Full wwPDB X-ray Structure Validation Report ⓘ

Feb 6, 2023 – 03:45 pm GMT

PDB ID	:	7R39
Title	:	Crystal structure of S-adenosyl-L-homocysteine hydrolase from Sulfolobus acidocaldarius in complex with adenosine
Authors	:	Saleem-Batcha, R.; Popadic, D.; Andexer, J.N.
Deposited on	:	2022-02-06
Resolution	:	2.50 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

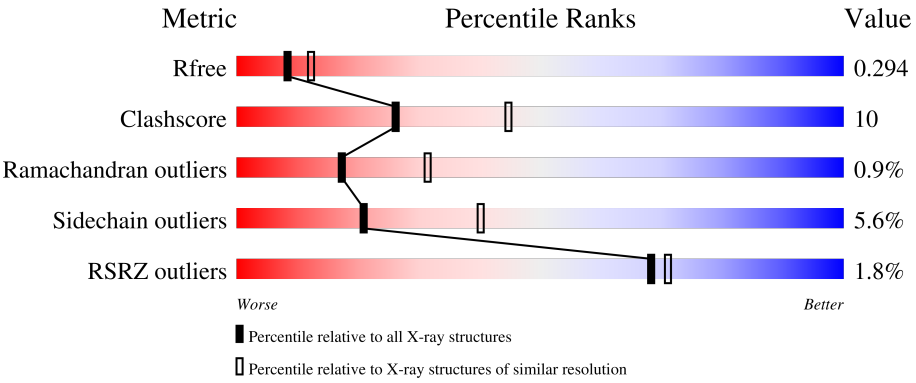
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.32.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.1

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 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	438	68% 22% • 6%
1	B	438	3% 71% 21% • 6%
1	C	438	70% 23% • 6%
1	D	438	70% 23% • 6%
1	E	438	65% 26% • 6%

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Mol	Chain	Length	Quality of chain
1	F	438	2% 67% 26% 6%
1	G	438	2% 68% 24% 6%
1	H	438	% 73% 19% 6%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 26548 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 Adenosylhomocysteinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	B	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	C	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	D	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	E	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	F	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	G	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			
1	H	412	Total	C	N	O	S	0	0	0
			3220	2035	566	608	11			

There are 184 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-22	MET	-	initiating methionine	UNP Q4JAZ7
A	-21	GLY	-	expression tag	UNP Q4JAZ7
A	-20	SER	-	expression tag	UNP Q4JAZ7
A	-19	SER	-	expression tag	UNP Q4JAZ7
A	-18	HIS	-	expression tag	UNP Q4JAZ7
A	-17	HIS	-	expression tag	UNP Q4JAZ7
A	-16	HIS	-	expression tag	UNP Q4JAZ7
A	-15	HIS	-	expression tag	UNP Q4JAZ7
A	-14	HIS	-	expression tag	UNP Q4JAZ7
A	-13	HIS	-	expression tag	UNP Q4JAZ7
A	-12	SER	-	expression tag	UNP Q4JAZ7
A	-11	SER	-	expression tag	UNP Q4JAZ7
A	-10	GLY	-	expression tag	UNP Q4JAZ7

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-9	LEU	-	expression tag	UNP Q4JAZ7
A	-8	VAL	-	expression tag	UNP Q4JAZ7
A	-7	PRO	-	expression tag	UNP Q4JAZ7
A	-6	ARG	-	expression tag	UNP Q4JAZ7
A	-5	GLY	-	expression tag	UNP Q4JAZ7
A	-4	SER	-	expression tag	UNP Q4JAZ7
A	-3	HIS	-	expression tag	UNP Q4JAZ7
A	-2	MET	-	expression tag	UNP Q4JAZ7
A	-1	ALA	-	expression tag	UNP Q4JAZ7
A	0	SER	-	expression tag	UNP Q4JAZ7
B	-22	MET	-	initiating methionine	UNP Q4JAZ7
B	-21	GLY	-	expression tag	UNP Q4JAZ7
B	-20	SER	-	expression tag	UNP Q4JAZ7
B	-19	SER	-	expression tag	UNP Q4JAZ7
B	-18	HIS	-	expression tag	UNP Q4JAZ7
B	-17	HIS	-	expression tag	UNP Q4JAZ7
B	-16	HIS	-	expression tag	UNP Q4JAZ7
B	-15	HIS	-	expression tag	UNP Q4JAZ7
B	-14	HIS	-	expression tag	UNP Q4JAZ7
B	-13	HIS	-	expression tag	UNP Q4JAZ7
B	-12	SER	-	expression tag	UNP Q4JAZ7
B	-11	SER	-	expression tag	UNP Q4JAZ7
B	-10	GLY	-	expression tag	UNP Q4JAZ7
B	-9	LEU	-	expression tag	UNP Q4JAZ7
B	-8	VAL	-	expression tag	UNP Q4JAZ7
B	-7	PRO	-	expression tag	UNP Q4JAZ7
B	-6	ARG	-	expression tag	UNP Q4JAZ7
B	-5	GLY	-	expression tag	UNP Q4JAZ7
B	-4	SER	-	expression tag	UNP Q4JAZ7
B	-3	HIS	-	expression tag	UNP Q4JAZ7
B	-2	MET	-	expression tag	UNP Q4JAZ7
B	-1	ALA	-	expression tag	UNP Q4JAZ7
B	0	SER	-	expression tag	UNP Q4JAZ7
C	-22	MET	-	initiating methionine	UNP Q4JAZ7
C	-21	GLY	-	expression tag	UNP Q4JAZ7
C	-20	SER	-	expression tag	UNP Q4JAZ7
C	-19	SER	-	expression tag	UNP Q4JAZ7
C	-18	HIS	-	expression tag	UNP Q4JAZ7
C	-17	HIS	-	expression tag	UNP Q4JAZ7
C	-16	HIS	-	expression tag	UNP Q4JAZ7
C	-15	HIS	-	expression tag	UNP Q4JAZ7
C	-14	HIS	-	expression tag	UNP Q4JAZ7

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-13	HIS	-	expression tag	UNP Q4JAZ7
C	-12	SER	-	expression tag	UNP Q4JAZ7
C	-11	SER	-	expression tag	UNP Q4JAZ7
C	-10	GLY	-	expression tag	UNP Q4JAZ7
C	-9	LEU	-	expression tag	UNP Q4JAZ7
C	-8	VAL	-	expression tag	UNP Q4JAZ7
C	-7	PRO	-	expression tag	UNP Q4JAZ7
C	-6	ARG	-	expression tag	UNP Q4JAZ7
C	-5	GLY	-	expression tag	UNP Q4JAZ7
C	-4	SER	-	expression tag	UNP Q4JAZ7
C	-3	HIS	-	expression tag	UNP Q4JAZ7
C	-2	MET	-	expression tag	UNP Q4JAZ7
C	-1	ALA	-	expression tag	UNP Q4JAZ7
C	0	SER	-	expression tag	UNP Q4JAZ7
D	-22	MET	-	initiating methionine	UNP Q4JAZ7
D	-21	GLY	-	expression tag	UNP Q4JAZ7
D	-20	SER	-	expression tag	UNP Q4JAZ7
D	-19	SER	-	expression tag	UNP Q4JAZ7
D	-18	HIS	-	expression tag	UNP Q4JAZ7
D	-17	HIS	-	expression tag	UNP Q4JAZ7
D	-16	HIS	-	expression tag	UNP Q4JAZ7
D	-15	HIS	-	expression tag	UNP Q4JAZ7
D	-14	HIS	-	expression tag	UNP Q4JAZ7
D	-13	HIS	-	expression tag	UNP Q4JAZ7
D	-12	SER	-	expression tag	UNP Q4JAZ7
D	-11	SER	-	expression tag	UNP Q4JAZ7
D	-10	GLY	-	expression tag	UNP Q4JAZ7
D	-9	LEU	-	expression tag	UNP Q4JAZ7
D	-8	VAL	-	expression tag	UNP Q4JAZ7
D	-7	PRO	-	expression tag	UNP Q4JAZ7
D	-6	ARG	-	expression tag	UNP Q4JAZ7
D	-5	GLY	-	expression tag	UNP Q4JAZ7
D	-4	SER	-	expression tag	UNP Q4JAZ7
D	-3	HIS	-	expression tag	UNP Q4JAZ7
D	-2	MET	-	expression tag	UNP Q4JAZ7
D	-1	ALA	-	expression tag	UNP Q4JAZ7
D	0	SER	-	expression tag	UNP Q4JAZ7
E	-22	MET	-	initiating methionine	UNP Q4JAZ7
E	-21	GLY	-	expression tag	UNP Q4JAZ7
E	-20	SER	-	expression tag	UNP Q4JAZ7
E	-19	SER	-	expression tag	UNP Q4JAZ7
E	-18	HIS	-	expression tag	UNP Q4JAZ7

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-17	HIS	-	expression tag	UNP Q4JAZ7
E	-16	HIS	-	expression tag	UNP Q4JAZ7
E	-15	HIS	-	expression tag	UNP Q4JAZ7
E	-14	HIS	-	expression tag	UNP Q4JAZ7
E	-13	HIS	-	expression tag	UNP Q4JAZ7
E	-12	SER	-	expression tag	UNP Q4JAZ7
E	-11	SER	-	expression tag	UNP Q4JAZ7
E	-10	GLY	-	expression tag	UNP Q4JAZ7
E	-9	LEU	-	expression tag	UNP Q4JAZ7
E	-8	VAL	-	expression tag	UNP Q4JAZ7
E	-7	PRO	-	expression tag	UNP Q4JAZ7
E	-6	ARG	-	expression tag	UNP Q4JAZ7
E	-5	GLY	-	expression tag	UNP Q4JAZ7
E	-4	SER	-	expression tag	UNP Q4JAZ7
E	-3	HIS	-	expression tag	UNP Q4JAZ7
E	-2	MET	-	expression tag	UNP Q4JAZ7
E	-1	ALA	-	expression tag	UNP Q4JAZ7
E	0	SER	-	expression tag	UNP Q4JAZ7
F	-22	MET	-	initiating methionine	UNP Q4JAZ7
F	-21	GLY	-	expression tag	UNP Q4JAZ7
F	-20	SER	-	expression tag	UNP Q4JAZ7
F	-19	SER	-	expression tag	UNP Q4JAZ7
F	-18	HIS	-	expression tag	UNP Q4JAZ7
F	-17	HIS	-	expression tag	UNP Q4JAZ7
F	-16	HIS	-	expression tag	UNP Q4JAZ7
F	-15	HIS	-	expression tag	UNP Q4JAZ7
F	-14	HIS	-	expression tag	UNP Q4JAZ7
F	-13	HIS	-	expression tag	UNP Q4JAZ7
F	-12	SER	-	expression tag	UNP Q4JAZ7
F	-11	SER	-	expression tag	UNP Q4JAZ7
F	-10	GLY	-	expression tag	UNP Q4JAZ7
F	-9	LEU	-	expression tag	UNP Q4JAZ7
F	-8	VAL	-	expression tag	UNP Q4JAZ7
F	-7	PRO	-	expression tag	UNP Q4JAZ7
F	-6	ARG	-	expression tag	UNP Q4JAZ7
F	-5	GLY	-	expression tag	UNP Q4JAZ7
F	-4	SER	-	expression tag	UNP Q4JAZ7
F	-3	HIS	-	expression tag	UNP Q4JAZ7
F	-2	MET	-	expression tag	UNP Q4JAZ7
F	-1	ALA	-	expression tag	UNP Q4JAZ7
F	0	SER	-	expression tag	UNP Q4JAZ7
G	-22	MET	-	initiating methionine	UNP Q4JAZ7

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-21	GLY	-	expression tag	UNP Q4JAZ7
G	-20	SER	-	expression tag	UNP Q4JAZ7
G	-19	SER	-	expression tag	UNP Q4JAZ7
G	-18	HIS	-	expression tag	UNP Q4JAZ7
G	-17	HIS	-	expression tag	UNP Q4JAZ7
G	-16	HIS	-	expression tag	UNP Q4JAZ7
G	-15	HIS	-	expression tag	UNP Q4JAZ7
G	-14	HIS	-	expression tag	UNP Q4JAZ7
G	-13	HIS	-	expression tag	UNP Q4JAZ7
G	-12	SER	-	expression tag	UNP Q4JAZ7
G	-11	SER	-	expression tag	UNP Q4JAZ7
G	-10	GLY	-	expression tag	UNP Q4JAZ7
G	-9	LEU	-	expression tag	UNP Q4JAZ7
G	-8	VAL	-	expression tag	UNP Q4JAZ7
G	-7	PRO	-	expression tag	UNP Q4JAZ7
G	-6	ARG	-	expression tag	UNP Q4JAZ7
G	-5	GLY	-	expression tag	UNP Q4JAZ7
G	-4	SER	-	expression tag	UNP Q4JAZ7
G	-3	HIS	-	expression tag	UNP Q4JAZ7
G	-2	MET	-	expression tag	UNP Q4JAZ7
G	-1	ALA	-	expression tag	UNP Q4JAZ7
G	0	SER	-	expression tag	UNP Q4JAZ7
H	-22	MET	-	initiating methionine	UNP Q4JAZ7
H	-21	GLY	-	expression tag	UNP Q4JAZ7
H	-20	SER	-	expression tag	UNP Q4JAZ7
H	-19	SER	-	expression tag	UNP Q4JAZ7
H	-18	HIS	-	expression tag	UNP Q4JAZ7
H	-17	HIS	-	expression tag	UNP Q4JAZ7
H	-16	HIS	-	expression tag	UNP Q4JAZ7
H	-15	HIS	-	expression tag	UNP Q4JAZ7
H	-14	HIS	-	expression tag	UNP Q4JAZ7
H	-13	HIS	-	expression tag	UNP Q4JAZ7
H	-12	SER	-	expression tag	UNP Q4JAZ7
H	-11	SER	-	expression tag	UNP Q4JAZ7
H	-10	GLY	-	expression tag	UNP Q4JAZ7
H	-9	LEU	-	expression tag	UNP Q4JAZ7
H	-8	VAL	-	expression tag	UNP Q4JAZ7
H	-7	PRO	-	expression tag	UNP Q4JAZ7
H	-6	ARG	-	expression tag	UNP Q4JAZ7
H	-5	GLY	-	expression tag	UNP Q4JAZ7
H	-4	SER	-	expression tag	UNP Q4JAZ7
H	-3	HIS	-	expression tag	UNP Q4JAZ7

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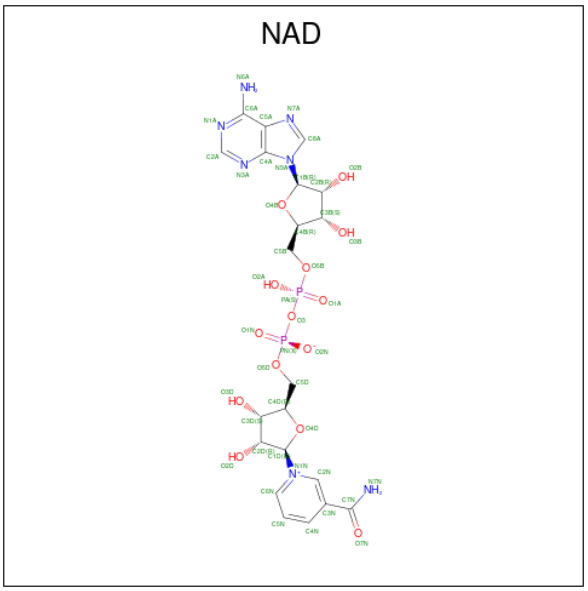
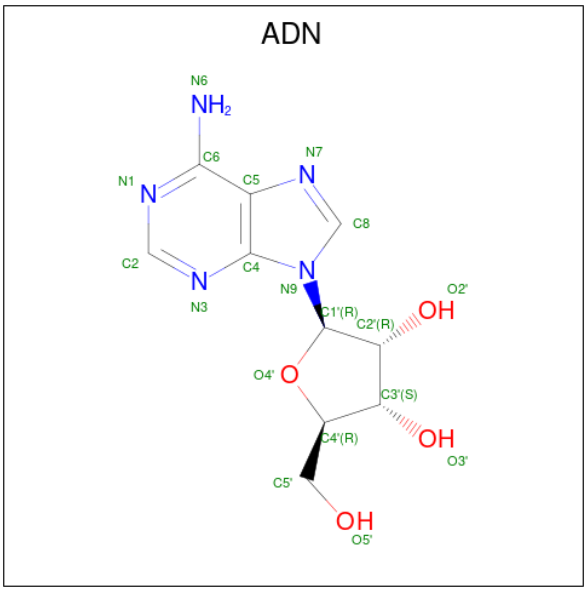
Chain	Residue	Modelled	Actual	Comment	Reference
H	-2	MET	-	expression tag	UNP Q4JAZ7
H	-1	ALA	-	expression tag	UNP Q4JAZ7
H	0	SER	-	expression tag	UNP Q4JAZ7

- Molecule 2 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	E	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	F	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	G	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	H	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 3 is ADENOSINE (three-letter code: ADN) (formula: $C_{10}H_{13}N_5O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 19 10 5 4	0	0
3	B	1	Total C N O 19 10 5 4	0	0
3	C	1	Total C N O 19 10 5 4	0	0
3	D	1	Total C N O 19 10 5 4	0	0
3	E	1	Total C N O 19 10 5 4	0	0
3	F	1	Total C N O 19 10 5 4	0	0
3	G	1	Total C N O 19 10 5 4	0	0
3	H	1	Total C N O 19 10 5 4	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	43	Total O 43 43	0	0
4	B	39	Total O 39 39	0	0
4	C	38	Total O 38 38	0	0
4	D	32	Total O 32 32	0	0

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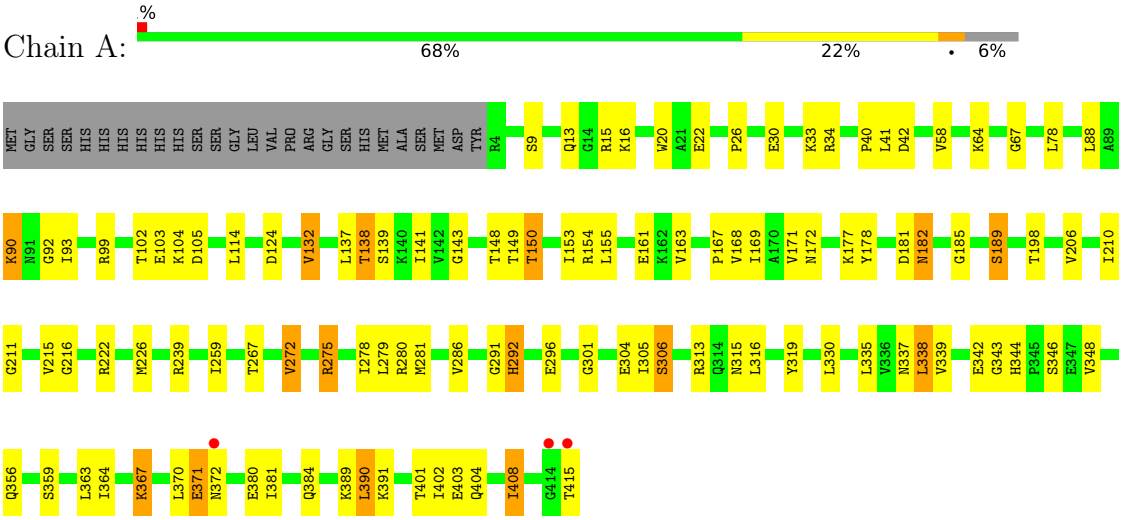
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	40	Total O 40 40	0	0
4	F	17	Total O 17 17	0	0
4	G	36	Total O 36 36	0	0
4	H	39	Total O 39 39	0	0

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.

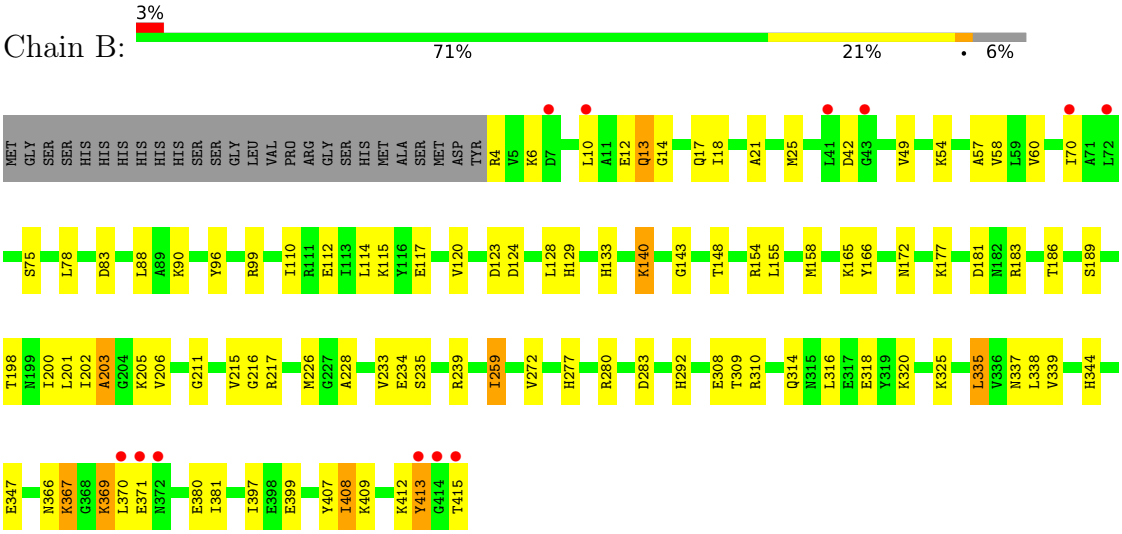
• Molecule 1: Adenosylhomocysteinase

Chain A:



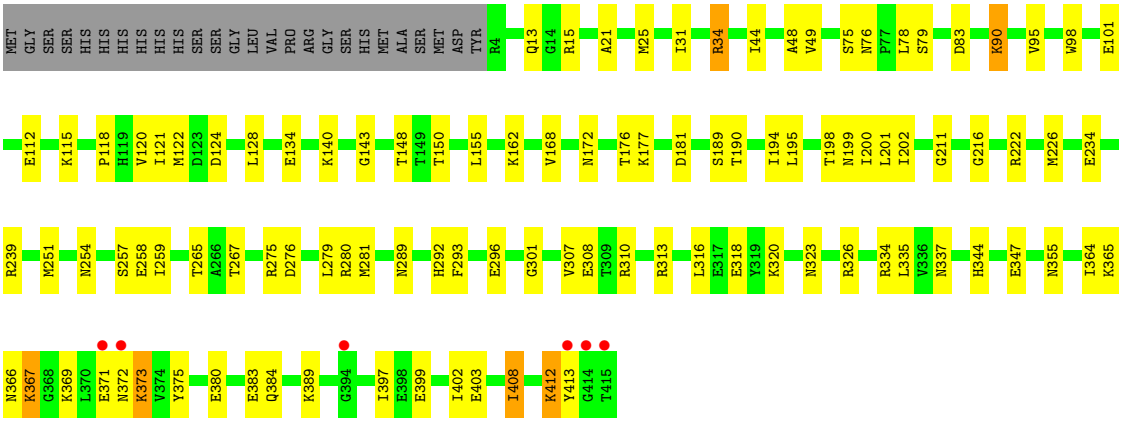
• Molecule 1: Adenosylhomocysteinase

Chain B:



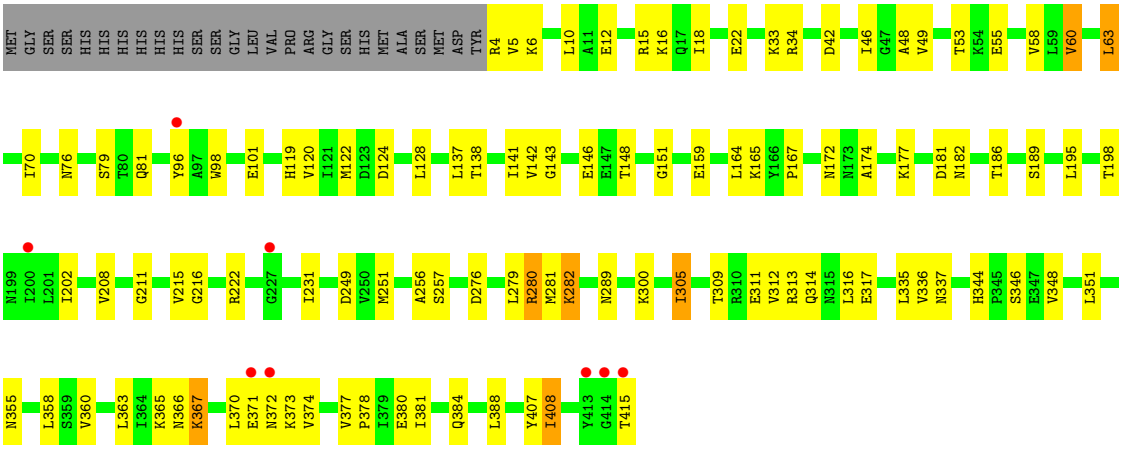
• Molecule 1: Adenosylhomocysteinase

Chain C:



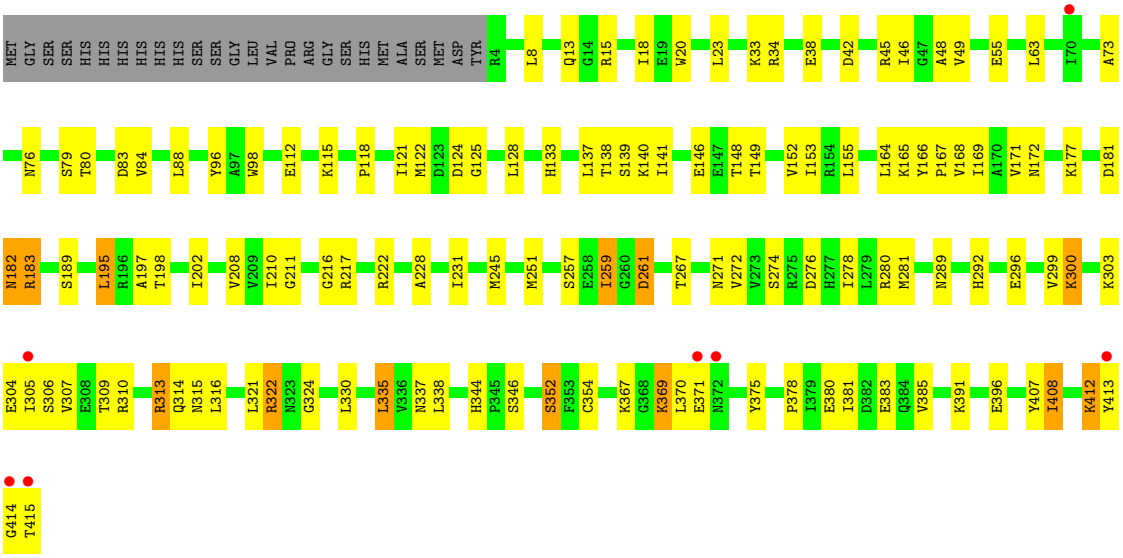
• Molecule 1: Adenosylhomocysteinase

Chain D:



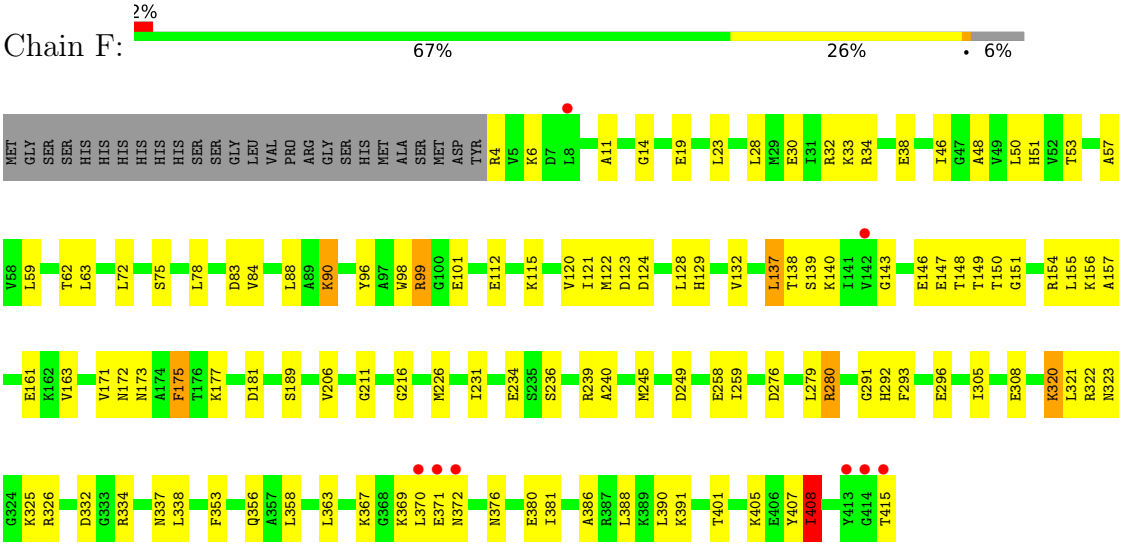
• Molecule 1: Adenosylhomocysteinase

Chain E:



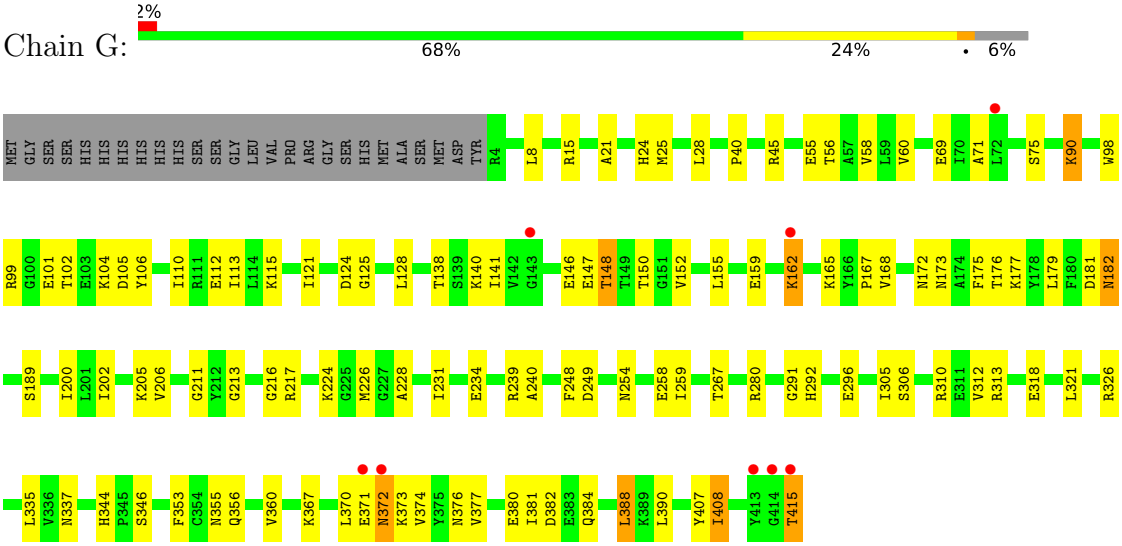
• Molecule 1: Adenosylhomocysteinase

Chain F:



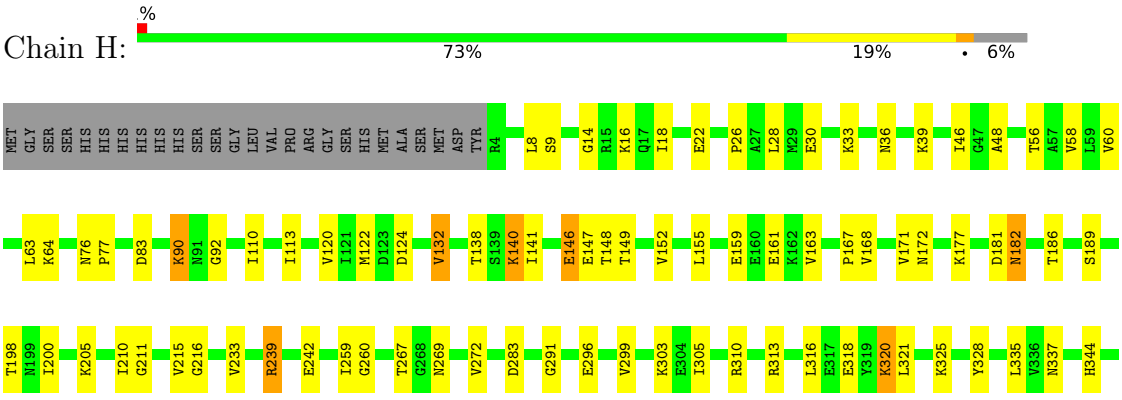
• Molecule 1: Adenosylhomocysteinase

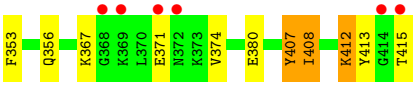
Chain G:



• Molecule 1: Adenosylhomocysteinase

Chain H:




F353
Q356
K367
G368
K369
L370
E371
N372
K373
V374
E380
Y407
I408
K412
Y413
G414
T415

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	84.36Å 88.36Å 138.54Å 78.86° 74.85° 64.84°	Depositor
Resolution (Å)	46.16 – 2.50 46.16 – 2.50	Depositor EDS
% Data completeness (in resolution range)	87.4 (46.16-2.50) 87.4 (46.16-2.50)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.27 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.8.0267, PHENIX 1.19.1_4122	Depositor
R, R_{free}	0.229 , 0.282 0.244 , 0.294	Depositor DCC
R_{free} test set	5267 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	39.3	Xtriage
Anisotropy	0.522	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 37.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	26548	wwPDB-VP
Average B, all atoms (Å^2)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 49.99 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.8964e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAD, ADN

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	0.30	0/3267	0.58	0/4406
1	B	0.29	0/3267	0.58	0/4406
1	C	0.30	0/3267	0.61	0/4406
1	D	0.32	0/3267	0.61	0/4406
1	E	0.33	0/3267	0.61	0/4406
1	F	0.29	0/3267	0.60	0/4406
1	G	0.30	0/3267	0.60	0/4406
1	H	0.29	0/3267	0.60	0/4406
All	All	0.30	0/26136	0.60	0/35248

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	3220	0	3282	76	0
1	B	3220	0	3282	64	0
1	C	3220	0	3282	64	0
1	D	3220	0	3282	68	0
1	E	3220	0	3282	82	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	3220	0	3282	71	0
1	G	3220	0	3282	71	0
1	H	3220	0	3282	61	0
2	A	44	0	26	5	0
2	B	44	0	26	4	0
2	C	44	0	26	2	0
2	D	44	0	26	3	0
2	E	44	0	26	4	0
2	F	44	0	26	3	0
2	G	44	0	26	2	0
2	H	44	0	26	4	0
3	A	19	0	13	1	0
3	B	19	0	13	1	0
3	C	19	0	13	1	0
3	D	19	0	13	1	0
3	E	19	0	13	1	0
3	F	19	0	13	1	0
3	G	19	0	13	2	0
3	H	19	0	13	1	0
4	A	43	0	0	0	0
4	B	39	0	0	1	0
4	C	38	0	0	1	0
4	D	32	0	0	0	0
4	E	40	0	0	3	0
4	F	17	0	0	1	0
4	G	36	0	0	1	0
4	H	39	0	0	0	0
All	All	26548	0	26568	551	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 10.

