



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 2, 2023 – 04:42 PM EDT

PDB ID : 3RHO
Title : Crystal structure of the E673Q MUTANT OF C-Terminal domain of 10'FOR MYLTETRAHYDROFOLATE DEHYDROGENASE in complex with NADP
Authors : Tsybovsky, Y.
Deposited on : 2011-04-11
Resolution : 2.26 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 : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.35
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35

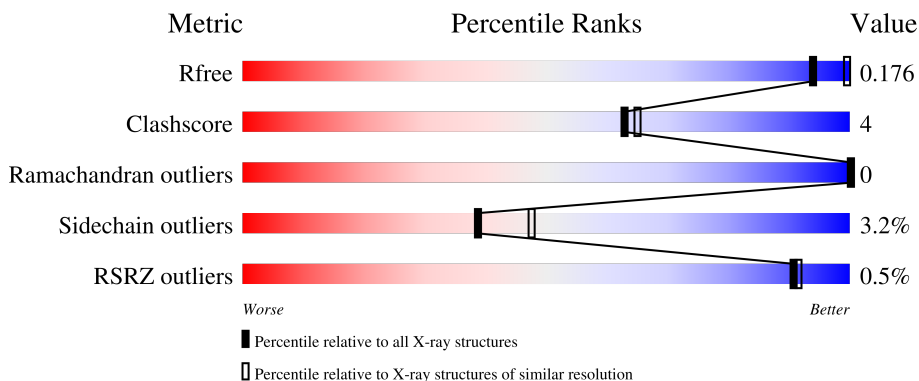
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.26 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1377 (2.26-2.26)
Clashscore	141614	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	517	 78% 15% . .
1	B	517	 79% 16% . .
1	C	517	 75% 19% . .
1	D	517	 78% 17% . .

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 17496 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 Aldehyde dehydrogenase 1 family, member L1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	498	3906	2478	672	735	21	4	19	0
1	B	498	3906	2478	672	735	21	0	19	0
1	C	498	3906	2478	672	735	21	0	19	0
1	D	498	3906	2478	672	735	21	0	19	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	386	MET	-	expression tag	UNP Q5HQB2
A	387	ARG	-	expression tag	UNP Q5HQB2
A	388	GLY	-	expression tag	UNP Q5HQB2
A	389	SER	-	expression tag	UNP Q5HQB2
A	390	HIS	-	expression tag	UNP Q5HQB2
A	391	HIS	-	expression tag	UNP Q5HQB2
A	392	HIS	-	expression tag	UNP Q5HQB2
A	393	HIS	-	expression tag	UNP Q5HQB2
A	394	HIS	-	expression tag	UNP Q5HQB2
A	395	THR	-	expression tag	UNP Q5HQB2
A	396	THR	-	expression tag	UNP Q5HQB2
A	673	GLN	GLU	engineered mutation	UNP Q5HQB2
B	386	MET	-	expression tag	UNP Q5HQB2
B	387	ARG	-	expression tag	UNP Q5HQB2
B	388	GLY	-	expression tag	UNP Q5HQB2
B	389	SER	-	expression tag	UNP Q5HQB2
B	390	HIS	-	expression tag	UNP Q5HQB2
B	391	HIS	-	expression tag	UNP Q5HQB2
B	392	HIS	-	expression tag	UNP Q5HQB2
B	393	HIS	-	expression tag	UNP Q5HQB2
B	394	HIS	-	expression tag	UNP Q5HQB2

Continued on next page...

Continued from previous page...

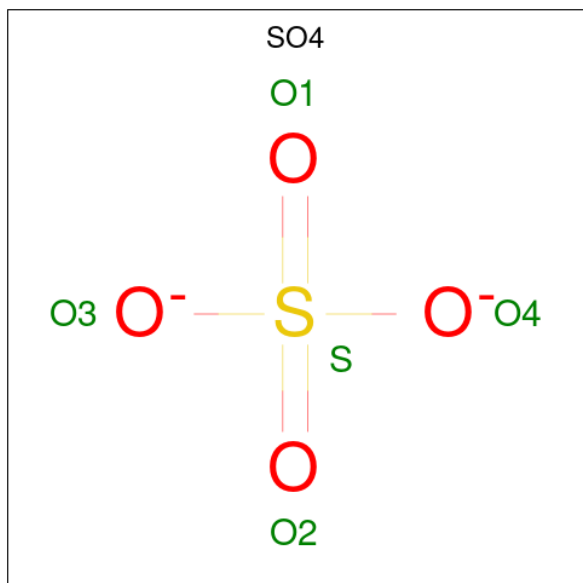
Chain	Residue	Modelled	Actual	Comment	Reference
B	395	THR	-	expression tag	UNP Q5HZB2
B	396	THR	-	expression tag	UNP Q5HZB2
B	673	GLN	GLU	engineered mutation	UNP Q5HZB2
C	386	MET	-	expression tag	UNP Q5HZB2
C	387	ARG	-	expression tag	UNP Q5HZB2
C	388	GLY	-	expression tag	UNP Q5HZB2
C	389	SER	-	expression tag	UNP Q5HZB2
C	390	HIS	-	expression tag	UNP Q5HZB2
C	391	HIS	-	expression tag	UNP Q5HZB2
C	392	HIS	-	expression tag	UNP Q5HZB2
C	393	HIS	-	expression tag	UNP Q5HZB2
C	394	HIS	-	expression tag	UNP Q5HZB2
C	395	THR	-	expression tag	UNP Q5HZB2
C	396	THR	-	expression tag	UNP Q5HZB2
C	673	GLN	GLU	engineered mutation	UNP Q5HZB2
D	386	MET	-	expression tag	UNP Q5HZB2
D	387	ARG	-	expression tag	UNP Q5HZB2
D	388	GLY	-	expression tag	UNP Q5HZB2
D	389	SER	-	expression tag	UNP Q5HZB2
D	390	HIS	-	expression tag	UNP Q5HZB2
D	391	HIS	-	expression tag	UNP Q5HZB2
D	392	HIS	-	expression tag	UNP Q5HZB2
D	393	HIS	-	expression tag	UNP Q5HZB2
D	394	HIS	-	expression tag	UNP Q5HZB2
D	395	THR	-	expression tag	UNP Q5HZB2
D	396	THR	-	expression tag	UNP Q5HZB2
D	673	GLN	GLU	engineered mutation	UNP Q5HZB2

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: C₂₁H₂₈N₇O₁₇P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	56	21	7	23	5	3	1
2	B	1	56	21	7	23	5	3	1
2	C	1	56	21	7	23	5	3	1
2	D	1	56	21	7	23	5	3	1

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



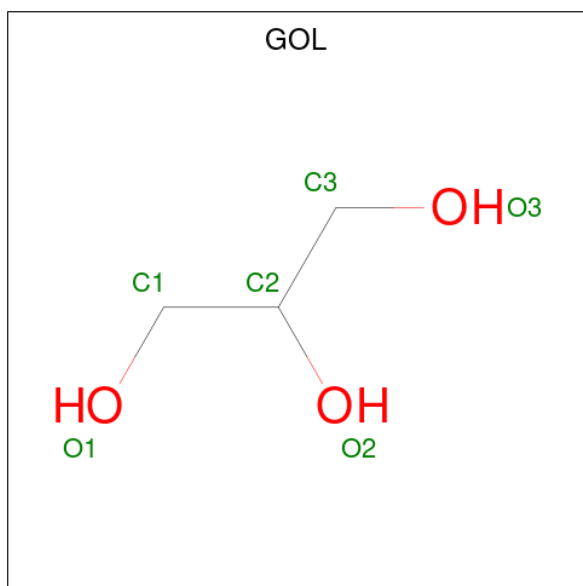
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	A	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	B	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0
3	C	1	Total 5 O 4 S 1	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

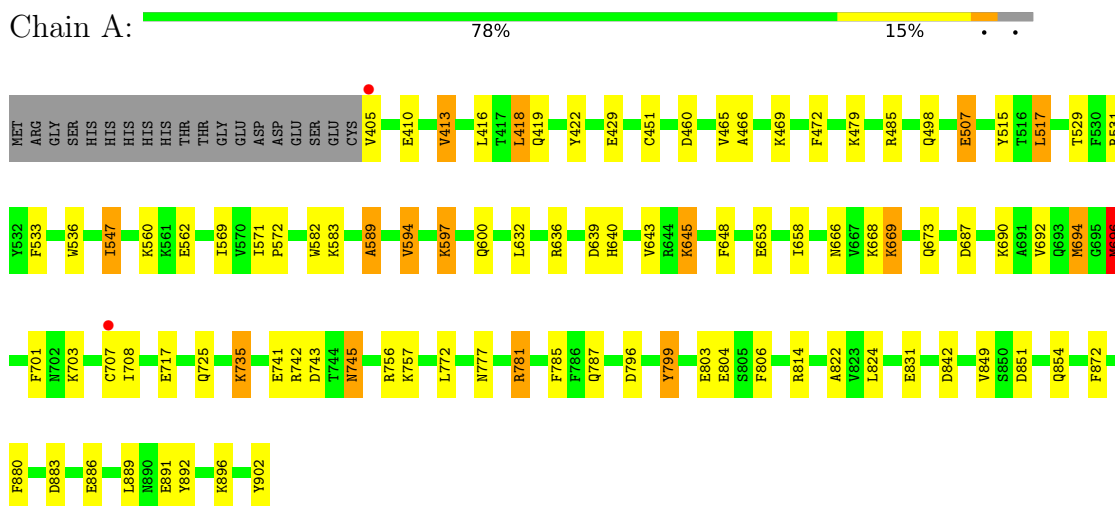
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	377	Total 377	O 377	0	4
5	B	336	Total 336	O 336	0	3
5	C	394	Total 394	O 394	0	3
5	D	377	Total 377	O 377	0	3

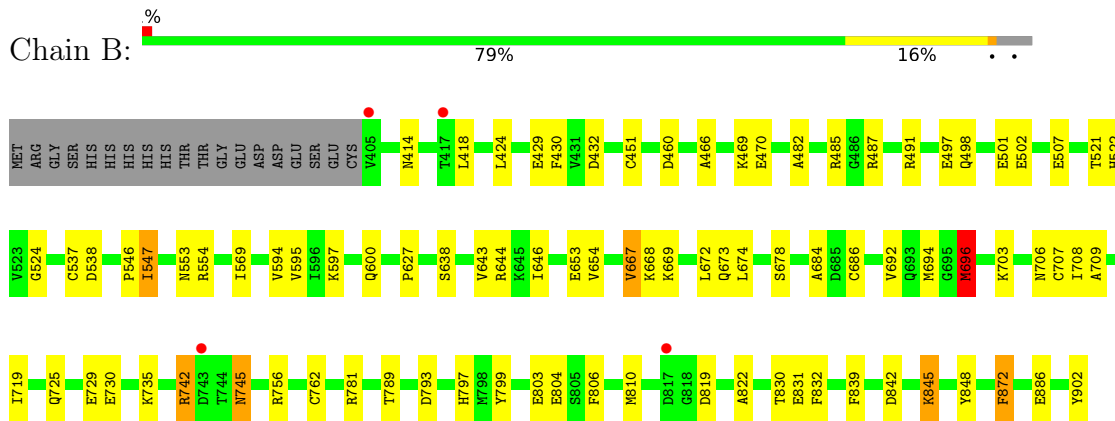
3 Residue-property plots [i](#)

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.

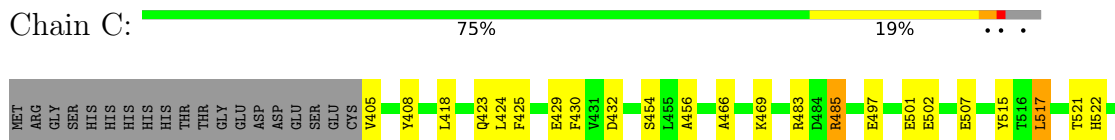
- Molecule 1: Aldehyde dehydrogenase 1 family, member L1

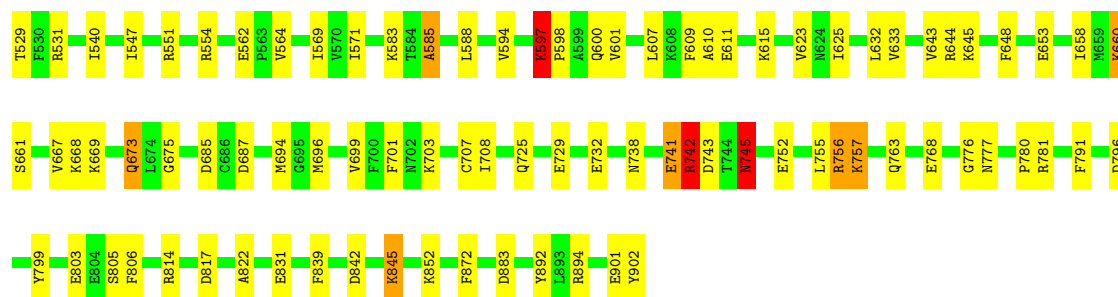


- Molecule 1: Aldehyde dehydrogenase 1 family, member L1

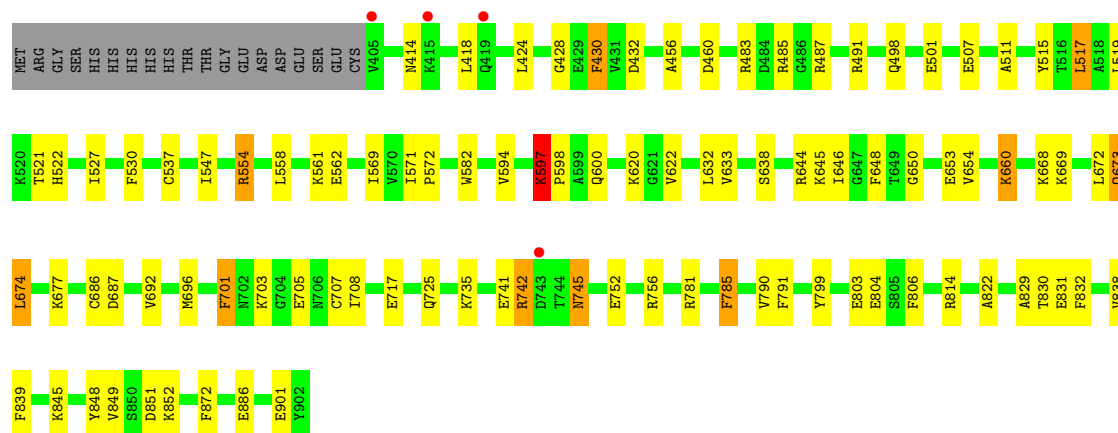
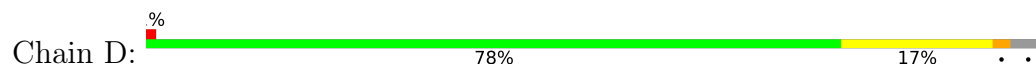


