



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 07:00 PM UTC

PDB ID : 4BNM / pdb_00004bnm
Title : Crystal structure of S. aureus FabI in complex with NADP and 5-hexyl- 2-(2-methylphenoxy)phenol
Authors : Schiebel, J.; Chang, A.; Bommineni, G.R.; Tonge, P.J.; Kisker, C.
Deposited on : 2013-05-15
Resolution : 2.35 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

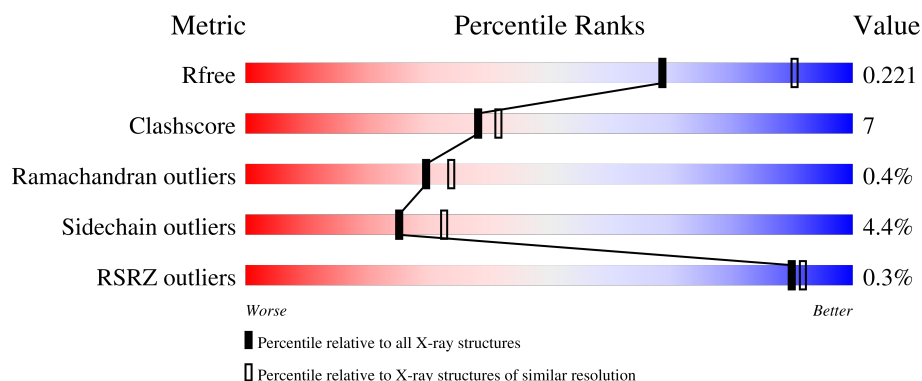
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

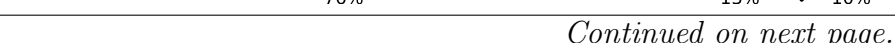
The reported resolution of this entry is 2.35 Å.

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}	180053	1596 (2.36-2.36)
Clashscore	190562	1663 (2.36-2.36)
Ramachandran outliers	187476	1646 (2.36-2.36)
Sidechain outliers	187428	1646 (2.36-2.36)
RSRZ outliers	180081	1598 (2.36-2.36)

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	282	
1	B	282	
1	C	282	
1	D	282	
1	E	282	

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Mol	Chain	Length	Quality of chain
1	F	282	
1	G	282	
1	H	282	

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
4	GLU	B	1001	-	-	X	-
4	GLU	C	1001	-	-	X	-
4	GLU	F	1001	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 17629 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	6	0
			1993	1255	346	388	4			
1	B	255	Total	C	N	O	S	0	7	0
			2006	1265	348	389	4			
1	C	255	Total	C	N	O	S	0	5	0
			1992	1255	344	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	5	0
			1992	1255	344	389	4			
1	F	255	Total	C	N	O	S	0	4	0
			1986	1251	344	387	4			
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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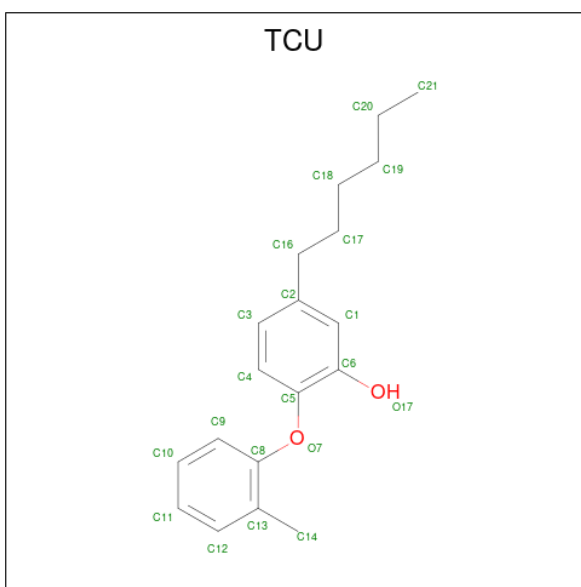
Chain	Residue	Modelled	Actual	Comment	Reference
F	-22	HIS	-	expression tag	UNP Q7A6D8
F	-21	HIS	-	expression tag	UNP Q7A6D8
F	-20	HIS	-	expression tag	UNP Q7A6D8
F	-19	HIS	-	expression tag	UNP Q7A6D8
F	-18	HIS	-	expression tag	UNP Q7A6D8
F	-17	PRO	-	expression tag	UNP Q7A6D8
F	-16	MET	-	expression tag	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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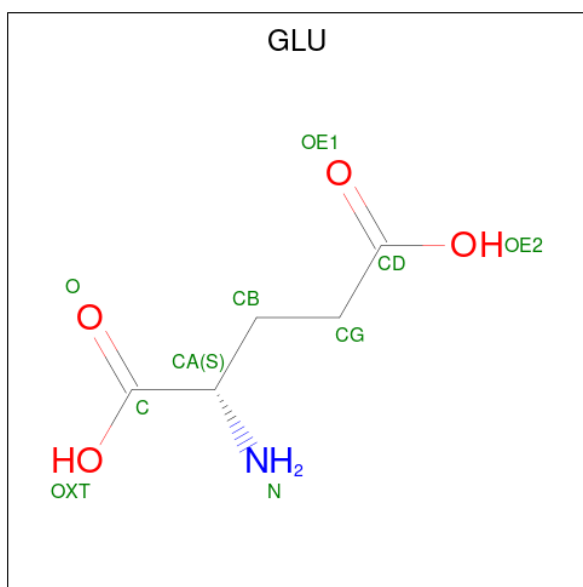
Chain	Residue	Modelled	Actual	Comment	Reference
G	-7	GLU	-	expression tag	UNP Q7A6D8
G	-6	ASN	-	expression tag	UNP Q7A6D8
G	-5	LEU	-	expression tag	UNP Q7A6D8
G	-4	TYR	-	expression tag	UNP Q7A6D8
G	-3	PHE	-	expression tag	UNP Q7A6D8
G	-2	GLN	-	expression tag	UNP Q7A6D8
G	-1	GLY	-	expression tag	UNP Q7A6D8
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 5-HEXYL-2-(2-METHYLPHENOXY)PHENOL (CCD ID: TCU) (formula: C₁₉H₂₄O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			21	19	2		
2	B	1	Total	C	O	0	0
			21	19	2		
2	C	1	Total	C	O	0	0
			21	19	2		
2	D	1	Total	C	O	0	0
			21	19	2		
2	E	1	Total	C	O	0	0
			21	19	2		
2	F	1	Total	C	O	0	0
			21	19	2		
2	G	1	Total	C	O	0	0
			21	19	2		
2	H	1	Total	C	O	0	0
			21	19	2		

- Molecule 3 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).



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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	166	Total	O	0	0
			166	166		
5	B	126	Total	O	0	0
			126	126		
5	C	149	Total	O	0	0
			149	149		
5	D	111	Total	O	0	0
			111	111		
5	E	154	Total	O	0	0
			154	154		
5	F	150	Total	O	0	0
			150	150		
5	G	145	Total	O	0	0
			145	145		

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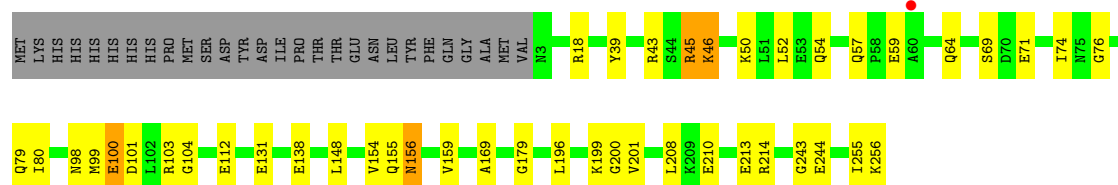
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	H	115	Total 115	O 115	0	0

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.

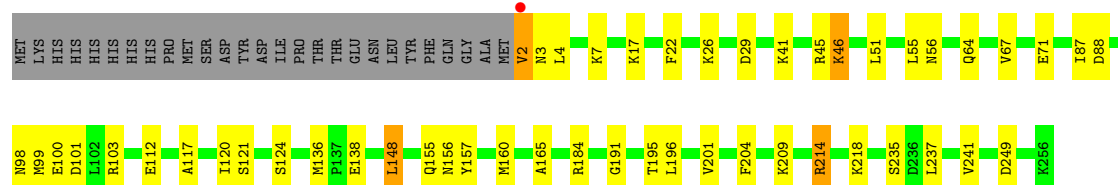
• Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain A: 



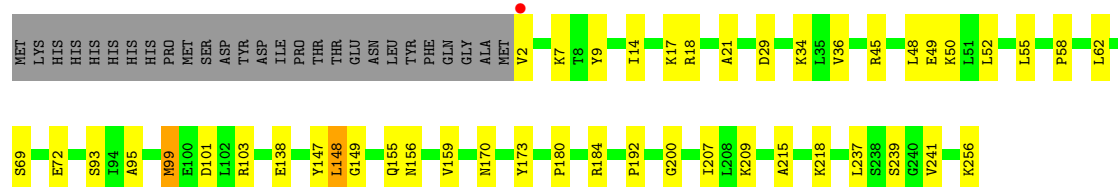
• Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain B: 



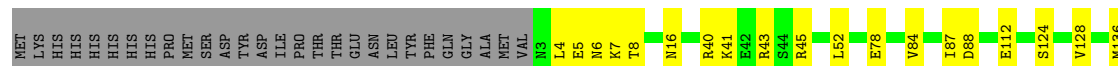
• Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain C: 



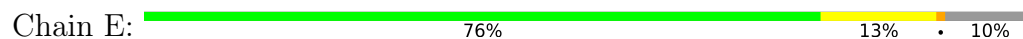
• Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]

Chain D: 

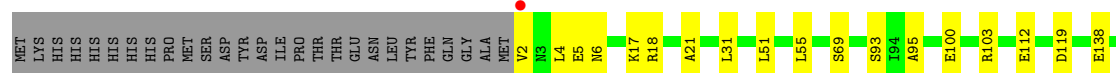
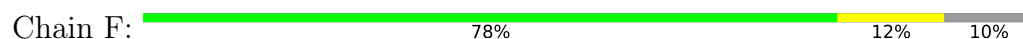




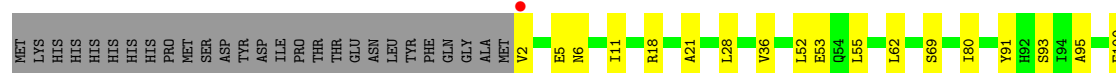
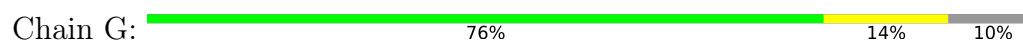
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]



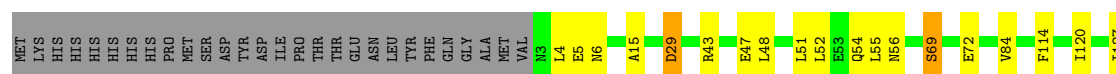
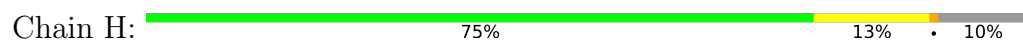
- Molecule 1: ENOYL-[ACYL-CARRIER-PROTEIN] REDUCTASE [NADPH]



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



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



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	89.11Å 94.80Å 94.57Å 98.02° 112.18° 97.44°	Depositor
Resolution (Å)	46.38 – 2.35 46.38 – 2.35	Depositor EDS
% Data completeness (in resolution range)	97.6 (46.38-2.35) 97.6 (46.38-2.35)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.09 (at 2.34Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.148 , 0.212 0.164 , 0.221	Depositor DCC
R_{free} test set	5716 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	25.7	Xtriage
Anisotropy	0.382	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 39.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	17629	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.65% of the height of the origin peak. No significant pseudotranslation is detected.*

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: TCU, NAP

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	0.65	0/2032	1.07	6/2736 (0.2%)
1	B	0.65	0/2048	1.04	1/2757 (0.0%)
1	C	0.66	0/2028	1.04	4/2732 (0.1%)
1	D	0.60	0/2001	0.99	0/2696
1	E	0.63	0/2028	1.03	5/2732 (0.2%)
1	F	0.68	0/2019	1.08	0/2720
1	G	0.67	0/2028	1.06	0/2732
1	H	0.63	0/2012	1.04	1/2710 (0.0%)
All	All	0.64	0/16196	1.05	17/21815 (0.1%)

There are no bond length outliers.

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	179	GLY	CA-C-N	-6.87	112.62	120.04
1	A	179	GLY	C-N-CA	-6.87	112.62	120.04
1	C	170	ASN	N-CA-C	-6.86	103.89	111.36
1	A	101	ASP	N-CA-C	-6.65	104.30	112.88
1	C	29	ASP	N-CA-C	-6.01	104.30	111.69
1	C	99	MET	N-CA-C	5.59	117.38	111.28
1	E	57	GLN	CA-C-N	-5.58	112.87	119.84
1	E	57	GLN	C-N-CA	-5.58	112.87	119.84
1	A	57	GLN	CA-C-N	-5.40	114.21	120.04
1	A	57	GLN	C-N-CA	-5.40	114.21	120.04
1	E	176	LEU	N-CA-C	-5.39	105.32	111.14
1	C	36	VAL	N-CA-C	-5.38	100.44	108.46
1	A	243	GLY	N-CA-C	-5.38	107.56	115.30
1	H	29	ASP	N-CA-C	-5.23	105.58	111.28
1	E	179	GLY	O-C-N	5.14	122.92	121.07
1	B	204	PHE	N-CA-C	5.08	117.48	111.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	171	VAL	N-CA-C	5.03	115.75	110.62

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	1993	0	2013	34	0
1	B	2006	0	2035	35	0
1	C	1992	0	2009	31	0
1	D	1971	0	1981	29	0
1	E	1992	0	2009	33	0
1	F	1986	0	2003	31	0
1	G	1992	0	2009	24	0
1	H	1979	0	1994	27	1
2	A	21	0	23	2	0
2	B	21	0	23	1	0
2	C	21	0	23	2	0
2	D	21	0	23	1	0
2	E	21	0	24	2	0
2	F	21	0	23	1	0
2	G	21	0	23	2	0
2	H	21	0	23	2	0
3	A	48	0	25	0	0
3	B	48	0	25	1	0
3	C	48	0	25	1	0
3	D	48	0	25	3	0
3	E	48	0	25	0	0
3	F	48	0	25	0	0
3	G	48	0	25	1	0
3	H	48	0	25	2	0
4	B	10	0	5	7	0
4	C	10	0	5	5	0
4	E	10	0	5	1	0
4	F	10	0	5	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	G	10	0	5	0	0
5	A	166	0	0	11	0
5	B	126	0	0	8	0
5	C	149	0	0	3	0
5	D	111	0	0	5	1
5	E	154	0	0	4	0
5	F	150	0	0	1	0
5	G	145	0	0	3	0
5	H	115	0	0	2	0
All	All	17629	0	16463	226	1

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 7.

