



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 23, 2024 – 02:52 AM EDT

PDB ID : 6GCQ
Title : Trypanosoma brucei PTR1 in complex with inhibitor 2b (F192)
Authors : Pozzi, C.; Landi, G.; Mangani, S.
Deposited on : 2018-04-18
Resolution : 1.58 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 2.37.1
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) : 2.37.1

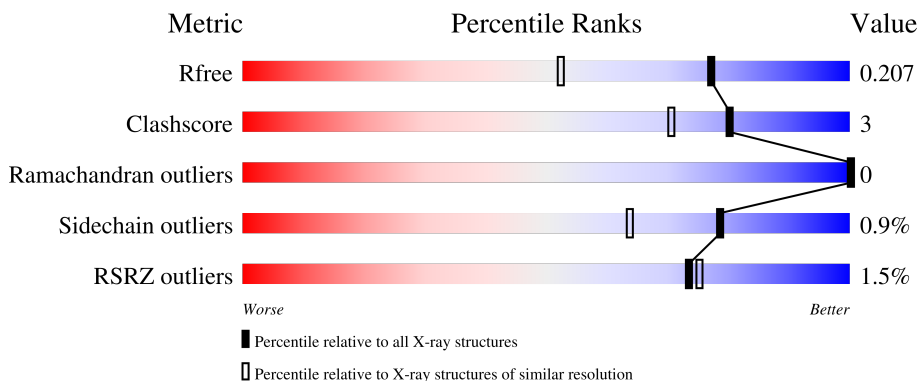
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.58 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	5534 (1.60-1.56)
Clashscore	141614	5861 (1.60-1.56)
Ramachandran outliers	138981	5708 (1.60-1.56)
Sidechain outliers	138945	5703 (1.60-1.56)
RSRZ outliers	127900	5431 (1.60-1.56)

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 ≥ 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	288	 82% 5% 13%
1	B	288	 83% 5% 12%
1	C	288	 80% 7% 12%
1	D	288	 83% 5% 13%

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 8678 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 Pteridine reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	251	1905	1202	332	359	12	0	9	0
1	B	253	1915	1210	333	361	11	0	10	0
1	C	252	1894	1197	329	356	12	0	11	0
1	D	250	1874	1182	327	353	12	0	7	0

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP O76290
A	-18	GLY	-	expression tag	UNP O76290
A	-17	SER	-	expression tag	UNP O76290
A	-16	SER	-	expression tag	UNP O76290
A	-15	HIS	-	expression tag	UNP O76290
A	-14	HIS	-	expression tag	UNP O76290
A	-13	HIS	-	expression tag	UNP O76290
A	-12	HIS	-	expression tag	UNP O76290
A	-11	HIS	-	expression tag	UNP O76290
A	-10	HIS	-	expression tag	UNP O76290
A	-9	SER	-	expression tag	UNP O76290
A	-8	SER	-	expression tag	UNP O76290
A	-7	GLY	-	expression tag	UNP O76290
A	-6	LEU	-	expression tag	UNP O76290
A	-5	VAL	-	expression tag	UNP O76290
A	-4	PRO	-	expression tag	UNP O76290
A	-3	ARG	-	expression tag	UNP O76290
A	-2	GLY	-	expression tag	UNP O76290
A	-1	SER	-	expression tag	UNP O76290
A	0	HIS	-	expression tag	UNP O76290
B	-19	MET	-	initiating methionine	UNP O76290

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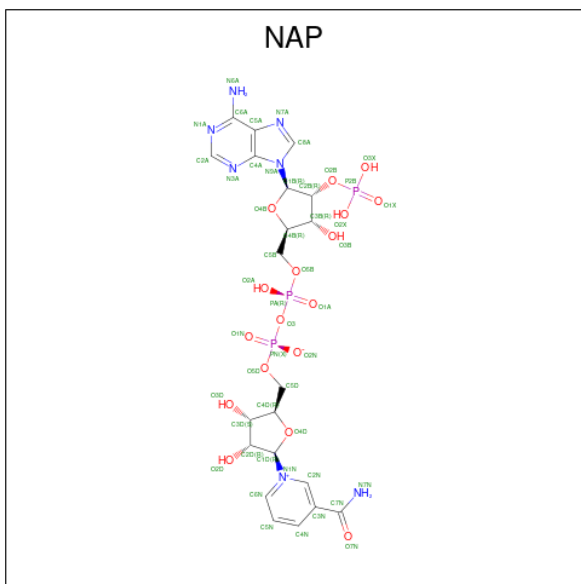
Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	expression tag	UNP O76290
B	-17	SER	-	expression tag	UNP O76290
B	-16	SER	-	expression tag	UNP O76290
B	-15	HIS	-	expression tag	UNP O76290
B	-14	HIS	-	expression tag	UNP O76290
B	-13	HIS	-	expression tag	UNP O76290
B	-12	HIS	-	expression tag	UNP O76290
B	-11	HIS	-	expression tag	UNP O76290
B	-10	HIS	-	expression tag	UNP O76290
B	-9	SER	-	expression tag	UNP O76290
B	-8	SER	-	expression tag	UNP O76290
B	-7	GLY	-	expression tag	UNP O76290
B	-6	LEU	-	expression tag	UNP O76290
B	-5	VAL	-	expression tag	UNP O76290
B	-4	PRO	-	expression tag	UNP O76290
B	-3	ARG	-	expression tag	UNP O76290
B	-2	GLY	-	expression tag	UNP O76290
B	-1	SER	-	expression tag	UNP O76290
B	0	HIS	-	expression tag	UNP O76290
C	-19	MET	-	initiating methionine	UNP O76290
C	-18	GLY	-	expression tag	UNP O76290
C	-17	SER	-	expression tag	UNP O76290
C	-16	SER	-	expression tag	UNP O76290
C	-15	HIS	-	expression tag	UNP O76290
C	-14	HIS	-	expression tag	UNP O76290
C	-13	HIS	-	expression tag	UNP O76290
C	-12	HIS	-	expression tag	UNP O76290
C	-11	HIS	-	expression tag	UNP O76290
C	-10	HIS	-	expression tag	UNP O76290
C	-9	SER	-	expression tag	UNP O76290
C	-8	SER	-	expression tag	UNP O76290
C	-7	GLY	-	expression tag	UNP O76290
C	-6	LEU	-	expression tag	UNP O76290
C	-5	VAL	-	expression tag	UNP O76290
C	-4	PRO	-	expression tag	UNP O76290
C	-3	ARG	-	expression tag	UNP O76290
C	-2	GLY	-	expression tag	UNP O76290
C	-1	SER	-	expression tag	UNP O76290
C	0	HIS	-	expression tag	UNP O76290
D	-19	MET	-	initiating methionine	UNP O76290
D	-18	GLY	-	expression tag	UNP O76290
D	-17	SER	-	expression tag	UNP O76290

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	expression tag	UNP O76290
D	-15	HIS	-	expression tag	UNP O76290
D	-14	HIS	-	expression tag	UNP O76290
D	-13	HIS	-	expression tag	UNP O76290
D	-12	HIS	-	expression tag	UNP O76290
D	-11	HIS	-	expression tag	UNP O76290
D	-10	HIS	-	expression tag	UNP O76290
D	-9	SER	-	expression tag	UNP O76290
D	-8	SER	-	expression tag	UNP O76290
D	-7	GLY	-	expression tag	UNP O76290
D	-6	LEU	-	expression tag	UNP O76290
D	-5	VAL	-	expression tag	UNP O76290
D	-4	PRO	-	expression tag	UNP O76290
D	-3	ARG	-	expression tag	UNP O76290
D	-2	GLY	-	expression tag	UNP O76290
D	-1	SER	-	expression tag	UNP O76290
D	0	HIS	-	expression tag	UNP O76290

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).



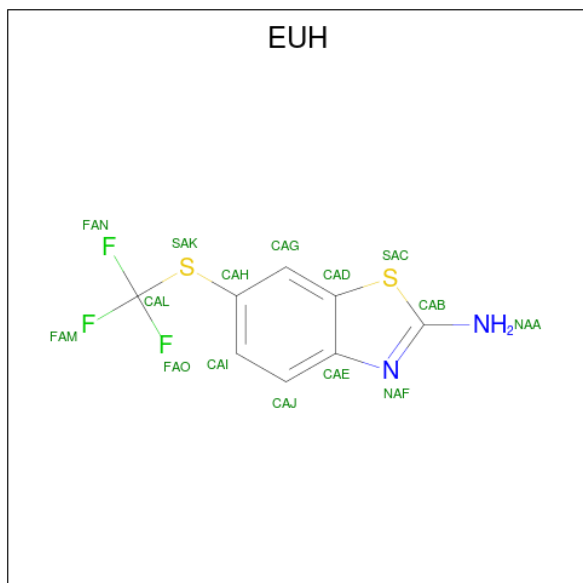
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
2	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
2	C	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 3 is 6-(trifluoromethylsulfanyl)-1,3-benzothiazol-2-amine (three-letter code: EUH) (formula: C₈H₅F₃N₂S₂).



