



## wwPDB EM Validation Summary Report ⓘ

Apr 28, 2024 – 03:37 am BST

PDB ID : 4V8V  
EMDB ID : EMD-2358  
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 : 20.00 Å(reported)  
Based on initial model : 4B3Y

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

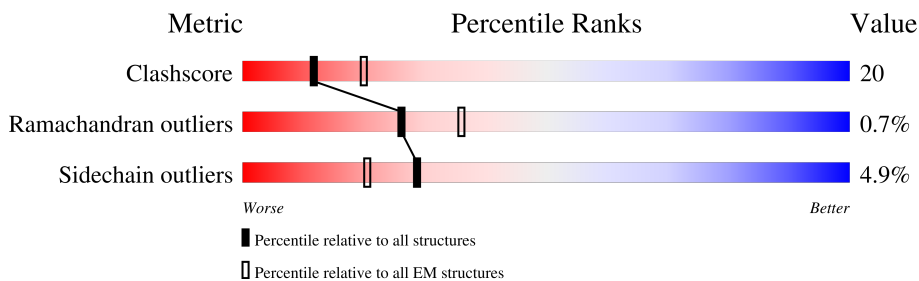
EMDB validation analysis : 0.0.1.dev92  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 20.00 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  $\geq 3$ , 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](#)

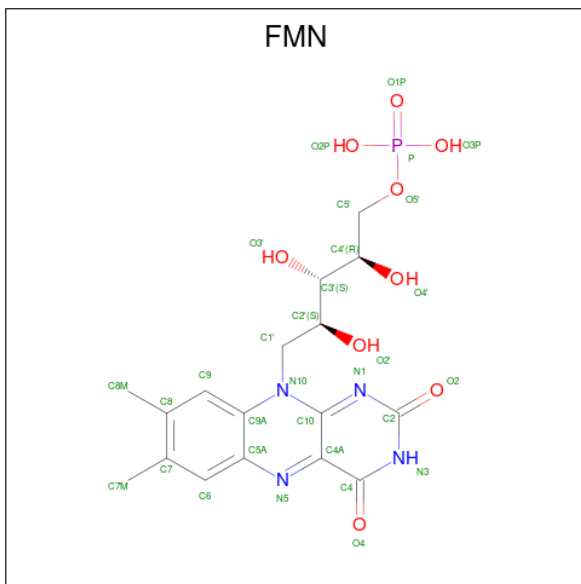
There are 2 unique types of molecules in this entry. The entry contains 125856 atoms, of which 0 are hydrogens and 0 are deuteriums.

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	A	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0
1	B	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0
1	C	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0
1	D	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0
1	E	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0
1	F	2822	Total 20945	C 13219	N 3662	O 3998	S 66	0	0

- Molecule 2 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: C<sub>17</sub>H<sub>21</sub>N<sub>4</sub>O<sub>9</sub>P).



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

*Continued on next page...*

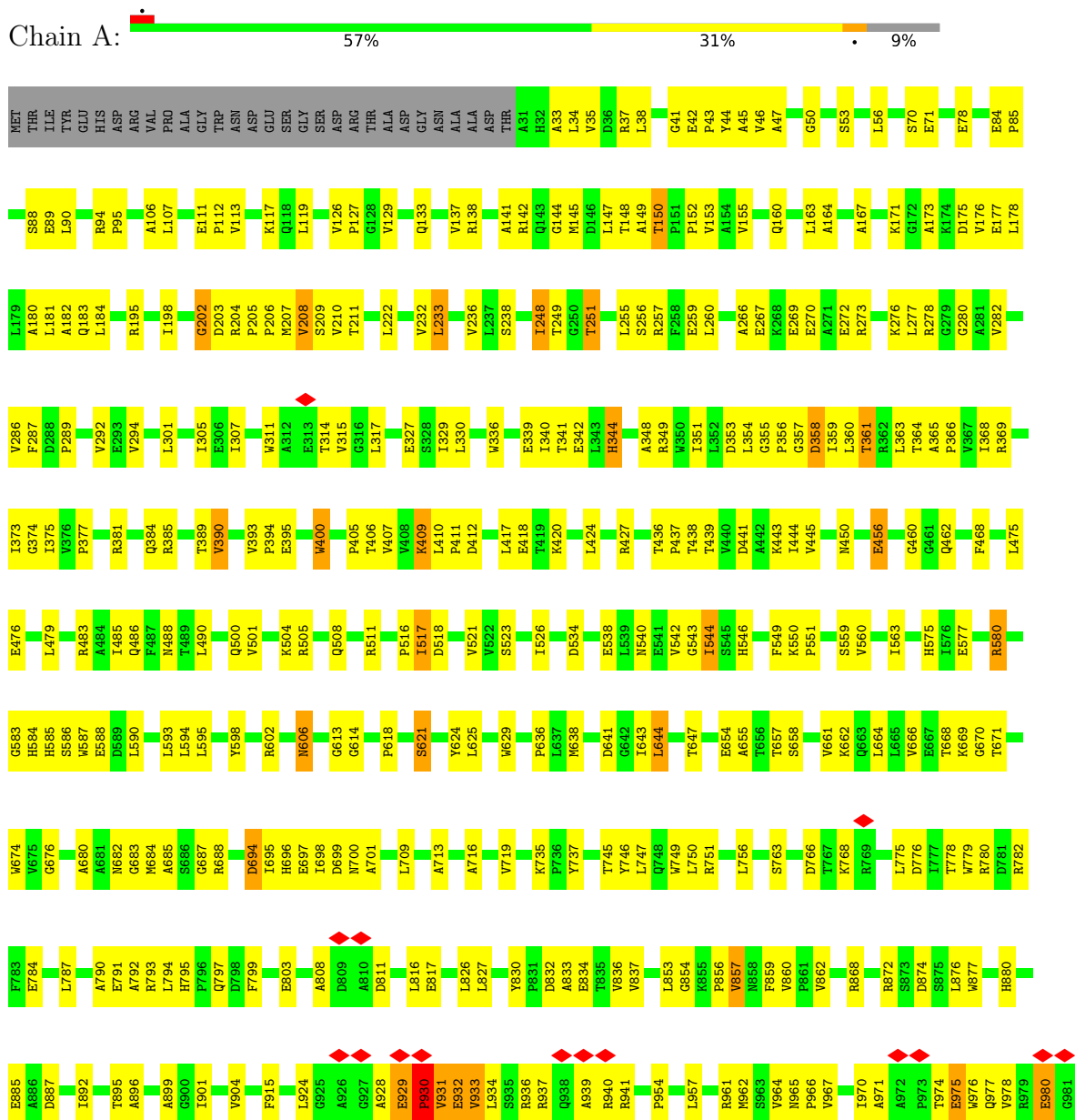
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>					<b>AltConf</b>
2	B	1	Total 31	C 17	N 4	O 9	P 1	0
2	C	1	Total 31	C 17	N 4	O 9	P 1	0
2	D	1	Total 31	C 17	N 4	O 9	P 1	0
2	E	1	Total 31	C 17	N 4	O 9	P 1	0
2	F	1	Total 31	C 17	N 4	O 9	P 1	0

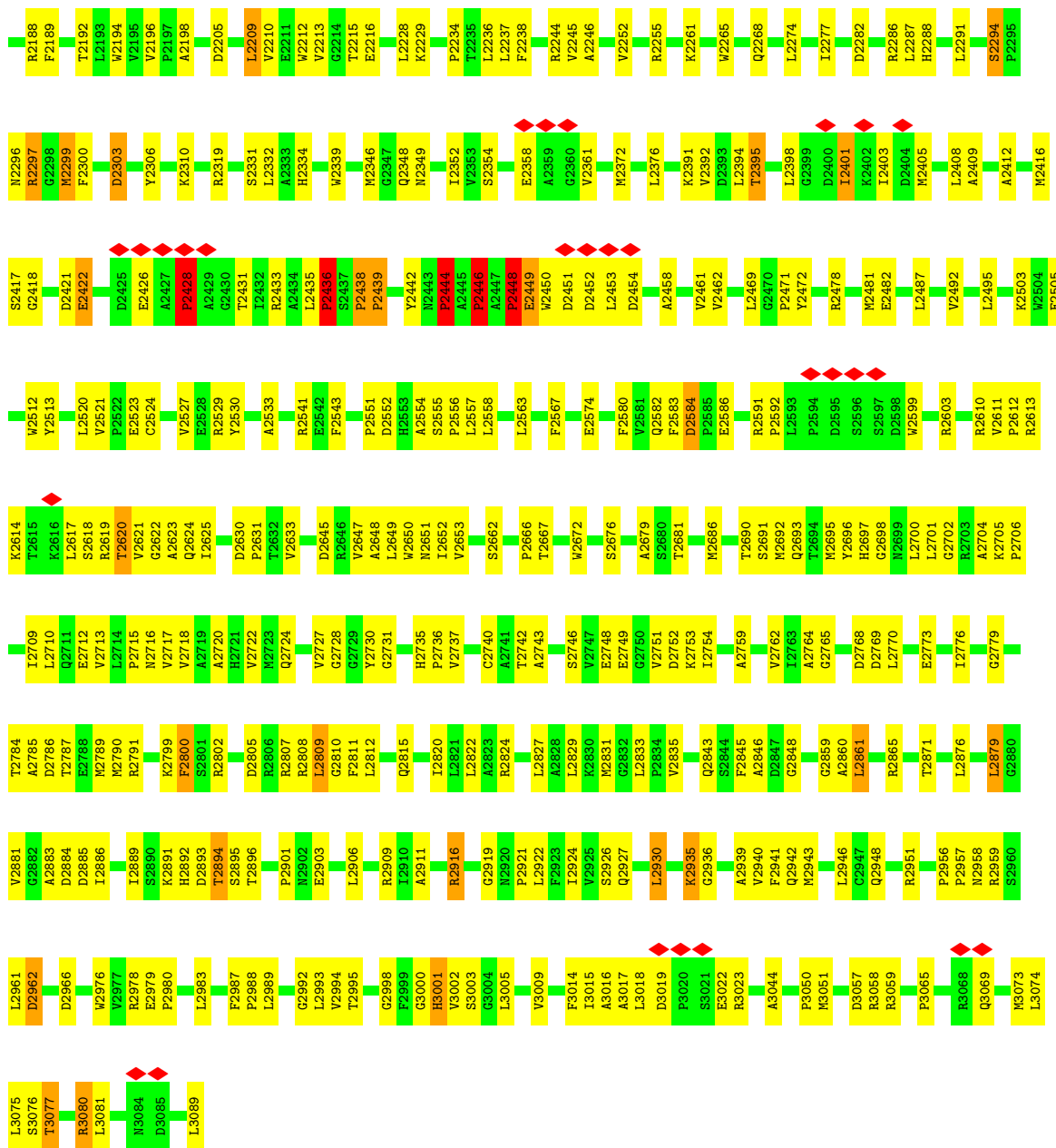
### 3 Residue-property plots [i](#)

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.

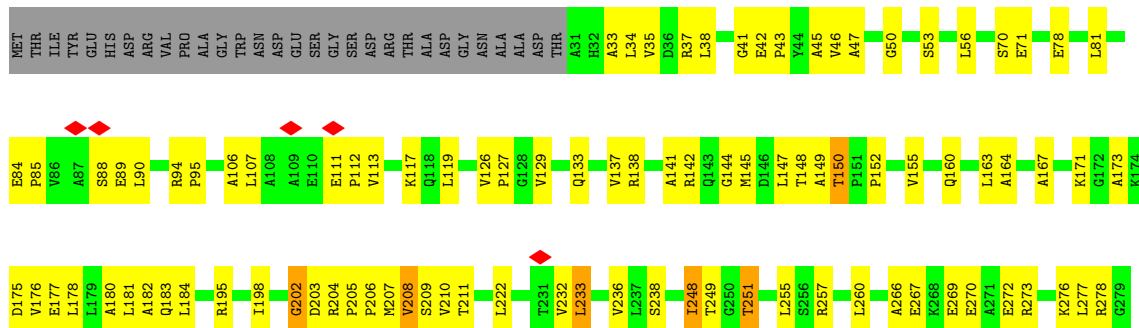
- Molecule 1: TYPE-I FATTY ACID SYNTHASE

