



## wwPDB EM Validation Summary Report ⓘ

Mar 10, 2024 – 09:15 PM EDT

PDB ID : 6PSW  
EMDB ID : EMD-20466  
Title : Escherichia coli RNA polymerase promoter unwinding intermediate (TRPo)  
with TraR and rpsT P2 promoter  
Authors : Chen, J.; Chiu, C.E.; Campbell, E.A.; Darst, S.A.  
Deposited on : 2019-07-13  
Resolution : 3.70 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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 ⓘ symbol.

The types of validation reports are described at

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

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

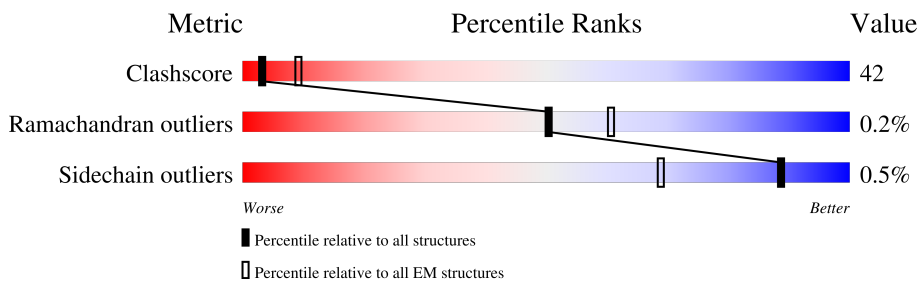
EMDB validation analysis : 0.0.1.dev70  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

# 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 3.70 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.



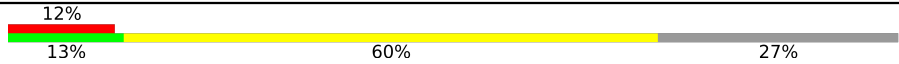

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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  $\geq 3$ , 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	G	329	
1	H	329	
1	M	329	
2	I	1342	
3	J	1430	
4	K	91	
5	L	616	
6	N	72	

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Mol	Chain	Length	Quality of chain
7	O	85	
8	P	85	

## 2 Entry composition i

There are 11 unique types of molecules in this entry. The entry contains 32773 atoms, of which 78 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	G	229	1762	1100	313	343	6	0	0
1	H	219	1678	1048	295	329	6	0	0
1	M	73	572	362	100	108	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	I	1341	10571	6633	1839	2056	43	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	J	1345	10460	6574	1864	1972	50	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J	1	VAL	-	expression tag	UNP P0A8T7
J	1408	LEU	-	expression tag	UNP P0A8T7
J	1409	GLU	-	expression tag	UNP P0A8T7
J	1410	LEU	-	expression tag	UNP P0A8T7
J	1411	GLU	-	expression tag	UNP P0A8T7
J	1412	VAL	-	expression tag	UNP P0A8T7
J	1413	LEU	-	expression tag	UNP P0A8T7
J	1414	PHE	-	expression tag	UNP P0A8T7
J	1415	GLN	-	expression tag	UNP P0A8T7
J	1416	GLY	-	expression tag	UNP P0A8T7
J	1417	PRO	-	expression tag	UNP P0A8T7

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Chain	Residue	Modelled	Actual	Comment	Reference
J	1418	SER	-	expression tag	UNP P0A8T7
J	1419	SER	-	expression tag	UNP P0A8T7
J	1420	GLY	-	expression tag	UNP P0A8T7
J	1421	HIS	-	expression tag	UNP P0A8T7
J	1422	HIS	-	expression tag	UNP P0A8T7
J	1423	HIS	-	expression tag	UNP P0A8T7
J	1424	HIS	-	expression tag	UNP P0A8T7
J	1425	HIS	-	expression tag	UNP P0A8T7
J	1426	HIS	-	expression tag	UNP P0A8T7
J	1427	HIS	-	expression tag	UNP P0A8T7
J	1428	HIS	-	expression tag	UNP P0A8T7
J	1429	HIS	-	expression tag	UNP P0A8T7
J	1430	HIS	-	expression tag	UNP P0A8T7

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	K	79	627	382	118	126	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	L	473	3854	2412	687	732	23	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	-2	SER	-	expression tag	UNP Q0P6L9
L	-1	GLU	-	expression tag	UNP Q0P6L9
L	0	PHE	-	expression tag	UNP Q0P6L9

- Molecule 6 is a protein called Protein TraR.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	N	72	571	353	105	108	5	0	0

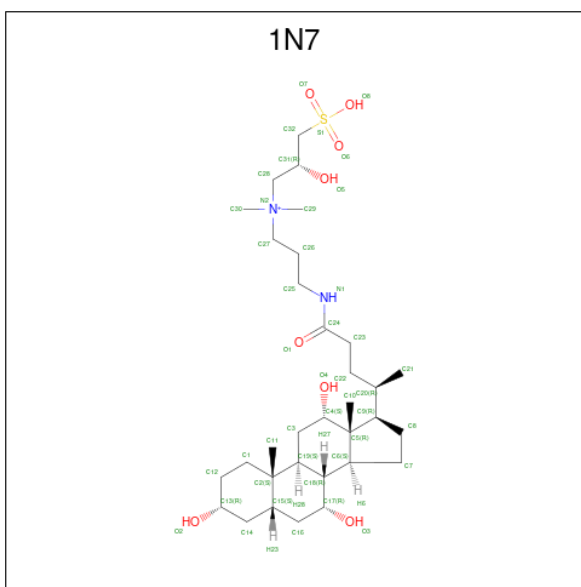
- Molecule 7 is a DNA chain called DNA (85-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	O	62	1270	606	237	365	62	0	0

- Molecule 8 is a DNA chain called DNA (85-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	P	62	1272	609	222	379	62	0	0

- Molecule 9 is CHAPSO (three-letter code: 1N7) (formula: C<sub>32</sub>H<sub>59</sub>N<sub>2</sub>O<sub>8</sub>S).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	H	O	
9	I	1	66	24	39	3	0
9	J	1	66	24	39	3	0

- Molecule 10 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
10	J	1	1	1	0

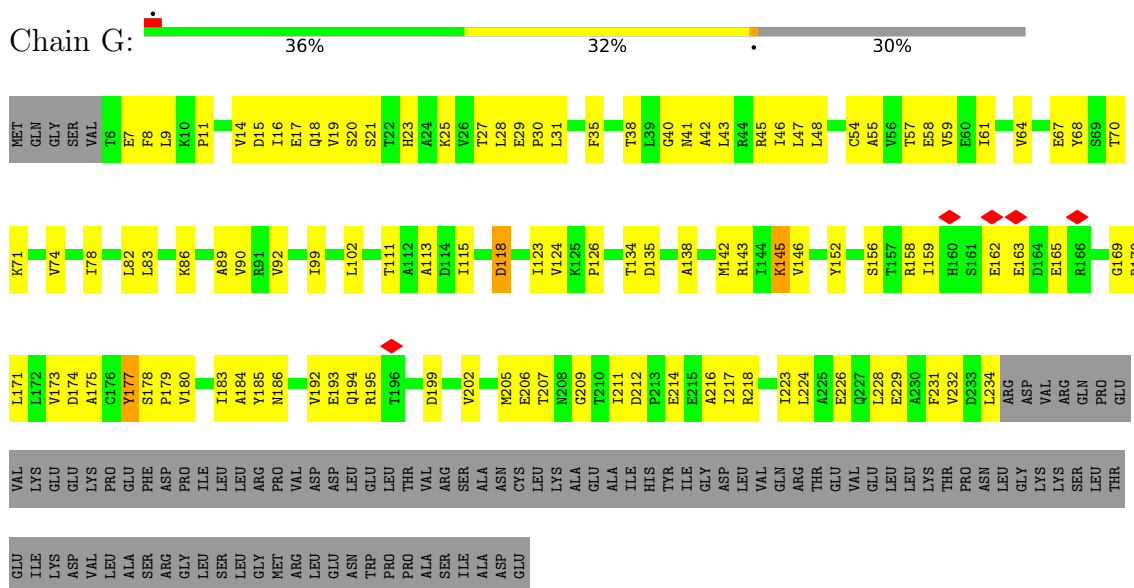
- Molecule 11 is ZINC ION (three-letter code: ZN) (formula: Zn).

