Full wwPDB EM Validation Report ⓘ

Nov 9, 2024 – 02:39 pm GMT

PDB ID	:	6GMH
EMDB ID	:	EMD-0031
Title	:	Structure of activated transcription complex Pol II-DSIF-PAF-SPT6
Authors	:	Vos, S.M.; Farnung, L.; Boehing, M.; Linden, A.; Wigge, C.; Urlaub, H.; Cramer, P.
Deposited on	:	2018-05-26
Resolution	:	3.10 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

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

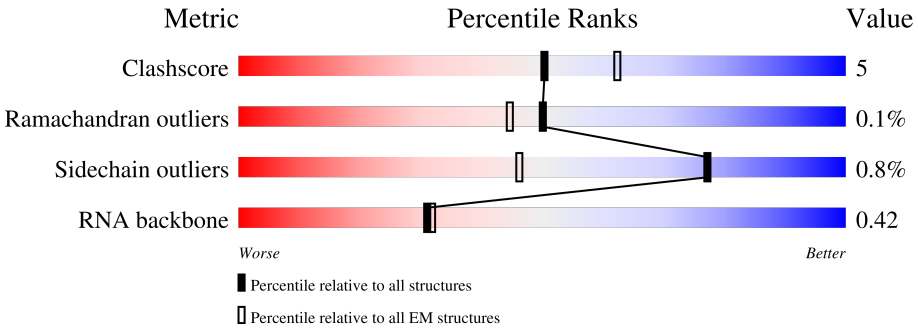
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.10 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	A	1970	60% 13% 27%
2	B	1174	80% 16%
3	C	275	77% 19%
4	D	142	77% 12% 11%
5	E	210	82% 16%
6	F	127	57% 7% 35%
7	G	172	77% 20%

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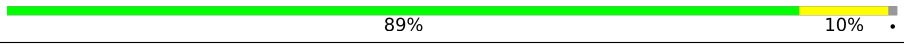
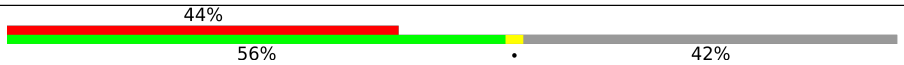
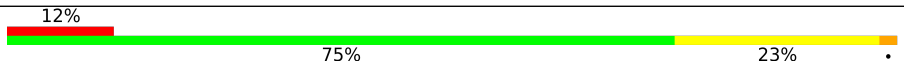
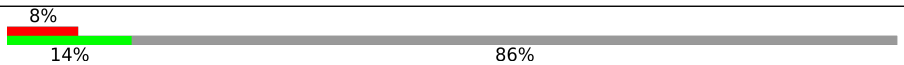
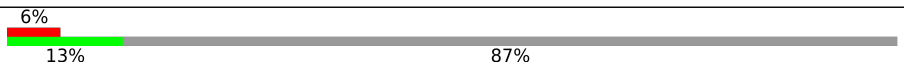
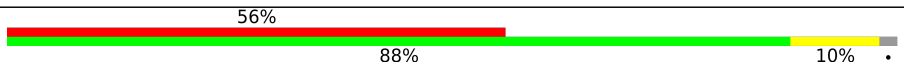
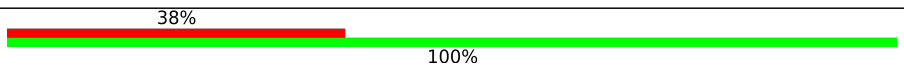
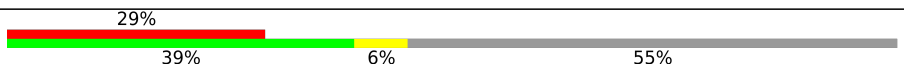
Mol	Chain	Length	Quality of chain
8	H	150	
9	I	125	
10	J	67	
11	K	117	
12	L	58	
13	M	1726	
14	N	48	
15	P	46	
16	Q	1178	
17	T	48	
18	U	776	
19	V	613	
20	W	305	
21	X	16	
22	Y	121	
23	Z	1087	

2 Entry composition (i)

There are 25 unique types of molecules in this entry. The entry contains 50239 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 RPB1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	N	O	P	S		
1	A	1441	11371	7151	2033	2115	2	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	1132	9052	5725	1592	1671	64	0	0

- Molecule 3 is a protein called RNA polymerase II subunit C.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	263	2115	1324	365	420	6	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	126	1004	630	170	200	4	0	0

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1333	866	214	245	8		

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

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

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

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

- Molecule 10 is a protein called RPB10.

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

- Molecule 11 is a protein called RPB11.

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

- Molecule 12 is a protein called RPB12.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	1002	Total	C	N	O	S	0	0
			4737	2583	1071	1076	7		

There are 3 discrepancies between the modelled and reference sequences:

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

- Molecule 14 is a DNA chain called Non-template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	37	Total	C	N	O	P	0	0
			773	361	158	217	37		

- Molecule 15 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	21	Total	C	N	O	P	0	0
			452	202	87	142	21		

- Molecule 16 is a protein called CTR9,RNA polymerase-associated protein CTR9 homolog,RNA polymerase-associated protein CTR9 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	884	Total	C	N	O	S	0	0
			4116	2199	953	961	3		

There are 5 discrepancies between the modelled and reference sequences:

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

- Molecule 17 is a DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	T	48	Total	C	N	O	P	0	0
			974	462	168	296	48		

- Molecule 18 is a protein called LEO1,LEO1,RNA polymerase-associated protein LEO1.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	U	110	Total	C	N	O	0	0
			440	220	110	110		

- Molecule 19 is a protein called PAF1,RNA polymerase II-associated factor 1 homolog,RNA polymerase II-associated factor 1 homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	V	81	Total	C	N	O	0	0
			324	162	81	81		

- Molecule 20 is a protein called WD repeat-containing protein 61.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	W	300	Total	C	N	O	S	0	0
			2333	1483	392	454	4		

- Molecule 21 is a protein called CDC73.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	X	16	Total	C	N	O	0	0
			63	32	16	15		

- Molecule 22 is a protein called Transcription elongation factor SPT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Y	116	Total	C	N	O	S	0	0
			911	570	159	173	9		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Y	-3	GLY	-	expression tag	UNP P63272
Y	-2	PRO	-	expression tag	UNP P63272
Y	-1	GLY	-	expression tag	UNP P63272
Y	0	SER	-	expression tag	UNP P63272

- Molecule 23 is a protein called Transcription elongation factor SPT5.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Z	486	Total	C	N	O	S	0	0
			3878	2465	684	712	17		

- Molecule 24 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 25 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

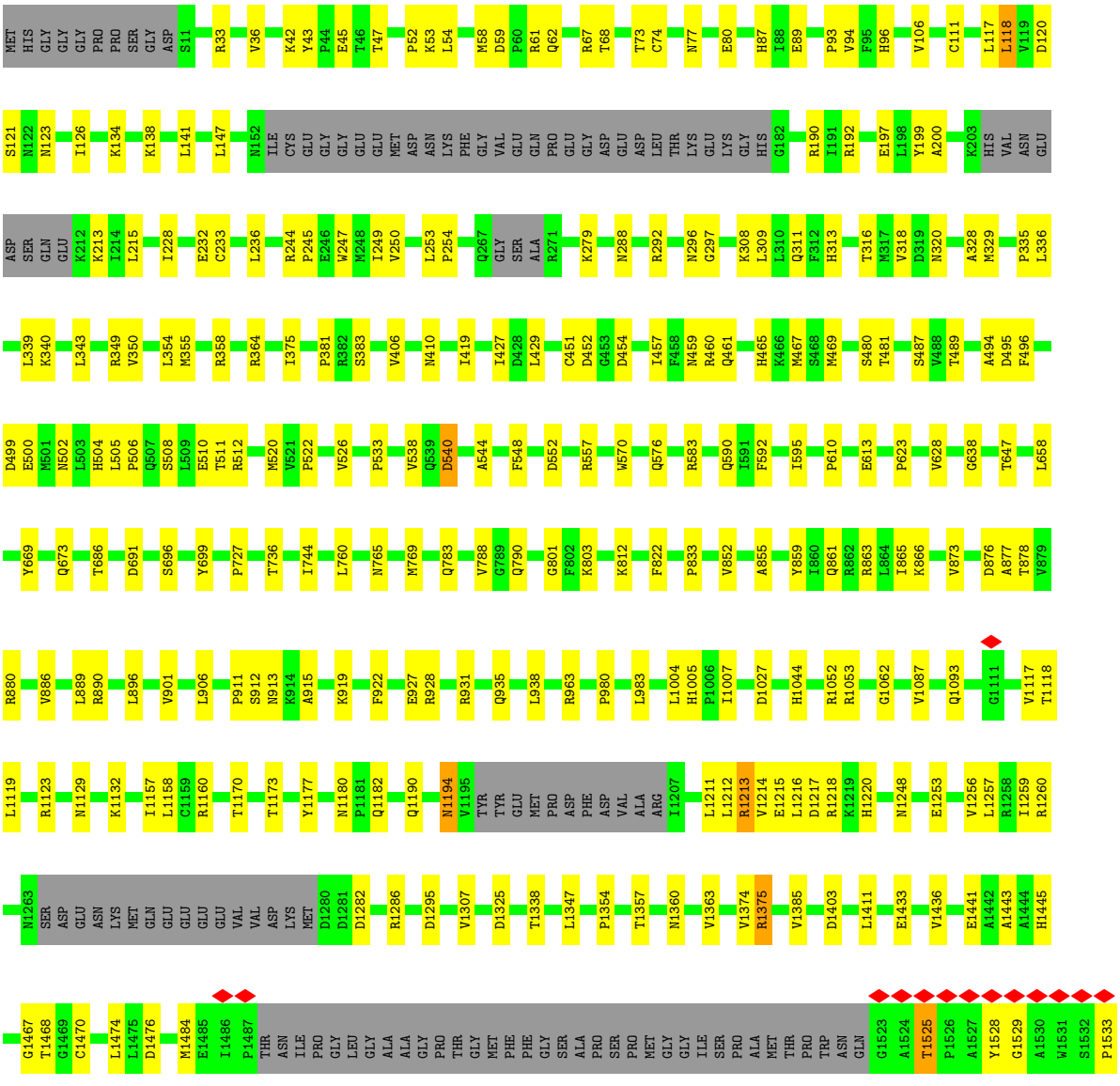
Mol	Chain	Residues	Atoms	AltConf
25	A	1	Total Mg 1 1	0

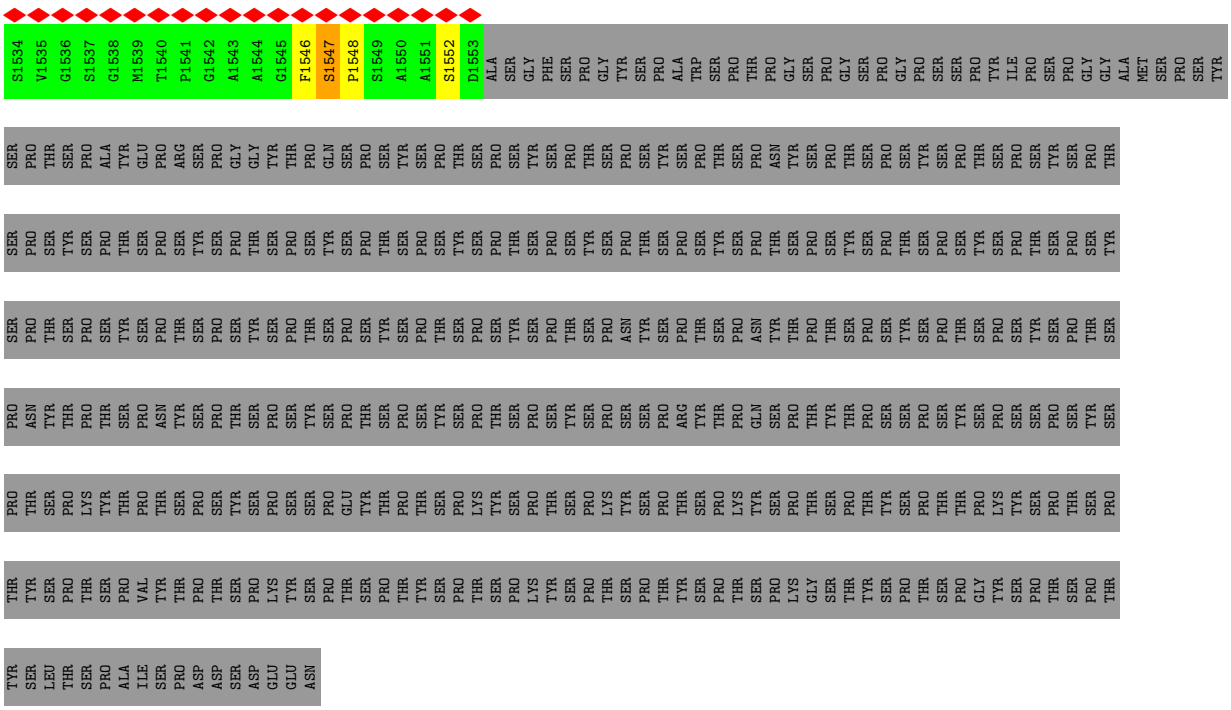
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: RPB1

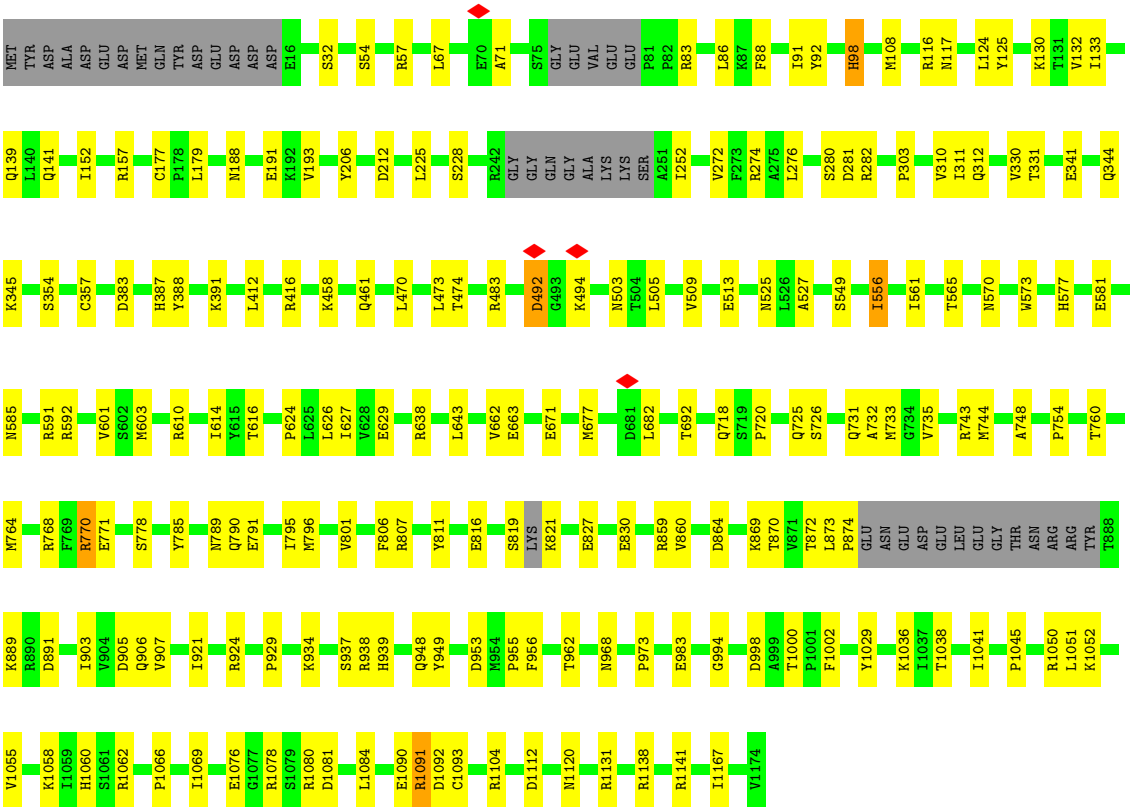
Chain A:





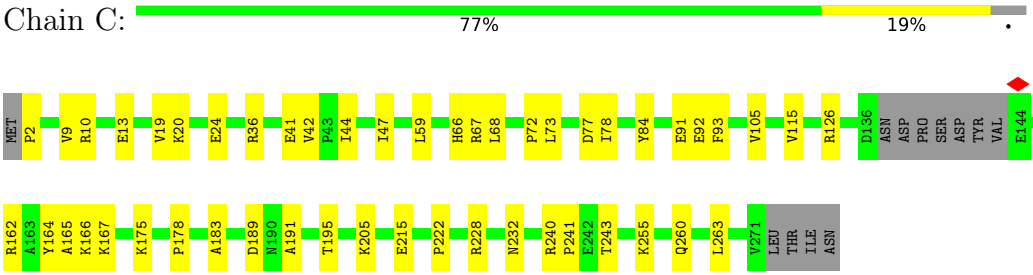
• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain B:



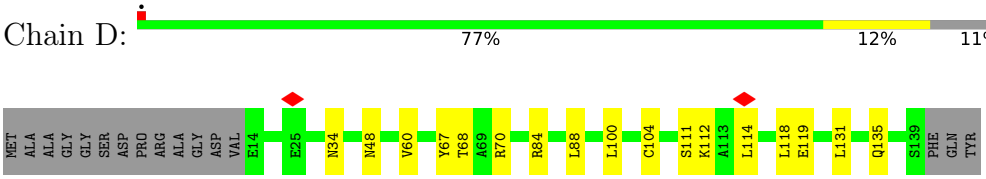
• Molecule 3: RNA polymerase II subunit C

Chain C:



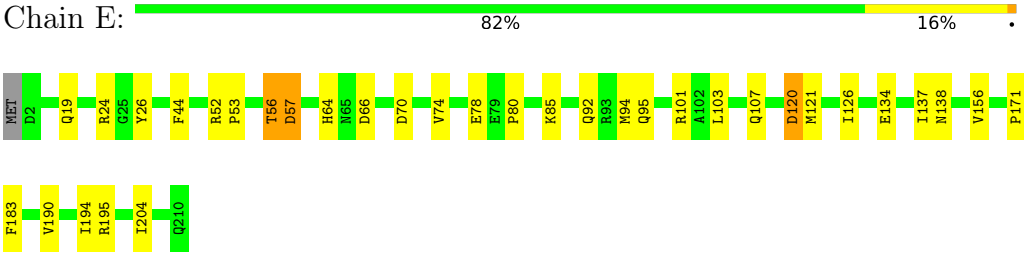
• Molecule 4: RNA polymerase II subunit D

Chain D:



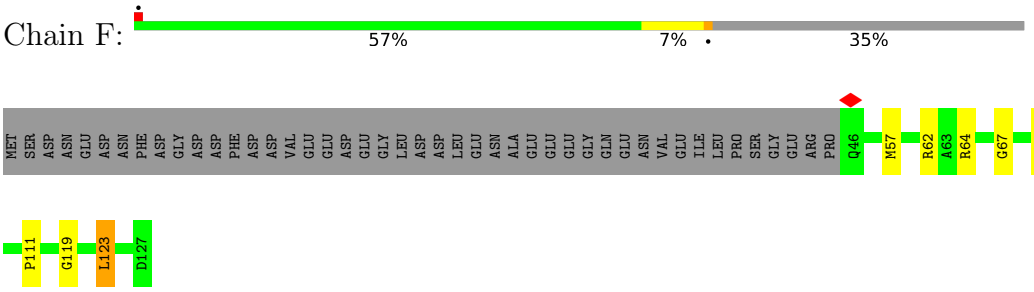
• Molecule 5: RNA polymerase II subunit E

