Full wwPDB EM Validation Report ⓘ

Nov 22, 2021 – 10:07 am GMT

PDB ID	:	7PW9
EMDB ID	:	EMD-13679
Title	:	Human SMG1-9 kinase complex bound to AMPPNP
Authors	:	Langer, L.M.; Conti, E.
Deposited on	:	2021-10-06
Resolution	:	3.12 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 following versions of software and data (see references ⓘ) were used in the production of this report:

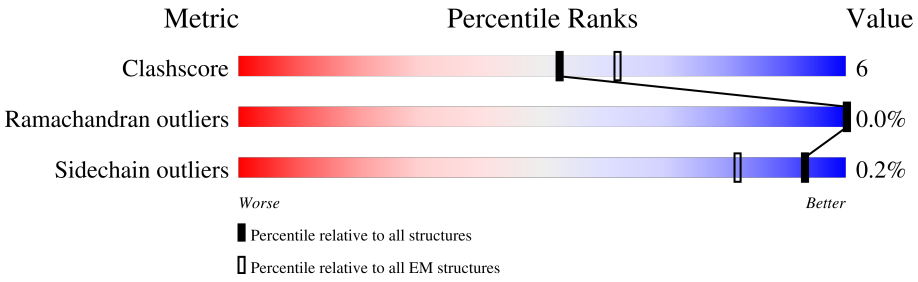
EMDB validation analysis	:	0.0.0.dev97
Mogul	:	1.8.4 (270009), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 3.12 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	3657	17% 48% 6% 47%
2	C	352	28% 71% 17% 12%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 16339 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 Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1952	13831	8884	2456	2428	63	0	0

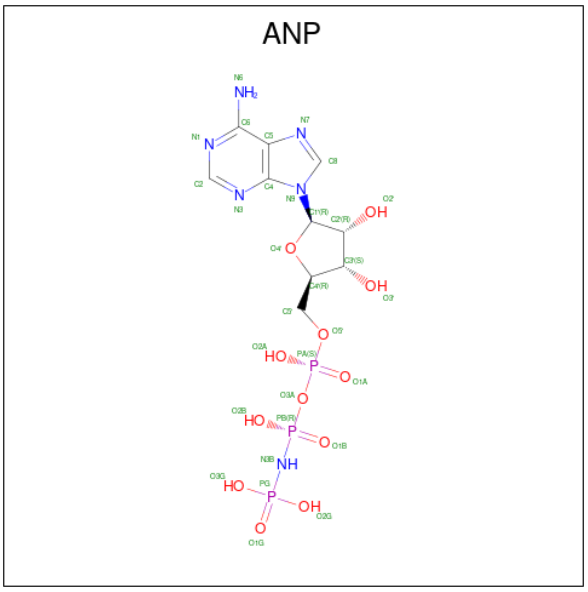
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	743	ARG	LYS	conflict	UNP Q96Q15
A	1209	SER	ALA	conflict	UNP Q96Q15

- Molecule 2 is a protein called Protein SMG9.

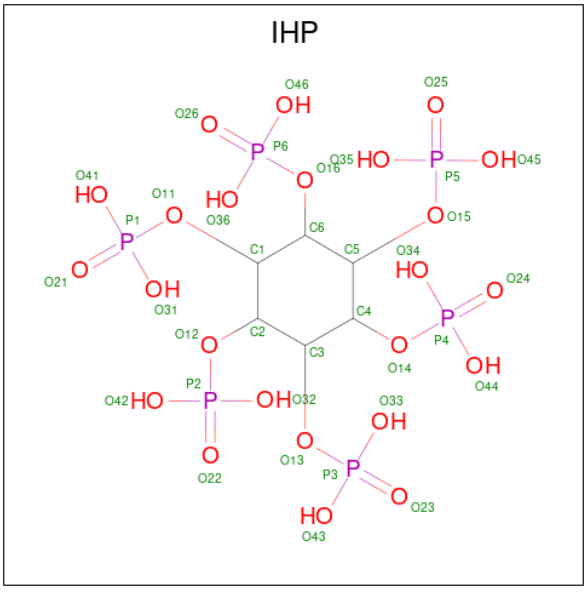
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	309	2409	1562	415	415	17	0	0

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$) (labeled as "Ligand of Interest" by depositor).



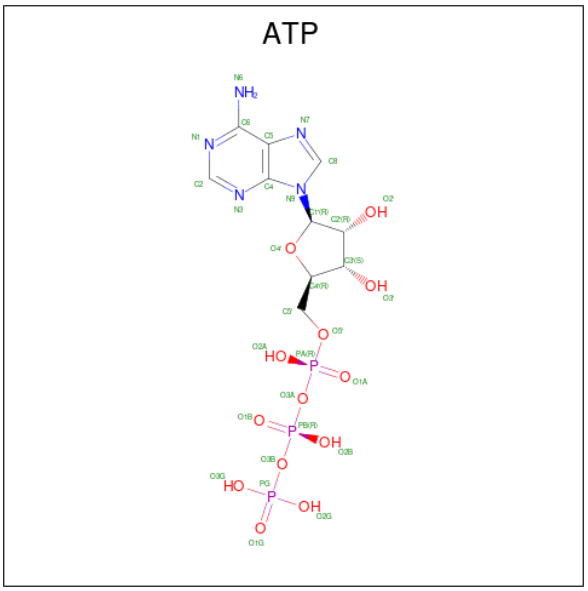
Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	6	12	3	

- Molecule 4 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: $C_6H_{18}O_{24}P_6$).



Mol	Chain	Residues	Atoms				AltConf
4	A	1	Total	C	O	P	0
			36	6	24	6	

- Molecule 5 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



Mol	Chain	Residues	Atoms					AltConf
5	C	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

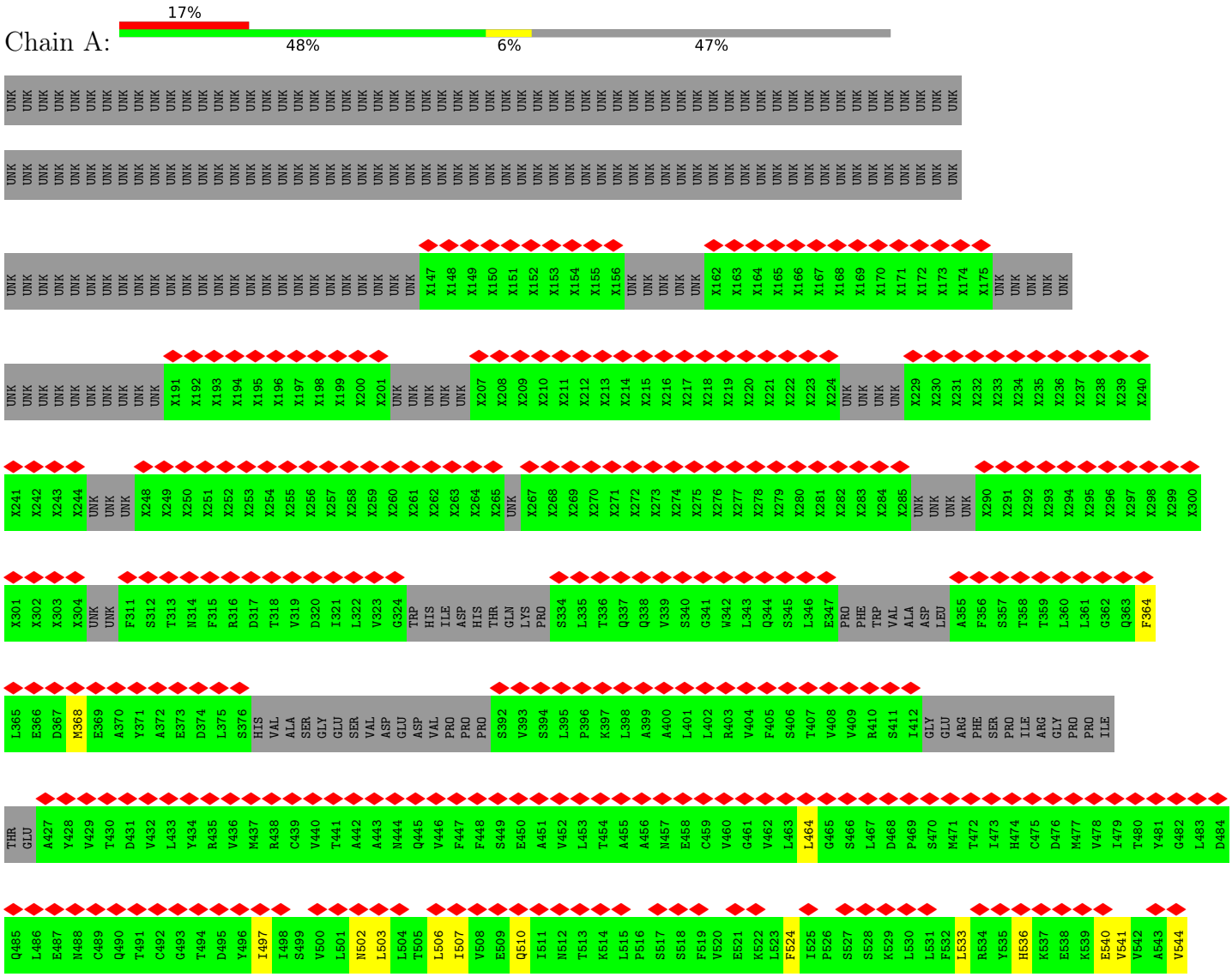
Mol	Chain	Residues	Atoms		AltConf
6	C	1	Total	Mg	0
			1	1	