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
11	J	2	Total 2	Zn 2	0
11	N	1	Total 1	Zn 1	0

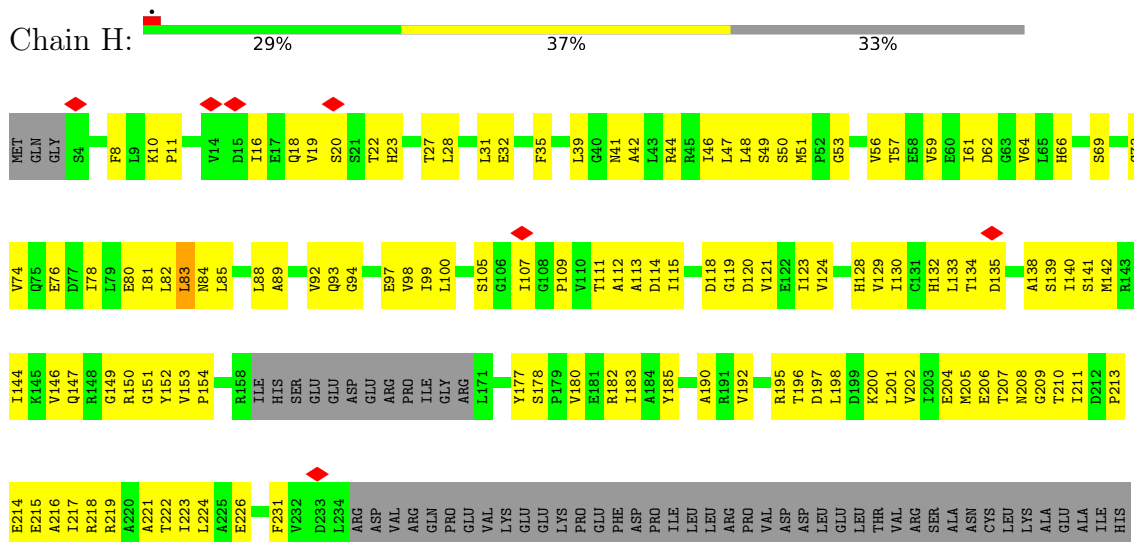
### 3 Residue-property plots i

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: DNA-directed RNA polymerase subunit alpha

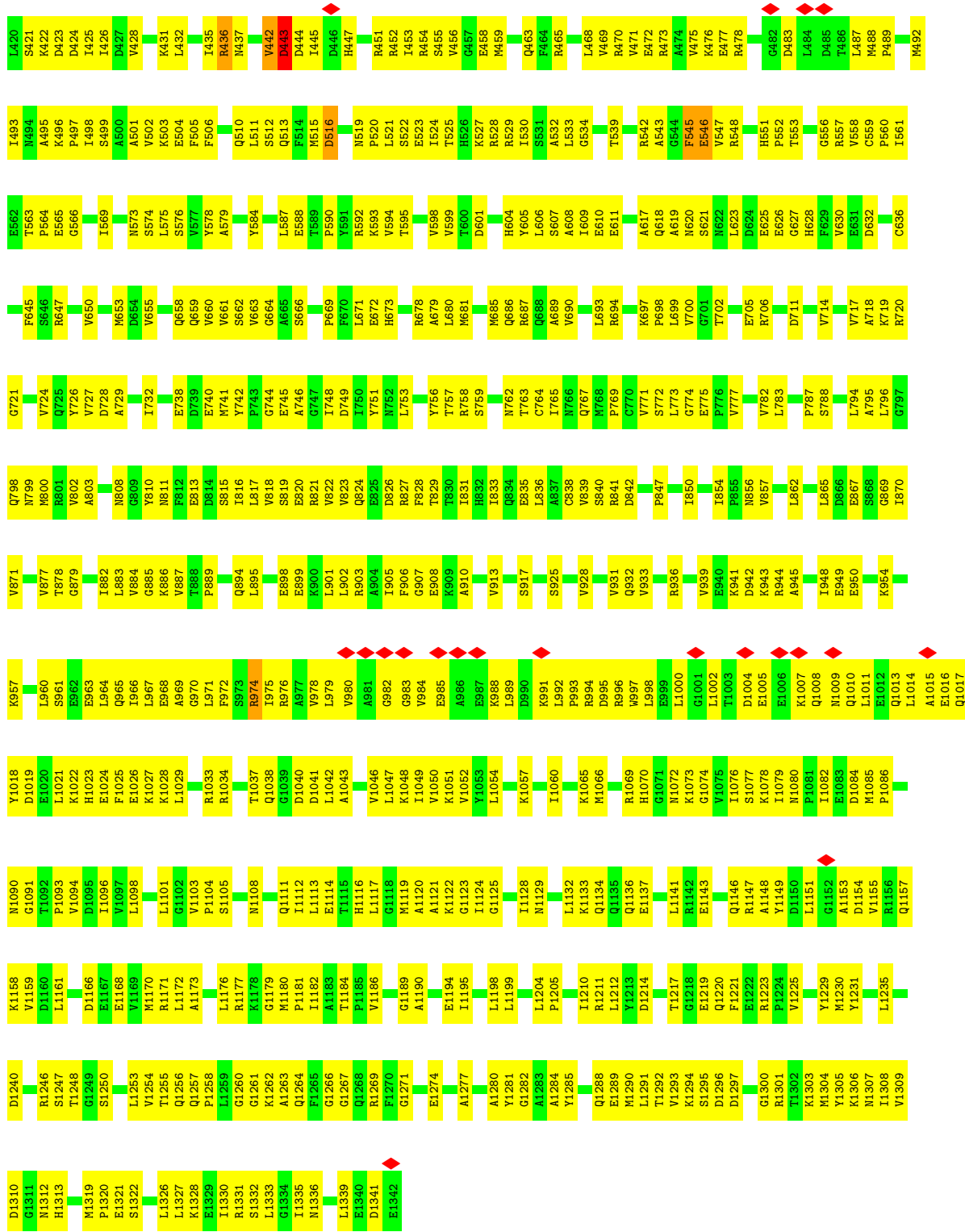


- Molecule 1: DNA-directed RNA polymerase subunit alpha





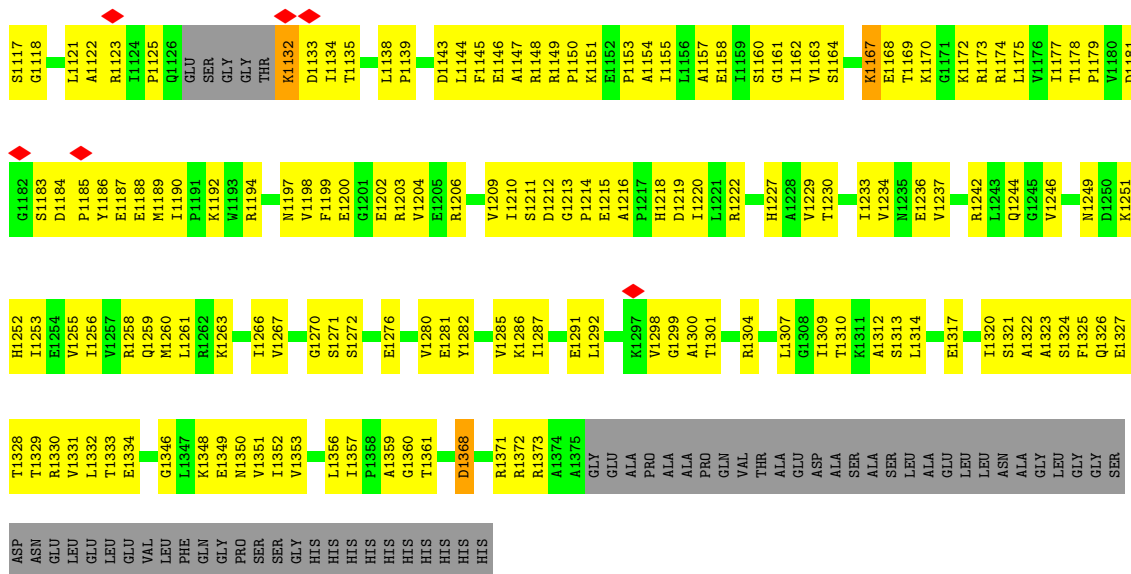




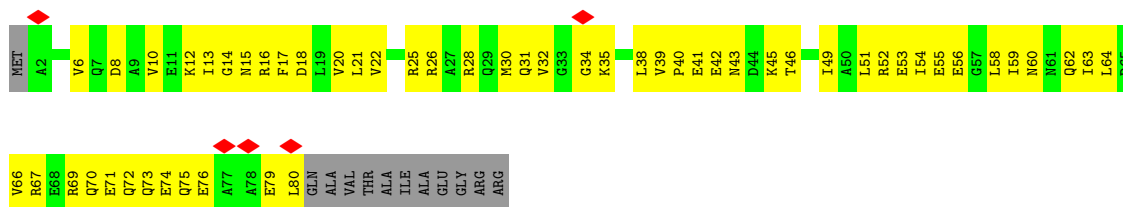
• Molecule 3: DNA-directed RNA polymerase subunit beta'



