W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

Jul 15, 2025 – 06:06 PM JST

PDB ID	:	9VQM / pdb_00009vqm
EMDB ID	:	EMD-65260
Title	:	Cryo-EM structure of Elapor1WT in tetrameric form
Authors	:	Ma, J.; Zheng, S.
Deposited on	:	2025-07-05
Resolution	:	3.50 Å(reported)

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

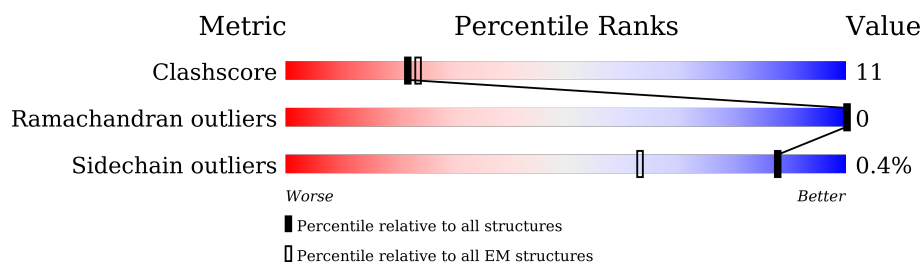|		
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.50 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		11
Ramachandran outliers		0
Sidechain outliers		0.4%

Worse — *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

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

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

Mol	Chain	Length	Quality of chain
1	A	990	28% / 60% 20% 20%
2	B	1004	33% / 57% 19% • 24%
2	C	1004	6% / 59% 22% 20%
2	D	1004	• / 57% 22% 21%
3	E	2	100% / 50% 50%
3	F	2	50% 50%
3	G	2	50% 50%

2   Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 24538 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 Endosome/lysosome-associated apoptosis and autophagy regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	796	Total 6122	C 3850	N 1028	O 1179	S 65	0	0

There are 17 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	24	ASP	-	expression tag	UNP A0A0A0MQC6
A	25	TYR	-	expression tag	UNP A0A0A0MQC6
A	26	LYS	-	expression tag	UNP A0A0A0MQC6
A	27	ASP	-	expression tag	UNP A0A0A0MQC6
A	28	ASP	-	expression tag	UNP A0A0A0MQC6
A	29	ASP	-	expression tag	UNP A0A0A0MQC6
A	30	ASP	-	expression tag	UNP A0A0A0MQC6
A	31	LYS	-	expression tag	UNP A0A0A0MQC6
A	32	GLY	-	expression tag	UNP A0A0A0MQC6
A	33	SER	-	expression tag	UNP A0A0A0MQC6
A	34	HIS	-	expression tag	UNP A0A0A0MQC6
A	35	HIS	-	expression tag	UNP A0A0A0MQC6
A	36	HIS	-	expression tag	UNP A0A0A0MQC6
A	37	HIS	-	expression tag	UNP A0A0A0MQC6
A	38	HIS	-	expression tag	UNP A0A0A0MQC6
A	39	HIS	-	expression tag	UNP A0A0A0MQC6
A	40	SER	-	expression tag	UNP A0A0A0MQC6

- Molecule 2 is a protein called Endosome/lysosome-associated apoptosis and autophagy regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	767	Total 5904	C 3712	N 989	O 1139	S 64	0	0
2	C	807	Total 6181	C 3882	N 1038	O 1196	S 65	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	792	6076	3825	1022	1167	62	0	0

There are 105 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	10	MET	-	initiating methionine	UNP A0A0A0MQC6
B	11	LYS	-	expression tag	UNP A0A0A0MQC6
B	12	THR	-	expression tag	UNP A0A0A0MQC6
B	13	ILE	-	expression tag	UNP A0A0A0MQC6
B	14	ILE	-	expression tag	UNP A0A0A0MQC6
B	15	ALA	-	expression tag	UNP A0A0A0MQC6
B	16	LEU	-	expression tag	UNP A0A0A0MQC6
B	17	SER	-	expression tag	UNP A0A0A0MQC6
B	18	TYR	-	expression tag	UNP A0A0A0MQC6
B	19	ILE	-	expression tag	UNP A0A0A0MQC6
B	20	PHE	-	expression tag	UNP A0A0A0MQC6
B	21	CYS	-	expression tag	UNP A0A0A0MQC6
B	22	LEU	-	expression tag	UNP A0A0A0MQC6
B	23	VAL	-	expression tag	UNP A0A0A0MQC6
B	24	PHE	-	expression tag	UNP A0A0A0MQC6
B	25	ALA	-	expression tag	UNP A0A0A0MQC6
B	26	ASP	-	expression tag	UNP A0A0A0MQC6
B	27	TYR	-	expression tag	UNP A0A0A0MQC6
B	28	LYS	-	expression tag	UNP A0A0A0MQC6
B	29	ASP	-	expression tag	UNP A0A0A0MQC6
B	30	ASP	-	expression tag	UNP A0A0A0MQC6
B	31	ASP	-	expression tag	UNP A0A0A0MQC6
B	32	ASP	-	expression tag	UNP A0A0A0MQC6
B	33	LYS	-	expression tag	UNP A0A0A0MQC6
B	34	GLY	-	expression tag	UNP A0A0A0MQC6
B	35	SER	-	expression tag	UNP A0A0A0MQC6
B	36	HIS	-	expression tag	UNP A0A0A0MQC6
B	37	HIS	-	expression tag	UNP A0A0A0MQC6
B	38	HIS	-	expression tag	UNP A0A0A0MQC6
B	39	HIS	-	expression tag	UNP A0A0A0MQC6
B	40	HIS	-	expression tag	UNP A0A0A0MQC6
B	41	HIS	-	expression tag	UNP A0A0A0MQC6
B	42	SER	-	expression tag	UNP A0A0A0MQC6
B	43	GLY	-	expression tag	UNP A0A0A0MQC6
B	44	MET	-	expression tag	UNP A0A0A0MQC6
C	10	MET	-	initiating methionine	UNP A0A0A0MQC6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	11	LYS	-	expression tag	UNP A0A0A0MQC6
C	12	THR	-	expression tag	UNP A0A0A0MQC6
C	13	ILE	-	expression tag	UNP A0A0A0MQC6
C	14	ILE	-	expression tag	UNP A0A0A0MQC6
C	15	ALA	-	expression tag	UNP A0A0A0MQC6
C	16	LEU	-	expression tag	UNP A0A0A0MQC6
C	17	SER	-	expression tag	UNP A0A0A0MQC6
C	18	TYR	-	expression tag	UNP A0A0A0MQC6
C	19	ILE	-	expression tag	UNP A0A0A0MQC6
C	20	PHE	-	expression tag	UNP A0A0A0MQC6
C	21	CYS	-	expression tag	UNP A0A0A0MQC6
C	22	LEU	-	expression tag	UNP A0A0A0MQC6
C	23	VAL	-	expression tag	UNP A0A0A0MQC6
C	24	PHE	-	expression tag	UNP A0A0A0MQC6
C	25	ALA	-	expression tag	UNP A0A0A0MQC6
C	26	ASP	-	expression tag	UNP A0A0A0MQC6
C	27	TYR	-	expression tag	UNP A0A0A0MQC6
C	28	LYS	-	expression tag	UNP A0A0A0MQC6
C	29	ASP	-	expression tag	UNP A0A0A0MQC6
C	30	ASP	-	expression tag	UNP A0A0A0MQC6
C	31	ASP	-	expression tag	UNP A0A0A0MQC6
C	32	ASP	-	expression tag	UNP A0A0A0MQC6
C	33	LYS	-	expression tag	UNP A0A0A0MQC6
C	34	GLY	-	expression tag	UNP A0A0A0MQC6
C	35	SER	-	expression tag	UNP A0A0A0MQC6
C	36	HIS	-	expression tag	UNP A0A0A0MQC6
C	37	HIS	-	expression tag	UNP A0A0A0MQC6
C	38	HIS	-	expression tag	UNP A0A0A0MQC6
C	39	HIS	-	expression tag	UNP A0A0A0MQC6
C	40	HIS	-	expression tag	UNP A0A0A0MQC6
C	41	HIS	-	expression tag	UNP A0A0A0MQC6
C	42	SER	-	expression tag	UNP A0A0A0MQC6
C	43	GLY	-	expression tag	UNP A0A0A0MQC6
C	44	MET	-	expression tag	UNP A0A0A0MQC6
D	10	MET	-	initiating methionine	UNP A0A0A0MQC6
D	11	LYS	-	expression tag	UNP A0A0A0MQC6
D	12	THR	-	expression tag	UNP A0A0A0MQC6
D	13	ILE	-	expression tag	UNP A0A0A0MQC6
D	14	ILE	-	expression tag	UNP A0A0A0MQC6
D	15	ALA	-	expression tag	UNP A0A0A0MQC6
D	16	LEU	-	expression tag	UNP A0A0A0MQC6
D	17	SER	-	expression tag	UNP A0A0A0MQC6

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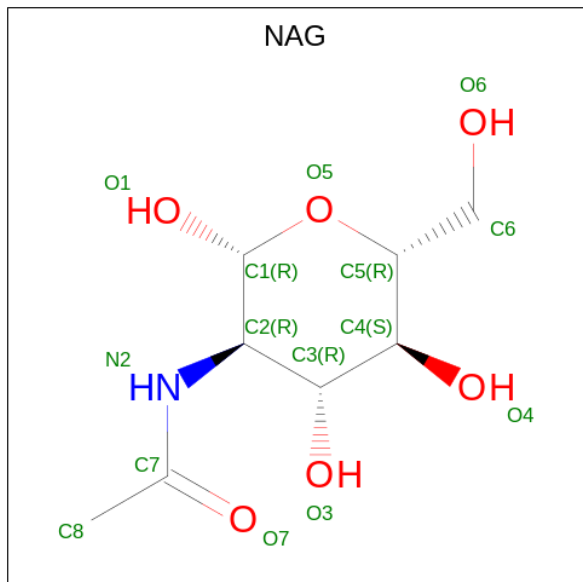
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Chain	Residue	Modelled	Actual	Comment	Reference
D	18	TYR	-	expression tag	UNP A0A0A0MQC6
D	19	ILE	-	expression tag	UNP A0A0A0MQC6
D	20	PHE	-	expression tag	UNP A0A0A0MQC6
D	21	CYS	-	expression tag	UNP A0A0A0MQC6
D	22	LEU	-	expression tag	UNP A0A0A0MQC6
D	23	VAL	-	expression tag	UNP A0A0A0MQC6
D	24	PHE	-	expression tag	UNP A0A0A0MQC6
D	25	ALA	-	expression tag	UNP A0A0A0MQC6
D	26	ASP	-	expression tag	UNP A0A0A0MQC6
D	27	TYR	-	expression tag	UNP A0A0A0MQC6
D	28	LYS	-	expression tag	UNP A0A0A0MQC6
D	29	ASP	-	expression tag	UNP A0A0A0MQC6
D	30	ASP	-	expression tag	UNP A0A0A0MQC6
D	31	ASP	-	expression tag	UNP A0A0A0MQC6
D	32	ASP	-	expression tag	UNP A0A0A0MQC6
D	33	LYS	-	expression tag	UNP A0A0A0MQC6
D	34	GLY	-	expression tag	UNP A0A0A0MQC6
D	35	SER	-	expression tag	UNP A0A0A0MQC6
D	36	HIS	-	expression tag	UNP A0A0A0MQC6
D	37	HIS	-	expression tag	UNP A0A0A0MQC6
D	38	HIS	-	expression tag	UNP A0A0A0MQC6
D	39	HIS	-	expression tag	UNP A0A0A0MQC6
D	40	HIS	-	expression tag	UNP A0A0A0MQC6
D	41	HIS	-	expression tag	UNP A0A0A0MQC6
D	42	SER	-	expression tag	UNP A0A0A0MQC6
D	43	GLY	-	expression tag	UNP A0A0A0MQC6
D	44	MET	-	expression tag	UNP A0A0A0MQC6

- Molecule 3 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	E	2	Total	C	N	O	0	0
			28	16	2	10		
3	F	2	Total	C	N	O	0	0
			28	16	2	10		
3	G	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).

Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	A	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	B	1	Total 14	C 8	N 1	O 5	0
4	C	1	Total 14	C 8	N 1	O 5	0
4	C	1	Total 14	C 8	N 1	O 5	0
4	C	1	Total 14	C 8	N 1	O 5	0
4	D	1	Total 14	C 8	N 1	O 5	0
4	D	1	Total 14	C 8	N 1	O 5	0
4	D	1	Total 14	C 8	N 1	O 5	0

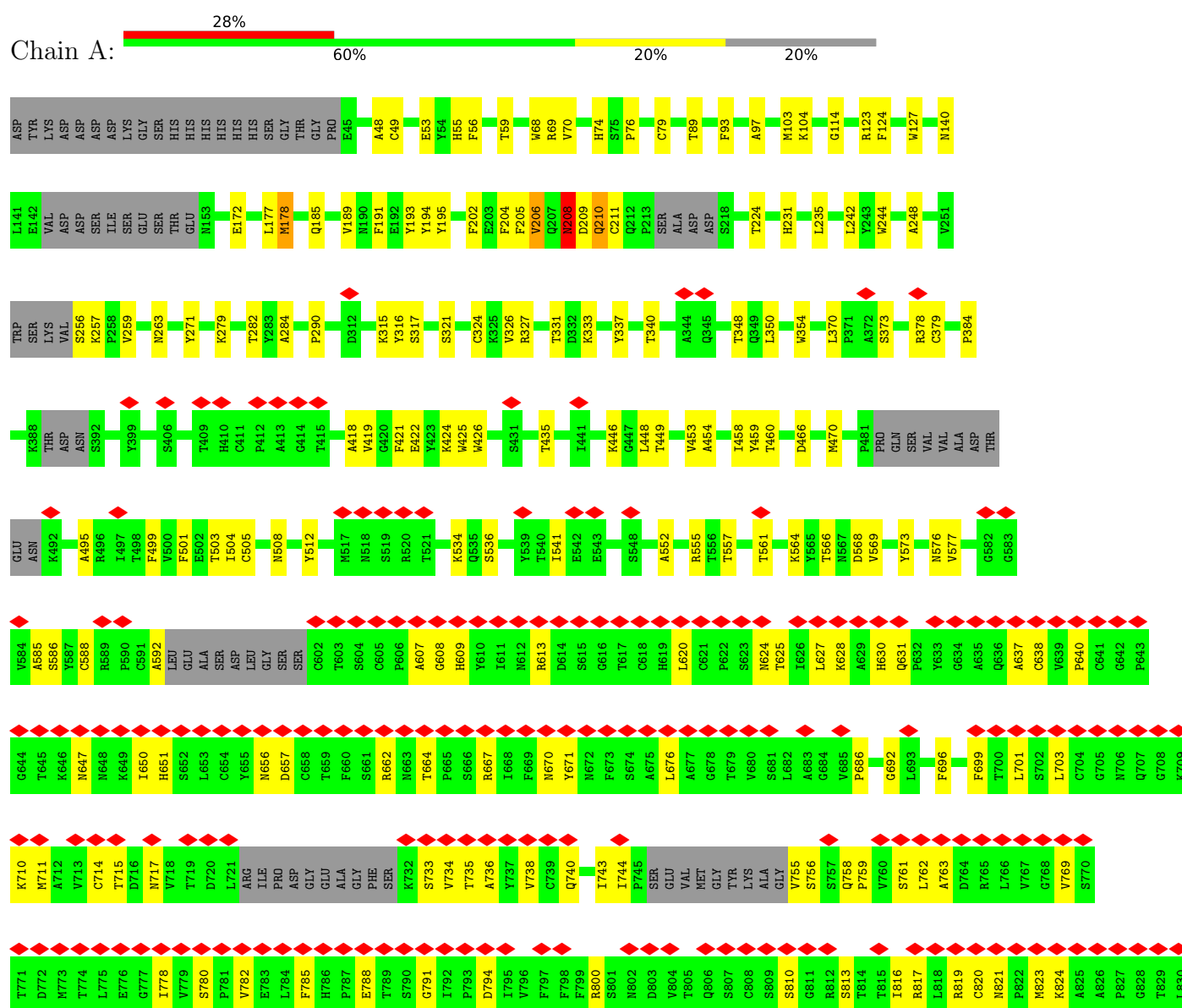- Molecule 5 is COPPER (II) ION (CCD ID: CU) (formula: Cu) (labeled as "Ligand of Interest" by depositor).

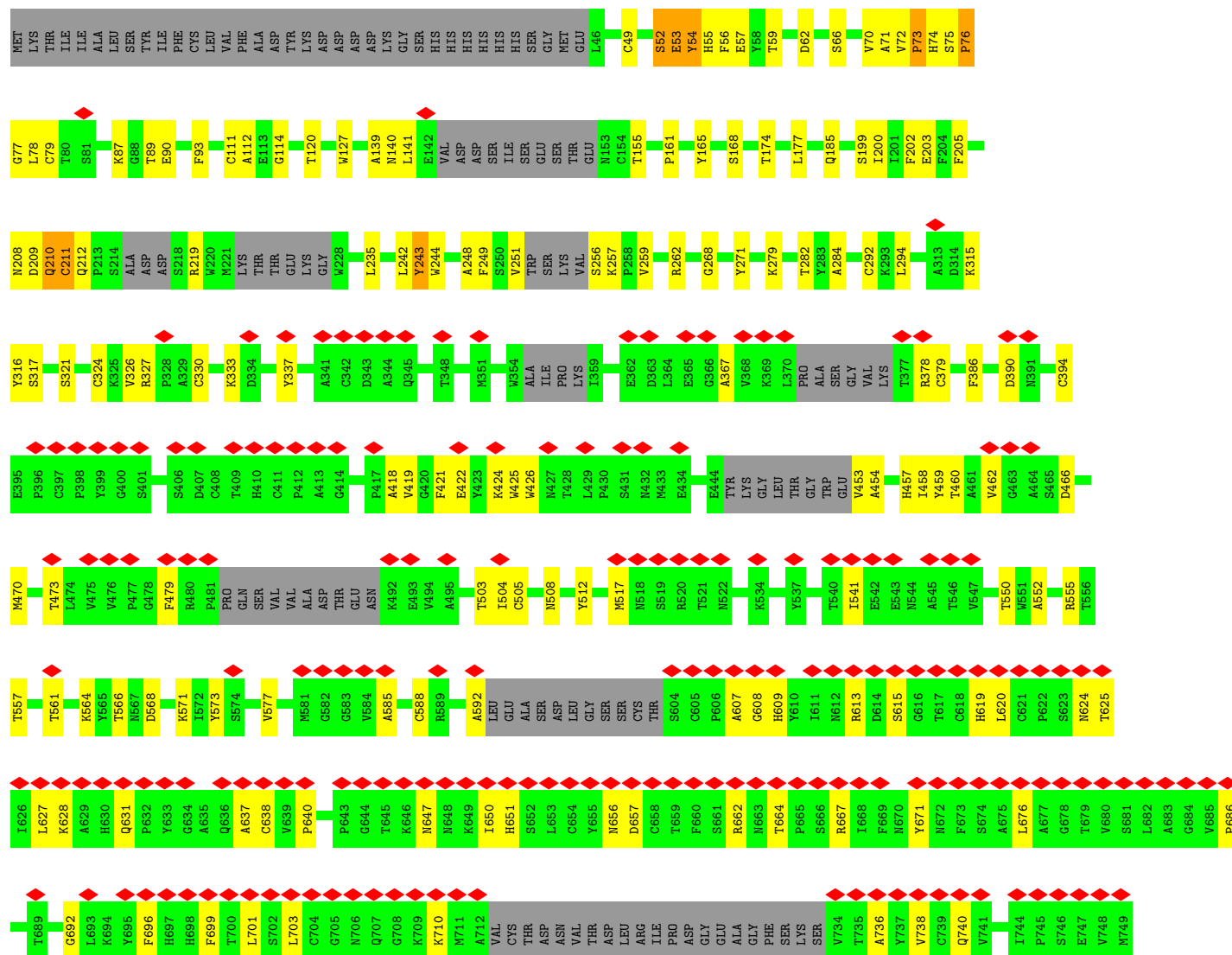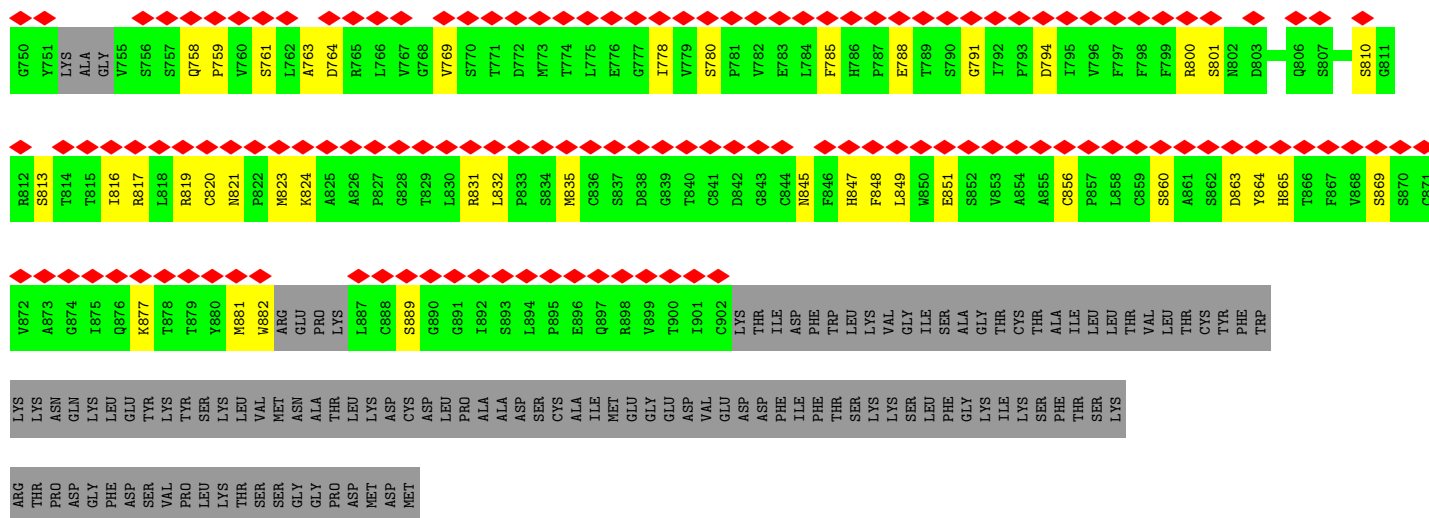| Mol	Chain	Residues	Atoms		AltConf
5	A	2	Total 2	Cu 2	0
5	B	1	Total 1	Cu 1	0

