wwPDB EM Validation Summary Report (i)

Dec 10, 2022 – 12:29 pm GMT

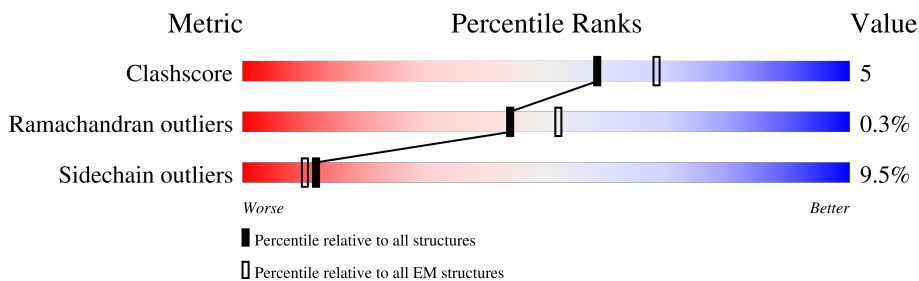|		
PDB ID	:	6QM7
EMDB ID	:	EMD-4590
Title	:	Leishmania tarentolae proteasome 20S subunit complexed with GSK3494245
Authors	:	Rowland, P.; Goswami, P.
Deposited on	:	2019-02-01
Resolution	:	2.80 Å(reported)
Based on initial model	:	4R3O

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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 2.80 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.
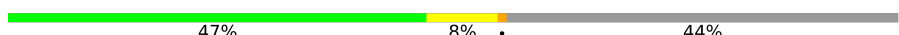
Metric	Percentile Ranks	Value
Clashscore		5
Ramachandran outliers		0.3%
Sidechain outliers		9.5%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures
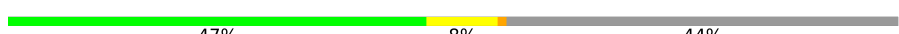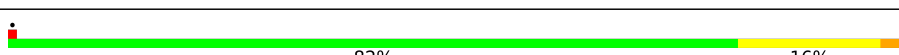
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	250	82% 14% ••
1	O	250	82% 15% ••
2	B	231	81% 16% ••
2	P	231	81% 16% ••
3	C	285	80% 15% • •
3	Q	285	79% 16% ••
4	D	248	77% 18% • •
4	R	248	76% 19% • •

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Mol	Chain	Length	Quality of chain
5	E	344	57% 9% · 33%
5	S	344	56% 10% · 33%
6	F	428	47% 8% · 44%
6	T	428	47% 8% · 44%
7	G	238	78% 15% · ·
7	U	238	79% 16% · ·
8	H	283	67% 13% · 19%
8	V	283	67% 13% · 19%
9	I	254	68% 17% · 14%
9	W	254	69% 17% · 14%
10	J	205	83% 14% ·
10	X	205	80% 18% ·
11	K	206	82% 16% ·
11	Y	206	81% 17% ·
12	L	302	58% 9% 33%
12	Z	302	58% 9% 33%
13	M	339	46% 15% · 37%
13	a	339	56% 7% 37%
14	N	220	80% 17% · ·
14	b	220	93% 6% ·

2   Entry composition ⓘ

There are 16 unique types of molecules in this entry. The entry contains 49518 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 Proteasome alpha1 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	244	Total	C	N	O	S	0	0
			1857	1169	323	353	12		
1	O	244	Total	C	N	O	S	0	0
			1857	1169	323	353	12		

- Molecule 2 is a protein called Proteasome alpha2 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	229	Total	C	N	O	S	0	0
			1754	1112	292	342	8		
2	P	229	Total	C	N	O	S	0	0
			1754	1112	292	342	8		

- Molecule 3 is a protein called Proteasome alpha3 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	276	Total	C	N	O	S	0	0
			2195	1379	382	422	12		
3	Q	276	Total	C	N	O	S	0	0
			2195	1379	382	422	12		

- Molecule 4 is a protein called Proteasome alpha4 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	239	Total	C	N	O	S	0	0
			1873	1180	322	363	8		
4	R	239	Total	C	N	O	S	0	0
			1873	1180	322	363	8		

- Molecule 5 is a protein called Proteasome alpha5 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	229	Total 1756	C 1094	N 302	O 347	S 13	0	0
5	S	229	Total 1756	C 1094	N 302	O 347	S 13	0	0

- Molecule 6 is a protein called Proteasome alpha6 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	238	Total 1869	C 1173	N 325	O 359	S 12	0	0
6	T	238	Total 1869	C 1173	N 325	O 359	S 12	0	0

- Molecule 7 is a protein called Proteasome alpha7 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	228	Total 1727	C 1077	N 306	O 334	S 10	0	0
7	U	228	Total 1727	C 1077	N 306	O 334	S 10	0	0

- Molecule 8 is a protein called Proteasome beta1 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	229	Total 1710	C 1062	N 295	O 341	S 12	0	0
8	V	229	Total 1710	C 1062	N 295	O 341	S 12	0	0

- Molecule 9 is a protein called Proteasome beta2 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	219	Total 1659	C 1037	N 292	O 318	S 12	0	0
9	W	219	Total 1659	C 1037	N 292	O 318	S 12	0	0

- Molecule 10 is a protein called Proteasome beta3 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	204	Total 1557	C 980	N 259	O 302	S 16	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
10	X	204	Total 1557	C 980	N 259	O 302	S 16	0	0

- Molecule 11 is a protein called Proteasome beta4 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	206	Total 1612	C 1012	N 280	O 304	S 16	0	0
11	Y	206	Total 1612	C 1012	N 280	O 304	S 16	0	0

- Molecule 12 is a protein called Proteasome beta5 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	202	Total 1579	C 998	N 277	O 297	S 7	0	0
12	Z	202	Total 1579	C 998	N 277	O 297	S 7	0	0

- Molecule 13 is a protein called Proteasome beta6 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	214	Total 1702	C 1079	N 287	O 324	S 12	0	0
13	a	214	Total 1702	C 1079	N 287	O 324	S 12	0	0

- Molecule 14 is a protein called Proteasome beta7 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	218	Total 1712	C 1083	N 292	O 323	S 14	0	0
14	b	218	Total 1712	C 1083	N 292	O 323	S 14	0	0

- Molecule 15 is {N}-[4-fluoranyl-3-(3-morpholin-4-ylimidazo[1,2-a]pyrimidin-7-yl)phenyl]pyrrolidine-1-carboxamide (three-letter code: J6E) (formula: $C_{21}H_{23}FN_6O_2$) (labeled as "Ligand of Interest" by depositor).

J6E
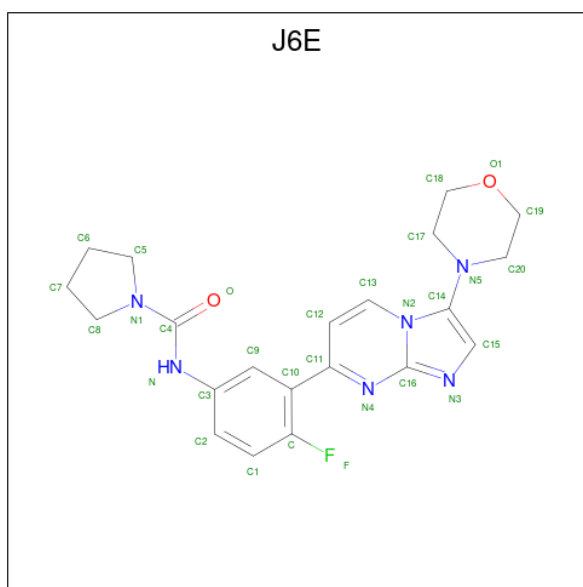
Mol	Chain	Residues	Atoms					AltConf
15	L	1	Total 30	C 21	F 1	N 6	O 2	0
15	Z	1	Total 30	C 21	F 1	N 6	O 2	0

- Molecule 16 is water.

Mol	Chain	Residues	Atoms		AltConf
16	A	9	Total 9	O 9	0
16	B	9	Total 9	O 9	0
16	C	8	Total 8	O 8	0
16	D	6	Total 6	O 6	0
16	E	8	Total 8	O 8	0
16	F	8	Total 8	O 8	0
16	G	12	Total 12	O 12	0
16	H	21	Total 21	O 21	0
16	I	7	Total 7	O 7	0
16	J	15	Total 15	O 15	0

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WORLDWIDE
PDB
PROTEIN DATA BANK

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Mol	Chain	Residues	Atoms		AltConf
16	K	9	Total 9	O 9	0
16	L	15	Total 15	O 15	0
16	M	13	Total 13	O 13	0
16	N	21	Total 21	O 21	0
16	O	11	Total 11	O 11	0
16	P	13	Total 13	O 13	0
16	Q	8	Total 8	O 8	0
16	R	9	Total 9	O 9	0
16	S	6	Total 6	O 6	0
16	T	8	Total 8	O 8	0
16	U	5	Total 5	O 5	0
16	V	19	Total 19	O 19	0
16	W	15	Total 15	O 15	0
16	X	23	Total 23	O 23	0
16	Y	8	Total 8	O 8	0
16	Z	17	Total 17	O 17	0
16	a	11	Total 11	O 11	0
16	b	20	Total 20	O 20	0

