



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 18, 2023 – 12:30 am GMT

PDB ID : 4BNN  
Title : Crystal structure of *S. aureus* FabI in complex with NADP and 2-(2-cyanophenoxy)-5-hexylphenol  
Authors : Schiebel, J.; Chang, A.; Bommineni, G.R.; Tonge, P.J.; Kisker, C.  
Deposited on : 2013-05-15  
Resolution : 2.25 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](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.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

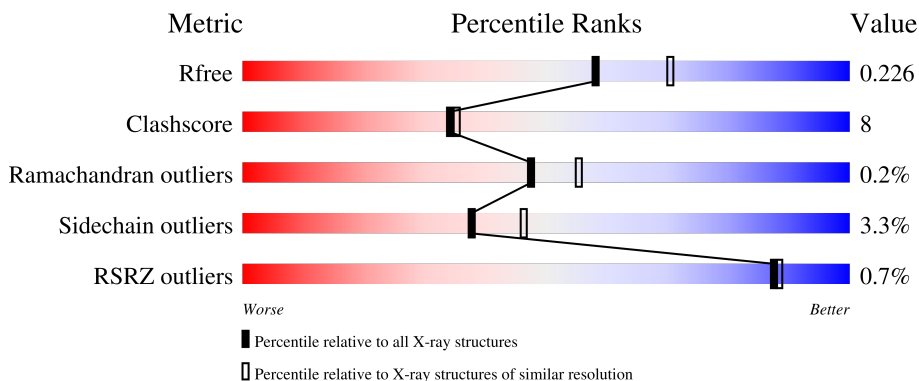
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.25 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	1377 (2.26-2.26)
Clashscore	141614	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

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	282	75% 13% • 10%
1	B	282	77% 13% • 10%
1	C	282	76% 14% • 10%
1	D	282	76% 13% 10%
1	E	282	76% 14% • 10%

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Mol	Chain	Length	Quality of chain
1	F	282	 73% 16% 10%
1	G	282	 78% 12% 10%
1	H	282	 77% 12% 10%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	GLU	A	1001	-	-	X	-
2	GLU	B	1001	-	-	X	-
2	GLU	C	1001	-	X	-	-
2	GLU	E	1001	-	-	X	-
2	GLU	F	1001	-	-	X	-

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 17807 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 ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH].

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	254	Total	C	N	O	S	0	13	0
			2052	1289	359	399	5			
1	B	255	Total	C	N	O	S	0	12	0
			2051	1289	357	400	5			
1	C	255	Total	C	N	O	S	0	6	0
			2000	1260	347	389	4			
1	D	254	Total	C	N	O	S	0	3	0
			1971	1241	340	386	4			
1	E	255	Total	C	N	O	S	0	13	0
			2059	1294	360	400	5			
1	F	255	Total	C	N	O	S	0	11	0
			2045	1285	357	398	5			
1	G	255	Total	C	N	O	S	0	5	0
			1992	1255	344	389	4			
1	H	254	Total	C	N	O	S	0	4	0
			1979	1246	343	386	4			

There are 216 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-25	MET	-	expression tag	UNP Q7A6D8
A	-24	LYS	-	expression tag	UNP Q7A6D8
A	-23	HIS	-	expression tag	UNP Q7A6D8
A	-22	HIS	-	expression tag	UNP Q7A6D8
A	-21	HIS	-	expression tag	UNP Q7A6D8
A	-20	HIS	-	expression tag	UNP Q7A6D8
A	-19	HIS	-	expression tag	UNP Q7A6D8
A	-18	HIS	-	expression tag	UNP Q7A6D8
A	-17	PRO	-	expression tag	UNP Q7A6D8
A	-16	MET	-	expression tag	UNP Q7A6D8
A	-15	SER	-	expression tag	UNP Q7A6D8
A	-14	ASP	-	expression tag	UNP Q7A6D8

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	TYR	-	expression tag	UNP Q7A6D8
A	-12	ASP	-	expression tag	UNP Q7A6D8
A	-11	ILE	-	expression tag	UNP Q7A6D8
A	-10	PRO	-	expression tag	UNP Q7A6D8
A	-9	THR	-	expression tag	UNP Q7A6D8
A	-8	THR	-	expression tag	UNP Q7A6D8
A	-7	GLU	-	expression tag	UNP Q7A6D8
A	-6	ASN	-	expression tag	UNP Q7A6D8
A	-5	LEU	-	expression tag	UNP Q7A6D8
A	-4	TYR	-	expression tag	UNP Q7A6D8
A	-3	PHE	-	expression tag	UNP Q7A6D8
A	-2	GLN	-	expression tag	UNP Q7A6D8
A	-1	GLY	-	expression tag	UNP Q7A6D8
A	0	ALA	-	expression tag	UNP Q7A6D8
A	2	VAL	LEU	engineered mutation	UNP Q7A6D8
B	-25	MET	-	expression tag	UNP Q7A6D8
B	-24	LYS	-	expression tag	UNP Q7A6D8
B	-23	HIS	-	expression tag	UNP Q7A6D8
B	-22	HIS	-	expression tag	UNP Q7A6D8
B	-21	HIS	-	expression tag	UNP Q7A6D8
B	-20	HIS	-	expression tag	UNP Q7A6D8
B	-19	HIS	-	expression tag	UNP Q7A6D8
B	-18	HIS	-	expression tag	UNP Q7A6D8
B	-17	PRO	-	expression tag	UNP Q7A6D8
B	-16	MET	-	expression tag	UNP Q7A6D8
B	-15	SER	-	expression tag	UNP Q7A6D8
B	-14	ASP	-	expression tag	UNP Q7A6D8
B	-13	TYR	-	expression tag	UNP Q7A6D8
B	-12	ASP	-	expression tag	UNP Q7A6D8
B	-11	ILE	-	expression tag	UNP Q7A6D8
B	-10	PRO	-	expression tag	UNP Q7A6D8
B	-9	THR	-	expression tag	UNP Q7A6D8
B	-8	THR	-	expression tag	UNP Q7A6D8
B	-7	GLU	-	expression tag	UNP Q7A6D8
B	-6	ASN	-	expression tag	UNP Q7A6D8
B	-5	LEU	-	expression tag	UNP Q7A6D8
B	-4	TYR	-	expression tag	UNP Q7A6D8
B	-3	PHE	-	expression tag	UNP Q7A6D8
B	-2	GLN	-	expression tag	UNP Q7A6D8
B	-1	GLY	-	expression tag	UNP Q7A6D8
B	0	ALA	-	expression tag	UNP Q7A6D8
B	2	VAL	LEU	engineered mutation	UNP Q7A6D8

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-25	MET	-	expression tag	UNP Q7A6D8
C	-24	LYS	-	expression tag	UNP Q7A6D8
C	-23	HIS	-	expression tag	UNP Q7A6D8
C	-22	HIS	-	expression tag	UNP Q7A6D8
C	-21	HIS	-	expression tag	UNP Q7A6D8
C	-20	HIS	-	expression tag	UNP Q7A6D8
C	-19	HIS	-	expression tag	UNP Q7A6D8
C	-18	HIS	-	expression tag	UNP Q7A6D8
C	-17	PRO	-	expression tag	UNP Q7A6D8
C	-16	MET	-	expression tag	UNP Q7A6D8
C	-15	SER	-	expression tag	UNP Q7A6D8
C	-14	ASP	-	expression tag	UNP Q7A6D8
C	-13	TYR	-	expression tag	UNP Q7A6D8
C	-12	ASP	-	expression tag	UNP Q7A6D8
C	-11	ILE	-	expression tag	UNP Q7A6D8
C	-10	PRO	-	expression tag	UNP Q7A6D8
C	-9	THR	-	expression tag	UNP Q7A6D8
C	-8	THR	-	expression tag	UNP Q7A6D8
C	-7	GLU	-	expression tag	UNP Q7A6D8
C	-6	ASN	-	expression tag	UNP Q7A6D8
C	-5	LEU	-	expression tag	UNP Q7A6D8
C	-4	TYR	-	expression tag	UNP Q7A6D8
C	-3	PHE	-	expression tag	UNP Q7A6D8
C	-2	GLN	-	expression tag	UNP Q7A6D8
C	-1	GLY	-	expression tag	UNP Q7A6D8
C	0	ALA	-	expression tag	UNP Q7A6D8
C	2	VAL	LEU	engineered mutation	UNP Q7A6D8
D	-25	MET	-	expression tag	UNP Q7A6D8
D	-24	LYS	-	expression tag	UNP Q7A6D8
D	-23	HIS	-	expression tag	UNP Q7A6D8
D	-22	HIS	-	expression tag	UNP Q7A6D8
D	-21	HIS	-	expression tag	UNP Q7A6D8
D	-20	HIS	-	expression tag	UNP Q7A6D8
D	-19	HIS	-	expression tag	UNP Q7A6D8
D	-18	HIS	-	expression tag	UNP Q7A6D8
D	-17	PRO	-	expression tag	UNP Q7A6D8
D	-16	MET	-	expression tag	UNP Q7A6D8
D	-15	SER	-	expression tag	UNP Q7A6D8
D	-14	ASP	-	expression tag	UNP Q7A6D8
D	-13	TYR	-	expression tag	UNP Q7A6D8
D	-12	ASP	-	expression tag	UNP Q7A6D8
D	-11	ILE	-	expression tag	UNP Q7A6D8

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-10	PRO	-	expression tag	UNP Q7A6D8
D	-9	THR	-	expression tag	UNP Q7A6D8
D	-8	THR	-	expression tag	UNP Q7A6D8
D	-7	GLU	-	expression tag	UNP Q7A6D8
D	-6	ASN	-	expression tag	UNP Q7A6D8
D	-5	LEU	-	expression tag	UNP Q7A6D8
D	-4	TYR	-	expression tag	UNP Q7A6D8
D	-3	PHE	-	expression tag	UNP Q7A6D8
D	-2	GLN	-	expression tag	UNP Q7A6D8
D	-1	GLY	-	expression tag	UNP Q7A6D8
D	0	ALA	-	expression tag	UNP Q7A6D8
D	2	VAL	LEU	engineered mutation	UNP Q7A6D8
E	-25	MET	-	expression tag	UNP Q7A6D8
E	-24	LYS	-	expression tag	UNP Q7A6D8
E	-23	HIS	-	expression tag	UNP Q7A6D8
E	-22	HIS	-	expression tag	UNP Q7A6D8
E	-21	HIS	-	expression tag	UNP Q7A6D8
E	-20	HIS	-	expression tag	UNP Q7A6D8
E	-19	HIS	-	expression tag	UNP Q7A6D8
E	-18	HIS	-	expression tag	UNP Q7A6D8
E	-17	PRO	-	expression tag	UNP Q7A6D8
E	-16	MET	-	expression tag	UNP Q7A6D8
E	-15	SER	-	expression tag	UNP Q7A6D8
E	-14	ASP	-	expression tag	UNP Q7A6D8
E	-13	TYR	-	expression tag	UNP Q7A6D8
E	-12	ASP	-	expression tag	UNP Q7A6D8
E	-11	ILE	-	expression tag	UNP Q7A6D8
E	-10	PRO	-	expression tag	UNP Q7A6D8
E	-9	THR	-	expression tag	UNP Q7A6D8
E	-8	THR	-	expression tag	UNP Q7A6D8
E	-7	GLU	-	expression tag	UNP Q7A6D8
E	-6	ASN	-	expression tag	UNP Q7A6D8
E	-5	LEU	-	expression tag	UNP Q7A6D8
E	-4	TYR	-	expression tag	UNP Q7A6D8
E	-3	PHE	-	expression tag	UNP Q7A6D8
E	-2	GLN	-	expression tag	UNP Q7A6D8
E	-1	GLY	-	expression tag	UNP Q7A6D8
E	0	ALA	-	expression tag	UNP Q7A6D8
E	2	VAL	LEU	engineered mutation	UNP Q7A6D8
F	-25	MET	-	expression tag	UNP Q7A6D8
F	-24	LYS	-	expression tag	UNP Q7A6D8
F	-23	HIS	-	expression tag	UNP Q7A6D8

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-22	HIS	-	expression tag	UNP Q7A6D8
F	-21	HIS	-	expression tag	UNP Q7A6D8
F	-20	HIS	-	expression tag	UNP Q7A6D8
F	-19	HIS	-	expression tag	UNP Q7A6D8
F	-18	HIS	-	expression tag	UNP Q7A6D8
F	-17	PRO	-	expression tag	UNP Q7A6D8
F	-16	MET	-	expression tag	UNP Q7A6D8
F	-15	SER	-	expression tag	UNP Q7A6D8
F	-14	ASP	-	expression tag	UNP Q7A6D8
F	-13	TYR	-	expression tag	UNP Q7A6D8
F	-12	ASP	-	expression tag	UNP Q7A6D8
F	-11	ILE	-	expression tag	UNP Q7A6D8
F	-10	PRO	-	expression tag	UNP Q7A6D8
F	-9	THR	-	expression tag	UNP Q7A6D8
F	-8	THR	-	expression tag	UNP Q7A6D8
F	-7	GLU	-	expression tag	UNP Q7A6D8
F	-6	ASN	-	expression tag	UNP Q7A6D8
F	-5	LEU	-	expression tag	UNP Q7A6D8
F	-4	TYR	-	expression tag	UNP Q7A6D8
F	-3	PHE	-	expression tag	UNP Q7A6D8
F	-2	GLN	-	expression tag	UNP Q7A6D8
F	-1	GLY	-	expression tag	UNP Q7A6D8
F	0	ALA	-	expression tag	UNP Q7A6D8
F	2	VAL	LEU	engineered mutation	UNP Q7A6D8
G	-25	MET	-	expression tag	UNP Q7A6D8
G	-24	LYS	-	expression tag	UNP Q7A6D8
G	-23	HIS	-	expression tag	UNP Q7A6D8
G	-22	HIS	-	expression tag	UNP Q7A6D8
G	-21	HIS	-	expression tag	UNP Q7A6D8
G	-20	HIS	-	expression tag	UNP Q7A6D8
G	-19	HIS	-	expression tag	UNP Q7A6D8
G	-18	HIS	-	expression tag	UNP Q7A6D8
G	-17	PRO	-	expression tag	UNP Q7A6D8
G	-16	MET	-	expression tag	UNP Q7A6D8
G	-15	SER	-	expression tag	UNP Q7A6D8
G	-14	ASP	-	expression tag	UNP Q7A6D8
G	-13	TYR	-	expression tag	UNP Q7A6D8
G	-12	ASP	-	expression tag	UNP Q7A6D8
G	-11	ILE	-	expression tag	UNP Q7A6D8
G	-10	PRO	-	expression tag	UNP Q7A6D8
G	-9	THR	-	expression tag	UNP Q7A6D8
G	-8	THR	-	expression tag	UNP Q7A6D8

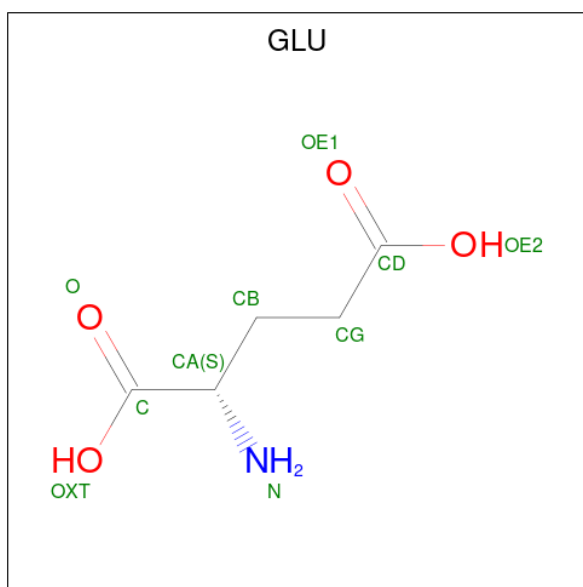
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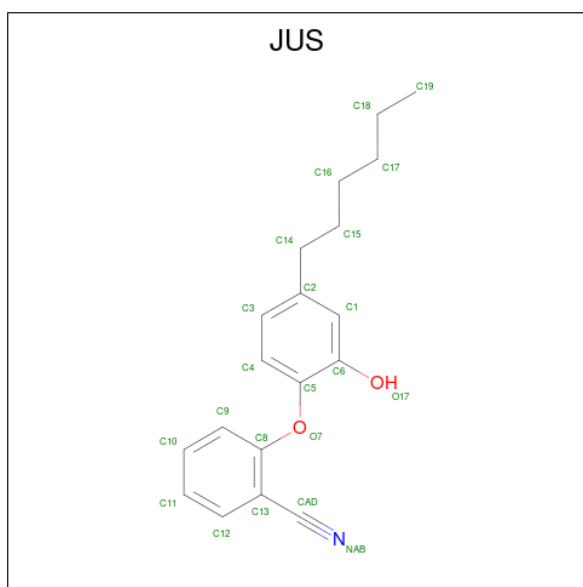
Chain	Residue	Modelled	Actual	Comment	Reference
G	-7	GLU	-	expression tag	UNP Q7A6D8
G	-6	ASN	-	expression tag	UNP Q7A6D8
G	-5	LEU	-	expression tag	UNP Q7A6D8
G	-4	TYR	-	expression tag	UNP Q7A6D8
G	-3	PHE	-	expression tag	UNP Q7A6D8
G	-2	GLN	-	expression tag	UNP Q7A6D8
G	-1	GLY	-	expression tag	UNP Q7A6D8
G	0	ALA	-	expression tag	UNP Q7A6D8
G	2	VAL	LEU	engineered mutation	UNP Q7A6D8
H	-25	MET	-	expression tag	UNP Q7A6D8
H	-24	LYS	-	expression tag	UNP Q7A6D8
H	-23	HIS	-	expression tag	UNP Q7A6D8
H	-22	HIS	-	expression tag	UNP Q7A6D8
H	-21	HIS	-	expression tag	UNP Q7A6D8
H	-20	HIS	-	expression tag	UNP Q7A6D8
H	-19	HIS	-	expression tag	UNP Q7A6D8
H	-18	HIS	-	expression tag	UNP Q7A6D8
H	-17	PRO	-	expression tag	UNP Q7A6D8
H	-16	MET	-	expression tag	UNP Q7A6D8
H	-15	SER	-	expression tag	UNP Q7A6D8
H	-14	ASP	-	expression tag	UNP Q7A6D8
H	-13	TYR	-	expression tag	UNP Q7A6D8
H	-12	ASP	-	expression tag	UNP Q7A6D8
H	-11	ILE	-	expression tag	UNP Q7A6D8
H	-10	PRO	-	expression tag	UNP Q7A6D8
H	-9	THR	-	expression tag	UNP Q7A6D8
H	-8	THR	-	expression tag	UNP Q7A6D8
H	-7	GLU	-	expression tag	UNP Q7A6D8
H	-6	ASN	-	expression tag	UNP Q7A6D8
H	-5	LEU	-	expression tag	UNP Q7A6D8
H	-4	TYR	-	expression tag	UNP Q7A6D8
H	-3	PHE	-	expression tag	UNP Q7A6D8
H	-2	GLN	-	expression tag	UNP Q7A6D8
H	-1	GLY	-	expression tag	UNP Q7A6D8
H	0	ALA	-	expression tag	UNP Q7A6D8
H	2	VAL	LEU	engineered mutation	UNP Q7A6D8

- Molecule 2 is GLUTAMIC ACID (three-letter code: GLU) (formula: C<sub>5</sub>H<sub>9</sub>NO<sub>4</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total 10	5	1	4	0	0
2	B	1	Total 10	5	1	4	0	0
2	C	1	Total 10	5	1	4	0	0
2	E	1	Total 10	5	1	4	0	0
2	F	1	Total 10	5	1	4	0	0
2	G	1	Total 10	5	1	4	0	0

- Molecule 3 is 2-(2-CYANOPHENOXY)-5-HEXYLPHENOL (three-letter code: JUS) (formula: C<sub>19</sub>H<sub>21</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	22	19	1	2	0	0
3	B	1	22	19	1	2	0	0
3	C	1	22	19	1	2	0	0
3	D	1	22	19	1	2	0	0
3	E	1	22	19	1	2	0	0
3	F	1	22	19	1	2	0	0
3	G	1	22	19	1	2	0	0
3	H	1	22	19	1	2	0	0

- Molecule 4 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: C<sub>21</sub>H<sub>28</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).




