wwPDB EM Validation Summary Report (i)

Apr 24, 2025 – 01:04 PM EDT

PDB ID	:	9BM3 / pdb_00009bm3
EMDB ID	:	EMD-44686
Title	:	State-5a of motor domain from full-length human dynein-1 in 5 mM ATP
Authors	:	Chai, P.; Zhang, K.
Deposited on	:	2024-05-02
Resolution	:	3.49 Å(reported)

This is a wwPDB EM Validation Summary 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:

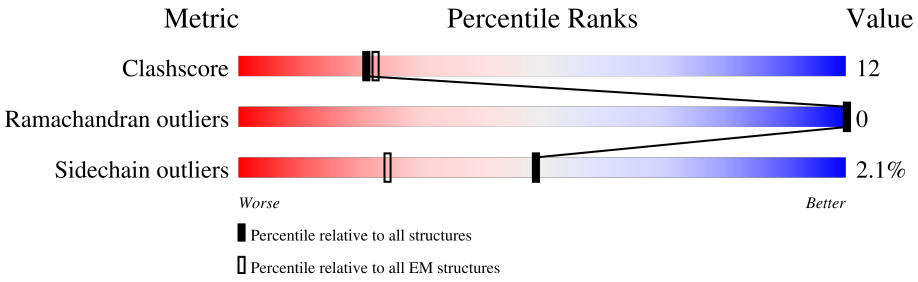
EMDB validation analysis	:	0.0.1.dev117
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, 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 3.49 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	9% 42% 16% • 42%

2 Entry composition

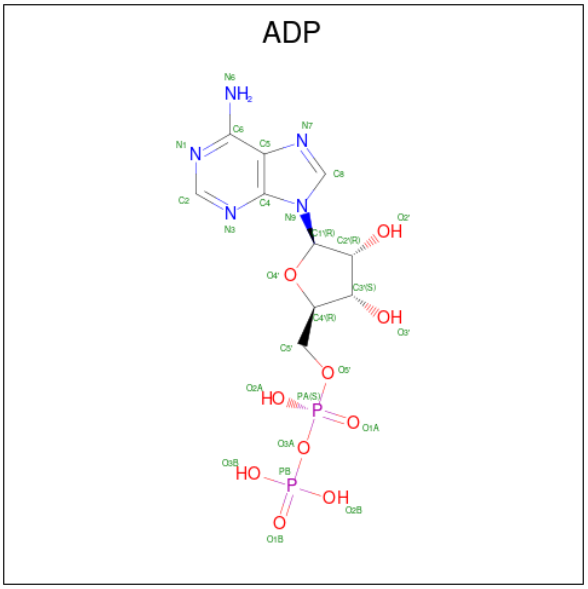
There are 3 unique types of molecules in this entry. The entry contains 21867 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

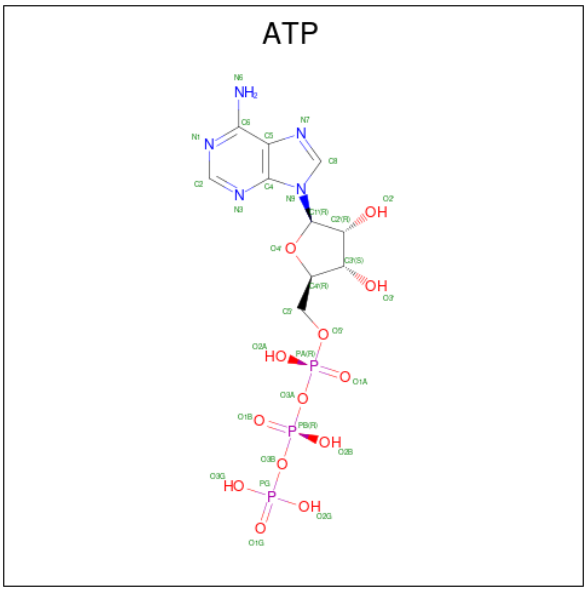
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2711	21755	13852	3757	4035	111	0	0

- 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
2	A	1	Total	C	N	O	P	0
			27	10	5	10	2	
2	A	1	Total	C	N	O	P	0
			27	10	5	10	2	

- 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).



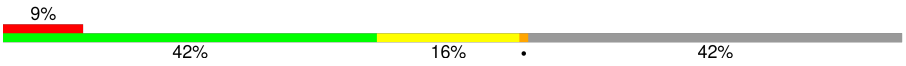
Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			31	10	5	13	3	

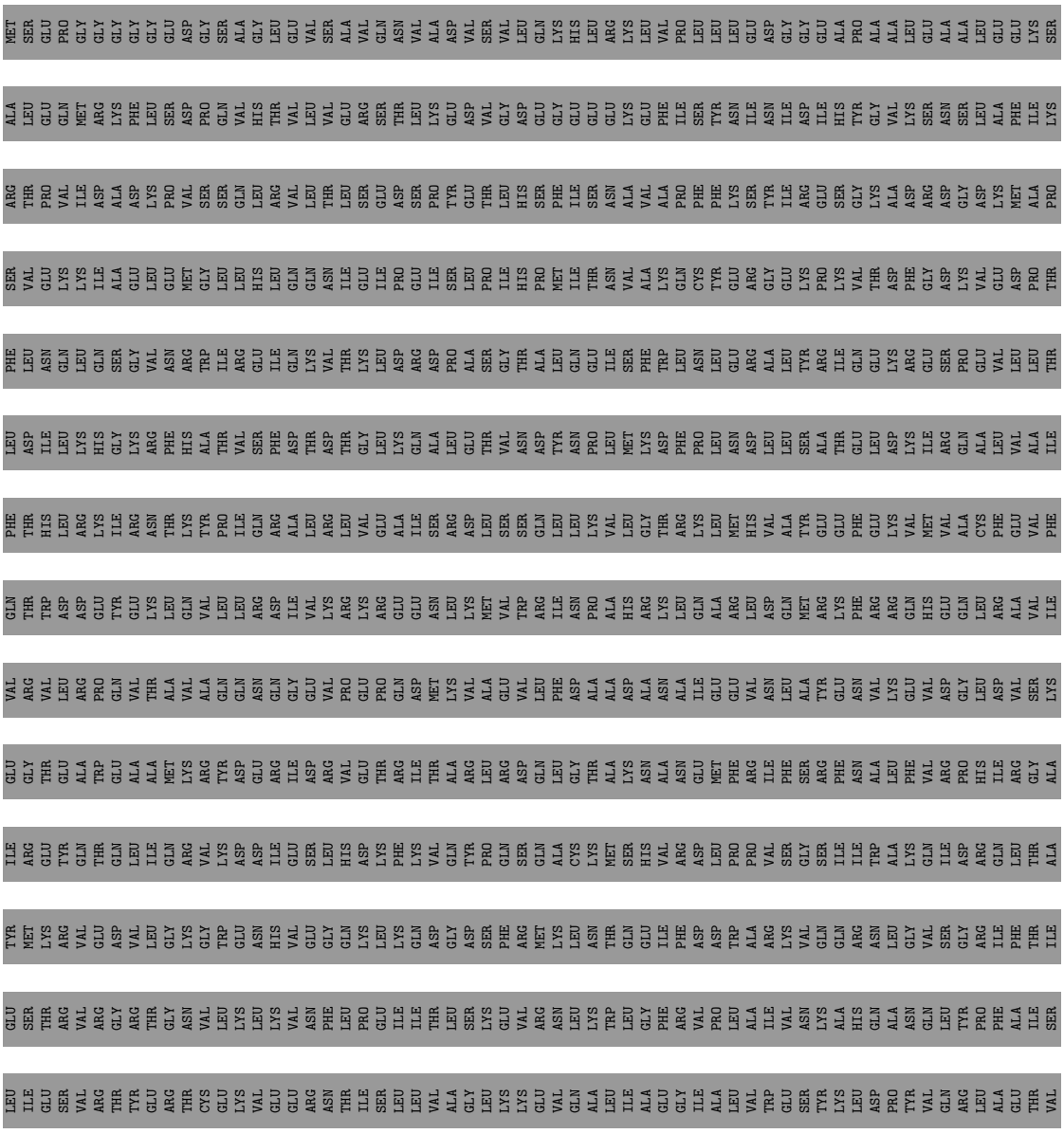
3 Residue-property plots (i)

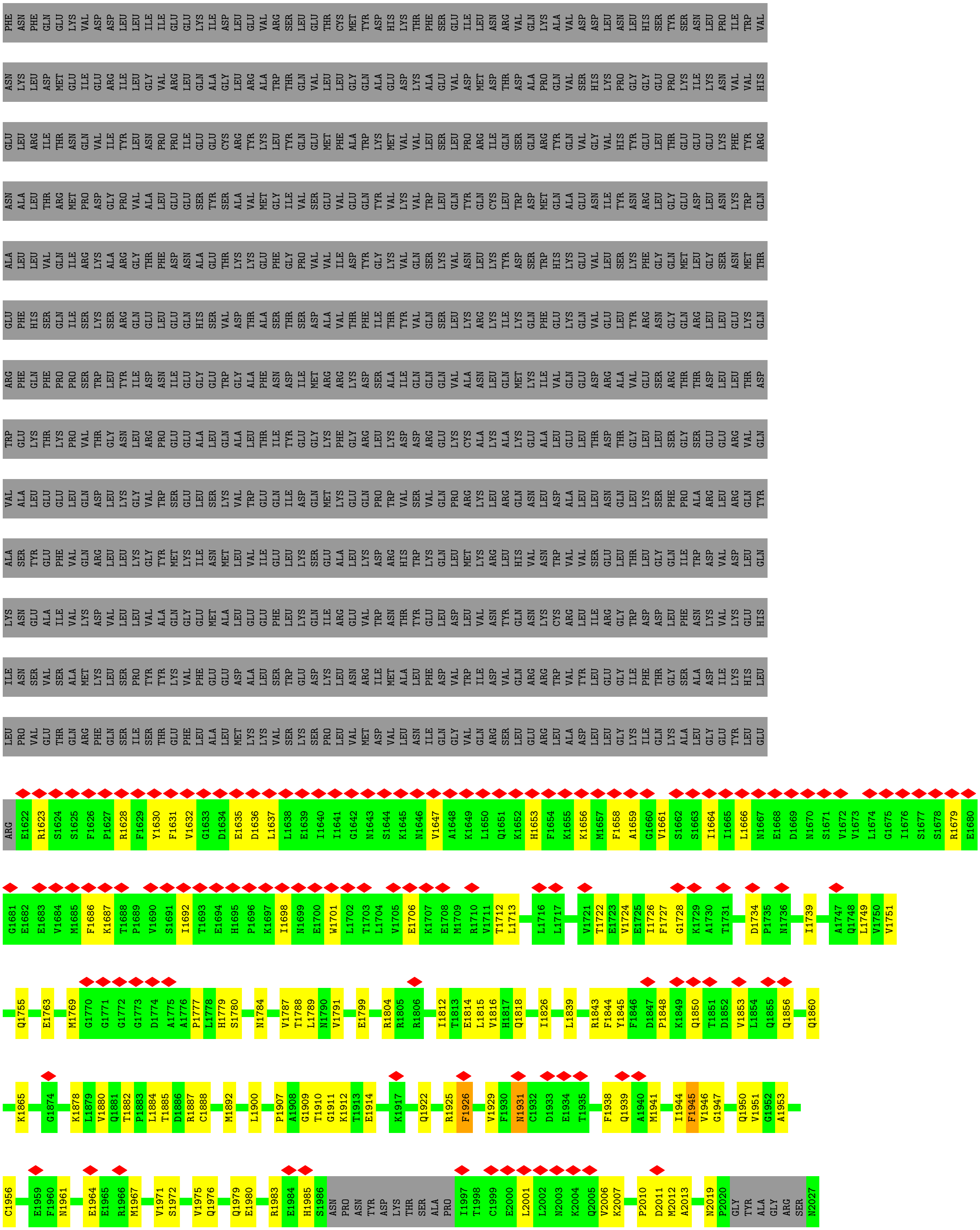
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

