



wwPDB EM Validation Summary Report ⓘ

Mar 19, 2024 – 02:54 PM JST

PDB ID : 5Y3R
EMDB ID : EMD-6803
Title : Cryo-EM structure of Human DNA-PK Holoenzyme
Authors : Yin, X.; Liu, M.; Tian, Y.; Wang, J.; Xu, Y.
Deposited on : 2017-07-29
Resolution : 6.60 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 ⓘ 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:

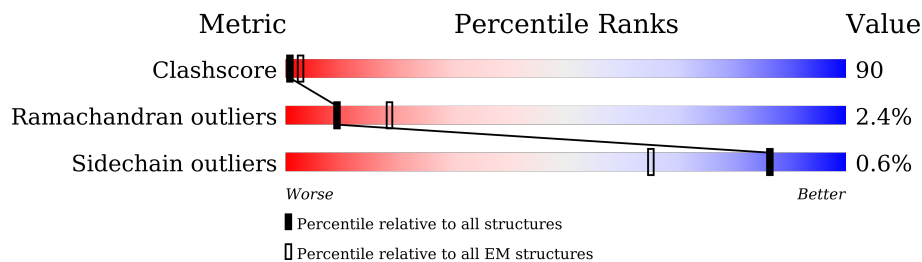
EMDB validation analysis : 0.0.1.dev70
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

1 Overall quality at a glance

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

The reported resolution of this entry is 6.60 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	501	
2	B	536	
3	K	15	
4	D	34	
5	E	36	
6	C	4119	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 38766 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 X-ray repair cross-complementing protein 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	493	3982	2550	675	739	18	0	0

- Molecule 2 is a protein called X-ray repair cross-complementing protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	526	4210	2696	707	784	23	0	0

- Molecule 3 is a protein called PRKDC-Helix.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	K	15	75	45	15	15	0	0

- Molecule 4 is a DNA chain called DNA (34-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	D	34	700	336	123	207	34	0	0

- Molecule 5 is a DNA chain called DNA (36-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	E	36	733	354	132	212	35	0	0

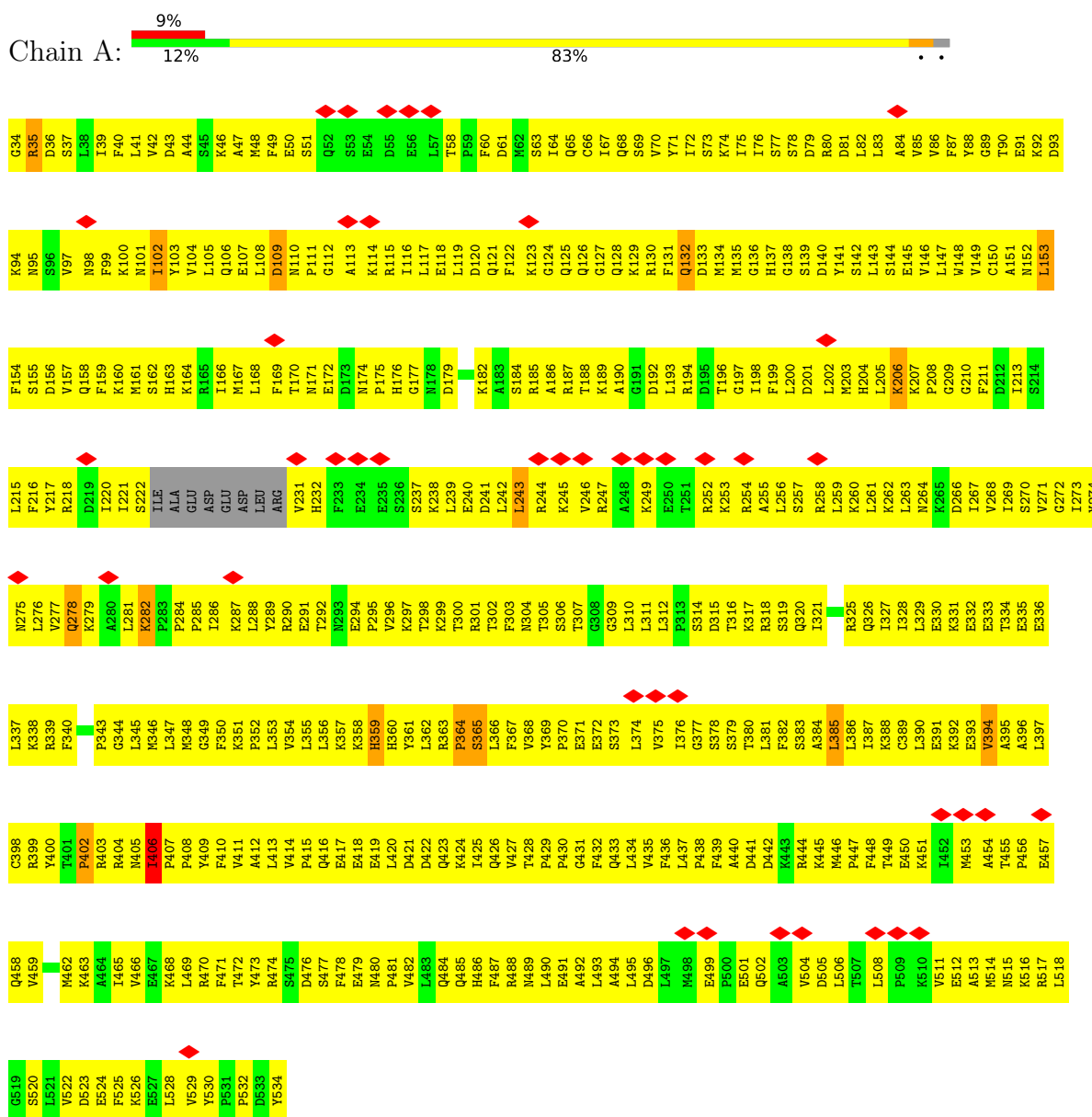
- Molecule 6 is a protein called DNA-dependent protein kinase catalytic subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	C	3636	29066	18608	4912	5356	190	0	0

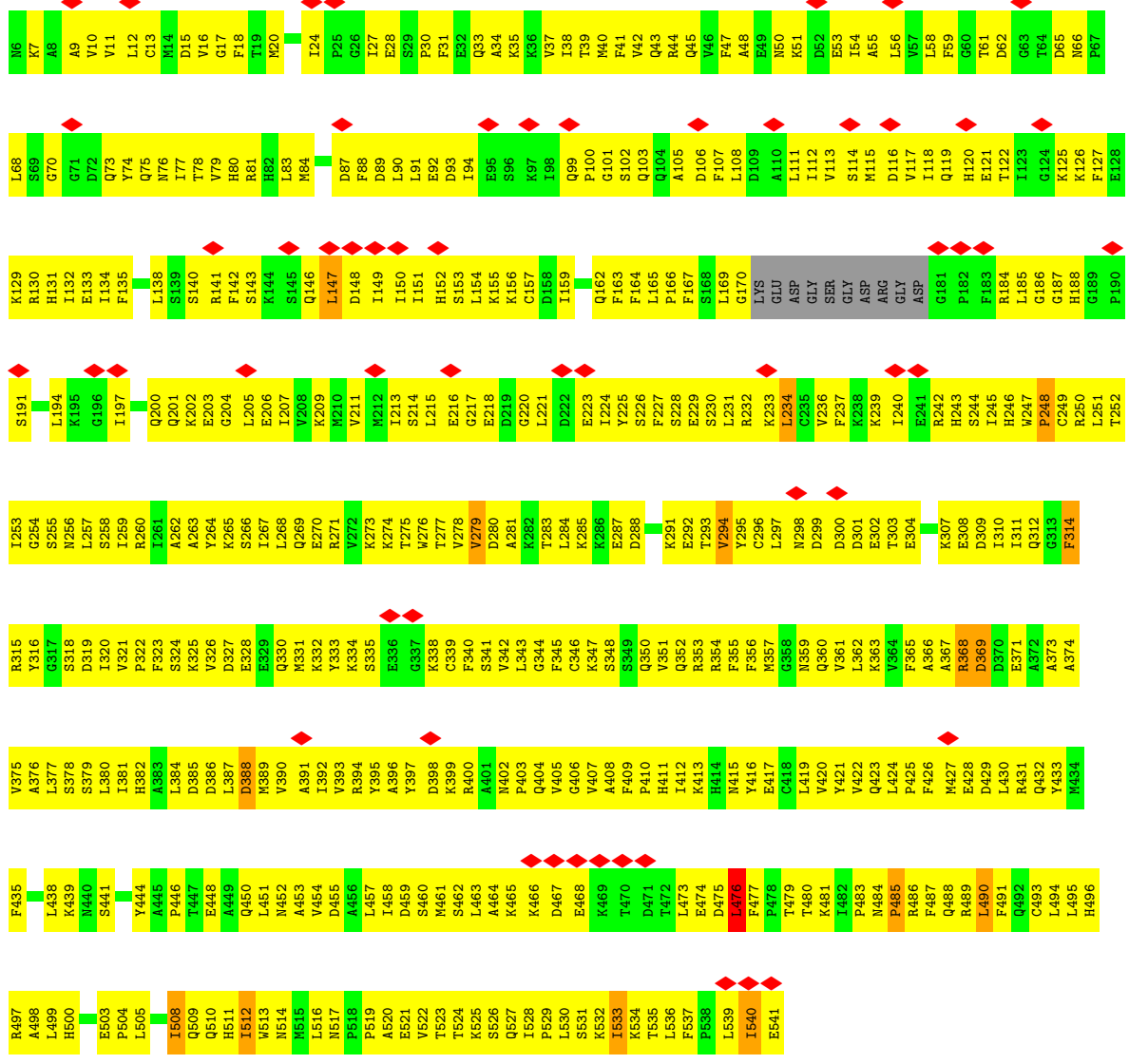
3 Residue-property plots

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.

