



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 11, 2023 – 10:25 AM EDT

PDB ID : 4MVJ  
Title : 2.85 Angstrom Resolution Crystal Structure of Glyceraldehyde 3-phosphate Dehydrogenase A (gapA) from Escherichia coli Modified by Acetyl Phosphate.  
Authors : Minasov, G.; Kuhn, M.; Dubrovskaja, I.; Winsor, J.; Shuvalova, L.; Grimshaw, S.; Kwon, K.; Anderson, W.F.; Center for Structural Genomics of Infectious Diseases (CSGID)  
Deposited on : 2013-09-24  
Resolution : 2.85 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](#) ①) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.35.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

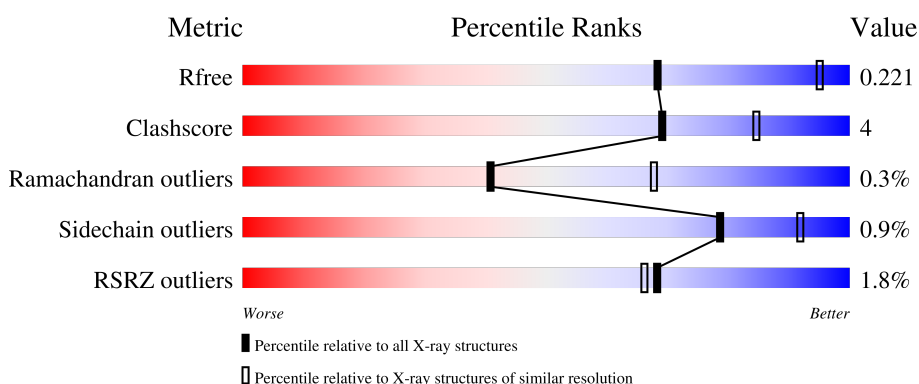
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.85 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.





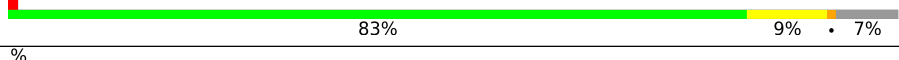

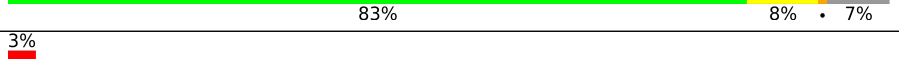
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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	355	 84% 8% • 7%
1	B	355	 84% 8% •• 6%
1	C	355	 83% 10% • 7%
1	K	355	 82% 10% • 7%
1	N	355	 85% 8% • 7%

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Mol	Chain	Length	Quality of chain
2	D	355	 % 83% 9% • 7%
2	L	355	 4% 85% 8% • 7%
3	E	355	 3% 85% 8% • 7%
4	F	355	 4% 81% 11% • 7%
4	J	355	 % 84% 8% • 7%
4	O	355	 % 83% 9% • 7%
5	G	355	 % 84% 9% • 7%
6	H	355	 % 85% 7% • 7%
7	I	355	 % 83% 8% • 7%
8	M	355	 % 83% 8% • 7%
9	P	355	 3% 85% 7% • 7%

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
12	PO4	A	407	-	-	X	-
12	PO4	B	409	-	X	-	-
9	SCY	P	150	-	-	X	-

## 2 Entry composition

There are 20 unique types of molecules in this entry. The entry contains 41155 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 Glyceraldehyde-3-phosphate dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	331	2509	1576	435	487	11	0	1	0
1	B	332	2514	1579	436	488	11	0	1	0
1	C	331	2499	1570	432	486	11	0	0	0
1	K	331	2509	1576	435	487	11	0	1	0
1	N	331	2509	1576	435	487	11	0	1	0

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-23	MET	-	expression tag	UNP C9QTS9
A	-22	HIS	-	expression tag	UNP C9QTS9
A	-21	HIS	-	expression tag	UNP C9QTS9
A	-20	HIS	-	expression tag	UNP C9QTS9
A	-19	HIS	-	expression tag	UNP C9QTS9
A	-18	HIS	-	expression tag	UNP C9QTS9
A	-17	HIS	-	expression tag	UNP C9QTS9
A	-16	SER	-	expression tag	UNP C9QTS9
A	-15	SER	-	expression tag	UNP C9QTS9
A	-14	GLY	-	expression tag	UNP C9QTS9
A	-13	VAL	-	expression tag	UNP C9QTS9
A	-12	ASP	-	expression tag	UNP C9QTS9
A	-11	LEU	-	expression tag	UNP C9QTS9
A	-10	GLY	-	expression tag	UNP C9QTS9
A	-9	THR	-	expression tag	UNP C9QTS9
A	-8	GLU	-	expression tag	UNP C9QTS9
A	-7	ASN	-	expression tag	UNP C9QTS9
A	-6	LEU	-	expression tag	UNP C9QTS9
A	-5	TYR	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	PHE	-	expression tag	UNP C9QTS9
A	-3	GLN	-	expression tag	UNP C9QTS9
A	-2	SER	-	expression tag	UNP C9QTS9
A	-1	ASN	-	expression tag	UNP C9QTS9
A	0	ALA	-	expression tag	UNP C9QTS9
B	-23	MET	-	expression tag	UNP C9QTS9
B	-22	HIS	-	expression tag	UNP C9QTS9
B	-21	HIS	-	expression tag	UNP C9QTS9
B	-20	HIS	-	expression tag	UNP C9QTS9
B	-19	HIS	-	expression tag	UNP C9QTS9
B	-18	HIS	-	expression tag	UNP C9QTS9
B	-17	HIS	-	expression tag	UNP C9QTS9
B	-16	SER	-	expression tag	UNP C9QTS9
B	-15	SER	-	expression tag	UNP C9QTS9
B	-14	GLY	-	expression tag	UNP C9QTS9
B	-13	VAL	-	expression tag	UNP C9QTS9
B	-12	ASP	-	expression tag	UNP C9QTS9
B	-11	LEU	-	expression tag	UNP C9QTS9
B	-10	GLY	-	expression tag	UNP C9QTS9
B	-9	THR	-	expression tag	UNP C9QTS9
B	-8	GLU	-	expression tag	UNP C9QTS9
B	-7	ASN	-	expression tag	UNP C9QTS9
B	-6	LEU	-	expression tag	UNP C9QTS9
B	-5	TYR	-	expression tag	UNP C9QTS9
B	-4	PHE	-	expression tag	UNP C9QTS9
B	-3	GLN	-	expression tag	UNP C9QTS9
B	-2	SER	-	expression tag	UNP C9QTS9
B	-1	ASN	-	expression tag	UNP C9QTS9
B	0	ALA	-	expression tag	UNP C9QTS9
C	-23	MET	-	expression tag	UNP C9QTS9
C	-22	HIS	-	expression tag	UNP C9QTS9
C	-21	HIS	-	expression tag	UNP C9QTS9
C	-20	HIS	-	expression tag	UNP C9QTS9
C	-19	HIS	-	expression tag	UNP C9QTS9
C	-18	HIS	-	expression tag	UNP C9QTS9
C	-17	HIS	-	expression tag	UNP C9QTS9
C	-16	SER	-	expression tag	UNP C9QTS9
C	-15	SER	-	expression tag	UNP C9QTS9
C	-14	GLY	-	expression tag	UNP C9QTS9
C	-13	VAL	-	expression tag	UNP C9QTS9
C	-12	ASP	-	expression tag	UNP C9QTS9
C	-11	LEU	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-10	GLY	-	expression tag	UNP C9QTS9
C	-9	THR	-	expression tag	UNP C9QTS9
C	-8	GLU	-	expression tag	UNP C9QTS9
C	-7	ASN	-	expression tag	UNP C9QTS9
C	-6	LEU	-	expression tag	UNP C9QTS9
C	-5	TYR	-	expression tag	UNP C9QTS9
C	-4	PHE	-	expression tag	UNP C9QTS9
C	-3	GLN	-	expression tag	UNP C9QTS9
C	-2	SER	-	expression tag	UNP C9QTS9
C	-1	ASN	-	expression tag	UNP C9QTS9
C	0	ALA	-	expression tag	UNP C9QTS9
K	-23	MET	-	expression tag	UNP C9QTS9
K	-22	HIS	-	expression tag	UNP C9QTS9
K	-21	HIS	-	expression tag	UNP C9QTS9
K	-20	HIS	-	expression tag	UNP C9QTS9
K	-19	HIS	-	expression tag	UNP C9QTS9
K	-18	HIS	-	expression tag	UNP C9QTS9
K	-17	HIS	-	expression tag	UNP C9QTS9
K	-16	SER	-	expression tag	UNP C9QTS9
K	-15	SER	-	expression tag	UNP C9QTS9
K	-14	GLY	-	expression tag	UNP C9QTS9
K	-13	VAL	-	expression tag	UNP C9QTS9
K	-12	ASP	-	expression tag	UNP C9QTS9
K	-11	LEU	-	expression tag	UNP C9QTS9
K	-10	GLY	-	expression tag	UNP C9QTS9
K	-9	THR	-	expression tag	UNP C9QTS9
K	-8	GLU	-	expression tag	UNP C9QTS9
K	-7	ASN	-	expression tag	UNP C9QTS9
K	-6	LEU	-	expression tag	UNP C9QTS9
K	-5	TYR	-	expression tag	UNP C9QTS9
K	-4	PHE	-	expression tag	UNP C9QTS9
K	-3	GLN	-	expression tag	UNP C9QTS9
K	-2	SER	-	expression tag	UNP C9QTS9
K	-1	ASN	-	expression tag	UNP C9QTS9
K	0	ALA	-	expression tag	UNP C9QTS9
N	-23	MET	-	expression tag	UNP C9QTS9
N	-22	HIS	-	expression tag	UNP C9QTS9
N	-21	HIS	-	expression tag	UNP C9QTS9
N	-20	HIS	-	expression tag	UNP C9QTS9
N	-19	HIS	-	expression tag	UNP C9QTS9
N	-18	HIS	-	expression tag	UNP C9QTS9
N	-17	HIS	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
N	-16	SER	-	expression tag	UNP C9QTS9
N	-15	SER	-	expression tag	UNP C9QTS9
N	-14	GLY	-	expression tag	UNP C9QTS9
N	-13	VAL	-	expression tag	UNP C9QTS9
N	-12	ASP	-	expression tag	UNP C9QTS9
N	-11	LEU	-	expression tag	UNP C9QTS9
N	-10	GLY	-	expression tag	UNP C9QTS9
N	-9	THR	-	expression tag	UNP C9QTS9
N	-8	GLU	-	expression tag	UNP C9QTS9
N	-7	ASN	-	expression tag	UNP C9QTS9
N	-6	LEU	-	expression tag	UNP C9QTS9
N	-5	TYR	-	expression tag	UNP C9QTS9
N	-4	PHE	-	expression tag	UNP C9QTS9
N	-3	GLN	-	expression tag	UNP C9QTS9
N	-2	SER	-	expression tag	UNP C9QTS9
N	-1	ASN	-	expression tag	UNP C9QTS9
N	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 2 is a protein called Glyceraldehyde-3-phosphate dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	331	Total	C	N	O	S	0	2	0
			2514	1578	437	488	11			
2	L	331	Total	C	N	O	S	0	1	0
			2506	1574	435	486	11			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-23	MET	-	expression tag	UNP C9QTS9
D	-22	HIS	-	expression tag	UNP C9QTS9
D	-21	HIS	-	expression tag	UNP C9QTS9
D	-20	HIS	-	expression tag	UNP C9QTS9
D	-19	HIS	-	expression tag	UNP C9QTS9
D	-18	HIS	-	expression tag	UNP C9QTS9
D	-17	HIS	-	expression tag	UNP C9QTS9
D	-16	SER	-	expression tag	UNP C9QTS9
D	-15	SER	-	expression tag	UNP C9QTS9
D	-14	GLY	-	expression tag	UNP C9QTS9
D	-13	VAL	-	expression tag	UNP C9QTS9
D	-12	ASP	-	expression tag	UNP C9QTS9
D	-11	LEU	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-10	GLY	-	expression tag	UNP C9QTS9
D	-9	THR	-	expression tag	UNP C9QTS9
D	-8	GLU	-	expression tag	UNP C9QTS9
D	-7	ASN	-	expression tag	UNP C9QTS9
D	-6	LEU	-	expression tag	UNP C9QTS9
D	-5	TYR	-	expression tag	UNP C9QTS9
D	-4	PHE	-	expression tag	UNP C9QTS9
D	-3	GLN	-	expression tag	UNP C9QTS9
D	-2	SER	-	expression tag	UNP C9QTS9
D	-1	ASN	-	expression tag	UNP C9QTS9
D	0	ALA	-	expression tag	UNP C9QTS9
L	-23	MET	-	expression tag	UNP C9QTS9
L	-22	HIS	-	expression tag	UNP C9QTS9
L	-21	HIS	-	expression tag	UNP C9QTS9
L	-20	HIS	-	expression tag	UNP C9QTS9
L	-19	HIS	-	expression tag	UNP C9QTS9
L	-18	HIS	-	expression tag	UNP C9QTS9
L	-17	HIS	-	expression tag	UNP C9QTS9
L	-16	SER	-	expression tag	UNP C9QTS9
L	-15	SER	-	expression tag	UNP C9QTS9
L	-14	GLY	-	expression tag	UNP C9QTS9
L	-13	VAL	-	expression tag	UNP C9QTS9
L	-12	ASP	-	expression tag	UNP C9QTS9
L	-11	LEU	-	expression tag	UNP C9QTS9
L	-10	GLY	-	expression tag	UNP C9QTS9
L	-9	THR	-	expression tag	UNP C9QTS9
L	-8	GLU	-	expression tag	UNP C9QTS9
L	-7	ASN	-	expression tag	UNP C9QTS9
L	-6	LEU	-	expression tag	UNP C9QTS9
L	-5	TYR	-	expression tag	UNP C9QTS9
L	-4	PHE	-	expression tag	UNP C9QTS9
L	-3	GLN	-	expression tag	UNP C9QTS9
L	-2	SER	-	expression tag	UNP C9QTS9
L	-1	ASN	-	expression tag	UNP C9QTS9
L	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 3 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	331	2520	1582	434	493	11	0	2	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-23	MET	-	expression tag	UNP C9QTS9
E	-22	HIS	-	expression tag	UNP C9QTS9
E	-21	HIS	-	expression tag	UNP C9QTS9
E	-20	HIS	-	expression tag	UNP C9QTS9
E	-19	HIS	-	expression tag	UNP C9QTS9
E	-18	HIS	-	expression tag	UNP C9QTS9
E	-17	HIS	-	expression tag	UNP C9QTS9
E	-16	SER	-	expression tag	UNP C9QTS9
E	-15	SER	-	expression tag	UNP C9QTS9
E	-14	GLY	-	expression tag	UNP C9QTS9
E	-13	VAL	-	expression tag	UNP C9QTS9
E	-12	ASP	-	expression tag	UNP C9QTS9
E	-11	LEU	-	expression tag	UNP C9QTS9
E	-10	GLY	-	expression tag	UNP C9QTS9
E	-9	THR	-	expression tag	UNP C9QTS9
E	-8	GLU	-	expression tag	UNP C9QTS9
E	-7	ASN	-	expression tag	UNP C9QTS9
E	-6	LEU	-	expression tag	UNP C9QTS9
E	-5	TYR	-	expression tag	UNP C9QTS9
E	-4	PHE	-	expression tag	UNP C9QTS9
E	-3	GLN	-	expression tag	UNP C9QTS9
E	-2	SER	-	expression tag	UNP C9QTS9
E	-1	ASN	-	expression tag	UNP C9QTS9
E	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 4 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	F	331	Total	C	N	O	S	0	3	0
			2531	1588	440	492	11			
4	J	330	Total	C	N	O	S	0	1	0
			2504	1573	434	487	10			
4	O	331	Total	C	N	O	S	0	0	0
			2502	1572	432	487	11			

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-23	MET	-	expression tag	UNP C9QTS9
F	-22	HIS	-	expression tag	UNP C9QTS9
F	-21	HIS	-	expression tag	UNP C9QTS9
F	-20	HIS	-	expression tag	UNP C9QTS9
F	-19	HIS	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-18	HIS	-	expression tag	UNP C9QTS9
F	-17	HIS	-	expression tag	UNP C9QTS9
F	-16	SER	-	expression tag	UNP C9QTS9
F	-15	SER	-	expression tag	UNP C9QTS9
F	-14	GLY	-	expression tag	UNP C9QTS9
F	-13	VAL	-	expression tag	UNP C9QTS9
F	-12	ASP	-	expression tag	UNP C9QTS9
F	-11	LEU	-	expression tag	UNP C9QTS9
F	-10	GLY	-	expression tag	UNP C9QTS9
F	-9	THR	-	expression tag	UNP C9QTS9
F	-8	GLU	-	expression tag	UNP C9QTS9
F	-7	ASN	-	expression tag	UNP C9QTS9
F	-6	LEU	-	expression tag	UNP C9QTS9
F	-5	TYR	-	expression tag	UNP C9QTS9
F	-4	PHE	-	expression tag	UNP C9QTS9
F	-3	GLN	-	expression tag	UNP C9QTS9
F	-2	SER	-	expression tag	UNP C9QTS9
F	-1	ASN	-	expression tag	UNP C9QTS9
F	0	ALA	-	expression tag	UNP C9QTS9
J	-23	MET	-	expression tag	UNP C9QTS9
J	-22	HIS	-	expression tag	UNP C9QTS9
J	-21	HIS	-	expression tag	UNP C9QTS9
J	-20	HIS	-	expression tag	UNP C9QTS9
J	-19	HIS	-	expression tag	UNP C9QTS9
J	-18	HIS	-	expression tag	UNP C9QTS9
J	-17	HIS	-	expression tag	UNP C9QTS9
J	-16	SER	-	expression tag	UNP C9QTS9
J	-15	SER	-	expression tag	UNP C9QTS9
J	-14	GLY	-	expression tag	UNP C9QTS9
J	-13	VAL	-	expression tag	UNP C9QTS9
J	-12	ASP	-	expression tag	UNP C9QTS9
J	-11	LEU	-	expression tag	UNP C9QTS9
J	-10	GLY	-	expression tag	UNP C9QTS9
J	-9	THR	-	expression tag	UNP C9QTS9
J	-8	GLU	-	expression tag	UNP C9QTS9
J	-7	ASN	-	expression tag	UNP C9QTS9
J	-6	LEU	-	expression tag	UNP C9QTS9
J	-5	TYR	-	expression tag	UNP C9QTS9
J	-4	PHE	-	expression tag	UNP C9QTS9
J	-3	GLN	-	expression tag	UNP C9QTS9
J	-2	SER	-	expression tag	UNP C9QTS9
J	-1	ASN	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
J	0	ALA	-	expression tag	UNP C9QTS9
O	-23	MET	-	expression tag	UNP C9QTS9
O	-22	HIS	-	expression tag	UNP C9QTS9
O	-21	HIS	-	expression tag	UNP C9QTS9
O	-20	HIS	-	expression tag	UNP C9QTS9
O	-19	HIS	-	expression tag	UNP C9QTS9
O	-18	HIS	-	expression tag	UNP C9QTS9
O	-17	HIS	-	expression tag	UNP C9QTS9
O	-16	SER	-	expression tag	UNP C9QTS9
O	-15	SER	-	expression tag	UNP C9QTS9
O	-14	GLY	-	expression tag	UNP C9QTS9
O	-13	VAL	-	expression tag	UNP C9QTS9
O	-12	ASP	-	expression tag	UNP C9QTS9
O	-11	LEU	-	expression tag	UNP C9QTS9
O	-10	GLY	-	expression tag	UNP C9QTS9
O	-9	THR	-	expression tag	UNP C9QTS9
O	-8	GLU	-	expression tag	UNP C9QTS9
O	-7	ASN	-	expression tag	UNP C9QTS9
O	-6	LEU	-	expression tag	UNP C9QTS9
O	-5	TYR	-	expression tag	UNP C9QTS9
O	-4	PHE	-	expression tag	UNP C9QTS9
O	-3	GLN	-	expression tag	UNP C9QTS9
O	-2	SER	-	expression tag	UNP C9QTS9
O	-1	ASN	-	expression tag	UNP C9QTS9
O	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 5 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	G	331	2520	1582	437	490	11	0	2	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-23	MET	-	expression tag	UNP C9QTS9
G	-22	HIS	-	expression tag	UNP C9QTS9
G	-21	HIS	-	expression tag	UNP C9QTS9
G	-20	HIS	-	expression tag	UNP C9QTS9
G	-19	HIS	-	expression tag	UNP C9QTS9
G	-18	HIS	-	expression tag	UNP C9QTS9
G	-17	HIS	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-16	SER	-	expression tag	UNP C9QTS9
G	-15	SER	-	expression tag	UNP C9QTS9
G	-14	GLY	-	expression tag	UNP C9QTS9
G	-13	VAL	-	expression tag	UNP C9QTS9
G	-12	ASP	-	expression tag	UNP C9QTS9
G	-11	LEU	-	expression tag	UNP C9QTS9
G	-10	GLY	-	expression tag	UNP C9QTS9
G	-9	THR	-	expression tag	UNP C9QTS9
G	-8	GLU	-	expression tag	UNP C9QTS9
G	-7	ASN	-	expression tag	UNP C9QTS9
G	-6	LEU	-	expression tag	UNP C9QTS9
G	-5	TYR	-	expression tag	UNP C9QTS9
G	-4	PHE	-	expression tag	UNP C9QTS9
G	-3	GLN	-	expression tag	UNP C9QTS9
G	-2	SER	-	expression tag	UNP C9QTS9
G	-1	ASN	-	expression tag	UNP C9QTS9
G	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 6 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	H	331	2505	1574	432	488	11	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-23	MET	-	expression tag	UNP C9QTS9
H	-22	HIS	-	expression tag	UNP C9QTS9
H	-21	HIS	-	expression tag	UNP C9QTS9
H	-20	HIS	-	expression tag	UNP C9QTS9
H	-19	HIS	-	expression tag	UNP C9QTS9
H	-18	HIS	-	expression tag	UNP C9QTS9
H	-17	HIS	-	expression tag	UNP C9QTS9
H	-16	SER	-	expression tag	UNP C9QTS9
H	-15	SER	-	expression tag	UNP C9QTS9
H	-14	GLY	-	expression tag	UNP C9QTS9
H	-13	VAL	-	expression tag	UNP C9QTS9
H	-12	ASP	-	expression tag	UNP C9QTS9
H	-11	LEU	-	expression tag	UNP C9QTS9
H	-10	GLY	-	expression tag	UNP C9QTS9
H	-9	THR	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
H	-8	GLU	-	expression tag	UNP C9QTS9
H	-7	ASN	-	expression tag	UNP C9QTS9
H	-6	LEU	-	expression tag	UNP C9QTS9
H	-5	TYR	-	expression tag	UNP C9QTS9
H	-4	PHE	-	expression tag	UNP C9QTS9
H	-3	GLN	-	expression tag	UNP C9QTS9
H	-2	SER	-	expression tag	UNP C9QTS9
H	-1	ASN	-	expression tag	UNP C9QTS9
H	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 7 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
7	I	330	2507	1575	434	488	10	0	1	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	-23	MET	-	expression tag	UNP C9QTS9
I	-22	HIS	-	expression tag	UNP C9QTS9
I	-21	HIS	-	expression tag	UNP C9QTS9
I	-20	HIS	-	expression tag	UNP C9QTS9
I	-19	HIS	-	expression tag	UNP C9QTS9
I	-18	HIS	-	expression tag	UNP C9QTS9
I	-17	HIS	-	expression tag	UNP C9QTS9
I	-16	SER	-	expression tag	UNP C9QTS9
I	-15	SER	-	expression tag	UNP C9QTS9
I	-14	GLY	-	expression tag	UNP C9QTS9
I	-13	VAL	-	expression tag	UNP C9QTS9
I	-12	ASP	-	expression tag	UNP C9QTS9
I	-11	LEU	-	expression tag	UNP C9QTS9
I	-10	GLY	-	expression tag	UNP C9QTS9
I	-9	THR	-	expression tag	UNP C9QTS9
I	-8	GLU	-	expression tag	UNP C9QTS9
I	-7	ASN	-	expression tag	UNP C9QTS9
I	-6	LEU	-	expression tag	UNP C9QTS9
I	-5	TYR	-	expression tag	UNP C9QTS9
I	-4	PHE	-	expression tag	UNP C9QTS9
I	-3	GLN	-	expression tag	UNP C9QTS9
I	-2	SER	-	expression tag	UNP C9QTS9
I	-1	ASN	-	expression tag	UNP C9QTS9

