



## wwPDB EM Validation Summary Report ⓘ

Dec 12, 2022 – 06:57 PM EST

PDB ID : 3JBT  
EMDB ID : EMD-6480  
Title : Atomic structure of the Apaf-1 apoptosome  
Authors : Zhou, M.; Li, Y.; Hu, Q.; Bai, X.; Huang, W.; Yan, C.; Scheres, S.H.W.; Shi, Y.  
Deposited on : 2015-10-15  
Resolution : 3.80 Å (reported)  
Based on initial models : 3J2T, 4RSZ

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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.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

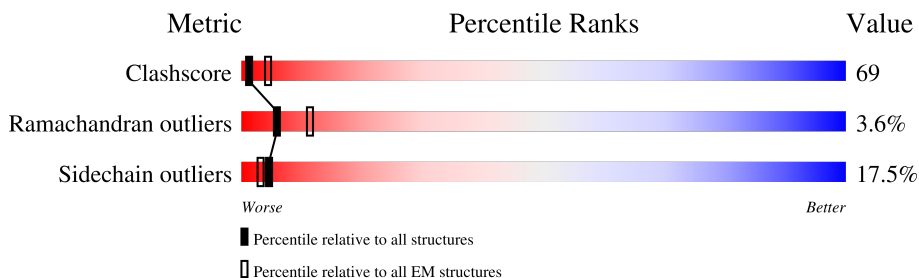
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.80 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.



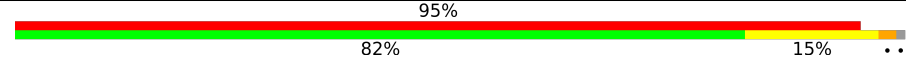
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	1260	
1	C	1260	
1	E	1260	
1	G	1260	
1	I	1260	
1	K	1260	
1	M	1260	
2	B	105	

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Mol	Chain	Length	Quality of chain
2	D	105	 94% 82% 15% ..
2	F	105	 94% 82% 15% ..
2	H	105	 95% 82% 15% ..
2	J	105	 94% 83% 14% ..
2	L	105	 94% 82% 15% ..
2	N	105	 94% 82% 16% ..

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 70252 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 Apoptotic protease-activating factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1144	9139	5789	1569	1720	61	0	0
1	C	1144	9139	5789	1569	1720	61	0	0
1	E	1144	9139	5789	1569	1720	61	0	0
1	G	1144	9139	5789	1569	1720	61	0	0
1	I	1144	9139	5789	1569	1720	61	0	0
1	K	1144	9139	5789	1569	1720	61	0	0
1	M	1144	9139	5789	1569	1720	61	0	0

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1249	LEU	-	expression tag	UNP O14727
A	1250	GLU	-	expression tag	UNP O14727
A	1251	HIS	-	expression tag	UNP O14727
A	1252	HIS	-	expression tag	UNP O14727
A	1253	HIS	-	expression tag	UNP O14727
A	1254	HIS	-	expression tag	UNP O14727
A	1255	HIS	-	expression tag	UNP O14727
A	1256	HIS	-	expression tag	UNP O14727
A	1257	HIS	-	expression tag	UNP O14727
A	1258	HIS	-	expression tag	UNP O14727
A	1259	HIS	-	expression tag	UNP O14727
A	1260	HIS	-	expression tag	UNP O14727
C	1249	LEU	-	expression tag	UNP O14727
C	1250	GLU	-	expression tag	UNP O14727
C	1251	HIS	-	expression tag	UNP O14727
C	1252	HIS	-	expression tag	UNP O14727

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1253	HIS	-	expression tag	UNP O14727
C	1254	HIS	-	expression tag	UNP O14727
C	1255	HIS	-	expression tag	UNP O14727
C	1256	HIS	-	expression tag	UNP O14727
C	1257	HIS	-	expression tag	UNP O14727
C	1258	HIS	-	expression tag	UNP O14727
C	1259	HIS	-	expression tag	UNP O14727
C	1260	HIS	-	expression tag	UNP O14727
E	1249	LEU	-	expression tag	UNP O14727
E	1250	GLU	-	expression tag	UNP O14727
E	1251	HIS	-	expression tag	UNP O14727
E	1252	HIS	-	expression tag	UNP O14727
E	1253	HIS	-	expression tag	UNP O14727
E	1254	HIS	-	expression tag	UNP O14727
E	1255	HIS	-	expression tag	UNP O14727
E	1256	HIS	-	expression tag	UNP O14727
E	1257	HIS	-	expression tag	UNP O14727
E	1258	HIS	-	expression tag	UNP O14727
E	1259	HIS	-	expression tag	UNP O14727
E	1260	HIS	-	expression tag	UNP O14727
G	1249	LEU	-	expression tag	UNP O14727
G	1250	GLU	-	expression tag	UNP O14727
G	1251	HIS	-	expression tag	UNP O14727
G	1252	HIS	-	expression tag	UNP O14727
G	1253	HIS	-	expression tag	UNP O14727
G	1254	HIS	-	expression tag	UNP O14727
G	1255	HIS	-	expression tag	UNP O14727
G	1256	HIS	-	expression tag	UNP O14727
G	1257	HIS	-	expression tag	UNP O14727
G	1258	HIS	-	expression tag	UNP O14727
G	1259	HIS	-	expression tag	UNP O14727
G	1260	HIS	-	expression tag	UNP O14727
I	1249	LEU	-	expression tag	UNP O14727
I	1250	GLU	-	expression tag	UNP O14727
I	1251	HIS	-	expression tag	UNP O14727
I	1252	HIS	-	expression tag	UNP O14727
I	1253	HIS	-	expression tag	UNP O14727
I	1254	HIS	-	expression tag	UNP O14727
I	1255	HIS	-	expression tag	UNP O14727
I	1256	HIS	-	expression tag	UNP O14727
I	1257	HIS	-	expression tag	UNP O14727
I	1258	HIS	-	expression tag	UNP O14727

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Chain	Residue	Modelled	Actual	Comment	Reference
I	1259	HIS	-	expression tag	UNP O14727
I	1260	HIS	-	expression tag	UNP O14727
K	1249	LEU	-	expression tag	UNP O14727
K	1250	GLU	-	expression tag	UNP O14727
K	1251	HIS	-	expression tag	UNP O14727
K	1252	HIS	-	expression tag	UNP O14727
K	1253	HIS	-	expression tag	UNP O14727
K	1254	HIS	-	expression tag	UNP O14727
K	1255	HIS	-	expression tag	UNP O14727
K	1256	HIS	-	expression tag	UNP O14727
K	1257	HIS	-	expression tag	UNP O14727
K	1258	HIS	-	expression tag	UNP O14727
K	1259	HIS	-	expression tag	UNP O14727
K	1260	HIS	-	expression tag	UNP O14727
M	1249	LEU	-	expression tag	UNP O14727
M	1250	GLU	-	expression tag	UNP O14727
M	1251	HIS	-	expression tag	UNP O14727
M	1252	HIS	-	expression tag	UNP O14727
M	1253	HIS	-	expression tag	UNP O14727
M	1254	HIS	-	expression tag	UNP O14727
M	1255	HIS	-	expression tag	UNP O14727
M	1256	HIS	-	expression tag	UNP O14727
M	1257	HIS	-	expression tag	UNP O14727
M	1258	HIS	-	expression tag	UNP O14727
M	1259	HIS	-	expression tag	UNP O14727
M	1260	HIS	-	expression tag	UNP O14727

- Molecule 2 is a protein called Cytochrome c.

Mol	Chain	Residues	Atoms				AltConf	Trace	
2	B	104	Total	C	N	O	S	0	0
			823	524	144	151	4		
2	D	104	Total	C	N	O	S	0	0
			823	524	144	151	4		
2	F	104	Total	C	N	O	S	0	0
			823	524	144	151	4		
2	H	104	Total	C	N	O	S	0	0
			823	524	144	151	4		
2	J	104	Total	C	N	O	S	0	0
			823	524	144	151	4		
2	L	104	Total	C	N	O	S	0	0
			823	524	144	151	4		

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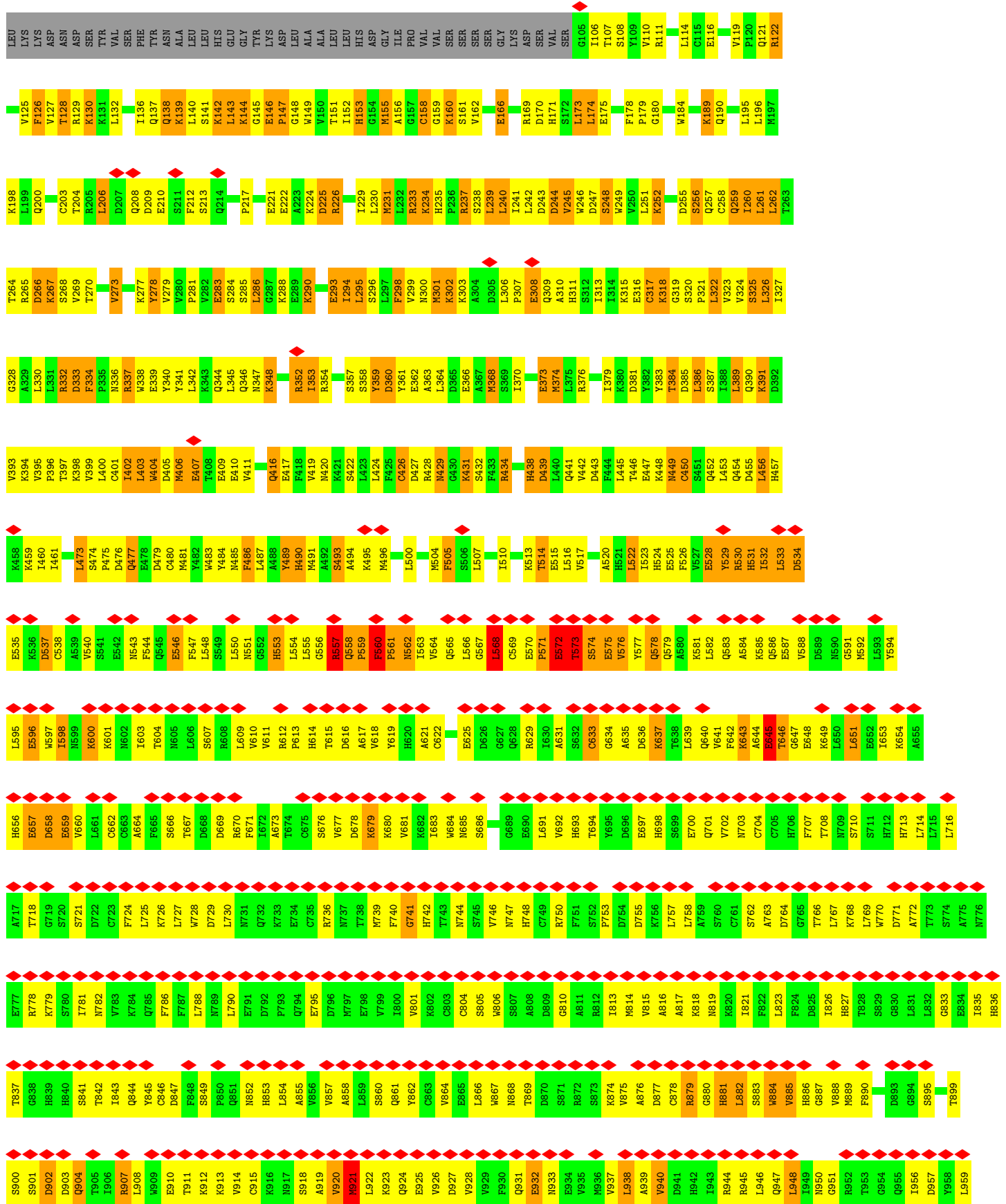


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Mol	Chain	Residues	Atoms					AltConf
			Total	C	Fe	N	O	
5	L	1	Total 43	34	1	4	4	0
5	N	1	Total 43	34	1	4	4	0









K1200	K1201	W1201	W1202	N1203	A1143	T1144	G1145	D1146	D1147	H1148	E1149	E1150	I1151	R1152	I1153	W1154	N1155	W1156	S1157	N1158	G1159	E1160	L1161	L1162	H1163	L1164	C1165	A1166	P1167	L1168	S1169	E1170	E1171	G1172	A1173	A1174	T1175	H1176	G1177	G1178	W1179	V1180	T1181	D1182	L1183	C1184	F1185	S1186	P1187	D1188	H1189	K1190	H1191	L1192	I1193	S1194	A1195	G1196	G1197	Y1198	I1199
D1080	F1081	V1082	C1083	H1084	O1085	G1086	T1087	V1088	L1089	S1090	C1091	I1092	I1093	S1094	H1095	D1096	A1097	T1098	K1099	F1100	S1101	S1102	T1103	S1104	A1105	D1106	K1107	T1108	A1109	K1110	I1111	S1113	F1114	D1115	L1116	L1117	L1118	P1119	L1120	H1121	E1122	L1123	R1124	G1125	H1126	H1127	G1128	C1129	V1130	R1131	C1132	S1133	A1134	F1135	S1136	V1137	D1138	S1139			
T1140	L1141	L1142	A1143	T1144	G1145	D1146	D1147	H1148	E1149	E1150	I1151	R1152	I1153	W1154	N1155	W1156	S1157	N1158	G1159	E1160	L1161	L1162	H1163	L1164	C1165	A1166	P1167	L1168	S1169	E1170	E1171	G1172	A1173	A1174	T1175	H1176	G1177	G1178	W1179	V1180	T1181	D1182	L1183	C1184	F1185	S1186	P1187	D1188	H1189	K1190	H1191	L1192	I1193	S1194	A1195	G1196	G1197	Y1198	I1199		
T1400	T1401	T1402	T1403	T1404	T1405	T1406	T1407	T1408	T1409	T1410	T1411	T1412	T1413	T1414	T1415	T1416	T1417	T1418	T1419	T1420	T1421	T1422	T1423	T1424	T1425	T1426	T1427	T1428	T1429	T1430	T1431	T1432	T1433	T1434	T1435	T1436	T1437	T1438	T1439	T1440	T1441	T1442	T1443	T1444	T1445	T1446	T1447	T1448	T1449	T1450	T1451	T1452	T1453	T1454	T1455	T1456	T1457	T1458	T1459	T1460	
D658	C538	A539	V540	S541	E542	F544	Q545	E546	F547	S549	L550	M551	G552	H553	L554	L555	M556	R557	Q558	P559	F560	P561	M562	I563	V564	Q565	L566	G567	L568	C569	E570	P571	I572	T573	S574	E575	V576	Y577	Q578	Q579	A580	K581	L582	Q583	A584	K585	Q586	E587	V588	D589	G591	M592	L593	Y594	L595	E596					
W597	N599	K600	K601	M602	I603	T604	N605	L606	S607	R608	L609	M610	V611	P613	H614	T615	D616	A617	V618	V619	H620	C622	E625	D626	G627	Q628	R629	I630	A631	S632	C633	G634	A635	D636	K637	T638	L639	Q640	V641	F642	K643	A644	E645	T646	G647	E648	K649	L650	L651	E652	I653	K654	A655	H656	E657						
D658	E659	V660	L661	C662	C663	A664	F665	S666	T667	D668	D669	R670	F671	A673	T674	S676	D678	K679	K680	V681	K682	I683	W684	N685	S686	G689	E690	L691	V692	H693	T694	V695	D696	E697	H698	S699	E700	Q701	V702	N703	F642	C704	C705	H706	F707	T708	N709	L710	L651	E652	I653	K654	A655	H656	E657						
G719	S720	S721	D722	C723	F724	L725	K726	L727	W728	D729	L730	W731	Q732	K733	E734	C735	R736	W737	T738	W739	F740	G741	H742	T743	W744	S745	V746	W747	H748	C749	R750	F751	S752	P753	D754	D755	K756	L757	L758	A759	S760	C761	S762	A763	D764	G765	T766	L767	K768	L769	W770	D771	A772	T773	S774	A775	N776	E777	R778		
K779	S780	I781	N782	V783	K784	Q785	F786	F787	L788	N789	L790	E791	Q792	F793	Q794	E795	D796	W797	E798	V799	I800	V801	K802	C803	C804	S805	M806	S807	A808	D809	G810	A811	I813	M814	V815	A816	A817	K818	N819	K820	I821	F822	L823	F824	D825	I826	H827	T828	S829	G830	L831	L832	G833	E834	I835	H836	T837	G838			
H839	H840	S841	T842	I843	Q844	C846	D847	F848	S849	P850	Q851	N852	H853	L854	A855	V856	W857	L858	L859	S860	Q861	T862	C863	V864	L866	M867	N868	T869	D870	S871	A872	K874	V875	A876	D877	C878	R879	C880	H881	L882	S883	V884	H885	H886	C887	V888	N889	F890	D893	G894	S895	S896	F897	L898	T899						
S900	S901	D902	D903	Q904	T905	I906	R907	L908	N909	E910	T911	K912	K913	V914	C915	R916	S918	A919	V920	L922	K923	Q924	E925	V926	D927	V928	V929	F930	Q931	E932	N933	E934	V935	M936	V937	L938	A939	V940	D941	H942	I943	R944	R945	L946	Q947	L948	V949	N950	C951	R952	T953	G954	Q955	I956	D957	V958	L959				
T960	E961	A962	Q963	V964	S965	C966	C967	L969	S970	P971	H972	L973	Q974	Y975	I976	A977	F978	G979	D980	E981	N982	G983	A984	I985	E986	I987	L988	E989	L990	V991	N992	R994	I995	F996	Q997	S998	R999	F1000	I1001	H1002	K1003	K1004	T1005	V1006	W1007	H1008	I1009	Q1010	I1011	T1012	I1013	D1014	E1015	K1016	L1018	I1019					
S1020	S1021	S1022	D1023	D1024	A1025	E1026	I1027	Q1028	V1029	W1030	N1031	W1032	Q1033	L1034	D1035	K1036	C1037	I1038	F1039	L1040	R1041	G1042	H1043	Q1044	I1045	T1046	V1047	K1048	L1049	F1050	R1051	L1052	L1053	K1054	M1055	S1056	R1057	L1058	L1059	S1060	W1061	S1062	F1063	D1064	G1065	T1066	V1067	K1068	V1069	W1070	N1071	I1072	I1073	T1074	G1075	M1076	E1078	K1079			
D1080	F1081	V1082	C1083	H1084	O1085	G1086	T1087	V1088	L1089	S1090	C1091	I1092	I1093	S1094	H1095	D1096	A1097	T1098	K1099	F1100	S1101	S1102	T1103	S1104	A1105	D1106	K1107	T1108	A1109	K1110	I1111	S1113	F1114	D1115	L1116	L1117	L1118	P1119	L1120	H1121	E1122	L1123	R1124	G1125	H1126	H1127	G1128	C1129	V1130	R1131	C1132	S1133	A1134	F1135	S1136	V1137	D1138	S1139			
T1140	L1141	L1142	A1143	T1144	G1145	D1146	D1147	H1148	E1149	E1150	I1151	R1152	I1153	W1154	N1155	W1156	S1157	N1158	G1159	E1160	L1161	L1162	H1163	L1164	C1165	A1166	P1167	L1168	S1169	E1170	E1171	G1172	A1173	A1174	T1175	H1176	G1177	G1178	W1179	V1180	T1181	D1182	L1183	C1184	F1185	S1186	P1187	D1188	H1189	K1190	H1191	L1192	I1193	S1194	A1195	G1196	G1197	Y1198	I1199		

