



wwPDB EM Validation Summary Report ⓘ

Nov 23, 2022 – 07:38 AM EST

PDB ID : 7UA9
EMDB ID : EMD-26416
Title : Structure of dephosphorylated human RyR2 in the open state
Authors : Miotto, M.C.; Marks, A.R.
Deposited on : 2022-03-11
Resolution : 3.59 Å (reported)
Based on initial model : 7U9Q

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.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) : 2.31.3

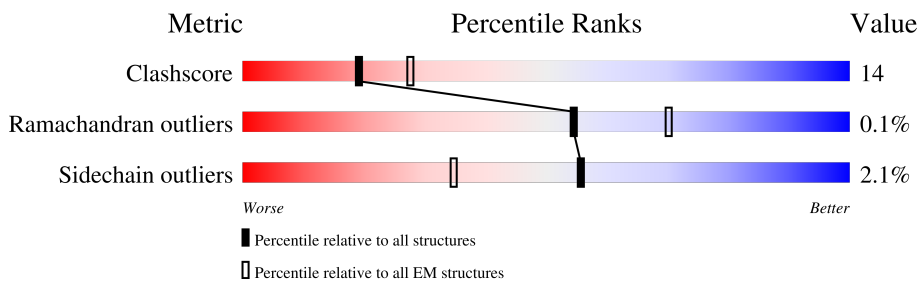
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.59 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	E	108	
1	F	108	
1	G	108	
1	H	108	
2	A	4967	
2	B	4967	
2	C	4967	
2	D	4967	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 138656 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 Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	E	107	818	516	144	154	4	0	0
1	F	107	818	516	144	154	4	0	0
1	G	107	818	516	144	154	4	0	0
1	H	107	818	516	144	154	4	0	0

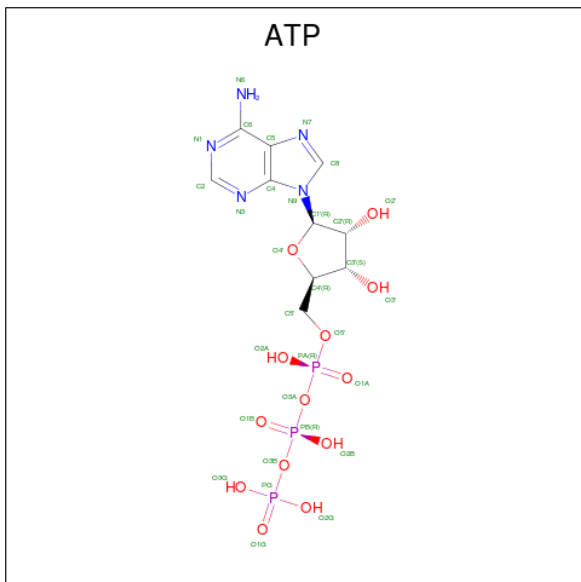
- Molecule 2 is a protein called Ryanodine receptor 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	4224	33771	21516	5745	6280	230	2	0
2	B	4224	33771	21516	5745	6280	230	2	0
2	C	4224	33771	21516	5745	6280	230	2	0
2	D	4224	33771	21516	5745	6280	230	2	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total	Zn	0
			1	1	
3	B	1	Total	Zn	0
			1	1	
3	C	1	Total	Zn	0
			1	1	
3	D	1	Total	Zn	0
			1	1	

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf	
			Total	C	N	O		P
4	A	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	A	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	B	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	B	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	C	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	C	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	D	1	Total	C	N	O	P	0
			62	20	10	26	6	
4	D	1	Total	C	N	O	P	0
			62	20	10	26	6	

- Molecule 5 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

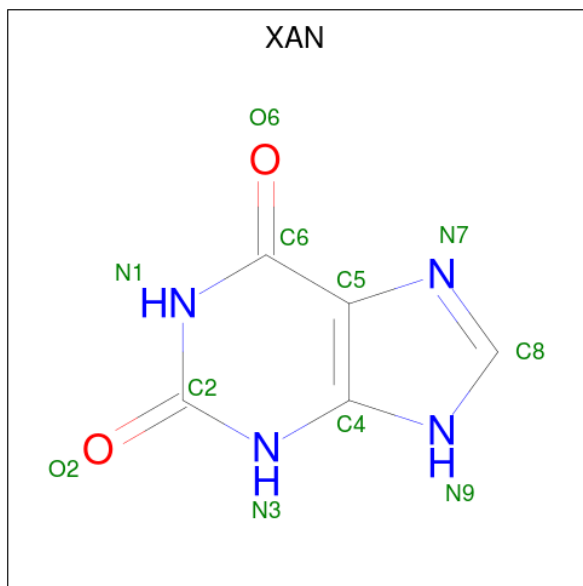
Mol	Chain	Residues	Atoms		AltConf
			Total	Ca	
5	A	1	Total	Ca	0
			1	1	
5	B	1	Total	Ca	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
5	C	1	Total	Ca	0
			1	1	
5	D	1	Total	Ca	0
			1	1	

- Molecule 6 is XANTHINE (three-letter code: XAN) (formula: $C_5H_4N_4O_2$) (labeled as "Ligand of Interest" by depositor).

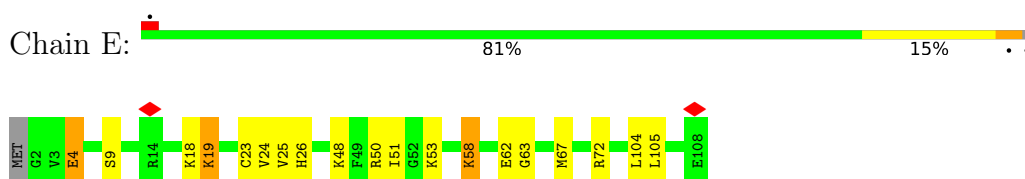


Mol	Chain	Residues	Atoms				AltConf
6	A	1	Total	C	N	O	0
			11	5	4	2	
6	B	1	Total	C	N	O	0
			11	5	4	2	
6	C	1	Total	C	N	O	0
			11	5	4	2	
6	D	1	Total	C	N	O	0
			11	5	4	2	

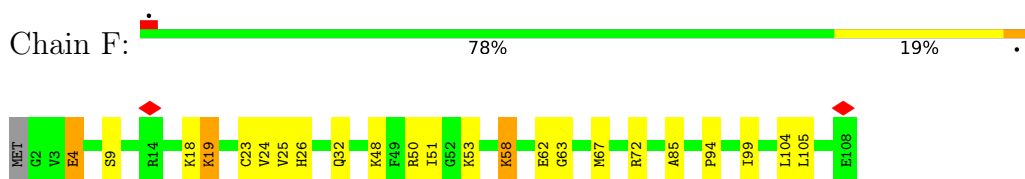
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

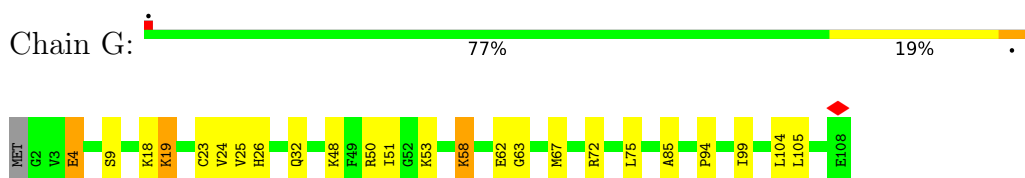
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



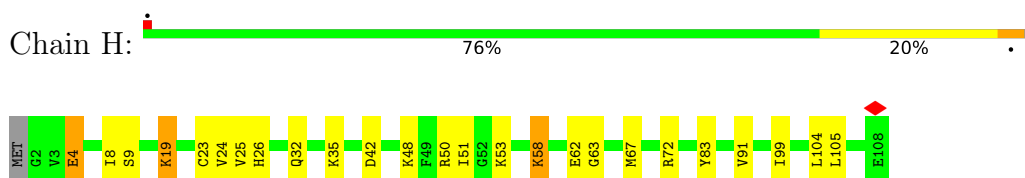
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B



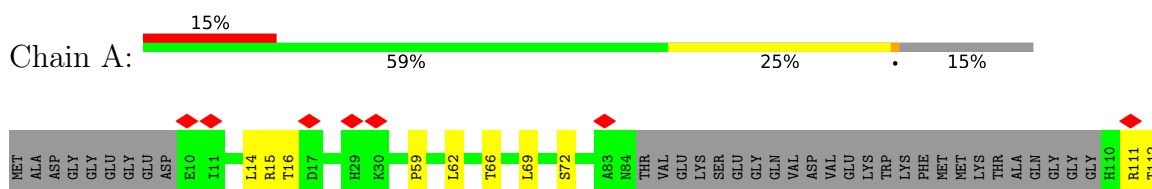
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B

