WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Mar 24, 2026 – 03:37 pm GMT

PDB ID	:	9RDK / pdb_00009rdk
EMDB ID	:	EMD-53937
Title	:	Cryo-EM structure of the human SAGA co-activator complex
Authors	:	Damilot, M.; Ben-Shem, A.; Papai, G.
Deposited on	:	2025-06-03
Resolution	:	2.41 Å(reported)

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.41 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		1
Ramachandran outliers		0.1%
Sidechain outliers		1.3%

Worse   *Better*

▮ Percentile relative to all structures

◻ Percentile relative to all EM structures

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.557

Worse   *Better*

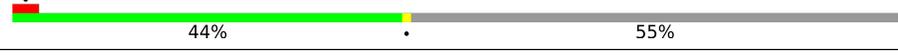▮ Percentile relative to all EM structures

◻ Percentile relative to EM structures of similar resolution

Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	5662 (1.92 - 2.91)

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	E	251	49% 51%
2	N	892	6% 94%
3	L	589	88% 8%
4	A	1217	8% 92%

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Mol	Chain	Length	Quality of chain
5	C	3859	80%　　　16%
6	D	414	42%　　　56%
7	G	161	56%　　　43%
8	H	218	44%　　　55%
9	I	317	70%　　　28%
10	J	335	53%　　　46%
11	K	622	61%　　　37%
12	M	779	48%　　　50%
13	B	86	56%　　　42%

2 Entry composition ⓘ

There are 13 unique types of molecules in this entry. The entry contains 54084 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 Transcription initiation factor TFIID subunit 9B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	E	124	995	635	175	180	5	0	0

- Molecule 2 is a protein called Ataxin-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	N	53	435	274	84	73	4	0	0

- Molecule 3 is a protein called TAF5-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 5L.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	L	540	4279	2691	739	828	21	0	0

- Molecule 4 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	A	1168	9158	5817	1558	1738	45	0	0

- Molecule 5 is a protein called Transformation/transcription domain-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	C	3258	26232	16878	4516	4650	188	0	0

- Molecule 6 is a protein called STAGA complex 65 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	D	182	1493	945	268	274	6	0	0

- Molecule 7 is a protein called Transcription initiation factor TFIID subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	91	Total	C	N	O	S	0	0
			744	463	132	145	4		

- Molecule 8 is a protein called Transcription initiation factor TFIID subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	99	Total	C	N	O	S	0	0
			784	501	128	151	4		

- Molecule 9 is a protein called Transcription initiation protein SPT3 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	228	Total	C	N	O	S	0	0
			1858	1169	337	338	14		

- Molecule 10 is a protein called Transcriptional adapter 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	181	Total	C	N	O	S	0	0
			1474	927	270	272	5		

- Molecule 11 is a protein called TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L.
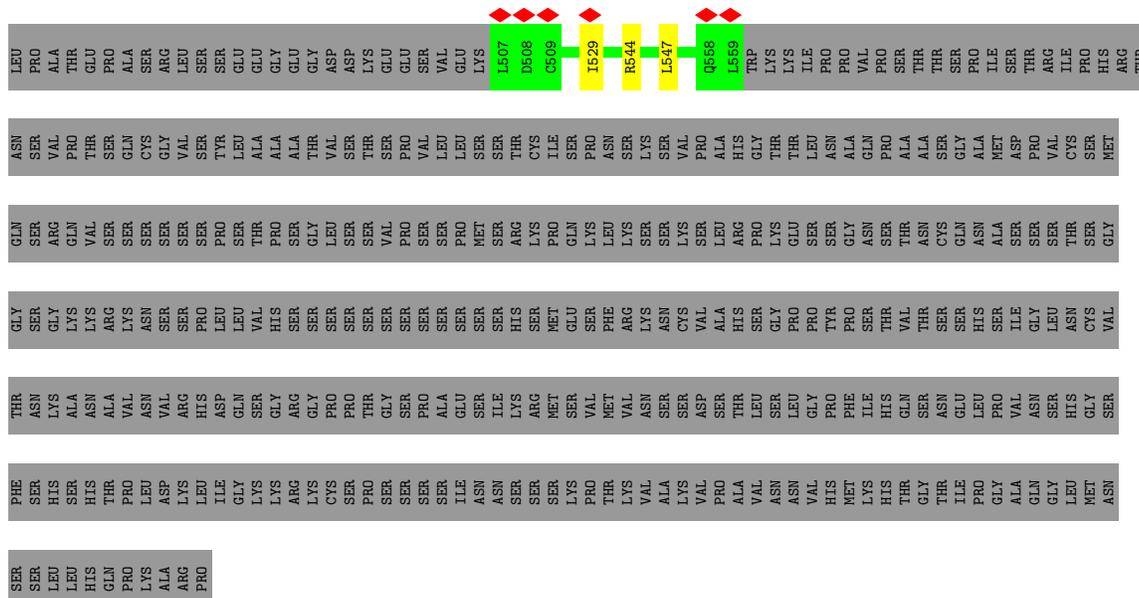
Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	389	Total	C	N	O	S	0	0
			3065	1956	537	559	13		

- Molecule 12 is a protein called Transcription factor SPT20 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M	388	Total	C	N	O	S	0	0
			3138	1971	548	596	23		

- Molecule 13 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	B	50	Total	C	N	O	S	0	0
			429	275	74	76	4		

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: Transcription initiation factor TFIID subunit 9B

Chain E:
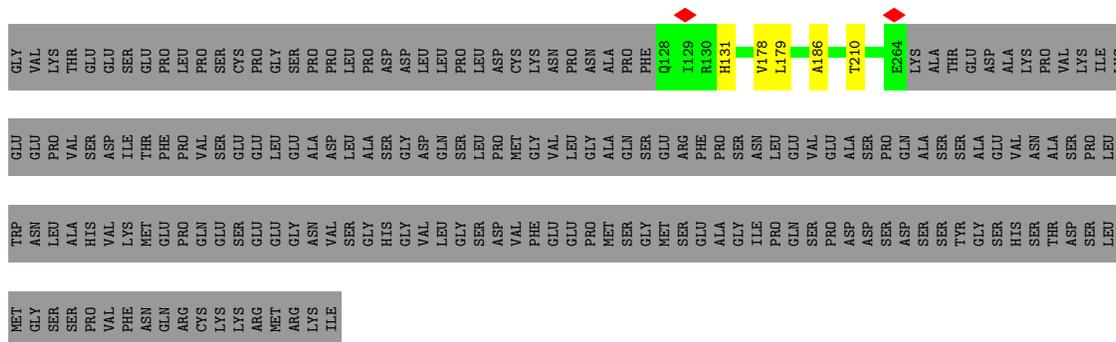

• Molecule 2: Ataxin-7

Chain N:

• Molecule 3: TAF5-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 5L

Chain L:

