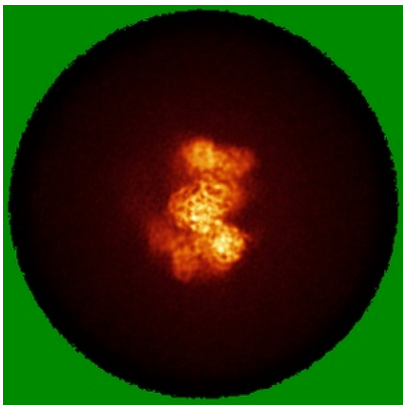
6.4.1 Primary map



X

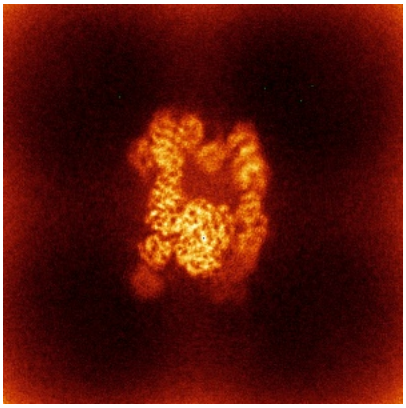


Y

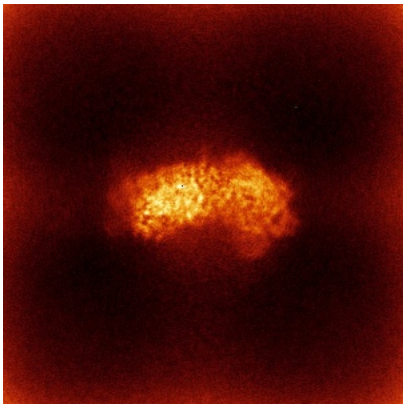


Z

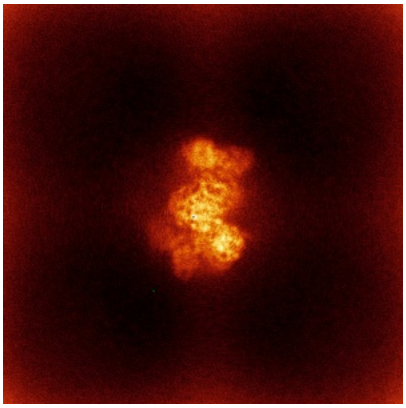
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 1.0. 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

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.