- Molecule 1: Aldehyde dehydrogenase 1 family, member L1





- Molecule 1: Aldehyde dehydrogenase 1 family, member L1



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	259.90Å 194.40Å 97.22Å 90.00° 109.09° 90.00°	Depositor
Resolution (Å)	49.15 – 2.26 49.12 – 2.26	Depositor EDS
% Data completeness (in resolution range)	99.5 (49.15-2.26) 99.5 (49.12-2.26)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.74 (at 2.24Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.149 , 0.178 0.149 , 0.176	Depositor DCC
R_{free} test set	10652 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	26.5	Xtrriage
Anisotropy	0.015	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 49.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.015 for -h-2*1,-k,l	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	17496	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.82% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: NAP, GOL, SO4

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	1.63	39/4066 (1.0%)	1.09	15/5496 (0.3%)
1	B	1.63	45/4066 (1.1%)	1.08	17/5496 (0.3%)
1	C	1.74	55/4066 (1.4%)	1.19	26/5496 (0.5%)
1	D	1.67	53/4066 (1.3%)	1.07	12/5496 (0.2%)
All	All	1.66	192/16264 (1.2%)	1.11	70/21984 (0.3%)

All (192) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	501	GLU	CD-OE2	12.97	1.40	1.25
1	B	831	GLU	CG-CD	9.77	1.66	1.51
1	C	653	GLU	CG-CD	9.66	1.66	1.51
1	D	804	GLU	CG-CD	9.26	1.65	1.51
1	B	501	GLU	CD-OE2	8.98	1.35	1.25
1	C	653	GLU	CD-OE1	8.89	1.35	1.25
1	D	501	GLU	CD-OE2	8.88	1.35	1.25
1	D	653	GLU	CB-CG	8.80	1.68	1.52
1	D	831	GLU	CG-CD	8.72	1.65	1.51
1	D	653	GLU	CD-OE1	8.70	1.35	1.25
1	C	777	ASN	CB-CG	8.60	1.70	1.51
1	B	653	GLU	CD-OE1	8.47	1.34	1.25
1	C	653	GLU	CB-CG	8.29	1.67	1.52
1	C	645	LYS	CD-CE	8.20	1.71	1.51
1	A	669	LYS	CE-NZ	8.04	1.69	1.49
1	C	466	ALA	CA-CB	8.03	1.69	1.52
1	B	653	GLU	CG-CD	8.02	1.64	1.51
1	C	745	ASN	CB-CG	-7.98	1.32	1.51
1	D	831	GLU	CB-CG	7.98	1.67	1.52
1	D	460	ASP	CB-CG	7.83	1.68	1.51
1	D	530	PHE	CE2-CZ	7.83	1.52	1.37
1	B	848	TYR	CE1-CZ	7.70	1.48	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	405	VAL	CB-CG1	7.68	1.69	1.52
1	A	507	GLU	CG-CD	7.65	1.63	1.51
1	B	653	GLU	CB-CG	7.42	1.66	1.52
1	C	469	LYS	CE-NZ	-7.39	1.30	1.49
1	A	804	GLU	CG-CD	7.29	1.62	1.51
1	A	485	ARG	CG-CD	7.29	1.70	1.51
1	D	839	PHE	CE2-CZ	7.27	1.51	1.37
1	D	501	GLU	CG-CD	7.24	1.62	1.51
1	C	562	GLU	CG-CD	7.19	1.62	1.51
1	A	562	GLU	CG-CD	7.11	1.62	1.51
1	D	717	GLU	CB-CG	6.98	1.65	1.52
1	C	768[A]	GLU	CB-CG	6.91	1.65	1.52
1	C	768[B]	GLU	CB-CG	6.91	1.65	1.52
1	B	762	CYS	CB-SG	6.89	1.94	1.82
1	C	507	GLU	CG-CD	6.89	1.62	1.51
1	D	511	ALA	CA-CB	6.87	1.66	1.52
1	B	839	PHE	CE2-CZ	6.86	1.50	1.37
1	C	752	GLU	CB-CG	6.85	1.65	1.52
1	B	451	CYS	CB-SG	6.84	1.93	1.82
1	C	742	ARG	CD-NE	-6.84	1.34	1.46
1	D	742	ARG	CG-CD	6.82	1.69	1.51
1	B	742	ARG	CG-CD	6.80	1.69	1.51
1	D	654	VAL	CB-CG2	6.78	1.67	1.52
1	A	472	PHE	CG-CD2	6.75	1.48	1.38
1	C	564	VAL	CB-CG2	-6.70	1.38	1.52
1	C	763	GLN	CG-CD	6.70	1.66	1.51
1	C	609	PHE	CE2-CZ	6.67	1.50	1.37
1	B	831	GLU	CB-CG	6.66	1.64	1.52
1	D	485	ARG	CG-CD	6.66	1.68	1.51
1	B	686	CYS	CB-SG	6.65	1.93	1.82
1	C	699	VAL	CA-CB	6.64	1.68	1.54
1	A	741[A]	GLU	CG-CD	6.63	1.61	1.51
1	A	741[B]	GLU	CG-CD	6.63	1.61	1.51
1	D	653	GLU	CG-CD	6.55	1.61	1.51
1	B	839	PHE	CG-CD2	6.55	1.48	1.38
1	C	839	PHE	CE2-CZ	6.52	1.49	1.37
1	C	831	GLU	CB-CG	6.48	1.64	1.52
1	A	498	GLN	CG-CD	6.46	1.66	1.51
1	D	832	PHE	CE1-CZ	6.45	1.49	1.37
1	B	804	GLU	CG-CD	6.42	1.61	1.51
1	A	831	GLU	CG-CD	6.41	1.61	1.51
1	B	678	SER	CB-OG	6.34	1.50	1.42

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	537	CYS	CB-SG	6.29	1.93	1.82
1	B	886	GLU	CG-CD	6.29	1.61	1.51
1	C	756	ARG	CZ-NH1	6.24	1.41	1.33
1	B	638[A]	SER	CB-OG	-6.23	1.34	1.42
1	B	638[B]	SER	CB-OG	-6.23	1.34	1.42
1	C	623	VAL	CB-CG2	6.22	1.66	1.52
1	C	485	ARG	CG-CD	6.21	1.67	1.51
1	A	653	GLU	CB-CG	-6.20	1.40	1.52
1	B	507	GLU	CG-CD	6.17	1.61	1.51
1	D	829	ALA	CA-CB	6.15	1.65	1.52
1	D	645	LYS	CD-CE	6.13	1.66	1.51
1	D	648	PHE	CD2-CE2	6.10	1.51	1.39
1	D	901	GLU	CD-OE1	6.09	1.32	1.25
1	A	886	GLU	CG-CD	6.09	1.61	1.51
1	D	791	PHE	CG-CD1	6.06	1.47	1.38
1	A	472	PHE	CE2-CZ	6.06	1.48	1.37
1	D	790	VAL	CA-CB	-6.06	1.42	1.54
1	D	561	LYS	CD-CE	6.06	1.66	1.51
1	D	822	ALA	CA-CB	6.05	1.65	1.52
1	A	469	LYS	CE-NZ	-6.04	1.33	1.49
1	C	694	MET	CB-CG	6.02	1.70	1.51
1	D	507	GLU	CG-CD	6.01	1.60	1.51
1	D	677	LYS	CD-CE	5.99	1.66	1.51
1	D	597	LYS	CE-NZ	5.97	1.64	1.49
1	D	848	TYR	CE1-CZ	5.97	1.46	1.38
1	C	515	TYR	CE2-CZ	5.97	1.46	1.38
1	C	540	ILE	CA-CB	5.97	1.68	1.54
1	C	502	GLU	CD-OE2	5.96	1.32	1.25
1	D	752	GLU	CG-CD	5.96	1.60	1.51
1	B	654	VAL	CB-CG2	5.95	1.65	1.52
1	A	466	ALA	CA-CB	5.91	1.64	1.52
1	B	819	ASP	C-O	5.90	1.34	1.23
1	A	413	VAL	CB-CG1	-5.89	1.40	1.52
1	A	422	TYR	CD2-CE2	5.89	1.48	1.39
1	D	562	GLU	CB-CG	5.88	1.63	1.52
1	A	756	ARG	CG-CD	5.86	1.66	1.51
1	C	497	GLU	CD-OE1	5.85	1.32	1.25
1	D	648	PHE	CD1-CE1	5.83	1.50	1.39
1	D	669	LYS	CE-NZ	5.81	1.63	1.49
1	A	902	TYR	CD1-CE1	5.81	1.48	1.39
1	D	705	GLU	CB-CG	5.79	1.63	1.52
1	A	742	ARG	CG-CD	5.79	1.66	1.51

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	430	PHE	CE1-CZ	5.78	1.48	1.37
1	B	485	ARG	CG-CD	5.77	1.66	1.51
1	B	822	ALA	CA-CB	5.77	1.64	1.52
1	C	644	ARG	CZ-NH1	5.77	1.40	1.33
1	C	696	MET	CB-CG	5.76	1.69	1.51
1	A	460	ASP	CB-CG	5.75	1.63	1.51
1	D	515	TYR	CD1-CE1	5.70	1.48	1.39
1	B	709	ALA	CA-CB	5.69	1.64	1.52
1	A	756	ARG	CB-CG	5.68	1.67	1.52
1	B	460	ASP	CB-CG	5.67	1.63	1.51
1	D	791	PHE	CE2-CZ	5.66	1.48	1.37
1	A	886	GLU	CB-CG	5.64	1.62	1.52
1	A	756	ARG	CZ-NH1	5.64	1.40	1.33
1	C	517	LEU	CG-CD1	5.63	1.72	1.51
1	A	880	PHE	CE1-CZ	5.60	1.48	1.37
1	C	732	GLU	CB-CG	5.60	1.62	1.52
1	B	669	LYS	CE-NZ	5.59	1.63	1.49
1	B	810	MET	N-CA	-5.59	1.35	1.46
1	D	849	VAL	CB-CG2	5.58	1.64	1.52
1	B	554	ARG	CZ-NH1	5.57	1.40	1.33
1	C	601	VAL	CB-CG2	5.57	1.64	1.52
1	C	611	GLU	CB-CG	5.57	1.62	1.52
1	B	502	GLU	CD-OE1	5.53	1.31	1.25
1	A	429	GLU	CB-CG	-5.51	1.41	1.52
1	B	819	ASP	CB-CG	5.51	1.63	1.51
1	D	582	TRP	CB-CG	5.51	1.60	1.50
1	D	622	VAL	CB-CG1	5.51	1.64	1.52
1	C	756	ARG	CG-CD	5.46	1.65	1.51
1	D	752	GLU	CD-OE1	5.46	1.31	1.25
1	B	537	CYS	CB-SG	5.45	1.91	1.82
1	C	502	GLU	CD-OE1	5.43	1.31	1.25
1	D	785	PHE	CE2-CZ	5.42	1.47	1.37
1	C	732	GLU	CG-CD	5.41	1.60	1.51
1	B	872	PHE	CB-CG	-5.40	1.42	1.51
1	B	470	GLU	CD-OE1	5.40	1.31	1.25
1	C	901	GLU	CG-CD	5.40	1.60	1.51
1	B	501	GLU	CG-CD	5.37	1.60	1.51
1	A	831	GLU	CB-CG	5.37	1.62	1.52
1	A	589	ALA	CA-CB	5.36	1.63	1.52
1	A	666	ASN	CB-CG	5.34	1.63	1.51
1	D	886	GLU	CG-CD	5.33	1.59	1.51
1	D	686	CYS	CB-SG	5.33	1.91	1.82

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	667	VAL	CA-CB	5.32	1.66	1.54
1	B	553	ASN	CB-CG	5.31	1.63	1.51
1	A	451	CYS	CB-SG	5.31	1.91	1.82
1	C	408	TYR	CE1-CZ	5.31	1.45	1.38
1	C	429	GLU	CG-CD	5.25	1.59	1.51
1	C	883	ASP	CB-CG	5.25	1.62	1.51
1	B	832	PHE	CE1-CZ	5.25	1.47	1.37
1	C	791	PHE	CE2-CZ	5.25	1.47	1.37
1	A	891	GLU	CG-CD	5.25	1.59	1.51
1	C	585	ALA	CA-CB	5.24	1.63	1.52
1	A	645	LYS	CB-CG	5.24	1.66	1.52
1	C	892	TYR	CG-CD1	5.23	1.46	1.39
1	C	554	ARG	CG-CD	5.23	1.65	1.51
1	A	822	ALA	CA-CB	5.22	1.63	1.52
1	C	756	ARG	CB-CG	5.22	1.66	1.52
1	A	515	TYR	CG-CD2	5.21	1.46	1.39
1	B	595	VAL	CB-CG1	5.21	1.63	1.52
1	B	497	GLU	CG-CD	5.20	1.59	1.51
1	D	638[A]	SER	CB-OG	-5.19	1.35	1.42
1	D	638[B]	SER	CB-OG	-5.19	1.35	1.42
1	B	524	GLY	CA-C	5.19	1.60	1.51
1	C	405	VAL	CB-CG1	5.18	1.63	1.52
1	A	799	TYR	CD1-CE1	5.14	1.47	1.39
1	A	594	VAL	CB-CG2	-5.14	1.42	1.52
1	C	822	ALA	CA-CB	5.14	1.63	1.52
1	C	661	SER	C-O	5.12	1.33	1.23
1	D	701	PHE	CE1-CZ	5.12	1.47	1.37
1	A	896	LYS	CD-CE	5.11	1.64	1.51
1	B	466	ALA	CA-CB	5.11	1.63	1.52
1	B	789	THR	C-O	5.10	1.33	1.23
1	D	838	VAL	CB-CG1	5.08	1.63	1.52
1	C	780	PRO	CA-C	5.07	1.62	1.52
1	C	756	ARG	NE-CZ	5.06	1.39	1.33
1	D	527	ILE	CB-CG2	5.06	1.68	1.52
1	B	730	GLU	CG-CD	5.05	1.59	1.51
1	B	482	ALA	CA-CB	5.05	1.63	1.52
1	D	673	GLN	CG-CD	5.04	1.62	1.51
1	B	546	PRO	N-CA	5.04	1.55	1.47
1	C	814	ARG	CG-CD	5.03	1.64	1.51
1	A	883	ASP	CB-CG	5.02	1.62	1.51
1	C	776	GLY	CA-C	-5.02	1.43	1.51
1	D	741[A]	GLU	CG-CD	5.01	1.59	1.51

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	741[B]	GLU	CG-CD	5.01	1.59	1.51
1	C	675	GLY	CA-C	5.00	1.59	1.51

