Full wwPDB EM Validation Report

Dec 18, 2025 – 04:29 PM JST

PDB ID	:	9WMT / pdb_00009wmt
EMDB ID	:	EMD-66104
Title	:	Co-transcriptional histone H3K36 methylation complex containing RNA polymerase II elongation complex, Set2, and the upstream nucleosome. (temp115, type A)
Authors	:	Kujirai, T.; Ehara, H.; Ito, T.; Henmi, M.; Sekine, S.; Kurumizaka, H.
Deposited on	:	2025-09-03
Resolution	:	3.59 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 (i) symbol.

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

The following versions of software and data (see references (1)) were used in the production of this report:

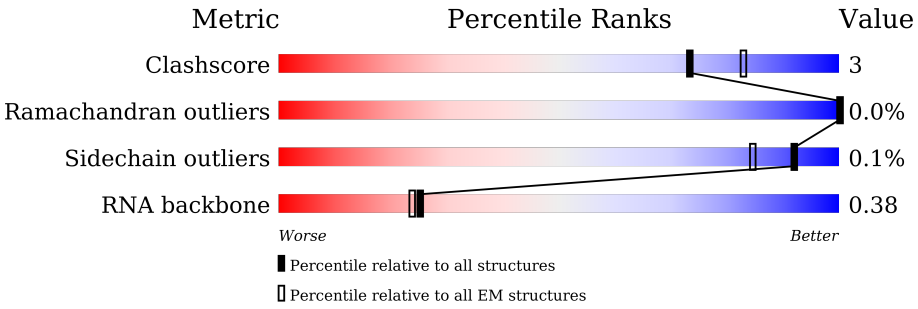
EMDB validation analysis	:	0.0.1.dev129
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

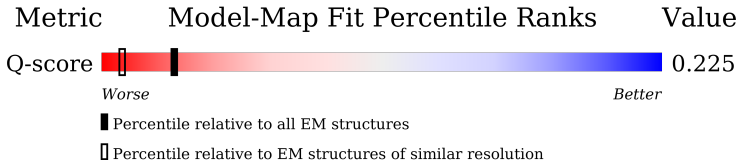
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.59 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	12565 (3.09 - 4.09)

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	1743	76% 5% 19%
2	B	1227	88% 7% 5%
3	C	304	82% 13%

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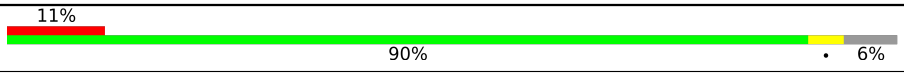
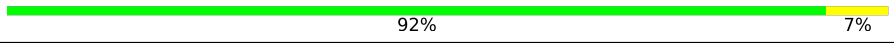
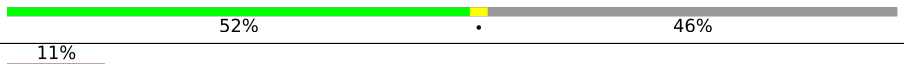
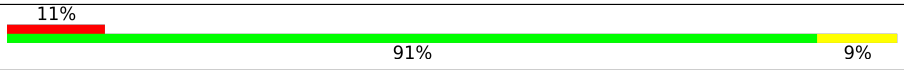
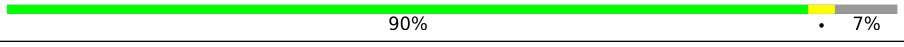
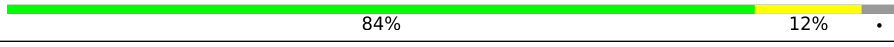
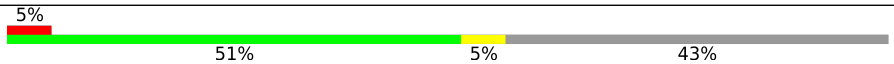
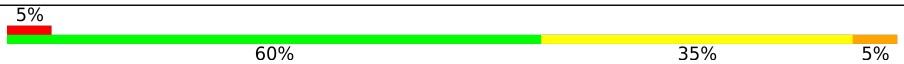
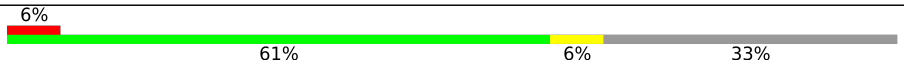
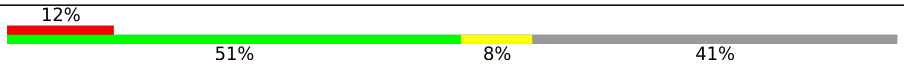
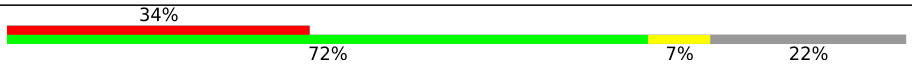
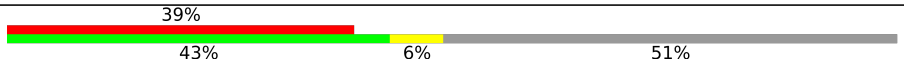
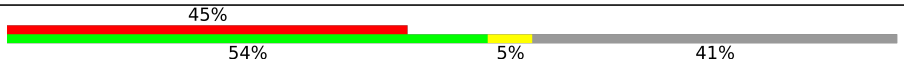
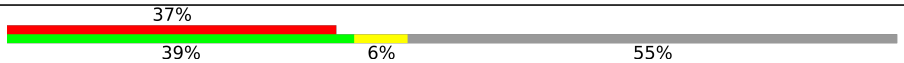
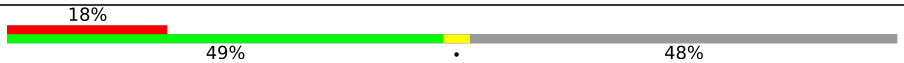
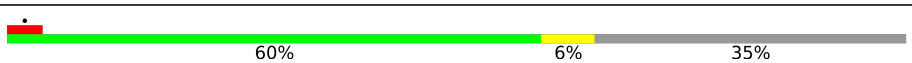
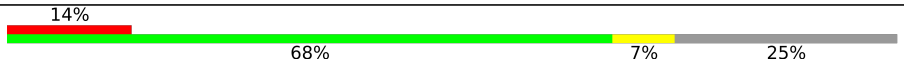
Mol	Chain	Length	Quality of chain
4	D	186	
5	E	214	
6	F	155	
7	G	171	
8	H	145	
9	I	115	
10	J	72	
11	K	118	
12	L	72	
13	M	113	
14	N	198	
15	P	20	
16	T	198	
17	V	108	
18	W	911	
19	m	1503	
20	n	417	
21	q	1084	
22	r	544	
23	s	725	
24	u	459	
25	v	396	
26	x	395	
27	a	139	
27	e	139	

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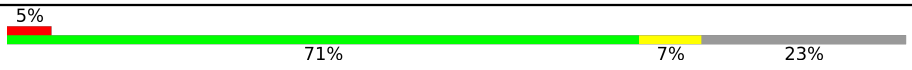
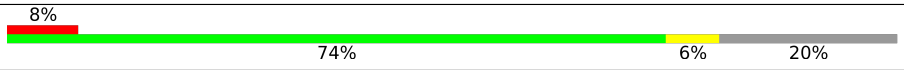
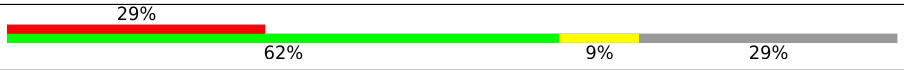
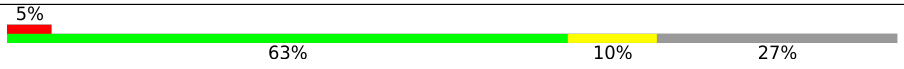
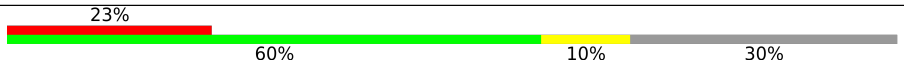
Mol	Chain	Length	Quality of chain
28	b	106	
28	f	106	
29	c	133	
29	g	133	
30	d	129	
30	h	129	

2 Entry composition (i)

There are 33 unique types of molecules in this entry. The entry contains 78546 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1404	11064	6975	1930	2089	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	1164	9284	5848	1639	1739	58	0	0

- Molecule 3 is a protein called RNA polymerase II third largest subunit B44, part of central core.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	263	2098	1319	354	413	12	0	0

- Molecule 4 is a protein called RNA polymerase II subunit B32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	174	1349	828	244	274	3	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	213	1741	1094	312	325	10	0	0

- Molecule 6 is a protein called RNA polymerase subunit ABC23, common to RNA polymerases I, II, and III.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	84	Total	C	N	O	S	0	0
			677	429	114	131	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1325	858	214	248	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	133	Total	C	N	O	S	0	0
			1053	671	169	209	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	111	Total	C	N	O	S	0	0
			917	565	161	180	11		

- Molecule 10 is a protein called RNA polymerase subunit ABC10-beta, common to RNA polymerases I, II, and III.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	67	Total	C	N	O	S	0	0
			554	355	97	96	6		

- Molecule 11 is a protein called RNA polymerase II subunit B12.5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	113	Total	C	N	O	S	0	0
			932	599	160	169	4		

- Molecule 12 is a protein called RNA polymerase subunit ABC10-alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	45	Total	C	N	O	S	0	0
			359	221	72	61	5		

- Molecule 13 is a protein called Transcription elongation factor 1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	64	Total	C	N	O	S	0	0
			505	318	82	99	6		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	-2	GLY	-	expression tag	UNP C4QZ45
M	-1	PRO	-	expression tag	UNP C4QZ45
M	0	GLY	-	expression tag	UNP C4QZ45

- Molecule 14 is a DNA chain called DNA (198-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	121	Total	C	N	O	P	0	0
			2482	1182	414	765	121		

- Molecule 15 is a RNA chain called RNA (5'-R(P*GP*CP*UP*UP*GP*UP*GP*CP*UP*GP*UP*CP*UP*UP*CP*GP*UP*CP*CP*A)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	20	Total	C	N	O	P	0	0
			417	186	64	147	20		

- Molecule 16 is a DNA chain called DNA (198-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
16	T	132	Total	C	N	O	P	0	0
			2710	1276	554	748	132		

- Molecule 17 is a protein called Transcription elongation factor SPT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	V	106	Total	C	N	O	S	0	0
			824	512	150	155	7		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
V	7	MET	-	initiating methionine	UNP C4R0E6

- Molecule 18 is a protein called Transcription elongation factor SPT5.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	W	535	Total	C	N	O	S	0	0
			4250	2680	754	814	2		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
W	-2	GLY	-	expression tag	UNP C4R370
W	-1	PRO	-	expression tag	UNP C4R370
W	0	GLY	-	expression tag	UNP C4R370

- Molecule 19 is a protein called Transcription elongation factor Spt6.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	m	1178	Total	C	N	O	S	0	0
			9653	6112	1648	1866	27		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
m	-2	GLY	-	expression tag	UNP C4R7H2
m	-1	PRO	-	expression tag	UNP C4R7H2
m	0	GLY	-	expression tag	UNP C4R7H2

- Molecule 20 is a protein called Protein that interacts with Spt6p and copurifies with Spt5p and RNA polymerase II.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	n	139	Total	C	N	O	S	0	0
			1115	716	193	202	4		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
n	-2	GLY	-	expression tag	UNP C4R7L8
n	-1	PRO	-	expression tag	UNP C4R7L8
n	0	GLY	-	expression tag	UNP C4R7L8

- Molecule 21 is a protein called Component of the Paf1p complex.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	q	930	Total	C	N	O	S	0	0
			7552	4805	1283	1439	25		

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
q	-39	MET	-	initiating methionine	UNP C4R6B2
q	-38	LYS	-	expression tag	UNP C4R6B2
q	-37	ASP	-	expression tag	UNP C4R6B2
q	-36	HIS	-	expression tag	UNP C4R6B2
q	-35	LEU	-	expression tag	UNP C4R6B2
q	-34	ILE	-	expression tag	UNP C4R6B2
q	-33	HIS	-	expression tag	UNP C4R6B2
q	-32	ASN	-	expression tag	UNP C4R6B2
q	-31	HIS	-	expression tag	UNP C4R6B2
q	-30	HIS	-	expression tag	UNP C4R6B2
q	-29	LYS	-	expression tag	UNP C4R6B2
q	-28	HIS	-	expression tag	UNP C4R6B2
q	-27	GLU	-	expression tag	UNP C4R6B2
q	-26	HIS	-	expression tag	UNP C4R6B2
q	-25	ALA	-	expression tag	UNP C4R6B2
q	-24	HIS	-	expression tag	UNP C4R6B2
q	-23	ALA	-	expression tag	UNP C4R6B2
q	-22	GLU	-	expression tag	UNP C4R6B2
q	-21	HIS	-	expression tag	UNP C4R6B2
q	-20	ASP	-	expression tag	UNP C4R6B2
q	-19	TYR	-	expression tag	UNP C4R6B2
q	-18	LYS	-	expression tag	UNP C4R6B2
q	-17	ASP	-	expression tag	UNP C4R6B2
q	-16	ASP	-	expression tag	UNP C4R6B2
q	-15	ASP	-	expression tag	UNP C4R6B2
q	-14	ASP	-	expression tag	UNP C4R6B2
q	-13	LYS	-	expression tag	UNP C4R6B2
q	-12	GLU	-	expression tag	UNP C4R6B2
q	-11	HIS	-	expression tag	UNP C4R6B2
q	-10	LEU	-	expression tag	UNP C4R6B2
q	-9	TYR	-	expression tag	UNP C4R6B2
q	-8	PHE	-	expression tag	UNP C4R6B2
q	-7	GLN	-	expression tag	UNP C4R6B2
q	-6	GLY	-	expression tag	UNP C4R6B2
q	-5	SER	-	expression tag	UNP C4R6B2
q	-4	SER	-	expression tag	UNP C4R6B2
q	-3	GLY	-	expression tag	UNP C4R6B2
q	-2	SER	-	expression tag	UNP C4R6B2
q	-1	SER	-	expression tag	UNP C4R6B2
q	0	GLY	-	expression tag	UNP C4R6B2

- Molecule 22 is a protein called RNAPII-associated chromatin remodeling Paf1 complex sub-

unit.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	r	266	Total	C	N	O	S	0	0
			2139	1342	374	412	11		

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
r	-29	MET	-	initiating methionine	UNP F2QQ42
r	-28	LYS	-	expression tag	UNP F2QQ42
r	-27	ASP	-	expression tag	UNP F2QQ42
r	-26	HIS	-	expression tag	UNP F2QQ42
r	-25	LEU	-	expression tag	UNP F2QQ42
r	-24	ILE	-	expression tag	UNP F2QQ42
r	-23	HIS	-	expression tag	UNP F2QQ42
r	-22	ASN	-	expression tag	UNP F2QQ42
r	-21	HIS	-	expression tag	UNP F2QQ42
r	-20	HIS	-	expression tag	UNP F2QQ42
r	-19	LYS	-	expression tag	UNP F2QQ42
r	-18	HIS	-	expression tag	UNP F2QQ42
r	-17	GLU	-	expression tag	UNP F2QQ42
r	-16	HIS	-	expression tag	UNP F2QQ42
r	-15	ALA	-	expression tag	UNP F2QQ42
r	-14	HIS	-	expression tag	UNP F2QQ42
r	-13	ALA	-	expression tag	UNP F2QQ42
r	-12	GLU	-	expression tag	UNP F2QQ42
r	-11	HIS	-	expression tag	UNP F2QQ42
r	-10	LEU	-	expression tag	UNP F2QQ42
r	-9	TYR	-	expression tag	UNP F2QQ42
r	-8	PHE	-	expression tag	UNP F2QQ42
r	-7	GLN	-	expression tag	UNP F2QQ42
r	-6	GLY	-	expression tag	UNP F2QQ42
r	-5	SER	-	expression tag	UNP F2QQ42
r	-4	SER	-	expression tag	UNP F2QQ42
r	-3	GLY	-	expression tag	UNP F2QQ42
r	-2	SER	-	expression tag	UNP F2QQ42
r	-1	SER	-	expression tag	UNP F2QQ42
r	0	GLY	-	expression tag	UNP F2QQ42

- Molecule 23 is a protein called Histone-lysine N-methyltransferase, H3 lysine-36 specific.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	s	430	Total	C	N	O	S	0	0
			3415	2124	592	676	23		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
s	-2	GLY	-	expression tag	UNP C4QY01
s	-1	PRO	-	expression tag	UNP C4QY01
s	0	GLY	-	expression tag	UNP C4QY01

- Molecule 24 is a protein called Leo1.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	u	208	Total	C	N	O	S	0	0
			1707	1063	304	337	3		

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
u	-29	MET	-	initiating methionine	UNP C4R3K1
u	-28	LYS	-	expression tag	UNP C4R3K1
u	-27	ASP	-	expression tag	UNP C4R3K1
u	-26	HIS	-	expression tag	UNP C4R3K1
u	-25	LEU	-	expression tag	UNP C4R3K1
u	-24	ILE	-	expression tag	UNP C4R3K1
u	-23	HIS	-	expression tag	UNP C4R3K1
u	-22	ASN	-	expression tag	UNP C4R3K1
u	-21	HIS	-	expression tag	UNP C4R3K1
u	-20	HIS	-	expression tag	UNP C4R3K1
u	-19	LYS	-	expression tag	UNP C4R3K1
u	-18	HIS	-	expression tag	UNP C4R3K1
u	-17	GLU	-	expression tag	UNP C4R3K1
u	-16	HIS	-	expression tag	UNP C4R3K1
u	-15	ALA	-	expression tag	UNP C4R3K1
u	-14	HIS	-	expression tag	UNP C4R3K1
u	-13	ALA	-	expression tag	UNP C4R3K1
u	-12	GLU	-	expression tag	UNP C4R3K1
u	-11	HIS	-	expression tag	UNP C4R3K1
u	-10	LEU	-	expression tag	UNP C4R3K1
u	-9	TYR	-	expression tag	UNP C4R3K1
u	-8	PHE	-	expression tag	UNP C4R3K1
u	-7	GLN	-	expression tag	UNP C4R3K1
u	-6	GLY	-	expression tag	UNP C4R3K1
u	-5	SER	-	expression tag	UNP C4R3K1
u	-4	SER	-	expression tag	UNP C4R3K1
u	-3	GLY	-	expression tag	UNP C4R3K1
u	-2	SER	-	expression tag	UNP C4R3K1

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Chain	Residue	Modelled	Actual	Comment	Reference
u	-1	SER	-	expression tag	UNP C4R3K1
u	0	GLY	-	expression tag	UNP C4R3K1

- Molecule 25 is a protein called RNAP II-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	v	349	Total	C	N	O	S	0	0
			2878	1835	510	528	5		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
v	-2	GLY	-	expression tag	UNP C4R997
v	-1	SER	-	expression tag	UNP C4R997
v	0	ALA	-	expression tag	UNP C4R997

- Molecule 26 is a protein called Constituent of Paf1 complex with RNA polymerase II, Paf1p, Hpr1p, Ctr9, Leo1, Rtf1 and Ccr4p.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	x	205	Total	C	N	O	S	0	0
			1682	1086	287	307	2		

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
x	-29	MET	-	initiating methionine	UNP C4R1E6
x	-28	LYS	-	expression tag	UNP C4R1E6
x	-27	ASP	-	expression tag	UNP C4R1E6
x	-26	HIS	-	expression tag	UNP C4R1E6
x	-25	LEU	-	expression tag	UNP C4R1E6
x	-24	ILE	-	expression tag	UNP C4R1E6
x	-23	HIS	-	expression tag	UNP C4R1E6
x	-22	ASN	-	expression tag	UNP C4R1E6
x	-21	HIS	-	expression tag	UNP C4R1E6
x	-20	HIS	-	expression tag	UNP C4R1E6
x	-19	LYS	-	expression tag	UNP C4R1E6
x	-18	HIS	-	expression tag	UNP C4R1E6
x	-17	GLU	-	expression tag	UNP C4R1E6
x	-16	HIS	-	expression tag	UNP C4R1E6
x	-15	ALA	-	expression tag	UNP C4R1E6
x	-14	HIS	-	expression tag	UNP C4R1E6

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Chain	Residue	Modelled	Actual	Comment	Reference
x	-13	ALA	-	expression tag	UNP C4R1E6
x	-12	GLU	-	expression tag	UNP C4R1E6
x	-11	HIS	-	expression tag	UNP C4R1E6
x	-10	LEU	-	expression tag	UNP C4R1E6
x	-9	TYR	-	expression tag	UNP C4R1E6
x	-8	PHE	-	expression tag	UNP C4R1E6
x	-7	GLN	-	expression tag	UNP C4R1E6
x	-6	GLY	-	expression tag	UNP C4R1E6
x	-5	SER	-	expression tag	UNP C4R1E6
x	-4	SER	-	expression tag	UNP C4R1E6
x	-3	GLY	-	expression tag	UNP C4R1E6
x	-2	SER	-	expression tag	UNP C4R1E6
x	-1	SER	-	expression tag	UNP C4R1E6
x	0	GLY	-	expression tag	UNP C4R1E6

- Molecule 27 is a protein called Histone H3.3.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	a	91	Total	C	N	O	S	0	0
			739	466	141	130	2		
27	e	104	Total	C	N	O	S	0	0
			841	530	163	145	3		

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	-3	GLY	-	expression tag	UNP P84243
a	-2	SER	-	expression tag	UNP P84243
a	-1	HIS	-	expression tag	UNP P84243
a	36	MET	LYS	variant	UNP P84243
e	-3	GLY	-	expression tag	UNP P84243
e	-2	SER	-	expression tag	UNP P84243
e	-1	HIS	-	expression tag	UNP P84243
e	36	MET	LYS	variant	UNP P84243

- Molecule 28 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	b	82	Total	C	N	O	S	0	0
			653	412	127	113	1		
28	f	78	Total	C	N	O	S	0	0
			619	391	120	107	1		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
b	-3	GLY	-	expression tag	UNP P62805
b	-2	SER	-	expression tag	UNP P62805
b	-1	HIS	-	expression tag	UNP P62805
f	-3	GLY	-	expression tag	UNP P62805
f	-2	SER	-	expression tag	UNP P62805
f	-1	HIS	-	expression tag	UNP P62805

- Molecule 29 is a protein called Histone H2A type 1-B/E.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	c	106	Total	C	N	O	0	0
			819	517	160	142		
29	g	94	Total	C	N	O	0	0
			725	456	141	128		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
c	-3	GLY	-	expression tag	UNP P04908
c	-2	SER	-	expression tag	UNP P04908
c	-1	HIS	-	expression tag	UNP P04908
g	-3	GLY	-	expression tag	UNP P04908
g	-2	SER	-	expression tag	UNP P04908
g	-1	HIS	-	expression tag	UNP P04908

- Molecule 30 is a protein called Histone H2B type 1-J.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	d	94	Total	C	N	O	S	0	0
			732	459	131	139	3		
30	h	90	Total	C	N	O	S	0	0
			696	438	122	133	3		

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
d	-3	GLY	-	expression tag	UNP P06899
d	-2	SER	-	expression tag	UNP P06899
d	-1	HIS	-	expression tag	UNP P06899
d	120	CYS	LYS	engineered mutation	UNP P06899
h	-3	GLY	-	expression tag	UNP P06899

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Chain	Residue	Modelled	Actual	Comment	Reference
h	-2	SER	-	expression tag	UNP P06899
h	-1	HIS	-	expression tag	UNP P06899
h	120	CYS	LYS	engineered mutation	UNP P06899

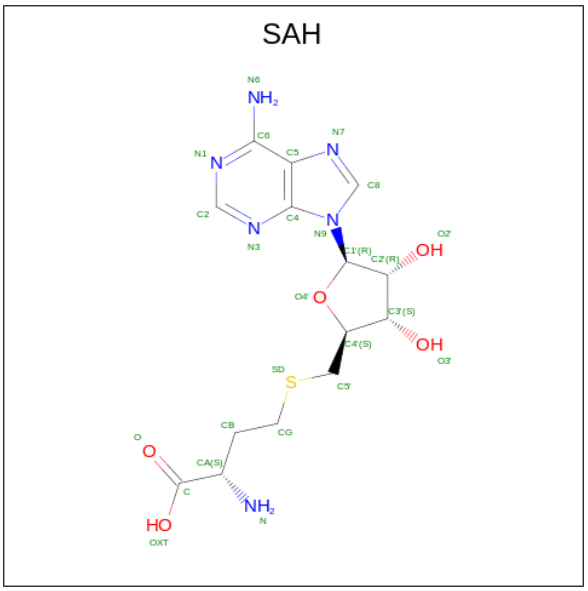
- Molecule 31 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
31	A	2	Total Zn 2 2	0
31	B	1	Total Zn 1 1	0
31	C	1	Total Zn 1 1	0
31	I	2	Total Zn 2 2	0
31	J	1	Total Zn 1 1	0
31	L	1	Total Zn 1 1	0
31	M	1	Total Zn 1 1	0
31	V	1	Total Zn 1 1	0
31	s	3	Total Zn 3 3	0

- Molecule 32 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

- Molecule 33 is S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula: $C_{14}H_{20}N_6O_5S$).



