



# wwPDB EM Validation Summary Report ⓘ

Nov 10, 2024 – 01:20 PM EST

PDB ID : 8TI2  
EMDB ID : EMD-41278  
Title : Cryo-EM structure of a SUR1/Kir6.2-Q52R ATP-sensitive potassium channel  
in the presence of PIP2 in the open conformation  
Authors : Driggers, C.M.; Shyng, S.-L.  
Deposited on : 2023-07-18  
Resolution : 3.28 Å(reported)  
Based on initial model : 6BAA

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.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

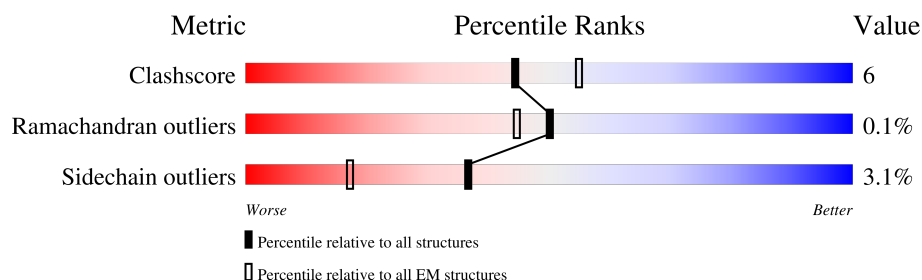
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.28 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	390	70% 12% 18%
1	B	390	70% 12% 18%
1	C	390	70% 13% 18%
1	D	390	70% 13% 18%
2	E	1582	21% 75% 13% • 11%
2	F	1582	21% 75% 13% • 11%
2	G	1582	21% 75% 13% • 11%
2	H	1582	21% 75% 13% • 11%

## 2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 50210 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called ATP-sensitive inward rectifier potassium channel 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	321	Total	C	N	O	S	1	0
			2528	1629	435	447	17		
1	B	321	Total	C	N	O	S	1	0
			2528	1629	435	447	17		
1	C	321	Total	C	N	O	S	1	0
			2528	1629	435	447	17		
1	D	321	Total	C	N	O	S	1	0
			2528	1629	435	447	17		

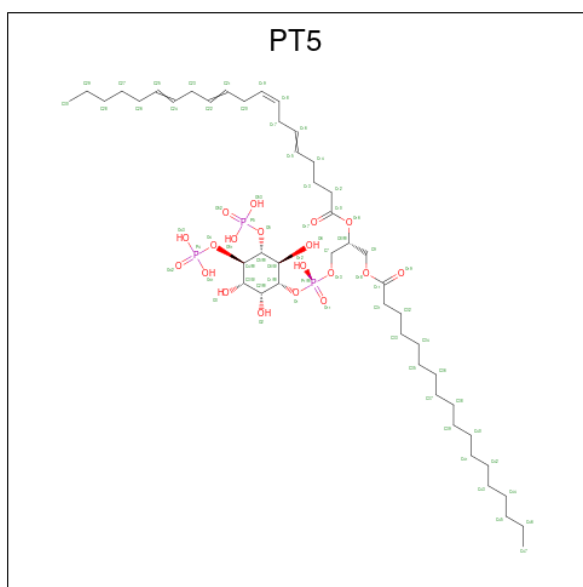
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	52	ARG	GLN	engineered mutation	UNP P70673
B	52	ARG	GLN	engineered mutation	UNP P70673
C	52	ARG	GLN	engineered mutation	UNP P70673
D	52	ARG	GLN	engineered mutation	UNP P70673

- Molecule 2 is a protein called SUR1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	1403	Total	C	N	O	S	1	0
			9744	6278	1688	1743	35		
2	H	1403	Total	C	N	O	S	1	0
			9744	6278	1688	1743	35		
2	G	1403	Total	C	N	O	S	1	0
			9744	6278	1688	1743	35		
2	F	1403	Total	C	N	O	S	1	0
			9744	6278	1688	1743	35		

- Molecule 3 is [(2R)-1-octadecanoyloxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propan-2-yl] (8Z)-icosa-5,8,11,14-tetraenoate (three-letter code: PT5) (formula: C<sub>47</sub>H<sub>85</sub>O<sub>19</sub>P<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).

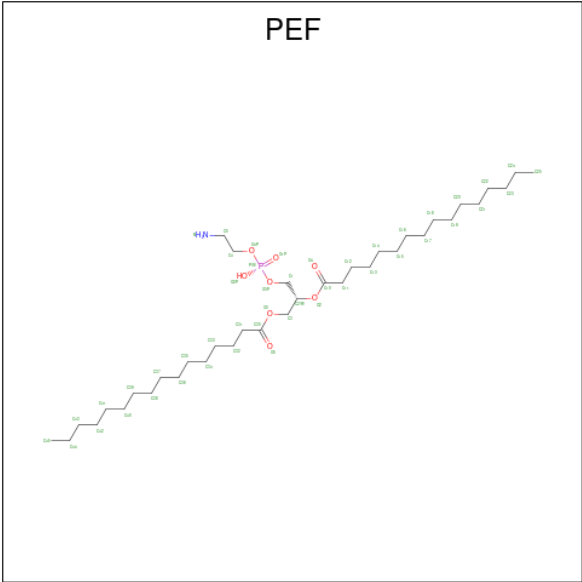


Mol	Chain	Residues	Atoms			AltConf
3	A	1	Total	C	O	P
			69	47	19	3
3	E	1	Total	C	O	P
			69	47	19	3
3	B	1	Total	C	O	P
			69	47	19	3
3	C	1	Total	C	O	P
			69	47	19	3
3	D	1	Total	C	O	P
			69	47	19	3
3	H	1	Total	C	O	P
			69	47	19	3
3	G	1	Total	C	O	P
			69	47	19	3
3	F	1	Total	C	O	P
			69	47	19	3

- Molecule 4 is POTASSIUM ION (three-letter code: K) (formula: K).

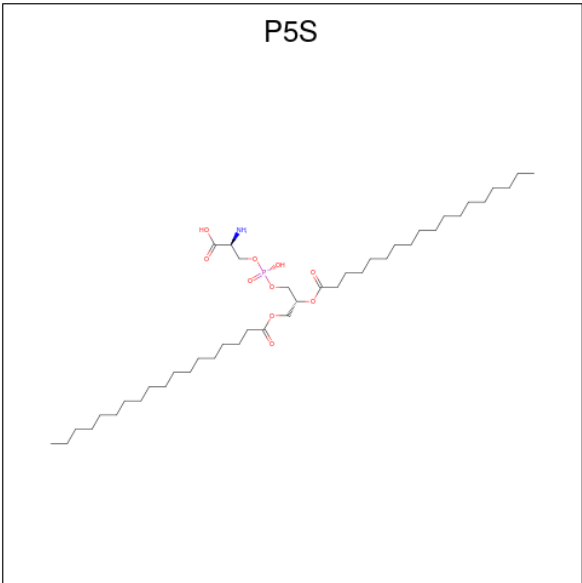
Mol	Chain	Residues	Atoms		AltConf
4	A	4	Total	K	0
			4	4	

- Molecule 5 is DI-PALMITOYL-3-SN-PHOSPHATIDYLETHANOLAMINE (three-letter code: PEF) (formula: C<sub>37</sub>H<sub>74</sub>NO<sub>8</sub>P).



Mol	Chain	Residues	Atoms					AltConf
5	E	1	Total	C	N	O	P	0
			28	18	1	8	1	
5	H	1	Total	C	N	O	P	0
			28	18	1	8	1	
5	G	1	Total	C	N	O	P	0
			28	18	1	8	1	
5	F	1	Total	C	N	O	P	0
			28	18	1	8	1	

- Molecule 6 is O-[(R)-{[(2R)-2,3-bis(octadecanoyloxy)propyl]oxy}(hydroxy)phosphoryl]-L-serine (three-letter code: P5S) (formula: C<sub>42</sub>H<sub>82</sub>NO<sub>10</sub>P).



Mol	Chain	Residues	Atoms					AltConf
6	E	1	Total	C	N	O	P	0
			50	38	1	10	1	
6	E	1	Total	C	N	O	P	0
			46	34	1	10	1	
6	H	1	Total	C	N	O	P	0
			50	38	1	10	1	
6	H	1	Total	C	N	O	P	0
			46	34	1	10	1	
6	G	1	Total	C	N	O	P	0
			50	38	1	10	1	
6	G	1	Total	C	N	O	P	0
			46	34	1	10	1	
6	F	1	Total	C	N	O	P	0
			50	38	1	10	1	
6	F	1	Total	C	N	O	P	0
			46	34	1	10	1	

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



Mol	Chain	Residues	Atoms				AltConf
7	E	1	Total	C	N	O	0
			14	8	1	5	
7	H	1	Total	C	N	O	0
			14	8	1	5	
7	G	1	Total	C	N	O	0
			14	8	1	5	

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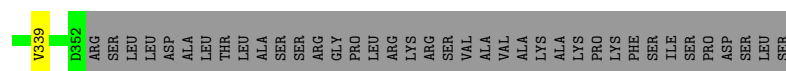
Mol	Chain	Residues	Atoms				AltConf
7	F	1	Total	C	N	O	0
			14	8	1	5	

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		AltConf
8	A	4	Total	O	0
			4	4	
8	B	3	Total	O	0
			3	3	
8	C	3	Total	O	0
			3	3	
8	D	4	Total	O	0
			4	4	

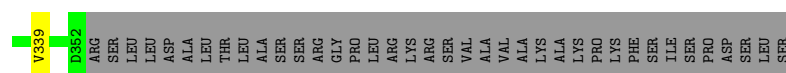
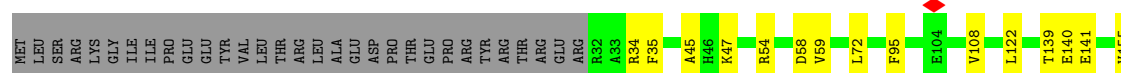






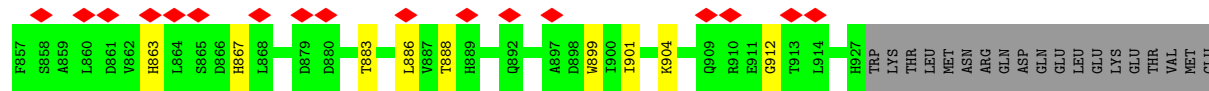
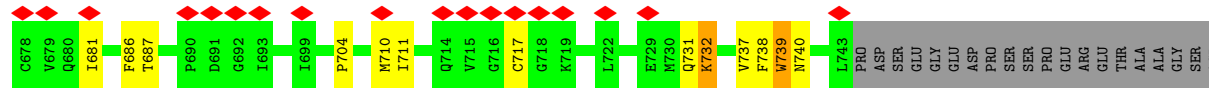
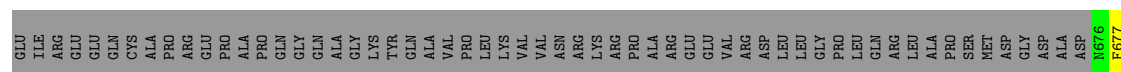
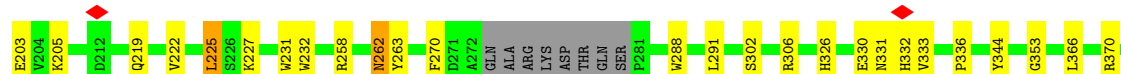
- Molecule 1: ATP-sensitive inward rectifier potassium channel 11