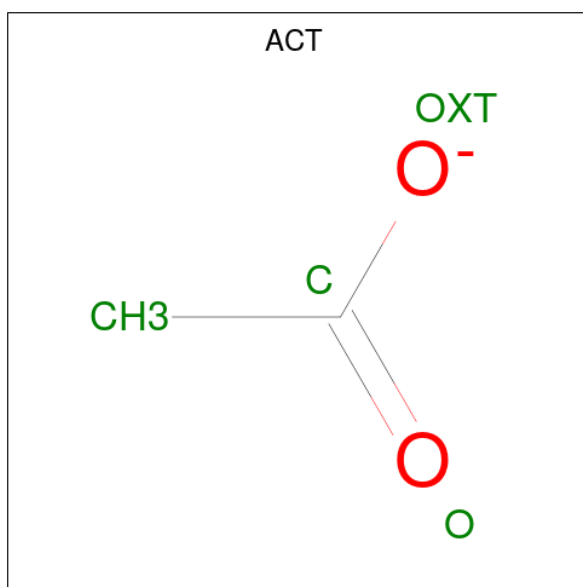
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
3	A	1	Total	C	F	N	S	0	0
			15	8	3	2	2		
3	B	1	Total	C	F	N	S	0	0
			15	8	3	2	2		
3	C	1	Total	C	F	N	S	0	0
			15	8	3	2	2		
3	D	1	Total	C	F	N	S	0	0
			15	8	3	2	2		

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	1
			12	6	6		

- Molecule 5 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



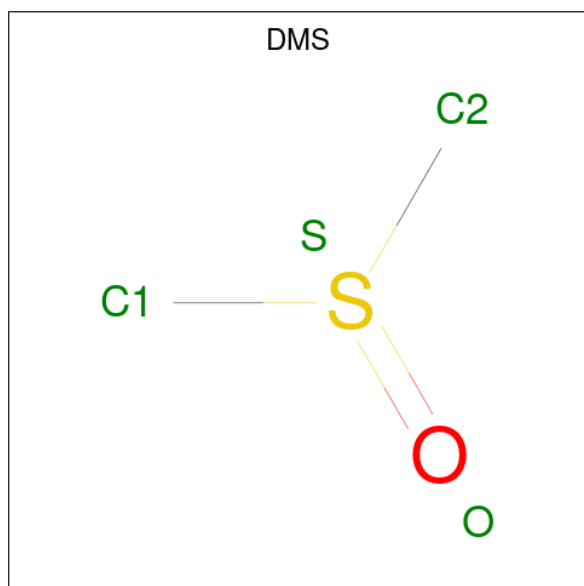
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	B	1	4	2	2	0	0

- Molecule 6 is DIMETHYL SULFOXIDE (three-letter code: DMS) (formula: C₂H₆OS).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	S		
6	A	1	4	2	1	1	0	0
6	B	1	4	2	1	1	0	0
6	C	1	4	2	1	1	0	1
6	D	1	4	2	1	1	0	0


- Molecule 7 is water.

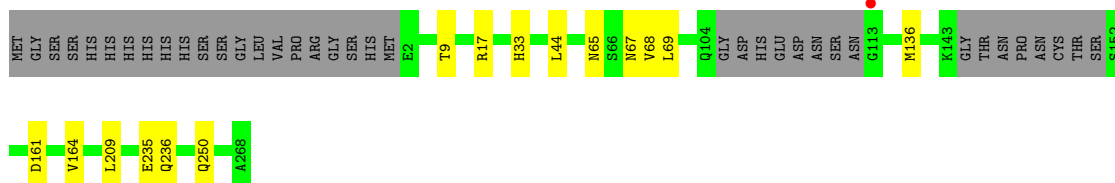
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
7	A	172	174	174	0	3
7	B	211	217	217	0	9
7	C	185	188	188	0	8
7	D	210	211	211	0	2

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.

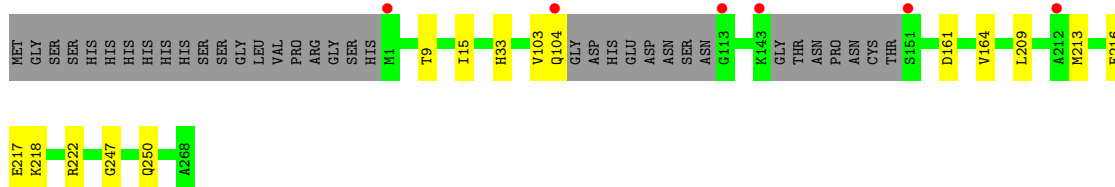
- Molecule 1: Pteridine reductase

Chain A: 




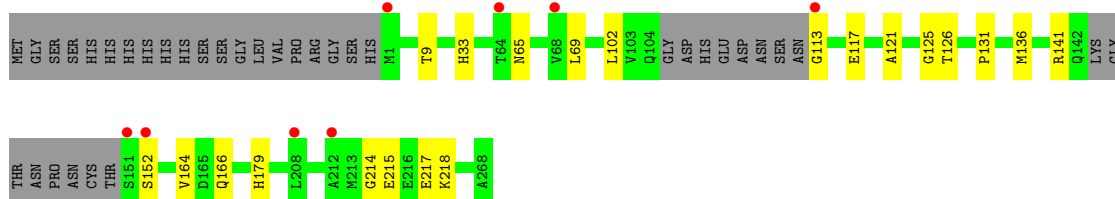
- Molecule 1: Pteridine reductase

Chain B: 




- Molecule 1: Pteridine reductase

Chain C: 



- Molecule 1: Pteridine reductase

Chain D: 





4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	74.66Å 89.91Å 82.86Å 90.00° 115.53° 90.00°	Depositor
Resolution (Å)	53.97 – 1.58 53.91 – 1.58	Depositor EDS
% Data completeness (in resolution range)	99.7 (53.97-1.58) 99.7 (53.91-1.58)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.36 (at 1.58Å)	Xtrriage
Refinement program	REFMAC 5.8.0222	Depositor
R, R_{free}	0.174 , 0.207 0.175 , 0.207	Depositor DCC
R_{free} test set	6810 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	18.0	Xtrriage
Anisotropy	0.228	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 54.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.002 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	8678	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 37.91 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.9952e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical 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: DMS, NAP, EUH, GOL, ACT

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	0.79	0/1953	0.87	0/2651
1	B	0.81	0/1963	0.88	0/2664
1	C	0.79	0/1951	0.86	0/2650
1	D	0.79	0/1922	0.85	0/2610
All	All	0.80	0/7789	0.87	0/10575

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	1905	0	1933	14	0
1	B	1915	0	1930	16	0
1	C	1894	0	1914	14	0
1	D	1874	0	1897	8	0
2	A	48	0	25	0	0
2	B	48	0	25	1	0
2	C	48	0	25	0	0
2	D	48	0	25	1	0
3	A	15	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	15	0	0	0	0
3	C	15	0	0	0	0
3	D	15	0	0	0	0
4	A	6	0	8	0	0
4	B	6	0	8	0	0
4	C	12	0	16	0	0
5	A	4	0	3	0	0
5	B	4	0	3	0	0
6	A	4	0	6	0	0
6	B	4	0	6	0	0
6	C	4	0	6	0	0
6	D	4	0	6	0	0
7	A	174	0	0	1	0
7	B	217	0	0	2	0
7	C	188	0	0	3	0
7	D	211	0	0	2	0
All	All	8678	0	7836	43	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 3.