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.
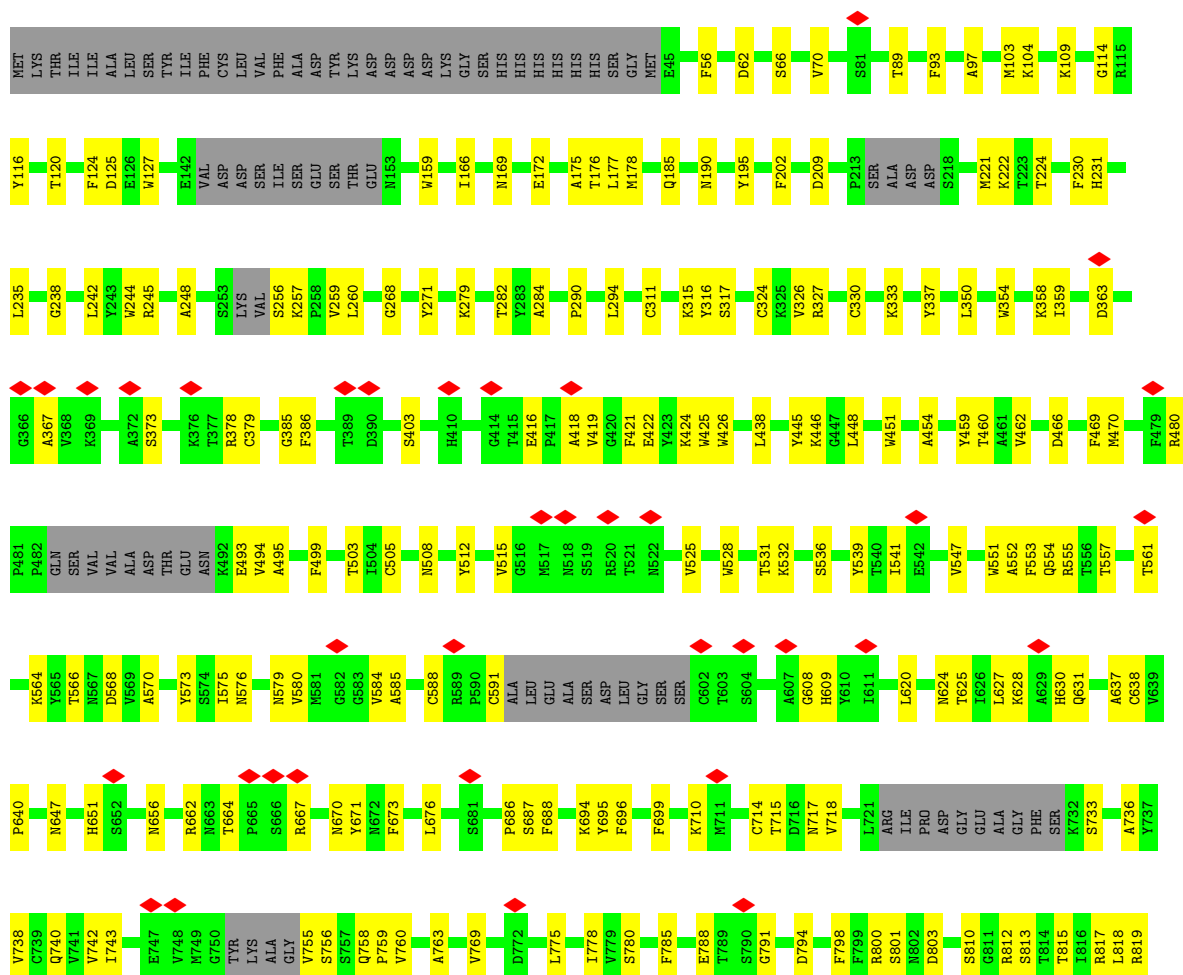
• Molecule 1: Endosome/lysosome-associated apoptosis and autophagy regulator 1
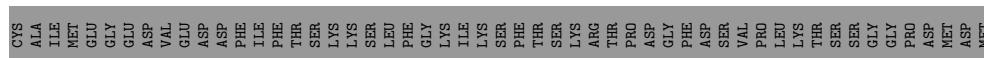
R831 L832 P833 S834 M835 C836 S837 D838 G839 T840 C841 D842 G843 C844 N845 F846 H847 F848 L849 W850 E851 S852 V853 A854 A855 C856 P857 L858 C859 S860 A861 S862 D863 Y864 H865 T866 F867 V868 S869 S870 C871 V872 A873 G874 I875 Q876 K877 T878 T879 Y880 M881 W882 R883 GLU PRO LYS L887 C888 S889 G890

G891 I892 S893 L894 P895 E896 Q897 R898 V899 T900 I901 C902 LYS THR ILE ASP PHE TRP LEU LYS VAL GLY ILE SER ALA GLY THR CYS THR ALA ILE LEU LEU THR VAL LEU THR CYS TYR PHE TRP LYS LYS ASN GLN LEU GLU GLU LYS TYR LYS SER LYS LEU VAL MET ASN ALA THR LEU

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

MET ASP MET

● Molecule 2: Endosome/lysosome-associated apoptosis and autophagy regulator 1

Chain B:

33%

57% 19% • 24%

MET LYS THR ILE ILE ALA LEU SER TYR PHE CYS VAL PHE ALA ASP TYR LYS ASP ASP ASP LYS SER GLY SER HIS HIS HIS HIS HIS HIS SER GLY MET GLU L46 C49 S52 E53 Y54 H55 F56 E57 Y58 T59 D62 S66 V70 A71 V72 P73 H74 S75 P76

G77 L78 C79 T80 S81 K87 G88 T89 E90 F93 C111 A112 E113 G114 T120 W127 A139 N140 L141 E142 VAL ASP ASP SER ILE SER GLU SER THR GLU N153 C154 T155 P161 Y165 S168 T174 L177 Q185 S199 I200 I201 F202 E203 F204 F205

N208 D209 Q210 C211 Q212 P213 S214 ALA ASP ASP S218 R219 W220 M221 LYS THR THR GLU LYS GLY W228 L235 L242 Y243 W244 A248 F249 S250 V251 TRP SER LYS VAL S256 K257 P258 V259 R262 G268 Y271 K279 T282 Y283 A284 C292 K293 L294 A313 D314 K315

Y316 S317 S321 C324 K325 V326 R327 P328 A329 C330 K333 D334 Y337 A341 C342 D343 A344 Q345 T348 M351 W354 ALA ILE PRO LYS I359 E362 D363 L364 E365 G366 A367 V368 K369 L370 PRO ALA SER GLY VAL LYS T377 R378 C379 F386 D390 N391 C394

E395 P396 C397 P398 Y399 G400 S401 S406 D407 C408 T409 H410 C411 P412 A413 G414 P417 A418 V419 G420 F421 E422 Y423 K424 W425 W426 N427 T428 L429 P430 S431 N432 M433 E434 E444 TYR LYS GLY LEU THR GLY TRP GLU V453 A454 H457 I458 Y459 T460 A461 V462 G463 A464 S465 D466

M470 T473 L474 V475 V476 P477 G478 F479 R480 P481 PRO GLN SER VAL VAL ALA ASP THR GLU ASN K492 E493 V494 A495 T503 I504 C505 N508 Y512 M517 N518 S519 R520 T521 N522 K534 Y537 T540 I541 E542 E543 N544 A545 T546 V547 T550 W551 A552 R555 T556

T557 T561 K564 Y565 T566 N567 D568 K571 I572 Y573 S574 V577 M581 G582 S583 V584 A585 C588 R589 A592 LEU GLU ALA SER ASP LEU GLY SER SER CYS THR S604 C605 P606 A607 G608 H609 Y610 I611 N612 R613 D614 S615 G616 T617 C618 H619 L620 C621 P622 S623 N624 T625

I626 L627 K628 A629 H630 Q631 P632 Y633 G634 A635 Q636 A637 C638 V639 P640 P643 G644 T645 K646 N647 N648 K649 I650 H651 S652 L653 C654 Y655 N656 D657 T658 T659 F660 S661 R662 N663 T664 P665 S666 R667 I668 F669 N670 Y671 N672 F673 S674 A675 L676 A677 G678 T679 V680 S681 L682 A683 G684 V685 P686

T689 G692 L693 K694 Y695 F696 H697 H698 F699 T700 L701 S702 L703 C704 G705 N706 Q707 G708 K709 K710 M711 A712 VAL CYS THR ASP ASN VAL THR ASP LEU ARG ILE PRO ASP GLY ALA GLY PHE SER LYS SER V734 T735 A736 Y737 V738 C739 Q740 V741 I744 P745 S746 E747 V748 M749

G750 Y751 LYS ALA GLY V755 S756 S757 Q758 P759 V760 S761 L762 A763 D764 R765 L766 V767 G768 V769 S770 T771 D772 M773 T774 L775 E776 G777 I778 V779 S780 P781 V782 E783 L784 F785 H786 P787 E788 T789 S790 G791 I792 P793 D794 I795 V796 F797 F798 F799 R800 S801 N802 D803 Q806 S807 S810 G811

R812 S813 T814 T815 I816 R817 L818 R819 C820 N821 P822 M823 K824 A825 A826 P827 G828 T829 L830 R831 L832 P833 S834 M835 C836 S837 D838 G839 T840 C841 D842 G843 C844 N845 F846 H847 F848 L849 W850 E851 S852 V853 A854 A855 C856 P857 L858 C859 S860 A861 S862 D863 Y864 H865 T866 F867 V868 S869 S870 C871

V872 A873 G874 I875 Q876 K877 T878 T879 Y880 M881 W882 ARG GLU PRO LYS L887 C888 S889 G890 G891 I892 S893 L894 P895 E896 Q897 R898 V899 T900 I901 C902 LYS THR ILE ASP PHE TRP LEU LYS VAL GLY ILE SER ALA GLY THR CYS THR ALA ILE LEU LEU THR VAL LEU THR CYS TYR PHE TRP

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

ARG THR PRO ASP GLY PHE ASP SER VAL PRO LEU LYS SER THR SER GLY GLY PRO ASP MET ASP MET

• Molecule 2: Endosome/lysosome-associated apoptosis and autophagy regulator 1

Chain C:

MET LYS THR ILE ILE ALA LEU SER TYR ILE PHE CYS LEU VAL PHE ALA ASP TYR LYS ASP ASP ASP LYS SER HIS HIS HIS HIS HIS SER GLY MET E45 F56 D62 S66 V70 S81 T89 F93 A97 M103 K104 K109 G114 R115

Y116 T120 F124 D125 E126 W127 E142 VAL ASP SER ILE SER GLU SER THR GLU N153 W159 I166 N169 E172 A175 T176 L177 M178 Q185 N190 Y195 F202 D209 P213 SER ALA ASP ASP S218 M221 K222 T223 T224 F230 H231

L235 G238 L242 Y243 W244 R245 A248 S253 LYS VAL S256 K257 P258 V259 L260 G268 Y271 K279 T282 Y283 A284 P290 L294 C311 K315 Y316 S317 C324 K325 V326 R327 C330 K333 Y337 L350 W354 K358 I359 D363

G366 A367 V368 K369 A372 S373 K376 T377 R378 C379 G385 F386 T389 D390 S403 H410 G414 T415 E416 P417 A418 V419 G420 F421 E422 Y423 K424 W425 W426 L438 Y445 K446 G447 L448 W451 A454 Y459 T460 A461 V462 D466 F469 M470 F479 R480

P481 P482 GLN SER VAL VAL ALA ASP THR GLU ASN K492 E493 V494 A495 F499 T503 I504 C505 N508 Y512 V515 G516 M517 N518 S519 R520 T521 N522 V525 W528 T531 K532 S536 Y539 T540 I541 E542 V547 W551 A552 F553 Q554 R555 T556 T557 T561

K564 Y565 T566 N567 D568 V569 A570 Y573 S574 I575 N576 N579 V580 M581 G582 G583 V584 A585 C588 R589 P590 C591 ALA LEU GLU ALA SER ASP LEU GLY SER SER C602 T603 S604 A607 G608 H609 Y610 I611 L620 N624 T625 I626 L627 K628 A629 H630 Q631 A637 C638 V639

P640 N647 H651 S652 N656 R662 N663 T664 P665 S666 R667 N670 Y671 N672 F673 L676 S681 P686 S687 F688 K694 Y695 F696 F699 K710 M711 C714 T715 D716 N717 V718 L721 ARG ILE PRO ASP GLY GLU ALA GLY PHE SER K732 S733 A736 Y737

V738 C739 Q740 V741 V742 I743 E747 V748 M749 G750 TYR LYS ALA GLY V755 S756 S757 Q758 P759 V760 A763 V769 D772 L775 I778 V779 S780 F785 E788 T789 S790 G791 D794 F798 F799 R800 S801 N802 D803 S810 G811 R812 S813 T814 T815 I816 R817 L818 R819