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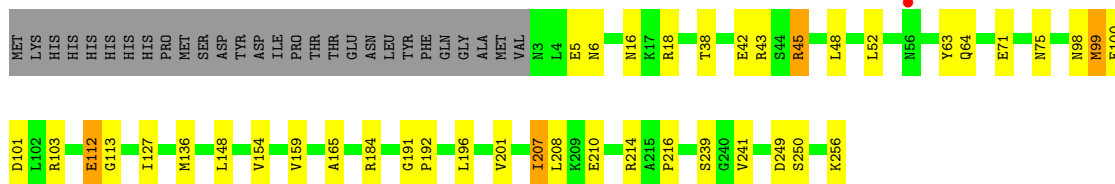
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
5	E	144	Total 144	O 144	0	0
5	F	130	Total 130	O 130	0	0
5	G	125	Total 125	O 125	0	0
5	H	105	Total 105	O 105	0	0

### 3 Residue-property plots


These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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.

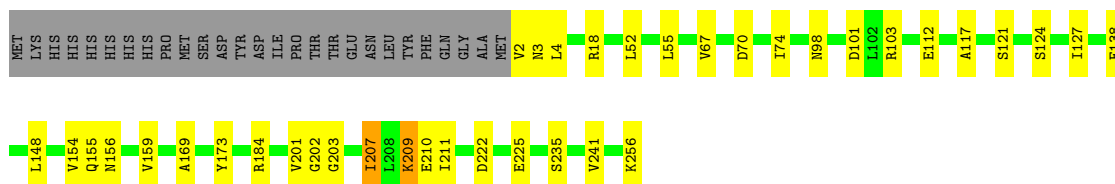
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain A: 




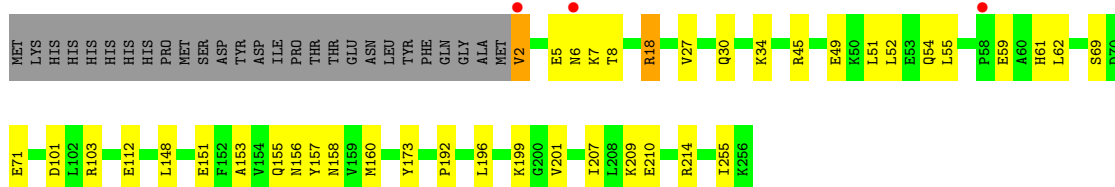
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain B: 




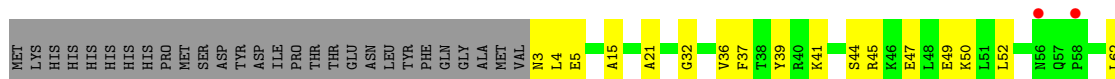
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain C: 



- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain D: 





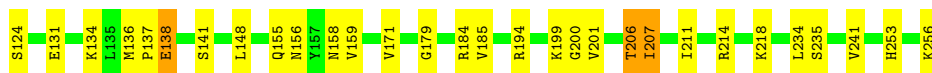
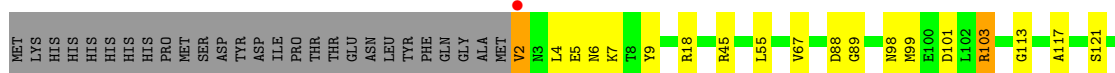
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain E: 76% 14% 10%



- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain F: 73% 16% 10%



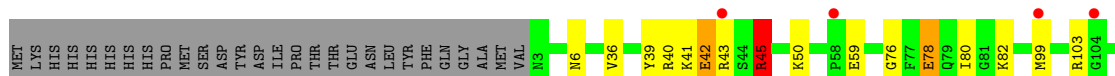
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain G: 78% 12% 10%



- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain H: 77% 12% 10%



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	89.92Å 94.60Å 94.27Å 97.92° 111.96° 97.31°	Depositor
Resolution (Å)	40.90 – 2.25 40.90 – 2.25	Depositor EDS
% Data completeness (in resolution range)	97.5 (40.90-2.25) 97.5 (40.90-2.25)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.23 (at 2.24Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.151 , 0.206 0.174 , 0.226	Depositor DCC
$R_{free}$ test set	6528 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	28.4	Xtrriage
Anisotropy	0.574	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 37.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.000 for -l,-k,-h	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	17807	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	34.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.41% 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: NAP, JUS

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	0.54	0/2091	0.83	2/2813 (0.1%)
1	B	0.56	1/2087 (0.0%)	0.78	0/2809
1	C	0.51	0/2039	0.79	1/2746 (0.0%)
1	D	0.57	0/2001	0.84	1/2696 (0.0%)
1	E	0.54	0/2098	0.84	0/2823
1	F	0.54	0/2078	0.81	0/2797
1	G	0.53	0/2028	0.81	1/2732 (0.0%)
1	H	0.51	0/2012	0.82	1/2710 (0.0%)
All	All	0.54	1/16434 (0.0%)	0.81	6/22126 (0.0%)

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	C	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	173	TYR	CD1-CE1	5.21	1.47	1.39

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	207	ILE	CG1-CB-CG2	-5.70	98.86	111.40
1	G	101	ASP	CB-CG-OD1	5.66	123.40	118.30
1	D	52	LEU	CA-CB-CG	5.40	127.71	115.30
1	C	101	ASP	CB-CG-OD1	5.37	123.13	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	45	ARG	NE-CZ-NH1	5.05	122.82	120.30
1	A	45	ARG	NE-CZ-NH1	5.04	122.82	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	2	VAL	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	2052	0	2071	63	0
1	B	2051	0	2067	29	0
1	C	2000	0	2022	33	0
1	D	1971	0	1981	26	0
1	E	2059	0	2080	47	0
1	F	2045	0	2061	51	0
1	G	1992	0	2009	25	0
1	H	1979	0	1994	26	0
2	A	10	0	5	16	0
2	B	10	0	5	6	0
2	C	10	0	5	2	0
2	E	10	0	5	7	0
2	F	10	0	5	12	0
2	G	10	0	5	2	0
3	A	22	0	20	3	0
3	B	22	0	21	2	0
3	C	22	0	20	4	0
3	D	22	0	21	0	0
3	E	22	0	20	1	0
3	F	22	0	20	1	0
3	G	22	0	20	2	0
3	H	22	0	20	2	0
4	A	48	0	25	1	0
4	B	48	0	25	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	48	0	25	1	0
4	D	48	0	25	0	0
4	E	48	0	25	1	0
4	F	48	0	25	0	0
4	G	48	0	25	0	0
4	H	48	0	25	3	0
5	A	170	0	0	15	0
5	B	135	0	0	3	0
5	C	130	0	0	6	0
5	D	99	0	0	2	0
5	E	144	0	0	10	0
5	F	130	0	0	6	0
5	G	125	0	0	2	0
5	H	105	0	0	6	0
All	All	17807	0	16677	280	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 8.

All (280) 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:E:103[A]:ARG:NH1	2:E:1001:GLU:OE2	1.77	1.16
1:F:103[B]:ARG:HH12	2:F:1001:GLU:HG2	1.07	1.16
1:F:103[B]:ARG:NH1	2:F:1001:GLU:HG2	1.62	1.15
1:F:103[B]:ARG:HH12	2:F:1001:GLU:CG	1.62	1.11
2:F:1001:GLU:O	2:F:1001:GLU:HG3	1.51	1.06
1:A:103[A]:ARG:HH12	2:A:1001:GLU:CG	1.71	1.04
1:A:103[B]:ARG:NH1	2:A:1001:GLU:HG2	1.77	0.99
1:C:18[B]:ARG:HH12	1:C:199:LYS:HE2	1.25	0.98
2:E:1001:GLU:HG3	2:E:1001:GLU:O	1.64	0.98
1:E:42[B]:GLU:OE1	1:E:45:ARG:NH2	1.97	0.97
1:A:43:ARG:HH22	1:E:104[B]:GLY:HA3	1.28	0.96
1:A:103[B]:ARG:NH1	2:A:1001:GLU:CG	2.29	0.95
2:E:1001:GLU:O	2:E:1001:GLU:CG	2.14	0.95
1:A:103[B]:ARG:HH12	2:A:1001:GLU:CG	1.81	0.94
1:A:103[B]:ARG:HH12	2:A:1001:GLU:HG2	1.33	0.92
1:B:18:ARG:NH2	5:B:2019:HOH:O	2.05	0.90
1:D:194:ARG:HD2	5:D:2015:HOH:O	1.72	0.88
1:B:103[A]:ARG:HH12	2:B:1001:GLU:CD	1.78	0.87
1:A:103[A]:ARG:HH12	2:A:1001:GLU:HG2	1.36	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103[A]:ARG:NH1	2:A:1001:GLU:OE2	2.08	0.87
1:D:3:ASN:HD21	1:D:5:GLU:HG3	1.39	0.86
1:E:18[A]:ARG:HD3	5:E:2011:HOH:O	1.77	0.84
1:F:103[B]:ARG:NH1	2:F:1001:GLU:CG	2.30	0.84
1:A:256:LYS:HG2	1:C:148:LEU:HD21	1.62	0.81
1:E:101[A]:ASP:HB3	1:E:159:VAL:CG1	2.11	0.80
1:C:210:GLU:HG3	1:C:214[B]:ARG:HD3	1.63	0.79
1:F:18[A]:ARG:HH12	1:F:199:LYS:NZ	1.81	0.78
1:G:2:VAL:HG13	1:G:2:VAL:O	1.83	0.77
1:B:103[A]:ARG:NH1	2:B:1001:GLU:OE2	2.16	0.76
1:E:101[A]:ASP:HB3	1:E:159:VAL:HG11	1.65	0.76
1:E:256:LYS:OXT	5:E:2120:HOH:O	2.02	0.76
1:F:206:THR:HG23	5:F:2129:HOH:O	1.84	0.76
1:F:103[A]:ARG:HH21	1:F:200:GLY:C	1.88	0.76
1:A:101[B]:ASP:OD2	1:A:113:GLY:HA3	1.85	0.76
1:E:101[B]:ASP:OD2	1:E:113:GLY:HA3	1.86	0.74
1:C:151:GLU:HB3	5:C:2092:HOH:O	1.87	0.74
1:H:210:GLU:HG2	1:H:214[B]:ARG:HG3	1.67	0.74
1:F:98:ASN:O	1:F:101[B]:ASP:HB2	1.86	0.74
1:H:42:GLU:OE2	5:H:2028:HOH:O	2.05	0.74
1:D:155:GLN:O	1:D:156:ASN:HB2	1.87	0.74
1:A:103[B]:ARG:NH1	2:A:1001:GLU:HG3	2.01	0.74
1:E:2:VAL:HG13	1:E:2:VAL:O	1.87	0.73
1:F:194:ARG:HG2	5:F:2103:HOH:O	1.88	0.72
1:E:100[B]:GLU:OE1	5:E:2061:HOH:O	2.07	0.72
1:B:203:GLY:H	2:B:1001:GLU:HB3	1.53	0.72
1:F:103[A]:ARG:HH12	2:F:1001:GLU:N	1.89	0.71
1:C:34:LYS:HE3	5:C:2006:HOH:O	1.90	0.70
5:A:2014:HOH:O	1:E:100[B]:GLU:HG3	1.91	0.70
1:B:203:GLY:H	2:B:1001:GLU:CB	2.03	0.70
1:B:2:VAL:HG12	1:B:3:ASN:H	1.57	0.70
1:C:103:ARG:NH1	2:C:1001:GLU:OE2	2.25	0.70
1:A:42[B]:GLU:HA	1:A:42[B]:GLU:OE1	1.91	0.70
1:E:52:LEU:HD23	1:E:55:LEU:HD12	1.74	0.70
1:D:15:ALA:O	1:D:47:GLU:HG2	1.91	0.69
1:C:207:ILE:CD1	3:C:1257:JUS:H192	2.23	0.69
1:H:42:GLU:CG	5:H:2028:HOH:O	2.39	0.69
1:A:18[A]:ARG:HD3	5:A:2019:HOH:O	1.92	0.69
1:F:101[B]:ASP:HB3	1:F:159:VAL:CG1	2.23	0.69
2:F:1001:GLU:CG	2:F:1001:GLU:O	2.35	0.68
1:F:101[A]:ASP:OD2	5:F:2066:HOH:O	2.12	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:101[B]:ASP:OD2	5:E:2060:HOH:O	2.12	0.68
1:A:112:GLU:HG2	1:E:42[A]:GLU:OE1	1.95	0.67
1:B:148:LEU:HD21	1:D:256:LYS:HG2	1.75	0.67
1:C:71[A]:GLU:HG2	5:C:2047:HOH:O	1.94	0.67
1:A:103[A]:ARG:NH1	2:A:1001:GLU:HG2	2.09	0.66
1:A:101[A]:ASP:HB3	1:A:159:VAL:CG1	2.25	0.66
1:A:184:ARG:HD2	1:A:241:VAL:O	1.96	0.66
1:C:201:VAL:HG11	3:C:1257:JUS:H181	1.77	0.66
1:A:42[B]:GLU:CD	1:A:45:ARG:HH21	1.98	0.66
1:F:18[B]:ARG:NH2	5:F:2019:HOH:O	2.29	0.65
1:A:5:GLU:O	1:A:6:ASN:HB2	1.95	0.65
1:F:101[B]:ASP:HB3	1:F:159:VAL:HG11	1.78	0.65
1:F:201:VAL:HG11	3:F:1257:JUS:H182	1.80	0.64
1:D:76:GLY:O	1:D:80:ILE:HG13	1.97	0.63
1:C:18[B]:ARG:NH1	1:C:199:LYS:HE2	2.06	0.63
1:F:148:LEU:HD21	1:H:256:LYS:HG2	1.80	0.63
1:C:18[B]:ARG:HH12	1:C:199:LYS:CE	2.08	0.63
1:D:36:VAL:HG11	1:D:80:ILE:HD13	1.80	0.63
1:B:207:ILE:O	1:B:211:ILE:HG12	1.99	0.63
1:C:158:ASN:OD1	5:C:2095:HOH:O	2.15	0.63
1:E:100[B]:GLU:HB2	5:E:2061:HOH:O	1.97	0.63
1:H:40:ARG:HD3	4:H:1258:NAP:C6A	2.29	0.63
1:C:18[B]:ARG:HH22	1:C:196:LEU:HD13	1.63	0.62
1:A:100[A]:GLU:HG3	1:E:43:ARG:HG2	1.82	0.62
1:A:43:ARG:NH2	1:E:104[B]:GLY:HA3	2.09	0.61
1:D:3:ASN:ND2	1:D:5:GLU:HG3	2.11	0.61
1:B:202:GLY:HA2	2:B:1001:GLU:HB2	1.82	0.61
1:H:76:GLY:O	1:H:80:ILE:HG13	2.00	0.61
1:C:207:ILE:HD12	3:C:1257:JUS:H192	1.81	0.61
1:A:103[A]:ARG:HH12	2:A:1001:GLU:CD	2.03	0.61
1:F:207:ILE:O	1:F:211:ILE:HG12	2.01	0.61
1:F:2:VAL:HG11	1:F:235:SER:HB2	1.82	0.60
1:H:36:VAL:HG11	1:H:80:ILE:HD13	1.83	0.60
1:B:155:GLN:O	1:B:156:ASN:HB2	2.02	0.60
1:F:253:HIS:HD2	5:G:2042:HOH:O	1.85	0.60
1:A:210:GLU:HG3	1:A:214[B]:ARG:HD2	1.83	0.60
1:D:196:LEU:HD23	5:D:2099:HOH:O	2.02	0.60
1:E:18[A]:ARG:NH2	1:E:199:LYS:CE	2.65	0.60
2:E:1001:GLU:O	2:E:1001:GLU:HG2	1.99	0.59
1:C:5:GLU:O	1:C:6:ASN:HB2	2.00	0.58
1:E:101[A]:ASP:HB3	1:E:159:VAL:HG12	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:1001:GLU:N	5:E:2142:HOH:O	2.36	0.58
1:E:18[A]:ARG:HH22	1:E:199:LYS:HE3	1.67	0.58
1:F:103[A]:ARG:HH11	2:F:1001:GLU:HG2	1.69	0.58
1:F:45:ARG:HD3	5:F:2032:HOH:O	2.03	0.58
1:F:18[A]:ARG:HH12	1:F:199:LYS:HZ2	1.52	0.58
1:A:239[B]:SER:O	5:A:2156:HOH:O	2.17	0.57
1:F:103[B]:ARG:HH12	2:F:1001:GLU:CB	2.17	0.57
1:G:59:GLU:HG3	1:G:61:HIS:NE2	2.19	0.57
1:E:18[A]:ARG:HH22	1:E:199:LYS:CE	2.18	0.57
1:F:103[B]:ARG:NH1	2:F:1001:GLU:CD	2.58	0.57
1:A:43:ARG:HG2	1:E:100[A]:GLU:HG3	1.85	0.57
1:A:103[A]:ARG:NH1	2:A:1001:GLU:CG	2.55	0.57
1:A:42[B]:GLU:OE1	1:A:45:ARG:NH2	2.29	0.57
1:G:59:GLU:HG3	1:G:61:HIS:CE1	2.40	0.57
1:F:256:LYS:HE3	1:H:148:LEU:HD21	1.87	0.56
1:A:43:ARG:NH1	1:E:101[B]:ASP:HA	2.20	0.56
1:F:18[A]:ARG:NH1	1:F:199:LYS:NZ	2.50	0.56
5:E:2125:HOH:O	1:H:239[B]:SER:O	2.18	0.55
1:A:103[B]:ARG:HH12	2:A:1001:GLU:HG3	1.62	0.55
1:H:215:ALA:O	1:H:218:LYS:HD3	2.06	0.55
1:G:69:SER:HB3	1:G:72:GLU:HB2	1.89	0.55
1:D:39:TYR:OH	1:D:45:ARG:HD2	2.06	0.55
1:A:100[B]:GLU:HG3	1:E:41:LYS:HE2	1.88	0.55
1:A:103[A]:ARG:NH1	2:A:1001:GLU:CD	2.60	0.55
1:B:101[B]:ASP:HB3	1:B:159:VAL:HG11	1.88	0.55
1:H:42:GLU:HG3	5:H:2028:HOH:O	2.03	0.55
1:B:222:ASP:OD1	1:B:225:GLU:HG3	2.06	0.55
1:F:103[A]:ARG:NH1	2:F:1001:GLU:HG2	2.22	0.54
1:A:48:LEU:O	1:A:52:LEU:HD23	2.06	0.54
1:A:191:GLY:HA3	5:A:2163:HOH:O	2.06	0.54
1:A:100[A]:GLU:HB3	1:E:196:LEU:HD21	1.88	0.54
1:E:256:LYS:HE3	1:G:148:LEU:HD21	1.90	0.54
1:G:63:TYR:CD1	1:G:63:TYR:N	2.76	0.54
1:B:201:VAL:HG11	3:B:1257:JUS:H181	1.91	0.53
1:A:101[A]:ASP:HB3	1:A:159:VAL:HG12	1.89	0.53
1:C:2:VAL:HG23	1:C:2:VAL:O	2.08	0.53
1:E:29:ASP:OD1	1:E:57:GLN:NE2	2.32	0.53
1:G:103:ARG:HH12	2:G:1001:GLU:CB	2.22	0.53
1:A:101[A]:ASP:HB3	1:A:159:VAL:HG11	1.91	0.53
1:D:37:PHE:HB2	1:D:62:LEU:HD23	1.91	0.52
1:B:70:ASP:O	1:B:74:ILE:HG13	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99[A]:MET:CE	5:A:2077:HOH:O	2.57	0.52
1:G:201:VAL:CG1	3:G:1257:JUS:H181	2.40	0.52
1:B:98:ASN:O	1:B:101[B]:ASP:HB2	2.09	0.52
1:G:103:ARG:HH12	2:G:1001:GLU:HB2	1.75	0.52
1:H:42:GLU:CD	5:H:2028:HOH:O	2.48	0.52
1:A:99[B]:MET:HE3	1:A:103[B]:ARG:HG3	1.92	0.51
1:H:253:HIS:HD2	5:H:2098:HOH:O	1.93	0.51
1:A:71[B]:GLU:HG3	1:A:75:ASN:ND2	2.26	0.51
2:A:1001:GLU:HB3	1:E:199:LYS:HZ3	1.75	0.51
1:B:256:LYS:HD3	1:D:256:LYS:HD2	1.93	0.51
5:A:2145:HOH:O	1:D:239[B]:SER:O	2.20	0.50
1:C:5:GLU:O	1:C:6:ASN:CB	2.59	0.50
1:G:215:ALA:O	1:G:218:LYS:HD3	2.11	0.50
1:A:101[B]:ASP:OD2	5:A:2075:HOH:O	2.19	0.50
1:F:171:VAL:HG13	1:F:185:VAL:HG12	1.93	0.50
1:A:42[A]:GLU:HB2	1:E:112:GLU:HG2	1.91	0.50
1:B:207:ILE:HD13	5:B:2108:HOH:O	2.12	0.50
1:H:6:ASN:HA	5:H:2005:HOH:O	2.11	0.50
1:C:103:ARG:HH12	2:C:1001:GLU:HG3	1.77	0.50
1:B:203:GLY:H	2:B:1001:GLU:HB2	1.77	0.50
1:D:21:ALA:HB2	1:D:93:SER:CB	2.42	0.49
1:G:155:GLN:O	1:G:156:ASN:HB2	2.12	0.49
1:E:2:VAL:O	1:E:2:VAL:CG1	2.59	0.49
1:G:201:VAL:HG11	3:G:1257:JUS:H181	1.94	0.49
1:A:196:LEU:HD21	1:E:100[A]:GLU:HB3	1.95	0.49
1:A:64:GLN:HG2	5:A:2058:HOH:O	2.12	0.49
1:F:117:ALA:O	1:F:121:SER:HB2	2.13	0.49
1:A:192:PRO:HG3	1:A:207:ILE:HG22	1.94	0.49
1:G:153:ALA:HA	1:H:173:TYR:CZ	2.48	0.49
1:C:8:THR:HA	1:C:34:LYS:O	2.12	0.49
1:D:67:VAL:HB	1:D:124:SER:HB2	1.95	0.49
1:F:101[B]:ASP:HB3	1:F:159:VAL:HG12	1.93	0.49
1:E:71[A]:GLU:HG2	1:E:75:ASN:ND2	2.27	0.48
1:E:148:LEU:HD21	1:G:256:LYS:HE3	1.95	0.48
1:E:101[A]:ASP:O	1:E:159:VAL:HG12	2.14	0.48
1:A:99[A]:MET:HE2	5:A:2077:HOH:O	2.14	0.48
1:C:173:TYR:CZ	1:D:153:ALA:HA	2.49	0.48
1:D:5:GLU:HA	1:D:32:GLY:O	2.13	0.48
1:A:18[B]:ARG:HD3	5:A:2020:HOH:O	2.13	0.48
1:B:101[B]:ASP:HB3	1:B:159:VAL:CG1	2.44	0.48
1:F:179:GLY:HA3	1:G:216:PRO:O	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:101[A]:ASP:OD2	1:F:113:GLY:HA3	2.14	0.48
1:F:158:ASN:HB3	5:F:2067:HOH:O	2.12	0.47
1:F:7:LYS:HA	1:F:88:ASP:OD2	2.14	0.47
1:F:131:GLU:O	1:F:134:LYS:HG3	2.15	0.47
1:A:207:ILE:HD13	5:A:2115:HOH:O	2.14	0.47
1:D:44:SER:O	1:D:47:GLU:HB3	2.15	0.47
1:G:188:ILE:HG21	1:G:226:VAL:HG13	1.96	0.47
1:C:52:LEU:HD11	1:C:62:LEU:HD21	1.96	0.47
1:G:213:GLU:O	1:G:218:LYS:HE3	2.15	0.47
1:C:59:GLU:HG3	1:C:61:HIS:NE2	2.30	0.47
1:B:3:ASN:HB3	5:B:2005:HOH:O	2.15	0.46
1:E:47:GLU:O	1:E:51:LEU:HG	2.15	0.46
1:B:209:LYS:HG3	1:B:210:GLU:N	2.29	0.46
1:E:18[A]:ARG:NH2	1:E:199:LYS:HE2	2.31	0.46
1:A:154:VAL:HG12	3:A:1257:JUS:H192	1.96	0.46
1:F:184:ARG:HD2	1:F:241:VAL:O	2.16	0.46
1:G:173:TYR:CZ	1:H:153:ALA:HA	2.51	0.46
1:F:2:VAL:HG11	1:F:235:SER:CB	2.44	0.46
1:G:39:TYR:CZ	1:G:64:GLN:HB2	2.51	0.46
1:B:117:ALA:O	1:B:121:SER:HB2	2.15	0.46
1:B:154:VAL:HG12	3:B:1257:JUS:H193	1.98	0.46
1:G:111:ARG:NH1	1:H:119:ASP:OD1	2.40	0.45
1:F:5:GLU:O	1:F:6:ASN:HB2	2.17	0.45
1:A:100[B]:GLU:OE1	4:E:1258:NAP:O3X	2.35	0.45
1:G:7:LYS:HA	1:G:88:ASP:OD2	2.17	0.45
3:H:1257:JUS:NAB	4:H:1258:NAP:H3D	2.32	0.45
1:A:201:VAL:HG12	3:A:1257:JUS:H181	1.98	0.45
1:D:103:ARG:HB3	1:D:103:ARG:CZ	2.46	0.45
1:F:9:TYR:CE1	1:F:234:LEU:HB3	2.52	0.45
1:F:136:MET:N	1:F:137:PRO:CD	2.80	0.45
1:B:184:ARG:HD2	1:B:241:VAL:O	2.17	0.45
1:D:155:GLN:O	1:D:156:ASN:CB	2.59	0.45
1:F:18[A]:ARG:HH12	1:F:199:LYS:HZ1	1.61	0.44
1:A:136:MET:HA	5:A:2100:HOH:O	2.18	0.44
1:E:157:TYR:CZ	1:E:160:MET:HG3	2.51	0.44
1:A:201:VAL:CG1	3:A:1257:JUS:H181	2.47	0.44
1:E:103[A]:ARG:HH12	2:E:1001:GLU:CG	2.30	0.44
1:A:192:PRO:HA	4:A:1258:NAP:O7N	2.18	0.44
1:D:87:ILE:O	1:D:136:MET:HG2	2.18	0.44
1:B:67:VAL:HB	1:B:124:SER:HB2	1.99	0.44
1:B:256:LYS:HE3	1:D:148:LEU:HD21	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:158:ASN:HB3	5:C:2066:HOH:O	2.17	0.44
1:A:249:ASP:O	1:A:250:SER:HB2	2.18	0.43
2:A:1001:GLU:CB	1:E:199:LYS:HZ3	2.31	0.43
1:C:155:GLN:O	1:C:156:ASN:HB2	2.18	0.43
1:C:157:TYR:CZ	1:C:160:MET:HG3	2.53	0.43
1:E:158:ASN:HB3	5:E:2065:HOH:O	2.18	0.43
1:E:103[A]:ARG:HH12	2:E:1001:GLU:CD	2.20	0.43
1:A:98:ASN:C	1:A:100[B]:GLU:N	2.70	0.43
1:F:103[B]:ARG:CZ	1:F:103[B]:ARG:HB3	2.49	0.43
1:F:155:GLN:O	1:F:156:ASN:HB2	2.19	0.43
1:F:214:ARG:HH21	1:H:214[B]:ARG:NH2	2.16	0.43
1:H:163:ALA:O	1:H:166:SER:HB3	2.18	0.43
1:B:2:VAL:HG11	1:B:235:SER:CB	2.48	0.42
1:A:165:ALA:CB	1:B:169:ALA:HB2	2.49	0.42
1:B:52:LEU:HD23	1:B:52:LEU:HA	1.88	0.42
1:H:157:TYR:CZ	1:H:160:MET:HG3	2.54	0.42
2:A:1001:GLU:CG	1:E:199:LYS:HZ2	2.32	0.42
1:A:18[A]:ARG:NH1	5:A:2019:HOH:O	2.38	0.42
1:C:27:VAL:O	1:C:30:GLN:HB3	2.19	0.42
1:C:153:ALA:HA	1:D:173:TYR:CZ	2.55	0.42
1:C:103:ARG:HG3	5:C:2064:HOH:O	2.20	0.42
1:H:41:LYS:HE2	4:H:1258:NAP:P2B	2.59	0.42
1:C:59:GLU:HG3	1:C:61:HIS:CE1	2.55	0.42
1:D:50:LYS:HE3	1:D:50:LYS:HB2	1.89	0.42
1:F:103[B]:ARG:NH1	2:F:1001:GLU:OE2	2.53	0.42
1:G:216:PRO:HD3	1:G:255:ILE:HG21	2.01	0.42
1:A:207:ILE:HD11	5:A:2112:HOH:O	2.19	0.41
1:E:207:ILE:O	1:E:211:ILE:HG12	2.21	0.41
1:F:89:GLY:CA	1:F:141:SER:O	2.68	0.41
1:E:5:GLU:O	1:E:6:ASN:HB2	2.20	0.41
1:A:38:THR:HA	1:A:63:TYR:O	2.20	0.41
1:H:103:ARG:NH2	1:H:200:GLY:O	2.54	0.41
1:C:45:ARG:NH1	1:C:49:GLU:OE2	2.52	0.41
1:A:16:ASN:HB2	5:A:2017:HOH:O	2.20	0.41
1:C:192:PRO:HA	4:C:1258:NAP:O7N	2.21	0.41
1:A:208:LEU:HD23	1:A:208:LEU:HA	1.91	0.41
1:G:22:PHE:CE2	1:G:26:LYS:HE2	2.56	0.41
1:A:101[A]:ASP:CB	1:A:159:VAL:HG11	2.51	0.41
1:E:133:LYS:HD3	5:E:2076:HOH:O	2.20	0.41
1:F:18[A]:ARG:NH1	1:F:199:LYS:HZ1	2.17	0.41
1:G:2:VAL:O	1:G:2:VAL:CG1	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:138:GLU:H	1:F:138:GLU:HG2	1.70	0.41
5:G:2087:HOH:O	1:H:172:LYS:HE3	2.20	0.41
1:H:78:GLU:O	1:H:82:LYS:HG3	2.20	0.41
1:E:136:MET:HA	5:E:2052:HOH:O	2.20	0.40
1:F:89:GLY:HA2	1:F:141:SER:O	2.21	0.40
1:F:99[B]:MET:C	1:F:101[B]:ASP:H	2.25	0.40
1:C:51:LEU:O	1:C:54:GLN:HB2	2.21	0.40
1:D:213:GLU:O	1:D:218:LYS:HE3	2.21	0.40
1:G:52:LEU:HA	1:G:52:LEU:HD23	1.87	0.40
1:H:39:TYR:CZ	1:H:45:ARG:HG3	2.56	0.40
1:A:216:PRO:O	1:D:179:GLY:HA3	2.21	0.40
1:H:147:TYR:CE2	3:H:1257:JUS:H151	2.57	0.40
1:C:201:VAL:CG1	3:C:1257:JUS:H181	2.50	0.40
1:E:154:VAL:HG12	3:E:1257:JUS:H192	2.03	0.40
1:F:67:VAL:HB	1:F:124:SER:HB2	2.04	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	265/282 (94%)	250 (94%)	12 (4%)	3 (1%)	14	10
1	B	265/282 (94%)	254 (96%)	11 (4%)	0	100	100
1	C	259/282 (92%)	246 (95%)	13 (5%)	0	100	100
1	D	255/282 (90%)	237 (93%)	17 (7%)	1 (0%)	34	37
1	E	266/282 (94%)	255 (96%)	10 (4%)	1 (0%)	34	37
1	F	264/282 (94%)	249 (94%)	15 (6%)	0	100	100
1	G	258/282 (92%)	245 (95%)	13 (5%)	0	100	100
1	H	256/282 (91%)	238 (93%)	18 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	2088/2256 (93%)	1974 (94%)	109 (5%)	5 (0%)	47 55

