



wwPDB EM Validation Summary Report ⓘ

Feb 24, 2022 – 12:59 am GMT

PDB ID : 7YXX
EMDB ID : EMD-14368
Title : Cryo-EM structure of USP9X
Authors : Deme, J.C.; Halabelian, L.; Arrowsmith, C.H.; Lea, S.M.; Structural Genomics Consortium (SGC)
Deposited on : 2022-02-16
Resolution : 3.30 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.0.dev97
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.26

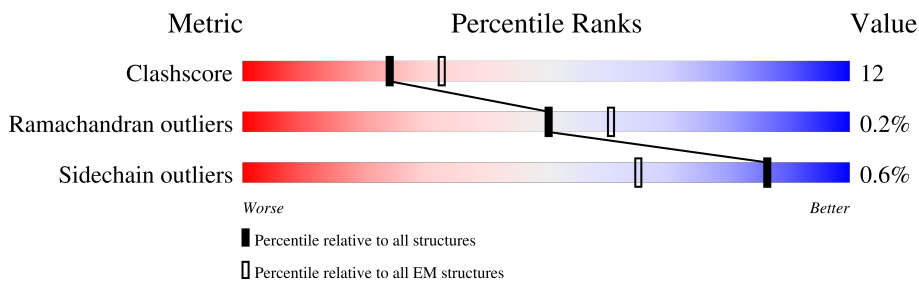
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.30 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	2579	
1	B	2579	
1	C	2579	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 42357 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 Probable ubiquitin carboxyl-terminal hydrolase FAF-X.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1754	14155	9062	2426	2571	96	1	0
1	B	1754	14155	9062	2426	2571	96	1	0
1	C	1741	14047	8997	2407	2547	96	1	0

There are 75 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	initiating methionine	UNP Q93008
A	-16	HIS	-	expression tag	UNP Q93008
A	-15	HIS	-	expression tag	UNP Q93008
A	-14	HIS	-	expression tag	UNP Q93008
A	-13	HIS	-	expression tag	UNP Q93008
A	-12	HIS	-	expression tag	UNP Q93008
A	-11	HIS	-	expression tag	UNP Q93008
A	-10	SER	-	expression tag	UNP Q93008
A	-9	SER	-	expression tag	UNP Q93008
A	-8	GLY	-	expression tag	UNP Q93008
A	-7	ARG	-	expression tag	UNP Q93008
A	-6	GLU	-	expression tag	UNP Q93008
A	-5	ASN	-	expression tag	UNP Q93008
A	-4	LEU	-	expression tag	UNP Q93008
A	-3	TYR	-	expression tag	UNP Q93008
A	-2	PHE	-	expression tag	UNP Q93008
A	-1	GLN	-	expression tag	UNP Q93008
A	0	GLY	-	expression tag	UNP Q93008
A	2555	ASP	-	expression tag	UNP Q93008
A	2556	TYR	-	expression tag	UNP Q93008
A	2557	LYS	-	expression tag	UNP Q93008
A	2558	ASP	-	expression tag	UNP Q93008
A	2559	ASP	-	expression tag	UNP Q93008
A	2560	ASP	-	expression tag	UNP Q93008

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Chain	Residue	Modelled	Actual	Comment	Reference
A	2561	LYS	-	expression tag	UNP Q93008
B	-17	MET	-	initiating methionine	UNP Q93008
B	-16	HIS	-	expression tag	UNP Q93008
B	-15	HIS	-	expression tag	UNP Q93008
B	-14	HIS	-	expression tag	UNP Q93008
B	-13	HIS	-	expression tag	UNP Q93008
B	-12	HIS	-	expression tag	UNP Q93008
B	-11	HIS	-	expression tag	UNP Q93008
B	-10	SER	-	expression tag	UNP Q93008
B	-9	SER	-	expression tag	UNP Q93008
B	-8	GLY	-	expression tag	UNP Q93008
B	-7	ARG	-	expression tag	UNP Q93008
B	-6	GLU	-	expression tag	UNP Q93008
B	-5	ASN	-	expression tag	UNP Q93008
B	-4	LEU	-	expression tag	UNP Q93008
B	-3	TYR	-	expression tag	UNP Q93008
B	-2	PHE	-	expression tag	UNP Q93008
B	-1	GLN	-	expression tag	UNP Q93008
B	0	GLY	-	expression tag	UNP Q93008
B	2555	ASP	-	expression tag	UNP Q93008
B	2556	TYR	-	expression tag	UNP Q93008
B	2557	LYS	-	expression tag	UNP Q93008
B	2558	ASP	-	expression tag	UNP Q93008
B	2559	ASP	-	expression tag	UNP Q93008
B	2560	ASP	-	expression tag	UNP Q93008
B	2561	LYS	-	expression tag	UNP Q93008
C	-17	MET	-	initiating methionine	UNP Q93008
C	-16	HIS	-	expression tag	UNP Q93008
C	-15	HIS	-	expression tag	UNP Q93008
C	-14	HIS	-	expression tag	UNP Q93008
C	-13	HIS	-	expression tag	UNP Q93008
C	-12	HIS	-	expression tag	UNP Q93008
C	-11	HIS	-	expression tag	UNP Q93008
C	-10	SER	-	expression tag	UNP Q93008
C	-9	SER	-	expression tag	UNP Q93008
C	-8	GLY	-	expression tag	UNP Q93008
C	-7	ARG	-	expression tag	UNP Q93008
C	-6	GLU	-	expression tag	UNP Q93008
C	-5	ASN	-	expression tag	UNP Q93008
C	-4	LEU	-	expression tag	UNP Q93008
C	-3	TYR	-	expression tag	UNP Q93008
C	-2	PHE	-	expression tag	UNP Q93008

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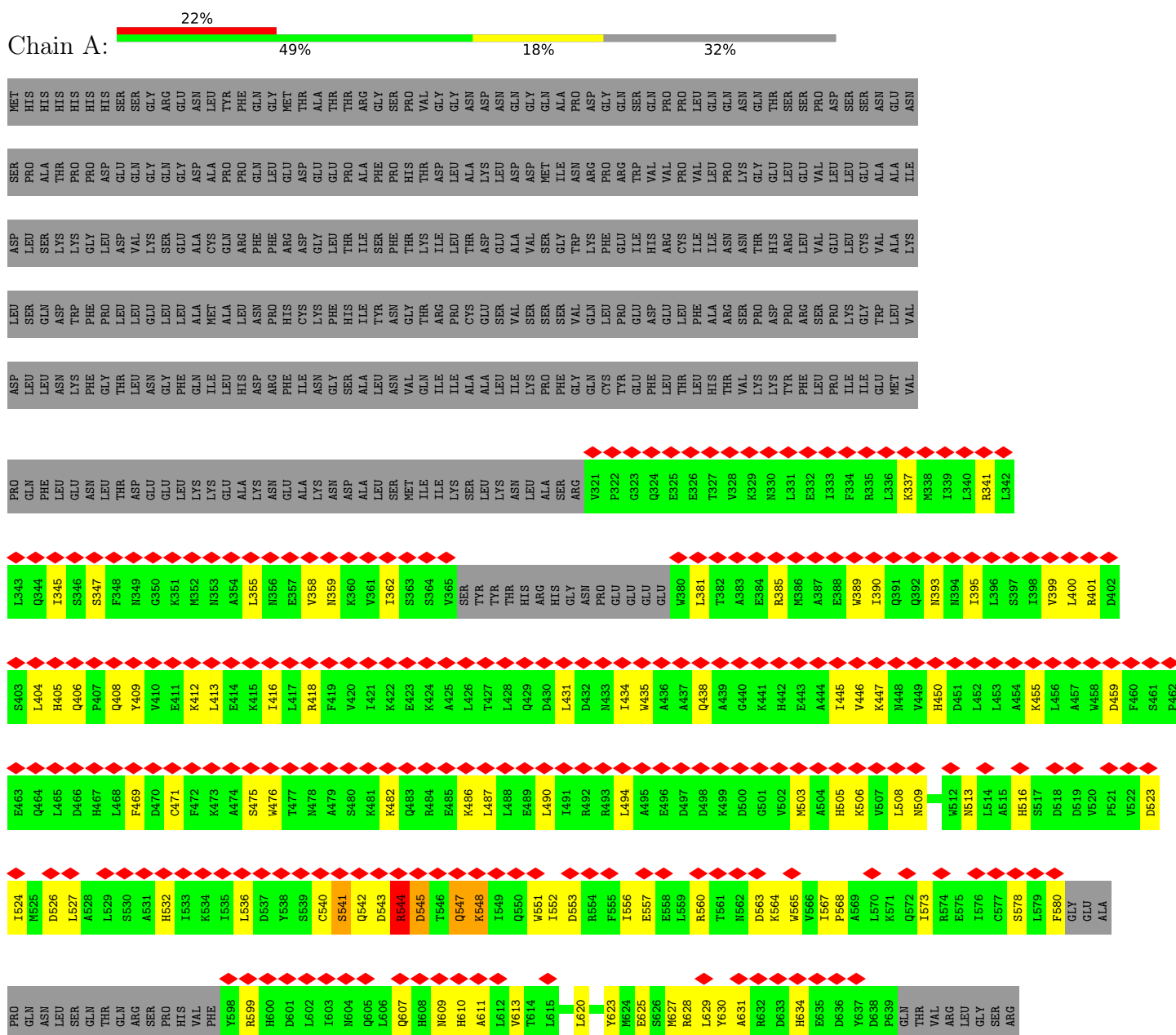
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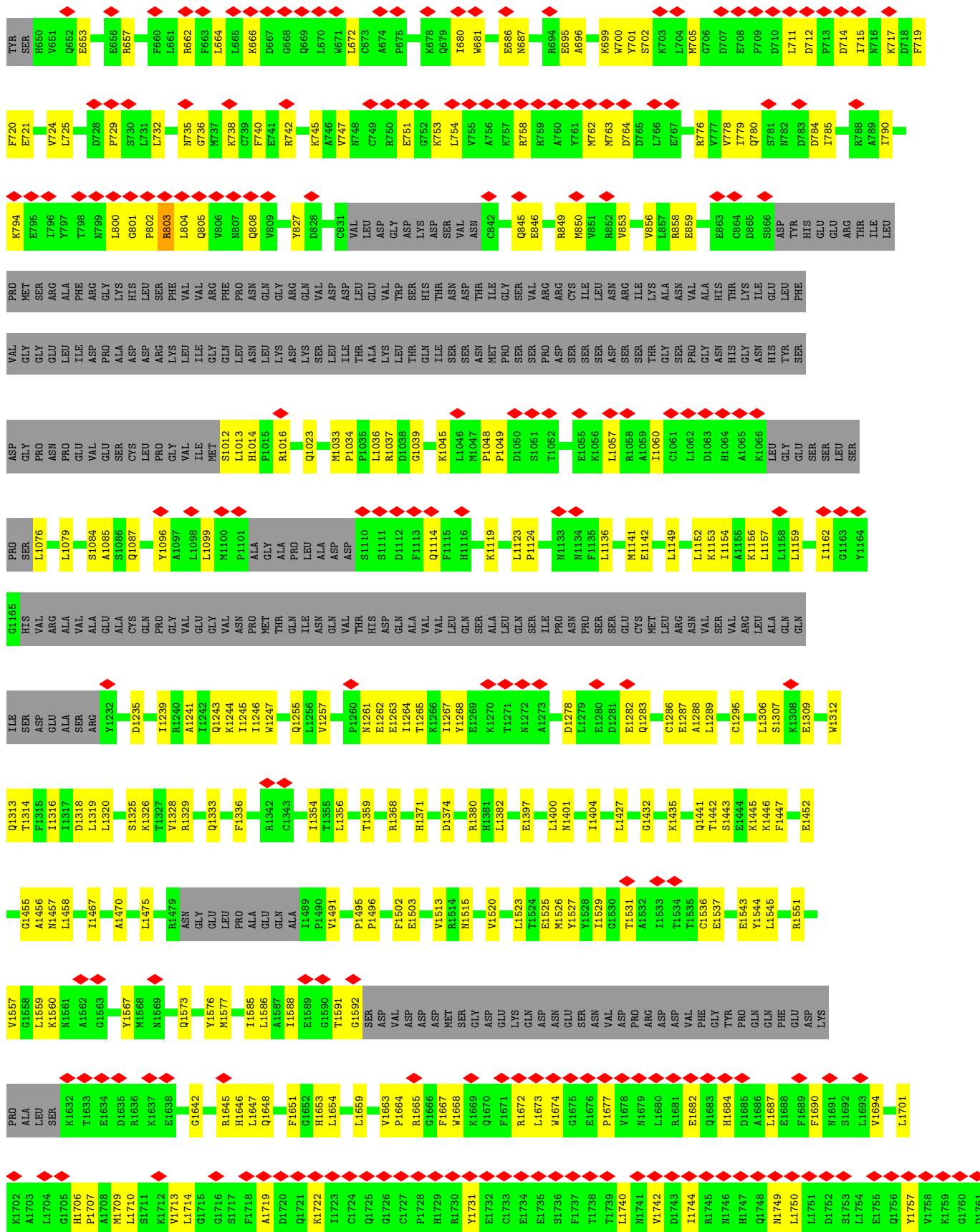
Chain	Residue	Modelled	Actual	Comment	Reference
C	-1	GLN	-	expression tag	UNP Q93008
C	0	GLY	-	expression tag	UNP Q93008
C	2555	ASP	-	expression tag	UNP Q93008
C	2556	TYR	-	expression tag	UNP Q93008
C	2557	LYS	-	expression tag	UNP Q93008
C	2558	ASP	-	expression tag	UNP Q93008
C	2559	ASP	-	expression tag	UNP Q93008
C	2560	ASP	-	expression tag	UNP Q93008
C	2561	LYS	-	expression tag	UNP Q93008