All (226) 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:103:ARG:NH1	4:C:1001:GLU:HG3	1.75	1.01
1:F:18[A]:ARG:NH1	1:F:199:LYS:NZ	2.19	0.91
1:F:148:LEU:HD21	1:H:256:LYS:HG2	1.54	0.89
1:D:41:LYS:HE3	1:D:43:ARG:NH1	1.92	0.84
1:F:18[A]:ARG:NH1	1:F:199:LYS:HZ1	1.73	0.84
1:E:42[B]:GLU:OE2	1:E:45:ARG:NH1	2.12	0.83
1:E:256:LYS:HG2	1:G:148:LEU:HD21	1.60	0.82
1:A:50:LYS:HD2	5:A:2043:HOH:O	1.80	0.81
1:C:103:ARG:HH11	4:C:1001:GLU:HG3	1.41	0.80
1:E:239[A]:SER:O	5:E:2145:HOH:O	1.97	0.80
4:E:1001:GLU:OXT	4:E:1001:GLU:HG3	1.82	0.79
1:B:103:ARG:NH1	4:B:1001:GLU:OE1	2.17	0.77
1:B:45[B]:ARG:HH21	1:B:46[B]:LYS:HE2	1.50	0.77
1:B:46[B]:LYS:HD2	5:B:2039:HOH:O	1.84	0.76
1:A:214:ARG:HD3	5:A:2142:HOH:O	1.86	0.75
1:A:256:LYS:HG2	1:C:148:LEU:HD21	1.70	0.74
1:G:101:ASP:OD1	5:G:2078:HOH:O	2.06	0.73
1:A:43:ARG:HG2	1:E:100:GLU:HG3	1.69	0.73
1:D:194:ARG:HD2	5:D:2012:HOH:O	1.91	0.70
1:C:69:SER:HB3	1:C:72:GLU:HB2	1.74	0.69
1:D:40:ARG:HD3	3:D:1257:NAP:C6A	2.24	0.68
1:A:244:GLU:OE1	5:A:2158:HOH:O	2.11	0.67
1:H:120:ILE:HD13	3:H:1257:NAP:H61A	1.59	0.67
1:A:159:VAL:HB	5:A:2082:HOH:O	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:18[A]:ARG:HH12	1:F:199:LYS:NZ	1.93	0.66
1:A:54:GLN:OE1	5:A:2050:HOH:O	2.13	0.66
1:C:207:ILE:HD11	5:C:2112:HOH:O	1.97	0.65
5:A:2095:HOH:O	1:E:42[A]:GLU:OE2	2.14	0.65
1:C:103:ARG:HH12	4:C:1001:GLU:N	1.94	0.64
1:E:201:VAL:HG11	2:E:1258:TCU:H201	1.80	0.63
1:F:256:LYS:HE3	1:H:148:LEU:HD21	1.80	0.63
1:C:45:ARG:NH1	1:C:49:GLU:OE2	2.32	0.63
1:F:18[A]:ARG:NH1	1:F:199:LYS:HZ2	1.96	0.63
1:A:50:LYS:CE	5:A:2043:HOH:O	2.47	0.62
1:C:17:LYS:HE3	1:C:18[B]:ARG:NH1	2.14	0.62
1:C:2:VAL:HG13	1:C:2:VAL:O	1.99	0.62
1:A:201:VAL:HG11	2:A:1257:TCU:H201	1.81	0.62
1:H:15:ALA:O	1:H:47:GLU:HG2	2.00	0.61
1:C:103:ARG:HH12	4:C:1001:GLU:HG3	1.62	0.61
1:H:155:GLN:O	1:H:156:ASN:HB2	2.00	0.60
1:C:207:ILE:HG13	2:C:1258:TCU:H192	1.83	0.60
1:A:18[A]:ARG:NH1	1:A:199:LYS:HE3	2.16	0.60
4:B:1001:GLU:OE1	4:B:1001:GLU:CA	2.50	0.59
1:H:5:GLU:O	1:H:6:ASN:HB2	2.02	0.59
1:C:7:LYS:HD2	1:C:9:TYR:OH	2.02	0.59
1:B:148:LEU:HD21	1:D:256:LYS:HG2	1.85	0.59
1:H:69:SER:OG	1:H:72:GLU:HG3	2.03	0.58
1:G:2:VAL:O	1:G:2:VAL:HG13	2.03	0.58
1:E:48:LEU:O	1:E:52:LEU:HD23	2.03	0.58
1:E:18[A]:ARG:HH21	1:E:199:LYS:NZ	2.01	0.58
1:B:103:ARG:HH12	4:B:1001:GLU:HA	1.69	0.58
1:F:18[A]:ARG:HH11	1:F:199:LYS:NZ	1.98	0.57
1:A:50:LYS:CD	5:A:2043:HOH:O	2.47	0.57
1:E:18[A]:ARG:NH2	1:E:199:LYS:HE2	2.20	0.57
4:B:1001:GLU:OE1	4:B:1001:GLU:HA	2.05	0.56
1:D:124:SER:O	1:D:128:VAL:HG23	2.05	0.56
1:A:155:GLN:O	1:A:156:ASN:HB2	2.05	0.56
1:D:41:LYS:HG2	5:D:2022:HOH:O	2.06	0.56
1:D:171:VAL:HG13	1:D:185:VAL:HG12	1.86	0.56
1:G:11:ILE:HD11	1:G:28:LEU:HD12	1.87	0.55
1:E:18[A]:ARG:NH2	1:E:199:LYS:NZ	2.54	0.55
1:E:64:GLN:HG2	5:E:2042:HOH:O	2.06	0.55
1:B:2:VAL:HG12	1:B:3:ASN:H	1.72	0.55
1:B:45[B]:ARG:NH2	1:B:46[B]:LYS:HE2	2.21	0.55
1:F:103:ARG:HH12	4:F:1001:GLU:HB3	1.71	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:184:ARG:HD2	1:F:241:VAL:O	2.08	0.54
1:E:18[A]:ARG:HH21	1:E:199:LYS:HZ3	1.54	0.53
1:F:2:VAL:HG22	1:F:31:LEU:HD13	1.89	0.53
1:F:18[A]:ARG:HH12	1:F:199:LYS:HZ2	1.53	0.53
1:G:201:VAL:HG11	2:G:1258:TCU:H201	1.89	0.53
1:C:17:LYS:HE3	1:C:18[B]:ARG:HH11	1.72	0.53
1:D:40:ARG:HD3	3:D:1257:NAP:C5A	2.39	0.53
1:F:103:ARG:NH1	4:F:1001:GLU:HB3	2.24	0.53
1:B:214:ARG:HD2	5:B:2105:HOH:O	2.07	0.53
1:B:117:ALA:O	1:B:121:SER:HB2	2.08	0.52
1:A:18[A]:ARG:HH12	1:A:199:LYS:HE3	1.75	0.52
1:E:165:ALA:HB2	1:F:169:ALA:HB2	1.92	0.51
1:A:201:VAL:CG1	2:A:1257:TCU:H201	2.39	0.51
1:B:191:GLY:HA3	5:B:2123:HOH:O	2.11	0.51
1:B:155:GLN:O	1:B:156:ASN:HB2	2.11	0.51
1:D:43:ARG:HG3	5:D:2024:HOH:O	2.10	0.51
1:B:184:ARG:HD2	1:B:241:VAL:O	2.10	0.51
1:D:41:LYS:HE3	1:D:43:ARG:HH12	1.76	0.51
1:A:74:ILE:HA	1:A:131:GLU:HG3	1.93	0.50
1:B:17:LYS:HB3	1:B:51:LEU:HD21	1.93	0.50
1:A:154:VAL:O	1:A:155:GLN:C	2.54	0.50
1:D:112[A]:GLU:H	1:D:112[A]:GLU:CD	2.19	0.50
1:G:36:VAL:HG11	1:G:80:ILE:HG12	1.94	0.50
1:E:18[A]:ARG:HH22	1:E:199:LYS:HE2	1.77	0.50
1:C:52:LEU:HD11	1:C:62:LEU:HD21	1.93	0.50
1:C:95:ALA:HB3	2:C:1258:TCU:H142	1.93	0.49
1:D:193:ILE:HG21	1:D:223:GLN:HG3	1.94	0.49
1:F:103:ARG:HD3	4:F:1001:GLU:OE2	2.11	0.49
1:A:112:GLU:CB	1:E:42[A]:GLU:OE1	2.60	0.49
1:A:45[A]:ARG:NH2	1:A:46:LYS:HE2	2.28	0.49
1:E:249:ASP:O	1:E:250:SER:HB2	2.10	0.49
1:E:191:GLY:HA3	5:E:2151:HOH:O	2.11	0.49
1:D:215:ALA:O	1:D:218:LYS:HD3	2.13	0.49
1:H:48:LEU:O	1:H:52:LEU:HD13	2.13	0.49
1:H:210:GLU:OE1	1:H:214:ARG:HG3	2.12	0.49
1:F:239[A]:SER:OG	1:G:228:LYS:NZ	2.43	0.48
1:G:192:PRO:HA	3:G:1257:NAP:O7N	2.13	0.48
1:H:210:GLU:HB3	5:H:2098:HOH:O	2.13	0.48
1:D:155:GLN:O	1:D:156:ASN:HB2	2.13	0.48
1:C:14:ILE:HB	1:C:48:LEU:HD21	1.95	0.48
1:C:155:GLN:O	1:C:156:ASN:HB2	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:87:ILE:O	1:D:136:MET:HG2	2.14	0.48
1:F:210:GLU:HG3	1:F:214:ARG:HD3	1.95	0.48
1:G:173:TYR:CZ	1:H:153:ALA:HA	2.49	0.48
1:A:100:GLU:H	1:A:100:GLU:CD	2.22	0.48
1:B:103:ARG:NH1	4:B:1001:GLU:HA	2.28	0.48
1:A:112:GLU:HB3	1:E:42[A]:GLU:OE1	2.14	0.47
1:B:87:ILE:O	1:B:136:MET:HG2	2.14	0.47
1:C:215:ALA:O	1:C:218:LYS:HD3	2.13	0.47
1:B:22:PHE:CE2	1:B:26:LYS:HE2	2.49	0.47
1:E:165:ALA:CB	1:F:169:ALA:HB2	2.44	0.47
1:F:21:ALA:HB2	1:F:93:SER:CB	2.44	0.47
1:A:103:ARG:O	1:A:104:GLY:C	2.57	0.47
1:C:173:TYR:CZ	1:D:153:ALA:HA	2.50	0.47
1:A:103:ARG:NH2	1:A:200:GLY:O	2.46	0.46
1:H:204:PHE:HD1	2:H:1258:TCU:H181	1.81	0.46
1:B:120:ILE:HD13	3:B:1257:NAP:H61A	1.80	0.46
1:G:249:ASP:O	1:G:250:SER:HB2	2.15	0.46
1:G:18[B]:ARG:HG3	1:G:18[B]:ARG:HH11	1.80	0.46
1:E:18[A]:ARG:NH2	1:E:199:LYS:CE	2.78	0.46
1:E:153:ALA:HA	1:F:173:TYR:CZ	2.49	0.46
5:A:2083:HOH:O	1:E:43:ARG:HD3	2.15	0.46
1:F:95:ALA:HB3	2:F:1258:TCU:H142	1.97	0.46
1:G:169:ALA:HB2	1:H:165:ALA:CB	2.46	0.46
1:E:133:LYS:HD3	5:E:2087:HOH:O	2.16	0.45
1:H:29:ASP:CG	1:H:56:ASN:H	2.25	0.45
1:H:51:LEU:O	1:H:54:GLN:HB2	2.17	0.45
1:H:188:ILE:HG21	1:H:226:VAL:HG13	1.98	0.45
1:B:29:ASP:CG	1:B:56:ASN:H	2.24	0.45
4:B:1001:GLU:OE1	4:B:1001:GLU:N	2.49	0.45
1:D:167:LEU:O	1:D:171:VAL:HG23	2.17	0.45
1:B:99:MET:C	1:B:101:ASP:N	2.73	0.45
5:B:2108:HOH:O	1:C:239[A]:SER:O	2.21	0.45
1:E:210:GLU:HG3	1:E:214:ARG:HD3	1.99	0.45
1:F:202:GLY:HA2	4:F:1001:GLU:HA	1.98	0.45
1:H:155:GLN:HA	5:H:2079:HOH:O	2.17	0.45
1:E:179:GLY:N	1:E:180:PRO:CD	2.80	0.45
1:A:76:GLY:O	1:A:80:ILE:HG13	2.17	0.45
1:D:8:THR:HG21	1:D:84:VAL:HG11	1.99	0.44
1:B:71[A]:GLU:HG2	5:B:2055:HOH:O	2.15	0.44
4:B:1001:GLU:N	4:B:1001:GLU:CD	2.75	0.44
1:E:9:TYR:CE1	1:E:234:LEU:HB3	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:98:ASN:HB3	1:B:100:GLU:OE1	2.17	0.44
1:C:7:LYS:HE3	5:C:2006:HOH:O	2.17	0.44
1:F:155:GLN:HG3	5:F:2083:HOH:O	2.18	0.44
1:G:21:ALA:HB2	1:G:93:SER:CB	2.47	0.44
1:F:17:LYS:HB3	1:F:51:LEU:HD21	1.98	0.44
1:H:29:ASP:CG	1:H:55:LEU:HB3	2.43	0.44
1:H:211:ILE:HD13	1:H:211:ILE:HA	1.82	0.44
1:G:153:ALA:HA	1:H:173:TYR:CZ	2.53	0.44
1:E:103:ARG:NH2	1:E:200:GLY:O	2.50	0.43
1:C:184:ARG:HD2	1:C:241:VAL:O	2.18	0.43
1:F:18[B]:ARG:HH11	1:F:18[B]:ARG:HG2	1.83	0.43
1:G:52:LEU:HA	1:G:52:LEU:HD23	1.79	0.43
1:A:169:ALA:HB2	1:B:165:ALA:CB	2.49	0.43
1:D:191:GLY:HA3	5:D:2110:HOH:O	2.18	0.43
1:F:2:VAL:HG12	1:G:2:VAL:N	2.33	0.43
1:H:215:ALA:O	1:H:218:LYS:HD2	2.18	0.43
1:B:214:ARG:NH2	1:D:210:GLU:OE2	2.51	0.43
1:E:201:VAL:CG1	2:E:1258:TCU:H201	2.48	0.43
1:G:136:MET:HA	5:G:2099:HOH:O	2.18	0.43
1:B:46[A]:LYS:HG2	5:B:2039:HOH:O	2.17	0.43
1:C:192:PRO:HA	3:C:1257:NAP:O7N	2.19	0.43
1:A:98:ASN:HB3	1:A:100:GLU:OE1	2.19	0.43
1:C:103:ARG:HH11	4:C:1001:GLU:CG	2.22	0.43
1:G:91:TYR:C	1:G:91:TYR:CD1	2.97	0.43
1:C:101:ASP:HB3	1:C:159:VAL:CG1	2.49	0.43
1:G:95:ALA:HB3	2:G:1258:TCU:H142	2.00	0.43
1:A:46:LYS:HE3	5:A:2035:HOH:O	2.18	0.42
1:D:84:VAL:O	1:D:84:VAL:CG1	2.65	0.42
1:H:197:SER:HB3	2:H:1258:TCU:C13	2.49	0.42
1:C:209:LYS:HB2	1:C:209:LYS:HE3	1.80	0.42
1:D:16:ASN:HD21	1:D:196:LEU:HB2	1.84	0.42
1:H:147:TYR:HB2	3:H:1257:NAP:C5N	2.48	0.42
1:A:64:GLN:HG2	5:A:2054:HOH:O	2.19	0.42
1:B:2:VAL:HG11	1:B:235:SER:CB	2.50	0.42
1:B:7:LYS:HA	1:B:88:ASP:OD2	2.19	0.42
1:F:160:MET:O	1:F:164:LYS:HG2	2.19	0.42
1:A:39:TYR:CE2	1:A:45[B]:ARG:HB2	2.54	0.42
1:C:147:TYR:C	1:C:149:GLY:N	2.78	0.42
1:F:5:GLU:O	1:F:6:ASN:HB2	2.19	0.42
1:F:31:LEU:HD23	1:F:31:LEU:HA	1.90	0.42
1:F:2:VAL:CG2	1:F:31:LEU:HD13	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:VAL:HG11	2:B:1258:TCU:H202	2.02	0.42
1:E:216:PRO:HD3	1:E:255:ILE:HG21	2.02	0.42
1:H:194[A]:ARG:NH2	1:H:208:LEU:HD23	2.34	0.42
1:G:137:PRO:HD2	5:G:2099:HOH:O	2.19	0.42
1:A:169:ALA:HB2	1:B:165:ALA:HB2	2.01	0.41
1:D:147:TYR:CE2	2:D:1258:TCU:H181	2.55	0.41
1:H:208:LEU:HD12	1:H:208:LEU:HA	1.82	0.41
1:E:42[B]:GLU:CD	1:E:45:ARG:NH1	2.76	0.41
1:G:171:VAL:HG13	1:G:185:VAL:HG12	2.01	0.41
1:A:196:LEU:HD12	1:A:196:LEU:HA	1.90	0.41
1:B:64:GLN:HG2	5:B:2052:HOH:O	2.19	0.41
1:A:71[A]:GLU:CD	1:A:71[A]:GLU:H	2.28	0.41
1:B:157:TYR:CZ	1:B:160:MET:HG3	2.55	0.41
1:H:154:VAL:O	1:H:155:GLN:C	2.63	0.41
1:G:5:GLU:O	1:G:6:ASN:HB2	2.20	0.41
1:G:2:VAL:O	1:G:2:VAL:CG1	2.69	0.41
1:B:249:ASP:OD1	1:B:249:ASP:C	2.61	0.41
1:E:111:ARG:NH1	1:F:119:ASP:OD1	2.48	0.41
1:G:103:ARG:NH2	1:G:200:GLY:O	2.54	0.41
1:B:67:VAL:CG2	1:B:124:SER:HB3	2.51	0.41
1:A:99:MET:HE3	1:A:99:MET:HB3	1.98	0.41
1:B:218:LYS:HD3	1:C:180:PRO:HG3	2.02	0.41
1:E:233:LEU:HD23	1:E:233:LEU:HA	1.88	0.41
1:C:21:ALA:HB2	1:C:93:SER:CB	2.51	0.40
1:A:39:TYR:CE2	1:A:45[A]:ARG:HB2	2.56	0.40
1:A:112:GLU:HB2	1:E:42[A]:GLU:OE1	2.22	0.40
1:B:196:LEU:HD23	5:B:2126:HOH:O	2.21	0.40
1:D:7:LYS:HA	1:D:88:ASP:OD2	2.21	0.40
1:H:114:PHE:CD1	1:H:114:PHE:C	3.00	0.40
1:C:58:PRO:HD2	5:C:2051:HOH:O	2.21	0.40
1:C:103:ARG:NH2	1:C:200:GLY:O	2.54	0.40
1:D:146:THR:O	3:D:1257:NAP:H6N	2.21	0.40
1:F:207:ILE:O	1:F:211:ILE:HG12	2.22	0.40
1:D:45:ARG:HG2	5:D:2029:HOH:O	2.21	0.40
1:D:5:GLU:O	1:D:6:ASN:HB2	2.21	0.40
1:D:154:VAL:O	1:D:155:GLN:C	2.63	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:194[B]:ARG:NH2	5:D:2036:HOH:O[1_665]	1.98	0.22

