WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Dec 9, 2024 – 02:40 PM JST

PDB ID	:	8JRI
EMDB ID	:	EMD-36598
Title	:	Cryo-EM structure of human 26S proteasomal RP subcomplex (Ea state) without any bound substrate.
Authors	:	Hsu, S.T.D.; Draczkowski, P.; Wang, Y.S.
Deposited on	:	2023-06-16
Resolution	:	3.40 Å(reported)
Based on initial model	:	6MSB

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

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

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

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

EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
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)	:	2.40

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 3.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
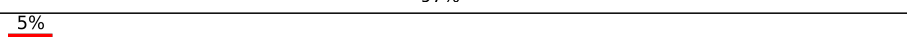
Metric	Percentile Ranks	Value
Ramachandran outliers		0.3%
Sidechain outliers		0.9%

Worse *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures
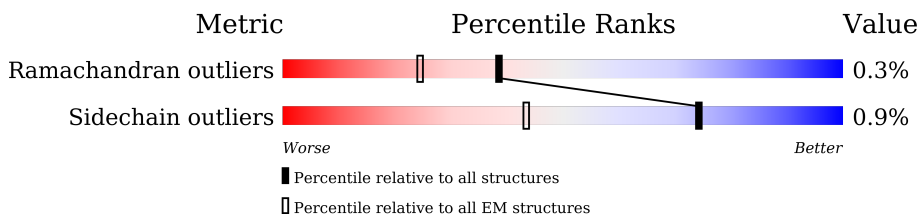
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	433	7% 90% · 9%
2	B	440	7% 87% 13%
3	C	406	5% 93% 7%
4	D	418	90% · 9%
5	G	246	97% ·
6	H	234	99% ·
7	I	261	95% ·
8	J	248	96% ·
9	K	241	96% · ·

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Mol	Chain	Length	Quality of chain
10	L	263	90% 10%
11	M	255	94% 6%
12	U	953	9% 84% 16%
13	c	310	93% 7%
14	V	534	22% 95% 5%
15	W	456	5% 93% 7%
16	X	422	5% 90% 10%
17	Y	389	96%
18	Z	324	88% 12%
19	a	376	99%
20	b	377	50% 49%
21	d	350	11% 69% 30%
22	e	70	53% 43%
23	f	908	81% 97%
24	E	389	5% 96%
25	F	439	86% 14%

2 Entry composition ⓘ

There are 28 unique types of molecules in this entry. The entry contains 62679 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 26S protease regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	394	Total	C	N	O	S	0	0
			2996	1886	531	561	18		

- Molecule 2 is a protein called 26S protease regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	384	Total	C	N	O	S	0	0
			2851	1786	493	560	12		

- Molecule 3 is a protein called 26S protease regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	379	Total	C	N	O	S	0	0
			2938	1850	531	541	16		

- Molecule 4 is a protein called 26S protease regulatory subunit 6B.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	380	Total	C	N	O	S	0	0
			3039	1923	524	579	13		

- Molecule 5 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	G	240	Total	C	N	O	S	0	0
			1826	1160	305	348	13		

- Molecule 6 is a protein called Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	232	Total	C	N	O	S	0	0
			1708	1081	289	333	5		

- Molecule 7 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	I	250	Total	C	N	O	S	0	0
			1912	1204	329	371	8		

- Molecule 8 is a protein called Proteasome subunit alpha type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	J	239	Total	C	N	O	S	0	0
			1715	1064	311	335	5		

- Molecule 9 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	K	234	Total	C	N	O	S	0	0
			1759	1102	290	356	11		

- Molecule 10 is a protein called Proteasome subunit alpha type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	238	Total	C	N	O	S	0	0
			1850	1159	334	346	11		

- Molecule 11 is a protein called Proteasome subunit alpha type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	M	240	Total	C	N	O	S	0	0
			1856	1178	314	353	11		

- Molecule 12 is a protein called 26S proteasome non-ATPase regulatory subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	U	804	Total	C	N	O	S	0	0
			4492	2721	874	883	14		

- Molecule 13 is a protein called 26S proteasome non-ATPase regulatory subunit 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	c	287	Total	C	N	O	S	0	0
			2260	1430	389	422	19		

- Molecule 14 is a protein called 26S proteasome non-ATPase regulatory subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	V	508	Total 3121	C 1926	N 596	O 592	S 7	0	0

- Molecule 15 is a protein called 26S proteasome non-ATPase regulatory subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	W	456	Total 3511	C 2216	N 609	O 665	S 21	0	0

- Molecule 16 is a protein called 26S proteasome non-ATPase regulatory subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	X	380	Total 2932	C 1860	N 503	O 557	S 12	0	0

- Molecule 17 is a protein called 26S proteasome non-ATPase regulatory subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Y	378	Total 3115	C 1987	N 533	O 578	S 17	0	0

- Molecule 18 is a protein called 26S proteasome non-ATPase regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	Z	286	Total 2281	C 1457	N 392	O 427	S 5	0	0

- Molecule 19 is a protein called 26S proteasome non-ATPase regulatory subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	a	373	Total 2901	C 1843	N 497	O 546	S 15	0	0

- Molecule 20 is a protein called 26S proteasome non-ATPase regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	b	191	Total 1458	C 910	N 261	O 279	S 8	0	0

- Molecule 21 is a protein called 26S proteasome non-ATPase regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	d	244	Total 1692	C 1076	N 294	O 317	S 5	0	0

- Molecule 22 is a protein called 26S proteasome complex subunit DSS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	e	40	Total 248	C 148	N 47	O 52	S 1	0	0

- Molecule 23 is a protein called 26S proteasome non-ATPase regulatory subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	f	878	Total 4328	C 2572	N 878	O 878	0	0

- Molecule 24 is a protein called 26S protease regulatory subunit 10B.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	E	375	Total 2877	C 1806	N 514	O 541	S 16	0	0

- Molecule 25 is a protein called 26S protease regulatory subunit 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	F	377	Total 2830	C 1783	N 491	O 541	S 15	0	0

- Molecule 26 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).

ATP
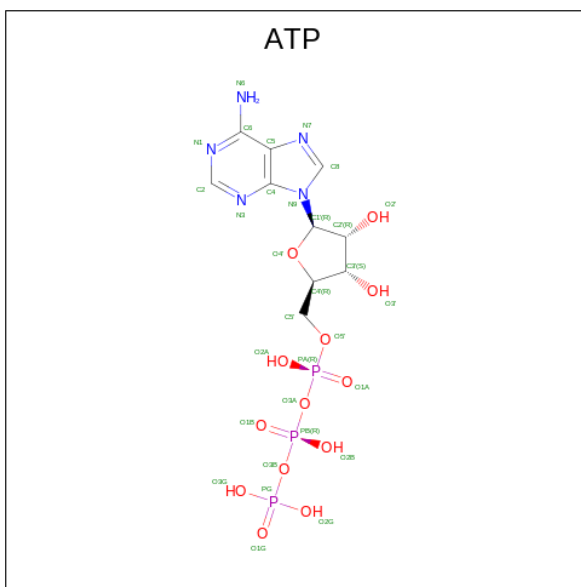
Mol	Chain	Residues	Atoms					AltConf
26	A	1	Total	C	N	O	P	0
			31	10	5	13	3	
26	B	1	Total	C	N	O	P	0
			31	10	5	13	3	
26	D	1	Total	C	N	O	P	0
			31	10	5	13	3	
26	E	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 27 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
27	A	1	Total	Mg	0
			1	1	
27	B	1	Total	Mg	0
			1	1	
27	D	1	Total	Mg	0
			1	1	
27	E	1	Total	Mg	0
			1	1	
27	F	1	Total	Mg	0
			1	1	

- Molecule 28 is A D E N O S I N E - 5'- D I P H O S P H A T E (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).

ADP
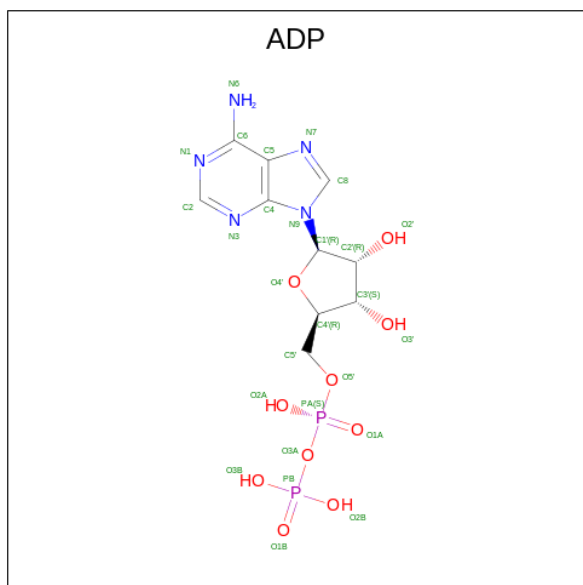
Mol	Chain	Residues	Atoms					AltConf
28	C	1	Total	C	N	O	P	0
			27	10	5	10	2	
28	F	1	Total	C	N	O	P	0
			27	10	5	10	2	

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: 26S protease regulatory subunit 7
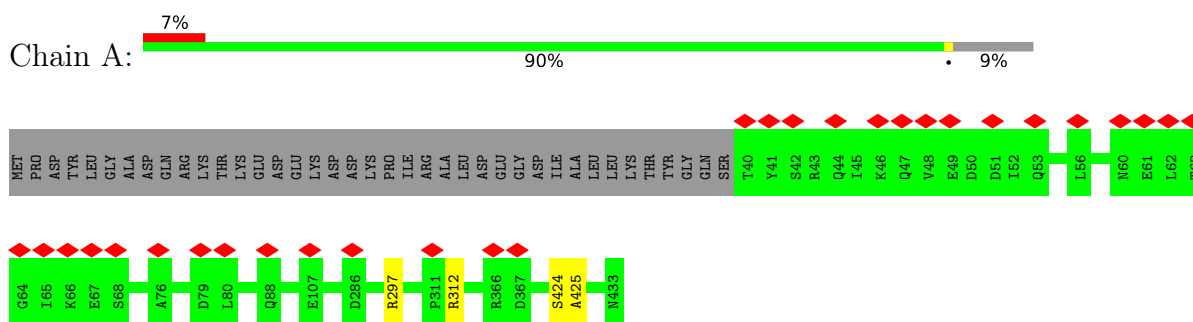
Chain A:

- Molecule 2: 26S protease regulatory subunit 4
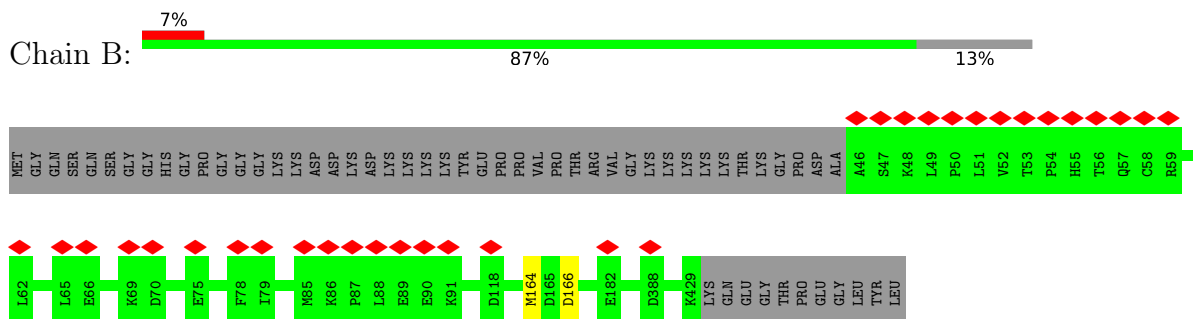
Chain B:

- Molecule 3: 26S protease regulatory subunit 8
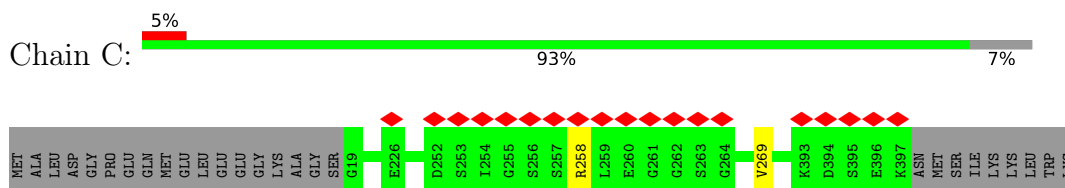
Chain C:

- Molecule 4: 26S protease regulatory subunit 6B

Chain D:

D410 E411 Q412 E413 Y417 K418
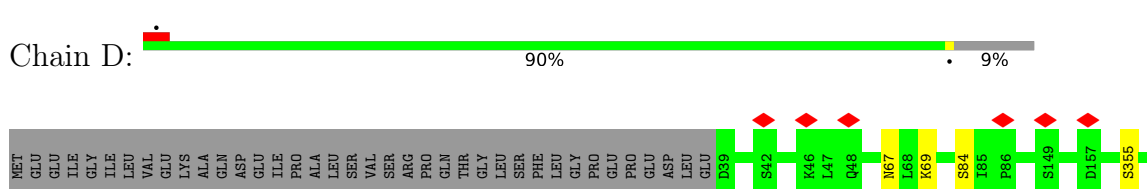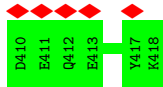
• Molecule 5: Proteasome subunit alpha type-6

Chain G:
97%

MET SER ARG GLY S5 K54 E244 ARG ASP
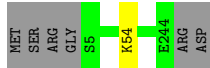
• Molecule 6: Proteasome subunit alpha type-2

Chain H:
99%

MET ALA E3 G201 A234

• Molecule 7: Proteasome subunit alpha type-4

Chain I:
95%

MET S2 A39 F61 K205 K238 K251 LYS GLU LYS GLU GLN LYS GLU LYS ASP LYS

• Molecule 8: Proteasome subunit alpha type-7

Chain J:
96%

MET S2 L96 D100 S201 E240 LYS LYS LYS GLN LYS LYS ALA SER

• Molecule 9: Proteasome subunit alpha type-5

Chain K:
96%

MET PHE LEU THR ARG SER GLU Y8 L21 D129 P130 M133 S134 I241

• Molecule 10: Proteasome subunit alpha type-1

Chain L:
90%   10%

MET PHE ARG M4 T207 D226 Q241 ARG LYS ALA GLN PRO ALA GLN PRO ALA ASP GLU PRO ALA GLU LYS ALA ASP GLU PRO MET GLU HIS

• Molecule 11: Proteasome subunit alpha type-3

Chain M:

94%   6%

MET SER ILE GLY **T5** **R40** **K207** **K244** GLU GLU ASP GLU SER ASP ASP ASN MET

• Molecule 12: 26S proteasome non-ATPase regulatory subunit 1

9%

Chain U:

84%   16%

MET ILE THR SER ALA ALA **G7** **E14** **Q18** **A23** **L27** **V30** **E40** **K44** **D51** **E52** **G53** **F54** **R55** **G85** **D92** **L118** **P119** **E120** **G121** **E122** **K123** **K124** **Y147** **P174** **G175** **A178** **Y179** **S180** **E209** **C217** **V229** **E239** **D240** **Q266** **N267**

L268 **R269** **T270** VAL GLY THR PRO ILE ALA SER VAL PRO GLY SER THR ASN THR GLY THR VAL PRO GLY SER GLU LYS ASP SER ASP SER MET GLU THR GLU GLU LYS THR SER SER ALA PHE VAL GLY LYS THR PRO GLU GLU ALA SER PRO GLU PRO LYS **D320** **L323** **N345** **N346** **N347** **T348**

N389 **L390** **K417** **E418** **A419** **T425** **P428** **K429** **D430** **T431** **S432** **P433** **G434** **S435** **D456** **N467** **D495** **L693** **I701** **K715** **S750** **R751** **T752** **S759** **G790** **L791** **N792** **L795** **K796** **M797** **P798** **K799** **V800** **Q801** **C806** **S809** **P814** ALA PRO LEU GLU VAL PRO

LYS GLU LYS GLU LYS GLU LYS VAL SER THR ALA VAL LEU SER ILE THR ALA LYS LYS ALA LYS LYS LYS GLU LYS GLU LYS LYS GLU GLU GLU LYS MET GLU VAL ASP GLU ALA GLU LYS LYS GLU GLU LYS LYS GLU LYS LYS LYS GLU LYS LYS GLU PRO GLU **P873** **L877** **L878** **D879** **N880** **P881**

M894 **P895** **E896** **T897** **C898** **R899** **I908** **I911** **D916** **T917** SER GLU ASP ILE GLU GLU LEU VAL GLU PRO VAL ALA ALA HIS GLY PRO LYS ILE GLU GLU GLU GLN GLU PRO GLU PRO PRO GLU PRO PHE GLU TYR ILE ASP ASP

• Molecule 13: 26S proteasome non-ATPase regulatory subunit 14

Chain c:

93%   7%

MET ASP ARG LEU ARG LEU GLY GLY MET PRO GLY LEU GLY GLN GLY PRO PRO THR ASP ALA PRO **A24** **G81** **V87** **N166** **V169** **E268** **K273** **K310**

• Molecule 14: 26S proteasome non-ATPase regulatory subunit 3

22%

Chain V:

95%   5%

MET LYS GLN GLY SER ALA ARG ARG GLY ALA ASP LYS ALA LYS PRO **P18** **P19** **G20** **G21** **G22** **E23** **Q24** **E25** **P32** **E39** **G49** **E50** **A51** **D52** **G53** **K54** **T55** **A56** **A57** **A58** **A59** **H62** **R65** **D74** **I75** **K76** **E77** **H78** **V79** **K80** **Q81** **L82** **E83** **K84** **A85** **V86**

A97 **L98** **R99** **M100** **L101** **P102** **S103** **T104** **S105** **R106** **R107** **L108** **N109** **H110** **Y111** **V112** **L113** **Y114** **K115** **A116** **V17** **Q118** **G119** **F120** **F121** **T122** **S123** **N124** **N125** **A126** **T127** **R128** **D129** **F130** **P138** **T141** **E142** **A143** **D144** **L145** **Q146** **Q168** **L169** **L170** **V171** **K186** **I187** **L191** **M192** **Q193** **K194** **I195** **S196** **T197** **Q198**

N199 **R200** **R201** **A202** **L205** **D243** **A244** **K273** **S274** **V275** **F276** **P277** **N281** **E304** **V322** **G323** **F324** **P343** **D344** **F348** **P351** **D429** **I464** **D465** **P497** **N502** **K503** **D504** **L505** **E506** **S507** **A508** **E509** **E510** **R511** **R512** **K523** **E524** **M525** ALA GLU ASP ASP ASP SER

PHE
PRO

- Molecule 15: 26S proteasome non-ATPase regulatory subunit 12

Chain W:

5%

93% 7%

M1 R39 L40 Q41 E42 V43 S64 R65 I66 L67 V68 A69 V70 M73 C74 Y75 E79 W80 L83 N84 E85 L89 R93 N94 S95 Q96 Q99 A100 V101 M104 V105 Q106 Q107 E113 E114 I115 T116 D117 L118 L124 K135 I136 Y137 V138 E139 I140 E141

E154 Q155 N156 V159 L169 T173 N210 T211 K212 F213 F214 S260 E261 K262 R316 S332 L333 E334 S335 P336 A337 T338 L455 Q456

- Molecule 16: 26S proteasome non-ATPase regulatory subunit 11

Chain X:

5%

90% 10%

MET ALA ALA ALA ALA VAL VAL GLU PHE GLN ARG ALA GLN SER LEU LEU SER THR ASP ARG GLU ALA SER ILE ILE LEU HIS SER ILE VAL LYS ARG ASP ASP GLN GLU ASN ASP GLU GLU ALA V43 S49 L56 L57 A58 K59 T60 A63 D98 M99 E100 A101 A102 T103

G104 Q105 Y143 D161 Y201 K223 D224 S241 I242 D243 D266 G273 K274 D360 K420 L421 T422

- Molecule 17: 26S proteasome non-ATPase regulatory subunit 6

Chain Y:

96%

MET PRO LEU GLU ASN LEU GLU GLU GLU GLY LEU P12 L28 W63 Q64 I65 L95 G96 I100 L202 D203 T204 V205 S206 T207 L213 M389

- Molecule 18: 26S proteasome non-ATPase regulatory subunit 7

Chain Z:

88% 12%

MET PRO GLU LEU A5 N109 L131 P150 T182 T183 V184 L220 N282 E286 K287 K288 E289 G290 GLN GLU LYS GLU GLU SER LYS LYS ASP ARG LYS GLU ASP LYS LYS GLU LYS ASP LYS LYS GLU LYS SER ASP VAL LYS LYS GLU GLU LYS LYS GLU LYS LYS

- Molecule 19: 26S proteasome non-ATPase regulatory subunit 13

Chain a:

99%

MET LYS ASP V4 S14 F63 H69 R70 D184 I185 H219 P220 V221 Q231 T376

- Molecule 20: 26S proteasome non-ATPase regulatory subunit 4

Chain b:

50% 49%

M1 L22 D119 N137 N149 N158 G162 K163 D164 G165 T166 G176 P177 S178 L179 L183 A190 G191 GLU GLY ALA MET LEU GLY LEU GLY ALA SER ASP PHE GLU GLY VAL ASP PRO SER ALA ASP PRO GLU LEU ALA LEU ALA LEU ARG VAL SER MET

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

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

• Molecule 21: 26S proteasome non-ATPase regulatory subunit 8

11%

Chain d:

69% 30%

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

SER ARG LYS MET ALA ALA ALA VAL ASN GLY ALA ALA GLY PHE SER SER GLY PRO ALA ALA THR SER GLY ALA VAL LEU GLN ALA ALA LEU THR GLY M1 K6 G7 N10 R11 K12 S13 P14 N15 L16 S17 K18 C19 L26 K27 L28 V29 L30 LEU GLU LEU ASN PHE LEU

PRO THR THR GLY THR LYS LEU T44 Q47 L48 I49 L50 A51 R52 L55 I63 Y74 D84 Y85 E91 Y94 N110 K125 A154 K155 D168 N201 P219 S227 Q228 Q229 Q230 K231 T236 I237 P238 S239 V257

• Molecule 22: 26S proteasome complex subunit DSS1

Chain e:

53% 43%

M1 D9 LEU GLY LEU LEU GLU GLU GLU ASP GLU PHE GLU GLU GLU PRO ALA GLU ASP TRP ALA GLY LEU ASP GLU ASP ASP ALA HIS VAL TRP E40 W43 D44 L56 R57 E68 T69 S70

• Molecule 23: 26S proteasome non-ATPase regulatory subunit 2

81%

Chain f:

97%

M1 E2 E3 G4 G5 R6 D7 K8 A9 P10 V11 Q12 P13 Q14 Q15 S16 P17 A18 A19 A20 P21 G22 G23 T24 D25 E26 K27 P28 S29 G30 K31 E32 R33 R34 D35 A36 G37 D38 K39 D40 K41 E42 Q43 E44 L45 S46 E47 E48 D49 K50 Q51 L52 Q53 D54 E55 L56 E57 M58 L59 V60

E61 R62 L63 G64 E65 K66 D67 T68 S69 L70 Y71 R72 P73 A74 L75 E76 E77 L78 R79 R80 Q81 I82 R83 S84 S85 T86 T87 S88 M89 T90 S91 V92 P93 K94 P95 L96 K97 F98 L99 R100 P101 H102 Y103 G104 K105 L106 K107 E108 I109 Y110 E111 N112 M113 A114 P115 G116 E117 N118 K119 R120

F121 A122 A123 D124 I125 I126 S127 V128 L129 A130 M131 T132 M133 S134 G135 E136 R137 E138 C139 L140 R143 L144 V145 G146 S147 Q148 E149 E150 L151 A152 S153 W154 G155 H156 E157 Y158 V159 R160 H161 L162 A163 G164 E165 V166 A167 K168 E169 W170 Q171 E172 L173 D174 D175 A176 E177 K178 V179 Q180 R181

E182 P183 L184 L185 T186 L187 V188 K189 E190 I191 V192 P193 Y194 N195 M196 A197 H198 N199 A200 E201 H202 E203 A204 C205 D206 L207 L208 M209 E210 I211 E212 Q213 V214 D215 M216 L217 E218 K219 D220 I221 D222 E223 N224 A225 Y226 A227 K228 V229 C230 L231 Y232 L233 T234 S235 C236 V237 N238 E242

