



wwPDB EM Validation Summary Report ⓘ

Jan 14, 2025 – 03:22 PM JST

PDB ID : 8YFG
EMDB ID : EMD-39223
Title : Human PIEZO1-R2456H_MDFIC
Authors : Zhang, M.F.
Deposited on : 2024-02-24
Resolution : 4.50 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.dev113
MolProbity : 4.02b-467
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) : 2.40

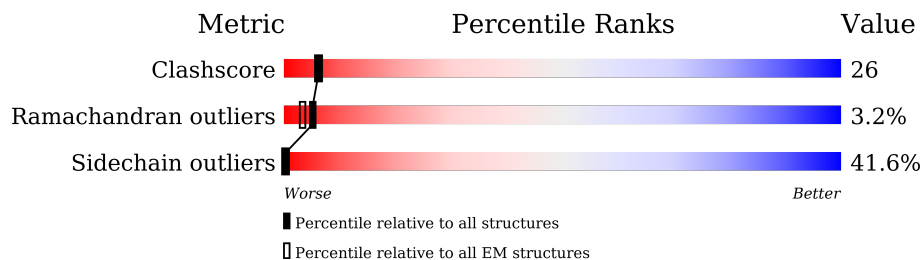
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.50 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 $\leq 5\%$. 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	2521	
1	B	2521	
1	D	2521	
2	C	246	
2	E	246	
2	F	246	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 31599 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 Piezo-type mechanosensitive ion channel component 1.

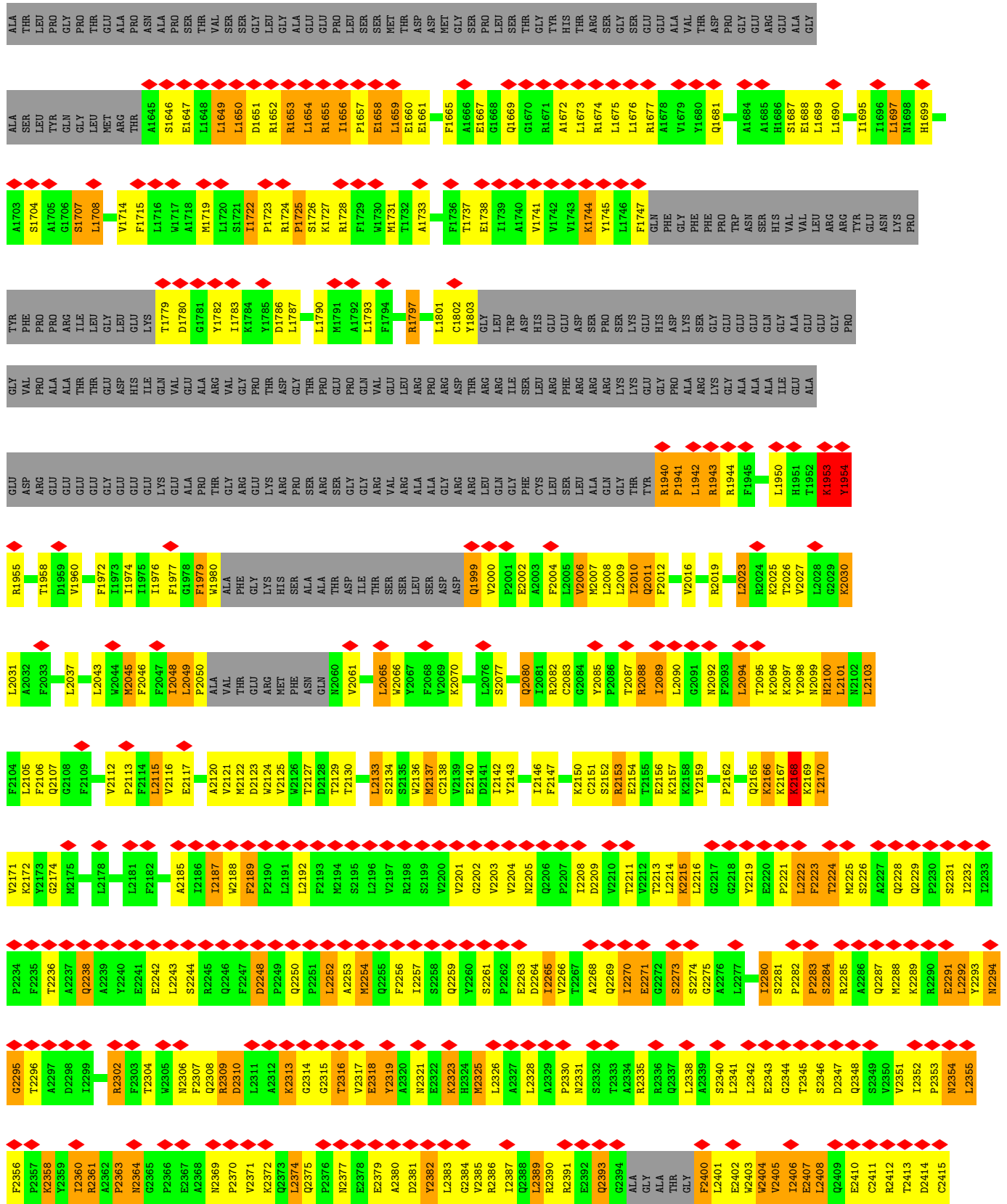
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1280	10394	6871	1728	1734	61	0	0
1	B	1280	10388	6865	1728	1734	61	0	0
1	D	1280	10394	6871	1728	1734	61	0	0

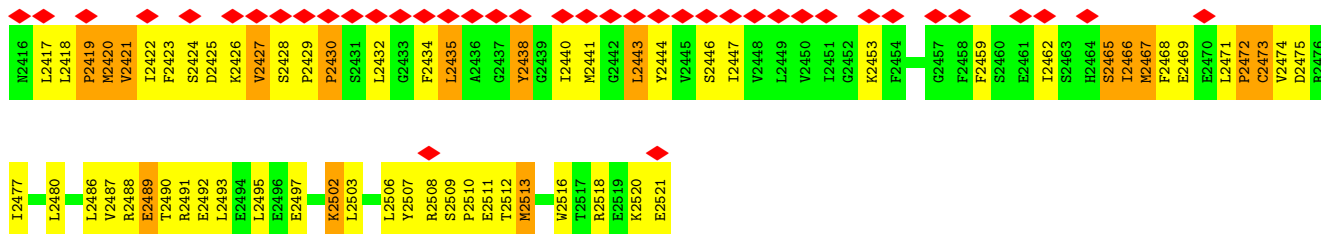
There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2456	HIS	ARG	variant	UNP Q92508
B	2456	HIS	ARG	variant	UNP Q92508
D	2456	HIS	ARG	variant	UNP Q92508

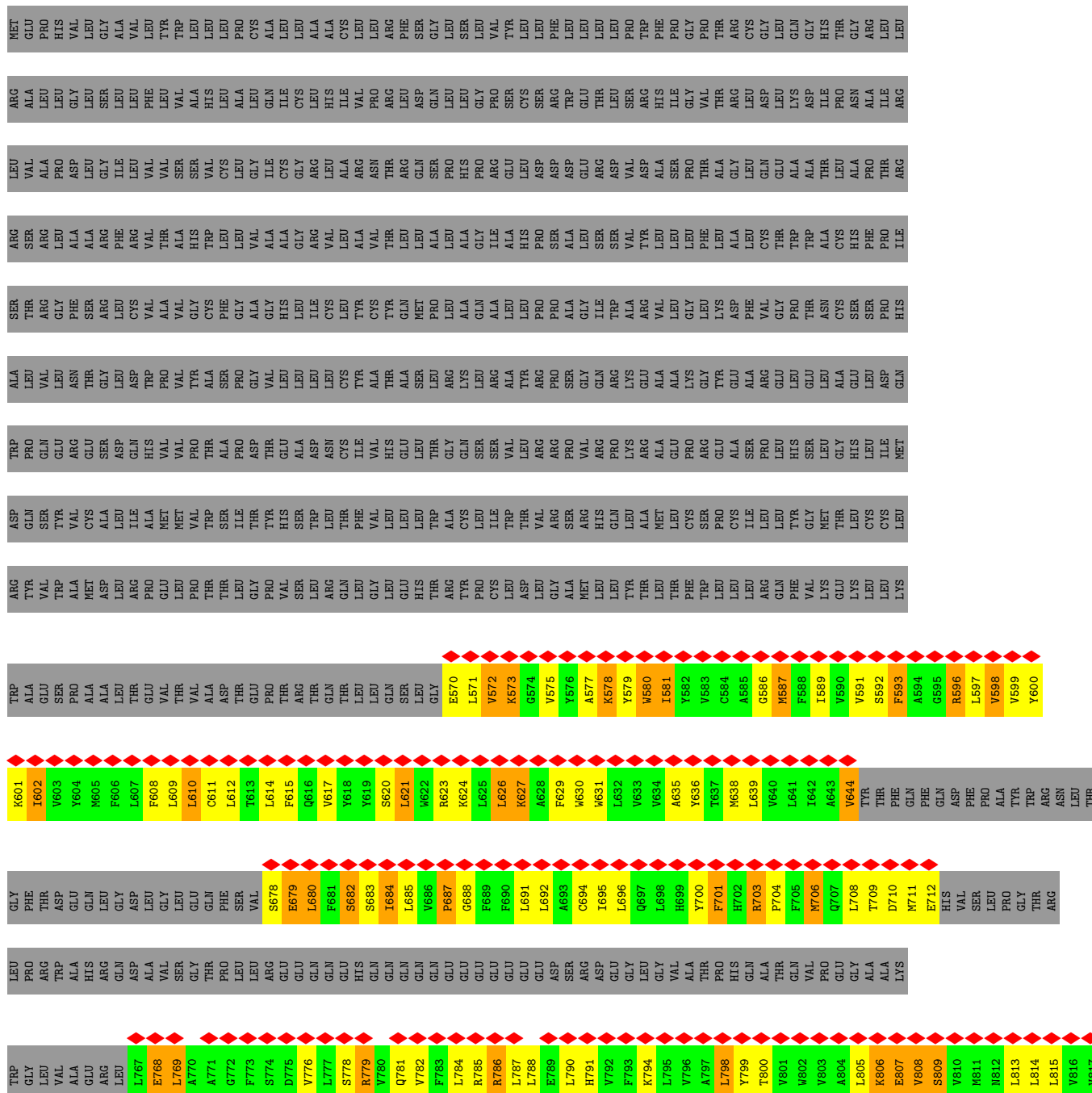
- Molecule 2 is a protein called MyoD family inhibitor domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	21	141	80	21	33	7	0	0
2	E	21	141	80	21	33	7	0	0
2	F	21	141	80	21	33	7	0	0

