Full wwPDB EM Validation Report ⓘ

Jun 29, 2025 – 09:05 am BST

PDB ID	:	7OPC / pdb_00007opc
EMDB ID	:	EMD-13015
Title	:	Pol II-CSB-CRL4CSA-UVSSA-SPT6-PAF (Structure 4)
Authors	:	Kokic, G.; Cramer, P.
Deposited on	:	2021-05-31
Resolution	:	3.00 Å(reported)

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 ⓘ symbol.

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

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

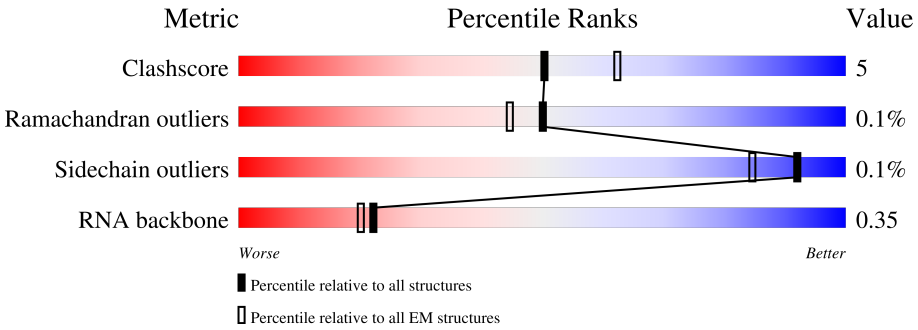
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 3.00 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	A	1970	65% 7% 28%
2	B	1174	6% 89% 7%
3	C	275	88% 7% 5%
4	D	142	14% 72% 18% 10%
5	E	210	91% 8%
6	F	127	5% 59% 6% 35%
7	G	172	10% 76% 22%

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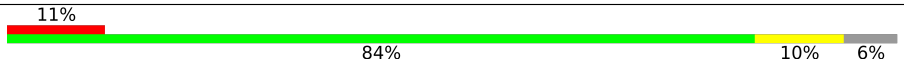
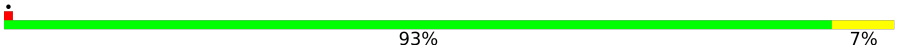
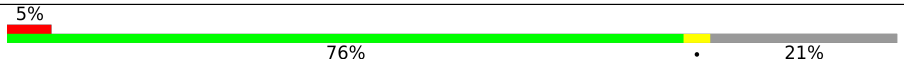
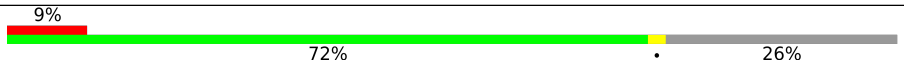
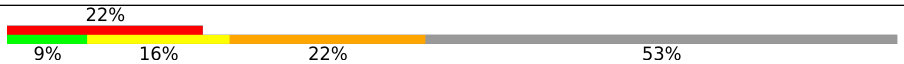
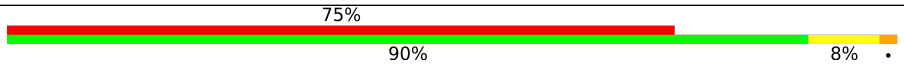
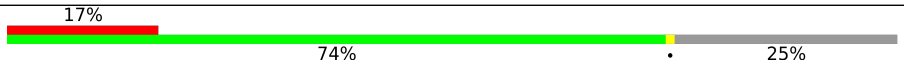
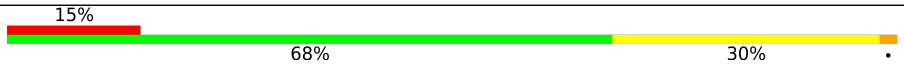
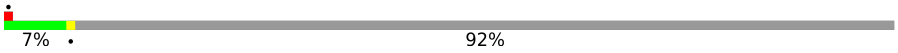
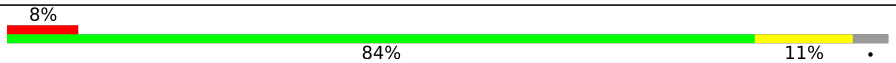
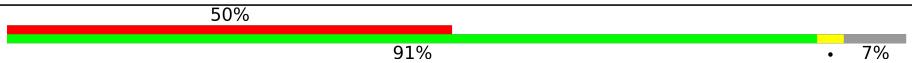
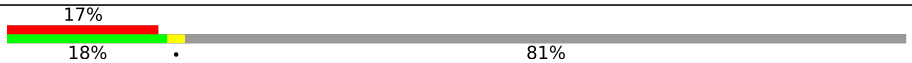
Mol	Chain	Length	Quality of chain
8	H	150	
9	I	125	
10	J	67	
11	K	117	
12	L	58	
13	M	1729	
14	N	47	
15	P	45	
16	R	40	
17	S	1179	
18	T	47	
19	U	666	
20	V	531	
21	Y	305	
22	Z	531	
23	a	396	
24	b	1496	
25	c	712	
26	d	1143	
27	e	762	
28	f	108	

2 Entry composition (i)

There are 30 unique types of molecules in this entry. The entry contains 64223 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1412	11179	7033	2002	2074	70	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	B	1131	9052	5727	1592	1669	64	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	260	2089	1309	359	415	6	0	0

- Molecule 4 is a protein called RPOL4c domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	128	1013	636	172	201	4	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase II subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	209	1720	1089	300	323	8	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerase II subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	82	657	418	113	121	5	0	0

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1334	867	216	243	8		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	148	Total	C	N	O	S	0	0
			1186	750	194	237	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	117	Total	C	N	O	S	0	0
			949	587	169	182	11		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	67	Total	C	N	O	S	0	0
			533	345	90	92	6		

- Molecule 11 is a protein called RNA_pol_L_2 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	115	Total	C	N	O	S	0	0
			920	593	152	173	2		

- Molecule 12 is a protein called RNA polymerase II subunit K.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	46	Total	C	N	O	S	0	0
			388	241	75	66	6		

- Molecule 13 is a protein called Transcription elongation factor SPT6.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	810	Total	C	N	O	S	0	0
			6648	4226	1155	1234	33		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	-2	SER	-	expression tag	UNP Q7KZ85
M	-1	ASN	-	expression tag	UNP Q7KZ85
M	0	ALA	-	expression tag	UNP Q7KZ85

- Molecule 14 is a DNA chain called NTS.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	35	Total	C	N	O	P	0	0
			727	344	142	206	35		

- Molecule 15 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	21	Total	C	N	O	P	0	0
			454	204	89	140	21		

- Molecule 16 is a protein called LEO1 helix.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	R	40	Total	C	N	O	0	0
			160	80	40	40		

- Molecule 17 is a protein called RNA polymerase-associated protein CTR9 homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	S	890	Total	C	N	O	0	0
			3560	1780	890	890		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	1174	GLU	-	expression tag	UNP Q6PD62
S	1175	ASN	-	expression tag	UNP Q6PD62
S	1176	LEU	-	expression tag	UNP Q6PD62
S	1177	TYR	-	expression tag	UNP Q6PD62
S	1178	PHE	-	expression tag	UNP Q6PD62
S	1179	GLN	-	expression tag	UNP Q6PD62

- Molecule 18 is a DNA chain called TS.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	T	47	Total	C	N	O	P	0	0
			947	453	159	288	47		

- Molecule 19 is a protein called RNA polymerase-associated protein LEO1.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	U	104	Total	C	N	O	0	0
			416	208	104	104		

- Molecule 20 is a protein called RNA polymerase II-associated factor 1 homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	V	217	Total	C	N	O	0	0
			868	434	217	217		

- Molecule 21 is a protein called WD repeat-containing protein 61.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	Y	300	Total	C	N	O	0	0
			1200	600	300	300		

- Molecule 22 is a protein called Parafibromin.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	Z	43	Total	C	N	O	0	0
			172	86	43	43		

- Molecule 23 is a protein called DNA excision repair protein ERCC-8.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	a	365	Total	C	N	O	S	0	0
			2849	1775	507	548	19		

- Molecule 24 is a protein called DNA excision repair protein ERCC-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	b	520	Total	C	N	O	S	0	0
			4261	2746	748	746	21		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
b	-2	SER	-	expression tag	UNP Q03468
b	-1	ASN	-	expression tag	UNP Q03468
b	0	ALA	-	expression tag	UNP Q03468
b	538	ARG	LYS	conflict	UNP Q03468

- Molecule 25 is a protein called UV-stimulated scaffold protein A.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	c	141	Total	C	N	O	0	0
			564	282	141	141		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
c	-2	SER	-	expression tag	UNP Q2YD98
c	-1	ASN	-	expression tag	UNP Q2YD98
c	0	ALA	-	expression tag	UNP Q2YD98

- Molecule 26 is a protein called DNA damage-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	d	1096	Total	C	N	O	S	0	0
			7439	4560	1353	1492	34		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
d	-2	SER	-	expression tag	UNP Q16531
d	-1	ASN	-	expression tag	UNP Q16531
d	0	ALA	-	expression tag	UNP Q16531

- Molecule 27 is a protein called Cullin-4A.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	e	711	Total	C	N	O	0	0
			2845	1422	711	712		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
e	-2	SER	-	expression tag	UNP Q13619
e	-1	ASN	-	expression tag	UNP Q13619
e	0	ALA	-	expression tag	UNP Q13619

- Molecule 28 is a protein called E3 ubiquitin-protein ligase RBX1.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	f	21	Total 84	C 42	N 21	O 21	0	0

- Molecule 29 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
29	A	2	Total 2	Zn 2	0
29	B	1	Total 1	Zn 1	0
29	C	1	Total 1	Zn 1	0
29	I	2	Total 2	Zn 2	0
29	J	1	Total 1	Zn 1	0
29	L	1	Total 1	Zn 1	0

- Molecule 30 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

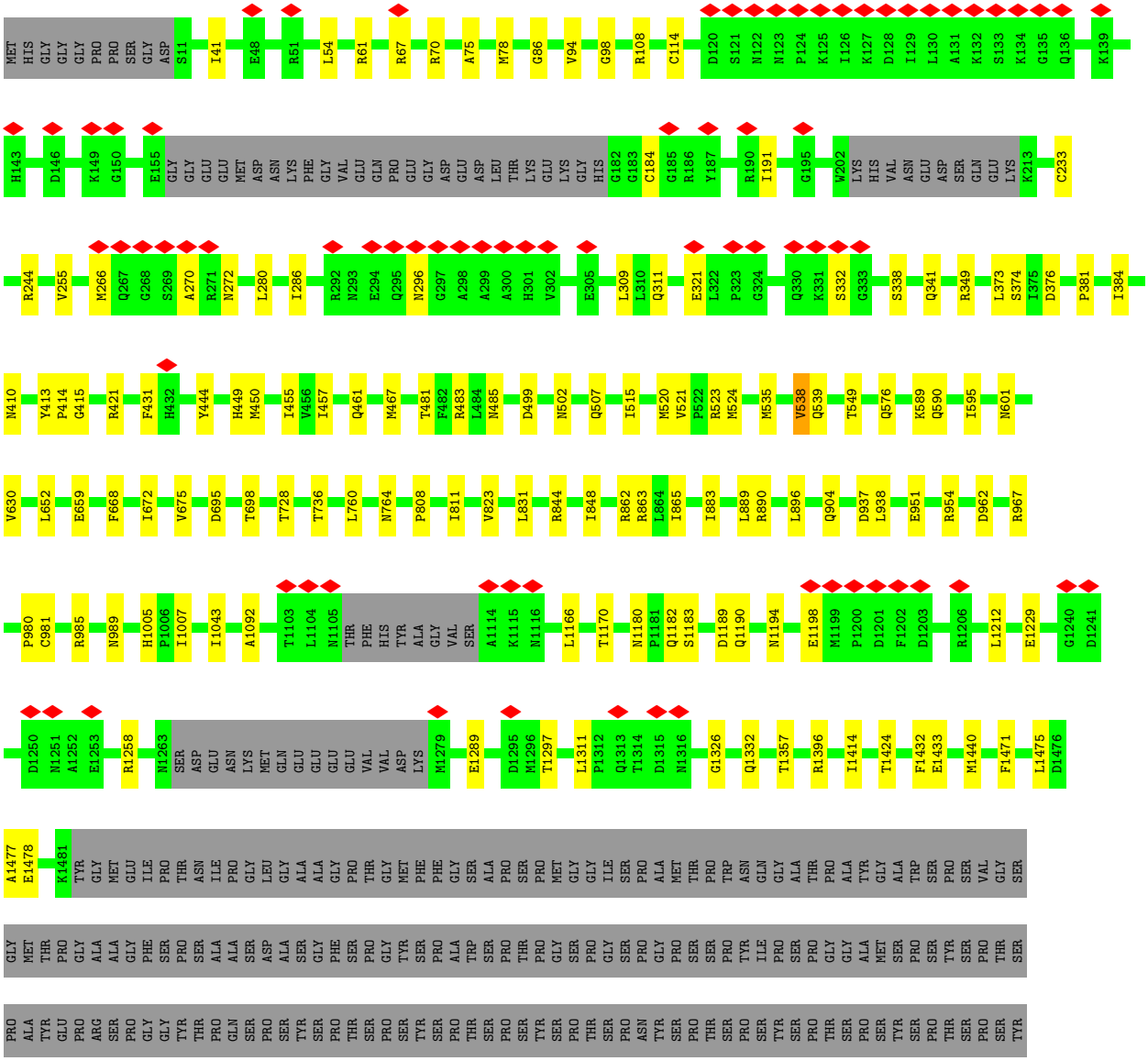
Mol	Chain	Residues	Atoms		AltConf
30	A	1	Total 1	Mg 1	0

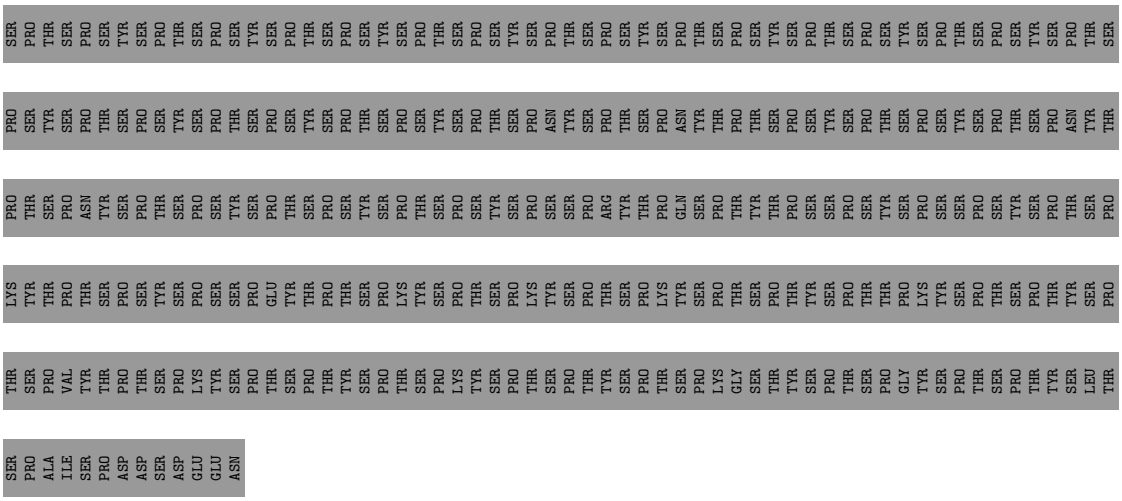
3 Residue-property plots (i)

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.

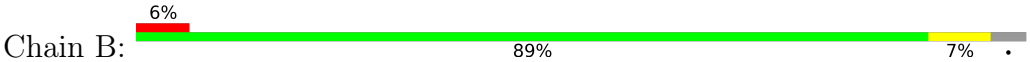
• Molecule 1: DNA-directed RNA polymerase II subunit RPB1

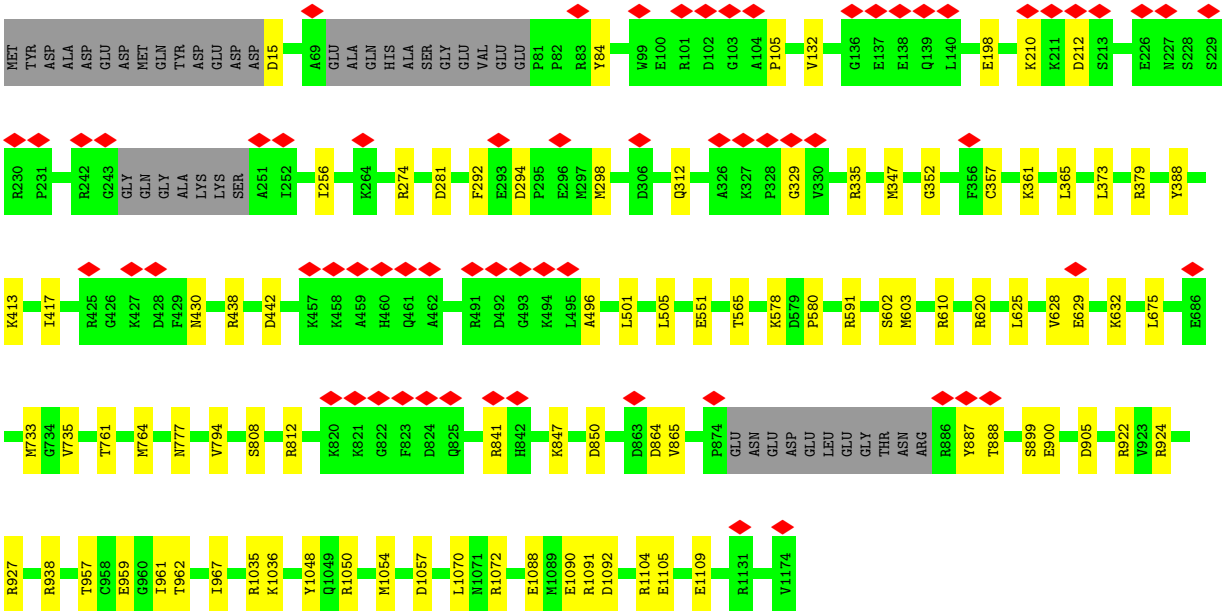
Chain A:



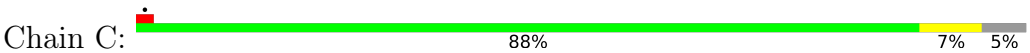


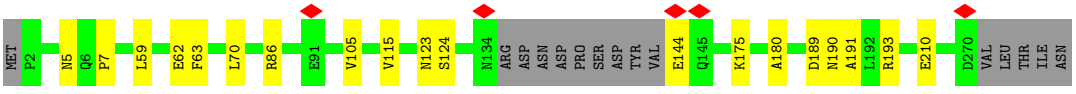
• Molecule 2: DNA-directed RNA polymerase subunit beta



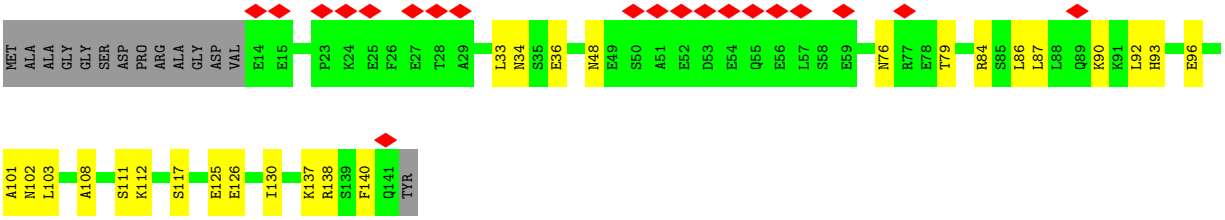


• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

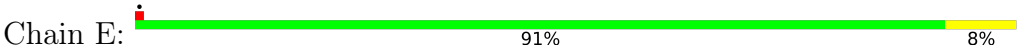


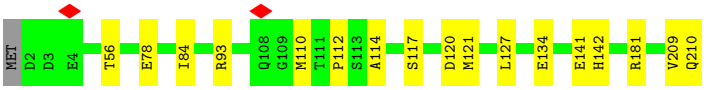


• Molecule 4: RPOL4c domain-containing protein

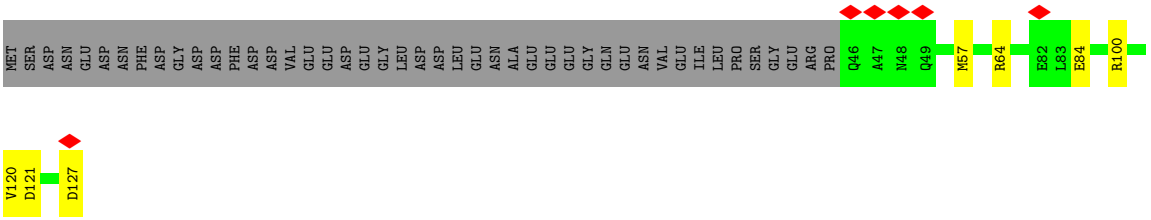


• Molecule 5: DNA-directed RNA polymerase II subunit E

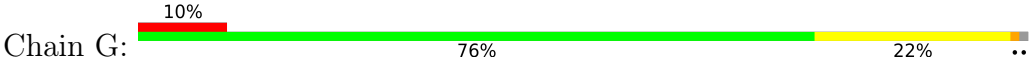


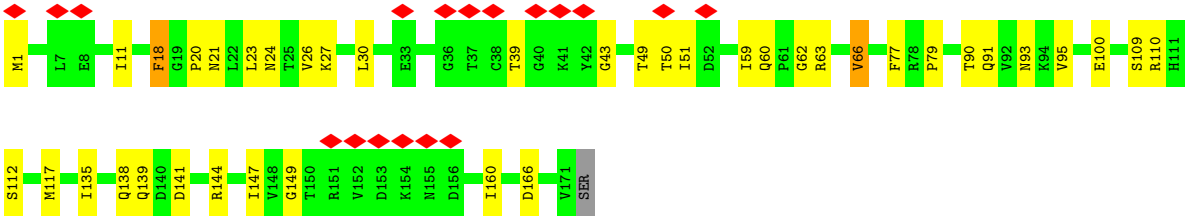


• Molecule 6: DNA-directed RNA polymerase II subunit F

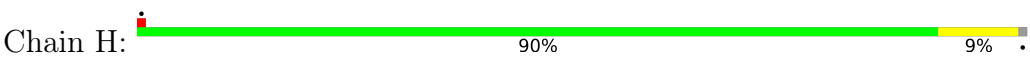


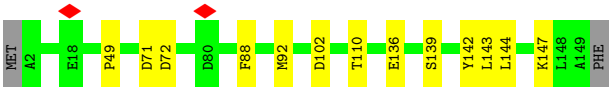
• Molecule 7: DNA-directed RNA polymerase II subunit RPB7