N245 S246 A247 L248 L249 R250 C251 A252 V255 F256 F259 S260 R261 F262 P263 E264 A265 L266 R267 L268 A269 L270 M271 M275 E276 L277 V278 E279 D280 I281 F282 T283 S284 D287 V288 V289 V290 Q291 K292 Q293 M294 A295 F296 M297 L298 G299 R300 H301 G302 V303 F304 L305 E306 L307 S308 E309

D310 V311 E312 E313 Y314 E315 D316 L317 T318 E319 I320 M321 S322 N323 V324 Q325 L326 N327 S328 N329 F330 L331 A332 L333 A334 R335 E336 L337 D338 I339 M340 E341 P342 K343 V344 P345 D346 D347 I348 Y349 K350 T351 H352 L353 E354 ASN ASN ARG PHE GLY GLY SER GLY SER GLN VAL D366 S367 A368 R369

M370 N371 L372 A373 S374 S375 F376 V377 N378 G379 F380 V381 N382 A383 A384 F385 G386 Q387 D388 K389 L390 L391 T392 D393 D394 G395 N396 K397 W398 L399 Y400 N401 N402 K403 D404 H405 G406 M407 L408 S409 A410 A411 A412 S413 L414 G415 M416 I417 L418 L419 W420 D421 V422 D423 G424 G425 L426 T427 Q428 I429

D430 K431 Y432 L433 Y434 S435 S436 E437 D438 Y439 I440 K441 S442 G443 A444 L445 L446 A447 C448 G449 I450 V451 N452 S453 G454 V455 R456 N457 E458 C459 D460 P461 A462 L463 A464 L465 L466 S467 D468 Y469 V470 L471 H472 N473 S474 N475 R478 L479 F483 G484 L485 G486 L487 A488 Y489 A490 G491 S492

N493 R494 E495 D496 V497 L498 T499 L500 L501 L502 P503 V504 M505 G506 D507 S508 K509 S510 S511 M512 E513 V514 A515 G516 V517 T518 A519 G528 S529 C530 N531 V534 T537 I538 L539 E544 K545 S546 E547 T548 E549 L550 K551 D552 T553 Y554 A555 R556 W557 L558 P559 L560 H566 L567 G568

K569 G570 E571 A572 I573 E574 A575 I576 L577 L580 E581 V582 V583 S584 E585 R588 A591 N592 V595 D596 V597 C598 A599 Y600 A601 G602 S603 G604 N605 H614 I615 C616 S617 E618 H619 F620 D621 S622 K623 E624 K625 E626 E627 D628 K629 D630 K631 K632 K633 K634 K635 D636 K637 E641

A642 P643 A644 D645 M646 G647 A648 H649 Q650 V654 A658 L659 I660 A661 M662 E665 I666 G667 A668 E669 M670 A671 L672 R673 T674 F675 G676 H677 L678 L679 R680 Y681 G682 E683 P684 T685 L686 R687 R688 A689 V690 P691 L692 A693 L694 A695 I696 I697 S698 V699 S700 N701 P702 R703 L704 N705

D708 T709 L710 S711 K712 F713 S714 H715 D716 A717 D718 P719 E720 V721 S722 Y723 N724 S725 I726 F727 A728 M729 G730 M731 V732 G733 S734 G735 T736 N737 N738 A739 R740 L741 A742 A743 M744 L745 R746 Q747 L748 A749 Q750 Y751 H752 P756 N757 N758 L759 F760 M761 V762 R763 Q766 G767 L768 T769 H770

L771 G772 K773 L776 T777 L778 C779 P780 Y781 H782 S783 D784 R785 Q786 L787 M788 S789 Q790 V791 A792 V793 A794 G795 L796 L797 T798 V799 L800 V801 S802 F803 L804 D805 V806 R807 N808 I809 I810 L811 G812 K813 S814 H815 Y816 V817 L818 Y819 G820 L821 V822 A823 A824 M825 Q826 P827 R828 M829 L830 V831

T832 F833 D834 E835 E836 L837 R838 P839 L840 P841 V842 S843 V844 R845 V846 G847 V850 D851 V852 V853 G854 Q855 A856 G857 K858 P859 K860 T861 I862 T863 G864 F865 Q866 T867 H868 T869 T870 P871 V872 L873 L874 A875 H876 G877 E878 R879 A880 E881 L882 A883 T884 E885 E886 F887 L888 P889 VAL THR PRO

ILE LEU GLU GLY PHE VAL ILE LEU ARG LYS ASN PRO ASN TYR ASP LEU

• Molecule 24: 26S protease regulatory subunit 10B

5%

Chain E: 96% .

MET ALA ASP PRO ARG ASP LYS ALA LEU GLN ASP TYR ARG LYS K15 L16 L17 E18 H19 K20 E21 I22 D23 G24 R25 L26 K27 E28 L29 R30 E31 Q32 E35 K38 E41 P127 N262 V389

• Molecule 25: 26S protease regulatory subunit 6A

Chain F:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	153646	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 $(e^-/\text{Å}^2)$	49	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	70000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.931	Depositor
Minimum map value	-1.690	Depositor
Average map value	-0.003	Depositor
Map value standard deviation	0.087	Depositor
Recommended contour level	0.5	Depositor
Map size (Å)	560.0, 560.0, 560.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4, 1.4, 1.4	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ATP, MG, ADP

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	0.26	0/3047	0.54	0/4123
2	B	0.25	0/2888	0.50	0/3912
3	C	0.26	0/2977	0.51	0/4008
4	D	0.26	0/3089	0.53	0/4168
5	G	0.26	0/1859	0.49	0/2523
6	H	0.27	0/1743	0.48	0/2372
7	I	0.26	0/1942	0.52	0/2628
8	J	0.25	0/1739	0.52	0/2372
9	K	0.26	0/1786	0.52	0/2419
10	L	0.26	0/1885	0.55	0/2552
11	M	0.26	0/1891	0.49	0/2552
12	U	0.24	0/4510	0.44	0/6215
13	c	0.25	0/2302	0.49	0/3110
14	V	0.25	0/3149	0.49	0/4317
15	W	0.26	0/3557	0.56	0/4799
16	X	0.25	0/2975	0.48	0/4016
17	Y	0.26	0/3173	0.53	0/4273
18	Z	0.26	0/2324	0.47	0/3150
19	a	0.25	0/2951	0.50	0/3998
20	b	0.25	0/1478	0.53	0/2001
21	d	0.25	0/1717	0.47	0/2339
22	e	0.24	0/248	0.53	0/333
23	f	0.24	0/4326	0.42	0/6016
24	E	0.25	0/2921	0.51	0/3945
25	F	0.25	0/2869	0.48	0/3884
All	All	0.25	0/63346	0.50	0/86025

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2　Too-close contacts　ⓘ

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

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	392/433 (90%)	340 (87%)	50 (13%)	2 (0%)	25	54
2	B	382/440 (87%)	348 (91%)	34 (9%)	0	100	100
3	C	377/406 (93%)	344 (91%)	31 (8%)	2 (0%)	25	54
4	D	378/418 (90%)	334 (88%)	42 (11%)	2 (0%)	25	54
5	G	238/246 (97%)	223 (94%)	15 (6%)	0	100	100
6	H	230/234 (98%)	221 (96%)	9 (4%)	0	100	100
7	I	248/261 (95%)	233 (94%)	15 (6%)	0	100	100
8	J	237/248 (96%)	223 (94%)	14 (6%)	0	100	100
9	K	232/241 (96%)	216 (93%)	13 (6%)	3 (1%)	10	33
10	L	236/263 (90%)	221 (94%)	13 (6%)	2 (1%)	16	44
11	M	238/255 (93%)	224 (94%)	14 (6%)	0	100	100
12	U	798/953 (84%)	778 (98%)	20 (2%)	0	100	100
13	c	285/310 (92%)	274 (96%)	11 (4%)	0	100	100
14	V	506/534 (95%)	472 (93%)	31 (6%)	3 (1%)	22	50
15	W	454/456 (100%)	400 (88%)	47 (10%)	7 (2%)	8	30
16	X	378/422 (90%)	350 (93%)	28 (7%)	0	100	100
17	Y	376/389 (97%)	348 (93%)	27 (7%)	1 (0%)	37	66
18	Z	284/324 (88%)	269 (95%)	15 (5%)	0	100	100
19	a	371/376 (99%)	354 (95%)	17 (5%)	0	100	100

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
20	b	189/377 (50%)	174 (92%)	15 (8%)	0	100	100
21	d	240/350 (69%)	217 (90%)	21 (9%)	2 (1%)	16	44
22	e	36/70 (51%)	25 (69%)	9 (25%)	2 (6%)	1	10
23	f	874/908 (96%)	766 (88%)	107 (12%)	1 (0%)	48	78
24	E	373/389 (96%)	359 (96%)	14 (4%)	0	100	100
25	F	373/439 (85%)	360 (96%)	13 (4%)	0	100	100
All	All	8725/9742 (90%)	8073 (92%)	625 (7%)	27 (0%)	38	66

All (27) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
14	V	322	VAL
14	V	324	PHE
14	V	465	ASP
15	W	137	TYR
21	d	219	PRO
22	e	43	TRP
23	f	756	PRO
15	W	115	ILE
15	W	118	LEU
21	d	239	SER
1	A	425	ALA
15	W	84	ASN
22	e	56	LEU
4	D	84	SER
9	K	21	LEU
10	L	226	ASP
15	W	260	SER
15	W	316	ARG
17	Y	207	THR
1	A	424	SER
4	D	355	SER
10	L	207	THR
3	C	258	ARG
9	K	133	MET
9	K	130	PRO
3	C	269	VAL
15	W	138	VAL

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	307/372 (82%)	305 (99%)	2 (1%)	81	88
2	B	292/385 (76%)	290 (99%)	2 (1%)	81	88
3	C	314/352 (89%)	314 (100%)	0	100	100
4	D	333/366 (91%)	331 (99%)	2 (1%)	84	90
5	G	193/210 (92%)	192 (100%)	1 (0%)	86	91
6	H	164/191 (86%)	164 (100%)	0	100	100
7	I	193/221 (87%)	192 (100%)	1 (0%)	86	91
8	J	155/211 (74%)	155 (100%)	0	100	100
9	K	189/203 (93%)	189 (100%)	0	100	100
10	L	198/224 (88%)	198 (100%)	0	100	100
11	M	192/212 (91%)	191 (100%)	1 (0%)	86	91
12	U	159/816 (20%)	158 (99%)	1 (1%)	84	90
13	c	252/268 (94%)	252 (100%)	0	100	100
14	V	172/460 (37%)	172 (100%)	0	100	100
15	W	355/416 (85%)	328 (92%)	27 (8%)	11	34
16	X	303/362 (84%)	302 (100%)	1 (0%)	91	95
17	Y	334/344 (97%)	329 (98%)	5 (2%)	60	76
18	Z	257/295 (87%)	255 (99%)	2 (1%)	79	87
19	a	307/336 (91%)	305 (99%)	2 (1%)	81	88
20	b	167/312 (54%)	166 (99%)	1 (1%)	84	90
21	d	133/294 (45%)	132 (99%)	1 (1%)	79	87
22	e	12/63 (19%)	11 (92%)	1 (8%)	9	30
24	E	303/341 (89%)	302 (100%)	1 (0%)	91	95
25	F	286/379 (76%)	286 (100%)	0	100	100
All	All	5570/7633 (73%)	5519 (99%)	51 (1%)	74	86

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	297	ARG
1	A	312	ARG
2	B	164	MET
2	B	166	ASP
4	D	67	ASN
4	D	69	LYS
5	G	54	LYS
7	I	238	LYS
11	M	40	ARG
12	U	715	LYS
15	W	73	MET
15	W	75	TYR
15	W	79	GLU
15	W	80	TRP
15	W	83	LEU
15	W	85	GLU
15	W	89	LEU
15	W	93	ARG
15	W	96	GLN
15	W	99	GLN
15	W	101	VAL
15	W	104	MET
15	W	105	VAL
15	W	106	GLN
15	W	107	GLN
15	W	113	GLU
15	W	116	THR
15	W	124	LEU
15	W	135	LYS
15	W	137	TYR
15	W	140	ILE
15	W	141	GLU
15	W	154	GLU
15	W	159	VAL
15	W	169	LEU
15	W	173	THR
15	W	262	LYS
16	X	420	LYS
17	Y	202	LEU
17	Y	204	THR
17	Y	205	VAL
17	Y	207	THR
17	Y	213	LEU