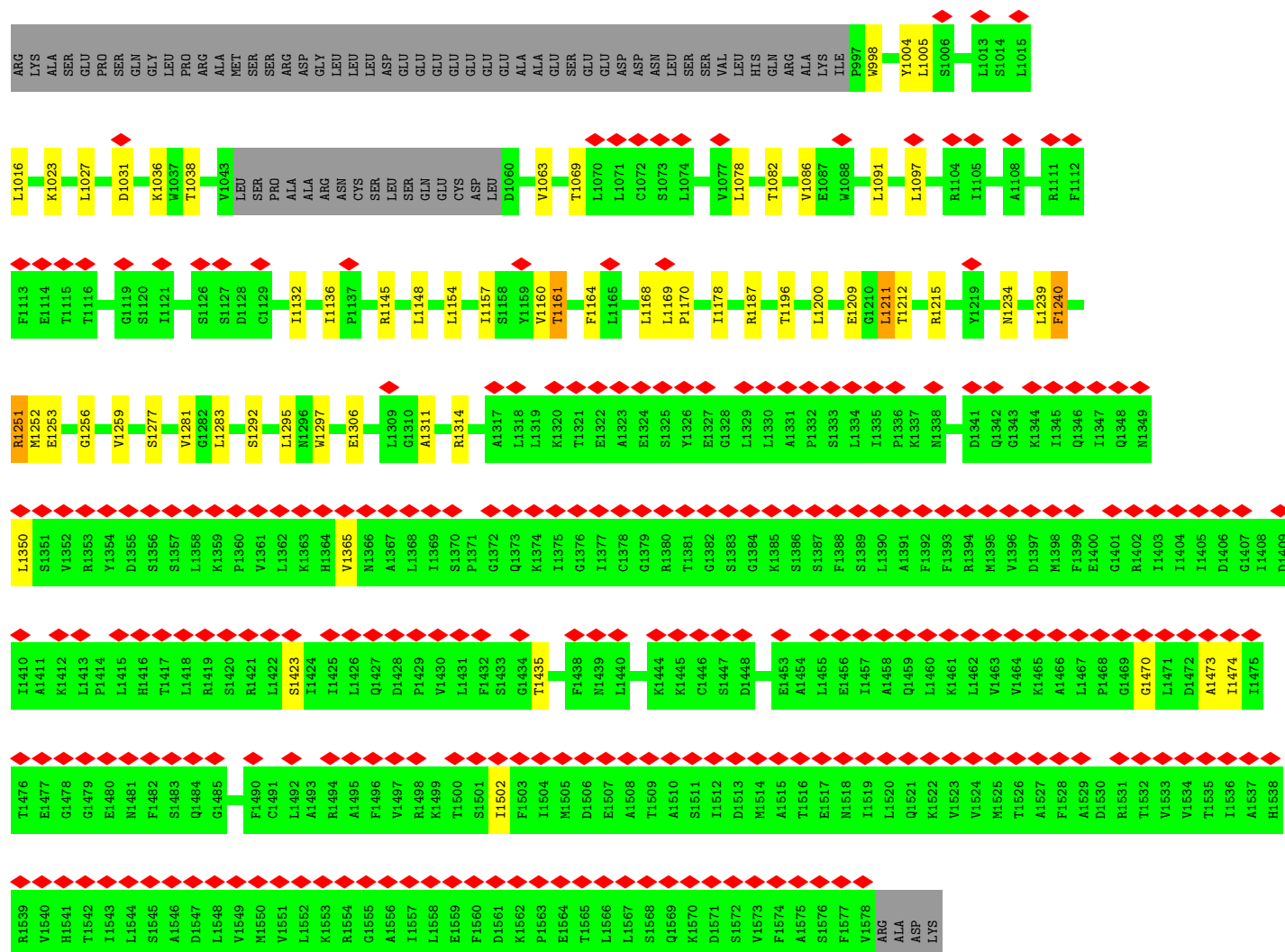
Chain D: 70% 13% 18%



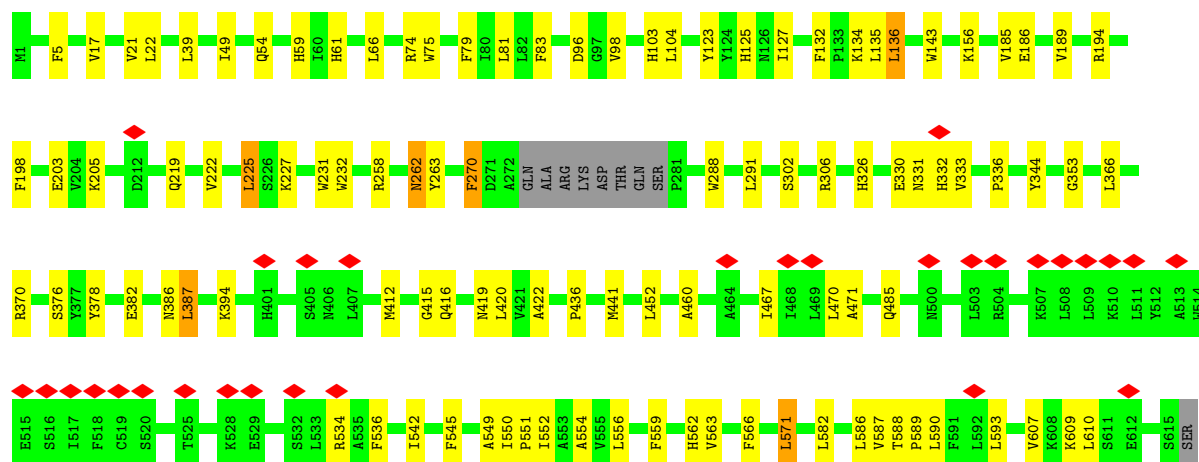
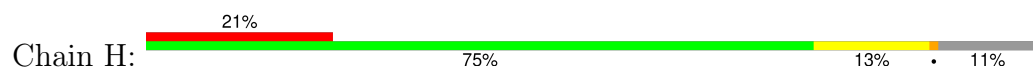
- Molecule 2: SUR1

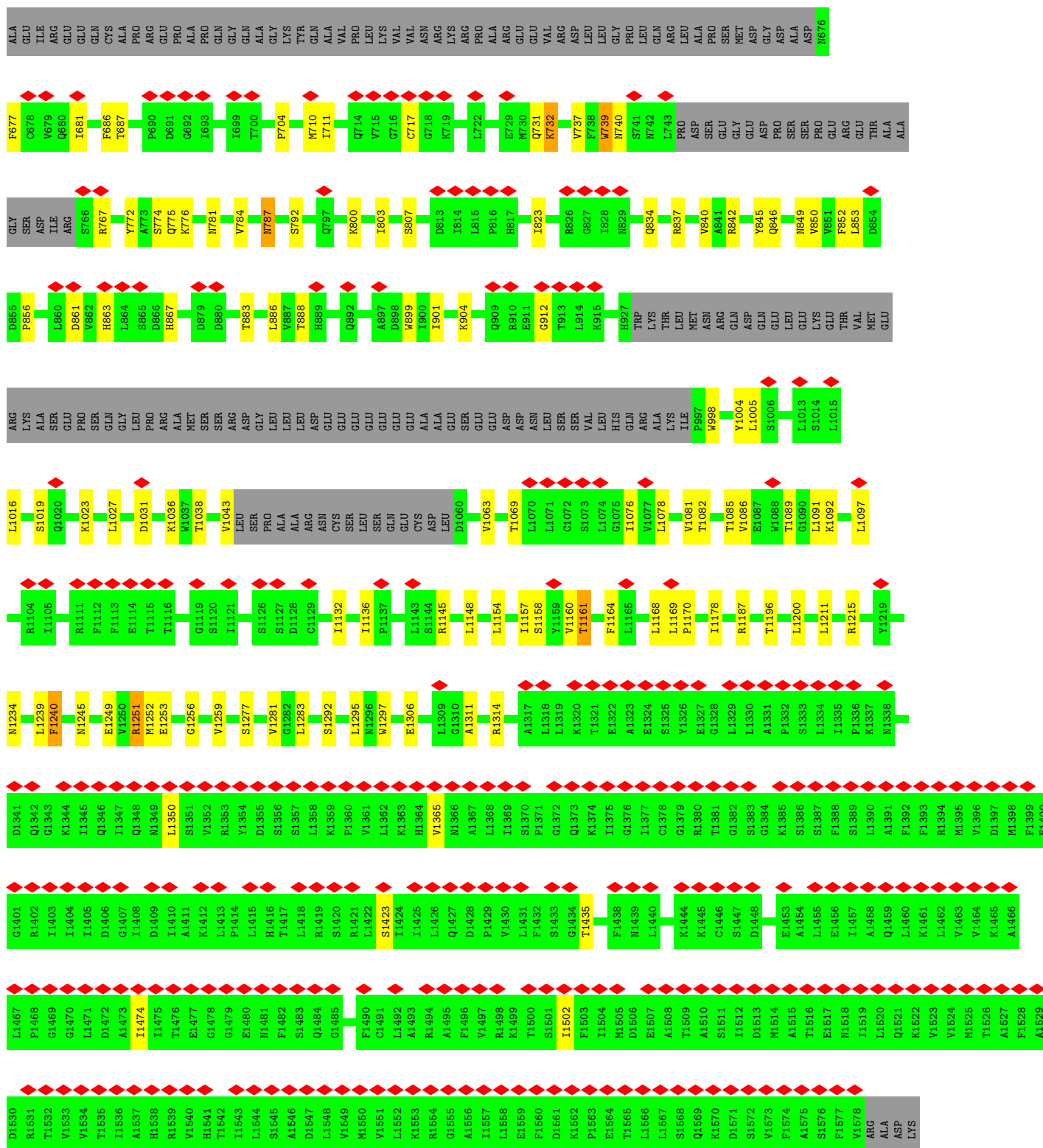
Chain E: 21% 75% 13% 11%



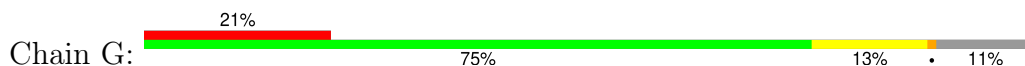


## • Molecule 2: SUR1





### • Molecule 2: SUR1







V1523	L1460	R1394	S1333	G1210
V1524	K1461	M1395	L1334	L1211
M1525	L1462	V1396	I1335	R1215
T1526	V1463	D1397	P1336	
A1527	V1464	M1398	K1337	V1219
F1528	K1465	F1399	N1338	
A1529	A1466	E1400		N1234
D1530	L1467	G1401	D1341	
R1531	P1468	R1402	Q1342	L1239
T1532	G1469	I1403	G1343	F1240
V1533	G1470	I1404	K1344	
V1534	L1471	I1405	I1345	M1245
T1535	D1472	D1406	Q1346	E1249
I1536	A1473	G1407	I1347	V1250
A1537	T1474	I1408	Q1348	R1251
H1538	I1475	D1409	N1349	M1252
R1539	T1476	I1410	L1350	E1253
V1540	E1477	A1411	S1351	G1256
H1541	G1478	K1412	V1352	V1259
T1542	G1479	L1413	R1353	
I1543	I1543	P1414	Y1354	S1277
L1544	E1480	L1415	D1355	V1281
S1545	N1481	H1416	S1356	G1282
A1546	F1482	T1417	S1357	L1283
D1547	S1483	L1418	L1358	
L1548	Q1484	R1419	K1359	S1292
V1549	G1485	S1420	P1360	L1295
M1550		R1421	V1361	M1296
V1551	F1490	L1422	L1362	W1297
L1552	C1491	S1423	K1363	E1306
K1553	L1492	T1424	H1364	
R1554	A1493	I1425	V1365	L1309
A1556	R1494	L1426	N1366	G1310
	A1495	Q1427	A1367	A1311
V1557	F1496	D1428	L1368	
L1558	V1497	P1429	I1369	R1314
E1559	K1498	V1430	S1370	
F1560	L1499	L1431	P1371	A1317
D1561	T1500	F1432	G1372	L1318
K1562	S1501	S1433	Q1373	L1319
	I1502	G1434	T1321	K1320
	F1503	T1435	K1374	E1322
F1563	I1504		I1375	A1323
E1564	M1505	F1438	G1376	E1324
T1565	D1506	N1439	I1377	S1325
L1566	E1507	L1440	C1378	Y1326
L1567	A1508		G1379	E1327
S1568	T1509	K1444	R1380	G1328
Q1569	A1510	K1445	T1381	L1329
K1570	S1511	C1446	G1382	L1330
D1571	I1512	S1447	S1383	A1331
S1572	D1513	D1448	K1384	P1332
V1573	M1514		G1385	
F1574	A1515	E1453	S1386	
A1575	T1516	A1454	S1387	
F1577	E1517	L1455	F1388	
V1578	N1518	I1457	S1389	
	I1519	A1458	L1390	
	L1520	Q1459	A1391	
	K1522		F1392	
			F1393	
ARG				
ALA				
ASP				
LYS				

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C4	Depositor
Number of particles used	14115	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 ( $e^-/\text{\AA}^2$ )	55	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.644	Depositor
Minimum map value	-0.269	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.014	Depositor
Recommended contour level	0.08	Depositor
Map size (Å)	495.59998, 495.59998, 495.59998	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.826, 0.826, 0.826	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: NAG, K, P5S, PEF, PT5

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	0.27	0/2589	0.47	0/3519
1	B	0.27	0/2589	0.47	0/3519
1	C	0.27	0/2589	0.47	0/3519
1	D	0.27	0/2589	0.47	0/3519
2	E	0.24	0/9933	0.42	0/13611
2	F	0.24	0/9933	0.42	0/13611
2	G	0.24	0/9933	0.42	0/13611
2	H	0.24	0/9933	0.42	0/13611
All	All	0.25	0/50088	0.43	0/68520

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	2528	0	2566	34	0
1	B	2528	0	2566	34	0
1	C	2528	0	2566	33	0
1	D	2528	0	2566	33	0
2	E	9744	0	8752	118	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	9744	0	8752	120	0
2	G	9744	0	8752	120	0
2	H	9744	0	8752	122	0
3	A	69	0	80	4	0
3	B	69	0	80	4	0
3	C	69	0	80	4	0
3	D	69	0	80	4	0
3	E	69	0	80	6	0
3	F	69	0	80	7	0
3	G	69	0	80	6	0
3	H	69	0	80	7	0
4	A	4	0	0	0	0
5	E	28	0	29	1	0
5	F	28	0	29	2	0
5	G	28	0	29	2	0
5	H	28	0	29	1	0
6	E	96	0	127	3	0
6	F	96	0	127	3	0
6	G	96	0	127	3	0
6	H	96	0	127	3	0
7	E	14	0	13	0	0
7	F	14	0	13	0	0
7	G	14	0	13	0	0
7	H	14	0	13	0	0
8	A	4	0	0	0	0
8	B	3	0	0	0	0
8	C	3	0	0	0	0
8	D	4	0	0	0	0
All	All	50210	0	46588	599	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 6.

The worst 5 of 599 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:1023:LYS:HE2	2:F:1078:LEU:HB3	1.68	0.76
2:E:1023:LYS:HE2	2:E:1078:LEU:HB3	1.68	0.76
2:H:1023:LYS:HE2	2:H:1078:LEU:HB3	1.68	0.76
2:G:1023:LYS:HE2	2:G:1078:LEU:HB3	1.68	0.75
2:E:1160:VAL:HG23	2:E:1161:THR:HG22	1.71	0.72

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	320/390 (82%)	311 (97%)	9 (3%)	0	100	100
1	B	320/390 (82%)	307 (96%)	13 (4%)	0	100	100
1	C	320/390 (82%)	307 (96%)	13 (4%)	0	100	100
1	D	320/390 (82%)	307 (96%)	13 (4%)	0	100	100
2	E	1392/1582 (88%)	1326 (95%)	64 (5%)	2 (0%)	48	77
2	F	1392/1582 (88%)	1329 (96%)	60 (4%)	3 (0%)	44	72
2	G	1392/1582 (88%)	1332 (96%)	58 (4%)	2 (0%)	48	77
2	H	1392/1582 (88%)	1331 (96%)	58 (4%)	3 (0%)	44	72
All	All	6848/7888 (87%)	6550 (96%)	288 (4%)	10 (0%)	50	77

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	412	MET
2	G	412	MET
2	F	412	MET
2	E	258	ARG
2	E	738	PHE

### 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	281/341 (82%)	277 (99%)	4 (1%)	62	78
1	B	281/341 (82%)	277 (99%)	4 (1%)	62	78
1	C	281/341 (82%)	277 (99%)	4 (1%)	62	78
1	D	281/341 (82%)	277 (99%)	4 (1%)	62	78
2	E	829/1371 (60%)	799 (96%)	30 (4%)	30	57
2	F	829/1371 (60%)	798 (96%)	31 (4%)	29	56
2	G	829/1371 (60%)	798 (96%)	31 (4%)	29	56
2	H	829/1371 (60%)	798 (96%)	31 (4%)	29	56
All	All	4440/6848 (65%)	4301 (97%)	139 (3%)	37	61