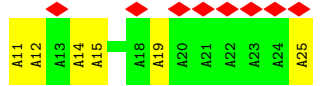
- Molecule 1: X-ray repair cross-complementing protein 6



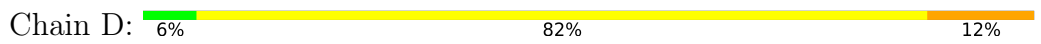
- Molecule 2: X-ray repair cross-complementing protein 5



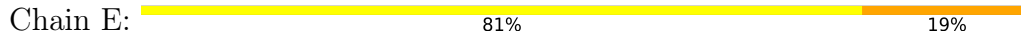
• Molecule 3: PRKDC-Helix



• Molecule 4: DNA (34-MER)



• Molecule 5: DNA (36-MER)



C16	A17	G18	C19	T20	A21	A22	T23	G24	C25	C26	C27	A28	T29	A30	A31	T32	A33	C34	C35	A36	T37	A38	A39	T40	A41	A42	T43	A44	T45	T46	T47	T48	T49	T50	A51
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• Molecule 6: DNA-dependent protein kinase catalytic subunit



C10	S11	L12	L13	R14	L15	Q16	E17	S20	A21	A22	D23	R24	A30	G31	H32	Q33	L34	I35	R36	G37	L38	G39	Q40	E41	I42	V43	L44	S45	M46	S47	P48	A49	V50	L51	A52	L53	S54	T55	S56	L57	V58	F59	S60	R61	D62	F63	G64	L65	L66	V67	V68	V69	R70															
K71	S72	L73	N74	S75	I76	E77	F78	R79	E80	C81	R82	E83	E84	I85	L86	K87	F88	L89	C90	F91	I92	L93	E94	K95	M96	G97	Q98	K99	I100	Y103	S104	E106	I107	K108	M109	S47	T110	C111	T112	S113	V114	T116	K117	L53	D118	R119	A120	L121	K122	C123	K124	L125	P126	A127	L128	L129	L130	L131										
I132	K133	L134	L135	Q136	I137	F138	R139	S140	S141	C81	R82	E83	E84	I85	L86	K87	F88	L89	C90	F91	I92	L93	E94	K95	M96	G97	Q98	K99	I100	Y103	S104	E106	I107	K108	M109	S47	T110	C111	T112	S113	V114	T116	K117	L53	D118	R119	A120	L121	K122	C123	K124	L125	P126	A127	L128	L129	L130	L131										
E194	N195	L196	F197	R198	A199	F200	L201	G202	E203	L204	K205	Q206	Q207	M208	A270	G271	S210	A211	R212	E214	P215	L217	P218	V219	L220	G222	C223	L224	K225	G226	L227	S228	S229	L230	L231	C232	N233	K236	S237	M238	E239	E240	D241	P242	Q243	T244	S245	R246	E247	I248	F249	M250	F251	L252	L253	K254												
A255	I256	R257	Q258	Q259	D260	L261	L262	K263	R264	Y265	A266	V267	S268	S269	A270	G271	S210	A211	R212	E214	P215	L217	P218	V219	L220	G222	C223	L224	K225	G226	L227	S228	S229	L230	L231	C232	N233	K236	S237	M238	E239	E240	D241	P242	Q243	T244	S245	R246	E247	I248	F249	M250	F251	L252	L253	K254												
L316	E317	S318	F319	L320	K321	Q322	S323	S324	M325	M326	V327	K328	K329	N330	A331	M332	K333	H334	K335	K336	K337	L338	Q339	Y340	F341	M342	E343	Q344	F345	Y346	G347	L348	L349	P411	S412	F413	Q414	L415	S416	N417	A418	S419	V420	L421	L422	Y423	L424	D425	T426	V427	P428	E429	V430	F431	T432	P433	V434	V435	E436	H437								
I376	N377	A378	K379	D380	V381	L443	F383	M384	Y385	V386	E387	L388	I389	Q390	R391	C392	K393	Q394	M395	F396	L397	T398	Q399	T400	D401	D405	R406	Y407	Q409	M410	P411	S412	F413	Q414	L415	S416	N417	A418	S419	V420	L421	L422	Y423	L424	D425	T426	V427	P428	E429	V430	F431	T432	P433	V434	V435	E436	H437											
L438	V439	V440	H441	Q442	D444	S445	F446	P447	Q448	Y449	S450	P451	K452	M453	Q454	L455	G456	V457	E577	K578	L579	D580	L581	T582	L583	E584	V646	V647	S648	F649	S650	V651	E552	G553	L554	E590	E592	N593	G594	D595	M540	M541	D542	S543	L544	L545	A546	D547	E548	A549	F550	F551	S552	V553	N554	S555	A609	A610	R675	L497	PR0							
LYS	GLY	PRO	GLU	SER	GLU	ASP	GLP	HIS	ARG	ALA	SER	GLY	VAL	THR	THR	ARG	GLY	LYS	THR	LYS	VAL	PRO	THR	TYR	K225	E526	V527	V528	D529	L530	F531	R532	H533	L534	L535	S536	S537	D538	Q539	M540	M541	D542	S543	L544	L545	A546	D547	E548	A549	F550	F551	S552	V553	N554	S555	A609	A610	R675	L497	PR0								
S559	L560	N561	H562	L563	L564	Y565	D566	E567	F568	V569	C630	R631	S571	V572	L573	K574	L575	V576	E577	K578	L579	D580	L581	T582	L583	E584	V646	V647	S648	F649	S650	V651	E552	G553	L554	E590	E592	N593	G594	D595	M540	M541	D542	S543	L544	L545	A546	D547	E548	A549	F550	F551	S552	V553	N554	S555	A609	A610	R675	L497	PR0							
D619	F620	S621	L622	F623	L624	N625	L626	V627	E628	F629	C630	R631	S571	V572	L573	K574	L575	V576	E577	K578	L579	D580	L581	T582	L583	E584	V646	V647	S648	F649	S650	V651	E552	G553	L554	E590	E592	N593	G594	D595	M540	M541	D542	S543	L544	L545	A546	D547	E548	A549	F550	F551	S552	V553	N554	S555	A609	A610	R675	L497	PR0							
L612	L613	P614	L615	L616	P617	K618	L619	F620	S621	L622	F623	L624	N625	L626	V627	E628	F629	C630	R631	S571	V572	L573	K574	L575	V576	E577	K578	L579	D580	L581	T582	L583	E584	V646	V647	S648	F649	S650	V651	E552	G553	L554	E590	E592	N593	G594	D595	M540	M541	D542	S543	L544	L545	A546	D547	E548	A549	F550	F551	S552	V553	N554	S555	A609	A610	R675	L497	PR0

