



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 12, 2021 – 05:18 PM GMT

PDB ID : 6YYJ  
Title : Crystal structure of native Phycocyanin from *T. elongatus* in spacegroup P21212 at 2.1 Angstroms  
Authors : Feiler, C.G.; Falke, S.; Sarrou, I.  
Deposited on : 2020-05-05  
Resolution : 2.16 Å(reported)

This is a wwPDB X-ray Structure 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/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.16  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.16

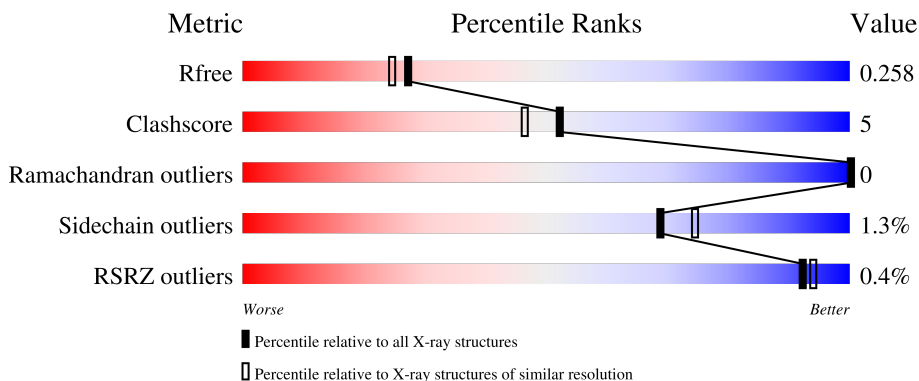
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*






The reported resolution of this entry is 2.16 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.



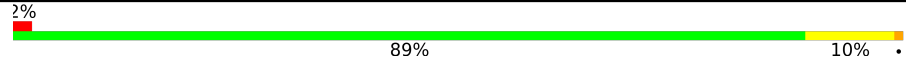
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1479 (2.16-2.16)
Clashscore	141614	1585 (2.16-2.16)
Ramachandran outliers	138981	1560 (2.16-2.16)
Sidechain outliers	138945	1559 (2.16-2.16)
RSRZ outliers	127900	1456 (2.16-2.16)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	162	 83% 16% .
1	C	162	 89% 10% .
1	E	162	 90% 10%
2	B	172	 89% 11%
2	D	172	 88% 11% .

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Mol	Chain	Length	Quality of chain
2	F	172	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a small red segment on the left labeled '2%', a large green segment in the middle labeled '89%', and a small yellow segment on the right labeled '10%'. A small black dot is visible at the far right end of the bar.</p>

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 15873 atoms, of which 7716 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 C-phycoerythrin alpha chain.

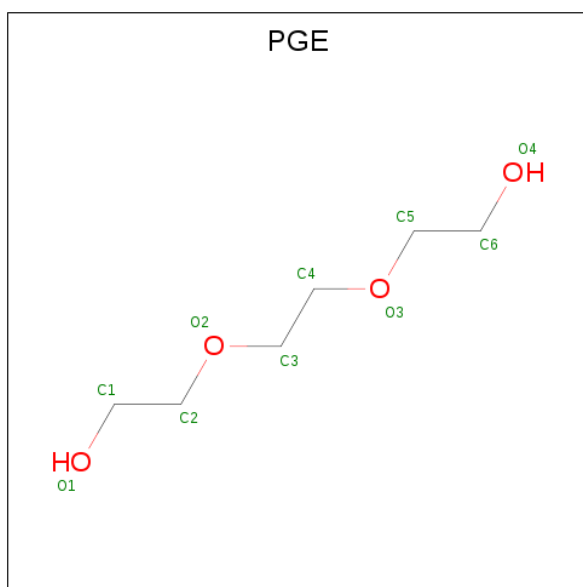
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	162	2452	776	1218	208	243	7	0	2	0
1	C	162	2396	771	1171	205	242	7	0	0	0
1	E	162	2448	776	1215	208	242	7	0	1	0

- Molecule 2 is a protein called C-phycoerythrin beta chain.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
2	B	172	2532	786	1264	225	249	8	0	0	0
2	D	172	2542	790	1268	225	251	8	0	1	0
2	F	172	2549	789	1275	228	249	8	0	0	0

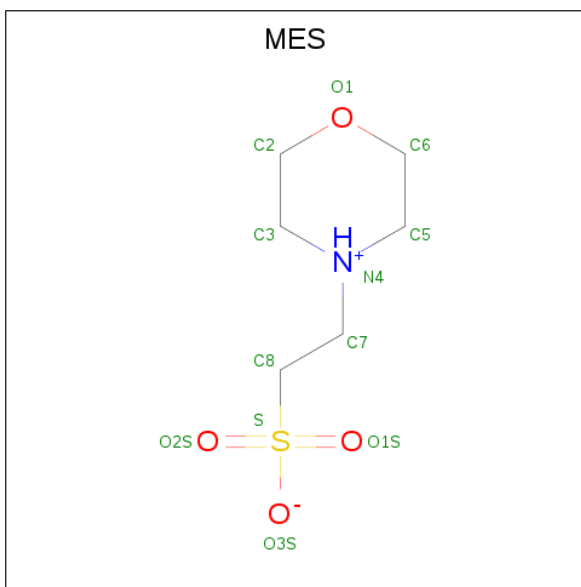
- Molecule 3 is 3-[5-[[[3 {R},4 {R}]-3-ethyl-4-methyl-5-oxidanylidene-3,4-dihydropyrrol-2-yl]methyl]-2-[[5-[( {Z} )-(4-ethyl-3-methyl-5-oxidanylidene-pyrrol-2-ylidene)methyl]-3-(3-hydroxy-3-oxopropyl)-4-methyl-1 {H}]-pyrrol-2-yl]methyl]-4-methyl-1 {H}-pyrrol-3-yl]propanoic acid (three-letter code: PXQ) (formula: C<sub>33</sub>H<sub>42</sub>N<sub>4</sub>O<sub>6</sub>).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	24	6	14	4	0	0
4	C	1	24	6	14	4	0	0
4	C	1	24	6	14	4	0	0
4	E	1	24	6	14	4	0	0
4	E	1	24	6	14	4	0	0

- Molecule 5 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	N	O	S			
5	B	1	Total	C	N	O	S	0	0	
			12	6	1	4	1			
5	C	1	Total	C	N	O	S	0	0	
			12	6	1	4	1			
5	D	1	Total	C	N	O	S	0	0	
			12	6	1	4	1			
5	E	1	Total	C	H	N	O	S	0	0
			25	6	13	1	4	1		


- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	24	Total	O	0	0
			24	24		
6	B	29	Total	O	0	0
			29	29		
6	C	30	Total	O	0	0
			30	30		
6	D	33	Total	O	0	0
			33	33		
6	E	37	Total	O	0	0
			37	37		
6	F	11	Total	O	0	0
			11	11		

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


These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron 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 dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). 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: C-phycoerythrin alpha chain

Chain A:  83% 16%




- Molecule 1: C-phycoerythrin alpha chain

Chain C:  89% 10%




- Molecule 1: C-phycoerythrin alpha chain

Chain E:  90% 10%




- Molecule 2: C-phycoerythrin beta chain

Chain B:  89% 11% 2%




- Molecule 2: C-phycoerythrin beta chain

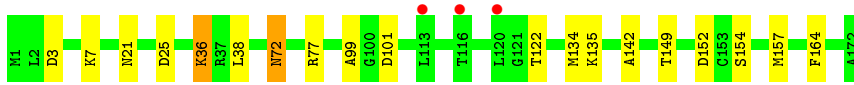
Chain D:  88% 11%



- Molecule 2: C-phycoerythrin beta chain

Chain F:  89% 10% 2%





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	118.36Å 98.23Å 104.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.84 – 2.16 47.84 – 2.16	Depositor EDS
% Data completeness (in resolution range)	99.5 (47.84-2.16) 99.5 (47.84-2.16)	Depositor EDS
$R_{merge}$	0.23	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.06 (at 2.16Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.204 , 0.258 0.204 , 0.258	Depositor DCC
$R_{free}$ test set	2101 reflections (3.18%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	38.6	Xtrriage
Anisotropy	0.245	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.41 , 43.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	15873	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	49.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.51% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 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: PXQ, PGE, MEN, MES

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	0.64	1/1264 (0.1%)	0.82	5/1713 (0.3%)
1	C	0.61	0/1247	0.68	0/1691
1	E	0.57	0/1258	0.72	1/1705 (0.1%)
2	B	0.57	0/1272	0.71	0/1722
2	D	0.65	2/1281 (0.2%)	0.87	3/1734 (0.2%)
2	F	0.53	0/1278	0.68	1/1729 (0.1%)
All	All	0.60	3/7600 (0.0%)	0.75	10/10294 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	32	LYS	CE-NZ	-8.18	1.28	1.49
1	A	76	SER	C-O	-7.57	1.08	1.23
2	D	32	LYS	CB-CG	-5.05	1.39	1.52

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
2	D	32	LYS	CD-CE-NZ	-16.40	73.98	111.70
2	D	32	LYS	CG-CD-CE	-9.12	84.55	111.90
1	A	76	SER	O-C-N	-7.97	109.95	122.70
1	A	76	SER	C-N-CA	-7.78	102.26	121.70
1	A	30	ARG	NE-CZ-NH2	-7.70	116.45	120.30

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	1234	1218	1216	20	0
1	C	1225	1171	1202	21	0
1	E	1233	1215	1215	12	0
2	B	1268	1264	1264	15	0
2	D	1274	1268	1267	15	0
2	F	1274	1275	1275	13	0
3	A	43	0	0	0	0
3	B	86	74	0	1	0
3	C	43	37	0	1	0
3	D	86	37	0	1	0
3	E	43	0	0	0	0
3	F	86	74	0	3	0
4	A	10	14	14	2	0
4	C	20	28	28	7	0
4	E	20	28	28	0	0
5	B	12	0	12	2	0
5	C	12	0	12	1	0
5	D	12	0	12	5	0
5	E	12	13	12	1	0
6	A	24	0	0	1	0
6	B	29	0	0	0	0
6	C	30	0	0	0	0
6	D	33	0	0	1	0
6	E	37	0	0	1	0
6	F	11	0	0	0	0
All	All	8157	7716	7557	85	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 5.