All (551) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:112:GLU:O	1:C:115:LYS:HG2	1.73	0.89
1:H:138:THR:HA	1:H:141:ILE:HD12	1.57	0.85
1:H:189:SER:HB3	1:H:337:ASN:HB2	1.63	0.79
1:E:172:ASN:HA	1:E:177:LYS:HD2	1.64	0.78
1:G:305:ILE:HG22	1:G:321:LEU:HD22	1.64	0.78
1:F:305:ILE:HG22	1:F:321:LEU:HD22	1.69	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:305:ILE:HD12	1:H:321:LEU:HD21	1.68	0.74
1:B:335:LEU:HD13	1:B:338:LEU:HB2	1.70	0.73
1:C:176:THR:HG23	1:C:355:ASN:HD21	1.54	0.72
1:F:172:ASN:HA	1:F:177:LYS:HG2	1.70	0.72
1:E:112:GLU:O	1:E:115:LYS:HG2	1.90	0.72
1:C:402:ILE:HD12	1:C:403:GLU:H	1.55	0.71
1:C:307:VAL:HG23	1:C:308:GLU:HG3	1.72	0.71
1:G:15:ARG:HE	1:G:90:LYS:HE3	1.56	0.70
1:C:380:GLU:O	1:C:384:GLN:HG3	1.91	0.69
1:A:40:PRO:HG2	1:A:41:LEU:HD22	1.74	0.69
1:B:17:GLN:HE22	1:H:313:ARG:HD2	1.58	0.69
1:G:189:SER:HB3	1:G:337:ASN:HB2	1.76	0.68
1:B:189:SER:HB3	1:B:337:ASN:HB2	1.74	0.68
1:A:401:THR:HG22	1:A:403:GLU:H	1.59	0.68
1:B:198:THR:HG22	1:B:316:LEU:HD22	1.76	0.68
1:A:137:LEU:O	1:A:139:SER:N	2.28	0.67
1:A:169:ILE:HD12	1:A:359:SER:HB3	1.75	0.67
1:D:46:ILE:CG2	1:D:70:ILE:HD13	2.25	0.67
1:A:132:VAL:HG13	1:A:138:THR:HG22	1.76	0.67
1:A:167:PRO:HD3	1:A:371:GLU:HA	1.77	0.67
1:G:138:THR:HA	1:G:141:ILE:HG13	1.76	0.67
1:F:124:ASP:HA	1:F:147:GLU:HB3	1.75	0.67
1:D:172:ASN:HA	1:D:177:LYS:HG2	1.77	0.67
1:F:173:ASN:HD22	1:F:376:ASN:HD21	1.42	0.66
1:D:76:ASN:HB3	1:D:79:SER:HB3	1.78	0.66
1:E:183:ARG:HE	1:E:217:ARG:HG3	1.60	0.66
1:C:189:SER:HB3	1:C:337:ASN:HB2	1.78	0.66
1:G:200:ILE:HD11	1:G:205:LYS:HE2	1.77	0.65
1:A:402:ILE:HD12	1:A:402:ILE:H	1.62	0.65
1:D:407:TYR:O	1:D:408:ILE:HG13	1.97	0.65
1:D:138:THR:HA	1:D:141:ILE:HD12	1.79	0.64
1:C:402:ILE:HD12	1:C:403:GLU:N	2.13	0.64
1:G:337:ASN:HD21	2:G:501:NAD:H72N	1.44	0.64
1:H:36:ASN:OD1	1:H:39:LYS:NZ	2.31	0.64
1:E:138:THR:HA	1:E:141:ILE:HD12	1.79	0.63
1:E:167:PRO:HD3	1:E:371:GLU:HA	1.78	0.63
1:B:172:ASN:HA	1:B:177:LYS:HG2	1.80	0.63
1:F:78:LEU:HD12	1:F:334:ARG:HD2	1.80	0.63
1:H:299:VAL:O	1:H:303:LYS:HG3	1.98	0.63
1:F:112:GLU:HA	1:F:115:LYS:HE3	1.80	0.63
1:F:231:ILE:HG12	1:F:249:ASP:HB3	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:308:GLU:HB2	1:C:320:LYS:HG3	1.80	0.62
1:C:276:ASP:HA	1:C:279:LEU:HD12	1.81	0.62
1:C:172:ASN:HA	1:C:177:LYS:HG2	1.81	0.62
1:G:155:LEU:HD22	1:G:168:VAL:HG11	1.81	0.61
1:G:415:THR:O	1:G:415:THR:OG1	2.18	0.61
1:A:278:ILE:HA	1:A:281:MET:CE	2.31	0.61
1:C:251:MET:SD	1:C:259:ILE:HD11	2.40	0.61
1:D:337:ASN:HD21	2:D:501:NAD:H72N	1.48	0.61
1:D:60:VAL:HG22	1:D:70:ILE:HG12	1.83	0.61
1:A:401:THR:HB	1:A:404:GLN:HG3	1.81	0.61
1:D:159:GLU:OE1	1:D:374:VAL:N	2.32	0.61
1:A:206:VAL:HG11	1:A:259:ILE:HG22	1.81	0.60
1:D:122:MET:HE1	1:D:360:VAL:HG21	1.83	0.60
1:D:366:ASN:O	1:D:367:LYS:HG3	2.01	0.60
1:F:4:ARG:HB3	1:F:96:TYR:HD1	1.66	0.60
1:C:372:ASN:ND2	1:C:372:ASN:O	2.34	0.60
1:E:76:ASN:HB3	1:E:79:SER:HB3	1.83	0.60
1:F:11:ALA:HB1	1:F:90:LYS:HD3	1.83	0.60
1:D:122:MET:CE	1:D:360:VAL:HG21	2.32	0.60
1:F:337:ASN:HD21	2:F:501:NAD:H72N	1.48	0.60
1:H:124:ASP:O	1:H:148:THR:HG22	2.01	0.60
1:E:337:ASN:HD21	2:E:501:NAD:H72N	1.50	0.59
1:D:34:ARG:HH22	1:D:388:LEU:HD11	1.66	0.59
1:D:143:GLY:HA3	1:D:363:LEU:HD22	1.85	0.59
1:A:177:LYS:HD2	1:A:181:ASP:HB3	1.84	0.59
1:D:5:VAL:HG12	1:D:6:LYS:H	1.68	0.59
1:C:75:SER:OG	1:C:124:ASP:HB3	2.02	0.59
1:A:172:ASN:HA	1:A:177:LYS:HG2	1.84	0.59
1:A:380:GLU:O	1:A:384:GLN:HG3	2.02	0.59
1:C:181:ASP:OD1	1:C:344:HIS:HE1	1.86	0.59
1:F:150:THR:O	1:F:154:ARG:HG3	2.03	0.59
1:F:206:VAL:HG11	1:F:259:ILE:HG22	1.83	0.59
1:F:177:LYS:HD2	1:F:181:ASP:HB3	1.85	0.58
1:B:308:GLU:HB2	1:B:320:LYS:HB2	1.85	0.58
1:D:49:VAL:HG23	1:D:128:LEU:HD22	1.85	0.58
2:E:501:NAD:C4N	3:E:502:ADN:H3'	2.33	0.58
1:E:407:TYR:O	1:E:408:ILE:HB	2.03	0.58
1:H:337:ASN:HD21	2:H:501:NAD:H72N	1.50	0.58
1:C:318:GLU:OE2	1:C:326:ARG:HD3	2.04	0.58
1:E:34:ARG:NE	1:E:38:GLU:OE2	2.34	0.58
1:H:310:ARG:NH1	1:H:318:GLU:OE2	2.36	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:206:VAL:HG11	1:G:259:ILE:HG22	1.86	0.58
1:E:146:GLU:O	1:E:171:VAL:HG22	2.03	0.58
1:E:189:SER:HB3	1:E:337:ASN:HB2	1.86	0.58
1:B:49:VAL:HG23	1:B:128:LEU:HD22	1.86	0.58
1:H:283:ASP:HB2	1:H:325:LYS:HG2	1.85	0.58
1:H:198:THR:HG22	1:H:316:LEU:HD22	1.86	0.57
2:B:501:NAD:C4N	3:B:502:ADN:H3'	2.34	0.57
1:E:165:LYS:O	1:E:371:GLU:HB3	2.04	0.57
1:F:137:LEU:O	1:F:139:SER:N	2.38	0.57
1:A:124:ASP:O	1:A:148:THR:HG22	2.05	0.57
1:B:347:GLU:OE2	1:H:200:ILE:HD12	2.05	0.57
1:D:231:ILE:HD12	1:D:251:MET:HE2	1.87	0.56
1:G:138:THR:HA	1:G:141:ILE:CG1	2.35	0.56
1:E:49:VAL:HG12	1:E:73:ALA:HB3	1.87	0.56
1:E:167:PRO:HG3	1:E:369:LYS:HE3	1.87	0.56
1:G:172:ASN:HA	1:G:177:LYS:HG2	1.87	0.56
1:H:64:LYS:NZ	1:H:92:GLY:HA3	2.20	0.56
1:D:146:GLU:OE2	1:D:151:GLY:HA3	2.06	0.56
1:H:147:GLU:O	1:H:177:LYS:HE3	2.06	0.56
1:E:335:LEU:HD13	1:E:338:LEU:HB2	1.87	0.56
1:B:75:SER:OG	1:B:124:ASP:HB3	2.06	0.56
1:E:46:ILE:HD13	1:E:63:LEU:HD13	1.88	0.56
1:E:139:SER:HB3	1:E:140:LYS:HD2	1.87	0.56
1:H:18:ILE:O	1:H:22:GLU:HG3	2.05	0.56
1:A:380:GLU:HG2	1:A:381:ILE:N	2.21	0.56
1:D:276:ASP:O	1:D:280:ARG:HG3	2.05	0.56
1:D:378:PRO:HB2	1:D:381:ILE:HD12	1.88	0.56
1:A:88:LEU:HD22	1:A:93:ILE:HG13	1.86	0.55
1:A:16:LYS:HG2	1:C:310:ARG:HH21	1.72	0.55
1:G:177:LYS:HD2	1:G:181:ASP:HB3	1.87	0.55
1:A:198:THR:HG22	1:A:316:LEU:HD22	1.87	0.55
1:G:147:GLU:OE2	3:G:502:ADN:O2'	2.21	0.55
1:F:146:GLU:O	1:F:171:VAL:HG22	2.06	0.55
1:A:278:ILE:HA	1:A:281:MET:HE3	1.89	0.55
1:E:313:ARG:HG3	1:E:316:LEU:HB3	1.89	0.55
1:D:98:TRP:O	1:D:101:GLU:HG3	2.07	0.54
1:D:312:VAL:CG1	1:D:316:LEU:HG	2.37	0.54
1:G:310:ARG:HG2	1:G:318:GLU:HB3	1.89	0.54
1:H:146:GLU:O	1:H:171:VAL:HG22	2.07	0.54
1:D:279:LEU:HD21	1:D:305:ILE:HG12	1.90	0.54
1:F:353:PHE:HA	1:F:356:GLN:HB2	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:121:ILE:HG23	1:F:128:LEU:HD23	1.89	0.54
1:G:258:GLU:HG2	1:G:280:ARG:HG2	1.88	0.54
2:G:501:NAD:C4N	3:G:502:ADN:H3'	2.37	0.54
1:A:155:LEU:HD22	1:A:168:VAL:HG11	1.89	0.54
1:D:186:THR:HG21	1:D:215:VAL:HG13	1.89	0.54
1:B:14:GLY:O	1:B:18:ILE:HG13	2.08	0.54
1:D:177:LYS:HD2	1:D:181:ASP:HB3	1.90	0.54
1:E:380:GLU:HG2	1:E:381:ILE:N	2.22	0.54
1:G:213:GLY:O	1:G:217:ARG:HG2	2.08	0.54
1:F:380:GLU:HG2	1:F:381:ILE:N	2.23	0.53
1:A:15:ARG:HH12	1:A:90:LYS:HB2	1.73	0.53
1:C:83:ASP:OD1	1:C:83:ASP:N	2.38	0.53
1:H:181:ASP:OD1	1:H:344:HIS:HE1	1.92	0.53
1:H:239:ARG:HA	1:H:242:GLU:HB2	1.90	0.53
2:A:501:NAD:C4N	3:A:502:ADN:H3'	2.38	0.53
1:E:149:THR:O	1:E:153:ILE:HG13	2.08	0.53
1:A:342:GLU:CD	1:C:313:ARG:HH22	2.12	0.53
1:E:197:ALA:O	1:E:313:ARG:HD2	2.09	0.53
1:F:146:GLU:OE1	1:F:146:GLU:HA	2.08	0.53
2:F:501:NAD:C4N	3:F:502:ADN:H3'	2.38	0.53
1:G:356:GLN:O	1:G:360:VAL:HG23	2.08	0.53
2:H:501:NAD:C4N	3:H:502:ADN:H3'	2.38	0.53
1:D:189:SER:HB3	1:D:337:ASN:HB2	1.91	0.53
1:D:384:GLN:HE21	1:D:384:GLN:HA	1.73	0.53
1:F:46:ILE:HD13	1:F:63:LEU:HD13	1.91	0.53
1:B:366:ASN:ND2	1:B:369:LYS:HE2	2.24	0.53
1:C:121:ILE:HG23	1:C:128:LEU:HD23	1.91	0.53
1:E:169:ILE:HD13	1:E:375:TYR:HB2	1.91	0.52
1:H:132:VAL:HG13	1:H:138:THR:HG22	1.91	0.52
1:E:138:THR:HG21	1:E:165:LYS:CB	2.40	0.52
1:G:165:LYS:O	1:G:371:GLU:HB3	2.10	0.52
1:D:167:PRO:HD3	1:D:371:GLU:HA	1.91	0.52
1:B:21:ALA:O	1:B:25:MET:HG3	2.10	0.52
1:B:177:LYS:HD2	1:B:181:ASP:HB3	1.92	0.52
1:C:257:SER:O	1:C:281:MET:HA	2.09	0.52
1:E:305:ILE:HG23	1:E:321:LEU:HD22	1.91	0.52
1:H:28:LEU:HD23	1:H:58:VAL:HG12	1.91	0.52
1:H:56:THR:O	1:H:60:VAL:HG22	2.09	0.52
1:C:44:ILE:HD12	1:C:364:ILE:HD12	1.91	0.52
1:E:189:SER:OG	1:E:344:HIS:HA	2.10	0.52
1:F:19:GLU:O	1:F:23:LEU:HD12	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:337:ASN:ND2	2:E:501:NAD:H72N	2.08	0.51
1:F:407:TYR:O	1:F:408:ILE:HB	2.10	0.51
1:E:49:VAL:CG2	1:E:128:LEU:HB2	2.40	0.51
1:B:54:LYS:O	1:B:58:VAL:HG23	2.10	0.51
1:B:407:TYR:O	1:B:408:ILE:HB	2.10	0.51
1:D:164:LEU:HD12	1:D:165:LYS:H	1.75	0.51
1:G:146:GLU:HG2	1:G:155:LEU:HD12	1.92	0.51
1:B:206:VAL:HG11	1:B:259:ILE:HG22	1.92	0.51
1:D:195:LEU:HD11	1:D:202:ILE:HD11	1.91	0.51
1:A:143:GLY:HA3	1:A:363:LEU:HD22	1.92	0.51
1:A:338:LEU:HD13	1:A:343:GLY:HA3	1.92	0.51
1:F:123:ASP:HB3	1:F:146:GLU:OE1	2.10	0.51
1:F:148:THR:CG2	1:F:150:THR:HG22	2.41	0.51
1:B:166:TYR:HA	1:B:371:GLU:HG3	1.93	0.51
1:E:164:LEU:HD21	1:E:168:VAL:HG12	1.92	0.51
1:G:407:TYR:O	1:G:408:ILE:HB	2.11	0.51
1:E:49:VAL:HG21	1:E:128:LEU:HB2	1.92	0.51
1:G:224:LYS:NZ	4:G:601:HOH:O	2.38	0.51
1:H:155:LEU:HD23	1:H:168:VAL:HG11	1.93	0.50
1:E:48:ALA:HA	1:E:122:MET:O	2.11	0.50
1:H:14:GLY:O	1:H:18:ILE:HG13	2.11	0.50
1:D:46:ILE:HG22	1:D:70:ILE:HD13	1.93	0.50
1:E:182:ASN:OD1	1:E:182:ASN:N	2.44	0.50
1:F:291:GLY:HA3	1:F:296:GLU:OE2	2.11	0.50
1:G:56:THR:O	1:G:60:VAL:HG22	2.10	0.50
1:D:208:VAL:HG22	1:D:231:ILE:HB	1.94	0.50
1:G:224:LYS:HD2	1:G:248:PHE:HE1	1.76	0.50
1:E:210:ILE:HG21	1:E:272:VAL:HG13	1.94	0.50
1:E:267:THR:HG21	1:E:272:VAL:HG21	1.93	0.50
1:A:138:THR:HA	1:A:141:ILE:HG13	1.93	0.50
1:A:306:SER:OG	1:A:319:TYR:HB3	2.11	0.50
1:F:323:ASN:ND2	1:F:325:LYS:HD3	2.26	0.50
1:C:181:ASP:OD1	1:C:344:HIS:CE1	2.64	0.49
2:C:501:NAD:C4N	3:C:502:ADN:H3'	2.42	0.49
1:B:99:ARG:HH12	1:B:339:VAL:HG13	1.78	0.49
1:C:162:LYS:HA	1:C:372:ASN:OD1	2.13	0.49
1:D:22:GLU:HG3	1:D:58:VAL:HG22	1.94	0.49
1:G:234:GLU:HB3	1:G:240:ALA:HB2	1.93	0.49
1:H:407:TYR:O	1:H:408:ILE:HB	2.13	0.49
1:A:150:THR:O	1:A:154:ARG:HG3	2.12	0.49
1:A:338:LEU:HD13	1:A:343:GLY:CA	2.42	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:412:LYS:HE3	1:C:413:TYR:N	2.27	0.49
1:E:335:LEU:CD1	1:E:338:LEU:HB2	2.43	0.49
1:H:267:THR:O	1:H:296:GLU:OE2	2.31	0.49
1:E:261:ASP:OD1	1:E:261:ASP:N	2.45	0.49
1:F:258:GLU:CD	1:F:280:ARG:HH21	2.16	0.49
1:E:208:VAL:HG22	1:E:231:ILE:HB	1.94	0.49
1:F:401:THR:O	1:F:405:LYS:HG3	2.13	0.49
1:A:64:LYS:NZ	1:A:92:GLY:HA3	2.28	0.48
1:F:75:SER:OG	1:F:124:ASP:HB3	2.13	0.48
1:B:120:VAL:HA	1:B:143:GLY:O	2.12	0.48
1:D:120:VAL:HA	1:D:143:GLY:O	2.13	0.48
1:A:78:LEU:O	1:A:99:ARG:NH1	2.47	0.48
1:D:380:GLU:HG2	1:D:381:ILE:N	2.29	0.48
1:H:181:ASP:OD1	1:H:344:HIS:CE1	2.65	0.48
1:A:226:MET:SD	1:C:222:ARG:HD2	2.53	0.48
1:B:337:ASN:HD21	2:B:501:NAD:H72N	1.61	0.48
1:F:146:GLU:OE2	1:F:151:GLY:HA3	2.12	0.48
1:G:71:ALA:HB1	1:G:113:ILE:HD13	1.96	0.48
1:H:172:ASN:HA	1:H:177:LYS:HD2	1.94	0.48
1:A:304:GLU:HA	1:A:304:GLU:OE1	2.13	0.48
1:D:257:SER:O	1:D:281:MET:HA	2.14	0.48
1:F:32:ARG:HE	1:F:62:THR:HA	1.78	0.48
1:F:48:ALA:HA	1:F:122:MET:O	2.14	0.48
1:D:34:ARG:NH2	1:D:388:LEU:HD11	2.29	0.48
1:F:189:SER:HB2	1:F:337:ASN:HB2	1.96	0.48
1:G:353:PHE:HA	1:G:356:GLN:HB2	1.96	0.48
1:E:124:ASP:O	1:E:148:THR:HG22	2.13	0.48
1:E:167:PRO:CD	1:E:371:GLU:HA	2.41	0.48
1:E:271:ASN:HB2	4:E:603:HOH:O	2.13	0.48
1:F:98:TRP:O	1:F:101:GLU:HG3	2.14	0.48
1:A:343:GLY:O	1:C:199:ASN:ND2	2.46	0.48
1:C:198:THR:HG22	1:C:316:LEU:HD22	1.96	0.48
2:D:501:NAD:C4N	3:D:502:ADN:H3'	2.43	0.48
1:A:291:GLY:HA3	1:A:296:GLU:OE2	2.13	0.47
1:B:117:GLU:CD	1:B:140:LYS:HD2	2.34	0.47
1:B:154:ARG:O	1:B:158:MET:HG3	2.15	0.47
1:G:24:HIS:HB2	1:G:346:SER:OG	2.13	0.47
1:G:224:LYS:HD2	1:G:248:PHE:CE1	2.49	0.47
1:B:110:ILE:O	1:B:114:LEU:HB2	2.14	0.47
1:D:12:GLU:O	1:D:16:LYS:HG3	2.14	0.47
1:D:189:SER:OG	1:D:344:HIS:HA	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:289:ASN:O	1:E:335:LEU:HA	2.14	0.47
1:F:161:GLU:HB3	1:F:163:VAL:HG13	1.95	0.47
1:G:254:ASN:HB3	1:G:280:ARG:NH2	2.29	0.47
1:H:210:ILE:HG23	1:H:233:VAL:HB	1.97	0.47
1:F:48:ALA:HB3	1:F:72:LEU:HD22	1.96	0.47
1:G:254:ASN:HB3	1:G:280:ARG:HH22	1.80	0.47
1:H:211:GLY:O	1:H:216:GLY:HA3	2.15	0.47
1:B:78:LEU:O	1:B:99:ARG:NH1	2.37	0.47
1:B:112:GLU:O	1:B:115:LYS:HG2	2.14	0.47
1:B:409:LYS:HD2	1:B:409:LYS:O	2.15	0.47
1:D:337:ASN:ND2	2:D:501:NAD:H72N	2.12	0.47
1:E:15:ARG:HA	1:E:18:ILE:HD12	1.96	0.47
1:E:300:LYS:HA	1:E:300:LYS:HD3	1.58	0.47
1:F:28:LEU:HD21	1:F:59:LEU:HA	1.97	0.47
1:H:110:ILE:O	1:H:113:ILE:HG13	2.15	0.47
1:H:318:GLU:HB2	1:H:328:TYR:CE1	2.50	0.47
1:B:181:ASP:OD1	1:B:344:HIS:HE1	1.97	0.47
1:H:26:PRO:O	1:H:30:GLU:HG2	2.14	0.47
1:H:189:SER:OG	1:H:344:HIS:HA	2.15	0.47
1:A:20:TRP:CZ3	1:C:316:LEU:HD21	2.50	0.47
1:F:57:ALA:HB1	1:F:88:LEU:HD11	1.97	0.47
1:B:140:LYS:HE3	1:B:140:LYS:HB3	1.68	0.46
1:C:90:LYS:HB3	1:C:90:LYS:HE3	1.65	0.46
1:A:315:ASN:OD1	1:A:339:VAL:HG12	2.14	0.46
1:B:60:VAL:HG22	1:B:70:ILE:HG21	1.97	0.46
1:E:251:MET:HE1	1:E:259:ILE:HD11	1.96	0.46
1:G:98:TRP:O	1:G:101:GLU:HG3	2.15	0.46
1:G:211:GLY:O	1:G:216:GLY:HA3	2.15	0.46
1:H:155:LEU:CD2	1:H:168:VAL:HG11	2.45	0.46
1:A:286:VAL:HG13	1:A:330:LEU:HD13	1.97	0.46
1:B:335:LEU:HG	4:B:610:HOH:O	2.15	0.46
1:C:31:ILE:HA	1:C:34:ARG:HG2	1.97	0.46
1:C:120:VAL:HA	1:C:143:GLY:O	2.16	0.46
1:H:46:ILE:HG12	1:H:120:VAL:HB	1.97	0.46
1:B:13:GLN:O	1:B:13:GLN:NE2	2.49	0.46
1:B:189:SER:CB	1:B:337:ASN:HB2	2.44	0.46
1:C:412:LYS:HE3	1:C:413:TYR:H	1.80	0.46
1:H:259:ILE:HD12	1:H:260:GLY:N	2.31	0.46
1:E:211:GLY:O	1:E:216:GLY:HA3	2.15	0.46
1:H:167:PRO:HD3	1:H:371:GLU:HA	1.98	0.46
1:C:49:VAL:HG23	1:C:128:LEU:HD22	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:75:SER:OG	1:G:124:ASP:HB3	2.16	0.46
1:G:189:SER:OG	1:G:344:HIS:HA	2.15	0.46
1:A:342:GLU:OE2	1:C:313:ARG:NH2	2.48	0.46
1:C:373:LYS:HB3	1:C:375:TYR:CE1	2.51	0.46
1:F:369:LYS:O	1:F:371:GLU:HG2	2.16	0.46
1:A:401:THR:HG22	1:A:403:GLU:N	2.25	0.46
1:B:6:LYS:HD2	1:B:6:LYS:HA	1.71	0.46
1:B:201:LEU:O	1:B:205:LYS:HG3	2.16	0.46
1:E:33:LYS:HA	1:E:33:LYS:HE2	1.98	0.46
1:G:310:ARG:HD3	1:G:318:GLU:OE2	2.16	0.46
1:H:140:LYS:HB2	1:H:140:LYS:HE2	1.38	0.46
1:A:102:THR:HG23	1:A:105:ASP:OD2	2.16	0.46
1:A:210:ILE:HG21	1:A:272:VAL:HG13	1.98	0.46
1:A:275:ARG:HD3	1:A:305:ILE:HD11	1.97	0.46
1:C:337:ASN:HD21	2:C:501:NAD:H72N	1.64	0.46
1:E:49:VAL:HG13	1:E:128:LEU:HD22	1.98	0.46
1:G:258:GLU:CG	1:G:280:ARG:HG2	2.46	0.46
1:A:279:LEU:HD11	1:A:305:ILE:HG21	1.98	0.45
1:B:129:HIS:CD2	1:B:155:LEU:HD11	2.49	0.45
1:B:183:ARG:HD2	1:B:217:ARG:HG3	1.97	0.45
1:D:164:LEU:HD12	1:D:165:LYS:N	2.31	0.45
1:E:202:ILE:HG22	1:E:228:ALA:HB2	1.98	0.45
1:E:257:SER:O	1:E:281:MET:HA	2.15	0.45
1:E:378:PRO:HB2	1:E:381:ILE:HD12	1.97	0.45
1:A:280:ARG:NH1	1:A:280:ARG:HG2	2.32	0.45
1:A:315:ASN:O	1:A:330:LEU:HA	2.16	0.45
1:C:275:ARG:HG3	1:C:301:GLY:HA3	1.98	0.45
1:F:34:ARG:NH2	1:F:388:LEU:HD11	2.31	0.45
1:G:231:ILE:HG12	1:G:249:ASP:HB3	1.99	0.45
1:B:57:ALA:HB1	1:B:88:LEU:HD11	1.99	0.45
1:B:186:THR:HG21	1:B:215:VAL:HG13	1.99	0.45
1:H:305:ILE:CD1	1:H:321:LEU:HD21	2.41	0.45
1:B:83:ASP:OD1	1:B:83:ASP:N	2.49	0.45
1:D:311:GLU:HG3	1:D:317:GLU:OE2	2.17	0.45
1:E:222:ARG:HD2	1:G:226:MET:SD	2.57	0.45
1:E:251:MET:HE1	1:E:259:ILE:CD1	2.47	0.45
1:C:124:ASP:O	1:C:148:THR:HG22	2.16	0.45
1:C:155:LEU:HD13	1:C:168:VAL:HG11	1.99	0.45
1:H:83:ASP:OD1	1:H:83:ASP:N	2.48	0.45
1:A:33:LYS:HD3	1:A:33:LYS:HA	1.61	0.45
1:C:373:LYS:HA	1:C:373:LYS:HD3	1.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:149:THR:HB	2:F:501:NAD:H2D	1.97	0.45
1:A:178:TYR:HA	1:A:182:ASN:OD1	2.17	0.45
1:F:33:LYS:HA	1:F:33:LYS:HD3	1.66	0.45
1:F:308:GLU:OE1	1:F:320:LYS:HD3	2.17	0.45
1:H:200:ILE:HD11	1:H:205:LYS:NZ	2.32	0.45
1:C:211:GLY:O	1:C:216:GLY:HA3	2.17	0.45
1:E:354:CYS:HB3	1:E:385:VAL:HG22	1.99	0.45
1:H:320:LYS:HE2	1:H:320:LYS:HB3	1.50	0.45
1:H:64:LYS:HZ2	1:H:92:GLY:HA3	1.82	0.44
1:D:211:GLY:O	1:D:216:GLY:HA3	2.16	0.44
1:A:222:ARG:HD2	1:C:226:MET:SD	2.57	0.44
1:B:133:HIS:ND1	1:B:158:MET:HE1	2.33	0.44
1:C:21:ALA:O	1:C:25:MET:HG3	2.17	0.44
1:E:412:LYS:HG3	4:E:610:HOH:O	2.18	0.44
1:F:6:LYS:HB2	1:F:98:TRP:HB2	2.00	0.44
1:G:355:ASN:HD22	1:G:377:VAL:HG11	1.82	0.44
1:A:41:LEU:HD12	1:A:364:ILE:HG13	1.98	0.44
1:A:161:GLU:HB3	1:A:163:VAL:HG23	1.99	0.44
1:A:280:ARG:HG2	1:A:280:ARG:HH11	1.82	0.44
1:D:5:VAL:HG12	1:D:6:LYS:N	2.31	0.44
1:F:51:HIS:CD2	1:F:338:LEU:HD13	2.52	0.44
1:A:185:GLY:O	1:A:189:SER:HB2	2.17	0.44
1:C:76:ASN:HB3	1:C:79:SER:HB3	1.99	0.44
1:E:322:ARG:H	1:E:322:ARG:HG2	1.32	0.44
1:F:386:ALA:O	1:F:390:LEU:HD13	2.17	0.44
1:A:389:LYS:HD3	1:A:389:LYS:HA	1.78	0.44
1:B:233:VAL:HG12	2:B:501:NAD:H2A	1.99	0.44
1:D:33:LYS:HD3	1:D:33:LYS:HA	1.79	0.44
1:G:148:THR:HG23	1:G:150:THR:H	1.83	0.44
1:B:234:GLU:OE1	1:B:235:SER:N	2.51	0.44
1:F:157:ALA:O	1:F:161:GLU:HB2	2.17	0.44
1:D:4:ARG:HB3	1:D:96:TYR:HD1	1.83	0.44
1:E:55:GLU:HG2	1:E:346:SER:HA	2.00	0.44
1:E:80:THR:HG21	1:E:98:TRP:HA	2.00	0.44
1:G:167:PRO:HD3	1:G:371:GLU:HG2	2.00	0.44
1:A:267:THR:O	1:A:296:GLU:OE2	2.35	0.44
1:E:118:PRO:HG2	1:E:121:ILE:HD11	2.00	0.44
1:E:124:ASP:O	1:E:146:GLU:OE2	2.36	0.44
1:E:133:HIS:CE1	1:E:166:TYR:CE1	3.06	0.44
1:F:234:GLU:HB3	1:F:240:ALA:HB2	1.99	0.44
1:G:102:THR:H	1:G:105:ASP:HB2	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:168:VAL:HG13	1:G:374:VAL:HG13	2.00	0.44
1:G:291:GLY:HA3	1:G:296:GLU:OE2	2.18	0.44
1:C:366:ASN:HB2	1:C:369:LYS:NZ	2.33	0.43
1:E:322:ARG:C	1:E:324:GLY:H	2.20	0.43
1:A:137:LEU:C	1:A:139:SER:H	2.21	0.43
1:A:292:HIS:ND1	1:A:335:LEU:HD11	2.33	0.43
1:D:222:ARG:HD2	1:F:226:MET:SD	2.59	0.43
1:F:211:GLY:O	1:F:216:GLY:HA3	2.19	0.43
1:B:4:ARG:HB3	1:B:96:TYR:HD1	1.83	0.43
1:E:83:ASP:OD1	1:E:84:VAL:N	2.51	0.43
1:E:96:TYR:CD2	1:E:112:GLU:HG2	2.54	0.43
1:F:276:ASP:HA	1:F:279:LEU:HD12	2.00	0.43
1:A:155:LEU:CD2	1:A:168:VAL:HG11	2.49	0.43
1:D:177:LYS:HD2	1:D:181:ASP:CB	2.48	0.43
1:E:20:TRP:HD1	1:G:312:VAL:HG11	1.82	0.43
1:H:353:PHE:HA	1:H:356:GLN:HB2	2.01	0.43
1:E:177:LYS:O	1:E:181:ASP:N	2.48	0.43
1:A:22:GLU:HG3	1:A:58:VAL:HG22	2.00	0.43
1:B:123:ASP:OD2	1:B:128:LEU:HB3	2.18	0.43
1:E:307:VAL:HG13	1:E:322:ARG:HD3	2.01	0.43
1:H:48:ALA:HB2	1:H:122:MET:HE2	2.00	0.43
1:H:159:GLU:OE1	1:H:374:VAL:HG22	2.18	0.43
1:C:189:SER:OG	1:C:344:HIS:HA	2.18	0.43
1:D:351:LEU:O	1:D:355:ASN:ND2	2.50	0.43
1:E:267:THR:O	1:E:296:GLU:OE2	2.37	0.43
1:E:299:VAL:O	1:E:303:LYS:HG3	2.17	0.43
1:H:148:THR:O	1:H:152:VAL:HG23	2.18	0.43
1:D:53:THR:HA	1:D:81:GLN:HG3	1.99	0.43
1:E:299:VAL:HG22	1:E:303:LYS:HZ2	1.84	0.43
1:H:318:GLU:HB2	1:H:328:TYR:HE1	1.84	0.43
1:A:348:VAL:HG12	1:C:201:LEU:HD22	2.01	0.43
1:A:370:LEU:C	1:A:372:ASN:H	2.22	0.43
1:B:202:ILE:HG22	1:B:228:ALA:HB2	2.01	0.43
1:D:63:LEU:HD12	1:D:63:LEU:HA	1.86	0.43
1:E:13:GLN:H	1:E:13:GLN:CD	2.21	0.43
2:E:501:NAD:H8A	4:E:635:HOH:O	2.19	0.43
1:F:292:HIS:O	1:F:293:PHE:HB2	2.19	0.43
1:H:33:LYS:HB2	1:H:33:LYS:HE2	1.78	0.43
1:B:283:ASP:HB2	1:B:325:LYS:HG2	2.01	0.43
1:B:380:GLU:HG2	1:B:381:ILE:N	2.33	0.43
1:C:190:THR:O	1:C:194:ILE:HG13	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:53:THR:C	1:F:84:VAL:HG11	2.39	0.43
1:G:55:GLU:HG2	1:G:346:SER:HA	2.01	0.43
1:G:380:GLU:HG2	1:G:381:ILE:N	2.34	0.43
1:A:182:ASN:O	1:A:215:VAL:HA	2.19	0.42
1:A:337:ASN:HD21	2:A:501:NAD:H72N	1.66	0.42
1:B:123:ASP:OD2	1:B:128:LEU:N	2.52	0.42
1:B:211:GLY:O	1:B:216:GLY:HA3	2.19	0.42
1:B:412:LYS:O	1:B:413:TYR:CG	2.72	0.42
1:E:133:HIS:HE1	1:E:166:TYR:CE1	2.37	0.42
1:F:34:ARG:O	1:F:38:GLU:HG3	2.19	0.42
1:E:274:SER:O	1:E:278:ILE:HG13	2.18	0.42
1:G:45:ARG:HG2	1:G:69:GLU:HB3	2.00	0.42
1:H:412:LYS:HG3	1:H:413:TYR:N	2.34	0.42
1:C:98:TRP:O	1:C:101:GLU:HG3	2.19	0.42
1:D:231:ILE:HD13	1:D:249:ASP:HB3	2.00	0.42
1:D:282:LYS:HE3	1:D:282:LYS:HB2	1.62	0.42
1:F:175:PHE:H	1:F:175:PHE:HD1	1.66	0.42
1:F:280:ARG:H	1:F:280:ARG:HG3	1.64	0.42
1:F:370:LEU:C	1:F:372:ASN:H	2.22	0.42
1:B:124:ASP:O	1:B:148:THR:HG22	2.20	0.42
1:D:370:LEU:HD13	1:D:373:LYS:HD3	2.01	0.42
1:G:148:THR:O	1:G:152:VAL:HG23	2.19	0.42
2:A:501:NAD:H6N	2:A:501:NAD:H2D	1.82	0.42
1:B:259:ILE:HD13	1:B:259:ILE:HA	1.78	0.42
1:D:182:ASN:O	1:D:215:VAL:HA	2.20	0.42
1:E:177:LYS:HG2	1:E:352:SER:HB3	2.02	0.42
1:G:159:GLU:HG3	1:G:372:ASN:O	2.19	0.42
1:A:171:VAL:HG21	1:A:356:GLN:OE1	2.20	0.42
1:C:177:LYS:HD2	1:C:181:ASP:HB3	2.02	0.42
1:F:363:LEU:HD23	1:F:363:LEU:HA	1.91	0.42
1:F:405:LYS:HB3	1:F:405:LYS:HE3	1.88	0.42
1:B:335:LEU:HD12	1:B:339:VAL:HG23	2.02	0.42
1:F:146:GLU:HG2	1:F:155:LEU:HD12	2.01	0.42
1:G:189:SER:CB	1:G:337:ASN:HB2	2.47	0.42
1:D:208:VAL:HG21	1:D:256:ALA:HB1	2.02	0.42
1:E:315:ASN:O	1:E:330:LEU:HA	2.20	0.42
1:F:32:ARG:HH21	1:F:62:THR:N	2.17	0.42
1:F:177:LYS:HD2	1:F:181:ASP:CB	2.49	0.42
1:H:186:THR:HG21	1:H:215:VAL:HG13	2.01	0.42
1:A:26:PRO:O	1:A:30:GLU:HG2	2.20	0.42
1:A:301:GLY:O	1:A:305:ILE:HG12	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:42:ASP:HA	1:A:67:GLY:O	2.20	0.41
1:B:272:VAL:HG22	2:B:501:NAD:N6A	2.35	0.41
1:B:310:ARG:HH21	1:H:16:LYS:HG2	1.85	0.41
1:C:254:ASN:HB3	1:C:280:ARG:HH22	1.85	0.41
1:D:380:GLU:HG2	1:D:381:ILE:H	1.83	0.41
1:E:20:TRP:CD1	1:G:312:VAL:HG11	2.54	0.41
1:G:21:ALA:O	1:G:25:MET:HG3	2.20	0.41
1:G:202:ILE:HG22	1:G:228:ALA:HB2	2.02	0.41
1:G:267:THR:O	1:G:296:GLU:OE2	2.37	0.41
1:H:149:THR:HB	2:H:501:NAD:H2D	2.02	0.41
1:B:366:ASN:HD22	1:B:369:LYS:HE2	1.83	0.41
1:D:55:GLU:HG2	1:D:346:SER:HA	2.02	0.41
1:G:106:TYR:O	1:G:110:ILE:HD13	2.20	0.41
1:A:64:LYS:HZ1	1:A:92:GLY:HA3	1.84	0.41
1:A:211:GLY:O	1:A:216:GLY:HA3	2.21	0.41
1:A:380:GLU:HG2	1:A:381:ILE:H	1.85	0.41
1:B:309:THR:HA	1:B:318:GLU:O	2.19	0.41
1:C:15:ARG:HA	1:C:15:ARG:HD3	1.83	0.41
1:D:15:ARG:HA	1:D:18:ILE:HD12	2.01	0.41
1:F:234:GLU:HG3	1:F:236:SER:H	1.85	0.41
1:B:408:ILE:HD12	1:B:408:ILE:HA	1.94	0.41
1:C:195:LEU:CD1	1:C:202:ILE:HD11	2.51	0.41
1:D:289:ASN:O	1:D:336:VAL:HG12	2.20	0.41
1:E:125:GLY:HA3	1:E:292:HIS:CD2	2.56	0.41
1:E:167:PRO:HB3	1:E:370:LEU:O	2.19	0.41
1:F:50:LEU:C	1:F:75:SER:HB2	2.41	0.41
1:H:182:ASN:O	1:H:215:VAL:HA	2.20	0.41
1:B:165:LYS:HD3	1:B:165:LYS:HA	1.64	0.41
1:G:124:ASP:HA	1:G:147:GLU:HB3	2.02	0.41
1:G:173:ASN:HB3	1:G:376:ASN:HD21	1.86	0.41
1:H:76:ASN:ND2	1:H:77:PRO:HD2	2.35	0.41
1:A:390:LEU:HD12	1:A:390:LEU:HA	1.90	0.41
1:B:17:GLN:NE2	1:H:313:ARG:HD2	2.32	0.41
1:C:78:LEU:HD12	1:C:334:ARG:HD2	2.02	0.41
1:C:258:GLU:OE2	1:C:280:ARG:HD2	2.20	0.41
1:D:48:ALA:HA	1:D:122:MET:O	2.21	0.41
1:E:155:LEU:CD1	1:E:168:VAL:HG21	2.50	0.41
1:G:162:LYS:HE2	1:G:162:LYS:HB2	1.80	0.41
1:G:179:LEU:HD23	1:G:179:LEU:HA	1.93	0.41
1:A:182:ASN:OD1	1:A:182:ASN:N	2.53	0.41
1:A:344:HIS:HB3	1:A:348:VAL:CG2	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:90:LYS:HE2	1:B:90:LYS:HB3	1.81	0.41
1:D:174:ALA:HB2	1:D:377:VAL:HG21	2.02	0.41
1:G:176:THR:HG22	1:G:382:ASP:OD1	2.21	0.41
1:C:265:THR:OG1	1:C:289:ASN:HA	2.20	0.41
1:C:292:HIS:O	1:C:293:PHE:HB2	2.21	0.41
1:D:189:SER:CB	1:D:337:ASN:HB2	2.51	0.41
1:D:195:LEU:HA	1:D:198:THR:O	2.20	0.41
1:G:28:LEU:HD23	1:G:58:VAL:HG12	2.02	0.41
1:H:272:VAL:HG22	2:H:501:NAD:N6A	2.36	0.41
1:C:48:ALA:HA	1:C:122:MET:O	2.21	0.41
1:C:118:PRO:HG3	4:C:602:HOH:O	2.20	0.41
1:C:140:LYS:HB3	1:C:140:LYS:HE2	1.84	0.41
1:D:119:HIS:O	1:D:142:VAL:HG12	2.21	0.41
1:D:124:ASP:O	1:D:148:THR:HG22	2.21	0.41
1:D:138:THR:HG21	1:D:165:LYS:CB	2.51	0.41
1:E:88:LEU:HD23	1:E:88:LEU:HA	1.90	0.41
1:E:195:LEU:HD12	1:E:195:LEU:HA	1.78	0.41
1:E:314:GLN:HG2	1:E:315:ASN:ND2	2.36	0.41
1:F:175:PHE:N	1:F:175:PHE:CD1	2.89	0.41
1:F:370:LEU:HD23	1:F:370:LEU:HA	1.69	0.41
1:H:161:GLU:HB3	1:H:163:VAL:HG23	2.02	0.41
1:H:291:GLY:HA3	1:H:296:GLU:OE2	2.21	0.41
1:B:203:ALA:O	1:B:228:ALA:HA	2.20	0.41
1:C:347:GLU:OE1	1:C:347:GLU:N	2.47	0.41
1:D:124:ASP:O	1:D:146:GLU:OE2	2.39	0.41
1:F:120:VAL:HA	1:F:143:GLY:O	2.21	0.41
1:G:112:GLU:OE1	1:G:115:LYS:NZ	2.27	0.41
1:H:182:ASN:N	1:H:182:ASN:OD1	2.54	0.41
1:G:121:ILE:HG23	1:G:128:LEU:HD23	2.03	0.40
1:G:388:LEU:HD12	1:G:388:LEU:HA	1.73	0.40
1:H:8:LEU:HG	1:H:90:LYS:HE3	2.02	0.40
1:A:272:VAL:HG22	2:A:501:NAD:N6A	2.36	0.40
1:C:267:THR:O	1:C:296:GLU:OE2	2.38	0.40
1:E:49:VAL:HA	1:E:73:ALA:O	2.21	0.40
1:G:124:ASP:O	1:G:146:GLU:OE2	2.40	0.40
1:G:175:PHE:O	1:G:179:LEU:HB2	2.22	0.40
1:G:182:ASN:OD1	1:G:182:ASN:N	2.55	0.40
1:B:54:LYS:H	1:B:54:LYS:HG2	1.64	0.40
1:C:15:ARG:HE	1:C:90:LYS:NZ	2.20	0.40
1:C:389:LYS:HD2	1:C:389:LYS:HA	1.93	0.40
1:G:125:GLY:HA3	1:G:292:HIS:CD2	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:181:ASP:OD1	1:A:181:ASP:C	2.59	0.40
1:B:277:HIS:HA	1:B:280:ARG:HD2	2.02	0.40
1:E:33:LYS:HE2	1:E:33:LYS:CA	2.52	0.40
1:F:14:GLY:HA3	1:F:83:ASP:O	2.21	0.40
1:F:78:LEU:O	1:F:99:ARG:HD2	2.22	0.40
1:G:318:GLU:CD	1:G:326:ARG:HD2	2.42	0.40
1:A:114:LEU:HD23	1:A:114:LEU:HA	1.91	0.40
1:A:149:THR:HB	2:A:501:NAD:H2D	2.03	0.40
1:D:370:LEU:C	1:D:372:ASN:H	2.25	0.40
1:F:129:HIS:O	1:F:132:VAL:HG12	2.21	0.40
1:F:391:LYS:HD2	4:F:613:HOH:O	2.20	0.40
1:G:370:LEU:C	1:G:372:ASN:H	2.25	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	410/438 (94%)	387 (94%)	19 (5%)	4 (1%)	15	28
1	B	410/438 (94%)	385 (94%)	21 (5%)	4 (1%)	15	28
1	C	410/438 (94%)	387 (94%)	20 (5%)	3 (1%)	22	39
1	D	410/438 (94%)	388 (95%)	18 (4%)	4 (1%)	15	28
1	E	410/438 (94%)	386 (94%)	19 (5%)	5 (1%)	13	24
1	F	410/438 (94%)	386 (94%)	20 (5%)	4 (1%)	15	28
1	G	410/438 (94%)	387 (94%)	20 (5%)	3 (1%)	22	39
1	H	410/438 (94%)	387 (94%)	20 (5%)	3 (1%)	22	39
All	All	3280/3504 (94%)	3093 (94%)	157 (5%)	30 (1%)	17	31

