



wwPDB EM Validation Summary Report ⓘ

Nov 29, 2022 – 04:49 PM EST

PDB ID : 8DGF
EMDB ID : EMD-27422
Title : Avs4 bound to phage PhiV-1 portal
Authors : Wilkinson, M.E.; Gao, L.; Strecker, J.; Makarova, K.S.; Macrae, R.K.; Koonin, E.V.; Zhang, F.
Deposited on : 2022-06-23
Resolution : 2.90 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

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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.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

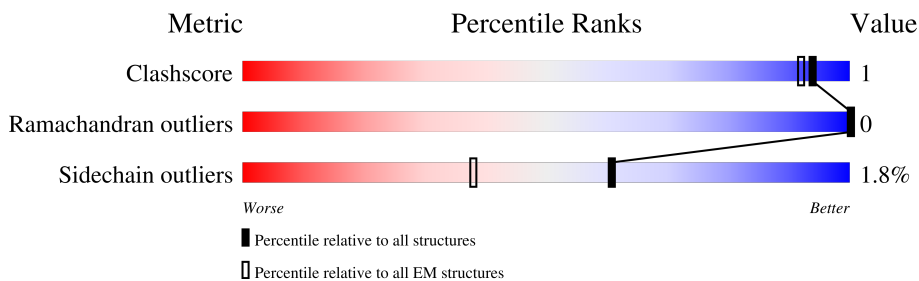
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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	1587	66% 93% ..
1	B	1587	69% 92%
1	C	1587	66% 94% ..
1	D	1587	69% 93%
2	E	535	82% 76% 5% . 18%
2	F	535	82% 73% 8% 18%
2	G	535	82% 79% . 18%
2	H	535	82% 74% 7% . 18%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 64958 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 ATP-binding protein Avs4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1541	12805	8291	2104	2370	40	0	0
1	B	1534	12756	8265	2094	2358	39	0	0
1	C	1541	12805	8291	2104	2370	40	0	0
1	D	1534	12756	8265	2094	2358	39	0	0

- Molecule 2 is a protein called Portal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	438	3427	2165	565	678	19	0	0
2	F	438	3427	2165	565	678	19	0	0
2	G	438	3427	2165	565	678	19	0	0
2	H	438	3427	2165	565	678	19	0	0

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



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

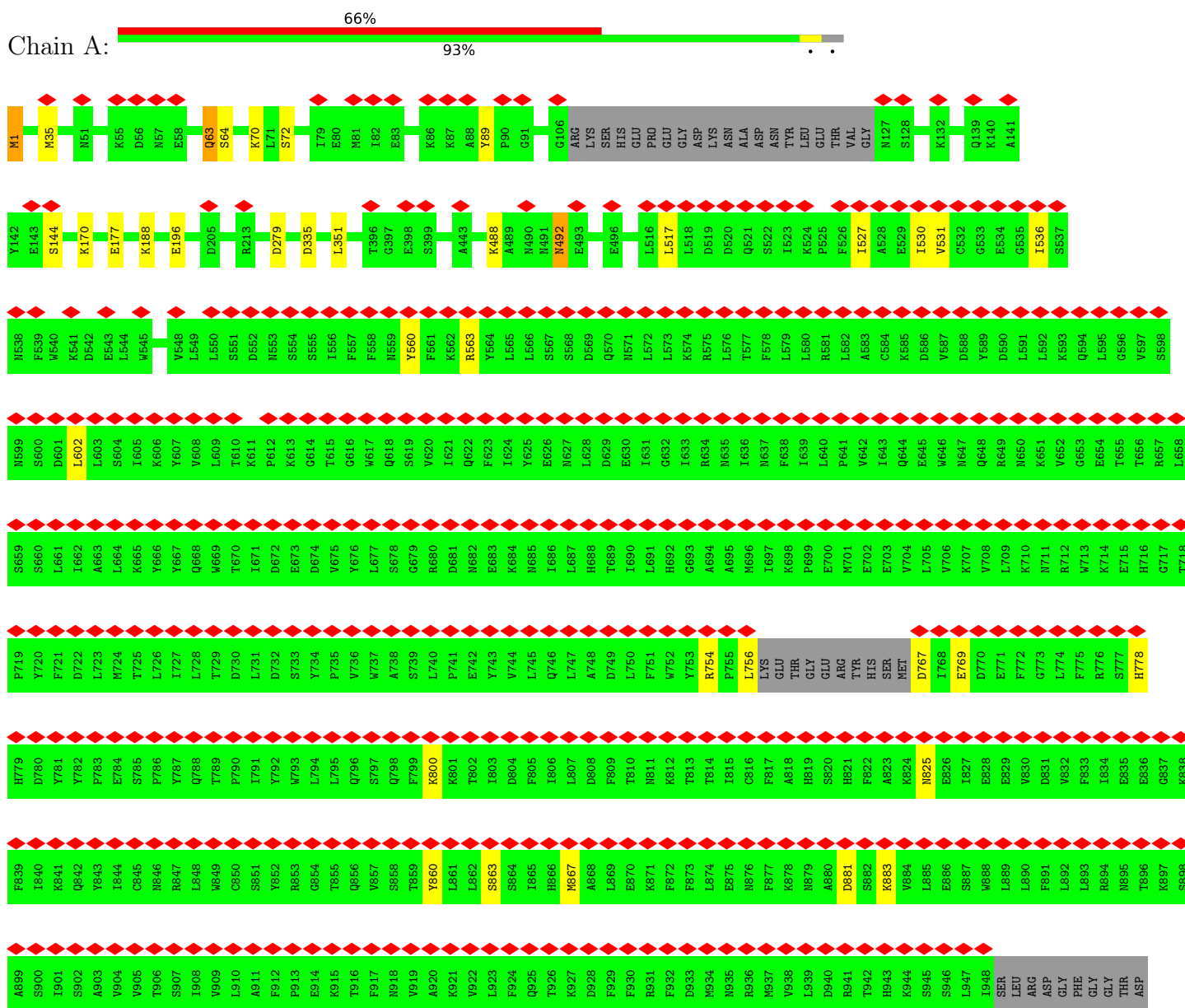
- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
4	A	1	Total	Mg	0
			1	1	
4	B	1	Total	Mg	0
			1	1	
4	C	1	Total	Mg	0
			1	1	
4	D	1	Total	Mg	0
			1	1	

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.

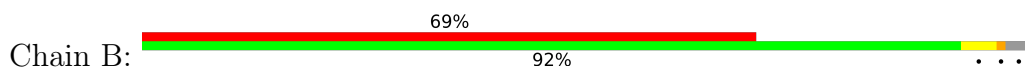
- Molecule 1: ATP-binding protein Avs4



TYR	ARG	L1019	P1020	S1079	M1139	Y1199	L1269	D1319	T1379	C1439	K1499
R961	S962	P1021	D1021	E1080	I1140	H1200	K1260	L1320	L1380	K1440	S1500
L963	L964	E1022	A1023	H1081	P1141	M1201	P1261	H1321	H1381	D1441	L1501
E965	E966	Q1024	M1082	M1082	A1142	Y1202	K1262	I1322	A1382	G1442	M1502
E967	R968	Q1025	K1083	M1082	A1143	P1203	K1263	L1323	P1383	D1443	M1503
		T1026	Y1084	Y1084	V1144	M1204	V1264	M1324	V1384	R1444	I1504
		E1027	V1085	V1085	C1145	E1205	I1265	T1325	S1385	Y1445	A1505
		A1028	T1086	T1086	S1146	R1206	L1266	A1326	D1386	V1446	S1506
		D1029	E1027	E1027	V1147	E1207	S1267	F1327	I1387	Y1447	C1507
		K1030	K1088	K1088	L1148	T1208	R1268	Q1328	P1388	V1448	Y1508
		A970	L1089	L1089	L1149	I1209	R1269	L1329	D1389	D1449	L1509
		A971	W1090	W1090	L1150	K1210	I1270	I1330	Y1390	K1450	M1510
		C972	A1091	A1091	D1151	T1211	I1271	P1331	I1391	I1451	Q1511
		D973	S1092	S1092	Y1152	I1212	H1272	D1332	K1392	I1452	G1512
		D974	Y1093	Y1093	F1153	L1213	E1273	D1333	P1393	K1453	I1513
		V975	K1094	K1094	M1154	L1214	S1274	T1334	F1394	S1454	T1514
		H976	Q1095	Q1095	M1154	L1215	R1275	V1335	L1395	Y1455	W1515
		R977	E1096	E1096	L1156	T1216	Y1276	M1336	D1396	Y1456	L1516
		R978	K1097	K1097	M1157	L1217	Q1277	I1337	G1397	F1457	S1517
		T979	R1038	D1098	M1158	F1218	VAL	E1338	F1398	A1458	E1518
		R980	M1039	E1099	M1158	M1219	ASP	H1339	M1399	E1459	I1519
		L981	D1040	R1100	E1160	D1220	TVR	K1340	G1400	S1460	L1520
		E982	R1041	Y1101	R1161	H1221	ASP	K1341	S1401	P1461	S1521
		L984	K1042	K1102	E1162	I1222	I1282	L1342	E1402	V1462	V1522
		A985	K1043	M1103	Y1163	I1223	K1283	V1343	P1403	K1463	M1523
		L986	M1044	Y1104	C1164	G1224	K1284	I1344	I1404	E1464	K1524
		H987	K1045	G1105	K1165	M1225	I1285	L1345	S1405	N1465	K1525
		R988	I1046	M1106	D1166	A1226	I1287	I1346	E1406	S1466	L1526
		T990	T1047	Y1107	I1167	G1227	M1288	V1347	L1407	N1467	W1527
		F991	T1048	E1108	V1168	G1228	K1289	K1348	F1408	G1468	E1528
		R992	K1049	D1109	L1169	R1229	V1290	R1349	K1409	K1469	K1529
		S993	M1110	M1110	A1170	Y1230	F1291	F1350	K1410	H1470	K1530
		E994	K1051	Q1111	Y1171	S1231	L1292	S1351	F1411	T1471	L1531
		R996	E1052	Q1112	S1172	F1232	M1293	T1352	I1412	F1472	E1532
		T997	E1053	I1113	K1173	F1233	M1294	S1353	L1413	K1473	M1533
		E998	G1054	A1114	L1174	P1234	Y1295	L1354	V1414	D1474	D1534
		D1000	I1055	A1115	P1175	S1235	K1296	L1355	E1415	S1475	T1535
		A1001	I1056	Q1116	L1176	M1236	H1297	L1356	D1416	N1476	V1536
		I1002	I1057	E1117	K1177	V1237	C1298	S1357	R1417	S1477	Y1537
		E1003	S1058	T1118	E1178	I1238	I1299	V1358	L1418	Q1478	Y1538
		R1004	F1059	K1119	E1179	H1239	I1299	R1359	M1419	F1479	L1539
		Q1005	M1060	K1119	G1179	H1239	S1300	E1360	T1420	F1480	E1540
		Q1006	A1061	I1121	M1181	L1241	M1301	D1361	Y1421	C1481	C1541
		V1007	P1061	I1122	Y1182	W1242	V1302	R1362	A1422	D1482	L1542
		L1008	E1062	K1123	Q1183	L1243	D1304	V1363	K1423	V1483	R1543
		W1009	D1064	K1124	V1184	D1244	M1305	F1364	F1424	S1484	Y1544
		D1010	P1065	L1125	Q1185	Y1245	K1306	Y1365	W1425	R1485	I1545
		F1012	M1066	M1126	Q1186	F1246	I1307	A1366	K1426	T1486	M1546
		D1013	K1067	M1126	D1187	D1247	S1308	L1367	Y1427	M1487	M1549
		K1014	L1068	E1127	G1188	D1248	I1309	R1368	W1428	H1488	E1550
		Y1015	Q1069	G1129	T1189	M1249	D1310	Q1369	D1429	H1489	R1551
		Y1016	Y1070	G1130	T1190	Q1250	D1311	S1370	L1430	C1490	E1552
		M1017	S1071	E1131	A1191	S1251	D1311	F1371	F1431	P1491	E1553
		K1077	E1072	E1132	T1192	L1252	G1313	L1372	F1432	S1492	I1554
			E1073	F1133	S1193	L1253	S1314	E1373	D1433	T1493	R1555
			A1074	R1134	A1194	F1254	M1315	R1374	K1434	L1494	E1563
			I1075	L1135	L1195	G1255	K1316	F1375	V1435	Y1495	V1564
			K1076	L1136	P1196	F1256	D1317	A1376	V1436	S1496	L1565
			M1077	M1137	V1197	L1257	V1318	Y1377	T1437	L1497	
			N1078	G1138	I1198	I1258	F1378	F1378	L1438	A1498	

D1569	F1570	L1571	V1572	E1573	K1574	G1575	S1576	V1577	G1578	Y1580	M1581	S1582	N1585	I1586	L1587
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• Molecule 1: ATP-binding protein Avs4