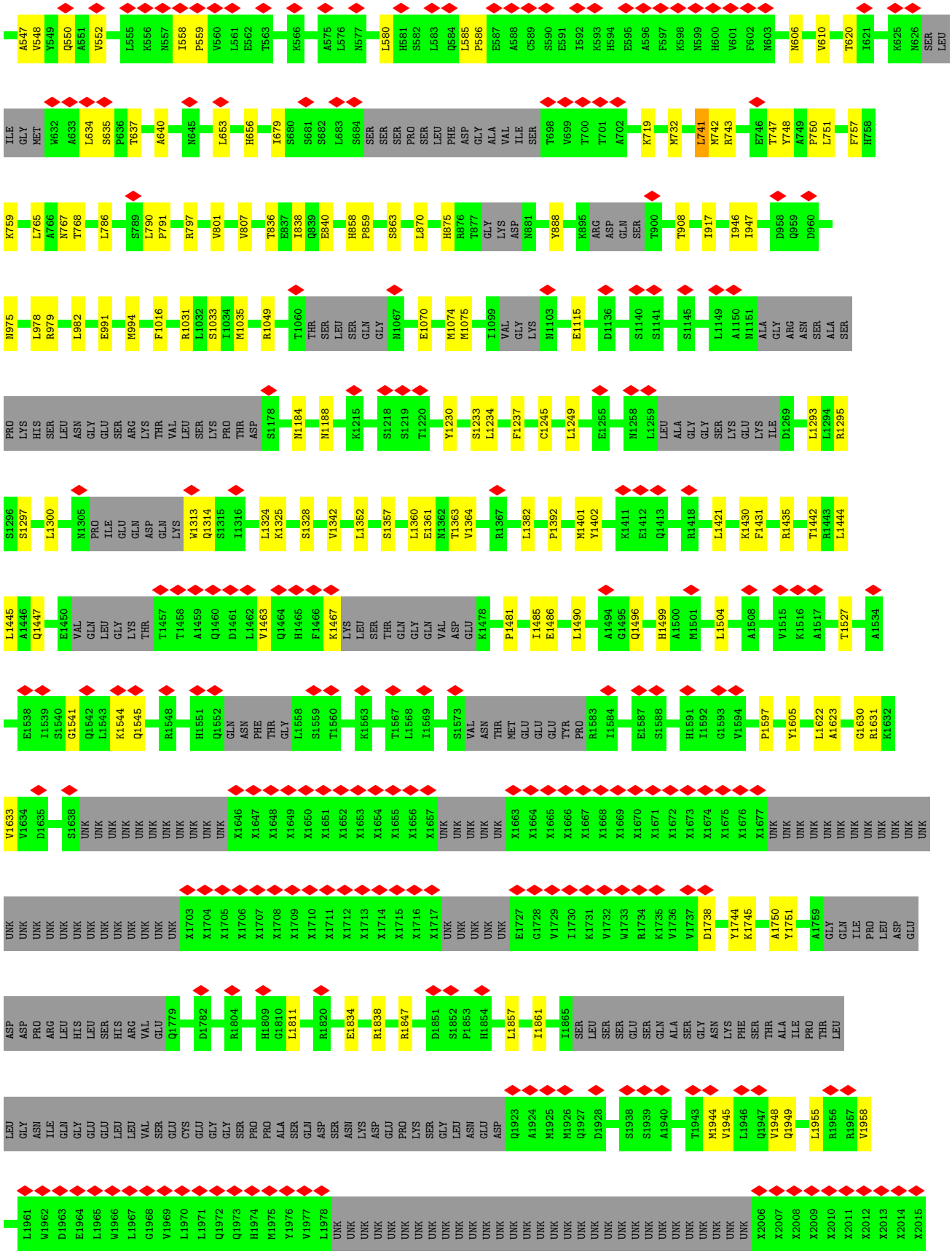
3 Residue-property plots (i)

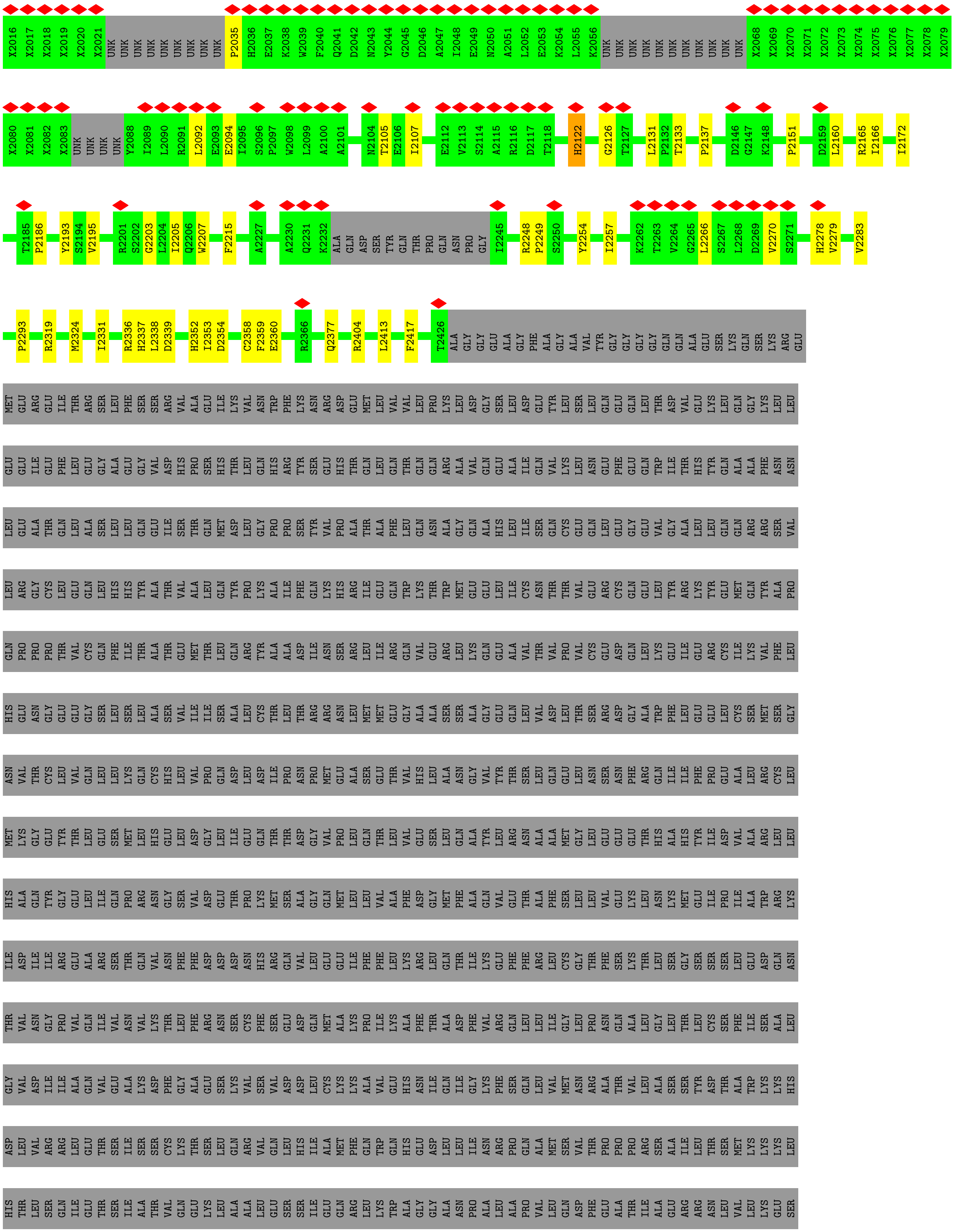
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