3 Residue-property plots ⓘ

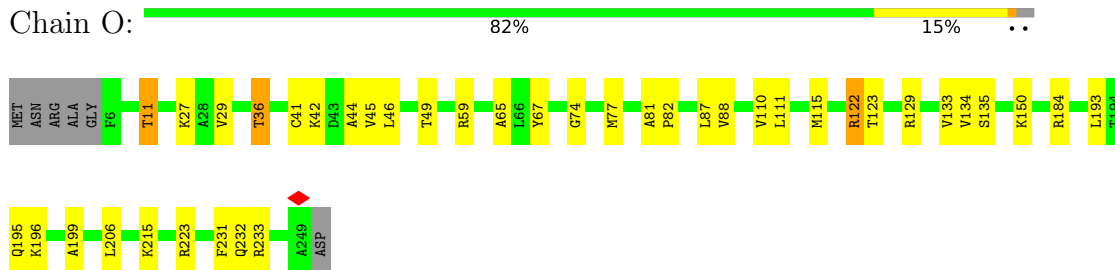These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.
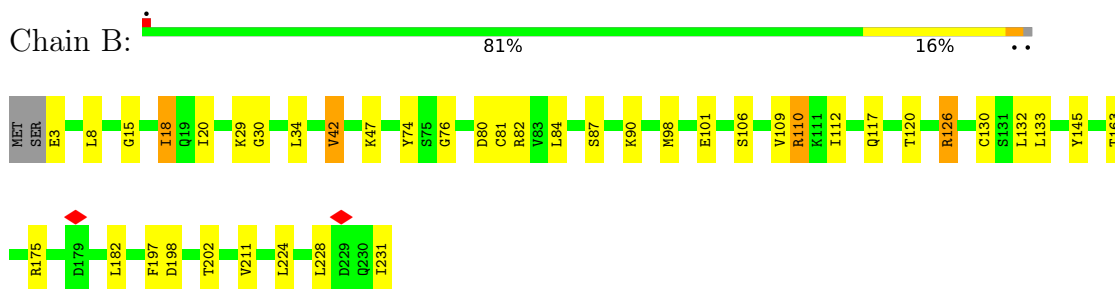
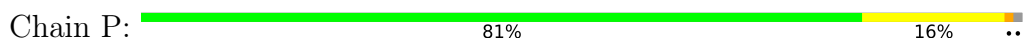- Molecule 1: Proteasome alpha1 chain
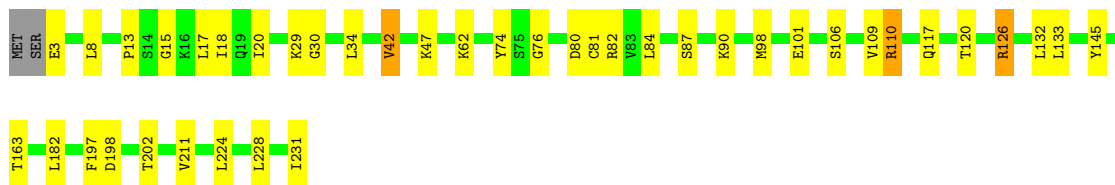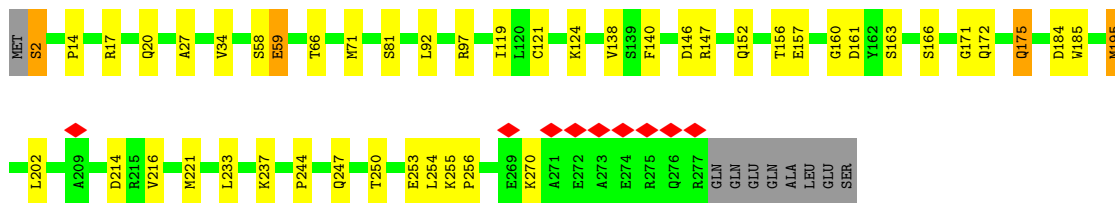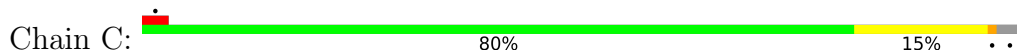
Chain A:

- Molecule 1: Proteasome alpha1 chain

Chain O:

- Molecule 2: Proteasome alpha2 chain

Chain B:

- Molecule 2: Proteasome alpha2 chain

Chain P:

MET SER E3 L8 P13 S14 G15 K16 L17 I18 Q19 I20 K29 G30 L34 V42 K47 K62 Y74 S75 G76 D80 C81 R82 V83 L84 S87 K90 M98 E101 S106 V109 R110 Q117 T120 R126 L132 L133 Y145

T163 L182 F197 D198 T202 V211 L224 L228 I231

• Molecule 3: Proteasome alpha3 chain

Chain C:

80%　　　　　15%

MET S2 P14 R17 Q20 A27 V34 S58 E59 T66 M71 S81 L92 R97 I119 L120 C121 K124 V138 S139 F140 D146 R147 Q152 T156 E157 G160 D161 Y162 S163 S166 G171 Q172 Q175 D184 W185 M195

L202 A209 D214 R215 V216 M221 L233 K237 P244 Q247 T250 E253 L254 K255 P256 E269 K270 A271 E272 A273 E274 R275 Q276 R277 GLN GLN GLU GLN ALA LEU GLU SER

• Molecule 3: Proteasome alpha3 chain

Chain Q:

79%　　　　　16%

MET S2 F12 S13 P14 R17 Q20 Y23 A27 V34 S58 E59 T66 M71 I78 G79 C80 S81 L92 R97 L116 I119 L120 C121 Y130 V138 S139 F140 L141 R147 T156 E157 G160 D161 Y162 S163 S166 G171 Q172

Q175 D184 W185 L191 M195 L202 D214 R215 V216 E217 V218 A219 V220 M221 L233 K237 P244 T250 E253 L254 E269 K270 A271 E272 R275 Q276 R277 GLN GLN GLU GLN ALA LEU GLU SER

• Molecule 4: Proteasome alpha4 chain

Chain D:

77%　　　　　18%

MET S2 R5 P12 Y21 E24 K28 V33 V42 S49 A50 T58 I59 R60 K61 V65 Y70 L71 R81 K86 E90 C91 Q92 E99 M102 L107 Y110 Q115 S124 T131 F136 P142 D148 P149 M152

M172 D178 V186 L193 L194 V197 E198 S199 R202 N203 I204 E205 L206 L209 T218 K231 E235 E236 A237 A238 A239 K240 LYS LYS ARG GLN ALA GLU GLN GLU

• Molecule 4: Proteasome alpha4 chain

Chain R:

76%　　　　　19%

MET S2 R5 P12 Q18 Y21 E24 K28 V42 S49 A50 R60 K61 K64 V65 Y70 L71 R81 K86 E90 C91 Q92 Y98 E99 M102 L107 V108 R109 Y110 Q115 S124 T131 F136 P142 W145 D148

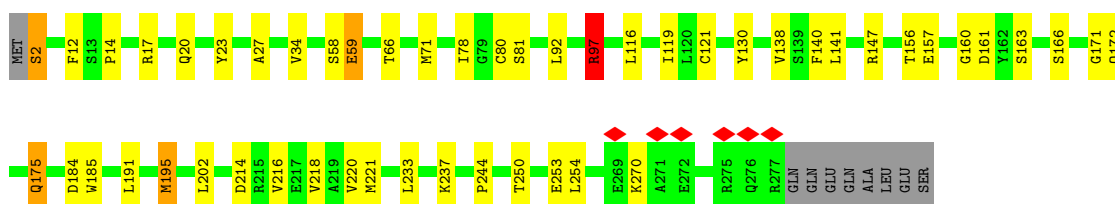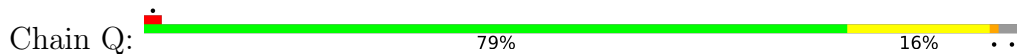P149 M152 C153 S154 S175 D178 V186 L193 L194 V197 R202 N203 I204 E205 L206 L209 T218 K231 E224 E235 E236 A237 A238 A239 K240 LYS LYS ARG GLN ALA GLU GLN GLU

• Molecule 5: Proteasome alpha5 chain

Chain E:

57%   9%   ·   33%

MET LEU LEU PRO ARG LEU PHE SER PHE PRO VAL CYS TRP SER ARG ALA LEU LEU SER LEU VAL CYS VAL TYR HIS VAL SER LEU SER PHE PRO SER ASN SER ARG ARG LEU CYS ALA THR PRO LEU LEU PRO LEU PRO CYS LEU CYS LYS LEU PRO ALA GLY HIS SER PRO ARG LYS ARG CYS

LEU PHE SER LEU SER CYS PHE LEU ASP LEU THR TYR PHE CYS ILE ILE SER PHE LEU HIS SER VAL SER CYS HIS LEU CYS PHE PRO LEU ARG ARG THR ARG ALA ARG HIS PRO ILE MET PHE THR SER LYS SER **E107** **Y108** **D109** **N113** **E118** **I121** **L138** **G139** **I140**

A149 **A150** **S156** **A175** **A176** **V177** **A185** **L188** **Q197** **N204** **E205** **L219** **S220** **I221** **Q222** **F223** **G224** GLU SER GLY GLY ARG ARG LYS **L232** **V239** **Q255** **S259** **T263** **Q268** **A269** **I270** **Q278** **S279** **V280** **R287** **I301** **E307** **S311** **R321** **K326**

L327 **M342** PRO GLU

• Molecule 5: Proteasome alpha5 chain

Chain S:

56%   10%   ·   33%

MET LEU LEU PRO ARG LEU PHE SER PHE PRO VAL CYS TRP SER ARG ALA LEU LEU SER LEU VAL CYS VAL TYR HIS VAL SER LEU SER PHE PRO SER ASN SER ARG ARG LEU CYS ALA THR PRO LEU LEU PRO LEU PRO CYS LEU CYS LYS LEU PRO ALA GLY HIS SER PRO ARG LYS ARG CYS

LEU PHE SER PHE LEU SER CYS PHE LEU ASP LEU THR TYR PHE CYS ILE ILE SER PHE LEU HIS SER VAL SER CYS HIS LEU CYS PHE PRO LEU ARG ARG THR ARG ALA ARG HIS PRO ILE MET PHE THR SER LYS SER **E107** **Y108** **D109** **E118** **I131** **I140** **L148** **A149** **A150**

S156 **A175** **A176** **V177** **A185** **L188** **Q197** **T213** **L219** **S220** **G224** GLU SER GLY GLY ARG ARG LYS **L232** **V239** **S240** **A244** **W254** **Q255** **S259** **Q268** **A269** **I270** **Q278** **S279** **V280** **E283** **R284** **R287** **D300** **I301** **E307** **S311** **K326** **L327**

E334 **M342** PRO GLU

• Molecule 6: Proteasome alpha6 chain

Chain F:

47%   8%   ·   44%

MET GLN SER ARG GLY GLY GLY TRP ASP THR GLY ASP THR ASP SER SER LEU PRO PRO PHE SER CYS SER PRO ALA PHE SER SER PRO LEU ALA PHE GLY GLU GLY ALA ASP GLY CYS ALA TYR ALA ALA CYS ILE ALA ALA LEU THR LEU

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

ARG SER PHE SER LEU LYS LYS SER GLU GLY LYS ASN GLN GLN ARG ARG LEU GLN ALA PRO ASP SER GLN LYS THR ARG THR GLN LYS GLU LYS GLN THR LEU GLN ILE TYR LEU ARG CYS VAL MET PHE LYS **N168** **S172** **I186** **V193** **T199** **V200** **K203**

E220 **E230** **I231** **V235** **G236** **M237** **S238** **I239** **M273** **A274** **I277** **K280** **H281** **Q282** **I285** **R291** **G296** **L297** **L298** **L299** **V313** **V318** **A325** **Q331** **K358** **S362** **E366** **G367** **I368** **V372** **I379** **F389** **E392** **R395** **L398** **M403** **R404** **P405**

GLU ASP ARG VAL ALA VAL ALA GLU GLU GLU GLY MET LEU HIS GLY GLN PRO LEU ASP VAL GLU GLU

● Molecule 6: Proteasome alpha6 chain

Chain T:

47%　　8%　　44%

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

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

ARG SER PHE SER LEU LYS LYS GLU SER LYS ASN GLN GLN ARG ARG LEU GLN ALA PRO ASP SER GLN LYS THR ARG THR GLN LYS GLU GLN THR LEU GLN ILE TYR LEU ARG CYS VAL MET PHE LYS **N168** **S172** **I186** **V193** **T199** **V200** **K203**

E220 **E230** **I231** **V235** **G236** **M237** **S238** **I239** **M273** **A274** **I277** **K280** **H281** **Q282** **I285** **G296** **L297** **L298** **L299** **V313** **V318** **A325** **M326** **S330** **Q331** **S362** **E366** **G367** **I368** **V372** **I379** **F389** **R395** **L398** **M403** **R404** **P405** GLU ASP ARG VAL

ALA VAL ALA GLU GLU ASP GLU GLU MET LEU HIS GLU GLN PRO LEU ASP VAL GLU GLU

● Molecule 7: Proteasome alpha7 chain

Chain G:

78%　　15%

MET ALA GLY THR GLY **S6** **S11** **T12** **D13** **K29** **A37** **D44** **G45** **V46** **V47** **V48** **A49** **V50** **E51** **K52** **N65** **R66** **I67** **R72** **Q73** **C77** **I78** **C79** **G80** **L81** **L82** **P83** **D84** **G85** **I88** **E95** **R100** **R115** **F127** **C134** **I137** **Y141** **L148** **F149**

V150 **S151** **D152** **T156** **V163** **A164** **L165** **L184** **K192** **K203** **E212** **W215** **V216** **D221** **R222** **K223** **M231** **V232** **P233** ALA GLU THR SER HIS

● Molecule 7: Proteasome alpha7 chain

Chain U:

79%　　16%

MET ALA GLY THR GLY **S6** **D13** **K29** **A37** **V38** **C42** **K43** **D44** **G45** **V46** **V47** **V48** **A49** **V50** **E51** **K52** **N65** **R66** **R72** **Q73** **C77** **I78** **C79** **G80** **G85** **I88** **R91** **R100** **A113** **N114** **R115** **F127** **C134** **I138** **Y141** **V150** **S151** **D152**

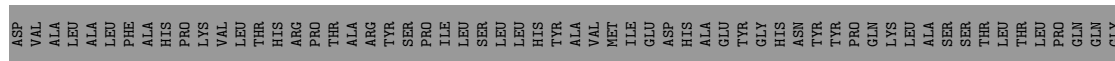**T156** **V163** **L184** **K192** **E212** **W215** **V216** **D221** **R222** **K223** **M231** **V232** **P233** ALA GLU THR SER HIS

● Molecule 8: Proteasome beta1 chain

Chain H:

67%　　13%　　19%

MET LEU GLN ARG PRO ASP HIS THR LEU LEU GLN GLU GLN PRO ALA TYR PRO LYS ASP ILE ALA ALA GLN LYS LEU THR GLU ASN GLY ALA GLN GLY LYS LEU PHE PRO ASP ALA ALA VAL ILE ASP PRO GLN LEU SER LYS ALA VAL SER LEU GLY **T55** **A59** **Y62**

V67 **L68** **T74** **L88** **C98** **R99** **S100** **L109** **V113** **L117** **Y120** **D123** **I124** **L136** **F137** **M143** **I148** **S149** **A150** **S170** **S173** **C174** **V175** **Y179** **A180** **L181** **S186** **Y190** **S191** **S204** **E205** **C206** **R212** **Y218** **S223** **L227** **I231**

E237 P244 T263 Q266 S269 I274 G283

• Molecule 8: Proteasome beta1 chain

Chain V:

67%   13%   •   19%

MET LEU GLN ARG PRO ASP HIS THR LEU LEU GLN GLU PRO ALA TYR PRO LYS ASP ILE ALA GLN LYS LEU THR GLU ASN GLY PRO ALA GLN ALA GLY LYS GLN LEU PHE GLN PRO ASP PRO ALA VAL ILE ASP PRO GLN LEU LEU SER LYS ALA VAL SER LEU GLY T55 A59 Y62

V67 L68 T74 L88 C98 R99 S100 L109 L117 Y120 D123 I124 L136 F137 M140 M143 I148 S149 A150 I168 P169 S170 S173 S191 S204 E205 C206 R212 Y218 S223 G226 L227 I231 E237 P244 K257 Y258

T263 Q266 S269 S270 I274 G283

• Molecule 9: Proteasome beta2 chain

Chain I:

68%   17%   •   14%

MET PRO GLY PHE ASN PHE GLU ASN VAL GLN ARG ASN LEU ASN LEU GLU GLY GLU GLY TYR SER ALA PRO ARG THR LEU LYS THR GLY T30 V33 L43 T47 C60 M66 M71 C72 C73 T81 V84 T85 L92 A93 L94 T99 Q102 S103 L106

E107 A108 L112 H115 L116 L127 V134 E135 I142 R150 T155 S158 S186 Q166 L167 K172 A185 S186 A187 K190 T200 Q201 V202 D203 V204 C205 T208 E213 K220 E223 R224 M225 Y226 L233 T238 L241 L248 VAL ASP ILE

VAL ASP ALA

• Molecule 9: Proteasome beta2 chain

Chain W:

69%   17%   •   14%

MET PRO GLY PHE ASN PHE GLU ASN VAL GLN ARG ASN LEU ASN LEU GLU GLY GLU GLY TYR SER ALA PRO ARG THR LEU LYS THR GLY T30 T31 I32 V33 L43 T47 C60 M66 A67 P68 M71 C72 C73 T81 V84 T85 L94 T99 Q102 S103

L106 H115 L116 E135 I142 R150 T155 S158 A165 Q166 L167 K172 A185 S186 A187 K190 S198 G199 T200 Q201 V202 D203 V204 C205 T208 E213 K220 E223 R224 M225 Y226 L233 T238 L248 VAL ASP ILE VAL ASP ALA

• Molecule 10: Proteasome beta3 chain

Chain J:

83%   14%   •

MET S2 V21 N26 E30 I35 K41 S48 T58 M73 E79 A88 T92 S93 Y96 R99 P107 V108 E118 A123 T124 D125 I126 I127 E134 D135 Y136 V137 W154 R155 P156 L163 A168 Q169 L180 V186 K201

K204 D205

• Molecule 10: Proteasome beta3 chain

Chain X: 80% 18%

MET S2 I22 E30 I35 K41 L42 H43 S48 I49 V50 Y51 T58 M73 L76 E79 T92 S93 Y96 R99 P107 V108 S111 E118 V119 Y120 A123 T124 D125 L126 I127 G128 E134 D135 Y136 V137 W154 R155 P156 L163