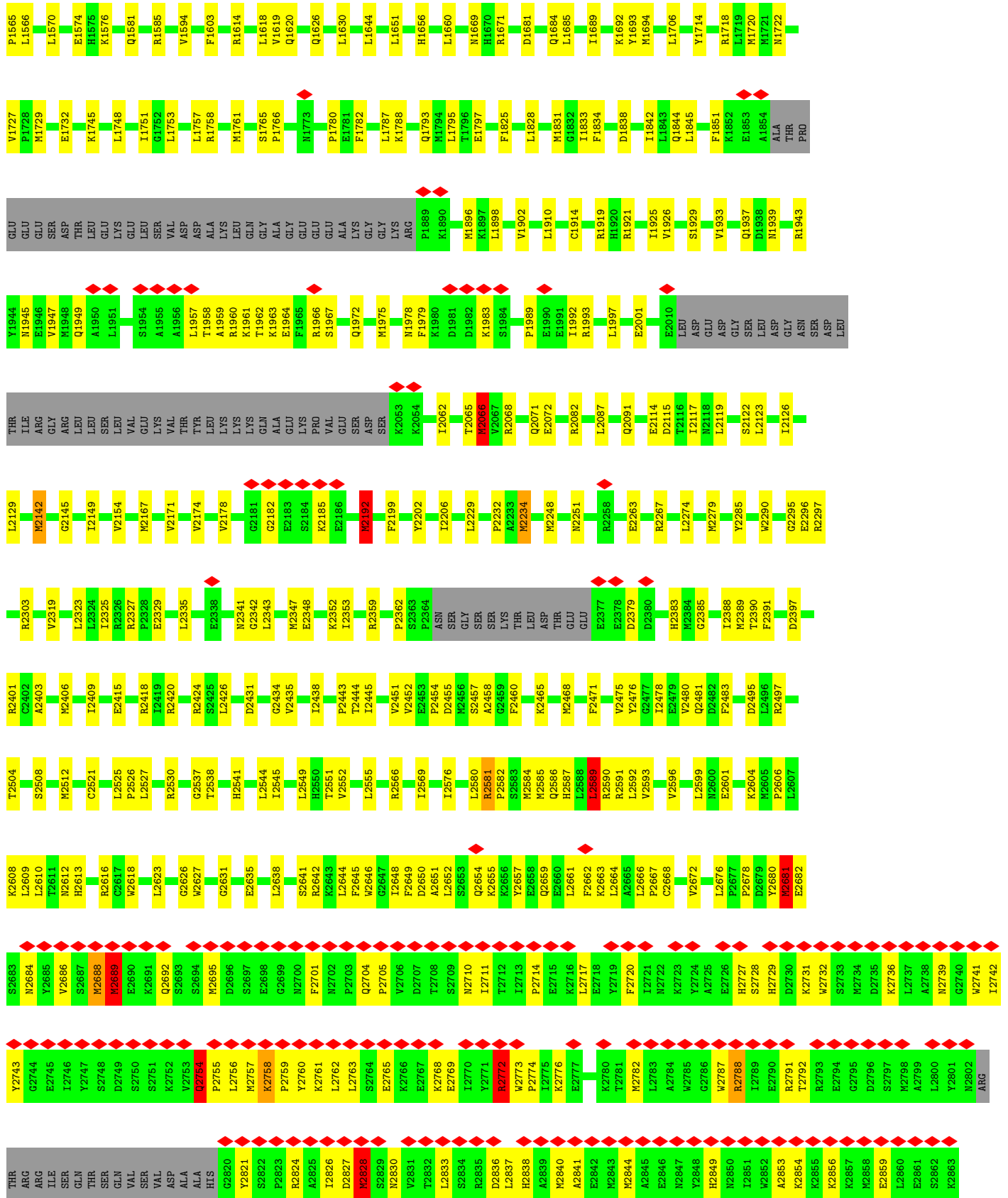


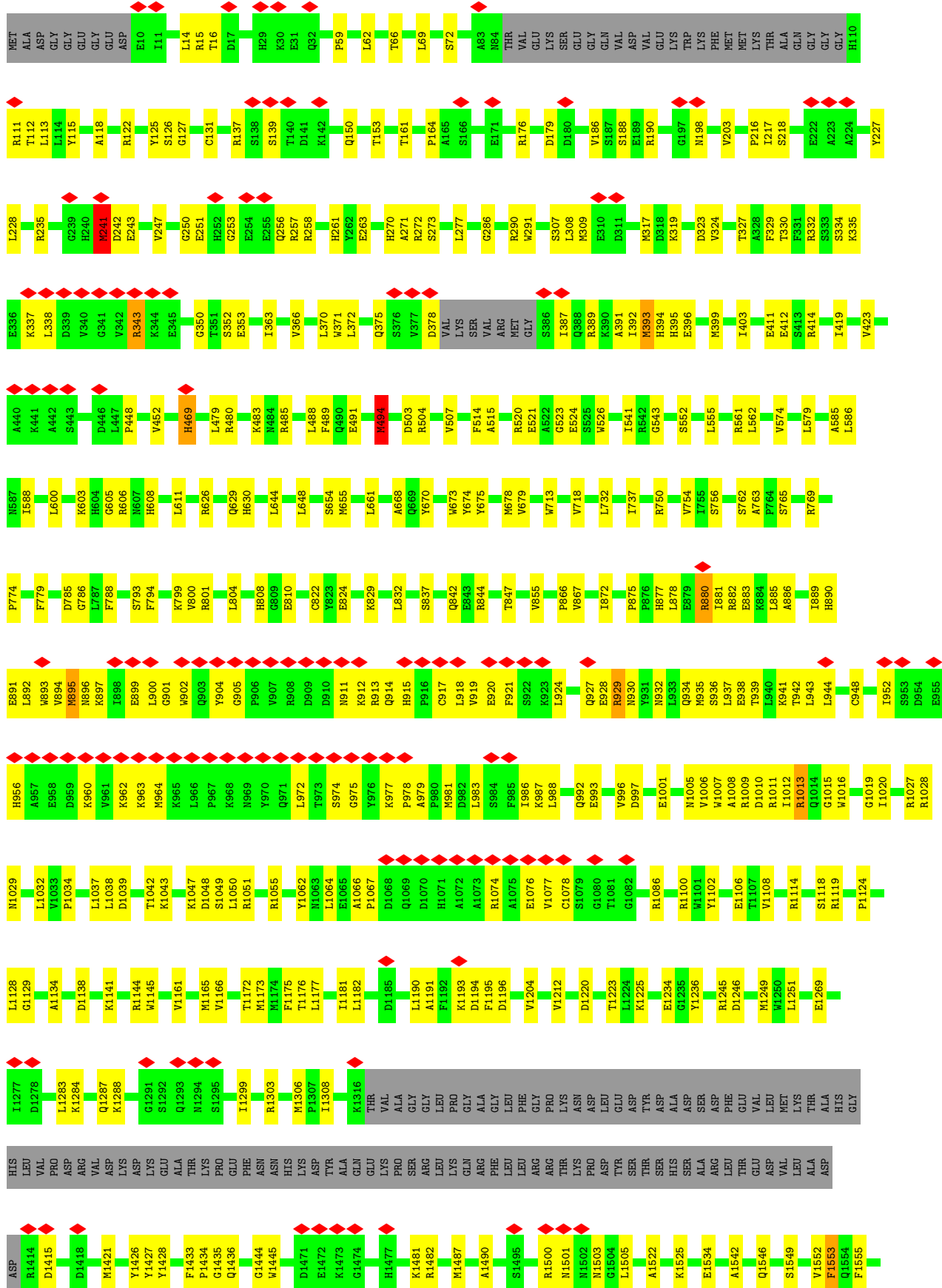
- Molecule 1: Peptidyl-prolyl cis-trans isomerase FKBP1B