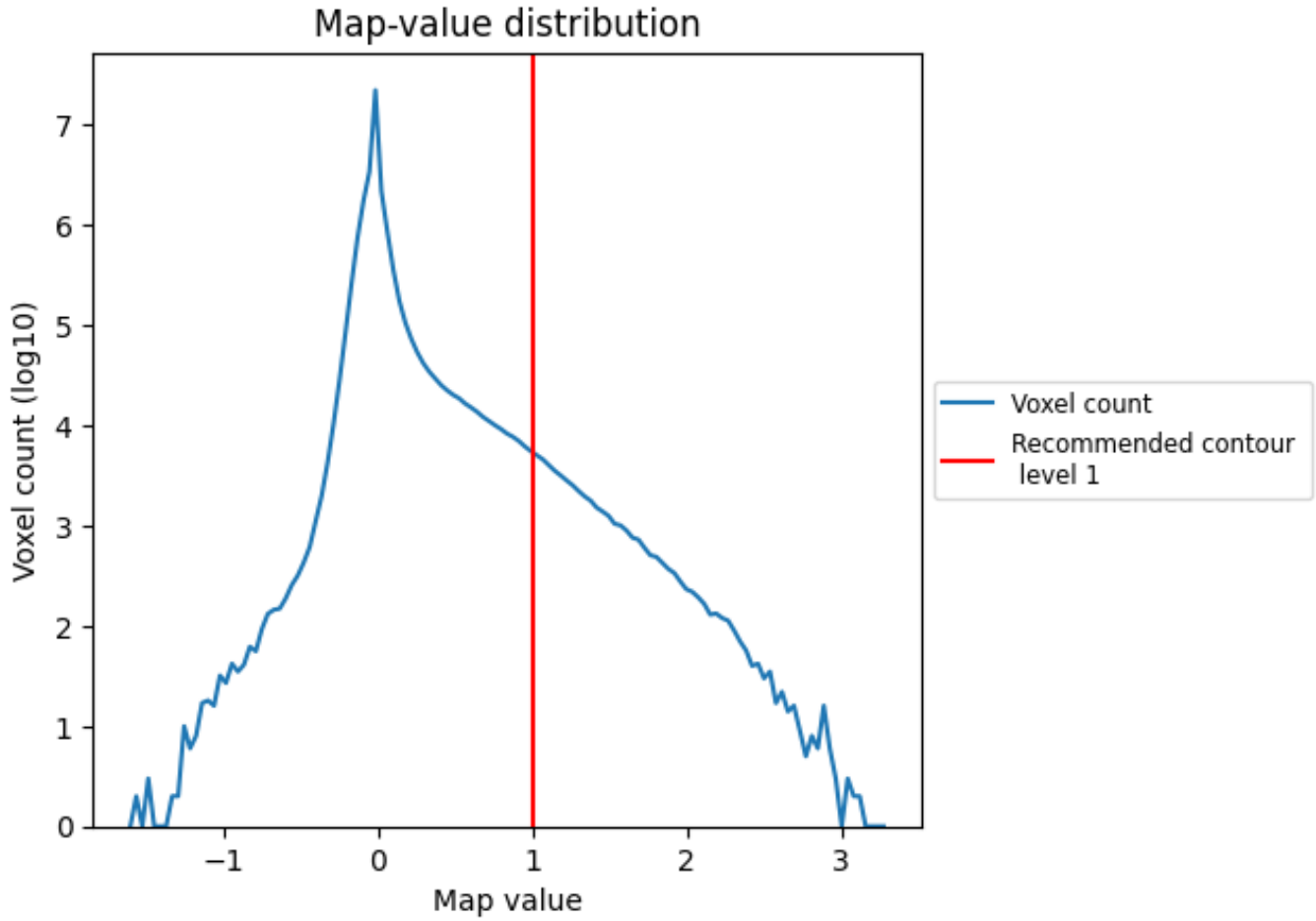
6.6 Mask visualisation (i)