5 of 139 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	F	270	PHE
2	F	732	LYS
2	F	1161	THR
2	H	81	LEU
2	H	66	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 4 are monoatomic - leaving 24 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$
7	NAG	G	1605	2	14,14,15	0.46	0	17,19,21	0.41	0
6	P5S	H	1603	-	48,49,53	0.55	0	50,56,60	0.75	1 (2%)
5	PEF	G	1602	-	27,27,46	1.21	3 (11%)	30,32,51	1.14	2 (6%)
7	NAG	F	1605	2	14,14,15	0.46	0	17,19,21	0.41	0
3	PT5	B	401	-	69,69,69	1.20	6 (8%)	84,87,87	1.44	9 (10%)
5	PEF	E	1602	-	27,27,46	1.21	3 (11%)	30,32,51	1.13	2 (6%)
3	PT5	A	401	-	69,69,69	1.20	6 (8%)	84,87,87	1.44	9 (10%)
6	P5S	F	1604	-	44,45,53	0.58	0	46,52,60	0.99	1 (2%)
6	P5S	E	1603	-	48,49,53	0.55	0	50,56,60	0.75	1 (2%)
6	P5S	G	1603	-	48,49,53	0.55	0	50,56,60	0.75	1 (2%)
3	PT5	F	1601	-	69,69,69	1.21	6 (8%)	84,87,87	1.33	8 (9%)
6	P5S	E	1604	-	44,45,53	0.58	0	46,52,60	0.99	1 (2%)
7	NAG	H	1605	2	14,14,15	0.46	0	17,19,21	0.41	0
5	PEF	H	1602	-	27,27,46	1.21	3 (11%)	30,32,51	1.13	2 (6%)
3	PT5	D	401	-	69,69,69	1.20	6 (8%)	84,87,87	1.44	9 (10%)
3	PT5	C	401	-	69,69,69	1.20	6 (8%)	84,87,87	1.44	9 (10%)
3	PT5	E	1601	-	69,69,69	1.21	6 (8%)	84,87,87	1.33	8 (9%)
6	P5S	H	1604	-	44,45,53	0.58	0	46,52,60	0.99	1 (2%)
6	P5S	G	1604	-	44,45,53	0.58	0	46,52,60	0.99	1 (2%)
7	NAG	E	1605	2	14,14,15	0.46	0	17,19,21	0.41	0
3	PT5	H	1601	-	69,69,69	1.21	6 (8%)	84,87,87	1.33	8 (9%)
5	PEF	F	1602	-	27,27,46	1.21	3 (11%)	30,32,51	1.14	2 (6%)
6	P5S	F	1603	-	48,49,53	0.55	0	50,56,60	0.75	1 (2%)
3	PT5	G	1601	-	69,69,69	1.21	6 (8%)	84,87,87	1.33	8 (9%)

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
7	NAG	G	1605	2	-	2/6/23/26	0/1/1/1
6	P5S	H	1603	-	-	13/55/55/59	-
5	PEF	G	1602	-	-	11/31/31/50	-
7	NAG	F	1605	2	-	2/6/23/26	0/1/1/1
3	PT5	B	401	-	-	24/66/90/90	0/1/1/1
5	PEF	E	1602	-	-	11/31/31/50	-
3	PT5	A	401	-	-	24/66/90/90	0/1/1/1
6	P5S	F	1604	-	-	16/51/51/59	-
6	P5S	E	1603	-	-	13/55/55/59	-
6	P5S	G	1603	-	-	13/55/55/59	-
3	PT5	F	1601	-	-	28/66/90/90	0/1/1/1
6	P5S	E	1604	-	-	16/51/51/59	-
7	NAG	H	1605	2	-	2/6/23/26	0/1/1/1
5	PEF	H	1602	-	-	11/31/31/50	-
3	PT5	D	401	-	-	24/66/90/90	0/1/1/1
3	PT5	C	401	-	-	24/66/90/90	0/1/1/1
3	PT5	E	1601	-	-	28/66/90/90	0/1/1/1
6	P5S	H	1604	-	-	16/51/51/59	-
6	P5S	G	1604	-	-	16/51/51/59	-
7	NAG	E	1605	2	-	2/6/23/26	0/1/1/1
3	PT5	H	1601	-	-	28/66/90/90	0/1/1/1
5	PEF	F	1602	-	-	11/31/31/50	-
6	P5S	F	1603	-	-	13/55/55/59	-
3	PT5	G	1601	-	-	28/66/90/90	0/1/1/1

The worst 5 of 60 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1601	PT5	P4-O4	4.71	1.67	1.59
3	F	1601	PT5	P4-O4	4.70	1.67	1.59
3	H	1601	PT5	P4-O4	4.70	1.67	1.59
3	E	1601	PT5	P4-O4	4.70	1.67	1.59
3	C	401	PT5	P4-O4	4.45	1.67	1.59

The worst 5 of 84 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	G	1604	P5S	OG-CB-CA	5.67	113.00	108.06

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	F	1604	P5S	OG-CB-CA	5.67	113.00	108.06
6	H	1604	P5S	OG-CB-CA	5.66	113.00	108.06
6	E	1604	P5S	OG-CB-CA	5.65	112.99	108.06
3	A	401	PT5	C2-C1-C6	4.64	117.29	110.86

There are no chirality outliers.

5 of 376 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	401	PT5	C7-O13-P1-O11
3	A	401	PT5	C7-O13-P1-O1
3	A	401	PT5	C1-O1-P1-O12
3	A	401	PT5	C1-O1-P1-O13
3	E	1601	PT5	C1-O1-P1-O12

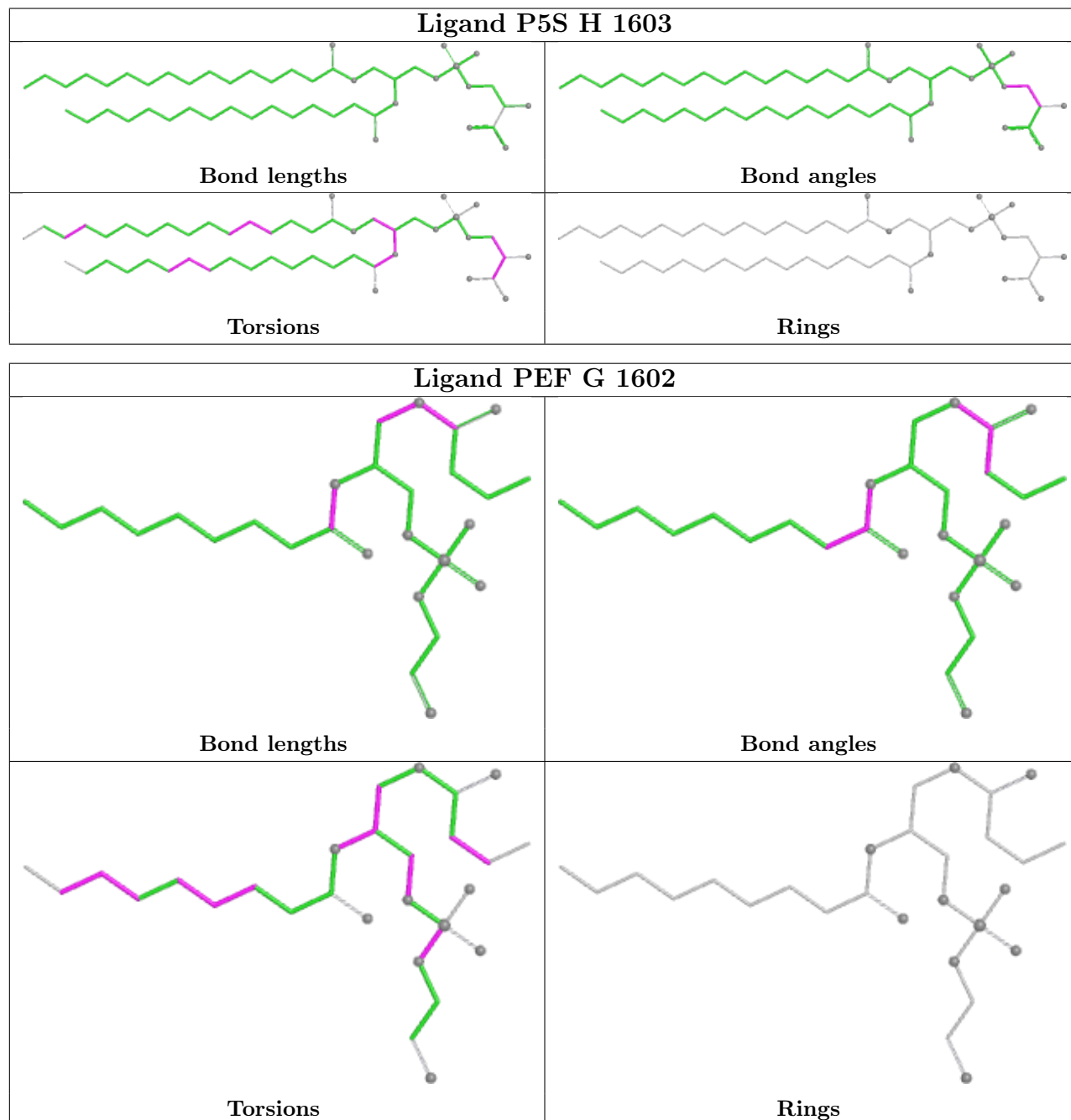
There are no ring outliers.

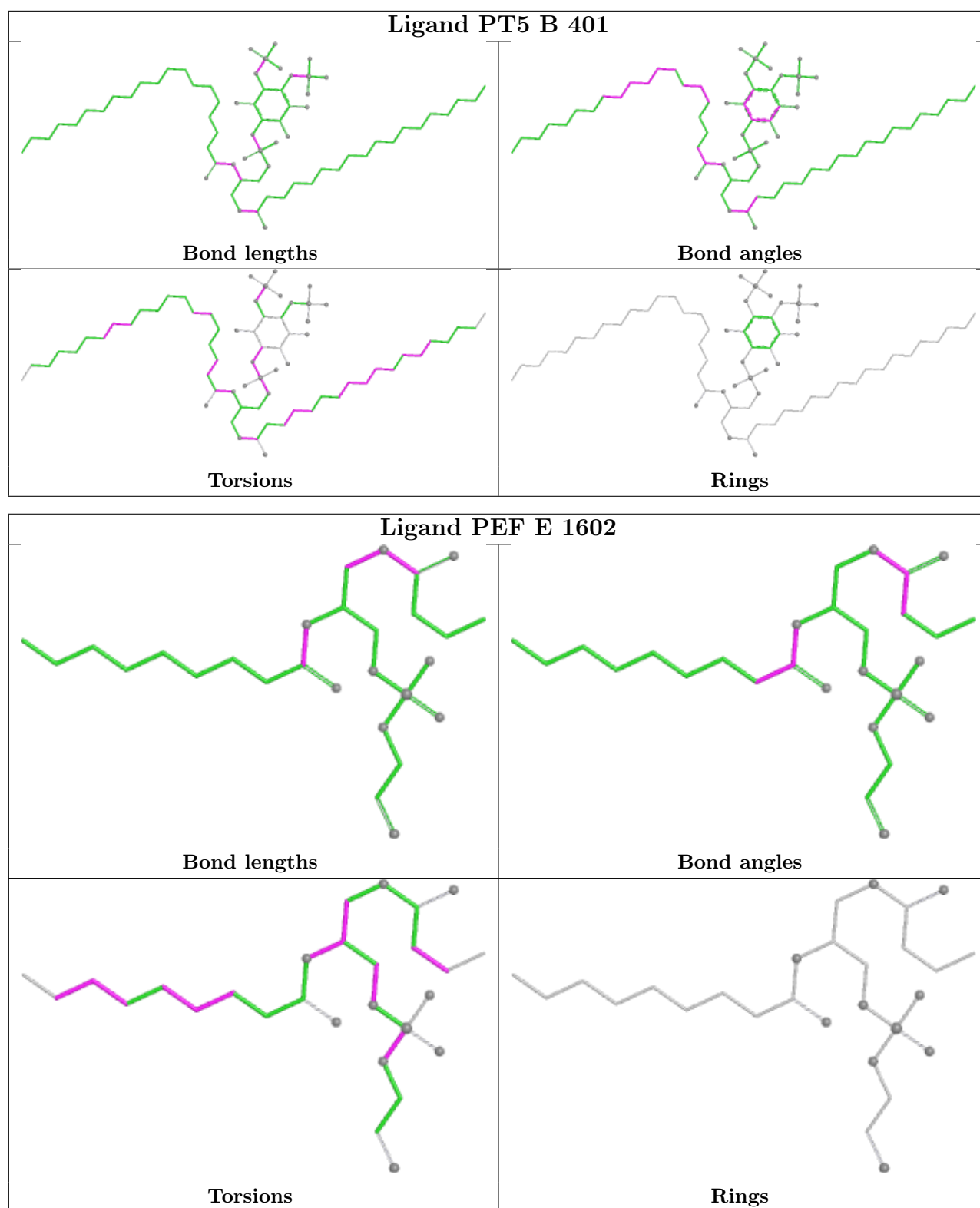
20 monomers are involved in 52 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	H	1603	P5S	2	0
5	G	1602	PEF	2	0
3	B	401	PT5	4	0
5	E	1602	PEF	1	0
3	A	401	PT5	4	0
6	F	1604	P5S	1	0
6	E	1603	P5S	2	0
6	G	1603	P5S	2	0
3	F	1601	PT5	7	0
6	E	1604	P5S	1	0
5	H	1602	PEF	1	0
3	D	401	PT5	4	0
3	C	401	PT5	4	0
3	E	1601	PT5	6	0
6	H	1604	P5S	1	0
6	G	1604	P5S	1	0
3	H	1601	PT5	7	0
5	F	1602	PEF	2	0
6	F	1603	P5S	2	0
3	G	1601	PT5	6	0

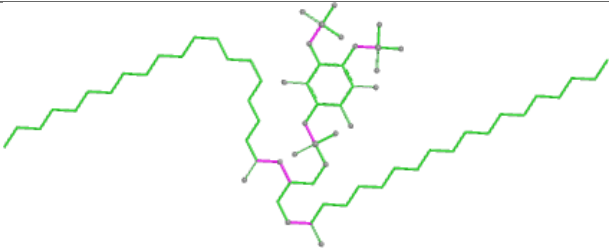
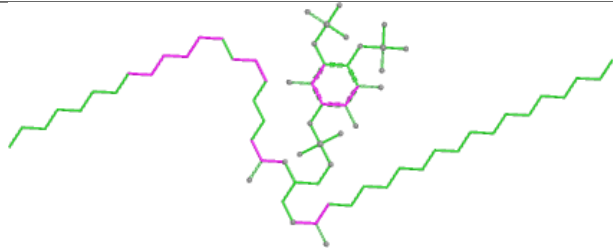
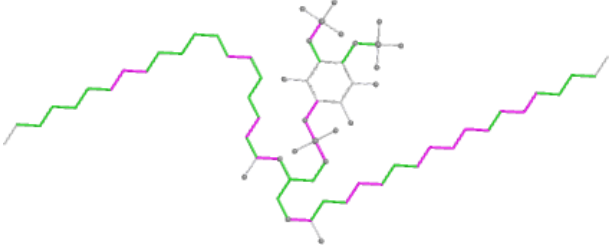
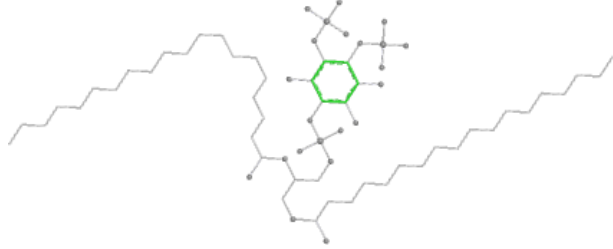
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In

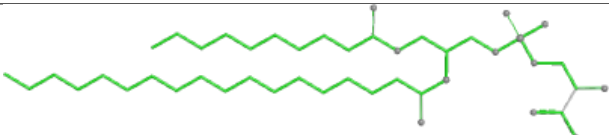
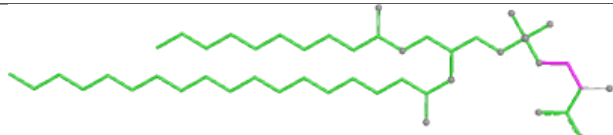
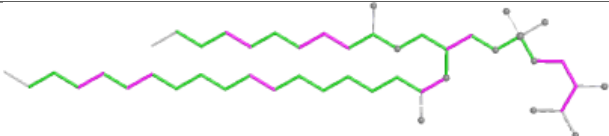
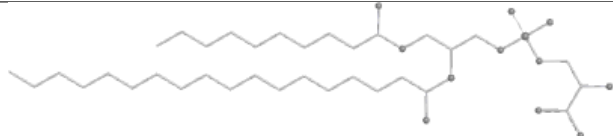
addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. 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.