• Molecule 2: Endosome/lysosome-associated apoptosis and autophagy regulator 1

Chain D:

57%   22%   21%

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc opyranose

Chain E:

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc opyranose

Chain F:

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc opyranose

Chain G:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	291029	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.195	Depositor
Minimum map value	-2.354	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.056	Depositor
Recommended contour level	0.28	Depositor
Map size (Å)	380.45, 380.45, 380.45	wwPDB
Map dimensions	350, 350, 350	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.087, 1.087, 1.087	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: CU, 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	0.20	0/6280	0.43	3/8535 (0.0%)
2	B	0.26	3/6055 (0.0%)	0.55	20/8226 (0.2%)
2	C	0.11	0/6342	0.31	0/8627
2	D	0.17	0/6233	0.44	4/8472 (0.0%)
All	All	0.19	3/24910 (0.0%)	0.44	27/33860 (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
2	B	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	71	ALA	CA-CB	-6.24	1.44	1.53
2	B	73	PRO	CA-C	-5.76	1.45	1.52
2	B	75	SER	CA-CB	-5.08	1.46	1.54

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	206	VAL	N-CA-CB	-11.31	97.40	111.31
2	B	243	TYR	N-CA-CB	-10.90	91.62	111.13
2	B	55	HIS	CB-CA-C	-10.64	87.97	109.79
2	B	209	ASP	CB-CA-C	-10.64	94.17	110.88
2	B	54	TYR	N-CA-CB	-9.28	95.41	111.55

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	52	SER	Mainchain

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	6122	0	5781	129	0
2	B	5904	0	5546	116	0
2	C	6181	0	5805	147	0
2	D	6076	0	5724	156	0
3	E	28	0	25	1	0
3	F	28	0	25	2	0
3	G	28	0	25	3	0
4	A	42	0	39	2	0
4	B	42	0	39	1	0
4	C	42	0	39	1	0
4	D	42	0	39	1	0
5	A	2	0	0	0	0
5	B	1	0	0	0	0
All	All	24538	0	23087	542	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 11.

The worst 5 of 542 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)
2:D:682:LEU:HD21	2:D:830:LEU:HD23	1.51	0.91
2:B:77:GLY:O	2:B:78:LEU:HD22	1.75	0.87
2:D:438:LEU:HB3	2:D:469:PHE:HB2	1.62	0.82
2:D:628:LYS:HB3	2:D:637:ALA:HB1	1.67	0.76
2:D:169:ASN:ND2	2:D:173:CYS:O	2.19	0.75

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	776/990 (78%)	743 (96%)	33 (4%)	0	100	100
2	B	741/1004 (74%)	714 (96%)	27 (4%)	0	100	100
2	C	789/1004 (79%)	753 (95%)	36 (5%)	0	100	100
2	D	770/1004 (77%)	736 (96%)	34 (4%)	0	100	100
All	All	3076/4002 (77%)	2946 (96%)	130 (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	687/856 (80%)	683 (99%)	4 (1%)	84	91
2	B	663/869 (76%)	658 (99%)	5 (1%)	79	88
2	C	692/869 (80%)	692 (100%)	0	100	100
2	D	678/869 (78%)	677 (100%)	1 (0%)	92	97
All	All	2720/3463 (78%)	2710 (100%)	10 (0%)	88	95

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	74	HIS
2	B	243	TYR
2	D	74	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	210	GLN
2	B	53	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 32 such sidechains are listed below:

Mol	Chain	Res	Type
2	D	467	ASN
2	D	508	ASN
2	B	427	ASN
2	B	339	HIS
2	D	670	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 ⓘ

6 monosaccharides are 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	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
3	NAG	E	1	3,1	14,14,15	0.42	0	17,19,21	1.27	1 (5%)
3	NAG	E	2	3	14,14,15	0.25	0	17,19,21	0.41	0
3	NAG	F	1	3,2	14,14,15	0.43	0	17,19,21	1.26	1 (5%)
3	NAG	F	2	3	14,14,15	0.23	0	17,19,21	0.41	0
3	NAG	G	1	3,2	14,14,15	0.40	0	17,19,21	1.22	1 (5%)
3	NAG	G	2	3	14,14,15	0.27	0	17,19,21	0.39	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
3	NAG	E	1	3,1	-	3/6/23/26	0/1/1/1
3	NAG	E	2	3	-	2/6/23/26	0/1/1/1
3	NAG	F	1	3,2	-	3/6/23/26	0/1/1/1
3	NAG	F	2	3	-	0/6/23/26	0/1/1/1
3	NAG	G	1	3,2	-	3/6/23/26	0/1/1/1
3	NAG	G	2	3	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	1	NAG	C1-O5-C5	4.74	118.61	112.19
3	F	1	NAG	C1-O5-C5	4.64	118.48	112.19
3	G	1	NAG	C1-O5-C5	4.52	118.32	112.19

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	1	NAG	C3-C2-N2-C7
3	G	1	NAG	C4-C5-C6-O6
3	F	1	NAG	C4-C5-C6-O6
3	E	1	NAG	C4-C5-C6-O6
3	E	1	NAG	O5-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	1	NAG	2	0
3	G	2	NAG	2	0
3	F	1	NAG	2	0
3	E	1	NAG	1	0
3	F	2	NAG	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

bond angles, torsion angles, and ring geometry for oligosaccharide.

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths　　　Bond angles

Torsions　　　Rings
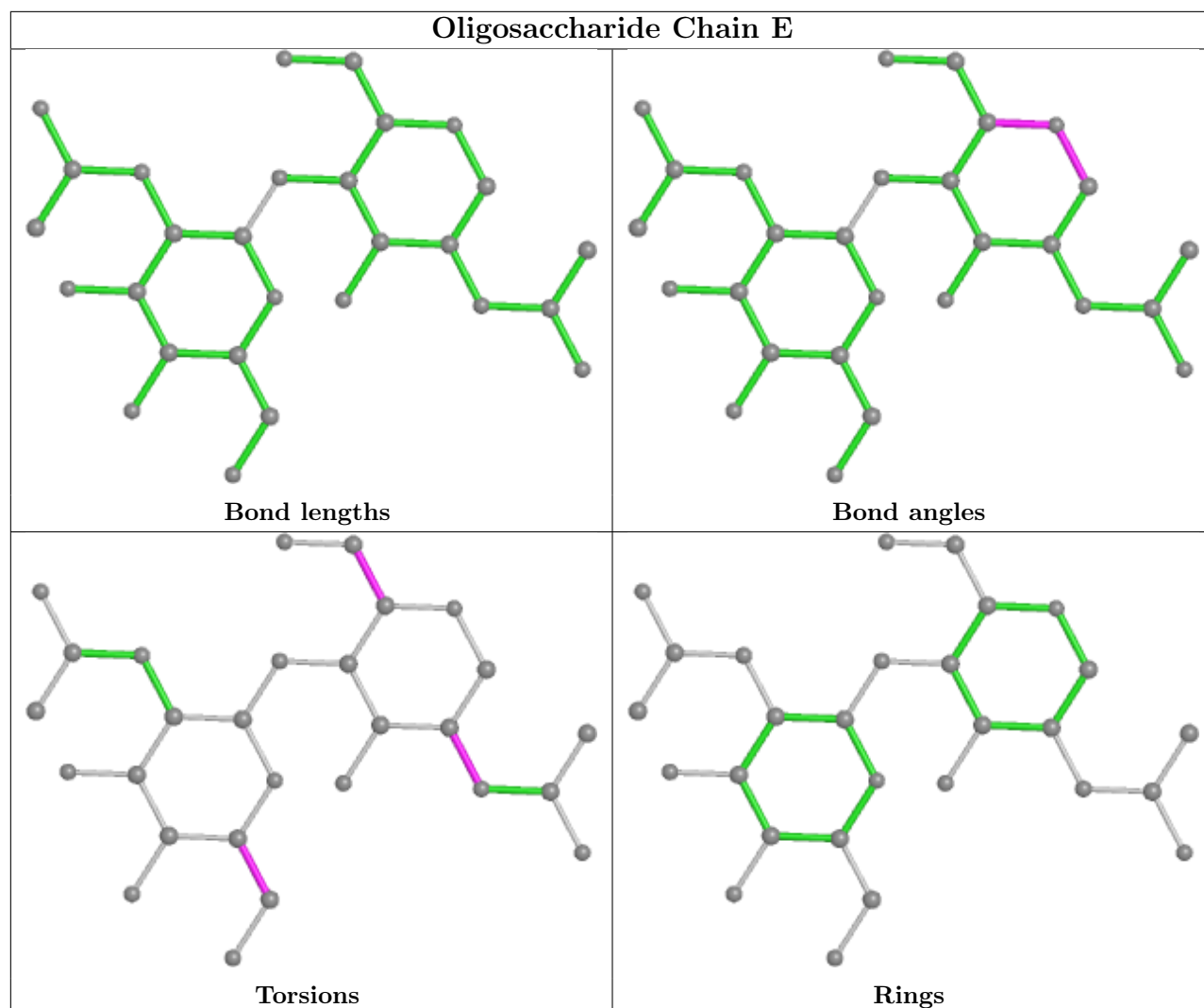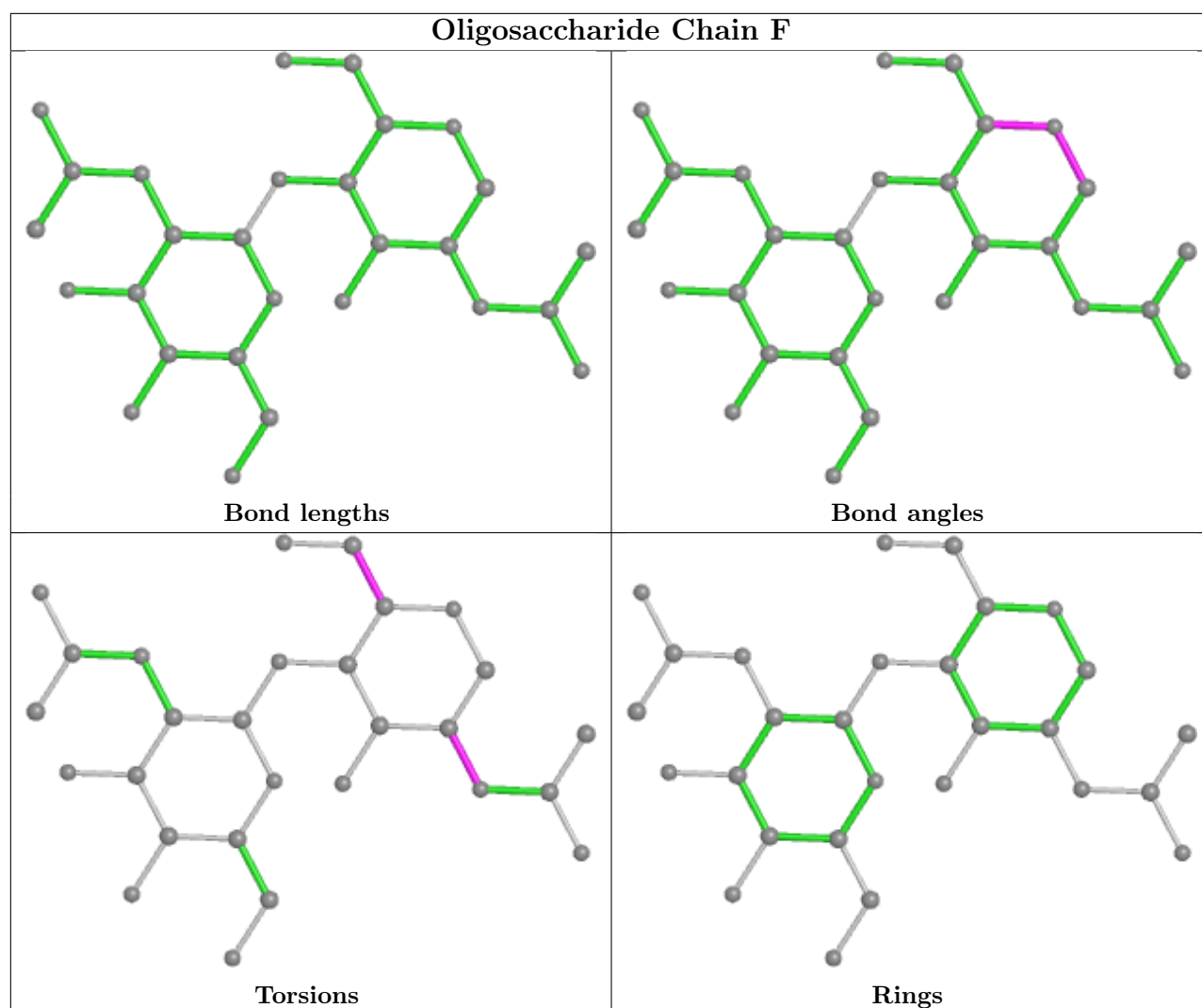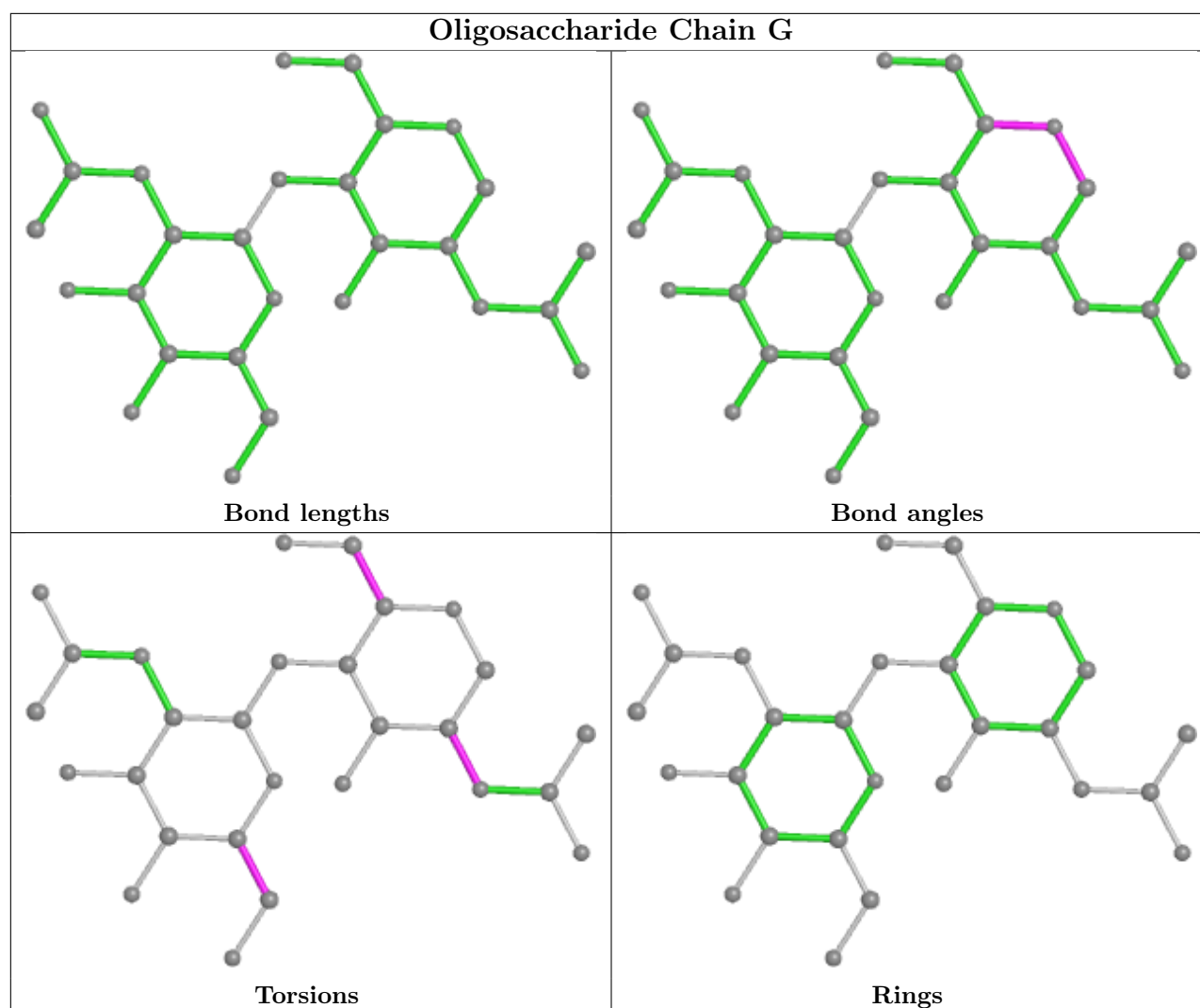
5.6　Ligand geometry ⓘ