• Molecule 4: Splicing factor 3B subunit 3
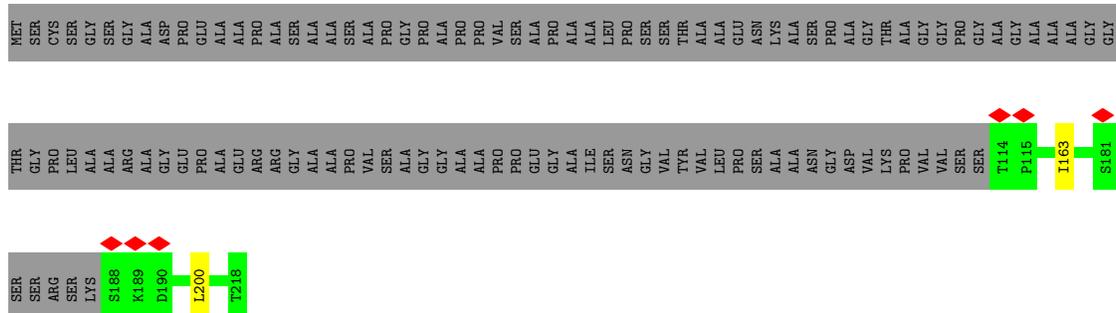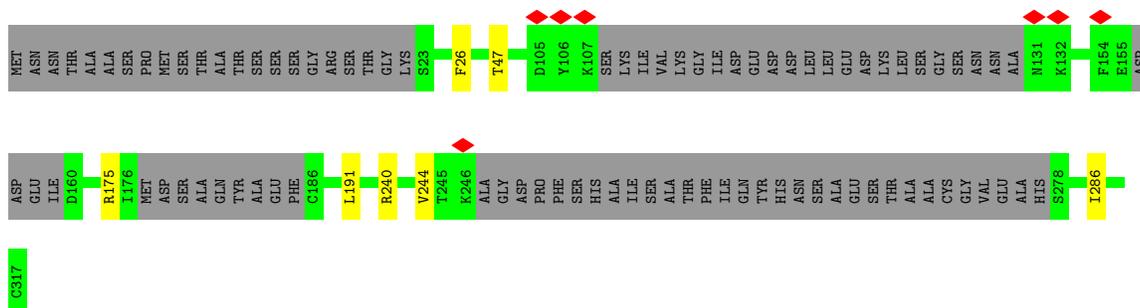
Chain A:

• Molecule 5: Transformation/transcription domain-associated protein

• Molecule 6: STAGA complex 65 subunit gamma

Chain D:

42% 56%

GLY VAL LYS THR GLU GLU SER GLU PRO LEU PRO SER CYS PRO GLY SER PRO PRO LEU PRO ASP LEU LEU LEU ASP LYS ASN THR ALA PRO PHE Q128 I129 R130 H131 V178 L179 A186 T210 E264 LYS ALA THR GLU ASP ALA LYS PRO VAL LYS ILE LYS

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

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

MET GLY SER SER PRO VAL PHE ASN GLN ARG CYS LYS LYS LYS ARG MET ARG LYS ILE

• Molecule 7: Transcription initiation factor TFIID subunit 12

Chain G:

56% 43%

MET ASN GLN PHE GLY PRO SER ALA LEU ILE ASN LEU SER ASN PHE SER SER ILE LYS PRO GLU PRO ALA SER THR PRO PRO GLN GLY SER MET ALA ASN SER THR ALA VAL VAL LYS ILE PRO GLY THR PRO GLY ALA GLY ARG LEU SER PRO GLU ASN ASN GLN VAL LEU T59

M83 E135 I136 ARG PRO TYR LYS LYS ALA CYS T144 T145 E146 A153 R156 LYS THR THR LYS LYS

• Molecule 8: Transcription initiation factor TFIID subunit 10

Chain H:

44% 55%

MET SER CYS SER GLY SER GLY ALA ASP PRO GLU ALA ALA ALA PRO ALA SER ALA ALA SER ALA PRO GLY PRO ALA PRO PRO VAL SER ALA PRO ALA ALA LEU PRO SER SER THR ALA ALA GLU ASN LYS SER ALA PRO ALA GLY THR ALA GLY LYS PRO GLY ALA GLY ALA ALA ALA GLY

THR GLY PRO LEU ALA ALA ARG ALA GLY GLU PRO ALA GLU ARG ARG GLY ALA ALA ALA PRO VAL SER ALA GLY LYS ALA ALA PRO PRO GLU GLY LYS ALA ILE SER ASN GLY VAL TYR VAL LEU PRO SER ALA ALA ASN GLY ASP VAL LYS PRO VAL VAL SER SER T114 P115 I163 S181 GLY

SER SER ARG SER LYS S188 K189 D190 L200 T218

• Molecule 9: Transcription initiation protein SPT3 homolog

Chain I:

70% 28%

MET ASN ASN THR ALA ALA SER PRO MET SER SER THR ALA THR SER SER SER GLY ARG SER THR GLY LYS S23 F26 T47 D105 Y106 K107 SER LYS ILE VAL LYS GLY ILE ASP GLU ASP LEU LEU GLU ASP LYS SER LEU SER GLY SER ASN ASN N131 K132 F154 E155 ASP

ASP GLU ILE D160 R175 I176 MET ASP SER ALA GLN TYR ALA GLU PHE C186 L191 R240 V244 T245 K246 ALA GLY ASP PRO PHE SER HIS ALA ILE SER ALA THR PHE ILE GLN TYR HIS SER ASN SER ALA GLU GLU SER THR ALA ALA CYS GLY VAL GLU ALA HIS S278 I286

C317

● Molecule 10: Transcriptional adapter 1

Chain J:

53%　　　　46%

● Molecule 11: TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L

Chain K:

61%　　　　37%

● Molecule 12: Transcription factor SPT20 homolog

Chain M:

48%　　　　50%

LEU LEU GLN LEU PRO GLY GLY SER LEU ILE PHE ASN THR LEU GLN GLN GLN GLN GLN GLN LEU SER GLN PHE THR PRO GLN GLN PRO GLN GLN PRO THR THR CYS SER PRO GLN GLN PRO GLY GLU GLN GLY GLY SER GLU GLN GLY SER THR SER GLN GLU GLN GLN ALA LEU SER ALA GLN GLN

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

GLN MET ALA MET ALA ALA ALA ALA GLN THR ALA GLN LEU HIS HIS HIS ARG HIS THR GLY SER GLN SER LYS SER LYS MET LYS ARG GLY THR PRO THR PRO PRO LYS PHE

• Molecule 13: Splicing factor 3B subunit 5

Chain B: 56% • 42%

MET THR ASP ARG TYR THR ILE HIS SER GLN LEU GLU HIS LEU GLN SER LYS TYR ILE GLY THR GLY HIS ALA ASP T26 LYS V33 MET P75 CYS GLY PRO PRO ALA ASP LYS PRO GLU GLU ASN

