



wwPDB EM Validation Summary Report ⓘ

Apr 27, 2024 – 01:04 pm BST

PDB ID : 4V8W
EMDB ID : EMD-2357
Title : Structure and conformational variability of the Mycobacterium tuberculosis fatty acid synthase multienzyme complex
Authors : Ciccarelli, L.; Connell, S.R.; Enderle, M.; Mills, D.J.; Vonck, J.; Grininger, M.
Deposited on : 2013-04-18
Resolution : 17.50 Å(reported)
Based on initial model : 3ZEN

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.4, 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 : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

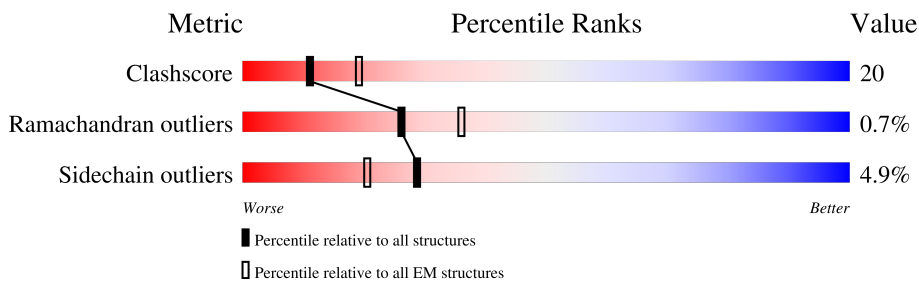
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 17.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	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	3089	
1	B	3089	
1	C	3089	
1	D	3089	
1	E	3089	
1	F	3089	

2 Entry composition i

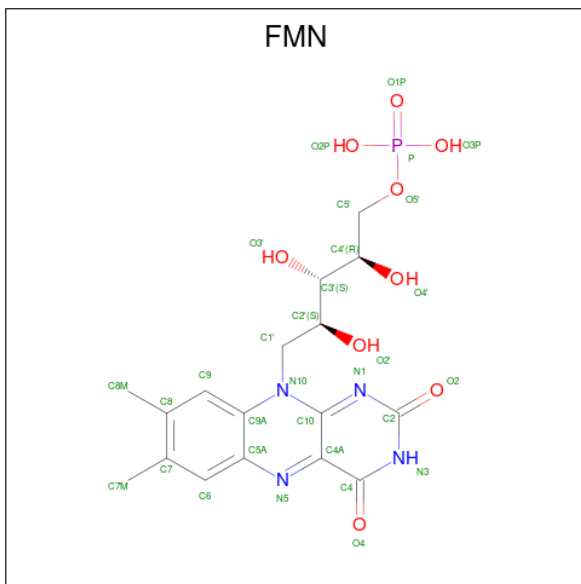
There are 2 unique types of molecules in this entry. The entry contains 123082 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 TYPE-I FATTY ACID SYNTHASE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	D	2452	Total	C	N	O	S	0	0
			18171	11459	3176	3473	63		
1	E	2822	Total	C	N	O	S	0	0
			20945	13219	3662	3998	66		
1	F	2822	Total	C	N	O	S	0	0
			20945	13219	3662	3998	66		
1	A	2822	Total	C	N	O	S	0	0
			20945	13219	3662	3998	66		
1	B	2822	Total	C	N	O	S	0	0
			20945	13219	3662	3998	66		
1	C	2822	Total	C	N	O	S	0	0
			20945	13219	3662	3998	66		

- Molecule 2 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: C₁₇H₂₁N₄O₉P).

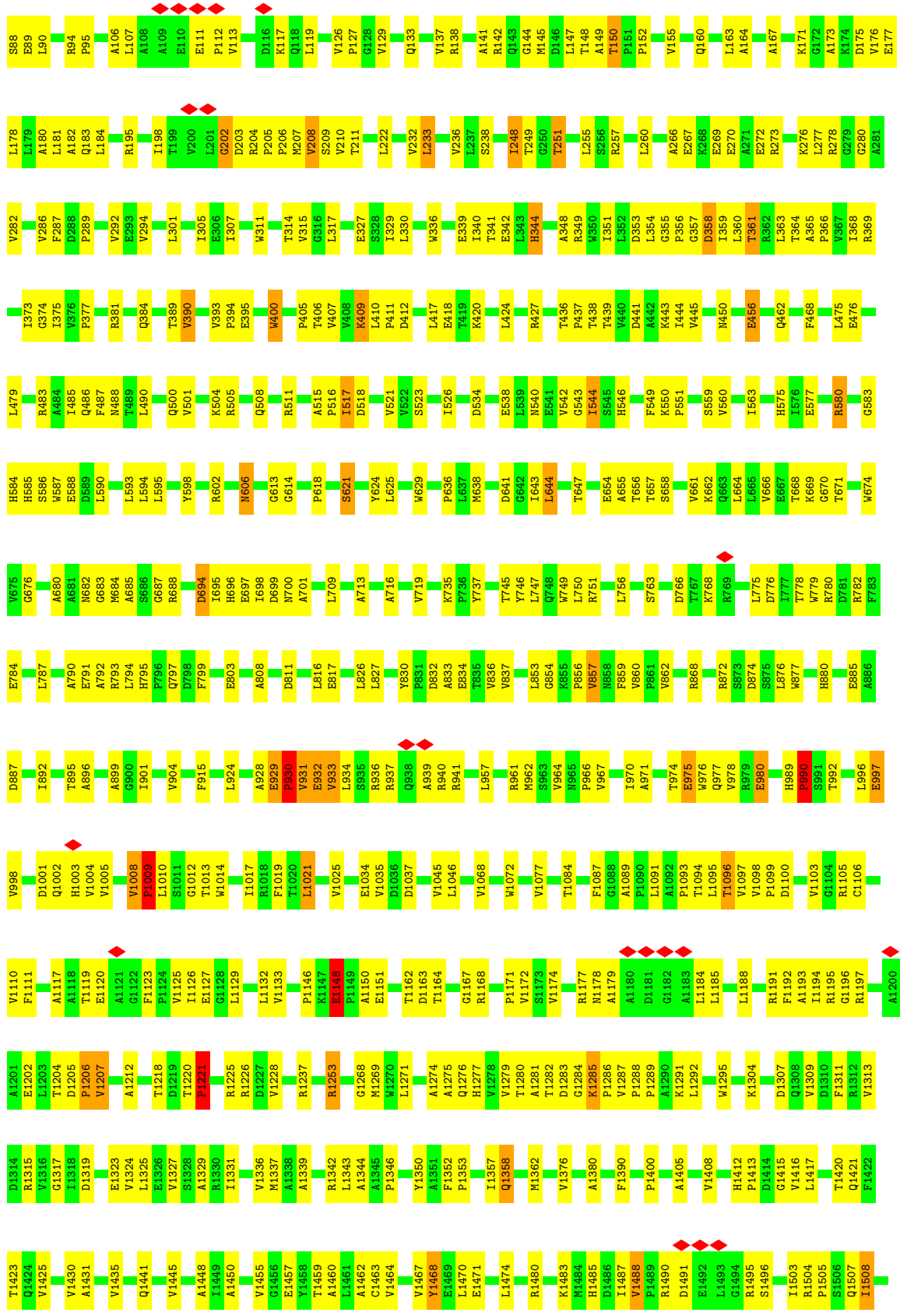


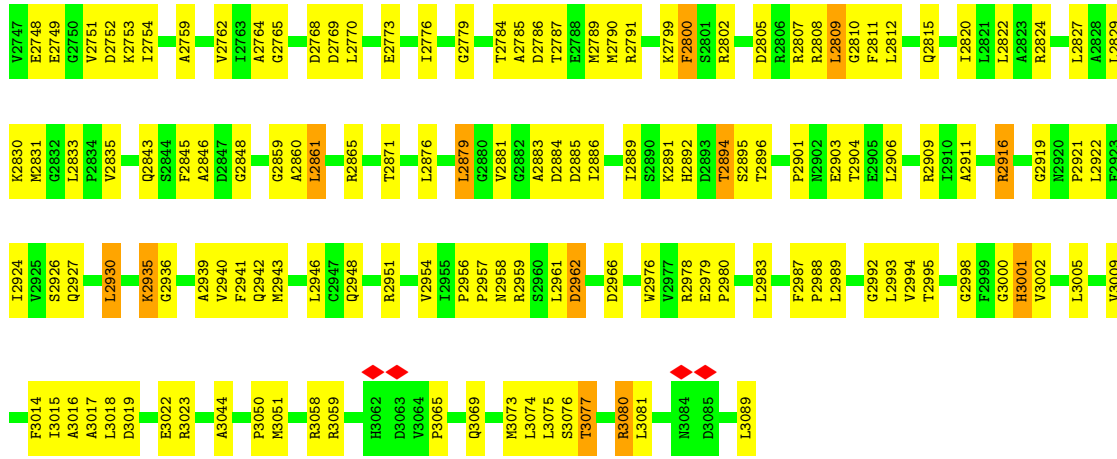
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
2	D	1	Total	C	N	O	P	0
			31	17	4	9	1	