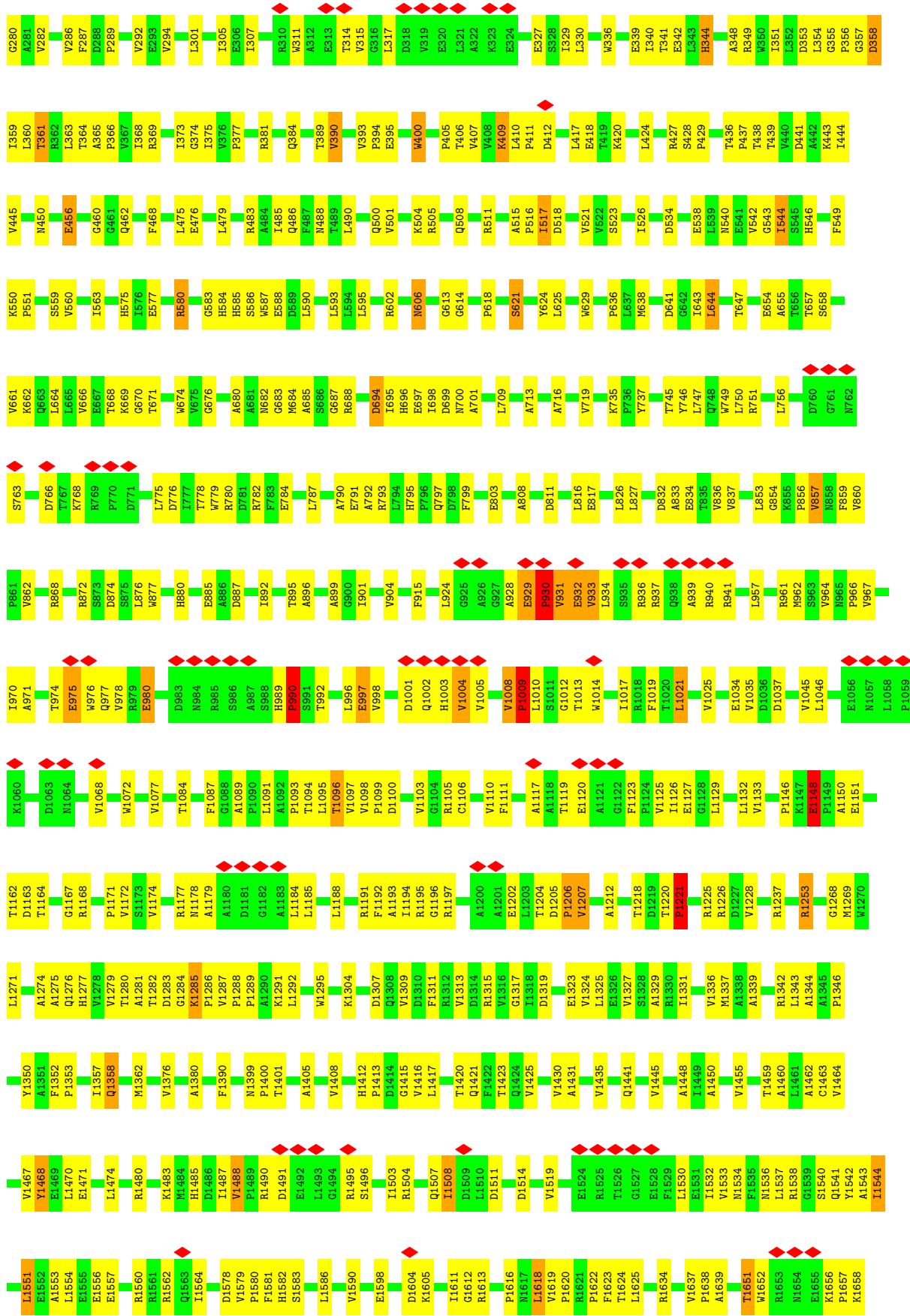


F2089	E2090	G2091	T2092	G2093	H2094	V2095	V2096	A2097	T2098	Q2099	A2100	W2101	W2102	W2103	Q2104	L2011	G2105	L2108	K2109	A2110	G2111	R2112	H2113	W2114	H2115	L2118	F2119	L2122	A2123	A2124	G2125	A2126	E2127	W2128	P2129	Y2134	E2137	V2140	W2141	T2163	V2164	A2166	T2167	R2170	D2173	D2174	R2175	L2176	K2180		
A1985	L1986	F1989	K1992	P1996	L2000	L2008	M2009	Q2010	L2011	G2012	L2013	S2014	D2015	V2016	V2017	T2018	T2019	P2020	E2021	A2022	A2023	T2024	D2025	V2032	T2047	A2053	V2054	V2055	F2056	D2057	D2058	R2059	W2060	L2067	L2070	E2074	I2076	D2079	A2080	Q2081	W2082	E2083	Q2084	L2086	S2086	Q2087	R2088				
LEU	ALA	ARG	THR	LYS	PRO	THR	TYR	VAL	ARG	GLY	GLY	ASP	LEU	LEU	ALA	ASN	GLN	LEU	THR	ARG	ASP	ALA	VAL	THR	TYR	ILE	THR	GLU	ARG	VAL	THR	LYS	THR	TRP	GLY	LEU	LEU	ASN	LEU	GLY	ALA	TRP	GLY	LEU	VAL	THR	LEU	THR	LEU	THR	
D1745	K1656	P1657	E1658	E1659	G1660	G1661	R1662	K1663	I1666	E1667	L1668	W1671	Q1672	F1673	A1674	W1679	D1684	L1685	L1686	F1687	E1689	G1694	L1695	L1696	F1699	V1701	I1702	I1703	G1704	V1705	T1710	V1711	A1712	G1713	L1714	P1722	E1723	Y1724	S1725	E1730	V1731	L1732	S1734	I1735	R1736	D1737	L1741				
A1543	L1544	L1551	E1552	L1554	E1555	E1556	E1557	R1560	R1561	R1562	G1563	I1564	D1578	V1579	P1580	F1581	H1582	S1583	L1586	V1590	E1598	K1605	I1611	G1612	R1613	P1616	L1618	V1619	P1620	R1621	F1622	F1623	T1624	L1625	R1634	V1637	P1638	A1639	A1647	L1648	Y1649	T1650	T1651	W1652							
L1470	E1471	L1474	R1480	K1483	M1484	H1485	D1486	I1487	V1488	P1489	R1490	D1491	E1492	L1493	G1494	R1495	S1496	N1497	I1503	R1504	P1505	S1506	Q1507	I1508	D1511	D1514	D1517	F1518	V1519	A1520	E1521	I1522	E1524	R1525	T1526	G1527	E1528	F1529	L1530	E1531	I1532	I1533	C1463	V1464	V1467	Y1468	R1537	R1538	G1539	Q1541	Y1542
L1280	A1281	T1282	L1283	K1285	P1286	L1287	P1289	A1289	K1291	G1292	L1293	W1295	K1304	D1307	Q1308	V1309	D1310	F1311	R1312	V1313	D1314	R1315	V1316	Q1317	T1318	D1319	E1323	V1324	L1325	E1326	V1327	S1328	R1330	I1331	G1332	S1333	V1336	M1337	A1338	A1339	R1342	L1343	A1344	L1271	A1274	A1275	Q1276	V1277	V1278	P1363	
T1280	A1281	T1282	L1283	K1285	P1286	L1287	P1289	A1289	K1291	G1292	L1293	W1295	K1304	D1307	Q1308	V1309	D1310	F1311	R1312	V1313	D1314	R1315	V1316	Q1317	T1318	D1319	E1323	V1324	L1325	E1326	V1327	S1328	R1330	I1331	G1332	S1333	V1336	M1337	A1338	A1339	R1342	L1343	A1344	L1271	A1274	A1275	Q1276	V1277	V1278	P1363	
I1357	Q1358	H1359	K1360	G1361	M1362	V1376	A1380	H1485	F1390	D1398	M1399	P1400	A1405	V1408	H1412	P1413	D1414	G1415	V1416	L1417	T1420	Q1421	F1422	T1423	Q1424	V1425	V1430	A1431	V1435	Q1441	V1445	A1448	I1449	A1450	V1455	T1459	L1460	L1461	A1462	C1463	V1464	V1467	Y1468	R1537	R1538	G1539	Q1541	Y1542			
P1171	V1172	S1173	V1174	R1177	S1186	M1178	A1179	A1180	D1181	G1182	A1183	L1184	L1185	L1188	R1191	F1192	A1193	I1194	R1195	G1196	R1197	E1202	L1203	Q1204	D1205	P1206	V1207	A1212	T1218	D1219	T1220	P1221	R1225	R1226	D1227	V1228	R1237	R1253	G1268	M1269	W1270	L1271	A1274	A1275	Q1276	V1277	V1278	P1363			
V1077	T1084	F1087	G1088	A1089	P1090	L1091	A1092	P1093	T1094	L1095	T1096	V1097	P1099	D1100	V1103	G1104	R1105	C1106	V1110	F1111	A1117	A1118	T1119	E1120	F1123	V1124	V1125	I1126	E1127	G1128	L1129	L1132	D1133	V1141	P1146	K1147	E1149	P1149	A1150	E1151	K1160	F1152	T1162	D1163	T1164	G1167	R1168				
S982	I983	A984	A987	S988	H989	P990	S991	L996	E997	V998	D1001	Q1002	S1003	V1004	V1005	V1008	F1009	L1010	S1011	G1012	T1013	V1014	I1017	R1018	F1019	T1020	L1021	V1025	E1034	V1035	D1036	D1037	V1045	L1046	E1056	H1057	L1058	P1059	K1060	V1061	V1062	D1063	H1064	V1068	L1069	V1070	D1071	W1072			



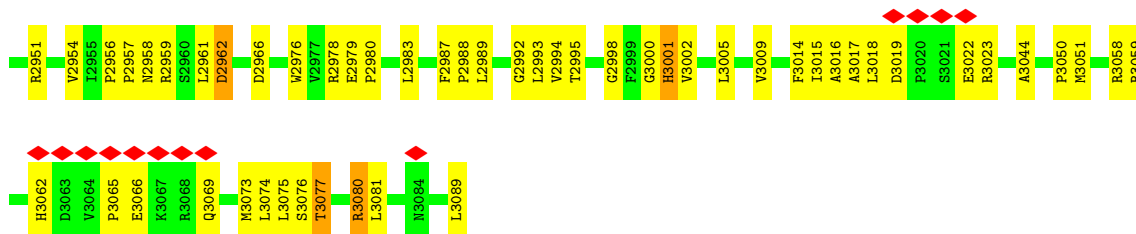
● Molecule 1: TYPE-I FATTY ACID SYNTHASE