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.

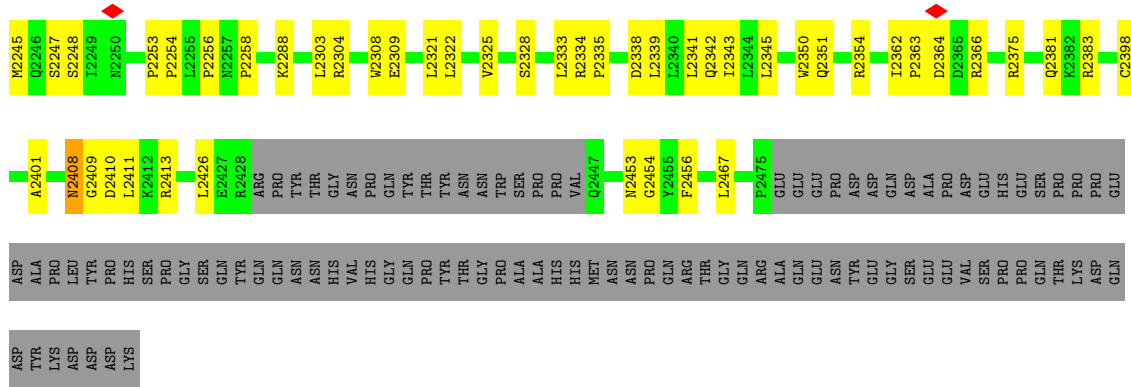
- Molecule 1: Probable ubiquitin carboxyl-terminal hydrolase FAF-X