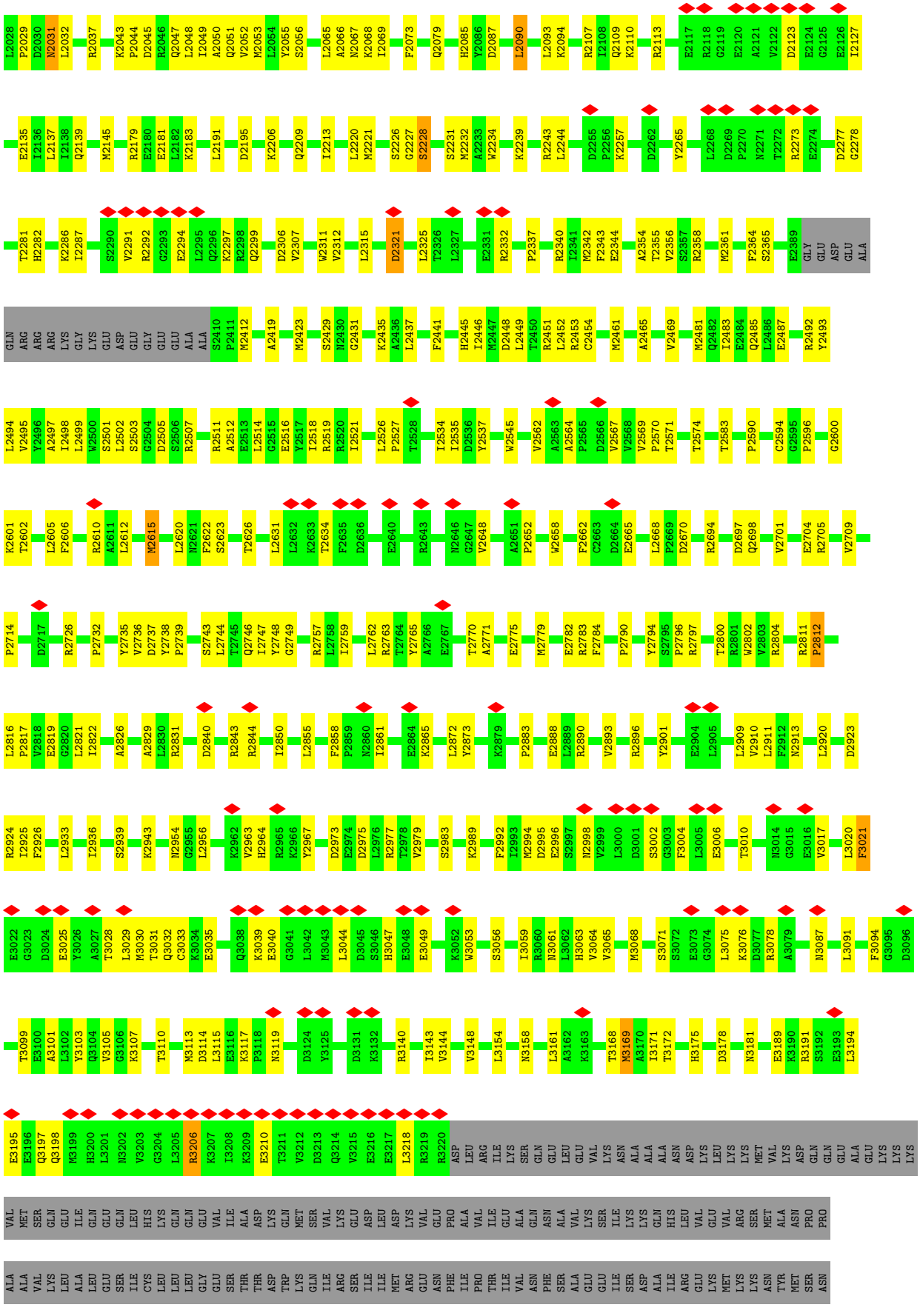
- Molecule 1: Cytoplasmic dynein 1 heavy chain 1