The worst 5 of 85 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:107:MET:HE2	1:A:112:ILE:HD11	1.48	0.94
1:C:38:MET:CE	1:C:100:VAL:HG22	2.10	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:128:ALA:O	2:D:132:GLN:HG2	1.86	0.74
1:C:81:LYS:HD2	4:C:202:PGE:H6	1.74	0.68
1:C:159:ASN:HB3	4:C:204:PGE:H4	1.79	0.64

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 X-ray entries followed by that with respect to entries of similar resolution.

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	162/162 (100%)	156 (96%)	6 (4%)	0	100	100
1	C	160/162 (99%)	156 (98%)	4 (2%)	0	100	100
1	E	161/162 (99%)	157 (98%)	4 (2%)	0	100	100
2	B	169/172 (98%)	164 (97%)	5 (3%)	0	100	100
2	D	170/172 (99%)	167 (98%)	3 (2%)	0	100	100
2	F	169/172 (98%)	164 (97%)	5 (3%)	0	100	100
All	All	991/1002 (99%)	964 (97%)	27 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 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 X-ray entries followed by that with respect to entries of similar resolution.

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	125/123 (102%)	124 (99%)	1 (1%)	81	86
1	C	123/123 (100%)	120 (98%)	3 (2%)	49	51
1	E	124/123 (101%)	121 (98%)	3 (2%)	49	51
2	B	126/127 (99%)	126 (100%)	0	100	100
2	D	127/127 (100%)	126 (99%)	1 (1%)	81	86
2	F	127/127 (100%)	125 (98%)	2 (2%)	62	67
All	All	752/750 (100%)	742 (99%)	10 (1%)	69	74

5 of 10 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	28	SER
1	E	57	GLN
1	E	117	GLU
1	C	125	SER
1	E	69	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	29	ASN
1	E	49	GLN
1	C	46	ASN
1	A	46	ASN
2	B	132	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

3 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the

expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	MEN	D	72	2	7,8,9	0.97	0	6,9,11	1.53	1 (16%)
2	MEN	F	72	2	7,8,9	1.14	1 (14%)	6,9,11	1.48	1 (16%)
2	MEN	B	72	2	7,8,9	0.86	0	6,9,11	1.95	2 (33%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MEN	D	72	2	-	3/7/8/10	-
2	MEN	F	72	2	-	5/7/8/10	-
2	MEN	B	72	2	-	2/7/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	72	MEN	OD1-CG	2.11	1.27	1.23

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	72	MEN	CB-CA-C	-3.63	104.67	111.47
2	F	72	MEN	CB-CA-C	-3.12	105.61	111.47
2	D	72	MEN	CB-CG-ND2	2.91	119.39	115.48
2	B	72	MEN	CB-CG-ND2	2.51	118.86	115.48

There are no chirality outliers.

5 of 10 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	72	MEN	O-C-CA-CB
2	F	72	MEN	C-CA-CB-CG
2	F	72	MEN	N-CA-CB-CG
2	F	72	MEN	CA-CB-CG-OD1
2	F	72	MEN	CA-CB-CG-ND2

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	72	MEN	2	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

18 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	PGE	E	202	-	9,9,9	0.45	0	8,8,8	0.43	0
3	PXQ	F	501	2	32,46,46	7.71	14 (43%)	34,67,67	2.12	8 (23%)
4	PGE	C	202	-	9,9,9	0.32	0	8,8,8	0.41	0
3	PXQ	F	500	2	32,46,46	7.77	14 (43%)	34,67,67	2.65	9 (26%)
4	PGE	A	202	-	9,9,9	0.35	0	8,8,8	0.36	0
5	MES	D	203	-	12,12,12	1.93	1 (8%)	14,16,16	2.34	7 (50%)
4	PGE	E	203	-	9,9,9	0.45	0	8,8,8	0.34	0
5	MES	C	203	-	12,12,12	2.30	1 (8%)	14,16,16	2.01	4 (28%)
5	MES	E	204	-	12,12,12	2.17	1 (8%)	14,16,16	2.02	5 (35%)
3	PXQ	A	201	1	32,46,46	7.79	14 (43%)	34,67,67	2.27	9 (26%)
3	PXQ	D	202	2	32,46,46	7.97	12 (37%)	34,67,67	2.16	8 (23%)
3	PXQ	D	201	2	32,46,46	7.36	13 (40%)	34,67,67	1.85	10 (29%)
3	PXQ	B	202	2	32,46,46	7.45	12 (37%)	34,67,67	2.17	9 (26%)
3	PXQ	C	201	1	32,46,46	7.64	13 (40%)	34,67,67	2.03	9 (26%)
3	PXQ	E	201	1	32,46,46	7.76	14 (43%)	34,67,67	2.20	7 (20%)
3	PXQ	B	201	2	32,46,46	7.70	14 (43%)	34,67,67	2.11	10 (29%)
4	PGE	C	204	-	9,9,9	0.33	0	8,8,8	0.75	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	MES	B	203	-	12,12,12	2.33	1 (8%)	14,16,16	2.00	5 (35%)

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
4	PGE	E	202	-	-	4/7/7/7	-
3	PXQ	F	501	2	-	4/19/58/58	0/4/4/4
4	PGE	C	202	-	-	4/7/7/7	-
3	PXQ	F	500	2	-	6/19/58/58	0/4/4/4
4	PGE	A	202	-	-	3/7/7/7	-
5	MES	D	203	-	-	4/6/14/14	0/1/1/1
4	PGE	E	203	-	-	2/7/7/7	-
5	MES	C	203	-	-	4/6/14/14	0/1/1/1
5	MES	E	204	-	-	1/6/14/14	0/1/1/1
3	PXQ	A	201	1	-	8/19/58/58	0/4/4/4
3	PXQ	D	202	2	-	4/19/58/58	0/4/4/4
3	PXQ	D	201	2	-	8/19/58/58	0/4/4/4
3	PXQ	B	202	2	-	4/19/58/58	0/4/4/4
3	PXQ	C	201	1	-	9/19/58/58	0/4/4/4
3	PXQ	E	201	1	-	7/19/58/58	0/4/4/4
3	PXQ	B	201	2	-	8/19/58/58	0/4/4/4
4	PGE	C	204	-	-	3/7/7/7	-
5	MES	B	203	-	-	2/6/14/14	0/1/1/1

The worst 5 of 124 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	202	PXQ	C4C-NC	31.02	1.53	1.29
3	F	501	PXQ	C4C-NC	30.82	1.53	1.29
3	A	201	PXQ	C4C-NC	30.40	1.52	1.29
3	E	201	PXQ	C4C-NC	29.84	1.52	1.29
3	C	201	PXQ	C4C-NC	29.19	1.51	1.29

The worst 5 of 100 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
3	A	201	PXQ	CAD-C3D-C4D	-9.83	120.39	127.30
3	F	500	PXQ	CAD-C3D-C4D	-9.43	120.67	127.30
3	B	202	PXQ	CAD-C3D-C4D	-8.38	121.41	127.30
3	F	501	PXQ	CAD-C3D-C4D	-7.68	121.90	127.30
3	E	201	PXQ	CAA-C2A-C1A	-6.78	122.53	127.30

There are no chirality outliers.

5 of 85 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	501	PXQ	C2A-C1A-CHA-C4D
3	F	501	PXQ	C3D-C4D-CHA-C1A
3	F	501	PXQ	NA-C4A-CHB-C1B
3	F	501	PXQ	C2D-C1D-CHD-C4C
3	F	500	PXQ	C2A-C1A-CHA-C4D

