



wwPDB EM Validation Summary Report ⓘ

Nov 27, 2022 – 05:36 PM EST

PDB ID : 7KHB
EMDB ID : EMD-21880
Title : Escherichia coli RNA polymerase and rrnBP1 promoter open complex
Authors : Shin, Y.; Qayyum, M.Z.; Murakami, K.S.
Deposited on : 2020-10-20
Resolution : 3.53 Å (reported)

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with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

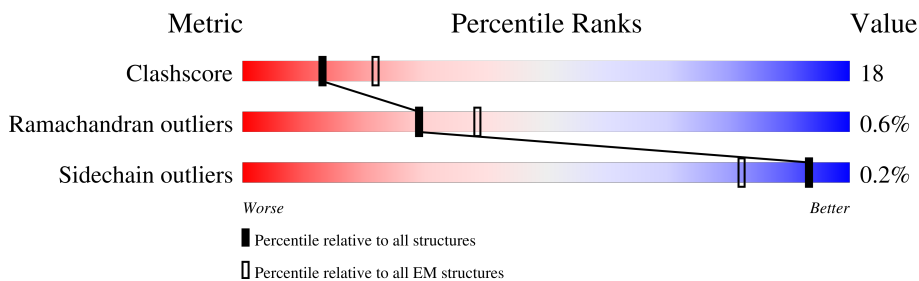
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

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 3.53 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	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 $\leq 5\%$. 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	329	
1	B	329	
2	C	1342	
3	D	1407	
4	E	91	
5	F	613	
6	X	64	
7	Y	64	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	ZN	D	2003	-	-	X	-

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 31608 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 DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	231	Total	C	N	O	S	0	0
			1794	1117	318	353	6		
1	B	230	Total	C	N	O	S	0	0
			1786	1112	317	351	6		

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	1340	Total	C	N	O	S	0	0
			10570	6631	1841	2055	43		

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	1340	Total	C	N	O	S	0	0
			10382	6522	1849	1962	49		

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	76	Total	C	N	O	S	0	0
			605	368	115	121	1		

- Molecule 5 is a protein called RNA polymerase sigma factor RpoD.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	471	Total	C	N	O	S	0	0
			3836	2403	684	726	23		

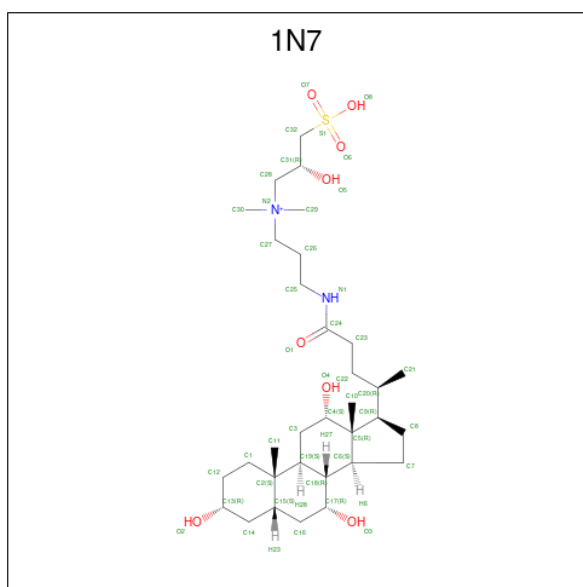
- Molecule 6 is a DNA chain called DNA (60-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	X	60	1221	582	219	360	60	0	0

- Molecule 7 is a DNA chain called DNA (64-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	Y	64	1325	628	248	385	64	0	0

- Molecule 8 is CHAPSO (three-letter code: 1N7) (formula: C₃₂H₅₉N₂O₈S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	S	
8	C	1	86	64	4	16	2	0
8	C	1	86	64	4	16	2	0

- Molecule 9 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
9	D	1	1	1	0

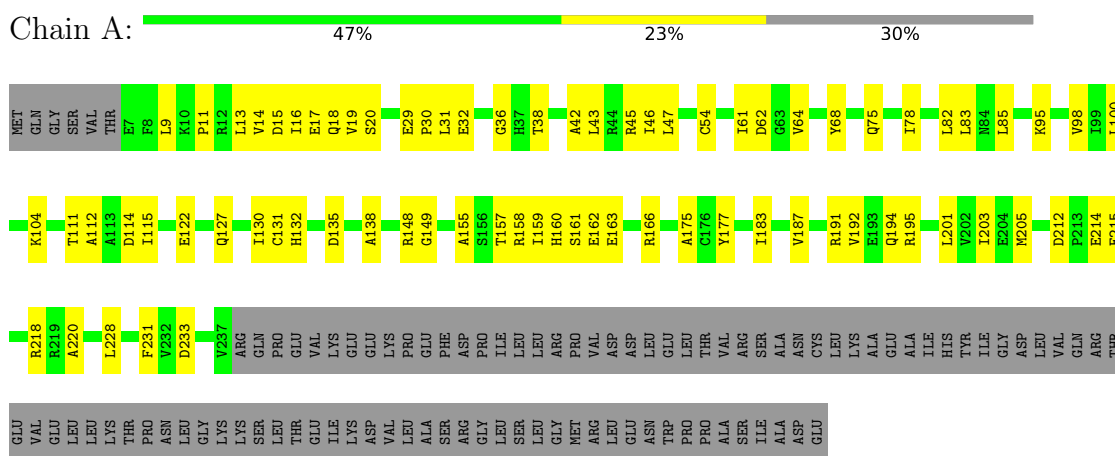
- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
10	D	2	Total 2	Zn 2	0

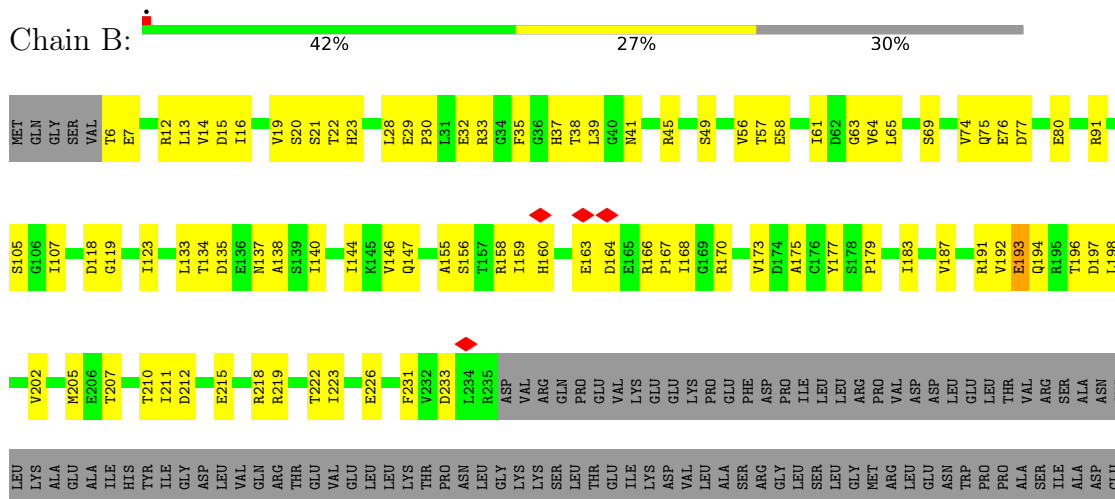
3 Residue-property plots

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: DNA-directed RNA polymerase subunit alpha