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	258/282 (92%)	245 (95%)	11 (4%)	2 (1%)	16	17
1	B	260/282 (92%)	247 (95%)	12 (5%)	1 (0%)	30	34
1	C	258/282 (92%)	245 (95%)	12 (5%)	1 (0%)	30	34
1	D	255/282 (90%)	244 (96%)	11 (4%)	0	100	100
1	E	258/282 (92%)	244 (95%)	12 (5%)	2 (1%)	16	17
1	F	257/282 (91%)	242 (94%)	14 (5%)	1 (0%)	30	34
1	G	258/282 (92%)	243 (94%)	14 (5%)	1 (0%)	30	34
1	H	256/282 (91%)	238 (93%)	18 (7%)	0	100	100
All	All	2060/2256 (91%)	1948 (95%)	104 (5%)	8 (0%)	30	34

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	148	LEU
1	C	148	LEU
1	G	148	LEU
1	E	155	GLN
1	A	148	LEU
1	A	156	ASN
1	F	194	ARG
1	E	194	ARG

5.3.2 Protein sidechains ⓘ

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	213/234 (91%)	200 (94%)	13 (6%)	17	20
1	B	215/234 (92%)	204 (95%)	11 (5%)	21	26
1	C	213/234 (91%)	206 (97%)	7 (3%)	33	44
1	D	210/234 (90%)	205 (98%)	5 (2%)	43	57
1	E	213/234 (91%)	207 (97%)	6 (3%)	38	51
1	F	212/234 (91%)	204 (96%)	8 (4%)	29	39
1	G	213/234 (91%)	201 (94%)	12 (6%)	19	23
1	H	211/234 (90%)	201 (95%)	10 (5%)	23	30
All	All	1700/1872 (91%)	1628 (96%)	72 (4%)	25	35

All (72) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45[A]	ARG
1	A	45[B]	ARG
1	A	46	LYS
1	A	52	LEU
1	A	59	GLU
1	A	69	SER
1	A	79	GLN
1	A	100	GLU
1	A	138	GLU
1	A	208	LEU
1	A	210	GLU
1	A	213	GLU
1	A	255	ILE
1	B	2	VAL
1	B	4	LEU
1	B	41	LYS
1	B	46[A]	LYS
1	B	46[B]	LYS
1	B	55	LEU

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Mol	Chain	Res	Type
1	B	112	GLU
1	B	138	GLU
1	B	209	LYS
1	B	214	ARG
1	B	237	LEU
1	C	34	LYS
1	C	50	LYS
1	C	55	LEU
1	C	99	MET
1	C	138	GLU
1	C	237	LEU
1	C	256	LYS
1	D	4	LEU
1	D	52	LEU
1	D	78	GLU
1	D	228	LYS
1	D	255	ILE
1	E	79	GLN
1	E	138	GLU
1	E	207	ILE
1	E	208	LEU
1	E	237	LEU
1	E	255	ILE
1	F	4	LEU
1	F	55	LEU
1	F	69	SER
1	F	100	GLU
1	F	112	GLU
1	F	138	GLU
1	F	237	LEU
1	F	256	LYS
1	G	53	GLU
1	G	55	LEU
1	G	62	LEU
1	G	69	SER
1	G	100	GLU
1	G	112	GLU
1	G	206	THR
1	G	207	ILE
1	G	208	LEU
1	G	209	LYS
1	G	211	ILE

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Mol	Chain	Res	Type
1	G	216	PRO
1	H	4	LEU
1	H	43	ARG
1	H	69	SER
1	H	84	VAL
1	H	127	ILE
1	H	138	GLU
1	H	207	ILE
1	H	210	GLU
1	H	214	ARG
1	H	216	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	ASN
1	A	54	GLN
1	A	170	ASN
1	A	253	HIS
1	B	56	ASN
1	B	68	GLN
1	B	156	ASN
1	B	170	ASN
1	C	170	ASN
1	D	3	ASN
1	D	64	GLN
1	D	68	GLN
1	D	98	ASN
1	D	253	HIS
1	E	56	ASN
1	E	253	HIS
1	F	68	GLN
1	F	170	ASN
1	G	3	ASN
1	H	56	ASN
1	H	68	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

21 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	$\# Z > 2$
2	TCU	B	1258	-	22,22,22	0.62	0	28,28,28	0.85	0
4	GLU	B	1001	-	8,9,9	1.17	0	8,11,11	0.87	0
3	NAP	H	1257	-	50,52,52	1.60	5 (10%)	71,80,80	1.74	16 (22%)
3	NAP	C	1257	-	50,52,52	1.60	5 (10%)	71,80,80	1.79	17 (23%)
3	NAP	E	1257	-	50,52,52	1.46	3 (6%)	71,80,80	1.81	17 (23%)
2	TCU	D	1258	-	22,22,22	0.69	1 (4%)	28,28,28	0.84	1 (3%)
4	GLU	F	1001	-	8,9,9	1.13	0	8,11,11	0.88	0
2	TCU	F	1258	-	22,22,22	0.60	0	28,28,28	0.95	2 (7%)
2	TCU	A	1257	-	22,22,22	0.70	0	28,28,28	1.01	2 (7%)
2	TCU	E	1258	-	22,22,22	0.48	0	28,28,28	0.92	1 (3%)
3	NAP	G	1257	-	50,52,52	1.61	6 (12%)	71,80,80	1.81	16 (22%)
4	GLU	C	1001	-	8,9,9	1.05	0	8,11,11	1.18	1 (12%)
4	GLU	G	1001	-	8,9,9	1.07	0	8,11,11	1.23	1 (12%)
4	GLU	E	1001	-	8,9,9	1.13	0	8,11,11	0.85	0
2	TCU	G	1258	-	22,22,22	0.59	0	28,28,28	0.97	1 (3%)
2	TCU	C	1258	-	22,22,22	0.69	0	28,28,28	1.00	0
3	NAP	D	1257	-	50,52,52	1.64	5 (10%)	71,80,80	1.86	19 (26%)
3	NAP	F	1257	-	50,52,52	1.53	5 (10%)	71,80,80	1.82	11 (15%)
2	TCU	H	1258	-	22,22,22	0.65	0	28,28,28	0.92	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAP	A	1258	-	50,52,52	1.52	4 (8%)	71,80,80	1.96	16 (22%)
3	NAP	B	1257	-	50,52,52	1.62	3 (6%)	71,80,80	1.83	13 (18%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	TCU	B	1258	-	-	2/10/10/10	0/2/2/2
4	GLU	B	1001	-	-	3/9/9/9	-
3	NAP	H	1257	-	-	6/35/67/67	0/5/5/5
3	NAP	C	1257	-	-	5/35/67/67	0/5/5/5
3	NAP	E	1257	-	-	5/35/67/67	0/5/5/5
2	TCU	D	1258	-	-	4/10/10/10	0/2/2/2
4	GLU	F	1001	-	-	4/9/9/9	-
2	TCU	F	1258	-	-	2/10/10/10	0/2/2/2
2	TCU	A	1257	-	-	2/10/10/10	0/2/2/2
2	TCU	E	1258	-	-	3/10/10/10	0/2/2/2
3	NAP	G	1257	-	-	4/35/67/67	0/5/5/5
4	GLU	C	1001	-	-	2/9/9/9	-
4	GLU	G	1001	-	-	4/9/9/9	-
4	GLU	E	1001	-	-	5/9/9/9	-
2	TCU	G	1258	-	-	3/10/10/10	0/2/2/2
2	TCU	C	1258	-	-	1/10/10/10	0/2/2/2
3	NAP	D	1257	-	-	7/35/67/67	0/5/5/5
3	NAP	F	1257	-	-	9/35/67/67	0/5/5/5
2	TCU	H	1258	-	-	2/10/10/10	0/2/2/2
3	NAP	A	1258	-	-	5/35/67/67	0/5/5/5
3	NAP	B	1257	-	-	7/35/67/67	0/5/5/5

All (37) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1257	NAP	O7N-C7N	8.84	1.40	1.24
3	D	1257	NAP	O7N-C7N	8.76	1.40	1.24
3	C	1257	NAP	O7N-C7N	8.41	1.39	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1257	NAP	O7N-C7N	8.32	1.39	1.24
3	G	1257	NAP	O7N-C7N	8.30	1.39	1.24
3	H	1257	NAP	O7N-C7N	8.17	1.39	1.24
3	A	1258	NAP	O7N-C7N	7.86	1.38	1.24
3	E	1257	NAP	O7N-C7N	7.56	1.38	1.24
3	H	1257	NAP	C2A-N1A	3.15	1.39	1.33
3	B	1257	NAP	C2A-N1A	3.13	1.39	1.33
3	A	1258	NAP	C2A-N1A	2.84	1.39	1.33
3	H	1257	NAP	C2A-N3A	2.84	1.39	1.33
3	G	1257	NAP	C8A-N7A	2.76	1.37	1.31
3	D	1257	NAP	C2A-N3A	2.72	1.38	1.33
3	C	1257	NAP	C2A-N1A	2.71	1.38	1.33
3	F	1257	NAP	C2A-N3A	2.71	1.38	1.33
3	C	1257	NAP	P2B-O2B	2.70	1.64	1.59
3	A	1258	NAP	C2A-N3A	2.68	1.38	1.33
3	B	1257	NAP	C2A-N3A	2.66	1.38	1.33
3	C	1257	NAP	C2A-N3A	2.64	1.38	1.33
3	D	1257	NAP	C2N-N1N	2.58	1.37	1.35
3	G	1257	NAP	C2A-N1A	2.49	1.38	1.33
3	F	1257	NAP	C8A-N7A	2.43	1.36	1.31
3	D	1257	NAP	C2A-N1A	2.37	1.38	1.33
3	G	1257	NAP	P2B-O2B	2.31	1.63	1.59
3	G	1257	NAP	C2A-N3A	2.26	1.37	1.33
3	E	1257	NAP	C5A-N7A	-2.23	1.35	1.39
3	F	1257	NAP	C2A-N1A	2.16	1.37	1.33
3	G	1257	NAP	O4B-C4B	-2.15	1.40	1.45
3	D	1257	NAP	PA-O3	2.14	1.61	1.59
3	C	1257	NAP	PA-O3	2.13	1.61	1.59
3	H	1257	NAP	C8A-N7A	2.12	1.35	1.31
3	A	1258	NAP	C2N-N1N	2.12	1.37	1.35
3	F	1257	NAP	O4D-C4D	-2.12	1.40	1.45
2	D	1258	TCU	C14-C13	2.11	1.55	1.51
3	E	1257	NAP	C8A-N7A	2.00	1.35	1.31
3	H	1257	NAP	P2B-O2B	2.00	1.63	1.59

All (135) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1258	NAP	N3A-C2A-N1A	-6.13	119.31	128.58
3	F	1257	NAP	N3A-C2A-N1A	-6.10	119.34	128.58
3	E	1257	NAP	C3N-C7N-N7N	6.00	125.14	117.74
3	A	1258	NAP	C3N-C7N-N7N	5.65	124.70	117.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1257	NAP	N3A-C2A-N1A	-5.61	120.09	128.58
3	D	1257	NAP	N3A-C2A-N1A	-5.58	120.14	128.58
3	E	1257	NAP	N3A-C2A-N1A	-5.53	120.21	128.58
3	A	1258	NAP	N9A-C8A-N7A	-5.49	106.15	113.94
3	C	1257	NAP	N3A-C2A-N1A	-5.39	120.42	128.58
3	D	1257	NAP	N9A-C8A-N7A	-5.27	106.46	113.94
3	G	1257	NAP	N3A-C2A-N1A	-5.23	120.66	128.58
3	B	1257	NAP	N9A-C8A-N7A	-5.20	106.56	113.94
3	C	1257	NAP	C3N-C7N-N7N	4.97	123.87	117.74
3	F	1257	NAP	C3N-C7N-N7N	4.91	123.79	117.74
3	F	1257	NAP	O7N-C7N-C3N	-4.86	113.66	119.60
3	H	1257	NAP	N3A-C2A-N1A	-4.68	121.50	128.58
3	F	1257	NAP	C5A-C4A-N3A	-4.61	120.37	126.72
3	H	1257	NAP	C3N-C7N-N7N	4.58	123.38	117.74
3	H	1257	NAP	N9A-C8A-N7A	-4.51	107.54	113.94
3	G	1257	NAP	N9A-C8A-N7A	-4.37	107.74	113.94
3	C	1257	NAP	N9A-C8A-N7A	-4.37	107.74	113.94
3	A	1258	NAP	C4A-N9A-C8A	4.24	110.19	105.74
3	A	1258	NAP	C5A-N7A-C8A	4.18	110.02	103.45
3	G	1257	NAP	C3N-C7N-N7N	4.17	122.88	117.74
3	D	1257	NAP	C4A-N9A-C8A	4.13	110.08	105.74
3	D	1257	NAP	C3N-C7N-N7N	4.13	122.83	117.74
3	B	1257	NAP	C4A-N9A-C8A	4.13	110.07	105.74
3	A	1258	NAP	O3-PN-O1N	-4.09	98.41	110.70
3	F	1257	NAP	N9A-C8A-N7A	-4.05	108.19	113.94
3	B	1257	NAP	C3N-C7N-N7N	4.03	122.70	117.74
3	H	1257	NAP	C5A-N7A-C8A	4.00	109.74	103.45
3	A	1258	NAP	O7N-C7N-C3N	-3.99	114.72	119.60
3	B	1257	NAP	O7N-C7N-C3N	-3.96	114.76	119.60
3	D	1257	NAP	C5A-N7A-C8A	3.94	109.65	103.45
3	E	1257	NAP	C5A-C4A-N3A	-3.90	121.35	126.72
3	F	1257	NAP	C2A-N3A-C4A	3.88	121.30	111.83
3	B	1257	NAP	C5A-N7A-C8A	3.76	109.37	103.45
3	G	1257	NAP	C5A-C4A-N3A	-3.74	121.57	126.72
3	G	1257	NAP	C5A-N7A-C8A	3.60	109.11	103.45
3	F	1257	NAP	O4B-C1B-C2B	-3.57	100.44	106.59
3	E	1257	NAP	N9A-C8A-N7A	-3.57	108.87	113.94
3	C	1257	NAP	O7N-C7N-C3N	-3.57	115.23	119.60
3	B	1257	NAP	O4B-C1B-C2B	-3.48	100.59	106.59
3	C	1257	NAP	C5A-C4A-N3A	-3.46	121.95	126.72
3	B	1257	NAP	C5A-C4A-N3A	-3.46	121.95	126.72
3	H	1257	NAP	C5A-C4A-N3A	-3.40	122.03	126.72

