Full wwPDB EM Validation Report ⓘ

Apr 24, 2025 – 01:01 PM EDT

PDB ID	:	9BMR / pdb_00009bmr
EMDB ID	:	EMD-44708
Title	:	State-1 of motor domain from full-length human phi dynein-1 in 5 mM ADP
Authors	:	Chai, P.; Zhang, K.
Deposited on	:	2024-05-02
Resolution	:	2.60 Å(reported)

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

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

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

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

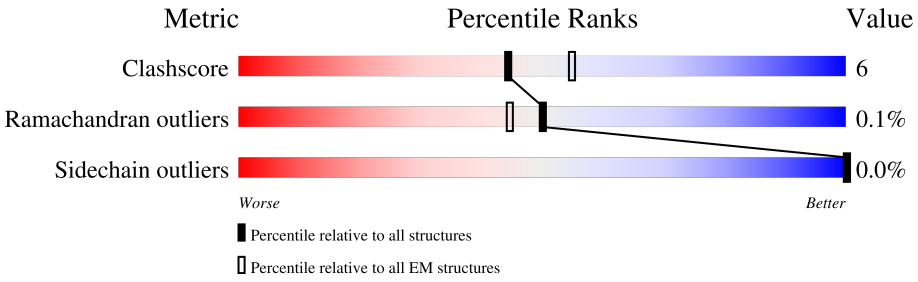
EMDB validation analysis	:	0.0.1.dev117
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

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 2.60 Å.

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



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

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	4646	6% 53% 10% 37%

2 Entry composition

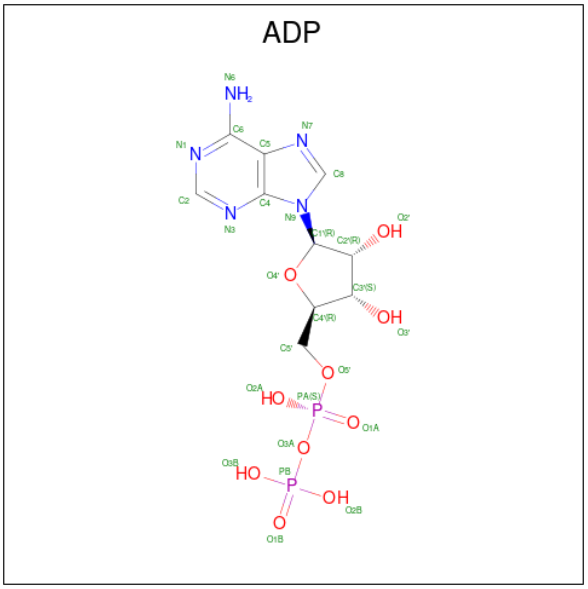
There are 4 unique types of molecules in this entry. The entry contains 23707 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Cytoplasmic dynein 1 heavy chain 1.

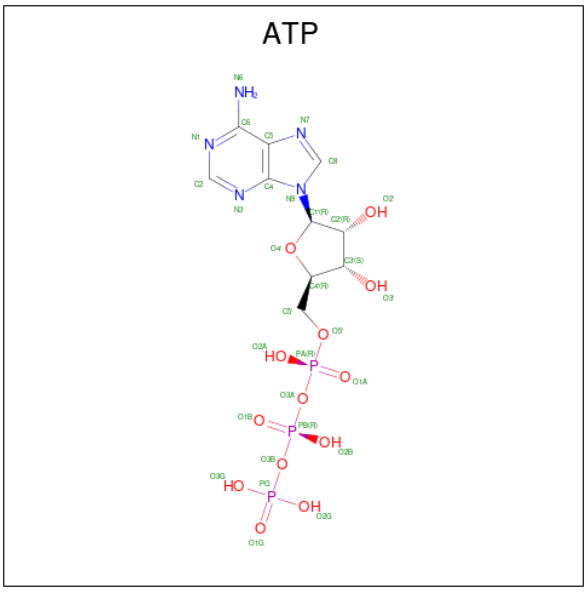
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2937	23593	15028	4070	4378	117	0	0

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0
			Total	C	N	O	P	
2	A	1	27	10	5	10	2	0

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

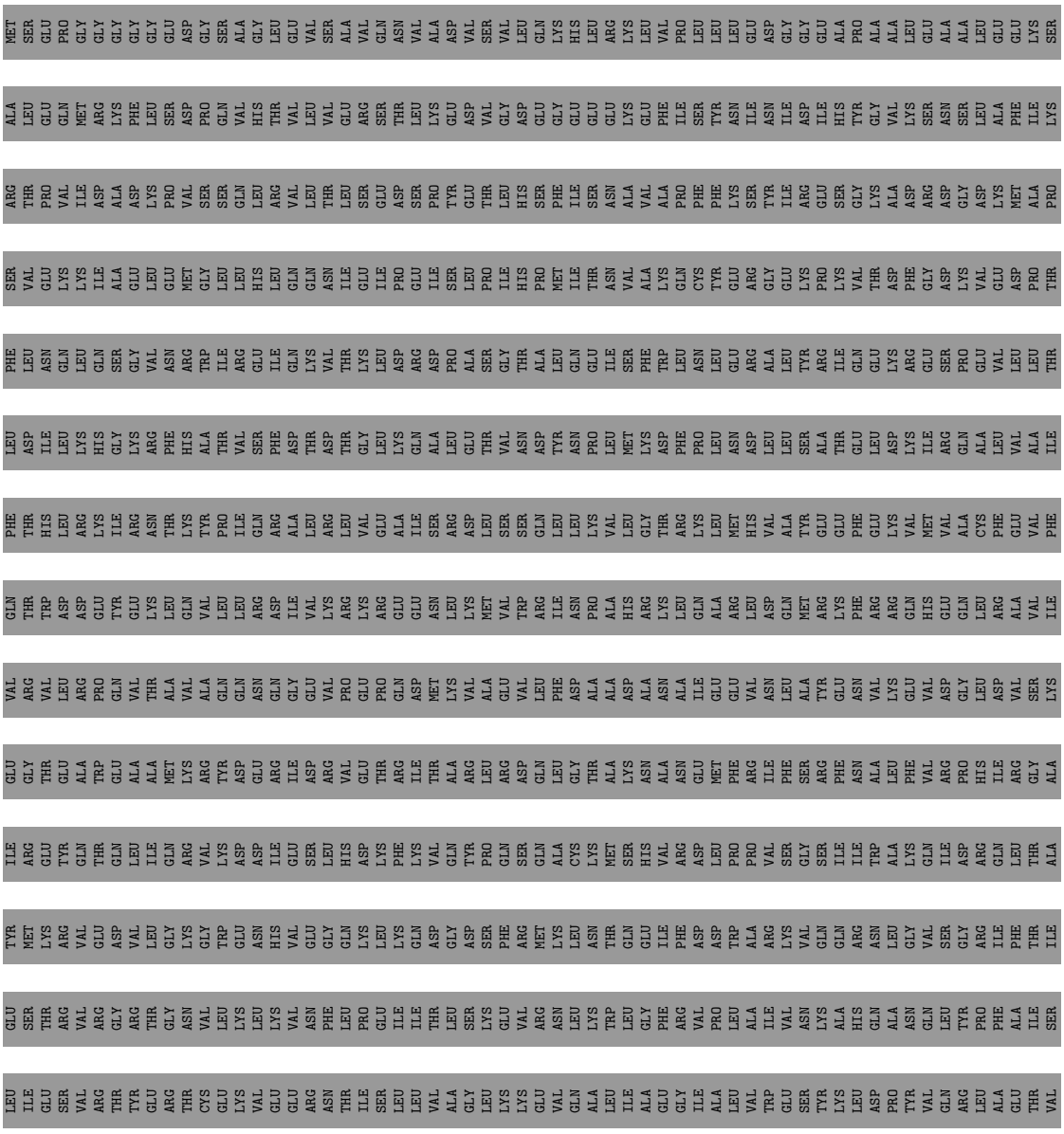
Mol	Chain	Residues	Atoms		AltConf
4	A	2	Total	Mg	0
			2	2	

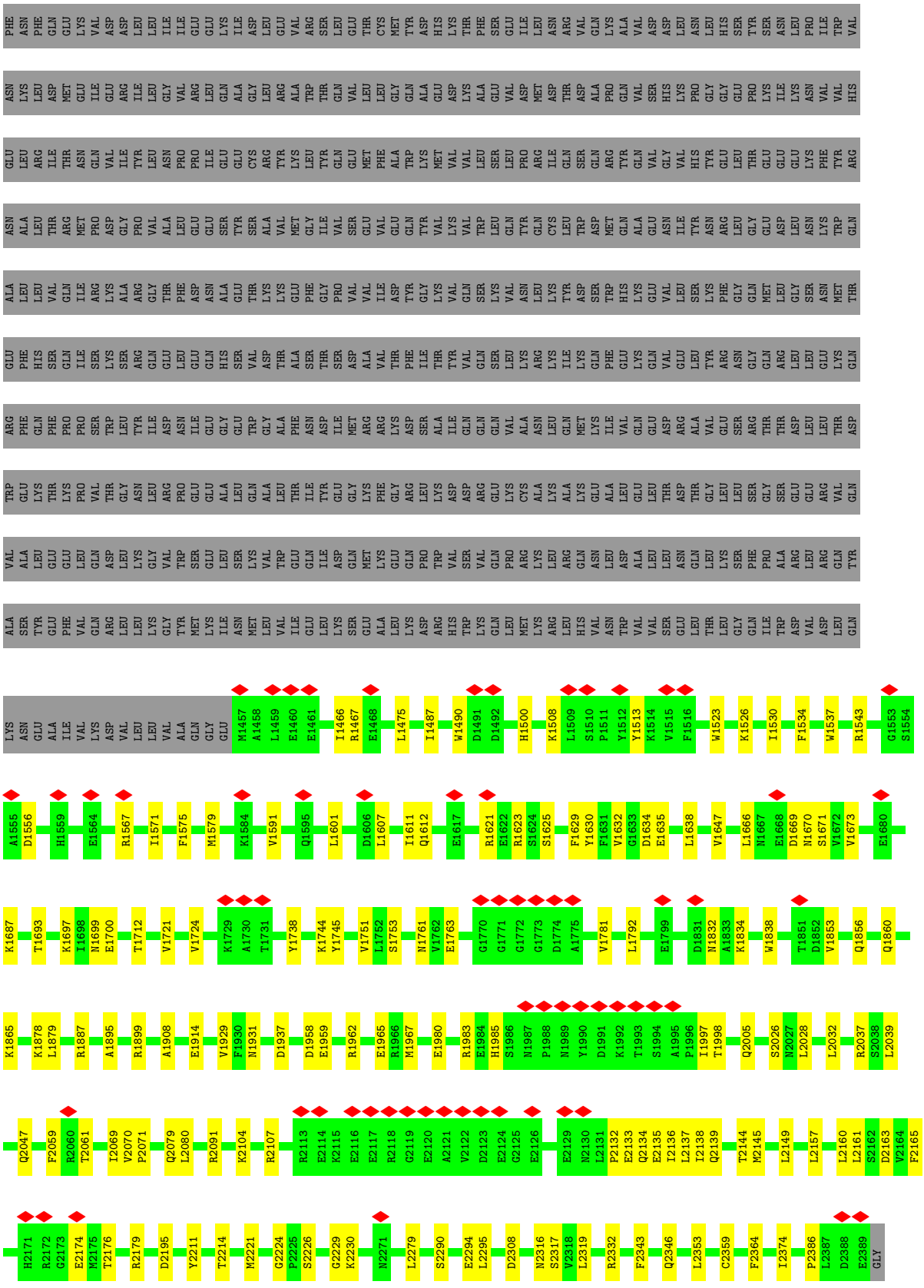
3 Residue-property plots (i)

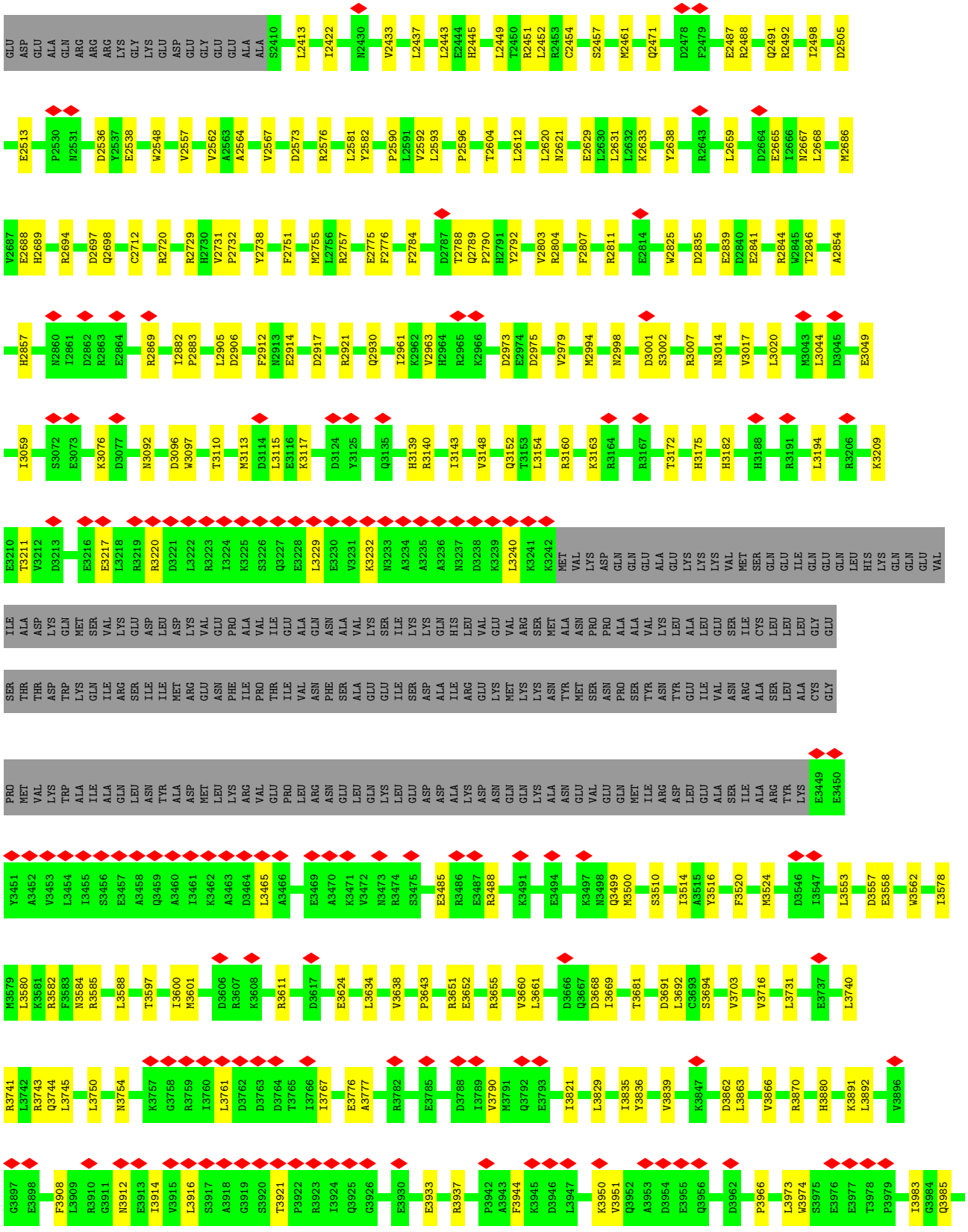
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Cytoplasmic dynein 1 heavy chain 1

