Full wwPDB X-ray Structure Validation Report (i)

May 3, 2025 – 03:12 PM EDT

PDB ID	:	3AD9 / pdb_00003ad9
Title	:	Heterotetrameric Sarcosine Oxidase from Corynebacterium sp. U-96 sarcosine-reduced form
Authors	:	Suzuki, H.; Moriguchi, T.; Ida, K.
Deposited on	:	2010-01-15
Resolution	:	2.30 Å(reported)

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

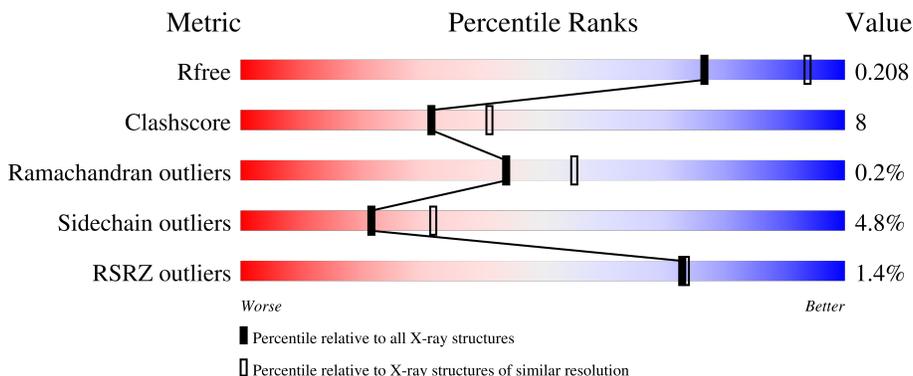|		
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 2.30 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	Percentile Ranks	Value
Rfree		0.208
Clashscore		8
Ramachandran outliers		0.2%
Sidechain outliers		4.8%
RSRZ outliers		1.4%

Worse ▬▬▬▬▬▬▬▬▬▬ *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	5963 (2.30-2.30)
Clashscore	180529	6698 (2.30-2.30)
Ramachandran outliers	177936	6640 (2.30-2.30)
Sidechain outliers	177891	6640 (2.30-2.30)
RSRZ outliers	164620	5963 (2.30-2.30)

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	964	83% ... 14% ..
2	B	404	81% ... 14% ...
3	C	203	80% ... 13% ..
4	D	99	86% ... 6% 8%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	SO4	A	2559	-	-	X	-

2 Entry composition ⓘ

There are 10 unique types of molecules in this entry. The entry contains 13569 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 SARCOSINE OXIDASE ALPHA SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	963	Total 7229	C 4507	N 1287	O 1413	S 22	0	0	0

- Molecule 2 is a protein called SARCOSINE OXIDASE BETA SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	397	Total 3079	C 1965	N 533	O 571	S 10	0	1	0

- Molecule 3 is a protein called SARCOSINE OXIDASE GAMMA SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	195	Total 1433	C 902	N 257	O 271	S 3	0	0	0

- Molecule 4 is a protein called SARCOSINE OXIDASE DELTA SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	91	Total 749	C 476	N 135	O 133	S 5	0	0	0

- Molecule 5 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (CCD ID: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$).
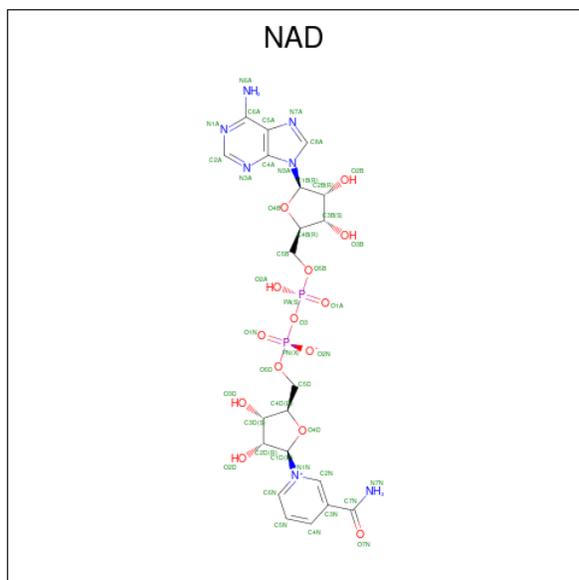
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total 44	C 21	N 7	O 14	P 2	0	0