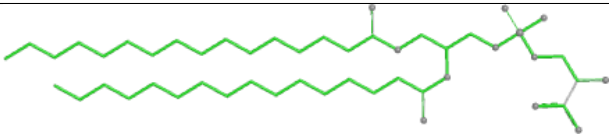
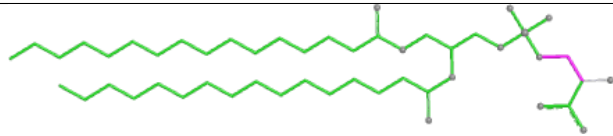
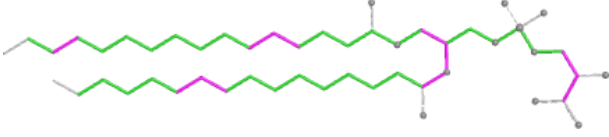
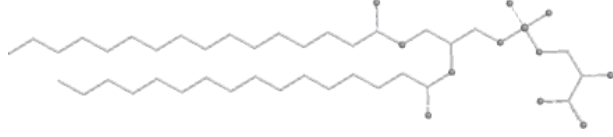


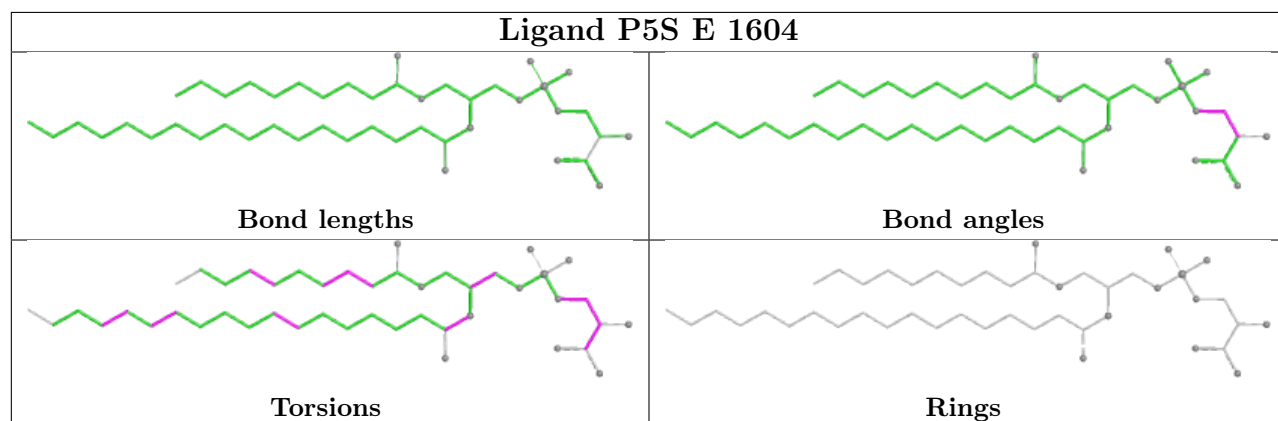
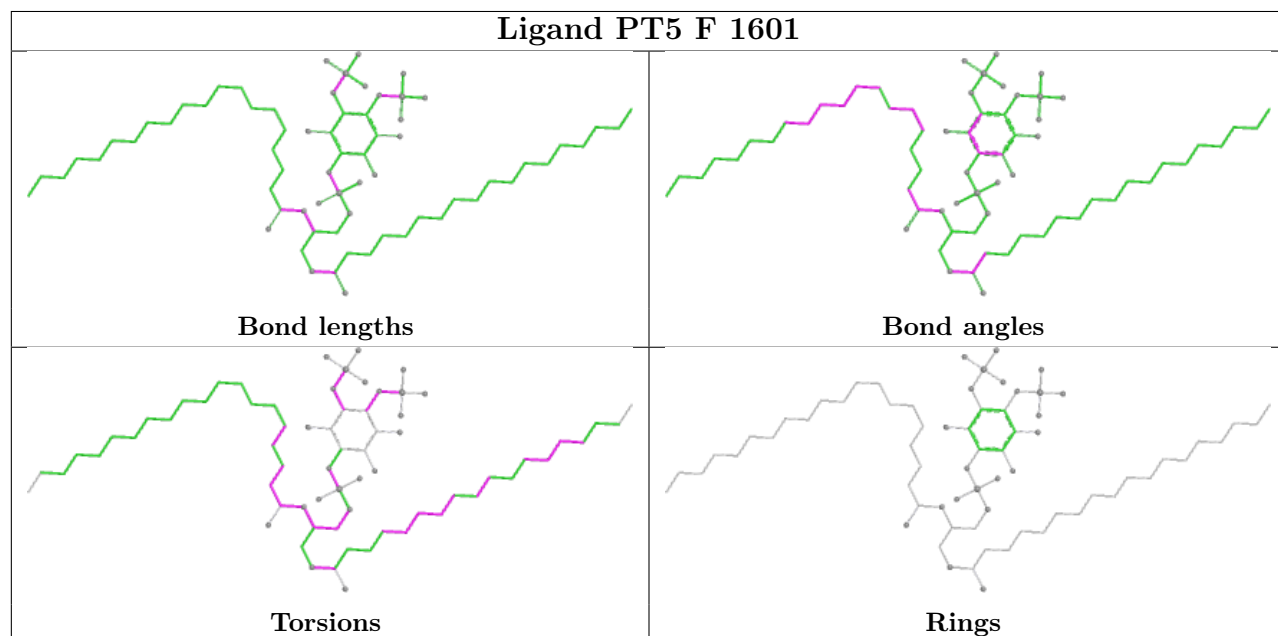
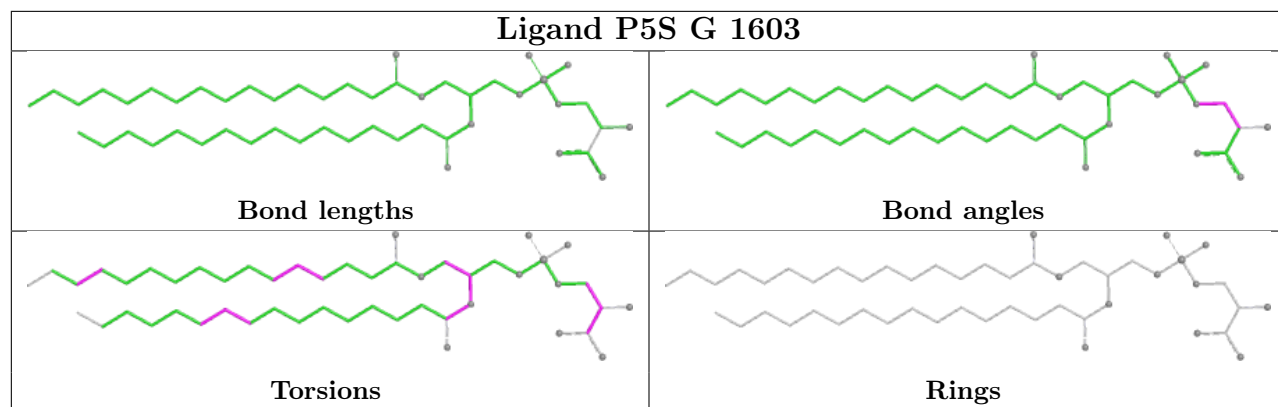


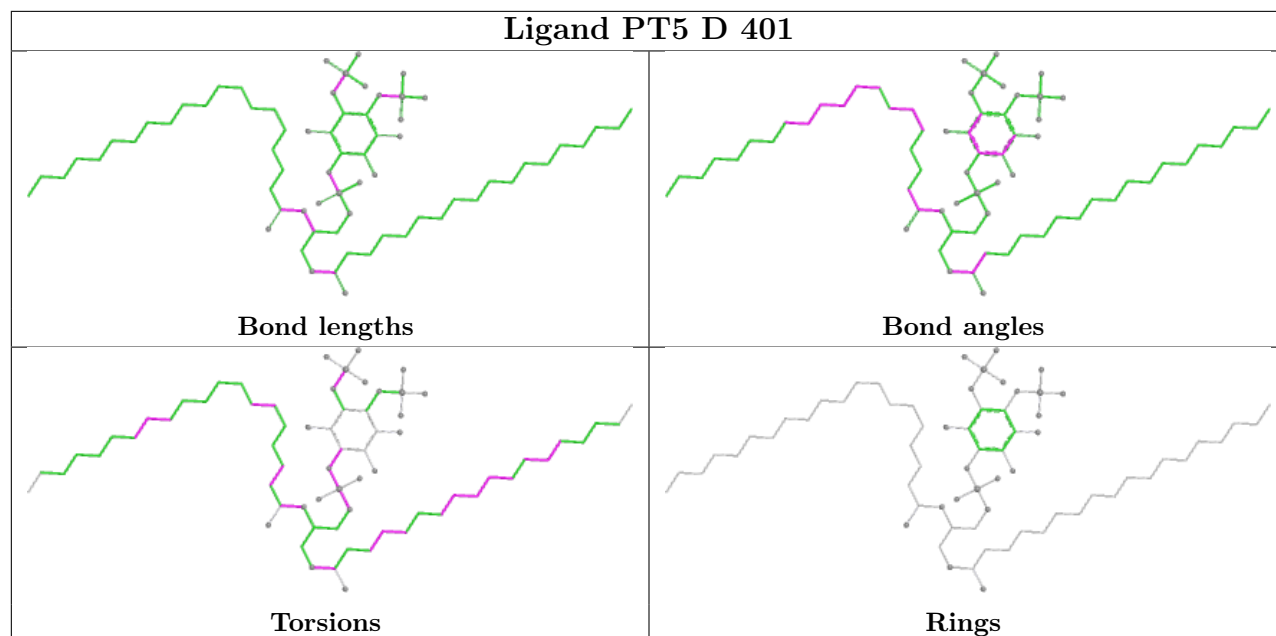
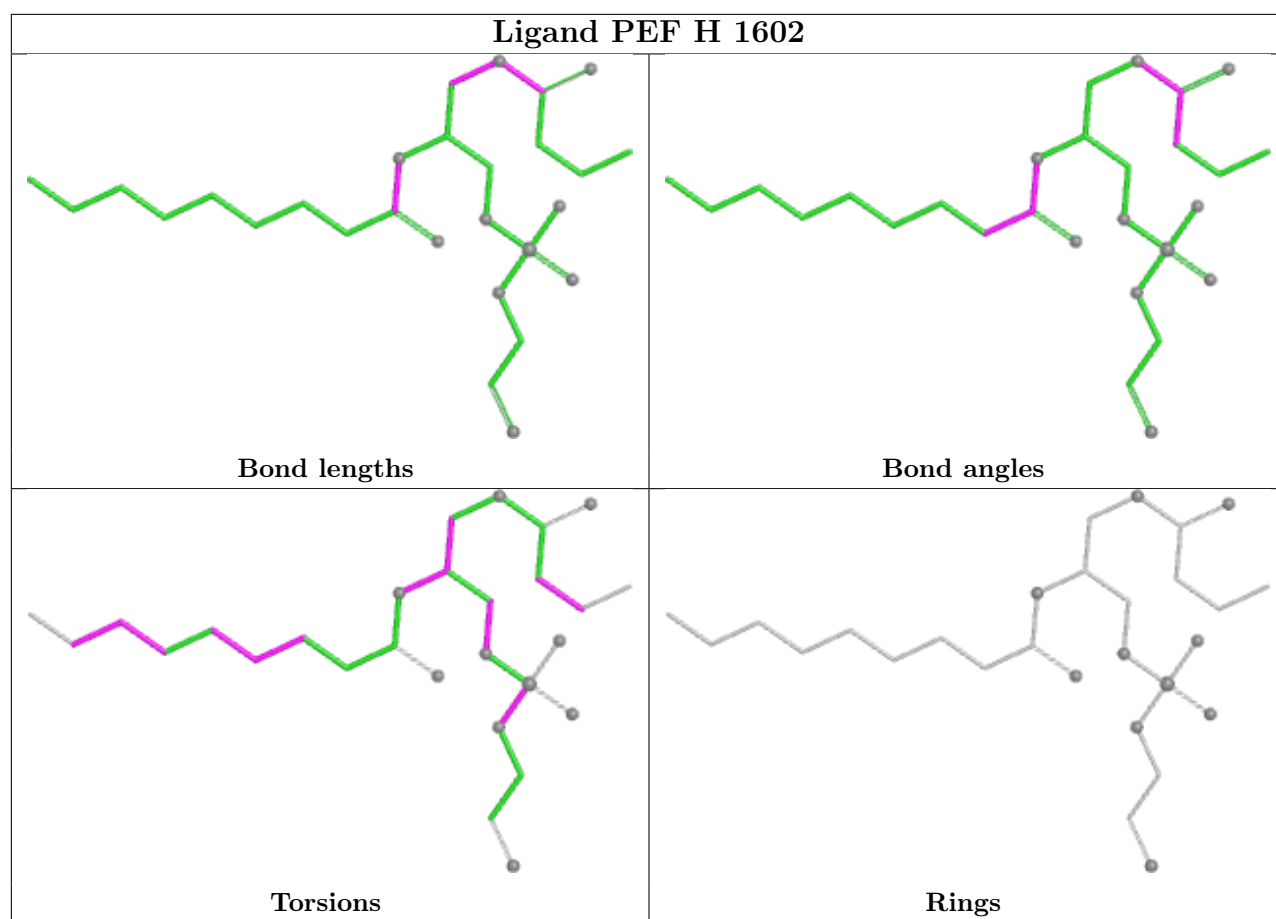


