



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 9, 2022 – 01:14 pm BST

PDB ID : 7PGH  
Title : NaVAe1/Sp1CTDp (DDM)  
Authors : Lolicato, M.; Arrigoni, C.  
Deposited on : 2021-08-14  
Resolution : 4.19 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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.28.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0267  
CCP4 : 7.1.010 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.28.1

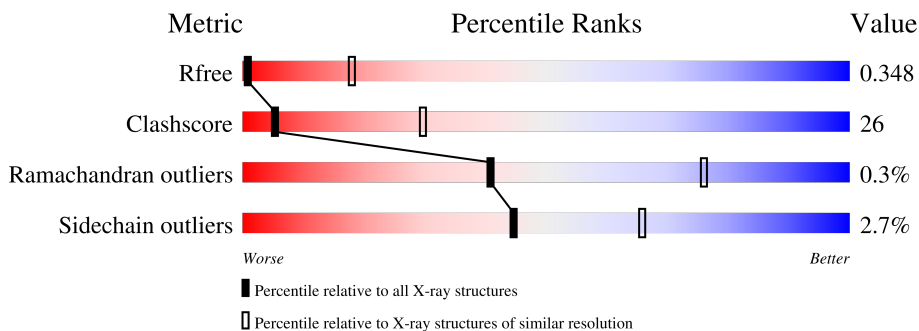
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 4.19 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	1005 (4.62-3.78)
Clashscore	141614	1044 (4.60-3.80)
Ramachandran outliers	138981	1000 (4.60-3.80)
Sidechain outliers	138945	1007 (4.62-3.78)

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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	A	143	46% (green), 45% (yellow), 8% (grey)
1	B	143	56% (green), 31% (yellow), 12% (grey)
1	C	143	50% (green), 41% (yellow), 8% (grey)
1	D	143	48% (green), 37% (yellow), 11% (grey)
1	E	143	50% (green), 43% (yellow), 7% (grey)
1	F	143	50% (green), 42% (yellow), 7% (grey)
1	G	143	44% (green), 42% (yellow), 10% (grey)

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Mol	Chain	Length	Quality of chain
1	H	143	 48% 40% 10%

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 8697 atoms, of which 0 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 Ion transport protein, Voltage-gated sodium channel subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	Se			
1	F	133	1052	701	162	184	5	0	0	0
1	A	131	1036	692	157	182	5	0	0	0
1	B	126	1006	668	157	176	5	0	0	0
1	C	131	1044	696	162	181	5	0	0	0
1	D	127	1016	679	155	177	5	0	0	0
1	E	138	1082	719	172	186	5	0	0	0
1	G	129	1026	687	157	177	5	0	0	0
1	H	128	1020	683	155	177	5	0	0	0

There are 48 discrepancies between the modelled and reference sequences:

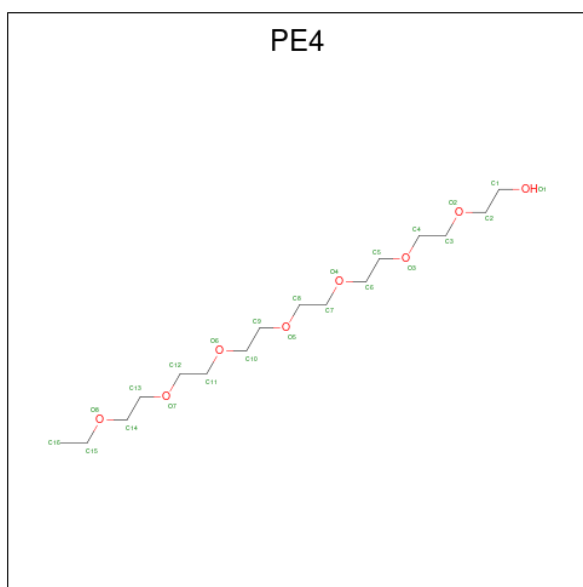
Chain	Residue	Modelled	Actual	Comment	Reference
F	137	GLY	-	expression tag	UNP Q0ABW0
F	138	PRO	-	expression tag	UNP Q0ABW0
F	139	SER	-	expression tag	UNP Q0ABW0
F	140	SER	-	expression tag	UNP Q0ABW0
F	141	PRO	-	expression tag	UNP Q0ABW0
F	142	SER	ALA	conflict	UNP Q0ABW0
A	137	GLY	-	expression tag	UNP Q0ABW0
A	138	PRO	-	expression tag	UNP Q0ABW0
A	139	SER	-	expression tag	UNP Q0ABW0
A	140	SER	-	expression tag	UNP Q0ABW0
A	141	PRO	-	expression tag	UNP Q0ABW0
A	142	SER	ALA	conflict	UNP Q0ABW0
B	137	GLY	-	expression tag	UNP Q0ABW0

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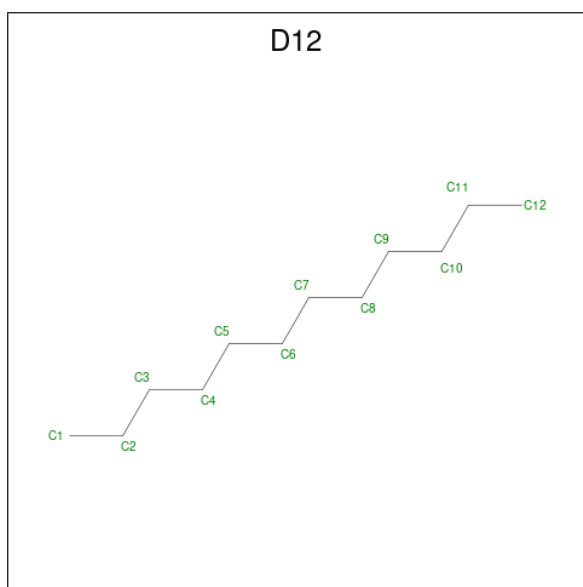
Chain	Residue	Modelled	Actual	Comment	Reference
B	138	PRO	-	expression tag	UNP Q0ABW0
B	139	SER	-	expression tag	UNP Q0ABW0
B	140	SER	-	expression tag	UNP Q0ABW0
B	141	PRO	-	expression tag	UNP Q0ABW0
B	142	SER	ALA	conflict	UNP Q0ABW0
C	137	GLY	-	expression tag	UNP Q0ABW0
C	138	PRO	-	expression tag	UNP Q0ABW0
C	139	SER	-	expression tag	UNP Q0ABW0
C	140	SER	-	expression tag	UNP Q0ABW0
C	141	PRO	-	expression tag	UNP Q0ABW0
C	142	SER	ALA	conflict	UNP Q0ABW0
D	137	GLY	-	expression tag	UNP Q0ABW0
D	138	PRO	-	expression tag	UNP Q0ABW0
D	139	SER	-	expression tag	UNP Q0ABW0
D	140	SER	-	expression tag	UNP Q0ABW0
D	141	PRO	-	expression tag	UNP Q0ABW0
D	142	SER	ALA	conflict	UNP Q0ABW0
E	137	GLY	-	expression tag	UNP Q0ABW0
E	138	PRO	-	expression tag	UNP Q0ABW0
E	139	SER	-	expression tag	UNP Q0ABW0
E	140	SER	-	expression tag	UNP Q0ABW0
E	141	PRO	-	expression tag	UNP Q0ABW0
E	142	SER	ALA	conflict	UNP Q0ABW0
G	137	GLY	-	expression tag	UNP Q0ABW0
G	138	PRO	-	expression tag	UNP Q0ABW0
G	139	SER	-	expression tag	UNP Q0ABW0
G	140	SER	-	expression tag	UNP Q0ABW0
G	141	PRO	-	expression tag	UNP Q0ABW0
G	142	SER	ALA	conflict	UNP Q0ABW0
H	137	GLY	-	expression tag	UNP Q0ABW0
H	138	PRO	-	expression tag	UNP Q0ABW0
H	139	SER	-	expression tag	UNP Q0ABW0
H	140	SER	-	expression tag	UNP Q0ABW0
H	141	PRO	-	expression tag	UNP Q0ABW0
H	142	SER	ALA	conflict	UNP Q0ABW0