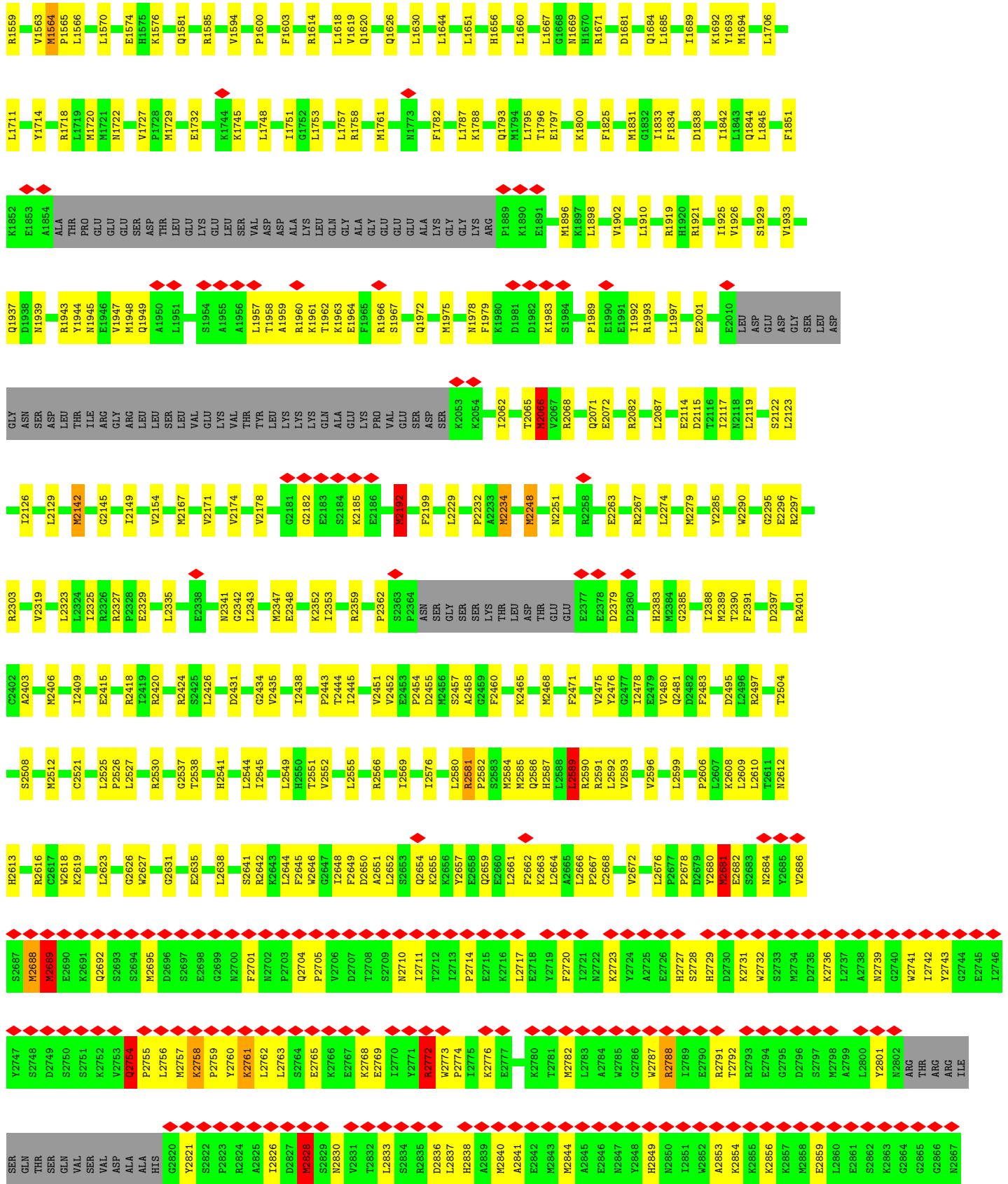


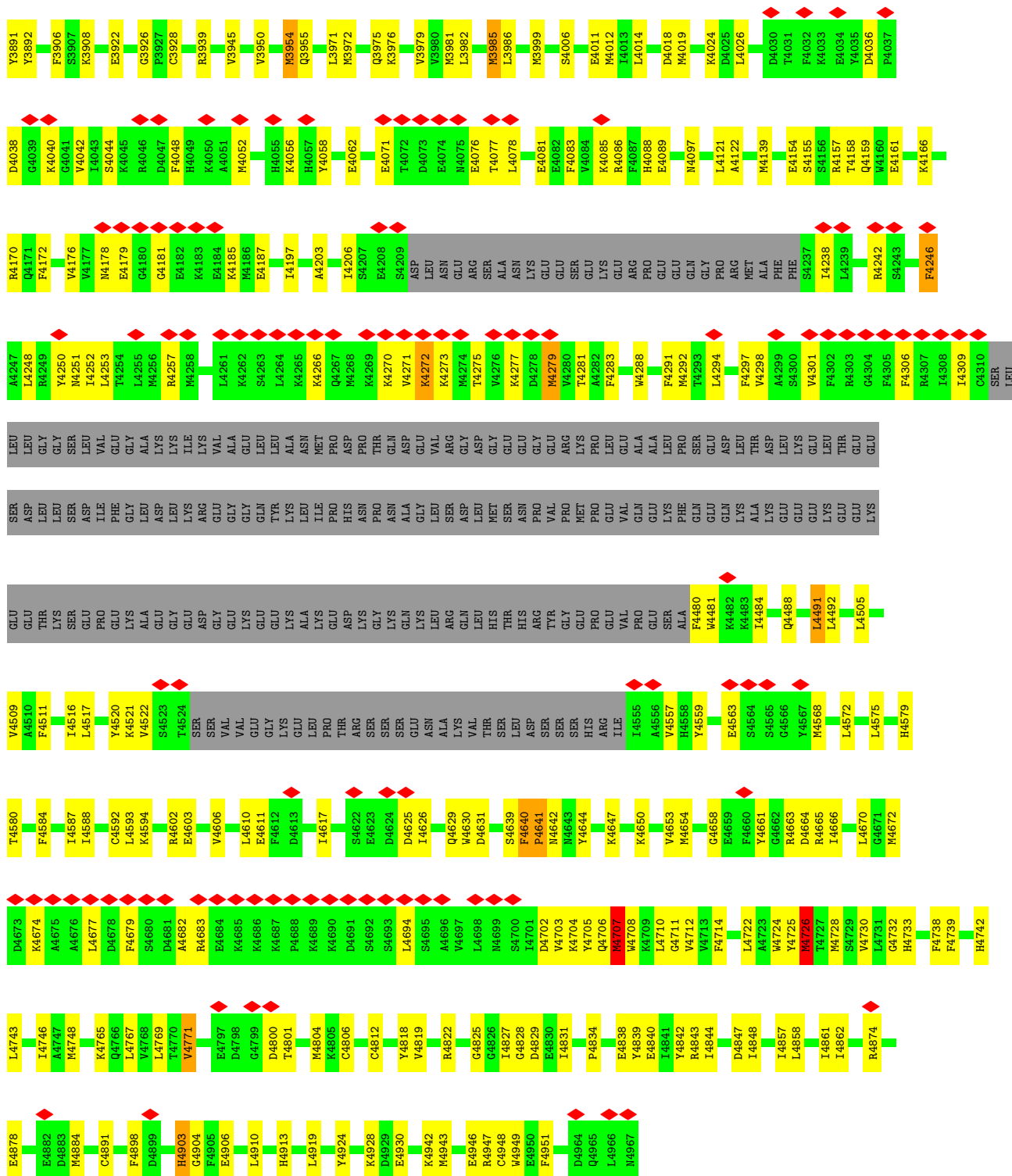
- Molecule 2: Ryanodine receptor 2







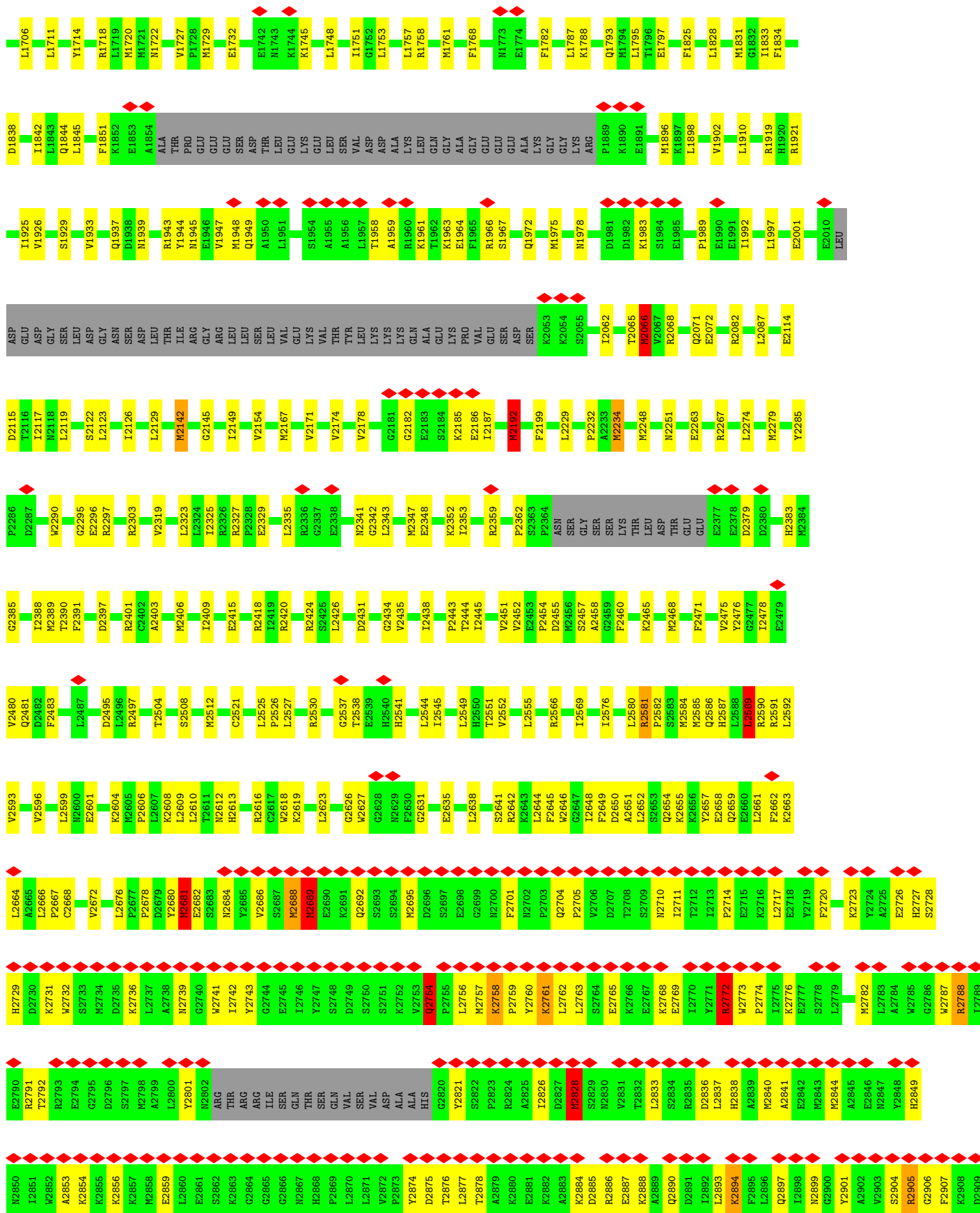




• Molecule 2: Ryanodine receptor 2



S1549	S1550	S1551	V1552	F1553	F1554	F1555	E1556	R1559	V1563	M1564	P1565	L1566	L1570	H1574	H1575	K1576	Q1581	R1585	V1594	P1600	F1603	L1614	L1618	V1619	Q1620	Q1626	L1630	H1656	L1660	N1669	H1670	R1671	D1681	Q1684	L1685	I1689	K1692	Y1693	M1694																							
GLU	ASP	VAL	LEU	ALA	ASP	HIS	LEU	PRO	ARG	VAL	ASP	LYS	LYS	GLU	ALA	THR	LYS	PRO	PHE	ASN	ASN	HIS	LYS	ASP	TYR	ALA	GLN	GLU	THR	VAL	GLY	PRO	ALA	GLY	LEU	PRO	THR	ARG	LYS	PRO	ASP	GLU	TYR	SER	THR	SER	ALA	ARG	PHE	GLU	VAL	LEU										
M1249	M1250	L1251	E1269	I1277	L1283	K1284	Q1287	K1288	G1291	S1292	L1293	M1294	S1295	M1296	I1299	R1303	M1306	F1307	I1308	K1316	THR	VAL	GLY	GLY	ALA	GLY	LEU	PRO	ALA	GLY	LEU	PRO	ALA	ALA	ALA	LEU	PHE	GLY	PRO	LYS	ASN	ASP	LEU	GLU	ASP	TYR	ALA	ALA	SER	ASP	PHE	GLU	VAL	LEU								
E1106	T1107	V1108	R1114	S1118	R1119	P1124	L1128	G1129	A1134	R1144	W1145	V1161	M1165	V1166	T1172	M1173	F1174	T1175	T1176	L1177	I1181	L1182	L1190	A1191	F1192	K1193	D1194	F1195	D1196	V1204	V1212	D1220	T1223	L1224	K1225	E1234	G1235	Y1236	D1246																							
R1009	D1010	R1011	I1012	R1013	Q1014	G1015	W1016	G1019	I1020	R1027	R1028	M1029	L1032	V1033	P1034	L1037	L1038	D1039	T1042	K1043	K1047	D1048	S1049	L1050	R1051	R1055	Y1062	R1063	L1064	E1065	Q1066	P1067	D1068	Q1069	D1070	H1071	A1072	R1074	A1075	E1076	V1077	C1078	S1079	G1080	R1086	W1101	Y1102															
L940	K941	T942	L943	L944	A945	L946	G947	C948	I952	E955	H956	A957	E958	N959	K960	V961	K962	K963	M964	K965	L966	P967	K968	N969	Y970	Q971	L972	T973	S974	G975	Y976	K977	P978	A979	F980	M981	L982	S984	F985	K987	L988	Q992	R992	N993	A994	M995	V996	D997	E1001	N1005	V1006	W1007	A1008									
L876	E879	R880	I881	R882	E883	K884	L885	A886	I889	H890	E891	L892	K893	V894	M895	N896	K897	I898	E899	L900	G901	W902	Q903	Y904	G905	P906	G908	E910	C922	V923	E924	K929	L932	S937	Q942	E943	R944	T947	V955	V956	P957	V958	L959	R966	I967	R968	L969	R975	P976	H977	Q927	E928	R929	N930	Y931	L932	L933	Q934	M935	S936	L937	T939
R561	L562	V574	L579	A585	L586	N587	I588	L600	K603	H604	G605	R606	N607	H608	L611	G629	H630	L644	R647	L648	S654	M655	L661	A668	Q669	Y670	W673	Y674	Y675	M678	V679	A688	W713	V718	L730	H731	L732	I737	R750																							
V754	I755	S762	A763	P764	S765	R769	P774	F779	D785	G786	L787	F788	S793	F794	K799	V800	R801	L804	H808	G809	E810	C822	V823	E824	K829	L832	S837	Q842	E843	R844	T847	V855	P866	I872	P875	P876	H877																									
S413	R414	I419	V423	L436	S437	K438	K439	A440	K441	A442	S443	D446	L447	P448	V452	D467	E468	H469	L479	R480	K483	L488	F489	M494	D503	R504	V507	F514	A515	R520	E521	G523	E524	S525	W526	I541	R542	G543	S552	L555																						
A328	F329	T330	F331	R332	S333	S334	K335	E336	K337	L338	D339	V340	G341	V342	R343	K344	E345	V346	D347	S352	E353	I363	V366	L370	W371	L372	Q375	S376	V377	D378	VAL	LYS	SER	VAL	ARG	MET	GLY	S386	I387	L388	M389	E390	K390	A391	L392	M393	H394	H395	E396	M399	I403	E412										
S218	S221	E222	A223	A224	Y227	L228	R235	G239	H240	M241	E242	E243	V247	G250	E251	H252	G253	E254	E255	Q256	R257	R258	H261	M262	E263	A271	R272	S273	L277	G286	R290	W291	S307	L308	M309	E310	D311	K312	M317	D318	K319	D323	V324	T327																		
GLY	GLY	GLY	H110	R111	L112	L113	L114	Y115	A118	R122	Y125	S126	G127	C131	R137	S138	S139	T140	K142	L143	Q150	T153	T161	P164	A165	S166	K167	E171	G172	R176	D179	D180	V186	S187	S188	E189	R190	G197	N198	V203	P216	I217																				



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	36491	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.549	Depositor
Minimum map value	-0.006	Depositor
Average map value	0.012	Depositor
Map value standard deviation	0.029	Depositor
Recommended contour level	0.13	Depositor
Map size (Å)	428.544, 428.544, 428.544	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.837, 0.837, 0.837	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: CA, ZN, XAN, ATP

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	E	0.28	0/834	0.60	0/1123
1	F	0.27	0/834	0.60	0/1123
1	G	0.28	0/834	0.61	0/1123
1	H	0.27	0/834	0.61	0/1123
2	A	0.58	8/34511 (0.0%)	0.56	33/46614 (0.1%)
2	B	0.58	8/34511 (0.0%)	0.56	32/46614 (0.1%)
2	C	0.58	8/34511 (0.0%)	0.56	33/46614 (0.1%)
2	D	0.58	8/34511 (0.0%)	0.56	33/46614 (0.1%)
All	All	0.57	32/141380 (0.0%)	0.56	131/190948 (0.1%)

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
2	A	0	7
2	B	0	7
2	C	0	7
2	D	0	7
All	All	0	28

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	3117	PHE	CD1-CE1	43.66	2.26	1.39
2	D	3117	PHE	CD1-CE1	43.66	2.26	1.39
2	A	3117	PHE	CD1-CE1	43.62	2.26	1.39
2	C	3117	PHE	CD1-CE1	43.59	2.26	1.39
2	A	3117	PHE	CE2-CZ	42.78	2.18	1.37

The worst 5 of 131 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	3043	ARG	CD-NE-CZ	22.54	155.15	123.60
2	B	3043	ARG	CD-NE-CZ	22.53	155.15	123.60
2	D	3043	ARG	CD-NE-CZ	22.52	155.13	123.60
2	C	3043	ARG	CD-NE-CZ	22.52	155.13	123.60
2	B	3043	ARG	CG-CD-NE	11.67	136.30	111.80

There are no chirality outliers.

5 of 28 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	A	2754	GLN	Peptide
2	A	2772	ARG	Sidechain
2	A	2828	MET	Peptide
2	A	3043	ARG	Sidechain
2	A	469	HIS	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	E	818	0	821	13	0
1	F	818	0	821	14	0
1	G	818	0	821	15	0
1	H	818	0	821	18	0
2	A	33771	0	33453	977	0
2	B	33771	0	33453	977	0
2	C	33771	0	33453	977	0
2	D	33771	0	33453	988	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	62	0	24	2	0
4	B	62	0	24	2	0
4	C	62	0	24	2	0
4	D	62	0	24	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
6	A	11	0	4	0	0
6	B	11	0	4	0	0
6	C	11	0	4	0	0
6	D	11	0	4	0	0
All	All	138656	0	137208	3905	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 14.

The worst 5 of 3905 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:3117:PHE:CG	2:D:3117:PHE:CD1	1.80	1.67
2:B:3117:PHE:CD2	2:B:3117:PHE:CG	1.78	1.66
2:B:3117:PHE:CG	2:B:3117:PHE:CD1	1.80	1.66
2:D:3117:PHE:CG	2:D:3117:PHE:CD2	1.78	1.63
2:C:3117:PHE:CD2	2:C:3117:PHE:CG	1.78	1.62

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	E	105/108 (97%)	103 (98%)	2 (2%)	0	100	100
1	F	105/108 (97%)	103 (98%)	2 (2%)	0	100	100
1	G	105/108 (97%)	103 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H	105/108 (97%)	103 (98%)	2 (2%)	0	100	100
2	A	4198/4967 (84%)	4064 (97%)	131 (3%)	3 (0%)	51	83
2	B	4198/4967 (84%)	4064 (97%)	131 (3%)	3 (0%)	51	83
2	C	4198/4967 (84%)	4062 (97%)	133 (3%)	3 (0%)	51	83
2	D	4198/4967 (84%)	4064 (97%)	131 (3%)	3 (0%)	51	83
All	All	17212/20300 (85%)	16666 (97%)	534 (3%)	12 (0%)	54	83

5 of 12 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	1553	PHE
2	A	2988	ARG
2	A	4641	PRO
2	B	1553	PHE
2	B	2988	ARG

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	E	88/89 (99%)	85 (97%)	3 (3%)	37	69
1	F	88/89 (99%)	85 (97%)	3 (3%)	37	69
1	G	88/89 (99%)	85 (97%)	3 (3%)	37	69
1	H	88/89 (99%)	85 (97%)	3 (3%)	37	69
2	A	3708/4358 (85%)	3633 (98%)	75 (2%)	55	79
2	B	3708/4358 (85%)	3633 (98%)	75 (2%)	55	79
2	C	3708/4358 (85%)	3633 (98%)	75 (2%)	55	79
2	D	3708/4358 (85%)	3633 (98%)	75 (2%)	55	79
All	All	15184/17788 (85%)	14872 (98%)	312 (2%)	56	78

5 of 312 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	4726	MET
2	D	3235	MET
2	D	203	VAL
2	D	2066	MET
2	D	4272	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 50 such sidechains are listed below:

Mol	Chain	Res	Type
2	C	2654	GLN
2	C	4629	GLN
2	D	4642	ASN
2	C	2684	ASN
2	C	3850	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 20 ligands modelled in this entry, 8 are monoatomic - leaving 12 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
6	XAN	C	5004	-	8,12,12	1.51	2 (25%)	4,17,17	3.25	2 (50%)
6	XAN	B	5004	-	8,12,12	1.51	2 (25%)	4,17,17	3.28	2 (50%)
4	ATP	B	5002	-	26,33,33	0.59	0	31,52,52	0.73	2 (6%)
4	ATP	C	5005	-	26,33,33	0.60	0	31,52,52	0.75	2 (6%)
4	ATP	C	5002	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
4	ATP	D	5005	-	26,33,33	0.61	0	31,52,52	0.75	2 (6%)
6	XAN	D	5004	-	8,12,12	1.51	2 (25%)	4,17,17	3.26	2 (50%)
4	ATP	B	5005	-	26,33,33	0.60	0	31,52,52	0.75	2 (6%)
4	ATP	D	5002	-	26,33,33	0.59	0	31,52,52	0.73	2 (6%)
4	ATP	A	5005	-	26,33,33	0.60	0	31,52,52	0.75	2 (6%)
4	ATP	A	5002	-	26,33,33	0.60	0	31,52,52	0.73	2 (6%)
6	XAN	A	5004	-	8,12,12	1.51	2 (25%)	4,17,17	3.25	2 (50%)

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
6	XAN	C	5004	-	-	-	0/2/2/2
6	XAN	B	5004	-	-	-	0/2/2/2
4	ATP	B	5002	-	-	9/18/38/38	0/3/3/3
4	ATP	C	5005	-	-	4/18/38/38	0/3/3/3
4	ATP	C	5002	-	-	9/18/38/38	0/3/3/3
4	ATP	D	5005	-	-	4/18/38/38	0/3/3/3
6	XAN	D	5004	-	-	-	0/2/2/2
4	ATP	B	5005	-	-	4/18/38/38	0/3/3/3
4	ATP	D	5002	-	-	9/18/38/38	0/3/3/3
4	ATP	A	5005	-	-	4/18/38/38	0/3/3/3
4	ATP	A	5002	-	-	9/18/38/38	0/3/3/3
6	XAN	A	5004	-	-	-	0/2/2/2

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	5004	XAN	C5-C4	-2.63	1.34	1.40
6	C	5004	XAN	C5-C4	-2.63	1.34	1.40
6	A	5004	XAN	C5-C4	-2.63	1.34	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	5004	XAN	C5-C4	-2.62	1.34	1.40
6	B	5004	XAN	O6-C6	-2.25	1.18	1.24

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	5004	XAN	C2-N1-C6	5.83	120.06	115.14
6	D	5004	XAN	C2-N1-C6	5.78	120.03	115.14
6	A	5004	XAN	C2-N1-C6	5.77	120.01	115.14
6	C	5004	XAN	C2-N1-C6	5.76	120.00	115.14
6	B	5004	XAN	C5-C6-N1	-2.53	119.97	123.43

There are no chirality outliers.