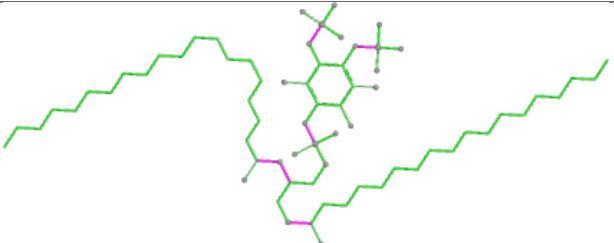
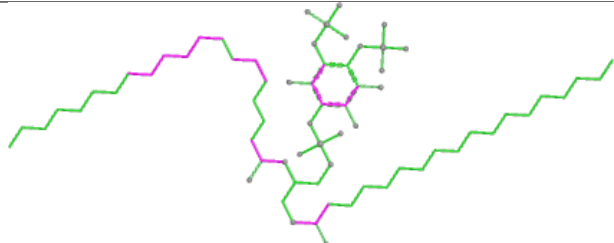
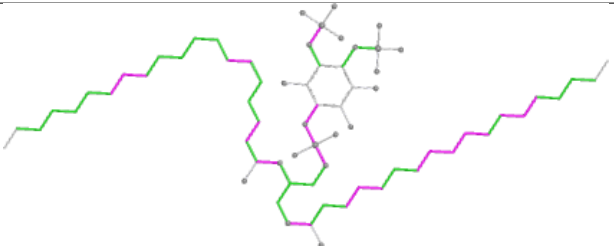
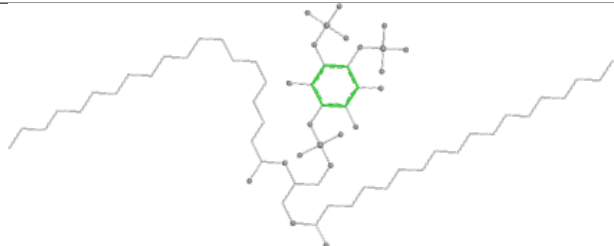
Ligand PT5 A 401	
	
Bond lengths	Bond angles
	
Torsions	Rings

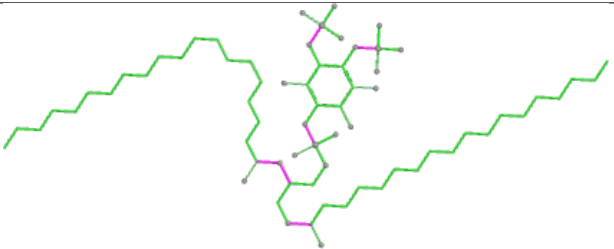
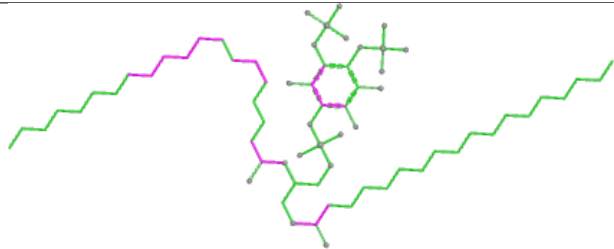
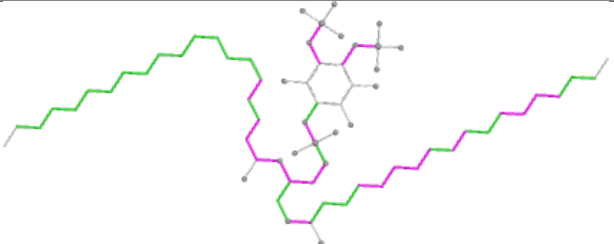
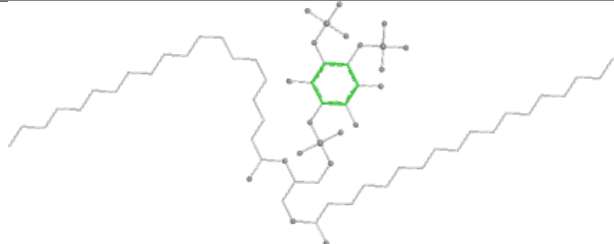
Ligand P5S F 1604	
	
Bond lengths	Bond angles
	
Torsions	Rings

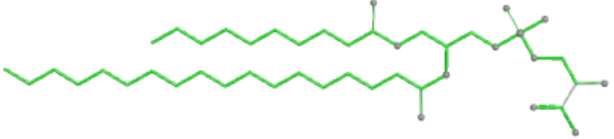
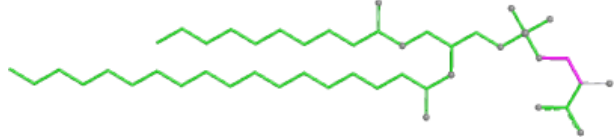
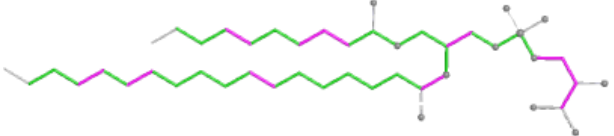
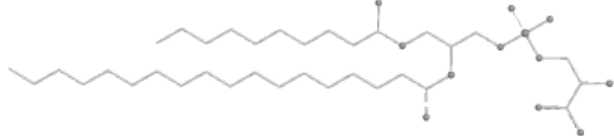
Ligand P5S E 1603	
	
Bond lengths	Bond angles
	
Torsions	Rings

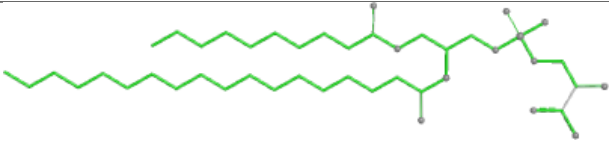
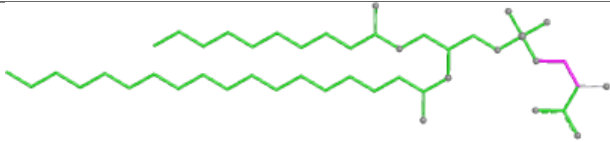
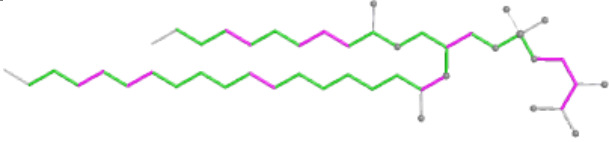
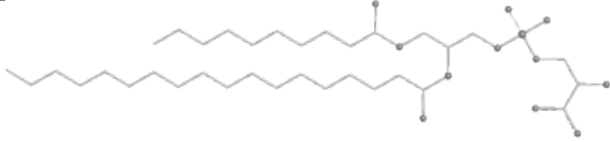


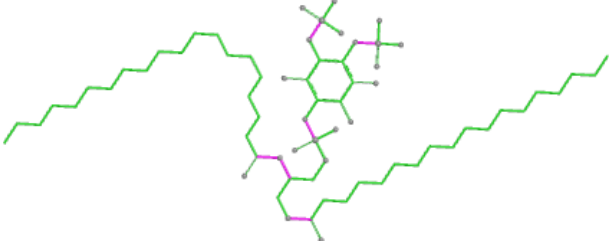
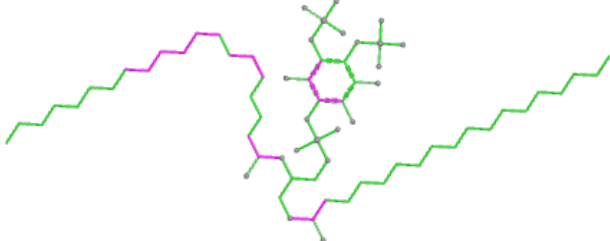
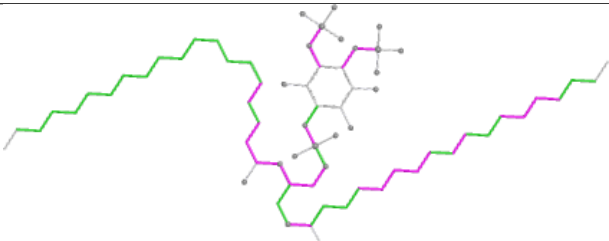
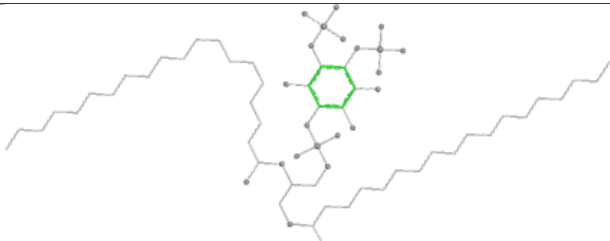


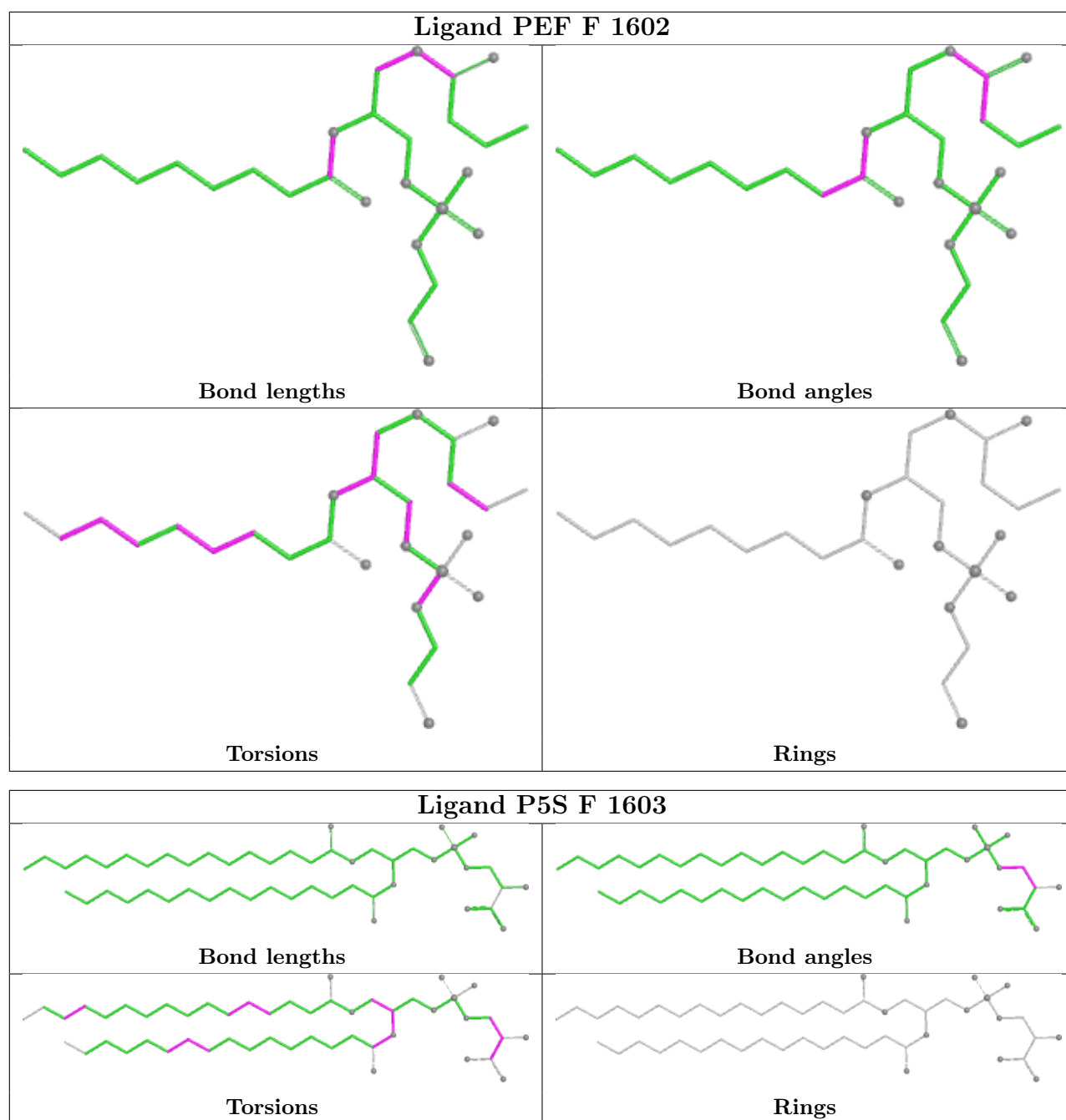
Ligand PT5 C 401	
	
Bond lengths	Bond angles
	
Torsions	Rings

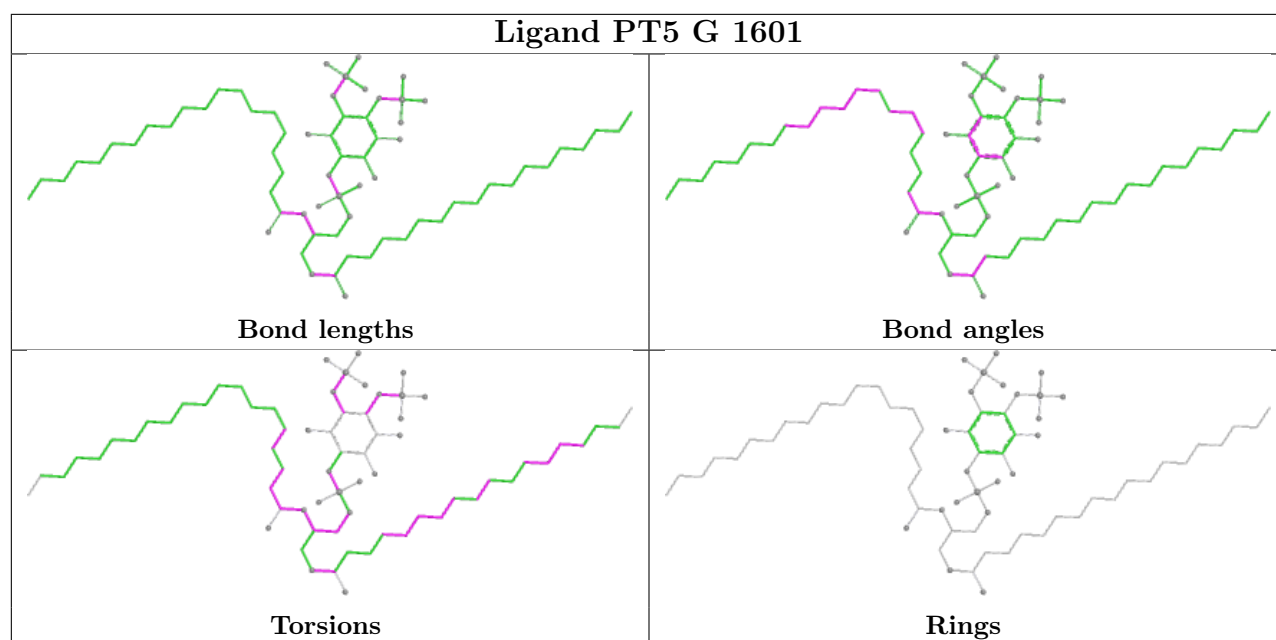
Ligand PT5 E 1601	
	
Bond lengths	Bond angles
	
Torsions	Rings

Ligand P5S H 1604	
	
Bond lengths	Bond angles
	
Torsions	Rings

Ligand P5S G 1604	
	
Bond lengths	Bond angles
	
Torsions	Rings

Ligand PT5 H 1601	
	
Bond lengths	Bond angles
	
Torsions	Rings





## 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.

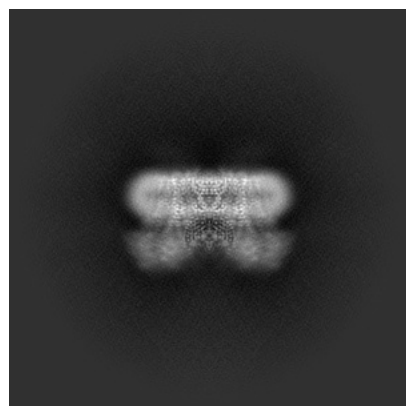
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41278. These allow visual inspection of the internal detail of the map and identification of artifacts.