Chain E:



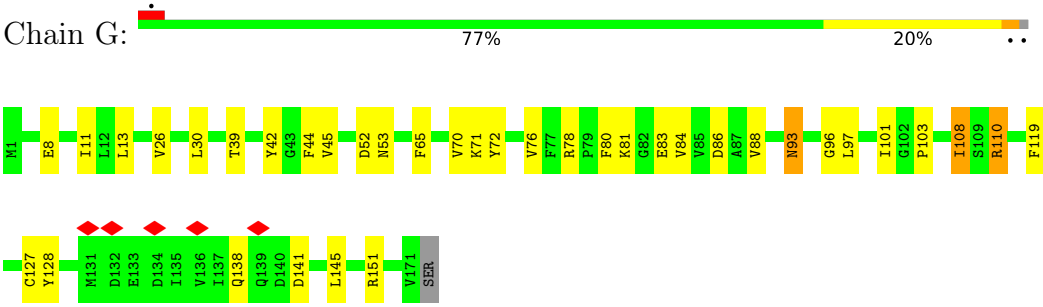
• Molecule 6: RNA polymerase II subunit F

Chain F:



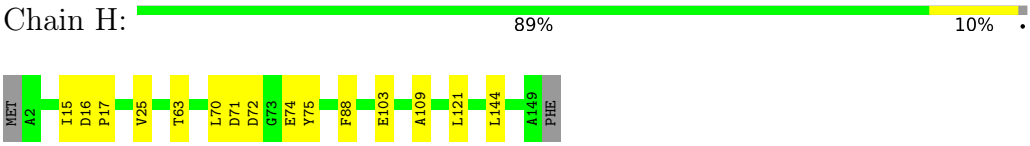
• Molecule 7: RNA polymerase II subunit G

Chain G:



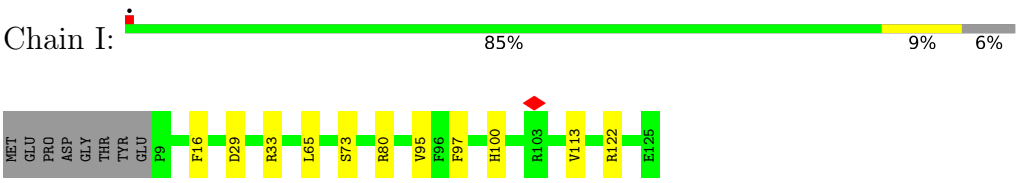
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:



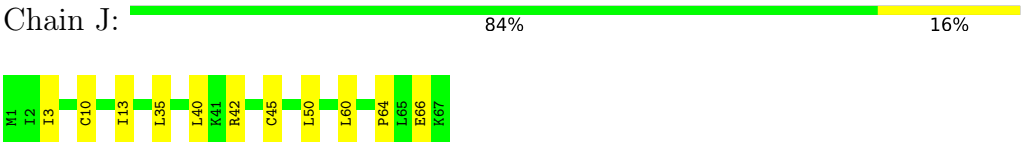
• Molecule 9: DNA-directed RNA polymerase II subunit RPB9

Chain I:



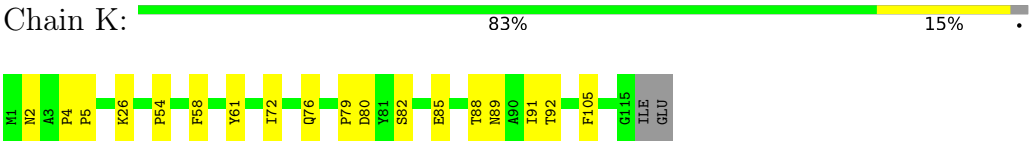
• Molecule 10: RPB10

Chain J:



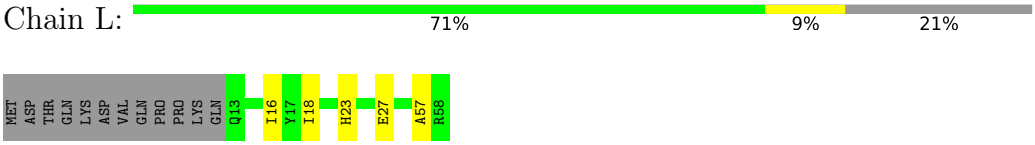
• Molecule 11: RPB11

Chain K:



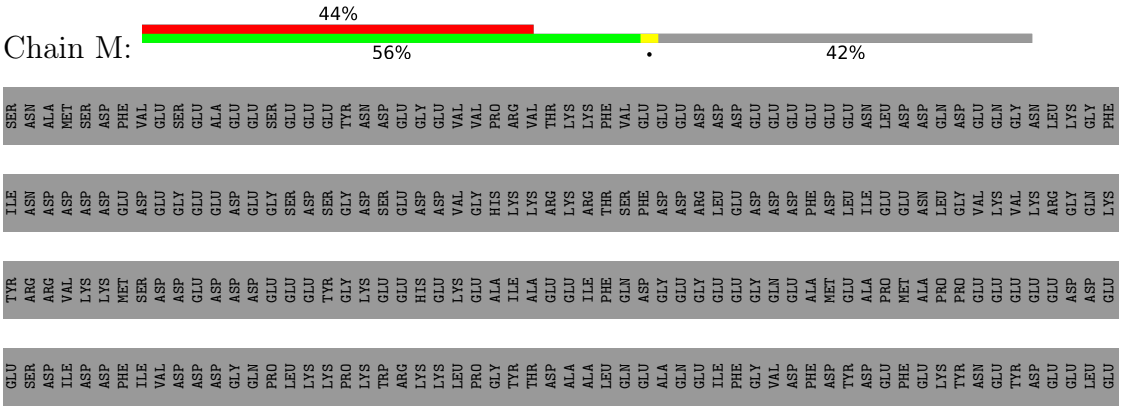
• Molecule 12: RPB12

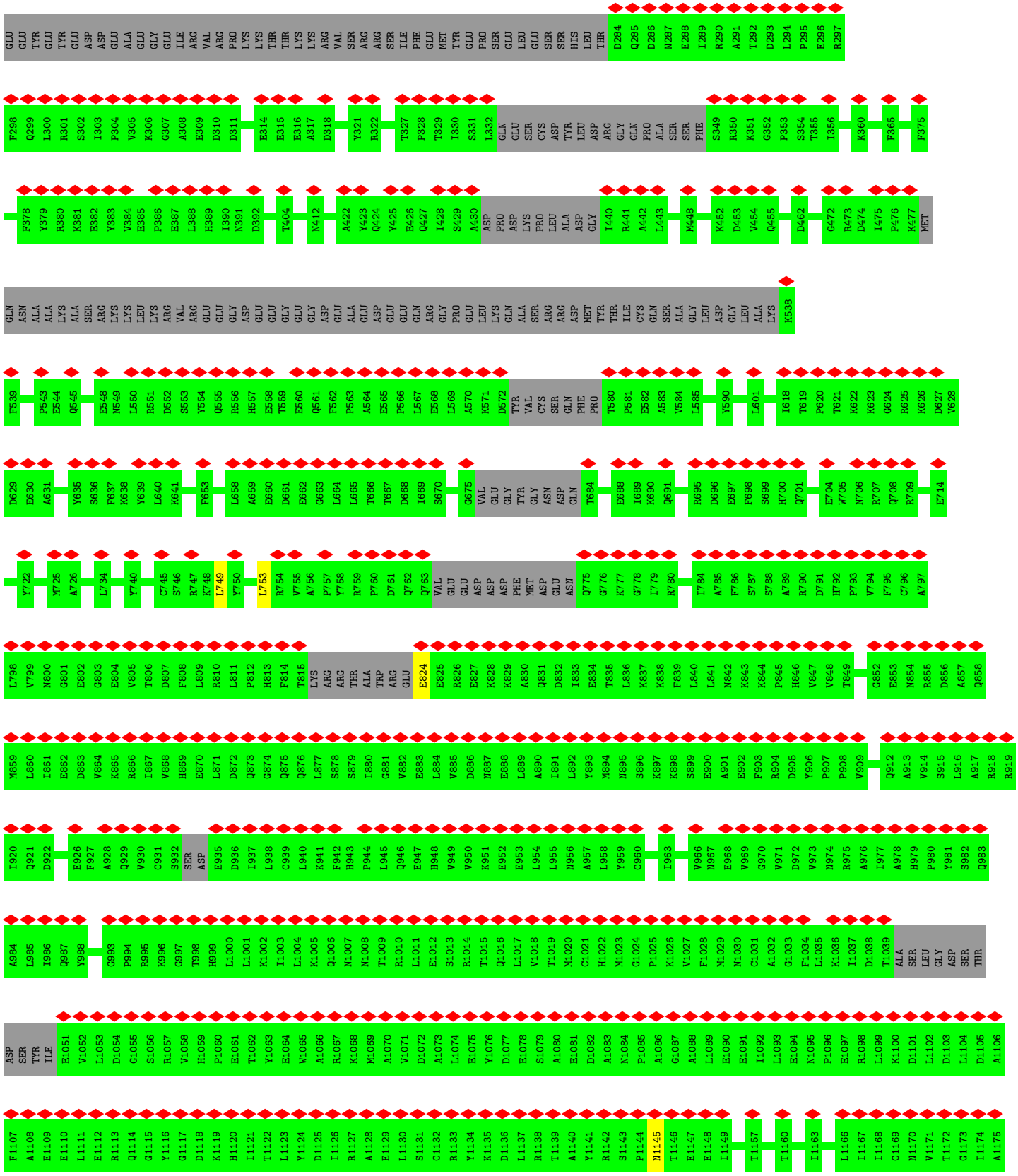
Chain L:

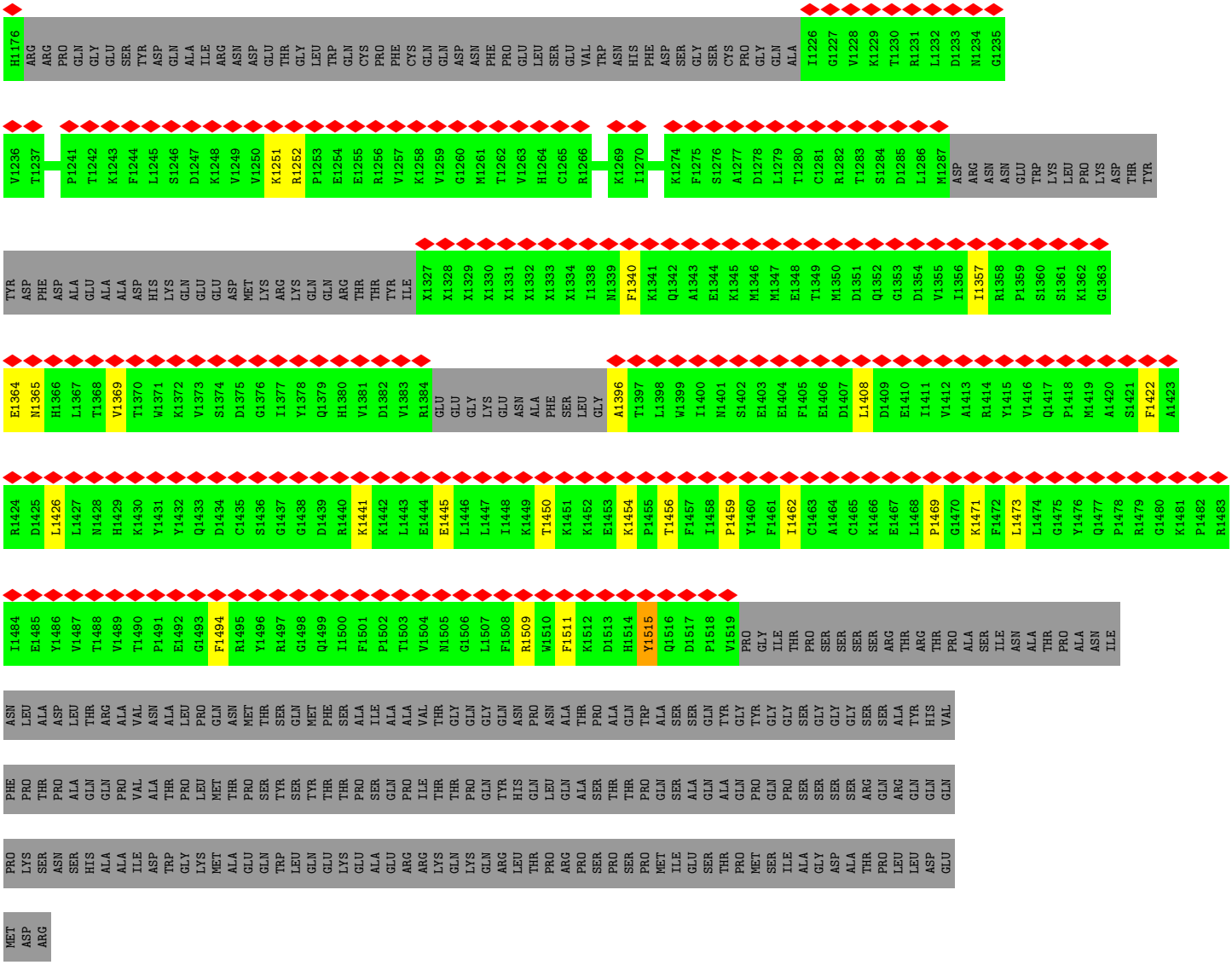


• Molecule 13: Transcription elongation factor SPT6,Transcription elongation factor SPT6,Transcription elongation factor SPT6

Chain M:

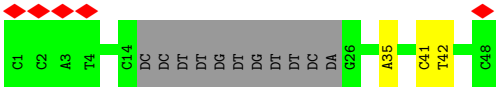



GLU GLU TYR GLU TYR GLU ASP ASP GLU ALA GLU GLY GLU ILE ARG VAL ARG PRO LYS LYS THR THR LYS LYS ARG VAL SER ARG ARG SER ILE PHE GLU MET TYR GLU PRO SER GLU LEU GLU SER SER HIS LEU THR D284 Q285 D286 N287 E288 I289 R290 A291 T292 D293 L294 P295 E296 R297
F298 Q299 L300 R301 S302 I303 P304 V305 K306 G307 A308 E309 D310 D311 E314 E315 E316 A317 D318 Y321 R322 T327 P328 T329 I330 S331 L332 GLN GLU SER CYS ASP TYR LEU ASP ARG GLY GLN PRO ALA SER SER PHE S349 R350 K351 G352 P353 S354 T355 I356 K360 F365 F375
F378 Y379 R380 K381 E382 Y383 V384 E385 P386 E387 L388 H389 I390 N391 D392 T404 N412 A422 Y423 Q424 Y425 E426 Q427 I428 S429 A430 ASP PRO ASP LYS PRO LEU ALA ASP GLY I440 R441 A442 L443 M448 K452 D453 V454 Q455 D462 G472 R473 D474 I475 P476 K477 MET
GLN ASN ALA ALA LYS ALA SER ARG LYS LYS LEU LYS ARG VAL ARG GLU GLU GLY ASP GLU GLU GLY GLU GLY ASP GLU ALA GLU ASP GLU GLU GLN ARG GLY PRO GLU LEU LYS GLN ALA SER ARG ARG ASP MET TYR THR ILE CYS GLN SER ALA GLY LEU ASP GLY LEU ALA LYS K538
F539 P543 E544 Q545 E548 N549 L550 R551 D552 S553 Y554 Q555 R556 H557 E558 T559 E560 Q561 F562 P563 A564 E565 P566 L567 E568 L569 A570 K571 D572 TYR VAL CYS SER GLN PHE PRO T580 P581 E582 A583 V584 L585 Y590 L601 I618 T619 P620 T621 K622 K623 G624 R625 K626 D627 V628
D629 E630 A631 Y635 S636 F637 K638 Y639 L640 K641 F653 L658 A659 E660 D661 E662 G663 L664 L665 T666 T667 D668 I669 S670 G675 VAL GLU GLY TYR GLY ASN ASP GLN T684 E688 I689 K690 Q691 R695 D696 E697 F698 S699 H700 Q701 E704 W705 N706 R707 Q708 R709 E714
Y722 M725 A726 L734 Y740 C745 S746 R747 K748 L749 Y750 L753 R754 V755 A756 P757 Y758 R759 P760 D761 Q762 Q763 VAL GLU GLU ASP ASP ASP PHE MET ASP GLU ASN Q775 G776 K777 G778 I779 R780 I784 A785 F786 S787 S788 A789 R790 D791 H792 P793 V794 F795 C796 A797
L798 V799 N800 G801 E802 D803 E804 V805 T806 D807 F808 L809 R810 L811 P812 H813 F814 T815 LYS ARG ARG THR ALA TRP ARG GLU E824 E825 R826 E827 K828 K829 A830 Q831 D832 I833 E834 T835 L836 K837 K838 F839 L840 L841 N842 K843 K844 P845 H846 V847 V848 T849 G852 E853 N854 R855 D856 A857 Q858
M859 L860 I861 E862 D863 V864 K865 R866 I867 V868 H869 E870 L871 D872 Q873 G874 Q875 Q876 L877 S878 S879 I880 G881 V882 E883 L884 V885 D886 N887 E888 L889 A890 I891 L892 Y893 M894 N895 S896 K897 K898 S899 E900 A901 E902 F903 R904 P905 Y906 P907 P908 V909 Q912 A913 V914 S915 L916 A917 R918 R919
I920 Q921 D922 E926 F927 A928 Q929 V930 C931 S932 SER ASP E935 D936 I937 L938 C939 L940 K941 F942 H943 P944 L945 Q946 E947 H948 V949 V950 K961 E952 E953 L954 L955 N956 A957 L958 Y959 C960 I963 V966 N967 E968 V969 G970 V971 D972 V973 N974 R975 A976 I977 A978 H979 P980 Y981 S982 Q983
A984 L985 I986 Q987 Y988 G993 P994 R995 K996 G997 T998 H999 L1000 L1001 K1002 I1003 L1004 K1005 Q1006 N1007 N1008 T1009 R1010 L1011 E1012 S1013 R1014 T1015 Q1016 L1017 V1018 T1019 M1020 C1021 H1022 M1023 G1024 P1025 K1026 V1027 F1028 M1029 N1030 C1031 A1032 G1033 F1034 L1035 K1036 I1037 D1038 T1039 ALA SER LEU GLY ASP SER THR
ASP SER TYR ILE E1051 V1052 L1053 D1054 G1055 S1056 R1057 V1058 H1059 P1060 E1061 T1062 Y1063 E1064 W1065 A1066 R1067 K1068 M1069 A1070 V1071 D1072 A1073 L1074 E1075 Y1076 D1077 E1078 S1079 A1080 E1081 D1082 A1083 N1084 P1085 A1086 G1087 A1088 L1089 E1090 E1091 I1092 L1093 E1094 N1095 P1096 E1097 R1098 L1099 K1100 D1101 L1102 D1103 L1104 D1105 A1106
F1107 A1108 E1109 E1110 L1111 E1112 R1113 Q1114 G1115 Y1116 G1117 D1118 K1119 H1120 I1121 T1122 L1123 Y1124 D1125 I1126 R1127 A1128 E1129 L1130 S1131 C1132 R1133 Y1134 K1135 D1136 L1137 R1138 T1139 A1140 Y1141 R1142 S1143 P1144 N1145 T1146 E1147 E1148 I1149 T1157 T1160 I1163 L1166 I1167 I1168 C1169 N1170 V1171 T1172 G1173 I1174 A1175