Of 15 ligands modelled in this entry, 3 are monoatomic - leaving 12 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	$\#|Z| > 2$
4	NAG	A	1103	1	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	A	1102	1	14,14,15	0.33	0	17,19,21	0.44	0
4	NAG	C	1102	2	14,14,15	0.39	0	17,19,21	0.37	0
4	NAG	D	1101	2	14,14,15	0.31	0	17,19,21	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	NAG	D	1103	2	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	B	1103	2	14,14,15	0.23	0	17,19,21	0.44	0
4	NAG	B	1102	2	14,14,15	0.34	0	17,19,21	0.40	0
4	NAG	A	1101	1	14,14,15	0.31	0	17,19,21	0.40	0
4	NAG	C	1103	2	14,14,15	0.22	0	17,19,21	0.43	0
4	NAG	D	1102	2	14,14,15	0.38	0	17,19,21	0.48	0
4	NAG	C	1101	2	14,14,15	0.96	1 (7%)	17,19,21	1.12	1 (5%)
4	NAG	B	1101	2	14,14,15	0.28	0	17,19,21	0.51	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
4	NAG	A	1103	1	-	2/6/23/26	0/1/1/1
4	NAG	A	1102	1	-	2/6/23/26	0/1/1/1
4	NAG	C	1102	2	-	2/6/23/26	0/1/1/1
4	NAG	D	1101	2	-	0/6/23/26	0/1/1/1
4	NAG	D	1103	2	-	2/6/23/26	0/1/1/1
4	NAG	B	1103	2	-	2/6/23/26	0/1/1/1
4	NAG	B	1102	2	-	2/6/23/26	0/1/1/1
4	NAG	A	1101	1	-	4/6/23/26	0/1/1/1
4	NAG	C	1103	2	-	2/6/23/26	0/1/1/1
4	NAG	D	1102	2	-	2/6/23/26	0/1/1/1
4	NAG	C	1101	2	-	2/6/23/26	0/1/1/1
4	NAG	B	1101	2	-	2/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	1101	NAG	O5-C1	3.24	1.48	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	1101	NAG	C1-O5-C5	4.39	118.14	112.19

There are no chirality outliers.

5 of 24 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1102	NAG	O5-C5-C6-O6
4	A	1101	NAG	C4-C5-C6-O6
4	C	1102	NAG	O5-C5-C6-O6
4	A	1102	NAG	C4-C5-C6-O6
4	A	1101	NAG	C8-C7-N2-C2

There are no ring outliers.

4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1102	NAG	2	0
4	C	1102	NAG	1	0
4	B	1102	NAG	1	0
4	D	1102	NAG	1	0

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-65260. 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   ⓘ
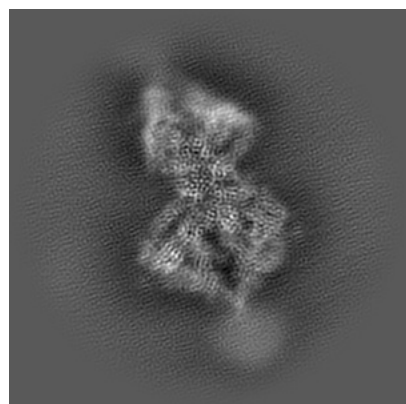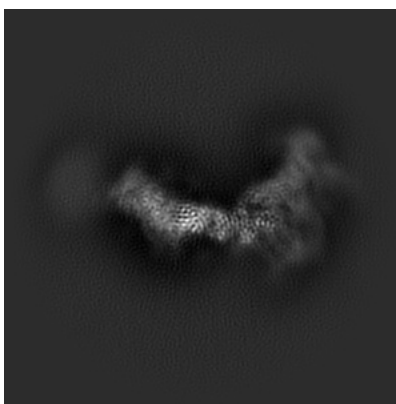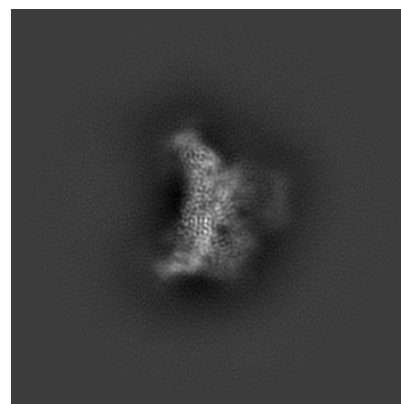
6.1.1   Primary map

X   Y   Z

6.1.2   Raw map

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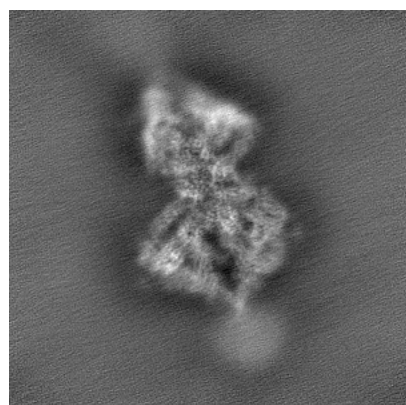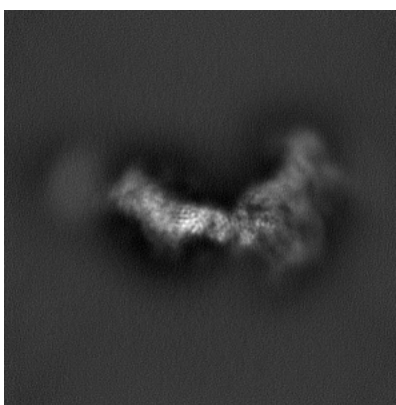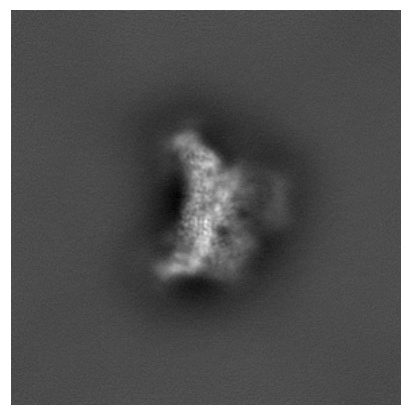
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
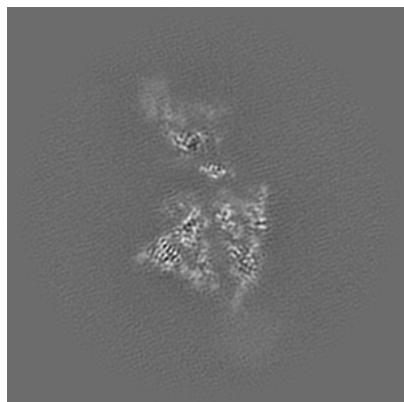
6.2.1 Primary map
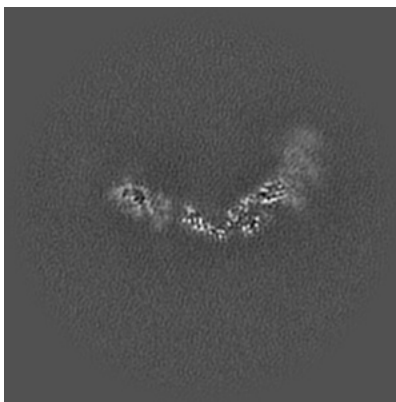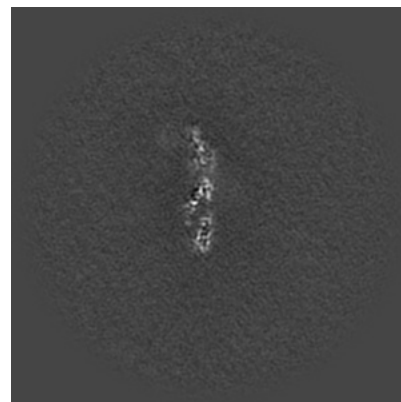
X Index: 175   Y Index: 175   Z Index: 175