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	148	LEU
1	A	99[A]	MET
1	A	99[B]	MET
1	A	148	LEU
1	D	156	ASN

### 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	219/234 (94%)	217 (99%)	2 (1%)	78 86
1	B	219/234 (94%)	212 (97%)	7 (3%)	39 47
1	C	214/234 (92%)	206 (96%)	8 (4%)	34 40
1	D	210/234 (90%)	205 (98%)	5 (2%)	49 58
1	E	220/234 (94%)	211 (96%)	9 (4%)	30 36
1	F	218/234 (93%)	209 (96%)	9 (4%)	30 36
1	G	213/234 (91%)	208 (98%)	5 (2%)	50 59
1	H	211/234 (90%)	202 (96%)	9 (4%)	29 33
All	All	1724/1872 (92%)	1670 (97%)	54 (3%)	38 49

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	112	GLU
1	A	127	ILE
1	B	4	LEU
1	B	55	LEU
1	B	112	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	127	ILE
1	B	138	GLU
1	B	207	ILE
1	B	209	LYS
1	C	7	LYS
1	C	18[A]	ARG
1	C	18[B]	ARG
1	C	55	LEU
1	C	69	SER
1	C	112	GLU
1	C	209	LYS
1	C	255	ILE
1	D	4	LEU
1	D	41	LYS
1	D	49	GLU
1	D	127	ILE
1	D	207	ILE
1	E	59	GLU
1	E	82	LYS
1	E	99[A]	MET
1	E	99[B]	MET
1	E	100[A]	GLU
1	E	100[B]	GLU
1	E	210	GLU
1	E	237	LEU
1	E	255	ILE
1	F	2	VAL
1	F	4	LEU
1	F	55	LEU
1	F	103[A]	ARG
1	F	103[B]	ARG
1	F	138	GLU
1	F	206	THR
1	F	207	ILE
1	F	218	LYS
1	G	50	LYS
1	G	55	LEU
1	G	112	GLU
1	G	138	GLU
1	G	209	LYS
1	H	42	GLU
1	H	43	ARG

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Mol	Chain	Res	Type
1	H	45	ARG
1	H	50	LYS
1	H	59	GLU
1	H	78	GLU
1	H	99	MET
1	H	127	ILE
1	H	194	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	253	HIS
1	D	3	ASN
1	F	253	HIS
1	H	253	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](#)

22 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	NAP	C	1258	-	45,52,52	1.62	4 (8%)	56,80,80	1.78	9 (16%)
3	JUS	F	1257	-	23,23,23	0.56	0	29,29,29	1.11	1 (3%)
4	NAP	H	1258	-	45,52,52	1.69	3 (6%)	56,80,80	1.59	8 (14%)
3	JUS	E	1257	-	23,23,23	0.60	0	29,29,29	0.95	3 (10%)
3	JUS	B	1257	-	23,23,23	0.68	0	29,29,29	0.88	2 (6%)
2	GLU	F	1001	-	8,9,9	1.30	1 (12%)	10,11,11	0.95	0
3	JUS	G	1257	-	23,23,23	0.46	0	29,29,29	1.05	2 (6%)
2	GLU	C	1001	-	8,9,9	1.00	0	10,11,11	1.62	3 (30%)
3	JUS	D	1257	-	23,23,23	0.62	0	29,29,29	0.99	2 (6%)
3	JUS	A	1257	-	23,23,23	0.68	0	29,29,29	1.03	2 (6%)
4	NAP	E	1258	-	45,52,52	1.57	3 (6%)	56,80,80	1.73	9 (16%)
4	NAP	F	1258	-	45,52,52	1.64	4 (8%)	56,80,80	1.61	6 (10%)
4	NAP	A	1258	-	45,52,52	1.68	4 (8%)	56,80,80	1.75	8 (14%)
4	NAP	B	1258	-	45,52,52	1.53	3 (6%)	56,80,80	1.70	8 (14%)
2	GLU	A	1001	-	8,9,9	1.24	1 (12%)	10,11,11	0.97	0
2	GLU	E	1001	-	8,9,9	1.03	0	10,11,11	1.30	2 (20%)
2	GLU	B	1001	-	8,9,9	1.17	0	10,11,11	1.40	1 (10%)
3	JUS	C	1257	-	23,23,23	0.59	0	29,29,29	0.80	1 (3%)
2	GLU	G	1001	-	8,9,9	1.25	1 (12%)	10,11,11	1.16	0
3	JUS	H	1257	-	23,23,23	0.55	0	29,29,29	0.88	2 (6%)
4	NAP	G	1258	-	45,52,52	1.58	4 (8%)	56,80,80	1.56	6 (10%)
4	NAP	D	1258	-	45,52,52	1.68	3 (6%)	56,80,80	1.61	8 (14%)

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	NAP	C	1258	-	-	5/31/67/67	0/5/5/5
3	JUS	F	1257	-	-	3/12/12/12	0/2/2/2
4	NAP	H	1258	-	-	5/31/67/67	0/5/5/5
3	JUS	E	1257	-	-	3/12/12/12	0/2/2/2
3	JUS	B	1257	-	-	2/12/12/12	0/2/2/2
2	GLU	F	1001	-	-	5/9/9/9	-
3	JUS	G	1257	-	-	2/12/12/12	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GLU	C	1001	-	-	9/9/9/9	-
3	JUS	D	1257	-	-	1/12/12/12	0/2/2/2
3	JUS	A	1257	-	-	2/12/12/12	0/2/2/2
4	NAP	E	1258	-	-	6/31/67/67	0/5/5/5
4	NAP	F	1258	-	-	5/31/67/67	0/5/5/5
4	NAP	A	1258	-	-	7/31/67/67	0/5/5/5
4	NAP	B	1258	-	-	7/31/67/67	0/5/5/5
2	GLU	A	1001	-	-	6/9/9/9	-
2	GLU	E	1001	-	-	8/9/9/9	-
2	GLU	B	1001	-	-	4/9/9/9	-
3	JUS	C	1257	-	-	3/12/12/12	0/2/2/2
2	GLU	G	1001	-	-	7/9/9/9	-
3	JUS	H	1257	-	-	4/12/12/12	0/2/2/2
4	NAP	G	1258	-	-	8/31/67/67	0/5/5/5
4	NAP	D	1258	-	-	7/31/67/67	0/5/5/5

All (31) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	1258	NAP	O7N-C7N	8.93	1.41	1.24
4	D	1258	NAP	O7N-C7N	8.80	1.41	1.24
4	F	1258	NAP	O7N-C7N	8.35	1.40	1.24
4	C	1258	NAP	O7N-C7N	8.31	1.40	1.24
4	G	1258	NAP	O7N-C7N	7.93	1.39	1.24
4	A	1258	NAP	O7N-C7N	7.70	1.38	1.24
4	B	1258	NAP	O7N-C7N	7.61	1.38	1.24
4	E	1258	NAP	O7N-C7N	7.52	1.38	1.24
4	A	1258	NAP	C2A-N3A	4.64	1.39	1.32
4	H	1258	NAP	C2A-N3A	4.10	1.38	1.32
4	D	1258	NAP	C2A-N3A	4.05	1.38	1.32
4	E	1258	NAP	C2A-N3A	3.91	1.38	1.32
4	F	1258	NAP	C2A-N3A	3.73	1.38	1.32
4	G	1258	NAP	C2A-N3A	3.61	1.37	1.32
4	B	1258	NAP	C2A-N3A	3.55	1.37	1.32
4	E	1258	NAP	C2A-N1A	2.84	1.39	1.33
4	C	1258	NAP	C2A-N3A	2.82	1.36	1.32
4	D	1258	NAP	C2A-N1A	2.81	1.39	1.33
4	A	1258	NAP	C2A-N1A	2.65	1.38	1.33
4	F	1258	NAP	C2A-N1A	2.54	1.38	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	1258	NAP	P2B-O2B	2.48	1.64	1.59
4	H	1258	NAP	C2A-N1A	2.40	1.38	1.33
4	F	1258	NAP	P2B-O2B	2.27	1.63	1.59
2	F	1001	GLU	CG-CD	2.24	1.55	1.50
4	A	1258	NAP	C2N-N1N	2.15	1.37	1.35
2	G	1001	GLU	CG-CD	2.13	1.55	1.50
4	C	1258	NAP	C2N-N1N	2.11	1.37	1.35
4	B	1258	NAP	C2A-N1A	2.11	1.37	1.33
2	A	1001	GLU	CG-CD	2.07	1.55	1.50
4	G	1258	NAP	P2B-O2B	2.05	1.63	1.59
4	G	1258	NAP	C2A-N1A	2.01	1.37	1.33