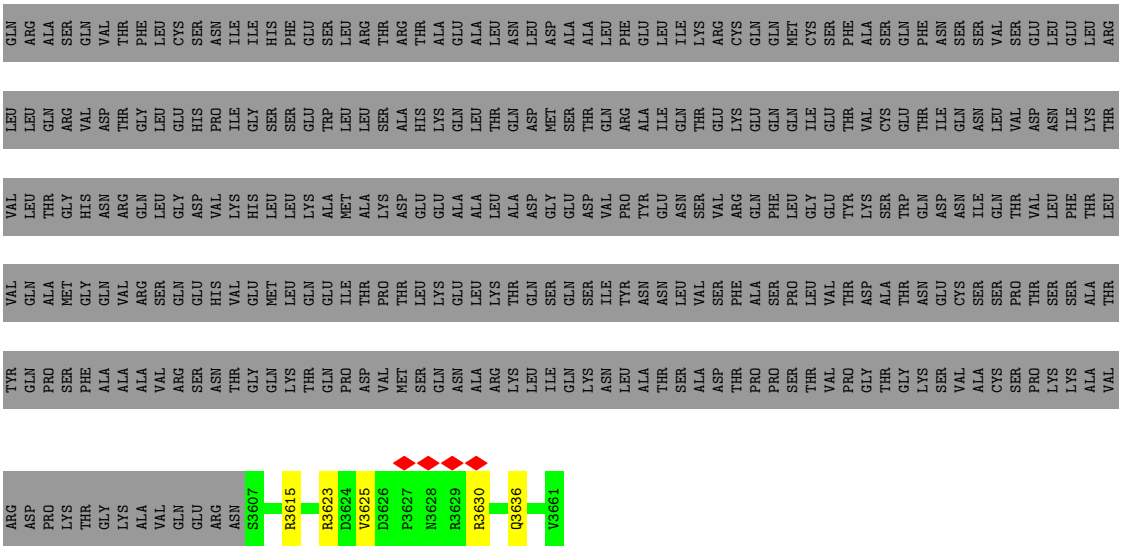
• Molecule 1: Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1,Serine/threonine-protein kinase SMG1

Chain A:



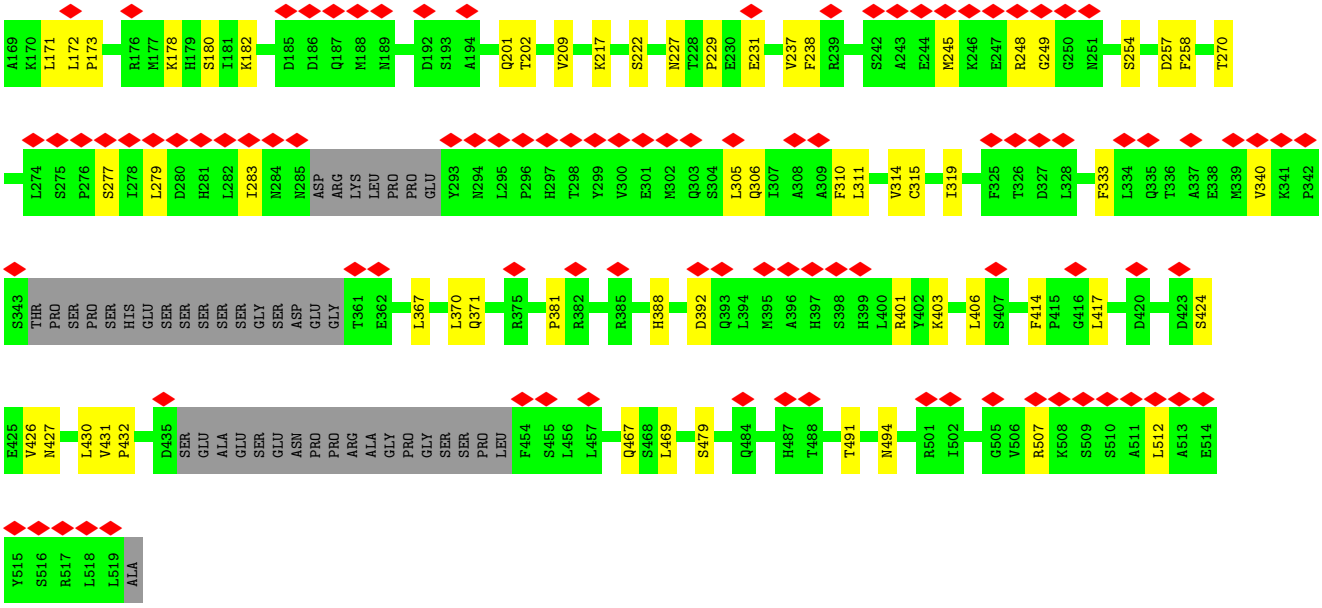

A547 V548 Y549 Q550 A551 V552 L555 K556 N557 I558 P559 V560 L561 E562 T563 K566 A575 L576 N577 L580 H581 S582 L583 Q584 L585 P586 E587 A588 C589 S590 E591 I592 K593 H594 E595 A596 F597 K598 N599 H600 V601 F602 N603 N606 V610 T620 I621 K625 N626 SER LEU
ILE GLY MET W632 A633 L634 S635 P636 T637 A640 N645 L653 H656 I679 S680 S681 S682 L683 S684 SER SER SER PRO SER LEU PHE ASP GLY ALA VAL ILE SER T698 V699 T700 T701 A702 K719 M732 L741 M742 R743 E746 T747 Y748 A749 P750 L751 F757 H758
K759 L765 A766 N767 T768 L786 S789 L790 P791 R797 V801 V807 T836 E837 I838 Q839 E840 H858 P859 S863 L870 H875 R876 T877 GLY LYS ASP N881 Y888 K895 ARG ASP GLN SER T900 T908 I917 I946 I947 D958 Q959 D960
N975 L978 R979 L982 E991 M994 F1016 R1031 L1032 S1033 I1034 M1035 R1049 T1060 THR SER LEU SER GLN GLY N1067 E1070 M1074 M1075 I1099 VAL GLY LYS N1103 E1115 D1136 S1140 S1141 S1145 L1149 A1150 N1151 ALA GLY ARG ASN SER ALA SER
PRO LYS HIS SER LEU ASN GLY GLU SER ARG LYS THR VAL LEU SER LYS PRO THR ASP S1178 N1184 N1188 K1215 S1218 S1219 T1220 Y1230 S1233 L1234 F1237 C1245 L1249 E1255 N1258 L1259 LEU ALA GLY GLY SER LYS GLU LYS ILE D1269 L1293 L1294 R1295
S1296 S1297 L1300 N1305 PRO ILE GLU GLN ASP GLN LYS W1313 Q1314 S1315 I1316 L1324 K1325 S1328 V1342 L1352 S1357 L1360 E1361 N1362 T1363 V1364 R1367 L1382 P1392 M1401 Y1402 K1411 E1412 Q1413 R1418 L1421 K1430 F1431 R1435 T1442 R1443 L1444
L1445 A1446 Q1447 E1450 VAL GLN LEU GLY LYS THR T1457 T1458 A1459 Q1460 D1461 L1462 V1463 Q1464 H1465 F1466 K1467 LYS LEU SER THR GLN GLY GLN VAL ASP GLU K1478 P1481 I1485 E1486 L1490 A1494 G1495 Q1496 H1499 A1500 M1501 L1504 A1508 V1515 K1516 A1517 T1527 A1534
E1538 I1539 S1540 G1541 Q1542 L1543 K1544 Q1545 R1548 H1551 Q1552 GLN ASN PHE THR GLY L1558 S1559 T1560 K1563 T1567 L1568 I1569 S1573 VAL ASN THR MET GLU GLU GLU TYR PRO R1583 I1584 E1587 S1588 H1591 I1592 G1593 V1594 P1597 Y1605 L1622 A1623 G1630 R1631 K1632
V1633 V1634 D1635 S1638 UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK X1646 X1647 X1648 X1649 X1650 X1651 X1652 X1653 X1654 X1655 X1656 X1657 UNK UNK UNK UNK UNK X1663 X1664 X1665 X1666 X1667 X1668 X1669 X1670 X1671 X1672 X1673 X1674 X1675 X1676 X1677 UNK UNK UNK UNK UNK UNK UNK UNK UNK
UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK X1703 X1704 X1705 X1706 X1707 X1708 X1709 X1710 X1711 X1712 X1713 X1714 X1715 X1716 X1717 UNK UNK UNK UNK UNK E1727 G1728 V1729 I1730 K1731 V1732 W1733 R1734 K1735 V1736 V1737 D1738 Y1744 K1745 A1750 Y1751 A1759 GLY GLN ILE PRO LEU ASP GLU
ASP ASP PRO ARG LEU HIS LEU SER HIS ARG VAL GLU Q1779 D1782 R1804 H1809 G1810 L1811 R1820 E1834 R1838 R1847 D1851 S1852 P1853 H1854 L1857 I1861 I1865 SER LEU SER SER SER GLU SER GLN ALA SER GLY ASN LYS PHE SER THR ALA ILE PRO THR LEU
LEU GLY ASN ILE GLN GLY GLU GLU LEU LEU VAL SER GLU CYS GLU GLY GLY SER PRO PRO ALA SER GLN ASP SER ASN LYS ASP GLU PRO LYS SER GLY LEU ASN GLU ASP Q1923 A1924 M1925 M1926 Q1927 D1928 S1938 S1939 A1940 T1943 M1944 V1945 L1946 Q1947 V1948 Q1949 L1955 R1956 R1957 V1958
L1961 W1962 D1963 E1964 L1965 W1966 L1967 G1968 V1969 L1970 L1971 Q1972 Q1973 H1974 M1975 Y1976 V1977 L1978 UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK X2006 X2007 X2008 X2009 X2010 X2011 X2012 X2013 X2014 X2015