K1407	M1408	P1409	S1410	Y1411	K1412	D1413	L1414	L1415	E1416	H1417	L1418	L1419	R1420	E1421	K1422	L1423	T1424	A1425	Q1426	S1427	I1428	E1429	E1430	C1431	C1432	A1433	V1434	M1435	L1436	Y1437	G1438	F1439	D1440	A1441	Q1442	D1443	D1444	R1445	S1446	R1447	L1448	S1453	K1456	L1457	H1458	H1459	A1460	A1461	G1462	L1463	L1464	H1465	L1466	L1467	L1468	Q1471					
T1347	L1348	N1349	N1350	L1351	S1352	P1353	E1354	G1355	W1356	K1357	L1358	L1359	K1360	K1361	D1362	L1363	C1364	N1365	T1366	H1367	L1368	M1369	R1370	V1371	L1372	V1373	Q1374	T1375	L1376	C1377	E1378	P1379	A1380	S1381	I1382	F1383	F1384	N1385	I1386	G1387	D1388	V1389	Q1390	V1391	M1392	A1393	H1394	L1395	P1396	D1397	V1398	K1399	V1400	L1402	M1403	K1404	A1405	L1406			
E1285	A1286	Q1287	S1288	L1291	K1292	A1295	F1296	F1297	L1298	E1299	S1300	I1301	A1302	M1303	H1304	D1305	I1306	I1307	A1308	ALA	GLU	GLY	LYS	CYS	PHE	GLY	THR	ALA	ALA	GLY	ASN	ARG	THR	S1323	I1324	Q1325	E1326	E1327	R1329	Y1330	M1331	S1332	S1333	K1334	C1335	T1336	V1337	V1338	V1339	R1340	M1341	L1342	E1343	T1344	T1345	T1346					
I1221	M1222	T1223	F1224	G1227	G1228	C1229	Q1231	G1230	P1232	S1233	G1234	I1235	L1236	A1237	Q1238	P1239	L1240	L1241	L1242	Y1243	F1248	L1249	L1250	Q1251	A1252	L1253	L1254	C1255	W1256	D1257	L1258	L1259	L1260	L1261	A1262	A1263	L1264	E1265	Y1267	N1268	T1269	L1270	I1271	E1272	E1273	R1274	T1275	V1276	G1277	A1278	L1279	Q1280	V1281	L1282	G1283	T1284					
A1161	S1162	L1163	C1164	L1165	L1166	D1167	L1168	V1169	K1170	W1171	L1172	L1173	A1174	H1175	C1176	R1177	P1179	Q1180	THR	GLU	CYS	ARG	HIS	LYS	SER	ILE	GLU	LEU	PHE	TYP	LYS	PHE	VAL	PRO	LEU	LEU	LEU	PRO	GLY	ASN	ARG	PRO	ASN	LEU	TRP	LYS	ASP	VAL	K1213	E1214	E1215	G1216	V1217	S1218	F1219	L1220					
F1101	E1102	A1103	L1104	V1105	I1106	Y1107	M1108	E1109	S1110	L1111	A1112	L1113	A1114	H1115	A1116	D1117	K1118	K1119	S1120	L1121	G1122	T1123	I1124	Q1125	Q1126	C1127	L1128	D1129	A1130	I1131	D1132	H1133	L1134	C1135	R1136	I1137	I1138	E1139	K1140	K1141	H1142	V1143	L1144	L1145	N1146	K1147	A1148	K1149	R1150	R1151	R1152	L1153	L1154	A1155	G1156	F1157	P1158	L1159	S1160		
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R881	Q882	L883	Y884	E885	P886	L887	V888	M889	Q890	L891	I892	H893	W894	T895	N897	N898	K899	K1000	F1001	E1002	S1003	Q1004	D1005	T1006	V1007	A1008	L1009	L1010	E1011	A1012	I1013	L1014	D1015	G1016	I1017	V1018	D1019	P1020	D1022	S1023	T1024	L1025	R1026	D1027	T965	Q966	Y962	K963	R964	T965	P967	V968	L969	S970	R971	L972	A973	D977	Q978	V979	T980
L859	G860	L862	G863	G864	Q865	I866	N867	K868	N869	L870	A893	L871	T872	V873	T874	S875	S876	D877	E878	M879	K880	A881	S882	H883	Y884	G885	W886	D887	R888	E889	K890	L891	L892	L893	H894	A895	V896	P897	F898	R899	E900	M901	K902	P903	V904	I905	F906	L907	D908	R909	S910	L911	P912	R913	V914	E915	L916	L917	A918		
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Y799	L800	K801	T802	S803	A804	L805	S806	D807	Y748	V749	T809	LYS	ASN	ASN	TRP	GLU	VAL	SER	ALA	LEU	ARG	ALA	ALA	GLN	LYS	GLY	PHE	ASN	LYS	VAL	VAL	LEU	LYS	HIS	LEU	LYS	LYS	THR	LYS	ASN	ASN	ALA	I846	S847	L848	E849	K850	I851	R852	I853	R854	V855	L856	Q857	M858						
N739	I740	I741	E742	L743	D744	V745	R746	Y748	V749	P750	S751	L752	Q753	M754	A755	K757	L758	G759	L760	S761	Y762	T763	P764	L765	A766	V768	G769	L770	N771	A772	L773	E774	E775	V776	S777	I778	Y779	I780	D781	R782	H783	V784	M785	P787	Y788	K789	L790	I791	I792	L793	P794	C795	L796	D797	G798						
K679	I680	K681	Y682	PHE	GLU	GLY	VAL	SER	PRO	LYS	SER	LEU	LYS	HIS	SER	PRO	GLU	K700	Y701	S702	C703	F704	A705	L706	F707	V708	K709	G710	F711	K712	E713	V714	A715	E716	K717	M718	K719	Q720	Y721	K722	D723	E724	L725	A727	S728	C729	L730	T731	F732	L733	L734	S735	L736	P737	H738						

L1472	L1475	L1476	L1477	L1478	L1479	L1480	L1481	L1482	L1483	L1484	L1485	L1486	L1489	L1490	L1491	L1492	L1493	L1494	L1495	L1496	L1497	L1498	L1499	L1500	L1501	L1502	L1503	L1504	L1505	L1506	L1507	L1508	L1509	L1510	L1511	L1512	L1513	L1514	L1515	L1516	L1517	L1518	L1519	L1520	L1521	L1522	L1523	L1524	L1525	L1526	ARG	LEU	LEU	VAL	SER	LEU	LEU	LEU	LEU		
ASN	ALA	VAL	SER	LEU	SER	THR	ALA	SER	LEU	GLY	SER	SER	GLN	S1548	S1549	V1550	H1551	H1552	F1553	H1554	H1555	G1556	E1557	Y1558	L1559	Y1560	S1561	L1562	F1563	S1564	L1565	T1566	L1567	N1568	L1569	E1570	L1571	L1572	K1573	N1574	L1575	E1576	V1577	V1579	L1580	E1581	L1582	M1583	Q1584	S1585	L1586	L1587	K1588	M1589	V1590	L1591	L1592	L1593	L1594	L1595	L1596
L1597	M1598	G1599	L1600	L1601	D1602	Q1603	S1604	F1605	L1606	L1607	E1608	R1609	ASN	GLN	LYS	HIS	GLN	GLY	LEU	LYS	LEU	ALA	THR	ILE	LEU	HIS	TRP	L1630	L1631	W1632	W1633	A1634	K1635	D1636	S1637	P1638	L1639	E1640	T1641	K1642	M1643	A1644	V1645	L1646	A1647	M1648	L1649	A1650	K1651	L1652	L1653	R1711	R1712	Q1654	I1655	L1656	D1656				
S1657	S1658	VAL	SER	PHE	ASN	THR	ALA	SER	HIS	GLY	PHE	PRO	GLU	V1671	F1672	T1673	T1674	Y1675	S1676	L1677	L1678	L1679	A1680	D1681	T1682	M1683	K1684	L1685	L1686	H1687	L1688	K1689	G1690	Q1691	A1692	V1693	L1694	T1695	L1696	L1697	F1698	F1699	T1700	L1701	L1702	G1703	G1704	L1705	S1706	L1707	E1708	L1709	L1710	R1711	R1712	Q1654	I1655	L1656	D1656		
L1717	L1718	H1721	F1722	F1723	M1724	Q1725	S1726	R1727	L1728	E1729	F1730	P1731	G1732	T1733	P1734	R1735	F1736	N1737	N1738	Y1739	V1740	C1741	M1742	K1744	K1745	F1746	L1747	D1748	A1749	L1750	E1751	L1752	S1753	Q1754	S1755	P1756	M1757	L1758	L1759	E1760	L1761	M1762	T1763	GLU	VAL	LEU	CYS	ARG	GLU	GLN	GLN	HIS	VAL	TRP	MET	GLU	GLU	LEU			
PHE	GLN	SER	PHE	ARG	ARG	ILE	ALA	ARG	ARG	GLY	SER	CYS	THR	VAL	GLN	GLY	LEU	L1798	N1799	E1799	S1800	V1801	E1803	M1804	F1805	R1806	K1807	D1808	L1809	P1810	R1811	L1812	S1813	F1814	T1815	R1816	Q1817	S1818	F1819	V1820	D1821	SER	LEU	LEU	THR	LEU	LEU	TRP	HIS	CYS	SER	LEU	ASP	ALA	LEU	ARG					
GLU	PHE	PHE	SER	THR	ILE	VAL	ASP	ALA	ILE	ASP	VAL	LEU	LYS	SER	ARG	PHE	T1856	L1857	L1858	N1859	E1860	S1861	F1862	F1863	D1864	T1865	Q1866	L1867	L1868	K1869	K1870	M1871	G1872	Y1873	L1874	K1875	L1876	L1877	D1878	L1879	M1880	Y1881	S1882	R1883	L1884	P1885	K1886	D1887	L1888	V1889	H1890	A1891	K1892	E1893	S1894	K1895	L1896	M1897			
G1898	V1899	F1900	H1901	G1902	S1903	C1904	I1905	T1906	E1907	G1908	N1909	E1910	L1911	K1912	L1913	T1914	L1915	L1916	K1917	L1918	C1919	Y1920	D1921	F1922	I1923	T1924	E1925	M1926	A1927	G1928	C1929	E1930	M1931	Q1932	L1933	L1934	E1935	R1936	R1937	R1938	L1939	Y1940	H1941	C1942	A1943	A1944	Y1945	M1946	C1947	A1948	L1949	S1950	Y1951	I1952	C1953	C1954	V1955	F1956	M1957		
E1958	L1959	K1960	F1961	Y1962	Q1963	L1964	F1965	L1966	F1967	S1968	E1969	L1970	P1971	E1972	K1973	N1974	L1975	L1976	I1977	F1978	E1979	N1980	L1981	T1982	L1983	L1984	K1985	L1986	R1987	Y1988	N1989	Q2050	L1990	P1991	V1992	E1993	V1994	E1995	V1996	P1997	M1998	E1999	R2000	K2001	K2002	K2003	Y2004	I2005	E2006	L2007	K2008	K2009	E2010	A2011	R2012	E2013	A2014	A2015	N2016	G2017	
D2018	S2019	D2020	G2021	P2022	S2023	Y2024	M2025	L2028	S2029	R2030	L2031	A2032	D2033	S2034	T2035	L2036	S2037	E2038	E2039	M2040	S2041	K2102	H2103	N2104	H2105	R2106	S2107	L2108	G2109	Q2050	S2051	Y2052	S2053	Y2054	S2055	S2056	S2057	D2058	P2059	R2060	P2061	A2062	T2063	G2064	R2065	F2066	R2067	R2068	R2069	E2070	Q2071	L2192	H2193	G2131	K2132	P2074	T2075	V2076	H2077	D2078	
D2079	V2080	L2081	E2082	L2083	E2084	M2085	D2086	E2087	L2088	M2089	R2090	C2093	M2094	A2095	P2096	L2097	T2098	A2099	L2100	V2101	K2102	H2103	N2104	H2105	R2106	S2107	L2108	G2109	P2110	P2111	Q2112	G2113	E2114	E2115	D2116	S2117	S2118	P2119	R2120	D2121	L2122	P2123	S2124	W2125	M2126	K2127	F2128	L2129	H2130	G2131	K2132	L2133	G2134	N2135	L2136	L2137	V2138	P2139			
L2140	M2141	L2142	R2143	L2144	F2145	L2146	A2147	K2148	L2149	V2150	L2151	N2152	T2153	E2154	L2155	L2156	F2157	R2158	P2159	Y2160	A2161	K2162	W2163	L2164	L2165	S2166	P2167	L2168	L2169	Q2170	L2171	A2172	L2173	S2174	E2175	N2176	N2177	G2178	G2179	E2180	G2181	I2182	H2183	Y2184	M2185	V2186	L2187	E2188	I2189	V2190	A2191	T2192	I2193	L2194	S2195	L2196	T2197	N2198	L2199		
A2200	T2201	F2202	T2203	G2204	V2205	P2206	K2207	D2208	E2209	V2210	L2211	A2212	N2213	R2214	L2215	L2216	N2217	F2218	L2219	M2220	K2221	H2222	F2224	H2225	P2226	R2227	R2228	A2229	V2230	F2231	R2232	H2233	N2234	L2235	E2236	I2237	L2238	K2239	T2240	L2241	V2242	E2243	C2244	L2245	K2246	C2248	L2249	S2250	I2251	F2252	R2253	L2254	L2255	L2256	F2257	E2258	K2259				