Chain A:




PHE ASN PHE GLN GLU LYS VAL ASP ASP LEU LEU ILE ILE GLU GLU LYS ILE ASP LEU GLU VAL ARG SER LEU GLU THR CYS MET TYR ASP HIS LYS THR PHE SER GLU ILE LEU ASN ARG VAL GLN LYS ALA VAL ASP ASP LEU ASN LEU LEU HIS SER TYR SER ASN LEU PRO ILE VAL TRP
ASN LYS LEU ASP MET GLU ILE GLU ARG ILE LEU GLY VAL ARG LEU GLN ALA GLY LEU ARG ALA TRP THR GLN VAL LEU LEU GLY GLN ALA GLU ASP LYS ALA GLU VAL ASP MET ASP THR ASP ALA PRO GLN VAL SER HIS LYS PRO GLY GLY GLU PRO LYS ILE LYS ASN VAL VAL HIS
GLU LEU ARG ILE THR ASN GLN VAL ILE TYR LEU ASN PRO PRO ILE GLU GLU CYS ARG TYR LYS LEU TYR GLN GLU MET PHE ALA TRP LYS MET VAL LEU SER LEU PRO ARG ILE GLN SER GLN ARG TYR GLN VAL GLY VAL HIS TYR ASN ARG LEU GLY GLU LEU THR GLU GLU GLU LYS PHE TYR ARG
ASN ALA LEU THR ARG MET PRO ASP GLY PRO VAL ALA LEU GLU GLU SER TYR SER ALA VAL MET GLY ILE VAL SER GLU VAL GLU ASN GLN CYS LEU TRP ASP MET GLN ALA GLU ASN ILE TYR ASN ARG LEU GLY GLU ASP LEU ASN LYS SER TRP GLN
ALA LEU LEU VAL GLN ILE ARG LYS ALA ARG GLY THR PHE ASP ASN ALA GLU THR LYS LYS GLU PHE GLY PRO VAL VAL ILE ASP TYR GLY LYS VAL GLN SER LYS VAL ASN LEU LYS TYR ASP SER TRP HIS LYS GLU VAL LEU SER LYS PHE GLY GLN MET LEU GLY SER ASN MET THR
GLU PHE HIS SER GLN ILE SER LYS SER ASP VAL THR ALA SER THR SER ASP VAL ALA LEU THR PHE ILE THR TYR GLN LYS GLN PHE GLU LYS GLN VAL GLU LEU TYR ARG ASN GLY GLN LEU ARG LYS ILE LYS GLN LEU PHE GLU GLU LEU LEU GLU LYS GLN
ARG PHE GLN PHE PRO PRO SER TRP LEU TYR ILE ASP ASN ILE GLU ALA PHE ASN ASP ILE MET ARG ARG LYS ASP SER ALA ILE ASP GLN GLN VAL ALA ASN LEU GLN MET LYS ILE VAL GLU ASP ARG THR THR ASP
TRP GLU LYS THR LYS PRO VAL THR GLY ASN LEU LEU ARG PRO GLU GLU ALA LEU GLN ALA LEU THR ILE TYR GLU GLY LYS PHE GLY ARG LEU LYS ASP ASP ARG GLU LYS CYS ALA LYS ALA LYS GLU LEU GLU LEU THR ASP THR GLY LEU LEU SER GLU GLU GLU ARG VAL GLN
VAL ALA LEU GLU GLN ASP LEU LYS GLY VAL TRP SER GLU LEU SER LYS VAL TRP GLU GLN ILE ASP GLN MET LYS GLU GLN PRO TRP VAL SER VAL GLN PRO ARG LYS LEU ARG GLN ASN LEU ASP ALA LEU LEU ASN GLN LEU LYS GLN PHE SER PRO ALA ARG LEU ARG GLN TYR
ALA SER TYR GLU PHE VAL GLN ARG LEU LEU LYS GLY TYR MET LYS ILE ASN MET LEU VAL ILE GLU LEU LYS SER GLU ALA LEU LYS ASP ARG HIS TRP LYS GLN LEU MET LYS ARG LEU HIS VAL ASN TRP VAL VAL SER GLU LEU THR LEU GLY GLN ILE TRP ASP VAL ASP LEU GLN
LYS ASN GLU ALA ILE VAL LYS ASP VAL LEU LEU LEU VAL ALA GLN GLY GLU M1457 A1458 L1459 E1460 E1461 I1466 R1467 E1468 L1475 I1487 W1490 D1491 D1492 H1500 K1508 L1509 S1510 P1511 Y1512 Y1513 K1514 V1515 F1516 W1523 K1526 I1530 F1534 W1537 R1543 G1553 S1554
A1555 D1556 H1559 E1564 R1567 I1571 F1575 M1579 K1584 V1591 Q1595 L1601 D1606 L1607 I1611 Q1612 E1617 R1621 E1622 R1623 S1624 S1625 F1629 Y1630 F1631 V1632 G1633 D1634 E1635 L1638 V1647 L1666 N1667 E1668 D1669 N1670 S1671 V1672 V1673 E1680
K1687 T1693 K1697 I1698 N1699 E1700 T1712 V1721 V1724 K1729 A1730 T1731 Y1738 K1744 Y1745 V1751 L1752 S1753 N1761 V1762 E1763 G1770 G1771 G1772 G1773 D1774 A1775 V1781 L1792 E1799 D1831 N1832 A1833 K1834 W1838 T1851 D1852 V1853 Q1856 Q1860
K1865 K1878 L1879 R1887 A1895 R1899 A1908 E1914 V1929 F1930 N1931 D1937 D1958 E1959 R1962 E1965 R1966 M1967 E1980 R1983 E1984 H1985 S1986 N1987 P1988 N1989 Y1990 D1991 K1992 T1993 S1994 A1995 P1996 I1997 T1998 Q2005 S2026 N2027 L2028 L2032 R2037 S2038 L2039
Q2047 F2059 R2060 T2061 I2069 V2070 P2071 Q2079 L2080 R2091 K2104 R2107 R2113 E2114 K2115 E2116 E2117 R2118 G2119 E2120 A2121 V2122 D2123 E2124 G2125 E2126 E2129 N2130 L2131 P2132 E2133 Q2134 E2135 I2136 L2137 I2138 Q2139 T2144 M2145 L2149 L2157 L2160 L2161 S2162 D2163 V2164 F2165
H2171 R2172 G2173 E2174 M2175 T2176 R2179 D2195 Y2211 T2214 M2221 G2224 P2225 S2226 G2229 K2230 N2271 L2279 S2290 E2294 L2295 D2308 N2316 S2317 V2318 L2319 R2332 F2343 Q2346 L2353 C2359 F2364 I2374 P2386 L2387 D2388 E2389 GLY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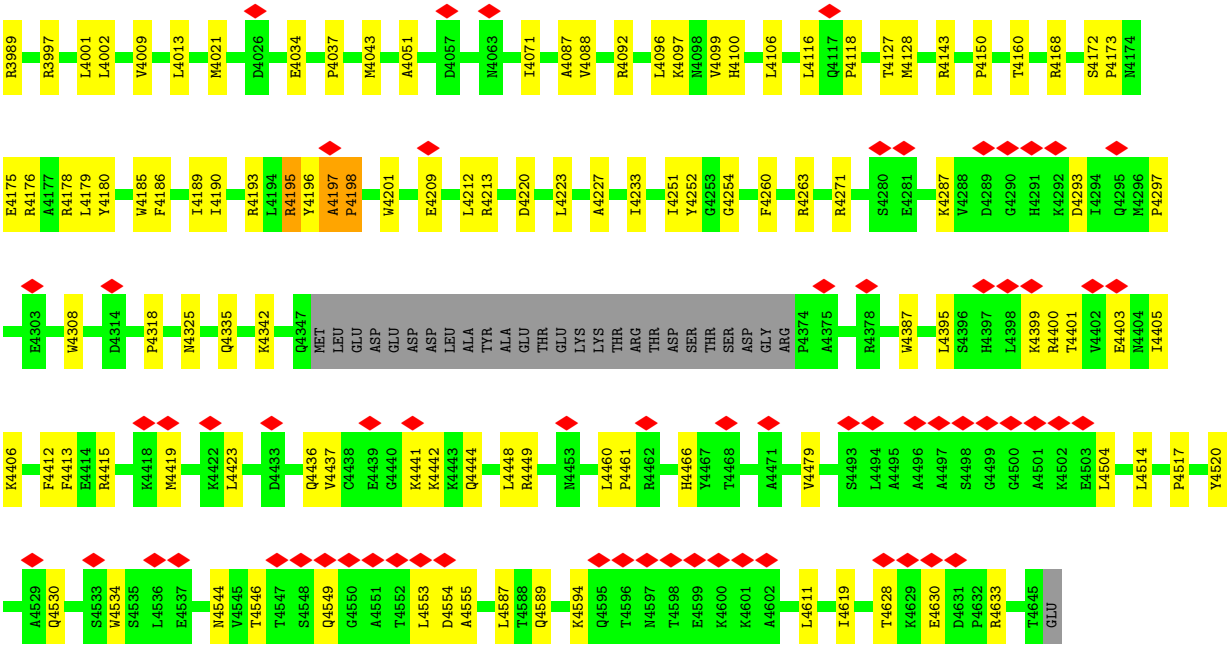
E2513 P2530 N2531 D2536 Y2537 E2538 W2548 V2557 V2562 A2563 A2564 V2567 D2573 R2576 L2581 Y2582 P2590 L2591 V2592 L2593 P2596 T2604 L2612 L2620 N2621 E2629 L2630 L2631 L2632 K2633 Y2638 R2643 L2659 D2664 E2665 I2666 N2667 L2668 M2686
V2687 E2688 H2689 R2694 D2697 Q2698 C2712 R2720 R2729 H2730 V2731 P2732 Y2738 F2751 M2755 L2756 R2757 E2775 F2776 F2784 D2787 T2788 Q2789 P2790 H2791 Y2792 V2803 R2804 F2807 R2811 E2814 W2825 D2835 E2839 D2840 E2841 R2844 W2845 T2846 A2854
H2857 N2860 I2861 D2862 R2863 E2864 R2869 I2882 P2883 L2905 D2906 F2912 N2913 E2914 D2917 R2921 Q2930 I2961 K2962 V2963 H2964 R2965 K2966 D2973 E2974 D2975 V2979 M2994 N2998 D3001 S3002 R3007 N3014 V3017 L3020 M3043 L3044 D3045 E3049
I3059 S3072 E3073 K3076 D3077 N3092 D3096 W3097 T3110 M3113 D3114 L3115 E3116 K3117 D3124 Y3125 Q3135 H3139 R3140 I3143 V3148 Q3152 T3153 L3154 R3160 K3163 R3164 R3167 T3172 H3175 H3182 H3188 R3191 L3194 R3206 K3209
E3210 T3211 V3212 D3213 E3216 E3217 L3218 R3219 R3220 D3221 L3222 R3223 I3224 K3225 S3226 Q3227 E3228 L3229 E3230 V3231 K3232 N3233 A3234 A3235 A3236 N3237 D3238 K3239 L3240 K3241 K3242 MET VAL LYS ASP GLN GLN GLU ALA GLU LYS LYS LYS VAL MET SER GLN GLU ILE GLN GLU GLN LEU HIS LYS GLN GLN GLU VAL
ILE ALA ASP LYS GLN MET SER VAL LYS GLU ASP LEU ASP LYS VAL GLU PRO ALA VAL ILE GLU ALA GLN GLN ASN ALA VAL LYS SER ILE LYS LYS GLN HIS LEU VAL GLU GLU VAL ARG SER MET ALA ASN PRO PRO ALA ALA VAL LYS LEU ALA LEU GLU SER ILE CYS LEU LEU LEU GLY GLU
SER THR THR ASP TRP LYS GLN ILE ILE ARG SER ILE ILE MET ARG GLU ASN PHE ILE PRO THR ILE VAL ASN PHE SER ALA GLU GLU ILE SER ASP ALA ILE ARG GLU LYS MET LYS LYS ASN TYR MET SER ASN PRO SER TYR ASN TYR GLU ILE VAL ASN ARG ALA SER LEU ALA CYS GLY
PRO MET VAL LYS TRP ALA ILE ALA GLN LEU ASN TYR ALA ASP MET LEU LYS ARG VAL GLU PRO LEU ARG ASN GLU LEU GLN LYS LEU GLU ASP ASP ALA LYS ASP ASN GLN GLN LYS ALA ASN GLU VAL GLU GLN MET ILE ARG ASP LEU GLU ALA SER ILE ALA ARG TYR LYS E3449 E3450
Y3451 A3452 V3453 L3454 I3455 S3456 E3457 A3458 Q3459 A3460 I3461 K3462 A3463 D3464 L3465 A3466 E3469 A3470 K3471 V3472 N3473 R3474 S3475 E3485 R3486 E3487 R3488 K3491 E3494 K3497 N3498 Q3499 M3500 S3510 I3514 A3515 Y3516 F3520 M3524 D3546 I3547 L3553 D3557 E3558 W3562 I3578
M3579 L3580 K3581 R3582 F3583 N3584 R3585 L3588 T3597 I3600 M3601 D3606 R3607 K3608 R3611 D3617 E3624 L3634 V3638 P3643 R3651 E3652 R3655 V3660 L3661 D3666 Q3667 D3668 I3669 T3681 D3691 L3692 C3693 S3694 V3703 V3716 L3731 E3737 L3740
R3741 L3742 R3743 Q3744 L3745 L3750 N3754 K3757 G3758 R3759 I3760 L3761 D3762 D3763 D3764 T3765 I3766 I3767 E3776 A3777 R3782 E3785 D3788 I3789 V3790 M3791 Q3792 E3793 I3821 L3829 I3835 Y3836 V3839 K3847 D3862 L3863 V3866 R3870 H3880 K3891 L3892 V3896
G3897 E3898 F3908 L3909 R3910 G3911 N3912 E3913 I3914 V3915 L3916 S3917 A3918 G3919 S3920 T3921 P3922 R3923 I3924 Q3925 G3926 E3930 E3933 R3937 P3942 A3943 F3944 K3945 D3946 L3947 K3950 V3951 Q3952 A3953 D3954 E3955 Q3956 D3962 P3966 L3973 W3974 S3975 E3976 E3977 T3978 P3979 I3983 Q3984 Q3985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E4175 R4176 A4177 R4178 L4179 Y4180 W4185 F4186 I4189 I4190 R4193 L4194 R4195 Y4196 A4197 P4198 W4201 E4209 L4212 R4213 D4220 L4223 A4227 I4233 I4251 Y4252 G4253 G4254 F4260 R4263 R4271 S4280 E4281 K4287 V4288 D4289 G4290 H4291 K4292 D4293 I4294 Q4295 M4296 P4297
E4303 W4308 D4314 P4318 N4325 Q4335 K4342 Q4347 MET LEU GLU ASP GLU ASP ASP LEU ALA TYR ALA GLU THR GLU LYS LYS THR ARG THR ASP SER THR SER ASP GLY ARG P4374 A4375 R4378 W4387 L4395 S4396 H4397 L4398 K4399 R4400 T4401 V4402 E4403 N4404 I4405
K4406 F4412 F4413 E4414 R4415 K4418 M4419 K4422 L4423 D4433 Q4436 V4437 C4438 E4439 G4440 K4441 K4442 K4443 Q4444 L4448 R4449 N4453 L4460 P4461 R4462 H4466 Y4467 T4468 A4471 V4479 S4493 L4494 A4495 A4496 A4497 S4498 G4499 G4500 A4501 K4502 E4503 L4504 L4514 P4517 Y4520
A4529 Q4530 S4533 W4534 S4535 L4536 E4537 N4544 V4545 T4546 T4547 S4548 Q4549 G4550 A4551 T4552 L4553 D4554 A4555 L4587 T4588 Q4589 K4594 Q4595 T4596 N4597 T4598 E4599 K4600 K4601 A4602 L4611 I4619 T4628 K4629 E4630 D4631 P4632 R4633 T4645 GLU