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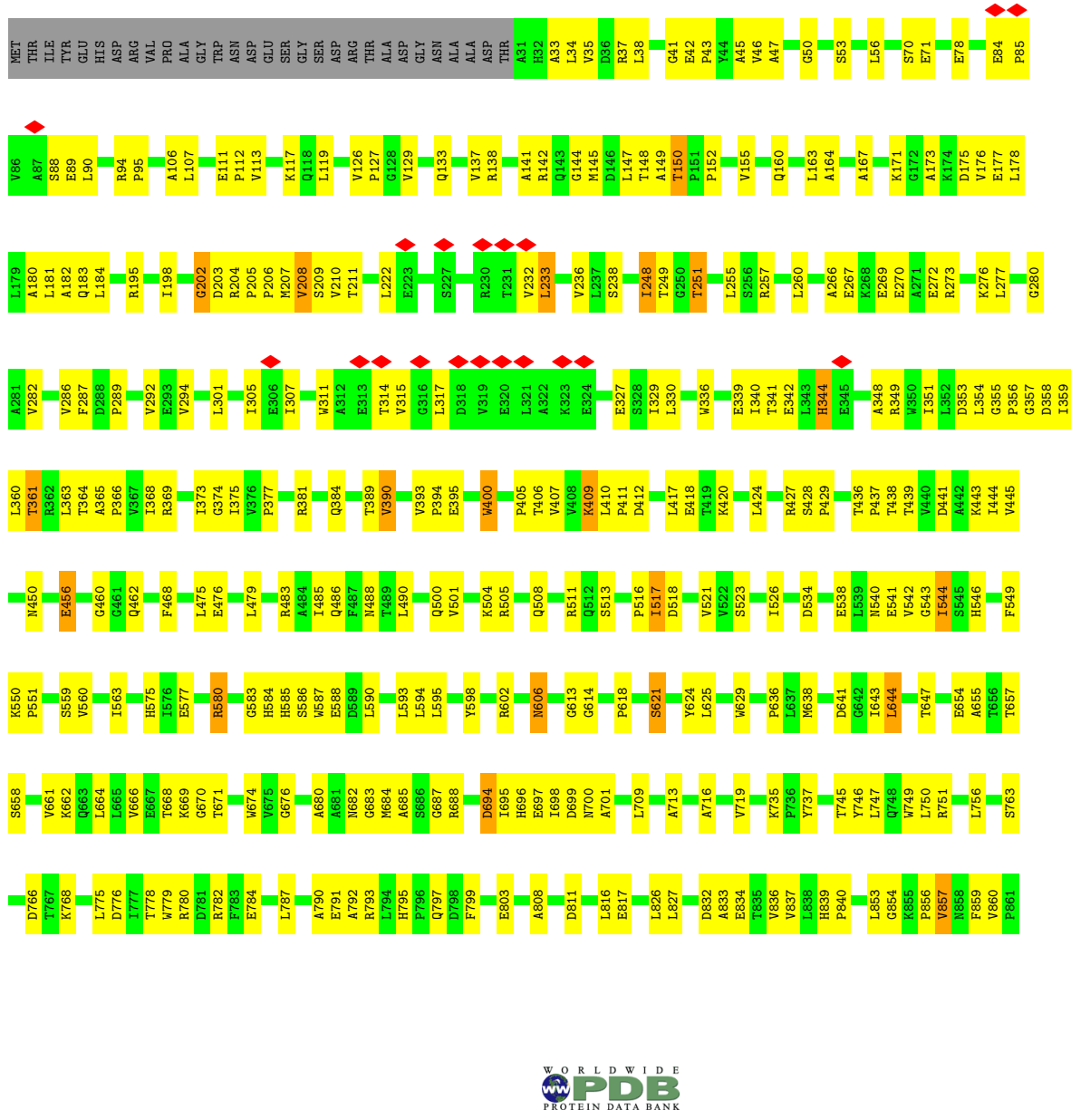
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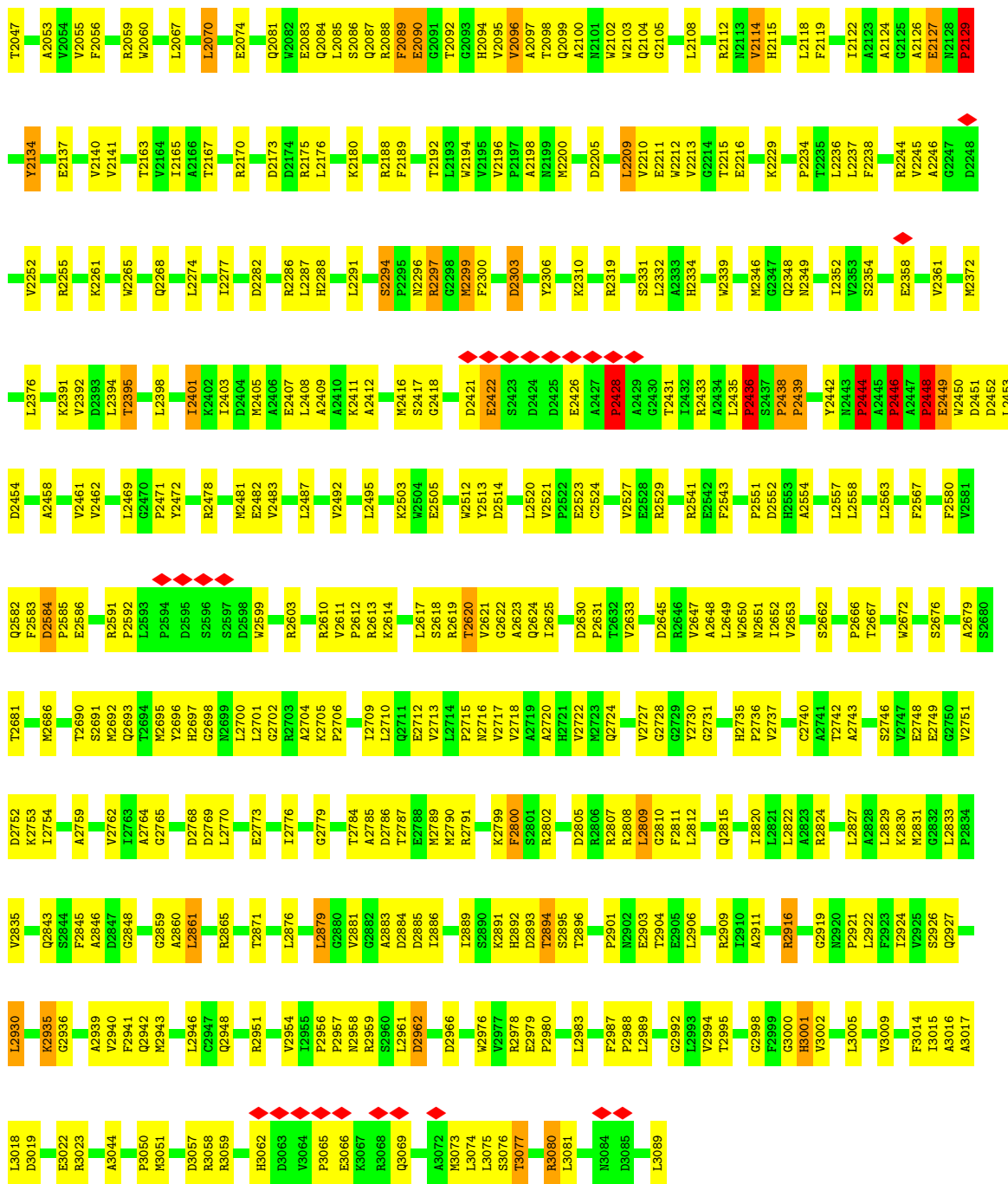
Mol	Chain	Residues	Atoms					AltConf
2	E	1	Total 31	C 17	N 4	O 9	P 1	0
2	F	1	Total 31	C 17	N 4	O 9	P 1	0
2	A	1	Total 31	C 17	N 4	O 9	P 1	0
2	B	1	Total 31	C 17	N 4	O 9	P 1	0
2	C	1	Total 31	C 17	N 4	O 9	P 1	0