5 of 52 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	5002	ATP	PB-O3B-PG-O2G
4	A	5002	ATP	C5'-O5'-PA-O1A
4	A	5002	ATP	C5'-O5'-PA-O2A
4	A	5002	ATP	C5'-O5'-PA-O3A
4	B	5002	ATP	PB-O3B-PG-O2G

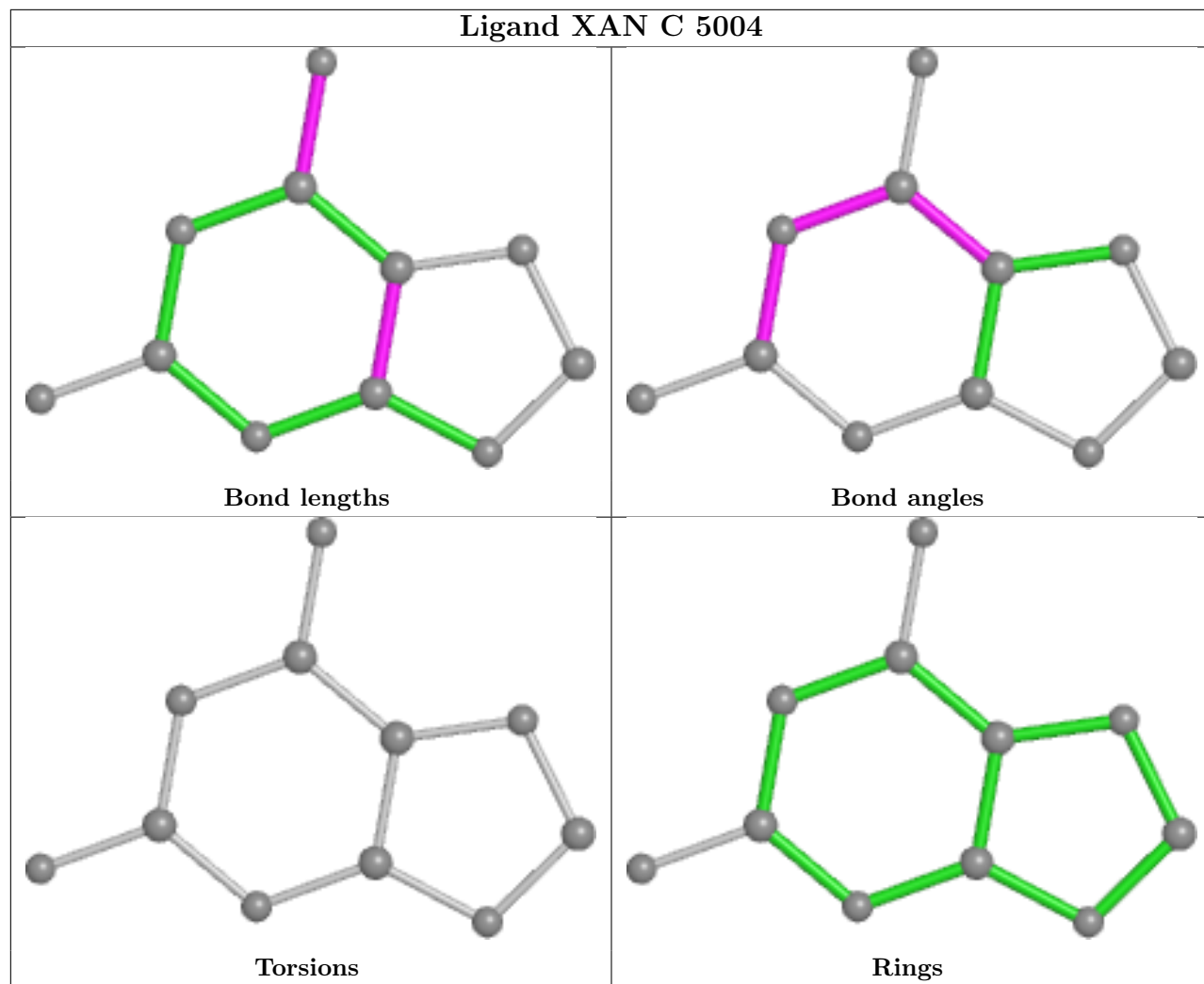
There are no ring outliers.

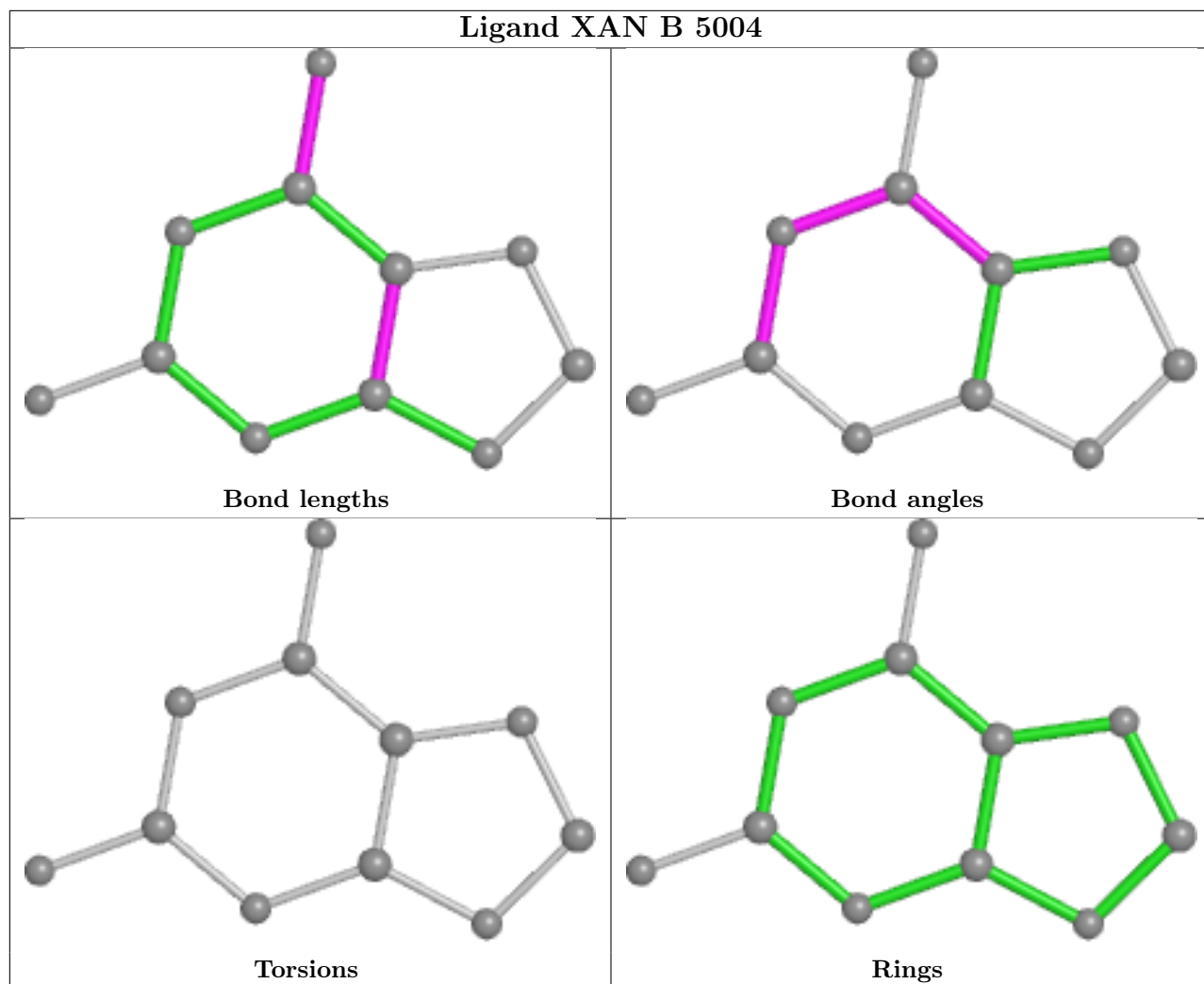
4 monomers are involved in 8 short contacts:

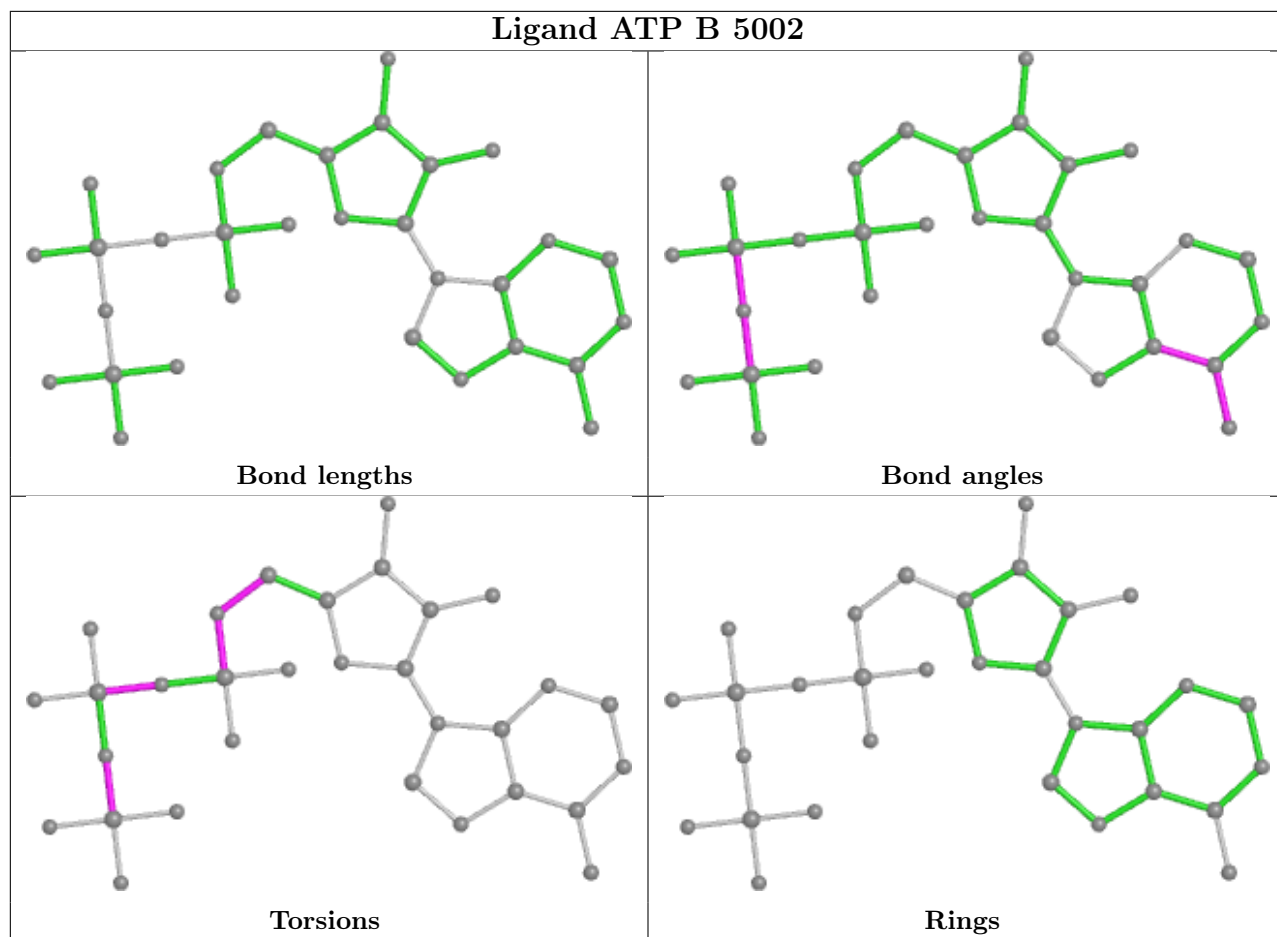
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	5005	ATP	2	0
4	D	5005	ATP	2	0
4	B	5005	ATP	2	0
4	A	5005	ATP	2	0

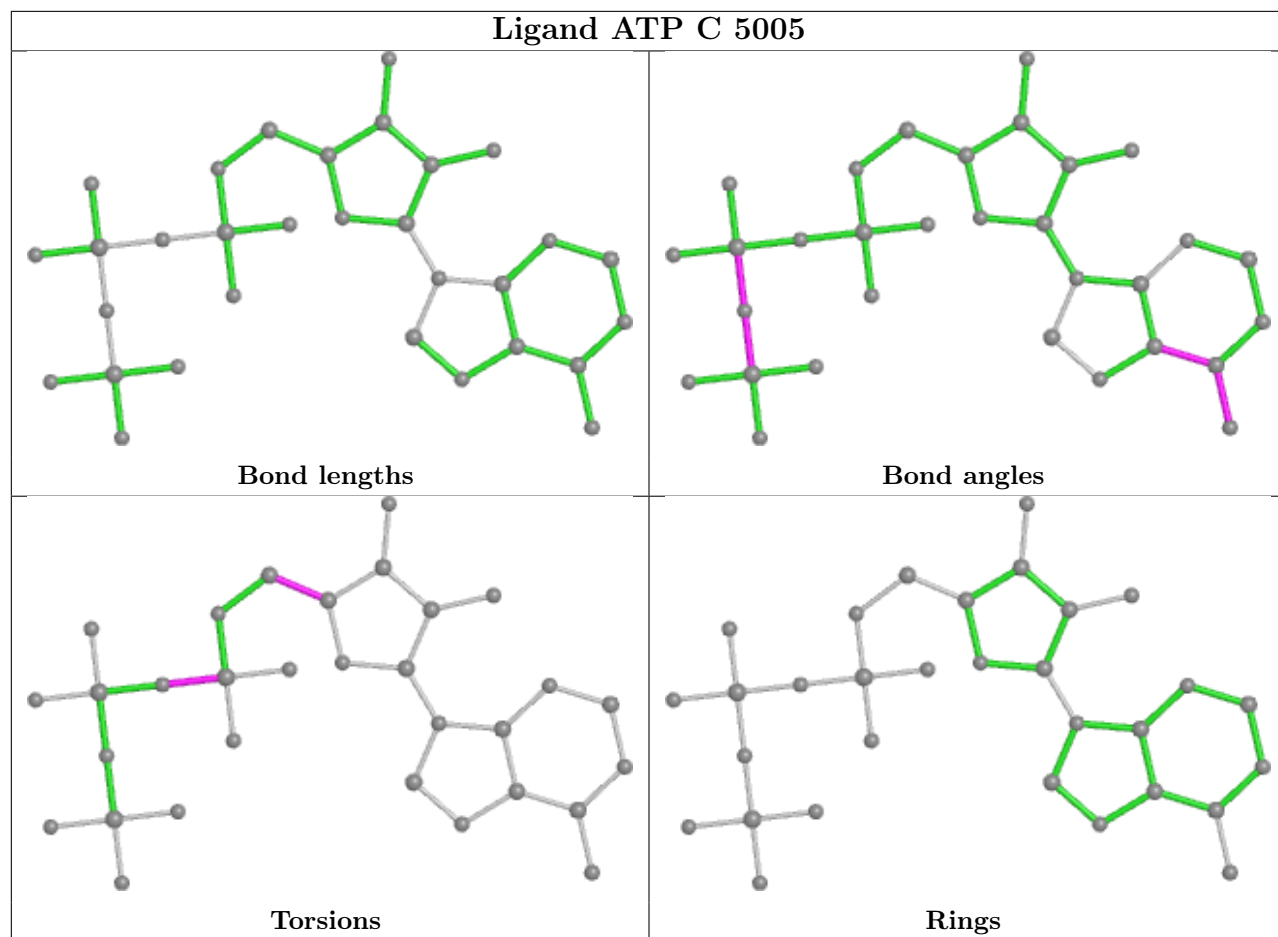
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