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	272167	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/Å^2)$	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	29.833	Depositor
Minimum map value	-0.813	Depositor
Average map value	0.056	Depositor
Map value standard deviation	0.638	Depositor
Recommended contour level	3	Depositor
Map size (Å)	408.0, 408.0, 408.0	wwPDB
Map dimensions	408, 408, 408	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0, 1.0, 1.0	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	E	0.28	0/1018	0.52	0/1384
2	N	0.31	0/448	0.61	0/604
3	L	0.32	0/4366	0.62	0/5920
4	A	0.30	0/9345	0.61	3/12680 (0.0%)
5	C	0.34	0/26775	0.66	12/36210 (0.0%)
6	D	0.30	0/1528	0.58	0/2068
7	G	0.27	0/753	0.52	0/1013
8	H	0.29	0/800	0.57	0/1082
9	I	0.33	0/1881	0.63	0/2518
10	J	0.26	0/1506	0.53	0/2039
11	K	0.30	0/3129	0.59	0/4251
12	M	0.32	0/3196	0.62	2/4316 (0.0%)
13	B	0.31	0/441	0.55	0/594
All	All	0.32	0/55186	0.63	17/74679 (0.0%)

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
1	E	0	1
4	A	0	1
5	C	0	5
6	D	0	1
9	I	0	1
11	K	0	1
All	All	0	10

There are no bond length outliers.

All (17) bond angle outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	160	GLN	CA-CB-CG	6.50	127.11	114.10
5	C	2015	LYS	CB-CG-CD	6.03	125.17	111.30
12	M	22	ARG	CA-CB-CG	5.79	125.68	114.10
4	A	343	LYS	CA-C-N	5.60	136.02	125.66
4	A	343	LYS	C-N-CA	5.60	136.02	125.66
5	C	1947	ARG	CA-CB-CG	5.53	125.15	114.10
5	C	1947	ARG	CB-CG-CD	5.52	123.99	111.30
5	C	2332	LYS	CB-CG-CD	5.49	123.92	111.30
5	C	309	MET	CB-CG-SD	5.49	129.16	112.70
5	C	1229	GLU	CA-CB-CG	5.35	124.81	114.10
5	C	1419	GLU	CB-CG-CD	5.29	121.58	112.60
5	C	2015	LYS	CA-CB-CG	5.27	124.65	114.10
5	C	3306	MET	CA-CB-CG	5.24	124.57	114.10
12	M	305	GLU	CB-CG-CD	5.12	121.30	112.60
5	C	1941	MET	CB-CG-SD	5.10	128.01	112.70
5	C	3116	GLU	CB-CG-CD	5.09	121.26	112.60
4	A	191	GLU	CB-CG-CD	5.05	121.19	112.60

There are no chirality outliers.

All (10) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	A	343	LYS	Peptide
5	C	1759	PHE	Peptide
5	C	2302	ARG	Sidechain
5	C	2668	GLN	Peptide
5	C	3111	LYS	Peptide
5	C	772	HIS	Peptide
6	D	74	ARG	Sidechain
1	E	128	ARG	Peptide
9	I	175	ARG	Sidechain
11	K	7	ARG	Sidechain

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	E	995	0	1018	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	N	435	0	412	2	0
3	L	4279	0	4177	11	0
4	A	9158	0	9102	15	0
5	C	26232	0	26838	55	0
6	D	1493	0	1459	4	0
7	G	744	0	740	1	0
8	H	784	0	781	2	0
9	I	1858	0	1903	2	0
10	J	1474	0	1448	2	0
11	K	3065	0	3081	4	0
12	M	3138	0	3156	6	0
13	B	429	0	407	0	0
All	All	54084	0	54522	97	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 1.