• Molecule 14: Non-template DNA

Chain N:

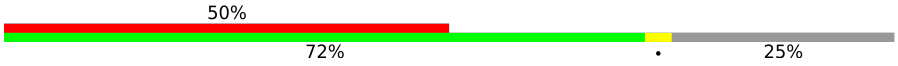


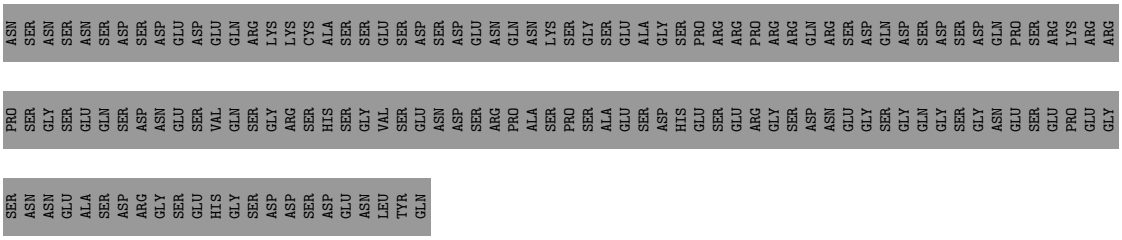
• Molecule 15: RNA

Chain P:

• Molecule 16: CTR9,RNA polymerase-associated protein CTR9 homolog,RNA polymerase-associated protein CTR9 homolog

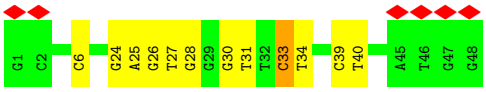
Chain Q:





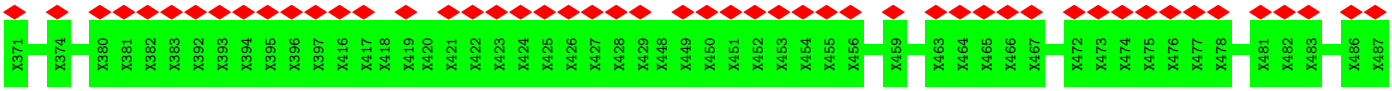
• Molecule 17: Template DNA

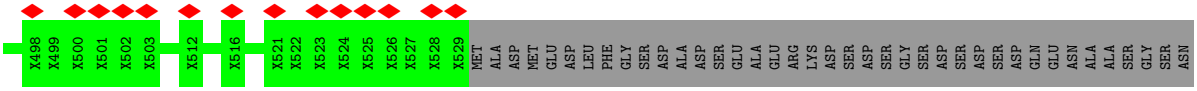
Chain T:

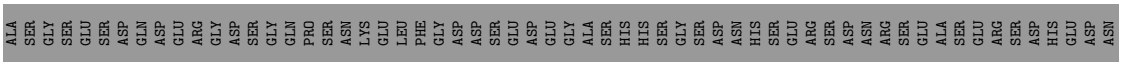


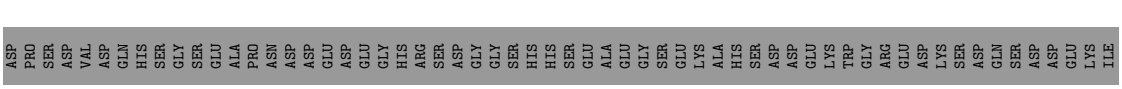
• Molecule 18: LEO1,LEO1,RNA polymerase-associated protein LEO1

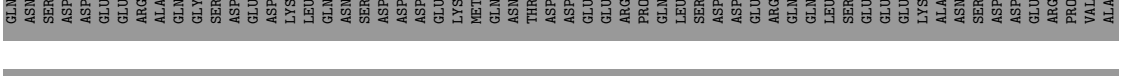
Chain U:

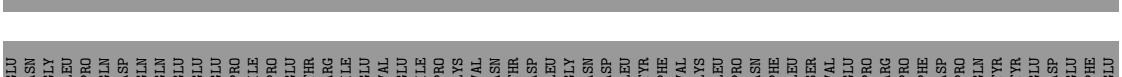


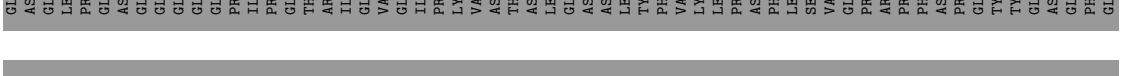


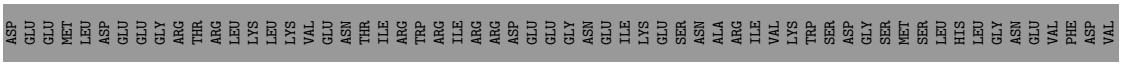


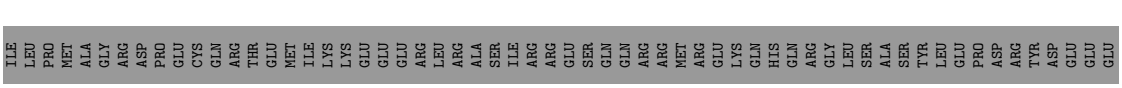


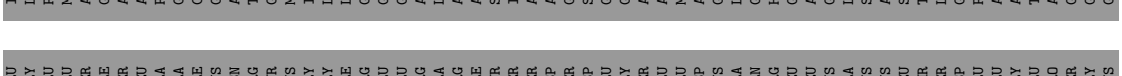






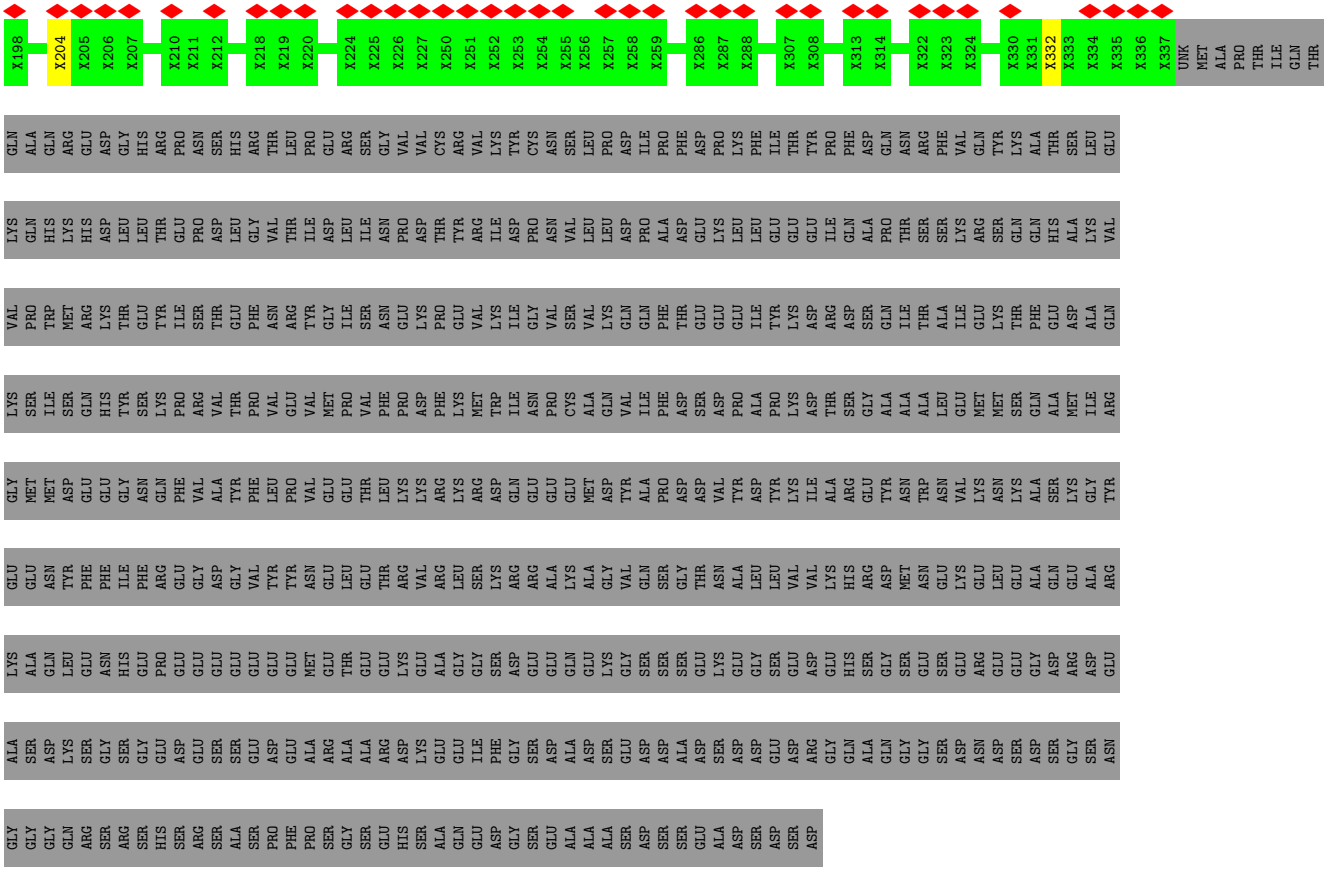






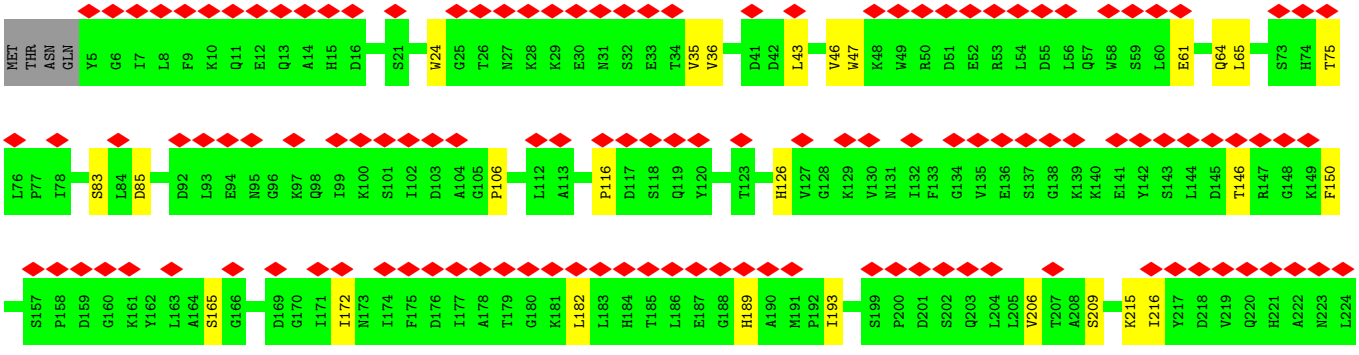
• Molecule 19: PAF1,RNA polymerase II-associated factor 1 homolog,RNA polymerase II-associated factor 1 homolog

Chain V:



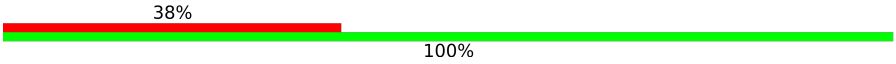
• Molecule 20: WD repeat-containing protein 61

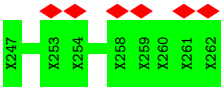
Chain W:



• Molecule 21: CDC73

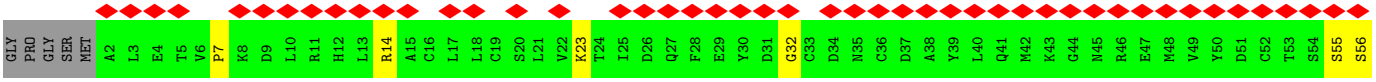
Chain X:

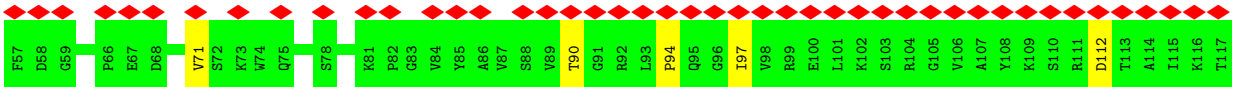




• Molecule 22: Transcription elongation factor SPT4

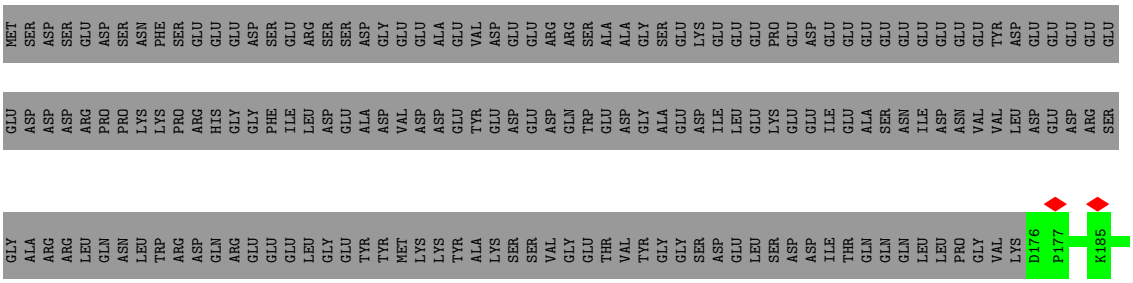
Chain Y:

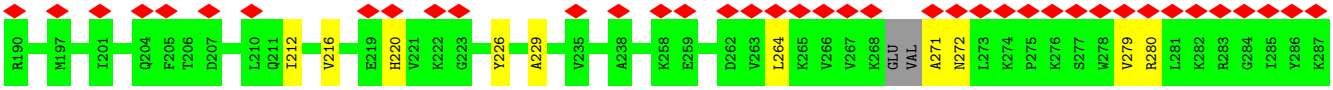


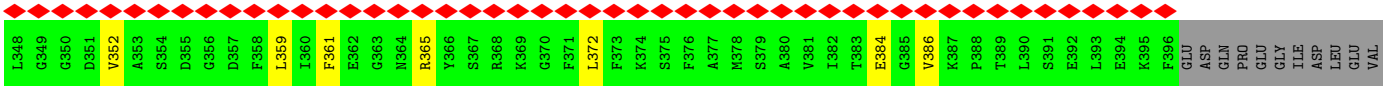


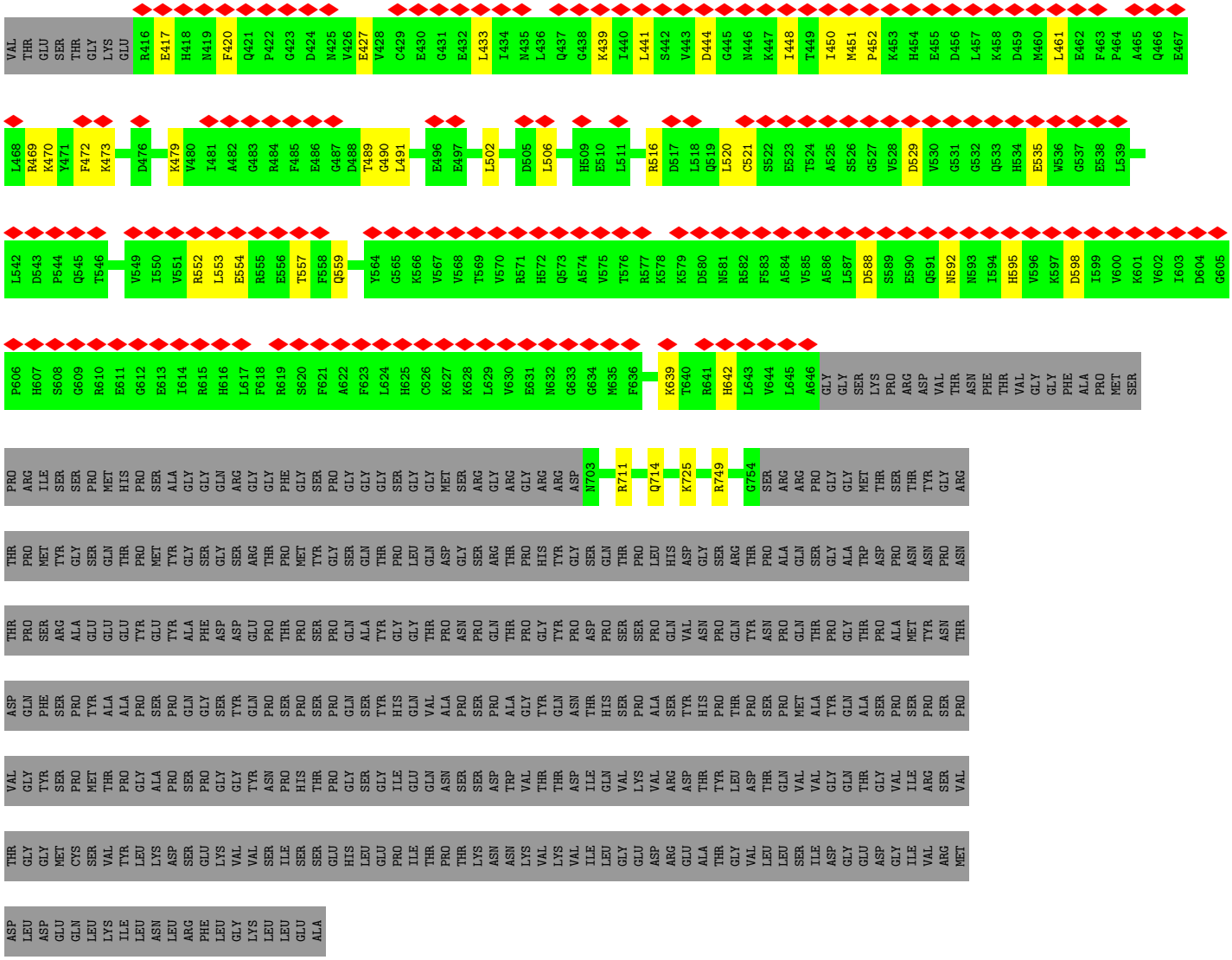
• Molecule 23: Transcription elongation factor SPT5

Chain Z:








VAL THR GLU SER THR GLY LYS GLU R416 E417 H418 N419 F420 Q421 P422 G423 D424 N425 V426 E427 V428 C429 E430 G431 E432 L433 I434 N435 L436 Q437 G438 K439 I440 L441 S442 V443 D444 G445 N446 K447 I448 T449 I450 M451 P452 K453 H454 E455 D456 L457 K458 D459 M460 L461 E462 F463 P464 A465 Q466 E467
L468 R469 K470 Y471 F472 K473 D476 K479 V480 I481 A482 G483 R484 F485 E486 G487 D488 T489 G490 L491 E496 E497 L502 D505 L506 H509 E510 L511 R516 D517 L518 Q519 L520 C521 S522 E523 T524 A525 S526 G527 V528 D529 V530 G531 G532 Q533 H534 E535 W536 G537 E538 L539
L542 D543 P544 Q545 T546 V549 I550 V551 R552 L553 E554 R555 E556 T557 F558 Q559 Y564 G565 K566 V567 V568 T569 V570 R571 H572 Q573 A574 V575 T576 R577 K578 K579 D580 N581 R582 F583 A584 V585 A586 L587 D588 S589 E590 Q591 N592 R593 I594 H595 V596 K597 D598 I599 V600 K601 V602 I603 D604 G605
P606 H607 S608 G609 R610 E611 G612 E613 I614 R615 H616 L617 F618 R619 S620 F621 A622 F623 L624 H625 C626 K627 K628 L629 V630 E631 N632 G633 G634 M635 F636 K639 T640 R641 H642 L643 V644 L645 A646 GLY GLY SER LYS PRO ARG ASP VAL THR ASN PHE THR VAL GLY GLY PHE ALA PRO MET SER
PRO ARG ILE SER SER PRO MET HIS PRO SER ALA GLY GLY GLN ARG GLY GLY PHE GLY SER PRO GLY GLY GLY SER GLY GLY MET SER ARG GLY ARG GLY ARG ARG ASP N703 R711 Q714 K725 R749 G754 SER ARG ARG PRO GLY GLY MET THR SER THR TYR GLY ARG
THR PRO MET TYR GLY SER GLN THR PRO MET TYR GLY SER GLY SER ARG THR PRO MET TYR GLY SER GLN THR PRO LEU GLN LEU ASP GLY SER ARG THR PRO HIS TYR GLY SER GLN THR PRO LEU HIS ASP GLY SER ARG THR PRO ALA GLN SER GLY ALA TRP ASP PRO ASN ASN PRO ASN
THR PRO SER ARG ALA GLU GLU TYR GLU TYR ALA PHE ASP ASP GLU PRO THR PRO SER PRO GLN ALA TYR GLY GLY THR PRO ASN PRO GLN THR PRO GLY TYR PRO ASP PRO SER SER PRO GLN VAL ASN PRO GLN TYR ASN PRO GLN THR PRO GLY THR PRO ALA MET TYR ASN THR
ASP GLN PHE SER PRO TYR ALA ALA PRO SER PRO GLN GLY SER TYR GLN PRO SER PRO SER PRO GLN SER TYR HIS GLN VAL ALA PRO SER PRO ALA GLY TYR GLN ASN THR HIS SER PRO ALA SER TYR HIS PRO THR PRO SER PRO MET ALA TYR GLN ALA SER PRO SER PRO SER PRO
VAL GLY TYR SER PRO MET THR PRO GLY ALA PRO SER PRO GLY GLY TYR ASN PRO HIS THR PRO GLY SER GLY ILE GLU GLN ASN SER SER ASP TRP VAL THR THR ASP ILE GLN VAL LYS VAL ARG ASP THR TYR LEU ASP THR GLN VAL VAL GLY GLN THR GLY VAL ILE ARG SER VAL
THR GLY GLY MET CYS SER VAL TYR LEU LYS ASP SER GLU LYS VAL VAL SER ILE SER SER GLU HIS LEU GLU PRO ILE THR PRO THR LYS ASN ASN LYS VAL LYS VAL ILE ILE LEU GLY GLU ASP ARG GLU ALA THR GLY VAL LEU LEU SER ILE ASP GLY GLU ASP GLY ILE VAL ARG MET
ASP LEU ASP GLU GLN LEU LYS ILE LEU ASN LEU ARG PHE LEU GLY LYS LEU LEU GLU ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	374964	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	130000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.155	Depositor
Minimum map value	-0.057	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.0157	Depositor
Map size (Å)	377.64, 377.64, 377.64	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.049, 1.049, 1.049	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: SEP, ZN, TPO, MG

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	0.38	0/11558	0.63	3/15601 (0.0%)
2	B	0.41	0/9232	0.61	2/12462 (0.0%)
3	C	0.42	0/2158	0.58	0/2931
4	D	0.31	0/1017	0.55	0/1368
5	E	0.36	0/1751	0.65	1/2366 (0.0%)
6	F	0.35	0/667	0.55	0/901
7	G	0.34	0/1364	0.64	0/1853
8	H	0.41	0/1207	0.65	0/1628
9	I	0.35	0/972	0.56	0/1316
10	J	0.42	0/542	0.56	0/730
11	K	0.40	0/939	0.60	2/1271 (0.2%)
12	L	0.41	0/394	0.65	0/524
13	M	0.26	0/4724	0.49	0/6031
14	N	0.59	0/870	0.88	0/1341
15	P	0.44	0/506	1.08	5/787 (0.6%)
16	Q	0.25	0/2923	0.44	0/3746
17	T	0.64	0/1087	0.96	1/1674 (0.1%)
20	W	0.27	0/2392	0.55	0/3257
22	Y	0.26	0/927	0.48	0/1250
23	Z	0.28	0/3946	0.53	0/5314
All	All	0.37	0/49176	0.61	14/66351 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
2	B	0	3
3	C	0	1

Continued on next page...

Continued from previous page...

Mol	Chain	#Chirality outliers	#Planarity outliers
5	E	0	2
7	G	0	1
13	M	0	3
All	All	0	12

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	E	120	ASP	CB-CG-OD1	8.67	126.11	118.30
11	K	80	ASP	CB-CG-OD1	7.44	124.99	118.30
15	P	36	G	P-O3'-C3'	6.96	128.05	119.70
15	P	32	G	C4-N9-C1'	6.88	135.44	126.50
1	A	118	LEU	CA-CB-CG	6.87	131.09	115.30
2	B	492	ASP	CB-CG-OD1	6.35	124.02	118.30
15	P	32	G	C8-N9-C1'	-5.81	119.44	127.00
1	A	1158	LEU	CA-CB-CG	5.76	128.56	115.30
2	B	556	ILE	C-N-CA	5.53	135.52	121.70
1	A	1257	LEU	CA-CB-CG	5.50	127.94	115.30
17	T	33	DC	OP1-P-O3'	5.29	116.84	105.20
15	P	32	G	N3-C4-C5	-5.28	125.96	128.60
15	P	32	G	N3-C4-N9	5.21	129.13	126.00
11	K	79	PRO	C-N-CA	5.06	134.36	121.70

There are no chirality outliers.

All (12) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	460	ARG	Peptide
1	A	538	VAL	Peptide
2	B	629	GLU	Peptide
2	B	71	ALA	Peptide
2	B	98	HIS	Peptide
3	C	91	GLU	Peptide
5	E	56	THR	Peptide
5	E	57	ASP	Peptide
7	G	124	ASN	Peptide
13	M	1145	ASN	Peptide
13	M	1251	LYS	Peptide
13	M	1252	ARG	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	11371	0	11488	183	0
2	B	9052	0	9081	130	0
3	C	2115	0	2057	36	0
4	D	1004	0	980	12	0
5	E	1720	0	1737	25	0
6	F	657	0	684	8	0
7	G	1333	0	1321	26	0
8	H	1186	0	1147	11	0
9	I	949	0	879	9	0
10	J	533	0	554	9	0
11	K	920	0	942	12	0
12	L	388	0	393	6	0
13	M	4737	0	2252	21	0
14	N	773	0	412	3	0
15	P	452	0	229	5	0
16	Q	4116	0	1657	20	0
17	T	974	0	541	9	0
18	U	440	0	18	0	0
19	V	324	0	15	1	0
20	W	2333	0	2246	21	0
21	X	63	0	2	0	0
22	Y	911	0	904	8	0
23	Z	3878	0	3941	38	0
24	A	2	0	0	0	0
24	B	1	0	0	0	0
24	C	1	0	0	0	0
24	I	2	0	0	0	0
24	J	1	0	0	0	0
24	L	1	0	0	0	0
24	Y	1	0	0	0	0
25	A	1	0	0	0	0
All	All	50239	0	43480	495	0