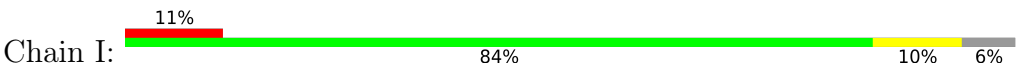


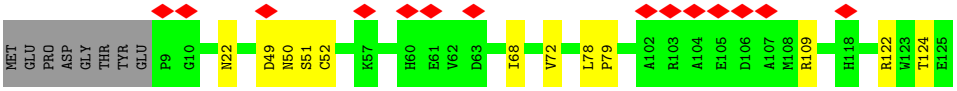
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3





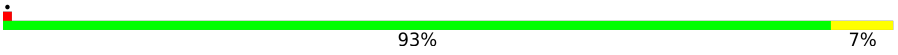
• Molecule 9: DNA-directed RNA polymerase II subunit RPB9





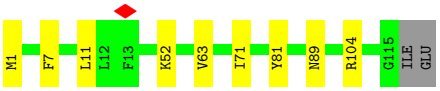
• Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:



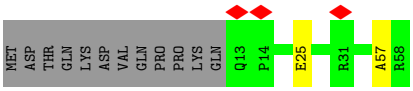
• Molecule 11: RNA_pol_L_2 domain-containing protein

Chain K:



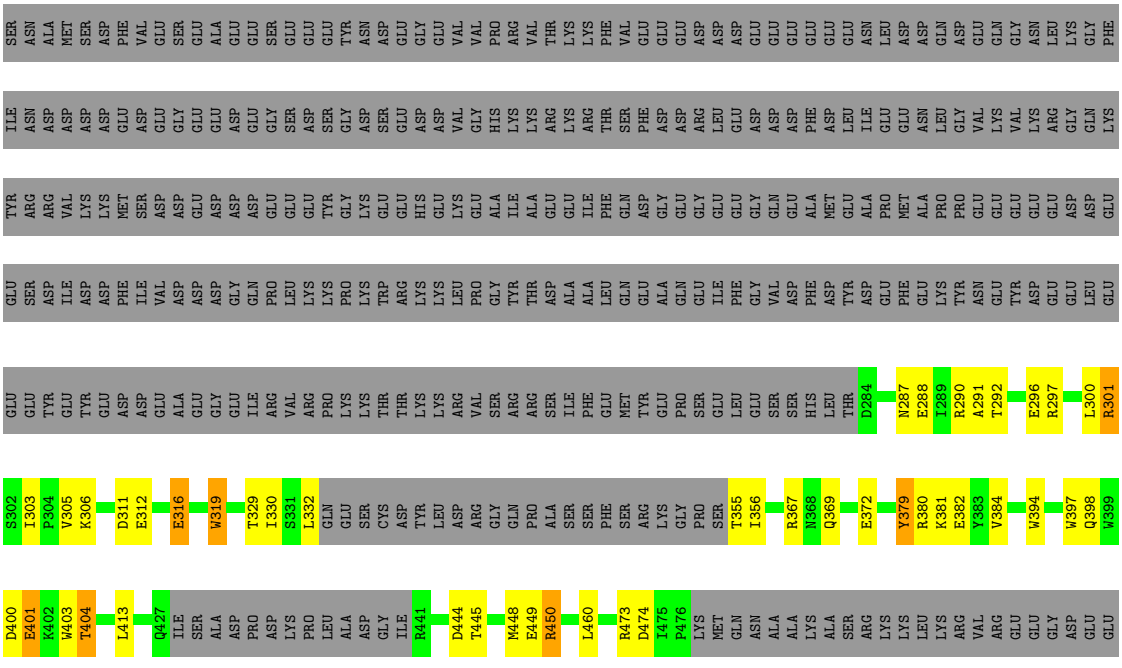
• Molecule 12: RNA polymerase II subunit K

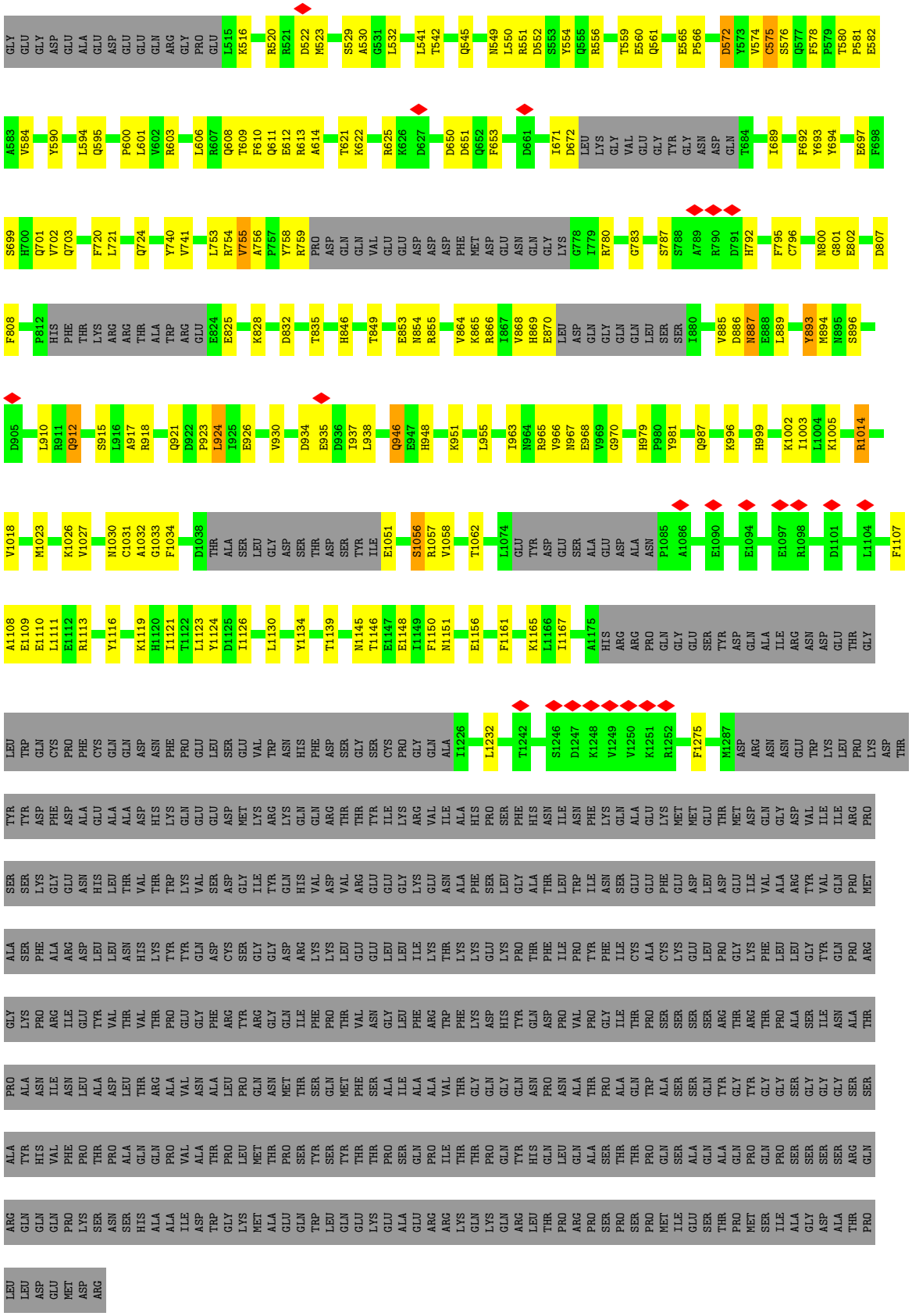
Chain L:



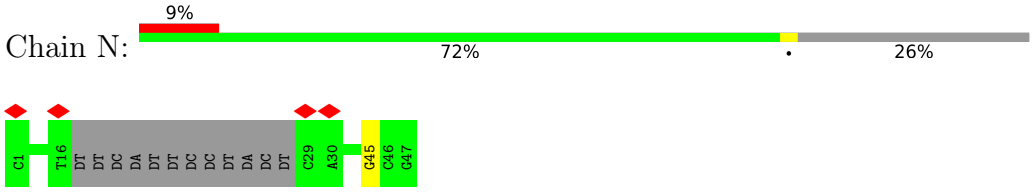
• Molecule 13: Transcription elongation factor SPT6

Chain M:

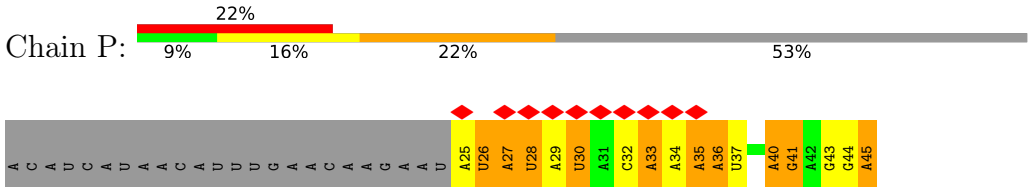




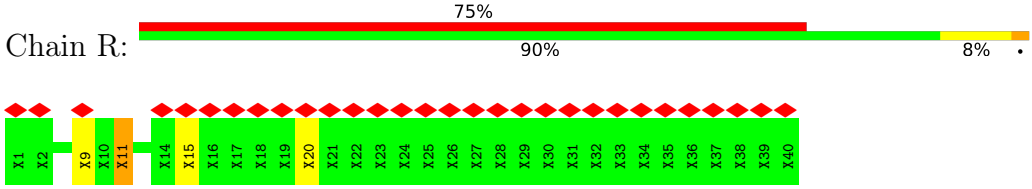
• Molecule 14: NTS



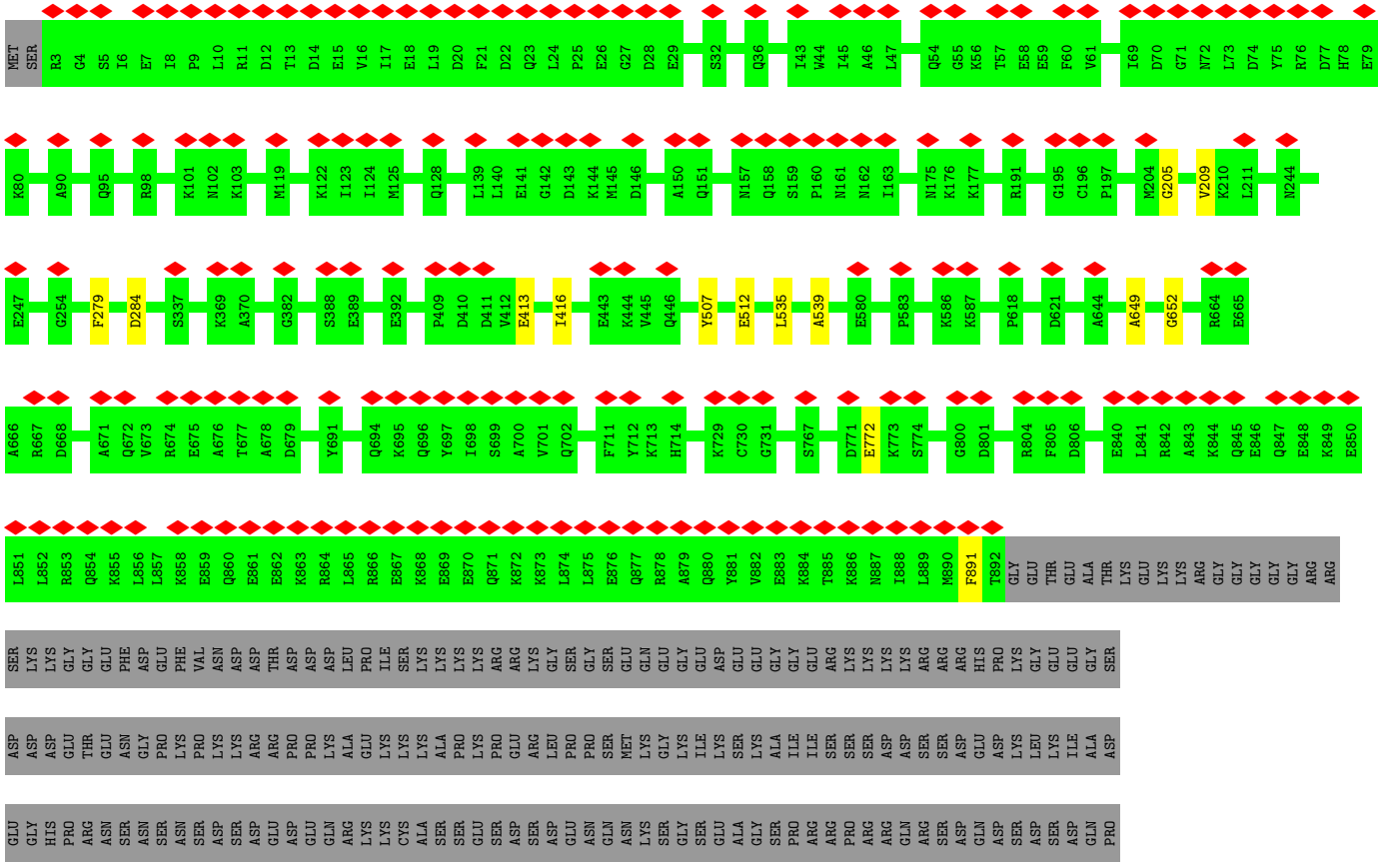
• Molecule 15: RNA

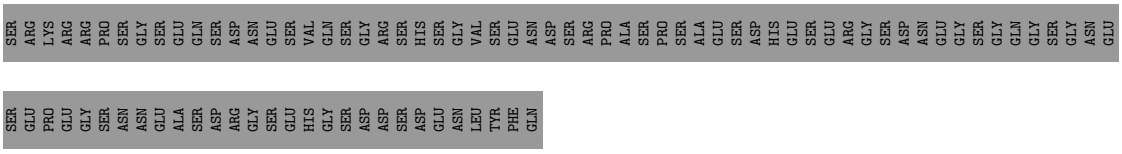


• Molecule 16: LEO1 helix

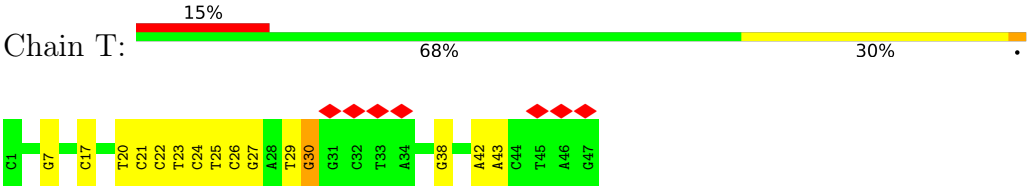


• Molecule 17: RNA polymerase-associated protein CTR9 homolog

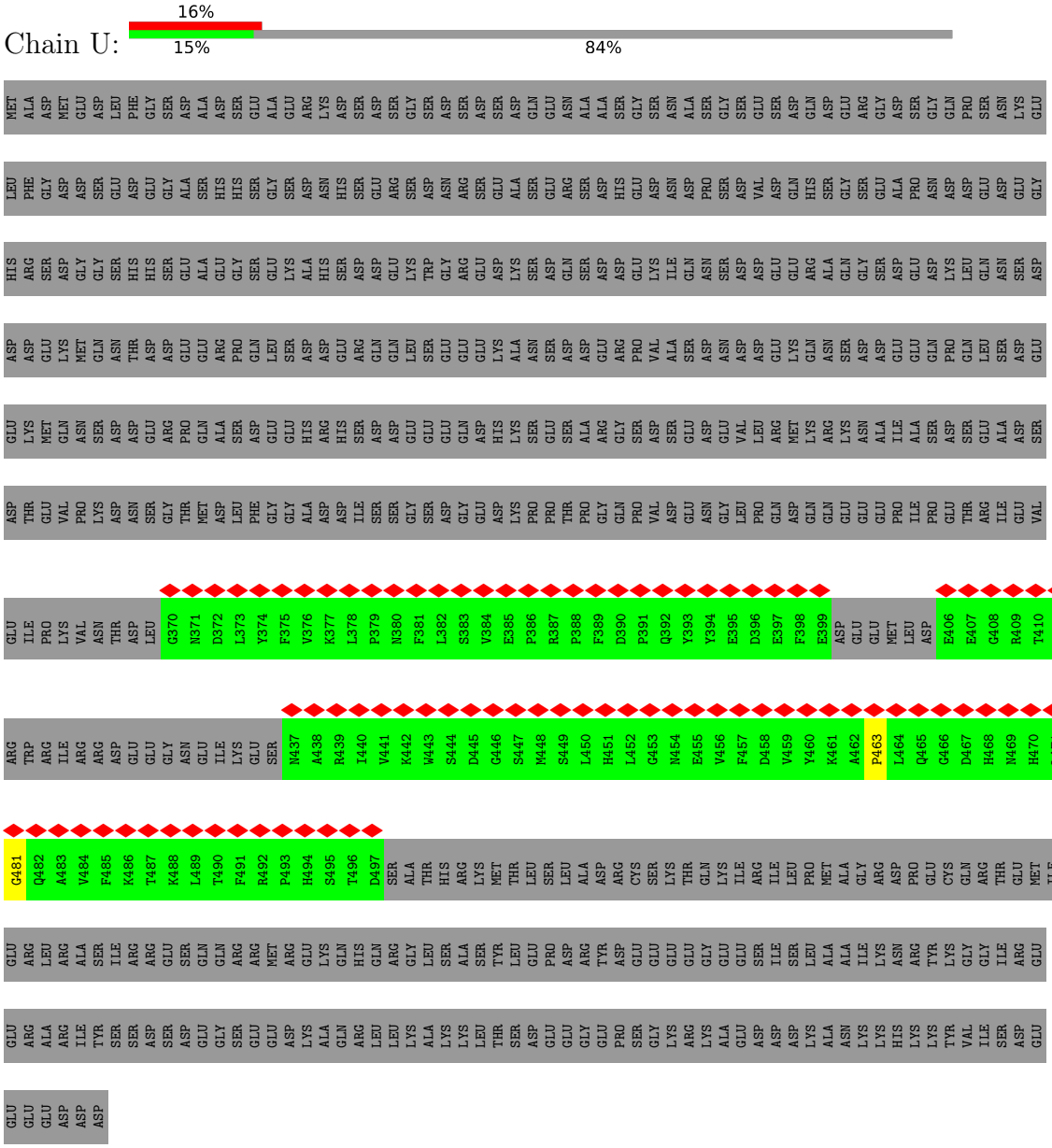




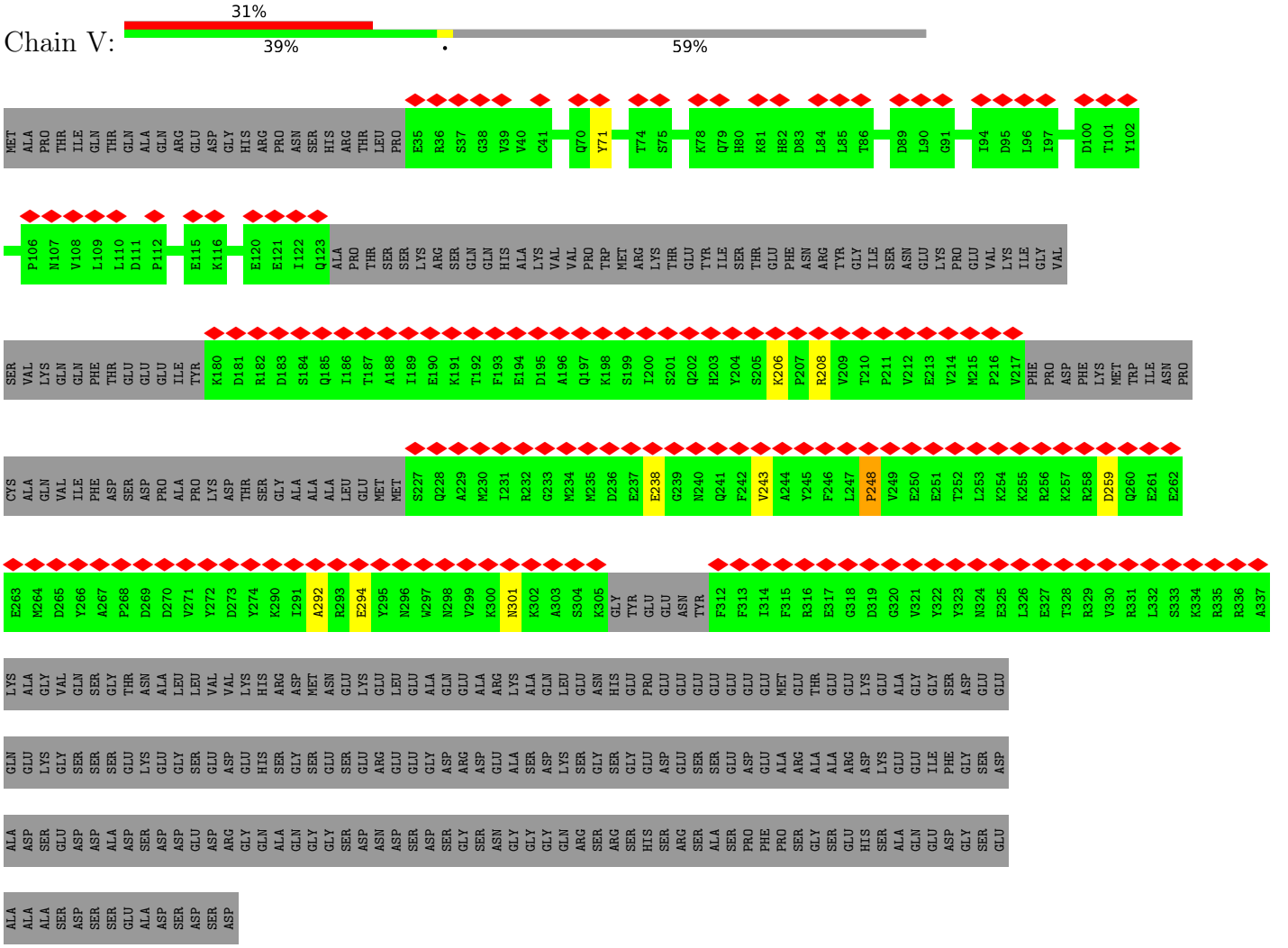
• Molecule 18: TS



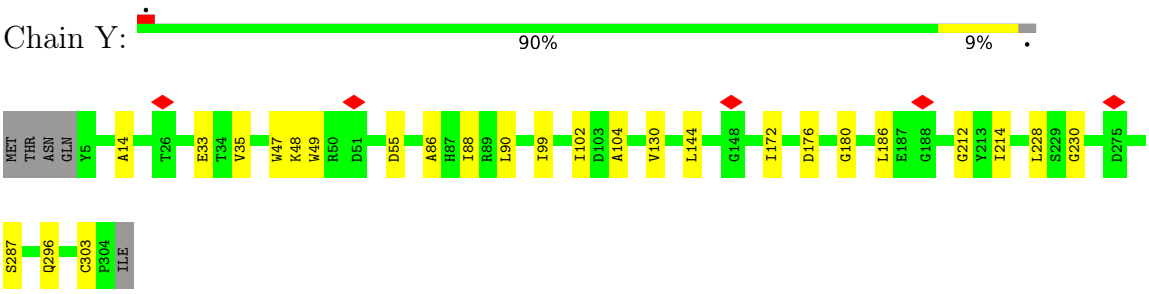
• Molecule 19: RNA polymerase-associated protein LEO1