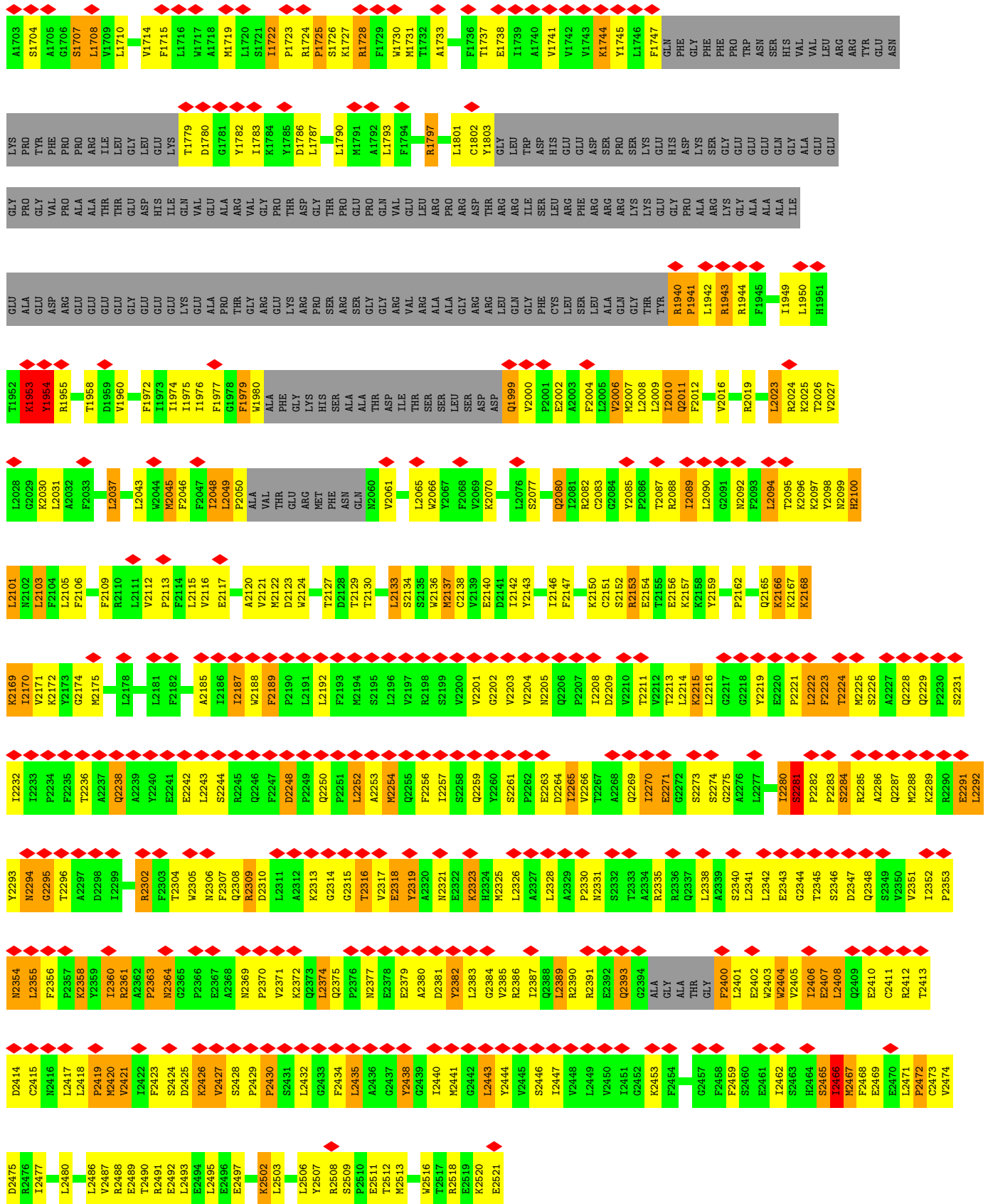




● Molecule 1: Piezo-type mechanosensitive ion channel component 1

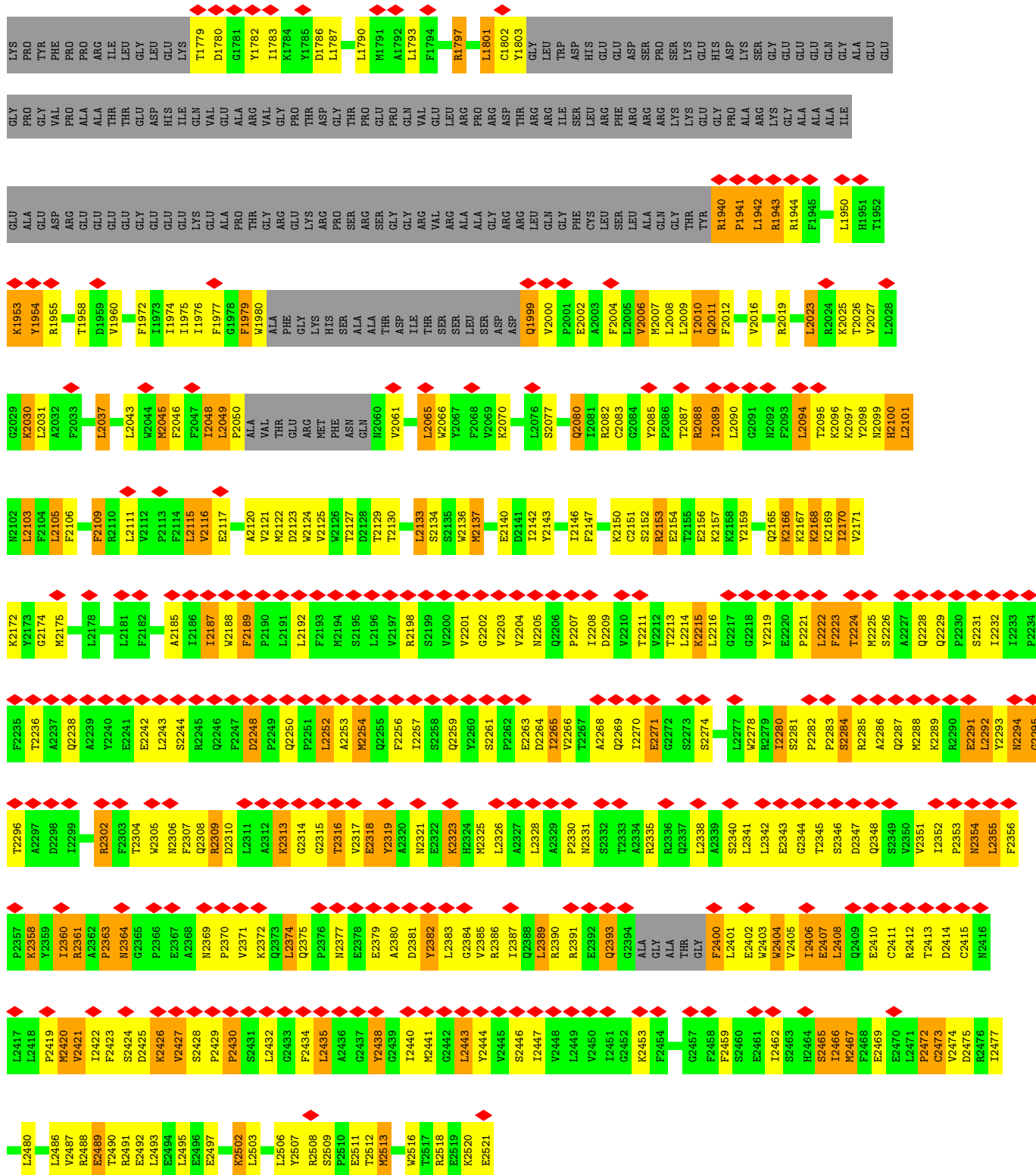


W819	A820	F821	A822	L823	P824	Y825	P826	R827	F828	R829	R830	M831	A832	S833	C834	L835	S836	T837	W838	T840	C841	V842	I843	I844	V845	C846	K847	M848	L849	Y850	Q851	L852	K853	V854	V855	P856	P857	GLN	GLU	TYR	SER	SER	ASN	CYS	THR	GLU	PRO	PHE	PRO	ASN	SER	THR	LEU	PRO	THR	GLU					
ILE	SER	GLN	SER	LEU	TYR	ARG	PRO	VAL	ASP	PRO	ALA	N915	W916	F917	G918	V919	R920	K921	G922	F923	P924	N925	L926	G927	Y928	I929	Q930	N931	H932	L933	Q934	V935	L936	L938	L939	V940	F941	E942	A943	I944	V945	Y946	R947	R948	Q949	E950	H951	Y952	R953	R954	Q955	H956	GLN	LEU	PRO	ALA	PRO				
LEU	PRO	ALA	GLN	ALA	VAL	PHE	ALA	SER	G970	T971	R972	Q973	Q974	L975	D976	Q977	D978	L979	L980	G981	C982	L983	K984	Y985	F986	L987	N988	F989	F990	F991	Y992	K993	F994	G995	L996	E997	I998	C999	F1000	L1001	M1002	A1003	V1004	M1005	V1006	I1007	G1008	Q1009	Q1010	M1011	M1012	F1013	L1014	V1015	T1016	L1017	H1018	G1019	C1020		
W1021	L1022	V1023	A1024	I1025	T1026	T1027	R1028	H1029	H1030	R1031	Q1032	A1033	I1034	A1035	R1036	L1037	W1038	P1039	M1040	Y1041	C1042	L1043	F1044	L1045	A1046	L1047	F1048	L1049	L1050	Q1051	Q1052	Y1053	L1054	L1055	C1056	L1057	G1058	MET	PRO	PRO	ALA	LEU	CYS	ILE	GLY	ASP	THR	TYR	PRO	ARG	TRP	ASP	ARG	LEU	PRO	ALA	VAL	PRO	MET	ASN	ALA
LEU	ILE	LYS	TRP	LEU	TYR	LEU	PRO	ASP	PHE	ARG	ALA	PRO	ASN	I1096	T1097	N1098	L1099	I1100	S1101	D1102	F1103	L1104	L1105	L1106	L1107	C1108	A1109	S1110	I1111	Q1112	W1113	Q1114	V1115	F1116	S1117	A1118	E1119	L1120	T1121	GLU	GLU	TRP	GLN	GLN	ARG	MET	ALA	VAL	ASN	THR	ASP	ARG	LEU	PRO	ALA	VAL	LEU	ARG	GLY		
GLU	PRO	ASN	PRO	VAL	PRO	ASN	PHE	ILE	HIS	CYS	SER	Y1154	L1155	D1156	M1157	L1158	K1159	V1160	A1161	Y1162	F1163	R1164	Y1165	L1166	F1167	W1168	L1169	V1170	L1171	V1172	V1173	L1174	F1175	T1176	G1177	G1178	A1179	T1180	R1181	I1182	S1183	I1184	F1185	G1186	L1187	G1188	Y1189	L1190	L1191	A1192	C1193	F1194	Y1195	L1196	L1197	L1198	F1199	G1200			
T1201	A1202	L1203	L1204	Q1205	R1206	D1207	T1208	R1209	A1210	R1211	L1212	V1213	L1214	W1215	D1216	C1217	L1218	I1219	A1283	G1284	I1285	Y1286	W1287	D1288	S1289	I1290	C1291	F1292	F1293	F1294	L1295	L1296	L1297	Q1298	R1299	R1300	V1301	F1302	L1303	S1304	H1305	Y1306	Y1307	L1308	H1309	V1310	R1311	A1312	D1313	Q1314	A1315	A1316	T1317	A1318	L1319	L1320					