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

All (495) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:85:LYS:NZ	14:N:41:DC:OP2	1.92	1.03
2:B:816:GLU:OE2	2:B:869:LYS:NZ	2.00	0.95
9:I:65:LEU:O	9:I:122:ARG:NH1	2.06	0.88
1:A:803:LYS:O	1:A:812:LYS:NZ	2.12	0.83
1:A:355:MET:SD	2:B:1091:ARG:NH1	2.50	0.82
2:B:387:HIS:NE2	2:B:671:GLU:OE2	2.13	0.81
13:M:1454:LYS:NZ	13:M:1456:THR:OG1	2.15	0.79
1:A:358:ARG:NH1	17:T:27:DT:OP1	2.17	0.78
3:C:93:PHE:HE1	3:C:166:LYS:HZ3	1.32	0.78
1:A:1375:ARG:NH1	1:A:1403:ASP:OD1	2.18	0.77
2:B:1131:ARG:NH1	23:Z:535:GLU:OE1	2.18	0.77
2:B:859:ARG:NH1	2:B:860:VAL:O	2.19	0.76
1:A:927:GLU:OE2	1:A:931:ARG:NH2	2.14	0.75
16:Q:885:THR:O	16:Q:889:LEU:HB2	1.87	0.75
1:A:340:LYS:HG3	1:A:1436:VAL:HG21	1.72	0.71
3:C:19:VAL:HG23	3:C:241:PRO:HB2	1.72	0.71
1:A:686:THR:HG21	2:B:1041:ILE:HA	1.74	0.70
1:A:33:ARG:HH21	2:B:1141:ARG:HE	1.40	0.69
16:Q:784:LYS:NZ	20:W:64:GLN:OE1	2.26	0.68
1:A:87:HIS:NE2	1:A:89:GLU:OE2	2.27	0.68
2:B:592:ARG:NE	2:B:663:GLU:OE2	2.18	0.68
2:B:274:ARG:NH1	2:B:311:ILE:O	2.26	0.67
7:G:97:LEU:HB3	7:G:108:ILE:HG23	1.76	0.67
22:Y:23:LYS:NZ	22:Y:32:GLY:O	2.26	0.66
4:D:114:LEU:HD22	7:G:84:VAL:HG11	1.78	0.66
2:B:473:LEU:HD11	2:B:1052:LYS:HD3	1.76	0.65
2:B:819:SER:H	2:B:827:GLU:HB2	1.61	0.65
23:Z:529:ASP:HB2	23:Z:553:LEU:HD13	1.78	0.65
6:F:57:MET:HB2	6:F:123:LEU:HD13	1.79	0.65
3:C:92:GLU:OE1	23:Z:711:ARG:NH1	2.30	0.65
1:A:861:GLN:HE21	1:A:865:ILE:HD11	1.61	0.65
1:A:54:LEU:HB3	1:A:61:ARG:HH12	1.62	0.64
4:D:60:VAL:HG13	7:G:103:PRO:HB3	1.79	0.64
1:A:199:TYR:HB3	1:A:215:LEU:HD23	1.80	0.64
2:B:282:ARG:HH11	9:I:16:PHE:HD2	1.45	0.64
1:A:461:GLN:NE2	2:B:1090:GLU:OE2	2.30	0.64
23:Z:417:GLU:OE2	23:Z:516:ARG:NH1	2.31	0.64
2:B:91:ILE:HD11	2:B:124:LEU:HD12	1.80	0.63
2:B:310:VAL:HG23	2:B:311:ILE:HD12	1.80	0.63
3:C:47:ILE:HD11	3:C:68:LEU:HB3	1.80	0.63
1:A:459:ASN:HB3	1:A:469:MET:HG2	1.81	0.63
1:A:865:ILE:HD13	2:B:1092:ASP:OD2	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:G:11:ILE:HD11	7:G:26:VAL:HG13	1.81	0.63
13:M:1441:LYS:NZ	13:M:1445:GLU:OE2	2.31	0.63
1:A:381:PRO:HB3	1:A:480:SER:HA	1.81	0.62
3:C:47:ILE:HA	3:C:165:ALA:HA	1.81	0.62
1:A:576:GLN:O	1:A:590:GLN:NE2	2.32	0.62
1:A:865:ILE:HG21	2:B:1092:ASP:OD2	2.00	0.62
2:B:458:LYS:HB2	2:B:461:GLN:HB2	1.81	0.62
3:C:41:GLU:OE1	3:C:255:LYS:NZ	2.27	0.62
23:Z:306:LYS:HA	23:Z:372:LEU:O	2.01	0.61
2:B:98:HIS:HB2	2:B:108:MET:HB2	1.83	0.61
1:A:200:ALA:O	1:A:213:LYS:HA	2.01	0.60
23:Z:479:LYS:HD3	23:Z:521:CYS:HB2	1.83	0.60
2:B:354:SER:HG	2:B:357:CYS:HG	1.48	0.60
23:Z:220:HIS:NE2	23:Z:384:GLU:OE1	2.34	0.60
1:A:457:ILE:HG22	1:A:504:HIS:HB2	1.84	0.60
23:Z:450:ILE:HG23	23:Z:452:PRO:HD3	1.84	0.59
20:W:35:VAL:HB	20:W:47:TRP:HB2	1.83	0.59
23:Z:639:LYS:HB2	23:Z:642:HIS:HD2	1.68	0.59
2:B:344:GLN:NE2	2:B:354:SER:O	2.36	0.59
2:B:565:THR:HG22	2:B:610:ARG:HB3	1.85	0.59
2:B:32:SER:HB3	2:B:643:LEU:HD21	1.83	0.59
3:C:154:ARG:NH1	10:J:60:LEU:O	2.36	0.59
16:Q:763:ARG:HH12	20:W:65:LEU:HD11	1.68	0.59
13:M:1357:ILE:HG21	13:M:1408:LEU:HD13	1.85	0.59
23:Z:439:LYS:O	23:Z:452:PRO:HA	2.03	0.59
2:B:179:LEU:HD22	2:B:768:ARG:HD3	1.84	0.59
1:A:318:VAL:HG12	1:A:339:LEU:HD12	1.85	0.58
1:A:727:PRO:HA	1:A:736:THR:HG21	1.84	0.58
1:A:1190:GLN:O	1:A:1194:ASN:HB2	2.03	0.58
7:G:8:GLU:HA	7:G:70:VAL:O	2.03	0.58
1:A:94:VAL:HG13	1:A:311:GLN:HG2	1.83	0.58
1:A:47:THR:HA	1:A:52:PRO:HA	1.85	0.58
1:A:1218:ARG:NH1	1:A:1253:GLU:HA	2.18	0.58
20:W:36:VAL:HG22	20:W:46:VAL:HG22	1.86	0.58
1:A:520:MET:HG3	1:A:522:PRO:HD2	1.85	0.58
1:A:783:GLN:HG3	1:A:788:VAL:HA	1.86	0.58
1:A:919:LYS:HE2	1:A:1053:ARG:HH12	1.67	0.58
1:A:320:ASN:ND2	1:A:336:LEU:O	2.37	0.58
9:I:73:SER:HA	9:I:95:VAL:HG11	1.86	0.57
2:B:953:ASP:OD1	3:C:36:ARG:NH2	2.33	0.57
23:Z:595:HIS:N	23:Z:598:ASP:OD2	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:175:LYS:NZ	12:L:57:ALA:HB3	2.19	0.57
1:A:45:GLU:HB2	1:A:53:LYS:NZ	2.19	0.57
1:A:576:GLN:HA	8:H:75:TYR:HB2	1.87	0.57
1:A:886:VAL:HG13	5:E:171:PRO:HD3	1.86	0.57
2:B:483:ARG:NH2	2:B:527:ALA:O	2.38	0.57
2:B:725:GLN:NE2	2:B:937:SER:O	2.38	0.57
1:A:138:LYS:NZ	1:A:1441:GLU:OE2	2.26	0.57
23:Z:279:VAL:HA	23:Z:386:VAL:HG21	1.87	0.56
2:B:748:ALA:HB3	2:B:811:TYR:HB2	1.86	0.56
4:D:67:TYR:OH	7:G:86:ASP:O	2.22	0.56
23:Z:444:ASP:H	23:Z:448:ILE:HG23	1.70	0.56
2:B:549:SER:HG	2:B:577:HIS:HE2	1.53	0.56
2:B:718:GLN:HG2	2:B:720:PRO:HD2	1.88	0.56
4:D:100:LEU:HD21	4:D:118:LEU:HD11	1.87	0.56
16:Q:763:ARG:HH22	16:Q:788:LEU:HD23	1.70	0.56
20:W:206:VAL:HG22	20:W:216:ILE:HG12	1.88	0.56
23:Z:272:ASN:HD21	23:Z:384:GLU:HB2	1.70	0.56
1:A:1552:SER:HB3	13:M:1509:ARG:HH12	1.70	0.56
3:C:59:LEU:HD12	3:C:151:VAL:HG23	1.88	0.56
2:B:191:GLU:OE2	2:B:743:ARG:NH2	2.39	0.56
2:B:692:THR:OG1	9:I:80:ARG:NH1	2.39	0.56
1:A:922:PHE:HA	1:A:1052:ARG:HD3	1.87	0.55
16:Q:885:THR:O	16:Q:889:LEU:CB	2.53	0.55
2:B:806:PHE:O	2:B:1050:ARG:NH1	2.39	0.55
9:I:29:ASP:O	9:I:33:ARG:HA	2.05	0.55
5:E:64:HIS:ND1	5:E:66:ASP:OD1	2.38	0.55
1:A:866:LYS:NZ	2:B:1091:ARG:HH22	2.05	0.55
2:B:1062:ARG:NH2	2:B:1066:PRO:O	2.37	0.55
1:A:42:LYS:O	1:A:288:ASN:ND2	2.40	0.54
23:Z:552:ARG:HB3	23:Z:559:GLN:HB2	1.89	0.54
1:A:855:ALA:HB3	2:B:494:LYS:NZ	2.23	0.54
1:A:919:LYS:HE2	1:A:1053:ARG:NH1	2.22	0.54
3:C:9:VAL:HG11	11:K:105:PHE:HD1	1.72	0.54
16:Q:763:ARG:NH1	20:W:65:LEU:HD21	2.23	0.54
20:W:75:THR:OG1	20:W:116:PRO:O	2.26	0.54
1:A:1552:SER:HB3	13:M:1509:ARG:NH1	2.21	0.53
1:A:358:ARG:NH2	2:B:1076:GLU:OE1	2.41	0.53
1:A:111:CYS:HB2	1:A:118:LEU:HB3	1.90	0.53
1:A:279:LYS:HZ1	1:A:328:ALA:HB1	1.73	0.53
2:B:193:VAL:HG21	2:B:470:LEU:HD13	1.90	0.53
2:B:770:ARG:HH11	2:B:771:GLU:HG3	1.73	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:877:ALA:HB3	1:A:890:ARG:NH1	2.23	0.53
1:A:1123:ARG:NH2	1:A:1360:ASN:OD1	2.42	0.53
10:J:10:CYS:SG	10:J:42:ARG:NH2	2.78	0.53
1:A:43:TYR:HB3	1:A:53:LYS:NZ	2.24	0.53
1:A:138:LYS:HG3	1:A:1441:GLU:OE2	2.09	0.53
5:E:134:GLU:OE2	5:E:181:ARG:NH2	2.42	0.53
1:A:1347:LEU:HD22	1:A:1354:PRO:HA	1.90	0.53
2:B:280:SER:OG	2:B:281:ASP:N	2.42	0.53
1:A:1212:LEU:HD22	1:A:1259:ILE:HD12	1.91	0.52
2:B:603:MET:HG3	2:B:614:ILE:HG12	1.91	0.52
7:G:138:GLN:N	7:G:141:ASP:OD2	2.29	0.52
1:A:1375:ARG:NH1	5:E:195:ARG:HH22	2.07	0.52
2:B:92:TYR:HB2	2:B:125:TYR:HB2	1.90	0.52
3:C:205:LYS:NZ	3:C:215:GLU:O	2.35	0.52
3:C:260:GLN:HB2	11:K:91:ILE:HG21	1.92	0.52
1:A:343:LEU:HA	1:A:349:ARG:H	1.74	0.52
2:B:872:THR:HA	2:B:889:LYS:HG2	1.89	0.52
2:B:225:LEU:HD22	2:B:228:SER:HB2	1.91	0.52
6:F:105:ILE:HG22	6:F:119:GLY:HA2	1.92	0.52
7:G:81:LYS:HD3	23:Z:473:LYS:NZ	2.24	0.52
20:W:297:GLU:OE1	20:W:299:HIS:NE2	2.43	0.52
23:Z:441:LEU:HB3	23:Z:451:MET:HB2	1.92	0.52
1:A:1005:HIS:HD2	1:A:1007:ILE:HG22	1.74	0.52
2:B:790:GLN:O	2:B:968:ASN:ND2	2.43	0.52
1:A:1546:PHE:HB3	13:M:1515:TYR:CZ	2.45	0.51
2:B:760:THR:OG1	2:B:764:MET:SD	2.62	0.51
1:A:106:VAL:HG22	1:A:236:LEU:HD11	1.93	0.51
1:A:508:SER:HB2	1:A:511:THR:HG22	1.92	0.51
1:A:866:LYS:HZ3	2:B:1091:ARG:HH22	1.58	0.51
1:A:1286:ARG:HH22	2:B:252:ILE:HA	1.75	0.51
3:C:67:ARG:NH1	10:J:3:ILE:O	2.40	0.51
1:A:1173:THR:HG22	1:A:1214:VAL:HG12	1.93	0.51
20:W:43:LEU:HD22	20:W:61:GLU:HG2	1.93	0.51
1:A:67:ARG:NE	15:P:35:A:OP1	2.44	0.51
3:C:10:ARG:HH22	3:C:228:ARG:HH22	1.59	0.51
2:B:939:HIS:NE2	2:B:983:GLU:OE1	2.38	0.50
22:Y:71:VAL:HG13	23:Z:264:LEU:HD11	1.93	0.50
1:A:197:GLU:OE2	1:A:308:LYS:NZ	2.45	0.50
5:E:80:PRO:HA	5:E:107:GLN:HB3	1.94	0.50
20:W:24:TRP:HE1	20:W:284:GLY:H	1.60	0.50
22:Y:14:ARG:HA	22:Y:55:SER:HA	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:592:PHE:HA	1:A:595:ILE:HD12	1.92	0.50
2:B:624:PRO:HA	2:B:663:GLU:O	2.11	0.50
7:G:101:ILE:HD11	7:G:145:LEU:HD11	1.94	0.50
1:A:190:ARG:HH12	1:A:192:ARG:HH22	1.59	0.50
2:B:1029:TYR:HA	2:B:1036:LYS:HA	1.94	0.50
1:A:489:THR:HG23	1:A:494:ALA:HB3	1.93	0.50
22:Y:7:PRO:HG3	22:Y:23:LYS:HA	1.94	0.50
1:A:583:ARG:NH1	3:C:222:PRO:O	2.45	0.50
1:A:1177:TYR:OH	1:A:1282:ASP:OD2	2.27	0.50
2:B:627:ILE:HD11	2:B:663:GLU:HG3	1.93	0.50
13:M:1462:ILE:HA	13:M:1473:LEU:O	2.12	0.50
1:A:228:ILE:O	1:A:244:ARG:NH2	2.34	0.49
3:C:47:ILE:HG22	3:C:165:ALA:HB2	1.94	0.49
1:A:613:GLU:OE2	1:A:623:PRO:HD2	2.12	0.49
1:A:913:ASN:N	1:A:1325:ASP:O	2.38	0.49
1:A:1347:LEU:HD21	1:A:1357:THR:HB	1.94	0.49
2:B:505:LEU:HD22	2:B:509:VAL:HB	1.94	0.49
2:B:626:LEU:HD23	2:B:662:VAL:HG12	1.95	0.49
23:Z:361:PHE:O	23:Z:365:ARG:HB2	2.12	0.49
1:A:67:ARG:HD3	1:A:68:THR:HG23	1.94	0.49
1:A:880:ARG:HG2	1:A:886:VAL:HA	1.95	0.49
2:B:1038:THR:HA	3:C:195:THR:HA	1.93	0.49
7:G:80:PHE:HD2	7:G:83:GLU:OE2	1.96	0.49
11:K:61:TYR:HA	11:K:72:ILE:O	2.13	0.49
5:E:74:VAL:HG12	5:E:103:LEU:HB2	1.95	0.49
23:Z:280:ARG:HH21	23:Z:288:ASP:HB3	1.78	0.49
8:H:72:ASP:HB3	8:H:74:GLU:H	1.77	0.49
11:K:85:GLU:HA	11:K:88:THR:HG22	1.94	0.49
1:A:244:ARG:HD2	1:A:245:PRO:HD2	1.94	0.49
1:A:1375:ARG:HH11	5:E:195:ARG:HH12	1.60	0.49
8:H:103:GLU:HB3	8:H:109:ALA:HB2	1.94	0.49
1:A:495:ASP:N	1:A:499:ASP:OD2	2.42	0.49
1:A:1533:PRO:HD3	13:M:1471:LYS:NZ	2.28	0.49
2:B:133:ILE:HB	2:B:139:GLN:HB3	1.94	0.49
2:B:1060:HIS:HB3	2:B:1078:ARG:HG3	1.94	0.49
3:C:72:PRO:HG3	10:J:13:ILE:HD11	1.95	0.49
5:E:19:GLN:OE1	5:E:138:ASN:ND2	2.41	0.49
7:G:8:GLU:HG2	7:G:71:LYS:HG2	1.95	0.49
9:I:97:PHE:HB2	9:I:100:HIS:HE2	1.76	0.49
20:W:165:SER:O	20:W:172:ILE:HA	2.12	0.49
1:A:790:GLN:HA	1:A:822:PHE:HA	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1374:VAL:HG11	1:A:1411:LEU:HD21	1.95	0.48
2:B:124:LEU:HD13	2:B:152:ILE:HD11	1.95	0.48
4:D:112:LYS:HD2	4:D:119:GLU:HG2	1.95	0.48
9:I:29:ASP:O	9:I:33:ARG:CA	2.61	0.48
1:A:296:ASN:OD1	1:A:297:GLY:N	2.46	0.48
2:B:130:LYS:O	2:B:141:GLN:HA	2.13	0.48
3:C:2:PRO:HB3	11:K:54:PRO:HD2	1.95	0.48
2:B:677:MET:H	2:B:682:LEU:HD22	1.79	0.48
2:B:733:MET:HE2	2:B:1052:LYS:HA	1.95	0.48
3:C:24:GLU:OE2	3:C:228:ARG:HG2	2.13	0.48
8:H:88:PHE:HD2	8:H:144:LEU:HD12	1.78	0.48
9:I:113:VAL:HG22	9:I:122:ARG:HG2	1.95	0.48
1:A:801:GLY:HA3	2:B:503:ASN:HB2	1.96	0.48
5:E:92:GLN:HG2	5:E:95:GLN:HE21	1.78	0.48
16:Q:863:LYS:HG2	16:Q:866:ARG:HH22	1.77	0.48
22:Y:90:THR:HG23	22:Y:112:ASP:OD2	2.13	0.48
1:A:500:GLU:OE2	2:B:1058:LYS:HD3	2.14	0.48
5:E:178:PRO:O	5:E:182:TYR:HB2	2.13	0.48
16:Q:791:ARG:HB3	20:W:106:PRO:HB3	1.96	0.48
7:G:30:LEU:HD22	7:G:70:VAL:HG11	1.95	0.48
23:Z:479:LYS:HG3	23:Z:489:THR:HG22	1.94	0.48
1:A:487:SER:OG	1:A:673:GLN:NE2	2.47	0.48
1:A:45:GLU:HB2	1:A:53:LYS:HZ3	1.78	0.48
3:C:183:ALA:HB3	3:C:232:ASN:HB3	1.95	0.48
4:D:34:ASN:O	4:D:68:THR:OG1	2.31	0.48
16:Q:786:LEU:HD21	16:Q:820:LEU:HB3	1.96	0.48
1:A:383:SER:H	11:K:2:ASN:HD21	1.61	0.48
2:B:864:ASP:OD1	23:Z:725:LYS:NZ	2.47	0.48
1:A:419:ILE:HG23	1:A:427:ILE:HB	1.94	0.48
2:B:272:VAL:O	2:B:276:LEU:HB2	2.14	0.48
20:W:126:HIS:HA	20:W:150:PHE:HD1	1.79	0.48
1:A:540:ASP:OD2	2:B:790:GLN:HG2	2.14	0.47
1:A:1528:TYR:CG	13:M:1469:PRO:HD2	2.49	0.47
1:A:1476:ASP:HB2	6:F:105:ILE:HG23	1.96	0.47
2:B:744:MET:SD	2:B:906:GLN:NE2	2.79	0.47
1:A:36:VAL:HG23	2:B:1138:ARG:NH1	2.29	0.47
22:Y:56:SER:HB3	23:Z:271:ALA:HA	1.96	0.47
1:A:451:CYS:SG	1:A:452:ASP:N	2.87	0.47
2:B:341:GLU:HG3	2:B:345:LYS:NZ	2.29	0.47
14:N:42:DT:O4	17:T:6:DC:N4	2.47	0.47
1:A:855:ALA:HB3	2:B:494:LYS:HZ1	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:88:PHE:HZ	2:B:412:LEU:HD21	1.80	0.47
10:J:35:LEU:HD11	10:J:50:LEU:HD12	1.95	0.47
5:E:194:ILE:HG13	5:E:204:ILE:HG22	1.95	0.47
11:K:82:SER:HB3	11:K:85:GLU:HG2	1.97	0.47
23:Z:490:GLY:HA3	23:Z:502:LEU:HD13	1.97	0.47
1:A:233:CYS:HA	1:A:236:LEU:HB3	1.95	0.47
1:A:861:GLN:HE22	1:A:1093:GLN:HA	1.80	0.47
1:A:1027:ASP:OD1	1:A:1027:ASP:N	2.46	0.47
2:B:949:TYR:HB3	2:B:953:ASP:HB2	1.96	0.47
6:F:79:VAL:HG22	6:F:81:VAL:H	1.78	0.47
7:G:151:ARG:HE	23:Z:491:LEU:HG	1.80	0.47
20:W:83:SER:OG	20:W:85:ASP:OD1	2.24	0.47
1:A:77:ASN:H	1:A:80:GLU:HB3	1.79	0.47
1:A:1467:GLY:H	1:A:1470:CYS:HB2	1.80	0.47
5:E:56:THR:OG1	5:E:78:GLU:OE2	2.21	0.47
14:N:35:DA:OP2	14:N:35:DA:H2'	2.15	0.47
1:A:190:ARG:NH1	1:A:192:ARG:HH22	2.12	0.47
2:B:117:ASN:ND2	2:B:188:ASN:O	2.39	0.47
4:D:84:ARG:O	4:D:88:LEU:HB2	2.15	0.47
23:Z:216:VAL:HB	23:Z:226:TYR:HB2	1.97	0.47
23:Z:588:ASP:OD1	23:Z:592:ASN:N	2.42	0.47
23:Z:714:GLN:HB2	23:Z:749:ARG:HG2	1.97	0.47
1:A:1123:ARG:HG2	1:A:1385:VAL:HG11	1.98	0.46
2:B:570:ASN:HD21	2:B:616:THR:HB	1.80	0.46
16:Q:430:ALA:O	16:Q:434:TYR:N	2.47	0.46
2:B:819:SER:HG	2:B:821:LYS:N	2.13	0.46
17:T:24:DG:H2'	17:T:25:DA:C8	2.50	0.46
2:B:994:GLY:HA2	10:J:50:LEU:HD11	1.96	0.46
9:I:29:ASP:O	9:I:33:ARG:N	2.48	0.46
17:T:33:DC:H2"	17:T:34:DT:H5"	1.96	0.46
1:A:880:ARG:NH1	6:F:111:PRO:HB2	2.31	0.46
2:B:157:ARG:NH2	2:B:177:CYS:O	2.46	0.46
1:A:96:HIS:HB2	1:A:250:VAL:HG23	1.98	0.46
2:B:934:LYS:HG2	2:B:1051:LEU:HD12	1.96	0.46
7:G:127:CYS:SG	7:G:128:TYR:N	2.89	0.46
1:A:329:MET:HA	1:A:335:PRO:HA	1.96	0.46
1:A:1375:ARG:NH1	5:E:195:ARG:HH12	2.13	0.46
2:B:905:ASP:HB2	2:B:924:ARG:HG3	1.97	0.46
2:B:1069:ILE:HD11	15:P:37:G:OP1	2.16	0.46
1:A:43:TYR:HB3	1:A:53:LYS:HZ2	1.81	0.46
1:A:866:LYS:HZ3	2:B:1091:ARG:NH2	2.14	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1066:PRO:HB3	15:P:35:A:H62	1.80	0.46
3:C:42:VAL:HB	3:C:178:PRO:HG3	1.98	0.46
5:E:44:PHE:HB3	5:E:53:PRO:HB3	1.97	0.46
13:M:1357:ILE:HG12	13:M:1369:VAL:HG22	1.98	0.46
1:A:358:ARG:HH12	17:T:27:DT:P	2.38	0.46
2:B:252:ILE:HG22	2:B:303:PRO:HB3	1.98	0.46
23:Z:472:PHE:HE1	23:Z:520:LEU:HB2	1.81	0.46
8:H:16:ASP:HA	8:H:17:PRO:HD3	1.80	0.46
13:M:1511:PHE:O	13:M:1515:TYR:N	2.48	0.46
17:T:39:DC:H2"	17:T:40:DT:H72	1.98	0.46
7:G:80:PHE:HB2	7:G:83:GLU:HG3	1.98	0.45
1:A:1004:LEU:HD13	1:A:1062:GLY:HA2	1.98	0.45
1:A:1170:THR:HA	1:A:1216:LEU:HA	1.99	0.45
2:B:274:ARG:NH1	2:B:312:GLN:HA	2.31	0.45
1:A:375:ILE:HD13	1:A:669:TYR:HD2	1.81	0.45
3:C:44:ILE:HD12	3:C:178:PRO:HB3	1.97	0.45
8:H:63:THR:HB	8:H:70:LEU:HD23	1.97	0.45
10:J:40:LEU:HD22	10:J:45:CYS:HB3	1.98	0.45
23:Z:352:VAL:HG23	23:Z:359:LEU:HD21	1.98	0.45
1:A:93:PRO:HB3	1:A:249:ILE:HD13	1.98	0.45
23:Z:479:LYS:NZ	23:Z:521:CYS:O	2.50	0.45
1:A:228:ILE:HG23	1:A:232:GLU:HG2	1.99	0.45
1:A:1529:GLY:H	13:M:1396:ALA:HB2	1.81	0.45
8:H:25:VAL:HG21	8:H:121:LEU:HD22	1.96	0.45
2:B:54:SER:HA	2:B:57:ARG:HG2	1.99	0.45
7:G:138:GLN:HG2	7:G:141:ASP:OD2	2.16	0.45
1:A:889:LEU:O	1:A:890:ARG:NE	2.48	0.45
1:A:1282:ASP:N	1:A:1282:ASP:OD1	2.47	0.45
20:W:193:ILE:HA	20:W:209:SER:HA	1.99	0.45
22:Y:94:PRO:HD2	22:Y:97:ILE:HD12	1.98	0.45
1:A:244:ARG:HB3	1:A:247:TRP:CD2	2.52	0.45
1:A:502:ASN:OD1	1:A:502:ASN:N	2.46	0.45
2:B:1062:ARG:NH1	2:B:1081:ASP:O	2.49	0.45
13:M:1426:LEU:HD22	13:M:1462:ILE:HD13	1.99	0.45
23:Z:433:LEU:HD13	23:Z:461:LEU:HD13	1.97	0.45
2:B:1062:ARG:HH12	2:B:1066:PRO:HD2	1.82	0.45
11:K:89:ASN:HA	11:K:92:THR:HG22	1.99	0.45
1:A:480:SER:HB3	11:K:2:ASN:HB2	1.99	0.44
1:A:628:VAL:HA	1:A:638:GLY:HA3	1.99	0.44
16:Q:882:VAL:HA	16:Q:885:THR:HG22	1.98	0.44
16:Q:839:ARG:HA	16:Q:842:ARG:HG2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:Z:554:GLU:OE1	23:Z:557:THR:OG1	2.36	0.44
1:A:906:LEU:HD23	1:A:1044:HIS:HD2	1.82	0.44
5:E:70:ASP:OD1	5:E:70:ASP:N	2.49	0.44
16:Q:817:CYS:SG	16:Q:818:SER:N	2.91	0.44
7:G:39:THR:HG23	7:G:42:TYR:H	1.82	0.44
1:A:526:VAL:HA	1:A:533:PRO:HA	1.99	0.44
2:B:98:HIS:CE1	2:B:116:ARG:NH1	2.85	0.44
17:T:30:DG:H2'	17:T:31:DT:C6	2.53	0.44
1:A:696:SER:HA	1:A:699:TYR:HB2	1.98	0.44
1:A:1217:ASP:OD2	1:A:1220:HIS:HD2	2.01	0.44
2:B:907:VAL:HG22	2:B:921:ILE:HG12	1.99	0.44
2:B:1112:ASP:OD1	2:B:1112:ASP:N	2.48	0.44
2:B:206:TYR:HA	2:B:383:ASP:OD2	2.17	0.44
7:G:81:LYS:HD3	23:Z:473:LYS:HZ1	1.81	0.44
16:Q:667:ARG:O	16:Q:671:ALA:N	2.51	0.44
1:A:1093:GLN:HE22	2:B:1093:CYS:HA	1.83	0.44
3:C:78:ILE:HD11	3:C:126:ARG:HD2	1.99	0.44
1:A:454:ASP:HA	1:A:512:ARG:HH22	1.83	0.44
1:A:510:GLU:HG3	6:F:67:GLY:HA3	2.00	0.44
1:A:552:ASP:HB3	8:H:25:VAL:HG12	2.00	0.44
1:A:896:LEU:HD13	1:A:980:PRO:HG3	1.98	0.44
1:A:912:SER:HB3	1:A:915:ALA:H	1.83	0.44
1:A:912:SER:O	1:A:963:ARG:NH2	2.51	0.43
2:B:778:SER:O	2:B:1045:PRO:HA	2.18	0.43
3:C:175:LYS:HZ3	12:L:57:ALA:HB3	1.83	0.43
1:A:120:ASP:O	1:A:123:ASN:N	2.52	0.43
7:G:45:VAL:HG22	7:G:76:VAL:HG12	2.00	0.43
13:M:1422:PHE:HB3	13:M:1494:PHE:CE1	2.54	0.43
1:A:852:VAL:HG13	2:B:494:LYS:HD3	2.00	0.43
1:A:533:PRO:O	1:A:647:THR:OG1	2.29	0.43
1:A:253:LEU:HD12	1:A:254:PRO:HD2	2.00	0.43
1:A:1211:LEU:HB3	1:A:1260:ARG:NH1	2.33	0.43
2:B:330:VAL:HG13	2:B:331:THR:HG23	2.00	0.43
13:M:1450:THR:HB	13:M:1459:PRO:HG3	2.00	0.43
16:Q:770:LYS:O	16:Q:827:HIS:NE2	2.52	0.43
2:B:212:ASP:OD1	2:B:212:ASP:N	2.51	0.43
1:A:350:VAL:HA	1:A:354:LEU:HD12	2.00	0.43
1:A:496:PHE:HB2	2:B:791:GLU:O	2.19	0.43
1:A:833:PRO:HG3	2:B:1002:PHE:CG	2.53	0.43
1:A:1295:ASP:OD1	1:A:1295:ASP:N	2.51	0.43
1:A:364:ARG:NE	1:A:500:GLU:OE1	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:364:ARG:HD2	2:B:1084:LEU:HD11	2.00	0.43
1:A:1468:THR:HG23	6:F:64:ARG:HB2	1.99	0.43
1:A:1474:LEU:HB2	6:F:105:ILE:HG13	2.00	0.43
5:E:24:ARG:NH2	5:E:182:TYR:O	2.42	0.43
13:M:1364:GLU:OE1	13:M:1365:ASN:ND2	2.52	0.43
19:V:204:UNK:O	19:V:332:UNK:N	2.52	0.43
1:A:1118:THR:O	1:A:1123:ARG:HB2	2.19	0.43
3:C:105:VAL:HG11	3:C:115:VAL:HG22	2.01	0.43
7:G:13:LEU:O	7:G:65:PHE:HA	2.19	0.43
7:G:52:ASP:H	7:G:72:TYR:HA	1.84	0.43
22:Y:14:ARG:HG2	22:Y:55:SER:HB3	2.01	0.43
2:B:388:TYR:HE1	2:B:391:LYS:HZ2	1.65	0.42
3:C:162:ARG:NH1	3:C:164:TYR:HE2	2.17	0.42
5:E:120:ASP:OD1	5:E:121:MET:N	2.52	0.42
8:H:16:ASP:OD1	8:H:16:ASP:N	2.52	0.42
2:B:132:VAL:O	2:B:139:GLN:HA	2.18	0.42
2:B:591:ARG:HE	2:B:603:MET:HE2	1.84	0.42
2:B:937:SER:OG	2:B:938:ARG:N	2.52	0.42
4:D:60:VAL:HG11	7:G:44:PHE:CE2	2.54	0.42
16:Q:497:VAL:O	16:Q:501:TYR:N	2.51	0.42
3:C:77:ASP:N	3:C:77:ASP:OD1	2.52	0.42
10:J:64:PRO:O	12:L:23:HIS:NE2	2.48	0.42
11:K:4:PRO:HA	11:K:5:PRO:HD3	1.91	0.42
1:A:1375:ARG:HD2	5:E:195:ARG:NH1	2.34	0.42
2:B:124:LEU:HD22	2:B:152:ILE:HG13	2.01	0.42
2:B:789:ASN:HB3	2:B:795:ILE:HG13	2.01	0.42
2:B:830:GLU:OE2	2:B:889:LYS:NZ	2.36	0.42
2:B:873:LEU:HD12	2:B:874:PRO:HD2	2.00	0.42
3:C:240:ARG:HB2	3:C:243:THR:HG22	2.02	0.42
11:K:58:PHE:HB3	11:K:76:GLN:HB3	2.01	0.42
13:M:824:GLU:N	15:P:29:C:OP2	2.53	0.42
16:Q:496:SER:O	16:Q:500:SER:N	2.43	0.42
1:A:873:VAL:HG23	1:A:1087:VAL:HG21	2.02	0.42
1:A:901:VAL:HA	1:A:980:PRO:HA	2.02	0.42
1:A:1525:TPO:O1P	13:M:1340:PHE:HB2	2.20	0.42
2:B:731:GLN:NE2	15:P:44:A:O3'	2.53	0.42
4:D:70:ARG:HH12	7:G:88:VAL:HG11	1.82	0.42
4:D:70:ARG:NH1	7:G:88:VAL:HG11	2.34	0.42
5:E:26:TYR:HA	5:E:64:HIS:HA	2.01	0.42
8:H:15:ILE:HD12	8:H:15:ILE:HA	1.97	0.42
20:W:189:HIS:CE1	20:W:215:LYS:HD2	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:313:HIS:HA	1:A:316:THR:HG22	2.01	0.42
2:B:581:GLU:OE2	2:B:585:ASN:ND2	2.52	0.42
20:W:65:LEU:HD12	20:W:85:ASP:HB3	2.02	0.42
1:A:769:MET:SD	2:B:973:PRO:HG3	2.60	0.42
1:A:1215:GLU:OE2	1:A:1256:VAL:HG22	2.20	0.42
2:B:770:ARG:NH1	2:B:771:GLU:HG3	2.34	0.42
23:Z:639:LYS:HB2	23:Z:642:HIS:CD2	2.52	0.42
1:A:406:VAL:HG13	1:A:429:LEU:HD21	2.02	0.42
3:C:47:ILE:HG23	3:C:73:LEU:HD11	2.00	0.42
7:G:110:ARG:HG3	7:G:119:PHE:CZ	2.55	0.42
1:A:544:ALA:O	1:A:548:PHE:HB2	2.20	0.42
1:A:1180:ASN:ND2	1:A:1182:GLN:HE21	2.18	0.42
2:B:785:TYR:CZ	2:B:955:PRO:HD3	2.55	0.42
8:H:71:ASP:N	8:H:71:ASP:OD1	2.53	0.42
1:A:658:LEU:HD23	1:A:658:LEU:HA	1.88	0.42
5:E:24:ARG:NE	5:E:183:PHE:O	2.53	0.42
10:J:66:GLU:HG2	12:L:18:ILE:HD13	2.02	0.42
20:W:237:ASN:HB3	20:W:280:VAL:HG22	2.01	0.42
23:Z:212:ILE:HG22	23:Z:229:ALA:HB2	2.02	0.42
1:A:481:THR:HG22	2:B:1055:VAL:HG21	2.01	0.41
2:B:796:MET:HB2	2:B:948:GLN:HG2	2.02	0.41
2:B:801:VAL:HG13	2:B:929:PRO:HD2	2.02	0.41
2:B:870:THR:HA	2:B:891:ASP:HA	2.01	0.41
5:E:101:ARG:HD3	5:E:126:ILE:HG13	2.01	0.41
5:E:156:VAL:HG22	5:E:190:VAL:HG12	2.01	0.41
1:A:279:LYS:HZ1	1:A:328:ALA:CB	2.34	0.41
1:A:461:GLN:HG2	17:T:26:DG:H1'	2.02	0.41
1:A:1213:ARG:NE	1:A:1215:GLU:OE2	2.52	0.41
2:B:513:GLU:HG2	2:B:525:ASN:HD22	1.85	0.41
2:B:735:VAL:HG23	2:B:754:PRO:HG2	2.01	0.41
1:A:691:ASP:OD2	1:A:765:ASN:HB2	2.20	0.41
2:B:474:THR:OG1	2:B:732:ALA:O	2.33	0.41
1:A:1547:SEP:O	1:A:1547:SEP:OG	2.39	0.41
2:B:513:GLU:HG3	2:B:726:SER:HB3	2.03	0.41
2:B:601:VAL:HG22	2:B:616:THR:HG23	2.01	0.41
1:A:59:ASP:HB3	1:A:62:GLN:HB2	2.02	0.41
1:A:570:TRP:O	11:K:26:LYS:NZ	2.41	0.41
17:T:27:DT:H2'	17:T:28:DG:H8	1.85	0.41
1:A:876:ASP:HB2	1:A:878:THR:HG22	2.02	0.41
1:A:1117:VAL:HG23	1:A:1119:LEU:HG	2.03	0.41
13:M:749:LEU:O	13:M:753:LEU:N	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:Q:757:VAL:HA	16:Q:796:LEU:HD12	2.01	0.41
20:W:146:THR:HG22	20:W:182:LEU:HD22	2.03	0.41
1:A:505:LEU:HD12	1:A:506:PRO:HD2	2.03	0.41
1:A:1157:ILE:HD12	1:A:1160:ARG:HH11	1.85	0.41
1:A:1347:LEU:HB3	5:E:137:ILE:HD12	2.03	0.41
1:A:1547:SEP:HA	1:A:1548:PRO:HD3	1.74	0.41
2:B:67:LEU:HD11	2:B:416:ARG:HG3	2.02	0.41
16:Q:763:ARG:NH1	20:W:65:LEU:HD11	2.34	0.41
1:A:126:ILE:HD11	1:A:147:LEU:HD22	2.02	0.41
1:A:935:GLN:HB2	1:A:938:LEU:HD13	2.03	0.41
1:A:1132:LYS:HE3	1:A:1363:VAL:HG11	2.03	0.41
1:A:1307:VAL:HG13	1:A:1338:THR:HG22	2.02	0.41
2:B:903:ILE:O	2:B:924:ARG:N	2.54	0.41
7:G:93:ASN:HB3	7:G:96:GLY:H	1.85	0.41
23:Z:420:PHE:CD1	23:Z:470:LYS:HE3	2.56	0.41
1:A:610:PRO:HG2	1:A:613:GLU:HB2	2.03	0.41
2:B:807:ARG:NH1	3:C:66:HIS:CD2	2.89	0.41
3:C:84:TYR:CZ	3:C:167:LYS:HE3	2.56	0.41
4:D:111:SER:HB2	4:D:131:LEU:HD21	2.02	0.41
1:A:983:LEU:HD23	1:A:983:LEU:HA	1.89	0.41
1:A:1443:ALA:HB2	2:B:1167:ILE:HG23	2.02	0.41
2:B:956:PHE:HB3	2:B:962:THR:HG22	2.03	0.41
4:D:104:CYS:SG	4:D:135:GLN:NE2	2.93	0.41
1:A:141:LEU:HD13	1:A:1445:HIS:HE1	1.86	0.40
1:A:465:HIS:CD2	1:A:467:MET:HB2	2.57	0.40
1:A:1546:PHE:HB3	13:M:1515:TYR:CE1	2.56	0.40
2:B:556:ILE:H	2:B:556:ILE:HG13	1.61	0.40
2:B:561:ILE:HD11	2:B:573:TRP:HH2	1.86	0.40
3:C:13:GLU:HB3	3:C:20:LYS:HB3	2.02	0.40
1:A:1533:PRO:HD3	13:M:1471:LYS:HZ3	1.86	0.40
2:B:86:LEU:HD23	2:B:130:LYS:HB3	2.03	0.40
3:C:189:ASP:O	3:C:191:ALA:N	2.55	0.40
16:Q:390:ASP:O	16:Q:394:ARG:N	2.53	0.40
1:A:859:TYR:OH	1:A:1433:GLU:OE2	2.30	0.40
12:L:16:ILE:HG12	12:L:27:GLU:HG2	2.03	0.40
20:W:233:SER:OG	20:W:234:TRP:N	2.52	0.40
1:A:73:THR:OG1	1:A:74:CYS:N	2.52	0.40
2:B:998:ASP:OD2	2:B:1000:THR:HG22	2.21	0.40
3:C:175:LYS:HZ2	12:L:57:ALA:HB3	1.86	0.40
1:A:54:LEU:CB	1:A:61:ARG:HH12	2.31	0.40
1:A:863:ARG:NH1	1:A:1129:ASN:HD21	2.19	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1375:ARG:HH12	5:E:195:ARG:HH22	1.69	0.40
23:Z:427:GLU:OE2	23:Z:469:ARG:NH2	2.55	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	1425/1970 (72%)	1340 (94%)	82 (6%)	3 (0%)	44 74
2	B	1122/1174 (96%)	1062 (95%)	59 (5%)	1 (0%)	48 79
3	C	259/275 (94%)	245 (95%)	14 (5%)	0	100 100
4	D	124/142 (87%)	122 (98%)	2 (2%)	0	100 100
5	E	207/210 (99%)	199 (96%)	7 (3%)	1 (0%)	25 58
6	F	80/127 (63%)	78 (98%)	2 (2%)	0	100 100
7	G	169/172 (98%)	165 (98%)	4 (2%)	0	100 100
8	H	146/150 (97%)	135 (92%)	11 (8%)	0	100 100
9	I	115/125 (92%)	107 (93%)	8 (7%)	0	100 100
10	J	65/67 (97%)	64 (98%)	1 (2%)	0	100 100
11	K	113/117 (97%)	109 (96%)	4 (4%)	0	100 100
12	L	44/58 (76%)	38 (86%)	6 (14%)	0	100 100
13	M	970/1726 (56%)	918 (95%)	52 (5%)	0	100 100
16	Q	581/1178 (49%)	555 (96%)	25 (4%)	1 (0%)	44 74
20	W	298/305 (98%)	278 (93%)	20 (7%)	0	100 100
22	Y	114/121 (94%)	114 (100%)	0	0	100 100
23	Z	476/1087 (44%)	466 (98%)	9 (2%)	1 (0%)	44 74
All	All	6308/9004 (70%)	5995 (95%)	306 (5%)	7 (0%)	50 79