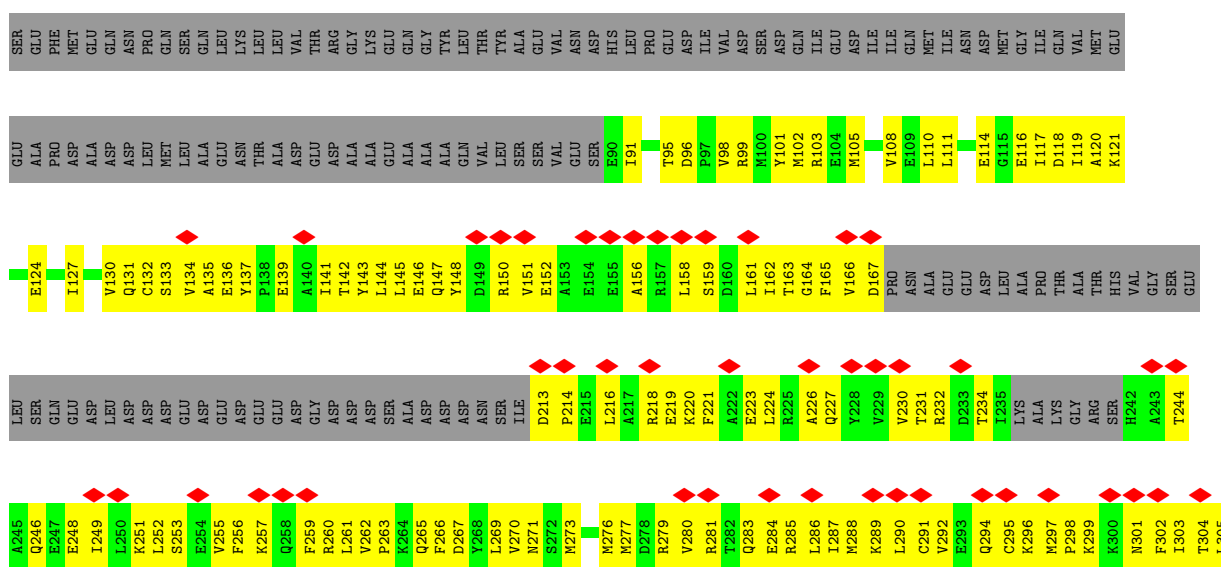
S1057	S1058	S1059	V1060	V1061	L1062	D1063	S1064	A1065	A1066	R1067	T1068	G1070	G1071	K1072	D1073	L1074	R1075	P1076	A1077	L1078	K1079	I1080	D1082	A1083	Q1084	N1086	L1087	V1088	I1090	F1091	T1093	D1094	M1095	P1096	A1097	Q1098	Y1099	F1100	L1101	P1102	G1103	A1105	I1106	V1107	Q1108	L1109	D1110	D1111	G1112	V1113	Q1114	I1115	S1116									
Y995	R996	Y997	P998	Y999	G1000	A1001	V1002	L1003	A1004	K1005	G1006	G1008	E1009	A1012	E1015	T1016	V1017	A1018	N1019	V1020	D1021	H1023	T1024	M1025	P1026	V1027	I1028	E1030	V1031	S1032	G1033	F1034	L1035	R1036	F1037	T1038	D1039	M1040	T1041	G1043	Q1044	T1045	I1046	T1047	R1048	E987	F988	G989	D1051	E1052	L1053	T1054	G1055	L1056								
R933	T934	F935	H936	I937	G938	A939	A940	A941	A942	A943	A944	A945	A946	A947	A948	A949	A950	A951	A952	A953	A954	A955	A956	A957	A958	A959	A960	A961	A962	A963	A964	A965	A966	A967	A968	A969	A970	A971	A972	A973	A974	A975	A976	A977	A978	A979	A980	A981	A982	A983	A984	A985	A986	A987	A988	A989	A990	A991	A992	A993	A994	
L856	L857	V858	P859	R860	L864	H865	E866	C869	D870	L871	E874	N875	S876	D877	D878	A879	V880	K881	S884	V885	C888	D889	R890	D891	B894	C895	A896	H897	R901	D902	L903	A904	I909	N910	K911	G912	E913	A914	I915	G916	V917	I918	I923	G924	E925	P926	L930	T931	K932	E933	S934											
L783	A784	T785	T786	K789	T790	A791	L796	T797	R798	R799	L800	V803	A804	Q805	D806	L807	T810	E811	D812	C814	G815	T816	T820	M821	R822	T823	V824	I826	E827	G828	G829	D830	E833	P834	L835	V839	L840	T844	A845	E846	D847	V848	L849	K850	P851	G852	L853	A854	D855													
E714	K715	Q716	F717	S718	F719	N720	S721	I722	T723	M725	R731	G732	S733	A734	A735	Q736	I737	R738	Q739	L740	F741	G742	M743	L746	M747	A748	K749	P750	S753	I754	I755	E756	T757	P758	I759	T760	A761	N762	F763	R764	E765	G766	L767	N768	V769	L770	Q771	F772	F773	I774	S775	T776	K781	G782								
M644	P647	E648	K649	S650	K650	H651	E652	I653	I654	S655	E656	A657	E658	V661	E662	A663	I664	Q665	E666	Q667	F668	Q669	S670	G671	L672	E677	R678	K681	V682	D683	L684	I685	M686	A689	N690	V693	M697	M698	D699	N700	L701	Q702	T703	E704	T705	V706	I707	N708	R709	D710	G711	L641	D642	E713								
T567	S568	L569	K570	T573	V574	G575	R576	A577	I578	L579	V580	M581	I582	V583	P584	K585	P588	Y589	S590	I591	V592	M593	K598	I601	Y609	R610	L611	L612	G613	L614	K615	P616	I619	F620	Q623	I624	M625	Y626	T627	Y631	A632	A633	G636	E637	S638	G640	L641	D642	D643													
P427	T428	L429	H430	L431	L432	G433	L434	Q435	A436	P439	V440	L441	I442	E443	G444	K445	A446	I447	Q448	L449	H450	P451	L452	Y457	N458	A459	D460	D464	Q465	M466	A467	V468	H469	V470	P471	L472	L474	E475	E479	A480	L483	M484	M485	S486	T487	M488	I490	L491	M495	G496	E497											
V857	G858	P859	L863	H864	L868	P869	K870	K871	M872	R873	A874	L875	F877	L878	F879	P879	L885	Q888	R889	L890	A891	T892	N893	K895	A896	A897	K898	K899	M900	V901	A902	V903	F904	M905	V906	A907	V908	F909	D910	L911	D912	E913	V914	I915	L916	L917	L918	L919	L920	L921	L922	L923	L924	L925	L926	L927	L928	L929	L930	L931	L932	L933
D134	I135	E136	R137	V138	E142	S143	Y144	V145	V146	I147	E148	G149	G150	M151	T152	M153	L154	Q157	Q158	I159	L160	L161	E162	E163	Q164	Y165	L166	L169	D174	E175	F176	D177	A178	K179	M180	A184	I185	Q186	L189	M192	D193	L194	E195	Q196	E197	Q200	L201	R202	E203	E204	L205											
D67	Y68	E69	C70	L71	C72	G73	K74	Y75	K76	R77	L78	K79	H80	V83	I84	C85	E86	K87	C88	G89	V92	T93	Q94	T95	K96	V97	R98	R99	E100	R101	M102	G103	H104	I105	E106	L107	A108	T111	L114	M115	L117	S122	R123	L124	G125	L126	L127	L128	D129	M130	P131	L132	R133									
T208	N209	E211	T212	K213	R214	K215	L216	L217	T218	K219	I221	K222	L223	L224	V228	A302	N232	K233	G389	A305	L306	L307	D308	N309	G310	R311	L316	L324	K325	A400	S326	L327	K334	Q335	R337	F338	R339	L342	D343	G344	K345	R346	V347	D348	Y349	S350	R351	L352	T273	N274	R275	R278										

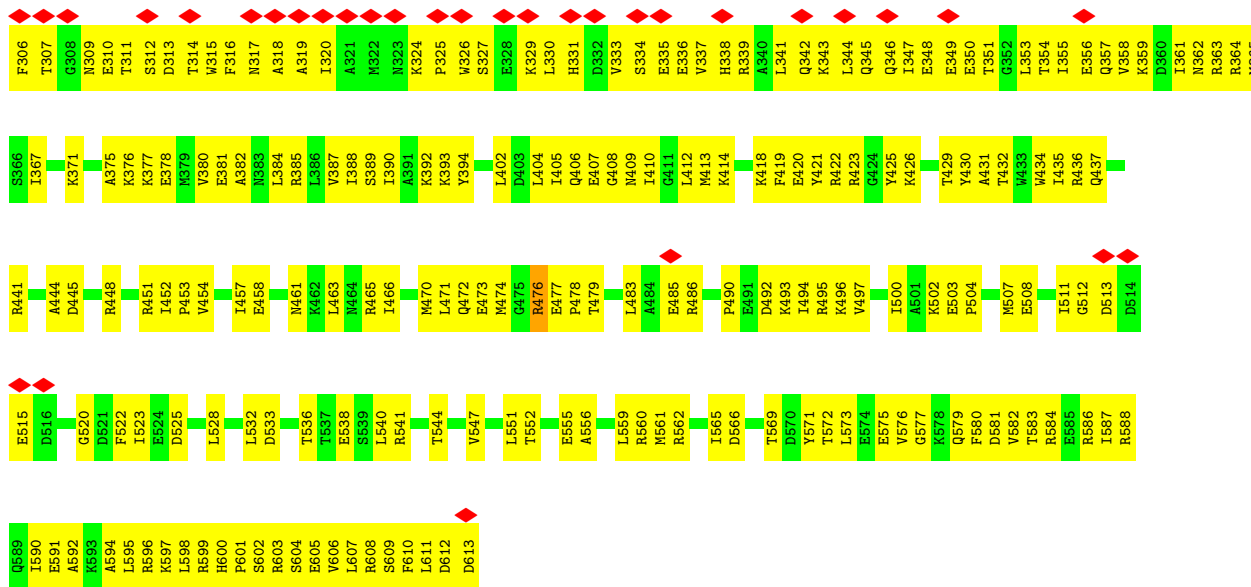


• Molecule 4: DNA-directed RNA polymerase subunit omega

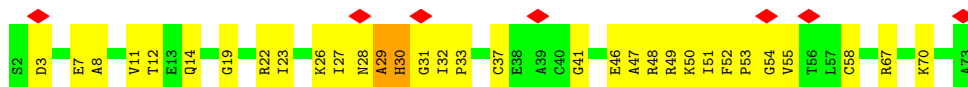


• Molecule 5: RNA polymerase sigma factor RpoD

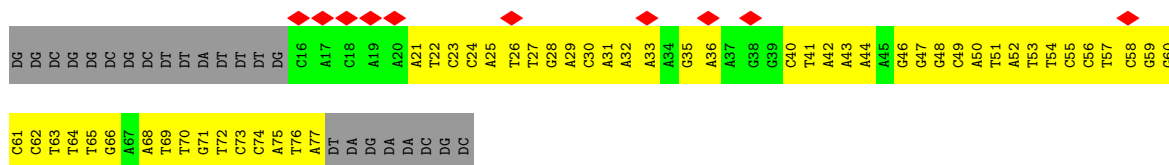
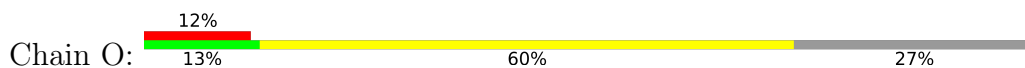