All (83) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1258	NAP	N3A-C2A-N1A	-6.44	118.61	128.68
4	D	1258	NAP	N3A-C2A-N1A	-6.33	118.78	128.68
4	F	1258	NAP	N3A-C2A-N1A	-6.19	119.00	128.68
4	B	1258	NAP	C3N-C7N-N7N	6.12	125.09	117.75
4	C	1258	NAP	N3A-C2A-N1A	-6.07	119.19	128.68
4	A	1258	NAP	N3A-C2A-N1A	-6.05	119.23	128.68
4	E	1258	NAP	N3A-C2A-N1A	-6.01	119.29	128.68
4	C	1258	NAP	C3N-C7N-N7N	6.01	124.96	117.75
4	A	1258	NAP	C3N-C7N-N7N	5.99	124.94	117.75
4	G	1258	NAP	N3A-C2A-N1A	-5.69	119.78	128.68
4	E	1258	NAP	C3N-C7N-N7N	5.68	124.56	117.75
4	H	1258	NAP	N3A-C2A-N1A	-5.49	120.10	128.68
4	F	1258	NAP	C3N-C7N-N7N	5.47	124.32	117.75
4	G	1258	NAP	C3N-C7N-N7N	4.90	123.64	117.75
4	C	1258	NAP	O7N-C7N-C3N	-4.49	114.26	119.63
4	A	1258	NAP	O7N-C7N-C3N	-4.34	114.43	119.63
4	H	1258	NAP	O4B-C1B-C2B	-4.14	99.41	106.59
4	E	1258	NAP	O7N-C7N-C3N	-4.14	114.68	119.63
4	B	1258	NAP	O7N-C7N-C3N	-3.98	114.87	119.63
4	G	1258	NAP	O7N-C7N-C3N	-3.92	114.94	119.63
4	D	1258	NAP	C2N-C3N-C4N	3.90	122.68	118.26
4	H	1258	NAP	O7N-C7N-C3N	-3.53	115.41	119.63
4	H	1258	NAP	C3N-C7N-N7N	3.36	121.78	117.75
4	D	1258	NAP	O7N-C7N-C3N	-3.16	115.86	119.63
4	F	1258	NAP	O7N-C7N-N7N	-3.15	118.10	122.58
4	E	1258	NAP	C1B-N9A-C4A	-3.12	121.16	126.64
4	A	1258	NAP	O4B-C1B-C2B	-3.05	101.30	106.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	1258	NAP	C3D-C2D-C1D	-2.98	96.49	100.98
3	G	1257	JUS	C15-C14-C2	-2.93	102.66	113.68
2	C	1001	GLU	CB-CA-C	-2.82	103.58	110.30
3	H	1257	JUS	O7-C5-C6	2.81	121.47	116.22
4	F	1258	NAP	O2N-PN-O1N	2.81	126.11	112.24
4	D	1258	NAP	C3N-C2N-N1N	-2.74	117.75	120.43
4	C	1258	NAP	C4A-C5A-N7A	-2.72	106.57	109.40
4	G	1258	NAP	C1B-N9A-C4A	-2.71	121.88	126.64
4	H	1258	NAP	O2N-PN-O1N	2.70	125.57	112.24
3	A	1257	JUS	C15-C14-C2	-2.68	103.58	113.68
4	B	1258	NAP	C3D-C2D-C1D	-2.67	96.95	100.98
4	B	1258	NAP	O3X-P2B-O2X	2.67	117.84	107.64
4	C	1258	NAP	O5B-C5B-C4B	-2.66	99.82	108.99
4	D	1258	NAP	C1B-N9A-C4A	-2.59	122.09	126.64
2	B	1001	GLU	CB-CG-CD	-2.58	105.65	112.51
3	D	1257	JUS	C8-C13-CAD	2.54	122.05	119.57
3	E	1257	JUS	C15-C14-C2	-2.49	104.30	113.68
4	A	1258	NAP	C3D-C2D-C1D	-2.47	97.26	100.98
4	G	1258	NAP	C2N-C3N-C4N	2.47	121.05	118.26
3	H	1257	JUS	C8-C13-CAD	2.46	121.96	119.57
3	G	1257	JUS	O7-C5-C6	2.45	120.81	116.22
4	C	1258	NAP	C5A-C6A-N6A	2.41	124.01	120.35
4	E	1258	NAP	O3X-P2B-O2X	2.35	116.63	107.64
4	D	1258	NAP	O4B-C1B-C2B	-2.35	102.51	106.59
2	C	1001	GLU	OE1-CD-CG	-2.35	115.54	123.08
4	F	1258	NAP	O4D-C1D-C2D	-2.33	103.52	106.93
3	F	1257	JUS	C15-C14-C2	-2.32	104.95	113.68
4	H	1258	NAP	O2X-P2B-O1X	2.31	119.71	110.68
4	A	1258	NAP	O5B-C5B-C4B	-2.30	101.07	108.99
4	G	1258	NAP	O4D-C1D-C2D	-2.30	103.56	106.93
4	A	1258	NAP	C3N-C2N-N1N	-2.28	118.19	120.43
4	C	1258	NAP	C2A-N1A-C6A	2.27	122.63	118.75
3	A	1257	JUS	C17-C16-C15	-2.26	102.96	114.42
4	A	1258	NAP	C2N-C3N-C4N	2.24	120.80	118.26
3	D	1257	JUS	C15-C14-C2	-2.23	105.28	113.68
4	B	1258	NAP	O4B-C1B-C2B	-2.23	102.72	106.59
3	E	1257	JUS	C8-C13-CAD	2.22	121.73	119.57
2	E	1001	GLU	OE1-CD-CG	-2.18	116.09	123.08
3	B	1257	JUS	C15-C14-C2	-2.17	105.50	113.68
3	C	1257	JUS	C15-C14-C2	-2.17	105.51	113.68
4	B	1258	NAP	O2N-PN-O1N	2.16	122.92	112.24
4	H	1258	NAP	O3B-C3B-C4B	-2.16	104.81	111.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	1258	NAP	O4D-C1D-C2D	-2.14	103.79	106.93
2	C	1001	GLU	O-C-CA	-2.14	114.58	122.14
2	E	1001	GLU	CG-CB-CA	-2.13	108.87	113.84
4	F	1258	NAP	C6N-N1N-C2N	-2.12	120.04	121.97
4	H	1258	NAP	C3B-C2B-C1B	-2.12	98.90	102.89
4	B	1258	NAP	O3B-C3B-C2B	-2.12	105.15	111.17
4	D	1258	NAP	O2N-PN-O1N	2.12	122.71	112.24
3	E	1257	JUS	O7-C5-C6	2.09	120.13	116.22
4	C	1258	NAP	C2D-C3D-C4D	2.09	106.71	102.64
3	B	1257	JUS	O7-C8-C9	2.08	126.28	120.73
4	E	1258	NAP	C5N-C4N-C3N	-2.08	117.89	120.34
4	D	1258	NAP	C6N-N1N-C2N	-2.08	120.08	121.97
4	E	1258	NAP	C6N-N1N-C2N	-2.07	120.08	121.97
4	E	1258	NAP	C2N-C3N-C4N	2.04	120.57	118.26

There are no chirality outliers.

All (109) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1001	GLU	O-C-CA-N
2	B	1001	GLU	N-CA-CB-CG
2	B	1001	GLU	C-CA-CB-CG
2	C	1001	GLU	N-CA-CB-CG
2	E	1001	GLU	O-C-CA-N
2	E	1001	GLU	C-CA-CB-CG
2	F	1001	GLU	C-CA-CB-CG
2	G	1001	GLU	N-CA-CB-CG
3	H	1257	JUS	C8-C13-CAD-NAB
4	A	1258	NAP	C5D-O5D-PN-O1N
4	A	1258	NAP	C5D-O5D-PN-O2N
4	A	1258	NAP	O4D-C1D-N1N-C2N
4	A	1258	NAP	O4D-C1D-N1N-C6N
4	B	1258	NAP	C5D-O5D-PN-O2N
4	B	1258	NAP	O4D-C1D-N1N-C2N
4	C	1258	NAP	C5D-O5D-PN-O3
4	C	1258	NAP	C5D-O5D-PN-O1N
4	C	1258	NAP	O4D-C1D-N1N-C2N
4	D	1258	NAP	C5D-O5D-PN-O1N
4	D	1258	NAP	C5D-O5D-PN-O2N
4	D	1258	NAP	O4D-C1D-N1N-C2N
4	D	1258	NAP	O4D-C1D-N1N-C6N
4	E	1258	NAP	PN-O3-PA-O5B

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Mol	Chain	Res	Type	Atoms
4	E	1258	NAP	C5D-O5D-PN-O1N
4	E	1258	NAP	C5D-O5D-PN-O2N
4	E	1258	NAP	O4D-C1D-N1N-C2N
4	F	1258	NAP	C5D-O5D-PN-O1N
4	F	1258	NAP	C5D-O5D-PN-O2N
4	F	1258	NAP	O4D-C1D-N1N-C2N
4	G	1258	NAP	C5D-O5D-PN-O1N
4	G	1258	NAP	C5D-O5D-PN-O2N
4	G	1258	NAP	O4D-C1D-N1N-C2N
4	G	1258	NAP	O4D-C1D-N1N-C6N
4	H	1258	NAP	C5D-O5D-PN-O1N
4	H	1258	NAP	C5D-O5D-PN-O2N
4	H	1258	NAP	O4D-C1D-N1N-C2N
2	E	1001	GLU	OXT-C-CA-N
2	A	1001	GLU	OXT-C-CA-N
3	H	1257	JUS	C2-C14-C15-C16
3	C	1257	JUS	C2-C14-C15-C16
3	A	1257	JUS	C15-C16-C17-C18
2	F	1001	GLU	OXT-C-CA-N
3	E	1257	JUS	C15-C16-C17-C18
3	E	1257	JUS	C2-C14-C15-C16
3	D	1257	JUS	C15-C16-C17-C18
3	G	1257	JUS	C15-C16-C17-C18
3	F	1257	JUS	C2-C14-C15-C16
3	G	1257	JUS	C14-C15-C16-C17
3	C	1257	JUS	C15-C16-C17-C18
3	A	1257	JUS	C14-C15-C16-C17
3	F	1257	JUS	C14-C15-C16-C17
3	E	1257	JUS	C14-C15-C16-C17
3	B	1257	JUS	C2-C14-C15-C16
3	B	1257	JUS	C14-C15-C16-C17
2	A	1001	GLU	CA-CB-CG-CD
2	C	1001	GLU	O-C-CA-N
2	F	1001	GLU	O-C-CA-N
2	G	1001	GLU	O-C-CA-N
4	C	1258	NAP	O4B-C4B-C5B-O5B
2	C	1001	GLU	C-CA-CB-CG
2	G	1001	GLU	C-CA-CB-CG
2	C	1001	GLU	CA-CB-CG-CD
3	F	1257	JUS	C16-C17-C18-C19
4	B	1258	NAP	C5D-O5D-PN-O3
4	F	1258	NAP	C5D-O5D-PN-O3

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Mol	Chain	Res	Type	Atoms
4	B	1258	NAP	PA-O3-PN-O1N
2	F	1001	GLU	O-C-CA-CB
4	B	1258	NAP	C5D-O5D-PN-O1N
3	H	1257	JUS	C14-C15-C16-C17
2	E	1001	GLU	O-C-CA-CB
2	F	1001	GLU	OXT-C-CA-CB
2	E	1001	GLU	OXT-C-CA-CB
3	H	1257	JUS	C16-C17-C18-C19
4	G	1258	NAP	PA-O3-PN-O1N
2	A	1001	GLU	O-C-CA-CB
2	C	1001	GLU	OXT-C-CA-CB
2	E	1001	GLU	OE2-CD-CG-CB
2	B	1001	GLU	OE1-CD-CG-CB
2	C	1001	GLU	O-C-CA-CB
2	G	1001	GLU	O-C-CA-CB
2	E	1001	GLU	OE1-CD-CG-CB
4	B	1258	NAP	PA-O3-PN-O2N
4	D	1258	NAP	PA-O3-PN-O2N
2	B	1001	GLU	OE2-CD-CG-CB
2	C	1001	GLU	OXT-C-CA-N
2	G	1001	GLU	OXT-C-CA-N
2	G	1001	GLU	CA-CB-CG-CD
4	D	1258	NAP	O4B-C4B-C5B-O5B
4	G	1258	NAP	O4B-C4B-C5B-O5B
2	C	1001	GLU	OE1-CD-CG-CB
4	A	1258	NAP	C5D-O5D-PN-O3
4	A	1258	NAP	C2D-C1D-N1N-C6N
4	D	1258	NAP	C5D-O5D-PN-O3
4	E	1258	NAP	C5D-O5D-PN-O3
4	G	1258	NAP	C5D-O5D-PN-O3
4	H	1258	NAP	C5D-O5D-PN-O3
4	A	1258	NAP	O4B-C4B-C5B-O5B
4	B	1258	NAP	O4B-C4B-C5B-O5B
4	E	1258	NAP	O4B-C4B-C5B-O5B
4	F	1258	NAP	O4B-C4B-C5B-O5B
4	H	1258	NAP	O4B-C4B-C5B-O5B
2	C	1001	GLU	OE2-CD-CG-CB
4	G	1258	NAP	PA-O3-PN-O2N
2	A	1001	GLU	OXT-C-CA-CB
2	G	1001	GLU	OXT-C-CA-CB
4	C	1258	NAP	C3B-C4B-C5B-O5B
2	A	1001	GLU	OE1-CD-CG-CB

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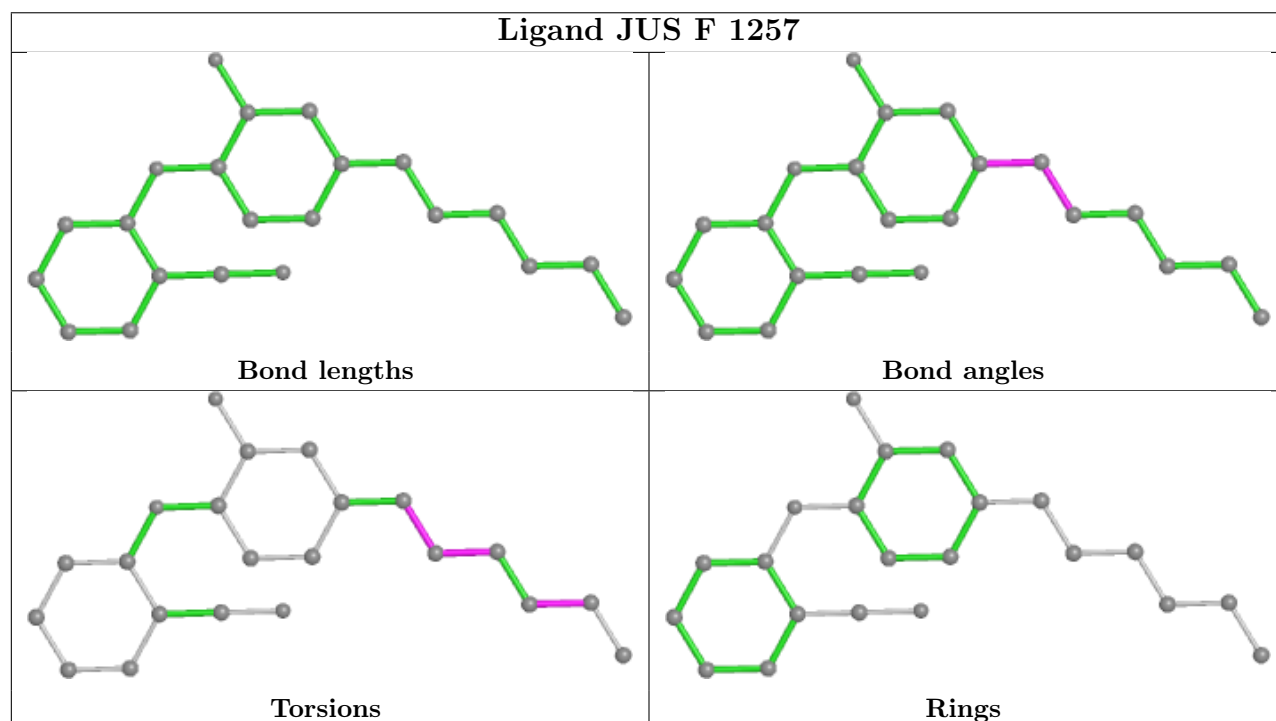
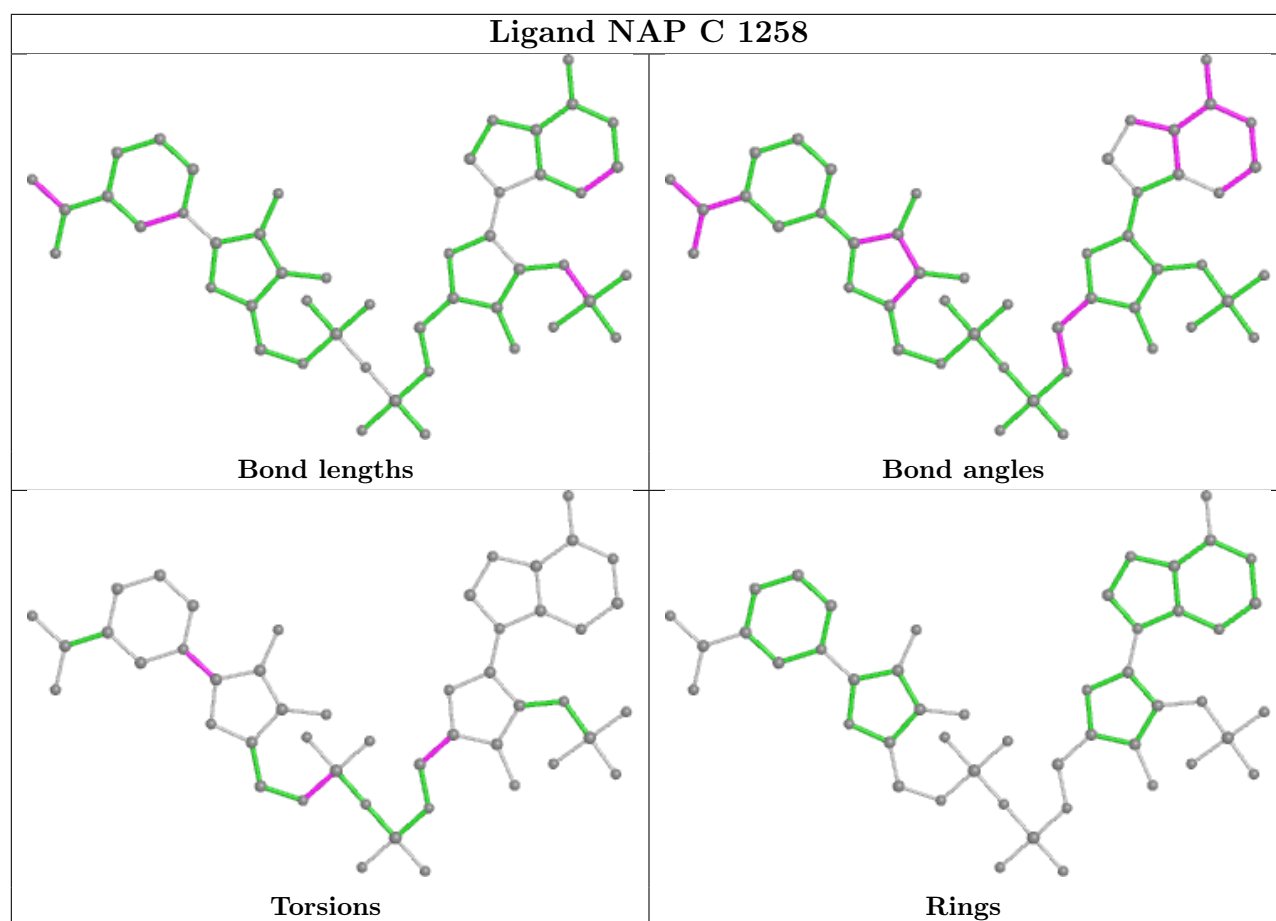
Mol	Chain	Res	Type	Atoms
2	E	1001	GLU	N-CA-CB-CG
3	C	1257	JUS	C14-C15-C16-C17