I166 A167 A168 Q169 L180 V186 K204 D205

• Molecule 11: Proteasome beta4 chain

Chain K: 82% 16%

M1 A2 E3 C10 K11 D12 Y13 V14 M15 V16 F24 I29 T37 Q38 L39 Q43 L44 V45 A46 C47 E50 E59 Y60 I61 L65 M70 T82 M86 R87 N88 R97 V103 V121 P124 M129 L132 G133 T134 R156 L162 S163

L168 R181 S187 K192 H206

• Molecule 11: Proteasome beta4 chain

Chain Y: 81% 17%

M1 A2 E3 C10 K11 D12 Y13 V14 M15 V16 F24 I29 T37 Q38 L39 Q43 L44 V45 A46 E50 E59 Y60 I61 M70 T82 M86 R87 N88 R97 N104 V121 P124 Y128 M129 L132 G133 T134 H143 G144 R156 L162

S163 L168 R181 S187 K192 V199 H206

• Molecule 12: Proteasome beta5 chain

Chain L: 58% 9% 33%

MET PHE ALA ASP PHE GLU ALA VAL THR SER ASN PHE LEU ASP ASP CYS PRO ARG VAL GLY PRO PHE THR TYR HIS ASN MET ASP GLU ASP THR LEU GLU GLU PRO LEU SER LEU CYS SER TYR ARG ARG ALA PRO GLN GLN THR ASP GLU ARG SER PRO ALA SER CYS ASP ALA

VAL THR ALA ASP PRO LEU ASP SER SER ARG TYR LEU HIS GLY GLU ASN ARG CYS TRP THR LEU LYS VAL SER PRO VAL PRO ARG ALA ILE PRO LEU LEU ASP MET LYS LYS GLY T100 T101 T102 L103 A119 S120 T121 Q128 T129 V130 M131 L134 E135 I136 T143 L144

C151 E155 G159 M160 T198 D214 S218 L224 D239 D245 A262 D266 S269 W283 S301 GLN

• Molecule 12: Proteasome beta5 chain

Chain Z: 58% 9% 33%

MET PHE ALA ASP PHE GLU ALA VAL THR SER ASN PHE LEU ASP ASP CYS PRO ARG VAL GLY PRO PHE THR TYR HIS ASN MET ASP GLU ASP THR LEU GLU GLU PRO LEU SER LEU CYS SER TYR ARG ARG ALA PRO GLN GLN THR ASP GLU ARG SER PRO ALA SER CYS ASP ALA

VAL THR ALA ASP PRO LEU ASP SER SER ARG TYR LEU HIS GLY GLU ASN ARG CYS TRP THR LEU LYS VAL SER PRO VAL PRO ARG ALA ILE PRO LEU LEU ASP MET LYS LYS GLY T100 L103 S117 R118 A119 S120 T121 T129 V130 M131 L134 E135 I136 L144 C151

E155 G159 M160 L164 R168 Y187 R190 L194 M199 S218 L224 F225 D239 D245 W283 T284 S301 GLN

• Molecule 13: Proteasome beta6 chain

Chain M:

46% 15% • 37%

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

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

ALA LYS GLN GLN W126 S127 P128 N132 T136 D143 F144 V145 I146 L147 A148 R152 L153 N154 F157 C158 L159 S166 K167 Q170 Y176 M177 A178 S179 N180 G181 M182 Q183 A184 D185 R186 Q190 Q191 M192 R196 V197 K198 W199 Y200 A215 Q216 S219

L222 R226 T232 F233 N234 V237 G238 L239 D240 E241 Y250 F259 T263 R264 V271 E291 M292 L301 E310 D317 S318 V319 S320 F321 V329 L336 R337 K338 D339

• Molecule 13: Proteasome beta6 chain

Chain a:

56% 7% 37%

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

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

ALA LYS GLN GLN W126 D143 F144 V145 R152 L153 N154 F157 C158 L159 K167 R186 M192 R196 V197 K198 Q216 L222 R226 T232 L239 D240 E241 T263 E291 M292 E310 D317 K338 D339

• Molecule 14: Proteasome beta7 chain

Chain N:

80% 17% ••

MET A2 S3 I8 K11 V16 L23 L24 L29 A30 K31 W32 I38 S45 A46 Y53 E68 R69 Y73 D77 S82 R96 M106 T116 D123 Y137 I141 A142 L143 R147 Q148 D155 R159 D168 V172 R179

K183 F184 Q185 V186 A187 D192 G193 V194 P199 F200 W206 I219 ARG

• Molecule 14: Proteasome beta7 chain

Chain b:

93% 6% •

MET A2 S3 L24 S45 E68 R69 D77 S82 R96 M106 D123 D155 R179 D192 I219 ARG

4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	182775	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 $(e^-/\text{Å}^2)$	30	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.622	Depositor
Minimum map value	-0.361	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.022	Depositor
Recommended contour level	0.0667	Depositor
Map size (Å)	321.00003, 321.00003, 321.00003	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: J6E

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	0.61	0/1889	0.88	0/2562
1	O	0.60	0/1889	0.89	0/2562
2	B	0.61	0/1787	0.84	0/2421
2	P	0.61	0/1787	0.84	0/2421
3	C	0.61	0/2242	0.86	0/3034
3	Q	0.61	0/2242	0.86	1/3034 (0.0%)
4	D	0.63	0/1902	0.87	0/2562
4	R	0.62	0/1902	0.87	0/2562
5	E	0.63	0/1784	0.85	0/2414
5	S	0.63	0/1784	0.86	0/2414
6	F	0.62	0/1907	0.84	0/2575
6	T	0.61	0/1907	0.84	0/2575
7	G	0.62	0/1759	0.85	1/2379 (0.0%)
7	U	0.62	0/1759	0.85	0/2379
8	H	0.60	0/1742	0.89	2/2359 (0.1%)
8	V	0.61	0/1742	0.89	1/2359 (0.0%)
9	I	0.59	0/1685	0.87	0/2284
9	W	0.59	0/1685	0.87	0/2284
10	J	0.60	0/1583	0.89	0/2135
10	X	0.61	0/1583	0.89	0/2135
11	K	0.60	0/1643	0.89	0/2222
11	Y	0.60	0/1643	0.89	0/2222
12	L	0.60	0/1613	0.87	0/2183
12	Z	0.59	0/1613	0.87	0/2183
13	M	0.58	0/1743	0.89	0/2354
13	a	0.58	0/1743	0.90	0/2354
14	N	0.60	0/1748	0.88	1/2363 (0.0%)
14	b	0.60	0/1748	0.87	0/2363
All	All	0.61	0/50054	0.87	6/67694 (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
2	P	0	1
3	C	0	2
3	Q	0	3
10	J	0	1
10	X	0	1
All	All	0	8

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	H	218	TYR	CB-CG-CD1	6.96	125.17	121.00
8	V	218	TYR	CB-CG-CD1	6.79	125.08	121.00
8	H	218	TYR	CB-CG-CD2	-5.65	117.61	121.00
3	Q	97	ARG	NE-CZ-NH1	5.28	122.94	120.30
14	N	147	ARG	NE-CZ-NH2	-5.22	117.69	120.30

There are no chirality outliers.

5 of 8 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	140	PHE	Peptide
3	C	171	GLY	Peptide
10	J	204	LYS	Peptide
2	P	132	LEU	Peptide
3	Q	130	TYR	Peptide

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	1857	0	1871	17	0
1	O	1857	0	1871	17	0
2	B	1754	0	1741	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	P	1754	0	1741	14	0
3	C	2195	0	2142	21	0
3	Q	2195	0	2142	26	0
4	D	1873	0	1868	16	0
4	R	1873	0	1868	21	0
5	E	1756	0	1736	16	0
5	S	1756	0	1736	15	0
6	F	1869	0	1823	18	0
6	T	1869	0	1823	17	0
7	G	1727	0	1691	23	0
7	U	1727	0	1691	17	0
8	H	1710	0	1665	19	0
8	V	1710	0	1665	16	0
9	I	1659	0	1684	21	0
9	W	1659	0	1684	22	0
10	J	1557	0	1552	18	0
10	X	1557	0	1552	21	0
11	K	1612	0	1571	21	0
11	Y	1612	0	1571	22	0
12	L	1579	0	1538	13	0
12	Z	1579	0	1538	12	0
13	M	1702	0	1638	26	0
13	a	1702	0	1638	0	0
14	N	1712	0	1668	25	0
14	b	1712	0	1668	0	0
15	L	30	0	0	0	0
15	Z	30	0	0	0	0
16	A	9	0	0	1	0
16	B	9	0	0	0	0
16	C	8	0	0	0	0
16	D	6	0	0	0	0
16	E	8	0	0	0	0
16	F	8	0	0	0	0
16	G	12	0	0	0	0
16	H	21	0	0	0	0
16	I	7	0	0	0	0
16	J	15	0	0	0	0
16	K	9	0	0	0	0
16	L	15	0	0	0	0
16	M	13	0	0	0	0
16	N	21	0	0	0	0
16	O	11	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
16	P	13	0	0	0	0
16	Q	8	0	0	0	0
16	R	9	0	0	0	0
16	S	6	0	0	0	0
16	T	8	0	0	0	0
16	U	5	0	0	0	0
16	V	19	0	0	0	0
16	W	15	0	0	1	0
16	X	23	0	0	0	0
16	Y	8	0	0	0	0
16	Z	17	0	0	0	0
16	a	11	0	0	0	0
16	b	20	0	0	0	0
All	All	49518	0	48376	436	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 5.