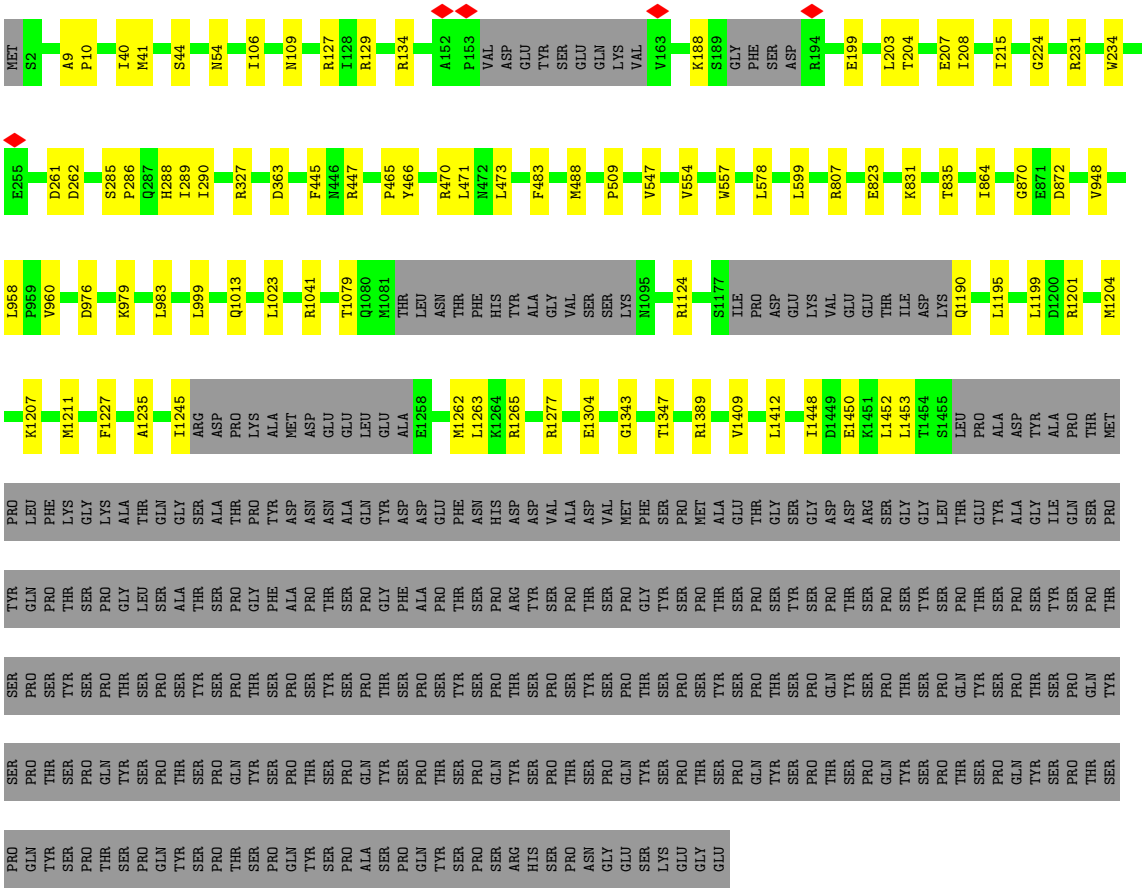
Mol	Chain	Residues	Atoms					AltConf
33	s	1	Total	C	N	O	S	0
			26	14	6	5	1	

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.

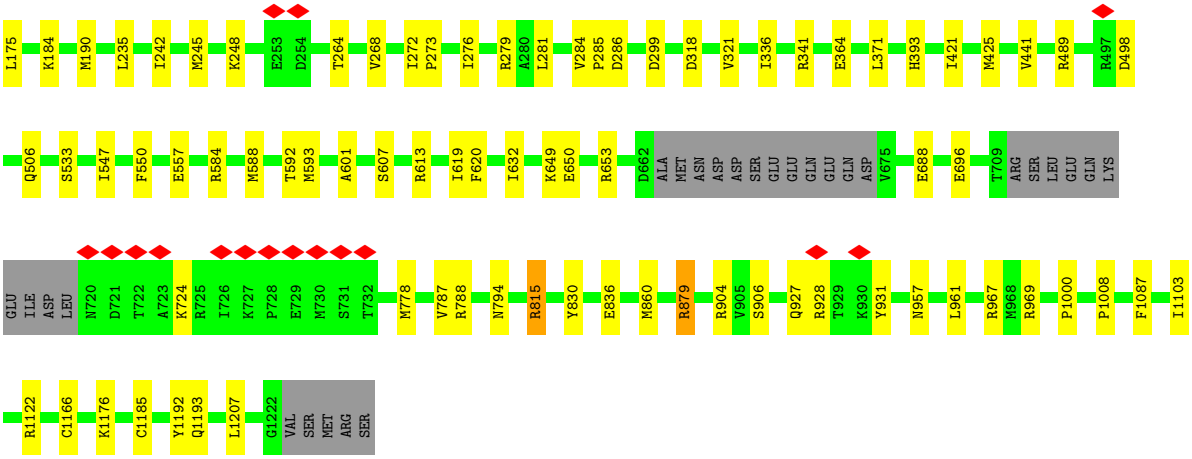
• Molecule 1: DNA-directed RNA polymerase subunit

Chain A:



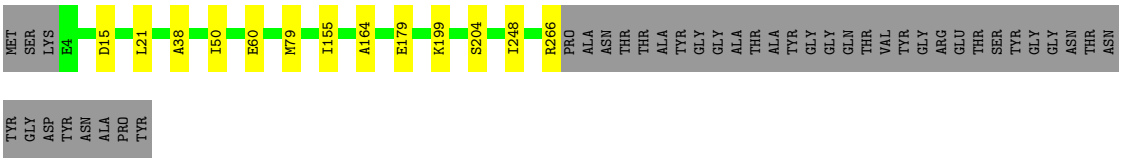
• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain B:



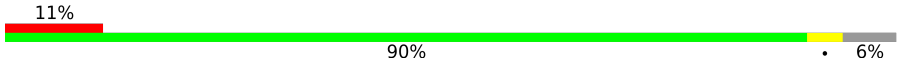
• Molecule 3: RNA polymerase II third largest subunit B44, part of central core

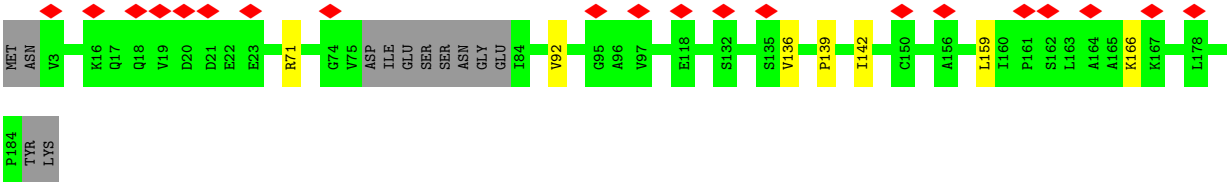
Chain C:



• Molecule 4: RNA polymerase II subunit B32

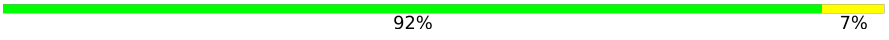
Chain D:





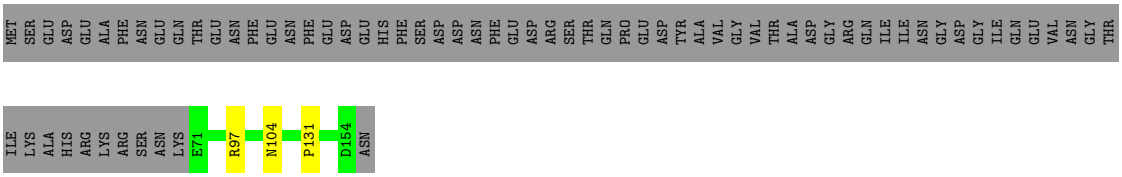
• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1

Chain E:



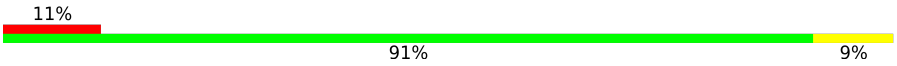
• Molecule 6: RNA polymerase subunit ABC23, common to RNA polymerases I, II, and III

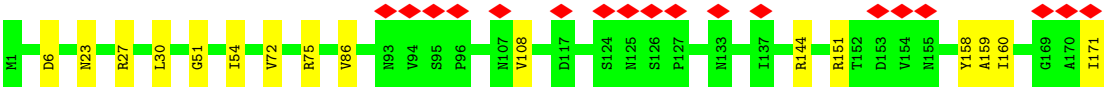
Chain F:



• Molecule 7: RNA polymerase II subunit

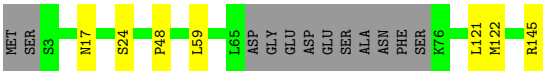
Chain G:





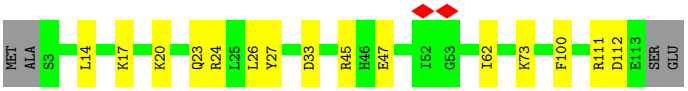
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:



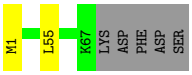
• Molecule 9: DNA-directed RNA polymerase subunit

Chain I:



• Molecule 10: RNA polymerase subunit ABC10-beta, common to RNA polymerases I, II, and III

Chain J:

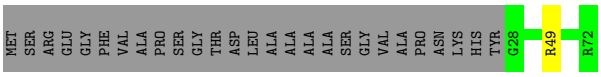


• Molecule 11: RNA polymerase II subunit B12.5

Chain K:

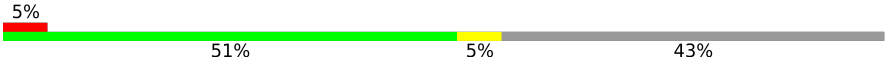
• Molecule 12: RNA polymerase subunit ABC10-alpha

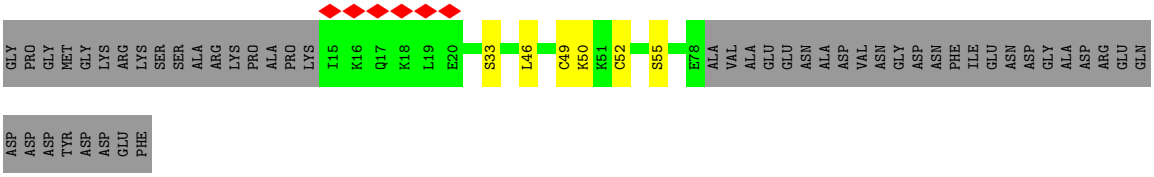
Chain L:



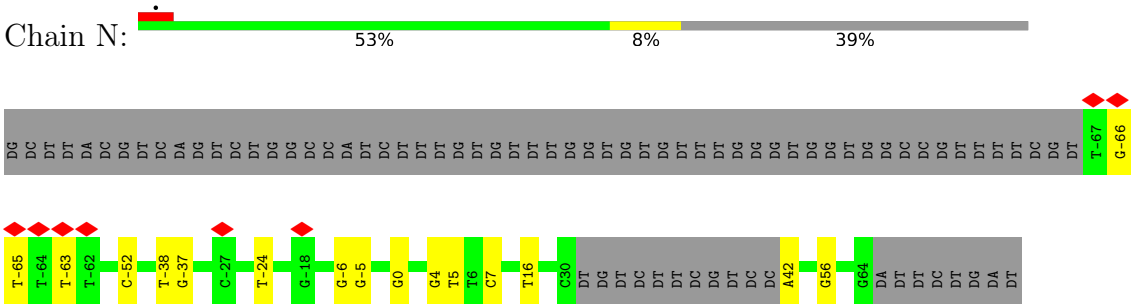
• Molecule 13: Transcription elongation factor 1 homolog

Chain M:

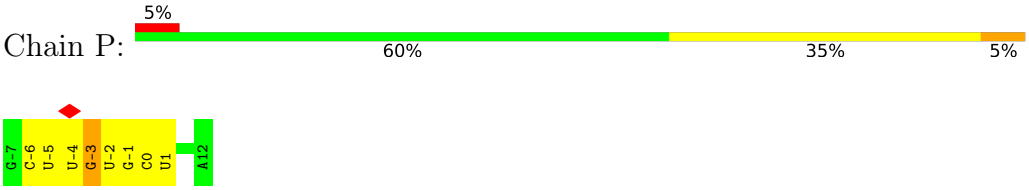




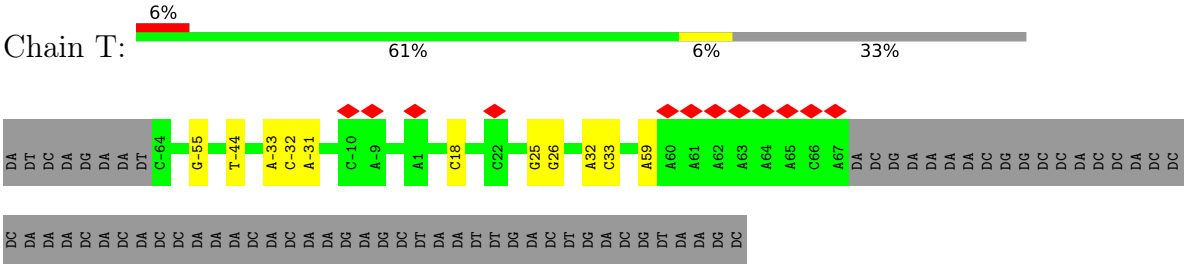
• Molecule 14: DNA (198-MER)



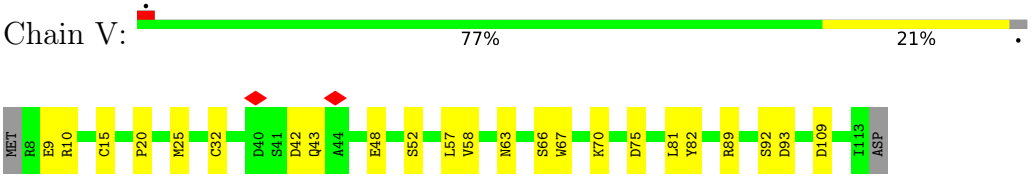
• Molecule 15: RNA (5'-R(P*GP*CP*UP*UP*GP*UP*GP*CP*UP*GP*UP*CP*UP*UP*CP*GP*UP*CP*CP*A)-3')



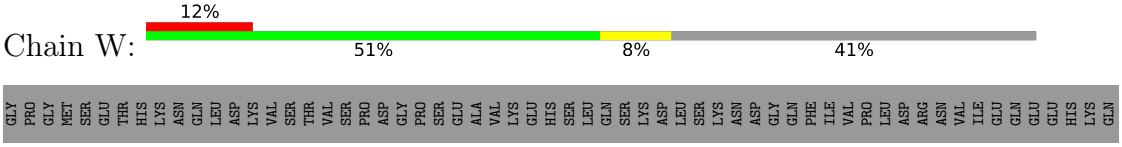
• Molecule 16: DNA (198-MER)

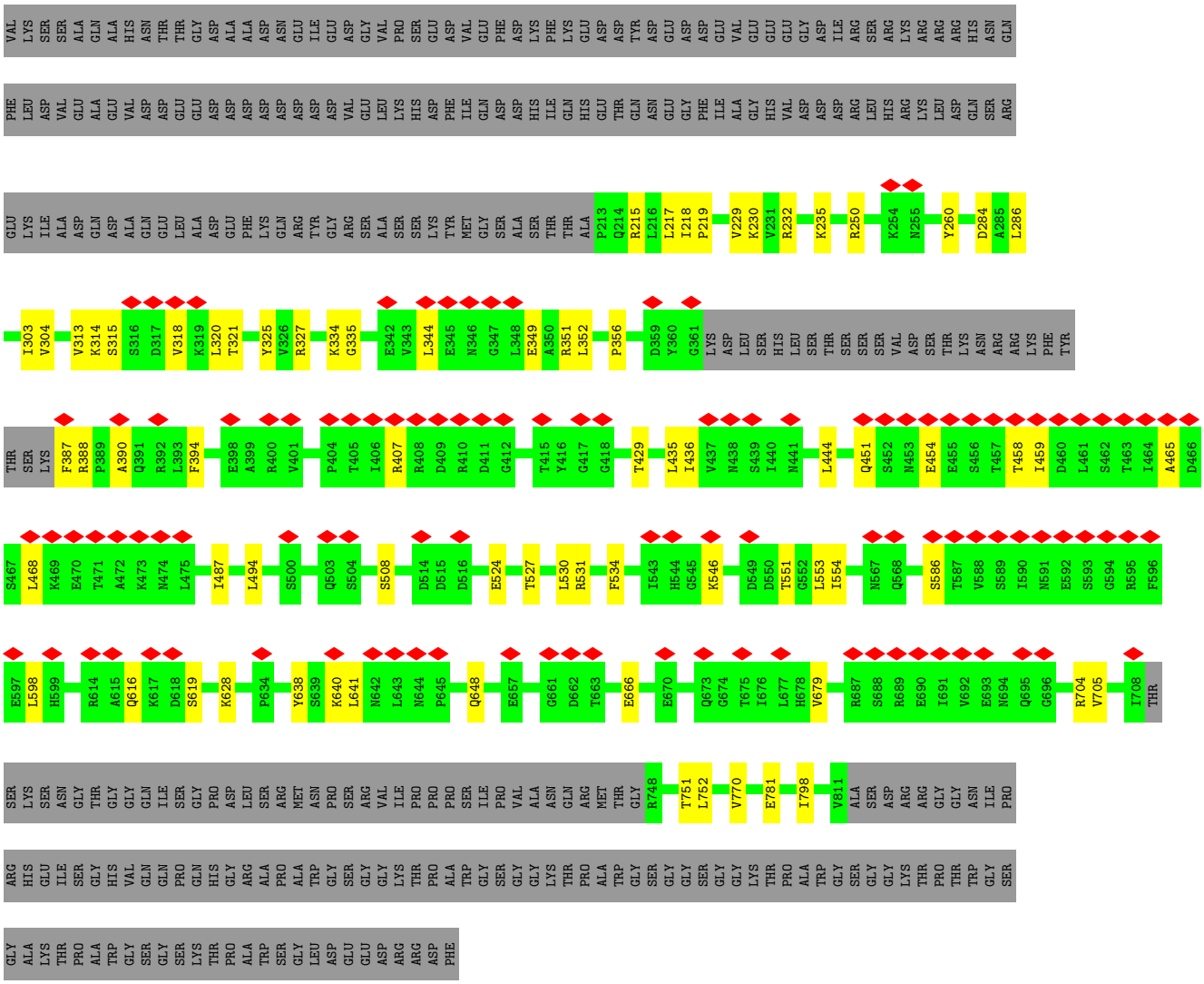


• Molecule 17: Transcription elongation factor SPT4



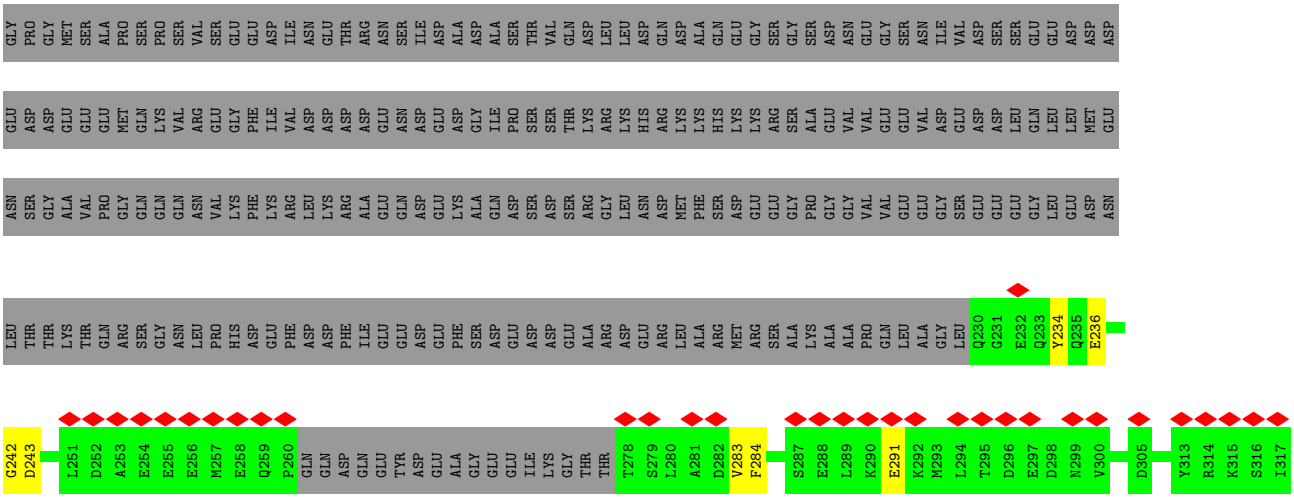
• Molecule 18: Transcription elongation factor SPT5