X2016 X2017 X2018 X2019 X2020 X2021 UNK UNK UNK UNK UNK UNK UNK UNK P2035 H2036 E2037 K2038 W2039 F2040 Q2041 D2042 N2043 Y2044 G2045 D2046 A2047 I2048 E2049 N2050 A2051 L2052 E2053 K2054 L2055 K2056 UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK UNK X2068 X2069 X2070 X2071 X2072 X2073 X2074 X2075 X2076 X2077 X2078 X2079
X2080 X2081 X2082 X2083 UNK UNK UNK UNK Y2088 I2089 L2090 R2091 L2092 E2093 E2094 I2095 S2096 P2097 W2098 L2099 A2100 A2101 N2104 T2105 E2106 I2107 E2112 V2113 S2114 A2115 R2116 D2117 T2118 H2122 G2126 T2127 L2131 P2132 T2133 P2137 D2146 G2147 K2148 P2151 D2159 L2160 R2165 I2166 I2172
T2185 P2186 Y2193 S2194 V2195 R2201 S2202 G2203 L2204 I2205 Q2206 W2207 F2215 A2227 A2230 Q2231 K2232 ALA GLN ASP SER TYR GLN THR PRO GLN ASN PRO GLY I2245 R2248 P2249 S2250 Y2254 I2257 K2262 T2263 V2264 G2265 L2266 S2267 L2268 D2269 V2270 S2271 H2278 V2279 V2283
P2293 R2319 M2324 I2331 R2336 H2337 L2338 D2339 H2352 I2353 D2354 C2358 F2359 E2360 R2366 Q2377 R2404 L2413 F2417 T2426 ALA GLY GLY GLU ALA GLY PHE ALA GLY ALA VAL TYR GLY GLY GLY GLY GLN GLN ALA GLU SER LYS GLN SER LYS ARG GLU



• Molecule 2: Protein SMG9

Chain C:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	168050	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 ($e^-/Å^2$)	60.99	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.596	Depositor
Minimum map value	-2.477	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.101	Depositor
Recommended contour level	0.818	Depositor
Map size (Å)	292.8128, 292.8128, 292.8128	wwPDB
Map dimensions	344, 344, 344	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85120004, 0.85120004, 0.85120004	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, IHP, ATP, ANP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.25	0/13105	0.47	0/17900
2	C	0.25	0/2465	0.49	0/3346
All	All	0.25	0/15570	0.47	0/21246

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	13831	0	12513	135	0
2	C	2409	0	2356	43	0
3	A	31	0	13	2	0
4	A	36	0	6	0	0
5	C	31	0	12	1	0
6	C	1	0	0	0	0
All	All	16339	0	14900	173	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 6.

All (173) close contacts within the same asymmetric unit are listed below, sorted by their clash

magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:742:MET:HE1	1:A:757:PHE:CD1	2.08	0.87
1:A:679:ILE:HG21	1:A:741:LEU:HD21	1.59	0.84
1:A:732:MET:SD	1:A:767:ASN:ND2	2.52	0.82
1:A:558:ILE:HG13	1:A:559:PRO:HD3	1.68	0.75
1:A:585:LEU:HD12	1:A:586:PRO:HD2	1.69	0.74
2:C:367:LEU:O	2:C:427:ASN:ND2	2.23	0.70
1:A:2186:PRO:HB2	1:A:2319:ARG:HD2	1.75	0.69
2:C:403:LYS:HG2	2:C:426:VAL:HG12	1.73	0.69
2:C:227:ASN:ND2	2:C:231:GLU:OE1	2.29	0.65
1:A:679:ILE:HD13	1:A:741:LEU:CD2	2.29	0.62
1:A:2160:LEU:HD22	1:A:2203:GLY:HA3	1.81	0.62
1:A:991:GLU:OE1	1:A:1049:ARG:NH2	2.33	0.62
1:A:2404:ARG:NH2	1:A:3636:GLN:OE1	2.33	0.62
1:A:524:PHE:HZ	1:A:552:VAL:HG11	1.65	0.61
1:A:679:ILE:CD1	1:A:741:LEU:HD23	2.30	0.61
2:C:270:THR:HG21	2:C:311:LEU:HD11	1.81	0.61
1:A:2248:ARG:HG3	1:A:2249:PRO:HD2	1.82	0.60
1:A:1352:LEU:HD11	1:A:1392:PRO:HB3	1.84	0.59
2:C:182:LYS:NZ	2:C:254:SER:O	2.34	0.59
2:C:305:LEU:HD12	2:C:340:VAL:HG21	1.84	0.59
1:A:2133:THR:HG21	3:A:3701:ANP:H5'2	1.84	0.59
1:A:536:HIS:HB3	1:A:541:VAL:HG11	1.85	0.59
1:A:1300:LEU:HD22	1:A:1364:VAL:HG22	1.84	0.59
1:A:1328:SER:HG	1:A:1357:SER:HG	1.51	0.59
2:C:491:THR:H	2:C:494:ASN:HB2	1.67	0.59
2:C:414:PHE:HB3	2:C:417:LEU:HD23	1.83	0.59
1:A:2336:ARG:NH2	1:A:2354:ASP:O	2.35	0.59
1:A:858:HIS:HB3	2:C:201:GLN:NE2	2.18	0.58
1:A:741:LEU:HG	1:A:741:LEU:O	2.03	0.58
2:C:392:ASP:OD2	2:C:424:SER:OG	2.20	0.58
1:A:742:MET:CE	1:A:757:PHE:CE1	2.87	0.58
1:A:2105:THR:HG22	1:A:2107:ILE:H	1.68	0.58
1:A:637:THR:HG23	1:A:640:ALA:H	1.67	0.57
1:A:503:LEU:O	1:A:507:ILE:HD12	2.03	0.57
2:C:249:GLY:O	2:C:277:SER:OG	2.22	0.57
1:A:1857:LEU:HD12	1:A:1861:ILE:HD12	1.86	0.57
1:A:888:TYR:O	2:C:479:SER:OG	2.18	0.56
1:A:1467:LYS:HD2	1:A:1499:HIS:HB3	1.88	0.56
1:A:464:LEU:HG	1:A:510:GLN:HG2	1.86	0.56
1:A:1834:GLU:O	1:A:1838:ARG:NH1	2.38	0.56
1:A:1623:ALA:HB1	1:A:1751:TYR:CE1	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1811:LEU:O	1:A:1847:ARG:NH2	2.37	0.55
1:A:1031:ARG:O	1:A:1035:MET:HG3	2.07	0.55
1:A:1313:TRP:O	1:A:1314:GLN:NE2	2.38	0.55
1:A:2254:TYR:HA	1:A:2257:ILE:HG22	1.90	0.55
2:C:381:PRO:HB3	2:C:417:LEU:HD11	1.88	0.55
1:A:2257:ILE:HD12	1:A:2283:VAL:HG21	1.89	0.54
1:A:2193:TYR:OH	1:A:2353:ILE:O	2.25	0.54
1:A:2358:CYS:SG	1:A:2359:PHE:N	2.80	0.54
2:C:209:VAL:HG22	2:C:319:ILE:HB	1.89	0.54
2:C:229:PRO:HG2	2:C:467:GLN:HG3	1.88	0.54
1:A:2166:ILE:HD12	1:A:2331:ILE:HD11	1.90	0.54
1:A:364:PHE:O	1:A:368:MET:HG2	2.08	0.53
1:A:1738:ASP:O	1:A:1745:LYS:NZ	2.40	0.53
2:C:222:SER:O	2:C:227:ASN:HB2	2.08	0.53
1:A:2266:LEU:HD23	1:A:2270:VAL:HG21	1.90	0.53
1:A:1233:SER:HB2	1:A:1249:LEU:HD12	1.90	0.53
2:C:202:THR:HG22	2:C:491:THR:HG22	1.91	0.53
1:A:836:THR:O	1:A:840:GLU:HG2	2.10	0.52
1:A:742:MET:CE	1:A:757:PHE:CD1	2.88	0.52
1:A:748:TYR:HB3	1:A:751:LEU:HD12	1.91	0.52
1:A:656:HIS:HA	2:C:381:PRO:HG2	1.92	0.52
2:C:305:LEU:HD22	2:C:333:PHE:HE1	1.75	0.52
1:A:679:ILE:HD12	1:A:741:LEU:HD23	1.91	0.51
1:A:1857:LEU:HD11	1:A:1948:VAL:HG11	1.91	0.51
1:A:743:ARG:HD2	1:A:786:LEU:HA	1.92	0.51
1:A:2360:GLU:OE2	1:A:3615:ARG:NH2	2.41	0.51
1:A:978:LEU:O	1:A:982:LEU:HG	2.10	0.51
1:A:2324:MET:SD	1:A:2352:HIS:HD2	2.34	0.51
1:A:3625:VAL:HG13	1:A:3625:VAL:O	2.11	0.51
1:A:1444:LEU:O	1:A:1447:GLN:HG3	2.11	0.51
1:A:679:ILE:HD13	1:A:741:LEU:HD21	1.92	0.51
1:A:550:GLN:HB2	1:A:620:THR:HG21	1.92	0.50
1:A:742:MET:HE2	1:A:757:PHE:CE1	2.46	0.50
1:A:1325:LYS:NZ	1:A:1361:GLU:OE2	2.45	0.50
1:A:991:GLU:HA	1:A:994:MET:HE2	1.94	0.50
2:C:217:LYS:NZ	5:C:601:ATP:O3G	2.40	0.50
1:A:1463:VAL:HG21	1:A:1496:GLN:HG2	1.94	0.50
1:A:875:HIS:HB3	2:C:173:PRO:HG3	1.94	0.49
1:A:1184:ASN:OD1	1:A:1188:ASN:ND2	2.45	0.49
1:A:1481:PRO:O	1:A:1485:ILE:HG12	2.12	0.49
1:A:679:ILE:HD13	1:A:741:LEU:HD23	1.91	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:245:MET:HG2	2:C:248:ARG:HH11	1.78	0.49
1:A:679:ILE:CD1	1:A:741:LEU:CD2	2.89	0.49
1:A:719:LYS:NZ	1:A:759:LYS:HG3	2.28	0.49
1:A:1445:LEU:HD12	1:A:1490:LEU:HD22	1.95	0.49
2:C:279:LEU:O	2:C:283:ILE:HG12	2.13	0.48
1:A:1115:GLU:O	1:A:1435:ARG:NE	2.29	0.48
2:C:388:HIS:CD2	2:C:426:VAL:HG22	2.48	0.48
1:A:742:MET:HE1	1:A:757:PHE:CE1	2.43	0.48
1:A:1630:GLY:HA2	1:A:1633:VAL:HG12	1.95	0.48
1:A:947:ILE:HG22	1:A:1033:SER:HB3	1.96	0.48
1:A:2172:ILE:HD12	1:A:2413:LEU:HD22	1.96	0.48
1:A:540:GLU:O	1:A:544:VAL:HG22	2.13	0.47
1:A:497:ILE:HG23	1:A:533:LEU:HD11	1.96	0.47
1:A:2092:LEU:HB2	1:A:2126:GLY:HA2	1.95	0.47
3:A:3701:ANP:O2A	3:A:3701:ANP:O1B	2.32	0.47
2:C:180:SER:HB2	2:C:257:ASP:OD1	2.15	0.47
1:A:1070:GLU:O	1:A:1074:MET:HG3	2.14	0.46
1:A:1442:THR:HG22	1:A:1490:LEU:HD21	1.97	0.46
1:A:1541:GLY:O	1:A:1545:GLN:HG3	2.15	0.46
1:A:1297:SER:O	1:A:1402:TYR:OH	2.27	0.46
1:A:2331:ILE:HG12	1:A:2358:CYS:SG	2.56	0.46
1:A:1605:TYR:HB3	1:A:1622:LEU:HB2	1.97	0.46
2:C:371:GLN:HB2	2:C:430:LEU:HD23	1.98	0.46
2:C:381:PRO:HG3	2:C:417:LEU:HD21	1.98	0.45
1:A:547:ALA:O	1:A:550:GLN:HG2	2.17	0.45
1:A:2122:HIS:C	1:A:2122:HIS:HD1	2.19	0.45
2:C:388:HIS:HD2	2:C:426:VAL:HG22	1.80	0.45
1:A:863:SER:HB3	2:C:171:LEU:HD12	1.98	0.45
2:C:403:LYS:HB2	2:C:403:LYS:HE2	1.75	0.44
2:C:237:VAL:HG23	2:C:238:PHE:CD2	2.52	0.44
1:A:719:LYS:HZ1	1:A:759:LYS:HG3	1.82	0.44
1:A:975:ASN:O	1:A:979:ARG:HG3	2.17	0.44
1:A:580:LEU:HD21	1:A:653:LEU:HD11	1.98	0.44
1:A:807:VAL:HG23	1:A:908:THR:HG23	2.00	0.44
1:A:2215:PHE:HB2	1:A:2338:LEU:HB3	1.99	0.44
1:A:1360:LEU:O	1:A:1363:THR:HG22	2.18	0.44
1:A:838:ILE:HG22	1:A:1342:VAL:HG13	2.00	0.43
2:C:311:LEU:O	2:C:315:CYS:HB2	2.18	0.43
1:A:747:THR:O	1:A:750:PRO:HD2	2.18	0.43
2:C:257:ASP:OD1	2:C:258:PHE:N	2.51	0.43
1:A:1035:MET:HB2	1:A:1075:MET:HE1	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2165:ARG:HD2	1:A:2417:PHE:CE1	2.53	0.43
2:C:370:LEU:HD11	2:C:431:VAL:HG23	1.99	0.43
1:A:994:MET:HG2	1:A:1016:PHE:CE1	2.54	0.43
1:A:1382:LEU:HD12	1:A:1431:PHE:CE1	2.54	0.43
1:A:2131:LEU:HB2	1:A:2137:PRO:HD2	2.00	0.43
1:A:1430:LYS:NZ	1:A:1486:GLU:OE2	2.38	0.43
2:C:432:PRO:HD3	2:C:469:LEU:HD12	2.01	0.43
1:A:2293:PRO:HB3	1:A:2377:GLN:HG2	2.01	0.42
1:A:1249:LEU:HD23	1:A:1295:ARG:HG2	2.00	0.42
1:A:1944:MET:O	1:A:1948:VAL:HG12	2.20	0.42
1:A:765:LEU:O	1:A:768:THR:HG22	2.20	0.42
1:A:1504:LEU:HD21	1:A:1527:THR:OG1	2.19	0.42
1:A:1293:LEU:HD22	1:A:1360:LEU:HD12	2.01	0.42
1:A:1945:VAL:HG12	1:A:1949:GLN:OE1	2.19	0.42
2:C:178:LYS:HD3	2:C:178:LYS:HA	1.84	0.42
1:A:1955:LEU:HA	1:A:1958:VAL:HG12	2.02	0.42
1:A:859:PRO:HD2	2:C:201:GLN:NE2	2.35	0.42
1:A:1623:ALA:HB2	1:A:1750:ALA:HB1	2.02	0.42
1:A:1324:LEU:HD13	1:A:1361:GLU:HA	2.01	0.42
1:A:1623:ALA:HB1	1:A:1751:TYR:CD1	2.54	0.42
1:A:1623:ALA:HB2	1:A:1750:ALA:CB	2.50	0.42
1:A:790:LEU:HD12	1:A:791:PRO:HD2	2.01	0.41
1:A:870:LEU:HD22	1:A:946:ILE:HD13	2.01	0.41
1:A:1463:VAL:O	1:A:1467:LYS:HB2	2.19	0.41
1:A:2195:VAL:HG12	1:A:2205:ILE:HG12	2.02	0.41
1:A:1401:MET:SD	1:A:1421:LEU:HD21	2.60	0.41
1:A:1631:ARG:HA	1:A:1744:TYR:OH	2.21	0.41
2:C:171:LEU:HD23	2:C:171:LEU:H	1.84	0.41
2:C:172:LEU:HD13	2:C:173:PRO:HD2	2.02	0.41
2:C:306:GLN:HG2	2:C:512:LEU:HD13	2.01	0.41
1:A:502:ASN:O	1:A:506:LEU:HD23	2.20	0.41
1:A:558:ILE:HG22	1:A:634:LEU:HD12	2.02	0.41
1:A:1544:LYS:HE2	1:A:1597:PRO:HD3	2.03	0.41
1:A:558:ILE:HG13	1:A:559:PRO:CD	2.45	0.41
1:A:544:VAL:O	1:A:548:VAL:HG23	2.20	0.41
1:A:2035:PRO:HB2	1:A:2094:GLU:HA	2.02	0.41
1:A:606:ASN:O	1:A:610:VAL:HG23	2.21	0.41
1:A:2337:HIS:CE1	1:A:2339:ASP:HB2	2.56	0.41
2:C:306:GLN:OE1	2:C:507:ARG:NH1	2.54	0.41
2:C:406:LEU:HD23	2:C:406:LEU:O	2.21	0.41
1:A:1230:TYR:CZ	1:A:1234:LEU:HD11	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:310:PHE:O	2:C:314:VAL:HG22	2.21	0.41
1:A:2151:PRO:HG2	1:A:2207:TRP:HB3	2.03	0.40
1:A:2195:VAL:HG12	1:A:2205:ILE:HG23	2.03	0.40
1:A:797:ARG:O	1:A:801:VAL:HG23	2.21	0.40
1:A:3623:ARG:NH1	1:A:3630:ARG:HB2	2.36	0.40
1:A:917:ILE:HD11	1:A:982:LEU:HB3	2.04	0.40
1:A:1445:LEU:HD23	1:A:1445:LEU:HA	1.93	0.40
1:A:2278:HIS:CE1	1:A:2279:VAL:HG23	2.56	0.40
1:A:1237:PHE:HB2	1:A:1245:CYS:SG	2.62	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	1707/3657 (47%)	1653 (97%)	53 (3%)	1 (0%)	51 83
2	C	301/352 (86%)	287 (95%)	14 (5%)	0	100 100
All	All	2008/4009 (50%)	1940 (97%)	67 (3%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	635	SER