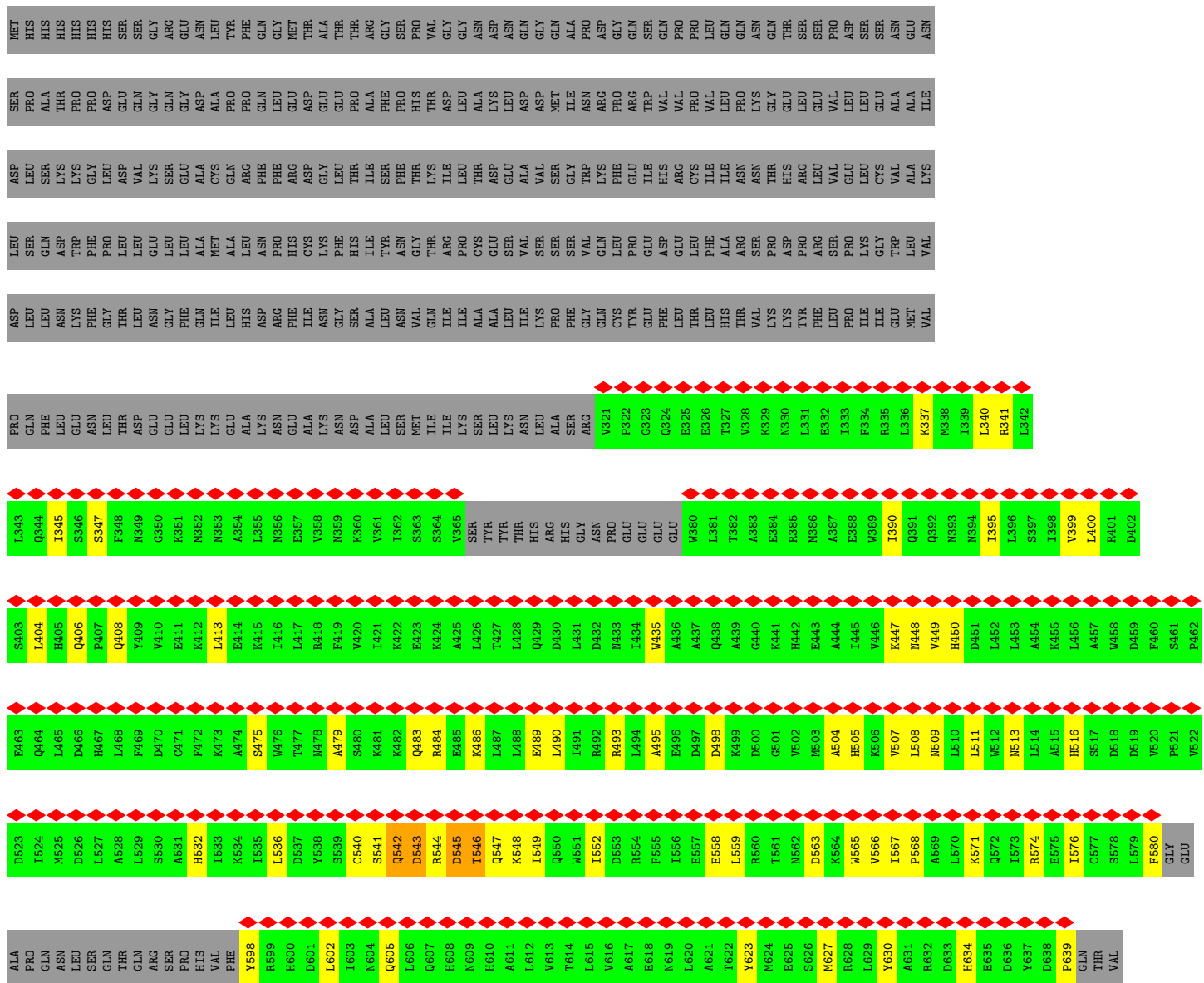


L343	Q344	I345	S346	S347	F348	N349	G350	K351	M352	N353	A354	L355	N356	V357	V358	N359	K360	V361	I362	S363	S364	V365	SER	TYR	THR	HIS	HIS	ASN	PRO	GLU	GLU	GLU	W380	L381	T382	A383	E384	R385	M386	A387	E388	V389	L390	Q391	Q392	N393	N394	I395	L396	S397	I398	V399	L400	R401	D402					
S403	L404	H405	Q406	P407	Q408	Y409	V410	S411	E412	K413	E414	K415	I416	L417	R418	F419	V420	I421	K422	E423	K424	A425	L426	T427	L428	Q429	D430	L431	D432	N433	I434	W435	A436	A437	Q438	A439	G440	K441	H442	E443	A444	I445	V446	K447	N448	V449	H450	D451	L452	L453	A454	K455	L456	A457	W458	D459	S461	P462		
E463	Q464	L465	D466	H467	L468	F469	D470	S471	F472	K473	A474	S475	W476	T477	N478	A479	S480	K481	K482	Q483	R484	A485	K486	L487	L488	E489	L490	I491	R492	R493	L494	A495	E496	D497	D498	K499	D500	G501	V502	M503	A504	H505	K506	V507	L508	N509	L510	L511	L512	N513	L514	A515	L516	S517	D518	D519	V520	P521	V522	
D523	I524	M525	D526	L527	A528	L529	S530	A531	H532	I533	K534	I535	L536	D537	Y538	S539	C540	S541	Q542	D543	R544	D545	T546	K547	Q548	I549	Q550	M551	I552	D553	R554	F555	I556	E557	E558	L559	R560	T561	N562	D563	M564	W565	V566	I567	P568	A569	L570	K571	Q572	I573	R574	E575	I576	C577	S578	L579	F580	GLY	GLU	
ALA	PRO	GLN	ASN	LEU	SER	GLN	THR	GLN	ARG	SER	PRO	HIS	VAL	PHE	Y598	R599	H600	D601	L602	I603	N604	Q605	D606	Q607	H608	M609	H610	A611	L612	V613	T614	L615	V616	A617	E618	M619	L620	A621	T622	Y623	M624	E625	S626	M627	R628	L629	Y630	A631	R632	D633	H634	E635	D636	H637	P639	GLN	THR	VAL		
ARG	LEU	GLY	SER	TYR	SER	H650	V651	E653	V654	Q655	E656	R657	L658	M659	F660	L661	R662	F663	L664	L665	K666	D667	G668	Q669	L670	W671	L672	C673	A674	P675	Q676	A677	K678	Q679	I680	W681	K682	C683	L684	A685	E686	M687	A688	V689	Y690	L691	C692	D693	R694	A696	C697	F698	W699	Y701	S702					
K703	L704	M705	G706	D707	E708	F709	D710	L711	D712	F713	D714	I715	W716	K717	D718	F719	E721	S722	M723	V724	L725	Q726	L727	D728	P729	S730	L731	L732	I733	E734	W735	G736	M737	K738	C739	F740	E741	R742	F743	F744	K745	A746	V747	W748	C749	R750	E751	G752	K753	D814	L754	V755	A756	K757	R758	R759	A760	Y761	M762	
M763	D764	D765	L766	E767	L768	I769	G770	L771	D772	Y773	L774	W775	R776	V777	V778	I779	Q780	S781	N782	D783	D784	I785	A786	S787	R788	A789	I790	D791	L792	L793	K794	E795	I796	Y797	T798	W799	L800	G801	P802	R803	L804	Q805	V806	M807	Q808	V809	M810	I811	H812	E813	D814	F815	L816	Q817	S818	C819	F820	D821	R822	
L823	R824	A825	S826	D828	T829	L830	C831	VAL	LEU	ASP	GLY	ASP	LYS	ASP	SER	VAL	ASN	C842	A843	R844	Q845	E846	A847	W848	R849	M850	W853	L854	T855	V856	L857	R858	E859	Y860	I861	N862	E863	C864	D865	ASP	TVR	HIS	GLU	GLU	ARG	THR	ILE	ASP	LEU	PRO	MET	SER	ARG	ALA	PHE	ARG	GLY			
LYS	HIS	LEU	SER	PHE	VAL	VAL	ARG	GLY	GLN	PRO	ASN	GLN	ASP	THR	ALA	LYS	TRP	SER	HIS	THR	ASN	ASP	THR	THR	VAL	ARG	ASP	CYS	ILE	LEU	ASN	ASN	HIS	THR	LYS	LYS	ILE	GLU	LEU	PHE	VAL	GLY	GLY	GLU	LEU	ILE	ASP	PRO												
ALA	ASP	ARG	ARG	LYS	LEU	ILE	GLY	GLN	GLN	LEU	ASN	LYS	ASP	THR	ALA	LYS	VAL	THR	THR	ILE	GLY	SER	SER	VAL	PRO	ASP	ASP	GLY	THR	GLY	ALA	ASN	ASN	HIS	THR	GLY	ASN	ASN	PRO	PRO	PRO	GLU	VAL	VAL	SER	PHE	ASP	GLU												
SER	CYS	LEU	PRO	GLY	VAL	ILE	MET	S1012	L1013	H1014	LEU	P1015	R1016	Y1017	I1018	S1019	F1020	L1021	W1022	Q1023	V1024	A1025	D1026	L1027	G1028	S1029	S1030	L1031	N1032	M1033	P1034	P1035	L1036	R1037	D1038	G1039	A1040	R1041	V1042	L1043	M1044	K1045	L1046	M1047	P1048	P1049	D1050	S1051	T1052	T1053	I1054	E1055	K1056	L1057	R1058	A1059	I1060	C1061	L1062	D1063
H1064	A1065	K1066	LEU	GLY	GLU	SER	SER	LEU	PRO	SER	L1076	D1077	F1080	F1081	G1082	P1083	S1084	Q1087	V1088	L1089	Y1090	L1091	T1092	E1093	I1094	V1095	Y1096	A1097	L1098	L1099	M1100	P1101	ALA	GLY	ALA	PRO	LEU	ALA	ASP	ASP	S1110	S1111	D1112	F1113	Q1114	F1115	H1116	K1119	S1120	L1123	P1124	L1125	V1126	L1127						
S1128	M1129	L1130	R1131	N1132	N1133	N1134	F1135	L1136	P1137	M1138	A1139	D1140	M1141	E1142	T1143	R1144	R1145	G1146	A1147	Y1148	L1149	N1150	A1151	L1152	K1153	I1154	A1155	K1156	L1157	L1158	L1159	T1160	A1161	I1162	G1163	Y1164	HIS	VAL	ARG	ALA	VAL	ALA	S1110	S1111	D1112	F1113	Q1114	F1115	H1116	K1119	S1120	L1123	P1124	L1125	V1126	L1127				

ASN	GLN	VAL	THR	HIS	ASP	GLN	ALA	VAL	LEU	GLN	SER	ALA	LEU	GLN	ILE	PRO	ASN	PRO	SER	GLU	CYS	MET	LEU	ARG	ASN	VAL	SER	VAL	ARG	LEU	GLN	GLN	ILE	SER	ASP	GLU	ALA	SER	ARG	Y1232	M1233	P1234	D1235	I1236	C1237	V1238	I1239	R1240	A1241	I1242	Q1243	K1244	I1245	I1246	W1247																																																																																																										
A1248	H1322	C1323	K1326	T1327	V1328	R1329	Q1330	W1331	A1332	L1333	E1334	Q1335	F1336	L1337	F1337	L1338	R1342	C1343	C1344	M1345	R1348	L1351	L1357	F1358	L1361	E1367	R1368	A1369	K1370	H1371	D1374	Y1375	F1376	T1377	L1378	L1379	R1380	H1381	M1384	R1385	A1386	Y1387	M1388	S1389	M1390	M1395	L1399	W1406	L1407	K1408	R1409	I1410	R1411	D1412	V1414	K1415	E1423	C1425	L1426	E1428	G1429	H1430	L1431	G1432	V1433	T1434	K1435	E1436	L1437	F1440	Q1441	T1442	S1443	E1444	K1445	K1446	F1447	H1448	E1452	G1453	G1454	G1455	M1456	L1457	L1458	L1459	K1460	E1461	L1462	I1463	D1464	D1465	F1466	L1467	F1468	P1469	M1472	R1479	ASN	GLY	GLU	ASN	GLY	P1579																																																									
L1572	I1576	Y1577	I1578	P1579	I1588	E1589	L1590	T1591	G1592	SER	P1490	V1491	G1492	G1493	T1497	L1498	F1502	E1503	V1510	G1511	V1513	R1514	M1515	V1520	Y1527	T1531	A1532	I1533	T1534	T1535	C1536	K1554	F1555	V1556	V1557	G1558	L1559	K1560	M1561	A1562	G1563	A1564	T1565	C1566	Y1567	M1568	M1569	I1572	Y1576	M1577	I1578	P1579	G1652	H1653	L1654	Y1661	P1664	R1665	G1666	F1667	M1668	K1669	F1671	R1672	L1673	W1674	G1675	E1676	P1677	M1678	L1680	E1681	E1682	H1684	D1685	F1690	M1691	S1692	L1693	V1694	L1697	L1701	K1702	L1703	G1705	H1706	P1707	A1708	M1709	L1710	S1711	K1712	L1713	G1715	G1716	F1717	F1718	A1719	D1720	Q1721	K1722	I1723	C1724	Q1725	G1726	C1727	P1728	H1729	R1730	Y1731	E1732	C1733	E1734	E1735	S1736	F1737	T1738	T1739	L1740	M1741	V1742	D1743	I1744	R1745	M1746	H1747	Q1748	M1749	L1750	L1751	D1752	S1753	L1754	E1755	Q1756	Y1757	L1758	K1759	G1760	D1761	L1762	L1763	E1764	G1765	A1766	M1767	L1768	Y1769	H1770	C1771	E1772	K1773	C1774	M1775	K1776	K1777	V1778	D1779	V1780	K1782	R1783
L1784	L1785	I1786	K1787	K1788	L1789	P1790	Y1791	I1795	Q1796	L1797	K1798	R1799	F1800	D1801	L1802	D1803	W1804	E1805	R1806	C1808	E1807	A1809	I1810	K1811	F1812	M1813	D1814	Y1815	F1816	E1817	R1820	E1821	L1822	D1823	M1824	E1825	P1826	Y1827	T1828	V1829	A1830	G1831	V1832	L1833	K1834	L1835	E1836	G1837	D1838	ASN	VAL	ASN	PRO	GLU	SER	GLN	LEU																																																																																																								
I1887	I1987	G1988	R1989	S1990	Y1991	R1992	K1993	Q1997	Q2004	M2007	E2008	Y2009	F2010	Q2011	F2012	P2027	P2028	L2034	A2037	R1940	R1941	Q1942	K1943	R1944	V1945	L1946	M1947	Y1953	M1956	THR	ILE	ASP	Q1961	D1962	D1963	E1964	L1965	I1966	R1967	Y1968	I1969	S1970	GLU	LEU	ALA	ALA	ILE	THR	THR	ARG	PRO	HIS	GLN	ILE	ILE																																																																																																										
E2106	A2124	C2133	P2136	F2137	ALA	SER	PRO	GLY	PRO	SER	SER	GLN	ALA	ALA	TWR	ASP	S2153	D2154	H2155	V2160	L2161	N2162	L2163	L2164	R2165	V2168	L2047	G2172	R2173	A2049	R2050	F2051	L2052	T2054	T2055	G2056	R2064	A2067	W2070	S2081	V2084	V2092	R2099	E2102																																																																																																																					