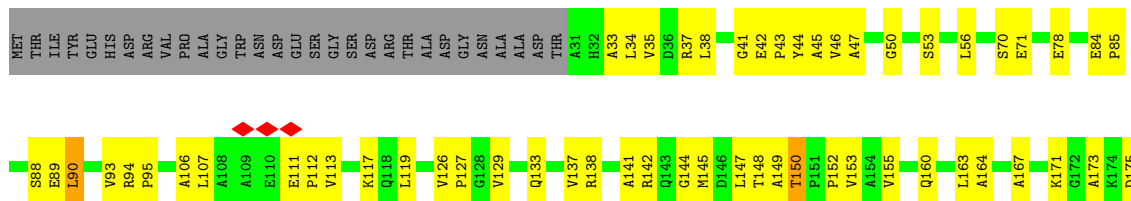


• Molecule 1: TYPE-I FATTY ACID SYNTHASE



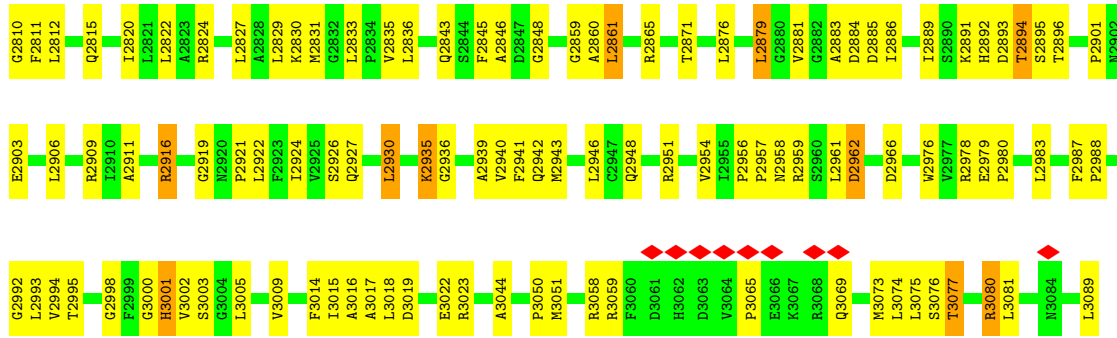


• Molecule 1: TYPE-I FATTY ACID SYNTHASE

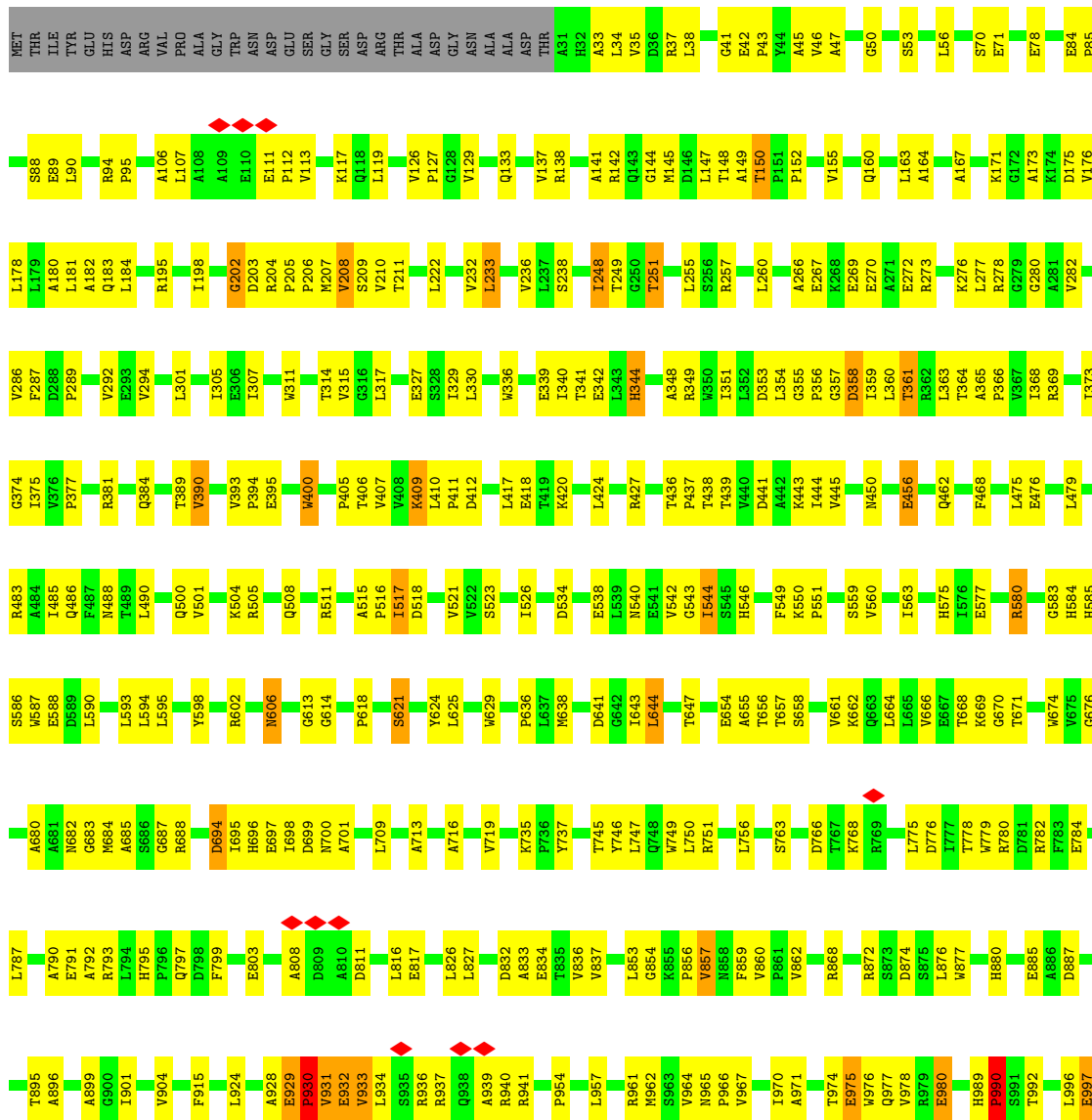


D1491	E1492	R1495	S1496	N1497	T1503	R1504	P1505	Q1506	I1508	I1509	L1510	D1511	D1514	D1517	F1518	A1519	A1520	E1521	I1522	S1523	E1524	R1525	T1526	G1527	G1527	L1529	L1530	E1531	V1532	V1533	N1534	F1535	N1536	L1537	R1538	G1539	Q1540	Q1541	A1543	I1544	A1549	G1550	L1551	E1552	A1553	L1554	E1555	E1556	E1557	R1560	R1561
V176	E177	L178	L179	A180	L181	A182	Q183	L184	R195	I198	G202	D203	R204	P205	P206	M207	V208	S209	V210	T211	L222	T231	V232	L233	V236	L237	S238	L248	T249	G250	T251	L255	S256	R257	L260	A266	E267	R268	E269	E270	A271	E272	R273	K276	L277	R278	G279	G280			
A281	V282	V286	F287	D288	P289	V292	W293	L301	I305	E306	I307	W311	T314	V315	G316	L317	E327	S328	L330	W336	E339	I340	T341	E342	L343	H344	A348	R349	W350	I351	L352	D353	L354	G355	P356	G357	D358	L359	L360	T361	R362	R363	T364	A365	P366	I368					
R369	I373	G374	I375	V376	P377	R381	Q384	R385	T389	V390	V393	P394	E395	R398	P399	W400	P405	T406	V407	T314	V408	I329	L410	P411	D412	E417	L418	E419	K420	L424	R427	T436	P437	T438	T439	D440	A441	K442	K443	I444	V445	N450	R456	G460	G461	V462					
F468	L475	E476	H584	H585	S586	R483	A484	I485	Q486	F487	M488	T489	Q500	V501	K504	R505	Q508	R511	P516	I517	D518	V521	V522	S523	I526	D534	E538	L539	N540	E541	V542	G543	I544	H546	F549	K550	P551	V661	K662	Q663	L664	L665	V666	H575	I576						
E577	R580	G583	H584	H585	S586	W587	D589	L590	L593	L594	L595	Y598	R602	N606	G613	G614	P618	S621	Y624	L625	W629	P636	L637	M638	D641	G642	I643	L644	T647	E654	T656	T657	S658	V661	T767	K768	R769	P770	D771	L775	D776										
K669	G670	T671	W674	G675	G676	A680	A681	N682	G683	M684	A685	S686	G687	R688	D689	L685	H696	E697	I698	D699	N700	A701	L709	A713	A716	V719	K735	P736	Y737	T745	Y746	L747	Q748	W749	R751	L756	S763	D766	T767	K768	R769	P770	D771	L775	D776						
T778	W779	R780	D781	R782	F783	E784	L787	A790	E791	A792	R793	L794	H795	P796	Q797	F798	D799	E803	A808	D809	A810	D811	L816	E817	L826	L827	Y830	P831	D832	A833	E834	R835	V836	L853	G854	R855	P856	N858	F859	V860	F861	V862	R868	R872	S873	D874					
S875	L876	W877	H880	D881	E885	D886	D887	I892	T895	A896	A899	G900	I901	V904	F915	L924	A928	E929	V931	E932	V933	L934	S935	R936	R937	Q938	A939	R940	R941	P954	L957	R961	N962	S963	V964	N965	P966	V967	I970	A971	T974	E975	W976	Q977	V978						
R979	E980	H989	P990	S991	T992	L996	E997	V998	D1001	Q1002	H1003	V1004	V1005	V1008	L1010	G1012	T1013	W1014	I1017	R1018	S1011	F1019	T1020	L1021	V1025	E1034	V1035	D1036	D1037	V1045	L1046	V1068	V1070	D1071	W1072	V1077	T1084	F1087	Q1088	A1089	P1090	L1091	A1092	P1093	T1094						
L1095	T1097	V1098	P1099	D1100	V1103	G1104	R1105	C1106	V1110	F1111	A1117	L1118	T1119	E1120	A1121	G1122	P1124	V1125	I1126	E1127	L1129	L1132	V1133	P1146	E1148	P1149	A1150	E1151	F1152	T1162	D1163	T1164	G1167	R1168	P1171	V1172	S1173	V1174	R1177	N1178	A1179	P1286	V1287	P1288	D1181	G1182	L1184				
L1185	L1188	R1191	F1192	A1193	L1194	R1195	G1196	R1197	A1200	A1201	E1202	L1203	T1204	D1205	P1206	V1207	A1212	T1218	D1219	T1220	F1221	R1225	L1226	D1227	V1228	R1237	R1253	G1268	M1269	V1270	L1271	A1274	A1275	Q1276	H1277	V1278	T1279	A1281	T1282	D1283	G1284	K1285	P1286	V1287	P1288	A1290	A1291				
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G2729	L2649	E2542	Y2442	M2346	E2216	R2113	G2012	ALA	ILE	ILE	ALA	A1674	A1563	
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G2731	M2651	P2551	P2444	Q2348	R2229	H2115	S2014	ALA	PRD	ILE	ALA	D1684	T1565	
I2652	I2652	D2552	A2445	N2349	P2234	L2118	D2015	ALA	GLN	THR	GLU	L1685	G1566	
P2736	I2653	A2553	P2446	R2349	T2235	F2119	V2016	SER	ARG	ASP	ALA	L1686	D1578	
V2737	S2662	A2554	A2447	T2352	L2236	F2119	V2017	GLY	ALA	GLY	ALA	L1687	P1579	
C2740	P2666	P2448	P2448	V2353	L2237	I2122	P2020	ALA	VAL	THR	ALA	F1687	P1580	
A2741	L2557	E2449	W2450	S2354	F2238	A2124	E2021	ASP	SER	SER	ALA	E1690	F1581	
T2742	D2451	W2450	D2451	E2356	R2244	G2125	V2032	ASP	ARG	ARG	ALA	G1694	H1582	
A2743	D2452	D2452	L2453	A2359	W2245	A2126	V2032	LYS	ASN	ASN	ALA	L1695	L1586	
S2746	L2453	D2454	L2454	G2360	A2246	E2127	T2047	VAL	GLY	GLN	ALA	L1695	V1590	
V2747	V2252	V2361	V2361	V2361	V2252	N2128	T2047	ILE	LYS	LEU	PRO	V1590	V1590	
F2747	R2255	M2372	M2372	M2372	R2255	P2129	A2053	ASP	ARG	GLN	ALA	R1699	E1598	
F2580	R2255	G2130	G2130	G2130	R2255	G2130	A2054	GLY	ARG	LEU	VAL	F1701	E1598	
E2748	K2261	K2131	K2131	K2131	V2055	V2054	V2054	ALA	ALA	VAL	VAL	V1701	E1598	
E2749	K2261	Y2134	Y2134	Y2134	F2056	F2056	F2056	VAL	TVR	ASP	ALA	I1702	K1605	
G2750	W2265	E2137	E2137	E2137	D2058	D2058	D2058	ALA	THR	LEU	PRO	G1704	I1611	
C2751	Q2268	V2140	V2140	V2140	W2060	W2060	W2060	VAL	VAL	GLU	ALA	K1706	G1612	
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K2753	T2277	T2163	T2163	T2163	L2070	L2070	L2070	ARG	THR	ASN	SER	T1710	I1615	
H2674	D2282	I2165	I2165	I2165	E2074	E2074	E2074	GLY	TRP	GLY	GLY	V1711	P1616	
H2675	R2286	T2167	T2167	T2167	Q2081	Q2081	Q2081	VAL	GLU	ALA	PRO	G1713	I1617	
S2676	L2287	R2170	R2170	R2170	W2082	W2082	W2082	THR	THR	ASP	ASP	L1714	I1618	
F2581	H2288	D2173	D2173	D2173	E2083	E2083	E2083	ALA	ALA	ALA	ALA	E1723	P1620	
F2581	L2291	D2174	D2174	D2174	Q2084	Q2084	Q2084	ALA	ALA	ALA	ALA	Y1724	F1622	
F2581	S2294	R2175	R2175	R2175	L2085	L2085	L2085	GLY	LYS	ASP	ASP	S1725	P1622	
F2581	M2296	L2176	L2176	L2176	Q2087	Q2087	Q2087	THR	VAL	GLY	VAL	E1730	T1624	
F2581	R2297	K2180	K2180	K2180	R2088	R2088	R2088	ALA	PHE	ALA	ALA	L1634	R1634	
F2581	M2299	R2188	R2188	R2188	E2090	E2090	E2090	ALA	ALA	ALA	ALA	V1637	V1637	
F2581	F2300	F2189	F2189	F2189	T2092	T2092	T2092	GLY	THR	THR	THR	P1638	P1638	
F2581	D2303	T2192	T2192	T2192	G2091	G2091	G2091	VAL	VAL	VAL	VAL	E1735	A1639	
F2581	S2433	W2193	W2193	W2193	W2096	W2096	W2096	ASP	ALA	ALA	ALA	D1737	T1651	
F2581	D2424	W2194	W2194	W2194	V2096	V2096	V2096	ALA	THR	THR	THR	L1741	W1652	
F2581	D2424	V2195	V2195	V2195	A2097	A2097	A2097	ALA	ALA	ALA	ALA	D1745	K1656	
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F2581	A2427	A2198	A2198	A2198	Q2099	Q2099	Q2099	THR	THR	THR	THR	ASP	K1658	
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F2581	T2431	D2209	D2209	D2209	K1992	K1992	K1992	VAL	VAL	VAL	VAL	PRO	C1661	
F2581	I2432	R2210	R2210	R2210	W2102	W2102	W2102	ARG	ARG	ARG	ARG	PRO	R1662	
F2581	R2433	Q2104	Q2104	Q2104	W2103	W2103	W2103	THR	PHE	THR	THR	GLU	K1663	
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F2581	L2435	W2212	W2212	W2212	L2108	L2108	L2108	LEU	LEU	LEU	LEU	ASP	E1667	
F2581	S2437	A2110	A2110	A2110	A2109	A2109	A2109	GLY	GLY	GLY	GLY	GLU	L1668	
F2581	P2438	G2214	G2214	G2214	G2111	G2111	G2111	LEU	LEU	LEU	LEU	PRO	V1671	
F2581	P2438	G2214	G2214	G2214	G2111	G2111	G2111	ASP	ASP	ASP	ASP	THR	Q1672	

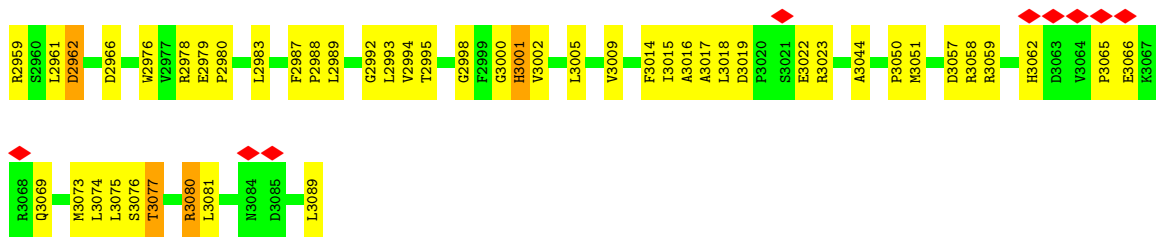


● Molecule 1: TYPE-I FATTY ACID SYNTHASE



L1668	R1562	R1480	V1376	G1284	F1087	T974	D874	L686	I563	G460	R362
Q1563	Q1563	K1483	A1380	K1285	G1088	E975	S875	V686	I563	Q461	L363
I1564	I1564	P1286	A1380	P1286	A1089	A1180	A1089	L876	I563	Q462	T364
D1578	D1578	V1287	D1181	V1287	P1090	Q977	W877	T668	I563	F468	A365
V1579	V1579	P1288	G1182	P1288	L1091	L1091	Y978	K669	I563	L475	P366
P1580	P1580	P1289	G1182	P1289	A1092	R979	H880	G670	I563	L476	I368
F1581	F1581	A1290	L1184	A1290	P1093	E880	E885	T671	I563	L479	R369
H1582	H1582	K1291	L1185	K1291	T1094	D983	A886	W674	I563	E476	I373
S1583	S1583	L1292	L1188	L1292	L1095	H994	D887	G775	I563	L479	G374
L1586	L1586	K1304	L1188	K1304	T1097	H994	D887	I375	I563	R483	I375
V1590	V1590	D1307	R1191	D1307	V1098	H989	I892	S586	I563	A484	V376
E1598	E1598	Q1308	F1192	Q1308	P1099	S991	T895	E588	I563	I485	P377
K1605	K1605	V1309	A1193	V1309	D1100	T992	A896	D589	I563	Q486	R381
D1606	D1606	D1310	I1194	D1310	V1103	A899	A899	L590	I563	F487	Q384
P1607	P1607	F1311	R1195	F1311	R1104	G900	G900	L593	I563	L488	Q384
I1611	I1611	R1312	G1196	R1312	R1105	A909	A909	L594	I563	T489	T389
G1612	G1612	V1313	R1197	V1313	C1106	E937	I901	L595	I563	L490	V390
I1618	I1618	E834	E1202	E834	V1110	D1001	V904	Y598	I563	Q500	V393
D1613	D1613	V1316	L1203	V1316	F1111	Q1002	F915	R602	I563	V501	P394
P1616	P1616	G1317	D1204	G1317	A1117	H1003	F799	E395	I563	K504	E395
M1617	M1617	I1318	P1206	I1318	A1118	V1004	E803	M606	I563	R505	W400
V1619	V1619	D1319	V1207	D1319	E1120	V1005	L924	Q608	I563	Q508	P405
P1620	P1620	E1323	A1212	E1323	F1123	V1008	G925	G613	I563	R511	T406
R1621	R1621	V1324	L1325	V1324	P1124	P1009	A926	G614	I563	P516	V407
F1622	F1622	L1326	T1218	L1326	G925	D809	A810	W700	I563	I517	V408
P1623	P1623	V1327	D1219	V1327	L1010	A810	D811	A700	I563	D518	L410
L1624	L1624	S1328	T1220	S1328	S1012	L709	L709	S621	I563	V521	D412
G1627	G1627	A1329	P1221	A1329	G927	A928	A928	Y624	I563	V522	L417
L1625	L1625	R1330	R1225	R1330	E1128	E930	E930	L625	I563	S623	E418
F1629	F1629	G1332	R1226	G1332	L1132	V931	V931	L629	I563	I526	K420
I1633	I1633	S1333	D1227	S1333	V1133	E932	E932	P636	I563	D634	L424
R1634	R1634	V1336	V1228	V1336	P1146	F1019	V933	L637	I563	E538	R427
S1725	S1725	M1337	R1237	M1337	K1147	T1020	L934	L644	I563	N540	T436
V1637	V1637	A1338	M1247	A1338	E1148	L1021	L934	V542	I563	V542	P437
A1639	A1639	A1339	P1248	A1339	P1149	V1025	S935	G543	I563	I544	T438
D1650	D1650	R1342	M1247	R1342	A1150	E1034	R936	P856	I563	S645	T439
T1651	T1651	L1343	P1248	L1343	E1151	V1035	R937	V857	I563	H546	D441
W1652	W1652	A1344	P1248	A1344	F1152	D1036	Q938	G642	I563	H546	D441
K1656	K1656	A1345	G1268	A1345	T1162	D1037	R940	L644	I563	F549	A442
P1657	P1657	C1462	M1269	C1462	D1162	R1045	R941	V542	I563	F549	A442
P1657	P1657	L1271	L1271	L1271	T1164	V1045	R941	G543	I563	K550	I444
E1658	E1658	A1350	L1271	A1350	T1164	L1046	P954	P856	I563	P651	V445
L1660	L1660	A1351	A1274	A1351	G1167	V1068	L957	L796	I563	S659	N450
E1661	E1661	F1352	A1275	F1352	R1168	T1069	L957	T656	I563	T657	F443
R1662	R1662	P1353	Q1276	P1353	P1171	V1070	R961	S658	I563	T657	F443
E1663	E1663	I1357	H1277	I1357	W1072	D1071	W1072	S658	I563	S658	I444
L1666	L1666	H1359	V1279	H1359	S1173	W1072	S963	D766	I563	V661	V445
E1667	E1667	K1360	T1280	K1360	V1174	V1077	N965	T767	I563	T767	V661
		G1361	A1281	G1361	R1177	T1084	P966	K768	I563	Q663	V660
		M1362	T1282	M1362			V967	R769	I563	Q663	V660
			D1283				I970	P770	I563	L664	E456
							A971		I563		