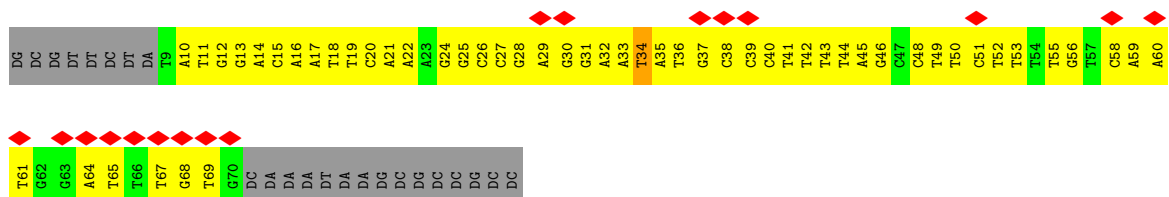
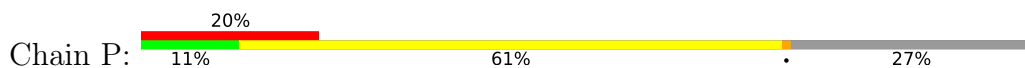
• Molecule 6: Protein TraR



• Molecule 7: DNA (85-MER)



• Molecule 8: DNA (85-MER)



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	46650	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 ( $e^-/\text{\AA}^2$ )	80	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.154	Depositor
Minimum map value	-0.109	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	332.8, 332.8, 332.8	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.3, 1.3, 1.3	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: 1N7, MG, 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	G	0.40	0/1784	0.50	0/2419
1	H	0.36	0/1697	0.52	0/2301
1	M	0.25	0/579	0.51	0/784
2	I	0.42	0/10740	0.52	0/14492
3	J	0.40	0/10619	0.53	0/14338
4	K	0.33	0/629	0.49	0/847
5	L	0.31	0/3906	0.49	0/5251
6	N	0.30	0/581	0.52	0/785
7	O	0.59	0/1426	0.94	0/2197
8	P	0.64	0/1424	1.00	1/2197 (0.0%)
All	All	0.41	0/33385	0.58	1/45611 (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	I	0	3

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	P	34	DT	O4'-C4'-C3'	-7.22	101.61	104.50

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	I	442	VAL	Peptide
2	I	545	PHE	Peptide
2	I	57	PHE	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	G	1762	0	1785	112	0
1	H	1678	0	1698	149	0
1	M	572	0	602	56	0
2	I	10571	0	10580	919	0
3	J	10460	0	10679	950	0
4	K	627	0	634	51	0
5	L	3854	0	3911	471	0
6	N	571	0	558	35	0
7	O	1270	0	698	87	0
8	P	1272	0	705	105	0
9	I	27	39	38	5	0
9	J	27	39	38	5	0
10	J	1	0	0	0	0
11	J	2	0	0	0	0
11	N	1	0	0	0	0
All	All	32695	78	31926	2698	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 42.

The worst 5 of 2698 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)
9:J:1504:1N7:C19	9:J:1504:1N7:C3	1.84	1.54
9:I:1401:1N7:C3	9:I:1401:1N7:C19	1.82	1.52
5:L:146:GLU:O	5:L:150:ARG:HG3	1.48	1.10
3:J:145:VAL:HG23	3:J:159:ILE:HG22	1.36	1.05
3:J:965:SER:HB2	3:J:973:LEU:HD11	1.38	1.03



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	G	227/329 (69%)	195 (86%)	32 (14%)	0	100	100
1	H	215/329 (65%)	188 (87%)	26 (12%)	1 (0%)	29	66
1	M	71/329 (22%)	63 (89%)	8 (11%)	0	100	100
2	I	1339/1342 (100%)	1177 (88%)	158 (12%)	4 (0%)	41	74
3	J	1339/1430 (94%)	1187 (89%)	152 (11%)	0	100	100
4	K	77/91 (85%)	69 (90%)	8 (10%)	0	100	100
5	L	467/616 (76%)	422 (90%)	45 (10%)	0	100	100
6	N	70/72 (97%)	62 (89%)	6 (9%)	2 (3%)	4	32
All	All	3805/4538 (84%)	3363 (88%)	435 (11%)	7 (0%)	50	78

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	I	546	GLU
2	I	974	ARG
6	N	29	ALA
2	I	443	ASP
6	N	30	HIS

### 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	G	193/286 (68%)	189 (98%)	4 (2%)	53	74
1	H	184/286 (64%)	183 (100%)	1 (0%)	88	94
1	M	65/286 (23%)	65 (100%)	0	100	100
2	I	1155/1157 (100%)	1149 (100%)	6 (0%)	88	94
3	J	1127/1189 (95%)	1122 (100%)	5 (0%)	91	95
4	K	67/75 (89%)	67 (100%)	0	100	100
5	L	421/543 (78%)	420 (100%)	1 (0%)	93	97
6	N	61/61 (100%)	61 (100%)	0	100	100
All	All	3273/3883 (84%)	3256 (100%)	17 (0%)	89	94

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	J	1167	LYS
5	L	476	ARG
2	I	436	ARG
2	I	443	ASP
2	I	516	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 33 such sidechains are listed below:

Mol	Chain	Res	Type
5	L	227	GLN
5	L	265	GLN
6	N	28	ASN
2	I	1080	ASN
2	I	932	GLN

### 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 6 ligands modelled in this entry, 4 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
9	1N7	J	1504	-	30,30,46	5.06	15 (50%)	47,48,72	2.42	18 (38%)
9	1N7	I	1401	-	30,30,46	4.81	14 (46%)	47,48,72	2.21	14 (29%)

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
9	1N7	J	1504	-	-	0/7/72/92	0/4/4/4
9	1N7	I	1401	-	-	2/7/72/92	0/4/4/4

The worst 5 of 29 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	J	1504	1N7	C3-C19	18.59	1.84	1.53
9	I	1401	1N7	C3-C19	17.29	1.82	1.53
9	J	1504	1N7	C3-C4	12.02	1.73	1.53
9	I	1401	1N7	C3-C4	10.88	1.71	1.53
9	I	1401	1N7	C5-C4	-8.87	1.40	1.54

The worst 5 of 32 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	J	1504	1N7	C9-C5-C6	5.92	106.06	100.09

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	J	1504	1N7	C9-C5-C4	-5.47	112.67	117.67
9	I	1401	1N7	C19-C3-C4	-4.92	107.80	114.30
9	I	1401	1N7	C7-C6-C18	-4.89	111.49	118.33
9	I	1401	1N7	C9-C5-C4	-4.55	113.51	117.67

There are no chirality outliers.

All (2) torsion outliers are listed below:

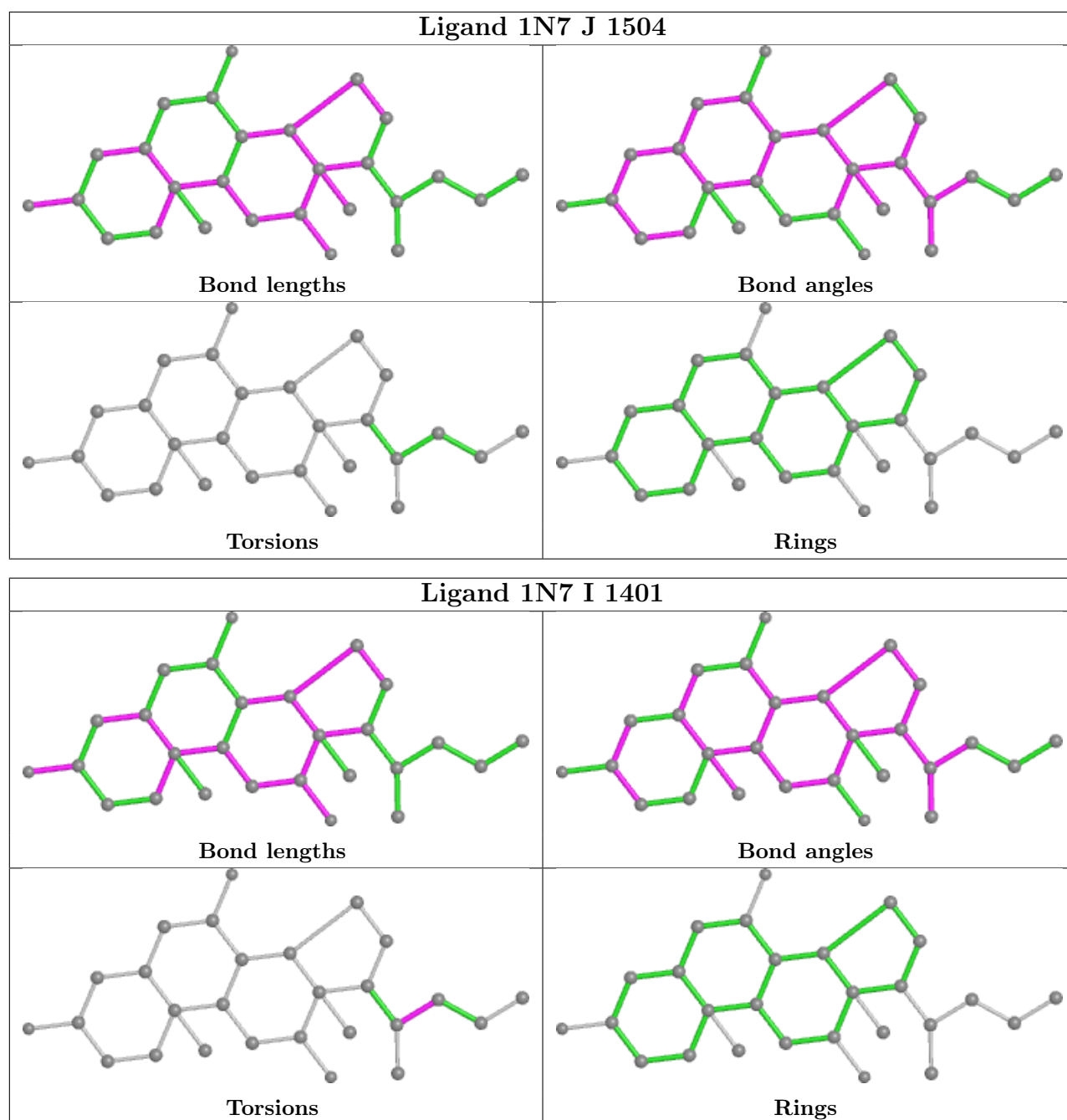
Mol	Chain	Res	Type	Atoms
9	I	1401	1N7	C9-C20-C22-C23
9	I	1401	1N7	C21-C20-C22-C23

There are no ring outliers.

2 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	J	1504	1N7	5	0
9	I	1401	1N7	5	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.

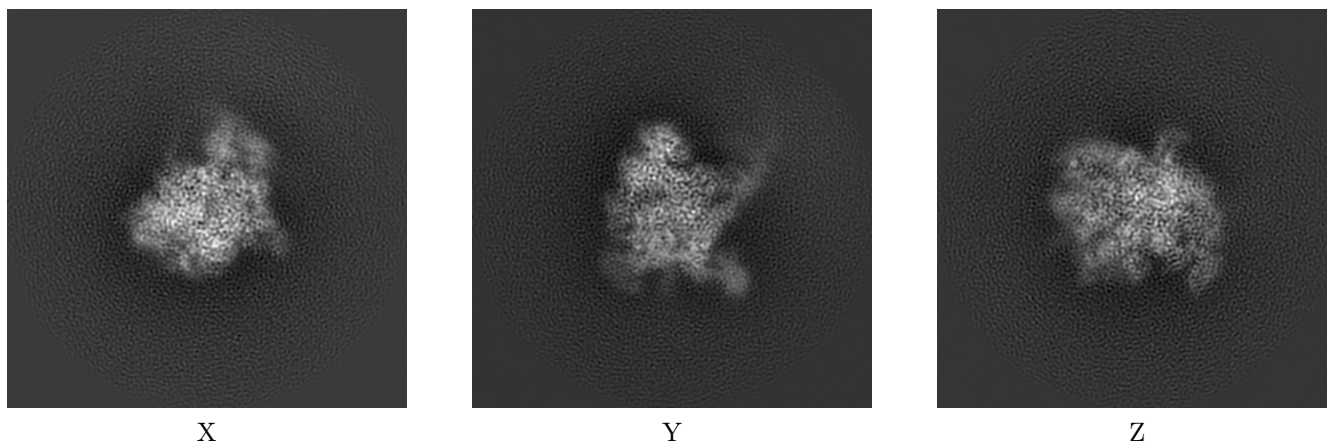
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20466. 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](#)

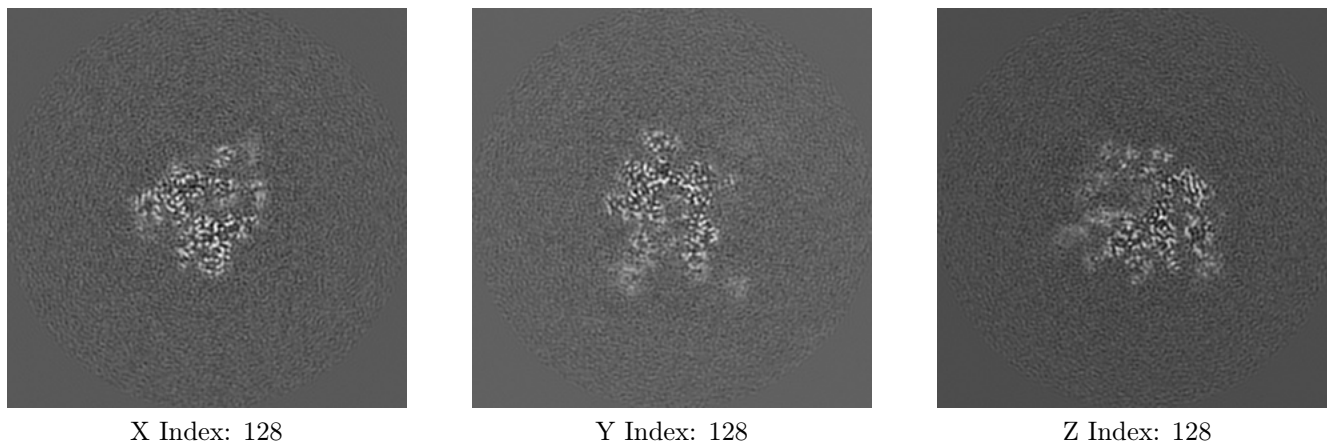
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

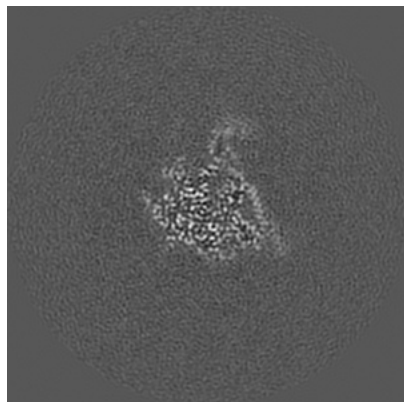
#### 6.2.1 Primary map



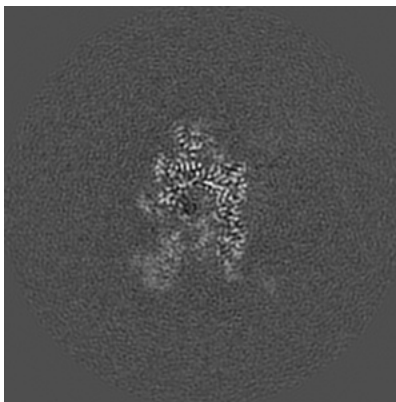
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

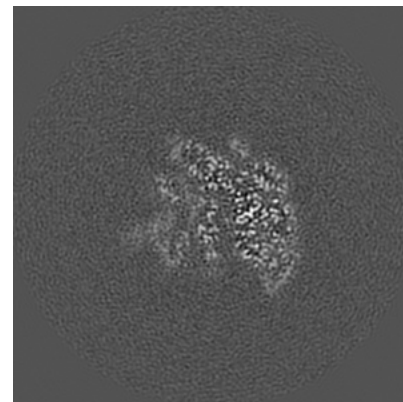
### 6.3.1 Primary map



X Index: 147



Y Index: 125

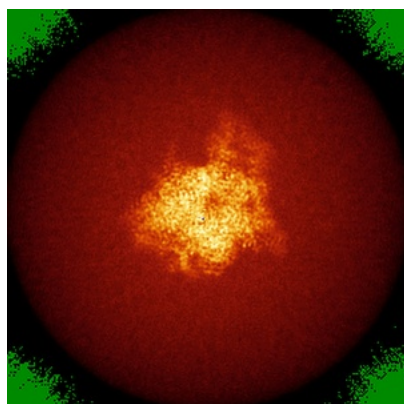


Z Index: 121

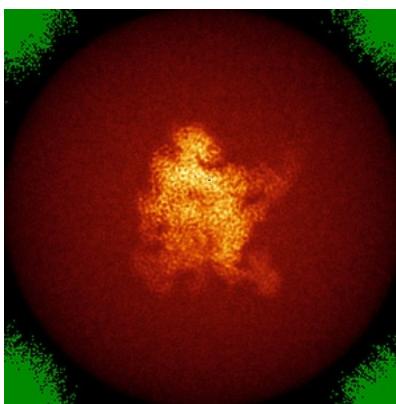
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