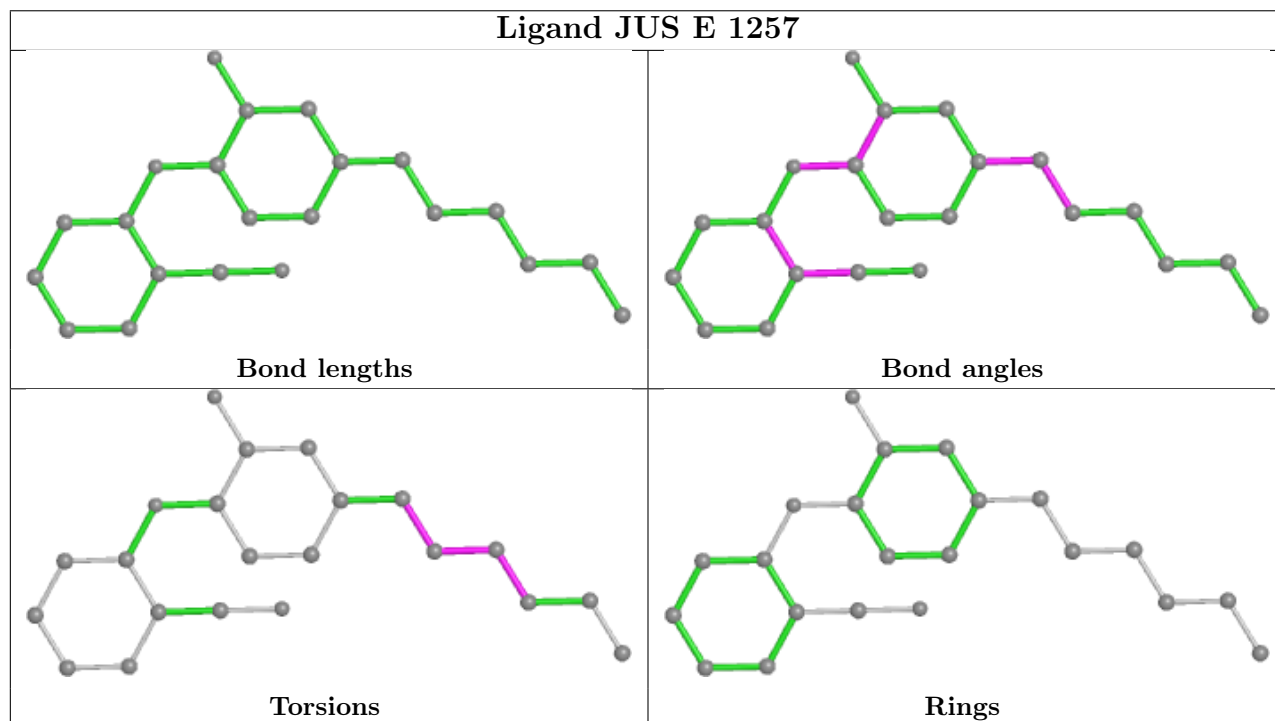
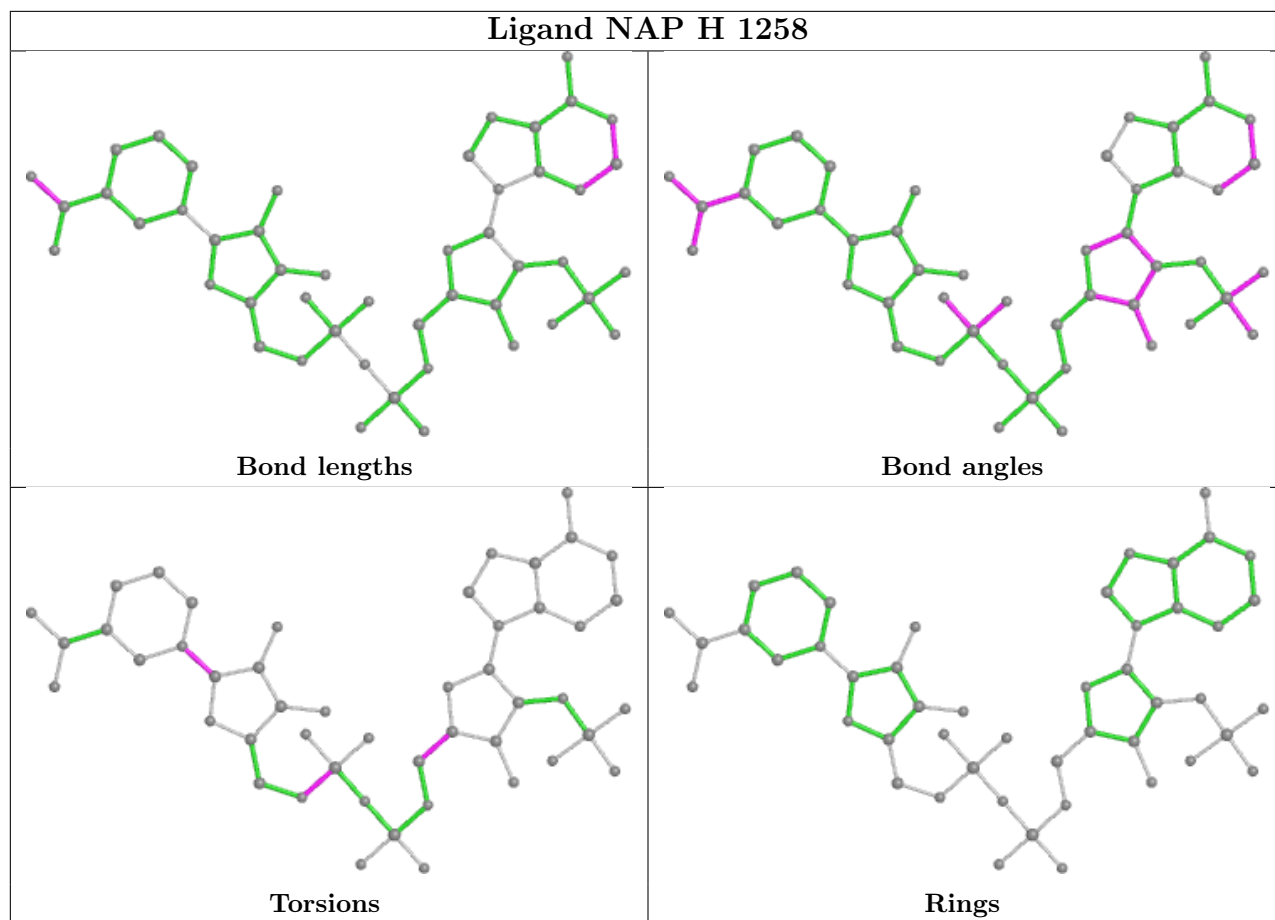
There are no ring outliers.

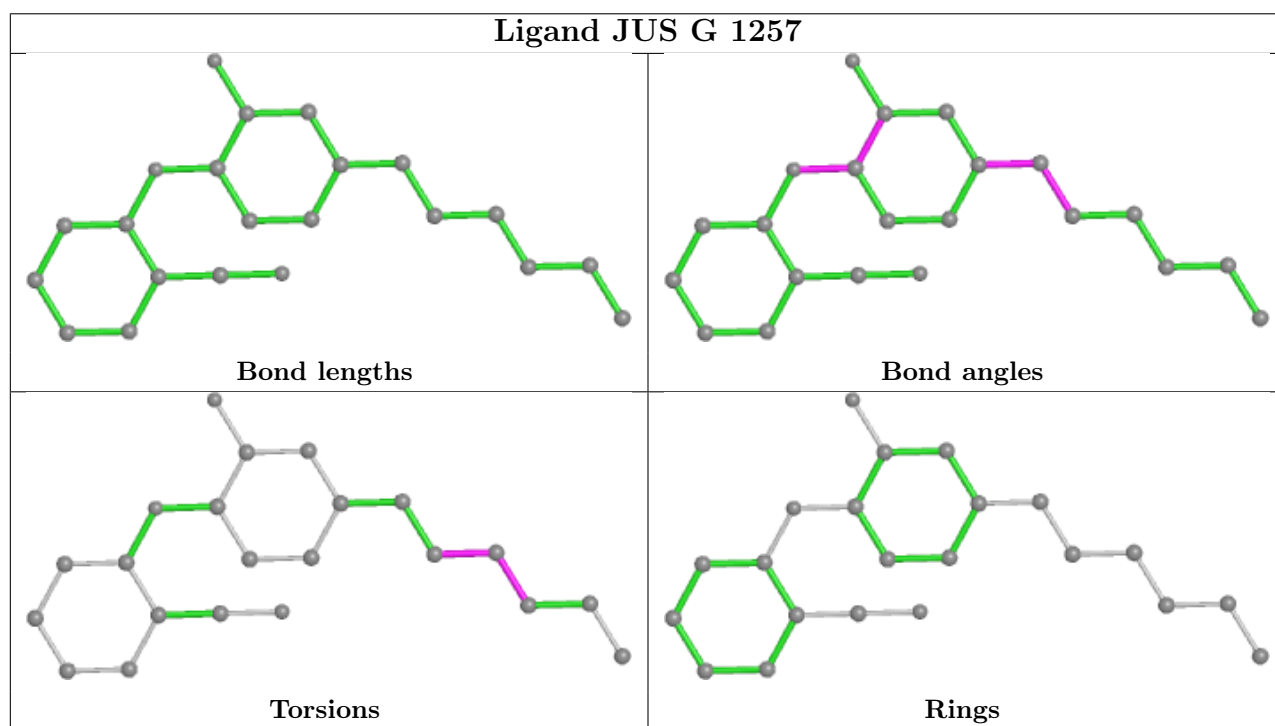
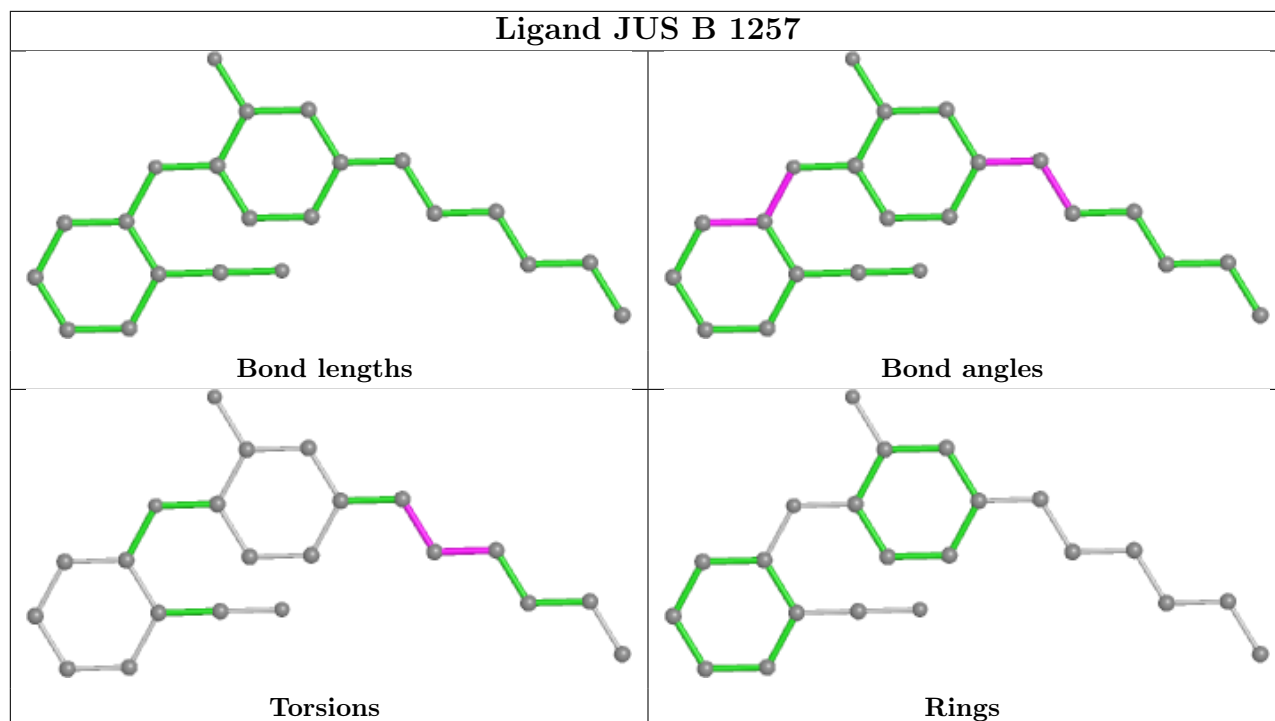
17 monomers are involved in 65 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1258	NAP	1	0
3	F	1257	JUS	1	0
4	H	1258	NAP	3	0
3	E	1257	JUS	1	0
3	B	1257	JUS	2	0
2	F	1001	GLU	12	0
3	G	1257	JUS	2	0
2	C	1001	GLU	2	0
3	A	1257	JUS	3	0
4	E	1258	NAP	1	0
4	A	1258	NAP	1	0
2	A	1001	GLU	16	0
2	E	1001	GLU	7	0
2	B	1001	GLU	6	0
3	C	1257	JUS	4	0
2	G	1001	GLU	2	0
3	H	1257	JUS	2	0

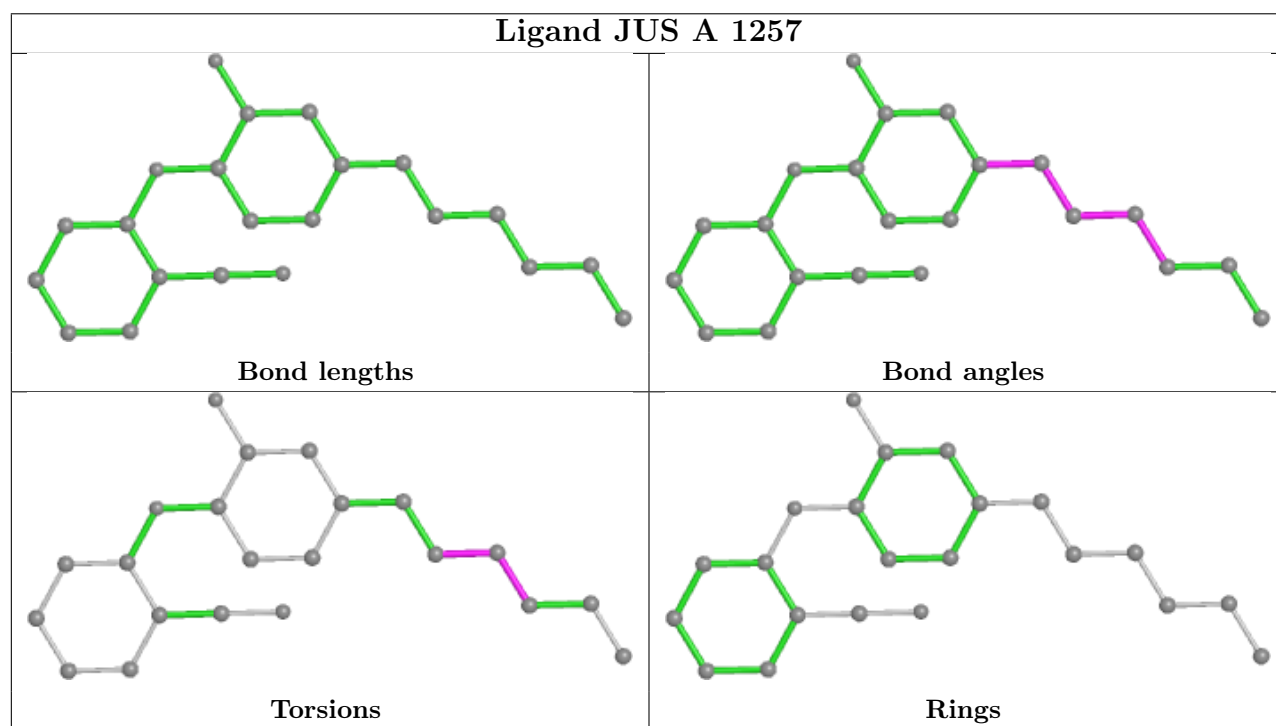
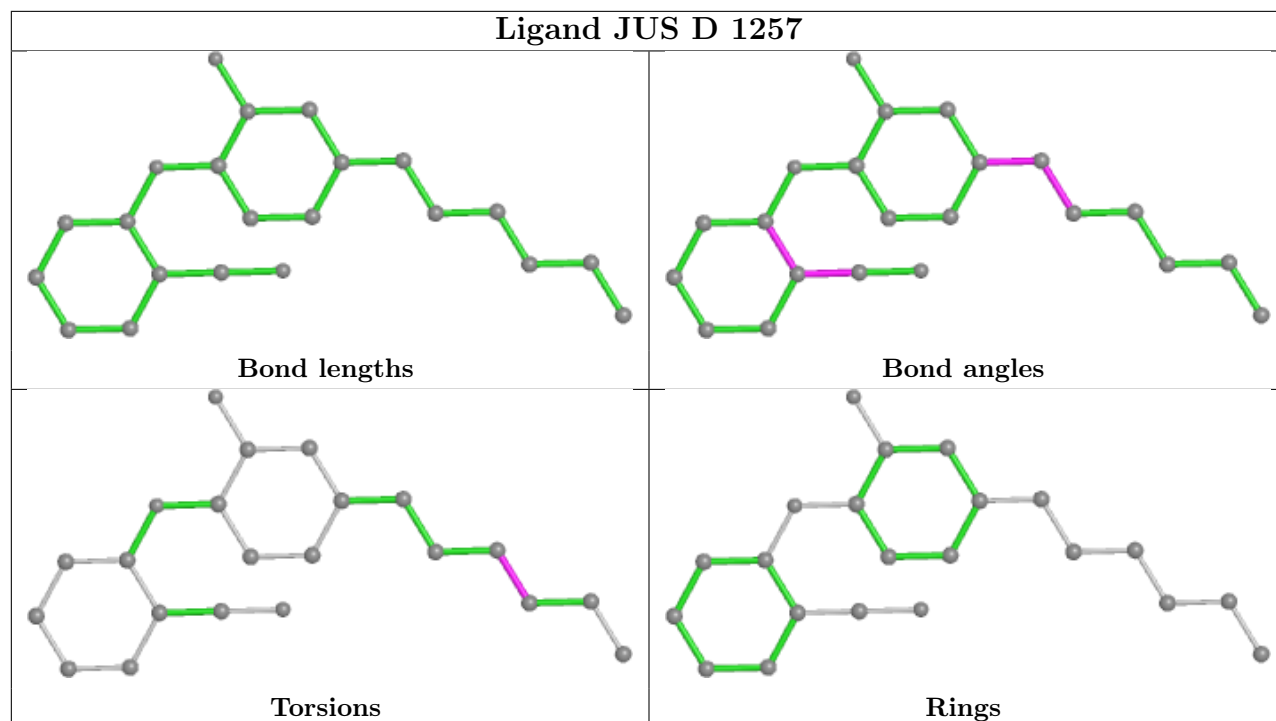
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