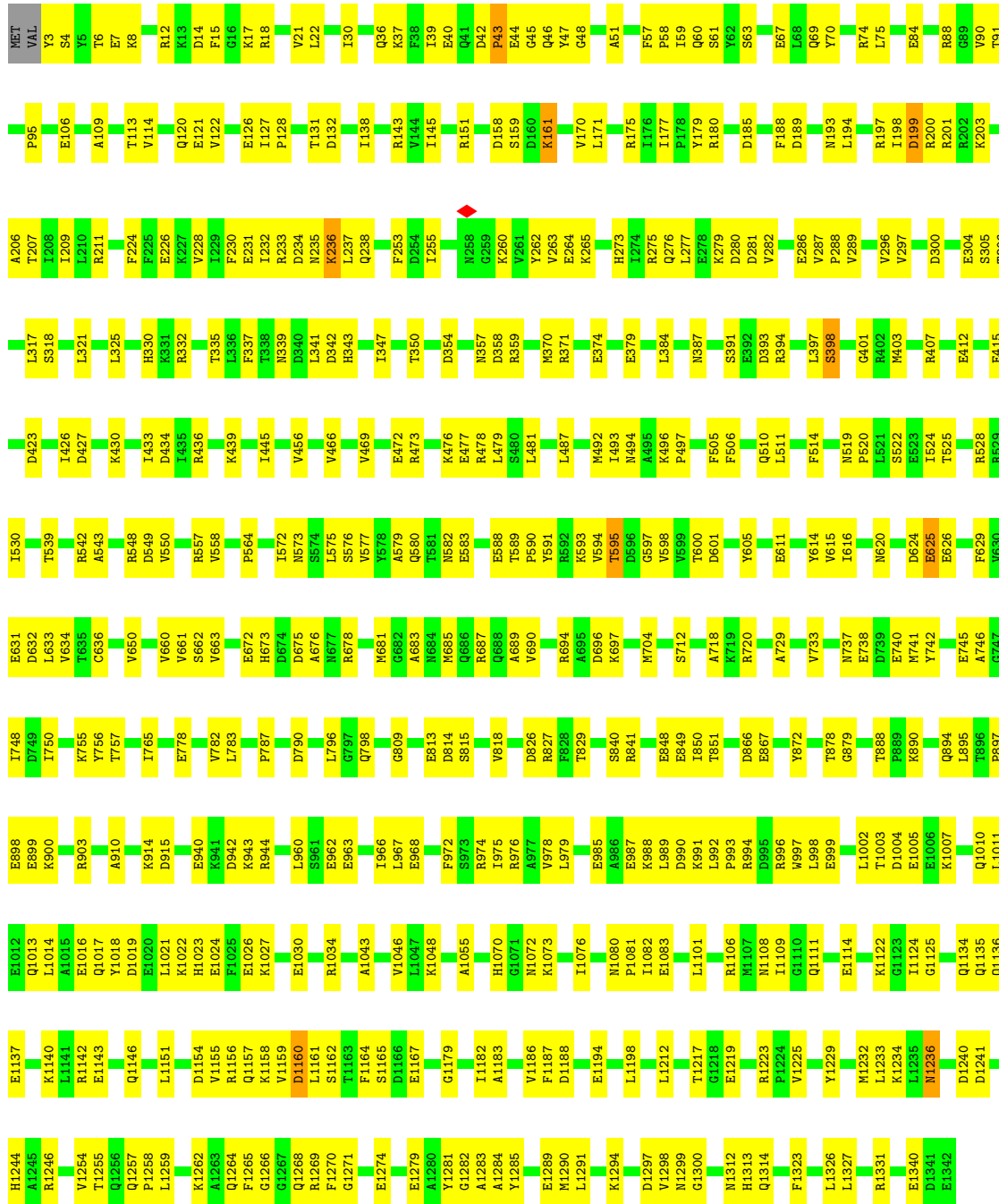


- Molecule 1: DNA-directed RNA polymerase subunit alpha

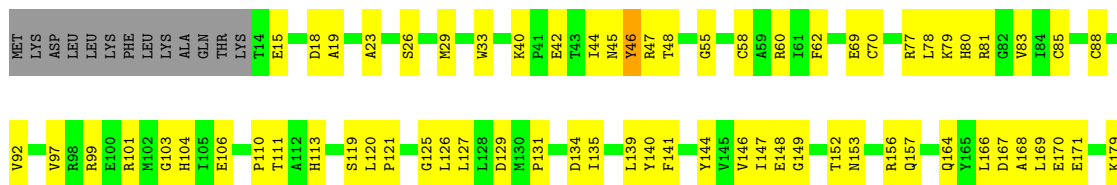


- Molecule 2: DNA-directed RNA polymerase subunit beta





• Molecule 3: DNA-directed RNA polymerase subunit beta'