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Mol	Chain	Res	Type
18	Z	109	ASN
18	Z	282	ASN
19	a	219	HIS
19	a	231	GLN
20	b	137	ASN
21	d	110	ASN
22	e	57	ARG
24	E	262	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
4	D	48	GLN
4	D	257	ASN
15	W	96	GLN
15	W	106	GLN
19	a	62	ASN
20	b	34	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 11 ligands modelled in this entry, 5 are monoatomic - leaving 6 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	$\#|Z| > 2$
26	ATP	B	501	27	26,33,33	0.62	0	31,52,52	0.78	2 (6%)
26	ATP	A	501	27	26,33,33	0.62	0	31,52,52	0.83	2 (6%)
28	ADP	C	501	-	24,29,29	0.94	1 (4%)	29,45,45	1.48	4 (13%)
26	ATP	D	501	27	26,33,33	0.63	0	31,52,52	0.75	1 (3%)
26	ATP	E	401	27	26,33,33	0.63	0	31,52,52	0.83	3 (9%)
28	ADP	F	501	27	24,29,29	1.00	1 (4%)	29,45,45	1.43	3 (10%)

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
26	ATP	B	501	27	-	6/18/38/38	0/3/3/3
26	ATP	A	501	27	-	5/18/38/38	0/3/3/3
28	ADP	C	501	-	-	4/12/32/32	0/3/3/3
26	ATP	D	501	27	-	9/18/38/38	0/3/3/3
26	ATP	E	401	27	-	10/18/38/38	0/3/3/3
28	ADP	F	501	27	-	5/12/32/32	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
28	F	501	ADP	C5-C4	2.53	1.47	1.40
28	C	501	ADP	C5-C4	2.41	1.47	1.40

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
28	F	501	ADP	PA-O3A-PB	-4.48	117.45	132.83
28	C	501	ADP	PA-O3A-PB	-3.98	119.18	132.83
28	C	501	ADP	N3-C2-N1	-3.06	123.90	128.68
28	C	501	ADP	C3'-C2'-C1'	2.80	105.20	100.98
28	C	501	ADP	C4-C5-N7	-2.75	106.53	109.40
28	F	501	ADP	N3-C2-N1	-2.69	124.48	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
28	F	501	ADP	C4-C5-N7	-2.65	106.64	109.40
26	B	501	ATP	C5-C6-N6	2.32	123.88	120.35
26	A	501	ATP	C5-C6-N6	2.29	123.83	120.35
26	E	401	ATP	C5-C6-N6	2.27	123.80	120.35
26	D	501	ATP	C5-C6-N6	2.27	123.80	120.35
26	E	401	ATP	C3'-C2'-C1'	2.03	104.04	100.98
26	E	401	ATP	PB-O3B-PG	2.03	139.78	132.83
26	A	501	ATP	PB-O3B-PG	2.01	139.72	132.83
26	B	501	ATP	PB-O3B-PG	2.01	139.72	132.83

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
26	A	501	ATP	C5'-O5'-PA-O1A
26	A	501	ATP	C5'-O5'-PA-O2A
26	B	501	ATP	C5'-O5'-PA-O1A
26	B	501	ATP	C5'-O5'-PA-O2A
26	D	501	ATP	PB-O3B-PG-O2G
26	D	501	ATP	C5'-O5'-PA-O1A
26	E	401	ATP	PB-O3B-PG-O2G
26	E	401	ATP	C5'-O5'-PA-O1A
26	E	401	ATP	C5'-O5'-PA-O2A
26	E	401	ATP	O4'-C4'-C5'-O5'
26	E	401	ATP	C3'-C4'-C5'-O5'
28	C	501	ADP	C5'-O5'-PA-O2A
28	C	501	ADP	C5'-O5'-PA-O3A
28	F	501	ADP	C5'-O5'-PA-O1A
28	F	501	ADP	C5'-O5'-PA-O3A
26	A	501	ATP	O4'-C4'-C5'-O5'
26	A	501	ATP	C3'-C4'-C5'-O5'
26	D	501	ATP	O4'-C4'-C5'-O5'
26	D	501	ATP	C3'-C4'-C5'-O5'
28	F	501	ADP	O4'-C4'-C5'-O5'
28	F	501	ADP	C3'-C4'-C5'-O5'
26	D	501	ATP	PB-O3A-PA-O1A
26	B	501	ATP	PA-O3A-PB-O2B
28	C	501	ADP	C3'-C4'-C5'-O5'
26	B	501	ATP	PG-O3B-PB-O2B
28	F	501	ADP	C4'-C5'-O5'-PA
26	E	401	ATP	PG-O3B-PB-O1B
28	C	501	ADP	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
26	D	501	ATP	PB-O3B-PG-O3G
26	E	401	ATP	PB-O3B-PG-O3G
26	A	501	ATP	C5'-O5'-PA-O3A
26	B	501	ATP	C5'-O5'-PA-O3A
26	D	501	ATP	C5'-O5'-PA-O3A
26	E	401	ATP	C5'-O5'-PA-O3A
26	B	501	ATP	PA-O3A-PB-O1B
26	D	501	ATP	PB-O3A-PA-O2A
26	E	401	ATP	PG-O3B-PB-O2B
26	D	501	ATP	PB-O3B-PG-O1G
26	E	401	ATP	PB-O3B-PG-O1G

There are no ring outliers.

No monomer is involved in short contacts.

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

Ligand ATP B 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ADP C 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP D 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP E 401