The worst 5 of 436 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:91:CYS:SG	4:D:107:LEU:HD13	2.20	0.82
1:O:36:THR:HG22	1:O:49:THR:HG23	1.62	0.82
5:E:185:ALA:HB2	5:E:239:VAL:HG21	1.66	0.78
1:A:36:THR:HG22	1:A:49:THR:HG23	1.67	0.77
8:V:68:LEU:HD23	8:V:98:CYS:SG	2.24	0.77

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	242/250 (97%)	233 (96%)	9 (4%)	0	100	100
1	O	242/250 (97%)	233 (96%)	9 (4%)	0	100	100
2	B	227/231 (98%)	216 (95%)	11 (5%)	0	100	100
2	P	227/231 (98%)	218 (96%)	9 (4%)	0	100	100
3	C	274/285 (96%)	266 (97%)	8 (3%)	0	100	100
3	Q	274/285 (96%)	265 (97%)	9 (3%)	0	100	100
4	D	237/248 (96%)	228 (96%)	7 (3%)	2 (1%)	19	49
4	R	237/248 (96%)	226 (95%)	9 (4%)	2 (1%)	19	49
5	E	225/344 (65%)	222 (99%)	3 (1%)	0	100	100
5	S	225/344 (65%)	221 (98%)	4 (2%)	0	100	100
6	F	236/428 (55%)	230 (98%)	5 (2%)	1 (0%)	34	66
6	T	236/428 (55%)	229 (97%)	6 (2%)	1 (0%)	34	66
7	G	226/238 (95%)	218 (96%)	8 (4%)	0	100	100
7	U	226/238 (95%)	219 (97%)	7 (3%)	0	100	100
8	H	227/283 (80%)	212 (93%)	14 (6%)	1 (0%)	34	66
8	V	227/283 (80%)	213 (94%)	13 (6%)	1 (0%)	34	66
9	I	217/254 (85%)	204 (94%)	10 (5%)	3 (1%)	11	34
9	W	217/254 (85%)	205 (94%)	9 (4%)	3 (1%)	11	34
10	J	202/205 (98%)	192 (95%)	9 (4%)	1 (0%)	29	61
10	X	202/205 (98%)	191 (95%)	10 (5%)	1 (0%)	29	61
11	K	204/206 (99%)	194 (95%)	10 (5%)	0	100	100
11	Y	204/206 (99%)	195 (96%)	9 (4%)	0	100	100
12	L	200/302 (66%)	188 (94%)	12 (6%)	0	100	100
12	Z	200/302 (66%)	188 (94%)	12 (6%)	0	100	100
13	M	212/339 (62%)	204 (96%)	5 (2%)	3 (1%)	11	34
13	a	212/339 (62%)	204 (96%)	5 (2%)	3 (1%)	11	34
14	N	216/220 (98%)	202 (94%)	14 (6%)	0	100	100
14	b	216/220 (98%)	204 (94%)	12 (6%)	0	100	100
All	All	6290/7666 (82%)	6020 (96%)	248 (4%)	22 (0%)	44	72

5 of 22 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	49	SER
4	R	49	SER
9	W	200	THR
9	I	200	THR
9	I	223	GLU

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	193/197 (98%)	177 (92%)	16 (8%)	11	32
1	O	193/197 (98%)	177 (92%)	16 (8%)	11	32
2	B	188/190 (99%)	164 (87%)	24 (13%)	4	13
2	P	188/190 (99%)	164 (87%)	24 (13%)	4	13
3	C	233/241 (97%)	210 (90%)	23 (10%)	8	23
3	Q	233/241 (97%)	210 (90%)	23 (10%)	8	23
4	D	200/208 (96%)	175 (88%)	25 (12%)	4	14
4	R	200/208 (96%)	174 (87%)	26 (13%)	4	13
5	E	193/301 (64%)	178 (92%)	15 (8%)	12	35
5	S	193/301 (64%)	178 (92%)	15 (8%)	12	35
6	F	200/363 (55%)	184 (92%)	16 (8%)	12	34
6	T	200/363 (55%)	185 (92%)	15 (8%)	13	37
7	G	184/190 (97%)	169 (92%)	15 (8%)	11	33
7	U	184/190 (97%)	167 (91%)	17 (9%)	9	27
8	H	184/229 (80%)	170 (92%)	14 (8%)	13	36
8	V	184/229 (80%)	168 (91%)	16 (9%)	10	30
9	I	180/209 (86%)	163 (91%)	17 (9%)	8	26
9	W	180/209 (86%)	163 (91%)	17 (9%)	8	26
10	J	167/168 (99%)	153 (92%)	14 (8%)	11	31
10	X	167/168 (99%)	151 (90%)	16 (10%)	8	24

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
11	K	172/172 (100%)	153 (89%)	19 (11%)	6	19
11	Y	172/172 (100%)	154 (90%)	18 (10%)	7	20
12	L	163/253 (64%)	152 (93%)	11 (7%)	16	43
12	Z	163/253 (64%)	152 (93%)	11 (7%)	16	43
13	M	181/288 (63%)	156 (86%)	25 (14%)	3	11
13	a	181/288 (63%)	159 (88%)	22 (12%)	5	15
14	N	181/183 (99%)	166 (92%)	15 (8%)	11	32
14	b	181/183 (99%)	168 (93%)	13 (7%)	14	38
All	All	5238/6384 (82%)	4740 (90%)	498 (10%)	12	25

5 of 498 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
13	M	337	ARG
11	Y	88	ASN
2	P	198	ASP
11	Y	59	GLU
13	a	198	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 74 such sidechains are listed below:

Mol	Chain	Res	Type
7	U	65	ASN
13	a	188	GLN
9	W	102	GLN
11	Y	143	HIS
9	I	247	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

2 ligands 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	$\#|Z| > 2$
15	J6E	Z	4000	-	29,34,34	0.64	0	34,48,48	0.74	2 (5%)
15	J6E	L	4000	-	29,34,34	0.66	0	34,48,48	0.86	1 (2%)

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
15	J6E	Z	4000	-	-	0/12/31/31	0/5/5/5
15	J6E	L	4000	-	-	0/12/31/31	0/5/5/5

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
15	L	4000	J6E	C13-C12-C11	2.89	120.13	118.03
15	Z	4000	J6E	C13-C12-C11	2.71	120.00	118.03
15	Z	4000	J6E	C12-C13-N2	-2.07	118.09	120.66

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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wwPDB
PROTEIN DATA BANK