All (70) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	742	ARG	NE-CZ-NH2	-18.10	111.25	120.30
1	C	742	ARG	NE-CZ-NH1	12.23	126.42	120.30
1	B	694	MET	CG-SD-CE	9.28	115.05	100.20
1	D	487	ARG	NE-CZ-NH1	9.03	124.82	120.30
1	D	485	ARG	NE-CZ-NH2	-8.65	115.97	120.30
1	C	554	ARG	NE-CZ-NH2	-8.17	116.22	120.30
1	B	487	ARG	NE-CZ-NH1	7.89	124.25	120.30
1	A	694	MET	CG-SD-CE	7.84	112.75	100.20
1	A	696	MET	CG-SD-CE	7.35	111.97	100.20
1	B	696	MET	CG-SD-CE	7.34	111.95	100.20
1	B	554	ARG	NE-CZ-NH2	-7.34	116.63	120.30
1	C	742	ARG	CD-NE-CZ	7.29	133.80	123.60
1	C	756	ARG	NE-CZ-NH1	7.25	123.92	120.30
1	B	781[A]	ARG	NE-CZ-NH2	-7.16	116.72	120.30
1	B	781[B]	ARG	NE-CZ-NH2	-7.16	116.72	120.30
1	C	696	MET	CA-CB-CG	7.12	125.40	113.30
1	A	687	ASP	CB-CG-OD2	6.72	124.35	118.30
1	C	842	ASP	CB-CG-OD2	6.68	124.32	118.30
1	A	485	ARG	NE-CZ-NH2	-6.67	116.97	120.30
1	C	687	ASP	CB-CG-OD1	-6.66	112.31	118.30
1	C	687	ASP	CB-CG-OD2	6.63	124.27	118.30
1	B	487	ARG	NE-CZ-NH2	-6.60	117.00	120.30
1	B	644	ARG	NE-CZ-NH2	-6.42	117.09	120.30
1	D	432	ASP	CB-CG-OD1	6.41	124.07	118.30
1	D	644	ARG	NE-CZ-NH2	-6.21	117.19	120.30
1	A	531	ARG	NE-CZ-NH1	-6.20	117.20	120.30
1	C	796	ASP	CB-CG-OD2	6.17	123.85	118.30
1	D	687	ASP	CB-CG-OD1	-6.13	112.78	118.30
1	C	432	ASP	CB-CG-OD1	6.06	123.76	118.30
1	C	644	ARG	NE-CZ-NH1	5.98	123.29	120.30
1	A	597	LYS	CD-CE-NZ	-5.96	98.00	111.70
1	C	554	ARG	NE-CZ-NH1	5.94	123.27	120.30
1	B	842	ASP	CB-CG-OD2	5.92	123.63	118.30
1	B	644	ARG	NE-CZ-NH1	5.89	123.24	120.30
1	B	469	LYS	CD-CE-NZ	-5.88	98.17	111.70
1	C	531	ARG	NE-CZ-NH1	-5.84	117.38	120.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	519	LEU	CB-CG-CD2	-5.78	101.18	111.00
1	B	742	ARG	NE-CZ-NH1	5.75	123.17	120.30
1	B	432	ASP	CB-CG-OD1	5.74	123.47	118.30
1	D	517	LEU	CB-CG-CD1	-5.72	101.28	111.00
1	C	469	LYS	CD-CE-NZ	-5.67	98.65	111.70
1	C	485	ARG	NE-CZ-NH2	-5.65	117.48	120.30
1	C	817	ASP	CB-CG-OD1	5.62	123.36	118.30
1	A	796	ASP	CB-CG-OD2	5.54	123.28	118.30
1	D	554	ARG	NE-CZ-NH2	-5.51	117.54	120.30
1	B	485	ARG	NE-CZ-NH2	-5.46	117.57	120.30
1	A	636	ARG	NE-CZ-NH1	-5.45	117.57	120.30
1	A	842	ASP	CB-CG-OD2	5.42	123.18	118.30
1	C	756	ARG	NE-CZ-NH2	-5.37	117.62	120.30
1	D	814	ARG	NE-CZ-NH1	-5.37	117.62	120.30
1	C	660	LYS	CD-CE-NZ	-5.33	99.43	111.70
1	D	674	LEU	C-N-CA	-5.30	111.16	122.30
1	C	781[A]	ARG	NE-CZ-NH2	-5.27	117.66	120.30
1	C	781[B]	ARG	NE-CZ-NH2	-5.27	117.66	120.30
1	D	487	ARG	NE-CZ-NH2	-5.23	117.68	120.30
1	A	639	ASP	CB-CG-OD1	5.22	123.00	118.30
1	A	756	ARG	NE-CZ-NH1	5.20	122.90	120.30
1	C	894	ARG	NE-CZ-NH2	-5.19	117.70	120.30
1	B	845	LYS	CD-CE-NZ	-5.17	99.80	111.70
1	A	517	LEU	CB-CG-CD1	-5.17	102.22	111.00
1	A	772	LEU	CB-CG-CD2	-5.16	102.22	111.00
1	A	743[A]	ASP	CB-CG-OD2	-5.11	113.70	118.30
1	A	743[B]	ASP	CB-CG-OD2	-5.11	113.70	118.30
1	B	538	ASP	CB-CG-OD1	5.10	122.89	118.30
1	C	777	ASN	N-CA-CB	-5.08	101.45	110.60
1	C	597	LYS	CD-CE-NZ	-5.06	100.07	111.70
1	D	672	LEU	CB-CG-CD1	-5.02	102.46	111.00
1	C	743[A]	ASP	CB-CG-OD1	-5.02	113.79	118.30
1	C	743[B]	ASP	CB-CG-OD1	-5.02	113.79	118.30
1	B	793	ASP	CB-CG-OD1	5.01	122.81	118.30

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	3906	0	3923	35	0
1	B	3906	0	3922	29	0
1	C	3906	0	3923	42	0
1	D	3906	0	3923	31	0
2	A	56	0	14	1	0
2	B	56	0	14	1	0
2	C	56	0	14	1	0
2	D	56	0	14	1	0
3	A	35	0	0	0	0
3	B	40	0	0	1	0
3	C	40	0	0	2	0
3	D	25	0	0	1	0
4	A	6	0	8	0	0
4	B	6	0	8	2	0
4	C	6	0	8	0	0
4	D	6	0	8	0	0
5	A	377	0	0	6	0
5	B	336	0	0	5	0
5	C	394	0	0	6	0
5	D	377	0	0	3	0
All	All	17496	0	15779	138	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (138) 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:A:669:LYS:CE	1:A:669:LYS:NZ	1.69	1.50
1:B:799:TYR:CE2	1:B:803[A]:GLU:HG3	2.14	0.83
1:D:742:ARG:HD2	5:D:1465:HOH:O	1.83	0.78
1:B:725[A]:GLN:NE2	1:B:729:GLU:OE2	2.19	0.76
1:A:569:ILE:HD12	1:A:594:VAL:HG21	1.69	0.74
1:B:706:ASN:HD21	4:B:3026:GOL:H12	1.53	0.73
1:B:673:GLN:HB2	5:B:1472:HOH:O	1.89	0.72
1:A:799:TYR:CE2	1:A:803[A]:GLU:HG3	2.27	0.70
1:B:414:ASN:OD1	1:B:742:ARG:NH2	2.27	0.66
1:D:708:ILE:CG2	1:D:872:PHE:HE1	2.08	0.66
1:D:799:TYR:CE2	1:D:803[A]:GLU:HG3	2.32	0.65

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:410:GLU:OE1	1:A:419[B]:GLN:NE2	2.27	0.64
1:B:569:ILE:HD12	1:B:594:VAL:HG21	1.79	0.64
1:C:852:LYS:NZ	3:C:3002:SO4:O3	2.29	0.63
1:D:735:LYS:H	1:D:745:ASN:HD21	1.45	0.63
1:C:745:ASN:HD22	1:C:745:ASN:C	2.02	0.63
1:A:600:GLN:NE2	5:A:1208:HOH:O	2.27	0.62
1:D:708:ILE:CG2	1:D:872:PHE:CE1	2.83	0.61
1:C:756:ARG:NH2	5:C:1221:HOH:O	2.34	0.61
2:D:903[B]:NAP:H6N	2:D:903[B]:NAP:H52N	1.82	0.61
2:B:903[B]:NAP:H6N	2:B:903[B]:NAP:H52N	1.83	0.60
1:C:742:ARG:HD2	3:C:3028:SO4:O4	2.01	0.60
1:C:799:TYR:CE2	1:C:803[A]:GLU:HG3	2.36	0.60
1:A:517:LEU:HD11	1:A:701:PHE:CZ	2.37	0.60
1:A:777:ASN:H	1:A:787:GLN:HE21	1.50	0.59
1:B:756:ARG:NH2	5:B:1282:HOH:O	2.35	0.59
1:B:692:VAL:O	1:B:696:MET:HG3	2.03	0.59
1:B:735:LYS:H	1:B:745:ASN:HD21	1.51	0.58
2:C:903[B]:NAP:H52N	2:C:903[B]:NAP:H6N	1.84	0.57
1:B:706:ASN:ND2	4:B:3026:GOL:H12	2.18	0.57
1:A:717:GLU:OE2	1:A:814:ARG:HD3	2.05	0.57
1:A:632:LEU:C	1:A:632:LEU:HD23	2.25	0.56
1:B:491[B]:ARG:HH12	1:B:498:GLN:HE22	1.52	0.56
1:B:799:TYR:CZ	1:B:803[A]:GLU:HG3	2.42	0.55
1:D:428:GLY:HA3	1:D:620[A]:LYS:HG2	1.89	0.55
1:D:600:GLN:NE2	5:D:352:HOH:O	2.38	0.54
1:C:456:ALA:HB3	1:C:633:VAL:HG21	1.90	0.54
1:C:632:LEU:C	1:C:632:LEU:HD23	2.28	0.53
1:C:424:LEU:O	1:C:430:PHE:HA	2.09	0.53
1:D:756:ARG:NH2	5:D:1384:HOH:O	2.41	0.53
1:D:781[B]:ARG:HD2	1:D:785:PHE:CD2	2.44	0.53
1:C:648:PHE:CD1	1:C:658:ILE:HD12	2.44	0.53
1:C:725[A]:GLN:NE2	1:C:729:GLU:OE2	2.39	0.53
1:C:669:LYS:NZ	5:C:998:HOH:O	2.41	0.53
1:D:414:ASN:OD1	1:D:742:ARG:NH2	2.37	0.52
1:C:521:THR:O	1:C:522:HIS:C	2.47	0.52
1:C:569:ILE:HD12	1:C:594:VAL:HG21	1.91	0.52
1:B:708:ILE:CG2	1:B:872:PHE:HE1	2.23	0.52
1:C:425:PHE:CD2	1:C:610:ALA:HB1	2.45	0.52
1:C:597:LYS:HD2	1:C:598:PRO:O	2.10	0.52
1:C:643:VAL:O	1:C:668:LYS:HE3	2.11	0.51
1:D:424:LEU:O	1:D:430:PHE:HA	2.10	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:777:ASN:H	1:A:787:GLN:NE2	2.08	0.50
5:B:77:HOH:O	1:D:483:ARG:HD3	2.11	0.50
1:C:685:ASP:OD2	1:C:845:LYS:NZ	2.44	0.50
1:D:632:LEU:C	1:D:632:LEU:HD23	2.32	0.50
1:B:600:GLN:NE2	5:B:974:HOH:O	2.45	0.49
1:A:851:ASP:OD2	1:C:902:TYR:OH	2.25	0.49
1:C:600:GLN:NE2	5:C:930:HOH:O	2.43	0.49
2:A:903[B]:NAP:H6N	2:A:903[B]:NAP:H52N	1.93	0.49
1:D:554:ARG:NE	3:D:3020:SO4:O4	2.31	0.49
5:A:1015:HOH:O	1:C:483:ARG:HD3	2.13	0.49
1:D:521:THR:O	1:D:522:HIS:C	2.51	0.48
1:A:824:LEU:HD21	1:A:849:VAL:HG13	1.95	0.48
1:A:569:ILE:HG23	1:A:583:LYS:HD3	1.95	0.48
1:C:615:LYS:NZ	5:C:1327:HOH:O	2.46	0.48
1:C:738:ASN:HB3	1:C:741[A]:GLU:CG	2.43	0.48
1:A:648:PHE:CD1	1:A:658:ILE:HD12	2.47	0.48
1:A:479:LYS:NZ	5:A:1367:HOH:O	2.46	0.47
1:A:692:VAL:O	1:A:696:MET:CG	2.62	0.47
1:B:684:ALA:HA	1:B:719:ILE:HD13	1.95	0.47
1:B:902:TYR:OH	1:D:851:ASP:OD2	2.23	0.47
1:A:571:ILE:HB	1:A:572:PRO:HD2	1.96	0.47
1:A:413:VAL:CG1	1:A:418:LEU:HD22	2.45	0.47
1:B:708:ILE:CG2	1:B:872:PHE:CE1	2.98	0.47
1:C:725[A]:GLN:HE21	1:C:729:GLU:CD	2.18	0.46
1:D:456:ALA:HB3	1:D:633:VAL:HG21	1.98	0.46
1:B:491[B]:ARG:NH1	1:B:498:GLN:HE22	2.14	0.46
1:B:521:THR:O	1:B:522:HIS:C	2.53	0.46
1:D:692:VAL:O	1:D:696:MET:HG2	2.15	0.46
1:A:735:LYS:H	1:A:745:ASN:HD21	1.63	0.45
1:B:424:LEU:O	1:B:430:PHE:HA	2.17	0.45
1:B:735:LYS:H	1:B:745:ASN:ND2	2.14	0.45
1:C:423:GLN:HA	1:C:454:SER:OG	2.16	0.45
1:D:558:LEU:HD12	1:D:558:LEU:C	2.37	0.45
1:C:648:PHE:CD1	1:C:658:ILE:CD1	3.00	0.45
1:D:646:ILE:HG12	1:D:668:LYS:HD3	1.97	0.45
1:D:571:ILE:HB	1:D:572:PRO:HD2	1.98	0.45
1:D:597:LYS:HD2	1:D:598:PRO:O	2.17	0.45
3:B:3003:SO4:O1	1:D:852:LYS:NZ	2.43	0.45
1:C:517:LEU:HD11	1:C:701:PHE:CZ	2.52	0.45
1:A:533:PHE:HB3	1:A:589:ALA:HB2	1.99	0.44
1:A:692:VAL:O	1:A:696:MET:HG3	2.17	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:646:ILE:HG12	1:B:668:LYS:HD3	1.98	0.44
1:C:610:ALA:HB2	1:C:625:ILE:HD12	1.99	0.44
1:C:757:LYS:HE2	1:C:805:SER:O	2.17	0.44
1:D:491[B]:ARG:HH12	1:D:498:GLN:HE22	1.65	0.44
1:D:735:LYS:N	1:D:745:ASN:HD21	2.11	0.44
1:A:547:ILE:H	1:A:547:ILE:HD13	1.83	0.44
1:C:571:ILE:HG13	1:C:598:PRO:HA	2.00	0.43
1:C:673:GLN:OE1	1:C:872:PHE:CE2	2.71	0.43
1:C:738:ASN:HB3	1:C:741[A]:GLU:HG3	2.00	0.43
1:A:529:THR:HG21	1:A:582:TRP:HA	1.99	0.43
1:A:571:ILE:HB	1:A:572:PRO:CD	2.49	0.43
1:D:735:LYS:H	1:D:745:ASN:ND2	2.15	0.43
1:A:781[B]:ARG:HD2	1:A:785:PHE:CE2	2.54	0.43
1:A:645:LYS:HE3	1:A:892:TYR:CE1	2.54	0.42
1:C:551:ARG:HD3	5:C:1259:HOH:O	2.19	0.42
1:C:660:LYS:HG3	1:D:660:LYS:HG3	2.01	0.42
1:C:741[B]:GLU:OE1	5:C:939:HOH:O	2.21	0.42
1:D:571:ILE:HB	1:D:572:PRO:CD	2.49	0.42
1:A:708:ILE:CG2	1:A:872:PHE:HE1	2.32	0.42
1:C:708:ILE:CG2	1:C:872:PHE:HE1	2.32	0.42
1:B:424:LEU:CD2	1:B:627:PRO:HD2	2.49	0.42
1:C:485:ARG:HD3	1:C:588:LEU:O	2.19	0.42
1:D:517:LEU:HD11	1:D:701:PHE:CZ	2.54	0.42
1:D:569:ILE:HD12	1:D:594:VAL:HG21	2.02	0.41
1:C:673:GLN:OE1	1:C:872:PHE:HE2	2.03	0.41
1:A:465:VAL:HG11	1:A:640:HIS:CE1	2.55	0.41
1:B:797:HIS:HD2	5:B:954:HOH:O	2.02	0.41
1:A:560[B]:LYS:CD	5:A:1267:HOH:O	2.68	0.41
1:A:560[B]:LYS:HD3	5:A:1267:HOH:O	2.21	0.41
1:A:690:LYS:HD2	1:A:694:MET:HG2	2.01	0.41
1:C:569:ILE:HG23	1:C:583:LYS:HD3	2.03	0.41
1:B:643:VAL:O	1:B:668:LYS:HE3	2.21	0.41
1:C:799:TYR:CD2	1:C:803[A]:GLU:HG3	2.56	0.41
1:A:536:TRP:CG	1:A:889:LEU:HD11	2.56	0.41
1:A:799:TYR:CD2	1:A:803[A]:GLU:HG3	2.56	0.41
1:B:799:TYR:CD2	1:B:803[A]:GLU:HG3	2.55	0.41
1:B:672:LEU:HB3	1:B:674:LEU:HD21	2.03	0.40
1:C:425:PHE:CG	1:C:610:ALA:HB1	2.57	0.40
1:C:529:THR:HG22	1:C:585:ALA:HB3	2.03	0.40
1:B:547:ILE:H	1:B:547:ILE:HD13	1.86	0.40
1:B:735:LYS:N	1:B:745:ASN:HD21	2.17	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:607:LEU:HD23	1:C:607:LEU:HA	1.91	0.40
1:A:854:GLN:HG3	5:A:1262:HOH:O	2.20	0.40
1:D:650:GLY:O	1:D:674:LEU:HA	2.22	0.40
1:A:643:VAL:O	1:A:668:LYS:HE3	2.22	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	515/517 (100%)	501 (97%)	14 (3%)	0	100	100
1	B	515/517 (100%)	495 (96%)	20 (4%)	0	100	100
1	C	515/517 (100%)	492 (96%)	23 (4%)	0	100	100
1	D	515/517 (100%)	497 (96%)	18 (4%)	0	100	100
All	All	2060/2068 (100%)	1985 (96%)	75 (4%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	428/426 (100%)	410 (96%)	18 (4%)	30	34
1	B	428/426 (100%)	415 (97%)	13 (3%)	41	50