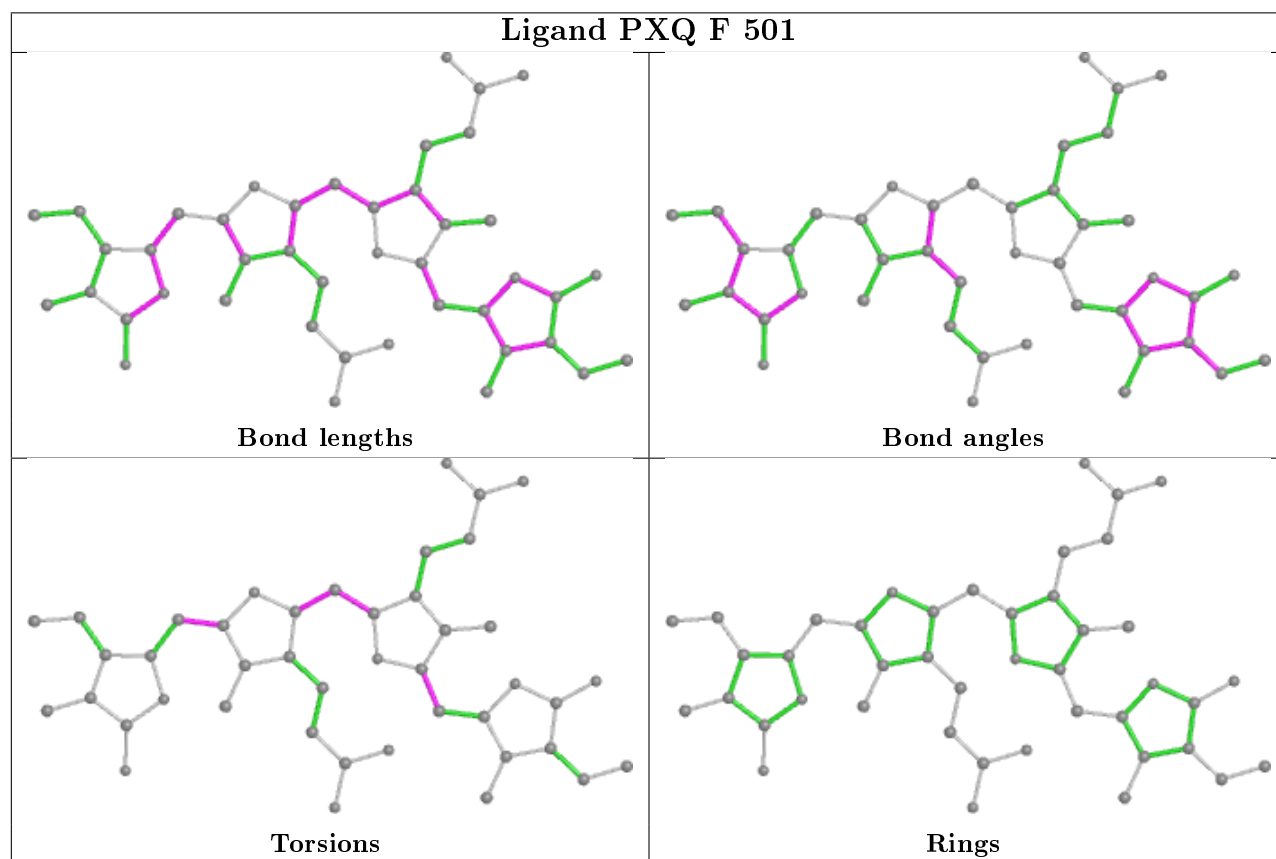
There are no ring outliers.

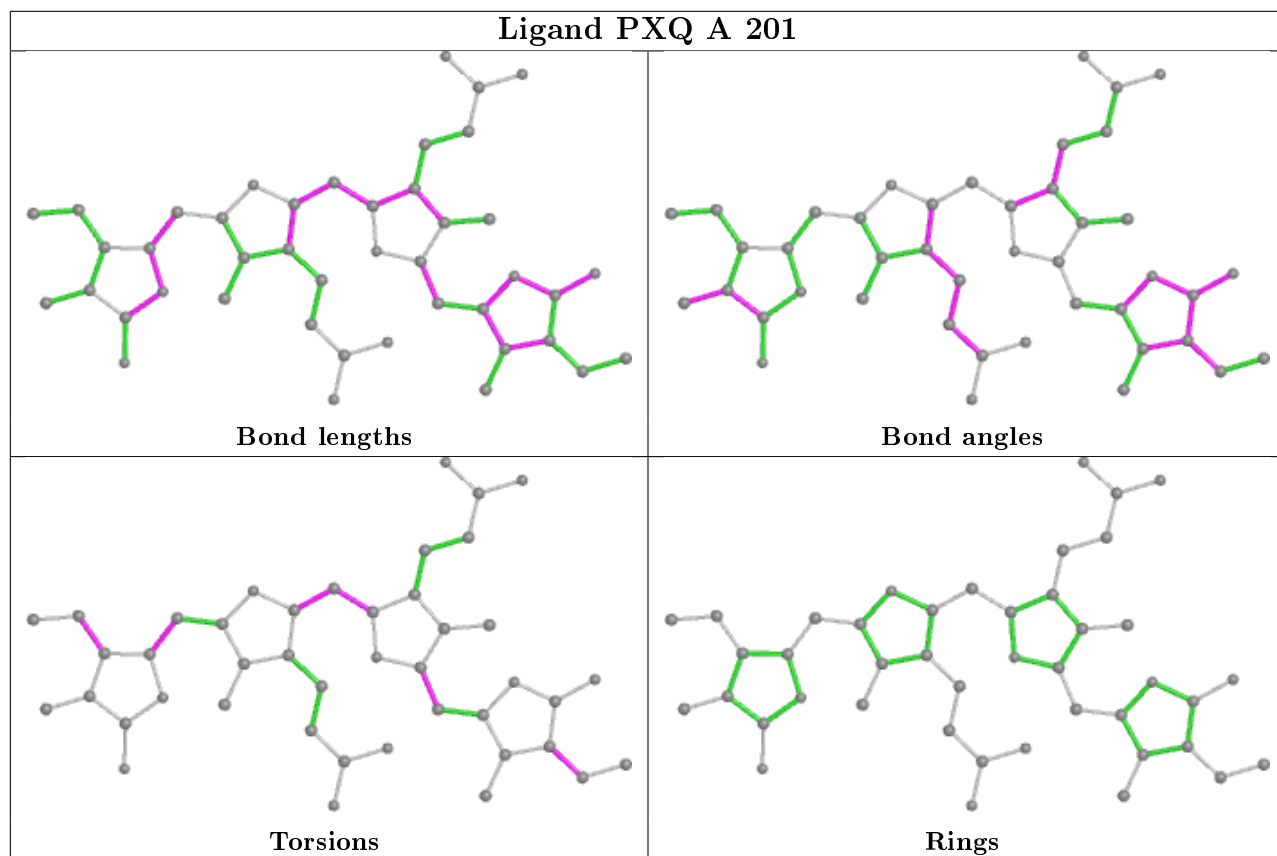
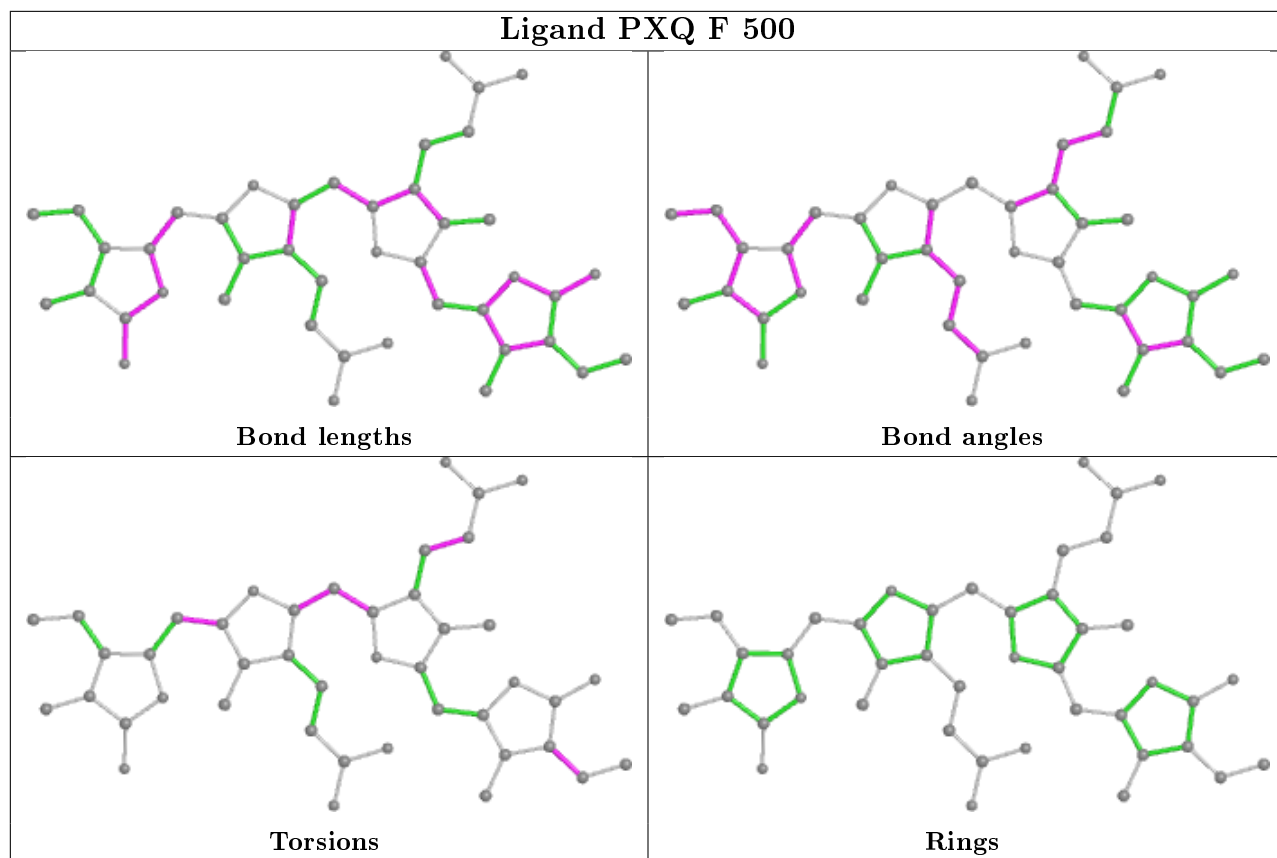
12 monomers are involved in 24 short contacts:

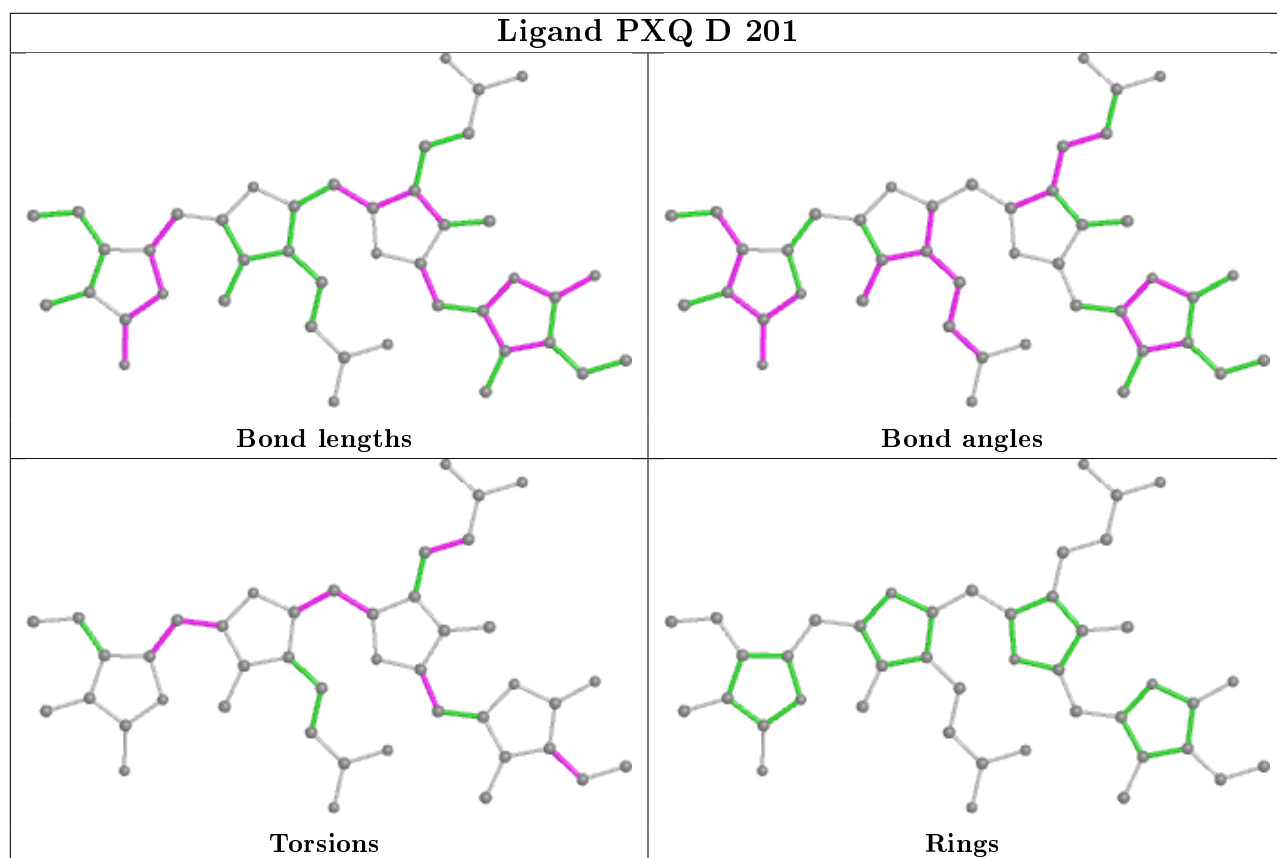
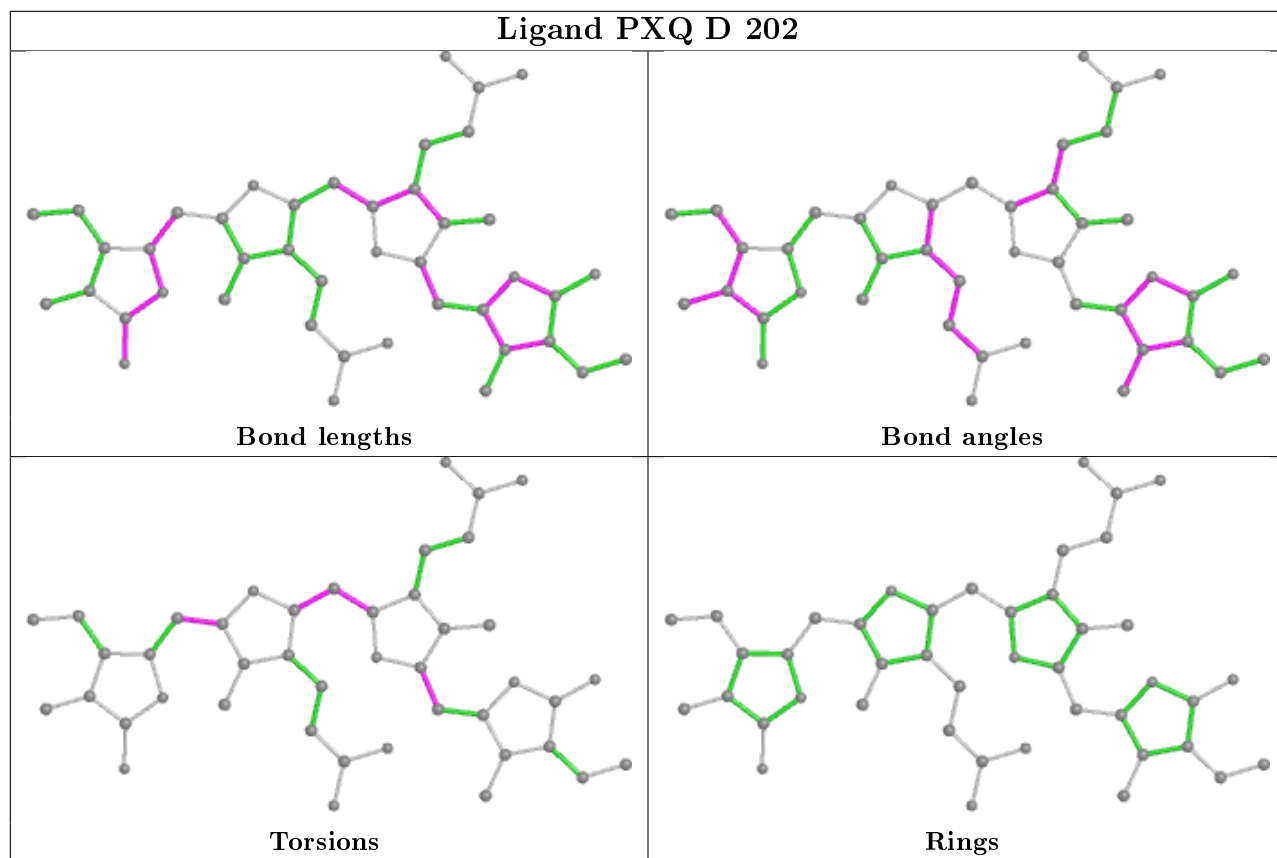
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	F	501	PXQ	2	0
4	C	202	PGE	4	0
3	F	500	PXQ	1	0
4	A	202	PGE	2	0
5	D	203	MES	5	0
5	C	203	MES	1	0
5	E	204	MES	1	0
3	D	202	PXQ	1	0
3	B	202	PXQ	1	0
3	C	201	PXQ	1	0
4	C	204	PGE	3	0
5	B	203	MES	2	0