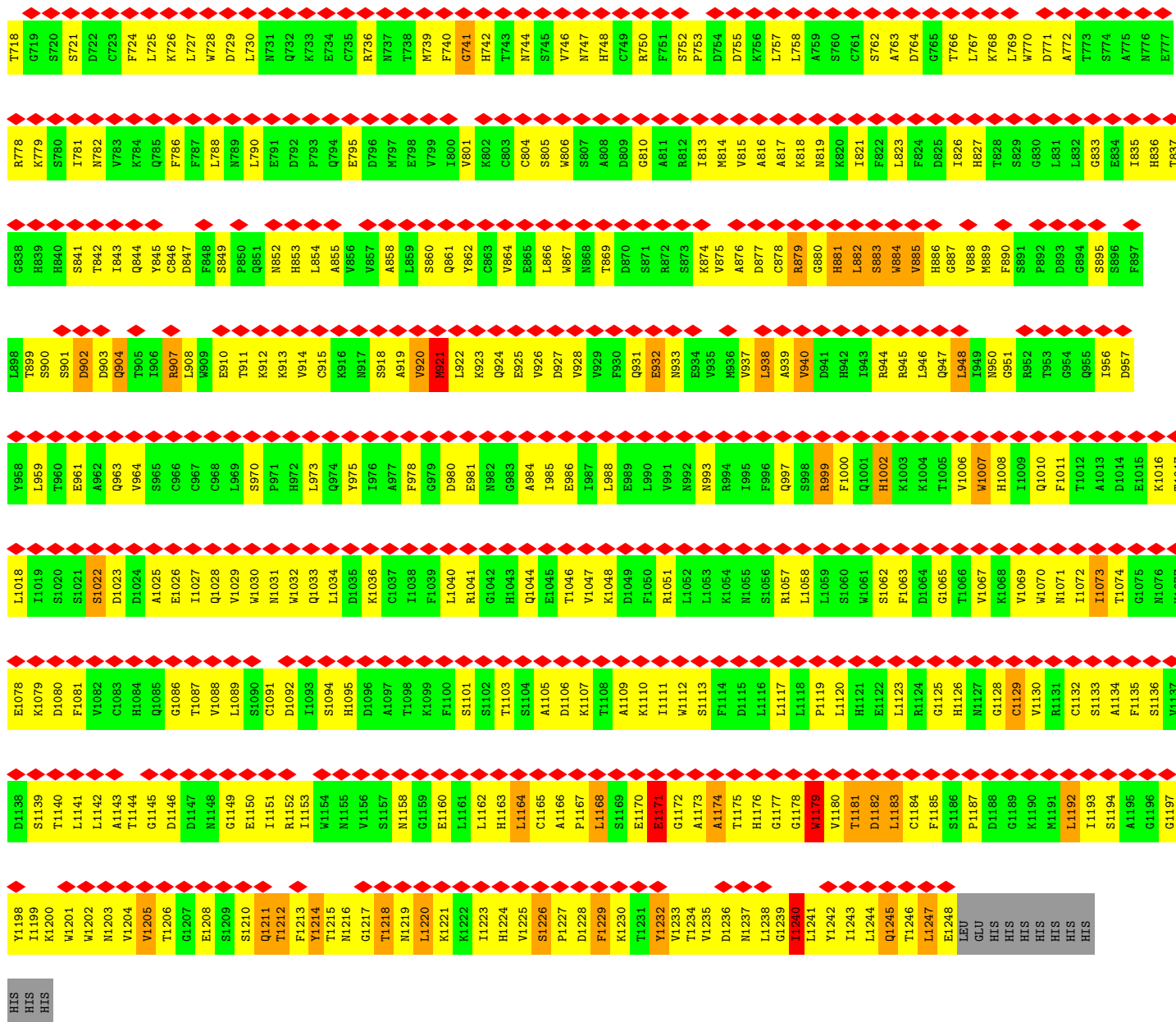








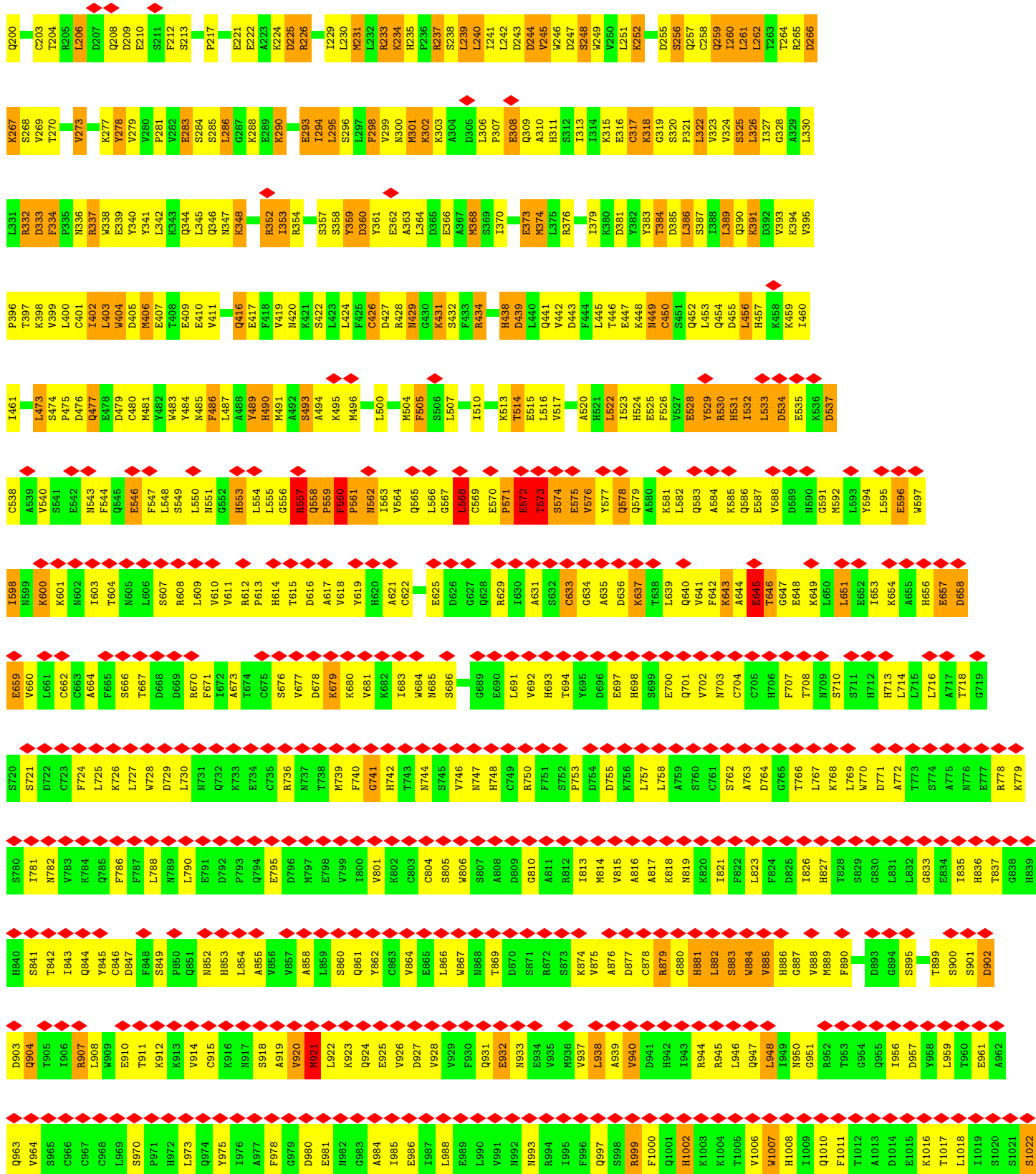


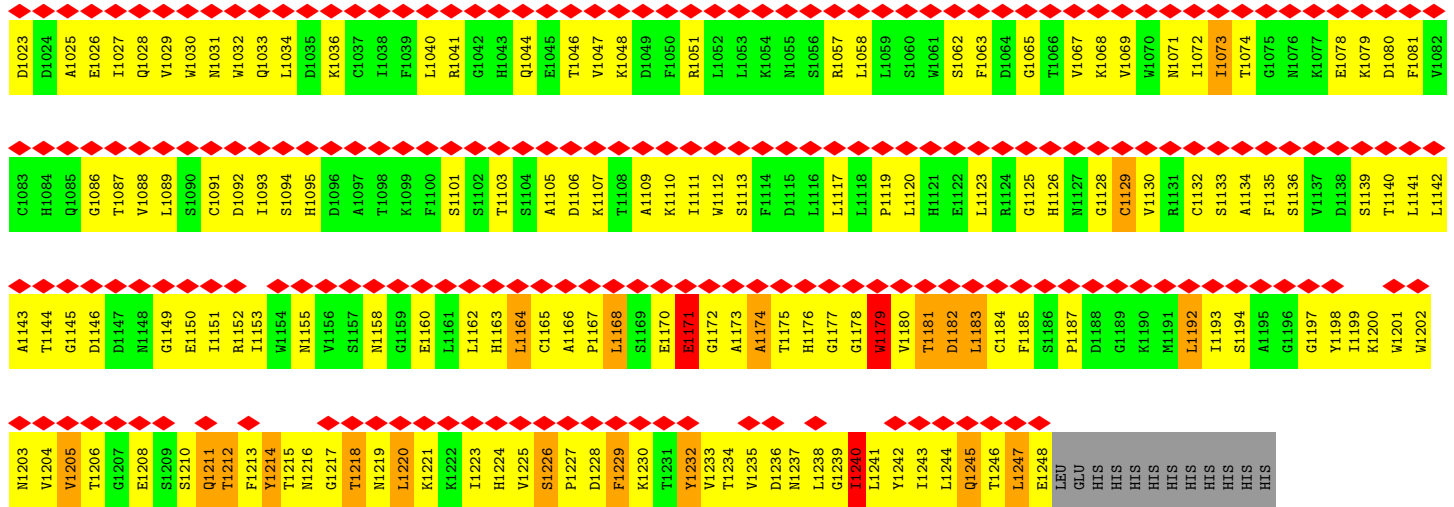


● Molecule 1: Apoptotic protease-activating factor 1

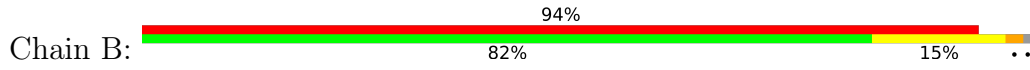


MET	LEU	V125	G105	W184	K189	Q190	L195	L196	M197	K198	L199
ASP	LYS	F126	I106	D169	D170	Q190	L195	L196	M197	K198	L199
ALA	ASP	V127	T107	H171	H171	Q190	L195	L196	M197	K198	L199
LYS	ASP	T128	S108	L173	L173	Q190	L195	L196	M197	K198	L199
ALA	ASN	R129	F109	L174	L174	Q190	L195	L196	M197	K198	L199
ARG	ASP	K130	R111	E175	E175	Q190	L195	L196	M197	K198	L199
ASN	VAL	I136	R114	E166	E166	Q190	L195	L196	M197	K198	L199
CYS	LEU	Q137	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	LEU	Q138	G115	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	LEU	K139	G115	E166	E166	Q190	L195	L196	M197	K198	L199
GLN	LEU	L140	E116	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	ALA	S141	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ARG	ALA	K142	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLU	LEU	L143	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ALA	LEU	G144	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ALA	HIS	G145	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	LEU	E146	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASP	GLY	F147	L114	E166	E166	Q190	L195	L196	M197	K198	L199
THR	TYR	G148	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	ASP	V150	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ALA	ALA	T151	L114	E166	E166	Q190	L195	L196	M197	K198	L199
TYR	TYR	I152	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ILE	LEU	H153	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ILE	LEU	G154	L114	E166	E166	Q190	L195	L196	M197	K198	L199
MET	LEU	M155	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASP	LEU	A156	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ILE	ASP	G157	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASP	PRO	C158	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASP	PRO	G159	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLY	VAL	K160	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	VAL	S161	L114	E166	E166	Q190	L195	L196	M197	K198	L199
THR	LEU	V162	L114	E166	E166	Q190	L195	L196	M197	K198	L199
THR	SER	E166	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLU	GLY	R169	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLU	GLU	D170	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LYS	ASP	H171	L114	E166	E166	Q190	L195	L196	M197	K198	L199
VAL	VAL	S172	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ARG	SER	L174	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASN	ARG	E175	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ASN	ASN	F178	L114	E166	E166	Q190	L195	L196	M197	K198	L199
PRO	PRO	P179	L114	E166	E166	Q190	L195	L196	M197	K198	L199
THR	THR	G180	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLN	GLN	V184	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLN	GLN	W184	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ARG	ARG	K189	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ALA	ALA	Q190	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ALA	ALA	G115	L114	E166	E166	Q190	L195	L196	M197	K198	L199
MET	MET	E116	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	LEU	L124	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ILE	ILE	L244	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LYS	LYS	Q1245	L114	E166	E166	Q190	L195	L196	M197	K198	L199
MET	MET	T1246	L114	E166	E166	Q190	L195	L196	M197	K198	L199
ILE	ILE	E1248	L114	E166	E166	Q190	L195	L196	M197	K198	L199
LEU	LEU	GLU	L114	E166	E166	Q190	L195	L196	M197	K198	L199
GLU	GLU	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	HIS	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	HIS	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	HIS	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	HIS	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199
HIS	HIS	HIS	L114	E166	E166	Q190	L195	L196	M197	K198	L199