FME	V2	K3	M4	Q45	S46	K55	D56	N57	E58	Q63	S64	K65	D68	T69	K70	L71	S72	K75	A76	D77	L78	I79	E80	M81	K86	K87	A88	Y89	P90	W103	GLY	GLN	GLY	ARG	LYS	ARG	SER	HIS	HIS	GLU	PRO	GLU	GLU	ASP	ASP	LYS	ASN	ALA	ASP	ASN	ASN	TVR	LEU	GLU	THR	VAL
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GLY	ASN	SER	ASN	D130	P131	K132	I133	K134	I135	E136	V137	D138	Q139	K140	A141	Y142	E143	S144	G145	I146	H171	N176	D205	R213	H214	L219	H220	E221	N222	L223	V224	Q225	K226	K227	I228	E234	K244	E248	Q252	Y253	D287	E288	L289	R290	K291	L302	E303																																																																							
D308	K311	K321	W322	M331	Y332	L333	A334	D335	V346	L336	M337	Y338	A339	F340	I341	D342	I343	Y344	K345	I346	T347	E357	E363	D366	T396	G397	E398	M492	E500	R515	L516	L517	L518	D519	D520	Q521	S522	I523	P524	P525	F526	I527	A528	E529	I530	C532	G533	E534	G535																																																																					
I536	S537	N538	F539	W540	K541	D542	E543	L544	W545	V546	A547	V548	L549	L550	S551	D552	N553	S554	S555	I556	F557	F558	N559	Y560	F561	R562	Y564	L565	L566	S567	S568	D569	Q570	N571	L572	L573	K574	R575	L576	T577	F578	L579	L580	R581	L582	A583	C584	K585	D586	V587	D588	Y589	D590	L591	L592	K593	Q594	L595																																																												
G596	V597	S598	N599	D600	L602	L603	L604	I605	K606	V607	V608	L609	T610	K611	P612	N613	G614	T615	G616	W617	Q618	S619	V620	I621	Q622	F623	I624	Y625	E626	N627	L628	D629	E630	I631	G632	G633	R634	N635	I636	N637	F638	I639	L640	P641	V642	I643	Q644	E645	W646	N647	Q648	D649	M650	K651	L652	G653	E654	T655																																																												
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GLY	THR	ASP	TYR	ARG	N961	S962	L963	H964	E965	E966	D967	R968	I969	K970	A971	D972	D973	V974	V975	H976	R977	N978	T979	Y980	L981	E982	N983	L984	A985	L986	H987	Q988	I989	F991	R992	S993	E994	N995	V996	T997	E998	K999	D1000	A1001	I1002	E1003	R1004	Q1005	Q1006	S946	L947	I948	SER	LEU	ARG	ASP	GLY	PHE	GLY	I1015																																																										
Y1016	N1017	Q1018	L1019	P1020	D1021	E1022	A1023	Q1024	E1025	T1026	E1027	L1028	D1029	K1030	T1031	M1032	R1033	L1034	C1035	L1036	A1037	R1038	M1039	D1040	R1041	R1042	K1043	M1044	K1045	I1046	T1047	T1048	K1049	E1050	K1051	D1052	E1053	G1054	I1055	E1056	I1057	S1058	F1059	M1060	P1061	E1062	I1063	D1064	K1065	K1066	L1067	Q1068	Q1069	D1010	Y1070	F1012	S1071	E1072	K1014	A1074	I1075																																																									
K1076	K1077	N1078	S1079	E1080	H1081	M1082	K1083	Y1084	V1085	T1086	L1087	K1088	L1089	W1090	A1091	S1092	Y1093	K1094	R1095	E1096	K1097	D1098	E1099	R1100	Y1101	K1102	N1103	Y1104	G1105	M1106	Y1107	E1108	D1109	N1110	P1111	Q1112	I1113	A1114	L1115	Q1116	E1117	T1118	K1119	E1120	I1121	I1122	K1123	K1124	L1125	N1126	E1127	E1128	G1129	G1130	E1131	D1132	E1073	K1014	A1074	I1075																																																										
L1136	M1137	G1138	N1139	I1140	P1141	A1142	D1143	V1144	C1145	S1146	V1147	L1148	L1149	L1150	D1151	Y1152	F1153	M1154	Q1155	L1156	N1157	M1158	E1159	R1160	R1161	E1162	Y1163	C1164	K1165	D1166	I1167	E1168	L1169	A1170	Y1171	K1172	L1173	L1174	P1175	L1176	K1177	E1178	G1179	Y1180	N1181	Y1182	Q1183	V1184	O1185	D1186	G1187	T1188	T1189	S1190	A1191	I1192	S1193	A1194	L1195																																																											

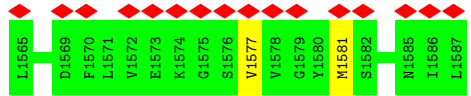
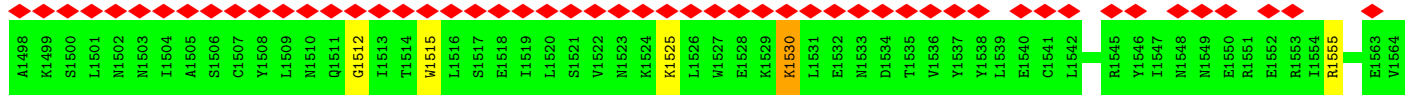
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• Molecule 1: ATP-binding protein Avs4

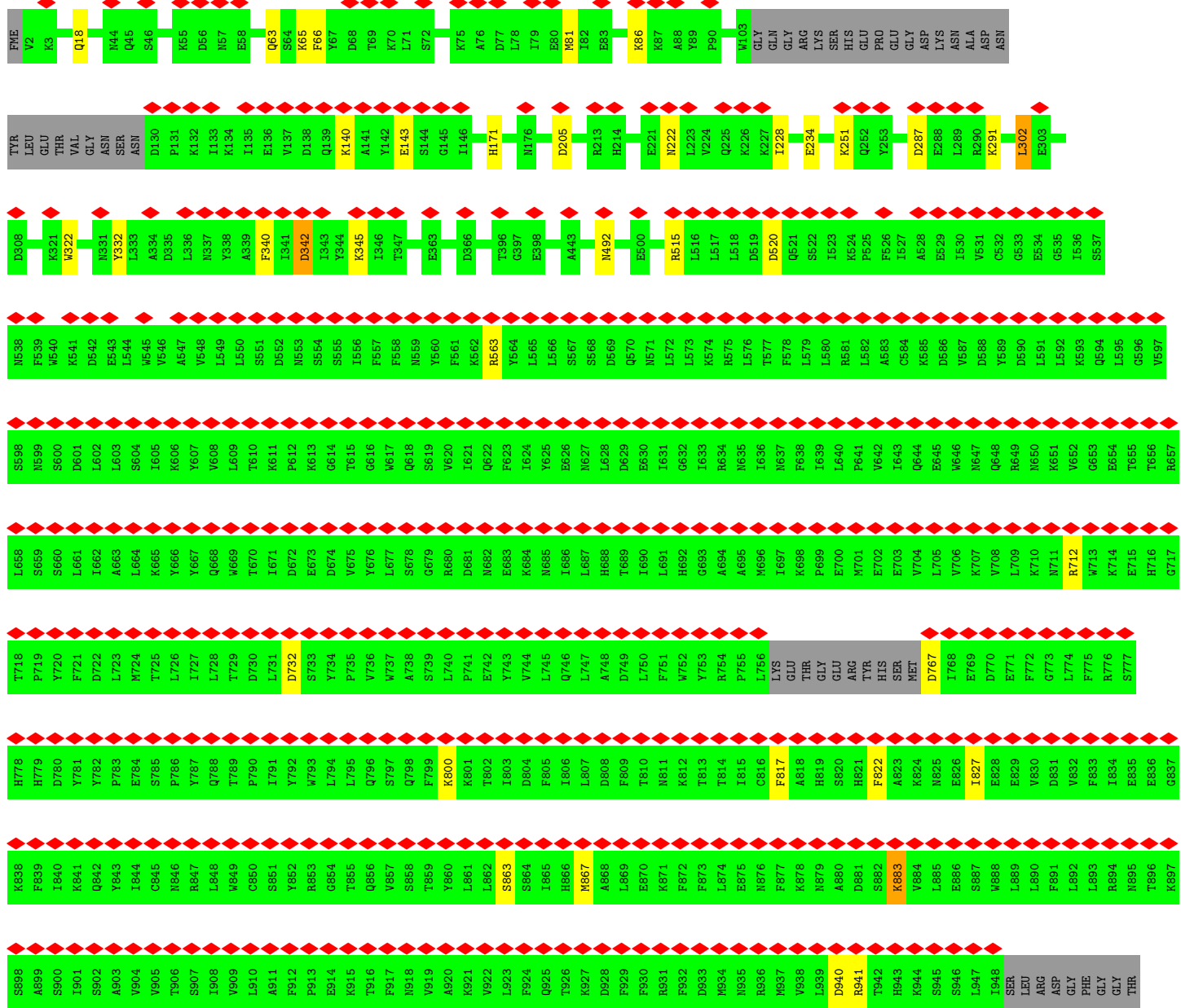
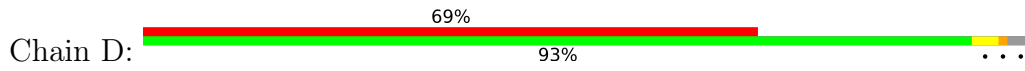


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K1440	L1380	L1320	K1260	H1200	I1140	E1080	P1020		S900	I840	D780	Y720
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D1443	P1383	L1323	Y1263	P1203	D1143	K1083	A1023		A903	Y843	P783	L723
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Y1445	S1385	T1325	I1265	E1205	C1145	V1085	E1025		V905	C845	S785	T725
M1446	D1386	A1326	L1266	R1206	S1146	L1086	T1026		T906	R846	P786	L726
V1447	F1387	F1327	S1267	E1207	V1147	L1087	E1027		S907	R847	Y787	I727
V1448	P1388	Q1328	R1268	T1208	L1148	K1088	A1028		I908	R848	Q788	L728
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F1457	G1397	I1337	Q1277	L1217	M1157	K1097	A1037		F917	W857	S797	W737
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F1411	S1351	T1351	L1292	I1231	Y1171	K1111	K1051		K931	K871	N811	F751
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V1414	V1414	L1354	Y1295	P1234	L1174	A1114	G1054		M934	L874	T814	R754
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R1417	R1417	V1357	C1298	V1237	K1177	E1117	I1057		M937	F877	F817	LYS
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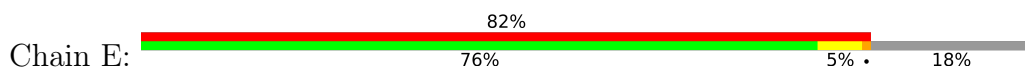
• Molecule 1: ATP-binding protein Avs4



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A1498	K1499	S1500	L1501	M1502	M1503	I1504	A1505	S1506	C1507	Y1508	L1509	M1510	Q1511	G1512	I1513	T1514	W1515	L1516	S1517	E1518	I1519	L1520	S1521	V1522	K1524	K1525	L1526	W1527	E1528	K1529	K1530	L1531	E1532	M1533	D1534	Y1535	V1536	Y1537	Y1538	L1539	E1540	C1541	L1542	V1543	R1544	R1545	Y1546	I1547	M1548	M1549	E1550	R1551	E1552	R1553	Q1562	E1563				

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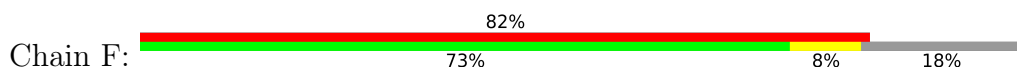
• Molecule 2: Portal protein