All (97) 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)
5:C:1908:LEU:HD11	5:C:1920:VAL:HG22	1.49	0.92
4:A:663:LEU:HD23	4:A:679:LEU:HD12	1.61	0.83
3:L:143:THR:HG21	3:L:149:ILE:HD13	1.74	0.69
5:C:2925:VAL:HG11	5:C:3667:THR:HG21	1.74	0.69
5:C:1427:MET:HE2	5:C:1451:VAL:HG21	1.75	0.67
5:C:2350:ILE:HG23	5:C:2354:LEU:HD23	1.77	0.67
11:K:366:VAL:HG13	11:K:444:LEU:HD13	1.80	0.64
5:C:386:VAL:HG13	5:C:390:LEU:HD11	1.79	0.62
12:M:128:LEU:HD22	12:M:135:ILE:HD11	1.83	0.61
5:C:1604:LEU:HD12	5:C:1649:ILE:HD11	1.86	0.56
3:L:98:PRO:HB2	3:L:195:ILE:HD12	1.87	0.56
5:C:1559:ILE:HD11	5:C:1596:ASP:OD2	2.05	0.56
6:D:186:ALA:HB2	8:H:163:ILE:HD11	1.88	0.56
6:D:178:VAL:HG13	8:H:200:LEU:HD22	1.89	0.55
5:C:382:LEU:O	5:C:386:VAL:HG12	2.08	0.54
11:K:247:LEU:HD12	11:K:296:ILE:HG21	1.90	0.54
4:A:1028:THR:HG23	4:A:1029:TYR:CD2	2.44	0.53
5:C:754:TYR:CE1	5:C:805:LEU:HD12	2.44	0.52
5:C:1478:VAL:HA	5:C:1481:THR:HG22	1.92	0.52
3:L:88:HIS:O	3:L:92:VAL:HG12	2.09	0.52
5:C:1905:PHE:O	5:C:1909:LEU:HD22	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:547:LEU:HD23	12:M:127:LEU:HD12	1.92	0.52
5:C:560:ILE:O	5:C:564:ILE:HD12	2.09	0.52
4:A:1011:TRP:HB2	4:A:1025:ALA:HB3	1.92	0.51
5:C:1171:LEU:HD12	5:C:1175:TRP:CZ3	2.46	0.51
5:C:959:TYR:CE2	5:C:2620:ILE:HD13	2.45	0.50
5:C:1012:THR:HG22	5:C:1080:GLU:OE1	2.12	0.50
3:L:136:VAL:HG21	3:L:158:PHE:CE2	2.47	0.49
5:C:2471:TYR:CZ	5:C:2475:LEU:HD11	2.47	0.49
5:C:1767:GLU:OE1	5:C:1824:MET:HE2	2.13	0.49
11:K:366:VAL:CG1	11:K:444:LEU:HD13	2.43	0.49
5:C:2953:LEU:HD22	5:C:3005:TRP:CD1	2.48	0.49
5:C:2949:ILE:HD11	5:C:2970:VAL:HG11	1.94	0.49
5:C:1916:ALA:O	5:C:1920:VAL:HG23	2.13	0.48
4:A:931:VAL:HG21	4:A:938:GLU:OE2	2.13	0.47
2:N:529:ILE:HG23	2:N:544:ARG:HD3	1.95	0.47
5:C:1555:ARG:O	5:C:1559:ILE:HG23	2.15	0.47
5:C:2866:LYS:O	5:C:2870:VAL:HG23	2.14	0.47
3:L:136:VAL:HG21	3:L:158:PHE:CZ	2.50	0.47
5:C:2167:ILE:HD12	5:C:2168:CYS:N	2.29	0.47
3:L:128:LEU:HD21	3:L:137:ILE:HG21	1.96	0.47
5:C:2094:THR:O	5:C:2098:VAL:HG22	2.15	0.47
5:C:1321:ARG:NH1	5:C:1324:THR:HG22	2.29	0.47
5:C:3267:PHE:CZ	5:C:3318:LEU:HD22	2.51	0.46
11:K:197:VAL:HG21	11:K:234:TYR:HB3	1.97	0.46
5:C:1336:TYR:CZ	5:C:1340:LEU:HD11	2.51	0.46
5:C:2335:LEU:HD12	5:C:2338:MET:HE1	1.98	0.46
5:C:2219:LEU:CD1	5:C:2239:LEU:HD13	2.45	0.46
4:A:1144:VAL:HG12	4:A:1148:LEU:HD12	1.98	0.46
5:C:838:SER:O	5:C:842:VAL:HG23	2.16	0.45
4:A:550:ASN:HB2	4:A:592:LEU:HD12	1.98	0.45
5:C:686:ALA:CB	5:C:731:MET:HE2	2.46	0.45
3:L:81:LEU:HD11	3:L:92:VAL:HG13	1.98	0.45
5:C:1748:GLN:N	5:C:1751:ALA:HB3	2.31	0.44
5:C:2949:ILE:HD11	5:C:2970:VAL:CG1	2.48	0.44
6:D:79:LEU:HD12	6:D:80:ILE:N	2.32	0.44
5:C:2350:ILE:CG2	5:C:2354:LEU:HD23	2.46	0.44
3:L:146:ILE:H	3:L:146:ILE:HD12	1.83	0.44
10:J:209:GLY:O	10:J:212:VAL:HG22	2.18	0.44
5:C:1054:VAL:HG11	5:C:1125:ILE:HG21	1.99	0.44
5:C:2297:LEU:HD21	5:C:2347:ILE:HD13	2.00	0.43
5:C:1427:MET:CE	5:C:1451:VAL:HG21	2.44	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:240:ARG:O	9:I:244:VAL:HG23	2.19	0.43
5:C:2946:ALA:HA	5:C:2949:ILE:HD12	2.01	0.43
3:L:276:ILE:HD13	3:L:578:LEU:HD13	2.01	0.42
5:C:223:LYS:O	5:C:287:THR:HG21	2.19	0.42
5:C:686:ALA:HB1	5:C:731:MET:HE2	2.01	0.42
12:M:410:GLN:OE1	12:M:423:MET:HE1	2.19	0.42
5:C:96:ILE:HD12	5:C:96:ILE:H	1.84	0.42
5:C:2499:LEU:O	5:C:2502:VAL:HG22	2.19	0.42
4:A:753:GLY:C	4:A:754:ILE:HD12	2.44	0.42
5:C:2824:TRP:CE3	12:M:263:LEU:HD11	2.54	0.42
4:A:1056:VAL:HG12	4:A:1089:ALA:HB1	2.01	0.42
3:L:99:LEU:HD21	3:L:191:LEU:HD22	2.00	0.42
5:C:2953:LEU:HD22	5:C:3005:TRP:NE1	2.34	0.42
5:C:230:ILE:HD12	5:C:231:ILE:N	2.35	0.42
5:C:1767:GLU:CD	5:C:1824:MET:HE2	2.44	0.42
5:C:2695:TYR:CE1	5:C:2699:THR:HG21	2.55	0.42
4:A:815:ARG:HD2	4:A:819:MET:HE3	2.02	0.42
5:C:158:VAL:HG11	5:C:233:VAL:HG21	2.01	0.42
12:M:154:MET:HE3	12:M:154:MET:HA	2.01	0.42
5:C:1245:LEU:HD22	5:C:1263:SER:OG	2.20	0.42
7:G:83:MET:HB2	10:J:277:MET:HE1	2.02	0.42
4:A:120:PHE:HB3	4:A:170:VAL:HG12	2.02	0.41
4:A:483:LEU:HD13	4:A:493:GLU:HB3	2.03	0.41
5:C:2969:THR:O	5:C:2973:THR:HG23	2.20	0.41
5:C:1661:HIS:O	5:C:1664:VAL:HG22	2.20	0.41
5:C:1754:PHE:O	5:C:1757:VAL:HG12	2.20	0.41
9:I:47:THR:HG23	9:I:286:ILE:HD12	2.03	0.41
3:L:189:LYS:O	3:L:193:LEU:HD23	2.21	0.41
5:C:2797:MET:HE1	12:M:263:LEU:HD13	2.03	0.41
4:A:66:MET:HE2	4:A:123:VAL:HG22	2.03	0.41
5:C:2475:LEU:HD13	6:D:131:HIS:CD2	2.56	0.40
4:A:484:VAL:HG21	4:A:497:SER:HB3	2.02	0.40
5:C:861:LEU:HG	5:C:865:ILE:HD12	2.02	0.40
4:A:197:THR:HG23	4:A:199:GLU:H	1.87	0.40
4:A:556:ILE:HD12	4:A:556:ILE:O	2.20	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	122/251 (49%)	118 (97%)	4 (3%)	0	100	100
2	N	51/892 (6%)	47 (92%)	4 (8%)	0	100	100
3	L	532/589 (90%)	507 (95%)	25 (5%)	0	100	100
4	A	1156/1217 (95%)	1086 (94%)	68 (6%)	2 (0%)	44	58
5	C	3188/3859 (83%)	3004 (94%)	178 (6%)	6 (0%)	44	58
6	D	176/414 (42%)	169 (96%)	6 (3%)	1 (1%)	22	31
7	G	87/161 (54%)	83 (95%)	4 (5%)	0	100	100
8	H	95/218 (44%)	93 (98%)	2 (2%)	0	100	100
9	I	218/317 (69%)	205 (94%)	13 (6%)	0	100	100
10	J	177/335 (53%)	168 (95%)	9 (5%)	0	100	100
11	K	383/622 (62%)	375 (98%)	8 (2%)	0	100	100
12	M	380/779 (49%)	361 (95%)	19 (5%)	0	100	100
13	B	48/86 (56%)	47 (98%)	1 (2%)	0	100	100
All	All	6613/9740 (68%)	6263 (95%)	341 (5%)	9 (0%)	50	64