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	174680	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.973	Depositor
Minimum map value	-1.420	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.062	Depositor
Recommended contour level	0.38	Depositor
Map size (Å)	422.40002, 422.40002, 422.40002	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.27	0/24093	0.48	2/32651 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	1669	ASP	CB-CG-OD2	5.42	123.18	118.30
1	A	2308	ASP	CB-CG-OD1	5.14	122.93	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	4195	ARG	Sidechain

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	23593	0	23657	294	0
2	A	81	0	36	3	0
3	A	31	0	12	4	0
4	A	2	0	0	0	0
All	All	23707	0	23705	296	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 (296) 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:2221:MET:HG2	1:A:2343:PHE:HB2	1.55	0.89
1:A:2629:GLU:OE2	1:A:2633:LYS:NZ	2.12	0.83
1:A:4271:ARG:HD3	1:A:4633:ARG:HH12	1.43	0.83
1:A:1490:TRP:HH2	1:A:1537:TRP:HD1	1.29	0.80
1:A:4088:VAL:HG11	1:A:4116:LEU:HD21	1.67	0.76
1:A:2562:VAL:O	1:A:2804:ARG:NH1	2.21	0.74
1:A:2149:LEU:HD11	1:A:2157:LEU:HD13	1.68	0.74
1:A:1571:ILE:HD13	1:A:1607:LEU:HB3	1.69	0.73
1:A:1490:TRP:CH2	1:A:1537:TRP:HD1	2.08	0.72
1:A:4037:PRO:HB2	1:A:4118:PRO:HG2	1.71	0.72
1:A:2788:THR:HG22	1:A:2789:GLN:HG2	1.72	0.72
1:A:2930:GLN:HG3	1:A:3059:ILE:HG23	1.73	0.71
1:A:4190:ILE:HD12	1:A:4201:TRP:HZ2	1.56	0.70
1:A:2581:LEU:HD11	1:A:2593:LEU:HD21	1.72	0.70
1:A:4549:GLN:HG3	1:A:4587:LEU:HB2	1.73	0.70
1:A:1466:ILE:HG12	1:A:1500:HIS:HD1	1.57	0.69
1:A:4197:ALA:HB3	1:A:4198:PRO:HD3	1.76	0.68
1:A:2775:GLU:OE1	1:A:2857:HIS:NE2	2.24	0.67
1:A:4176:ARG:NH1	1:A:4220:ASP:OD2	2.27	0.66
1:A:3661:LEU:HD12	1:A:3668:ASP:HB2	1.76	0.66
1:A:2906:ASP:OD2	1:A:3655:ARG:NH1	2.29	0.65
1:A:3638:VAL:HG12	1:A:3681:THR:HB	1.79	0.64
1:A:2452:LEU:HD13	1:A:2729:ARG:HH21	1.63	0.64
1:A:2536:ASP:OD1	1:A:2576:ARG:NH1	2.31	0.64
1:A:1487:ILE:HD12	1:A:1537:TRP:NE1	2.14	0.63
1:A:1908:ALA:HB3	1:A:2353:LEU:HD22	1.81	0.63
1:A:3557:ASP:OD1	1:A:3743:ARG:NH1	2.32	0.62
1:A:2138:ILE:HD12	1:A:2161:LEU:HD22	1.79	0.62
3:A:4702:ATP:C8	3:A:4702:ATP:H5'1	2.35	0.62
1:A:4097:LYS:HA	1:A:4127:THR:HB	1.79	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2080:LEU:O	1:A:4415:ARG:NH1	2.33	0.62
3:A:4702:ATP:H5'1	3:A:4702:ATP:H8	1.64	0.62
1:A:2226:SER:HA	3:A:4702:ATP:O1G	2.00	0.61
1:A:1751:VAL:HG21	1:A:1878:LYS:HE3	1.83	0.61
1:A:2457:SER:HB2	1:A:2732:PRO:HB3	1.82	0.61
1:A:2905:LEU:HD11	1:A:3652:GLU:HB3	1.82	0.61
1:A:3761:LEU:HA	1:A:3767:ILE:HD11	1.82	0.60
1:A:4436:GLN:HG3	1:A:4441:LYS:HB2	1.84	0.60
1:A:2039:LEU:HD12	1:A:4254:GLY:HA2	1.84	0.60
1:A:2488:ARG:HG3	1:A:2492:ARG:HH12	1.65	0.60
1:A:1466:ILE:HG12	1:A:1500:HIS:ND1	2.17	0.59
1:A:3510:SER:HB3	1:A:3553:LEU:HD21	1.85	0.59
1:A:1623:ARG:HD3	1:A:1630:TYR:HA	1.84	0.59
1:A:4318:PRO:HG2	1:A:4325:ASN:HA	1.85	0.59
1:A:2562:VAL:HG11	1:A:2755:MET:HB2	1.85	0.58
1:A:4287:LYS:H	1:A:4293:ASP:HB3	1.68	0.58
1:A:2279:LEU:HA	1:A:2698:GLN:HG3	1.86	0.58
1:A:2422:ILE:HD13	1:A:2487:GLU:HA	1.85	0.58
1:A:2841:GLU:OE1	1:A:2844:ARG:NH1	2.36	0.58
1:A:3951:VAL:CG2	1:A:3973:LEU:HD21	2.33	0.58
1:A:4071:ILE:HD11	1:A:4096:LEU:HB3	1.86	0.57
1:A:3839:VAL:HG21	1:A:3863:LEU:HA	1.85	0.57
1:A:4544:ASN:HD22	1:A:4589:GLN:HG3	1.70	0.57
1:A:2107:ARG:NH2	1:A:2139:GLN:OE1	2.38	0.57
1:A:3597:THR:HG23	1:A:3634:LEU:HD21	1.86	0.57
1:A:4209:GLU:OE2	1:A:4213:ARG:NE	2.36	0.57
1:A:1567:ARG:O	1:A:1571:ILE:HG13	2.05	0.57
1:A:1931:ASN:HD22	1:A:2317:SER:H	1.51	0.57
1:A:3655:ARG:HG2	1:A:3660:VAL:HG22	1.86	0.56
1:A:4444:GLN:O	1:A:4449:ARG:NH1	2.38	0.56
1:A:2319:LEU:HD13	1:A:2359:CYS:SG	2.45	0.56
1:A:3891:LYS:HD2	1:A:4013:LEU:HD23	1.87	0.56
1:A:3601:MET:HG3	1:A:3611:ARG:NH2	2.21	0.56
1:A:2449:LEU:HD11	1:A:2454:CYS:SG	2.46	0.56
1:A:1490:TRP:HH2	1:A:1537:TRP:CD1	2.17	0.56
1:A:4168:ARG:NE	1:A:4220:ASP:OD1	2.30	0.56
1:A:4071:ILE:HG13	1:A:4099:VAL:HG12	1.87	0.55
1:A:3951:VAL:HG22	1:A:3973:LEU:HD21	1.87	0.55
1:A:4554:ASP:OD1	1:A:4555:ALA:N	2.37	0.55
1:A:3172:THR:HG21	1:A:3694:SER:HB3	1.87	0.55
1:A:2433:VAL:HG22	1:A:2498:ILE:HD11	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1537:TRP:CE3	1:A:1601:LEU:HD11	2.41	0.55
1:A:1985:HIS:CD2	1:A:1997:ILE:HD13	2.41	0.55
1:A:2573:ASP:OD1	1:A:2576:ARG:NH2	2.40	0.55
1:A:1998:THR:HG21	1:A:2005:GLN:HB3	1.88	0.55
1:A:2047:GLN:HA	1:A:2070:VAL:HG21	1.89	0.55
1:A:2294:GLU:OE1	1:A:2294:GLU:N	2.39	0.55
1:A:3580:LEU:HD13	1:A:3600:ILE:HD11	1.89	0.54
1:A:2694:ARG:NH1	1:A:2697:ASP:OD2	2.40	0.54
1:A:1571:ILE:HD12	1:A:1611:ILE:HD11	1.90	0.54
1:A:2596:PRO:HB2	1:A:2738:TYR:CZ	2.43	0.54
1:A:2665:GLU:HB3	1:A:2668:LEU:HD12	1.90	0.53
1:A:3182:HIS:NE2	1:A:3582:ARG:O	2.40	0.53
1:A:1543:ARG:NH1	1:A:1612:GLN:OE1	2.41	0.53
1:A:3914:ILE:O	1:A:3937:ARG:NH1	2.42	0.53
1:A:3691:ASP:OD1	1:A:3692:LEU:N	2.42	0.53
1:A:1887:ARG:HE	1:A:2039:LEU:HD11	1.74	0.53
1:A:3916:LEU:HD11	1:A:3937:ARG:HG3	1.91	0.52
1:A:2621:ASN:OD1	1:A:3014:ASN:ND2	2.43	0.52
1:A:3750:LEU:O	1:A:3754:ASN:ND2	2.42	0.52
1:A:1832:ASN:HD21	1:A:1834:LYS:HB2	1.72	0.52
1:A:1687:LYS:HD3	1:A:1712:THR:HG23	1.91	0.52
1:A:2620:LEU:HD22	1:A:2631:LEU:HD23	1.91	0.52
1:A:3044:LEU:HD22	1:A:3049:GLU:HB3	1.90	0.52
1:A:1965:GLU:HG2	1:A:2026:SER:HB3	1.91	0.52
1:A:2973:ASP:OD2	1:A:3007:ARG:NH2	2.43	0.51
1:A:1487:ILE:HD12	1:A:1537:TRP:HE1	1.73	0.51
1:A:1929:VAL:H	1:A:2332:ARG:NH2	2.09	0.51
1:A:2835:ASP:HB3	1:A:3092:ASN:HD22	1.74	0.51
1:A:1467:ARG:HE	1:A:1523:TRP:HZ2	1.56	0.51
1:A:3624:GLU:HG3	1:A:3669:ILE:HD13	1.93	0.51
1:A:3194:LEU:HD23	1:A:3500:MET:SD	2.51	0.51
1:A:4179:LEU:HD12	1:A:4223:LEU:HD22	1.92	0.51
1:A:4413:PHE:HD2	1:A:4504:LEU:HD13	1.75	0.51
1:A:1860:GLN:HG2	1:A:1865:LYS:HG2	1.93	0.51
1:A:4178:ARG:NH2	1:A:4297:PRO:O	2.44	0.51
1:A:3520:PHE:HB3	1:A:3524:MET:HB3	1.91	0.50
1:A:2224:GLY:O	1:A:2346:GLN:HA	2.12	0.50
1:A:4517:PRO:HG3	1:A:4611:LEU:HD13	1.93	0.50
1:A:2144:THR:HG22	1:A:2145:MET:HE2	1.94	0.50
1:A:3750:LEU:HG	1:A:3754:ASN:HD21	1.76	0.50
1:A:1671:SER:HB2	1:A:1693:THR:HG23	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2487:GLU:O	1:A:2491:GLN:HG3	2.11	0.50
1:A:4460:LEU:HD12	1:A:4461:PRO:HD2	1.93	0.50
1:A:1929:VAL:H	1:A:2332:ARG:HH21	1.59	0.50
1:A:2807:PHE:CE2	1:A:2811:ARG:HD3	2.46	0.50
1:A:4009:VAL:HG13	1:A:4013:LEU:HD12	1.92	0.50
1:A:2638:TYR:HB3	1:A:2659:LEU:HD11	1.93	0.50
1:A:3211:THR:HG23	1:A:3761:LEU:HD11	1.93	0.50
1:A:1575:PHE:O	1:A:1579:MET:HG2	2.12	0.49
1:A:2917:ASP:OD2	1:A:2921:ARG:NH2	2.45	0.49
1:A:2374:ILE:HD13	1:A:2452:LEU:HD21	1.95	0.49
1:A:2564:ALA:HB3	1:A:2567:VAL:HG23	1.94	0.49
1:A:2538:GLU:HB3	1:A:2548:TRP:CE2	2.48	0.49
1:A:1929:VAL:HG13	1:A:1958:ASP:OD2	2.12	0.49
1:A:1914:GLU:HG2	2:A:4701:ADP:O1A	2.13	0.49
1:A:2869:ARG:HA	1:A:2869:ARG:NE	2.28	0.49
1:A:4403:GLU:HA	1:A:4406:LYS:HE2	1.95	0.49
1:A:4436:GLN:HG2	1:A:4442:LYS:HG2	1.95	0.49
1:A:3944:PHE:CE1	1:A:3974:TRP:HB3	2.48	0.49
1:A:4043:MET:HB3	1:A:4051:ALA:HB3	1.95	0.49
1:A:2174:GLU:OE1	1:A:2176:THR:OG1	2.30	0.48
1:A:4400:ARG:HE	1:A:4405:ILE:HD11	1.77	0.48
1:A:1647:VAL:HG21	1:A:1670:ASN:HB3	1.95	0.48
1:A:4387:TRP:CD1	1:A:4479:VAL:HG11	2.47	0.48
1:A:2069:ILE:HB	1:A:2137:LEU:HD21	1.96	0.48
1:A:1959:GLU:HB3	1:A:1962:ARG:HG3	1.96	0.48
1:A:4180:TYR:OH	1:A:4220:ASP:OD1	2.30	0.48
1:A:2211:TYR:O	1:A:2214:THR:OG1	2.29	0.48
1:A:2751:PHE:HB3	1:A:2803:VAL:HG11	1.96	0.48