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 J6E Z 4000

Bond lengths   Bond angles

Torsions   Rings

Ligand J6E L 4000

Bond lengths   Bond angles

Torsions   Rings
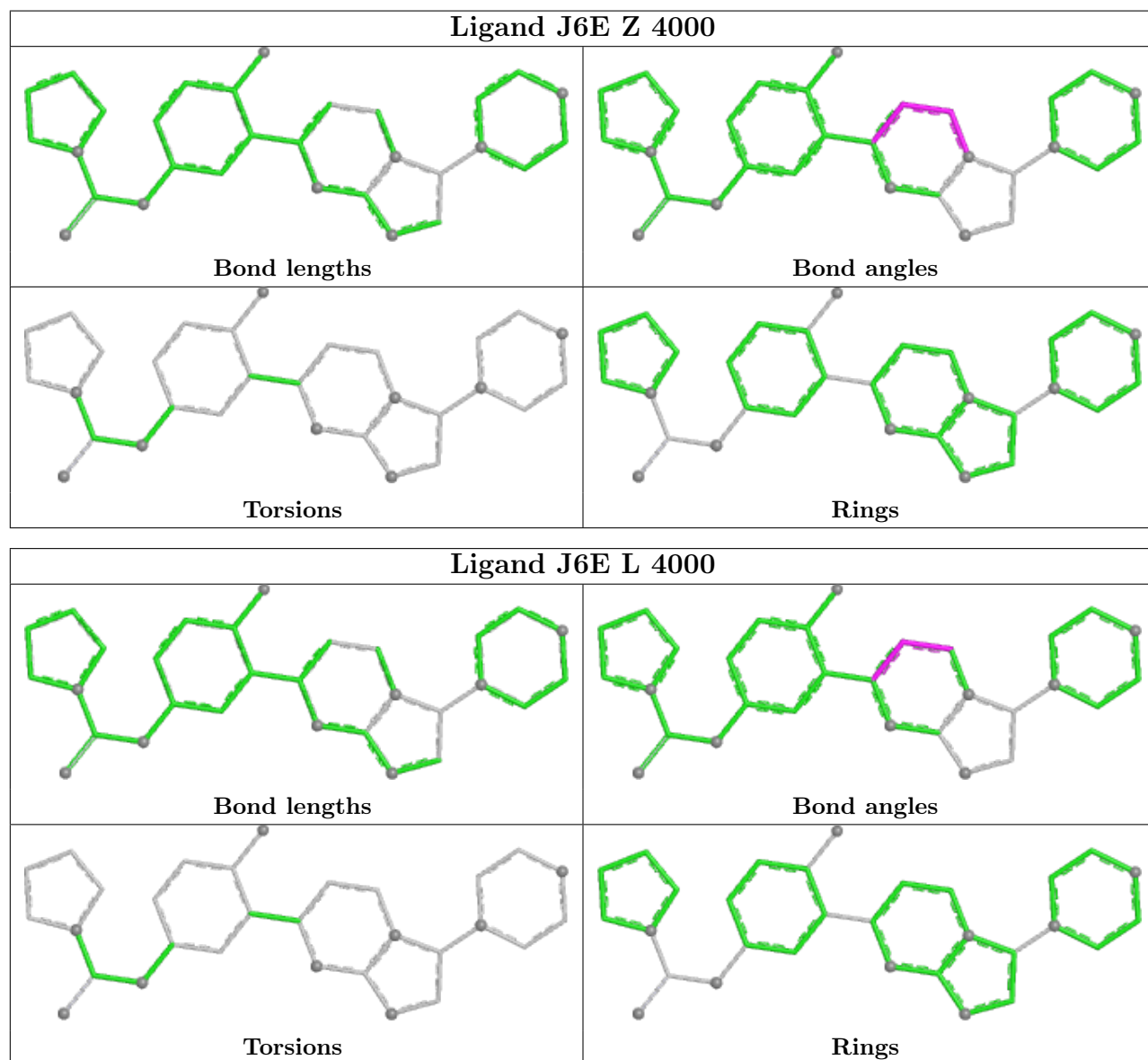
5.7 Other polymers ⓘ

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-4590. 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 |
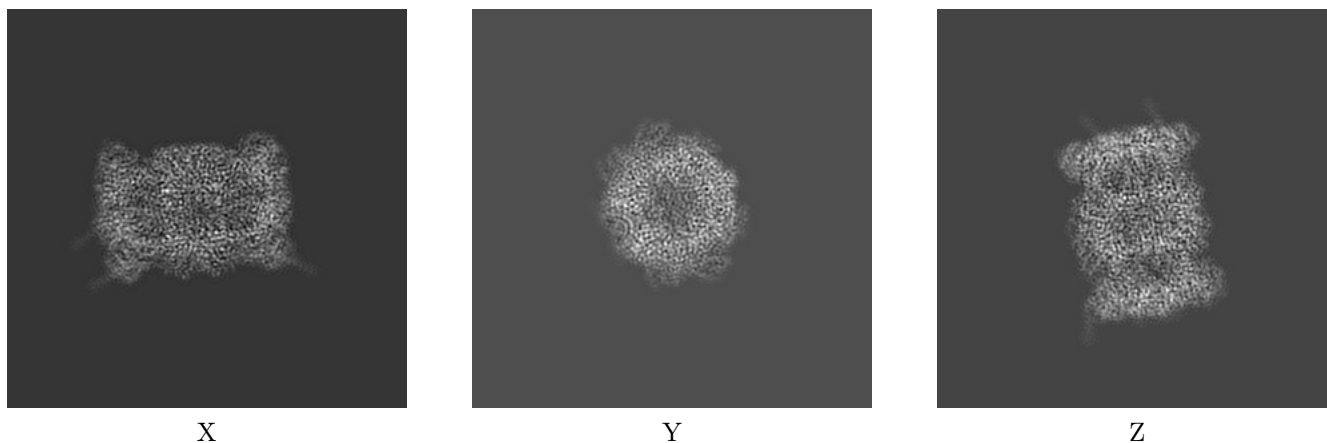
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map

| X Index: 150 | Y Index: 150 | Z Index: 150 |
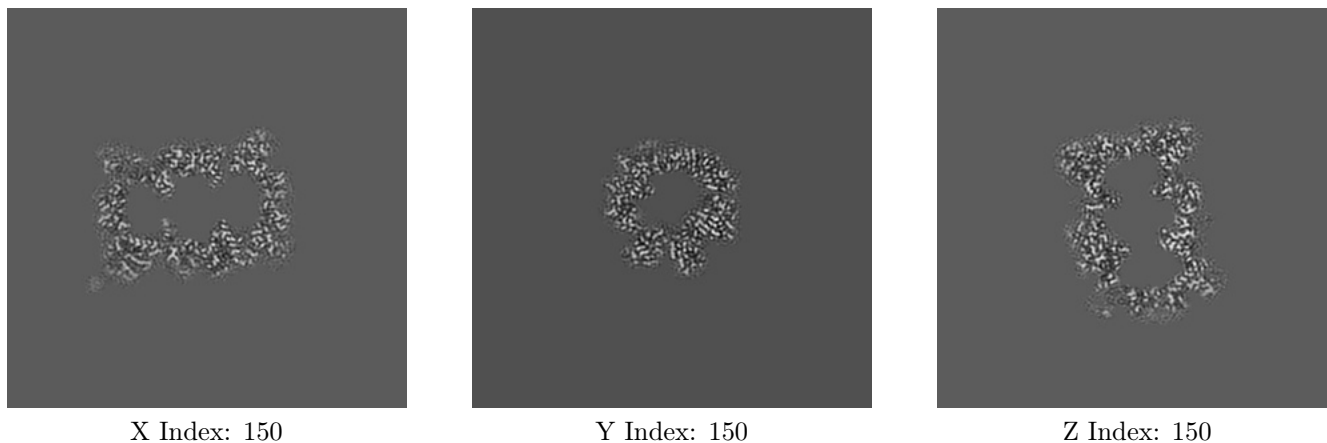
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
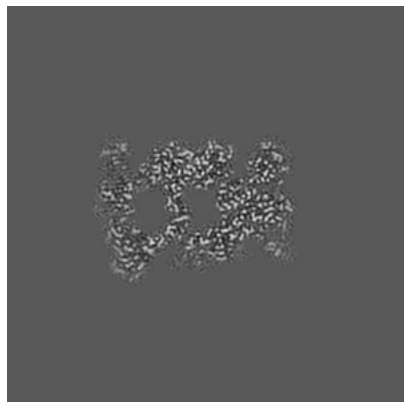
6.3.1 Primary map

| X Index: 174 | Y Index: 121 | Z Index: 127 |

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

6.4 Orthogonal surface views ⓘ
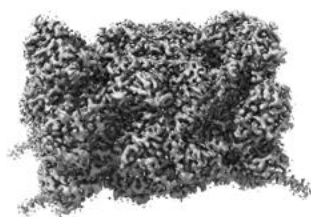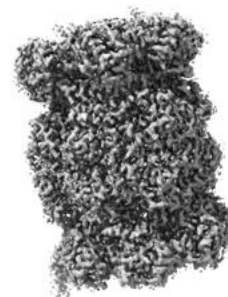
6.4.1 Primary map

| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.0667. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5   Mask visualisation ⓘ