V2881	T2787	E2712	R2619	P2592	D2425	R2319	A2198	W2101	L2000	GLY
G2882	E2788	V2713	T2620	E2523	E2426	R2319	D2205	W2102	L2000	GLY
A2883	M2789	L2714	V2621	E2524	A2427	K2324	P2209	W2103	Q2010	ASP
D2884	M2790	P2715	G2622	E2525	P2428	K2324	L2209	Q2104	L2011	LEU
D2885	R2791	N2716	A2623	E2526	A2429	E2328	W2210	G2105	G2012	LEU
L2886		Q2624	A2624	V2527	T2431	E2328	E2209	SER	G2013	THR
		V2718	L2625	E2528	T2432	E2328	E2211	ASP	L2014	ALA
T2889	F2800	A2719	D2630	R2529	T2433	S2331	W2212	L2108	L2013	ALA
S2890	S2801	A2720	D2631	R2530	R2433	L2332	W2213	A2109	S2014	SER
K2891	R2802	H2721	P2632	A2533	A2434	A2333	G2214	A2110	D2015	ILE
H2892		V2722	V2633	A2533	L2435	H2334	T2215	ALA	V2016	ALA
D2893	D2805	N2723	V2633	A2533	S2436	H2334	T2215	ALA	V2017	ALA
T2894	F2806	Q2724	D2645	R2541	S2437	W2339	E2216	LEU	T2018	THR
S2895	R2807		D2645	E2542	P2438		K2229	ALA	T2019	ALA
T2896	R2808	V2727	E2646	F2543	P2439	M2346		ALA	T2019	ALA
P2901	L2809	G2728	V2647	F2543	Y2442	Q2347	P2234	VAL	P2020	ALA
N2902	G2810	G2729	A2648	P2551	N2443	Q2348	T2235	ASP	E2021	ALA
E2903	F2811	Y2730	L2649	D2552	N2444	N2349	L2236	VAL	A2022	ALA
	L2812	G2731	W2650	H2553	P2444	L2347	L2237	ARG	A2023	ALA
			N2651	A2554	A2445	T2352	F2238	ARG	T2024	ALA
	Q2815	H2735	I2652	A2555	P2446	V2353	R2244	ASN	V2032	ALA
		P2736	V2653	P2556	A2447	S2354	V2245	GLN	V2032	ALA
	I2820	V2737	V2653	L2557	P2448	E2358	A2246	LEU	T2047	VAL
	L2822	C2740	S2662	L2558	E2449	E2358	S2247	PRO	T2047	VAL
	A2823	A2741	T2665	L2563	W2450	V2361	S2248	ASP	A2053	ALA
	R2824	T2742	P2666	F2567	D2451	M2372	G2248	LEU	V2054	ALA
		A2743	T2667	F2567	D2452	L2376	V2262	PRO	V2054	ALA
					L2453	L2376	R2255	GLY	F2056	ALA
		S2746	W2672	E2574	D2454	L2376	R2255	VAL	D2057	ALA
	L2827	V2747	S2676	A2575	A2458	K2391	K2261	THR	D2058	PRO
	L2829	E2748	S2676	F2580	V2461	V2392	R2261	ASN	R2059	SER
	K2830	E2749	S2676	V2581	V2462	D2393	W2265	GLY	W2060	GLY
	M2831	G2750	A2679	Q2582	V2462	L2394	Q2268	THR	L2067	GLY
	L2832	D2751	S2680	V2583	L2469	G2370	L2274	THR	L2070	ARG
	L2833	D2752	A2681	D2584	G2370	D2400	I2277	LEU	E2074	ALA
	P2834	K2753	M2686	P2585	Y2472	I2401	I2277	PRO	D2079	ALA
	V2835	L2754		E2586	R2478	K2402	R2286	THR	A2080	ALA
					M2481	D2404	L2287	ALA	Q2081	ALA
	Q2843	K2758	T2690	P2591	E2482	M2405	H2288	GLY	Q2082	ALA
	S2844	A2759	S2691	P2592	V2483	L2408	L2291	THR	E2083	ALA
	F2845	A2759	M2692	L2594	V2483	A2409	S2294	ALA	Q2084	ALA
	A2846		Q2693	P2594	L2487	A2409	P2295	THR	L2065	ALA
	D2847	V2762	T2694	D2595	L2487	A2409	R2297	GLY	S2086	THR
	G2848	L2763	M2695	D2598	V2492	A2412	M2296	VAL	Q2087	ALA
	A2855	A2764	M2695	W2599	V2492	A2412	R2297	ALA	R2088	ALA
	P2856	G2765	M2696	R2603	L2495	M2416	G2298	LEU	F2089	ILE
	H2697	D2768	H2697	R2610	L2495	S2417	W2299	THR	E2090	ALA
	G2698	S2697	S2698	V2611	K2503	G2418	F2300	ALA	G2091	ALA
	N2699	D2769	D2598	P2612	W2504	A2419	F2189	GLY	T2092	ALA
	L2700	L2770	W2599	R2613	E2505	A2419	F2189	THR	H2094	ALA
	L2701	E2773	G2702	K2614	E2505	A2419	F2189	THR	G2094	ALA
	G2702			L2617	W2512	A2419	F2189	THR	L1986	ALA
	A2704			S2618	W2512	A2419	F2189	THR	L1986	ALA
	K2705	G2779			E2513	A2419	F2189	THR	F1989	ALA
	P2706				W2513	A2419	F2189	THR	K1992	ALA
	L2709	T2784			W2513	A2419	F2189	THR	P1996	ALA
	L2710	D2786			L2520	A2419	F2189	THR	P1996	ALA
	Q2711				V2521	A2419	F2189	THR	P1996	ALA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	9136	Depositor
Resolution determination method	Not provided	
CTF correction method	Not provided	
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	Not provided	
Minimum defocus (nm)	1800	Depositor
Maximum defocus (nm)	4500	Depositor
Magnification	59000	Depositor
Image detector	KODAK SO-163 FILM	Depositor
Maximum map value	9.063	Depositor
Minimum map value	-2.149	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	2.0	Depositor
Map size (\AA)	456.0, 456.0, 456.0	wwPDB
Map dimensions	200, 200, 200	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	2.28, 2.28, 2.28	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: FMN

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	27/21335 (0.1%)	0.51	13/29037 (0.0%)
1	B	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
1	C	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
1	D	0.41	26/18511 (0.1%)	0.50	13/25179 (0.1%)
1	E	0.39	26/21335 (0.1%)	0.51	13/29037 (0.0%)
1	F	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
All	All	0.40	160/125186 (0.1%)	0.51	78/170364 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	5
1	B	0	5
1	C	0	5
1	D	0	2
1	E	0	5
1	F	0	5
All	All	0	27

The worst 5 of 160 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	2442	TYR	CB-CG	-6.39	1.42	1.51
1	A	2442	TYR	CB-CG	-6.35	1.42	1.51
1	B	2442	TYR	CB-CG	-6.35	1.42	1.51
1	D	2442	TYR	CB-CG	-6.33	1.42	1.51
1	F	2442	TYR	CB-CG	-6.33	1.42	1.51

The worst 5 of 78 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	930	PRO	N-CA-CB	6.99	111.69	103.30
1	C	930	PRO	N-CA-CB	6.98	111.68	103.30
1	F	930	PRO	N-CA-CB	6.97	111.66	103.30
1	A	930	PRO	N-CA-CB	6.96	111.66	103.30
1	D	930	PRO	N-CA-CB	6.96	111.65	103.30

There are no chirality outliers.

5 of 27 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	1148	GLU	Peptide
1	D	2584	ASP	Peptide
1	E	150	THR	Peptide
1	E	202	GLY	Peptide
1	E	357	GLY	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	20945	0	20595	882	0
1	B	20945	0	20595	872	0
1	C	20945	0	20595	896	0
1	D	18171	0	17756	765	0
1	E	20945	0	20595	882	0
1	F	20945	0	20594	1028	0
2	A	31	0	19	4	0
2	B	31	0	19	4	0
2	C	31	0	19	4	0
2	D	31	0	19	4	0
2	E	31	0	19	4	0
2	F	31	0	19	4	0
All	All	123082	0	120844	4979	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 20.

The worst 5 of 4979 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:F:1039:ALA:HB2	1:F:1125:VAL:CG1	1.35	1.53
1:F:958:TRP:CH2	1:F:1131:SER:OG	1.76	1.38
1:F:1385:ARG:NH1	1:F:2411:LYS:NZ	1.74	1.36
1:F:953:ALA:CB	1:F:1032:ILE:HD11	1.58	1.33
1:F:2407:GLU:O	1:F:2411:LYS:HG3	1.26	1.29

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	2818/3089 (91%)	2642 (94%)	157 (6%)	19 (1%)	22	63
1	B	2818/3089 (91%)	2642 (94%)	158 (6%)	18 (1%)	25	66
1	C	2818/3089 (91%)	2642 (94%)	157 (6%)	19 (1%)	22	63
1	D	2448/3089 (79%)	2293 (94%)	138 (6%)	17 (1%)	22	63
1	E	2818/3089 (91%)	2641 (94%)	159 (6%)	18 (1%)	25	66
1	F	2818/3089 (91%)	2630 (93%)	163 (6%)	25 (1%)	17	57
All	All	16538/18534 (89%)	15490 (94%)	932 (6%)	116 (1%)	26	63

5 of 116 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	930	PRO
1	D	1148	GLU
1	D	2428	PRO
1	D	2436	PRO
1	D	2446	PRO

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	2096/2402 (87%)	1994 (95%)	102 (5%)	25	50
1	B	2096/2402 (87%)	1993 (95%)	103 (5%)	25	50
1	C	2095/2402 (87%)	1993 (95%)	102 (5%)	25	50
1	D	1808/2402 (75%)	1720 (95%)	88 (5%)	25	50
1	E	2097/2402 (87%)	1995 (95%)	102 (5%)	25	50
1	F	2097/2402 (87%)	1992 (95%)	105 (5%)	24	49
All	All	12289/14412 (85%)	11687 (95%)	602 (5%)	29	50

5 of 602 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	2196	VAL
1	C	2401	ILE
1	B	2444	PRO
1	B	2192	THR
1	C	544	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 136 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	486	GLN
1	C	1057	ASN
1	C	2651	ASN
1	F	575	HIS
1	F	540	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 ligands 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
2	FMN	E	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.27	7 (14%)
2	FMN	A	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.26	8 (16%)
2	FMN	C	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.26	7 (14%)
2	FMN	D	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.27	8 (16%)
2	FMN	B	4000	-	33,33,33	1.08	2 (6%)	48,50,50	1.26	8 (16%)
2	FMN	F	4000	-	33,33,33	1.06	2 (6%)	48,50,50	1.25	7 (14%)

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
2	FMN	E	4000	-	-	5/18/18/18	0/3/3/3
2	FMN	A	4000	-	-	5/18/18/18	0/3/3/3
2	FMN	C	4000	-	-	5/18/18/18	0/3/3/3
2	FMN	D	4000	-	-	5/18/18/18	0/3/3/3
2	FMN	B	4000	-	-	5/18/18/18	0/3/3/3
2	FMN	F	4000	-	-	5/18/18/18	0/3/3/3

The worst 5 of 12 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	4000	FMN	C4A-N5	4.16	1.38	1.30
2	A	4000	FMN	C4A-N5	4.11	1.38	1.30
2	E	4000	FMN	C4A-N5	4.11	1.38	1.30
2	D	4000	FMN	C4A-N5	4.08	1.38	1.30
2	F	4000	FMN	C4A-N5	4.07	1.38	1.30

The worst 5 of 45 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	4000	FMN	C4-N3-C2	-3.02	120.06	125.64
2	E	4000	FMN	C4-N3-C2	-2.99	120.11	125.64
2	F	4000	FMN	C4-N3-C2	-2.98	120.13	125.64
2	E	4000	FMN	C4A-C10-N10	2.98	120.83	116.48
2	D	4000	FMN	C4-N3-C2	-2.96	120.17	125.64

There are no chirality outliers.