K3842	K3843	K3844	K3845	K3846	K3847	K3848	K3849	K3850	K3851	K3852	K3853	K3854	K3855	K3856	K3857	K3858	K3859	K3860	K3861	K3862	K3863	K3864	K3865	K3866	K3867	K3868	K3869	K3870	K3871	K3872	K3873	K3874	K3875	K3876	K3877	K3878	K3879	K3880	K3881	K3882	K3883	K3884	K3885	K3886	K3887	K3888	K3889	K3890	K3891	K3892	K3893	K3894	F3897	F3898	F3899	L3900	L3901	S3902		
S3782	Q3783	R3784	A3785	L3786	Q3787	L3788	R3789	L3790	Y3791	S3792	L3793	L3794	P3795	M3796	L3797	S3798	L3799	L3800	G3801	L3802	L3803	E3804	R3805	L3806	E3807	N3808	N3809	L3810	L3811	K3812	L3813	D3814	L3815	L3816	L3817	L3818	L3819	M3820	Q3821	Q3822	E3823	E3824	K3825	A3826	A3827	L3828	L3829	S3830	R3831	R3832	R3833	A3834	R3835	R3836	E3837	E3838	R3839	K3840	D3841	
G3721	F3722	D3723	E3724	R3725	V3726	L3727	V3728	M3729	A3730	S3731	L3732	R3733	R3734	P3735	K3736	R3737	L3738	L3739	L3740	R3741	L3742	E3743	R3746	E3747	H3748	R3749	E3750	L3751	V3752	K3753	G3754	L3755	G3756	D3757	L3758	R3759	Q3760	D3761	Q3762	R3763	V3764	E3765	Q3766	L3767	F3768	Q3769	V3770	M3771	N3772	G3773	L3774	L3775	A3776	Q3777	D3778	S3779	R3839	A3780	C3781	
N3660	D3661	T3662	T3663	N3664	M3665	L3666	L3667	L3668	K3669	N3670	N3671	K3672	S3673	K3674	K3675	P3676	Q3677	L3678	L3679	L3680	K3681	E3682	C3683	S3684	P3685	L3686	M3687	S3688	D3689	F3690	K3691	V3692	E3693	F3694	L3695	L3696	R3697	L3698	L3699	E3700	I3701	P3702	G3703	Q3704	Y3705	D3706	R3707	R3708	G3709	K3710	P3711	E3714	L3651	L3652	A3594	E3595	L3596	A3597		
K3598	T3599	P3600	V3601	N3602	K3603	K3604	N3605	L3606	E3607	M3609	Y3610	E3611	R3612	M3613	Y3614	A3615	A3616	L3617	G3618	D3619	P3620	K3621	A3622	P3623	G3624	L3625	G3626	A3627	F3628	R3629	E3693	F3694	L3695	L3696	R3697	L3698	L3699	E3633	L3634	F3635	G3637	K3638	E3639	F3640	D3641	K3642	H3643	F3644	G3645	S3649	K3650	L3651	L3652	A3594	E3595	L3596	A3597			
E3477	E3478	T3479	L3480	S3481	L3482	M3483	T3484	K3485	E3486	I3487	S3488	S3489	P3490	P3491	C3492	M3493	Q3494	F3495	I3496	S3497	M3498	I3499	S3500	H3501	M3502	S3503	Q3504	A3505	L3506	D3507	K3508	L3509	D3510	E3511	A3512	A3513	V3514	Q3515	H3516	S3517	V3518	E3519	E3520	I3521	T3522	D3523	M3524	Y3525	P3526	Q3527	A3528	I3529	V3530	E3531	R3532	F3533	L3534	E3535	S3536	
L3416	A3417	D3418	F3419	S3420	D3421	Q3422	Q3423	L3424	K3425	K3426	E3427	E3428	A3431	S3432	V3433	T3434	S3435	S3436	E3437	L3438	L3439	Q3440	A3441	P3442	Q3443	A3444	L3445	V3446	V3447	E3448	K3449	H3450	L3451	K3452	L3453	K3454	K3455	L3456	N3457	N3458	N3459	E3460	A3461	R3462	L3463	K3464	F3465	P3466	R3467	L3468	L3469	Q3470	L3471	L3472	E3473	R3474	Y3475	P3476		
E3357	E3358	S3359	S3360	S3361	F3362	D3363	T3364	S3365	T3366	T3367	K3368	K3369	M3370	K3371	K3372	E3373	F3374	E3375	G3376	E3377	L3378	I3379	S3380	E3381	R3382	H3383	H3384	L3385	E3386	E3387	A3388	V3389	Q3390	A3391	A3392	E3393	E3394	E3395	R3396	Q3397	P3398	P3399	S3400	W3401	S3402	C3403	G3404	P3405	G3408	F3409	I3410	D3411	A3412	Y3413	M3414	T3415				
S3294	E3295	Q3296	V3297	L3298	T3299	V3300	L3301	K3302	L3303	V3304	S3305	L3306	L3307	D3308	E3309	N3310	N3311	V3312	S3313	S3314	Y3315	L3316	L3317	S3318	K3319	L3320	L3321	A3322	F3323	R3324	D3325	Q3326	R3327	L3328	L3329	L3330	G3331	T3332	T3333	Y3334	R3335	I3336	I3337	A3338	M3339	C3340	R3341	L3342	S3343	H3344	R3345	L3348	A3349	E3350	I3351	R3352	G3353	E3354	D3355	
K3172	M3173	D3174	P3175	M3176	N3177	L3178	W3179	D3180	D3181	I3182	I3183	T3184	N3185	R3186	Q3249	N3250	M3251	F3252	S3253	L3254	A3255	M3256	K3257	L3258	L3259	E3260	R3261	L3262	H3263	K3264	E3265	S3266	R3267	T3268	M3269	D3270	K3271	W3272	L3273	L3274	V3275	W3276	V3277	Q3278	S3279	Y3280	C3281	R3282	L3283	S3284	H3285	R3286	R3287	L3288	ASP	I3227	S3228	R3291	R3292	C3293
F3110	K3111	K3112	N3113	Y3114	S3115	S3116	L3117	D3118	V3119	L3120	L3121	H3122	Q3123	S3124	R3125	L3126	T3127	K3128	L3129	Q3130	S3131	V3132	S3133	A3134	L3135	L3136	E3137	L3138	Q3139	E3140	F3141	I3142	S3143	F3144	A3145	S3146	K3147	Q3148	E3149	N3150	L3151	S3152	S3153	Q3154	V3155	P3156	R3159	L3160	N3161	N3162	T3163	K3164	T3165	R3166	R3167	Y3168	P3169			