M180 G161 A182 E183 A184 L185 L188 E195 A305 Q196 E197 C198 E199 Q200 L201 R202 L205 T208 N209 S210 E211 T212 K213 R214 K215 K216 K217 L218 K219 R220 K222 L223 L224 E225 A226 V227 V228 M232 V244 L252 H364 Q365 A261 M266 D267 L268 Y269 R270 F277 K378 L279 Y362 I291	E295 M298 Q300 E301 D304 A306 L306 L307 R311 R312 G313 S319 N320 L324 K325 S326 L327 A328 D329 R337 F338 R339 Q340 R346 V347 D348 R352 T356 V357 R362 L363 H364 Q365 P369 M372 A373 R270 F377 K378 Y362 I291	R388 K395 V407 Q665 I411 I416 A417 E418 H419 M424 R425 A426 P427 P439 E443 G444 L449 H450 V453 S454 D460 F461 D462 M466 V470 T473 L474 E475 A476 Q477 L478 E479 A480 R481 A482 N488 Q504 T514 R515 M525 V526 L527 T528 E532	A533 E534 V548 K549 I552 T553 E554 Y555 E556 K557 M560 G561 E562 N700 V564 T567 K570 I578 L579 M580 M581 I582 V583 F584 K585 Y589 A595 L596 M604 K615 A630 R634 S638 V639 G640 I641 I646 P647 K648 N768 K649 K650 V652 L654 E658	V661 A662 E663 V664 Q665 E666 Q669 E677 K681 V682 I685 N700 E704 V705 V706 R709 D710 G711 Q716 V717 F718 F719 M725 S733 Q736 G742 M747 A748 K749 P750 I755 L757 I759 N762 F763 R764 L767 M768 V769 L770 Q771 Y772 F773 I774	S775 T776 G782 T786 K789 D802 E811 C814 G815 T816 H817 E818 M821 M822 T823 P824 V825 I826 E827 V831 K832 E833 P834 D837 R838 E846 D847 E848 L849 K850 S851 G852 D855 F856 L857 V858 S948 S949 I950 Q951 V952 K953 N954 K955 G956 K959 L960 N962	E874 M875 S876 V877 D878 A879 V880 K881 S884 D889 T890 D891 V894 C895 C898 R901 D902 G906 E925 P926 L930 T931 MET ARG THR PHE HIS ILE GLY GLY ALA ALA SER ARG ALA ALA A946 E947 S948 S949 I950 Q951 V952 K953 N954 K955 G956 K959 L960 N962	V963 K964 S965 V966 V967 N968 K972 L973 V974 T975 T976 S977 T980 L982 K983 L984 D986 R990 K996 V997 A1001 V1002 L1003 T991 M1005 G1006 E1009 Q1010 V1011 G1014 A1015 T1016 V1017 A1018 M1019 V1020 D1021 T1024 V1027 E1030 V1031 S1032 T1033 F1034 V1035 T1038 D1039	M1040 Q1044 T1045 I1046 T1047 R1048 Q1049 E1052 L1053 T1054 S1057 S1058 L1059 V1060 V1061 L1062 S1064 A1065 E1066 R1067 T1068 A1069 G1070 K1071 K1072 D1073 L1074 R1075 P1076 A1077 L1078 K1079 I1080 V1081 D1082 A1083 Q1084 M1085 M1086 D1087 L1088 V1089 T1090 P1091 G1092 S1093 T1093 D1094 M1095 L1101 P1102 G1103 K1104 A1105 I1106 V1107	E1110 D1111 G1112 Q1113 Q1114 I1115 S1116 S1117 L1121 A1122 R1123 I1124 G1125 GLN SER GLY GLY LYS ASP ILE T1135 R1140 R1148 R1149 P1150 K1151 E1152 L1156 A1157 E1158 I1159 S1160 G1161 I1162 V1163 S1164 F1165 G1166 K1167 E1168 T1169 K1170 G1171 K1172 R1173 R1174 L1175 V1176 T1177 I1177 T1178 P1179 V1180	S1183 D1184 P1185 Y1186 E1187 E1188 M1189 I1190 M1197 V1198 F1199 E1200 G1201 R1203 V1204 E1205 R1206 G1207 D1208 E1215 A1216 I1220 H1227 T1230 D1239 R1242 D1250 K1251 H1252 I1253 E1254 V1257 I1266 V1267 F1274 L1275 Q1279 V1280 E1281 S1282 S1283 R1284 V1285 K1286 I1287 V1298	G1299 A1300 T1301 S1313 L1314 A1315 T1316 E1317 S1318 A1323 S1324 F1325 Q1326 V1331 D1342 E1343 L1344 R1345 G1346 L1347 K1348 E1349 M1350 I1351 I1352 V1353 L1356 G1376 GLU ALA PRD ALA ALA PRD GLN VAL THR ALA GLU ASP ALA SER SER SER SER LEU ALA GLU LEU LEU LEU ASN ALA GLY LEU GLY	GLY SER ASP ASN GLU
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● Molecule 4: DNA-directed RNA polymerase subunit omega



MET A2 R3 V4 T5 V6 Q7 V10 E11 K12 M15 A16 F17 D18 L21 V22 R25 R28 V32 G33 G34 K35 D36 P37 E42 K45 T46 T47 V48 T49 A50 L51 I54 E55 E56 L64 D65 E68 R69 Q70 E71 Q72 Q73 E74 Q75 E76 A77 ALA GLU

LEU
GLN
ALA
VAL
THR
ALA
ILE
ALA
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GLY
ARG
ARG

• Molecule 5: RNA polymerase sigma factor RpoD



MET
GLU
GLN
ASN
VAL
PRO
GLU
SER
GLN
GLN
LEU
LEU
LYS
ASN
LEU
LEU
VAL
THR
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LYS
ALA
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TYR
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R93
T94
T95
D96
P97
P97
Y98
R99
M100
R103
E104
M105
L110
L111
T112
R113
R113
E116
I117
D118
I119
A120
VAL
K121
R122
I123
E124
PRO

I127
V130
Q131
V134
P136
E139
A140
I141
L144
L145
E146
Q147
Y148
D149
R150
V151
E152
E155
A156
R157
L158
L161
G164
F165
V166
D167
PRO
ASN
VAL
ALA
GLU
GLU
ASP
LEU
ALA
PRO
THR
ALA
ALA
THR
HIS
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THR
THR
HIS
VAL
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I235
K236
K236
ALA
LYS
GLY
ARG
SER
HIS
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A245
Q246
E247
E248
I249
L250
D251
K251
L252
S253
E254
V255
F256
GLU

ASP
GLU
ASP
GLU
L330
ASP
GLY
ASP
ASP
Y268
L269
V270
M271
S272
M273
R274
V275
M276
M277
D278
V280
Q283
E284
R285
L286
L287
M288
K289
L290
A226
V229
V230
T231
T231
T234
I235
K236
K236
ALA
LYS
GLY
ARG
SER
HIS
T244
A245
Q246
E247
E248
I249
L250
D251
K251
L252
S253
E254
V255
F256
GLU

K257
Q258
R259
L261
Q265
F266
D267
Y268
L269
V270
M271
S272
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R274
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M276
M277
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K251
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S253
E254
V255
F256
GLU

V326
S327
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H331
D332
V333
S334
E335
E336
V337
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R385
L386
V387
I388
K392
T395
N396
M489
P490
R397
G398
L399
Q400
P401
L402
P325
GLU

D403
L404
M409
L412
M413
V416
R423
G424
Y425
K426
F427
S428
T429
W433
W434
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R436
Q437
A438
I439
A444
D445
Q446
A447
R448
R451
T452
P453
I457
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S467
M470
L471
Q472
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A484
F485
R486
M487
L488
M489
P490
R397
G398
L399
Q400
P401
L402
P325
GLU

K496
V497
L498
K499
I500
A501
I505
D513
D514
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D516
E524
D525
T526
T527
T536
T552
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E575
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G577
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E585
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R588
Q589
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A594
L595
R596
F597
L598
R599
H600
P601
S602
R603
S604
E605
GLU

R608
D612
ASP

• Molecule 6: DNA (60-MER)



A17
T18
T19
T20
C21
C22
C23
C24
T25
A30
G31
A38
T39
A40
A41
C42
T43
C44
C45
C46
T47
A48
T49
A50
A51
T52
G53
C54
A58
DC
DC
DA
DC
T63
G64
A65
C66
A67
C72
T73
C74
T75
A76
C77
G78
A79
G80

• Molecule 7: DNA (64-MER)





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	349752	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 ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.104	Depositor
Minimum map value	-0.049	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.012	Depositor
Map size (\AA)	388.80002, 388.80002, 388.80002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.08, 1.08, 1.08	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, MG, 1N7

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	0.33	0/1816	0.60	0/2461
1	B	0.31	0/1808	0.63	0/2450
2	C	0.36	0/10739	0.60	0/14489
3	D	0.33	0/10539	0.62	1/14234 (0.0%)
4	E	0.27	0/607	0.60	0/817
5	F	0.29	0/3887	0.65	0/5224
6	X	0.76	0/1366	1.06	2/2101 (0.1%)
7	Y	0.74	0/1488	1.04	0/2298
All	All	0.39	0/32250	0.67	3/44074 (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	C	0	2
3	D	0	3
All	All	0	5

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	X	23	DT	O4'-C1'-N1	6.83	112.78	108.00
3	D	1203	ARG	CG-CD-NE	-6.07	99.04	111.80
6	X	47	DT	O4'-C1'-N1	5.87	112.11	108.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	236	LYS	Peptide
2	C	595	THR	Peptide
3	D	1184	ASP	Peptide
3	D	860	ARG	Peptide
3	D	901	ARG	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1794	0	1819	60	0
1	B	1786	0	1813	71	0
2	C	10570	0	10582	367	0
3	D	10382	0	10571	422	0
4	E	605	0	612	24	0
5	F	3836	0	3907	189	0
6	X	1221	0	677	40	0
7	Y	1325	0	721	37	0
8	C	86	0	116	2	0
9	D	1	0	0	0	0
10	D	2	0	0	2	0
All	All	31608	0	30818	1139	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 18.