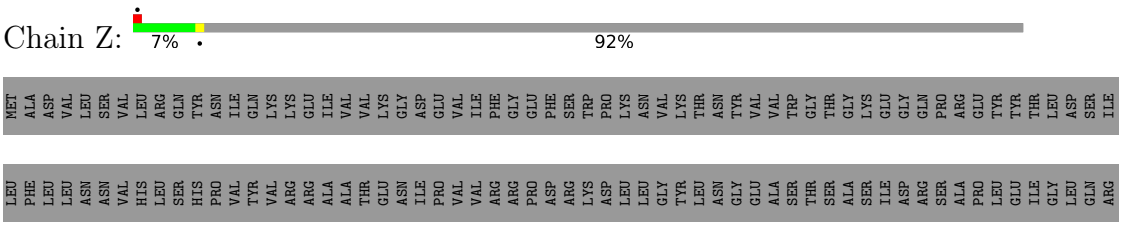
• Molecule 20: RNA polymerase II-associated factor 1 homolog

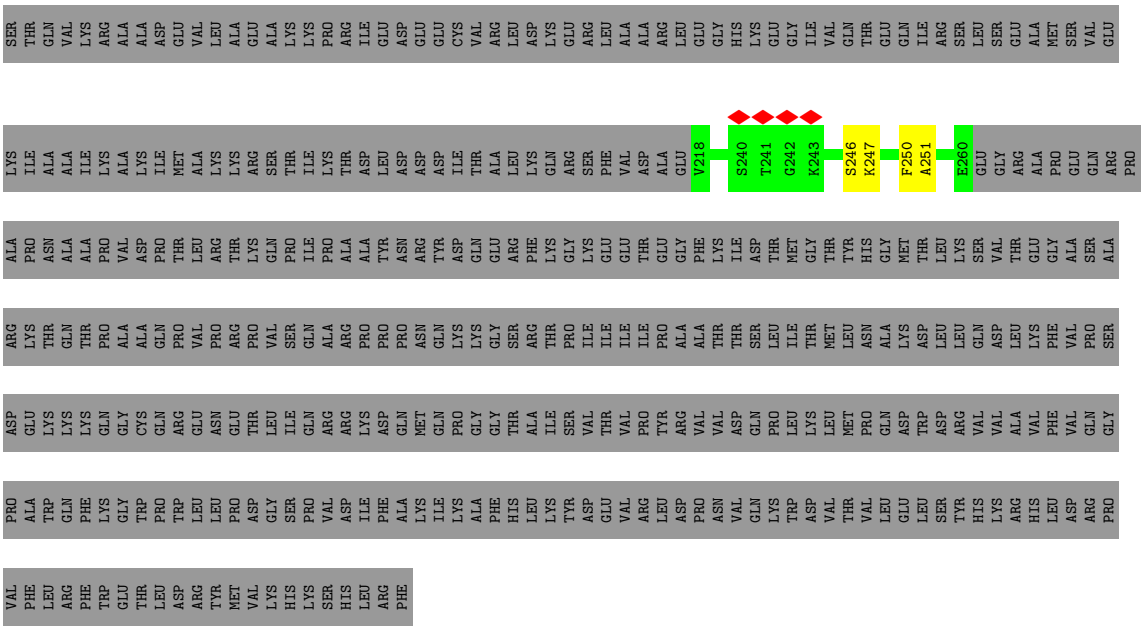


• Molecule 21: WD repeat-containing protein 61

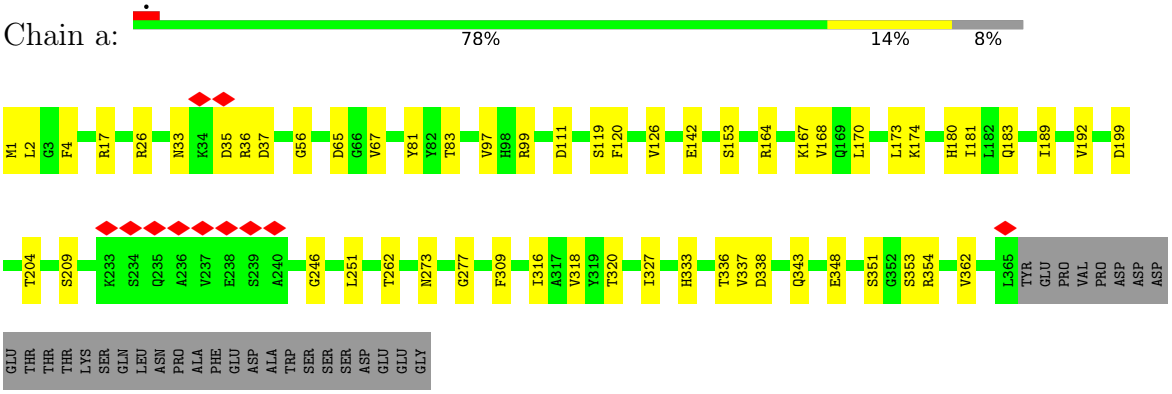


• Molecule 22: Parafibromin

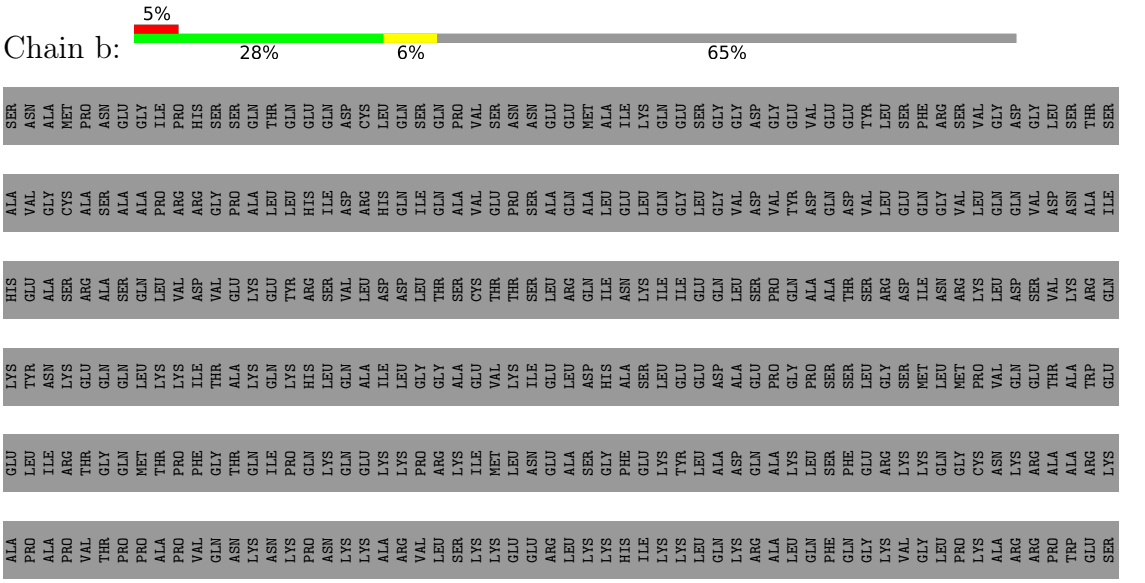


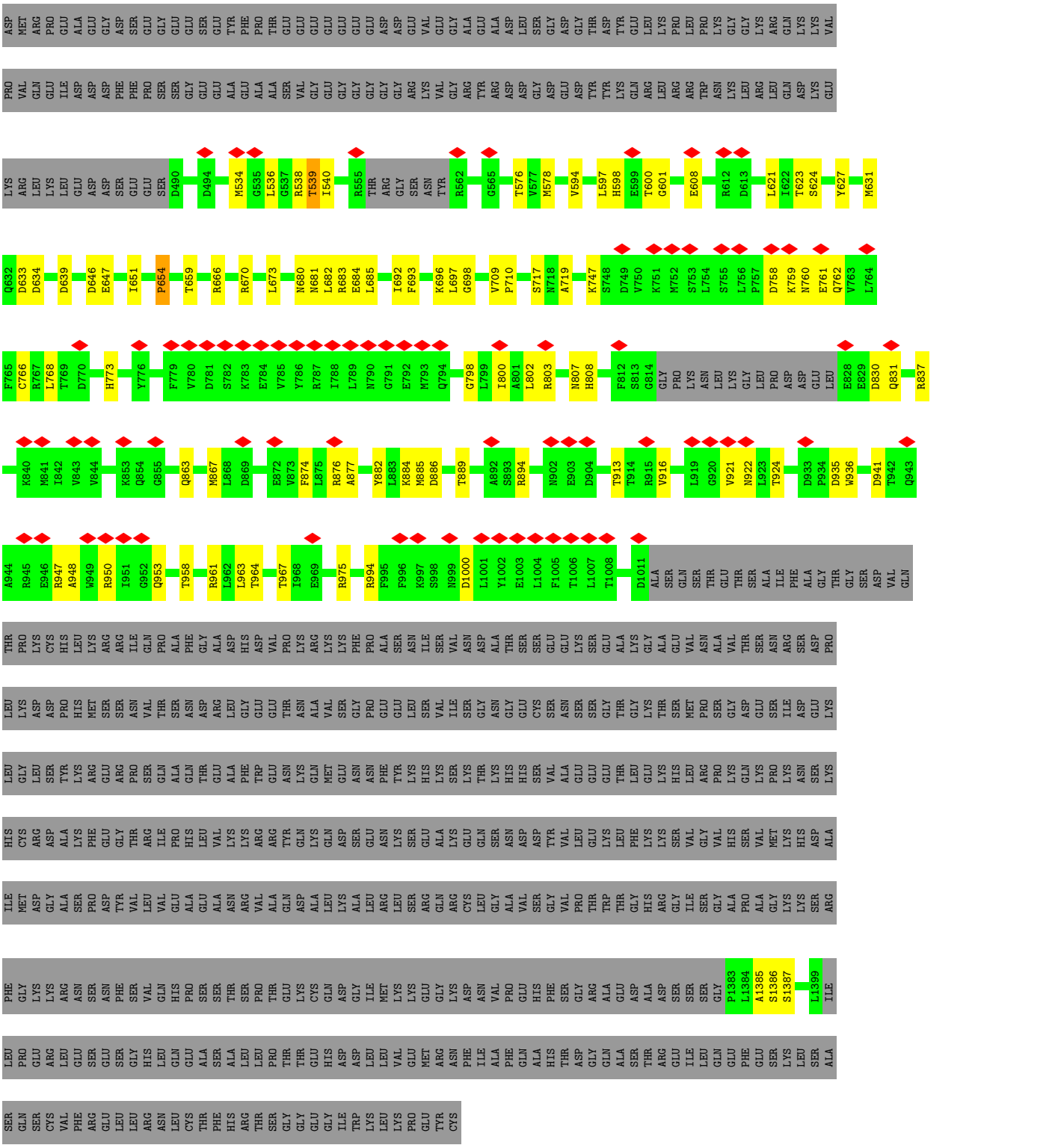


• Molecule 23: DNA excision repair protein ERCC-8



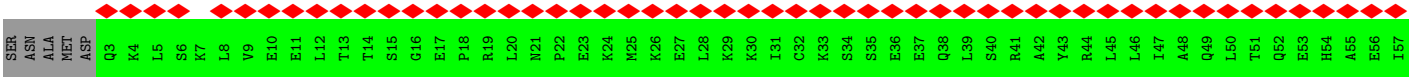
• Molecule 24: DNA excision repair protein ERCC-6

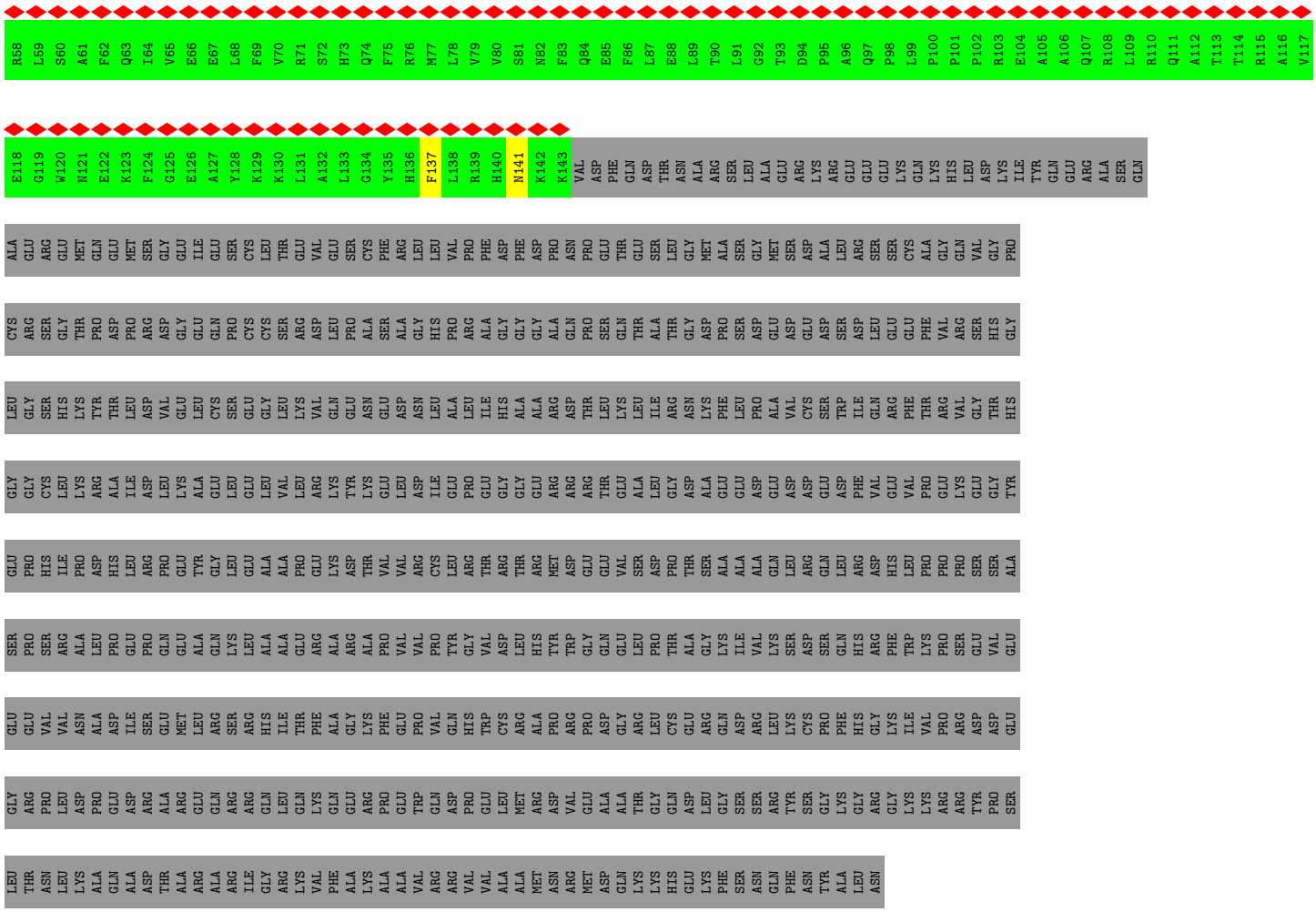




• Molecule 25: UV-stimulated scaffold protein A

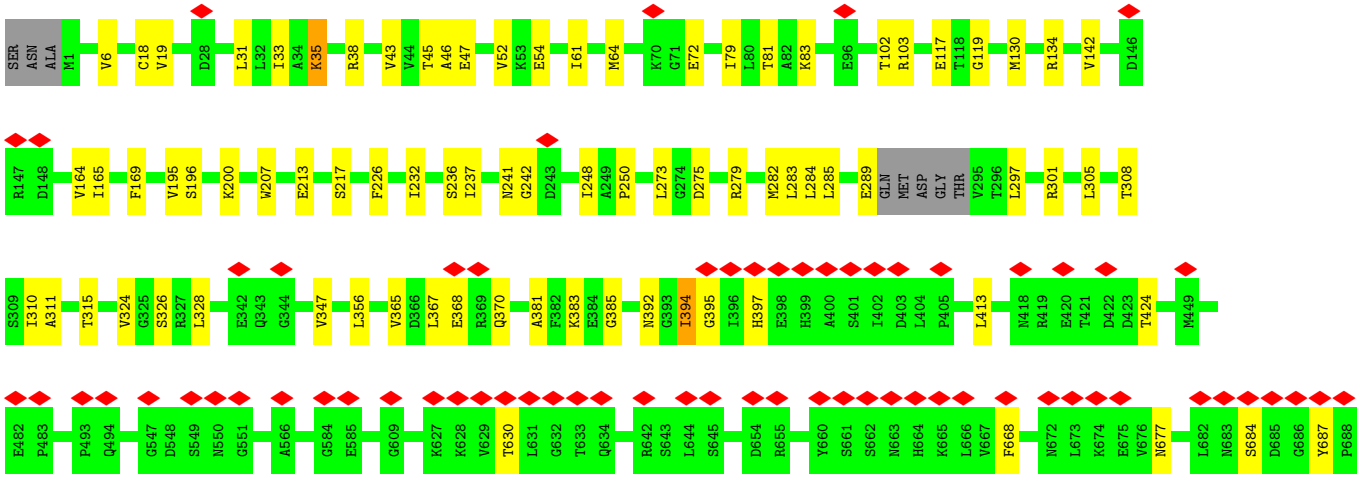
Chain c:

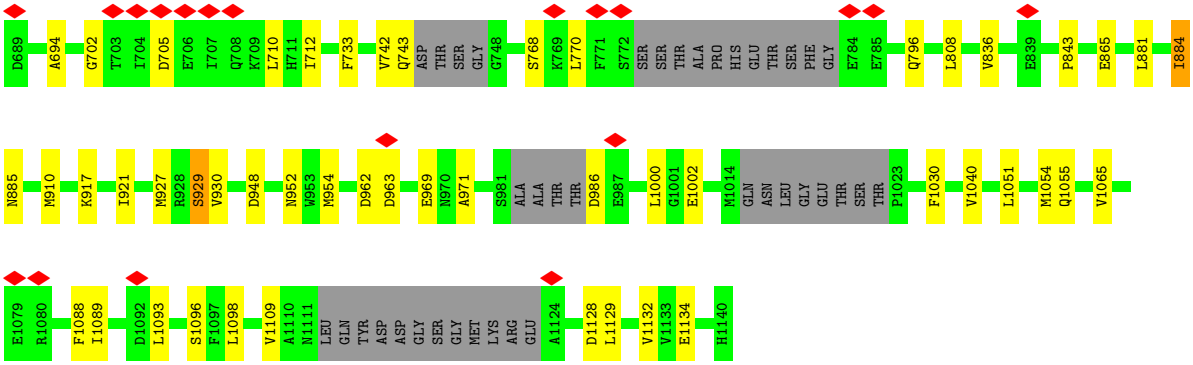




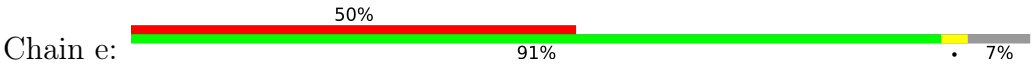
• Molecule 26: DNA damage-binding protein 1

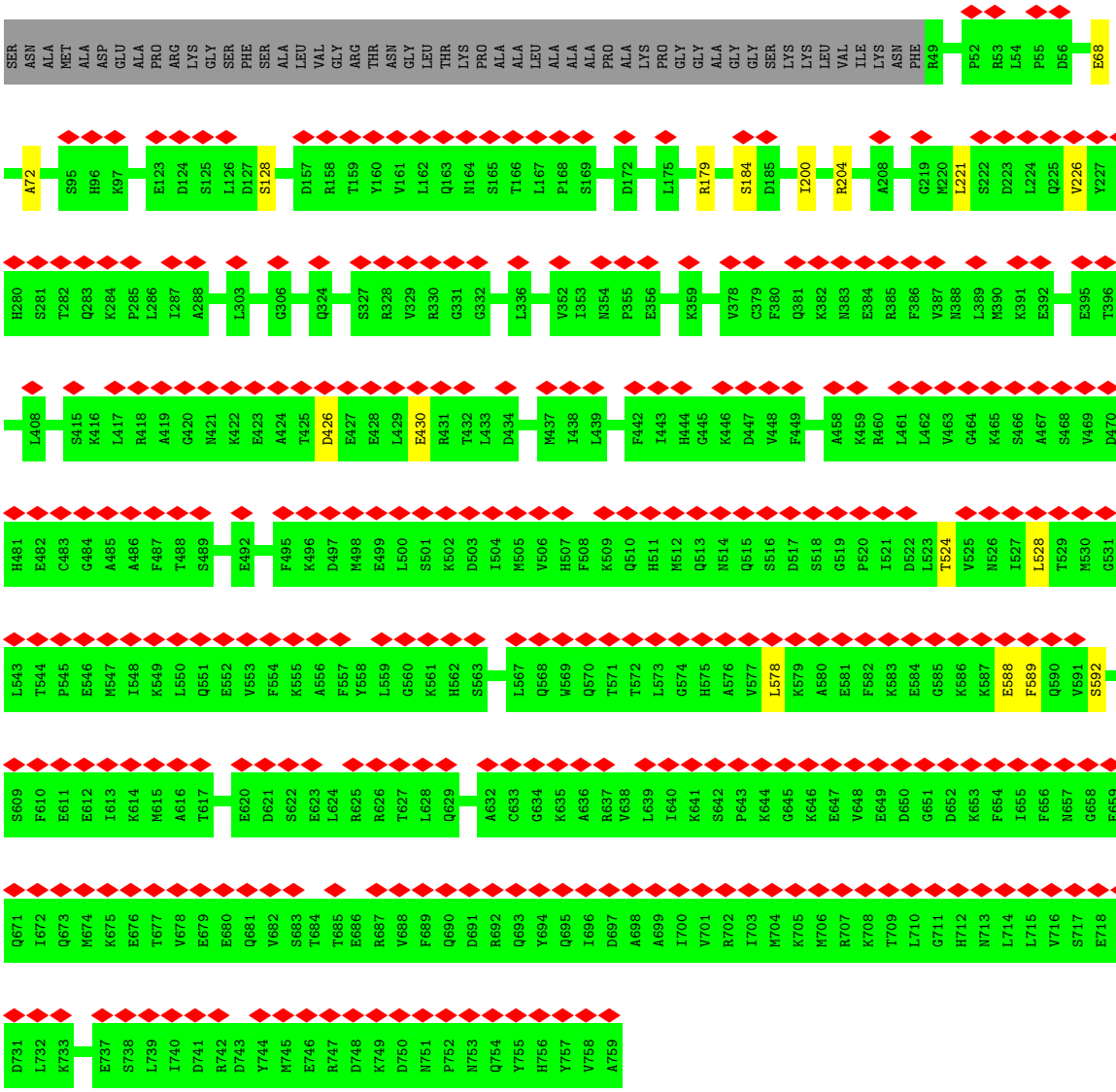
Chain d:





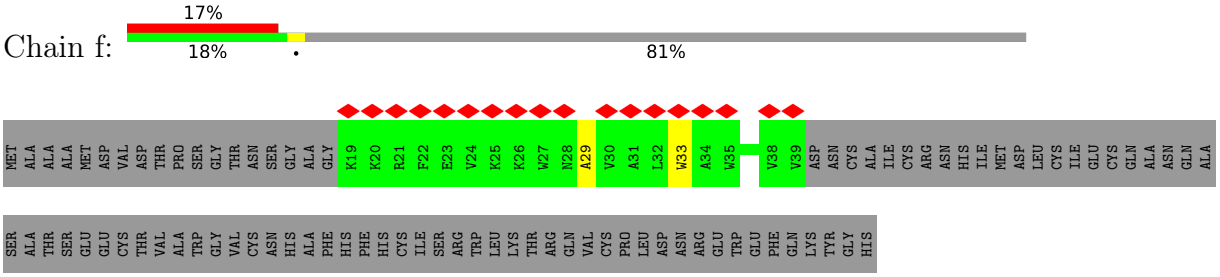
• Molecule 27: Cullin-4A





• Molecule 28: E3 ubiquitin-protein ligase RBX1

Chain f:


17%
18%
81%
MET ALA ALA ALA MET ASP VAL ASP THR PRO SER GLY THR ASN SER GLY ALA GLY K19 K20 R21 F22 E23 V24 K25 K26 W27 W28 A29 V30 A31 L32 W33 A34 W35 V38 V39 ASP ASN CYS ALA ILE CYS ARG ASN HIS ILE MET ASP LEU CYS ILE GLU CYS GLN ALA ASN GLN ALA
SER ALA THR SER GLU GLU CYS THR VAL ALA TRP GLY VAL CYS ASN HIS ALA PHE HIS PHE HIS CYS ILE SER ARG TRP LEU LYS THR ARG GLN VAL CYS PRO LEU ASP ASN ARG GLU TRP GLU PHE GLN LYS TYR GLY HIS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	100000	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 ($e^-/Å^2$)	40.4	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.173	Depositor
Minimum map value	-0.112	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	440.99997, 440.99997, 440.99997	wwPDB
Map dimensions	420, 420, 420	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: 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	A	0.25	0/11382	0.42	0/15368
2	B	0.25	0/9233	0.40	0/12463
3	C	0.29	0/2132	0.44	0/2896
4	D	0.94	0/1027	0.80	0/1384
5	E	0.23	0/1751	0.37	0/2366
6	F	0.23	0/667	0.36	0/901
7	G	1.22	2/1365 (0.1%)	0.85	1/1853 (0.1%)
8	H	0.25	0/1207	0.38	0/1628
9	I	0.21	0/972	0.41	0/1316
10	J	0.24	0/542	0.38	0/730
11	K	0.24	0/939	0.35	0/1271
12	L	0.28	0/394	0.43	0/524
13	M	1.76	34/6770 (0.5%)	1.05	6/9119 (0.1%)
14	N	1.05	0/817	0.57	0/1258
15	P	2.14	18/510 (3.5%)	0.82	1/793 (0.1%)
17	S	0.32	0/3559	0.76	2/4447 (0.0%)
18	T	1.90	13/1056 (1.2%)	0.79	2/1624 (0.1%)
19	U	0.33	0/413	0.66	0/511
20	V	0.34	0/864	0.80	2/1073 (0.2%)
21	Y	0.33	0/1199	0.76	0/1497
22	Z	0.36	0/171	0.86	0/212
23	a	0.54	0/2908	0.58	0/3939
24	b	1.13	2/4364 (0.0%)	0.73	0/5893
25	c	0.11	0/563	0.27	0/702
26	d	0.29	0/7547	0.46	1/10071 (0.0%)
27	e	0.34	0/2844	0.85	1/3552 (0.0%)
28	f	0.24	0/83	0.81	0/102
All	All	0.79	69/65279 (0.1%)	0.63	16/87493 (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
1	A	0	1
13	M	0	1
16	R	0	1
23	a	0	1
26	d	0	2
27	e	0	1
All	All	0	7

All (69) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
13	M	912	GLN	CB-CG	-7.90	1.28	1.52
15	P	45	A	P-OP1	-7.42	1.34	1.49
13	M	1014	ARG	CD-NE	-7.10	1.36	1.46
7	G	59	ILE	CG1-CD1	-6.85	1.25	1.51
15	P	44	G	P-OP1	-6.80	1.35	1.49
13	M	946	GLN	CB-CG	-6.78	1.32	1.52
15	P	26	U	C1'-N1	6.72	1.57	1.47
15	P	30	U	C1'-N1	6.40	1.57	1.47
18	T	23	DT	P-OP1	-6.26	1.35	1.48
15	P	43	G	C5-C4	-6.25	1.25	1.38
15	P	44	G	P-OP2	-6.18	1.36	1.49
15	P	41	G	C2-N3	-6.11	1.20	1.32
15	P	32	C	C1'-N1	6.08	1.57	1.48
13	M	603	ARG	CG-CD	-5.99	1.34	1.52
13	M	1030	ASN	CB-CG	-5.99	1.37	1.52
13	M	1014	ARG	CZ-NH1	-5.91	1.24	1.32
13	M	987	GLN	CB-CG	-5.85	1.34	1.52
13	M	397	TRP	CG-CD2	-5.79	1.33	1.43
13	M	600	PRO	CB-CG	-5.78	1.20	1.49
15	P	43	G	O3'-P	-5.71	1.52	1.61
18	T	25	DT	N1-C2	-5.71	1.26	1.38
15	P	41	G	N1-C2	-5.69	1.26	1.37
18	T	25	DT	C5-C6	-5.68	1.22	1.34
18	T	22	DC	N3-C4	-5.68	1.22	1.33
13	M	653	PHE	CB-CG	-5.66	1.37	1.50
13	M	404	THR	CA-CB	-5.66	1.44	1.53
15	P	45	A	P-OP2	-5.64	1.37	1.49
13	M	755	VAL	CB-CG2	-5.58	1.34	1.52
15	P	41	G	N9-C4	-5.55	1.26	1.38
13	M	720	PHE	CB-CG	-5.55	1.37	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	P	44	G	N1-C2	-5.55	1.26	1.37
13	M	301	ARG	CG-CD	-5.54	1.35	1.52
13	M	549	ASN	CB-CG	-5.53	1.38	1.52
13	M	893	TYR	CB-CG	-5.51	1.39	1.51
13	M	316	GLU	CB-CG	-5.49	1.35	1.52
18	T	25	DT	C4-C5	-5.48	1.33	1.44
15	P	45	A	P-O5'	-5.41	1.51	1.59
24	b	670	ARG	CG-CD	-5.40	1.36	1.52
18	T	27	DG	C5-C6	-5.39	1.31	1.42
13	M	887	ASN	C-N	-5.38	1.23	1.33
13	M	1034	PHE	CD2-CE2	-5.38	1.22	1.38
15	P	41	G	N9-C8	-5.35	1.27	1.37
13	M	924	LEU	CG-CD2	-5.35	1.34	1.52
7	G	66	VAL	CB-CG1	-5.35	1.34	1.52
15	P	41	G	C5-C4	-5.31	1.27	1.38
13	M	379	TYR	CA-CB	-5.25	1.42	1.53
13	M	566	PRO	CB-CG	-5.25	1.23	1.49
13	M	946	GLN	CG-CD	-5.24	1.39	1.52
13	M	379	TYR	CB-CG	-5.22	1.40	1.51
13	M	319	TRP	CD2-CE2	-5.22	1.32	1.41
13	M	693	TYR	CB-CG	-5.21	1.40	1.51
13	M	948	HIS	C-N	-5.18	1.24	1.33
13	M	397	TRP	CB-CG	-5.18	1.34	1.50
13	M	578	PHE	C-N	-5.17	1.21	1.33
18	T	26	DC	O5'-C5'	-5.17	1.27	1.42
15	P	25	A	C1'-N9	-5.17	1.40	1.48
18	T	24	DC	N1-C2	-5.16	1.30	1.40
24	b	654	PRO	CB-CG	-5.11	1.24	1.49
18	T	25	DT	P-OP2	-5.11	1.38	1.48
18	T	23	DT	C1'-N1	-5.10	1.34	1.49
18	T	25	DT	C2-N3	-5.09	1.27	1.37
13	M	401	GLU	CB-CG	-5.09	1.37	1.52
13	M	741	VAL	CB-CG2	-5.06	1.35	1.52
13	M	1034	PHE	CG-CD2	-5.06	1.28	1.38
15	P	40	A	C5-C6	-5.05	1.30	1.41
18	T	22	DC	P-OP1	-5.05	1.38	1.48
18	T	24	DC	C2-O2	-5.01	1.14	1.24
13	M	400	ASP	CB-CG	-5.01	1.39	1.52
13	M	595	GLN	CG-CD	-5.01	1.39	1.52

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	M	1014	ARG	NE-CZ-NH1	-7.79	113.71	121.50
27	e	128	SER	N-CA-C	-7.63	103.33	114.39
13	M	1014	ARG	NE-CZ-NH2	7.07	125.57	119.20
13	M	724	GLN	N-CA-CB	6.31	120.06	110.28
17	S	772	GLU	CA-C-N	5.91	132.33	121.70
17	S	772	GLU	C-N-CA	5.91	132.33	121.70
26	d	929	SER	N-CA-C	5.68	122.91	110.80
13	M	450	ARG	NE-CZ-NH2	5.62	124.25	119.20
15	P	45	A	O5'-P-OP1	-5.54	91.38	108.00
7	G	18	PHE	N-CA-C	-5.48	102.90	110.35
20	V	71	TYR	CA-C-N	5.34	131.32	121.70
20	V	71	TYR	C-N-CA	5.34	131.32	121.70
13	M	1056	SER	CA-CB-OG	-5.29	100.52	111.10
13	M	316	GLU	N-CA-CB	5.13	117.62	109.82
18	T	30	DG	N9-C1'-C2'	5.02	121.03	113.50
18	T	30	DG	O4'-C1'-C2'	-5.01	98.89	106.40

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	538	VAL	Peptide
13	M	575	CYS	Peptide
16	R	11	UNK	Peptide
23	a	174	LYS	Peptide
26	d	35	LYS	Peptide
26	d	884	ILE	Peptide
27	e	403	ASN	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11179	0	11313	107	0
2	B	9052	0	9087	60	0
3	C	2089	0	2031	14	0
4	D	1013	0	972	21	0
5	E	1720	0	1737	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	F	657	0	684	5	0
7	G	1334	0	1333	26	0
8	H	1186	0	1147	7	0
9	I	949	0	879	9	0
10	J	533	0	553	5	0
11	K	920	0	942	7	0
12	L	388	0	393	2	0
13	M	6648	0	6644	142	0
14	N	727	0	393	1	0
15	P	454	0	210	12	0
16	R	160	0	2	3	0
17	S	3560	0	940	8	0
18	T	947	0	519	14	0
19	U	416	0	111	0	0
20	V	868	0	212	3	0
21	Y	1200	0	341	15	0
22	Z	172	0	44	2	0
23	a	2849	0	2778	36	0
24	b	4261	0	4302	75	0
25	c	564	0	143	1	0
26	d	7439	0	6530	97	0
27	e	2845	0	753	10	0
28	f	84	0	20	2	0
29	A	2	0	0	0	0
29	B	1	0	0	0	0
29	C	1	0	0	0	0
29	I	2	0	0	0	0
29	J	1	0	0	0	0
29	L	1	0	0	0	0
30	A	1	0	0	0	0
All	All	64223	0	55013	635	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (635) 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)
1:A:114:CYS:SG	1:A:184:CYS:HB3	1.83	1.18
24:b:975:ARG:NH2	24:b:1000:ASP:OD1	1.92	1.02
24:b:536:LEU:HD21	24:b:747:LYS:HG2	1.42	1.00