WET	ALA	SER	GLN	R6	R7	E8	O9	F10	A11	E12	M13	G14	A15	K16	A17	V18	Y19	D20	A21	L22	R23	N24	D25	R26	S28	Y29	E30	T31	R32	A33	E34	N35	C36	A37	K38	Y39	T40	I41	P42	S43	L44	F45	P46	D48	S49	D50	N51	A52	S53	T54	D55	V56	T57	L58	P59	H60
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Q61	N121	V181	D241	N501	ALA	A421	ILE
A62	Y122	T182	A242	P302	VAL	V422	LEU
V63	I123	L183	S243	A303	GLN	E423	LYS
G64	E124	D184	Y244	G304	THR	P424	PRO
A65	S125	K185	P245	I305	GLY	T425	GLU
R66	N126	T186	V246	T306	GLU	T426	GLU
G67	S127	A187	D247	Q307	VAL	S427	GLN
L68	Y128	Y188	A248	V308	THR	T428	GLN
N69	R129	A189	C249	R309	ALA	G429	MET
N70	V130	A190	P250	R310	ALA	M430	ALA
L71	T131	L191	Y251	L311	E372	E431	GLU
A72	L132	P192	I252	T312	I374	A432	ALA
S73	F133	E193	P253	K313	R375	L433	ALA
K74	E134	D194	V254	A314	V376	G434	GLY
L76	T135	D195	R255	Q315	V377	R435	THR
M76	L136	R196	M256	T316	A378	G436	ALA
L77	K137	R197	V257	S379	Q437	Q437	LEU
A78	Q138	A198	R258	D318	D438	D438	ASN
L79	L139	M199	I259	F319	L439	L439	ALA
F80	V140	D200	D260	V320	D440	D440	ALA
P81	V141	S201	G261	S321	K441	K441	SER
M82	A142	G202	E262	G322	L442	L442	ALA
Q83	G143	Q203	S263	R323	E443	E443	ALA
T84	M144	E204	Y264	P324	R444	R444	GLY
M85	A145	H205	G265	E325	C445	C445	ALA
M86	L146	K206	R266	D326	T446	T446	GLY
K87	L147	G207	S267	I327	A447	A447	LEU
L88	Y148	D208	Y268	S328	A448	A448	ALA
T89	I149	E209	C269	F329	W449	W449	THR
I90	P150	M210	E270	L330	S450	S450	ALA
S91	E151	I211	E271	Q331	A451	A451	SER
E92	P152	D212	Y272	L332	L452	L452	PRO
F93	E153	V213	L273	E333	A453	A453	GLU
E94	G154	Y214	G274	K334	P454	P454	MET
A95	A155	T215	D275	A335	M455	M455	GLU
K96	Y156	H216	L276	A336	GLN	GLN	ALA
Q97	N157	I217	R277	D337	ASN	ASN	ALA
L98	P158	Y218	S278	F338	M400	M400	ALA
V99	M159	L219	L279	S339	V401	V401	GLN
A100	K160	D220	E280	V340	ASP	ASP	ALA
Q101	L161	E221	M281	I341	ILE	ILE	GLY
P102	Y162	I222	L282	K342	ILE	ILE	VAL
A103	R163	S223	Q283	A343	L405	L405	PRO
E104	L164	G224	E284	V344	K406	K406	ALA
L105	S165	E225	A285	I345	Q407	Q407	ILE
A106	S166	Y226	I286	S346	LEU	LEU	LEU
K107	Y167	L227	V287	E347	ILE	ILE	ALA
V108	V168	K228	K288	I348	A410	A410	ALA
E109	V169	Y229	M289	E349	T411	T411	ASN
E110	Q170	E230	E290	G350	M412	M412	ALA
G111	R171	E231	M291	R351	Q413	Q413	ILE
L112	D172	I232	I292	L352	T414	T414	ILE
S113	A173	D233	S293	S353	P415	P415	ASP
M114	F174	G234	A294	Y354	E416	E416	THR
V115	G175	V235	K295	A355	L417	L417	SER
E116	T176	E236	V296	F356	P418	P418	GLY
R117	V177	V237	I297	M357	R419	R419	SER
I118	L178	D238	G298	L358	E420	E420	THR
L119	Q179	G239	L299	M359			GLY
M120	I180	T240	V300	SER			

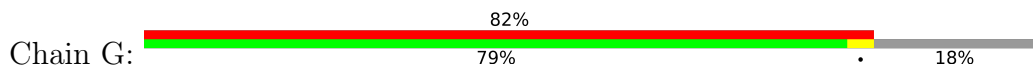
• Molecule 2: Portal protein



MET	Q61	N121	V181	D241	M121	V181	D241
ALA	A62	Y122	T182	A242	Y122	T182	A242
SER	V63	I123	L183	S243	I123	L183	S243
GLM	G64	E124	D184	Y244	E124	D184	Y244
K6	R66	S125	K185	P245	S125	K185	P245
R7	R66	N126	T186	V246	N126	T186	V246
E8	G67	S127	A187	D247	S127	A187	D247
G9	L68	Y128	Y188	A248	Y128	Y188	A248
F10	N69	R129	A189	C249	R129	A189	C249
A11	N70	V130	A190	P250	V130	A190	P250
E12	L71	T131	L191	Y251	T131	L191	Y251
N13	A72	L132	P192	I252	L132	P192	I252
G14	S73	F133	E193	P253	S73	F133	E193
A15	K74	E134	D194	V254	K74	E134	D194
K16	L76	T135	D195	R255	L76	T135	D195
A17	M76	L136	R196	M256	A17	M76	L136
V18	L77	K137	R197	V257	V18	L77	K137
Y19	A78	Q138	A198	R258	Y19	A78	Q138
D20	L79	L139	M199	I259	D20	L79	L139
A21	F80	V140	D200	D260	A21	F80	V140
L22	P81	V141	S201	G261	L22	P81	V141
K23	M82	A142	G202	E262	K23	M82	A142
N24	Q83	G143	Q203	S263	N24	Q83	G143
D25	T84	M144	E204	Y264	D25	T84	M144
R26	M85	A145	H205	G265	R26	M85	A145
N27	M86	L146	K206	R266	N27	M86	L146
S28	K87	L147	G207	S267	S28	K87	L147
Y29	L88	Y148	D208	Y268	Y29	L88	Y148
E30	T89	I149	E209	C269	E30	T89	I149
T31	I90	P150	M210	E270	T31	I90	P150
R32	S91	E151	I211	E271	R32	S91	E151
A33	E92	P152	D212	Y272	A33	E92	P152
E34	F93	E153	V213	L273	E34	F93	E153
N35	E94	G154	Y214	G274	N35	E94	G154
C36	A95	A155	T215	D275	C36	A95	A155
A37	K96	Y156	H216	L276	A37	K96	Y156
K38	Q97	N157	I217	R277	K38	Q97	N157
Y39	L98	P158	Y218	S278	Y39	L98	P158
T40	V99	M159	L219	L279	T40	V99	M159
I41	A100	K160	D220	E280	I41	A100	K160
P42	Q101	L161	E221	M281	P42	Q101	L161
S43	P102	Y162	I222	L282	S43	P102	Y162
L44	A103	R163	S223	Q283	L44	A103	R163
F45	E104	L164	G224	E284	F45	E104	L164
P46	L105	S165	E225	A285	P46	L105	S165
K47	A106	S166	Y226	I286	K47	A106	S166
D48	K107	Y167	L227	V287	D48	K107	Y167
S49	V108	V168	K228	K288	S49	V108	V168
D50	E109	V169	Y229	M289	D50	E109	V169
N51	Q110	Q170	E230	E290	N51	Q110	Q170
A52	G111	R171	E231	M291	A52	G111	R171
S53	L112	D172	I232	I292	S53	L112	D172
T54	S113	A173	D233	S293	T54	S113	A173
D55	M114	F174	G234	A294	D55	M114	F174
Y56	V115	G175	V235	K295	Y56	V115	G175
T57	E116	T176	E236	V296	T57	E116	T176
S58	R117	V177	V237	I297	S58	R117	V177
M60	I118	L178	D238	G298	M60	I118	L178
	L119	Q179	G239	L299		L119	Q179
	M120	I180	T240	V300		M120	I180

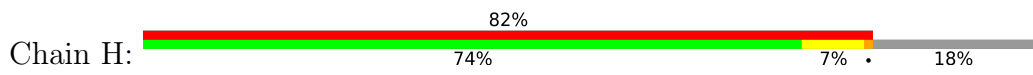
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ALA	VAL	GLN	ARG	THR	GLY	GLU	ARG	VAL	THR	ALA	E372	E373	I374	R375	Y376	V377	A378	S379	E380	L381	E382	D383	T384	L385	G386	G387	V388	Y389	S390	I391	L392	S393	Q394	E395	A396	Q397	L398	P399	ASP	M400	V401	R402	V403	L404	L405	K406	Q407	L408	Q409	A410	T411	E349	N412	Q413	I414	P415	E416	L417	P418	K419	E420					
A421	V422	E423	P424	T425	I426	S427	T428	G429	M430	E431	A432	L433	G434	R435	G436	Q437	D438	L439	D440	K441	L442	E443	R444	C445	I446	A447	A448	W449	S450	A451	L452	A453	P454	M455	GLN	ASN	ASP	PRO	ASP	ASP	ILE	ASN	ASN	ILE	ILE	THR	ILE	LYS	ILE	LEU	ARG	ILE	ILE	ALA	ASN	ALA	ILE	ILE	GLY	ILE	ILE	ASP	THR	THR	SER	GLY
ILE	LEU	LYS	THR	PRO	GLU	GLU	LYS	GLN	GLN	GLU	MET	ALA	ALA	ALA	GLY	GLY	THR	ALA	LEU	GLU	ASN	ALA	ALA	ALA	ALA	ALA	ALA	THR	THR	ALA	PRO	PRO	GLU	ASN	MET	GLU	ALA	ALA	ALA	ALA	ALA	GLN	GLN	GLN	GLY	GLY	VAL	PRO	PRO	ASN																

• Molecule 2: Portal protein



MET	ALA	SER	GLN	K6	R7	E8	G9	F10	A11	E12	M13	G14	A15	K16	A17	V18	Y19	D20	A21	L22	K23	N24	D25	R26	N27	S28	Y29	E30	T31	R32	A33	E34	M35	C36	A37	K38	Y39	T40	P42	I41	S43	L44	F45	P46	K47	D48	S49	D50	M51	A52	S53	T54	D55	Y56	T57	T58	P59	W60								
Q61	A62	V63	G64	A65	R66	G67	L68	M69	A189	N70	L71	A72	S73	K74	L75	M76	L77	A78	L79	F80	P81	M82	Q83	T84	W85	M86	K87	L88	T89	I90	S91	E92	F93	E94	A95	K96	Q97	L98	T99	A100	Q101	P102	A103	E104	P105	L106	K107	D108	E109	G110	L111	S112	M113	F114	V115	E116	R117	L118	L119	M120						
M121	Y122	I123	E124	M126	S127	Y128	R129	A189	A190	L191	P192	F193	E194	V195	R196	N197	Q198	M199	D200	S201	G202	Q203	E204	H205	K206	G207	D208	E209	M210	I211	D212	V213	Y214	T215	H216	I217	Y218	L219	D220	E221	E222	S223	G224	E225	A285	Y226	L227	K228	Y229	E230	I231	I232	D233	A294	K295	E236	V237	G238	G239	T240						
V181	T182	L183	D184	K185	T186	A187	Y188	A189	A190	L191	P192	F193	E194	V195	R196	N197	Q198	M199	D200	S201	G202	Q203	E204	H205	K206	G207	D208	E209	M210	I211	D212	V213	Y214	T215	H216	I217	Y218	L219	D220	E221	E222	S223	G224	E225	A285	Y226	L227	K228	Y229	E230	I231	I232	D233	A294	K295	E236	V237	G238	G239	T240						
D241	A242	S243	Y244	P245	D246	A248	P249	P250	Y251	I252	P253	V254	R255	M256	V257	R258	I259	D260	G261	E262	S263	Y264	G265	R266	S267	Y268	C269	E270	E271	Y272	L273	G274	D275	L276	R277	S278	L279	E280	N281	Q282	E283	A284	A285	I286	Y287	K288	M289	S290	M291	I292	S293	A294	K295	V296	I297	G298	L299	V300								
N301	P302	A303	G304	I305	T306	Q307	V308	R309	R310	L311	T312	K313	A314	Q315	T316	G317	D318	F319	V320	S321	G322	R323	P324	E325	D326	I327	S328	F329	L330	Q331	L332	E333	K334	A335	A336	D337	F338	S339	V340	A341	K342	A343	V344	S345	E346	Q347	I348	E349	G350	R351	L352	S353	Y354	A355	F356	M357	L358	N359	SER							
ALA	VAL	GLN	ARG	THR	GLY	GLU	ARG	VAL	THR	ALA	E372	E373	I374	R375	Y376	V377	A378	S379	E380	L381	E382	D383	T384	L385	G386	G387	V388	Y389	S390	I391	L392	S393	Q394	E395	A396	Q397	L398	P399	ASP	M400	V401	R402	V403	L404	L405	K406	Q407	L408	Q409	A410	T411	E349	N412	Q413	I414	P415	E416	L417	P418	K419	E420					
A421	V422	E423	P424	T425	I426	S427	T428	G429	M430	E431	A432	L433	G434	R435	G436	Q437	D438	L439	D440	K441	L442	E443	R444	C445	I446	A447	A448	W449	S450	A451	L452	A453	P454	M455	GLN	ASN	ASP	PRO	ASP	ASP	ILE	ASN	ASN	ILE	ILE	THR	ILE	LYS	ILE	LEU	ARG	ILE	ILE	ALA	ASN	ALA	ILE	ILE	GLY	ILE	ILE	ASP	THR	THR	SER	GLY
ILE	LEU	LYS	THR	PRO	GLU	GLU	LYS	GLN	GLN	GLU	MET	ALA	ALA	ALA	GLY	GLY	THR	ALA	LEU	GLU	ASN	ALA	ALA	ALA	ALA	ALA	THR	THR	ALA	PRO	PRO	GLU	ASN	MET	GLU	ALA	ALA	ALA	ALA	ALA	GLN	GLN	GLN	GLY	GLY	VAL	PRO	PRO	ASN																	

