Full wwPDB EM Validation Report (i)

Jul 3, 2024 – 09:33 am BST

PDB ID	:	7O4L
EMDB ID	:	EMD-12722
Title	:	Yeast TFIIH in the expanded state within the pre-initiation complex
Authors	:	Schilbach, S.; Aibara, S.; Dienemann, C.; Grabbe, F.; Cramer, P.
Deposited on	:	2021-04-06
Resolution	:	3.40 Å(reported)
Based on initial model	:	5OQJ

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 (1)) were used in the production of this report:

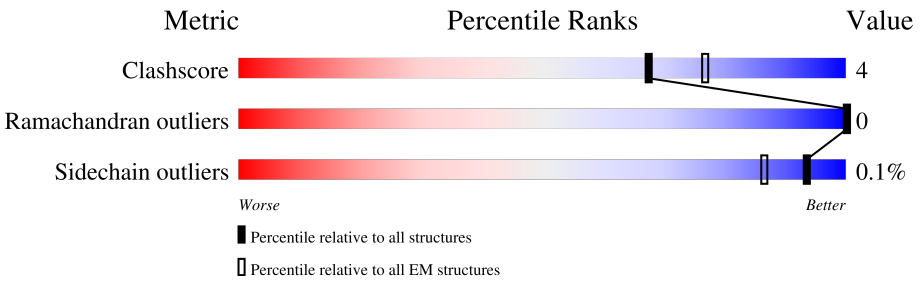
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

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	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	0	778	87% 10% •
2	1	645	6% 76% 5% 19%
3	2	517	19% 76% 10% 14%
4	3	324	36% • 60%
5	4	341	80% 6% 14%
6	5	76	32% 75% 11% 14%
7	6	464	9% 72% 9% 19%
8	7	843	62% 10% 28%

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Mol	Chain	Length	Quality of chain
9	A	1733	12% 87%
10	B	1224	6% 93%
11	D	221	66% 7% 27%
12	F	155	10% 33% 65%
13	G	177	85% 12%
14	N	106	9% 91%
15	T	106	8% 91%
16	W	492	9% 56% 7% 37%
17	X	328	38% 59%

2 Entry composition (i)

There are 22 unique types of molecules in this entry. The entry contains 35159 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 General transcription and DNA repair factor IIH helicase subunit XPD.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	752	6091	3882	1029	1142	38	0	0

- Molecule 2 is a protein called General transcription and DNA repair factor IIH subunit TFB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	521	4206	2654	733	797	22	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	-2	GLY	-	expression tag	UNP P32776
1	-1	GLY	-	expression tag	UNP P32776
1	0	SER	-	expression tag	UNP P32776

- Molecule 3 is a protein called General transcription and DNA repair factor IIH subunit TFB2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	445	3597	2327	591	663	16	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
2	-3	GLY	-	expression tag	UNP Q02939
2	-2	PRO	-	expression tag	UNP Q02939
2	-1	GLY	-	expression tag	UNP Q02939
2	0	SER	-	expression tag	UNP Q02939

- Molecule 4 is a protein called RNA polymerase II transcription factor B subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	131	1089	692	180	209	8	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
3	-2	GLY	-	expression tag	UNP Q03290
3	-1	PRO	-	expression tag	UNP Q03290
3	0	HIS	-	expression tag	UNP Q03290

- Molecule 5 is a protein called General transcription and DNA repair factor IIH subunit TFB4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	293	2274	1454	377	429	14	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
4	-2	SER	-	expression tag	UNP Q12004
4	-1	ASN	-	expression tag	UNP Q12004
4	0	ALA	-	expression tag	UNP Q12004

- Molecule 6 is a protein called General transcription and DNA repair factor IIH subunit TFB5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	5	65	514	326	90	95	3	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
5	-3	GLY	-	expression tag	UNP Q3E7C1
5	-2	PRO	-	expression tag	UNP Q3E7C1
5	-1	GLY	-	expression tag	UNP Q3E7C1
5	0	SER	-	expression tag	UNP Q3E7C1

- Molecule 7 is a protein called General transcription and DNA repair factor IIH subunit SSL1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	6	374	2946	1870	507	541	28	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
6	-2	GLY	-	expression tag	UNP Q04673
6	-1	GLY	-	expression tag	UNP Q04673
6	0	SER	-	expression tag	UNP Q04673

- Molecule 8 is a protein called General transcription and DNA repair factor IIH helicase subunit XPB.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	7	607	4881	3104	846	905	26	0	0

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	A	227	1752	1102	301	330	19	0	0

- Molecule 10 is a protein called DNA-directed RNA polymerase II subunit RPB2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	B	81	644	409	114	113	8	0	0

- Molecule 11 is a protein called DNA-directed RNA polymerase II subunit RPB4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	D	162	1296	801	230	263	2	0	0

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	F	55	454	296	80	76	2	0	0

- Molecule 13 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	G	171	1339	861	222	248	8	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	172	HIS	-	expression tag	UNP P34087
G	173	HIS	-	expression tag	UNP P34087
G	174	HIS	-	expression tag	UNP P34087
G	175	HIS	-	expression tag	UNP P34087
G	176	HIS	-	expression tag	UNP P34087
G	177	HIS	-	expression tag	UNP P34087

- Molecule 14 is a DNA chain called Nontemplate DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
14	N	10	205	99	39	57	10	0	0

- Molecule 15 is a DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
15	T	10	205	100	32	63	10	0	0

- Molecule 16 is a protein called Transcription initiation factor IIE subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	W	311	2521	1589	438	487	7	0	0

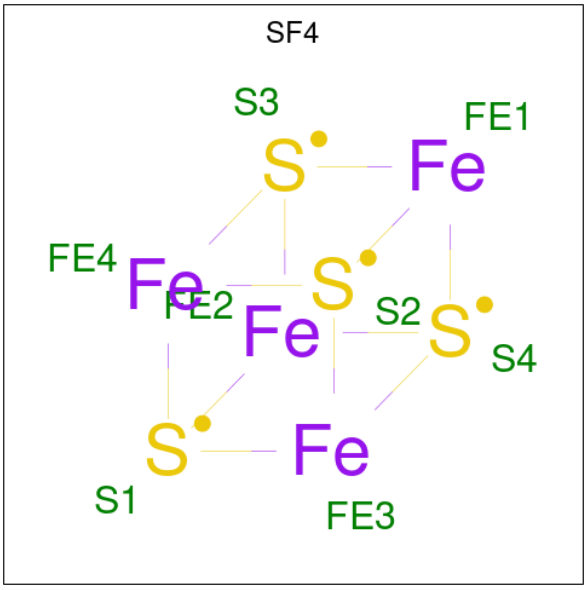
There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
W	483	ALA	-	expression tag	UNP P36100
W	484	ALA	-	expression tag	UNP P36100
W	485	ALA	-	expression tag	UNP P36100
W	486	LEU	-	expression tag	UNP P36100
W	487	GLU	-	expression tag	UNP P36100
W	488	HIS	-	expression tag	UNP P36100
W	489	HIS	-	expression tag	UNP P36100
W	490	HIS	-	expression tag	UNP P36100
W	491	HIS	-	expression tag	UNP P36100
W	492	HIS	-	expression tag	UNP P36100

- Molecule 17 is a protein called Transcription initiation factor IIE subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	X	135	1094	694	190	205	5	0	0

- Molecule 18 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).

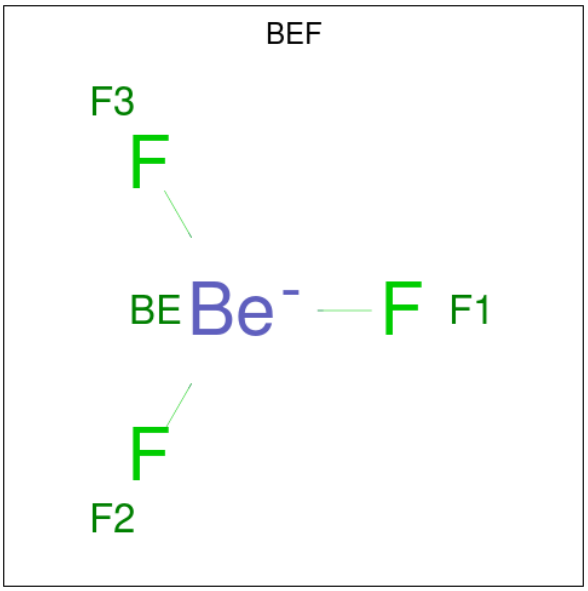


Mol	Chain	Residues	Atoms			AltConf
			Total	Fe	S	
18	0	1	8	4	4	0

- Molecule 19 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
19	3	2	2	2	0
19	4	1	1	1	0
19	6	4	4	4	0
19	A	2	2	2	0
19	B	1	1	1	0
19	W	1	1	1	0

- Molecule 20 is BERYLLIUM TRIFLUORIDE ION (three-letter code: BEF) (formula: BeF_3).

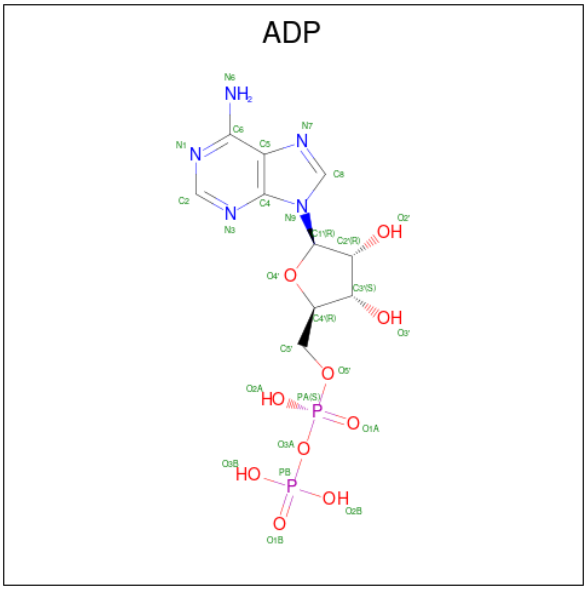


Mol	Chain	Residues	Atoms			AltConf
			Total	Be	F	
20	7	1	4	1	3	0

- Molecule 21 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
21	7	1	1	1	0

- Molecule 22 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



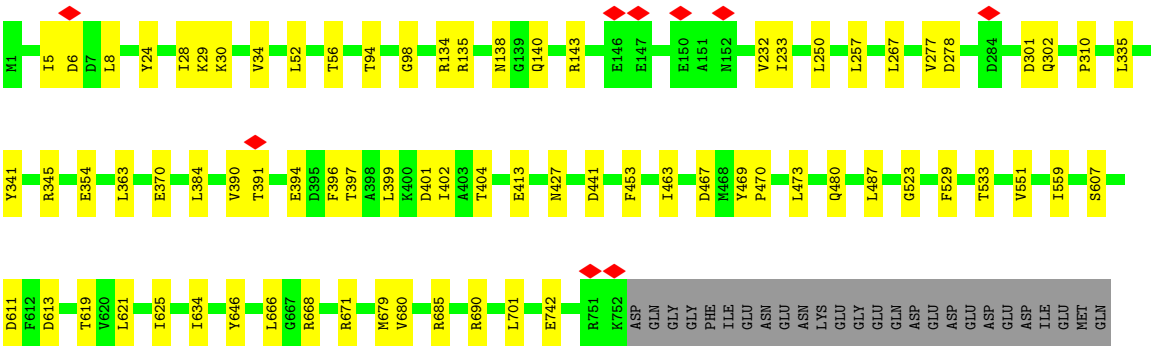
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
22	7	1	27	10	5	10	2	0

3 Residue-property plots (i)

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.

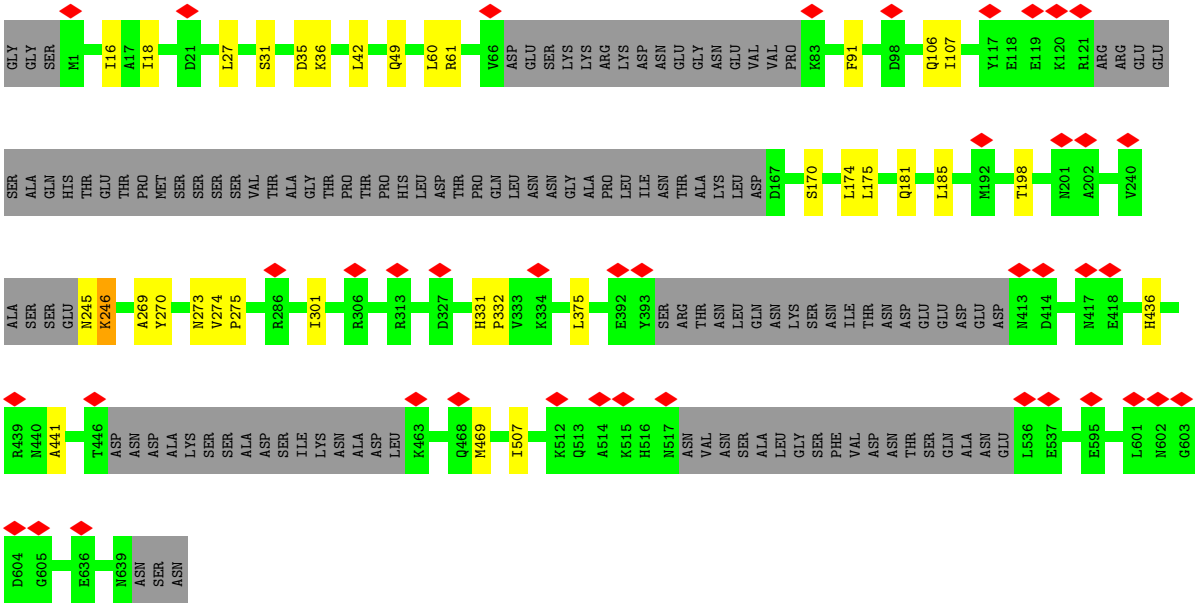
• Molecule 1: General transcription and DNA repair factor IIH helicase subunit XPD

Chain 0:



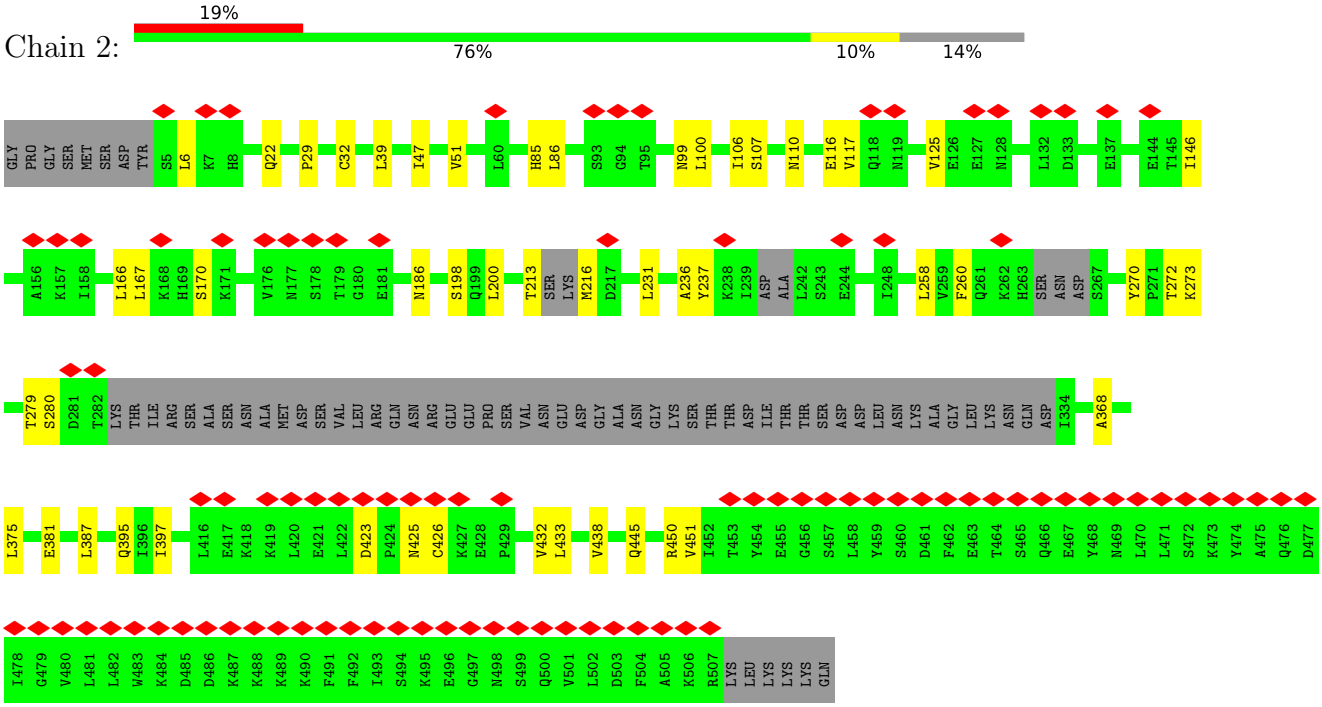
• Molecule 2: General transcription and DNA repair factor IIH subunit TFB1

Chain 1:



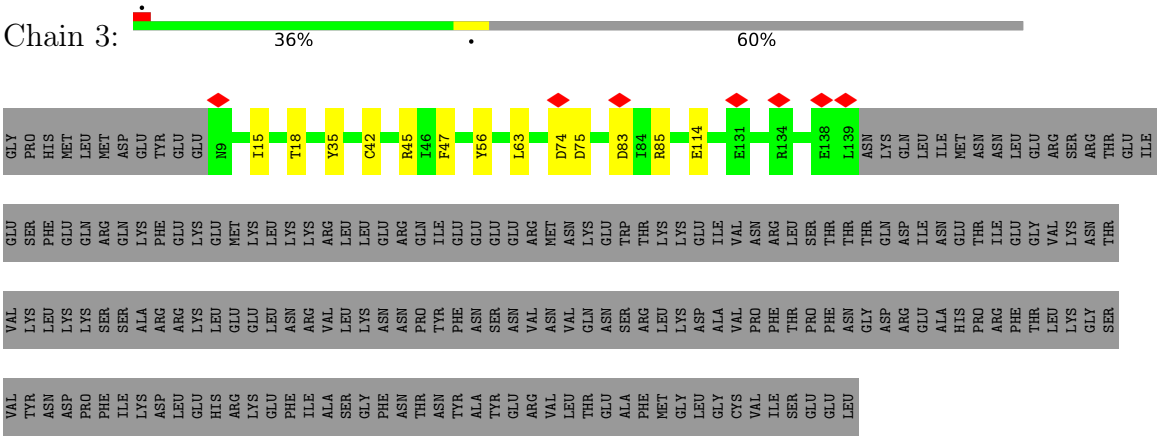
• Molecule 3: General transcription and DNA repair factor IIH subunit TFB2

Chain 2:



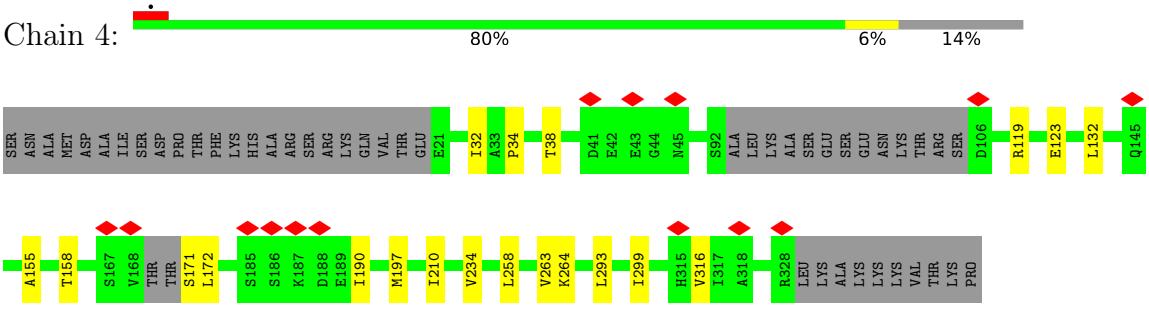
• Molecule 4: RNA polymerase II transcription factor B subunit 3

Chain 3:



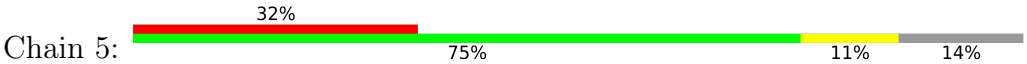
• Molecule 5: General transcription and DNA repair factor IIH subunit TFB4

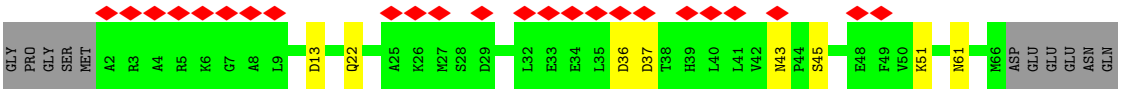
Chain 4:



• Molecule 6: General transcription and DNA repair factor IIH subunit TFB5

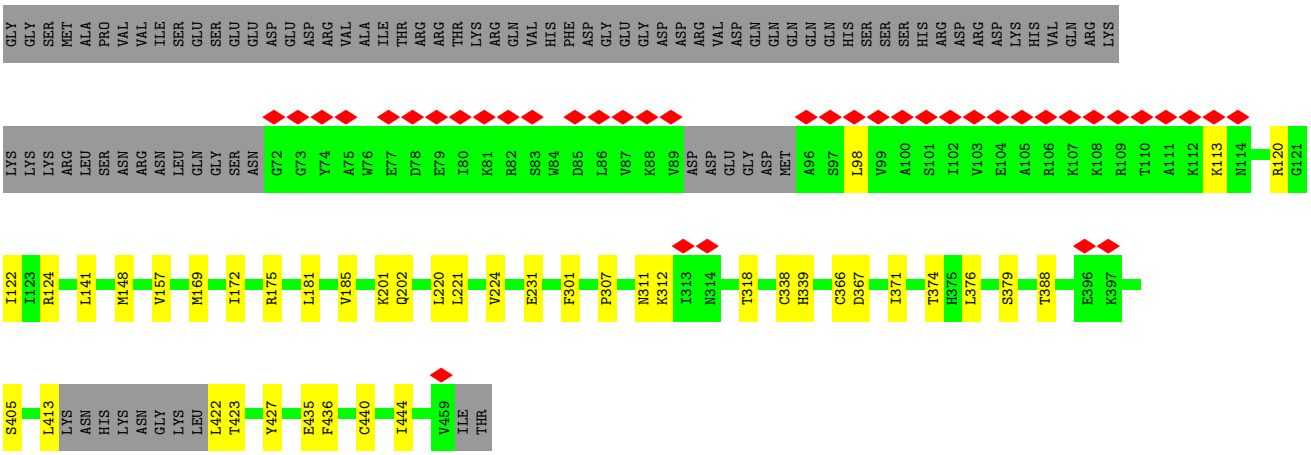
Chain 5:





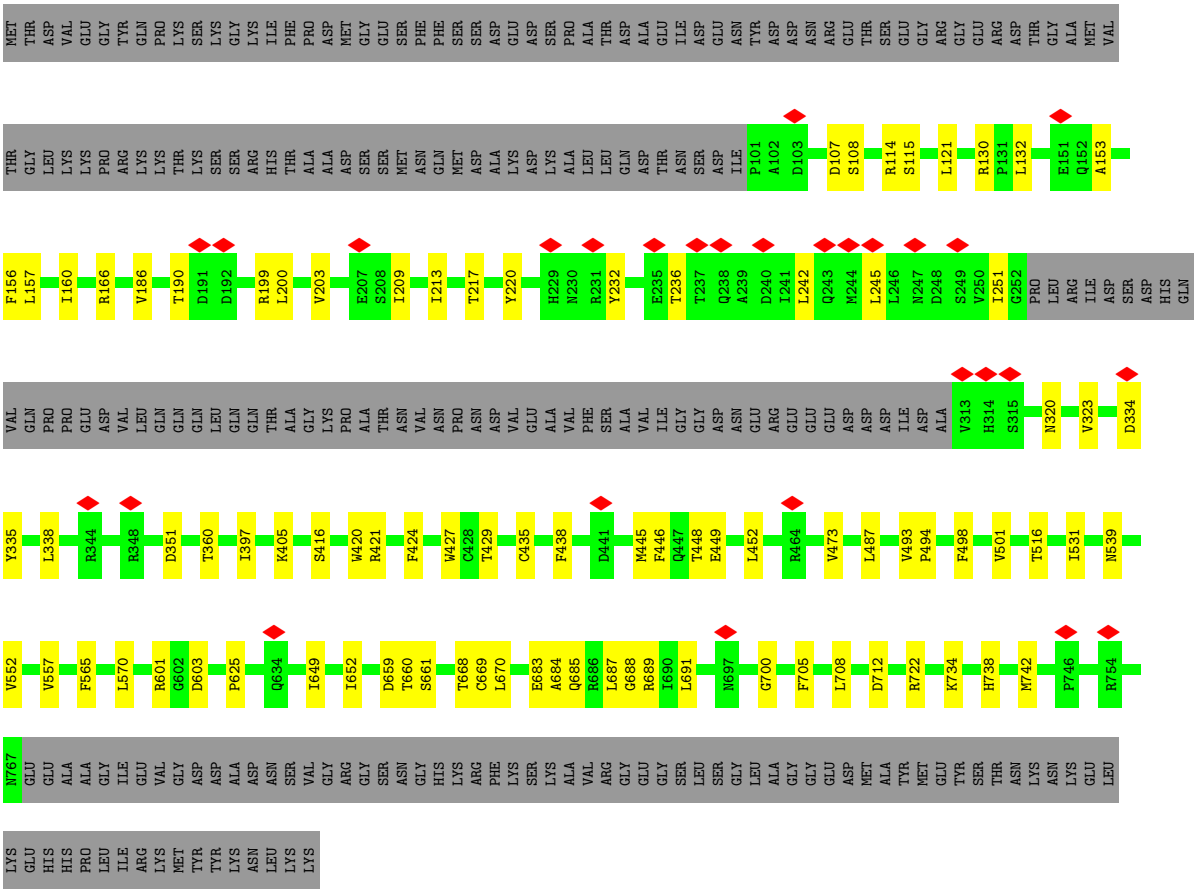
• Molecule 7: General transcription and DNA repair factor IIH subunit SSL1

Chain 6:



• Molecule 8: General transcription and DNA repair factor IIH helicase subunit XPB

Chain 7:



• Molecule 9: DNA-directed RNA polymerase II subunit RPB1

Chain A: 12% 87%

MET VAL GLY GLN GLN Y6 F22 A33 LYS ILE ARG PHE PRO GLU THR MET ASP GLU THR GLN THR ARG ALA LYS ILE GLY GLY LEU ASN ASP P56 R57 L58 GLY SER ILE ASP ARG ASN LEU K66 T69 E72 GLY MET ASN E76 H83 ILE ASP LEU ALA LYS PRO VAL

PHE HIS V93 G94 F95 K98 I99 K100 K101 L114 LEU ASP GLU HIS ASN GLU LEU MET ARG GLN ALA LEU ALA ILE LYS ASP SER LYS LYS ARG PHE ALA ALA ILE TRP THR LEU C142 T150 ASP VAL PRO SER GLU ASP ASP PRO THR GLN LEU VAL SER R164 R175 K176 D177

G178 L179 K180 D188 ARG ALA THR GLY ASP ALA D195 E196 T204 L208 K212 S215 VAL LYS ASP PHE THR SER LEU GLY PHE N225 S229 R230 P231 E232 W233 MET ILE LEU THR CYS LEU P240 V241 P242 P243 P244 P245 V246 ARG PRO SER ILE SER PHE ASN GLU SER GLN

ARG GLY GLU ASP ASP LEU THR PHE LYS LEU ALA ASP ILE LEU LYS ALA ASN ILE SER LEU GLU THR LEU E280 A284 P285 H286 H287 A288 I289 E290 E291 A292 E293 S294 L295 L296 Q297 F298 H299 V300 A301 T302 Y303 M304 ASP ASN ASP ILE ALA GLY GLN PRO GLN ALA LEU GLN LYS SER

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

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

ASN ASP PRO VAL LEU PHE ASN ARG GLN PRO SER LEU HIS LYS MET SER MET MET ALA HIS ARG VAL LYS VAL ILE PRO TYR SER THR PHE ARG LEU ASN LEU SER VAL THR SER PRO TYR ASN ALA ASP PHE ASP GLY ASP GLU MET ASN LEU HIS VAL P492 Q493 L501 SER GLN LEU