1:A:3950:LYS:HB3	1:A:3973:LEU:CD1	2.43	0.48
1:A:4251:ILE:HG22	1:A:4252:TYR:CD2	2.49	0.48
1:A:1556:ASP:OD2	1:A:1621:ARG:NH2	2.43	0.47
1:A:2445:HIS:NE2	1:A:2449:LEU:HD22	2.28	0.47
1:A:1761:ASN:HB3	1:A:1781:VAL:HG22	1.96	0.47
1:A:2443:LEU:HD21	1:A:2513:GLU:OE1	2.14	0.47
1:A:4196:TYR:O	1:A:4197:ALA:C	2.52	0.47
1:A:3731:LEU:HD11	1:A:3790:VAL:HG12	1.97	0.47
1:A:1931:ASN:HD21	1:A:2316:ASN:HB2	1.79	0.47
1:A:3175:HIS:CD2	1:A:3585:ARG:HH22	2.32	0.47
1:A:2061:THR:OG1	1:A:2133:GLU:OE1	2.28	0.47
1:A:2386:PRO:HG3	1:A:2413:LEU:HD13	1.97	0.47
1:A:1623:ARG:NH1	1:A:1632:VAL:O	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4628:THR:OG1	1:A:4630:GLU:HG2	2.15	0.47
1:A:2134:GLN:O	1:A:2138:ILE:HG12	2.15	0.47
1:A:2138:ILE:HD11	1:A:2165:PHE:CG	2.50	0.47
1:A:3703:VAL:HG21	1:A:3829:LEU:HD22	1.97	0.47
1:A:3835:ILE:HG12	1:A:3870:ARG:HD2	1.95	0.46
1:A:3966:PRO:HG3	1:A:3997:ARG:HG3	1.97	0.46
1:A:2592:VAL:HG23	1:A:2731:VAL:HG11	1.97	0.46
1:A:4423:LEU:HD13	1:A:4466:HIS:ND1	2.31	0.46
1:A:4175:GLU:OE1	1:A:4175:GLU:N	2.48	0.46
1:A:2179:ARG:NH2	1:A:2195:ASP:OD1	2.43	0.46
1:A:1623:ARG:NH1	1:A:1629:PHE:O	2.47	0.46
1:A:2445:HIS:HB3	1:A:2505:ASP:OD2	2.15	0.46
1:A:3553:LEU:HB2	1:A:3578:ILE:HD13	1.97	0.46
1:A:1931:ASN:ND2	1:A:2316:ASN:HB2	2.31	0.46
1:A:2590:PRO:O	1:A:2732:PRO:HD2	2.15	0.46
1:A:2790:PRO:HB3	1:A:3076:LYS:HG2	1.98	0.46
1:A:3175:HIS:HB3	1:A:3516:TYR:CE1	2.50	0.46
1:A:4172:SER:HB2	1:A:4173:PRO:HD3	1.98	0.45
1:A:3110:THR:O	1:A:3140:ARG:NH1	2.49	0.45
1:A:1721:VAL:HA	1:A:1724:VAL:HG12	1.98	0.45
1:A:1937:ASP:HA	1:A:1967:MET:HG3	1.98	0.45
1:A:2688:GLU:OE1	1:A:2689:HIS:CE1	2.69	0.45
1:A:2961:ILE:HD11	1:A:2998:ASN:HB3	1.98	0.45
1:A:3117:LYS:HE2	1:A:3139:HIS:CD2	2.51	0.45
1:A:3921:THR:HG21	1:A:3933:GLU:HG2	1.98	0.45
1:A:4087:ALA:HA	1:A:4092:ARG:HB3	1.98	0.45
1:A:3217:GLU:HB2	1:A:3220:ARG:HH21	1.82	0.45
1:A:1879:LEU:HD22	2:A:4701:ADP:C4	2.51	0.45
1:A:4401:THR:O	1:A:4405:ILE:HG12	2.17	0.45
1:A:2668:LEU:HD21	1:A:2720:ARG:CZ	2.47	0.45
1:A:4412:PHE:HZ	1:A:4514:LEU:HD13	1.82	0.45
1:A:4190:ILE:HD12	1:A:4201:TRP:CZ2	2.45	0.45
1:A:4517:PRO:HG2	1:A:4619:ILE:HD12	1.98	0.45
1:A:2963:VAL:HG23	1:A:3643:PRO:HB2	1.99	0.44
1:A:1635:GLU:HA	1:A:1638:LEU:HD12	1.98	0.44
1:A:2290:SER:HB2	1:A:2295:LEU:HG	1.99	0.44
1:A:4100:HIS:HB3	1:A:4128:MET:HB2	1.99	0.44
1:A:1697:LYS:HB3	1:A:1700:GLU:OE1	2.18	0.44
1:A:2912:PHE:CE2	1:A:2914:GLU:HB2	2.52	0.44
1:A:3485:GLU:HG3	1:A:3488:ARG:HH22	1.83	0.44
1:A:4185:TRP:O	1:A:4189:ILE:HG12	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4189:ILE:O	1:A:4193:ARG:HG3	2.17	0.44
1:A:4034:GLU:OE1	1:A:4143:ARG:NH1	2.41	0.44
1:A:4160:THR:HG23	1:A:4212:LEU:HD21	1.99	0.44
1:A:4186:PHE:O	1:A:4190:ILE:HG12	2.18	0.44
1:A:1980:GLU:OE2	1:A:1983:ARG:NH1	2.51	0.44
1:A:2548:TRP:CD1	1:A:2576:ARG:HG2	2.53	0.44
1:A:1625:SER:HB2	1:A:1699:ASN:ND2	2.33	0.44
1:A:3601:MET:HG3	1:A:3611:ARG:HH21	1.80	0.44
1:A:2776:PHE:HZ	1:A:2846:THR:HG23	1.83	0.43
1:A:1763:GLU:OE2	1:A:1838:TRP:NE1	2.37	0.43
1:A:3160:ARG:O	1:A:3163:LYS:HG2	2.17	0.43
1:A:3880:HIS:ND1	1:A:4021:MET:HG3	2.33	0.43
1:A:1666:LEU:HD23	1:A:1673:VAL:HA	2.00	0.43
1:A:1724:VAL:HG11	1:A:1753:SER:HB3	2.00	0.43
1:A:2437:LEU:HD21	1:A:2451:ARG:HG3	2.00	0.43
1:A:2557:VAL:O	1:A:2757:ARG:NH2	2.52	0.43
1:A:2994:MET:HG3	1:A:2998:ASN:HD22	1.84	0.43
1:A:4227:ALA:HB2	1:A:4233:ILE:HD12	2.01	0.43
1:A:4415:ARG:HE	1:A:4415:ARG:HB3	1.54	0.43
1:A:2028:LEU:HG	1:A:2032:LEU:HD23	1.99	0.43
1:A:2457:SER:O	1:A:2461:MET:HG3	2.18	0.43
1:A:4437:VAL:HG21	1:A:4448:LEU:HD13	2.00	0.43
1:A:3154:LEU:HG	1:A:3516:TYR:CD1	2.54	0.43
1:A:2538:GLU:HB3	1:A:2548:TRP:CZ2	2.54	0.43
1:A:3148:VAL:O	1:A:3152:GLN:HG3	2.19	0.43
1:A:3240:LEU:HD23	1:A:3240:LEU:HA	1.93	0.43
1:A:2882:ILE:HB	1:A:2883:PRO:HD2	2.01	0.43
1:A:2975:ASP:O	1:A:2979:VAL:HG23	2.18	0.43
1:A:3514:ILE:HD11	1:A:3553:LEU:HD13	2.00	0.43
1:A:4297:PRO:HB3	1:A:4308:TRP:CD1	2.54	0.43
1:A:4415:ARG:O	1:A:4419:MET:HG2	2.19	0.43
1:A:4611:LEU:HB2	1:A:4619:ILE:HD11	2.00	0.43
1:A:1997:ILE:H	1:A:1997:ILE:HD12	1.83	0.42
1:A:2230:LYS:HG2	1:A:2364:PHE:CG	2.54	0.42
1:A:3232:LYS:HA	1:A:3232:LYS:HD3	1.76	0.42
1:A:3745:LEU:HD13	1:A:3777:ALA:HA	2.01	0.42
1:A:2825:TRP:CZ3	1:A:2854:ALA:HB2	2.55	0.42
1:A:3096:ASP:OD1	1:A:3097:TRP:N	2.50	0.42
1:A:3110:THR:O	1:A:3113:MET:HB2	2.19	0.42
1:A:4173:PRO:HD2	1:A:4176:ARG:HH21	1.84	0.42
1:A:4395:LEU:HD12	1:A:4395:LEU:HA	1.86	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3558:GLU:HG2	1:A:3562:TRP:CE2	2.54	0.42
1:A:2079:GLN:HB2	1:A:2160:LEU:HD11	2.00	0.42
1:A:4196:TYR:CZ	1:A:4318:PRO:HB3	2.55	0.42
1:A:3194:LEU:HD21	1:A:3499:GLN:HB2	2.01	0.42
1:A:2784:PHE:HB3	1:A:2792:TYR:CD2	2.54	0.42
1:A:2488:ARG:CG	1:A:2492:ARG:HH12	2.32	0.42
1:A:1475:LEU:HD12	1:A:1591:VAL:HG21	2.02	0.41
1:A:1899:ARG:N	1:A:1899:ARG:HD2	2.34	0.41
1:A:2163:ASP:OD1	1:A:4530:GLN:NE2	2.53	0.41
1:A:2581:LEU:HD12	1:A:2604:THR:HG22	2.02	0.41
1:A:2961:ILE:HG13	1:A:2963:VAL:HG13	2.00	0.41
1:A:3862:ASP:OD1	1:A:3866:VAL:HG23	2.20	0.41
1:A:4412:PHE:CZ	1:A:4520:TYR:HB2	2.55	0.41
1:A:4423:LEU:HD22	1:A:4466:HIS:HB2	2.01	0.41
1:A:1526:LYS:O	1:A:1530:ILE:HG13	2.20	0.41
1:A:3741:ARG:NH2	1:A:3776:GLU:OE1	2.53	0.41
1:A:4546:THR:HG21	1:A:4589:GLN:HE21	1.85	0.41
1:A:1490:TRP:HZ3	1:A:1534:PHE:HB3	1.83	0.41
1:A:3209:LYS:HB2	1:A:3209:LYS:HE2	1.77	0.41
1:A:3908:PHE:HE1	1:A:4001:LEU:HD11	1.86	0.41
1:A:4260:PHE:HD1	1:A:4263:ARG:NH2	2.19	0.41
1:A:1623:ARG:NH2	1:A:1634:ASP:OD1	2.54	0.41
1:A:1853:VAL:HA	1:A:1856:GLN:HG3	2.01	0.41
1:A:2070:VAL:HB	1:A:2071:PRO:HD3	2.02	0.41
1:A:2631:LEU:HD13	1:A:2686:MET:HE1	2.02	0.41
1:A:3115:LEU:HD13	1:A:3143:ILE:HG21	2.01	0.41
1:A:2107:ARG:HD2	1:A:2136:ILE:HG12	2.03	0.41
1:A:3740:LEU:O	1:A:3744:GLN:HG3	2.20	0.41
1:A:1895:ALA:HB2	1:A:2037:ARG:HB2	2.02	0.41
1:A:3951:VAL:HG23	1:A:3973:LEU:HD21	2.01	0.41
1:A:2091:ARG:NH1	2:A:4701:ADP:H5'2	2.36	0.41
1:A:3584:ASN:O	1:A:3651:ARG:NH2	2.53	0.41
1:A:4150:PRO:O	1:A:4195:ARG:NH2	2.53	0.41
1:A:1834:LYS:HA	1:A:1834:LYS:HD3	1.88	0.41
1:A:2226:SER:OG	1:A:2729:ARG:HD2	2.21	0.41
1:A:2912:PHE:HE2	1:A:2914:GLU:HB2	1.86	0.41
1:A:3017:VAL:HB	1:A:3020:LEU:HB2	2.03	0.41
1:A:3985:GLN:HB3	1:A:3989:ARG:NH1	2.36	0.41
1:A:4099:VAL:HG23	1:A:4106:LEU:HD11	2.02	0.41
1:A:4553:LEU:HD23	1:A:4553:LEU:HA	1.87	0.41
1:A:1738:TYR:HE2	1:A:1792:LEU:HD21	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2132:PRO:HB2	1:A:2135:GLU:HB3	2.02	0.41
1:A:2582:TYR:CE2	1:A:2612:LEU:HD13	2.56	0.41
1:A:2667:ASN:OD1	1:A:2712:CYS:HB2	2.20	0.41
1:A:3588:LEU:HD21	1:A:3638:VAL:HG11	2.02	0.41
1:A:3716:VAL:HB	1:A:3836:TYR:OH	2.20	0.41
1:A:1508:LYS:HG2	1:A:1513:TYR:CZ	2.56	0.41
1:A:3229:LEU:HD12	1:A:3465:LEU:HD13	2.03	0.40
1:A:3912:ASN:O	1:A:3937:ARG:NH1	2.54	0.40
1:A:4002:LEU:HD11	1:A:4335:GLN:HB3	2.04	0.40
1:A:4399:LYS:HE2	1:A:4399:LYS:HB3	1.95	0.40
1:A:3001:ASP:OD1	1:A:3002:SER:N	2.54	0.40
1:A:3821:ILE:HB	1:A:4342:LYS:HG2	2.04	0.40
1:A:1744:LYS:HD3	1:A:1745:TYR:CE2	2.55	0.40
1:A:2059:PHE:CZ	1:A:2104:LYS:HD3	2.55	0.40
1:A:2290:SER:HA	1:A:2294:GLU:OE1	2.21	0.40
1:A:3892:LEU:HD13	1:A:3983:ILE:HG21	2.03	0.40
1:A:1612:GLN:HG3	1:A:1638:LEU:HD13	2.04	0.40
1:A:2229:GLY:HA2	3:A:4702:ATP:O2A	2.21	0.40
1:A:2839:GLU:OE1	1:A:2839:GLU:HA	2.22	0.40
1:A:4534:TRP:CD2	1:A:4594:LYS:HD3	2.56	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	2929/4646 (63%)	2882 (98%)	45 (2%)	2 (0%)	48 71