• Molecule 2: Portal protein



MET	ALA	SER	GLN	K6	R7	E8	G9	F10	A11	E12	N13	G14	A15	K16	A17	V18	Y19	D20	A21	L22	K23	N24	D25	K26	N27	S28	Y29	E30	T31	R32	A33	E34	N35	C36	A37	K38	Y39	T40	I41	P42	S43	L44	F45	P46	K47	D48	S49	D50	N51	A52	S53	T54	D55	Y56	T57	T58	P59	W60																	
Q61	A62	V63	G64	A65	R66	G67	L68	N69	N70	L71	A72	S73	K74	L75	M76	L77	A78	L79	F80	P81	M82	Q83	T84	M85	M86	K87	L88	T89	I90	S91	E92	F93	E94	A95	K96	Q97	P98	L99	V99	A100	Q101	P102	A103	E104	L105	A106	K107	V108	E109	E110	G111	L112	S113	M114	V115	E116	R117	I118	L119	M120															
M121	Y122	I123	E124	S125	N126	S127	Y128	R129	V130	T131	L132	F133	E134	T135	L136	K137	Q138	L139	V140	V141	A142	G143	N144	A145	L146	L147	Y148	I149	P150	E151	P152	E153	G154	A155	Y156	M157	P158	L159	M159	K160	L161	Y162	R163	L164	S165	S166	Y167	V168	V169	Q170	R171	D172	A173	G175	T176	V177	L178	Q179	I180																
V181	T182	L183	D184	L185	T186	A187	V188	A189	A190	L191	P192	E193	D194	V195	R196	M197	A198	M199	D200	S201	G202	Q203	E204	H205	K206	G207	D208	E209	M210	I211	D212	V213	Y214	T215	H216	I217	Y218	L219	D220	E221	E222	S223	G224	E225	Y226	L227	K228	Y229	E230	E231	I232	D233	G234	V235	E236	V237	D238	G239	T240																
D241	A242	S243	Y244	P245	V246	D247	A248	C249	P250	Y251	I252	P253	V254	R255	M256	V257	R258	I259	D260	G261	E262	S263	Y264	G265	R266	S267	Y268	C269	E270	E271	Y272	L273	G274	D275	L276	R277	S278	L279	E280	M281	L282	Q283	E284	A285	I286	V287	K288	M289	S290	M291	I292	S293	A294	K295	V296	I297	G298	L299	V300																
N301	P302	A303	G304	I305	T306	Q307	V308	R309	R310	L311	T312	K313	A314	Q315	T316	G317	D318	F319	V320	S321	G322	R323	P324	E325	D326	I327	S328	F329	L330	Q331	L332	E333	K334	A335	A336	D337	F338	S339	V340	A341	K342	A343	V344	S345	E346	Q347	T348	E349	G350	R351	L352	S353	Y354	A355	F356	M357	L358	N359	SER																
ALA	VAL	GLN	ARG	THR	GLY	GLU	ARG	VAL	THR	ALA	E372	E373	I374	R375	Y376	V377	A378	S379	E380	L381	E382	D383	T384	L385	G386	G387	V388	Y389	S390	I391	L392	S393	Q394	E395	L396	Q397	L398	P399	M400	V401	R402	V403	L404	L405	K406	Q407	L408	Q409	I410	A411	ASN	ALA	ASN	ILE	ASN	ALA	THR	ILE	LYS	LEU	ARG	ILE	ALA	ASN	ALA	ILE	GLY	ILE	ASP	THR	SER	GLY	P418	R419	E420
A421	V422	E423	P424	T425	I426	S427	T428	G429	M430	E431	A432	L433	G434	R435	G436	Q437	D438	L439	D440	R441	L442	E443	R444	C445	L446	A447	A448	W449	R450	A451	L452	A453	P454	M455	GLN	ASN	ASP	PRO	ASP	ILE	ASN	ASN	ILE	ALA	THR	ILE	LYS	LEU	ARG	ILE	ALA	ASN	ALA	ILE	GLY	ILE	ASP	THR	SER	GLY															
ILE	LEU	LYS	THR	PRO	GLU	GLU	LYS	GLN	GLU	MET	ALA	ALA	GLU	ALA	GLN	GLY	THR	ALA	LEU	ASN	ALA	ALA	SER	ALA	GLY	GLY	ALA	ALA	LEU	ALA	THR	ALA	PRO	GLU	ASN	ASN	MET	GLU	ALA	ALA	ALA	ALA	ALA	ALA	GLY	MET	VAL	PRO	ASN																										

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	169977	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	31	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.138	Depositor
Minimum map value	-0.055	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.02	Depositor
Map size (\AA)	372.3703, 372.3703, 372.3703	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.034362, 1.034362, 1.034362	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: FME, ATP, MG

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	0.39	0/13095	0.66	6/17695 (0.0%)
1	B	0.40	0/13056	0.67	8/17643 (0.0%)
1	C	0.39	0/13095	0.66	6/17695 (0.0%)
1	D	0.40	0/13056	0.66	8/17643 (0.0%)
2	E	0.73	3/3485 (0.1%)	0.89	8/4720 (0.2%)
2	F	0.48	2/3485 (0.1%)	0.80	10/4720 (0.2%)
2	G	0.54	1/3485 (0.0%)	0.81	6/4720 (0.1%)
2	H	0.47	1/3485 (0.0%)	0.82	13/4720 (0.3%)
All	All	0.44	7/66242 (0.0%)	0.70	65/89556 (0.1%)

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	324	PRO	CG-CD	-32.03	0.45	1.50
2	G	454	PRO	CG-CD	-19.71	0.85	1.50
2	F	324	PRO	CG-CD	-11.44	1.12	1.50
2	E	324	PRO	CB-CG	11.21	2.06	1.50
2	H	324	PRO	CG-CD	-10.89	1.14	1.50

The worst 5 of 65 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	324	PRO	CB-CG-CD	-27.29	0.07	106.50
2	G	454	PRO	N-CD-CG	-20.29	72.77	103.20
2	E	324	PRO	CA-N-CD	-15.21	90.20	111.50
2	F	398	LEU	CB-CG-CD2	-12.07	90.47	111.00
2	F	324	PRO	N-CD-CG	-11.55	85.88	103.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	12805	0	12724	25	0
1	B	12756	0	12683	32	0
1	C	12805	0	12724	22	0
1	D	12756	0	12683	26	0
2	E	3427	0	3400	16	0
2	F	3427	0	3400	22	0
2	G	3427	0	3400	9	0
2	H	3427	0	3400	21	0
3	A	31	0	12	0	0
3	B	31	0	12	0	0
3	C	31	0	12	0	0
3	D	31	0	12	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
All	All	64958	0	64462	156	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 1.

The worst 5 of 156 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)
2:F:117:ARG:HH12	2:F:121:ASN:HB2	1.39	0.87
2:H:117:ARG:HH12	2:H:121:ASN:HB2	1.46	0.79
1:C:937:MET:HG2	1:C:941:ARG:HH12	1.51	0.76
1:A:1359:ARG:O	1:A:1359:ARG:NH1	2.25	0.69
1:C:1359:ARG:O	1:C:1359:ARG:NH1	2.26	0.69

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	1531/1587 (96%)	1499 (98%)	32 (2%)	0	100	100
1	B	1524/1587 (96%)	1490 (98%)	34 (2%)	0	100	100
1	C	1531/1587 (96%)	1501 (98%)	30 (2%)	0	100	100
1	D	1524/1587 (96%)	1490 (98%)	34 (2%)	0	100	100
2	E	434/535 (81%)	422 (97%)	12 (3%)	0	100	100
2	F	434/535 (81%)	422 (97%)	12 (3%)	0	100	100
2	G	434/535 (81%)	419 (96%)	15 (4%)	0	100	100
2	H	434/535 (81%)	425 (98%)	9 (2%)	0	100	100
All	All	7846/8488 (92%)	7668 (98%)	178 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1422/1461 (97%)	1400 (98%)	22 (2%)	65	87
1	B	1418/1461 (97%)	1393 (98%)	25 (2%)	59	85
1	C	1422/1461 (97%)	1400 (98%)	22 (2%)	65	87
1	D	1418/1461 (97%)	1390 (98%)	28 (2%)	55	82
2	E	370/435 (85%)	363 (98%)	7 (2%)	57	84
2	F	370/435 (85%)	361 (98%)	9 (2%)	49	79

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	370/435 (85%)	366 (99%)	4 (1%)	73	92
2	H	370/435 (85%)	361 (98%)	9 (2%)	49	79
All	All	7160/7584 (94%)	7034 (98%)	126 (2%)	61	85

5 of 126 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	492	ASN
2	F	326	ASP
1	D	234	GLU
2	F	323	ARG
2	H	86	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	825	ASN
1	B	825	ASN
2	F	157	ASN
2	F	413	GLN
2	H	205	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](#)

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	FME	A	1	1	8,9,10	1.04	0	7,9,11	2.72	2 (28%)
1	FME	C	1	1	8,9,10	1.05	0	7,9,11	2.81	2 (28%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	FME	A	1	1	-	6/7/9/11	-
1	FME	C	1	1	-	6/7/9/11	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	1	FME	CA-N-CN	-5.49	114.38	122.82
1	A	1	FME	CA-N-CN	-5.30	114.67	122.82
1	C	1	FME	O1-CN-N	4.50	137.12	125.27
1	A	1	FME	O1-CN-N	4.36	136.74	125.27

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1	FME	O1-CN-N-CA
1	A	1	FME	O-C-CA-CB
1	C	1	FME	O1-CN-N-CA
1	C	1	FME	O-C-CA-CB
1	A	1	FME	CB-CG-SD-CE

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1	FME	1	0
1	C	1	FME	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	ATP	C	1601	4	26,33,33	0.70	0	31,52,52	0.81	2 (6%)
3	ATP	B	1601	4	26,33,33	0.67	0	31,52,52	0.78	2 (6%)
3	ATP	A	1601	4	26,33,33	0.70	0	31,52,52	0.81	2 (6%)
3	ATP	D	1601	4	26,33,33	0.67	0	31,52,52	0.78	2 (6%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ATP	C	1601	4	-	1/18/38/38	0/3/3/3
3	ATP	B	1601	4	-	0/18/38/38	0/3/3/3
3	ATP	A	1601	4	-	1/18/38/38	0/3/3/3
3	ATP	D	1601	4	-	0/18/38/38	0/3/3/3

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1601	ATP	PB-O3B-PG	2.24	140.50	132.83
3	A	1601	ATP	PB-O3B-PG	2.23	140.47	132.83
3	A	1601	ATP	C5-C6-N6	2.11	123.56	120.35
3	C	1601	ATP	C5-C6-N6	2.07	123.49	120.35
3	B	1601	ATP	PB-O3B-PG	2.06	139.91	132.83

There are no chirality outliers.

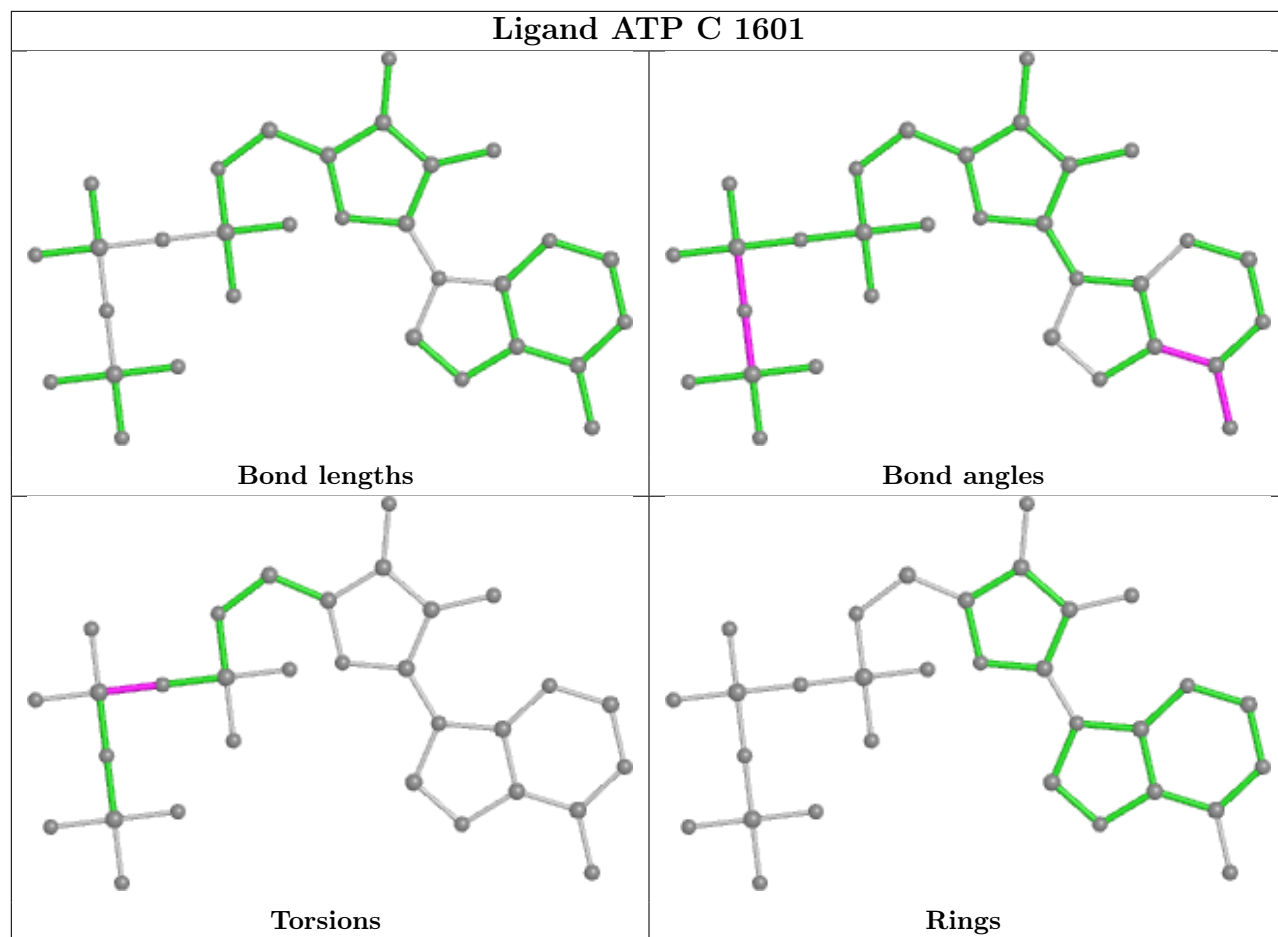
All (2) torsion outliers are listed below:

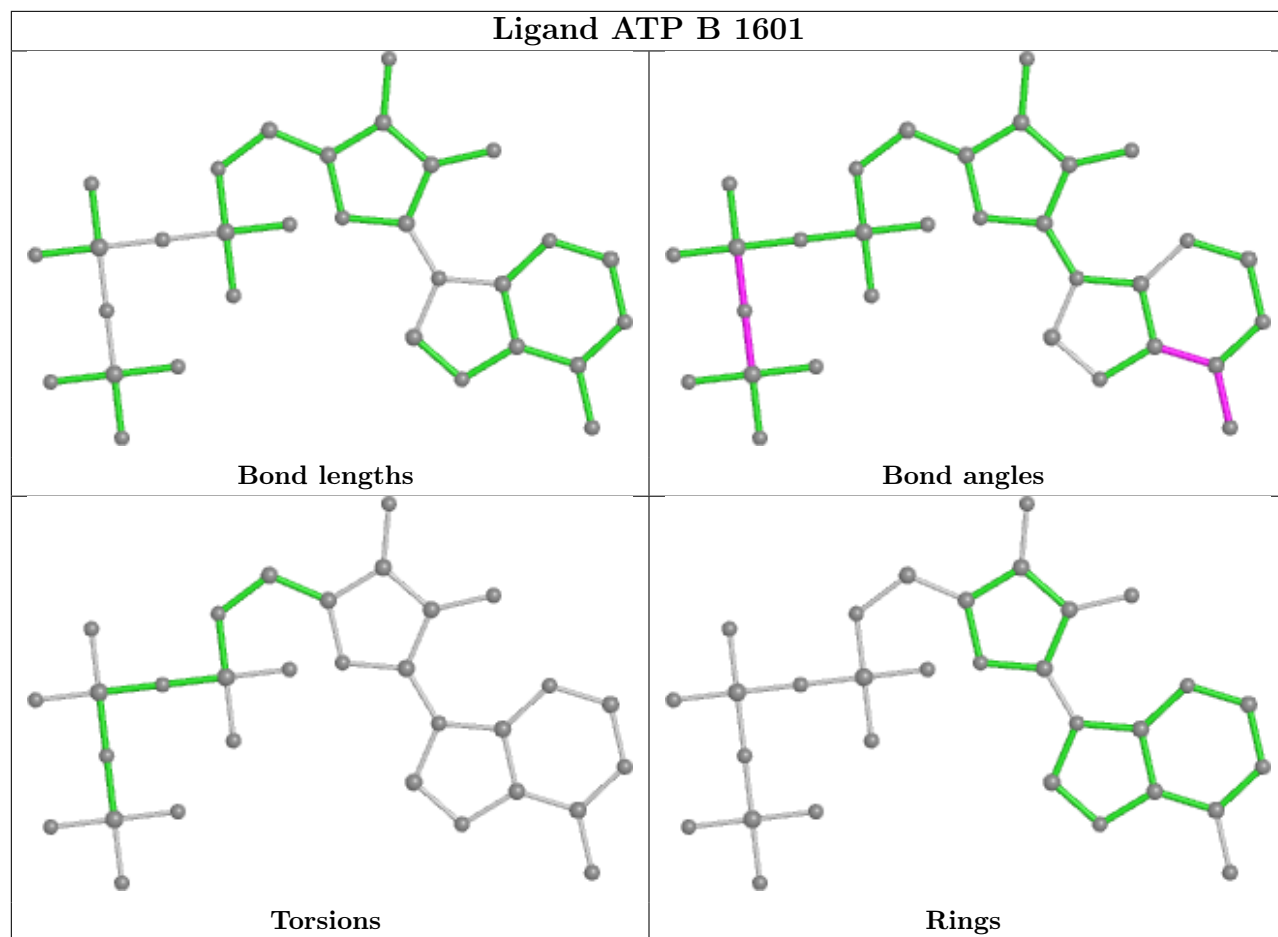
Mol	Chain	Res	Type	Atoms
3	A	1601	ATP	PA-O3A-PB-O2B
3	C	1601	ATP	PA-O3A-PB-O2B

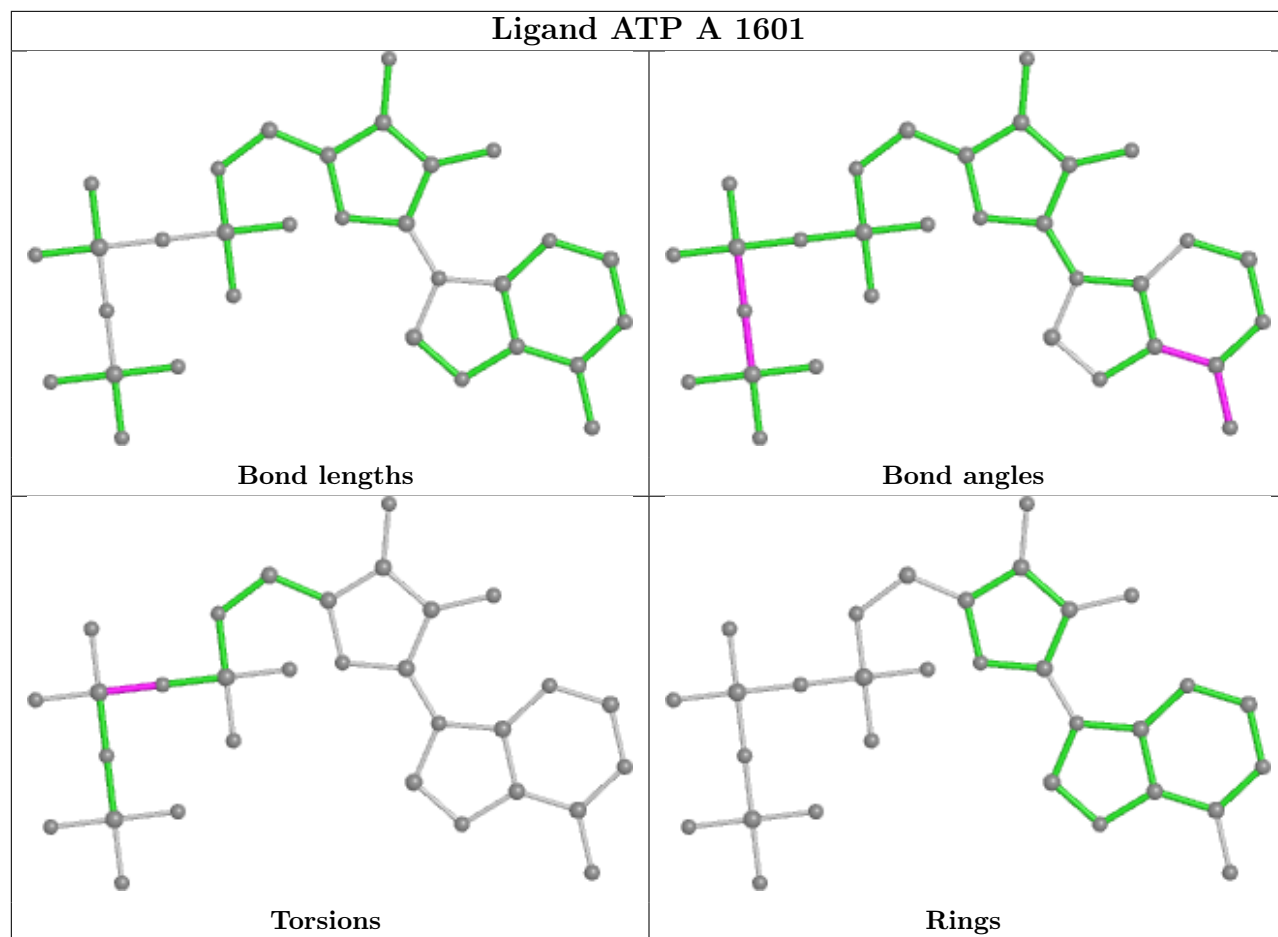
There are no ring outliers.

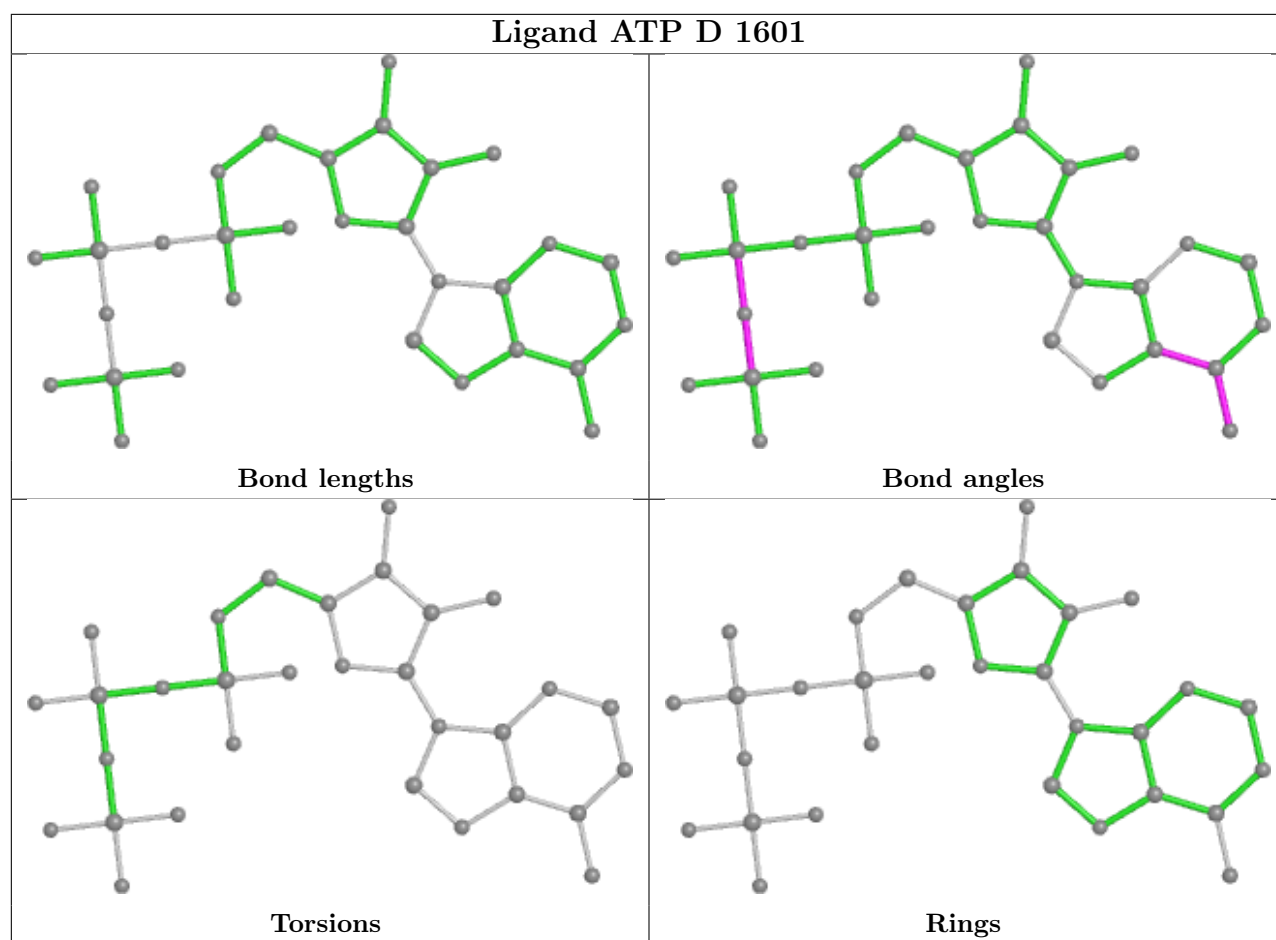
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.









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.