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 HIS SER TYR SER ASN LEU PRO ILE TRP VAL
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 VAL LEU SER LEU PRO ARG ILE GLN SER GLN ARG TYR GLN VAL GLY VAL HIS TYR 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 GLN TYR VAL LYS VAL TRP LEU GLN TYR GLN CYS LEU TRP ASP MET GLN ALA GLU ASN ILE TYR ASN ARG LEU GLY GLU ASP LEU ASN LYS TRP GLN
ALA LEU LEU VAL GLN ILE ARG LYS ALA ARG GLY THR PHE ASP ASN ALA GLU THR 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 ARG GLN GLU LEU GLU GLN HIS SER VAL ASP THR ALA SER THR SER ASP ALA VAL THR PHE ILE THR TYR VAL GLN SER LEU LYS ARG LYS ILE LYS GLN PHE GLU LYS GLN VAL GLU LEU TYR ARG ASN GLY GLN ARG LEU LEU GLU LYS GLN
ARG PHE GLN PHE PRO PRO SER TRP LEU TYR ILE ASP ASN ILE GLU GLY GLU TRP GLY ALA PHE ASN ASP ILE MET ARG ARG LYS ASP SER ALA ILE GLN GLN GLN VAL ALA ASN LEU GLN MET LYS ILE VAL GLN GLU ASP ARG ALA VAL GLU SER ARG THR THR ASP LEU LEU THR ASP
TRP GLU LYS THR LYS PRO VAL THR GLY ASN 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 ALA LEU GLU LEU THR ASP THR GLY LEU LEU SER GLY SER GLU GLU ARG VAL GLN
VAL ALA LEU GLU GLU LEU 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 SER PHE 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 VAL ALA GLN GLY GLU MET ALA LEU GLU GLU PHE LEU LYS GLN ILE ARG GLU VAL TRP ASN THR TYR GLU LEU ASP LEU VAL ASN TYR GLN ASN LYS CYS ARG LEU ILE ARG GLY TRP ASP ASP LEU PHE ASN LYS VAL LYS GLU HIS
ILE ASN SER VAL SER ALA MET LYS LEU SER PRO TYR TYR LYS VAL PHE GLU GLU ASP ALA LEU SER TRP GLU ASP LYS LEU ASN ARG ILE MET ALA LEU PHE ASP VAL TRP ILE ASP VAL GLN ARG ARG TRP VAL TYR LEU GLU GLY ILE PHE THR GLY SER ALA ASP ILE LYS HIS LEU
LEU PRO VAL GLU THR GLN ARG PHE GLN SER ILE SER THR GLU PHE LEU ALA LEU MET LYS LYS VAL SER LYS SER PRO LEU VAL MET ASP VAL LEU ASN ILE GLN GLY VAL GLN ARG SER LEU GLU ARG LEU ALA ASP LEU LEU GLY LYS ILE GLN LYS ALA LEU GLY GLU TYR LEU GLU
ARG E1622 R1623 S1624 S1625 F1626 P1627 R1628 F1629 Y1630 F1631 V1632 G1633 D1634 E1635 D1636 L1637 L1638 E1639 I1640 I1641 G1642 N1643 S1644 K1645 N1646 V1647 A1648 K1649 L1650 Q1651 K1652 H1653 F1654 K1655 K1656 M1657 F1658 A1659 G1660 V1661 S1662 S1663 I1664 I1665 L1666 N1667 E1668 D1669 N1670 S1671 V1672 V1673 L1674 G1675 I1676 S1677 S1678 R1679 E1680
G1681 E1682 E1683 V1684 M1685 F1686 K1687 T1688 P1689 V1690 S1691 I1692 T1693 E1694 H1695 P1696 K1697 I1698 N1699 E1700 W1701 L1702 T1703 L1704 V1705 E1706 K1707 E1708 M1709 R1710 V1711 T1712 L1713 L1716 L1717 V1721 T1722 E1723 V1724 E1725 I1726 F1727 G1728 K1729 A1730 T1731 D1734 P1735 N1736 I1739 A1747 Q1748 L1749 V1750 V1751
Q1755 E1763 M1769 G1770 G1771 G1772 G1773 D1774 A1775 A1776 P1777 L1778 H1779 S1780 N1784 V1787 T1788 L1789 N1790 V1791 E1799 R1804 R1805 R1806 I1812 T1813 E1814 L1815 V1816 H1817 Q1818 I1826 L1839 R1843 F1844 Y1845 F1846 D1847 P1848 K1849 Q1850 T1851 D1852 V1853 L1854 Q1855 Q1856 Q1860
K1865 G1874 K1878 L1879 V1880 Q1881 T1882 P1883 L1884 T1885 D1886 R1887 C1888 M1892 L1900 P1907 A1908 G1909 T1910 G1911 K1912 T1913 E1914 K1917 Q1922 R1925 F1926 V1929 F1930 N1931 C1932 D1933 E1934 T1935 F1938 Q1939 A1940 M1941 I1944 F1945 V1946 G1947 Q1950 V1951 G1952 A1953
C1956 E1959 F1960 N1961 E1964 E1965 R1966 M1967 V1971 S1972 V1975 Q1976 Q1979 E1980 R1983 E1984 H1985 S1986 ASN PRO ASN TYR ASP LYS THR SER ALA PRO I1997 T1998 C1999 E2000 L2001 L2002 N2003 K2004 Q2005 V2006 K2007 P2010 D2011 M2012 A2013 N2019 P2020 GLY TYR ALA GLY ARG SER N2027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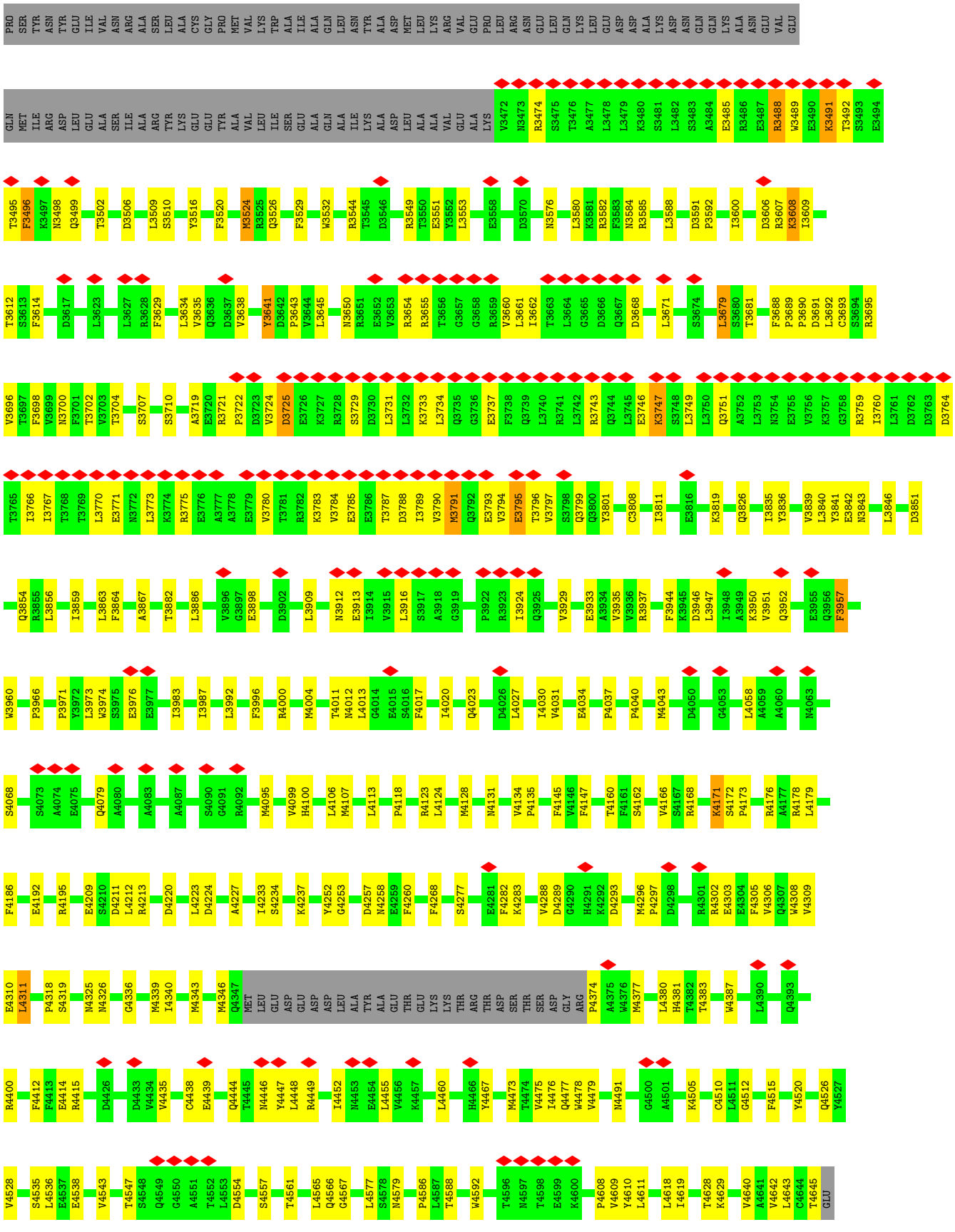
E2135 I2136 L2137 I2138 Q2139 M2145 R2179 E2180 E2181 L2182 K2183 L2191 D2195 K2206 Q2209 I2213 L2220 M2221 S2226 G2227 S2228 S2231 M2232 A2233 W2234 K2239 R2243 L2244 D2255 P2256 K2257 D2262 Y2265 L2268 D2269 P2270 N2271 T2272 R2273 E2274 D2277 G2278
T2281 H2282 K2286 I2287 S2290 V2291 R2292 G2293 E2294 L2295 Q2296 K2297 R2298 Q2299 D2306 V2307 W2311 V2312 L2315 D2321 L2325 T2326 L2327 E2331 R2332 P2337 R2340 T2341 M2342 F2343 E2344 A2354 T2355 V2356 S2357 R2358 M2361 F2364 S2365 E2389 GLY GLU ASP GLU ALA
GLN ARG ARG ARG LYS GLY LYS GLU ASP GLU GLY GLU GLU ALA ALA S2410 P2411 M2412 A2419 M2423 S2429 N2430 G2431 K2435 A2436 L2437 F2441 H2445 I2446 M2447 D2448 L2449 T2450 R2451 L2452 R2453 C2454 M2461 A2465 V2469 M2481 Q2482 I2483 E2484 Q2485 L2486 E2487 R2492 Y2493
L2494 V2495 Y2496 A2497 I2498 L2499 W2500 S2501 L2502 S2503 G2504 D2505 S2506 R2507 R2511 A2512 E2513 L2514 G2515 E2516 Y2517 I2518 R2519 R2520 I2521 L2526 P2527 T2528 I2534 I2535 D2536 Y2537 W2545 V2562 A2563 A2564 P2565 D2566 V2567 V2568 V2569 P2570 T2571 T2574 T2583 P2590 C2594 G2595 P2596 G2600
K2601 T2602 L2605 F2606 R2610 A2611 L2612 M2615 L2620 W2621 F2622 S2623 T2626 L2631 L2632 K2633 T2634 F2635 D2636 E2640 R2643 N2646 G2647 V2648 A2651 P2652 W2658 F2662 C2663 D2664 E2665 L2668 P2669 D2670 R2694 D2697 Q2698 V2701 E2704 R2705 V2709
P2714 D2717 R2726 P2732 Y2735 V2736 D2737 Y2738 P2739 S2743 L2744 T2745 Q2746 I2747 Y2748 G2749 R2757 L2758 I2759 L2762 R2763 T2764 Y2765 A2766 E2767 T2770 A2771 E2775 M2779 E2782 R2783 F2784 P2790 Y2794 S2795 P2796 R2797 T2800 R2801 W2802 Y2803 R2804 R2811 P2812
L2816 P2817 V2818 E2819 G2820 L2821 I2822 A2826 A2829 L2830 R2831 D2840 R2843 R2844 I2850 L2855 F2858 P2859 N2860 I2861 E2864 K2865 L2872 Y2873 K2879 P2883 E2888 L2889 R2890 V2893 R2896 Y2901 E2904 L2905 L2909 V2910 L2911 F2912 N2913 L2920 D2923
R2924 I2925 F2926 L2933 I2936 S2939 K2943 N2964 G2955 L2956 K2962 V2963 H2964 R2965 K2966 Y2967 D2973 E2974 D2975 L2976 R2977 T2978 V2979 S2983 K2989 F2992 I2993 M2994 D2995 E2996 S2997 N2998 V2999 L3000 D3001 S3002 G3003 F3004 L3005 E3006 T3010 N3014 G3015 E3016 V3017 L3020 F3021
E3022 G3023 D3024 E3025 Y3026 A3027 T3028 L3029 M3030 T3031 Q3032 C3033 K3034 E3035 Q3038 K3039 E3040 G3041 L3042 M3043 L3044 D3045 S3046 H3047 E3048 E3049 K3052 W3053 S3056 I3059 R3060 N3061 L3062 H3063 V3064 V3065 M3068 S3071 S3072 E3073 G3074 L3075 K3076 D3077 R3078 A3079 N3087 L3091 F3094 G3095 D3096
T3099 E3100 A3101 L3102 Y3103 Q3104 V3105 G3106 K3107 T3110 M3113 D3114 L3115 E3116 K3117 P3118 N3119 D3124 Y3125 D3131 K3132 R3140 I3143 V3144 V3148 L3154 N3158 L3161 A3162 K3163 T3168 M3169 A3170 I3171 T3172 H3175 D3178 N3181 E3189 K3190 R3191 S3192 E3193 L3194
E3195 E3196 Q3197 Q3198 M3199 H3200 L3201 N3202 V3203 G3204 L3205 R3206 K3207 I3208 K3209 E3210 T3211 V3212 D3213 Q3214 V3215 E3216 E3217 L3218 R3219 R3220 ASP LEU ARG ILE LYS SER GLN GLU LEU GLU VAL LYS SER ILE LYS ASN ALA ALA ALA ASN ASP LYS LEU LYS LYS 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 ASN ASN PHE SER ALA VAL LYS SER ILE LYS LYS GLN HIS LEU VAL GLU VAL ARG SER MET ALA ASN PRO PRO
ALA ALA VAL LYS LEU ALA ILE LEU GLU SER ILE CYS LEU LEU LEU GLY GLU SER THR THR ASP TRP LYS GLN 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 LYS ALA ASN GLU VAL GLU
GLN MET ILE ARG ASP LEU GLU ALA SER ILE ALA ARG TYR LYS GLU GLU TYR ALA VAL LEU ILE SER GLU ALA GLN ALA ILE LYS ALA ASP LEU ALA ALA VAL GLU ALA LYS V3472 N3473 R3474 S3475 T3476 A3477 L3478 L3479 K3480 S3481 L3482 S3483 A3484 E3485 R3486 E3487 R3488 W3489 E3490 K3491 T3492 S3493 E3494
T3495 F3496 K3497 N3498 Q3499 T3502 D3506 L3509 S3510 Y3516 F3520 M3524 R3525 Q3526 F3529 W3532 R3544 T3545 D3546 R3549 T3550 E3551 Y3552 L3553 E3558 D3570 N3576 L3580 K3581 R3582 F3583 N3584 R3585 L3588 D3591 P3592 I3600 D3606 R3607 K3608 I3609
T3612 S3613 F3614 D3617 L3623 L3627 R3628 R3629 L3634 V3635 Q3636 D3637 V3638 Y3641 D3642 P3643 V3644 L3645 N3650 R3651 E3652 V3653 R3654 R3655 T3656 G3657 G3658 R3659 V3660 L3661 I3662 T3663 L3664 G3665 D3666 Q3667 D3668 L3671 S3674 L3679 S3680 T3681 F3688 P3689 P3690 D3691 L3692 C3693 S3694 R3695
V3696 T3697 F3698 V3699 N3700 F3701 T3702 V3703 T3704 S3707 S3710 A3719 E3720 R3721 P3722 D3723 V3724 D3725 E3726 K3727 R3728 S3729 D3730 L3731 L3732 K3733 L3734 Q3735 G3736 E3737 F3738 Q3739 L3740 R3741 L3742 R3743 Q3744 L3745 E3746 K3747 S3748 L3749 L3750 Q3751 A3752 L3753 N3754 E3755 V3756 K3757 G3758 R3759 I3760 L3761 D3762 D3763 D3764
T3765 I3766 I3767 T3768 T3769 L3770 E3771 N3772 L3773 K3774 R3775 E3776 A3777 A3778 E3779 V3780 T3781 R3782 K3783 V3784 E3785 E3786 T3787 D3788 I3789 V3790 M3791 Q3792 E3793 V3794 E3795 T3796 V3797 S3798 Q3799 Q3800 Y3801 C3808 I3811 E3816 K3819 Q3826 I3835 Y3836 V3839 L3840 Y3841 E3842 N3843 L3846 D3851
Q3854 R3855 L3856 I3859 L3863 F3864 A3867 T3882 L3886 V3896 G3897 E3898 D3902 L3909 N3912 E3913 I3914 V3915 L3916 S3917 A3918 G3919 P3922 R3923 I3924 Q3925 V3929 E3933 A3934 V3935 V3936 R3937 F3944 K3945 D3946 L3947 I3948 A3949 K3950 V3951 Q3952 E3955 Q3956 F3957
W3960 P3966 P3971 Y3972 L3973 W3974 S3975 E3976 E3977 I3983 I3987 L3992 F3996 R4000 M4004 T4011 N4012 L4013 G4014 E4015 S4016 F4017 I4020 Q4023 D4026 L4027 I4030 V4031 E4034 P4037 P4040 M4043 D4050 G4053 L4058 A4059 A4060 M4063
S4068 S4073 A4074 E4075 Q4079 A4080 A4083 A4087 S4090 G4091 R4092 M4095 V4099 H4100 L4106 M4107 L4113 P4118 R4123 L4124 M4128 N4131 V4134 P4135 F4145 V4146 F4147 T4160 F4161 S4162 V4166 S4167 R4168 K4171 S4172 P4173 R4176 A4177 R4178 L4179
F4186 E4192 R4195 E4209 S4210 D4211 L4212 R4213 D4220 L4223 D4224 A4227 I4233 S4234 K4237 Y4252 G4253 D4257 N4258 E4259 F4260 F4268 S4277 E4281 F4282 K4283 V4288 D4289 G4290 H4291 K4292 D4293 M4296 P4297 D4298 R4301 R4302 E4303 E4304 F4305 V4306 Q4307 W4308 V4309
E4310 L4311 P4318 S4319 N4325 N4326 G4336 M4339 I4340 M4343 M4346 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 W4376 M4377 L4380 H4381 T4382 T4383 W4387 L4390 Q4393
R4400 F4412 F4413 E4414 R4415 D4426 D4433 V4434 V4435 C4438 E4439 Q4444 T4445 N4446 Y4447 L4448 R4449 I4452 N4453 E4454 L4455 V4456 K4457 L4460 H4466 Y4467 M4473 T4474 V4475 I4476 Q4477 W4478 V4479 N4491 G4500 A4501 K4505 C4510 L4511 G4512 F4515 Y4520 Q4526 Y4527
V4528 S4535 L4536 E4537 E4538 V4543 T4547 S4548 Q4549 G4550 A4551 T4552 L4553 D4554 S4557 T4561 L4565 Q4566 G4567 L4577 S4578 N4579 P4586 L4587 T4588 W4592 T4596 N4597 T4598 E4599 K4600 P4608 V4609 Y4610 L4611 L4618 I4619 T4628 K4629 V4640 A4641 V4642 L4643 C4644 T4645 GLU

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	65824	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	0.644	Depositor
Minimum map value	-0.354	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.12	Depositor
Map size (Å)	332.80002, 332.80002, 332.80002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	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, 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	0/22220	0.51	5/30121 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	2812	PRO	CA-N-CD	-8.55	99.53	111.50
1	A	4311	LEU	CA-CB-CG	6.42	130.08	115.30
1	A	1848	PRO	CA-N-CD	-5.81	103.36	111.50
1	A	4113	LEU	CA-CB-CG	5.54	128.03	115.30
1	A	3791	MET	CA-CB-CG	5.17	122.09	113.30

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	21755	0	21789	510	0
2	A	81	0	36	6	0
3	A	31	0	12	0	0
All	All	21867	0	21837	510	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 12.