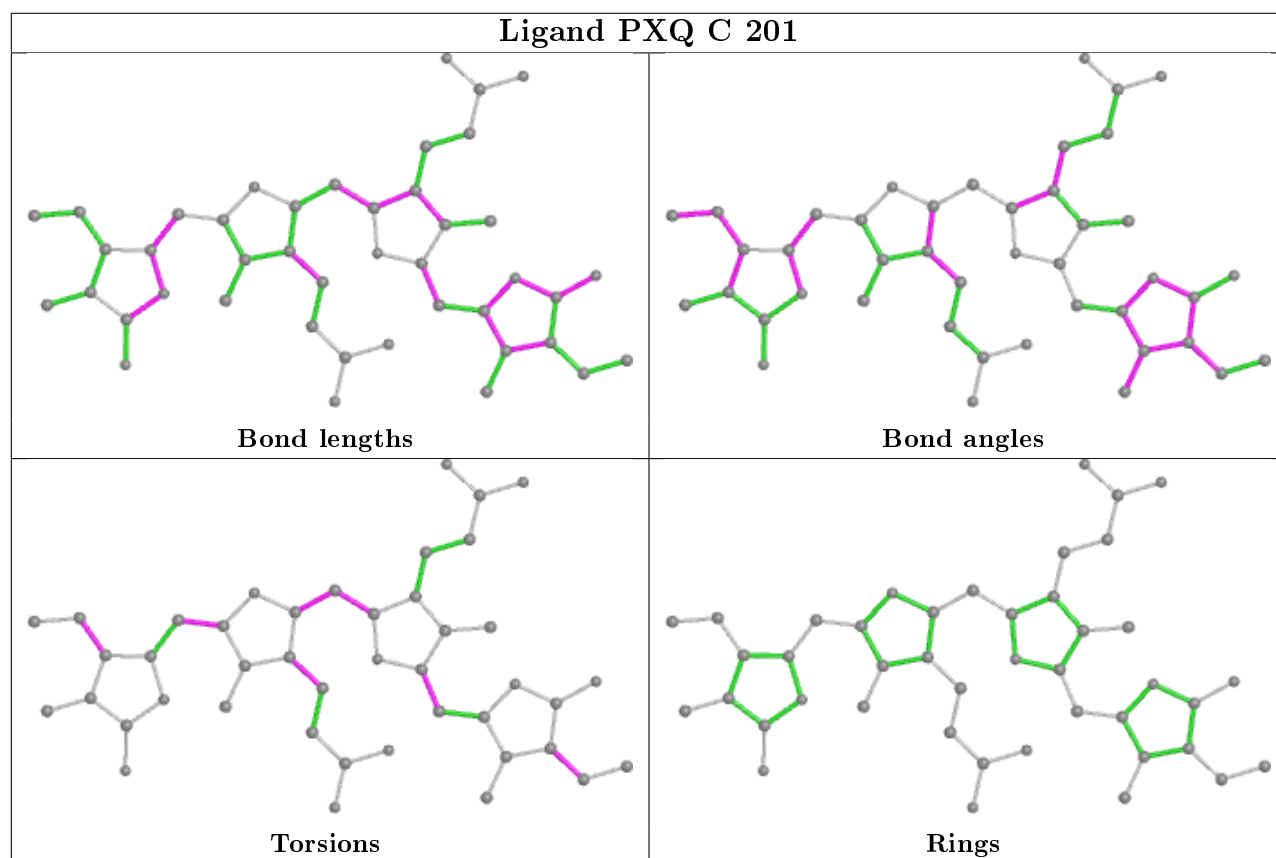
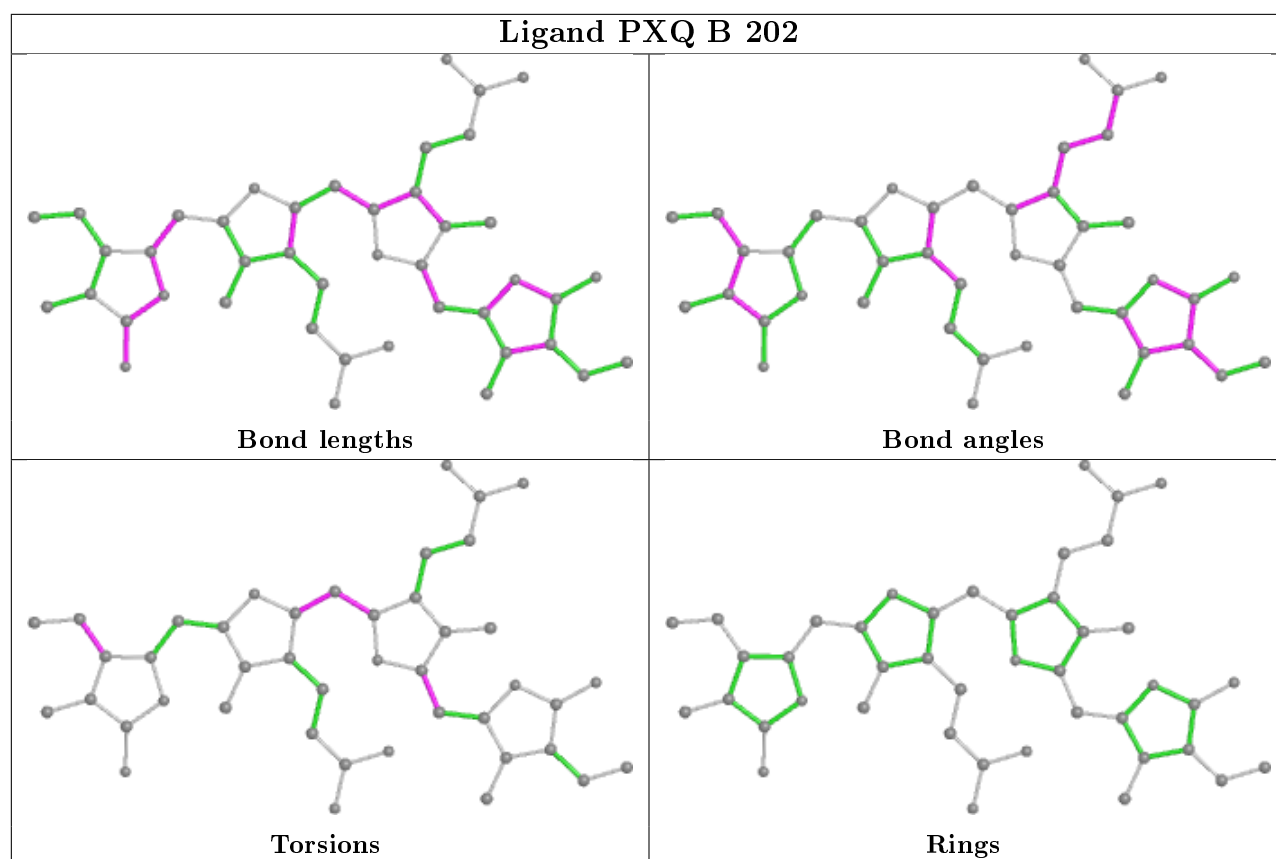
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

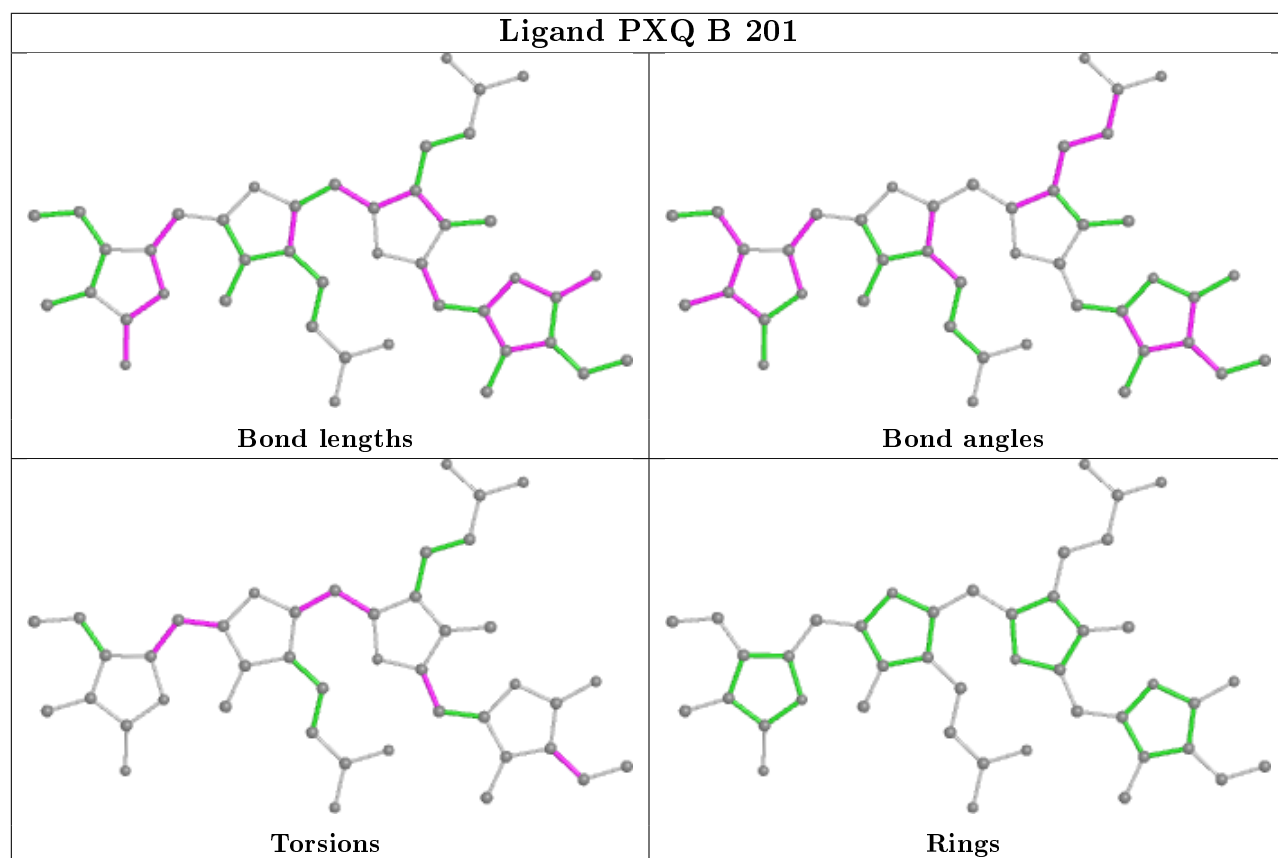
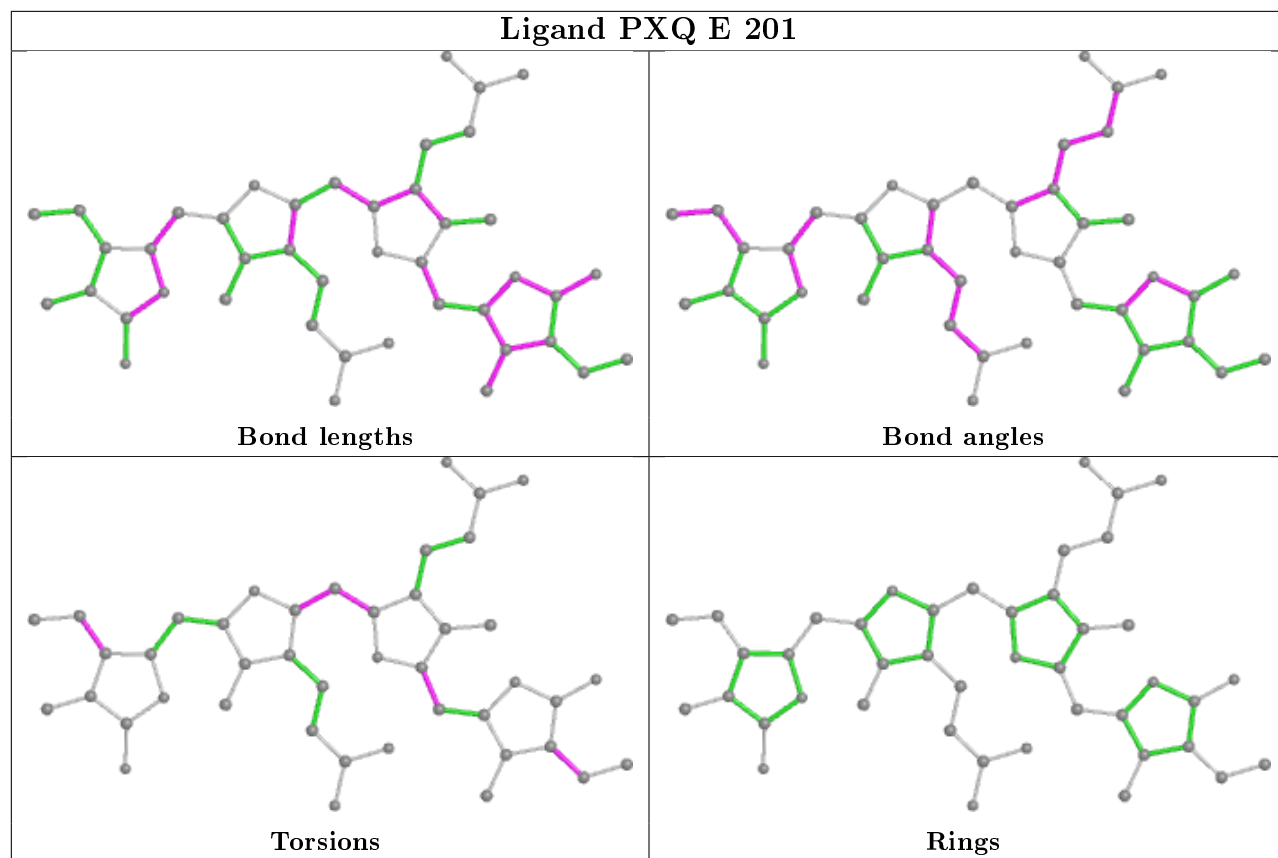
The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.