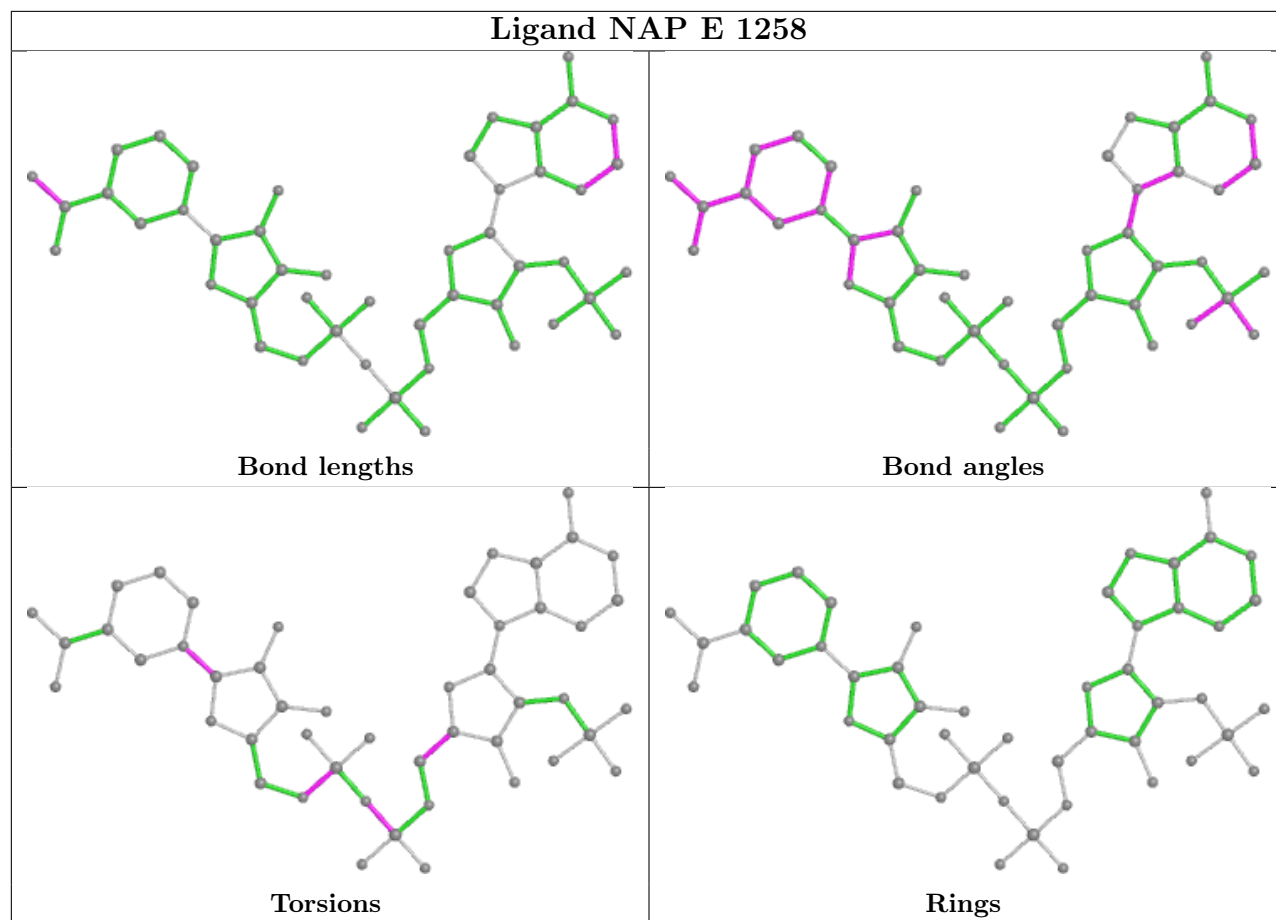


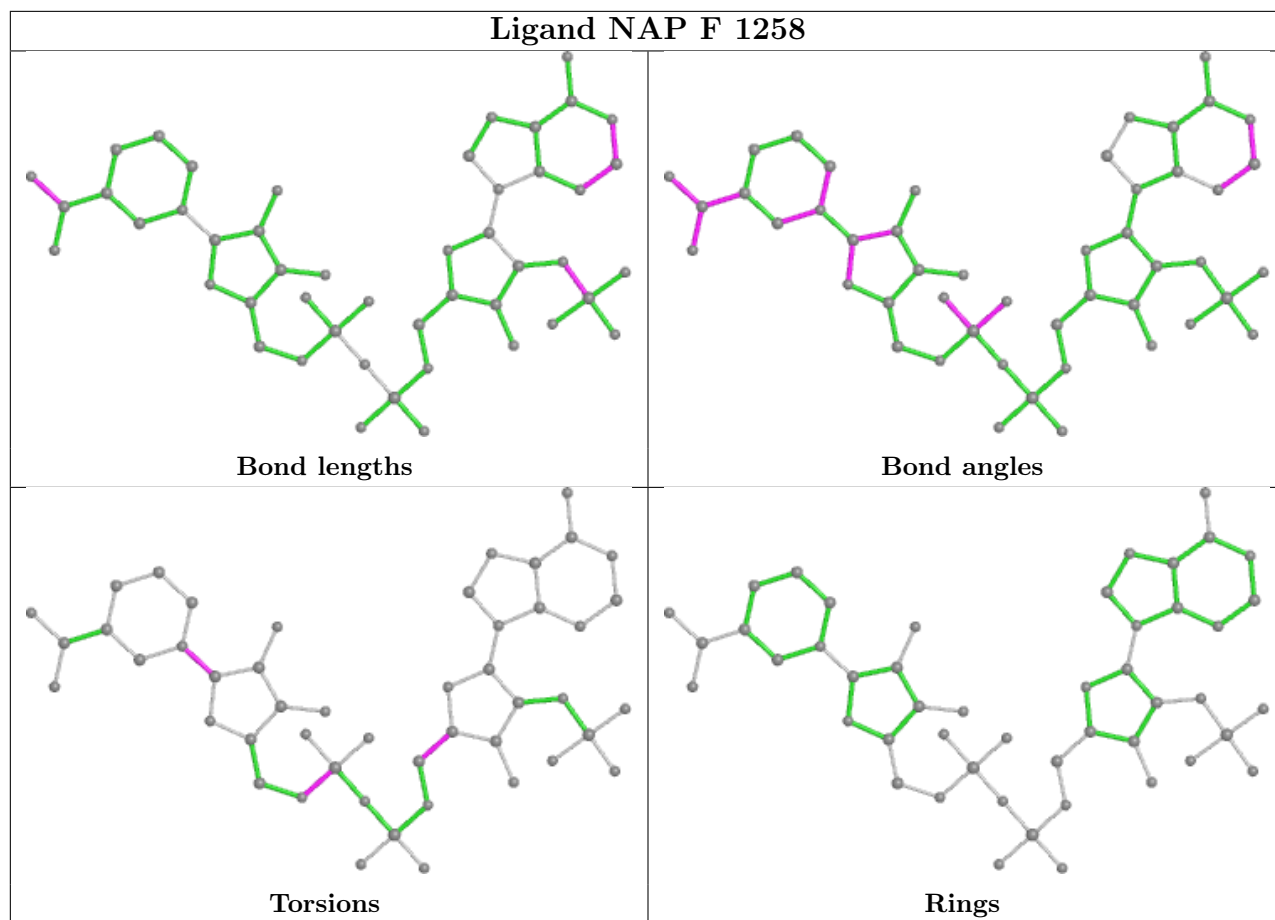


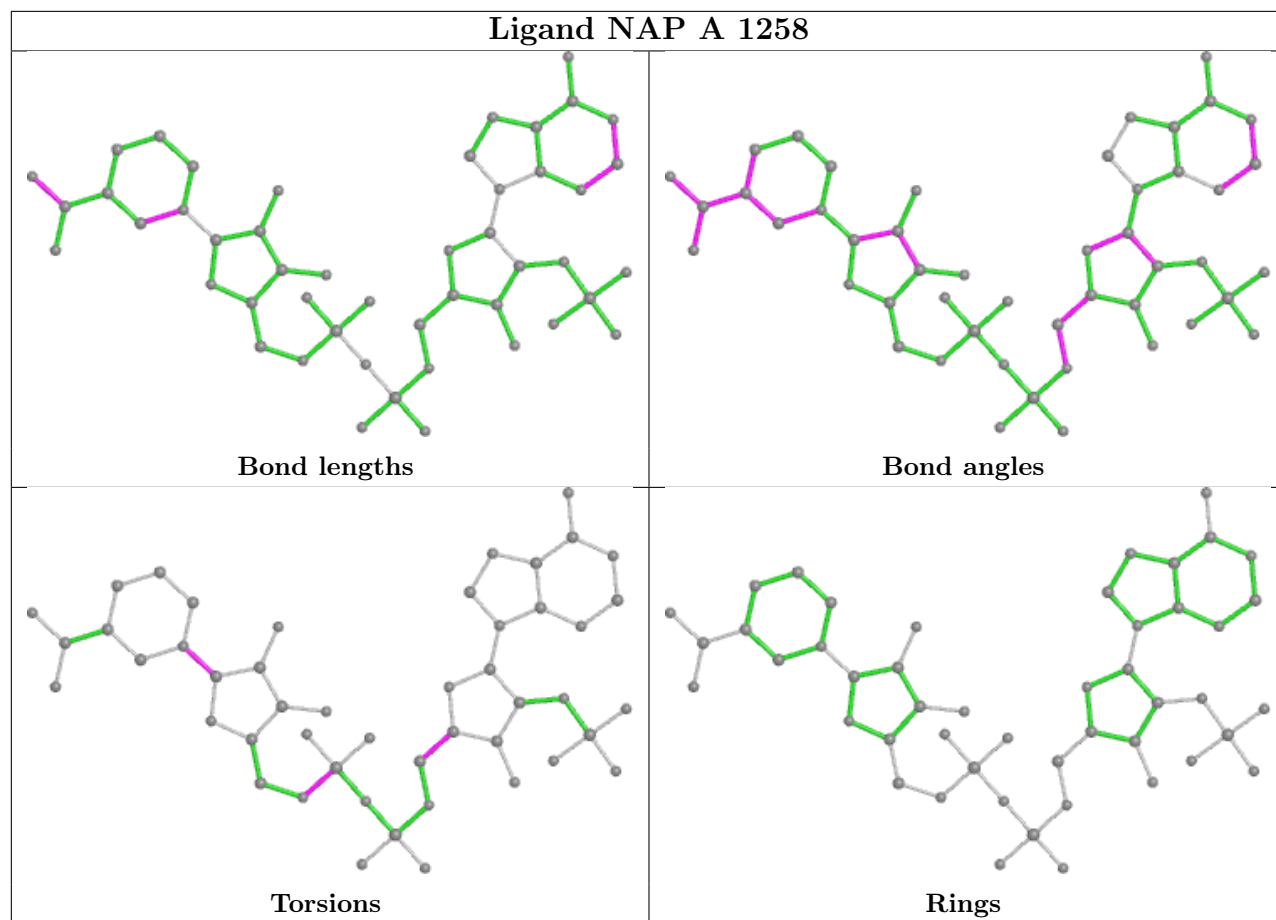


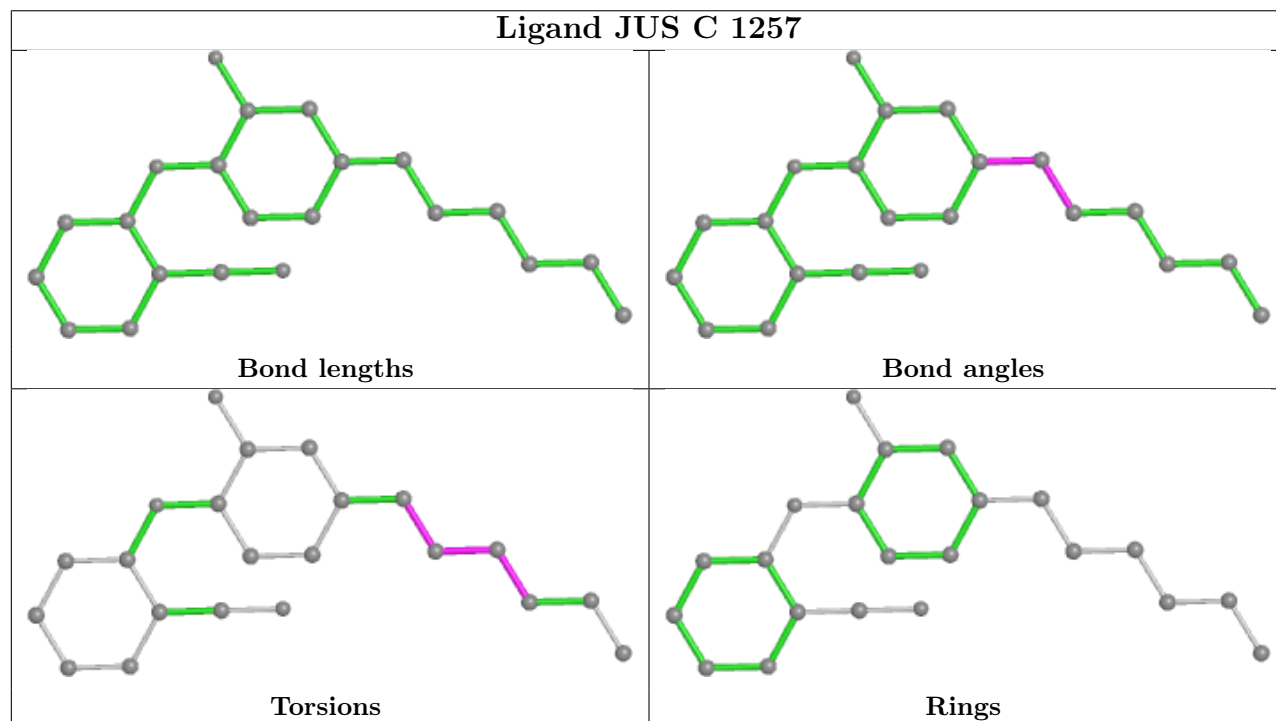
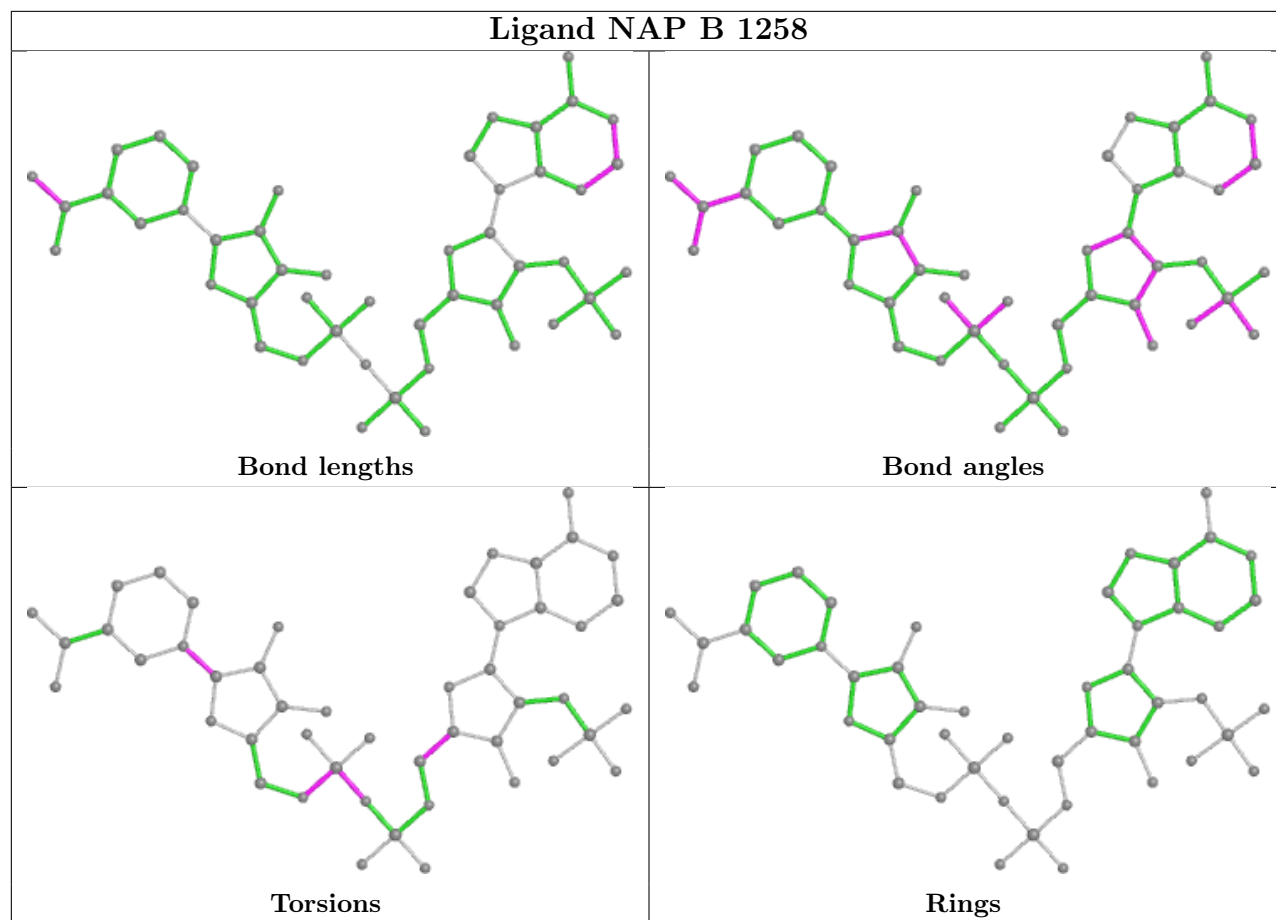


