



wwPDB EM Validation Summary Report ⓘ

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PDB ID : 5GL1
EMDB ID : EMD-9521
Title : Structure of RyR1 in an open state
Authors : Bai, X.C.; Yan, Z.; Wu, J.P.; Yan, N.
Deposited on : 2016-07-07
Resolution : 5.70 Å(reported)

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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:

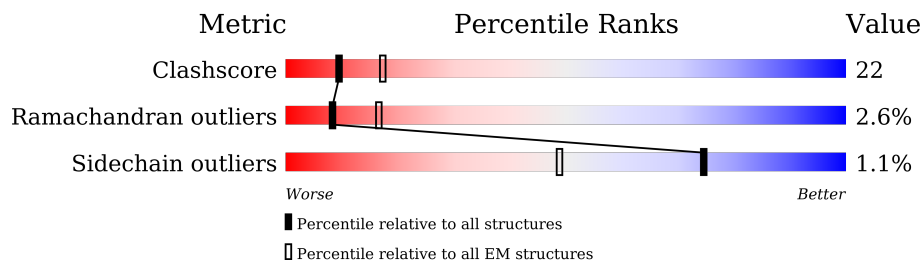
EMDB validation analysis : 0.0.1.dev70
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

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 5.70 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	5037	
1	C	5037	
1	E	5037	
1	G	5037	
2	B	108	
2	D	108	
2	F	108	
2	H	108	

2 Entry composition i

There are 3 unique types of molecules in this entry. The entry contains 110704 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 Ryanodine receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	3645	26843	17063	4667	4956	157	0	0
1	C	3645	26843	17063	4667	4956	157	0	0
1	E	3645	26843	17063	4667	4956	157	0	0
1	G	3645	26843	17063	4667	4956	157	0	0

- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	107	832	527	146	155	4	0	0
2	D	107	832	527	146	155	4	0	0
2	F	107	832	527	146	155	4	0	0
2	H	107	832	527	146	155	4	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

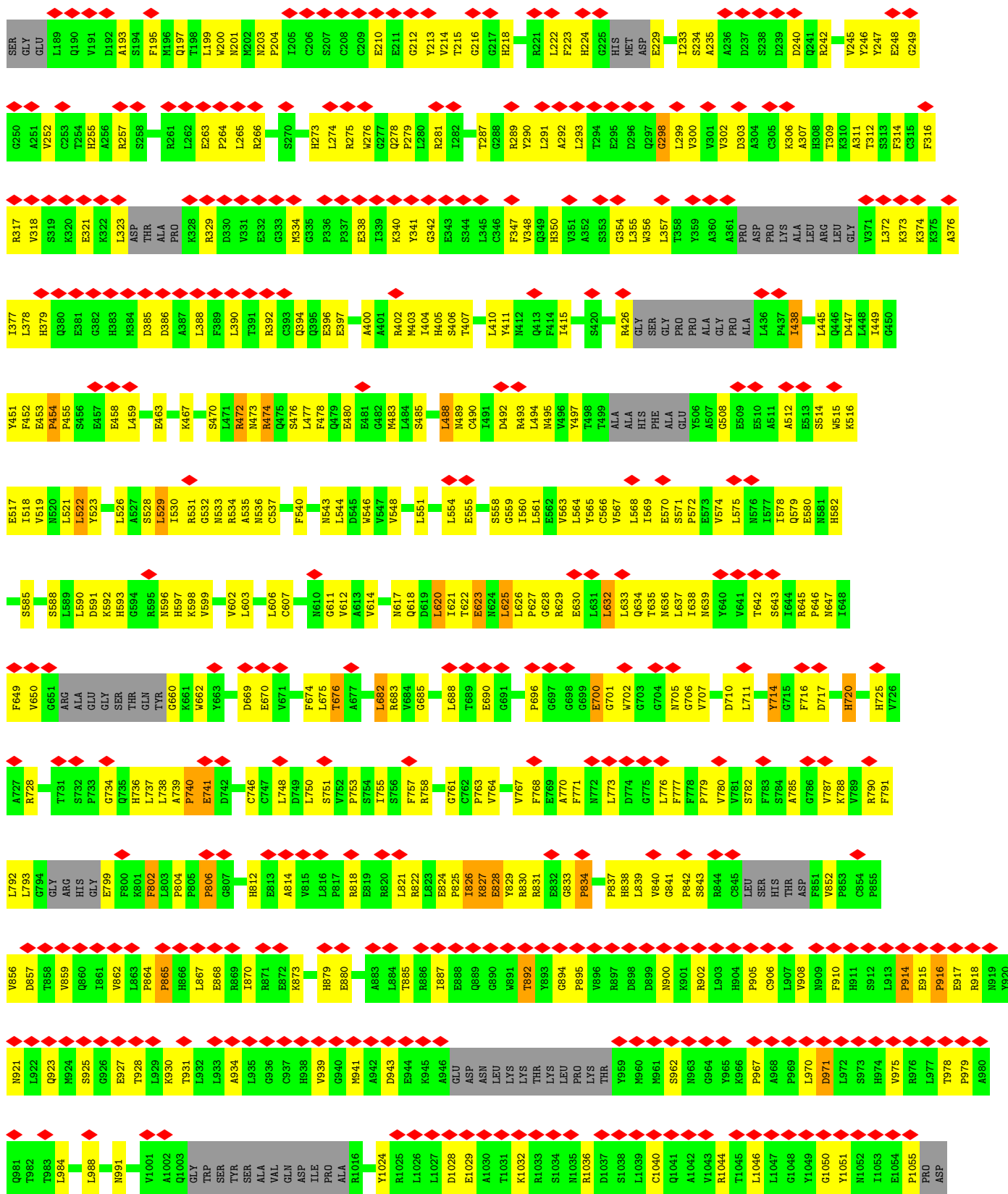
Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total	Zn	0
			1	1	
3	C	1	Total	Zn	0
			1	1	
3	E	1	Total	Zn	0
			1	1	
3	G	1	Total	Zn	0
			1	1	