H3903	H3904	H3905	H3906	H3907	H3908	H3909	H3910	H3911	H3912	H3913	H3914	H3915	H3916	H3917	H3918	H3919	H3920	H3921	H3922	H3923	H3924	H3925	H3926	H3927	H3928	H3929	H3930	H3931	H3932	H3933	H3934	H3935	H3936	H3937	H3938	H3939	H3940	H3941	H3942	H3943	H3944	H3947	H3948	H3949	H3950	H3951	H3952	H3955	H3956	H3957	H3958	H3959	H3960	H3961	H3962	H3963	H3964		
R3965	Q3966	F3967	I3968	N3969	L3970	M3971	L3972	P3973	M3974	K3975	E3976	T3977	G3978	L3979	M3980	Y3981	S3982	I3983	M3984	V3985	H3986	A3987	L3988	R3989	A3990	F3991	R3992	S3993	D3994	L3997	L3998	T3999	N4000	G3996	T4001	M4002	D4003	V4004	F4005	V4006	K4007	E4008	P4009	S4010	F4011	D4012	W4013	K4014	N4015	F4016	E4017	Q4018	K4019	M4020	L4021	K4022	K4023	G4024	
W4027	I4028	Q4029	E4030	I4031	M4032	V4033	A4034	E4035	G4036	M4037	W4038	Y4039	P4040	R4041	Q4042	K4043	I4044	C4045	Y4046	A4047	K4048	R4049	K4050	L4051	A4052	G4053	A4054	M4055	P4056	A4057	V4058	I4059	T4060	C4061	D4062	E4063	L4064	L4065	L4066	G4067	H4068	E4069	K4070	A4071	P4072	A4073	F4074	R4075	D4076	Y4077	V4078	A4079	V4080	A4081	R4082	G4083	S4084	K4085	P4086
H4087	N4088	I4089	R4090	A4091	Q4092	E4093	P4094	E4095	S4096	G4097	L4098	S4099	E4100	E4101	T4102	Q4103	V4104	K4105	C4106	L4107	M4108	D4109	Q4110	A4111	T4112	D4113	P4114	M4115	I4116	L4117	G4118	R4119	T4120	W4121	E4122	G4123	H4124	E4125	P4126	W4127	M4128																		

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	53451	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1700	Depositor
Maximum defocus (nm)	4700	Depositor
Magnification	18000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.139	Depositor
Minimum map value	-0.053	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.03	Depositor
Map size (\AA)	390.0, 390.0, 390.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.3, 1.3, 1.3	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.51	0/4060	0.75	3/5468 (0.1%)
2	B	0.45	0/4297	0.69	4/5798 (0.1%)
3	K	0.28	0/74	0.36	0/102
4	D	1.44	1/784 (0.1%)	1.23	5/1209 (0.4%)
5	E	1.38	2/822 (0.2%)	1.23	8/1266 (0.6%)
6	C	0.54	1/29665 (0.0%)	0.77	41/40094 (0.1%)
All	All	0.59	4/39702 (0.0%)	0.78	61/53937 (0.1%)

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	12
2	B	0	8
6	C	0	89
All	All	0	109

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	2	DG	C3'-O3'	-5.56	1.36	1.44
5	E	36	DA	N9-C4	-5.48	1.34	1.37
6	C	2245	TRP	CB-CG	-5.41	1.40	1.50
5	E	39	DA	C3'-O3'	-5.16	1.37	1.44

The worst 5 of 61 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	2323	LEU	CA-CB-CG	-9.10	94.38	115.30
6	C	734	LEU	CA-CB-CG	-8.80	95.05	115.30
5	E	44	DA	O4'-C4'-C3'	-8.59	100.85	106.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	1257	LEU	CA-CB-CG	-8.10	96.68	115.30
6	C	2884	LEU	CA-CB-CG	-7.98	96.96	115.30

There are no chirality outliers.

5 of 109 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	102	ILE	Peptide
1	A	109	ASP	Peptide
1	A	206	LYS	Peptide
1	A	268	VAL	Peptide
1	A	35	ARG	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3982	0	4064	899	0
2	B	4210	0	4250	708	0
3	K	75	0	74	5	0
4	D	700	0	388	182	0
5	E	733	0	410	214	0
6	C	29066	0	29396	5262	0
All	All	38766	0	38582	6927	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 90.

The worst 5 of 6927 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:C:3809:THR:HA	6:C:3930:VAL:O	1.25	1.32
6:C:3740:ILE:HB	6:C:3748:HIS:O	1.38	1.22
1:A:378:SER:O	1:A:382:PHE:HB3	1.39	1.21
6:C:700:LYS:N	6:C:703:CYS:HG	1.35	1.21
2:B:264:TYR:HB2	2:B:363:LYS:O	1.43	1.19

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	489/501 (98%)	411 (84%)	74 (15%)	4 (1%)	19	60
2	B	522/536 (97%)	444 (85%)	71 (14%)	7 (1%)	12	48
3	K	13/15 (87%)	12 (92%)	1 (8%)	0	100	100
6	C	3608/4119 (88%)	2742 (76%)	764 (21%)	102 (3%)	5	30
All	All	4632/5171 (90%)	3609 (78%)	910 (20%)	113 (2%)	9	33

5 of 113 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	368	ARG
6	C	430	VAL
6	C	473	PRO
6	C	905	ILE
6	C	1977	ILE

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	448/455 (98%)	447 (100%)	1 (0%)	93	96
2	B	474/481 (98%)	473 (100%)	1 (0%)	93	96
6	C	3238/3667 (88%)	3217 (99%)	21 (1%)	86	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	4160/4603 (90%)	4137 (99%)	23 (1%)	86	92

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	C	2785	ILE
6	C	3019	ILE
6	C	2816	ILE
6	C	3045	ILE
6	C	1491	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 106 such sidechains are listed below:

Mol	Chain	Res	Type
6	C	1738	ASN
6	C	2163	HIS
6	C	3704	GLN
6	C	1866	GLN
6	C	1980	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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 [i](#)

This section contains visualisations of the EMDB entry EMD-6803. These allow visual inspection of the internal detail of the map and identification of artifacts.

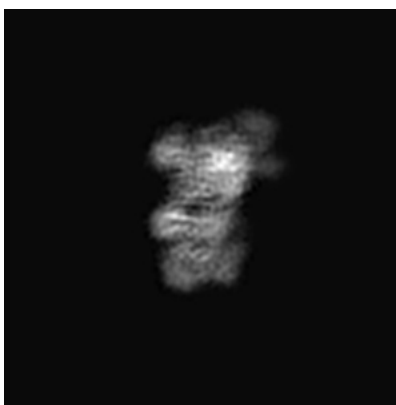
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

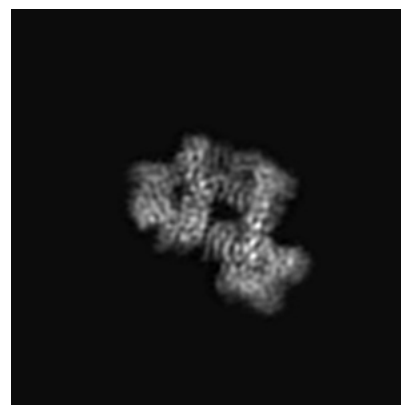
6.1.1 Primary map



X



Y

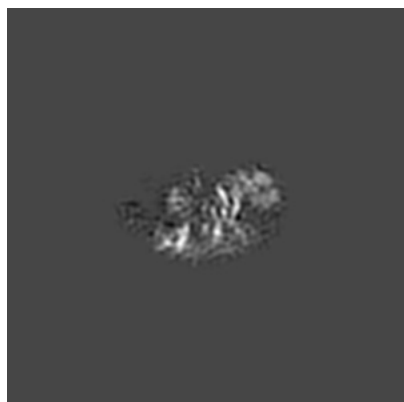


Z

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

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 150



Y Index: 150



Z Index: 150

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

6.3 Largest variance slices [i](#)

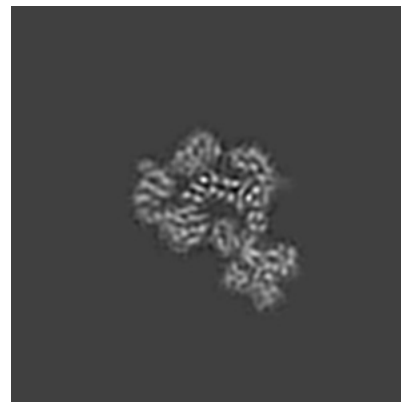
6.3.1 Primary map



X Index: 181



Y Index: 136

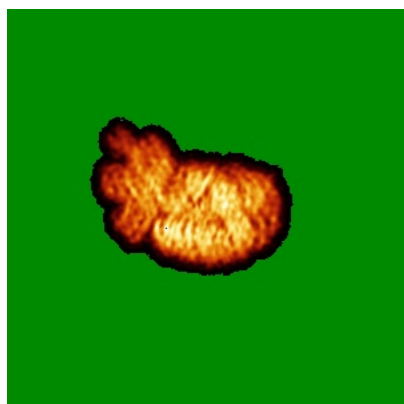


Z Index: 159

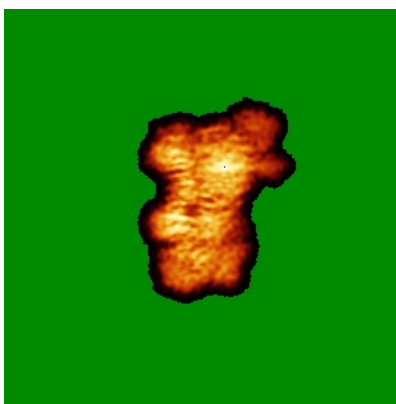
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