All (43) 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:C:164:VAL:HG22	1:C:179:HIS:CD2	2.09	0.88
1:B:250[B]:GLN:HG2	7:B:524:HOH:O	1.90	0.69
1:A:236:GLN:HE21	1:B:250[B]:GLN:CD	2.03	0.61
1:B:104:GLN:H	1:D:140:GLN:HE22	1.49	0.60
1:C:164:VAL:HG22	1:C:179:HIS:NE2	2.18	0.59
1:B:209:LEU:HD13	1:B:218[B]:LYS:HB3	1.84	0.58
1:A:65:ASN:HA	1:A:69:LEU:HD22	1.87	0.56
1:C:113:GLY:N	7:C:402:HOH:O	2.38	0.56
1:A:250:GLN:NE2	7:A:402:HOH:O	2.38	0.56
1:A:236:GLN:HE21	1:B:250[B]:GLN:HG3	1.72	0.54
1:A:161:ASP:HB3	1:A:164:VAL:HG13	1.91	0.52
1:A:236:GLN:HE21	1:B:250[B]:GLN:CG	2.24	0.51
1:B:103:VAL:HG22	7:D:408:HOH:O	2.11	0.51
1:A:136[B]:MET:HE2	1:C:102:LEU:HA	1.93	0.49
1:B:15:ILE:HB	2:B:301:NAP:H51N	1.95	0.49
1:D:140:GLN:NE2	7:D:402:HOH:O	2.26	0.48
1:D:65:ASN:HA	1:D:69:LEU:HD22	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:103:VAL:HG21	1:D:195:TYR:CZ	2.47	0.48
1:C:136[B]:MET:HG3	7:C:405:HOH:O	2.12	0.48
1:A:236:GLN:NE2	1:B:250[B]:GLN:HG3	2.28	0.47
1:B:9:THR:HA	1:B:33:HIS:HB3	1.96	0.47
1:B:161:ASP:HB3	1:B:164:VAL:HG13	1.97	0.47
1:D:219:ASP:O	1:D:223:ARG:HG3	2.13	0.47
1:C:65:ASN:HA	1:C:69:LEU:HD22	1.98	0.45
1:C:65:ASN:ND2	7:C:410:HOH:O	2.49	0.45
1:C:164:VAL:CG2	1:C:179:HIS:CD2	2.90	0.45
1:B:247:GLY:HA2	1:B:250[A]:GLN:HG3	1.99	0.45
1:B:216:GLU:HG2	1:B:217:GLU:N	2.31	0.44
1:D:130:ALA:HB3	1:D:131:PRO:HD3	1.99	0.44
1:D:9:THR:HA	1:D:33:HIS:HB3	2.00	0.43
1:A:136[B]:MET:HG3	1:C:102:LEU:O	2.18	0.43
1:A:67:ASN:HA	1:C:117:GLU:HG3	2.01	0.43
1:C:9:THR:HA	1:C:33:HIS:HB3	2.01	0.42
1:A:17:ARG:HG3	1:A:44:LEU:HD22	2.01	0.42
1:B:213:MET:HA	7:B:406:HOH:O	2.19	0.42
1:A:235[B]:GLU:CD	1:A:235[B]:GLU:H	2.23	0.41
1:C:214:GLY:O	1:C:218:LYS:HG3	2.21	0.41
1:A:9:THR:HA	1:A:33:HIS:HB3	2.03	0.40
1:D:35:HIS:HB2	2:D:301:NAP:C2A	2.51	0.40
1:C:121:ALA:O	1:C:125:GLY:HA3	2.20	0.40

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	254/288 (88%)	245 (96%)	9 (4%)	0	100	100
1	B	257/288 (89%)	247 (96%)	10 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	257/288 (89%)	247 (96%)	10 (4%)	0	100	100
1	D	251/288 (87%)	242 (96%)	9 (4%)	0	100	100
All	All	1019/1152 (88%)	981 (96%)	38 (4%)	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	203/231 (88%)	202 (100%)	1 (0%)	88	80
1	B	200/231 (87%)	200 (100%)	0	100	100
1	C	199/231 (86%)	193 (97%)	6 (3%)	41	15
1	D	199/231 (86%)	199 (100%)	0	100	100
All	All	801/924 (87%)	794 (99%)	7 (1%)	78	64

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	209	LEU
1	C	131	PRO
1	C	141	ARG
1	C	152	SER
1	C	166	GLN
1	C	215	GLU
1	C	217	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	25	GLN
1	A	65	ASN

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Mol	Chain	Res	Type
1	A	236	GLN
1	B	65	ASN
1	C	65	ASN
1	C	186	GLN
1	D	140	GLN
1	D	186	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](#)

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](#)

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
3	EUH	D	302	-	13,16,16	1.50	2 (15%)	18,24,24	1.76	4 (22%)
6	DMS	C	304[B]	-	3,3,3	0.70	0	3,3,3	1.31	1 (33%)
2	NAP	D	301	-	46,52,52	1.89	10 (21%)	61,80,80	1.61	9 (14%)
4	GOL	C	303[B]	-	5,5,5	0.46	0	5,5,5	0.82	0
2	NAP	B	301	-	46,52,52	1.59	9 (19%)	61,80,80	1.53	8 (13%)
5	ACT	A	304	-	3,3,3	0.61	0	3,3,3	1.43	0
6	DMS	B	305	-	3,3,3	0.30	0	3,3,3	1.37	1 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	GOL	B	303	-	5,5,5	0.55	0	5,5,5	0.59	0
3	EUH	C	302	-	13,16,16	1.77	4 (30%)	18,24,24	1.34	2 (11%)
2	NAP	A	301	-	46,52,52	1.77	12 (26%)	61,80,80	1.76	9 (14%)
3	EUH	A	302	-	13,16,16	1.83	5 (38%)	18,24,24	1.80	6 (33%)
3	EUH	B	302	-	13,16,16	1.43	3 (23%)	18,24,24	1.64	5 (27%)
2	NAP	C	301	-	46,52,52	1.32	7 (15%)	61,80,80	1.72	10 (16%)
6	DMS	D	303	-	3,3,3	0.55	0	3,3,3	1.96	1 (33%)
5	ACT	B	304	-	3,3,3	0.55	0	3,3,3	0.90	0
6	DMS	A	305	-	3,3,3	0.44	0	3,3,3	1.36	1 (33%)
4	GOL	A	303	-	5,5,5	0.61	0	5,5,5	0.64	0
4	GOL	C	303[A]	-	5,5,5	0.47	0	5,5,5	0.67	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
3	EUH	D	302	-	-	0/5/5/5	0/2/2/2
2	NAP	D	301	-	-	0/31/67/67	0/5/5/5
4	GOL	C	303[B]	-	-	2/4/4/4	-
2	NAP	B	301	-	-	0/31/67/67	0/5/5/5
4	GOL	B	303	-	-	2/4/4/4	-
3	EUH	C	302	-	-	0/5/5/5	0/2/2/2
2	NAP	A	301	-	-	0/31/67/67	0/5/5/5
3	EUH	A	302	-	-	0/5/5/5	0/2/2/2
3	EUH	B	302	-	-	0/5/5/5	0/2/2/2
2	NAP	C	301	-	-	0/31/67/67	0/5/5/5
4	GOL	A	303	-	-	0/4/4/4	-
4	GOL	C	303[A]	-	-	2/4/4/4	-

All (52) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	NAP	P2B-O2B	5.67	1.69	1.59
2	D	301	NAP	O4D-C1D	5.35	1.47	1.40
2	A	301	NAP	O4D-C1D	5.22	1.47	1.40
2	B	301	NAP	PA-O3	4.37	1.64	1.59
2	A	301	NAP	PA-O3	4.31	1.64	1.59
2	B	301	NAP	O4D-C1D	4.10	1.46	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	NAP	PA-O3	4.00	1.63	1.59
2	B	301	NAP	PN-O3	3.78	1.63	1.59
2	D	301	NAP	C7N-N7N	3.41	1.39	1.33
2	A	301	NAP	PN-O3	3.39	1.63	1.59
2	B	301	NAP	C2A-N3A	3.33	1.37	1.32
2	A	301	NAP	C2N-N1N	3.28	1.38	1.35
2	C	301	NAP	O4D-C1D	3.16	1.45	1.40
3	C	302	EUH	CAJ-CAE	-2.85	1.37	1.41
2	B	301	NAP	C7N-N7N	2.84	1.38	1.33
2	C	301	NAP	PN-O3	2.80	1.62	1.59
2	A	301	NAP	P2B-O2B	2.79	1.64	1.59
2	D	301	NAP	C2A-N3A	2.79	1.36	1.32
2	D	301	NAP	C2N-N1N	2.78	1.38	1.35
3	C	302	EUH	CAG-CAH	2.71	1.41	1.37
3	A	302	EUH	FAN-CAL	2.71	1.41	1.32
2	D	301	NAP	C4A-N3A	2.69	1.39	1.35
3	A	302	EUH	CAG-CAH	2.64	1.41	1.37
2	D	301	NAP	O2D-C2D	2.55	1.49	1.43
2	A	301	NAP	C4A-N3A	2.52	1.39	1.35
2	A	301	NAP	C2A-N3A	2.49	1.35	1.32
3	B	302	EUH	CAG-CAH	2.48	1.41	1.37
3	D	302	EUH	CAI-CAH	2.45	1.43	1.39
2	C	301	NAP	O4B-C4B	-2.44	1.39	1.45
3	D	302	EUH	FAN-CAL	-2.43	1.25	1.32
2	C	301	NAP	C2A-N3A	2.41	1.35	1.32
2	C	301	NAP	C2N-N1N	2.40	1.37	1.35
2	A	301	NAP	C7N-N7N	2.39	1.37	1.33
3	B	302	EUH	CAJ-CAI	2.36	1.41	1.36
3	C	302	EUH	FAM-CAL	2.35	1.40	1.32
2	B	301	NAP	C6N-N1N	2.30	1.40	1.35
3	A	302	EUH	CAJ-CAE	-2.28	1.38	1.41
3	B	302	EUH	FAO-CAL	2.25	1.39	1.32
2	C	301	NAP	O2D-C2D	2.21	1.48	1.43
2	D	301	NAP	C2A-N1A	2.21	1.37	1.33
2	B	301	NAP	P2B-O2B	2.19	1.63	1.59
3	C	302	EUH	CAH-SAK	2.18	1.81	1.78
3	A	302	EUH	CAJ-CAI	2.15	1.41	1.36
2	B	301	NAP	C5D-C4D	2.13	1.58	1.51
2	D	301	NAP	PN-O5D	2.13	1.67	1.59
2	A	301	NAP	O4B-C1B	2.13	1.43	1.40
2	A	301	NAP	C6A-C5A	2.10	1.51	1.43
2	A	301	NAP	C2A-N1A	2.10	1.37	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	302	EUH	CAH-SAK	-2.07	1.75	1.78
2	A	301	NAP	C4N-C3N	2.07	1.42	1.39
2	C	301	NAP	C6A-C5A	2.03	1.51	1.43
2	B	301	NAP	C2N-N1N	2.01	1.37	1.35