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	138	THR
1	A	408	ILE
1	B	408	ILE
1	B	413	TYR
1	C	371	GLU
1	C	408	ILE
1	D	408	ILE
1	E	408	ILE
1	F	138	THR
1	F	408	ILE
1	G	408	ILE
1	H	408	ILE
1	B	203	ALA
1	F	367	LYS
1	H	367	LYS
1	A	367	LYS
1	B	367	LYS
1	C	367	LYS
1	D	367	LYS
1	E	367	LYS
1	G	372	ASN
1	D	137	LEU
1	E	412	LYS
1	F	137	LEU
1	E	137	LEU
1	G	367	LYS
1	A	371	GLU
1	D	335	LEU
1	H	412	LYS
1	E	414	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.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	341/363 (94%)	317 (93%)	24 (7%)	15 29
1	B	341/363 (94%)	323 (95%)	18 (5%)	22 43

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	C	341/363 (94%)	322 (94%)	19 (6%)	21 40
1	D	341/363 (94%)	326 (96%)	15 (4%)	28 52
1	E	341/363 (94%)	312 (92%)	29 (8%)	10 21
1	F	341/363 (94%)	325 (95%)	16 (5%)	26 49
1	G	341/363 (94%)	323 (95%)	18 (5%)	22 43
1	H	341/363 (94%)	327 (96%)	14 (4%)	30 55
All	All	2728/2904 (94%)	2575 (94%)	153 (6%)	21 40

All (153) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	9	SER
1	A	13	GLN
1	A	34	ARG
1	A	90	LYS
1	A	103	GLU
1	A	104	LYS
1	A	132	VAL
1	A	150	THR
1	A	153	ILE
1	A	182	ASN
1	A	189	SER
1	A	239	ARG
1	A	272	VAL
1	A	275	ARG
1	A	292	HIS
1	A	306	SER
1	A	313	ARG
1	A	338	LEU
1	A	346	SER
1	A	367	LYS
1	A	390	LEU
1	A	391	LYS
1	A	408	ILE
1	A	415	THR
1	B	10	LEU
1	B	12	GLU
1	B	13	GLN
1	B	42	ASP
1	B	140	LYS

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Mol	Chain	Res	Type
1	B	200	ILE
1	B	226	MET
1	B	239	ARG
1	B	259	ILE
1	B	292	HIS
1	B	314	GLN
1	B	335	LEU
1	B	367	LYS
1	B	369	LYS
1	B	370	LEU
1	B	397	ILE
1	B	399	GLU
1	B	415	THR
1	C	13	GLN
1	C	34	ARG
1	C	90	LYS
1	C	95	VAL
1	C	134	GLU
1	C	150	THR
1	C	200	ILE
1	C	234	GLU
1	C	239	ARG
1	C	323	ASN
1	C	335	LEU
1	C	365	LYS
1	C	367	LYS
1	C	373	LYS
1	C	383	GLU
1	C	397	ILE
1	C	399	GLU
1	C	408	ILE
1	C	412	LYS
1	D	10	LEU
1	D	42	ASP
1	D	60	VAL
1	D	63	LEU
1	D	280	ARG
1	D	282	LYS
1	D	300	LYS
1	D	305	ILE
1	D	309	THR
1	D	313	ARG

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Mol	Chain	Res	Type
1	D	314	GLN
1	D	348	VAL
1	D	358	LEU
1	D	365	LYS
1	D	415	THR
1	E	8	LEU
1	E	23	LEU
1	E	42	ASP
1	E	45	ARG
1	E	152	VAL
1	E	182	ASN
1	E	183	ARG
1	E	195	LEU
1	E	198	THR
1	E	245	MET
1	E	259	ILE
1	E	261	ASP
1	E	276	ASP
1	E	280	ARG
1	E	300	LYS
1	E	304	GLU
1	E	306	SER
1	E	309	THR
1	E	310	ARG
1	E	313	ARG
1	E	322	ARG
1	E	335	LEU
1	E	352	SER
1	E	369	LYS
1	E	383	GLU
1	E	391	LYS
1	E	396	GLU
1	E	413	TYR
1	E	415	THR
1	F	30	GLU
1	F	90	LYS
1	F	99	ARG
1	F	140	LYS
1	F	156	LYS
1	F	175	PHE
1	F	239	ARG
1	F	245	MET

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Mol	Chain	Res	Type
1	F	280	ARG
1	F	320	LYS
1	F	322	ARG
1	F	326	ARG
1	F	332	ASP
1	F	358	LEU
1	F	408	ILE
1	F	415	THR
1	G	8	LEU
1	G	40	PRO
1	G	90	LYS
1	G	99	ARG
1	G	104	LYS
1	G	140	LYS
1	G	148	THR
1	G	162	LYS
1	G	182	ASN
1	G	239	ARG
1	G	306	SER
1	G	313	ARG
1	G	335	LEU
1	G	373	LYS
1	G	384	GLN
1	G	388	LEU
1	G	390	LEU
1	G	415	THR
1	H	9	SER
1	H	63	LEU
1	H	90	LYS
1	H	132	VAL
1	H	140	LYS
1	H	146	GLU
1	H	182	ASN
1	H	239	ARG
1	H	269	ASN
1	H	320	LYS
1	H	335	LEU
1	H	380	GLU
1	H	407	TYR
1	H	415	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	384	GLN
1	B	13	GLN
1	B	323	ASN
1	B	344	HIS
1	B	366	ASN
1	C	17	GLN
1	C	136	ASN
1	C	292	HIS
1	C	314	GLN
1	C	344	HIS
1	C	355	ASN
1	D	271	ASN
1	D	384	GLN
1	D	410	GLN
1	E	315	ASN
1	F	76	ASN
1	F	292	HIS
1	F	376	ASN
1	G	94	HIS
1	G	254	ASN
1	G	344	HIS
1	G	376	ASN
1	H	13	GLN
1	H	135	ASN
1	H	337	ASN
1	H	344	HIS
1	H	362	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

16 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	ADN	H	502	-	18,21,21	0.65	0	18,31,31	0.91	1 (5%)
2	NAD	E	501	-	42,48,48	1.51	7 (16%)	50,73,73	1.76	13 (26%)
3	ADN	D	502	-	18,21,21	0.68	0	18,31,31	0.88	1 (5%)
2	NAD	B	501	-	42,48,48	1.53	6 (14%)	50,73,73	1.77	14 (28%)
3	ADN	C	502	-	18,21,21	0.63	0	18,31,31	0.95	1 (5%)
2	NAD	C	501	-	42,48,48	1.52	5 (11%)	50,73,73	1.75	13 (26%)
2	NAD	F	501	-	42,48,48	1.52	7 (16%)	50,73,73	1.71	12 (24%)
3	ADN	F	502	-	18,21,21	0.66	0	18,31,31	0.86	1 (5%)
2	NAD	H	501	-	42,48,48	1.49	3 (7%)	50,73,73	1.71	13 (26%)
3	ADN	A	502	-	18,21,21	0.63	0	18,31,31	0.91	1 (5%)
2	NAD	G	501	-	42,48,48	1.51	7 (16%)	50,73,73	1.72	11 (22%)
3	ADN	G	502	-	18,21,21	0.67	0	18,31,31	0.89	1 (5%)
2	NAD	D	501	-	42,48,48	1.53	7 (16%)	50,73,73	1.72	13 (26%)
2	NAD	A	501	-	42,48,48	1.47	4 (9%)	50,73,73	1.73	12 (24%)
3	ADN	E	502	-	18,21,21	0.68	0	18,31,31	0.91	1 (5%)
3	ADN	B	502	-	18,21,21	0.65	0	18,31,31	0.91	1 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADN	H	502	-	-	0/2/22/22	0/3/3/3
2	NAD	E	501	-	-	11/26/62/62	0/5/5/5
3	ADN	D	502	-	-	2/2/22/22	0/3/3/3
2	NAD	B	501	-	-	11/26/62/62	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADN	C	502	-	-	2/2/22/22	0/3/3/3
2	NAD	C	501	-	-	11/26/62/62	0/5/5/5
2	NAD	F	501	-	-	14/26/62/62	0/5/5/5
3	ADN	F	502	-	-	2/2/22/22	0/3/3/3
2	NAD	H	501	-	-	12/26/62/62	0/5/5/5
3	ADN	A	502	-	-	0/2/22/22	0/3/3/3
2	NAD	G	501	-	-	15/26/62/62	0/5/5/5
3	ADN	G	502	-	-	2/2/22/22	0/3/3/3
2	NAD	D	501	-	-	9/26/62/62	0/5/5/5
2	NAD	A	501	-	-	10/26/62/62	0/5/5/5
3	ADN	E	502	-	-	2/2/22/22	0/3/3/3
3	ADN	B	502	-	-	2/2/22/22	0/3/3/3

All (46) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	501	NAD	PN-O5D	5.21	1.80	1.59
2	B	501	NAD	PN-O5D	5.21	1.80	1.59
2	G	501	NAD	PN-O5D	4.98	1.79	1.59
2	H	501	NAD	PN-O5D	4.87	1.79	1.59
2	E	501	NAD	PN-O5D	4.81	1.78	1.59
2	F	501	NAD	PN-O5D	4.76	1.78	1.59
2	D	501	NAD	PN-O5D	4.44	1.77	1.59
2	A	501	NAD	PN-O5D	4.31	1.76	1.59
2	D	501	NAD	PA-O5B	4.19	1.76	1.59
2	F	501	NAD	PA-O5B	3.97	1.75	1.59
2	C	501	NAD	PA-O5B	3.95	1.75	1.59
2	H	501	NAD	PA-O5B	3.94	1.75	1.59
2	B	501	NAD	PA-O5B	3.89	1.75	1.59
2	A	501	NAD	PA-O5B	3.86	1.74	1.59
2	G	501	NAD	PA-O5B	3.85	1.74	1.59
2	E	501	NAD	PA-O5B	3.77	1.74	1.59
2	C	501	NAD	C7N-N7N	3.01	1.38	1.33
2	A	501	NAD	C7N-N7N	2.91	1.38	1.33
2	F	501	NAD	C2A-N3A	2.79	1.36	1.32
2	D	501	NAD	C7N-N7N	2.76	1.38	1.33
2	H	501	NAD	C7N-N7N	2.75	1.38	1.33
2	D	501	NAD	C2A-N3A	2.72	1.36	1.32
2	C	501	NAD	C2A-N3A	2.59	1.36	1.32
2	F	501	NAD	C7N-N7N	2.57	1.37	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	NAD	C7N-N7N	2.54	1.37	1.33
2	E	501	NAD	C4A-N3A	2.52	1.39	1.35
2	B	501	NAD	C2A-N3A	2.48	1.36	1.32
2	A	501	NAD	C2A-N3A	2.47	1.36	1.32
2	G	501	NAD	C7N-N7N	2.43	1.37	1.33
2	F	501	NAD	C4A-N3A	2.42	1.39	1.35
2	E	501	NAD	C2A-N3A	2.38	1.35	1.32
2	G	501	NAD	C2A-N3A	2.35	1.35	1.32
2	G	501	NAD	C4A-N3A	2.27	1.38	1.35
2	F	501	NAD	C2A-N1A	2.23	1.38	1.33
2	D	501	NAD	C4A-N3A	2.18	1.38	1.35
2	E	501	NAD	C2A-N1A	2.18	1.38	1.33
2	F	501	NAD	O5D-C5D	-2.13	1.36	1.44
2	C	501	NAD	O2D-C2D	-2.13	1.38	1.43
2	G	501	NAD	C2A-N1A	2.11	1.37	1.33
2	B	501	NAD	C4A-N3A	2.10	1.38	1.35
2	E	501	NAD	C7N-N7N	2.10	1.37	1.33
2	B	501	NAD	C2A-N1A	2.09	1.37	1.33
2	G	501	NAD	O5D-C5D	-2.05	1.36	1.44
2	E	501	NAD	C2B-C1B	2.03	1.56	1.53
2	D	501	NAD	C2A-N1A	2.02	1.37	1.33
2	D	501	NAD	C2B-C1B	2.01	1.56	1.53

All (109) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	501	NAD	PN-O3-PA	-5.50	113.96	132.83
2	G	501	NAD	PN-O3-PA	-5.43	114.20	132.83
2	D	501	NAD	PN-O3-PA	-5.34	114.50	132.83
2	F	501	NAD	PN-O3-PA	-5.24	114.83	132.83
2	A	501	NAD	PN-O3-PA	-5.10	115.32	132.83
2	E	501	NAD	PN-O3-PA	-5.03	115.56	132.83
2	B	501	NAD	PN-O3-PA	-4.98	115.72	132.83
2	H	501	NAD	PN-O3-PA	-4.96	115.79	132.83
2	A	501	NAD	O2A-PA-O1A	3.85	131.27	112.24
2	B	501	NAD	O2A-PA-O1A	3.84	131.24	112.24
2	C	501	NAD	O2A-PA-O1A	3.80	131.02	112.24
2	F	501	NAD	O2A-PA-O1A	3.76	130.82	112.24
2	G	501	NAD	O2A-PA-O1A	3.74	130.75	112.24
2	H	501	NAD	O2N-PN-O1N	3.74	130.73	112.24
2	A	501	NAD	O2N-PN-O1N	3.70	130.55	112.24
2	B	501	NAD	O2N-PN-O1N	3.67	130.40	112.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	501	NAD	O2N-PN-O1N	3.67	130.39	112.24
2	E	501	NAD	O2A-PA-O1A	3.66	130.35	112.24
2	D	501	NAD	O2A-PA-O1A	3.65	130.29	112.24
2	F	501	NAD	O2N-PN-O1N	3.63	130.18	112.24
2	C	501	NAD	O2N-PN-O1N	3.62	130.16	112.24
2	G	501	NAD	O2N-PN-O1N	3.60	130.03	112.24
2	H	501	NAD	O2A-PA-O1A	3.51	129.61	112.24
2	D	501	NAD	O2N-PN-O1N	3.49	129.52	112.24
2	C	501	NAD	C3D-C2D-C1D	-3.19	96.17	100.98
2	A	501	NAD	C5B-C4B-C3B	-3.03	103.82	115.18
2	A	501	NAD	O5B-PA-O1A	-3.01	97.32	109.07
2	H	501	NAD	O5B-PA-O1A	-2.99	97.38	109.07
2	B	501	NAD	O5B-PA-O1A	-2.97	97.47	109.07
2	G	501	NAD	O5B-PA-O1A	-2.95	97.53	109.07
2	E	501	NAD	O5B-PA-O1A	-2.89	97.76	109.07
2	B	501	NAD	C3D-C2D-C1D	-2.88	96.65	100.98
2	A	501	NAD	O5D-PN-O1N	-2.87	97.83	109.07
2	D	501	NAD	O4B-C1B-C2B	-2.85	102.76	106.93
2	H	501	NAD	O5D-PN-O1N	-2.82	98.04	109.07
2	F	501	NAD	O5B-PA-O1A	-2.81	98.09	109.07
2	B	501	NAD	O5D-PN-O1N	-2.78	98.20	109.07
2	F	501	NAD	PN-O5D-C5D	-2.78	105.39	121.68
2	G	501	NAD	O5D-PN-O1N	-2.76	98.27	109.07
2	D	501	NAD	O5D-PN-O1N	-2.76	98.28	109.07
2	B	501	NAD	C2N-N1N-C1D	-2.73	113.05	119.14
2	G	501	NAD	O4B-C1B-C2B	-2.73	102.94	106.93
2	E	501	NAD	C2N-N1N-C1D	-2.71	113.09	119.14
2	A	501	NAD	O4B-C1B-C2B	-2.68	103.01	106.93
2	B	501	NAD	PN-O5D-C5D	-2.68	105.97	121.68
2	C	501	NAD	O5B-PA-O1A	-2.66	98.69	109.07
2	E	501	NAD	O5D-PN-O1N	-2.65	98.73	109.07
2	F	501	NAD	O5D-PN-O1N	-2.63	98.79	109.07
2	E	501	NAD	PN-O5D-C5D	-2.63	106.25	121.68
2	F	501	NAD	C5D-C4D-C3D	-2.62	105.37	115.18
2	G	501	NAD	PN-O5D-C5D	-2.60	106.43	121.68
2	E	501	NAD	C5B-C4B-C3B	-2.54	105.68	115.18
2	D	501	NAD	C5D-C4D-C3D	-2.53	105.69	115.18
2	C	501	NAD	O5D-PN-O1N	-2.53	99.19	109.07
2	H	501	NAD	O4B-C1B-C2B	-2.52	103.24	106.93
2	E	501	NAD	PA-O5B-C5B	-2.49	107.05	121.68
2	E	501	NAD	C5D-C4D-C3D	-2.49	105.84	115.18
2	H	501	NAD	PA-O5B-C5B	-2.48	107.12	121.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	502	ADN	C5-C6-N6	2.48	124.12	120.35
2	H	501	NAD	C5D-C4D-C3D	-2.48	105.90	115.18
2	A	501	NAD	PA-O5B-C5B	-2.46	107.27	121.68
3	C	502	ADN	C5-C6-N6	2.46	124.08	120.35
3	A	502	ADN	C5-C6-N6	2.45	124.08	120.35
2	H	501	NAD	PN-O5D-C5D	-2.43	107.41	121.68
2	G	501	NAD	PA-O5B-C5B	-2.42	107.52	121.68
2	D	501	NAD	O5B-PA-O1A	-2.41	99.64	109.07
2	C	501	NAD	PN-O5D-C5D	-2.40	107.58	121.68
2	H	501	NAD	C5B-C4B-C3B	-2.40	106.17	115.18
2	B	501	NAD	O2N-PN-O5D	-2.39	96.63	107.75
2	C	501	NAD	O2N-PN-O5D	-2.38	96.68	107.75
2	E	501	NAD	O4B-C1B-C2B	-2.38	103.45	106.93
3	F	502	ADN	C5-C6-N6	2.37	123.96	120.35
2	A	501	NAD	PN-O5D-C5D	-2.37	107.77	121.68
2	D	501	NAD	PN-O5D-C5D	-2.37	107.78	121.68
2	A	501	NAD	C1B-N9A-C4A	-2.35	122.51	126.64
2	H	501	NAD	O2N-PN-O5D	-2.35	96.83	107.75
3	G	502	ADN	C5-C6-N6	2.35	123.92	120.35
3	B	502	ADN	C5-C6-N6	2.34	123.90	120.35
2	B	501	NAD	C1B-N9A-C4A	-2.34	122.54	126.64
2	F	501	NAD	PA-O5B-C5B	-2.33	108.04	121.68
2	E	501	NAD	O2N-PN-O5D	-2.31	97.00	107.75
2	D	501	NAD	C5B-C4B-C3B	-2.31	106.54	115.18
2	D	501	NAD	C3D-C2D-C1D	-2.30	97.51	100.98
2	D	501	NAD	O2N-PN-O5D	-2.30	97.07	107.75
3	E	502	ADN	C5-C6-N6	2.30	123.84	120.35
2	C	501	NAD	O3D-C3D-C4D	-2.29	104.44	111.05
2	B	501	NAD	PA-O5B-C5B	-2.29	108.27	121.68
2	A	501	NAD	O2N-PN-O5D	-2.25	97.28	107.75
2	D	501	NAD	PA-O5B-C5B	-2.25	108.47	121.68
2	F	501	NAD	C5B-C4B-C3B	-2.25	106.75	115.18
2	F	501	NAD	O2N-PN-O5D	-2.25	97.32	107.75
2	B	501	NAD	O3D-C3D-C4D	-2.24	104.58	111.05
2	C	501	NAD	PA-O5B-C5B	-2.22	108.69	121.68
2	F	501	NAD	O4B-C1B-C2B	-2.22	103.69	106.93
3	H	502	ADN	C5-C6-N6	2.21	123.72	120.35
2	G	501	NAD	C5D-C4D-C3D	-2.19	106.98	115.18
2	E	501	NAD	C1B-N9A-C4A	-2.17	122.82	126.64
2	A	501	NAD	C5D-C4D-C3D	-2.15	107.11	115.18
2	G	501	NAD	O2N-PN-O5D	-2.15	97.75	107.75
2	D	501	NAD	C2N-N1N-C1D	-2.15	114.35	119.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	G	501	NAD	O3B-C3B-C4B	-2.14	104.85	111.05
2	B	501	NAD	C5B-C4B-C3B	-2.12	107.25	115.18
2	C	501	NAD	O4B-C1B-C2B	-2.11	103.84	106.93
2	H	501	NAD	C1B-N9A-C4A	-2.11	122.93	126.64
2	C	501	NAD	C5B-C4B-C3B	-2.05	107.51	115.18
2	F	501	NAD	O3B-C3B-C4B	-2.04	105.15	111.05
2	C	501	NAD	O3B-C3B-C4B	-2.03	105.19	111.05
2	B	501	NAD	O3B-C3B-C4B	-2.01	105.23	111.05
2	H	501	NAD	O3B-C3B-C4B	-2.01	105.25	111.05

There are no chirality outliers.