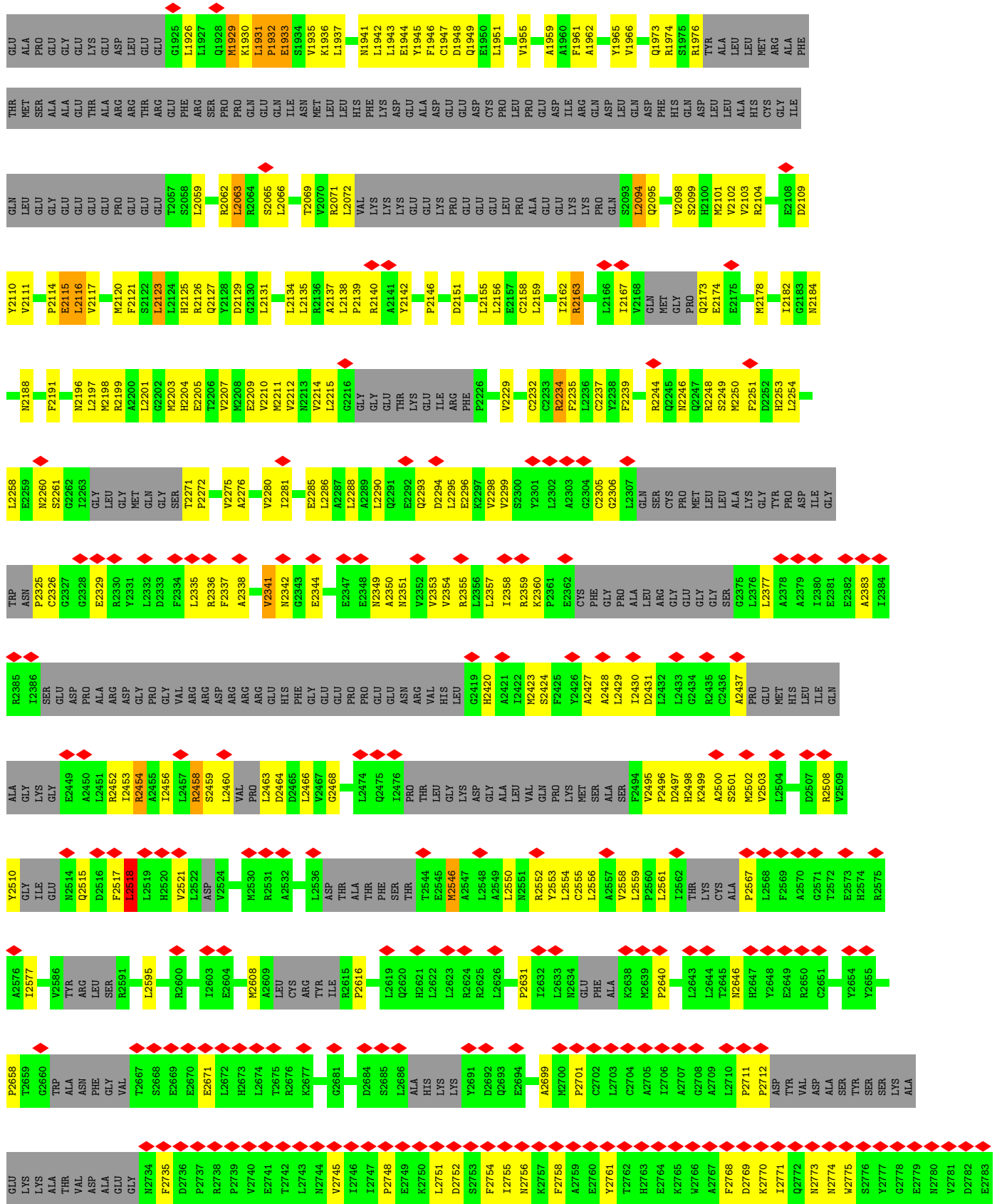
L590	D891	K592	H593	G594	R595	N596	H597	K598	V599	V602	L603	L606	C607	M610	G611	V614	M617	Q618	L619	I621	T622	L625	L626	P627	G628	R629	E630	L631	L632	L633	Q634	T635	M636	L637	I638	N639	Y640	V641	T642	S643	I644	R645	N646	I648	F649	V650	G651	ARG	ALA	GLU	GLY									
SER	THR	GLN	TYR	G660	K661	W662	Y663	D669	L748	E670	V671	F674	L675	T676	A677	L682	R683	V684	G685	L688	T689	E690	G691	P696	G697	G698	G699	E700	G701	W702	G703	G704	N705	G706	V707	D710	L711	Y714	G715	F716	D717	H720	H725	V726	A727	R728	T731	S732	P733	G734										
L737	L738	A739	E740	P741	D742	C746	C747	L748	D749	L750	S751	V752	F753	S754	I755	S756	F757	R758	G761	C762	P763	V764	V767	E768	E769	A770	F771	N772	L773	D774	G775	L776	F777	F778	P779	V780	V781	S782	F783	S784	A785	G786	V787	K788	V789	R790	F791	L792	L793	G794	GLY	ARG	HIS	GLY	E799					
F800	K801	F802	L803	P804	P805	G807	H812	E813	A814	V815	L816	P817	R818	E819	R820	L821	R822	L823	E824	P825	I826	K827	E828	Y829	R830	R831	E832	G833	P834	H838	L839	V840	G841	P842	S843	R844	C845	LEU	SER	HIS	THR	ASP	F851	V852	P853	C854	R855	V856	D857	L858	V859	Q860	I861	V862	L863	P864				
P865	H866	L867	E868	R869	I870	P806	R871	E872	H879	E880	A883	L884	T885	R886	I887	E888	Q889	G890	W891	T892	Y893	G894	P895	V896	R897	G898	D899	N900	K901	R902	L903	H904	P905	C906	L907	V908	N909	F910	H911	S912	S912	L913	P914	E915	P916	E917	R918	N919	Y920	I861	N921	L922	Q923	N924	S925	G926	E927	T928	L929	K930
T931	L932	L933	A934	L935	G936	C937	H938	V939	G940	M941	A942	D943	E944	K945	A946	GLU	ASN	LEU	LYS	THR	LYS	THR	LEU	PRO	LYS	THR	Y959	M960	M961	S962	N963	G964	Y965	R966	A968	P969	L970	D971	L972	S973	H974	V975	R976	L977	T978	P979	A980	T983	L984	L988	N991	G992	V1001							
A1002	Q1003	GLY	TRP	SER	TYR	ALA	VAL	ASN	ILE	PRO	ALA	R1016	Y1024	R1025	L1026	L1027	D1028	E1029	A1030	T1031	K1032	R1033	S1034	M1035	N1036	D1037	S1038	L1039	C1040	Q1041	G964	Y965	V1043	N1044	T1045	L1046	L1047	G1048	Y1049	G1050	Y1051	M1052	N1053	E1054	P1055	PRO	ASP	GLN	GLU	GLY	PRO	PRO	SER	GLN	VAL	GLU	ASN	GLN	SER	
ARG	TRP	ASP	R1071	R1072	I1074	F1075	A1077	K1079	S1080	Y1081	V1083	Q1084	S1085	G1086	R1087	Y1088	F1090	E1091	F1092	E1093	A1094	V1095	T1096	T1097	G1098	E1099	M1100	R1101	V1102	G1103	A1105	R1106	P1107	E1108	L1109	R1110	P1111	D1112	V1113	E1114	L1115	G1116	A1117	D1118	E1119	L1120	V1123	F1124	G1126	H1127	R1128									
G1129	Q1130	R1131	W1132	H1133	L1134	G1135	S1136	E1137	P1138	F1139	G1140	R1141	V1143	Q1144	S1145	G1146	D1147	V1148	C1151	M1152	T1153	D1154	L1155	T1156	M1157	N1158	F1162	T1163	L1164	H1165	G1166	E1167	V1168	L1169	MET	SER	ASP	SER	GLY	SER	THR	A1178	F1179	R1180	E1181	I1182	G1185	D1186	G1187	F1188	L1189	P1190	V1191	D1261	C1192					
S1193	L1194	G1197	Q1198	V1199	H1200	H1201	N1203	L1204	G1205	Q1206	D1207	S1210	L1211	R1212	F1213	F1214	A1215	I1216	E1221	G1222	F1223	E1224	P1225	F1226	A1227	M1250	Q1231	V1234	T1235	T1236	W1237	F1238	S1239	L1240	S1241	L1242	P1243	Q1244	F1245	E1246	P1247	E1251	H1252	P1253	H1254	Y1255	E1256	R1259	M1260	D1261	GLY									
THR	VAL	ASP	THR	PRO	PRO	CYS	LEU	ARG	L1272	R1275	T1276	W1277	G1278	S1279	L1283	V1284	E1286	M1287	F1288	L1289	R1290	L1291	L1292	L1293	P1294	V1295	Q1296	F1297	HIS	GLN	PHE	ARG	CYS	THR	ALA	ALA	THR	PRO	LEU	ALA	PRO	PRO	PRO	GLY	GLN	ALA	ALA	ASP	ALA	ALA	ARG									
ALA	ALA	GLU	PRO	ASP	PRO	ASP	TYR	GLU	ASN	ARG	ARG	SER	ALA	GLY	TRP	GLY	GLU	ALA	ALA	GLY	LYS	GLU	GLY	VAL	GLY	THR	PRO	ALA	ASP	ASN	THR	PHE	GLN	GLY	VAL	GLY	VAL	ARG	ALA	PRO	ASN	GLU	GLY	LYS	ASP	ALA	THR	THR	GLU	LYS	ASN									
LYS	LYS	ARG	GLY	PHE	LEU	PHE	LYS	ALA	LYS	ALA	ALA	MET	THR	MET	PRO	PRO	ALA	THR	PRO	ALA	ASP	VAL	VAL	VAL	VAL	VAL	PRO	PRO	ALA	ASP	ASN	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR									

SER	C1447	L1519	E1596	R1661	R1727	ARG	I1862	LEU	THR	GLU	S2192	L2201	SER
C1448	V1520	A1531	V1597	F1662	R1728	L1796	L1863	GLU	ARG	GLU	L2123	G2202	T2271
M1452	ASP	N1532	Q1598	H1664	M1730	P1800	K1864	GLU	PHE	GLU	E2125	M2203	P2272
Y1457	LEU	M1537	M1600	H1665	L1731	A1801	M1865	L1925	ARG	G1925	S2058	H2204	V2275
H1458	THR	N1537	M1601	T1666	S1732	I1802	I1866	L1926	SER	L1927	L2059	E2205	A2276
G1459	G1525	N1537	P1602	L1667	S1733	E1805	E1867	L1927	PRO	Y2128	R2062	E2209	V2280
M1462	A1531	N1532	V1603	R1668	I1734	A1806	A1869	Q1928	PRO	L2063	D2129	V2210	I2281
M1463	N1532	M1537	S1604	L1669	I1735	L1807	P1868	M1929	GLN	R2064	G2130	M2211	N2284
F1464	N1537	N1537	M1605	Y1670	I1735	R1808	P1868	K1930	GLU	S2065	L2131	V2212	E2285
D1465	N1537	N1537	M1606	Y1671	I1735	R1808	P1868	L1931	GLN	L2066	L2134	V2214	A2287
L1466	N1537	N1537	M1607	Y1672	I1735	D1809	P1868	P1932	ILE	L2066	L2135	L2215	L2288
S1467	F1539	N1537	M1608	A1673	I1735	K1810	P1868	E1933	ASN	L2066	L2136	L2216	L2290
LYS		N1537	M1609	C1674	T1742	M1813	P1868	S1934	MET	T2069	R2137	GLY	Q2289
VAL		N1537	M1610	L1676	T1742	M1814	P1868	V1935	GLU	V2070	A2137	GLY	Q2291
ARG		N1537	M1611	L1676	L1747	M1814	P1868	K1936	LEU	R2071	L2138	GLY	E2292
ALA		N1537	M1612	L1676	F1748	L1815	P1868	L1937	LEU	L2072	L2139	GLU	D2294
V1472		N1537	L1613	M1679	P1749	V1819	P1868	M1941	PHE	VAL	P2139	THR	E2296
G1477		N1537	E1616	R1680	P1750	R1820	P1868	L1942	LYS	LYS	R2140	THR	V2298
D1478		N1537	T1617	V1681	GLY	A1682	P1868	L1943	ASP	LYS	A2141	LYS	V2299
E1479		N1537	R1618	H1683	ARG	H1683	P1868	E1944	GLU	GLU	Y2142	GLU	Q2293
Q1480		N1537	R1618	H1683	LYS	H1683	P1868	Y1945	ALA	LYS	P2146	ARG	D2294
G1481		N1537	A1619	A1684	GLY	A1684	P1868	F1946	ASP	GLU	GLU	PHE	L2295
H1482		N1537	R1621	L1685	GLY	Q1824	P1868	C1947	GLU	PRO	PRO	PHE	E2296
V1483		N1537	G1621	C1686	ASN	H1825	P1868	D1948	GLU	GLU	GLU	PHE	K2297
H1484		N1537	A1622	H1688	ALA	A1826	P1868	Q1949	ASP	GLU	GLU	PHE	V2298
S1485		N1537	L1555	V1689	ARG	R1827	P1868	F1950	GLU	LEU	LEU	PHE	V2299
S1486		N1537	P1556	H1689	ARG	D1828	P1868	L1951	LEU	PRO	PRO	PHE	G2230
L1487		N1537	V1561	D1690	HIS	V1829	P1868	L1955	ASP	ALA	ALA	PHE	Y2301
K1488		N1537	I1562	Q1691	G1761	Q1691	P1868	V1955	GLU	GLU	GLU	PHE	L2302
C1489		N1537	Q1563	A1692	P1763	L1762	P1868	L1958	GLU	GLU	GLU	PHE	L2303
S1490		N1537	F1564	H1693	P1763	L1762	P1868	L1958	ILE	GLU	GLU	PHE	F2234
M1491		N1537	E1565	L1695	G1766	V1834	P1868	F1961	GLN	PRO	PRO	PHE	F2235
CYS		N1537	A1577	L1695	G1766	V1834	P1868	A1962	ASP	GLN	GLN	PHE	G2236
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	V2237
PHE		N1537	LYS	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	G2238
ASP		N1537	GLN	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	E2239
VAL		N1537	ASN	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	R2330
SER		N1537	ASN	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	Y2331
PRO		N1537	ILE	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	L2332
GLN		N1537	PRO	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	D2333
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
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GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
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VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
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ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
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PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
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PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
PRO		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLN		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
GLY		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
ASP		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
VAL		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU	GLN	GLN	PHE	
SER		N1537	LEU	L1695	G1766	V1834	P1868	V1966	GLU				