● Molecule 1: Probable ubiquitin carboxyl-terminal hydrolase FAF-X



M1515	D1412	H1324	A1248	V1126	A1065	GLU	PRO	L823	M763	M764	M765	K703	ARG
V1520	D1413	S1325	S1263	M1129	K1066	SER	ALA	K824	D764	D764	D765	L704	LEU
S1523	V1414	T1326	L1254	L1130	LEU	CYS	ASP	A825	D765	D765	D766	M705	GLY
T1524	K1415	R1327	L1254	L1131	GLY	PRO	ARG	S826	L766	L766	L767	G706	SER
E1525	K1426	V1328	Q1256	R1132	SER	VAL	LYS	Y827	L767	L767	L768	E708	TYR
M1526	L1427	Q1330	L1256	M1133	LEU	VAL	ILE	D828	E768	E768	E769	P709	SER
T1531	H1430	V1331	V1257	M1134	SER	LEU	LEU	T829	I769	I769	G770	P709	SER
A1532	L1431	A1332	P1260	F1135	SER	PRO	GLN	L830	G770	G770	L771	D710	H650
I1533	G1432	Q1333	M1261	L1136	L1076	LEU	ASN	C831	L771	L771	L772	L711	H651
T1534	V1433	Q1335	E1262	P1137	D1077	LEU	ASP	VAL	L772	L772	Y773	D712	E653
E1537	L1434	F1336	E1263	M1138	S1078	LEU	LYS	GLY	Y773	Y773	L774	P713	H654
V1548	K1436	M1339	I1264	R1139	R1016	ASP	LYS	ASP	L774	L774	L775	D714	H655
R1551	L1437	R1342	T1265	A1138	Y1017	VAL	VAL	ASP	W775	W775	W776	I715	H657
K1554	L1438	C1343	Y1266	D1140	F1080	LEU	ILE	ASP	V776	V776	V777	N716	H658
G1555	Q1441	R1348	E1269	M1141	F1081	LEU	THR	SER	V777	V777	V778	K717	H659
F1556	K1445	F1353	K1270	E1142	G1082	LEU	ALA	VAL	I778	I778	I779	D718	H660
L1559	K1446	I1354	T1271	T1143	P1083	LEU	LYS	C942	O779	O779	O780	F720	H661
K1560	F1447	I1355	N1272	R1144	S1084	LEU	TRP	A943	Q780	Q780	Q781	E721	H662
M1561	L1448	T1356	A1273	R1145	A1085	THR	HIS	R944	S781	S781	S782	S722	H663
A1562	E1462	L1356	G1274	G1146	A1086	THR	THR	Q845	N782	N782	N783	S722	H664
G1563	L1462	L1357	Q1087	Y1148	Q1087	ASN	ASN	E946	D784	D784	D785	V724	H665
A1564	I1467	F1358	L1149	L1149	Y1090	ASN	THR	A947	I785	I785	I786	L725	H666
T1565	K1456	L1358	M1150	M1150	L1091	THR	ILE	V948	A786	A786	A787	Q726	H667
C1566	L1457	T1359	A1151	A1151	T1092	PRO	GLY	R949	S787	S787	S788	L727	H668
V1567	M1457	V1360	K1153	K1153	E1093	SER	VAL	M850	R787	R787	R788	D728	H669
G1573	L1462	I1361	L1154	L1154	V1094	PRO	VAL	V851	S788	S788	S789	P729	H670
Q1574	I1467	R1366	A1155	A1155	V1095	ASP	ARG	R852	A789	A789	A790	P729	H671
I1585	R1479	A1369	K1156	K1156	Y1096	SER	CYS	V853	I790	I790	I791	S730	H672
E1589	ASN	K1370	L1157	L1157	A1097	SER	ILE	L854	D791	D791	D792	L731	H673
G1590	GLU	H1371	L1158	L1158	L1098	SER	LEU	T855	L792	L792	L793	L732	H674
T1591	LEU	D1374	L1159	L1159	L1099	ASP	ASN	V856	L793	L793	L794	T733	H675
G1592	PRO	V1375	T1160	T1160	M1100	SER	ILE	L857	K794	K794	K795	E734	H676
SER	ALA	F1376	A1161	A1161	P1101	GLY	ALA	R858	I796	I796	I797	N735	H677
ASP	GLN	L1377	I1162	I1162	ALA	PRO	ALA	E859	Y797	Y797	Y798	G736	H678
VAL	GLN	L1378	G1163	G1163	GLY	ASP	ALA	Y860	T798	T798	T799	K738	H679
ASP	ALA	L1379	Y1164	Y1164	LEU	ASP	HIS	I861	C739	C739	C740	F743	H680
ASP	ALA	L1380	G1165	G1165	LEU	ASP	HIS	N862	L800	L800	L801	E741	H681
ASP	ALA	L1381	HIS	HIS	ALA	ASP	HIS	E863	G801	G801	G802	E741	H682
ASP	ALA	L1382	VAL	VAL	ASP	ASP	HIS	C864	P802	P802	P803	R742	H683
ASP	ALA	L1383	VAL	VAL	ASP	ASP	THR	D865	R803	R803	R804	R742	H684
ASP	ALA	L1384	ALA	ALA	S1110	VAL	THR	S866	L804	L804	L805	F744	H685
ASP	ALA	L1385	ALA	ALA	S1111	VAL	ASP	ASP	L804	L804	L805	F744	H686
ASP	ALA	L1386	ALA	ALA	D1112	GLU	VAL	TYR	Q805	Q805	Q806	K745	H687
ASP	ALA	L1387	ALA	ALA	F1113	CYS	PRO	GLY	V806	V806	V807	A746	H688
ASP	ALA	L1388	ALA	ALA	Q1114	GLN	ASN	GLU	N807	N807	N808	V747	H689
ASP	ALA	L1389	ALA	ALA	T1052	PRO	GLU	GLU	Q808	Q808	Q809	W748	H690
ASP	ALA	L1390	ALA	ALA	F1115	GLY	ILE	THR	V809	V809	V810	C749	H691
ASP	ALA	L1391	ALA	ALA	H1116	VAL	ILE	ILE	V810	V810	V811	R750	H692
ASP	ALA	L1392	ALA	ALA	F1117	VAL	LEU	PRO	E751	E751	E752	G752	H693
ASP	ALA	L1393	ALA	ALA	L1118	GLY	LEU	MET	I811	I811	I812	G752	H694
ASP	ALA	L1394	ALA	ALA	K1119	VAL	ASP	SER	E813	E813	E814	K753	H695
ASP	ALA	L1395	ALA	ALA	S1120	PRO	ASN	ARG	D814	D814	D815	L754	H696
ASP	ALA	L1396	ALA	ALA	G1121	MET	THR	PHE	F815	F815	F816	V755	H697
ASP	ALA	L1397	ALA	ALA	L1122	THR	GLN	ARG	I816	I816	I817	A756	H698
ASP	ALA	L1398	ALA	ALA	P1123	GLN	GLN	ARG	Q817	Q817	Q818	K757	H699
ASP	ALA	L1399	ALA	ALA	L1123	GLN	GLN	ARG	C819	C819	C820	R758	H700
ASP	ALA	L1400	ALA	ALA	L1124	GLN	GLN	ARG	D821	D821	D822	Y761	H701
ASP	ALA	L1401	ALA	ALA	L1125	GLN	GLN	ARG	R822	R822	R823	M762	H702