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	1257	NAP	O7N-C7N-C3N	-3.34	115.51	119.60
3	E	1257	NAP	C5A-N7A-C8A	3.33	108.69	103.45
3	C	1257	NAP	C5A-N7A-C8A	3.20	108.48	103.45
3	H	1257	NAP	C4A-C5A-N7A	-3.19	106.94	110.58
3	F	1257	NAP	C5A-N7A-C8A	3.18	108.44	103.45
3	D	1257	NAP	C2B-C1B-N9A	-3.18	108.52	113.75
3	D	1257	NAP	C4B-O4B-C1B	-3.16	102.48	109.47
3	E	1257	NAP	C2A-N3A-C4A	3.15	119.52	111.83
3	D	1257	NAP	C5A-C4A-N3A	-3.13	122.40	126.72
3	B	1257	NAP	N3A-C4A-N9A	3.12	132.47	127.17
3	G	1257	NAP	C2N-C3N-C4N	3.11	121.87	118.26
2	H	1258	TCU	O7-C5-C6	3.10	121.83	116.59
3	A	1258	NAP	C5A-C4A-N3A	-3.09	122.46	126.72
3	E	1257	NAP	O7N-C7N-C3N	-3.06	115.86	119.60
3	A	1258	NAP	C2A-N3A-C4A	3.03	119.23	111.83
3	B	1257	NAP	C2A-N3A-C4A	3.03	119.23	111.83
3	G	1257	NAP	C2A-N3A-C4A	2.98	119.12	111.83
3	G	1257	NAP	C4A-C5A-N7A	-2.98	107.17	110.58
3	A	1258	NAP	C4B-O4B-C1B	-2.97	102.92	109.47
3	G	1257	NAP	O5B-C5B-C4B	-2.93	99.02	108.99
3	D	1257	NAP	C3B-C2B-C1B	-2.91	97.23	102.81
3	H	1257	NAP	C4A-N9A-C8A	2.88	108.77	105.74
3	D	1257	NAP	C2A-N3A-C4A	2.87	118.84	111.83
3	C	1257	NAP	C4A-N9A-C8A	2.86	108.74	105.74
3	C	1257	NAP	C2A-N3A-C4A	2.86	118.81	111.83
3	E	1257	NAP	C6N-N1N-C2N	-2.80	119.50	121.88
3	G	1257	NAP	C6N-N1N-C2N	-2.77	119.52	121.88
3	C	1257	NAP	C6N-N1N-C1D	-2.75	114.33	119.73
3	F	1257	NAP	N3A-C4A-N9A	2.75	131.84	127.17
3	H	1257	NAP	O7N-C7N-C3N	-2.73	116.26	119.60
3	D	1257	NAP	N3A-C4A-N9A	2.73	131.81	127.17
3	D	1257	NAP	O7N-C7N-N7N	-2.71	118.71	122.62
3	A	1258	NAP	C4A-C5A-N7A	-2.70	107.50	110.58
3	E	1257	NAP	O3D-C3D-C2D	-2.68	103.24	111.82
3	E	1257	NAP	O4B-C1B-C2B	-2.63	102.06	106.59
3	H	1257	NAP	O3-PN-O1N	-2.58	102.95	110.70
3	B	1257	NAP	O2N-PN-O1N	2.55	124.30	112.44
3	H	1257	NAP	C2B-C1B-N9A	-2.55	109.56	113.75
3	A	1258	NAP	N3A-C4A-N9A	2.53	131.48	127.17
3	D	1257	NAP	O3-PN-O1N	-2.53	103.08	110.70
3	C	1257	NAP	N3A-C4A-N9A	2.53	131.47	127.17
3	H	1257	NAP	C2A-N3A-C4A	2.52	117.98	111.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	E	1257	NAP	O7N-C7N-N7N	-2.51	118.99	122.62
3	E	1257	NAP	C4A-C5A-N7A	-2.49	107.74	110.58
3	G	1257	NAP	O3-PN-O1N	-2.46	103.30	110.70
3	E	1257	NAP	O3-PN-O1N	-2.43	103.41	110.70
3	D	1257	NAP	O4B-C1B-N9A	2.42	112.74	108.09
3	H	1257	NAP	O4B-C1B-N9A	2.42	112.73	108.09
2	G	1258	TCU	O7-C5-C6	2.41	120.67	116.59
3	G	1257	NAP	O4B-C1B-C2B	-2.41	102.44	106.59
3	H	1257	NAP	O2B-P2B-O1X	-2.40	100.77	109.33
3	F	1257	NAP	C4A-C5A-N7A	-2.38	107.86	110.58
3	E	1257	NAP	N3A-C4A-N9A	2.37	131.19	127.17
2	D	1258	TCU	O7-C5-C6	2.36	120.58	116.59
3	A	1258	NAP	O4B-C4B-C3B	2.34	109.80	105.15
3	D	1257	NAP	O2N-PN-O1N	2.34	123.33	112.44
3	D	1257	NAP	O4B-C1B-C2B	-2.34	102.57	106.59
3	H	1257	NAP	C4B-O4B-C1B	-2.32	104.35	109.47
3	D	1257	NAP	C4A-C5A-N7A	-2.30	107.95	110.58
3	C	1257	NAP	C4N-C3N-C7N	-2.28	114.84	121.06
3	C	1257	NAP	C4B-O4B-C1B	-2.28	104.43	109.47
3	C	1257	NAP	O2A-PA-O3	-2.28	101.11	107.27
3	C	1257	NAP	O2N-PN-O1N	2.28	123.04	112.44
3	E	1257	NAP	C2B-C1B-N9A	-2.27	110.02	113.75
3	B	1257	NAP	O3-PN-O1N	-2.26	103.89	110.70
4	G	1001	GLU	OE1-CD-CG	-2.25	115.95	123.09
3	C	1257	NAP	O4B-C1B-C2B	-2.23	102.74	106.59
3	H	1257	NAP	N3A-C4A-N9A	2.23	130.96	127.17
3	G	1257	NAP	O4B-C1B-N9A	2.23	112.37	108.09
3	G	1257	NAP	C4A-N9A-C1B	-2.20	121.48	126.63
3	D	1257	NAP	C4A-N9A-C1B	-2.19	121.51	126.63
2	F	1258	TCU	O7-C5-C6	2.18	120.28	116.59
4	C	1001	GLU	CG-CB-CA	-2.18	108.87	113.86
3	H	1257	NAP	O2X-P2B-O2B	2.16	114.28	105.85
3	A	1258	NAP	C2N-C3N-C4N	2.16	120.77	118.26
3	A	1258	NAP	O2N-PN-O1N	2.15	122.45	112.44
3	G	1257	NAP	C4A-N9A-C8A	2.14	107.99	105.74
3	E	1257	NAP	O4B-C1B-N9A	2.14	112.20	108.09
3	E	1257	NAP	O2X-P2B-O2B	2.14	114.18	105.85
3	C	1257	NAP	C2N-C3N-C4N	2.14	120.74	118.26
2	F	1258	TCU	C17-C16-C2	-2.12	105.75	113.67
2	E	1258	TCU	C17-C16-C2	-2.11	105.80	113.67
3	D	1257	NAP	O2X-P2B-O2B	2.10	114.05	105.85
3	F	1257	NAP	O2A-PA-O3	-2.09	101.63	107.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1257	TCU	C3-C2-C1	2.08	121.42	118.55
3	C	1257	NAP	O5B-C5B-C4B	-2.06	101.99	108.99
3	A	1258	NAP	C4A-N9A-C1B	-2.05	121.83	126.63
3	B	1257	NAP	C2N-C3N-C4N	2.01	120.60	118.26
2	A	1257	TCU	C11-C10-C9	-2.00	117.77	120.24

There are no chirality outliers.

All (85) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1258	NAP	C5D-O5D-PN-O3
3	A	1258	NAP	C5D-O5D-PN-O1N
3	A	1258	NAP	C5D-O5D-PN-O2N
3	A	1258	NAP	O4D-C1D-N1N-C2N
3	B	1257	NAP	C5D-O5D-PN-O3
3	B	1257	NAP	C5D-O5D-PN-O1N
3	B	1257	NAP	O4D-C1D-N1N-C2N
3	C	1257	NAP	C5D-O5D-PN-O3
3	C	1257	NAP	C5D-O5D-PN-O1N
3	C	1257	NAP	C5D-O5D-PN-O2N
3	C	1257	NAP	O4D-C1D-N1N-C2N
3	D	1257	NAP	C5D-O5D-PN-O3
3	D	1257	NAP	C5D-O5D-PN-O1N
3	D	1257	NAP	C5D-O5D-PN-O2N
3	D	1257	NAP	O4D-C1D-N1N-C2N
3	E	1257	NAP	C5D-O5D-PN-O3
3	E	1257	NAP	C5D-O5D-PN-O1N
3	E	1257	NAP	C5D-O5D-PN-O2N
3	E	1257	NAP	O4D-C1D-N1N-C2N
3	F	1257	NAP	C5B-O5B-PA-O2A
3	F	1257	NAP	PN-O3-PA-O5B
3	F	1257	NAP	C5D-O5D-PN-O3
3	F	1257	NAP	C5D-O5D-PN-O1N
3	F	1257	NAP	C5D-O5D-PN-O2N
3	G	1257	NAP	C5D-O5D-PN-O3
3	G	1257	NAP	O4D-C1D-N1N-C2N
3	H	1257	NAP	C5D-O5D-PN-O3
3	H	1257	NAP	C5D-O5D-PN-O1N
3	H	1257	NAP	O4D-C1D-N1N-C2N
4	B	1001	GLU	CA-CB-CG-CD
4	E	1001	GLU	C-CA-CB-CG
4	F	1001	GLU	N-CA-CB-CG

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Mol	Chain	Res	Type	Atoms
4	G	1001	GLU	N-CA-CB-CG
2	H	1258	TCU	C17-C18-C19-C20
2	D	1258	TCU	C2-C16-C17-C18
2	A	1257	TCU	C2-C16-C17-C18
2	F	1258	TCU	C2-C16-C17-C18
4	E	1001	GLU	OXT-C-CA-N
2	H	1258	TCU	C2-C16-C17-C18
2	B	1258	TCU	C2-C16-C17-C18
2	B	1258	TCU	C17-C18-C19-C20
4	G	1001	GLU	OXT-C-CA-N
2	D	1258	TCU	C17-C18-C19-C20
2	A	1257	TCU	C17-C18-C19-C20
4	B	1001	GLU	OXT-C-CA-N
2	D	1258	TCU	C16-C17-C18-C19
3	D	1257	NAP	PA-O3-PN-O1N
4	E	1001	GLU	O-C-CA-CB
4	E	1001	GLU	OXT-C-CA-CB
4	E	1001	GLU	O-C-CA-N
4	G	1001	GLU	O-C-CA-N
2	E	1258	TCU	C2-C16-C17-C18
3	B	1257	NAP	PN-O3-PA-O5B
2	G	1258	TCU	C2-C16-C17-C18
2	E	1258	TCU	C16-C17-C18-C19
2	F	1258	TCU	C16-C17-C18-C19
4	G	1001	GLU	C-CA-CB-CG
2	C	1258	TCU	C17-C18-C19-C20
4	C	1001	GLU	N-CA-CB-CG
2	E	1258	TCU	C17-C18-C19-C20
3	B	1257	NAP	C5D-O5D-PN-O2N
3	F	1257	NAP	C5B-O5B-PA-O1A
3	G	1257	NAP	C5D-O5D-PN-O1N
2	G	1258	TCU	C16-C17-C18-C19
3	D	1257	NAP	PA-O3-PN-O2N
3	H	1257	NAP	C2B-O2B-P2B-O2X
2	D	1258	TCU	C18-C19-C20-C21
3	A	1258	NAP	O4D-C1D-N1N-C6N
3	B	1257	NAP	O4D-C1D-N1N-C6N
3	C	1257	NAP	O4D-C1D-N1N-C6N
3	D	1257	NAP	O4D-C1D-N1N-C6N
3	E	1257	NAP	O4D-C1D-N1N-C6N
3	F	1257	NAP	O4D-C1D-N1N-C2N
3	F	1257	NAP	O4D-C1D-N1N-C6N

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Mol	Chain	Res	Type	Atoms
3	G	1257	NAP	O4D-C1D-N1N-C6N
3	H	1257	NAP	O4D-C1D-N1N-C6N
4	F	1001	GLU	OE1-CD-CG-CB
2	G	1258	TCU	C17-C18-C19-C20
4	F	1001	GLU	OE2-CD-CG-CB
4	F	1001	GLU	C-CA-CB-CG
3	F	1257	NAP	O4B-C4B-C5B-O5B
3	B	1257	NAP	O4B-C4B-C5B-O5B
4	C	1001	GLU	OXT-C-CA-CB
3	H	1257	NAP	C2B-O2B-P2B-O1X
4	B	1001	GLU	O-C-CA-N

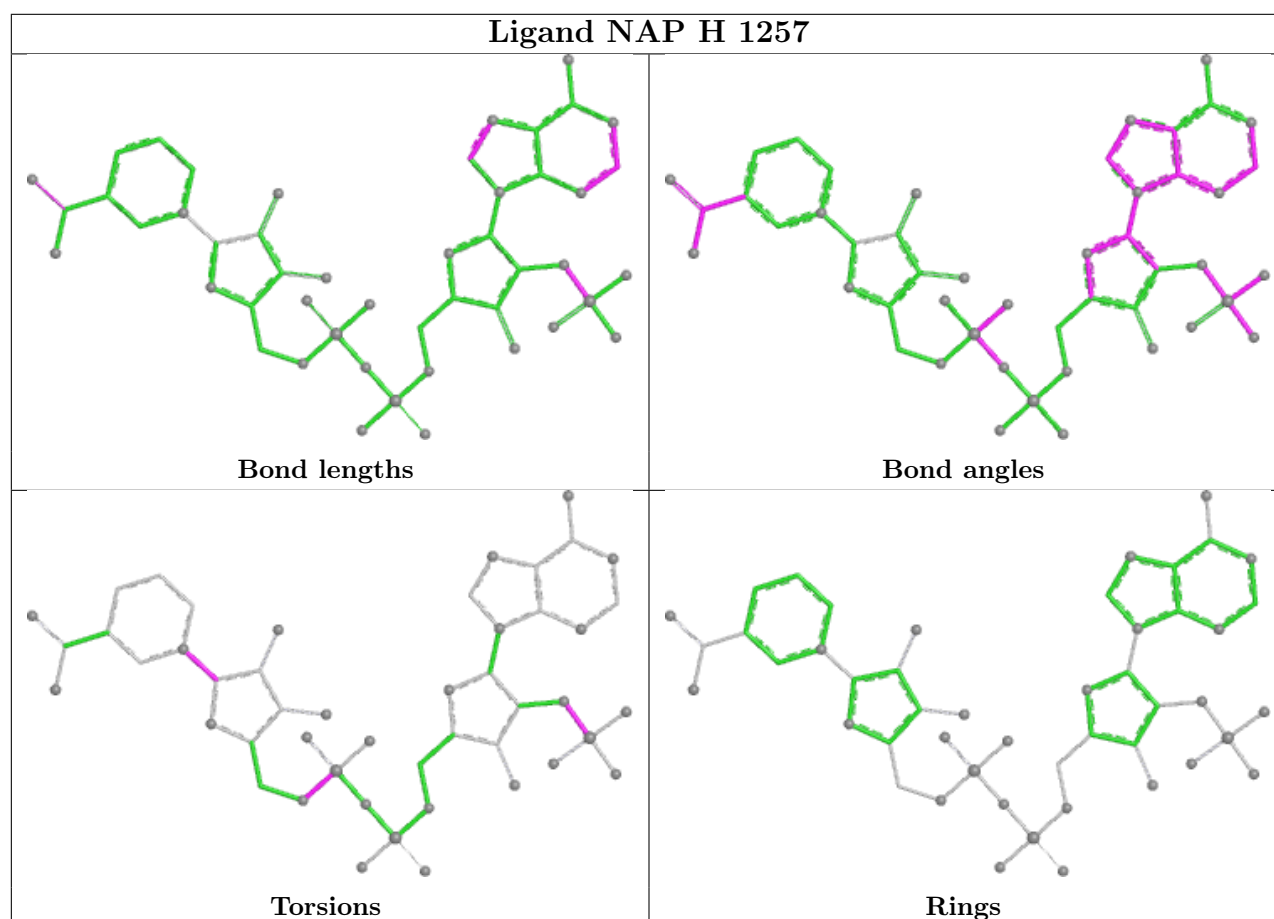
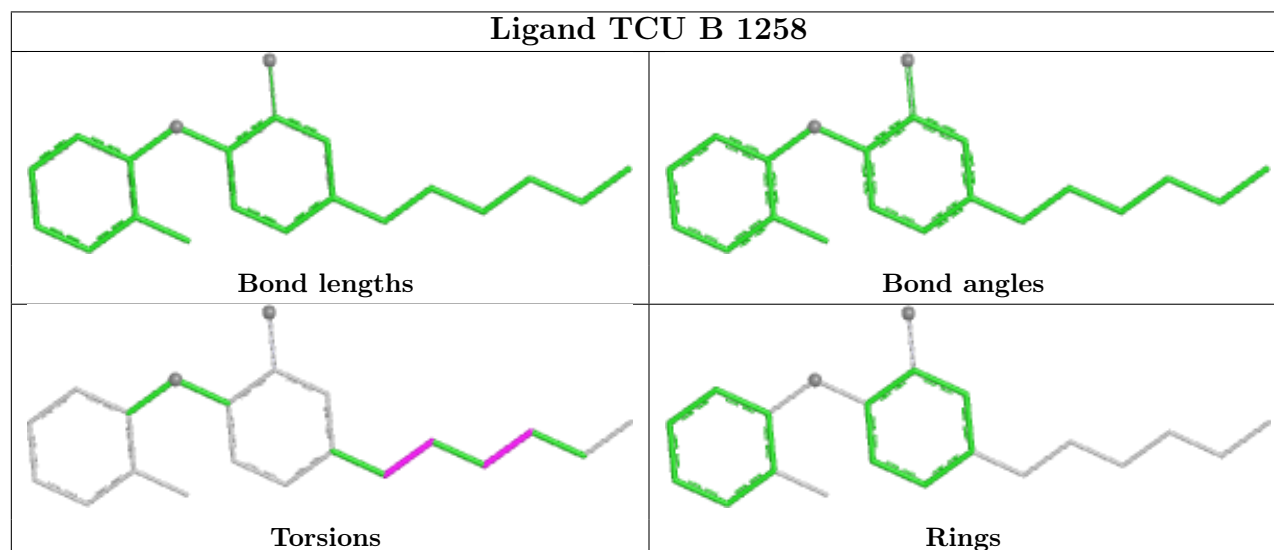
There are no ring outliers.