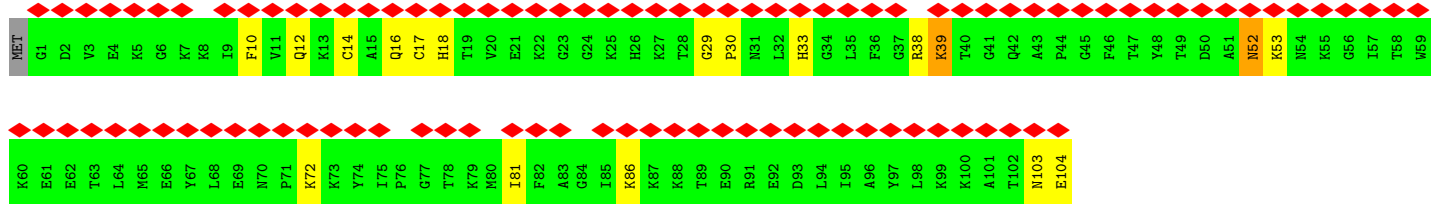




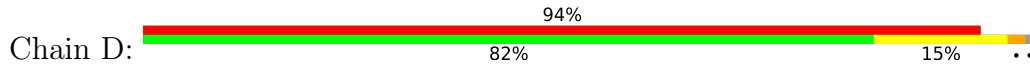
• Molecule 2: Cytochrome c



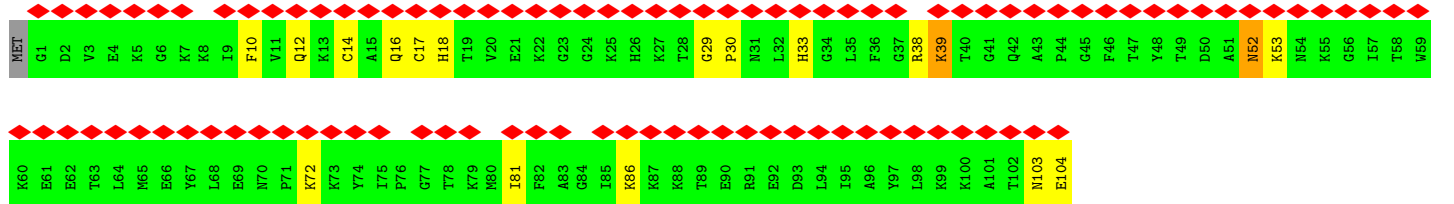
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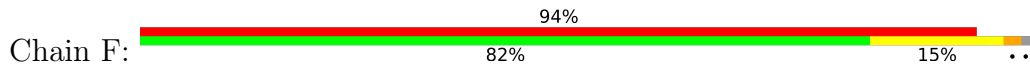
• Molecule 2: Cytochrome c



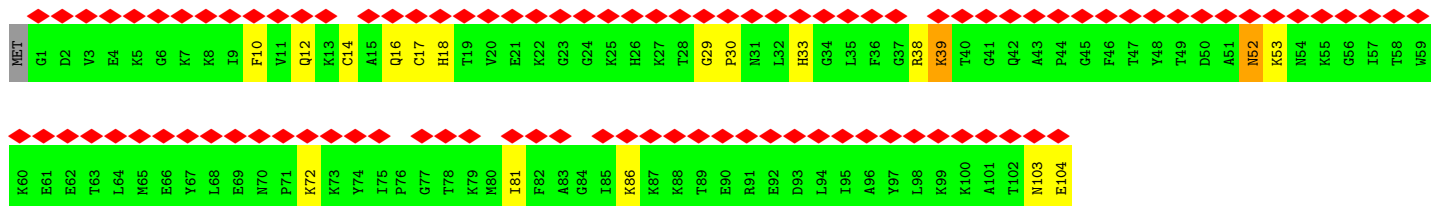
Chain D:



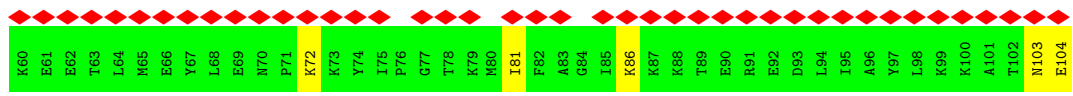
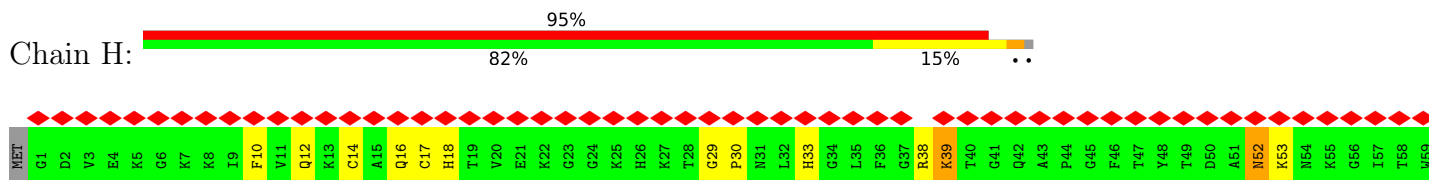
• Molecule 2: Cytochrome c



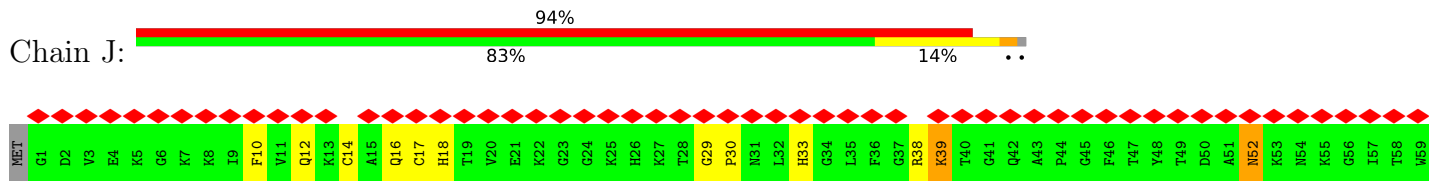
Chain F:



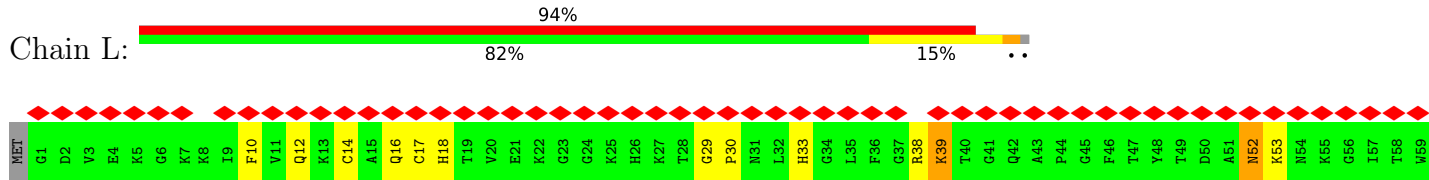
• Molecule 2: Cytochrome c



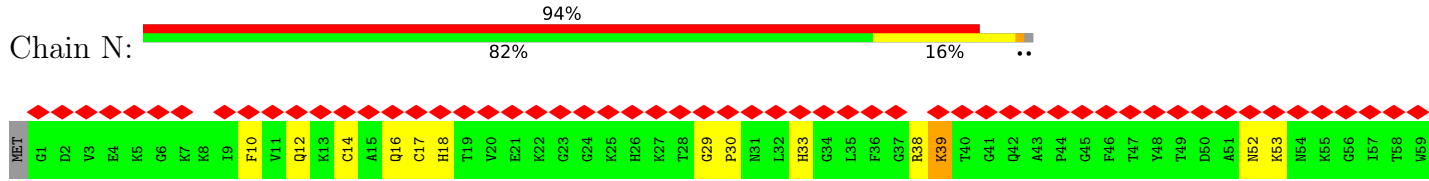
• Molecule 2: Cytochrome c



• Molecule 2: Cytochrome c



• Molecule 2: Cytochrome c



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C7	Depositor
Number of particles used	134919	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	Not provided	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 (4k x 4k)	Depositor
Maximum map value	0.351	Depositor
Minimum map value	-0.239	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.04	Depositor
Map size ( $\text{\AA}$ )	422.40002, 422.40002, 422.40002	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.32, 1.32, 1.32	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: DTP, MG, HEM

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	0.30	0/9337	0.51	2/12636 (0.0%)
1	C	0.30	0/9337	0.51	2/12636 (0.0%)
1	E	0.30	0/9337	0.51	2/12636 (0.0%)
1	G	0.30	0/9337	0.51	2/12636 (0.0%)
1	I	0.30	0/9337	0.51	2/12636 (0.0%)
1	K	0.30	0/9337	0.51	2/12636 (0.0%)
1	M	0.30	0/9337	0.51	2/12636 (0.0%)
2	B	0.65	0/839	0.73	0/1118
2	D	0.65	0/839	0.73	0/1118
2	F	0.65	0/839	0.73	0/1118
2	H	0.65	0/839	0.73	0/1118
2	J	0.65	0/839	0.73	0/1118
2	L	0.65	0/839	0.73	0/1118
2	N	0.65	0/839	0.73	0/1118
All	All	0.34	0/71232	0.53	14/96278 (0.0%)

There are no bond length outliers.

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	880	GLY	N-CA-C	5.73	127.43	113.10
1	I	880	GLY	N-CA-C	5.73	127.43	113.10
1	K	880	GLY	N-CA-C	5.73	127.43	113.10
1	M	880	GLY	N-CA-C	5.73	127.42	113.10
1	E	880	GLY	N-CA-C	5.72	127.41	113.10

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	9139	0	9005	1372	0
1	C	9139	0	9005	1371	0
1	E	9139	0	9005	1360	0
1	G	9139	0	9005	1382	0
1	I	9139	0	9005	1358	0
1	K	9139	0	9005	1357	0
1	M	9139	0	9005	1366	0
2	B	823	0	849	31	0
2	D	823	0	849	33	0
2	F	823	0	849	30	0
2	H	823	0	849	34	0
2	J	823	0	849	32	0
2	L	823	0	849	33	0
2	N	823	0	849	31	0
3	A	30	0	12	6	0
3	C	30	0	12	6	0
3	E	30	0	12	6	0
3	G	30	0	12	6	0
3	I	30	0	12	7	0
3	K	30	0	12	6	0
3	M	30	0	12	6	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
4	I	1	0	0	0	0
4	K	1	0	0	0	0
4	M	1	0	0	0	0
5	B	43	0	30	15	0
5	D	43	0	30	16	0
5	F	43	0	30	14	0
5	H	43	0	30	16	0
5	J	43	0	30	15	0
5	L	43	0	30	15	0
5	N	43	0	30	13	0
All	All	70252	0	69272	9596	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 69.

The worst 5 of 9596 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:E:544:PHE:CE1	1:E:576:VAL:HG13	1.28	1.68
1:G:544:PHE:CE1	1:G:576:VAL:HG13	1.28	1.67
1:C:544:PHE:CE1	1:C:576:VAL:HG13	1.28	1.65
1:C:862:TYR:CD1	1:C:885:VAL:HG12	1.26	1.64
1:A:544:PHE:CE1	1:A:576:VAL:HG13	1.28	1.64

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	1142/1260 (91%)	999 (88%)	98 (9%)	45 (4%)	3	28
1	C	1142/1260 (91%)	999 (88%)	98 (9%)	45 (4%)	3	28
1	E	1142/1260 (91%)	999 (88%)	98 (9%)	45 (4%)	3	28
1	G	1142/1260 (91%)	999 (88%)	98 (9%)	45 (4%)	3	28
1	I	1142/1260 (91%)	999 (88%)	98 (9%)	45 (4%)	3	28
1	K	1142/1260 (91%)	999 (88%)	97 (8%)	46 (4%)	3	28
1	M	1142/1260 (91%)	999 (88%)	97 (8%)	46 (4%)	3	28
2	B	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
2	D	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
2	F	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
2	H	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
2	J	102/105 (97%)	100 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	L	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
2	N	102/105 (97%)	100 (98%)	2 (2%)	0	100	100
All	All	8708/9555 (91%)	7693 (88%)	698 (8%)	317 (4%)	6	30

5 of 317 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	147	PRO
1	A	557	ARG
1	A	560	PHE
1	A	562	ASN
1	A	645	GLU

### 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	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	C	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	E	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	G	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	I	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	K	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
1	M	1027/1131 (91%)	838 (82%)	189 (18%)	1	11
2	B	86/87 (99%)	80 (93%)	6 (7%)	15	46
2	D	86/87 (99%)	80 (93%)	6 (7%)	15	46
2	F	86/87 (99%)	80 (93%)	6 (7%)	15	46
2	H	86/87 (99%)	80 (93%)	6 (7%)	15	46
2	J	86/87 (99%)	81 (94%)	5 (6%)	20	51
2	L	86/87 (99%)	80 (93%)	6 (7%)	15	46
2	N	86/87 (99%)	80 (93%)	6 (7%)	15	46

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	7791/8526 (91%)	6427 (82%)	1364 (18%)	<b>4</b> <b>13</b>

5 of 1364 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	I	633	CYS
1	K	1170	GLU
1	I	1171	GLU
1	I	619	TYR
1	K	332	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 208 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	1237	ASN
1	I	1126	HIS
1	M	840	HIS
1	I	138	GLN
1	I	457	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

Of 21 ligands modelled in this entry, 7 are monoatomic - leaving 14 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	DTP	C	1301	4	26,32,32	0.86	1 (3%)	30,50,50	1.56	4 (13%)
5	HEM	N	201	2	41,50,50	1.31	6 (14%)	45,82,82	1.74	6 (13%)
5	HEM	L	201	2	41,50,50	1.32	6 (14%)	45,82,82	1.73	6 (13%)
5	HEM	F	201	2	41,50,50	1.31	5 (12%)	45,82,82	1.73	6 (13%)
3	DTP	E	1301	4	26,32,32	0.87	1 (3%)	30,50,50	1.56	4 (13%)
3	DTP	M	1301	4	26,32,32	0.86	1 (3%)	30,50,50	1.56	4 (13%)
5	HEM	D	201	2	41,50,50	1.31	6 (14%)	45,82,82	1.73	6 (13%)
5	HEM	J	201	2	41,50,50	1.32	6 (14%)	45,82,82	1.73	6 (13%)
5	HEM	B	201	2	41,50,50	1.31	6 (14%)	45,82,82	1.73	6 (13%)
3	DTP	G	1301	4	26,32,32	0.87	1 (3%)	30,50,50	1.56	4 (13%)
3	DTP	K	1301	4	26,32,32	0.86	1 (3%)	30,50,50	1.56	4 (13%)
3	DTP	A	1301	4	26,32,32	0.86	1 (3%)	30,50,50	1.56	4 (13%)
5	HEM	H	201	2	41,50,50	1.32	6 (14%)	45,82,82	1.73	6 (13%)
3	DTP	I	1301	4	26,32,32	0.86	1 (3%)	30,50,50	1.56	4 (13%)

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	DTP	C	1301	4	-	5/18/34/34	0/3/3/3
5	HEM	N	201	2	-	7/12/54/54	-
5	HEM	L	201	2	-	7/12/54/54	-
5	HEM	F	201	2	-	7/12/54/54	-
3	DTP	E	1301	4	-	5/18/34/34	0/3/3/3
3	DTP	M	1301	4	-	5/18/34/34	0/3/3/3
5	HEM	D	201	2	-	7/12/54/54	-
5	HEM	J	201	2	-	7/12/54/54	-
5	HEM	B	201	2	-	7/12/54/54	-
3	DTP	G	1301	4	-	5/18/34/34	0/3/3/3
3	DTP	K	1301	4	-	5/18/34/34	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DTP	A	1301	4	-	5/18/34/34	0/3/3/3
5	HEM	H	201	2	-	7/12/54/54	-
3	DTP	I	1301	4	-	5/18/34/34	0/3/3/3

The worst 5 of 48 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	J	201	HEM	C1B-NB	-3.40	1.34	1.40
5	H	201	HEM	C1B-NB	-3.38	1.34	1.40
5	L	201	HEM	C1B-NB	-3.37	1.34	1.40
5	N	201	HEM	C1B-NB	-3.37	1.34	1.40
5	F	201	HEM	C1B-NB	-3.35	1.34	1.40

The worst 5 of 70 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	J	201	HEM	CHC-C4B-NB	4.71	129.54	124.43
5	N	201	HEM	CHC-C4B-NB	4.70	129.53	124.43
5	L	201	HEM	CHC-C4B-NB	4.69	129.52	124.43
5	H	201	HEM	CHC-C4B-NB	4.67	129.51	124.43
5	D	201	HEM	CHC-C4B-NB	4.65	129.49	124.43

There are no chirality outliers.