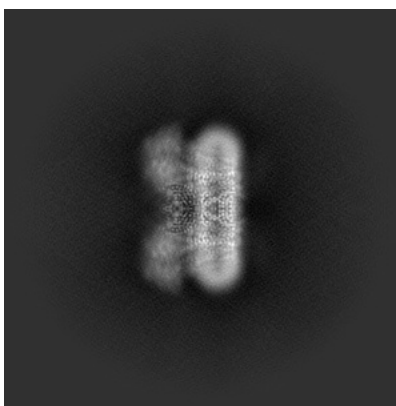
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

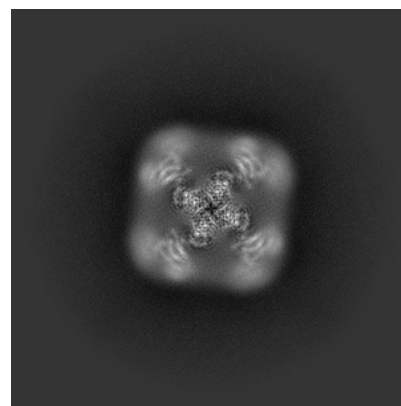
#### 6.1.1 Primary map



X

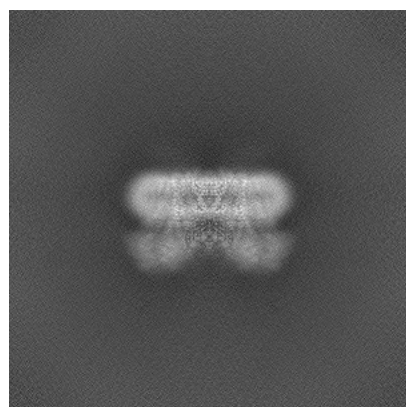


Y

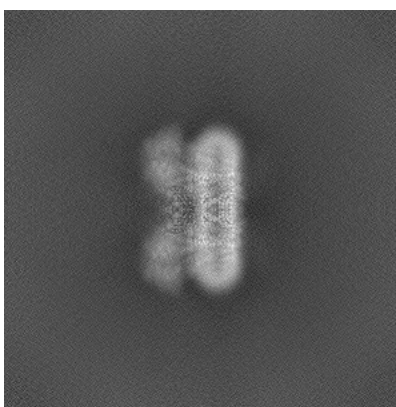


Z

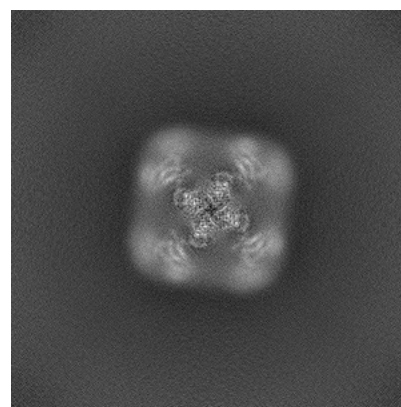
#### 6.1.2 Raw map



X



Y



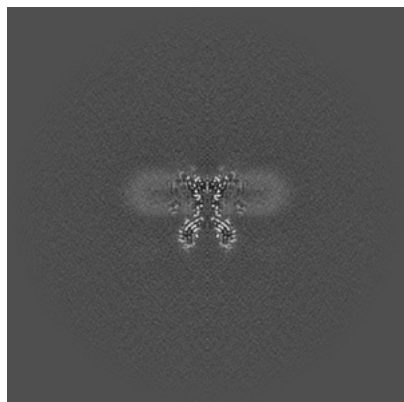
Z

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

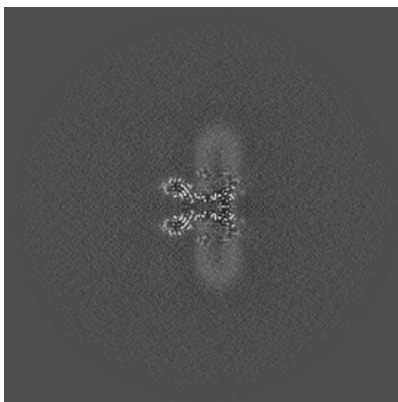


## 6.2 Central slices [i](#)

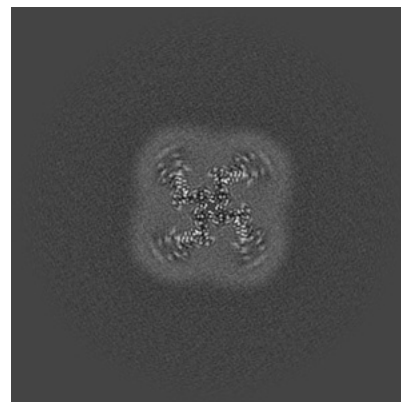
### 6.2.1 Primary map



X Index: 300

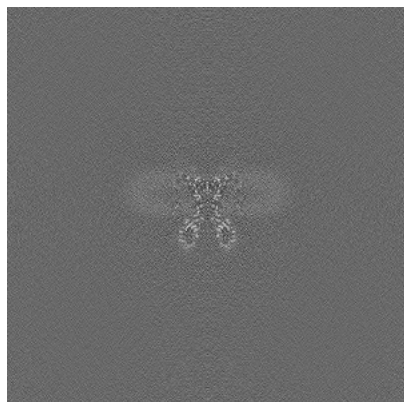


Y Index: 300

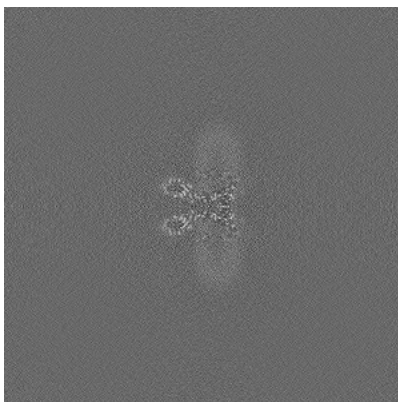


Z Index: 300

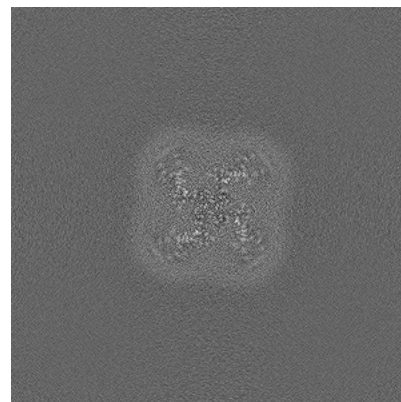
### 6.2.2 Raw map



X Index: 300



Y Index: 300

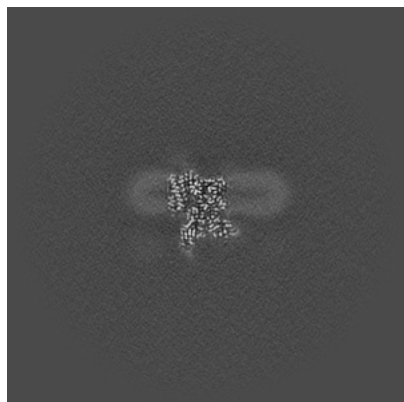


Z Index: 300

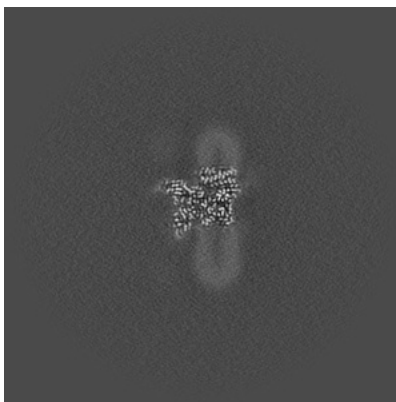
The images above show central slices of the map in three orthogonal directions.

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

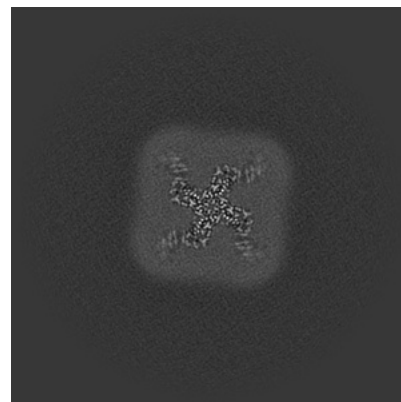
### 6.3.1 Primary map



X Index: 290

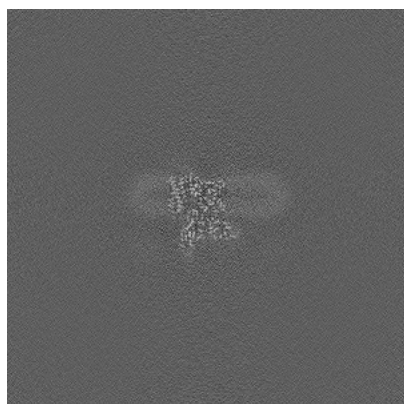


Y Index: 290

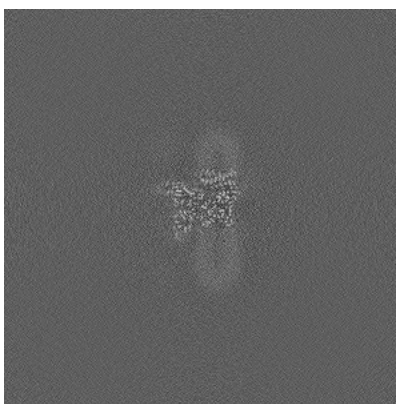


Z Index: 341

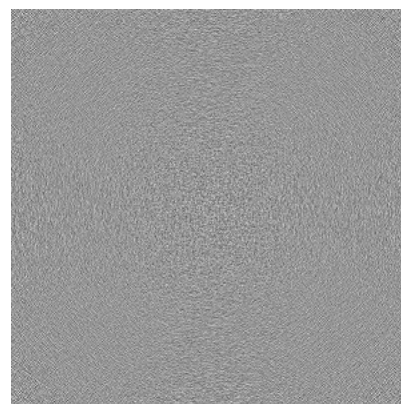
### 6.3.2 Raw map



X Index: 290



Y Index: 290

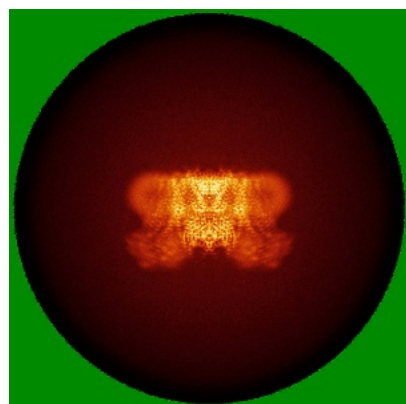


Z Index: 0

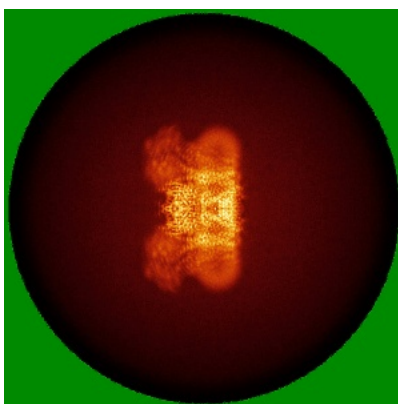
The images above show the largest variance slices of the map in three orthogonal directions.

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

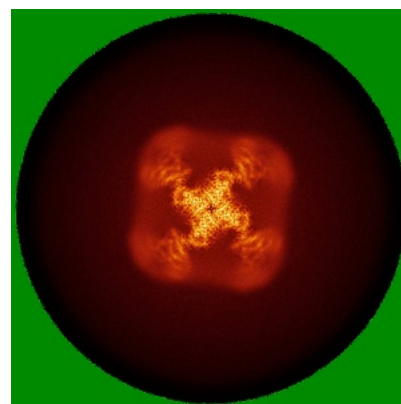
### 6.4.1 Primary map



X

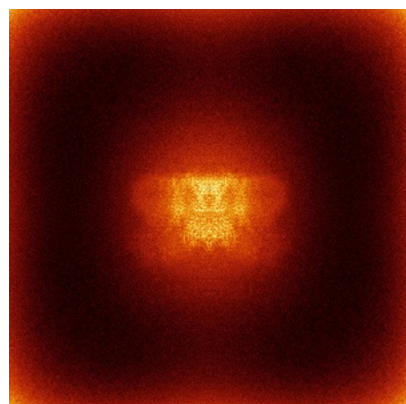


Y

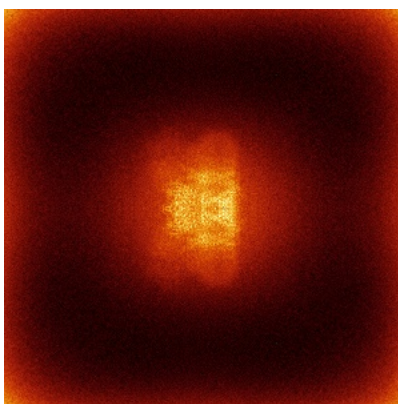


Z

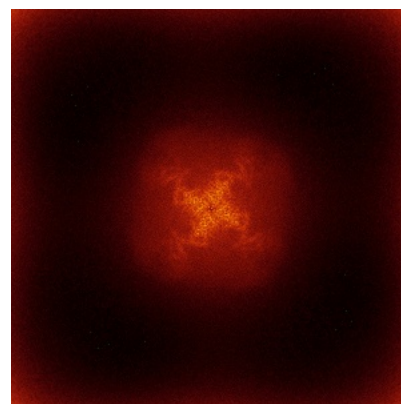
### 6.4.2 Raw map



X



Y



Z

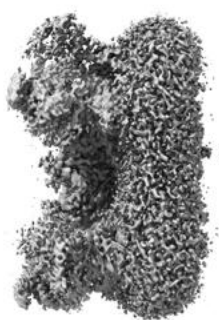
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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

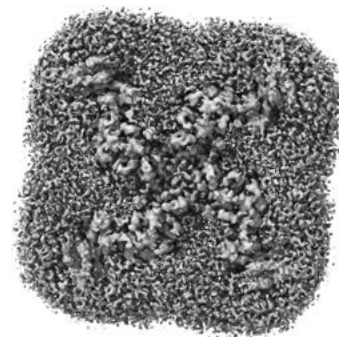
### 6.5.1 Primary map



X



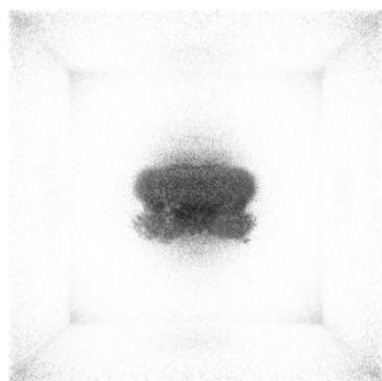
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.08. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

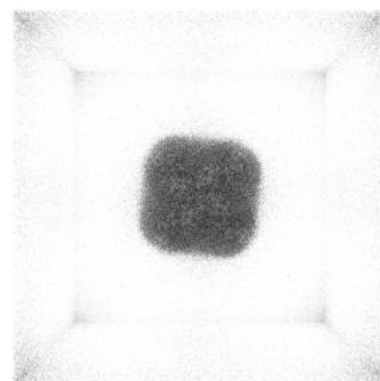
### 6.5.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.