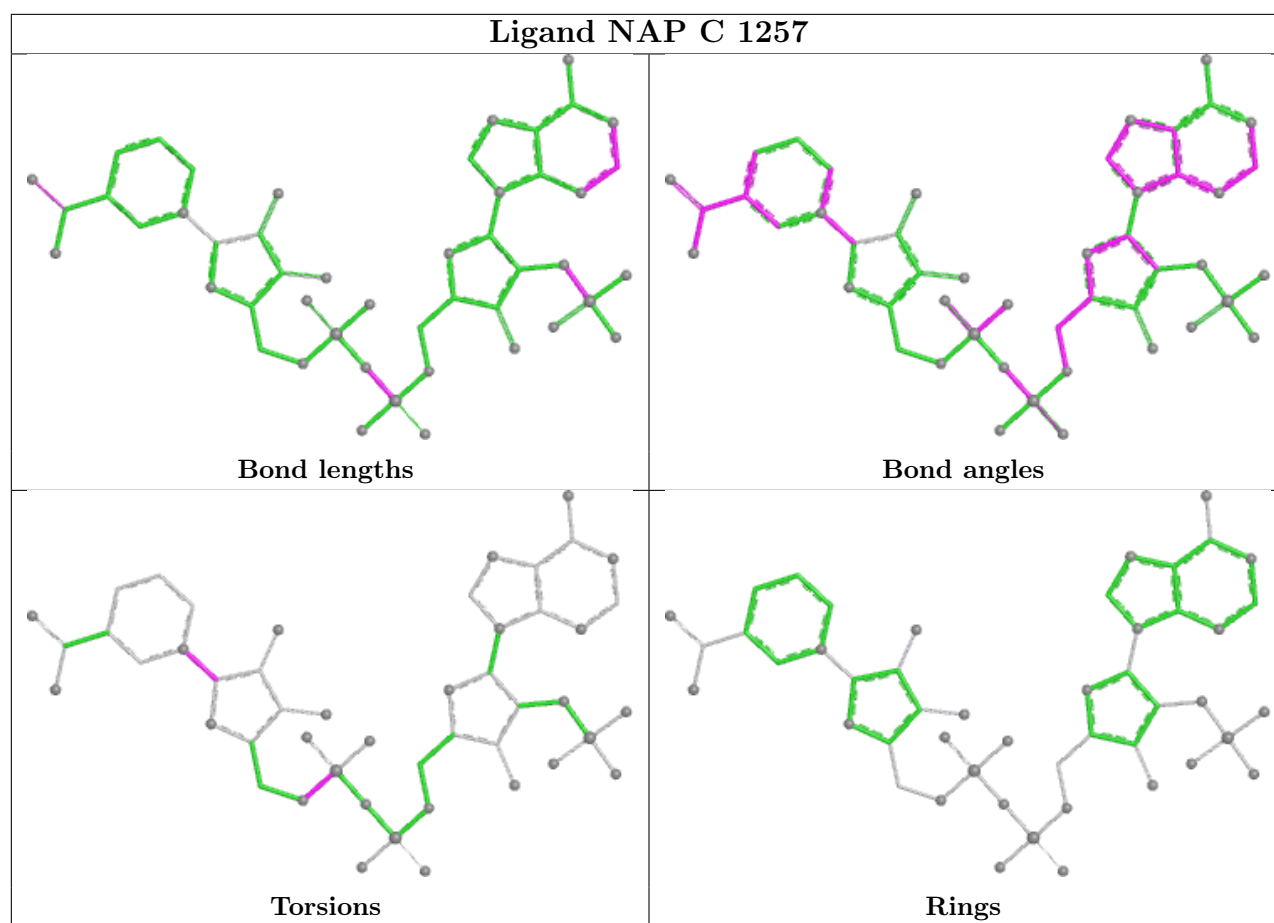
17 monomers are involved in 38 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1258	TCU	1	0
4	B	1001	GLU	7	0
3	H	1257	NAP	2	0
3	C	1257	NAP	1	0
2	D	1258	TCU	1	0
4	F	1001	GLU	4	0
2	F	1258	TCU	1	0
2	A	1257	TCU	2	0
2	E	1258	TCU	2	0
3	G	1257	NAP	1	0
4	C	1001	GLU	5	0
4	E	1001	GLU	1	0
2	G	1258	TCU	2	0
2	C	1258	TCU	2	0
3	D	1257	NAP	3	0
2	H	1258	TCU	2	0
3	B	1257	NAP	1	0

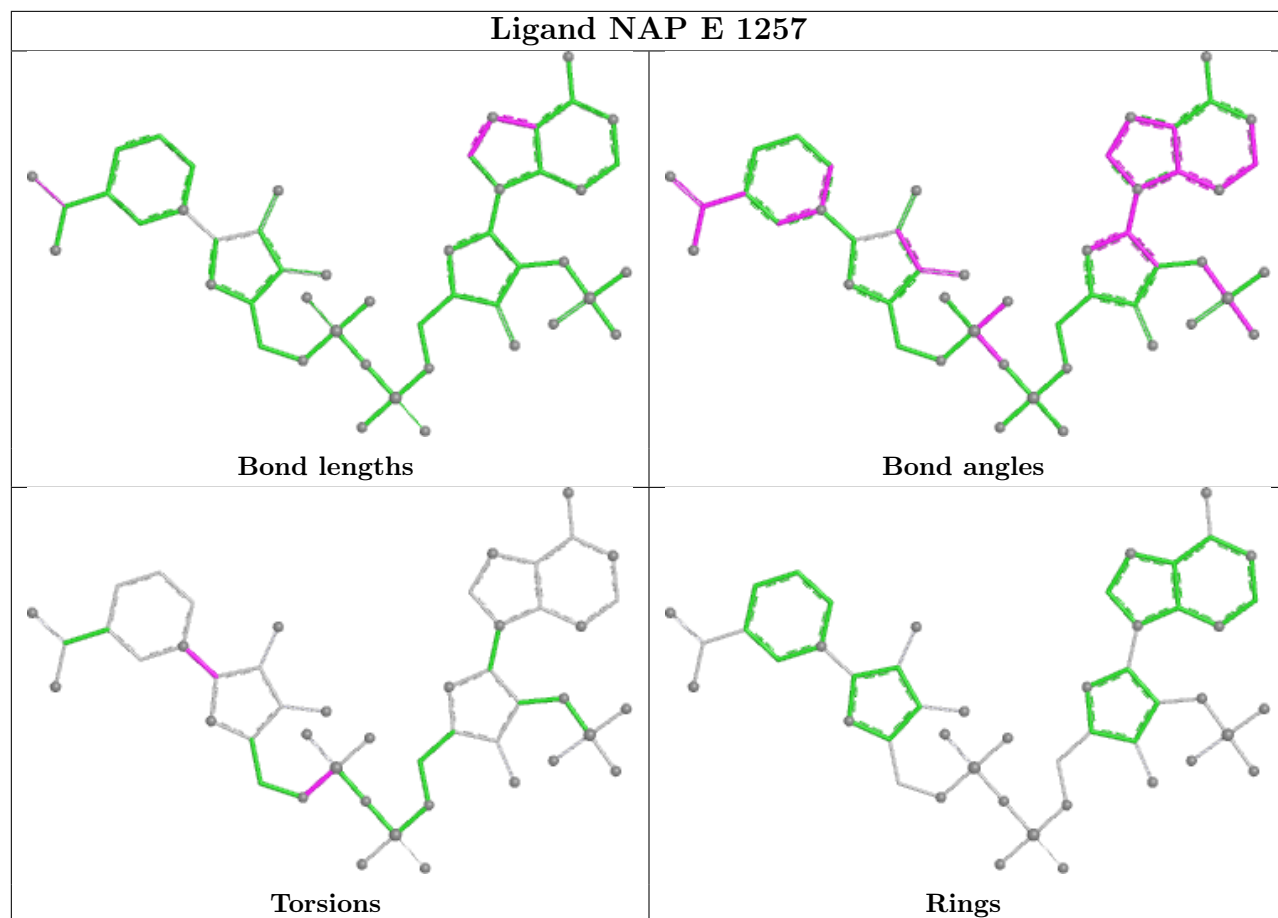
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