The worst 5 of 510 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:3662:ILE:HD11	1:A:3671:LEU:HB2	1.54	0.87
1:A:3790:VAL:HG13	1:A:3794:VAL:HB	1.56	0.87
1:A:3661:LEU:HD11	1:A:3668:ASP:HB3	1.61	0.83
1:A:3731:LEU:HD12	1:A:3790:VAL:HG21	1.66	0.78
1:A:2925:ILE:HG21	1:A:2933:LEU:HG	1.67	0.77

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	2699/4646 (58%)	2635 (98%)	64 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	2407/4125 (58%)	2356 (98%)	51 (2%)	48	71

5 of 51 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3169	MET
1	A	3551	GLU
1	A	4171	LYS
1	A	3206	ARG
1	A	3491	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1922	GLN
1	A	3032	GLN
1	A	3181	ASN

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)

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	ADP	A	4703	-	24,29,29	0.89	0	29,45,45	1.29	3 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	ADP	A	4704	-	24,29,29	0.86	0	29,45,45	1.18	2 (6%)
3	ATP	A	4702	-	28,33,33	0.75	0	34,52,52	0.77	1 (2%)
2	ADP	A	4701	-	24,29,29	0.72	0	29,45,45	0.73	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	4703	-	-	4/12/32/32	0/3/3/3
2	ADP	A	4704	-	-	4/12/32/32	0/3/3/3
3	ATP	A	4702	-	-	1/18/38/38	0/3/3/3
2	ADP	A	4701	-	-	2/12/32/32	0/3/3/3

There are no bond length outliers.

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	4703	ADP	N3-C2-N1	-3.99	123.26	128.67
2	A	4704	ADP	N3-C2-N1	-3.63	123.75	128.67
2	A	4704	ADP	C4-C5-N7	-2.46	106.74	109.34
3	A	4702	ATP	C5-C6-N6	2.40	123.97	120.31
2	A	4701	ADP	C5-C6-N6	2.29	123.81	120.31

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

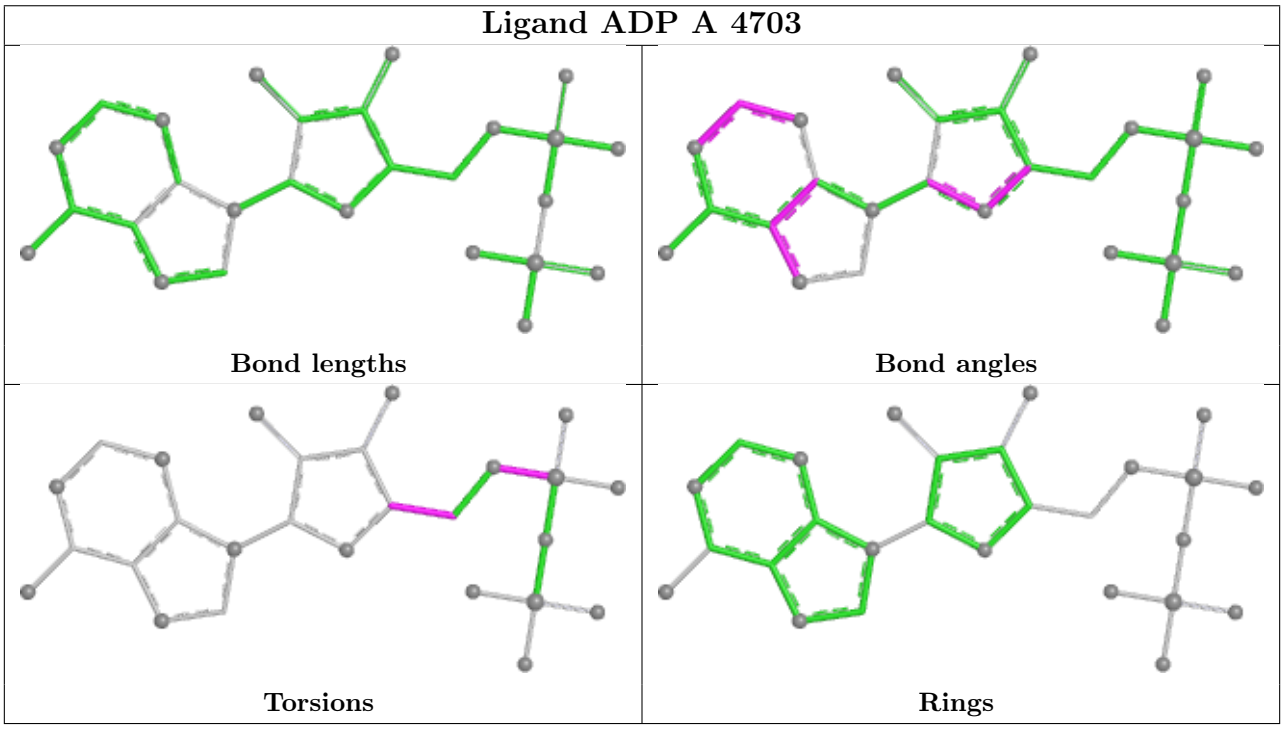
Mol	Chain	Res	Type	Atoms
2	A	4703	ADP	C5'-O5'-PA-O1A
2	A	4703	ADP	C5'-O5'-PA-O2A
2	A	4703	ADP	C5'-O5'-PA-O3A
2	A	4704	ADP	PA-O3A-PB-O2B
2	A	4704	ADP	PA-O3A-PB-O3B

There are no ring outliers.

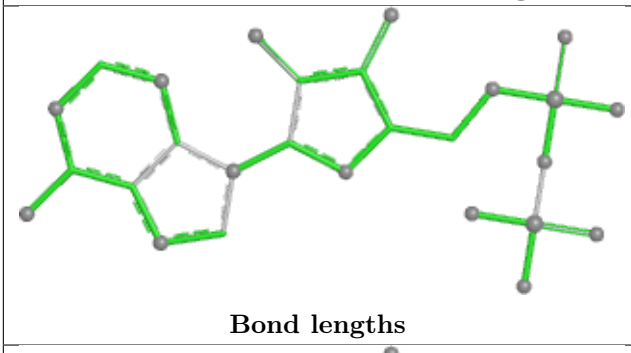
2 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4703	ADP	4	0
2	A	4701	ADP	2	0

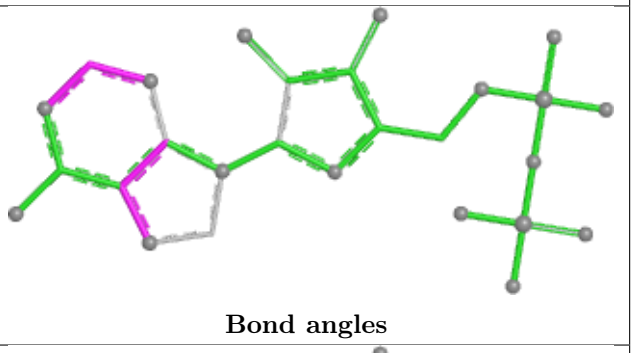
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.