- Molecule 6 is SULFATE ION (CCD ID: SO4) (formula: O_4S).
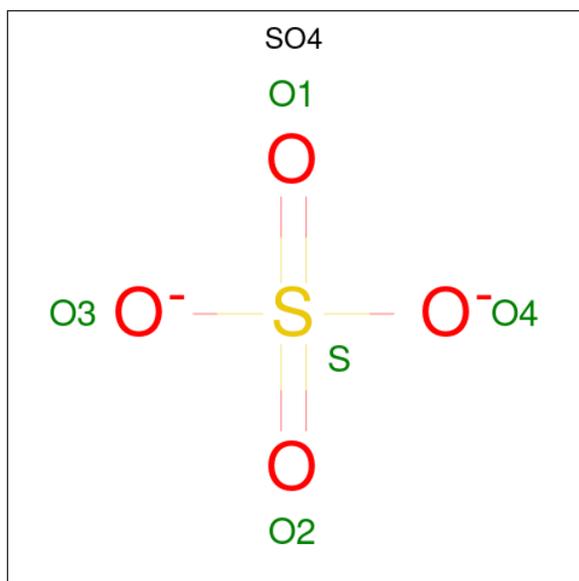
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 5	O 4	S 1	0	0
6	A	1	Total 5	O 4	S 1	0	0
6	A	1	Total 5	O 4	S 1	0	0

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

- Molecule 7 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).
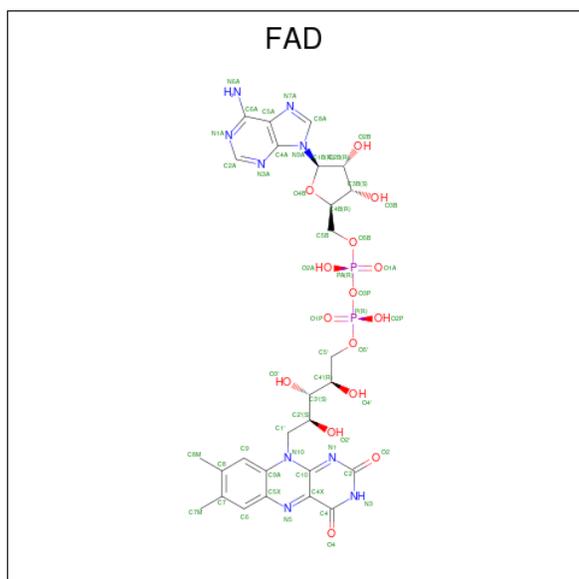
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
7	B	1	Total 53	C 27	N 9	O 15	P 2	0	0

- Molecule 8 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

FMN

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
8	B	1	31	17	4	9	1	0	0

- Molecule 9 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
9	D	1	1	1	0	0

- Molecule 10 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	557	Total 557	O 557	0	0
10	B	163	Total 163	O 163	0	0
10	C	119	Total 119	O 119	0	0
10	D	66	Total 66	O 66	0	0