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

7 Map analysis (i)

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

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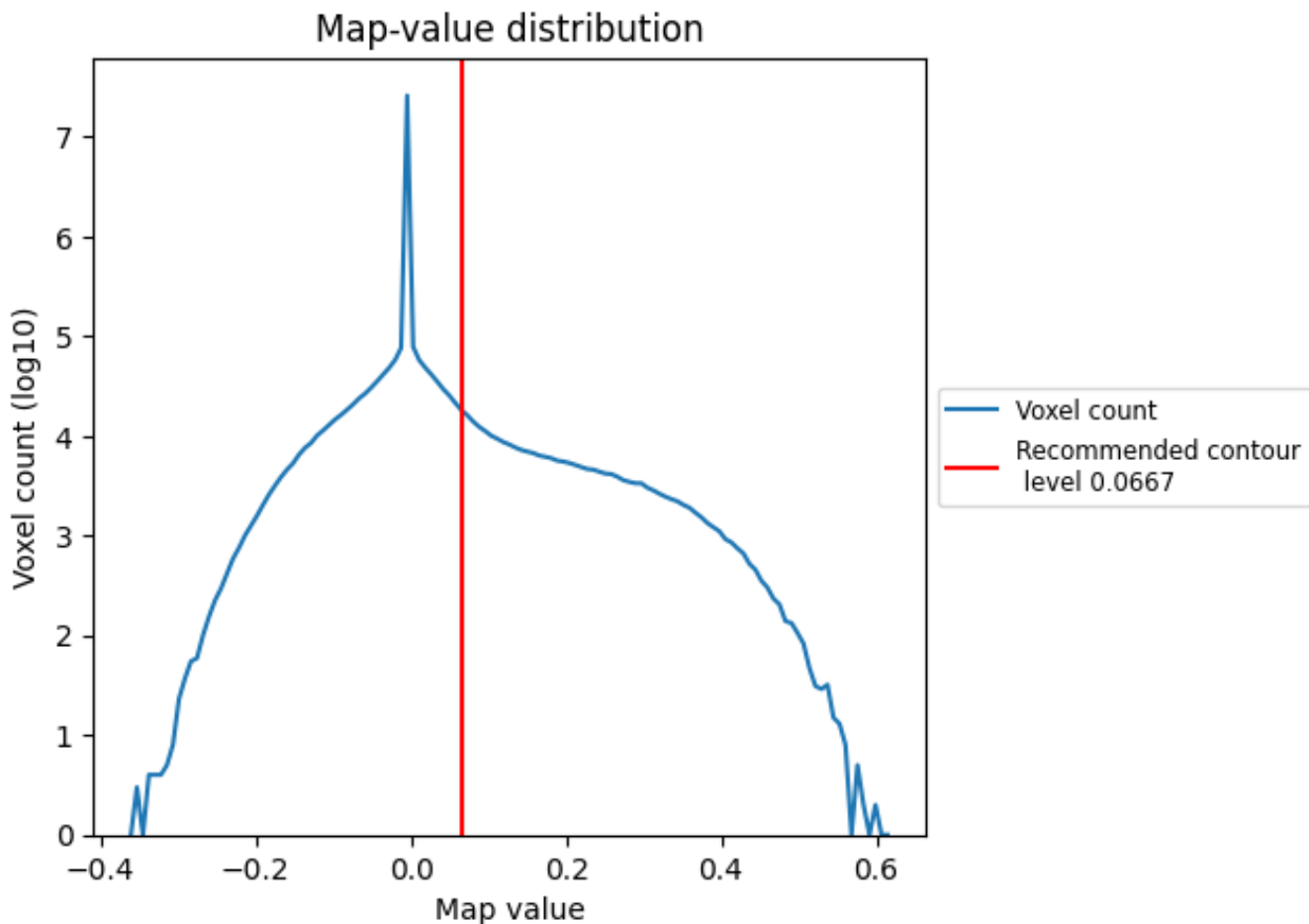
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
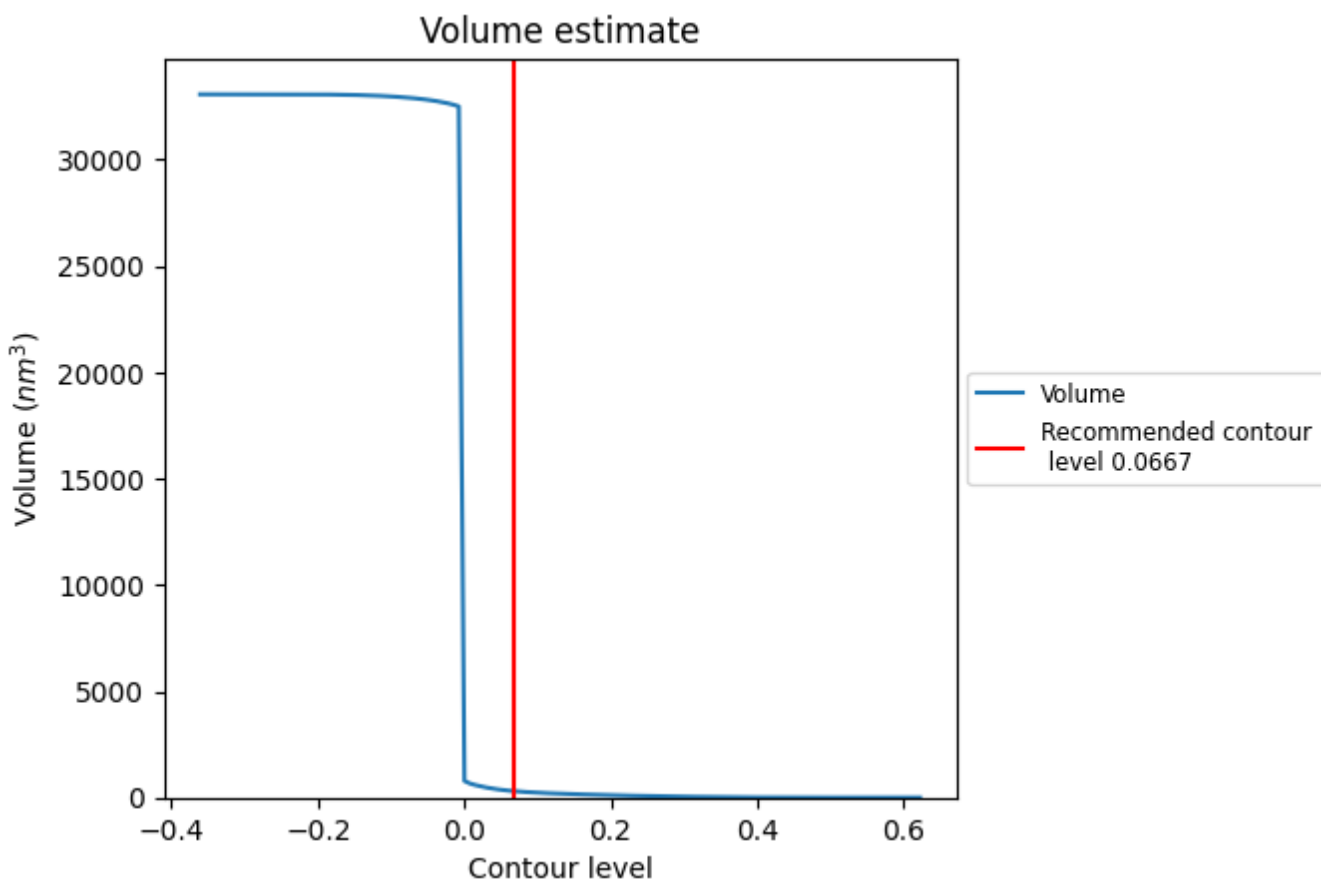
The volume at the recommended contour level is 306 nm^3; this corresponds to an approximate mass of 276 kDa.

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 ⓘ
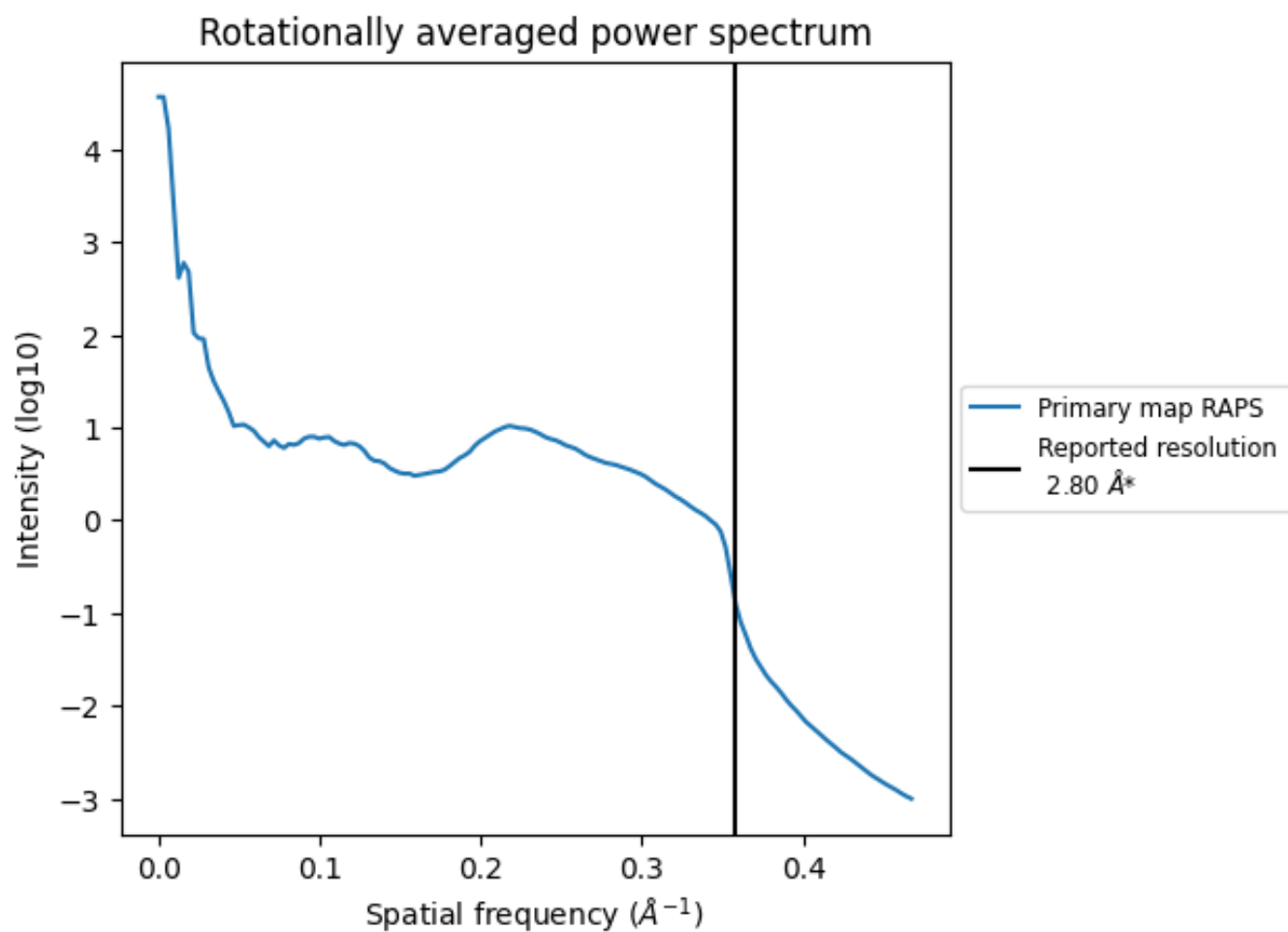
*Reported resolution corresponds to spatial frequency of 0.357 Å^{-1}

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-4590 and PDB model 6QM7. Per-residue inclusion information can be found in section 3 on page 9.