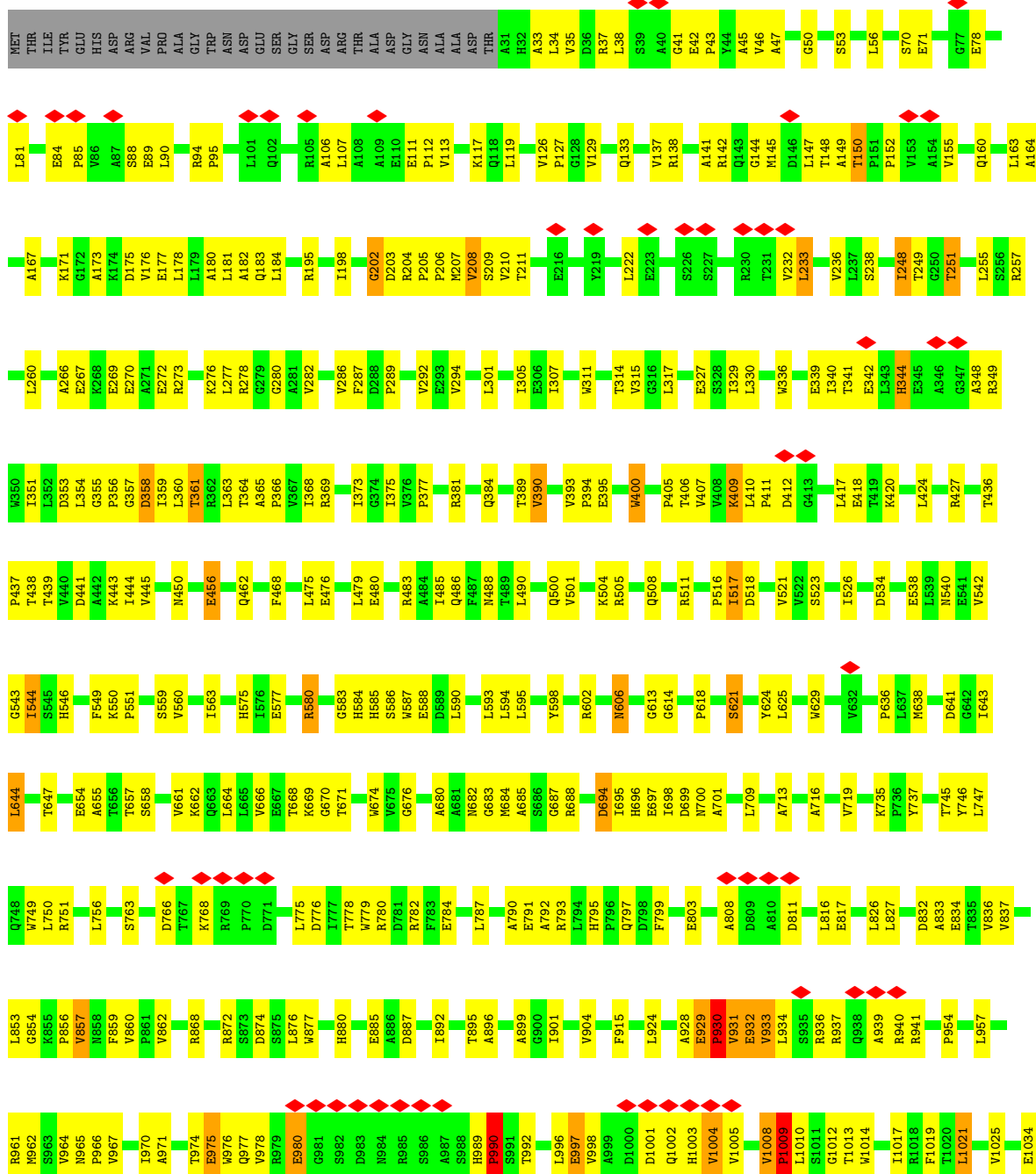


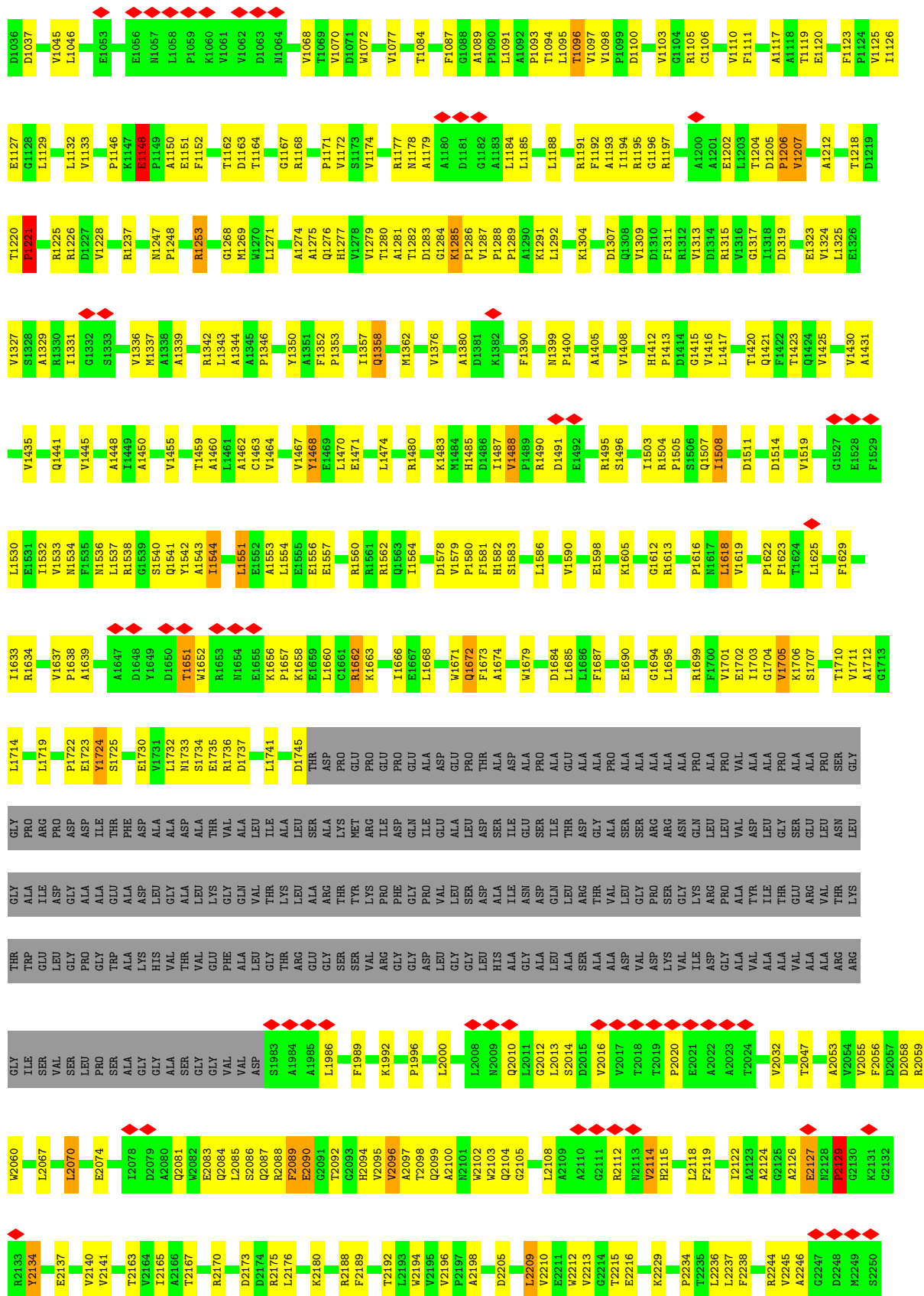


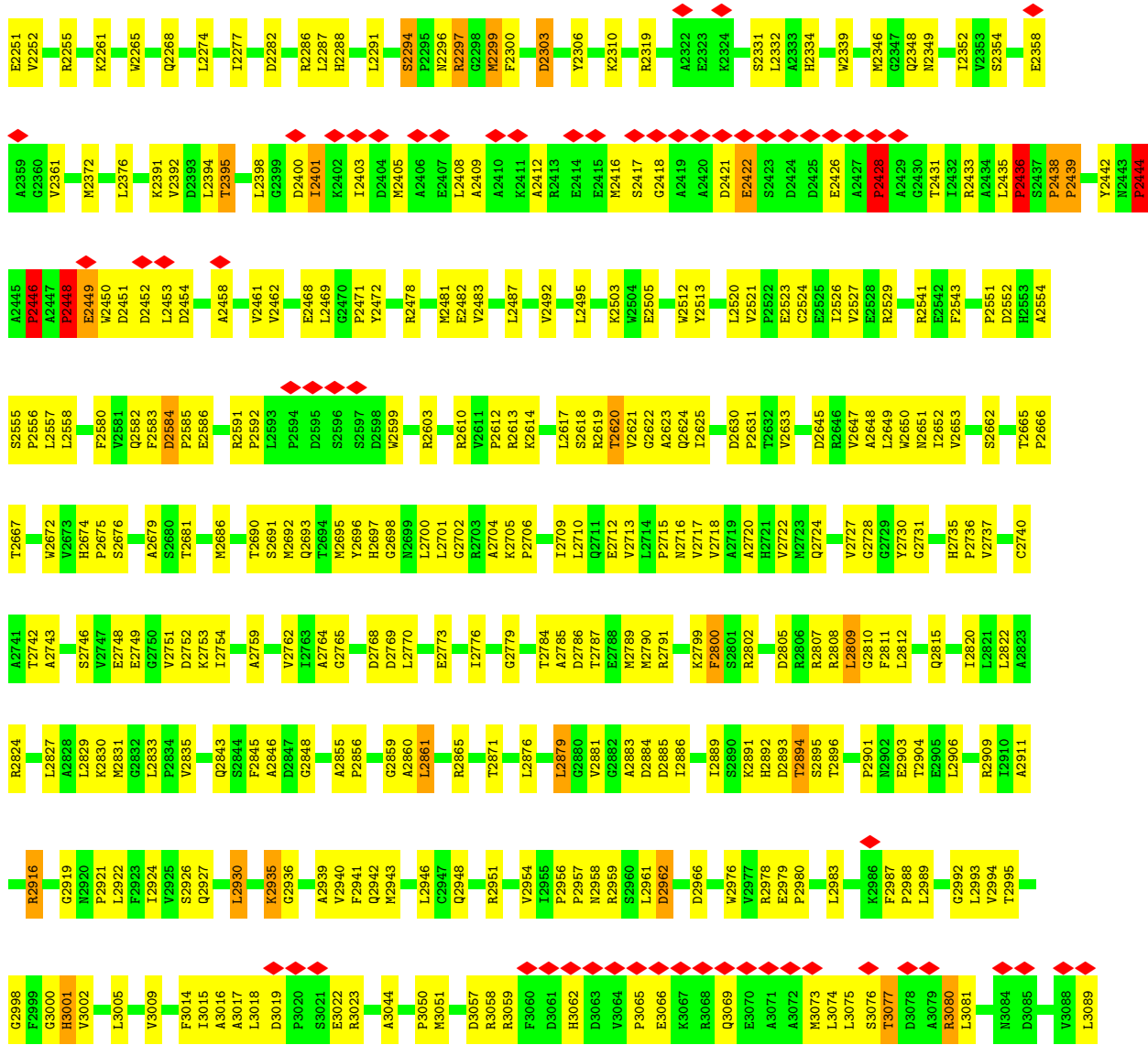
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ILE	ALA	LEU	SER	ALA	LYS	WET	ARG	VAL	ILE	ARG	GLN	PRO	ILE	ILE	GLN	ASP	THR	THR	GLY	ALA	SER	SER	ALA	GLN	LEU	LEU	ALA	VAL	ASP	ALA	ILE	LEU	GLY	SER	GLU	VAL	ASP	GLY	ALA	ALA	ASP	GLY	GLY	VAL	VAL	GLY	GLN	VAL	VAL				
THR	LYS	LEU	ALA	ARG	GLY	THR	TYR	LYS	PRO	PHE	GLY	THR	GLY	ILE	ASN	ASP	LEU	THR	ALA	VAL	LEU	GLY	VAL	ARG	LYS	PRO	ALA	ALA	ILE	THR	GLU	THR	GLY	ILE	VAL	GLY	GLY	PRO	GLY	ALA	ALA	LYS	HIS	VAL	THR	GLY	GLY	PHE	ALA	LEU			
GLY	THR	ARG	GLU	GLY	SER	VAL	ARG	VAL	GLY	GLY	LEU	GLY	HIS	ALA	GLY	ALA	ALA	ALA	ALA	ALA	ASP	VAL	GLY	ASP	LYS	VAL	ASP	VAL	VAL	ALA	ALA	THR	THR	ILE	SER	VAL	VAL	VAL	VAL	LEU	LEU	PRO	GLY	GLY	HIS	VAL	VAL	GLY	GLY	VAL	VAL	ASP	
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Q2084	L2085	S2086	R2088	F2089	E2090	G2091	T2092	H2094	L2095	V2096	A2097	T2098	Q2099	A2100	W2101	W2102	W2103	Q2104	G2105	L2108	A2109	A2110	G2111	R2112	W2113	W2114	H2115	L2118	F2119	L2122	A2123	A2124	G2125	A2126	E2127	W2128	P2129	Y2134	E2137	V2140	V2141	T2163	V2164	L2165	A2166	T2167	R2170	D2173					
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E2773	L2776	G2779	T2784	A2785	D2786	T2787	E2788	D2789	M2790	R2791	K2799	F2800	S2801	R2802	D2805	R2806	R2807	R2808	L2809	G2810	F2811	L2812	Q2815	T2820	L2821	L2822	R2823	R2824	L2827	A2828	L2829	K2830	M2831	G2832	L2833	P2834	V2835	L2836	Q2843	S2844	F2845	A2846	D2847	F2848	G2848	M2849	G2859	L2860	L2861	Q2861	Q2948		
R2865	T2871	L2876	L2879	G2880	G2882	A2883	D2884	D2885	L2886	T2889	S2890	K2891	H2892	D2893	T2894	F2896	P2901	R2902	E2903	L2906	R2909	L2910	A2911	R2916	G2919	R2920	L2922	F2923	L2924	V2925	S2926	Q2927	L2930	K2935	G2936	A2939	V2940	F2941	Q2942	M2943	L2946	C2947	Q2948										



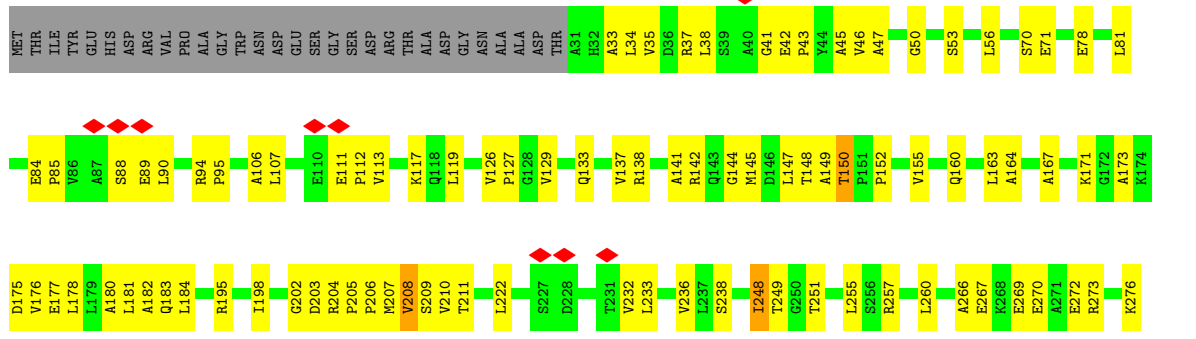
• Molecule 1: TYPE-I FATTY ACID SYNTHASE