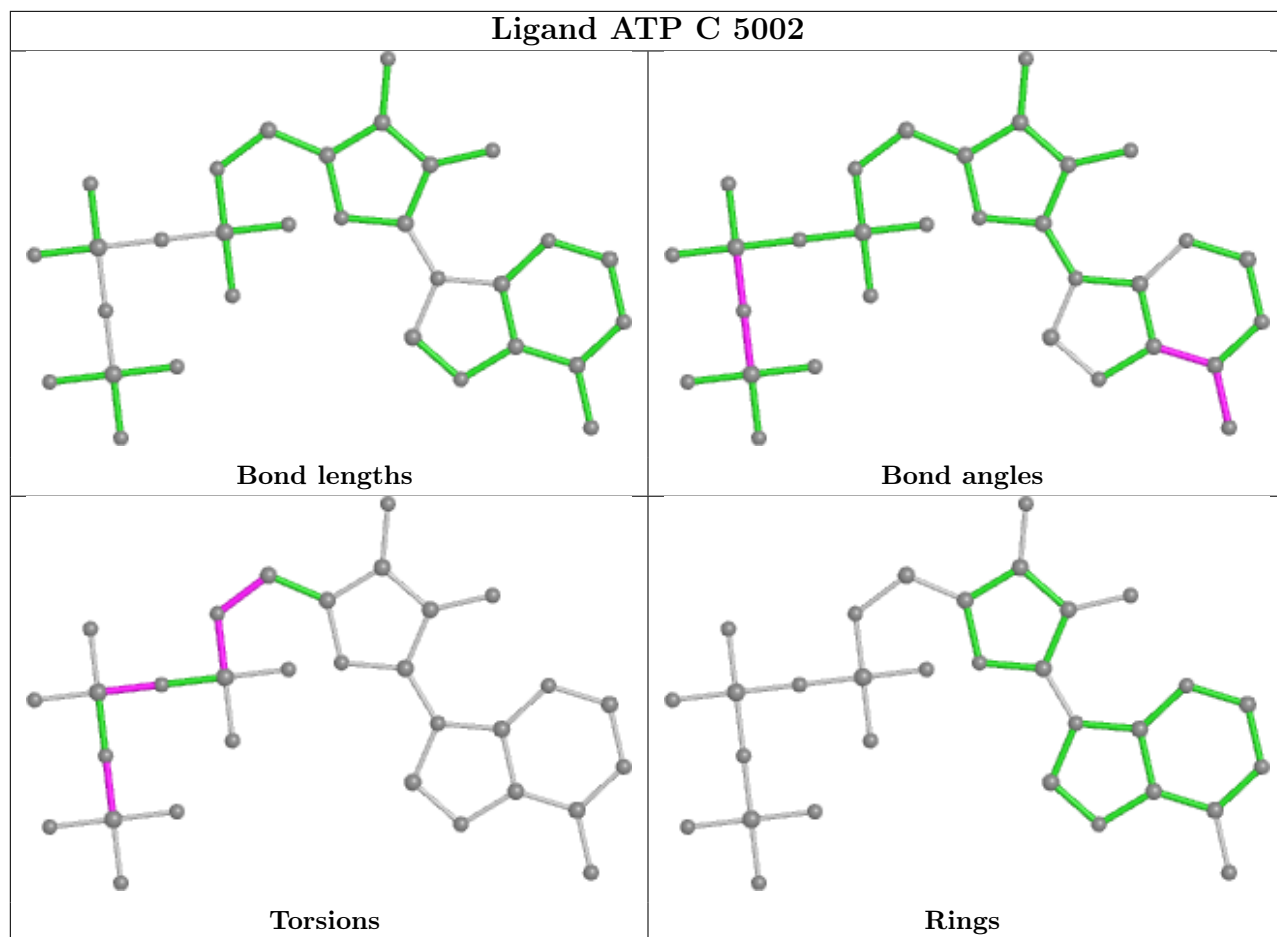
equivalents in the CSD to analyse the geometry.