GLY	T731	ARG	S925	GLN	L988	GLN	V1123	GLY	G1187	PRO	H1254	LYS	R1438	ILE	S1510
ARG	S732	HIS	G926	VAL	N991	VAL	F1124	F1188	F1188	PRO	Y1255	ASP	V1439	S1511	S1511
GLY	S733	GLY	G927	ASN	N991	GLU	L1189	L1189	L1189	ALA	E1256	THR	F1440	H1511	H1511
E799	E799	E799	E927	GLN	N991	GLN	G1126	P1190	P1190	ASP	R1259	THR	A1441	D1513	D1513
F900	F900	F900	T928	SER	V1001	SER	R1128	V1191	V1191	ALA	D1261	LYS	G1447	L1514	L1514
F802	F802	F802	L929	TRP	A1002	TRP	Q1109	C1192	C1192	ARG	M1260	ASN	G1448	V1515	V1515
P804	P804	P804	T931	ALA	Q1003	ASP	R1131	L1194	L1194	ALA	D1261	LYS	V1448	I1516	I1516
P805	P805	P805	L932	TRP	GLY	V1072	W1132	G1196	G1196	THR	H1201	ARG	W1452	L1519	L1519
P806	P806	P806	L933	TYR	GLY	R1073	L1134	G1197	G1197	GLU	L1202	GLY	V1457	V1520	V1520
G507	G507	G507	A934	SER	TRP	L1074	G1135	W1199	W1199	ASP	L1204	PHE	Y1457	L1520	L1520
HB12	HB12	HB12	L935	ALA	ALA	R1076	S1136	G1200	G1200	PRO	H1201	THR	Y1457	L1520	L1520
E813	E813	E813	T931	VAL	VAL	A1077	G1136	H1201	H1201	ASP	C1201	GLY	H1457	L1520	L1520
L748	L748	L748	L932	GLN	GLN	E1077	L1134	L1202	L1202	THR	L1202	ALA	H1458	L1520	L1520
L748	L748	L748	L933	GLN	GLN	K1078	L1134	L1202	L1202	THR	L1202	ALA	H1458	L1520	L1520
D749	D749	D749	L933	ASP	ASP	K1079	G1135	L1204	L1204	THR	L1204	ALA	H1458	L1520	L1520
L750	L750	L750	A934	ILE	ILE	S1080	G1136	G1200	G1200	THR	L1204	LYS	H1458	L1520	L1520
S751	S751	S751	V939	PRO	PRO	Y1081	R1141	Q1206	Q1206	ARG	R1275	ALA	H1458	L1520	L1520
V752	V752	V752	G940	ALA	ALA	T1082	P1142	Q1206	Q1206	ARG	T1276	ALA	H1458	L1520	L1520
P817	P817	P817	M941	PRO	R1016	V1083	Q1144	D1207	D1207	ARG	W1277	GLY	H1458	L1520	L1520
P753	P753	P753	A942	ALA	ALA	Q1084	Q1144	D1207	D1207	ARG	W1277	GLY	H1458	L1520	L1520
S754	S754	S754	A942	Y1024	Y1024	S1085	S1146	S1210	S1210	GLY	W1277	GLY	H1458	L1520	L1520
S755	S755	S755	R820	R1025	R1025	G1086	G1146	L1211	L1211	GLY	S1279	GLY	H1458	L1520	L1520
S756	S756	S756	L821	L1026	L1026	W1087	G1146	R1212	R1212	TRP	Q1280	TRP	H1458	L1520	L1520
F757	F757	F757	R822	L1027	L1027	W1088	V1147	F1213	F1213	GLY	Q1280	GLY	H1458	L1520	L1520
R758	R758	R758	I887	D1028	D1028	Y1089	V1147	F1214	F1214	GLY	Q1280	GLY	H1458	L1520	L1520
G761	G761	G761	E888	GLU	GLU	E1091	C1151	A1215	A1215	THR	L1283	THR	H1458	L1520	L1520
C762	C762	C762	E888	F1090	F1090	E1091	M1152	E1285	E1285	GLY	V1284	GLY	H1458	L1520	L1520
P763	P763	P763	S825	ASN	ASN	F1092	I1153	E1285	E1285	GLY	V1284	GLY	H1458	L1520	L1520
V764	V764	V764	K827	LEU	LEU	A1094	D1154	L1287	L1287	LYS	F1288	LYS	H1458	L1520	L1520
V767	V767	V767	W891	LYS	LYS	V1095	L1155	L1287	L1287	LYS	F1288	LYS	H1458	L1520	L1520
F768	F768	F768	T892	THR	THR	T1097	L1155	L1287	L1287	LYS	F1288	LYS	H1458	L1520	L1520
E769	E769	E769	Y829	LYS	LYS	T1097	L1155	L1287	L1287	LYS	F1288	LYS	H1458	L1520	L1520
A770	A770	A770	R830	THR	THR	S1034	E1157	F1223	F1223	ALA	L1291	ALA	H1458	L1520	L1520
F771	F771	F771	R831	LYS	LYS	A1034	E1157	F1223	F1223	ALA	L1291	ALA	H1458	L1520	L1520
N772	N772	N772	E832	LEU	LEU	M1035	M1158	P1225	P1225	LYS	S1292	LYS	H1458	L1520	L1520
L773	L773	L773	P833	PRO	PRO	E1099	M1158	P1225	P1225	LYS	S1292	LYS	H1458	L1520	L1520
D774	D774	D774	P834	THR	THR	M100	F1162	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
G775	G775	G775	Y896	LYS	LYS	R101	T1163	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L776	L776	L776	R897	THR	THR	V102	L1164	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
F777	F777	F777	D898	GLU	GLU	G103	G1166	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
F778	F778	F778	D899	LEU	LEU	W104	E1167	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
V780	V780	V780	N900	GLU	GLU	A105	V1168	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
W781	W781	W781	K901	GLU	GLU	R106	L1169	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
S782	S782	S782	S843	GLU	GLU	P107	ME1	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
F783	F783	F783	R844	THR	THR	E108	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
S784	S784	S784	R844	HIS	HIS	R110	ASP	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
G786	G786	G786	C845	THR	THR	P111	GLY	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
W787	W787	W787	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
V787	V787	V787	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
K788	K788	K788	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
V789	V789	V789	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
F791	F791	F791	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L792	L792	L792	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L793	L793	L793	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L794	L794	L794	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
G794	G794	G794	R845	LEU	LEU	P111	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
V859	V859	V859	P837	GLY	GLY	Y859	F1163	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
Q860	Q860	Q860	H838	GLY	GLY	M960	L1164	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
I861	I861	I861	L839	GLY	GLY	G961	G1166	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
V862	V862	V862	V840	GLY	GLY	H961	E1167	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L863	L863	L863	G841	GLY	GLY	S962	V1168	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
P864	P864	P864	P842	GLY	GLY	K901	L1169	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
P865	P865	P865	S843	GLY	GLY	S963	ME1	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
H866	H866	H866	R844	GLY	GLY	G964	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L867	L867	L867	R844	GLY	GLY	S964	ASP	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
P805	P805	P805	C845	GLY	GLY	K965	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
E868	E868	E868	R844	GLY	GLY	S966	GLY	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
R869	R869	R869	C845	GLY	GLY	P967	GLY	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
I870	I870	I870	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L871	L871	L871	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
E872	E872	E872	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
K873	K873	K873	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
H879	H879	H879	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
E880	E880	E880	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
A883	A883	A883	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
L884	L884	L884	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
T885	T885	T885	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
R886	R886	R886	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
I887	I887	I887	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
E888	E888	E888	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
Q889	Q889	Q889	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
G890	G890	G890	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
W891	W891	W891	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
T892	T892	T892	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
Y829	Y829	Y829	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
R830	R830	R830	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
R831	R831	R831	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
E832	E832	E832	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
G833	G833	G833	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
P834	P834	P834	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
P837	P837	P837	R845	GLY	GLY	P967	SER	A1227	A1227	THR	V1295	THR	H1458	L1520	L1520
H838	H838	H838	R845	GLY	GLY	P967	SER	A1227							

