Full wwPDB EM Validation Report

May 18, 2024 – 09:36 PM EDT

PDB ID	:	7KTS
EMDB ID	:	EMD-23028
Title	:	Negative stain EM structure of the human SAGA coactivator complex (TR-RAP, core, splicing module)
Authors	:	Herbst, D.A.; Esbin, M.N.; Nogales, E.
Deposited on	:	2020-11-24
Resolution	:	19.09 Å(reported)
Based on initial model	:	5IFE

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

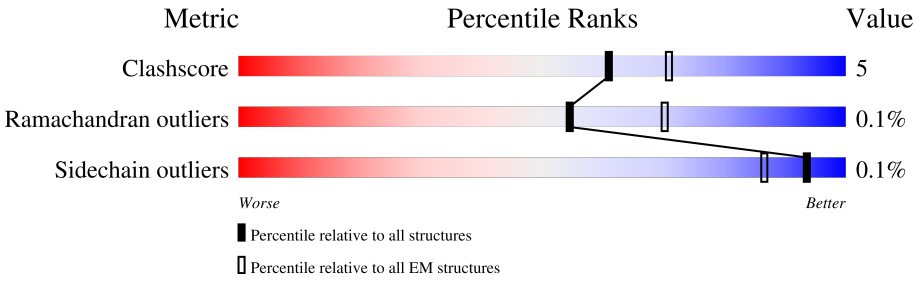
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 19.09 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	3848	15% 73% 6% 21%
2	B	589	15% 83% 8% 9%
3	C	811	12% 47% 50%
4	D	749	6% 25% 71%
5	E	251	12% 48% 51%
6	F	622	7% 53% 44%
7	G	161	20% 62% 36%
8	H	218	41% 55%

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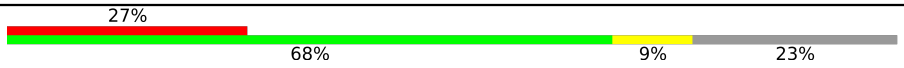
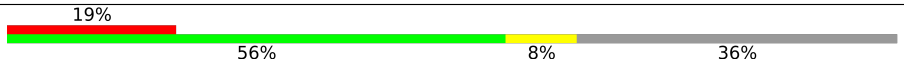
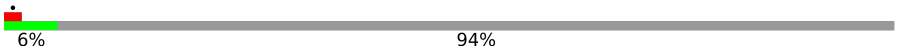
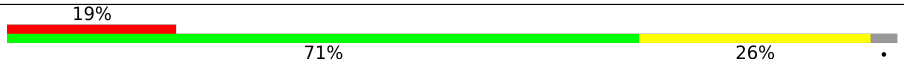
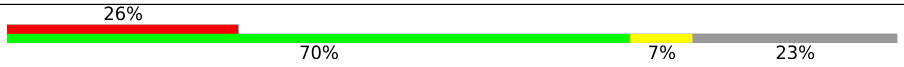
Mol	Chain	Length	Quality of chain
9	I	317	
10	J	335	
11	N	892	
12	S	1217	
13	T	86	

2 Entry composition

There are 13 unique types of molecules in this entry. The entry contains 100130 atoms, of which 48957 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 Transformation/transcription domain-associated protein, Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	3042	45856	14890	22462	4097	4249	158	3	0

- Molecule 2 is a protein called TAF5-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 5L.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	B	534	8338	2657	4113	727	819	22	0	0

- Molecule 3 is a protein called Isoform 3 of Transcription factor SPT20 homolog.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	C	407	6609	2066	3316	580	624	23	1	0

- Molecule 4 is a protein called STAGA complex 65 subunit gamma, DhaA,STAGA complex 65 subunit gamma,STAGA complex 65 subunit gamma, DhaA,STAGA complex 65 subunit gamma,STAGA complex 65 subunit gamma, DhaA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	D	219	3149	1045	1485	299	312	8	0	0

- Molecule 5 is a protein called Transcription initiation factor TFIID subunit 9B.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	E	124	2013	635	1018	175	180	5	0	0

- Molecule 6 is a protein called TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L,TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L,TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	F	351	Total	C	H	N	O	S	0	0
			3398	1308	1254	409	421	6		

- Molecule 7 is a protein called Transcription initiation factor TFIID subunit 12.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	G	103	Total	C	H	N	O	S	0	0
			1704	527	859	152	161	5		

- Molecule 8 is a protein called Transcription initiation factor TFIID subunit 10.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	H	99	Total	C	H	N	O	S	0	0
			1566	501	782	128	151	4		

- Molecule 9 is a protein called Transcription initiation protein SPT3 homolog,Transcription initiation protein SPT3 homolog,Transcription initiation protein SPT3 homolog.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	I	243	Total	C	H	N	O	S	0	0
			3823	1207	1911	343	350	12		

- Molecule 10 is a protein called Transcriptional adapter 1.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	J	214	Total	C	H	N	O	S	0	0
			3380	1073	1675	305	321	6		

- Molecule 11 is a protein called Ataxin-7.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	N	53	Total	C	H	N	O	S	1	0
			864	280	419	87	74	4		

- Molecule 12 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	S	1177	Total	C	H	N	O	S	0	0
			18381	5858	9154	1568	1756	45		

- Molecule 13 is a protein called Splicing factor 3B subunit 5.

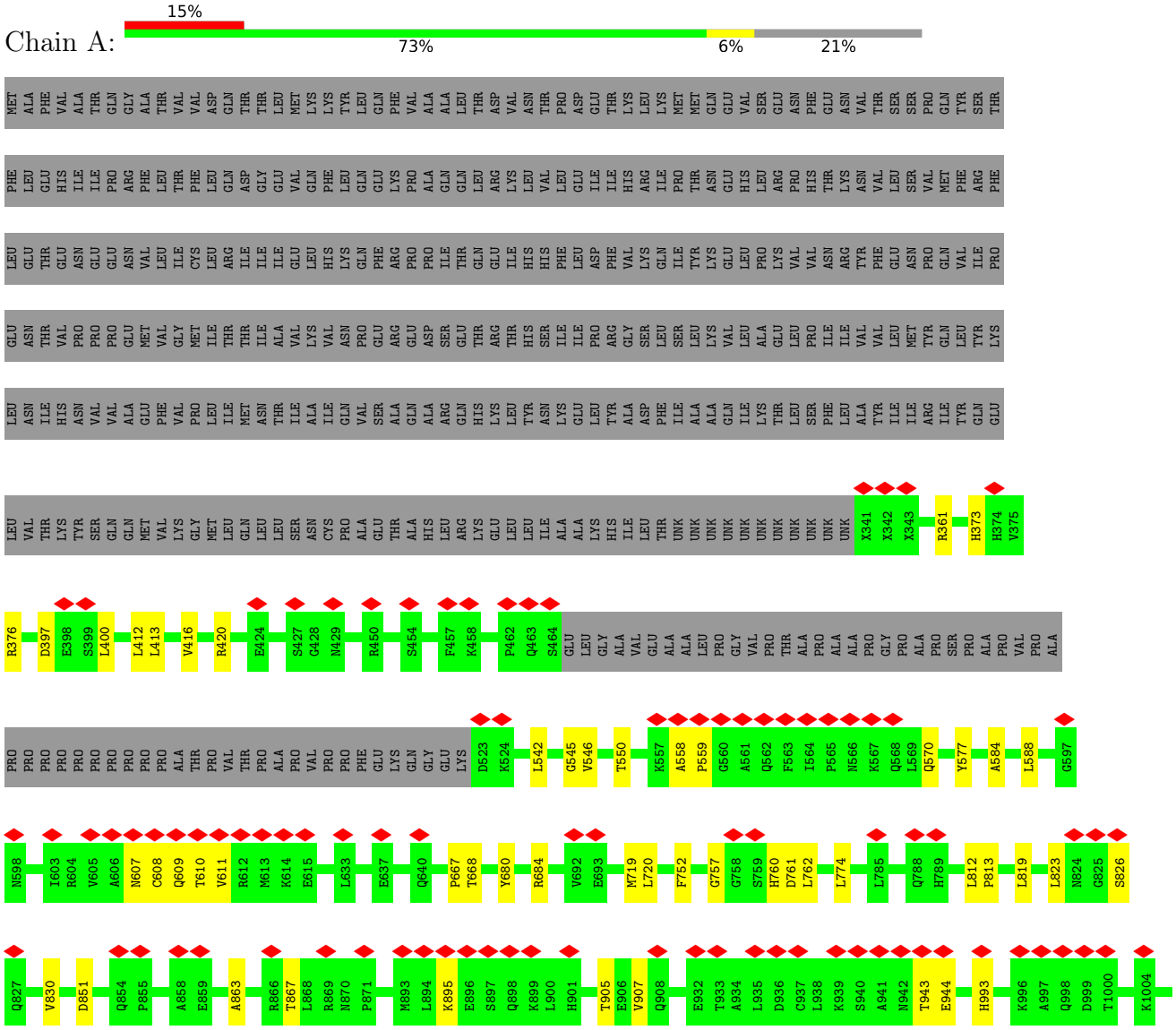
Mol	Chain	Residues	Atoms						AltConf	Trace
13	T	66	Total	C	H	N	O	S	0	0
			1049	343	509	94	98	5		

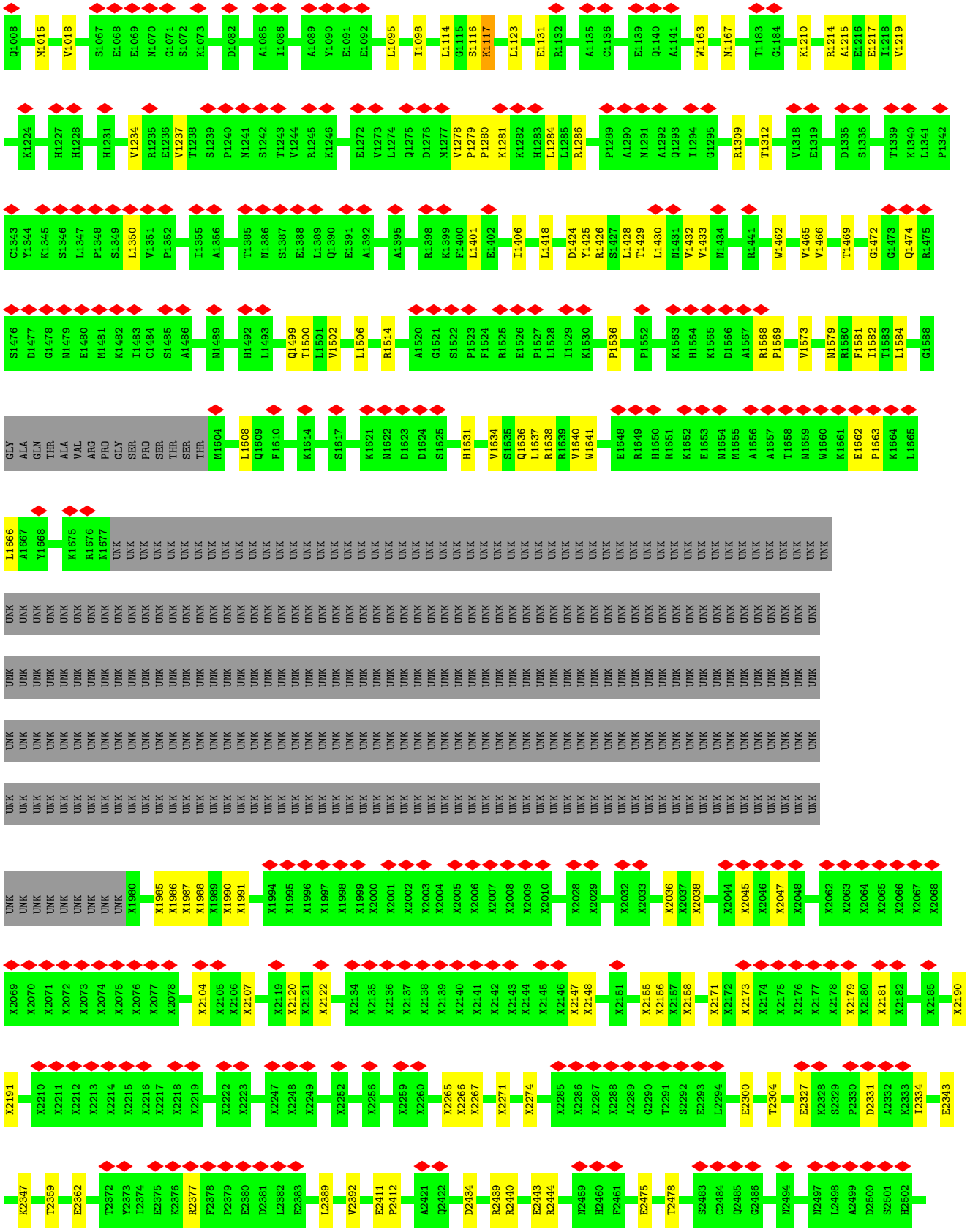
3 Residue-property plots (i)

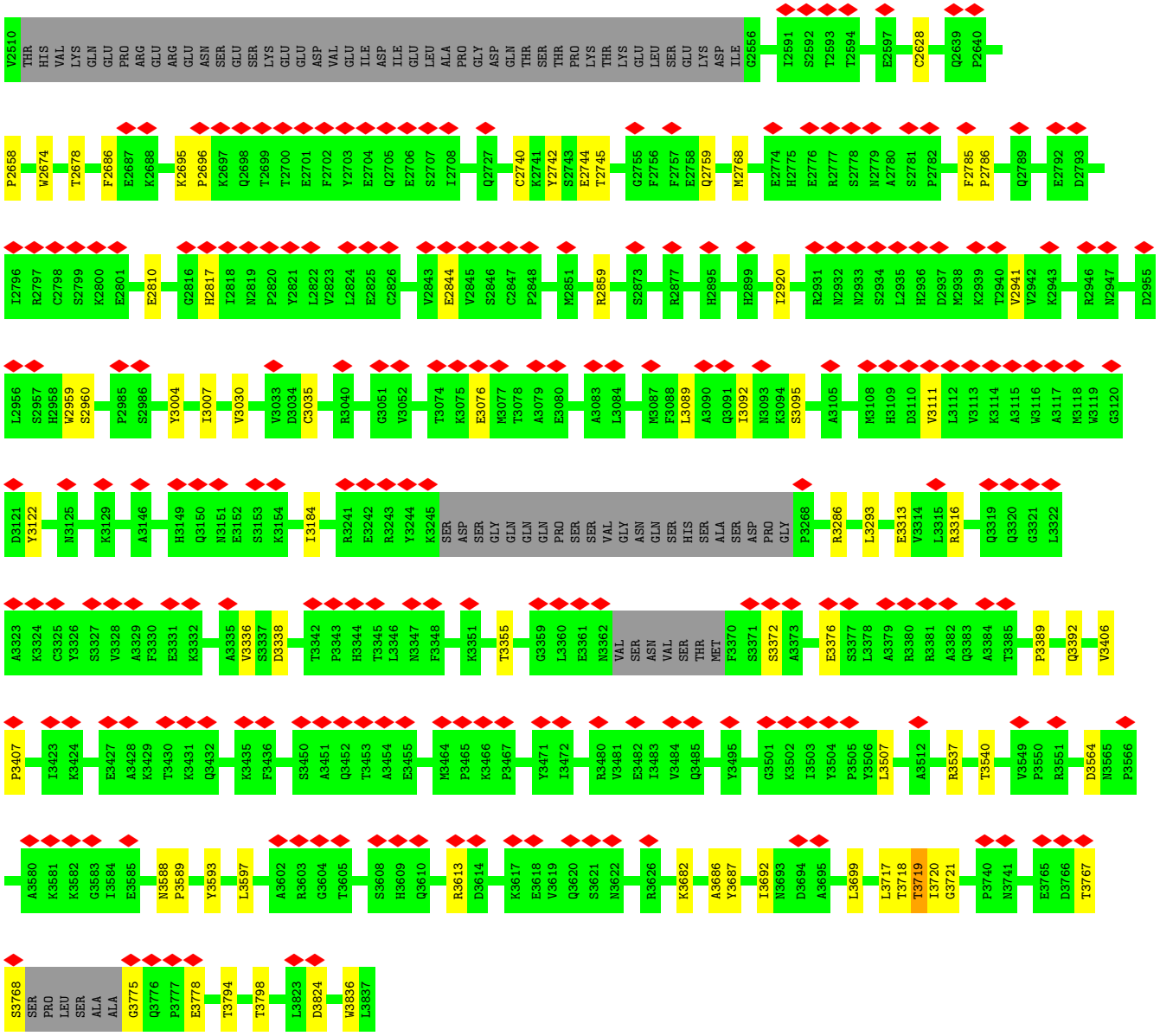
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein,Transformation/transcription domain-associated protein

Chain A:

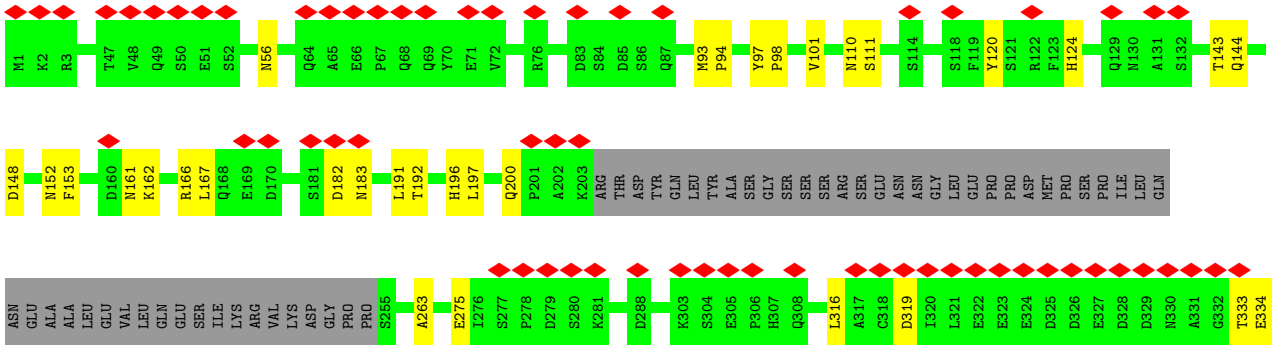


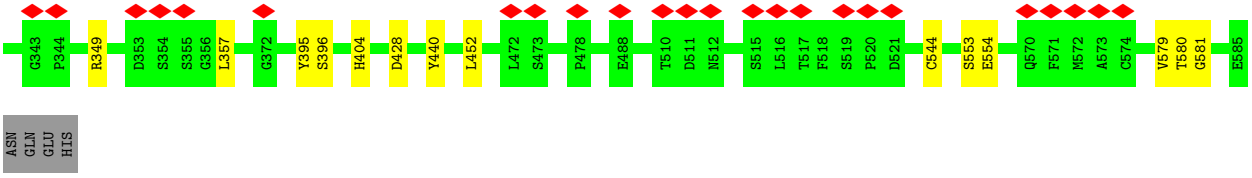

Q1008 M1015 V1018 S1067 E1068 E1069 N1070 G1071 S1072 K1073 D1082 A1085 I1086 A1089 Y1090 E1091 E1092 L1095 I1098 L1114 G1115 S1116 K1117 L1123 E1131 R1132 A1135 C1136 E1139 Q1140 A1141 W1163 N1167 T1183 G1184 K1210 R1214 A1215 E1216 E1217 I1218 V1219
K1224 H1227 H1228 H1231 V1234 R1235 E1236 V1237 T1238 S1239 P1240 N1241 S1242 T1243 V1244 R1245 K1246 E1272 V1273 L1274 Q1275 D1276 M1277 V1278 P1279 P1280 K1281 K1282 H1283 L1284 L1285 R1286 P1289 A1290 N1291 A1292 Q1293 I1294 G1295 R1309 T1312 V1318 E1319 D1335 S1336 T1339 K1340 L1341 P1342
C1343 Y1344 K1345 S1346 L1347 P1348 S1349 L1350 V1351 P1352 I1355 A1356 T1385 N1386 S1387 E1388 L1389 Q1390 E1391 A1392 A1395 R1398 K1399 F1400 L1401 E1402 I1406 L1418 D1424 Y1425 R1426 S1427 L1428 T1429 L1430 N1431 V1432 V1433 N1434 R1441 W1462 V1465 V1466 T1469 G1472 G1473 Q1474 R1475
S1476 D1477 G1478 N1479 E1480 M1481 K1482 I1483 C1484 S1485 A1486 N1489 H1492 L1493 Q1499 T1500 L1501 V1502 L1506 R1514 A1520 G1521 S1522 P1523 F1524 R1525 E1526 P1527 L1528 I1529 K1530 P1536 P1552 K1563 H1564 K1565 D1566 A1567 R1568 P1569 V1573 N1579 R1580 F1581 I1582 T1583 L1584 G1588
GLY ALA GLN THR ALA VAL ARG PRO GLY SER PRO SER THR SER THR M1604 L1608 Q1609 F1610 K1614 S1617 K1621 N1622 D1623 D1624 S1625 H1631 V1634 S1635 Q1636 L1637 R1638 R1639 V1640 W1641 E1648 R1649 H1650 R1651 K1652 E1653 N1654 M1655 A1656 A1657 T1658 N1659 W1660 K1661 E1662 P1663 K1664 L1665
L1666 A1667 Y1668 K1675 R1676 N1677 UNK
X1980 X1985 X1986 X1987 X1988 X1989 X1990 X1991 X1994 X1995 X1996 X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007 X2008 X2009 X2010 X2028 X2029 X2032 X2033 X2036 X2037 X2038 X2044 X2045 X2046 X2047 X2048 X2062 X2063 X2064 X2065 X2066 X2067 X2068
X2069 X2070 X2071 X2072 X2073 X2074 X2075 X2076 X2077 X2078 X2104 X2105 X2106 X2107 X2119 X2120 X2121 X2122 X2134 X2135 X2136 X2137 X2138 X2139 X2140 X2141 X2142 X2143 X2144 X2145 X2146 X2147 X2148 X2151 X2155 X2156 X2157 X2158 X2171 X2172 X2173 X2174 X2175 X2176 X2177 X2178 X2179 X2180 X2181 X2182 X2185 X2190
X2191 X2210 X2211 X2212 X2213 X2214 X2215 X2216 X2217 X2218 X2219 X2222 X2223 X2247 X2248 X2249 X2252 X2256 X2259 X2260 X2265 X2266 X2267 X2271 X2274 X2285 X2286 X2287 X2288 A2289 G2290 T2291 S2292 E2293 L2294 E2300 T2304 E2327 K2328 S2329 P2330 D2331 A2332 K2333 I2334 E2343
K2347 T2359 E2362 T2372 Y2373 I2374 E2375 K2376 R2377 F2378 P2379 E2380 D2381 L2382 E2383 L2389 V2392 E2411 P2412 A2421 Q2422 D2434 R2439 R2440 E2443 R2444 N2459 H2460 F2461 E2475 T2478 S2483 C2484 Q2485 G2486 N2494 N2497 L2498 A2499 D2500 S2501 H2502



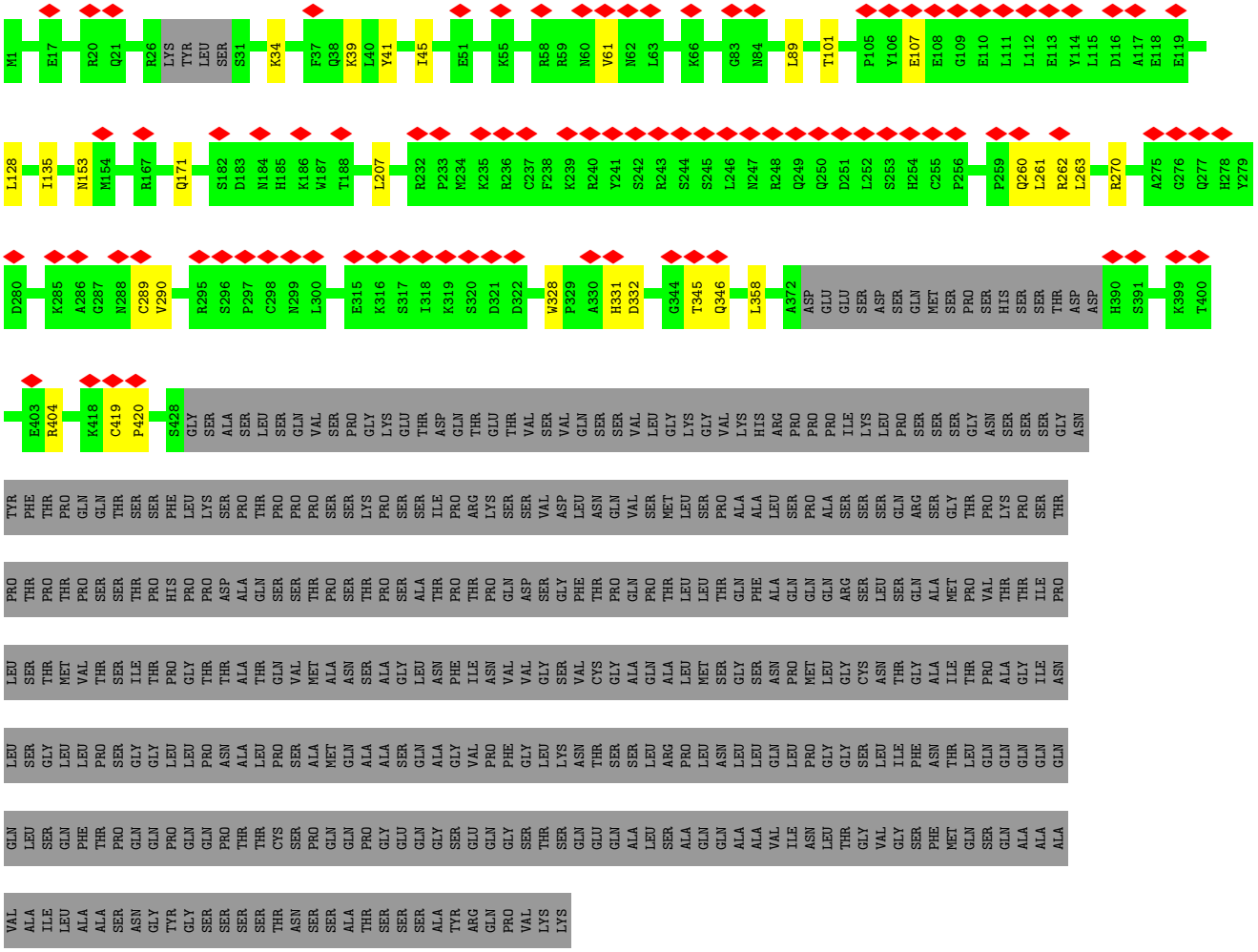
• Molecule 2: TAF5-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 5L

Chain B:

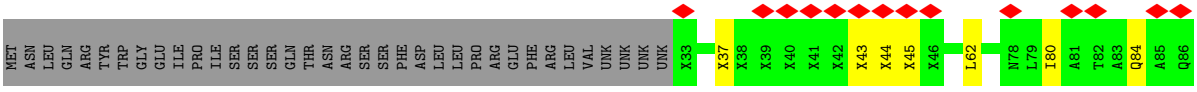


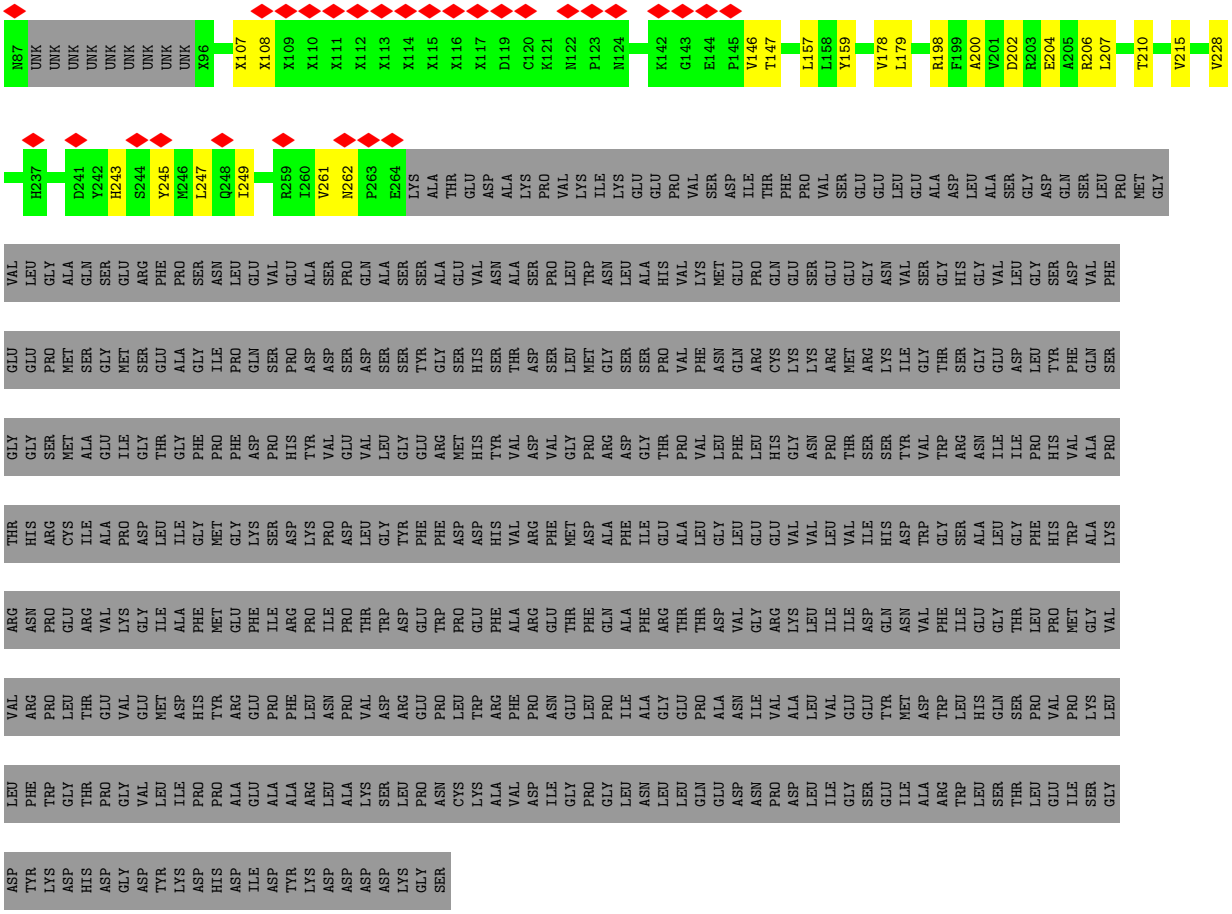


• Molecule 3: Isoform 3 of Transcription factor SPT20 homolog



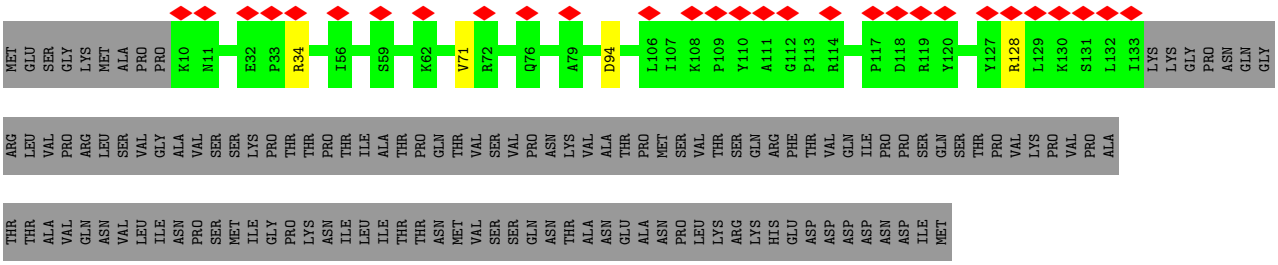
• Molecule 4: STAGA complex 65 subunit gamma, DhaA,STAGA complex 65 subunit gamma,STAGA complex 65 subunit gamma, DhaA,STAGA complex 65 subunit gamma,STAGA complex 65 subunit gamma, DhaA





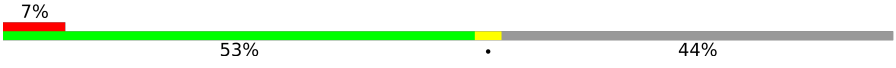
• Molecule 5: Transcription initiation factor TFIID subunit 9B

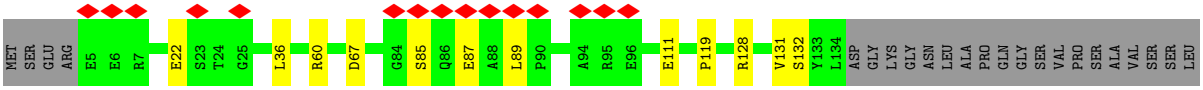
Chain E:

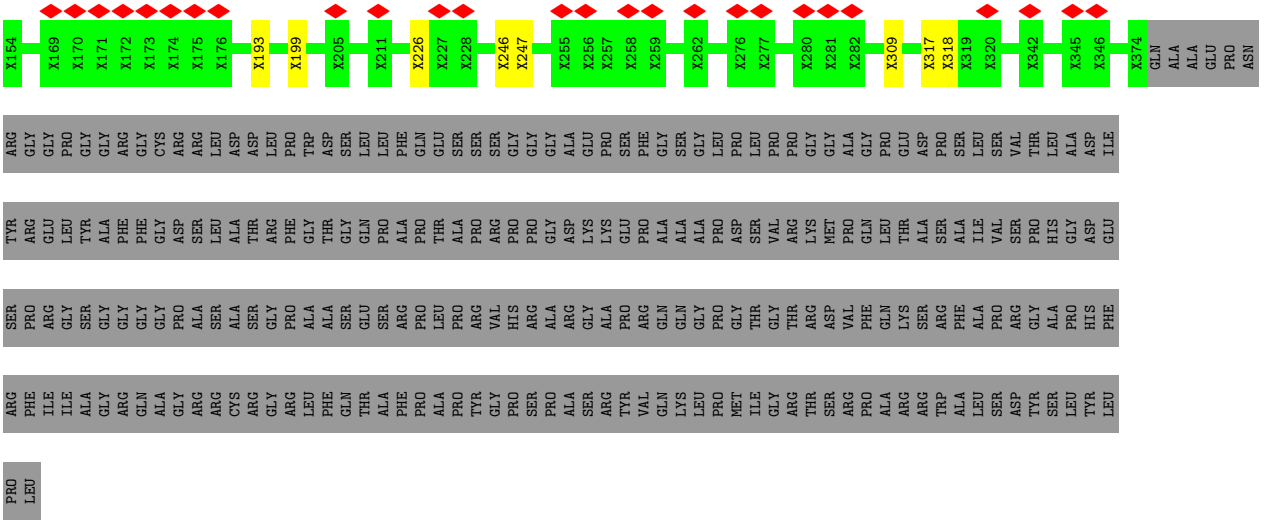


• Molecule 6: TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L,TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L,TAF6-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 6L