LYS	GLY	TYR	ASP	PRO	LYS	GLU	MET	ASP	HIS	ARG	GLN	ASP	CYS	LEU	PRO	VAL	GLU	A1283	G1284	I1285	Y1286	W1287	D1288	S1289	I1290	C1291	F1292	F1293	F1294	L1295	L1296	L1297	Q1298	R1299	R1300	V1301	F1302	L1303	S1304	H1305	Y1306	Y1307	L1308	H1309	V1310	R1311	A1312	D1313	Q1314	A1315	A1316	T1317	A1318	L1319	L1320						
A1321	S1322	R1323	L1327	Y1328	N1332	L1333	K1334	S1335	I1336	H1339	R1340	E1343	E1344	K1346	L1347	A1348	Q1349	L1350	K1351	M1354	E1355	R1356	L1357	R1358	A1359	K1360	Q1361	E1362	K1363	H1364	R1365	Q1366	G1367	R1368	V1369	D1370	ARG	PRO	GLN	ASP	THR	GLY	PRO	GLN	LYS	ASP	PRO	ALA	VAL	GLY	GLN	LEU	PRO								
GLY	PRO	ASP	PRO	GLY	SER	PRO	PRO	ARG	ARG	GLN	TRP	TRP	ARG	TRP	LEU	D1408	H1409	A1410	T1411	G1412	I1413	H1414	S1415	D1416	G1417	Y1418	F1419	E1422	S1423	D1424	S1425	E1426	E1427	GLU	GLU	PRO	ALA	VAL	PRO	GLY	GLU	ALA	ALA	GLY	ASP	ARG	PRO	GLU	VAL	GLY	GLN	LEU	TYR								
GLN	ALA	TRP	VAL	THR	ALA	GLN	VAL	LEU	ARG	ARG	GLN	TRP	GLN	GLN	GLU	GLN	ALA	ALA	GLN	GLN	LEU	PRO	THR	GLY	GLY	GLY	PRO	PRO	S1422	S1423	D1424	S1425	E1426	E1427	GLU	GLU	PRO	ALA	VAL	PRO	GLY	GLU	ALA	ALA	GLY	ASP	ARG	PRO	GLU	VAL	GLY	GLN	LEU	TYR							
SER	THR	ALA	F1513	L1514	W1515	M1516	L1517	Q1518	Q1519	A1520	L1521	E1524	L1529	F1532	T1533	R1534	H1535	H1536	G1537	T1538	M1539	S1540	L1543	R1544	A1545	E1546	R1547	Y1548	L1549	L1550	T1551	Q1552	L1554	L1555	Q1556	G1557	C1558	E1559	V1560	H1561	R1562	G1563	V1564	L1565	D1566	Q1567	L1568	TYR	THR	SER	GLN	ALA	GLU								
ALA	THR	LEU	PRO	GLY	THR	GLU	ALA	ASN	ALA	PRO	SER	THR	SER	GLY	LEU	ALA	GLU	LEU	SER	MET	THR	ASP	MET	GLY	GLY	PRO	LEU	LEU	HIS	THR	ARG	GLY	SER	GLU	GLU	ALA	VAL	ASP	PRO	PRO	GLY	GLU	ARG	GLU	ALA	L1565	D1566	Q1567	L1568	TYR	THR	SER	GLN	ALA	GLU						
ALA	SER	LEU	GLN	GLY	THR	GLU	ALA	ASN	ALA	PRO	SER	THR	SER	GLY	LEU	ALA	GLU	LEU	SER	MET	THR	ASP	MET	GLY	GLY	PRO	LEU	LEU	HIS	THR	ARG	GLY	SER	GLU	GLU	ALA	VAL	ASP	PRO	PRO	GLY	GLU	ARG	GLU	ALA	L1565	D1566	Q1567	L1568	TYR	THR	SER	GLN	ALA	GLU						
ALA	SER	LEU	GLN	GLY	THR	GLU	ALA	ASN	ALA	PRO	SER	THR	SER	GLY	LEU	ALA	GLU	LEU	SER	MET	THR	ASP	MET	GLY	GLY	PRO	LEU	LEU	HIS	THR	ARG	GLY	SER	GLU	GLU	ALA	VAL	ASP	PRO	PRO	GLY	GLU	ARG	GLU	ALA	L1685	L1688	L1689	L1690	I1695	L1696	L1697	N1698	H1699							



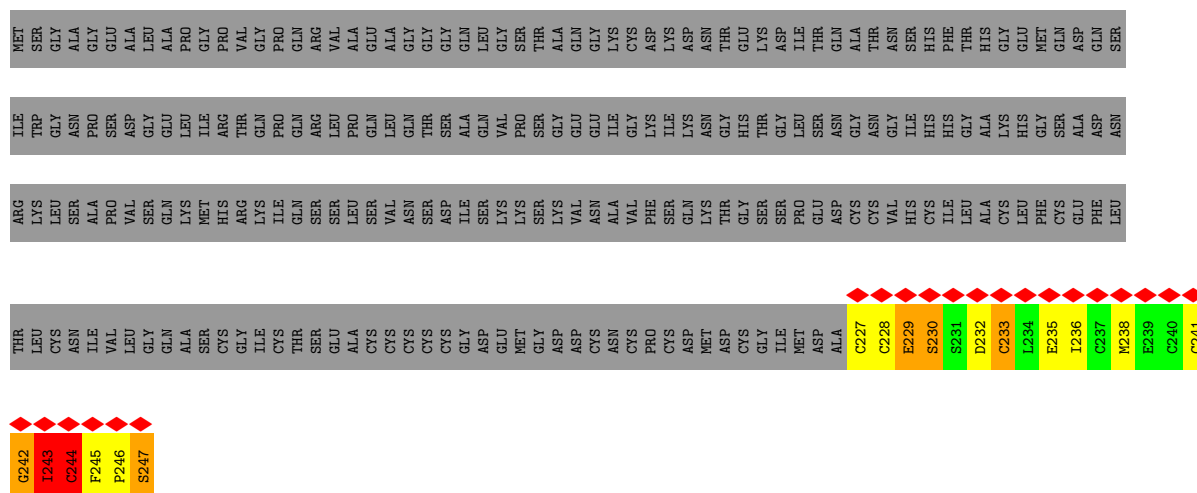
• Molecule 1: Piezo-type mechanosensitive ion channel component 1