- Molecule 2 is 2-{2-[2-(2-{2-[2-(2-ETHOXY-ETHOXY)-ETHOXY]-ETHOXY}-ETHOXY)-ETHOXY]-ETHOXY}-ETHANOL (three-letter code: PE4) (formula: C<sub>16</sub>H<sub>34</sub>O<sub>8</sub>).



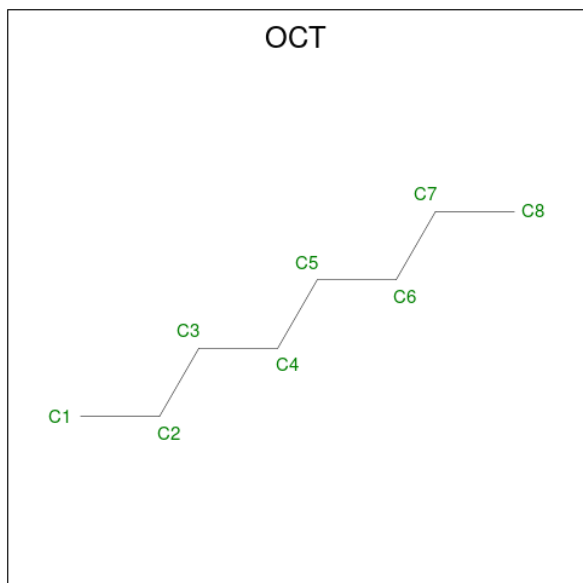
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	F	1	Total C O 24 16 8	0	0
2	F	1	Total C O 24 16 8	0	0
2	F	1	Total C O 24 16 8	0	0
2	F	1	Total C O 24 16 8	0	0
2	A	1	Total C O 24 16 8	0	0
2	A	1	Total C O 24 16 8	0	0
2	A	1	Total C O 24 16 8	0	0
2	G	1	Total C O 24 16 8	0	0
2	H	1	Total C O 24 16 8	0	0

- Molecule 3 is DODECANE (three-letter code: D12) (formula: C<sub>12</sub>H<sub>26</sub>).



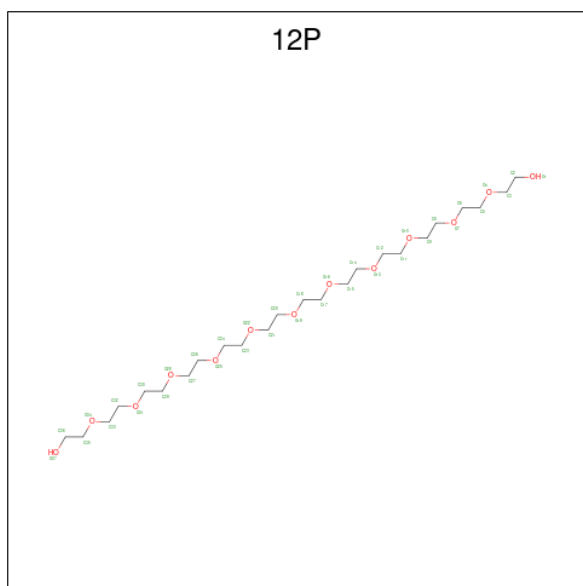
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 12 12	0	0
3	B	1	Total C 12 12	0	0
3	G	1	Total C 12 12	0	0
3	H	1	Total C 12 12	0	0

- Molecule 4 is N-OCTANE (three-letter code: OCT) (formula:  $C_8H_{18}$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total C 8 8	0	0

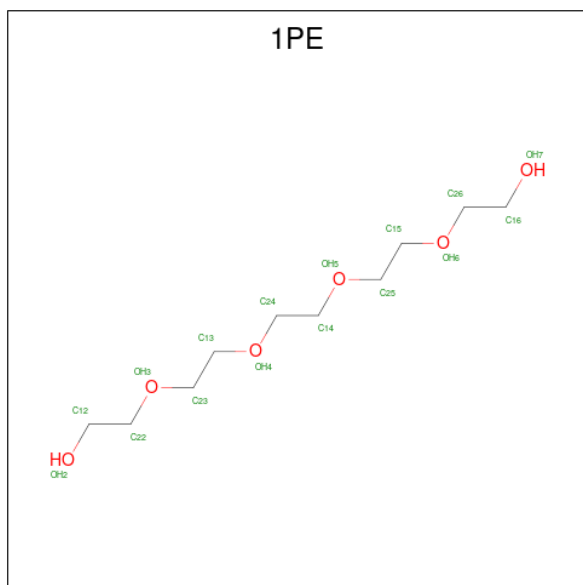
- Molecule 5 is DODECAETHYLENE GLYCOL (three-letter code: 12P) (formula:  $C_{24}H_{50}O_{13}$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C O 37 24 13	0	0
5	C	1	Total C O 37 24 13	0	0
5	H	1	Total C O 37 24 13	0	0

- Molecule 6 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula:  $C_{10}H_{22}O_6$ ).





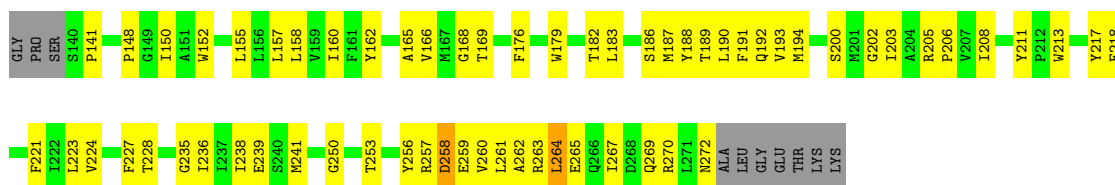
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	D	1	Total	C O	0	0
			16	10 6		
6	H	1	Total	C O	0	0
			16	10 6		

### 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. 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. 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.