5 of 84 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1301	DTP	C5'-O5'-PA-O2A
3	A	1301	DTP	C5'-O5'-PA-O3A
3	C	1301	DTP	C5'-O5'-PA-O2A
3	C	1301	DTP	C5'-O5'-PA-O3A
3	E	1301	DTP	C5'-O5'-PA-O2A

There are no ring outliers.

14 monomers are involved in 147 short contacts:

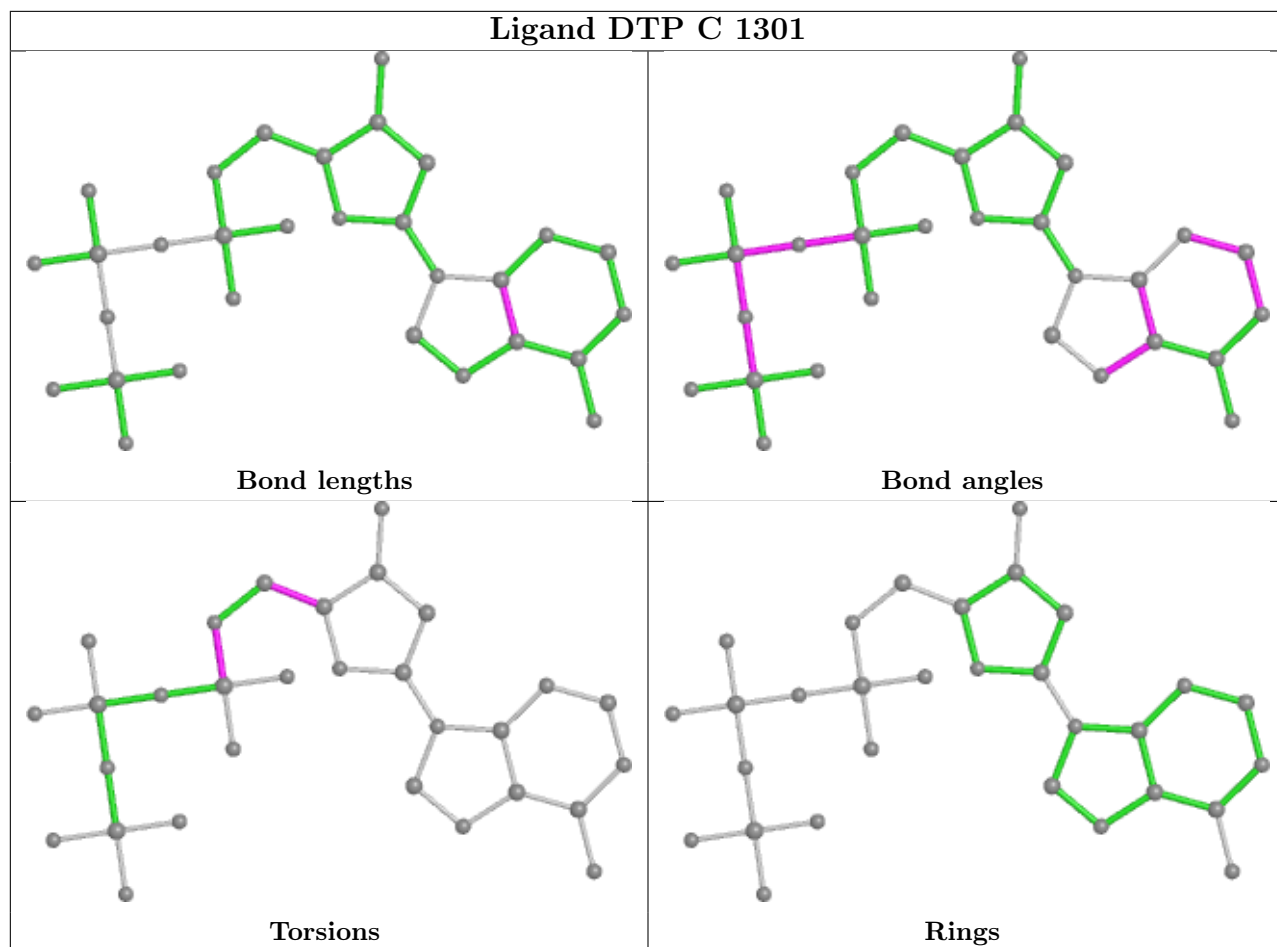
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1301	DTP	6	0
5	N	201	HEM	13	0
5	L	201	HEM	15	0
5	F	201	HEM	14	0

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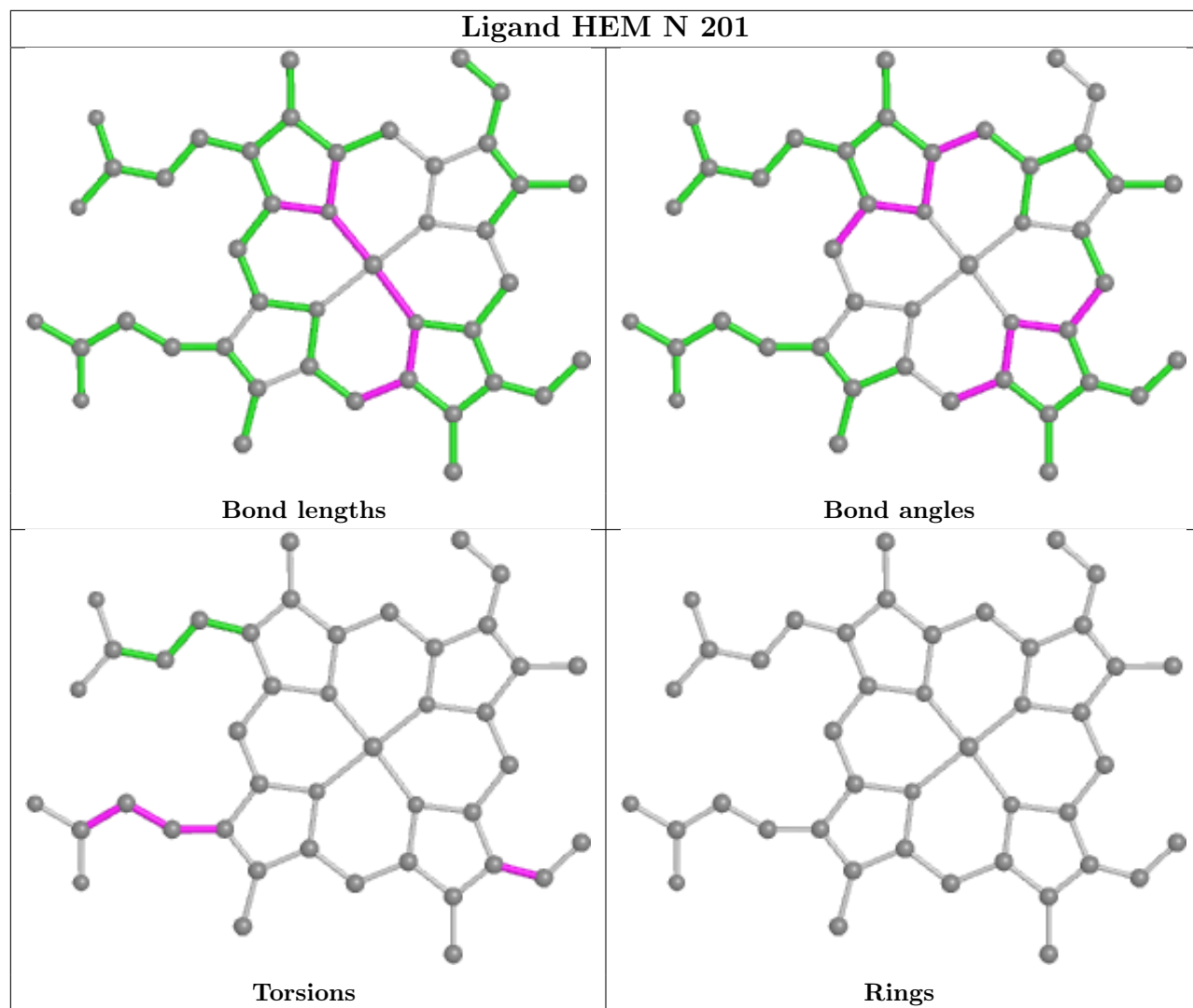
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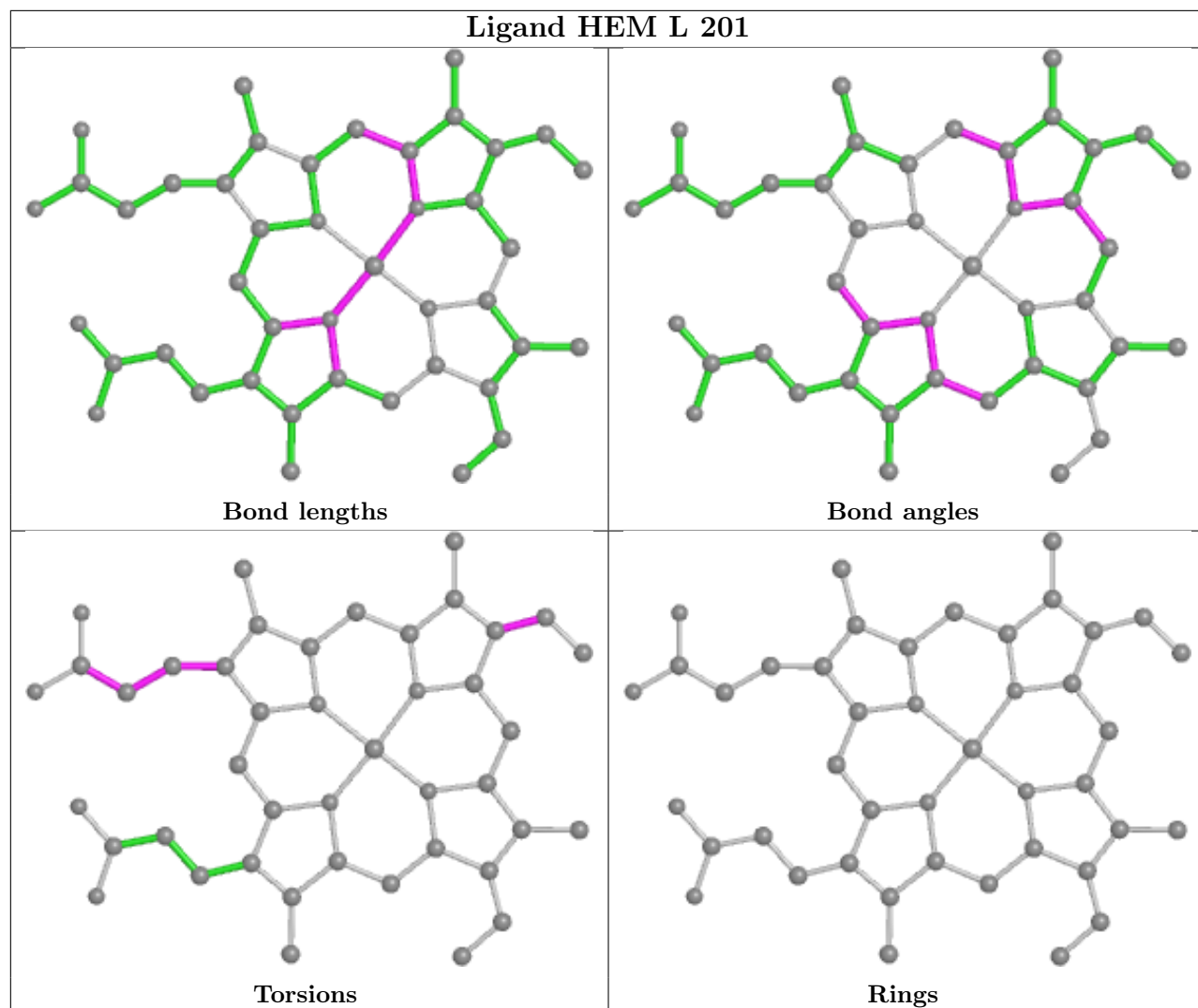
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	1301	DTP	6	0
3	M	1301	DTP	6	0
5	D	201	HEM	16	0
5	J	201	HEM	15	0
5	B	201	HEM	15	0
3	G	1301	DTP	6	0
3	K	1301	DTP	6	0
3	A	1301	DTP	6	0
5	H	201	HEM	16	0
3	I	1301	DTP	7	0

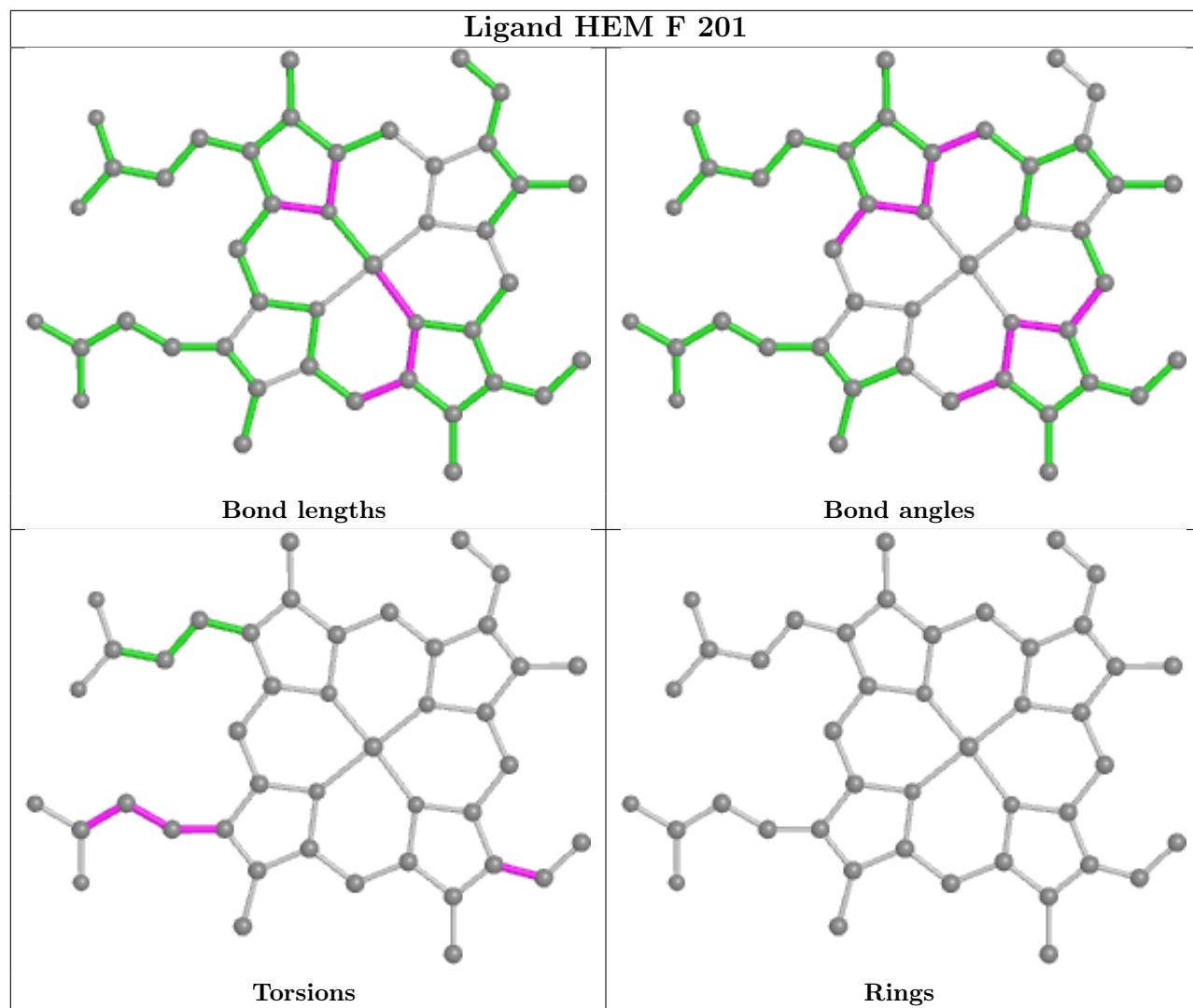
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