All (105) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	NAD	C5B-O5B-PA-O1A
2	A	501	NAD	PN-O3-PA-O5B
2	A	501	NAD	O4B-C4B-C5B-O5B
2	A	501	NAD	O4D-C1D-N1N-C2N
2	A	501	NAD	O4D-C1D-N1N-C6N
2	A	501	NAD	C2D-C1D-N1N-C2N
2	A	501	NAD	C2D-C1D-N1N-C6N
2	B	501	NAD	C5B-O5B-PA-O1A
2	B	501	NAD	O4D-C1D-N1N-C2N
2	B	501	NAD	O4D-C1D-N1N-C6N
2	B	501	NAD	C2D-C1D-N1N-C2N
2	B	501	NAD	C2D-C1D-N1N-C6N
2	C	501	NAD	C5B-O5B-PA-O1A
2	C	501	NAD	O4D-C1D-N1N-C2N
2	C	501	NAD	O4D-C1D-N1N-C6N
2	C	501	NAD	C2D-C1D-N1N-C2N
2	C	501	NAD	C2D-C1D-N1N-C6N
2	D	501	NAD	C5B-O5B-PA-O1A
2	D	501	NAD	O4D-C1D-N1N-C2N
2	D	501	NAD	O4D-C1D-N1N-C6N
2	D	501	NAD	C2D-C1D-N1N-C2N
2	D	501	NAD	C2D-C1D-N1N-C6N
2	E	501	NAD	C5B-O5B-PA-O1A
2	E	501	NAD	O4B-C4B-C5B-O5B
2	E	501	NAD	O4D-C1D-N1N-C2N
2	E	501	NAD	O4D-C1D-N1N-C6N
2	E	501	NAD	C2D-C1D-N1N-C2N
2	E	501	NAD	C2D-C1D-N1N-C6N

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Mol	Chain	Res	Type	Atoms
2	F	501	NAD	C5B-O5B-PA-O1A
2	F	501	NAD	O4B-C4B-C5B-O5B
2	F	501	NAD	C5D-O5D-PN-O1N
2	F	501	NAD	O4D-C4D-C5D-O5D
2	F	501	NAD	O4D-C1D-N1N-C2N
2	F	501	NAD	O4D-C1D-N1N-C6N
2	F	501	NAD	C2D-C1D-N1N-C2N
2	F	501	NAD	C2D-C1D-N1N-C6N
2	G	501	NAD	C5B-O5B-PA-O1A
2	G	501	NAD	PN-O3-PA-O5B
2	G	501	NAD	O4B-C4B-C5B-O5B
2	G	501	NAD	C5D-O5D-PN-O1N
2	G	501	NAD	O4D-C4D-C5D-O5D
2	G	501	NAD	O4D-C1D-N1N-C2N
2	G	501	NAD	O4D-C1D-N1N-C6N
2	G	501	NAD	C2D-C1D-N1N-C2N
2	G	501	NAD	C2D-C1D-N1N-C6N
2	H	501	NAD	C5B-O5B-PA-O1A
2	H	501	NAD	O4D-C1D-N1N-C2N
2	H	501	NAD	O4D-C1D-N1N-C6N
2	H	501	NAD	C2D-C1D-N1N-C2N
2	H	501	NAD	C2D-C1D-N1N-C6N
3	D	502	ADN	O4'-C4'-C5'-O5'
3	D	502	ADN	C3'-C4'-C5'-O5'
3	C	502	ADN	O4'-C4'-C5'-O5'
3	F	502	ADN	O4'-C4'-C5'-O5'
3	C	502	ADN	C3'-C4'-C5'-O5'
3	F	502	ADN	C3'-C4'-C5'-O5'
3	B	502	ADN	C3'-C4'-C5'-O5'
2	A	501	NAD	C3B-C4B-C5B-O5B
2	B	501	NAD	O4B-C4B-C5B-O5B
2	B	501	NAD	C3B-C4B-C5B-O5B
2	C	501	NAD	O4B-C4B-C5B-O5B
2	C	501	NAD	C3B-C4B-C5B-O5B
2	D	501	NAD	O4B-C4B-C5B-O5B
2	D	501	NAD	C3B-C4B-C5B-O5B
2	F	501	NAD	C3B-C4B-C5B-O5B
2	F	501	NAD	C3D-C4D-C5D-O5D
2	G	501	NAD	C3D-C4D-C5D-O5D
2	H	501	NAD	O4B-C4B-C5B-O5B
2	H	501	NAD	C3B-C4B-C5B-O5B
3	E	502	ADN	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
2	E	501	NAD	C3B-C4B-C5B-O5B
2	G	501	NAD	C3B-C4B-C5B-O5B
3	G	502	ADN	C3'-C4'-C5'-O5'
3	B	502	ADN	O4'-C4'-C5'-O5'
3	E	502	ADN	O4'-C4'-C5'-O5'
3	G	502	ADN	O4'-C4'-C5'-O5'
2	B	501	NAD	PN-O3-PA-O1A
2	B	501	NAD	PN-O3-PA-O5B
2	C	501	NAD	PN-O3-PA-O5B
2	F	501	NAD	PN-O3-PA-O5B
2	H	501	NAD	PN-O3-PA-O5B
2	A	501	NAD	C5B-O5B-PA-O3
2	B	501	NAD	C5B-O5B-PA-O3
2	C	501	NAD	C5B-O5B-PA-O3
2	D	501	NAD	C5B-O5B-PA-O3
2	E	501	NAD	C5B-O5B-PA-O3
2	F	501	NAD	C5B-O5B-PA-O3
2	G	501	NAD	C5B-O5B-PA-O3
2	H	501	NAD	C5B-O5B-PA-O3
2	A	501	NAD	C5B-O5B-PA-O2A
2	B	501	NAD	C5B-O5B-PA-O2A
2	C	501	NAD	C5B-O5B-PA-O2A
2	D	501	NAD	C5B-O5B-PA-O2A
2	E	501	NAD	C5B-O5B-PA-O2A
2	F	501	NAD	C5B-O5B-PA-O2A
2	F	501	NAD	C5D-O5D-PN-O2N
2	G	501	NAD	C5B-O5B-PA-O2A
2	H	501	NAD	C5B-O5B-PA-O2A
2	E	501	NAD	O4D-C4D-C5D-O5D
2	H	501	NAD	O4D-C4D-C5D-O5D
2	G	501	NAD	PN-O3-PA-O1A
2	C	501	NAD	O4D-C4D-C5D-O5D
2	E	501	NAD	C5D-O5D-PN-O1N
2	G	501	NAD	C5D-O5D-PN-O2N
2	H	501	NAD	C5D-O5D-PN-O1N

There are no ring outliers.

16 monomers are involved in 28 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	502	ADN	1	0
2	E	501	NAD	4	0

Continued on next page...

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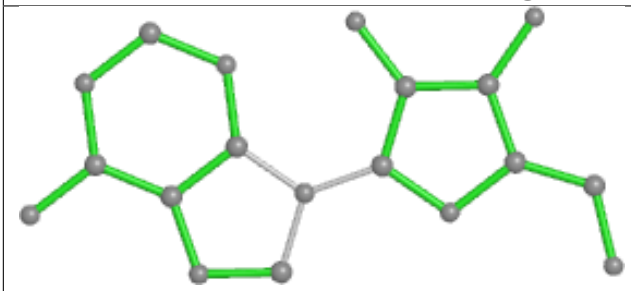
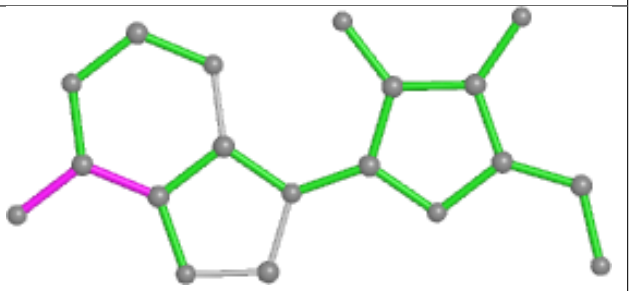
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	502	ADN	1	0
2	B	501	NAD	4	0
3	C	502	ADN	1	0
2	C	501	NAD	2	0
2	F	501	NAD	3	0
3	F	502	ADN	1	0
2	H	501	NAD	4	0
3	A	502	ADN	1	0
2	G	501	NAD	2	0
3	G	502	ADN	2	0
2	D	501	NAD	3	0
2	A	501	NAD	5	0
3	E	502	ADN	1	0
3	B	502	ADN	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

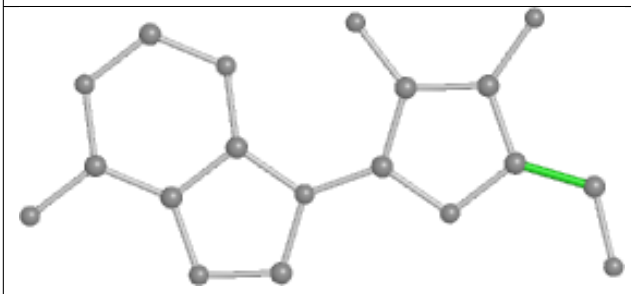
Ligand ADN H 502



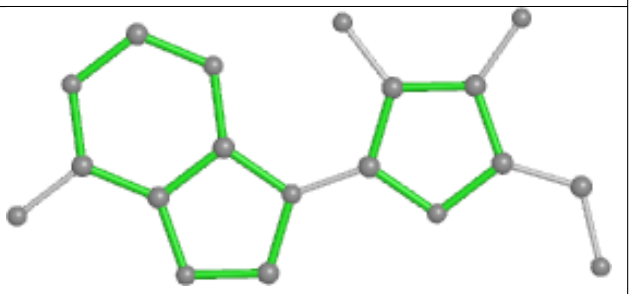
Bond lengths



Bond angles

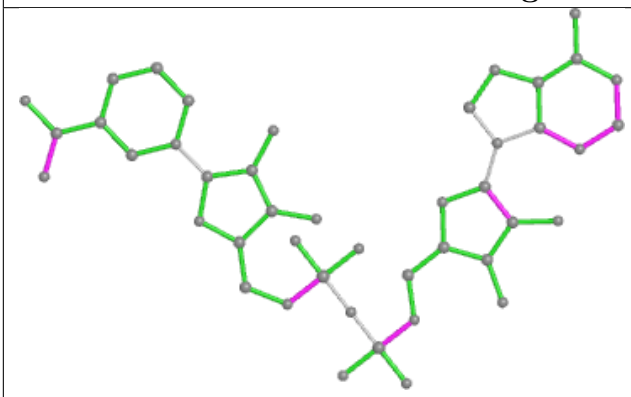


Torsions

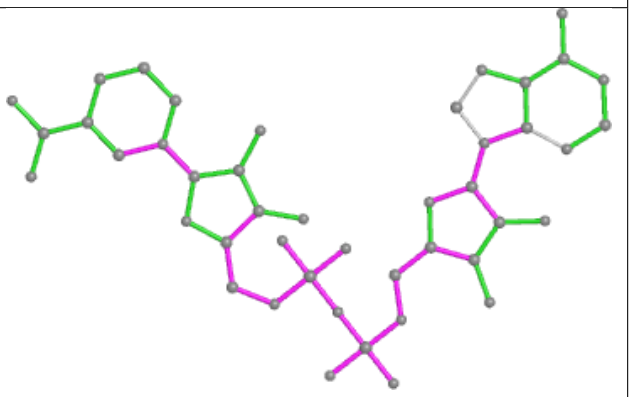


Rings

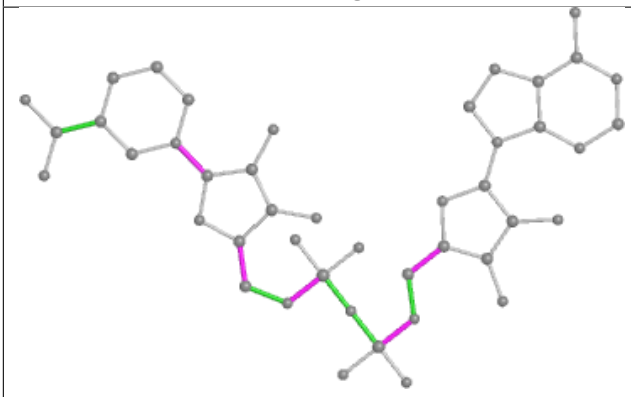
Ligand NAD E 501



Bond lengths



Bond angles



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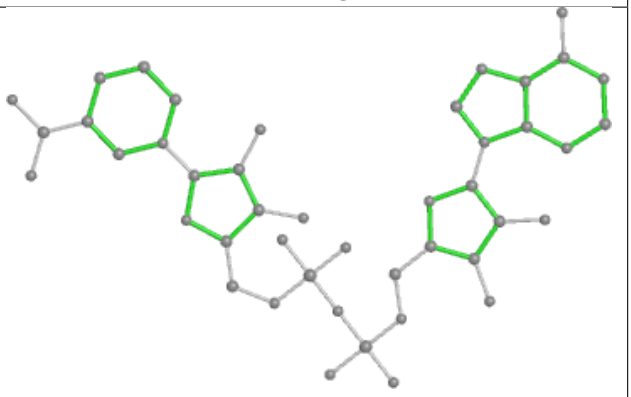
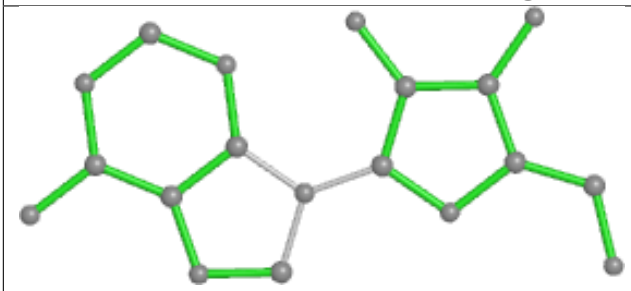
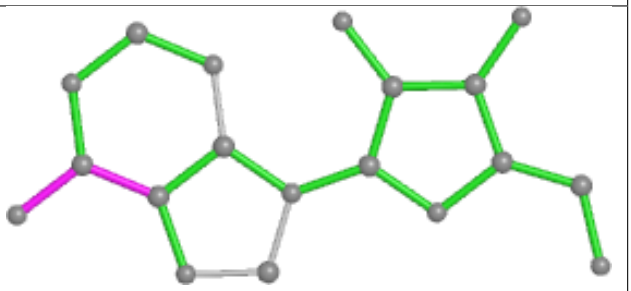


Rings

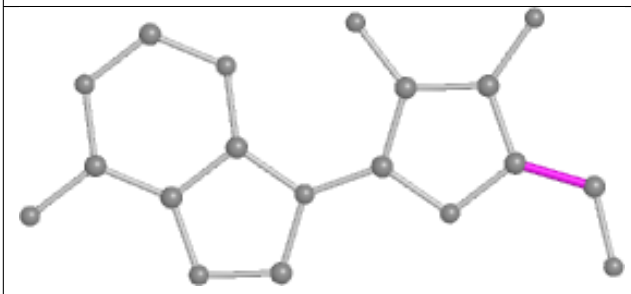
Ligand ADN D 502



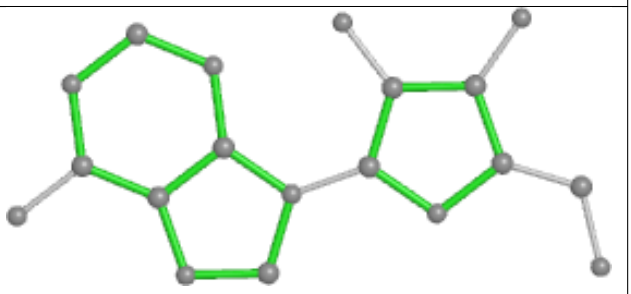
Bond lengths



Bond angles

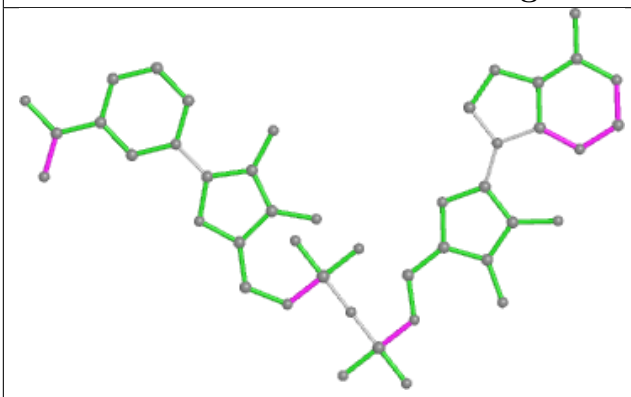


Torsions

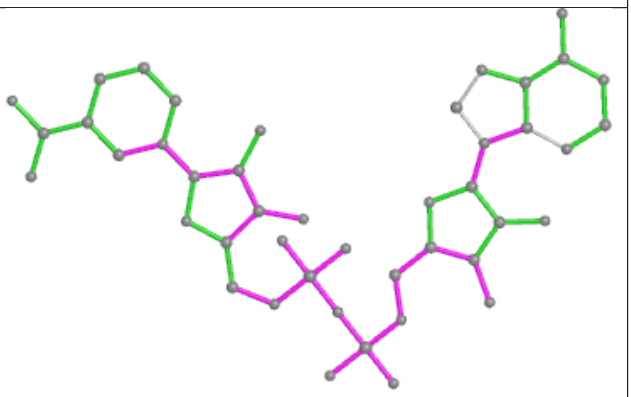


Rings

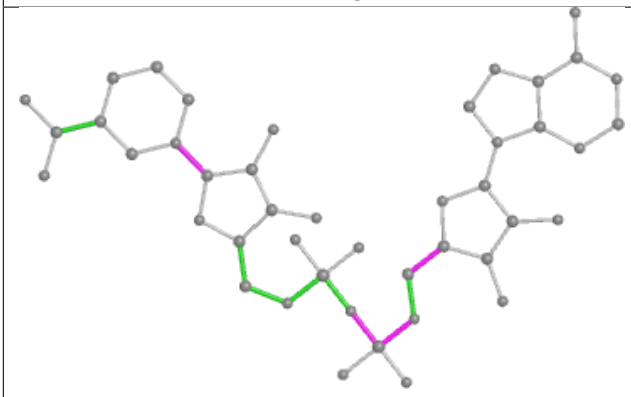
Ligand NAD B 501



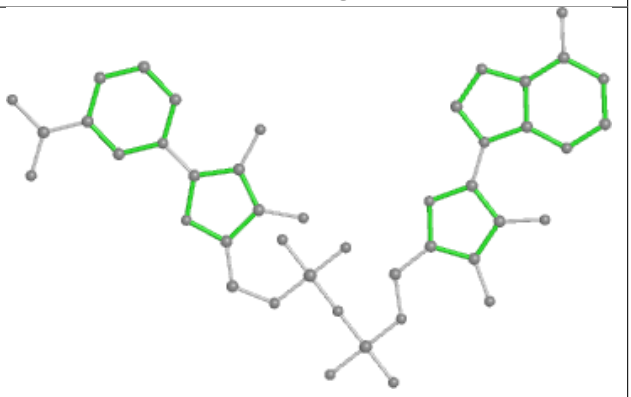
Bond lengths



Bond angles

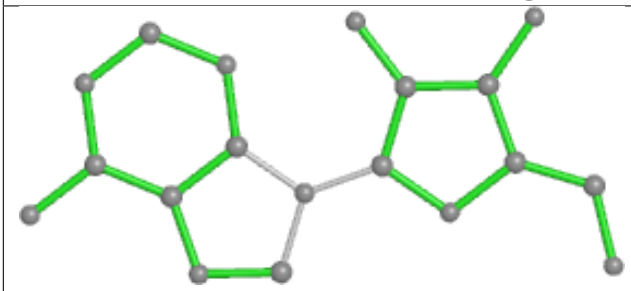


Torsions



Rings

Ligand ADN C 502



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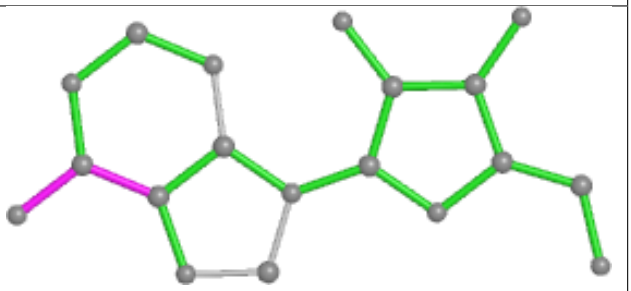

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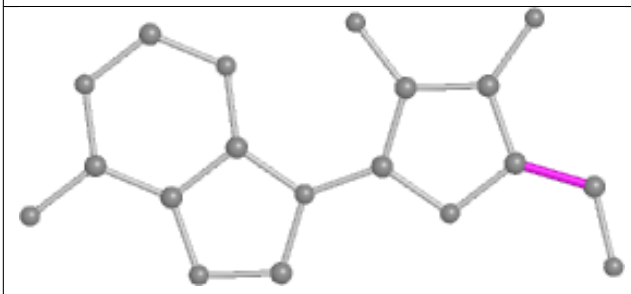

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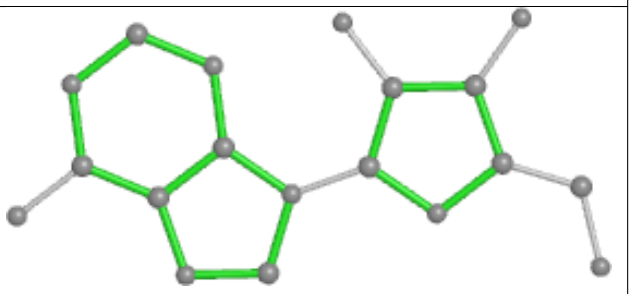
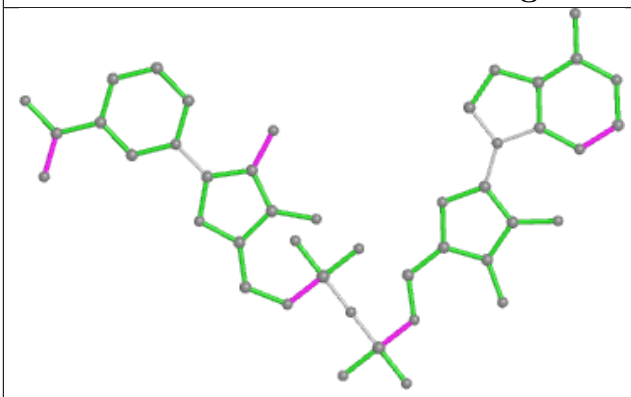


Rings

Ligand NAD C 501



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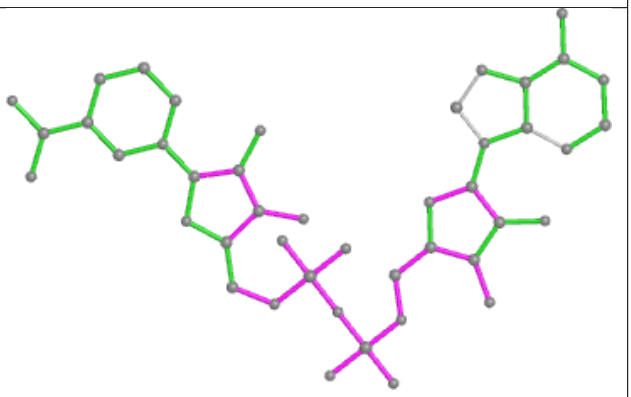

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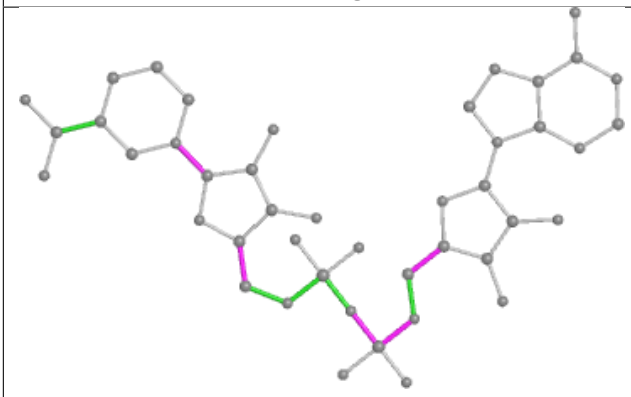

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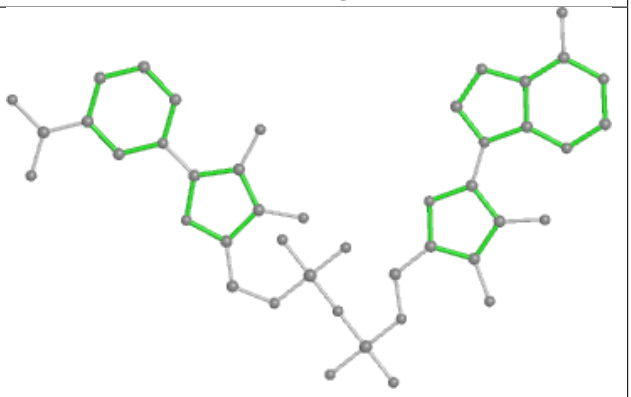

Rings

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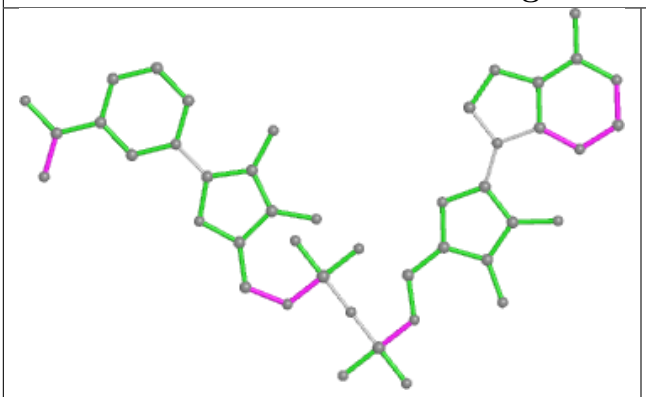

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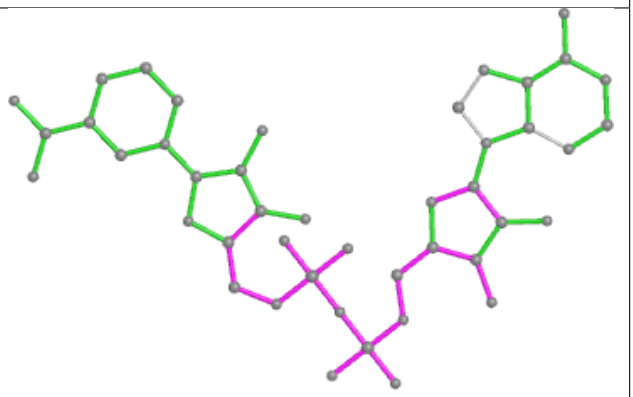