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4197	ALA

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Mol	Chain	Res	Type
1	A	4198	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	2605/4125 (63%)	2604 (100%)	1 (0%)	100 100

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2471	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1643	ASN
1	A	1931	ASN
1	A	2554	GLN
1	A	2713	ASN
1	A	3092	ASN
1	A	3200	HIS
1	A	3602	ASN
1	A	3735	GLN
1	A	3754	ASN
1	A	4335	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	ADP	A	4704	-	24,29,29	0.75	0	29,45,45	0.74	1 (3%)
2	ADP	A	4703	-	24,29,29	0.75	0	29,45,45	0.73	1 (3%)
3	ATP	A	4702	4	28,33,33	0.76	0	34,52,52	0.79	1 (2%)
2	ADP	A	4701	4	24,29,29	0.74	0	29,45,45	0.75	1 (3%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ADP	A	4704	-	-	2/12/32/32	0/3/3/3
2	ADP	A	4703	-	-	1/12/32/32	0/3/3/3
3	ATP	A	4702	4	-	2/18/38/38	0/3/3/3
2	ADP	A	4701	4	-	0/12/32/32	0/3/3/3

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	4701	ADP	C5-C6-N6	2.34	123.87	120.31
2	A	4704	ADP	C5-C6-N6	2.31	123.83	120.31
2	A	4703	ADP	C5-C6-N6	2.26	123.75	120.31
3	A	4702	ATP	C5-C6-N6	2.22	123.70	120.31

There are no chirality outliers.

All (5) torsion outliers are listed below:

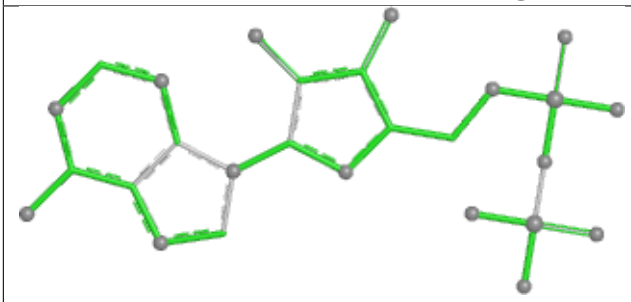
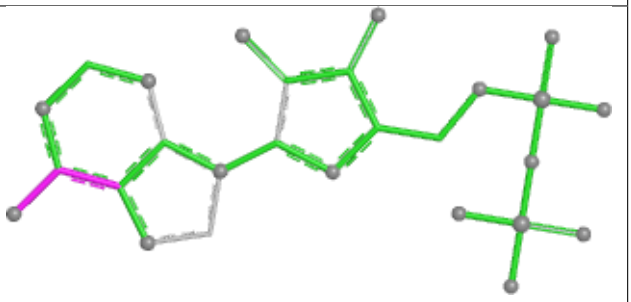
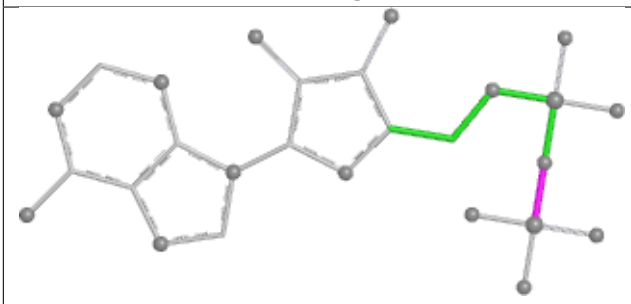
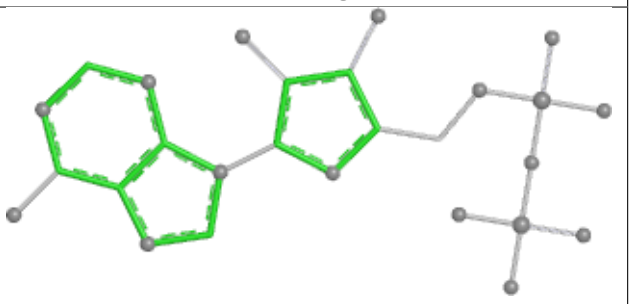
Mol	Chain	Res	Type	Atoms
2	A	4704	ADP	PA-O3A-PB-O2B
3	A	4702	ATP	O4'-C4'-C5'-O5'
2	A	4704	ADP	PA-O3A-PB-O1B
3	A	4702	ATP	C3'-C4'-C5'-O5'
2	A	4703	ADP	PA-O3A-PB-O3B

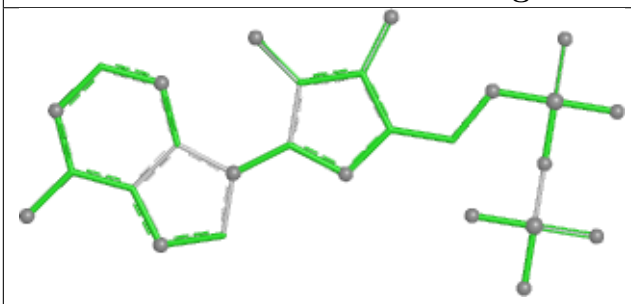
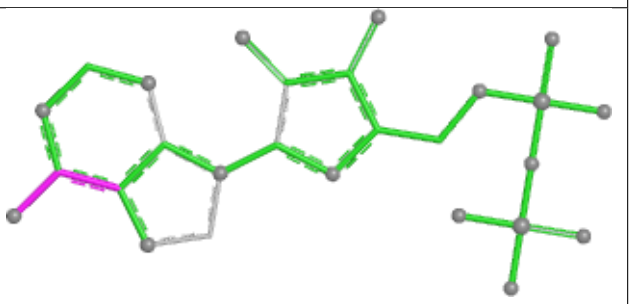
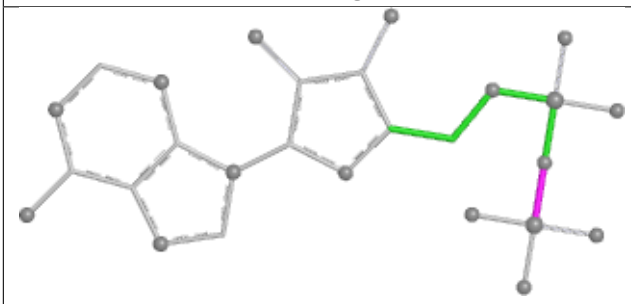
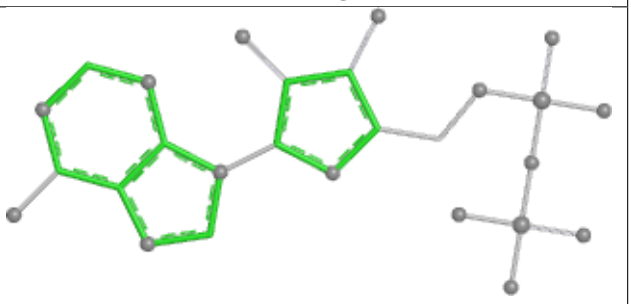
There are no ring outliers.

2 monomers are involved in 7 short contacts:

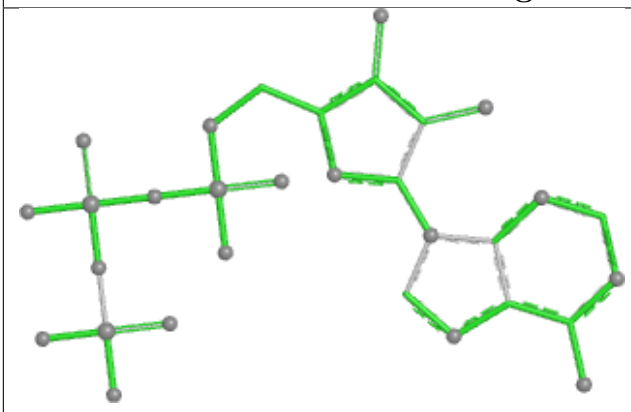
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	4702	ATP	4	0
2	A	4701	ADP	3	0

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.

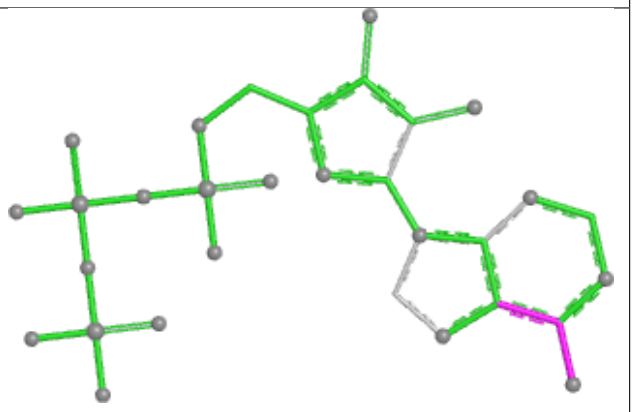
Ligand ADP A 4704	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ADP A 4703	
 Bond lengths	 Bond angles
 Torsions	 Rings

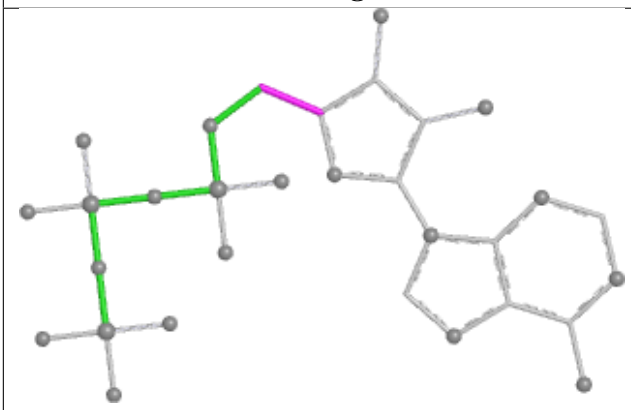
Ligand ATP A 4702



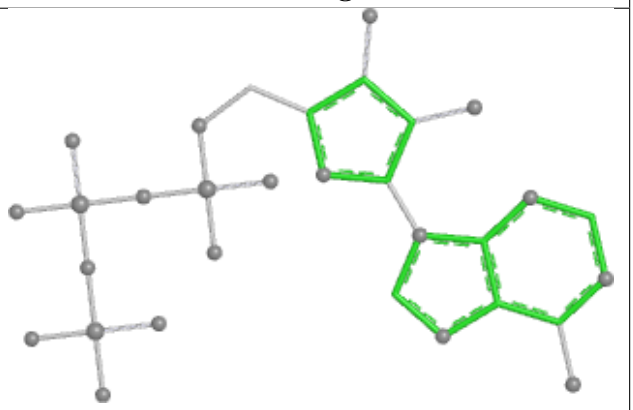
Bond lengths



Bond angles

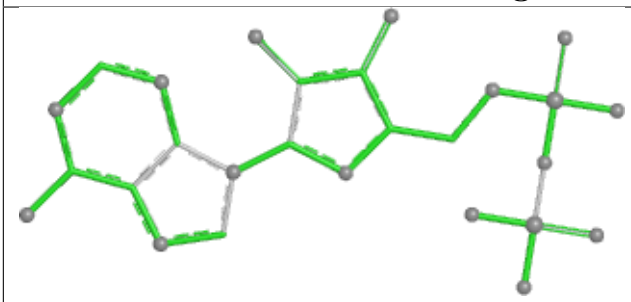


Torsions

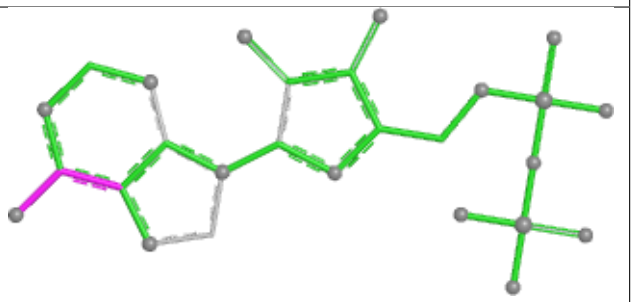


Rings

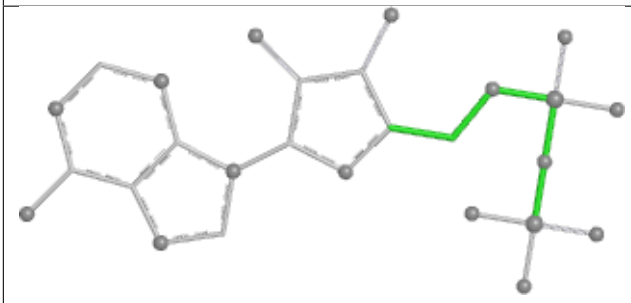
Ligand ADP A 4701



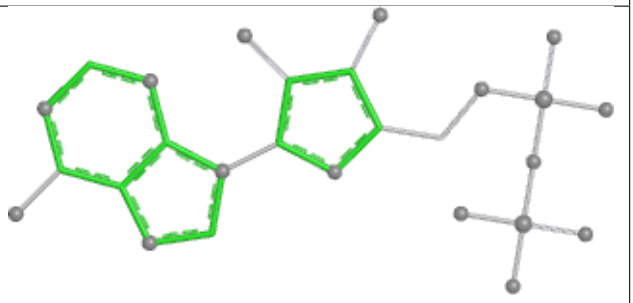
Bond lengths



Bond angles



Torsions



Rings

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.