LEU	PRO	ALA	GLN	ALA	VAL	PHE	ALA	SER	G970	T971	R972	Q973	Q974	L975	D976	D977	D978	L979	L980	G981	C982	L983	K984	F985	F986	L987	N988	F989	F990	F991	Y992	K993	F994	G995	L996	E997	E998	C999	F1000	L1001	M1002	M1003	V1004	M1005	V1006	I1007	G1008	Q1009	R1010	M1011	M1012	F1013	L1014	V1015	T1016	H1017	G1019	G1020								
V1021	L1022	V1023	A1024	I1025	T1027	R1028	R1029	H1030	R1031	Q1032	A1033	I1034	A1035	R1036	L1037	W1038	P1039	N1040	Y1041	C1042	L1043	F1044	L1045	A1046	L1047	F1048	L1049	L1050	Y1051	Q1052	Y1053	L1054	L1055	C1056	L1057	G1058	MET	PRO	PRO	ALA	ALA	CYS	ILE	ASP	TVR	PRO	PRO	TRP	TRP	TRP	ARG	ALA	ALA	VAL	PRO	MET	ASN	SER	ALA							
LEU	ILE	TRP	LEU	TYR	LEU	PRO	PHE	PHE	ARG	ALA	PRO	ASN	S1096	T1097	M1098	L1099	L1100	S1101	D1102	F1103	L1104	L1105	L1106	L1107	C1108	A1109	S1110	Q1111	Q1112	W1113	Q1114	V1115	F1116	S1117	A1118	E1119	L1120	T1121	GLU	GLU	TRP	GLN	ARG	MET	ALA	GLY	VAL	ASN	TRP	TRP	ASP	ARG	LEU	GLU	PRO	LEU	VAL	ARG	GLY							
GLU	PRO	ASN	VAL	PRO	ASN	PHE	ILE	HIS	CYS	ARG	SER	Y1154	L1155	D1156	M1157	L1158	K1159	A1161	V1162	F1163	R1164	Y1165	L1166	F1167	W1168	L1169	V1170	V1172	V1173	V1174	F1175	V1176	T1177	G1178	A1179	T1180	R1181	I1182	S1183	I1184	F1185	G1186	L1187	G1188	G1189	Y1189	L1190	L1191	A1192	C1193	F1194	Y1195	L1196	L1197	F1198	L1199	G1200									
T1201	A1202	L1203	L1204	Q1205	R1206	D1207	T1208	R1209	A1210	R1211	L1212	V1213	L1214	W1215	D1216	C1217	L1218	L1219	L1220	Y1221	M1222	V1223	T1224	V1225	I1226	I1227	S1228	K1229	M1230	M1231	L1232	S1233	LEU	LEU	ALA	CYS	VAL	PHE	VAL	GLU	GLN	MET	GLN	GLN	THR	PHE	CYS	TRP	VAL	ILE	GLN	LEU	PHE	SER	LEU	VAL	CYS	THR	VAL							
LYS	GLY	TYR	TRP	ASP	PRO	LYS	GLU	MET	MET	ASP	GLN	ASP	CYS	LEU	PRO	VAL	GLU	A1283	G1284	I1285	L1286	W1287	D1288	S1289	V1290	C1291	F1292	F1293	F1294	L1295	L1296	L1297	Q1298	R1299	R1300	V1301	F1302	L1303	S1304	H1305	Y1306	Y1307	L1308	H1309	V1310	R1311	A1312	D1313	L1314	Q1315	A1316	T1317	A1318	L1319	L1320											
A1321	S1322	R1323	L1327	Y1328	M1332	L1333	K1334	S1335	I1336	H1339	R1340	E1343	E1344	K1345	S1346	L1347	A1348	Q1349	L1350	K1351	M1354	E1355	R1356	I1357	R1358	K1359	K1360	Q1361	E1362	K1363	H1364	R1365	Q1366	G1367	R1368	V1369	D1370	ARG	SER	PRO	GLN	ASP	THR	GLY	PRO	LYS	ASP	PRO	GLY	LEU	ALA	GLN	LEU	TYR												
GLY	PRO	ASP	SER	PRO	GLY	SER	SER	PRO	PRO	ARG	GLN	TRP	TRP	ARG	TRP	LEU	D1408	H1409	A1410	T1411	V1412	I1413	H1414	S1415	G1416	D1417	Y1418	F1419	S1422	S1423	D1424	S1425	E1426	E1427	GLU	GLU	GLU	ALA	VAL	PRO	GLU	ALA	PRO	GLU	ASP	PRO	ARG	SER	PRO	ALA	VAL	ALA	GLY	SER	HIS	VAL	VAL	GLN	ARG	ALA	VAL	PHE	GLN	LEU	ALA	TYR
GLN	ALA	TRP	VAL	THR	ASN	ALA	GLN	VAL	LEU	ARG	ARG	GLN	GLM	GLN	GLU	GLN	ALA	ARG	GLM	GLU	ALA	GLY	GLN	LEU	PRO	THR	GLY	GLY	PRO	SER	GLN	VAL	ALA	ALA	GLU	GLU	GLU	ALA	ALA	ALA	GLY	GLY	SER	THR	PRO	GLY	HIS	VAL	VAL	GLN	ARG	ALA	VAL	PHE	GLN	LEU	ALA	TYR								
SER	THR	ALA	GLN	F1513	L1514	W1515	M1516	L1517	Q1518	Q1519	A1520	L1521	E1524	L1529	F1532	T1533	R1534	H1535	I1536	G1537	T1538	M1539	S1540	L1543	R1544	A1545	E1546	R1547	Y1548	L1549	T1551	E1552	Q1553	L1554	L1555	Q1556	G1557	G1558	E1559	V1560	H1561	R1562	V1563	L1565	D1566	Q1567	L1568	TYR	THR	SER	GLN	ALA	GLU													
ALA	THR	LEU	PRO	PRO	THR	GLU	ALA	GLA	ASN	PRO	PRO	SER	VAL	SER	GLY	LEU	ALA	GLU	GLU	PRO	THR	MET	ASP	ASP	MET	GLY	SER	PRO	LEU	HIS	THR	ARG	GLY	GLY	GLU	GLU	ALA	VAL	THR	ASP	PRO	PRO	GLY	GLU	ARG	GLU	ALA	VAL	PHE	GLN	LEU	ALA	TYR	THR	SER	GLN	ALA	GLU								
ALA	SER	LEU	TYR	GLN	GLY	LEU	MET	ARG	THR	A1645	S1646	L1716	W1717	A1718	M1719	L1720	S1721	I1722	P1723	R1724	P1725	S1726	K1727	R1728	E1658	L1659	E1660	E1661	F1665	A1666	E1667	G1668	Q1669	R1670	R1671	A1672	L1673	R1674	L1675	L1676	R1677	A1678	V1679	Y1680	Q1681	A1684	A1685	H1686	S1687	E1688	L1689	L1690	I1695	T1696	L1697	N1698	H1699									
A1703	S1704	A1705	G1706	S1707	L1708	V1709	L1710	V1714	F1715	L1716	W1717	A1718	M1719	L1720	S1721	I1722	P1723	R1724	P1725	S1726	K1727	R1728	E1658	L1659	E1660	E1661	F1665	A1666	E1667	G1668	Q1669	R1670	R1671	A1672	L1673	R1674	L1675	L1676	R1677	A1678	V1679	Y1680	Q1681	A1684	A1685	H1686	S1687	E1688	L1689	L1690	I1695	T1696	L1697	N1698	H1699											



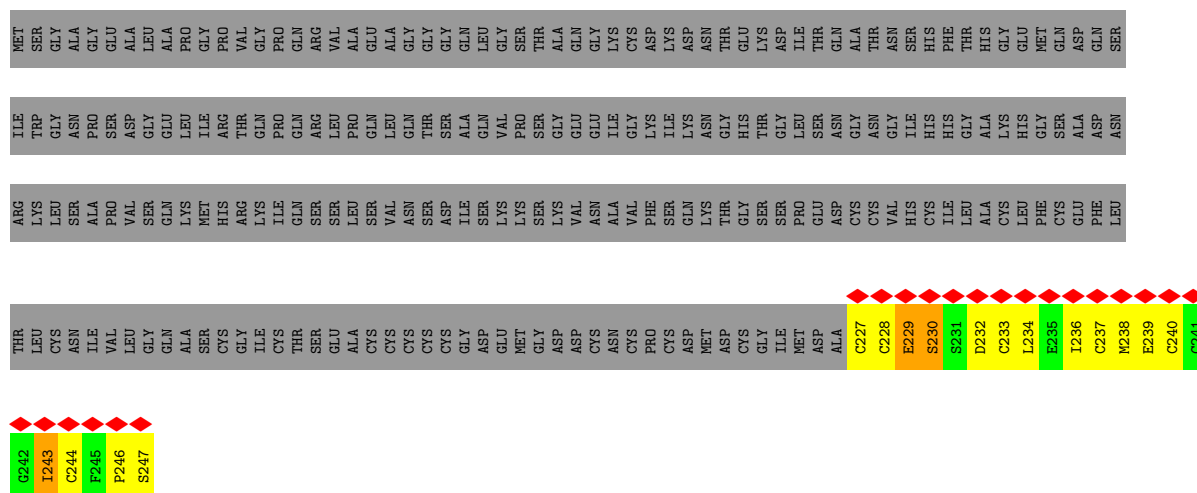
● Molecule 2: MyoD family inhibitor domain-containing protein





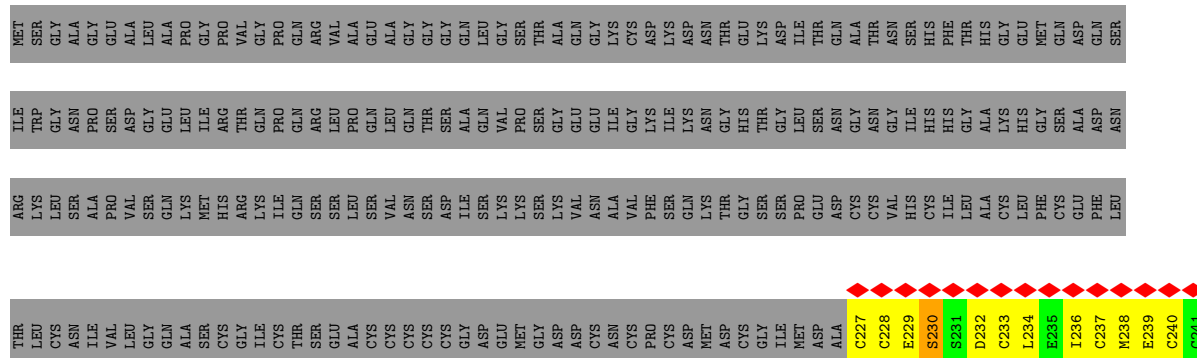
● Molecule 2: MyoD family inhibitor domain-containing protein

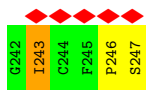
Chain E:  9% 5% 91%



● Molecule 2: MyoD family inhibitor domain-containing protein

Chain F:  8% 5% 91%





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	16739	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TECNAI 10	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.136	Depositor
Minimum map value	-0.039	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.04	Depositor
Map size (\AA)	410.4, 410.4, 410.4	wwPDB
Map dimensions	720, 720, 720	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.57, 0.57, 0.57	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	0.37	0/10646	0.58	3/14437 (0.0%)
1	B	0.37	0/10639	0.58	5/14428 (0.0%)
1	D	0.37	0/10646	0.57	3/14437 (0.0%)
2	C	0.46	0/141	1.06	3/188 (1.6%)
2	E	0.34	0/141	0.74	0/188
2	F	0.43	0/141	0.93	1/188 (0.5%)
All	All	0.37	0/32354	0.58	15/43866 (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	D	0	1

There are no bond length outliers.

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	2281	SER	CB-CA-C	-6.28	98.17	110.10
1	B	2438	TYR	N-CA-C	5.93	127.03	111.00
1	A	2438	TYR	N-CA-C	5.92	126.99	111.00
1	D	2438	TYR	N-CA-C	5.92	126.98	111.00
2	C	245	PHE	N-CA-C	-5.89	95.09	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	2105	LEU	Mainchain

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	10394	0	10576	559	0
1	B	10388	0	10569	571	0
1	D	10394	0	10576	554	0
2	C	141	0	118	16	0
2	E	141	0	118	47	0
2	F	141	0	118	43	0
All	All	31599	0	32075	1642	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 26.

The worst 5 of 1642 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:B:2171:VAL:HA	2:F:236:ILE:CD1	1.41	1.48
1:D:2171:VAL:HA	2:E:236:ILE:CD1	1.41	1.47
1:D:1695:ILE:HD11	1:D:1714:VAL:CG2	1.55	1.36
1:B:2171:VAL:HA	2:F:236:ILE:CG1	1.57	1.35
1:A:1695:ILE:HD11	1:A:1714:VAL:CG2	1.55	1.34

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	1248/2521 (50%)	1063 (85%)	144 (12%)	41 (3%)	3 21

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	1248/2521 (50%)	1071 (86%)	137 (11%)	40 (3%)	3	21
1	D	1248/2521 (50%)	1072 (86%)	139 (11%)	37 (3%)	3	23
2	C	19/246 (8%)	14 (74%)	3 (16%)	2 (10%)	0	6
2	E	19/246 (8%)	17 (90%)	0	2 (10%)	0	6
2	F	19/246 (8%)	17 (90%)	1 (5%)	1 (5%)	1	16
All	All	3801/8301 (46%)	3254 (86%)	424 (11%)	123 (3%)	5	21

5 of 123 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1409	HIS
1	A	1723	PRO
1	A	1725	PRO
1	A	1953	LYS
1	A	2316	THR

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	1108/2172 (51%)	645 (58%)	463 (42%)	0	0
1	B	1107/2172 (51%)	646 (58%)	461 (42%)	0	0
1	D	1108/2172 (51%)	649 (59%)	459 (41%)	0	0
2	C	18/203 (9%)	10 (56%)	8 (44%)	0	0
2	E	18/203 (9%)	11 (61%)	7 (39%)	0	0
2	F	18/203 (9%)	12 (67%)	6 (33%)	0	2
All	All	3377/7125 (47%)	1973 (58%)	1404 (42%)	0	0

5 of 1404 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	230	SER

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Mol	Chain	Res	Type
1	D	1548	TYR
1	D	617	VAL
2	C	229	GLU
1	D	1007	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 54 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	2080	GLN
1	D	697	GLN
1	D	2206	GLN
1	B	2100	HIS
1	B	2250	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](#)

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.