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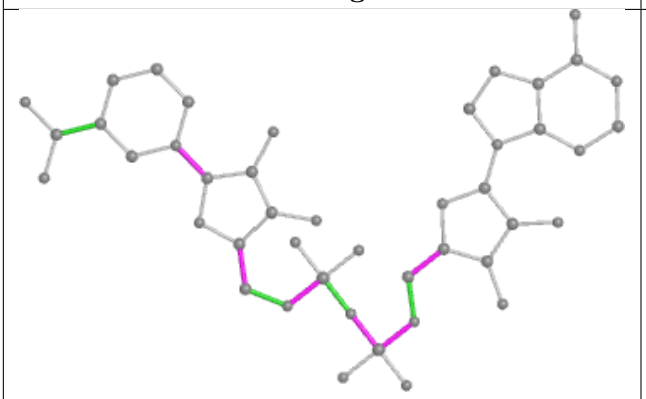

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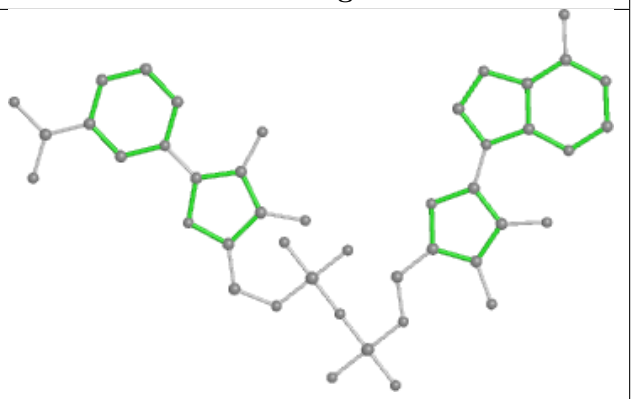

Rings

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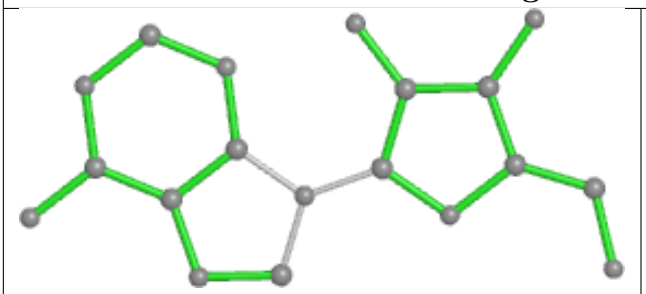

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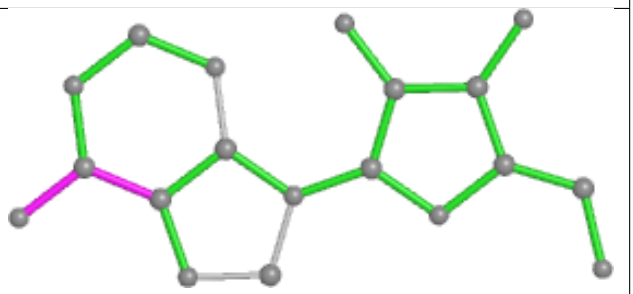

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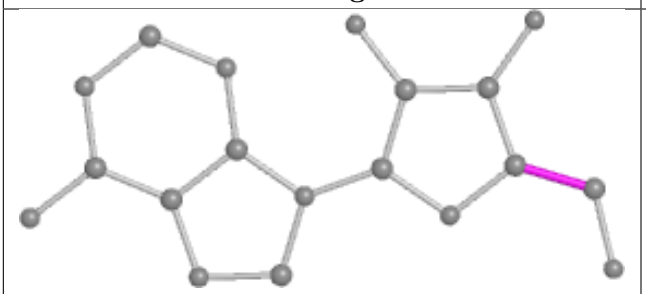

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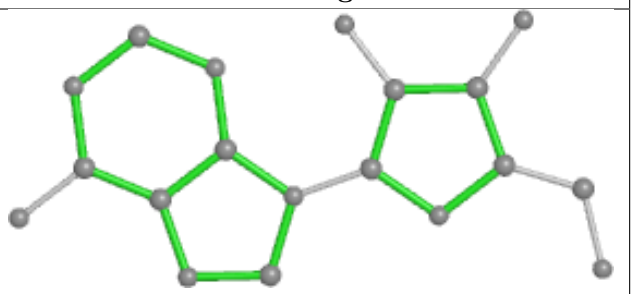
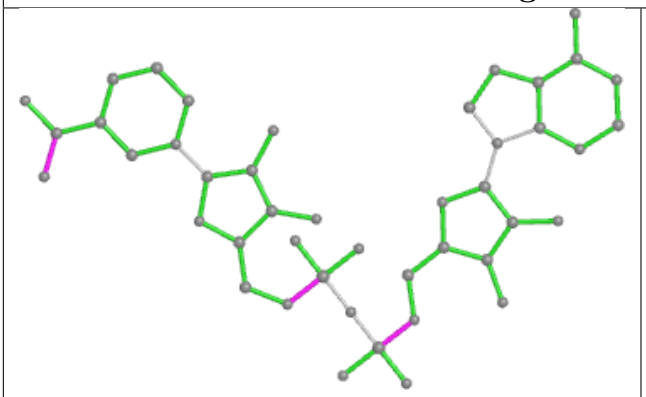


Rings

Ligand NAD H 501



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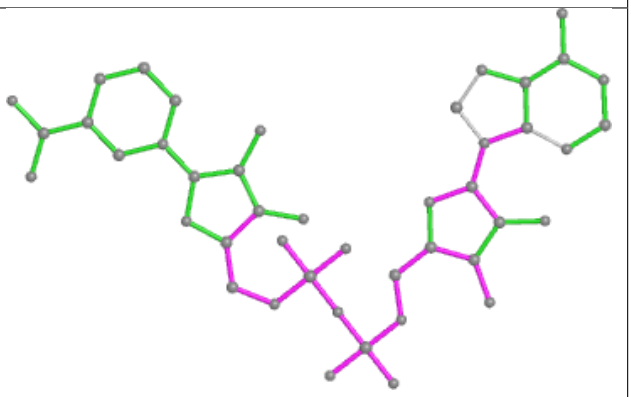

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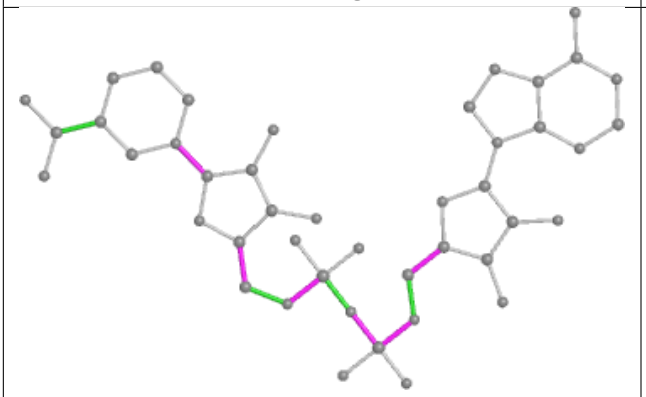

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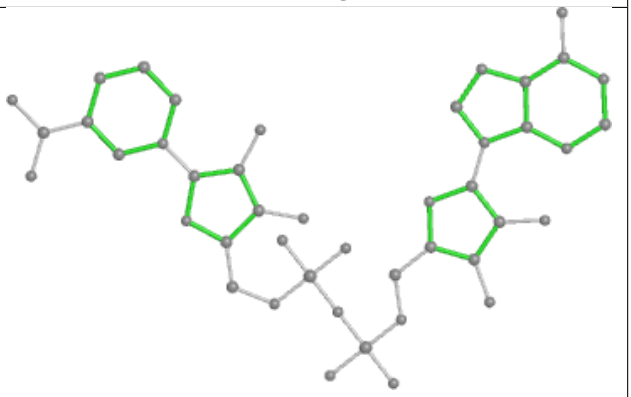
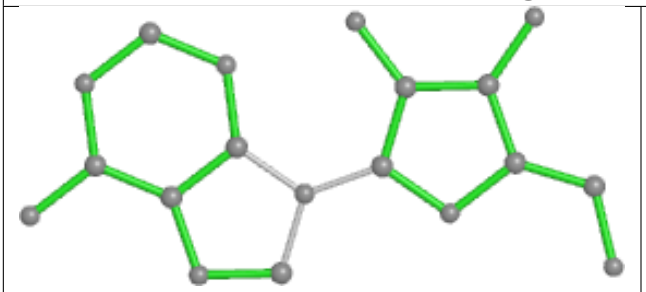


Rings

Ligand ADN A 502



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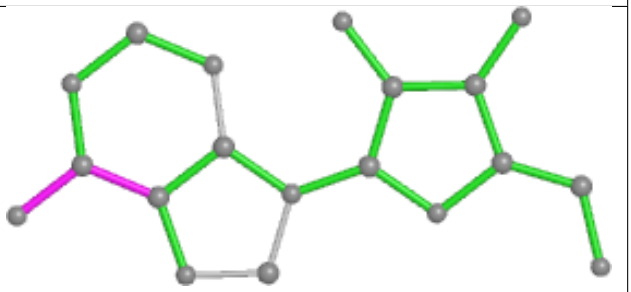
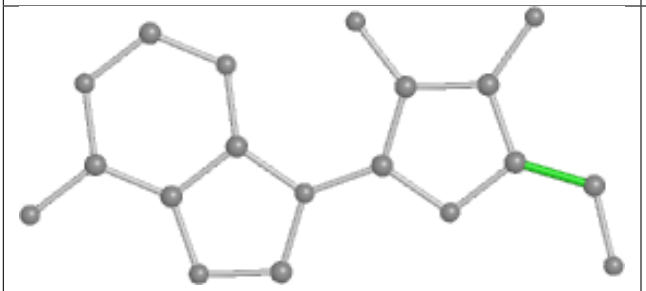


Bond angles



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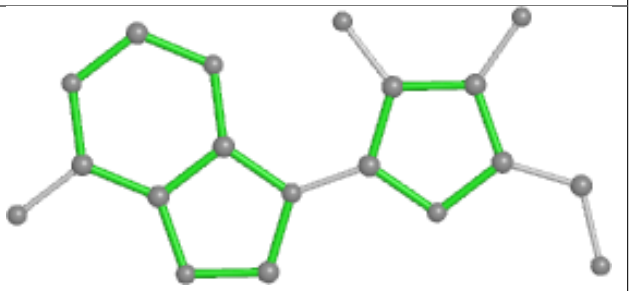
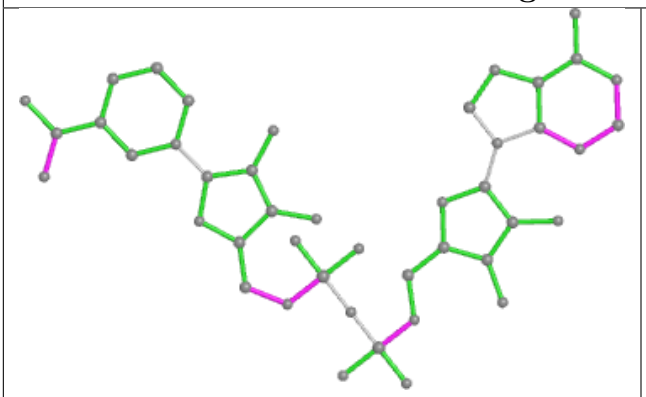


Rings

Ligand NAD G 501



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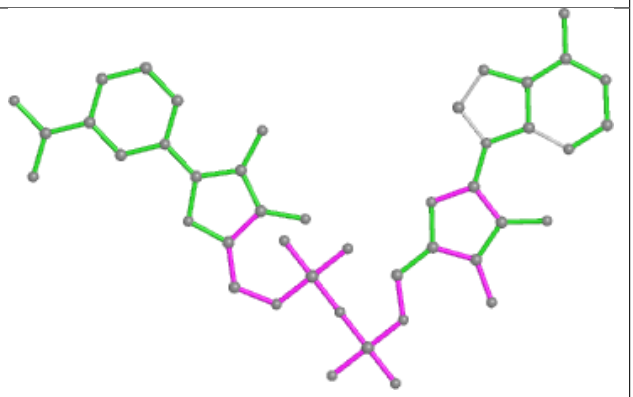
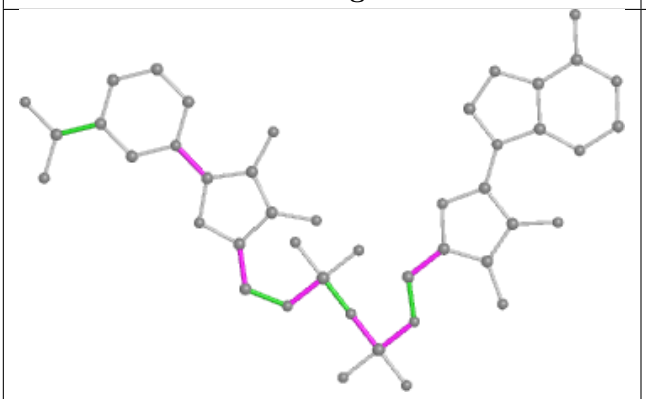


Bond angles



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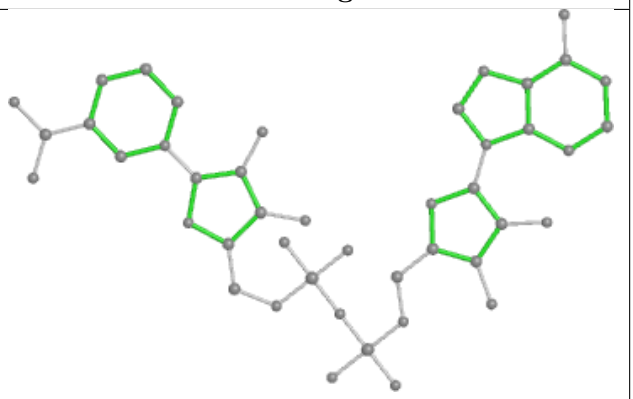
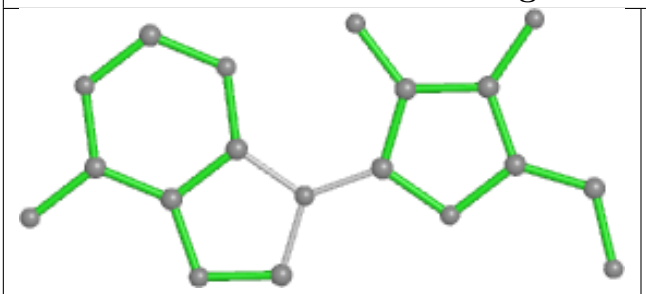


Rings

Ligand ADN G 502



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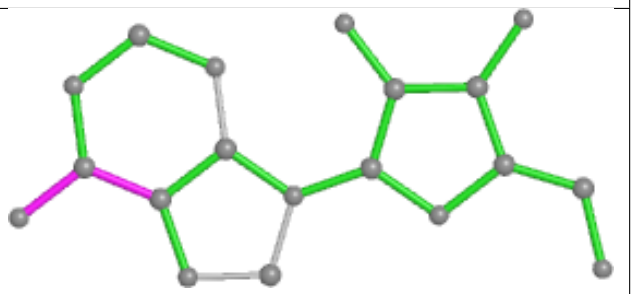
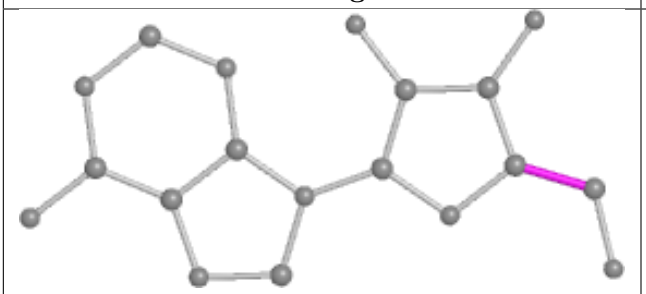
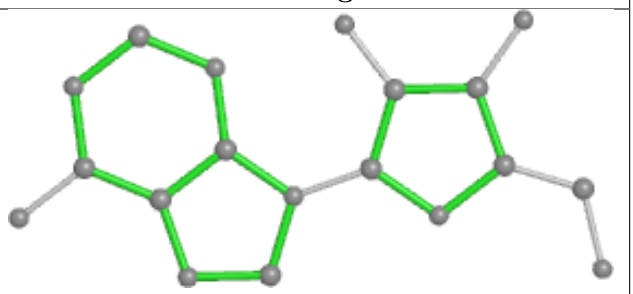


Bond angles

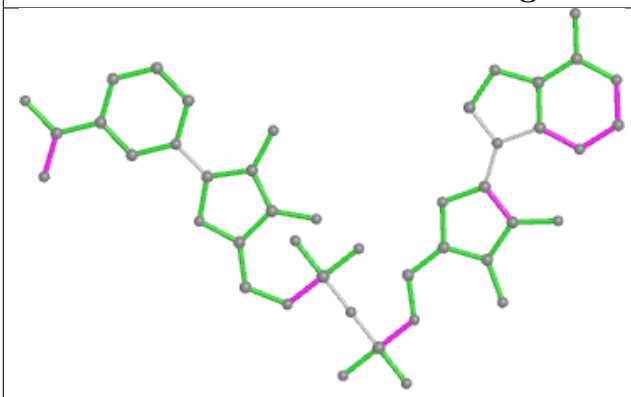


Torsions

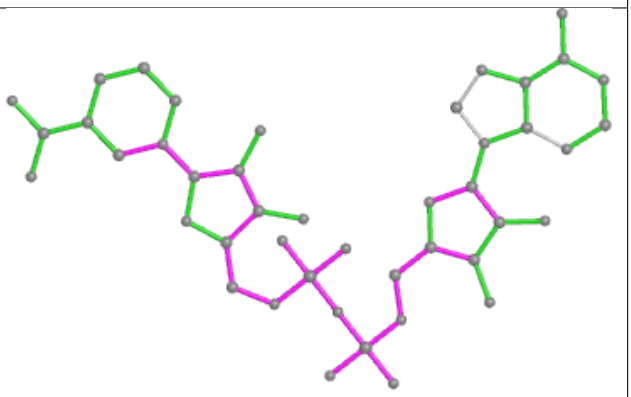


Rings

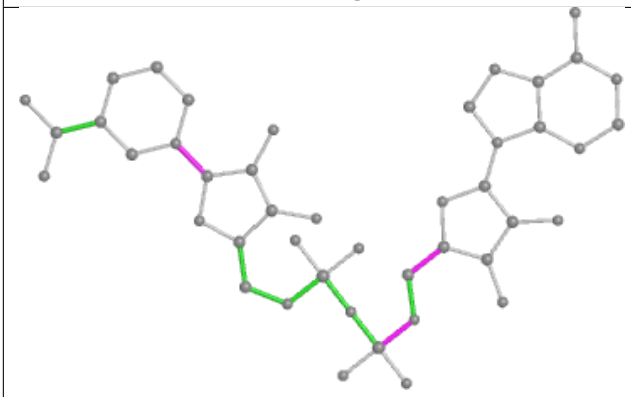
Ligand NAD D 501



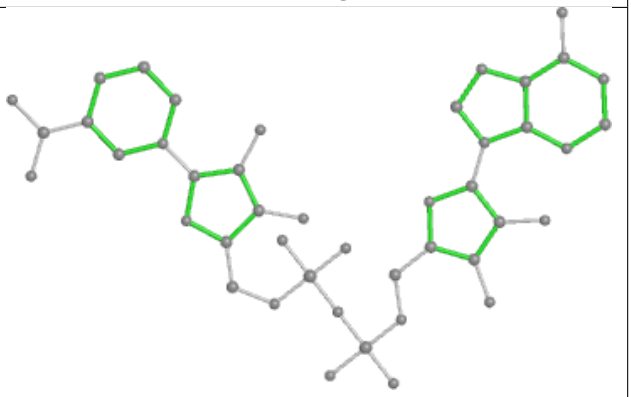
Bond lengths



Bond angles

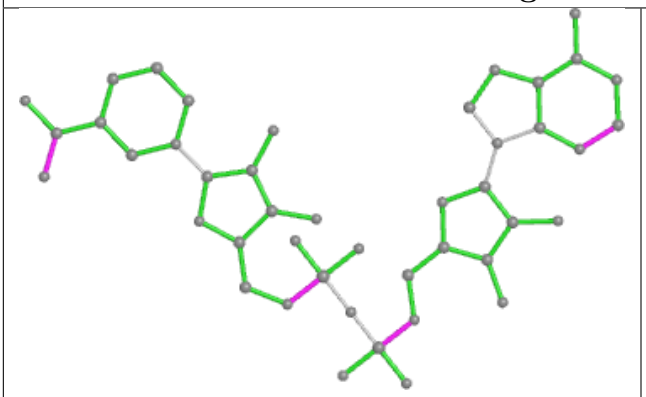


Torsions

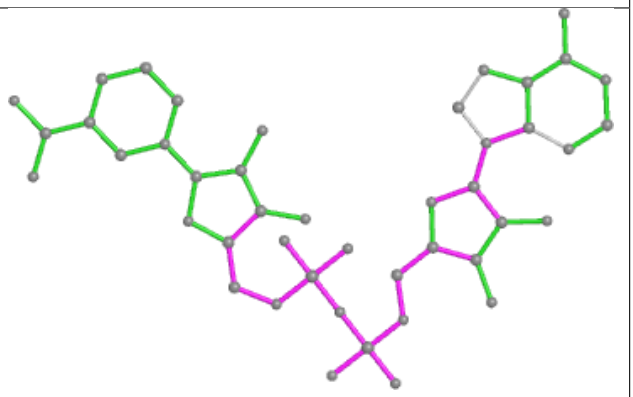


Rings

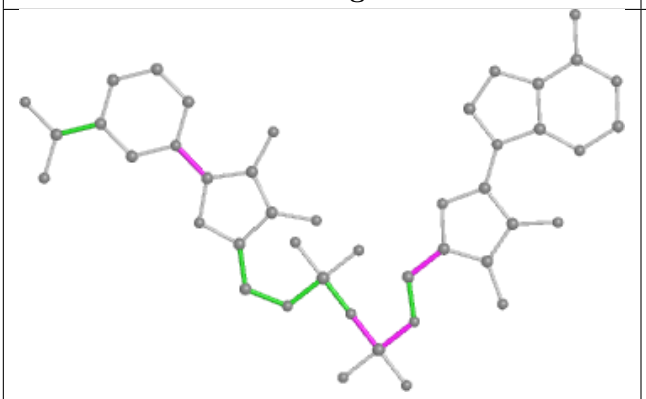
Ligand NAD A 501



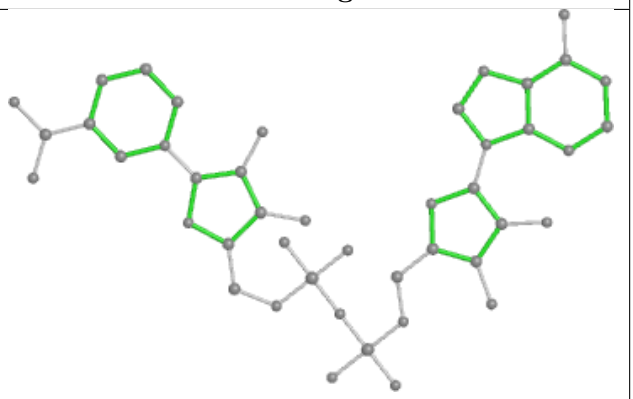
Bond lengths



Bond angles

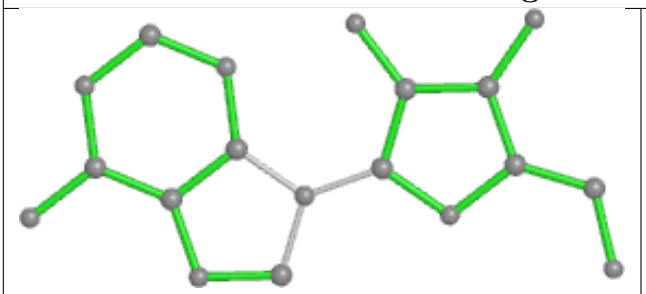


Torsions

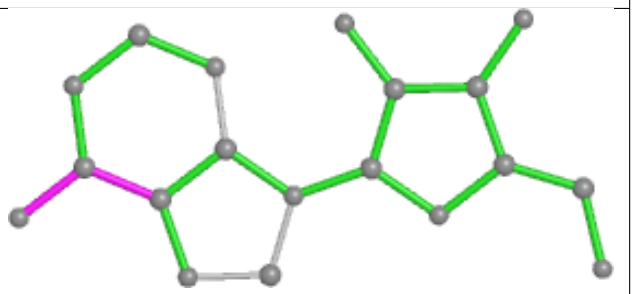


Rings

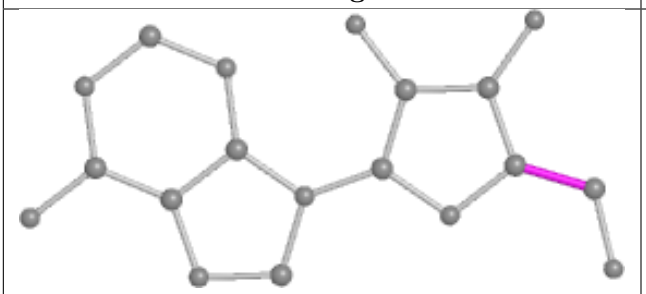
Ligand ADN E 502



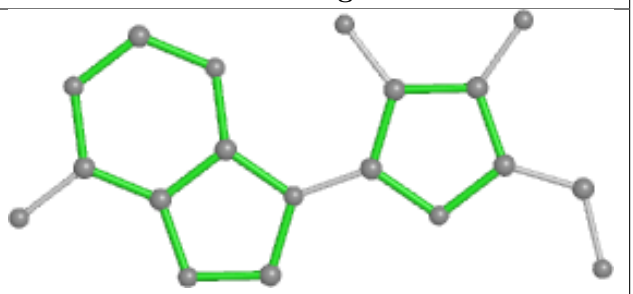
Bond lengths



Bond angles

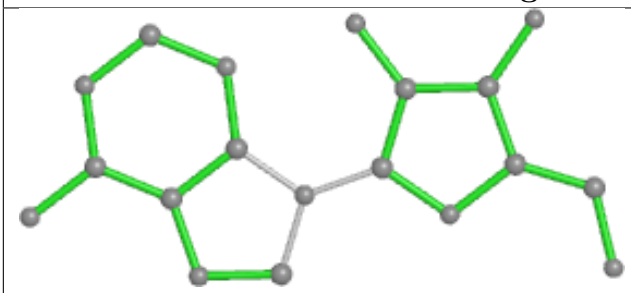


Torsions

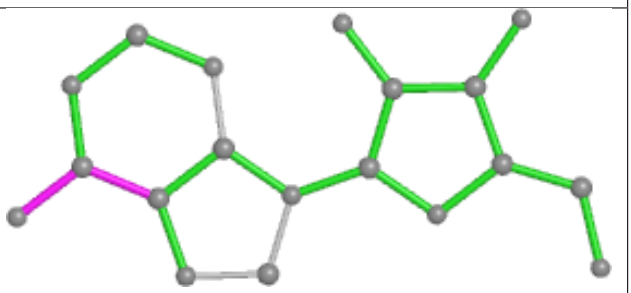


Rings

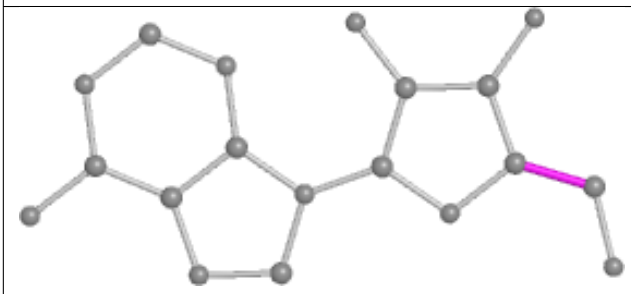
Ligand ADN B 502



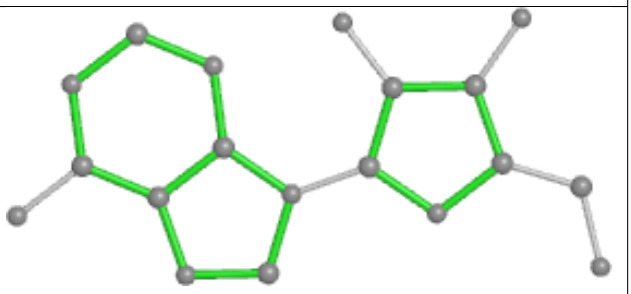
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	412/438 (94%)	-0.05	3 (0%)	87	89	21, 37, 60, 78	0
1	B	412/438 (94%)	0.15	12 (2%)	51	55	27, 49, 72, 82	0
1	C	412/438 (94%)	-0.01	6 (1%)	73	75	20, 39, 56, 84	0
1	D	412/438 (94%)	0.15	8 (1%)	66	69	26, 48, 67, 95	0
1	E	412/438 (94%)	-0.00	7 (1%)	70	72	23, 37, 54, 100	0
1	F	412/438 (94%)	0.14	8 (1%)	66	69	25, 52, 75, 105	0
1	G	412/438 (94%)	0.08	8 (1%)	66	69	22, 43, 62, 77	0
1	H	412/438 (94%)	0.09	6 (1%)	73	75	24, 45, 66, 84	0
All	All	3296/3504 (94%)	0.07	58 (1%)	68	71	20, 43, 67, 105	0