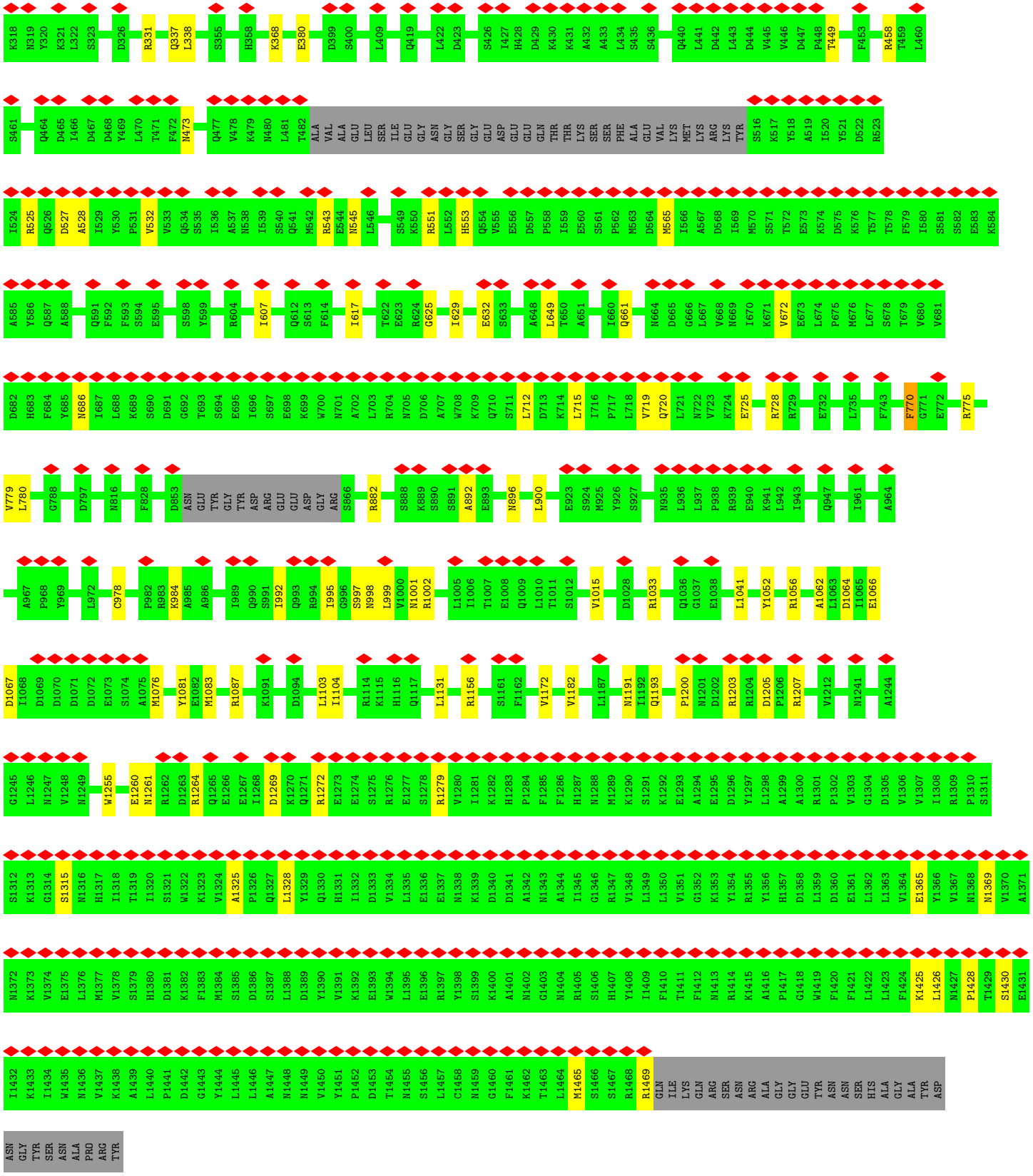




• Molecule 19: Transcription elongation factor Spt6

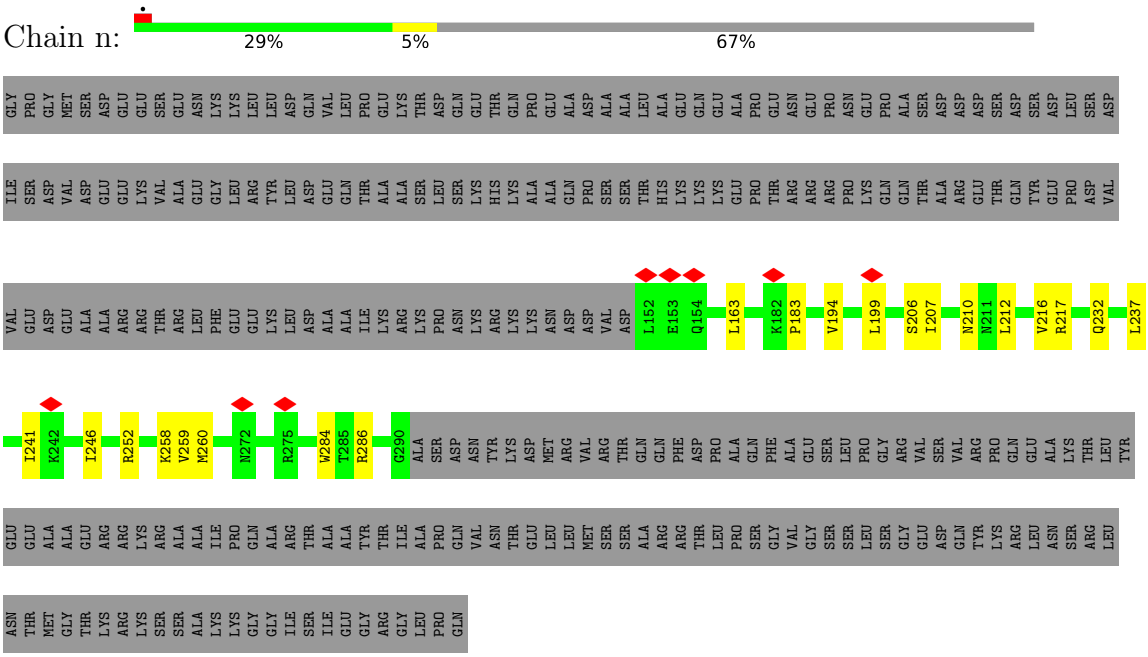
Chain m:





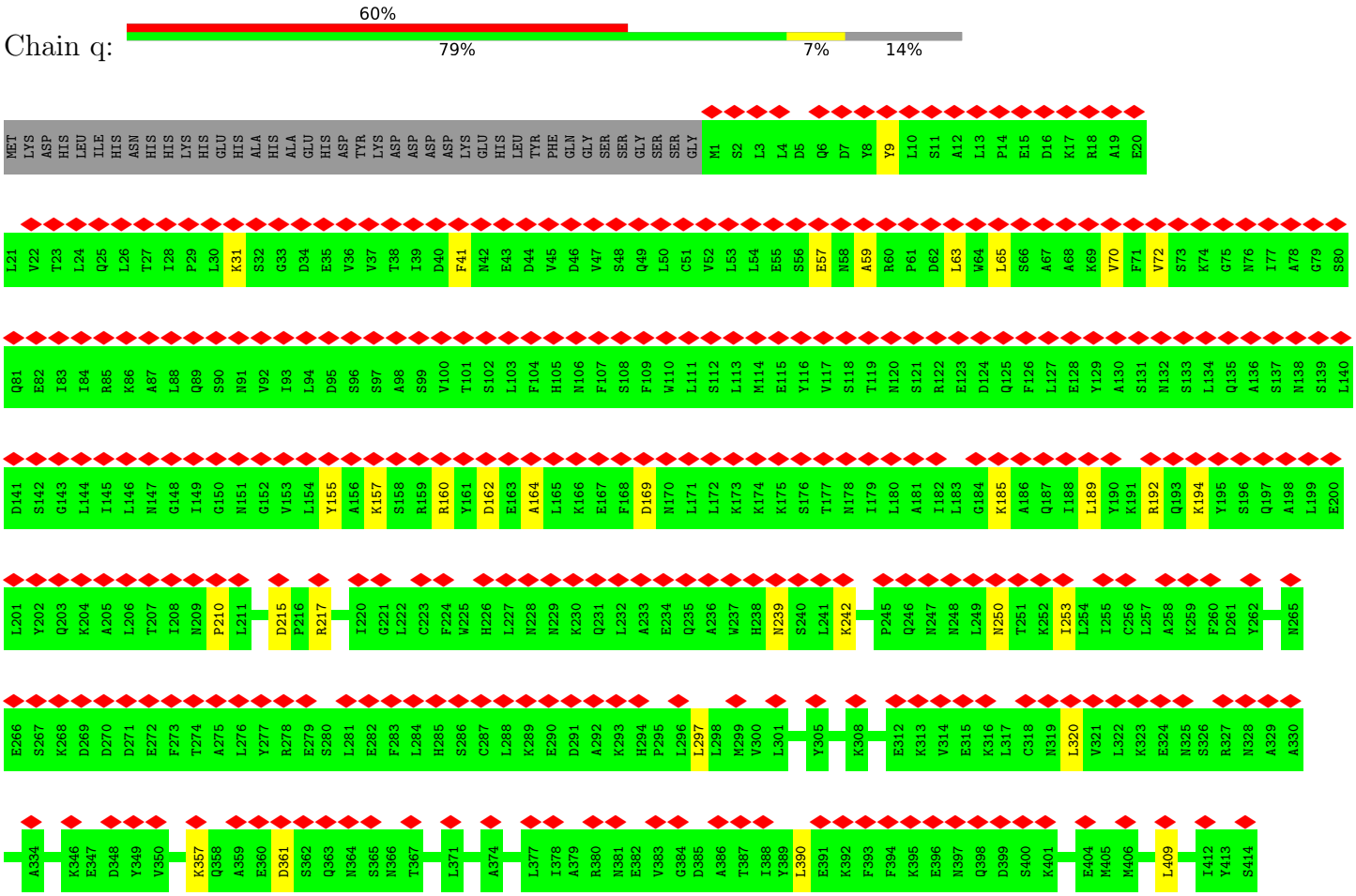
• Molecule 20: Protein that interacts with Spt6p and copurifies with Spt5p and RNA polymerase II

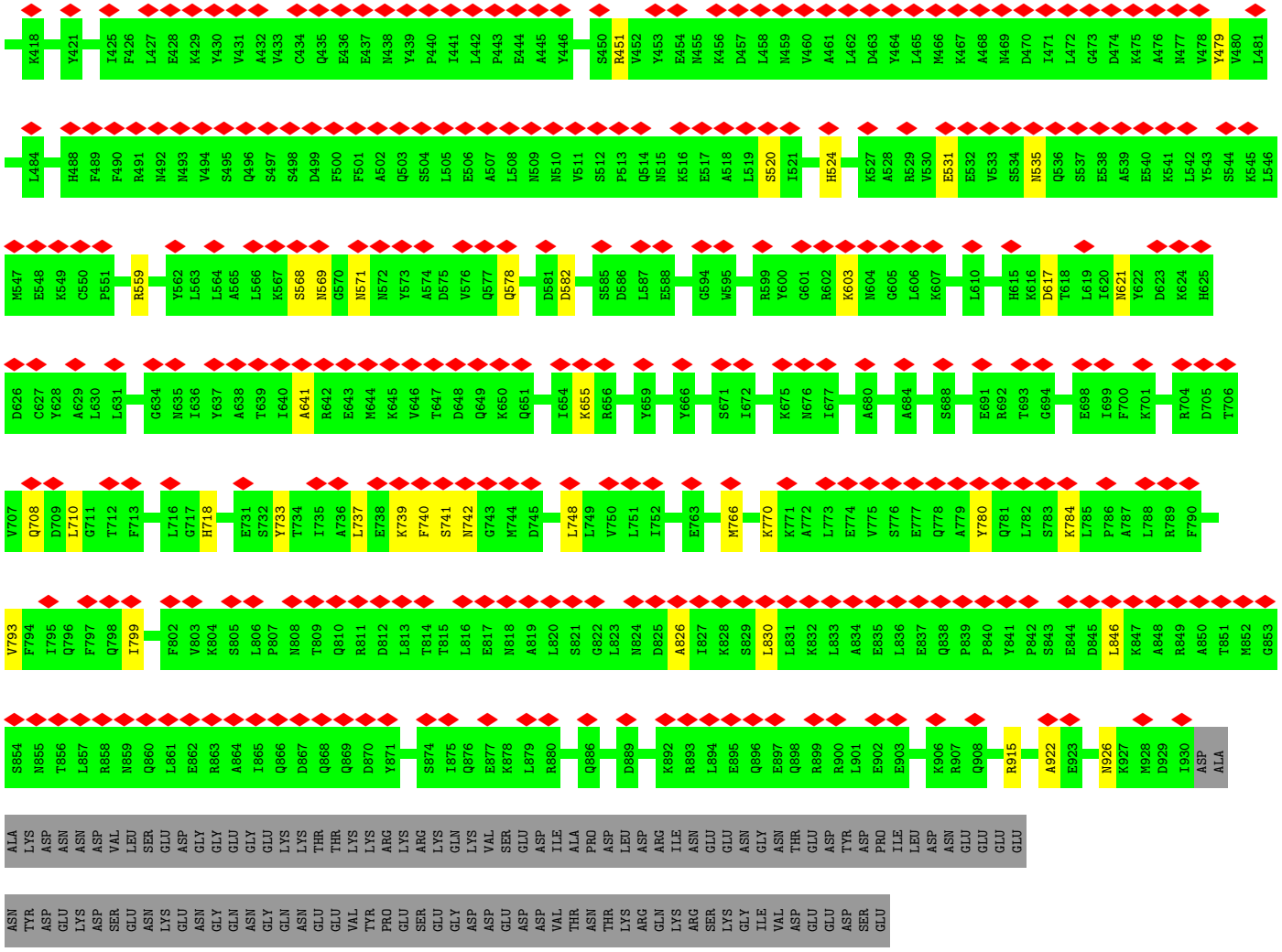
Chain n:

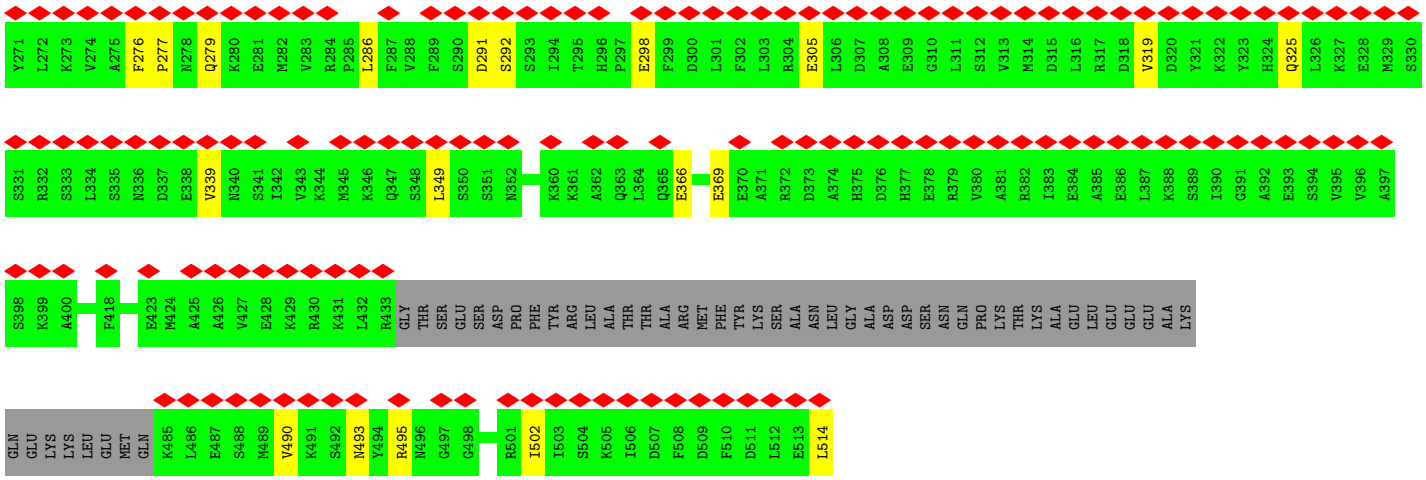


• Molecule 21: Component of the Paf1p complex

Chain q:

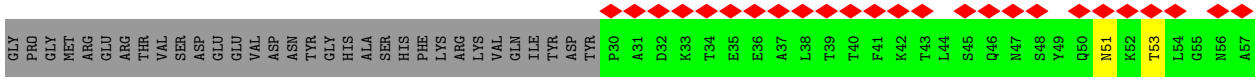


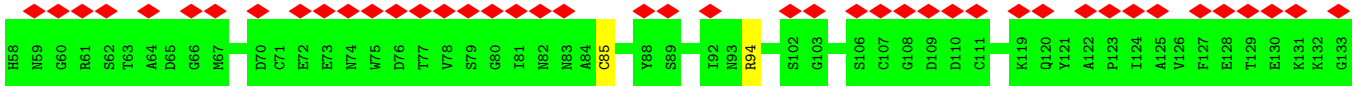

K418 Y421 I425 F426 L427 E428 K429 Y430 V431 A432 V433 C434 Q435 E436 E437 N438 Y439 P440 I441 L442 P443 E444 A445 Y446 S450 R451 V452 Y453 E454 N455 K456 D457 L458 M459 V460 A461 L462 D463 Y464 L465 M466 K467 A468 N469 D470 I471 L472 G473 D474 K475 A476 N477 V478 Y479 V480 L481
L484 H488 F489 F490 R491 N492 N493 V494 S495 Q496 S497 S498 D499 F500 F501 A502 Q503 S504 L505 E506 A507 L508 N509 N510 V511 S512 P513 Q514 N515 K516 E517 A518 L519 S520 I521 H524 K527 A528 R529 V530 E531 E532 V533 S534 N535 Q536 S537 E538 A539 E540 K541 L542 Y543 S544 K545 L546
M547 E548 K549 C550 P551 R559 Y562 L563 L564 A565 L566 K567 S568 N569 G570 N571 N572 Y573 A574 D575 V576 Q577 Q578 D581 D582 S585 D586 L587 E588 G594 W595 R599 Y600 G601 R602 K603 N604 G605 L606 K607 L610 H615 K616 D617 T618 L619 I620 N621 Y622 D623 K624 H625
D626 C627 Y628 A629 L630 L631 G634 N635 I636 Y637 A638 T639 I640 A641 R642 E643 M644 K645 V646 T647 D648 Q649 K650 Q651 I654 K655 R656 Y659 Y666 S671 I672 K675 N676 I677 A680 A684 S688 E691 R692 T693 G694 E698 I699 F700 K701 R704 D705 T706
V707 Q708 D709 L710 G711 T712 F713 L716 G717 H718 E731 S732 Y733 T734 I735 A736 L737 E738 K739 F740 S741 N742 G743 M744 D745 L748 L749 V750 L751 I752 E763 M766 K770 K771 A772 L773 E774 V775 S776 E777 Q778 A779 Y780 Q781 L782 S783 K784 L785 P786 A787 L788 R789 F790
V793 F794 I795 Q796 F797 Q798 I799 F802 V803 K804 S805 L806 P807 N808 T809 Q810 R811 D812 L813 T814 T815 L816 E817 N818 A819 L820 S821 G822 L823 N824 D825 A826 I827 K828 S829 L830 L831 K832 L833 A834 E835 L836 E837 Q838 P839 P840 Y841 P842 S843 E844 D845 L846 K847 A848 R849 A850 T851 M852 G853
S854 N855 T856 L857 R858 N859 Q860 L861 E862 R863 A864 I865 Q866 D867 Q868 Q869 D870 Y871 S874 I875 Q876 E877 K878 L879 R880 Q886 D889 K892 R893 L894 E895 Q896 E897 Q898 R899 R900 L901 E902 E903 K906 R907 Q908 R915 A922 E923 N926 K927 M928 D929 I930 ASP ALA
ALA LYS ASP ASN ASN ASP VAL LEU SER GLU ASP GLY GLY GLU GLY GLU LYS LYS THR THR LYS LYS ARG LYS ARG LYS GLN LYS VAL SER GLU ASP ILE ALA PRO ASP LEU ASP ARG ILE ASN GLU GLU ASN GLY ASN THR GLU ASP TYR ASP PRO ILE LEU LEU ASP ASN GLU GLU GLU GLU
ASN TYR ASP GLU LYS ASP SER GLU ASN LYS GLU ASN GLY GLN ASN GLY GLN ASN GLU GLU VAL TYR PRO GLU SER GLU GLY ASP GLU ASP ASP VAL THR ASN THR LYS ARG GLN LYS ARG SER LYS GLY ILE VAL ASP GLU GLU ASP SER GLU
• Molecule 22: RNAPII-associated chromatin remodeling Paf1 complex subunit
Chain r:
39%
43%
6%
51%
MET LYS ASP HIS LEU ILE HIS ASN HIS HIS LYS HIS GLU HIS ALA HIS ALA GLU HIS LEU TYR PHE GLN GLY SER SER GLY SER SER GLY MET SER ASP LYS GLU GLN ASP LEU ASP GLU ASP LEU LEU ALA LEU ALA GLY GLY ALA GLY SER ASP SER GLU SER ASN SER ALA TYR SER PRO
GLU GLN GLU VAL SER ARG LYS SER LYS LYS ILE VAL ASN ASP SER GLU ASP GLU ASN ASN ASP SER ASP GLY GLU GLN LEU LEU ASN PRO TYR PRO LEU GLU ASP LYS PHE LYS ASP GLU ALA ASP ARG ALA ARG LEU LEU LEU GLY LEU SER GLU MET GLU ARG GLU ALA ILE LEU TYR GLU
ARG SER GLN GLU VAL ILE LYS LEU LYS GLU LYS HIS LEU LEU SER LEU ARG ALA LYS GLN SER GLN LEU GLU LYS THR ALA ARG GLU GLY PRO LYS SER SER LYS THR ASN LYS LEU SER GLU LEU LYS LYS GLN ARG GLU GLN LYS SER LYS ARG GLN ARG SER ASP GLU TYR SER ASP
GLU GLU ASP ASP TYR ARG TYR GLU GLU GLU VAL GLY ASP ASN ASP ASP MET SER ASP ASN TYR ILE ASP GLU ASP ASP ALA VAL PHE VAL GLU PRO LYS LYS SER SER ARG SER GLN GLU LEU S193 K194 P195 A196 T197 L198 S199 D200 I201 N202 K203 I204 I205 F206 G207 R208 T209 A210
M211 S212 K213 Y214 W215 Y216 Y217 P218 E219 F220 D221 D222 V223 V224 K225 G226 M227 Y228 L229 R230 L231 N232 T233 G234 S235 GLY GLY ASN GLY PHE S241 P242 Y243 K244 V245 V246 E247 V248 L249 G250 S251 Q252 R253 I254 K255 G256 S257 A258 Y259 G260 L261 N262 S263 K264 E265 N266 N267 C268 D269 M270