5 of 30 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	4000	FMN	O3'-C3'-C4'-C5'
2	E	4000	FMN	O3'-C3'-C4'-C5'
2	F	4000	FMN	O3'-C3'-C4'-C5'
2	A	4000	FMN	O3'-C3'-C4'-C5'
2	B	4000	FMN	O3'-C3'-C4'-C5'

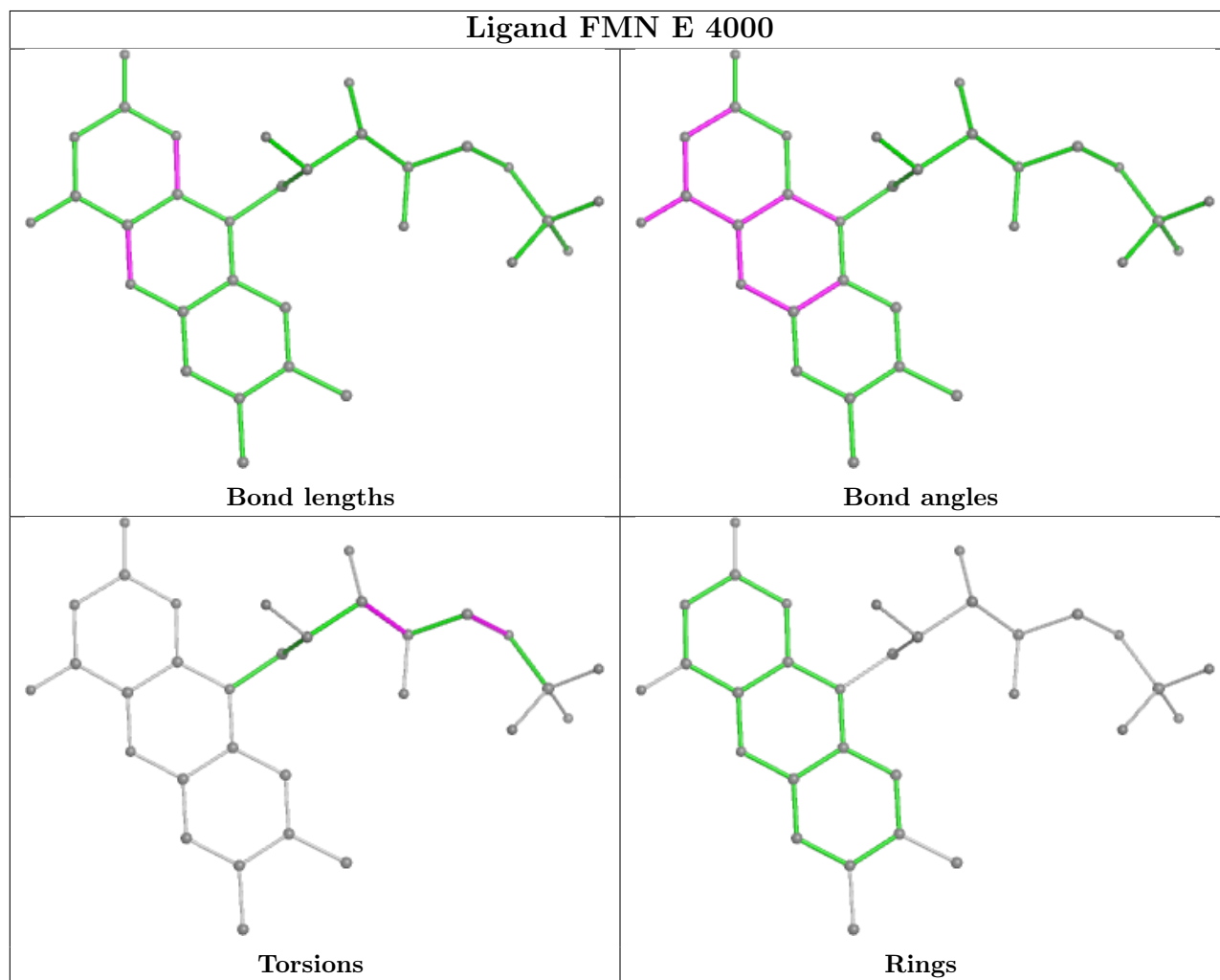
There are no ring outliers.

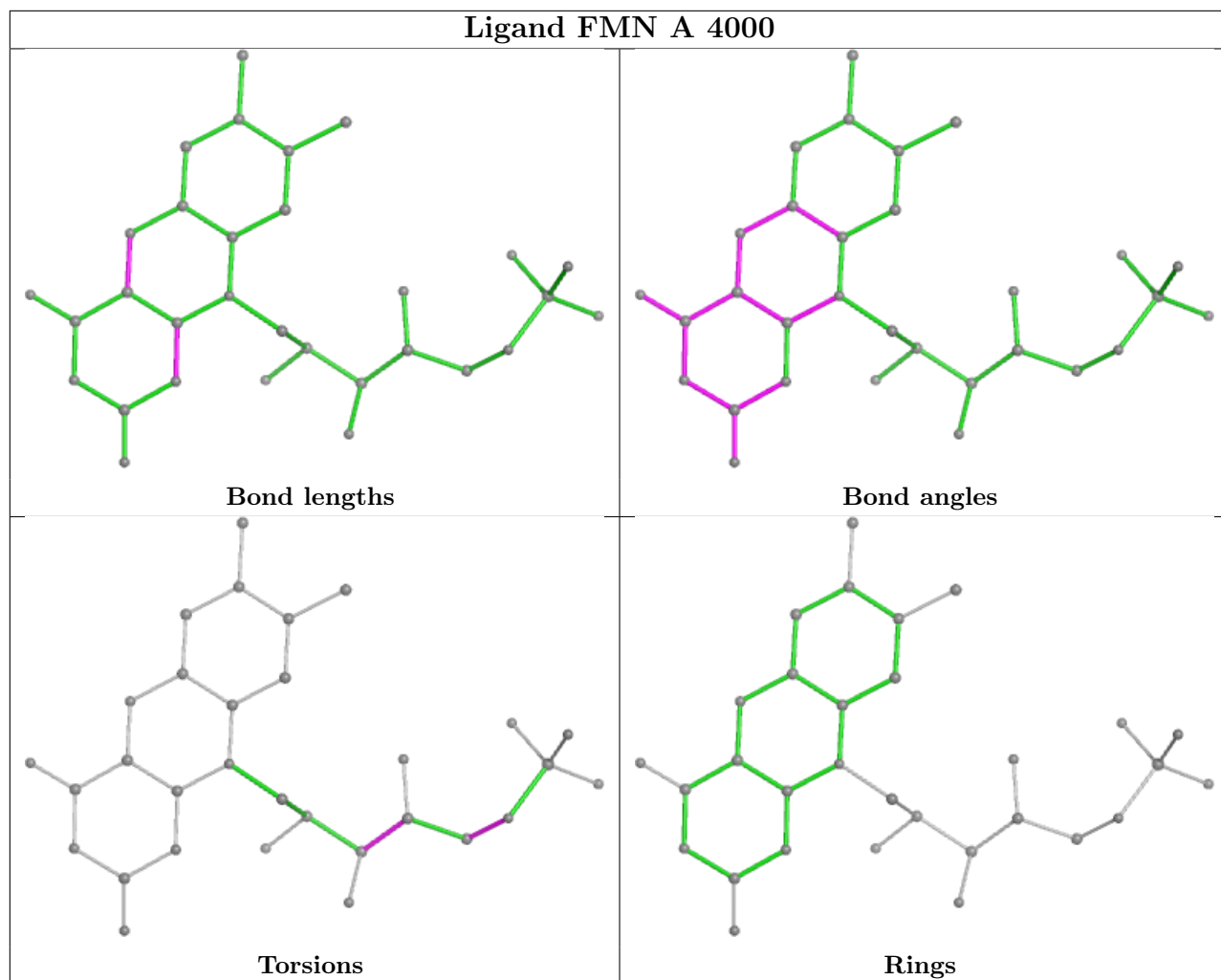
6 monomers are involved in 24 short contacts:

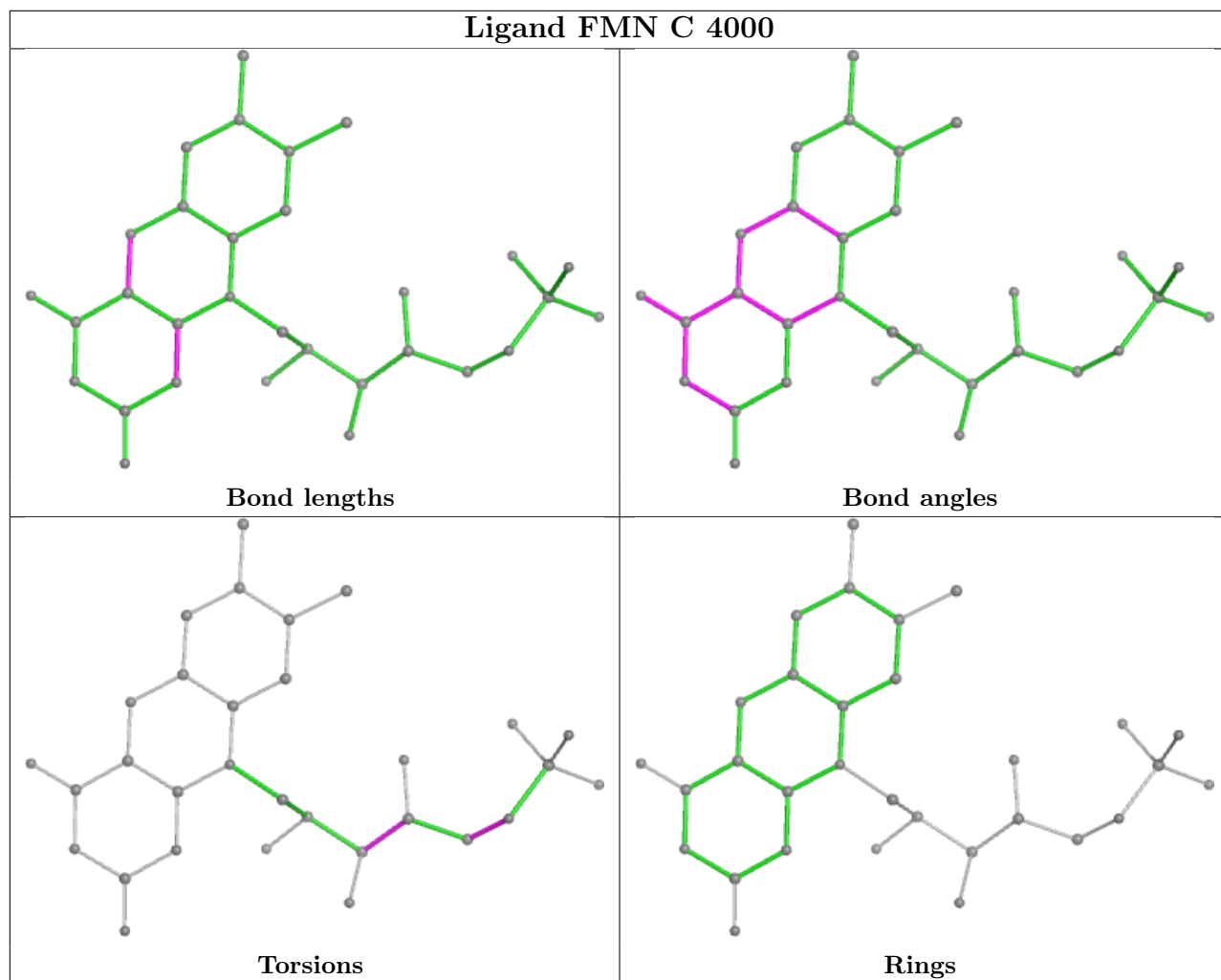
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	4000	FMN	4	0
2	A	4000	FMN	4	0
2	C	4000	FMN	4	0
2	D	4000	FMN	4	0
2	B	4000	FMN	4	0
2	F	4000	FMN	4	0