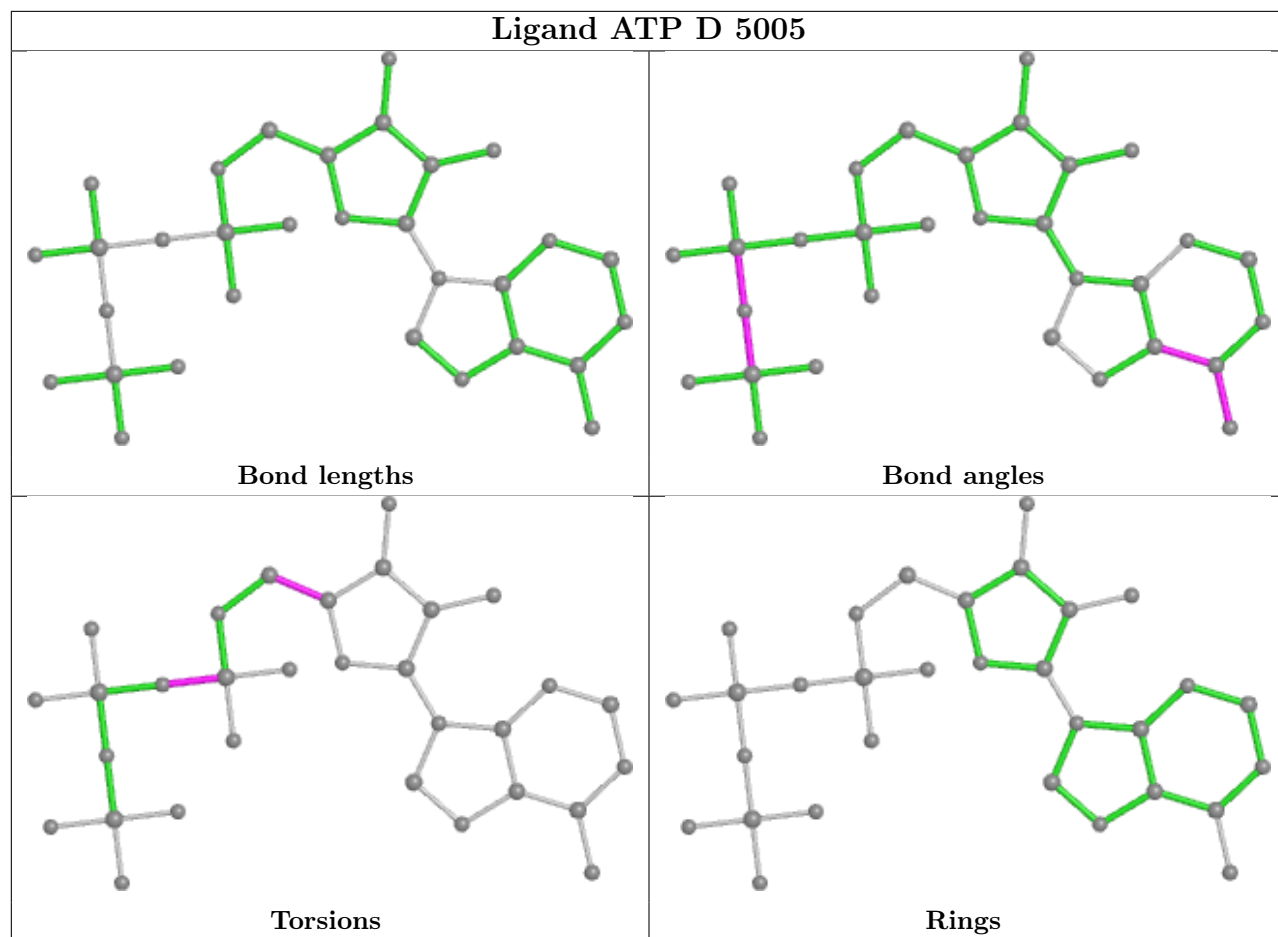


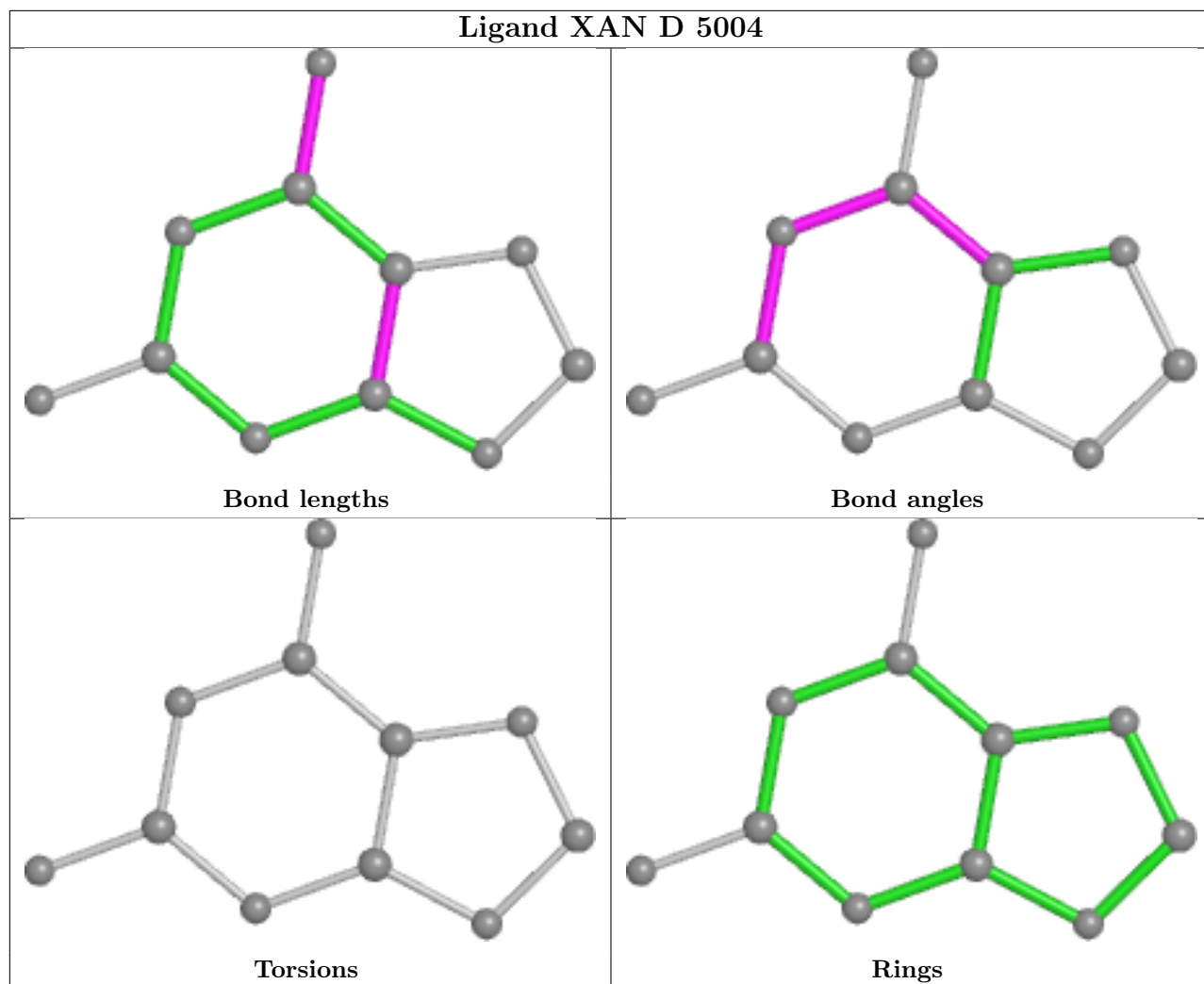


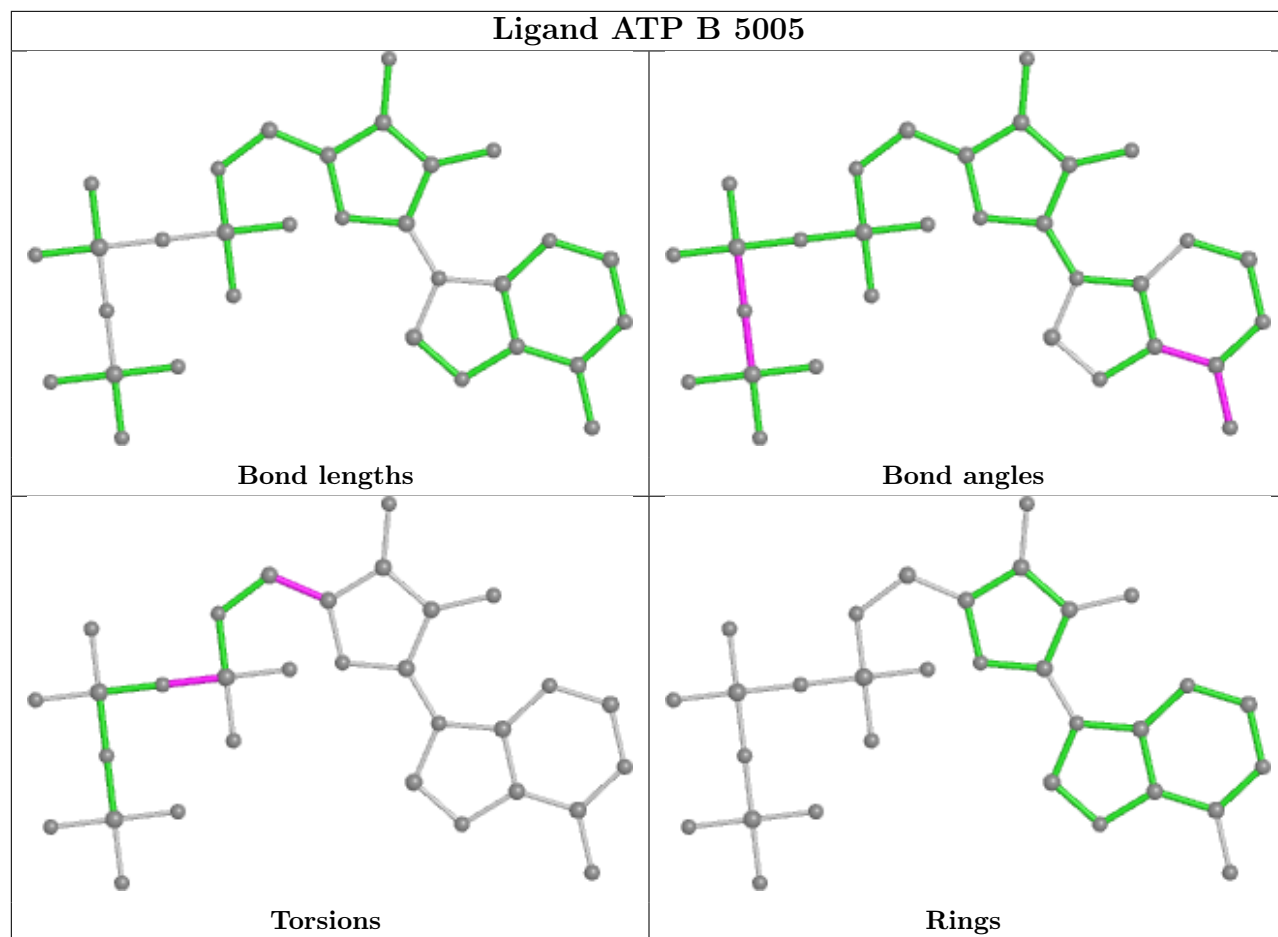


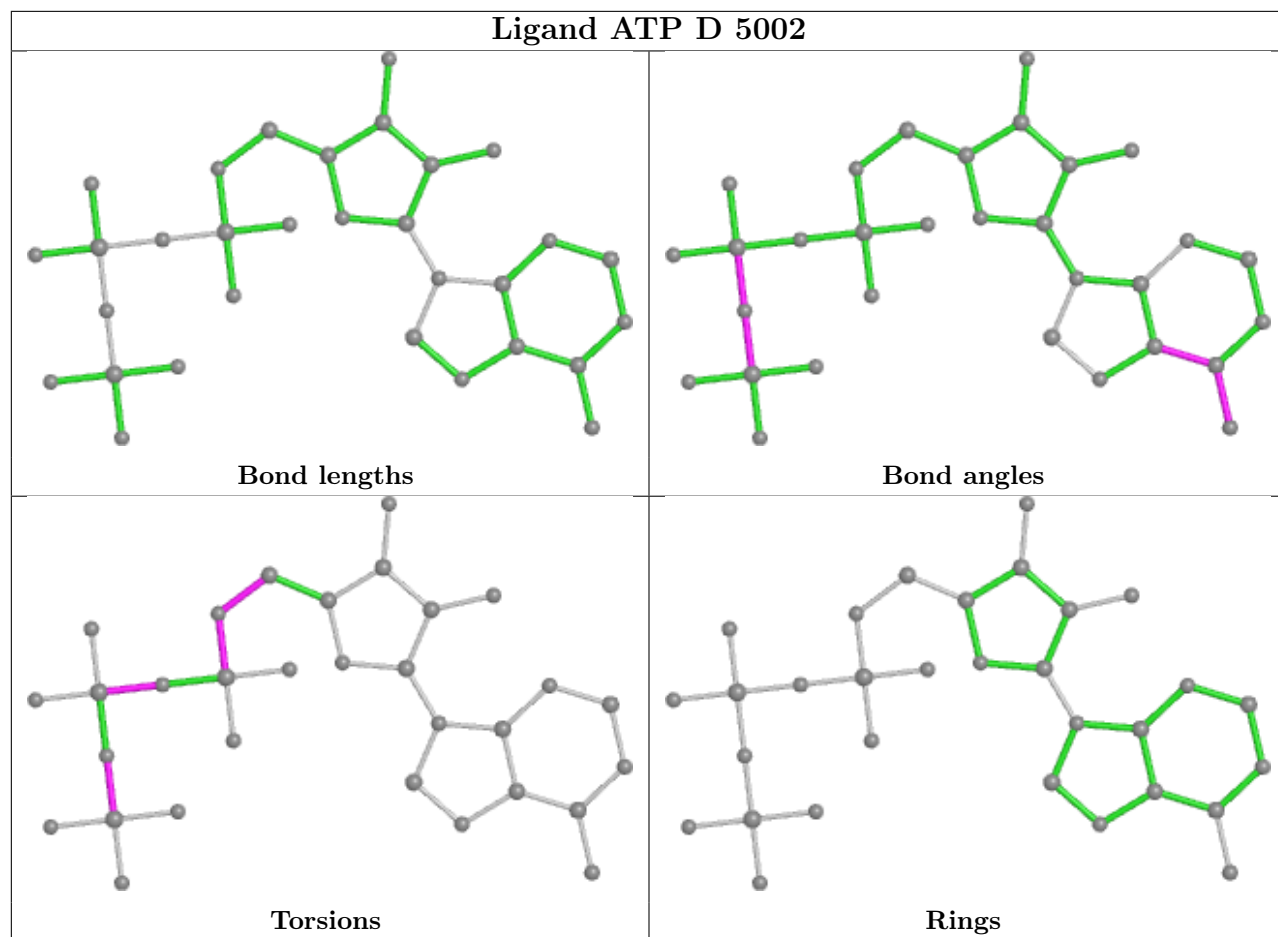


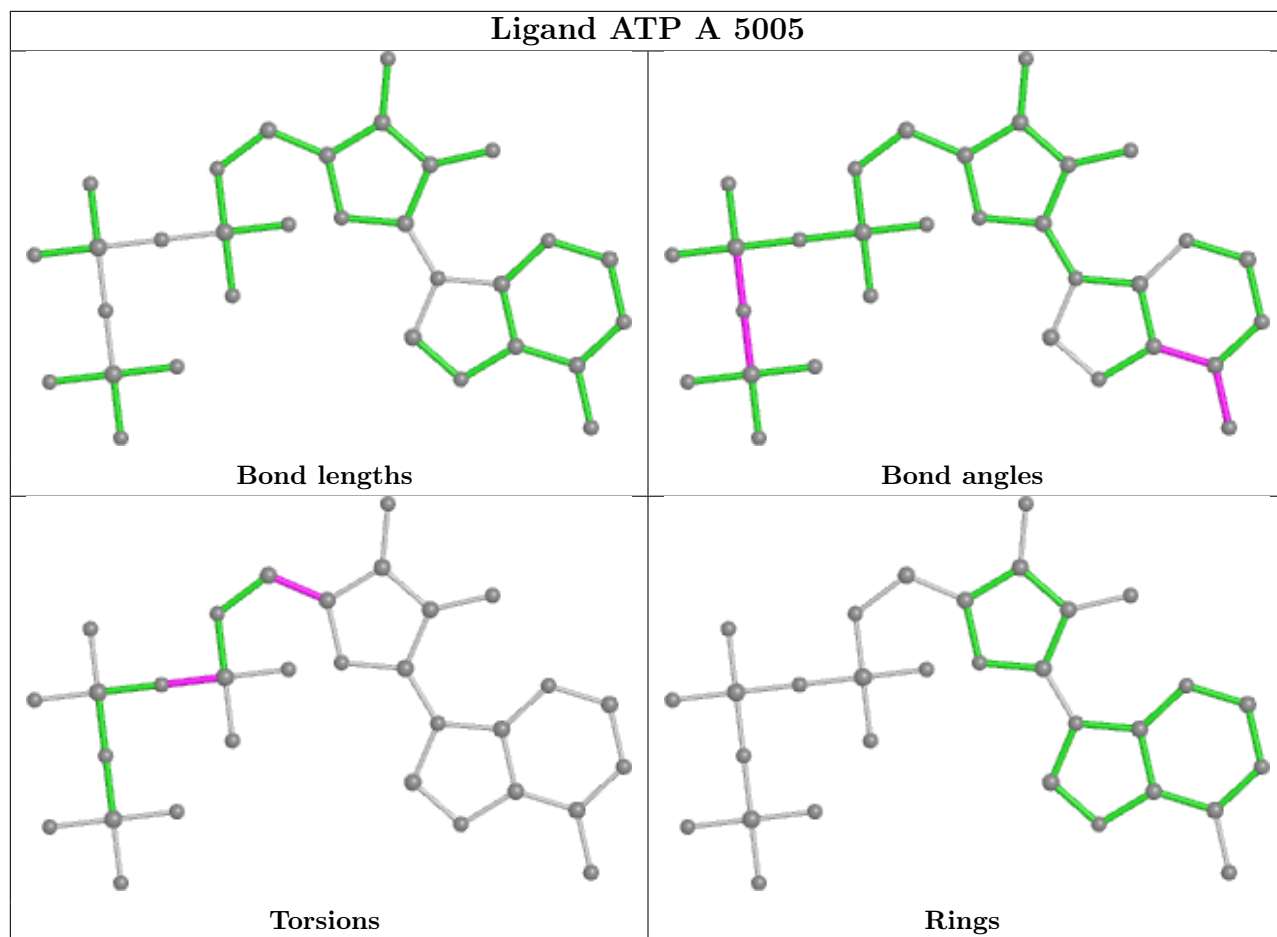


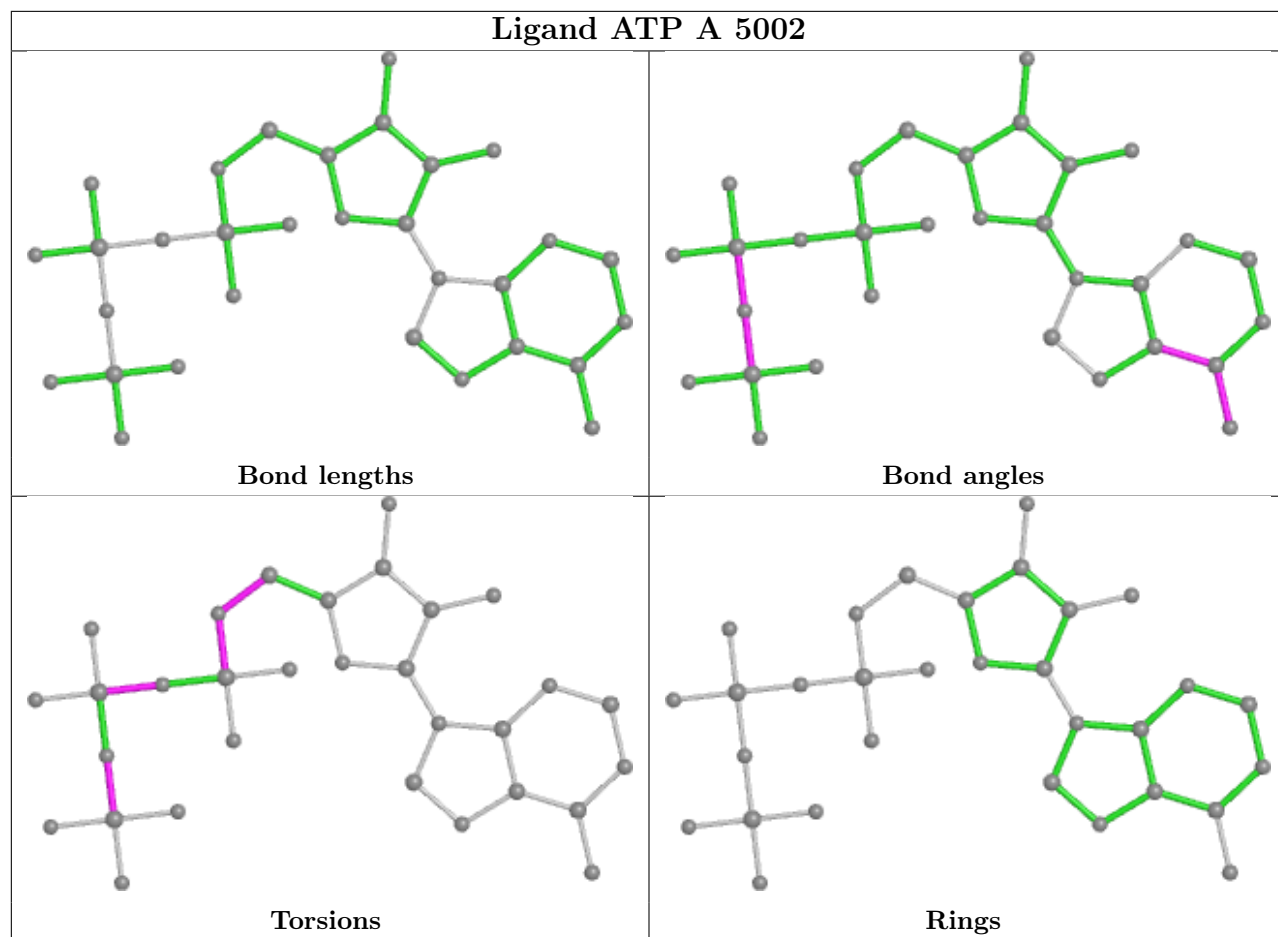


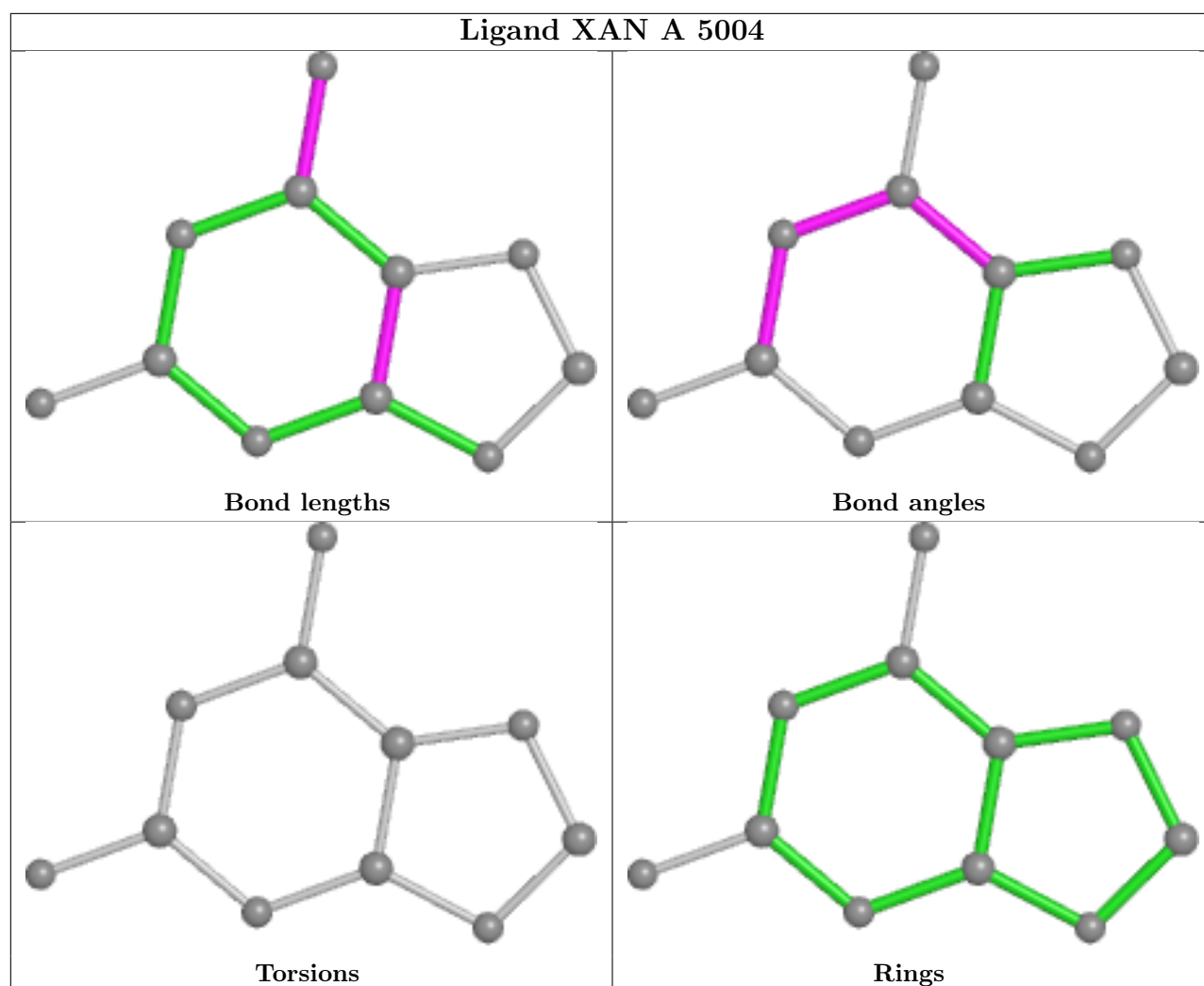












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

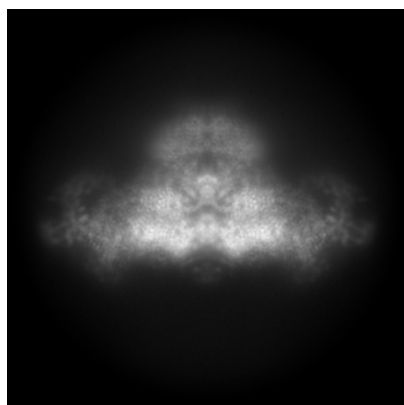
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26416. These allow visual inspection of the internal detail of the map and identification of artifacts.

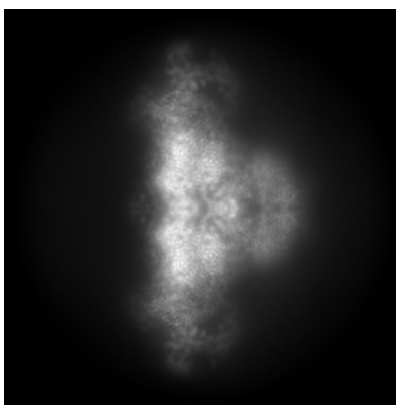
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

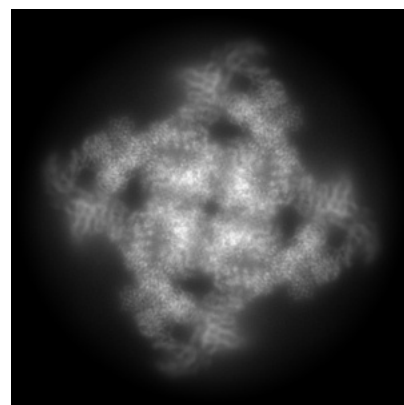
6.1.1 Primary map



X



Y

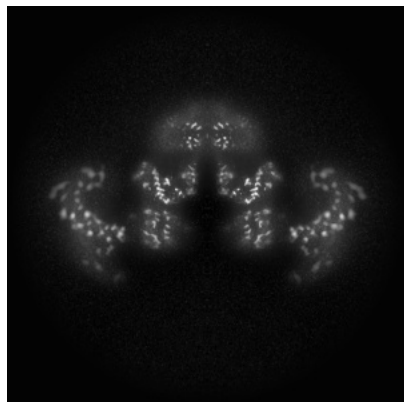


Z

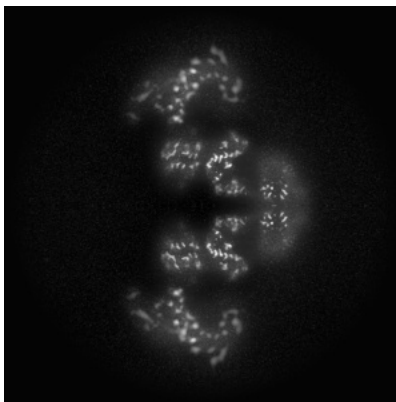