All (58) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	415	THR	9.8
1	D	415	THR	7.9
1	C	415	THR	7.7
1	B	415	THR	7.6
1	F	415	THR	7.3
1	B	413	TYR	6.2
1	D	413	TYR	5.6
1	D	414	GLY	5.4
1	H	372	ASN	5.3
1	G	372	ASN	5.2
1	C	372	ASN	4.9
1	G	413	TYR	4.8
1	E	415	THR	4.5
1	B	372	ASN	4.3
1	E	413	TYR	4.2
1	B	371	GLU	4.2

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Mol	Chain	Res	Type	RSRZ
1	H	415	THR	4.2
1	E	414	GLY	4.1
1	C	414	GLY	3.9
1	D	371	GLU	3.8
1	B	43	GLY	3.6
1	F	413	TYR	3.6
1	G	414	GLY	3.6
1	B	370	LEU	3.5
1	F	372	ASN	3.5
1	E	371	GLU	3.4
1	A	372	ASN	3.4
1	F	142	VAL	3.2
1	H	414	GLY	3.0
1	E	372	ASN	3.0
1	C	413	TYR	3.0
1	H	368	GLY	2.9
1	B	70	ILE	2.8
1	D	372	ASN	2.8
1	F	371	GLU	2.8
1	A	415	THR	2.8
1	E	70	ILE	2.7
1	G	371	GLU	2.7
1	A	414	GLY	2.6
1	C	394	GLY	2.6
1	F	370	LEU	2.4
1	D	200	ILE	2.4
1	F	8	LEU	2.4
1	C	371	GLU	2.4
1	G	162	LYS	2.3
1	E	305	ILE	2.3
1	G	143	GLY	2.2
1	B	7	ASP	2.2
1	D	96	TYR	2.2
1	G	72	LEU	2.2
1	B	10	LEU	2.2
1	H	369	LYS	2.2
1	F	414	GLY	2.1
1	B	414	GLY	2.1
1	B	41	LEU	2.1
1	D	227	GLY	2.1
1	H	371	GLU	2.1
1	B	72	LEU	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

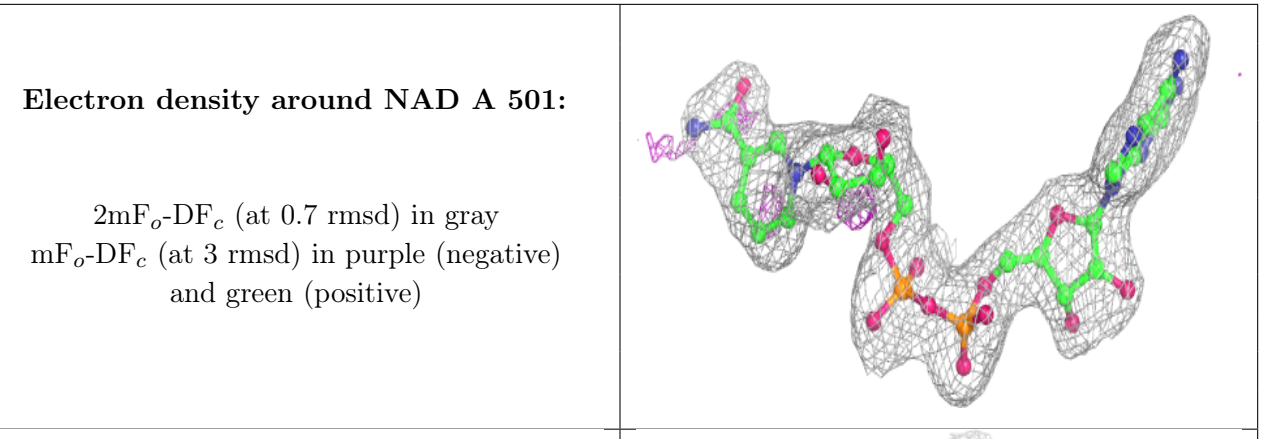
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	NAD	A	501	44/44	0.94	0.13	23,30,37,41	0
2	NAD	B	501	44/44	0.94	0.13	26,36,46,55	0
2	NAD	C	501	44/44	0.94	0.13	24,31,37,38	0
2	NAD	F	501	44/44	0.94	0.13	36,43,48,51	0
2	NAD	G	501	44/44	0.94	0.13	27,38,44,51	0
3	ADN	F	502	19/19	0.94	0.17	29,41,48,49	0
2	NAD	E	501	44/44	0.95	0.12	27,34,41,48	0
3	ADN	A	502	19/19	0.95	0.14	23,29,36,38	0
2	NAD	D	501	44/44	0.95	0.12	32,36,43,45	0
3	ADN	B	502	19/19	0.96	0.13	22,30,42,43	0
3	ADN	C	502	19/19	0.96	0.12	22,26,38,40	0
3	ADN	E	502	19/19	0.96	0.14	19,25,35,40	0
2	NAD	H	501	44/44	0.96	0.12	27,33,40,46	0
3	ADN	G	502	19/19	0.96	0.13	29,35,42,42	0
3	ADN	H	502	19/19	0.96	0.12	22,32,40,45	0
3	ADN	D	502	19/19	0.97	0.13	23,31,42,44	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.

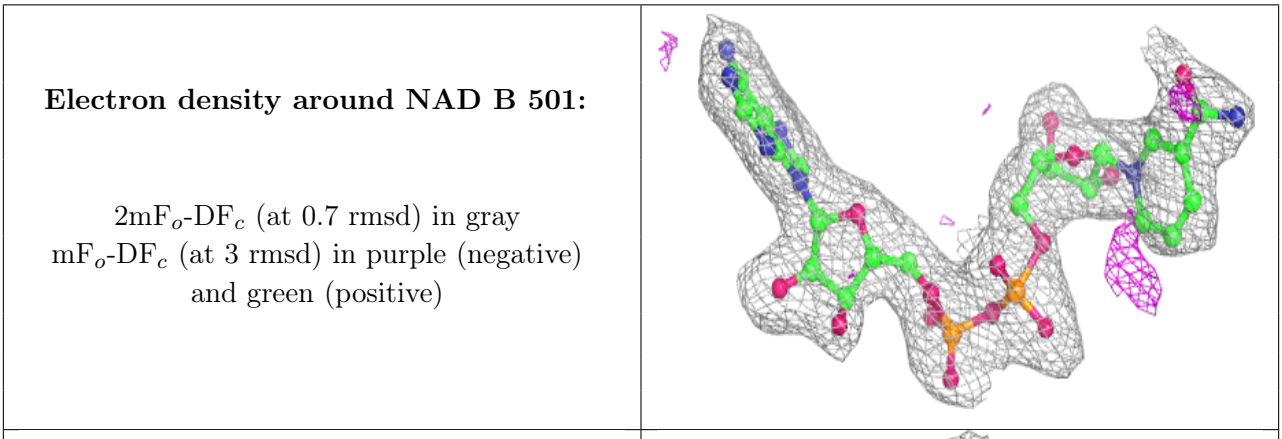
Electron density around NAD A 501:

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



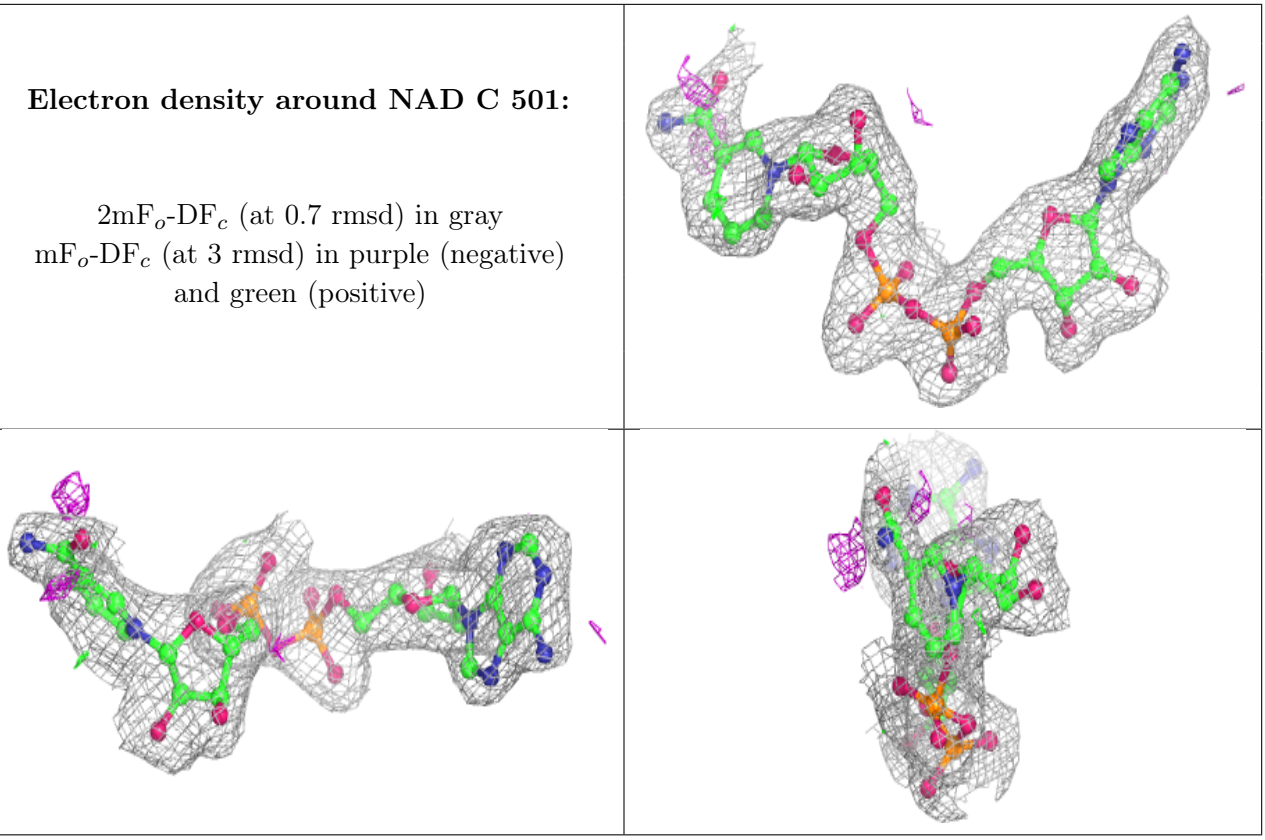
Electron density around NAD B 501:

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



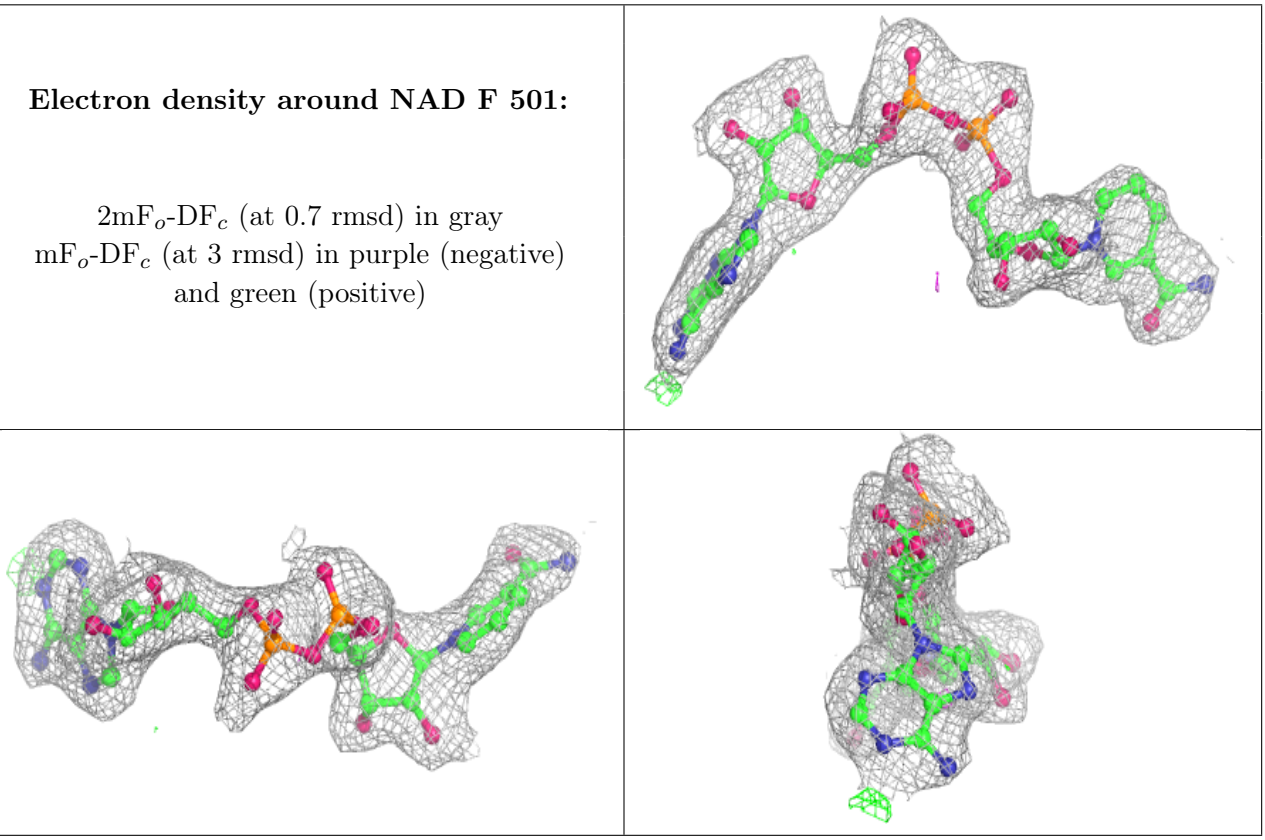
Electron density around NAD C 501:

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



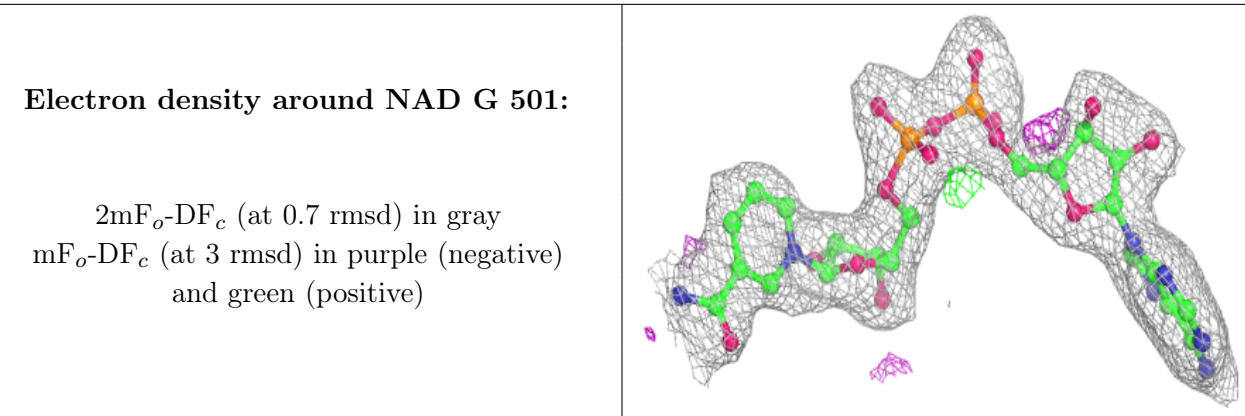
Electron density around NAD F 501:

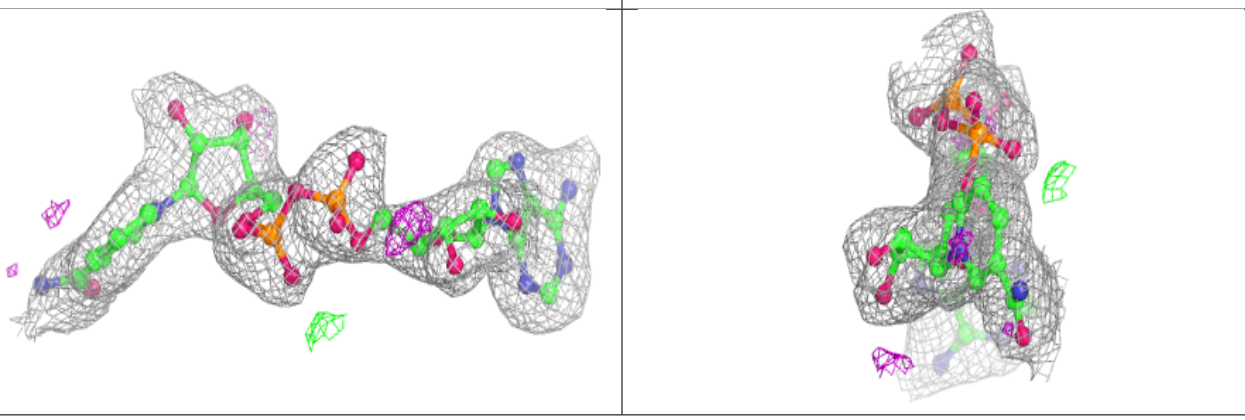
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around NAD G 501:

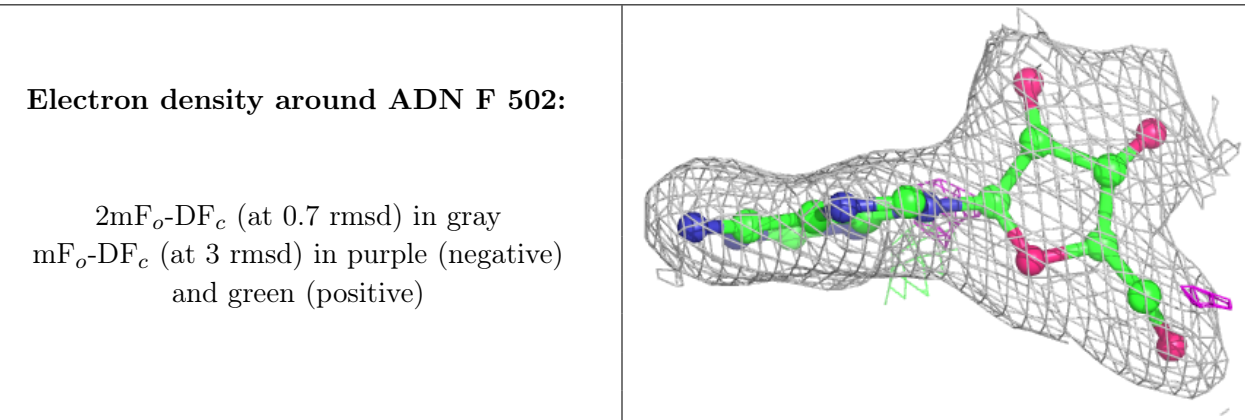
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

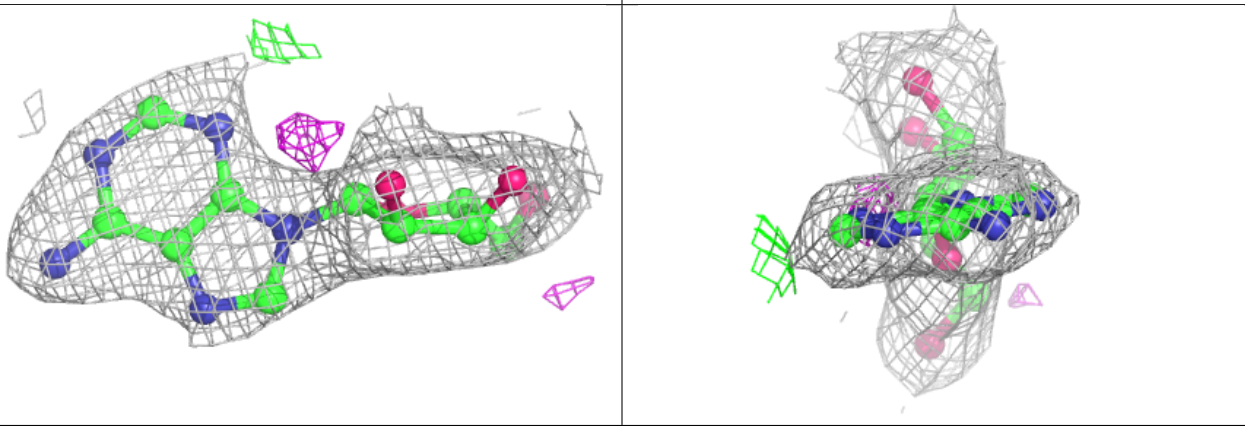




Electron density around ADN F 502:

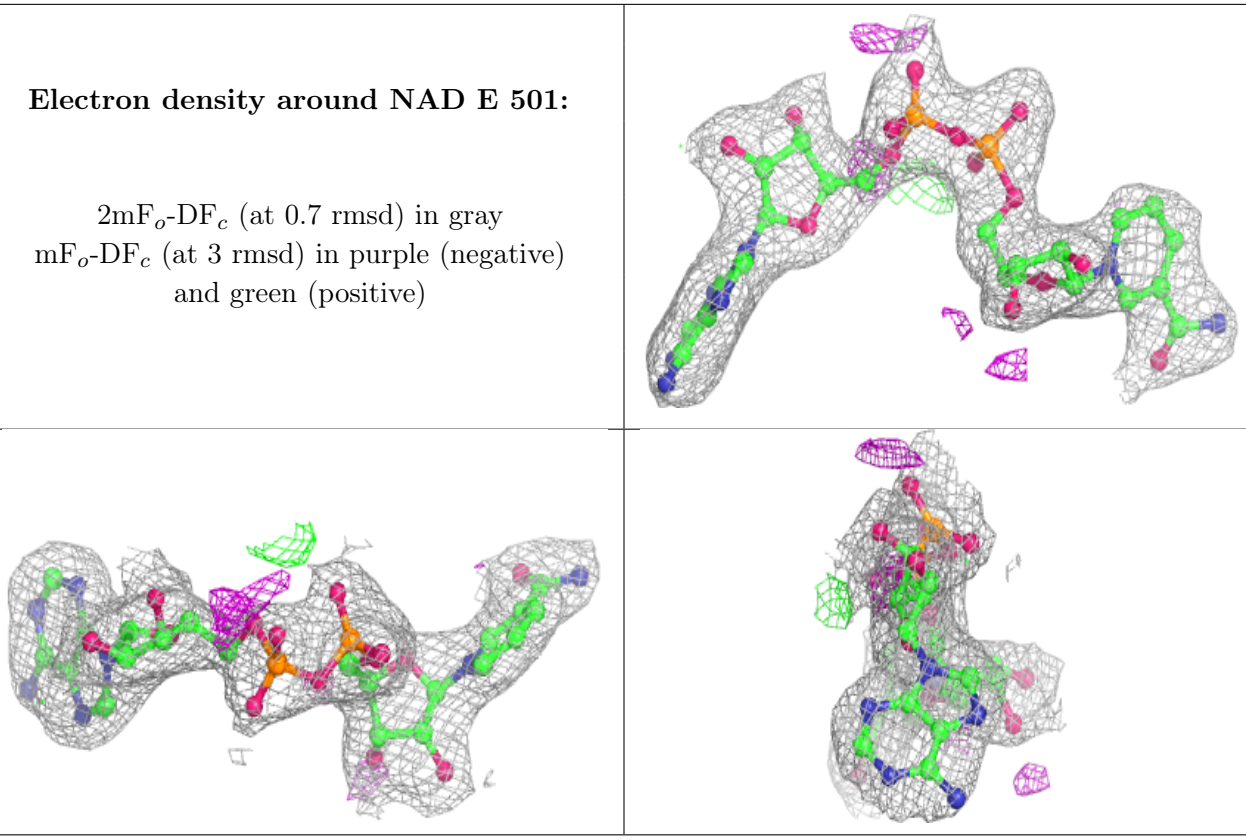
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