GLU	K1632	K1633	E1634	D1635	K1636	E1638	Y1639	M1640	I1641	G1642	L1644	R1645	H1646	Q1648	H1653	S1657	L1658	L1659	Q1660	Y1663	P1664	R1665	G1666	F1667	L1668	K1669	Q1670	F1671	R1672	L1673																												
SER	V1674	G1675	E1676	P1677	V1678	N1679	L1680	R1681	E1682	Q1683	H1684	D1685	A1686	L1687	E1688	F1689	A1700	L1701	K1702	A1703	L1704	G1705	H1706	A1708	M1709	L1710	L1714	G1715	G1716	S1717	F1718	A1719	D1720	Q1721	K1722	I1723	C1724	Q1725	G1726	C1727	P1728	H1729	R1730	Y1731	E1732	C1733	E1734	S1735	F1737	T1738	T1739	L1740						
VAL	M1741	V1742	D1743	I1744	M1745	H1747	Q1748	M1749	L1750	L1751	D1752	S1753	L1754	E1755	Q1756	D1761	L1762	L1763	E1764	G1765	M1766	M1767	A1768	H1769	H1770	C1771	E1772	M1773	C1774	M1775	K1776	K1777	V1778	D1779	T1780	V1781	K1782	M1783	L1784	L1785	L1786	K1787	K1788	L1789	L1793	A1794	L1797	K1798	F1800	D1801	Y1802							
PRO	V1804	E1805	E1806	C1807	A1808	I1810	K1811	F1812	M1813	D1814	Y1815	F1816	E1817	F1818	P1819	R1820	E1821	L1822	D1823	M1824	E1825	P1826	Y1827	T1828	V1829	A1830	G1831	V1832	A1833	K1834	L1835	E1836	G1837	D1838	ASN	VAL	ASN	PRO	GLU	SER	GLN	LEU	ILE	GLN	GLN	GLN	SER	GLU	SER	THR	ALA	G1859	S1860	T1861	K1862	Y1863		
ASP	R1864	L1865	V1866	S1872	G1873	Q1874	A1875	S1876	G1877	G1878	H1879	Y1880	L1885	Q1886	R1887	M1888	G1889	G1890	ASP	GLY	GLU	ARG	ASN	R1896	D1901	D1902	G1903	D1904	V1905	T1906	E1907	C1908	K1909	M1910	D1911	D1912	D1913	E1914	E1915	M1916	K1917	M1918	Q1919	C1920	F1921	G1922	G1923	E1924	Y1925	M1926	G1927	V1928	F1929	D1931	H1932	M1933		
ARG	M1934	K1935	R1936	M1937	S1938	Y1939	R1940	R1941	Q1942	K1943	R1944	W1945	M1946	N1947	A1948	L1951	F1952	Y1953	E1954	R1955	M1956	ASP	THR	ILE	ASP	Q1961	D1962	D1963	E1964	L1965	A1966	R1967	Y1968	I1969	S1970	LEU	ALA	ILE	THR	THR	ARG	PRO	HIS	GLN	ILE	ILE	MET	PRO	SER	ALA	I1967	E1988	R1989	S1990	R1991	L1992	K1993	Q1994
THR	M1995	M1999	R2002	M2007	E2008	Q2011	F2012	M2013	K2014	K2015	L2016	L2017	M2020	L2024	G2029	Q2030	D2031	H2032	L2033	A2037	E2038	M2042	L2045	Q2046	L2047	A2049	R2050	F2051	L2052	G2056	F2057	V2062	V2063	R2064	A2067	W2070	R2079	H2080	V2084	R2085	F2088	A2089																
GLN	H2090	R2091	V2092	L2093	E2102	E2106	F2122	F2122	D2130	C2133	F2137	ALA	SER	PRO	GLY	PRO	SER	SER	ALA	TYR	ASP	M2149	D2154	L2164	V2168	L2175	Q2176	Q2177	M2180	V2183	T2194	Q2195	L2196	K2198	L2199	S2200	V2201	P2202	A2203	M2206	L2207	S2209	L2235															
VAL	I2236	R2237	N2240	S2241	M2245	S2248	I2249	N2250	D2261	P2270	I2271	D2277	F2280	V2281	R2282	T2283	K2287	K2288	I2289	I2290	S2294	L2303	R2304	C2307	F2308	E2309	L2322	W2323	Q2324	V2325	S2328	L2333	L2339	Q2342	D2348	S2349	W2350	R2354	D2364	D2365																		
ASP	R2366	D2367	G2368	D2371	T2372	L2373	K2377	R2383	A2384	Y2385	K2389	Y2402	Q2406	G2409	F2412	R2413	T2416	W2417	V2419	E2426	F2427	R2428	ARG	PRO	TYR	THR	GLY	ASN	PRO	GLN	GLN	ASN	ASN	TRP	SER	PRO	PRO	VAL	SER	ASN	THR	THR	SER	ASN	GLY	TYR												
GLY	PHE	LEU	GLU	ARG	S2460	A2463	L2473	C2474	P2475	GLU	GLU	GLU	ASN	PRO	TYR	ASP	ASP	GLN	ASP	ALA	PRO	ASP	VAL	SER	GLU	HIS	GLU	PRO	GLN	THR	LYS	PRO	ASP	GLN	ASP	GLN	ASP	VAL	GLU	ASN	ALA	ALA	HIS															
HIS	HIS	MET	ASN	ASN	PRO	GLN	ARG	THR	GLY	GLN	GLN	ASN	TYR	GLU	GLY	SER	GLU	GLU	ALA	PRO	VAL	SER	SER	GLU	HIS	PRO	GLN	THR	LYS	PRO	ASP	GLN	ASP	GLN	ASP	VAL	GLU	ASN	ALA	ALA	HIS																	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	330000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	56.7	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.330	Depositor
Minimum map value	-0.608	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.034	Depositor
Recommended contour level	0.221	Depositor
Map size (Å)	372.73602, 372.73602, 372.73602	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8320001, 0.8320001, 0.8320001	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	0.26	0/14461	0.47	0/19559
1	B	0.26	0/14461	0.47	0/19559
1	C	0.26	0/14351	0.47	0/19411
All	All	0.26	0/43273	0.47	0/58529

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [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	14155	0	14051	332	0
1	B	14155	0	14051	327	0
1	C	14047	0	13957	348	0
All	All	42357	0	42059	1000	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 1000 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:C:2413:ARG:O	1:C:2416:THR:HG22	1.31	1.24

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1521:ASP:O	1:C:1524:THR:HG22	1.38	1.20
1:B:540:CYS:HB2	1:B:544:ARG:HA	1.29	1.07
1:C:1789:LEU:HB3	1:C:1863:TYR:OH	1.58	1.02
1:A:1265:THR:HA	1:A:1268:TYR:CD2	2.02	0.95

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	1721/2579 (67%)	1631 (95%)	86 (5%)	4 (0%)	47 77
1	B	1721/2579 (67%)	1631 (95%)	90 (5%)	0	100 100
1	C	1708/2579 (66%)	1614 (94%)	88 (5%)	6 (0%)	34 66
All	All	5150/7737 (67%)	4876 (95%)	264 (5%)	10 (0%)	50 77

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	544	ARG
1	A	2454	GLY
1	C	2365	ASP
1	C	546	THR
1	C	1348	ARG

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	1544/2286 (68%)	1532 (99%)	12 (1%)	81	89
1	B	1544/2286 (68%)	1536 (100%)	8 (0%)	88	93
1	C	1532/2286 (67%)	1522 (99%)	10 (1%)	84	90
All	All	4620/6858 (67%)	4590 (99%)	30 (1%)	86	91

5 of 30 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	544	ARG
1	C	1357	LEU
1	B	794	LYS
1	C	2050	ARG
1	C	545	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 15 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	1813	ASN
1	C	1653	HIS
1	B	1947	ASN
1	C	2221	GLN
1	C	406	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

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.

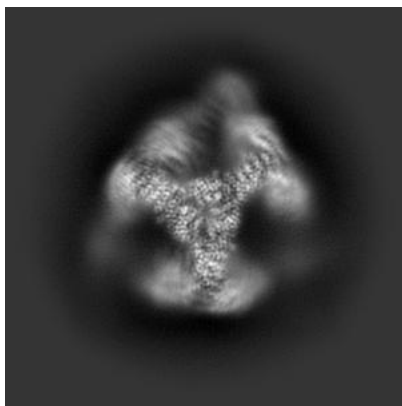
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-14368. These allow visual inspection of the internal detail of the map and identification of artifacts.

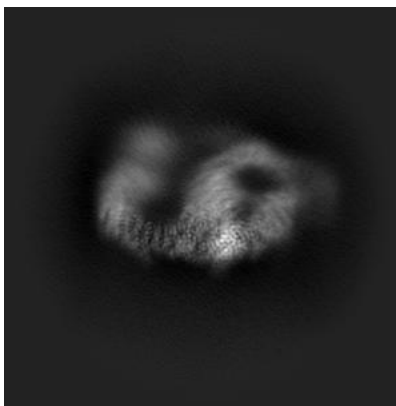
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

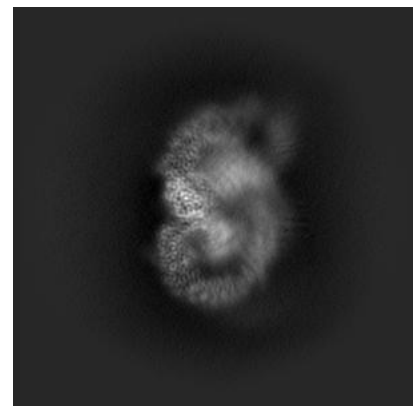
6.1.1 Primary map



X

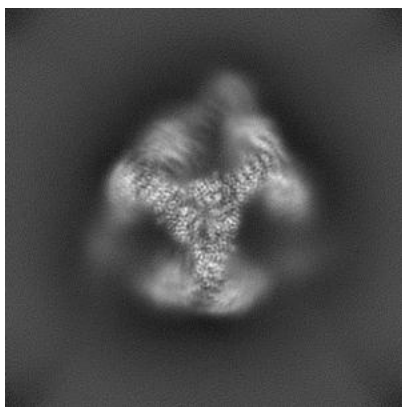


Y

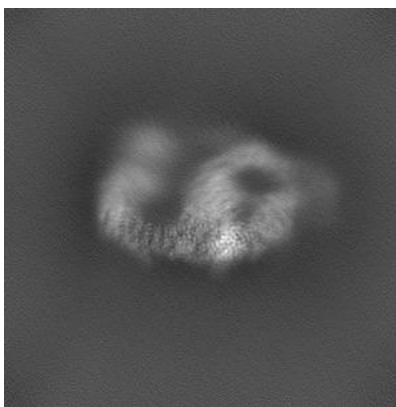


Z

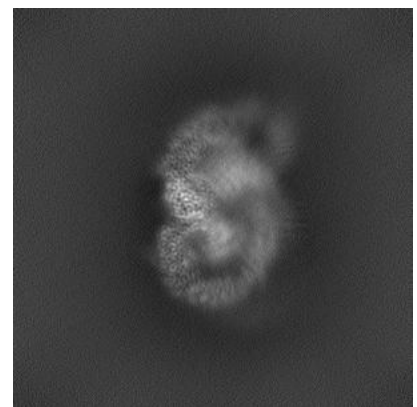
6.1.2 Raw map



X



Y

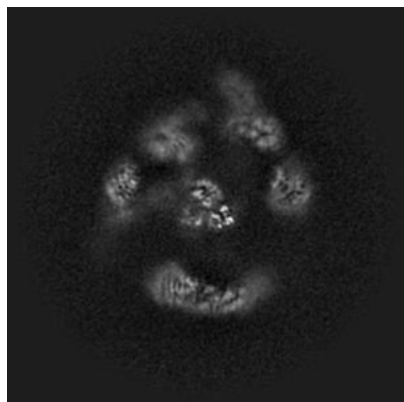


Z

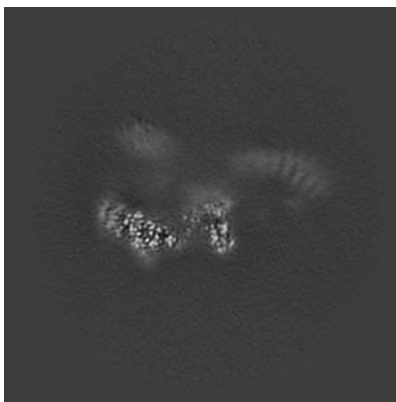
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