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	A	405	SER
5	C	387	ARG
5	C	678	ASN
5	C	1931	VAL
5	C	2195	ARG
6	D	31	LEU
4	A	137	LYS
5	C	1836	ALA
5	C	2689	ARG

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	E	110/224 (49%)	109 (99%)	1 (1%)	75	87
2	N	46/779 (6%)	46 (100%)	0	100	100
3	L	478/521 (92%)	474 (99%)	4 (1%)	79	89
4	A	1013/1051 (96%)	1002 (99%)	11 (1%)	70	84
5	C	2916/3423 (85%)	2870 (98%)	46 (2%)	58	75
6	D	165/370 (45%)	163 (99%)	2 (1%)	67	82
7	G	83/141 (59%)	83 (100%)	0	100	100
8	H	86/154 (56%)	86 (100%)	0	100	100
9	I	203/273 (74%)	201 (99%)	2 (1%)	73	85
10	J	161/287 (56%)	159 (99%)	2 (1%)	67	82
11	K	330/505 (65%)	327 (99%)	3 (1%)	75	87
12	M	360/687 (52%)	357 (99%)	3 (1%)	79	89
13	B	46/77 (60%)	44 (96%)	2 (4%)	25	40
All	All	5997/8492 (71%)	5921 (99%)	76 (1%)	64	80

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	128	ARG
3	L	69	GLN
3	L	126	MET
3	L	136	VAL
3	L	311	VAL
4	A	368	ASP
4	A	477	SER
4	A	590	MET
4	A	701	LEU
4	A	803	ASP
4	A	814	GLN
4	A	845	GLU

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Mol	Chain	Res	Type
4	A	946	GLU
4	A	978	LEU
4	A	985	HIS
4	A	1088	LYS
5	C	66	ILE
5	C	228	LEU
5	C	298	TYR
5	C	314	LEU
5	C	395	LEU
5	C	409	GLU
5	C	413	SER
5	C	655	VAL
5	C	659	VAL
5	C	690	VAL
5	C	774	LEU
5	C	805	LEU
5	C	916	VAL
5	C	1295	HIS
5	C	1464	CYS
5	C	1475	MET
5	C	1552	SER
5	C	1558	LEU
5	C	1559	ILE
5	C	1587	MET
5	C	1603	VAL
5	C	1706	ARG
5	C	1750	ARG
5	C	1863	THR
5	C	1866	TRP
5	C	1890	ILE
5	C	1917	ARG
5	C	1920	VAL
5	C	1924	MET
5	C	2005	LEU
5	C	2017	GLU
5	C	2101	LEU
5	C	2155	THR
5	C	2174	LEU
5	C	2176	PHE
5	C	2209	LEU
5	C	2215	LEU
5	C	2449	CYS

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Mol	Chain	Res	Type
5	C	2880	MET
5	C	2993	MET
5	C	3135	SER
5	C	3251	LEU
5	C	3368	LEU
5	C	3462	GLU
5	C	3601	CYS
5	C	3604	LYS
6	D	179	LEU
6	D	210	THR
9	I	26	PHE
9	I	191	LEU
10	J	143	MET
10	J	144	MET
11	K	118	ILE
11	K	129	VAL
11	K	291	LEU
12	M	5	LEU
12	M	250	GLN
12	M	358	LEU
13	B	26	THR
13	B	33	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (49) such sidechains are listed below:

Mol	Chain	Res	Type
2	N	548	ASN
2	N	554	HIS
3	L	88	HIS
3	L	194	HIS
3	L	243	GLN
3	L	532	ASN
4	A	9	GLN
4	A	28	GLN
4	A	1094	ASN
4	A	1143	HIS
4	A	1152	HIS
5	C	405	ASN
5	C	703	ASN
5	C	735	HIS
5	C	777	GLN
5	C	791	ASN

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Mol	Chain	Res	Type
5	C	889	HIS
5	C	920	GLN
5	C	936	GLN
5	C	1048	HIS
5	C	1253	ASN
5	C	1300	GLN
5	C	1661	HIS
5	C	1702	ASN
5	C	1748	GLN
5	C	1922	GLN
5	C	2348	GLN
5	C	2593	ASN
5	C	2619	HIS
5	C	2646	HIS
5	C	2662	GLN
5	C	2766	GLN
5	C	3081	GLN
5	C	3185	HIS
5	C	3642	GLN
5	C	3697	GLN
5	C	3700	GLN
5	C	3843	ASN
6	D	232	GLN
8	H	168	ASN
8	H	173	HIS
10	J	203	HIS
10	J	215	GLN
10	J	322	HIS
11	K	86	GLN
11	K	108	ASN
11	K	162	HIS
11	K	375	GLN
12	M	368	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-53937. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections ⓘ

6.1.1 Primary map

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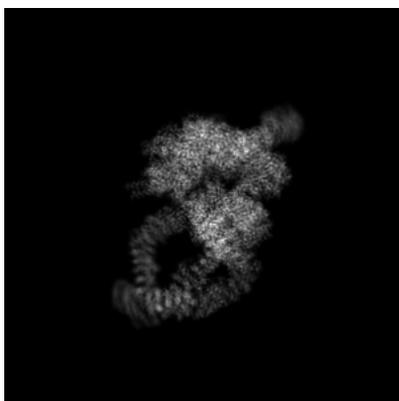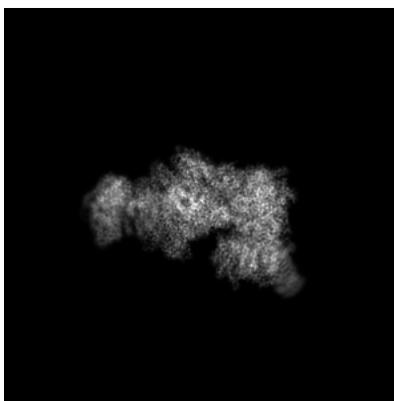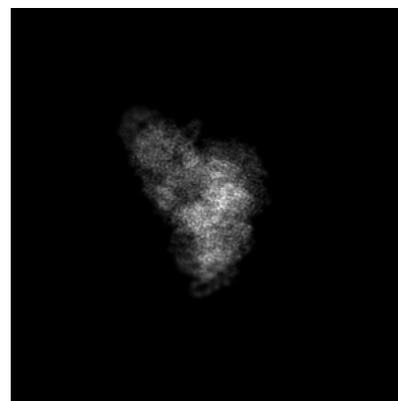
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map