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	E	57	ASP
1	A	911	PRO
2	B	492	ASP
1	A	540	ASP
23	Z	506	LEU
1	A	121	SER
16	Q	301	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	1257/1747 (72%)	1242 (99%)	15 (1%)	67 83
2	B	992/1027 (97%)	985 (99%)	7 (1%)	81 90
3	C	240/252 (95%)	239 (100%)	1 (0%)	89 94
4	D	109/126 (86%)	108 (99%)	1 (1%)	75 88
5	E	191/192 (100%)	189 (99%)	2 (1%)	73 86
6	F	71/111 (64%)	69 (97%)	2 (3%)	38 66
7	G	146/153 (95%)	141 (97%)	5 (3%)	32 62
8	H	129/131 (98%)	129 (100%)	0	100 100
9	I	105/112 (94%)	105 (100%)	0	100 100
10	J	56/56 (100%)	56 (100%)	0	100 100
11	K	104/106 (98%)	104 (100%)	0	100 100
12	L	43/55 (78%)	43 (100%)	0	100 100
13	M	154/1514 (10%)	153 (99%)	1 (1%)	84 91
16	Q	121/752 (16%)	120 (99%)	1 (1%)	79 89
20	W	255/260 (98%)	254 (100%)	1 (0%)	89 94
22	Y	102/105 (97%)	102 (100%)	0	100 100
23	Z	427/940 (45%)	426 (100%)	1 (0%)	92 96

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	4502/7639 (59%)	4465 (99%)	37 (1%)	77 89

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	58	MET
1	A	117	LEU
1	A	134	LYS
1	A	292	ARG
1	A	309	LEU
1	A	410	ASN
1	A	557	ARG
1	A	744	ILE
1	A	760	LEU
1	A	928	ARG
1	A	1194	ASN
1	A	1213	ARG
1	A	1248	ASN
1	A	1375	ARG
1	A	1484	MET
2	B	83	ARG
2	B	638	ARG
2	B	770	ARG
2	B	1080	ARG
2	B	1091	ARG
2	B	1104	ARG
2	B	1120	ASN
3	C	263	LEU
4	D	48	ASN
5	E	52	ARG
5	E	94	MET
6	F	62	ARG
6	F	123	LEU
7	G	53	ASN
7	G	78	ARG
7	G	93	ASN
7	G	108	ILE
7	G	110	ARG
13	M	1515	TYR
16	Q	775	ASN
20	W	237	ASN
23	Z	338	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	313	HIS
1	A	678	ASN
1	A	757	GLN
1	A	861	GLN
1	A	884	ASN
1	A	1005	HIS
1	A	1082	HIS
1	A	1108	HIS
1	A	1182	GLN
1	A	1194	ASN
1	A	1220	HIS
1	A	1248	ASN
2	B	23	GLN
2	B	98	HIS
2	B	344	GLN
2	B	725	GLN
2	B	1053	HIS
2	B	1120	ASN
3	C	66	HIS
3	C	145	GLN
4	D	135	GLN
5	E	95	GLN
7	G	53	ASN
7	G	93	ASN
9	I	22	ASN
9	I	41	ASN
13	M	1365	ASN
13	M	1514	HIS
16	Q	756	ASN
16	Q	775	ASN
20	W	126	HIS
20	W	189	HIS
20	W	221	HIS
20	W	273	HIS
22	Y	12	HIS
23	Z	272	ASN
23	Z	519	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
15	P	20/46 (43%)	8 (40%)	3 (15%)

All (8) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
15	P	27	A
15	P	29	C
15	P	30	C
15	P	31	G
15	P	33	A
15	P	36	G
15	P	37	G
15	P	39	A

All (3) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
15	P	28	A
15	P	36	G
15	P	38	G

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\#\|Z\| > 2$
1	SEP	A	1547	1,13	8,9,10	1.69	2 (25%)	8,12,14	2.36	2 (25%)
1	TPO	A	1525	1	8,10,11	1.52	1 (12%)	10,14,16	2.02	1 (10%)

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
1	SEP	A	1547	1,13	-	1/5/8/10	-
1	TPO	A	1525	1	-	0/9/11/13	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1547	SEP	P-O1P	3.57	1.62	1.50
1	A	1525	TPO	P-O1P	3.24	1.61	1.50
1	A	1547	SEP	P-O2P	2.00	1.62	1.54

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	1525	TPO	P-OG1-CB	-5.99	105.11	123.21
1	A	1547	SEP	P-OG-CB	-5.94	101.94	118.30
1	A	1547	SEP	OG-CB-CA	2.46	110.53	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1547	SEP	N-CA-CB-OG

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1547	SEP	2	0
1	A	1525	TPO	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 10 ligands modelled in this entry, 10 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
18	U	3
19	V	3
13	M	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	U	492:UNK	C	498:UNK	N	29.01
1	V	293:UNK	C	307:UNK	N	14.62
1	U	429:UNK	C	448:UNK	N	12.83
1	V	227:UNK	C	250:UNK	N	9.56
1	V	260:UNK	C	285:UNK	N	6.58
1	M	1334:UNK	C	1338:ILE	N	6.19
1	U	397:UNK	C	416:UNK	N	3.22

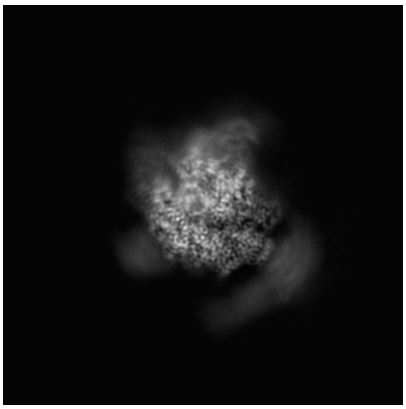
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-0031. These allow visual inspection of the internal detail of the map and identification of artifacts.