A4129	A4130	PHE	GLN	GLU	P4135	A4136	A4137	D4138	F4141	N4142	V4143	V4144	V4145	L4146	L4147	L4148	N4149	L4150	S4151	E4152	H4153	V4154	P4155	H4156	D4157	P4158	R4159	L4160	L4161	N4162	F4163	L4164	S4169	L4170	L4171	E4172	V4173	F4174	R4175	F4176	L4177	L4178	L4181	E4182	L4183	N4184	G4185	S4187	R4188	R4189	T4190	E4191	R4192	L4193					
V4055	E4056	M4057	I4058	L4059	K4060	F4061	F4062	D4063	M4064	PHE	LEU	L4000	M4001	K4002	L4003	A4004	Q4005	S4007	S4008	Q4009	I4010	E4011	L4012	L4013	L4017	D4018	P4084	R4085	G4086	D4092	M4097	D4098	S4099	Q4100	LYS	Q4102	F4103	T4104	G4105	P4106	E4107	I4108	Q4109	F4110	L4111	L4112	A4117	D4118	E4119	N4120	N4124	F4125	E4126	E4127	F4128				
V3986	D3987	A3988	V3989	G3990	I3991	F3992	L3993	H3994	V3995	F3996	M4000	M4001	K4002	L4003	A4004	Q4005	S4007	S4008	Q4009	I4010	E4011	L4012	L4013	L4017	D4018	P4084	R4085	G4086	D4092	M4097	D4098	S4099	Q4100	LYS	Q4102	F4103	T4104	G4105	P4106	E4107	I4108	Q4109	F4110	L4111	L4112	A4117	D4118	E4119	N4120	N4124	F4125	E4126	E4127	F4128					
G3908	N3909	T3910	N3914	I3915	I3916	I3917	C3918	T3919	V3920	D3921	Y3922	L3923	L3924	R3925	L3926	Q3927	I3930	F3933	Y3934	W3935	Y3936	Y3937	S3938	D3941	E3944	K3953	S3956	V3957	A3958	K3959	Q3960	F3962	N3963	S3964	L3965	T3966	Y3968	I3969	Q3970	G3971	F3972	Q3977	L3980	A3981	H3982	S3983	R3984	L3985											
C3839	S3840	V3841	L3842	D3843	L3844	R3849	F3852	ALA	GLU	GLY	LEU	GLY	GLY	VAL	ASN	ASP	GLY	THR	VAL	ILE	ASN	ARG	GLN	ASN	GLY	GLU	VAL	ALA	D3877	D3878	F3879	F3880	T3881	Q3882	D3883	L3884	F3885	R3886	L3887	Q3888	Q3889	L3890	L3891	C3892	E3893	F3899	Q3900	N3901	Y3902	T3905	Q3906	T3907							
E3757	M3758	E3759	K3760	Q3761	R3762	L3763	L3764	Y3765	Q3766	Q3767	S3768	R3769	L3770	H3771	T3772	R3773	G3774	A3775	A3776	H3778	Y3779	L3780	Q3781	S3784	A3785	C3786	K3787	E3788	E3789	M3793	V3794	T3797	L3805	N3806	G3807	G3808	N3809	A3810	F3811	V3812	Q3813	Q3814	K3815	L3820	K3821	D3822	F3828	L3835	M3836	Q3837	T3838								
GLU	GLU	GLU	GLU	GLU	GLU	VAL	GLU	K3694	L3698	L3701	V3702	H3703	L3704	E3712	K3713	S3714	K3715	L3716	D3717	D3719	A3724	D3727	I3728	M3729	A3730	K3731	S3732	C3733	HIS	LEU	GLU	GLY	GLY	ASN	GLY	GLY	ALA	GLU	GLU	GLU	VAL	E3750	V3751	S3752	F3753	E3754	E3755	K3756											
LYS	SER	LYS	LYS	ALA	VAL	TRP	HIS	LYS	LEU	SER	LYS	GLN	ARG	ARG	ALA	VAL	VAL	VAL	ALA	CYS	PHE	VAL	MET	ALA	LEU	TYR	ARG	GLY	LEU	ASN	PRO	GLY	ARG	PRO	GLU	GLU	ASP	ALA	ASP	ASP	GLU	LYS	ILE	VAL	ARG	ARG	GLN	ASP	LEU	TYR	HIS	LEU	GLN	THR	GLU	GLY	GLN		
E3651	F3652	L3653	Q3654	Q3655	N3656	L3657	H3658	L3659	Q3660	G3661	K3662	P3667	S3668	L3669	R3670	W3671	MET	ALA	LEU	TYR	ARG	GLY	LEU	ASN	PRO	GLY	ARG	GLU	GLU	ASP	ALA	ASP	ASP	GLU	GLY	ILE	VAL	ARG	ARG	GLN	ASP	VAL	GLN	LEU	ILE	GLU	VAL	VAL	TYR	HIS	LEU	LEU	GLN	THR	GLU	HIS	PRO	TYR	
S9489	D9490	Q9491	GLU	ARG	T9494	K3495	K3496	K3497	D8501	R8502	Y3503	S3504	VAL	GLN	THR	SER	LEU	ILE	VAL	ALA	T3513	L3514	K3515	K3516	M3517	L3518	P3519	I3620	L3381	E3382	A3383	K3384	A3387	E3388	E3389	G3390	E3391	V3394	R3395	D3396	E3397	PHE	SER	VAL	LEU	C3402	R3403	D3404	L3405	Y3406	A3407	L3408	D3483	Y3409	L3411	L3412	I3413	R3414	R3415
V3417	D3418	N3419	N3420	A3421	H3422	W3423	L3424	THR	GLU	P3427	N3428	A3429	N3430	A3431	E3432	F3433	L3434	F3435	ARG	M3437	Y3438	W3445	K3447	S3448	H3449	N3450	E3455	N3457	N3465	F3469	L3470	THR	ALA	ASP	SER	LYS	SER	LEU	LYS	M3478	A3641	A3479	K3480	A3481	G3482	D3483	A3484	Q3485	S3486	G3487	G3488								
E3352	L3353	L3354	H3355	S3356	H3357	F3358	I3359	T3360	T3361	I3362	G3363	ARG	LEU	ARG	K3367	R3368	V3369	V3373	A3374	E3375	E3376	E3377	Q3378	L3379	R3380	N3381	E3382	A3383	K3384	A3387	E3388	E3389	G3390	E3391	V3394	R3395	D3396	E3397	PHE	SER	VAL	LEU	C3402	R3403	D3404	L3405	Y3406	A3407	L3408	D3483	Y3409	L3411	L3412	I3413	R3414	R3415			