| X Index: 204 | Y Index: 204 | Z Index: 204 |
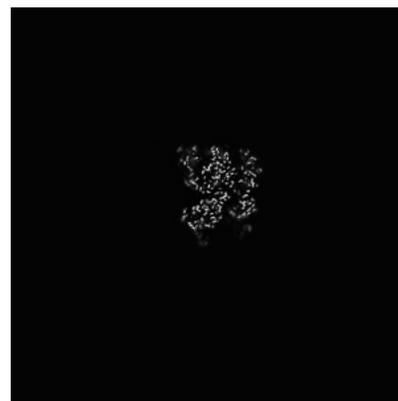
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
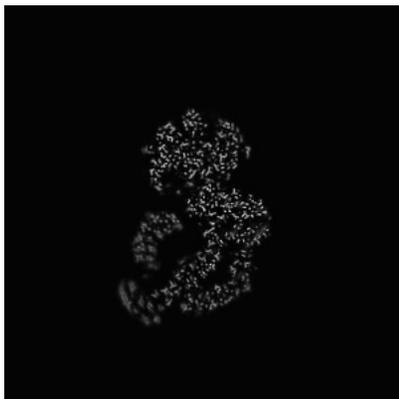
6.3.1 Primary map

| X Index: 211 | Y Index: 219 | Z Index: 261 |

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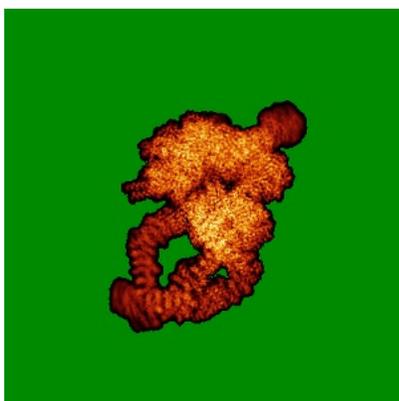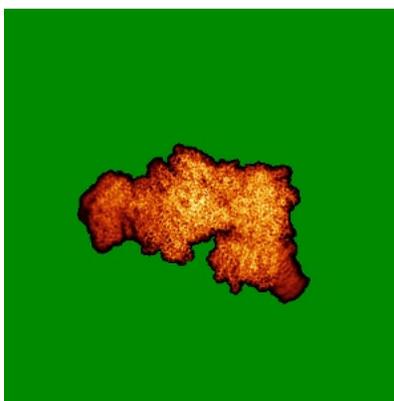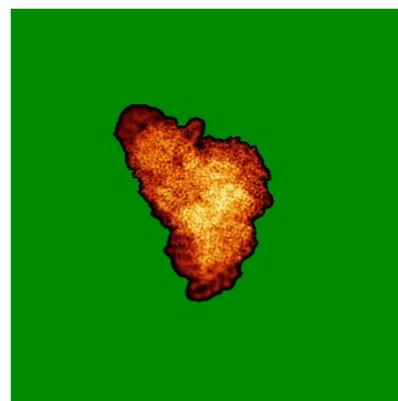
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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 3.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

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 ⓘ
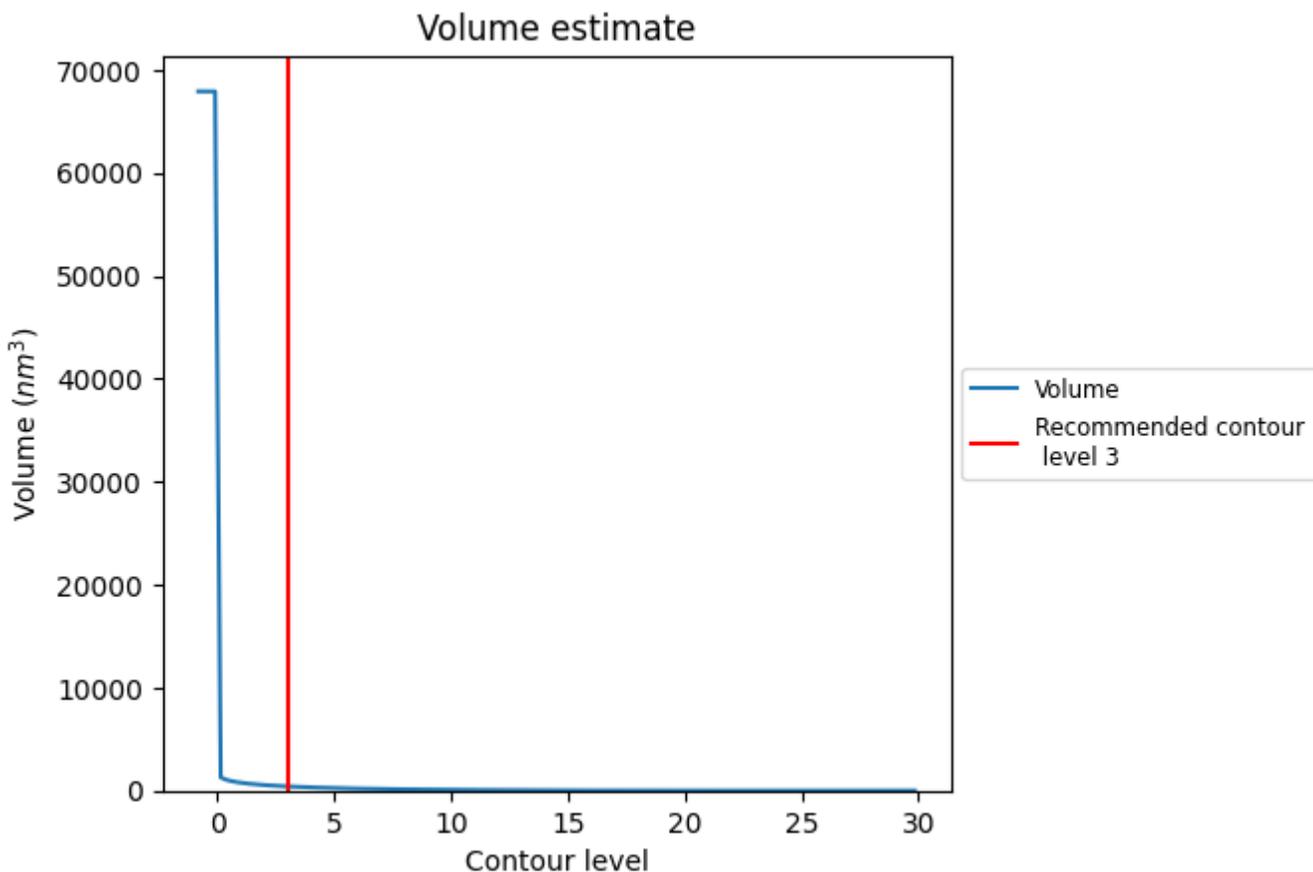
The volume at the recommended contour level is 409 nm^3; this corresponds to an approximate mass of 369 kDa.