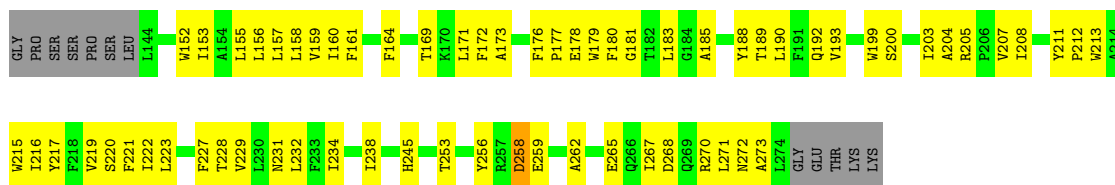
- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain F: 



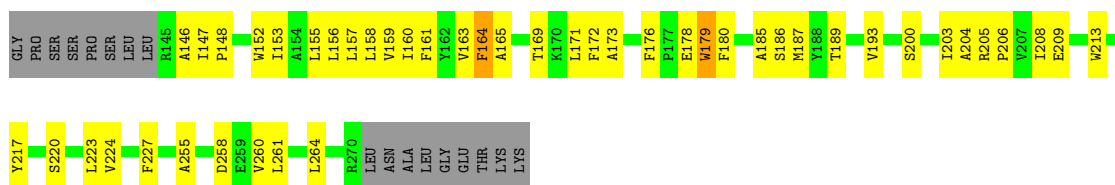
- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain A: 



- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain B: 



- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain C: 





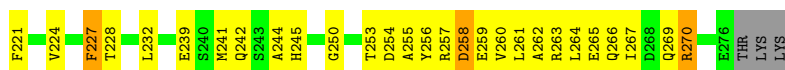
- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain D: 48% 37% 11%



- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain E: 50% 43%



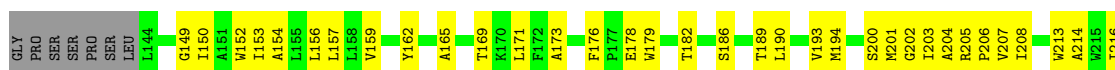
- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain G: 44% 42% 10%



- Molecule 1: Ion transport protein, Voltage-gated sodium channel subunit

Chain H: 48% 40% 10%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	123.47Å 134.70Å 155.54Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	14.99 – 4.19 14.99 – 4.19	Depositor EDS
% Data completeness (in resolution range)	99.0 (14.99-4.19) 99.0 (14.99-4.19)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.99 (at 4.14Å)	Xtriage
Refinement program	PHENIX 1.14_3260	Depositor
R, $R_{free}$	0.318 , 0.337 0.325 , 0.348	Depositor DCC
$R_{free}$ test set	851 reflections (4.50%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	267.0	Xtriage
Anisotropy	0.157	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	(Not available) , (Not available)	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	8697	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	317.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.14% 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: 12P, D12, 1PE, PE4, OCT

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	0.36	0/1061	0.65	1/1441 (0.1%)
1	B	0.33	0/1030	0.64	1/1395 (0.1%)
1	C	0.35	0/1069	0.63	1/1450 (0.1%)
1	D	0.39	0/1041	0.69	2/1412 (0.1%)
1	E	0.36	0/1107	0.73	2/1501 (0.1%)
1	F	0.35	0/1077	0.69	3/1462 (0.2%)
1	G	0.39	0/1051	0.69	0/1426
1	H	0.38	0/1045	0.64	1/1418 (0.1%)
All	All	0.36	0/8481	0.67	11/11505 (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
1	B	0	1
1	G	0	1
All	All	0	2

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	141	PRO	N-CA-CB	7.68	112.52	103.30
1	H	230	LEU	CA-CB-CG	6.69	130.69	115.30
1	D	179	TRP	CA-CB-CG	6.67	126.37	113.70
1	B	148	PRO	N-CA-CB	6.01	110.52	103.30
1	C	155	LEU	CA-CB-CG	-5.92	101.69	115.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	179	TRP	Peptide
1	G	266	GLN	Peptide

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1036	0	1014	69	0
1	B	1006	0	977	52	0
1	C	1044	0	1030	57	0
1	D	1016	0	1001	70	0
1	E	1082	0	1055	76	0
1	F	1052	0	1025	69	0
1	G	1026	0	1012	72	0
1	H	1020	0	1006	54	0
2	A	72	0	102	3	0
2	F	96	0	136	2	0
2	G	24	0	34	4	0
2	H	24	0	34	0	0
3	A	12	0	26	0	0
3	B	12	0	26	1	0
3	G	12	0	26	0	0
3	H	12	0	26	0	0
4	C	8	0	18	0	0
5	C	74	0	100	1	0
5	H	37	0	50	0	0
6	D	16	0	22	0	0
6	H	16	0	22	0	0
All	All	8697	0	8742	461	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 26.

The worst 5 of 461 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:G:145:ARG:HH22	1:H:238:ILE:HD12	1.22	1.00
1:E:260:VAL:HG22	1:E:263:ARG:HH11	1.37	0.89
1:E:256:TYR:O	1:E:259:GLU:HG3	1.74	0.87
1:A:172:PHE:HD2	1:A:176:PHE:HE2	1.20	0.87
1:F:155:LEU:HD12	1:D:230:LEU:HD11	1.57	0.87

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	129/143 (90%)	107 (83%)	22 (17%)	0	100	100
1	B	124/143 (87%)	105 (85%)	18 (14%)	1 (1%)	19	60
1	C	129/143 (90%)	113 (88%)	16 (12%)	0	100	100
1	D	125/143 (87%)	107 (86%)	18 (14%)	0	100	100
1	E	136/143 (95%)	96 (71%)	39 (29%)	1 (1%)	22	62
1	F	131/143 (92%)	105 (80%)	25 (19%)	1 (1%)	19	60
1	G	127/143 (89%)	111 (87%)	16 (13%)	0	100	100
1	H	126/143 (88%)	107 (85%)	19 (15%)	0	100	100
All	All	1027/1144 (90%)	851 (83%)	173 (17%)	3 (0%)	41	76

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	141	PRO
1	F	269	GLN
1	B	147	ILE

### 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	106/115 (92%)	104 (98%)	2 (2%)	57	74
1	B	102/115 (89%)	101 (99%)	1 (1%)	76	86
1	C	107/115 (93%)	105 (98%)	2 (2%)	57	74
1	D	105/115 (91%)	98 (93%)	7 (7%)	16	43
1	E	107/115 (93%)	104 (97%)	3 (3%)	43	65
1	F	107/115 (93%)	107 (100%)	0	100	100
1	G	105/115 (91%)	99 (94%)	6 (6%)	20	48
1	H	105/115 (91%)	103 (98%)	2 (2%)	57	74
All	All	844/920 (92%)	821 (97%)	23 (3%)	44	66

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	270	ARG
1	G	205	ARG
1	G	179	TRP
1	G	215	TRP
1	D	176	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	F	192	GLN
1	F	231	ASN
1	E	242	GLN
1	G	246	HIS
1	H	245	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](#)

19 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	OCT	C	301	-	7,7,7	0.31	0	6,6,6	0.70	0
5	12P	C	302	-	36,36,36	0.55	0	35,35,35	0.20	0
2	PE4	F	303	-	23,23,23	0.56	0	22,22,22	0.21	0
2	PE4	F	301	-	23,23,23	0.56	0	22,22,22	0.24	0
2	PE4	A	302	-	23,23,23	0.56	0	22,22,22	0.23	0
2	PE4	G	302	-	23,23,23	0.56	0	22,22,22	0.21	0
5	12P	H	304	-	36,36,36	0.55	0	35,35,35	0.19	0
2	PE4	A	303	-	23,23,23	0.56	0	22,22,22	0.20	0
6	1PE	D	301	-	15,15,15	0.54	0	14,14,14	0.21	0
3	D12	A	301	-	11,11,11	0.30	0	10,10,10	0.82	0
3	D12	B	301	-	11,11,11	0.30	0	10,10,10	0.81	0
2	PE4	A	304	-	23,23,23	0.56	0	22,22,22	0.20	0
2	PE4	H	302	-	23,23,23	0.56	0	22,22,22	0.21	0
5	12P	C	303	-	36,36,36	0.55	0	35,35,35	0.21	0
2	PE4	F	302	-	23,23,23	0.56	0	22,22,22	0.20	0
3	D12	G	301	-	11,11,11	0.29	0	10,10,10	0.84	0
6	1PE	H	303	-	15,15,15	0.54	0	14,14,14	0.21	0
2	PE4	F	304	-	23,23,23	0.56	0	22,22,22	0.19	0
3	D12	H	301	-	11,11,11	0.29	0	10,10,10	0.85	0