6.2.2 Raw map
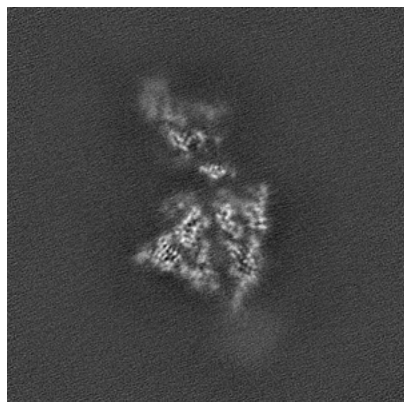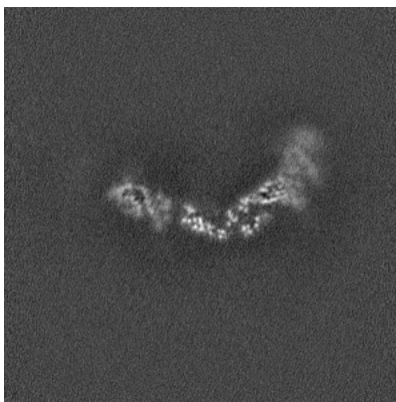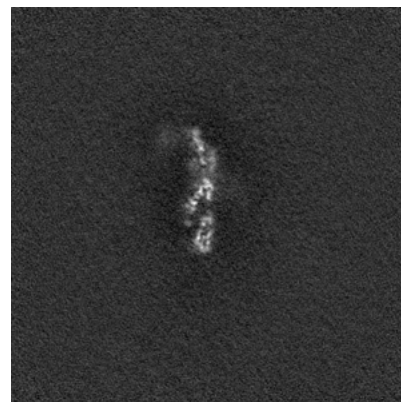
X Index: 175   Y Index: 175   Z Index: 175

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

6.3 Largest variance slices (i)

6.3.1 Primary map
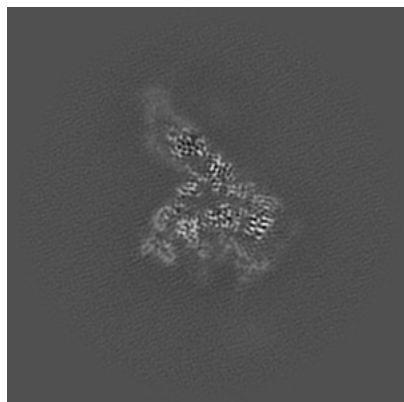
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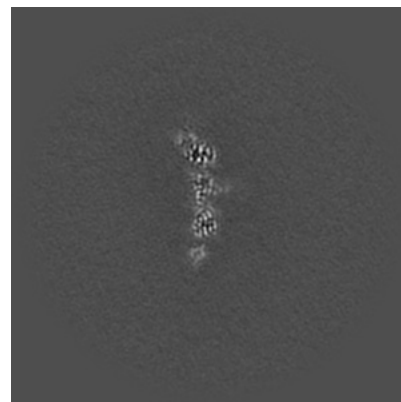
6.3.2 Raw map
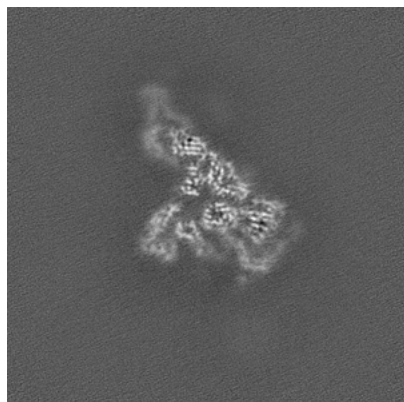
X Index: 162	Y Index: 163	Z Index: 160
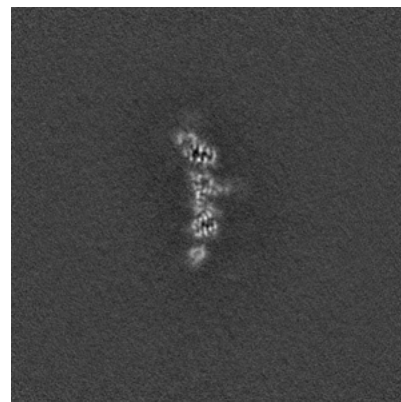
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
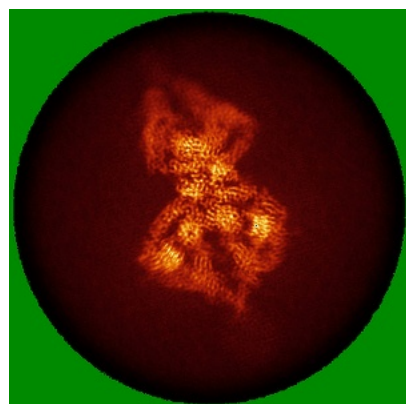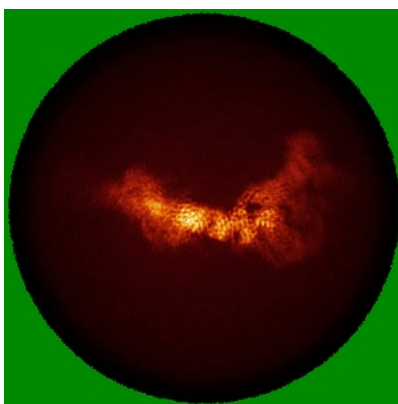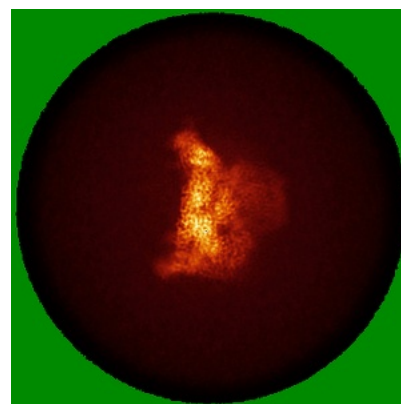
X	Y	Z