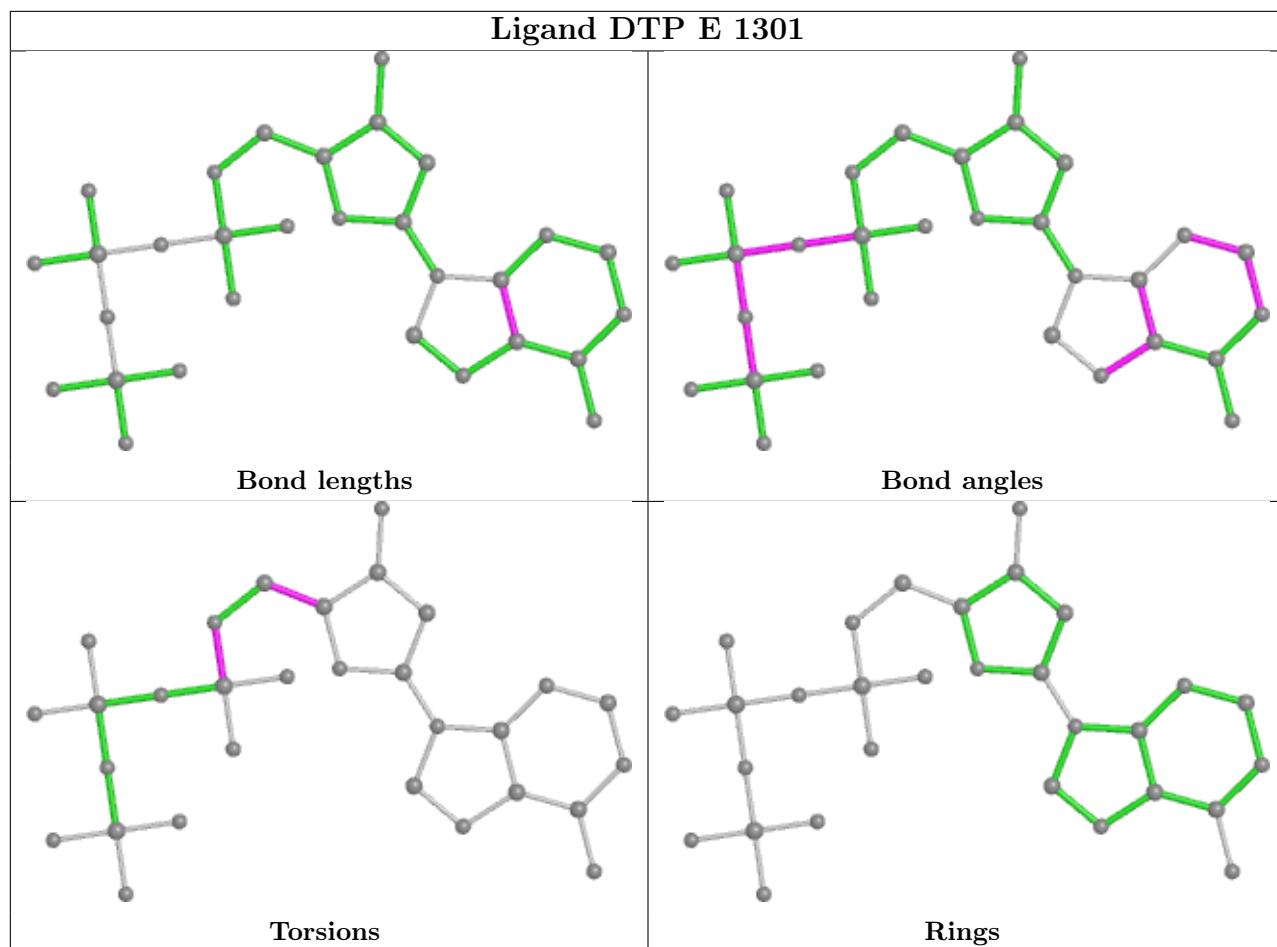


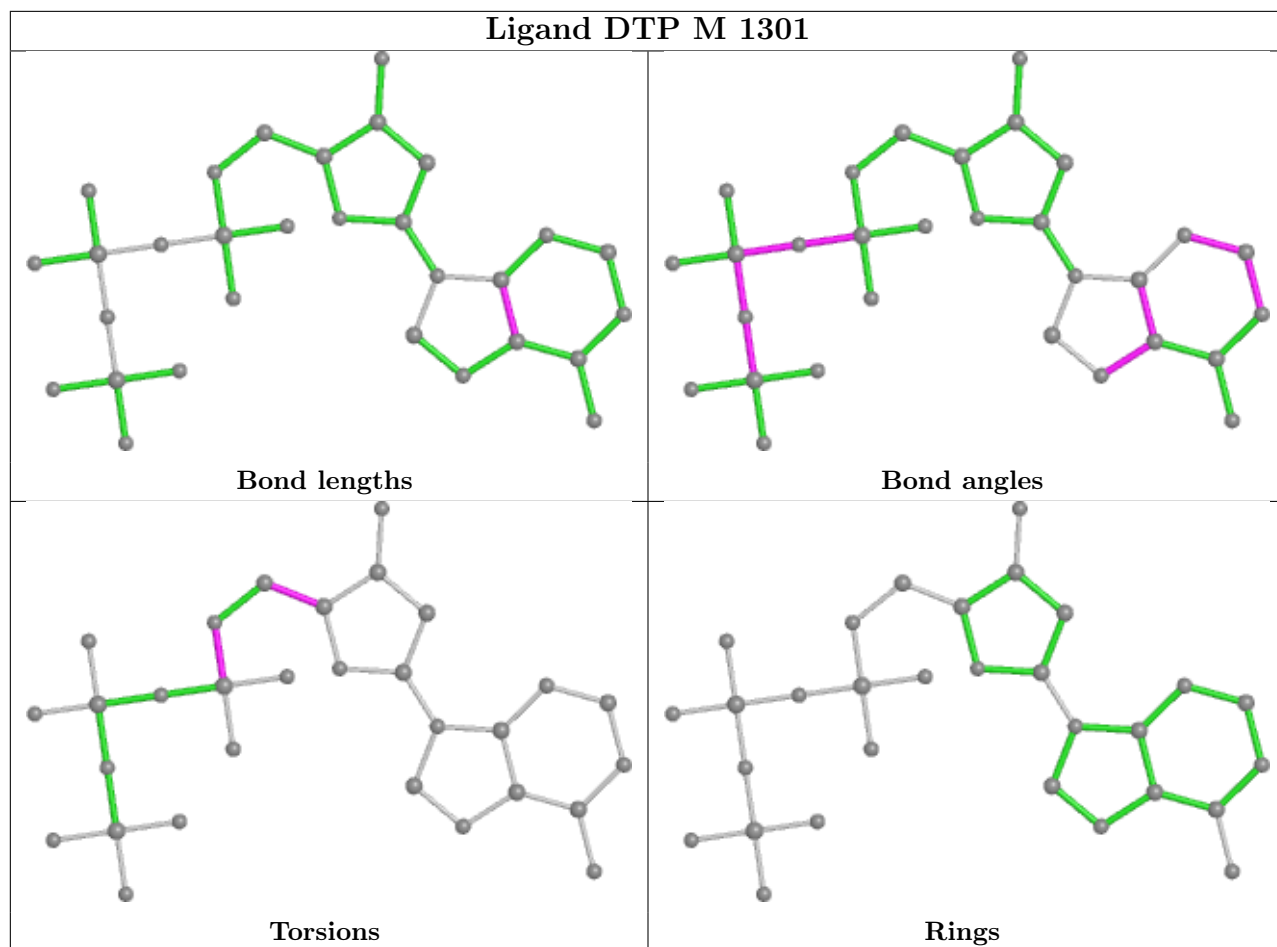


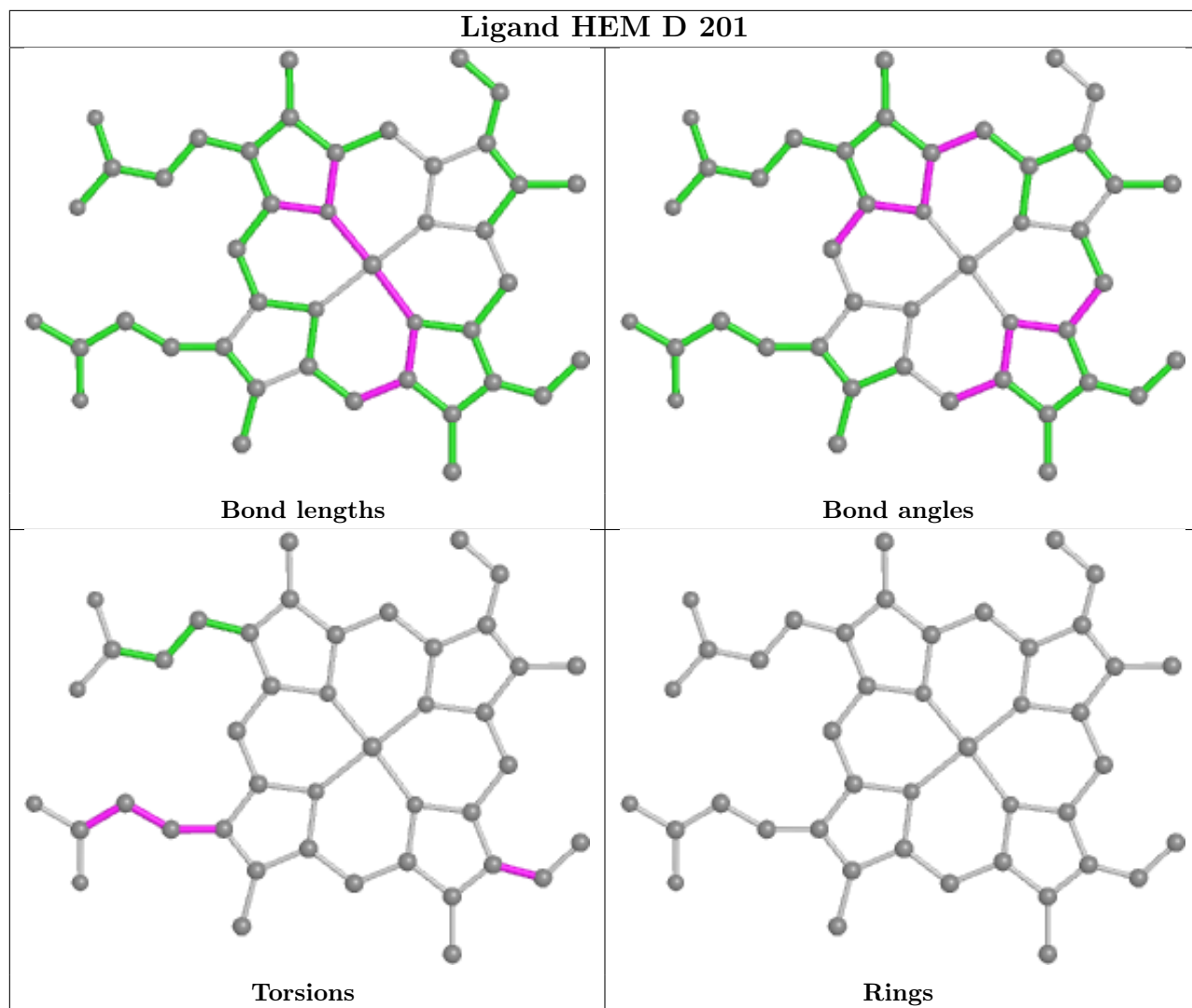


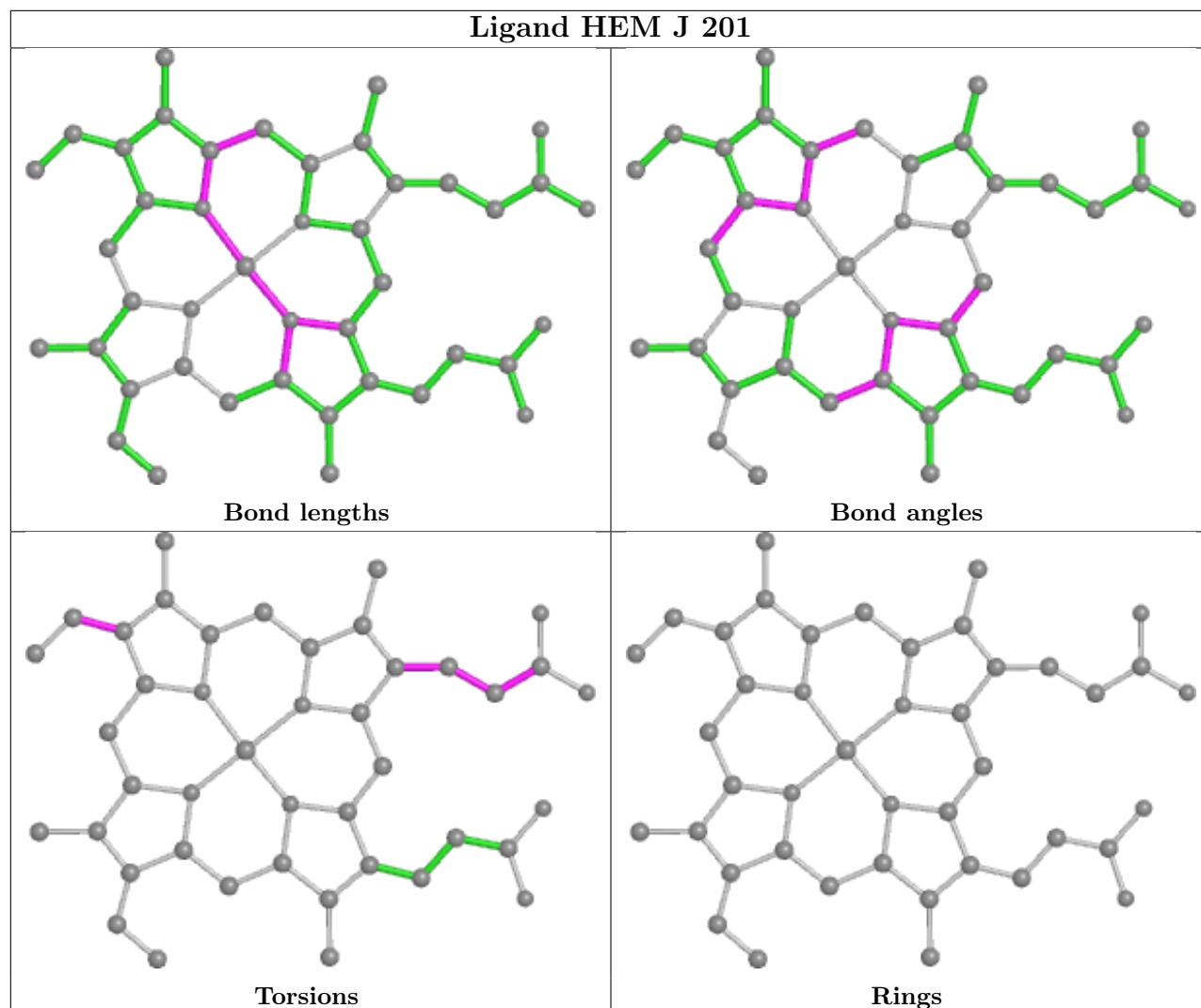


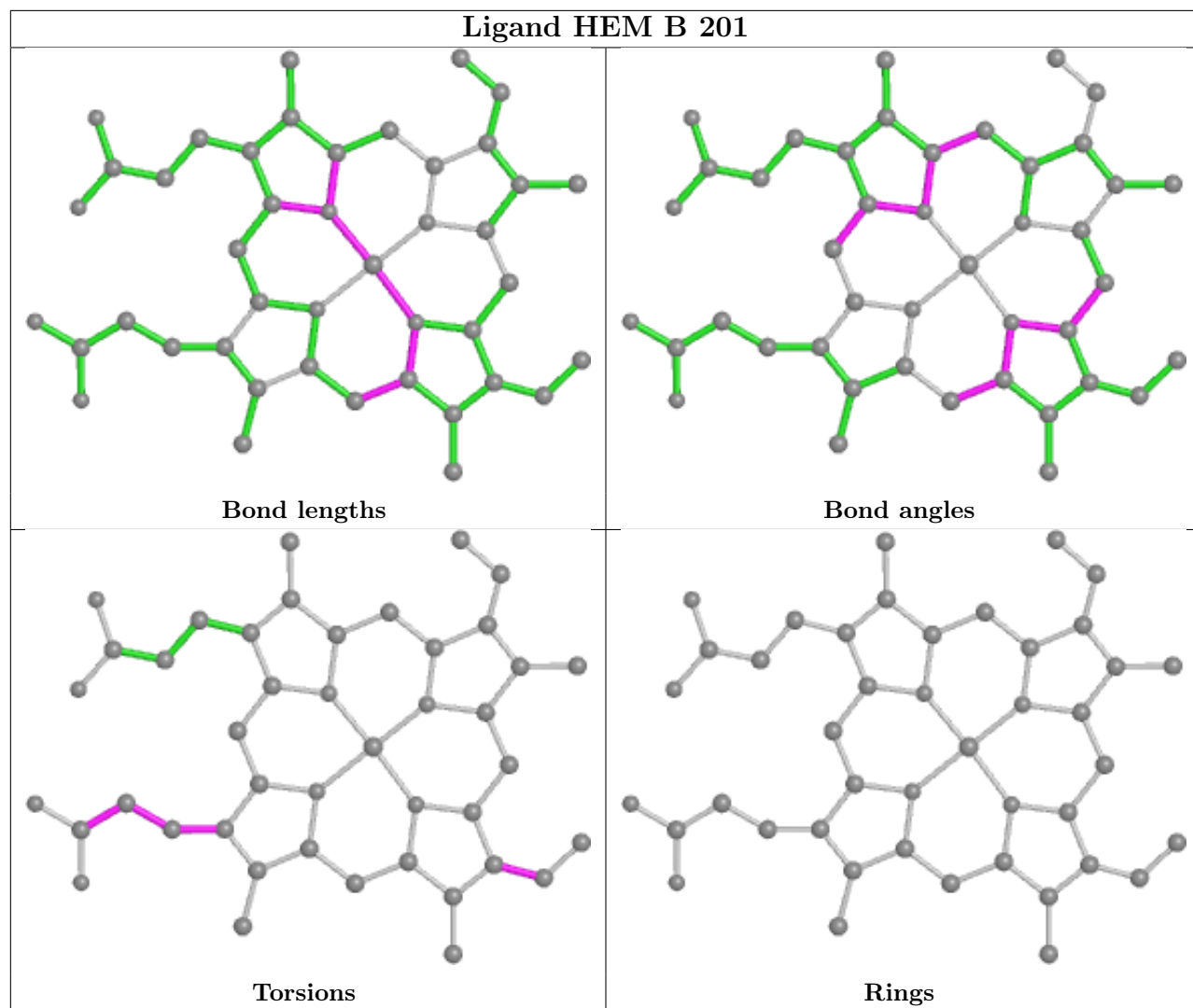




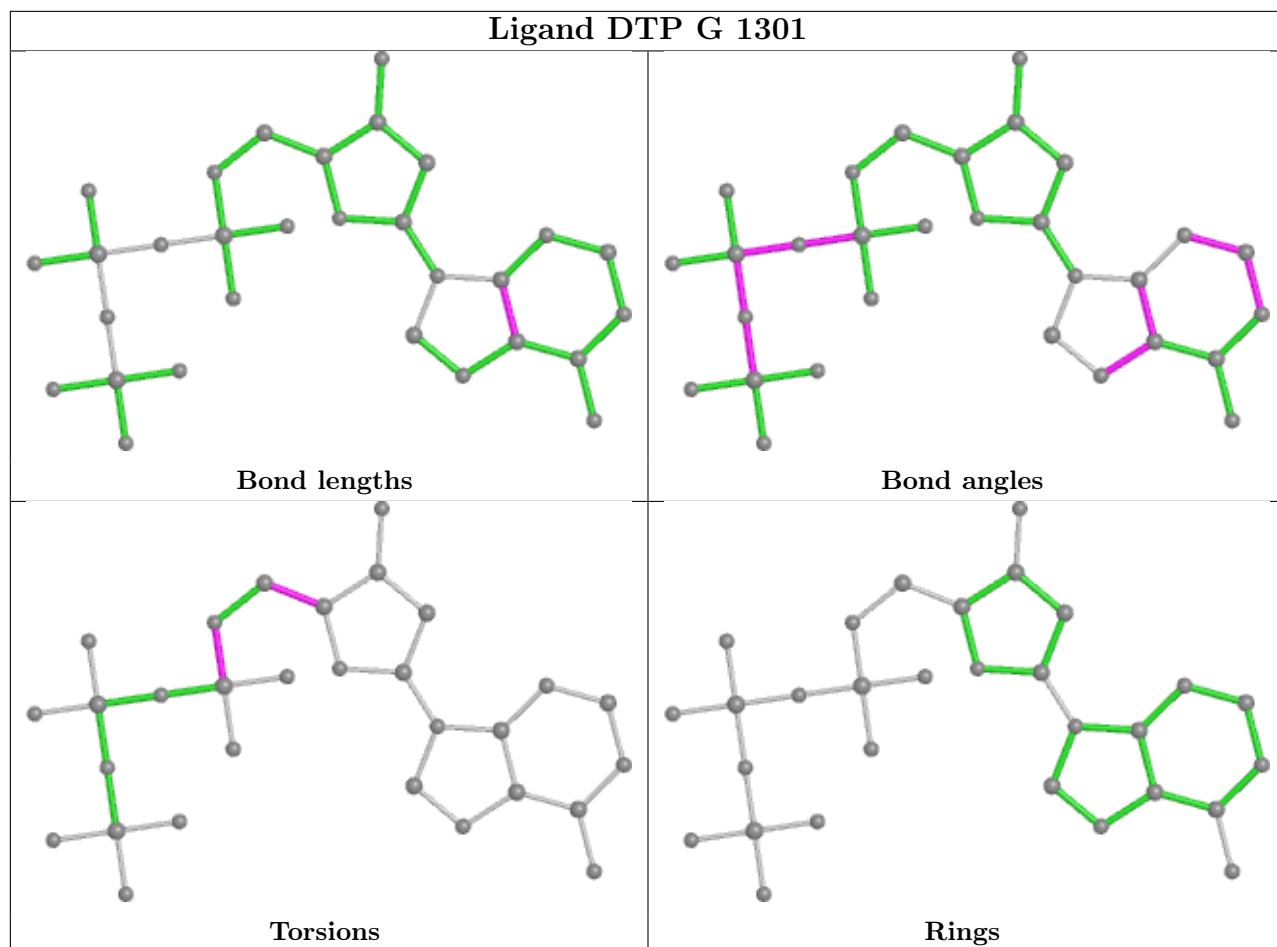


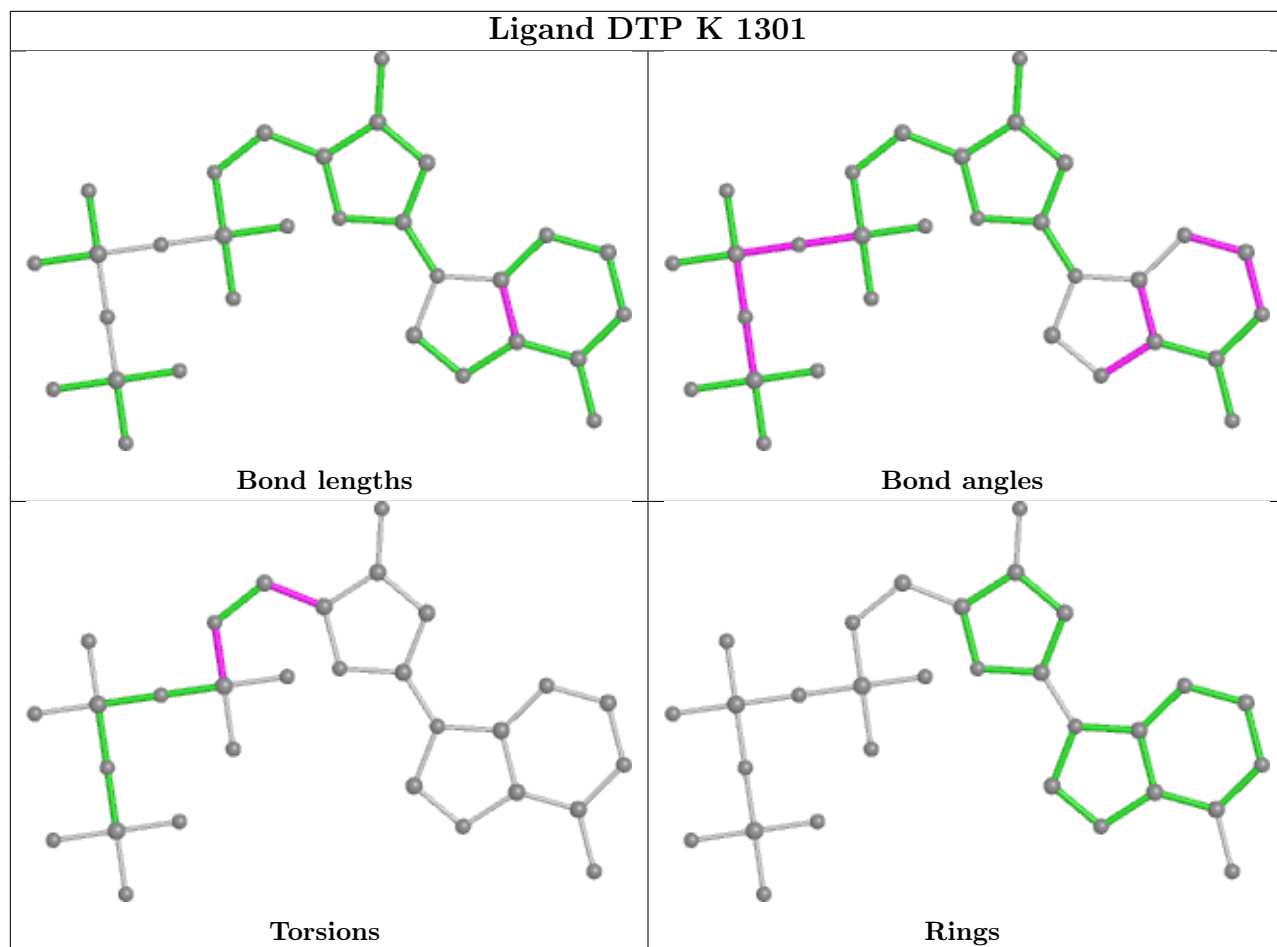


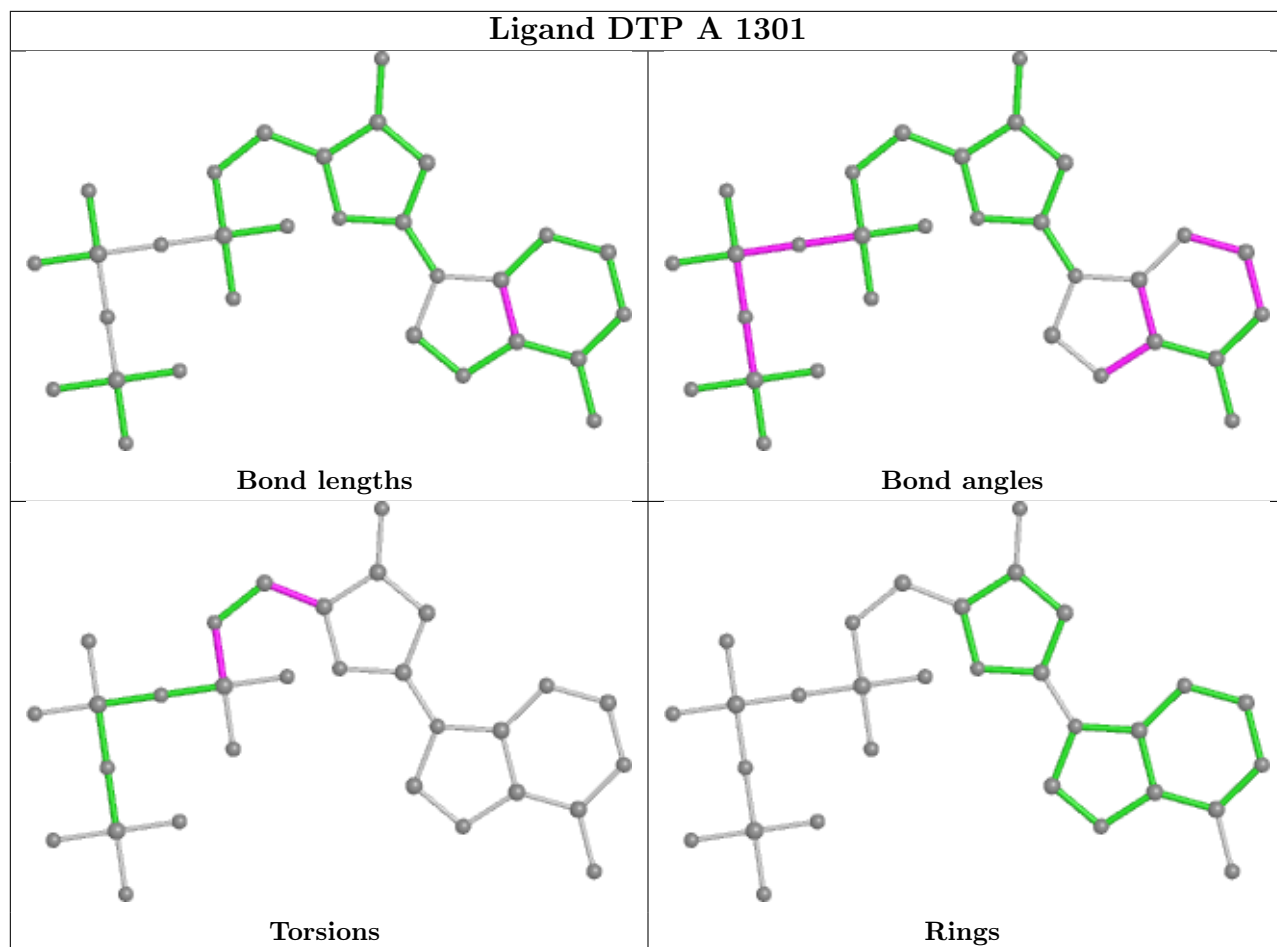


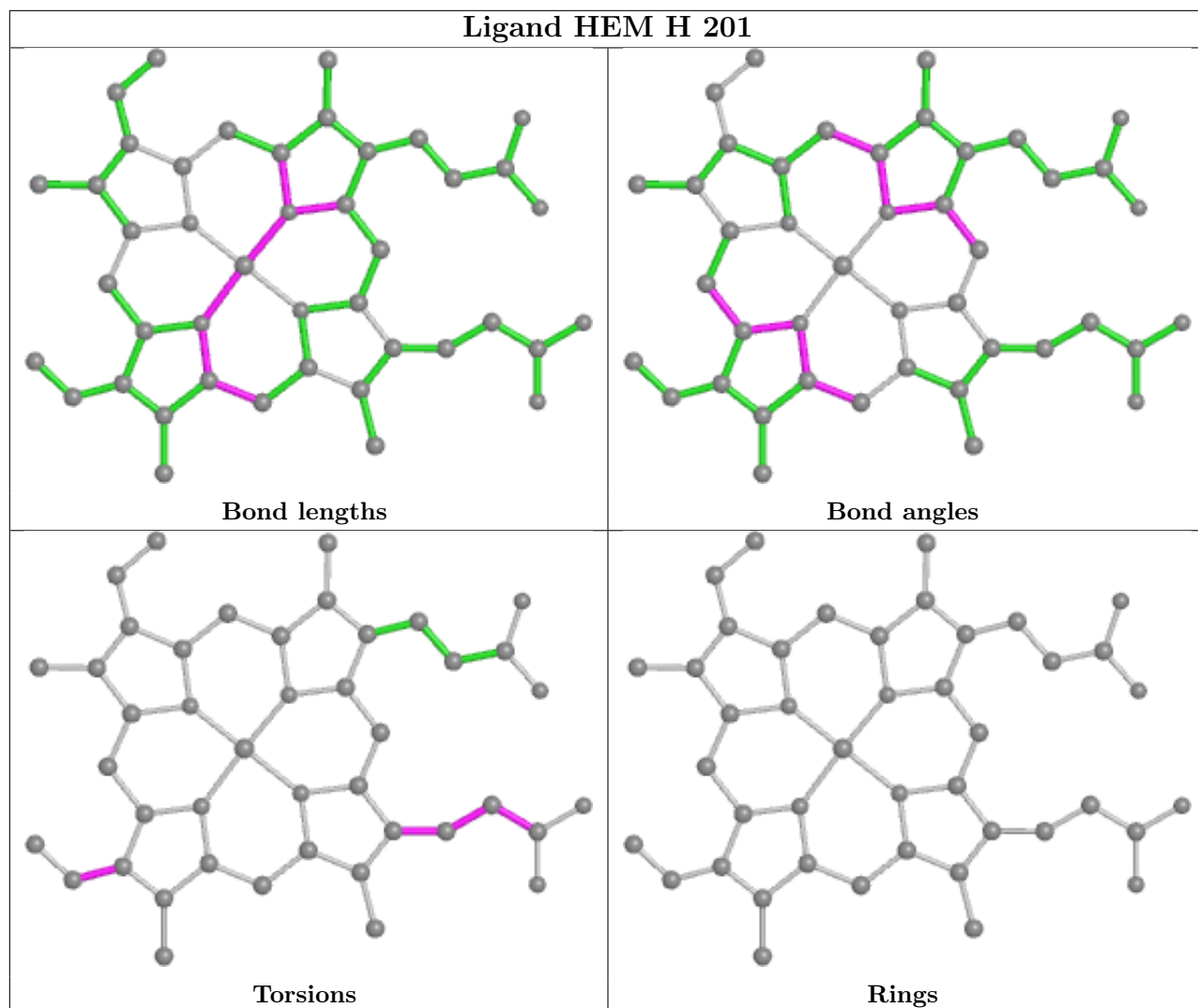


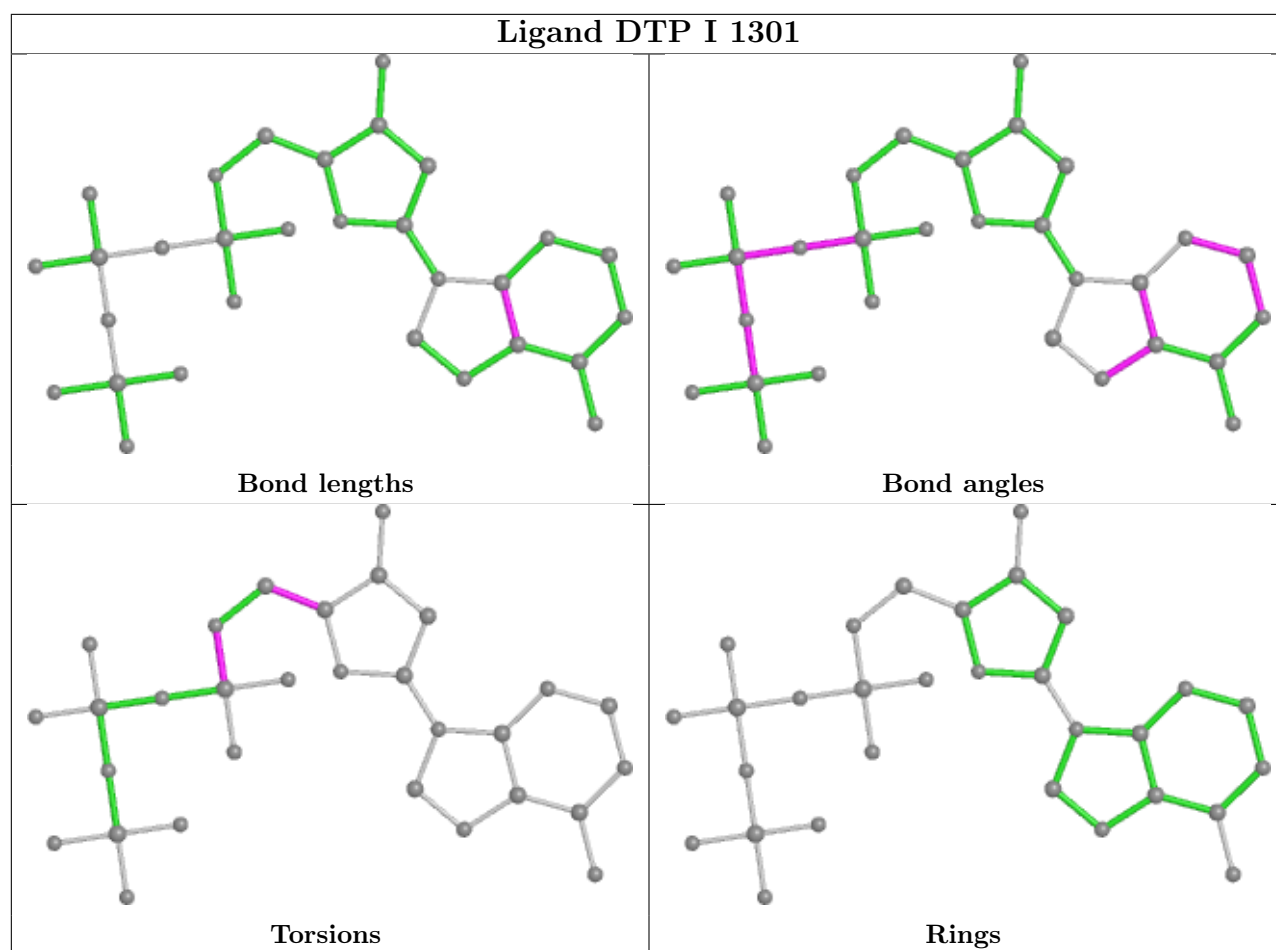












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

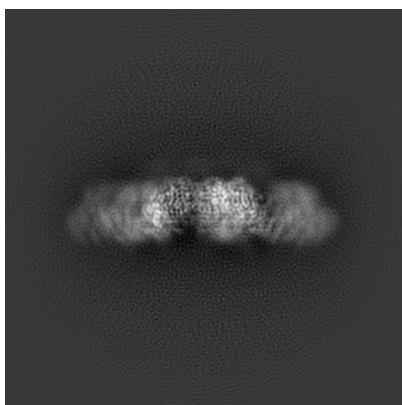