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

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

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

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

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

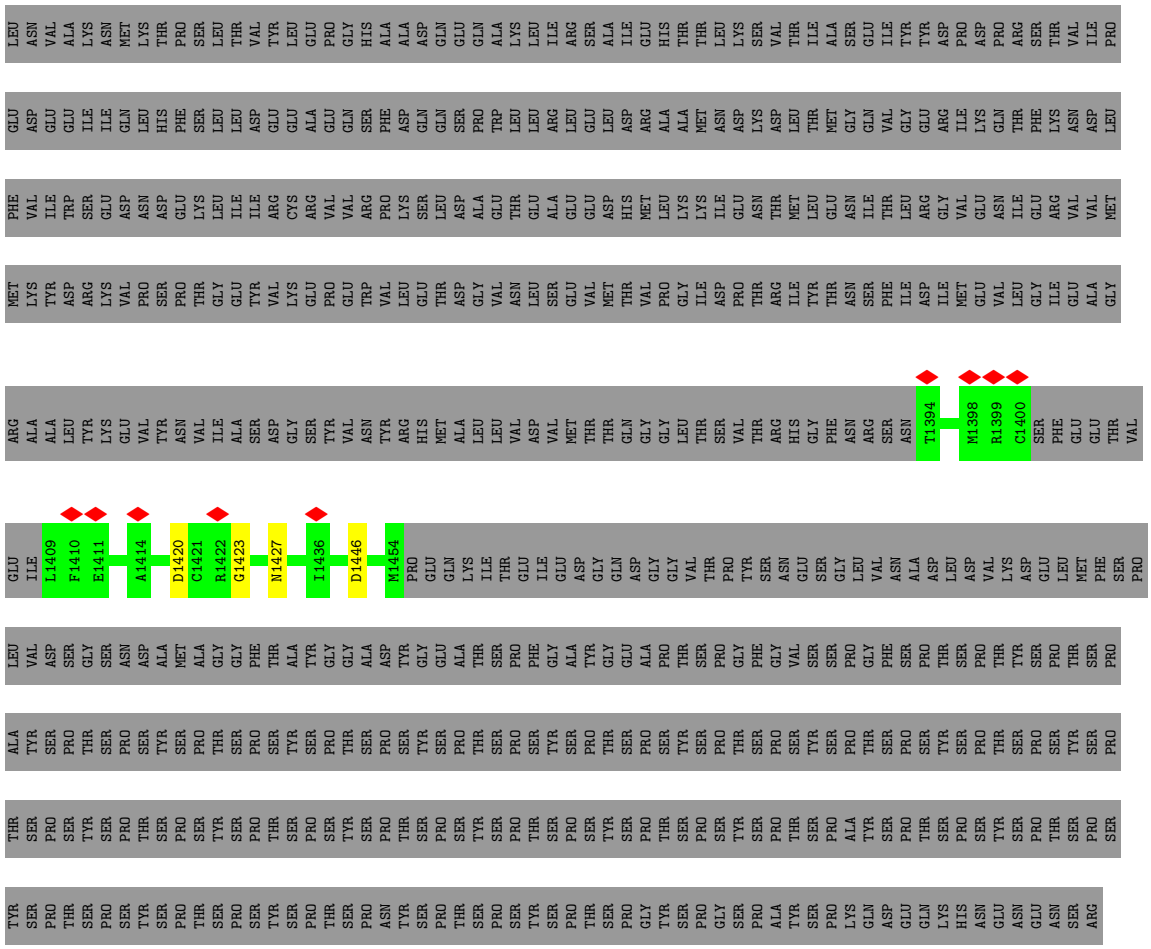
LEU ARG GLY LEU THR PRO GLN GLU PHE PHE PHE HIS ALA MET GLY GLY ARG GLU GLY LEU ILE ASP THR ALA VAL LYS THR GLY TYR ILE GLN ARG VAL LEU ASP ILE MET VAL HIS TYR ASP ASP ASN THR THR ARG ASN SER LEU LEU GLU ASP ASN GLY SER LEU LEU GLY ASN VAL ILE

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

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

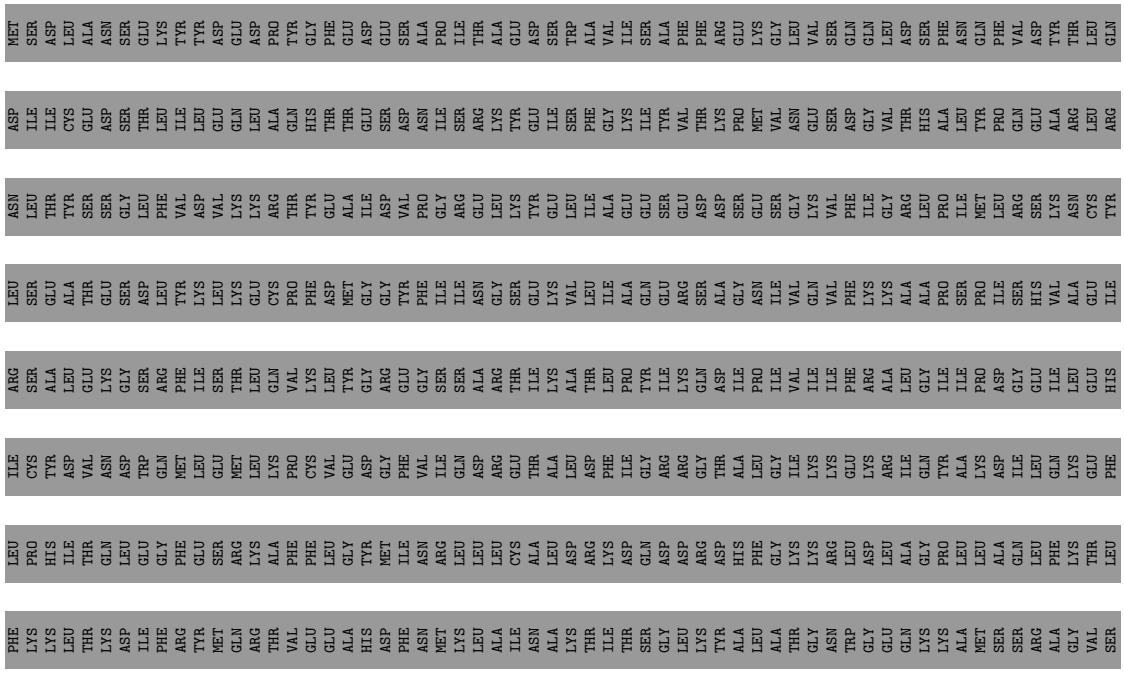
ASP ILE VAL LEU GLY VAL LYS ASP LEU GLN GLU ASN LEU VAL VAL LEU ARG GLY LYS ASN GLU ILE ILE GLN ASN ALA GLN ARG ASP ALA VAL THR LEU PHE CYS LEU LEU ARG SER ARG LEU ALA THR ARG ARG VAL LEU GLN GLU TYR ARG LEU THR LYS ASN ALA PHE ALA

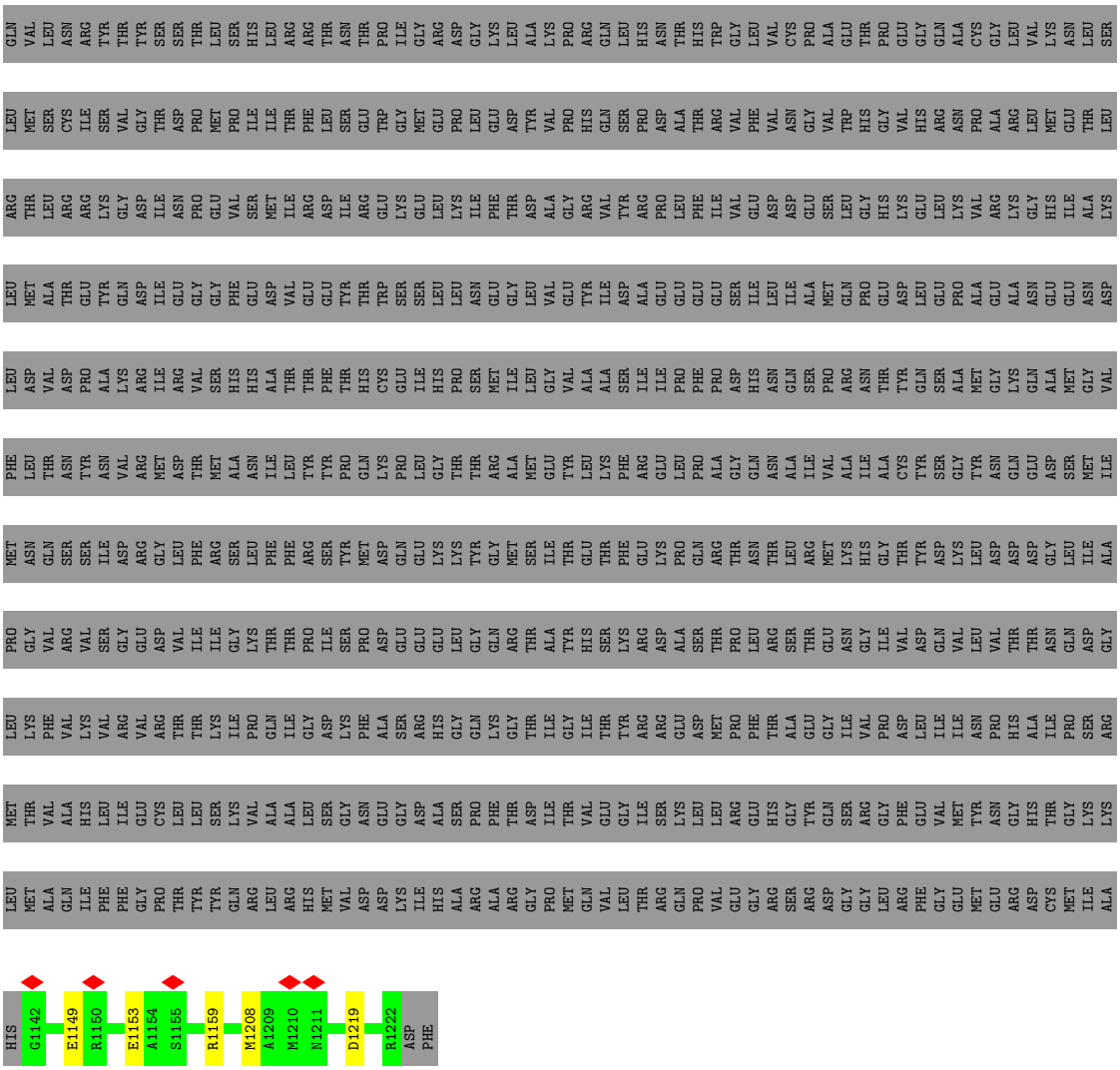
VAL LEU SER ASN ILE GLU ALA GLN PHE LEU ARG SER VAL VAL HIS PRO GLY GLU GLU MET VAL GLY VAL LEU ALA ALA SER ILE GLY GLU PRO ALA THR GLN MET THR LEU ASN THR PHE HIS PHE ALA GLY VAL ALA SER LYS LYS VAL THR SER GLY VAL PRO ARG LEU LYS ILE



- Molecule 10: DNA-directed RNA polymerase II subunit RPB2

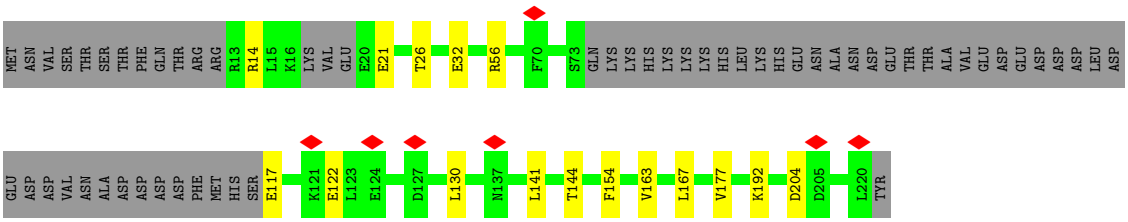
Chain B: 6% 93%





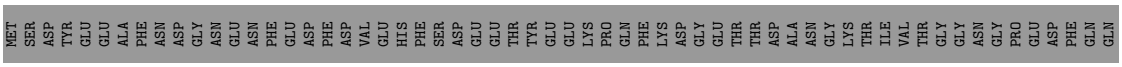
• Molecule 11: DNA-directed RNA polymerase II subunit RPB4

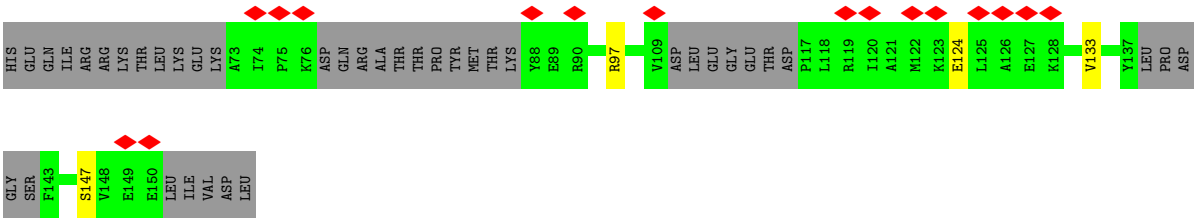
Chain D:



• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC2

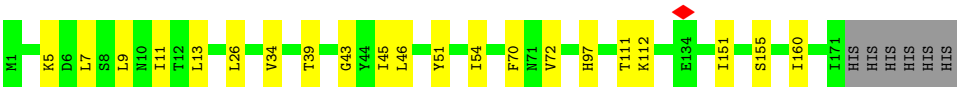
Chain F:





• Molecule 13: DNA-directed RNA polymerase II subunit RPB7

Chain G:



• Molecule 14: Nontemplate DNA

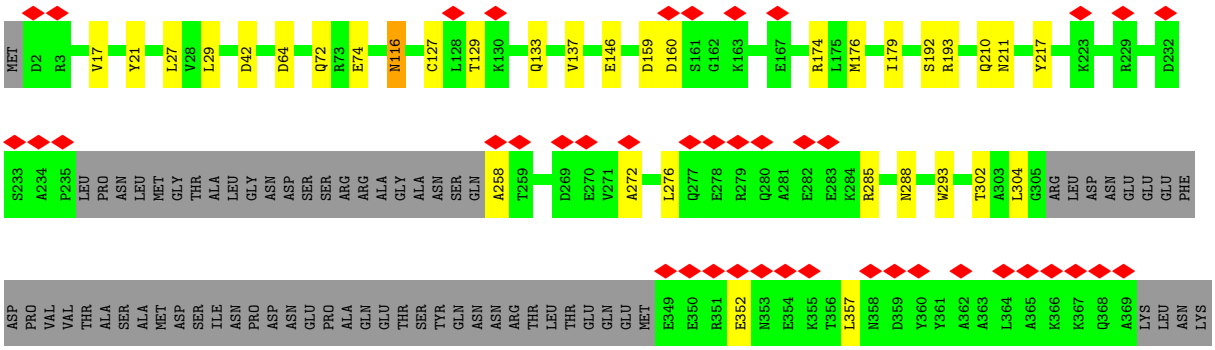
Chain N:

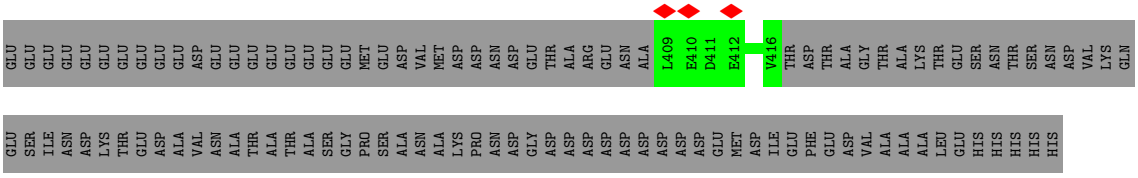
• Molecule 15: Template DNA

Chain T:

• Molecule 16: Transcription initiation factor IIE subunit alpha

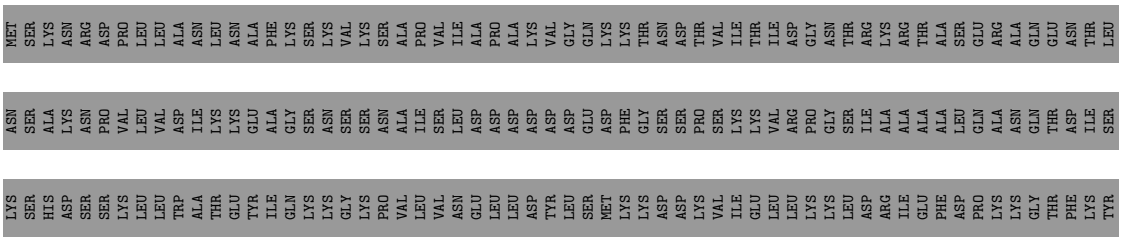
Chain W:

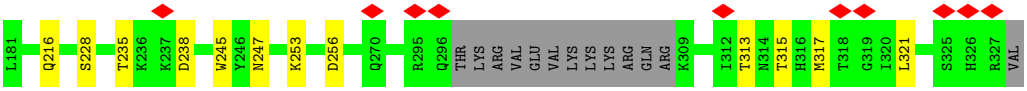




• Molecule 17: Transcription initiation factor IIE subunit beta

Chain X:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	34198	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 ($e^-/Å^2$)	43.6	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	130000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	93.916	Depositor
Minimum map value	-66.865	Depositor
Average map value	0.052	Depositor
Map value standard deviation	1.010	Depositor
Recommended contour level	3.7	Depositor
Map size (Å)	398.99997, 398.99997, 398.99997	wwPDB
Map dimensions	380, 380, 380	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.05, 1.05, 1.05	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: ADP, SF4, MG, BEF, ZN

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	0	0.24	0/6209	0.39	0/8384
2	1	0.23	0/4269	0.36	0/5744
3	2	0.24	0/3664	0.36	0/4952
4	3	0.24	0/1109	0.37	0/1492
5	4	0.24	0/2312	0.39	0/3127
6	5	0.22	0/520	0.38	0/701
7	6	0.25	0/3007	0.43	2/4066 (0.0%)
8	7	0.25	0/4984	0.42	2/6742 (0.0%)
9	A	0.23	0/1777	0.37	0/2378
10	B	0.25	0/655	0.41	0/879
11	D	0.23	0/1303	0.38	0/1747
12	F	0.23	0/460	0.35	0/614
13	G	0.25	0/1367	0.42	0/1844
14	N	0.49	0/230	0.91	0/352
15	T	0.57	0/228	1.09	0/350
16	W	0.23	0/2564	0.37	0/3459
17	X	0.24	0/1115	0.39	0/1502
All	All	0.25	0/35773	0.41	4/48333 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	6	301	PHE	CB-CG-CD1	-7.93	115.25	120.80
7	6	301	PHE	CB-CG-CD2	7.75	126.23	120.80
8	7	565	PHE	CB-CG-CD1	-7.43	115.60	120.80
8	7	565	PHE	CB-CG-CD2	7.04	125.72	120.80

There are no chirality outliers.