6.4.2 Raw map

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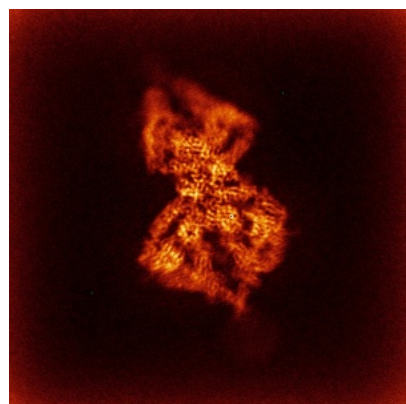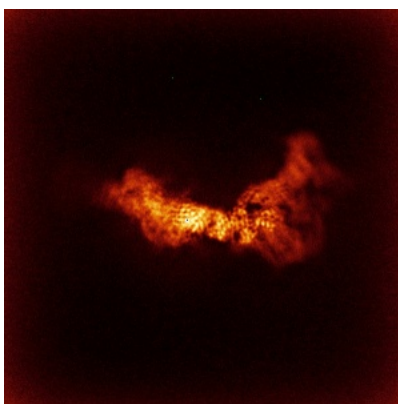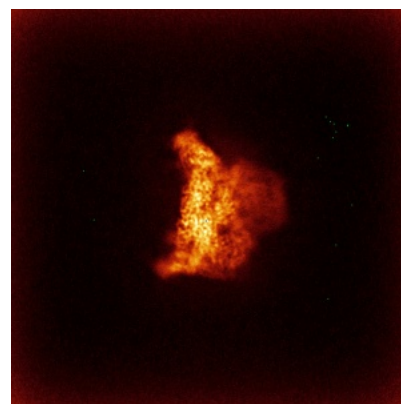
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.28. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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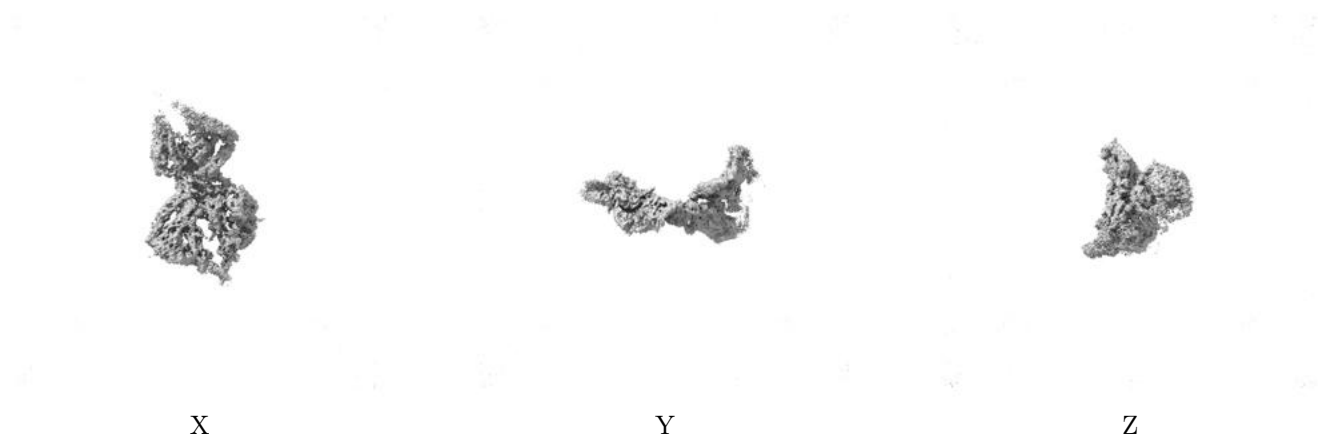
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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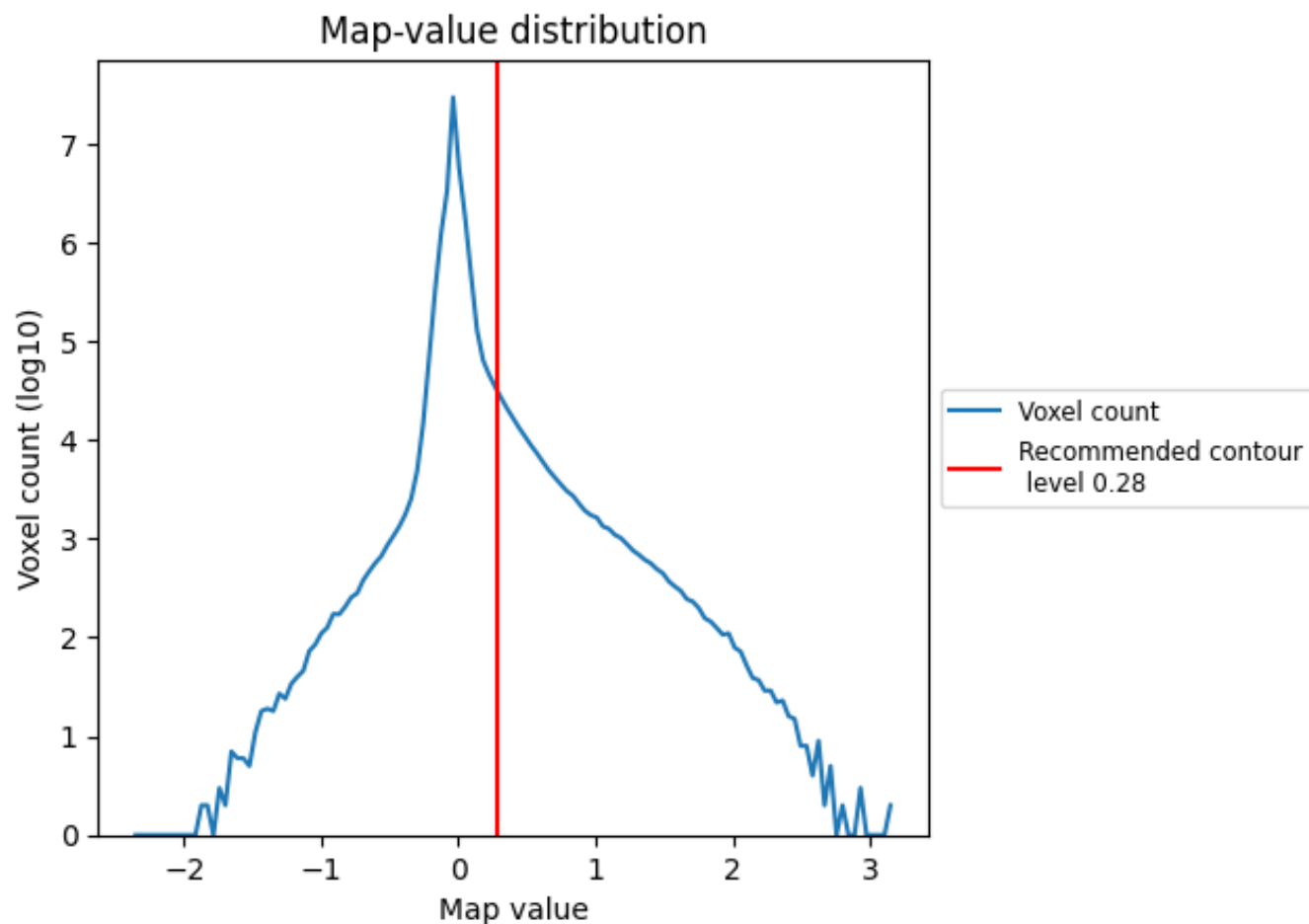
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
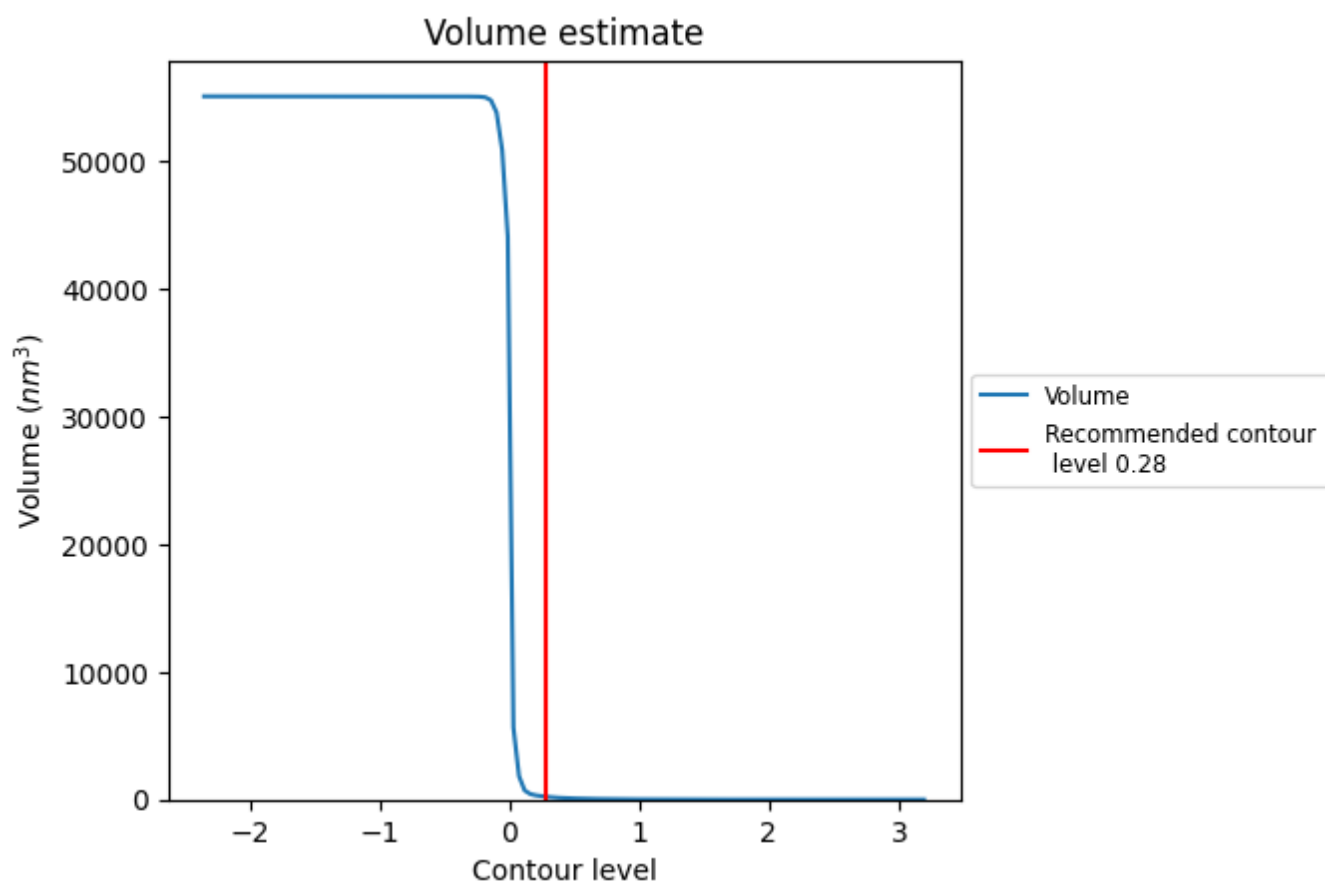
The volume at the recommended contour level is 222 nm^3; this corresponds to an approximate mass of 201 kDa.

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 ⓘ
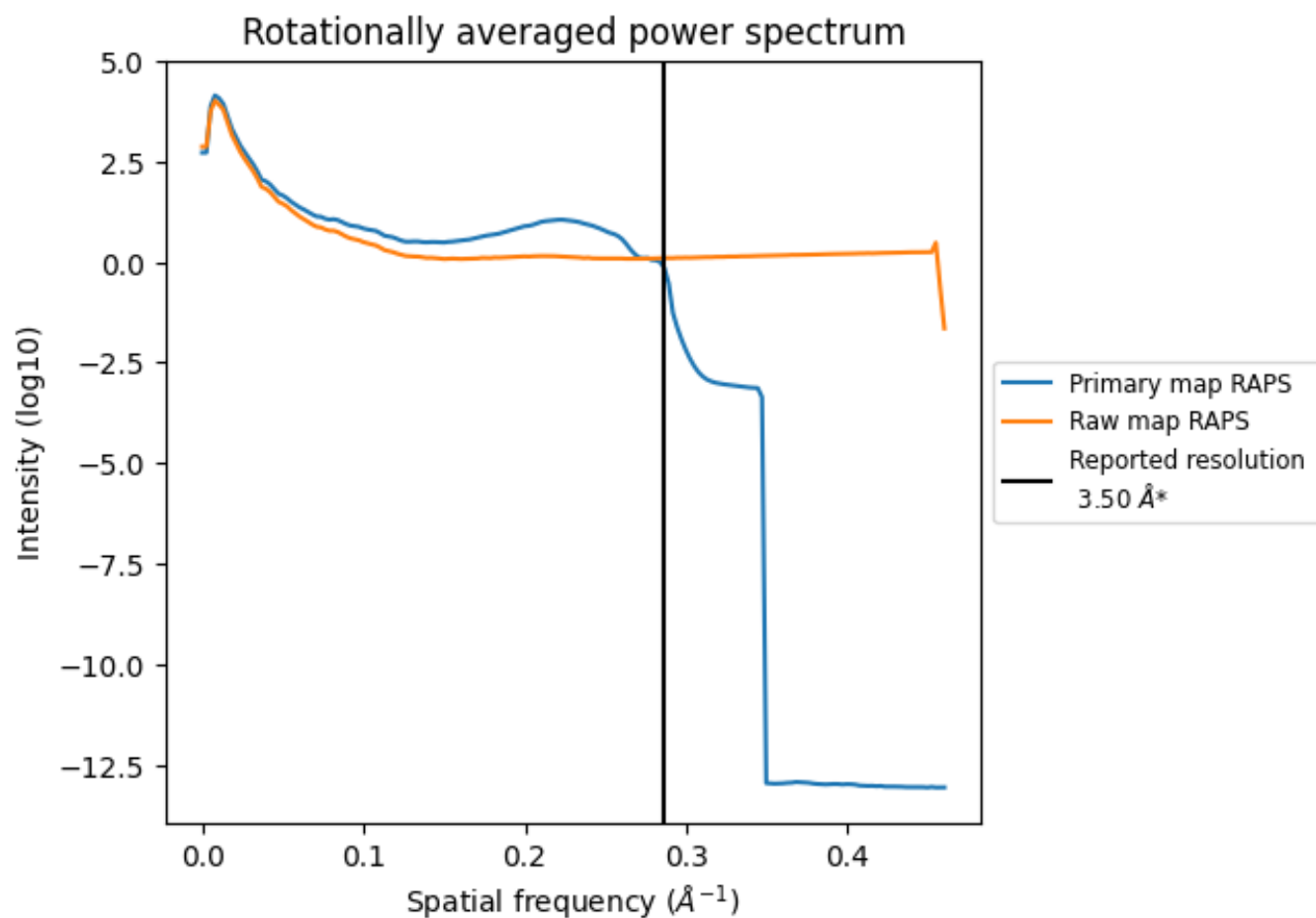
*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