All (57) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	NAP	O4B-C1B-N9A	6.02	116.73	108.75
2	A	301	NAP	N3A-C2A-N1A	-5.78	120.82	128.67
2	D	301	NAP	O4B-C1B-N9A	5.67	116.26	108.75
2	B	301	NAP	C4B-O4B-C1B	-5.01	105.33	109.92
2	A	301	NAP	C4B-O4B-C1B	-4.93	105.41	109.92
2	D	301	NAP	C1B-N9A-C4A	-4.71	118.36	126.64
2	C	301	NAP	C1B-N9A-C4A	-4.34	119.02	126.64
2	B	301	NAP	C1B-N9A-C4A	-4.30	119.09	126.64
2	D	301	NAP	C2B-C1B-N9A	-4.18	103.28	112.56
2	D	301	NAP	N3A-C2A-N1A	-4.14	123.06	128.67
2	A	301	NAP	C1B-N9A-C4A	-4.12	119.40	126.64
3	D	302	EUH	CAE-CAD-SAC	-3.95	106.61	111.85
2	C	301	NAP	N3A-C2A-N1A	-3.75	123.58	128.67
2	A	301	NAP	O4B-C1B-N9A	3.74	113.70	108.75
2	B	301	NAP	O7N-C7N-C3N	-3.73	115.03	119.60
3	B	302	EUH	NAA-CAB-NAF	3.70	127.89	123.19
2	A	301	NAP	C5N-C4N-C3N	-3.69	116.74	120.36
2	C	301	NAP	O2B-P2B-O1X	-3.65	96.33	109.33
2	A	301	NAP	O2B-P2B-O1X	-3.44	97.08	109.33
2	C	301	NAP	C2B-C1B-N9A	-3.28	105.28	112.56
3	A	302	EUH	NAA-CAB-NAF	3.25	127.32	123.19
2	C	301	NAP	C3N-C7N-N7N	3.24	121.73	117.74
3	A	302	EUH	CAE-CAD-SAC	-3.17	107.64	111.85
2	A	301	NAP	C2B-C1B-N9A	-3.05	105.77	112.56
3	A	302	EUH	CAD-CAE-NAF	3.03	115.08	108.04
2	D	301	NAP	O7N-C7N-C3N	-2.94	116.00	119.60
3	C	302	EUH	CAD-CAE-NAF	2.92	114.84	108.04
6	D	303	DMS	O-S-C1	2.92	121.09	106.49
3	B	302	EUH	CAI-CAJ-CAE	-2.85	117.39	120.80
3	D	302	EUH	CAG-CAD-SAC	2.75	130.60	125.10
2	B	301	NAP	O2N-PN-O3	2.71	114.61	107.27
2	B	301	NAP	C2B-C1B-N9A	-2.68	106.60	112.56
2	C	301	NAP	C4A-C5A-N7A	-2.64	106.55	109.34
3	B	302	EUH	CAD-CAE-NAF	2.61	114.11	108.04

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	301	NAP	O2D-C2D-C3D	2.60	120.16	111.82
2	B	301	NAP	O2B-P2B-O1X	-2.53	100.31	109.33
2	C	301	NAP	C6N-N1N-C1D	-2.52	114.79	119.73
2	B	301	NAP	N3A-C2A-N1A	-2.50	125.28	128.67
2	D	301	NAP	O3X-P2B-O2X	2.47	117.06	107.80
3	A	302	EUH	CAI-CAJ-CAE	2.43	123.71	120.80
3	D	302	EUH	FAO-CAL-FAN	2.42	112.78	106.52
2	C	301	NAP	C4B-O4B-C1B	-2.40	107.72	109.92
2	D	301	NAP	O2B-P2B-O1X	-2.36	100.92	109.33
2	D	301	NAP	O2N-PN-O1N	2.34	123.33	112.44
6	B	305	DMS	O-S-C1	2.33	118.14	106.49
2	B	301	NAP	O7N-C7N-N7N	2.27	125.89	122.62
3	D	302	EUH	CAD-CAE-NAF	2.25	113.28	108.04
3	A	302	EUH	CAG-CAD-SAC	2.21	129.53	125.10
6	C	304[B]	DMS	O-S-C1	2.11	117.06	106.49
2	A	301	NAP	O2N-PN-O3	2.09	112.91	107.27
6	A	305	DMS	O-S-C1	2.09	116.93	106.49
3	C	302	EUH	CAE-CAD-SAC	-2.08	109.09	111.85
3	B	302	EUH	CAI-CAH-CAG	2.08	122.33	119.61
2	D	301	NAP	O3B-C3B-C2B	2.08	117.00	111.19
3	A	302	EUH	CAJ-CAI-CAH	-2.05	115.70	120.60
2	A	301	NAP	C4D-O4D-C1D	-2.05	108.05	109.92
3	B	302	EUH	CAE-CAD-SAC	-2.03	109.15	111.85

There are no chirality outliers.

All (6) torsion outliers are listed below:

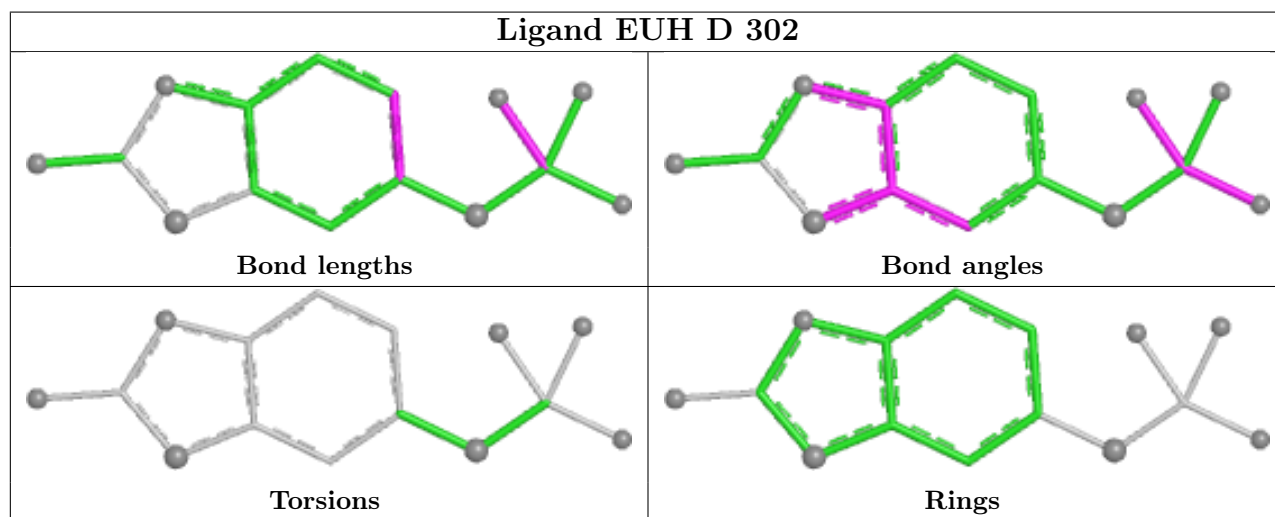
Mol	Chain	Res	Type	Atoms
4	B	303	GOL	C1-C2-C3-O3
4	C	303[A]	GOL	O1-C1-C2-C3
4	C	303[B]	GOL	O1-C1-C2-C3
4	C	303[B]	GOL	O1-C1-C2-O2
4	B	303	GOL	O2-C2-C3-O3
4	C	303[A]	GOL	O1-C1-C2-O2