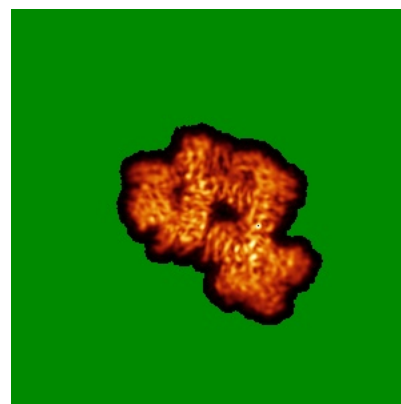
6.4.1 Primary map



X



Y

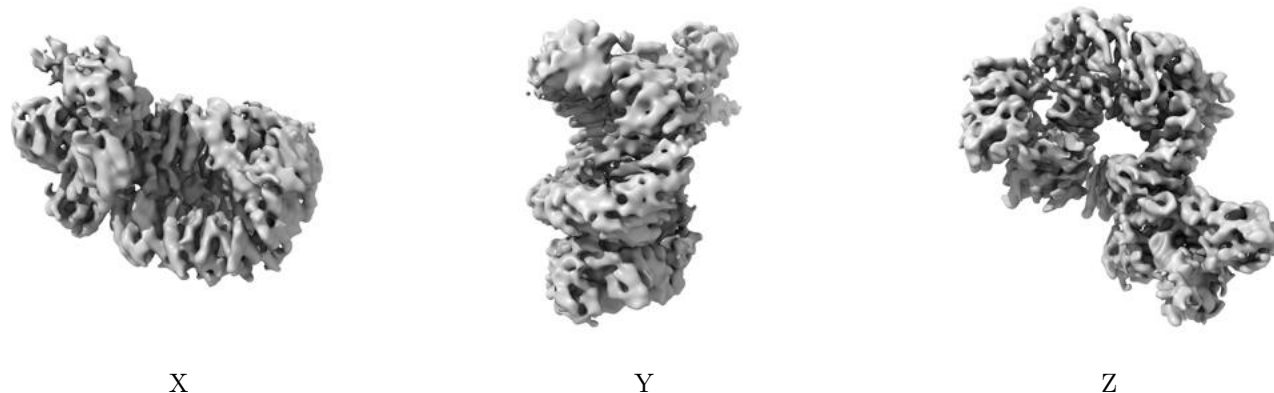


Z

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



The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

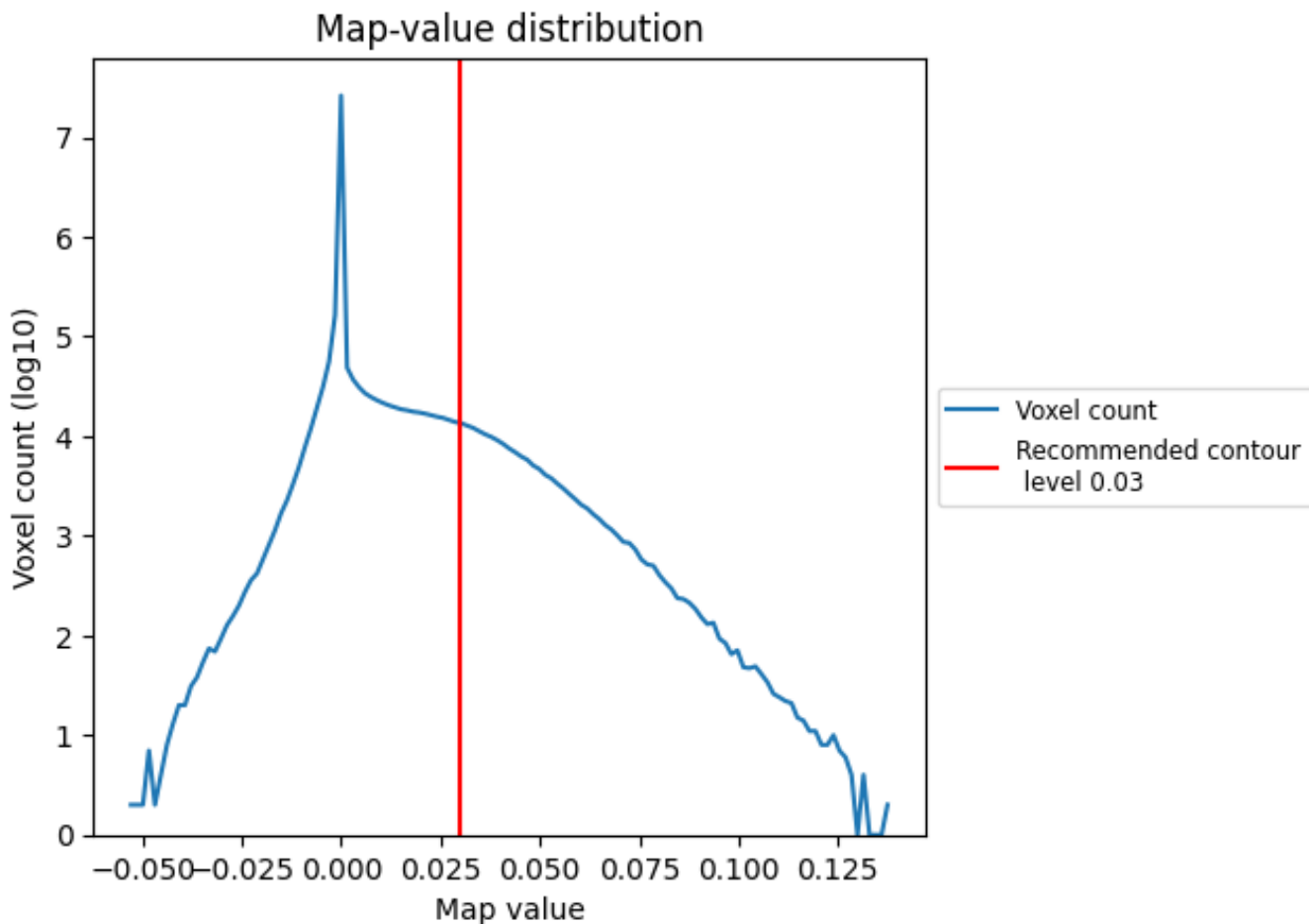
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