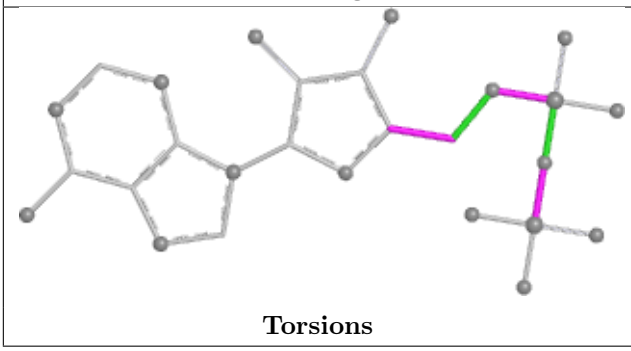
Ligand ADP A 4704



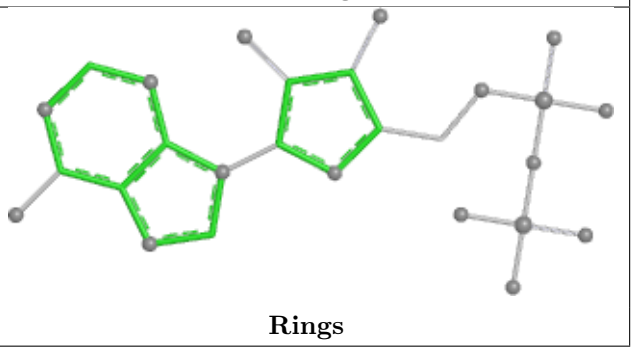
Bond lengths



Bond angles

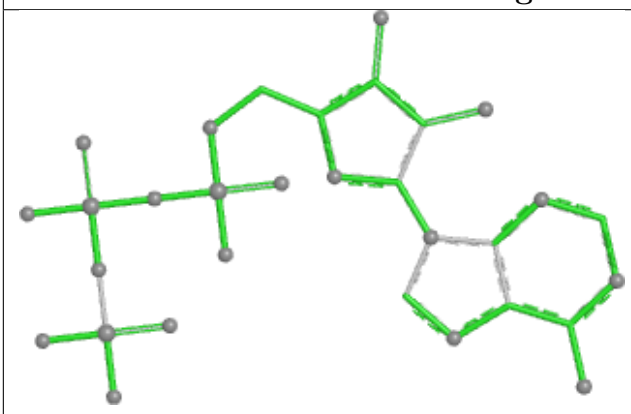


Torsions

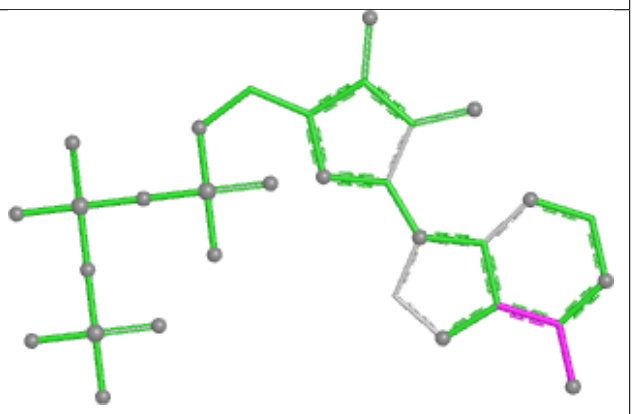


Rings

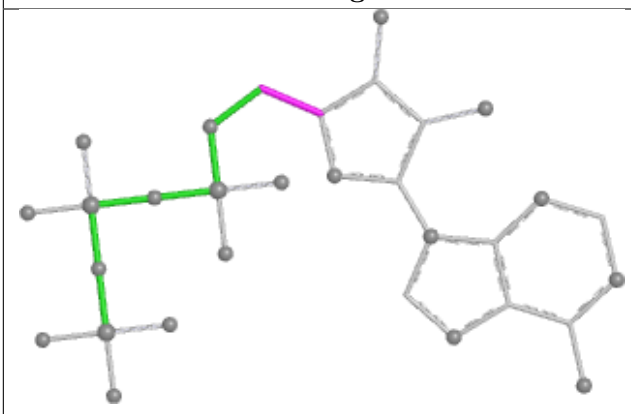
Ligand ATP A 4702



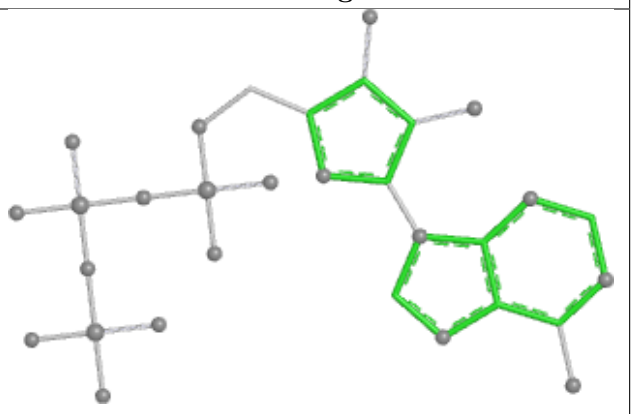
Bond lengths



Bond angles

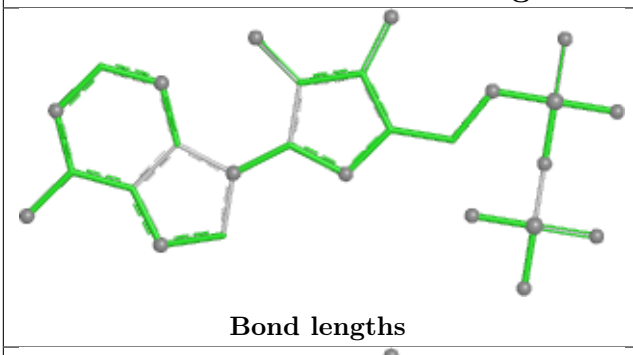


Torsions

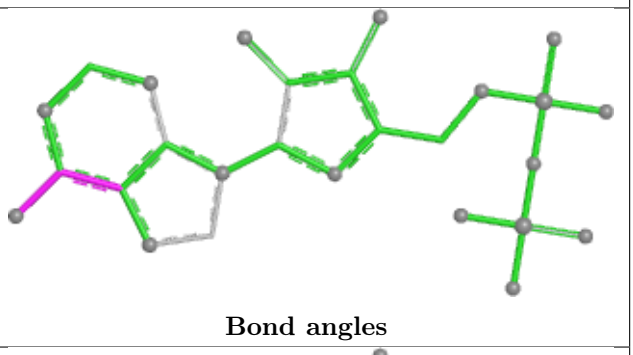


Rings

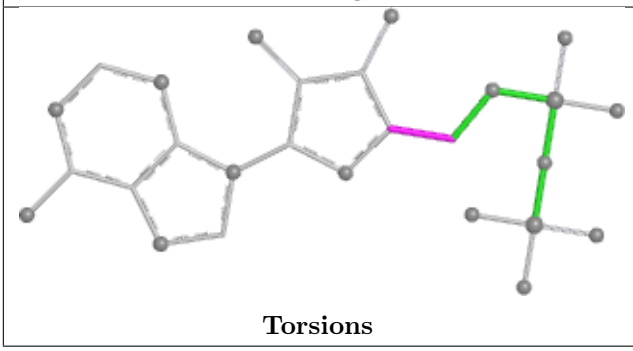
Ligand ADP A 4701



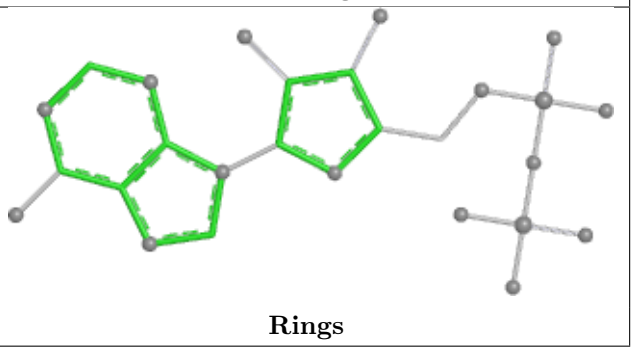
Bond lengths



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.

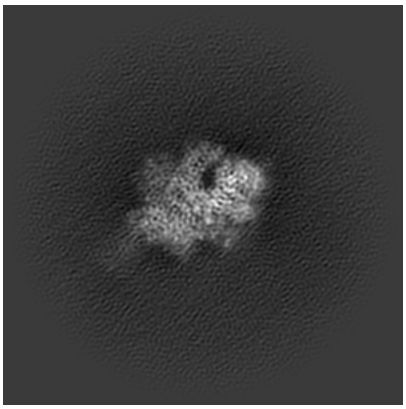
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-44686. These allow visual inspection of the internal detail of the map and identification of artifacts.

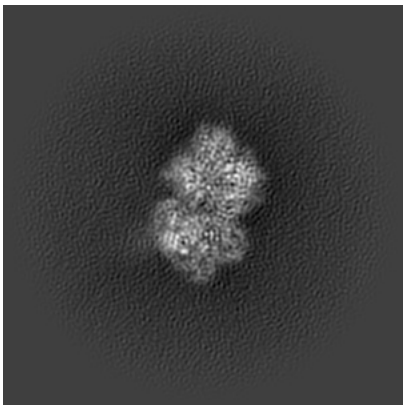
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

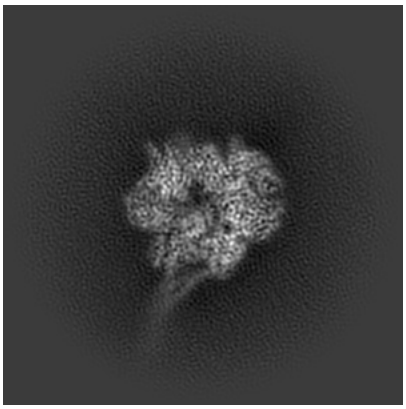
6.1.1 Primary map



X

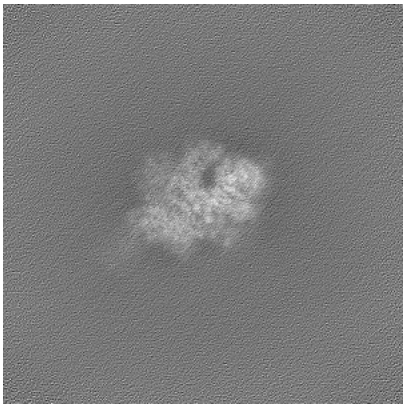


Y

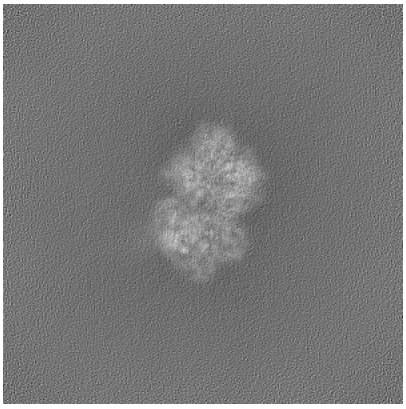


Z

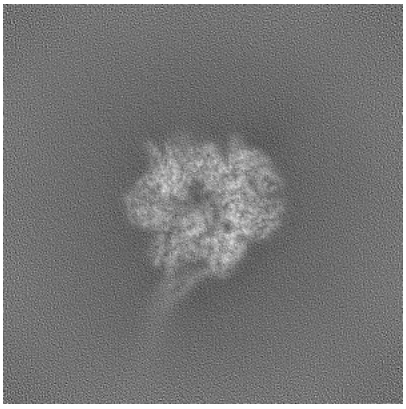
6.1.2 Raw map



X



Y



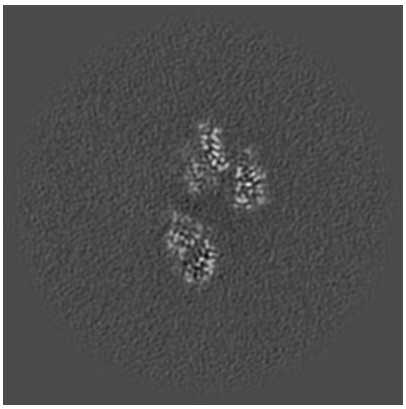
Z

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

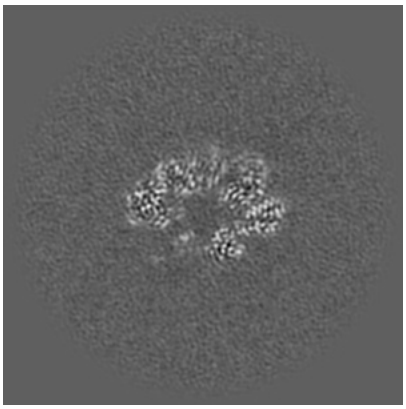
6.2 Central slices (i)

6.2.1 Primary map

X Index: 200

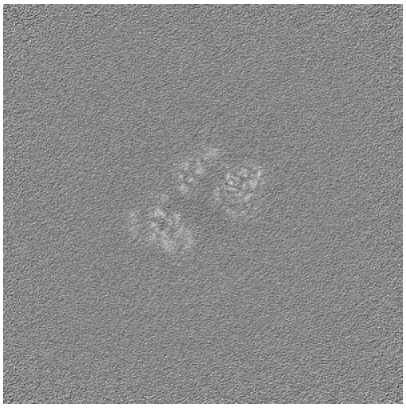


Y Index: 200

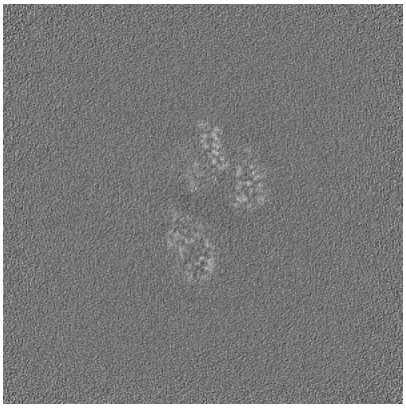


Z Index: 200

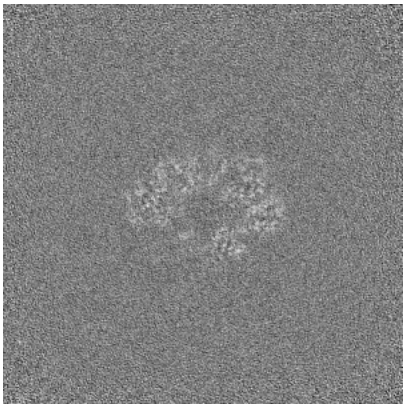
6.2.2 Raw map



X Index: 200



Y Index: 200

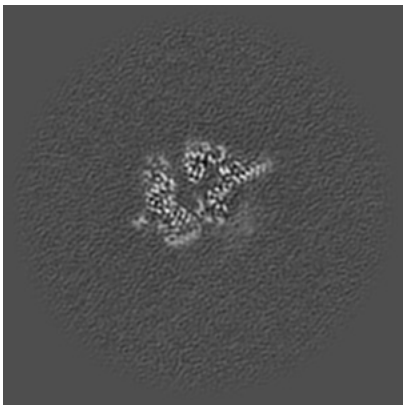


Z Index: 200

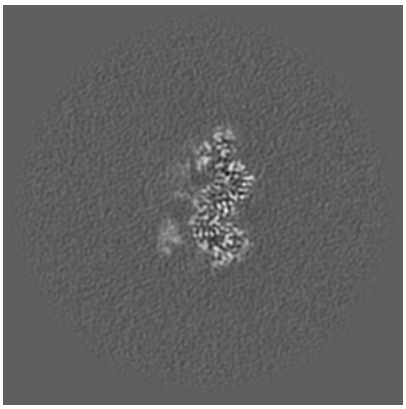
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