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Chain	Residue	Modelled	Actual	Comment	Reference
I	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 8 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
8	M	331	2508	1575	433	489	11	0	1	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	-23	MET	-	expression tag	UNP C9QTS9
M	-22	HIS	-	expression tag	UNP C9QTS9
M	-21	HIS	-	expression tag	UNP C9QTS9
M	-20	HIS	-	expression tag	UNP C9QTS9
M	-19	HIS	-	expression tag	UNP C9QTS9
M	-18	HIS	-	expression tag	UNP C9QTS9
M	-17	HIS	-	expression tag	UNP C9QTS9
M	-16	SER	-	expression tag	UNP C9QTS9
M	-15	SER	-	expression tag	UNP C9QTS9
M	-14	GLY	-	expression tag	UNP C9QTS9
M	-13	VAL	-	expression tag	UNP C9QTS9
M	-12	ASP	-	expression tag	UNP C9QTS9
M	-11	LEU	-	expression tag	UNP C9QTS9
M	-10	GLY	-	expression tag	UNP C9QTS9
M	-9	THR	-	expression tag	UNP C9QTS9
M	-8	GLU	-	expression tag	UNP C9QTS9
M	-7	ASN	-	expression tag	UNP C9QTS9
M	-6	LEU	-	expression tag	UNP C9QTS9
M	-5	TYR	-	expression tag	UNP C9QTS9
M	-4	PHE	-	expression tag	UNP C9QTS9
M	-3	GLN	-	expression tag	UNP C9QTS9
M	-2	SER	-	expression tag	UNP C9QTS9
M	-1	ASN	-	expression tag	UNP C9QTS9
M	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 9 is a protein called Glyceraldehyde-3-phosphate Dehydrogenase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
9	P	330	2507	1575	434	488	10	0	1	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
P	-23	MET	-	expression tag	UNP C9QTS9
P	-22	HIS	-	expression tag	UNP C9QTS9
P	-21	HIS	-	expression tag	UNP C9QTS9
P	-20	HIS	-	expression tag	UNP C9QTS9
P	-19	HIS	-	expression tag	UNP C9QTS9
P	-18	HIS	-	expression tag	UNP C9QTS9
P	-17	HIS	-	expression tag	UNP C9QTS9
P	-16	SER	-	expression tag	UNP C9QTS9
P	-15	SER	-	expression tag	UNP C9QTS9
P	-14	GLY	-	expression tag	UNP C9QTS9
P	-13	VAL	-	expression tag	UNP C9QTS9
P	-12	ASP	-	expression tag	UNP C9QTS9
P	-11	LEU	-	expression tag	UNP C9QTS9
P	-10	GLY	-	expression tag	UNP C9QTS9
P	-9	THR	-	expression tag	UNP C9QTS9
P	-8	GLU	-	expression tag	UNP C9QTS9
P	-7	ASN	-	expression tag	UNP C9QTS9
P	-6	LEU	-	expression tag	UNP C9QTS9
P	-5	TYR	-	expression tag	UNP C9QTS9
P	-4	PHE	-	expression tag	UNP C9QTS9
P	-3	GLN	-	expression tag	UNP C9QTS9
P	-2	SER	-	expression tag	UNP C9QTS9
P	-1	ASN	-	expression tag	UNP C9QTS9
P	0	ALA	-	expression tag	UNP C9QTS9

- Molecule 10 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	1	Total Na 1 1	0	0
10	B	2	Total Na 2 2	0	0
10	C	1	Total Na 1 1	0	0
10	D	1	Total Na 1 1	0	0
10	E	1	Total Na 1 1	0	0
10	G	1	Total Na 1 1	0	0
10	H	1	Total Na 1 1	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	I	1	Total 1	Na 1	0	0
10	K	1	Total 1	Na 1	0	0
10	M	1	Total 1	Na 1	0	0
10	N	1	Total 1	Na 1	0	0

- Molecule 11 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

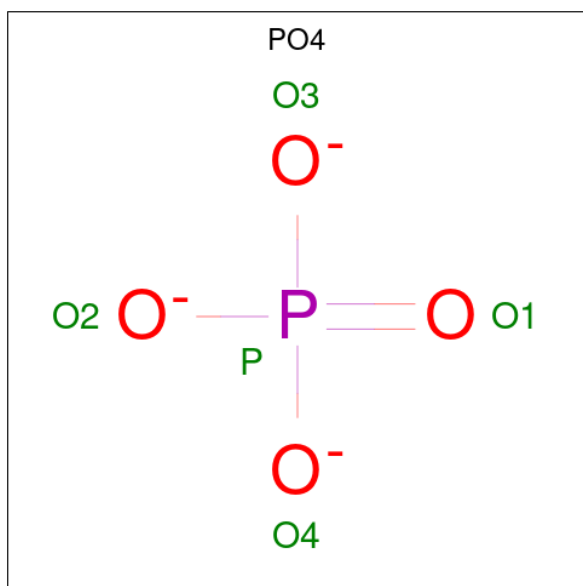
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	4	Total 4	Cl 4	0	0
11	B	6	Total 6	Cl 6	0	0
11	C	5	Total 5	Cl 5	0	0
11	D	5	Total 5	Cl 5	0	0
11	E	5	Total 5	Cl 5	0	0
11	F	1	Total 1	Cl 1	0	0
11	G	4	Total 4	Cl 4	0	0
11	H	1	Total 1	Cl 1	0	0
11	I	2	Total 2	Cl 2	0	0
11	J	2	Total 2	Cl 2	0	0
11	K	6	Total 6	Cl 6	0	0
11	L	1	Total 1	Cl 1	0	0
11	M	2	Total 2	Cl 2	0	0
11	N	1	Total 1	Cl 1	0	0
11	O	2	Total 2	Cl 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	P	2	Total Cl 2 2	0	0

- Molecule 12 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



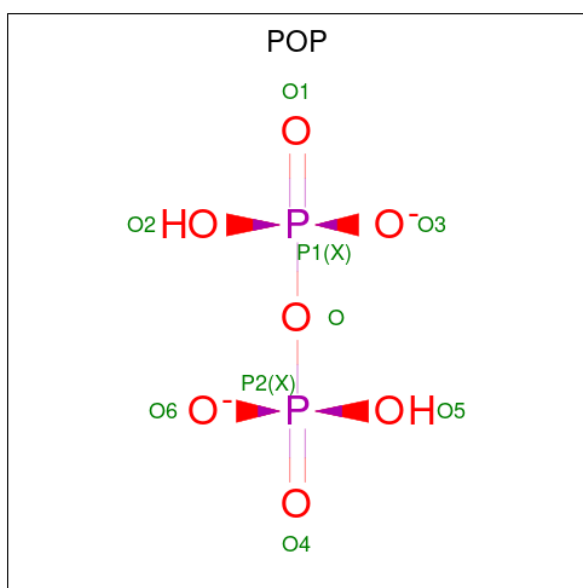
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total O P 5 4 1	0	0
12	A	1	Total O P 5 4 1	0	0
12	A	1	Total O P 5 4 1	0	0
12	B	1	Total O P 5 4 1	0	0
12	D	1	Total O P 5 4 1	0	0
12	D	1	Total O P 5 4 1	0	0
12	E	1	Total O P 5 4 1	0	0
12	F	1	Total O P 5 4 1	0	0
12	H	1	Total O P 5 4 1	0	0
12	I	1	Total O P 5 4 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	J	1	Total	O	P	0	0
			5	4	1		
12	J	1	Total	O	P	0	0
			5	4	1		
12	L	1	Total	O	P	0	0
			5	4	1		
12	P	1	Total	O	P	0	0
			5	4	1		
12	P	1	Total	O	P	0	0
			5	4	1		

- Molecule 13 is PYROPHOSPHATE 2- (three-letter code: POP) (formula:  $\text{H}_2\text{O}_7\text{P}_2$ ).



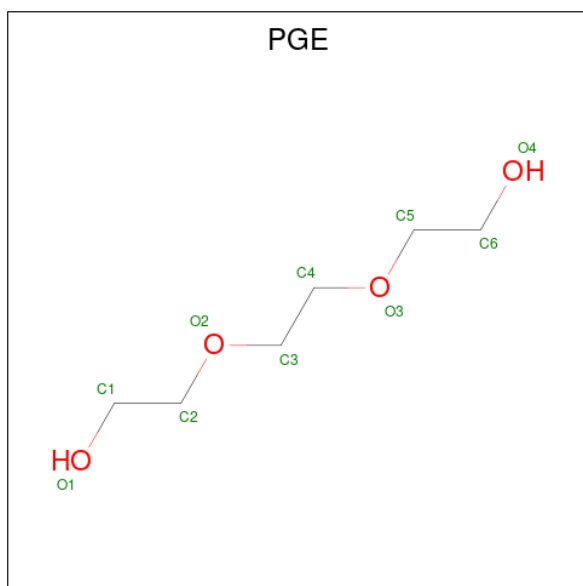
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
13	A	1	Total	O	P	0	0
			9	7	2		
13	B	1	Total	O	P	0	0
			9	7	2		
13	F	1	Total	O	P	0	0
			9	7	2		
13	G	1	Total	O	P	0	0
			9	7	2		
13	J	1	Total	O	P	0	0
			9	7	2		
13	M	1	Total	O	P	0	0
			9	7	2		





Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
15	H	1	Total	C	O	0	0
			4	2	2		

- Molecule 16 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>).



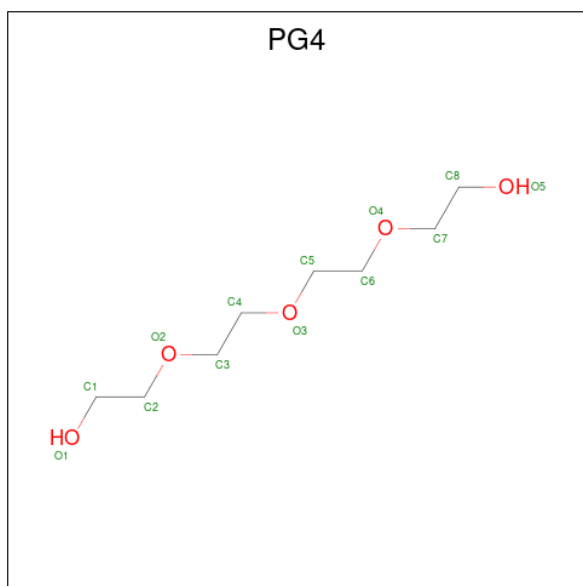
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
16	H	1	Total	C	O	0	0
			10	6	4		

- Molecule 17 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



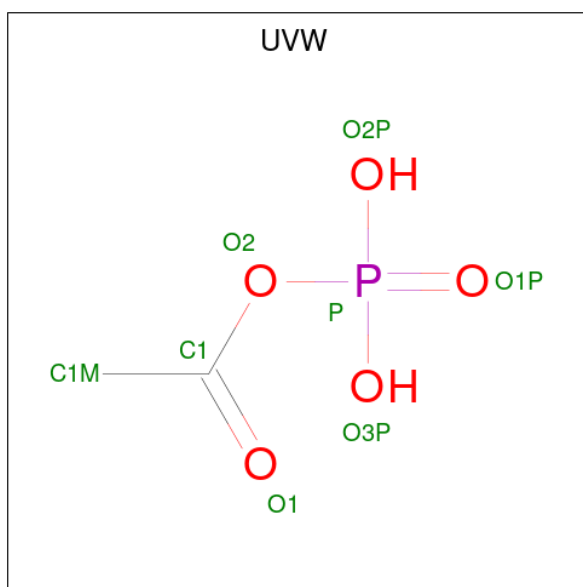
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
17	H	1	Total	C	O	0	0
			7	4	3		

- Molecule 18 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula:  $C_8H_{18}O_5$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
18	J	1	Total	C	O	0	0
			13	8	5		

- Molecule 19 is ACETYLPHOSPHATE (three-letter code: UVW) (formula:  $C_2H_5O_5P$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
19	M	1	8	2	5	1	0	0

- Molecule 20 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
20	A	39	Total	O	0	0
			39	39		
20	B	35	Total	O	0	3
			38	38		
20	C	61	Total	O	0	0
			61	61		
20	D	37	Total	O	0	1
			38	38		
20	E	23	Total	O	0	0
			23	23		
20	F	27	Total	O	0	0
			27	27		
20	G	33	Total	O	0	2
			35	35		
20	H	21	Total	O	0	1
			22	22		
20	I	22	Total	O	0	1
			23	23		
20	J	28	Total	O	0	0
			28	28		
20	K	26	Total	O	0	0
			26	26		

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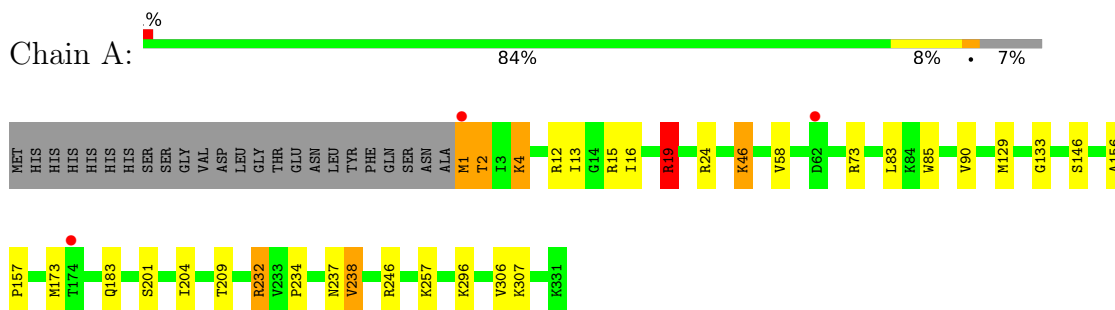
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
20	L	20	Total O 20 20	0	0
20	M	24	Total O 24 24	0	0
20	N	11	Total O 11 11	0	0
20	O	20	Total O 20 20	0	0
20	P	16	Total O 16 16	0	0



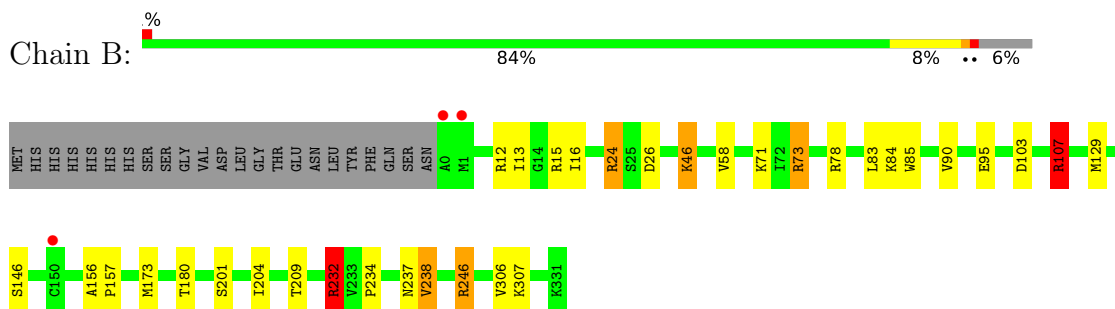
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

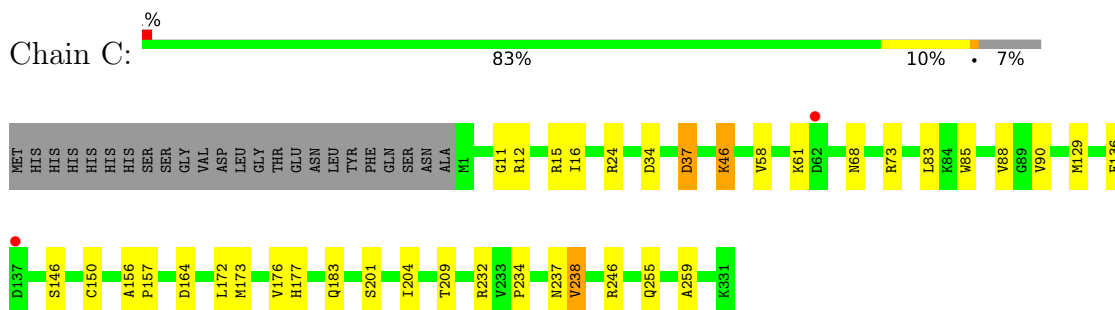
- Molecule 1: Glyceraldehyde-3-phosphate dehydrogenase A



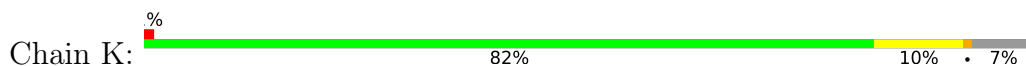
- Molecule 1: Glyceraldehyde-3-phosphate dehydrogenase A

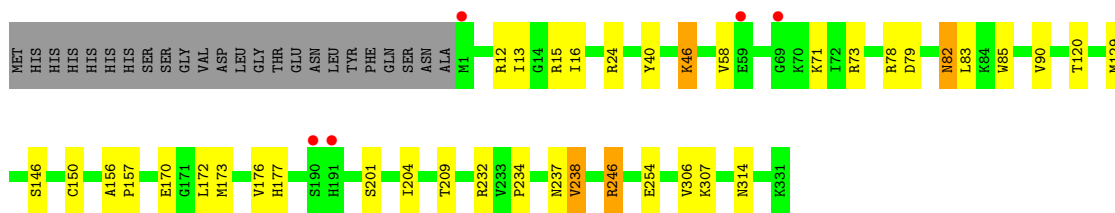


- Molecule 1: Glyceraldehyde-3-phosphate dehydrogenase A

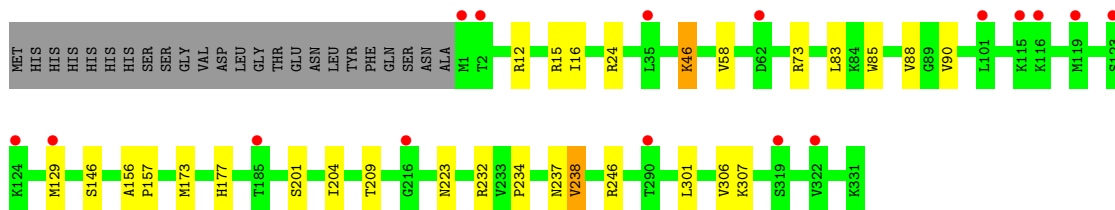
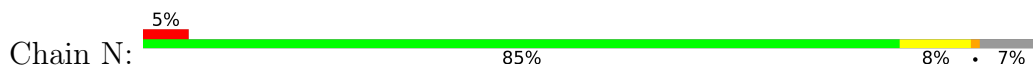


- Molecule 1: Glyceraldehyde-3-phosphate dehydrogenase A

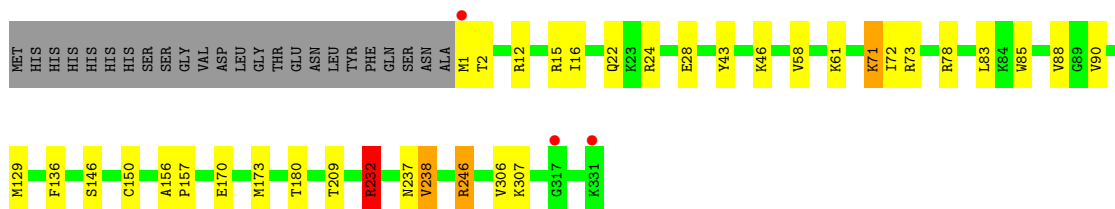
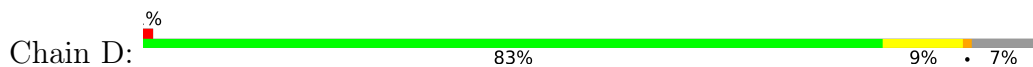




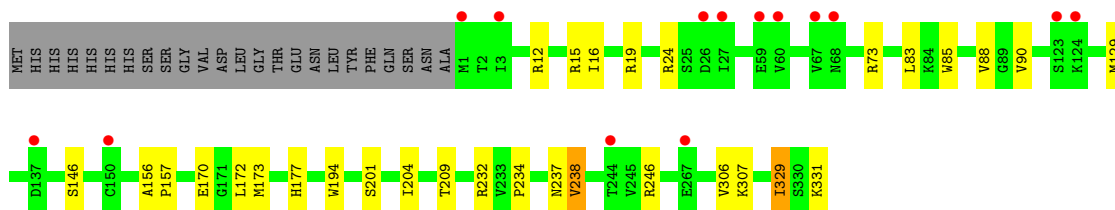
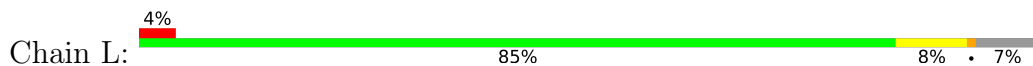
• Molecule 1: Glyceraldehyde-3-phosphate dehydrogenase A



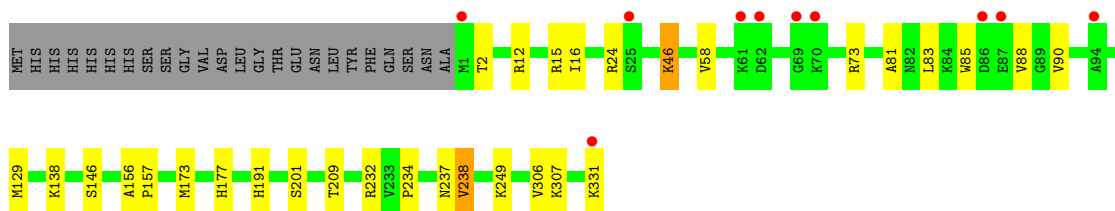
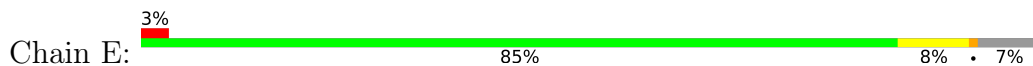
• Molecule 2: Glyceraldehyde-3-phosphate dehydrogenase A



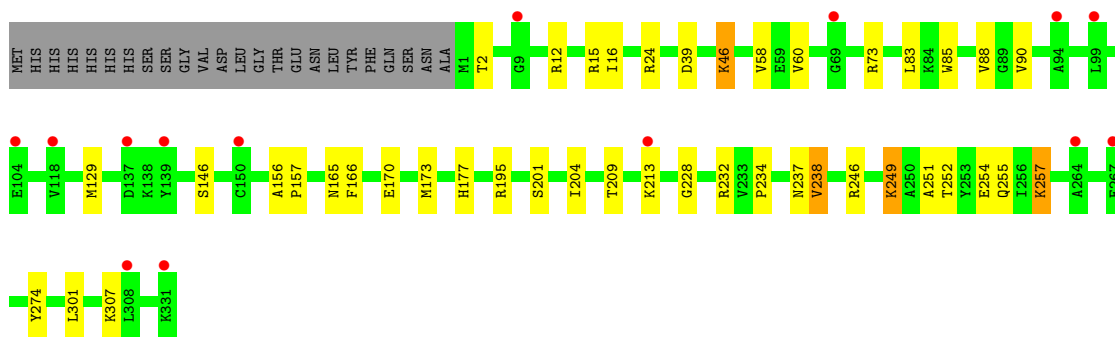
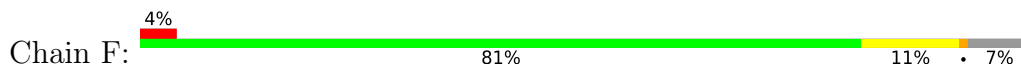
• Molecule 2: Glyceraldehyde-3-phosphate dehydrogenase A



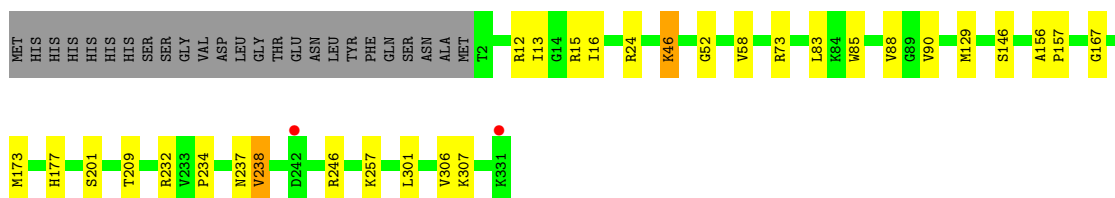
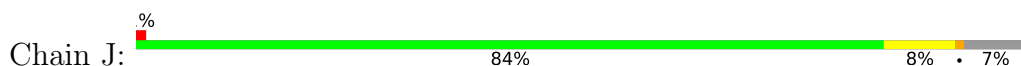
• Molecule 3: Glyceraldehyde-3-phosphate Dehydrogenase A