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	1226/2797 (44%)	1224 (100%)	2 (0%)	93 97
2	C	251/318 (79%)	250 (100%)	1 (0%)	91 96
All	All	1477/3115 (47%)	1474 (100%)	3 (0%)	93 97

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

Mol	Chain	Res	Type
1	A	741	LEU
1	A	2122	HIS
2	C	401	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	322	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 4 ligands modelled in this entry, 1 is monoatomic - leaving 3 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

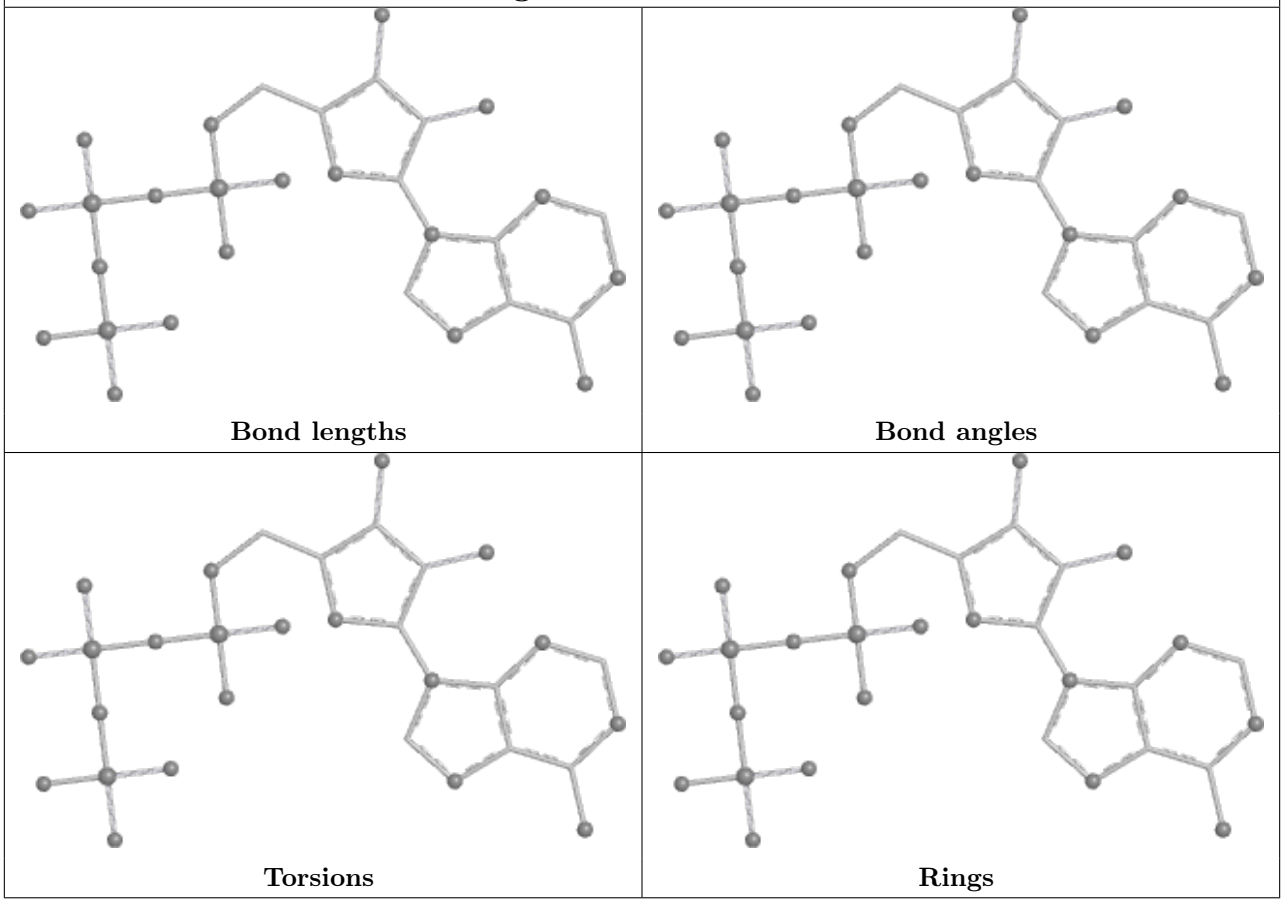
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

Ligand ANP A 3701



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

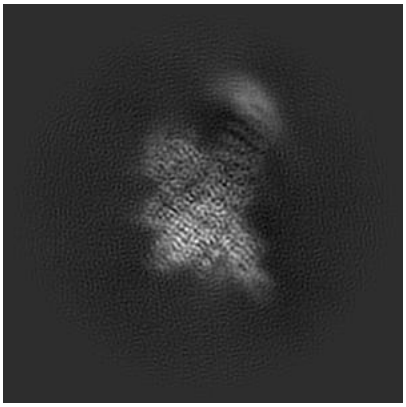
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-13679. These allow visual inspection of the internal detail of the map and identification of artifacts.

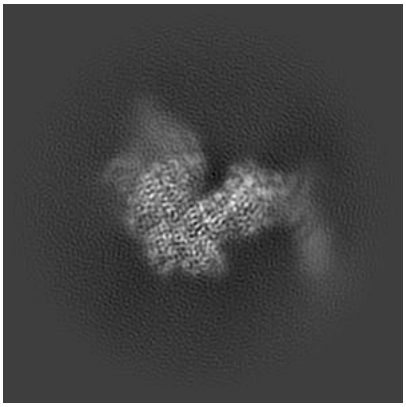
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

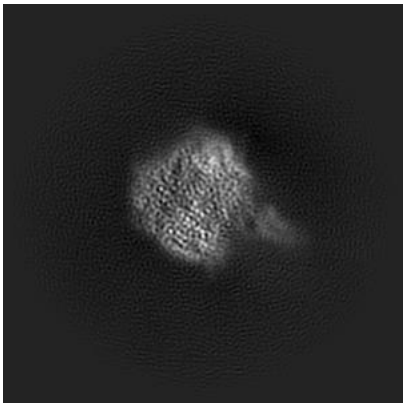
6.1.1 Primary map



X



Y

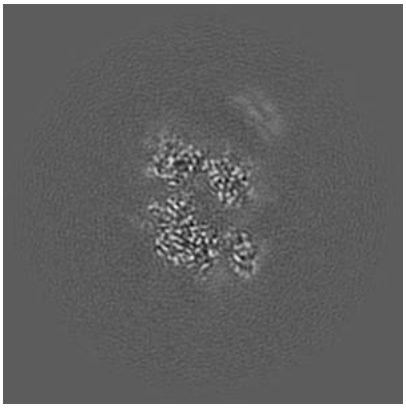


Z

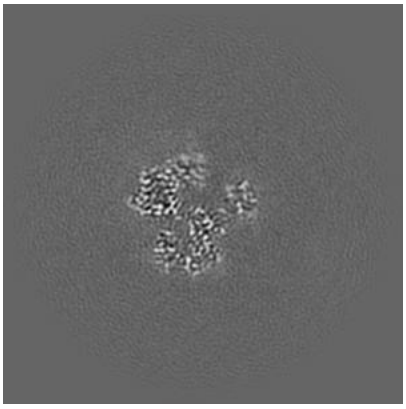
The images above show the map projected in three orthogonal directions.

6.2 Central slices

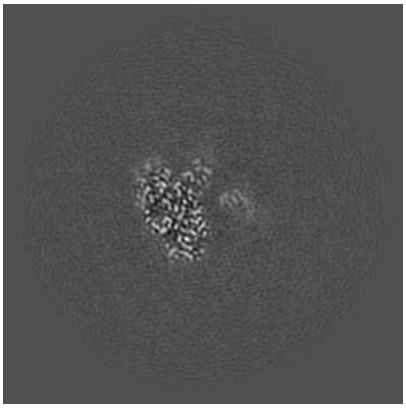
6.2.1 Primary map



X Index: 172



Y Index: 172

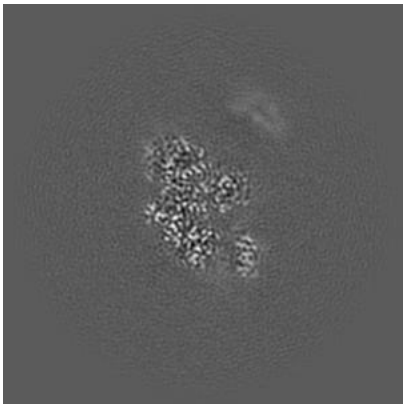


Z Index: 172

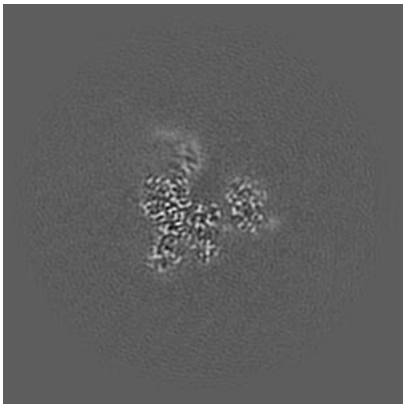
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