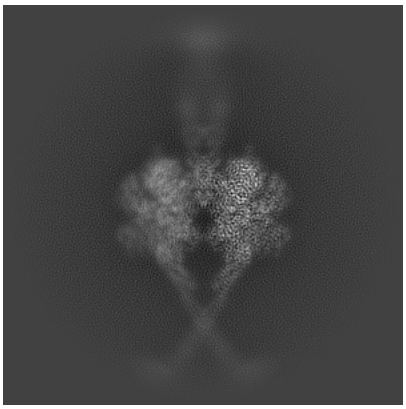
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-44708. These allow visual inspection of the internal detail of the map and identification of artifacts.

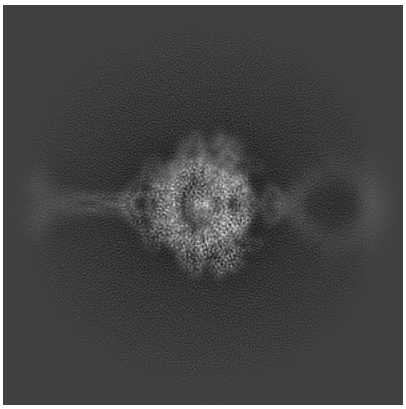
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

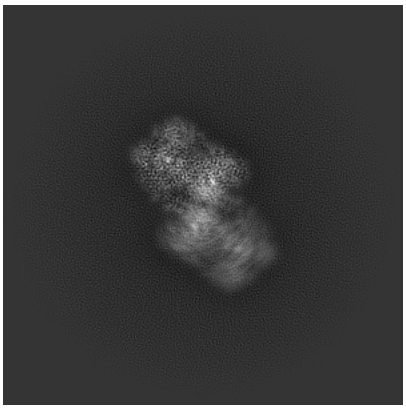
6.1.1 Primary map



X

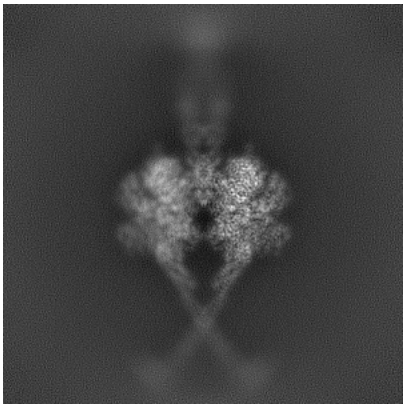


Y

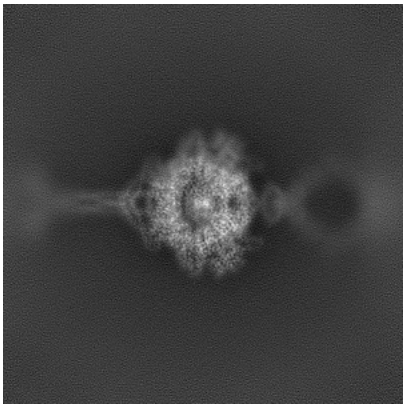


Z

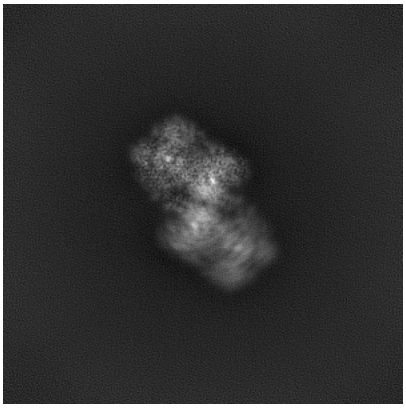
6.1.2 Raw map



X



Y

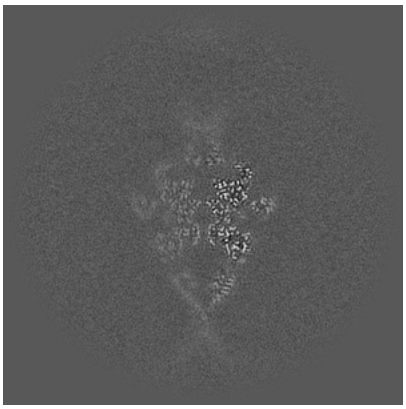


Z

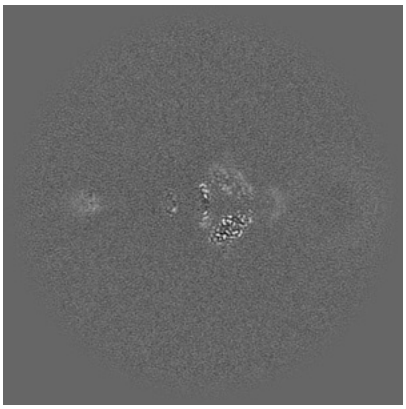
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

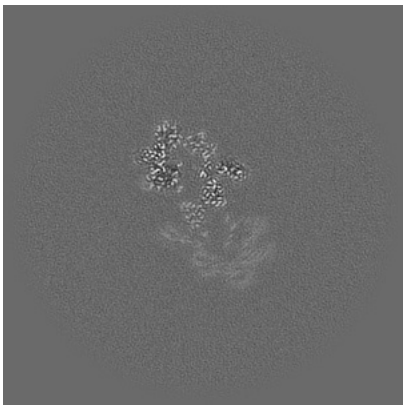
6.2.1 Primary map



X Index: 192

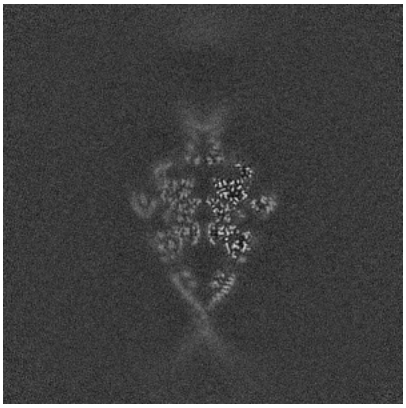


Y Index: 192

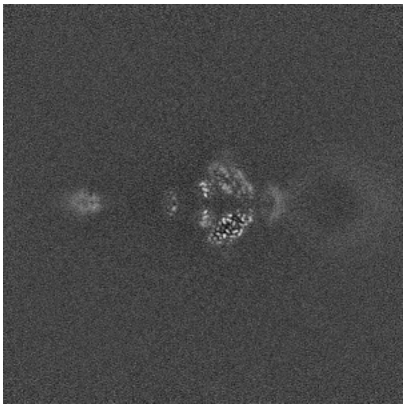


Z Index: 192

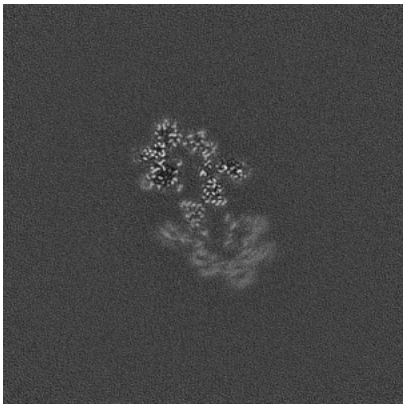
6.2.2 Raw map



X Index: 192



Y Index: 192

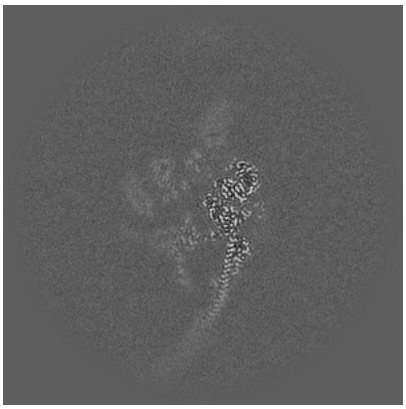


Z Index: 192

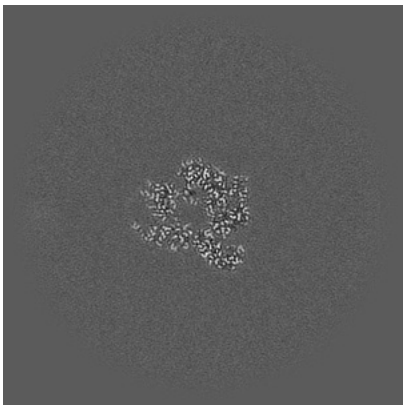
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

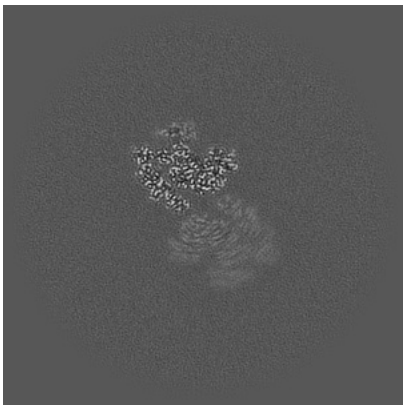
6.3.1 Primary map



X Index: 201



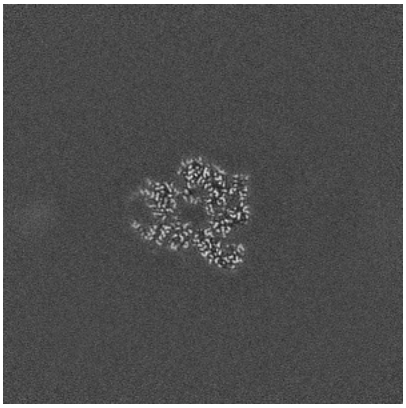
Y Index: 226



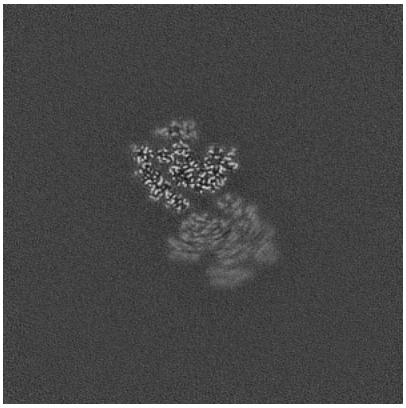
Z Index: 211

6.3.2 Raw map

X Index: 201



Y Index: 226

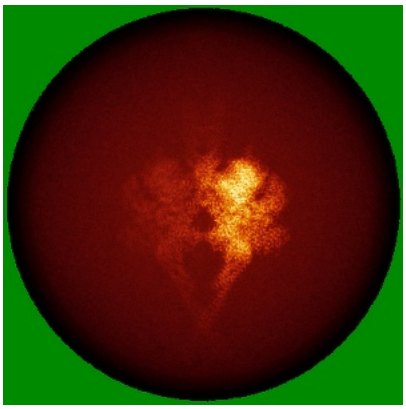


Z Index: 211

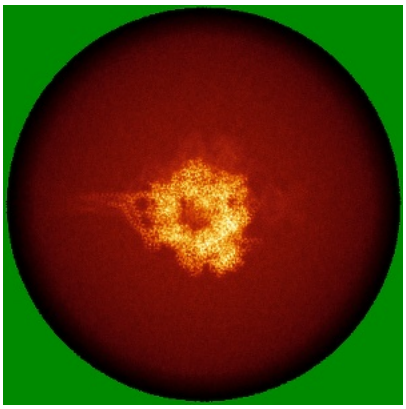
The images above show the largest variance slices of the map in three orthogonal directions.