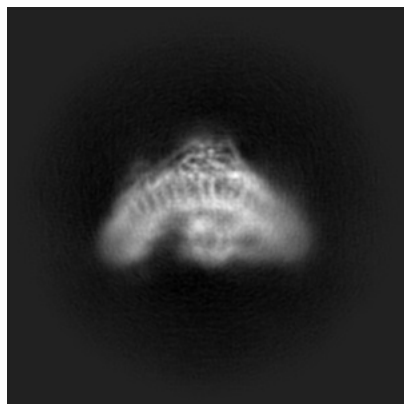
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-39223. These allow visual inspection of the internal detail of the map and identification of artifacts.

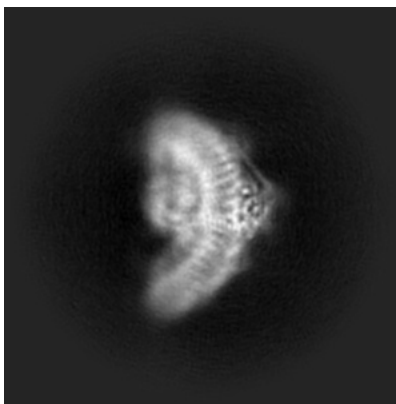
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

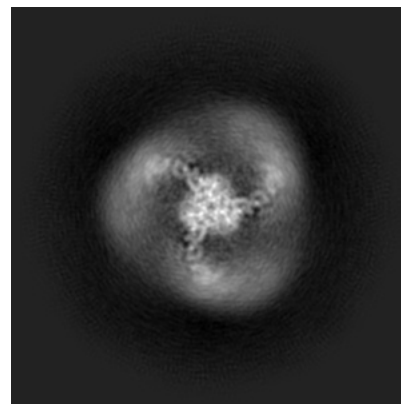
6.1.1 Primary map



X

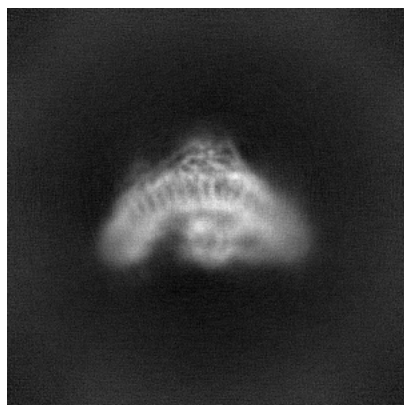


Y

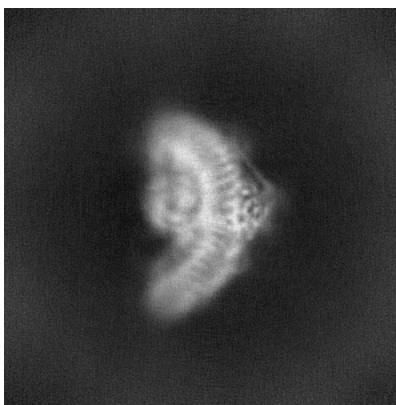


Z

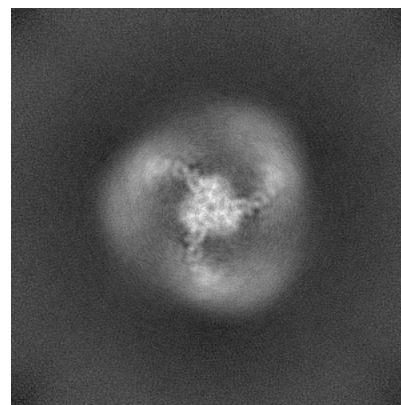
6.1.2 Raw map



X



Y

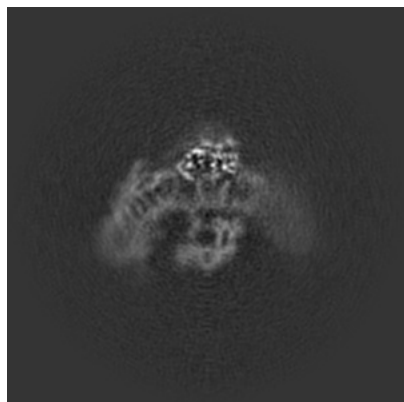


Z

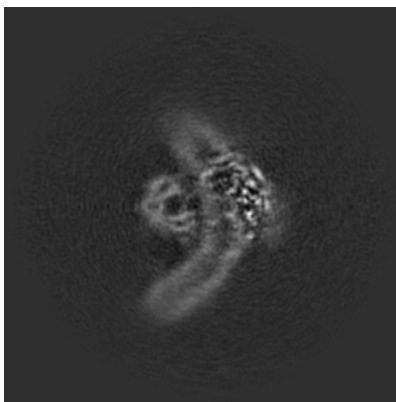
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

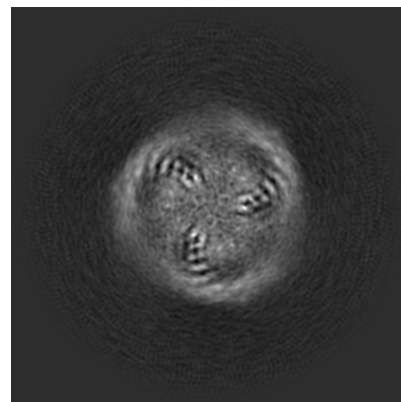
6.2.1 Primary map



X Index: 360

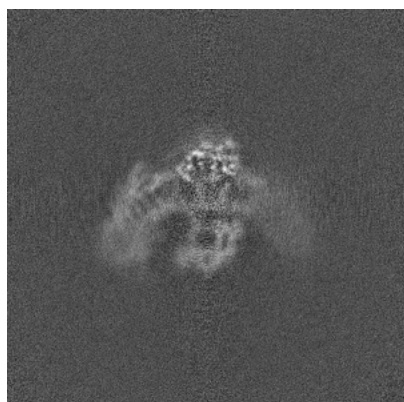


Y Index: 360

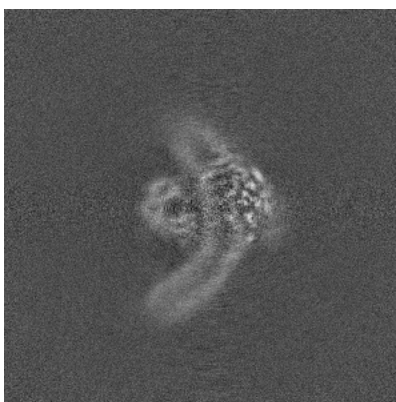


Z Index: 360

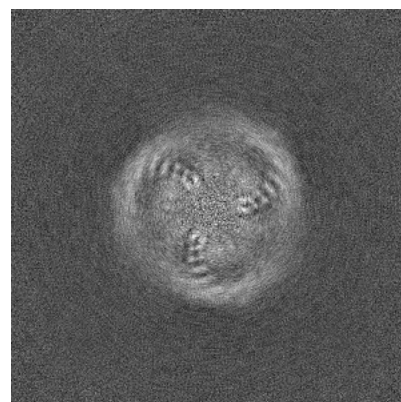
6.2.2 Raw map



X Index: 360



Y Index: 360

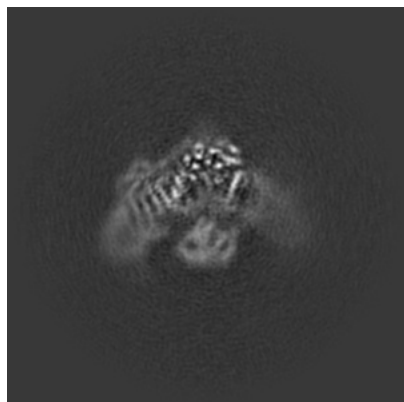


Z Index: 360

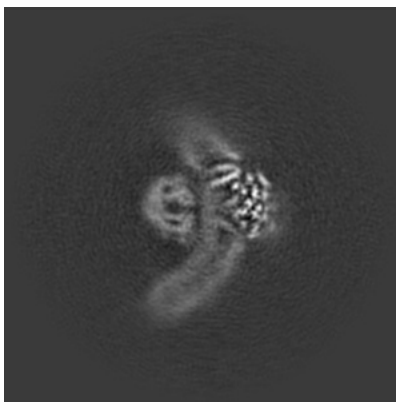
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

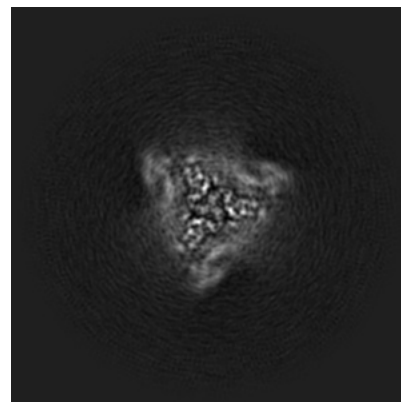
6.3.1 Primary map



X Index: 341

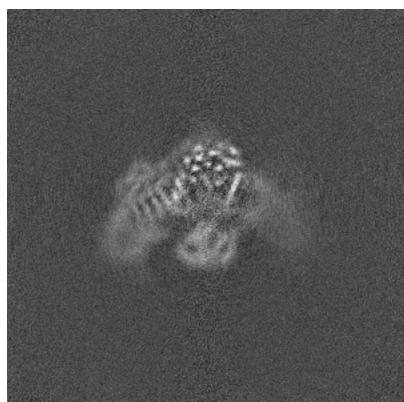


Y Index: 350

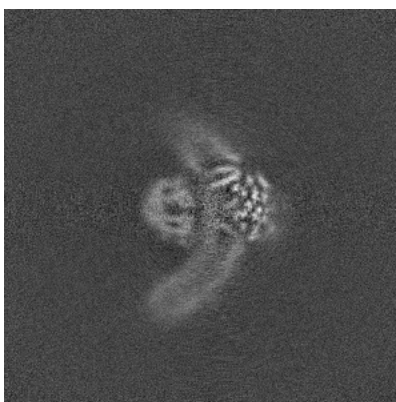


Z Index: 415

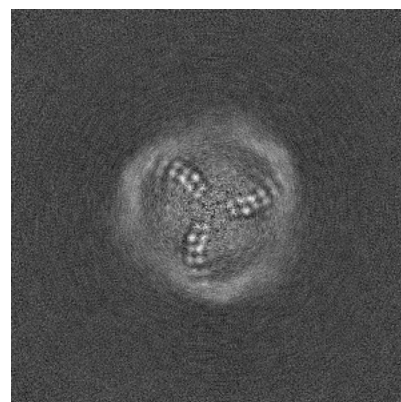
6.3.2 Raw map



X Index: 342



Y Index: 350



Z Index: 371

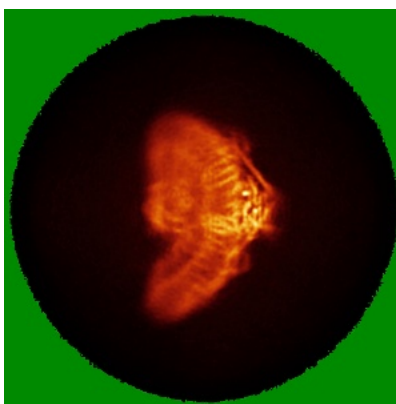
The images above show the largest variance slices of the map in three orthogonal directions.