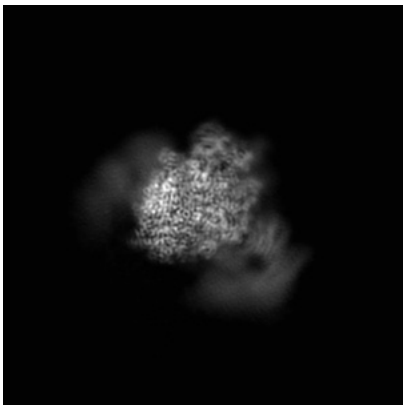
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

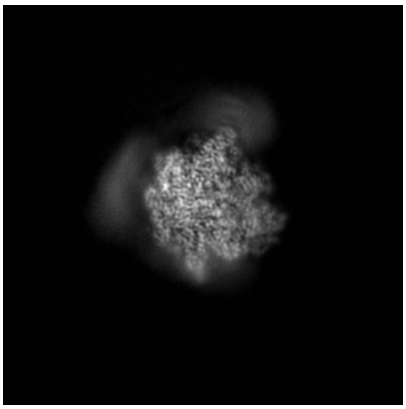
6.1.1 Primary map



X

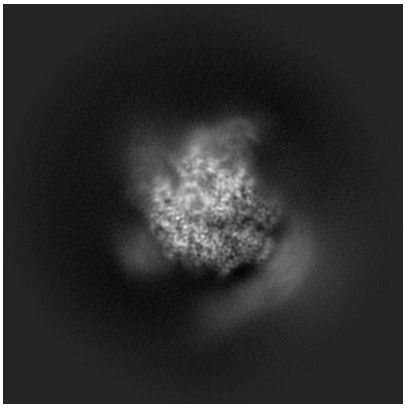


Y

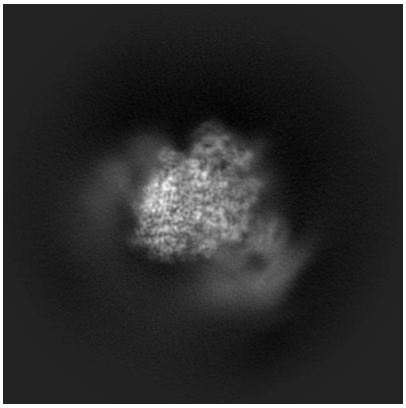


Z

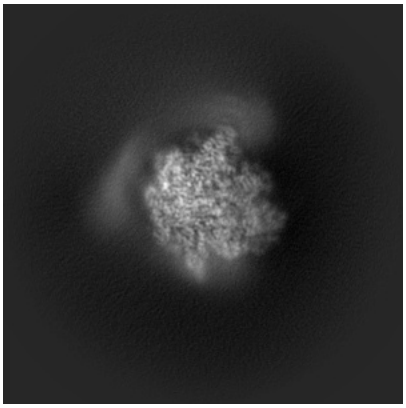
6.1.2 Raw map



X



Y

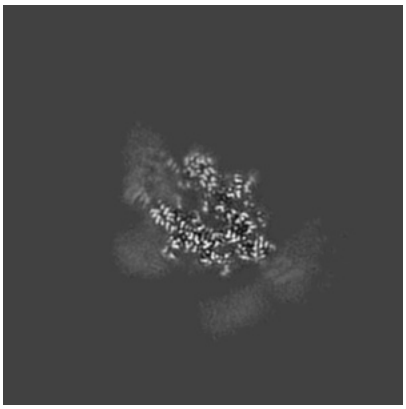


Z

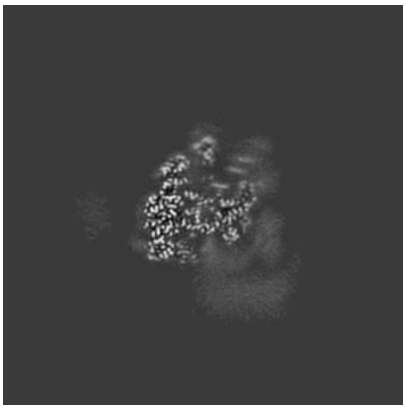
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

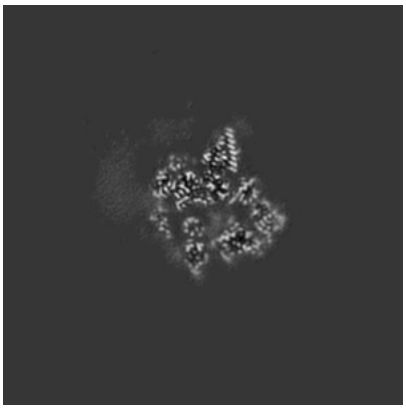
6.2.1 Primary map



X Index: 180

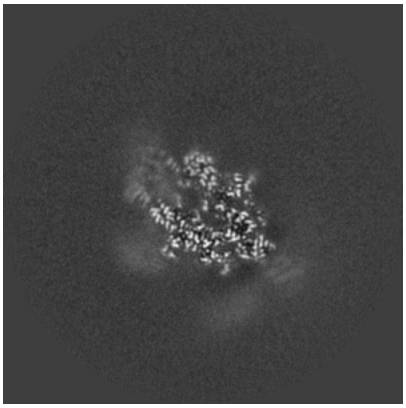


Y Index: 180

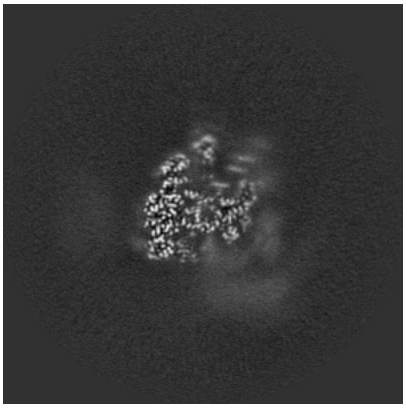


Z Index: 180

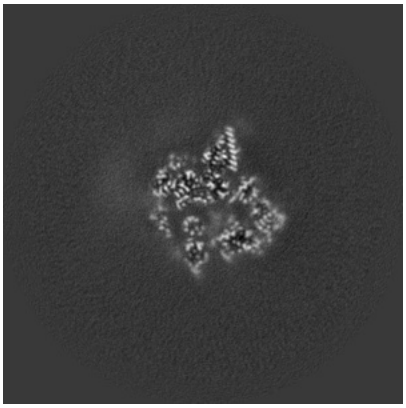
6.2.2 Raw map



X Index: 180



Y Index: 180

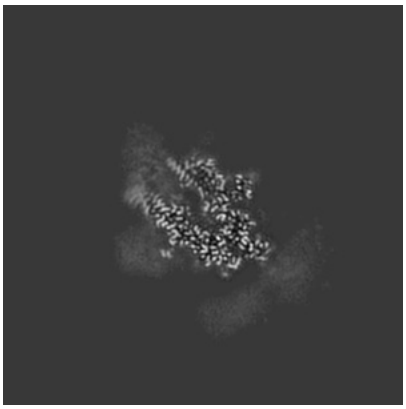


Z Index: 180

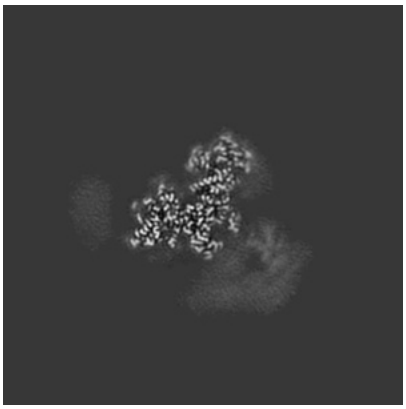
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

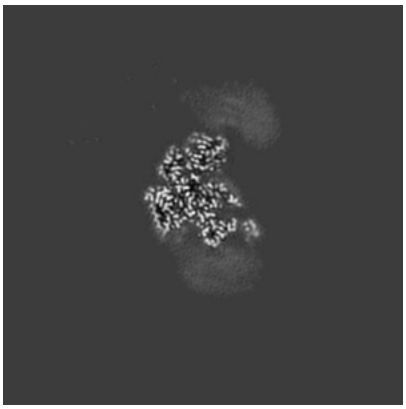
6.3.1 Primary map



X Index: 177

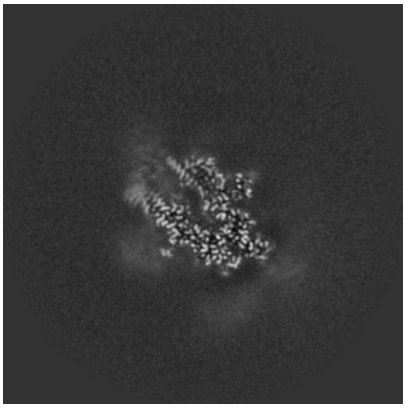


Y Index: 198

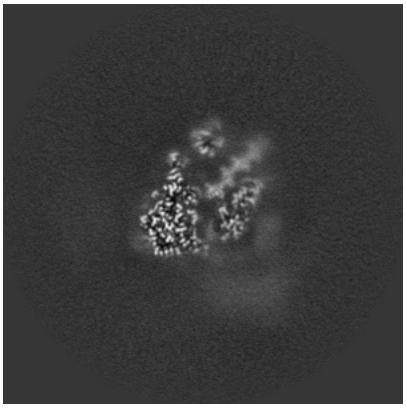


Z Index: 143

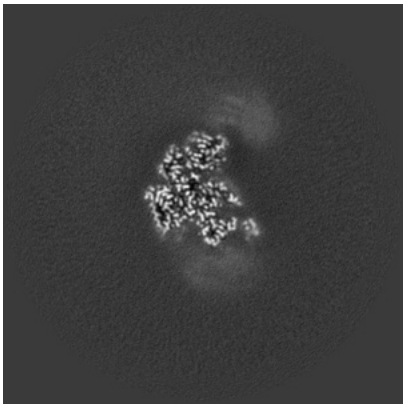
6.3.2 Raw map



X Index: 177



Y Index: 173

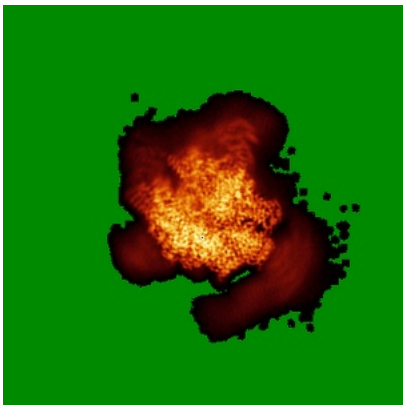


Z Index: 143

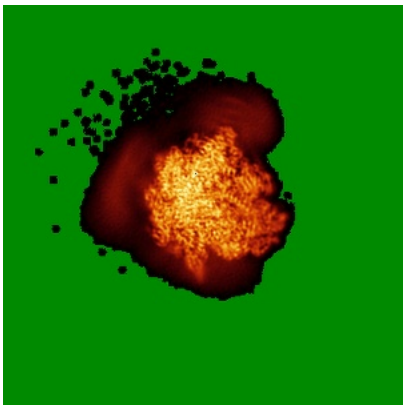
The images above show the largest variance slices of the map in three orthogonal directions.

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

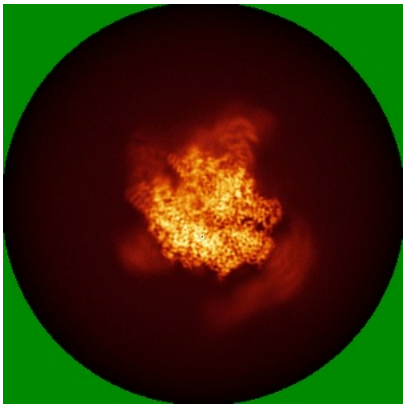
6.4.1 Primary map

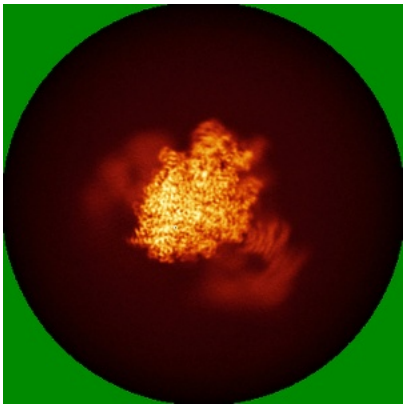

X

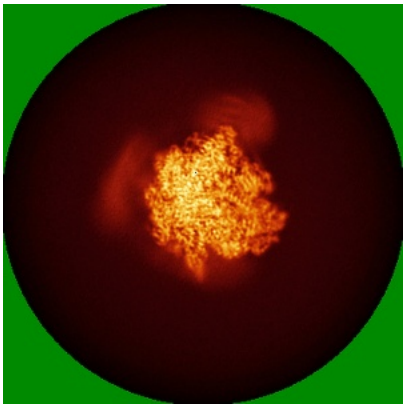

Y


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 0.0157. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X

Y

Z

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

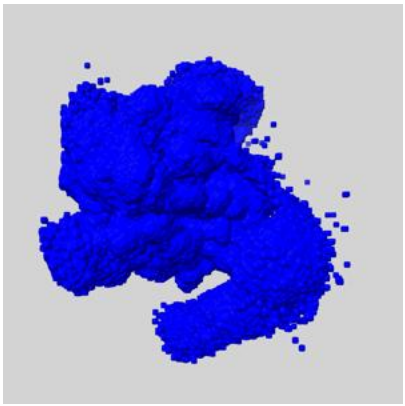
6.6 Mask visualisation (i)

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

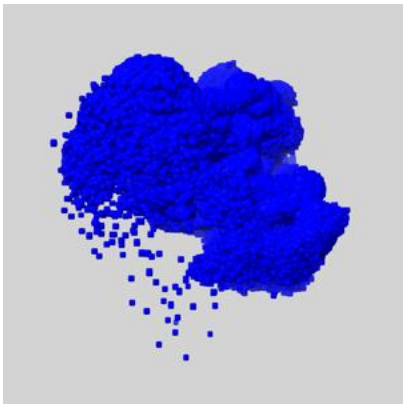
A mask typically either:

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

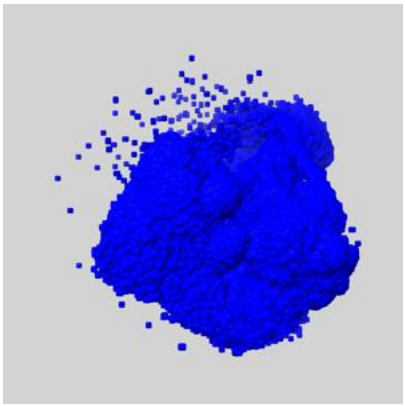
6.6.1 emd_0031_msk_1.map (i)



X



Y

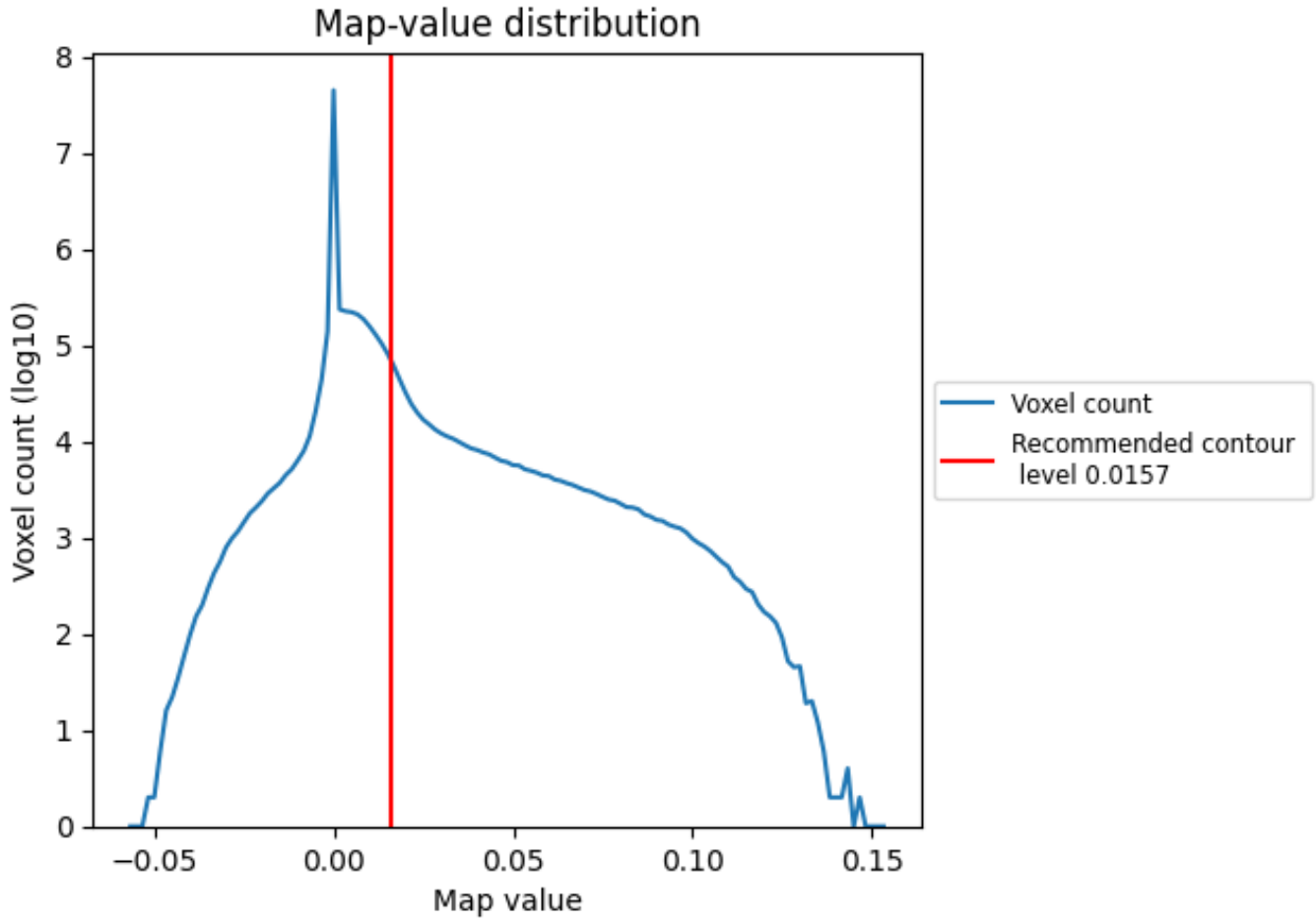


Z

7 Map analysis

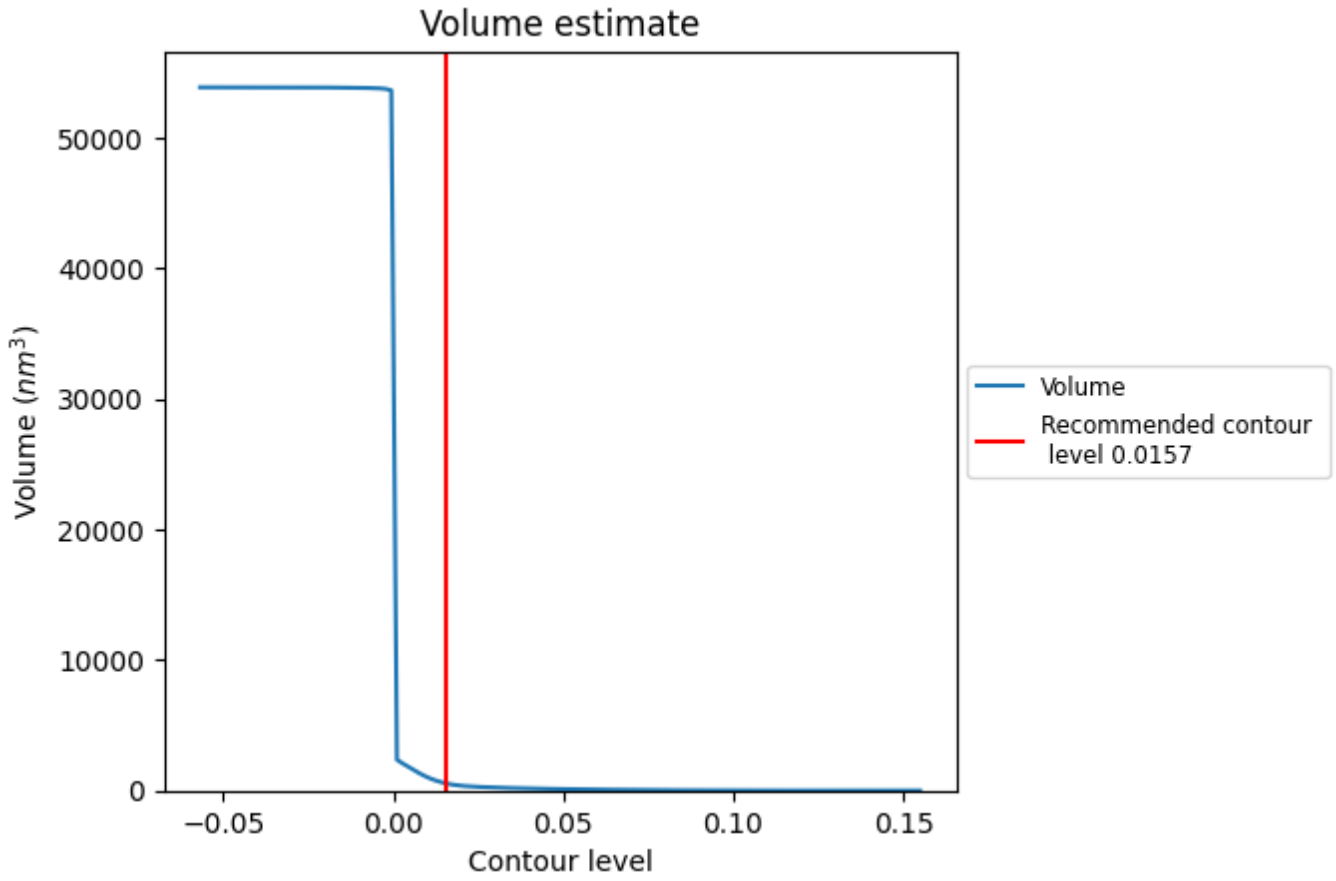
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