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

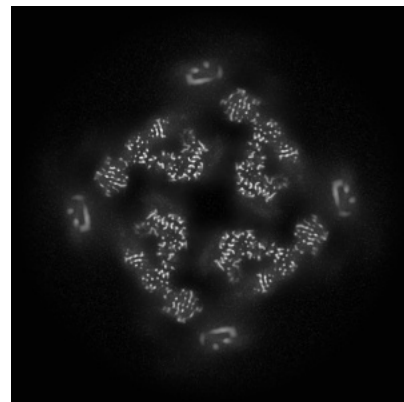
6.2.1 Primary map



X Index: 256



Y Index: 256



Z Index: 256

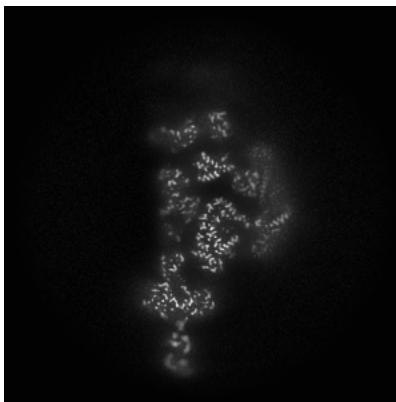
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

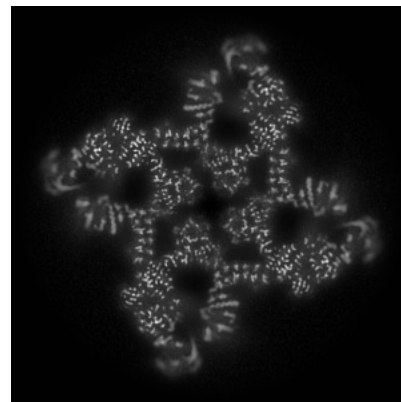
6.3.1 Primary map



X Index: 206



Y Index: 306



Z Index: 227

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

6.4 Orthogonal surface views [i](#)

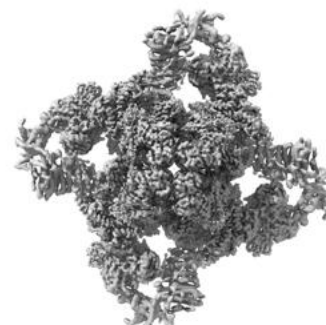
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.13. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

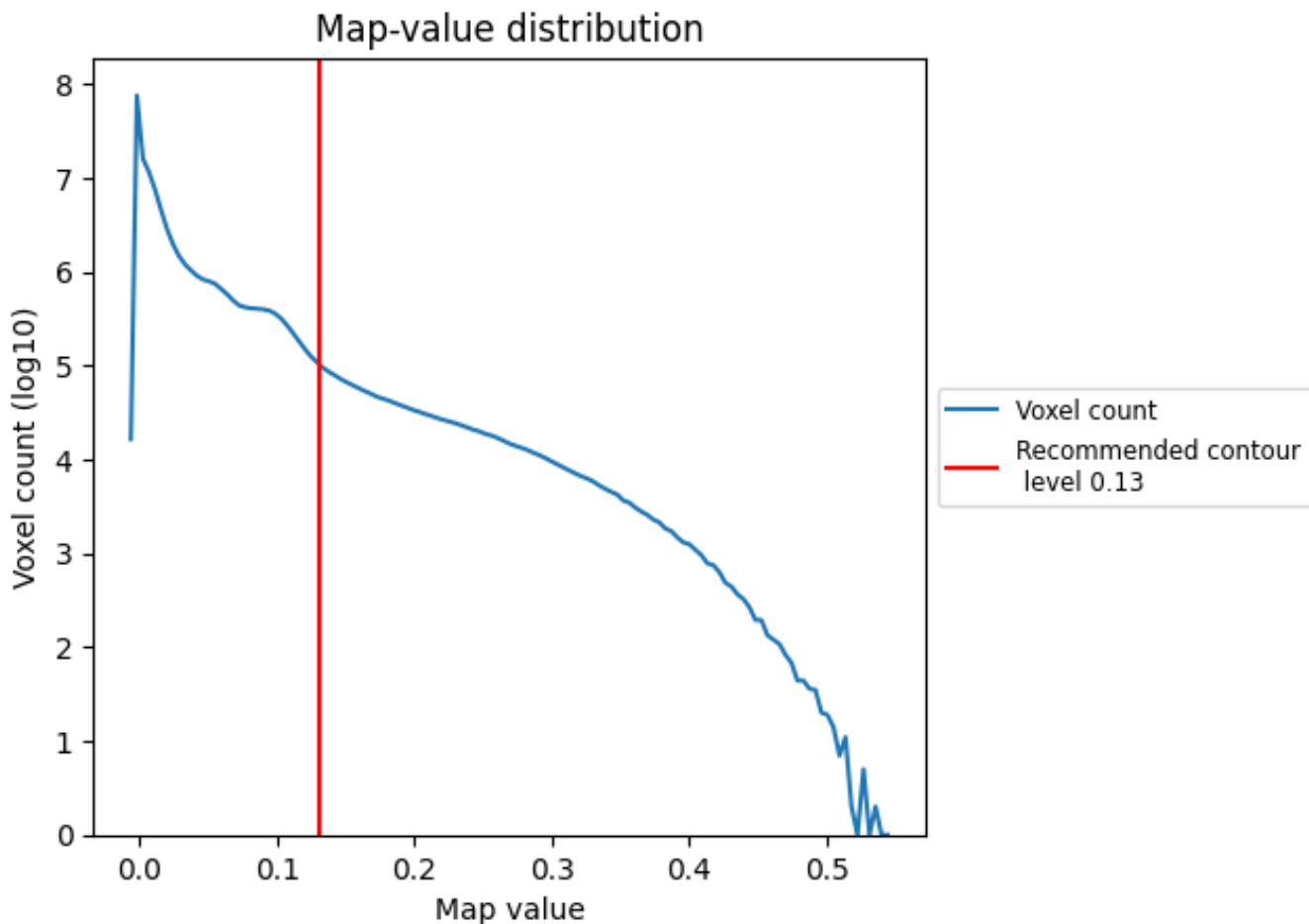
6.5 Mask visualisation

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

7 Map analysis [i](#)

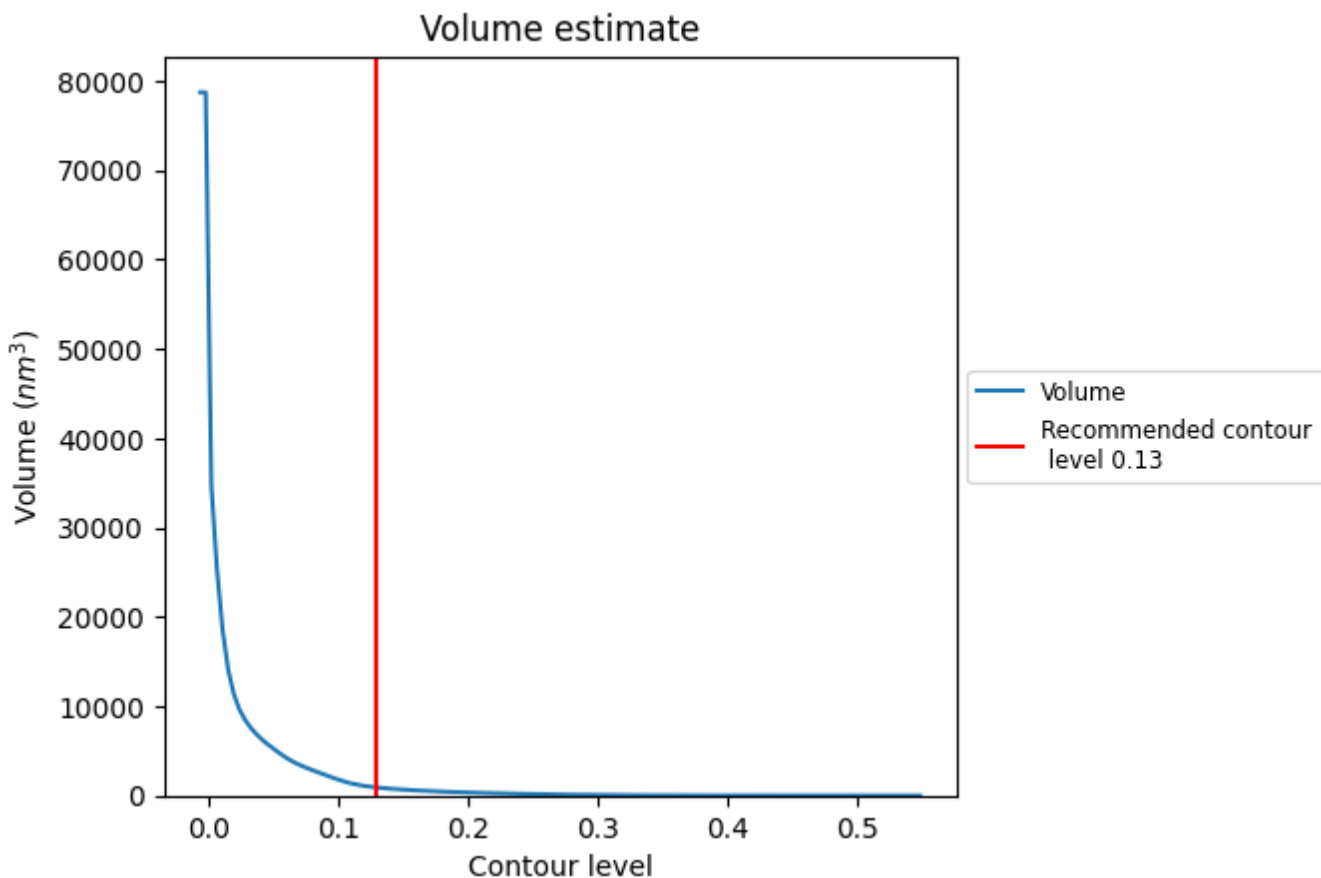
This section contains the results of statistical analysis of the map.