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

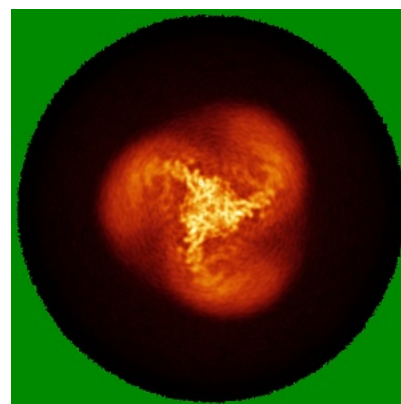
6.4.1 Primary map



X

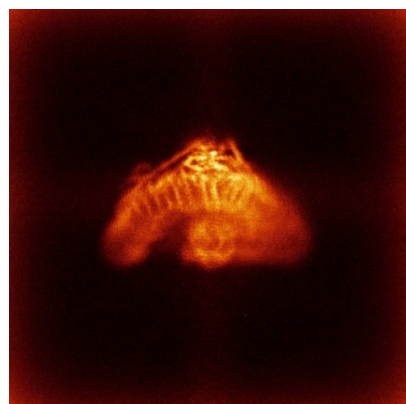


Y

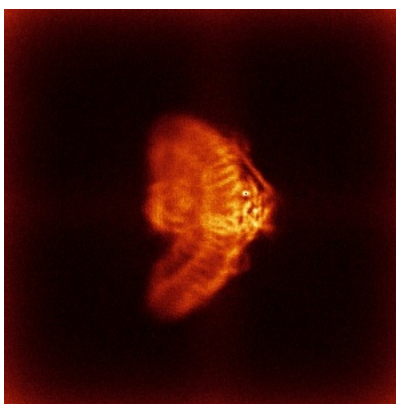


Z

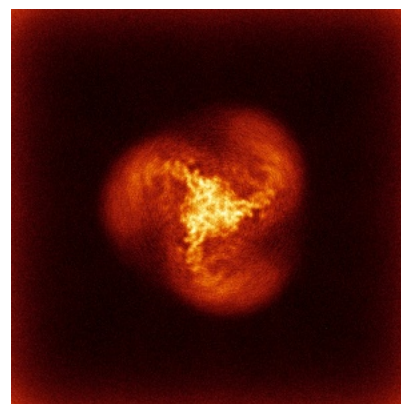
6.4.2 Raw map



X



Y

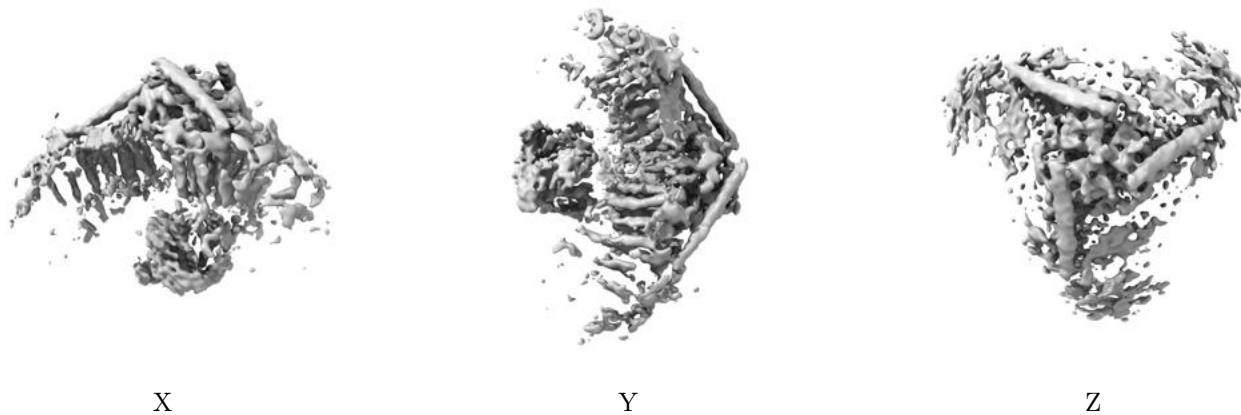


Z

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.

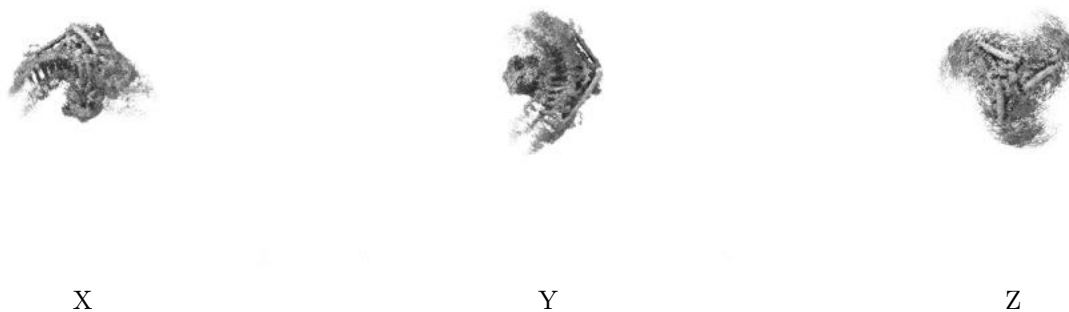
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.04. 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



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.

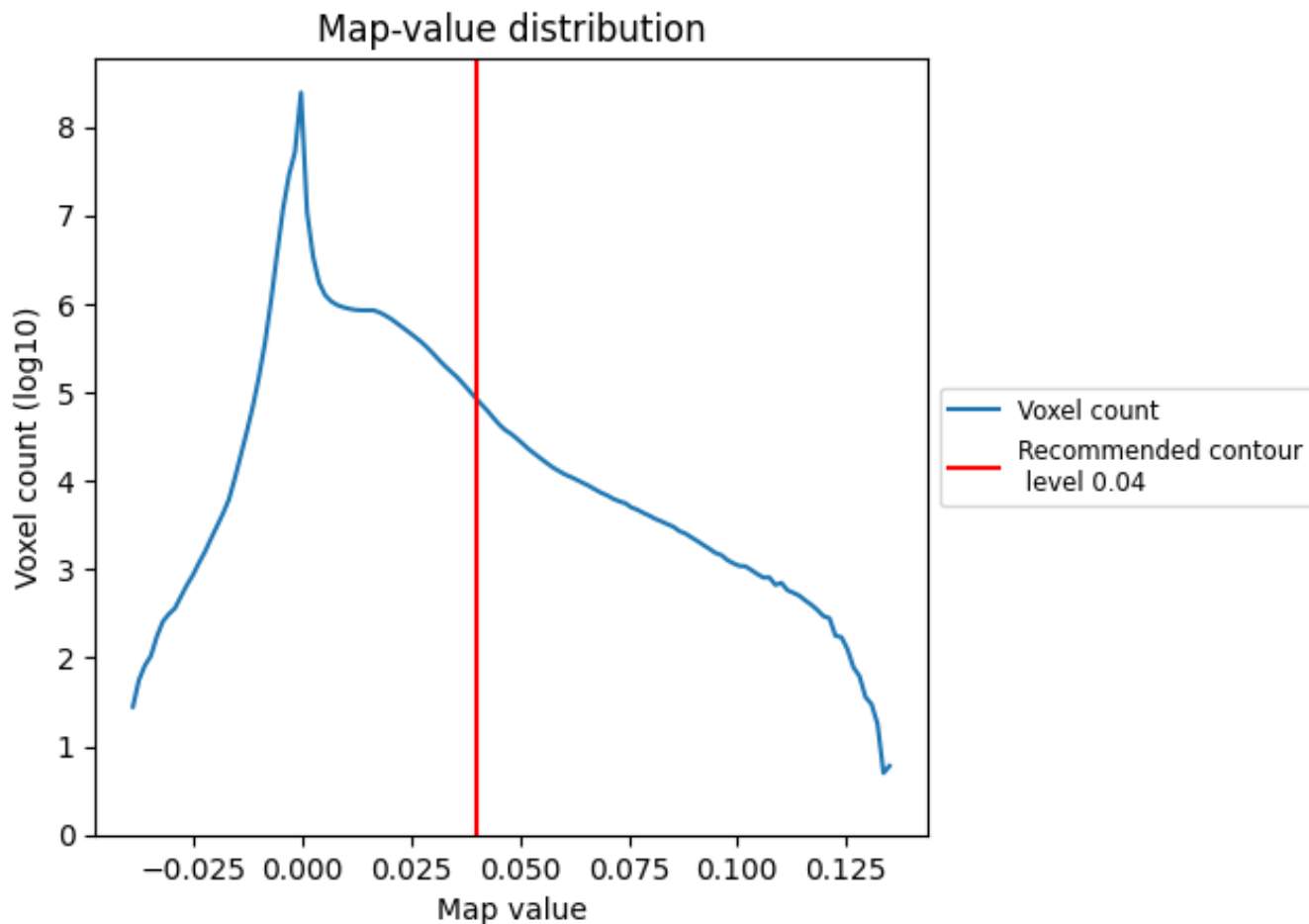
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