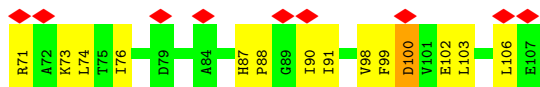




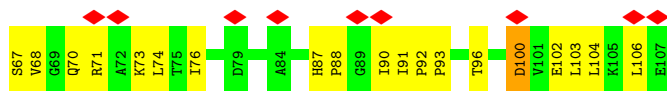
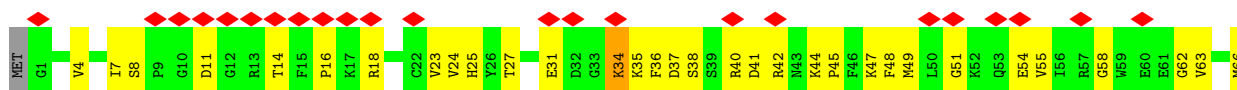
E2784	E2785	E2786	E2787	E2788	E2789	E2790	E2791	E2792	E2793	E2794	E2795	E2796	E2797	E2798	E2799	E2800	E2801	E2802	E2803	E2804	E2805	E2806	E2807	E2808	E2809	E2810	E2811	E2812	E2813	E2814	E2815	E2816	E2817	E2818	E2819	E2820	E2821	E2822	E2823	E2824	E2825	E2826	E2827	E2828	E2829	E2830	GLU	GLU	THR	GLU	LYS	LYS	THR	ARG	LYS	LYS	THR	ARG	LYS	LYS	ILE	SER	
L2904	L2905	V2906	P2907	Y2908	D2909	G2910	L2911	L2912	A2913	K2914	E2915	K2916	E2917	A2918	D2919	E2920	L2921	K2922	A2923	Q2924	E2925	L2926	L2927	K2928	E2929	L2930	Q2931	N2932	M2933	E2934	Y2935	A2936	V2937	T2938	E2939	G2940	LEU	LYS	ASP	MET	GLU	LEU	ASP	THR	ASP	SER	ILE	GLU	LYS	ARG	PHE	ALA	ALA	PHE	GLY	PHE	ASP	ASP	GLN	GLN	GLN	LEU	
L3024	L3025	G3026	S3027	G3028	Q3029	H3030	A3031	S3032	N3033	K3034	E3035	K3036	E3037	M3038	I3039	THR	SER	LEU	F3043	L3046	A3047	A3048	L3049	V3050	R3051	H3052	R3053	V3054	S3055	L3056	F3057	G3058	T3059	D3060	A3061	P3062	ALA	VAL	VAL	ASN	ASN	CYS	LEU	Y3016	F3017	L3018	S3019	A3072	T3020	A3022	K3023												
E3086	I3087	A3090	GLY	ARG	LEU	SER	F3095	F3096	E3097	S3098	A3099	I3103	E3104	K3105	M3106	V3107	E3108	N3109	L3110	R3111	L3112	G3113	L3114	V3115	S3116	ALA	ALA	ARG	THR	GLN	VAL	GLY	VAL	GLY	GLN	ASN	THR	THR	T3132	T3133	L3137	L3140	H3146	I3147	Q3151	F3152	GLY	ASP	ASP	VAL	ILE												
L3158	D3159	D3160	V3161	Q3162	V3163	S3164	C3165	Y3166	T3168	L3169	C3170	S3171	I3172	Y3173	S3174	L3175	G3176	T3177	L3178	LYS	ASN	THR	TYR	V3183	E3184	K3185	L3186	R3187	P3188	A3189	L3190	L3194	A3195	A3198	A3199	A3200	PRO	PRO	VAL	A3204	F3205	L3206	E3207	P3208	Q3209	L3210	A3215	C3216	S2217	VAL	TYR	THR	THR	THR	LYS	SER							
PRO	ARG	GLU	ARG	ALA	ILE	LEU	GLY	LEU	PRO	ASN	SER	PRO	VAL	GLU	MET	CYS	ASP	ILE	PRO	VAL	LEU	ASP	ARG	LEU	LEU	ALA	GLU	SER	GLY	ALA	ARG	TYR	THR	GLU	MET	HIS	VAL	ILE	ILE	T3273	L3274	F3275	M3276	L3277	C3278	S3279	Y3280	L3281	P3282	R3283													
W3284	W3285	E3286	R3287	P3288	G3289	E3290	ALA	PRO	PRO	PRO	P3294	A3295	L3296	P3297	A3298	G3299	A3300	P3301	P3302	P3303	C3304	T3305	A3306	V3307	T3308	S3309	D3310	H3311	L3312	N3313	SER	LEU	LEU	G3317	N3318	L3319	L3320	R3321	I3322	I3323	V3324	N3325	N3326	L3327	E3331	A3332	T3333	W3334	R3337	L3338	A3339	VAL	PHE	ALA	ALA	GLN	PRO	PRO	ILE	W3346			
S3347	R3348	A3349	R3350	P3351	E3352	L3353	L3354	H3355	S3356	H3357	F3358	I3359	P3360	T3361	I3362	G3363	ARG	LEU	ARG	K3367	R3368	A3369	G3370	K3371	V3372	V3373	A3374	E3375	E3376	E3377	Q3378	L3379	R3380	L3381	E3382	A3383	A3387	E3388	E3389	G3390	E3391	V3394	R3395	D3396	E3397	PHE	SER	VAL	LEU	VAL	C3402	R3403	D3404	L3405	Y3406	A3407	L3408	Y3409					
P3410	L3411	L3412	I3413	R3414	Y3415	V3416	D3417	N3418	N3419	R3420	A3421	H3422	W3423	L3424	THR	GLU	P3427	N3428	A3429	N3430	R3431	E3432	E3433	L3434	F3435	ARG	M3437	V3438	G3439	E3440	I3441	F3442	W3445	S3446	K3447	S3448	H3449	N3450	E3455	GLN	N3457	S3468	F3469	L3470	THR	ALA	ASP	SER	LYS	LYS	LYS	N3478	A3479	K3480	A3481	G3482							
D3483	A3484	Q3485	S3486	G3487	G3488	S3489	D3490	Q3491	GLU	ARG	T3494	K3495	K3496	K3497	D3501	R3502	Y3503	S3504	VAL	GLN	THR	SER	LEU	ILE	VAL	ALA	T3513	L3514	K3515	K3516	M3517	L3518	P3519	I3520	G3521	L3522	N3523	M3524	C3525	A3526	P3527	THR	ASP	GLN	ASP	LEU	ILE	VAL	ARG	ARG	VAL	GLN	MET	GLU	LEU	VAL	ALA	SER	ALA	VAL	VAL	TYR	HIS
V3549	R3550	E3551	G3552	L3553	Q3554	R3555	N3556	L3557	H3558	L3559	Q3560	K3561	V3562	V3563	E3564	P3567	S3568	L3569	R3570	W3571	K3572	MET	ALA	LEU	LEU	TYR	ARG	GLY	LEU	PRO	GLY	ARG	GLU	GLU	ASP	ASP	ASP	PRO	GLU	LYS	ILE	VAL	VAL	ARG	ARG	VAL	GLN	VAL	GLN	VAL	GLN	VAL	VAL	VAL	TYR	HIS							



- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A



- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	30000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.243	Depositor
Minimum map value	-0.085	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.075	Depositor
Map size (\AA)	482.40002, 482.40002, 482.40002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.34, 1.34, 1.34	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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	1.21	41/27312 (0.2%)	1.12	151/37004 (0.4%)
1	C	1.20	39/27312 (0.1%)	1.12	154/37004 (0.4%)
1	E	1.21	35/27312 (0.1%)	1.12	158/37004 (0.4%)
1	G	1.21	38/27312 (0.1%)	1.11	145/37004 (0.4%)
2	B	0.91	1/851 (0.1%)	0.93	2/1146 (0.2%)
2	D	0.91	1/851 (0.1%)	0.92	2/1146 (0.2%)
2	F	0.91	1/851 (0.1%)	0.92	2/1146 (0.2%)
2	H	0.93	1/851 (0.1%)	0.90	0/1146
All	All	1.20	157/112652 (0.1%)	1.11	614/152600 (0.4%)

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	36
1	C	0	35
1	E	0	36
1	G	0	34
All	All	0	141

The worst 5 of 157 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	G	80	GLU	CG-CD	11.12	1.68	1.51
1	G	3661	TRP	CB-CG	10.06	1.68	1.50
1	A	3661	TRP	CB-CG	9.81	1.68	1.50
1	G	1976	ARG	NE-CZ	9.78	1.45	1.33
1	A	741	GLU	CG-CD	9.74	1.66	1.51

The worst 5 of 614 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	G	80	GLU	OE1-CD-OE2	-10.92	110.20	123.30
1	A	1212	ARG	NE-CZ-NH1	10.39	125.49	120.30
1	G	4796	MET	CG-SD-CE	10.33	116.73	100.20
1	G	1976	ARG	CD-NE-CZ	10.23	137.93	123.60
1	C	1212	ARG	NE-CZ-NH1	10.17	125.39	120.30

There are no chirality outliers.

5 of 141 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	31	GLU	Mainchain,Peptide
1	A	329	ARG	Mainchain,Peptide
1	A	734	GLY	Peptide
1	A	841	GLY	Mainchain,Peptide
1	A	894	GLY	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	26843	0	24428	1190	0
1	C	26843	0	24428	1200	0
1	E	26843	0	24428	1194	0
1	G	26843	0	24427	1209	0
2	B	832	0	831	58	0
2	D	832	0	831	54	0
2	F	832	0	831	58	0
2	H	832	0	831	58	0
3	A	1	0	0	0	0
3	C	1	0	0	0	0
3	E	1	0	0	0	0
3	G	1	0	0	0	0
All	All	110704	0	101035	4733	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 22.

The worst 5 of 4733 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4880:MET:HA	1:G:4578:LEU:HD11	1.26	1.17
1:A:4578:LEU:HD11	1:C:4880:MET:HA	1.18	1.17
1:E:4578:LEU:HD11	1:G:4880:MET:HA	1.25	1.16
1:C:4578:LEU:HD11	1:E:4880:MET:HA	1.17	1.10
1:A:4822:THR:HG22	1:C:4839:MET:SD	1.93	1.08

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	3483/5037 (69%)	3132 (90%)	258 (7%)	93 (3%)	5	31
1	C	3483/5037 (69%)	3133 (90%)	254 (7%)	96 (3%)	5	30
1	E	3483/5037 (69%)	3134 (90%)	255 (7%)	94 (3%)	5	31
1	G	3483/5037 (69%)	3137 (90%)	252 (7%)	94 (3%)	5	31
2	B	105/108 (97%)	95 (90%)	9 (9%)	1 (1%)	15	54
2	D	105/108 (97%)	95 (90%)	9 (9%)	1 (1%)	15	54
2	F	105/108 (97%)	96 (91%)	8 (8%)	1 (1%)	15	54
2	H	105/108 (97%)	97 (92%)	8 (8%)	0	100	100
All	All	14352/20580 (70%)	12919 (90%)	1053 (7%)	380 (3%)	8	31

5 of 380 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	806	PRO
1	A	900	ASN
1	A	914	PRO

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Mol	Chain	Res	Type
1	A	916	PRO
1	A	971	ASP

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	2502/4276 (58%)	2472 (99%)	30 (1%)	71 83
1	C	2504/4276 (59%)	2476 (99%)	28 (1%)	73 84
1	E	2501/4276 (58%)	2472 (99%)	29 (1%)	71 83
1	G	2501/4276 (58%)	2474 (99%)	27 (1%)	73 84
2	B	89/90 (99%)	88 (99%)	1 (1%)	73 84
2	D	89/90 (99%)	88 (99%)	1 (1%)	73 84
2	F	89/90 (99%)	88 (99%)	1 (1%)	73 84
2	H	89/90 (99%)	88 (99%)	1 (1%)	73 84
All	All	10364/17464 (59%)	10246 (99%)	118 (1%)	74 84

5 of 118 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	4207	MET
1	G	2555	CYS
1	E	1211	LEU
1	G	2518	LEU
1	G	978	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 155 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	4947	GLN
1	G	3809	ASN
1	G	224	HIS

Continued on next page...

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Mol	Chain	Res	Type
1	G	1130	GLN
1	G	4728	HIS

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](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

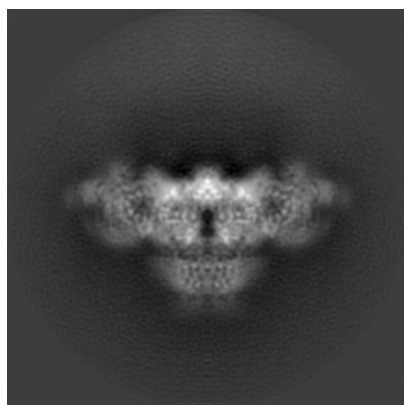
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9521. These allow visual inspection of the internal detail of the map and identification of artifacts.