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

7 Map analysis

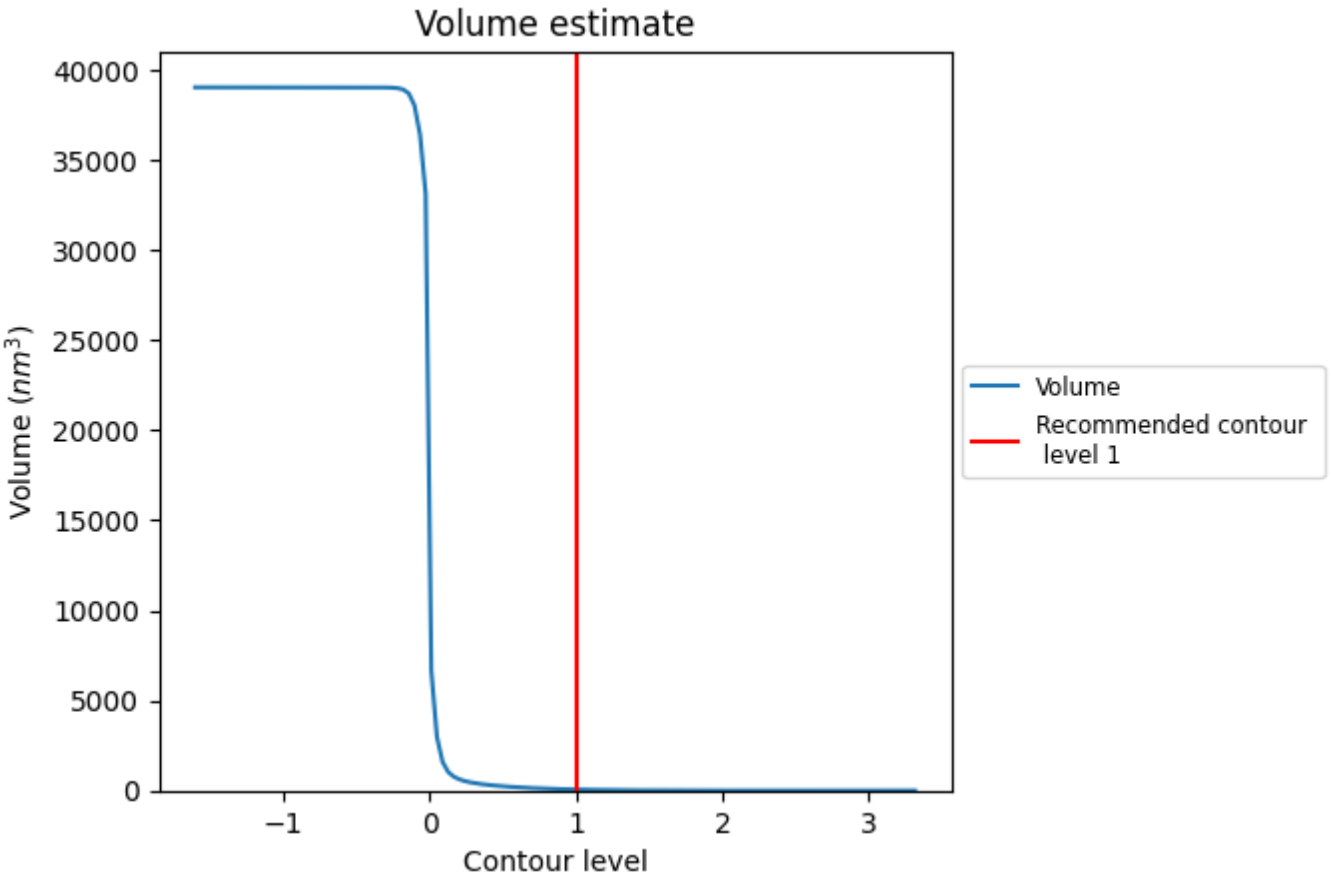
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