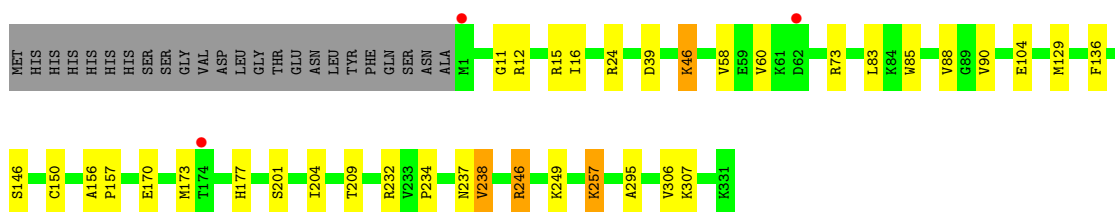
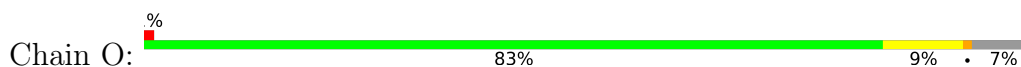
• Molecule 4: Glyceraldehyde-3-phosphate Dehydrogenase A



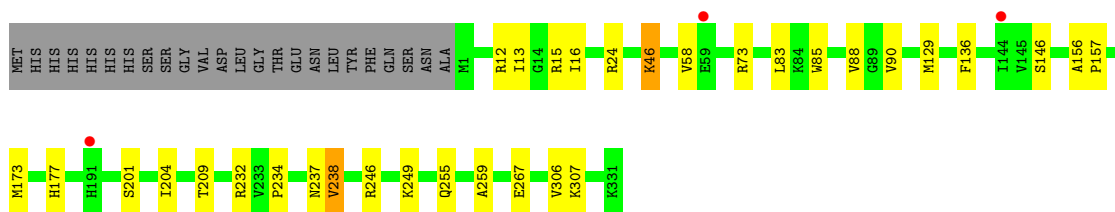
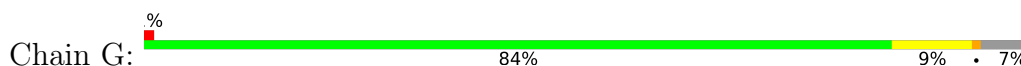
• Molecule 4: Glyceraldehyde-3-phosphate Dehydrogenase A



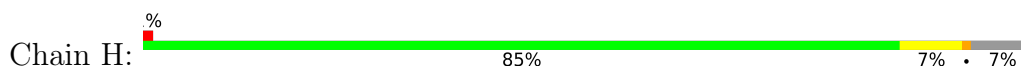
• Molecule 4: Glyceraldehyde-3-phosphate Dehydrogenase A

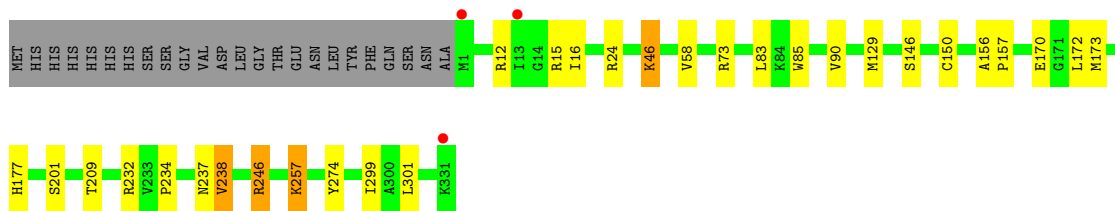


• Molecule 5: Glyceraldehyde-3-phosphate Dehydrogenase A

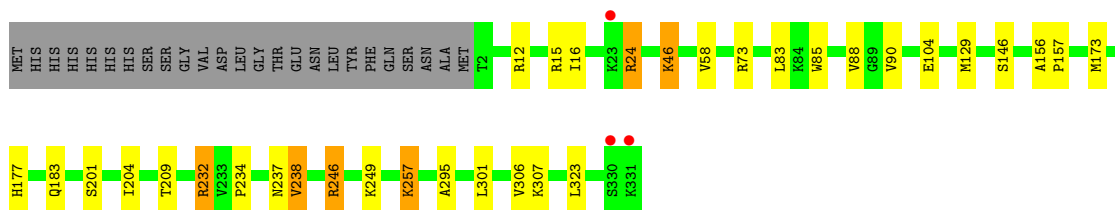
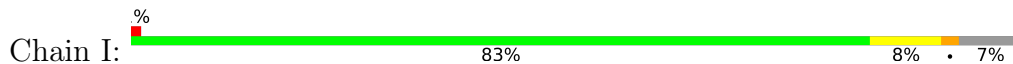


• Molecule 6: Glyceraldehyde-3-phosphate Dehydrogenase A

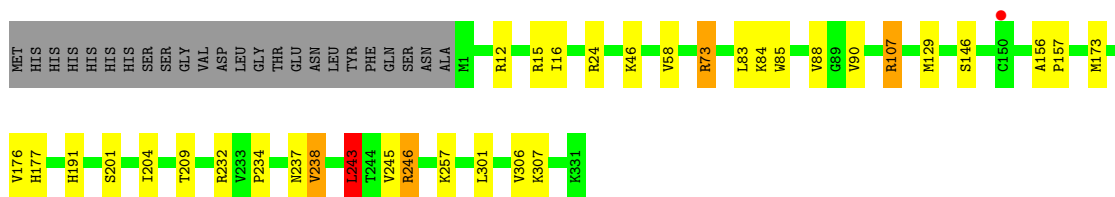
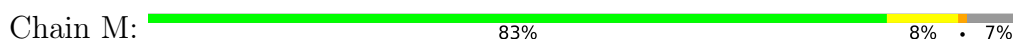




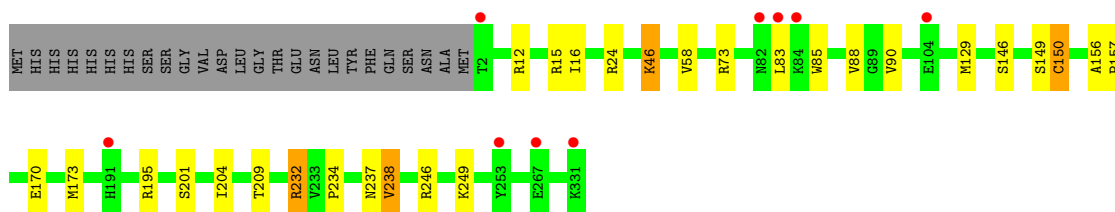
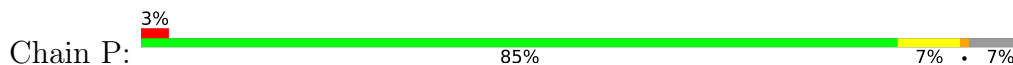
• Molecule 7: Glyceraldehyde-3-phosphate Dehydrogenase A



• Molecule 8: Glyceraldehyde-3-phosphate Dehydrogenase A



• Molecule 9: Glyceraldehyde-3-phosphate Dehydrogenase A



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	145.88Å 69.69Å 271.92Å 90.00° 98.80° 90.00°	Depositor
Resolution (Å)	29.91 – 2.85 29.91 – 2.85	Depositor EDS
% Data completeness (in resolution range)	99.8 (29.91-2.85) 99.9 (29.91-2.85)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.21 (at 2.85Å)	Xtrriage
Refinement program	REFMAC 5.8.0046	Depositor
R, $R_{free}$	0.186 , 0.224 0.183 , 0.221	Depositor DCC
$R_{free}$ test set	6389 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	64.0	Xtrriage
Anisotropy	0.258	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 56.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	41155	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	74.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.16% 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: UVW, PO4, PEG, NA, SCY, PG4, CL, PGE, ALY, POP, NAD, ACT

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z  > 5$	RMSZ	# $ Z  > 5$
1	A	0.69	2/2536 (0.1%)	1.90	18/3432 (0.5%)
1	B	0.73	2/2541 (0.1%)	1.70	19/3439 (0.6%)
1	C	0.71	0/2525	0.91	9/3417 (0.3%)
1	K	0.67	3/2536 (0.1%)	1.57	12/3432 (0.3%)
1	N	0.52	0/2536	0.87	9/3432 (0.3%)
2	D	0.68	2/2554 (0.1%)	1.33	17/3457 (0.5%)
2	L	0.57	0/2546	0.91	10/3446 (0.3%)
3	E	0.64	0/2533	0.91	9/3427 (0.3%)
4	F	0.58	0/2545	0.89	7/3443 (0.2%)
4	J	0.59	0/2518	0.89	6/3408 (0.2%)
4	O	0.57	0/2515	0.89	8/3403 (0.2%)
5	G	0.59	0/2537	0.88	8/3432 (0.2%)
6	H	0.59	0/2508	0.89	7/3392 (0.2%)
7	I	0.59	0/2508	1.02	10/3394 (0.3%)
8	M	0.64	0/2534	1.44	14/3429 (0.4%)
9	P	0.55	0/2511	0.97	14/3397 (0.4%)
All	All	0.62	9/40483 (0.0%)	1.17	177/54780 (0.3%)

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	A	0	1

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	24	ARG	CZ-NH1	-8.54	1.22	1.33
1	K	24	ARG	CD-NE	-7.65	1.33	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	107	ARG	CZ-NH1	-6.57	1.24	1.33
1	A	19	ARG	CD-NE	-6.46	1.35	1.46
1	K	24	ARG	CZ-NH2	6.18	1.41	1.33
2	D	28	GLU	CD-OE2	-5.84	1.19	1.25
1	B	15	ARG	CZ-NH1	-5.81	1.25	1.33
1	A	15	ARG	CZ-NH1	-5.41	1.26	1.33
2	D	15	ARG	CZ-NH1	-5.07	1.26	1.33

All (177) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	19	ARG	NE-CZ-NH1	-56.88	91.86	120.30
1	K	24	ARG	NE-CZ-NH1	-56.64	91.98	120.30
1	K	24	ARG	NE-CZ-NH2	49.91	145.26	120.30
1	A	19	ARG	NE-CZ-NH2	48.79	144.69	120.30
1	B	15	ARG	NE-CZ-NH1	-39.45	100.57	120.30
1	A	15	ARG	NE-CZ-NH1	-39.20	100.70	120.30
2	D	15	ARG	NE-CZ-NH1	-38.98	100.81	120.30
8	M	15	ARG	NE-CZ-NH1	-38.97	100.82	120.30
1	A	15	ARG	NE-CZ-NH2	37.60	139.10	120.30
1	B	15	ARG	NE-CZ-NH2	37.17	138.89	120.30
2	D	15	ARG	NE-CZ-NH2	36.76	138.68	120.30
8	M	15	ARG	NE-CZ-NH2	36.17	138.39	120.30
1	B	107	ARG	NE-CZ-NH1	-34.56	103.02	120.30
1	B	107	ARG	NE-CZ-NH2	29.64	135.12	120.30
1	B	73	ARG	NE-CZ-NH1	-28.29	106.15	120.30
8	M	73	ARG	NE-CZ-NH1	-27.28	106.66	120.30
8	M	73	ARG	NE-CZ-NH2	23.87	132.24	120.30
1	B	73	ARG	NE-CZ-NH2	23.49	132.04	120.30
7	I	246	ARG	NE-CZ-NH2	21.56	131.08	120.30
1	A	19	ARG	CD-NE-CZ	20.49	152.29	123.60
7	I	246	ARG	NE-CZ-NH1	-18.52	111.04	120.30
1	A	232	ARG	NE-CZ-NH1	-16.67	111.97	120.30
1	A	19	ARG	CG-CD-NE	16.15	145.72	111.80
9	P	232	ARG	NE-CZ-NH1	-15.87	112.36	120.30
2	D	232	ARG	NE-CZ-NH1	-15.56	112.52	120.30
8	M	73	ARG	CG-CD-NE	15.26	143.84	111.80
1	B	73	ARG	CG-CD-NE	15.06	143.42	111.80
1	B	232	ARG	NE-CZ-NH1	-14.87	112.87	120.30
4	J	15	ARG	NE-CZ-NH1	12.95	126.78	120.30
9	P	15	ARG	NE-CZ-NH1	12.42	126.51	120.30
4	F	15	ARG	NE-CZ-NH1	12.24	126.42	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	H	15	ARG	NE-CZ-NH1	12.06	126.33	120.30
1	K	24	ARG	CD-NE-CZ	12.01	140.42	123.60
7	I	15	ARG	NE-CZ-NH1	11.84	126.22	120.30
2	L	15	ARG	NE-CZ-NH1	11.84	126.22	120.30
1	N	15	ARG	NE-CZ-NH1	11.68	126.14	120.30
1	C	15	ARG	NE-CZ-NH1	11.44	126.02	120.30
1	A	232	ARG	NE-CZ-NH2	11.39	126.00	120.30
1	K	15	ARG	NE-CZ-NH1	11.36	125.98	120.30
4	O	15	ARG	NE-CZ-NH1	11.26	125.93	120.30
5	G	15	ARG	NE-CZ-NH1	11.23	125.91	120.30
3	E	15	ARG	NE-CZ-NH1	11.18	125.89	120.30
2	D	232	ARG	NE-CZ-NH2	11.16	125.88	120.30
1	A	15	ARG	CD-NE-CZ	11.10	139.14	123.60
1	B	73	ARG	CD-NE-CZ	11.09	139.12	123.60
1	B	15	ARG	CD-NE-CZ	11.03	139.05	123.60
1	B	232	ARG	NE-CZ-NH2	10.99	125.80	120.30
9	P	232	ARG	NE-CZ-NH2	10.96	125.78	120.30
2	D	15	ARG	CD-NE-CZ	10.81	138.74	123.60
8	M	15	ARG	CD-NE-CZ	10.71	138.59	123.60
9	P	15	ARG	NE-CZ-NH2	-10.69	114.96	120.30
8	M	73	ARG	CD-NE-CZ	10.53	138.34	123.60
9	P	195	ARG	NE-CZ-NH1	-10.40	115.10	120.30
6	H	15	ARG	NE-CZ-NH2	-10.20	115.20	120.30
2	L	329	ILE	CA-CB-CG1	10.09	130.17	111.00
4	F	15	ARG	NE-CZ-NH2	-10.04	115.28	120.30
7	I	246	ARG	CG-CD-NE	10.04	132.89	111.80
1	B	24	ARG	NE-CZ-NH1	-9.95	115.32	120.30
1	B	24	ARG	NE-CZ-NH2	9.94	125.27	120.30
1	K	15	ARG	NE-CZ-NH2	-9.93	115.33	120.30
1	N	15	ARG	NE-CZ-NH2	-9.88	115.36	120.30
4	J	15	ARG	NE-CZ-NH2	-9.88	115.36	120.30
4	O	15	ARG	NE-CZ-NH2	-9.83	115.39	120.30
5	G	15	ARG	NE-CZ-NH2	-9.80	115.40	120.30
3	E	15	ARG	NE-CZ-NH2	-9.80	115.40	120.30
7	I	15	ARG	NE-CZ-NH2	-9.79	115.41	120.30
2	L	15	ARG	NE-CZ-NH2	-9.70	115.45	120.30
7	I	246	ARG	CD-NE-CZ	9.55	136.97	123.60
1	C	15	ARG	NE-CZ-NH2	-9.50	115.55	120.30
2	L	329	ILE	CG1-CB-CG2	-9.26	91.02	111.40
1	B	71	LYS	CD-CE-NZ	8.63	131.54	111.70
1	A	73	ARG	NE-CZ-NH1	8.61	124.61	120.30
3	E	73	ARG	NE-CZ-NH1	7.91	124.25	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	N	73	ARG	NE-CZ-NH1	7.89	124.25	120.30
6	H	73	ARG	NE-CZ-NH1	7.88	124.24	120.30
2	D	73	ARG	NE-CZ-NH1	7.80	124.20	120.30
8	M	15	ARG	CG-CD-NE	-7.79	95.45	111.80
1	B	15	ARG	CG-CD-NE	-7.74	95.56	111.80
1	A	232	ARG	CD-NE-CZ	7.70	134.38	123.60
4	O	73	ARG	NE-CZ-NH1	7.69	124.14	120.30
4	J	73	ARG	NE-CZ-NH1	7.65	124.12	120.30
9	P	232	ARG	CD-NE-CZ	7.64	134.30	123.60
9	P	195	ARG	NE-CZ-NH2	7.48	124.04	120.30
4	F	73	ARG	NE-CZ-NH1	7.45	124.03	120.30
9	P	73	ARG	NE-CZ-NH1	7.33	123.97	120.30
1	C	73	ARG	NE-CZ-NH1	7.16	123.88	120.30
2	L	73	ARG	NE-CZ-NH1	7.10	123.85	120.30
5	G	73	ARG	NE-CZ-NH1	7.09	123.84	120.30
1	K	73	ARG	NE-CZ-NH1	6.94	123.77	120.30
1	C	24	ARG	NE-CZ-NH2	-6.88	116.86	120.30
1	A	73	ARG	NE-CZ-NH2	-6.84	116.88	120.30
2	L	329	ILE	CB-CG1-CD1	6.65	132.53	113.90
2	D	28	GLU	CA-CB-CG	6.65	128.03	113.40
7	I	73	ARG	NE-CZ-NH1	6.58	123.59	120.30
5	G	24	ARG	NE-CZ-NH2	-6.52	117.04	120.30
8	M	243	LEU	CA-CB-CG	6.50	130.24	115.30
2	D	61	LYS	CD-CE-NZ	-6.42	96.93	111.70
1	C	73	ARG	NE-CZ-NH2	-6.42	117.09	120.30
1	C	24	ARG	NE-CZ-NH1	6.41	123.50	120.30
2	D	24	ARG	NE-CZ-NH2	-6.38	117.11	120.30
8	M	24	ARG	NE-CZ-NH2	-6.25	117.17	120.30
2	D	78	ARG	NE-CZ-NH1	6.22	123.41	120.30
4	F	24	ARG	NE-CZ-NH2	-6.22	117.19	120.30
6	H	73	ARG	NE-CZ-NH2	-6.15	117.23	120.30
2	D	73	ARG	NE-CZ-NH2	-6.14	117.23	120.30
4	F	73	ARG	NE-CZ-NH2	-6.14	117.23	120.30
4	O	73	ARG	NE-CZ-NH2	-6.03	117.29	120.30
1	N	24	ARG	NE-CZ-NH2	-5.97	117.31	120.30
9	P	24	ARG	NE-CZ-NH2	-5.95	117.32	120.30
3	E	24	ARG	NE-CZ-NH2	-5.94	117.33	120.30
5	G	73	ARG	NE-CZ-NH2	-5.92	117.34	120.30
1	A	15	ARG	CG-CD-NE	-5.92	99.37	111.80
2	D	15	ARG	CG-CD-NE	-5.91	99.40	111.80
4	O	24	ARG	NE-CZ-NH2	-5.89	117.35	120.30
1	N	73	ARG	NE-CZ-NH2	-5.86	117.37	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	O	24	ARG	NE-CZ-NH1	5.83	123.22	120.30
4	J	24	ARG	NE-CZ-NH2	-5.81	117.39	120.30
6	H	246	ARG	NE-CZ-NH2	-5.75	117.43	120.30
4	J	73	ARG	NE-CZ-NH2	-5.72	117.44	120.30
7	I	204	ILE	N-CA-C	-5.68	95.67	111.00
3	E	331	LYS	CG-CD-CE	5.67	128.90	111.90
9	P	73	ARG	NE-CZ-NH2	-5.65	117.47	120.30
9	P	204	ILE	N-CA-C	-5.64	95.76	111.00
5	G	24	ARG	NE-CZ-NH1	5.64	123.12	120.30
1	K	246	ARG	NE-CZ-NH1	5.63	123.12	120.30
2	D	246	ARG	CG-CD-NE	5.63	123.63	111.80
3	E	73	ARG	NE-CZ-NH2	-5.63	117.49	120.30
1	A	246	ARG	NE-CZ-NH2	-5.62	117.49	120.30
2	L	73	ARG	NE-CZ-NH2	-5.61	117.49	120.30
2	L	24	ARG	NE-CZ-NH2	-5.61	117.49	120.30
2	L	246	ARG	NE-CZ-NH2	-5.56	117.52	120.30
1	B	107	ARG	CD-NE-CZ	5.56	131.38	123.60
1	B	204	ILE	N-CA-C	-5.55	96.02	111.00
3	E	331	LYS	CD-CE-NZ	5.54	124.43	111.70
1	B	232	ARG	CD-NE-CZ	5.51	131.32	123.60
8	M	246	ARG	CG-CD-NE	5.51	123.38	111.80
6	H	24	ARG	NE-CZ-NH2	-5.51	117.55	120.30
1	A	24	ARG	NE-CZ-NH2	-5.47	117.56	120.30
7	I	232	ARG	NE-CZ-NH2	-5.47	117.57	120.30
8	M	204	ILE	N-CA-C	-5.43	96.33	111.00
5	G	204	ILE	N-CA-C	-5.42	96.36	111.00
5	G	246	ARG	NE-CZ-NH2	-5.41	117.59	120.30
2	D	71	LYS	CA-CB-CG	-5.40	101.52	113.40
1	N	246	ARG	NE-CZ-NH2	-5.40	117.60	120.30
8	M	24	ARG	NE-CZ-NH1	5.37	122.98	120.30
1	C	176	VAL	N-CA-C	-5.35	96.57	111.00
1	K	78	ARG	NE-CZ-NH1	5.33	122.97	120.30
9	P	195	ARG	CB-CG-CD	-5.33	97.74	111.60
1	N	246	ARG	NE-CZ-NH1	5.32	122.96	120.30
1	N	204	ILE	N-CA-C	-5.31	96.66	111.00
6	H	246	ARG	NE-CZ-NH1	5.29	122.94	120.30
4	J	246	ARG	NE-CZ-NH2	-5.24	117.68	120.30
1	K	204	ILE	N-CA-C	-5.24	96.85	111.00
2	D	78	ARG	NE-CZ-NH2	-5.24	117.68	120.30
1	A	204	ILE	N-CA-C	-5.22	96.90	111.00
4	O	204	ILE	N-CA-C	-5.21	96.92	111.00
4	F	24	ARG	NE-CZ-NH1	5.21	122.91	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	246	ARG	NE-CZ-NH2	-5.21	117.70	120.30
8	M	176	VAL	N-CA-C	-5.20	96.95	111.00
1	A	24	ARG	NE-CZ-NH1	5.18	122.89	120.30
2	L	204	ILE	N-CA-C	-5.18	97.02	111.00
1	C	204	ILE	N-CA-C	-5.16	97.06	111.00
1	A	246	ARG	NE-CZ-NH1	5.15	122.88	120.30
1	B	246	ARG	CG-CD-NE	5.15	122.62	111.80
3	E	138	LYS	CB-CG-CD	5.15	124.99	111.60
2	D	232	ARG	CD-NE-CZ	5.13	130.79	123.60
1	C	246	ARG	NE-CZ-NH1	5.12	122.86	120.30
9	P	246	ARG	NE-CZ-NH1	5.11	122.86	120.30
1	N	24	ARG	NE-CZ-NH1	5.11	122.86	120.30
7	I	24	ARG	CG-CD-NE	-5.11	101.07	111.80
9	P	246	ARG	NE-CZ-NH2	-5.11	117.75	120.30
4	F	204	ILE	N-CA-C	-5.10	97.23	111.00
2	D	24	ARG	NE-CZ-NH1	5.07	122.84	120.30
3	E	24	ARG	NE-CZ-NH1	5.07	122.83	120.30
4	O	246	ARG	NE-CZ-NH1	5.02	122.81	120.30
1	K	73	ARG	NE-CZ-NH2	-5.01	117.79	120.30
1	K	176	VAL	N-CA-C	-5.00	97.49	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	19	ARG	Sidechain

## 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	2509	0	2522	20	0
1	B	2514	0	2527	21	0
1	C	2499	0	2516	24	0
1	K	2509	0	2522	25	0
1	N	2509	0	2522	14	0
2	D	2514	0	2526	22	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	L	2506	0	2521	15	0
3	E	2520	0	2526	13	0
4	F	2531	0	2538	29	0
4	J	2504	0	2511	16	0
4	O	2502	0	2517	24	0
5	G	2520	0	2529	19	0
6	H	2505	0	2519	19	0
7	I	2507	0	2510	22	0
8	M	2508	0	2521	19	0
9	P	2507	0	2512	16	0
10	A	1	0	0	0	0
10	B	2	0	0	0	0
10	C	1	0	0	0	0
10	D	1	0	0	0	0
10	E	1	0	0	0	0
10	G	1	0	0	0	0
10	H	1	0	0	0	0
10	I	1	0	0	0	0
10	K	1	0	0	0	0
10	M	1	0	0	0	0
10	N	1	0	0	0	0
11	A	4	0	0	2	0
11	B	6	0	0	0	0
11	C	5	0	0	1	0
11	D	5	0	0	1	0
11	E	5	0	0	0	0
11	F	1	0	0	0	0
11	G	4	0	0	1	0
11	H	1	0	0	0	0
11	I	2	0	0	0	0
11	J	2	0	0	0	0
11	K	6	0	0	0	0
11	L	1	0	0	0	0
11	M	2	0	0	0	0
11	N	1	0	0	0	0
11	O	2	0	0	1	0
11	P	2	0	0	0	0
12	A	15	0	0	2	0
12	B	5	0	0	0	0
12	D	10	0	0	2	0
12	E	5	0	0	0	0
12	F	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	H	5	0	0	0	0
12	I	5	0	0	0	0
12	J	10	0	0	0	0
12	L	5	0	0	0	0
12	P	10	0	0	0	0
13	A	9	0	0	2	0
13	B	9	0	0	2	0
13	F	9	0	0	1	0
13	G	9	0	0	1	0
13	J	9	0	0	1	0
13	M	9	0	0	1	0
14	C	44	0	26	4	0
14	D	44	0	26	3	0
14	E	44	0	26	1	0
14	I	44	0	26	0	0
14	K	44	0	26	5	0
14	O	44	0	26	6	0
14	P	44	0	26	2	0
15	H	4	0	3	0	0
16	H	10	0	14	0	0
17	H	7	0	10	0	0
18	J	13	0	18	0	0
19	M	8	0	3	0	0
20	A	39	0	0	1	0
20	B	38	0	0	1	0
20	C	61	0	0	3	0
20	D	38	0	0	1	0
20	E	23	0	0	1	0
20	F	27	0	0	2	0
20	G	35	0	0	2	0
20	H	22	0	0	0	0
20	I	23	0	0	1	0
20	J	28	0	0	0	0
20	K	26	0	0	4	0
20	L	20	0	0	1	0
20	M	24	0	0	0	0
20	N	11	0	0	1	0
20	O	20	0	0	2	0
20	P	16	0	0	0	0
All	All	41155	0	40569	299	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 4.