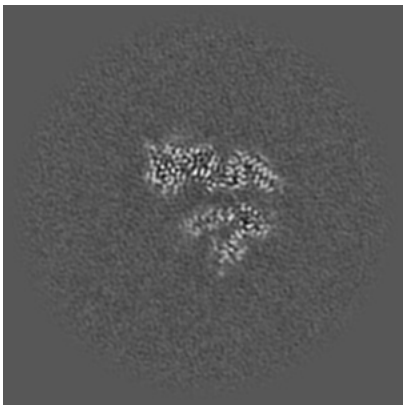
6.3.1 Primary map



X Index: 229

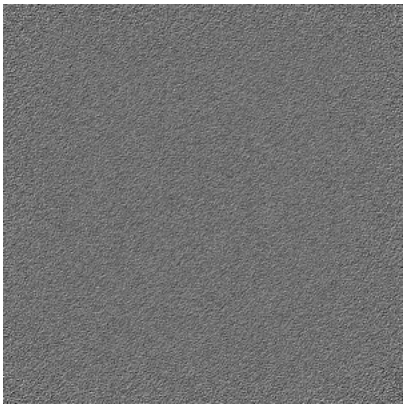


Y Index: 226

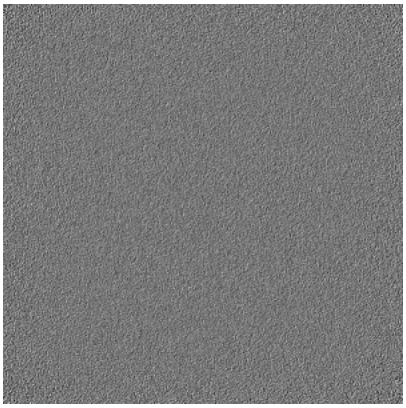


Z Index: 225

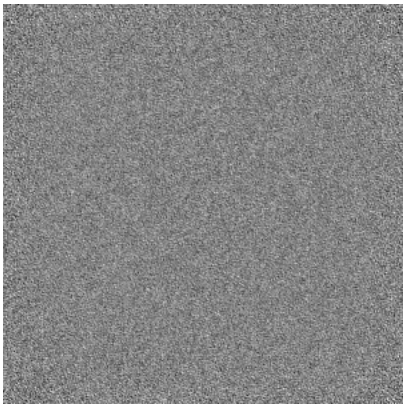
6.3.2 Raw map



X Index: 0



Y Index: 0

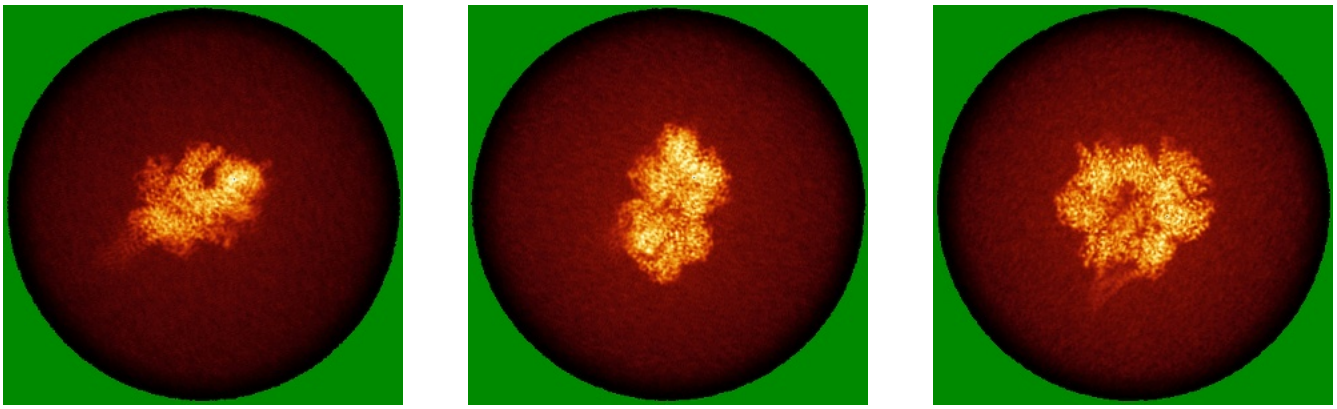


Z Index: 0

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

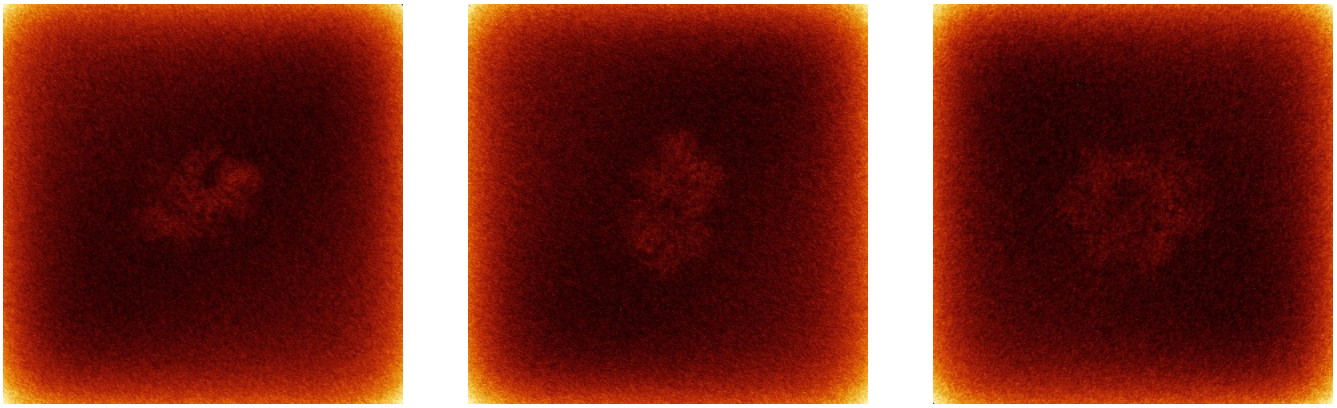
6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



X Y Z

6.4.2 Raw map

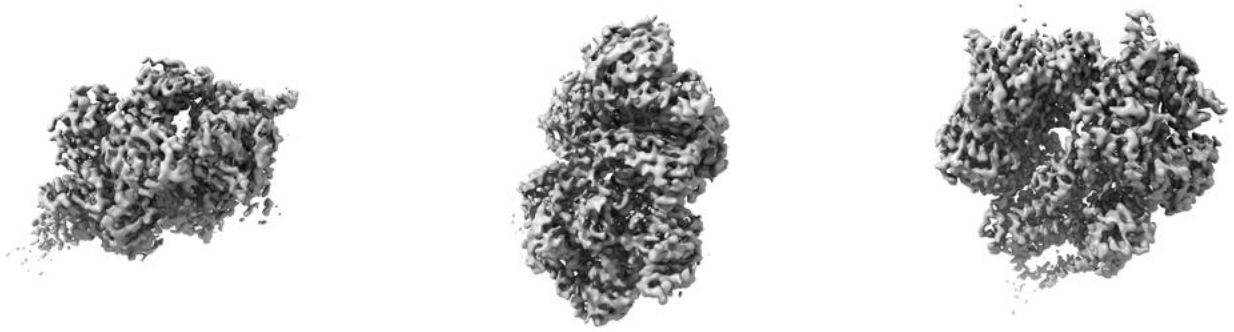


X Y Z

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 0.12. 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.

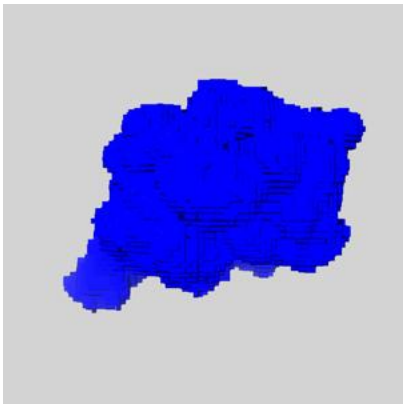
6.6 Mask visualisation (i)

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

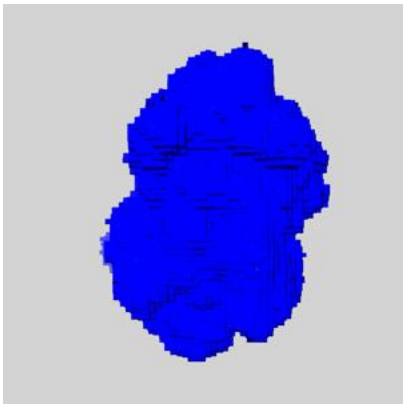
A mask typically either:

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

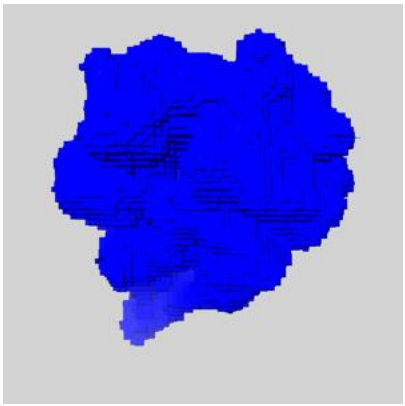
6.6.1 emd_44686_msk_1.map (i)