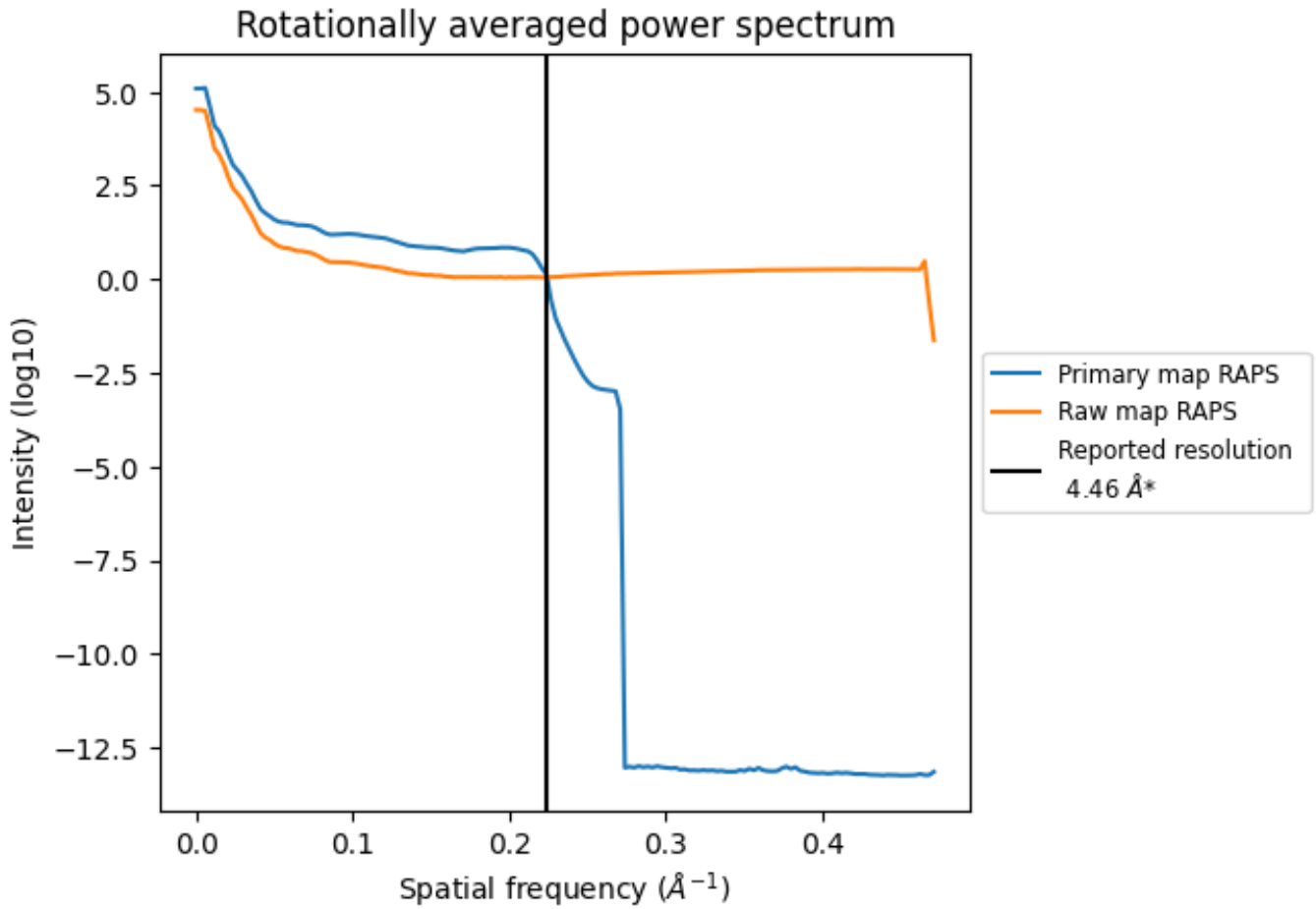
7.2 Volume estimate (i)



The volume at the recommended contour level is 59 nm^3; this corresponds to an approximate mass of 53 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)