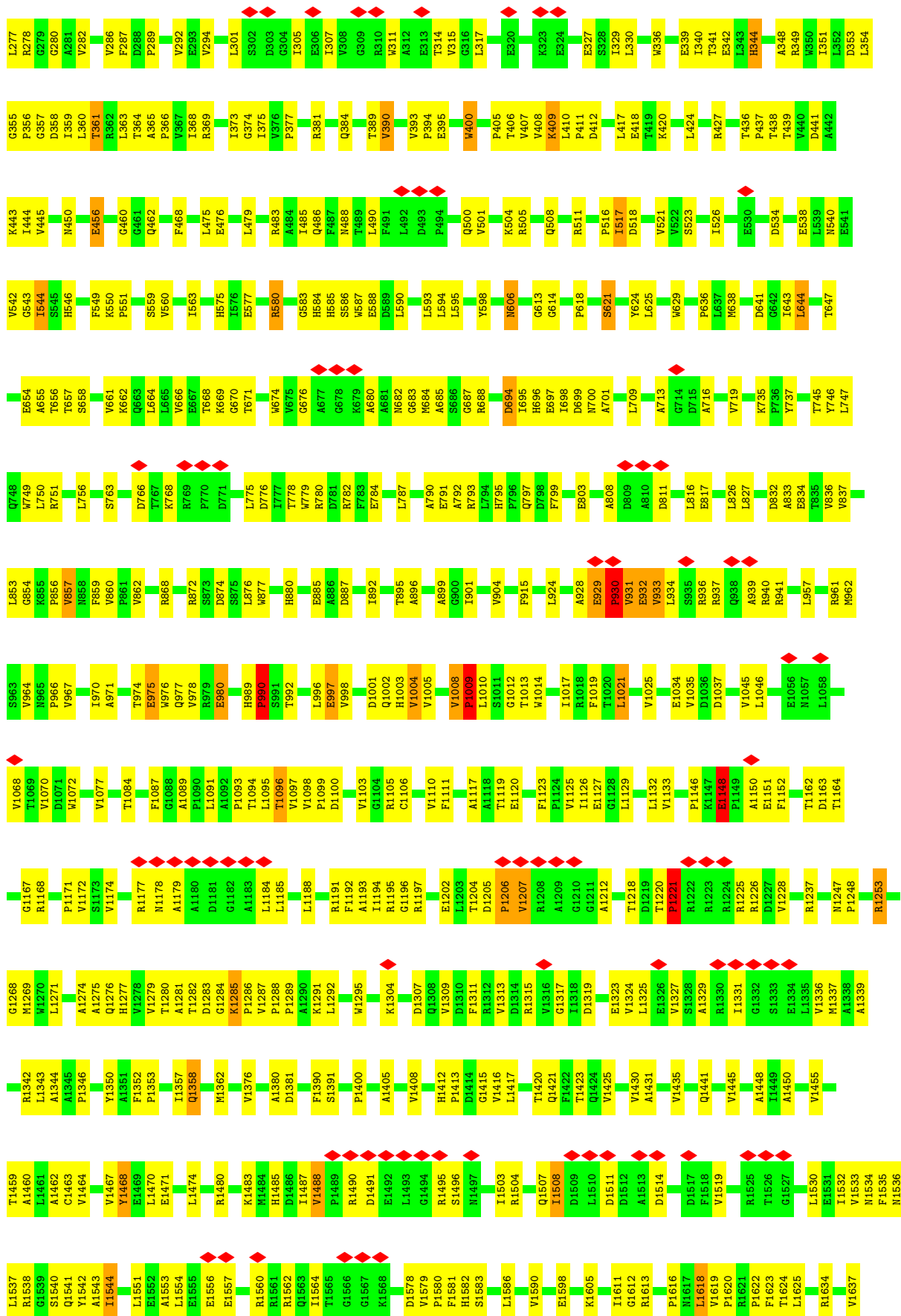




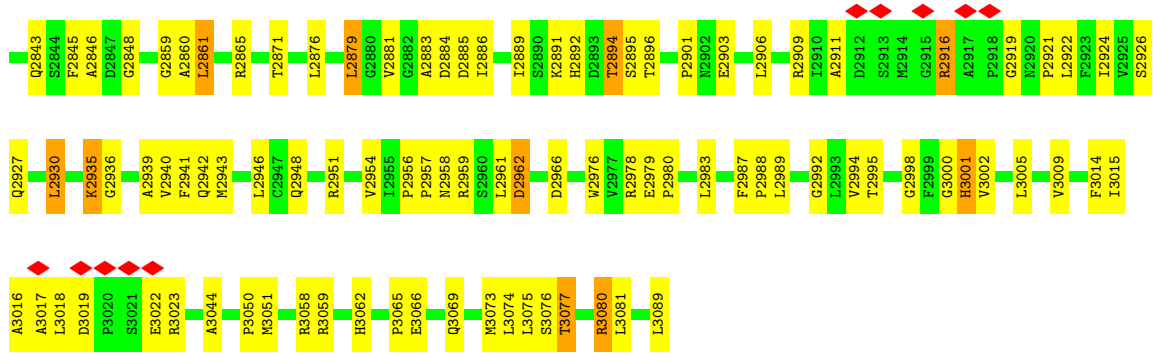


● Molecule 1: TYPE-I FATTY ACID SYNTHASE

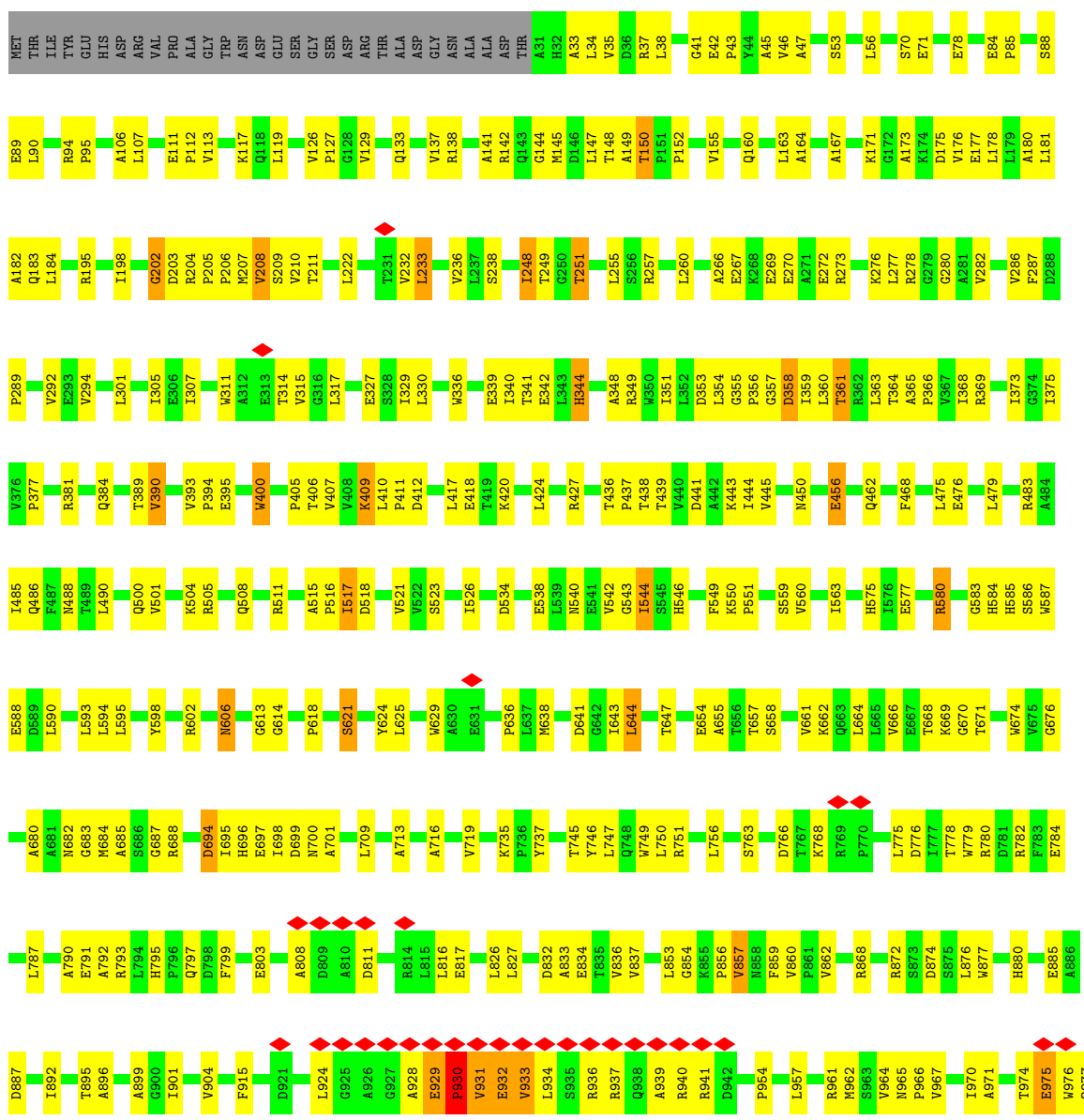




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A2759	P2471	P2585	P2471	I2403	I2165	Q2081	GLY	ALA	ALA	PHE	L1732	A1647
V2762	Y2472	E2586	Y2472	A2404	A2166	W2082	GLY	HIS	LEU	ASP	N1733	N1733
L2763	R2478	R2591	R2478	M2406	T2167	E2083	ALA	VAL	GLY	ALA	E1736	T1651
A2764	M2481	P2592	M2481	A2407	R2170	Q2084	SER	THR	LEU	ASP	R1737	M1652
G2765	E2482	L2583	E2482	L2408	D2173	L2085	GLY	VAL	LEU	ALA	D1737	K1656
D2768	V2483	L2583	L2408	R2409	R2287	S2086	VAL	PHE	GLY	THR	A1738	P1657
D2769	L2487	P2595	L2408	A2409	H2288	Q2087	VAL	ALA	GLN	VAL	A1739	K1658
L2770	L2487	S2596	L2408	A2412	R2175	F2088	ASP	VAL	LEU	LEU	V1740	E1659
E2773	V2492	S2597	L2412	R2413	L2176	E2090	S1983	GLY	THR	ILE	L1741	L1660
L2776	L2495	D2598	R2413	E2414	K2180	T2092	A1984	THR	ALA	ALA	D1745	C1661
K2703	L2495	W2599	E2414	E2415	R2188	G2093	A1985	ARG	LEU	SER	R1662	K1663
K2705	K2503	R2603	M2416	M2416	F2189	H2094	L1986	GLY	ALA	ALA		
P2706	W2504	R2610	S2417	G2418	T2192	V2095	F1989	SER	THR	LYS		
L2709	E2505	V2611	G2418	A2419	L2193	T2098	K1992	THR	TYR	ARG		
L2710	E2512	R2612	A2420	D2421	W2194	Q2099	P1996	PRO	LYS	ARG		
L2711	W2513	K2614	E2422	A2422	V2196	A2100	L2000	GLY	PRO	ILE		
L2713	L2520	L2617	S2423	S2423	P2197	W2102	A2004	ASP	VAL	GLU		
L2714	V2521	S2618	D2424	D2424	A2198	W2103	R2005	SER	LEU	ALA		
P2715	E2522	R2619	E2426	E2426	D2205	Q2104	L2008	GLY	LEU	THR		
M2716	E2524	T2620	A2427	A2427	L2209	Q2105	L2008	HIS	ALA	THR		
M2717	E2525	R2619	L2435	L2435	V2210	R2106	L2008	ALA	ILE	ALA		
M2718	E2526	T2621	L2435	L2435	F2211	A2109	N2009	GLY	ASN	GLU		
M2719	E2527	G2622	P2438	P2438	W2212	A2109	Q2010	ALA	ASP	ASP		
M2720	E2528	Q2624	P2438	P2438	G2214	A2110	Q2010	LEU	GLN	ILE		
M2721	E2529	L2625	P2438	P2438	G2214	G2111	L2011	ALA	LEU	THR		
M2722	E2530	D2630	P2438	P2438	W2339	R2112	G2012	ARG	THR	ASP		
M2723	E2531	P2631	L2435	L2435	Q2348	R2112	L2013	ALA	THR	GLY		
M2724	R2541	T2632	L2435	L2435	I2352	R2113	S2014	VAL	ALA	ALA		
M2725	E2542	V2633	P2438	P2438	L2236	R2113	V2015	ASP	VAL	SER		
M2726	F2543	D2645	P2438	P2438	F2238	F2119	V2016	VAL	ASP	SER		
M2727	P2551	R2647	P2438	P2438	L2237	T2122	P2020	LYS	ASP	ALA		
M2728	D2552	L2648	Y2442	Y2442	A2123	A2123	V2032	ARG	GLY	ALA		
M2729	H2553	L2649	W2443	W2443	A2124	A2124	T2047	SER	VAL	ALA		
M2730	A2554	M2650	P2444	P2444	G2125	G2125	A2053	GLY	VAL	ALA		
M2731	S2555	N2651	A2445	A2445	A2126	A2126	V2054	LEU	TYR	ALA		
M2735	P2556	L2652	P2446	P2446	G2247	G2247	V2054	LEU	ILE	THR		
M2736	L2557	V2653	P2446	P2446	E2127	E2127	V2055	ALA	THR	GLY		
M2737	L2558	S2662	P2448	P2448	R2128	R2128	D2057	VAL	GLU	ALA		
M2738	L2563	P2666	E2449	E2449	V2252	V2252	F2056	ALA	ARG	GLU		
M2739	P2567	T2667	W2450	W2450	V2252	V2252	D2058	ALA	THR	ALA		
M2740	F2567	L2668	D2451	D2451	R2285	R2285	R2059	ARG	THR	ALA		
M2741	E2574	W2672	D2452	D2452	K2261	K2261	W2060	GLY	THR	ASN		
M2742	E2574	W2672	L2453	L2453	W2265	W2265	L2067	GLY	THR	GLY		
M2743	F2580	S2676	D2454	D2454	L2395	L2395	L2070	ILE	GLY	ILE		
M2744	P2581	A2679	V2455	V2455	L2398	L2398	E2074	VAL	THR	ASP		
M2745	Q2582	V2681	D2457	D2457	G2399	G2399	E2074	GLY	GLY	GLY		
M2752	Q2582	V2681	A2458	A2458	D2400	D2400		LEU	ALA	ALA		
M2805	L2805	V2461	V2461	V2461	V2140	V2140		LEU	ALA	ALA		
M2806	R2806	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2807	R2807	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2808	R2808	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2809	L2809	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2810	G2810	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2811	F2811	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2812	L2812	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2815	Q2815	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2820	L2820	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2821	L2821	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2822	L2822	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2823	A2823	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2824	R2824	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2827	L2827	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2828	A2828	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2829	L2829	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2830	K2830	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2831	K2831	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2832	G2832	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2833	L2833	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2834	P2834	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		
M2835	V2835	V2462	V2462	V2462	V2141	V2141		LEU	ALA	ALA		

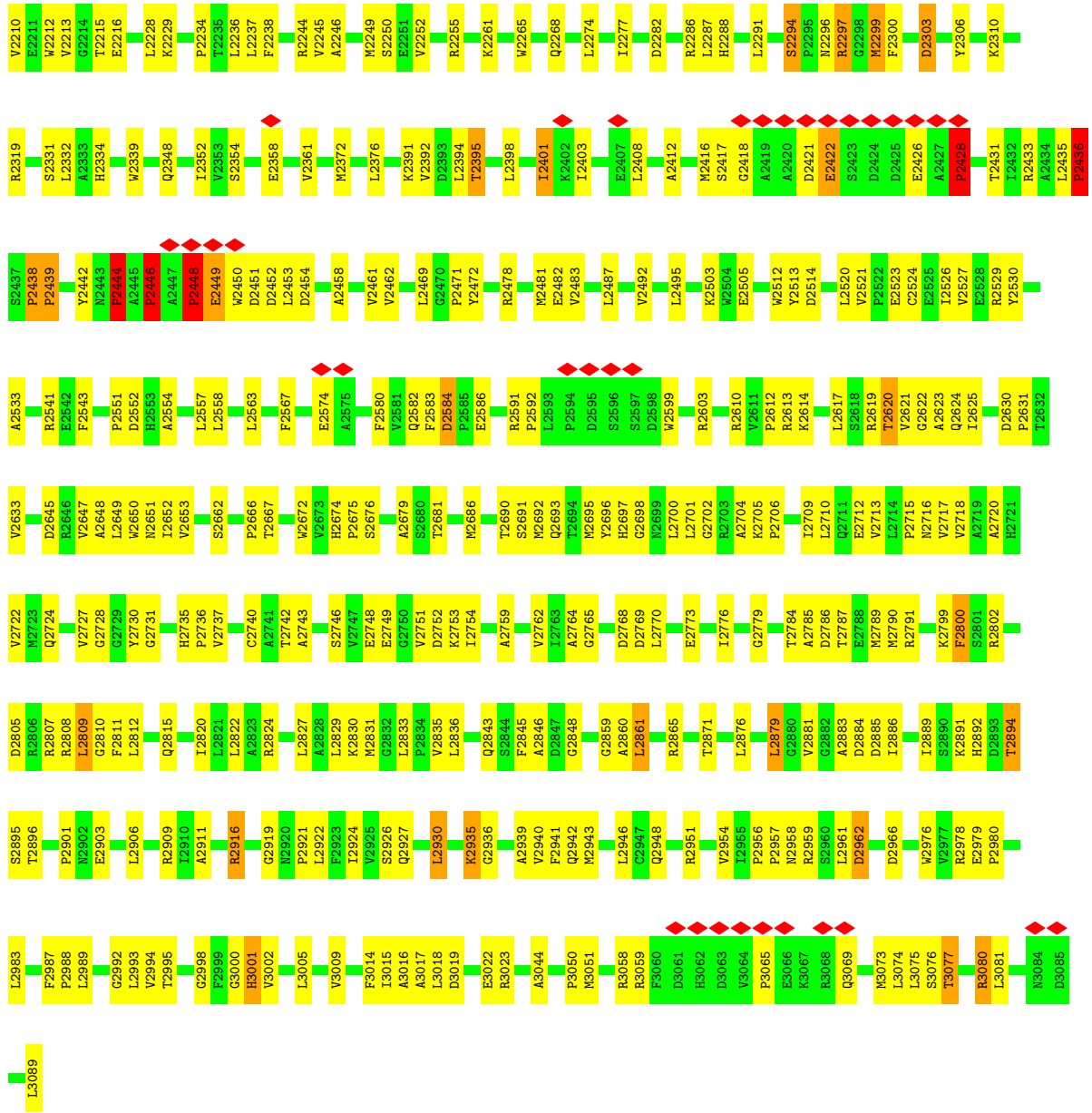


● Molecule 1: TYPE-I FATTY ACID SYNTHASE

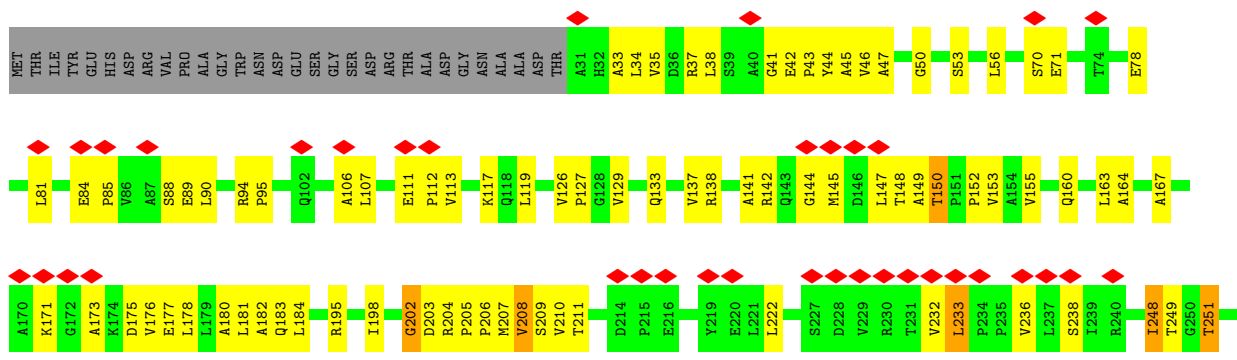


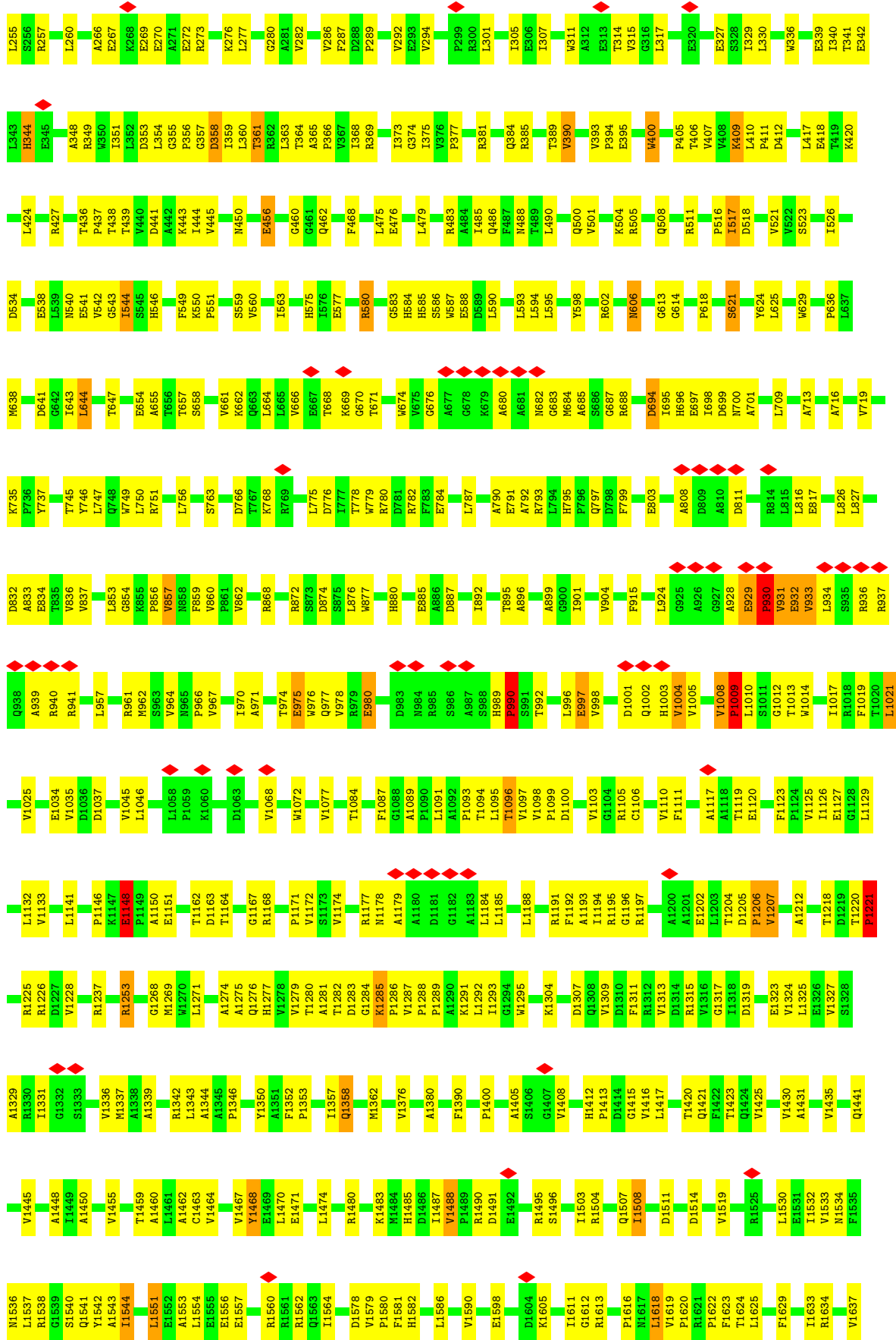
Q2104	L2008	GLY	F1671	Q1563	E1489	P1400	P1289	A1183	A1082	D983
G2105	M2009	LEU	Q1672	I1564	R1490	A1405	A1290	P1093	P1093	H984
L2108	Q2010	ASP	F1673	V1574	D1491	V1408	L1292	T1094	T1094	R985
A2109	L2011	ALA	A1674	D1578	R1495	H1412	W1295	L1096	T1096	S986
A2110	G2012	ASN	W1679	V1579	S1496	D1413	K1304	V1097	V1097	A987
G2111	L2013	LEU	D1684	P1580	L1500	F1414	Q1307	V1098	V1098	S988
R2112	S2014	ALA	L1685	H1582	R1503	G1415	D1308	P1099	P1099	H989
N2113	D2015	ARG	L1686	S1583	R1504	V1416	Q1309	D1100	P990	P990
V2016	V2016	VAL	F1687	L1586	F1507	L1417	V1310	V1103	S991	S991
V2017	V2017	ASP	E1680	S1587	I1508	L1420	F1311	G1104	T992	T992
T2018	T2018	VAL	G1694	V1590	D1509	Q1421	R1312	R1105	L996	L996
T2019	T2019	LEU	L1695	E1598	L1510	F1422	V1313	C1106	E997	E997
P2020	P2020	GLY	L1696	A1599	D1511	T1423	D1314	V1110	V998	V998
E2021	E2021	ILE	R1699	AL599	D1514	Q1424	R1315	F1111	D1001	D1001
A2022	A2022	ALA	F1700	D1604	F1517	Q1425	V1316	A1117	Q1002	Q1002
A2023	A2023	ALA	E1702	K1605	F1518	V1430	G1317	A1118	H1003	H1003
E2127	E2127	VAL	I1703	D1606	F1519	A1431	D1319	A1119	V1004	V1004
N2128	N2128	ALA	G1704	P1607	A1520	A1435	D1320	E1120	V1005	V1005
P2129	P2129	VAL	K1706	I1611	A1521	V1445	E1323	A1121	P1008	P1008
V2032	V2032	ALA	T1710	G1612	E1521	Q1441	L1324	A1122	P1009	P1009
T2047	T2047	ALA	I1615	R1613	I1522	V1445	L1325	G1122	L1010	L1010
A2053	A2053	ARG	L1616	I1614	S1523	V1448	E1326	F1123	L1010	L1010
V2054	V2054	THR	W1617	L1618	A1524	I1449	S1327	P1124	G1012	G1012
V2055	V2055	THR	L1714	P1620	T1526	A1450	I1331	W1125	T1013	T1013
F2056	F2056	LEU	P1722	P1621	G1527	V1455	V1336	E1127	W1014	W1014
R2059	R2059	LEU	E1723	R1622	V1528	W1456	M1337	L1129	I1017	I1017
W2060	W2060	GLY	Y1724	F1623	A1529	E1457	G1338	R1018	R1018	R1018
F2067	F2067	THR	S1725	L1624	L1530	Y1458	A1339	T1020	F1019	F1019
L2070	L2070	ALA	E1730	L1625	E1531	T1459	R1342	L1021	L1021	L1021
E2074	E2074	GLY	V1731	R1634	I1532	A1460	L1343	V1025	V1025	V1025
Q2081	Q2081	ALA	L1732	P1637	V1533	L1461	L1344	E1148	E1148	E1148
W2082	W2082	THR	N1733	P1638	M1534	A1462	A1344	P1149	P1149	P1149
E2083	E2083	VAL	S1734	A1639	F1535	C1463	A1345	A1150	V1035	V1035
Q2084	Q2084	LEU	E1735	A1639	L1537	V1464	P1346	D1036	D1036	D1036
L2085	L2085	VAL	R1736	A1639	L1537	V1464	P1346	E1151	E1151	E1151
S2086	S2086	PHE	D1737	A1639	R1538	V1467	Y1350	T1162	V1045	V1045
Q2087	Q2087	ALA	L1741	T1651	G1539	Y1468	A1351	D1163	L1046	L1046
R2088	R2088	ALA	D1745	W1652	H1539	E1469	F1352	T1164	T1164	T1164
F2089	F2089	GLY	THR	K1656	S1540	L1470	P1353	G1167	G1167	G1167
E2090	E2090	LEU	ASP	P1657	Q1541	E1471	P1353	R1168	R1168	R1168
G2091	G2091	LEU	ALA	K1658	Y1542	L1474	Q1388	V1068	V1068	V1068
T2092	T2092	ALA	LEU	K1659	I1544	L1474	Q1388	P1171	P1171	P1171
G2093	G2093	ALA	LEU	E1659	L1551	R1480	M1362	W1072	W1072	W1072
H2094	H2094	ARG	ALA	F1661	E1552	K1483	V1376	S1173	S1173	S1173
V2095	V2095	VAL	ARG	R1662	A1553	M1484	V1376	V1174	V1174	V1174
V2096	V2096	ARG	PRO	K1663	L1554	H1485	A1380	R1177	R1177	R1177
A2097	A2097	GLY	PRO	E1664	E1555	D1486	F1390	T1084	T1084	T1084
T2098	T2098	GLY	GLU	L1666	E1556	T1487	F1390	F1087	F1087	F1087
Q2099	Q2099	GLY	ALA	E1667	E1557	V1488	F1390	G1088	G1088	G1088
A2100	A2100	LEU	ASP	L1668	R1560	R1562	F1390	A1179	A1179	A1179
W2101	W2101	VAL	GLU	R1561	R1562	R1562	F1390	A1180	A1180	A1180
W2102	W2102	VAL	GLU	R1561	R1562	R1562	F1390	D1181	D1181	D1181
W2103	W2103	VAL	ASP	R1562	R1562	R1562	F1390	G1182	G1182	G1182