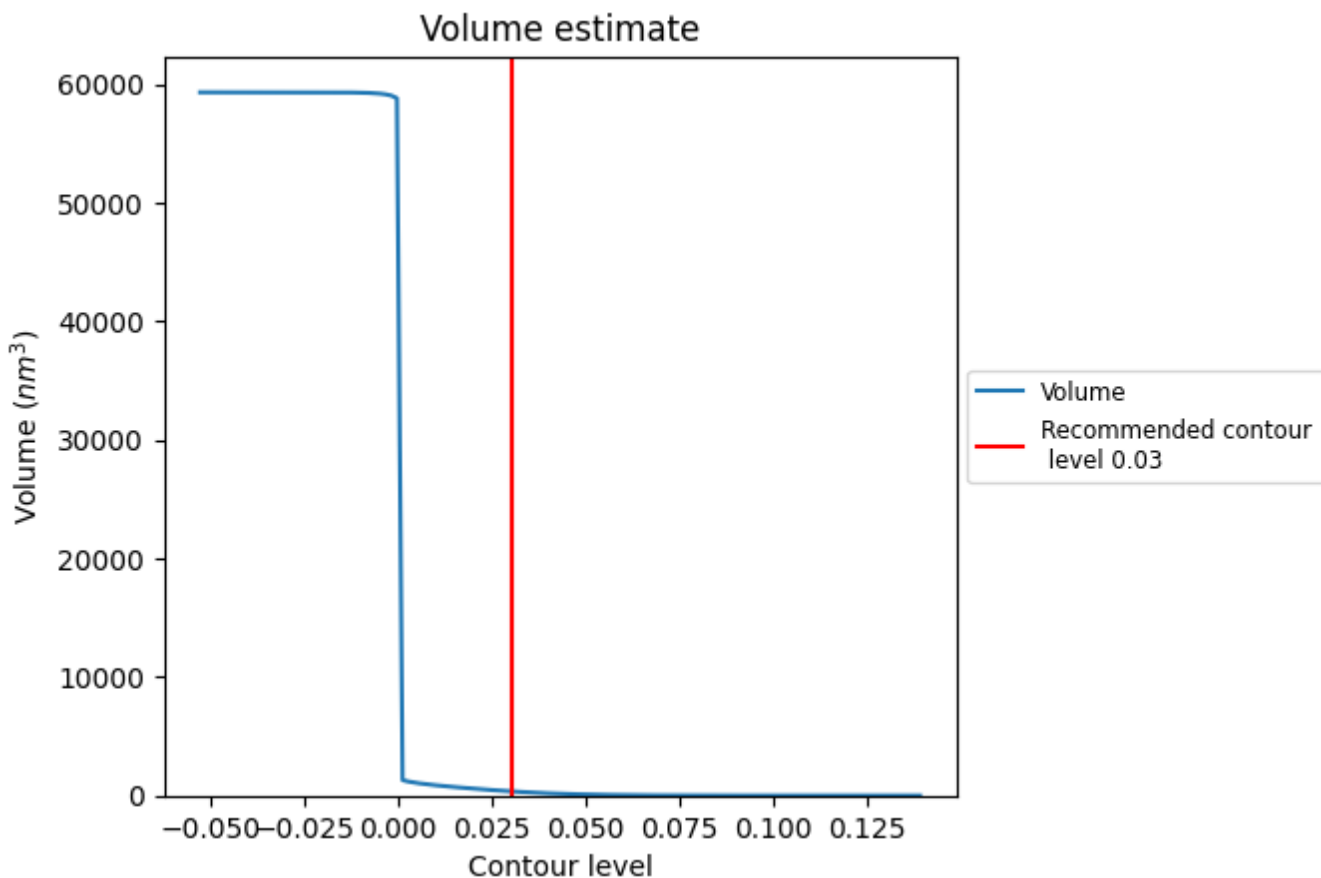
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

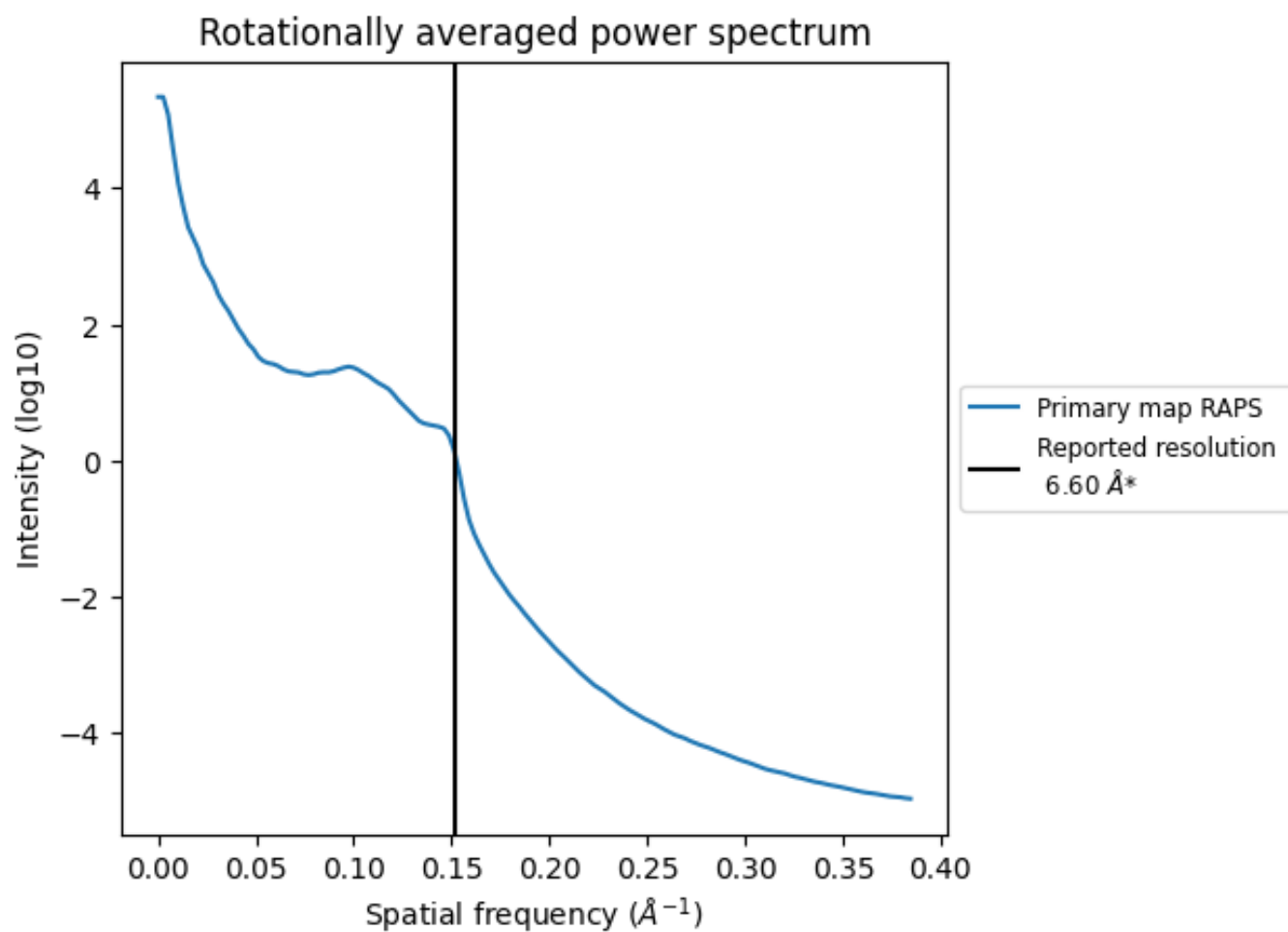
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 356 nm^3 ; this corresponds to an approximate mass of 322 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](#)