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	428/426 (100%)	412 (96%)	16 (4%)	34	40
1	D	428/426 (100%)	414 (97%)	14 (3%)	38	46
All	All	1712/1704 (100%)	1651 (96%)	61 (4%)	39	42

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	416	LEU
1	A	418	LEU
1	A	507	GLU
1	A	547	ILE
1	A	597	LYS
1	A	673	GLN
1	A	696	MET
1	A	703	LYS
1	A	707[A]	CYS
1	A	707[B]	CYS
1	A	725[A]	GLN
1	A	725[B]	GLN
1	A	735	LYS
1	A	745	ASN
1	A	757	LYS
1	A	781[A]	ARG
1	A	781[B]	ARG
1	A	806	PHE
1	B	418	LEU
1	B	429	GLU
1	B	547	ILE
1	B	597	LYS
1	B	667	VAL
1	B	696	MET
1	B	703	LYS
1	B	707[A]	CYS
1	B	707[B]	CYS
1	B	745	ASN
1	B	806	PHE
1	B	830	THR
1	B	845	LYS
1	C	418	LEU
1	C	547	ILE
1	C	597	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	667	VAL
1	C	673	GLN
1	C	703	LYS
1	C	707[A]	CYS
1	C	707[B]	CYS
1	C	741[A]	GLU
1	C	741[B]	GLU
1	C	742	ARG
1	C	745	ASN
1	C	755	LEU
1	C	757	LYS
1	C	806	PHE
1	C	845	LYS
1	D	418	LEU
1	D	547	ILE
1	D	597	LYS
1	D	660	LYS
1	D	673	GLN
1	D	703	LYS
1	D	707[A]	CYS
1	D	707[B]	CYS
1	D	725[A]	GLN
1	D	725[B]	GLN
1	D	745	ASN
1	D	806	PHE
1	D	830	THR
1	D	845	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	498	GLN
1	A	706	ASN
1	A	745	ASN
1	A	750	ASN
1	A	787	GLN
1	B	457	GLN
1	B	498	GLN
1	B	600	GLN
1	B	706	ASN
1	B	745	ASN
1	B	750	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	600	GLN
1	C	706	ASN
1	C	745	ASN
1	C	797	HIS
1	D	457	GLN
1	D	498	GLN
1	D	600	GLN
1	D	706	ASN
1	D	745	ASN

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](#)

40 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	NAP	C	903[A]	-	45,33,52	3.24	6 (13%)	56,52,80	1.93	8 (14%)
3	SO4	A	3015	-	4,4,4	0.51	0	6,6,6	1.53	1 (16%)
3	SO4	A	3001	-	4,4,4	0.38	0	6,6,6	0.52	0
3	SO4	B	3019	-	4,4,4	0.48	0	6,6,6	0.59	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	SO4	C	3002	-	4,4,4	0.27	0	6,6,6	0.37	0
4	GOL	B	3026	-	5,5,5	0.55	0	5,5,5	0.57	0
3	SO4	A	3018	-	4,4,4	0.55	0	6,6,6	0.67	0
2	NAP	A	903[B]	-	45,52,52	3.65	5 (11%)	56,80,80	1.21	5 (8%)
3	SO4	B	3003	-	4,4,4	0.43	0	6,6,6	0.47	0
3	SO4	B	3009	-	4,4,4	0.26	0	6,6,6	0.51	0
3	SO4	C	3007	-	4,4,4	0.33	0	6,6,6	1.53	1 (16%)
3	SO4	A	3024	-	4,4,4	0.19	0	6,6,6	0.45	0
3	SO4	D	3016	-	4,4,4	0.72	0	6,6,6	1.16	1 (16%)
3	SO4	B	3022	-	4,4,4	0.33	0	6,6,6	0.92	0
2	NAP	D	903[B]	-	45,52,52	2.23	5 (11%)	56,80,80	1.27	4 (7%)
2	NAP	B	903[A]	-	45,33,52	5.37	6 (13%)	56,52,80	2.57	9 (16%)
3	SO4	B	3005	-	4,4,4	0.33	0	6,6,6	1.14	1 (16%)
2	NAP	C	903[B]	-	45,52,52	2.40	5 (11%)	56,80,80	1.75	7 (12%)
3	SO4	B	3025	-	4,4,4	0.36	0	6,6,6	0.72	0
3	SO4	C	3013	-	4,4,4	0.40	0	6,6,6	1.47	1 (16%)
3	SO4	C	3023	-	4,4,4	0.24	0	6,6,6	0.70	0
3	SO4	C	3026	-	4,4,4	0.28	0	6,6,6	1.68	2 (33%)
3	SO4	C	3028	-	4,4,4	0.48	0	6,6,6	1.28	1 (16%)
3	SO4	D	3020	-	4,4,4	0.71	0	6,6,6	0.87	0
4	GOL	A	3025	-	5,5,5	0.69	0	5,5,5	1.16	1 (20%)
3	SO4	C	3010	-	4,4,4	0.15	0	6,6,6	0.48	0
3	SO4	A	3021	-	4,4,4	0.40	0	6,6,6	1.00	0
3	SO4	D	3027	-	4,4,4	0.24	0	6,6,6	0.81	0
3	SO4	D	3012	-	4,4,4	0.17	0	6,6,6	0.45	0
2	NAP	A	903[A]	-	45,33,52	4.75	6 (13%)	56,52,80	1.66	6 (10%)
2	NAP	B	903[B]	-	45,52,52	3.48	5 (11%)	56,80,80	2.28	8 (14%)
3	SO4	A	3006	-	4,4,4	0.24	0	6,6,6	1.21	0
4	GOL	C	3029	-	5,5,5	0.66	0	5,5,5	1.28	1 (20%)
3	SO4	B	3014	-	4,4,4	0.32	0	6,6,6	1.53	2 (33%)
4	GOL	D	3028	-	5,5,5	0.48	0	5,5,5	1.39	0
3	SO4	B	3004	-	4,4,4	0.39	0	6,6,6	0.38	0
3	SO4	C	3017	-	4,4,4	0.32	0	6,6,6	0.82	0
2	NAP	D	903[A]	-	45,33,52	3.20	6 (13%)	56,52,80	1.67	6 (10%)
3	SO4	D	3008	-	4,4,4	0.58	0	6,6,6	1.52	1 (16%)
3	SO4	A	3011	-	4,4,4	0.18	0	6,6,6	0.49	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	C	3029	-	-	3/4/4/4	-
2	NAP	A	903[A]	-	-	5/31/37/67	0/5/3/5
2	NAP	C	903[A]	-	-	4/31/37/67	0/5/3/5
2	NAP	B	903[B]	-	-	9/31/67/67	0/5/5/5
4	GOL	D	3028	-	-	2/4/4/4	-
2	NAP	D	903[B]	-	-	9/31/67/67	0/5/5/5
2	NAP	B	903[A]	-	-	5/31/37/67	0/5/3/5
4	GOL	A	3025	-	-	4/4/4/4	-
2	NAP	D	903[A]	-	-	7/31/37/67	0/5/3/5
2	NAP	A	903[B]	-	-	9/31/67/67	0/5/5/5
2	NAP	C	903[B]	-	-	9/31/67/67	0/5/5/5
4	GOL	B	3026	-	-	1/4/4/4	-

All (44) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	903[A]	NAP	O5D-C5D	27.51	2.50	1.44
2	A	903[A]	NAP	C3N-C7N	-21.66	1.18	1.50
2	A	903[B]	NAP	C3N-C7N	-21.66	1.18	1.50
2	A	903[A]	NAP	O5D-C5D	20.41	2.23	1.44
2	B	903[A]	NAP	C3N-C7N	-20.39	1.19	1.50
2	B	903[B]	NAP	C3N-C7N	-20.39	1.19	1.50
2	D	903[A]	NAP	O5D-C5D	15.36	2.03	1.44
2	C	903[A]	NAP	O5D-C5D	14.61	2.01	1.44
2	C	903[A]	NAP	C3N-C7N	-11.53	1.33	1.50
2	C	903[B]	NAP	C3N-C7N	-11.53	1.33	1.50
2	D	903[A]	NAP	C3N-C7N	-9.44	1.36	1.50
2	D	903[B]	NAP	C3N-C7N	-9.44	1.36	1.50
2	D	903[A]	NAP	O7N-C7N	9.26	1.41	1.24
2	D	903[B]	NAP	O7N-C7N	9.26	1.41	1.24
2	A	903[A]	NAP	O7N-C7N	8.87	1.41	1.24
2	A	903[B]	NAP	O7N-C7N	8.87	1.41	1.24
2	B	903[A]	NAP	O7N-C7N	8.86	1.41	1.24
2	B	903[B]	NAP	O7N-C7N	8.86	1.41	1.24
2	C	903[A]	NAP	O7N-C7N	8.84	1.41	1.24
2	C	903[B]	NAP	O7N-C7N	8.84	1.41	1.24
2	A	903[A]	NAP	C2A-N3A	4.08	1.38	1.32
2	A	903[B]	NAP	C2A-N3A	4.08	1.38	1.32

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	903[A]	NAP	C2A-N3A	3.95	1.38	1.32
2	C	903[B]	NAP	C2A-N3A	3.95	1.38	1.32
2	B	903[A]	NAP	C2A-N3A	3.69	1.38	1.32
2	B	903[B]	NAP	C2A-N3A	3.69	1.38	1.32
2	D	903[A]	NAP	C2A-N3A	3.63	1.37	1.32
2	D	903[B]	NAP	C2A-N3A	3.63	1.37	1.32
2	A	903[A]	NAP	C2A-N1A	2.48	1.38	1.33
2	A	903[B]	NAP	C2A-N1A	2.48	1.38	1.33
2	C	903[A]	NAP	C2N-N1N	2.40	1.37	1.35
2	C	903[B]	NAP	C2N-N1N	2.40	1.37	1.35
2	A	903[A]	NAP	C2N-N1N	2.40	1.37	1.35
2	A	903[B]	NAP	C2N-N1N	2.40	1.37	1.35
2	B	903[A]	NAP	C2A-N1A	2.35	1.38	1.33
2	B	903[B]	NAP	C2A-N1A	2.35	1.38	1.33
2	D	903[A]	NAP	C2N-N1N	2.34	1.37	1.35
2	D	903[B]	NAP	C2N-N1N	2.34	1.37	1.35
2	C	903[A]	NAP	C2A-N1A	2.29	1.38	1.33
2	C	903[B]	NAP	C2A-N1A	2.29	1.38	1.33
2	B	903[A]	NAP	C2N-N1N	2.28	1.37	1.35
2	B	903[B]	NAP	C2N-N1N	2.28	1.37	1.35
2	D	903[A]	NAP	C2A-N1A	2.20	1.38	1.33
2	D	903[B]	NAP	C2A-N1A	2.20	1.38	1.33

All (66) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	903[A]	NAP	PN-O5D-C5D	-8.87	69.68	121.68
2	B	903[A]	NAP	O7N-C7N-C3N	8.73	130.08	119.63
2	B	903[B]	NAP	O7N-C7N-C3N	8.73	130.08	119.63
2	A	903[A]	NAP	PN-O5D-C5D	-8.56	71.49	121.68
2	B	903[A]	NAP	C3N-C7N-N7N	-8.15	107.97	117.75
2	B	903[B]	NAP	C3N-C7N-N7N	-8.15	107.97	117.75
2	D	903[A]	NAP	PN-O5D-C5D	-7.89	75.39	121.68
2	C	903[A]	NAP	O7N-C7N-C3N	6.75	127.71	119.63
2	C	903[B]	NAP	O7N-C7N-C3N	6.75	127.71	119.63
2	B	903[A]	NAP	C4N-C3N-C7N	-6.27	104.26	121.04
2	B	903[B]	NAP	C4N-C3N-C7N	-6.27	104.26	121.04
2	C	903[A]	NAP	PN-O5D-C5D	-6.19	85.41	121.68
2	C	903[A]	NAP	C3N-C7N-N7N	-5.97	110.58	117.75
2	C	903[B]	NAP	C3N-C7N-N7N	-5.97	110.58	117.75
2	D	903[A]	NAP	N3A-C2A-N1A	-5.79	119.63	128.68
2	D	903[B]	NAP	N3A-C2A-N1A	-5.79	119.63	128.68