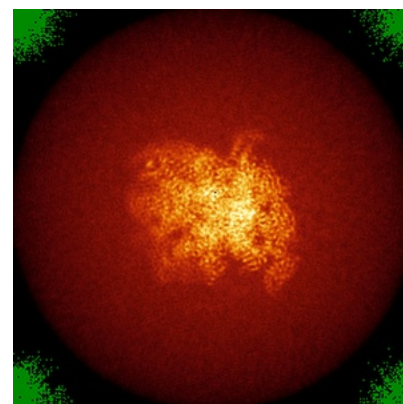
### 6.4.1 Primary map



X



Y

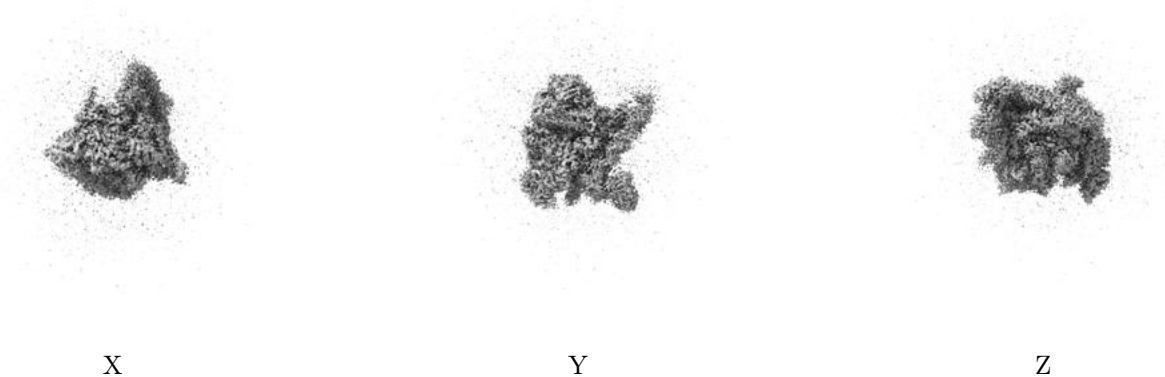


Z

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



The images above show the 3D surface view of the map at the recommended contour level 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.6 Mask visualisation [i](#)

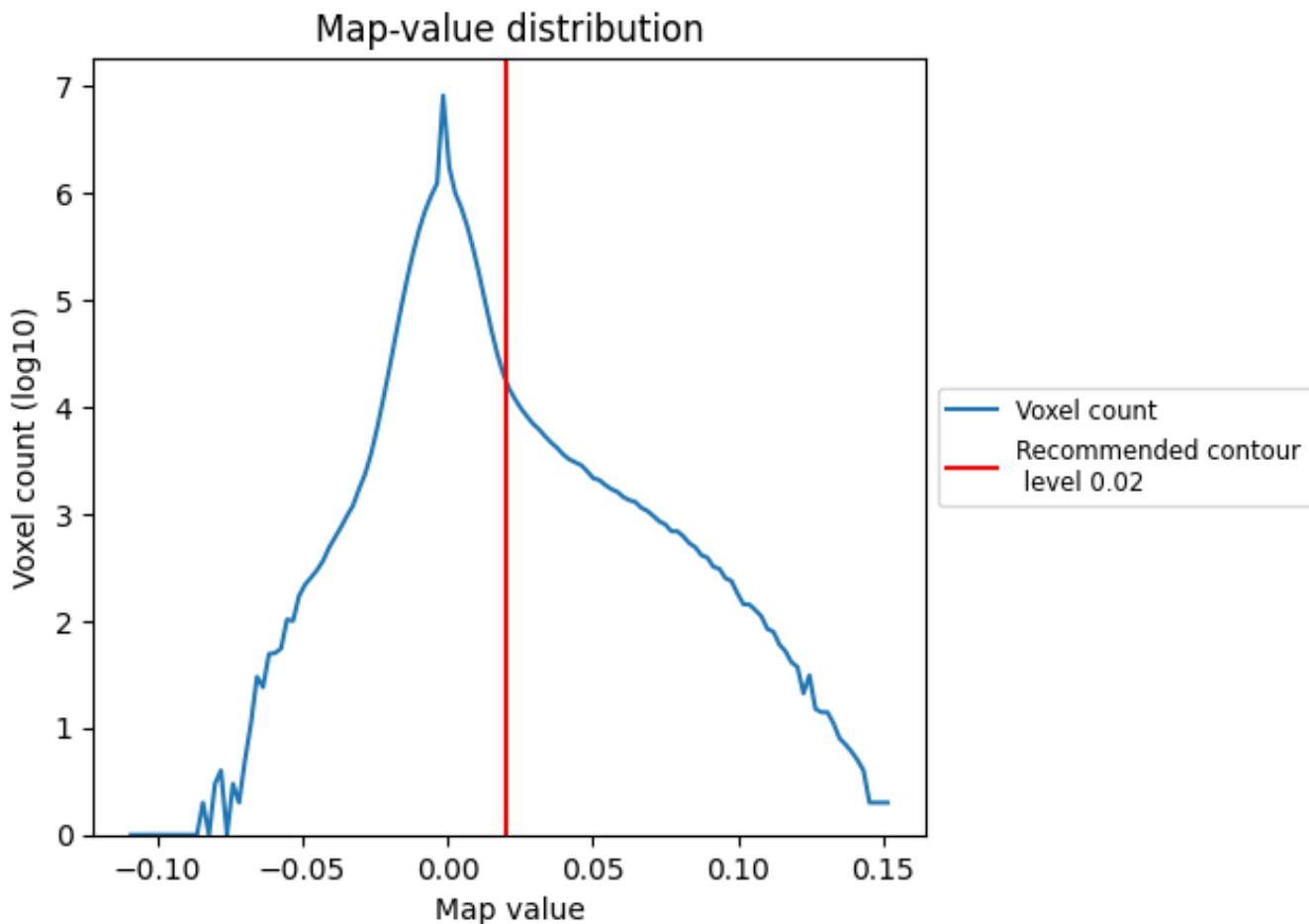
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

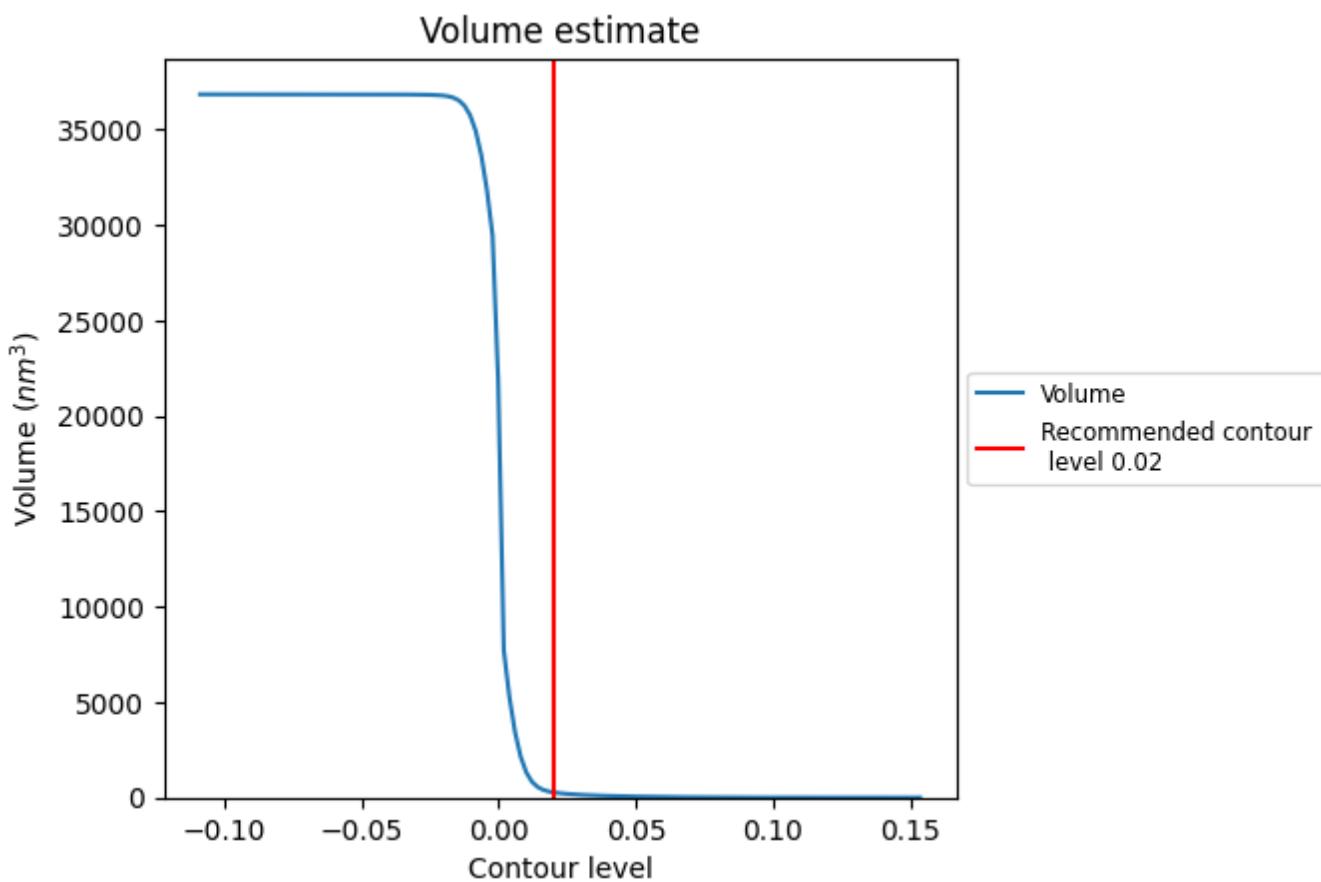
This section contains the results of statistical analysis of the map.