X



Y

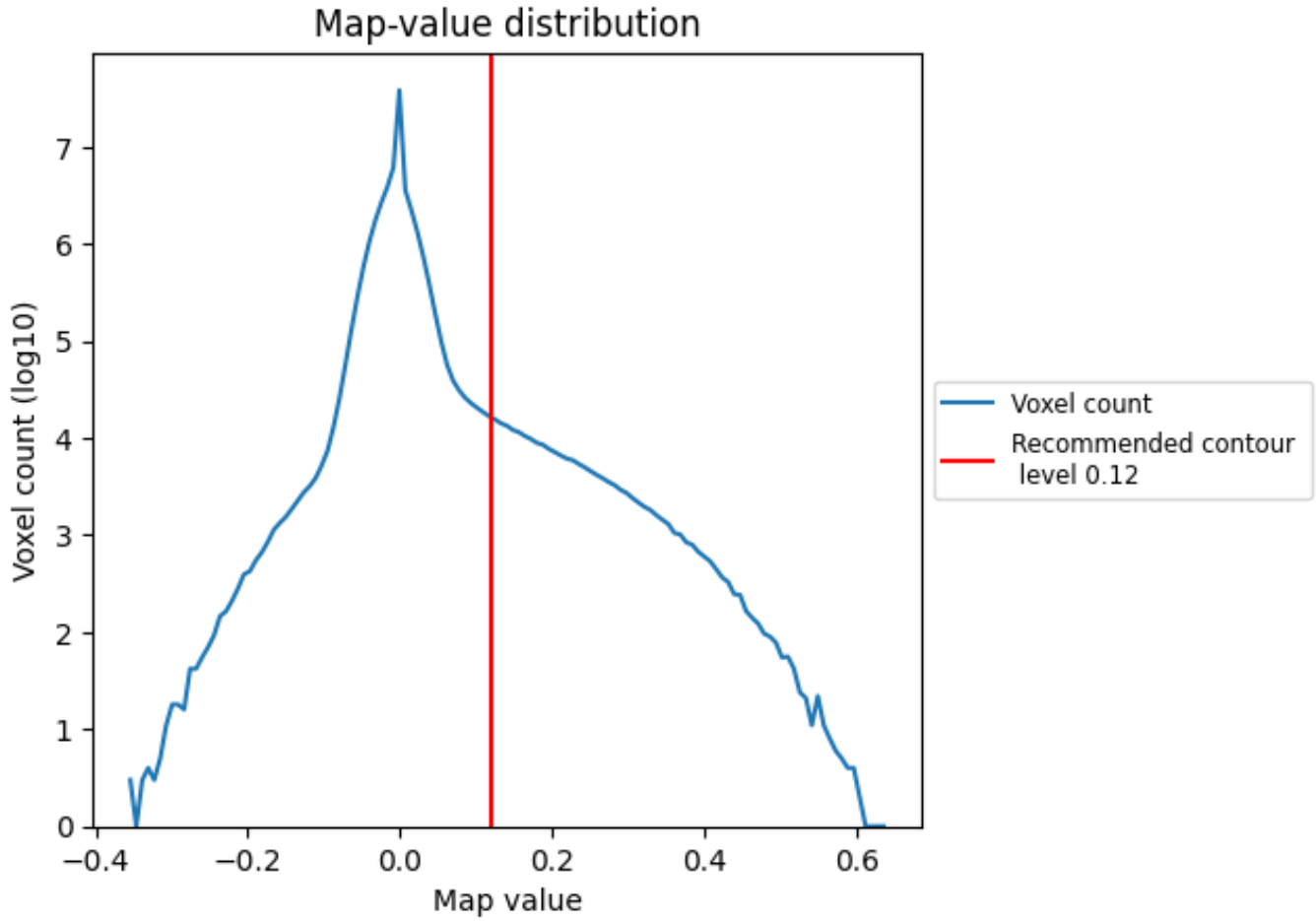


Z

7 Map analysis

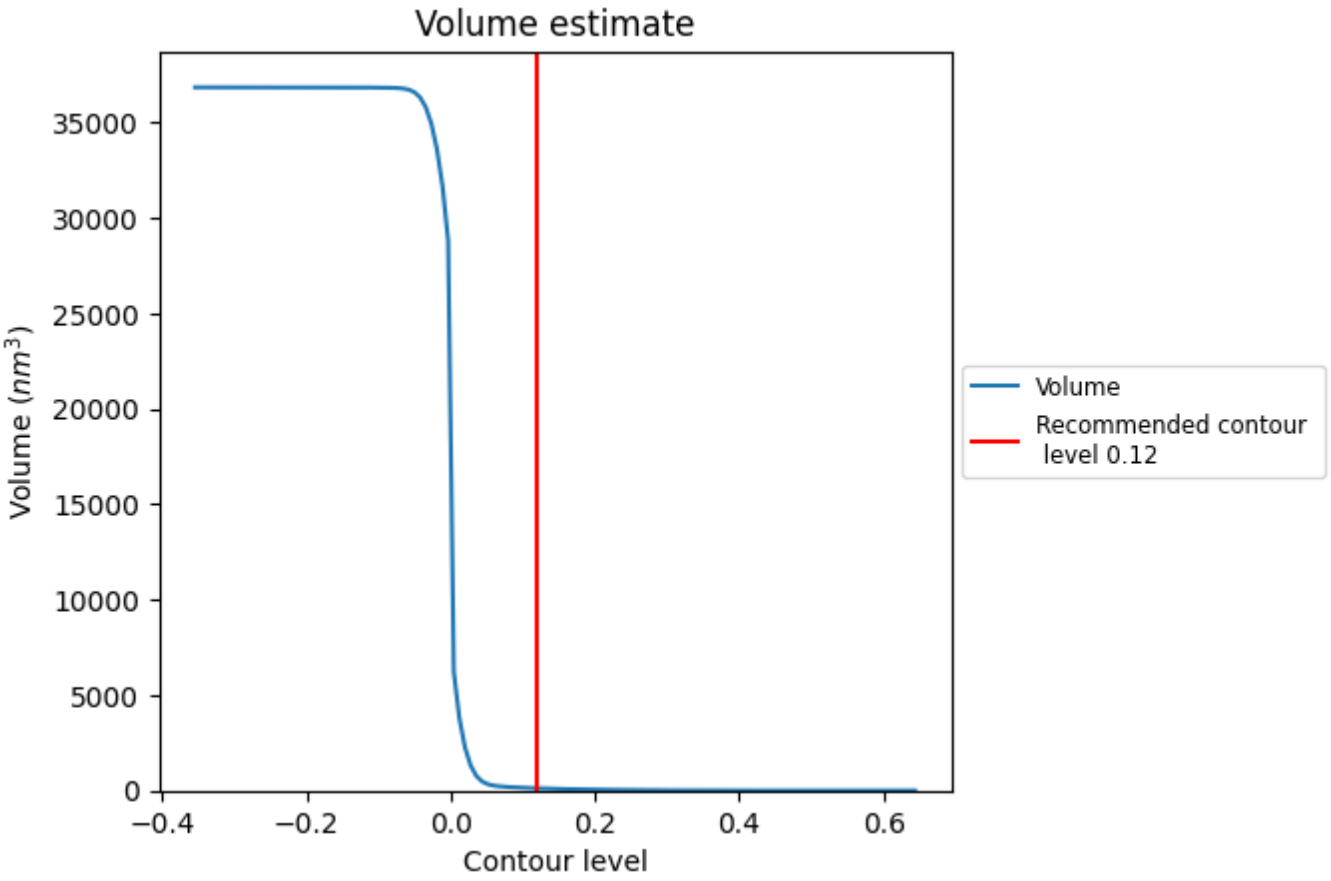
This section contains the results of statistical analysis of the map.

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.

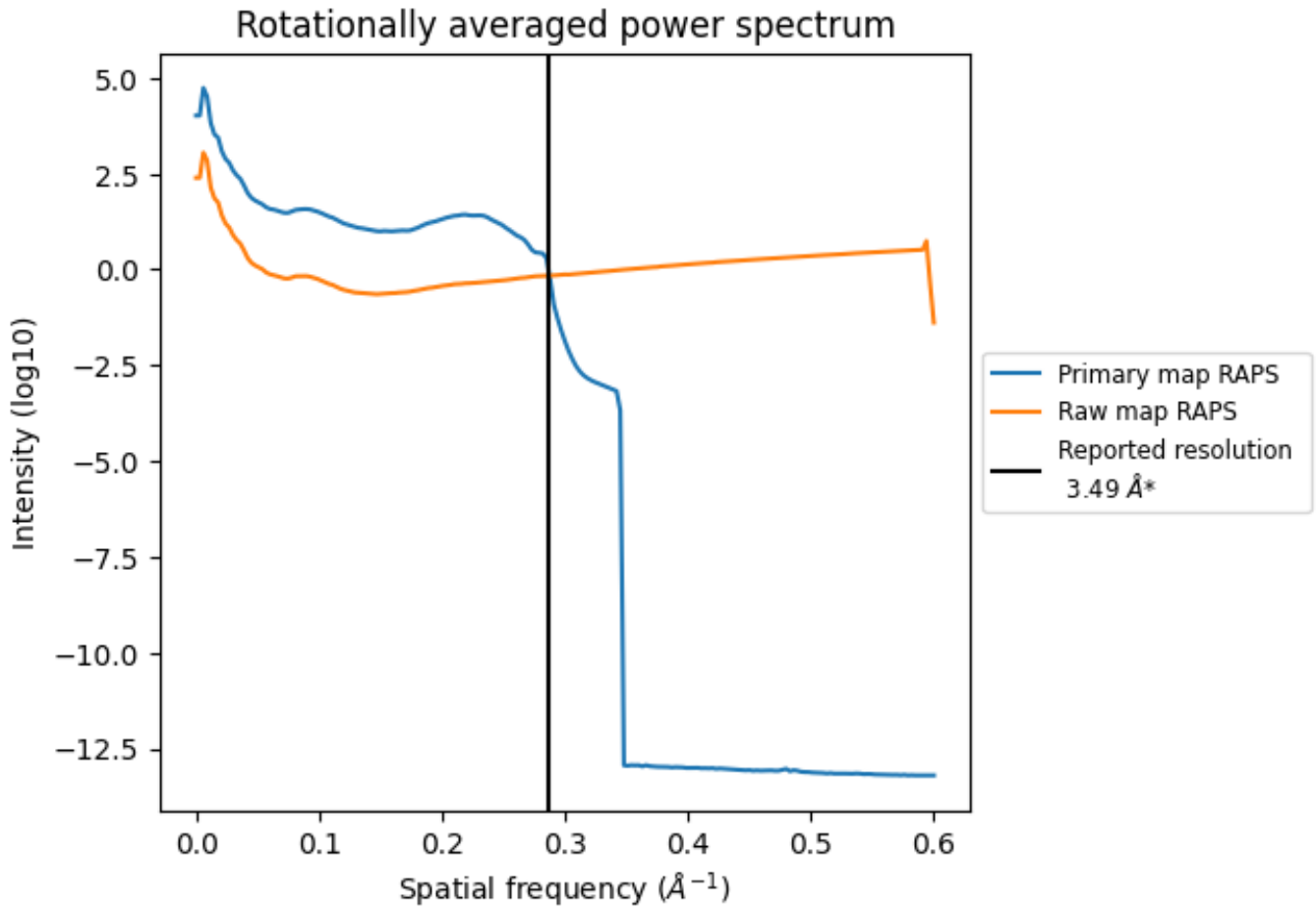
7.2 Volume estimate (i)



The volume at the recommended contour level is 118 nm^3; this corresponds to an approximate mass of 107 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)