Bond lengths

Bond angles

Torsions

Rings

Ligand ADP F 501

Bond lengths

Bond angles

Torsions

Rings
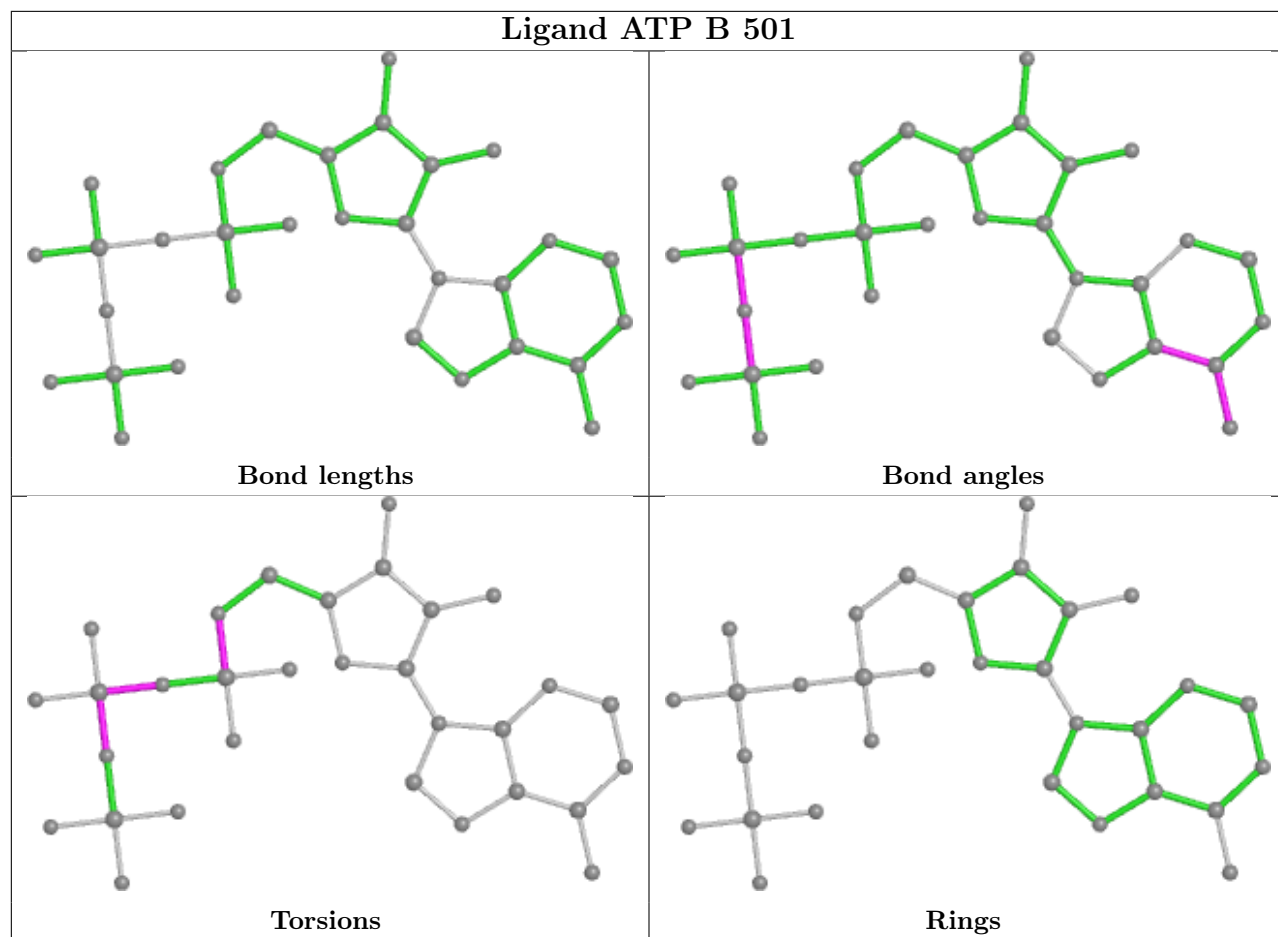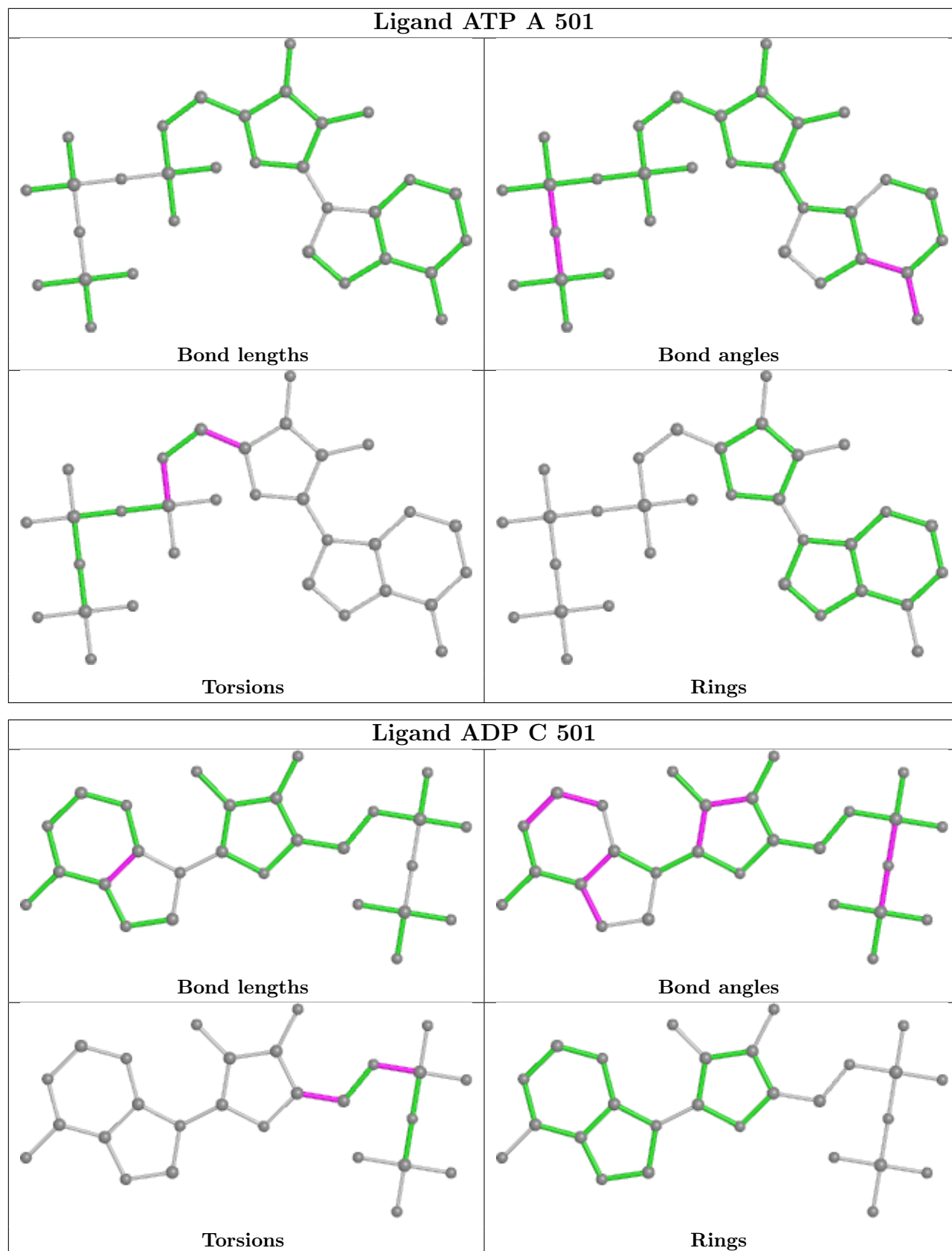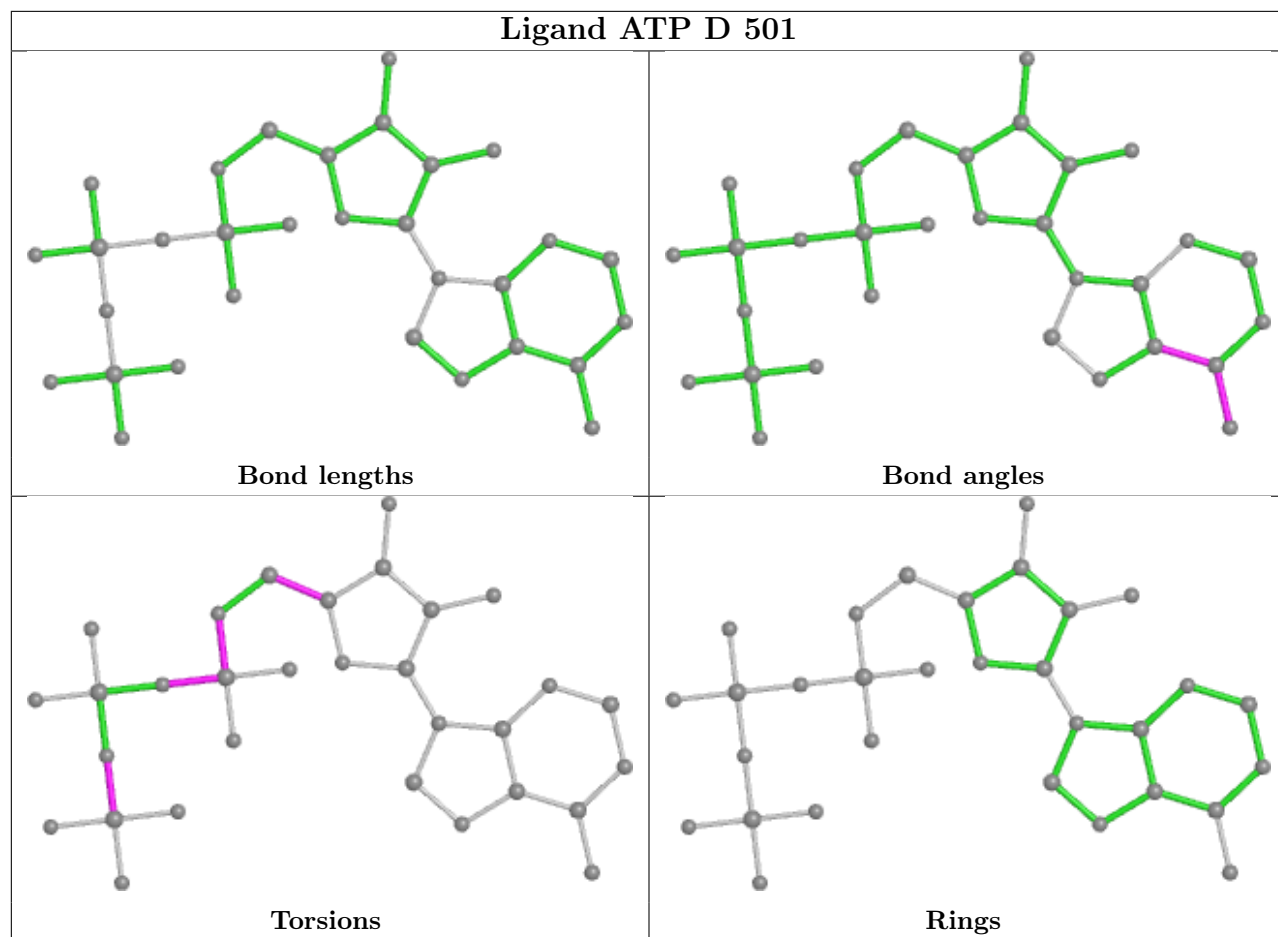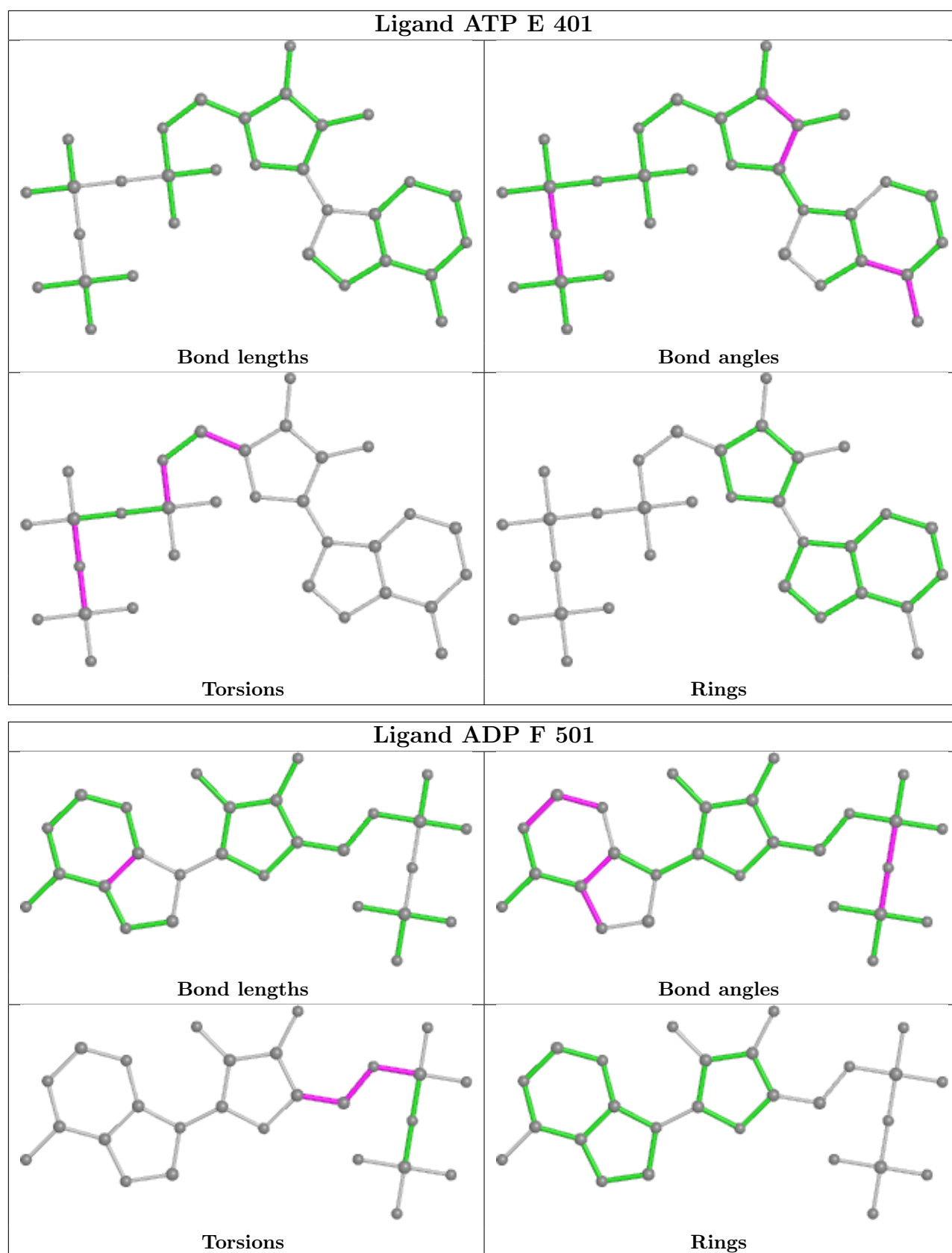
5.7 Other polymers ⓘ

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-36598. 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 ⓘ
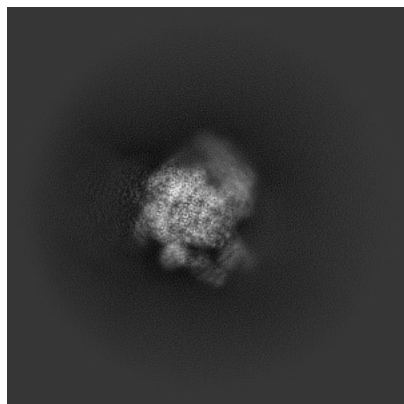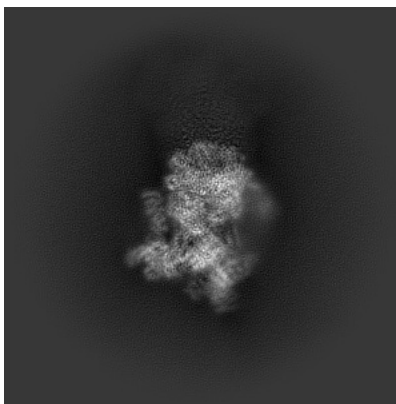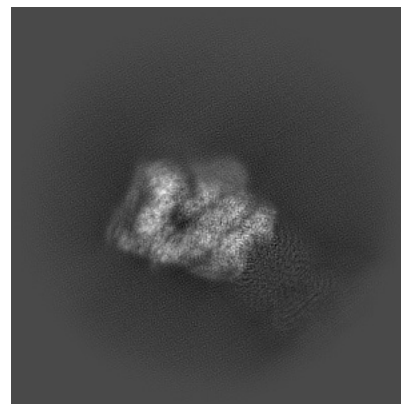
6.1.1　Primary map

X　　　　　　　Y　　　　　　　Z

6.1.2　Raw map

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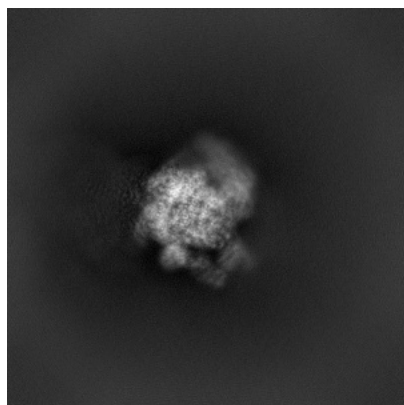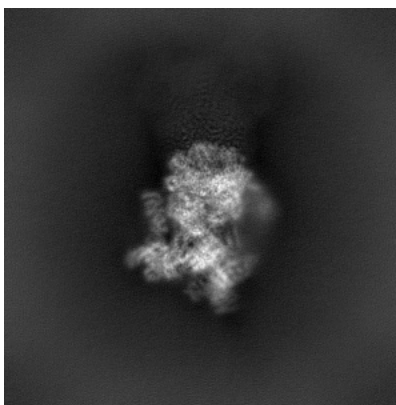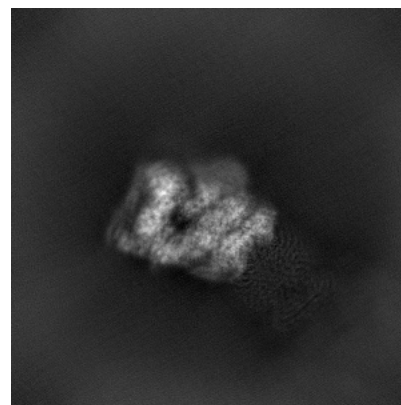
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map
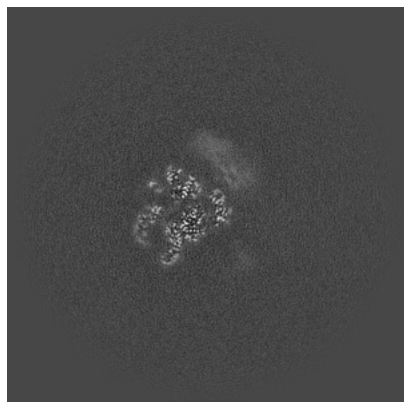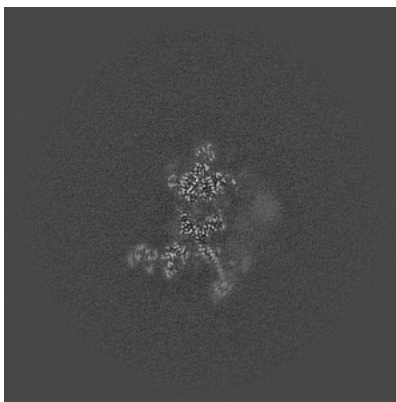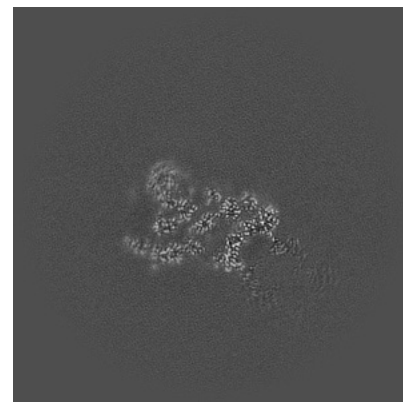
X Index: 200   Y Index: 200   Z Index: 200