All (299) 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)
7:I:104:GLU:OE2	4:O:104:GLU:OE2	1.85	0.94
13:A:409:POP:O2	13:A:409:POP:O4	1.85	0.93
13:M:405:POP:O6	13:M:405:POP:O2	1.91	0.88
1:K:71:LYS:HE3	20:K:522:HOH:O	1.76	0.83
8:M:243:LEU:HD22	8:M:245:VAL:HG13	1.61	0.82
1:K:254:GLU:HB2	20:K:511:HOH:O	1.80	0.80
1:A:183:GLN:HB3	20:A:512:HOH:O	1.83	0.79
4:F:166:PHE:HA	4:F:249:LYS:HG2	1.65	0.77
7:I:24:ARG:HH11	7:I:323:LEU:HB3	1.50	0.74
1:B:246:ARG:HD3	2:D:246:ARG:NH1	2.05	0.71
7:I:246:ARG:NE	1:K:246:ARG:HD2	2.06	0.71
1:B:13:ILE:N	13:B:410:POP:O4	2.24	0.69
8:M:243:LEU:CD2	8:M:245:VAL:HG13	2.24	0.67
7:I:183:GLN:HB3	20:I:503:HOH:O	1.93	0.67
9:P:150:SCY:HE2	14:P:401:NAD:C5N	2.25	0.66
14:E:401:NAD:N7N	14:E:401:NAD:O1N	2.30	0.63
1:A:1:MET:HA	1:A:1:MET:CE	2.29	0.63
1:B:83:LEU:HD13	1:B:85:TRP:CZ2	2.34	0.62
2:D:12:ARG:N	14:D:401:NAD:O2A	2.23	0.62
8:M:83:LEU:HD13	8:M:85:TRP:CZ2	2.35	0.62
9:P:83:LEU:HD13	9:P:85:TRP:CZ2	2.35	0.62
2:D:83:LEU:HD13	2:D:85:TRP:CZ2	2.35	0.61
4:J:13:ILE:HG12	13:J:406:POP:O6	2.01	0.61
4:J:83:LEU:HD13	4:J:85:TRP:CZ2	2.36	0.61
4:F:83:LEU:HD13	4:F:85:TRP:CZ2	2.35	0.61
5:G:83:LEU:HD13	5:G:85:TRP:CZ2	2.36	0.61
1:B:246:ARG:HD3	2:D:246:ARG:HH11	1.66	0.61
6:H:257:ALY:HG3	6:H:274:TYR:OH	2.01	0.60
2:L:83:LEU:HD13	2:L:85:TRP:CZ2	2.36	0.60
3:E:83:LEU:HD13	3:E:85:TRP:CZ2	2.36	0.60
6:H:83:LEU:HD13	6:H:85:TRP:CZ2	2.36	0.60
7:I:83:LEU:HD13	7:I:85:TRP:CZ2	2.36	0.60
4:O:83:LEU:HD13	4:O:85:TRP:CZ2	2.37	0.60
1:A:83:LEU:HD13	1:A:85:TRP:CZ2	2.36	0.60
1:C:183:GLN:HB3	20:C:514:HOH:O	2.02	0.60
1:K:83:LEU:HD13	1:K:85:TRP:CZ2	2.37	0.60
2:D:43:TYR:HD1	12:D:409:PO4:O3	1.85	0.59
1:C:83:LEU:HD13	1:C:85:TRP:CZ2	2.38	0.59
1:N:83:LEU:HD13	1:N:85:TRP:CZ2	2.37	0.59
4:F:251:ALA:HA	4:F:255:GLN:OE1	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:LYS:NZ	12:A:407:PO4:O1	2.36	0.58
4:F:257:ALY:HG3	4:F:274:TYR:OH	2.04	0.58
1:A:1:MET:HA	1:A:1:MET:HE2	1.85	0.57
1:A:13:ILE:HG12	13:A:409:POP:O3	2.05	0.57
7:I:24:ARG:NH1	7:I:323:LEU:HB3	2.18	0.57
5:G:13:ILE:HG12	13:G:406:POP:O5	2.04	0.57
8:M:73:ARG:NH1	8:M:84:LYS:O	2.37	0.56
5:G:267:GLU:HB2	20:G:518:HOH:O	2.05	0.56
1:A:2:THR:O	1:A:4:LYS:NZ	2.38	0.56
1:B:73:ARG:NH1	1:B:84:LYS:O	2.39	0.55
1:K:120:THR:O	14:K:401:NAD:H1D	2.06	0.55
1:K:177:HIS:HB3	1:K:232:ARG:HD3	1.88	0.55
4:F:166:PHE:HA	4:F:249:LYS:CG	2.37	0.55
1:B:24:ARG:NH2	1:B:26:ASP:OD2	2.41	0.54
4:J:177:HIS:HB3	4:J:232:ARG:HD3	1.89	0.54
2:D:71:LYS:HG2	2:D:72:ILE:N	2.21	0.54
1:A:19:ARG:HD3	11:A:405:CL:CL	2.45	0.53
1:A:296:LYS:HA	12:A:407:PO4:O3	2.08	0.53
8:M:191:HIS:H	8:M:191:HIS:CD2	2.24	0.53
2:L:177:HIS:HB3	2:L:232:ARG:HD3	1.91	0.53
7:I:246:ARG:CD	1:K:246:ARG:HD2	2.38	0.53
9:P:150:SCY:H	9:P:150:SCY:CD	2.19	0.53
2:D:46:LYS:HG2	2:D:58:VAL:CG1	2.39	0.53
1:K:237:ASN:OD1	1:K:314:ASN:OD1	2.27	0.52
1:N:177:HIS:HB3	1:N:232:ARG:HD3	1.91	0.52
1:K:150:CYS:SG	14:K:401:NAD:H4N	2.49	0.52
8:M:107:ARG:O	8:M:107:ARG:HG3	2.09	0.52
4:F:301:LEU:CD2	6:H:170:GLU:HB2	2.40	0.52
7:I:177:HIS:HB3	7:I:232:ARG:HD3	1.90	0.52
4:F:177:HIS:HB3	4:F:232:ARG:HD3	1.91	0.52
8:M:177:HIS:HB3	8:M:232:ARG:HD3	1.92	0.52
3:E:177:HIS:HB3	3:E:232:ARG:HD3	1.91	0.51
1:C:177:HIS:HB3	1:C:232:ARG:HD3	1.91	0.51
1:C:164:ASP:O	5:G:249:LYS:NZ	2.41	0.51
8:M:246:ARG:NE	4:O:246:ARG:HD2	2.25	0.51
4:O:177:HIS:HB3	4:O:232:ARG:HD3	1.91	0.51
6:H:177:HIS:HB3	6:H:232:ARG:HD3	1.91	0.51
9:P:149:SER:HB2	9:P:150:SCY:OCD	2.10	0.51
3:E:81:ALA:HA	20:E:506:HOH:O	2.12	0.50
4:O:306:VAL:HG12	4:O:307:LYS:N	2.27	0.50
4:J:12:ARG:O	4:J:16:ILE:HG12	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:12:ARG:O	1:K:16:ILE:HG12	2.12	0.50
1:C:12:ARG:O	1:C:16:ILE:HG12	2.12	0.50
1:C:34:ASP:OD1	14:C:401:NAD:H1B	2.11	0.50
1:A:12:ARG:O	1:A:16:ILE:HG12	2.12	0.49
5:G:12:ARG:O	5:G:16:ILE:HG12	2.12	0.49
5:G:177:HIS:HB3	5:G:232:ARG:HD3	1.94	0.49
5:G:46:ALY:HG3	5:G:58:VAL:CG1	2.43	0.49
1:K:46:ALY:HG3	1:K:58:VAL:CG1	2.43	0.49
1:B:85:TRP:HB3	1:B:90:VAL:HB	1.95	0.49
3:E:12:ARG:O	3:E:16:ILE:HG12	2.12	0.49
4:F:12:ARG:O	4:F:16:ILE:HG12	2.12	0.49
6:H:12:ARG:O	6:H:16:ILE:HG12	2.12	0.49
2:D:129:MET:HG2	2:D:146:SER:HB3	1.95	0.49
4:F:165:ASN:O	4:F:249:LYS:HD2	2.12	0.49
2:L:85:TRP:HB3	2:L:90:VAL:HB	1.95	0.49
1:A:85:TRP:HB3	1:A:90:VAL:HB	1.94	0.49
5:G:85:TRP:HB3	5:G:90:VAL:HB	1.95	0.49
8:M:12:ARG:O	8:M:16:ILE:HG12	2.13	0.49
9:P:85:TRP:HB3	9:P:90:VAL:HB	1.95	0.49
6:H:46:ALY:HG3	6:H:58:VAL:CG1	2.42	0.49
2:L:12:ARG:O	2:L:16:ILE:HG12	2.13	0.49
1:N:46:ALY:HG3	1:N:58:VAL:CG1	2.43	0.49
4:O:136:PHE:HB2	11:O:403:CL:CL	2.50	0.49
7:I:156:ALA:HB3	7:I:157:PRO:HD3	1.95	0.49
9:P:150:SCY:HE2	14:P:401:NAD:C6N	2.42	0.49
1:C:156:ALA:HB3	1:C:157:PRO:HD3	1.95	0.48
1:C:11:GLY:HA3	14:C:401:NAD:O5B	2.12	0.48
1:K:156:ALA:HB3	1:K:157:PRO:HD3	1.95	0.48
5:G:267:GLU:CB	20:G:518:HOH:O	2.61	0.48
1:N:12:ARG:O	1:N:16:ILE:HG12	2.12	0.48
1:B:12:ARG:O	1:B:16:ILE:HG12	2.14	0.48
5:G:136:PHE:HB2	11:G:403:CL:CL	2.51	0.48
7:I:12:ARG:O	7:I:16:ILE:HG12	2.13	0.48
2:D:12:ARG:O	2:D:16:ILE:HG12	2.12	0.48
2:L:129:MET:HG2	2:L:146:SER:HB3	1.96	0.48
3:E:85:TRP:HB3	3:E:90:VAL:HB	1.95	0.48
4:F:246:ARG:HD2	6:H:246:ARG:CD	2.44	0.48
4:J:46:ALY:HG3	4:J:58:VAL:CG1	2.44	0.48
1:N:85:TRP:HB3	1:N:90:VAL:HB	1.96	0.48
6:H:156:ALA:HB3	6:H:157:PRO:HD3	1.96	0.48
7:I:85:TRP:HB3	7:I:90:VAL:HB	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:O:12:ARG:O	4:O:16:ILE:HG12	2.13	0.48
9:P:12:ARG:O	9:P:16:ILE:HG12	2.12	0.48
2:D:170:GLU:OE2	2:D:246:ARG:NH1	2.47	0.48
1:B:12:ARG:N	13:B:410:POP:O4	2.48	0.47
2:D:156:ALA:HB3	2:D:157:PRO:HD3	1.96	0.47
4:J:301:LEU:CD2	2:L:170:GLU:HB2	2.43	0.47
8:M:46:LYS:HG2	8:M:58:VAL:CG1	2.43	0.47
6:H:129:MET:HG2	6:H:146:SER:HB3	1.95	0.47
4:O:11:GLY:HA3	14:O:401:NAD:O5B	2.14	0.47
6:H:85:TRP:HB3	6:H:90:VAL:HB	1.96	0.47
3:E:156:ALA:HB3	3:E:157:PRO:HD3	1.96	0.47
4:F:85:TRP:HB3	4:F:90:VAL:HB	1.97	0.47
5:G:156:ALA:HB3	5:G:157:PRO:HD3	1.96	0.47
9:P:129:MET:HG2	9:P:146:SER:HB3	1.96	0.47
2:D:150:CYS:SG	14:D:401:NAD:H4N	2.54	0.47
4:J:52:GLY:HA2	20:K:526:HOH:O	2.14	0.47
1:A:156:ALA:HB3	1:A:157:PRO:HD3	1.97	0.47
1:A:306:VAL:HG12	1:A:307:LYS:N	2.30	0.47
1:C:129:MET:HG2	1:C:146:SER:HB3	1.97	0.47
2:D:136:PHE:HB2	11:D:406:CL:CL	2.51	0.47
4:J:85:TRP:HB3	4:J:90:VAL:HB	1.95	0.47
8:M:85:TRP:HB3	8:M:90:VAL:HB	1.96	0.47
8:M:306:VAL:HG12	8:M:307:LYS:N	2.29	0.47
4:O:46:ALY:HG3	4:O:58:VAL:CG1	2.45	0.47
4:F:195:ARG:HG3	20:F:502:HOH:O	2.15	0.47
4:F:252:THR:O	4:F:255:GLN:HB2	2.15	0.47
4:F:301:LEU:HD23	6:H:170:GLU:HB2	1.97	0.47
5:G:129:MET:HG2	5:G:146:SER:HB3	1.96	0.47
14:O:401:NAD:H2N	14:O:401:NAD:H2D	1.41	0.47
4:J:129:MET:HG2	4:J:146:SER:HB3	1.97	0.47
14:K:401:NAD:H51N	20:K:519:HOH:O	2.14	0.47
4:O:156:ALA:HB3	4:O:157:PRO:HD3	1.97	0.47
1:A:129:MET:HG2	1:A:146:SER:HB3	1.97	0.46
1:B:129:MET:HG2	1:B:146:SER:HB3	1.97	0.46
4:F:246:ARG:CD	6:H:246:ARG:HD2	2.45	0.46
1:N:129:MET:HG2	1:N:146:SER:HB3	1.98	0.46
1:B:95:GLU:HG3	20:B:501:HOH:O	2.14	0.46
6:H:201:SER:HA	6:H:234:PRO:HB3	1.97	0.46
2:D:85:TRP:HB3	2:D:90:VAL:HB	1.97	0.46
4:F:307:LYS:HE2	6:H:172:LEU:HB3	1.97	0.46
7:I:129:MET:HG2	7:I:146:SER:HB3	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:M:129:MET:HG2	8:M:146:SER:HB3	1.96	0.46
4:F:201:SER:HA	4:F:234:PRO:HB3	1.97	0.46
1:C:259:ALA:HA	5:G:255:GLN:NE2	2.31	0.46
3:E:46:ALY:HG3	3:E:58:VAL:CG1	2.46	0.46
3:E:129:MET:HG2	3:E:146:SER:HB3	1.97	0.46
4:F:129:MET:HG2	4:F:146:SER:HB3	1.97	0.46
7:I:46:ALY:HG3	7:I:58:VAL:CG1	2.46	0.46
2:D:150:CYS:SG	14:D:401:NAD:C4N	3.04	0.46
1:N:156:ALA:HB3	1:N:157:PRO:HD3	1.97	0.46
7:I:246:ARG:HD3	1:K:246:ARG:HD2	1.98	0.46
1:K:201:SER:HA	1:K:234:PRO:HB3	1.97	0.46
4:O:85:TRP:HB3	4:O:90:VAL:HB	1.96	0.46
9:P:46:ALY:HG3	9:P:58:VAL:CG1	2.46	0.46
1:C:85:TRP:HB3	1:C:90:VAL:HB	1.98	0.46
4:J:201:SER:HA	4:J:234:PRO:HB3	1.98	0.46
1:K:85:TRP:HB3	1:K:90:VAL:HB	1.96	0.46
2:L:201:SER:HA	2:L:234:PRO:HB3	1.98	0.46
4:F:46:ALY:HG3	4:F:58:VAL:CG1	2.46	0.46
1:A:201:SER:HA	1:A:234:PRO:HB3	1.98	0.45
4:F:237:ASN:O	4:F:238:VAL:HB	2.16	0.45
4:F:246:ARG:HD2	6:H:246:ARG:HD2	1.98	0.45
1:B:46:ALY:HG3	1:B:58:VAL:CG1	2.46	0.45
4:J:156:ALA:HB3	4:J:157:PRO:HD3	1.97	0.45
1:A:46:ALY:HG3	1:A:58:VAL:CG1	2.46	0.45
1:C:46:ALY:HG3	1:C:58:VAL:CG1	2.47	0.45
1:C:136:PHE:HB2	11:C:405:CL:CL	2.53	0.45
7:I:301:LEU:CD2	1:K:170:GLU:HB2	2.47	0.45
7:I:306:VAL:HG12	7:I:307:LYS:N	2.32	0.45
1:K:129:MET:HG2	1:K:146:SER:HB3	1.99	0.45
4:O:201:SER:HA	4:O:234:PRO:HB3	1.98	0.45
1:B:24:ARG:NH2	1:B:26:ASP:OD1	2.48	0.45
1:K:237:ASN:O	1:K:238:VAL:HB	2.17	0.45
8:M:301:LEU:CD2	4:O:170:GLU:HB2	2.46	0.45
1:C:201:SER:HA	1:C:234:PRO:HB3	1.99	0.45
4:F:156:ALA:HB3	4:F:157:PRO:HD3	1.97	0.45
7:I:201:SER:HA	7:I:234:PRO:HB3	1.99	0.45
2:L:237:ASN:O	2:L:238:VAL:HB	2.18	0.45
8:M:156:ALA:HB3	8:M:157:PRO:HD3	1.98	0.45
4:O:12:ARG:HG2	14:O:401:NAD:O2A	2.17	0.45
1:B:156:ALA:HB3	1:B:157:PRO:HD3	1.98	0.44
1:N:223:ASN:HB2	20:N:510:HOH:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:O:249:LYS:HE3	20:O:518:HOH:O	2.17	0.44
2:D:1:MET:HG2	2:D:2:THR:H	1.82	0.44
4:O:129:MET:HG2	4:O:146:SER:HB3	1.98	0.44
1:K:40:TYR:CD1	2:L:194:TRP:CE2	3.05	0.44
8:M:201:SER:HA	8:M:234:PRO:HB3	1.99	0.44
4:F:170:GLU:HB2	6:H:301:LEU:CD2	2.48	0.44
2:L:156:ALA:HB3	2:L:157:PRO:HD3	1.99	0.44
1:C:150:CYS:SG	14:C:401:NAD:H4N	2.57	0.44
14:O:401:NAD:PN	14:O:401:NAD:H3D	2.56	0.44
9:P:201:SER:HA	9:P:234:PRO:HB3	1.98	0.44
1:A:307:LYS:HE2	1:C:172:LEU:HB3	2.00	0.43
1:B:237:ASN:O	1:B:238:VAL:HB	2.18	0.43
13:F:403:POP:O1	13:F:403:POP:O4	2.36	0.43
5:G:306:VAL:HG12	5:G:307:LYS:N	2.31	0.43
1:N:209:THR:HG23	1:N:209:THR:O	2.18	0.43
4:F:228:GLY:HA2	6:H:299:ILE:CD1	2.47	0.43
4:J:306:VAL:HG12	4:J:307:LYS:N	2.34	0.43
12:D:408:PO4:O3	20:D:537:HOH:O	2.21	0.43
4:O:237:ASN:O	4:O:238:VAL:HB	2.18	0.43
1:C:255:GLN:NE2	5:G:259:ALA:HA	2.32	0.43
8:M:209:THR:HG23	8:M:209:THR:O	2.18	0.43
6:H:237:ASN:O	6:H:238:VAL:HB	2.19	0.43
1:N:201:SER:HA	1:N:234:PRO:HB3	1.99	0.43
1:N:306:VAL:HG12	1:N:307:LYS:N	2.34	0.43
1:A:237:ASN:O	1:A:238:VAL:HB	2.17	0.43
7:I:257:ALY:HE2	7:I:295:ALA:HB1	2.01	0.43
4:J:209:THR:O	4:J:209:THR:HG23	2.19	0.43
3:E:237:ASN:O	3:E:238:VAL:HB	2.19	0.43
4:F:166:PHE:CA	4:F:249:LYS:HG2	2.42	0.43
8:M:237:ASN:O	8:M:238:VAL:HB	2.18	0.43
1:C:209:THR:O	1:C:209:THR:HG23	2.19	0.43
4:F:254:GLU:HG3	20:F:517:HOH:O	2.18	0.43
1:B:306:VAL:HG12	1:B:307:LYS:N	2.34	0.43
1:C:68:ASN:HA	20:C:547:HOH:O	2.19	0.43
9:P:156:ALA:HB3	9:P:157:PRO:HD3	2.00	0.43
2:D:306:VAL:HG12	2:D:307:LYS:N	2.34	0.43
9:P:150:SCY:CD	9:P:150:SCY:N	2.82	0.43
4:J:237:ASN:O	4:J:238:VAL:HB	2.19	0.42
4:J:307:LYS:HE2	2:L:172:LEU:HB3	2.01	0.42
2:L:209:THR:HG23	2:L:209:THR:O	2.19	0.42
4:O:257:ALY:HE2	4:O:295:ALA:HB1	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:P:237:ASN:O	9:P:238:VAL:HB	2.19	0.42
2:D:237:ASN:O	2:D:238:VAL:HB	2.19	0.42
7:I:237:ASN:O	7:I:238:VAL:HB	2.18	0.42
2:L:19:ARG:HD3	20:L:514:HOH:O	2.18	0.42
4:O:209:THR:O	4:O:209:THR:HG23	2.19	0.42
1:A:133:GLY:N	11:A:403:CL:CL	2.83	0.42
4:F:209:THR:HG23	4:F:209:THR:O	2.19	0.42
5:G:201:SER:HA	5:G:234:PRO:HB3	2.01	0.42
1:B:180:THR:OG1	1:B:232:ARG:NH1	2.52	0.42
1:B:209:THR:HG23	1:B:209:THR:O	2.18	0.42
1:B:201:SER:HA	1:B:234:PRO:HB3	2.02	0.42
2:L:88:VAL:HG13	2:L:90:VAL:HG23	2.02	0.42
2:D:209:THR:HG23	2:D:209:THR:O	2.19	0.42
3:E:209:THR:O	3:E:209:THR:HG23	2.20	0.42
5:G:237:ASN:O	5:G:238:VAL:HB	2.19	0.42
1:A:209:THR:HG23	1:A:209:THR:O	2.20	0.42
1:N:301:LEU:CD2	9:P:170:GLU:HB2	2.50	0.42
1:B:103:ASP:O	1:B:107:ARG:HB2	2.20	0.42
1:C:88:VAL:HG13	1:C:90:VAL:HG23	2.01	0.42
1:K:13:ILE:N	14:K:401:NAD:O2N	2.30	0.42
1:C:61:LYS:HD2	20:C:522:HOH:O	2.18	0.42
5:G:209:THR:HG23	5:G:209:THR:O	2.19	0.42
7:I:307:LYS:HE2	1:K:172:LEU:HB3	2.01	0.42
3:E:201:SER:HA	3:E:234:PRO:HB3	2.01	0.42
4:O:88:VAL:HG13	4:O:90:VAL:HG23	2.02	0.42
4:O:150:CYS:SG	14:O:401:NAD:C4N	3.08	0.42
1:C:237:ASN:O	1:C:238:VAL:HB	2.19	0.41
1:K:209:THR:HG23	1:K:209:THR:O	2.20	0.41
4:O:150:CYS:HB3	14:O:401:NAD:H4N	2.01	0.41
4:O:249:LYS:CE	20:O:518:HOH:O	2.68	0.41
1:C:37:ASP:OD1	1:C:37:ASP:N	2.47	0.41
4:F:88:VAL:HG13	4:F:90:VAL:HG23	2.02	0.41
1:K:13:ILE:HG12	14:K:401:NAD:O2N	2.19	0.41
9:P:209:THR:HG23	9:P:209:THR:O	2.20	0.41
2:D:180:THR:OG1	2:D:232:ARG:NH1	2.53	0.41
3:E:306:VAL:HG12	3:E:307:LYS:N	2.35	0.41
7:I:88:VAL:HG13	7:I:90:VAL:HG23	2.02	0.41
4:J:88:VAL:HG13	4:J:90:VAL:HG23	2.02	0.41
2:L:306:VAL:HG12	2:L:307:LYS:N	2.36	0.41
1:N:237:ASN:O	1:N:238:VAL:HB	2.21	0.41
6:H:209:THR:HG23	6:H:209:THR:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:I:209:THR:HG23	7:I:209:THR:O	2.20	0.41
1:B:246:ARG:HD3	2:D:246:ARG:CZ	2.51	0.41
3:E:88:VAL:HG13	3:E:90:VAL:HG23	2.02	0.41
1:K:306:VAL:HG12	1:K:307:LYS:N	2.36	0.41
1:N:88:VAL:HG13	1:N:90:VAL:HG23	2.02	0.41
8:M:88:VAL:HG13	8:M:90:VAL:HG23	2.02	0.41
9:P:88:VAL:HG13	9:P:90:VAL:HG23	2.02	0.41
4:F:39:ASP:HA	4:F:60:VAL:HG21	2.01	0.41
1:K:79:ASP:HB3	1:K:82:ASN:HD21	1.86	0.41
1:C:150:CYS:SG	14:C:401:NAD:C4N	3.09	0.40
5:G:88:VAL:HG13	5:G:90:VAL:HG23	2.03	0.40
2:D:88:VAL:HG13	2:D:90:VAL:HG23	2.03	0.40
4:O:39:ASP:HA	4:O:60:VAL:HG21	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	329/355 (93%)	314 (95%)	14 (4%)	1 (0%)	41	68
1	B	330/355 (93%)	316 (96%)	13 (4%)	1 (0%)	41	68
1	C	328/355 (92%)	315 (96%)	12 (4%)	1 (0%)	41	68
1	K	329/355 (93%)	314 (95%)	14 (4%)	1 (0%)	41	68
1	N	329/355 (93%)	315 (96%)	13 (4%)	1 (0%)	41	68
2	D	331/355 (93%)	317 (96%)	13 (4%)	1 (0%)	41	68
2	L	330/355 (93%)	315 (96%)	14 (4%)	1 (0%)	41	68
3	E	329/355 (93%)	314 (95%)	14 (4%)	1 (0%)	41	68
4	F	330/355 (93%)	316 (96%)	13 (4%)	1 (0%)	41	68
4	J	327/355 (92%)	313 (96%)	12 (4%)	2 (1%)	25	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	O	327/355 (92%)	312 (95%)	14 (4%)	1 (0%)	41	68
5	G	329/355 (93%)	315 (96%)	13 (4%)	1 (0%)	41	68
6	H	326/355 (92%)	311 (95%)	14 (4%)	1 (0%)	41	68
7	I	326/355 (92%)	311 (95%)	14 (4%)	1 (0%)	41	68
8	M	329/355 (93%)	313 (95%)	15 (5%)	1 (0%)	41	68
9	P	326/355 (92%)	312 (96%)	13 (4%)	1 (0%)	41	68
All	All	5255/5680 (92%)	5023 (96%)	215 (4%)	17 (0%)	41	68