There are no planarity outliers.

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	0	6091	0	6155	46	0
2	1	4206	0	4277	27	0
3	2	3597	0	3687	35	0
4	3	1089	0	1069	8	0
5	4	2274	0	2332	16	0
6	5	514	0	541	7	0
7	6	2946	0	2958	26	0
8	7	4881	0	4867	62	0
9	A	1752	0	1719	9	0
10	B	644	0	649	5	0
11	D	1296	0	1311	10	0
12	F	454	0	480	3	0
13	G	1339	0	1357	17	0
14	N	205	0	114	0	0
15	T	205	0	117	1	0
16	W	2521	0	2516	26	0
17	X	1094	0	1114	9	0
18	0	8	0	0	0	0
19	3	2	0	0	0	0
19	4	1	0	0	0	0
19	6	4	0	0	0	0
19	A	2	0	0	0	0
19	B	1	0	0	0	0
19	W	1	0	0	0	0
20	7	4	0	0	0	0
21	7	1	0	0	0	0
22	7	27	0	12	0	0
All	All	35159	0	35275	275	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 4.

All (275) 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)
8:7:424:PHE:CE2	8:7:452:LEU:HD22	1.93	1.04
8:7:397:ILE:HG12	8:7:424:PHE:CD1	2.01	0.96
1:0:52:LEU:HD21	1:0:233:ILE:HD13	1.50	0.94
8:7:424:PHE:CD2	8:7:452:LEU:HD22	2.04	0.92
5:4:293:LEU:HD11	7:6:376:LEU:HD22	1.52	0.89
8:7:397:ILE:HG12	8:7:424:PHE:HD1	1.34	0.87
8:7:683:GLU:OE1	8:7:722:ARG:NH1	2.11	0.84
8:7:421:ARG:NH2	8:7:435:CYS:SG	2.50	0.83
8:7:424:PHE:CD2	8:7:452:LEU:CD2	2.65	0.79
8:7:659:ASP:O	8:7:689:ARG:NH1	2.16	0.79
16:W:17:VAL:HG21	16:W:29:LEU:HD13	1.65	0.79
8:7:734:LYS:NZ	16:W:293:TRP:O	2.17	0.77
1:0:611:ASP:OD2	1:0:671:ARG:NH1	2.20	0.75
8:7:166:ARG:NH1	8:7:539:ASN:OD1	2.20	0.75
1:0:140:GLN:OE1	1:0:143:ARG:NH2	2.19	0.75
1:0:607:SER:O	1:0:668:ARG:NH1	2.20	0.74
1:0:529:PHE:O	1:0:533:THR:OG1	2.03	0.73
3:2:451:VAL:O	6:5:51:LYS:NZ	2.22	0.73
4:3:35:TYR:OH	4:3:83:ASP:OD2	2.07	0.72
1:0:613:ASP:OD2	1:0:671:ARG:NE	2.23	0.72
2:1:49:GLN:OE1	2:1:61:ARG:NH2	2.23	0.71
8:7:416:SER:OG	8:7:661:SER:O	2.09	0.70
16:W:42:ASP:OD1	16:W:210:GLN:NE2	2.24	0.70
9:A:57:ARG:O	9:A:69:THR:OG1	2.08	0.69
7:6:141:LEU:HD23	7:6:148:MET:SD	2.34	0.68
3:2:450:ARG:NE	6:5:13:ASP:OD2	2.25	0.67
1:0:5:ILE:HG22	1:0:6:ASP:H	1.60	0.67
2:1:31:SER:OG	16:W:211:ASN:OD1	2.14	0.66
7:6:338:CYS:SG	7:6:339:HIS:CE1	2.88	0.66
9:A:76:GLU:OE2	10:B:1159:ARG:NH1	2.28	0.66
8:7:130:ARG:NH1	8:7:199:ARG:O	2.30	0.64
17:X:321:LEU:HD12	17:X:321:LEU:O	1.97	0.64
3:2:213:THR:O	3:2:216:MET:N	2.31	0.64
6:5:22:GLN:HG3	8:7:570:LEU:HD13	1.79	0.64
7:6:422:LEU:HD23	7:6:423:THR:HG23	1.79	0.63
1:0:533:THR:HG21	1:0:619:THR:HG22	1.81	0.63
5:4:119:ARG:NH1	5:4:123:GLU:OE1	2.32	0.62
7:6:427:TYR:O	7:6:436:PHE:N	2.32	0.62
10:B:1153:GLU:OE1	10:B:1153:GLU:N	2.34	0.61
8:7:217:THR:HG22	8:7:217:THR:O	2.00	0.61
3:2:381:GLU:N	3:2:381:GLU:OE1	2.34	0.61
7:6:435:GLU:N	7:6:435:GLU:OE1	2.34	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:X:313:THR:O	17:X:315:THR:HG23	2.01	0.60
16:W:352:GLU:OE2	16:W:352:GLU:N	2.35	0.60
1:0:441:ASP:OD1	1:0:646:TYR:OH	2.10	0.60
3:2:231:LEU:HD22	3:2:237:TYR:CE2	2.37	0.60
7:6:405:SER:OG	7:6:440:CYS:SG	2.60	0.59
1:0:257:LEU:HD23	1:0:402:ILE:HD11	1.84	0.59
3:2:260:PHE:O	3:2:270:TYR:N	2.34	0.59
1:0:134:ARG:O	1:0:138:ASN:N	2.35	0.59
1:0:467:ASP:OD1	1:0:480:GLN:NE2	2.35	0.59
16:W:17:VAL:CG2	16:W:29:LEU:HD13	2.32	0.59
11:D:21:GLU:OE2	11:D:21:GLU:N	2.34	0.59
16:W:133:GLN:O	16:W:137:VAL:HG23	2.02	0.59
16:W:21:TYR:OH	16:W:64:ASP:OD2	2.18	0.58
1:0:370:GLU:N	1:0:370:GLU:OE1	2.36	0.58
2:1:274:VAL:HB	2:1:275:PRO:HD3	1.86	0.58
7:6:311:ASN:OD1	7:6:312:LYS:N	2.36	0.58
3:2:166:LEU:O	3:2:170:SER:OG	2.11	0.58
3:2:397:ILE:HD12	3:2:438:VAL:HG13	1.84	0.58
8:7:649:ILE:HD12	17:X:317:MET:CE	2.34	0.57
1:0:742:GLU:OE1	1:0:742:GLU:N	2.35	0.57
7:6:113:LYS:HA	7:6:388:THR:HG21	1.87	0.57
11:D:32:GLU:O	13:G:5:LYS:NZ	2.24	0.57
8:7:557:VAL:HB	8:7:708:LEU:HD23	1.87	0.57
5:4:234:VAL:HG22	5:4:264:LYS:HG3	1.87	0.56
2:1:301:ILE:HG23	2:1:301:ILE:O	2.06	0.56
17:X:235:THR:OG1	17:X:238:ASP:O	2.23	0.56
8:7:245:LEU:HD21	8:7:251:ILE:HD13	1.88	0.56
3:2:116:GLU:OE1	3:2:116:GLU:N	2.38	0.56
8:7:601:ARG:NH1	8:7:603:ASP:OD2	2.34	0.56
13:G:11:ILE:HD12	13:G:72:VAL:HG21	1.87	0.55
8:7:700:GLY:O	16:W:288:ASN:ND2	2.40	0.55
8:7:186:VAL:HG13	8:7:186:VAL:O	2.06	0.55
13:G:34:VAL:HG12	13:G:45:ILE:HG21	1.88	0.55
3:2:47:ILE:O	3:2:51:VAL:HG23	2.07	0.55
7:6:221:LEU:O	7:6:224:VAL:HG12	2.06	0.55
5:4:32:ILE:HD11	5:4:132:LEU:CD2	2.37	0.55
8:7:669:CYS:SG	8:7:670:LEU:N	2.80	0.55
3:2:425:ASN:OD1	3:2:426:CYS:N	2.39	0.55
2:1:469:MET:HA	5:4:38:THR:HG21	1.88	0.55
8:7:107:ASP:OD1	8:7:108:SER:N	2.40	0.55
8:7:153:ALA:O	8:7:157:LEU:HD23	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:6:157:VAL:HG22	7:6:169:MET:CE	2.37	0.54
16:W:176:MET:HA	16:W:179:ILE:HG22	1.89	0.54
3:2:231:LEU:HD22	3:2:237:TYR:HE2	1.72	0.54
12:F:97:ARG:NH2	12:F:124:GLU:OE2	2.40	0.54
1:0:250:LEU:HD11	1:0:401:ASP:OD1	2.08	0.54
4:3:42:CYS:SG	4:3:45:ARG:NH2	2.80	0.54
7:6:371:ILE:CD1	7:6:376:LEU:HD21	2.37	0.54
16:W:174:ARG:NH1	17:X:256:ASP:OD2	2.41	0.54
13:G:151:ILE:HG23	13:G:151:ILE:O	2.08	0.54
8:7:232:TYR:CD2	8:7:323:VAL:HG21	2.43	0.53
11:D:130:LEU:HD11	11:D:141:LEU:HD23	1.90	0.53
6:5:61:ASN:ND2	8:7:712:ASP:O	2.41	0.53
2:1:270:TYR:O	2:1:274:VAL:HG23	2.09	0.53
9:A:493:GLN:N	10:B:1149:GLU:OE2	2.38	0.53
1:0:301:ASP:OD1	1:0:302:GLN:N	2.42	0.53
8:7:132:LEU:HD11	8:7:157:LEU:HD21	1.89	0.52
8:7:397:ILE:HG12	8:7:424:PHE:CE1	2.42	0.52
8:7:685:GLN:O	8:7:689:ARG:NH1	2.43	0.52
1:0:345:ARG:NH2	1:0:354:GLU:OE2	2.43	0.52
8:7:487:LEU:HD12	8:7:531:ILE:HG12	1.91	0.52
8:7:121:LEU:HD12	8:7:121:LEU:O	2.10	0.52
3:2:236:ALA:HB2	3:2:270:TYR:CE1	2.45	0.52
12:F:133:VAL:HG12	12:F:147:SER:HA	1.91	0.52
8:7:670:LEU:HD22	8:7:705:PHE:CD1	2.45	0.52
1:0:135:ARG:NH1	1:0:391:THR:O	2.43	0.52
16:W:72:GLN:NE2	16:W:74:GLU:OE2	2.43	0.51
3:2:117:VAL:O	3:2:117:VAL:HG22	2.11	0.51
2:1:274:VAL:HB	2:1:275:PRO:CD	2.41	0.51
13:G:160:ILE:HG22	16:W:137:VAL:HG21	1.93	0.50
1:0:277:VAL:HG23	1:0:278:ASP:OD1	2.11	0.50
3:2:236:ALA:HB2	3:2:270:TYR:CD1	2.46	0.50
13:G:51:TYR:HA	13:G:54:ILE:HD11	1.92	0.50
2:1:18:ILE:HD11	2:1:27:LEU:HD12	1.93	0.50
5:4:316:VAL:HG11	7:6:318:THR:OG1	2.12	0.50
8:7:320:ASN:O	8:7:323:VAL:HG23	2.12	0.50
11:D:154:PHE:CE2	11:D:163:VAL:HG21	2.46	0.50
8:7:132:LEU:HD12	8:7:200:LEU:HB2	1.94	0.50
8:7:649:ILE:HD12	17:X:317:MET:HE1	1.93	0.50
16:W:159:ASP:OD1	16:W:160:ASP:N	2.45	0.50
2:1:170:SER:O	2:1:174:LEU:HD23	2.12	0.50
3:2:423:ASP:OD1	16:W:285:ARG:NH2	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:18:THR:HG23	4:3:18:THR:O	2.12	0.49
7:6:120:ARG:NH1	7:6:307:PRO:O	2.43	0.49
8:7:220:TYR:HE1	8:7:338:LEU:HD13	1.77	0.49
13:G:13:LEU:HD11	13:G:26:LEU:HG	1.93	0.49
8:7:498:PHE:O	8:7:501:VAL:HG22	2.13	0.49
2:1:18:ILE:CD1	2:1:27:LEU:HD12	2.42	0.49
2:1:175:LEU:O	2:1:181:GLN:NE2	2.46	0.49
11:D:192:LYS:NZ	11:D:204:ASP:OD1	2.45	0.49
2:1:16:ILE:HD11	2:1:27:LEU:HD11	1.95	0.48
13:G:54:ILE:HD12	13:G:54:ILE:H	1.78	0.48
4:3:85:ARG:NH1	4:3:114:GLU:OE2	2.46	0.48
8:7:429:THR:O	8:7:429:THR:HG22	2.13	0.48
1:0:5:ILE:HG21	1:0:29:LYS:HD3	1.94	0.48
5:4:32:ILE:HD11	5:4:132:LEU:HD23	1.96	0.48
13:G:5:LYS:HG2	13:G:7:LEU:HD21	1.96	0.48
7:6:172:ILE:HD11	7:6:220:LEU:HD12	1.96	0.48
16:W:42:ASP:OD2	16:W:217:TYR:OH	2.19	0.48
1:0:463:ILE:HG23	1:0:463:ILE:O	2.13	0.48
3:2:32:CYS:SG	3:2:107:SER:OG	2.42	0.48
4:3:63:LEU:HD23	4:3:63:LEU:H	1.78	0.48
8:7:659:ASP:OD1	8:7:660:THR:N	2.46	0.48
1:0:487:LEU:H	1:0:487:LEU:HD23	1.79	0.48
7:6:124:ARG:NE	7:6:231:GLU:OE1	2.44	0.48
9:A:1423:GLY:O	9:A:1427:ASN:ND2	2.44	0.48
2:1:441:ALA:HB3	5:4:190:ILE:HG21	1.96	0.47
3:2:397:ILE:HD12	3:2:438:VAL:CG1	2.44	0.47
16:W:192:SER:OG	16:W:193:ARG:N	2.46	0.47
4:3:74:ASP:OD1	4:3:75:ASP:N	2.48	0.47
6:5:36:ASP:OD1	6:5:37:ASP:N	2.44	0.47
1:0:413:GLU:N	1:0:413:GLU:OE1	2.47	0.47
1:0:634:ILE:HD12	1:0:634:ILE:H	1.79	0.47
17:X:216:GLN:N	17:X:216:GLN:OE1	2.47	0.47
3:2:368:ALA:HB3	3:2:375:LEU:HD21	1.96	0.47
1:0:335:LEU:HD21	1:0:399:LEU:HD22	1.96	0.47
2:1:60:LEU:HD12	2:1:91:PHE:HE2	1.79	0.47
13:G:111:THR:HG22	13:G:112:LYS:N	2.29	0.47
3:2:22:GLN:OE1	3:2:85:HIS:ND1	2.46	0.47
8:7:688:GLY:HA2	8:7:691:LEU:HD12	1.96	0.47
8:7:360:THR:HG22	8:7:427:TRP:CE3	2.49	0.47
13:G:9:LEU:HD22	13:G:34:VAL:CG2	2.45	0.47
8:7:448:THR:HG22	8:7:449:GLU:N	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:D:56:ARG:NH1	11:D:122:GLU:OE2	2.48	0.46
1:0:551:VAL:HG11	2:1:375:LEU:HD21	1.97	0.46
2:1:60:LEU:HD12	2:1:91:PHE:CE2	2.50	0.46
1:0:551:VAL:HG11	2:1:375:LEU:CD2	2.46	0.46
2:1:185:LEU:HD23	16:W:357:LEU:HD11	1.98	0.46
3:2:125:VAL:HG12	3:2:125:VAL:O	2.16	0.46
2:1:42:LEU:HD22	2:1:107:ILE:HG21	1.98	0.46
8:7:516:THR:OG1	8:7:685:GLN:NE2	2.43	0.46
6:5:43:ASN:OD1	6:5:45:SER:OG	2.05	0.45
2:1:507:ILE:HG23	5:4:263:VAL:HG21	1.98	0.45
8:7:493:VAL:N	8:7:494:PRO:HD2	2.31	0.45
1:0:310:PRO:HB3	1:0:404:THR:HG23	1.97	0.45
1:0:341:TYR:CD2	1:0:363:LEU:HD13	2.52	0.45
7:6:444:ILE:O	7:6:444:ILE:HG22	2.15	0.45
13:G:97:HIS:NE2	16:W:146:GLU:OE2	2.48	0.45
3:2:146:ILE:HD11	3:2:167:LEU:HD11	1.97	0.45
1:0:666:LEU:HD22	1:0:679:MET:HB3	1.99	0.45
2:1:106:GLN:NE2	16:W:258:ALA:O	2.46	0.45
3:2:375:LEU:HD23	3:2:375:LEU:H	1.81	0.45
2:1:436:HIS:O	2:1:436:HIS:ND1	2.50	0.44
3:2:39:LEU:HD13	3:2:47:ILE:CD1	2.48	0.44
5:4:258:LEU:H	5:4:258:LEU:HD23	1.81	0.44
1:0:232:VAL:HG21	1:0:453:PHE:CG	2.52	0.44
3:2:272:THR:HG22	3:2:273:LYS:N	2.31	0.44
7:6:98:LEU:HD13	7:6:413:LEU:CD1	2.47	0.44
11:D:26:THR:HG22	11:D:26:THR:O	2.16	0.44
2:1:331:HIS:ND1	2:1:332:PRO:O	2.48	0.44
8:7:334:ASP:OD1	8:7:335:TYR:N	2.50	0.44
8:7:438:PHE:CD1	8:7:473:VAL:HG11	2.53	0.44
9:A:225:ASN:N	9:A:229:SER:O	2.51	0.44
1:0:690:ARG:HG3	1:0:701:LEU:HD23	1.99	0.44
3:2:279:THR:O	3:2:280:SER:OG	2.30	0.44
5:4:210:ILE:HG23	5:4:210:ILE:O	2.18	0.44
7:6:157:VAL:HG22	7:6:169:MET:HE1	1.98	0.44
16:W:27:LEU:HD21	17:X:245:TRP:CZ3	2.53	0.44
1:0:56:THR:HG21	1:0:233:ILE:HD11	2.00	0.44
9:A:1446:ASP:HB2	12:F:133:VAL:HG13	2.00	0.44
1:0:427:ASN:O	1:0:427:ASN:ND2	2.51	0.44
2:1:245:ASN:OD1	2:1:246:LYS:N	2.51	0.44
8:7:209:ILE:O	8:7:213:ILE:HD12	2.18	0.44
7:6:175:ARG:NE	7:6:202:GLN:OE1	2.50	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:7:121:LEU:HD13	8:7:203:VAL:HB	2.00	0.43
8:7:236:THR:HB	8:7:242:LEU:HD11	2.00	0.43
8:7:445:MET:SD	8:7:446:PHE:N	2.91	0.43
11:D:167:LEU:HB3	11:D:177:VAL:HG23	2.01	0.43
3:2:387:LEU:HD22	3:2:445:GLN:HG3	2.00	0.43
5:4:197:MET:CE	7:6:374:THR:HG22	2.48	0.43
5:4:34:PRO:O	5:4:38:THR:HG23	2.18	0.43
1:0:473:LEU:N	1:0:473:LEU:HD12	2.34	0.43
4:3:15:ILE:HD11	4:3:56:TYR:CE1	2.54	0.43
8:7:670:LEU:HD22	8:7:705:PHE:HD1	1.82	0.43
1:0:390:VAL:HG11	1:0:396:PHE:HE2	1.83	0.43
3:2:106:ILE:O	3:2:110:ASN:ND2	2.52	0.43
3:2:29:PRO:HG2	3:2:117:VAL:HG23	2.01	0.42
13:G:39:THR:O	13:G:43:GLY:N	2.52	0.42
17:X:228:SER:O	17:X:247:ASN:ND2	2.51	0.42
1:0:621:LEU:HD12	1:0:680:VAL:HB	2.00	0.42
8:7:190:THR:N	8:7:217:THR:HG21	2.35	0.42
1:0:523:GLY:HA3	1:0:559:ILE:HD13	2.00	0.42
3:2:39:LEU:HD11	3:2:86:LEU:CD1	2.49	0.42
5:4:299:ILE:H	5:4:299:ILE:HD12	1.84	0.42
1:0:8:LEU:HD21	1:0:29:LYS:HD2	2.01	0.42
13:G:111:THR:HG22	13:G:112:LYS:H	1.83	0.42
1:0:625:ILE:HD12	1:0:685:ARG:HB2	2.01	0.42
3:2:99:ASN:OD1	3:2:100:LEU:N	2.53	0.42
7:6:185:VAL:O	7:6:185:VAL:HG13	2.20	0.42
5:4:171:SER:C	5:4:172:LEU:HD12	2.40	0.42
8:7:552:VAL:HG21	8:7:687:LEU:HD11	2.01	0.42
8:7:738:HIS:ND1	16:W:302:THR:O	2.46	0.42
11:D:144:THR:HG21	13:G:46:LEU:HD13	2.01	0.42
2:1:198:THR:O	2:1:198:THR:HG22	2.20	0.42
7:6:157:VAL:HG22	7:6:169:MET:HE3	2.01	0.42
16:W:116:ASN:O	16:W:116:ASN:ND2	2.50	0.42
16:W:127:CYS:SG	16:W:129:THR:OG1	2.64	0.42
16:W:272:ALA:O	16:W:276:LEU:HD23	2.19	0.42
1:0:30:LYS:O	1:0:34:VAL:HG12	2.20	0.41
2:1:35:ASP:OD1	2:1:36:LYS:N	2.53	0.41
6:5:43:ASN:OD1	6:5:45:SER:N	2.52	0.41
4:3:47:PHE:CE1	4:3:63:LEU:HD21	2.56	0.41
9:A:22:PHE:HZ	10:B:1208:MET:HG2	1.85	0.41
10:B:1219:ASP:OD1	10:B:1219:ASP:N	2.53	0.41
3:2:6:LEU:HD21	3:2:198:SER:HA	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:7:220:TYR:CE1	8:7:338:LEU:HD13	2.55	0.41
7:6:366:CYS:O	7:6:367:ASP:OD1	2.37	0.41
3:2:432:VAL:HG23	3:2:433:LEU:N	2.36	0.41
7:6:181:LEU:HD13	7:6:220:LEU:HD11	2.02	0.41
8:7:625:PRO:HG2	8:7:652:ILE:HG22	2.01	0.41
8:7:668:THR:HG23	8:7:669:CYS:N	2.36	0.41
11:D:117:GLU:OE1	11:D:117:GLU:N	2.54	0.41
1:0:394:GLU:O	1:0:397:THR:HG22	2.21	0.41
5:4:155:ALA:O	5:4:158:THR:OG1	2.33	0.41
1:0:469:TYR:HB2	1:0:470:PRO:HD3	2.03	0.41
3:2:200:LEU:HD11	3:2:258:LEU:HD21	2.03	0.41
8:7:351:ASP:OD1	8:7:405:LYS:NZ	2.42	0.41
8:7:420:TRP:O	8:7:424:PHE:HB2	2.21	0.41
8:7:516:THR:HG21	8:7:684:ALA:HB3	2.03	0.41
13:G:13:LEU:HD12	13:G:70:PHE:CE1	2.56	0.41
2:1:269:ALA:O	2:1:273:ASN:ND2	2.50	0.41
1:0:24:TYR:CZ	1:0:28:ILE:HD11	2.55	0.40
13:G:155:SER:O	13:G:155:SER:OG	2.33	0.40
3:2:186:ASN:OD1	3:2:395:GLN:NE2	2.55	0.40
1:0:94:THR:O	1:0:98:GLY:N	2.54	0.40
8:7:156:PHE:CE2	8:7:160:ILE:HD13	2.56	0.40
15:T:35:DA:H2'	15:T:36:DT:H72	2.03	0.40
1:0:267:LEU:HD21	1:0:384:LEU:HD23	2.03	0.40
7:6:122:ILE:HD12	7:6:379:SER:HB3	2.04	0.40
8:7:742:MET:HE1	16:W:304:LEU:HD12	2.04	0.40
9:A:244:PRO:N	9:A:245:PRO:CD	2.85	0.40
9:A:1420:ASP:N	9:A:1420:ASP:OD1	2.54	0.40
8:7:114:ARG:O	8:7:115:SER:OG	2.30	0.40