Chain F:

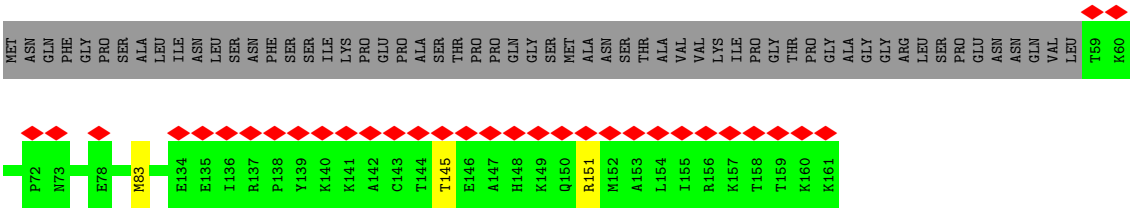






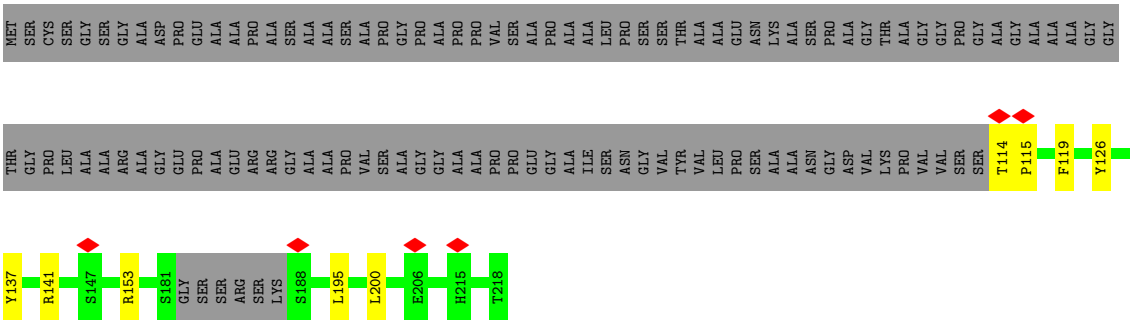
• Molecule 7: Transcription initiation factor TFIID subunit 12

Chain G:



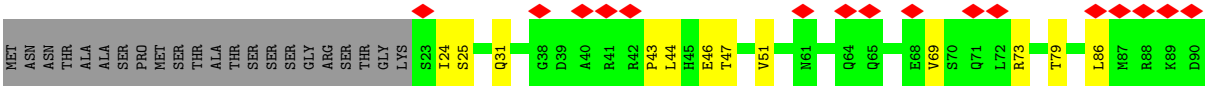
• Molecule 8: Transcription initiation factor TFIID subunit 10

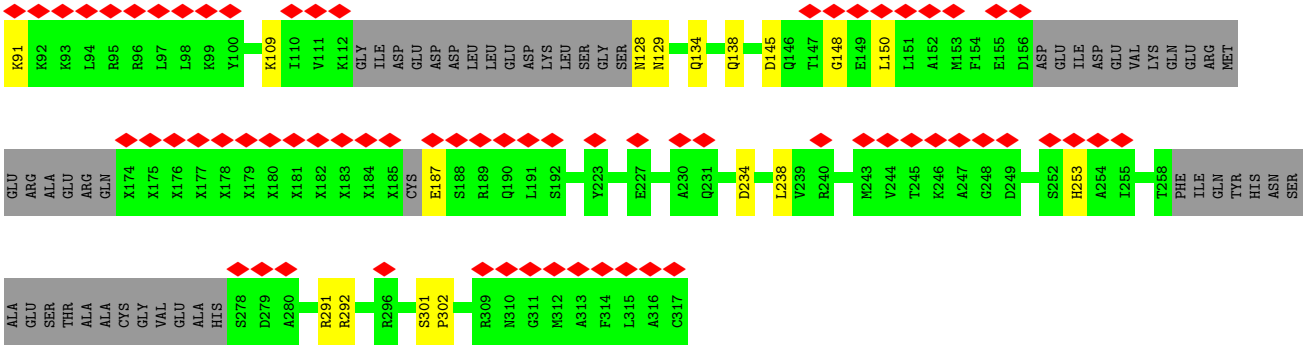
Chain H:



• Molecule 9: Transcription initiation protein SPT3 homolog,Transcription initiation protein SPT3 homolog,Transcription initiation protein SPT3 homolog

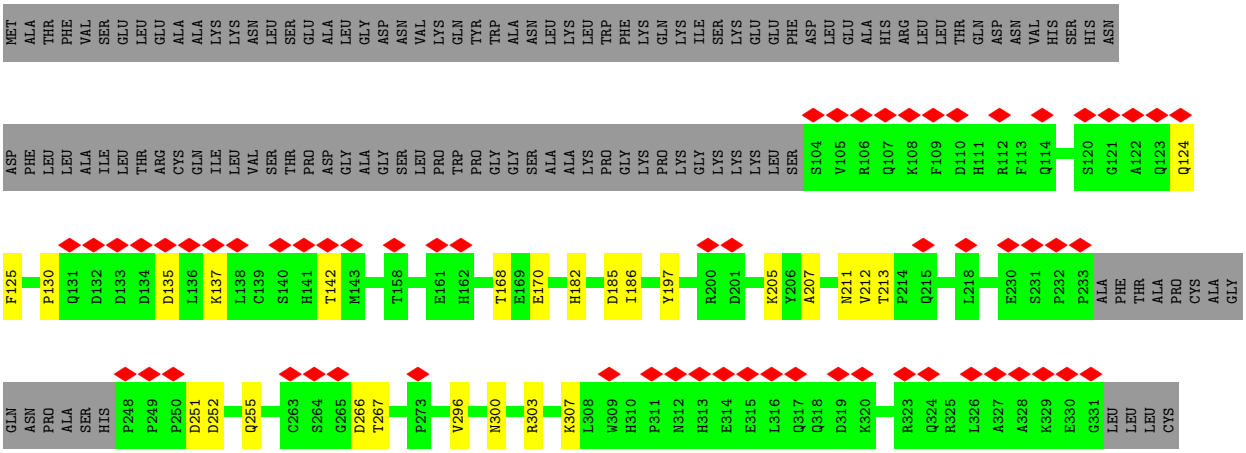
Chain I:





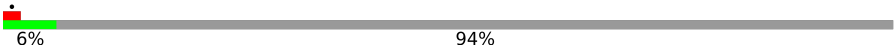
• Molecule 10: Transcriptional adapter 1

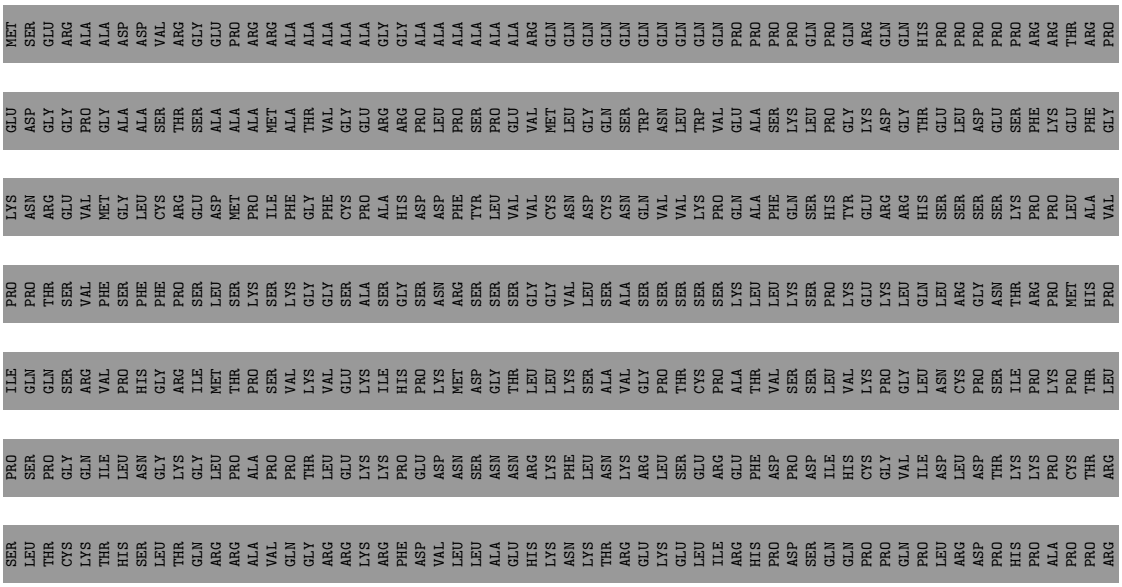
Chain J:

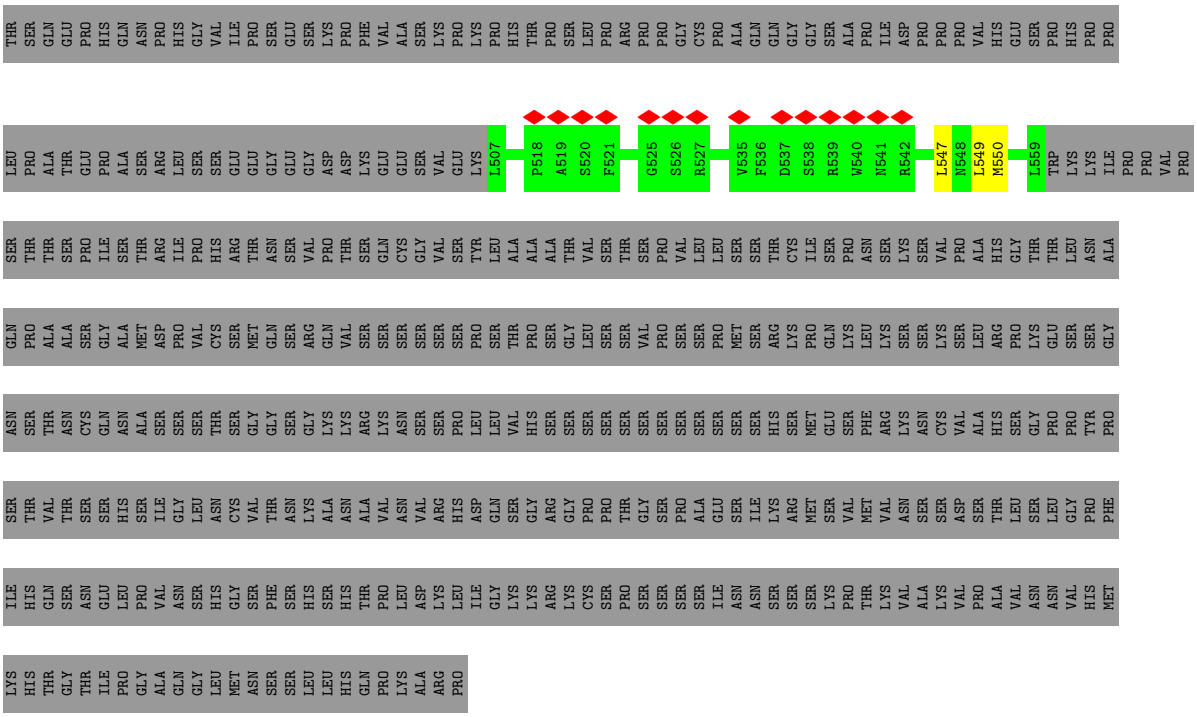


• Molecule 11: Ataxin-7

Chain N:

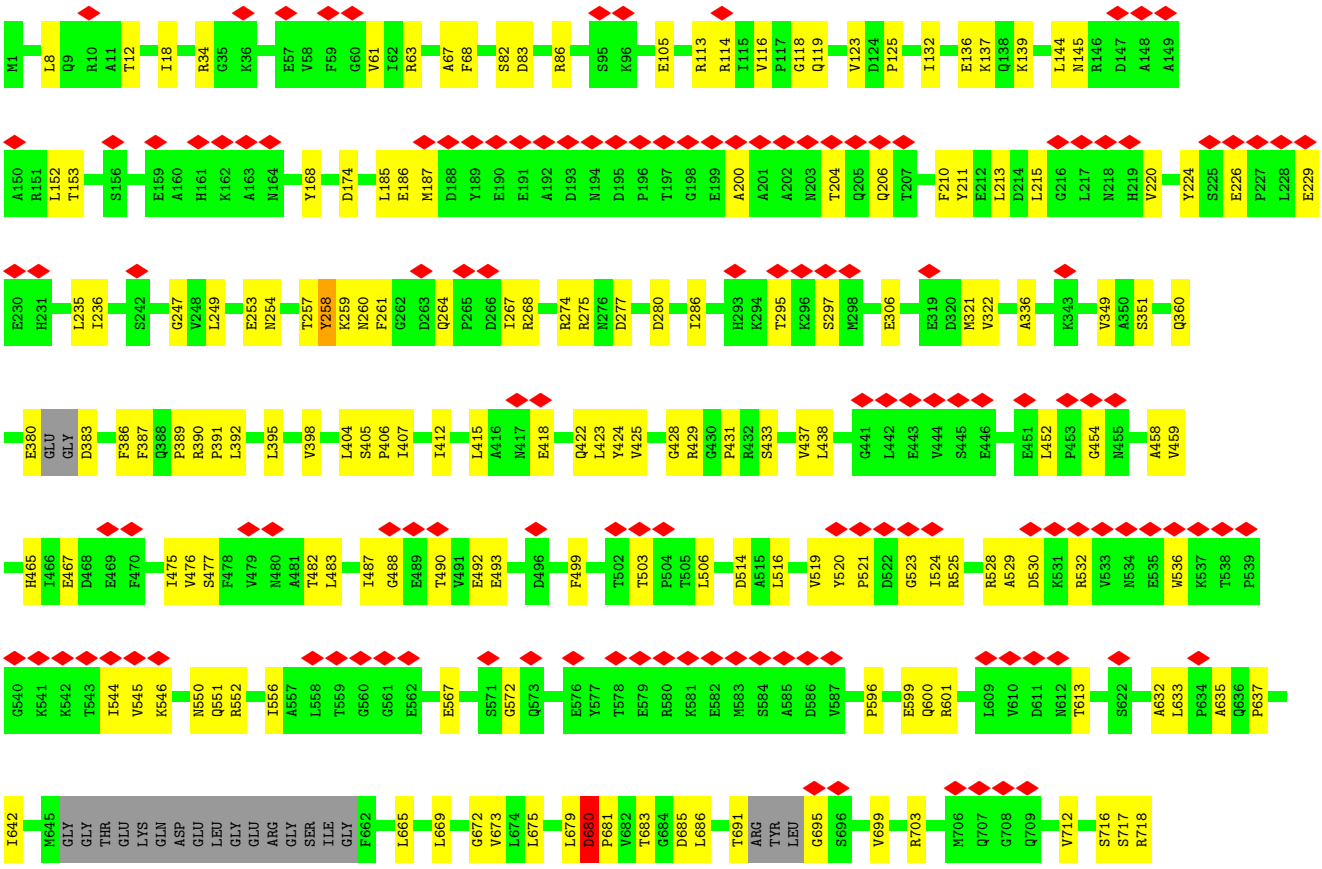


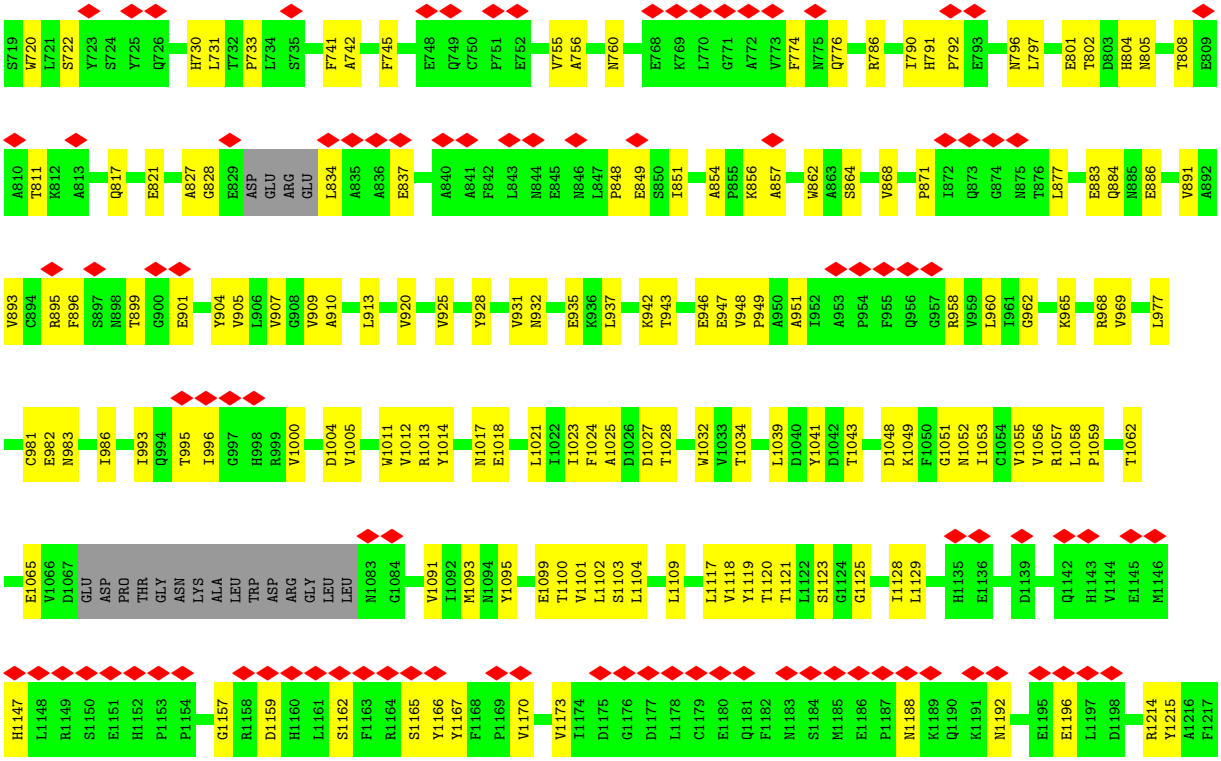




• Molecule 12: Splicing factor 3B subunit 3

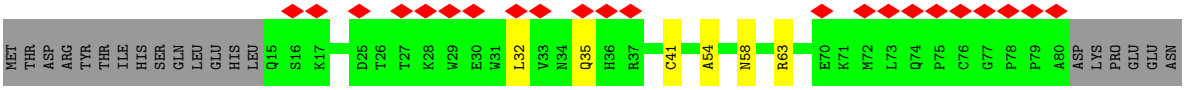
Chain S:





• Molecule 13: Splicing factor 3B subunit 5

Chain T:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	3157	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI 20	Depositor
Voltage (kV)	120	Depositor
Electron dose ($e^-/Å^2$)	35	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	3900	Depositor
Magnification	80000	Depositor
Image detector	GATAN ULTRASCAN 4000 (4k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.028	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.0302	Depositor
Map size (Å)	420.0, 420.0, 420.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4, 1.4, 1.4	Depositor

5 Model quality

5.1 Standard geometry

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	0.28	0/22230	0.41	0/30095
2	B	0.28	0/4315	0.43	0/5856
3	C	0.28	0/3355	0.40	0/4527
4	D	0.29	0/1513	0.41	0/2050
5	E	0.29	0/1018	0.40	0/1384
6	F	0.28	0/1055	0.43	0/1424
7	G	0.26	0/857	0.40	0/1150
8	H	0.30	0/800	0.41	0/1082
9	I	0.27	0/1879	0.39	0/2523
10	J	0.28	0/1745	0.40	0/2373
11	N	0.29	0/459	0.39	0/619
12	S	0.25	0/9415	0.46	0/12775
13	T	0.24	0/556	0.42	0/751
All	All	0.28	0/49197	0.42	0/66609

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
6	F	0	4

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
6	F	193	UNK	Peptide
6	F	199	UNK	Peptide