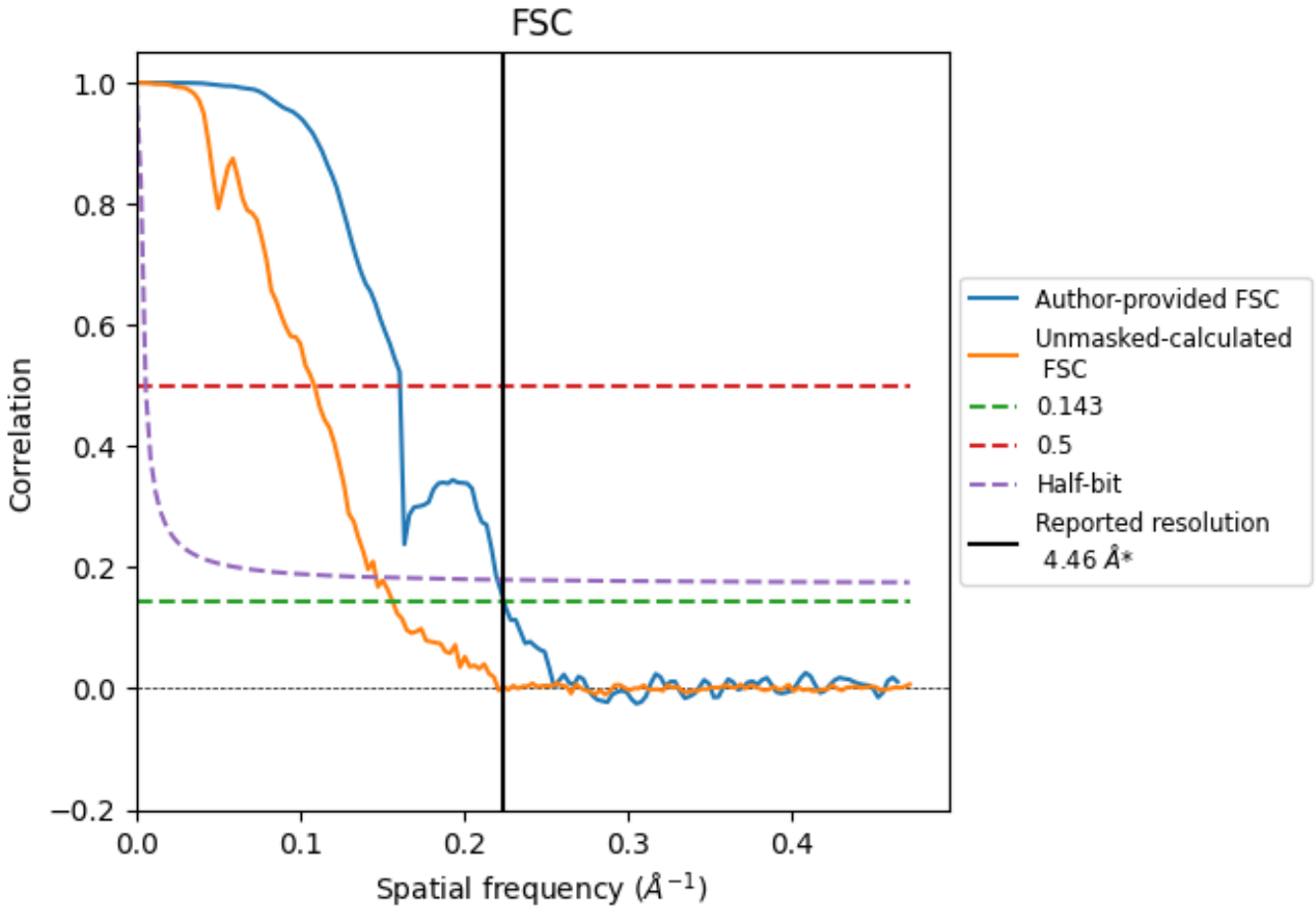


*Reported resolution corresponds to spatial frequency of 0.224 $Å^{-1}$

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 0.224 Å^{-1}

8.2 Resolution estimates (i)

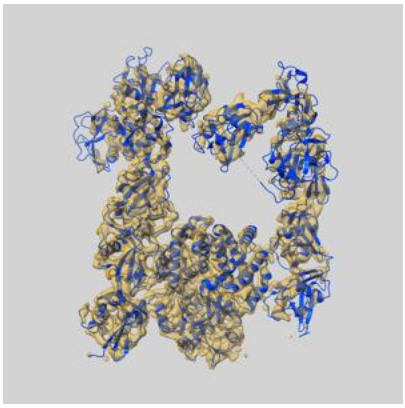
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.46	-	-
Author-provided FSC curve	4.46	6.22	4.54
Unmasked-calculated*	6.39	9.20	6.84

*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 6.39 differs from the reported value 4.46 by more than 10 %

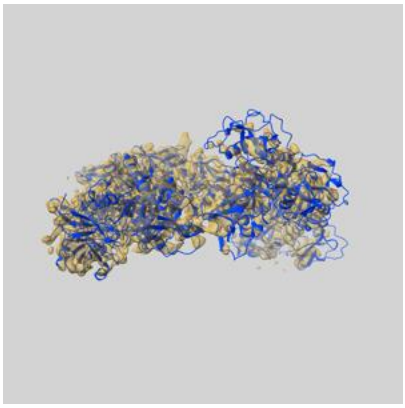
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-50570 and PDB model 9FMU. Per-residue inclusion information can be found in section 3 on page 6.