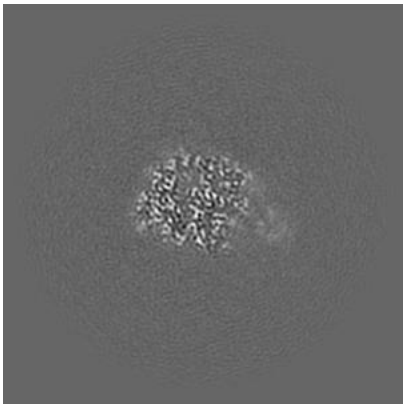
6.3.1 Primary map



X Index: 166



Y Index: 161



Z Index: 143

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

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.818. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

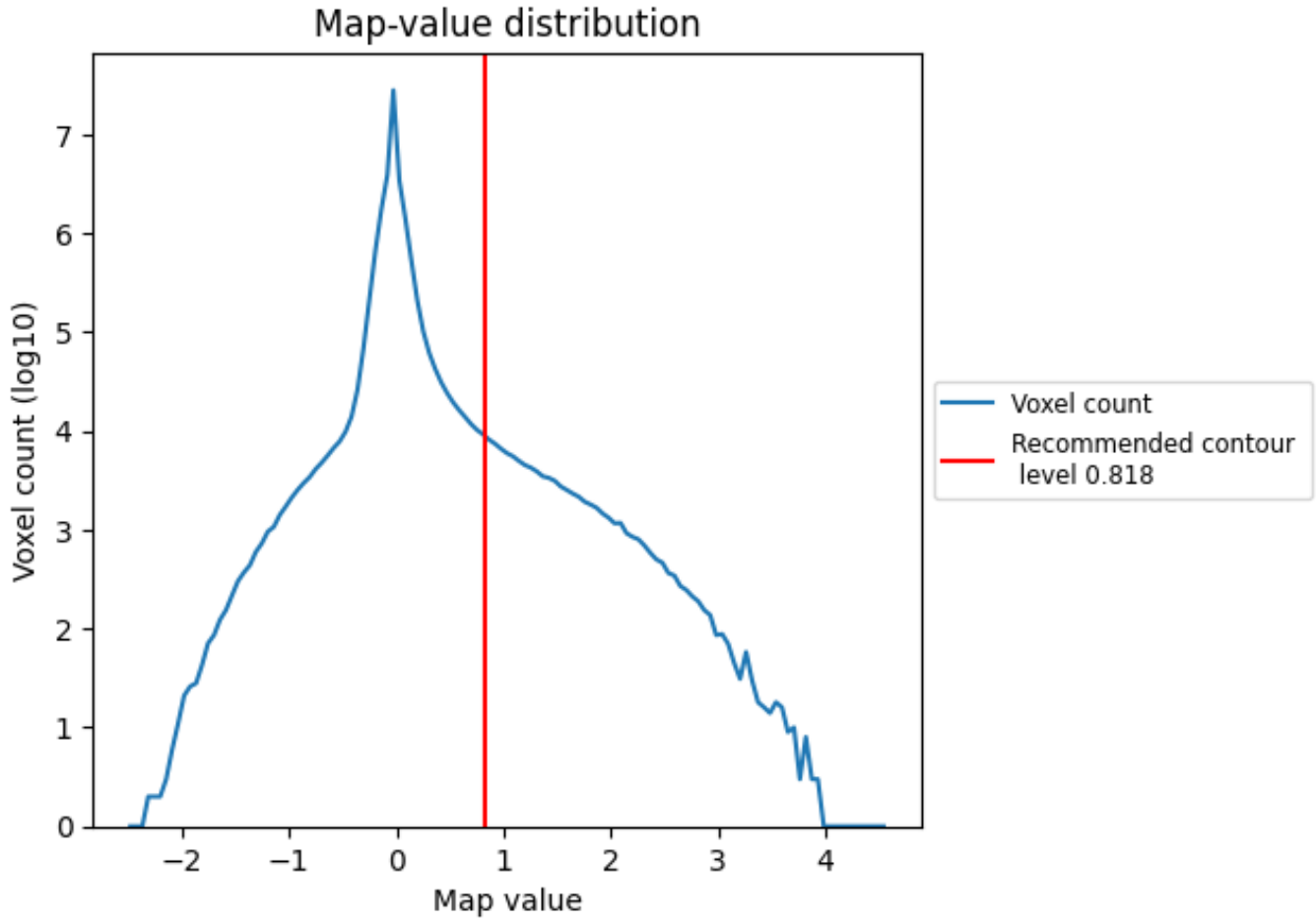
6.5 Mask visualisation (i)

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

7 Map analysis

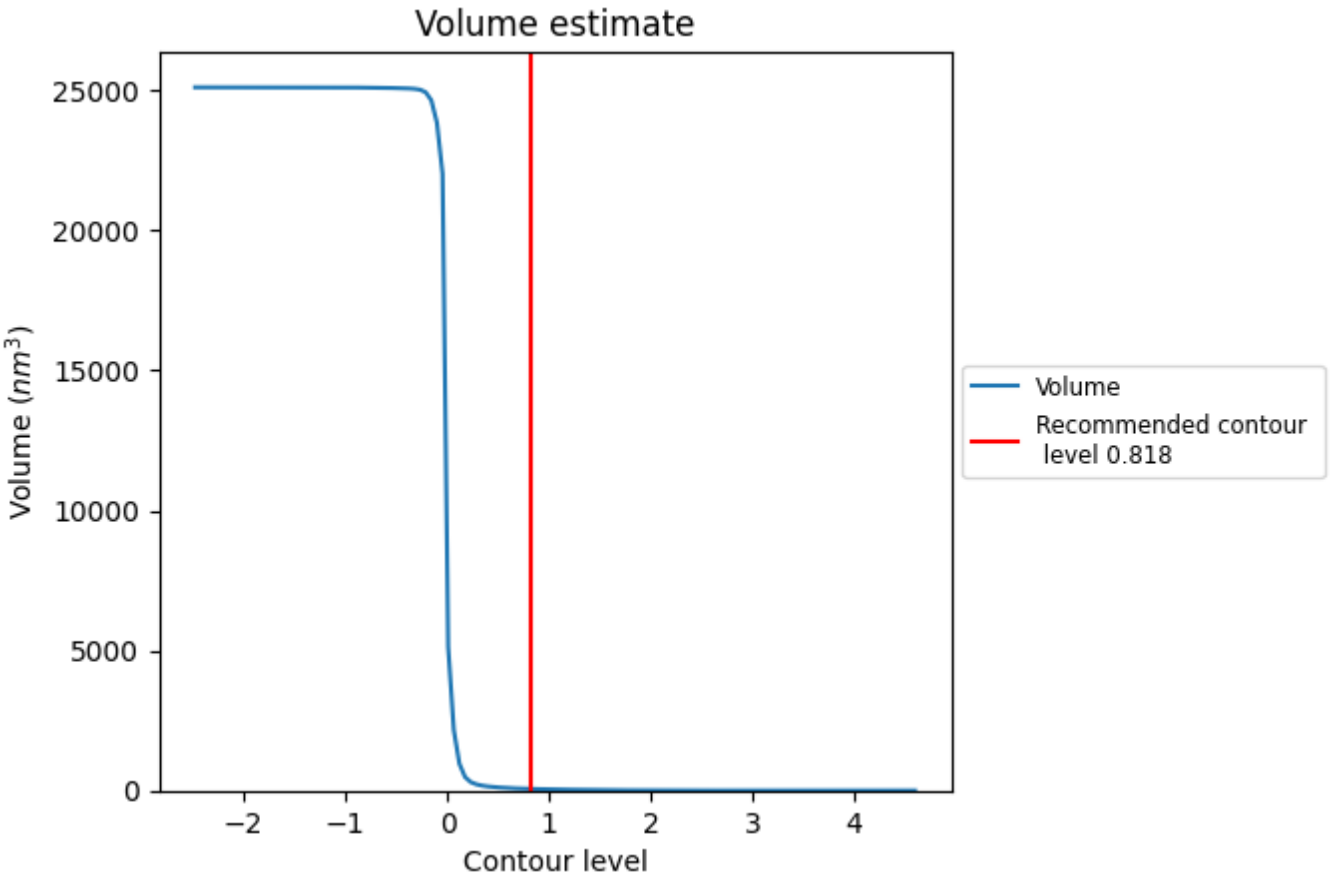
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