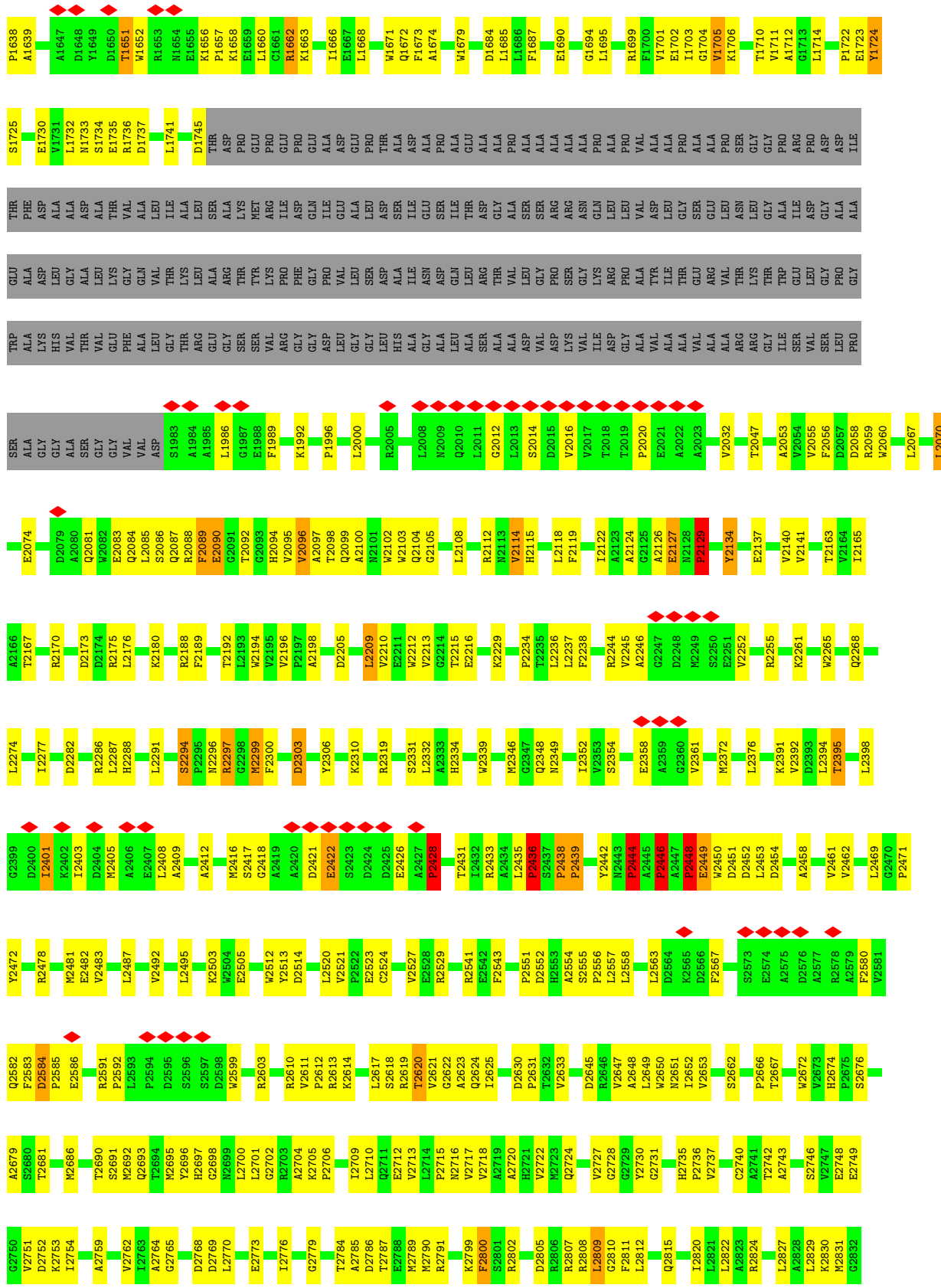




• Molecule 1: TYPE-I FATTY ACID SYNTHASE







L2833	L2834	V2835	Q2843	F2845	A2846	G2848	G2859	A2860	L2861	R2865	T2871	L2876	L2879	G2880	V2881	A2883	D2884	D2885	I2886	I2889	S2890	K2891	H2892	D2893	T2894	S2895	T2896	P2901	N2902	E2903	L2906	R2909	I2910	A2911	R2916	G2919	N2920	P2921	L2922	F2923	L2924	V2925	Q2927	
L2930	K2935	G2936	A2939	V2940	F2941	Q2942	M2943	L2946	G2947	Q2948	R2951	V2954	L2955	P2956	P2957	N2958	R2959	S2960	L2961	D2962	D2966	W2976	V2977	R2978	E2979	P2980	L2983	F2987	P2988	L2989	G2992	L2993	V2994	T2995	G2998	F2999	G3000	H3001	V3002	L3005	V3009	F3014	I3015	A3016
A3017	L3018	D3019	F3020	S3021	E3022	R3023	A3044	P3050	M3051	D3057	R3058	R3059	H3062	P3065	E3066	Q3069	M3073	L3074	L3075	S3076	T3077	R3080	L3081	L3089																				

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	4337	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	10.361	Depositor
Minimum map value	-2.852	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	1.8	Depositor
Map size ( $\text{\AA}$ )	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 ( $\text{\AA}$ )	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	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
1	E	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
1	F	0.39	27/21335 (0.1%)	0.51	13/29037 (0.0%)
All	All	0.39	162/128010 (0.1%)	0.51	78/174222 (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	5
1	E	0	5
1	F	0	5
All	All	0	30

The worst 5 of 162 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	2442	TYR	CB-CG	-6.38	1.42	1.51
1	A	2442	TYR	CB-CG	-6.36	1.42	1.51
1	B	2442	TYR	CB-CG	-6.35	1.42	1.51
1	F	2442	TYR	CB-CG	-6.33	1.42	1.51
1	D	2442	TYR	CB-CG	-6.31	1.42	1.51

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	930	PRO	N-CA-CB	7.04	111.75	103.30
1	B	930	PRO	N-CA-CB	7.01	111.71	103.30
1	D	930	PRO	N-CA-CB	6.99	111.69	103.30
1	E	930	PRO	N-CA-CB	6.98	111.68	103.30
1	A	930	PRO	N-CA-CB	6.97	111.66	103.30

There are no chirality outliers.

5 of 30 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1148	GLU	Peptide
1	A	150	THR	Peptide
1	A	202	GLY	Peptide
1	A	2584	ASP	Peptide
1	A	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	881	0
1	B	20945	0	20595	872	0
1	C	20945	0	20595	872	0
1	D	20945	0	20595	873	0
1	E	20945	0	20595	878	0
1	F	20945	0	20595	878	0
2	A	31	0	19	4	0
2	B	31	0	19	5	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	5	0
All	All	125856	0	123684	4910	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 4910 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1013:THR:HG23	1:A:1014:TRP:H	1.15	1.10
1:E:1013:THR:HG23	1:E:1014:TRP:H	1.15	1.09
1:A:2112:ARG:H	1:A:2115:HIS:CG	1.73	1.07
1:C:2094:HIS:CG	1:C:2096:VAL:HG22	1.90	1.06
1:D:1013:THR:HG23	1:D:1014:TRP:H	1.15	1.06

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%)	2641 (94%)	159 (6%)	18 (1%)	25	66
1	B	2818/3089 (91%)	2641 (94%)	158 (6%)	19 (1%)	22	63
1	C	2818/3089 (91%)	2642 (94%)	157 (6%)	19 (1%)	22	63
1	D	2818/3089 (91%)	2641 (94%)	158 (6%)	19 (1%)	22	63
1	E	2818/3089 (91%)	2642 (94%)	158 (6%)	18 (1%)	25	66
1	F	2818/3089 (91%)	2642 (94%)	157 (6%)	19 (1%)	22	63
All	All	16908/18534 (91%)	15849 (94%)	947 (6%)	112 (1%)	26	63

5 of 112 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	930	PRO
1	A	1148	GLU
1	A	2428	PRO
1	A	2436	PRO
1	A	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	2094/2402 (87%)	1992 (95%)	102 (5%)	25	50
1	B	2097/2402 (87%)	1994 (95%)	103 (5%)	25	50
1	C	2094/2402 (87%)	1992 (95%)	102 (5%)	25	50
1	D	2093/2402 (87%)	1991 (95%)	102 (5%)	25	50
1	E	2095/2402 (87%)	1993 (95%)	102 (5%)	25	50
1	F	2094/2402 (87%)	1992 (95%)	102 (5%)	25	50
All	All	12567/14412 (87%)	11954 (95%)	613 (5%)	29	50

5 of 613 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	1618	LEU
1	F	2070	LEU
1	E	2294	SER
1	E	1564	ILE
1	F	358	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 140 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	2942	GLN
1	F	540	ASN
1	F	1672	GLN
1	C	486	GLN
1	C	386	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	A	4000	-	33,33,33	1.06	2 (6%)	48,50,50	1.26	8 (16%)
2	FMN	E	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.26	7 (14%)
2	FMN	F	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.25	7 (14%)
2	FMN	C	4000	-	33,33,33	1.07	2 (6%)	48,50,50	1.26	8 (16%)
2	FMN	D	4000	-	33,33,33	1.08	2 (6%)	48,50,50	1.26	8 (16%)
2	FMN	B	4000	-	33,33,33	1.08	2 (6%)	48,50,50	1.26	8 (16%)

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

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	4.14	1.38	1.30
2	F	4000	FMN	C4A-N5	4.12	1.38	1.30
2	E	4000	FMN	C4A-N5	4.10	1.38	1.30
2	A	4000	FMN	C4A-N5	4.09	1.38	1.30
2	D	4000	FMN	C4A-N5	4.08	1.38	1.30

The worst 5 of 46 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	4000	FMN	C4-N3-C2	-3.02	120.06	125.64
2	C	4000	FMN	C4-N3-C2	-2.99	120.12	125.64
2	E	4000	FMN	C4-N3-C2	-2.98	120.13	125.64
2	D	4000	FMN	C4-N3-C2	-2.98	120.13	125.64
2	B	4000	FMN	C4-N3-C2	-2.97	120.15	125.64

There are no chirality outliers.

5 of 30 torsion outliers are listed below:

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

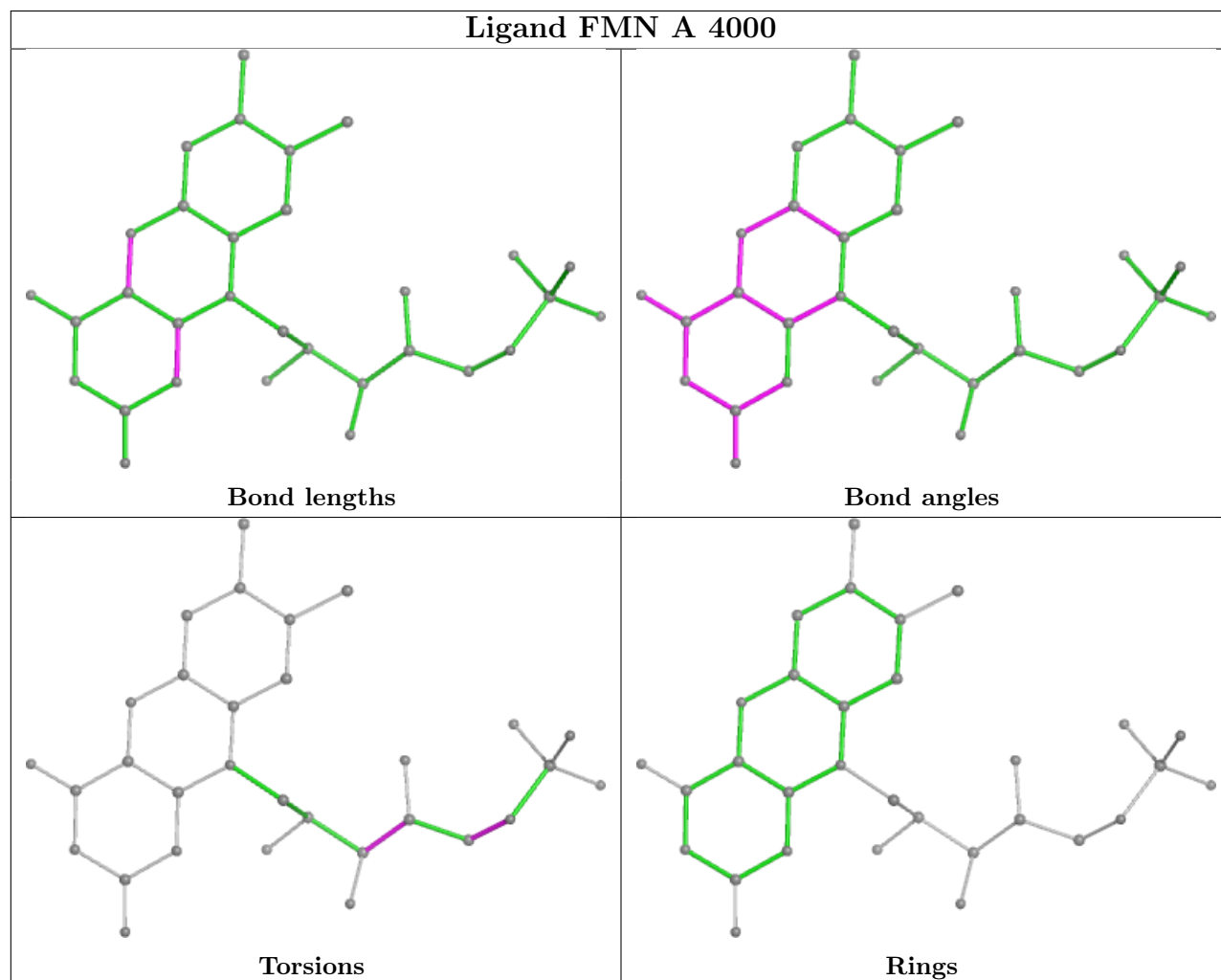
There are no ring outliers.