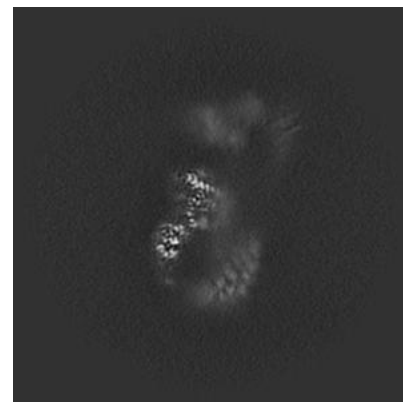
6.2.1 Primary map



X Index: 224

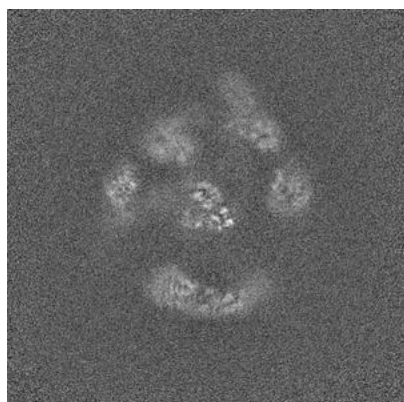


Y Index: 224



Z Index: 224

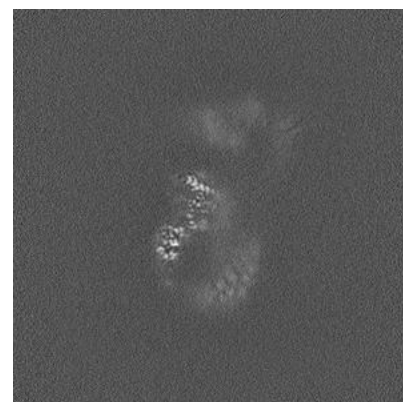
6.2.2 Raw map



X Index: 224



Y Index: 224

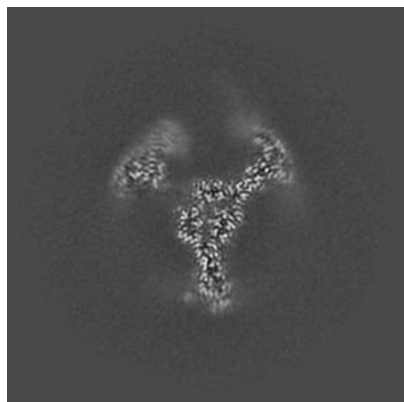


Z Index: 224

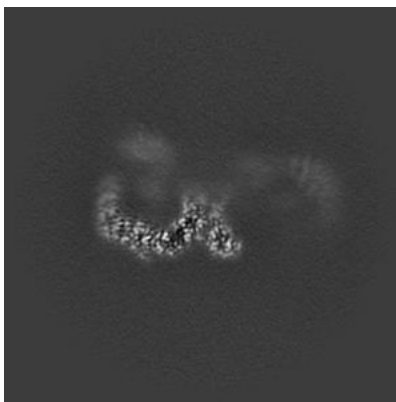
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

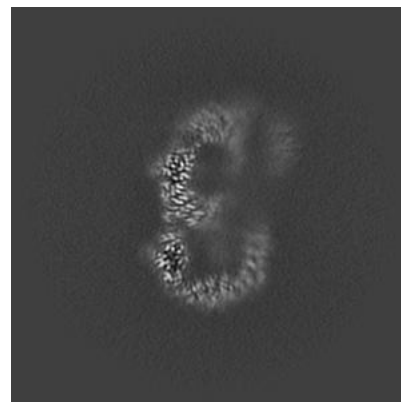
6.3.1 Primary map



X Index: 196

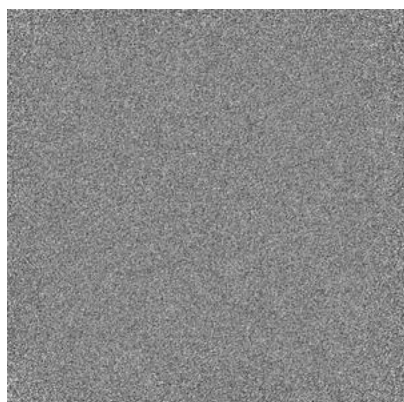


Y Index: 237

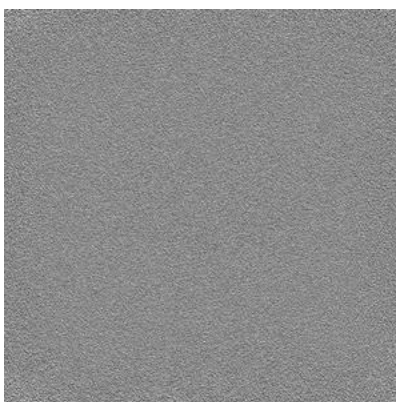


Z Index: 248

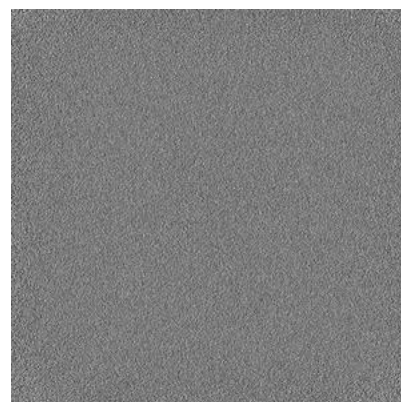
6.3.2 Raw map



X Index: 0



Y Index: 0



Z Index: 0

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

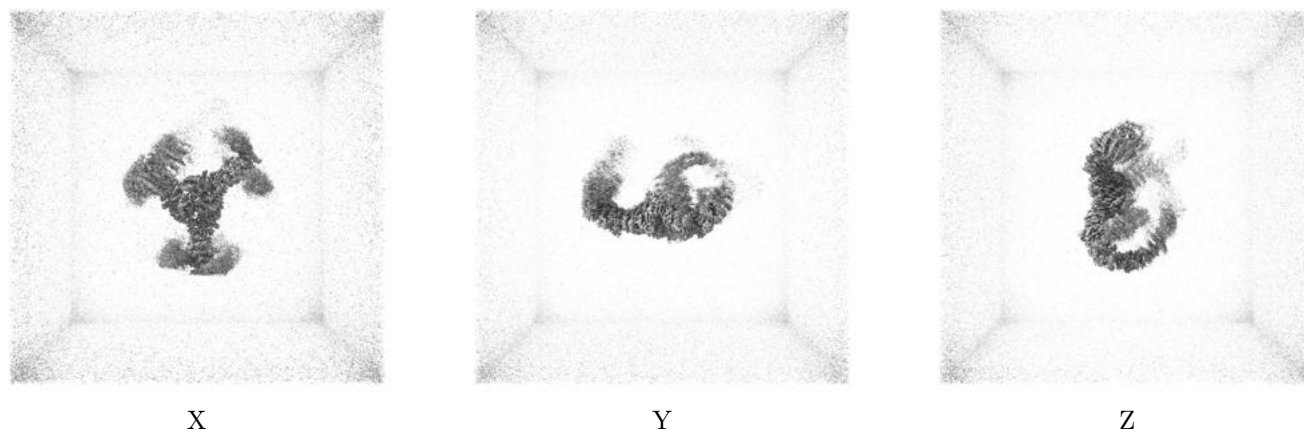
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.221. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 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.

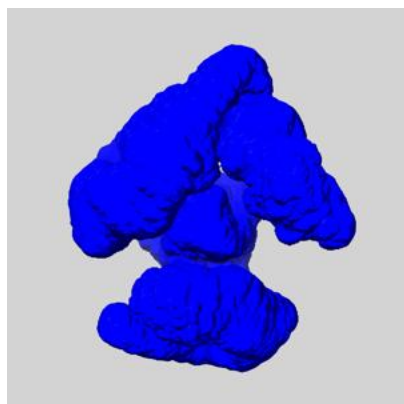
6.5 Mask visualisation [i](#)

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

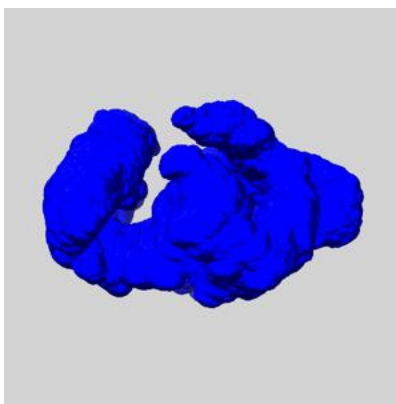
A mask typically either:

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

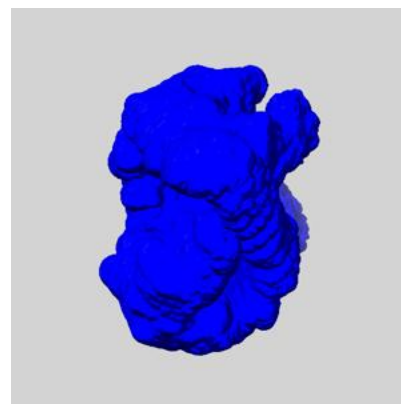
6.5.1 emd_14368_msk_1.map [i](#)