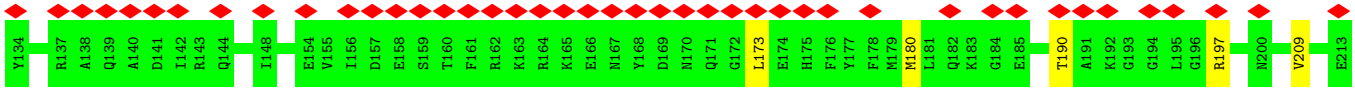


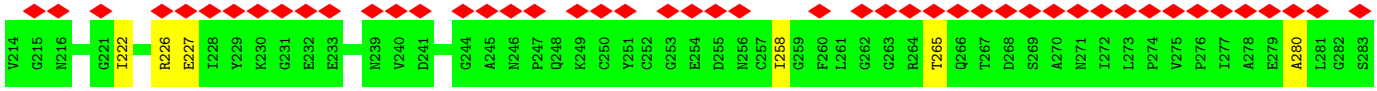
• Molecule 23: Histone-lysine N-methyltransferase, H3 lysine-36 specific

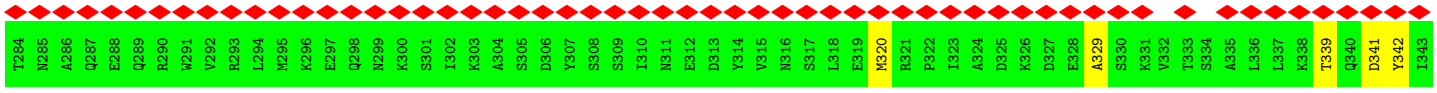
Chain s:

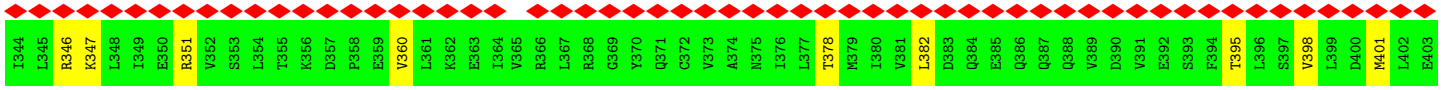


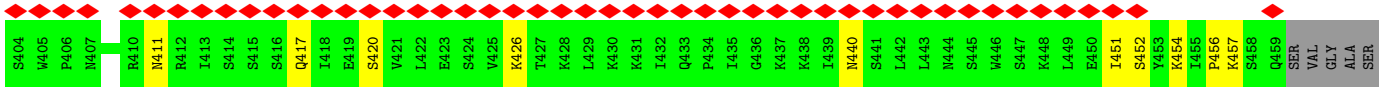


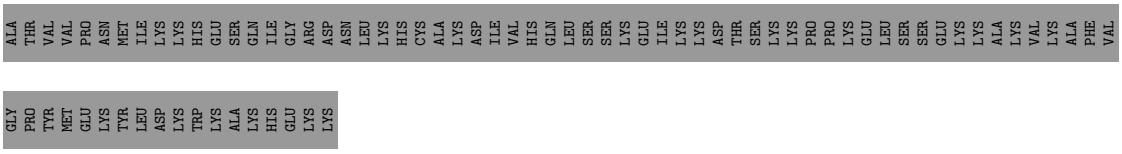






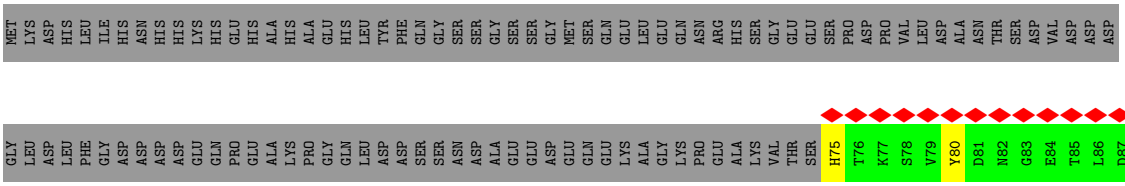






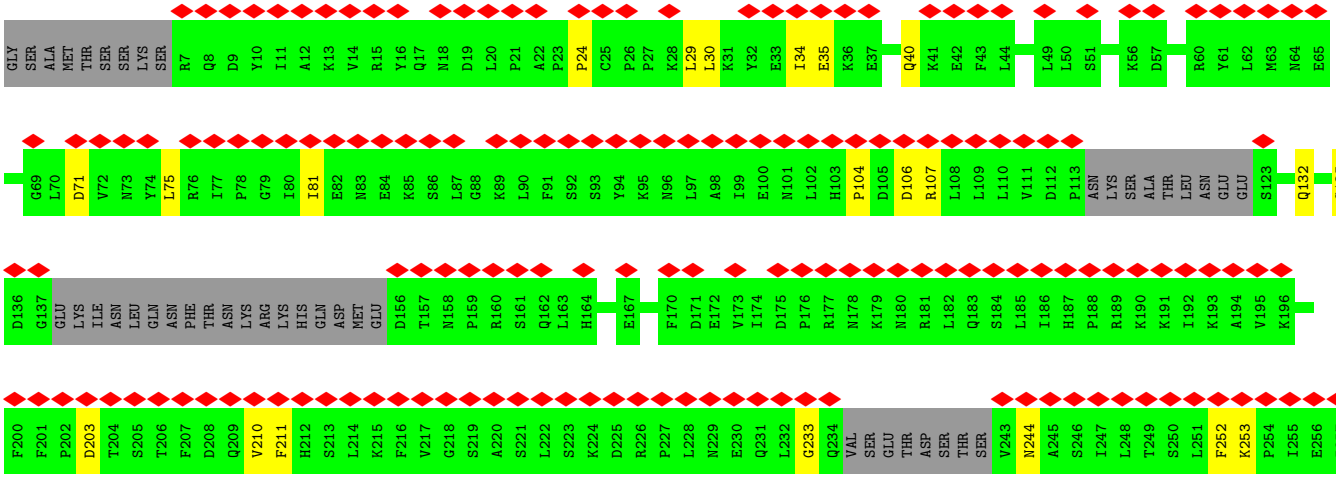
• Molecule 24: Leo1

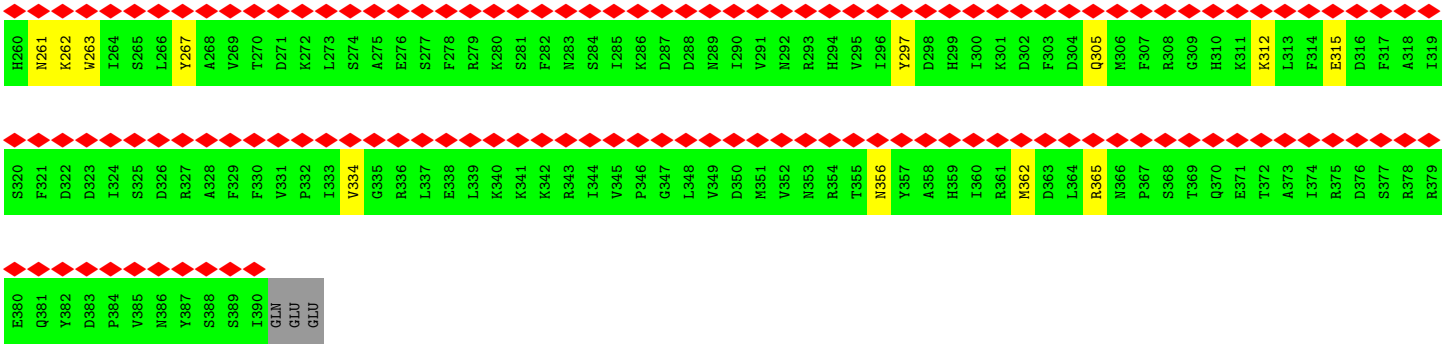
Chain u:



• Molecule 25: RNAP II-associated protein

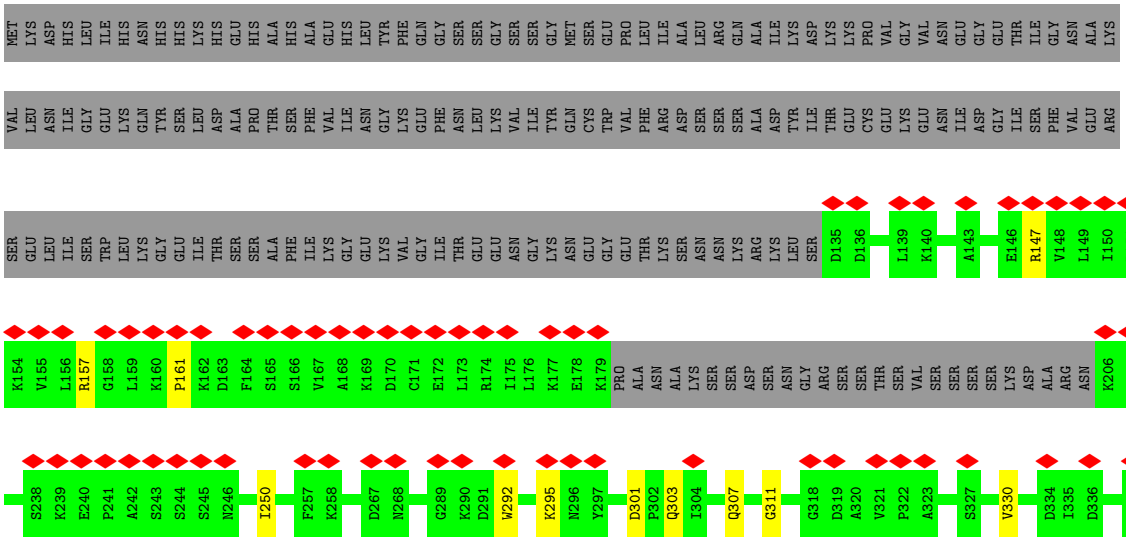
Chain v:





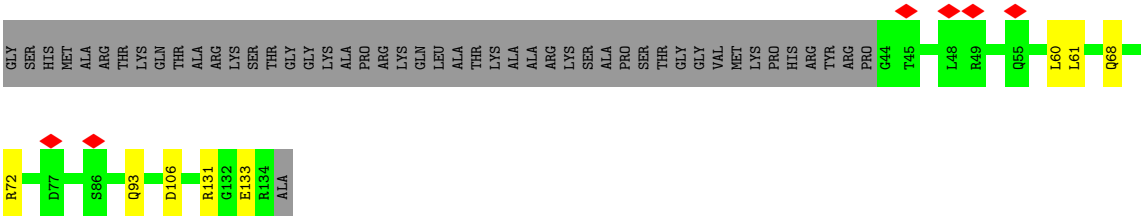
• Molecule 26: Constituent of Paf1 complex with RNA polymerase II, Paf1p, Hpr1p, Ctr9, Leo1, Rtf1 and Ccr4p

Chain x:



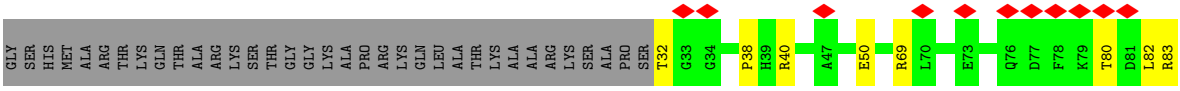
• Molecule 27: Histone H3.3

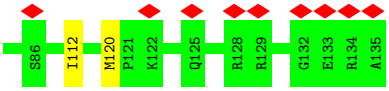
Chain a:



• Molecule 27: Histone H3.3

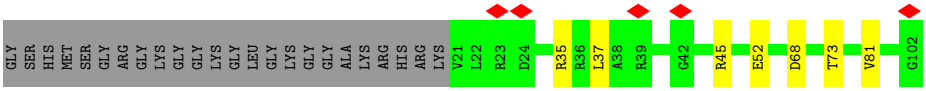
Chain e:





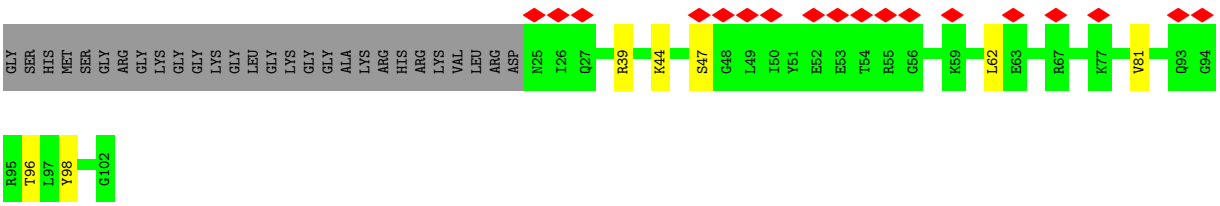
• Molecule 28: Histone H4

Chain b:



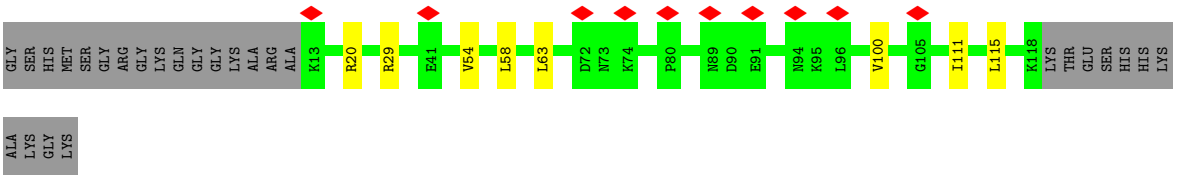
• Molecule 28: Histone H4

Chain f:



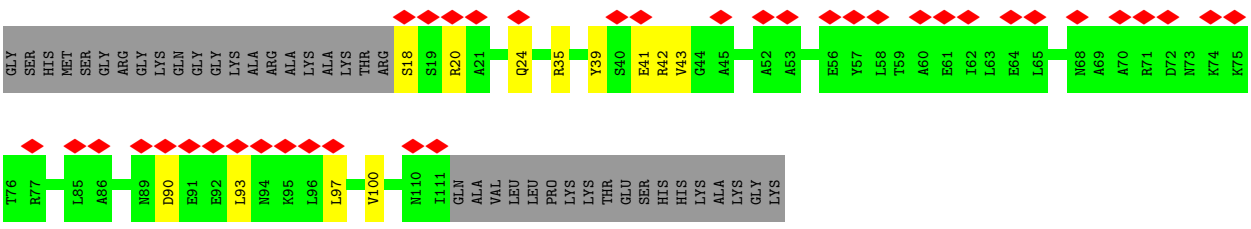
• Molecule 29: Histone H2A type 1-B/E

Chain c:



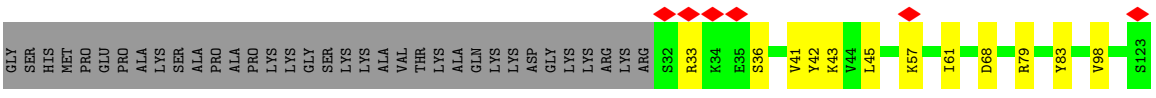
• Molecule 29: Histone H2A type 1-B/E

Chain g:



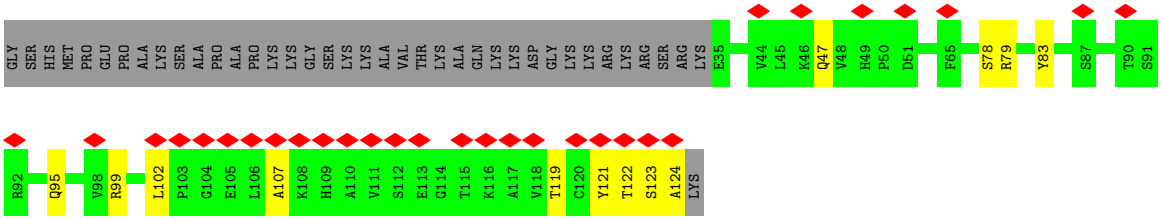
• Molecule 30: Histone H2B type 1-J

Chain d:



• Molecule 30: Histone H2B type 1-J

Chain h:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	35823	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	58	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.151	Depositor
Minimum map value	-0.051	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	398.25, 398.25, 398.25	wwPDB
Map dimensions	270, 270, 270	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.475, 1.475, 1.475	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: SAH, 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	0.20	0/11267	0.42	0/15222
2	B	0.20	0/9464	0.43	0/12763
3	C	0.20	0/2139	0.40	0/2895
4	D	0.14	0/1361	0.33	0/1837
5	E	0.19	0/1773	0.43	0/2385
6	F	0.18	0/687	0.37	0/931
7	G	0.14	0/1354	0.33	0/1837
8	H	0.20	0/1070	0.38	0/1444
9	I	0.11	0/934	0.28	0/1257
10	J	0.19	0/563	0.41	0/753
11	K	0.20	0/953	0.41	0/1291
12	L	0.20	0/365	0.45	0/484
13	M	0.15	0/513	0.37	0/693
14	N	0.29	0/2770	0.59	0/4278
15	P	0.25	0/462	0.59	0/716
16	T	0.27	0/3055	0.51	0/4706
17	V	0.16	0/840	0.44	0/1140
18	W	0.17	0/4319	0.41	0/5838
19	m	0.17	0/9847	0.38	0/13321
20	n	0.17	0/1132	0.38	0/1526
21	q	0.16	0/7689	0.33	0/10368
22	r	0.16	0/2169	0.34	0/2901
23	s	0.20	0/3469	0.49	0/4670
24	u	0.14	0/1740	0.31	0/2347
25	v	0.15	0/2944	0.33	0/3973
26	x	0.13	0/1716	0.30	0/2310
27	a	0.27	0/747	0.56	0/1001
27	e	0.28	0/853	0.55	0/1144
28	b	0.26	0/660	0.58	0/883
28	f	0.28	0/626	0.54	0/837
29	c	0.24	0/829	0.58	0/1118
29	g	0.23	0/734	0.52	0/991

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
30	d	0.25	0/743	0.57	0/998
30	h	0.27	0/707	0.62	0/954
All	All	0.20	0/80494	0.42	0/109812

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11064	0	11090	61	0
2	B	9284	0	9282	58	0
3	C	2098	0	2057	10	0
4	D	1349	0	1345	4	0
5	E	1741	0	1754	11	0
6	F	677	0	693	3	0
7	G	1325	0	1342	10	0
8	H	1053	0	1050	4	0
9	I	917	0	864	10	0
10	J	554	0	573	1	0
11	K	932	0	944	11	0
12	L	359	0	358	1	0
13	M	505	0	495	3	0
14	N	2482	0	1378	12	0
15	P	417	0	213	1	0
16	T	2710	0	1459	10	0
17	V	824	0	795	22	0
18	W	4250	0	4296	69	0
19	m	9653	0	9500	68	0
20	n	1115	0	1186	20	0
21	q	7552	0	7545	44	0
22	r	2139	0	2155	18	0
23	s	3415	0	3351	27	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
24	u	1707	0	1676	20	0
25	v	2878	0	2873	26	0
26	x	1682	0	1731	8	0
27	a	739	0	778	5	0
27	e	841	0	883	10	0
28	b	653	0	696	6	0
28	f	619	0	659	7	0
29	c	819	0	879	10	0
29	g	725	0	764	14	0
30	d	732	0	750	11	0
30	h	696	0	706	9	0
31	A	2	0	0	0	0
31	B	1	0	0	0	0
31	C	1	0	0	0	0
31	I	2	0	0	0	0
31	J	1	0	0	0	0
31	L	1	0	0	0	0
31	M	1	0	0	0	0
31	V	1	0	0	0	0
31	s	3	0	0	0	0
32	A	1	0	0	0	0
33	s	26	0	19	0	0
All	All	78546	0	76139	473	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 3.