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	0	750/778 (96%)	737 (98%)	13 (2%)	0	100	100
2	1	507/645 (79%)	494 (97%)	13 (3%)	0	100	100
3	2	435/517 (84%)	426 (98%)	9 (2%)	0	100	100
4	3	129/324 (40%)	125 (97%)	4 (3%)	0	100	100
5	4	287/341 (84%)	282 (98%)	5 (2%)	0	100	100
6	5	63/76 (83%)	62 (98%)	1 (2%)	0	100	100
7	6	368/464 (79%)	361 (98%)	7 (2%)	0	100	100
8	7	603/843 (72%)	581 (96%)	22 (4%)	0	100	100
9	A	199/1733 (12%)	196 (98%)	3 (2%)	0	100	100
10	B	79/1224 (6%)	77 (98%)	2 (2%)	0	100	100
11	D	156/221 (71%)	155 (99%)	1 (1%)	0	100	100
12	F	47/155 (30%)	46 (98%)	1 (2%)	0	100	100
13	G	169/177 (96%)	166 (98%)	3 (2%)	0	100	100
16	W	303/492 (62%)	297 (98%)	6 (2%)	0	100	100
17	X	131/328 (40%)	124 (95%)	7 (5%)	0	100	100
All	All	4226/8318 (51%)	4129 (98%)	97 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	0	684/707 (97%)	684 (100%)	0	100	100
2	1	482/590 (82%)	481 (100%)	1 (0%)	93	98
3	2	408/470 (87%)	408 (100%)	0	100	100
4	3	125/305 (41%)	125 (100%)	0	100	100
5	4	260/302 (86%)	260 (100%)	0	100	100
6	5	59/68 (87%)	59 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	6	338/419 (81%)	337 (100%)	1 (0%)	92	97
8	7	539/737 (73%)	539 (100%)	0	100	100
9	A	195/1520 (13%)	195 (100%)	0	100	100
10	B	69/1061 (6%)	69 (100%)	0	100	100
11	D	144/200 (72%)	143 (99%)	1 (1%)	84	92
12	F	48/137 (35%)	48 (100%)	0	100	100
13	G	152/158 (96%)	152 (100%)	0	100	100
16	W	280/436 (64%)	279 (100%)	1 (0%)	91	95
17	X	125/295 (42%)	124 (99%)	1 (1%)	81	91
All	All	3908/7405 (53%)	3903 (100%)	5 (0%)	93	98

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	1	246	LYS
7	6	201	LYS
11	D	14	ARG
16	W	116	ASN
17	X	253	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
7	6	192	HIS
7	6	445	HIS

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 (i)

Of 15 ligands modelled in this entry, 12 are monoatomic - leaving 3 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	$\#\|Z\| > 2$
20	BEF	7	901	22	0,3,3	-	-	-		
18	SF4	0	801	1	0,12,12	-	-	-		
22	ADP	7	903	20,21	24,29,29	0.68	0	29,45,45	0.68	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
18	SF4	0	801	1	-	-	0/6/5/5
22	ADP	7	903	20,21	-	3/12/32/32	0/3/3/3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