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)
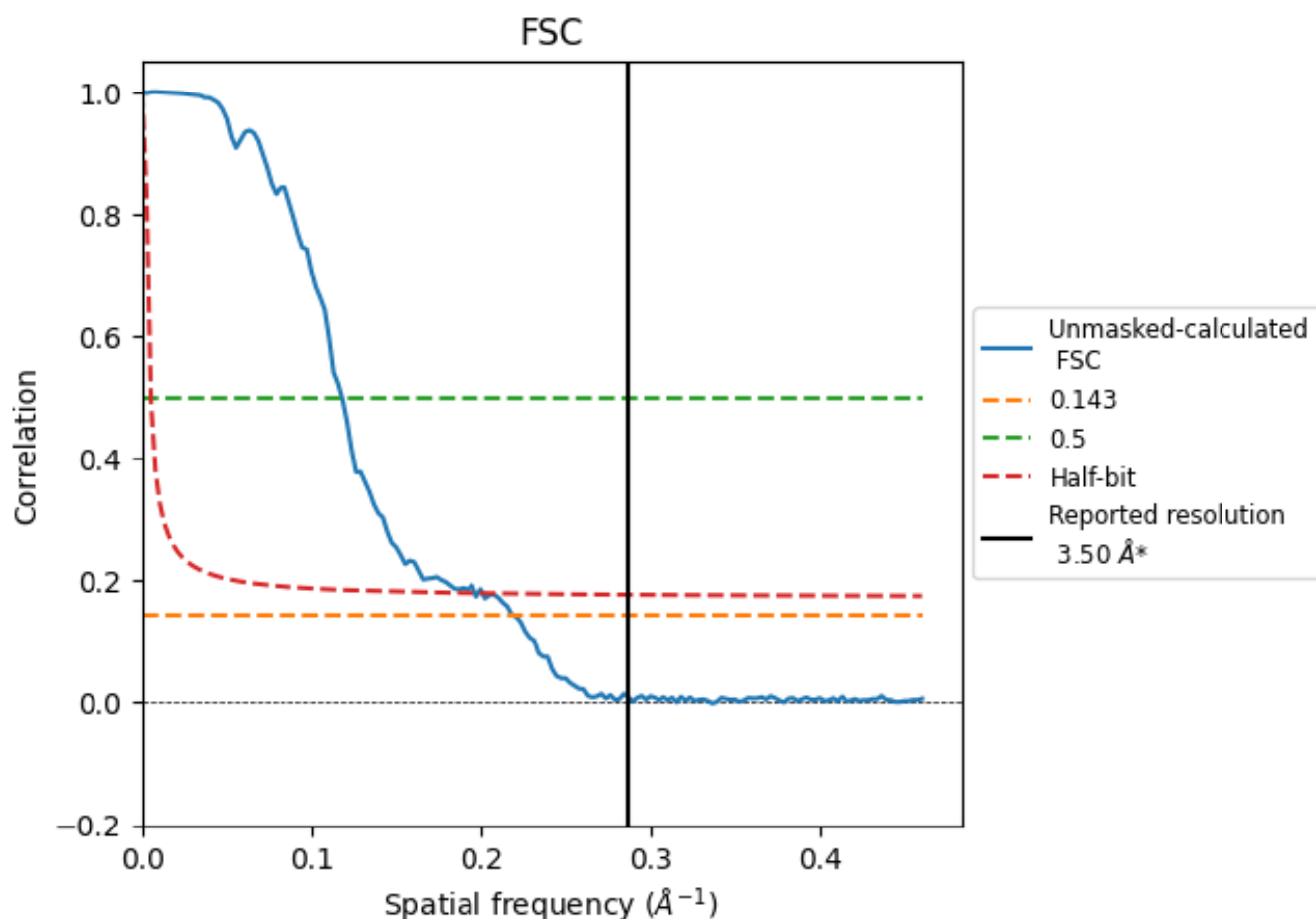
*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

8.2　Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.57	8.49	5.09

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.57 differs from the reported value 3.5 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-65260 and PDB model 9VQM. Per-residue inclusion information can be found in section 3 on page 9.

## 9.1 Map-model overlay ⓘ

| X | Y | Z |
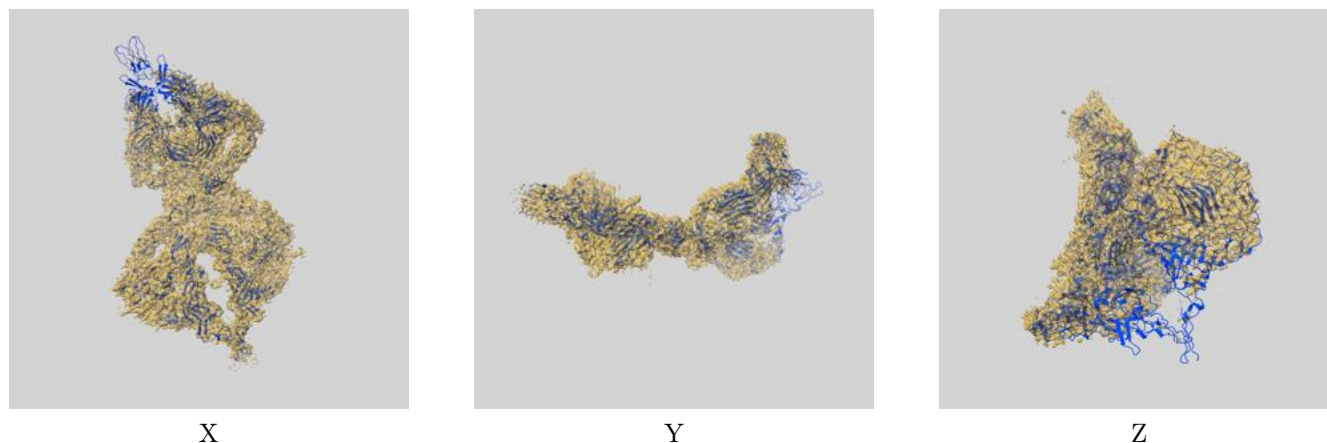
The images above show the 3D surface view of the map at the recommended contour level 0.28 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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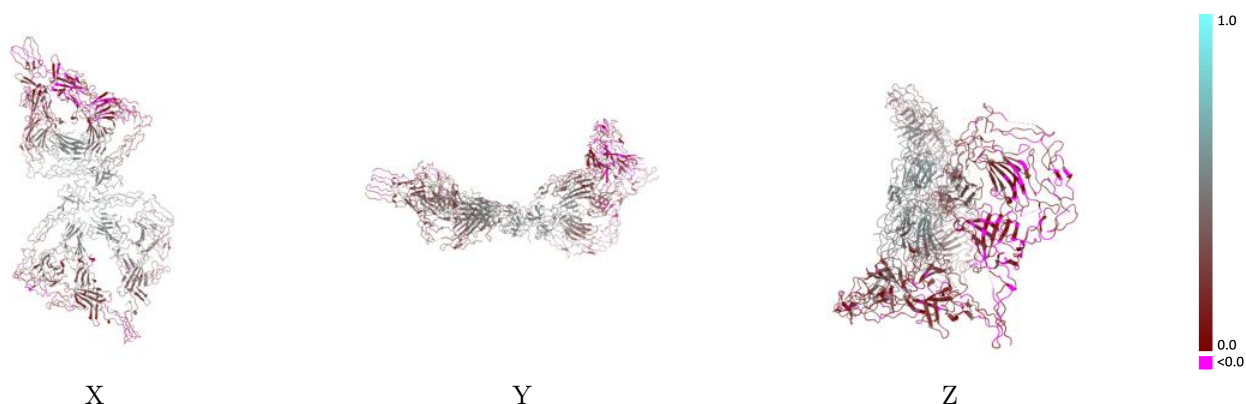
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
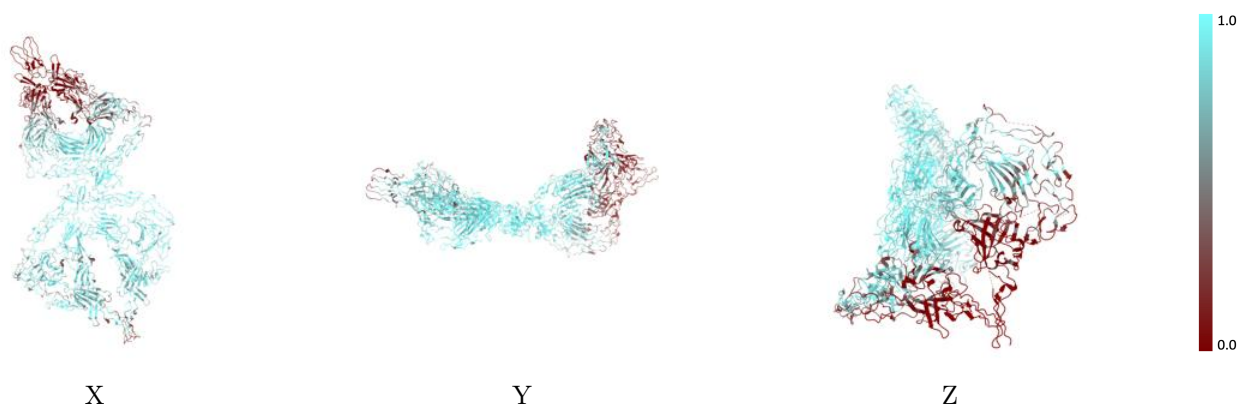
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.28).

9.4 Atom inclusion (i)
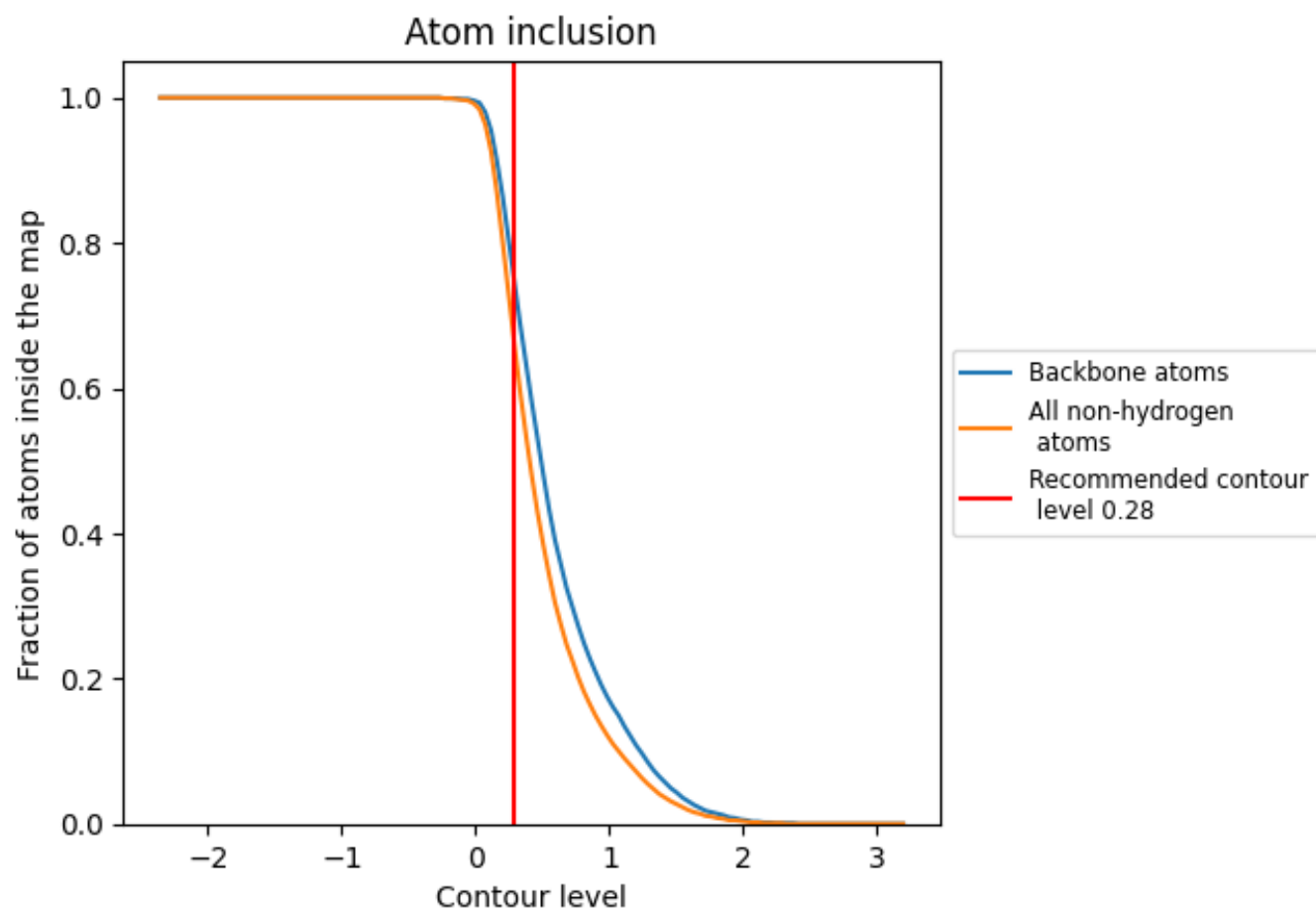
At the recommended contour level, 76% of all backbone atoms, 68% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.28) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6770	0.2990
A	0.5780	0.3050
B	0.4890	0.1780
C	0.7840	0.3070
D	0.8510	0.4020
E	0.1430	0.2460
F	0.6070	0.1720
G	0.8210	0.3660

1.0

0.0
<0.0