All (473) 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)
17:V:43:GLN:HB2	29:g:42:ARG:HD2	1.67	0.76
18:W:215:ARG:NH2	19:m:234:TYR:HE1	1.85	0.75
23:s:258:ILE:HG21	23:s:265:THR:HG21	1.68	0.74
18:W:304:VAL:HB	20:n:286:ARG:HH21	1.54	0.72
1:A:445:PHE:CE2	1:A:471:LEU:HD21	2.24	0.72
18:W:318:VAL:HG12	18:W:318:VAL:O	1.90	0.71
18:W:444:LEU:HD21	19:m:284:PHE:CE1	2.25	0.71
19:m:1066:GLU:OE1	23:s:411:ASN:HB2	1.90	0.70
18:W:215:ARG:HH22	19:m:234:TYR:HE1	1.39	0.69
23:s:451:ILE:HD12	23:s:454:LYS:CB	2.22	0.68
18:W:304:VAL:N	20:n:286:ARG:NH2	2.42	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1166:CYS:HB3	2:B:1185:CYS:SG	2.35	0.67
1:A:445:PHE:HE2	1:A:471:LEU:HD21	1.60	0.66
1:A:483:PHE:CD2	2:B:836:GLU:HB2	2.29	0.66
17:V:109:ASP:O	18:W:315:SER:HB2	1.96	0.66
14:N:-52:DC:OP1	29:c:20:ARG:NH2	2.28	0.66
18:W:444:LEU:HG	19:m:284:PHE:CE2	2.32	0.65
19:m:337:GLN:HG2	19:m:458:ARG:HH22	1.62	0.65
18:W:487:ILE:HD11	18:W:531:ARG:HB2	1.79	0.64
21:q:718:HIS:HD1	21:q:733:TYR:HH	1.45	0.64
1:A:285:SER:HB2	1:A:290:ILE:HD11	1.79	0.64
29:g:35:ARG:NH1	29:g:41:GLU:O	2.31	0.63
18:W:215:ARG:NH2	19:m:234:TYR:CE1	2.67	0.63
14:N:16:DT:O4'	27:e:83:ARG:NH2	2.30	0.63
19:m:1067:ASP:OD1	19:m:1067:ASP:O	2.16	0.63
30:h:79:ARG:NH1	30:h:83:TYR:OH	2.32	0.63
23:s:451:ILE:HD12	23:s:454:LYS:HB3	1.81	0.62
1:A:288:HIS:HE1	18:W:230:LYS:NZ	1.97	0.62
3:C:266:ARG:HH12	11:K:82:ARG:HH22	1.48	0.62
19:m:473:ASN:HA	19:m:525:ARG:HH22	1.64	0.62
19:m:331:ARG:HH21	19:m:368:LYS:HB3	1.65	0.62
1:A:1211:MET:SD	1:A:1211:MET:N	2.73	0.61
18:W:468:LEU:HD11	19:m:283:VAL:HG13	1.83	0.61
2:B:1103:ILE:O	2:B:1122:ARG:NH1	2.34	0.61
1:A:831:LYS:NZ	1:A:1079:THR:O	2.34	0.60
9:I:33:ASP:OD1	24:u:75:HIS:N	2.35	0.60
21:q:793:VAL:HG11	21:q:830:LEU:HG	1.82	0.60
27:a:68:GLN:HE21	27:a:72:ARG:HH21	1.49	0.60
29:g:39:TYR:HB3	30:h:78:SER:HB2	1.83	0.59
1:A:288:HIS:CE1	18:W:230:LYS:NZ	2.70	0.59
2:B:969:ARG:NH1	3:C:60:GLU:OE1	2.35	0.59
16:T:18:DC:OP2	28:b:35:ARG:NH2	2.35	0.59
21:q:569:ASN:O	21:q:603:LYS:NZ	2.36	0.59
21:q:922:ALA:O	21:q:926:ASN:ND2	2.35	0.59
17:V:92:SER:HB3	29:g:20:ARG:HB2	1.85	0.59
18:W:304:VAL:N	20:n:286:ARG:HH22	1.99	0.59
1:A:1262:MET:SD	1:A:1265:ARG:NH2	2.76	0.59
2:B:73:LYS:HG2	2:B:125:THR:HG22	1.85	0.59
21:q:253:ILE:HG12	21:q:297:LEU:HD21	1.84	0.59
17:V:67:TRP:CZ2	18:W:219:PRO:HD3	2.38	0.58
1:A:288:HIS:CE1	18:W:230:LYS:HZ1	2.22	0.58
14:N:-63:DT:OP1	30:d:42:TYR:OH	2.21	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:c:20:ARG:NH1	30:d:125:LYS:OXT	2.36	0.58
2:B:1176:LYS:HD2	18:W:598:LEU:HD23	1.86	0.58
18:W:444:LEU:HG	19:m:284:PHE:CZ	2.38	0.58
7:G:27:ARG:NH1	7:G:54:ILE:O	2.36	0.58
20:n:206:SER:O	20:n:210:ASN:ND2	2.35	0.58
21:q:169:ASP:OD1	21:q:185:LYS:NZ	2.35	0.58
2:B:778:MET:HE3	2:B:794:ASN:HB3	1.85	0.58
18:W:218:ILE:HG23	18:W:219:PRO:HD2	1.85	0.58
18:W:390:ALA:HB2	19:m:892:ALA:O	2.04	0.58
19:m:672:VAL:O	19:m:720:GLN:NE2	2.37	0.58
23:s:320:MET:HE3	23:s:347:LYS:HB3	1.86	0.58
16:T:18:DC:H5'	28:b:45:ARG:HH21	1.68	0.58
19:m:1066:GLU:OE1	23:s:411:ASN:CB	2.52	0.58
8:H:48:PRO:O	8:H:145:ARG:NH1	2.37	0.57
2:B:190:MET:SD	2:B:190:MET:N	2.77	0.57
4:D:71:ARG:HE	4:D:92:VAL:HG13	1.70	0.57
18:W:387:PHE:HA	19:m:896:ASN:OD1	2.04	0.57
18:W:407:ARG:HG3	27:e:80:THR:OG1	2.05	0.57
2:B:815:ARG:HD2	25:v:135:SER:HB3	1.86	0.57
10:J:1:MET:HA	10:J:55:LEU:HB2	1.86	0.57
2:B:489:ARG:NH2	2:B:533:SER:O	2.37	0.57
18:W:616:GLN:OE1	18:W:619:SER:OG	2.23	0.57
25:v:233:GLY:O	25:v:244:ASN:ND2	2.38	0.56
22:r:269:ASP:HB3	22:r:349:LEU:HD21	1.85	0.56
1:A:127:ARG:O	1:A:129:ARG:NH1	2.38	0.56
13:M:49:CYS:SG	13:M:52:CYS:HB2	2.45	0.56
16:T:59:DA:H4'	30:d:33:ARG:HD2	1.87	0.56
24:u:121:PHE:HB3	24:u:153:ARG:HB3	1.86	0.56
25:v:267:TYR:HB3	25:v:297:TYR:HB3	1.87	0.56
17:V:42:ASP:CG	29:g:35:ARG:HD3	2.31	0.56
21:q:531:GLU:O	21:q:535:ASN:N	2.38	0.56
19:m:1261:ASN:OD1	19:m:1264:ARG:NH2	2.39	0.56
1:A:1207:LYS:O	1:A:1277:ARG:NH2	2.39	0.56
2:B:50:VAL:HG21	2:B:82:ILE:HD11	1.86	0.56
1:A:473:LEU:HD23	2:B:836:GLU:HG3	1.88	0.56
8:H:59:LEU:HD21	8:H:122:MET:HE1	1.87	0.56
9:I:73:LYS:NZ	9:I:112:ASP:OD2	2.39	0.56
18:W:444:LEU:HD11	19:m:284:PHE:CD2	2.41	0.56
27:a:60:LEU:HD22	27:a:93:GLN:HE21	1.71	0.56
1:A:1201:ARG:NH2	1:A:1235:ALA:O	2.39	0.55
2:B:879:ARG:HG3	15:P:-3:G:H8	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:q:793:VAL:HG13	21:q:826:ALA:HB1	1.87	0.55
2:B:421:ILE:HD11	2:B:441:VAL:HG22	1.89	0.55
18:W:327:ARG:HB3	18:W:436:ILE:HD12	1.88	0.55
23:s:180:MET:HB3	27:e:38:PRO:HD3	1.88	0.55
22:r:200:ASP:HB3	22:r:319:VAL:HG11	1.88	0.55
23:s:190:THR:O	23:s:197:ARG:NH2	2.40	0.55
5:E:126:VAL:HG11	5:E:131:ILE:HG12	1.88	0.55
23:s:280:ALA:O	23:s:351:ARG:NH1	2.38	0.55
17:V:57:LEU:HD11	17:V:81:LEU:HD22	1.89	0.55
22:r:490:VAL:HG22	22:r:495:ARG:HE	1.72	0.55
17:V:15:CYS:HB3	17:V:32:CYS:SG	2.46	0.55
2:B:281:LEU:HD12	2:B:364:GLU:HB2	1.88	0.54
3:C:248:ILE:HG21	11:K:102:ASP:HB2	1.88	0.54
9:I:20:LYS:O	9:I:23:GLN:NE2	2.39	0.54
24:u:209:LEU:HB2	25:v:252:PHE:HB2	1.88	0.54
18:W:524:GLU:O	20:n:232:GLN:NE2	2.40	0.54
19:m:1056:ARG:HB3	19:m:1076:MET:HB3	1.88	0.54
4:D:159:LEU:HD22	7:G:86:VAL:HG11	1.90	0.54
2:B:927:GLN:HB2	2:B:931:TYR:HB3	1.90	0.54
14:N:7:DC:OP2	27:e:69:ARG:NH2	2.41	0.54
27:e:120:MET:SD	28:f:47:SER:OG	2.65	0.54
9:I:100:PHE:HE1	9:I:111:ARG:HE	1.56	0.54
19:m:607:ILE:HG22	19:m:719:VAL:HG11	1.89	0.54
21:q:157:LYS:NZ	25:v:71:ASP:OD1	2.40	0.54
18:W:313:VAL:O	18:W:314:LYS:C	2.51	0.54
26:x:292:TRP:HA	26:x:295:LYS:HE2	1.89	0.54
21:q:155:TYR:HB2	21:q:164:ALA:HB2	1.90	0.53
23:s:378:THR:HG23	23:s:382:LEU:HD12	1.90	0.53
24:u:199:LEU:HD11	25:v:211:PHE:HB3	1.91	0.53
13:M:33:SER:HA	13:M:50:LYS:HE2	1.91	0.53
17:V:48:GLU:CD	30:h:121:TYR:OH	2.51	0.53
2:B:557:GLU:OE2	2:B:584:ARG:NH1	2.41	0.53
2:B:235:LEU:HD23	2:B:242:ILE:HG13	1.91	0.53
1:A:40:ILE:HG23	1:A:54:ASN:HD22	1.72	0.53
16:T:-33:DA:H2"	16:T:-32:DC:H5"	1.91	0.53
24:u:145:ILE:O	24:u:149:THR:OG1	2.21	0.53
1:A:976:ASP:O	1:A:979:LYS:NZ	2.42	0.52
18:W:304:VAL:CB	20:n:286:ARG:HH21	2.21	0.52
19:m:532:VAL:HG22	19:m:565:MET:HE2	1.91	0.52
19:m:1083:MET:HE1	19:m:1131:LEU:HD23	1.91	0.52
9:I:14:LEU:HB3	9:I:27:TYR:HB3	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:m:236:GLU:OE2	20:n:252:ARG:NH2	2.43	0.52
9:I:45:ARG:NH2	9:I:47:GLU:OE2	2.42	0.52
19:m:1426:LEU:HD13	19:m:1469:ARG:HH21	1.74	0.52
2:B:393:HIS:NE2	2:B:696:GLU:OE2	2.42	0.52
2:B:906:SER:OG	18:W:781:GLU:OE1	2.27	0.52
1:A:999:LEU:O	1:A:1013:GLN:NE2	2.38	0.52
7:G:6:ASP:OD1	7:G:75:ARG:NH1	2.43	0.52
17:V:10:ARG:HA	17:V:52:SER:HA	1.91	0.52
26:x:157:ARG:HB3	26:x:161:PRO:HB3	1.91	0.52
18:W:327:ARG:NH1	18:W:335:GLY:O	2.38	0.52
21:q:59:ALA:HB1	21:q:63:LEU:HD12	1.91	0.52
23:s:85:CYS:O	23:s:94:ARG:NH1	2.43	0.52
21:q:766:MET:HG3	21:q:770:LYS:HE3	1.92	0.52
21:q:830:LEU:HD22	21:q:846:LEU:HB3	1.91	0.52
30:d:79:ARG:NH1	30:d:83:TYR:OH	2.41	0.52
21:q:578:GLN:NE2	21:q:582:ASP:OD1	2.43	0.52
23:s:51:ASN:OD1	23:s:53:THR:OG1	2.24	0.52
11:K:25:SER:O	26:x:307:GLN:NE2	2.41	0.51
21:q:239:ASN:HA	21:q:242:LYS:HD2	1.92	0.51
21:q:357:LYS:NZ	21:q:361:ASP:OD1	2.43	0.51
21:q:451:ARG:NH1	25:v:35:GLU:OE1	2.43	0.51
5:E:60:LEU:O	21:q:915:ARG:NH1	2.39	0.51
19:m:1033:ARG:HH12	19:m:1087:ARG:HH12	1.58	0.51
21:q:215:ASP:OD1	21:q:217:ARG:NH1	2.43	0.51
18:W:232:ARG:HH12	18:W:235:LYS:HE3	1.73	0.51
24:u:114:LEU:HD11	24:u:150:VAL:HG23	1.92	0.51
1:A:1124:ARG:NH2	1:A:1304:GLU:OE2	2.39	0.51
2:B:10:ASP:HB3	2:B:649:LYS:HG3	1.93	0.51
23:s:426:LYS:NZ	23:s:440:ASN:OD1	2.34	0.51
19:m:725:GLU:OE2	19:m:728:ARG:NH2	2.36	0.51
19:m:1200:PRO:O	19:m:1203:ARG:NH1	2.43	0.51
29:c:115:LEU:HD11	28:f:44:LYS:HB2	1.91	0.51
27:a:106:ASP:OD2	27:a:131:ARG:NH1	2.40	0.51
28:b:73:THR:HG21	28:b:81:VAL:HG22	1.91	0.51
1:A:447:ARG:HB2	1:A:488:MET:HE3	1.93	0.50
16:T:25:DG:H2"	16:T:26:DG:C8	2.46	0.50
17:V:89:ARG:NH1	17:V:109:ASP:OD2	2.45	0.50
18:W:304:VAL:CA	20:n:286:ARG:HH21	2.24	0.50
18:W:356:PRO:HG2	18:W:394:PHE:HB2	1.92	0.50
20:n:207:ILE:HG23	20:n:212:LEU:HB3	1.92	0.50
1:A:1195:LEU:HB2	1:A:1263:LEU:HD21	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:W:229:VAL:HG21	18:W:286:LEU:HD11	1.93	0.50
17:V:9:GLU:HA	17:V:20:PRO:HA	1.93	0.50
19:m:1002:ARG:HH11	19:m:1052:TYR:HH	1.59	0.50
21:q:250:ASN:HA	21:q:253:ILE:HD12	1.93	0.50
2:B:245:MET:HE1	2:B:371:LEU:HD21	1.93	0.50
19:m:1191:ASN:OD1	19:m:1193:GLN:NE2	2.42	0.50
26:x:226:LYS:HG3	26:x:250:ILE:HG22	1.93	0.50
18:W:666:GLU:HG2	18:W:705:VAL:HG12	1.93	0.50
18:W:666:GLU:HA	18:W:705:VAL:HA	1.94	0.50
19:m:1255:TRP:NE1	19:m:1260:GLU:OE1	2.42	0.50
20:n:260:MET:HG3	20:n:284:TRP:HZ3	1.76	0.50
1:A:286:PRO:HG2	1:A:289:ILE:HD12	1.93	0.49
1:A:1190:GLN:HA	1:A:1245:ILE:HA	1.95	0.49
18:W:351:ARG:HA	18:W:429:THR:HA	1.94	0.49
20:n:163:LEU:HD11	20:n:194:VAL:HG22	1.94	0.49
23:s:226:ARG:NH1	23:s:227:GLU:O	2.45	0.49
24:u:191:THR:HG22	24:u:219:VAL:HG22	1.95	0.49
20:n:216:VAL:HG13	20:n:237:LEU:HD13	1.94	0.49
19:m:1041:LEU:HD11	19:m:1081:TYR:HD2	1.77	0.49
21:q:31:LYS:HB2	21:q:57:GLU:HA	1.94	0.49
17:V:25:MET:SD	29:g:42:ARG:HD3	2.51	0.49
18:W:458:THR:O	18:W:459:ILE:C	2.53	0.49
23:s:451:ILE:HD12	23:s:454:LYS:HB2	1.93	0.49
29:c:63:LEU:HD13	30:d:45:LEU:HB2	1.94	0.49
1:A:9:ALA:O	2:B:1193:GLN:NE2	2.44	0.49
18:W:640:LYS:NZ	18:W:641:LEU:O	2.46	0.49
18:W:704:ARG:NH1	19:m:632:GLU:OE2	2.46	0.49
19:m:1425:LYS:HE3	19:m:1428:PRO:HA	1.94	0.49
26:x:311:GLY:HA3	26:x:330:VAL:HG12	1.95	0.49
2:B:336:ILE:O	2:B:341:ARG:NH1	2.46	0.49
2:B:613:ARG:HH21	9:I:62:ILE:HD11	1.76	0.49
3:C:38:ALA:HA	3:C:164:ALA:HB3	1.95	0.49
23:s:411:ASN:ND2	23:s:451:ILE:HG21	2.28	0.49
25:v:210:VAL:HG13	25:v:334:VAL:HG21	1.95	0.49
17:V:42:ASP:OD1	29:g:35:ARG:HD3	2.13	0.48
21:q:479:TYR:HD1	25:v:30:LEU:HB3	1.78	0.48
19:m:1172:VAL:HA	19:m:1182:VAL:HG12	1.93	0.48
2:B:268:VAL:HG11	2:B:272:ILE:HD11	1.95	0.48
2:B:601:ALA:HA	24:u:239:SER:HB3	1.95	0.48
1:A:363:ASP:OD1	1:A:363:ASP:N	2.45	0.48
2:B:248:LYS:NZ	2:B:264:THR:OG1	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:279:ARG:NH2	2:B:286:ASP:OD1	2.46	0.48
18:W:325:TYR:OH	18:W:451:GLN:OE1	2.31	0.48
21:q:390:LEU:HB3	21:q:409:LEU:HD21	1.96	0.48
1:A:599:LEU:O	8:H:121:LEU:HD12	2.13	0.48
23:s:329:ALA:HB2	23:s:360:VAL:HG13	1.96	0.48
11:K:14:ASP:N	11:K:14:ASP:OD1	2.47	0.48
1:A:106:ILE:HD13	1:A:215:ILE:HD11	1.96	0.48
5:E:49:MET:SD	5:E:49:MET:N	2.76	0.48
19:m:1269:ASP:OD1	19:m:1272:ARG:NH1	2.46	0.48
17:V:25:MET:SD	29:g:42:ARG:CD	3.02	0.48
19:m:998:ASN:HD22	19:m:999:LEU:N	2.12	0.48
1:A:204:THR:OG1	1:A:207:GLU:OE1	2.31	0.47
21:q:559:ARG:NH2	25:v:24:PRO:O	2.47	0.47
27:e:50:GLU:HG3	28:f:39:ARG:HG2	1.96	0.47
1:A:1199:LEU:HD13	1:A:1204:MET:HG3	1.96	0.47
21:q:72:VAL:HG21	25:v:75:LEU:HD13	1.97	0.47
22:r:223:VAL:HG22	22:r:325:GLN:HG2	1.95	0.47
24:u:80:TYR:CZ	25:v:356:ASN:HB2	2.49	0.47
19:m:882:ARG:HH22	19:m:1156:ARG:HH21	1.63	0.47
2:B:550:PHE:HB3	2:B:593:MET:HE1	1.96	0.47
18:W:494:LEU:HD21	20:n:183:PRO:HG3	1.96	0.47
29:g:24:GLN:HE21	30:h:47:GLN:HE21	1.63	0.47
29:g:90:ASP:HB3	29:g:93:LEU:HB2	1.96	0.47
1:A:1227:PHE:HB2	1:A:1245:ILE:HD11	1.97	0.47
21:q:65:LEU:HD13	25:v:81:ILE:HG12	1.96	0.47
24:u:173:TRP:NE1	24:u:179:SER:OG	2.37	0.47
5:E:34:MET:HE2	5:E:34:MET:HB2	1.80	0.47
1:A:1450:GLU:OE2	7:G:23:ASN:ND2	2.47	0.47
19:m:780:LEU:HD12	19:m:900:LEU:HB3	1.97	0.47
21:q:708:GLN:OE1	21:q:739:LYS:NZ	2.48	0.47
24:u:108:VAL:HG22	24:u:219:VAL:HB	1.96	0.47
19:m:1279:ARG:NH1	19:m:1315:SER:O	2.48	0.47
23:s:173:LEU:O	27:e:32:THR:OG1	2.32	0.47
21:q:210:PRO:O	21:q:217:ARG:NH2	2.39	0.46
22:r:493:ASN:HB2	22:r:502:ILE:HD11	1.96	0.46
30:h:122:THR:O	30:h:123:SER:C	2.59	0.46
1:A:215:ILE:O	1:A:231:ARG:NH2	2.47	0.46
1:A:261:ASP:OD1	1:A:262:ASP:N	2.48	0.46
19:m:625:GLY:O	19:m:629:ILE:HG12	2.14	0.46
25:v:263:TRP:HE1	25:v:356:ASN:HD21	1.61	0.46
1:A:807:ARG:NH1	2:B:724:LYS:O	2.43	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:288:HIS:HE1	18:W:230:LYS:HZ2	1.63	0.46
11:K:29:ASN:ND2	11:K:78:GLU:O	2.49	0.46
11:K:45:LEU:HG	11:K:94:ILE:HD13	1.98	0.46
11:K:99:LYS:HB2	11:K:99:LYS:HE2	1.73	0.46
29:c:29:ARG:NH1	30:d:36:SER:O	2.46	0.46
7:G:160:ILE:HD12	18:W:553:LEU:HD12	1.97	0.46
22:r:211:MET:HB3	22:r:286:LEU:HD23	1.97	0.46
29:c:100:VAL:HG12	28:f:96:THR:HB	1.97	0.46
29:g:20:ARG:HD2	30:h:124:ALA:C	2.40	0.46
7:G:151:ARG:HB3	7:G:158:TYR:HB2	1.98	0.46
14:N:4:DG:H1'	14:N:5:DT:H5'	1.96	0.46
17:V:58:VAL:N	17:V:82:TYR:O	2.45	0.46
17:V:67:TRP:NE1	18:W:217:LEU:O	2.49	0.46
23:s:417:GLN:O	23:s:420:SER:OG	2.32	0.46
1:A:1452:LEU:HD22	6:F:131:PRO:HB3	1.98	0.46
3:C:15:ASP:OD1	3:C:15:ASP:N	2.44	0.46
14:N:-38:DT:H2"	14:N:-37:DG:C8	2.51	0.45
22:r:276:PHE:HB2	22:r:279:GLN:HB2	1.98	0.45
30:d:68:ASP:OD2	28:f:98:TYR:OH	2.33	0.45
1:A:10:PRO:HG2	2:B:1192:TYR:HD1	1.80	0.45
13:M:46:LEU:HD11	13:M:55:SER:HB3	1.99	0.45
14:N:-66:DG:H2"	14:N:-65:DT:H71	1.97	0.45
19:m:527:ASP:OD1	19:m:528:ALA:N	2.47	0.45
24:u:97:HIS:NE2	25:v:203:ASP:OD2	2.47	0.45
25:v:258:ASN:OD1	25:v:261:ASN:N	2.44	0.45
18:W:638:TYR:CZ	19:m:882:ARG:HG3	2.52	0.45
19:m:1104:ILE:HD12	23:s:456:PRO:HB2	1.98	0.45
1:A:864:ILE:HD12	5:E:169:LEU:HD11	1.99	0.45
1:A:870:GLY:C	1:A:872:ASP:H	2.24	0.45
23:s:451:ILE:O	23:s:452:SER:C	2.59	0.45
27:a:133:GLU:OE1	27:a:133:GLU:N	2.47	0.45
2:B:86:ARG:NH2	22:r:369:GLU:OE1	2.50	0.45
14:N:-6:DG:H2"	14:N:-5:DG:C8	2.52	0.45
19:m:984:LYS:HE2	19:m:1015:VAL:HG21	1.99	0.45
21:q:737:LEU:O	21:q:742:ASN:N	2.48	0.45
28:b:68:ASP:N	28:b:68:ASP:OD1	2.50	0.45
1:A:1389:ARG:NH2	16:T:-44:DT:O2	2.50	0.45
18:W:527:THR:HA	18:W:530:LEU:HD12	1.99	0.45
21:q:189:LEU:HD22	21:q:194:LYS:HD2	1.98	0.45
22:r:244:LYS:NZ	22:r:305:GLU:OE2	2.46	0.45
12:L:49:ARG:HD3	22:r:339:VAL:HG11	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:m:1002:ARG:NH1	19:m:1052:TYR:OH	2.43	0.45
18:W:465:ALA:HA	18:W:468:LEU:HD12	1.98	0.45
18:W:546:LYS:NZ	19:m:291:GLU:OE1	2.48	0.45
23:s:209:VAL:HG22	23:s:222:ILE:HG12	1.99	0.45
1:A:835:THR:HG21	1:A:1079:THR:HA	1.99	0.45
21:q:320:LEU:HD13	22:r:514:LEU:HD11	1.99	0.45
1:A:466:TYR:HB2	1:A:470:ARG:NH2	2.32	0.45
18:W:320:LEU:HD12	18:W:321:THR:H	1.81	0.45
18:W:751:THR:HG23	18:W:798:ILE:HG12	1.99	0.45
4:D:139:PRO:HA	4:D:142:ILE:HD12	1.99	0.44
17:V:63:ASN:HB3	17:V:75:ASP:HA	1.99	0.44
18:W:303:ILE:HB	20:n:286:ARG:HH22	1.81	0.44
19:m:992:ILE:HG22	19:m:997:SER:HA	1.99	0.44
2:B:498:ASP:HB3	14:N:42:DA:C4	2.53	0.44
21:q:568:SER:O	21:q:571:ASN:ND2	2.50	0.44
22:r:366:GLU:HG2	24:u:252:VAL:HG22	1.99	0.44
5:E:21:MET:HE2	5:E:186:TYR:HA	2.00	0.44
5:E:89:ILE:HD13	5:E:118:SER:HB2	1.98	0.44
16:T:-32:DC:H2"	16:T:-31:DA:O5'	2.17	0.44
18:W:628:LYS:HE3	19:m:661:GLN:HE22	1.82	0.44
19:m:1425:LYS:NZ	19:m:1430:SER:O	2.41	0.44
4:D:136:VAL:O	4:D:166:LYS:NZ	2.50	0.44
29:c:63:LEU:HD11	30:d:41:VAL:HG13	1.99	0.44
18:W:318:VAL:O	18:W:318:VAL:CG1	2.61	0.44
19:m:1062:ALA:HB2	19:m:1103:LEU:HD11	1.99	0.44
23:s:339:THR:HG22	23:s:341:ASP:H	1.82	0.44
1:A:231:ARG:HB3	1:A:234:TRP:CD2	2.53	0.44
19:m:712:LEU:HA	19:m:715:LEU:HB2	1.98	0.44
1:A:41:MET:HG2	1:A:44:SER:HA	1.98	0.44
1:A:599:LEU:HD12	1:A:599:LEU:HA	1.73	0.44
2:B:284:VAL:N	2:B:285:PRO:HD2	2.32	0.44
11:K:55:ASP:OD1	11:K:55:ASP:N	2.41	0.44
19:m:1205:ASP:OD1	19:m:1207:ARG:NE	2.48	0.44
23:s:342:TYR:CZ	23:s:346:ARG:HD2	2.53	0.44
25:v:262:LYS:HD3	25:v:305:GLN:HE21	1.81	0.44
28:b:52:GLU:OE1	28:b:52:GLU:N	2.48	0.44
1:A:134:ARG:HH21	1:A:224:GLY:HA2	1.82	0.44
21:q:520:SER:O	21:q:524:HIS:ND1	2.48	0.44
24:u:90:LEU:HB2	25:v:362:MET:HE1	1.99	0.44
2:B:273:PRO:HG2	2:B:276:ILE:HD12	2.00	0.44
2:B:588:MET:HE3	2:B:588:MET:HB3	1.88	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:q:641:ALA:HB1	21:q:655:LYS:HG3	2.00	0.44
19:m:770:PHE:HB3	19:m:779:VAL:HG22	2.00	0.43
18:W:508:SER:HA	18:W:524:GLU:HA	1.99	0.43
19:m:338:LEU:HD23	19:m:338:LEU:HA	1.86	0.43
19:m:1365:GLU:O	19:m:1369:ASN:ND2	2.49	0.43
25:v:312:LYS:HB3	25:v:315:GLU:HG2	1.99	0.43
3:C:179:GLU:OE2	3:C:204:SER:OG	2.36	0.43
7:G:144:ARG:HB2	7:G:171:ILE:HD13	1.99	0.43
18:W:534:PHE:HB3	18:W:554:ILE:HD13	2.00	0.43
9:I:23:GLN:O	9:I:24:ARG:NE	2.51	0.43
21:q:617:ASP:OD1	21:q:621:ASN:ND2	2.51	0.43
23:s:395:THR:HA	23:s:398:VAL:HG12	2.00	0.43
30:d:43:LYS:HE3	30:d:43:LYS:HB2	1.86	0.43
1:A:958:LEU:HD13	1:A:1023:LEU:HD22	2.01	0.43
22:r:245:VAL:HG23	22:r:298:GLU:HG2	2.01	0.43
19:m:1064:ASP:OD1	23:s:457:LYS:NZ	2.46	0.43
25:v:104:PRO:HA	25:v:107:ARG:HD3	2.00	0.43
1:A:188:LYS:HE3	1:A:199:GLU:HB2	2.01	0.43
19:m:242:GLY:HA3	20:n:258:LYS:HG2	2.00	0.43
19:m:1426:LEU:HD21	19:m:1465:MET:HE2	1.99	0.43
1:A:465:PRO:O	1:A:470:ARG:NH2	2.51	0.43
2:B:547:ILE:HG21	2:B:619:ILE:HG21	2.00	0.43
18:W:451:GLN:NE2	18:W:454:GLU:OE1	2.52	0.43
2:B:81:LYS:NZ	24:u:247:TYR:O	2.43	0.43
2:B:650:GLU:OE1	2:B:653:ARG:NH2	2.49	0.43
22:r:230:ARG:NH1	22:r:292:SER:OG	2.45	0.43
1:A:547:VAL:HG22	1:A:578:LEU:HD21	2.01	0.43
1:A:1448:ILE:HD11	1:A:1453:LEU:HD11	2.01	0.43
2:B:788:ARG:O	2:B:967:ARG:NH1	2.52	0.42
24:u:200:VAL:HA	24:u:211:THR:HA	2.00	0.42
25:v:34:ILE:O	25:v:40:GLN:NE2	2.38	0.42
1:A:327:ARG:HG3	1:A:1409:VAL:HG21	2.01	0.42
23:s:401:MET:HE3	23:s:401:MET:HB3	1.89	0.42
3:C:79:MET:HE2	3:C:79:MET:HB3	1.87	0.42
7:G:30:LEU:HD22	7:G:72:VAL:HG11	2.00	0.42
18:W:344:LEU:HD12	18:W:349:GLU:HB2	2.01	0.42
26:x:301:ASP:OD1	26:x:303:GLN:NE2	2.53	0.42
18:W:752:LEU:HD23	18:W:770:VAL:HG12	2.00	0.42
20:n:217:ARG:HG3	20:n:259:VAL:HG21	2.02	0.42
21:q:155:TYR:HB3	21:q:160:ARG:HB2	2.02	0.42
2:B:928:ARG:NH2	19:m:775:ARG:O	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:m:545:ASN:ND2	19:m:553:HIS:O	2.53	0.42
19:m:1325:ALA:HB3	19:m:1328:LEU:HB3	2.02	0.42
22:r:277:PRO:HB2	22:r:305:GLU:HB3	2.01	0.42
1:A:983:LEU:HD13	1:A:1041:ARG:HA	2.01	0.42
2:B:83:TYR:HB2	2:B:116:TYR:HB2	2.01	0.42
24:u:208:ILE:HG22	25:v:253:LYS:HG3	2.00	0.42
2:B:860:MET:HE3	2:B:860:MET:HB3	1.84	0.42
21:q:41:PHE:CG	21:q:70:VAL:HG11	2.54	0.42
26:x:222:MET:HE3	26:x:222:MET:HB3	1.84	0.42
29:c:54:VAL:HG21	30:d:98:VAL:HG21	2.01	0.42
14:N:0:DG:H5'	27:e:40:ARG:HG2	2.02	0.42
17:V:93:ASP:HB3	29:g:18:SER:N	2.35	0.42
19:m:992:ILE:HA	19:m:995:ILE:HG12	2.02	0.42
2:B:607:SER:HB2	2:B:620:PHE:HB2	2.02	0.42
2:B:830:TYR:CZ	2:B:1000:PRO:HD3	2.55	0.42
19:m:380:GLU:HB3	19:m:978:CYS:SG	2.60	0.42
21:q:766:MET:HE1	21:q:799:ILE:HG23	2.02	0.42
29:c:111:ILE:HG23	29:c:115:LEU:HD23	2.00	0.42
2:B:299:ASP:OD1	2:B:299:ASP:N	2.52	0.42
16:T:32:DA:H2"	16:T:33:DC:H5"	2.02	0.41
18:W:334:LYS:HB3	18:W:388:ARG:HH12	1.84	0.41
22:r:263:SER:OG	22:r:264:LYS:N	2.53	0.41
30:d:57:LYS:O	30:d:61:ILE:HG13	2.19	0.41
29:g:97:LEU:HD22	29:g:100:VAL:HG21	2.02	0.41
2:B:632:ILE:HD11	2:B:688:GLU:HB3	2.01	0.41
6:F:97:ARG:HD2	6:F:97:ARG:HA	1.88	0.41
14:N:56:DG:C2	16:T:-55:DG:C2	3.08	0.41
17:V:42:ASP:HB3	29:g:43:VAL:H	1.84	0.41
17:V:67:TRP:HZ2	18:W:219:PRO:HD3	1.83	0.41
5:E:81:PHE:HE1	5:E:110:ILE:HD13	1.84	0.41
9:I:17:LYS:N	9:I:26:LEU:O	2.50	0.41
14:N:-24:DT:O2	16:T:25:DG:N2	2.53	0.41
21:q:162:ASP:OD1	21:q:192:ARG:NH2	2.51	0.41
21:q:737:LEU:HD12	21:q:741:SER:HB2	2.01	0.41
24:u:268:GLU:HA	24:u:271:ARG:HG2	2.03	0.41
1:A:203:LEU:HB3	1:A:208:ILE:HD11	2.01	0.41
2:B:318:ASP:HB3	2:B:321:VAL:HG22	2.02	0.41
7:G:108:VAL:HG22	7:G:159:ALA:HB3	2.02	0.41
18:W:551:THR:HG21	18:W:586:SER:HA	2.03	0.41
2:B:592:THR:HA	24:u:226:PHE:HZ	1.85	0.41
5:E:27:TYR:HA	5:E:63:PRO:HA	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
18:W:648:GLN:NE2	18:W:679:VAL:H	2.18	0.41
21:q:780:TYR:O	21:q:784:LYS:N	2.50	0.41
30:h:102:LEU:HB2	30:h:107:ALA:HB2	2.03	0.41
2:B:957:ASN:OD1	2:B:961:LEU:N	2.53	0.41
17:V:70:LYS:HG2	18:W:217:LEU:HD22	2.03	0.41
18:W:304:VAL:CA	20:n:286:ARG:NH2	2.83	0.41
21:q:710:LEU:HD13	21:q:740:PHE:HB2	2.01	0.41
30:h:119:THR:O	30:h:123:SER:N	2.53	0.41
1:A:948:VAL:O	5:E:200:ARG:NH1	2.50	0.41
1:A:1412:LEU:HD13	2:B:1207:LEU:HD21	2.02	0.41
3:C:50:ILE:HG12	3:C:155:ILE:HG22	2.03	0.41
6:F:104:ASN:HD22	6:F:104:ASN:HA	1.70	0.41
9:I:62:ILE:HD12	9:I:62:ILE:HA	1.93	0.41
18:W:250:ARG:NH2	18:W:284:ASP:OD2	2.53	0.41
18:W:352:LEU:HD11	18:W:435:LEU:HD11	2.01	0.41
22:r:206:PHE:H	22:r:229:LEU:HD21	1.84	0.41
27:e:82:LEU:HD22	28:f:81:VAL:HG23	2.03	0.41
1:A:363:ASP:HB3	1:A:509:PRO:HD3	2.03	0.41
1:A:823:GLU:OE2	2:B:506:GLN:NE2	2.53	0.41
3:C:21:LEU:HD22	11:K:101:LEU:HD11	2.03	0.41
11:K:65:HIS:HB3	11:K:68:PHE:HD2	1.86	0.41
19:m:449:THR:HG21	19:m:543:ARG:HD2	2.03	0.41
22:r:208:ARG:N	22:r:291:ASP:OD1	2.52	0.41
2:B:184:LYS:HB3	2:B:787:VAL:HG21	2.03	0.41
21:q:9:TYR:OH	25:v:106:ASP:OD2	2.28	0.41
21:q:710:LEU:HD11	21:q:748:LEU:HD11	2.03	0.41
29:c:58:LEU:HD23	29:c:58:LEU:HA	1.96	0.41
8:H:17:ASN:OD1	8:H:24:SER:OG	2.31	0.40
27:e:112:ILE:HD13	27:e:112:ILE:HA	1.87	0.40
1:A:557:TRP:O	11:K:26:ARG:NH1	2.54	0.40
2:B:174:THR:O	2:B:175:LEU:C	2.64	0.40
2:B:815:ARG:NH1	25:v:132:GLN:O	2.54	0.40
2:B:1008:PRO:HB3	2:B:1087:PHE:HE1	1.86	0.40
19:m:1001:ASN:OD1	19:m:1002:ARG:N	2.54	0.40
20:n:241:ILE:HG23	20:n:246:ILE:HD12	2.03	0.40
24:u:89:SER:HB3	25:v:365:ARG:HE	1.86	0.40
27:a:61:LEU:HD12	28:b:37:LEU:HD23	2.02	0.40
1:A:1343:GLY:O	1:A:1347:THR:OG1	2.29	0.40
5:E:63:PRO:HB3	5:E:74:LEU:HD23	2.03	0.40
7:G:51:GLY:HA2	7:G:54:ILE:HD11	2.03	0.40
19:m:617:ILE:HG13	19:m:649:LEU:HD11	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
25:v:29:LEU:N	26:x:147:ARG:O	2.51	0.40
30:h:95:GLN:O	30:h:99:ARG:HG3	2.21	0.40
1:A:109:ASN:HD21	20:n:199:LEU:HB3	1.84	0.40
1:A:554:VAL:HB	1:A:557:TRP:HB2	2.04	0.40
17:V:66:SER:HB2	18:W:260:TYR:HB3	2.04	0.40
18:W:524:GLU:HB2	20:n:232:GLN:HE22	1.87	0.40
19:m:243:ASP:OD1	19:m:243:ASP:N	2.55	0.40
28:f:62:LEU:HD23	28:f:62:LEU:HA	1.81	0.40
2:B:279:ARG:HD3	2:B:284:VAL:HG13	2.04	0.40
3:C:199:LYS:HB3	3:C:199:LYS:HE2	1.81	0.40
19:m:551:ARG:NH1	19:m:686:ASN:O	2.54	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	1392/1743 (80%)	1356 (97%)	35 (2%)	1 (0%)	48	79
2	B	1154/1227 (94%)	1127 (98%)	27 (2%)	0	100	100
3	C	261/304 (86%)	259 (99%)	2 (1%)	0	100	100
4	D	170/186 (91%)	168 (99%)	2 (1%)	0	100	100
5	E	211/214 (99%)	207 (98%)	4 (2%)	0	100	100
6	F	82/155 (53%)	79 (96%)	3 (4%)	0	100	100
7	G	169/171 (99%)	166 (98%)	3 (2%)	0	100	100
8	H	129/145 (89%)	125 (97%)	4 (3%)	0	100	100
9	I	109/115 (95%)	105 (96%)	4 (4%)	0	100	100
10	J	65/72 (90%)	65 (100%)	0	0	100	100
11	K	111/118 (94%)	109 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
12	L	43/72 (60%)	41 (95%)	2 (5%)	0	100	100
13	M	62/113 (55%)	61 (98%)	1 (2%)	0	100	100
17	V	104/108 (96%)	101 (97%)	3 (3%)	0	100	100
18	W	529/911 (58%)	503 (95%)	26 (5%)	0	100	100
19	m	1170/1503 (78%)	1152 (98%)	18 (2%)	0	100	100
20	n	137/417 (33%)	135 (98%)	2 (2%)	0	100	100
21	q	928/1084 (86%)	923 (100%)	5 (0%)	0	100	100
22	r	260/544 (48%)	254 (98%)	6 (2%)	0	100	100
23	s	428/725 (59%)	412 (96%)	16 (4%)	0	100	100
24	u	206/459 (45%)	206 (100%)	0	0	100	100
25	v	341/396 (86%)	330 (97%)	11 (3%)	0	100	100
26	x	201/395 (51%)	200 (100%)	1 (0%)	0	100	100
27	a	89/139 (64%)	89 (100%)	0	0	100	100
27	e	102/139 (73%)	100 (98%)	2 (2%)	0	100	100
28	b	80/106 (76%)	77 (96%)	3 (4%)	0	100	100
28	f	76/106 (72%)	74 (97%)	2 (3%)	0	100	100
29	c	104/133 (78%)	101 (97%)	3 (3%)	0	100	100
29	g	92/133 (69%)	90 (98%)	2 (2%)	0	100	100
30	d	92/129 (71%)	91 (99%)	1 (1%)	0	100	100
30	h	88/129 (68%)	83 (94%)	5 (6%)	0	100	100
All	All	8985/12191 (74%)	8789 (98%)	195 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	960	VAL