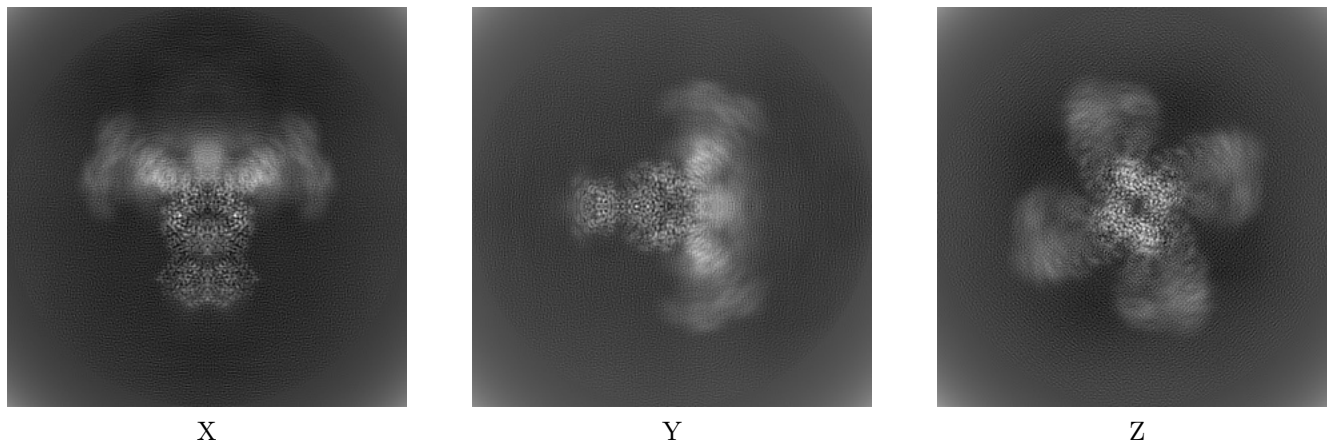
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-27422. These allow visual inspection of the internal detail of the map and identification of artifacts.

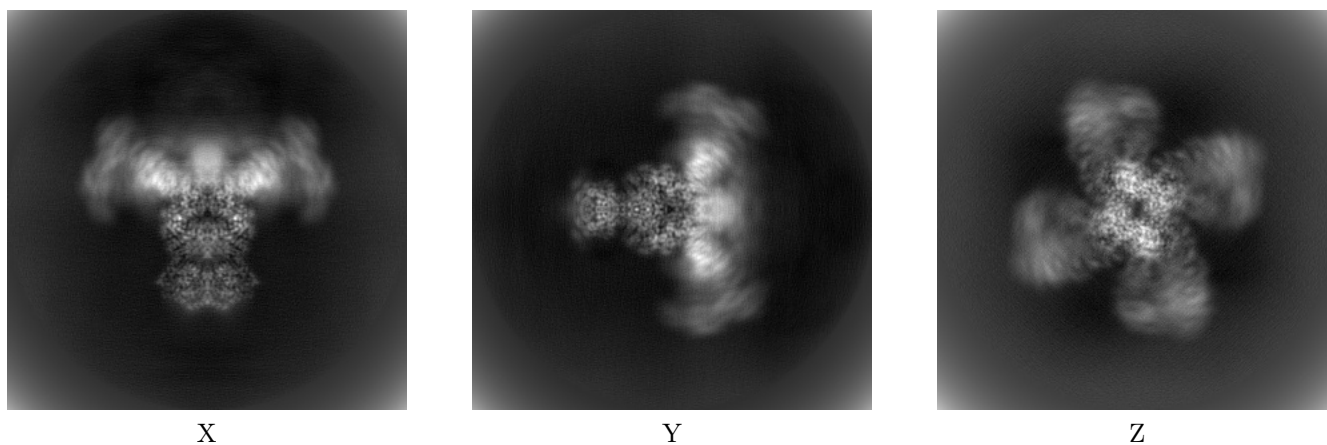
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



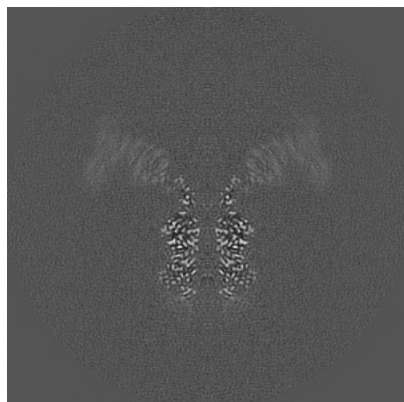
6.1.2 Raw map



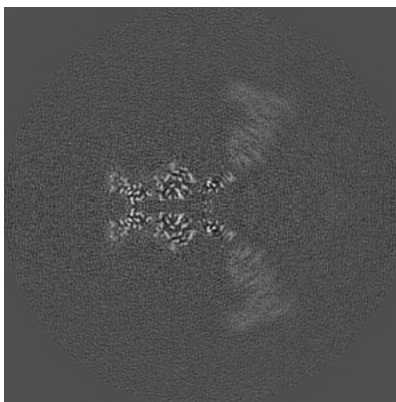
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

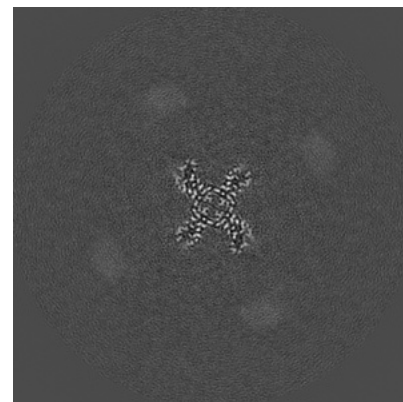
6.2.1 Primary map



X Index: 180

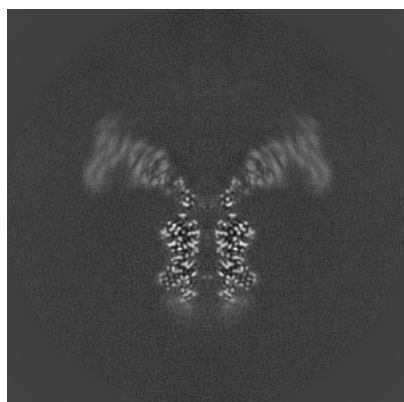


Y Index: 180

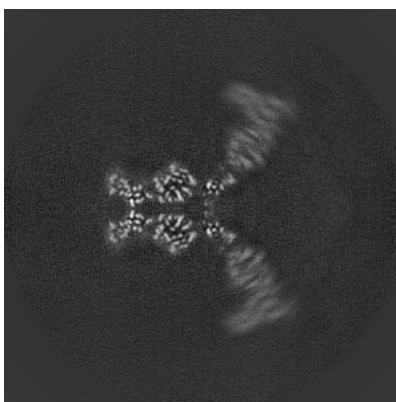


Z Index: 180

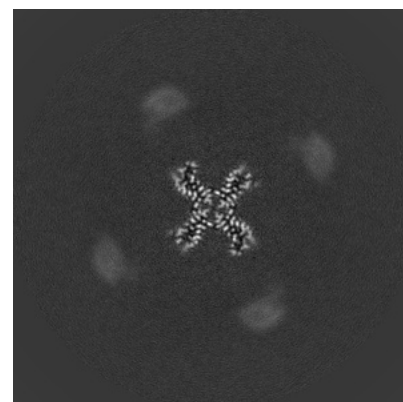
6.2.2 Raw map



X Index: 180



Y Index: 180

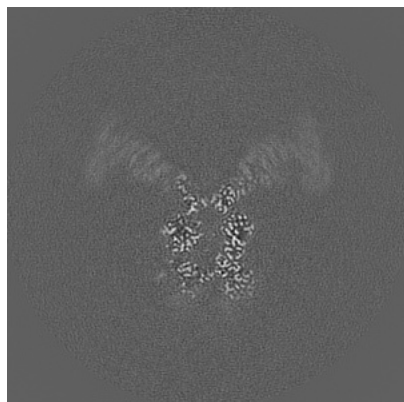


Z Index: 180

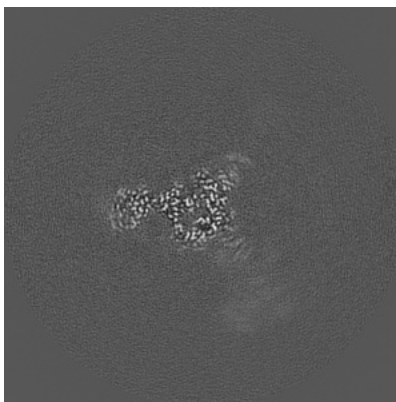
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

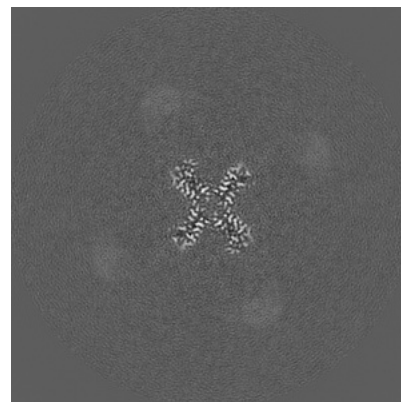
6.3.1 Primary map



X Index: 175

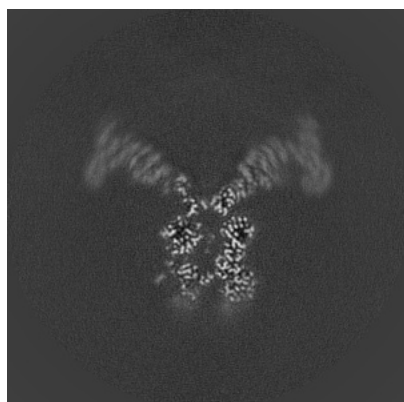


Y Index: 160

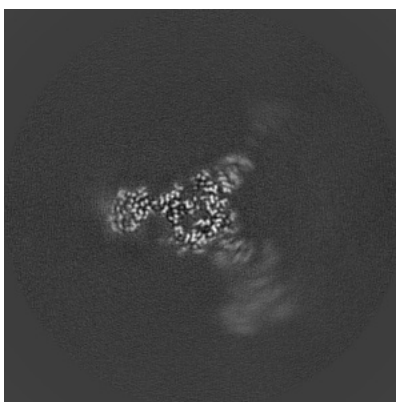


Z Index: 179

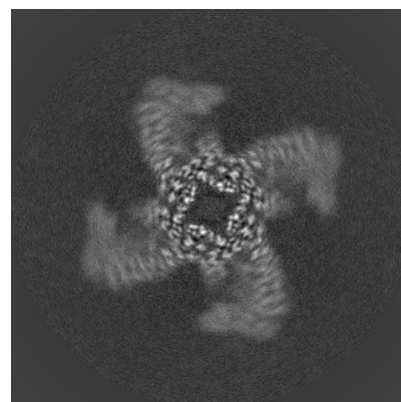
6.3.2 Raw map



X Index: 175



Y Index: 160

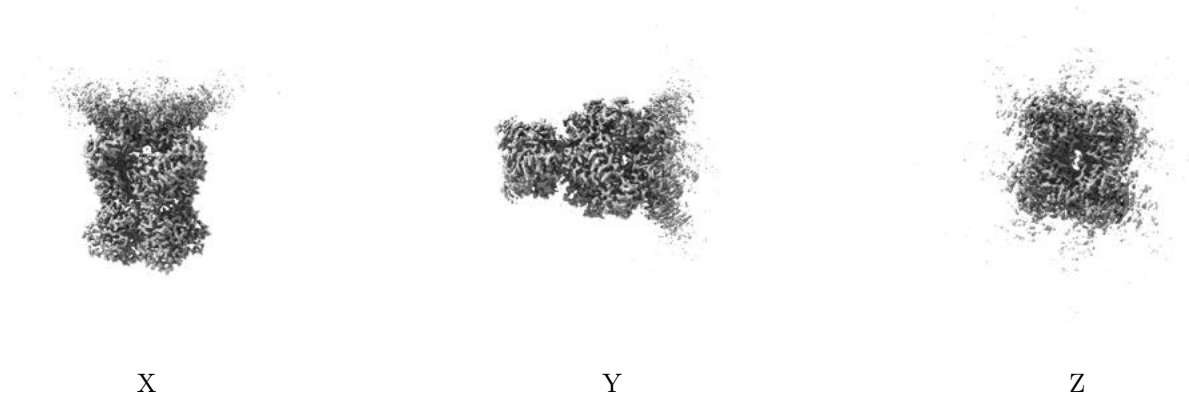


Z Index: 204

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

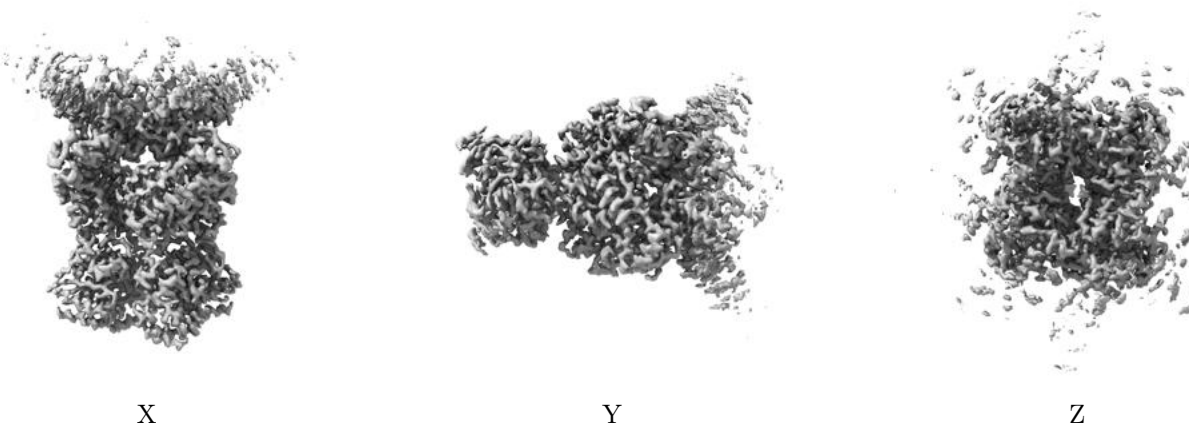
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02. 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.