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	903[A]	NAP	N3A-C2A-N1A	-5.33	120.35	128.68
2	B	903[B]	NAP	N3A-C2A-N1A	-5.33	120.35	128.68
2	B	903[A]	NAP	C2N-C3N-C7N	5.33	134.92	119.46
2	B	903[B]	NAP	C2N-C3N-C7N	5.33	134.92	119.46
2	A	903[A]	NAP	N3A-C2A-N1A	-5.10	120.71	128.68
2	A	903[B]	NAP	N3A-C2A-N1A	-5.10	120.71	128.68
2	C	903[A]	NAP	N3A-C2A-N1A	-4.96	120.93	128.68
2	C	903[B]	NAP	N3A-C2A-N1A	-4.96	120.93	128.68
3	C	3007	SO4	O4-S-O3	3.31	123.19	109.06
2	C	903[A]	NAP	C4N-C3N-C7N	-3.29	112.24	121.04
2	C	903[B]	NAP	C4N-C3N-C7N	-3.29	112.24	121.04
2	B	903[A]	NAP	C3D-C2D-C1D	3.26	105.89	100.98
2	B	903[B]	NAP	C3D-C2D-C1D	3.26	105.89	100.98
2	B	903[A]	NAP	C6N-N1N-C2N	-3.24	119.02	121.97
2	B	903[B]	NAP	C6N-N1N-C2N	-3.24	119.02	121.97
3	A	3015	SO4	O4-S-O3	-3.08	95.93	109.06
3	B	3014	SO4	O4-S-O3	-2.95	96.48	109.06
2	D	903[A]	NAP	C6N-N1N-C2N	-2.94	119.29	121.97
2	D	903[B]	NAP	C6N-N1N-C2N	-2.94	119.29	121.97
2	C	903[A]	NAP	C2N-C3N-C7N	2.88	127.82	119.46
2	C	903[B]	NAP	C2N-C3N-C7N	2.88	127.82	119.46
2	A	903[A]	NAP	C6N-N1N-C2N	-2.87	119.36	121.97
2	A	903[B]	NAP	C6N-N1N-C2N	-2.87	119.36	121.97
2	A	903[A]	NAP	C3D-C2D-C1D	2.82	105.22	100.98
2	A	903[B]	NAP	C3D-C2D-C1D	2.82	105.22	100.98
2	C	903[A]	NAP	C3D-C2D-C1D	2.79	105.18	100.98
2	C	903[B]	NAP	C3D-C2D-C1D	2.79	105.18	100.98
3	C	3013	SO4	O3-S-O2	-2.74	95.02	109.31
3	C	3026	SO4	O3-S-O2	2.72	123.48	109.31
2	D	903[A]	NAP	C3D-C2D-C1D	2.66	104.99	100.98
2	D	903[B]	NAP	C3D-C2D-C1D	2.66	104.99	100.98
2	C	903[A]	NAP	C6N-N1N-C2N	-2.66	119.55	121.97
2	C	903[B]	NAP	C6N-N1N-C2N	-2.66	119.55	121.97
4	C	3029	GOL	C3-C2-C1	2.50	121.41	111.70
3	C	3028	SO4	O4-S-O2	-2.48	96.37	109.31
3	B	3005	SO4	O4-S-O2	2.47	122.19	109.31
3	D	3016	SO4	O3-S-O1	-2.30	97.30	109.31
4	A	3025	GOL	O3-C3-C2	2.27	121.08	110.20
3	B	3014	SO4	O4-S-O1	2.25	121.07	109.31
2	A	903[A]	NAP	O4B-C1B-C2B	-2.23	102.72	106.59
2	A	903[B]	NAP	O4B-C1B-C2B	-2.23	102.72	106.59
2	D	903[A]	NAP	O5D-C5D-C4D	-2.20	101.43	108.99

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	3026	SO4	O4-S-O2	-2.16	98.01	109.31
2	B	903[A]	NAP	C1B-N9A-C4A	-2.13	122.89	126.64
2	B	903[B]	NAP	C1B-N9A-C4A	-2.13	122.89	126.64
2	D	903[A]	NAP	C1B-N9A-C4A	-2.13	122.90	126.64
2	D	903[B]	NAP	C1B-N9A-C4A	-2.13	122.90	126.64
3	D	3008	SO4	O4-S-O2	-2.08	98.44	109.31
2	A	903[A]	NAP	C4A-C5A-N7A	-2.06	107.26	109.40
2	A	903[B]	NAP	C4A-C5A-N7A	-2.06	107.26	109.40

There are no chirality outliers.

All (67) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	903[A]	NAP	C5D-O5D-PN-O1N
2	A	903[B]	NAP	C5B-O5B-PA-O1A
2	A	903[B]	NAP	C3D-C4D-C5D-O5D
2	B	903[A]	NAP	C5D-O5D-PN-O1N
2	B	903[B]	NAP	C5B-O5B-PA-O1A
2	B	903[B]	NAP	C3D-C4D-C5D-O5D
2	C	903[B]	NAP	C5B-O5B-PA-O1A
2	C	903[B]	NAP	C3D-C4D-C5D-O5D
2	D	903[A]	NAP	C5D-O5D-PN-O1N
2	D	903[B]	NAP	C5B-O5B-PA-O1A
2	D	903[B]	NAP	C3D-C4D-C5D-O5D
4	A	3025	GOL	O1-C1-C2-C3
4	A	3025	GOL	C1-C2-C3-O3
4	C	3029	GOL	C1-C2-C3-O3
4	C	3029	GOL	O2-C2-C3-O3
2	A	903[B]	NAP	O4D-C4D-C5D-O5D
4	A	3025	GOL	O1-C1-C2-O2
2	D	903[A]	NAP	C4N-C3N-C7N-N7N
2	D	903[B]	NAP	C4N-C3N-C7N-N7N
2	D	903[A]	NAP	C4N-C3N-C7N-O7N
2	D	903[B]	NAP	C4N-C3N-C7N-O7N
2	B	903[B]	NAP	O4D-C4D-C5D-O5D
2	C	903[B]	NAP	O4D-C4D-C5D-O5D
2	D	903[B]	NAP	O4D-C4D-C5D-O5D
2	B	903[B]	NAP	PN-O3-PA-O1A
4	B	3026	GOL	O2-C2-C3-O3
2	A	903[A]	NAP	C5D-O5D-PN-O3
2	A	903[B]	NAP	C5B-O5B-PA-O3
2	B	903[A]	NAP	C5D-O5D-PN-O3

Continued on next page...

Continued from previous page...

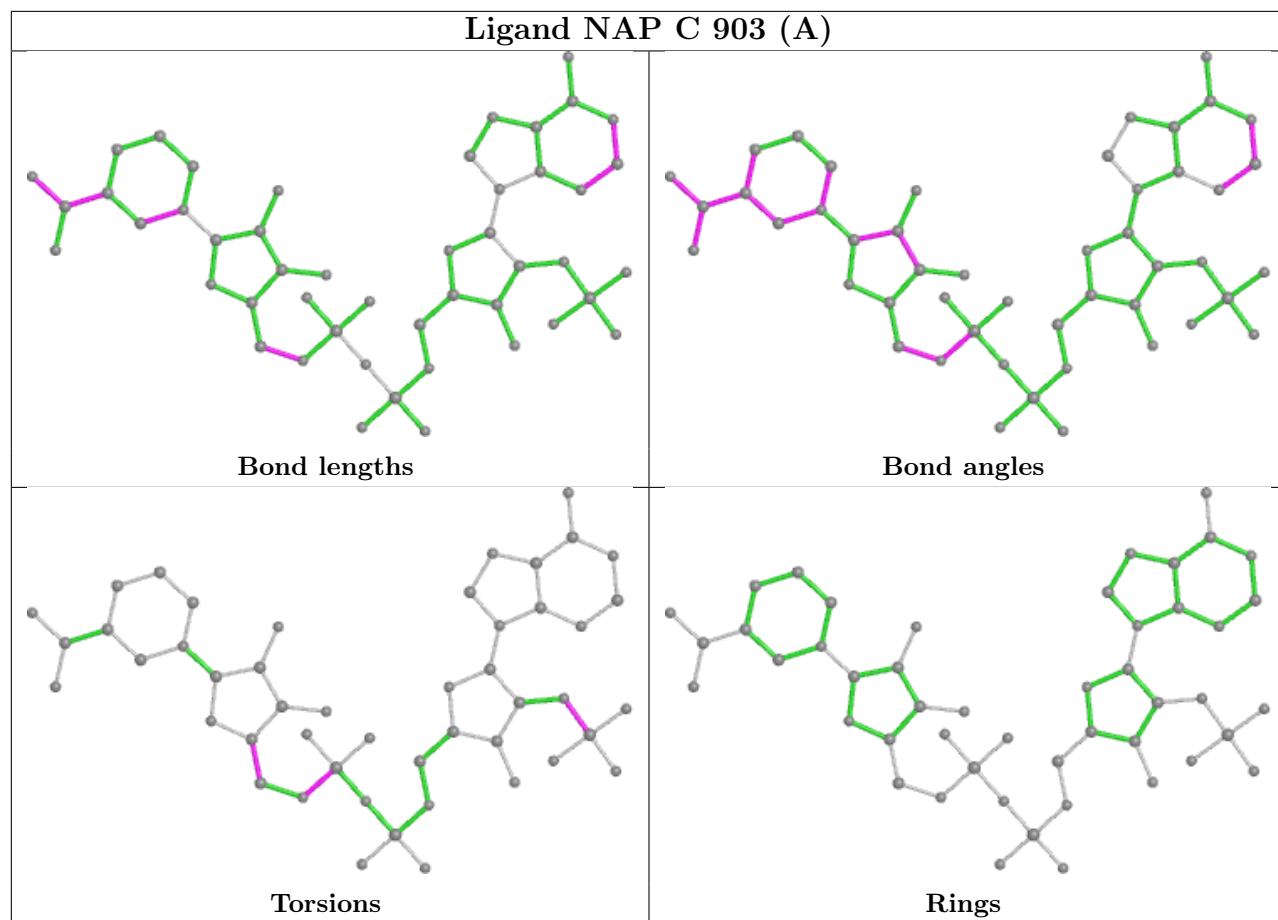
Mol	Chain	Res	Type	Atoms
2	B	903[B]	NAP	C5B-O5B-PA-O3
2	C	903[A]	NAP	C5D-O5D-PN-O3
2	C	903[B]	NAP	C5B-O5B-PA-O3
2	D	903[A]	NAP	C5D-O5D-PN-O3
2	D	903[B]	NAP	C5B-O5B-PA-O3
4	C	3029	GOL	O1-C1-C2-O2
2	D	903[B]	NAP	PN-O3-PA-O1A
2	A	903[B]	NAP	C5B-O5B-PA-O2A
2	B	903[B]	NAP	C5B-O5B-PA-O2A
2	C	903[A]	NAP	C5D-O5D-PN-O1N
2	C	903[B]	NAP	C5B-O5B-PA-O2A
2	D	903[A]	NAP	C5D-O5D-PN-O2N
2	D	903[B]	NAP	C5B-O5B-PA-O2A
4	D	3028	GOL	O1-C1-C2-O2
2	D	903[A]	NAP	O4D-C4D-C5D-O5D
2	A	903[B]	NAP	PN-O3-PA-O1A
2	A	903[B]	NAP	PN-O3-PA-O2A
2	C	903[B]	NAP	PN-O3-PA-O1A
4	A	3025	GOL	O2-C2-C3-O3
2	B	903[A]	NAP	C2B-O2B-P2B-O1X
2	B	903[B]	NAP	C2B-O2B-P2B-O1X
2	C	903[A]	NAP	C2B-O2B-P2B-O1X
2	C	903[B]	NAP	C2B-O2B-P2B-O1X
2	D	903[A]	NAP	C2B-O2B-P2B-O1X
2	D	903[B]	NAP	C2B-O2B-P2B-O1X
2	B	903[A]	NAP	C4N-C3N-C7N-O7N
2	B	903[B]	NAP	C4N-C3N-C7N-O7N
2	C	903[A]	NAP	O4D-C4D-C5D-O5D
2	A	903[A]	NAP	C4N-C3N-C7N-N7N
2	A	903[B]	NAP	C4N-C3N-C7N-N7N
2	B	903[B]	NAP	PN-O3-PA-O2A
2	C	903[B]	NAP	PN-O3-PA-O2A
2	C	903[B]	NAP	PA-O3-PN-O2N
2	A	903[A]	NAP	C5D-O5D-PN-O2N
2	B	903[A]	NAP	O4D-C4D-C5D-O5D
4	D	3028	GOL	O2-C2-C3-O3
2	A	903[A]	NAP	C3B-C2B-O2B-P2B
2	A	903[B]	NAP	C3B-C2B-O2B-P2B

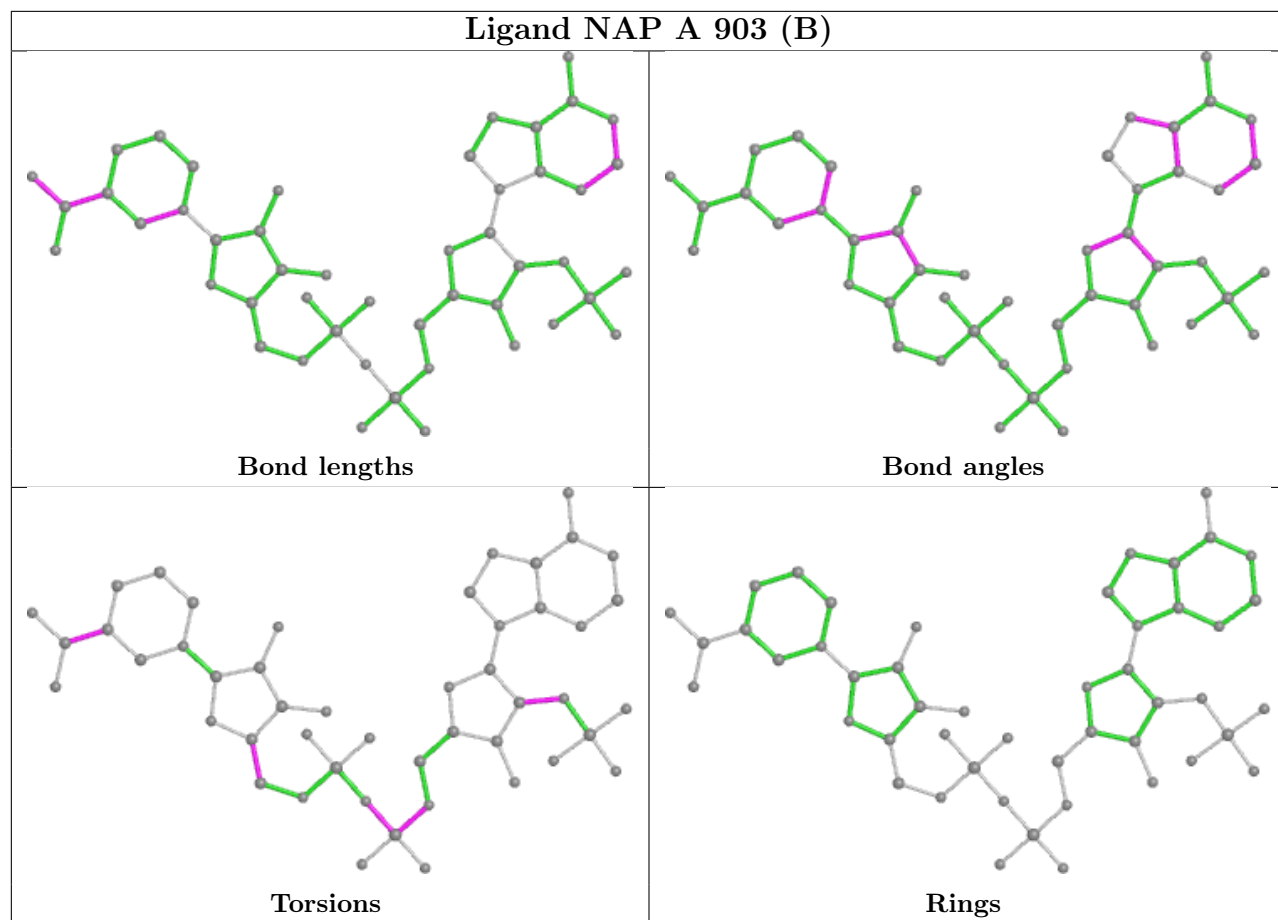
There are no ring outliers.