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	OCT	C	301	-	-	1/5/5/5	-
5	12P	C	302	-	-	18/34/34/34	-
2	PE4	F	303	-	-	11/21/21/21	-
2	PE4	F	301	-	-	11/21/21/21	-
2	PE4	A	302	-	-	10/21/21/21	-
2	PE4	G	302	-	-	15/21/21/21	-
5	12P	H	304	-	-	19/34/34/34	-
2	PE4	A	303	-	-	13/21/21/21	-
6	1PE	D	301	-	-	7/13/13/13	-
3	D12	A	301	-	-	0/9/9/9	-
3	D12	B	301	-	-	3/9/9/9	-
2	PE4	A	304	-	-	8/21/21/21	-
2	PE4	H	302	-	-	11/21/21/21	-
5	12P	C	303	-	-	16/34/34/34	-
2	PE4	F	302	-	-	10/21/21/21	-
3	D12	G	301	-	-	1/9/9/9	-
6	1PE	H	303	-	-	7/13/13/13	-
2	PE4	F	304	-	-	14/21/21/21	-
3	D12	H	301	-	-	2/9/9/9	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 177 torsion outliers are listed below:

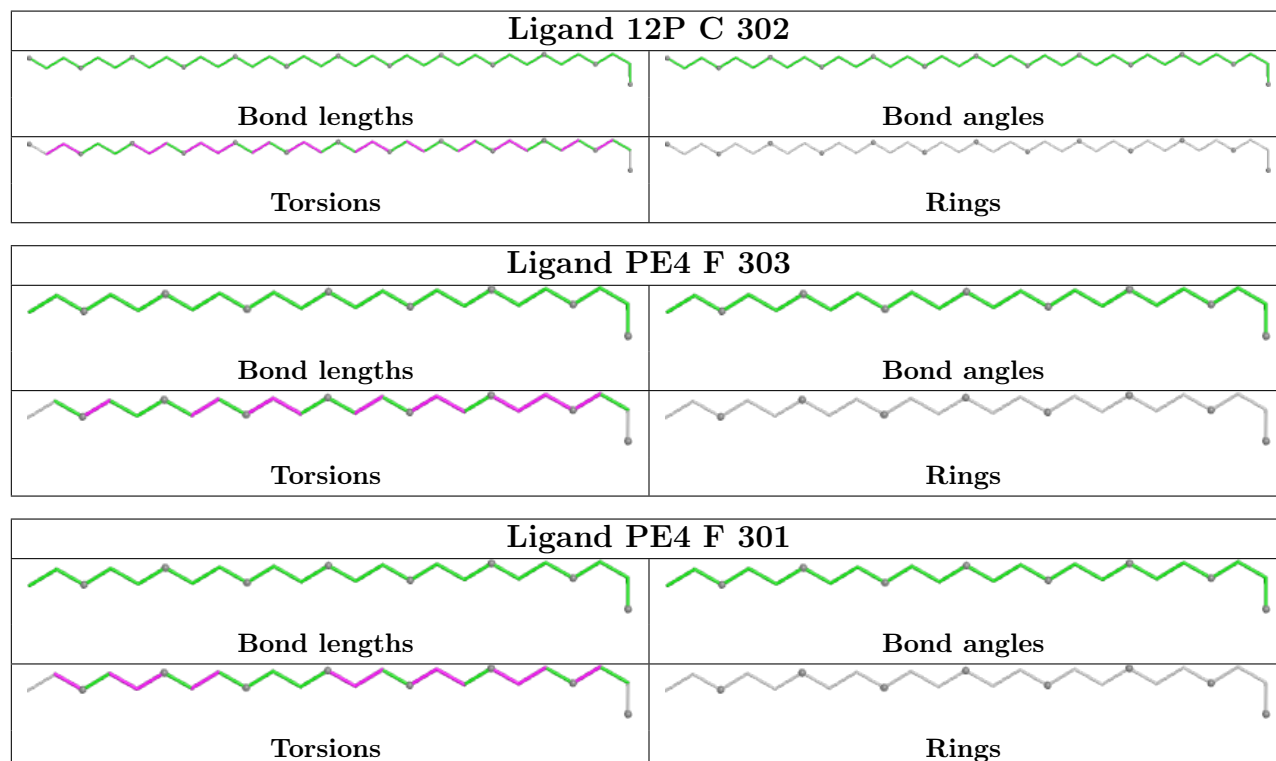
Mol	Chain	Res	Type	Atoms
2	A	304	PE4	O6-C10-C9-O5
2	H	302	PE4	O6-C10-C9-O5
5	H	304	12P	O25-C26-C27-O28
5	H	304	12P	O7-C8-C9-O10
2	F	301	PE4	O7-C13-C14-O8

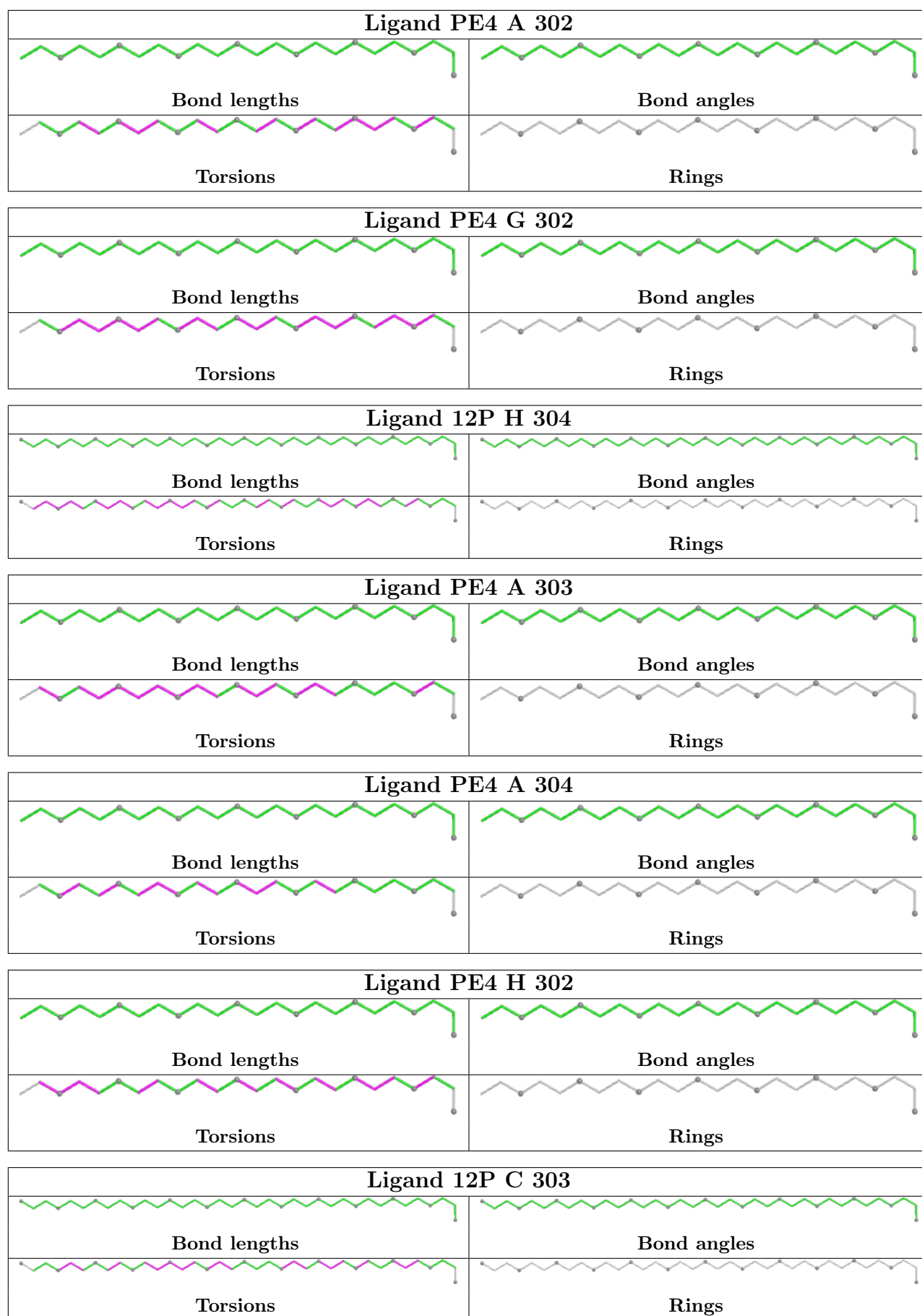
There are no ring outliers.