The worst 5 of 1139 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:277:MET:SD	5:F:362:ASN:ND2	2.28	1.07
3:D:816:THR:OG1	3:D:818:GLU:OE1	1.77	1.03
2:C:403:MET:SD	2:C:407:ARG:NH2	2.40	0.94
5:F:271:ASN:OD1	5:F:274:ARG:NH2	1.99	0.94
3:D:1344:LEU:O	3:D:1346:GLY:N	2.00	0.93

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	229/329 (70%)	211 (92%)	18 (8%)	0	100	100
1	B	228/329 (69%)	207 (91%)	19 (8%)	2 (1%)	17	58
2	C	1338/1342 (100%)	1228 (92%)	100 (8%)	10 (1%)	22	62
3	D	1334/1407 (95%)	1211 (91%)	117 (9%)	6 (0%)	34	71
4	E	74/91 (81%)	68 (92%)	6 (8%)	0	100	100
5	F	465/613 (76%)	430 (92%)	32 (7%)	3 (1%)	25	65
All	All	3668/4111 (89%)	3355 (92%)	292 (8%)	21 (1%)	29	65

5 of 21 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	21	SER
2	C	199	ASP
2	C	1160	ASP
3	D	338	PHE
3	D	1345	ARG

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	199/286 (70%)	199 (100%)	0	100	100
1	B	198/286 (69%)	198 (100%)	0	100	100
2	C	1155/1157 (100%)	1152 (100%)	3 (0%)	92	98

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	D	1113/1168 (95%)	1112 (100%)	1 (0%)	93	98
4	E	65/75 (87%)	65 (100%)	0	100	100
5	F	419/540 (78%)	416 (99%)	3 (1%)	84	93
All	All	3149/3512 (90%)	3142 (100%)	7 (0%)	93	98

5 of 7 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	1140	ARG
5	F	93	ARG
5	F	584	ARG
5	F	113	ARG
2	C	1236	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
5	F	357	GLN
5	F	345	GLN
3	D	762	ASN
3	D	667	GLN
3	D	962	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 5 ligands modelled in this entry, 3 are monoatomic - leaving 2 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
8	1N7	C	1401	-	45,46,46	4.05	20 (44%)	69,72,72	2.18	22 (31%)
8	1N7	C	1402	-	45,46,46	4.07	20 (44%)	69,72,72	1.84	16 (23%)

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
8	1N7	C	1401	-	-	4/27/92/92	1/4/4/4
8	1N7	C	1402	-	-	6/27/92/92	0/4/4/4

The worst 5 of 40 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	C	1402	1N7	C3-C4	-12.47	1.32	1.53
8	C	1401	1N7	C3-C4	-12.38	1.32	1.53
8	C	1402	1N7	C5-C9	-11.03	1.36	1.55
8	C	1401	1N7	C5-C9	-10.51	1.37	1.55
8	C	1402	1N7	C3-C19	-9.22	1.38	1.53

The worst 5 of 38 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	C	1401	1N7	C5-C6-C18	-7.23	105.50	114.74
8	C	1402	1N7	C5-C6-C18	-5.37	107.89	114.74
8	C	1401	1N7	C5-C9-C20	-4.85	113.70	119.50
8	C	1401	1N7	C6-C5-C4	-4.77	102.96	107.40
8	C	1401	1N7	C23-C22-C20	-4.44	106.40	114.52

There are no chirality outliers.

5 of 10 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	C	1401	1N7	N2-C28-C31-C32
8	C	1401	1N7	N2-C28-C31-O5
8	C	1402	1N7	N2-C28-C31-C32
8	C	1402	1N7	N2-C28-C31-O5
8	C	1402	1N7	C28-C31-C32-S1

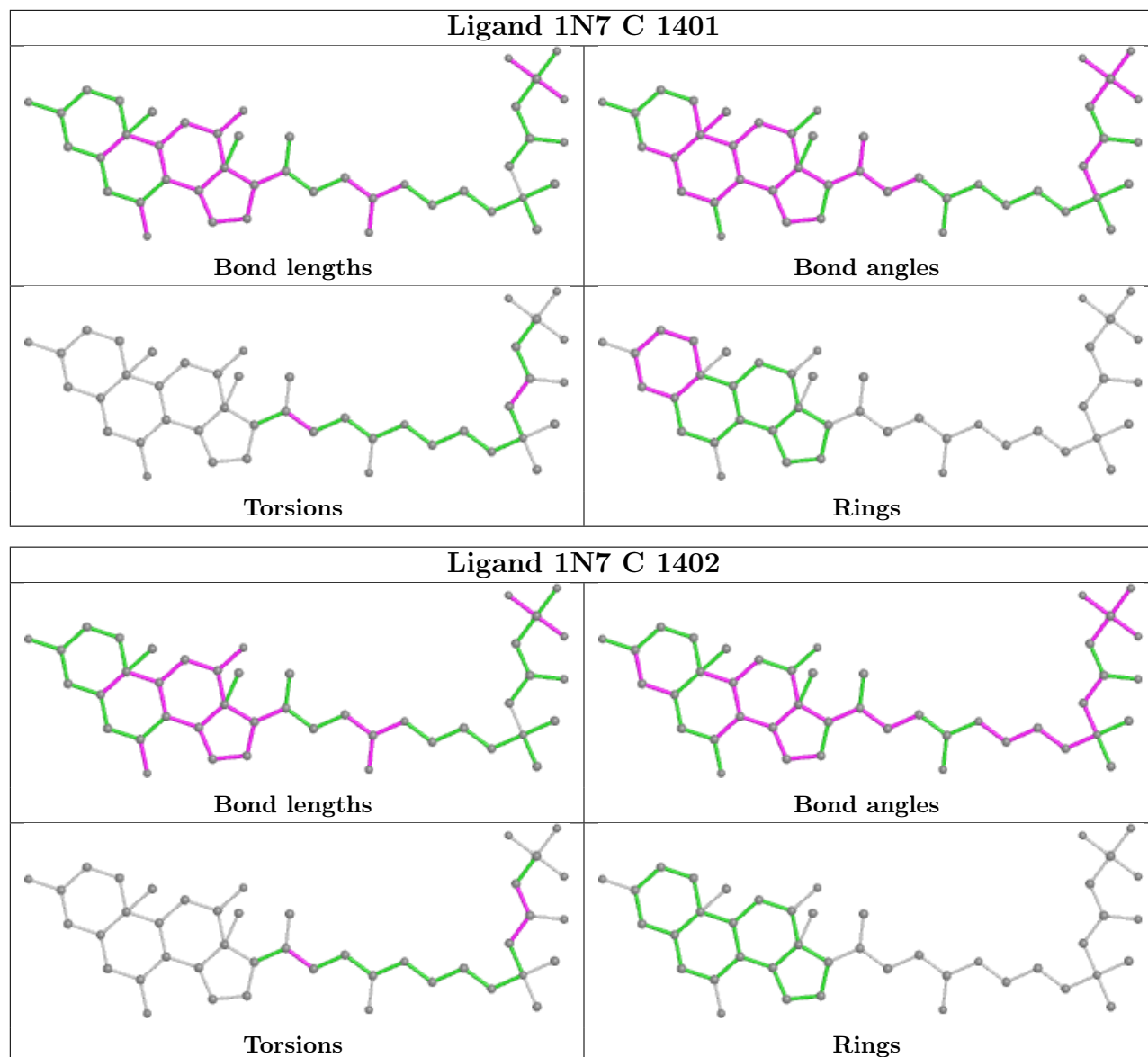
All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	C	1401	1N7	C1-C12-C13-C14-C15-C2