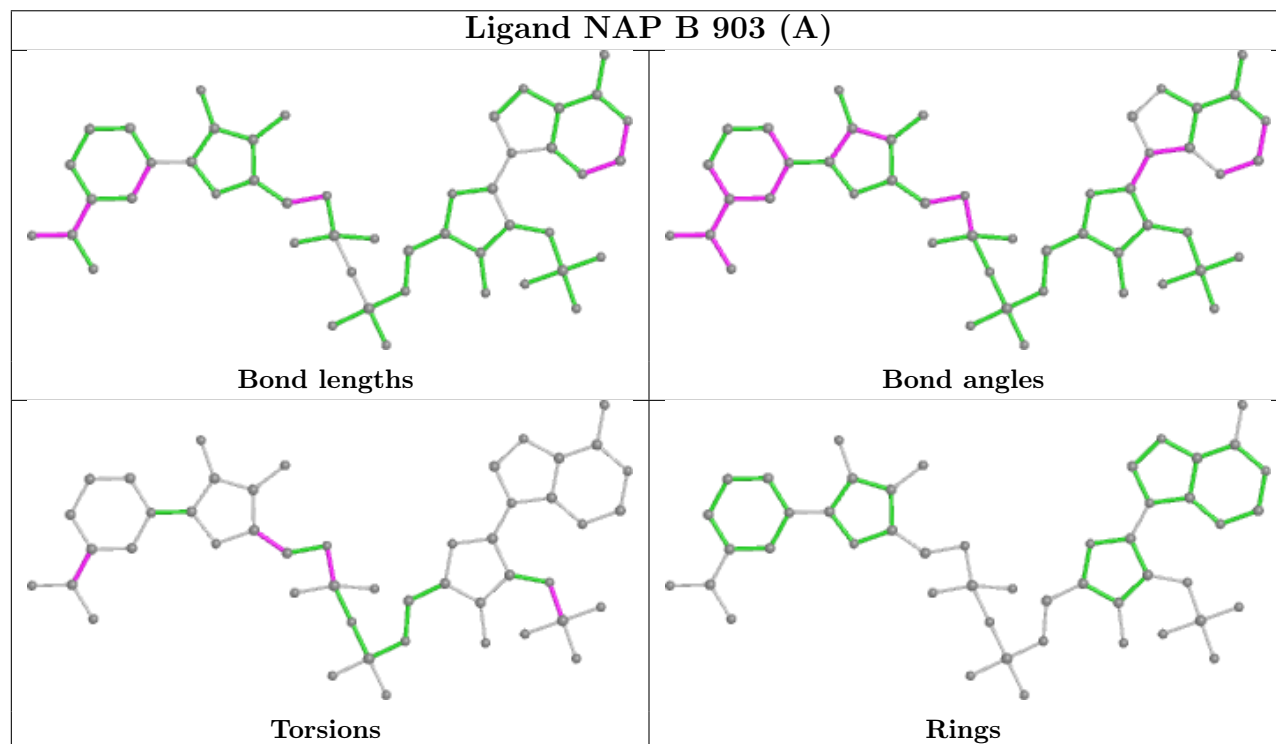
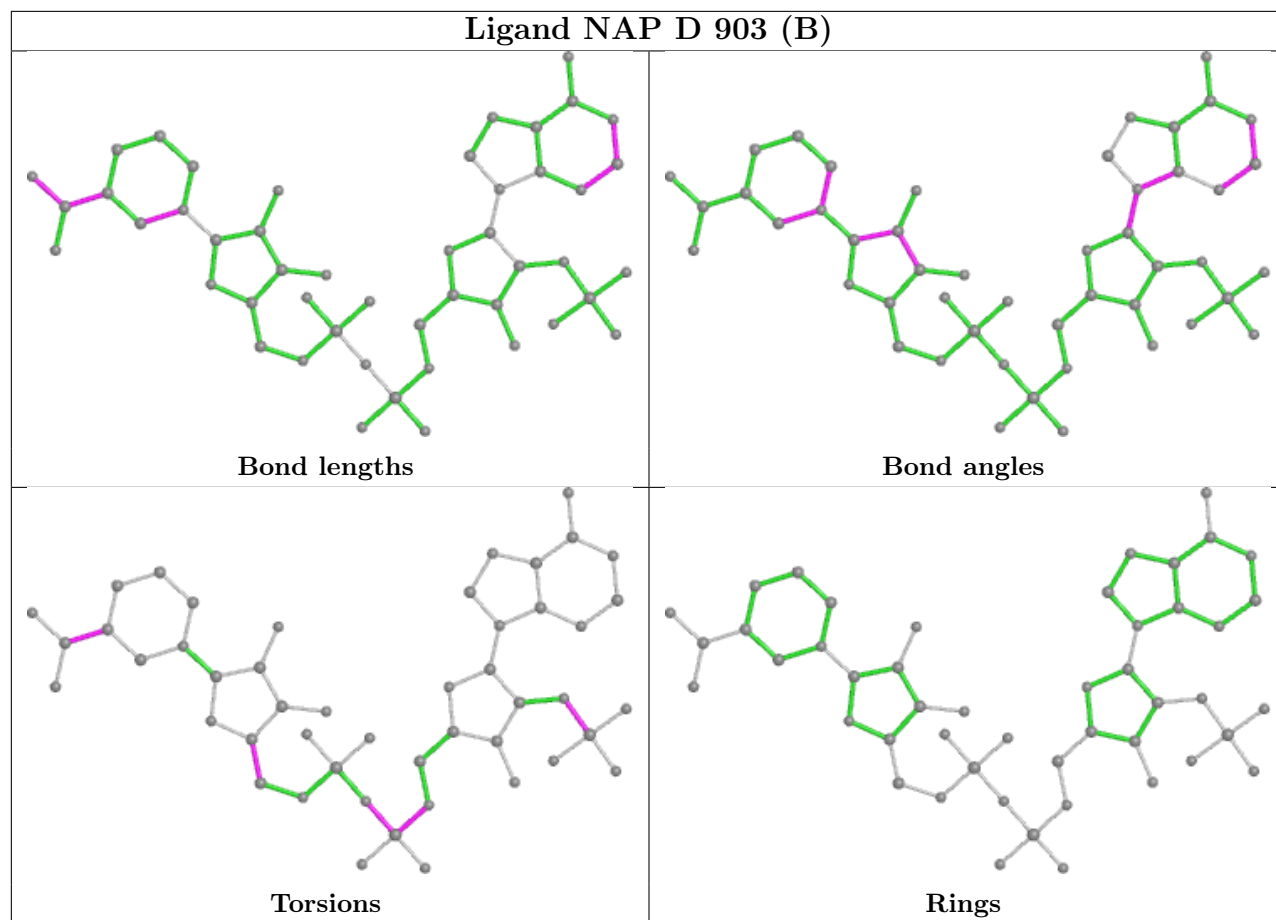
9 monomers are involved in 10 short contacts:

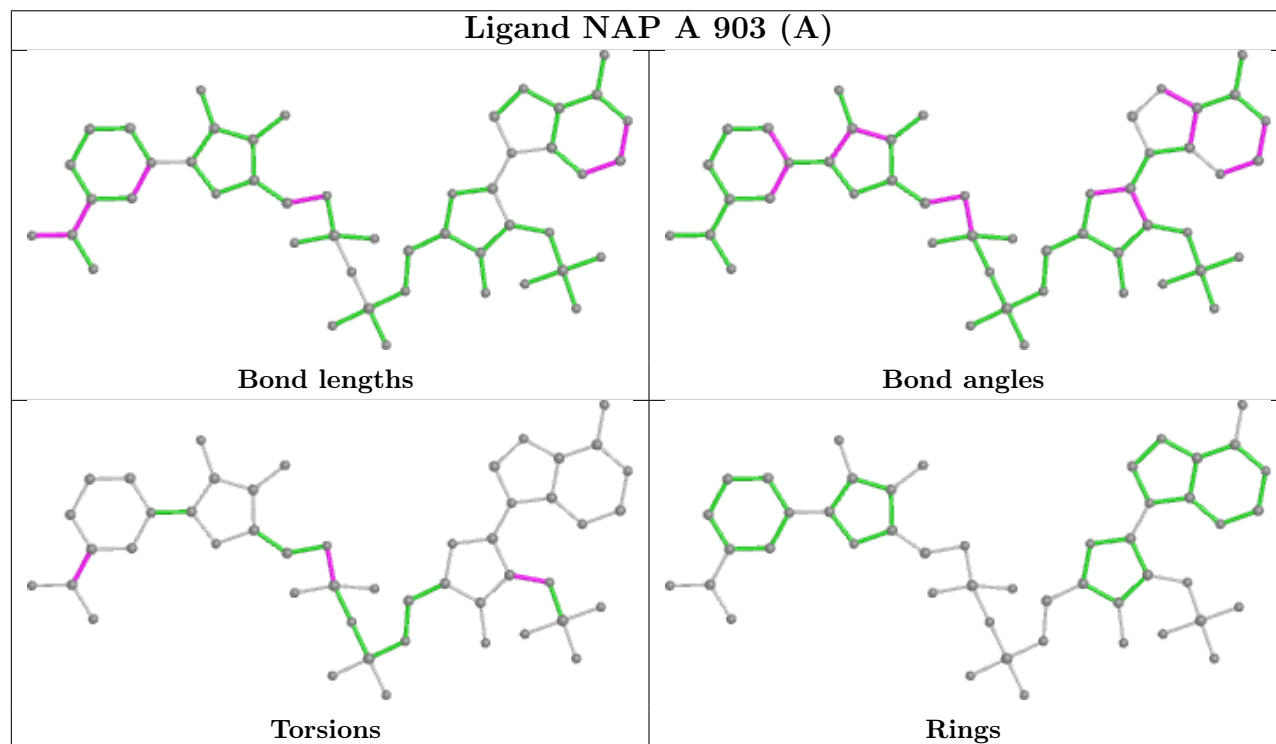
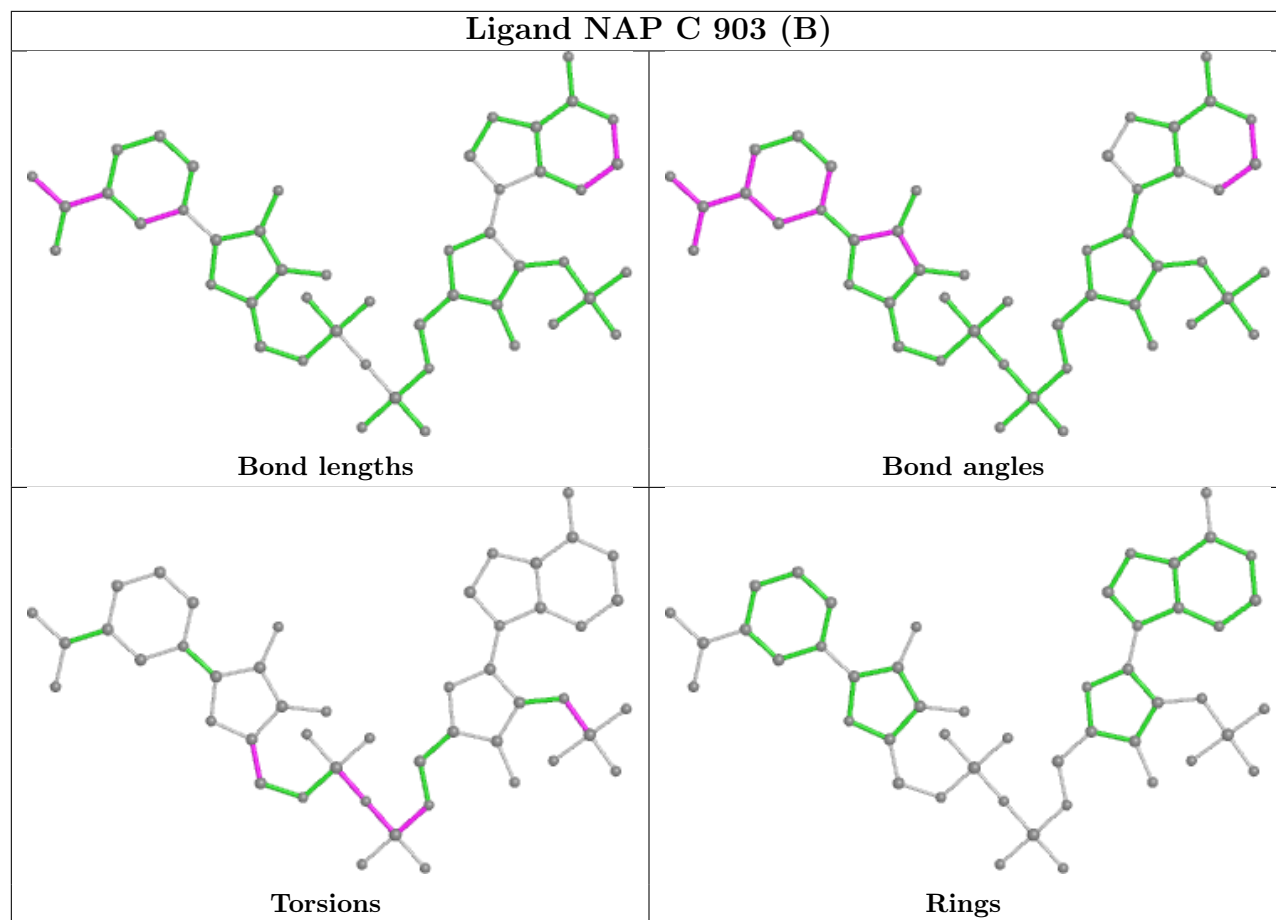
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	3002	SO4	1	0
4	B	3026	GOL	2	0
2	A	903[B]	NAP	1	0
3	B	3003	SO4	1	0
2	D	903[B]	NAP	1	0
2	C	903[B]	NAP	1	0
3	C	3028	SO4	1	0
3	D	3020	SO4	1	0
2	B	903[B]	NAP	1	0