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6480. These allow visual inspection of the internal detail of the map and identification of artifacts.

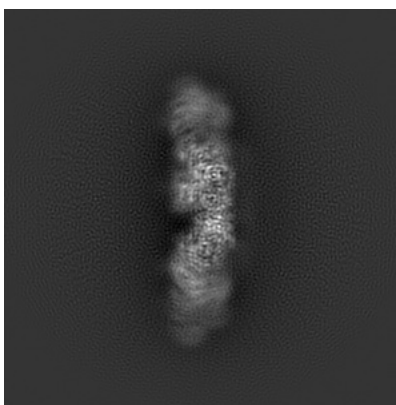
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

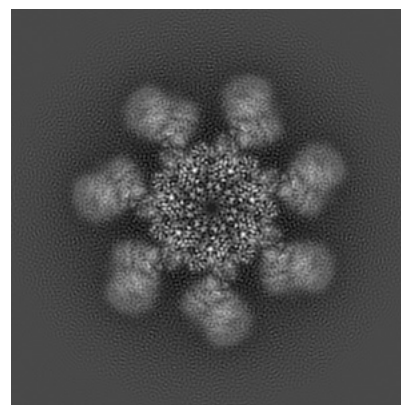
#### 6.1.1 Primary map



X



Y



Z

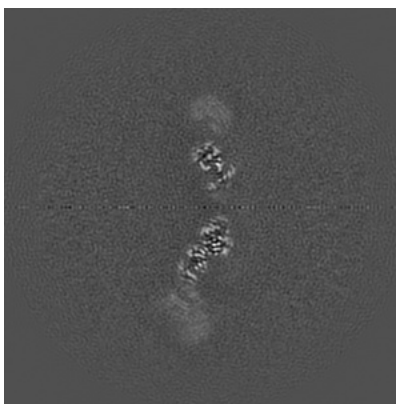
The images above show the map projected in three orthogonal directions.

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

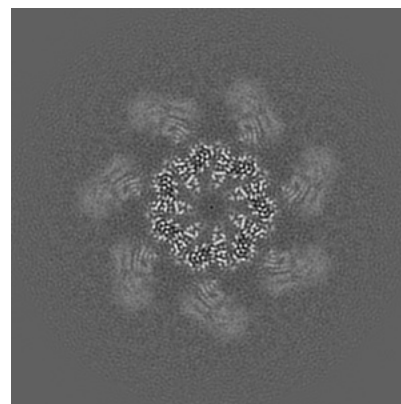
#### 6.2.1 Primary map



X Index: 160



Y Index: 160



Z Index: 160

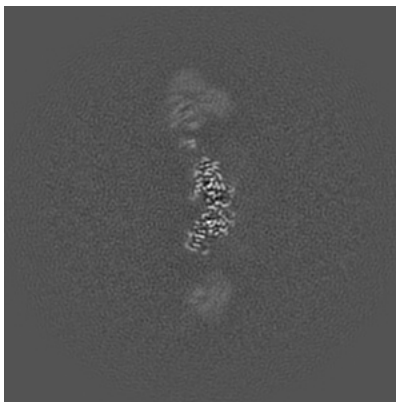