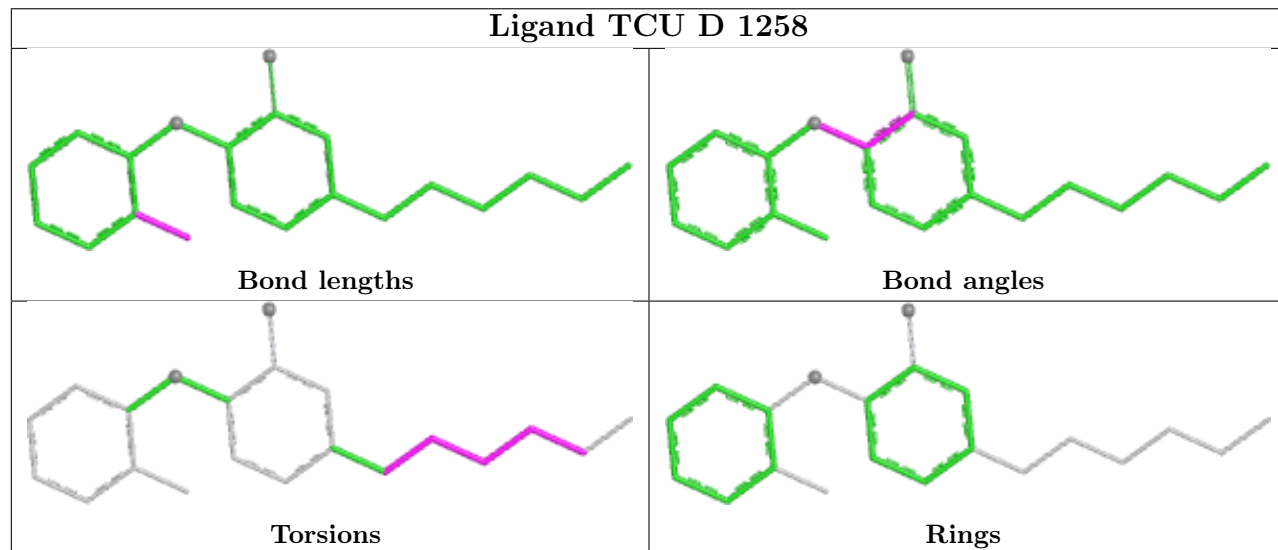


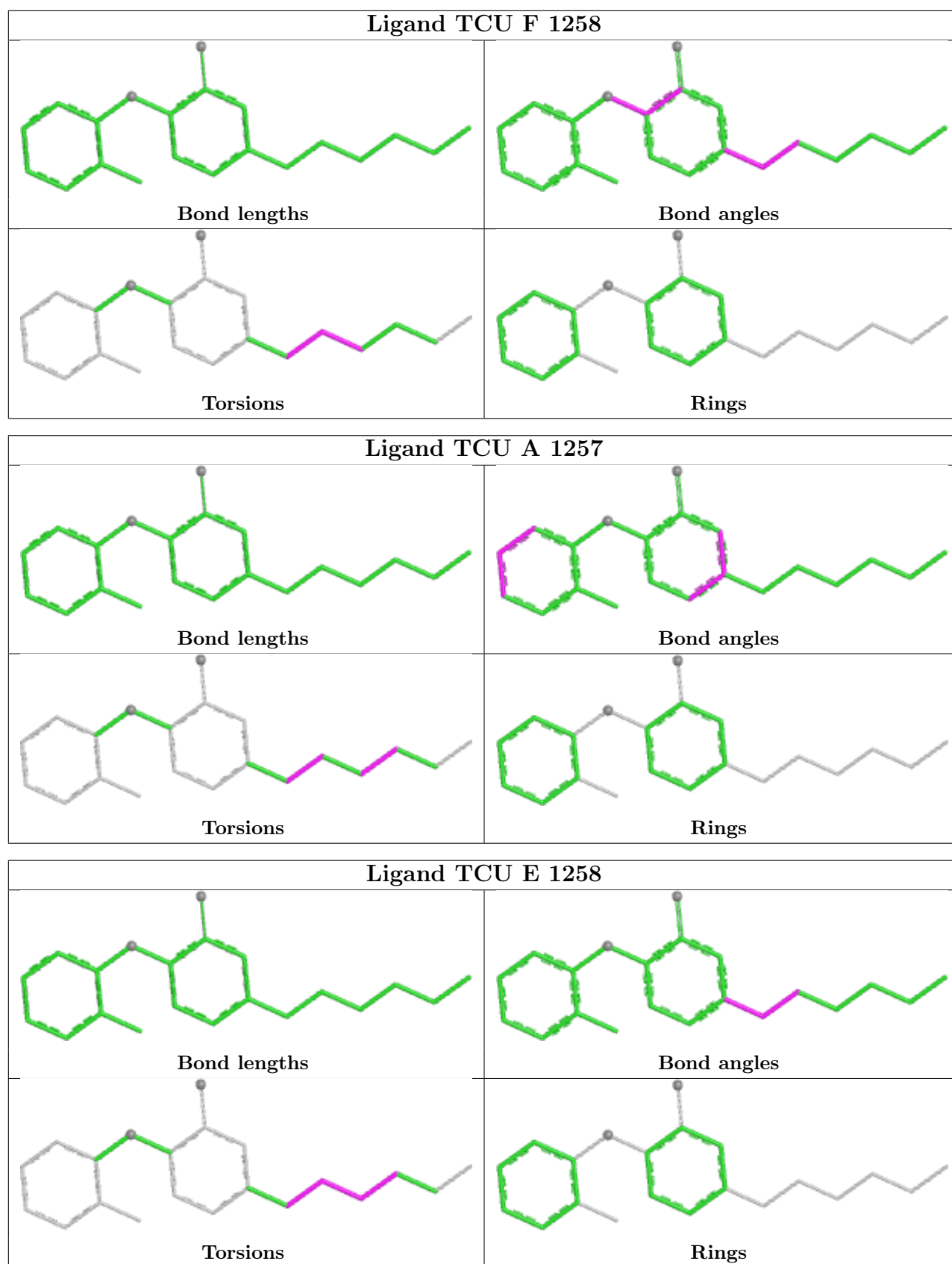


Ligand NAP E 1257

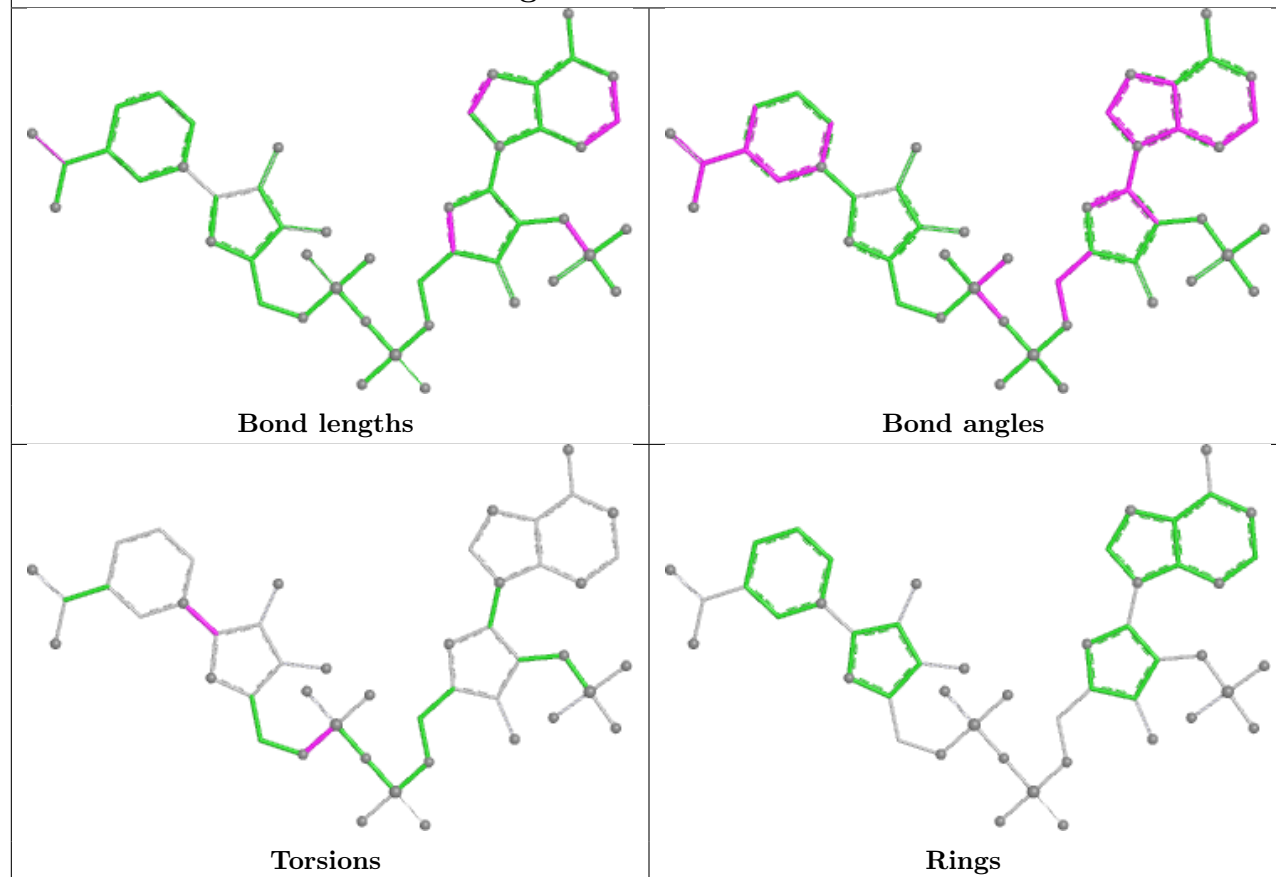


Ligand TCU D 1258

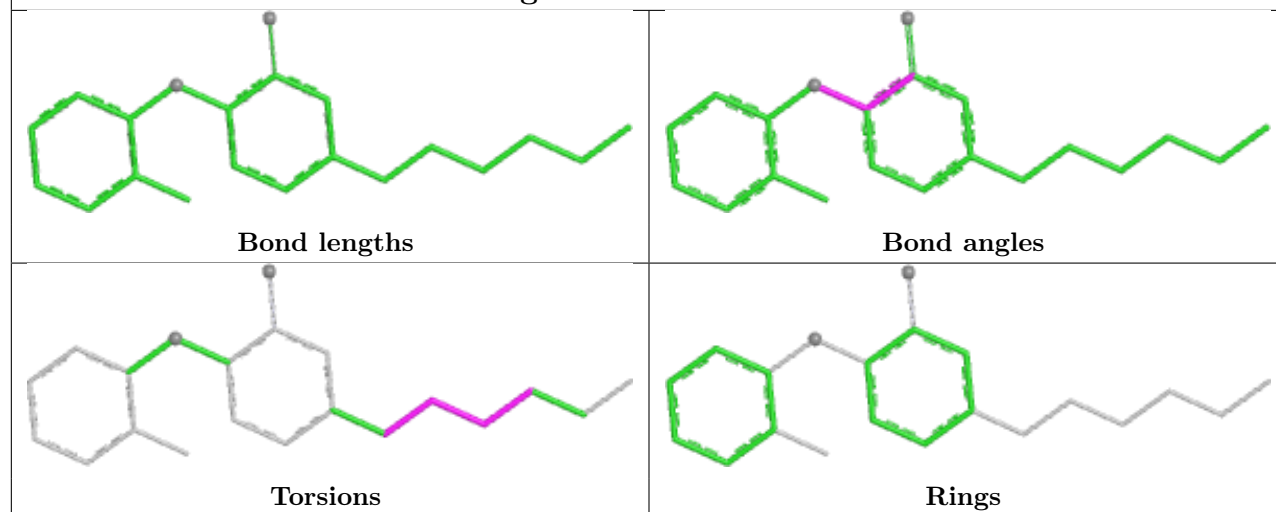




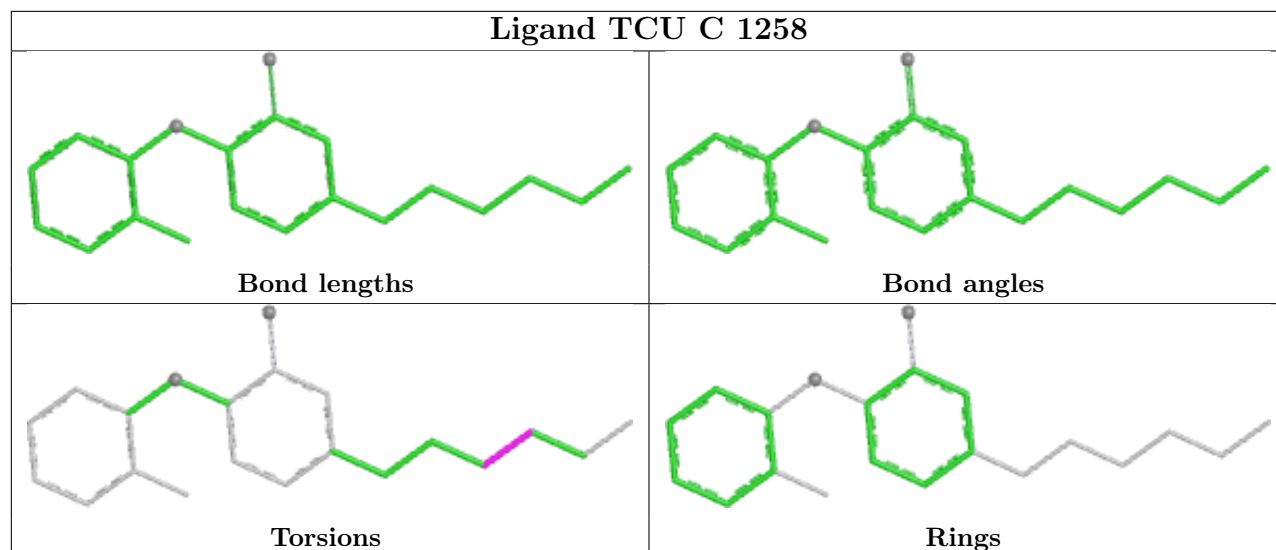
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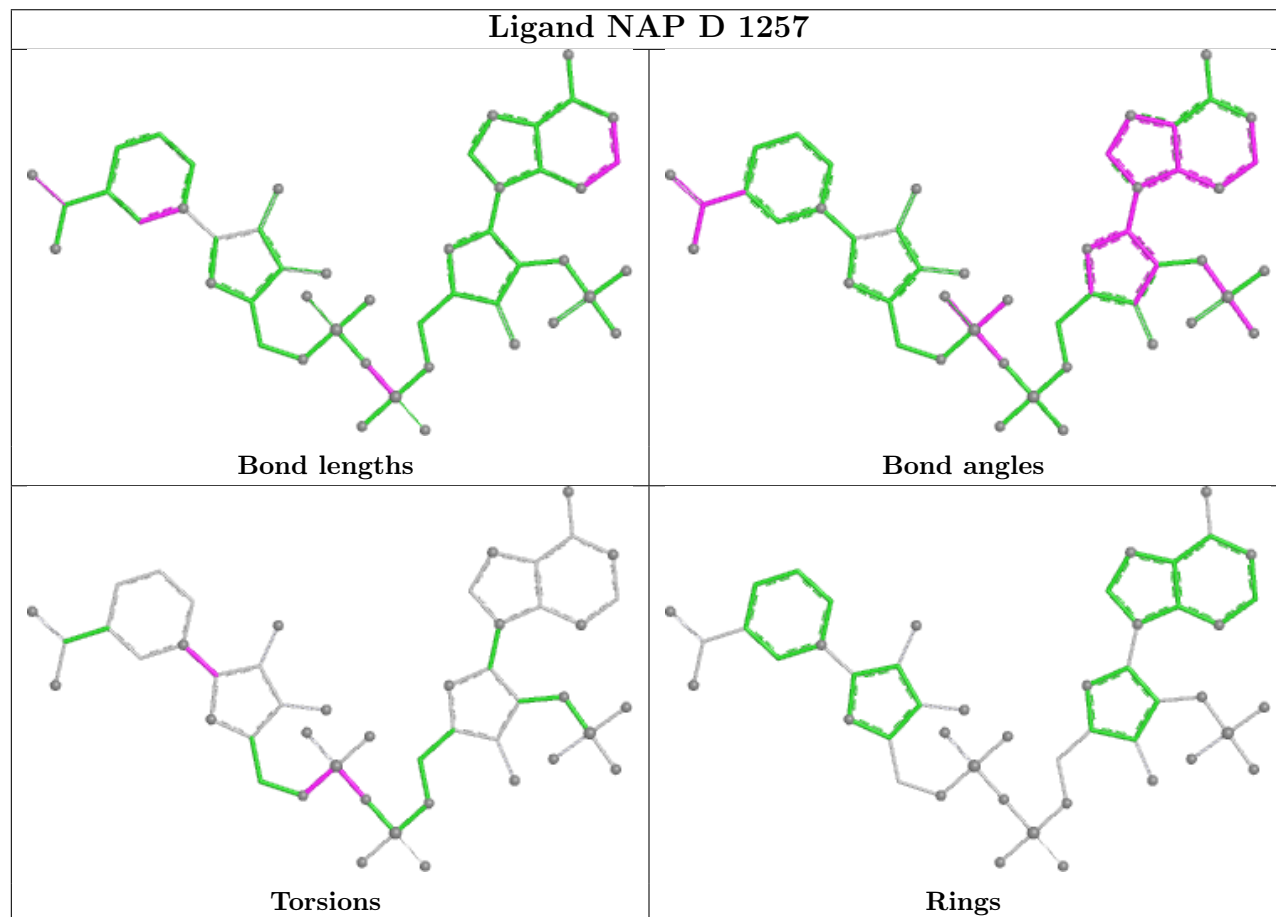
Ligand TCU G 1258