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	C	1401	1N7	1	0
8	C	1402	1N7	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for 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 than 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.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

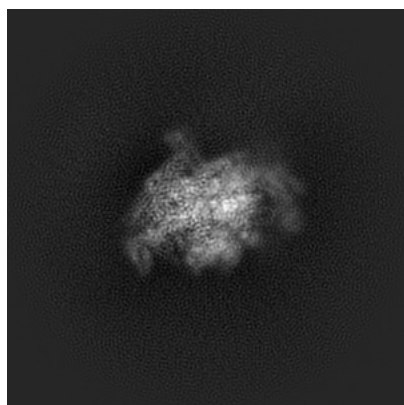
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21880. These allow visual inspection of the internal detail of the map and identification of artifacts.

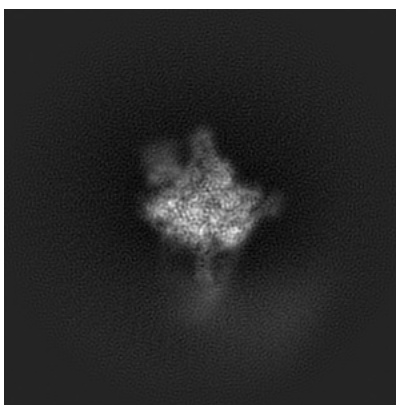
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

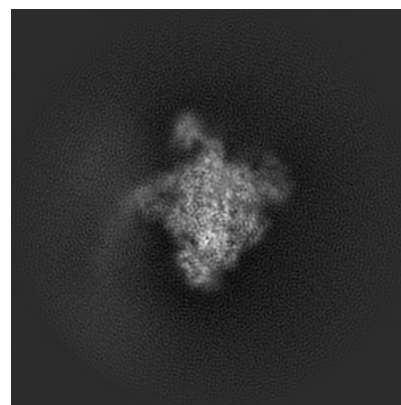
6.1.1 Primary map



X



Y

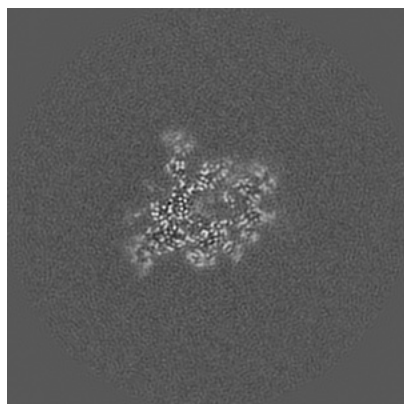


Z

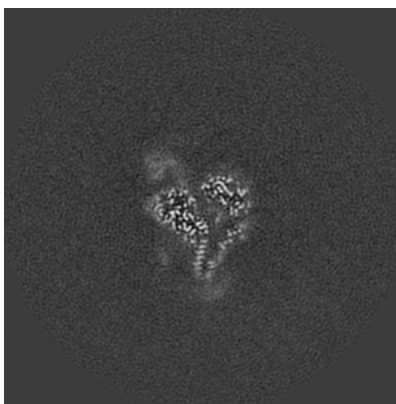
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

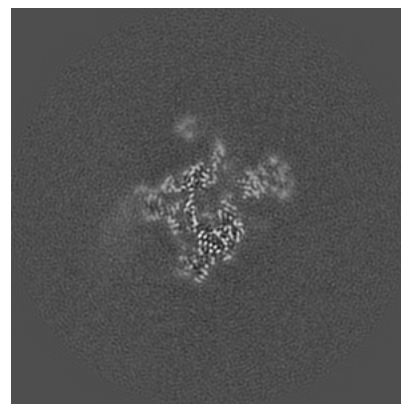
6.2.1 Primary map



X Index: 180



Y Index: 180

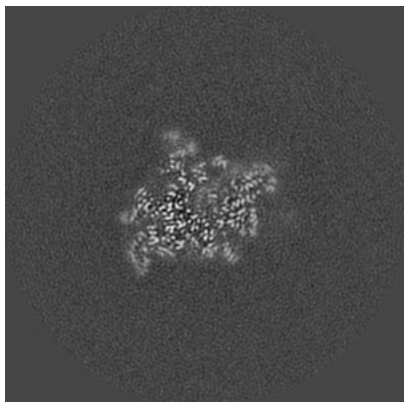


Z Index: 180

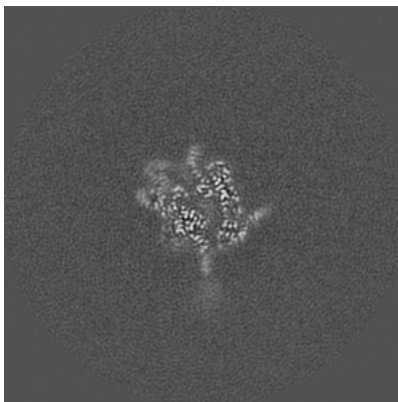
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

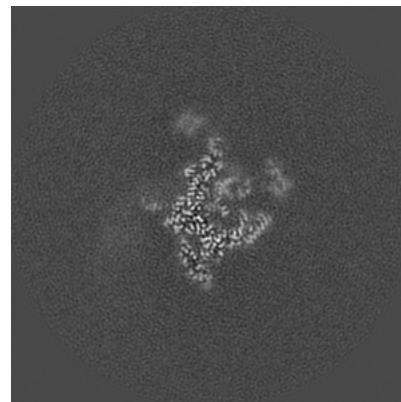
6.3.1 Primary map



X Index: 175



Y Index: 170



Z Index: 172

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.012. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