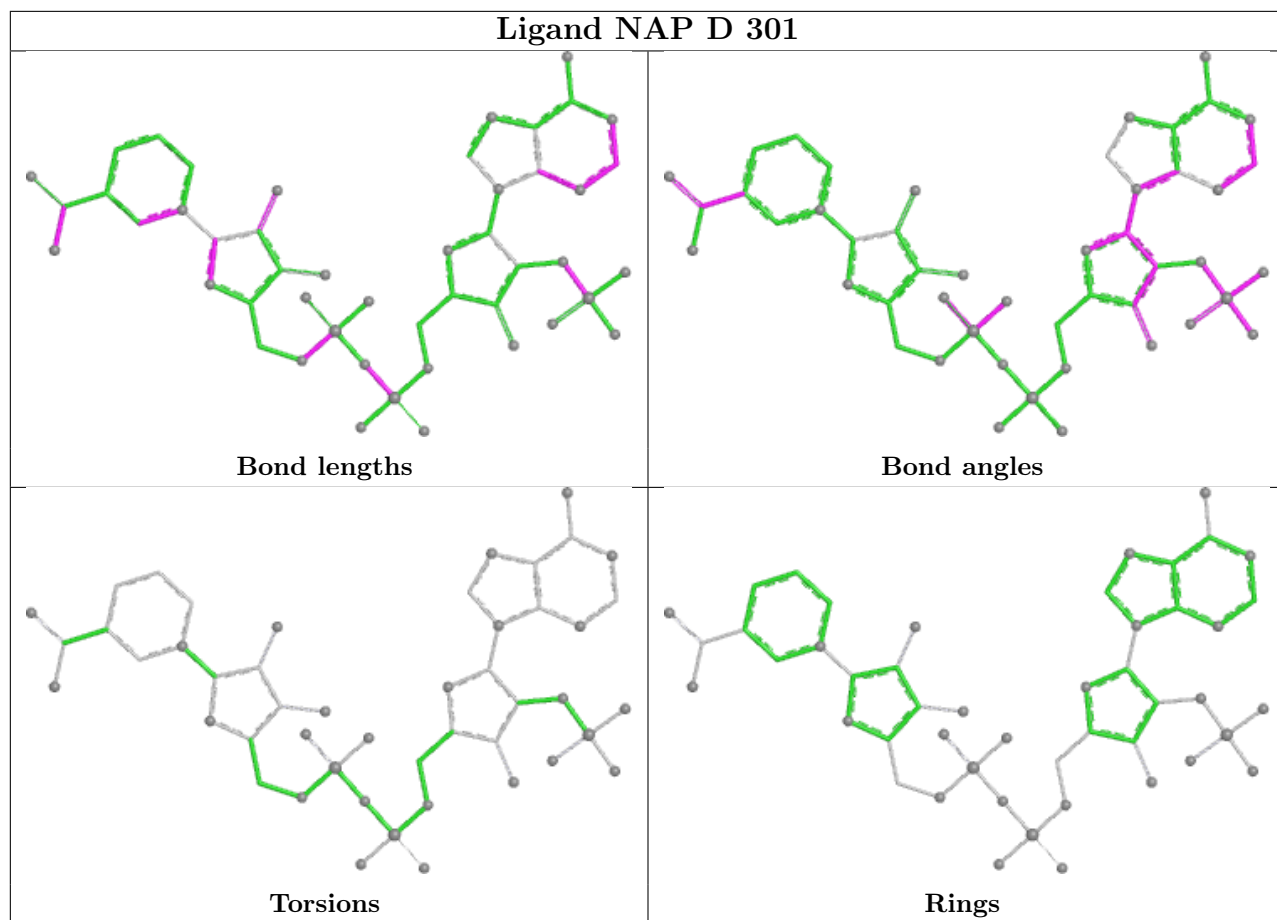
There are no ring outliers.

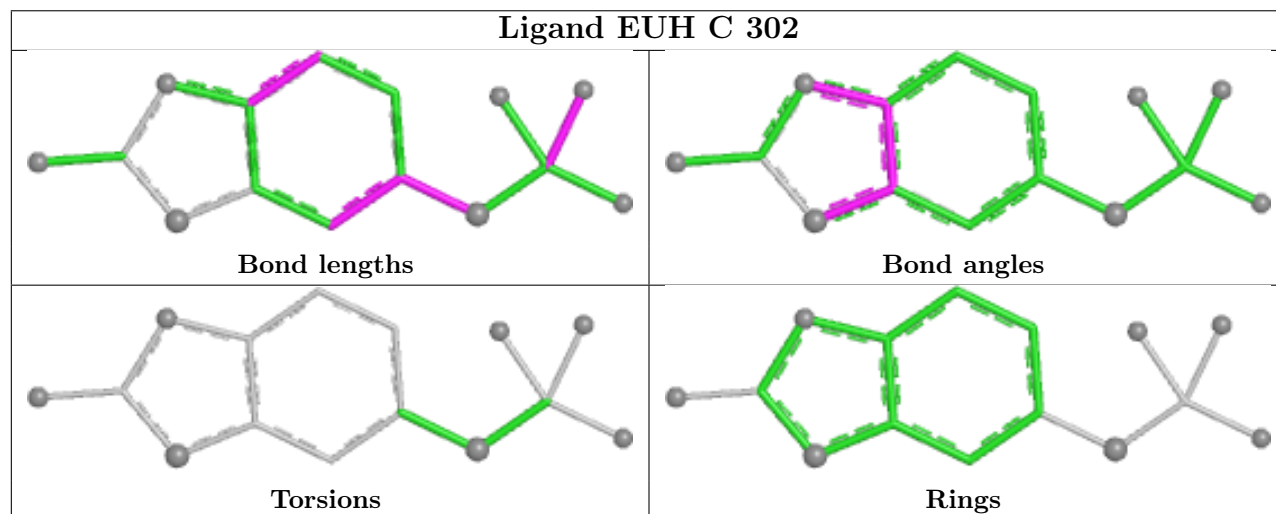
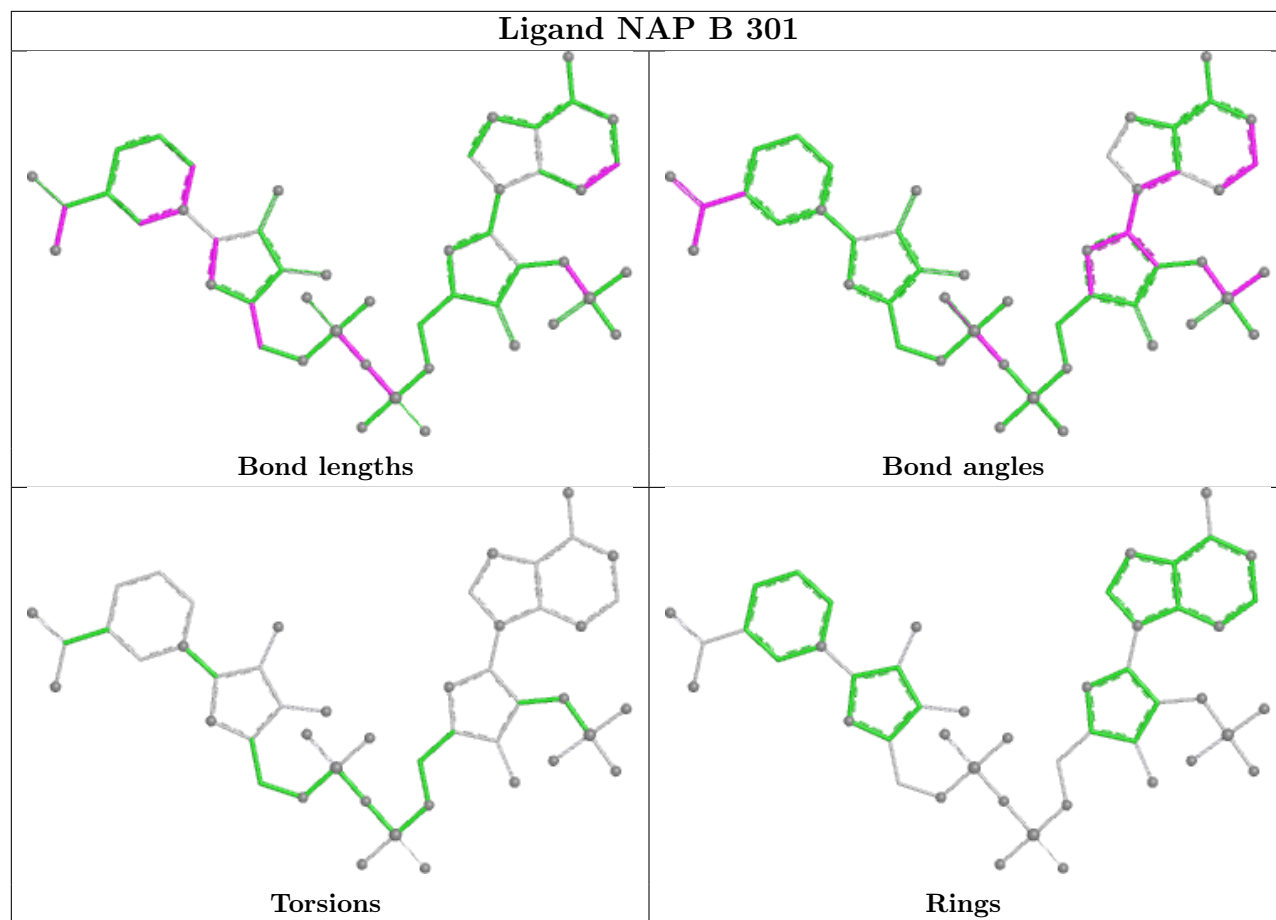
2 monomers are involved in 2 short contacts:

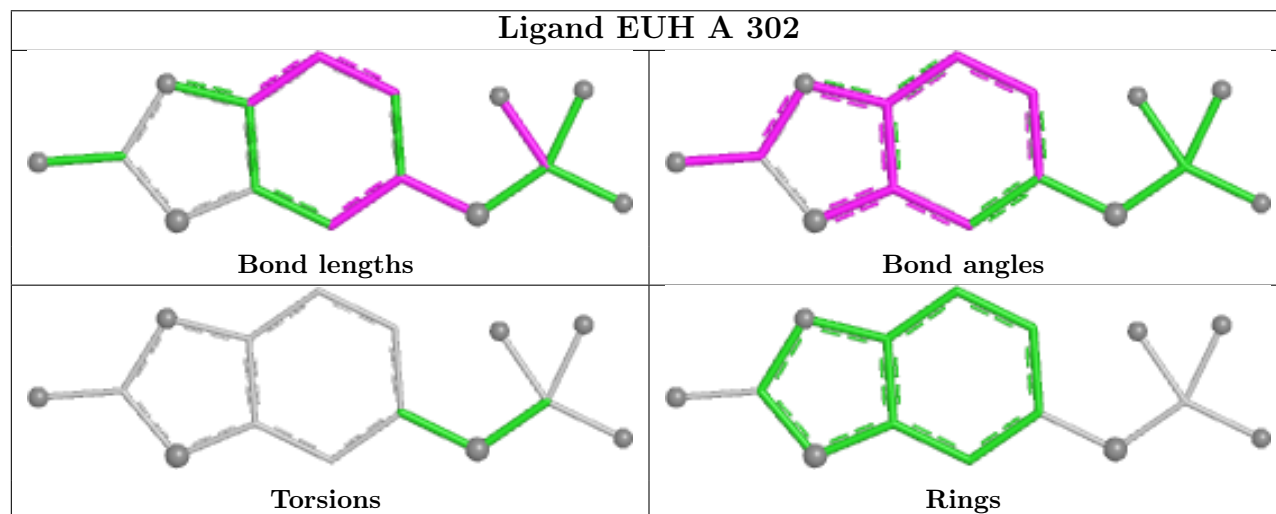
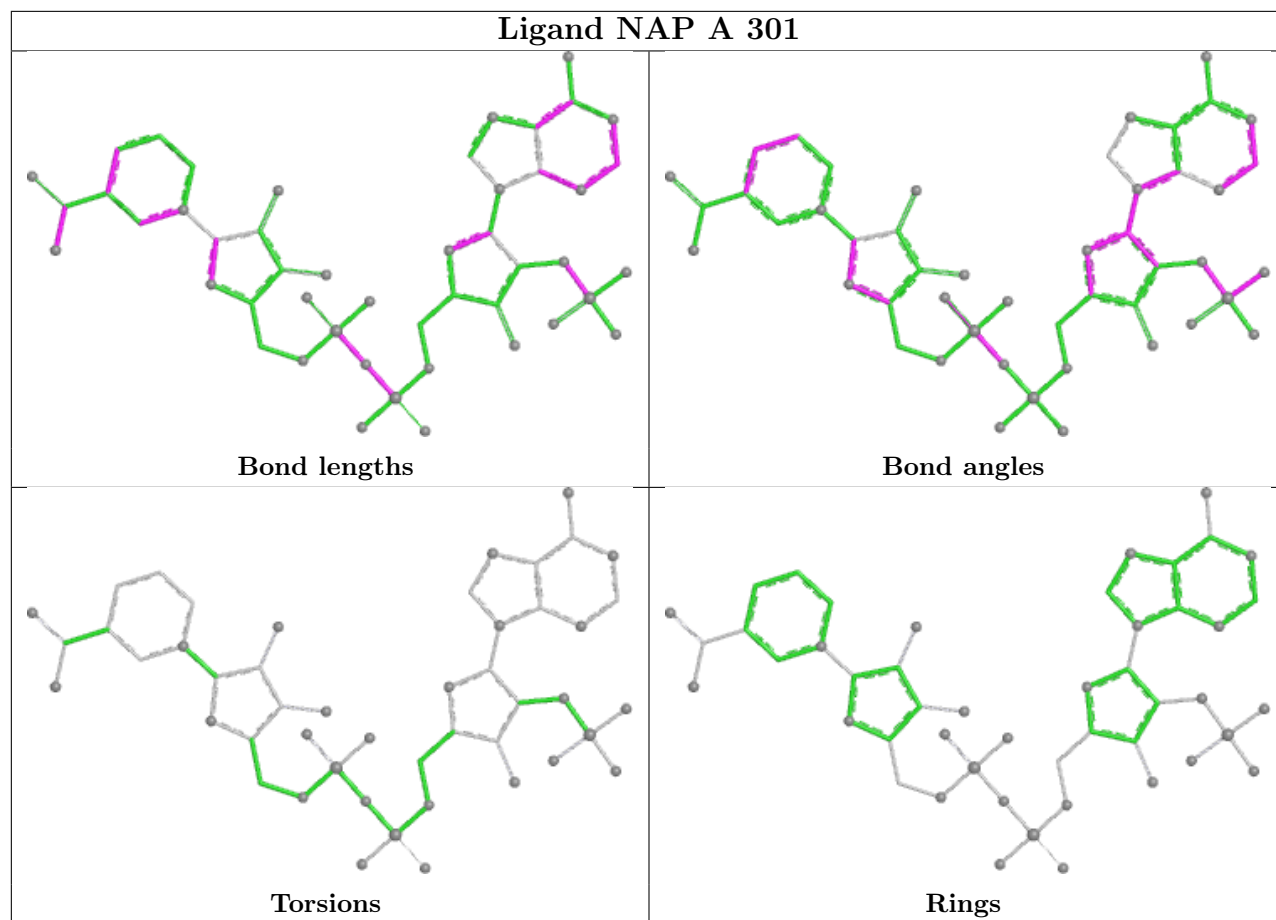
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	301	NAP	1	0
2	B	301	NAP	1	0

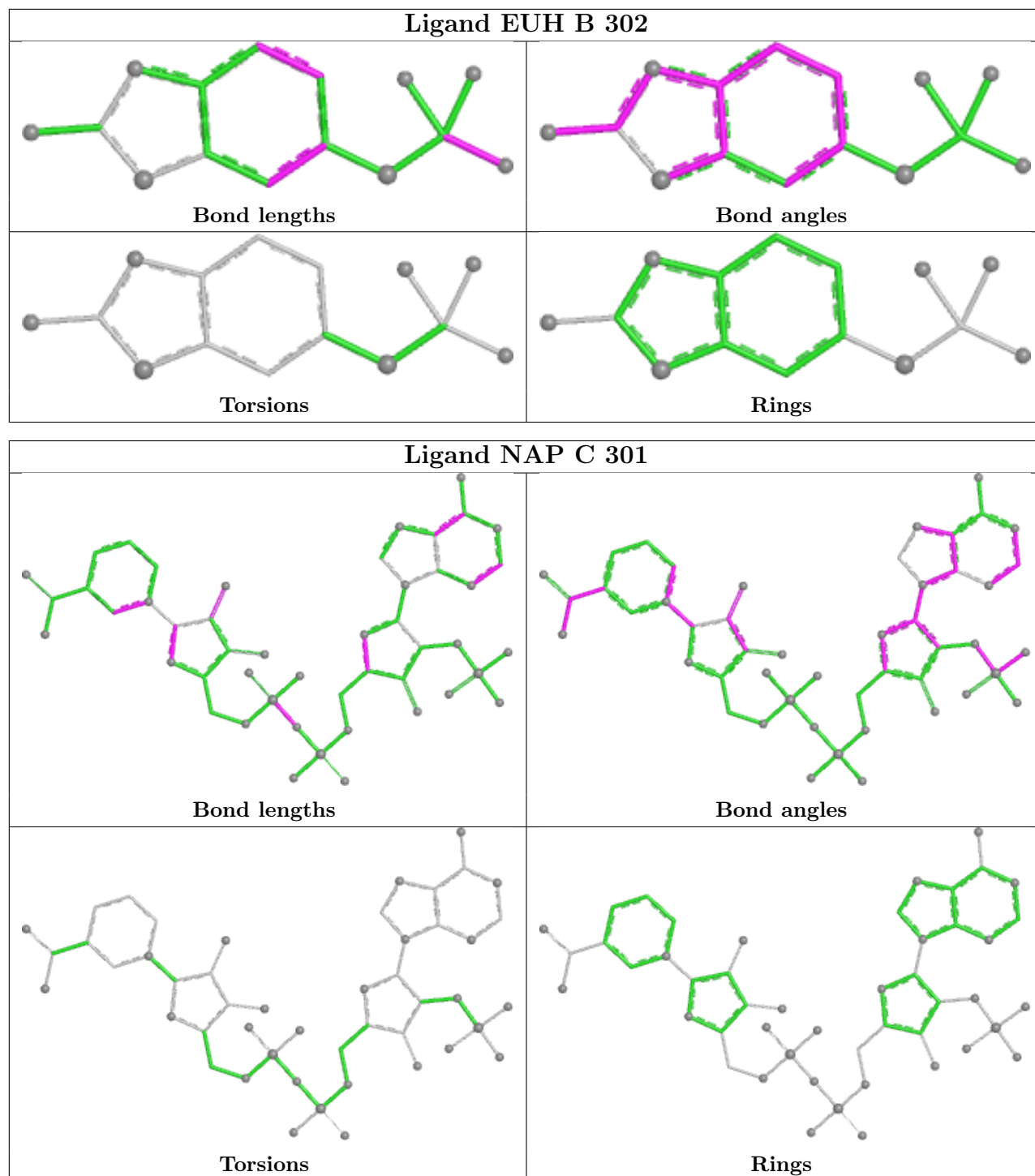
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