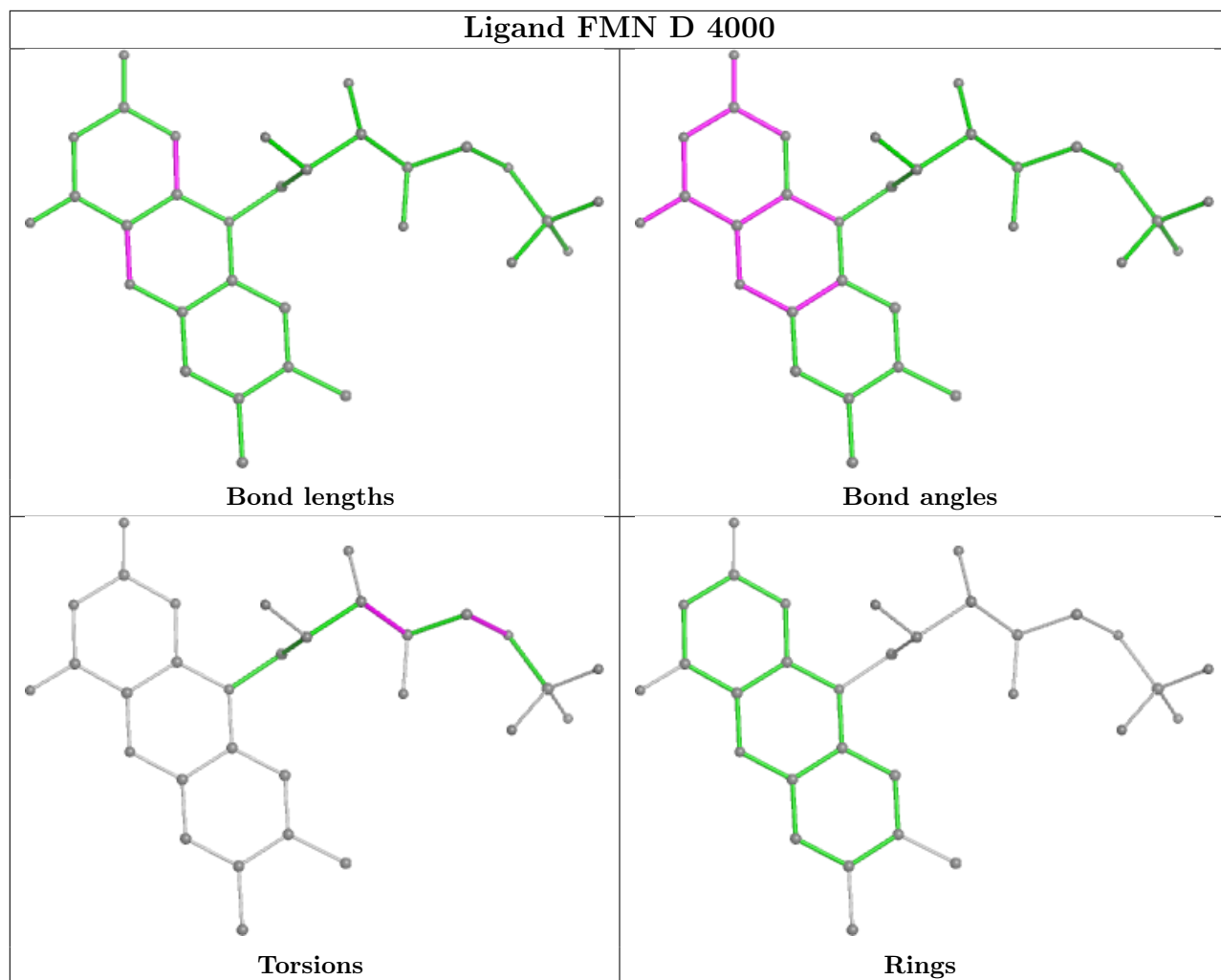
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

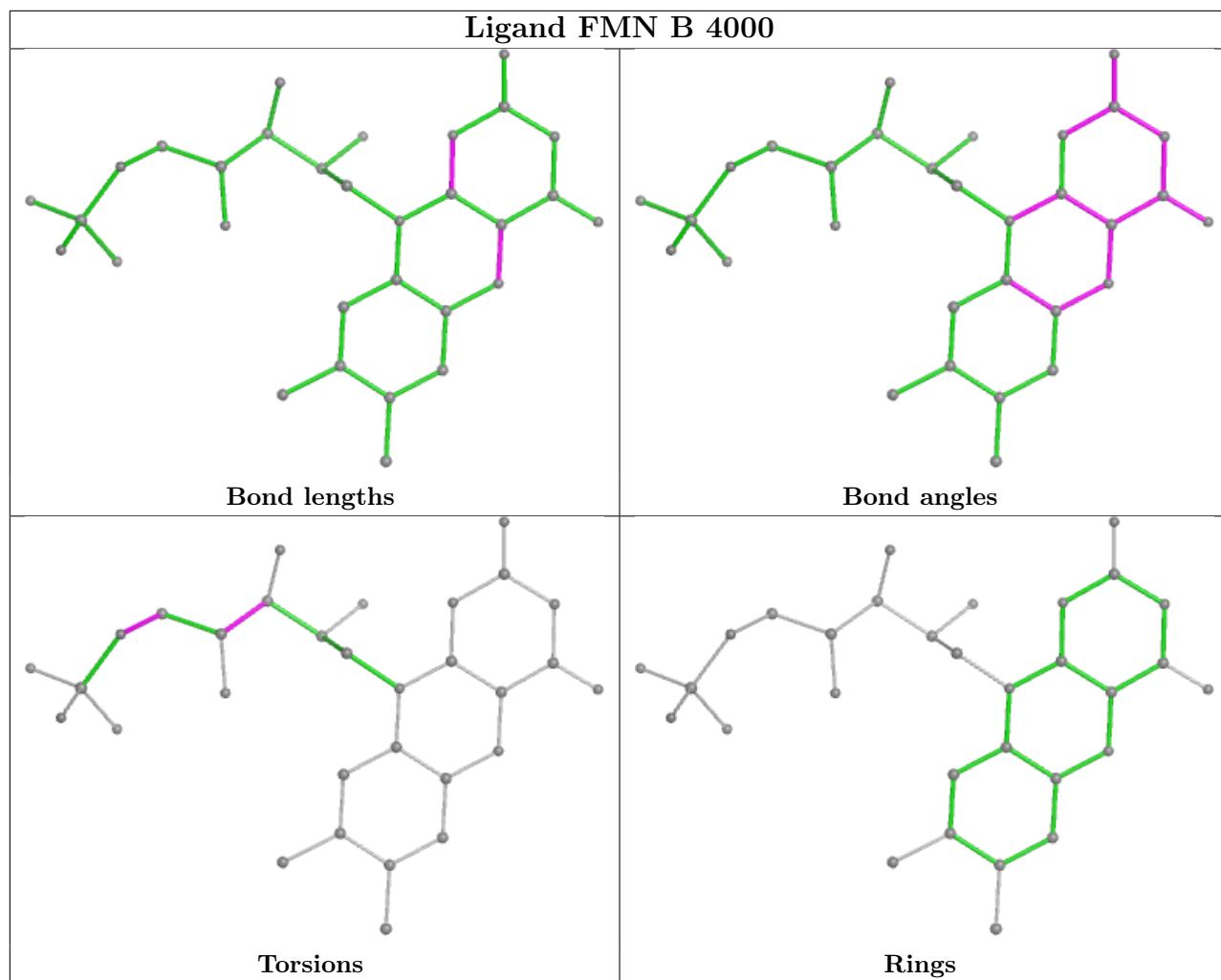
Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD 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.

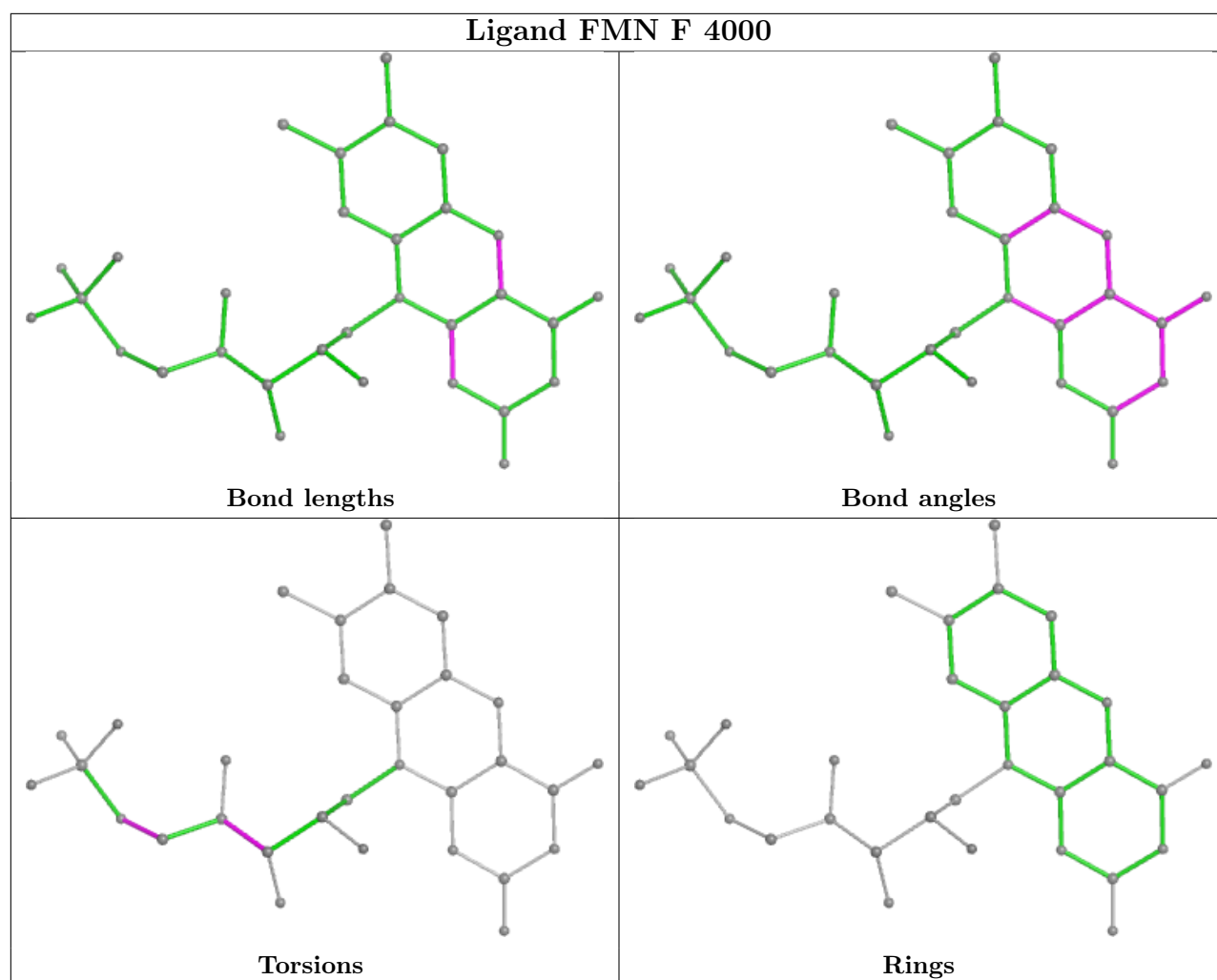












5.7 Other polymers [i](#)

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-2357. These allow visual inspection of the internal detail of the map and identification of artifacts.

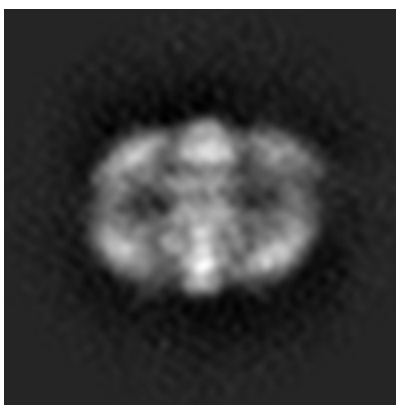
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

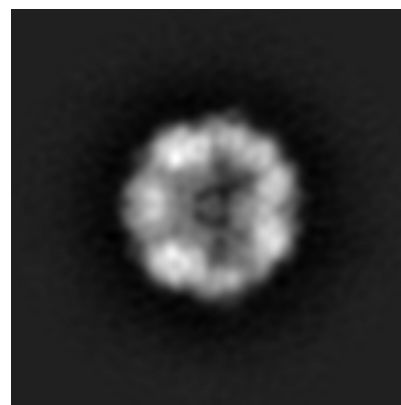
6.1.1 Primary map



X



Y

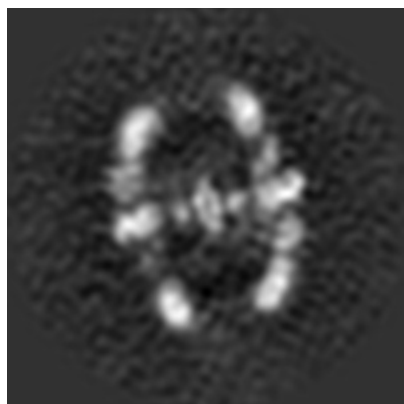


Z

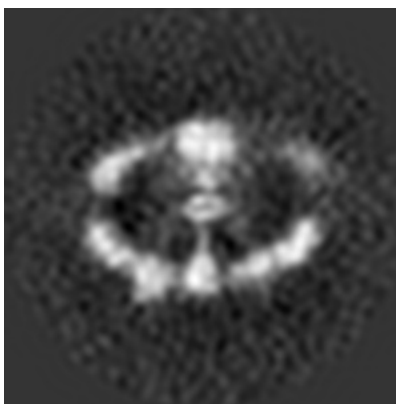
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