6.2.2 Raw map
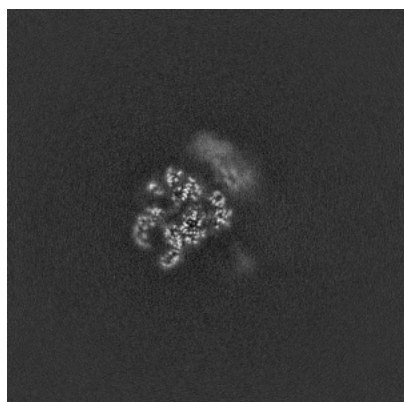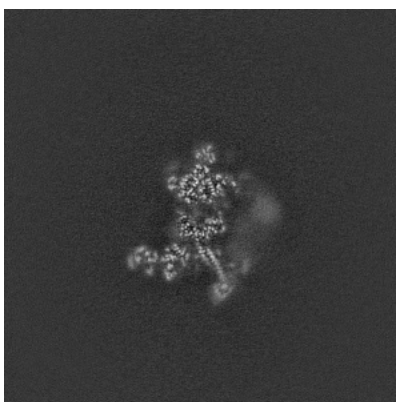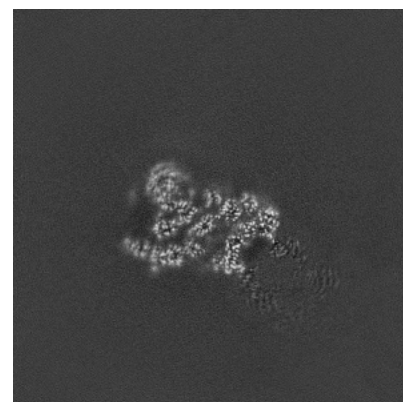
X Index: 200   Y Index: 200   Z Index: 200

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

6.3 Largest variance slices (i)

6.3.1 Primary map
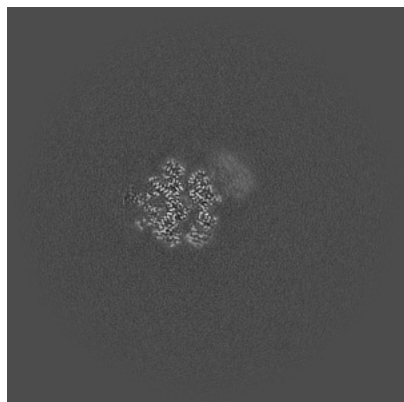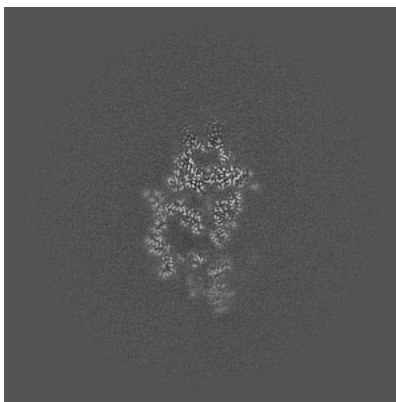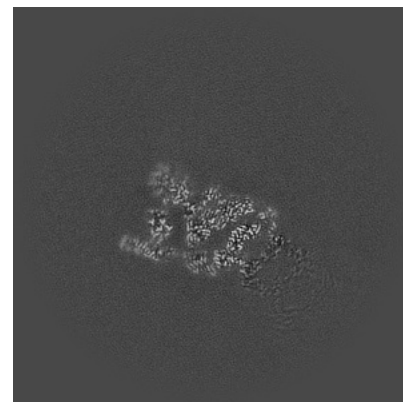
| X Index: 226 | Y Index: 170 | Z Index: 190 |

6.3.2 Raw map
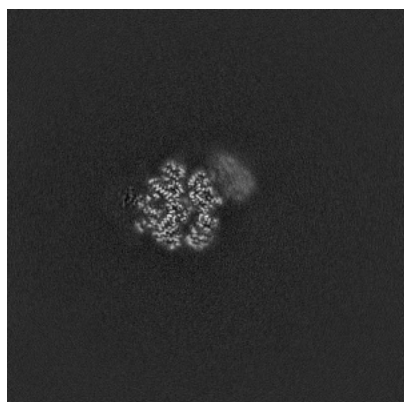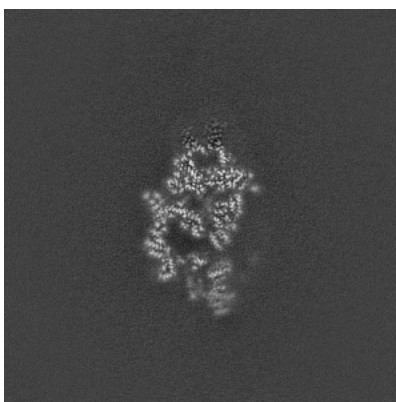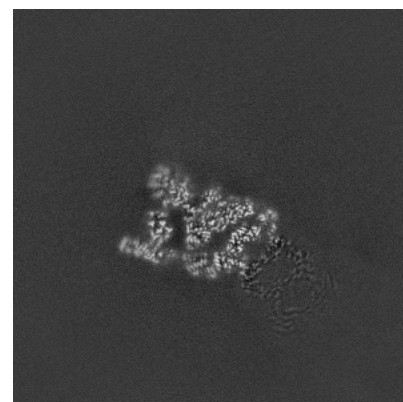
| X Index: 226 | Y Index: 170 | Z Index: 190 |

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

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

6.4.1 Primary map
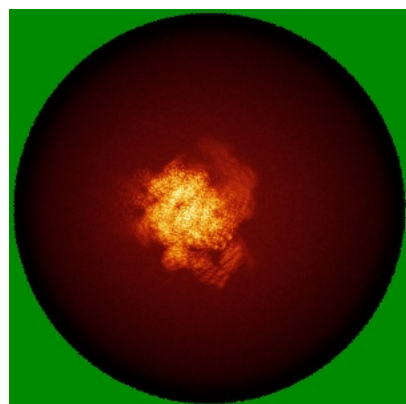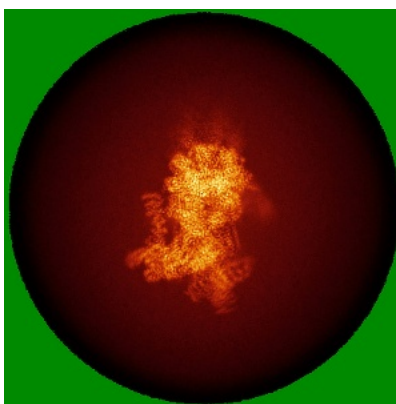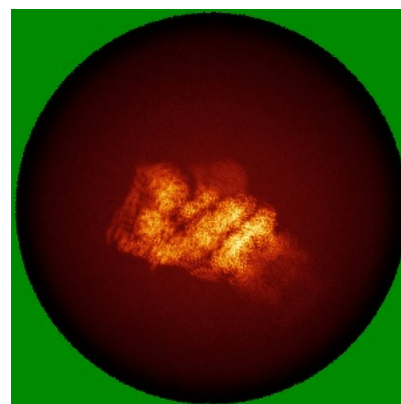
| X | Y | Z |

6.4.2 Raw map

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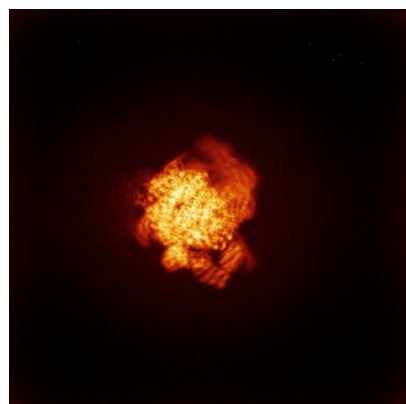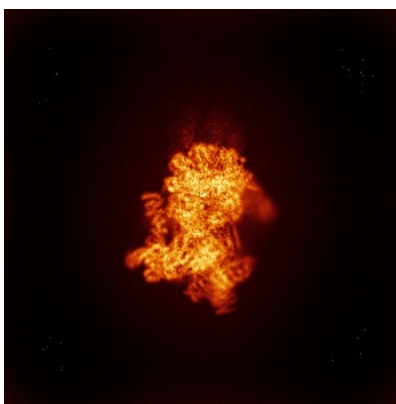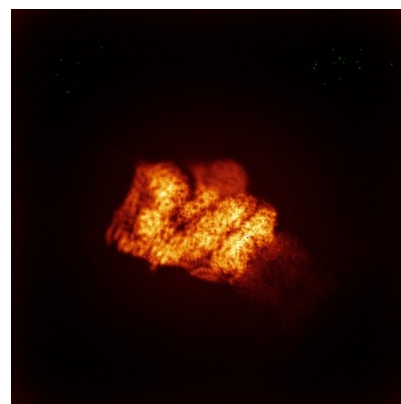
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z
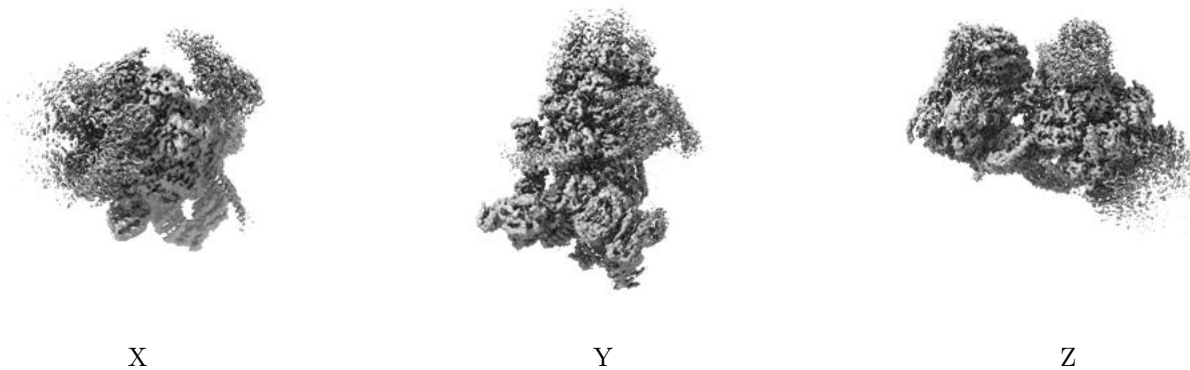
The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