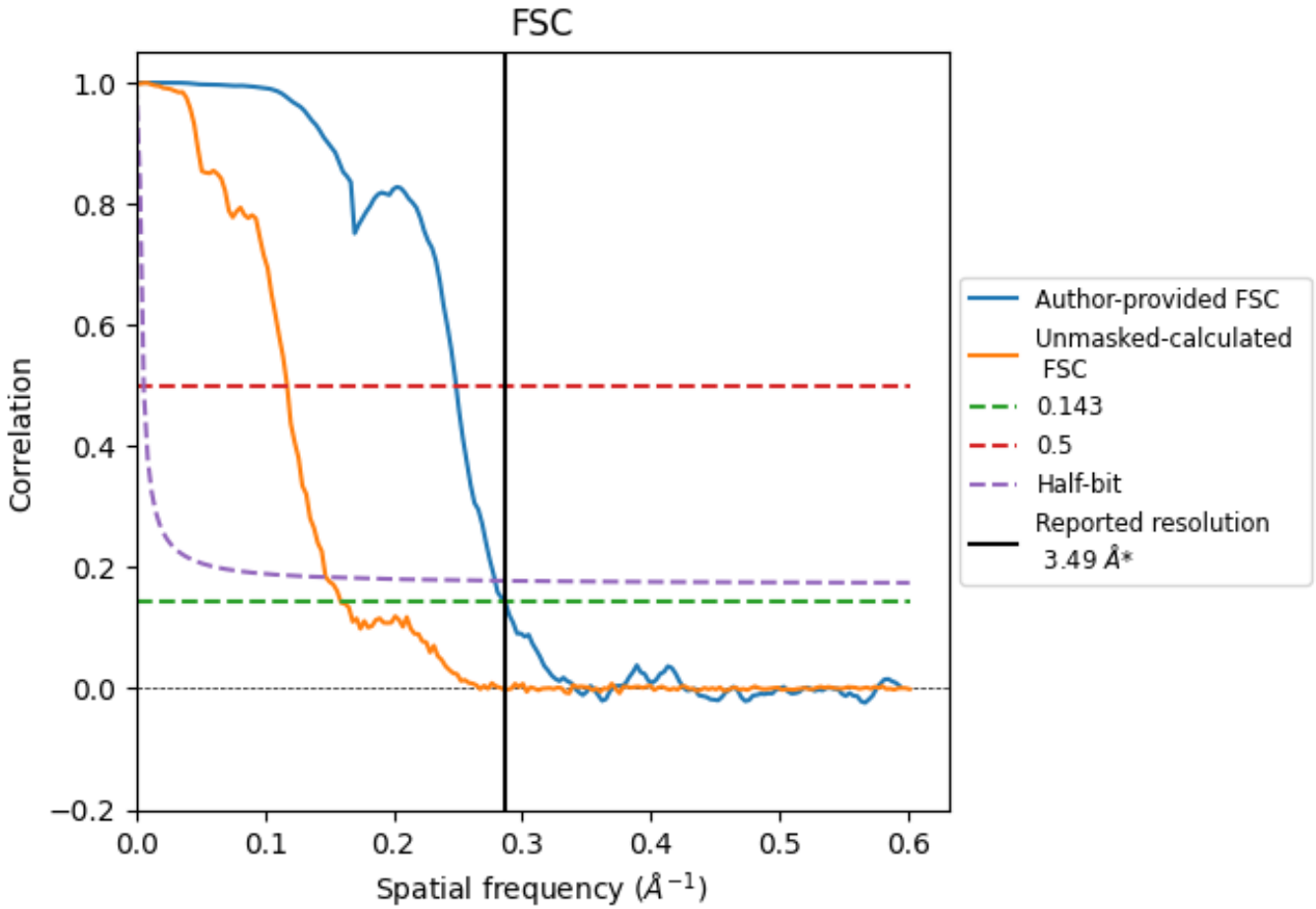


*Reported resolution corresponds to spatial frequency of 0.287 $Å^{-1}$

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 0.287 $Å^{-1}$

8.2 Resolution estimates (i)

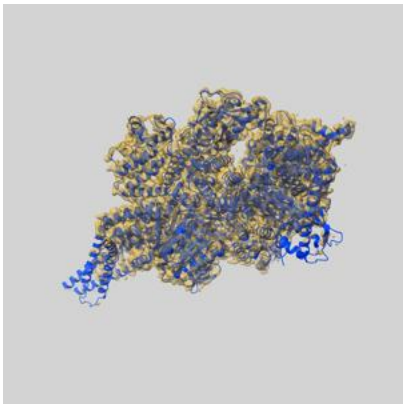
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.49	-	-
Author-provided FSC curve	3.49	4.02	3.59
Unmasked-calculated*	6.29	8.53	6.78

*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 6.29 differs from the reported value 3.49 by more than 10 %

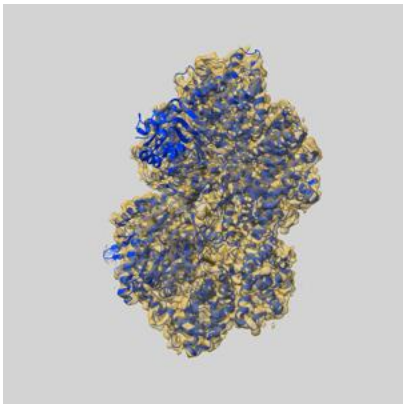
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-44686 and PDB model 9BM3. Per-residue inclusion information can be found in section 3 on page 5.

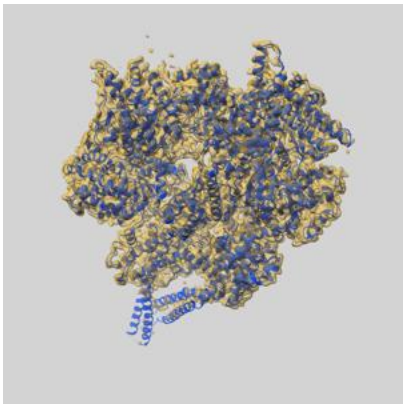
9.1 Map-model overlay



X



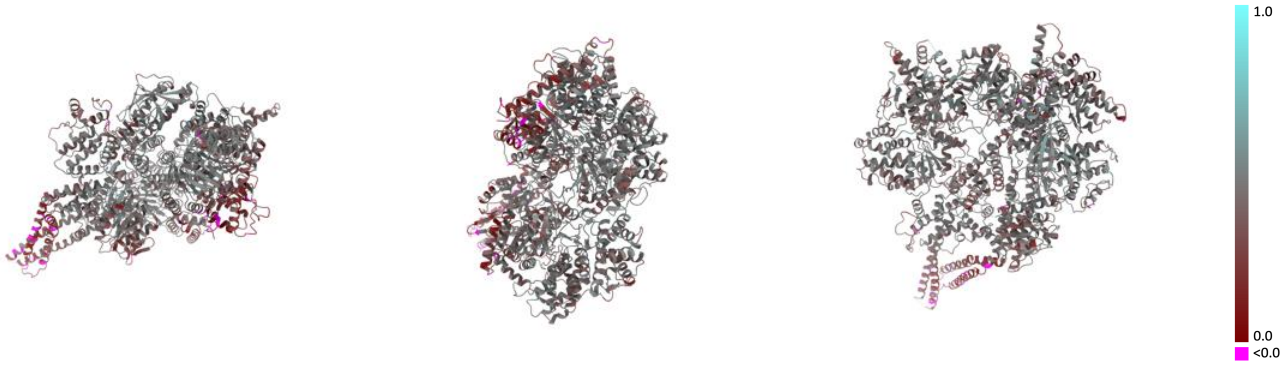
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.12 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.

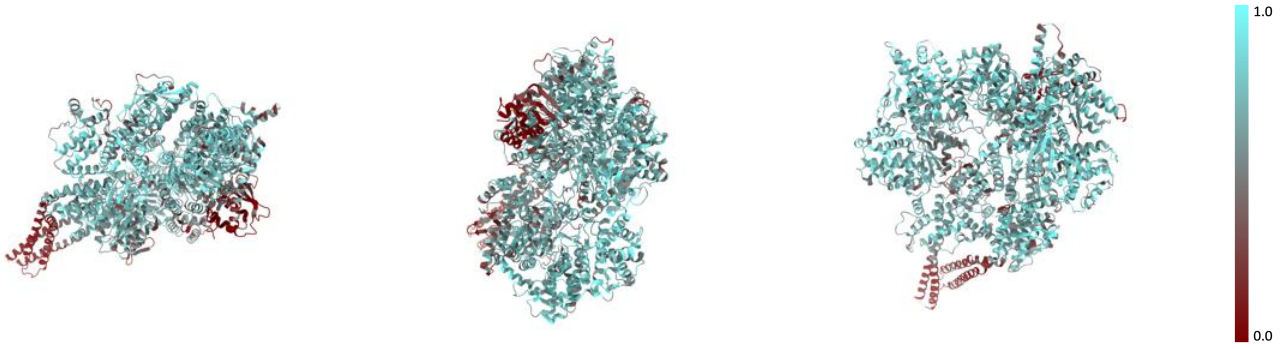
9.2 Q-score mapped to coordinate model



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.

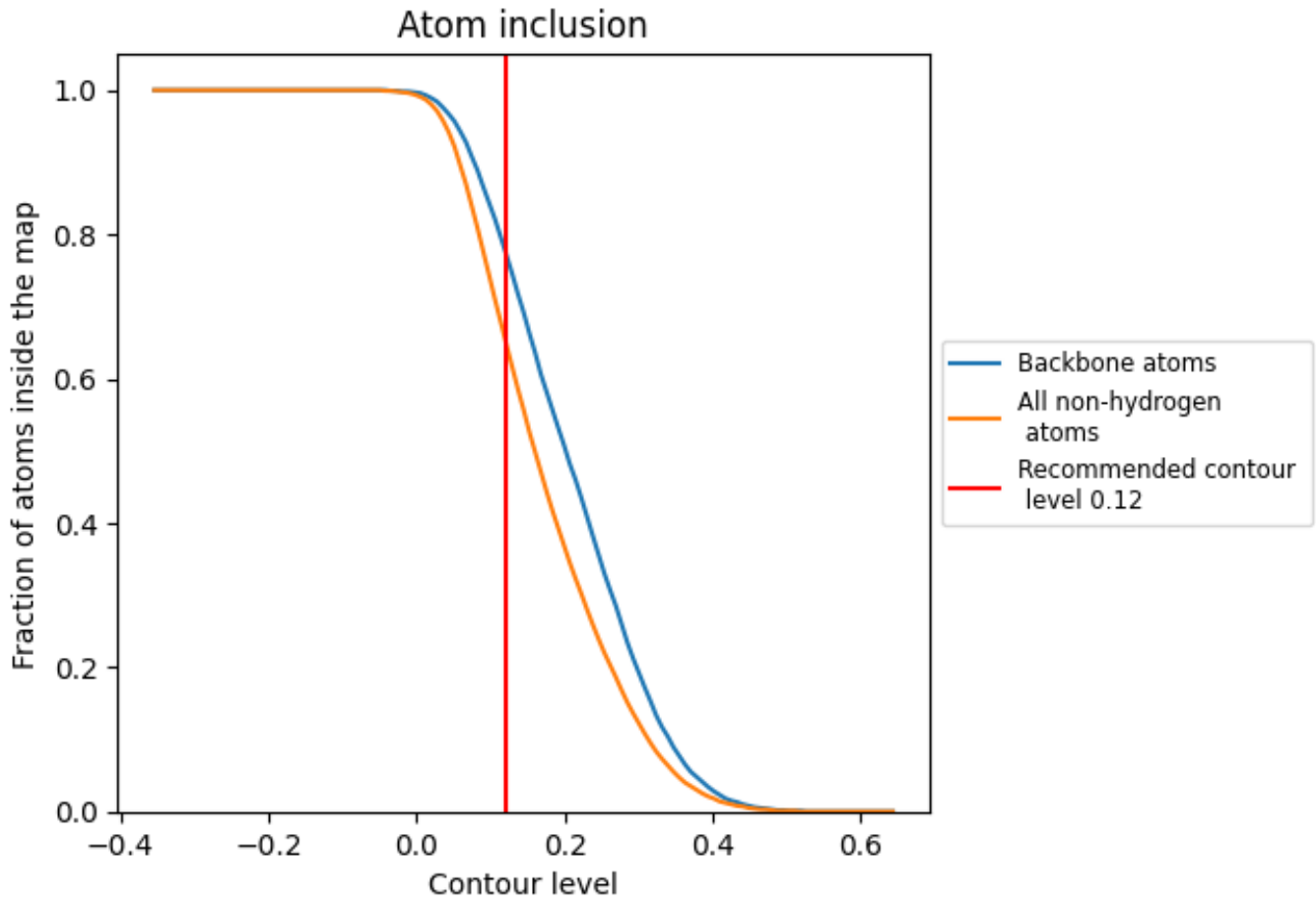
9.3 Atom inclusion mapped to coordinate model



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 (0.12).

9.4 Atom inclusion (i)



At the recommended contour level, 78% of all backbone atoms, 65% 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 (0.12) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6530	0.4170
A	0.6530	0.4170