The images above show central slices of the map in three orthogonal directions.

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

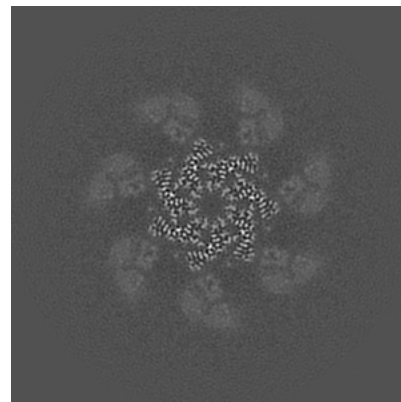
### 6.3.1 Primary map



X Index: 185



Y Index: 190

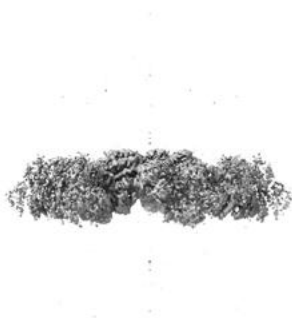


Z Index: 164

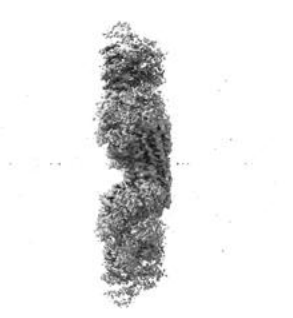
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal surface views [i](#)

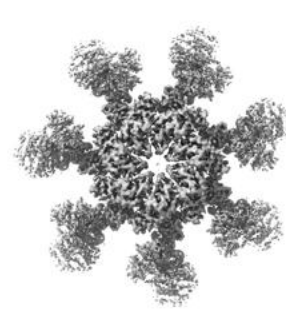
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.5 Mask visualisation

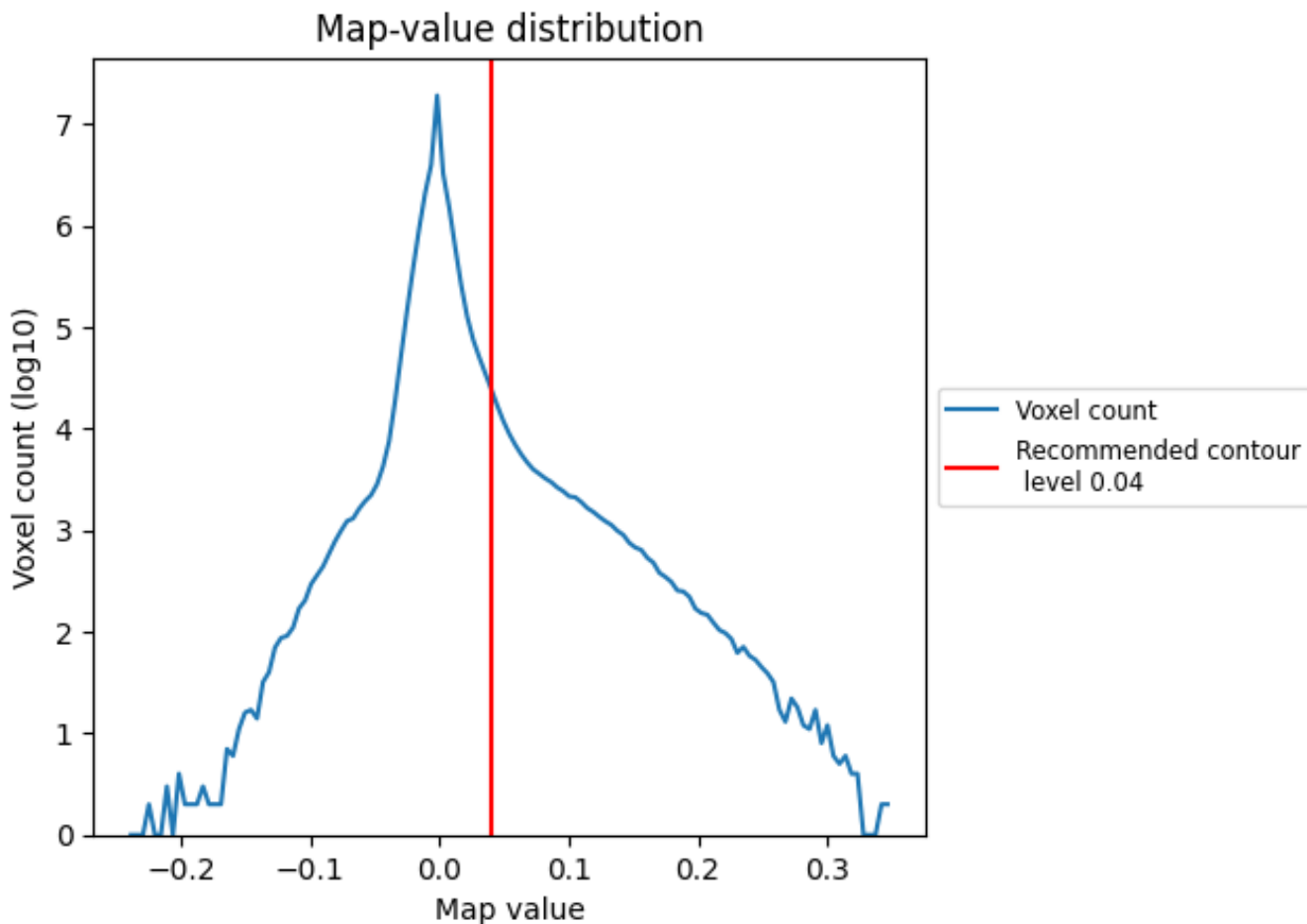
This section was not generated. No masks/segmentation were deposited.