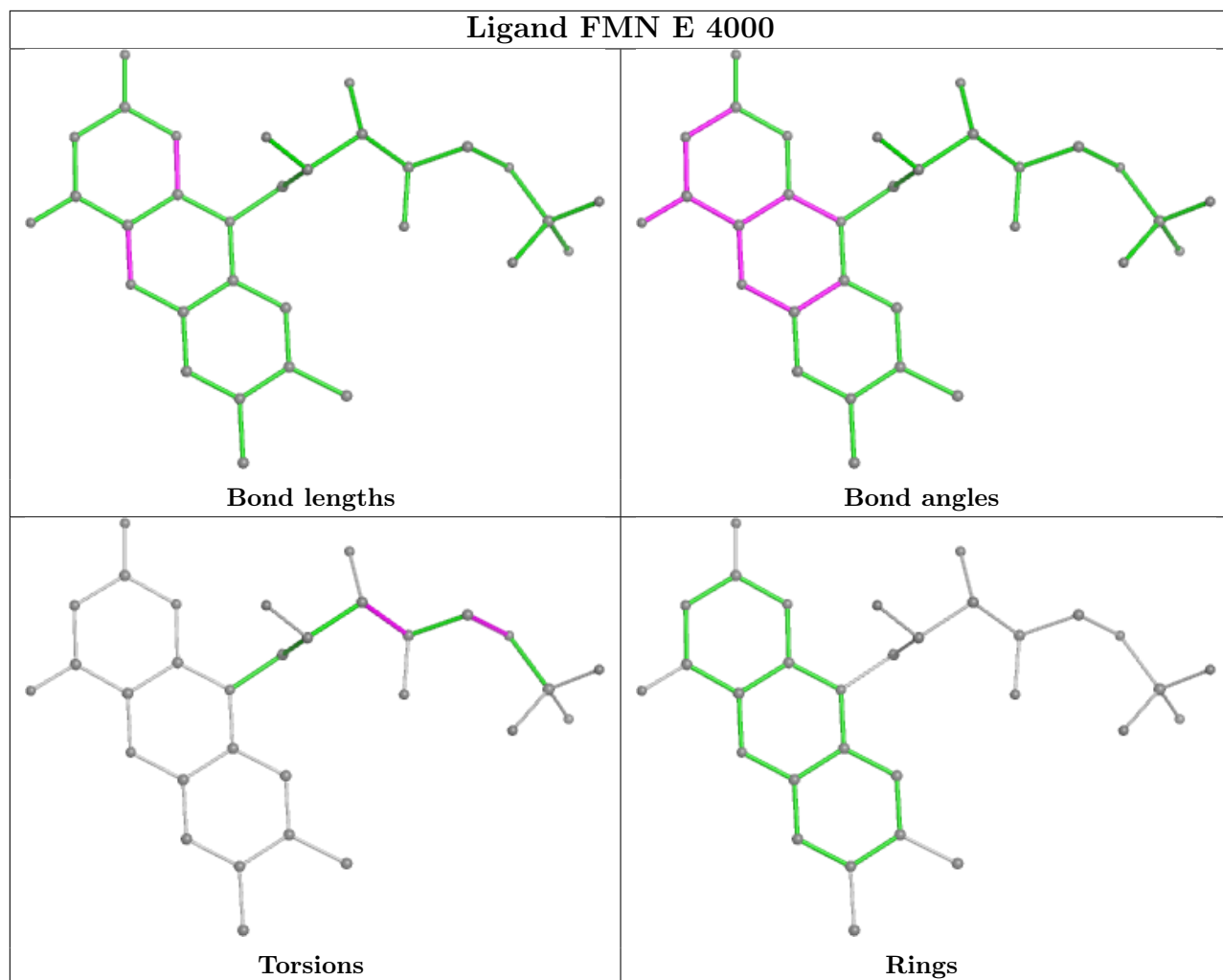
6 monomers are involved in 26 short contacts:

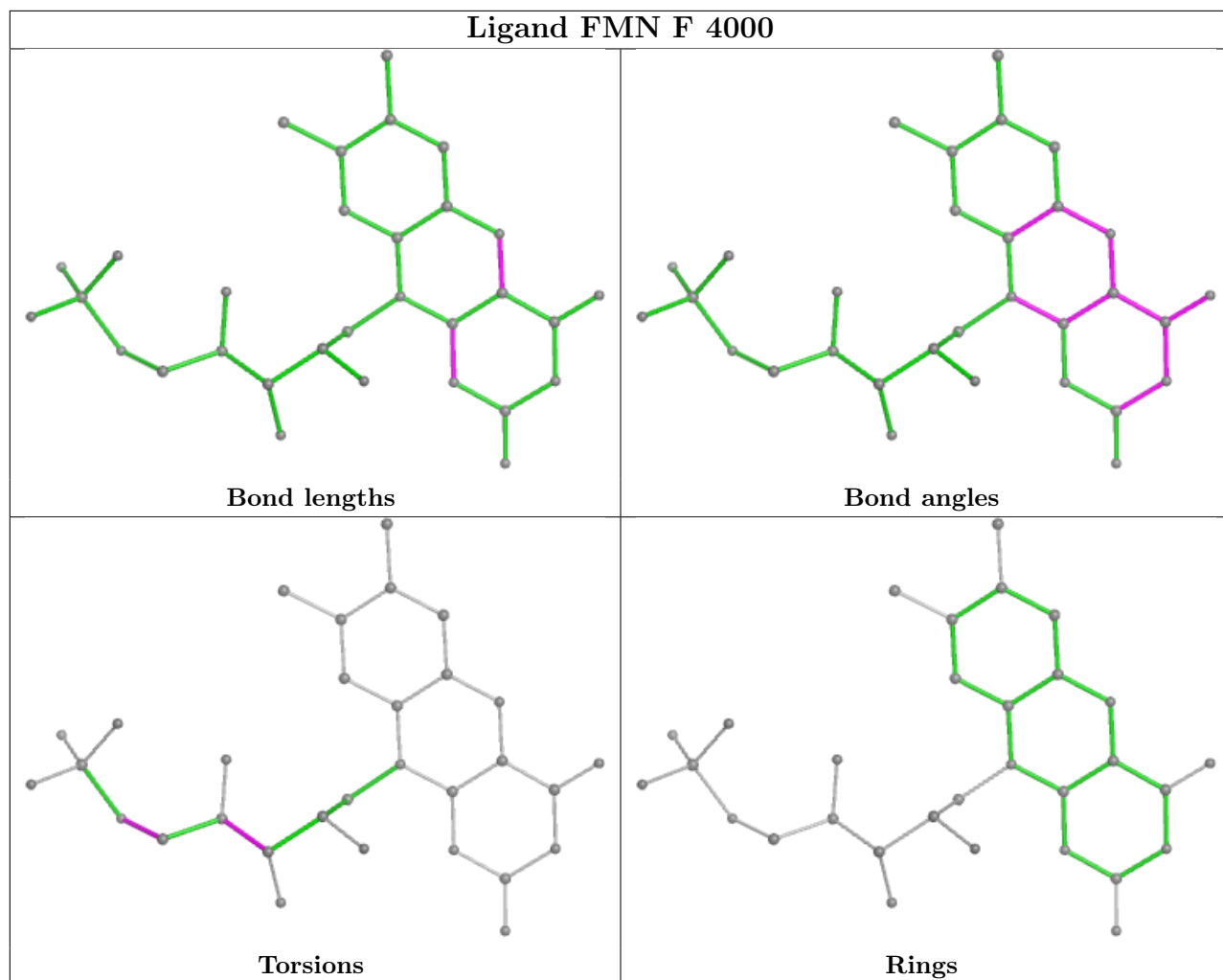
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4000	FMN	4	0
2	E	4000	FMN	4	0
2	F	4000	FMN	5	0
2	C	4000	FMN	4	0
2	D	4000	FMN	4	0
2	B	4000	FMN	5	0

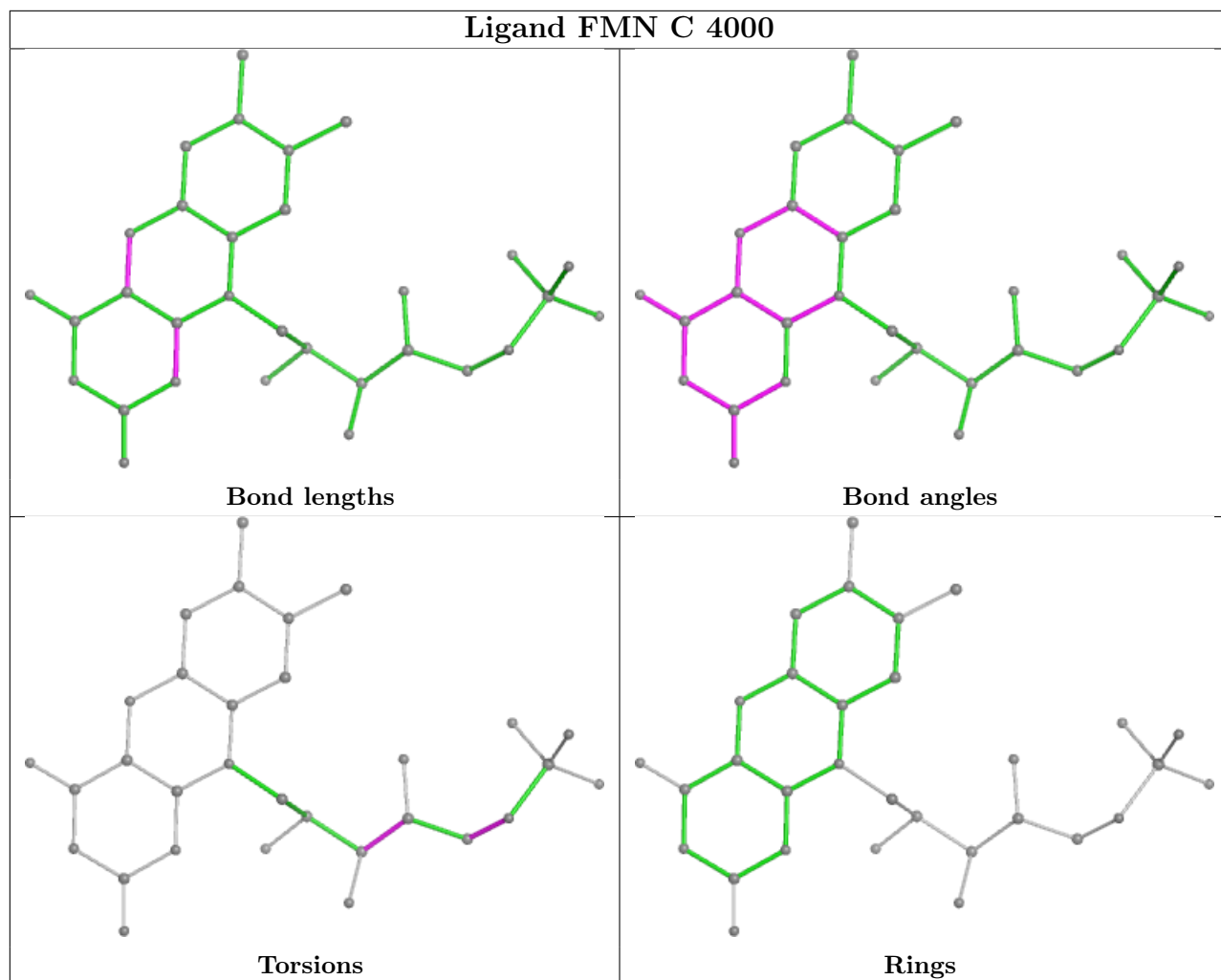
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

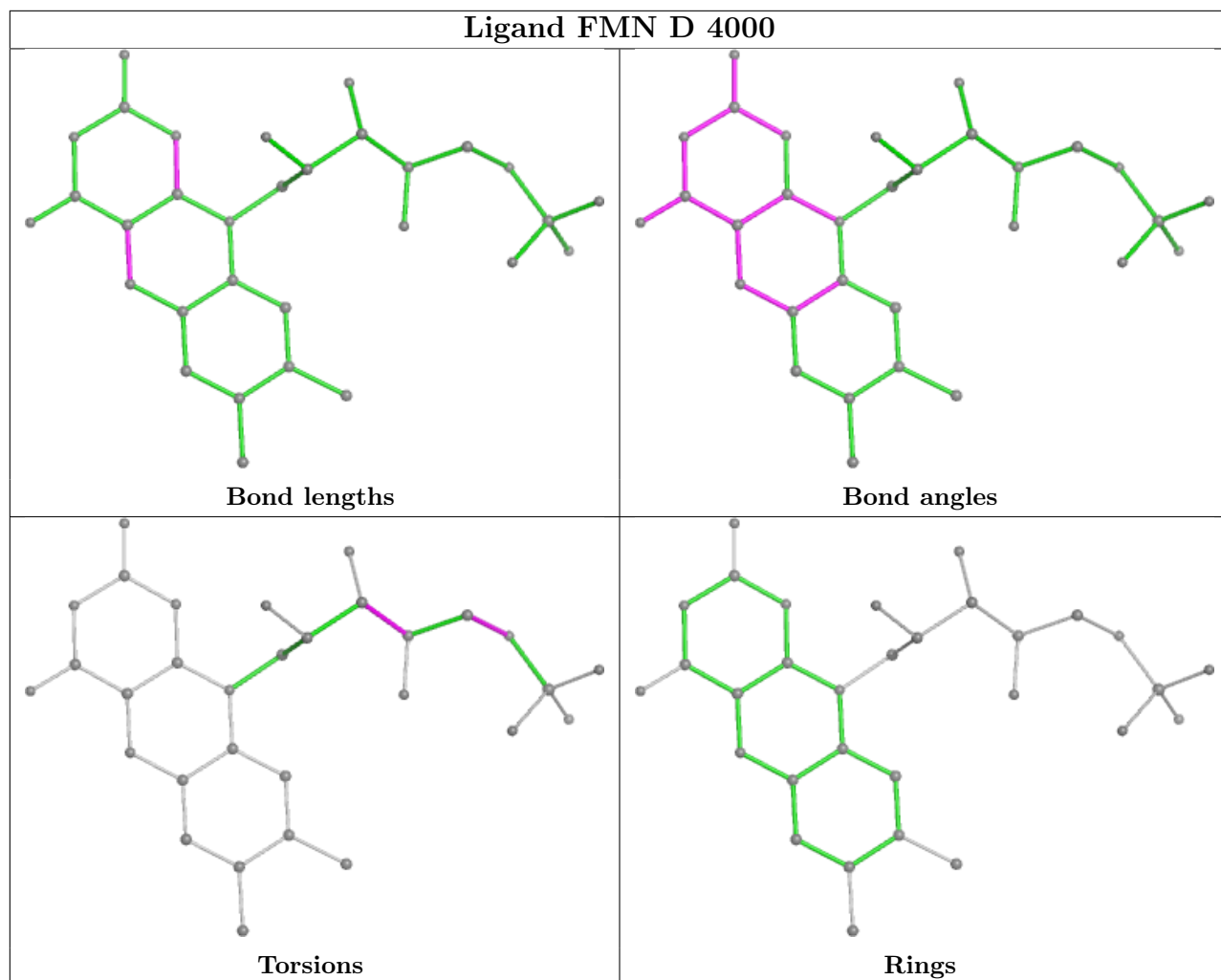
Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD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