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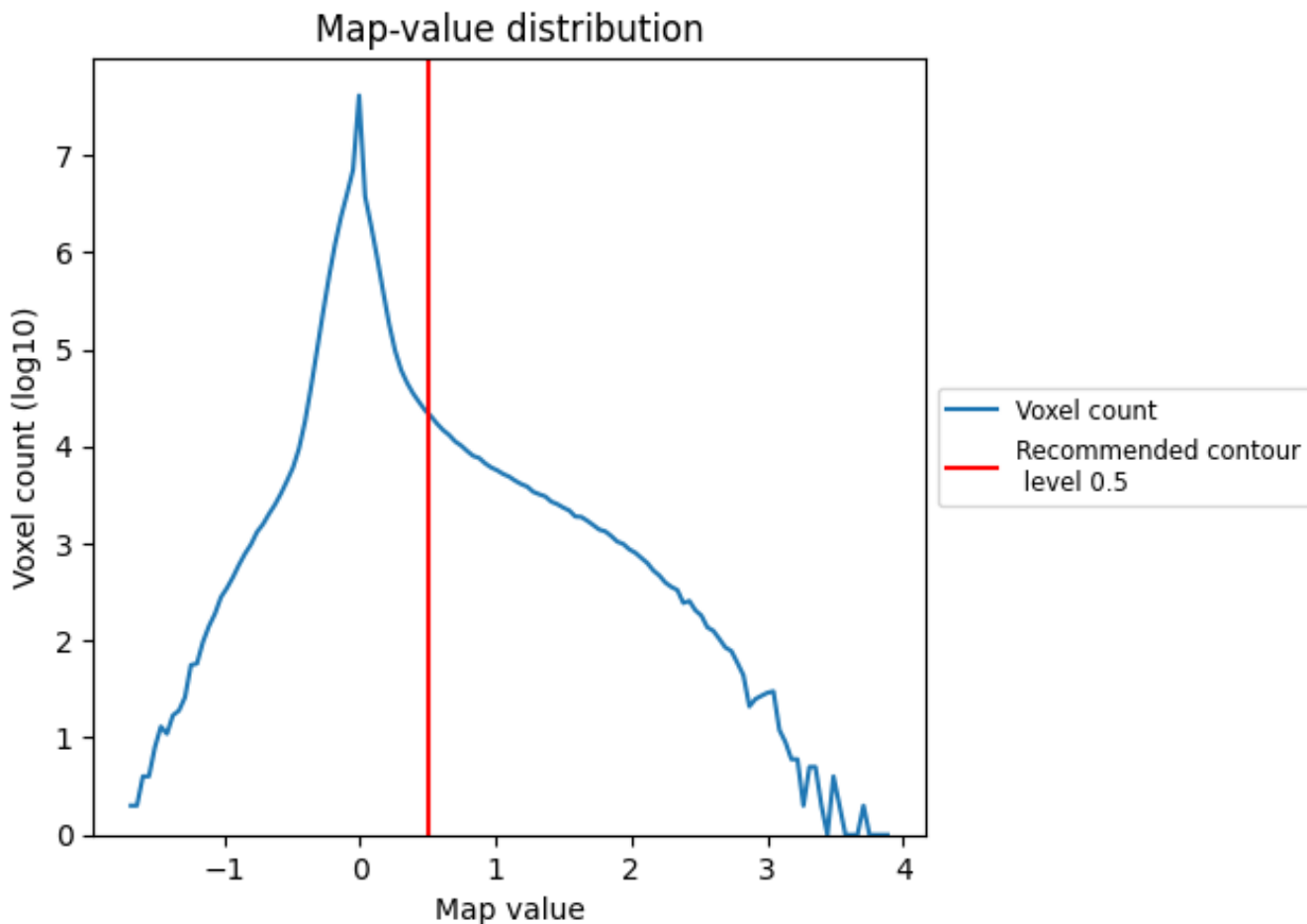
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
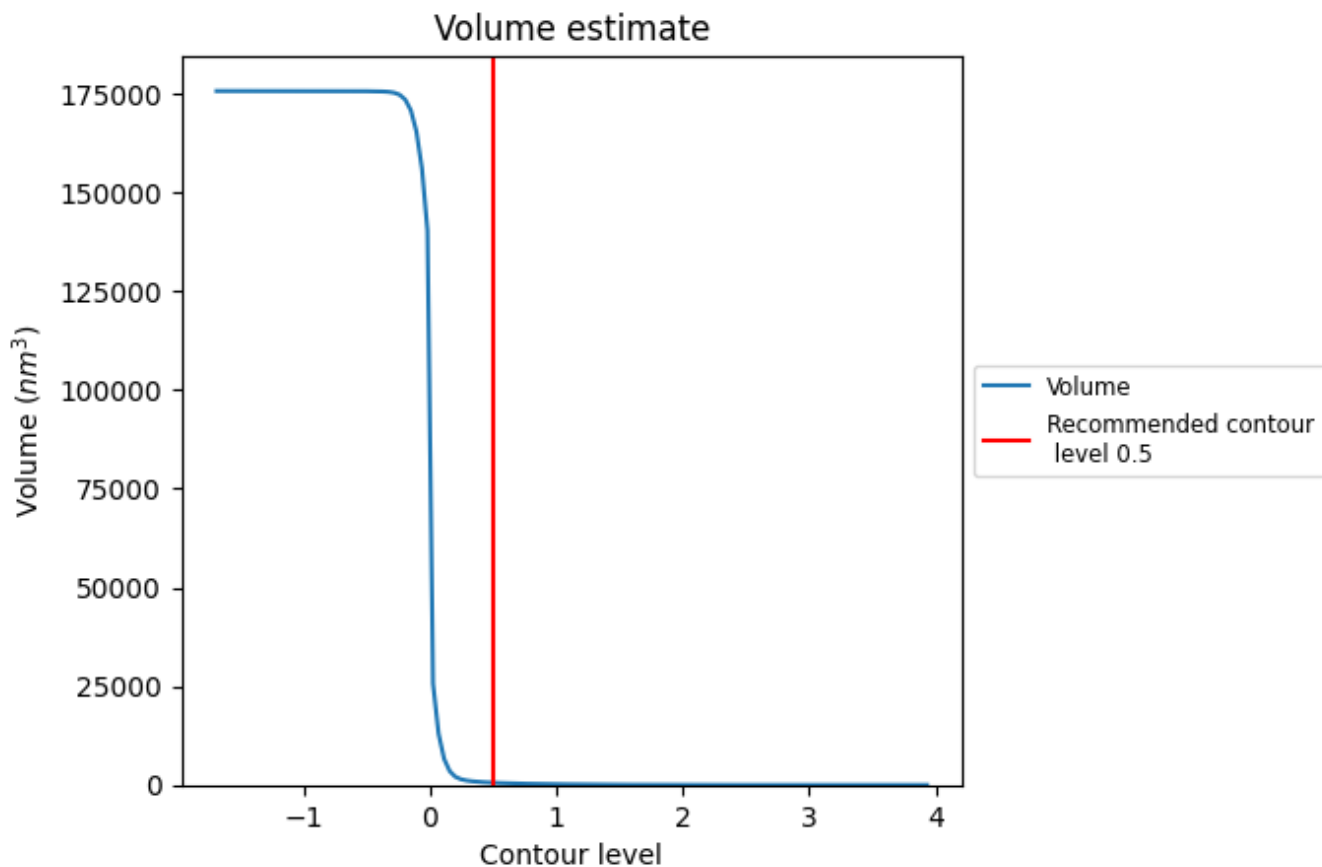
The volume at the recommended contour level is 557 nm^3; this corresponds to an approximate mass of 504 kDa.

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

7.3 Rotationally averaged power spectrum (i)
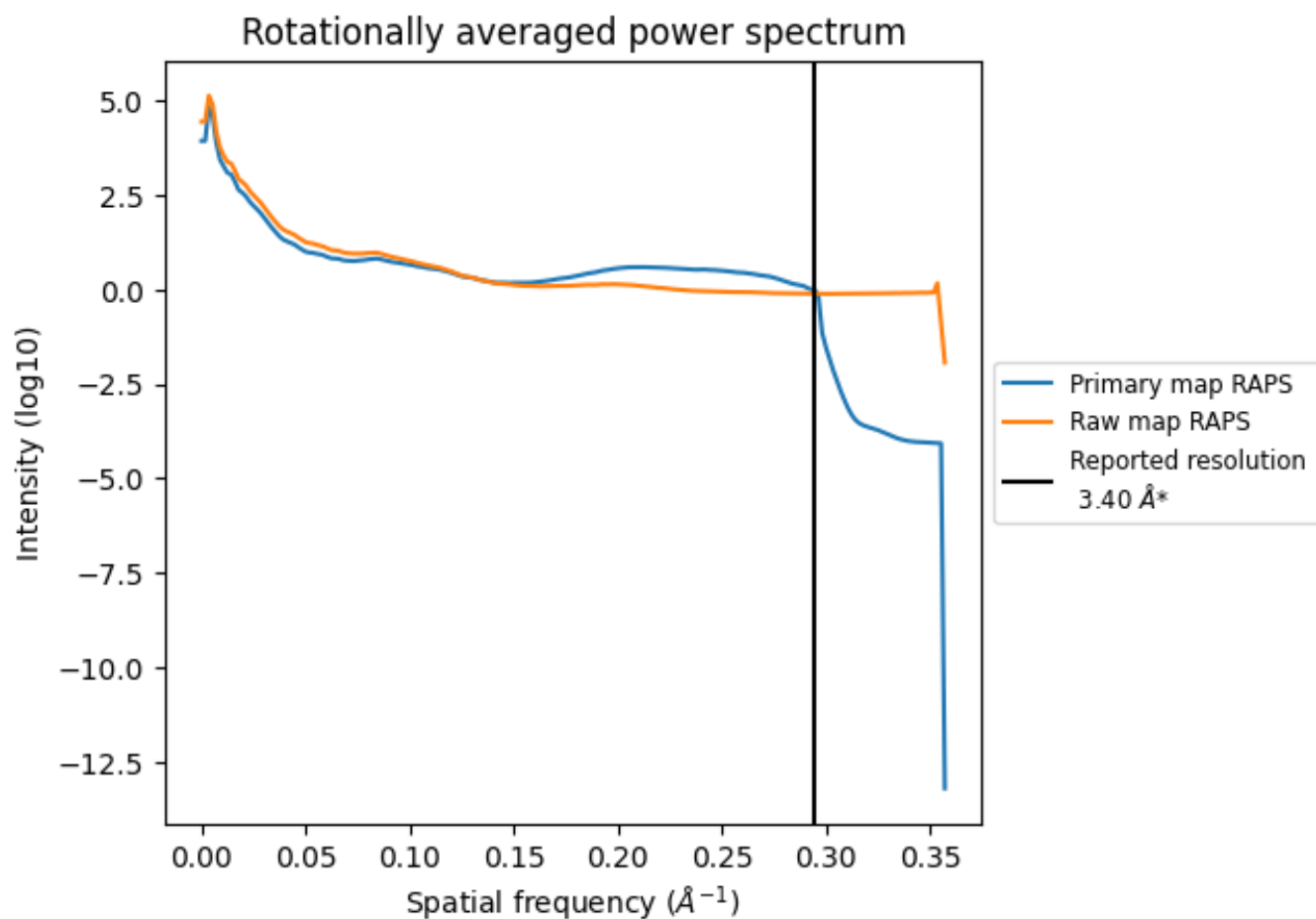
*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