## 7 Map analysis [i](#)

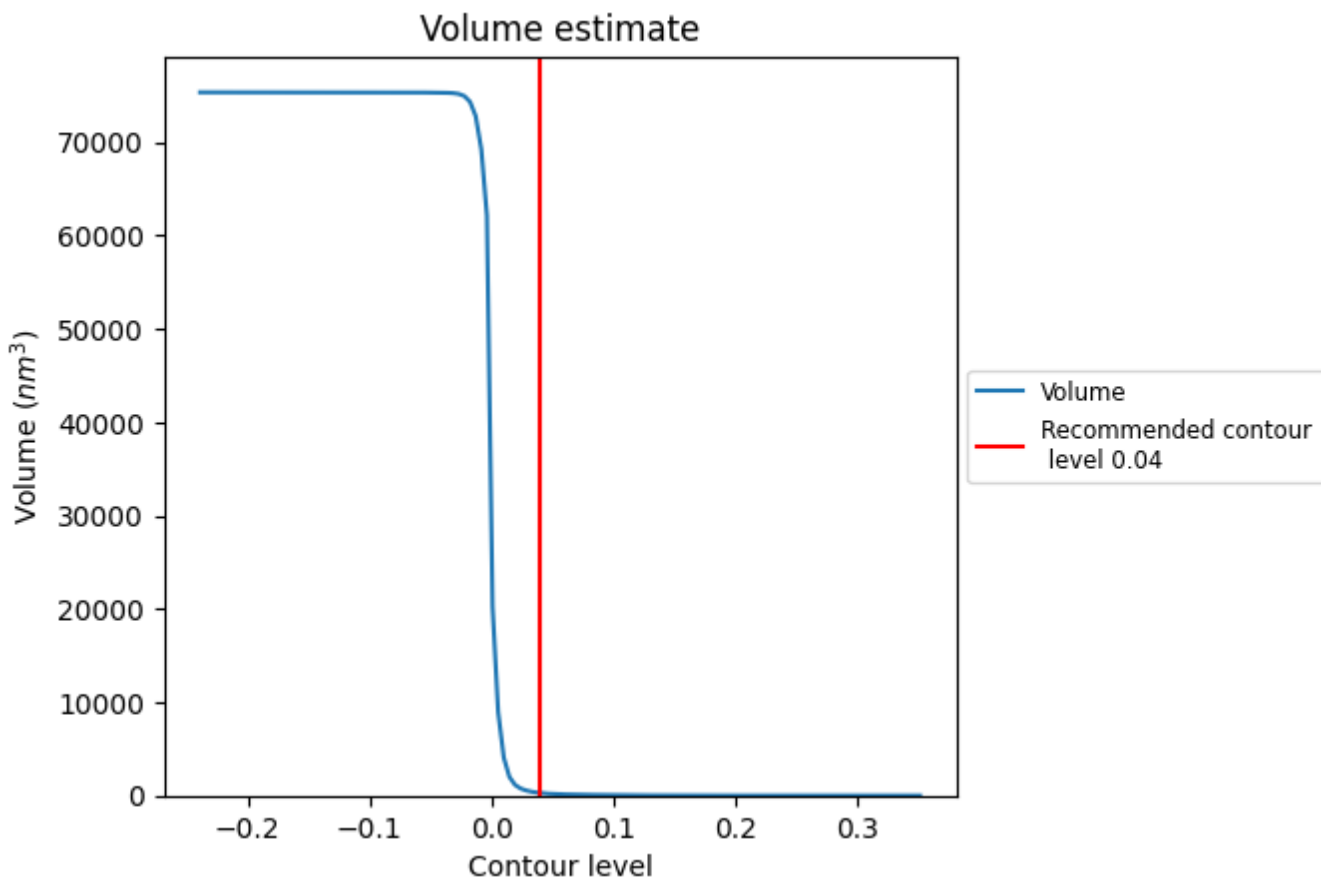
This section contains the results of statistical analysis of the map.

### 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.

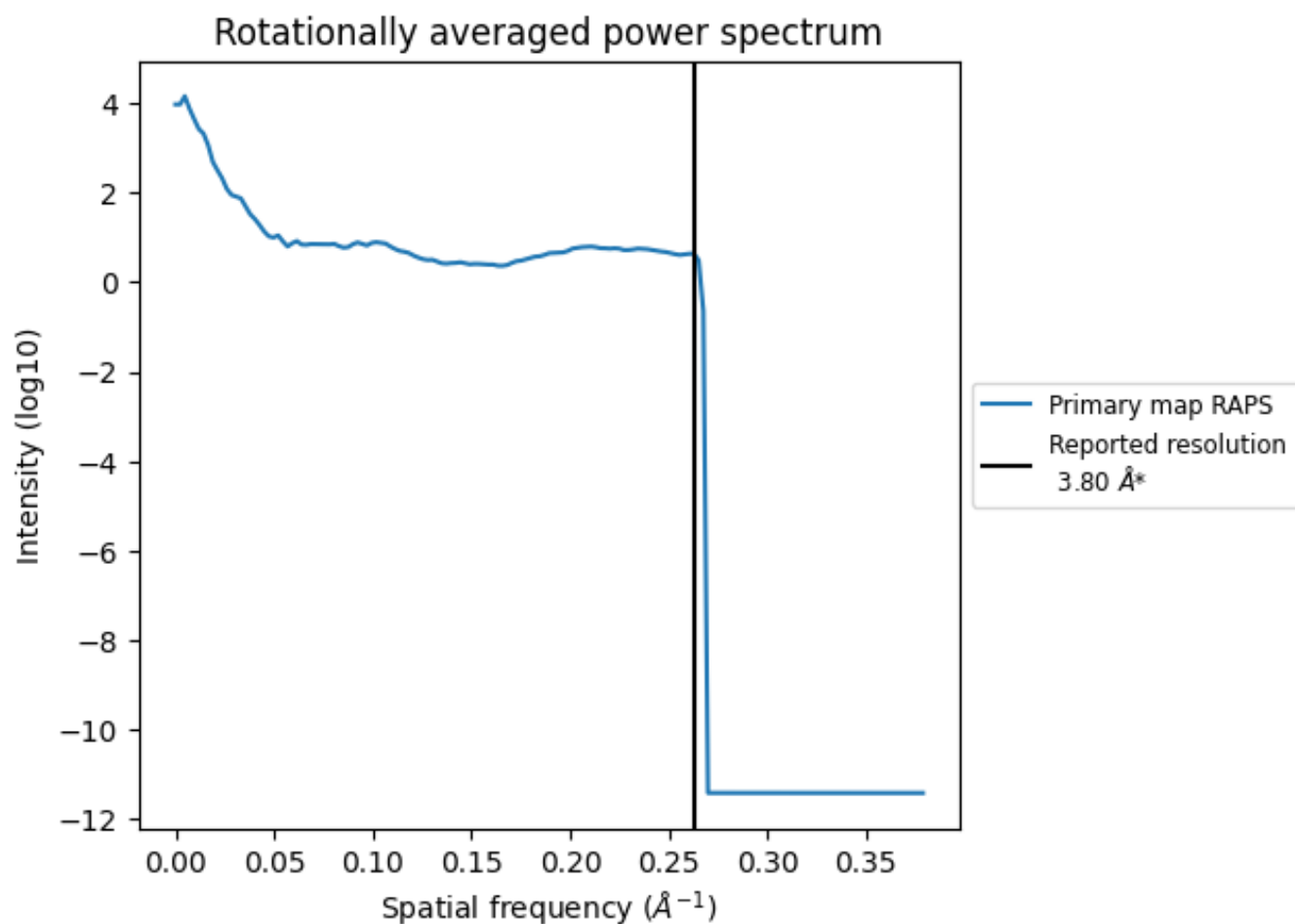
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 276 nm<sup>3</sup>; this corresponds to an approximate mass of 249 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 0.263 Å<sup>-1</sup>

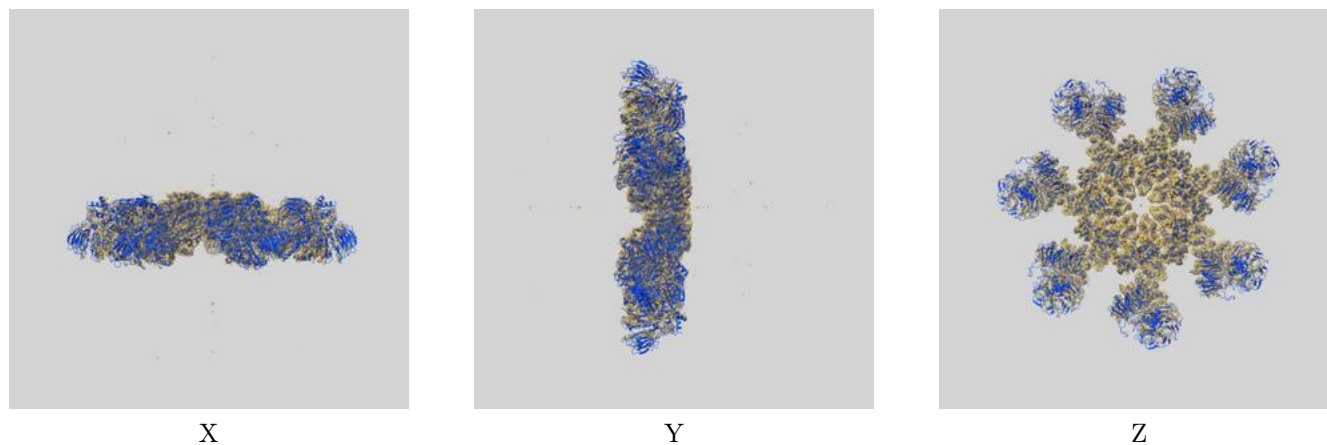
## 8 Fourier-Shell correlation

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

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

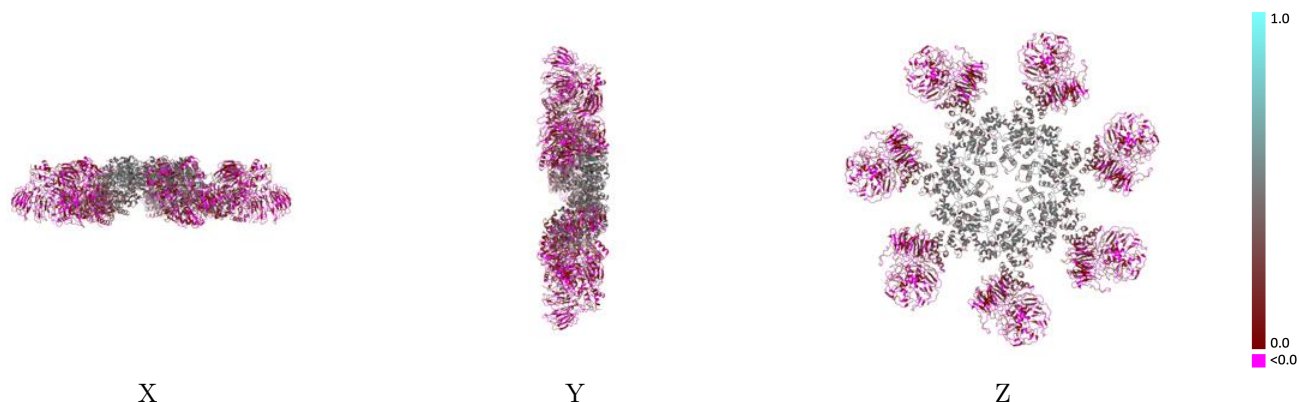
This section contains information regarding the fit between EMDB map EMD-6480 and PDB model 3JBT. Per-residue inclusion information can be found in section 3 on page 10.

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



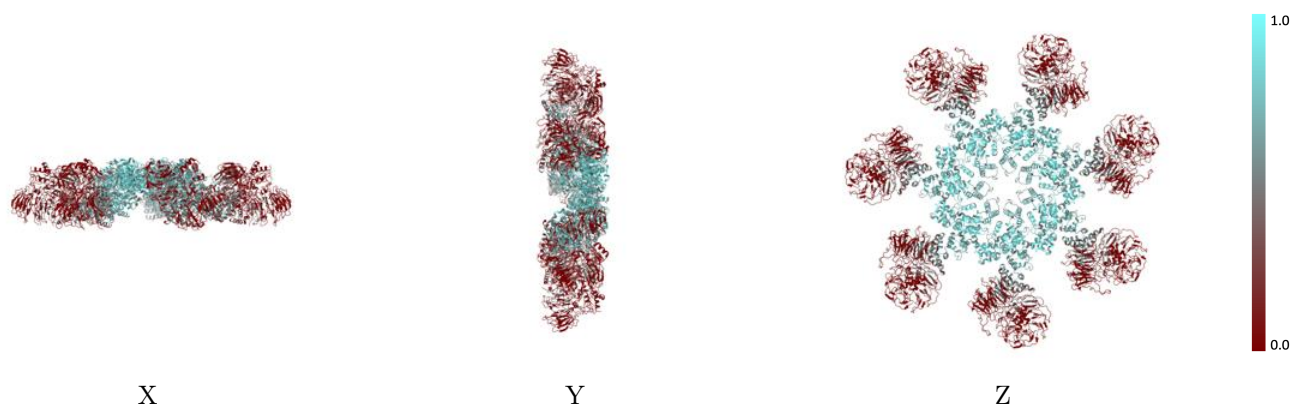
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



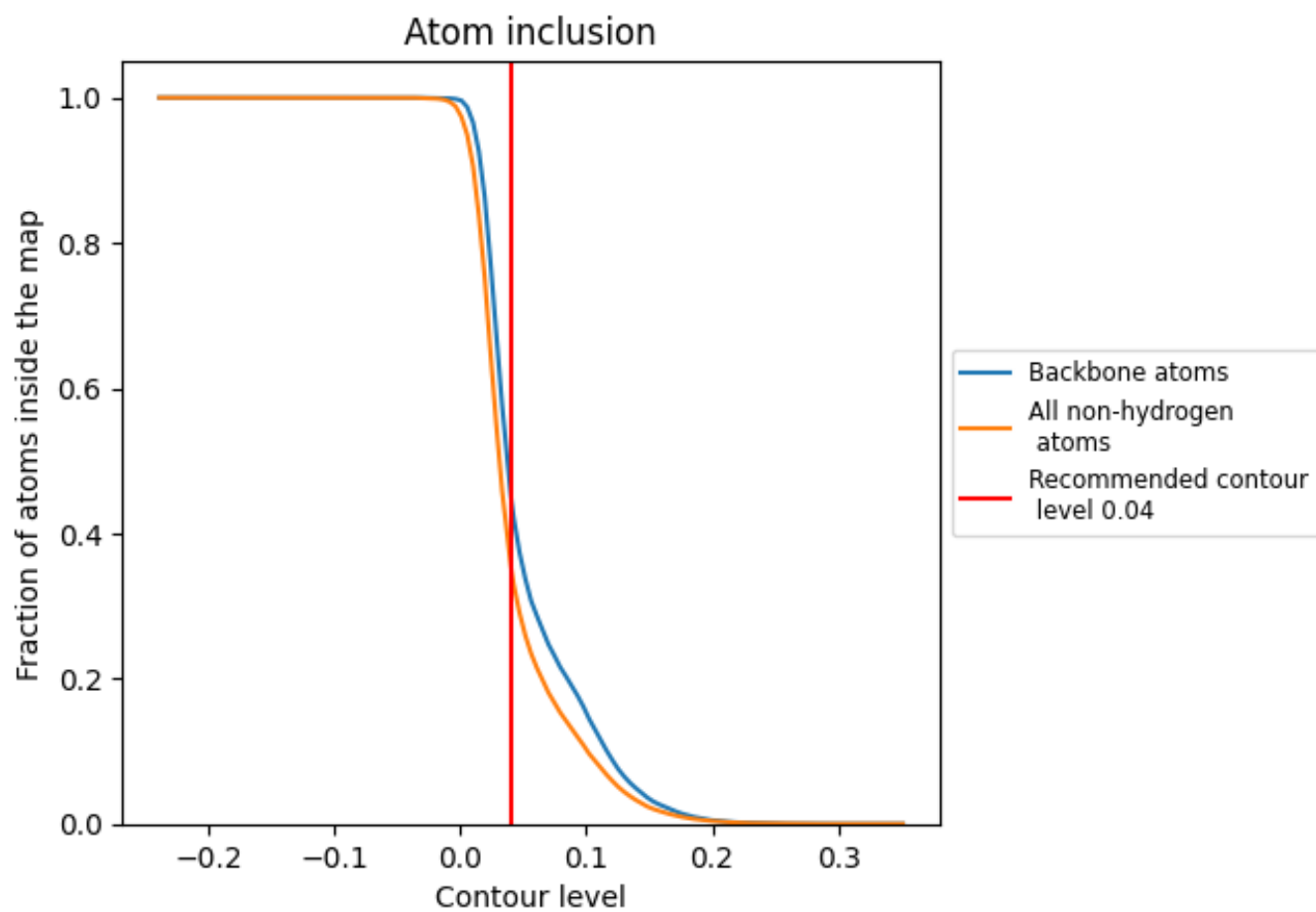
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.04).































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 45% of all backbone atoms, 35% of all non-hydrogen atoms, are inside the map.

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

The table lists the average atom inclusion at the recommended contour level (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.3547	 0.2010
A	 0.3790	 0.2120
B	 0.0961	 0.0860
C	 0.3784	 0.2120
D	 0.0938	 0.0880
E	 0.3796	 0.2120
F	 0.0985	 0.0840
G	 0.3785	 0.2110
H	 0.0985	 0.0830
I	 0.3779	 0.2110
J	 0.1032	 0.0870
K	 0.3790	 0.2110
L	 0.1008	 0.0900
M	 0.3801	 0.2110
N	 0.0973	 0.0860