X



Y

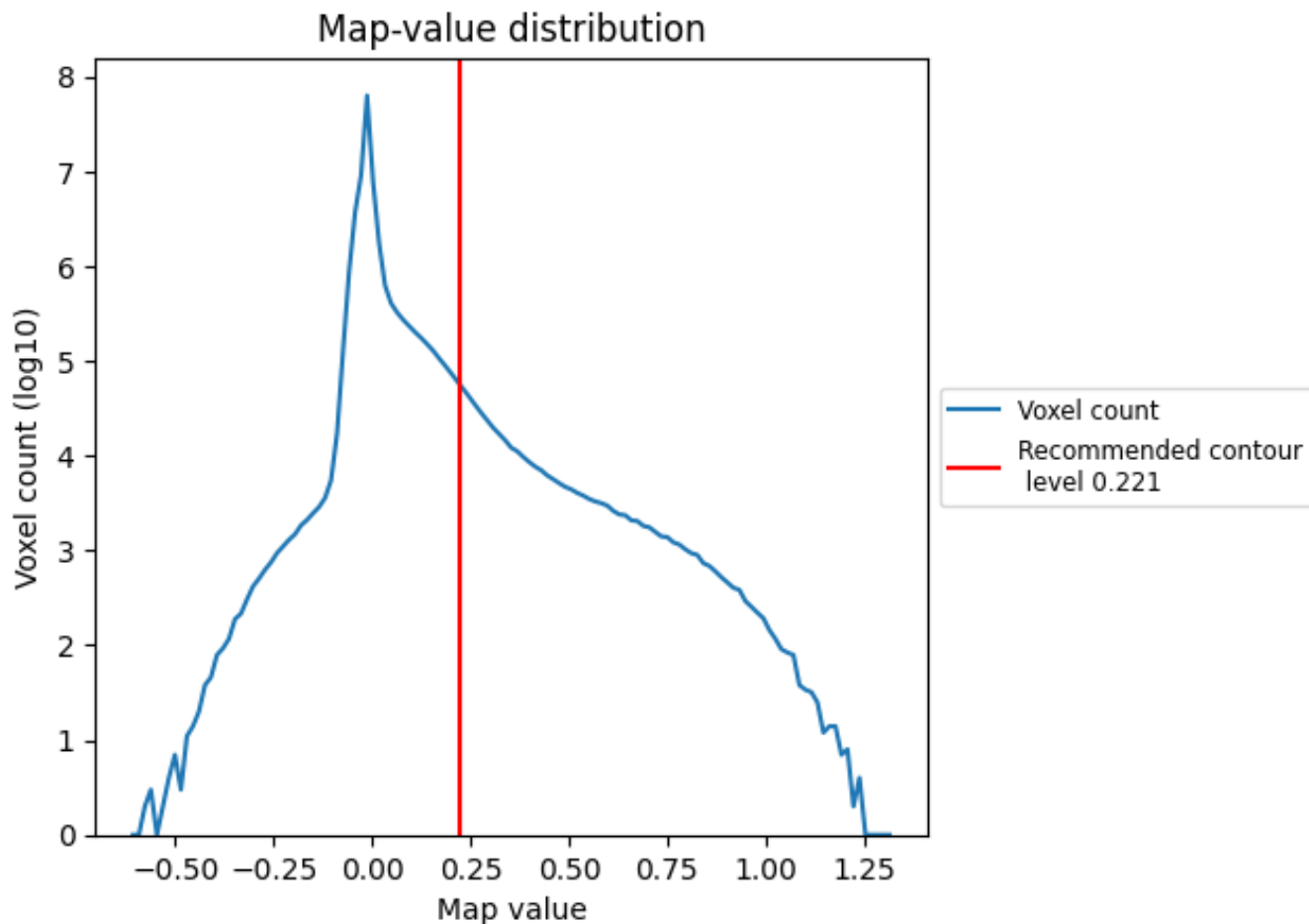


Z

7 Map analysis [i](#)

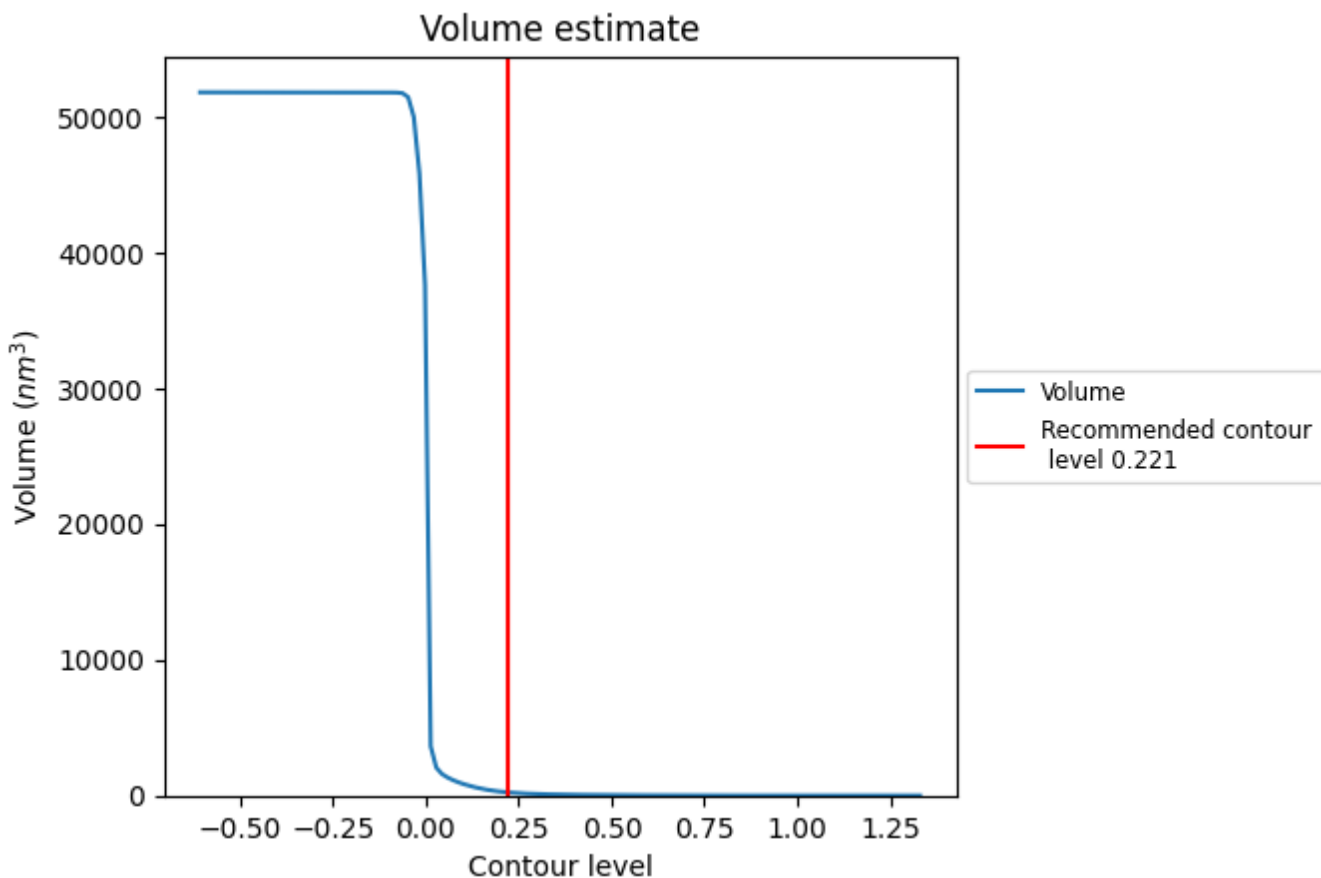
This section contains the results of statistical analysis of the map.

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.

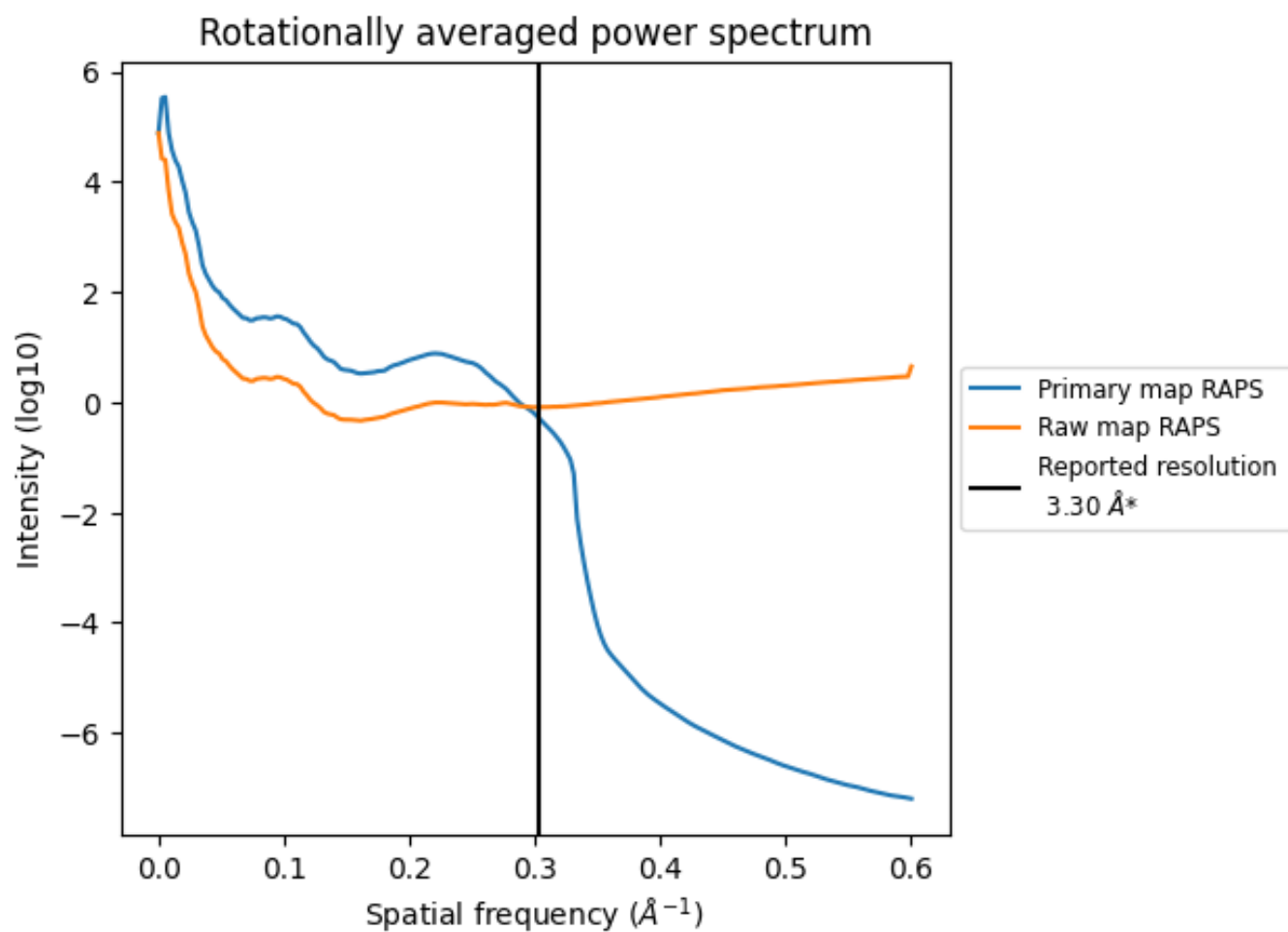
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 235 nm³; this corresponds to an approximate mass of 212 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