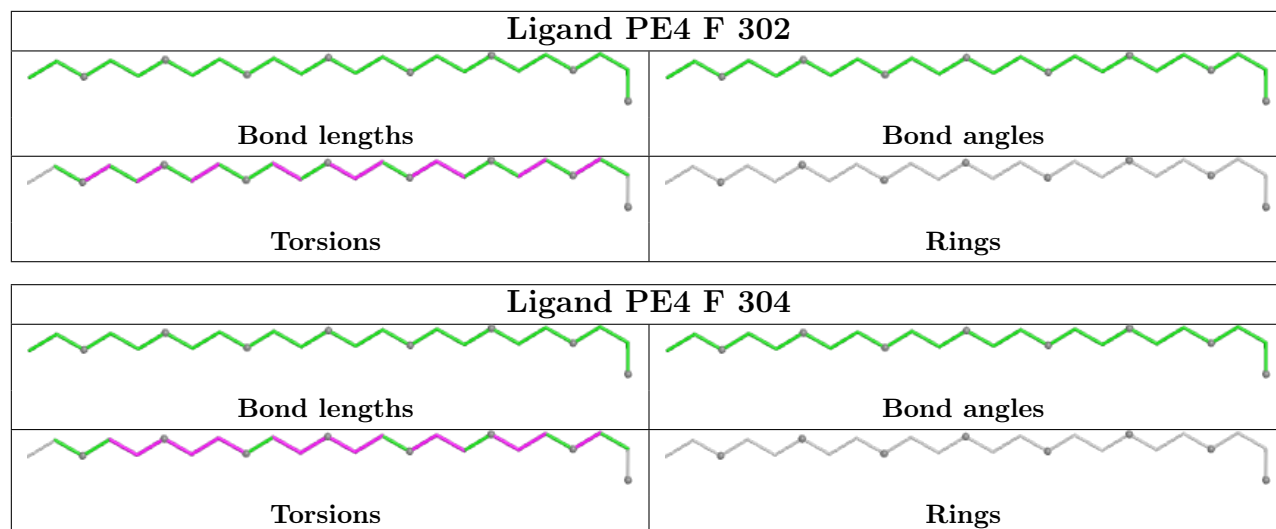
6 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	303	PE4	2	0
2	G	302	PE4	4	0
2	A	303	PE4	1	0
3	B	301	D12	1	0
2	A	304	PE4	2	0
5	C	303	12P	1	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](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

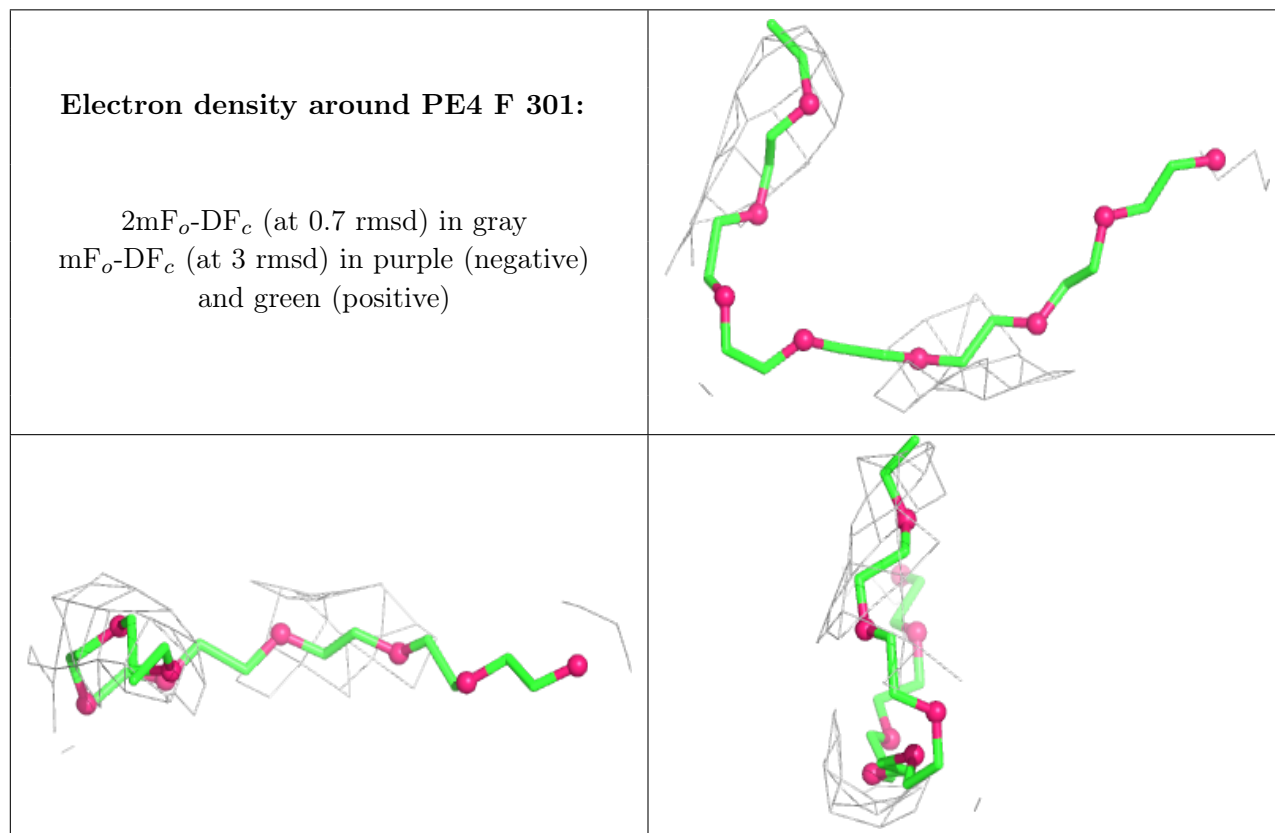
### 6.3 Carbohydrates [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.4 Ligands [i](#)