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	238	VAL
1	A	238	VAL
1	B	238	VAL
2	D	238	VAL
3	E	238	VAL
4	F	238	VAL
5	G	238	VAL
6	H	238	VAL
7	I	238	VAL
4	J	238	VAL
1	K	238	VAL
2	L	238	VAL
8	M	238	VAL
1	N	238	VAL
4	O	238	VAL
9	P	238	VAL
4	J	167	GLY

### 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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	266/286 (93%)	261 (98%)	5 (2%)	57	81
1	B	266/286 (93%)	262 (98%)	4 (2%)	65	86
1	C	265/286 (93%)	263 (99%)	2 (1%)	81	93
1	K	266/286 (93%)	264 (99%)	2 (1%)	81	93
1	N	266/286 (93%)	265 (100%)	1 (0%)	91	96
2	D	268/287 (93%)	265 (99%)	3 (1%)	73	90
2	L	267/287 (93%)	264 (99%)	3 (1%)	73	90
3	E	266/285 (93%)	263 (99%)	3 (1%)	73	90
4	F	267/285 (94%)	263 (98%)	4 (2%)	65	86
4	J	264/285 (93%)	263 (100%)	1 (0%)	91	96
4	O	264/285 (93%)	263 (100%)	1 (0%)	91	96
5	G	266/285 (93%)	265 (100%)	1 (0%)	91	96
6	H	263/284 (93%)	262 (100%)	1 (0%)	91	96
7	I	263/284 (93%)	262 (100%)	1 (0%)	91	96
8	M	266/286 (93%)	263 (99%)	3 (1%)	73	90
9	P	263/284 (93%)	261 (99%)	2 (1%)	81	93
All	All	4246/4567 (93%)	4209 (99%)	37 (1%)	78	92

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	2	THR
1	A	4	LYS
1	A	173	MET
1	A	232	ARG
1	B	78	ARG
1	B	107	ARG
1	B	173	MET
1	B	232	ARG
1	C	37	ASP
1	C	173	MET
2	D	22	GLN
2	D	173	MET
2	D	232	ARG

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Mol	Chain	Res	Type
3	E	2	THR
3	E	173	MET
3	E	191	HIS
4	F	2	THR
4	F	173	MET
4	F	213	LYS
4	F	249	LYS
5	G	173	MET
6	H	173	MET
7	I	173	MET
4	J	173	MET
1	K	82	ASN
1	K	173	MET
2	L	173	MET
2	L	329	ILE
2	L	331	LYS
8	M	107	ARG
8	M	173	MET
8	M	243	LEU
1	N	173	MET
4	O	173	MET
9	P	173	MET
9	P	232	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	K	82	ASN
8	M	191	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](#)

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

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The



Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	SCY	H	150	6	7,8,9	1.02	0	3,9,11	1.41	1 (33%)
1	ALY	C	46	1	10,11,12	1.41	1 (10%)	7,12,14	3.82	3 (42%)
4	ALY	J	46	4	10,11,12	1.28	1 (10%)	7,12,14	3.50	3 (42%)
9	ALY	P	46	9	10,11,12	1.06	1 (10%)	7,12,14	3.41	3 (42%)
7	ALY	I	46	7	10,11,12	1.39	2 (20%)	7,12,14	3.69	3 (42%)
9	ALY	P	249	9	10,11,12	0.42	0	7,12,14	3.13	2 (28%)
1	ALY	B	46	1	10,11,12	1.35	2 (20%)	7,12,14	3.77	3 (42%)
4	ALY	F	257	4	10,11,12	1.54	2 (20%)	7,12,14	5.84	3 (42%)
6	ALY	H	46	6	10,11,12	1.50	2 (20%)	7,12,14	2.97	3 (42%)
9	SCY	P	150	9	7,8,9	1.12	1 (14%)	3,9,11	1.04	0
4	ALY	F	46	4	10,11,12	0.95	0	7,12,14	3.57	3 (42%)
1	ALY	N	46	1	10,11,12	1.17	1 (10%)	7,12,14	3.24	3 (42%)
5	ALY	G	46	5	10,11,12	1.03	0	7,12,14	3.42	3 (42%)
7	ALY	I	249	7	10,11,12	0.61	0	7,12,14	2.71	3 (42%)
4	ALY	O	46	4	10,11,12	0.88	0	7,12,14	3.46	3 (42%)
4	ALY	J	257	4	10,11,12	1.39	1 (10%)	7,12,14	6.97	5 (71%)
7	ALY	I	257	7	10,11,12	1.40	2 (20%)	7,12,14	6.43	5 (71%)
3	ALY	E	46	3	10,11,12	1.10	0	7,12,14	3.71	3 (42%)
1	ALY	A	46	1	10,11,12	1.20	1 (10%)	7,12,14	3.52	3 (42%)
1	ALY	K	46	1	10,11,12	1.05	0	7,12,14	3.40	3 (42%)
4	ALY	O	257	4	10,11,12	1.33	2 (20%)	7,12,14	6.22	5 (71%)
8	ALY	M	257	8	10,11,12	1.57	2 (20%)	7,12,14	6.31	5 (71%)
6	ALY	H	257	6	10,11,12	1.32	3 (30%)	7,12,14	5.79	3 (42%)
3	ALY	E	249	3	10,11,12	0.65	0	7,12,14	3.12	2 (28%)
5	SCY	G	150	5	7,8,9	0.96	0	3,9,11	1.14	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	SCY	H	150	6	-	2/5/7/9	-
1	ALY	C	46	1	-	4/9/10/12	-
4	ALY	J	46	4	-	4/9/10/12	-
9	ALY	P	46	9	-	4/9/10/12	-
7	ALY	I	46	7	-	4/9/10/12	-
9	ALY	P	249	9	-	4/9/10/12	-
1	ALY	B	46	1	-	4/9/10/12	-
4	ALY	F	257	4	-	5/9/10/12	-
6	ALY	H	46	6	-	4/9/10/12	-
9	SCY	P	150	9	-	3/5/7/9	-
4	ALY	F	46	4	-	4/9/10/12	-
1	ALY	N	46	1	-	4/9/10/12	-
5	ALY	G	46	5	-	4/9/10/12	-
7	ALY	I	249	7	-	3/9/10/12	-
4	ALY	O	46	4	-	4/9/10/12	-
4	ALY	J	257	4	-	2/9/10/12	-
7	ALY	I	257	7	-	2/9/10/12	-
3	ALY	E	46	3	-	4/9/10/12	-
1	ALY	A	46	1	-	4/9/10/12	-
1	ALY	K	46	1	-	4/9/10/12	-
4	ALY	O	257	4	-	2/9/10/12	-
8	ALY	M	257	8	-	2/9/10/12	-
6	ALY	H	257	6	-	5/9/10/12	-
3	ALY	E	249	3	-	4/9/10/12	-
5	SCY	G	150	5	-	2/5/7/9	-

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	M	257	ALY	CE-NZ	3.19	1.53	1.46
4	J	257	ALY	CE-NZ	3.16	1.53	1.46
6	H	46	ALY	CE-NZ	3.09	1.53	1.46
4	F	257	ALY	CE-NZ	3.09	1.53	1.46
7	I	46	ALY	CE-NZ	2.84	1.52	1.46
6	H	46	ALY	OH-CH	-2.73	1.17	1.23
4	F	257	ALY	CH-NZ	2.69	1.41	1.34
1	B	46	ALY	CE-NZ	2.57	1.52	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	46	ALY	CB-CA	2.57	1.57	1.53
7	I	46	ALY	OH-CH	-2.51	1.17	1.23
7	I	257	ALY	CB-CA	-2.48	1.50	1.53
7	I	257	ALY	CE-NZ	2.45	1.51	1.46
1	B	46	ALY	OH-CH	-2.44	1.17	1.23
9	P	46	ALY	CE-NZ	2.43	1.51	1.46
4	O	257	ALY	CB-CA	-2.39	1.50	1.53
8	M	257	ALY	CH-NZ	2.39	1.41	1.34
6	H	257	ALY	CE-NZ	2.36	1.51	1.46
1	N	46	ALY	CE-NZ	2.35	1.51	1.46
4	O	257	ALY	CE-NZ	2.28	1.51	1.46
4	J	46	ALY	CE-NZ	2.26	1.51	1.46
6	H	257	ALY	CB-CA	2.23	1.56	1.53
9	P	150	SCY	CB-SG	-2.19	1.76	1.81
1	A	46	ALY	CE-NZ	2.15	1.51	1.46
6	H	257	ALY	CH-NZ	2.14	1.40	1.34

All (73) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	I	257	ALY	CE-NZ-CH	15.33	146.13	122.56
4	J	257	ALY	CE-NZ-CH	15.28	146.05	122.56
4	O	257	ALY	CE-NZ-CH	14.86	145.41	122.56
4	F	257	ALY	CE-NZ-CH	14.41	144.72	122.56
6	H	257	ALY	CE-NZ-CH	14.21	144.41	122.56
8	M	257	ALY	CE-NZ-CH	12.51	141.79	122.56
1	B	46	ALY	CE-NZ-CH	9.36	136.95	122.56
1	C	46	ALY	CE-NZ-CH	9.34	136.93	122.56
7	I	46	ALY	CE-NZ-CH	9.11	136.57	122.56
3	E	46	ALY	CE-NZ-CH	9.09	136.54	122.56
4	F	46	ALY	CE-NZ-CH	8.49	135.61	122.56
4	J	46	ALY	CE-NZ-CH	8.34	135.38	122.56
4	O	46	ALY	CE-NZ-CH	8.11	135.03	122.56
1	A	46	ALY	CE-NZ-CH	8.10	135.02	122.56
5	G	46	ALY	CE-NZ-CH	8.09	134.99	122.56
1	K	46	ALY	CE-NZ-CH	7.98	134.82	122.56
9	P	46	ALY	CE-NZ-CH	7.62	134.27	122.56
3	E	249	ALY	CE-NZ-CH	7.34	133.84	122.56
9	P	249	ALY	CE-NZ-CH	7.32	133.81	122.56
8	M	257	ALY	CH3-CH-NZ	6.48	127.57	116.09
1	N	46	ALY	CE-NZ-CH	6.09	131.92	122.56
4	J	257	ALY	CH3-CH-NZ	6.00	126.71	116.09

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	M	257	ALY	CD-CE-NZ	-5.99	95.08	112.21
4	J	257	ALY	CD-CE-NZ	-5.79	95.65	112.21
6	H	46	ALY	CE-NZ-CH	5.74	131.38	122.56
7	I	249	ALY	CE-NZ-CH	4.94	130.15	122.56
8	M	257	ALY	OH-CH-CH3	-4.86	113.03	122.06
4	O	257	ALY	CD-CE-NZ	-4.74	98.65	112.21
1	N	46	ALY	CH3-CH-NZ	4.69	124.40	116.09
7	I	257	ALY	CD-CE-NZ	-4.54	99.23	112.21
6	H	257	ALY	OH-CH-CH3	-4.34	113.99	122.06
8	M	257	ALY	CG-CD-CE	4.33	134.08	113.56
6	H	46	ALY	CH3-CH-NZ	4.24	123.61	116.09
7	I	249	ALY	CD-CE-NZ	-4.24	100.09	112.21
4	F	257	ALY	OH-CH-CH3	-4.22	114.22	122.06
4	J	257	ALY	OH-CH-CH3	-4.21	114.24	122.06
4	J	257	ALY	CG-CD-CE	4.14	133.18	113.56
9	P	46	ALY	CH3-CH-NZ	3.76	122.76	116.09
7	I	257	ALY	OH-CH-CH3	-3.69	115.21	122.06
1	N	46	ALY	OH-CH-CH3	-3.58	115.41	122.06
1	A	46	ALY	CH3-CH-NZ	3.38	122.08	116.09
4	O	46	ALY	CH3-CH-NZ	3.29	121.92	116.09
1	K	46	ALY	CH3-CH-NZ	3.21	121.77	116.09
4	J	46	ALY	CH3-CH-NZ	3.20	121.76	116.09
7	I	257	ALY	OH-CH-NZ	3.15	130.62	121.74
4	F	46	ALY	CH3-CH-NZ	3.15	121.67	116.09
4	F	257	ALY	OH-CH-NZ	3.13	130.54	121.74
6	H	46	ALY	OH-CH-CH3	-3.12	116.27	122.06
4	O	257	ALY	OH-CH-CH3	-3.08	116.33	122.06
6	H	257	ALY	OH-CH-NZ	3.06	130.36	121.74
1	A	46	ALY	OH-CH-CH3	-2.99	116.51	122.06
5	G	46	ALY	CH3-CH-NZ	2.94	121.30	116.09
9	P	46	ALY	OH-CH-CH3	-2.91	116.64	122.06
3	E	46	ALY	CH3-CH-NZ	2.91	121.24	116.09
4	O	257	ALY	OH-CH-NZ	2.85	129.76	121.74
1	C	46	ALY	CH3-CH-NZ	2.84	121.12	116.09
4	O	257	ALY	CG-CD-CE	2.83	126.96	113.56
9	P	249	ALY	CH3-CH-NZ	2.83	121.10	116.09
7	I	257	ALY	CG-CD-CE	2.76	126.65	113.56
3	E	249	ALY	CH3-CH-NZ	2.75	120.96	116.09
7	I	46	ALY	CH3-CH-NZ	2.64	120.76	116.09
5	G	46	ALY	OH-CH-CH3	-2.61	117.20	122.06
4	F	46	ALY	OH-CH-CH3	-2.57	117.29	122.06
4	O	46	ALY	OH-CH-CH3	-2.55	117.32	122.06

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	46	ALY	CH3-CH-NZ	2.55	120.60	116.09
1	K	46	ALY	OH-CH-CH3	-2.47	117.47	122.06
1	C	46	ALY	OH-CH-CH3	-2.33	117.74	122.06
4	J	46	ALY	OH-CH-CH3	-2.32	117.75	122.06
6	H	150	SCY	OCD-CD-CE	-2.15	114.24	123.07
7	I	46	ALY	OH-CH-CH3	-2.08	118.20	122.06
7	I	249	ALY	OH-CH-CH3	-2.04	118.27	122.06
3	E	46	ALY	OH-CH-CH3	-2.03	118.29	122.06
1	B	46	ALY	OH-CH-CH3	-2.02	118.31	122.06

There are no chirality outliers.

All (88) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	F	257	ALY	C-CA-CB-CG
5	G	150	SCY	OCD-CD-SG-CB
5	G	150	SCY	CE-CD-SG-CB
6	H	150	SCY	OCD-CD-SG-CB
6	H	150	SCY	CE-CD-SG-CB
6	H	257	ALY	C-CA-CB-CG
9	P	150	SCY	CA-CB-SG-CD
9	P	150	SCY	OCD-CD-SG-CB
9	P	150	SCY	CE-CD-SG-CB
4	O	257	ALY	CG-CD-CE-NZ
3	E	46	ALY	CG-CD-CE-NZ
4	F	46	ALY	CG-CD-CE-NZ
5	G	46	ALY	CG-CD-CE-NZ
1	K	46	ALY	CG-CD-CE-NZ
4	O	46	ALY	CG-CD-CE-NZ
9	P	46	ALY	CG-CD-CE-NZ
1	B	46	ALY	CG-CD-CE-NZ
1	C	46	ALY	CG-CD-CE-NZ
3	E	249	ALY	CG-CD-CE-NZ
6	H	46	ALY	CG-CD-CE-NZ
7	I	257	ALY	CG-CD-CE-NZ
1	N	46	ALY	CG-CD-CE-NZ
9	P	249	ALY	CG-CD-CE-NZ
1	A	46	ALY	OH-CH-NZ-CE
1	A	46	ALY	CH3-CH-NZ-CE
1	B	46	ALY	OH-CH-NZ-CE
1	B	46	ALY	CH3-CH-NZ-CE
1	C	46	ALY	OH-CH-NZ-CE

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Mol	Chain	Res	Type	Atoms
1	C	46	ALY	CH3-CH-NZ-CE
3	E	46	ALY	OH-CH-NZ-CE
3	E	46	ALY	CH3-CH-NZ-CE
3	E	249	ALY	OH-CH-NZ-CE
3	E	249	ALY	CH3-CH-NZ-CE
4	F	46	ALY	OH-CH-NZ-CE
4	F	46	ALY	CH3-CH-NZ-CE
5	G	46	ALY	OH-CH-NZ-CE
5	G	46	ALY	CH3-CH-NZ-CE
6	H	46	ALY	OH-CH-NZ-CE
6	H	46	ALY	CH3-CH-NZ-CE
7	I	46	ALY	OH-CH-NZ-CE
7	I	46	ALY	CH3-CH-NZ-CE
7	I	249	ALY	OH-CH-NZ-CE
7	I	249	ALY	CH3-CH-NZ-CE
4	J	46	ALY	OH-CH-NZ-CE
4	J	46	ALY	CH3-CH-NZ-CE
4	J	257	ALY	OH-CH-NZ-CE
4	J	257	ALY	CH3-CH-NZ-CE
1	K	46	ALY	OH-CH-NZ-CE
1	K	46	ALY	CH3-CH-NZ-CE
8	M	257	ALY	OH-CH-NZ-CE
8	M	257	ALY	CH3-CH-NZ-CE
1	N	46	ALY	OH-CH-NZ-CE
1	N	46	ALY	CH3-CH-NZ-CE
4	O	46	ALY	OH-CH-NZ-CE
4	O	46	ALY	CH3-CH-NZ-CE
9	P	46	ALY	OH-CH-NZ-CE
9	P	46	ALY	CH3-CH-NZ-CE
9	P	249	ALY	OH-CH-NZ-CE
9	P	249	ALY	CH3-CH-NZ-CE
4	J	46	ALY	CG-CD-CE-NZ
1	A	46	ALY	CG-CD-CE-NZ
7	I	46	ALY	CG-CD-CE-NZ
4	F	257	ALY	CG-CD-CE-NZ
6	H	257	ALY	CG-CD-CE-NZ
6	H	257	ALY	CA-CB-CG-CD
4	F	257	ALY	CA-CB-CG-CD
1	C	46	ALY	CE-CD-CG-CB
3	E	46	ALY	CE-CD-CG-CB
4	F	46	ALY	CE-CD-CG-CB
5	G	46	ALY	CE-CD-CG-CB

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Mol	Chain	Res	Type	Atoms
1	K	46	ALY	CE-CD-CG-CB
4	O	46	ALY	CE-CD-CG-CB
1	B	46	ALY	CE-CD-CG-CB
4	J	46	ALY	CE-CD-CG-CB
1	N	46	ALY	CE-CD-CG-CB
6	H	46	ALY	CE-CD-CG-CB
1	A	46	ALY	CE-CD-CG-CB
7	I	46	ALY	CE-CD-CG-CB
9	P	46	ALY	CE-CD-CG-CB
7	I	249	ALY	CA-CB-CG-CD
4	F	257	ALY	CE-CD-CG-CB
6	H	257	ALY	CE-CD-CG-CB
4	F	257	ALY	N-CA-CB-CG
6	H	257	ALY	N-CA-CB-CG
7	I	257	ALY	CE-CD-CG-CB
9	P	249	ALY	CE-CD-CG-CB
3	E	249	ALY	CE-CD-CG-CB
4	O	257	ALY	CE-CD-CG-CB

There are no ring outliers.