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

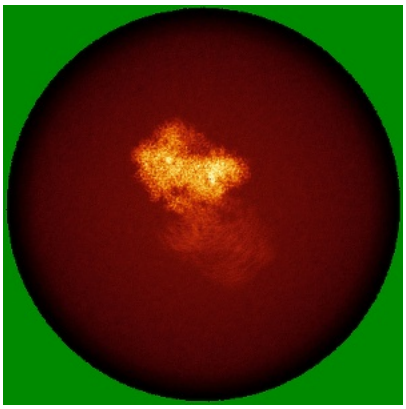
6.4.1 Primary map



X

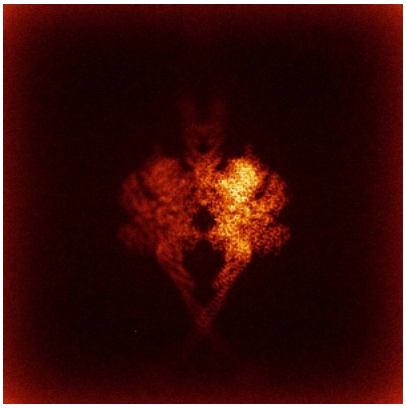


Y

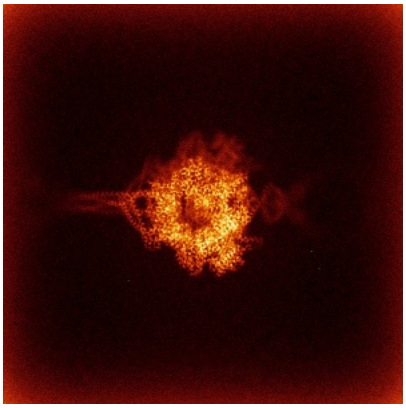


Z

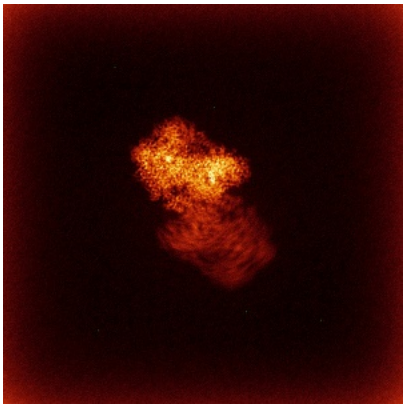
6.4.2 Raw map



X



Y

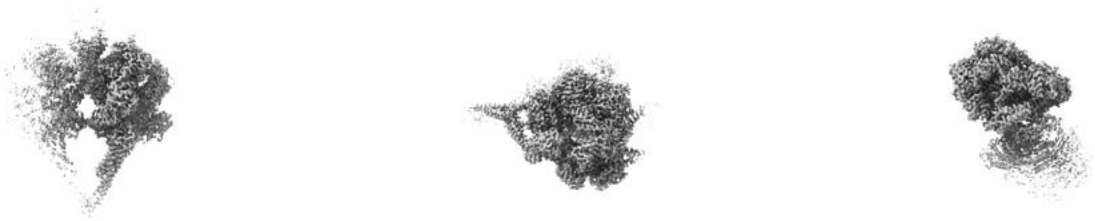


Z

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 0.38. 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.

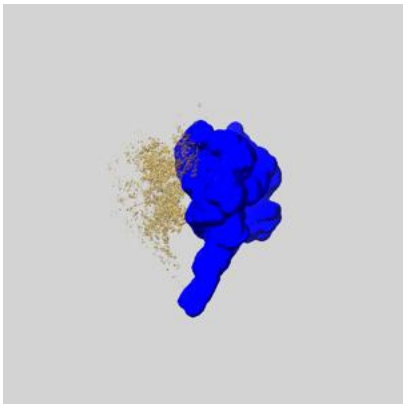
6.6 Mask visualisation (i)

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

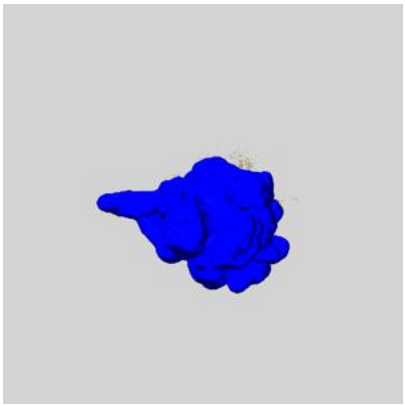
A mask typically either:

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

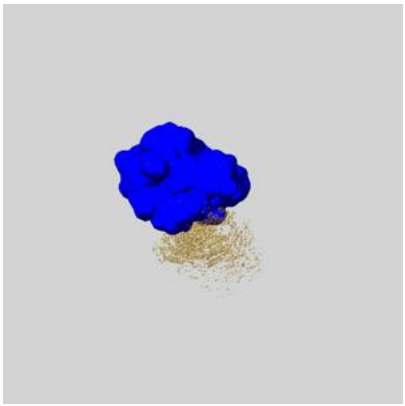
6.6.1 emd_44708_msk_1.map (i)



X



Y

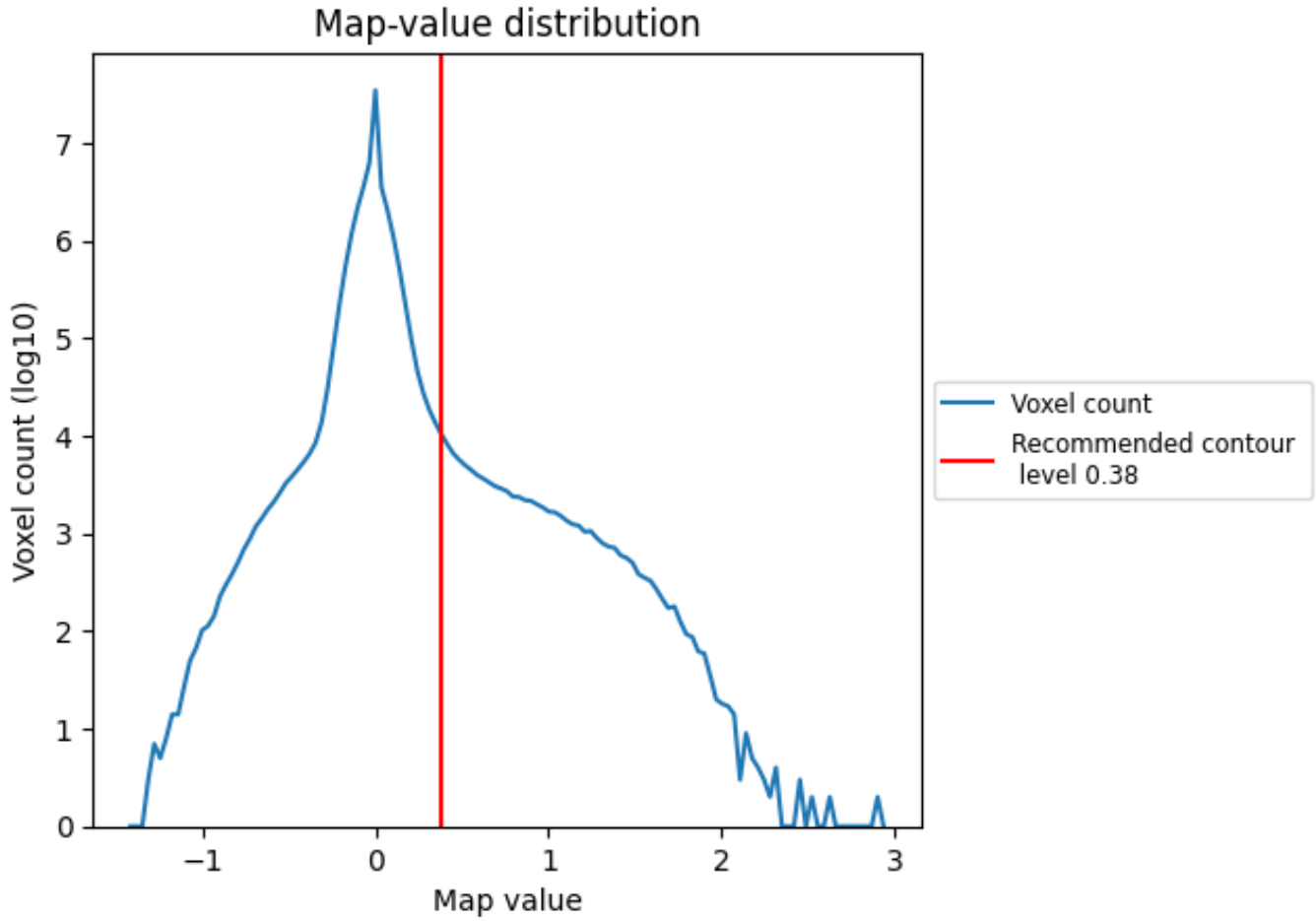


Z

7 Map analysis

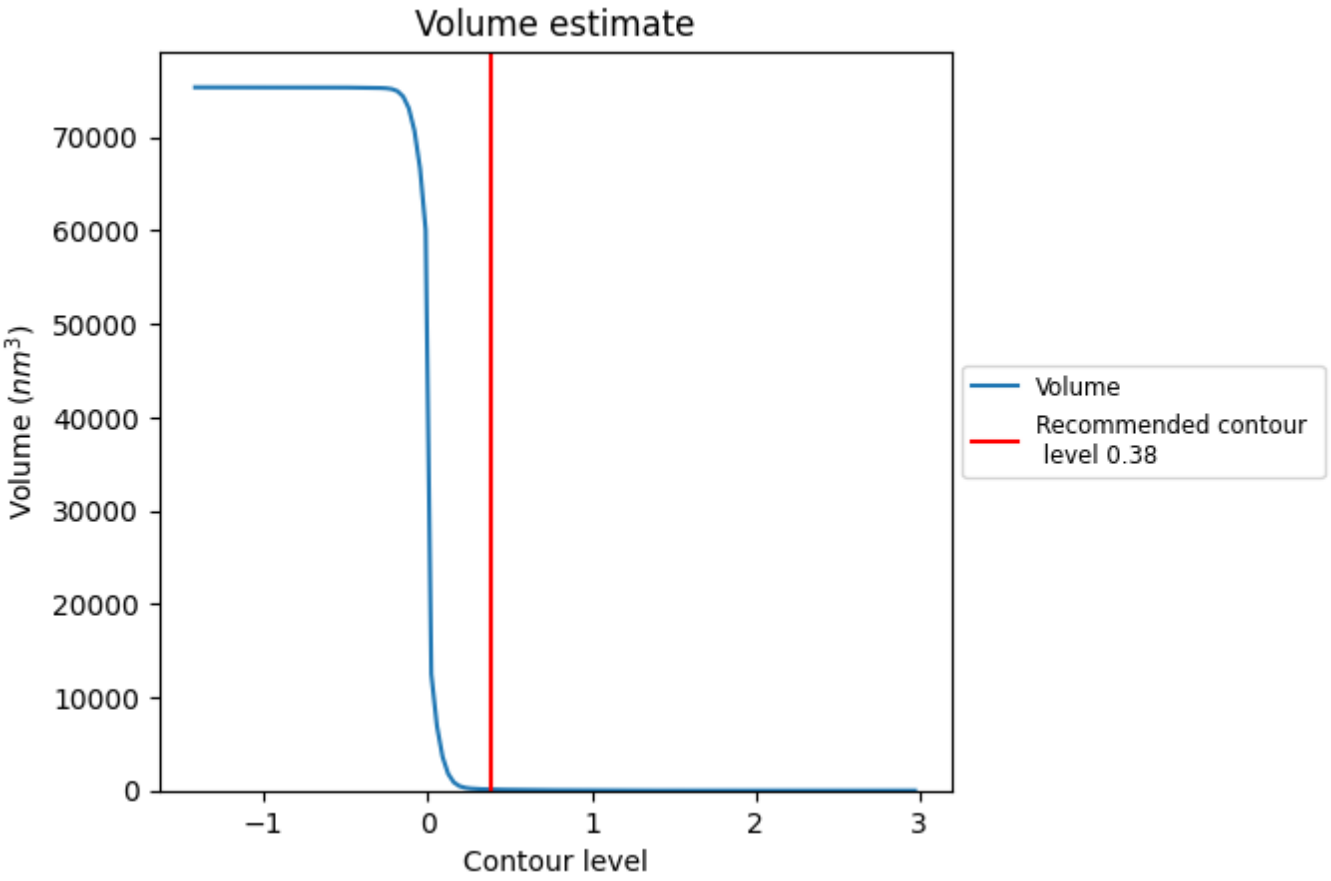
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

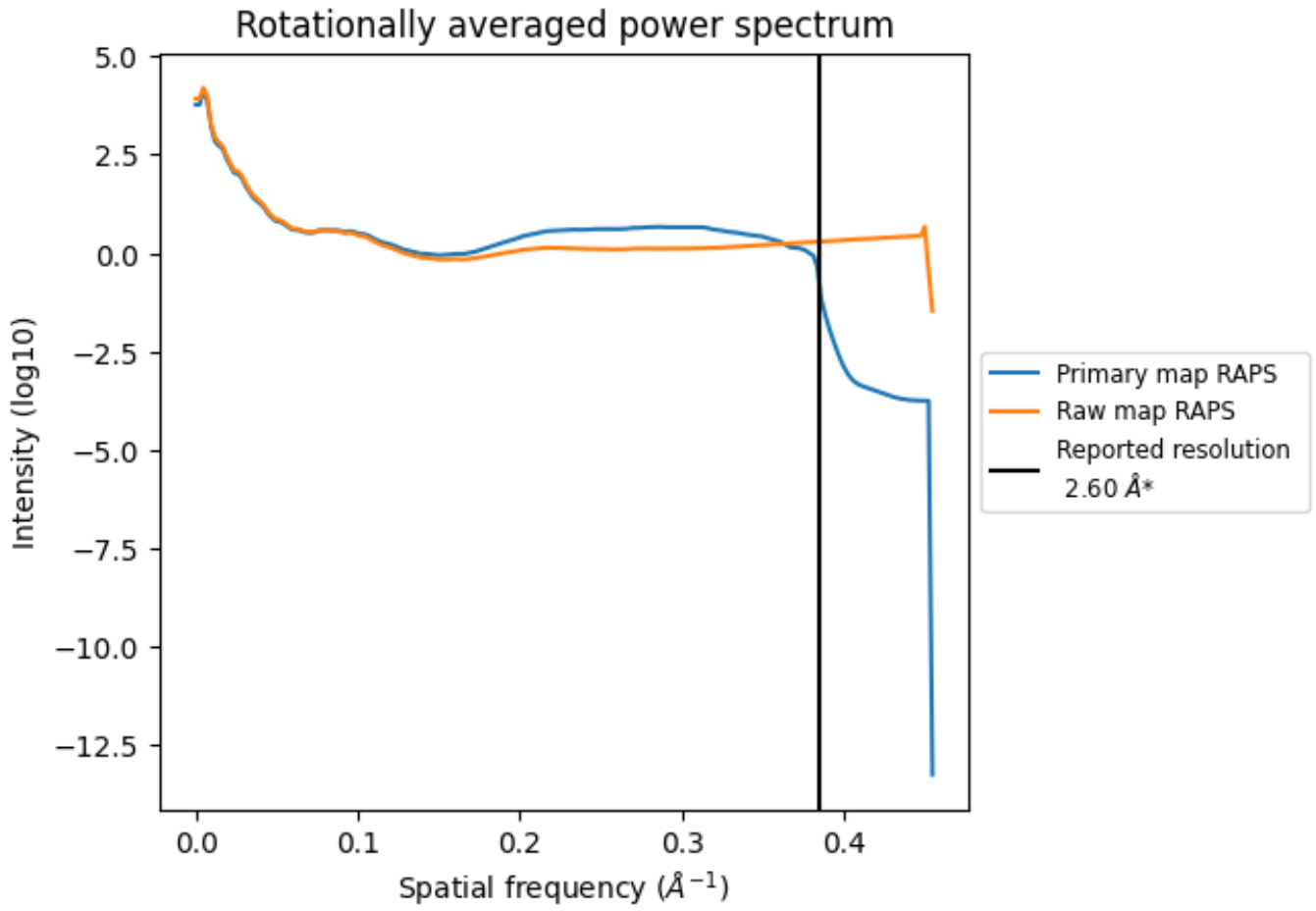
7.2 Volume estimate



The volume at the recommended contour level is 121 nm^3; this corresponds to an approximate mass of 109 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)