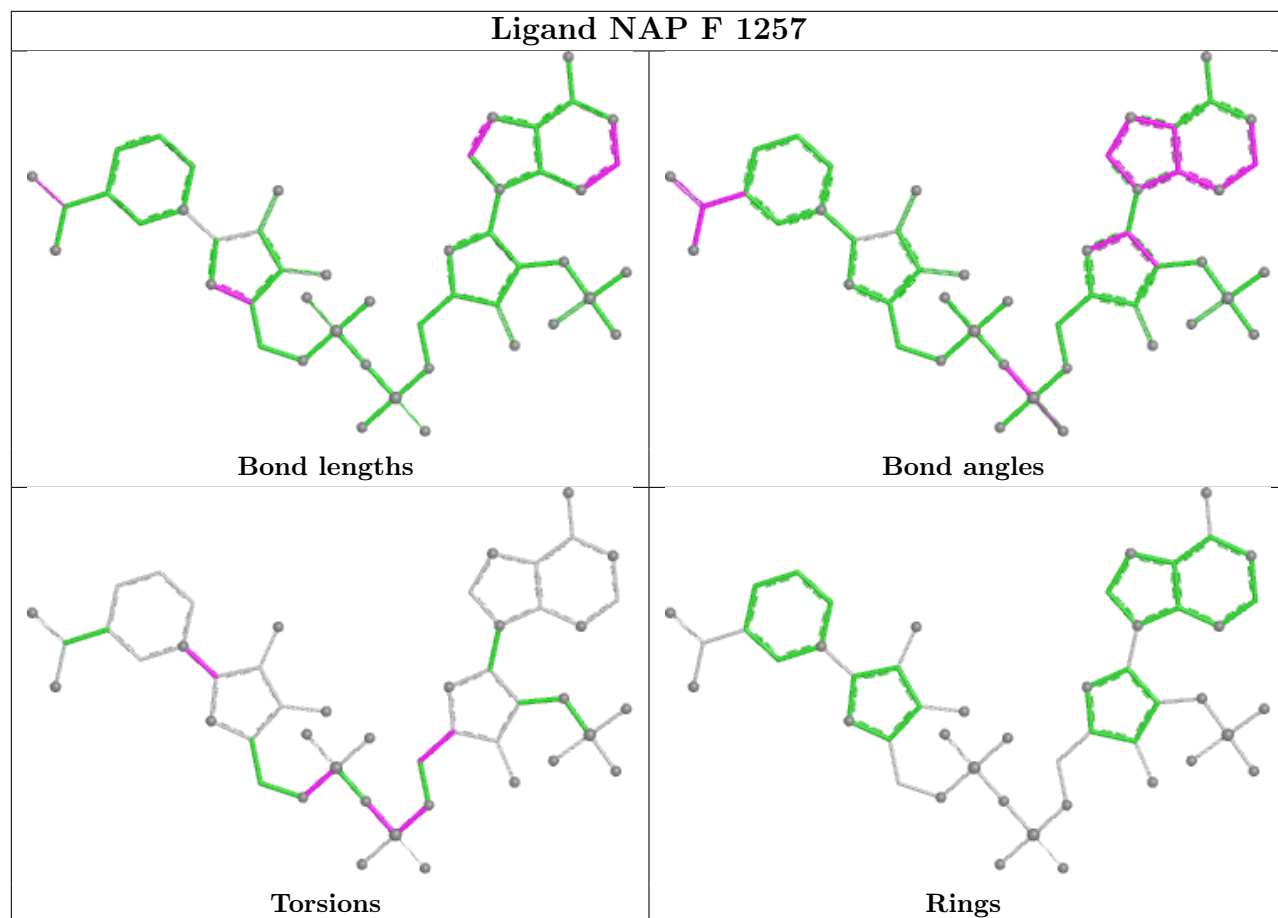
Ligand TCU C 1258



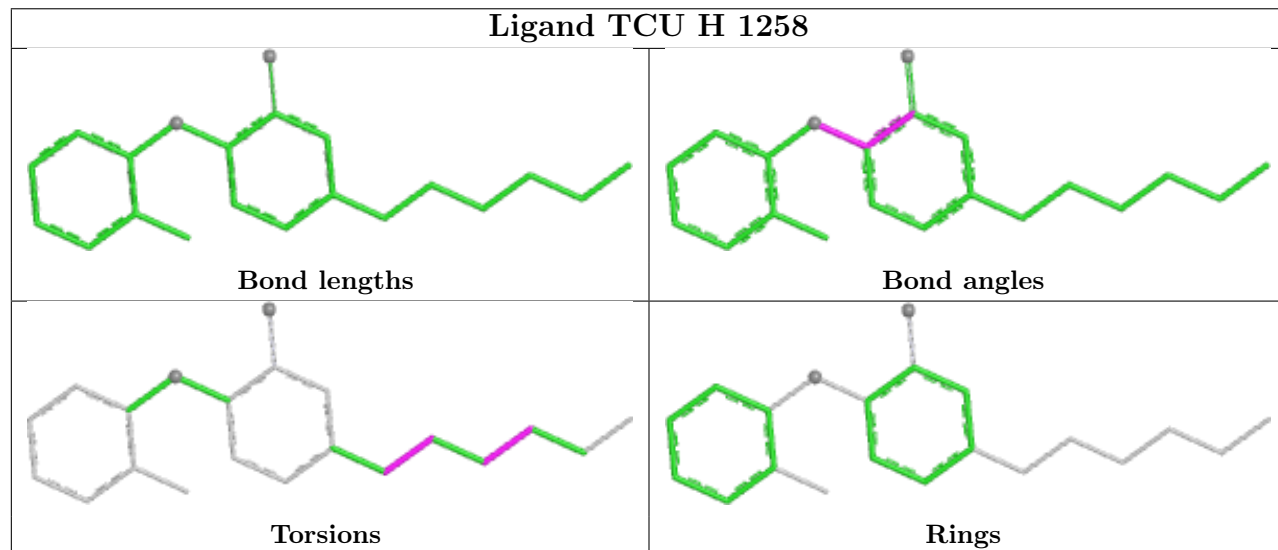
Ligand NAP D 1257

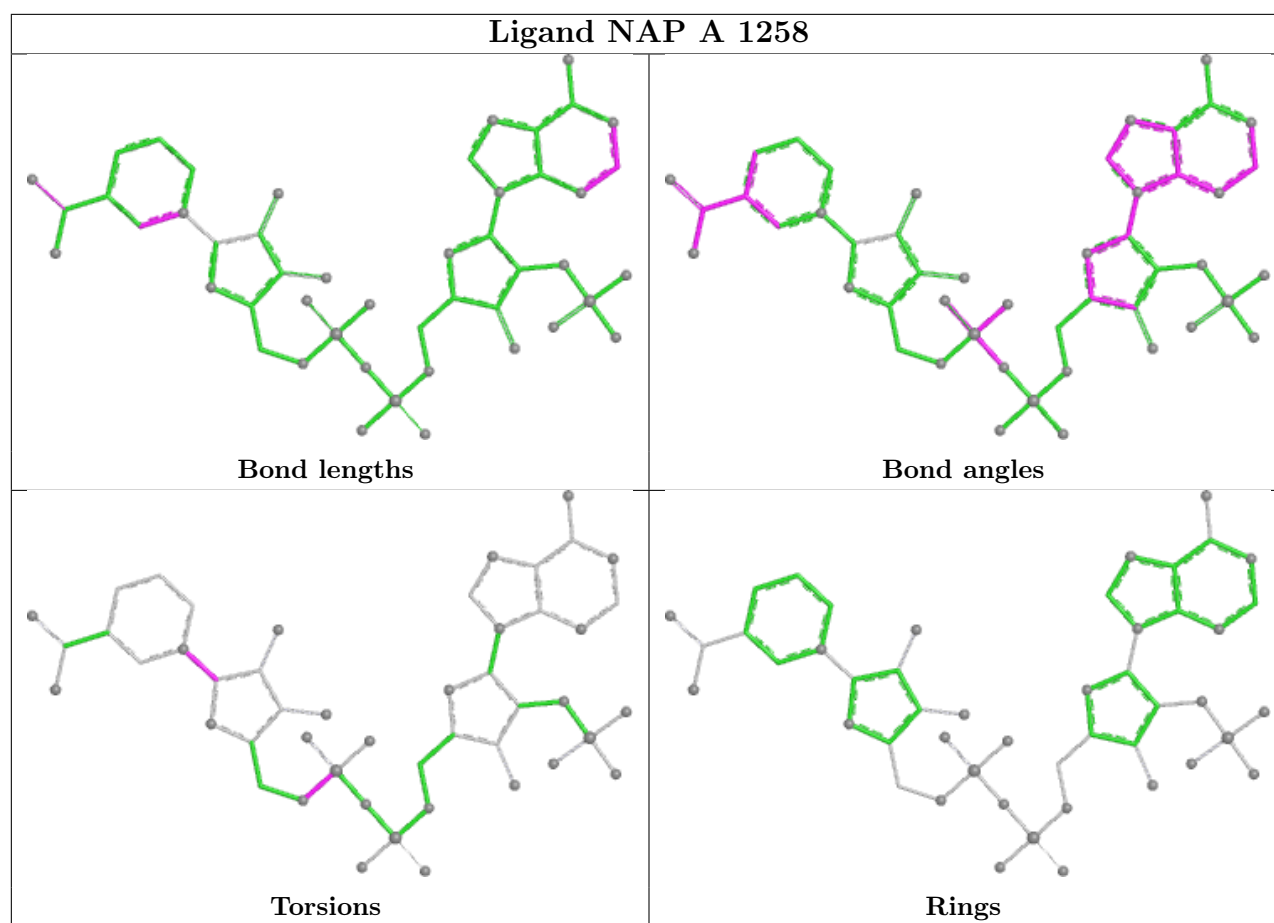


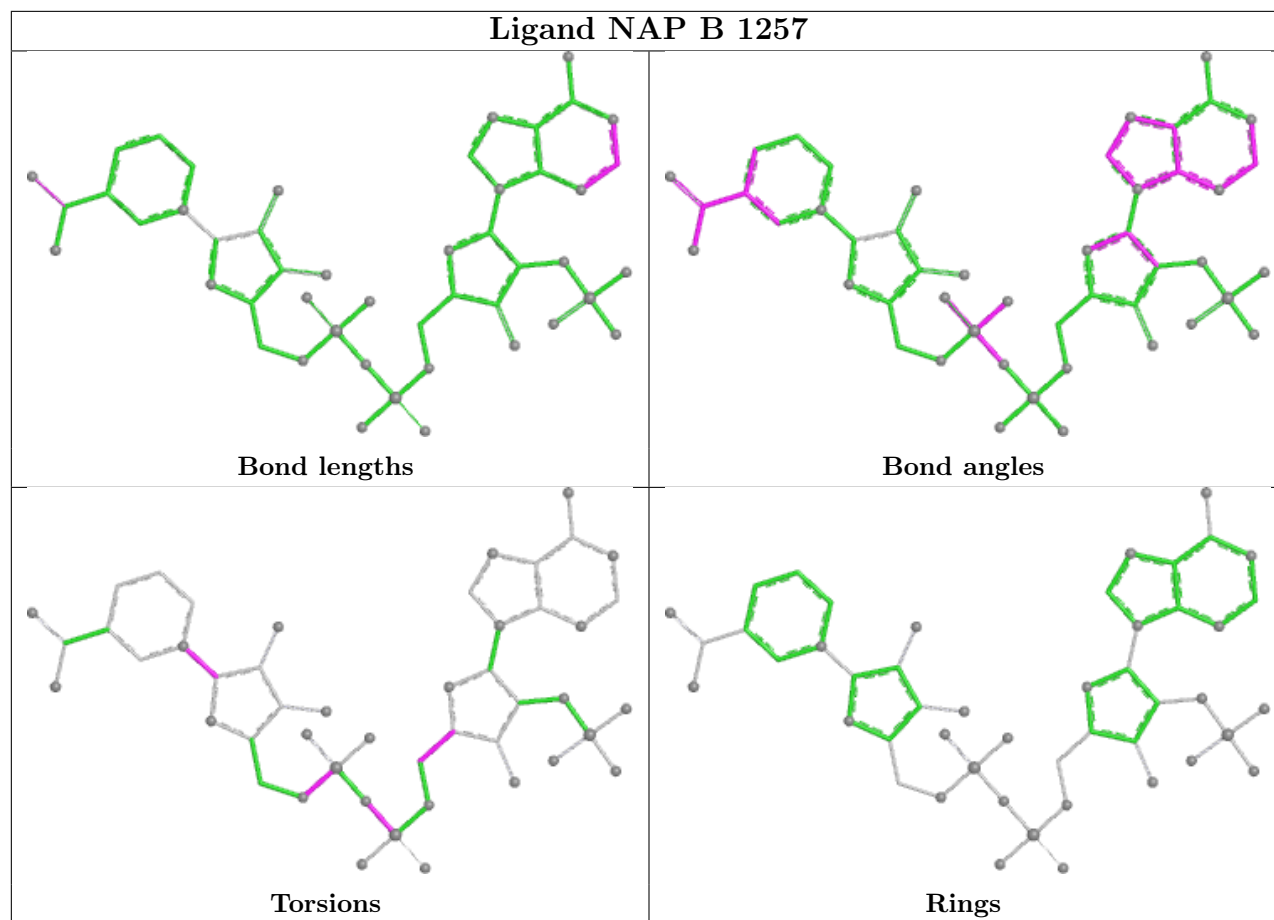
Ligand NAP F 1257



Ligand TCU H 1258







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	254/282 (90%)	-0.56	1 (0%) 88 91	12, 26, 49, 61	6 (2%)
1	B	255/282 (90%)	-0.52	1 (0%) 88 91	12, 28, 51, 68	7 (2%)
1	C	255/282 (90%)	-0.45	1 (0%) 88 91	13, 29, 52, 65	5 (1%)
1	D	254/282 (90%)	-0.46	0 100 100	11, 31, 55, 72	3 (1%)
1	E	255/282 (90%)	-0.62	1 (0%) 88 91	11, 26, 49, 61	5 (1%)
1	F	255/282 (90%)	-0.53	1 (0%) 88 91	11, 26, 49, 60	4 (1%)
1	G	255/282 (90%)	-0.52	1 (0%) 88 91	13, 28, 49, 62	5 (1%)
1	H	254/282 (90%)	-0.54	0 100 100	10, 27, 51, 63	4 (1%)
All	All	2037/2256 (90%)	-0.52	6 (0%) 90 92	10, 27, 51, 72	39 (1%)

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	2	VAL	4.2
1	G	2	VAL	3.4
1	B	2	VAL	3.1
1	F	2	VAL	3.1
1	E	2	VAL	3.0
1	A	60	ALA	2.0

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 oligosaccharides in this entry.

6.4 Ligands ⓘ

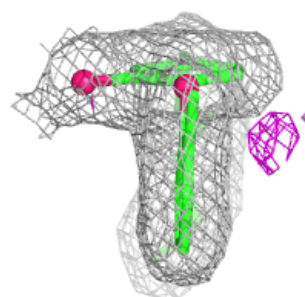
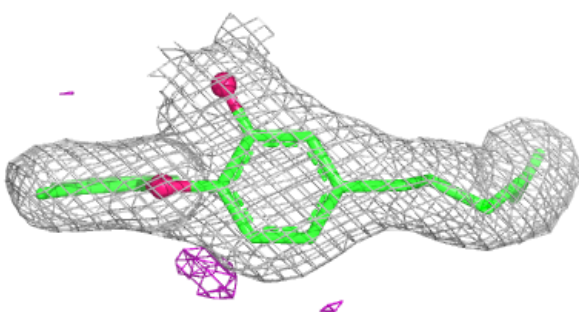
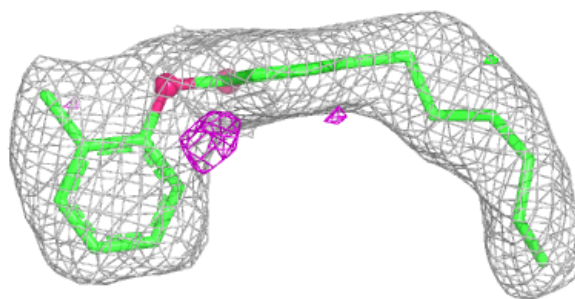
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	GLU	E	1001	10/10	0.65	0.24	100,101,102,104	0
4	GLU	B	1001	10/10	0.73	0.17	81,82,87,88	0
4	GLU	C	1001	10/10	0.76	0.20	87,90,91,91	0
4	GLU	G	1001	10/10	0.76	0.18	82,88,89,89	0
4	GLU	F	1001	10/10	0.77	0.21	99,100,102,103	0
2	TCU	G	1258	21/21	0.95	0.07	24,28,31,32	0
2	TCU	D	1258	21/21	0.95	0.09	33,37,39,41	0
2	TCU	A	1257	21/21	0.96	0.07	20,23,27,29	0
3	NAP	D	1257	48/48	0.97	0.06	24,33,44,50	0
2	TCU	B	1258	21/21	0.97	0.07	19,22,33,35	0
2	TCU	E	1258	21/21	0.97	0.06	18,22,28,29	0
2	TCU	F	1258	21/21	0.97	0.07	17,23,33,38	0
2	TCU	C	1258	21/21	0.97	0.06	17,24,30,32	0
2	TCU	H	1258	21/21	0.97	0.07	23,28,33,37	0
3	NAP	H	1257	48/48	0.98	0.06	23,29,43,46	0
3	NAP	C	1257	48/48	0.98	0.05	20,27,31,35	0
3	NAP	A	1258	48/48	0.98	0.05	19,25,30,32	0
3	NAP	E	1257	48/48	0.98	0.05	19,25,31,33	0
3	NAP	F	1257	48/48	0.98	0.05	18,24,30,32	0
3	NAP	G	1257	48/48	0.98	0.05	17,24,28,31	0
3	NAP	B	1257	48/48	0.99	0.04	18,24,29,32	0

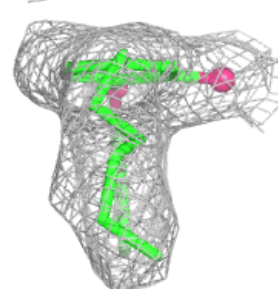
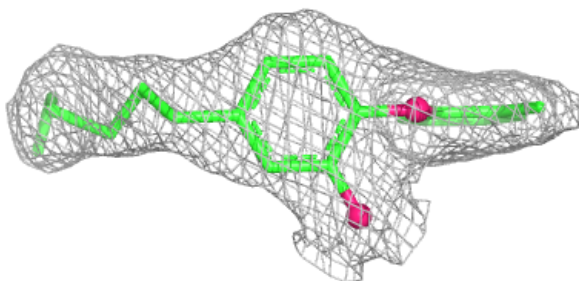
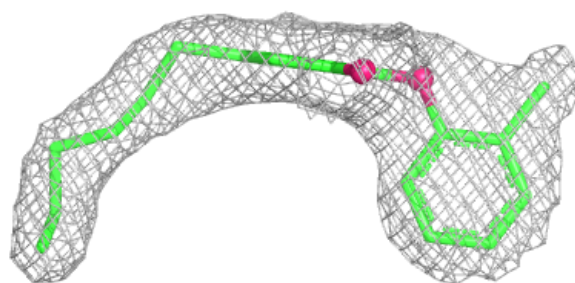
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around TCU 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)

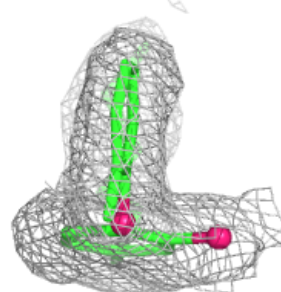
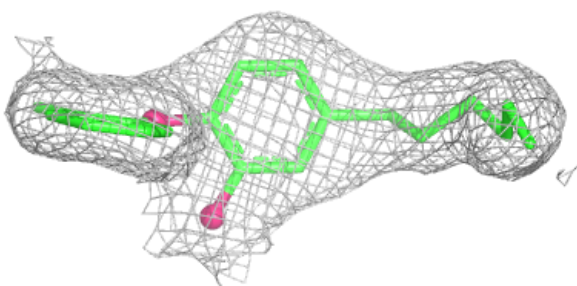
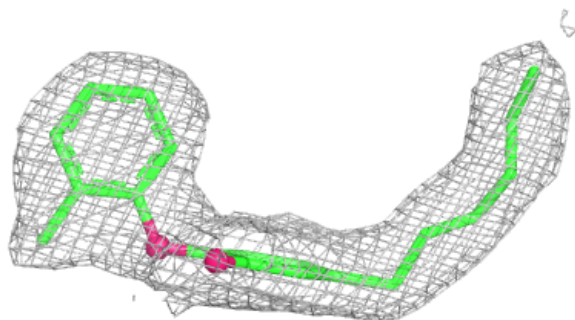
**Electron density around TCU D 1258:**

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

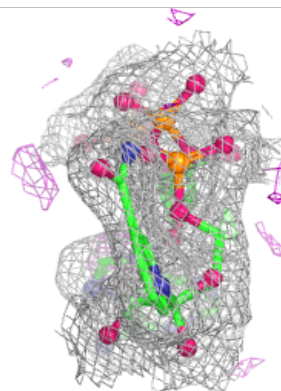
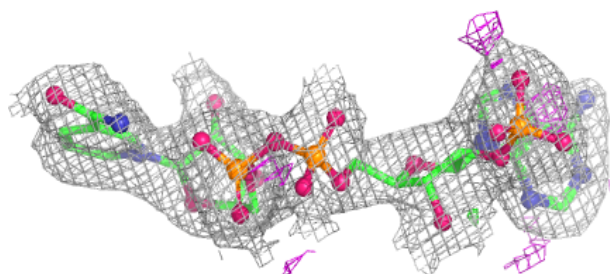
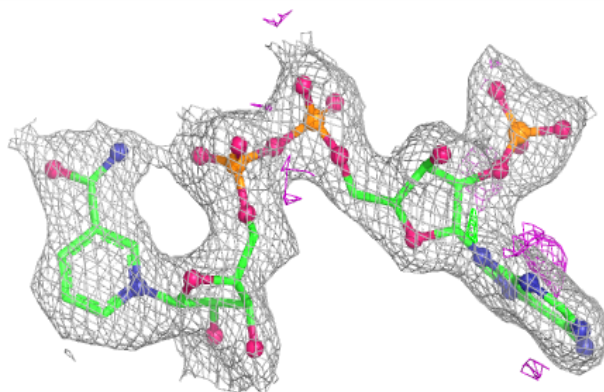


Electron density around TCU A 1257:

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and green (positive)

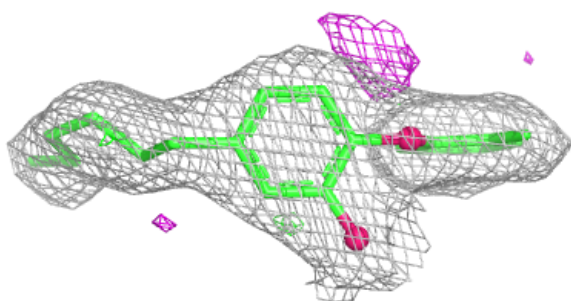
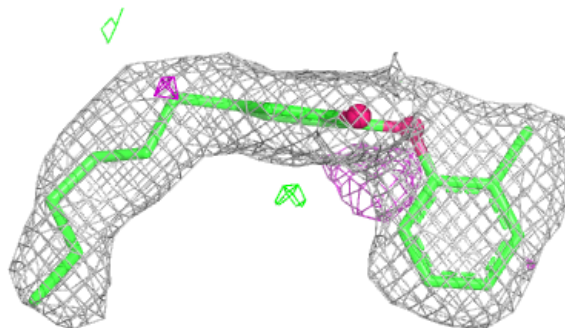
**Electron density around NAP D 1257:**