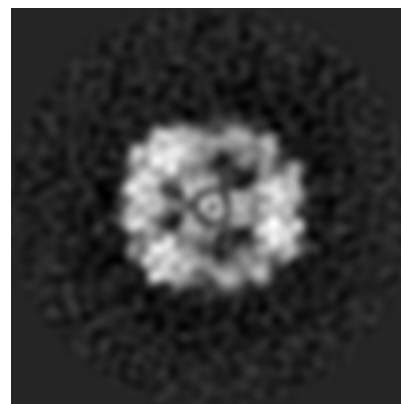
6.2.1 Primary map



X Index: 100



Y Index: 100



Z Index: 100

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

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

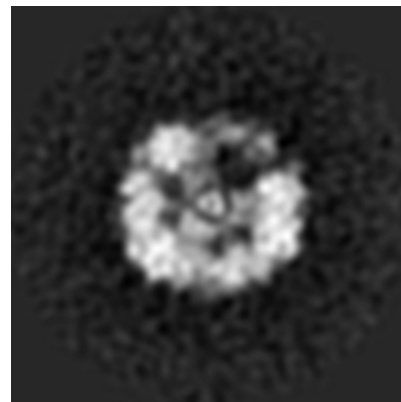
6.3.1 Primary map



X Index: 79



Y Index: 130

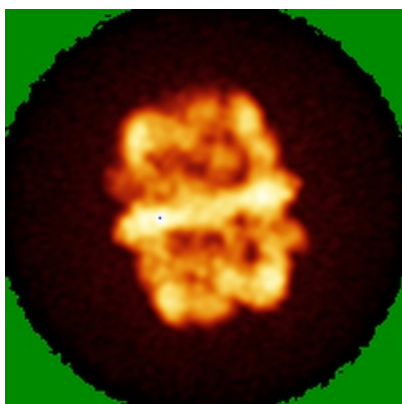


Z Index: 97

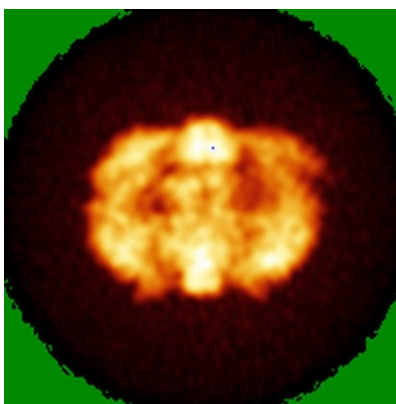
The images above show the largest variance slices of the map in three orthogonal directions.

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

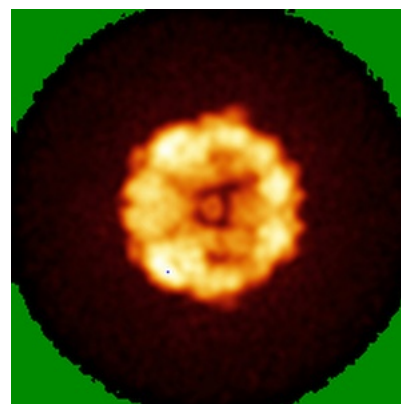
6.4.1 Primary map



X



Y

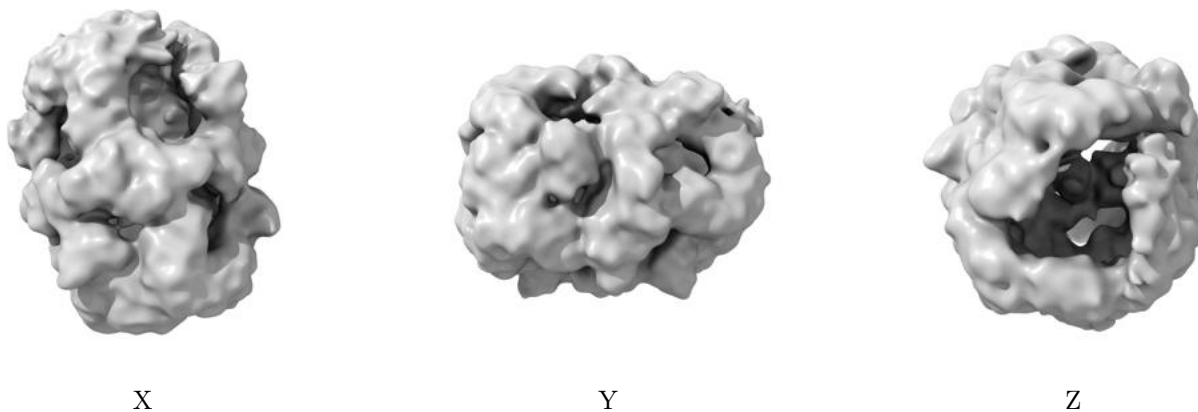


Z

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

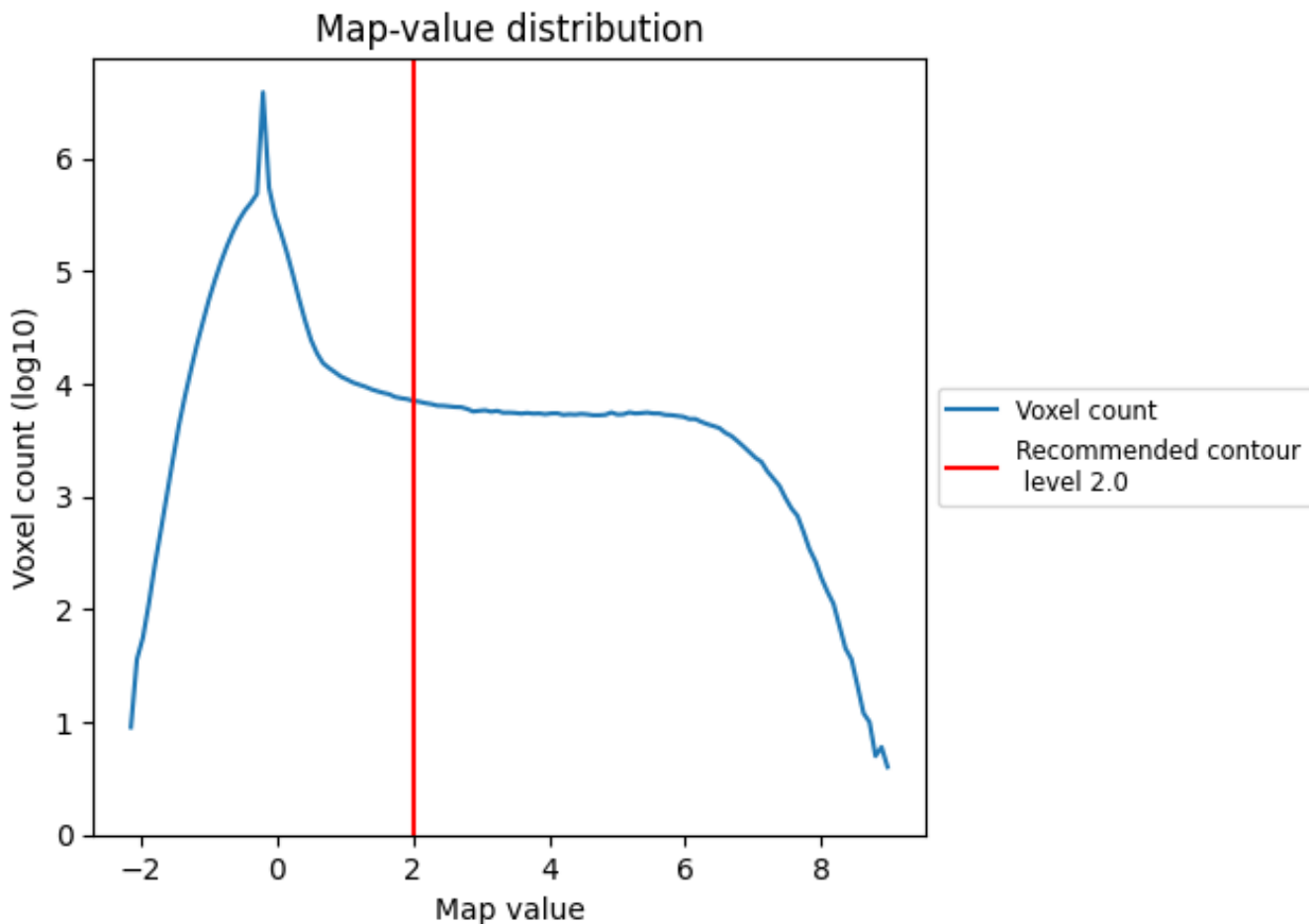
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

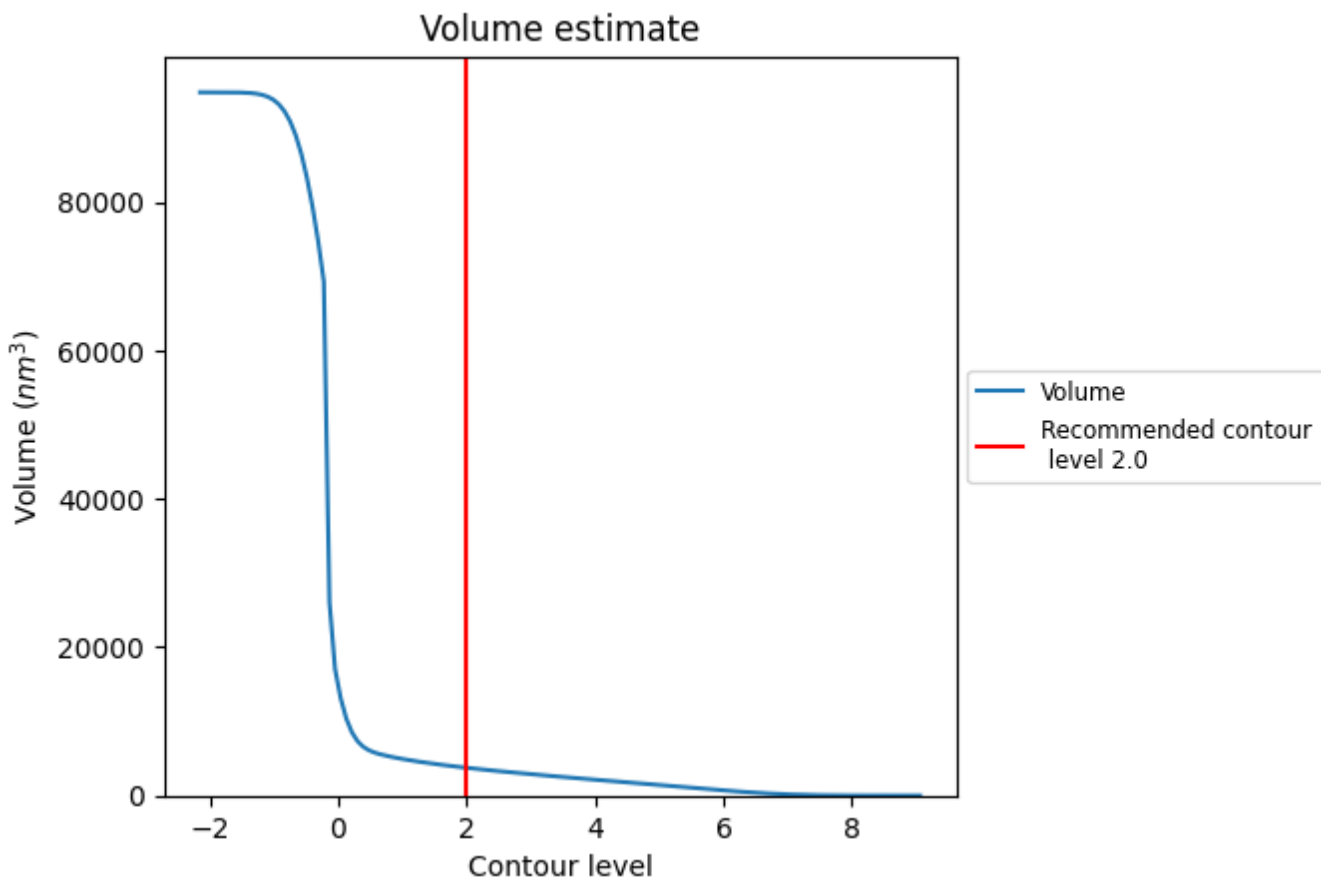
This section contains the results of statistical analysis of the map.

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.