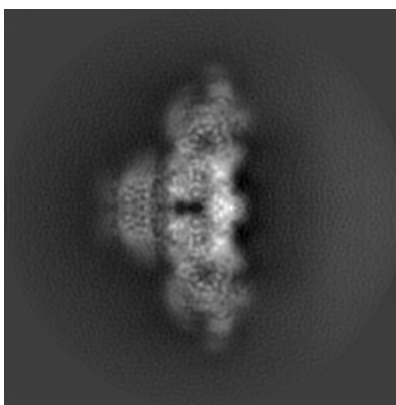
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

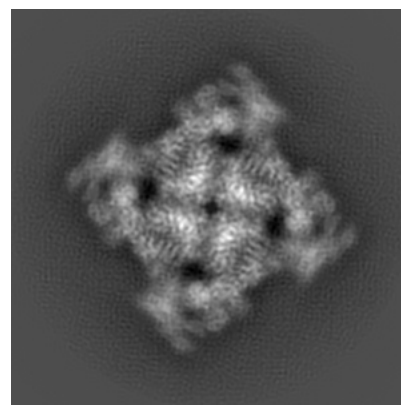
6.1.1 Primary map



X



Y

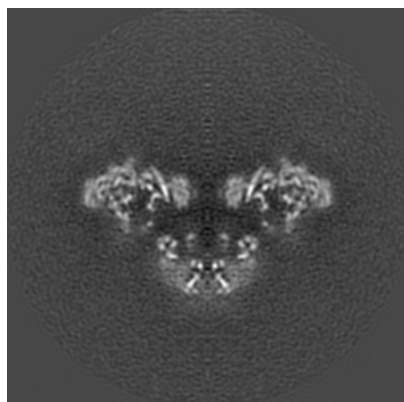


Z

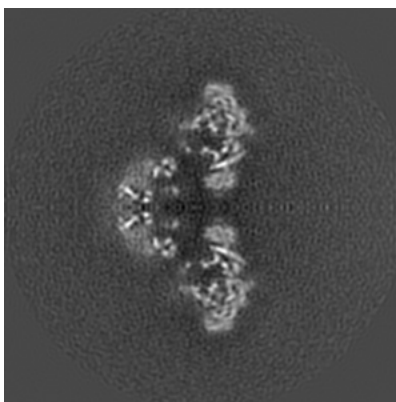
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

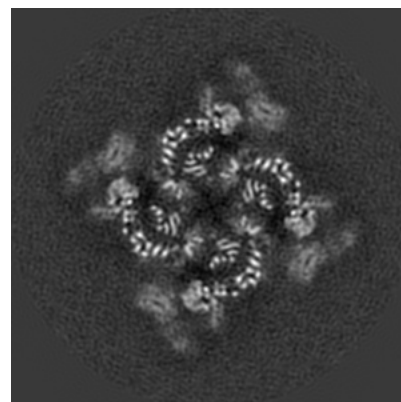
6.2.1 Primary map



X Index: 180



Y Index: 180

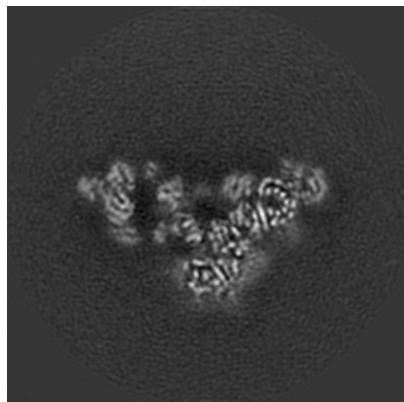


Z Index: 180

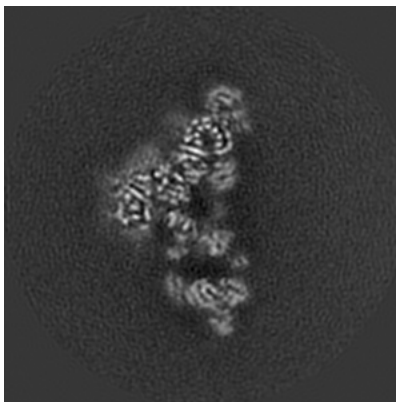
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [\(i\)](#)

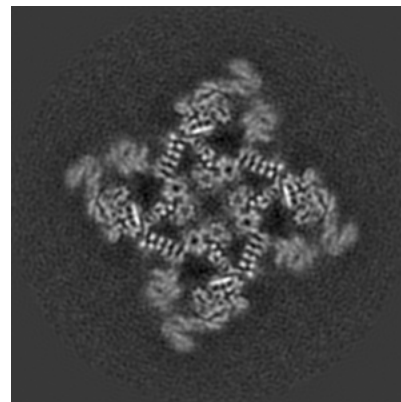
6.3.1 Primary map



X Index: 169



Y Index: 191

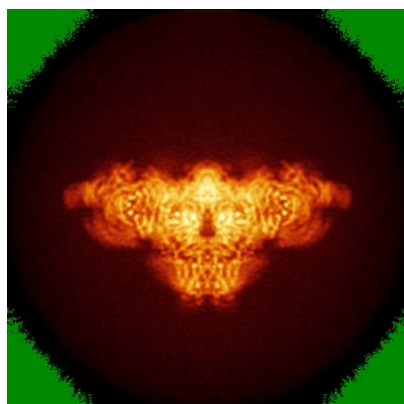


Z Index: 190

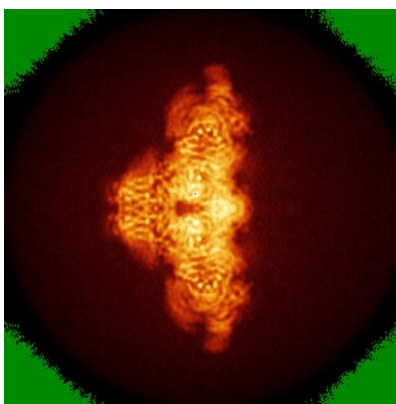
The images above show the largest variance slices of the map in three orthogonal directions.

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

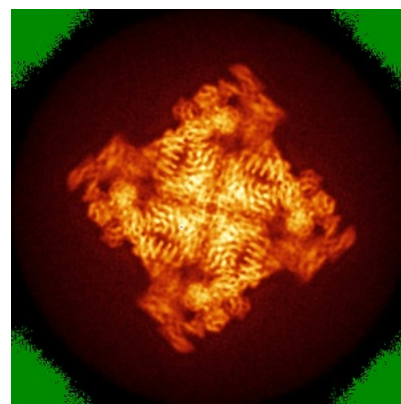
6.4.1 Primary map



X



Y

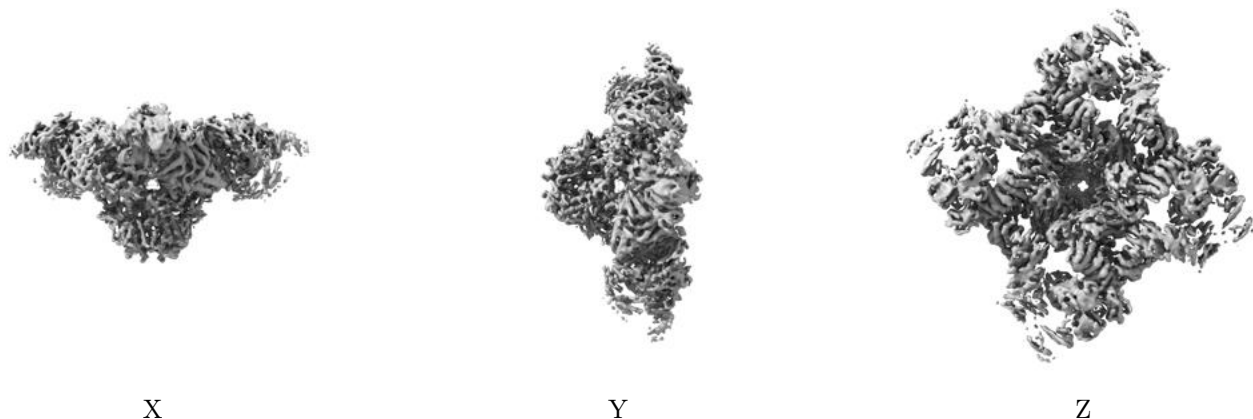


Z

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 0.075. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