### 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.

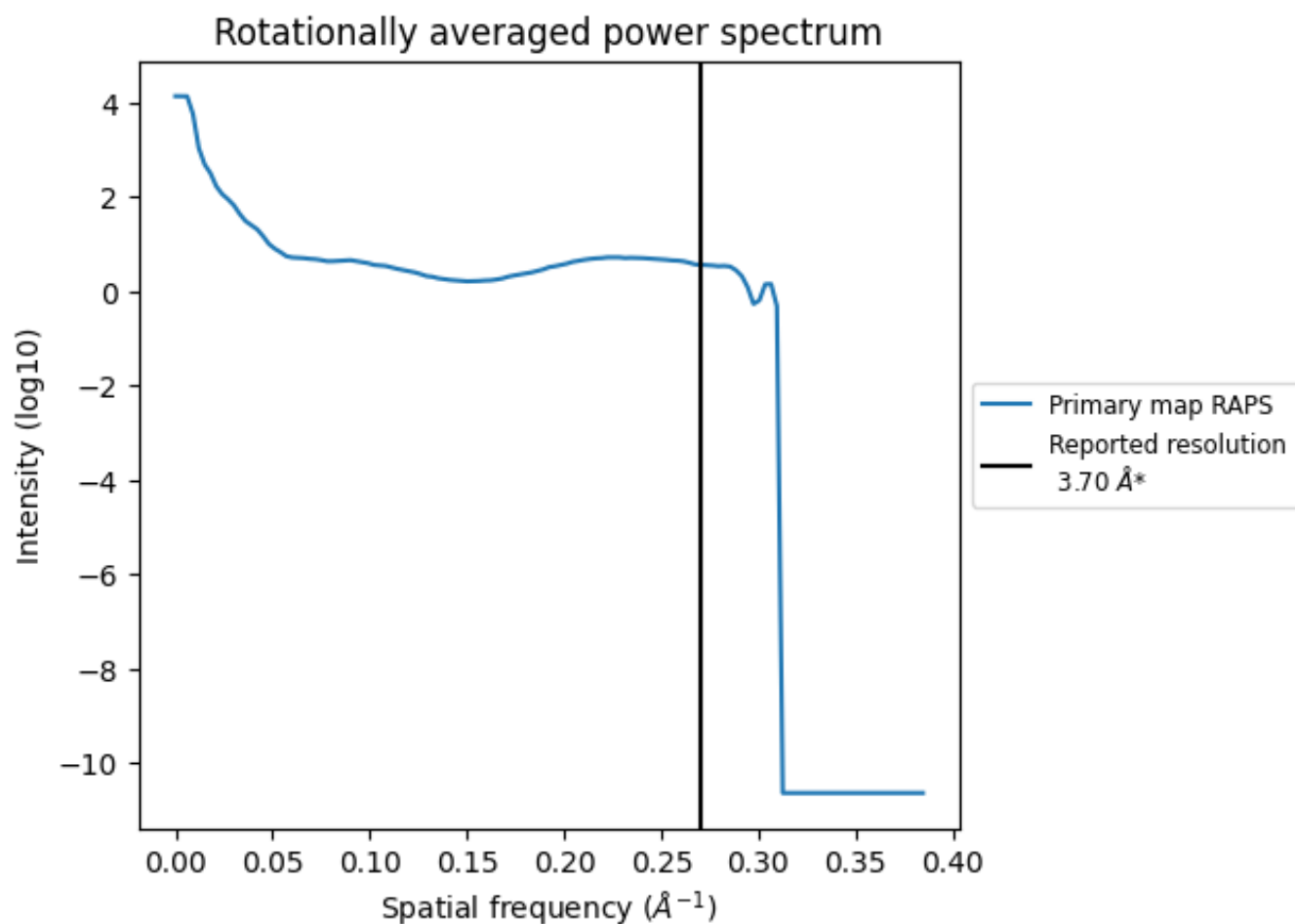
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 270 nm<sup>3</sup>; this corresponds to an approximate mass of 244 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 [\(i\)](#)

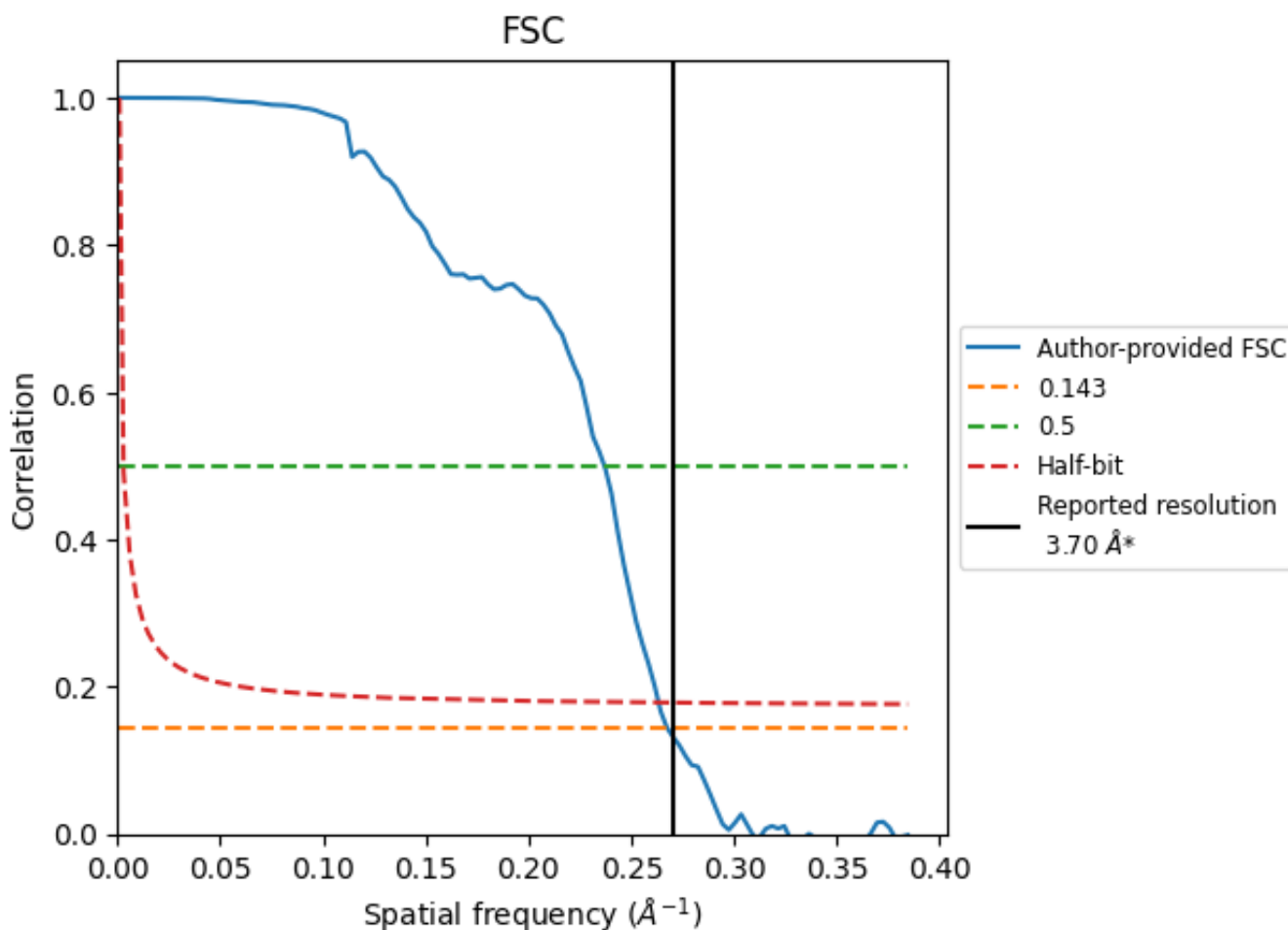


\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>

## 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 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

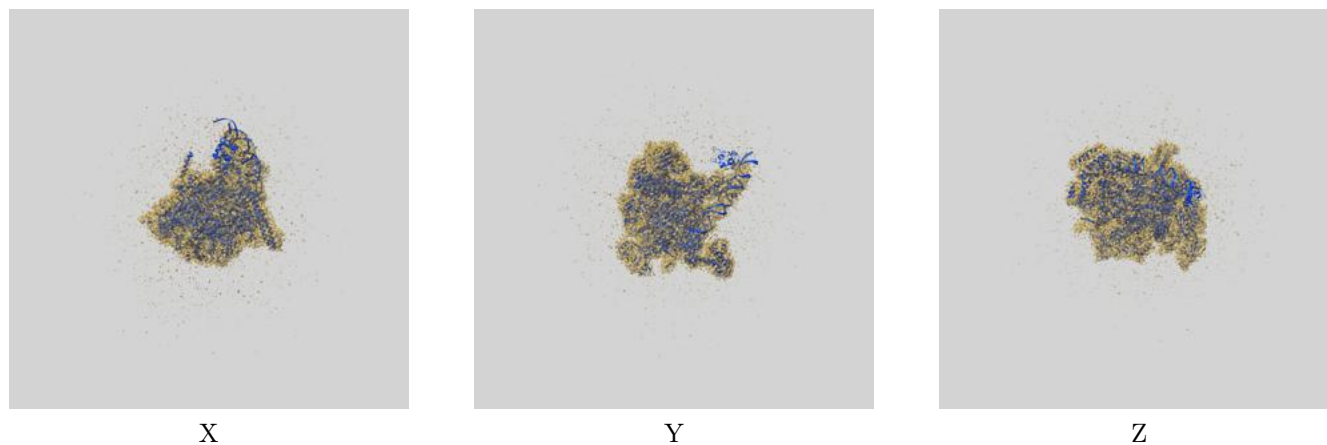
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.74	4.22	3.80
Unmasked-calculated*	-	-	-