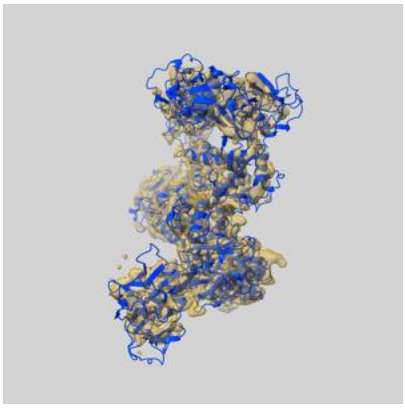
9.1 Map-model overlay



X



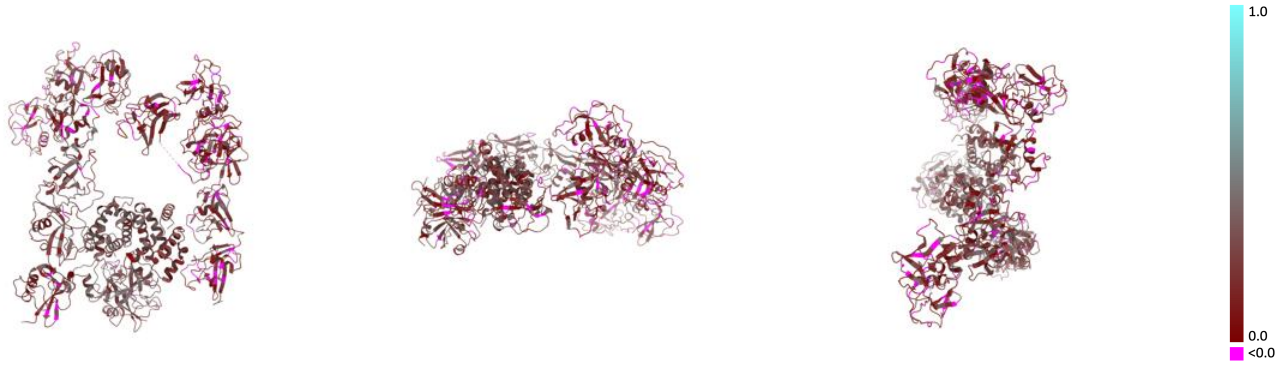
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 1.0 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.

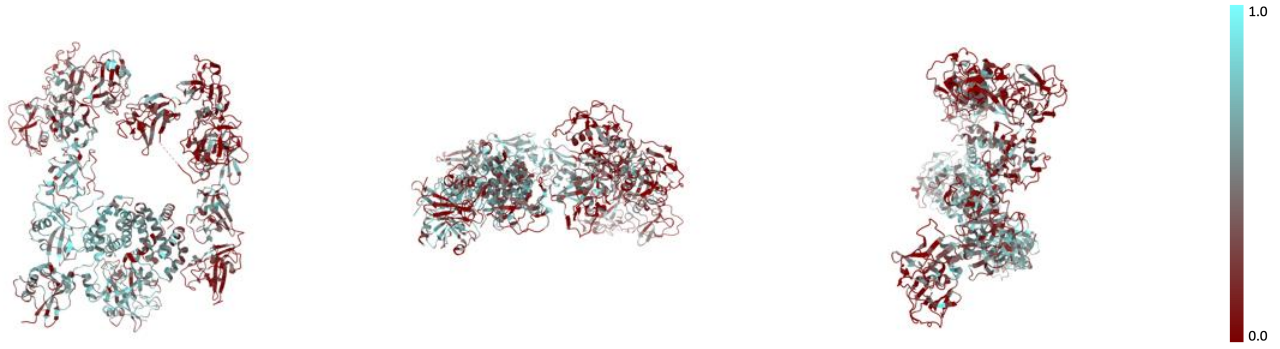
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