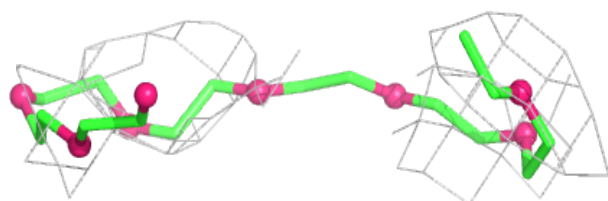
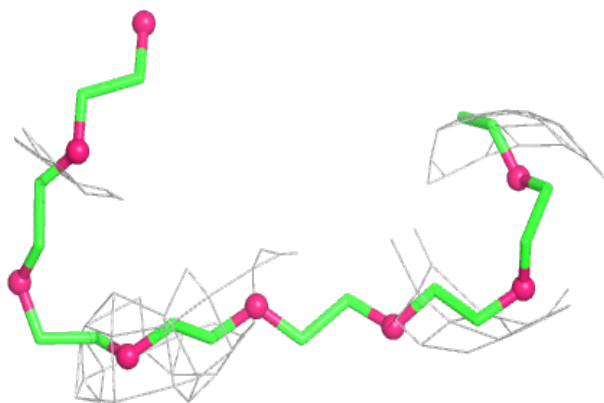
Unable to reproduce the depositors R factor - this section is therefore empty.

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.

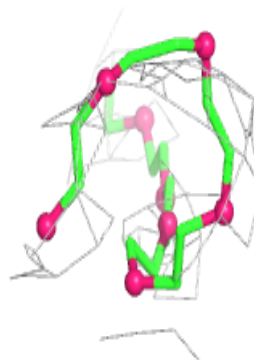
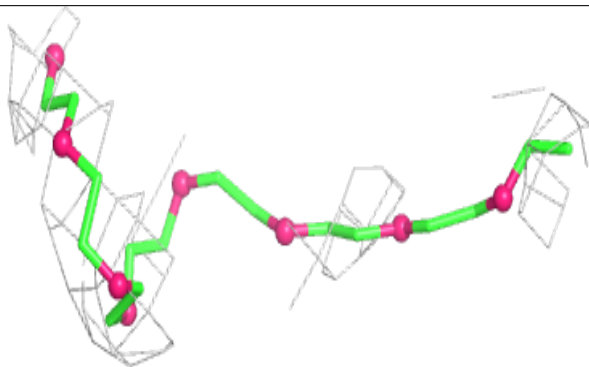
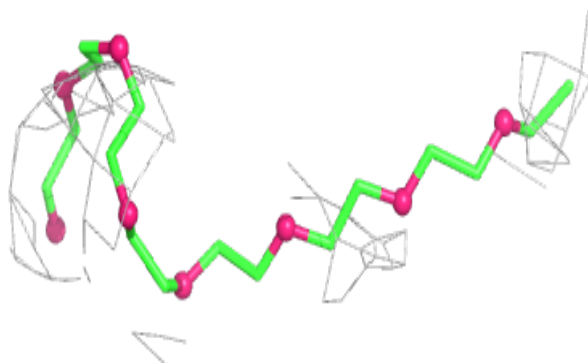


**Electron density around PE4 F 302:**

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

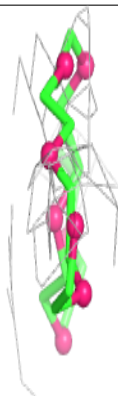
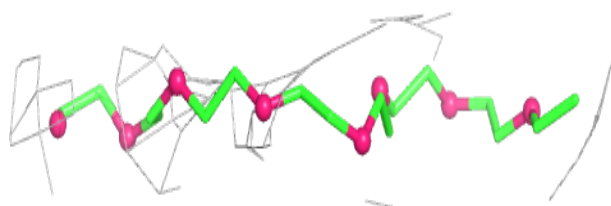
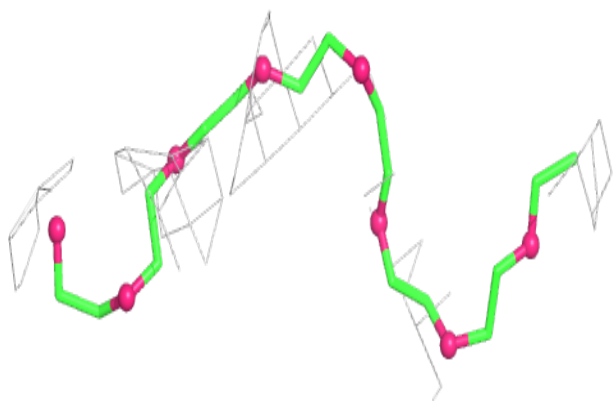
**Electron density around PE4 F 303:**

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



**Electron density around PE4 F 304:**

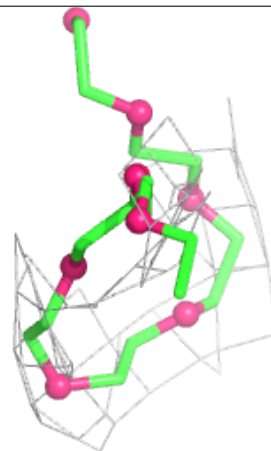
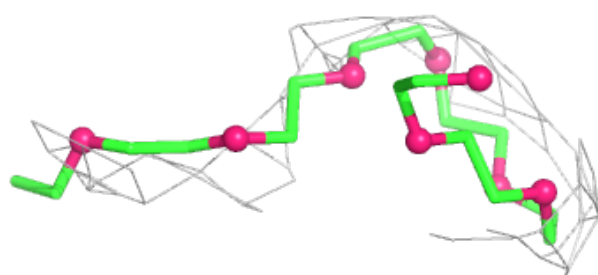
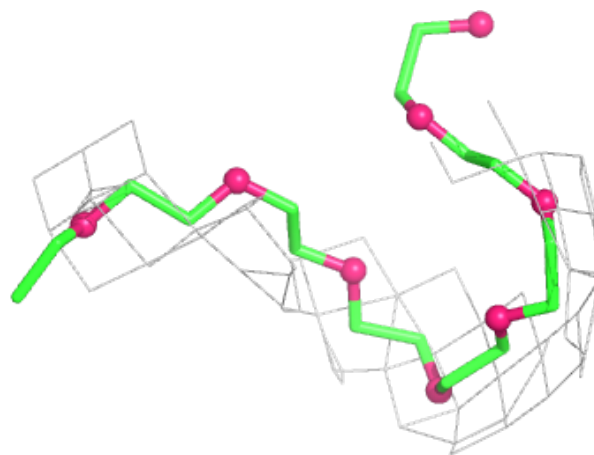
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