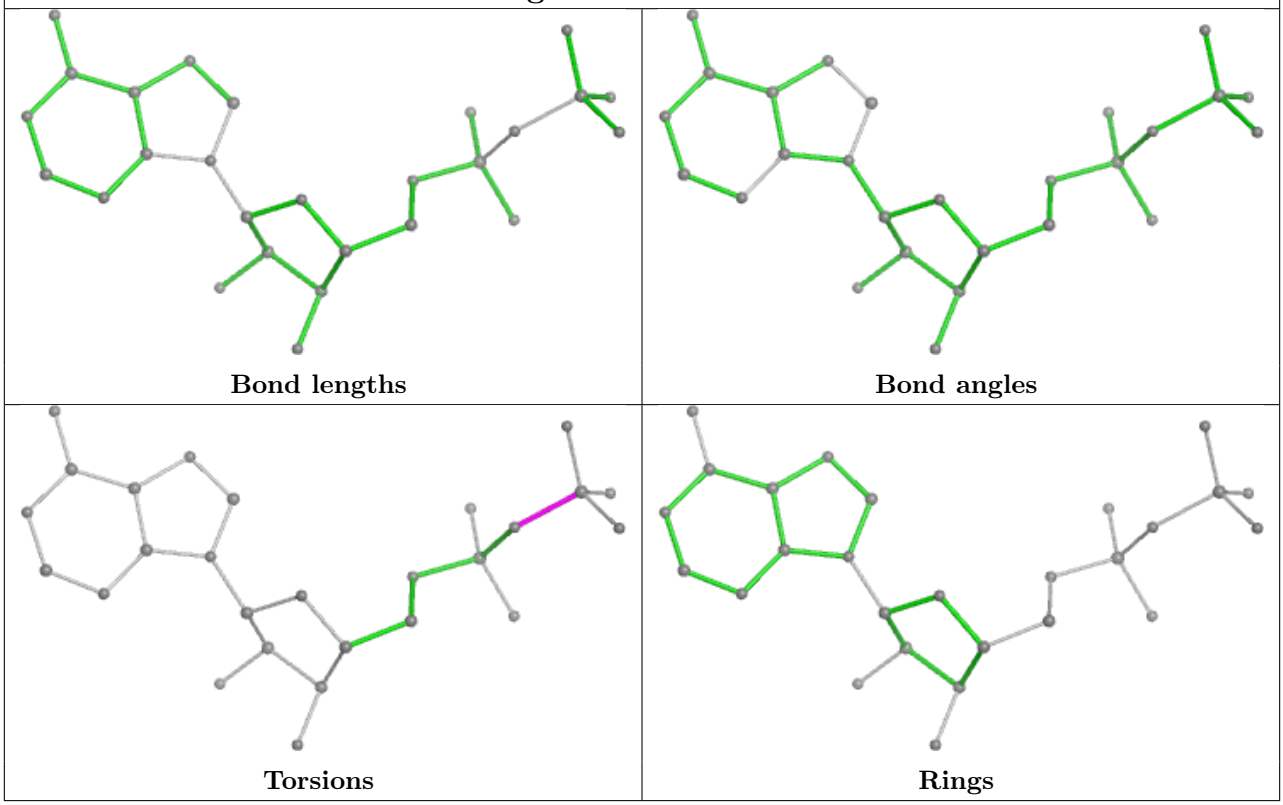
Mol	Chain	Res	Type	Atoms
22	7	903	ADP	PA-O3A-PB-O1B
22	7	903	ADP	PA-O3A-PB-O2B
22	7	903	ADP	PA-O3A-PB-O3B

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 ADP 7 903



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.

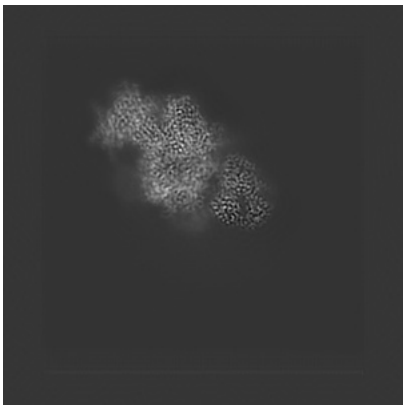
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-12722. These allow visual inspection of the internal detail of the map and identification of artifacts.

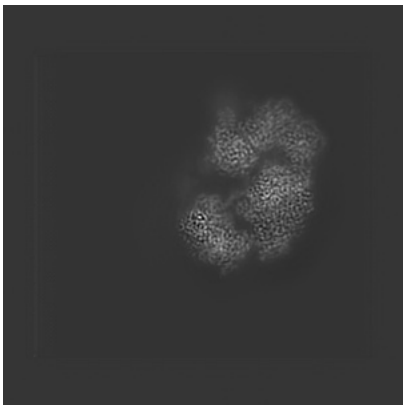
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

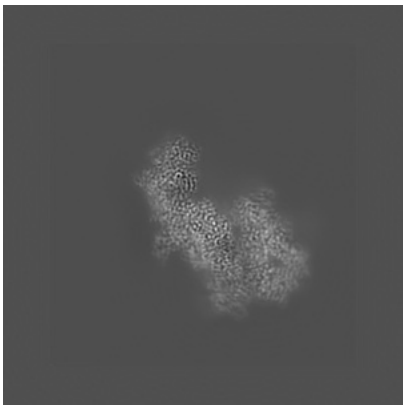
6.1.1 Primary map



X

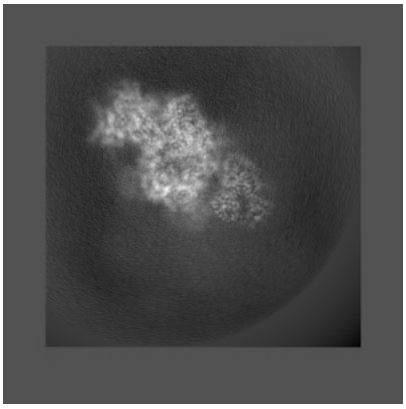


Y

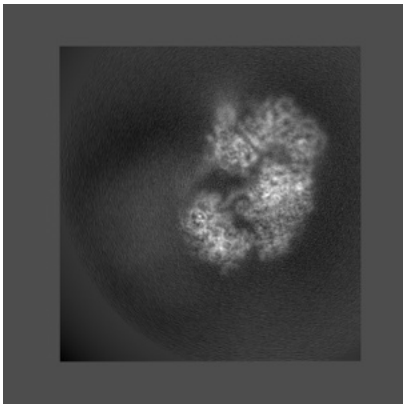


Z

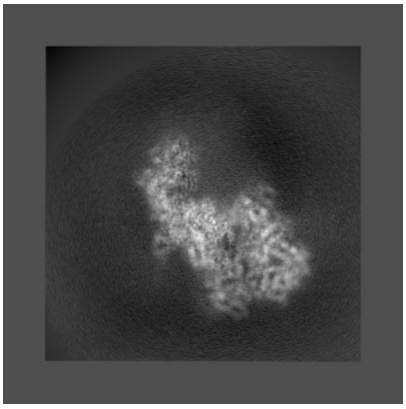
6.1.2 Raw map



X



Y

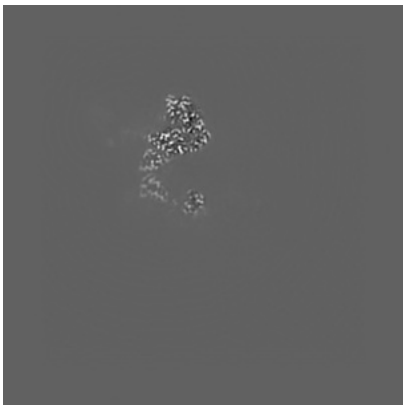


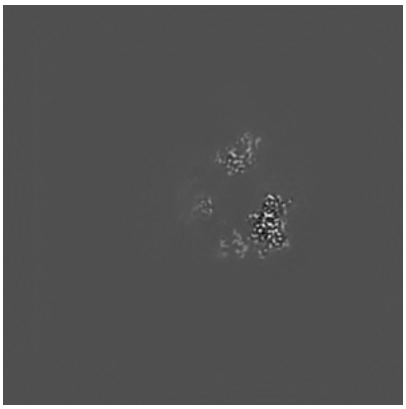
Z

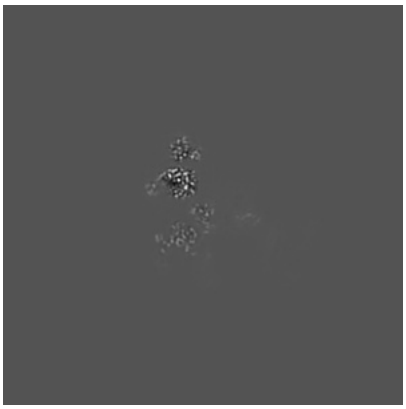
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

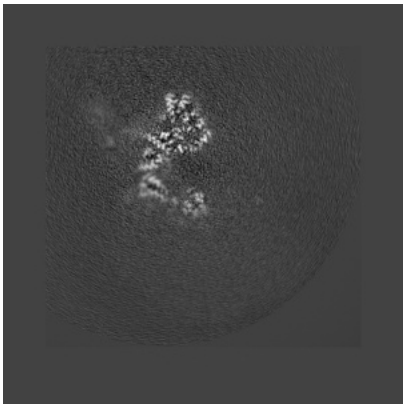
6.2.1 Primary map

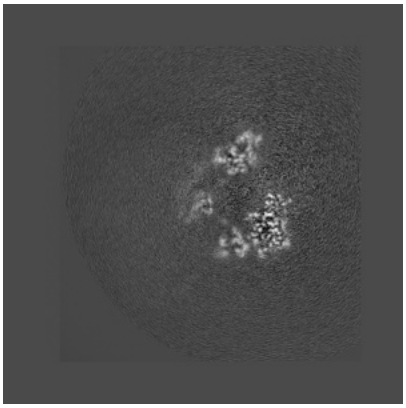

X Index: 190

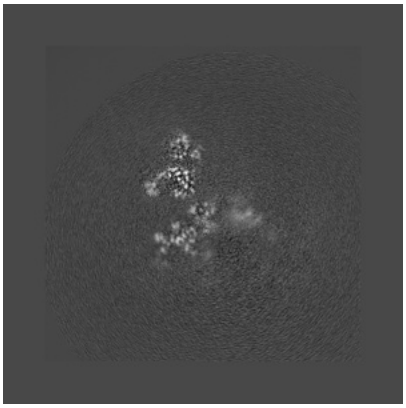

Y Index: 190


Z Index: 190

6.2.2 Raw map


X Index: 190


Y Index: 190

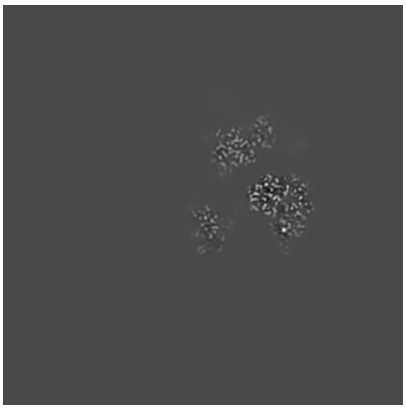

Z Index: 190

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

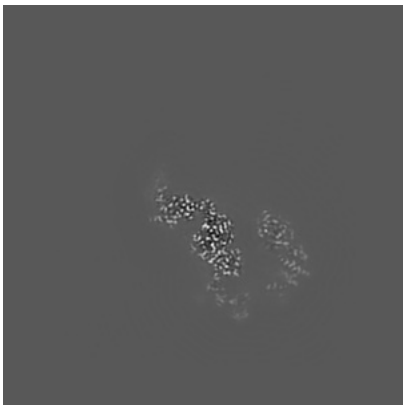
6.3 Largest variance slices (i)

6.3.1 Primary map

X Index: 174

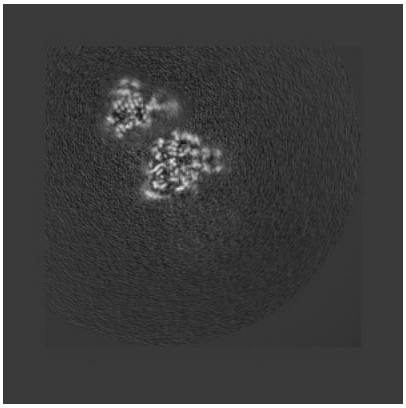


Y Index: 160

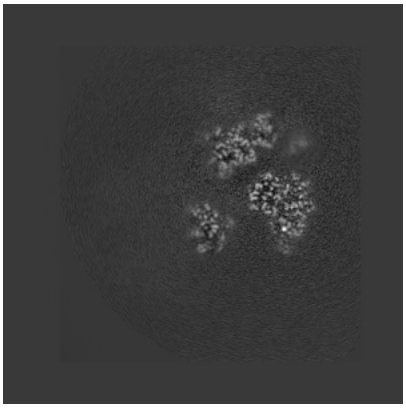


Z Index: 252

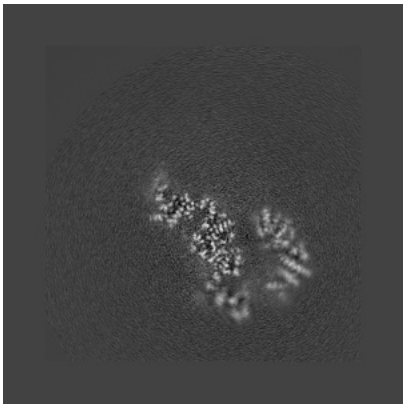
6.3.2 Raw map



X Index: 249



Y Index: 160

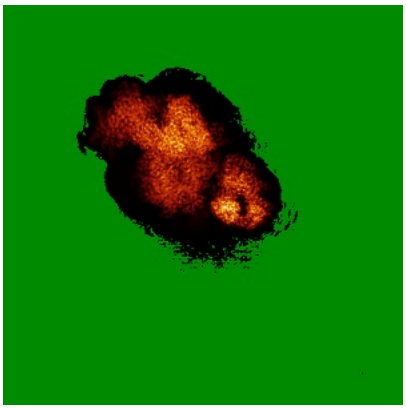


Z Index: 252

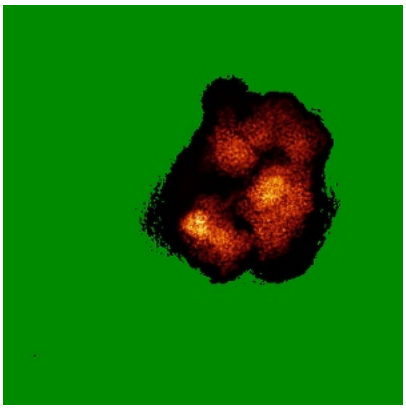
The images above show the largest variance slices of the map in three orthogonal directions.