9.1　Map-model overlay ⓘ
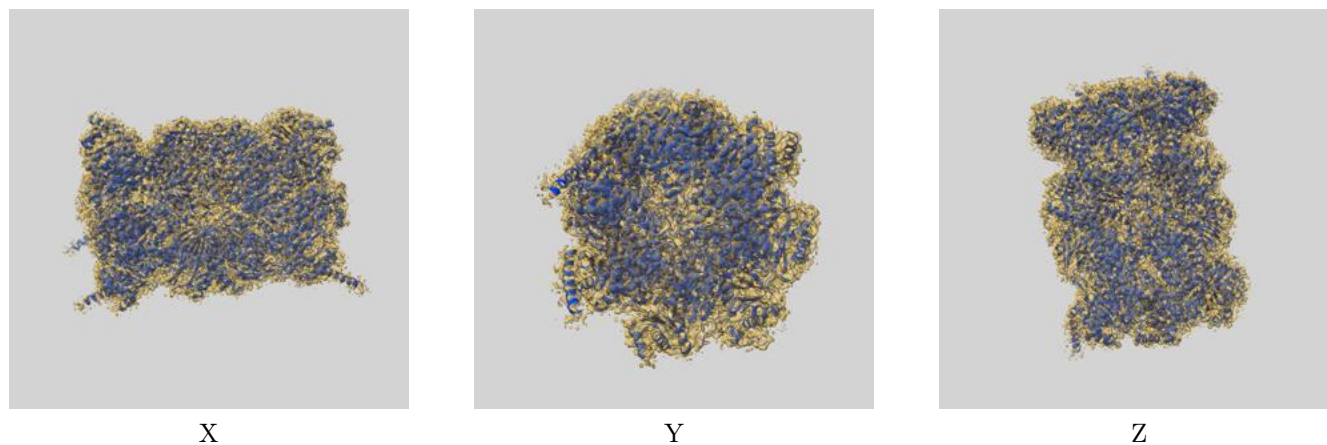
| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.0667 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
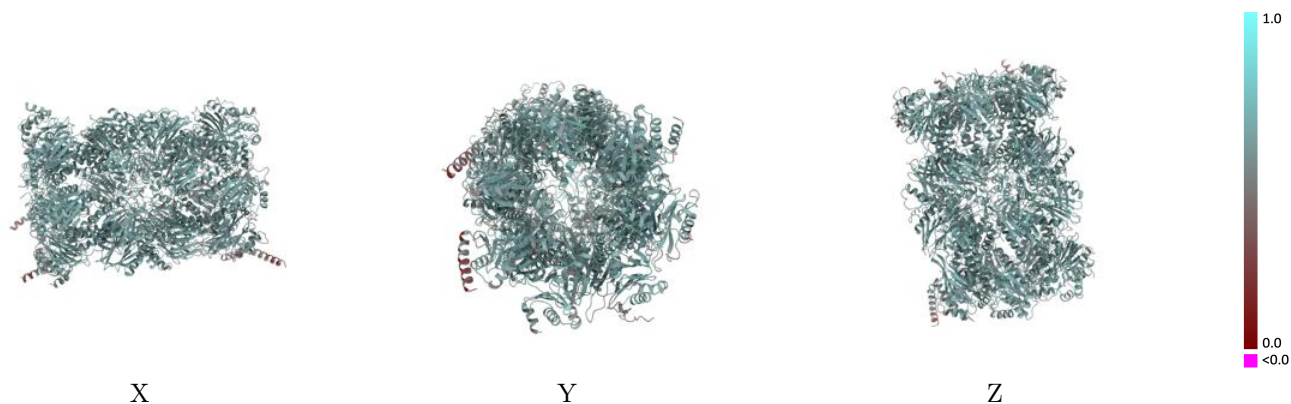
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
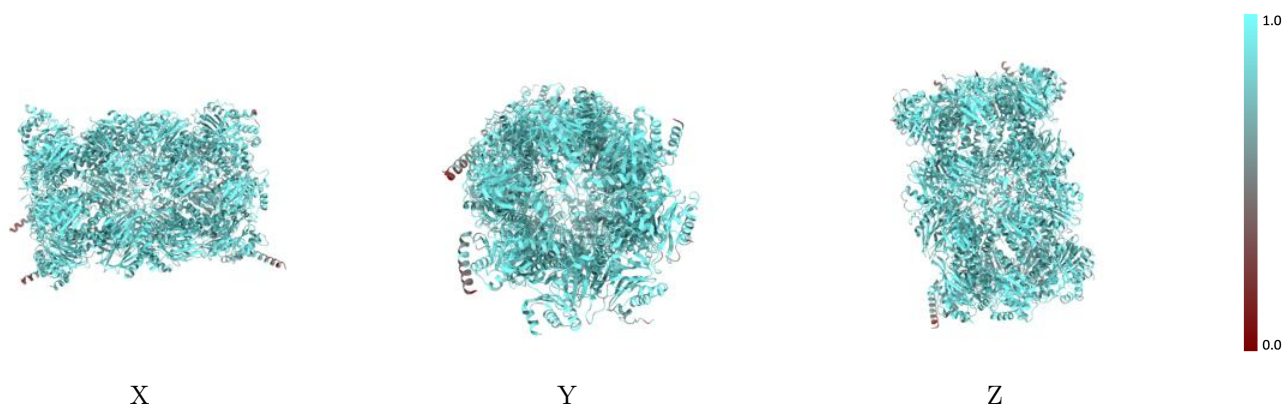
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0667).

9.4   Atom inclusion ⓘ
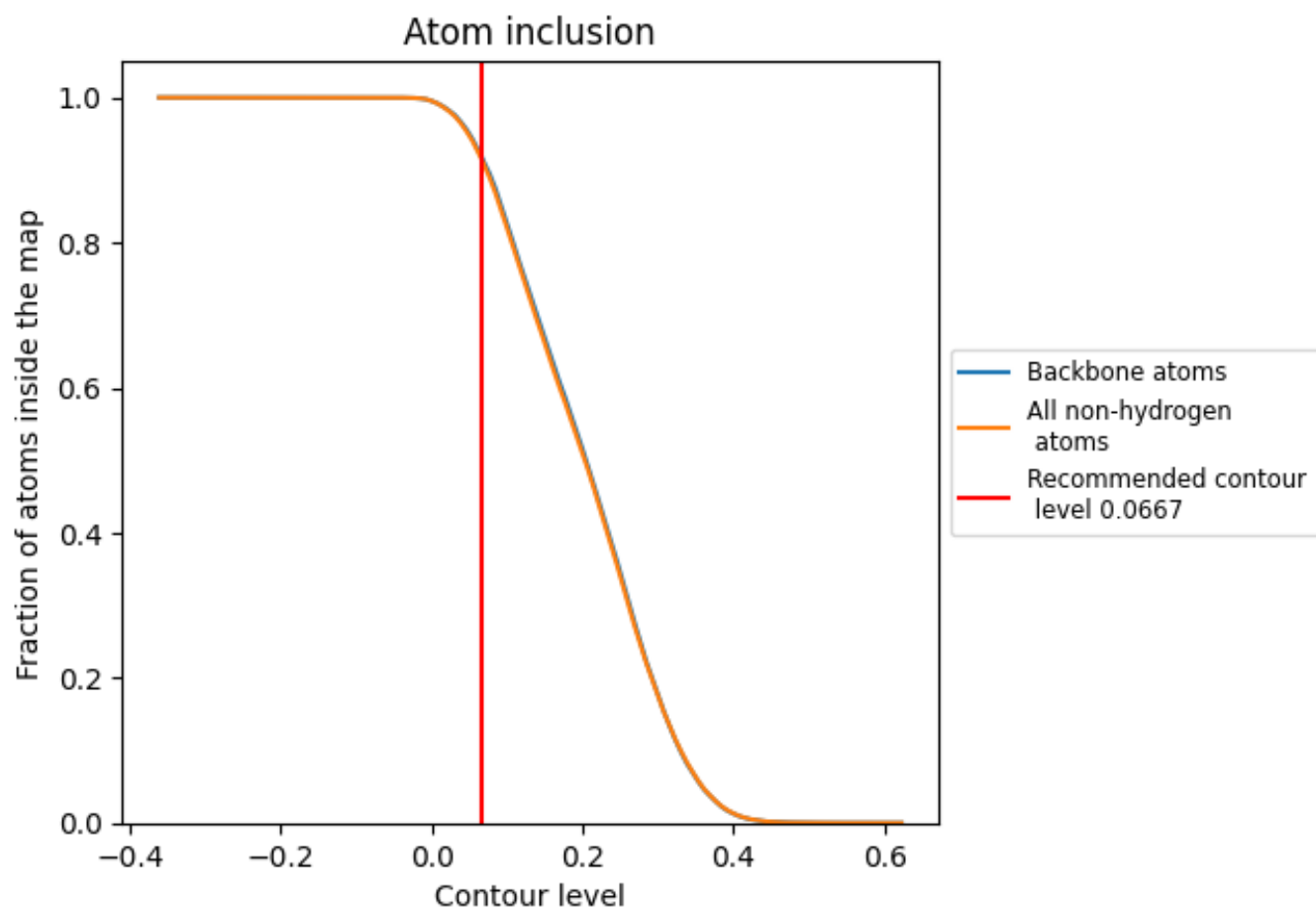
Atom inclusion

At the recommended contour level, 92% of all backbone atoms, 91% 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 (0.0667) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9140	0.6070
A	0.9098	0.6080
B	0.9067	0.6070
C	0.8768	0.5890
D	0.8670	0.5780
E	0.8926	0.5980
F	0.9042	0.6040
G	0.9150	0.6100
H	0.9606	0.6310
I	0.9274	0.6180
J	0.9431	0.6280
K	0.9353	0.6140
L	0.9495	0.6310
M	0.9442	0.6180
N	0.9401	0.6280
O	0.9147	0.6040
P	0.9125	0.6030
Q	0.8856	0.5750
R	0.8670	0.5680
S	0.9060	0.5930
T	0.9037	0.5980
U	0.9145	0.6050
V	0.9504	0.6270
W	0.9268	0.6080
X	0.9287	0.6200
Y	0.9378	0.6110
Z	0.9411	0.6250
a	0.9316	0.6110
b	0.9305	0.6220

1.0

0.0
<0.0