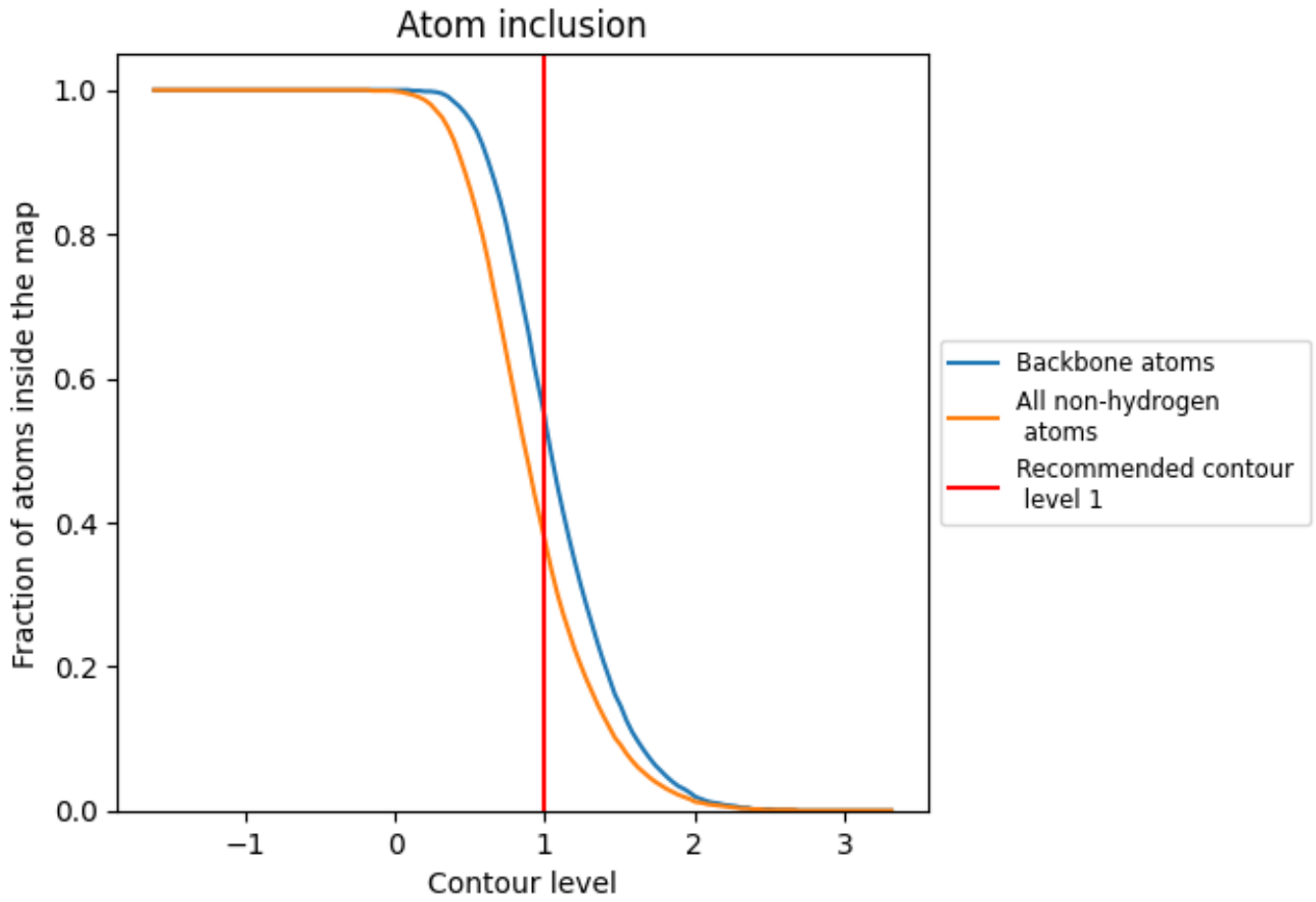
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1).

9.4 Atom inclusion (i)



At the recommended contour level, 55% of all backbone atoms, 38% 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) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.3760	0.2330
A	0.5970	0.3190
B	0.4940	0.2800
C	0.5670	0.3160
D	0.3820	0.2330
E	0.2110	0.1660