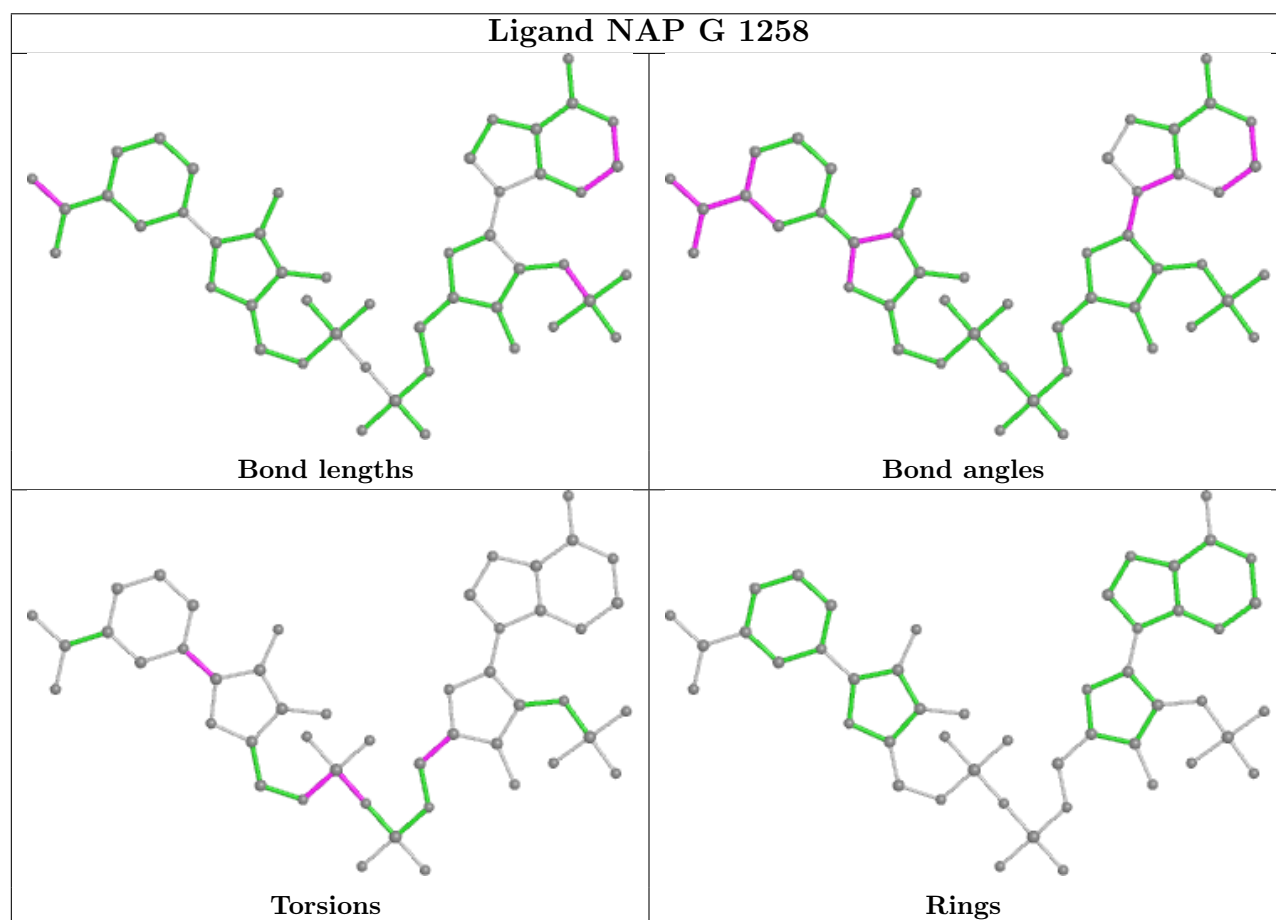
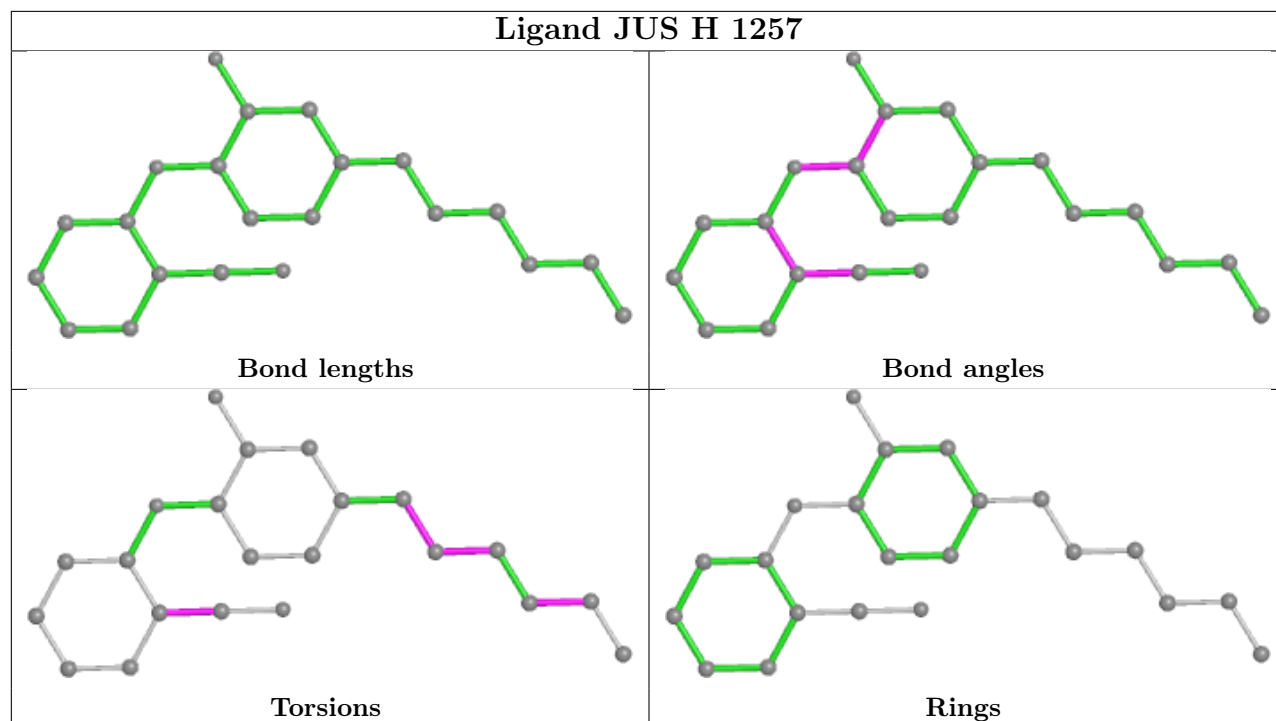


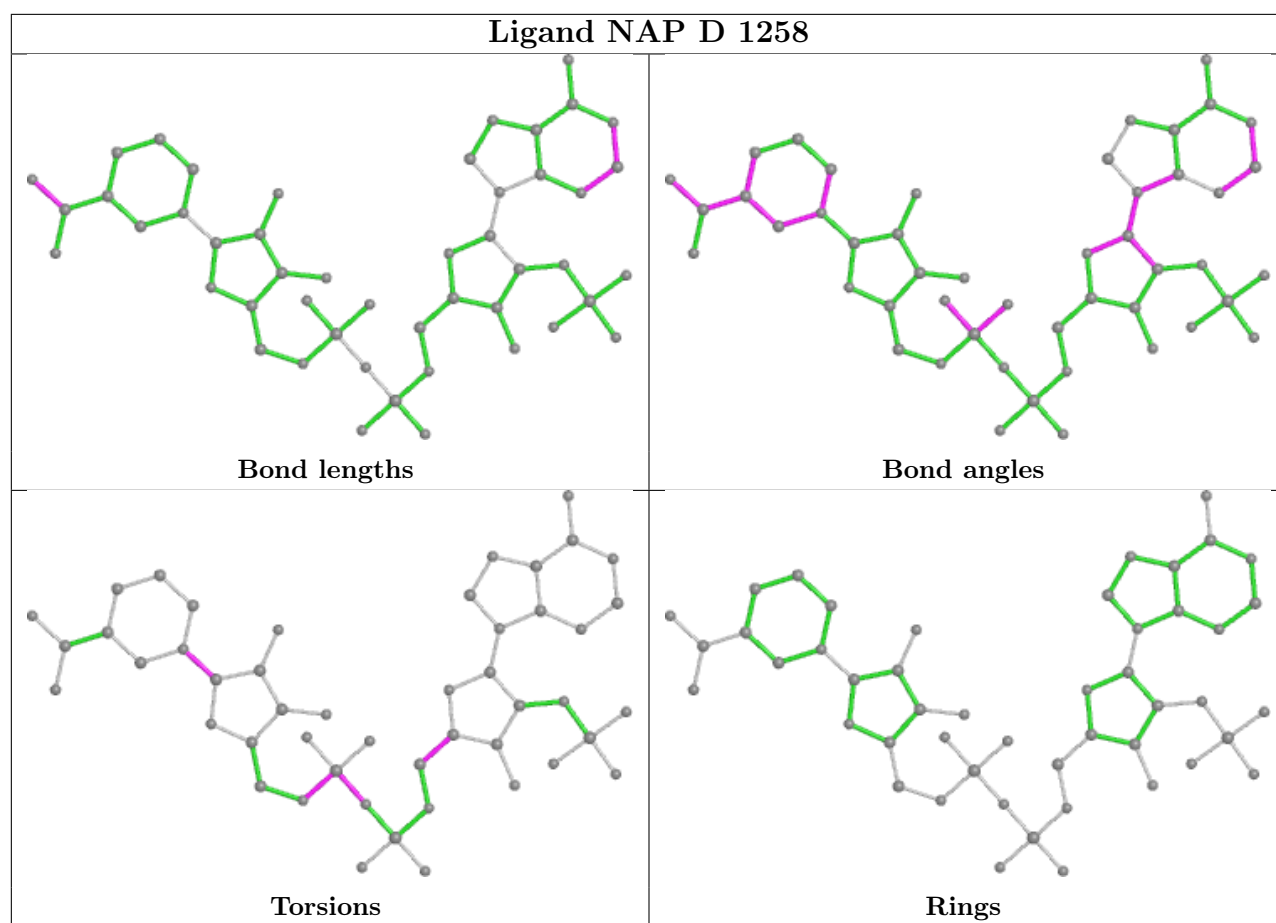












## 5.7 Other polymers [\(i\)](#)

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

### 6.1 Protein, DNA and RNA chains

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	254/282 (90%)	-0.39	1 (0%) 92 93	18, 29, 51, 64	0
1	B	255/282 (90%)	-0.47	0 100 100	18, 32, 56, 74	0
1	C	255/282 (90%)	-0.27	3 (1%) 79 81	21, 33, 56, 74	0
1	D	254/282 (90%)	-0.37	2 (0%) 86 87	18, 33, 63, 84	0
1	E	255/282 (90%)	-0.35	1 (0%) 92 93	18, 29, 53, 75	0
1	F	255/282 (90%)	-0.33	1 (0%) 92 93	18, 31, 58, 71	0
1	G	255/282 (90%)	-0.30	3 (1%) 79 81	20, 33, 58, 70	0
1	H	254/282 (90%)	-0.12	4 (1%) 72 74	18, 35, 67, 95	0
All	All	2037/2256 (90%)	-0.33	15 (0%) 87 88	18, 32, 59, 95	0

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	104	GLY	3.6
1	G	2	VAL	3.4
1	H	43	ARG	3.2
1	H	58	PRO	3.2
1	C	58	PRO	2.9
1	H	99	MET	2.8
1	E	2	VAL	2.7
1	C	6	ASN	2.7
1	D	56	ASN	2.4
1	F	2	VAL	2.4
1	G	6	ASN	2.3
1	G	58	PRO	2.3
1	D	58	PRO	2.2
1	C	2	VAL	2.2
1	A	56	ASN	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](#)

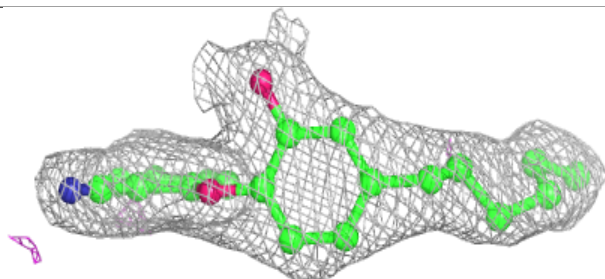
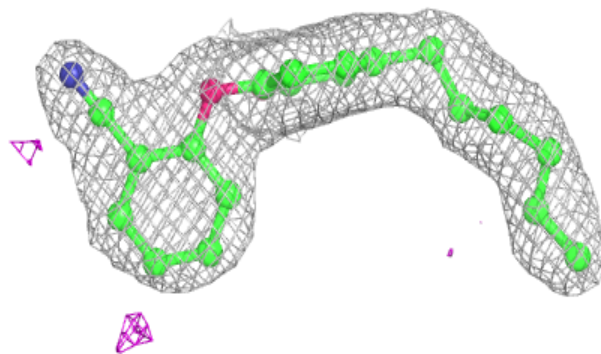
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	GLU	B	1001	10/10	0.64	0.33	70,72,78,78	0
2	GLU	E	1001	10/10	0.69	0.20	81,83,85,85	0
2	GLU	G	1001	10/10	0.76	0.23	78,80,82,85	0
2	GLU	A	1001	10/10	0.77	0.21	72,74,77,78	0
2	GLU	F	1001	10/10	0.80	0.18	71,77,79,80	0
2	GLU	C	1001	10/10	0.81	0.15	73,74,79,80	0
3	JUS	H	1257	22/22	0.96	0.12	31,37,40,42	0
4	NAP	H	1258	48/48	0.96	0.10	26,37,55,58	0
3	JUS	C	1257	22/22	0.97	0.15	26,30,33,36	0
3	JUS	D	1257	22/22	0.97	0.12	30,33,38,41	0
3	JUS	E	1257	22/22	0.97	0.11	22,28,33,34	0
3	JUS	G	1257	22/22	0.97	0.11	23,31,37,40	0
3	JUS	A	1257	22/22	0.97	0.15	19,28,34,41	0
4	NAP	C	1258	48/48	0.97	0.12	23,30,35,42	0
4	NAP	D	1258	48/48	0.97	0.10	26,35,52,55	0
3	JUS	B	1257	22/22	0.97	0.10	21,25,37,41	0
3	JUS	F	1257	22/22	0.98	0.12	20,28,33,37	0
4	NAP	A	1258	48/48	0.98	0.12	21,28,32,33	0
4	NAP	E	1258	48/48	0.98	0.09	18,27,33,40	0
4	NAP	F	1258	48/48	0.98	0.10	23,31,36,39	0
4	NAP	G	1258	48/48	0.98	0.10	25,31,36,41	0
4	NAP	B	1258	48/48	0.98	0.10	25,31,37,40	0

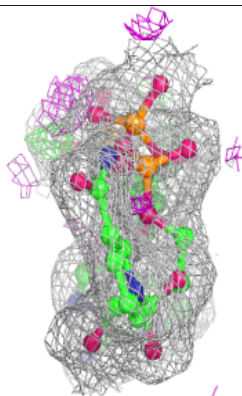
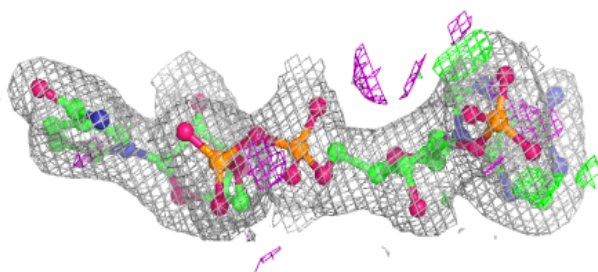
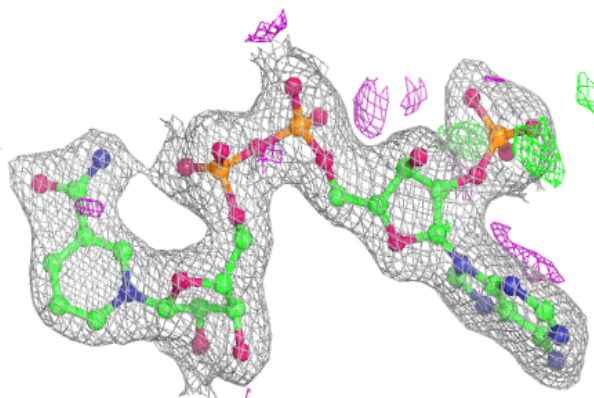
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around JUS H 1257:**

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

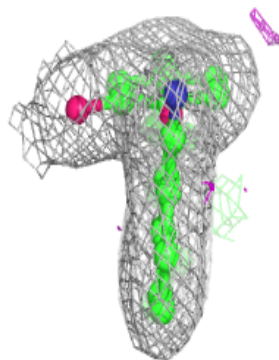
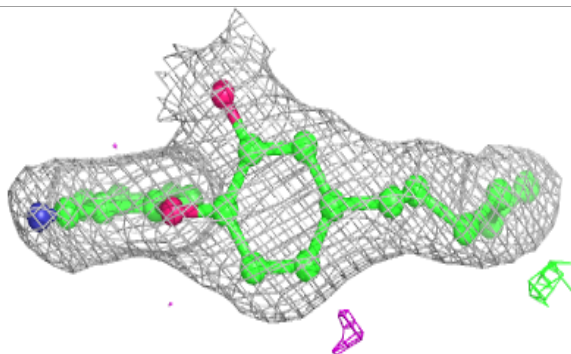
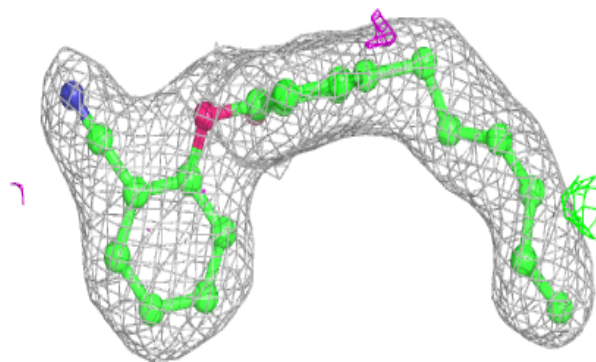
**Electron density around NAP H 1258:**

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

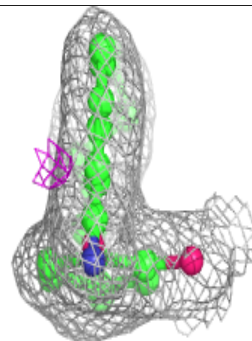
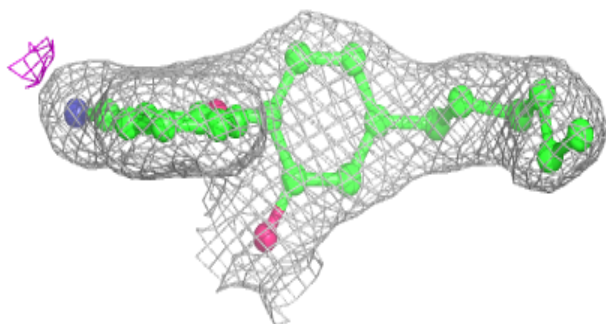
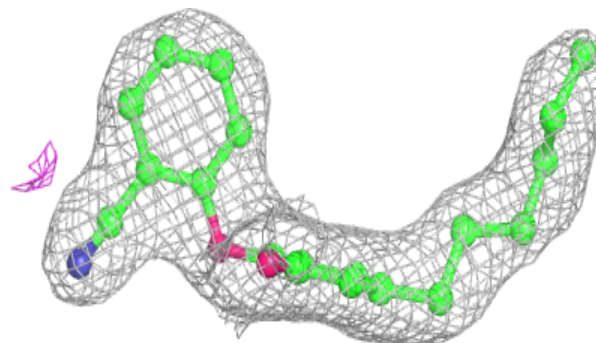


**Electron density around JUS C 1257:**

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

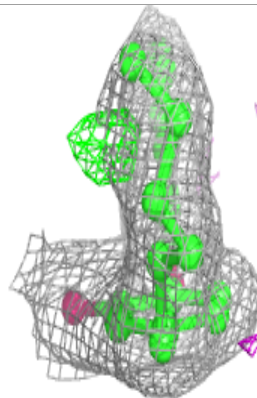
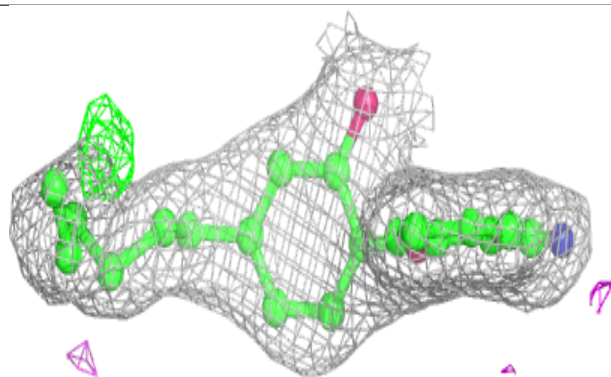
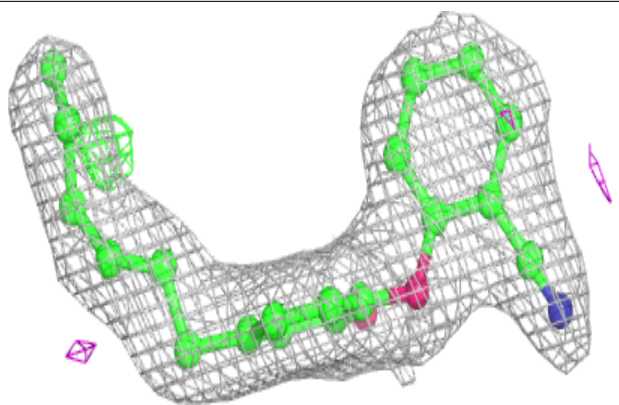
**Electron density around JUS D 1257:**