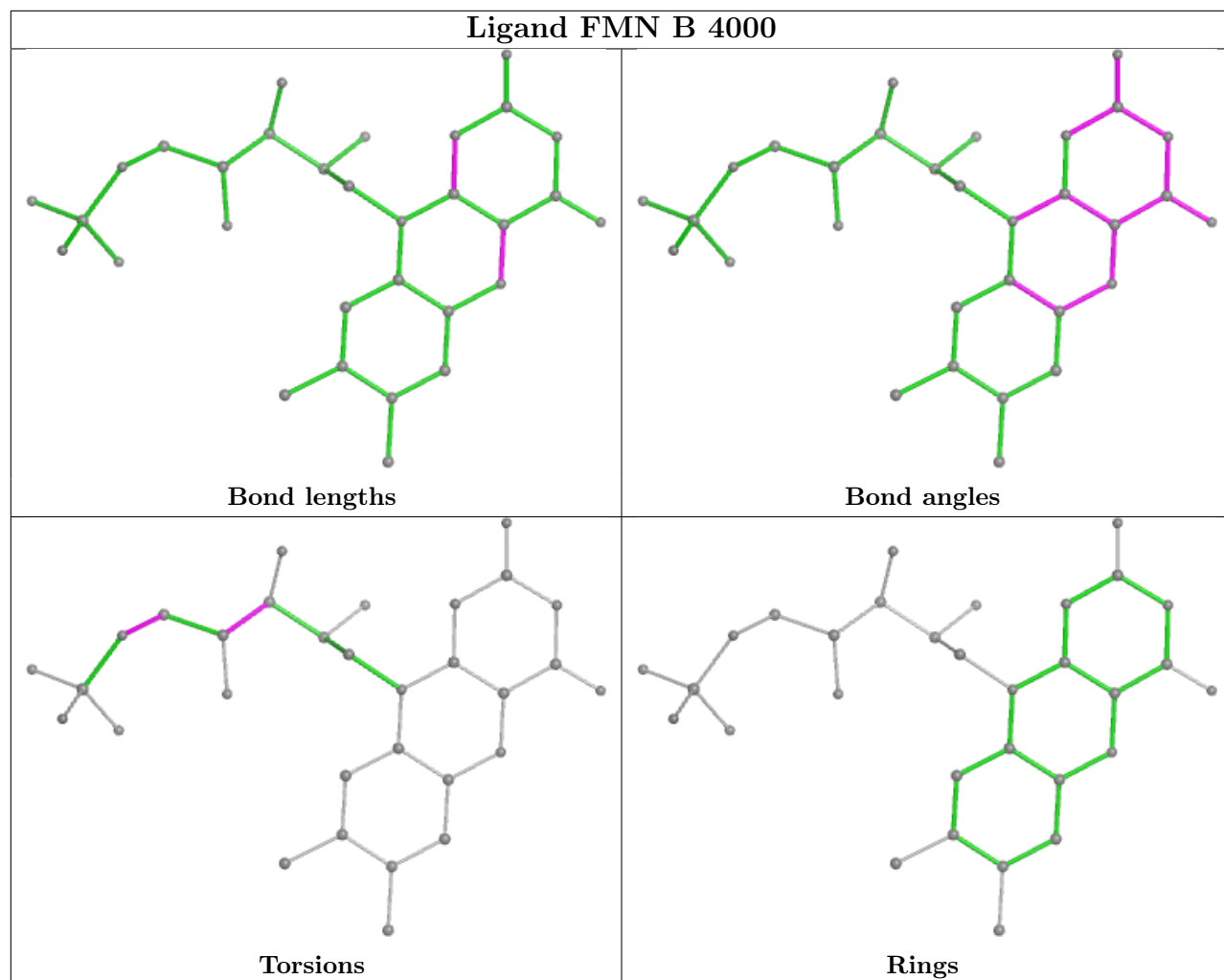












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

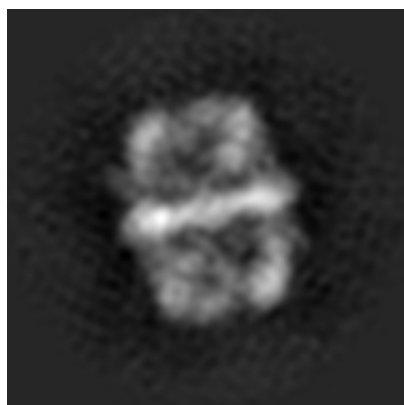
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-2358. These allow visual inspection of the internal detail of the map and identification of artifacts.

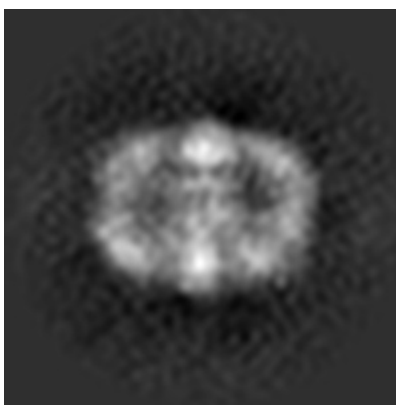
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

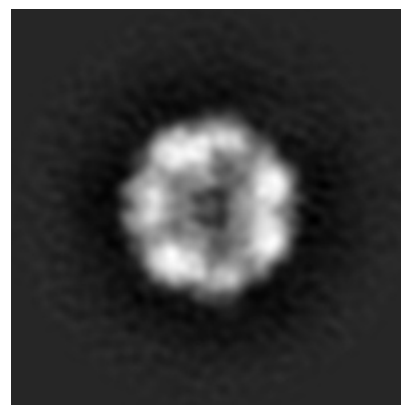
#### 6.1.1 Primary map



X



Y

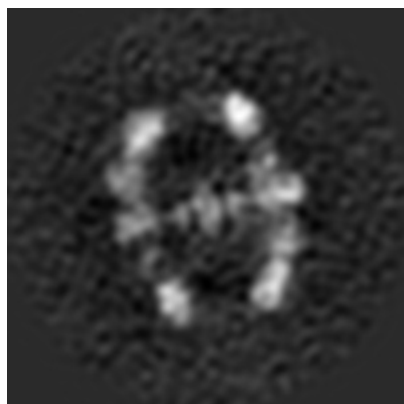


Z

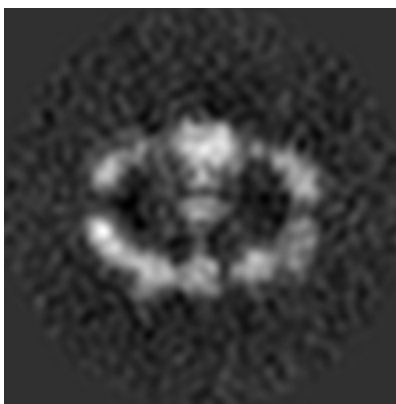
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

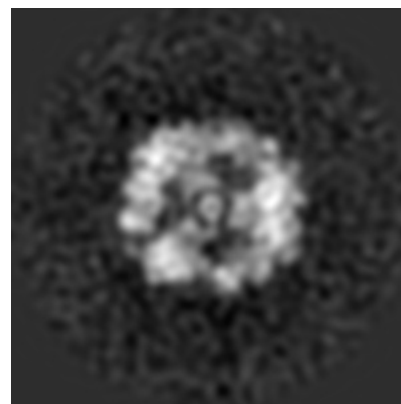
#### 6.2.1 Primary map



X Index: 100



Y Index: 100

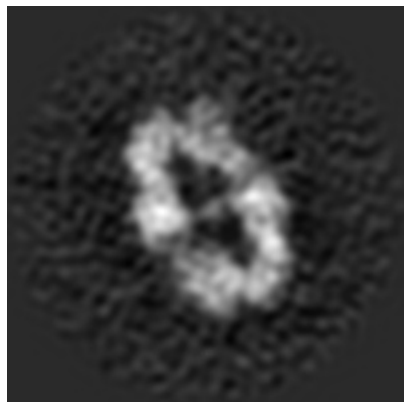


Z Index: 100

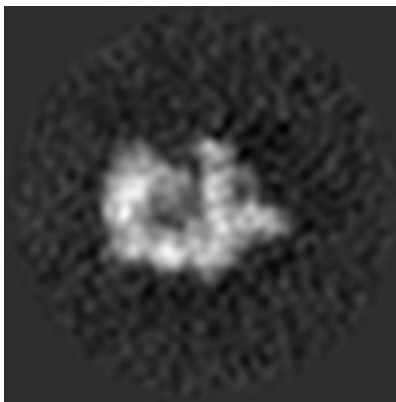
The images above show central slices of the map in three orthogonal directions.

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

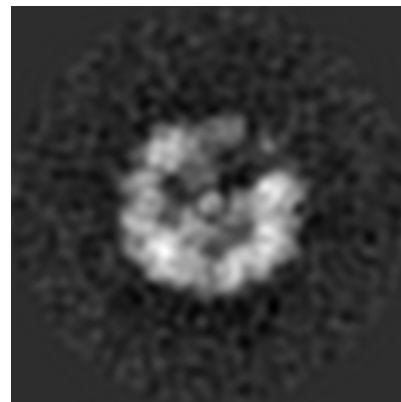
### 6.3.1 Primary map



X Index: 76



Y Index: 131

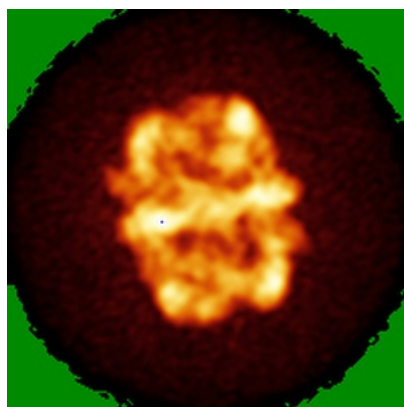


Z Index: 96

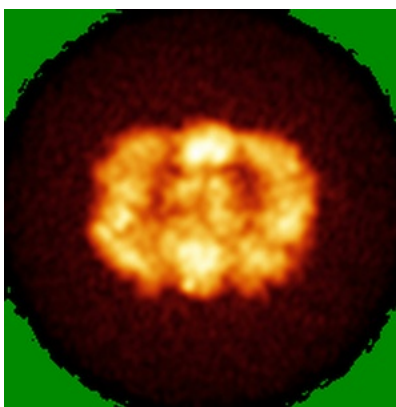
The images above show the largest variance slices of the map in three orthogonal directions.

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

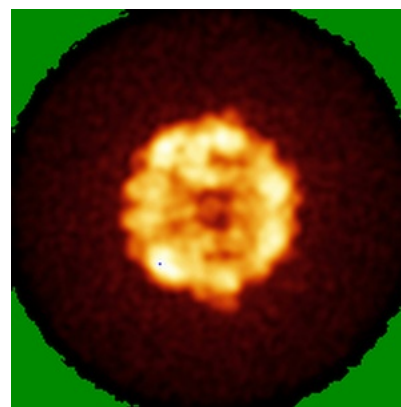
### 6.4.1 Primary map



X



Y

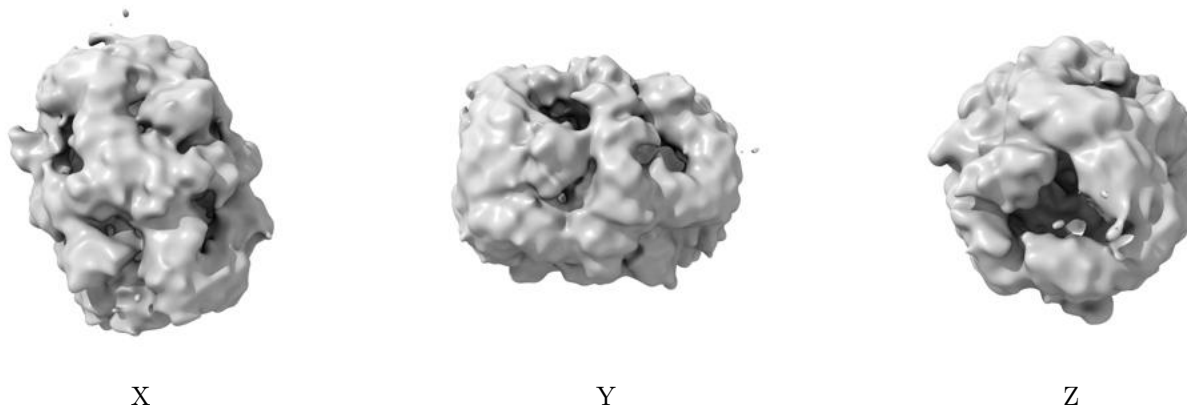


Z

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

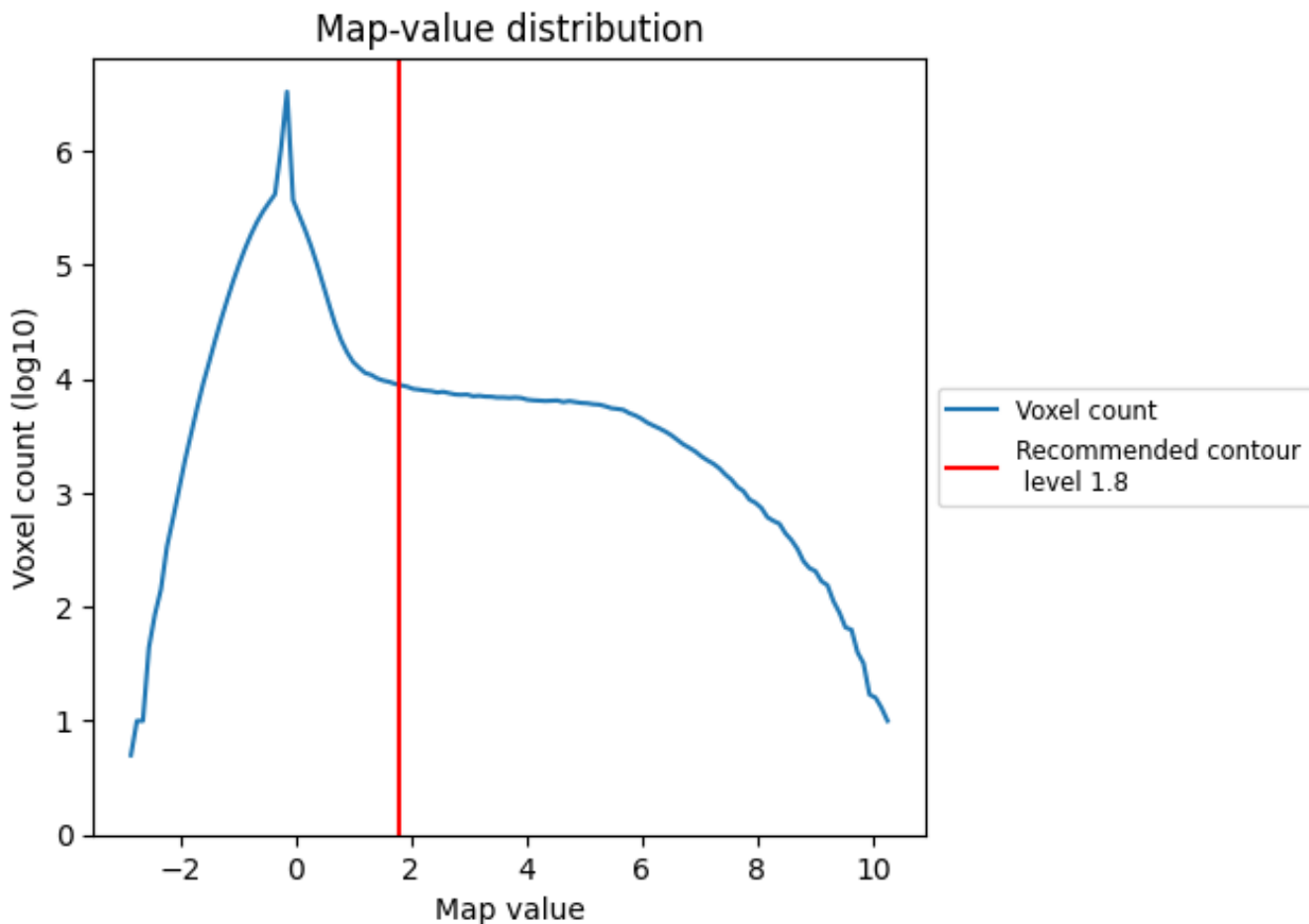
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