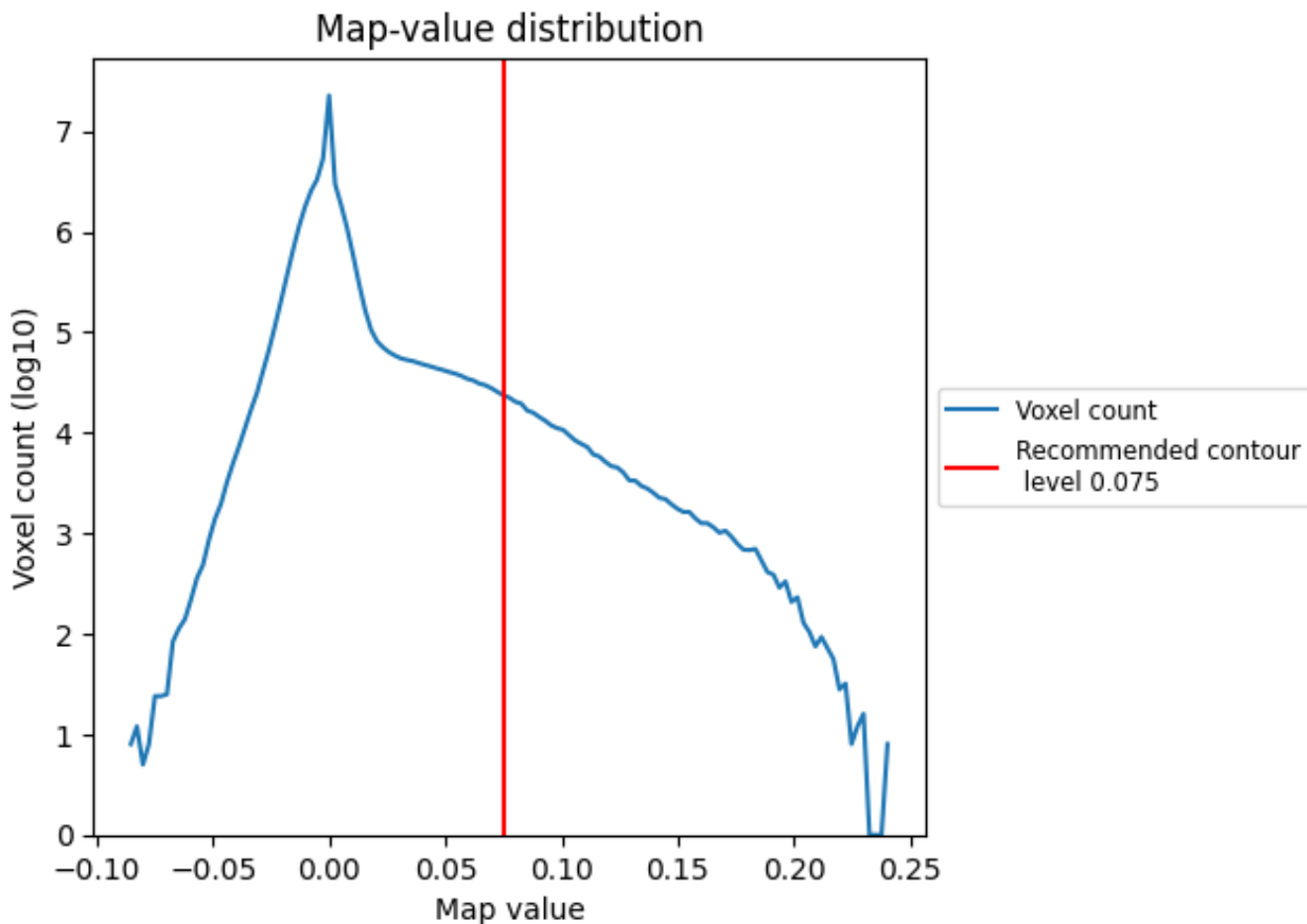
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

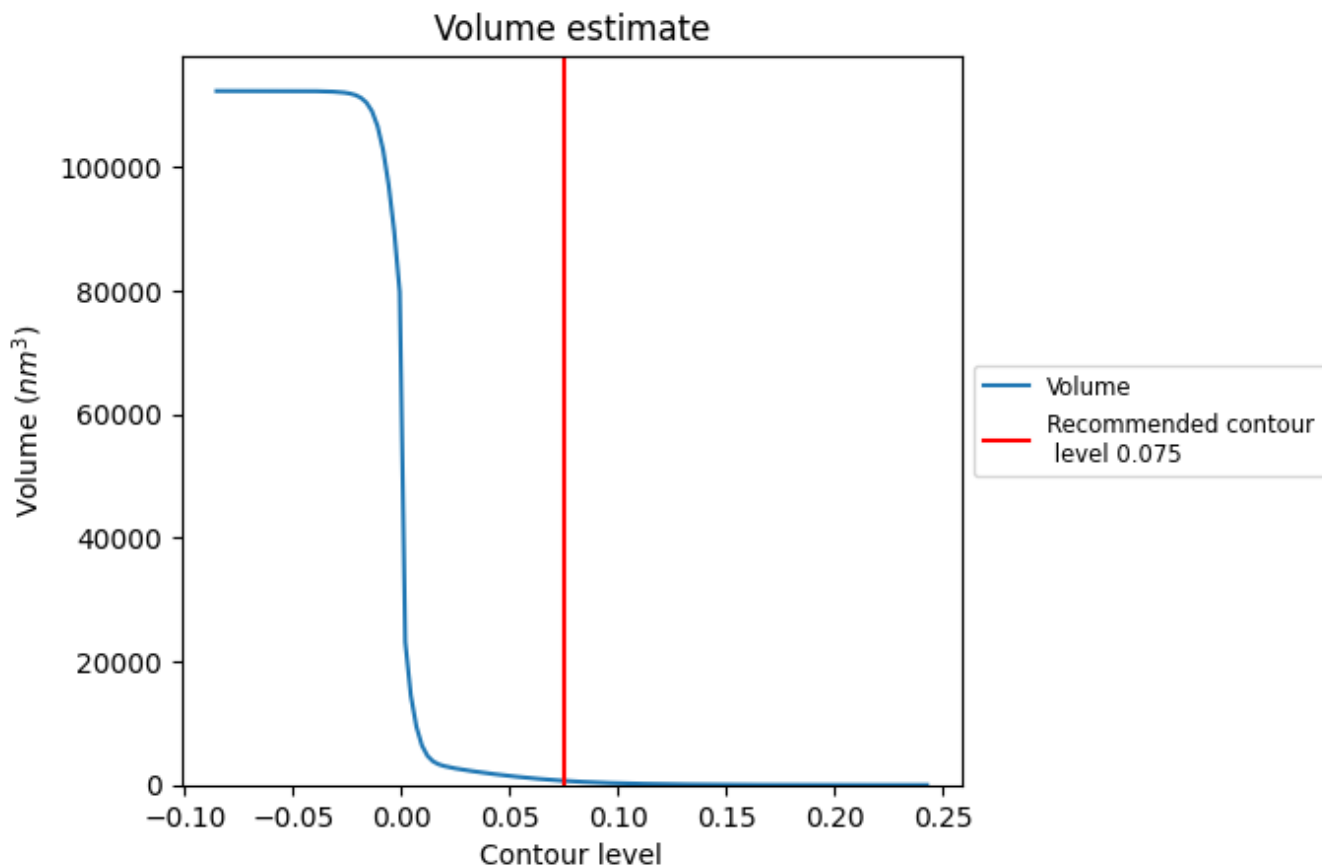
This section contains the results of statistical analysis of the map.

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.

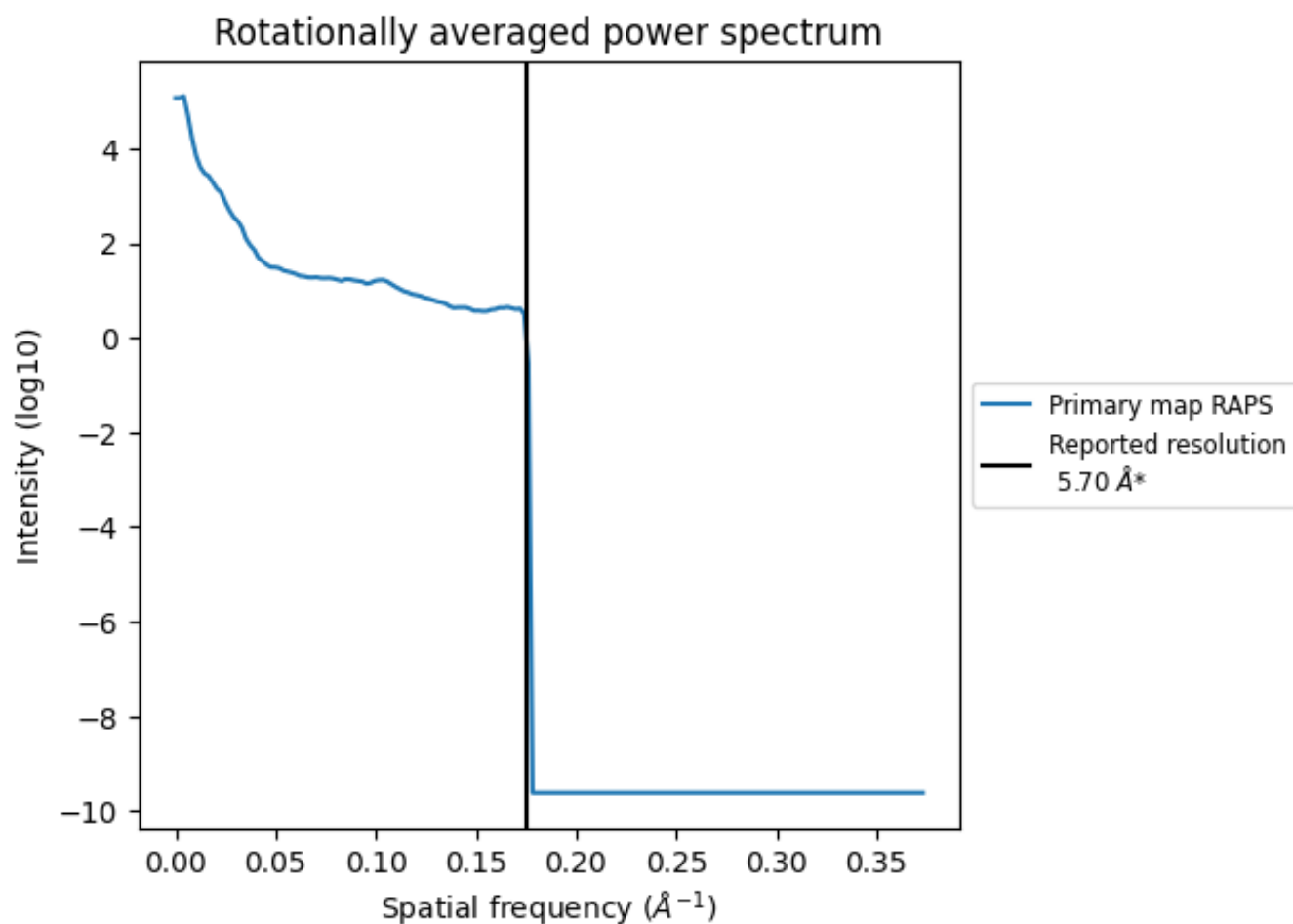
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 679 nm³; this corresponds to an approximate mass of 613 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 0.175 Å⁻¹