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

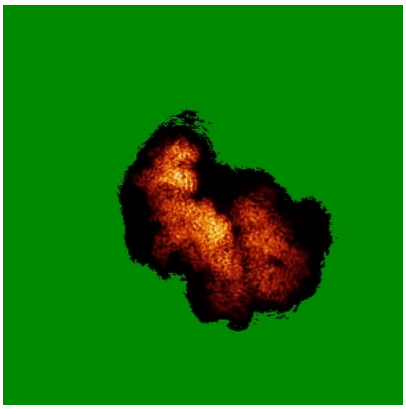
6.4.1 Primary map



X

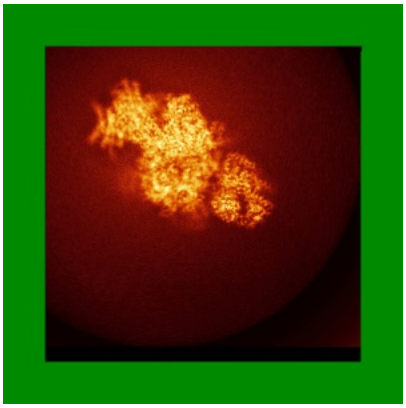


Y

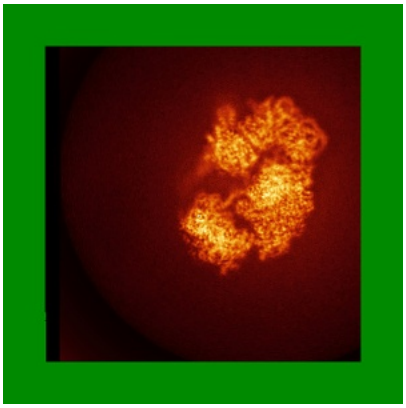


Z

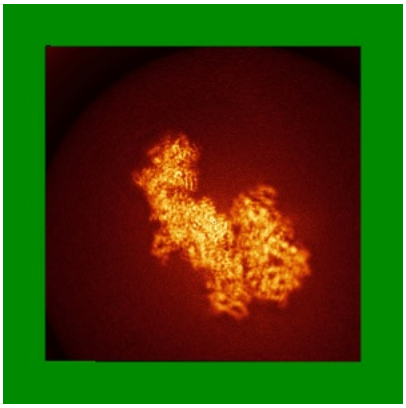
6.4.2 Raw map



X



Y

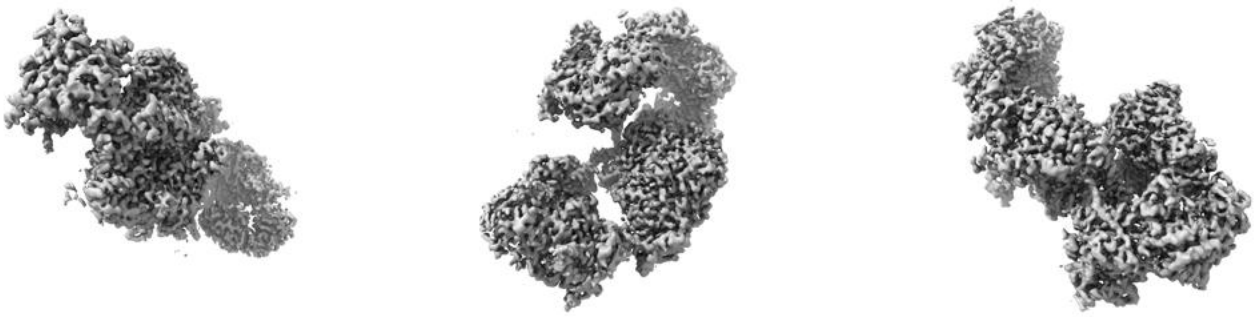


Z

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)

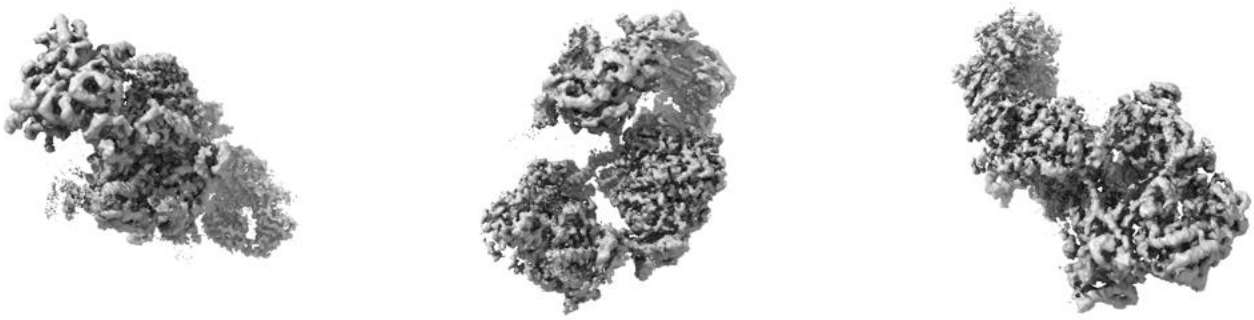
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 3.7. 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.

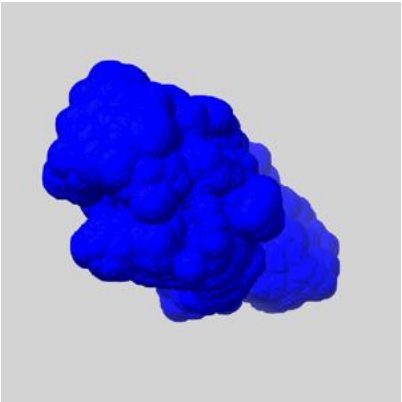
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

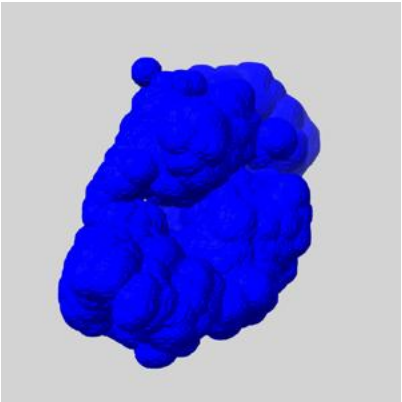
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

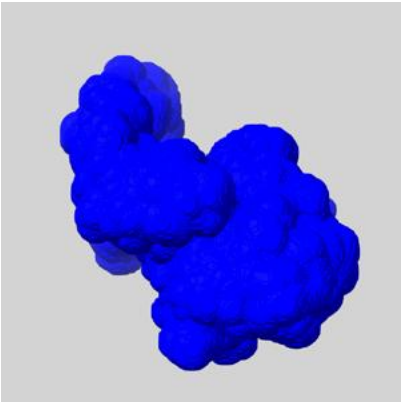
6.6.1 emd_12722_msk_1.map (i)



X



Y

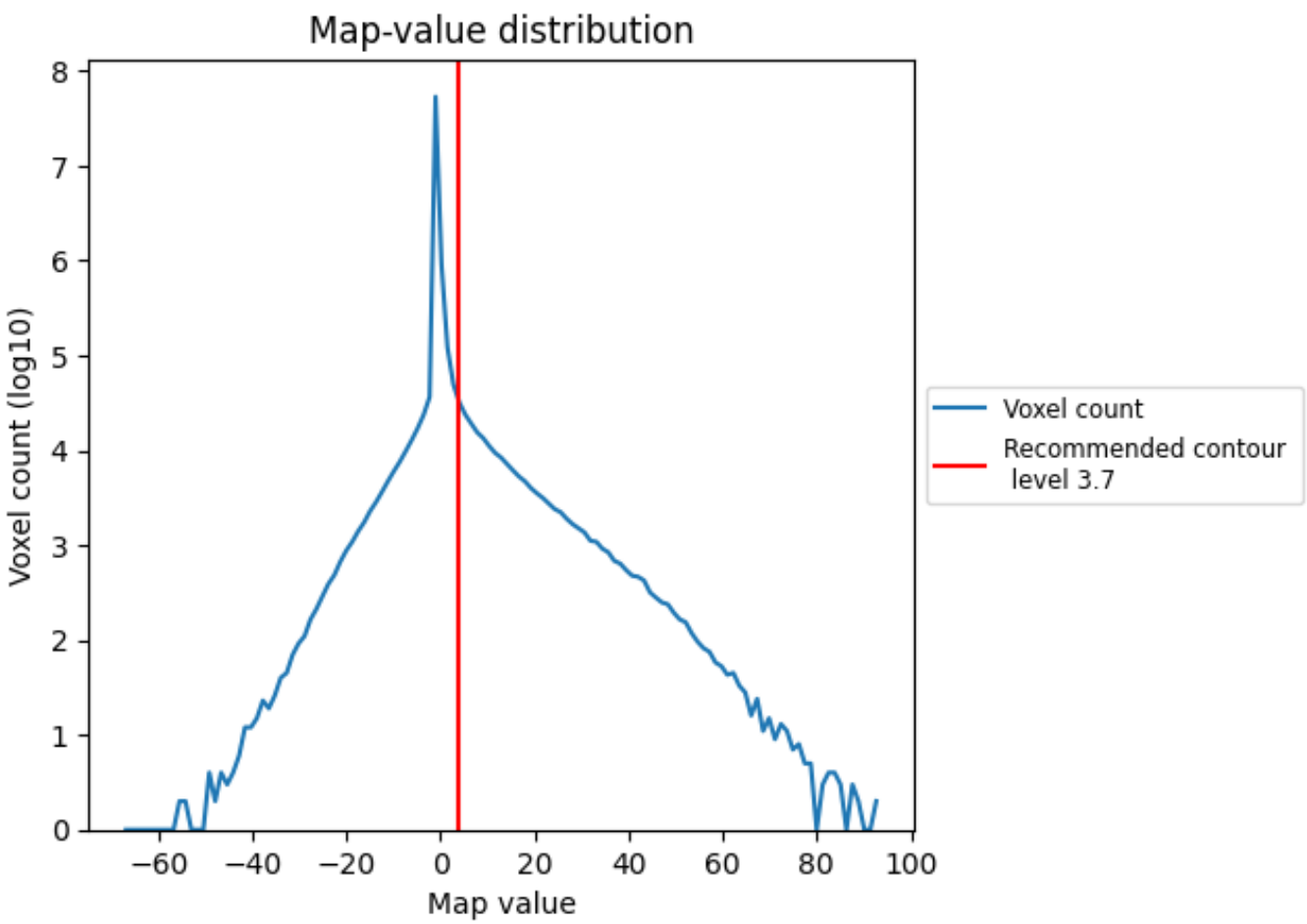


Z

7 Map analysis (i)

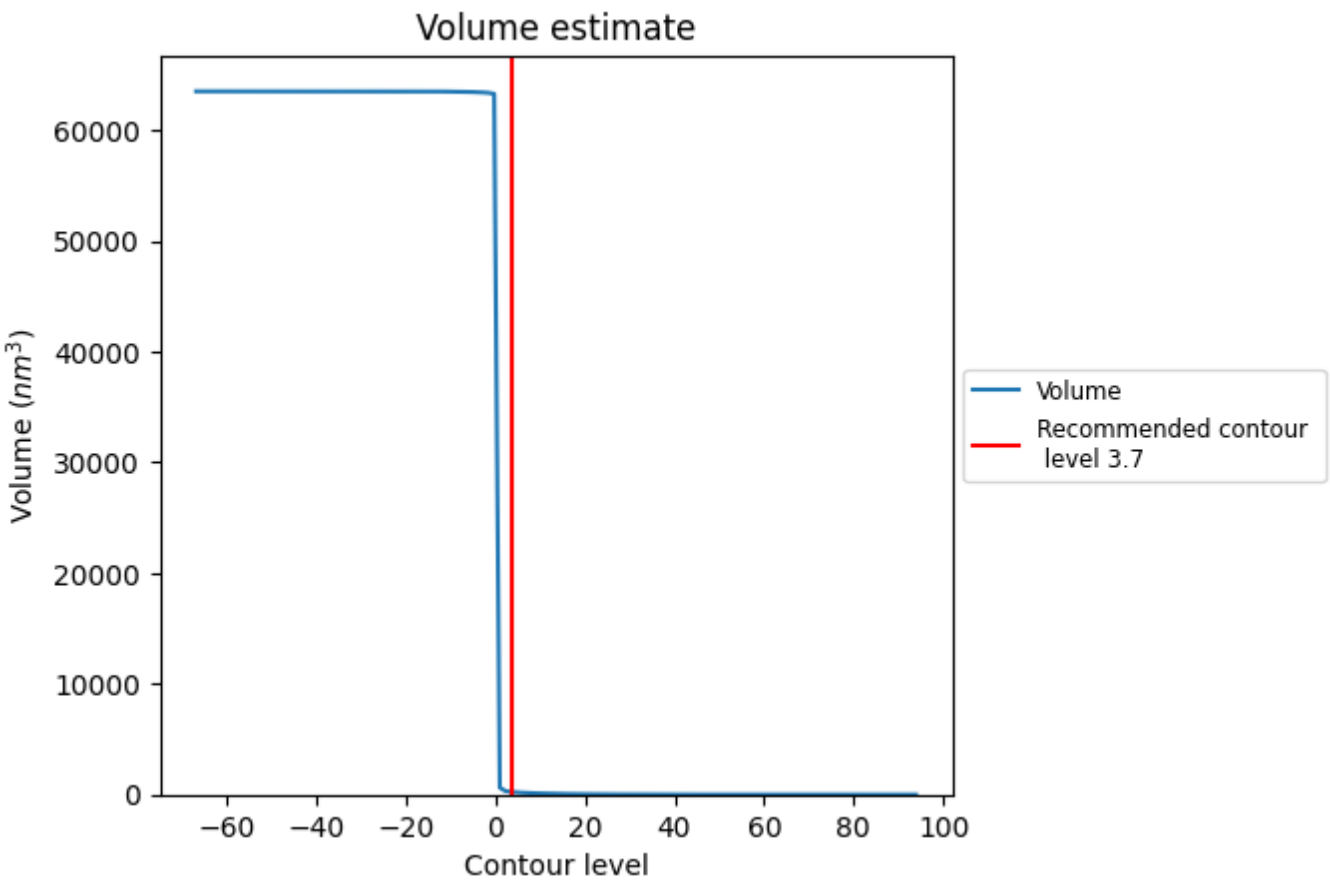
This section contains the results of statistical analysis of the map.

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.