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, 95th 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 ²)	Q<0.9
1	A	251/288 (87%)	-0.07	1 (0%) 92 93	13, 23, 42, 67	6 (2%)
1	B	253/288 (87%)	-0.33	6 (2%) 59 60	12, 18, 41, 68	1 (0%)
1	C	252/288 (87%)	-0.12	8 (3%) 47 49	13, 22, 44, 70	3 (1%)
1	D	250/288 (86%)	-0.33	0 100 100	11, 20, 38, 54	0
All	All	1006/1152 (87%)	-0.21	15 (1%) 73 75	11, 21, 42, 70	10 (0%)

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	113	GLY	5.9
1	C	212	ALA	4.7
1	B	212	ALA	3.9
1	C	1	MET	3.6
1	B	113	GLY	3.4
1	B	104	GLN	3.0
1	C	64	THR	2.9
1	B	1	MET	2.8
1	A	113	GLY	2.6
1	C	68	VAL	2.6
1	B	143	LYS	2.4
1	B	151	SER	2.4
1	C	152	SER	2.3
1	C	208	LEU	2.3
1	C	151	SER	2.2

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

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

6.3 Carbohydrates [i](#)

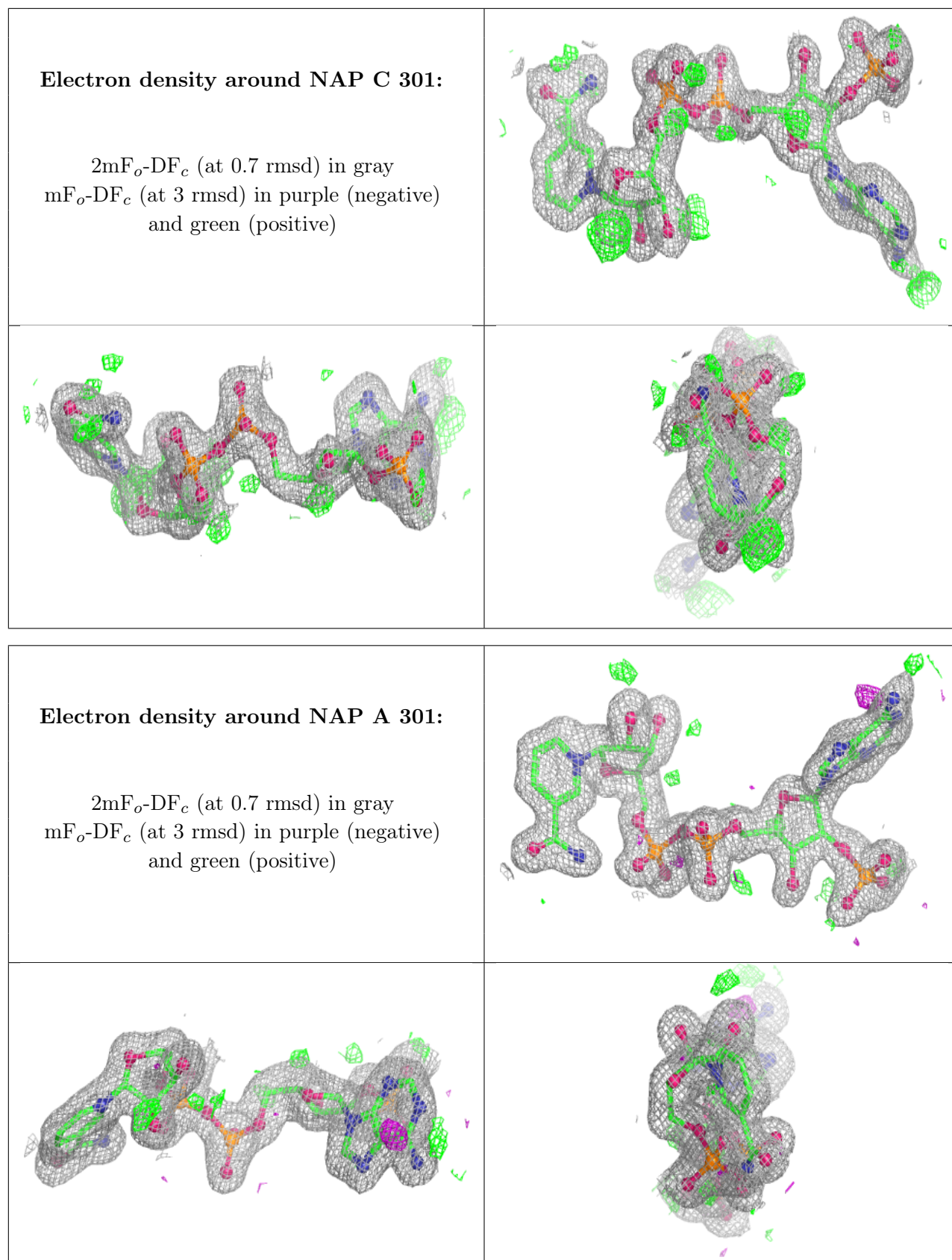
There are no monosaccharides in this entry.

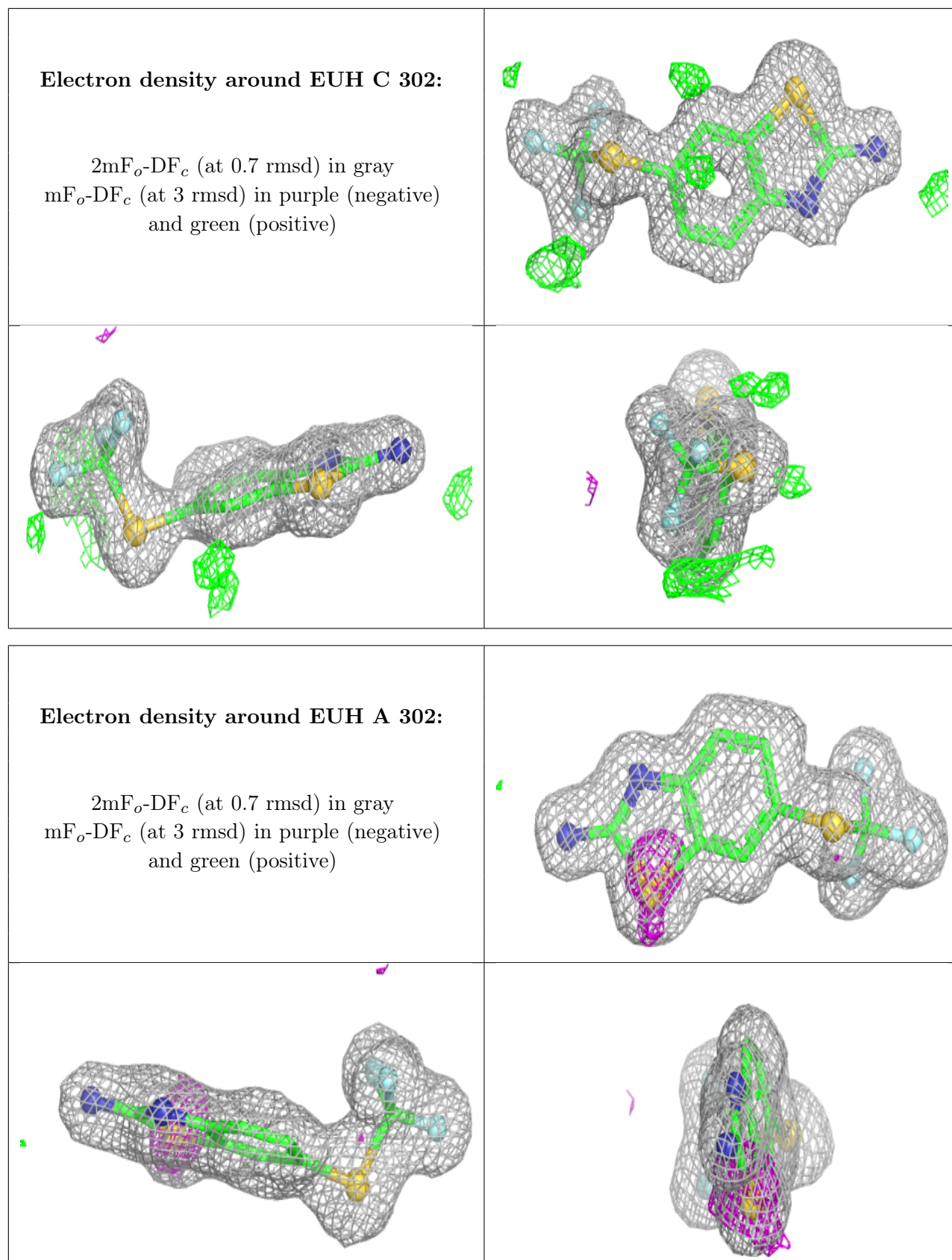
6.4 Ligands [i](#)