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Mol	Chain	Res	Type	Group
6	F	226	UNK	Peptide
6	F	247	UNK	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	23394	22462	22469	152	0
2	B	4225	4113	4113	31	0
3	C	3293	3316	3313	23	0
4	D	1664	1485	1488	20	0
5	E	995	1018	1018	5	0
6	F	2144	1254	1255	12	0
7	G	845	859	859	2	0
8	H	784	782	781	6	0
9	I	1912	1911	1910	20	0
10	J	1705	1675	1675	19	0
11	N	445	419	418	3	0
12	S	9227	9154	9154	196	0
13	T	540	509	509	5	0
All	All	51173	48957	48962	460	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 (460) 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)
6:F:317:UNK:O	6:F:318:UNK:CB	2.26	0.83
1:A:2920:ILE:HD11	1:A:2941:VAL:HG11	1.61	0.82
2:B:144:GLN:N	2:B:148:ASP:OD2	2.14	0.80
6:F:22:GLU:OE2	7:G:145:THR:OG1	1.99	0.80
10:J:135:ASP:OD2	10:J:137:LYS:NZ	2.16	0.78
1:A:2434:ASP:OD2	1:A:2439:ARG:NH2	2.18	0.77
1:A:2628:CYS:O	10:J:255:GLN:NE2	2.16	0.77
12:S:428:GLY:HA3	12:S:433:SER:HA	1.67	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2359:THR:N	1:A:2362:GLU:OE1	2.20	0.75
3:C:332:ASP:OD1	3:C:358:LEU:N	2.19	0.75
12:S:1103:SER:OG	12:S:1120:THR:HG22	1.86	0.74
12:S:210:PHE:HB2	12:S:224:TYR:HB2	1.70	0.73
1:A:2300:GLU:O	1:A:2304:THR:HG23	1.88	0.73
1:A:1988:UNK:O	1:A:1990:UNK:N	2.20	0.73
1:A:2810:GLU:OE1	3:C:270:ARG:NH1	2.22	0.73
10:J:212:VAL:HG13	10:J:213:THR:H	1.55	0.72
2:B:544:CYS:N	2:B:553:SER:OG	2.24	0.71
3:C:34:LYS:O	3:C:39:LYS:NZ	2.24	0.71
12:S:951:ALA:HB1	12:S:993:ILE:HG22	1.71	0.71
6:F:111:GLU:N	6:F:111:GLU:OE1	2.24	0.70
1:A:2658:PRO:HB2	10:J:267:THR:HG21	1.73	0.70
5:E:34:ARG:NE	6:F:87:GLU:O	2.22	0.70
4:D:62:LEU:HD23	4:D:243:HIS:NE2	2.07	0.70
12:S:459:VAL:HA	12:S:475:ILE:O	1.93	0.69
12:S:804:HIS:ND1	12:S:805:ASN:OD1	2.25	0.69
9:I:187:GLU:OE1	9:I:187:GLU:N	2.25	0.69
1:A:2920:ILE:HD11	1:A:2941:VAL:CG1	2.22	0.69
1:A:3717:LEU:O	1:A:3718:THR:OG1	2.10	0.69
12:S:423:LEU:HB2	12:S:438:LEU:HB2	1.75	0.69
12:S:797:LEU:HG	12:S:871:PRO:HG3	1.74	0.69
1:A:2179:UNK:O	1:A:2181:UNK:N	2.26	0.68
1:A:1641:TRP:CD1	1:A:1666:LEU:HD21	2.29	0.68
6:F:246:UNK:O	6:F:309:UNK:CB	2.42	0.68
2:B:200:GLN:N	2:B:200:GLN:OE1	2.27	0.68
10:J:124:GLN:OE1	10:J:125:PHE:N	2.27	0.68
1:A:3313:GLU:OE2	1:A:3316:ARG:NH2	2.28	0.67
2:B:275:GLU:OE1	2:B:349:ARG:NH1	2.27	0.67
1:A:993:HIS:ND1	1:A:1131:GLU:OE1	2.26	0.67
1:A:1114:LEU:HD11	1:A:1123:LEU:HD11	1.76	0.67
12:S:633:LEU:HD12	12:S:637:PRO:HG3	1.76	0.67
1:A:2959:TRP:CE3	1:A:3007:ILE:HD13	2.30	0.66
1:A:570:GLN:OE1	1:A:1514:ARG:NH2	2.28	0.66
12:S:745:PHE:HB2	12:S:755:VAL:HG23	1.77	0.65
12:S:567:GLU:OE2	12:S:601:ARG:NH1	2.29	0.65
12:S:1048:ASP:HB3	12:S:1052:ASN:H	1.62	0.65
12:S:1188:ASN:O	12:S:1192:ASN:ND2	2.29	0.65
12:S:260:ASN:HB3	12:S:264:GLN:HG2	1.76	0.65
1:A:1584:LEU:HD22	1:A:1608:LEU:HD21	1.78	0.65
12:S:275:ARG:HG2	12:S:386:PHE:HB3	1.77	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:635:ALA:HB3	12:S:669:LEU:HD23	1.79	0.65
12:S:550:ASN:OD1	12:S:551:GLN:N	2.30	0.65
2:B:143:THR:HG23	2:B:148:ASP:CB	2.27	0.64
12:S:1053:ILE:HD11	12:S:1101:VAL:HG21	1.79	0.64
2:B:182:ASP:OD1	2:B:183:ASN:N	2.31	0.64
12:S:642:ILE:HG12	12:S:665:LEU:HD23	1.80	0.64
12:S:552:ARG:NH1	12:S:600:GLN:O	2.30	0.63
12:S:893:VAL:HG22	12:S:905:VAL:HG22	1.80	0.63
1:A:584:ALA:O	1:A:588:LEU:HD23	1.99	0.63
10:J:300:ASN:OD1	10:J:303:ARG:NH1	2.31	0.63
1:A:2331:ASP:HB2	1:A:2334:ILE:HD12	1.81	0.62
1:A:1350:LEU:O	1:A:1350:LEU:HD23	1.98	0.62
1:A:905:THR:HG22	1:A:907:VAL:H	1.65	0.62
1:A:3613:ARG:NH1	1:A:3824:ASP:OD1	2.33	0.62
3:C:41:TYR:CE2	3:C:45:ILE:HD11	2.34	0.62
9:I:73:ARG:NH2	9:I:79:THR:OG1	2.32	0.62
12:S:412:ILE:HG12	12:S:423:LEU:HG	1.82	0.62
2:B:316:LEU:N	2:B:319:ASP:OD2	2.32	0.61
9:I:253:HIS:ND1	10:J:211:ASN:OD1	2.33	0.61
12:S:642:ILE:O	12:S:703:ARG:NH1	2.29	0.61
1:A:2171:UNK:O	1:A:2173:UNK:N	2.34	0.61
1:A:550:THR:HG22	1:A:577:TYR:OH	2.00	0.61
12:S:786:ARG:NH1	12:S:802:THR:O	2.33	0.61
1:A:895:LYS:O	1:A:3682:LYS:NZ	2.25	0.60
12:S:899:THR:HG21	12:S:904:TYR:HE2	1.66	0.60
12:S:996:ILE:HD13	12:S:1041:TYR:HD1	1.66	0.60
12:S:236:ILE:HB	12:S:249:LEU:HB2	1.83	0.60
2:B:152:ASN:OD1	2:B:153:PHE:N	2.34	0.60
12:S:139:LYS:NZ	12:S:211:TYR:OH	2.32	0.60
12:S:213:LEU:HD22	12:S:215:LEU:HD12	1.83	0.59
12:S:712:VAL:HG23	12:S:722:SER:HB3	1.82	0.59
1:A:3286:ARG:HA	1:A:3293:LEU:HD12	1.83	0.59
12:S:828:GLY:O	12:S:834:LEU:N	2.35	0.59
12:S:18:ILE:HD12	12:S:67:ALA:HB2	1.83	0.59
12:S:691:THR:HG22	12:S:716:SER:HB3	1.83	0.59
12:S:685:ASP:OD1	12:S:686:LEU:N	2.35	0.59
12:S:545:VAL:HG12	12:S:546:LYS:HG2	1.85	0.58
1:A:3076:GLU:OE1	1:A:3076:GLU:N	2.36	0.58
7:G:83:MET:SD	10:J:307:LYS:NZ	2.62	0.58
12:S:454:GLY:O	12:S:760:ASN:OD1	2.22	0.58
10:J:296:VAL:O	10:J:300:ASN:ND2	2.37	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:31:GLN:NE2	9:I:43:PRO:O	2.37	0.58
12:S:849:GLU:HG3	12:S:854:ALA:HA	1.84	0.57
1:A:757:GLY:O	1:A:760:HIS:NE2	2.37	0.57
12:S:61:VAL:HB	12:S:83:ASP:HB3	1.85	0.57
12:S:722:SER:HA	12:S:730:HIS:O	2.03	0.57
5:E:34:ARG:NE	6:F:85:SER:OG	2.38	0.57
10:J:251:ASP:OD1	10:J:252:ASP:N	2.38	0.57
1:A:3775:GLY:N	1:A:3778:GLU:OE2	2.38	0.57
12:S:392:LEU:HD12	12:S:395:LEU:HB2	1.85	0.57
2:B:161:ASN:HA	3:C:61:VAL:HG21	1.86	0.57
1:A:1309:ARG:HE	1:A:1312:THR:HG22	1.68	0.57
1:A:2960:SER:HG	1:A:3004:TYR:HH	1.52	0.57
12:S:1095:TYR:HB2	12:S:1173:VAL:HG21	1.86	0.57
12:S:264:GLN:HE22	12:S:321:MET:HA	1.70	0.57
1:A:826:SER:O	1:A:830:VAL:HG23	2.05	0.56
12:S:407:ILE:HG23	12:S:425:VAL:HG13	1.86	0.56
12:S:837:GLU:N	12:S:837:GLU:OE1	2.38	0.56
1:A:1499:GLN:O	1:A:1500:THR:OG1	2.10	0.56
2:B:554:GLU:N	2:B:554:GLU:OE1	2.38	0.56
12:S:168:TYR:HB2	12:S:185:LEU:HB2	1.88	0.56
12:S:827:ALA:HA	12:S:834:LEU:HD13	1.87	0.56
2:B:143:THR:HG23	2:B:148:ASP:HB3	1.88	0.56
4:D:80:ILE:O	4:D:84:GLN:OE1	2.24	0.56
3:C:128:LEU:HD13	3:C:135:ILE:HD11	1.88	0.56
12:S:187:MET:HE3	12:S:206:GLN:HB3	1.87	0.56
1:A:397:ASP:CB	1:A:400:LEU:HD12	2.36	0.55
1:A:3537:ARG:O	1:A:3540:THR:OG1	2.20	0.55
12:S:910:ALA:HB1	12:S:913:LEU:HD21	1.87	0.55
1:A:608:CYS:SG	1:A:610:THR:HG22	2.47	0.55
1:A:1217:GLU:OE1	1:A:1217:GLU:N	2.40	0.55
12:S:528:ARG:HD3	12:S:529:ALA:H	1.71	0.55
12:S:514:ASP:HB2	12:S:529:ALA:HB2	1.88	0.55
2:B:98:PRO:HA	2:B:101:VAL:HG12	1.89	0.55
6:F:60:ARG:NH2	6:F:67:ASP:OD2	2.37	0.55
10:J:142:THR:HG23	10:J:142:THR:O	2.06	0.55
12:S:680:ASP:HB3	12:S:681:PRO:CD	2.37	0.55
12:S:1032:TRP:HB3	12:S:1049:LYS:HD3	1.88	0.55
1:A:719:MET:SD	1:A:720:LEU:N	2.80	0.54
1:A:3718:THR:O	1:A:3721:GLY:N	2.41	0.54
1:A:1234:VAL:O	1:A:1237:VAL:HG12	2.08	0.54
2:B:110:ASN:HA	3:C:153:ASN:ND2	2.23	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:943:THR:HG21	12:S:977:LEU:HB2	1.90	0.54
1:A:1641:TRP:CG	1:A:1666:LEU:HD21	2.43	0.54
1:A:3184:ILE:HG23	3:C:328:TRP:CB	2.37	0.54
10:J:168:THR:HG23	10:J:170:GLU:H	1.73	0.54
12:S:145:ASN:O	12:S:153:THR:OG1	2.14	0.54
12:S:981:CYS:SG	12:S:982:GLU:N	2.81	0.54
1:A:1637:LEU:O	1:A:1640:VAL:HG22	2.08	0.53
12:S:675:LEU:HD23	12:S:686:LEU:HD11	1.90	0.53
12:S:804:HIS:HB3	13:T:58:ASN:H	1.73	0.53
12:S:1012:VAL:HG22	12:S:1023:ILE:HG12	1.90	0.53
1:A:1636:GLN:O	1:A:1640:VAL:HG13	2.08	0.53
12:S:458:ALA:HB3	12:S:477:SER:HB3	1.91	0.53
12:S:229:GLU:OE1	12:S:268:ARG:NH1	2.42	0.53
1:A:2959:TRP:CZ3	1:A:3007:ILE:HD13	2.43	0.53
12:S:896:PHE:HB2	12:S:899:THR:HG22	1.90	0.53
12:S:669:LEU:HB2	12:S:673:VAL:HG22	1.90	0.53
1:A:752:PHE:HZ	1:A:774:LEU:HD21	1.73	0.53
12:S:613:THR:HG22	12:S:632:ALA:HA	1.91	0.53
1:A:2475:GLU:OE1	1:A:2478:THR:HG23	2.08	0.53
12:S:805:ASN:O	12:S:856:LYS:HB3	2.09	0.53
1:A:1584:LEU:HD22	1:A:1608:LEU:CD2	2.39	0.52
4:D:43:UNK:O	4:D:45:UNK:N	2.42	0.52
12:S:868:VAL:O	12:S:877:LEU:N	2.40	0.52
4:D:198:ARG:NE	4:D:202:ASP:OD2	2.42	0.52
12:S:1103:SER:CB	12:S:1120:THR:HG22	2.38	0.52
9:I:73:ARG:HH22	9:I:79:THR:HG1	1.56	0.52
12:S:1004:ASP:OD1	12:S:1005:VAL:N	2.43	0.52
1:A:1116:SER:OG	1:A:1116:SER:O	2.24	0.52
1:A:2844:GLU:OE2	1:A:2859:ARG:NH2	2.43	0.52
12:S:1056:VAL:HG22	12:S:1091:VAL:HG22	1.91	0.52
12:S:274:ARG:HD2	12:S:389:PRO:HG3	1.92	0.52
1:A:2271:UNK:O	1:A:2274:UNK:N	2.43	0.52
13:T:32:LEU:HA	13:T:35:GLN:HG2	1.92	0.52
12:S:913:LEU:HD22	12:S:920:VAL:HG12	1.92	0.51
12:S:672:GLY:HA3	12:S:695:GLY:HA3	1.93	0.51
2:B:56:ASN:O	2:B:192:THR:HG21	2.11	0.51
1:A:2104:UNK:O	1:A:2107:UNK:N	2.44	0.51
9:I:47:THR:O	9:I:51:VAL:HG23	2.11	0.51
9:I:145:ASP:OD2	9:I:148:GLY:N	2.39	0.51
2:B:404:HIS:ND1	2:B:428:ASP:OD2	2.44	0.51
12:S:336:ALA:HA	12:S:351:SER:HA	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:380:GLU:O	12:S:383:ASP:N	2.44	0.51
12:S:490:THR:OG1	12:S:492:GLU:HG2	2.11	0.51
12:S:1104:LEU:HD23	12:S:1119:TYR:HB3	1.93	0.51
6:F:89:LEU:HD23	6:F:89:LEU:O	2.11	0.51
1:A:1428:LEU:HD12	1:A:1432:VAL:HB	1.94	0.50
1:A:558:ALA:HB1	1:A:559:PRO:HD2	1.93	0.50
4:D:245:TYR:CE2	4:D:249:ILE:HD11	2.46	0.50
12:S:200:ALA:O	12:S:204:THR:OG1	2.25	0.50
12:S:899:THR:HG21	12:S:904:TYR:CE2	2.45	0.50
12:S:1118:VAL:HG22	12:S:1128:ILE:HG22	1.92	0.50
12:S:796:ASN:HA	12:S:871:PRO:HD3	1.92	0.50
12:S:862:TRP:NE1	12:S:913:LEU:HB2	2.27	0.50
12:S:1121:THR:HG22	12:S:1125:GLY:H	1.77	0.50
12:S:524:ILE:HD11	12:S:556:ILE:HG21	1.92	0.50
12:S:114:ARG:HG3	13:T:41:CYS:SG	2.52	0.50
12:S:946:GLU:OE2	12:S:968:ARG:NH2	2.43	0.50
12:S:499:PHE:CZ	12:S:516:LEU:HD23	2.47	0.50
3:C:107:GLU:N	3:C:107:GLU:OE1	2.45	0.50
12:S:895:ARG:NH2	12:S:901:GLU:OE1	2.45	0.50
12:S:1011:TRP:CD1	12:S:1058:LEU:HD11	2.47	0.49
12:S:520:TYR:HE1	12:S:525:ARG:HB2	1.77	0.49
1:A:2817:HIS:CD2	3:C:262:ARG:HD2	2.46	0.49
9:I:145:ASP:HB2	9:I:150:LEU:HD12	1.94	0.49
12:S:259:LYS:HE2	12:S:261:PHE:HE1	1.78	0.49
1:A:3355:THR:HG23	1:A:3355:THR:O	2.11	0.49
2:B:333:THR:HG22	2:B:334:GLU:N	2.28	0.49
12:S:86:ARG:NH1	12:S:1157:GLY:O	2.45	0.49
1:A:2674:TRP:O	1:A:2678:THR:HG23	2.13	0.49
3:C:101:THR:HG22	11:N:550:MET:HB2	1.95	0.49
12:S:253:GLU:OE1	13:T:63:ARG:NH2	2.46	0.49
12:S:136:GLU:HG2	12:S:137:LYS:HB2	1.94	0.49
12:S:949:PRO:HA	12:S:962:GLY:O	2.12	0.49
4:D:146:VAL:HG12	4:D:147:THR:N	2.28	0.48
12:S:742:ALA:HA	12:S:755:VAL:O	2.13	0.48
1:A:1418:LEU:HD11	1:A:1432:VAL:HG13	1.94	0.48
1:A:558:ALA:HB1	1:A:559:PRO:CD	2.43	0.48
1:A:943:THR:HG22	1:A:944:GLU:N	2.28	0.48
1:A:1472:GLY:O	1:A:1474:GLN:NE2	2.46	0.48
1:A:2265:UNK:O	1:A:2266:UNK:C	2.61	0.48
4:D:243:HIS:O	4:D:247:LEU:HD23	2.13	0.48
12:S:801:GLU:O	12:S:864:SER:HA	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:958:ARG:NH2	12:S:1014:TYR:OH	2.45	0.48
12:S:1011:TRP:HB2	12:S:1025:ALA:HB3	1.96	0.48
1:A:2120:UNK:O	1:A:2122:UNK:N	2.47	0.48
1:A:3767:THR:O	1:A:3768:SER:HB2	2.14	0.48
2:B:97:TYR:HB3	2:B:98:PRO:HD3	1.94	0.48
8:H:137:TYR:O	8:H:141:ARG:NH1	2.47	0.48
12:S:1117:LEU:HB3	12:S:1129:LEU:HB2	1.95	0.48
4:D:43:UNK:O	4:D:44:UNK:C	2.61	0.48
12:S:520:TYR:HB2	12:S:521:PRO:HD2	1.96	0.48
12:S:1051:GLY:HA2	12:S:1100:THR:HA	1.93	0.48
12:S:1017:ASN:OD1	12:S:1018:GLU:N	2.46	0.48
4:D:206:ARG:HH21	4:D:207:LEU:HD21	1.77	0.48
2:B:162:LYS:H	3:C:61:VAL:HG21	1.78	0.48
4:D:107:UNK:O	4:D:108:UNK:C	2.61	0.48
9:I:44:LEU:HD21	9:I:46:GLU:OE2	2.13	0.48
12:S:528:ARG:NH1	12:S:572:GLY:O	2.46	0.48
1:A:851:ASP:OD2	3:C:404:ARG:NH2	2.42	0.48
1:A:1215:ALA:O	1:A:1219:VAL:HG23	2.13	0.48
9:I:292:ARG:HD3	10:J:205:LYS:O	2.14	0.48
1:A:1424:ASP:OD2	1:A:1426:ARG:NH2	2.47	0.47
12:S:679:LEU:HD12	12:S:683:THR:HB	1.95	0.47
12:S:1165:SER:OG	12:S:1170:VAL:HG23	2.13	0.47
1:A:1536:PRO:HB2	1:A:1573:VAL:HG21	1.96	0.47
1:A:3184:ILE:HG23	3:C:328:TRP:HB3	1.96	0.47
4:D:157:LEU:HD11	6:F:119:PRO:HG3	1.96	0.47
12:S:995:THR:HG22	12:S:1000:VAL:HA	1.97	0.47
2:B:143:THR:HG23	2:B:148:ASP:HB2	1.96	0.47
12:S:267:ILE:HD12	12:S:322:VAL:HG13	1.97	0.47
12:S:530:ASP:O	12:S:532:ARG:N	2.47	0.47
1:A:3095:SER:OG	1:A:3122:TYR:OH	2.25	0.47
1:A:3111:VAL:HG12	1:A:3111:VAL:O	2.13	0.47
12:S:716:SER:OG	12:S:717:SER:N	2.48	0.47
12:S:1043:THR:CG2	12:S:1057:ARG:HE	2.27	0.47
3:C:207:LEU:HD12	3:C:207:LEU:N	2.30	0.47
12:S:257:THR:HG23	12:S:268:ARG:HG2	1.97	0.47
1:A:1163:TRP:O	1:A:1167:ASN:ND2	2.45	0.47
2:B:349:ARG:O	2:B:357:LEU:HD12	2.15	0.47
9:I:24:ILE:HG22	9:I:25:SER:H	1.79	0.47
9:I:46:GLU:OE1	9:I:46:GLU:N	2.36	0.47
12:S:8:LEU:HB3	12:S:774:PHE:HE2	1.78	0.47
12:S:808:THR:HG23	12:S:811:THR:H	1.80	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:931:VAL:HG12	12:S:932:ASN:H	1.79	0.47
1:A:2440:ARG:O	1:A:2444:ARG:HG2	2.15	0.47
5:E:71:VAL:HG11	6:F:36:LEU:HD11	1.97	0.47
9:I:24:ILE:HG22	9:I:25:SER:N	2.29	0.46
12:S:12:THR:HA	12:S:34:ARG:NH1	2.30	0.46
12:S:1034:THR:HB	12:S:1102:LEU:HD23	1.96	0.46
1:A:2785:PHE:N	1:A:2786:PRO:CD	2.78	0.46
12:S:118:GLY:HA2	12:S:132:ILE:HD11	1.97	0.46
1:A:607:ASN:OD1	1:A:609:GLN:NE2	2.47	0.46
9:I:69:VAL:HG21	9:I:86:LEU:HD21	1.98	0.46
12:S:680:ASP:OD1	12:S:681:PRO:HD3	2.15	0.46
12:S:1013:ARG:NH2	12:S:1065:GLU:HG2	2.30	0.46
9:I:301:SER:N	9:I:302:PRO:CD	2.78	0.46
12:S:213:LEU:HG	12:S:220:VAL:HG22	1.98	0.46
12:S:483:LEU:HD11	12:S:493:GLU:HG3	1.97	0.46
12:S:596:PRO:HB2	12:S:599:GLU:HG2	1.98	0.46
1:A:1568:ARG:N	1:A:1569:PRO:HD2	2.31	0.46
1:A:1581:PHE:HA	1:A:1584:LEU:HD12	1.98	0.46
9:I:234:ASP:O	9:I:238:LEU:HD23	2.16	0.46
1:A:1210:LYS:O	1:A:1214:ARG:HG3	2.16	0.46
3:C:419:CYS:HB2	3:C:420:PRO:CD	2.46	0.46
1:A:680:TYR:OH	1:A:684:ARG:NH1	2.49	0.45
12:S:465:HIS:ND1	12:S:467:GLU:HG2	2.32	0.45
12:S:1011:TRP:HB3	12:S:1024:PHE:CZ	2.51	0.45
1:A:1278:VAL:HB	1:A:1279:PRO:CD	2.47	0.45
12:S:969:VAL:HB	12:S:981:CYS:HB3	1.98	0.45
12:S:1121:THR:HG23	12:S:1123:SER:H	1.81	0.45
1:A:2744:GLU:OE1	1:A:2744:GLU:N	2.46	0.45
12:S:431:PRO:HG3	12:S:854:ALA:HB2	1.99	0.45
12:S:1039:LEU:HB2	12:S:1043:THR:OG1	2.17	0.45
1:A:1462:TRP:O	1:A:1465:VAL:HG12	2.16	0.45
1:A:1631:HIS:HA	1:A:1634:VAL:HG12	1.98	0.45
6:F:131:VAL:HG12	6:F:132:SER:N	2.31	0.45
12:S:360:GLN:HB2	12:S:398:VAL:HG21	1.98	0.45
12:S:437:VAL:O	12:S:776:GLN:HA	2.17	0.45
12:S:848:PRO:HB2	12:S:851:ILE:HG22	1.97	0.45
1:A:412:LEU:O	1:A:416:VAL:HG23	2.17	0.45
4:D:159:TYR:OH	4:D:179:LEU:HD23	2.16	0.45
12:S:186:GLU:OE2	12:S:211:TYR:OH	2.24	0.45
1:A:2327:GLU:O	1:A:2377:ARG:NH1	2.49	0.45
1:A:2359:THR:OG1	1:A:2362:GLU:OE1	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3030:VAL:HG23	1:A:3035:CYS:SG	2.57	0.45
12:S:274:ARG:HG2	12:S:387:PHE:CZ	2.52	0.45
1:A:361:ARG:HD2	1:A:400:LEU:HD21	1.99	0.45
1:A:3794:THR:O	1:A:3798:THR:HG23	2.17	0.45
2:B:110:ASN:O	2:B:111:SER:OG	2.32	0.45
4:D:204:GLU:OE2	4:D:210:THR:OG1	2.35	0.45
12:S:280:ASP:H	12:S:857:ALA:CB	2.30	0.45
1:A:2389:LEU:HA	1:A:2392:VAL:HG22	1.99	0.44
1:A:761:ASP:OD1	1:A:761:ASP:C	2.54	0.44
1:A:2147:UNK:O	1:A:2148:UNK:C	2.65	0.44
2:B:440:TYR:HB3	2:B:452:LEU:HD11	1.98	0.44
12:S:429:ARG:NH2	13:T:54:ALA:O	2.50	0.44
3:C:289:CYS:SG	3:C:290:VAL:N	2.90	0.44
4:D:261:VAL:HG13	4:D:262:ASN:N	2.33	0.44
1:A:3588:ASN:N	1:A:3589:PRO:CD	2.81	0.44
12:S:883:GLU:HG3	12:S:884:GLN:H	1.81	0.44
1:A:1284:LEU:O	1:A:1286:ARG:N	2.50	0.44
1:A:3593:TYR:CE2	1:A:3597:LEU:HD11	2.52	0.44
1:A:373:HIS:O	1:A:376:ARG:NH1	2.49	0.44
1:A:667:PRO:O	1:A:668:THR:OG1	2.24	0.44
12:S:113:ARG:HB2	12:S:116:VAL:HB	2.00	0.44
12:S:817:GLN:O	12:S:821:GLU:HG2	2.17	0.44
4:D:228:VAL:HG22	8:H:119:PHE:CZ	2.52	0.44
12:S:12:THR:HA	12:S:34:ARG:HH11	1.83	0.44
4:D:37:UNK:CB	6:F:128:ARG:NH2	2.80	0.44
12:S:1052:ASN:HD21	12:S:1167:TYR:HB2	1.83	0.44
10:J:212:VAL:HG13	10:J:213:THR:N	2.27	0.43
1:A:2768:MET:CE	3:C:263:LEU:HD23	2.48	0.43
1:A:3718:THR:O	1:A:3719:THR:C	2.56	0.43
12:S:877:LEU:HD23	12:S:935:GLU:HA	1.99	0.43
12:S:965:LYS:HD2	12:S:986:ILE:O	2.18	0.43
1:A:1095:LEU:O	1:A:1098:ILE:HG22	2.18	0.43
1:A:2155:UNK:O	1:A:2156:UNK:C	2.66	0.43
1:A:2440:ARG:HB2	1:A:2443:GLU:OE1	2.18	0.43
2:B:395:TYR:O	2:B:396:SER:OG	2.28	0.43
4:D:178:VAL:HG13	8:H:200:LEU:HD22	1.99	0.43
12:S:405:SER:HA	12:S:406:PRO:HA	1.77	0.43
1:A:1662:GLU:N	1:A:1663:PRO:CD	2.82	0.43
12:S:1099:GLU:OE1	12:S:1121:THR:HG21	2.17	0.43
1:A:863:ALA:O	1:A:867:THR:HG23	2.18	0.43
1:A:1502:VAL:HG12	1:A:1506:LEU:HD12	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:J:182:HIS:CE1	10:J:186:ILE:HD11	2.54	0.43
12:S:452:LEU:HD13	12:S:476:VAL:HG11	1.99	0.43
12:S:925:VAL:HB	12:S:943:THR:HG23	2.00	0.43
12:S:82:SER:OG	12:S:83:ASP:N	2.52	0.43
12:S:404:LEU:HB3	12:S:407:ILE:HD11	2.01	0.43
12:S:488:GLY:C	12:S:490:THR:H	2.21	0.43
1:A:2343:GLU:OE2	1:A:2347:LYS:NZ	2.42	0.43
12:S:86:ARG:HA	12:S:105:GLU:O	2.19	0.43
12:S:144:LEU:HB3	12:S:152:LEU:HD11	2.00	0.43
12:S:482:THR:HG23	12:S:503:THR:O	2.19	0.43
1:A:812:LEU:N	1:A:813:PRO:CD	2.82	0.43
1:A:2695:LYS:HB3	1:A:2696:PRO:HD3	2.01	0.43
1:A:2740:CYS:SG	1:A:2742:TYR:O	2.77	0.43
12:S:741:PHE:O	12:S:756:ALA:HA	2.19	0.43
12:S:928:TYR:CD2	12:S:937:LEU:HB3	2.54	0.43
1:A:1990:UNK:O	1:A:1991:UNK:CB	2.67	0.42
1:A:3089:LEU:O	1:A:3092:ILE:O	2.37	0.42
4:D:159:TYR:CZ	4:D:179:LEU:HD23	2.54	0.42
2:B:191:LEU:HD22	2:B:197:LEU:HD11	2.02	0.42
12:S:226:GLU:HB2	12:S:261:PHE:HZ	1.84	0.42
12:S:1159:ASP:HB3	12:S:1162:SER:HB3	2.00	0.42
1:A:1430:LEU:HA	1:A:1433:VAL:HG22	2.02	0.42
1:A:1579:ASN:HA	1:A:1582:ILE:HD12	2.00	0.42
2:B:93:MET:N	2:B:94:PRO:CD	2.82	0.42
12:S:722:SER:HB2	12:S:731:LEU:HD13	2.01	0.42
1:A:3372:SER:O	1:A:3376:GLU:OE1	2.38	0.42
12:S:960:LEU:HD12	12:S:995:THR:HG21	2.02	0.42
12:S:1055:VAL:HB	12:S:1093:MET:HB3	2.01	0.42
1:A:1116:SER:O	1:A:1117:LYS:C	2.58	0.42
12:S:247:GLY:HA3	12:S:258:TYR:HE1	1.84	0.42
1:A:3686:ALA:HA	1:A:3687:TYR:CG	2.53	0.42
2:B:120:TYR:O	2:B:124:HIS:ND1	2.50	0.42
12:S:886:GLU:HB3	12:S:909:VAL:HG11	2.02	0.42
1:A:2155:UNK:O	1:A:2158:UNK:N	2.52	0.42
1:A:3389:PRO:O	1:A:3392:GLN:N	2.50	0.42
12:S:125:PRO:HG2	12:S:174:ASP:HA	2.01	0.42
12:S:418:GLU:H	12:S:418:GLU:HG2	1.54	0.42
1:A:1985:UNK:C	1:A:1987:UNK:N	2.82	0.42
4:D:178:VAL:HG11	8:H:195:LEU:CD2	2.49	0.42
8:H:114:THR:N	8:H:115:PRO:CD	2.83	0.42
1:A:1499:GLN:C	1:A:1500:THR:HG23	2.41	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3589:PRO:HB2	1:A:3836:TRP:CZ2	2.55	0.41
8:H:126:TYR:O	8:H:153:ARG:NH2	2.52	0.41
12:S:63:ARG:NH2	12:S:119:GLN:HB2	2.34	0.41
12:S:415:LEU:HB2	12:S:424:TYR:CZ	2.55	0.41
1:A:1499:GLN:O	1:A:1500:THR:CB	2.68	0.41
12:S:390:ARG:HG3	12:S:391:PRO:O	2.21	0.41
1:A:413:LEU:HD12	1:A:545:GLY:HA2	2.03	0.41
1:A:943:THR:HG22	1:A:944:GLU:H	1.84	0.41
1:A:1429:THR:OG1	1:A:1430:LEU:N	2.53	0.41
1:A:1638:ARG:HA	1:A:1641:TRP:NE1	2.35	0.41
1:A:3507:LEU:HG	1:A:3564:ASP:OD2	2.20	0.41
2:B:196:HIS:O	2:B:196:HIS:ND1	2.53	0.41
3:C:260:GLN:C	3:C:261:LEU:HD12	2.41	0.41
12:S:487:ILE:O	12:S:487:ILE:HG13	2.20	0.41
12:S:699:VAL:HG22	12:S:716:SER:HB2	2.03	0.41
1:A:3336:VAL:HG12	1:A:3338:ASP:HB2	2.02	0.41
1:A:3692:ILE:HD13	1:A:3699:LEU:HD23	2.02	0.41
10:J:197:TYR:HA	10:J:207:ALA:O	2.20	0.41
12:S:506:LEU:N	12:S:519:VAL:O	2.45	0.41
12:S:983:ASN:HB2	12:S:1021:LEU:HB2	2.00	0.41
1:A:542:LEU:O	1:A:546:VAL:HG23	2.20	0.41
1:A:761:ASP:OD1	1:A:762:LEU:N	2.53	0.41
1:A:1015:MET:O	1:A:1018:VAL:HG22	2.19	0.41
1:A:1986:UNK:C	1:A:1988:UNK:N	2.84	0.41
1:A:2036:UNK:C	1:A:2038:UNK:N	2.83	0.41
1:A:2265:UNK:O	1:A:2267:UNK:N	2.53	0.41
12:S:185:LEU:HD21	12:S:235:LEU:HD11	2.03	0.41
12:S:274:ARG:HB2	12:S:277:ASP:OD1	2.20	0.41
12:S:336:ALA:HB2	12:S:349:VAL:HG13	2.03	0.41
12:S:415:LEU:HD23	12:S:871:PRO:HG2	2.02	0.41
1:A:1401:LEU:HD21	1:A:1406:ILE:HD12	2.02	0.41
1:A:1638:ARG:HA	1:A:1641:TRP:CD1	2.56	0.41
12:S:286:ILE:HG12	12:S:306:GLU:OE2	2.20	0.41
12:S:1027:ASP:OD1	12:S:1028:THR:N	2.54	0.41
12:S:1103:SER:OG	12:S:1120:THR:CG2	2.65	0.41
1:A:611:VAL:HG22	1:A:611:VAL:O	2.21	0.41
1:A:2190:UNK:O	1:A:2191:UNK:C	2.69	0.41
12:S:521:PRO:HA	12:S:544:ILE:HG23	2.02	0.41
1:A:2120:UNK:C	1:A:2122:UNK:N	2.83	0.41
1:A:2740:CYS:SG	1:A:2745:THR:HB	2.60	0.41
1:A:2960:SER:OG	1:A:3004:TYR:OH	2.30	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:200:ALA:CB	4:D:215:VAL:HG13	2.51	0.41
9:I:91:LYS:HD2	9:I:91:LYS:N	2.36	0.41
10:J:130:PRO:HG3	11:N:549:LEU:HD22	2.03	0.41
12:S:235:LEU:HA	12:S:249:LEU:O	2.21	0.41
12:S:720:TRP:HA	12:S:733:PRO:HA	2.03	0.41
12:S:886:GLU:OE2	12:S:942:LYS:NZ	2.47	0.41
12:S:1059:PRO:HG2	12:S:1062:THR:HG23	2.03	0.41
12:S:1214:ARG:HB3	12:S:1215:TYR:CD1	2.56	0.41
1:A:1280:PRO:O	1:A:1281:LYS:HB3	2.21	0.41
2:B:263:ALA:HA	2:B:581:GLY:O	2.21	0.41
3:C:345:THR:HG22	3:C:346:GLN:N	2.36	0.41
12:S:68:PHE:HB3	12:S:123:VAL:HG21	2.03	0.41
12:S:295:THR:HG22	12:S:297:SER:H	1.86	0.41
12:S:791:HIS:HD2	12:S:792:PRO:HD2	1.86	0.41
3:C:89:LEU:HD12	11:N:547:LEU:HD21	2.02	0.40
5:E:128:ARG:NH2	10:J:266:ASP:OD2	2.54	0.40
9:I:128:ASN:OD1	9:I:129:ASN:N	2.54	0.40
12:S:280:ASP:H	12:S:857:ALA:HB3	1.86	0.40
12:S:415:LEU:HD11	12:S:790:ILE:HD12	2.03	0.40
12:S:418:GLU:HG3	12:S:422:GLN:NE2	2.36	0.40
12:S:947:GLU:HG3	12:S:948:VAL:N	2.36	0.40
1:A:3406:VAL:HB	1:A:3407:PRO:HD2	2.02	0.40
2:B:161:ASN:HA	3:C:61:VAL:CG2	2.51	0.40
2:B:166:ARG:C	2:B:167:LEU:HD12	2.41	0.40
12:S:418:GLU:OE1	12:S:718:ARG:HD3	2.20	0.40
1:A:819:LEU:O	1:A:823:LEU:HD23	2.21	0.40
1:A:2759:GLN:OE1	1:A:2759:GLN:N	2.52	0.40
2:B:579:VAL:HG12	2:B:580:THR:N	2.36	0.40
9:I:134:GLN:NE2	9:I:138:GLN:OE1	2.54	0.40
12:S:253:GLU:HG3	12:S:254:ASN:HD22	1.86	0.40
12:S:523:GLY:HA3	12:S:536:TRP:O	2.22	0.40
12:S:1117:LEU:HD23	12:S:1129:LEU:HD12	2.03	0.40
12:S:1147:HIS:NE2	12:S:1196:GLU:HG2	2.35	0.40
1:A:2411:GLU:N	1:A:2412:PRO:CD	2.84	0.40
1:A:2686:PHE:HZ	1:A:3720:ILE:HD12	1.87	0.40
3:C:171:GLN:NE2	5:E:94:ASP:HA	2.37	0.40
9:I:291:ARG:NH1	10:J:185:ASP:OD1	2.40	0.40
12:S:1109:LEU:HD21	12:S:1118:VAL:HG21	2.04	0.40
1:A:1425:TYR:CZ	1:A:1426:ARG:HG3	2.57	0.40
1:A:1466:VAL:O	1:A:1469:THR:HG22	2.21	0.40
1:A:2045:UNK:O	1:A:2047:UNK:N	2.55	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:S:891:VAL:HG23	12:S:907:VAL:HG22	2.03	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	2703/3848 (70%)	2570 (95%)	131 (5%)	2 (0%)	51	86
2	B	530/589 (90%)	494 (93%)	36 (7%)	0	100	100
3	C	402/811 (50%)	371 (92%)	31 (8%)	0	100	100
4	D	178/749 (24%)	171 (96%)	7 (4%)	0	100	100
5	E	122/251 (49%)	115 (94%)	7 (6%)	0	100	100
6	F	128/622 (21%)	124 (97%)	4 (3%)	0	100	100
7	G	101/161 (63%)	97 (96%)	4 (4%)	0	100	100
8	H	95/218 (44%)	93 (98%)	2 (2%)	0	100	100
9	I	223/317 (70%)	211 (95%)	12 (5%)	0	100	100
10	J	210/335 (63%)	196 (93%)	14 (7%)	0	100	100
11	N	52/892 (6%)	50 (96%)	2 (4%)	0	100	100
12	S	1165/1217 (96%)	1098 (94%)	66 (6%)	1 (0%)	51	86
13	T	64/86 (74%)	59 (92%)	5 (8%)	0	100	100
All	All	5973/10096 (59%)	5649 (95%)	321 (5%)	3 (0%)	54	86