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.

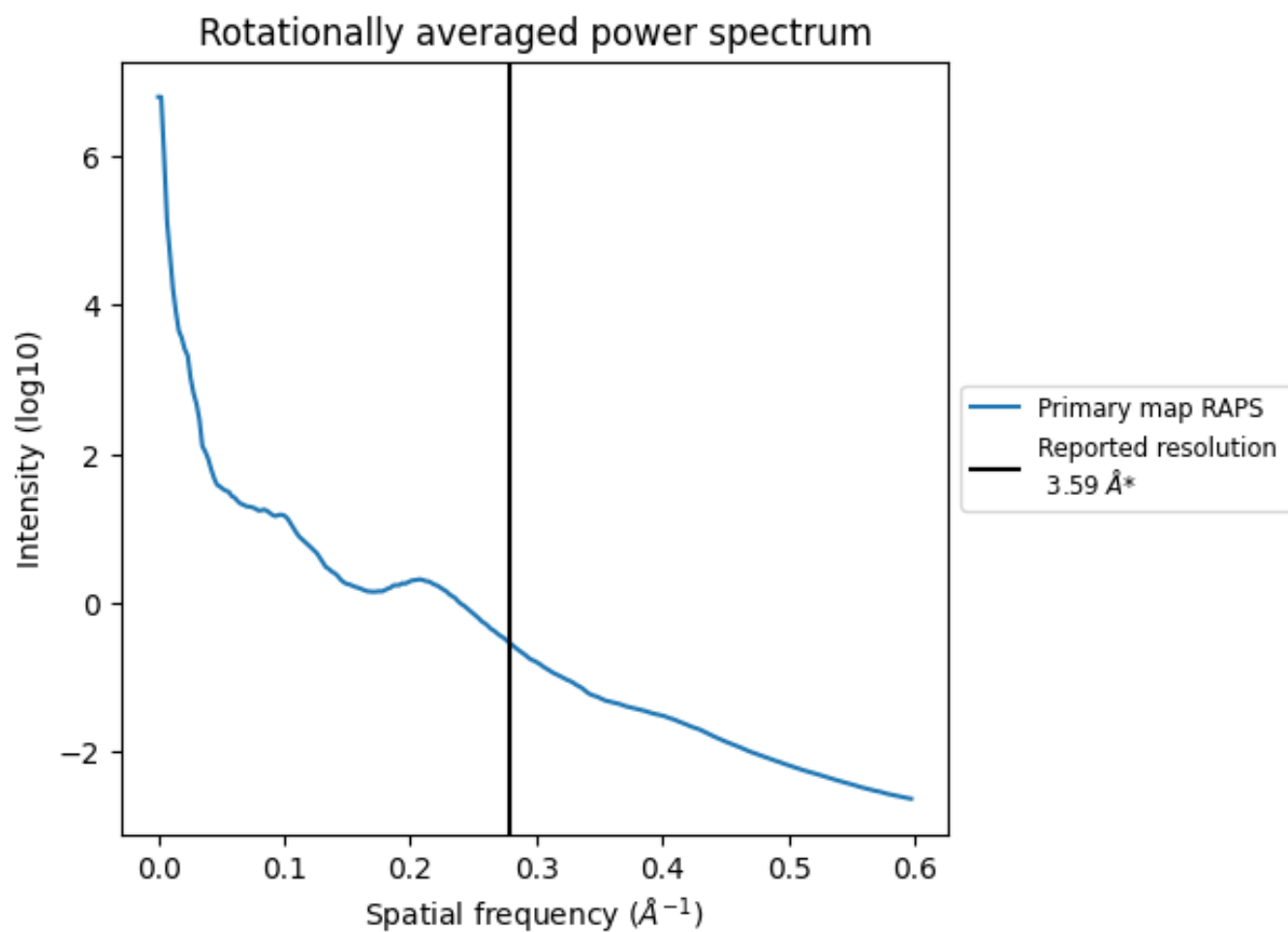
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 901 nm³; this corresponds to an approximate mass of 814 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 0.279 Å⁻¹

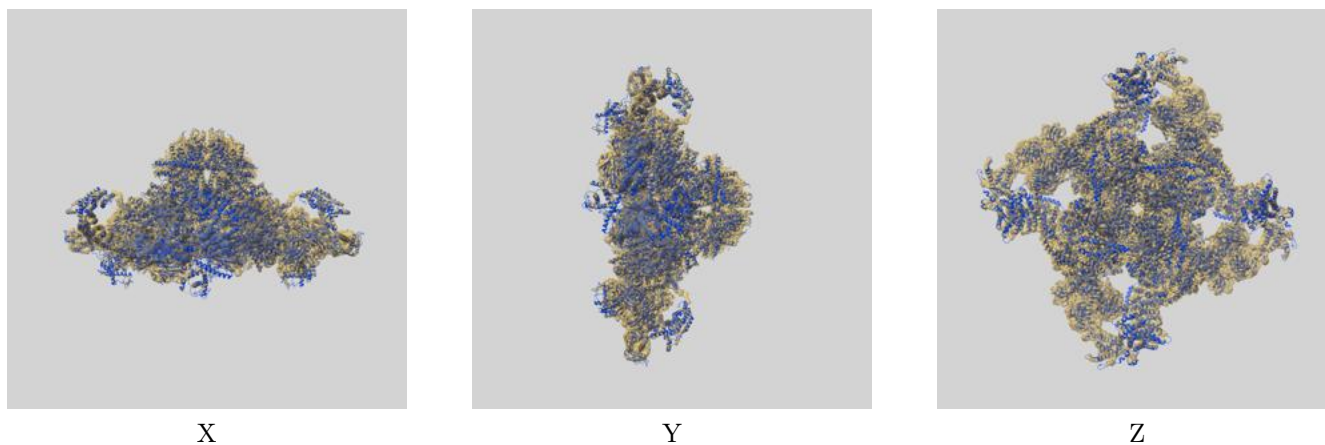
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

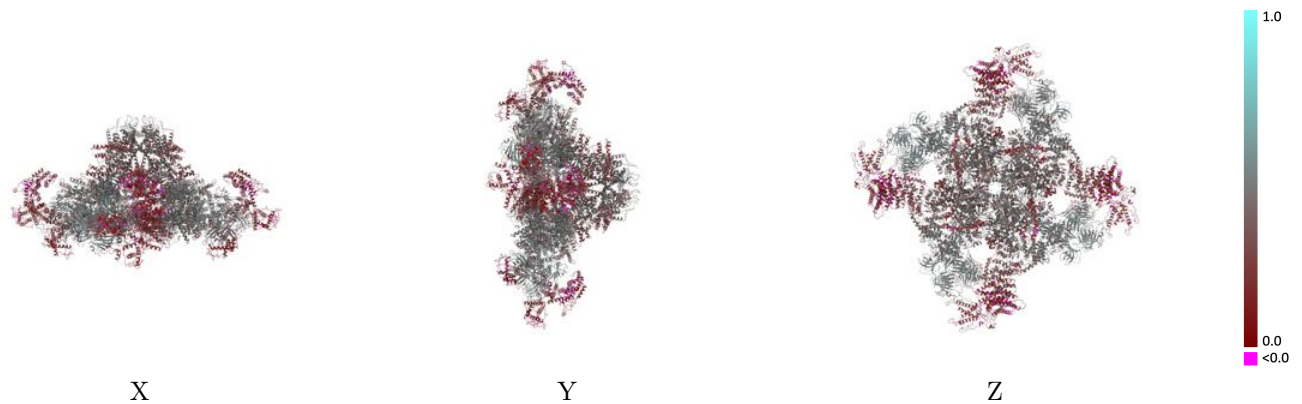
This section contains information regarding the fit between EMDB map EMD-26416 and PDB model 7UA9. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



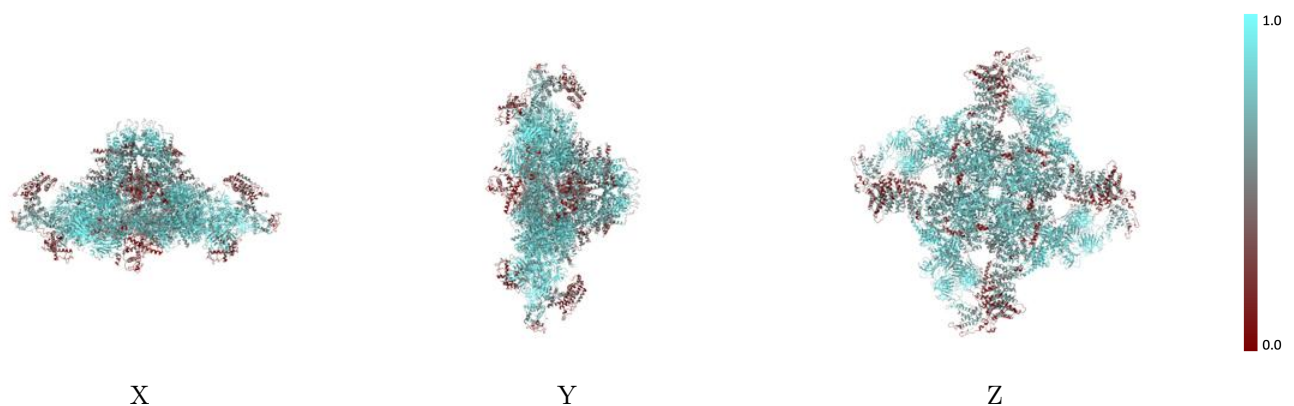
The images above show the 3D surface view of the map at the recommended contour level 0.13 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



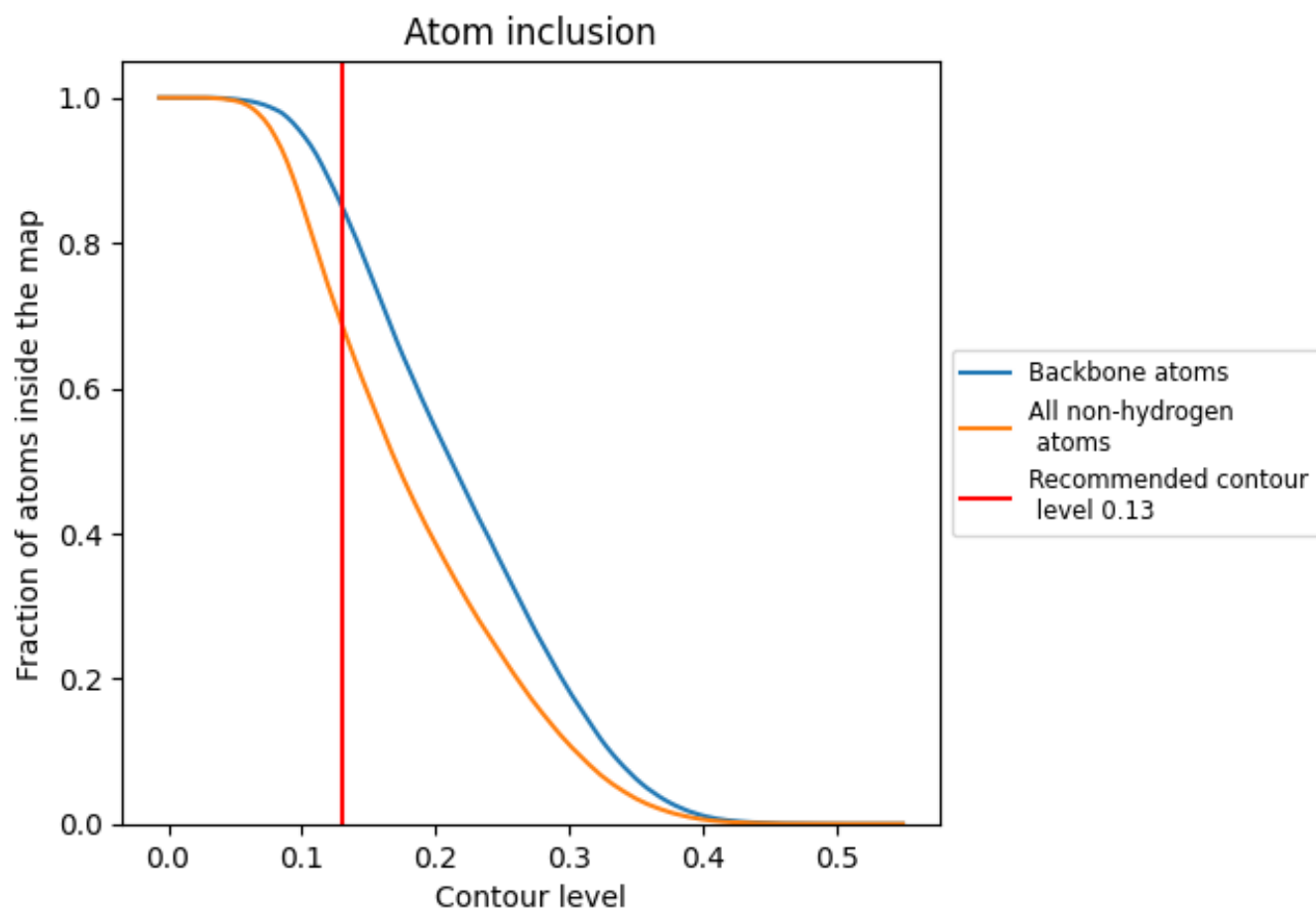
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.13).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 69% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.13) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6866	 0.3670
A	 0.6900	 0.3740
B	 0.6769	 0.3560
C	 0.6862	 0.3720
D	 0.6771	 0.3530
E	 0.8610	 0.5070
F	 0.8623	 0.4990
G	 0.8474	 0.5000
H	 0.8511	 0.5010