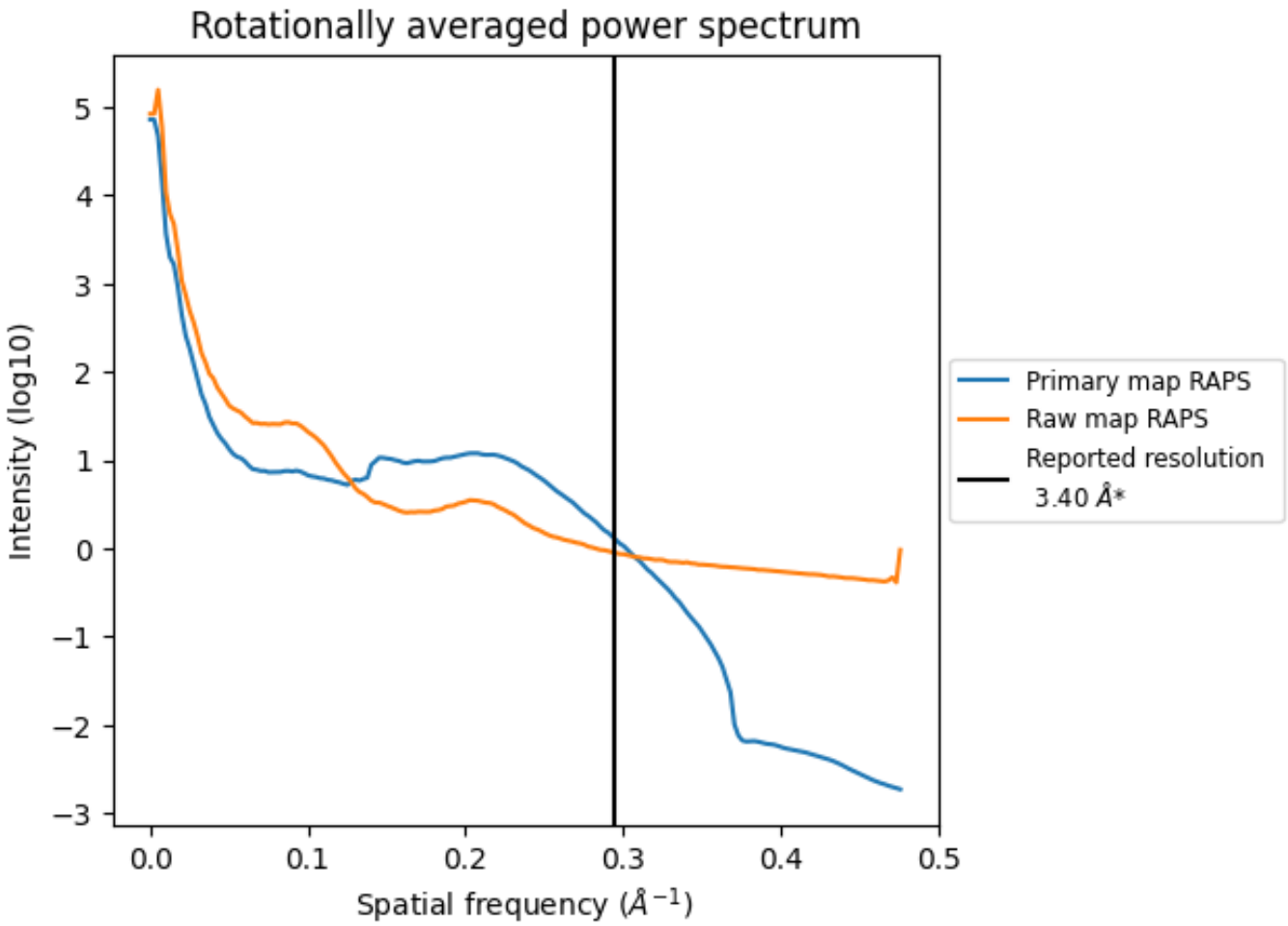
7.2 Volume estimate (i)



The volume at the recommended contour level is 233 nm^3; this corresponds to an approximate mass of 211 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)

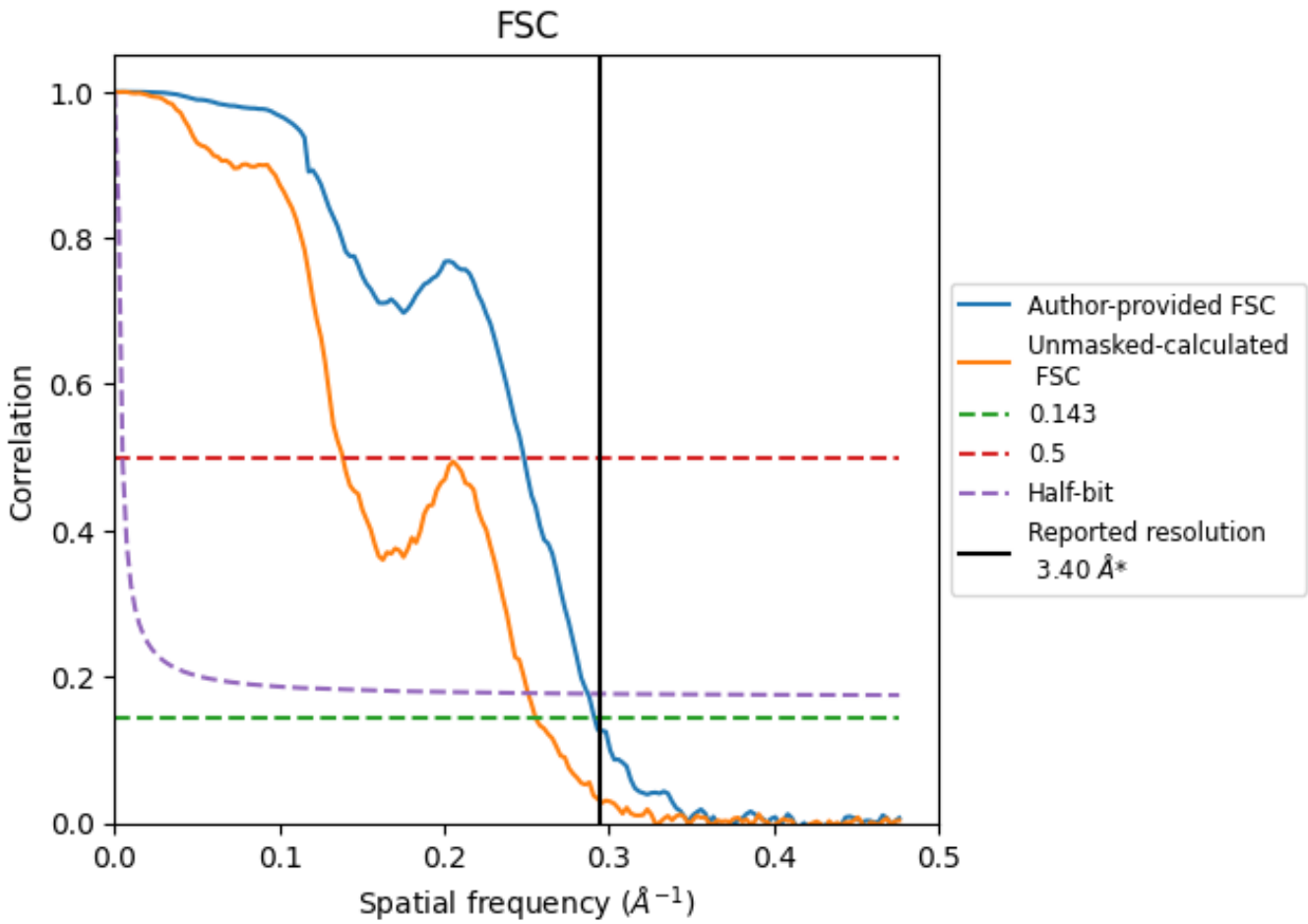


*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

8 Fourier-Shell correlation (i)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC (i)



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

8.2 Resolution estimates (i)

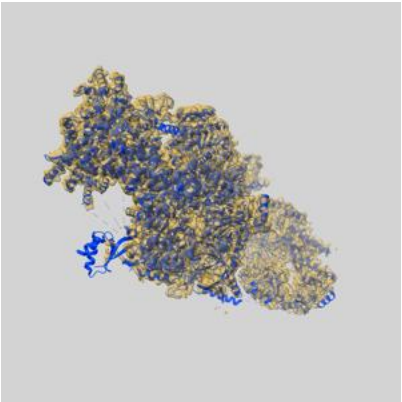
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.43	4.03	3.48
Unmasked-calculated*	3.91	7.22	3.98

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

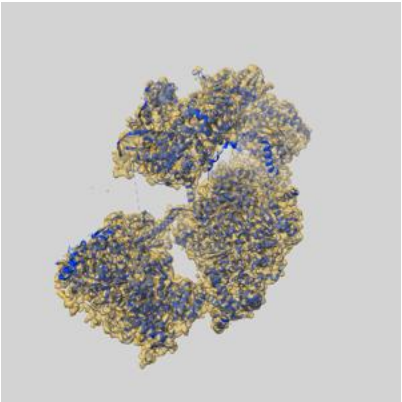
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-12722 and PDB model 7O4L. Per-residue inclusion information can be found in section 3 on page 11.

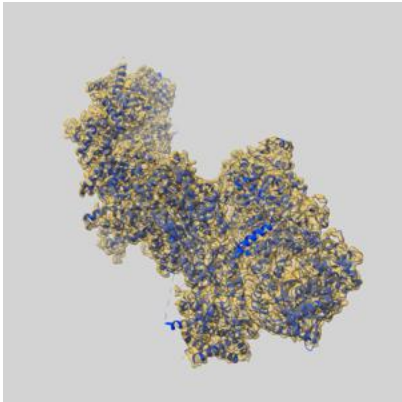
9.1 Map-model overlay (i)



X



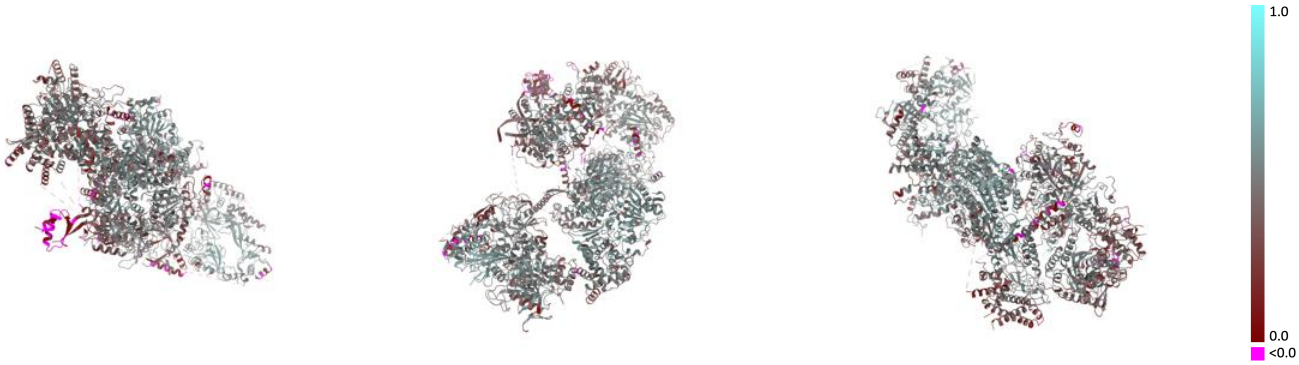
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 3.7 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.

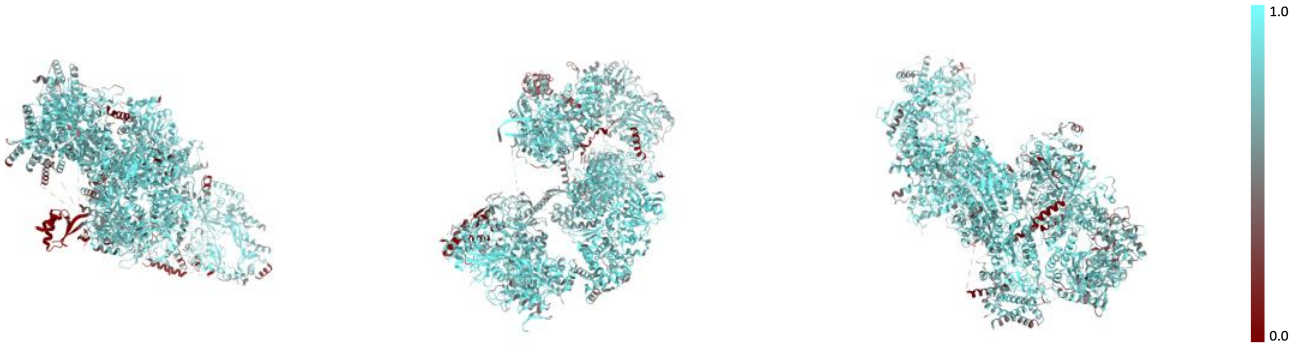
9.2 Q-score mapped to coordinate model (i)



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.

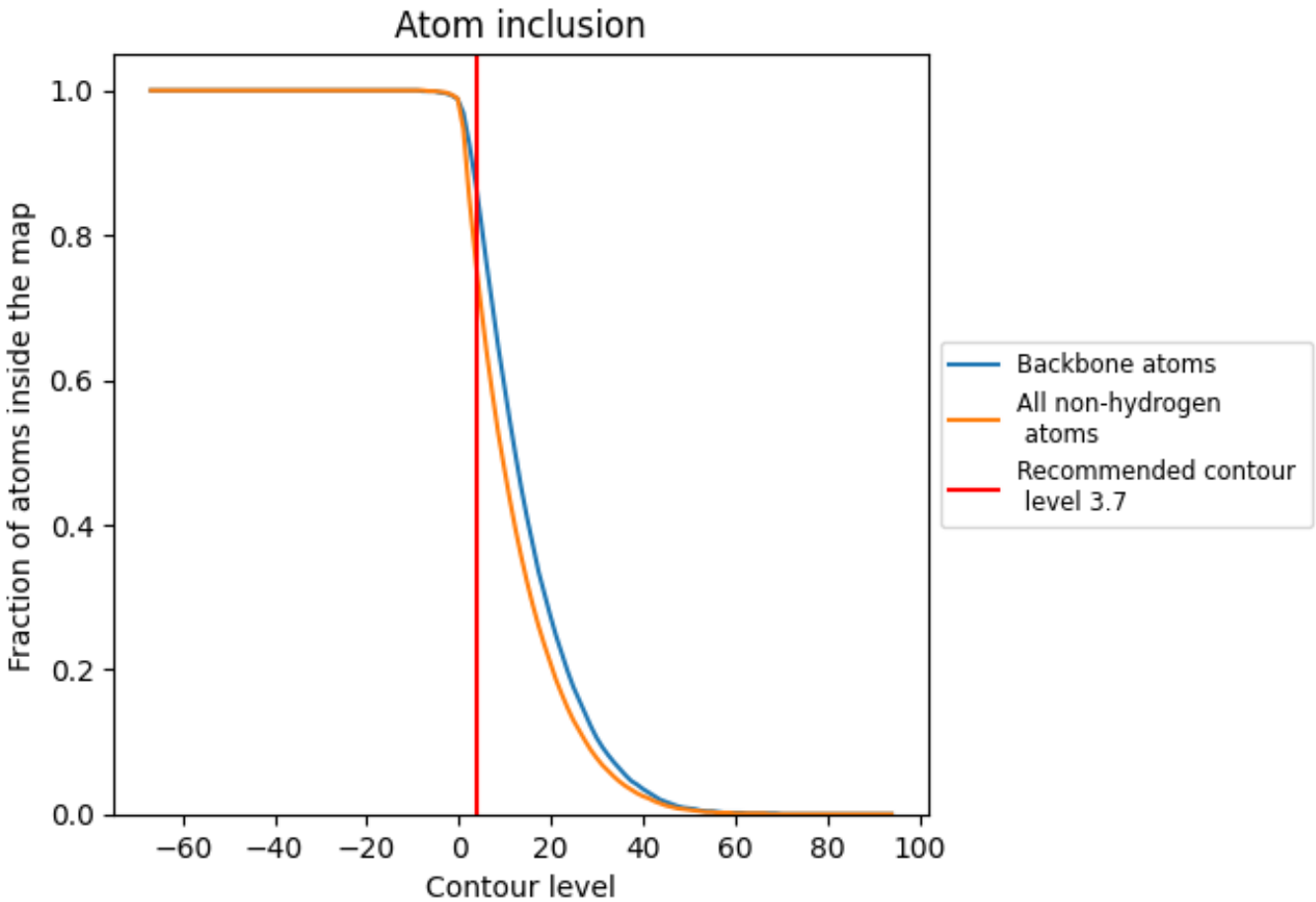
9.3 Atom inclusion mapped to coordinate model (i)



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 (3.7).

9.4 Atom inclusion (i)



At the recommended contour level, 87% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (3.7) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7610	0.4400
0	0.8690	0.5220
1	0.7100	0.3970
2	0.6330	0.3530
3	0.7590	0.4240
4	0.7970	0.4570
5	0.5340	0.3030
6	0.7760	0.4640
7	0.8110	0.4340
A	0.6080	0.4190
B	0.8500	0.5480
D	0.7570	0.4470
F	0.6350	0.4430
G	0.8890	0.5230
N	0.8540	0.3640
T	0.8540	0.3770
W	0.7100	0.4080
X	0.7270	0.4130