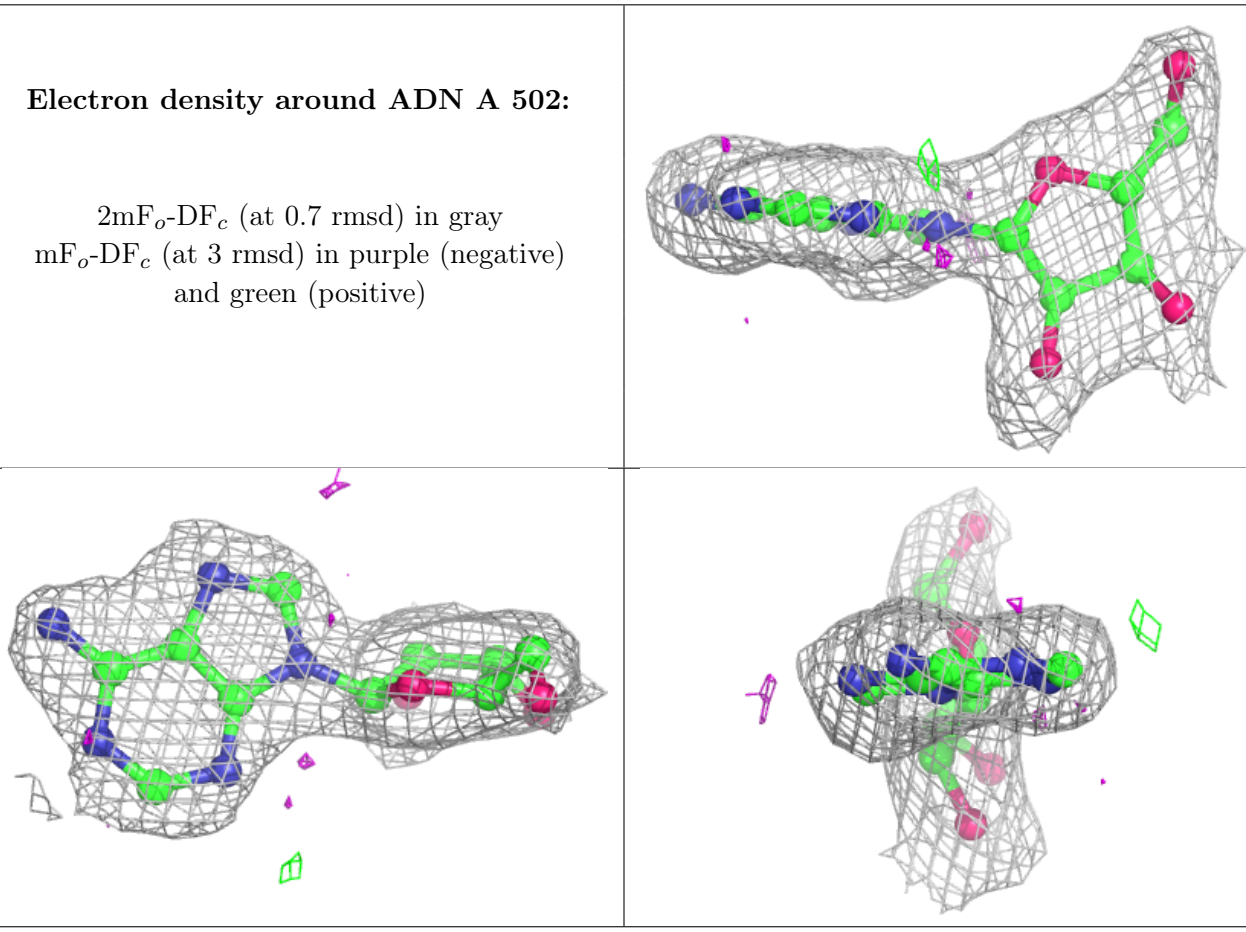
Electron density around NAD E 501:

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



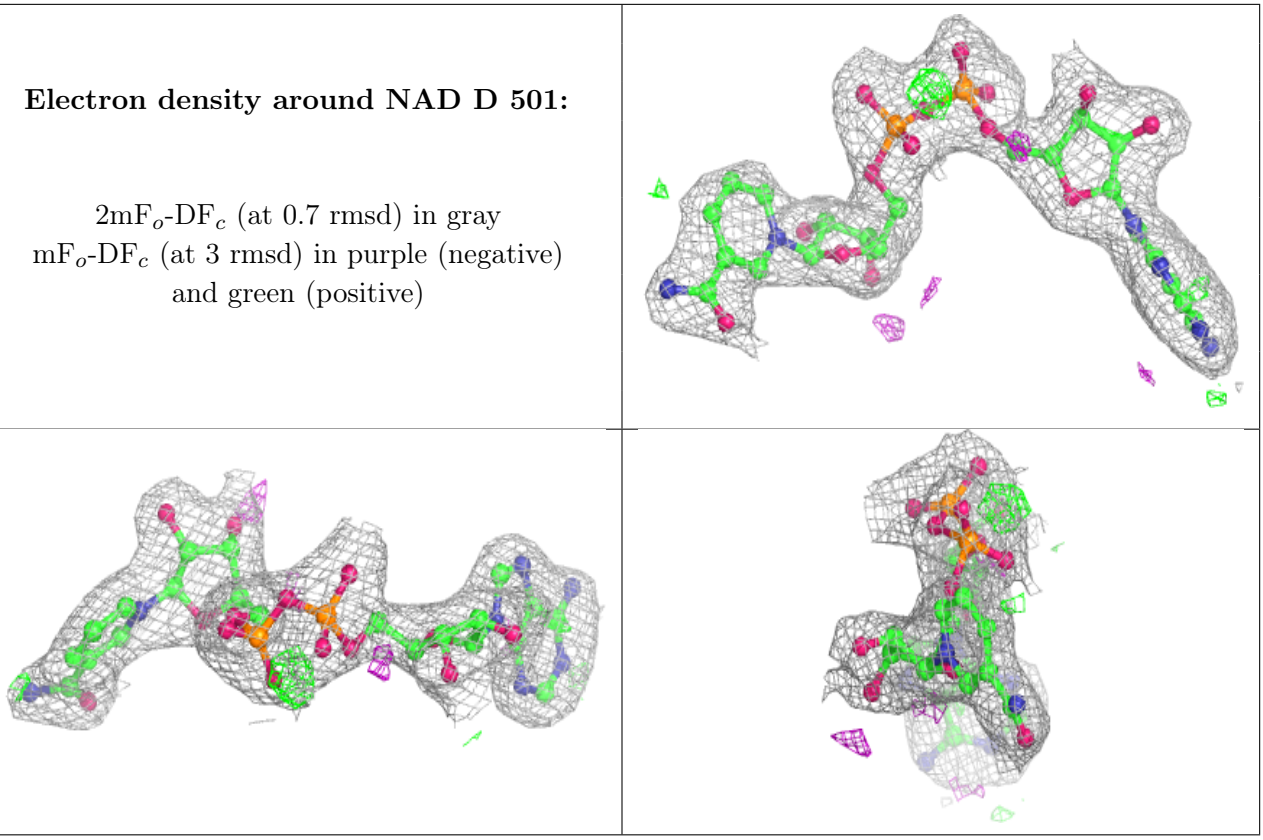
Electron density around ADN A 502:

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



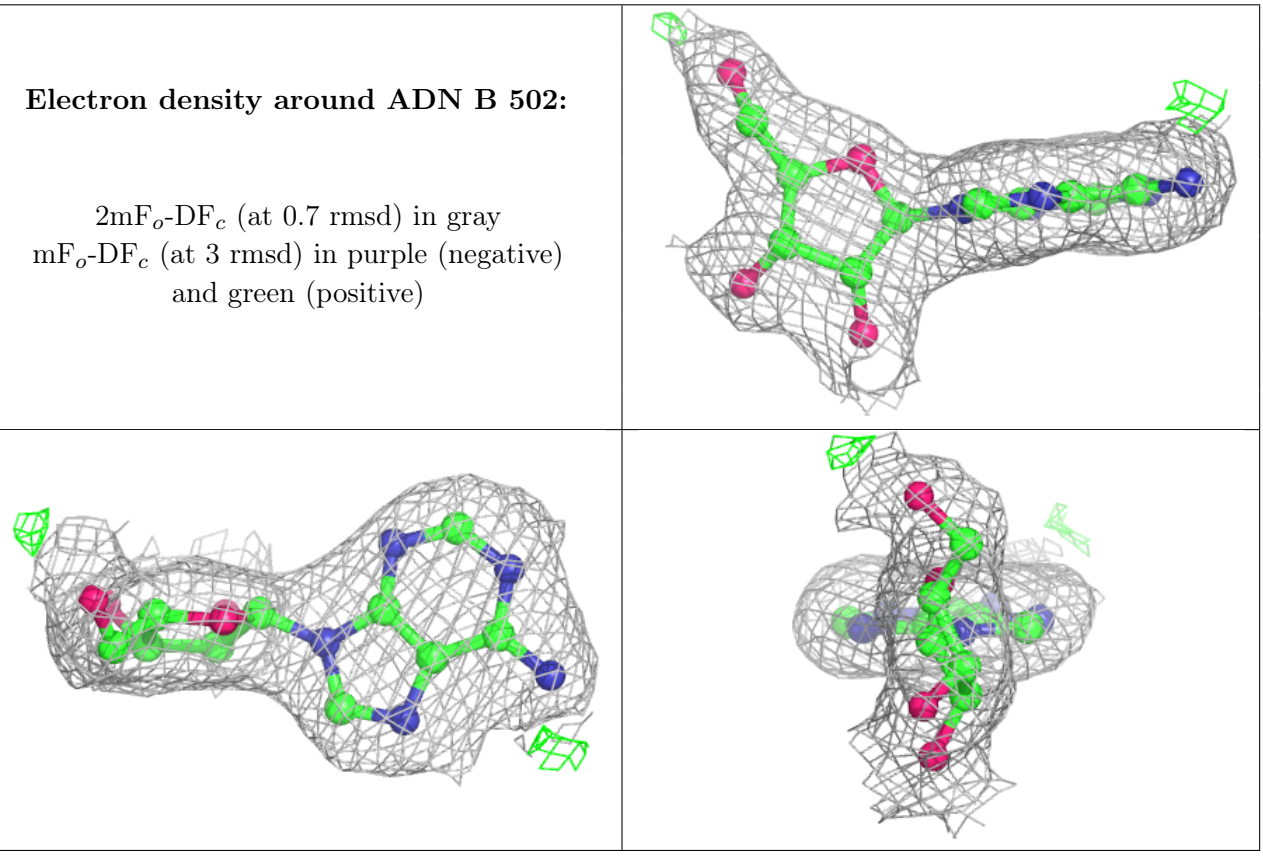
Electron density around NAD D 501:

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



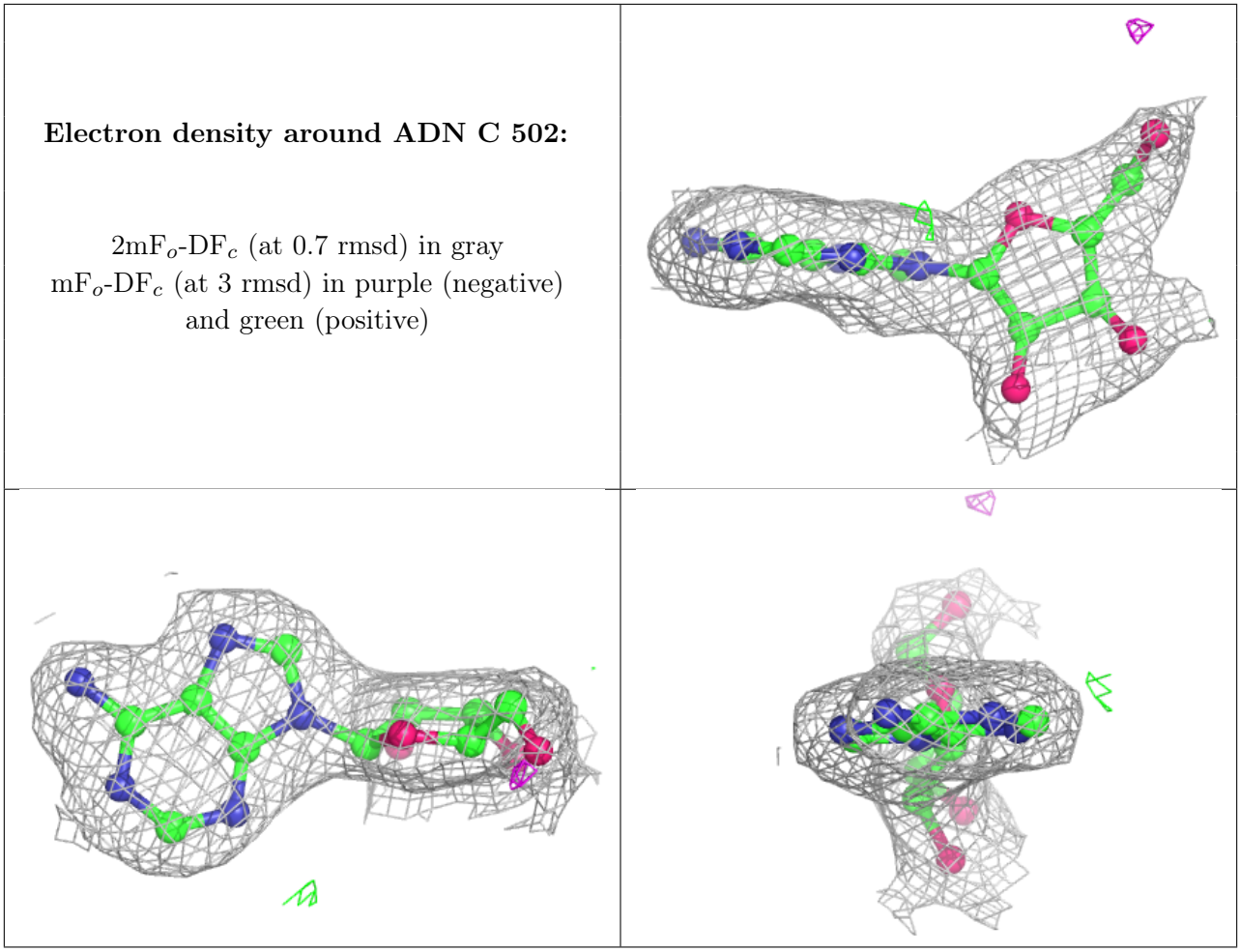
Electron density around ADN B 502:

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



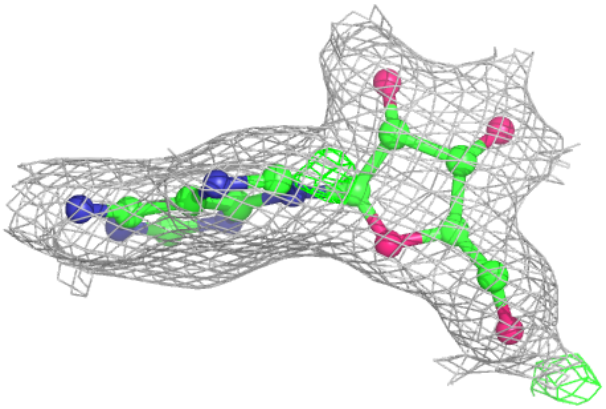
Electron density around ADN C 502:

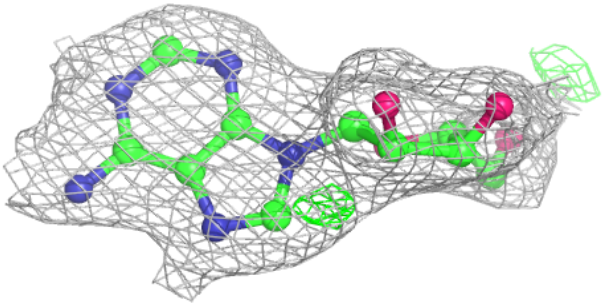
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

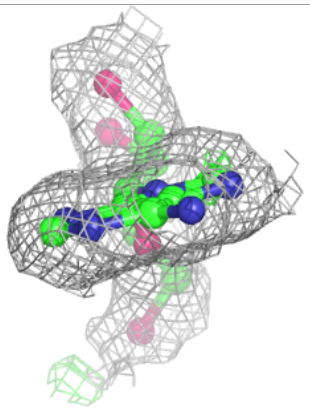


Electron density around ADN E 502:

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

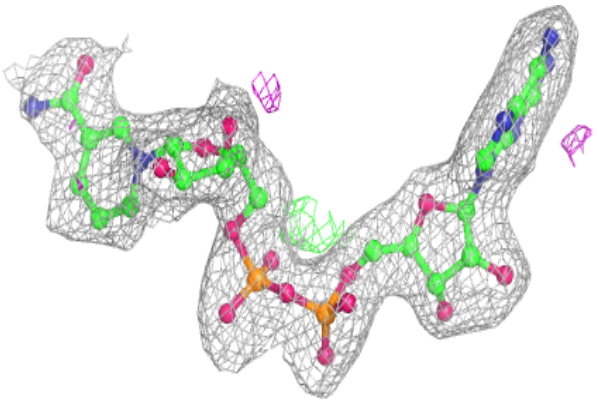


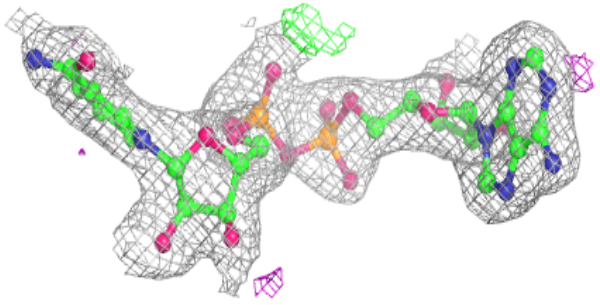


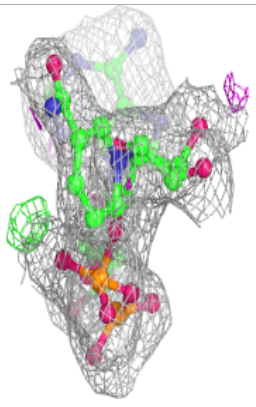


Electron density around NAD H 501:

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

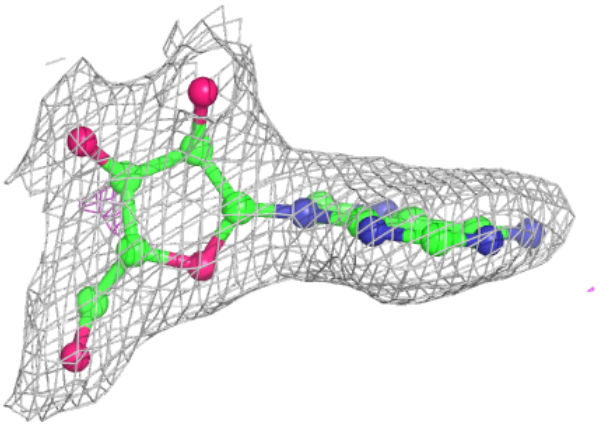


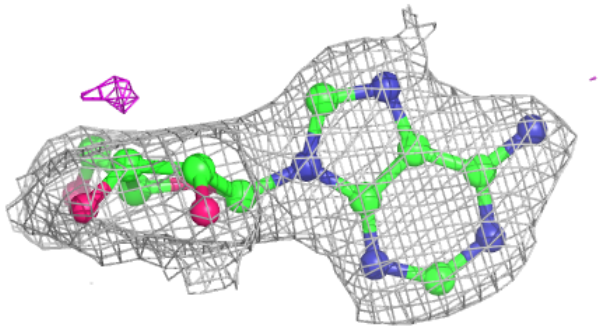


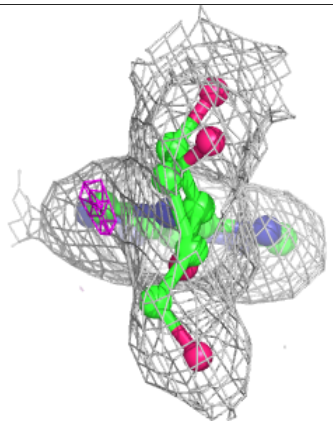


Electron density around ADN G 502:

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

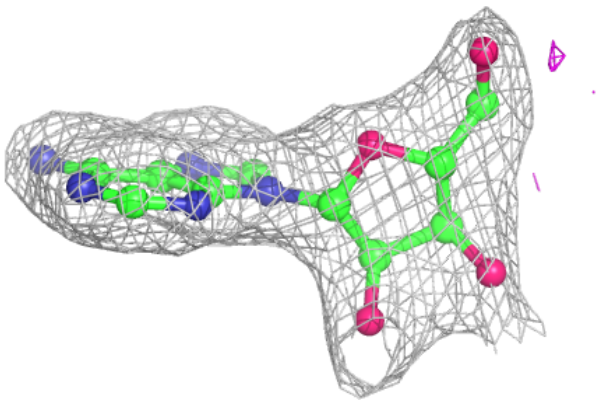


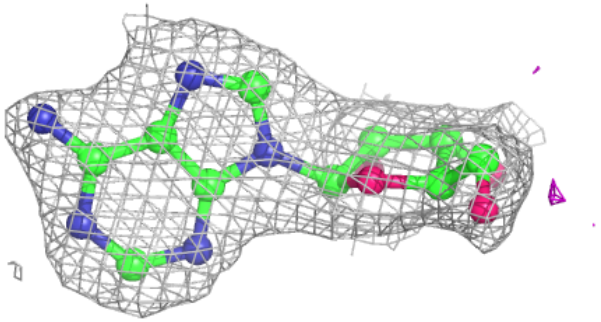


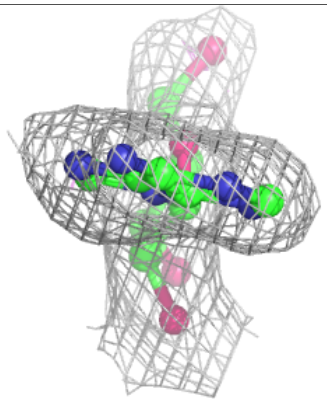


Electron density around ADN H 502:

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

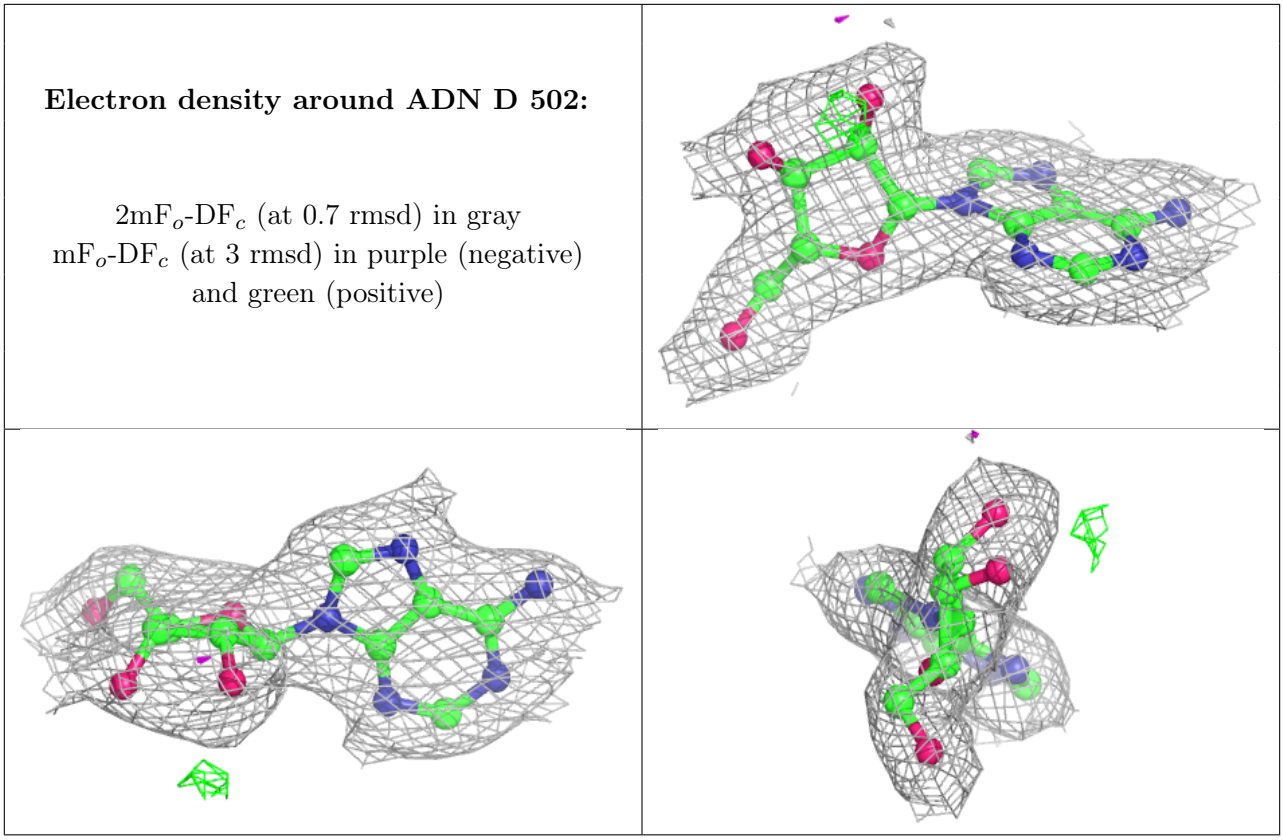






Electron density around ADN D 502:

$2mF_o$-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.