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	S	680	ASP
1	A	3719	THR

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Mol	Chain	Res	Type
1	A	1117	LYS

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	2409/2847 (85%)	2408 (100%)	1 (0%)	100 100
2	B	472/521 (91%)	472 (100%)	0	100 100
3	C	375/716 (52%)	373 (100%)	2 (0%)	88 93
4	D	164/610 (27%)	164 (100%)	0	100 100
5	E	110/224 (49%)	110 (100%)	0	100 100
6	F	112/315 (36%)	112 (100%)	0	100 100
7	G	94/141 (67%)	93 (99%)	1 (1%)	73 84
8	H	86/154 (56%)	86 (100%)	0	100 100
9	I	202/263 (77%)	201 (100%)	1 (0%)	88 93
10	J	188/287 (66%)	188 (100%)	0	100 100
11	N	47/779 (6%)	47 (100%)	0	100 100
12	S	1020/1051 (97%)	1017 (100%)	3 (0%)	92 95
13	T	57/77 (74%)	57 (100%)	0	100 100
All	All	5336/7985 (67%)	5328 (100%)	8 (0%)	93 97

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	420	ARG
3	C	331[A]	HIS
3	C	331[B]	HIS
7	G	151	ARG
9	I	109	LYS
12	S	258	TYR
12	S	680	ASP
12	S	1166	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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
1	A	15
4	D	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	2089:UNK	C	2090:UNK	N	31.46
1	A	2048:UNK	C	2049:UNK	N	19.99
1	A	2122:UNK	C	2123:UNK	N	18.57
1	A	2078:UNK	C	2079:UNK	N	16.12
1	A	357:UNK	C	358:GLU	N	14.95
1	A	2061:UNK	C	2062:UNK	N	13.57

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	2288:UNK	C	2289:ALA	N	13.41
1	A	2246:UNK	C	2247:UNK	N	13.11
1	A	2008:UNK	C	2009:UNK	N	11.31
1	A	2209:UNK	C	2210:UNK	N	10.68
1	A	2225:UNK	C	2226:UNK	N	10.31
1	A	2134:UNK	C	2135:UNK	N	8.89
1	A	2181:UNK	C	2182:UNK	N	7.97
1	D	47:UNK	C	52:MET	N	7.56
1	D	117:UNK	C	119:ASP	N	6.99
1	A	350:UNK	C	351:UNK	N	5.27
1	A	2103:UNK	C	2104:UNK	N	4.89

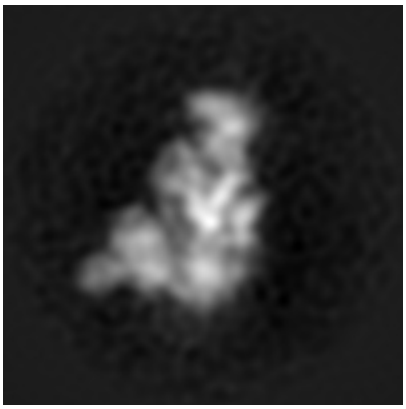
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-23028. These allow visual inspection of the internal detail of the map and identification of artifacts.

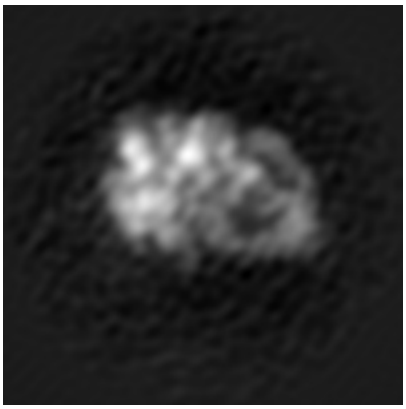
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

6.1.1 Primary map



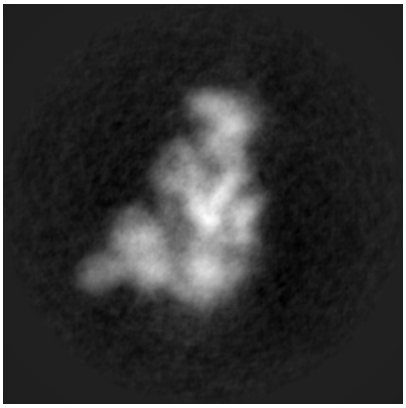
X



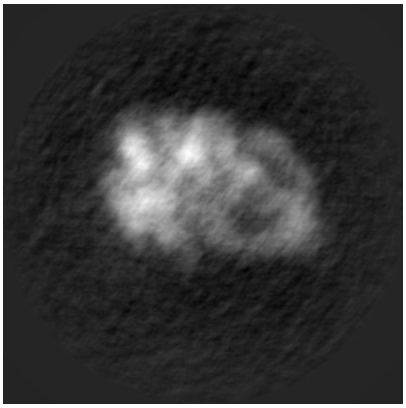
Y

Z

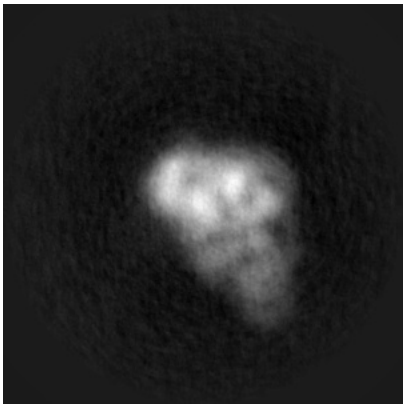
6.1.2 Raw map



X



Y

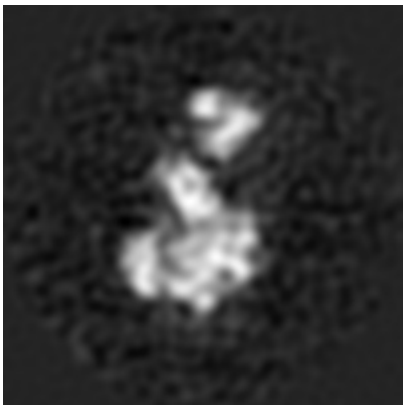


Z

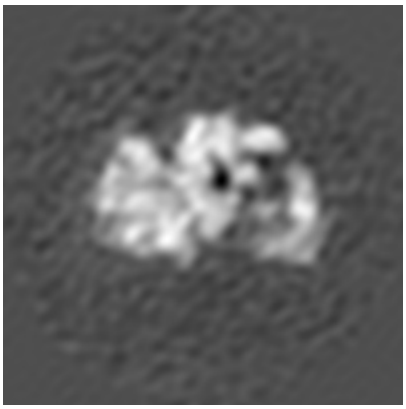
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

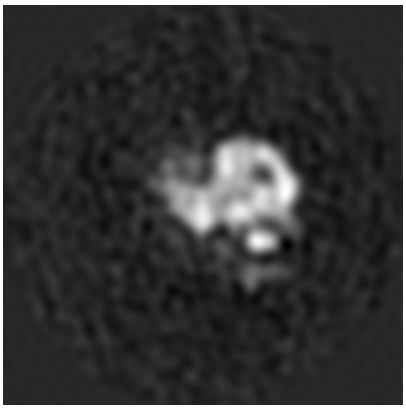
6.2.1 Primary map



X Index: 150

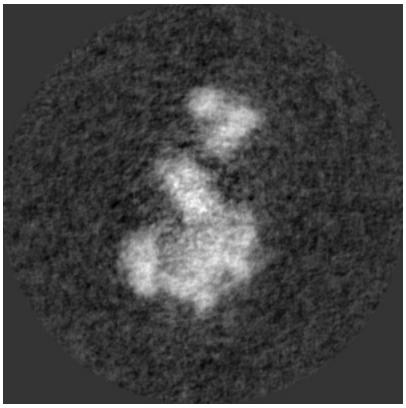


Y Index: 150

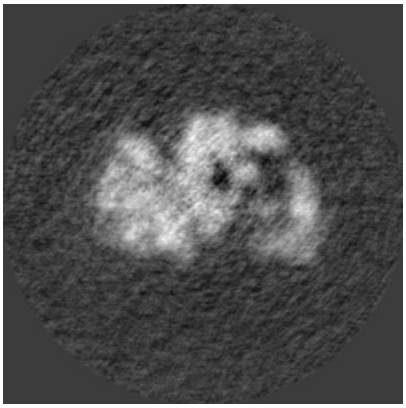


Z Index: 150

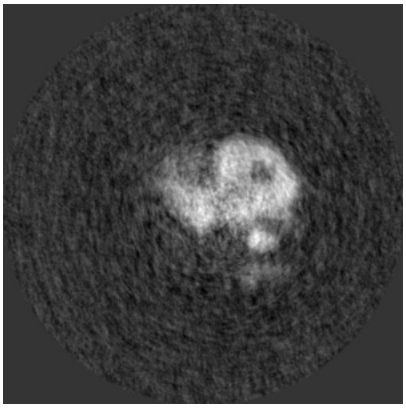
6.2.2 Raw map



X Index: 150



Y Index: 150

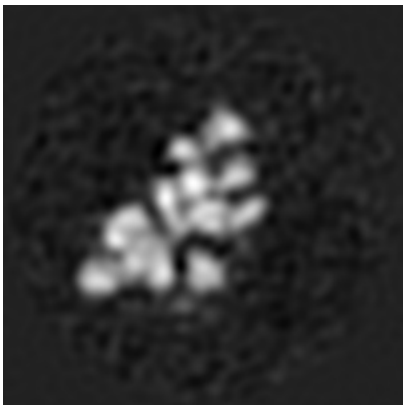


Z Index: 150

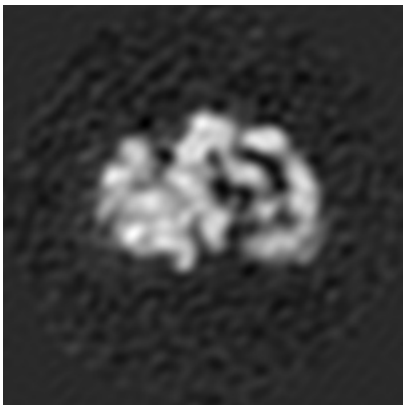
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