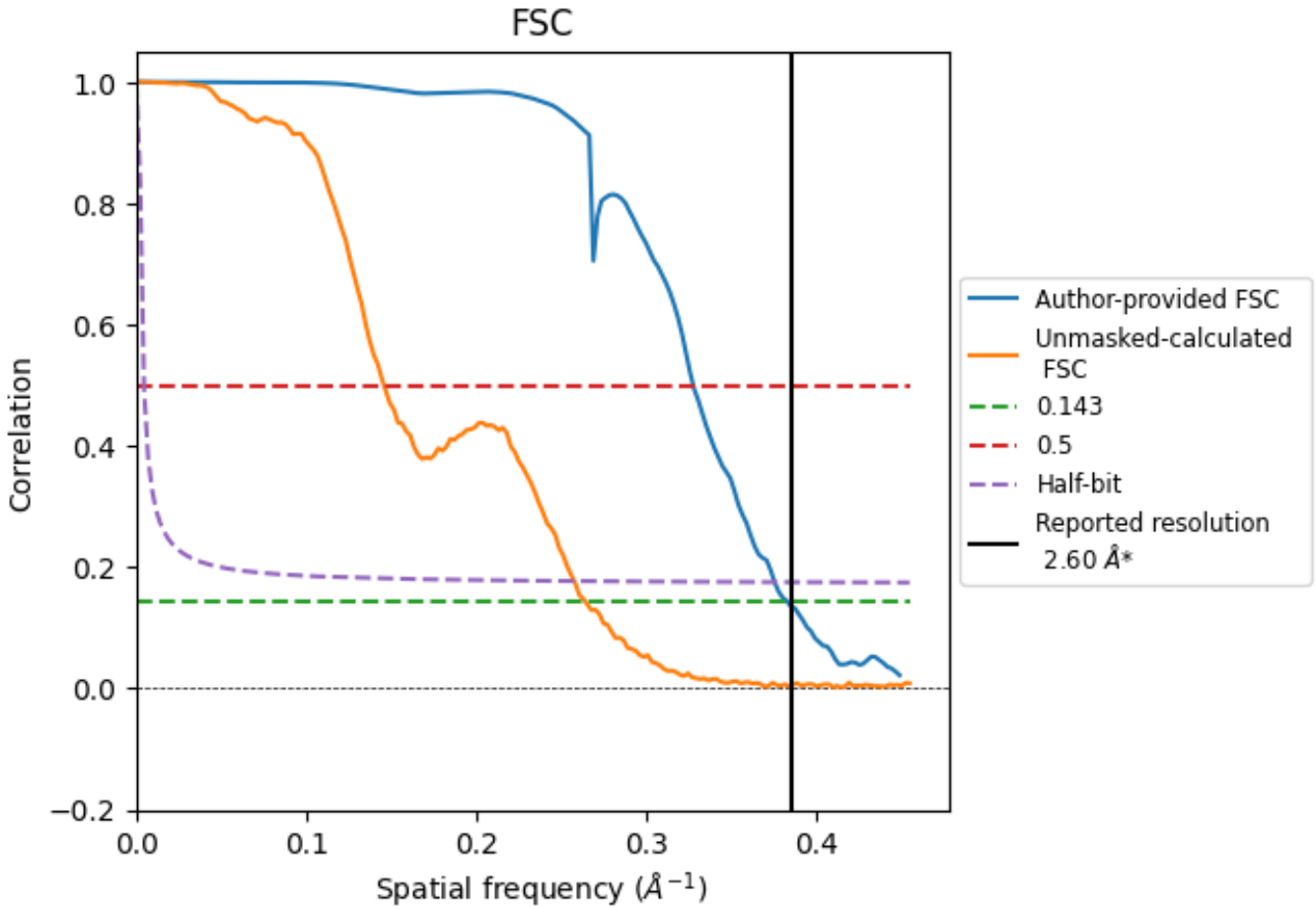


*Reported resolution corresponds to spatial frequency of 0.385 $Å^{-1}$

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 0.385 Å^{-1}

8.2 Resolution estimates (i)

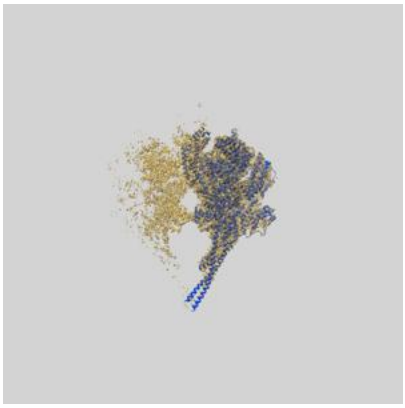
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.60	-	-
Author-provided FSC curve	2.61	3.05	2.67
Unmasked-calculated*	3.79	6.86	3.88

*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 3.79 differs from the reported value 2.6 by more than 10 %

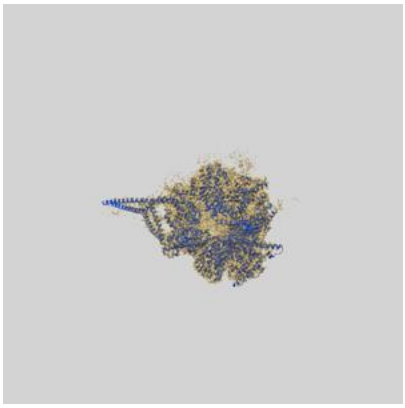
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-44708 and PDB model 9BMR. Per-residue inclusion information can be found in section 3 on page 5.

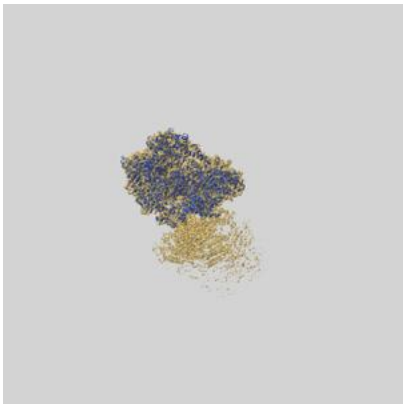
9.1 Map-model overlay



X



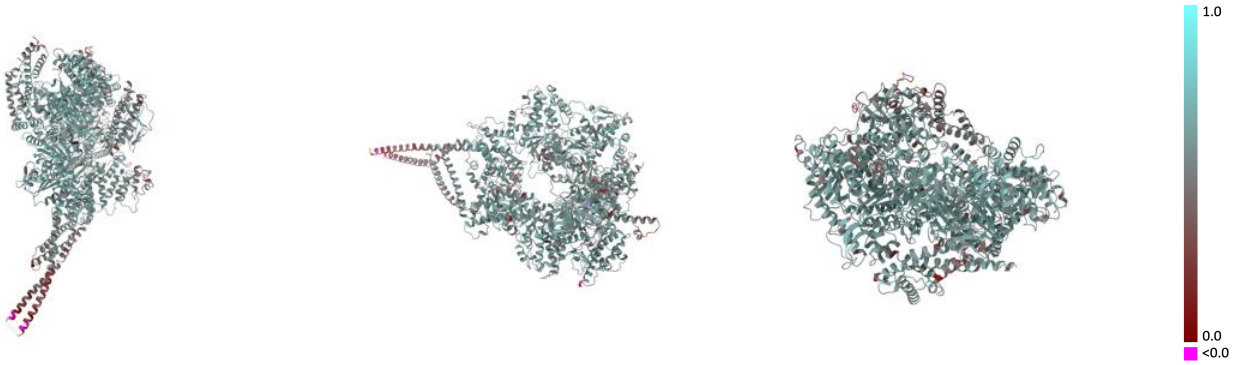
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.38 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.

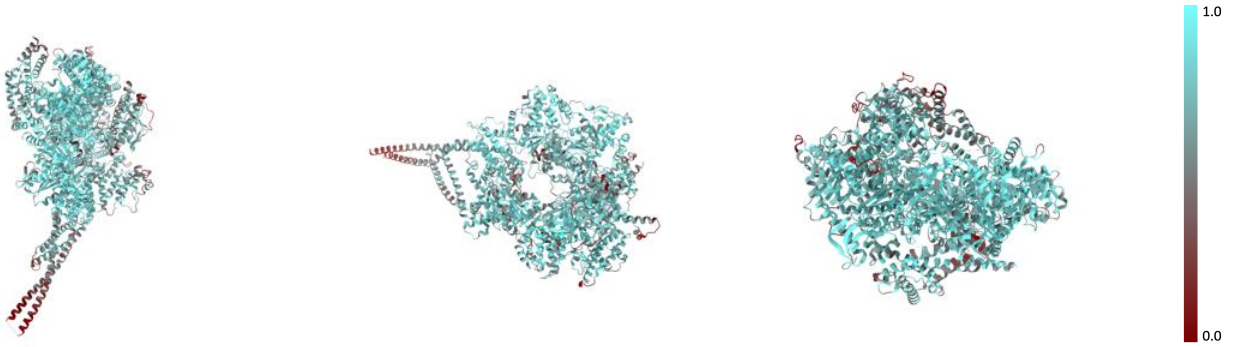
9.2 Q-score mapped to coordinate model (i)



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.

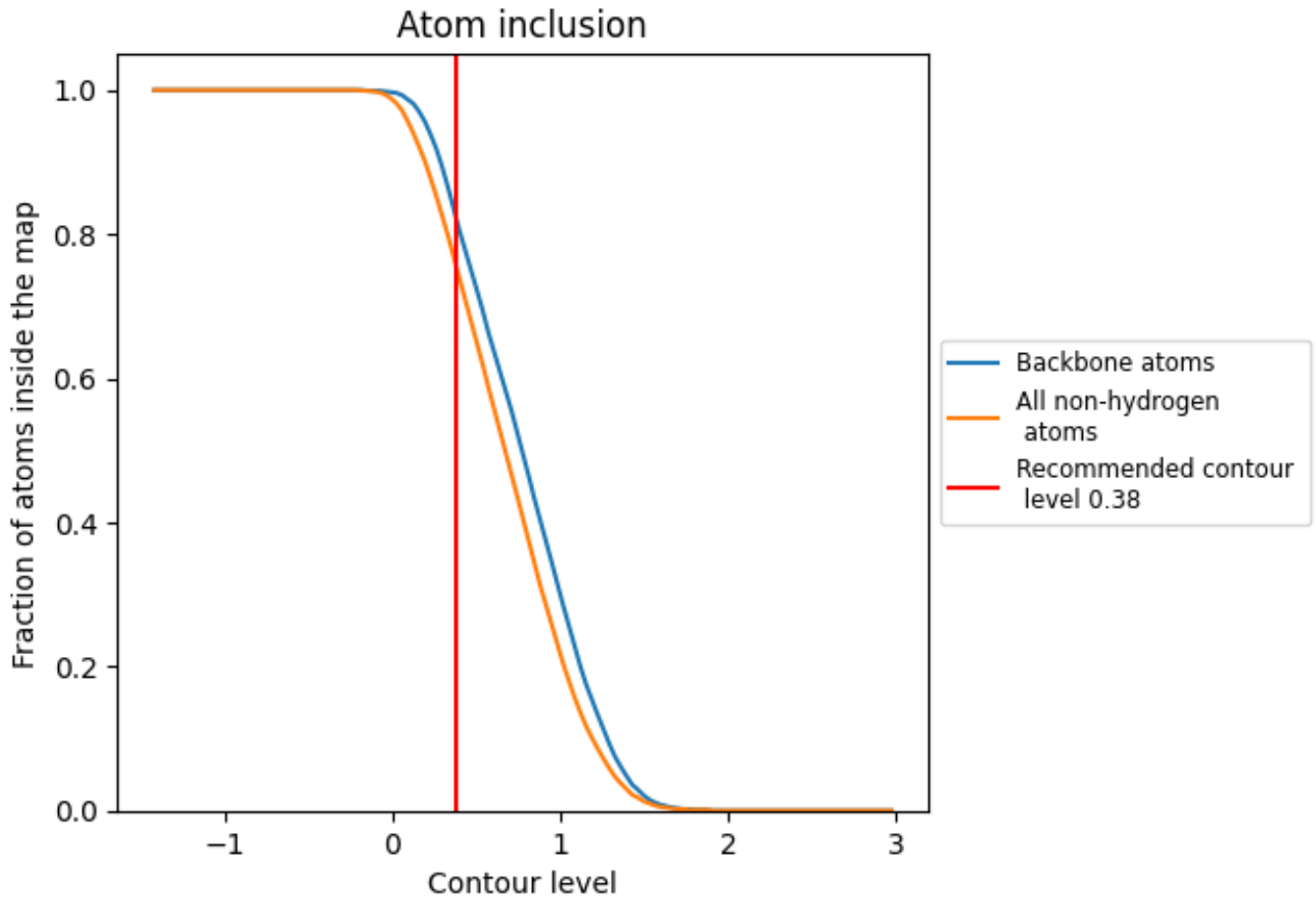
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.38).

9.4 Atom inclusion (i)



At the recommended contour level, 82% of all backbone atoms, 76% 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 (0.38) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7550	0.5630
A	0.7550	0.5630