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

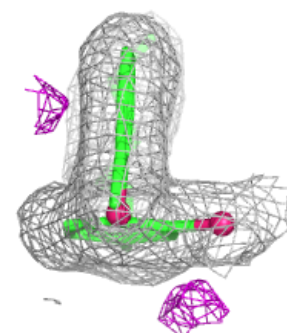
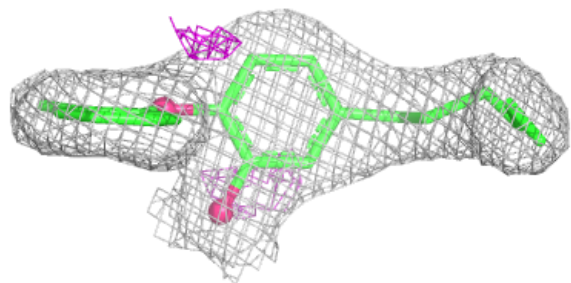
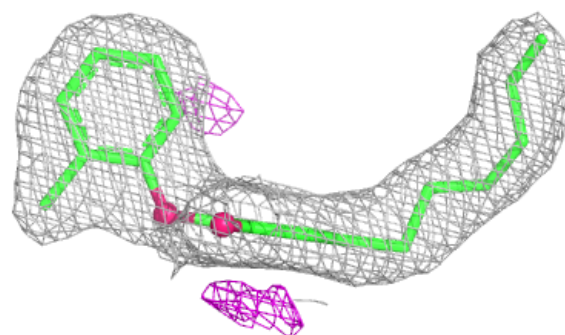


Electron density around TCU B 1258:

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and green (positive)

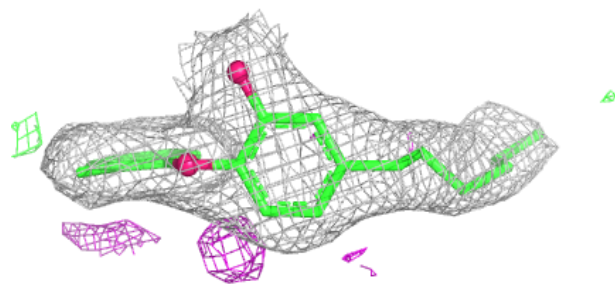
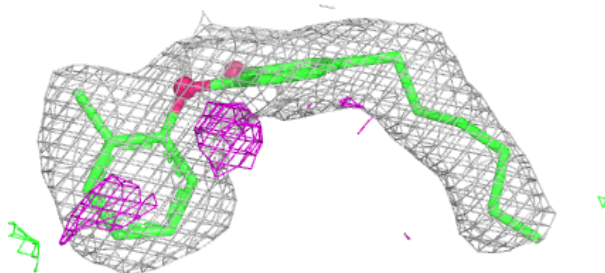
**Electron density around TCU E 1258:**

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and green (positive)

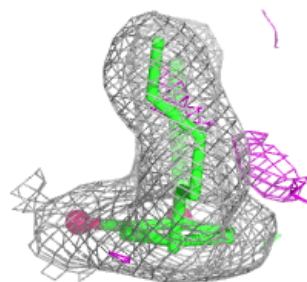
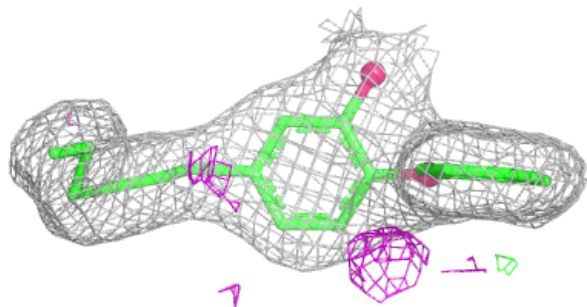
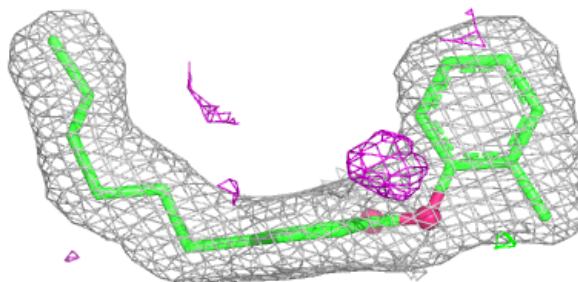


Electron density around TCU F 1258:

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and green (positive)

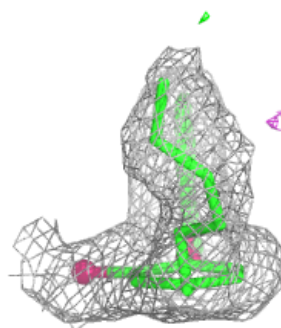
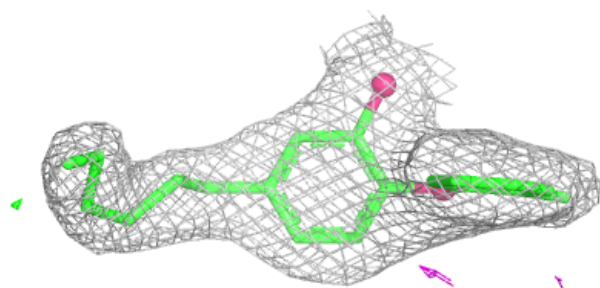
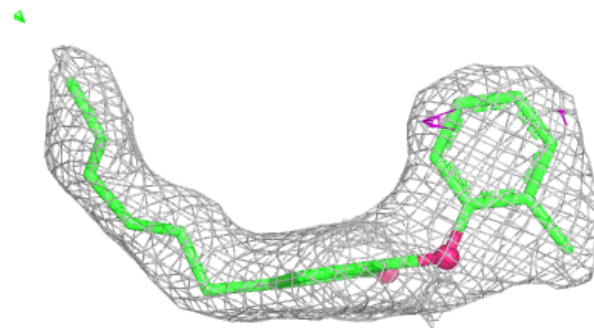
**Electron density around TCU C 1258:**

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and green (positive)

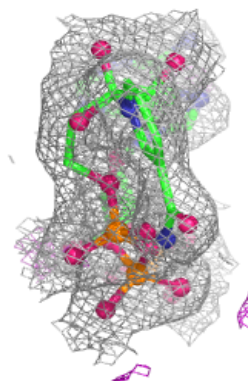
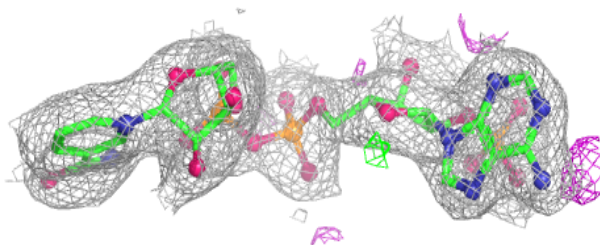
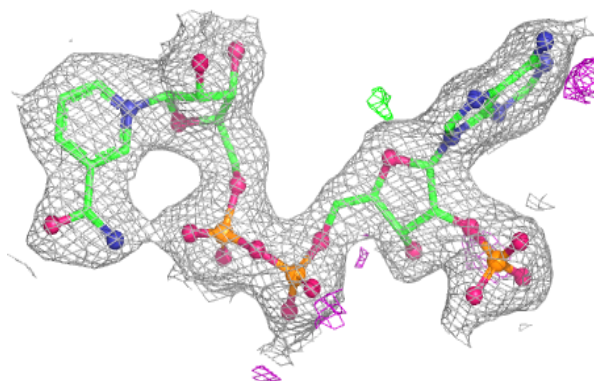


Electron density around TCU H 1258:

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

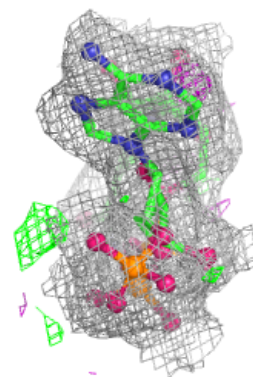
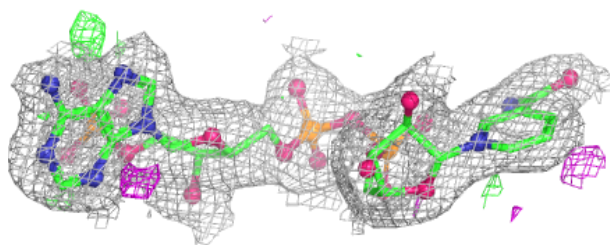
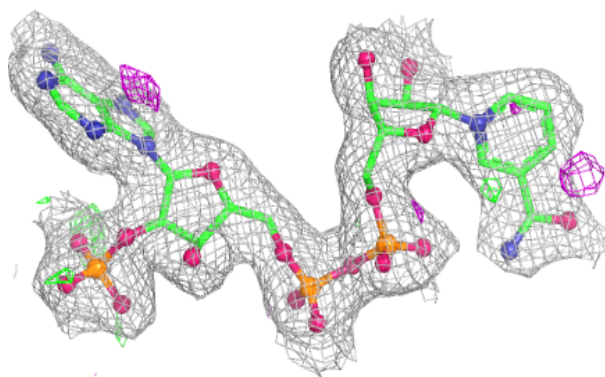
**Electron density around NAP H 1257:**

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

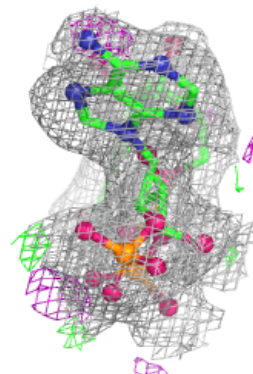
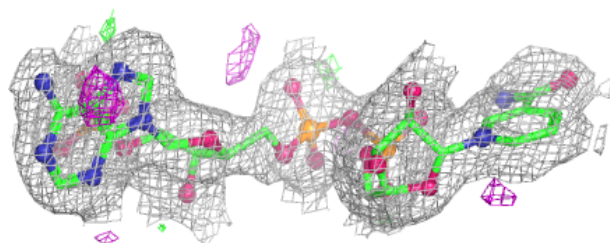
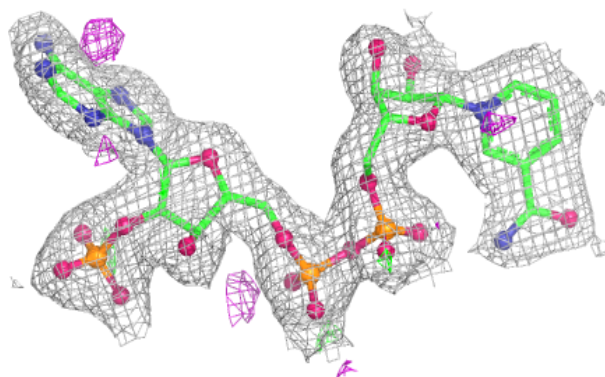


Electron density around NAP C 1257:

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and green (positive)

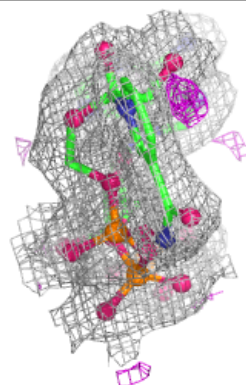
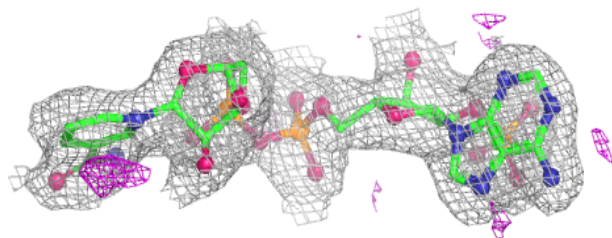
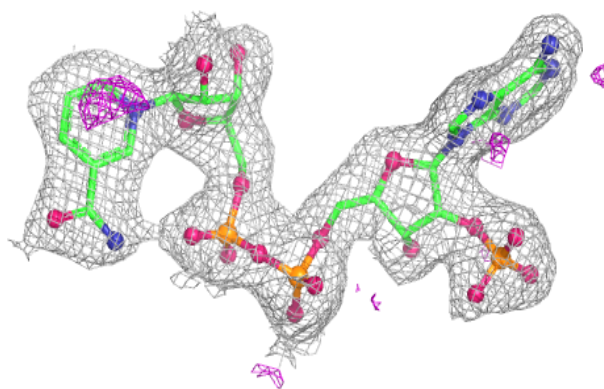
**Electron density around NAP A 1258:**

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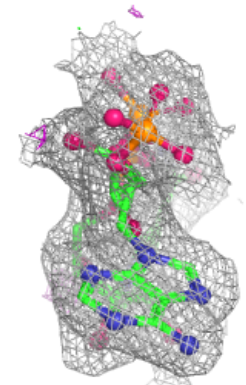
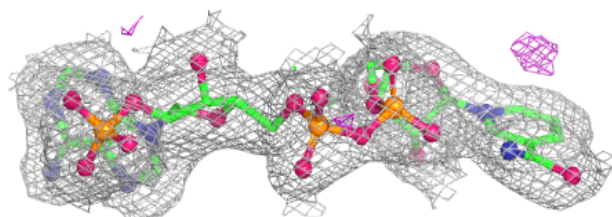
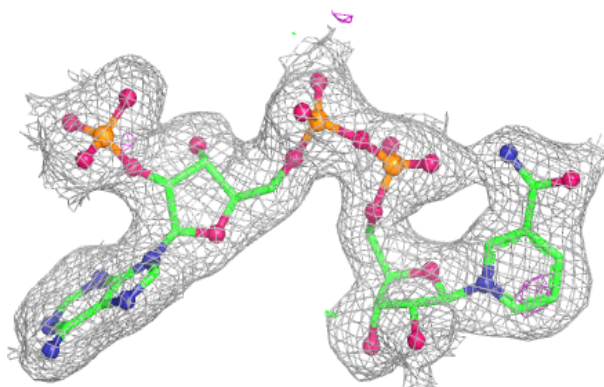


Electron density around NAP E 1257:

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

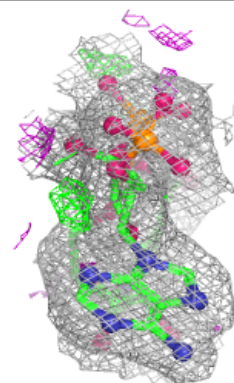
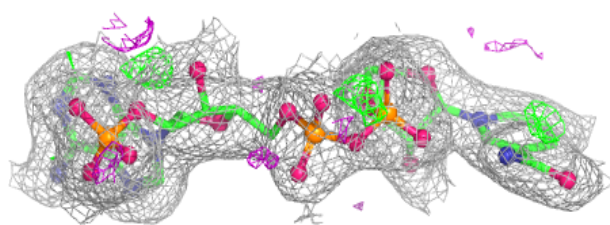
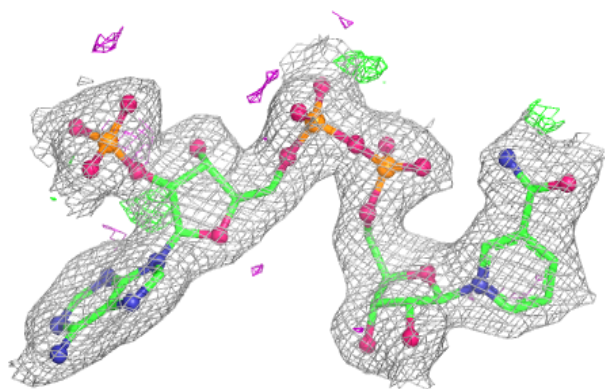
**Electron density around NAP F 1257:**

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

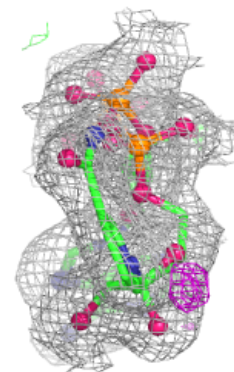
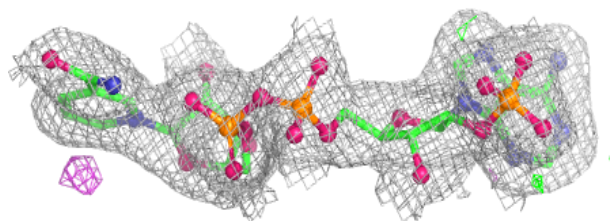
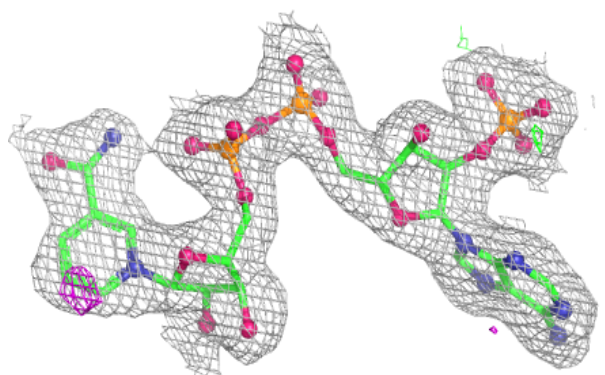


Electron density around NAP G 1257:

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

**Electron density around NAP 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)



6.5 Other polymers [i](#)

There are no such residues in this entry.