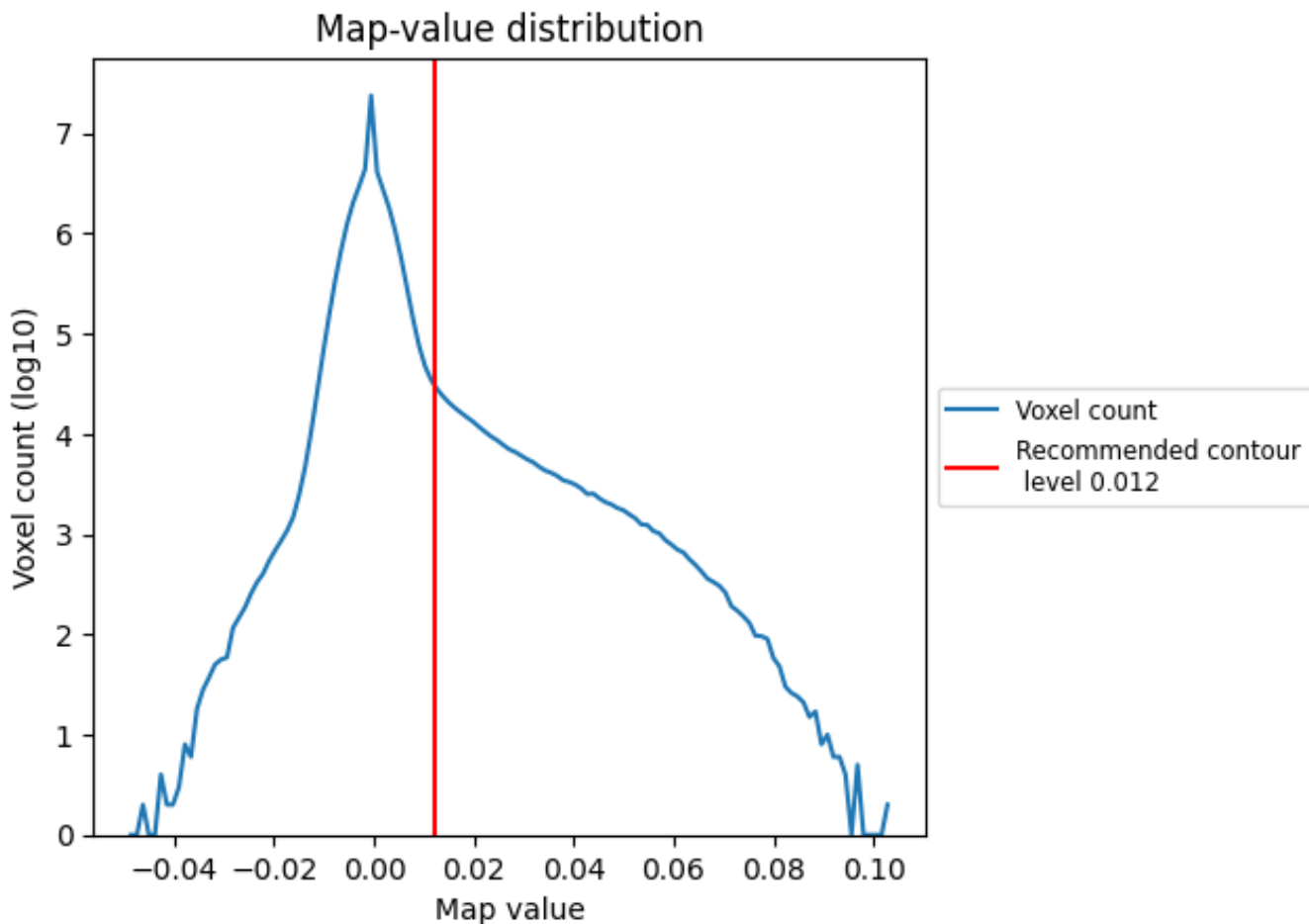
6.5 Mask visualisation

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

7 Map analysis [i](#)

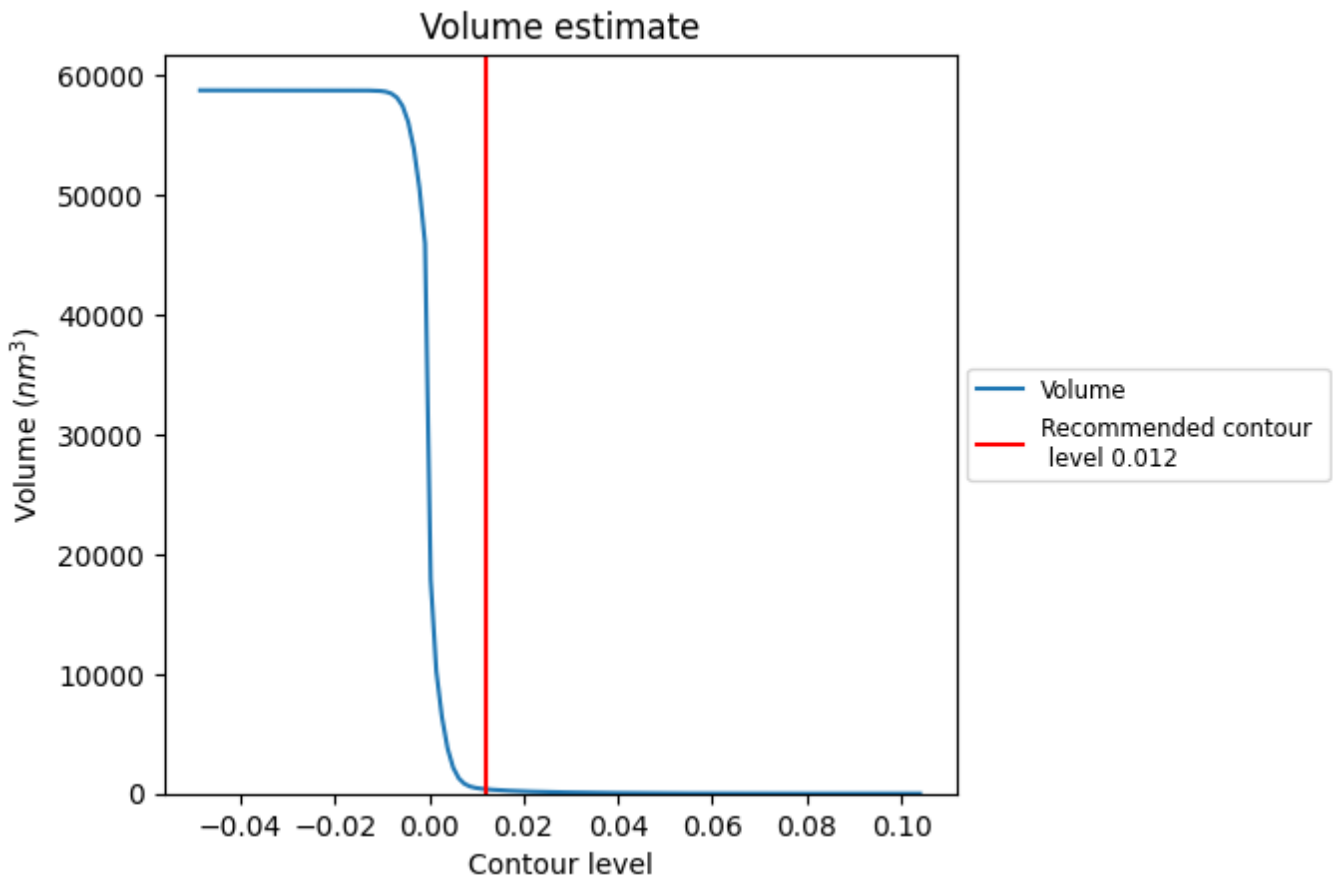
This section contains the results of statistical analysis of the map.