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

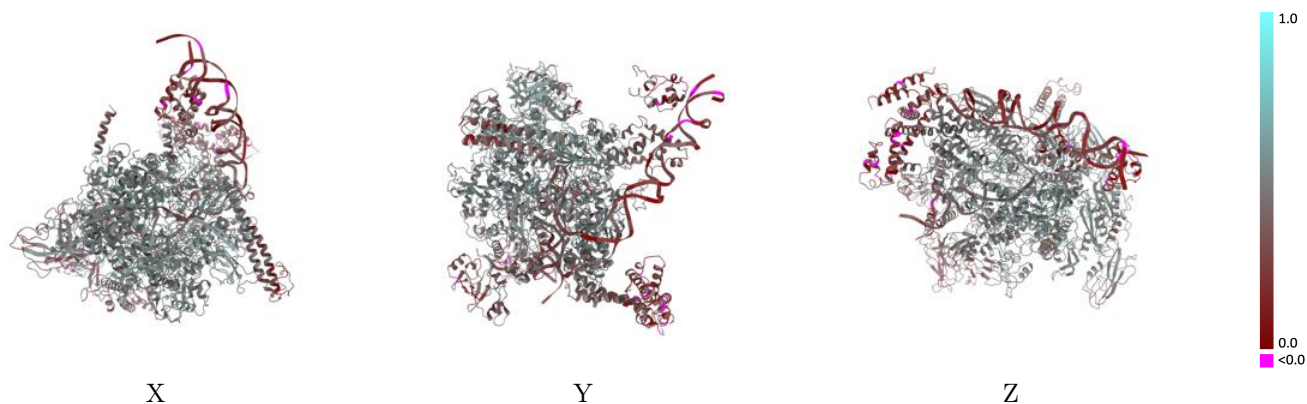
This section contains information regarding the fit between EMDB map EMD-20466 and PDB model 6PSW. Per-residue inclusion information can be found in section [3](#) on page [8](#).

### 9.1 Map-model overlay [i](#)



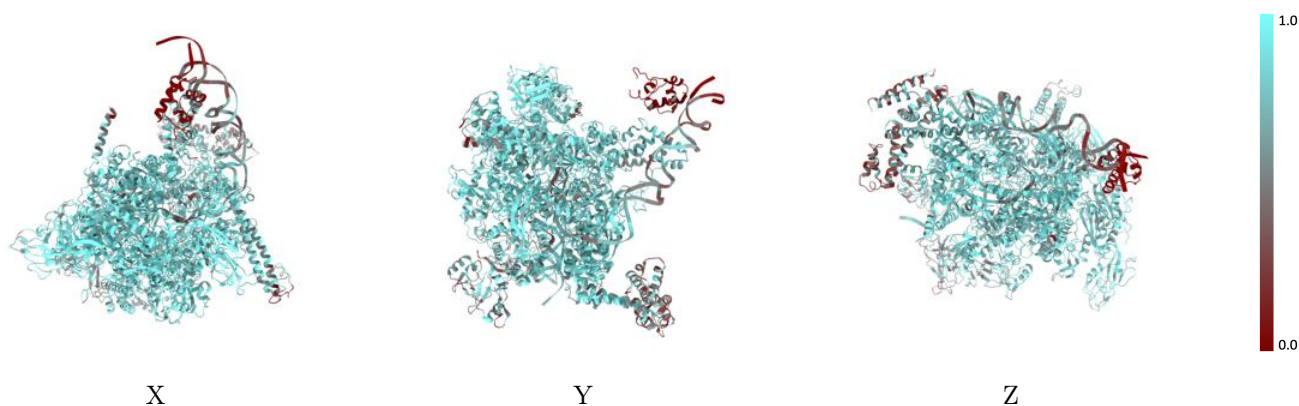
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



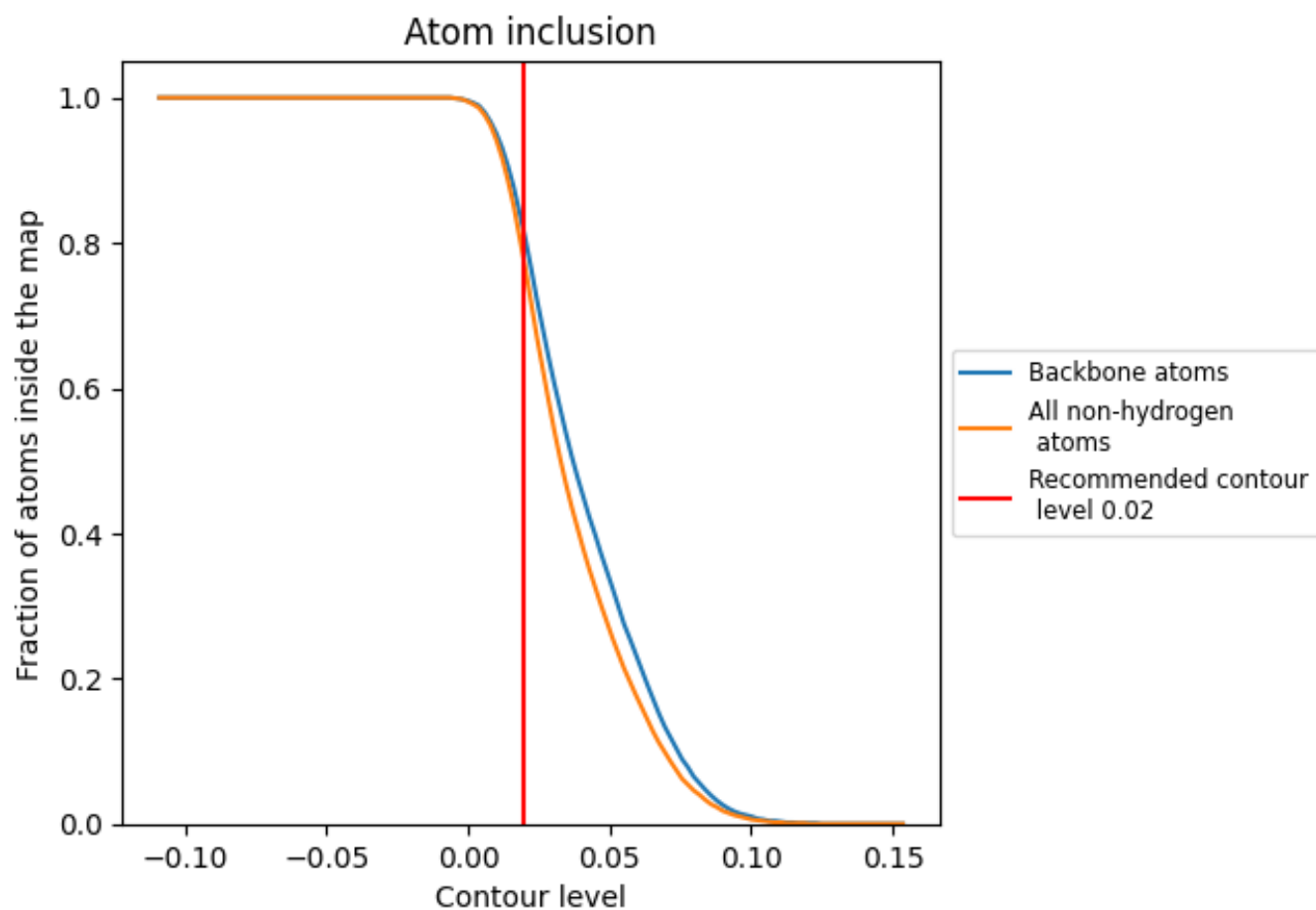
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.02).

## 9.4 Atom inclusion [i](#)

























At the recommended contour level, 81% of all backbone atoms, 77% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7700	 0.4380
G	 0.8590	 0.5010
H	 0.8260	 0.4660
I	 0.8270	 0.4750
J	 0.8220	 0.4710
K	 0.7380	 0.4650
L	 0.6770	 0.3560
M	 0.0460	 0.2530
N	 0.6890	 0.3990
O	 0.6260	 0.2570
P	 0.5650	 0.2460