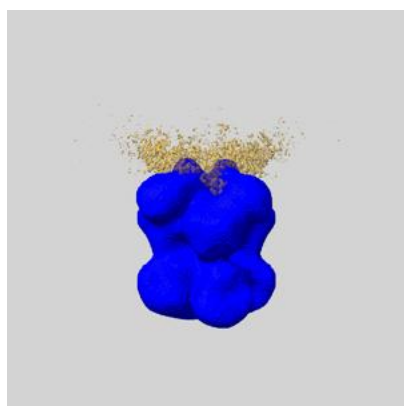
6.5 Mask visualisation [i](#)

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

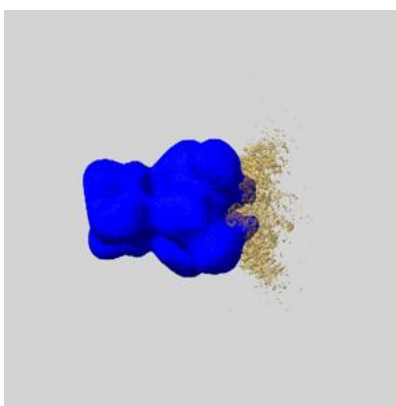
A mask typically either:

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

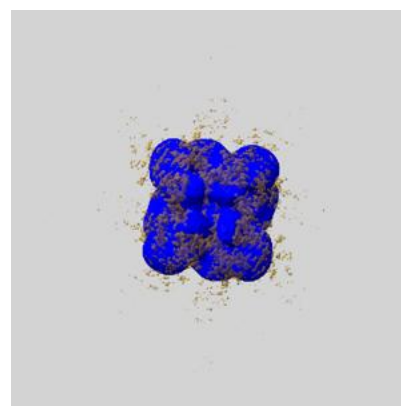
6.5.1 emd_27422_msk_1.map [i](#)



X



Y

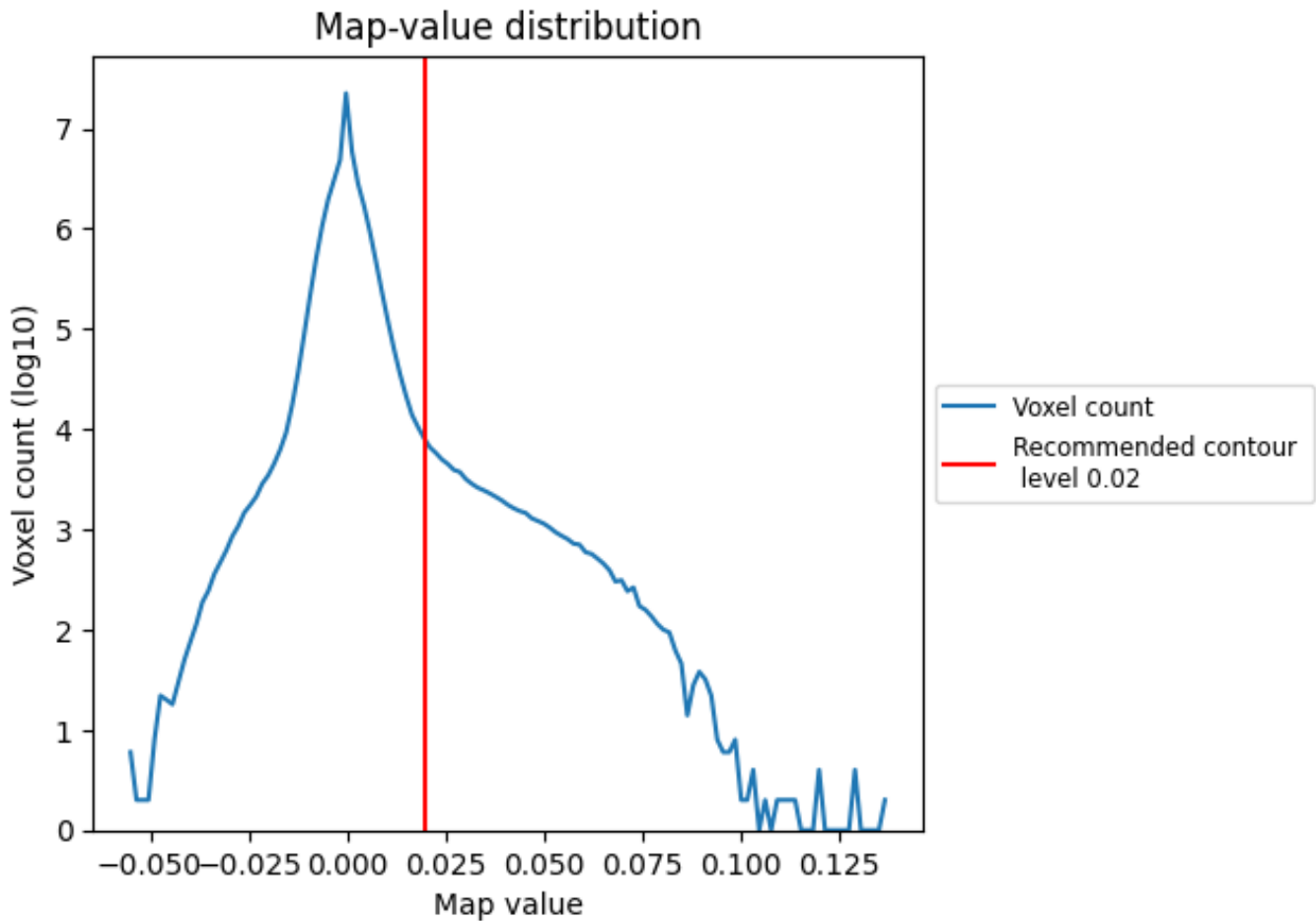


Z

7 Map analysis [i](#)

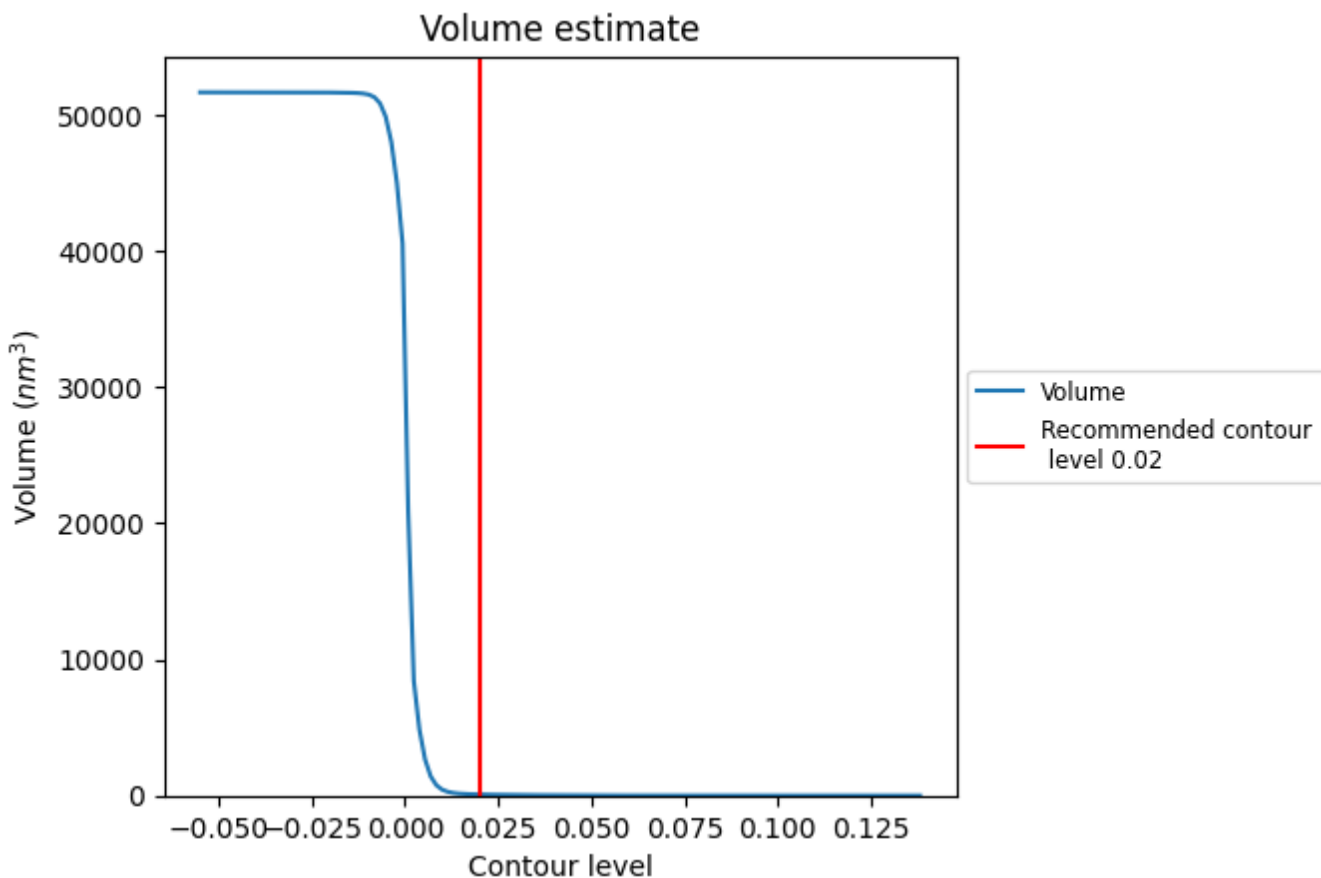
This section contains the results of statistical analysis of the map.

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.

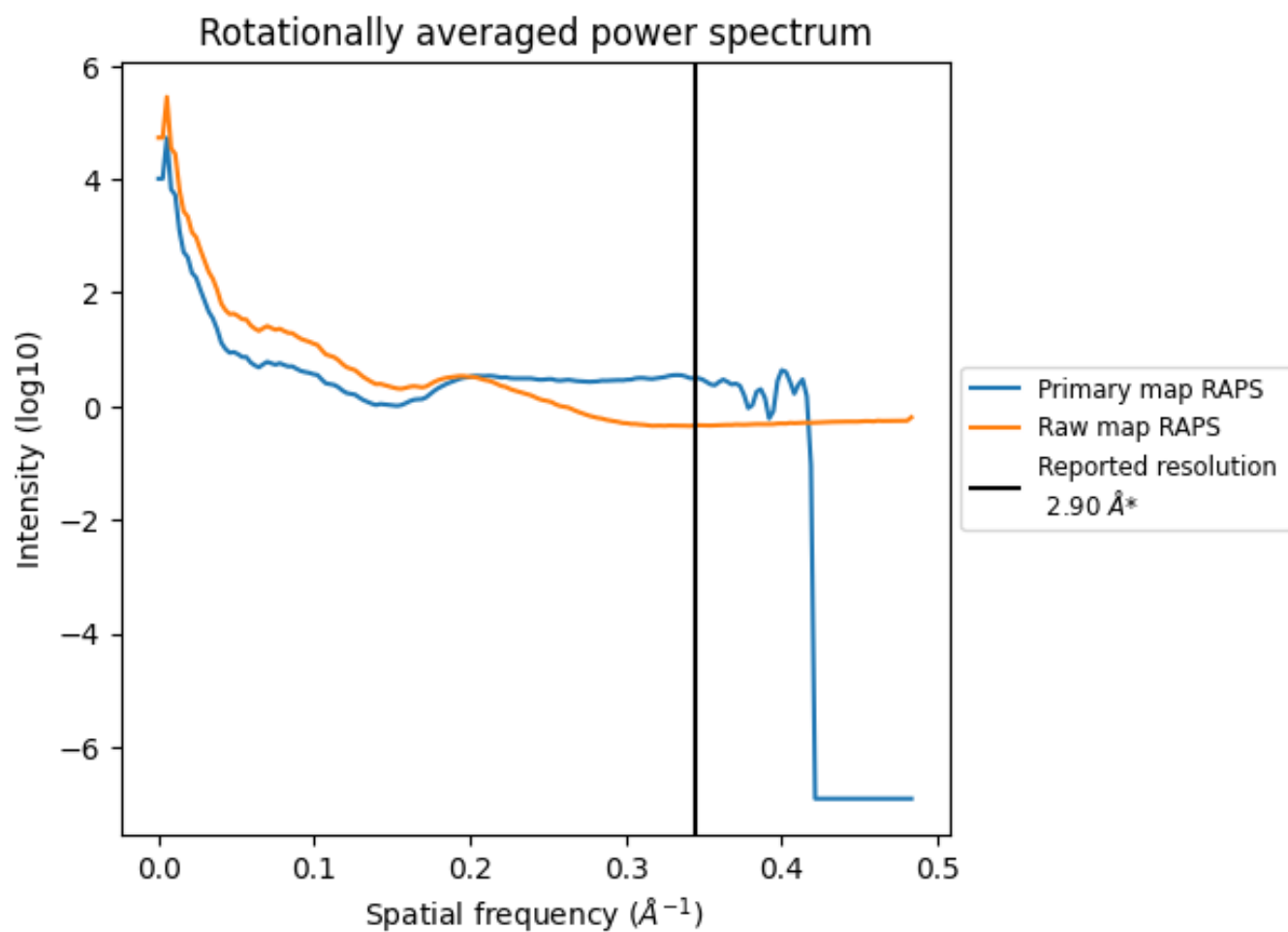
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 80 nm^3 ; this corresponds to an approximate mass of 73 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