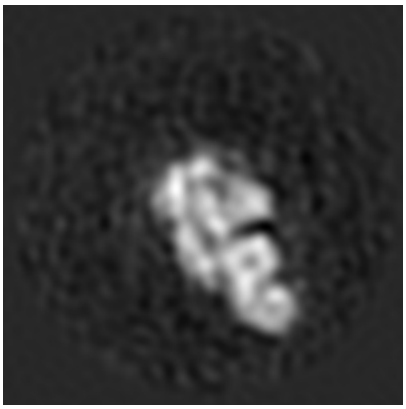
6.3.1 Primary map



X Index: 190

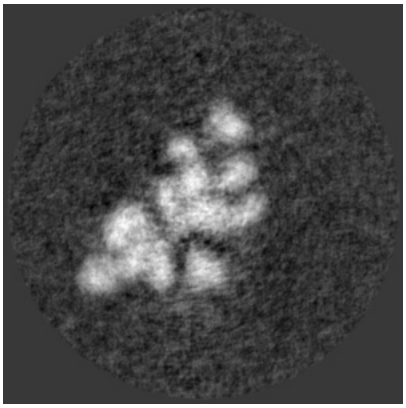


Y Index: 156

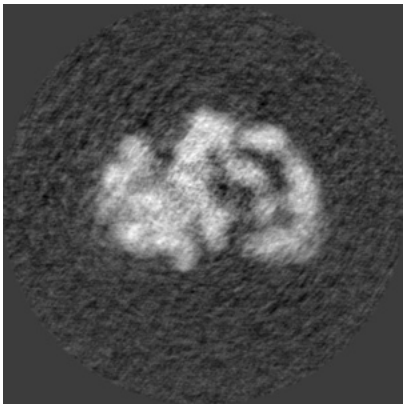


Z Index: 101

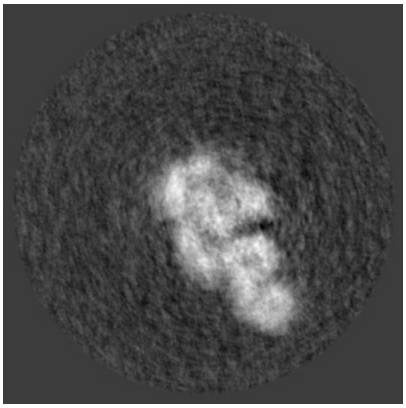
6.3.2 Raw map



X Index: 188



Y Index: 156

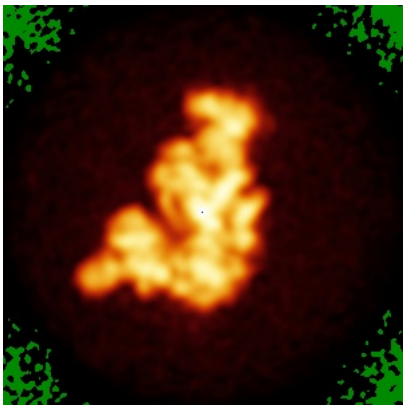


Z Index: 100

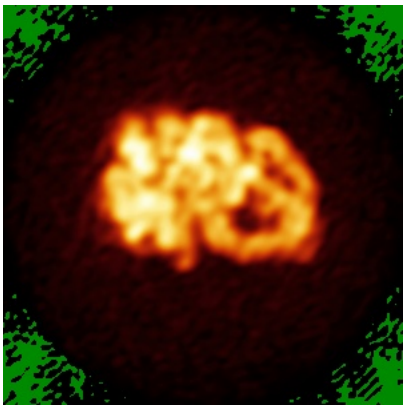
The images above show the largest variance slices of the map in three orthogonal directions.

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

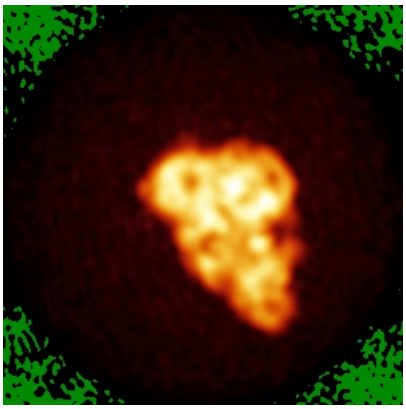
6.4.1 Primary map



X

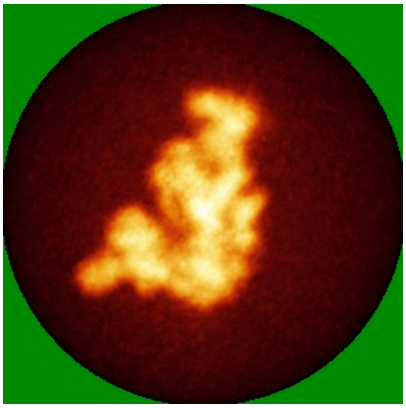


Y

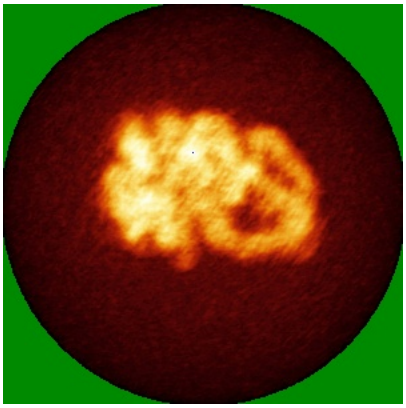


Z

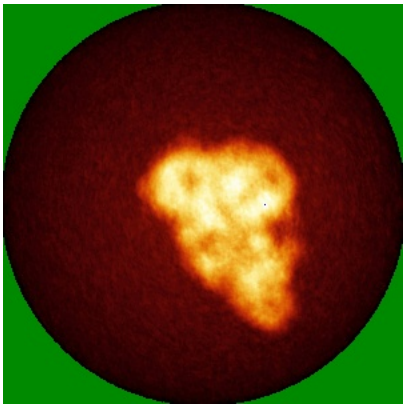
6.4.2 Raw map



X



Y

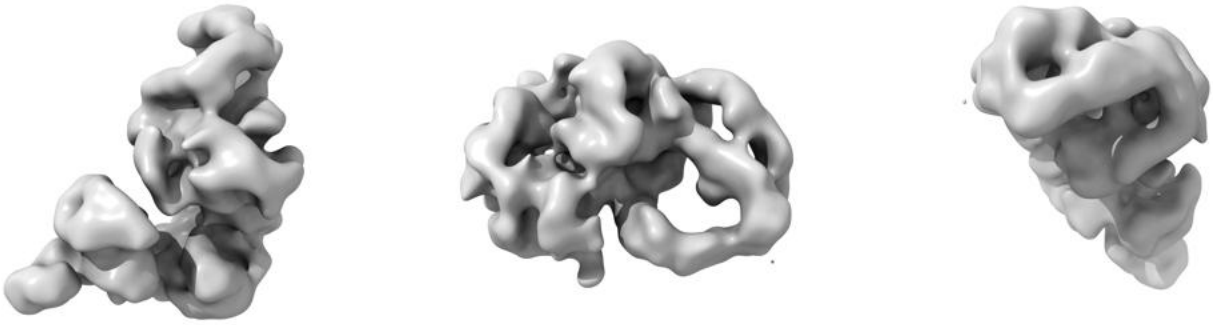


Z

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 0.0302. 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.

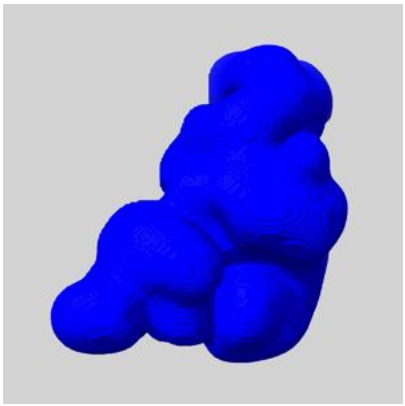
6.6 Mask visualisation (i)

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

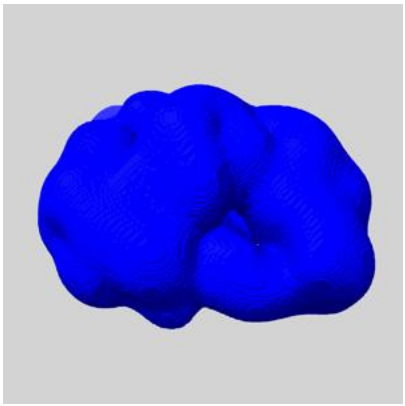
A mask typically either:

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

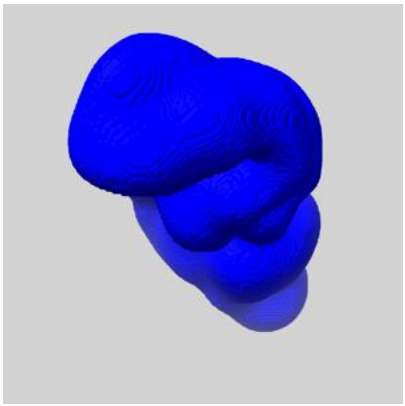
6.6.1 emd_23028_msk_1.map (i)



X



Y

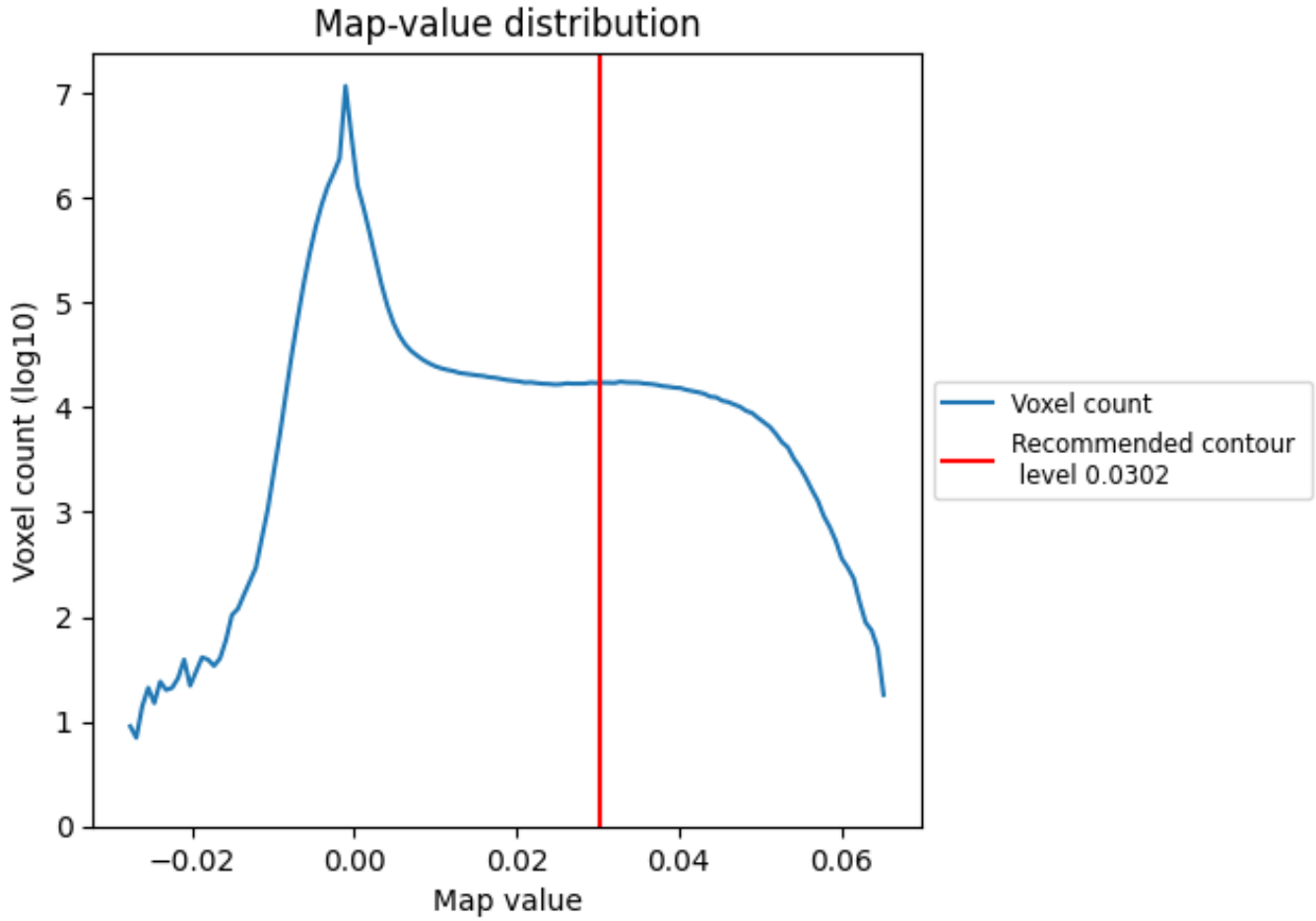


Z

7 Map analysis

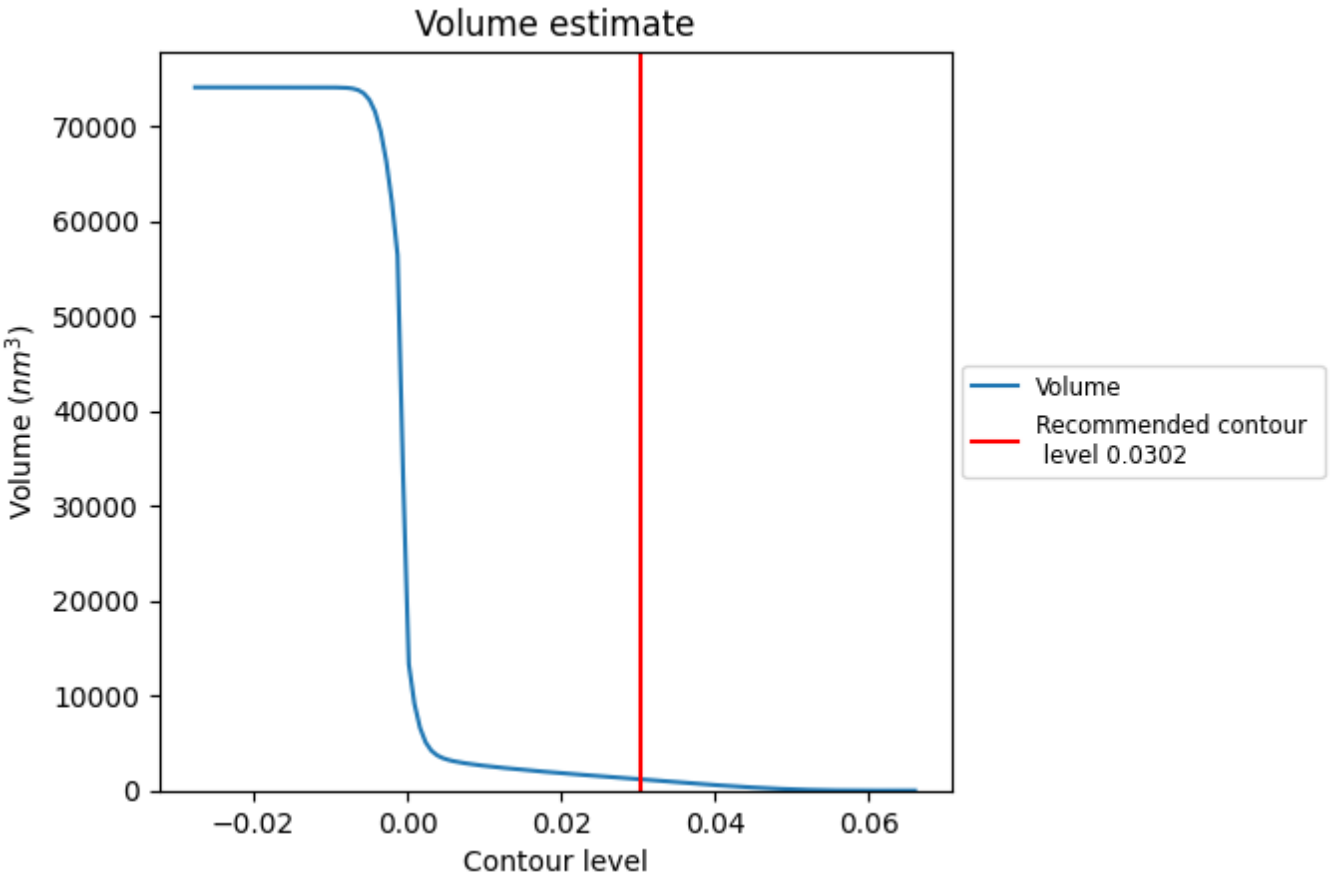
This section contains the results of statistical analysis of the map.