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.

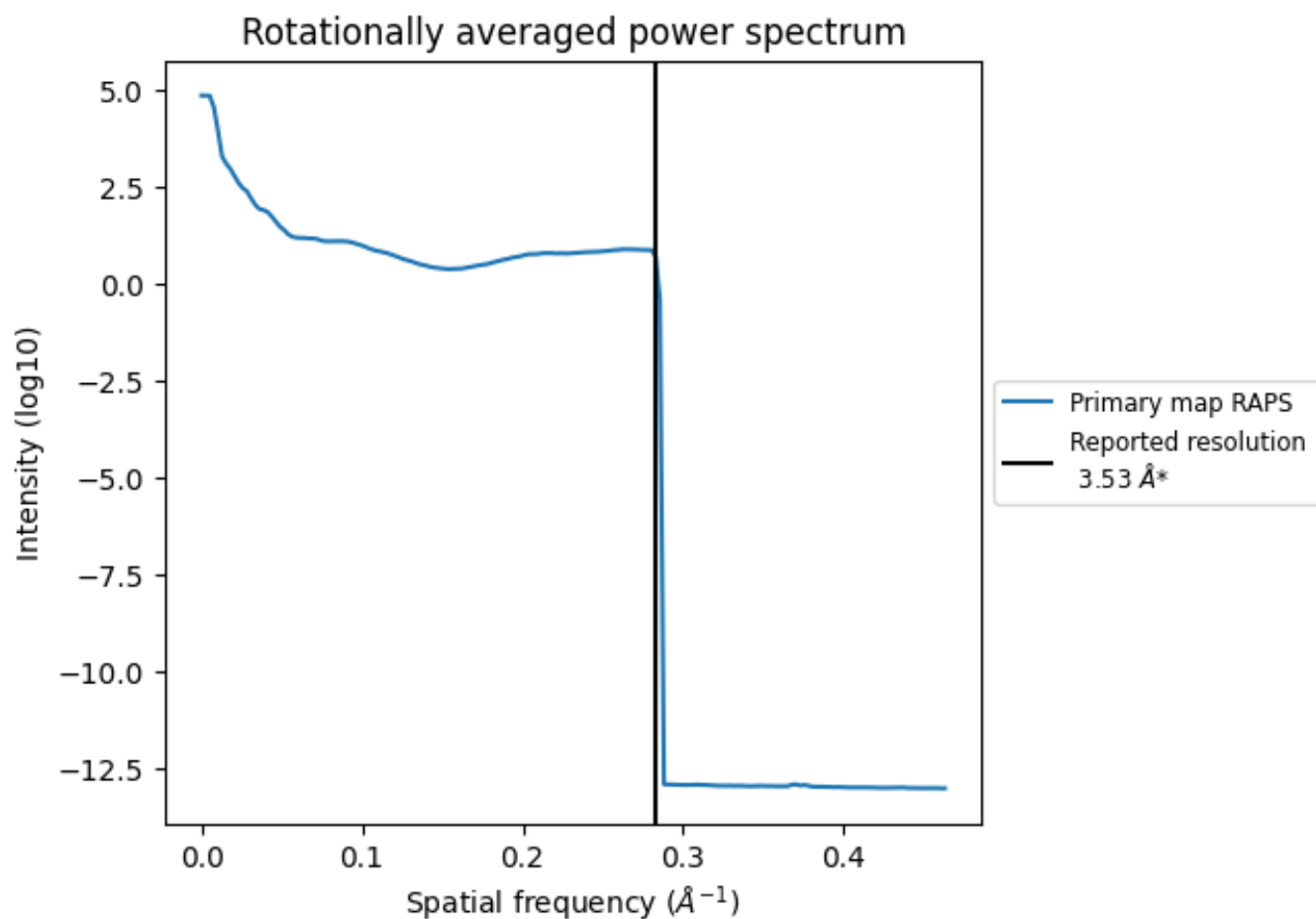
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 366 nm³; this corresponds to an approximate mass of 331 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 0.283 Å⁻¹

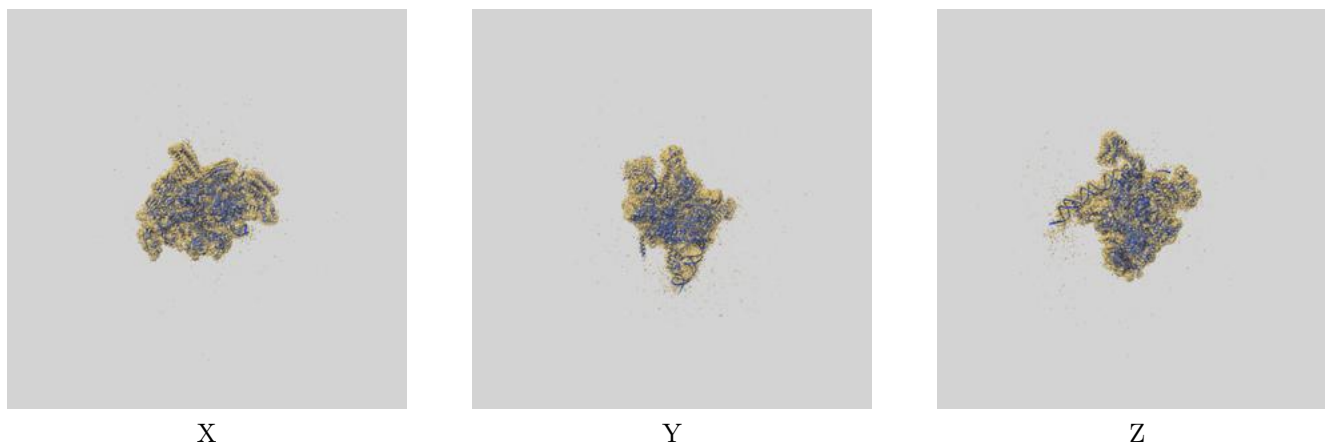
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