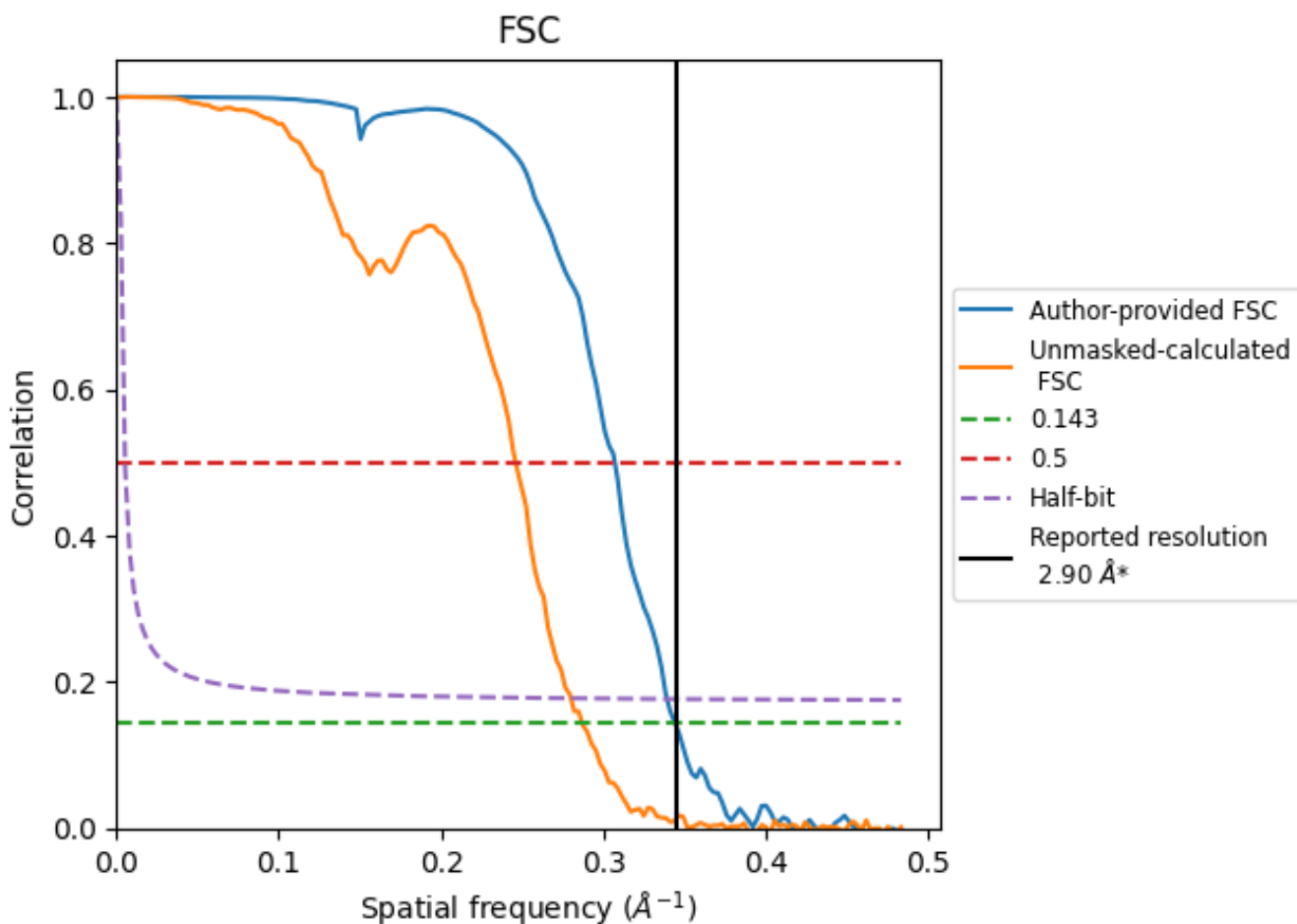


*Reported resolution corresponds to spatial frequency of 0.345 \AA^{-1}

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.345 Å⁻¹

8.2 Resolution estimates [i](#)

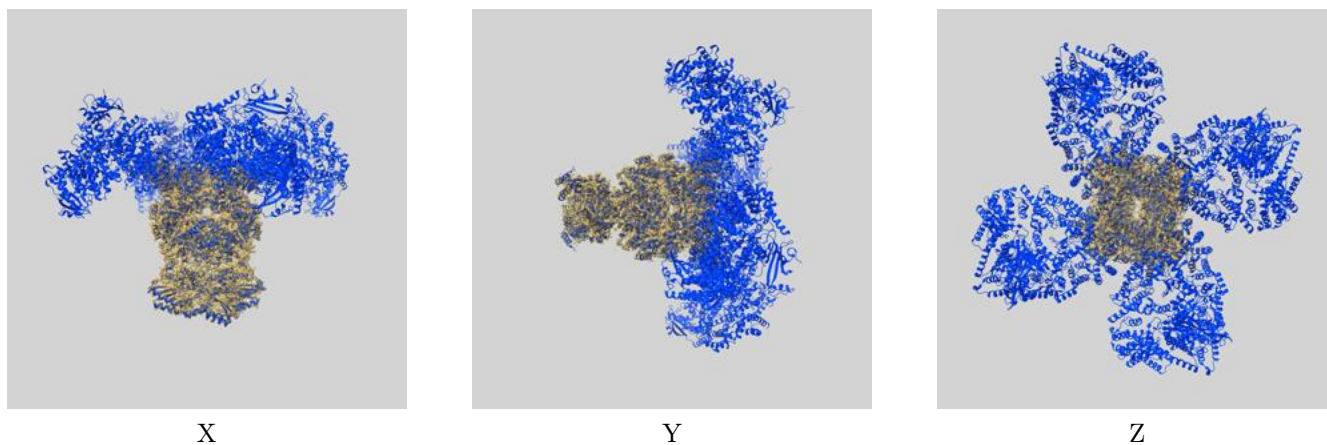
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.90	3.26	2.95
Unmasked-calculated*	3.48	4.07	3.57

*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 3.48 differs from the reported value 2.9 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-27422 and PDB model 8DGF. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay [i](#)



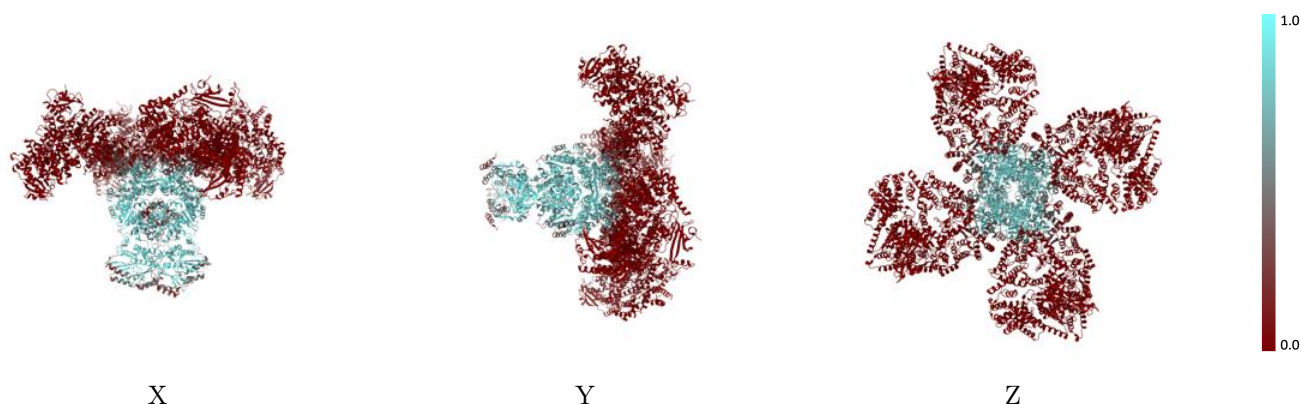
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



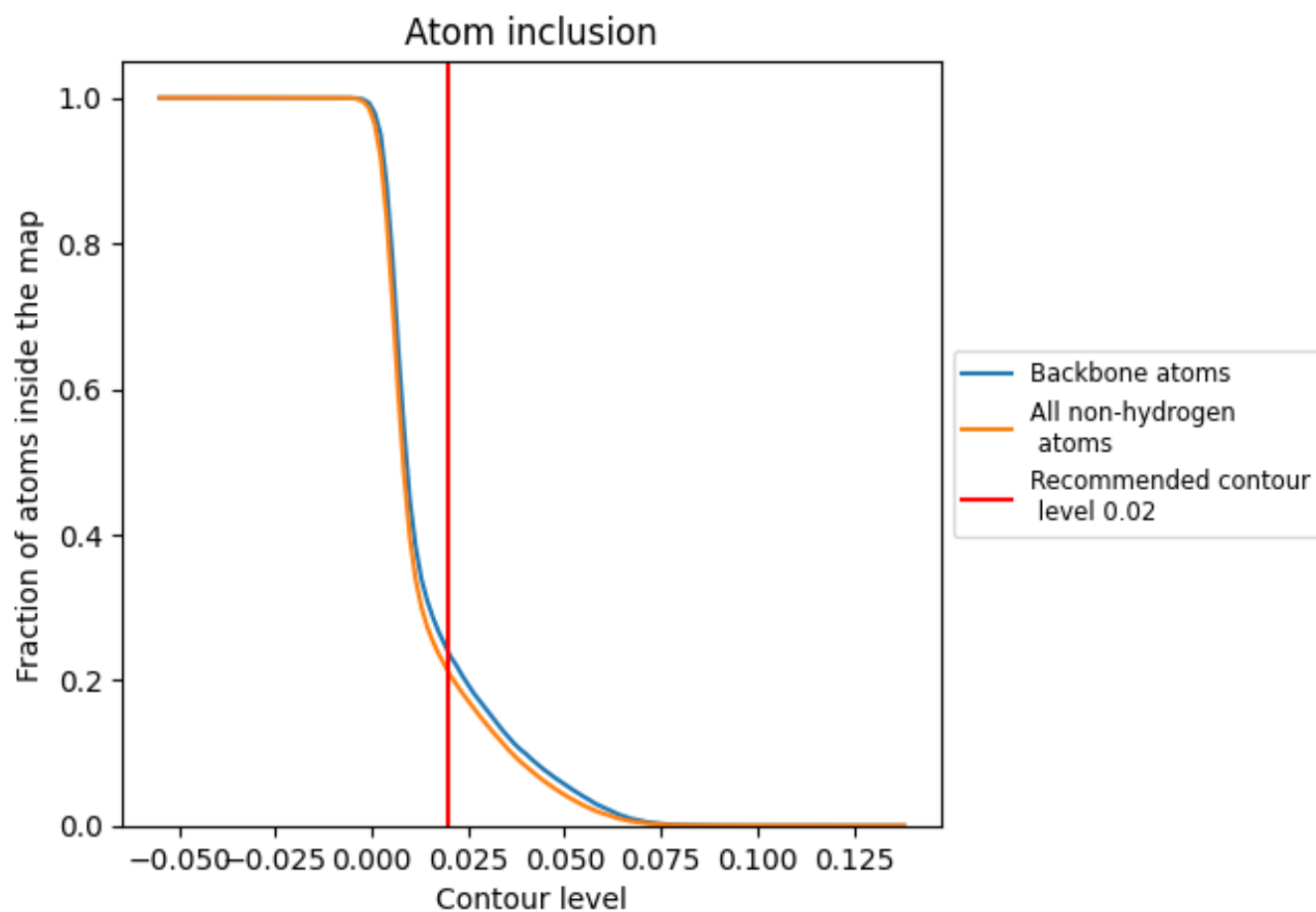
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.02).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 24% of all backbone atoms, 21% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.2108	 0.2340
A	 0.2863	 0.2990
B	 0.2481	 0.2640
C	 0.2865	 0.3000
D	 0.2473	 0.2650
E	 0.0000	 0.0570
F	 0.0000	 0.0470
G	 0.0000	 0.0570
H	 0.0000	 0.0470