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, 95th 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 ²)	Q<0.9
4	GOL	B	303	6/6	0.81	0.10	41,47,50,52	0
4	GOL	A	303	6/6	0.83	0.12	36,46,49,51	0
4	GOL	C	303[A]	6/6	0.85	0.18	17,28,30,34	6
4	GOL	C	303[B]	6/6	0.85	0.18	23,25,25,29	6
5	ACT	A	304	4/4	0.88	0.15	26,31,33,38	4
2	NAP	C	301	48/48	0.92	0.10	18,22,26,29	48
2	NAP	A	301	48/48	0.95	0.07	20,24,29,31	0
3	EUH	C	302	15/15	0.96	0.08	20,22,30,30	15
5	ACT	B	304	4/4	0.96	0.12	26,27,28,28	0
3	EUH	A	302	15/15	0.97	0.07	25,27,32,33	0
3	EUH	D	302	15/15	0.97	0.07	19,21,25,28	0
6	DMS	A	305	4/4	0.97	0.08	28,30,31,32	4
6	DMS	C	304[B]	4/4	0.97	0.28	15,16,19,20	4
2	NAP	B	301	48/48	0.98	0.08	15,19,21,23	0
3	EUH	B	302	15/15	0.98	0.07	18,20,29,29	0
6	DMS	B	305	4/4	0.98	0.07	21,21,21,25	4
2	NAP	D	301	48/48	0.98	0.05	15,20,24,26	0
6	DMS	D	303	4/4	0.98	0.07	21,23,24,25	4

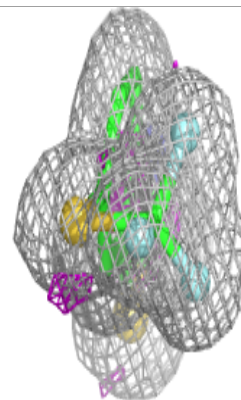
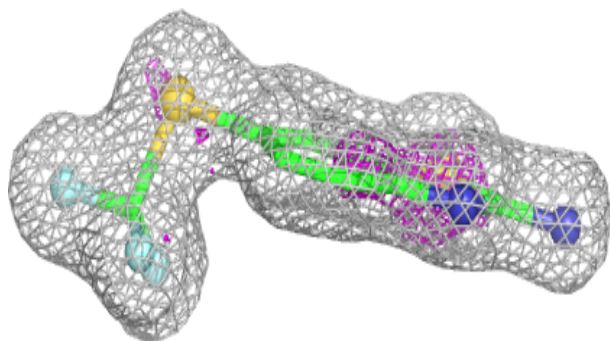
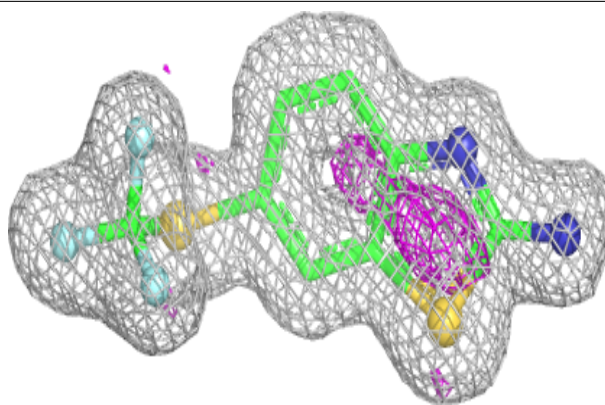
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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



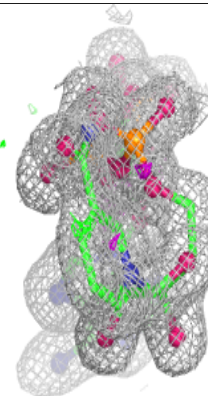
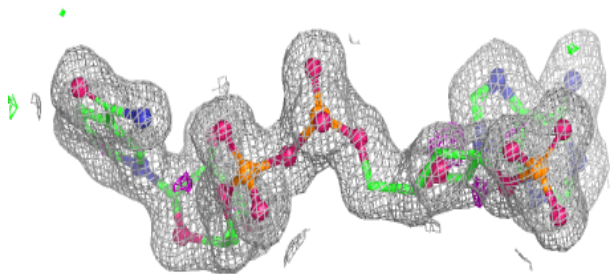
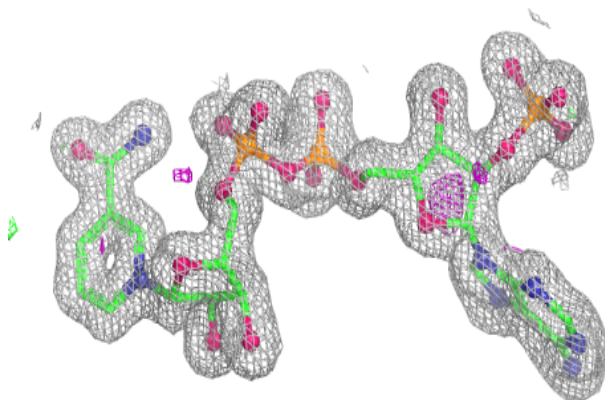


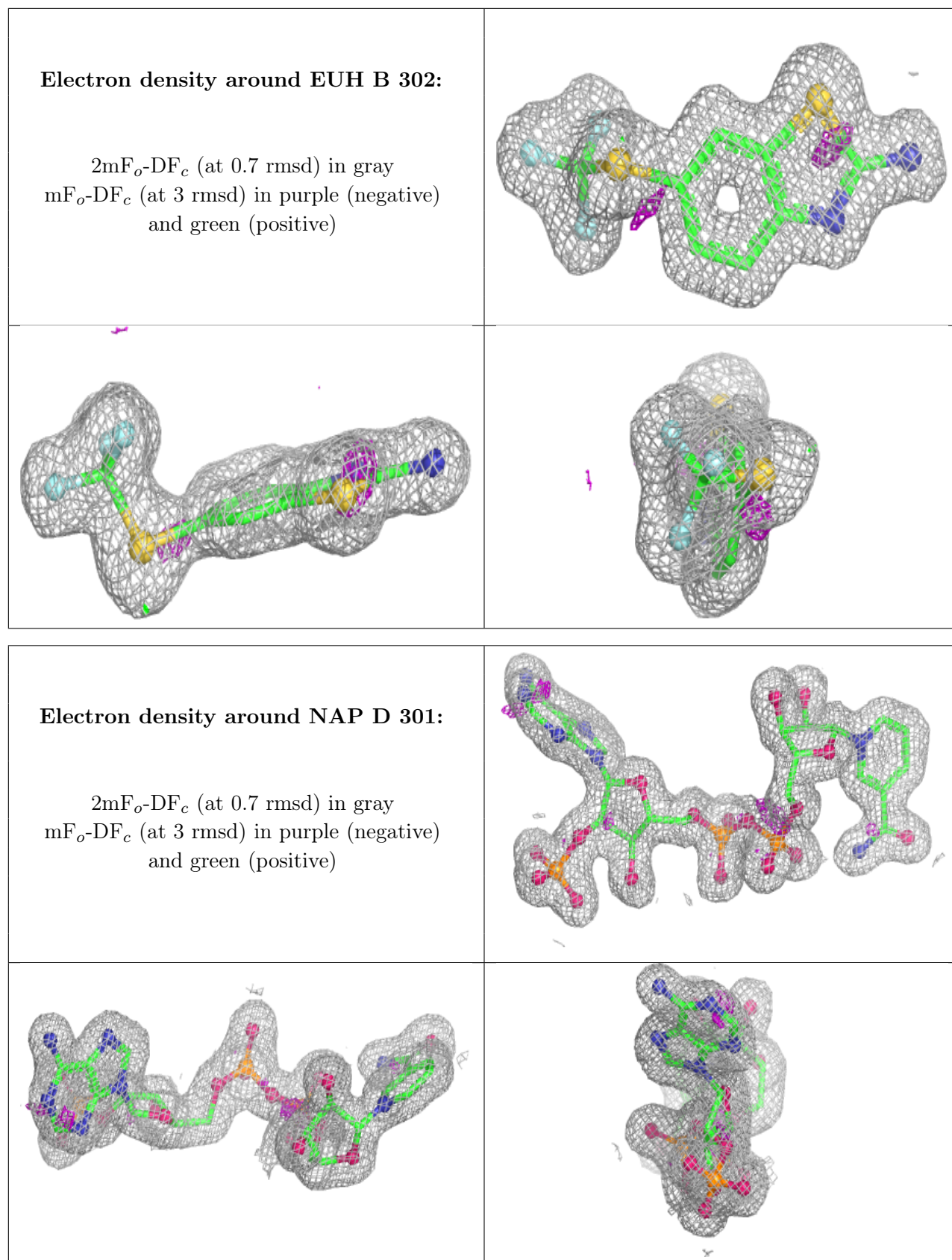
Electron density around EUH D 302:

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

**Electron density around NAP B 301:**

$2mF_o-DF_c$ (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.