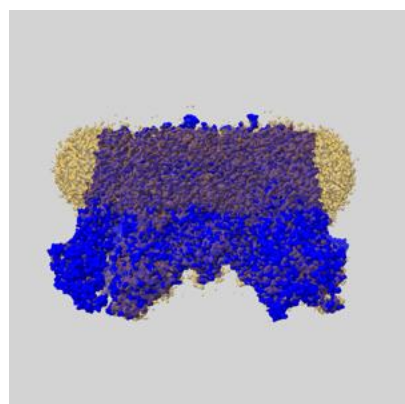
## 6.6 Mask visualisation [i](#)

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

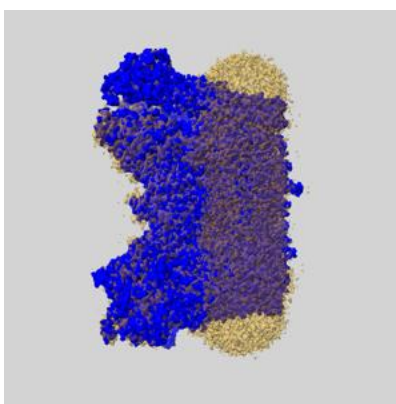
A mask typically either:

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

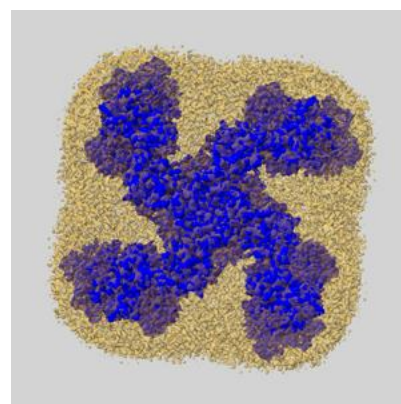
### 6.6.1 emd\_41278\_msk\_1.map [i](#)



X



Y

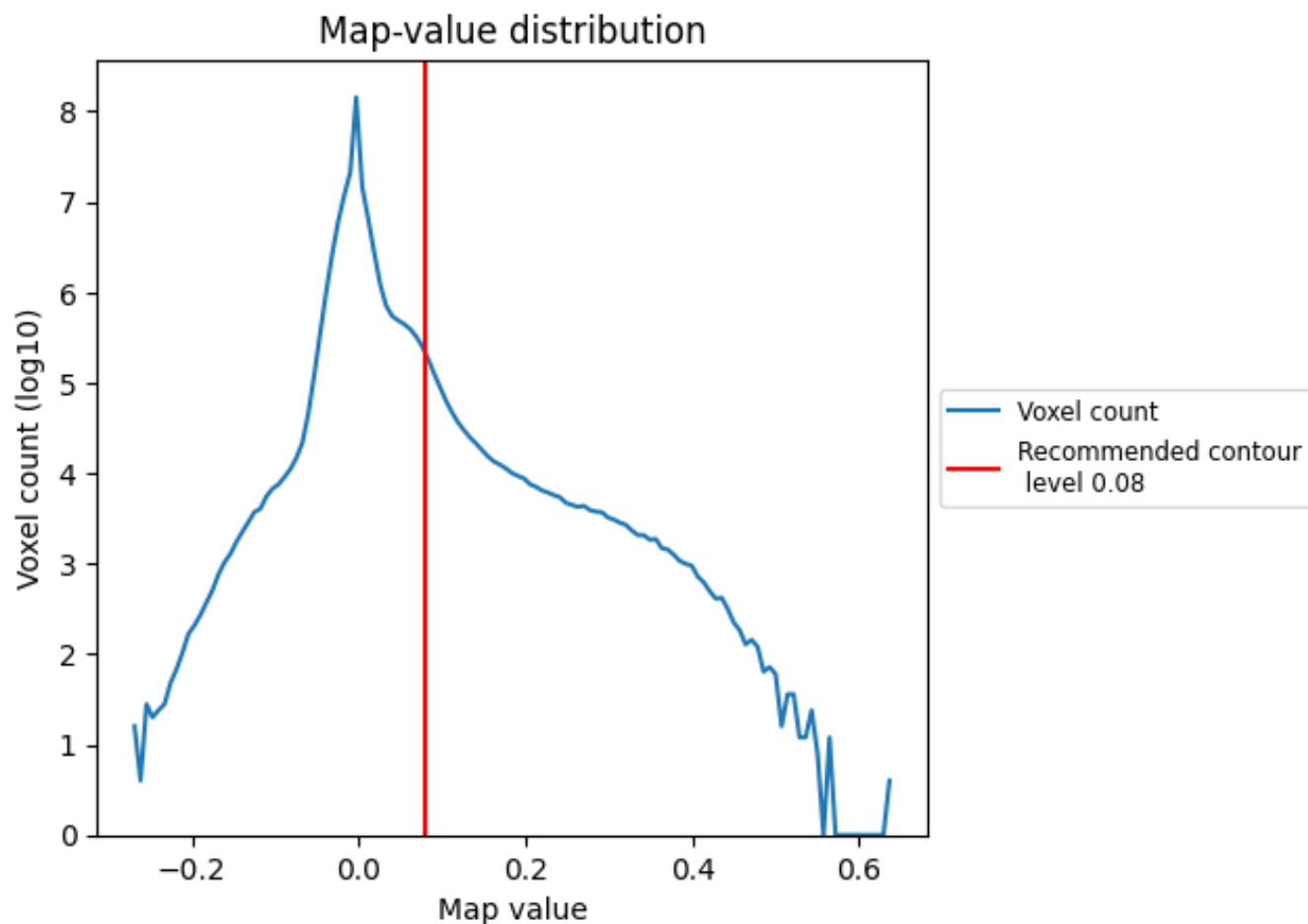


Z

## 7 Map analysis [i](#)

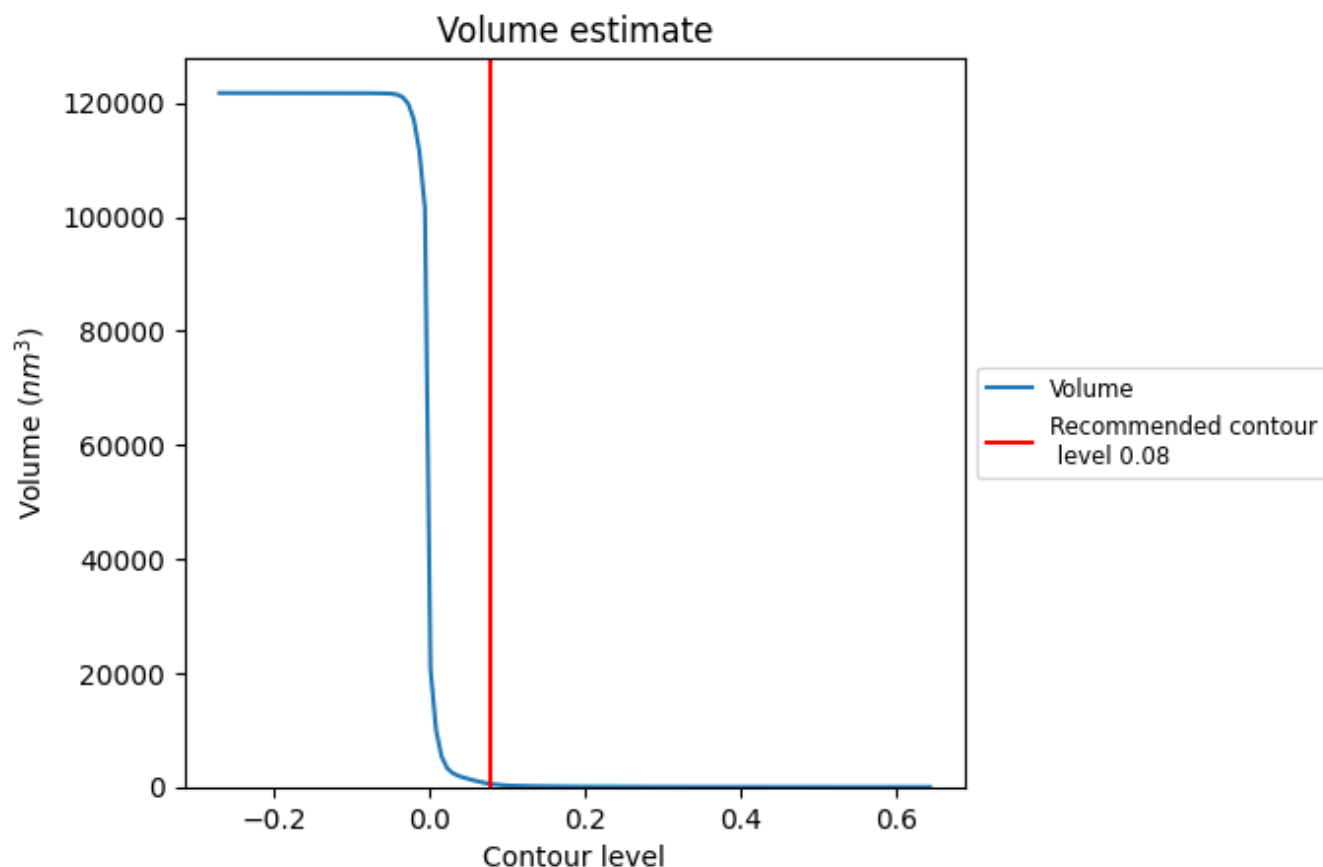
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

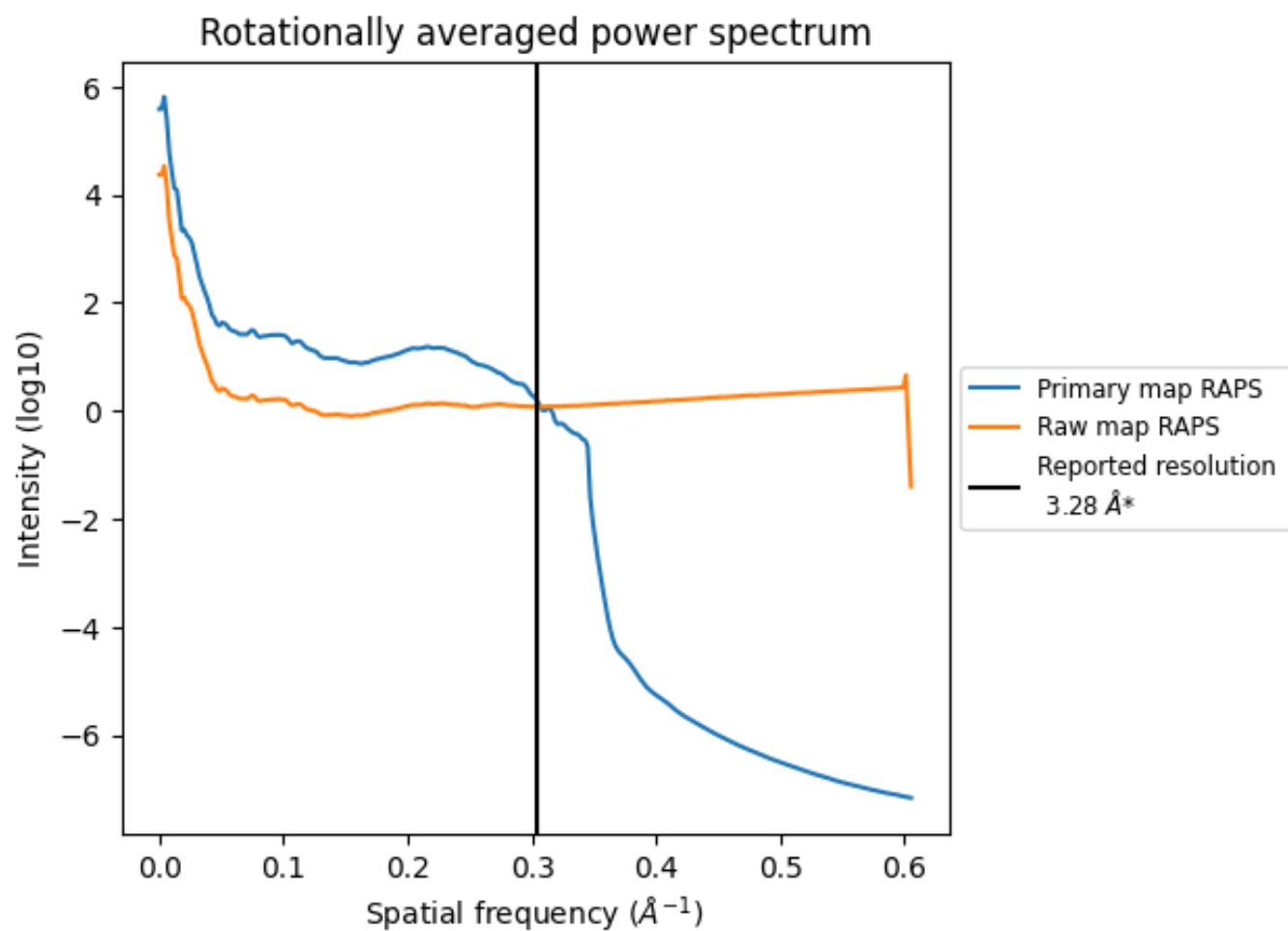
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 524  $\text{nm}^3$ ; this corresponds to an approximate mass of 473 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 ⓘ