18 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	46	ALY	1	0
4	J	46	ALY	1	0
9	P	46	ALY	1	0
7	I	46	ALY	1	0
1	B	46	ALY	1	0
4	F	257	ALY	1	0
6	H	46	ALY	1	0
9	P	150	SCY	5	0
4	F	46	ALY	1	0
1	N	46	ALY	1	0
5	G	46	ALY	1	0
4	O	46	ALY	1	0
7	I	257	ALY	1	0
3	E	46	ALY	1	0
1	A	46	ALY	1	0
1	K	46	ALY	1	0
4	O	257	ALY	1	0
6	H	257	ALY	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 94 ligands modelled in this entry, 61 are monoatomic - leaving 33 for Mogul analysis.

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
14	NAD	I	401	-	42,48,48	1.05	4 (9%)	50,73,73	1.14	4 (8%)
13	POP	A	409	-	6,8,8	0.87	0	13,13,13	1.91	4 (30%)
18	PG4	J	405	-	12,12,12	0.62	0	11,11,11	0.25	0
12	PO4	J	403	-	4,4,4	0.84	0	6,6,6	0.68	0
12	PO4	A	407	-	4,4,4	1.05	0	6,6,6	0.97	0
15	ACT	H	404	-	3,3,3	0.87	0	3,3,3	0.70	0
17	PEG	H	406	-	6,6,6	0.52	0	5,5,5	0.65	0
14	NAD	K	401	-	42,48,48	1.10	4 (9%)	50,73,73	1.43	8 (16%)
13	POP	G	406	-	6,8,8	1.10	0	13,13,13	0.94	0
13	POP	M	405	-	6,8,8	0.46	0	13,13,13	1.89	5 (38%)
12	PO4	D	409	-	4,4,4	1.19	0	6,6,6	0.59	0
12	PO4	L	402	-	4,4,4	0.76	0	6,6,6	0.66	0
13	POP	J	406	-	6,8,8	0.95	0	13,13,13	1.33	1 (7%)
13	POP	F	403	-	6,8,8	0.71	0	13,13,13	1.53	1 (7%)
14	NAD	D	401	-	42,48,48	1.02	3 (7%)	50,73,73	1.46	10 (20%)
12	PO4	D	408	-	4,4,4	1.49	1 (25%)	6,6,6	1.22	1 (16%)
12	PO4	H	403	-	4,4,4	0.92	0	6,6,6	0.81	0
12	PO4	J	404	-	4,4,4	1.03	0	6,6,6	0.56	0
12	PO4	I	405	-	4,4,4	0.94	0	6,6,6	0.80	0
16	PGE	H	405	-	9,9,9	0.71	0	8,8,8	0.37	0
12	PO4	P	405	-	4,4,4	1.09	0	6,6,6	0.98	0
12	PO4	E	408	-	4,4,4	0.40	0	6,6,6	1.07	1 (16%)
12	PO4	B	409	-	4,4,4	0.95	0	6,6,6	2.27	4 (66%)
14	NAD	O	401	-	42,48,48	0.85	2 (4%)	50,73,73	1.56	7 (14%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
14	NAD	E	401	-	42,48,48	0.96	2 (4%)	50,73,73	1.66	9 (18%)
19	UVW	M	404	-	6,7,7	1.50	1 (16%)	7,10,10	1.26	1 (14%)
12	PO4	P	404	-	4,4,4	0.67	0	6,6,6	0.87	0
12	PO4	A	408	-	4,4,4	0.61	0	6,6,6	0.85	0
14	NAD	C	401	-	42,48,48	1.39	6 (14%)	50,73,73	1.28	6 (12%)
12	PO4	A	406	-	4,4,4	0.48	0	6,6,6	1.89	1 (16%)
14	NAD	P	401	-	42,48,48	1.08	3 (7%)	50,73,73	1.38	6 (12%)
13	POP	B	410	-	6,8,8	0.77	0	13,13,13	1.42	2 (15%)
12	PO4	F	402	-	4,4,4	0.86	0	6,6,6	0.54	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
14	NAD	D	401	-	-	17/26/62/62	0/5/5/5
14	NAD	O	401	-	-	18/26/62/62	0/5/5/5
17	PEG	H	406	-	-	2/4/4/4	-
19	UVW	M	404	-	-	0/3/5/5	-
14	NAD	K	401	-	-	8/26/62/62	0/5/5/5
14	NAD	I	401	-	-	17/26/62/62	0/5/5/5
13	POP	G	406	-	-	0/6/6/6	-
13	POP	M	405	-	-	3/6/6/6	-
16	PGE	H	405	-	-	0/7/7/7	-
14	NAD	C	401	-	-	11/26/62/62	0/5/5/5
13	POP	A	409	-	-	3/6/6/6	-
18	PG4	J	405	-	-	5/10/10/10	-
14	NAD	P	401	-	-	18/26/62/62	0/5/5/5
13	POP	B	410	-	-	3/6/6/6	-
13	POP	J	406	-	-	1/6/6/6	-
14	NAD	E	401	-	-	11/26/62/62	0/5/5/5
13	POP	F	403	-	-	2/6/6/6	-

All (26) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	C	401	NAD	O4D-C1D	4.02	1.46	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	P	401	NAD	O4D-C1D	3.71	1.46	1.41
14	K	401	NAD	O4D-C1D	3.66	1.46	1.41
14	C	401	NAD	C2A-N3A	3.42	1.37	1.32
14	I	401	NAD	O4D-C1D	3.40	1.45	1.41
19	M	404	UVW	P-O2	3.40	1.64	1.59
14	C	401	NAD	O4B-C1B	3.13	1.45	1.41
14	C	401	NAD	C5A-C4A	3.12	1.49	1.40
14	D	401	NAD	O4B-C1B	2.82	1.45	1.41
12	D	408	PO4	P-O1	2.78	1.57	1.50
14	O	401	NAD	O4D-C1D	2.63	1.44	1.41
14	P	401	NAD	C5A-C4A	2.59	1.47	1.40
14	O	401	NAD	O4B-C1B	2.56	1.44	1.41
14	D	401	NAD	C5A-C4A	2.54	1.47	1.40
14	C	401	NAD	C6A-C5A	2.52	1.52	1.43
14	I	401	NAD	C5A-C4A	2.50	1.47	1.40
14	K	401	NAD	C5A-C4A	2.46	1.47	1.40
14	D	401	NAD	O4D-C1D	2.34	1.44	1.41
14	P	401	NAD	O4B-C1B	2.29	1.44	1.41
14	E	401	NAD	C5A-C4A	2.29	1.47	1.40
14	I	401	NAD	C2A-N3A	2.27	1.35	1.32
14	C	401	NAD	C3N-C7N	2.14	1.53	1.50
14	I	401	NAD	O4B-C1B	2.12	1.44	1.41
14	K	401	NAD	C2A-N3A	2.11	1.35	1.32
14	E	401	NAD	C2D-C1D	-2.02	1.50	1.53
14	K	401	NAD	O4B-C1B	2.01	1.43	1.41

All (71) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	E	401	NAD	PN-O3-PA	-5.40	114.30	132.83
14	D	401	NAD	PN-O3-PA	-4.28	118.12	132.83
14	O	401	NAD	N3A-C2A-N1A	-4.27	122.01	128.68
14	C	401	NAD	C4A-C5A-N7A	-4.17	105.06	109.40
14	E	401	NAD	N3A-C2A-N1A	-4.14	122.21	128.68
14	D	401	NAD	N3A-C2A-N1A	-4.05	122.36	128.68
13	A	409	POP	P2-O-P1	-3.98	119.16	132.83
14	O	401	NAD	C4A-C5A-N7A	-3.93	105.31	109.40
14	P	401	NAD	N3A-C2A-N1A	-3.90	122.58	128.68
14	E	401	NAD	C3N-C7N-N7N	-3.71	113.30	117.75
13	M	405	POP	P2-O-P1	-3.66	120.28	132.83
14	O	401	NAD	PN-O3-PA	-3.62	120.41	132.83
14	O	401	NAD	C3D-C2D-C1D	3.61	106.42	100.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	I	401	NAD	PN-O3-PA	-3.61	120.42	132.83
12	A	406	PO4	O4-P-O2	3.58	119.45	107.97
14	K	401	NAD	C4A-C5A-N7A	-3.53	105.72	109.40
13	M	405	POP	O6-P2-O5	3.53	121.11	107.64
12	B	409	PO4	O4-P-O1	3.35	123.15	110.89
14	I	401	NAD	N3A-C2A-N1A	-3.30	123.52	128.68
14	K	401	NAD	PN-O3-PA	-3.22	121.79	132.83
14	C	401	NAD	N3A-C2A-N1A	-3.05	123.92	128.68
14	K	401	NAD	N3A-C2A-N1A	-3.00	123.99	128.68
14	K	401	NAD	C6N-N1N-C2N	-2.97	119.27	121.97
14	E	401	NAD	C4A-C5A-N7A	-2.92	106.35	109.40
13	F	403	POP	P2-O-P1	-2.90	122.87	132.83
14	E	401	NAD	C3D-C2D-C1D	2.84	105.26	100.98
14	I	401	NAD	C4A-C5A-N7A	-2.82	106.46	109.40
12	B	409	PO4	O3-P-O2	2.81	116.99	107.97
14	C	401	NAD	O2N-PN-O1N	2.77	125.93	112.24
13	A	409	POP	O-P2-O4	-2.75	95.95	111.19
13	B	410	POP	O6-P2-O5	2.65	117.77	107.64
14	D	401	NAD	O2N-PN-O1N	2.61	125.12	112.24
14	P	401	NAD	C2N-C3N-C4N	2.56	121.16	118.26
13	A	409	POP	O6-P2-O4	2.49	120.43	110.68
14	K	401	NAD	C3B-C2B-C1B	2.49	104.72	100.98
12	B	409	PO4	O4-P-O2	-2.48	100.01	107.97
14	D	401	NAD	C2B-C3B-C4B	2.47	107.44	102.64
14	E	401	NAD	O2N-PN-O1N	2.47	124.45	112.24
13	A	409	POP	O3-P1-O2	2.44	116.96	107.64
14	C	401	NAD	C6N-N1N-C2N	-2.44	119.75	121.97
14	P	401	NAD	C2A-N1A-C6A	2.43	122.92	118.75
14	D	401	NAD	C3B-C2B-C1B	2.40	104.59	100.98
14	P	401	NAD	C3B-C2B-C1B	2.38	104.56	100.98
14	C	401	NAD	C3B-C2B-C1B	2.33	104.48	100.98
13	J	406	POP	O6-P2-O5	2.30	116.41	107.64
19	M	404	UVW	O2-P-O1P	-2.29	101.17	109.32
14	P	401	NAD	C6N-N1N-C2N	-2.28	119.90	121.97
14	D	401	NAD	C3N-C7N-N7N	2.25	120.45	117.75
13	M	405	POP	O2-P1-O1	2.24	119.47	110.68
12	B	409	PO4	O3-P-O1	-2.24	102.69	110.89
14	E	401	NAD	C2N-C3N-C4N	2.23	120.79	118.26
14	K	401	NAD	O2N-PN-O1N	2.23	123.24	112.24
13	M	405	POP	O-P1-O1	-2.21	98.91	111.19
13	B	410	POP	O3-P1-O1	2.21	119.33	110.68
14	C	401	NAD	C2N-N1N-C1D	2.18	123.98	119.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	O	401	NAD	C6N-N1N-C2N	-2.15	120.02	121.97
12	E	408	PO4	O4-P-O1	-2.15	103.04	110.89
14	K	401	NAD	O4D-C1D-C2D	-2.14	103.79	106.93
14	O	401	NAD	C2A-N1A-C6A	2.12	122.38	118.75
14	E	401	NAD	C3N-C2N-N1N	-2.11	118.36	120.43
14	D	401	NAD	C4A-C5A-N7A	-2.11	107.20	109.40
14	K	401	NAD	C5N-C4N-C3N	-2.11	117.85	120.34
14	D	401	NAD	O7N-C7N-N7N	-2.09	119.60	122.58
14	E	401	NAD	C2A-N1A-C6A	2.09	122.33	118.75
14	D	401	NAD	O3D-C3D-C2D	-2.07	105.12	111.82
12	D	408	PO4	O4-P-O1	-2.07	103.32	110.89
14	D	401	NAD	C2A-N1A-C6A	2.07	122.29	118.75
14	P	401	NAD	O2N-PN-O1N	2.07	122.47	112.24
14	I	401	NAD	O3D-C3D-C2D	-2.07	105.14	111.82
13	M	405	POP	O-P2-O4	-2.07	99.73	111.19
14	O	401	NAD	C3N-C2N-N1N	2.02	122.40	120.43

There are no chirality outliers.

All (119) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
13	A	409	POP	P2-O-P1-O2
13	B	410	POP	P1-O-P2-O5
13	F	403	POP	P2-O-P1-O3
13	M	405	POP	P2-O-P1-O2
13	M	405	POP	P1-O-P2-O6
14	C	401	NAD	C5B-O5B-PA-O1A
14	C	401	NAD	O4B-C4B-C5B-O5B
14	C	401	NAD	O4D-C1D-N1N-C2N
14	C	401	NAD	O4D-C1D-N1N-C6N
14	D	401	NAD	C5B-O5B-PA-O1A
14	D	401	NAD	O4B-C4B-C5B-O5B
14	D	401	NAD	C3B-C4B-C5B-O5B
14	D	401	NAD	C5D-O5D-PN-O1N
14	D	401	NAD	C5D-O5D-PN-O2N
14	D	401	NAD	O4D-C1D-N1N-C2N
14	E	401	NAD	C5B-O5B-PA-O1A
14	E	401	NAD	C5B-O5B-PA-O2A
14	E	401	NAD	O4B-C4B-C5B-O5B
14	E	401	NAD	C3B-C4B-C5B-O5B
14	E	401	NAD	C5D-O5D-PN-O1N
14	E	401	NAD	O4D-C4D-C5D-O5D

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Mol	Chain	Res	Type	Atoms
14	E	401	NAD	O4D-C1D-N1N-C2N
14	I	401	NAD	C5B-O5B-PA-O1A
14	I	401	NAD	C5D-O5D-PN-O3
14	I	401	NAD	O4D-C4D-C5D-O5D
14	I	401	NAD	C3D-C4D-C5D-O5D
14	I	401	NAD	O4D-C1D-N1N-C2N
14	K	401	NAD	C5B-O5B-PA-O2A
14	K	401	NAD	C5B-O5B-PA-O3
14	K	401	NAD	O4D-C1D-N1N-C2N
14	O	401	NAD	C5B-O5B-PA-O1A
14	O	401	NAD	O4D-C1D-N1N-C2N
14	O	401	NAD	O4D-C1D-N1N-C6N
14	O	401	NAD	C2D-C1D-N1N-C2N
14	O	401	NAD	C2D-C1D-N1N-C6N
14	O	401	NAD	C2N-C3N-C7N-O7N
14	O	401	NAD	C2N-C3N-C7N-N7N
14	O	401	NAD	C4N-C3N-C7N-N7N
14	P	401	NAD	C5B-O5B-PA-O2A
14	P	401	NAD	C5B-O5B-PA-O3
14	P	401	NAD	C5D-O5D-PN-O1N
14	P	401	NAD	C5D-O5D-PN-O2N
14	P	401	NAD	O4D-C1D-N1N-C2N
14	P	401	NAD	O4D-C1D-N1N-C6N
14	P	401	NAD	C2D-C1D-N1N-C2N
14	P	401	NAD	C2D-C1D-N1N-C6N
14	P	401	NAD	C2N-C3N-C7N-O7N
14	P	401	NAD	C2N-C3N-C7N-N7N
14	P	401	NAD	C4N-C3N-C7N-O7N
14	P	401	NAD	C4N-C3N-C7N-N7N
14	O	401	NAD	C4N-C3N-C7N-O7N
17	H	406	PEG	C4-C3-O2-C2
14	I	401	NAD	O4B-C4B-C5B-O5B
14	I	401	NAD	C3B-C4B-C5B-O5B
14	O	401	NAD	O4B-C4B-C5B-O5B
14	O	401	NAD	C3B-C4B-C5B-O5B
14	O	401	NAD	O4D-C4D-C5D-O5D
14	P	401	NAD	O4B-C4B-C5B-O5B
14	P	401	NAD	C3B-C4B-C5B-O5B
18	J	405	PG4	O3-C5-C6-O4
14	C	401	NAD	C2N-C3N-C7N-O7N
14	C	401	NAD	C2N-C3N-C7N-N7N
14	D	401	NAD	C2N-C3N-C7N-O7N

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Mol	Chain	Res	Type	Atoms
14	C	401	NAD	C4N-C3N-C7N-O7N
14	C	401	NAD	C4N-C3N-C7N-N7N
14	C	401	NAD	C3B-C4B-C5B-O5B
14	E	401	NAD	C3D-C4D-C5D-O5D
14	O	401	NAD	C3D-C4D-C5D-O5D
18	J	405	PG4	O1-C1-C2-O2
14	D	401	NAD	C4N-C3N-C7N-O7N
14	D	401	NAD	C4N-C3N-C7N-N7N
14	D	401	NAD	C2N-C3N-C7N-N7N
13	J	406	POP	P2-O-P1-O1
14	P	401	NAD	PN-O3-PA-O1A
14	P	401	NAD	C4B-C5B-O5B-PA
14	D	401	NAD	PN-O3-PA-O5B
14	O	401	NAD	PN-O3-PA-O5B
18	J	405	PG4	O4-C7-C8-O5
14	C	401	NAD	C5B-O5B-PA-O3
14	O	401	NAD	C5B-O5B-PA-O3
14	D	401	NAD	PA-O3-PN-O1N
14	D	401	NAD	PA-O3-PN-O2N
14	I	401	NAD	PA-O3-PN-O2N
14	K	401	NAD	PA-O3-PN-O1N
14	C	401	NAD	C5B-O5B-PA-O2A
14	D	401	NAD	C5B-O5B-PA-O2A
14	I	401	NAD	C5B-O5B-PA-O2A
14	I	401	NAD	C5D-O5D-PN-O1N
14	I	401	NAD	C5D-O5D-PN-O2N
14	K	401	NAD	C5B-O5B-PA-O1A
14	O	401	NAD	C5B-O5B-PA-O2A
14	I	401	NAD	C4N-C3N-C7N-O7N
14	E	401	NAD	PA-O3-PN-O2N
14	I	401	NAD	C2N-C3N-C7N-O7N
17	H	406	PEG	O2-C3-C4-O4
14	D	401	NAD	C4B-C5B-O5B-PA
14	K	401	NAD	O4D-C4D-C5D-O5D
13	M	405	POP	P2-O-P1-O1
14	E	401	NAD	PA-O3-PN-O1N
14	O	401	NAD	PA-O3-PN-O2N
14	P	401	NAD	PN-O3-PA-O5B
14	O	401	NAD	C4D-C5D-O5D-PN
14	I	401	NAD	C4N-C3N-C7N-N7N
18	J	405	PG4	C6-C5-O3-C4
14	K	401	NAD	O4B-C4B-C5B-O5B

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Mol	Chain	Res	Type	Atoms
14	I	401	NAD	C2N-C3N-C7N-N7N
13	A	409	POP	P2-O-P1-O3
13	A	409	POP	P1-O-P2-O6
13	B	410	POP	P1-O-P2-O6
13	F	403	POP	P1-O-P2-O5
14	D	401	NAD	C5B-O5B-PA-O3
14	D	401	NAD	C5D-O5D-PN-O3
14	E	401	NAD	C5B-O5B-PA-O3
14	I	401	NAD	C5B-O5B-PA-O3
14	P	401	NAD	C5D-O5D-PN-O3
14	I	401	NAD	PA-O3-PN-O1N
14	K	401	NAD	PA-O3-PN-O2N
13	B	410	POP	P1-O-P2-O4
18	J	405	PG4	O2-C3-C4-O3

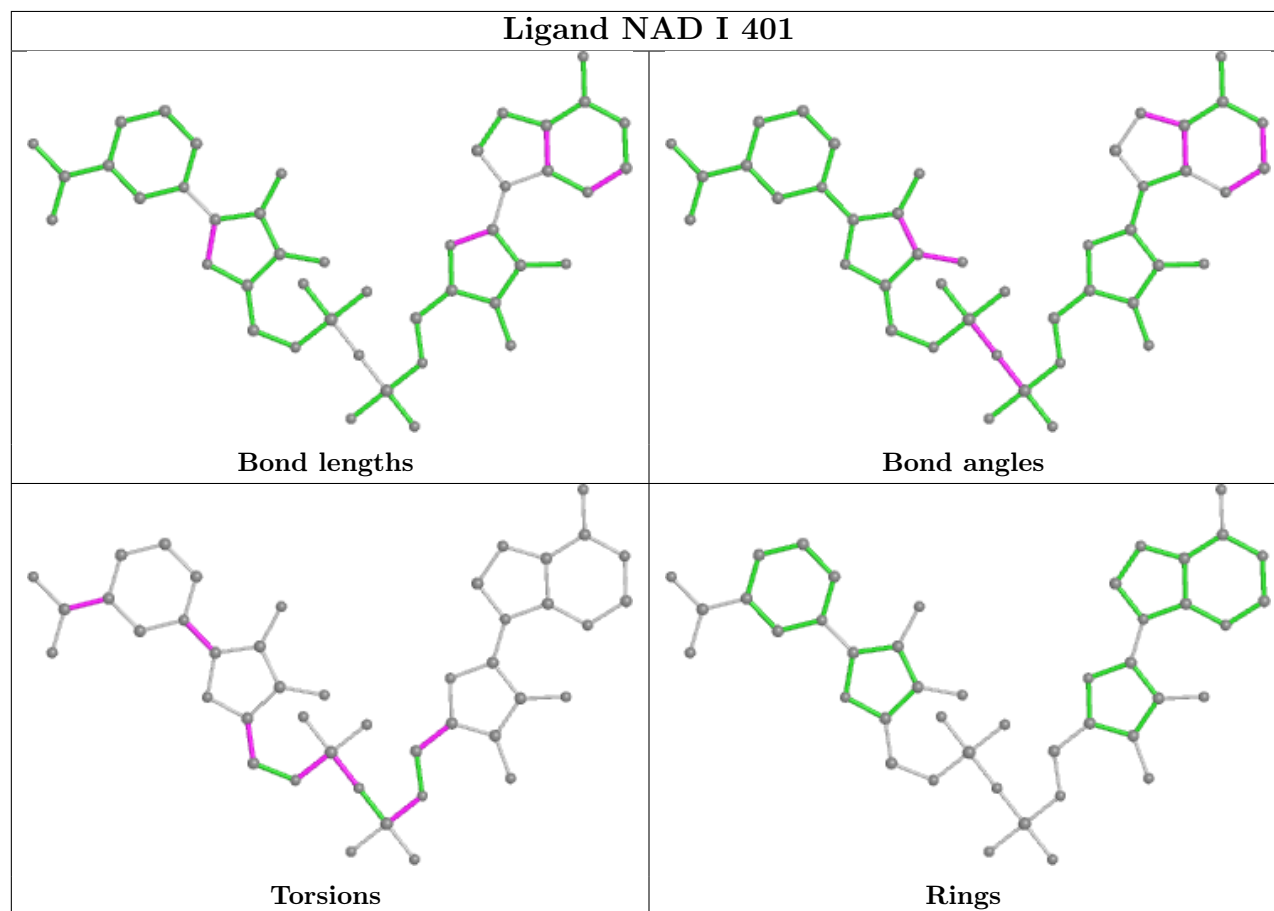
There are no ring outliers.