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	1219/1528 (80%)	1219 (100%)	0	100	100
2	B	1018/1077 (94%)	1014 (100%)	4 (0%)	89	95
3	C	236/264 (89%)	236 (100%)	0	100	100
4	D	149/160 (93%)	149 (100%)	0	100	100
5	E	196/197 (100%)	196 (100%)	0	100	100
6	F	75/137 (55%)	75 (100%)	0	100	100
7	G	148/148 (100%)	148 (100%)	0	100	100
8	H	120/130 (92%)	120 (100%)	0	100	100
9	I	106/109 (97%)	106 (100%)	0	100	100
10	J	61/66 (92%)	61 (100%)	0	100	100
11	K	104/109 (95%)	104 (100%)	0	100	100
12	L	38/56 (68%)	38 (100%)	0	100	100
13	M	61/99 (62%)	61 (100%)	0	100	100
17	V	90/92 (98%)	90 (100%)	0	100	100
18	W	482/796 (61%)	482 (100%)	0	100	100
19	m	1079/1354 (80%)	1078 (100%)	1 (0%)	92	97
20	n	125/361 (35%)	125 (100%)	0	100	100
21	q	824/962 (86%)	824 (100%)	0	100	100
22	r	239/485 (49%)	239 (100%)	0	100	100
23	s	380/649 (59%)	380 (100%)	0	100	100
24	u	192/406 (47%)	192 (100%)	0	100	100
25	v	325/369 (88%)	325 (100%)	0	100	100
26	x	190/354 (54%)	190 (100%)	0	100	100
27	a	77/112 (69%)	77 (100%)	0	100	100
27	e	87/112 (78%)	87 (100%)	0	100	100
28	b	67/81 (83%)	67 (100%)	0	100	100
28	f	63/81 (78%)	63 (100%)	0	100	100
29	c	84/102 (82%)	84 (100%)	0	100	100
29	g	74/102 (72%)	74 (100%)	0	100	100
30	d	80/107 (75%)	80 (100%)	0	100	100
30	h	76/107 (71%)	76 (100%)	0	100	100
All	All	8065/10712 (75%)	8060 (100%)	5 (0%)	92	97

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

Mol	Chain	Res	Type
2	B	425	MET
2	B	815	ARG
2	B	879	ARG
2	B	904	ARG
19	m	770	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (95) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	ASN
1	A	278	GLN
1	A	288	HIS
1	A	291	ASN
1	A	387	HIS
1	A	690	GLN
1	A	769	GLN
1	A	839	GLN
1	A	1080	GLN
2	B	157	HIS
2	B	477	ASN
2	B	492	ASN
2	B	524	GLN
2	B	549	ASN
2	B	996	HIS
2	B	1074	ASN
2	B	1179	GLN
3	C	8	ASN
3	C	25	ASN
4	D	46	HIS
4	D	130	ASN
4	D	170	ASN
5	E	53	GLN
5	E	162	GLN
6	F	104	ASN
6	F	119	GLN
6	F	127	GLN
7	G	122	ASN
8	H	43	ASN
11	K	113	ASN
12	L	55	HIS
13	M	65	GLN

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Mol	Chain	Res	Type
18	W	283	ASN
18	W	402	HIS
18	W	558	ASN
18	W	786	ASN
19	m	428	HIS
19	m	473	ASN
19	m	538	ASN
19	m	553	HIS
19	m	661	GLN
19	m	819	ASN
19	m	869	HIS
19	m	886	HIS
19	m	899	GLN
19	m	998	ASN
19	m	1191	ASN
19	m	1193	GLN
19	m	1242	GLN
19	m	1288	ASN
19	m	1338	ASN
19	m	1436	ASN
20	n	156	GLN
20	n	232	GLN
21	q	132	ASN
21	q	147	ASN
21	q	187	GLN
21	q	319	ASN
21	q	397	ASN
21	q	398	GLN
21	q	503	GLN
21	q	526	ASN
21	q	615	HIS
21	q	625	HIS
22	r	279	GLN
22	r	493	ASN
23	s	83	ASN
23	s	171	GLN
23	s	248	GLN
23	s	311	ASN
23	s	375	ASN
24	u	93	HIS
24	u	103	GLN
24	u	138	GLN

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Mol	Chain	Res	Type
24	u	172	GLN
24	u	261	GLN
25	v	64	ASN
25	v	199	HIS
25	v	283	ASN
25	v	381	GLN
26	x	246	ASN
26	x	251	GLN
27	a	68	GLN
27	a	93	GLN
27	a	108	ASN
28	b	75	HIS
29	c	94	ASN
30	d	84	ASN
30	d	95	GLN
27	e	39	HIS
27	e	55	GLN
28	f	64	ASN
29	g	24	GLN
29	g	84	GLN
30	h	67	ASN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
15	P	19/20 (95%)	8 (42%)	0

All (8) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
15	P	-6	C
15	P	-5	U
15	P	-4	U
15	P	-3	G
15	P	-2	U
15	P	-1	G
15	P	0	C
15	P	1	U

There are no RNA pucker outliers to report.