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

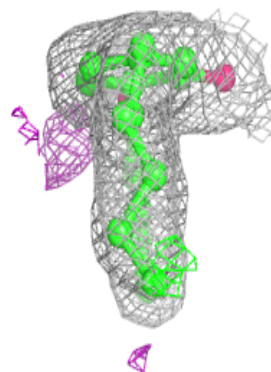
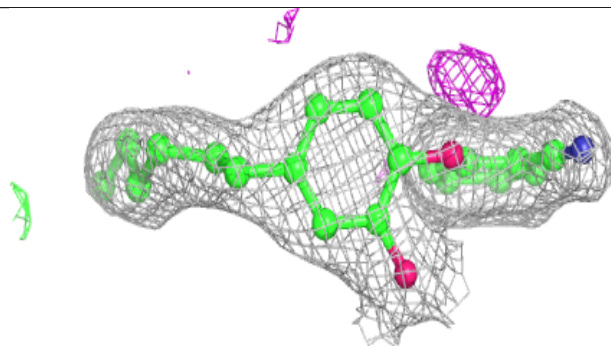
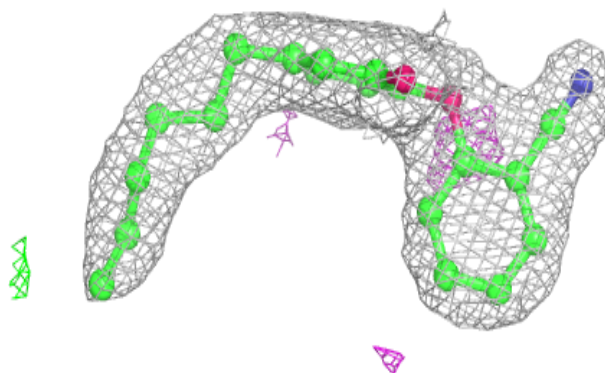


**Electron density around JUS E 1257:**

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

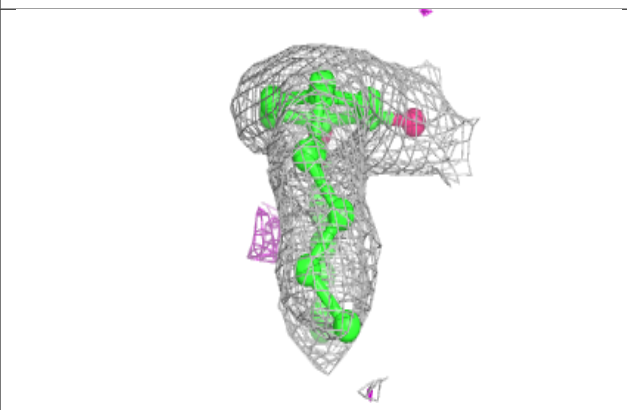
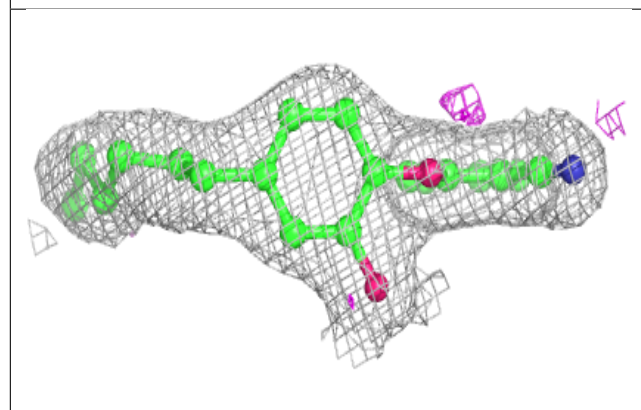
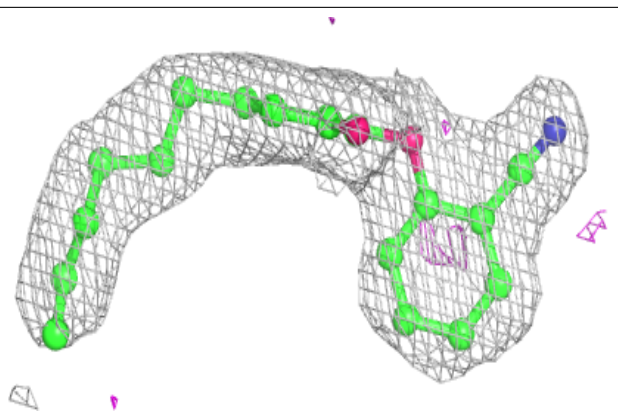
**Electron density around JUS G 1257:**

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

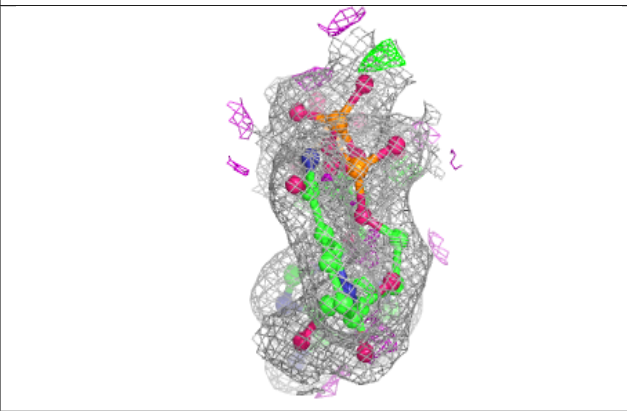
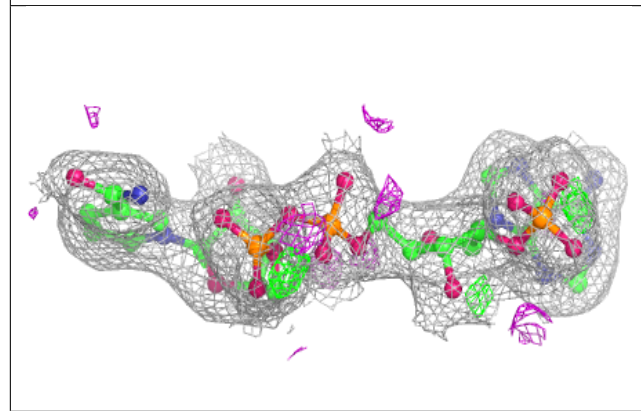
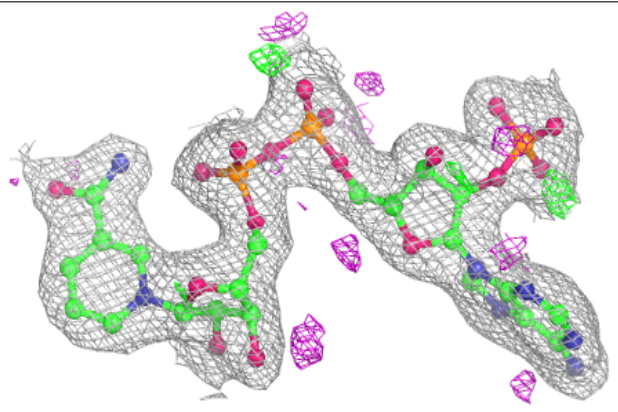


**Electron density around JUS A 1257:**

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

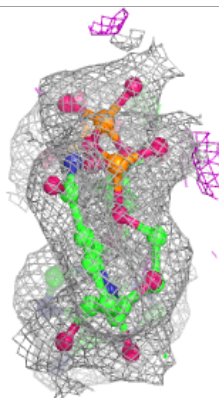
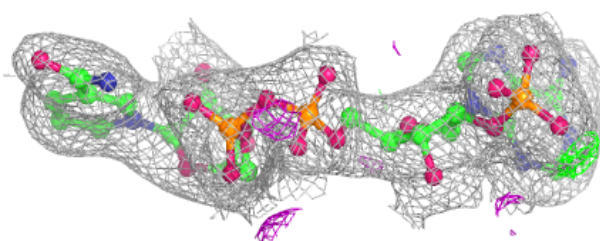
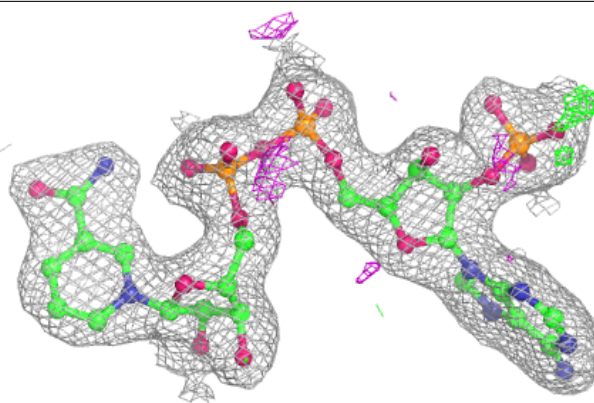
**Electron density around NAP C 1258:**

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

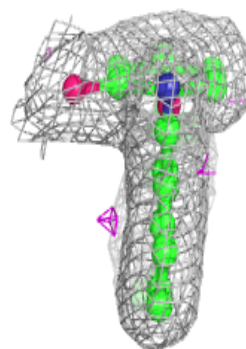
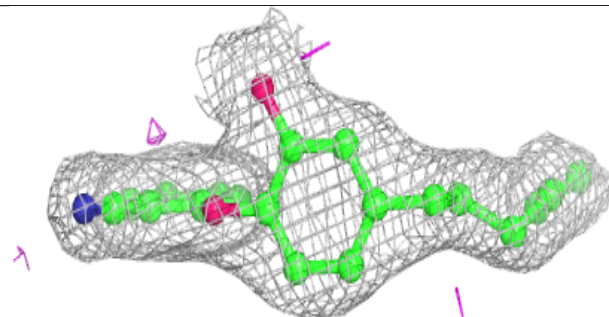
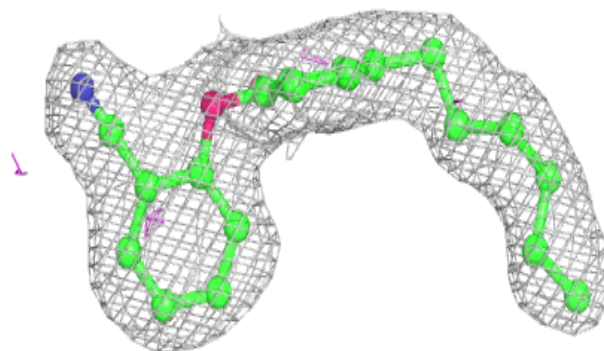


**Electron density around NAP D 1258:**

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

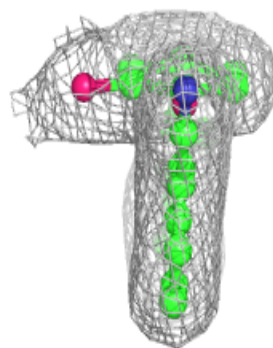
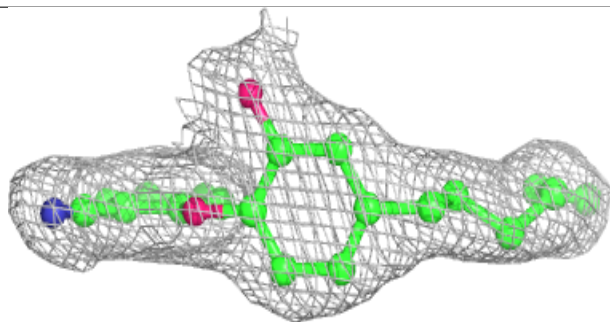
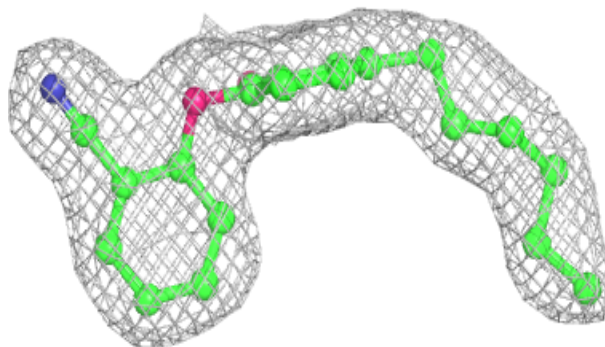
**Electron density around JUS B 1257:**

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

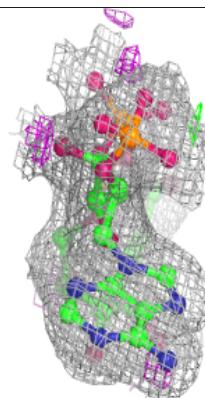
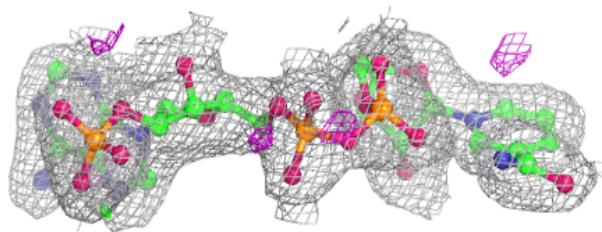
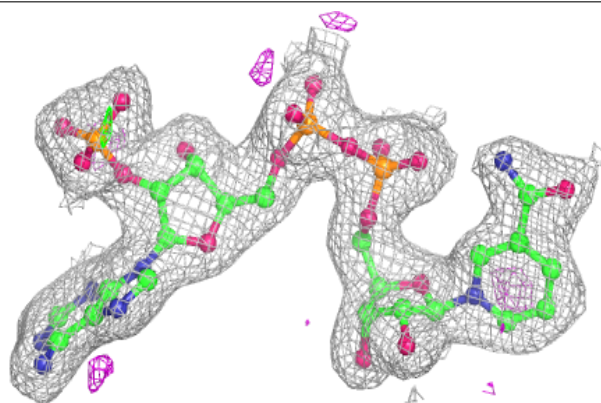


**Electron density around JUS F 1257:**

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

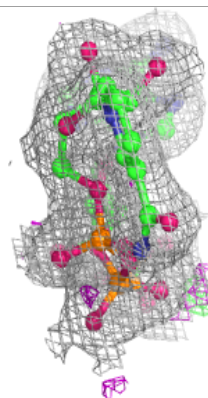
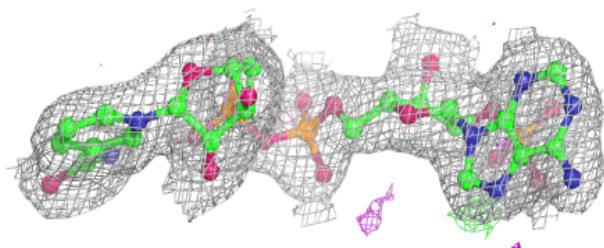
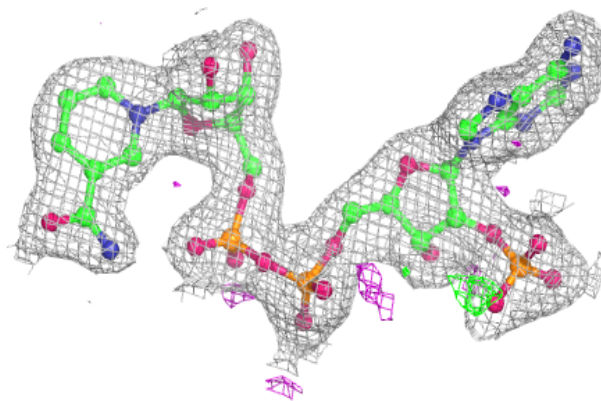
**Electron density around NAP A 1258:**

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and green (positive)

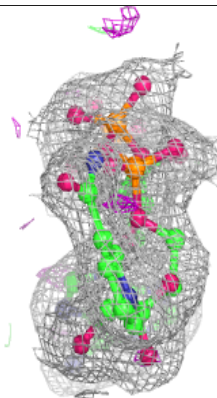
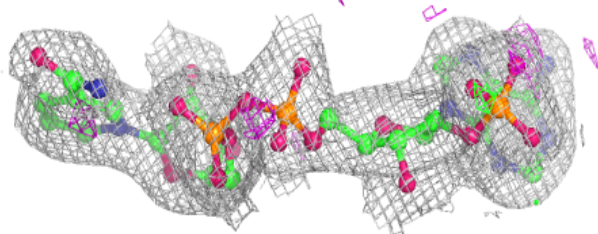
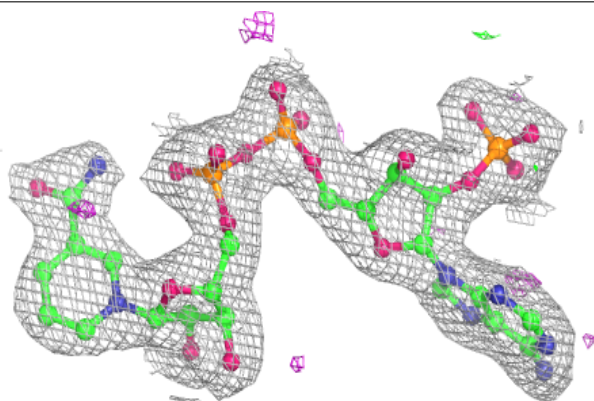


**Electron density around NAP E 1258:**

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

**Electron density around NAP F 1258:**

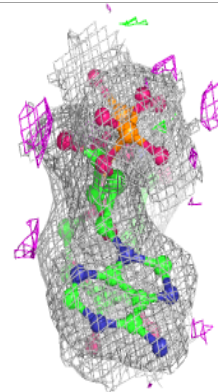
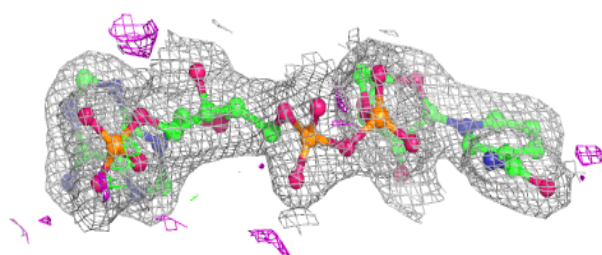
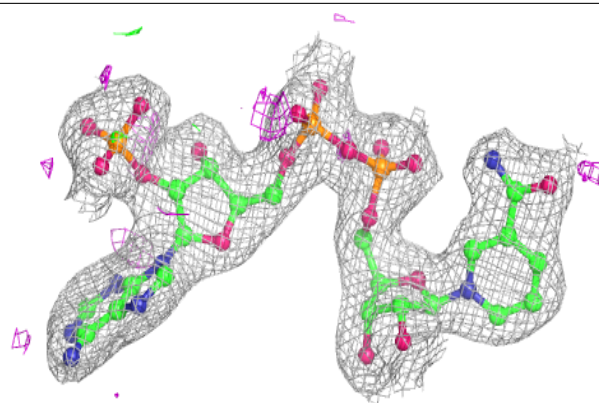
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



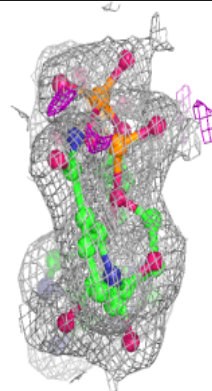
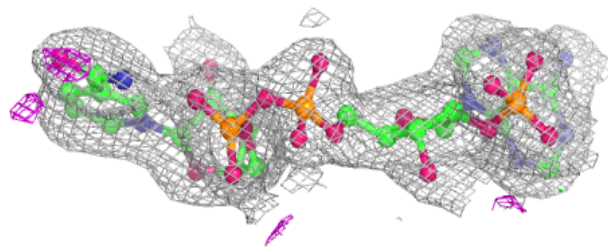
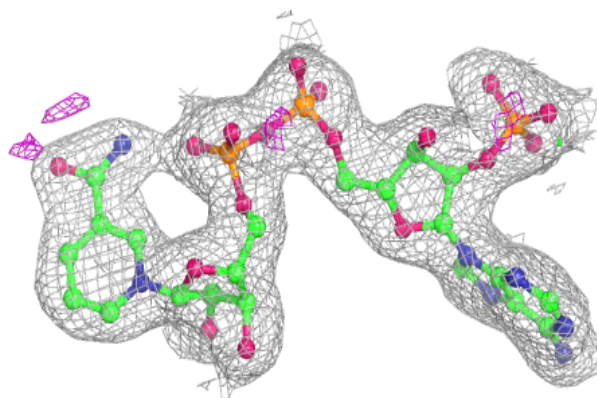


**Electron density around NAP G 1258:**

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

**Electron density around NAP B 1258:**

$2mF_o-DF_c$  (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.