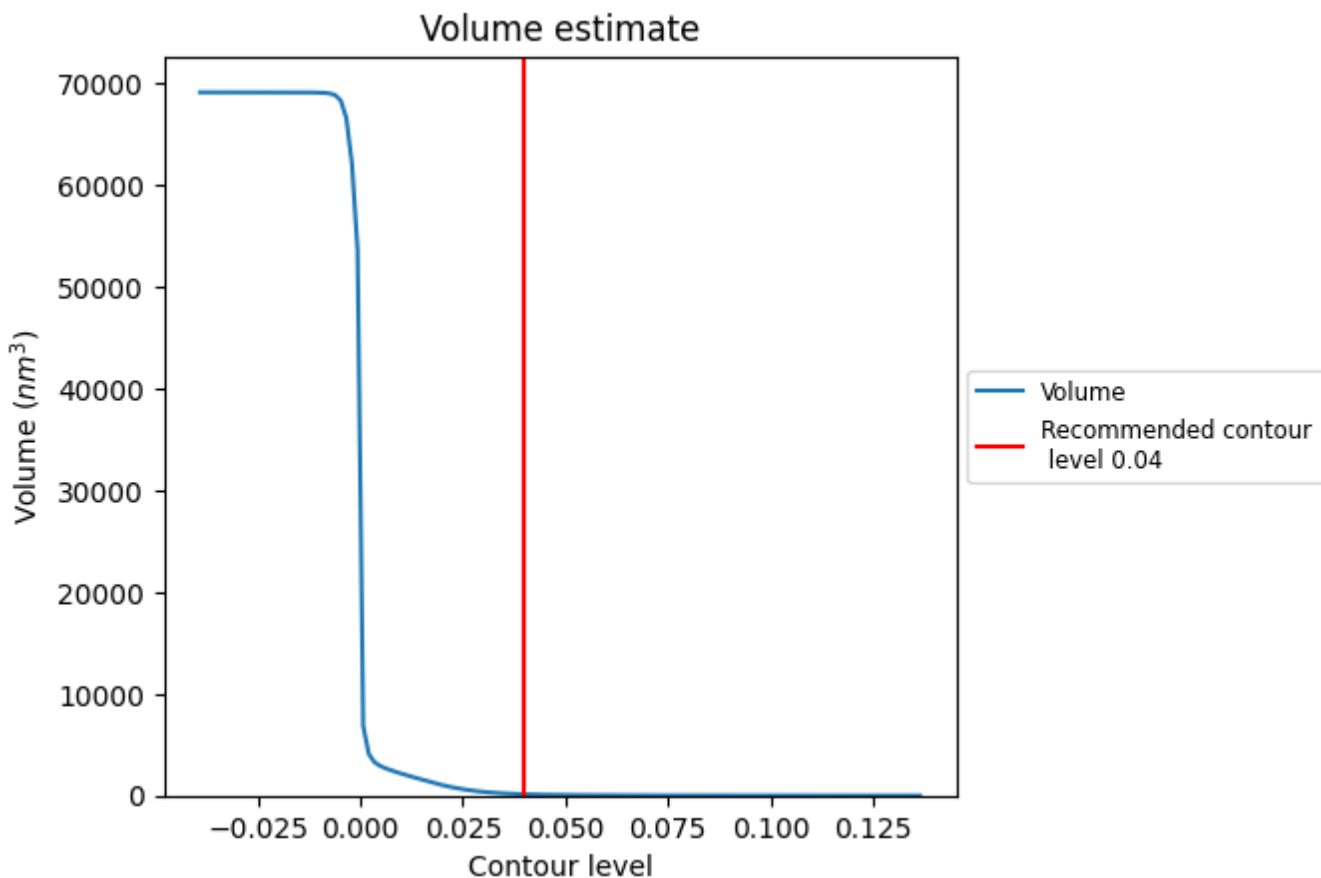
This section contains the results of statistical analysis of the map.

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.

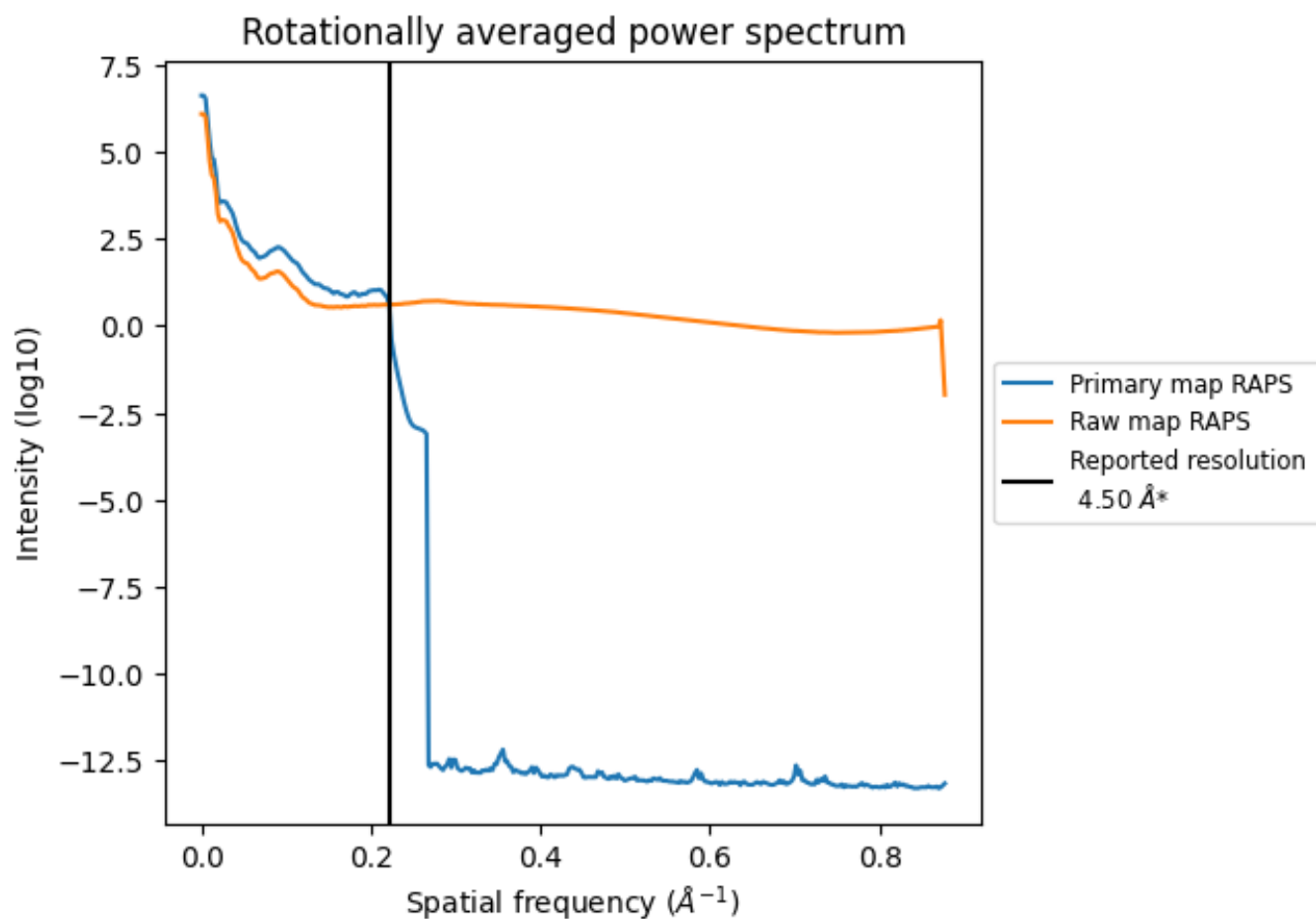
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 127 nm³; this corresponds to an approximate mass of 114 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](#)