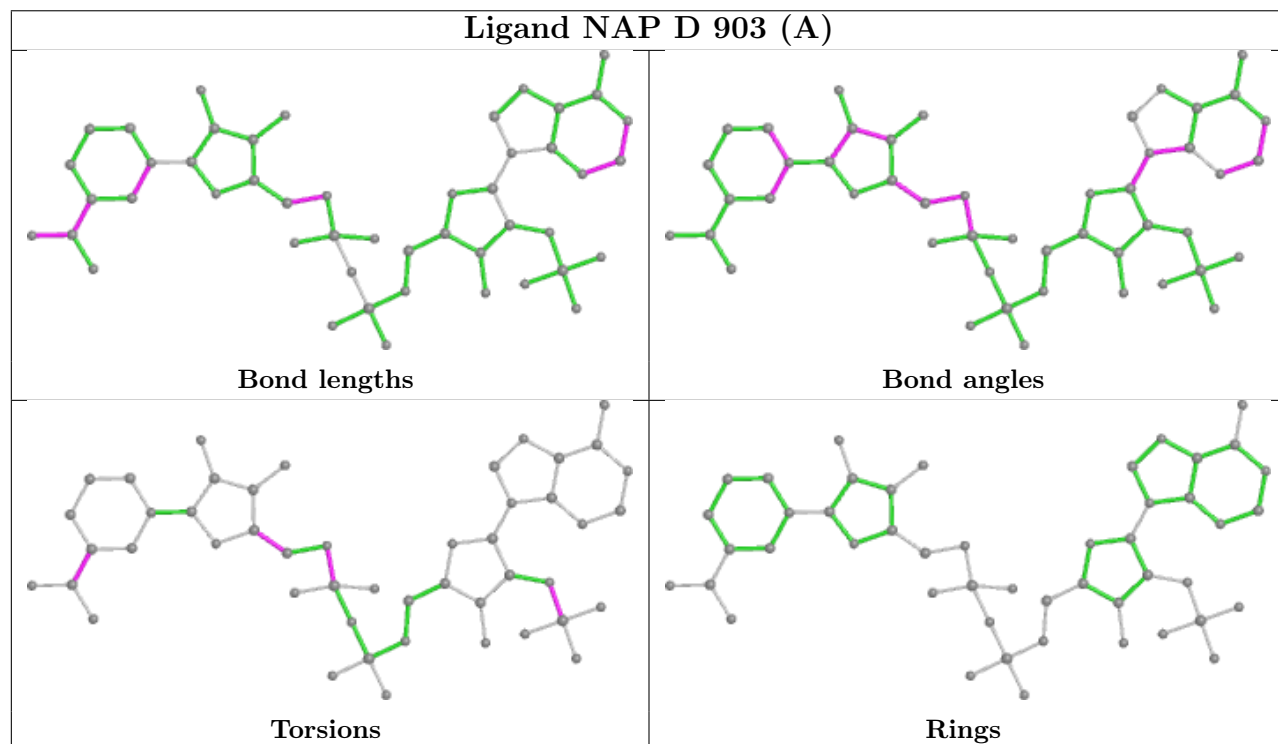
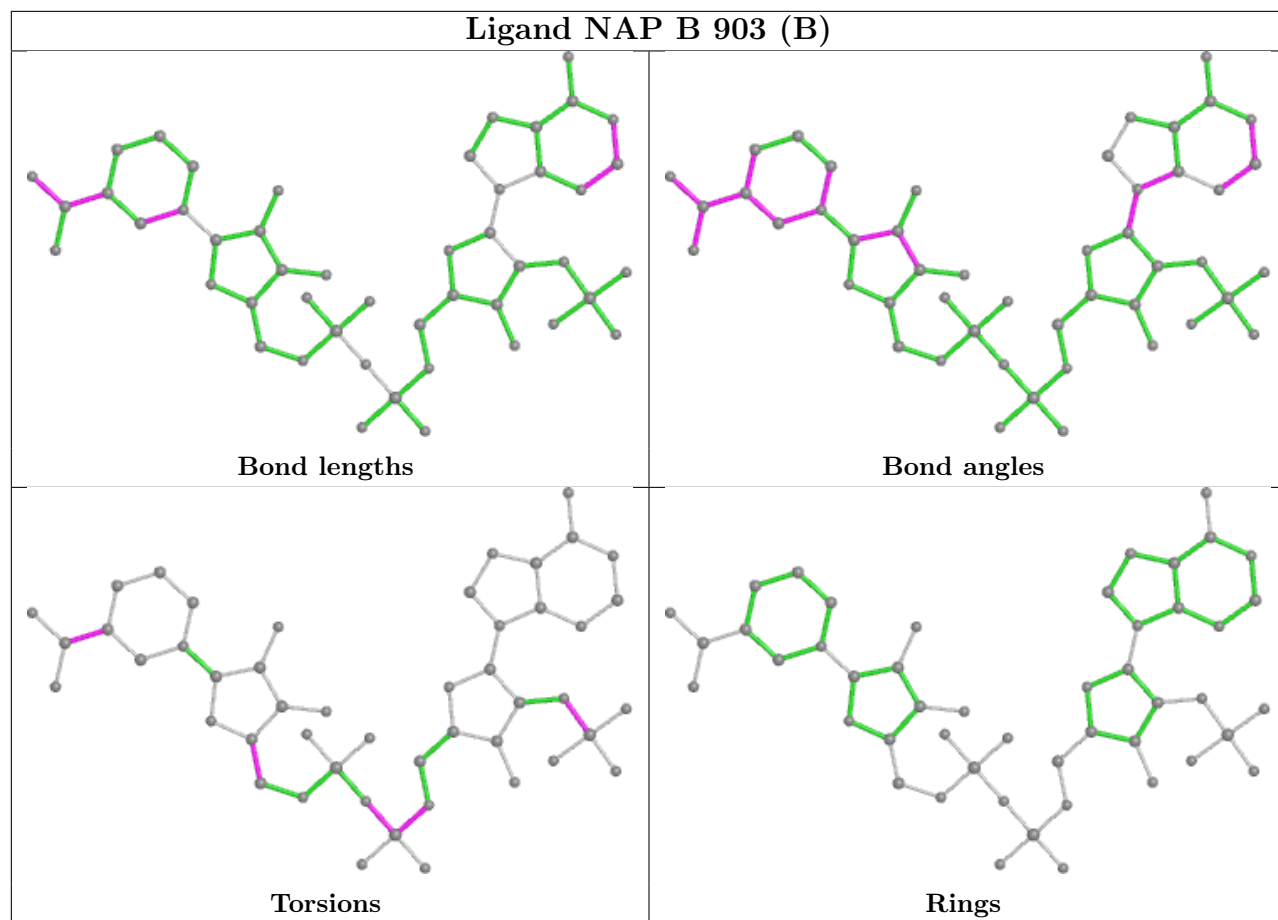
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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











5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	498/517 (96%)	-0.53	2 (0%) 92 93	13, 26, 38, 56	12 (2%)
1	B	498/517 (96%)	-0.50	4 (0%) 86 87	15, 28, 40, 63	14 (2%)
1	C	498/517 (96%)	-0.65	0 100 100	12, 24, 35, 61	17 (3%)
1	D	498/517 (96%)	-0.62	4 (0%) 86 87	13, 27, 41, 60	15 (3%)
All	All	1992/2068 (96%)	-0.57	10 (0%) 91 91	12, 26, 39, 63	58 (2%)

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	405	VAL	3.8
1	D	405	VAL	3.8
1	B	405	VAL	2.7
1	D	415	LYS	2.4
1	B	417	THR	2.2
1	D	419[A]	GLN	2.2
1	A	707[A]	CYS	2.2
1	D	743[A]	ASP	2.2
1	B	743[A]	ASP	2.1
1	B	817	ASP	2.1

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

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

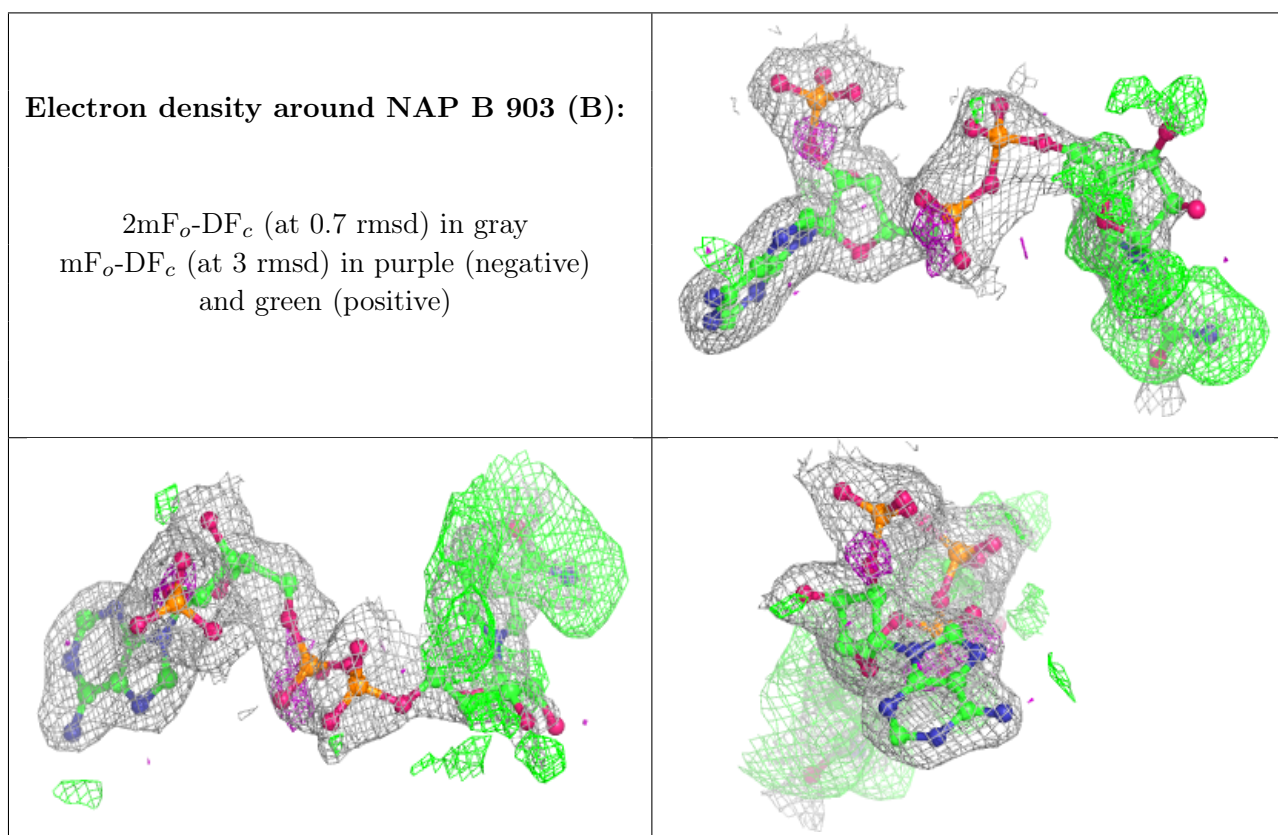
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	SO4	D	3020	5/5	0.75	0.19	48,49,54,56	5
3	SO4	A	3021	5/5	0.79	0.27	42,50,55,56	5
3	SO4	A	3011	5/5	0.80	0.28	58,59,62,64	5
3	SO4	A	3018	5/5	0.83	0.17	50,51,54,55	5
3	SO4	B	3022	5/5	0.85	0.24	37,46,48,50	5
3	SO4	D	3012	5/5	0.86	0.16	49,54,56,58	5
4	GOL	C	3029	6/6	0.88	0.17	59,66,72,75	0
3	SO4	C	3010	5/5	0.89	0.16	47,48,53,55	5
3	SO4	C	3017	5/5	0.89	0.19	52,53,55,56	5
4	GOL	A	3025	6/6	0.89	0.21	59,65,68,70	0
3	SO4	C	3023	5/5	0.89	0.19	46,52,54,56	5
3	SO4	B	3019	5/5	0.90	0.18	50,50,54,56	5
4	GOL	D	3028	6/6	0.90	0.21	68,73,75,76	0
4	GOL	B	3026	6/6	0.91	0.17	50,58,60,63	0
3	SO4	C	3026	5/5	0.92	0.16	45,47,49,51	5
3	SO4	D	3027	5/5	0.92	0.20	42,45,48,49	5
3	SO4	A	3024	5/5	0.92	0.23	57,58,60,60	5
2	NAP	B	903[B]	48/48	0.93	0.15	31,37,39,46	25
3	SO4	B	3009	5/5	0.93	0.16	46,47,50,53	5
2	NAP	C	903[A]	31/48	0.93	0.15	26,29,34,35	8
2	NAP	C	903[B]	48/48	0.93	0.15	26,29,36,42	25
3	SO4	B	3025	5/5	0.93	0.14	47,52,53,53	5
2	NAP	A	903[A]	31/48	0.93	0.15	27,31,35,35	8
2	NAP	A	903[B]	48/48	0.93	0.15	27,35,38,45	25
2	NAP	B	903[A]	31/48	0.93	0.15	31,34,39,39	8
2	NAP	D	903[B]	48/48	0.94	0.13	26,29,36,40	25
2	NAP	D	903[A]	31/48	0.94	0.13	26,29,37,38	8
3	SO4	B	3005	5/5	0.95	0.17	37,42,49,50	5
3	SO4	C	3002	5/5	0.96	0.11	40,42,47,47	5
3	SO4	D	3008	5/5	0.96	0.11	34,35,39,41	5
3	SO4	A	3001	5/5	0.96	0.09	59,60,62,62	5
3	SO4	C	3007	5/5	0.97	0.11	38,40,46,49	5
3	SO4	B	3003	5/5	0.98	0.12	28,28,32,33	5
3	SO4	A	3006	5/5	0.98	0.11	31,34,41,45	5
3	SO4	A	3015	5/5	0.98	0.14	30,42,48,51	0
3	SO4	C	3028	5/5	0.98	0.10	28,36,38,39	5
3	SO4	B	3014	5/5	0.99	0.20	34,45,48,54	0

Continued on next page...

Continued from previous page...