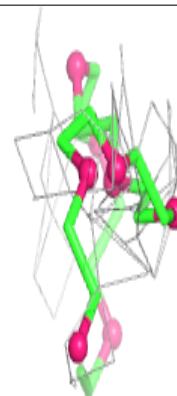
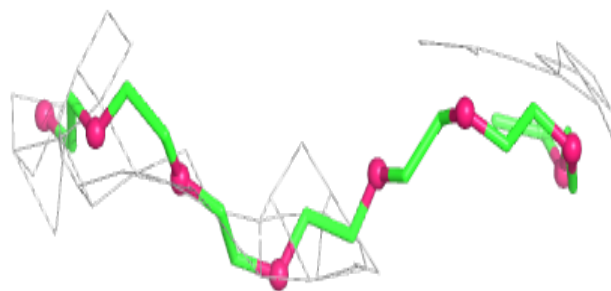
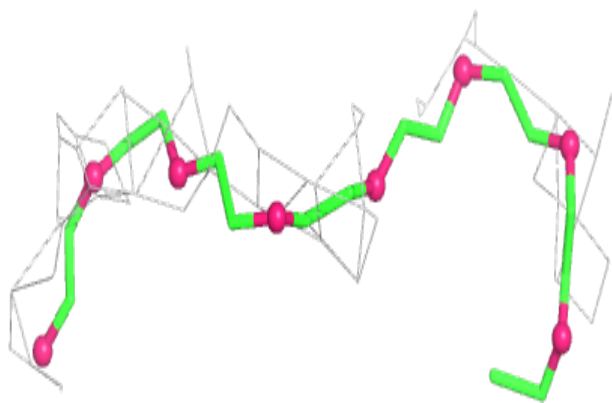
**Electron density around PE4 A 302:**

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

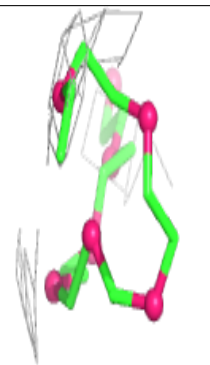
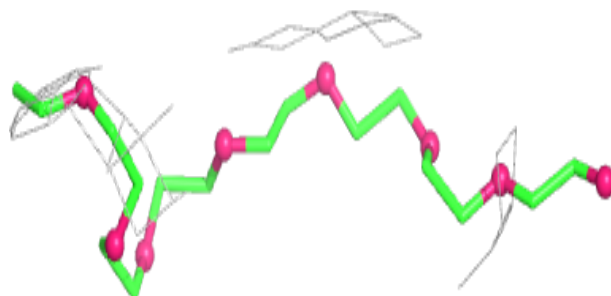
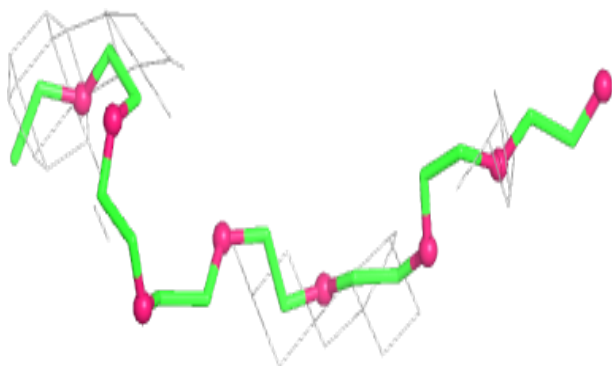


**Electron density around PE4 A 303:**

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

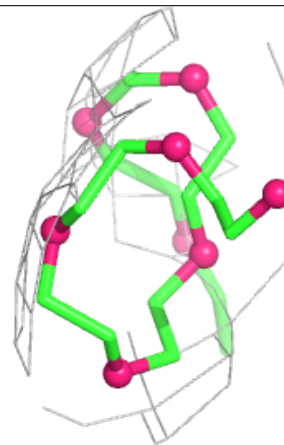
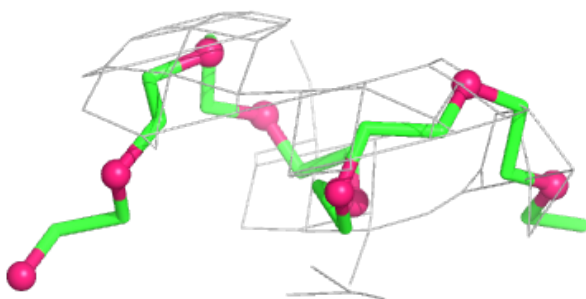
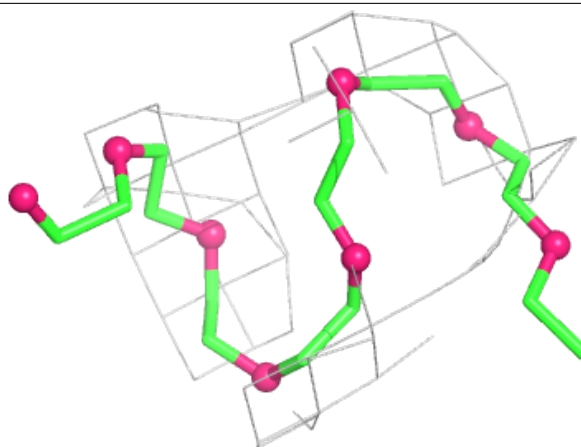
**Electron density around PE4 A 304:**

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



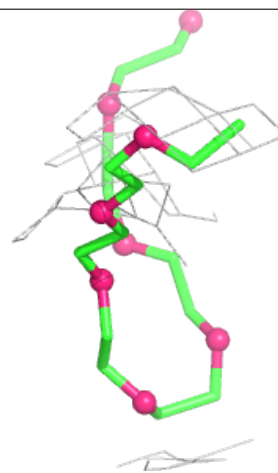
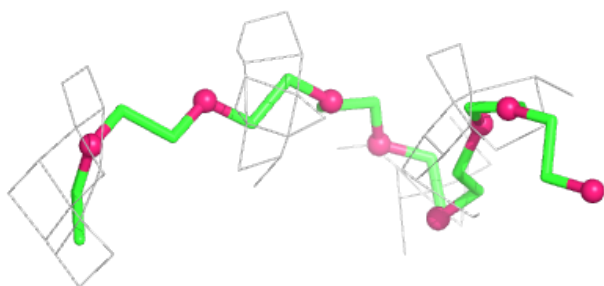
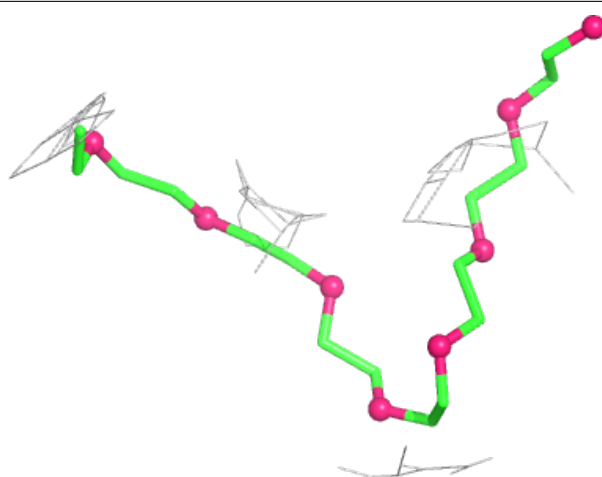
**Electron density around PE4 G 302:**