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 ⓘ
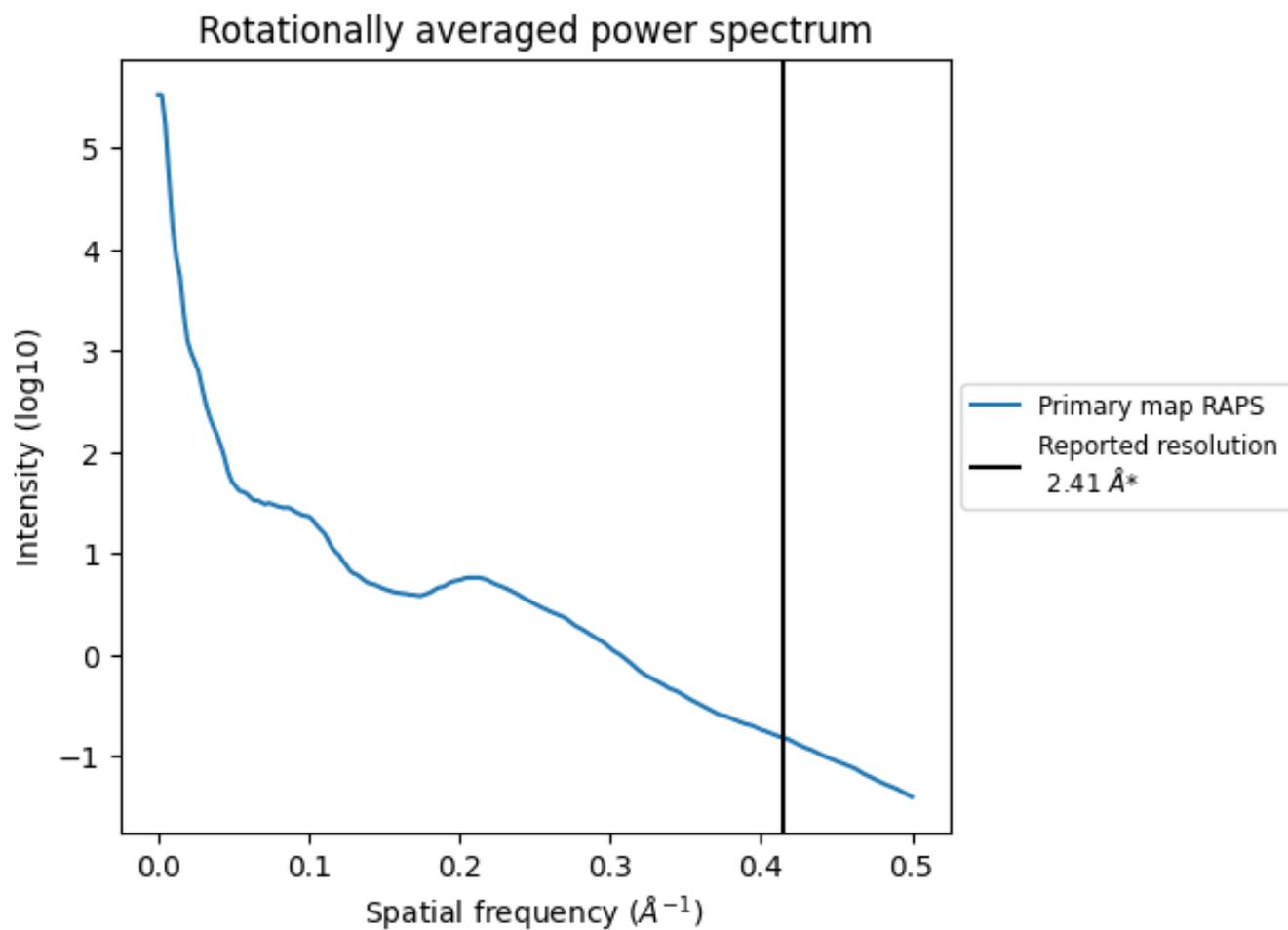
*Reported resolution corresponds to spatial frequency of 0.415 Å^{-1}

8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

9　Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-53937 and PDB model 9RDK. Per-residue inclusion information can be found in section 3 on page 6.

9.1　Map-model overlay ⓘ

X　　　　　　　　　　　　Y　　　　　　　　　　　　Z
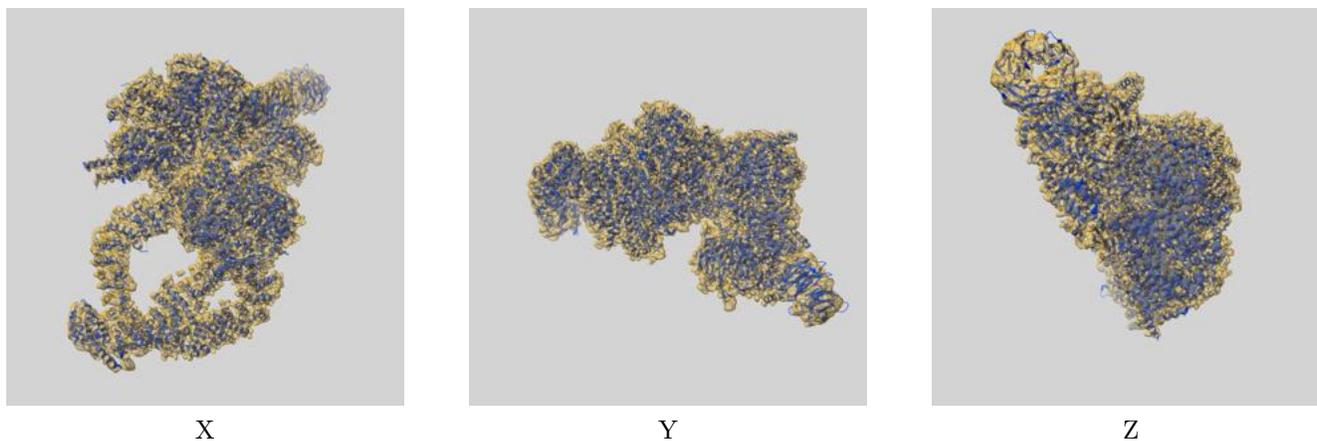
The images above show the 3D surface view of the map at the recommended contour level 3.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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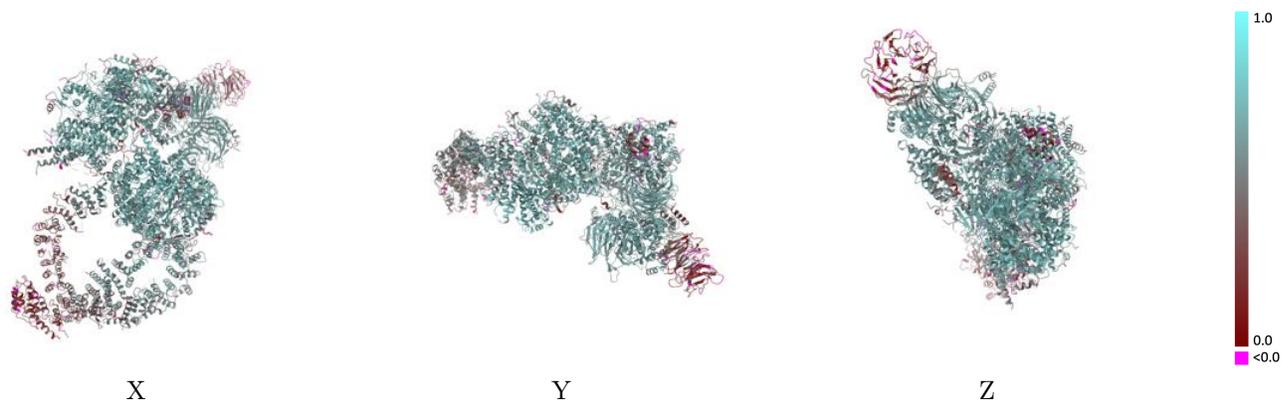
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model ⓘ
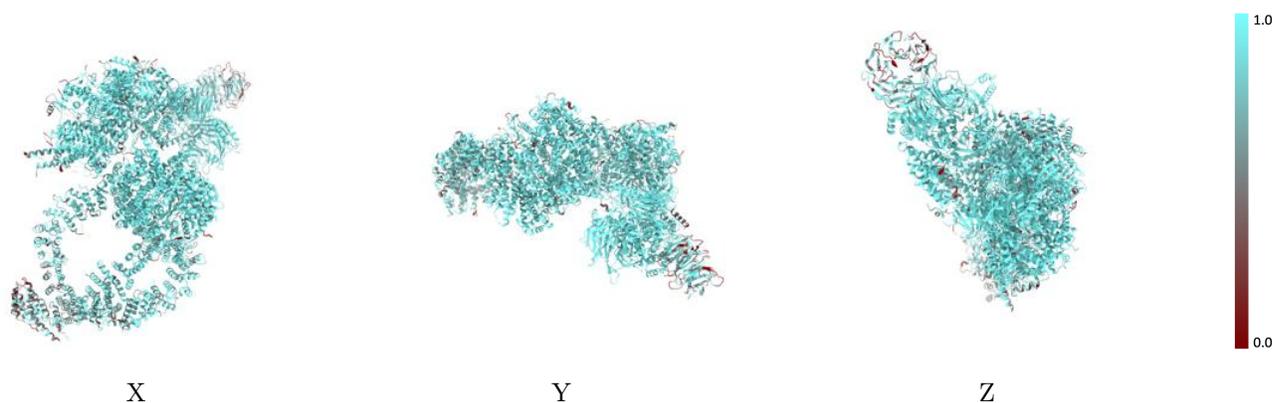
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (3).