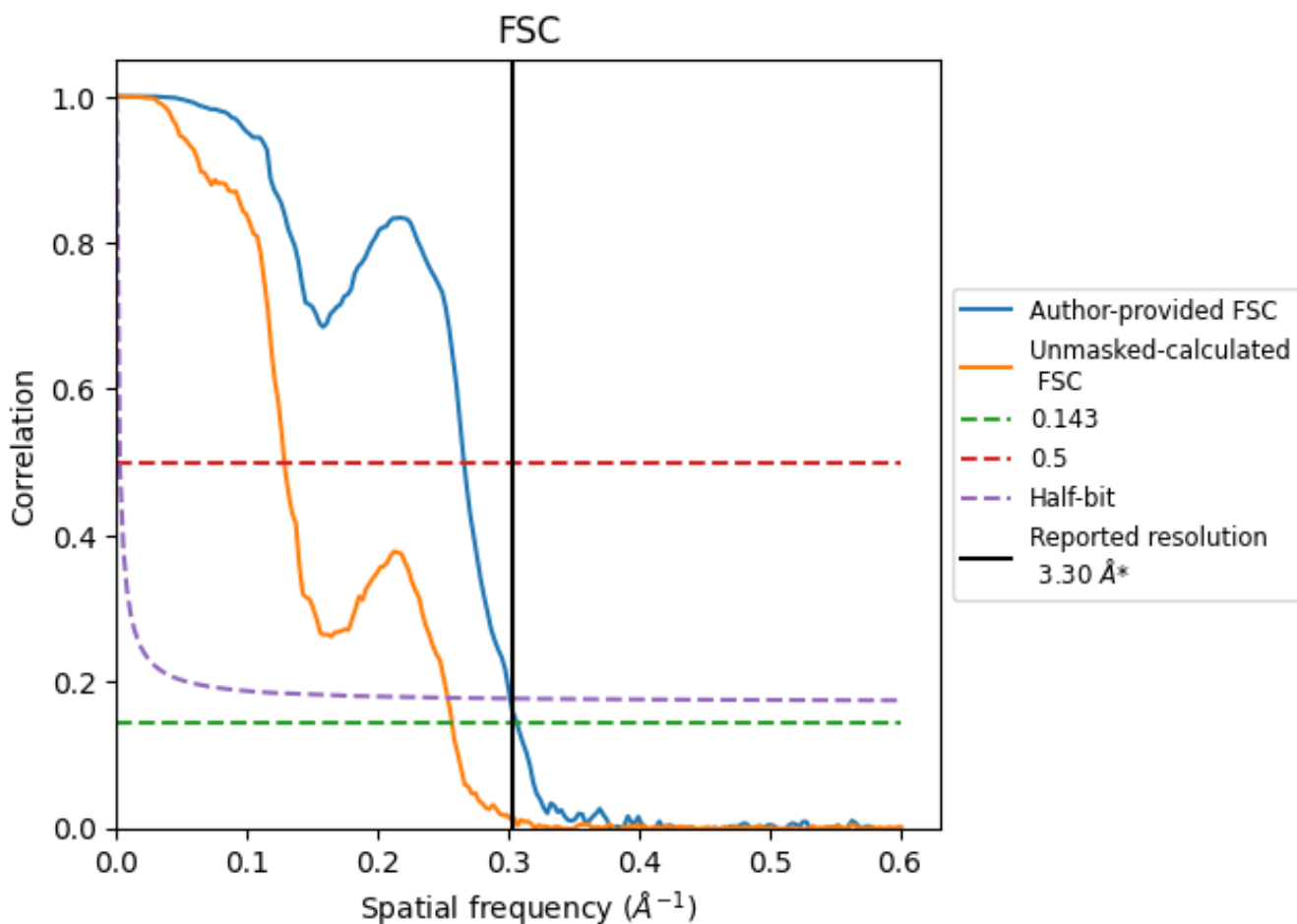


*Reported resolution corresponds to spatial frequency of 0.303 Å⁻¹

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 0.303 Å⁻¹

8.2 Resolution estimates [i](#)

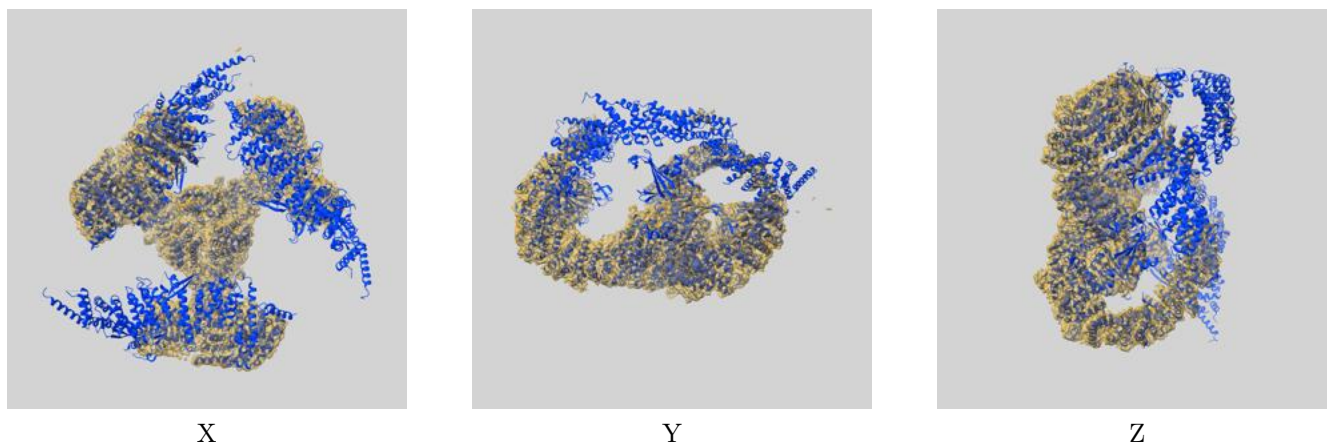
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	3.26	3.76	3.32
Unmasked-calculated*	3.89	7.77	3.94

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.89 differs from the reported value 3.3 by more than 10 %

9 Map-model fit [i](#)

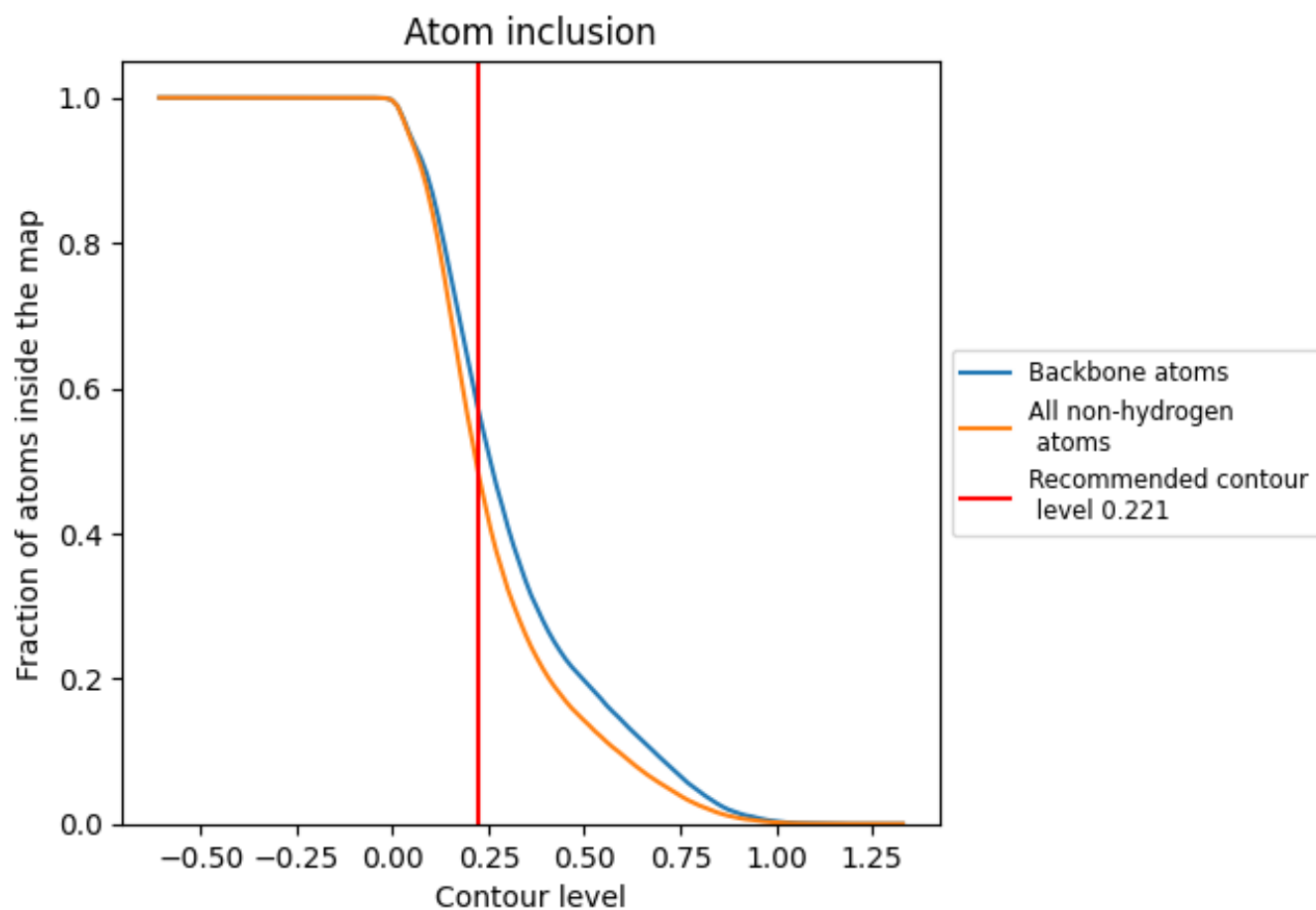
This section contains information regarding the fit between EMDB map EMD-14368 and PDB model 7YXX. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.221 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Atom inclusion [i](#)



At the recommended contour level, 58% of all backbone atoms, 49% of all non-hydrogen atoms, are inside the map.