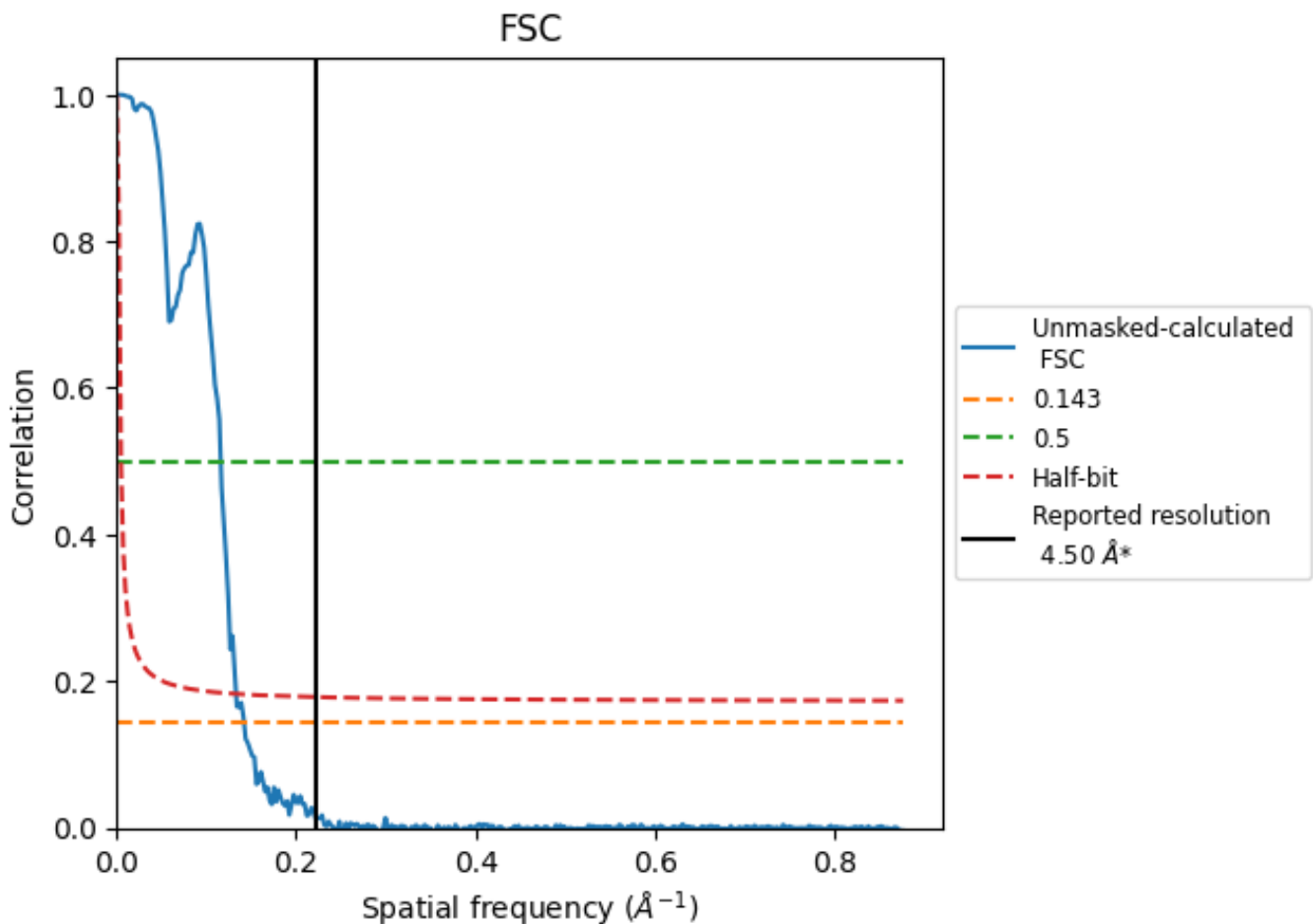


*Reported resolution corresponds to spatial frequency of 0.222 Å⁻¹

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 0.222 Å⁻¹

8.2 Resolution estimates [i](#)

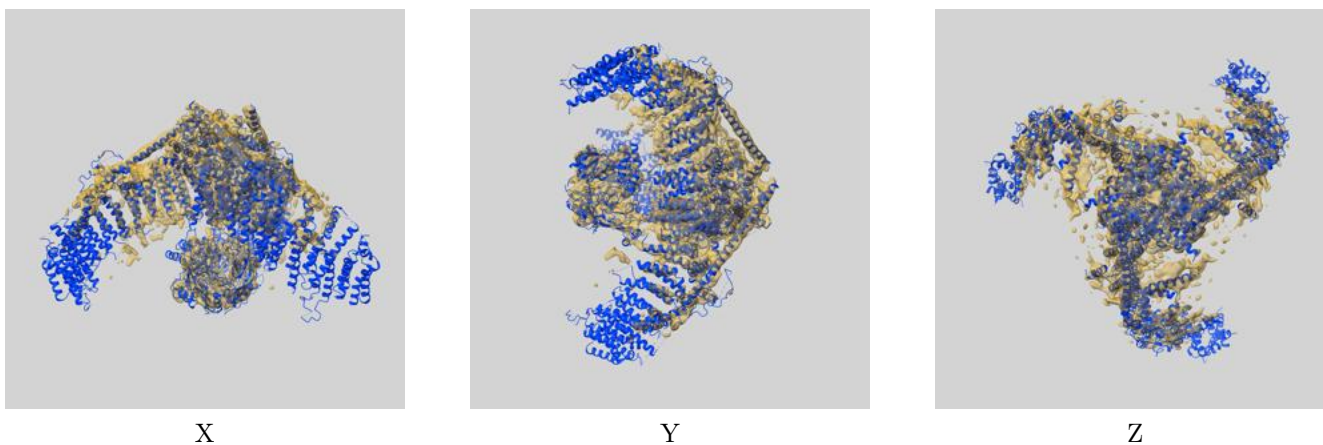
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.50	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.04	8.62	7.51

*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 7.04 differs from the reported value 4.5 by more than 10 %

9 Map-model fit [i](#)

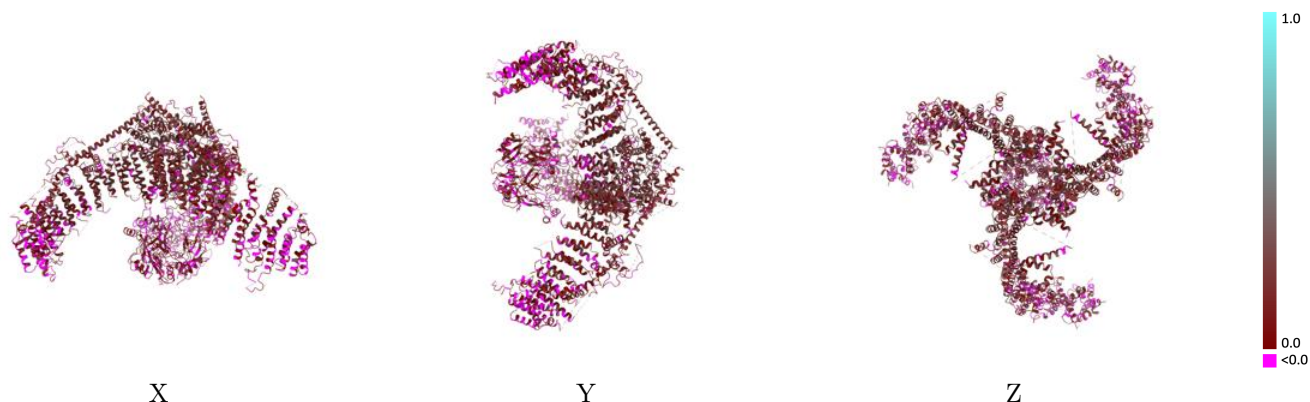
This section contains information regarding the fit between EMDB map EMD-39223 and PDB model 8YFG. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay [i](#)



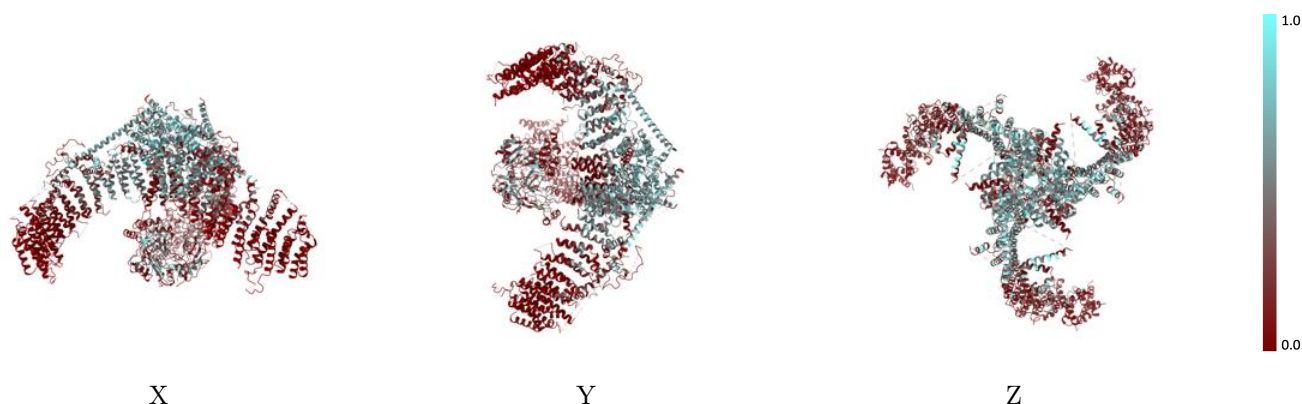
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



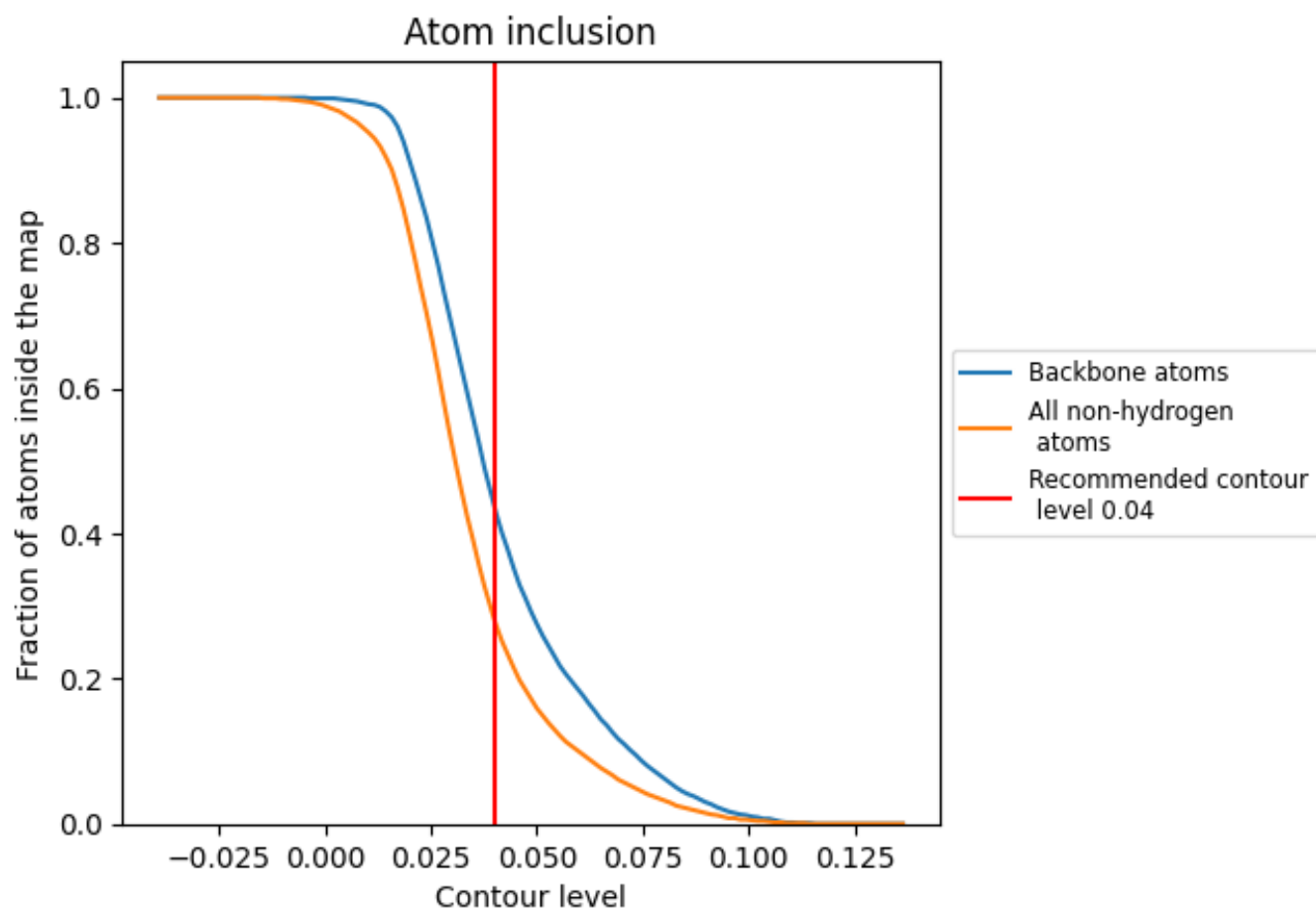
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.04).















9.4 Atom inclusion [i](#)



At the recommended contour level, 44% of all backbone atoms, 28% 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 (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.2810	 0.1280
A	 0.2840	 0.1280
B	 0.2840	 0.1290
C	 0.0710	 0.1130
D	 0.2840	 0.1290
E	 0.0850	 0.1200
F	 0.0920	 0.1240