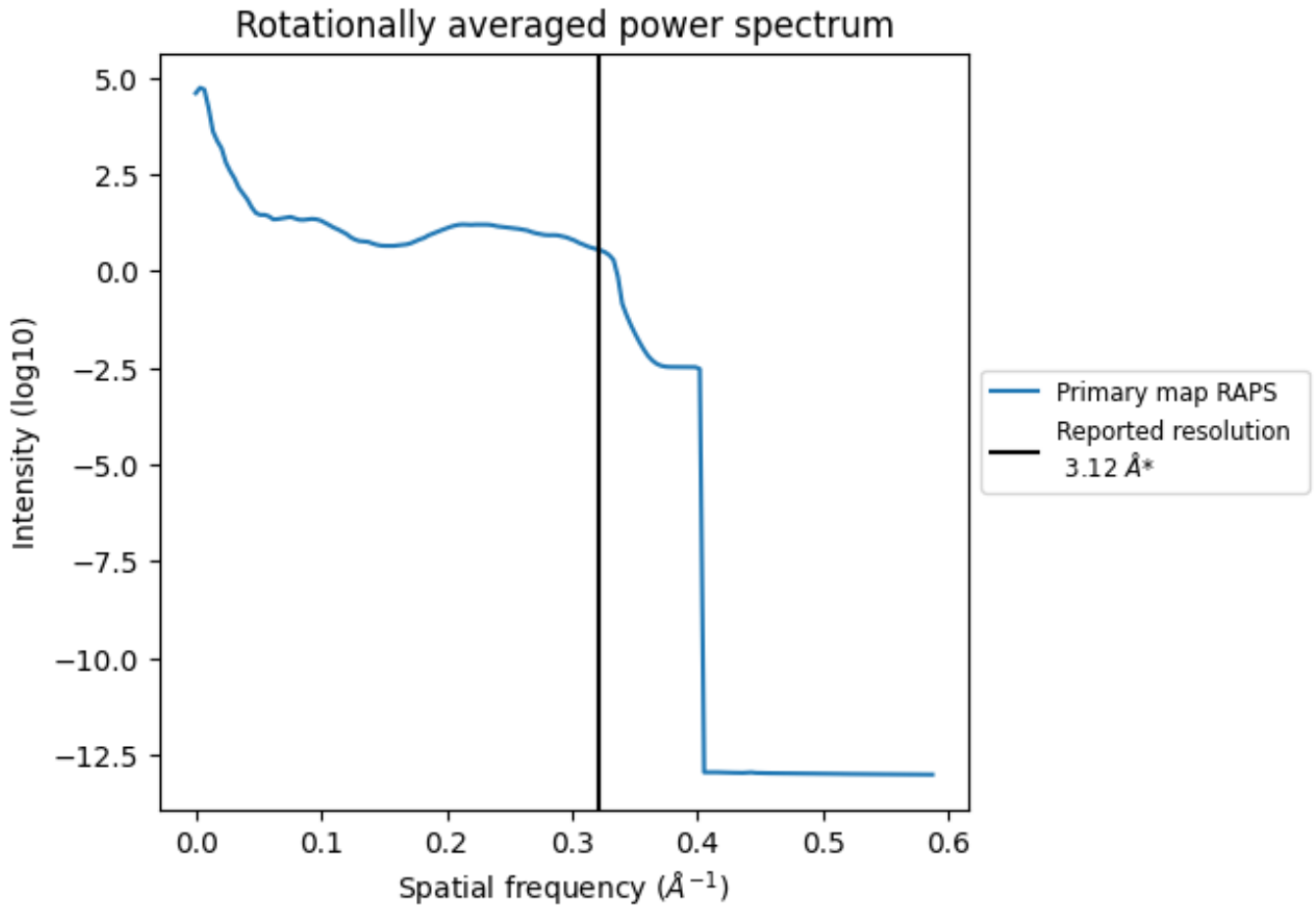
7.2 Volume estimate



The volume at the recommended contour level is 59 nm^3; this corresponds to an approximate mass of 54 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 0.321 $Å^{-1}$

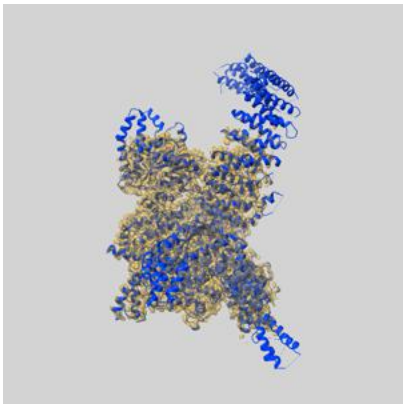
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

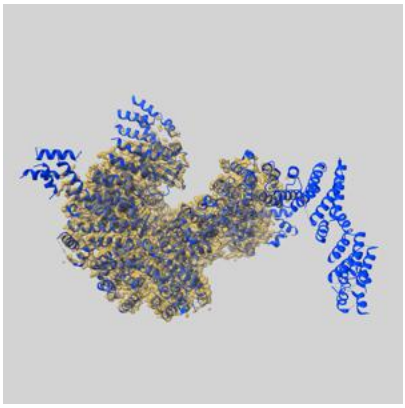
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-13679 and PDB model 7PW9. Per-residue inclusion information can be found in section 3 on page 6.

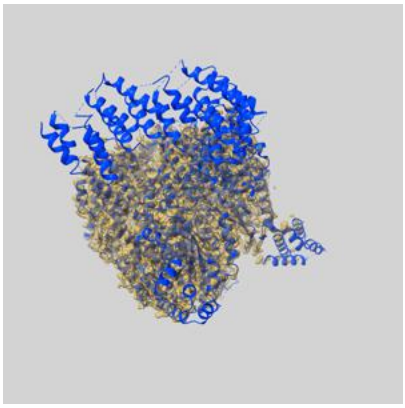
9.1 Map-model overlay



X



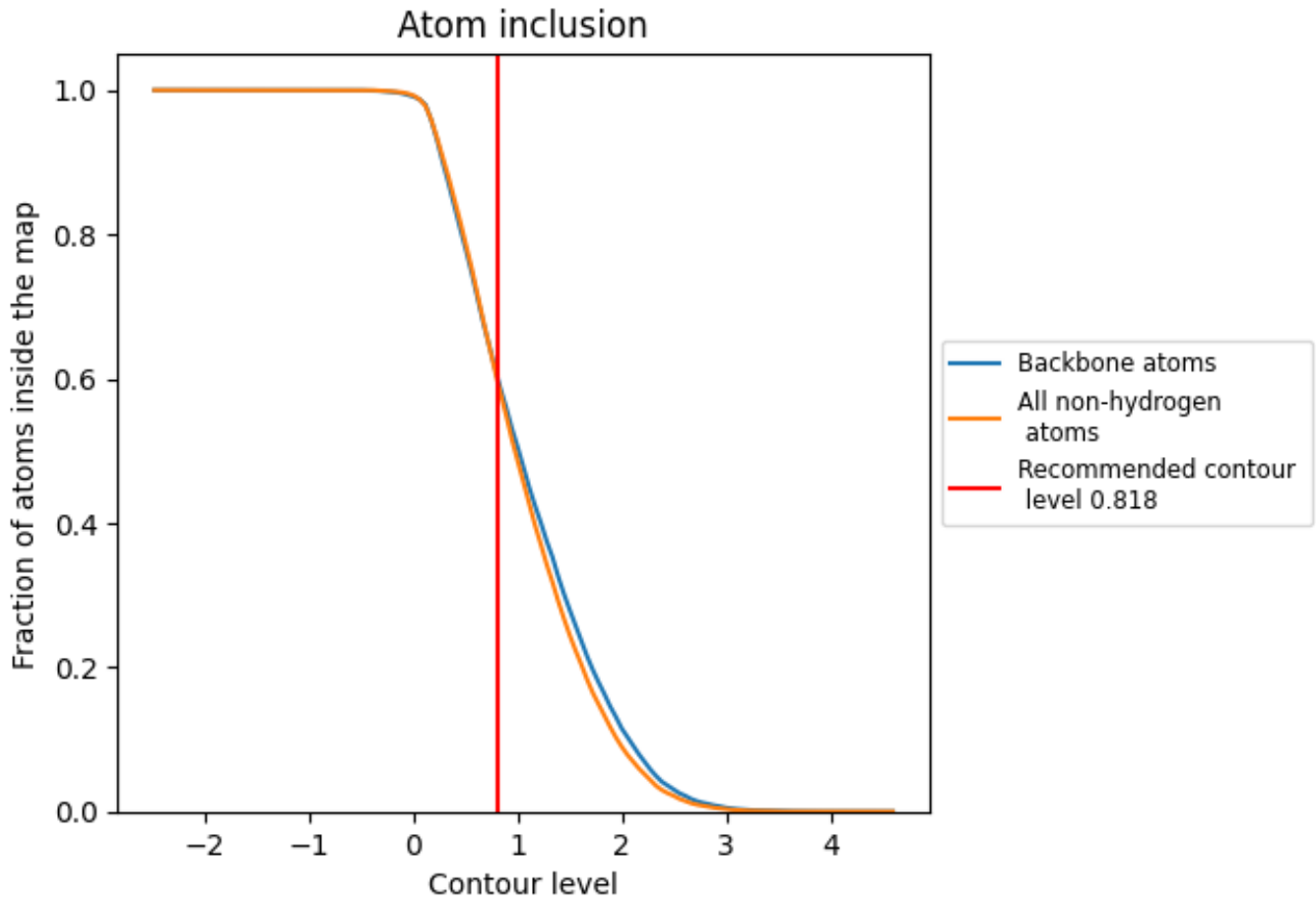
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.818 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 Atom inclusion (i)



At the recommended contour level, 60% of all backbone atoms, 59% of all non-hydrogen atoms, are inside the map.