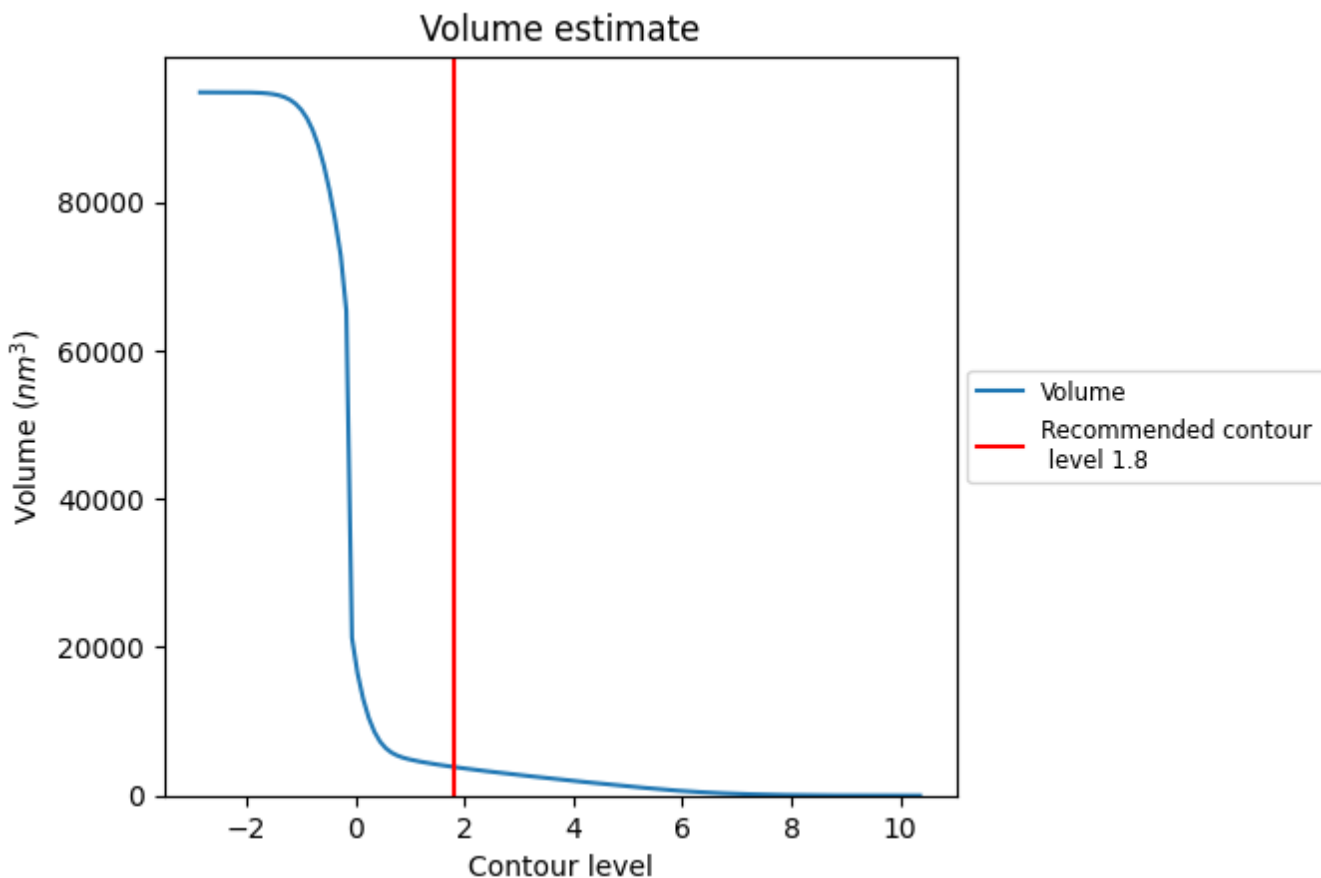
This section contains the results of statistical analysis of the map.

### 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.

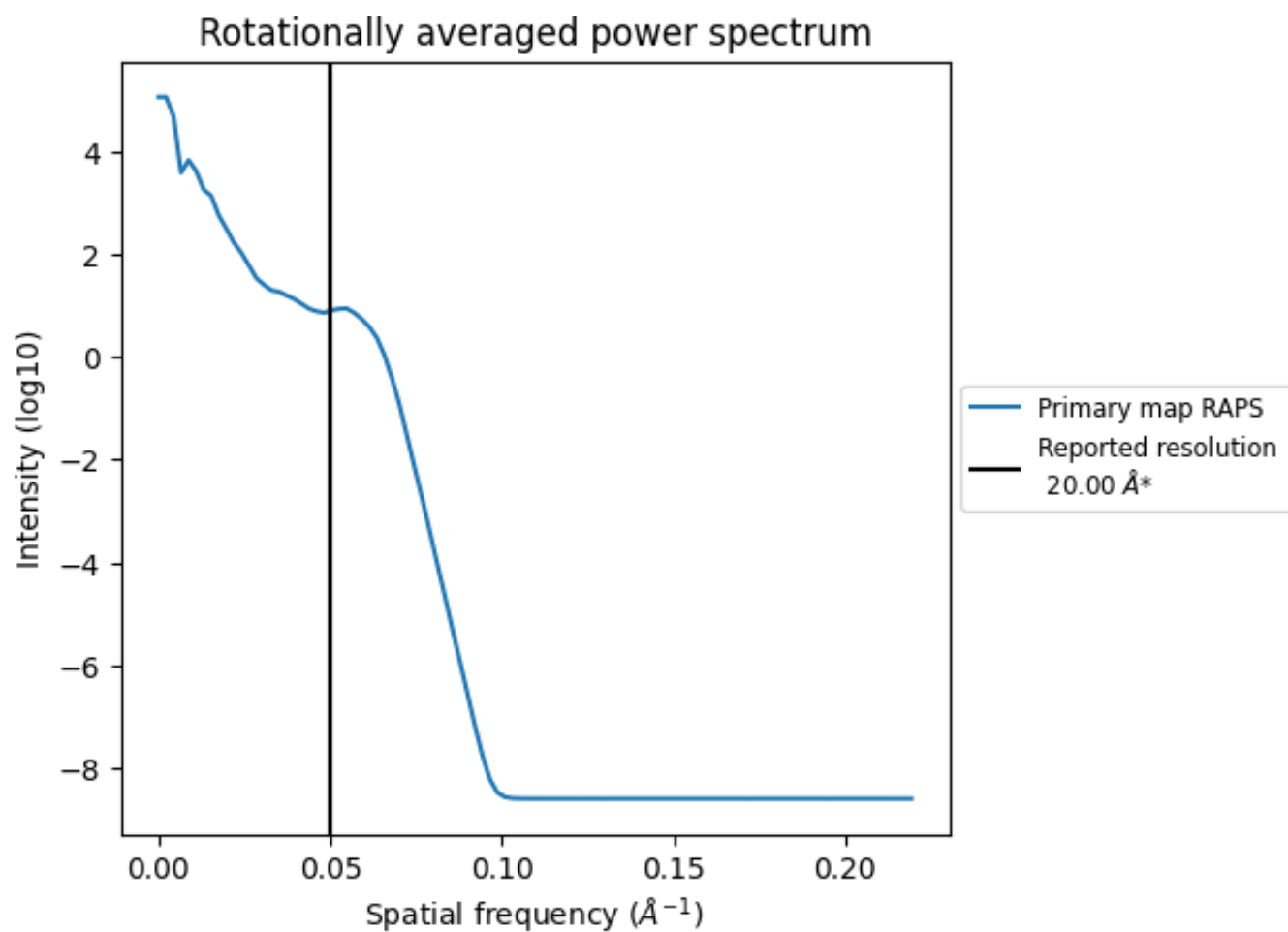
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3860 nm<sup>3</sup>; this corresponds to an approximate mass of 3487 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 0.050 Å<sup>-1</sup>

## 8 Fourier-Shell correlation

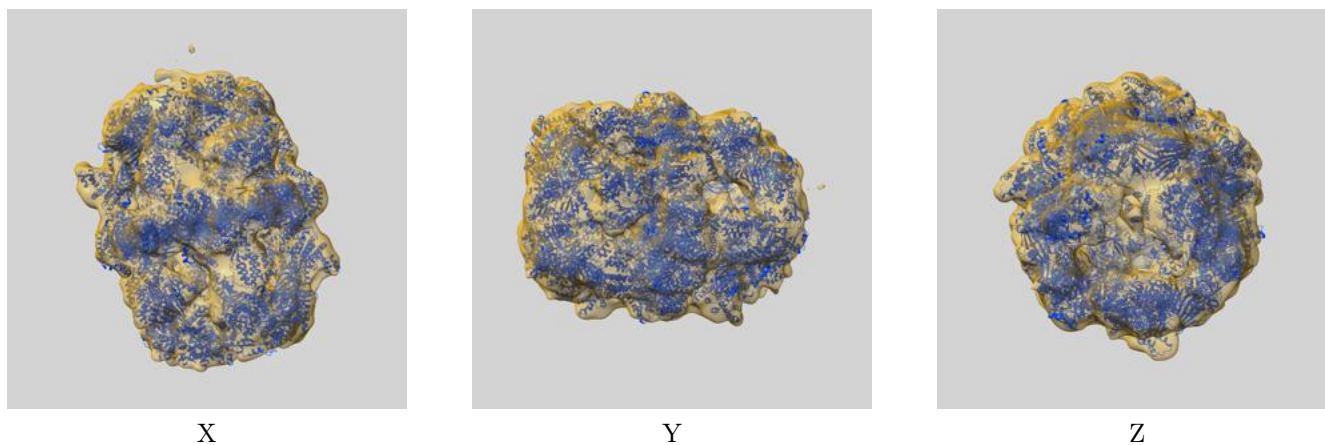
This section was not generated. No FSC curve or half-maps provided.



## 9 Map-model fit [i](#)

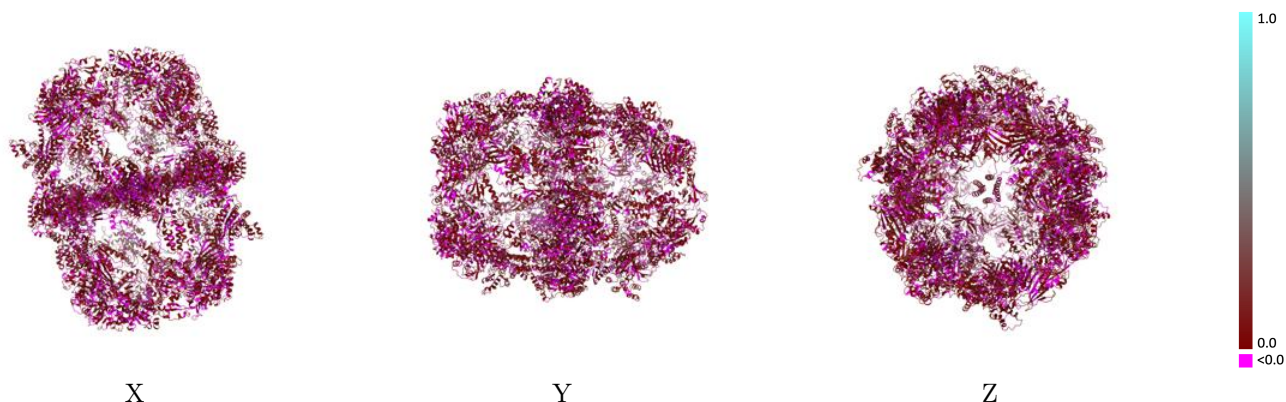
This section contains information regarding the fit between EMDB map EMD-2358 and PDB model 4V8V. Per-residue inclusion information can be found in section 3 on page 5.

### 9.1 Map-model overlay [i](#)



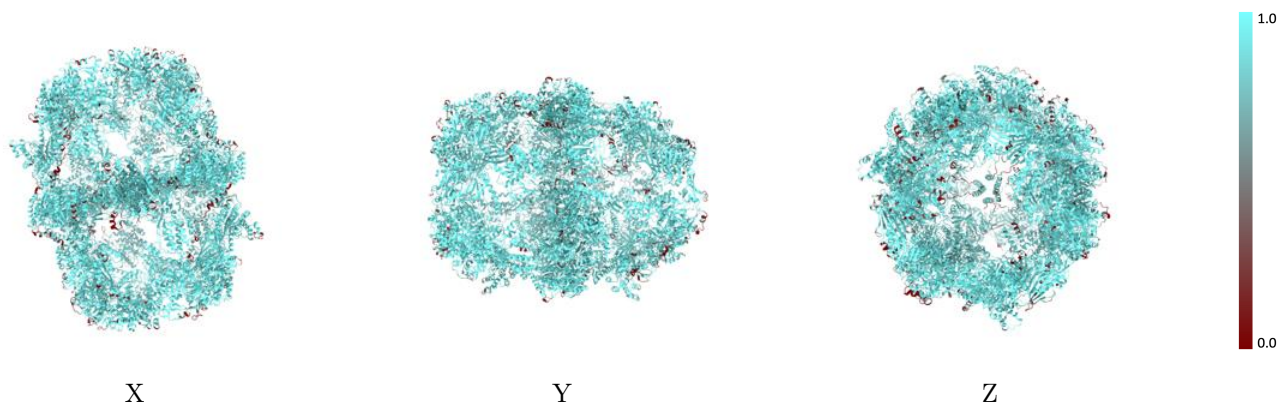
The images above show the 3D surface view of the map at the recommended contour level 1.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



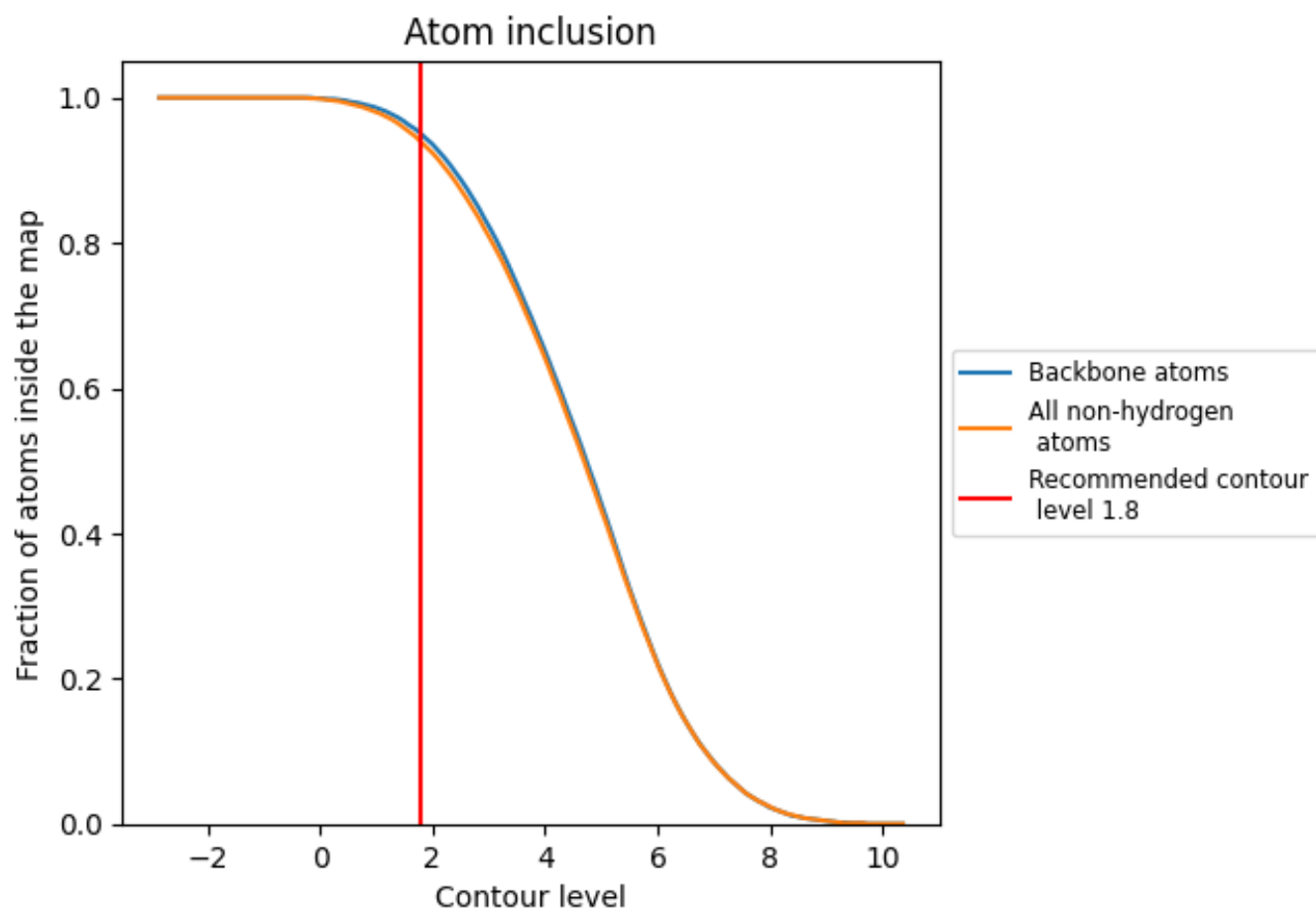
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (1.8).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 94% 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 (1.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9390	 0.0500
A	 0.9570	 0.0520
B	 0.9360	 0.0450
C	 0.9280	 0.0440
D	 0.9310	 0.0490
E	 0.9490	 0.0560
F	 0.9340	 0.0520