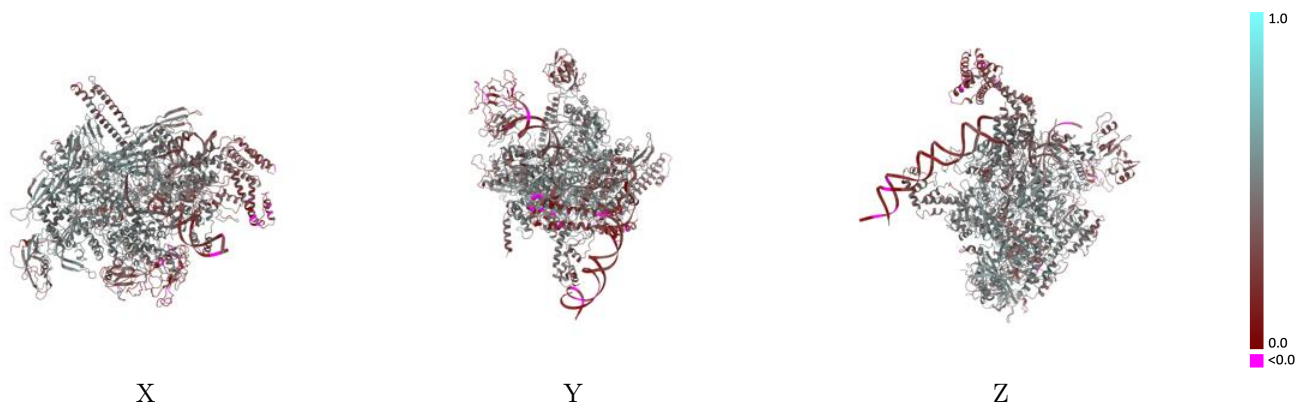
This section contains information regarding the fit between EMDB map EMD-21880 and PDB model 7KHB. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



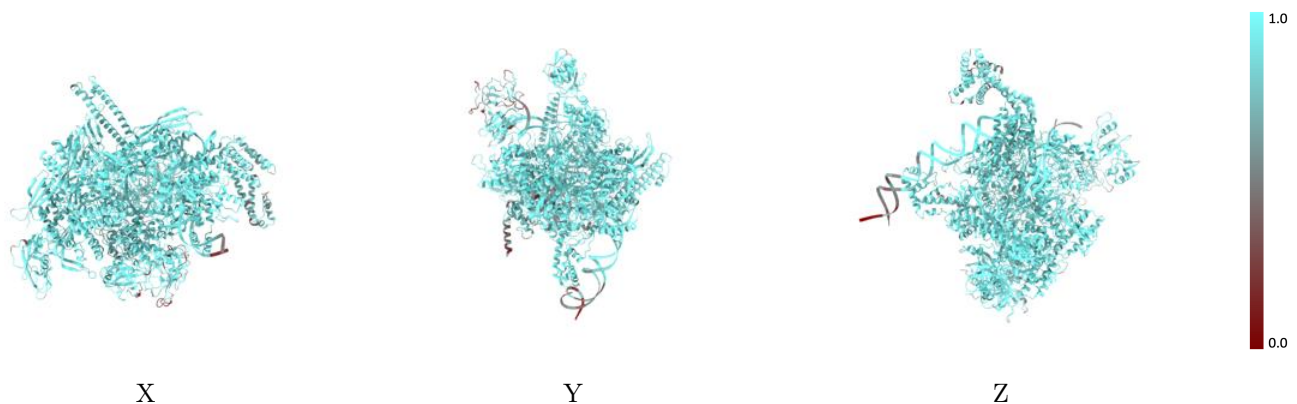
The images above show the 3D surface view of the map at the recommended contour level 0.012 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [\(i\)](#)



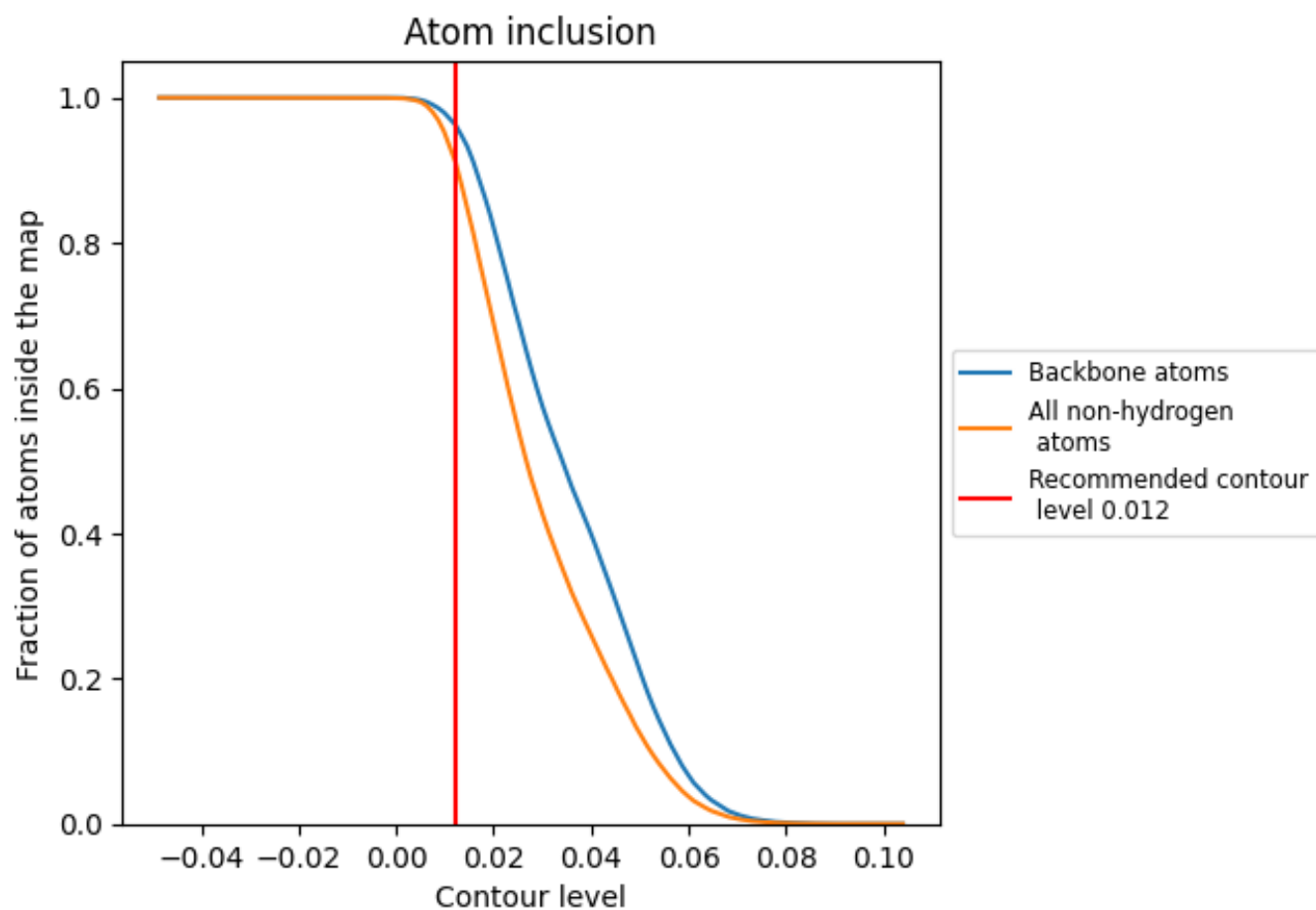
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [\(i\)](#)



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 (0.012).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 96% 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 (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9144	 0.4300
A	 0.9476	 0.4870
B	 0.9256	 0.4500
C	 0.9510	 0.4760
D	 0.9292	 0.4500
E	 0.6621	 0.4320
F	 0.8706	 0.3410
X	 0.7993	 0.2310
Y	 0.7970	 0.2400