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:b:534:MET:SD	24:b:538:ARG:NH1	2.36	0.98
24:b:536:LEU:HD21	24:b:747:LYS:CG	2.00	0.91
26:d:395:GLY:O	26:d:705:ASP:HB2	1.69	0.91
13:M:926:GLU:OE1	13:M:981:TYR:OH	1.90	0.88
1:A:338:SER:OG	1:A:341:GLN:OE1	1.92	0.88
2:B:501:LEU:HD12	2:B:505:LEU:HD12	1.57	0.87
13:M:1014:ARG:NH1	13:M:1032:ALA:O	2.08	0.87
2:B:565:THR:OG1	2:B:610:ARG:O	1.95	0.85
13:M:886:ASP:OD1	13:M:887:ASN:N	2.12	0.83
26:d:917:LYS:NZ	26:d:962:ASP:OD1	2.11	0.83
23:a:37:ASP:OD2	23:a:81:TYR:OH	1.97	0.82
13:M:1167:ILE:HD12	13:M:1232:LEU:HD11	1.60	0.81
24:b:539:THR:HG23	24:b:540:ILE:HD12	1.64	0.80
1:A:266:MET:HE3	1:A:270:ALA:HB3	1.63	0.80
23:a:1:MET:O	23:a:4:PHE:N	2.13	0.80
1:A:114:CYS:SG	1:A:184:CYS:CB	2.68	0.79
9:I:68:ILE:O	9:I:122:ARG:NH1	2.16	0.79
13:M:561:GLN:NE2	13:M:697:GLU:OE2	2.15	0.79
1:A:1190:GLN:O	1:A:1194:ASN:ND2	2.16	0.78
24:b:885:MET:HE2	24:b:894:ARG:HG3	1.66	0.78
13:M:825:GLU:O	13:M:828:LYS:N	2.15	0.78
26:d:370:GLN:NE2	26:d:668:PHE:O	2.16	0.77
13:M:893:TYR:O	13:M:896:SER:OG	2.01	0.77
4:D:93:HIS:HB3	4:D:96:GLU:OE1	1.85	0.76
2:B:357:CYS:SG	2:B:361:LYS:NZ	2.58	0.76
4:D:90:LYS:HE2	4:D:130:ILE:HD12	1.66	0.75
26:d:102:THR:OG1	26:d:1065:VAL:O	2.05	0.75
26:d:370:GLN:NE2	26:d:668:PHE:CA	2.50	0.74
26:d:130:MET:HE1	26:d:195:VAL:HG11	1.68	0.74
24:b:717:SER:O	24:b:994:ARG:NH2	2.20	0.74
24:b:863:GLN:NE2	24:b:941:ASP:OD1	2.20	0.74
2:B:924:ARG:NH1	3:C:62:GLU:OE1	2.21	0.74
13:M:445:THR:O	13:M:448:MET:N	2.20	0.74
2:B:352:GLY:O	2:B:361:LYS:NZ	2.20	0.74
1:A:374:SER:OG	1:A:376:ASP:OD1	2.06	0.73
26:d:368:GLU:HG2	26:d:630:THR:O	1.88	0.73
23:a:33:ASN:OD1	23:a:35:ASP:N	2.22	0.73
2:B:430:ASN:ND2	16:R:20:UNK:O	2.22	0.72
1:A:70:ARG:NH2	1:A:75:ALA:O	2.21	0.72
1:A:576:GLN:O	1:A:590:GLN:NE2	2.23	0.72
1:A:538:VAL:HG12	1:A:539:GLN:H	1.53	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:445:THR:O	13:M:449:GLU:N	2.21	0.71
3:C:180:ALA:O	10:J:42:ARG:NH2	2.23	0.71
1:A:413:TYR:OH	1:A:450:MET:O	2.08	0.71
24:b:831:GLN:N	24:b:831:GLN:OE1	2.24	0.71
26:d:226:PHE:O	26:d:241:ASN:ND2	2.23	0.71
1:A:549:THR:O	1:A:589:LYS:NZ	2.24	0.71
1:A:233:CYS:SG	1:A:244:ARG:NH1	2.64	0.70
23:a:26:ARG:NH1	26:d:927:MET:SD	2.64	0.70
1:A:67:ARG:NH2	15:P:33:A:OP1	2.24	0.70
2:B:198:GLU:OE2	2:B:388:TYR:OH	2.09	0.70
1:A:461:GLN:NE2	2:B:1090:GLU:OE2	2.24	0.70
13:M:692:PHE:O	13:M:694:TYR:N	2.25	0.70
24:b:639:ASP:OD2	24:b:666:ARG:NH1	2.25	0.69
2:B:957:THR:OG1	2:B:959:GLU:O	2.11	0.69
24:b:935:ASP:OD1	24:b:936:TRP:N	2.25	0.69
1:A:321:GLU:OE1	1:A:341:GLN:NE2	2.26	0.69
13:M:1145:ASN:O	13:M:1148:GLU:N	2.26	0.69
26:d:134:ARG:NH1	26:d:164:VAL:O	2.26	0.69
8:H:92:MET:HE2	8:H:143:LEU:HD22	1.74	0.68
13:M:1148:GLU:N	13:M:1148:GLU:OE1	2.26	0.68
26:d:1093:LEU:O	26:d:1096:SER:OG	2.10	0.68
13:M:580:THR:O	13:M:582:GLU:N	2.26	0.68
24:b:534:MET:HE1	24:b:538:ARG:NH1	2.09	0.68
1:A:266:MET:SD	18:T:30:DG:N3	2.67	0.68
1:A:457:ILE:HD11	1:A:515:ILE:HD12	1.76	0.68
26:d:130:MET:HE2	26:d:169:PHE:HZ	1.59	0.68
26:d:19:VAL:HG22	26:d:64:MET:HE3	1.74	0.67
1:A:431:PHE:HE2	15:P:33:A:H61	1.42	0.67
2:B:551:GLU:OE2	2:B:578:LYS:NZ	2.27	0.67
24:b:608:GLU:N	24:b:608:GLU:OE2	2.27	0.67
7:G:100:GLU:N	7:G:100:GLU:OE1	2.28	0.67
26:d:1054:MET:SD	26:d:1129:LEU:HD22	2.35	0.66
24:b:921:VAL:O	24:b:947:ARG:NH1	2.29	0.66
2:B:591:ARG:HE	2:B:603:MET:HE2	1.61	0.66
26:d:248:ILE:HD12	26:d:250:PRO:HG3	1.78	0.66
26:d:282:MET:HE2	26:d:305:LEU:HD11	1.78	0.66
26:d:47:GLU:OE1	26:d:47:GLU:N	2.29	0.66
1:A:1182:GLN:O	1:A:1190:GLN:NE2	2.29	0.66
13:M:1145:ASN:OD1	13:M:1146:THR:N	2.28	0.66
2:B:329:GLY:O	2:B:335:ARG:NE	2.29	0.65
24:b:540:ILE:HD12	24:b:540:ILE:H	1.60	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1198:GLU:OE1	1:A:1198:GLU:N	2.29	0.65
7:G:91:GLN:NE2	7:G:93:ASN:OD1	2.28	0.65
26:d:929:SER:O	26:d:930:VAL:HG13	1.97	0.65
24:b:762:GLN:OE1	24:b:958:THR:OG1	2.14	0.65
24:b:922:ASN:OD1	24:b:950:ARG:NE	2.29	0.65
26:d:1051:LEU:HD23	26:d:1054:MET:CE	2.27	0.65
13:M:529:SER:OG	13:M:530:ALA:N	2.30	0.65
26:d:370:GLN:HE22	26:d:668:PHE:C	2.03	0.65
26:d:768:SER:HB3	26:d:808:LEU:HD11	1.79	0.65
13:M:582:GLU:N	13:M:582:GLU:OE1	2.30	0.64
24:b:633:ASP:OD1	24:b:634:ASP:N	2.29	0.64
24:b:766:CYS:N	24:b:963:LEU:O	2.29	0.64
1:A:373:LEU:O	1:A:485:ASN:ND2	2.30	0.64
1:A:413:TYR:O	1:A:415:GLY:N	2.30	0.64
13:M:979:HIS:O	13:M:981:TYR:N	2.30	0.64
24:b:534:MET:CE	24:b:538:ARG:NH1	2.61	0.64
2:B:1104:ARG:NH1	2:B:1109:GLU:OE2	2.31	0.63
24:b:924:THR:O	24:b:953:GLN:NE2	2.32	0.63
13:M:934:ASP:OD1	13:M:935:GLU:N	2.32	0.63
13:M:1031:CYS:SG	13:M:1032:ALA:N	2.72	0.62
3:C:190:ASN:O	3:C:193:ARG:NH1	2.33	0.62
7:G:149:GLY:O	7:G:160:ILE:N	2.33	0.62
1:A:668:PHE:CE1	1:A:672:ILE:HD11	2.35	0.62
23:a:168:VAL:HG22	23:a:189:ILE:HD13	1.81	0.62
2:B:347:MET:HE1	2:B:365:LEU:HD22	1.82	0.62
2:B:841:ARG:NH2	15:P:35:A:N7	2.48	0.62
1:A:507:GLN:N	2:B:1105:GLU:OE2	2.33	0.62
13:M:551:ARG:NH1	13:M:552:ASP:OD1	2.32	0.62
13:M:1123:LEU:O	13:M:1126:ILE:N	2.33	0.62
1:A:1311:LEU:HD12	1:A:1332:GLN:HG3	1.82	0.61
5:E:56:THR:OG1	5:E:78:GLU:OE2	2.18	0.61
24:b:964:THR:OG1	24:b:967:THR:OG1	2.17	0.61
11:K:63:VAL:HG22	11:K:71:ILE:HG22	1.82	0.61
2:B:210:LYS:NZ	2:B:212:ASP:O	2.33	0.61
26:d:381:ALA:O	26:d:385:GLY:N	2.33	0.61
9:I:50:ASN:O	9:I:51:SER:OG	2.16	0.61
13:M:474:ASP:OD1	13:M:474:ASP:N	2.22	0.61
2:B:927:ARG:NH1	2:B:1057:ASP:OD2	2.33	0.61
26:d:684:SER:N	26:d:687:TYR:O	2.33	0.61
1:A:760:LEU:HD22	1:A:764:ASN:ND2	2.14	0.61
1:A:808:PRO:HG2	2:B:675:LEU:HD12	1.83	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:33:LEU:HD22	4:D:101:ALA:HB3	1.81	0.61
13:M:444:ASP:OD1	13:M:444:ASP:N	2.33	0.61
7:G:95:VAL:O	7:G:110:ARG:N	2.34	0.60
16:R:11:UNK:O	16:R:15:UNK:N	2.34	0.60
13:M:369:GLN:O	13:M:1026:LYS:NZ	2.30	0.60
1:A:659:GLU:OE2	1:A:985:ARG:NH1	2.34	0.60
8:H:71:ASP:OD2	8:H:142:TYR:OH	2.19	0.60
5:E:93:ARG:CZ	17:S:891:PHE:CA	2.79	0.60
1:A:41:ILE:HD12	1:A:255:VAL:HG11	1.83	0.60
2:B:794:VAL:HG12	2:B:967:ILE:HG22	1.83	0.60
1:A:862:ARG:NH2	1:A:1432:PHE:O	2.34	0.60
13:M:853:GLU:OE1	13:M:854:ASN:ND2	2.35	0.60
20:V:243:VAL:O	20:V:248:PRO:N	2.35	0.60
24:b:680:ASN:N	24:b:684:GLU:OE1	2.34	0.60
24:b:761:GLU:OE2	24:b:961:ARG:NH1	2.34	0.59
13:M:1108:ALA:HA	13:M:1111:LEU:HD12	1.84	0.59
7:G:49:THR:OG1	7:G:50:THR:N	2.31	0.59
13:M:572:ASP:OD1	13:M:572:ASP:N	2.33	0.59
1:A:521:VAL:HG13	1:A:535:MET:HE1	1.84	0.59
26:d:367:LEU:HD11	26:d:796:GLN:O	2.02	0.58
26:d:1109:VAL:HG12	26:d:1109:VAL:O	2.03	0.58
5:E:134:GLU:OE2	5:E:181:ARG:NH2	2.36	0.58
24:b:540:ILE:HD12	24:b:540:ILE:N	2.18	0.58
13:M:800:ASN:OD1	13:M:801:GLY:N	2.36	0.58
1:A:896:LEU:HD13	1:A:980:PRO:HG3	1.86	0.58
13:M:699:SER:OG	13:M:701:GLN:N	2.36	0.58
1:A:266:MET:CE	18:T:30:DG:H2'	2.34	0.58
8:H:102:ASP:OD2	8:H:110:THR:OG1	2.21	0.58
21:Y:212:GLY:O	21:Y:230:GLY:N	2.37	0.58
13:M:870:GLU:OE1	13:M:870:GLU:N	2.36	0.58
13:M:1062:THR:HG21	13:M:1126:ILE:HD11	1.86	0.58
2:B:501:LEU:HD12	2:B:505:LEU:CD1	2.32	0.58
21:Y:48:LYS:N	21:Y:55:ASP:O	2.37	0.58
2:B:565:THR:HG21	2:B:580:PRO:HB3	1.86	0.58
23:a:209:SER:OG	23:a:246:GLY:O	2.13	0.57
26:d:119:GLY:O	26:d:134:ARG:NH2	2.36	0.57
23:a:142:GLU:OE2	23:a:164:ARG:NH1	2.37	0.57
26:d:35:LYS:O	26:d:38:ARG:N	2.38	0.57
26:d:884:ILE:HG22	26:d:885:ASN:H	1.70	0.57
1:A:296:ASN:OD1	24:b:683:ARG:NH2	2.34	0.57
25:c:137:PHE:O	25:c:141:ASN:N	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:b:534:MET:HE1	24:b:538:ARG:HH12	1.69	0.57
24:b:682:LEU:O	24:b:685:LEU:N	2.38	0.57
13:M:473:ARG:NE	13:M:473:ARG:HA	2.18	0.57
7:G:109:SER:O	7:G:112:SER:OG	2.22	0.56
7:G:117:MET:HE2	7:G:135:ILE:HG13	1.86	0.56
2:B:413:LYS:O	2:B:417:ILE:HD12	2.03	0.56
23:a:17:ARG:NH1	26:d:117:GLU:O	2.39	0.56
24:b:646:ASP:OD1	24:b:647:GLU:N	2.38	0.56
4:D:36:GLU:OE2	4:D:84:ARG:NH1	2.39	0.56
13:M:787:SER:HG	13:M:792:HIS:CE1	2.21	0.56
26:d:881:LEU:HD21	26:d:921:ILE:HG21	1.86	0.56
1:A:421:ARG:NH1	1:A:444:TYR:OH	2.39	0.56
1:A:904:GLN:NE2	1:A:981:CYS:O	2.37	0.56
21:Y:172:ILE:O	21:Y:186:LEU:N	2.38	0.56
24:b:800:ILE:HD13	24:b:803:ARG:NH2	2.21	0.56
26:d:308:THR:O	26:d:383:LYS:NZ	2.35	0.56
13:M:297:ARG:NE	13:M:372:GLU:OE2	2.39	0.56
1:A:1180:ASN:ND2	1:A:1183:SER:OG	2.38	0.56
13:M:565:GLU:N	13:M:565:GLU:OE1	2.39	0.56
13:M:1002:LYS:O	13:M:1005:LYS:N	2.38	0.56
5:E:120:ASP:OD1	5:E:121:MET:N	2.38	0.56
13:M:650:ASP:OD1	13:M:651:ASP:N	2.37	0.56
24:b:627:TYR:HD1	24:b:631:MET:HE1	1.71	0.56
24:b:808:HIS:HB3	24:b:867:MET:HE1	1.86	0.55
4:D:33:LEU:O	4:D:36:GLU:N	2.39	0.55
24:b:800:ILE:HD13	24:b:803:ARG:HH21	1.71	0.55
26:d:395:GLY:O	26:d:705:ASP:CB	2.51	0.55
13:M:1151:ASN:ND2	13:M:1156:GLU:O	2.38	0.55
27:e:426:ASP:O	27:e:430:GLU:N	2.35	0.55
13:M:807:ASP:OD1	13:M:807:ASP:N	2.37	0.55
13:M:965:ARG:NH1	13:M:968:GLU:OE2	2.40	0.55
24:b:882:TYR:HE2	24:b:884:LYS:HB2	1.69	0.55
26:d:397:HIS:O	26:d:702:GLY:HA3	2.07	0.55
24:b:538:ARG:HH21	24:b:673:LEU:HB3	1.70	0.55
1:A:54:LEU:O	1:A:61:ARG:NH2	2.40	0.55
2:B:1090:GLU:OE1	2:B:1090:GLU:N	2.39	0.55
24:b:760:ASN:OD1	24:b:761:GLU:N	2.40	0.55
26:d:1055:GLN:HG3	26:d:1093:LEU:HD23	1.89	0.55
13:M:610:PHE:O	13:M:614:ALA:HB2	2.07	0.55
13:M:316:GLU:O	13:M:319:TRP:N	2.39	0.55
23:a:153:SER:HA	23:a:199:ASP:OD1	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:59:LEU:HD13	3:C:63:PHE:CD1	2.42	0.55
2:B:602:SER:OG	2:B:620:ARG:NH1	2.41	0.54
7:G:138:GLN:N	7:G:141:ASP:OD2	2.36	0.54
23:a:33:ASN:HB2	23:a:362:VAL:HG22	1.88	0.54
26:d:310:ILE:O	26:d:326:SER:OG	2.12	0.54
2:B:274:ARG:NH2	2:B:281:ASP:OD1	2.41	0.54
2:B:625:LEU:HD13	2:B:675:LEU:HD21	1.90	0.54
13:M:951:LYS:O	13:M:955:LEU:HD23	2.07	0.54
5:E:78:GLU:OE1	5:E:78:GLU:N	2.41	0.54
6:F:84:GLU:OE2	6:F:84:GLU:N	2.40	0.54
13:M:306:LYS:O	13:M:367:ARG:NH2	2.41	0.54
24:b:534:MET:CE	24:b:538:ARG:HH11	2.18	0.54
27:e:68:GLU:O	27:e:72:ALA:N	2.37	0.54
1:A:108:ARG:NH2	1:A:191:ILE:O	2.41	0.54
13:M:301:ARG:NH2	13:M:305:VAL:HG22	2.23	0.54
26:d:1051:LEU:HB2	26:d:1089:ILE:HD13	1.89	0.54
24:b:876:ARG:HH21	24:b:876:ARG:HG2	1.73	0.53
1:A:499:ASP:OD1	15:P:45:A:H4'	2.09	0.53
2:B:959:GLU:O	2:B:961:ILE:N	2.40	0.53
4:D:103:LEU:O	7:G:144:ARG:NH2	2.41	0.53
13:M:552:ASP:OD2	13:M:556:ARG:NE	2.41	0.53
13:M:1031:CYS:O	13:M:1033:GLY:N	2.42	0.53
27:e:578:LEU:O	27:e:589:PHE:N	2.34	0.53
1:A:413:TYR:O	1:A:449:HIS:ND1	2.41	0.53
17:S:279:PHE:O	17:S:284:ASP:N	2.40	0.53
27:e:179:ARG:O	27:e:184:SER:N	2.40	0.53
26:d:213:GLU:OE2	26:d:236:SER:N	2.42	0.53
2:B:847:LYS:NZ	2:B:864:ASP:OD2	2.22	0.52
23:a:111:ASP:OD2	24:b:1386:SER:OG	2.22	0.52
13:M:613:ARG:O	13:M:613:ARG:HG3	2.09	0.52
24:b:693:PHE:CD1	24:b:696:LYS:HB2	2.45	0.52
1:A:461:GLN:OE1	1:A:502:ASN:ND2	2.42	0.52
13:M:287:ASN:O	13:M:290:ARG:HG2	2.10	0.52
26:d:31:LEU:HD21	26:d:33:ILE:HD11	1.90	0.52
26:d:392:ASN:OD1	26:d:710:LEU:CD2	2.57	0.52
1:A:862:ARG:NH1	2:B:1088:GLU:OE2	2.42	0.52
13:M:288:GLU:O	13:M:292:THR:N	2.41	0.52
1:A:889:LEU:O	1:A:890:ARG:NH1	2.42	0.52
13:M:802:GLU:N	13:M:802:GLU:OE2	2.42	0.52
3:C:7:PRO:O	11:K:104:ARG:NH1	2.43	0.52
13:M:622:LYS:HA	13:M:625:ARG:HE	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:865:ILE:HD13	1:A:1092:ALA:HB3	1.91	0.51
13:M:1056:SER:OG	13:M:1058:VAL:HG22	2.09	0.51
24:b:876:ARG:HA	24:b:876:ARG:NE	2.25	0.51
26:d:130:MET:HE2	26:d:169:PHE:CZ	2.44	0.51
26:d:356:LEU:HD11	26:d:712:ILE:HD13	1.91	0.51
7:G:39:THR:O	7:G:43:GLY:N	2.40	0.51
13:M:551:ARG:HD3	13:M:601:LEU:HD11	1.92	0.51
21:Y:86:ALA:O	21:Y:104:ALA:N	2.43	0.51
23:a:192:VAL:HG12	23:a:204:THR:HG22	1.91	0.51
3:C:86:ARG:HD3	11:K:11:LEU:HD11	1.93	0.51
13:M:1051:GLU:OE1	13:M:1051:GLU:N	2.44	0.51
13:M:329:THR:HG22	13:M:329:THR:O	2.11	0.51
13:M:1113:ARG:HA	13:M:1116:TYR:HE1	1.76	0.51
24:b:540:ILE:H	24:b:540:ILE:CD1	2.24	0.51
1:A:951:GLU:OE2	1:A:954:ARG:NH2	2.44	0.51
4:D:90:LYS:CE	4:D:130:ILE:HD12	2.36	0.51
13:M:532:LEU:HD11	13:M:584:VAL:HG23	1.93	0.51
13:M:1165:LYS:HE3	13:M:1167:ILE:CG2	2.41	0.51
13:M:574:VAL:O	13:M:574:VAL:HG13	2.10	0.50
23:a:170:LEU:HD12	23:a:180:HIS:CD2	2.46	0.50
26:d:232:ILE:HD13	26:d:237:ILE:HG23	1.93	0.50
26:d:742:VAL:HG13	26:d:743:GLN:N	2.25	0.50
26:d:1128:ASP:O	26:d:1132:VAL:HG23	2.11	0.50
7:G:90:THR:O	7:G:139:GLN:NE2	2.43	0.50
1:A:601:ASN:ND2	1:A:989:ASN:OD1	2.43	0.50
23:a:1:MET:SD	26:d:910:MET:HE1	2.51	0.50
27:e:592:SER:O	27:e:596:THR:N	2.39	0.50
13:M:316:GLU:HG2	13:M:403:TRP:CE2	2.46	0.50
24:b:1385:ALA:O	24:b:1387:SER:N	2.45	0.50
24:b:886:ASP:O	24:b:889:THR:OG1	2.28	0.50
5:E:114:ALA:O	5:E:117:SER:OG	2.26	0.50
7:G:100:GLU:O	7:G:100:GLU:HG2	2.11	0.50
5:E:141:GLU:N	5:E:141:GLU:OE1	2.45	0.50
13:M:288:GLU:O	13:M:291:ALA:N	2.44	0.50
3:C:175:LYS:NZ	12:L:57:ALA:O	2.44	0.50
7:G:11:ILE:HD11	7:G:26:VAL:HG13	1.94	0.50
13:M:963:ILE:O	13:M:967:ASN:ND2	2.45	0.50
26:d:289:GLU:OE1	26:d:289:GLU:N	2.44	0.50
23:a:167:LYS:HZ2	23:a:183:GLN:HG2	1.77	0.49
24:b:719:ALA:O	24:b:994:ARG:NH2	2.45	0.49
26:d:1051:LEU:HD23	26:d:1054:MET:HE3	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:90:LYS:HD2	4:D:92:LEU:HD12	1.93	0.49
27:e:528:LEU:O	28:f:33:TRP:N	2.41	0.49
27:e:588:GLU:O	27:e:667:ILE:N	2.41	0.49
13:M:1156:GLU:OE1	13:M:1156:GLU:N	2.46	0.49
13:M:606:LEU:HD23	13:M:721:LEU:HD22	1.93	0.49
13:M:999:HIS:O	13:M:1003:ILE:HD12	2.12	0.49
23:a:36:ARG:NH2	23:a:348:GLU:OE2	2.42	0.49
1:A:481:THR:O	1:A:483:ARG:NE	2.46	0.49
2:B:312:GLN:NE2	9:I:22:ASN:OD1	2.46	0.49
13:M:550:LEU:HD22	13:M:689:ILE:CD1	2.43	0.49
13:M:575:CYS:SG	13:M:576:SER:N	2.85	0.49
13:M:1109:GLU:OE2	13:M:1113:ARG:NH1	2.46	0.49
21:Y:35:VAL:N	21:Y:47:TRP:O	2.44	0.49
21:Y:176:ASP:O	21:Y:180:GLY:N	2.38	0.49
1:A:1477:ALA:HB1	7:G:23:LEU:HD21	1.95	0.49
9:I:72:VAL:HG22	9:I:78:LEU:HD11	1.95	0.49
2:B:812:ARG:NH2	2:B:900:GLU:OE2	2.45	0.48
5:E:209:VAL:O	5:E:210:GLN:NE2	2.44	0.48
26:d:370:GLN:NE2	26:d:668:PHE:C	2.65	0.48
3:C:70:LEU:O	10:J:6:ARG:NE	2.40	0.48
21:Y:130:VAL:O	21:Y:144:LEU:N	2.43	0.48
2:B:764:MET:HE1	2:B:938:ARG:NH1	2.28	0.48
1:A:728:THR:H	1:A:736:THR:HG21	1.79	0.48
2:B:777:ASN:O	10:J:47:ARG:NH1	2.40	0.48
13:M:450:ARG:HH21	13:M:450:ARG:HG3	1.77	0.48
13:M:522:ASP:C	13:M:523:MET:HG3	2.38	0.48
13:M:1062:THR:O	13:M:1062:THR:HG22	2.14	0.48
24:b:975:ARG:HA	24:b:975:ARG:NE	2.27	0.48
13:M:394:TRP:O	13:M:398:GLN:HG3	2.12	0.48
24:b:536:LEU:HD21	24:b:747:LYS:HG3	1.90	0.48
1:A:523:ARG:NH1	6:F:127:ASP:OD2	2.47	0.48
7:G:21:ASN:OD1	7:G:24:ASN:HB2	2.14	0.48
9:I:50:ASN:ND2	9:I:52:CYS:O	2.46	0.48
1:A:1005:HIS:ND1	1:A:1007:ILE:HG22	2.29	0.48
13:M:865:LYS:O	13:M:869:HIS:ND1	2.41	0.48
1:A:455:ILE:HG23	1:A:520:MET:HE1	1.96	0.48
1:A:1229:GLU:OE1	1:A:1229:GLU:N	2.45	0.48
13:M:780:ARG:O	13:M:846:HIS:N	2.47	0.48
13:M:1002:LYS:O	13:M:1003:ILE:C	2.57	0.48
21:Y:14:ALA:N	21:Y:296:GLN:O	2.47	0.48
24:b:807:ASN:CG	24:b:867:MET:HE3	2.39	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:311:ASP:N	13:M:311:ASP:OD1	2.38	0.48
13:M:795:PHE:CD2	13:M:910:LEU:HG	2.49	0.48
26:d:6:VAL:HG22	26:d:1040:VAL:HG22	1.96	0.48
24:b:964:THR:HG1	24:b:967:THR:HG1	1.51	0.47
2:B:1035:ARG:NH1	2:B:1036:LYS:O	2.47	0.47
4:D:96:GLU:OE2	4:D:117:SER:HB3	2.14	0.47
18:T:20:DT:H2'	18:T:21:DC:O4'	2.13	0.47
21:Y:33:GLU:O	21:Y:49:TRP:N	2.48	0.47
1:A:98:GLY:HA3	1:A:1440:MET:HE3	1.97	0.47
23:a:2:LEU:HD12	26:d:836:VAL:CG2	2.44	0.47
26:d:1055:GLN:CG	26:d:1093:LEU:HD23	2.44	0.47
4:D:34:ASN:OD1	4:D:102:ASN:ND2	2.48	0.47
7:G:20:PRO:O	7:G:21:ASN:HB3	2.14	0.47
23:a:320:THR:OG1	23:a:327:ILE:HD11	2.15	0.47
21:Y:90:LEU:O	21:Y:99:ILE:N	2.41	0.47
24:b:681:ASN:N	24:b:681:ASN:OD1	2.45	0.47
2:B:105:PRO:HG2	16:R:9:UNK:C	2.44	0.47
3:C:144:GLU:OE1	3:C:144:GLU:N	2.48	0.47
13:M:808:PHE:HB2	13:M:910:LEU:HD21	1.96	0.47
17:S:205:GLY:O	17:S:209:VAL:N	2.48	0.47
23:a:181:ILE:HD12	23:a:183:GLN:HE21	1.79	0.47
26:d:275:ASP:OD2	26:d:279:ARG:NH1	2.48	0.47
1:A:114:CYS:HG	1:A:184:CYS:CB	2.22	0.47
24:b:536:LEU:HG	24:b:747:LYS:HE3	1.97	0.47
4:D:125:GLU:OE2	4:D:125:GLU:N	2.42	0.47
13:M:1111:LEU:O	13:M:1116:TYR:N	2.45	0.47
26:d:31:LEU:CD2	26:d:33:ILE:HD11	2.45	0.47
1:A:1297:THR:HG23	1:A:1297:THR:O	2.15	0.46
1:A:1357:THR:O	5:E:142:HIS:NE2	2.45	0.46
24:b:651:ILE:HG22	24:b:651:ILE:O	2.15	0.46
1:A:823:VAL:CG1	1:A:831:LEU:HD22	2.46	0.46
1:A:1166:LEU:O	1:A:1170:THR:OG1	2.13	0.46
2:B:905:ASP:N	2:B:922:ARG:O	2.47	0.46
4:D:140:PHE:CZ	13:M:523:MET:HE1	2.50	0.46
24:b:768:LEU:HD12	24:b:773:HIS:HA	1.98	0.46
26:d:929:SER:O	26:d:930:VAL:CG1	2.63	0.46
26:d:284:LEU:HD22	26:d:301:ARG:NH1	2.31	0.46
1:A:1478:GLU:N	1:A:1478:GLU:OE1	2.49	0.46
24:b:654:PRO:HA	24:b:659:THR:HG21	1.96	0.46
26:d:1000:LEU:HD23	26:d:1002:GLU:HB2	1.97	0.46
2:B:808:SER:OG	2:B:1050:ARG:NH1	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:d:929:SER:HB2	26:d:952:ASN:HB2	1.98	0.46
24:b:913:THR:CG2	24:b:916:VAL:HG22	2.46	0.46
26:d:45:THR:HG22	26:d:46:ALA:N	2.31	0.46
1:A:760:LEU:HD22	1:A:764:ASN:HD22	1.79	0.46
3:C:189:ASP:O	3:C:191:ALA:N	2.48	0.46
23:a:316:ILE:HD11	23:a:337:VAL:HG11	1.97	0.46
23:a:338:ASP:OD1	23:a:354:ARG:NH1	2.49	0.46
2:B:438:ARG:NH2	2:B:442:ASP:OD1	2.48	0.46
13:M:311:ASP:OD1	13:M:312:GLU:N	2.49	0.46
26:d:986:ASP:OD1	26:d:986:ASP:N	2.49	0.46
1:A:78:MET:O	2:B:1072:ARG:NH2	2.49	0.46
4:D:84:ARG:O	4:D:87:LEU:N	2.48	0.46
4:D:108:ALA:HB1	4:D:112:LYS:HZ3	1.81	0.46
8:H:136:GLU:O	8:H:139:SER:OG	2.27	0.46
24:b:808:HIS:CB	24:b:867:MET:HE1	2.45	0.46
1:A:67:ARG:NH2	15:P:33:A:H5'	2.31	0.45
1:A:321:GLU:OE1	1:A:321:GLU:N	2.50	0.45
1:A:844:ARG:NH2	2:B:501:LEU:HD13	2.31	0.45
7:G:117:MET:CE	7:G:135:ILE:HG13	2.46	0.45
26:d:38:ARG:NE	26:d:54:GLU:OE2	2.36	0.45
26:d:1051:LEU:CB	26:d:1089:ILE:HD13	2.46	0.45
27:e:221:LEU:O	27:e:226:VAL:N	2.45	0.45
26:d:165:ILE:HG21	26:d:217:SER:HA	1.97	0.45
9:I:109:ARG:HE	9:I:124:THR:HG21	1.81	0.45
13:M:296:GLU:HB2	13:M:996:LYS:HD2	1.98	0.45
13:M:754:ARG:HD2	13:M:754:ARG:O	2.16	0.45
13:M:755:VAL:HG23	13:M:923:PRO:HG2	1.98	0.45
13:M:1150:PHE:CZ	13:M:1161:PHE:CE2	3.04	0.45
13:M:296:GLU:OE2	13:M:300:LEU:HD21	2.16	0.45
13:M:542:THR:O	13:M:542:THR:HG23	2.15	0.45
13:M:915:SER:O	13:M:918:ARG:N	2.50	0.45
24:b:874:PHE:O	24:b:877:ALA:N	2.49	0.45
7:G:27:LYS:HE3	7:G:51:ILE:HD11	1.97	0.45
26:d:196:SER:O	26:d:200:LYS:N	2.49	0.45
1:A:332:SER:HB3	18:T:29:DT:H5"	1.97	0.45
1:A:668:PHE:CZ	1:A:672:ILE:HD11	2.52	0.45
13:M:379:TYR:O	13:M:380:ARG:NH1	2.46	0.45
13:M:590:TYR:CZ	13:M:594:LEU:HD21	2.52	0.45
21:Y:35:VAL:O	21:Y:47:TRP:N	2.40	0.45
24:b:758:ASP:OD1	24:b:759:LYS:N	2.49	0.45
1:A:695:ASP:OD1	1:A:698:THR:OG1	2.30	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:112:PRO:HB3	18:T:7:DG:H5'	1.98	0.45
7:G:62:GLY:O	7:G:63:ARG:HG2	2.17	0.45
9:I:109:ARG:NE	9:I:124:THR:HG21	2.32	0.45
13:M:783:GLY:O	13:M:796:CYS:HA	2.17	0.45
13:M:1126:ILE:O	13:M:1130:LEU:HD23	2.16	0.45
24:b:597:LEU:HB2	24:b:621:LEU:HD11	1.97	0.45
26:d:72:GLU:OE1	26:d:103:ARG:NH2	2.47	0.45
26:d:308:THR:HG22	26:d:347:VAL:HG11	1.98	0.45
1:A:823:VAL:HG11	1:A:831:LEU:HD22	1.98	0.45
13:M:554:TYR:O	13:M:556:ARG:N	2.49	0.45
20:V:292:ALA:C	20:V:294:GLU:H	2.25	0.45
24:b:600:THR:OG1	24:b:601:GLY:N	2.49	0.45
24:b:948:ALA:O	24:b:950:ARG:N	2.49	0.45
26:d:61:ILE:HG23	26:d:79:ILE:HG23	1.99	0.45
4:D:76:ASN:O	4:D:79:THR:OG1	2.24	0.44
13:M:413:LEU:HD12	13:M:460:LEU:HD11	1.99	0.44
13:M:753:LEU:HD13	13:M:924:LEU:HD13	1.98	0.44
13:M:1113:ARG:HA	13:M:1116:TYR:CE1	2.51	0.44
18:T:29:DT:O3'	18:T:30:DG:O4'	2.35	0.44
22:Z:247:LYS:O	22:Z:251:ALA:N	2.44	0.44
23:a:316:ILE:CD1	23:a:337:VAL:HG11	2.47	0.44
1:A:332:SER:HB3	18:T:29:DT:C5'	2.47	0.44
2:B:294:ASP:OD1	2:B:379:ARG:NH2	2.48	0.44
13:M:849:THR:HB	13:M:885:VAL:HG21	1.99	0.44
1:A:896:LEU:O	1:A:1396:ARG:NH1	2.50	0.44
2:B:15:ASP:OD1	2:B:15:ASP:N	2.47	0.44
23:a:126:VAL:HG21	23:a:173:LEU:HD22	1.98	0.44
24:b:830:ASP:O	24:b:837:ARG:NH2	2.48	0.44
26:d:6:VAL:HG23	26:d:1088:PHE:HD1	1.81	0.44
13:M:613:ARG:HG3	13:M:671:ILE:HG23	1.99	0.44
18:T:29:DT:C4	18:T:30:DG:C2	3.05	0.44
21:Y:88:ILE:N	21:Y:102:ILE:O	2.39	0.44
26:d:884:ILE:HD12	26:d:884:ILE:H	1.81	0.44
1:A:883:ILE:HD11	1:A:1424:THR:HA	1.99	0.44
3:C:5:ASN:OD1	11:K:52:LYS:NZ	2.51	0.44
8:H:88:PHE:CD1	8:H:144:LEU:HD12	2.52	0.44
21:Y:214:ILE:O	21:Y:228:LEU:N	2.40	0.44
4:D:108:ALA:O	4:D:111:SER:OG	2.20	0.44
13:M:1023:MET:HE3	13:M:1027:VAL:HG23	1.99	0.44
23:a:2:LEU:HD11	26:d:843:PRO:HG2	1.99	0.44
26:d:929:SER:HA	26:d:954:MET:HG2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:355:THR:HG23	13:M:356:ILE:N	2.33	0.44
26:d:43:VAL:HG23	26:d:52:VAL:HG11	2.00	0.44
1:A:272:ASN:ND2	18:T:30:DG:H2"	2.32	0.44
1:A:1189:ASP:OD2	1:A:1258:ARG:NE	2.51	0.44
8:H:71:ASP:OD1	8:H:72:ASP:N	2.51	0.44
11:K:7:PHE:CD1	11:K:11:LEU:HD12	2.53	0.44
13:M:756:ALA:N	13:M:1139:THR:O	2.48	0.44
17:S:413:GLU:O	17:S:416:ILE:N	2.51	0.44
23:a:333:HIS:HE2	23:a:351:SER:HG	1.63	0.44
1:A:114:CYS:SG	1:A:184:CYS:SG	3.16	0.43
1:A:266:MET:CE	1:A:270:ALA:HB3	2.40	0.43
1:A:863:ARG:HB3	1:A:1414:ILE:HG22	2.00	0.43
4:D:138:ARG:HH12	13:M:523:MET:HG2	1.83	0.43
18:T:38:DG:OP1	24:b:913:THR:HG21	2.18	0.43
26:d:310:ILE:HG21	26:d:328:LEU:HD12	1.99	0.43
2:B:84:TYR:HE2	2:B:132:VAL:HG22	1.83	0.43
23:a:56:GLY:O	23:a:343:GLN:NE2	2.48	0.43
1:A:467:MET:SD	1:A:524:MET:HB3	2.58	0.43
11:K:81:TYR:OH	11:K:89:ASN:OD1	2.33	0.43
13:M:699:SER:OG	13:M:702:VAL:N	2.51	0.43
15:P:40:A:H2'	15:P:41:G:O4'	2.17	0.43
26:d:275:ASP:OD1	26:d:279:ARG:N	2.52	0.43
26:d:963:ASP:OD1	26:d:963:ASP:N	2.51	0.43
2:B:256:ILE:HD11	2:B:373:LEU:HD21	2.00	0.43
2:B:887:TYR:O	2:B:888:THR:HG22	2.17	0.43
5:E:93:ARG:NH2	17:S:891:PHE:CA	2.81	0.43
13:M:608:GLN:O	13:M:612:GLU:OE1	2.36	0.43
13:M:1123:LEU:O	13:M:1124:TYR:C	2.61	0.43
23:a:142:GLU:CG	23:a:164:ARG:HB3	2.49	0.43
1:A:937:ASP:OD1	1:A:938:LEU:N	2.51	0.43
13:M:1119:LYS:O	13:M:1123:LEU:HD23	2.18	0.43
21:Y:287:SER:O	21:Y:303:CYS:N	2.46	0.43
23:a:273:ASN:O	23:a:277:GLY:N	2.51	0.43
2:B:628:VAL:HG12	2:B:629:GLU:O	2.18	0.43
3:C:123:ASN:OD1	3:C:124:SER:N	2.51	0.43
13:M:330:ILE:HG13	13:M:332:LEU:HD23	2.01	0.43
13:M:608:GLN:O	13:M:609:THR:C	2.60	0.43
13:M:966:VAL:O	13:M:970:GLY:N	2.46	0.43
20:V:206:LYS:O	20:V:208:ARG:N	2.49	0.43
24:b:576:THR:HG23	24:b:894:ARG:HG2	2.01	0.43
26:d:273:LEU:HD11	26:d:283:LEU:HB2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:850:ASP:OD1	2:B:850:ASP:N	2.52	0.43
13:M:1145:ASN:HB3	13:M:1148:GLU:OE1	2.19	0.43
1:A:1471:PHE:O	6:F:64:ARG:NH1	2.47	0.43
4:D:48:ASN:C	4:D:48:ASN:HD22	2.26	0.43
13:M:473:ARG:NH2	13:M:520:ARG:HE	2.16	0.43
27:e:524:THR:O	28:f:29:ALA:N	2.51	0.43
1:A:1475:LEU:HB2	7:G:66:VAL:HG21	2.00	0.43
13:M:542:THR:HG22	13:M:545:GLN:CD	2.42	0.43
13:M:755:VAL:HG23	13:M:755:VAL:O	2.17	0.43
23:a:251:LEU:HD23	23:a:262:THR:HG22	1.99	0.43
22:Z:246:SER:O	22:Z:250:PHE:N	2.42	0.42
24:b:623:THR:OG1	24:b:624:SER:N	2.49	0.42
13:M:303:ILE:HG21	13:M:404:THR:HG21	2.01	0.42
13:M:1018:VAL:HG12	13:M:1023:MET:O	2.19	0.42
23:a:2:LEU:HD12	26:d:836:VAL:HG22	1.99	0.42
24:b:538:ARG:NH2	24:b:673:LEU:HB3	2.34	0.42
24:b:692:ILE:HG13	24:b:693:PHE:N	2.34	0.42
1:A:255:VAL:HG23	1:A:280:LEU:HD22	2.01	0.42
7:G:27:LYS:O	7:G:30:LEU:N	2.51	0.42
26:d:207:TRP:CB	26:d:242:GLY:HA2	2.50	0.42
1:A:94:VAL:HG21	1:A:311:GLN:HA	2.01	0.42
1:A:381:PRO:HG2	1:A:384:ILE:HD12	2.01	0.42
1:A:413:TYR:HB3	1:A:414:PRO:HD3	2.01	0.42
17:S:535:LEU:O	17:S:539:ALA:N	2.47	0.42
23:a:119:SER:OG	23:a:120:PHE:N	2.52	0.42
26:d:394:ILE:HD13	26:d:394:ILE:N	2.34	0.42
26:d:930:VAL:HG22	26:d:948:ASP:HB3	2.00	0.42
26:d:1000:LEU:HD21	26:d:1030:PHE:CE1	2.54	0.42
6:F:100:ARG:NH2	6:F:121:ASP:O	2.52	0.42
7:G:1:MET:O	7:G:77:PHE:HA	2.19	0.42
13:M:559:THR:HG22	13:M:560:GLU:N	2.35	0.42
13:M:671:ILE:HG22	13:M:671:ILE:O	2.18	0.42
26:d:18:CYS:SG	26:d:315:THR:HG23	2.59	0.42
2:B:1091:ARG:NH2	2:B:1092:ASP:OD1	2.53	0.42
13:M:864:VAL:O	13:M:868:VAL:HG13	2.20	0.42
13:M:866:ARG:O	13:M:870:GLU:OE1	2.38	0.42
15:P:36:A:H2'	15:P:37:U:C6	2.54	0.42
23:a:65:ASP:OD2	23:a:67:VAL:HG22	2.20	0.42
1:A:410:ASN:OD1	1:A:449:HIS:NE2	2.46	0.42
1:A:967:ARG:NH2	1:A:1326:GLY:O	2.52	0.42
24:b:578:MET:HE1	24:b:598:HIS:CG	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:b:709:VAL:HB	24:b:710:PRO:HD3	2.01	0.42
1:A:266:MET:SD	18:T:30:DG:H2'	2.60	0.42
1:A:595:ILE:HD11	1:A:675:VAL:HG11	2.02	0.42
1:A:695:ASP:OD1	1:A:695:ASP:N	2.52	0.42
2:B:761:THR:H	2:B:764:MET:HE3	1.85	0.42
2:B:967:ILE:HG21	2:B:1048:TYR:OH	2.18	0.42
17:S:649:ALA:O	17:S:652:GLY:N	2.53	0.42
26:d:285:LEU:HB3	26:d:297:LEU:HD13	2.01	0.42
1:A:431:PHE:HE2	15:P:33:A:N6	2.12	0.42
2:B:629:GLU:N	2:B:632:LYS:O	2.41	0.42
13:M:702:VAL:HG23	13:M:703:GLN:OE1	2.20	0.42
1:A:1433:GLU:OE1	18:T:17:DC:H4'	2.19	0.41
4:D:86:LEU:HB2	4:D:137:LYS:HZ3	1.85	0.41
7:G:79:PRO:HB3	7:G:147:ILE:HD13	2.02	0.41
13:M:381:LYS:O	13:M:384:VAL:N	2.46	0.41
13:M:855:ARG:NE	13:M:1275:PHE:HD2	2.18	0.41
13:M:889:LEU:HG	13:M:930:VAL:HG11	2.00	0.41
13:M:1057:ARG:NH1	13:M:1134:TYR:CE1	2.88	0.41
27:e:200:ILE:O	27:e:204:ARG:N	2.53	0.41
5:E:110:MET:HG2	5:E:114:ALA:HB3	2.03	0.41
13:M:382:GLU:HB3	13:M:1121:ILE:HG22	2.01	0.41
13:M:672:ASP:OD1	13:M:672:ASP:N	2.52	0.41
24:b:594:VAL:O	24:b:594:VAL:HG23	2.19	0.41
24:b:627:TYR:CD1	24:b:631:MET:HE1	2.54	0.41
26:d:1109:VAL:HG22	26:d:1129:LEU:HD12	2.02	0.41
1:A:86:GLY:C	1:A:255:VAL:HG12	2.46	0.41
5:E:84:ILE:HG22	14:N:45:DG:P	2.60	0.41
6:F:57:MET:HE1	6:F:120:VAL:HG13	2.02	0.41
13:M:621:THR:O	13:M:622:LYS:C	2.64	0.41
13:M:937:ILE:HG23	13:M:938:LEU:N	2.36	0.41
26:d:969:GLU:HG2	26:d:971:ALA:H	1.84	0.41
1:A:431:PHE:CE2	15:P:33:A:N6	2.84	0.41
1:A:883:ILE:O	1:A:883:ILE:HG22	2.20	0.41
2:B:733:MET:HE1	2:B:1054:MET:HE2	2.02	0.41
23:a:336:THR:O	23:a:353:SER:OG	2.31	0.41
5:E:127:LEU:HD23	5:E:127:LEU:H	1.86	0.41
23:a:309:PHE:CD2	23:a:318:VAL:HG22	2.56	0.41
26:d:72:GLU:OE1	26:d:103:ARG:NH1	2.50	0.41
1:A:962:ASP:HB3	1:A:1043:ILE:HG23	2.02	0.41
7:G:60:GLN:O	7:G:62:GLY:O	2.39	0.41
13:M:758:TYR:CD1	13:M:759:ARG:N	2.89	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:b:697:LEU:O	24:b:698:GLY:O	2.39	0.41
26:d:6:VAL:HG23	26:d:1088:PHE:CD1	2.56	0.41
26:d:284:LEU:HD22	26:d:301:ARG:HH12	1.84	0.41
26:d:770:LEU:HD13	26:d:865:GLU:HB2	2.03	0.41
4:D:126:GLU:O	4:D:130:ILE:HG12	2.21	0.41
9:I:49:ASP:OD1	9:I:49:ASP:N	2.49	0.41
12:L:25:GLU:O	12:L:25:GLU:HG2	2.20	0.41
13:M:610:PHE:O	13:M:611:GLN:C	2.62	0.41
24:b:886:ASP:HA	24:b:913:THR:HG22	2.03	0.41
26:d:81:THR:HG22	26:d:83:LYS:H	1.85	0.41
13:M:332:LEU:HD11	13:M:740:TYR:HB2	2.02	0.41
13:M:832:ASP:O	13:M:835:THR:HG22	2.21	0.41
26:d:394:ILE:CG2	26:d:705:ASP:O	2.68	0.41
1:A:349:ARG:NH2	2:B:1070:LEU:HD21	2.35	0.41
2:B:899:SER:OG	11:K:1:MET:HE2	2.21	0.41
3:C:210:GLU:O	3:C:210:GLU:HG2	2.21	0.41
4:D:48:ASN:C	4:D:48:ASN:ND2	2.78	0.41
7:G:18:PHE:N	7:G:18:PHE:CD1	2.87	0.41
7:G:166:ASP:HB3	13:M:516:LYS:HB2	2.03	0.41
13:M:894:MET:SD	13:M:912:GLN:HG3	2.61	0.41
13:M:917:ALA:O	13:M:921:GLN:HG3	2.21	0.41
15:P:27:A:O2'	15:P:28:U:OP1	2.26	0.41
24:b:798:GLY:O	24:b:802:LEU:HD13	2.20	0.41
26:d:413:LEU:O	26:d:424:THR:N	2.54	0.41
26:d:1098:LEU:HD21	26:d:1134:GLU:OE2	2.21	0.41
1:A:848:ILE:HG21	2:B:496:ALA:HB1	2.03	0.41
1:A:883:ILE:HD11	1:A:1424:THR:HG22	2.03	0.41
2:B:735:VAL:HG21	10:J:55:LEU:HD13	2.02	0.41
23:a:97:VAL:HG13	23:a:99:ARG:NH2	2.36	0.41
2:B:292:PHE:HD1	2:B:298:MET:HE1	1.85	0.40
2:B:962:THR:O	10:J:9:THR:HG23	2.21	0.40
23:a:37:ASP:HB2	23:a:83:THR:HG22	2.02	0.40
13:M:301:ARG:HD2	13:M:401:GLU:HG2	2.03	0.40
13:M:541:LEU:HD23	13:M:541:LEU:O	2.21	0.40
13:M:1107:PHE:HA	13:M:1110:GLU:HG2	2.02	0.40
26:d:311:ALA:HB2	26:d:324:VAL:HG13	2.02	0.40
1:A:67:ARG:HH21	15:P:33:A:H5'	1.86	0.40
1:A:457:ILE:HD11	1:A:515:ILE:HG23	2.03	0.40
8:H:49:PRO:O	8:H:147:LYS:NZ	2.50	0.40
13:M:1111:LEU:HD13	13:M:1119:LYS:HB2	2.02	0.40
15:P:36:A:H2'	15:P:37:U:H6	1.87	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:Y:214:ILE:N	21:Y:228:LEU:O	2.38	0.40
1:A:266:MET:SD	18:T:30:DG:C4	3.15	0.40
1:A:630:VAL:HG21	1:A:652:LEU:HD21	2.04	0.40
1:A:811:ILE:HD12	9:I:79:PRO:HB3	2.03	0.40
13:M:1156:GLU:HG2	13:M:1161:PHE:CE2	2.56	0.40
26:d:130:MET:HE3	26:d:142:VAL:HG13	2.03	0.40
26:d:365:VAL:HG11	26:d:733:PHE:HE1	1.87	0.40
26:d:677:ASN:N	26:d:694:ALA:O	2.48	0.40
1:A:286:ILE:HD12	1:A:309:LEU:HD23	2.04	0.40
1:A:1212:LEU:HD11	1:A:1289:GLU:HB2	2.03	0.40
2:B:864:ASP:OD1	2:B:865:VAL:N	2.51	0.40
3:C:105:VAL:HG11	3:C:115:VAL:HG22	2.03	0.40
13:M:1150:PHE:HD1	13:M:1275:PHE:CE1	2.39	0.40
17:S:507:TYR:O	17:S:512:GLU:N	2.45	0.40
18:T:42:DA:H4'	18:T:43:DA:OP1	2.21	0.40
24:b:947:ARG:NE	24:b:947:ARG:HA	2.37	0.40
26:d:742:VAL:HG13	26:d:743:GLN:H	1.87	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	A	1402/1970 (71%)	1365 (97%)	37 (3%)	0	100	100
2	B	1123/1174 (96%)	1076 (96%)	47 (4%)	0	100	100
3	C	256/275 (93%)	249 (97%)	7 (3%)	0	100	100
4	D	126/142 (89%)	118 (94%)	8 (6%)	0	100	100
5	E	207/210 (99%)	204 (99%)	3 (1%)	0	100	100
6	F	80/127 (63%)	75 (94%)	5 (6%)	0	100	100
7	G	169/172 (98%)	158 (94%)	11 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
8	H	146/150 (97%)	142 (97%)	4 (3%)	0	100	100
9	I	115/125 (92%)	111 (96%)	4 (4%)	0	100	100
10	J	65/67 (97%)	65 (100%)	0	0	100	100
11	K	113/117 (97%)	111 (98%)	2 (2%)	0	100	100
12	L	44/58 (76%)	40 (91%)	4 (9%)	0	100	100
13	M	788/1729 (46%)	711 (90%)	75 (10%)	2 (0%)	37	70
17	S	888/1179 (75%)	842 (95%)	46 (5%)	0	100	100
19	U	98/666 (15%)	82 (84%)	14 (14%)	2 (2%)	6	29
20	V	209/531 (39%)	174 (83%)	31 (15%)	4 (2%)	6	31
21	Y	298/305 (98%)	278 (93%)	20 (7%)	0	100	100
22	Z	41/531 (8%)	40 (98%)	1 (2%)	0	100	100
23	a	363/396 (92%)	342 (94%)	21 (6%)	0	100	100
24	b	512/1496 (34%)	470 (92%)	42 (8%)	0	100	100
25	c	139/712 (20%)	136 (98%)	3 (2%)	0	100	100
26	d	1082/1143 (95%)	1004 (93%)	78 (7%)	0	100	100
27	e	709/762 (93%)	652 (92%)	57 (8%)	0	100	100
28	f	19/108 (18%)	18 (95%)	1 (5%)	0	100	100
All	All	8992/14145 (64%)	8463 (94%)	521 (6%)	8 (0%)	50	81