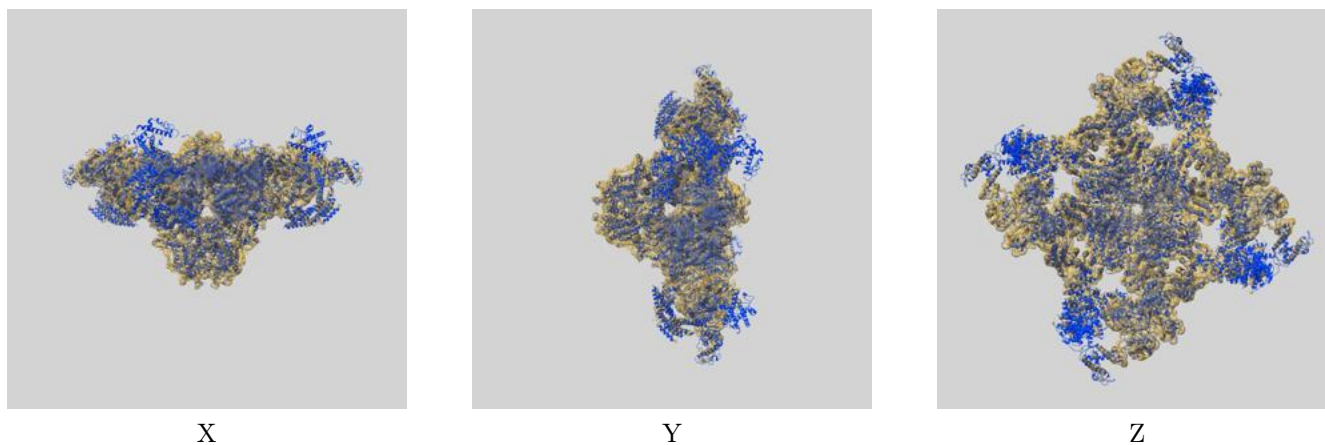
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

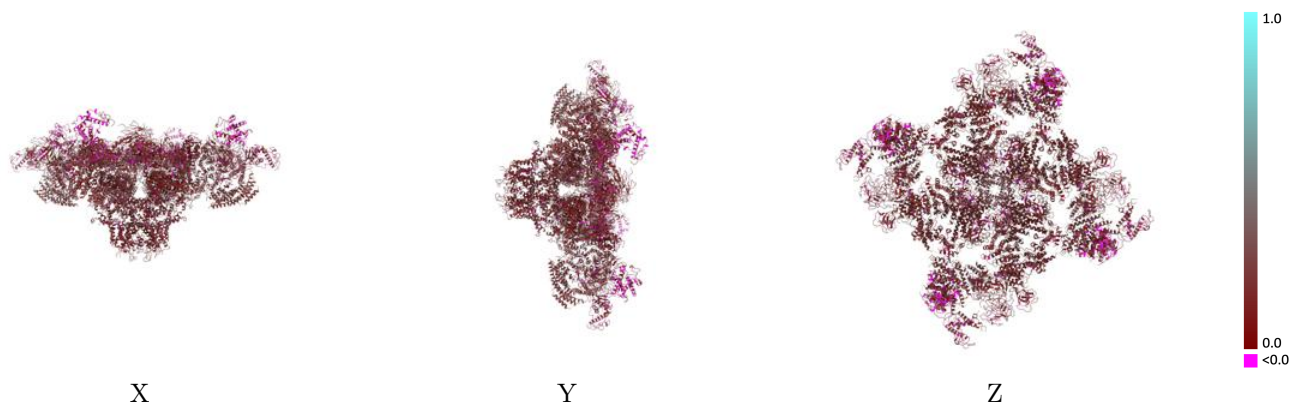
This section contains information regarding the fit between EMDB map EMD-9521 and PDB model 5GL1. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay [i](#)



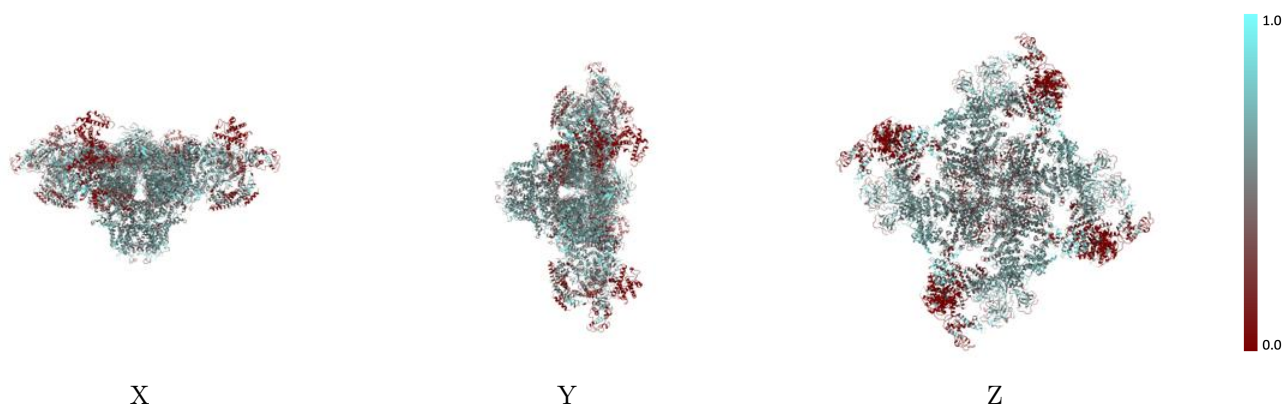
The images above show the 3D surface view of the map at the recommended contour level 0.075 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



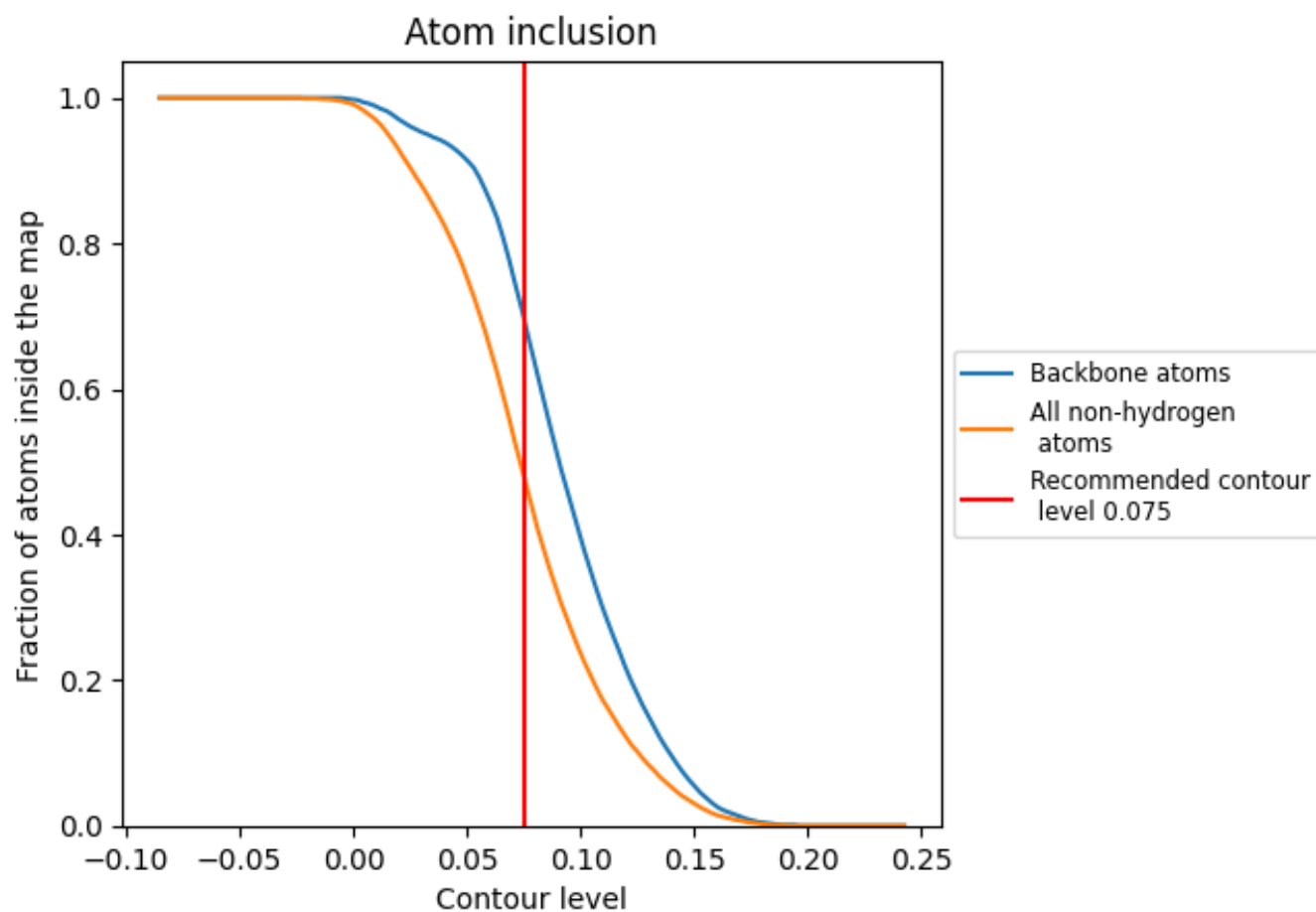
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.075).

9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 48% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.075) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4830	0.2010
A	0.4820	0.2020
B	0.4990	0.2060
C	0.4820	0.2010
D	0.4990	0.2080
E	0.4820	0.2010
F	0.5000	0.2050
G	0.4820	0.2010
H	0.4970	0.2040