9.4　Atom inclusion ⓘ
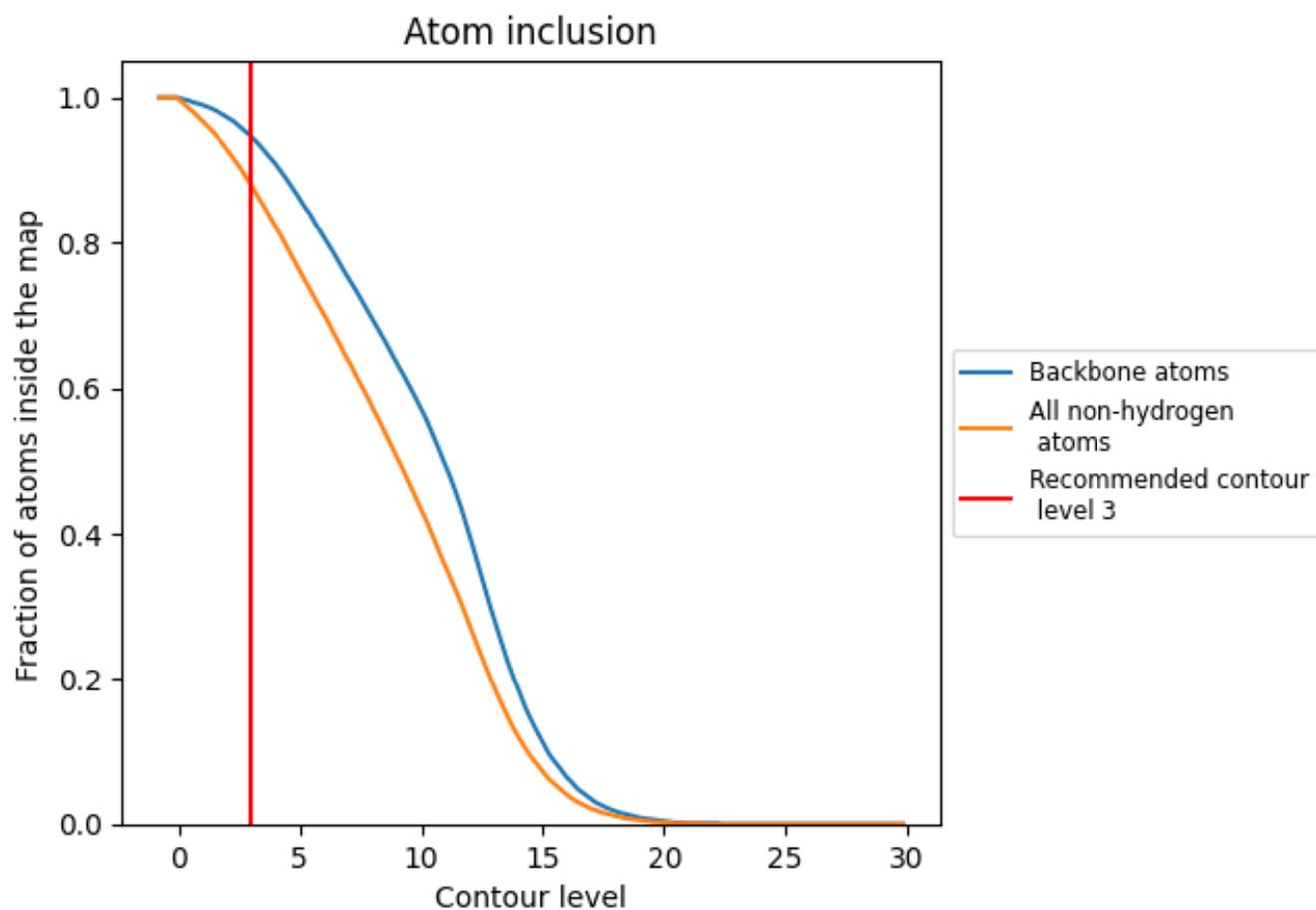
At the recommended contour level, 95% of all backbone atoms, 88% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8800	0.5570
A	0.8590	0.5060
B	0.9760	0.6570
C	0.8690	0.5500
D	0.9140	0.6250
E	0.9470	0.6490
G	0.8860	0.6180
H	0.9230	0.6380
I	0.9040	0.5880
J	0.9110	0.6200
K	0.9390	0.5920
L	0.9070	0.5700
M	0.8580	0.5580
N	0.8290	0.5510

1.0

0.0
<0.0