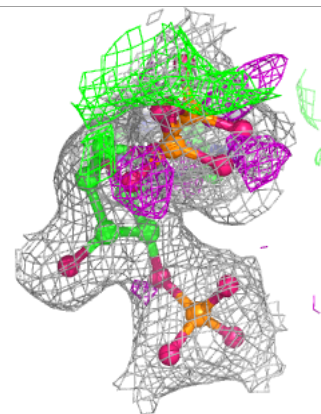
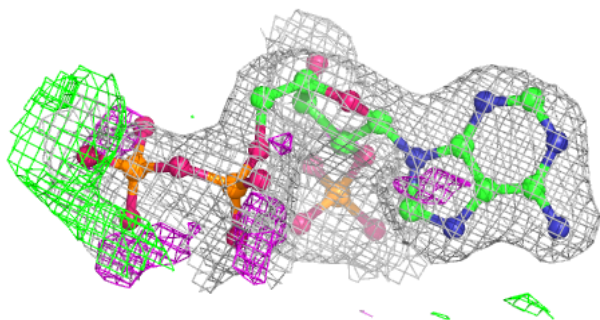
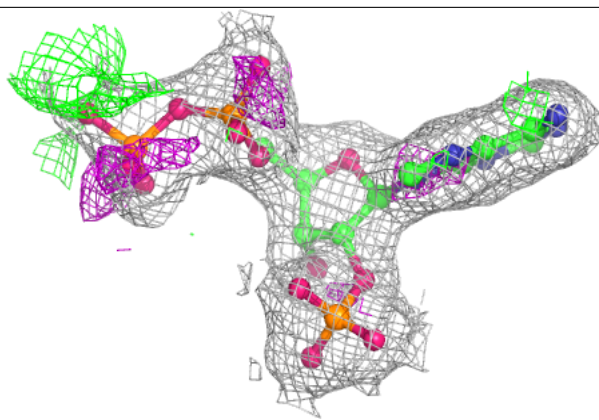
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	SO4	C	3013	5/5	0.99	0.12	32,41,45,47	0
3	SO4	B	3004	5/5	0.99	0.08	35,41,42,42	5
3	SO4	D	3016	5/5	0.99	0.17	30,43,45,50	0

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.

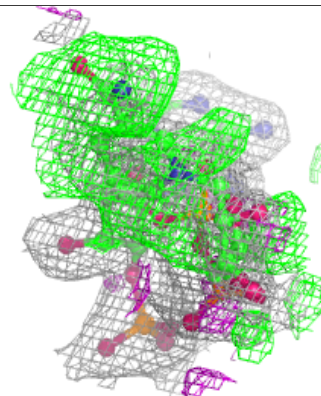
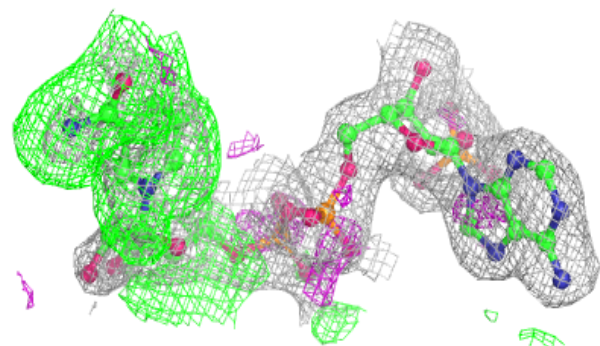
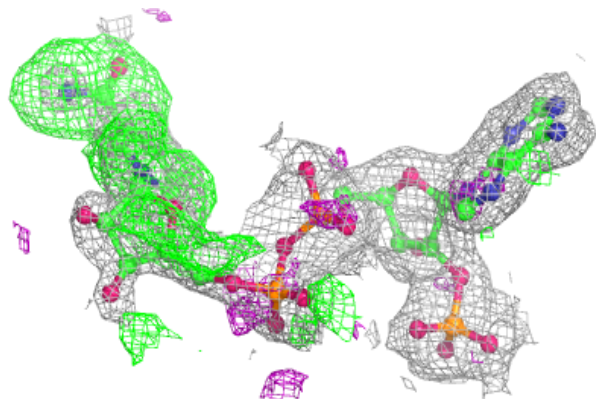


Electron density around NAP C 903 (A):

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

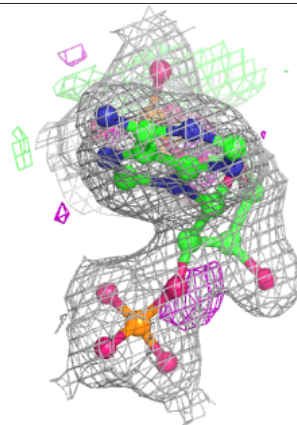
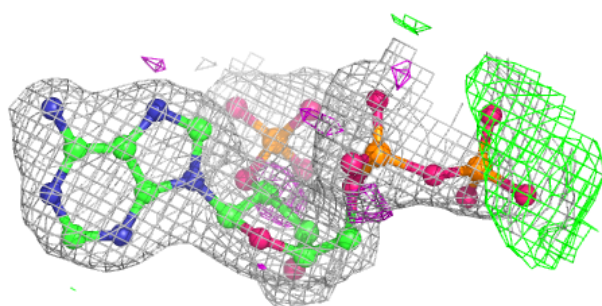
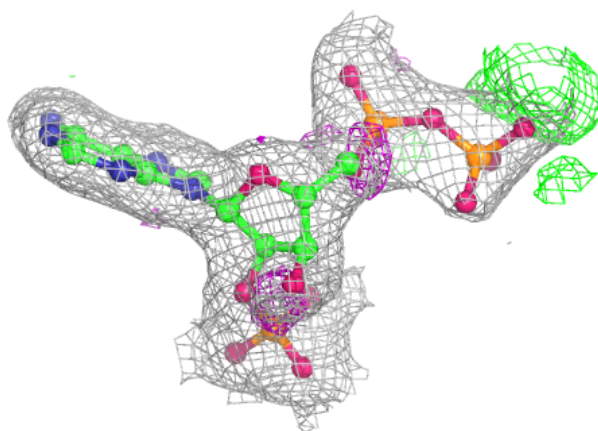
**Electron density around NAP C 903 (B):**

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

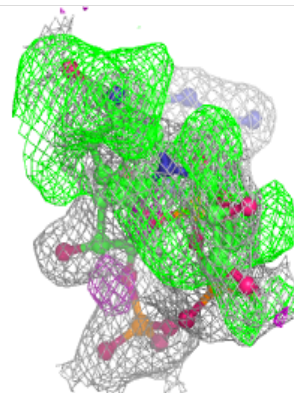
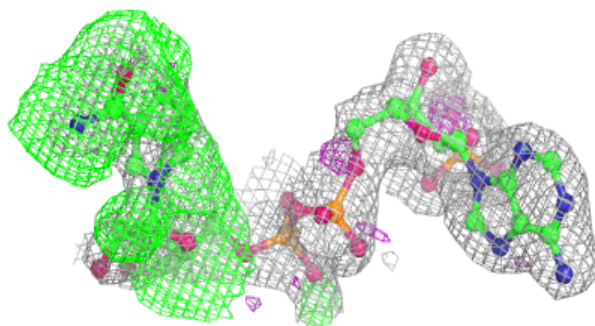
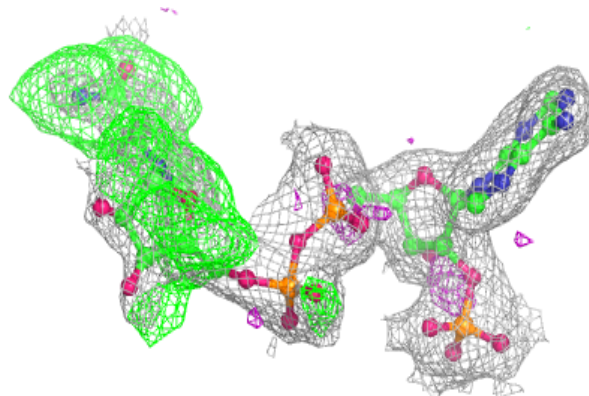


Electron density around NAP A 903 (A):

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

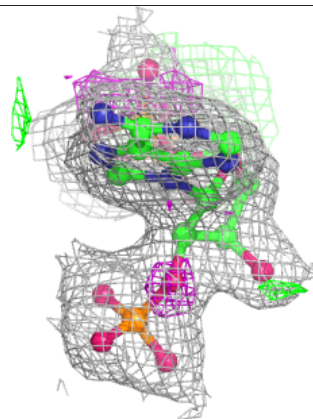
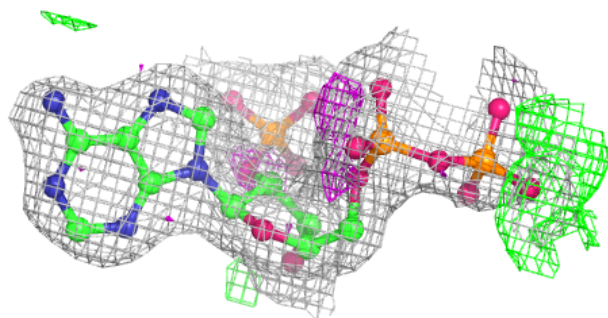
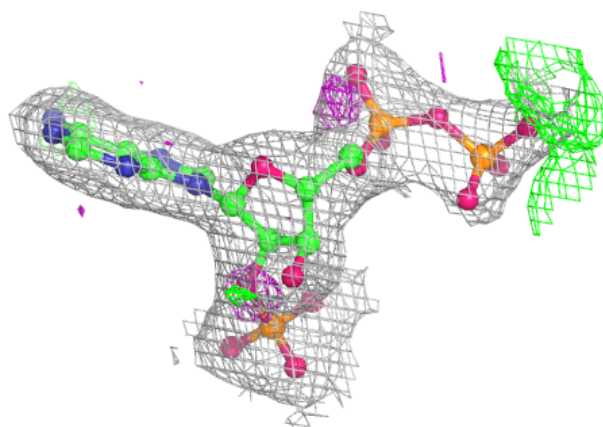
**Electron density around NAP A 903 (B):**

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

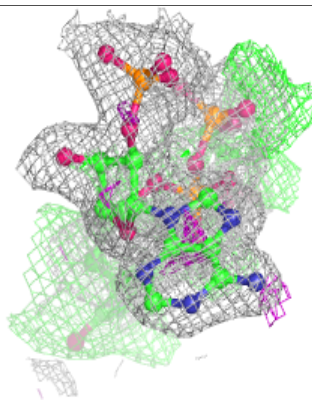
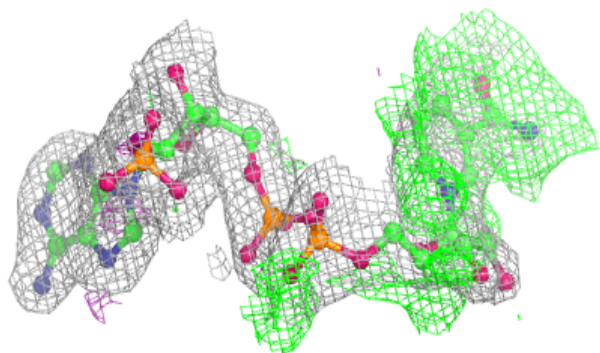
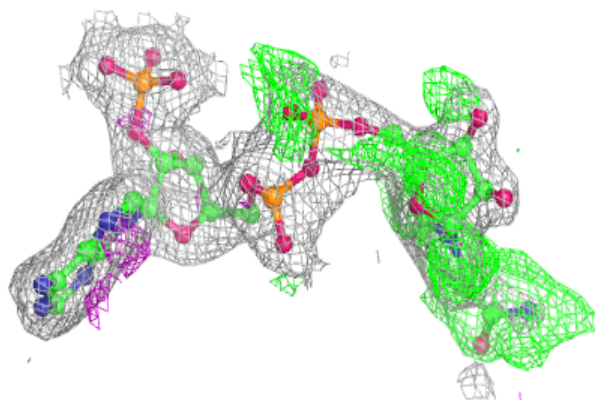


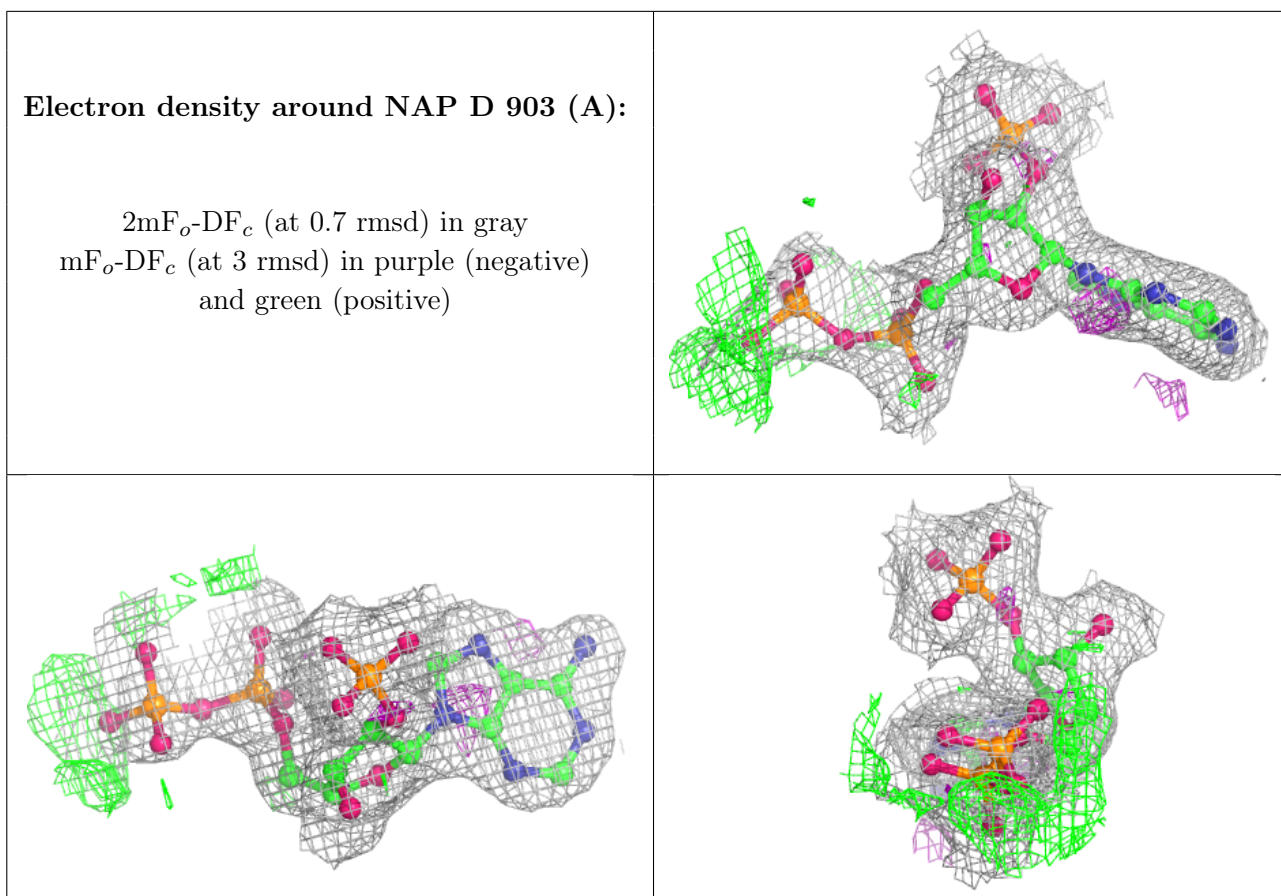
Electron density around NAP B 903 (A):

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

**Electron density around NAP D 903 (B):**

$2mF_o-DF_c$ (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.