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 ⓘ
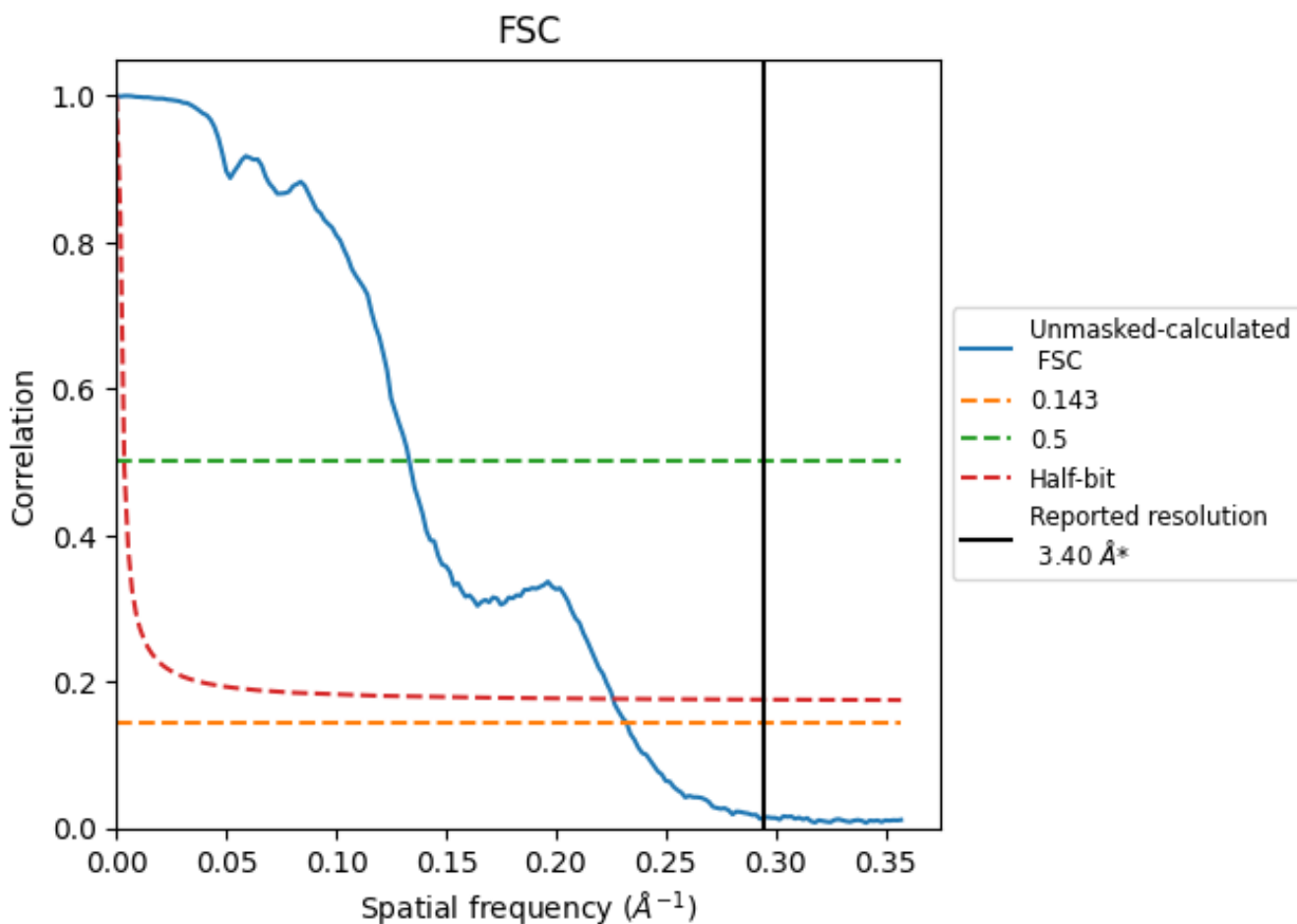
*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.30	7.50	4.42

*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 4.30 differs from the reported value 3.4 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-36598 and PDB model 8JRI. Per-residue inclusion information can be found in section 3 on page 10.

9.1 Map-model overlay ⓘ

X   Y   Z
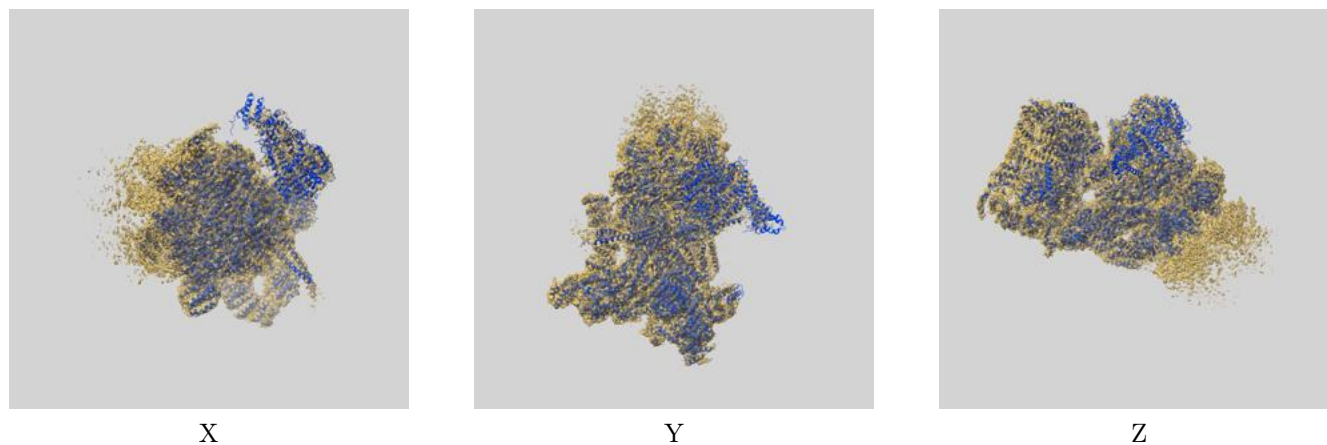
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

X Y Z
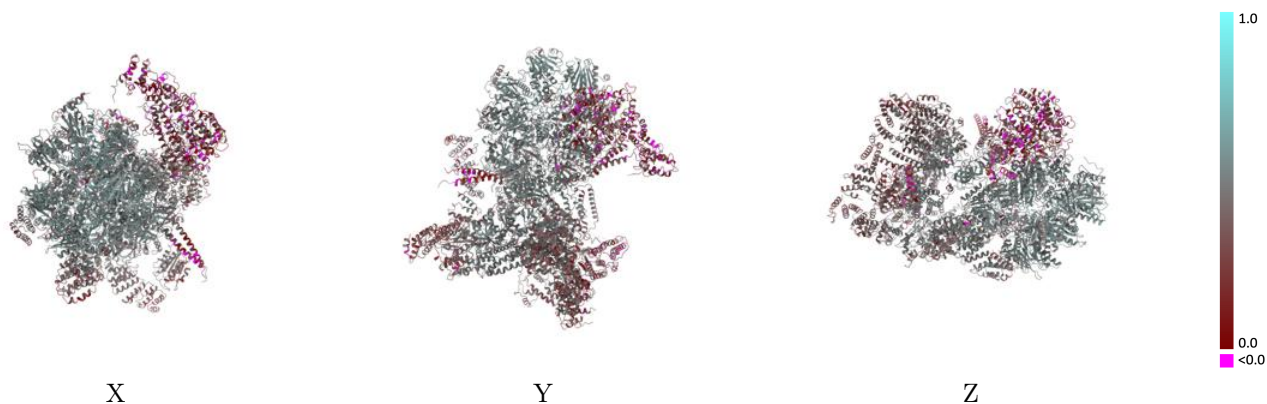
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
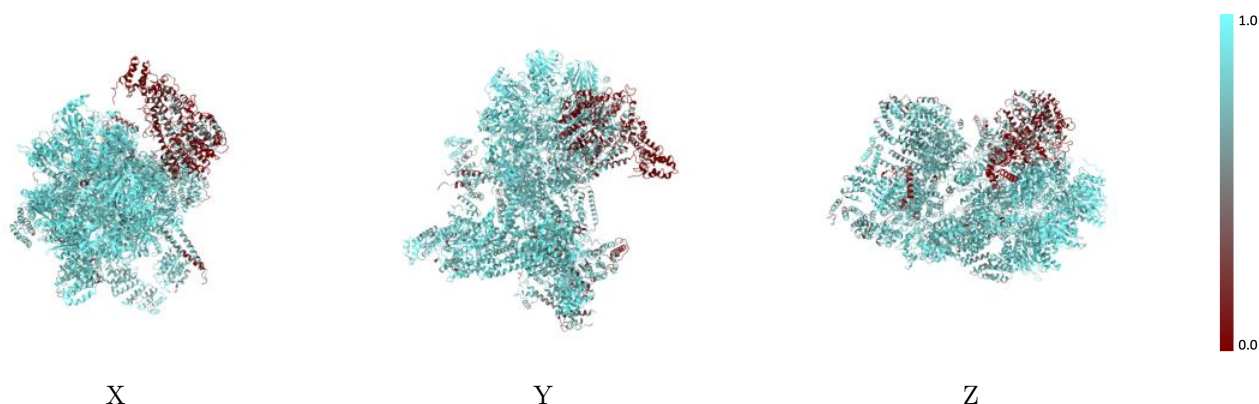
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.5).

9.4　Atom inclusion ⓘ
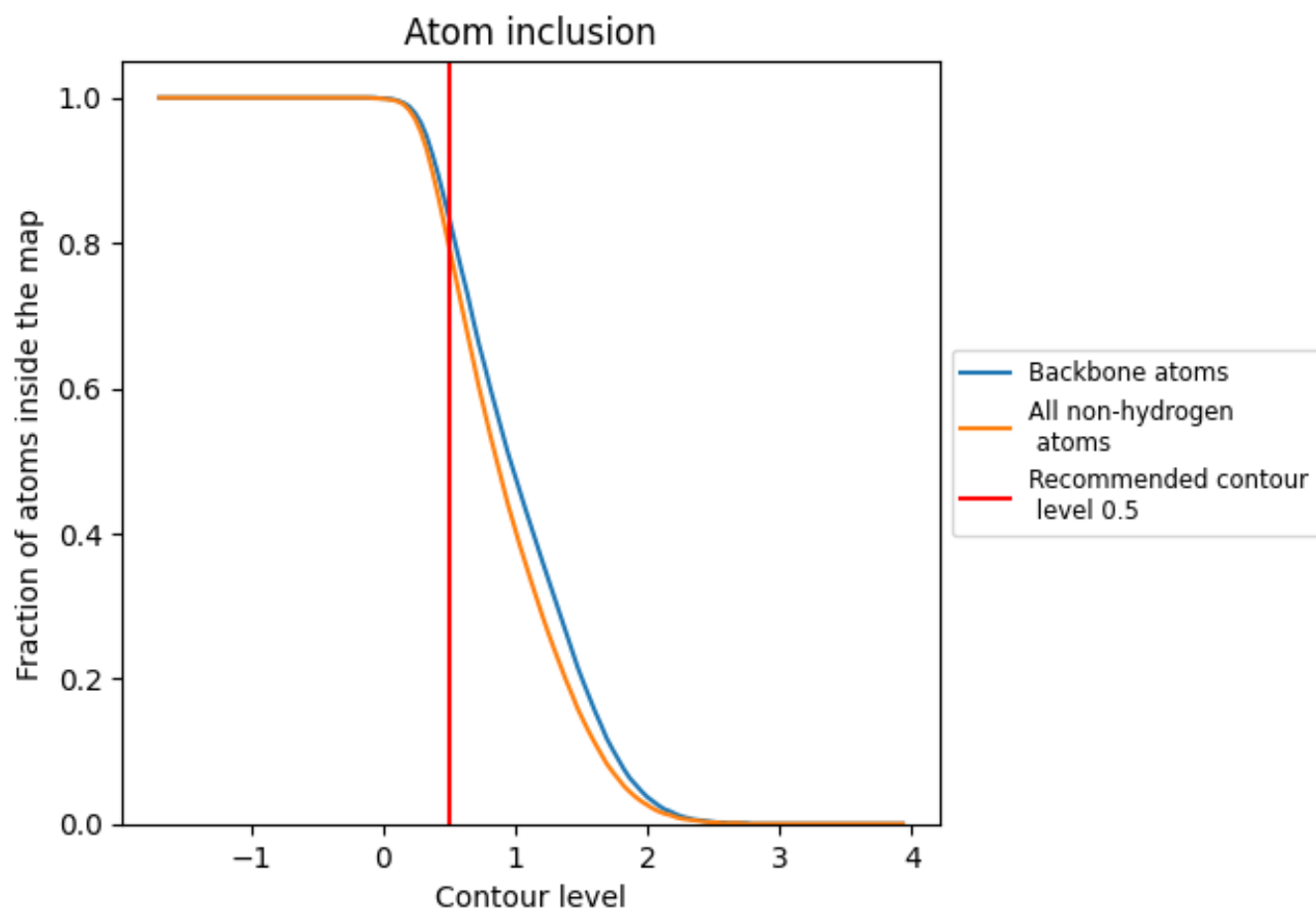
At the recommended contour level, 84% of all backbone atoms, 80% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7960	0.4430
A	0.8480	0.4840
B	0.8140	0.4760
C	0.8470	0.4900
D	0.8520	0.4940
E	0.8740	0.4970
F	0.8820	0.5050
G	0.9310	0.5310
H	0.9290	0.5310
I	0.8970	0.5020
J	0.9220	0.5170
K	0.9220	0.5300
L	0.9310	0.5350
M	0.9140	0.5180
U	0.7800	0.3730
V	0.7040	0.3580
W	0.8150	0.4050
X	0.7650	0.4450
Y	0.8510	0.4470
Z	0.8570	0.4750
a	0.8430	0.4010
b	0.7950	0.3580
c	0.8540	0.4770
d	0.6880	0.3610
e	0.7800	0.3820
f	0.2090	0.2270

1.0

0.0
<0.0