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
20	V	248	PRO
19	U	481	GLY
19	U	463	PRO
20	V	238	GLU
20	V	259	ASP
20	V	301	ASN
13	M	946	GLN
13	M	581	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1242/1749 (71%)	1242 (100%)	0	100	100
2	B	992/1027 (97%)	992 (100%)	0	100	100
3	C	237/252 (94%)	237 (100%)	0	100	100
4	D	108/126 (86%)	108 (100%)	0	100	100
5	E	191/192 (100%)	191 (100%)	0	100	100
6	F	71/111 (64%)	71 (100%)	0	100	100
7	G	147/153 (96%)	147 (100%)	0	100	100
8	H	129/131 (98%)	129 (100%)	0	100	100
9	I	105/112 (94%)	105 (100%)	0	100	100
10	J	56/56 (100%)	56 (100%)	0	100	100
11	K	104/106 (98%)	104 (100%)	0	100	100
12	L	43/55 (78%)	43 (100%)	0	100	100
13	M	722/1524 (47%)	721 (100%)	1 (0%)	92	98
23	a	320/348 (92%)	320 (100%)	0	100	100
24	b	466/1299 (36%)	465 (100%)	1 (0%)	92	97
26	d	689/1001 (69%)	688 (100%)	1 (0%)	92	98
All	All	5622/8242 (68%)	5619 (100%)	3 (0%)	92	98