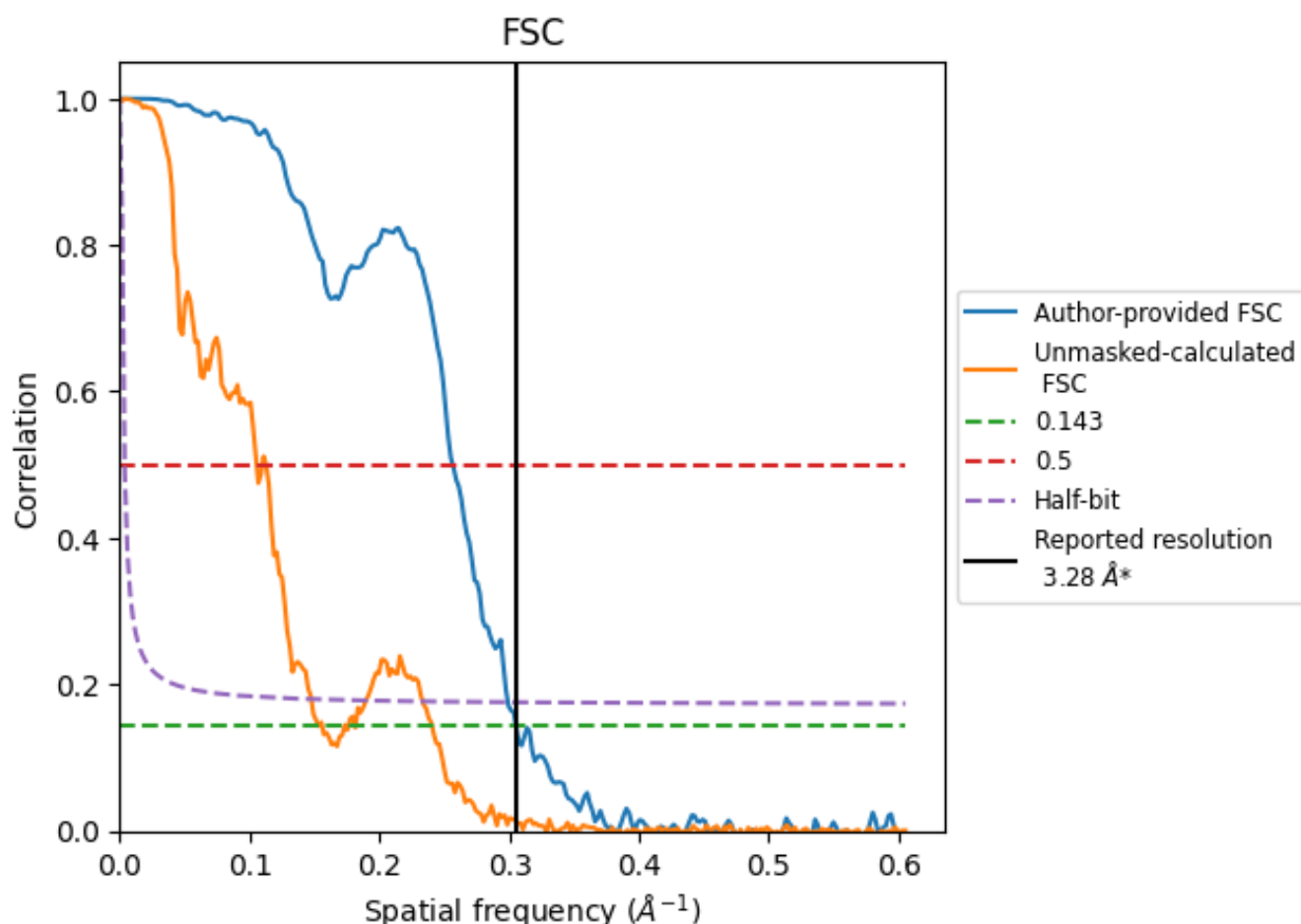
\*Reported resolution corresponds to spatial frequency of 0.305 Å<sup>-1</sup>



## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.305 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

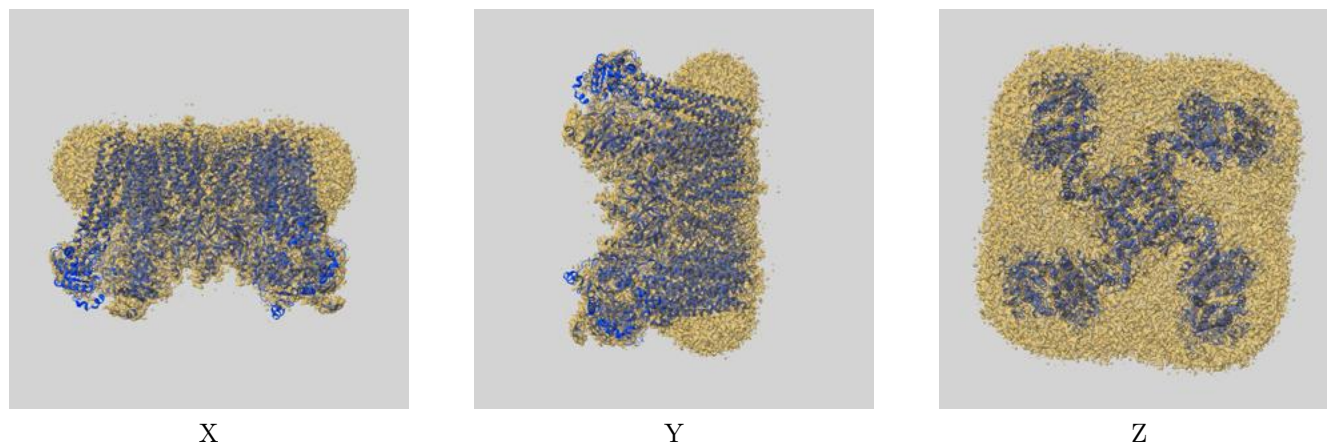
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.28	-	-
Author-provided FSC curve	3.28	3.90	3.34
Unmasked-calculated*	6.41	9.47	6.77

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.41 differs from the reported value 3.28 by more than 10 %

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

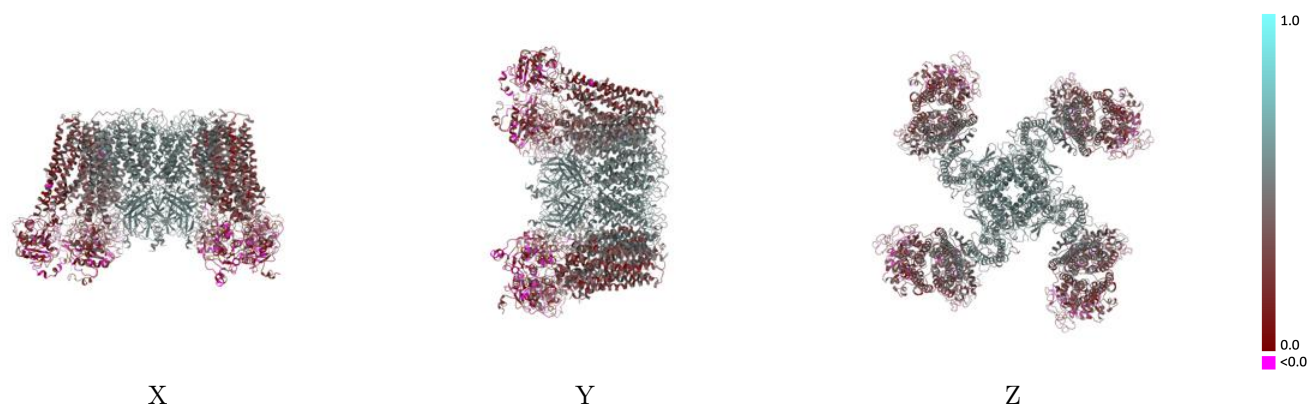
This section contains information regarding the fit between EMDB map EMD-41278 and PDB model 8TI2. Per-residue inclusion information can be found in section 3 on page 8.

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



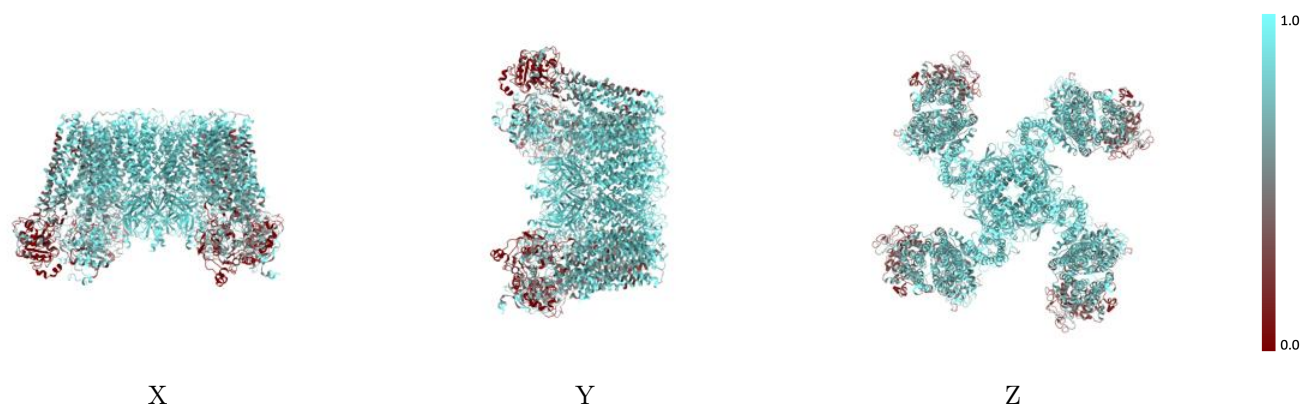
The images above show the 3D surface view of the map at the recommended contour level 0.08 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



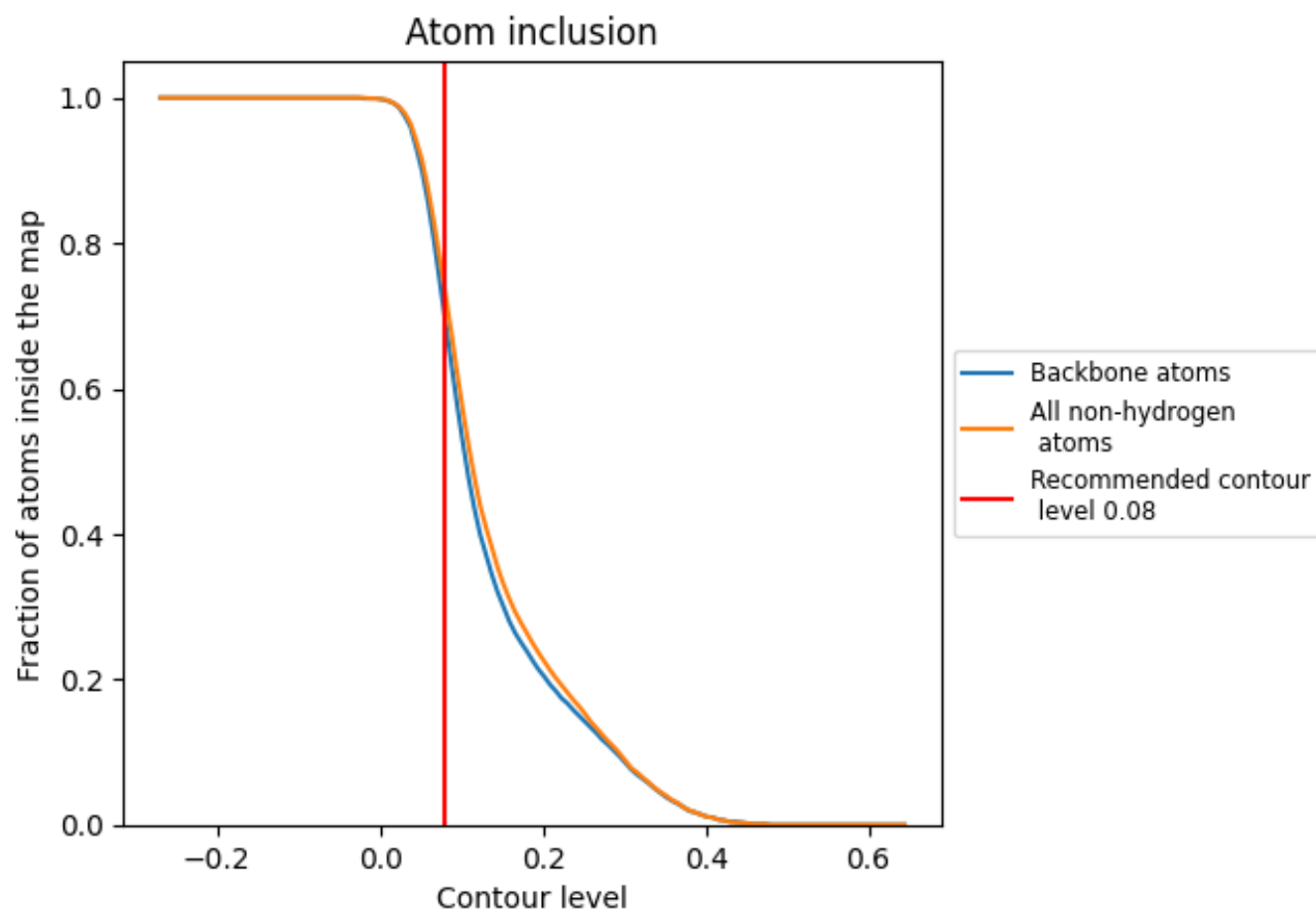
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.08).

## 9.4 Atom inclusion ⓘ



At the recommended contour level, 70% of all backbone atoms, 74% 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 (0.08) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.7350	<div></div> 0.3940
A	<div></div> 0.9290	<div></div> 0.5580
B	<div></div> 0.9280	<div></div> 0.5590
C	<div></div> 0.9280	<div></div> 0.5590
D	<div></div> 0.9270	<div></div> 0.5590
E	<div></div> 0.6900	<div></div> 0.3500
F	<div></div> 0.6890	<div></div> 0.3510
G	<div></div> 0.6900	<div></div> 0.3510
H	<div></div> 0.6900	<div></div> 0.3510

1.0

0.0

<0.0