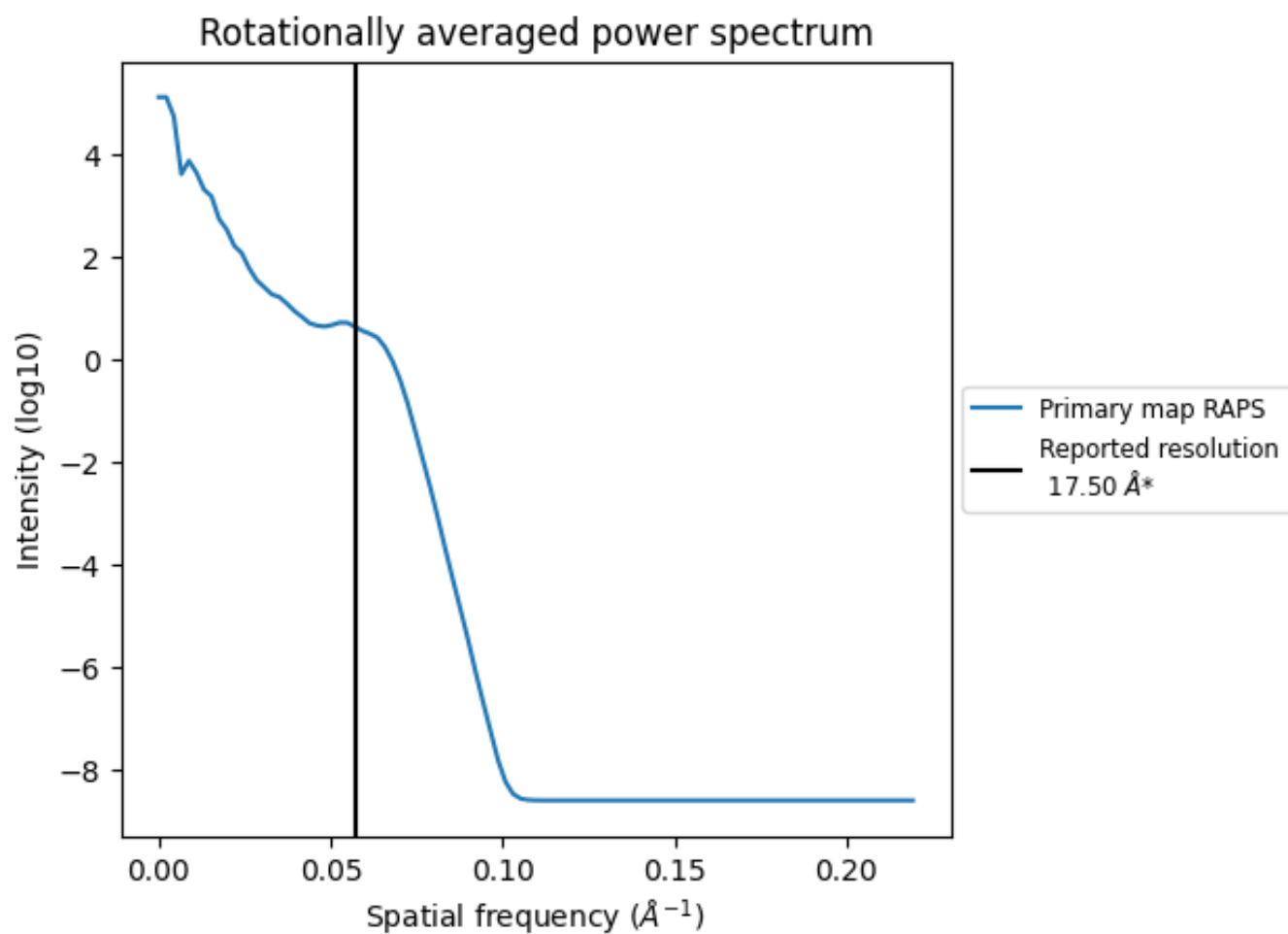
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3745 nm^3 ; this corresponds to an approximate mass of 3383 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 0.057 Å⁻¹

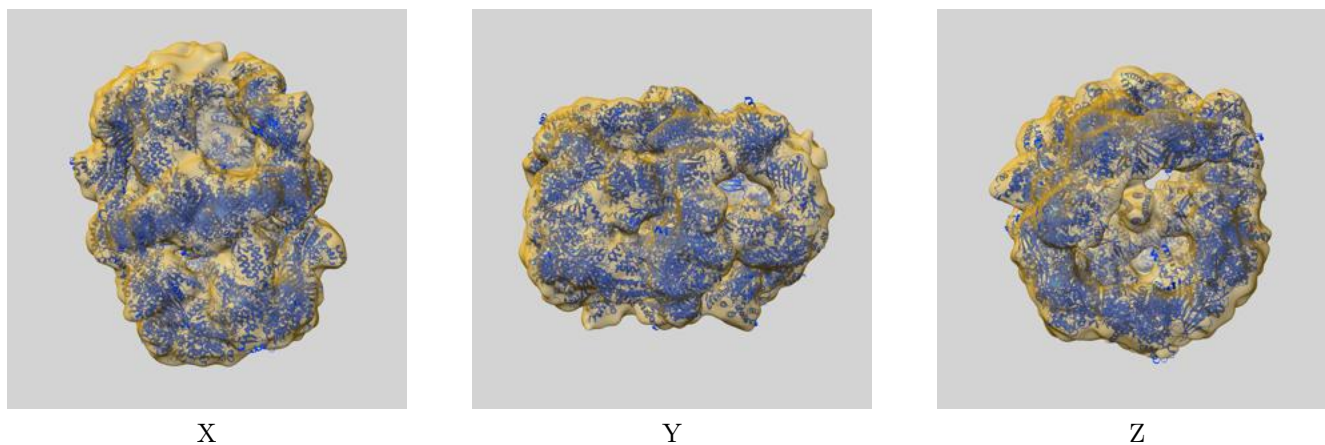
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

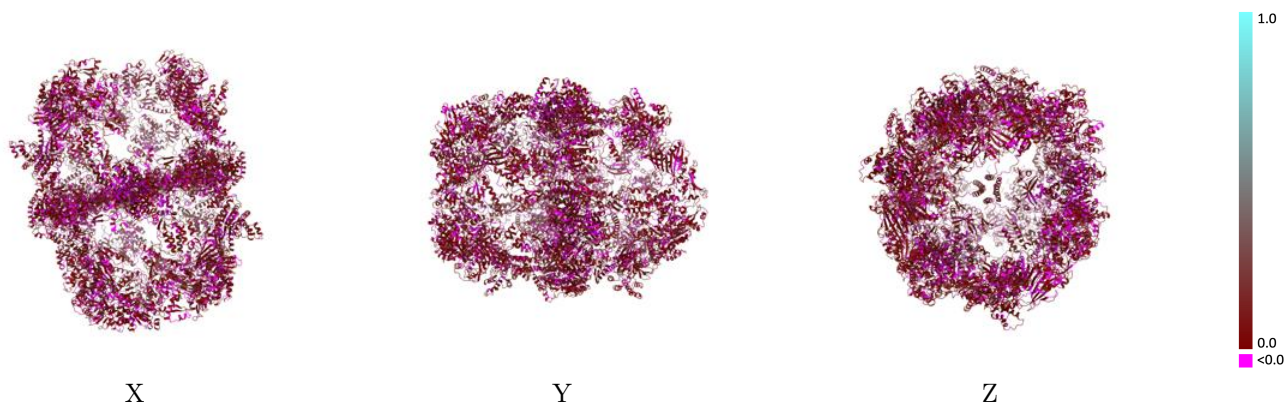
This section contains information regarding the fit between EMDB map EMD-2357 and PDB model 4V8W. Per-residue inclusion information can be found in section [3](#) on page [5](#).

9.1 Map-model overlay [i](#)



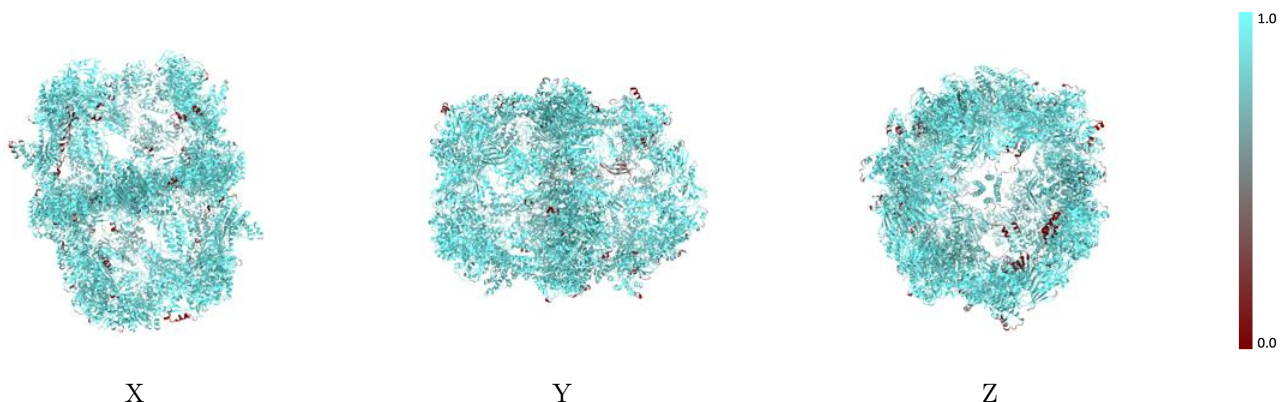
The images above show the 3D surface view of the map at the recommended contour level 2.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



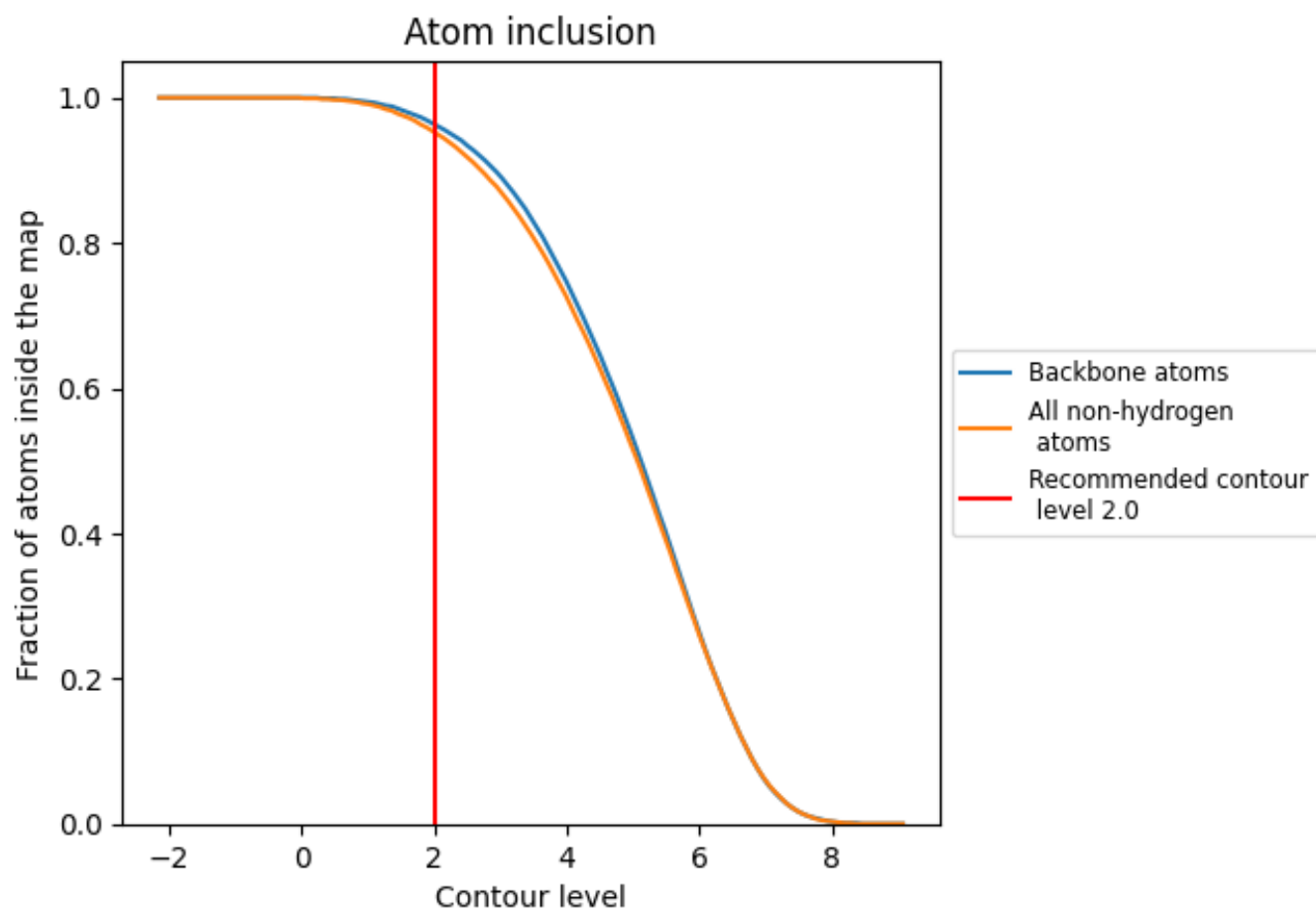
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (2.0).















9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 95% 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 (2.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9520	 0.0580
A	 0.9650	 0.0610
B	 0.9640	 0.0600
C	 0.9550	 0.0590
D	 0.9110	 0.0500
E	 0.9660	 0.0610
F	 0.9480	 0.0570