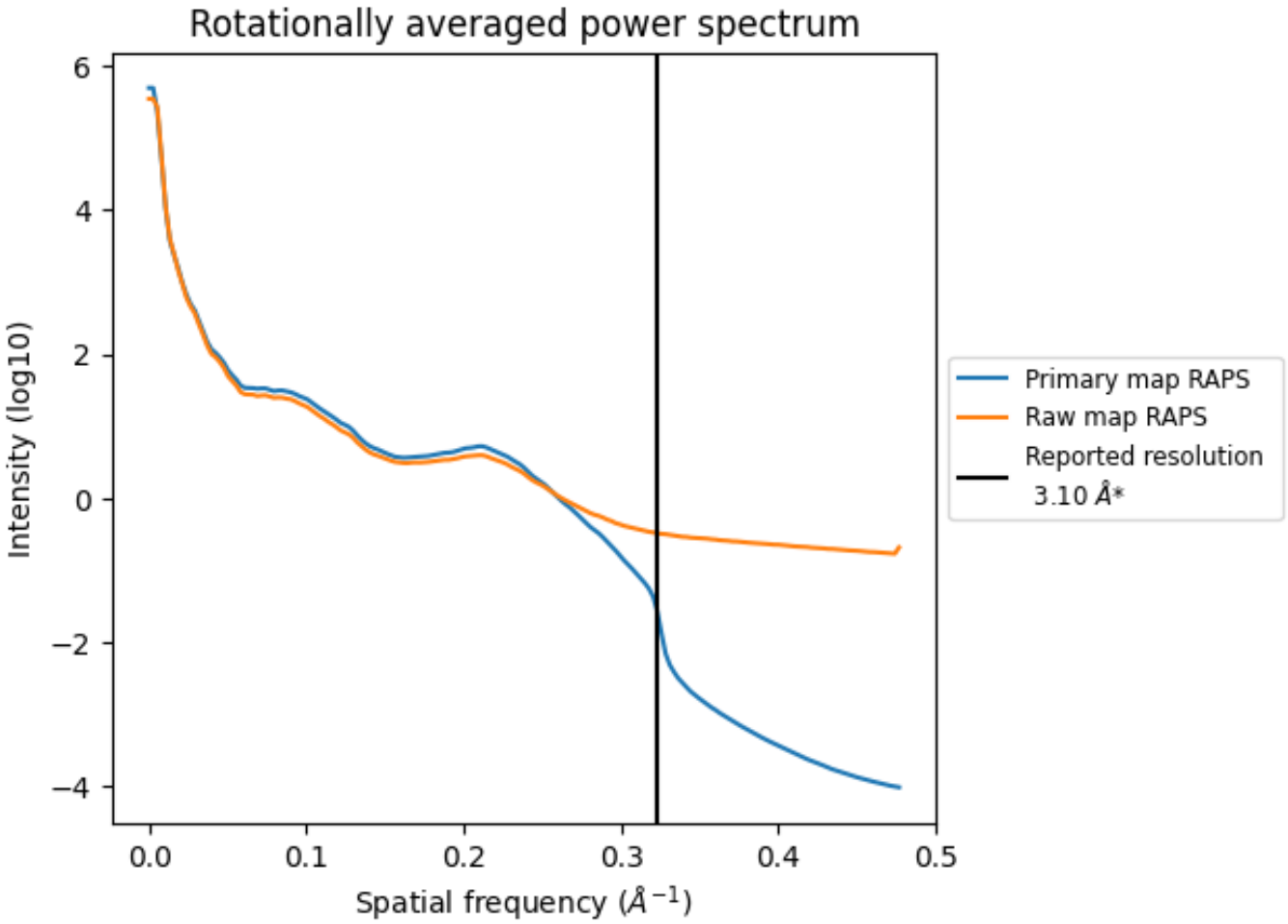
7.2 Volume estimate



The volume at the recommended contour level is 541 nm^3; this corresponds to an approximate mass of 489 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)

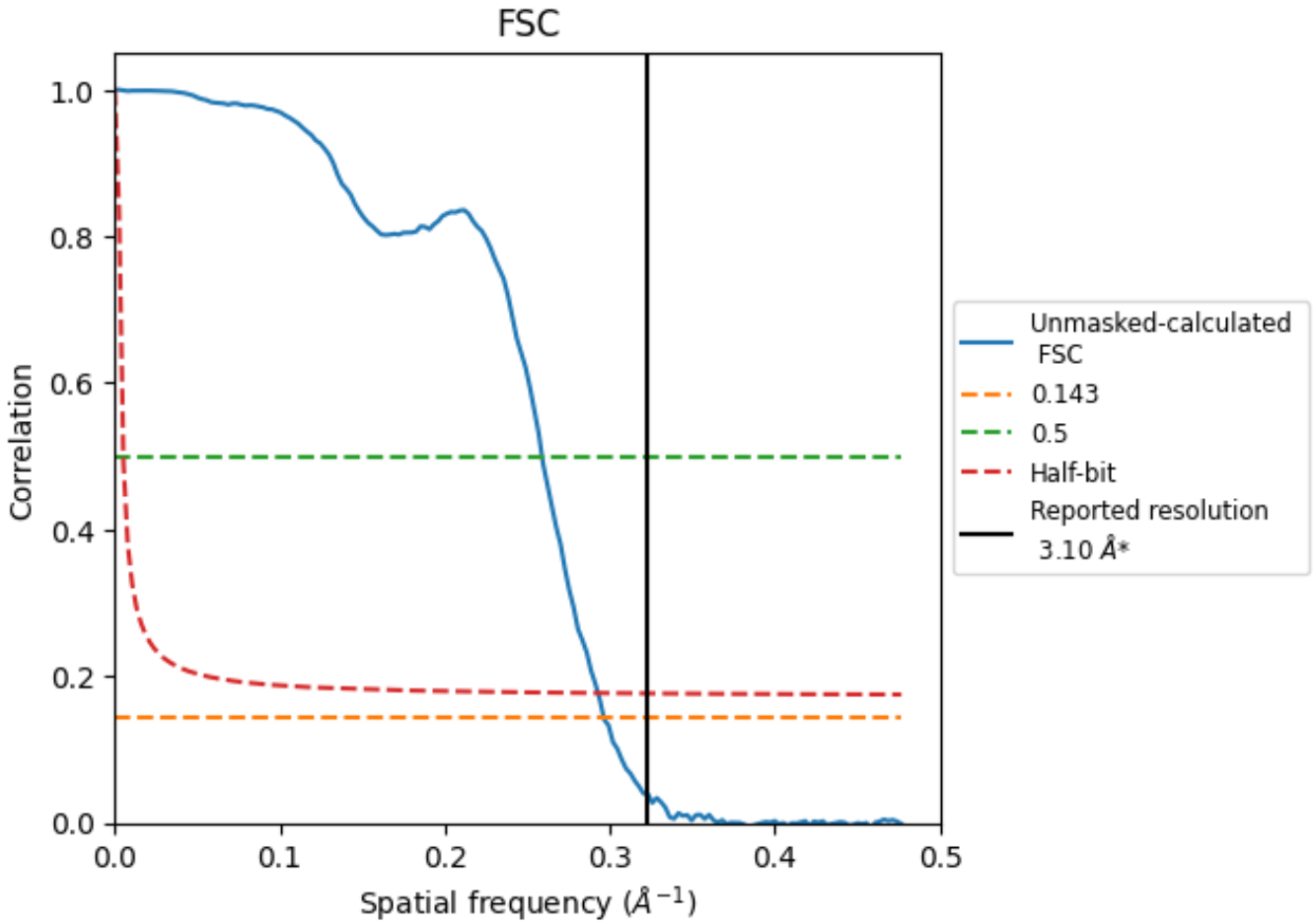


*Reported resolution corresponds to spatial frequency of 0.323 $Å^{-1}$

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 0.323 Å^{-1}

8.2 Resolution estimates (i)

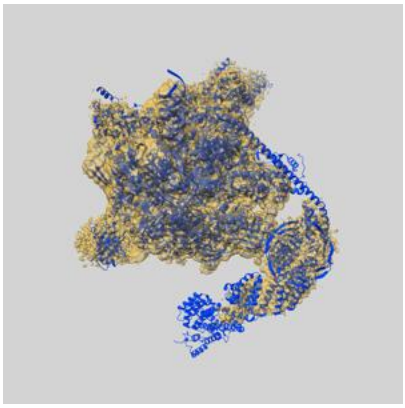
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.37	3.86	3.42

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

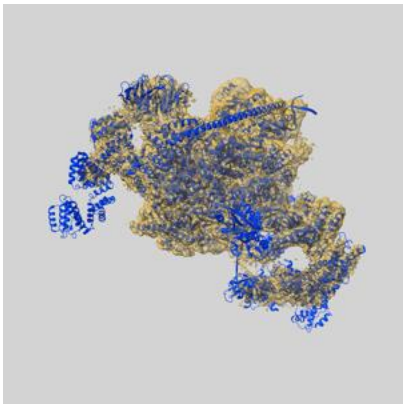
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-0031 and PDB model 6GMH. Per-residue inclusion information can be found in section 3 on page 9.

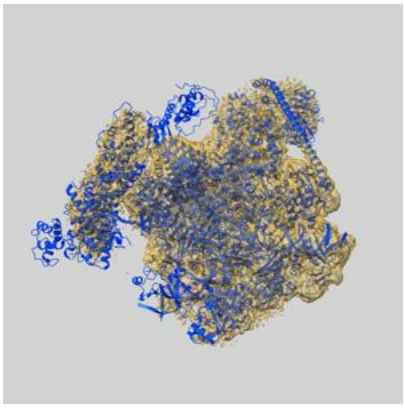
9.1 Map-model overlay



X



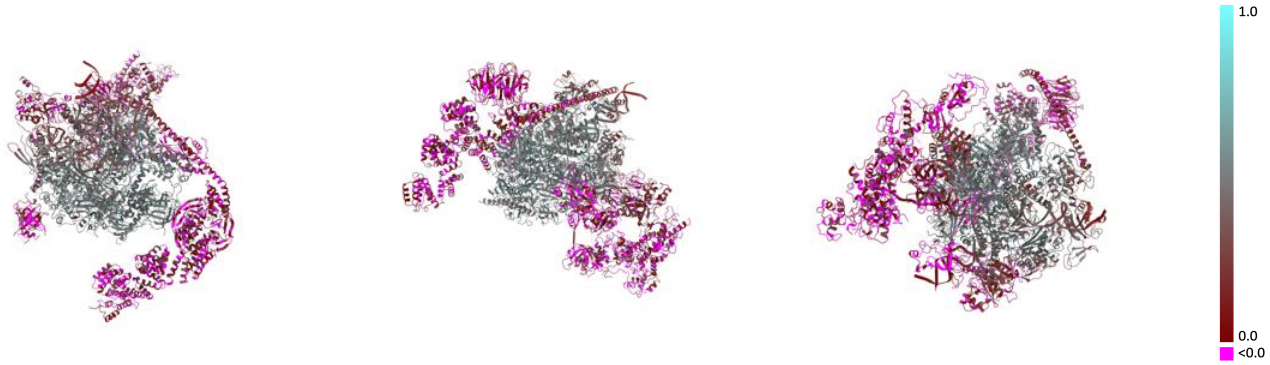
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0157 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.

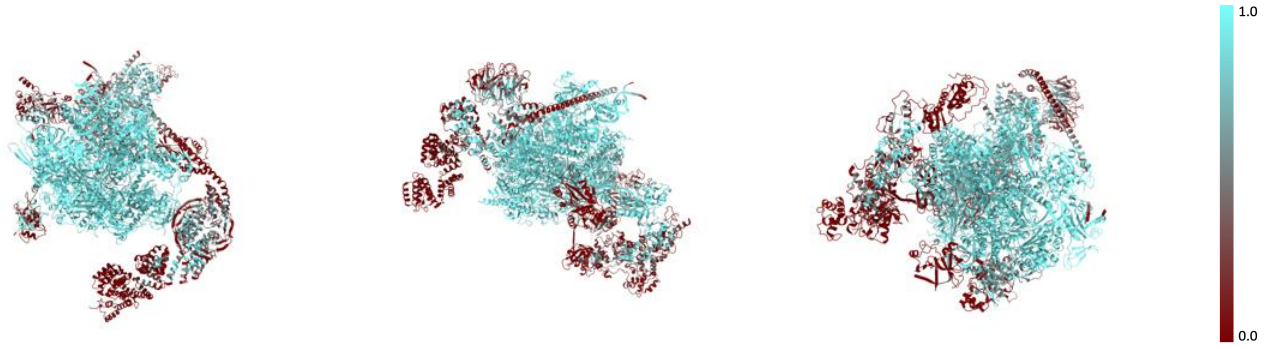
9.2 Q-score mapped to coordinate model (i)



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.

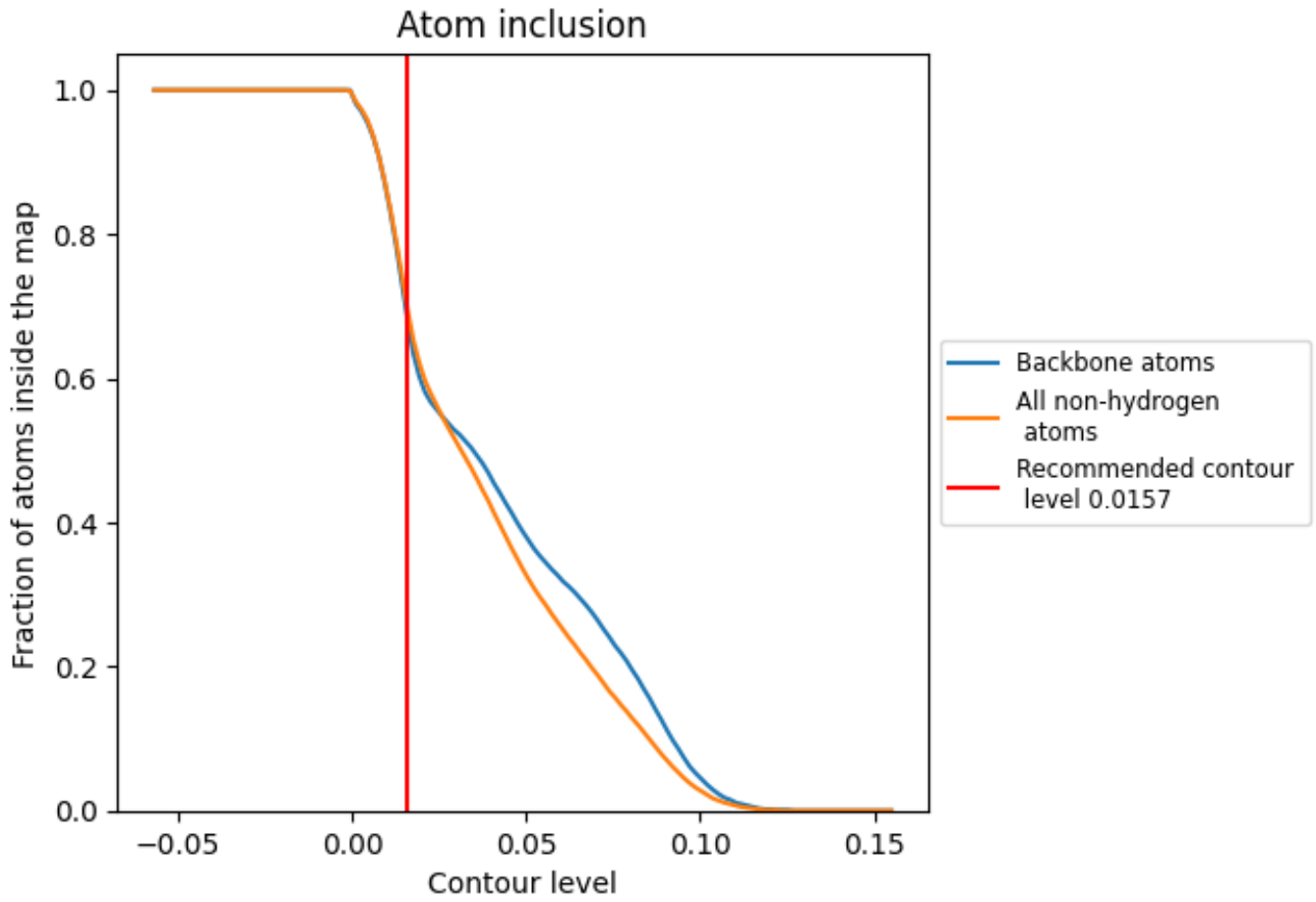
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0157).

9.4 Atom inclusion (i)



At the recommended contour level, 69% of all backbone atoms, 70% 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 (0.0157) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7030	0.3240
A	0.9290	0.4710
B	0.9540	0.4950
C	0.9460	0.5090
D	0.8230	0.2100
E	0.9540	0.4400
F	0.9330	0.5000
G	0.8430	0.2540
H	0.9280	0.4960
I	0.9400	0.4270
J	0.9600	0.5360
K	0.9620	0.5230
L	0.9410	0.4820
M	0.1680	0.0280
N	0.8370	0.2560
P	0.7010	0.2670
Q	0.2770	0.0810
T	0.8400	0.3330
U	0.3480	0.0230
V	0.4380	0.0630
W	0.3520	0.0410
X	0.5710	0.1690
Y	0.2040	0.1250
Z	0.3030	0.1100