15 monomers are involved in 33 short contacts:

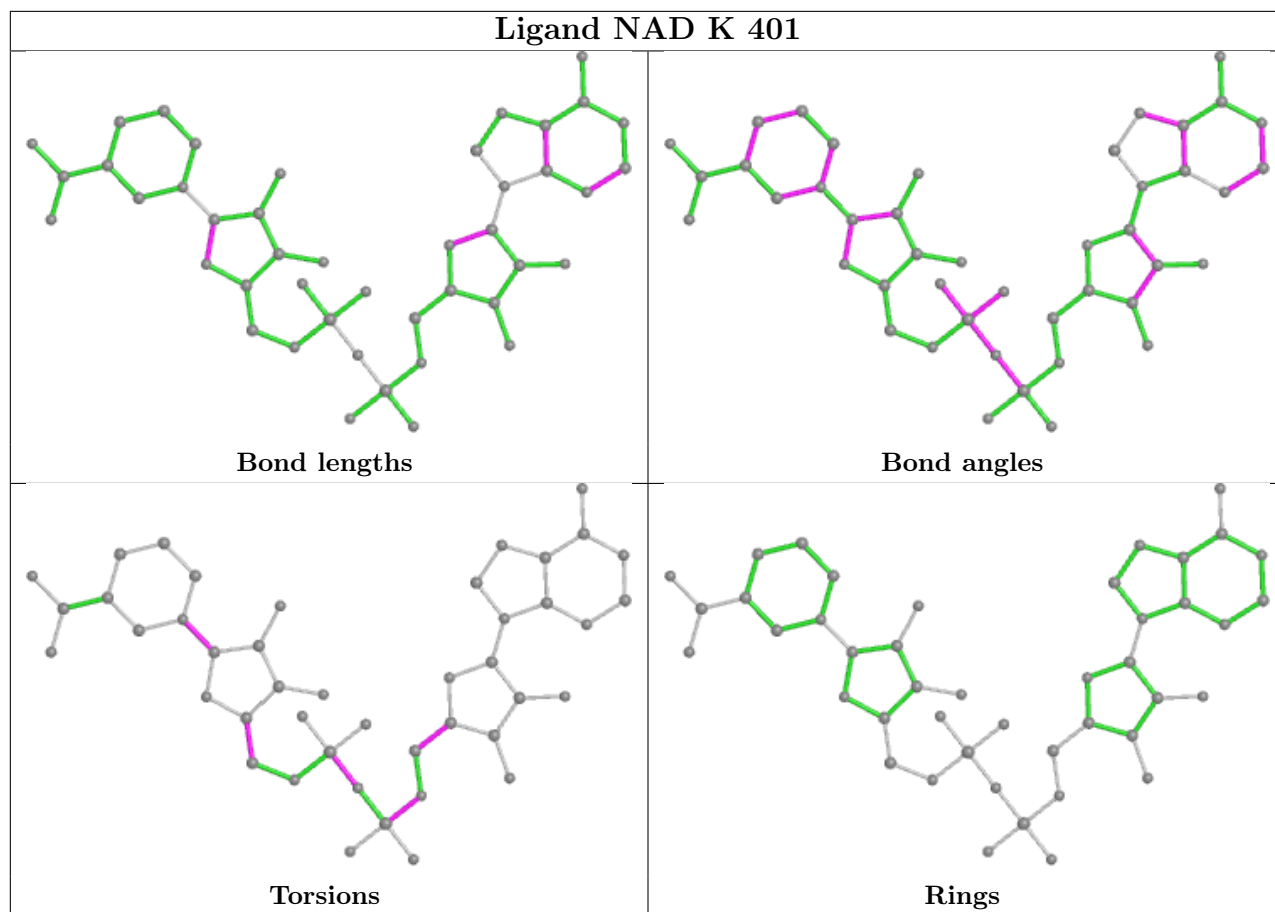
Mol	Chain	Res	Type	Clashes	Symm-Clashes
13	A	409	POP	2	0
12	A	407	PO4	2	0
14	K	401	NAD	5	0
13	G	406	POP	1	0
13	M	405	POP	1	0
12	D	409	PO4	1	0
13	J	406	POP	1	0
13	F	403	POP	1	0
14	D	401	NAD	3	0
12	D	408	PO4	1	0
14	O	401	NAD	6	0
14	E	401	NAD	1	0
14	C	401	NAD	4	0
14	P	401	NAD	2	0
13	B	410	POP	2	0

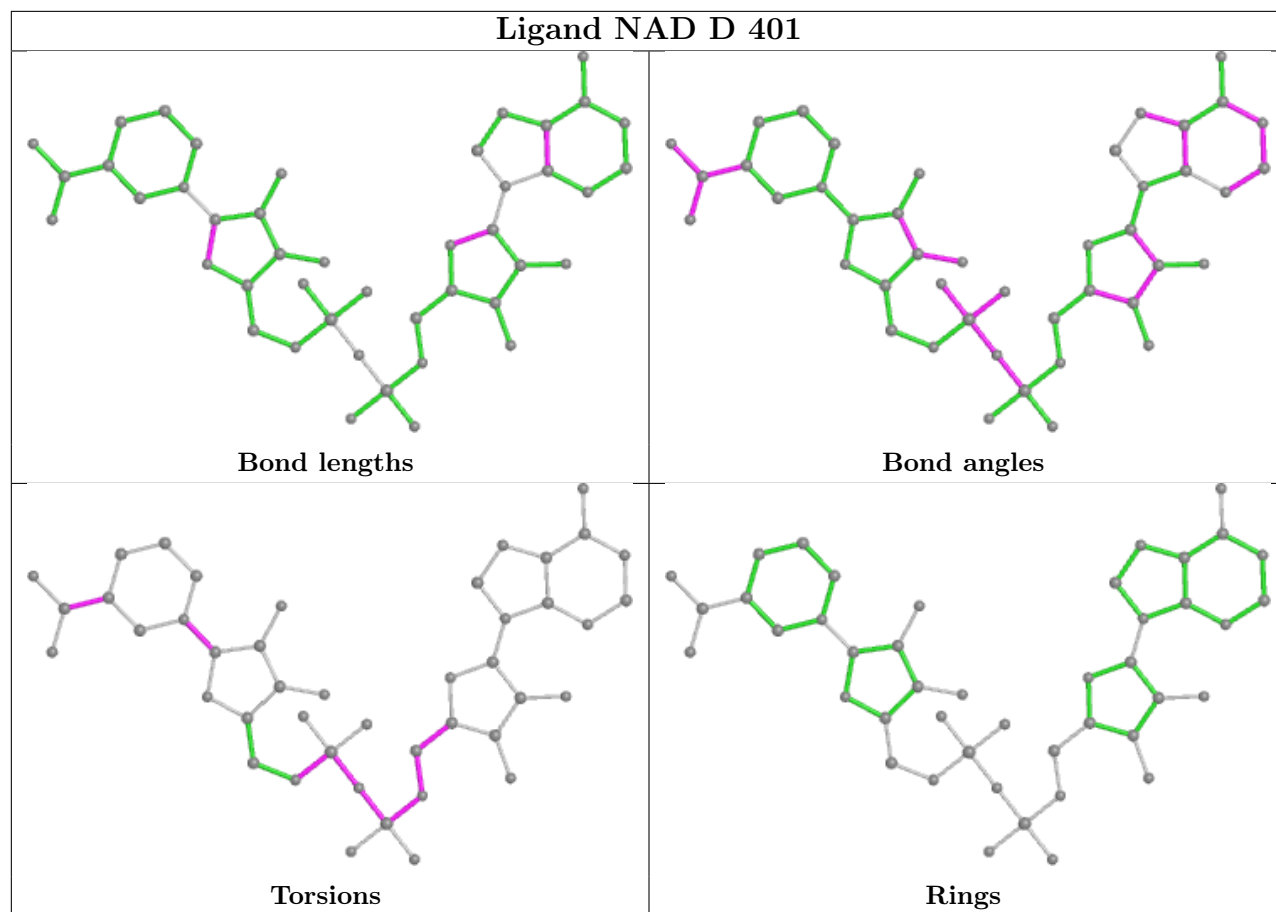
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring

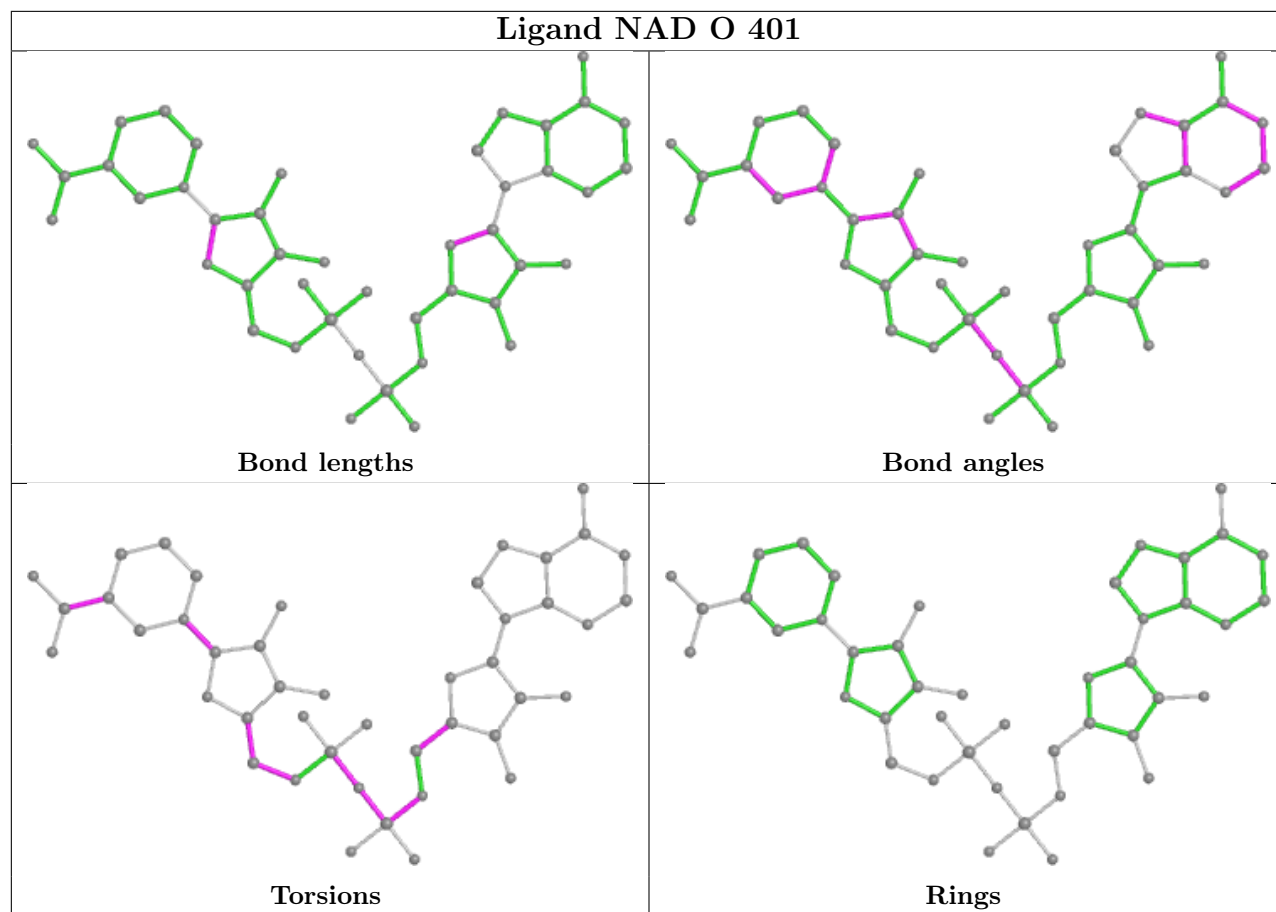
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

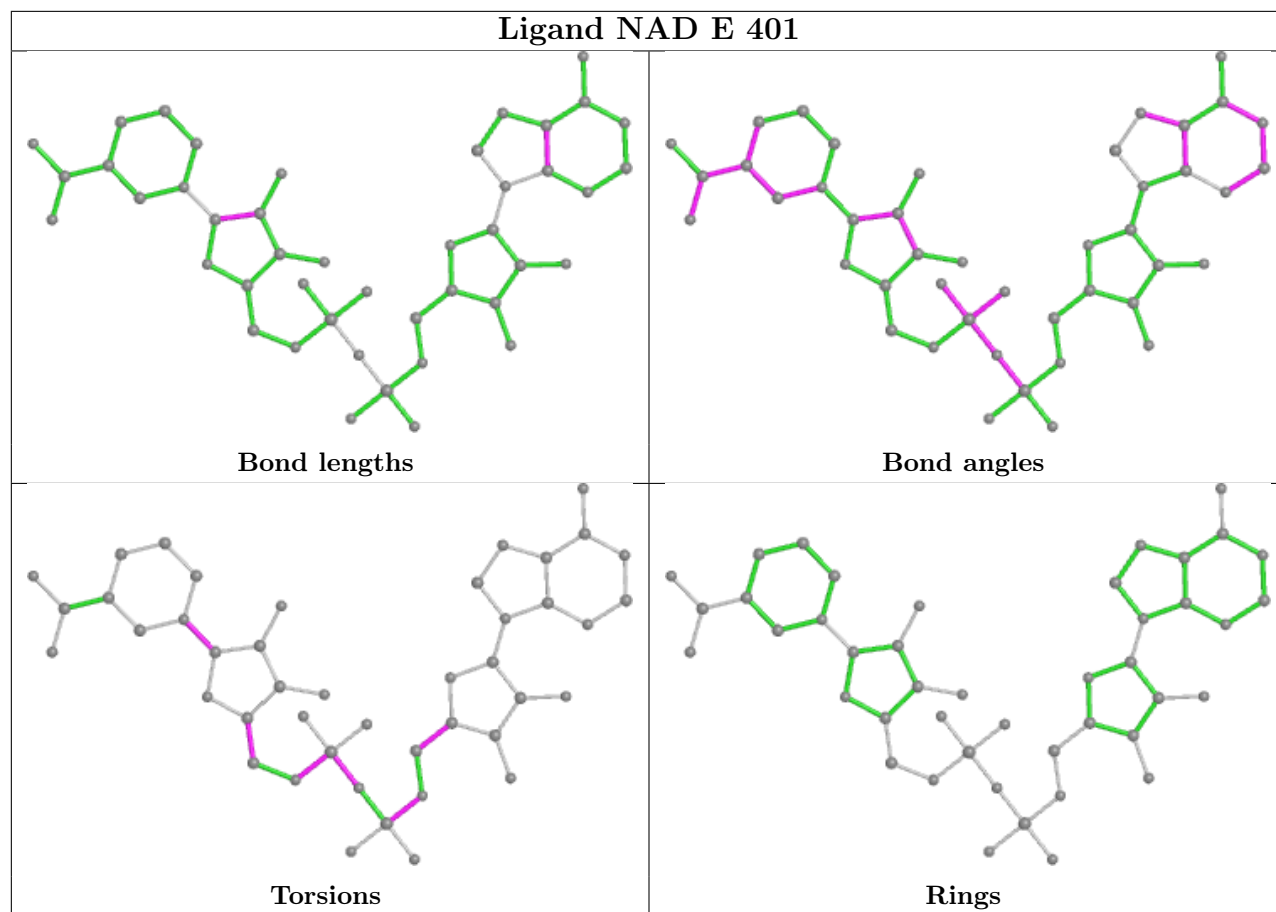


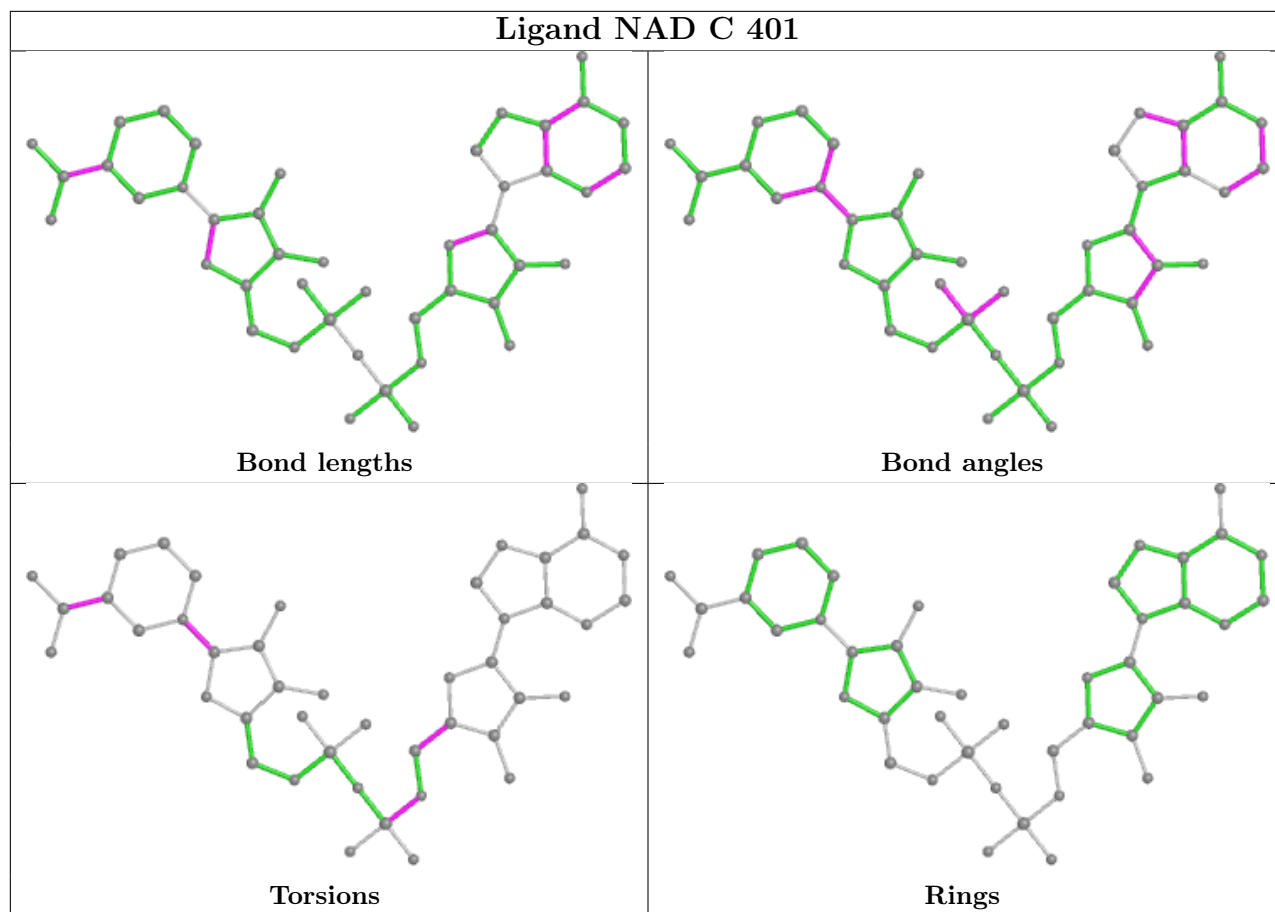


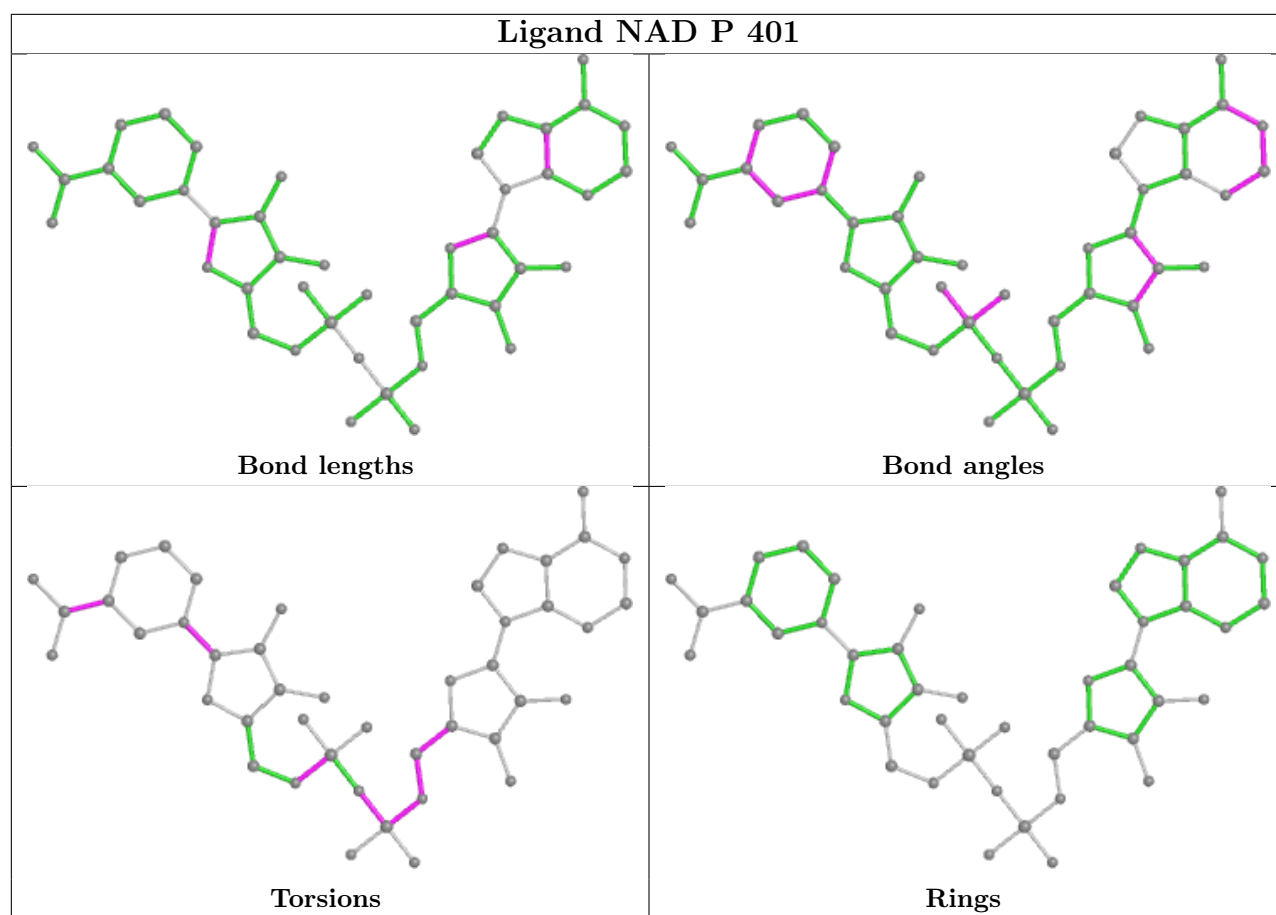












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	330/355 (92%)	-0.40	3 (0%) 84 84	35, 59, 92, 123	0
1	B	331/355 (93%)	-0.45	3 (0%) 84 84	36, 58, 93, 134	0
1	C	330/355 (92%)	-0.52	2 (0%) 89 89	30, 47, 80, 126	0
1	K	330/355 (92%)	-0.42	5 (1%) 73 72	34, 59, 93, 116	0
1	N	330/355 (92%)	0.17	16 (4%) 30 26	54, 97, 150, 182	0
2	D	331/355 (93%)	-0.29	3 (0%) 84 84	27, 65, 97, 153	1 (0%)
2	L	331/355 (93%)	0.06	14 (4%) 36 31	43, 97, 163, 193	0
3	E	329/355 (92%)	-0.36	10 (3%) 50 45	39, 62, 115, 160	0
4	F	329/355 (92%)	0.08	14 (4%) 35 30	45, 86, 124, 159	0
4	J	328/355 (92%)	-0.26	2 (0%) 89 89	35, 80, 126, 158	0
4	O	329/355 (92%)	-0.31	3 (0%) 84 84	42, 66, 106, 126	0
5	G	329/355 (92%)	-0.38	3 (0%) 84 84	40, 63, 102, 133	0
6	H	328/355 (92%)	-0.29	3 (0%) 84 84	43, 70, 102, 134	0
7	I	327/355 (92%)	-0.26	3 (0%) 84 84	34, 80, 123, 158	0
8	M	330/355 (92%)	-0.42	1 (0%) 94 94	40, 59, 98, 129	0
9	P	327/355 (92%)	-0.16	9 (2%) 53 48	45, 83, 123, 159	0
All	All	5269/5680 (92%)	-0.26	94 (1%) 68 66	27, 69, 124, 193	1 (0%)

All (94) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	E	62	ASP	6.1
9	P	82	ASN	5.9
1	N	124	LYS	4.8
1	K	191[A]	HIS	4.5
1	N	2	THR	4.4

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Mol	Chain	Res	Type	RSRZ
1	B	0	ALA	4.3
4	F	139	TYR	4.0
3	E	61	LYS	3.8
3	E	1	MET	3.7
1	N	1	MET	3.7
5	G	59	GLU	3.7
1	B	1	MET	3.6
4	F	213	LYS	3.5
2	L	68	ASN	3.4
4	O	1	MET	3.3
1	N	62	ASP	3.2
3	E	70	LYS	3.2
1	N	115	LYS	3.2
2	L	26	ASP	3.2
3	E	69	GLY	3.1
4	F	308	LEU	3.1
9	P	84	LYS	3.1
4	O	174	THR	3.1
6	H	331	LYS	3.0
2	L	150	CYS	3.0
4	J	331	LYS	3.0
2	L	1	MET	2.9
2	L	67	VAL	2.9
1	K	69	GLY	2.8
7	I	23	LYS	2.8
9	P	331	LYS	2.7
1	A	1	MET	2.7
2	L	27	ILE	2.6
2	L	123	SER	2.6
3	E	25	SER	2.6
2	D	1	MET	2.6
4	F	267	GLU	2.6
4	F	69	GLY	2.5
9	P	267	GLU	2.5
2	L	267	GLU	2.5
2	L	3	ILE	2.5
3	E	86	ASP	2.5
6	H	1	MET	2.5
4	F	118	VAL	2.4
1	K	1	MET	2.4
4	F	137[A]	ASP	2.4
1	N	322	VAL	2.4