## 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 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	162/162 (100%)	-0.04	0 100 100	35, 45, 59, 84	0
1	C	162/162 (100%)	-0.18	0 100 100	33, 41, 53, 85	0
1	E	162/162 (100%)	0.01	0 100 100	36, 44, 57, 70	0
2	B	171/172 (99%)	-0.04	1 (0%) 89 91	35, 43, 62, 69	0
2	D	171/172 (99%)	-0.34	0 100 100	30, 39, 57, 74	0
2	F	171/172 (99%)	0.08	3 (1%) 68 75	34, 46, 58, 86	0
All	All	999/1002 (99%)	-0.09	4 (0%) 92 94	30, 43, 58, 86	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	120	LEU	3.8
2	F	113	LEU	2.8
2	B	22	ALA	2.5
2	F	116	THR	2.2

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	MEN	D	72	9/10	0.96	0.12	40,52,60,67	0
2	MEN	B	72	9/10	0.96	0.10	42,53,70,70	0
2	MEN	F	72	9/10	0.98	0.15	37,48,69,69	0

### 6.3 Carbohydrates [i](#)

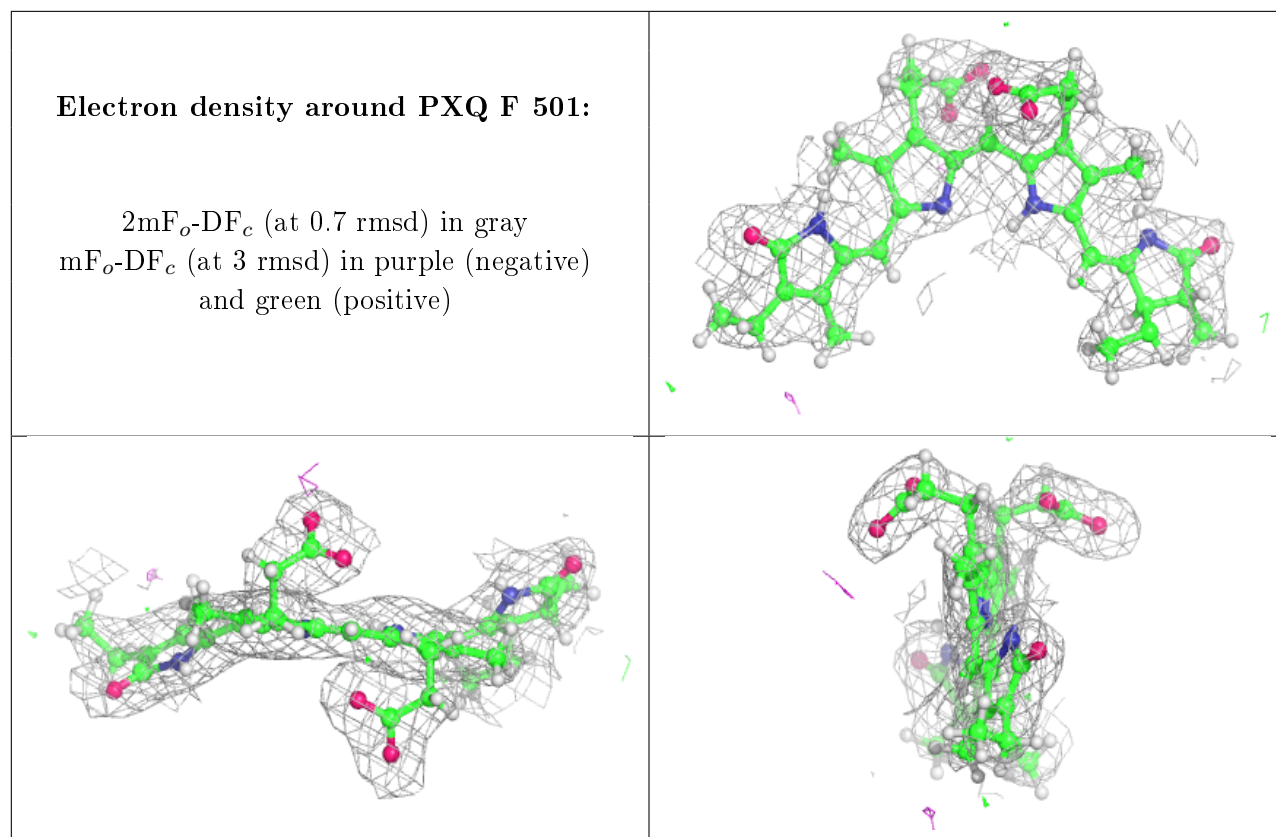
There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

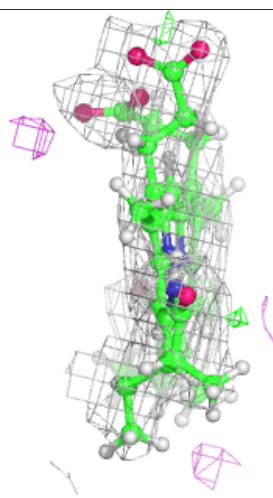
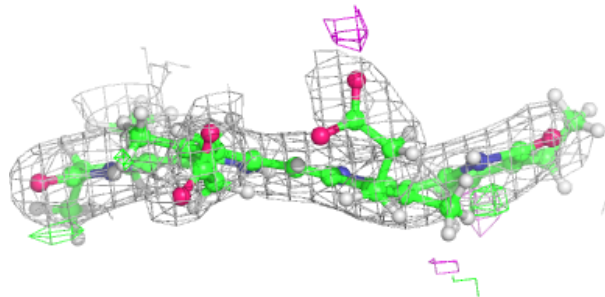
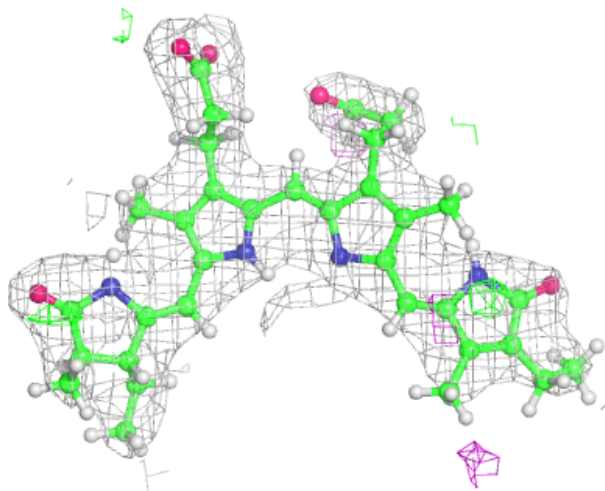
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
5	MES	B	203	12/12	0.70	0.22	112,130,200,203	0
5	MES	D	203	12/12	0.82	0.26	62,88,113,170	0
5	MES	E	204	12/12	0.83	0.19	63,80,113,122	0
4	PGE	E	202	10/10	0.88	0.13	45,63,84,86	0
3	PXQ	F	501	43/43	0.89	0.12	36,48,54,57	0
4	PGE	E	203	10/10	0.90	0.20	39,54,71,73	0
4	PGE	C	202	10/10	0.91	0.18	48,65,77,78	0
3	PXQ	D	201	43/43	0.92	0.14	34,50,64,75	0
3	PXQ	A	201	43/43	0.92	0.13	27,43,55,57	0
3	PXQ	B	201	43/43	0.93	0.14	38,51,64,72	0
4	PGE	C	204	10/10	0.93	0.11	33,51,63,68	0
4	PGE	A	202	10/10	0.94	0.14	41,55,70,74	0
5	MES	C	203	12/12	0.94	0.11	50,60,84,95	0
3	PXQ	C	201	43/43	0.95	0.12	32,43,53,55	0
3	PXQ	B	202	43/43	0.95	0.13	30,40,51,52	0
3	PXQ	F	500	43/43	0.95	0.20	31,52,72,73	0
3	PXQ	D	202	43/43	0.96	0.18	19,37,43,52	0
3	PXQ	E	201	43/43	0.96	0.12	23,39,47,50	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