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 15 ligands modelled in this entry, 14 are monoatomic - leaving 1 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	$\#\|Z\| > 2$
33	SAH	s	1904	-	24,28,28	1.25	3 (12%)	25,40,40	1.72	5 (20%)

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
33	SAH	s	1904	-	-	2/11/31/31	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
33	s	1904	SAH	C2-N3	4.08	1.38	1.32
33	s	1904	SAH	C2-N1	2.46	1.38	1.33
33	s	1904	SAH	OXT-C	-2.25	1.23	1.30

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
33	s	1904	SAH	N3-C2-N1	-5.45	120.16	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
33	s	1904	SAH	C5'-SD-CG	-3.52	91.70	102.27
33	s	1904	SAH	C3'-C2'-C1'	2.71	105.06	100.98
33	s	1904	SAH	OXT-C-O	-2.68	118.01	124.09
33	s	1904	SAH	OXT-C-CA	2.24	121.00	113.38

There are no chirality outliers.

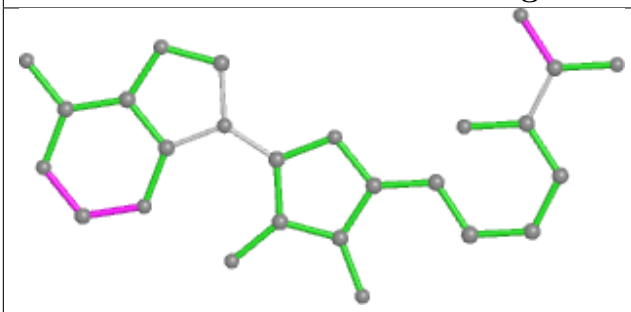
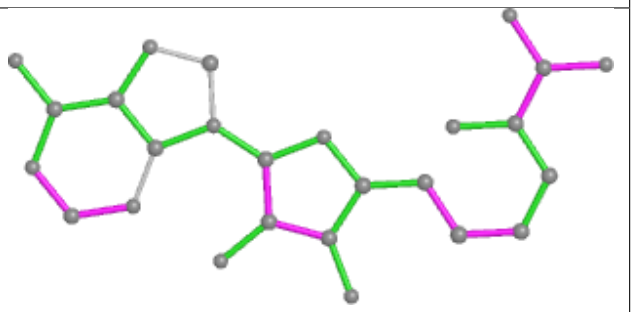
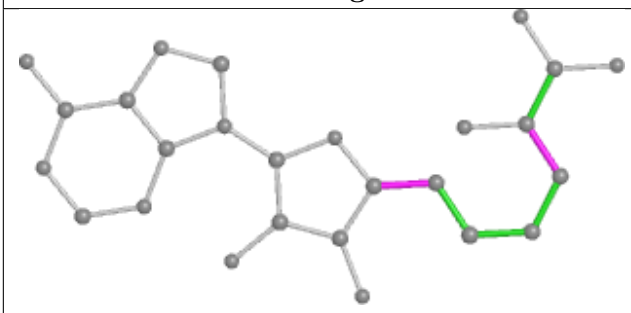
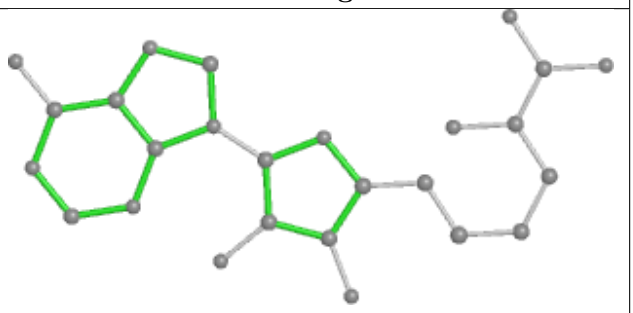
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
33	s	1904	SAH	C3'-C4'-C5'-SD
33	s	1904	SAH	N-CA-CB-CG

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand SAH s 1904	
 Bond lengths	 Bond angles
 Torsions	 Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

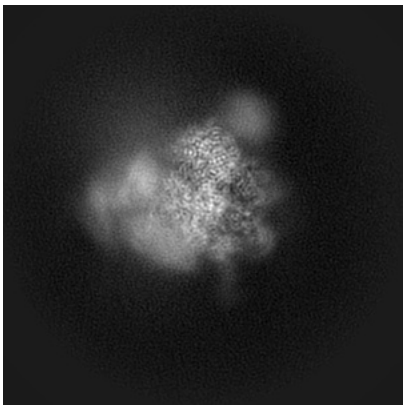
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-66104. These allow visual inspection of the internal detail of the map and identification of artifacts.

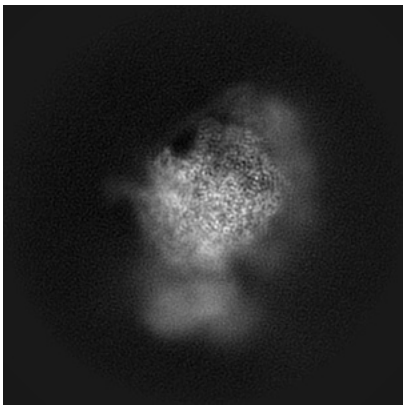
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

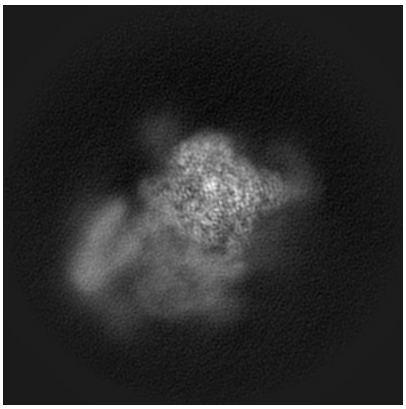
6.1.1 Primary map



X

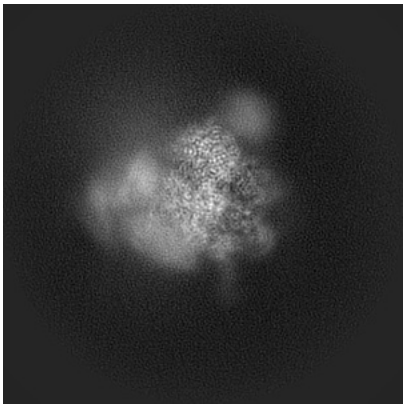


Y

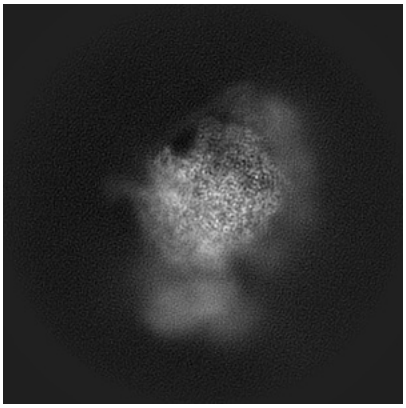


Z

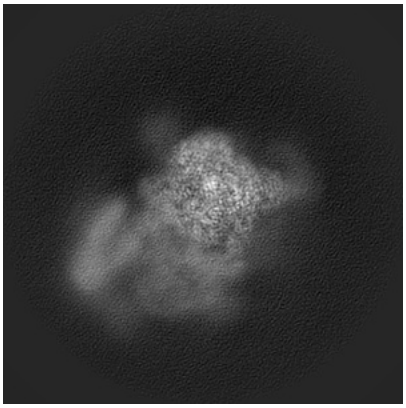
6.1.2 Raw map



X



Y

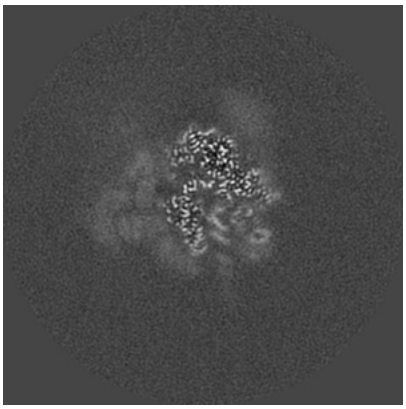


Z

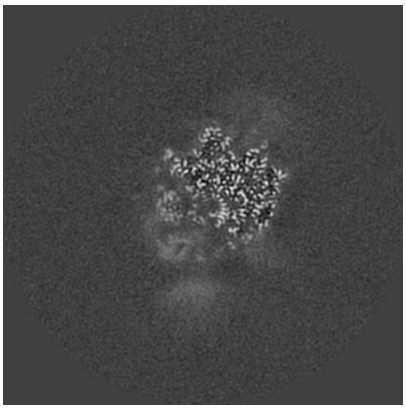
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

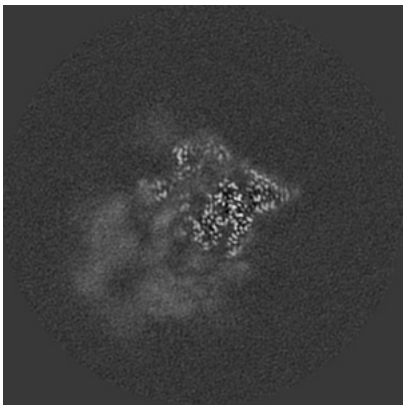
6.2.1 Primary map



X Index: 135

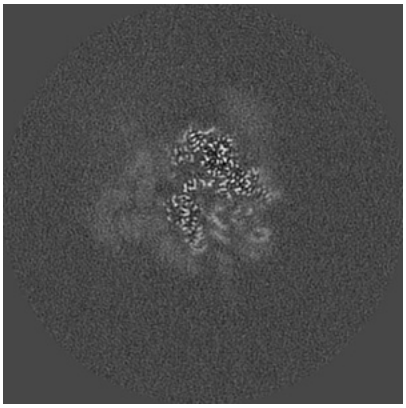


Y Index: 135

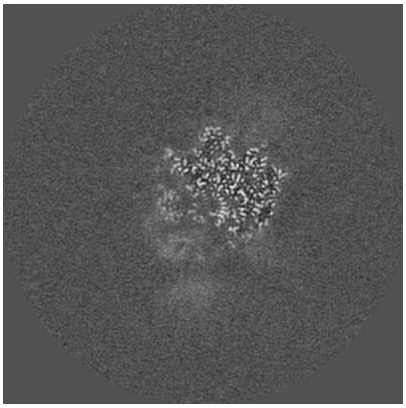


Z Index: 135

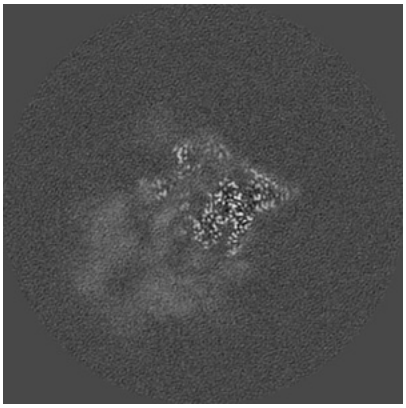
6.2.2 Raw map



X Index: 135



Y Index: 135

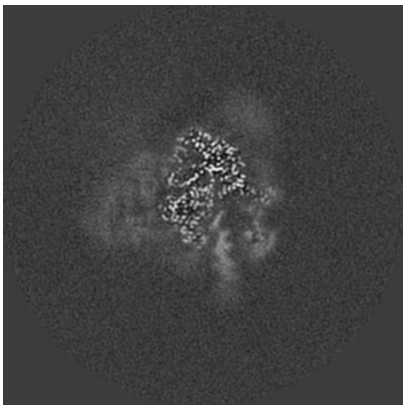


Z Index: 135

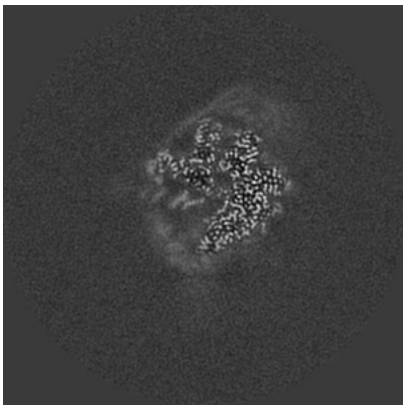
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

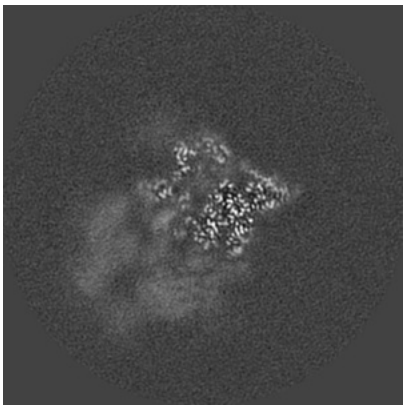
6.3.1 Primary map



X Index: 140

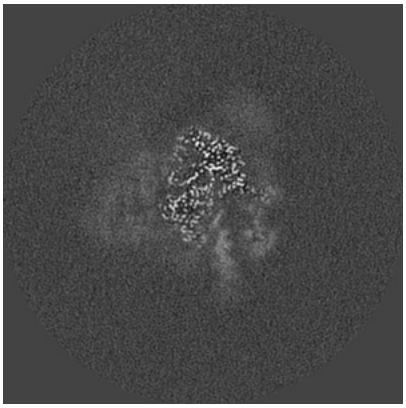


Y Index: 142

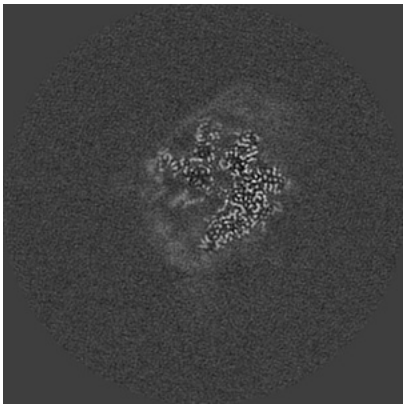


Z Index: 136

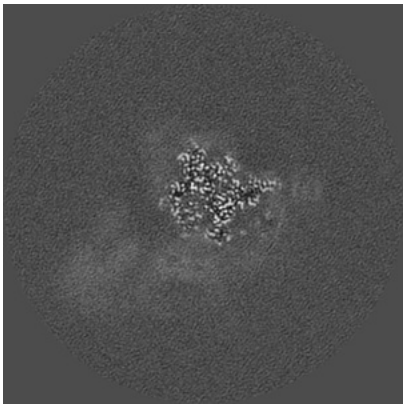
6.3.2 Raw map



X Index: 140



Y Index: 142

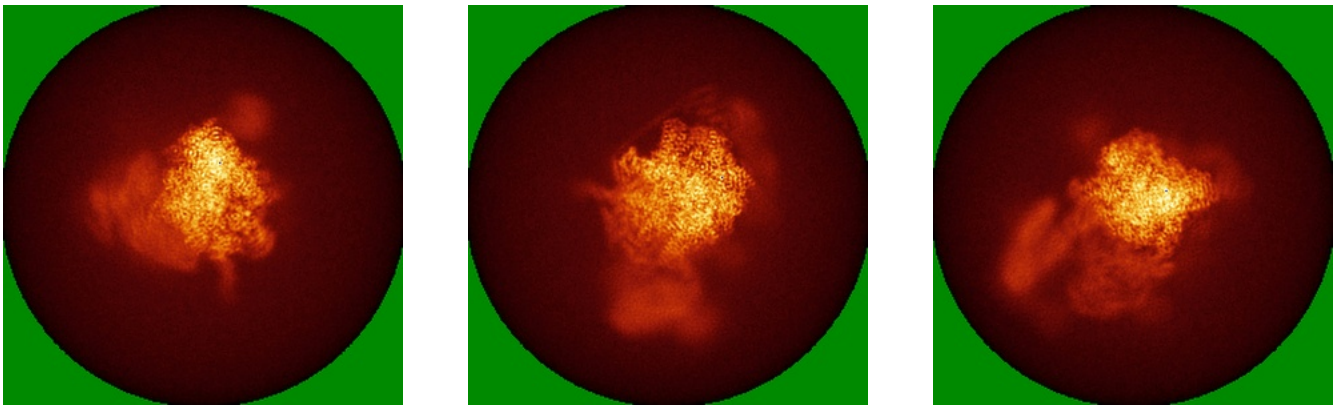


Z Index: 155

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

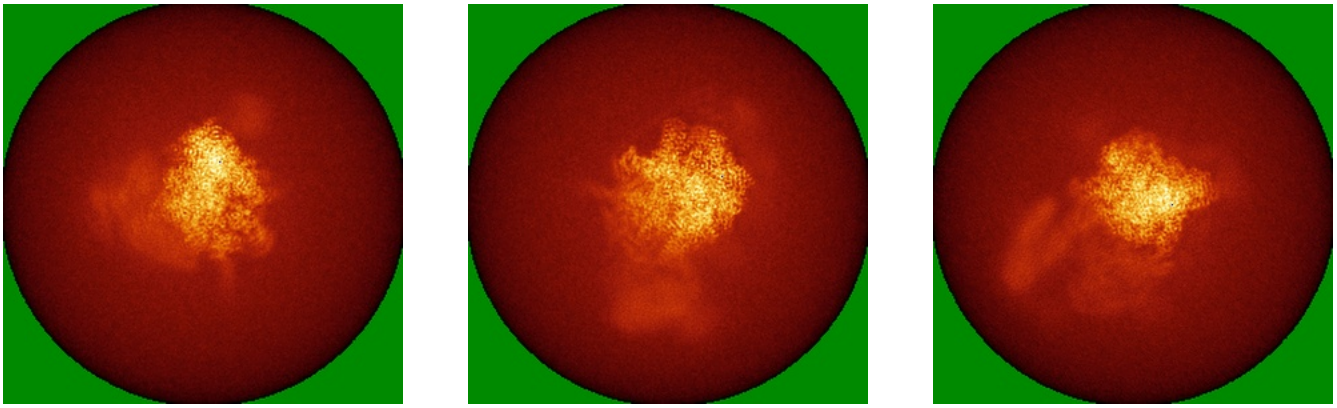
6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



X Y Z

6.4.2 Raw map



X Y Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

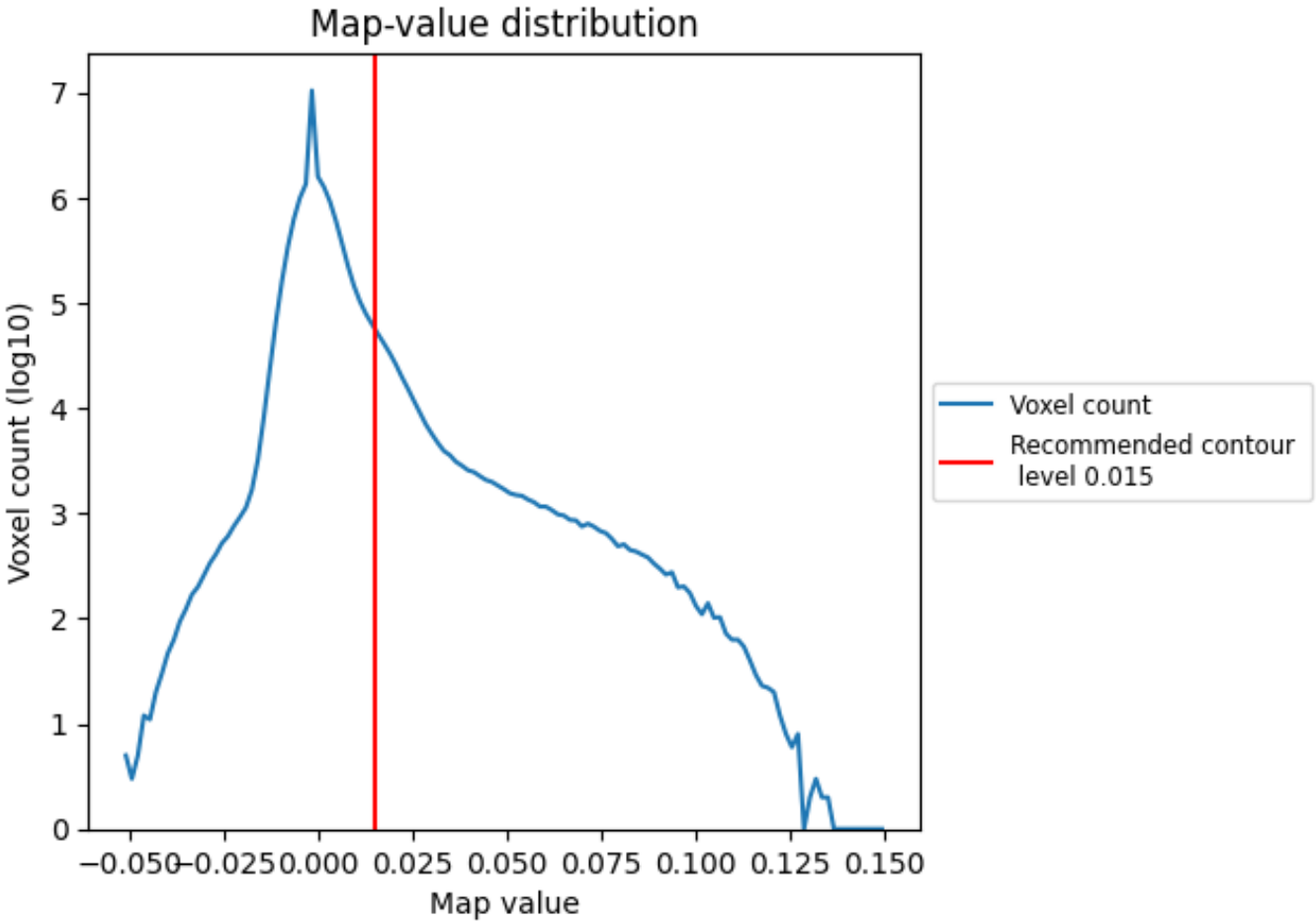
6.6 Mask visualisation (i)