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
13	M	572	ASP
24	b	539	THR
26	d	394	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	222	HIS
1	A	295	GLN
1	A	735	GLN
1	A	792	ASN
1	A	1077	ASN
1	A	1078	GLN

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Mol	Chain	Res	Type
2	B	227	ASN
2	B	319	ASN
2	B	1160	GLN
4	D	19	GLN
4	D	66	ASN
4	D	93	HIS
7	G	4	HIS
8	H	29	HIS
11	K	36	ASN
13	M	921	GLN
13	M	948	HIS
13	M	979	HIS
13	M	1007	ASN
23	a	47	ASN
23	a	183	GLN
23	a	228	GLN
24	b	524	GLN
24	b	649	HIS
26	d	163	HIS
26	d	261	HIS
26	d	1009	HIS

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
15	P	20/45 (44%)	9 (45%)	1 (5%)

All (9) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
15	P	26	U
15	P	27	A
15	P	28	U
15	P	29	A
15	P	30	U
15	P	33	A
15	P	34	A
15	P	35	A
15	P	36	A

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
15	P	27	A

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 9 ligands modelled in this entry, 9 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

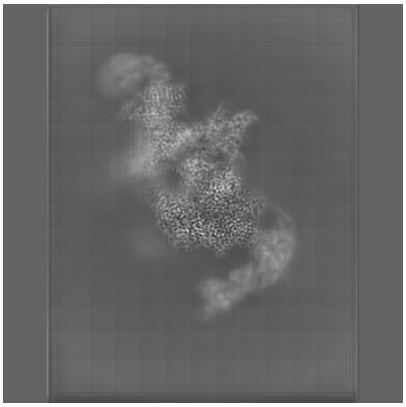
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-13015. These allow visual inspection of the internal detail of the map and identification of artifacts.

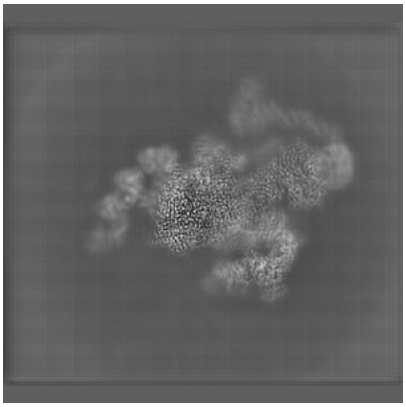
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

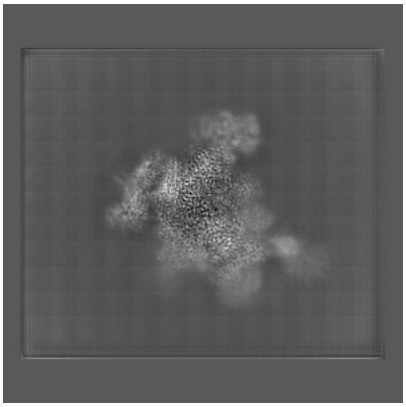
6.1.1 Primary map



X



Y

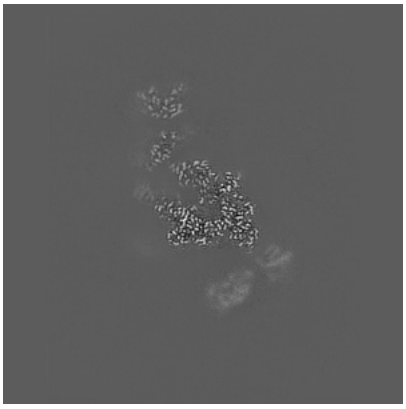


Z

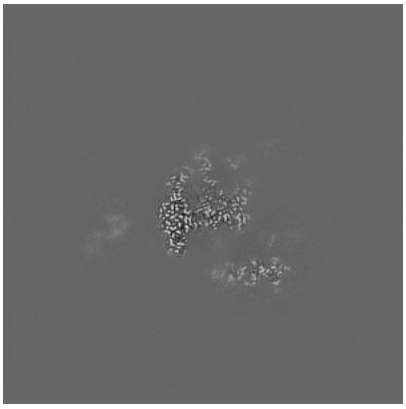
The images above show the map projected in three orthogonal directions.

6.2 Central slices

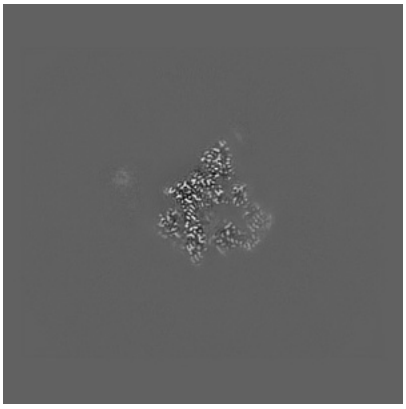
6.2.1 Primary map



X Index: 210



Y Index: 210

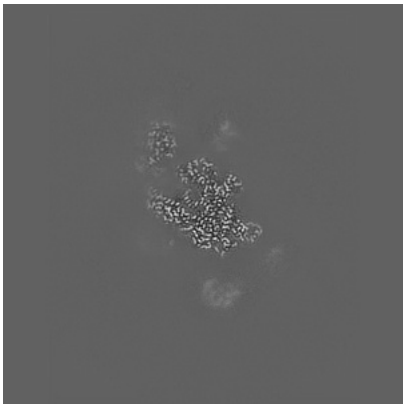


Z Index: 210

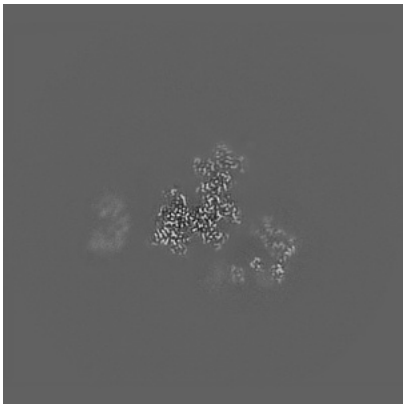
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

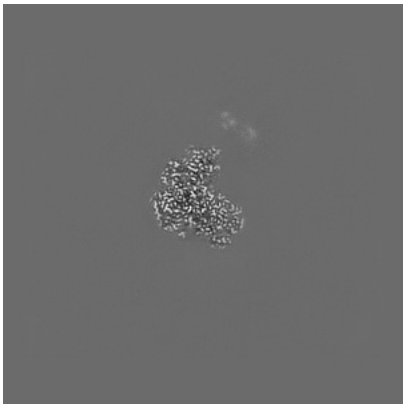
6.3.1 Primary map



X Index: 197



Y Index: 222

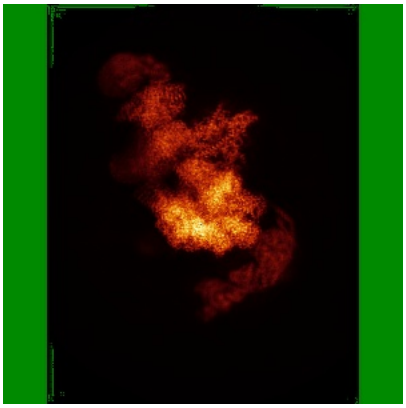


Z Index: 183

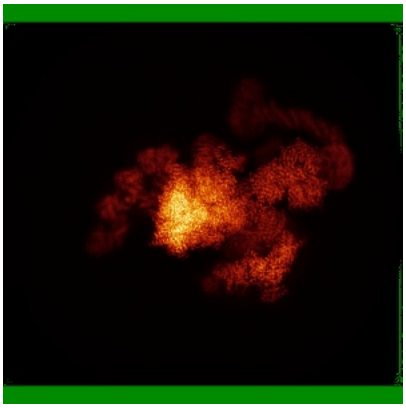
The images above show the largest variance slices of the map in three orthogonal directions.

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

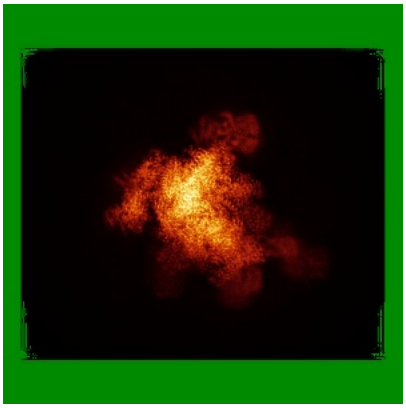
6.4.1 Primary map



X



Y

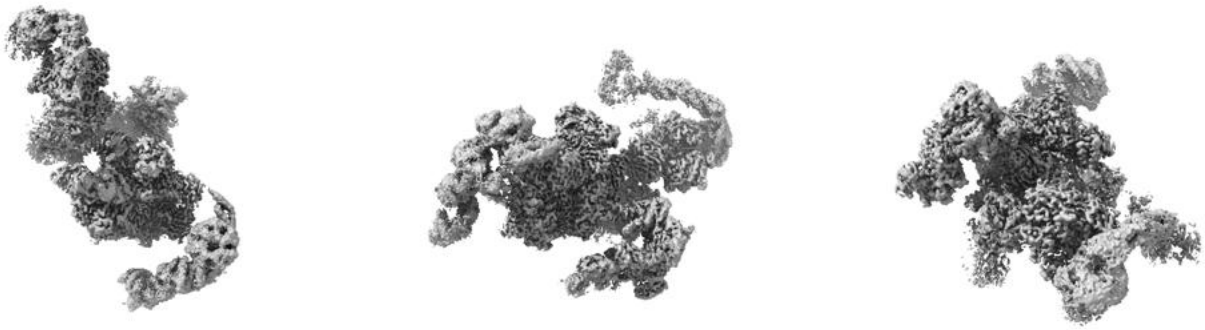


Z

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



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

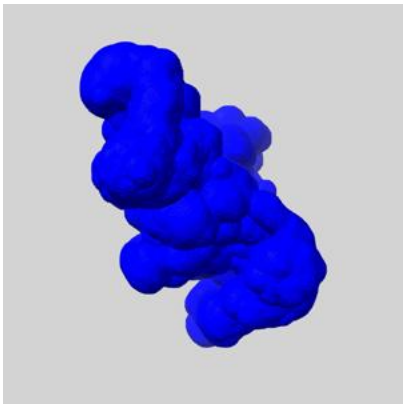
6.6 Mask visualisation

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

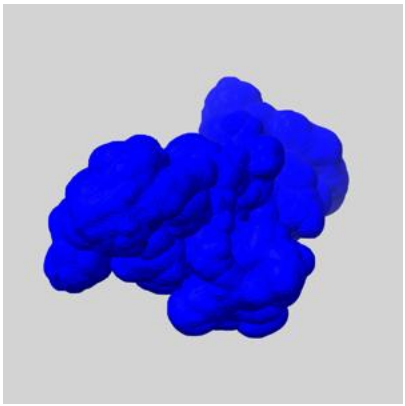
A mask typically either:

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

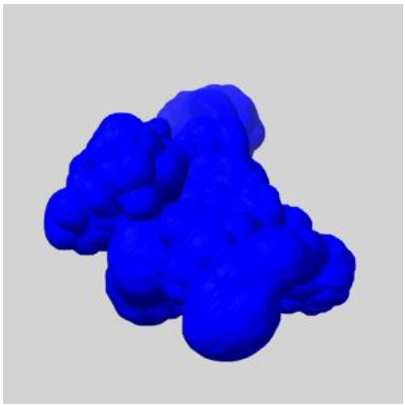
6.6.1 emd_13015_msk_1.map



X

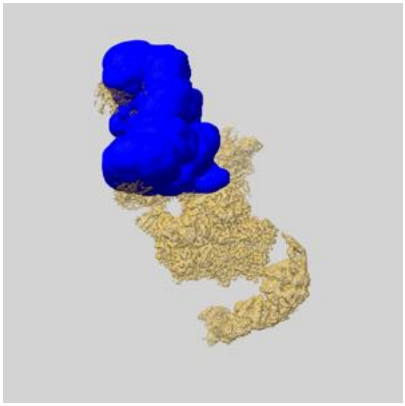


Y

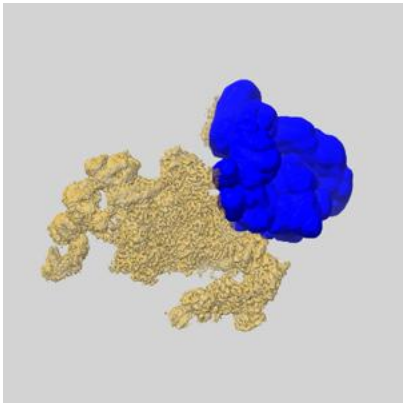


Z

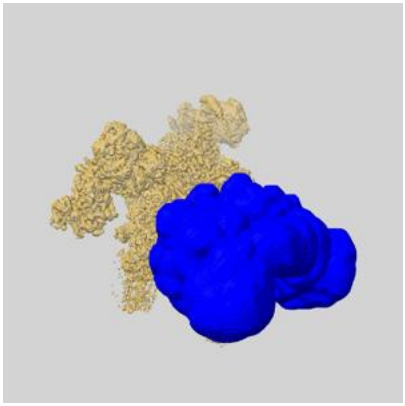
6.6.2 emd_13015_msk_2.map



X

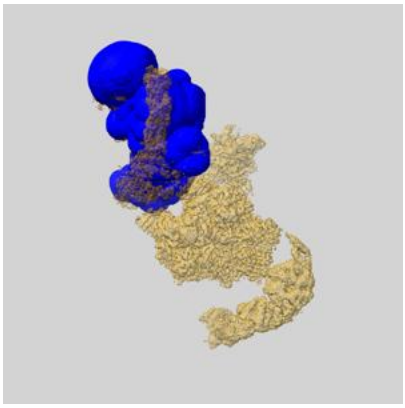


Y

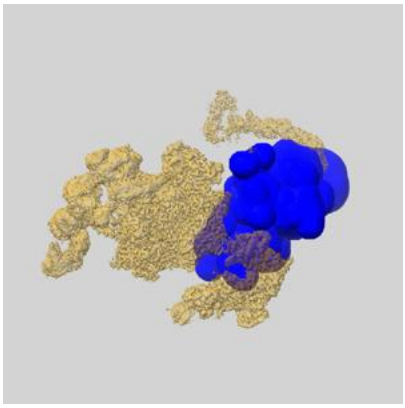


Z

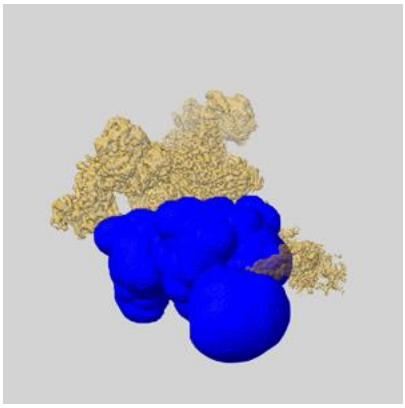
6.6.3 emd_13015_msk_3.map



X

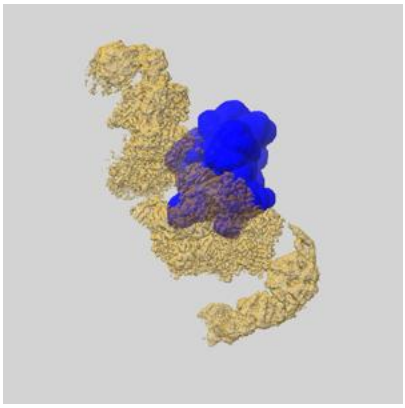


Y

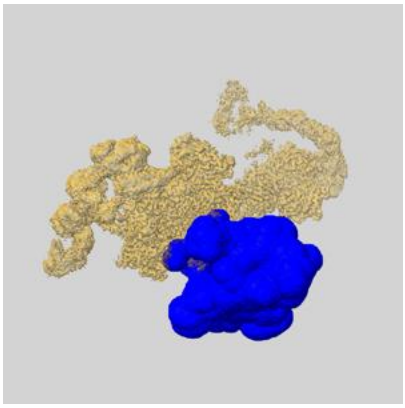


Z

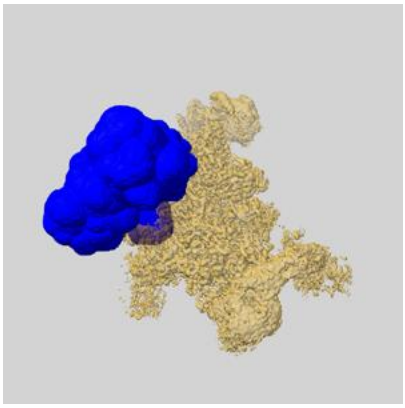
6.6.4 emd_13015_msk_4.map



X

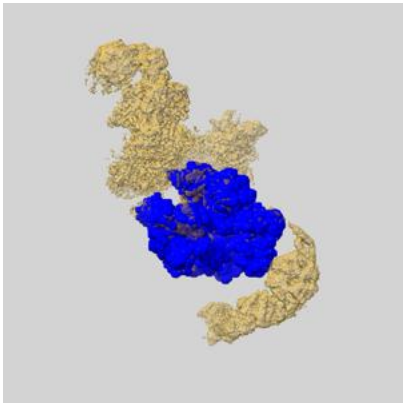


Y

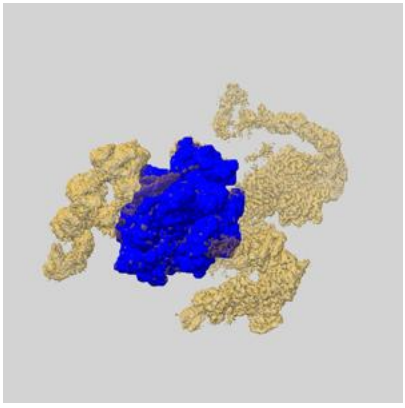


Z

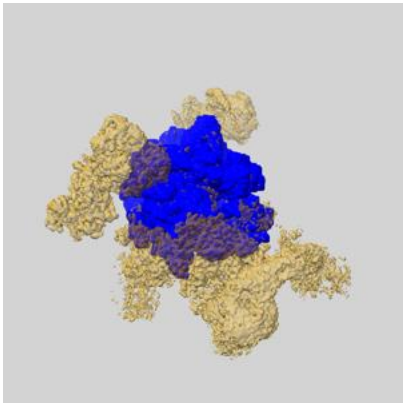
6.6.5 emd_13015_msk_5.map



X



Y

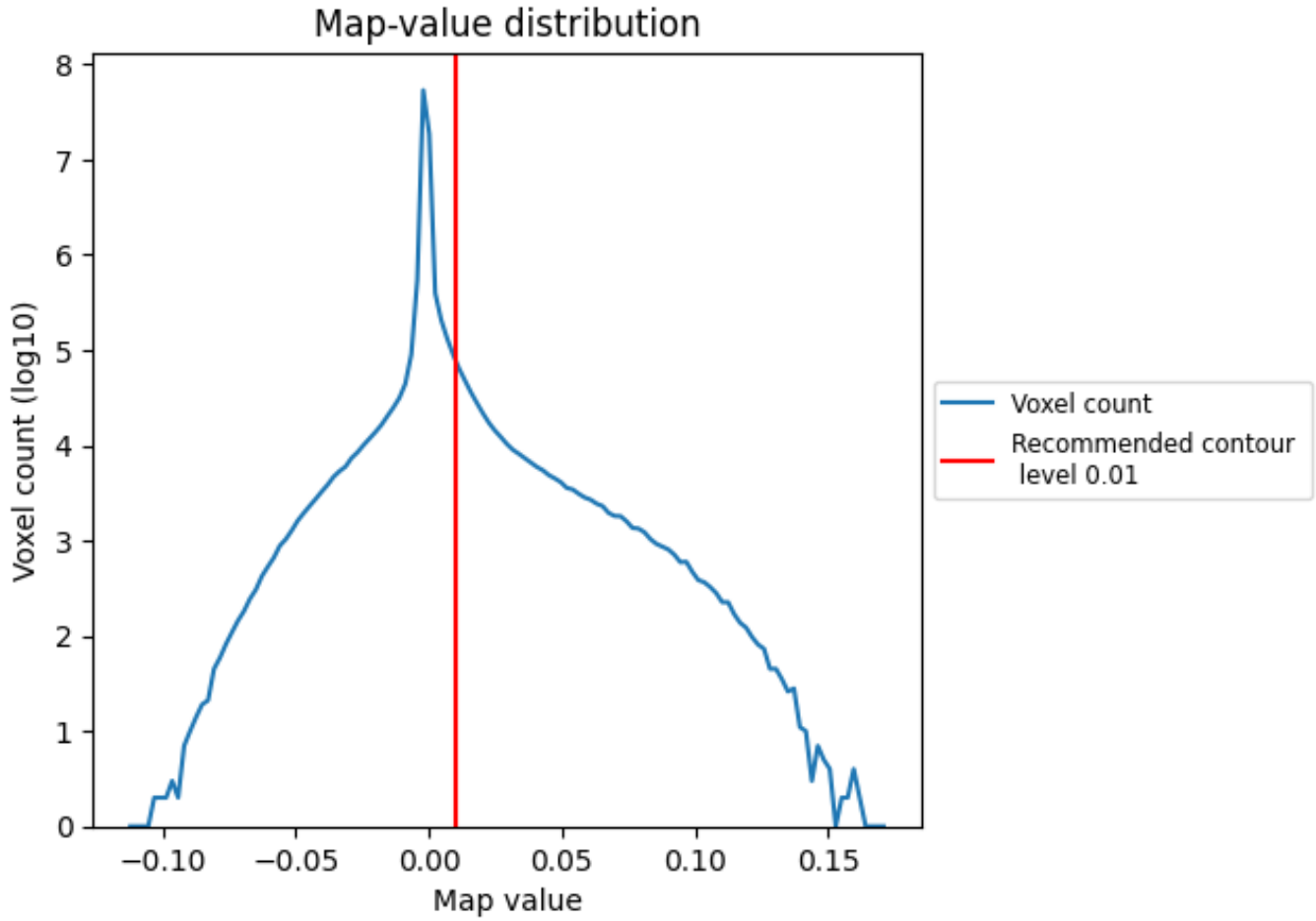


Z

7 Map analysis

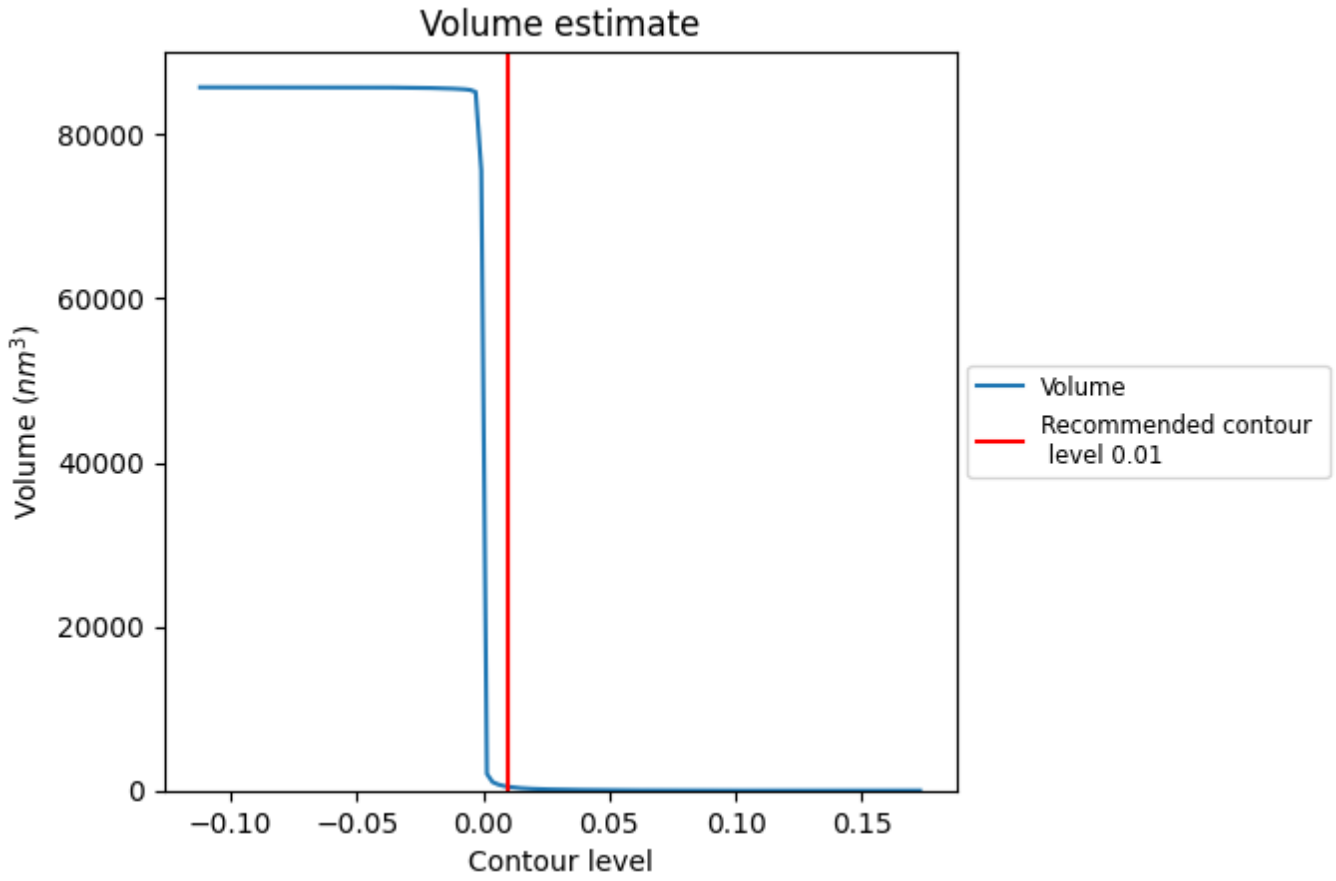
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

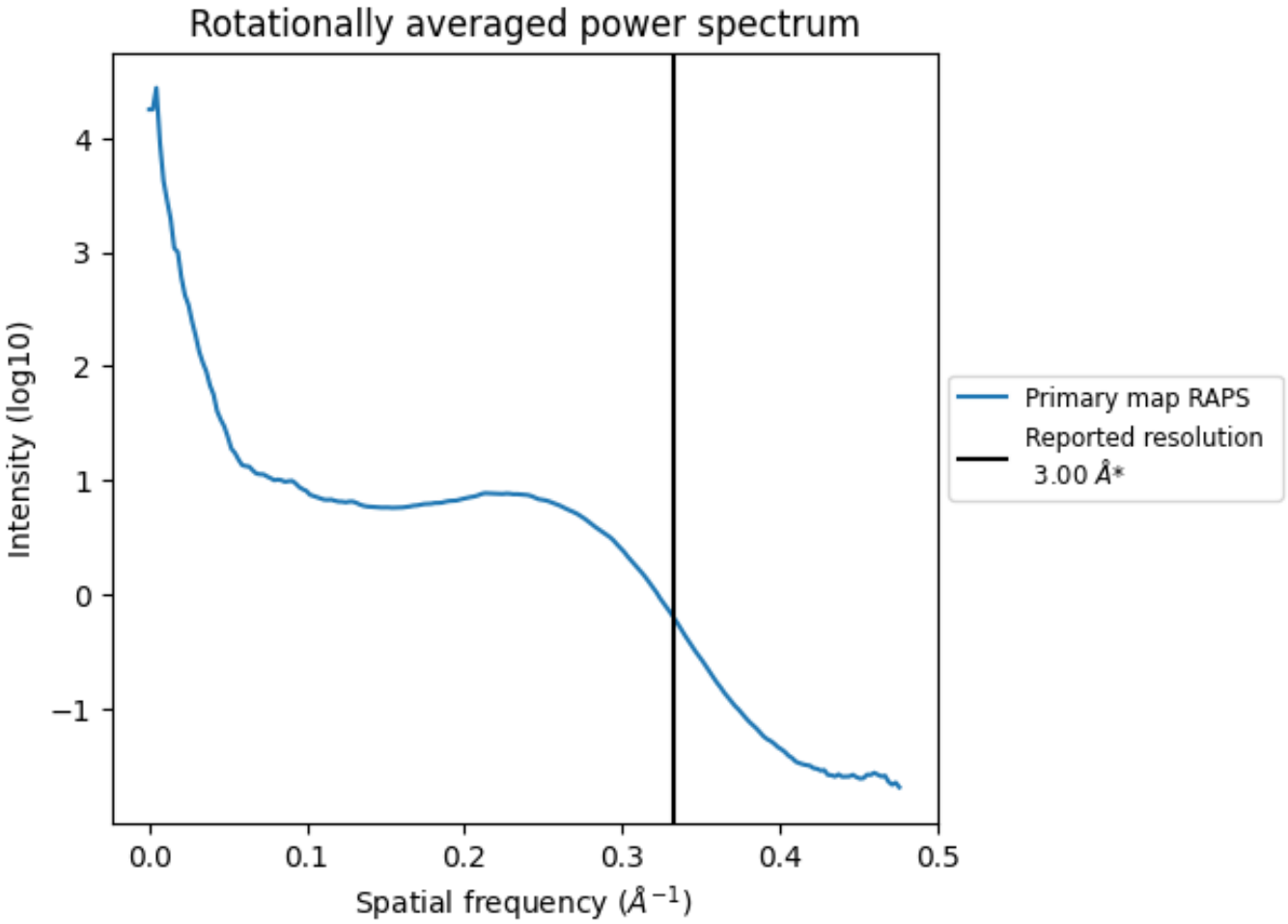
7.2 Volume estimate



The volume at the recommended contour level is 466 nm^3; this corresponds to an approximate mass of 421 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)

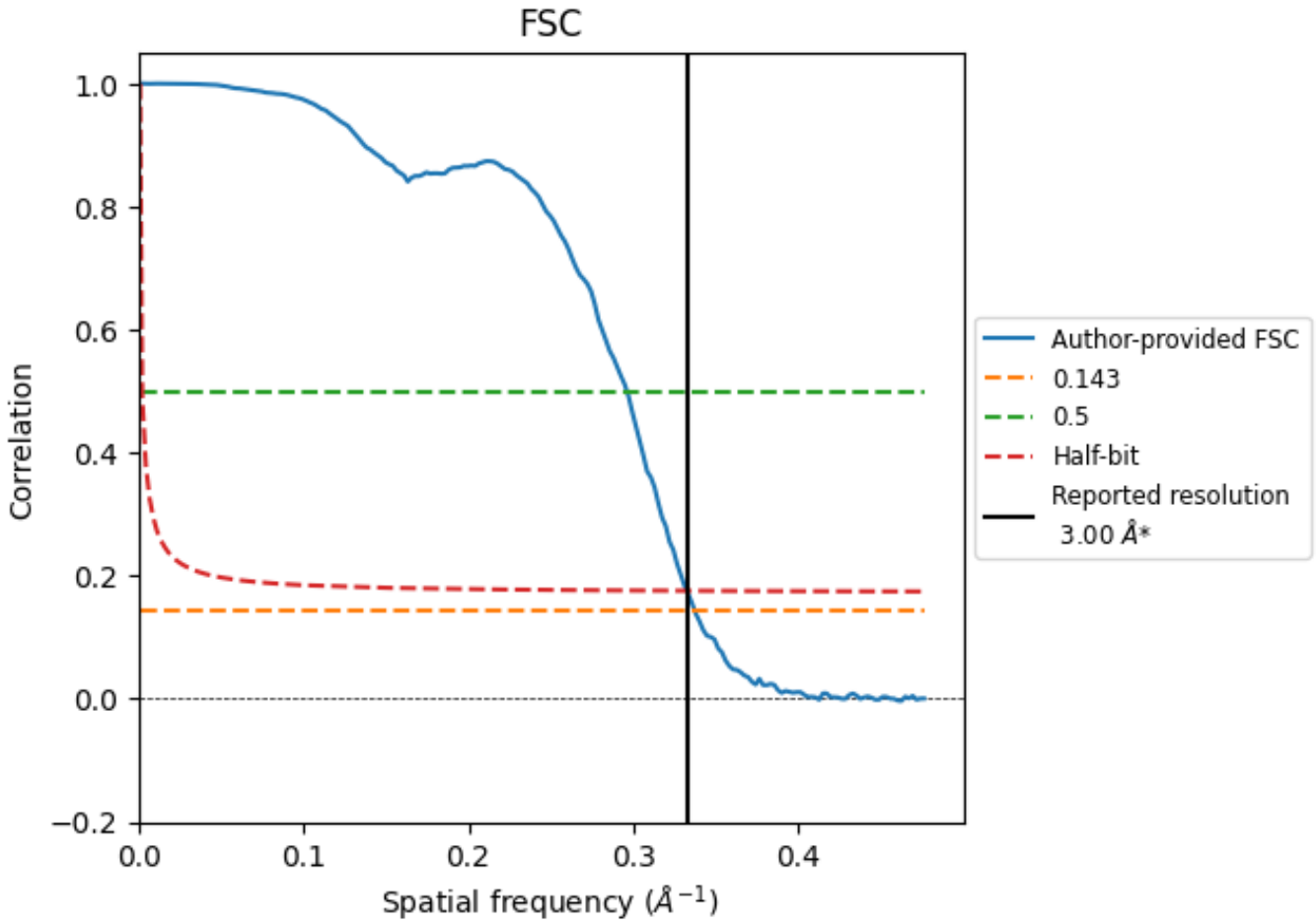


*Reported resolution corresponds to spatial frequency of 0.333 Å^{-1}

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.333 Å^{-1}

8.2 Resolution estimates (i)

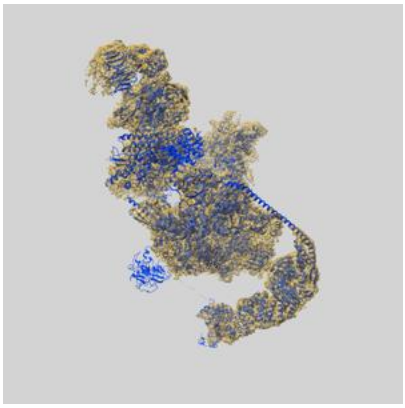
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	2.97	3.38	3.01
Unmasked-calculated*	-	-	-

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

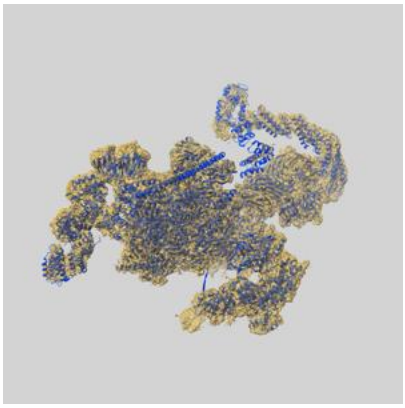
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-13015 and PDB model 7OPC. Per-residue inclusion information can be found in section 3 on page 10.

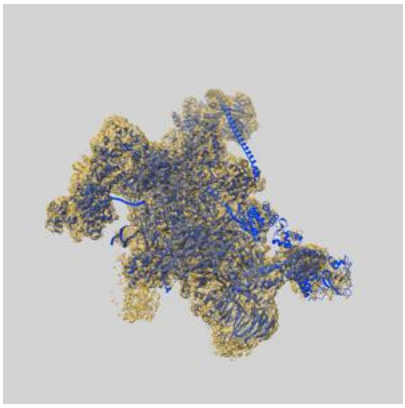
9.1 Map-model overlay



X



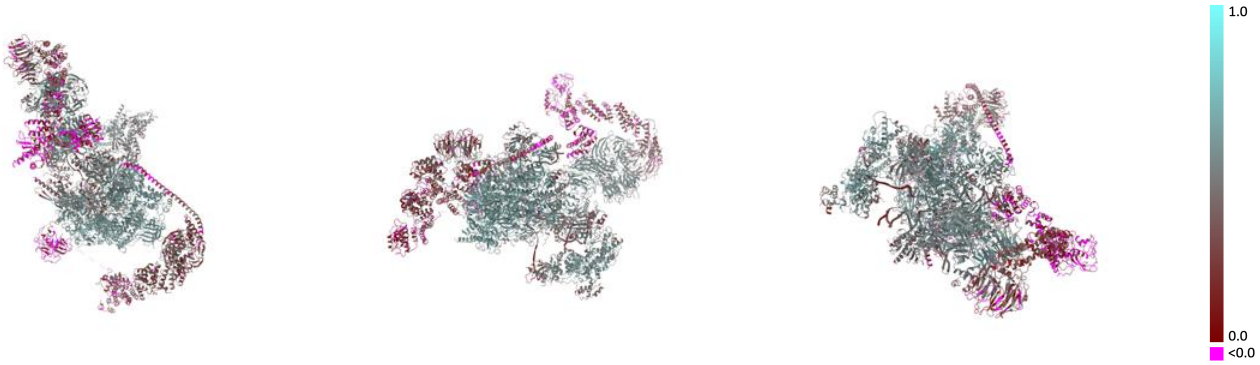
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.01 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.

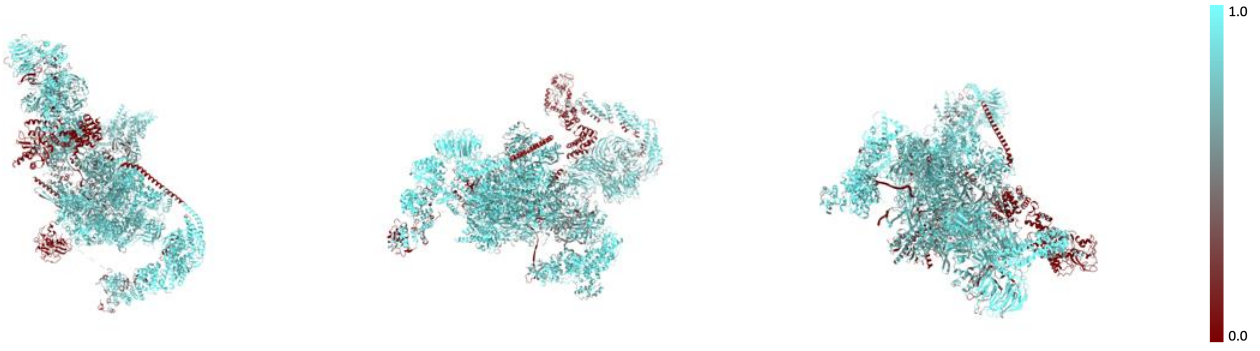
9.2 Q-score mapped to coordinate model (i)



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.

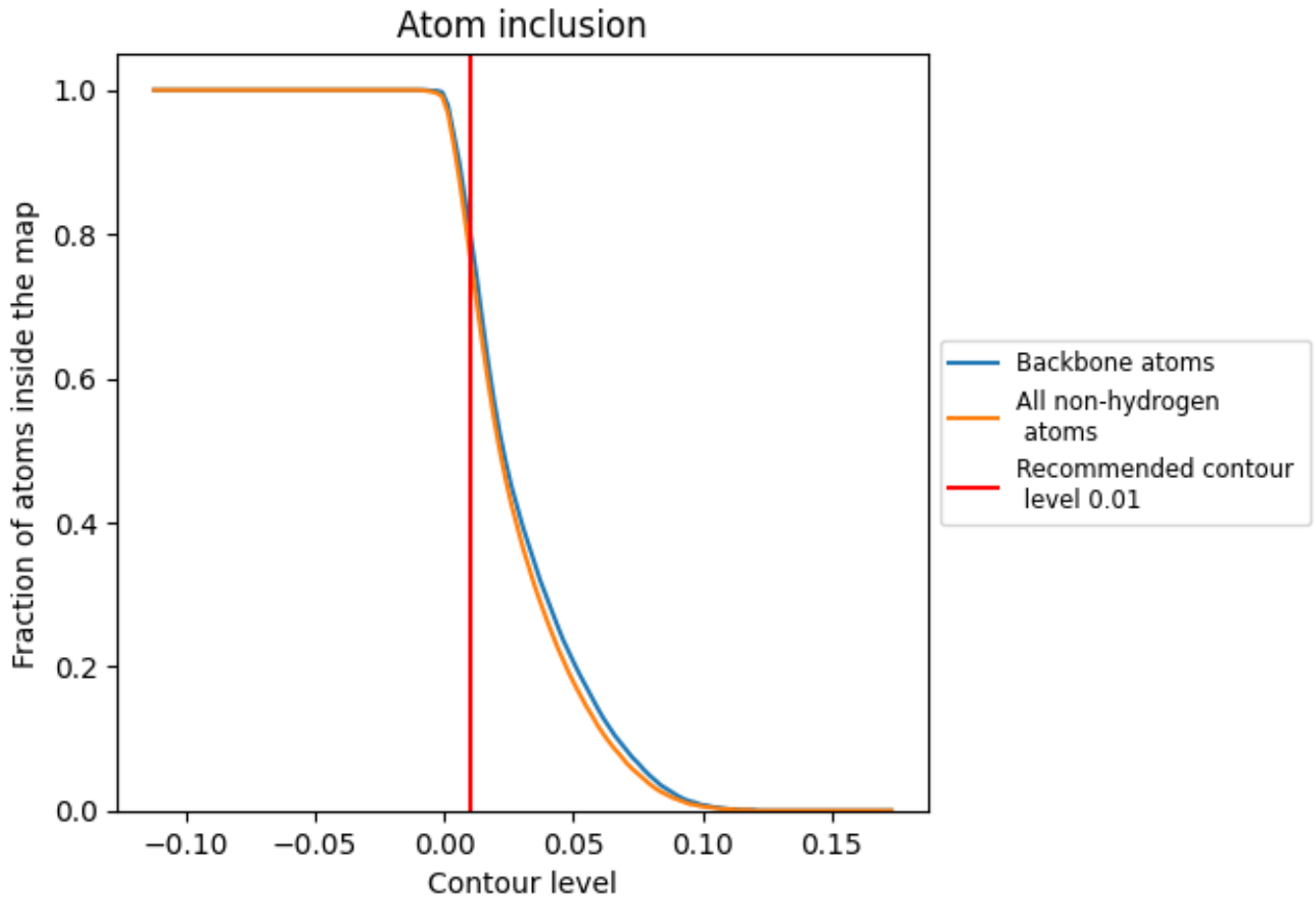
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.01).

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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7730	0.4720
A	0.8380	0.5550
B	0.8470	0.5620
C	0.9000	0.5900
D	0.6780	0.3980
E	0.8520	0.5440
F	0.8570	0.5740
G	0.7270	0.4960
H	0.8950	0.5870
I	0.7750	0.4930
J	0.9250	0.6210
K	0.9090	0.5940
L	0.7900	0.5050
M	0.8520	0.5020
N	0.6730	0.4220
P	0.5000	0.3790
R	0.1810	0.3350
S	0.7320	0.2220
T	0.7130	0.4540
U	0.0000	0.0260
V	0.1940	0.0750
Y	0.9360	0.3220
Z	0.8080	0.3040
a	0.8690	0.5690
b	0.6830	0.4780
c	0.0270	0.0480
d	0.7920	0.4690
e	0.4200	0.1280
f	0.1550	0.0860