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Mol	Chain	Res	Type	RSRZ
2	D	331	LYS	2.4
3	E	331	LYS	2.4
7	I	331	LYS	2.4
9	P	2	THR	2.3
4	F	99	LEU	2.3
1	K	59	GLU	2.3
2	D	317	GLY	2.3
2	L	137	ASP	2.3
9	P	191[A]	HIS	2.3
4	F	150	CYS	2.3
1	N	101	LEU	2.3
1	C	62	ASP	2.3
1	N	129	MET	2.3
6	H	13	ILE	2.3
3	E	94	ALA	2.3
5	G	144	ILE	2.3
9	P	253	TYR	2.3
1	N	290	THR	2.2
8	M	150	CYS	2.2
1	N	216	GLY	2.2
9	P	104	GLU	2.2
1	K	190	SER	2.2
9	P	83	LEU	2.2
2	L	60	VAL	2.2
1	A	174	THR	2.2
1	C	137	ASP	2.2
1	N	319	SER	2.2
2	L	124	LYS	2.2
3	E	87	GLU	2.2
1	N	35	LEU	2.2
4	F	94	ALA	2.2
2	L	59	GLU	2.2
4	O	62	ASP	2.2
1	B	150	CYS	2.2
1	N	119	MET	2.1
4	F	9	GLY	2.1
1	N	185	THR	2.1
4	F	264	ALA	2.1
5	G	191[A]	HIS	2.1
1	A	62	ASP	2.1
4	F	331	LYS	2.1
1	N	116	LYS	2.0

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Mol	Chain	Res	Type	RSRZ
1	N	123	SER	2.0
7	I	330	SER	2.0
4	J	242	ASP	2.0
4	F	104	GLU	2.0
2	L	244	THR	2.0

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

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	ALY	J	257	12/13	0.88	0.17	88,97,100,100	0
9	ALY	P	249	12/13	0.88	0.33	98,125,137,140	0
1	ALY	N	46	12/13	0.90	0.23	59,65,74,75	0
4	ALY	F	257	12/13	0.92	0.17	56,79,84,84	0
6	SCY	H	150	9/10	0.92	0.38	58,73,109,115	0
7	ALY	I	249	12/13	0.92	0.25	107,139,150,153	0
3	ALY	E	249	12/13	0.93	0.25	60,78,121,128	0
1	ALY	K	46	12/13	0.93	0.24	54,62,68,71	0
6	ALY	H	257	12/13	0.93	0.20	70,75,80,85	0
9	SCY	P	150	9/10	0.93	0.23	68,81,91,105	0
5	ALY	G	46	12/13	0.93	0.16	56,63,75,75	0
8	ALY	M	257	12/13	0.94	0.16	55,61,82,86	0
7	ALY	I	257	12/13	0.94	0.19	80,94,97,97	0
4	ALY	O	46	12/13	0.94	0.19	63,70,90,91	0
4	ALY	O	257	12/13	0.94	0.23	61,67,88,91	0
7	ALY	I	46	12/13	0.94	0.19	49,59,62,63	0
5	SCY	G	150	9/10	0.94	0.30	52,58,94,96	0
1	ALY	A	46	12/13	0.95	0.14	55,60,66,67	0
6	ALY	H	46	12/13	0.95	0.19	41,48,56,58	0
4	ALY	F	46	12/13	0.95	0.13	58,66,79,79	0
9	ALY	P	46	12/13	0.95	0.24	46,51,60,66	0
1	ALY	C	46	12/13	0.95	0.16	35,42,49,52	0
3	ALY	E	46	12/13	0.95	0.23	53,65,80,84	0
4	ALY	J	46	12/13	0.96	0.13	35,49,57,60	0
1	ALY	B	46	12/13	0.96	0.17	34,39,55,60	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
15	ACT	H	404	4/4	0.66	0.37	65,67,79,80	4
10	NA	N	401	1/1	0.71	0.09	89,89,89,89	0
10	NA	G	401	1/1	0.73	0.11	78,78,78,78	0
12	PO4	J	404	5/5	0.75	0.23	40,42,49,65	5
12	PO4	F	402	5/5	0.75	0.28	49,52,67,76	5
12	PO4	A	408	5/5	0.77	0.31	45,48,51,75	5
11	CL	C	407	1/1	0.78	0.28	54,54,54,54	1
12	PO4	H	403	5/5	0.79	0.19	53,56,60,80	5
12	PO4	P	405	5/5	0.81	0.22	45,52,58,76	5
10	NA	E	402	1/1	0.81	0.16	79,79,79,79	0
11	CL	A	404	1/1	0.82	0.28	91,91,91,91	0
14	NAD	K	401	44/44	0.82	0.34	38,53,63,66	44
11	CL	K	407	1/1	0.82	0.15	38,38,38,38	1
16	PGE	H	405	10/10	0.82	0.45	77,98,114,121	0
13	POP	G	406	9/9	0.83	0.51	37,49,59,68	9
11	CL	B	405	1/1	0.83	0.16	82,82,82,82	0
12	PO4	P	404	5/5	0.83	0.41	43,45,46,69	5
11	CL	D	404	1/1	0.83	0.20	70,70,70,70	0
18	PG4	J	405	13/13	0.83	0.30	79,101,107,118	0
12	PO4	E	408	5/5	0.84	0.17	49,68,77,104	5
14	NAD	C	401	44/44	0.84	0.27	52,86,101,113	0
11	CL	K	408	1/1	0.84	0.11	86,86,86,86	0
14	NAD	O	401	44/44	0.85	0.37	34,58,85,88	44
13	POP	J	406	9/9	0.85	0.30	28,40,44,48	9
12	PO4	I	405	5/5	0.85	0.15	32,39,46,66	5
12	PO4	J	403	5/5	0.85	0.15	52,58,65,92	5
19	UVW	M	404	8/8	0.85	0.23	83,101,127,139	0
14	NAD	D	401	44/44	0.86	0.34	40,56,69,76	44
13	POP	B	410	9/9	0.87	0.27	54,91,117,118	0
14	NAD	E	401	44/44	0.87	0.43	38,55,72,83	44
13	POP	M	405	9/9	0.87	0.35	30,41,54,56	9
13	POP	A	409	9/9	0.87	0.30	31,41,46,47	9

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
11	CL	C	405	1/1	0.88	0.14	70,70,70,70	0
10	NA	M	401	1/1	0.88	0.10	85,85,85,85	0
14	NAD	P	401	44/44	0.88	0.34	34,51,58,62	44
12	PO4	A	406	5/5	0.88	0.15	62,75,83,121	0
10	NA	I	402	1/1	0.88	0.08	91,91,91,91	0
11	CL	G	402	1/1	0.88	0.26	87,87,87,87	0
14	NAD	I	401	44/44	0.88	0.39	32,49,62,69	44
11	CL	D	407	1/1	0.89	0.08	66,66,66,66	0
11	CL	A	402	1/1	0.89	0.14	66,66,66,66	0
11	CL	A	405	1/1	0.90	0.22	70,70,70,70	0
11	CL	J	402	1/1	0.90	0.13	69,69,69,69	0
11	CL	D	406	1/1	0.91	0.12	71,71,71,71	0
10	NA	H	401	1/1	0.91	0.15	69,69,69,69	0
11	CL	L	401	1/1	0.91	0.12	53,53,53,53	0
11	CL	M	402	1/1	0.91	0.08	57,57,57,57	0
12	PO4	L	402	5/5	0.91	0.12	44,53,61,73	5
11	CL	O	403	1/1	0.91	0.09	61,61,61,61	0
11	CL	B	407	1/1	0.91	0.27	81,81,81,81	0
11	CL	G	403	1/1	0.91	0.09	74,74,74,74	0
12	PO4	B	409	5/5	0.91	0.22	27,34,38,38	5
13	POP	F	403	9/9	0.91	0.46	41,57,65,74	9
17	PEG	H	406	7/7	0.91	0.20	80,97,114,116	0
11	CL	J	401	1/1	0.91	0.09	67,67,67,67	0
11	CL	B	408	1/1	0.91	0.12	67,67,67,67	0
10	NA	A	401	1/1	0.92	0.11	54,54,54,54	0
11	CL	H	402	1/1	0.92	0.26	76,76,76,76	0
10	NA	D	402	1/1	0.92	0.11	65,65,65,65	0
11	CL	I	403	1/1	0.93	0.08	88,88,88,88	0
10	NA	C	402	1/1	0.93	0.11	67,67,67,67	0
12	PO4	D	408	5/5	0.93	0.47	24,24,34,51	5
11	CL	P	403	1/1	0.93	0.09	59,59,59,59	0
11	CL	D	403	1/1	0.93	0.10	71,71,71,71	0
10	NA	B	401	1/1	0.94	0.08	53,53,53,53	0
12	PO4	D	409	5/5	0.95	0.52	62,75,97,102	0
11	CL	K	406	1/1	0.95	0.07	70,70,70,70	0
11	CL	E	403	1/1	0.95	0.09	60,60,60,60	0
11	CL	F	401	1/1	0.95	0.12	79,79,79,79	0
10	NA	K	402	1/1	0.95	0.07	59,59,59,59	0
11	CL	D	405	1/1	0.95	0.09	73,73,73,73	0
11	CL	N	402	1/1	0.95	0.12	65,65,65,65	0
11	CL	O	402	1/1	0.96	0.22	93,93,93,93	0
11	CL	E	404	1/1	0.96	0.07	73,73,73,73	0

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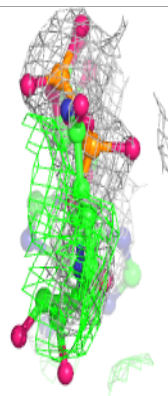
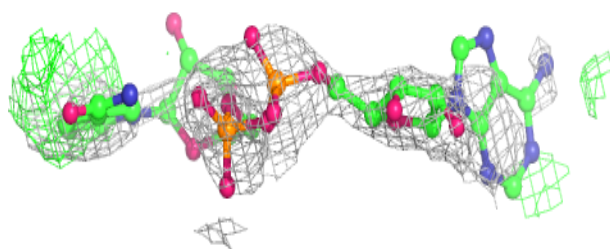
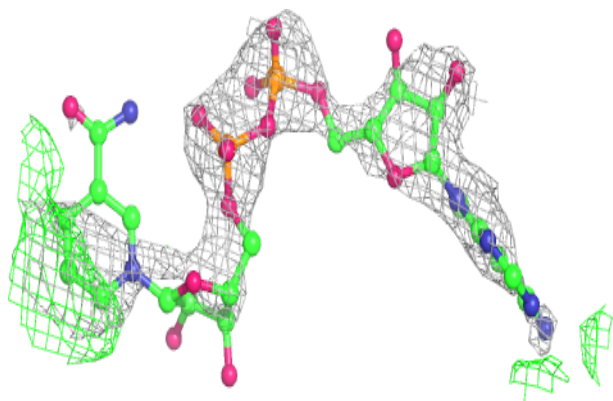
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
11	CL	C	404	1/1	0.96	0.06	57,57,57,57	0
11	CL	K	405	1/1	0.96	0.06	59,59,59,59	0
12	PO4	A	407	5/5	0.96	0.21	36,39,67,71	5
11	CL	A	403	1/1	0.96	0.07	71,71,71,71	0
11	CL	C	406	1/1	0.96	0.06	46,46,46,46	0
11	CL	G	404	1/1	0.96	0.07	75,75,75,75	0
11	CL	B	403	1/1	0.96	0.08	51,51,51,51	0
11	CL	B	404	1/1	0.96	0.10	71,71,71,71	0
11	CL	M	403	1/1	0.96	0.06	68,68,68,68	0
11	CL	I	404	1/1	0.96	0.08	67,67,67,67	0
11	CL	E	407	1/1	0.97	0.14	73,73,73,73	0
11	CL	B	406	1/1	0.97	0.09	80,80,80,80	0
11	CL	K	403	1/1	0.97	0.14	64,64,64,64	0
11	CL	K	404	1/1	0.97	0.06	51,51,51,51	0
11	CL	P	402	1/1	0.98	0.04	57,57,57,57	0
10	NA	B	402	1/1	0.98	0.52	71,71,71,71	0
11	CL	E	405	1/1	0.98	0.12	79,79,79,79	0
11	CL	G	405	1/1	0.98	0.08	46,46,46,46	0
11	CL	E	406	1/1	0.98	0.05	40,40,40,40	0
11	CL	C	403	1/1	1.00	0.07	52,52,52,52	0

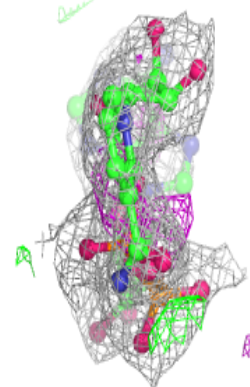
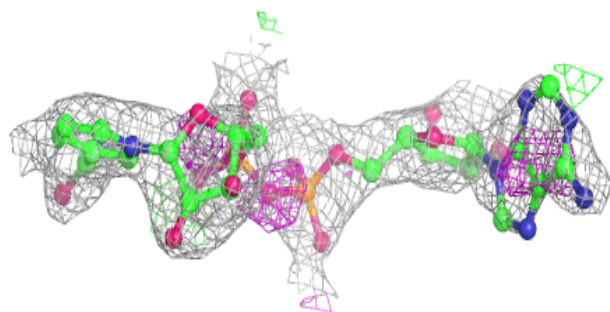
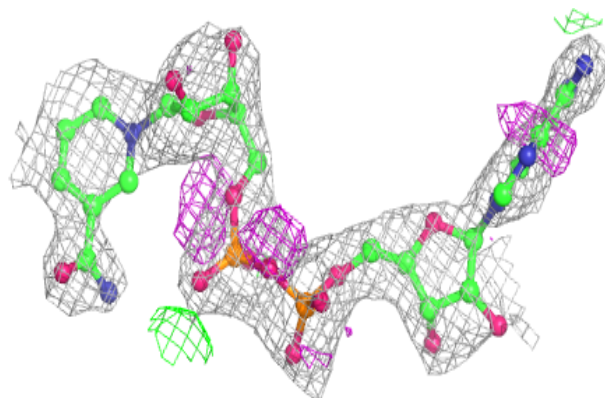
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around NAD K 401:**

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

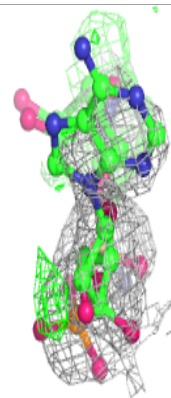
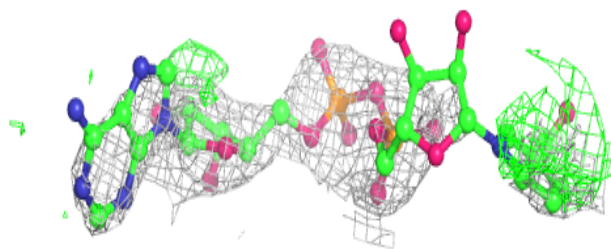
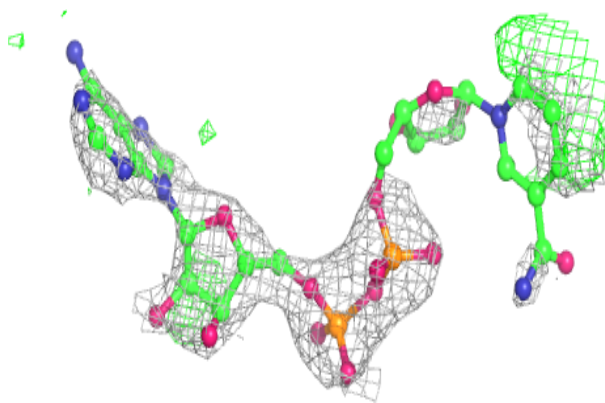
**Electron density around NAD C 401:**

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

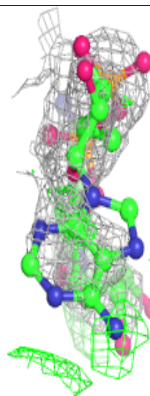
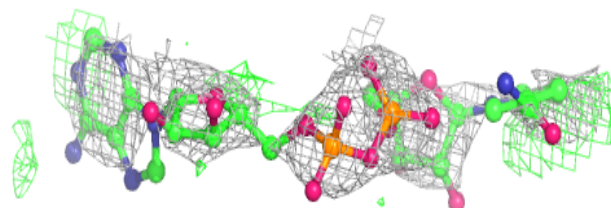
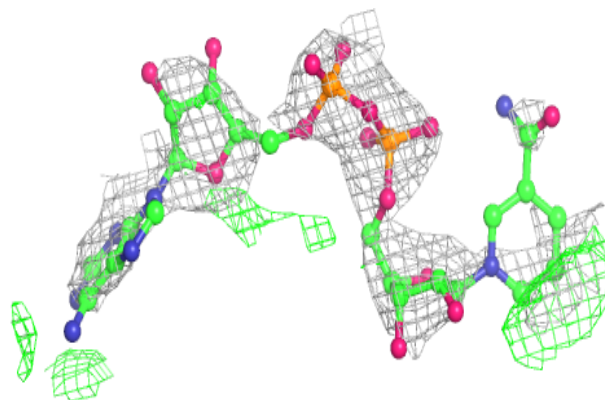


**Electron density around NAD O 401:**

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

**Electron density around NAD D 401:**

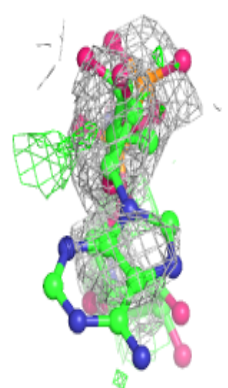
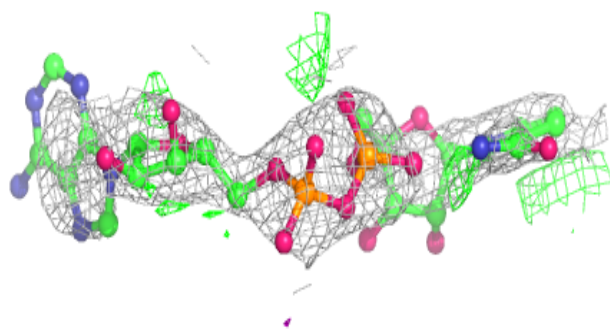
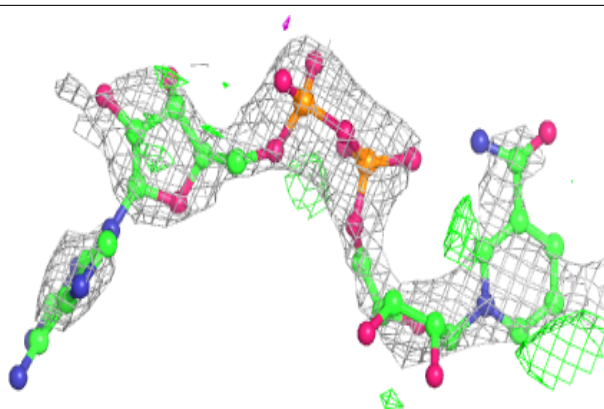
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



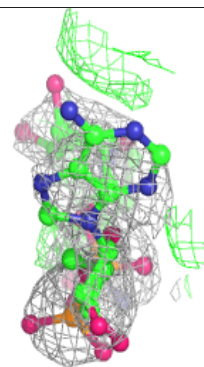
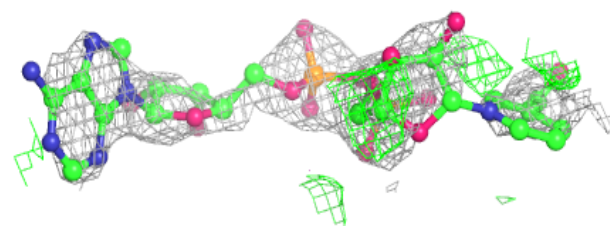
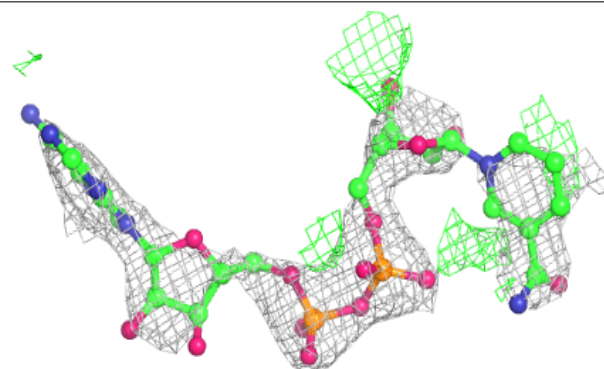


**Electron density around NAD E 401:**

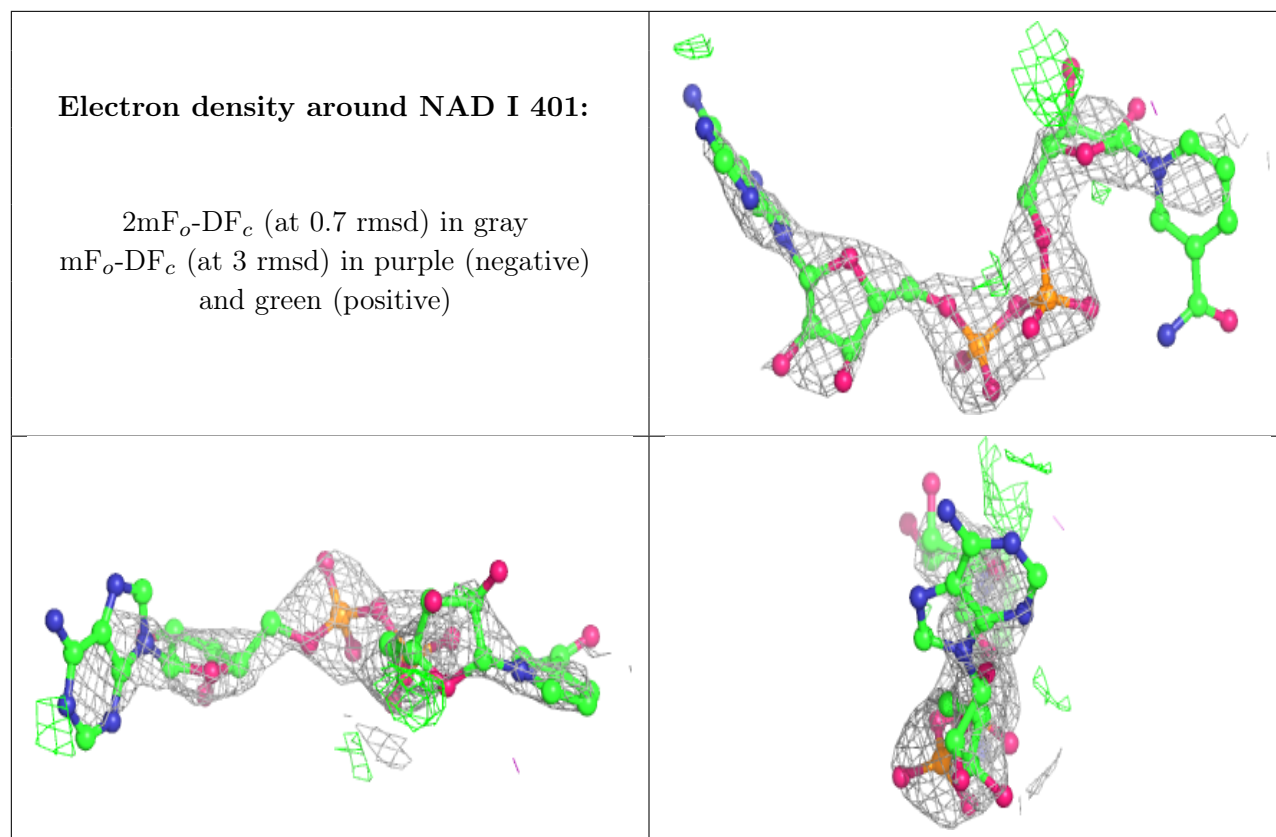
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around NAD P 401:**

$2mF_o-DF_c$  (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.