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

7 Map analysis

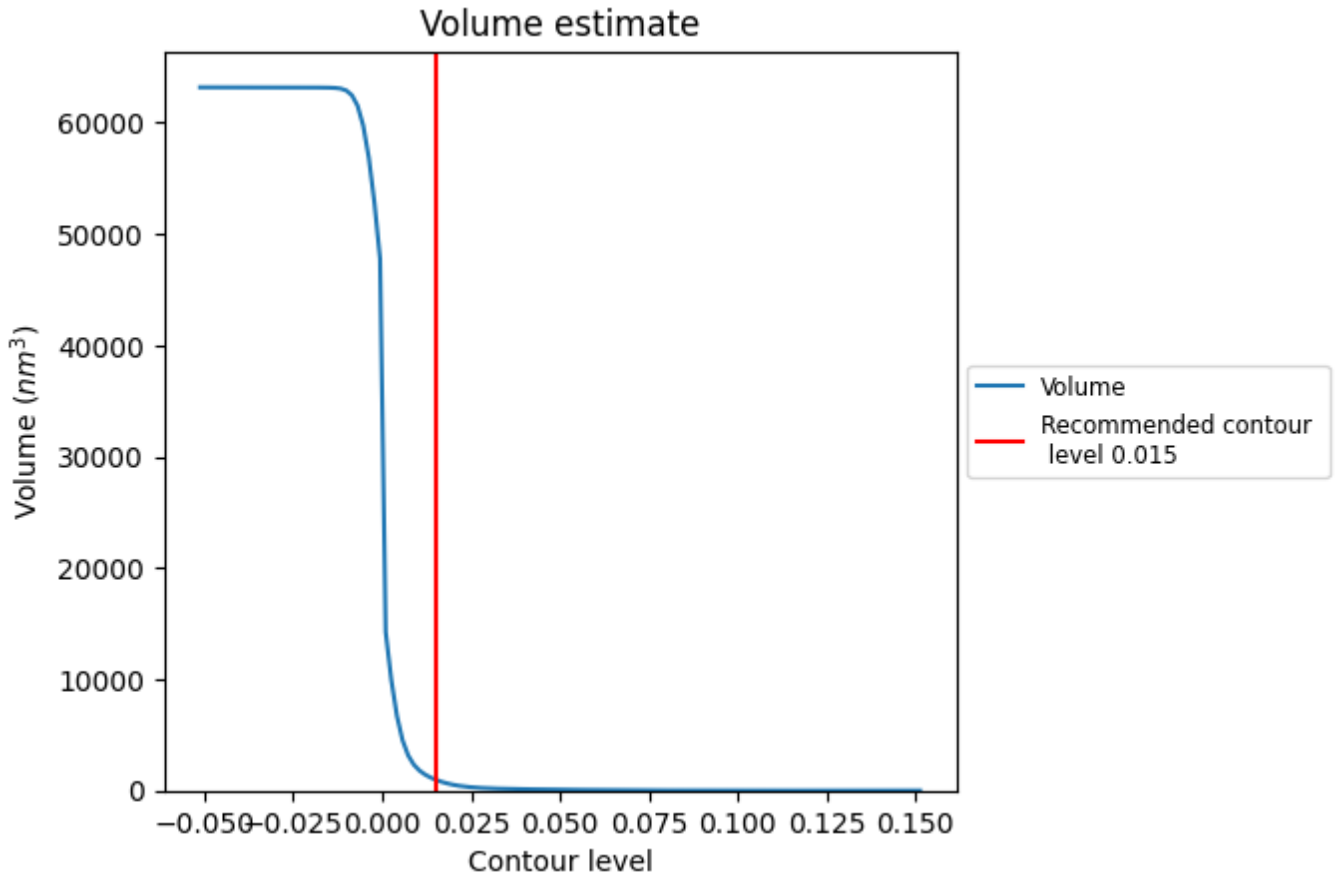
This section contains the results of statistical analysis of the map.

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.

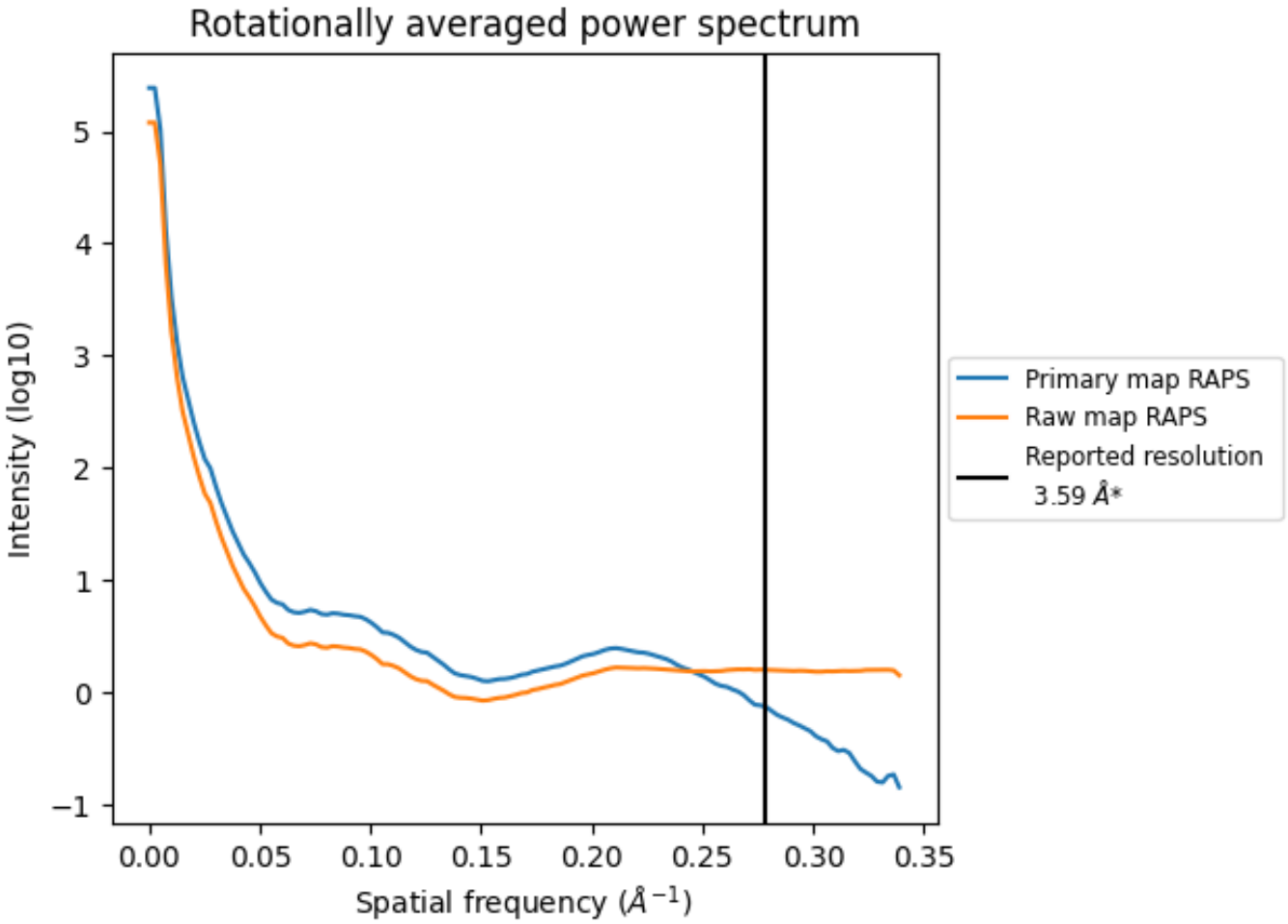
7.2 Volume estimate



The volume at the recommended contour level is 985 nm^3; this corresponds to an approximate mass of 889 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)

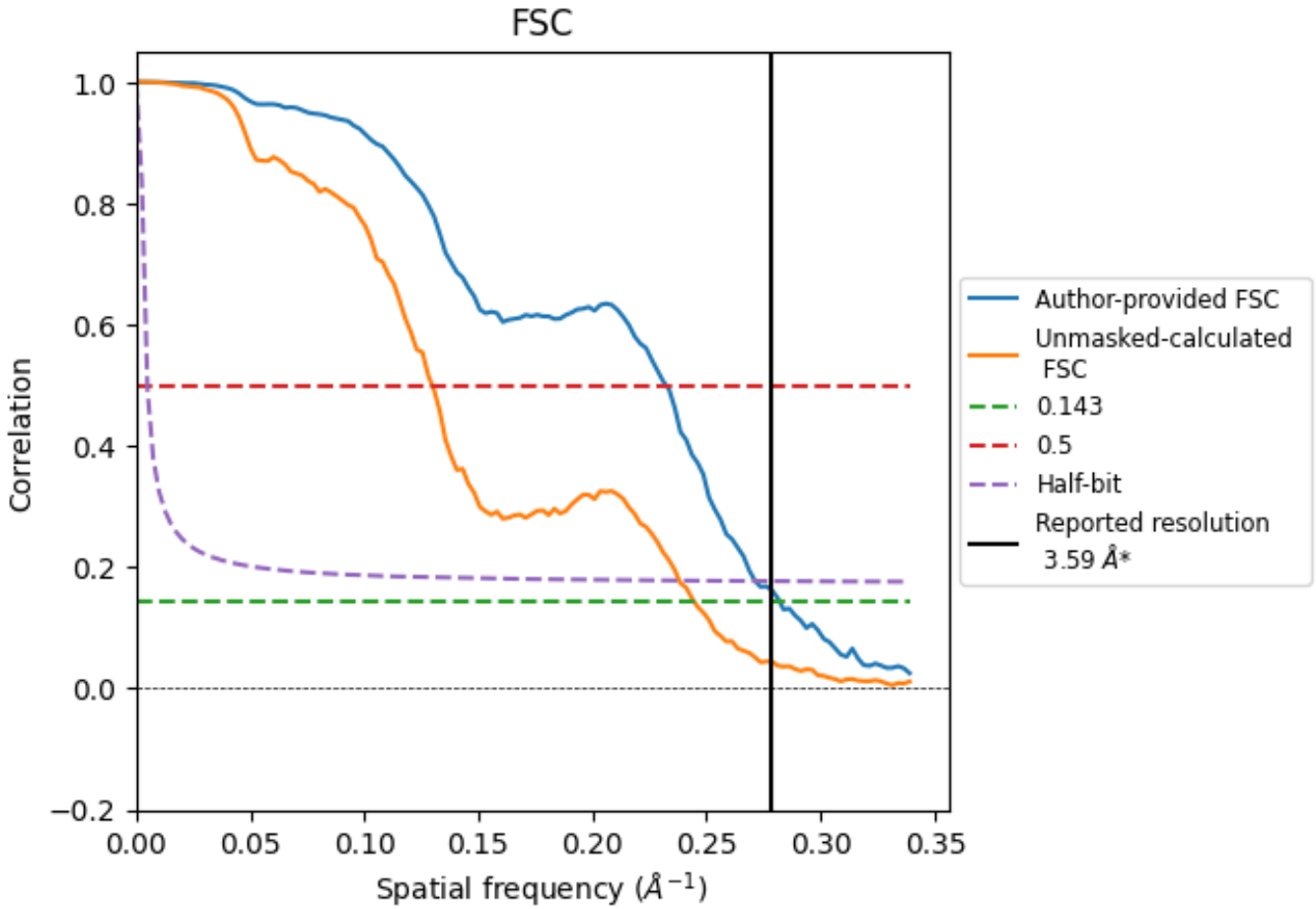


*Reported resolution corresponds to spatial frequency of 0.279 Å^{-1}

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 0.279 Å^{-1}

8.2 Resolution estimates (i)

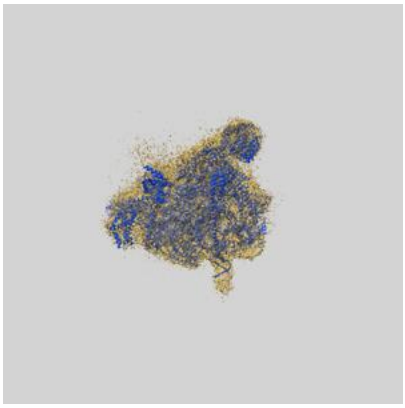
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.59	-	-
Author-provided FSC curve	3.55	4.31	3.68
Unmasked-calculated*	4.09	7.71	4.20

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.09 differs from the reported value 3.59 by more than 10 %

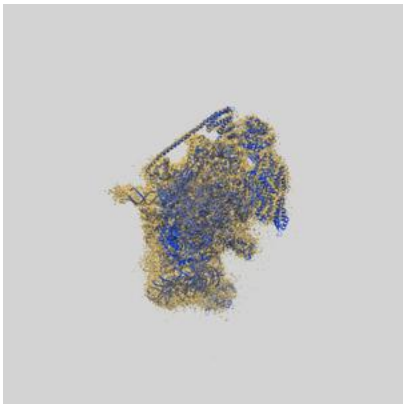
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-66104 and PDB model 9WMT. Per-residue inclusion information can be found in section 3 on page 17.

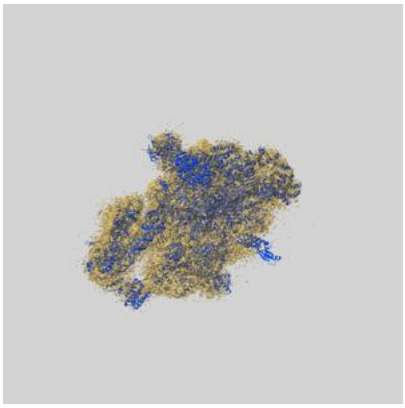
9.1 Map-model overlay



X



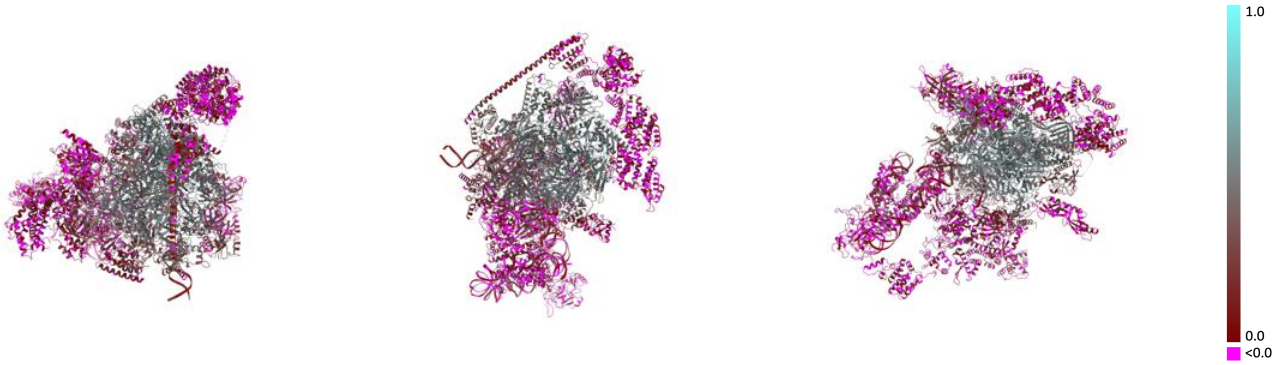
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.015 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.

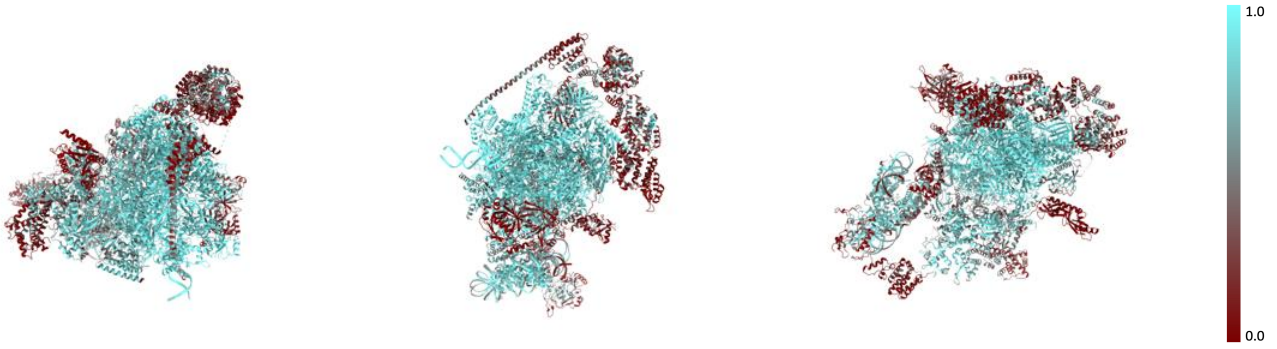
9.2 Q-score mapped to coordinate model (i)



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.

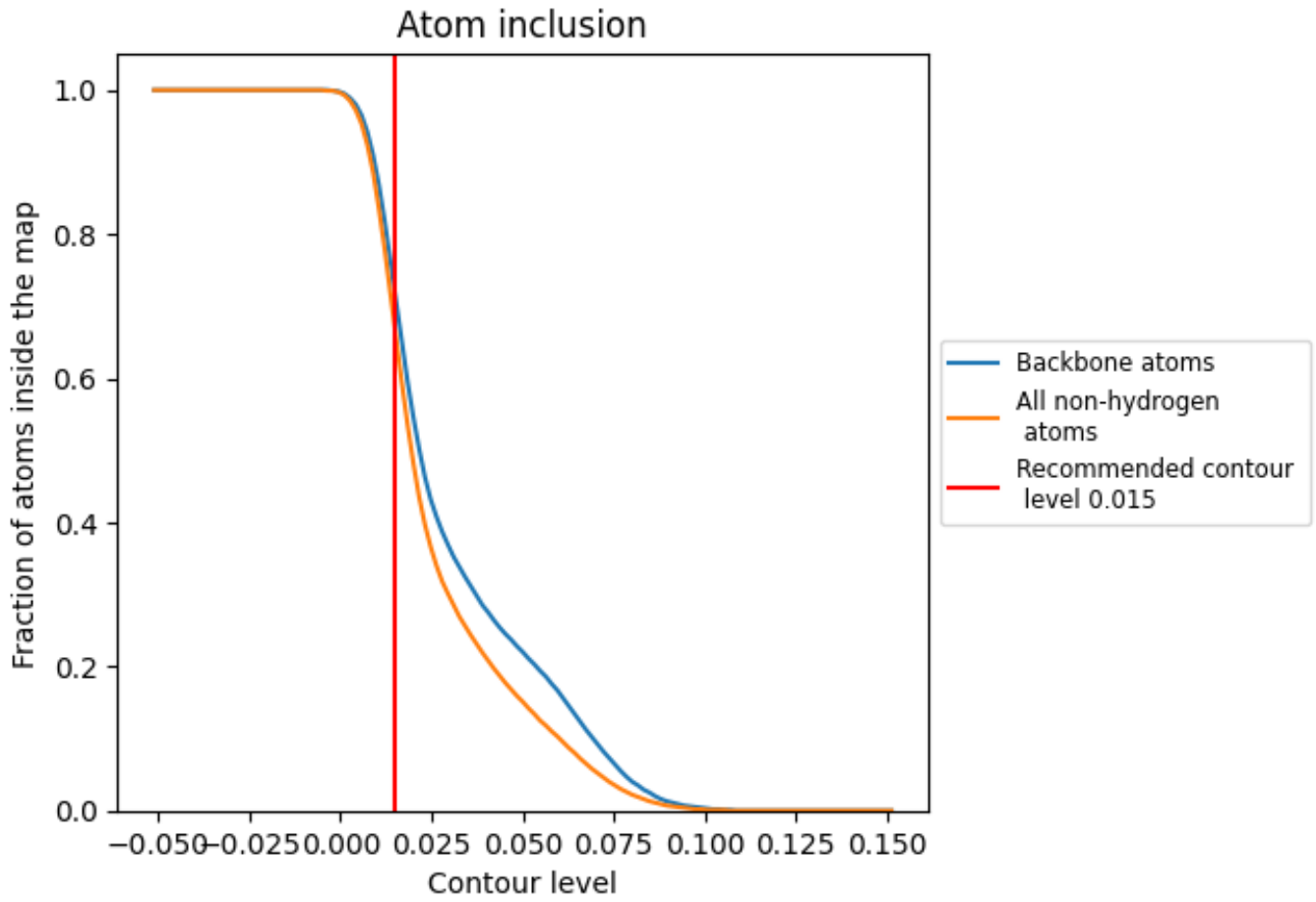
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.015).

9.4 Atom inclusion (i)



At the recommended contour level, 72% of all backbone atoms, 66% 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 (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6650	0.2250
A	0.9470	0.4690
B	0.9390	0.4770
C	0.9550	0.5070
D	0.7280	0.1600
E	0.9600	0.4480
F	0.9590	0.5000
G	0.7980	0.2700
H	0.9600	0.4840
I	0.9160	0.3420
J	0.9480	0.5090
K	0.9570	0.5110
L	0.9540	0.4560
M	0.8040	0.1460
N	0.7620	0.0890
P	0.8320	0.2980
T	0.7650	0.1240
V	0.8790	0.1050
W	0.6960	0.1530
a	0.8250	0.0160
b	0.8640	0.0210
c	0.7870	0.0310
d	0.7960	0.0070
e	0.6890	0.0140
f	0.6540	0.0260
g	0.4940	0.0290
h	0.5590	0.0250
m	0.4870	0.0470
n	0.7580	0.1650
q	0.2820	0.0510
r	0.2240	0.1160
s	0.2450	0.0090
u	0.1700	0.0920
v	0.1510	0.0410
x	0.4930	0.2330