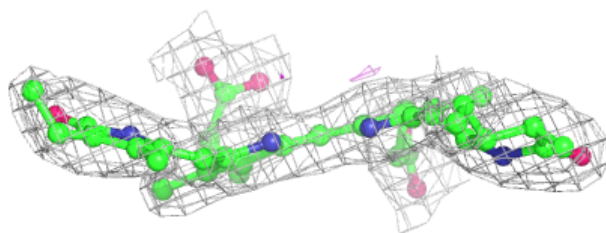
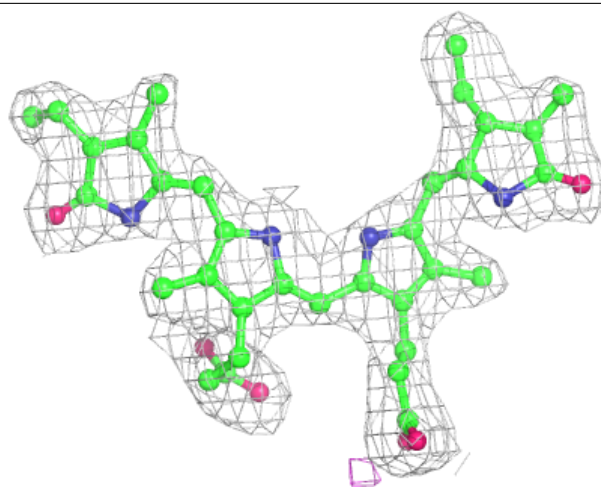
**Electron density around PXQ D 201:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



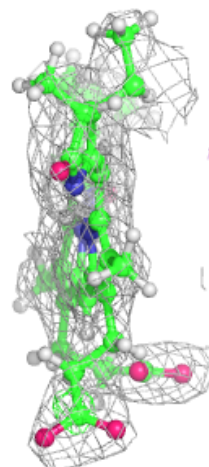
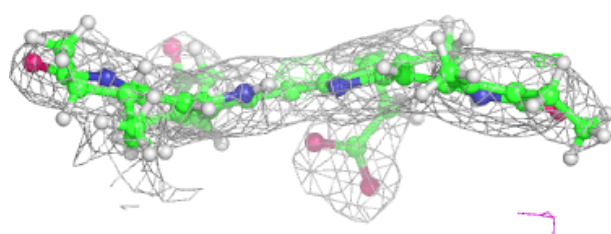
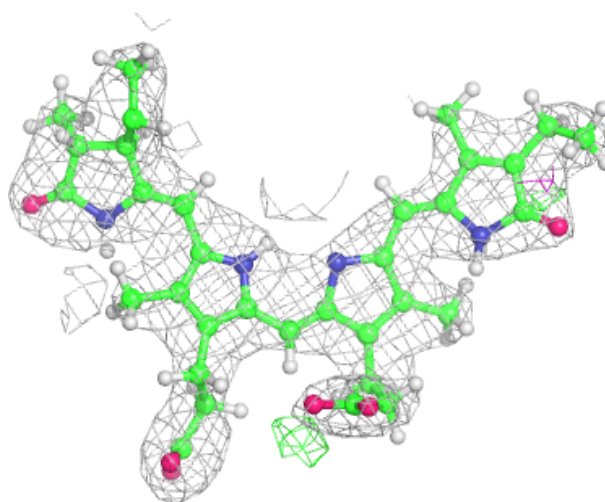
**Electron density around PXQ A 201:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



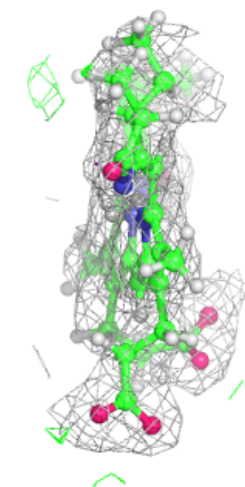
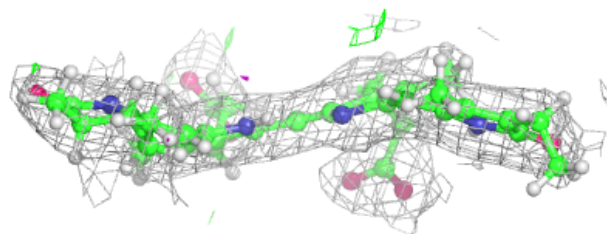
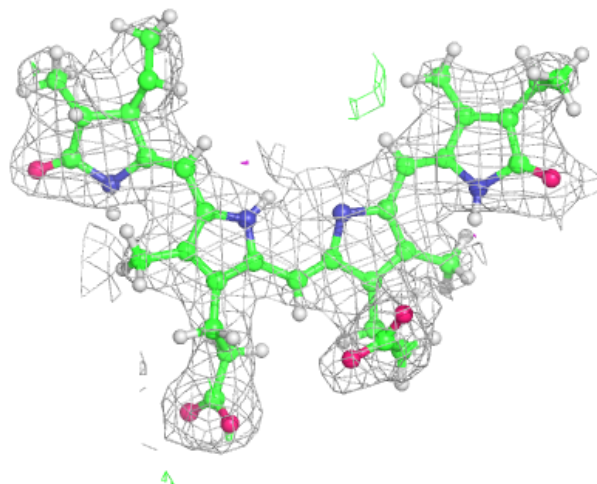
**Electron density around PXQ B 201:**

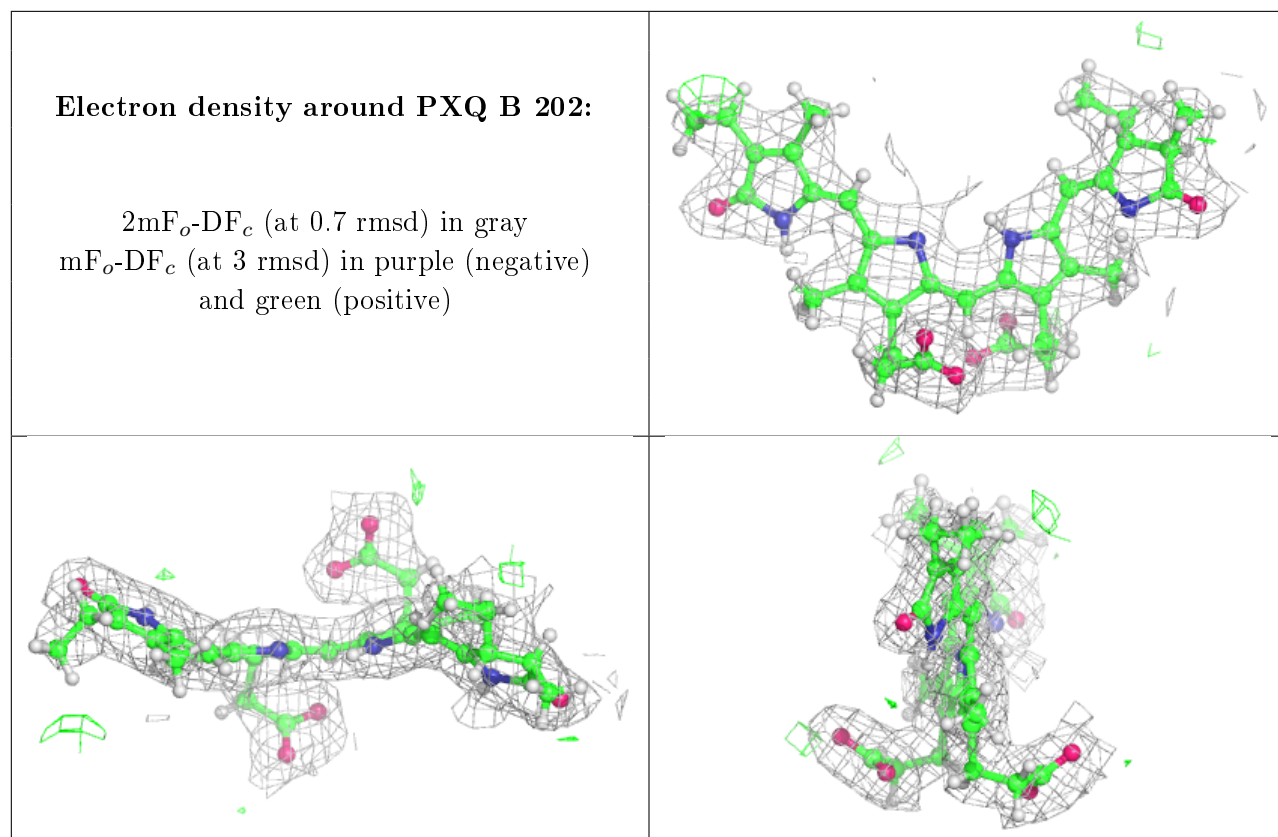
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around PXQ C 201:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