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



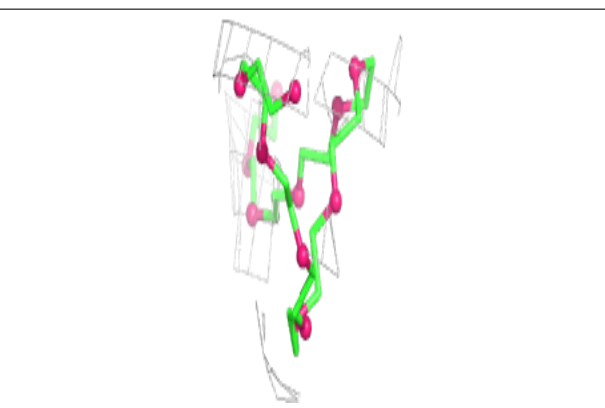
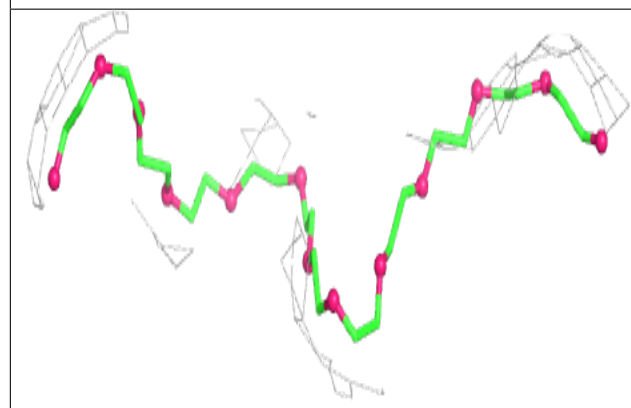
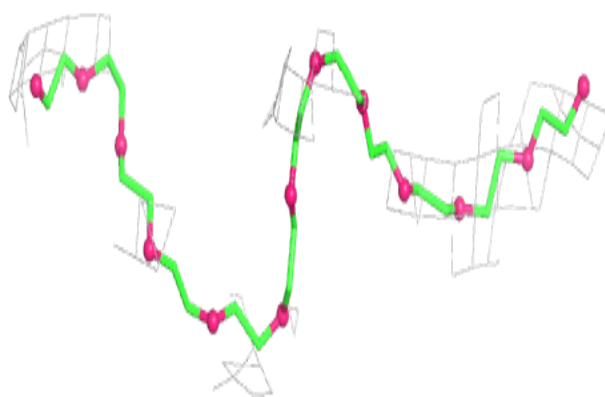
**Electron density around PE4 H 302:**

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

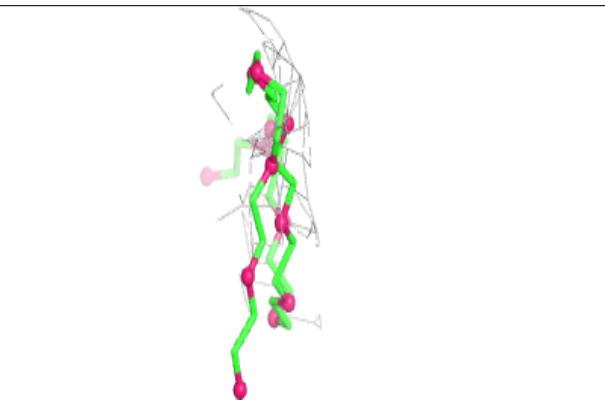
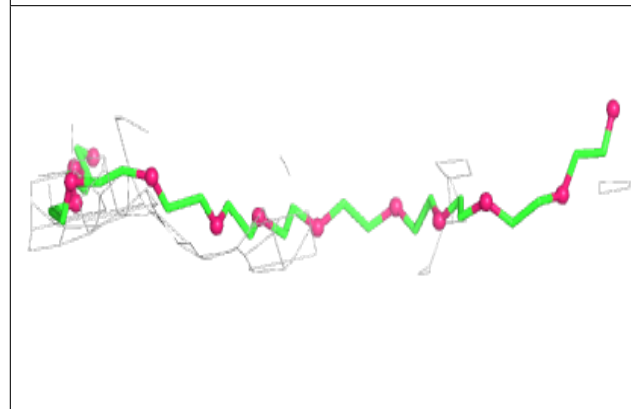


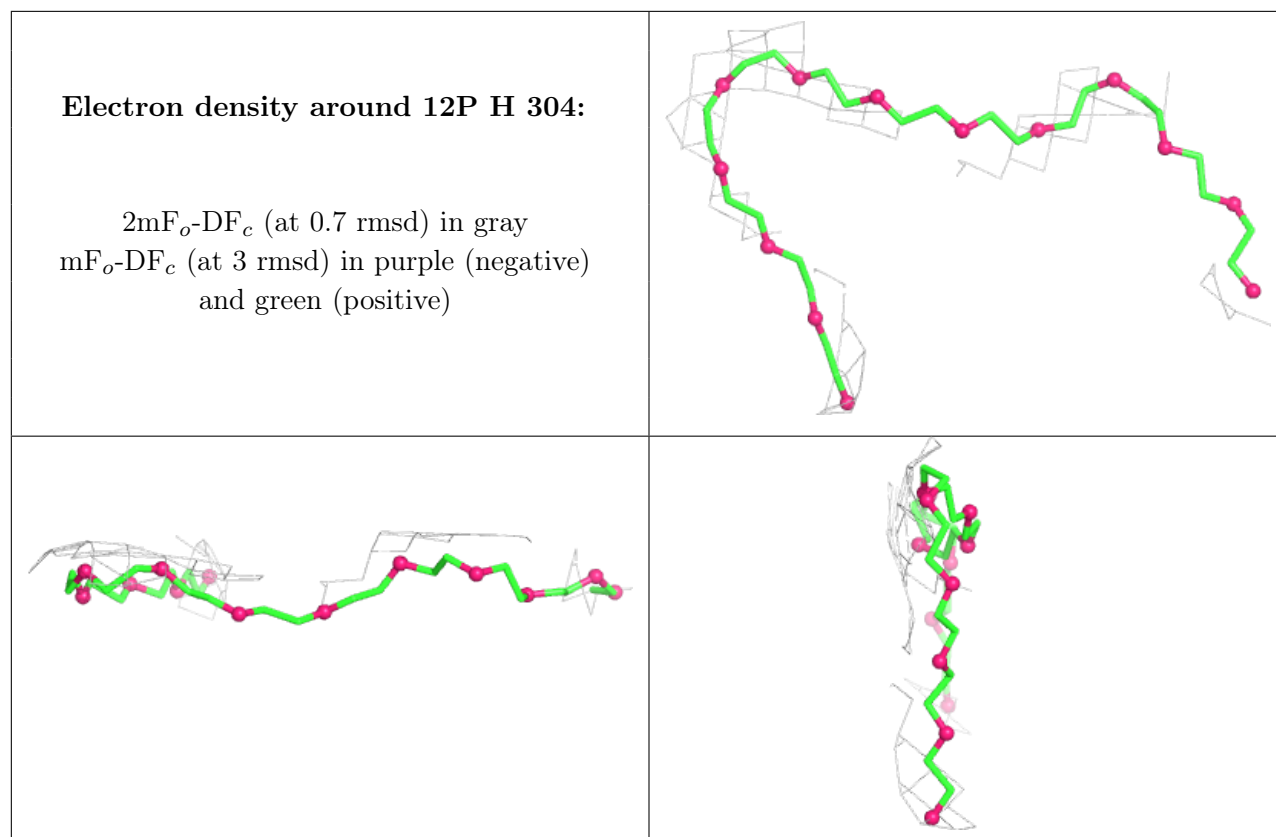
**Electron density around 12P C 302:**

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

**Electron density around 12P C 303:**

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





## 6.5 Other polymers [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.