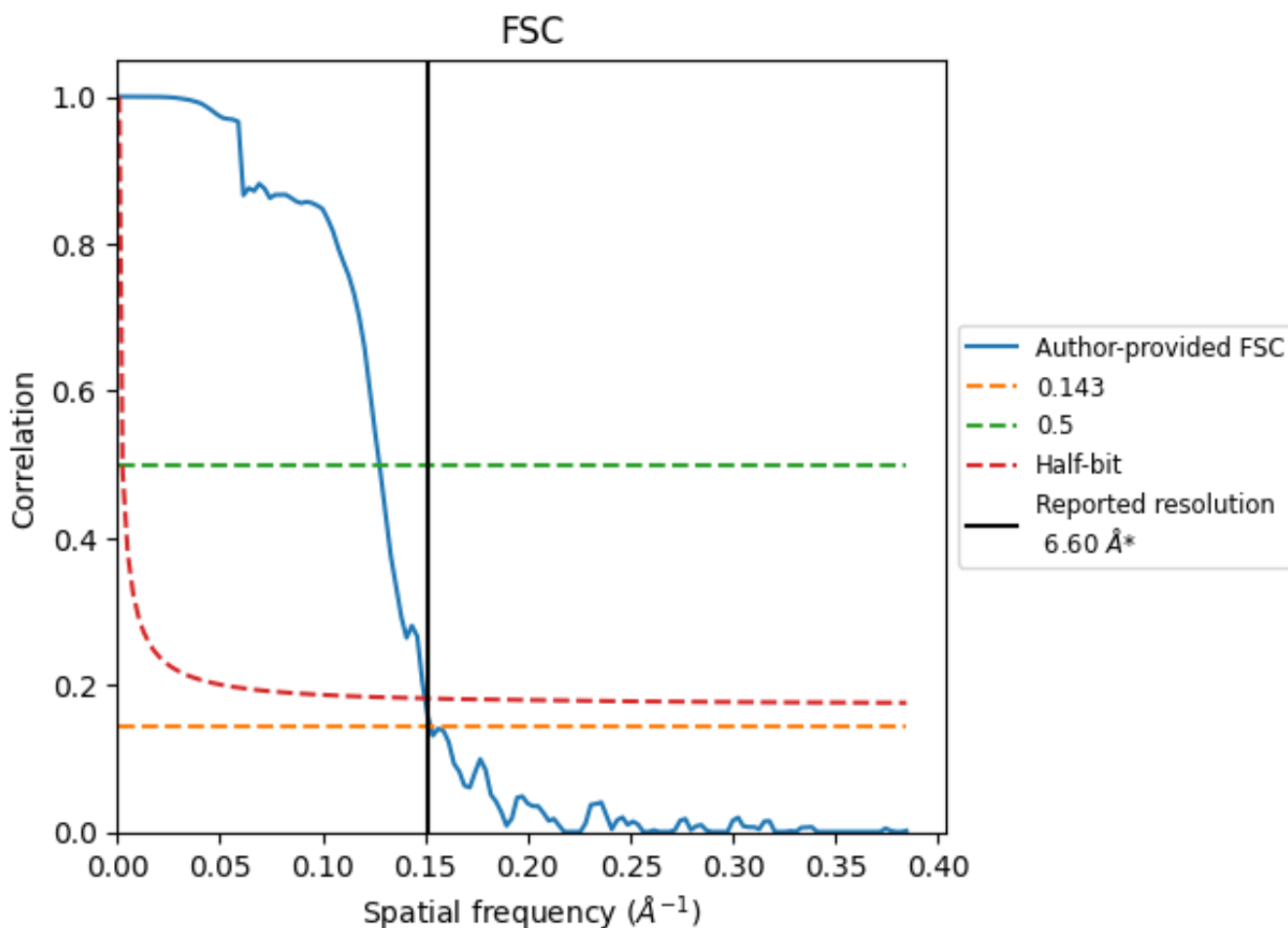


*Reported resolution corresponds to spatial frequency of 0.152\AA^{-1}

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.152 Å⁻¹

8.2 Resolution estimates [i](#)

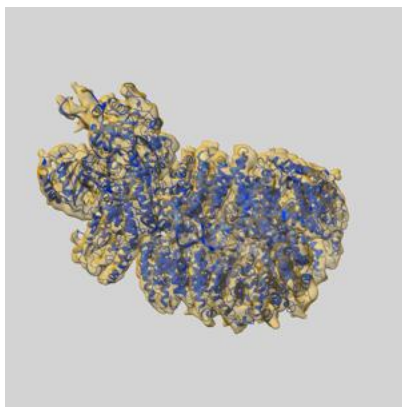
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	6.60	-	-
Author-provided FSC curve	6.55	7.82	6.67
Unmasked-calculated*	-	-	-

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

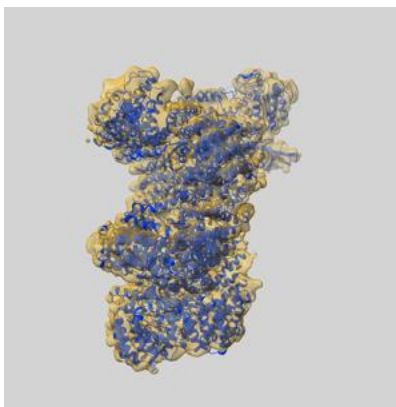
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-6803 and PDB model 5Y3R. Per-residue inclusion information can be found in section 3 on page 4.

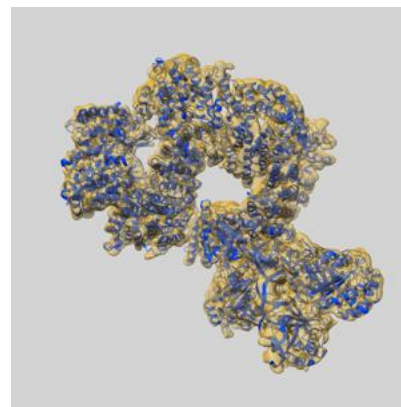
9.1 Map-model overlay [i](#)



X



Y



Z

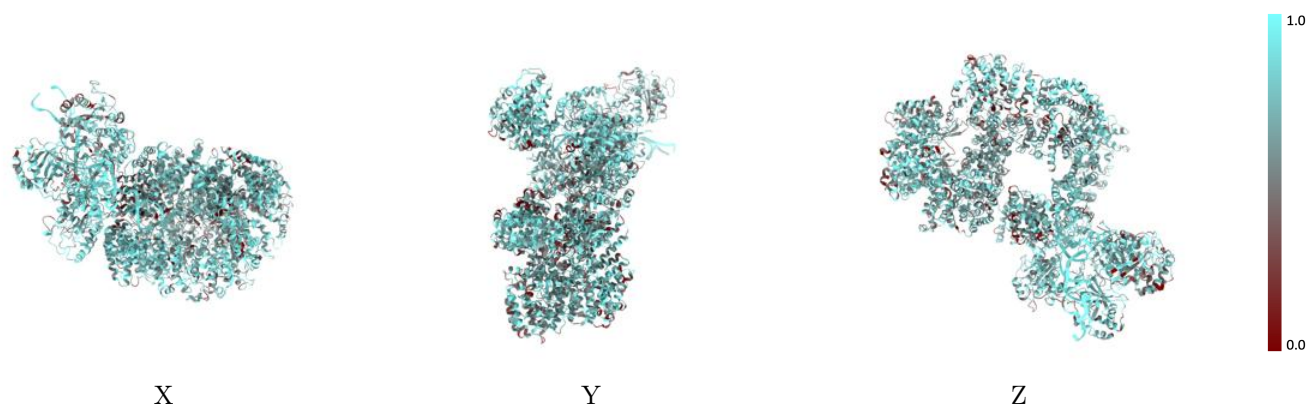
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



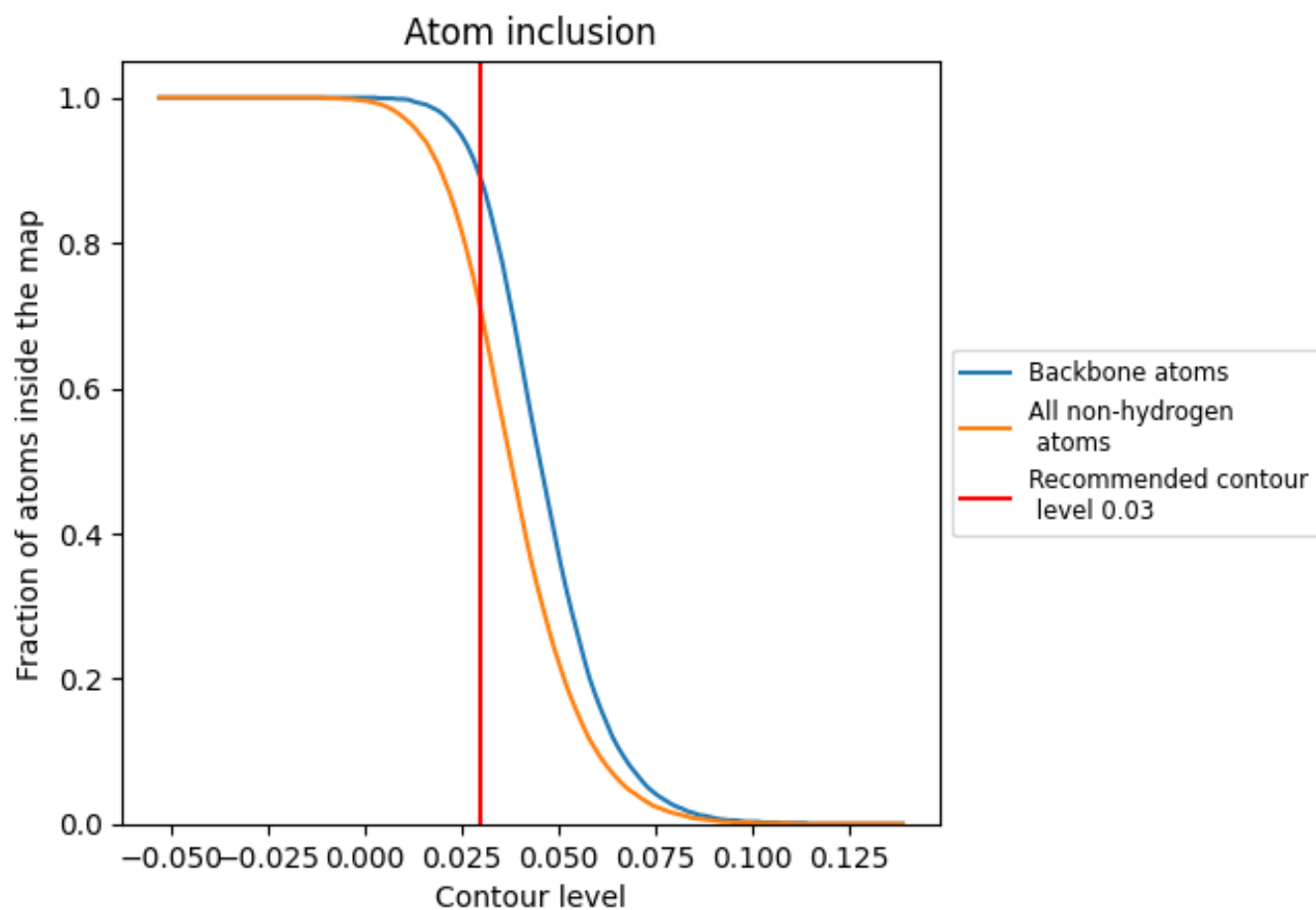
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (0.03).















9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 71% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7080	 0.2170
A	 0.7480	 0.2360
B	 0.7070	 0.2250
C	 0.6940	 0.2110
D	 0.9200	 0.2680
E	 0.8910	 0.2590
K	 0.4400	 0.2940