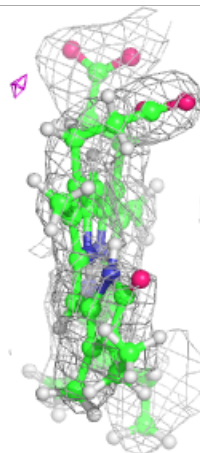
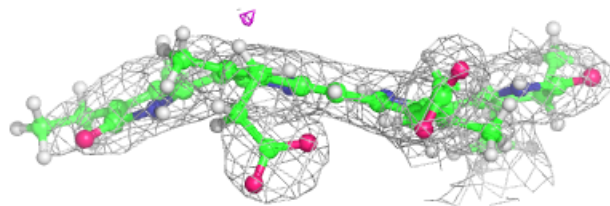
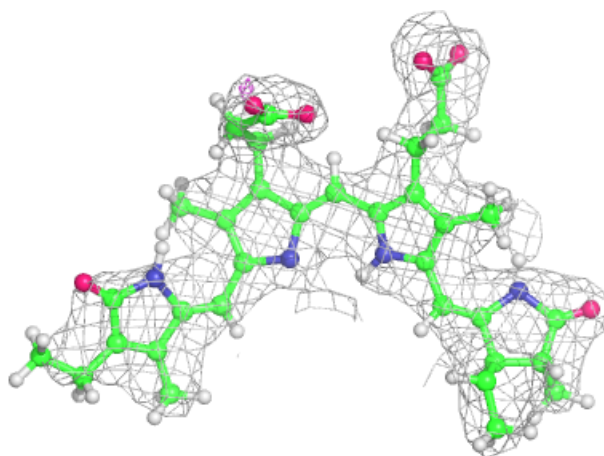


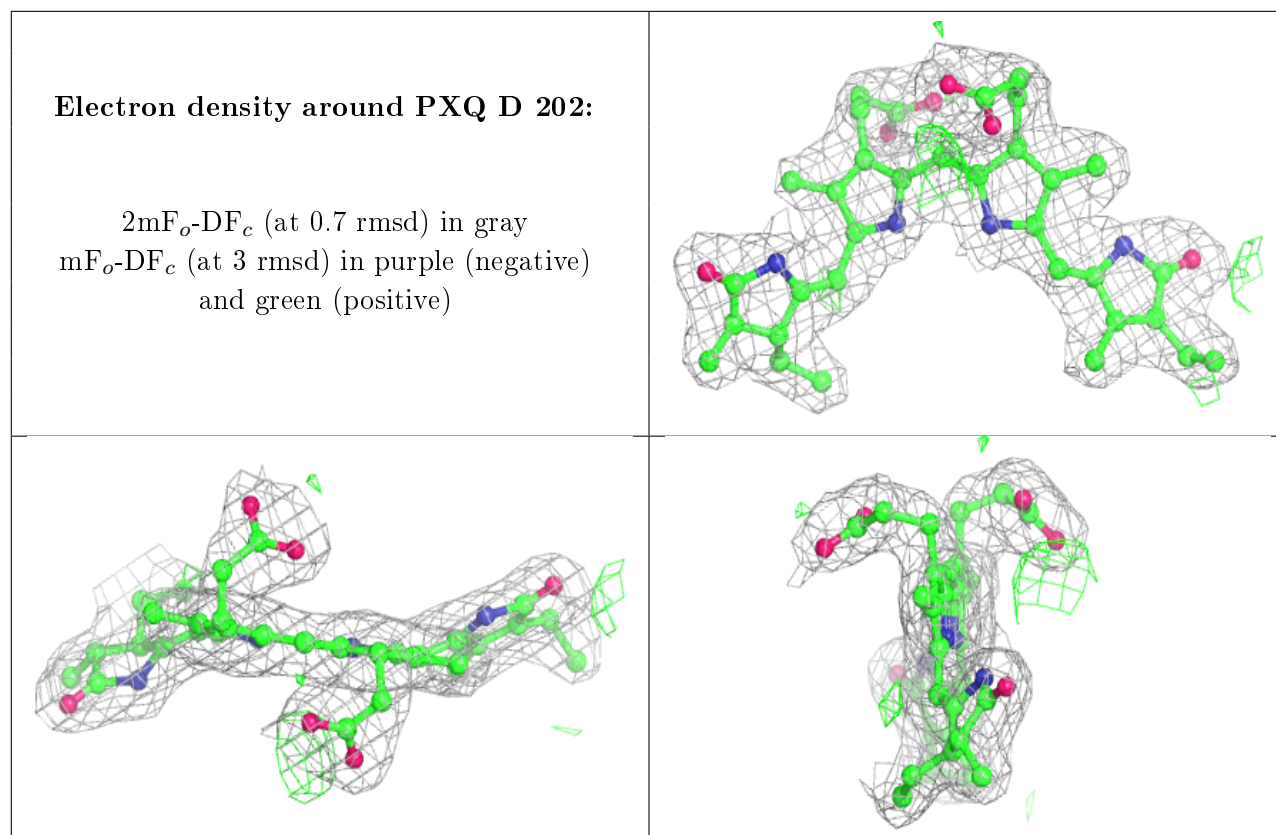


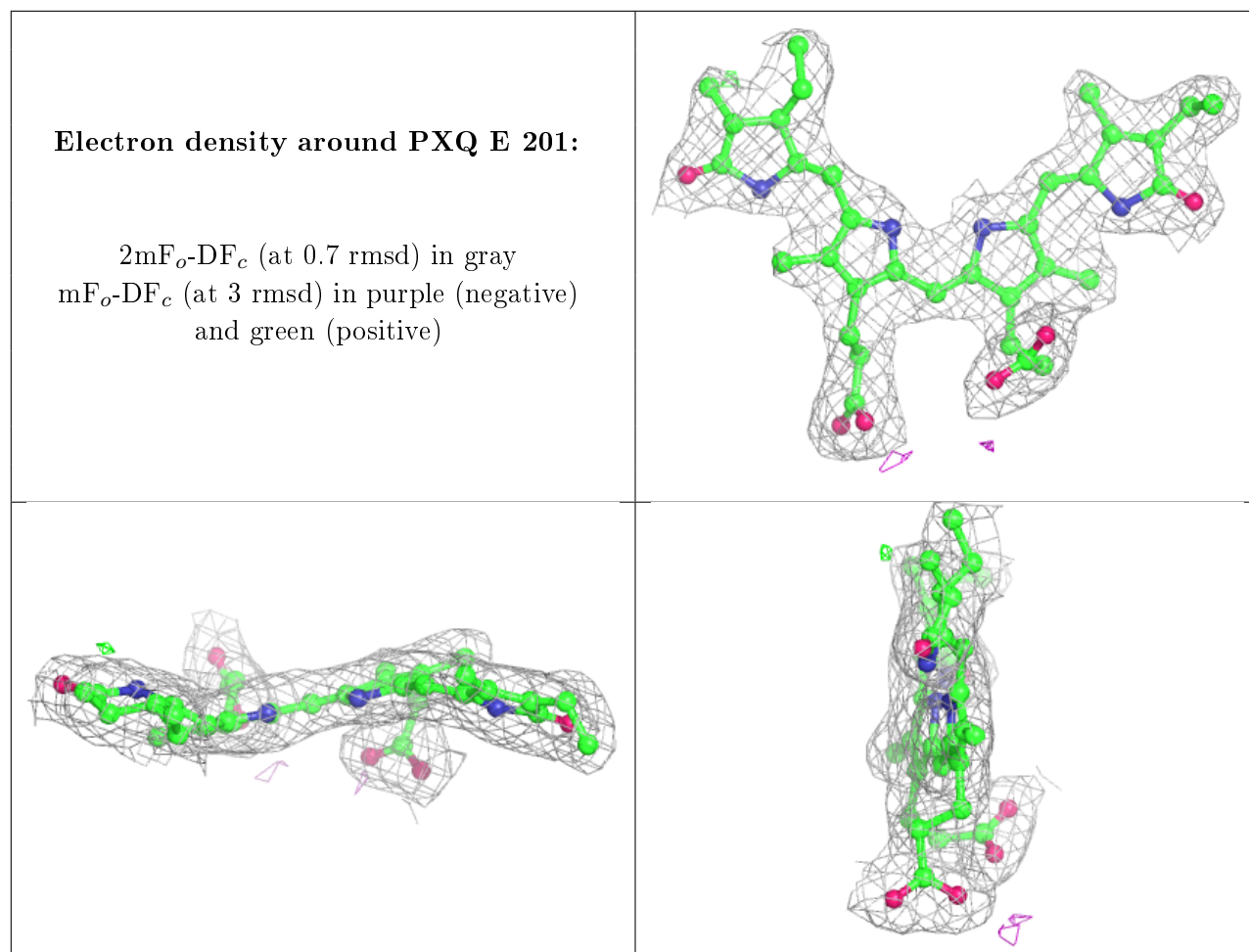


**Electron density around PXQ F 500:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)







## 6.5 Other polymers [i](#)

There are no such residues in this entry.