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.

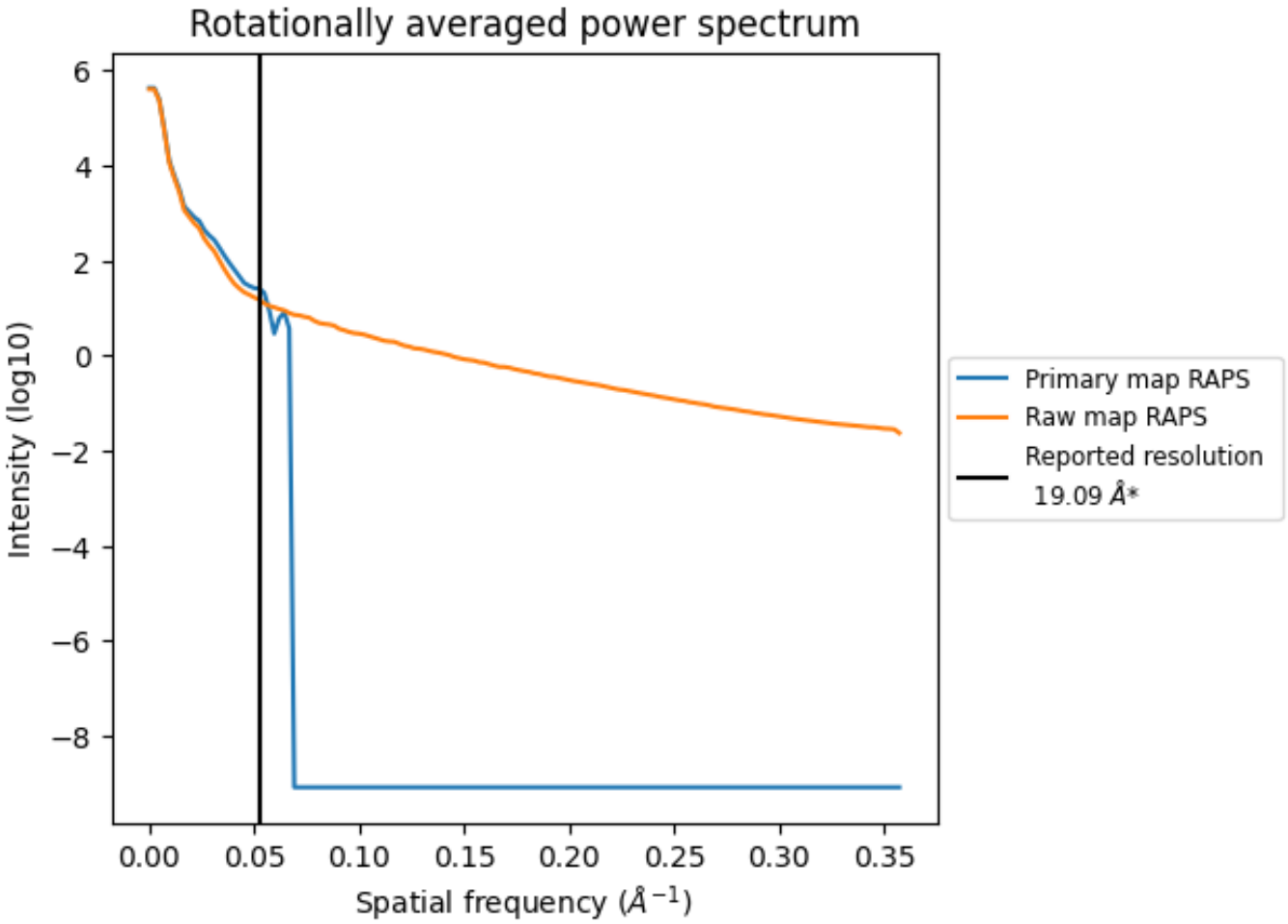
7.2 Volume estimate (i)



The volume at the recommended contour level is 1192 nm^3; this corresponds to an approximate mass of 1077 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)

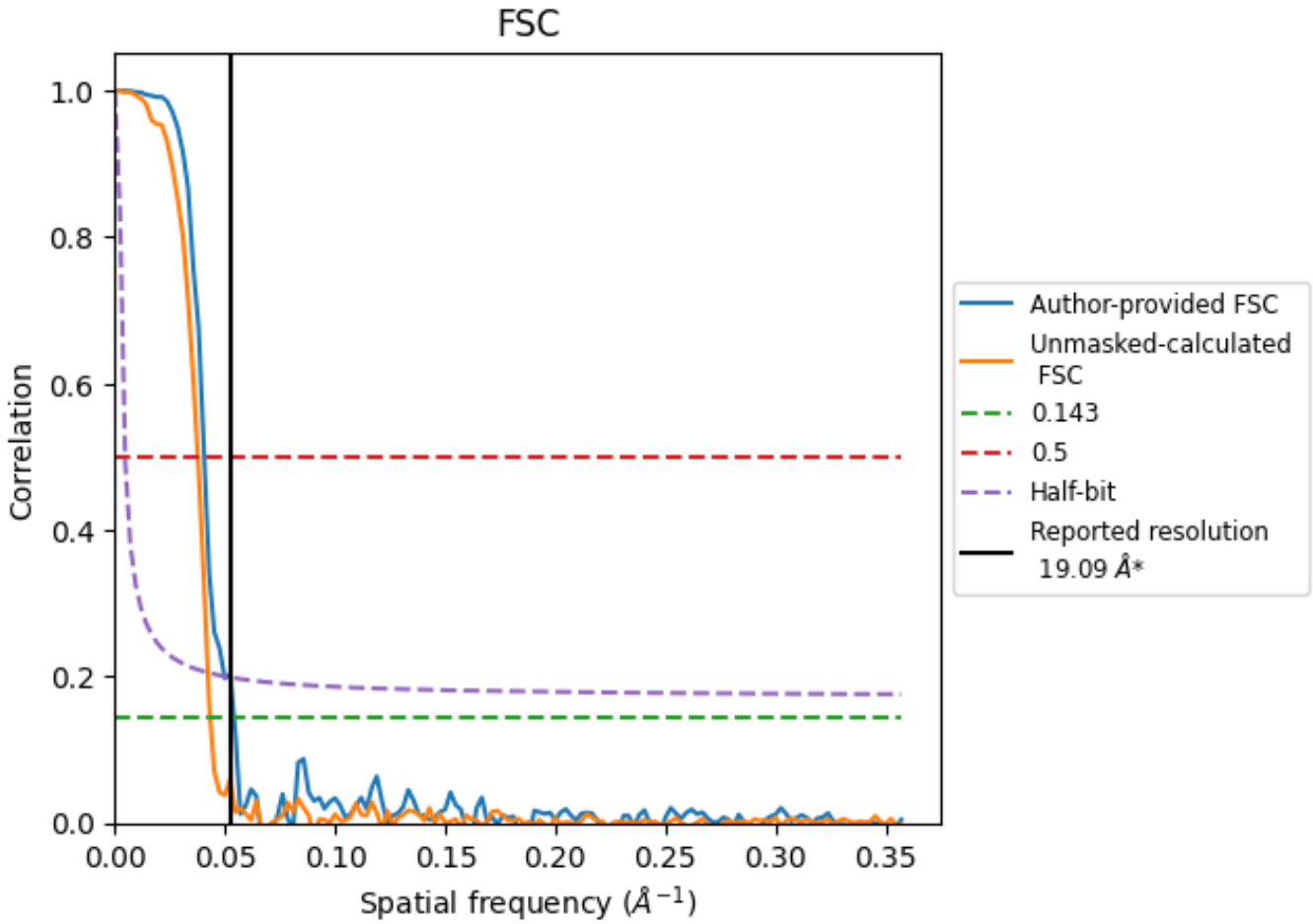


*Reported resolution corresponds to spatial frequency of 0.052 Å^{-1}

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 0.052 Å^{-1}

8.2 Resolution estimates (i)

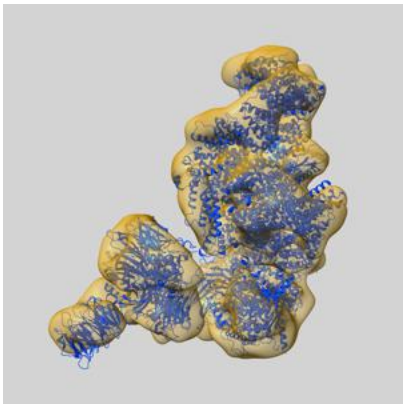
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	19.09	-	-
Author-provided FSC curve	18.48	24.63	20.04
Unmasked-calculated*	23.09	26.53	23.70

*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 23.09 differs from the reported value 19.09 by more than 10 %

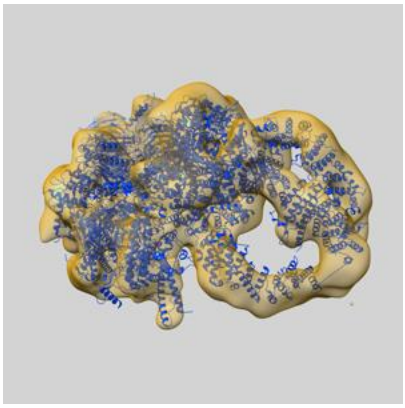
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-23028 and PDB model 7KTS. Per-residue inclusion information can be found in section 3 on page 7.

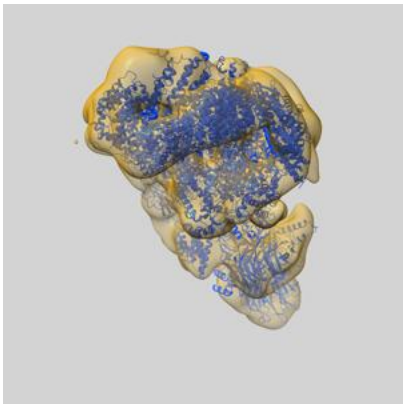
9.1 Map-model overlay



X



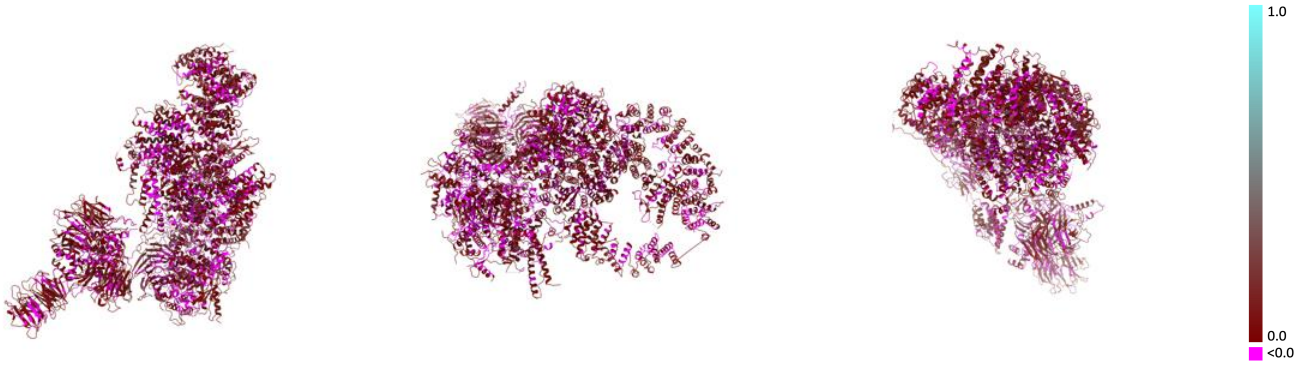
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0302 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.

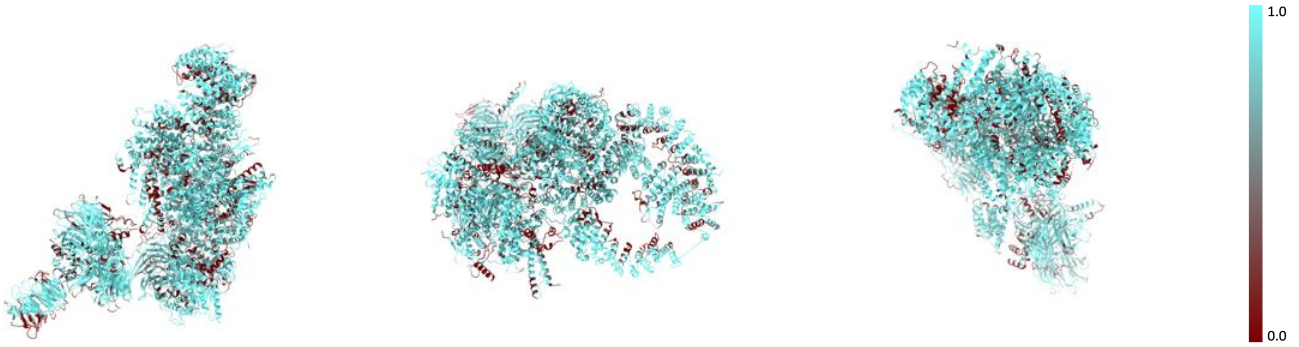
9.2 Q-score mapped to coordinate model (i)



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.

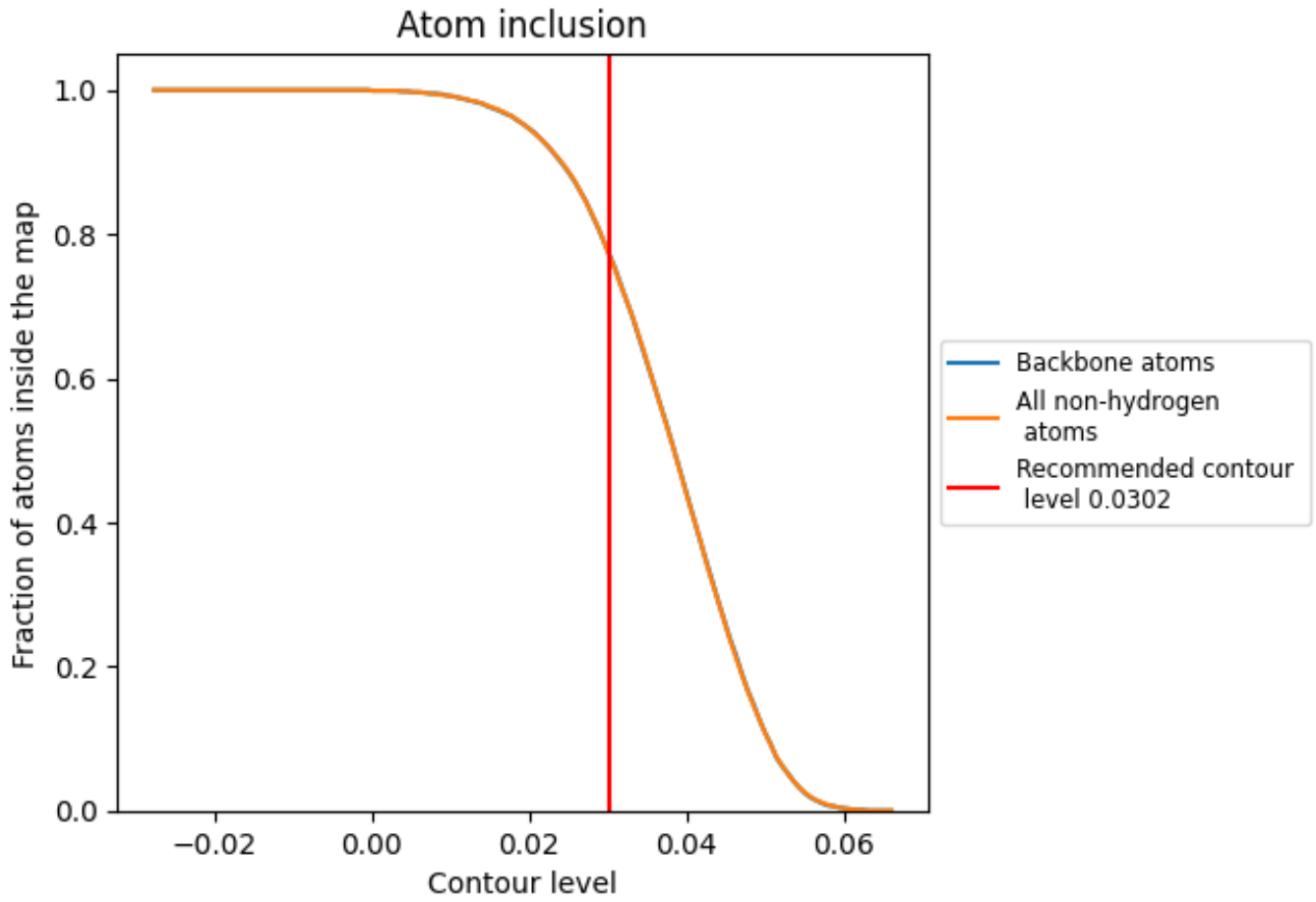
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0302).

9.4 Atom inclusion (i)



At the recommended contour level, 77% of all backbone atoms, 77% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.0302) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7700	0.0480
A	0.7850	0.0550
B	0.8250	0.0470
C	0.7260	0.0330
D	0.7970	0.0420
E	0.7520	0.0200
F	0.8700	0.0470
G	0.6450	0.0240
H	0.9260	0.0550
I	0.6410	0.0300
J	0.6940	0.0280
N	0.7100	0.0180
S	0.7750	0.0510
T	0.6250	0.0180