3 Residue-property plots ⓘ

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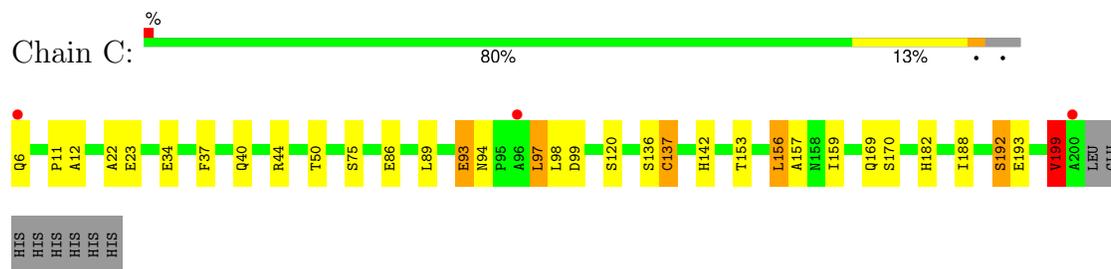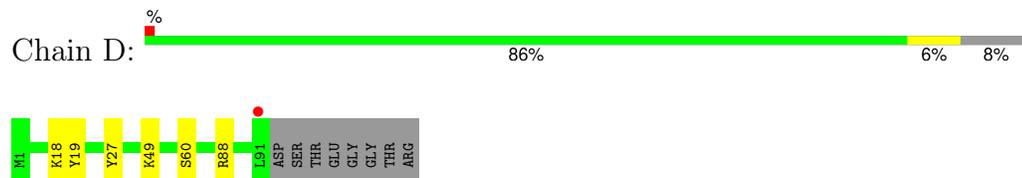
• Molecule 1: SARCOSINE OXIDASE ALPHA SUBUNIT
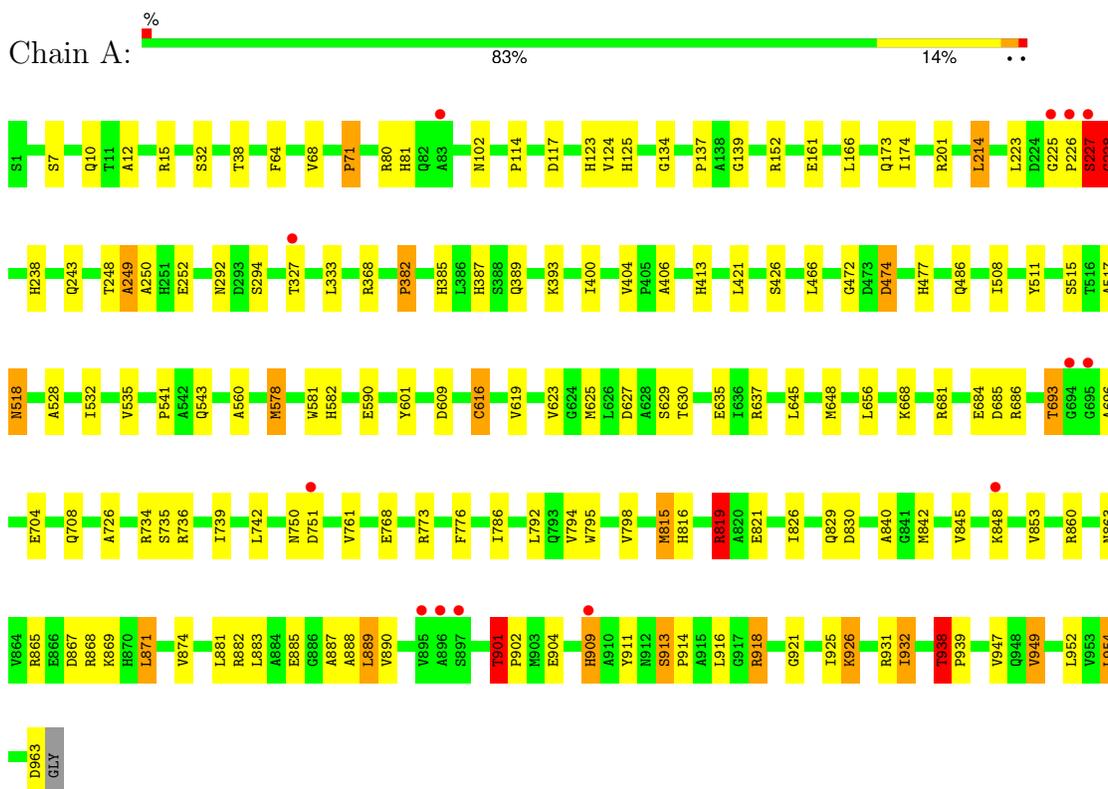
• Molecule 2: SARCOSINE OXIDASE BETA SUBUNIT
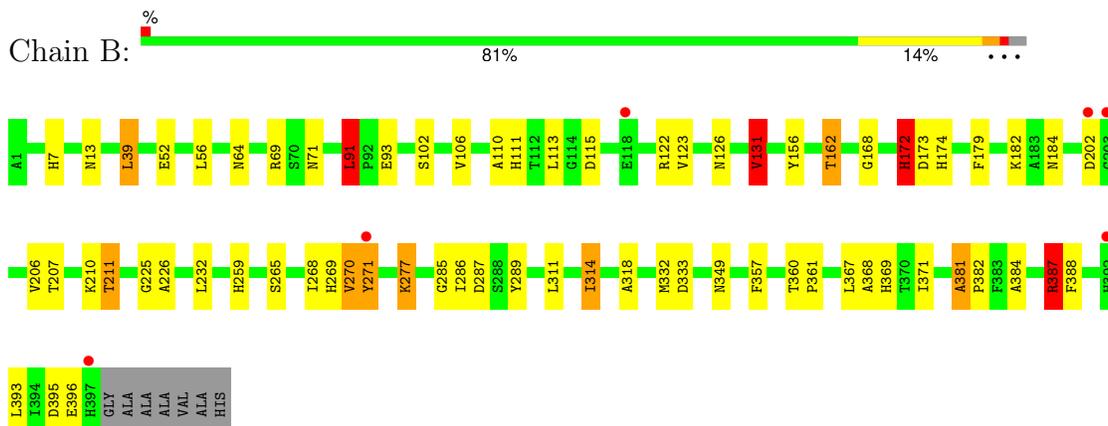
• Molecule 3: SARCOSINE OXIDASE GAMMA SUBUNIT

Chain C:

• Molecule 4: SARCOSINE OXIDASE DELTA SUBUNIT

Chain D:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 65 2 2	Depositor
Cell constants a, b, c, α, β, γ	198.56Å 198.56Å 196.64Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	61.25 – 2.30 61.25 – 2.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (61.25-2.30) 99.9 (61.25-2.30)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	5.18 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.169 , 0.211 0.169 , 0.208	Depositor DCC
R_{free} test set	5043 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	26.1	Xtriage
Anisotropy	0.033	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 42.5	EDS
L-test for twinning[2]	$< |L| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	13569	wwPDB-VP
Average B, all atoms (Å^2)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.40% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: FMN, NAD, FAD, SO4, ZN

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	1.20	7/7361 (0.1%)	1.14	25/10017 (0.2%)
2	B	1.18	5/3160 (0.2%)	1.18	16/4300 (0.4%)
3	C	1.28	0/1461	1.20	8/1998 (0.4%)
4	D	1.08	0/772	1.10	4/1040 (0.4%)
All	All	1.20	12/12754 (0.1%)	1.15	53/17355 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1
3	C	0	1
All	All	0	2

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	271[A]	TYR	C-N	13.66	1.46	1.33
2	B	271[B]	TYR	C-N	13.66	1.46	1.33
1	A	249	ALA	CA-CB	-7.46	1.40	1.53
1	A	81	HIS	CA-C	-6.62	1.44	1.52
2	B	270	VAL	C-N	6.50	1.42	1.33
1	A	227	SER	CA-C	6.44	1.61	1.52
1	A	225	GLY	C-O	5.63	1.31	1.24
1	A	201	ARG	CA-C	-5.52	1.46	1.53
2	B	206	VAL	CA-CB	5.27	1.60	1.54
1	A	227	SER	C-O	5.12	1.30	1.24
2	B	131	VAL	CA-CB	5.11	1.60	1.54
1	A	252	GLU	C-O	5.04	1.30	1.23

All (53) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	12	ALA	CA-C-N	-8.87	109.39	123.31
1	A	12	ALA	C-N-CA	-8.87	109.39	123.31
2	B	259	HIS	CA-C-N	7.68	127.40	119.64
2	B	259	HIS	C-N-CA	7.68	127.40	119.64
2	B	396	GLU	N-CA-C	7.64	121.20	112.57
3	C	75	SER	CB-CA-C	-7.24	98.37	110.68
1	A	938	THR	CB-CA-C	-6.84	98.81	109.55
3	C	137	CYS	CA-C-N	6.62	126.33	119.64
3	C	137	CYS	C-N-CA	6.62	126.33	119.64
4	D	88	ARG	CA-C-N	-6.53	113.91	120.31
4	D	88	ARG	C-N-CA	-6.53	113.91	120.31
2	B	91	LEU	CA-C-N	-6.53	111.81	119.05
2	B	91	LEU	C-N-CA	-6.53	111.81	119.05
2	B	318	ALA	N-CA-C	-6.38	101.50	110.50
1	A	12	ALA	N-CA-C	-6.19	101.93	110.35
1	A	623	VAL	N-CA-C	6.07	117.10	108.42
1	A	400	ILE	N-CA-C	-6.04	106.85	113.43
1	A	228	GLY	N-CA-C	6.00	127.39	113.18
2	B	387	ARG	NE-CZ-NH1	-5.98	115.52	121.50
1	A	214	LEU	CA-CB-CG	-5.92	95.57	116.30
1	A	38	THR	N-CA-C	-5.83	101.84	110.46
3	C	199	VAL	N-CA-C	5.80	117.06	109.58
1	A	909	HIS	CB-CA-C	-5.78	99.97	109.80
2	B	271[A]	TYR	CA-C-N	-5.76	114.25	121.96
2	B	271[A]	TYR	C-N-CA	-5.76	114.25	121.96
2	B	271[B]	TYR	CA-C-N	-5.76	114.25	121.96
2	B	271[B]	TYR	C-N-CA	-5.76	114.25	121.96
1	A	117	ASP	CA-C-N	-5.74	114.97	120.83
1	A	117	ASP	C-N-CA	-5.74	114.97	120.83
4	D	27	TYR	CA-C-N	-5.67	114.09	119.76
4	D	27	TYR	C-N-CA	-5.67	114.09	119.76
1	A	926	LYS	N-CA-C	5.63	118.14	111.33
1	A	901	THR	CA-C-N	5.62	125.55	119.76
1	A	901	THR	C-N-CA	5.62	125.55	119.76
1	A	581	TRP	N-CA-C	-5.58	105.28	111.36
1	A	543	GLN	N-CA-C	-5.57	105.29	111.36
3	C	153	THR	N-CA-C	-5.56	101.41	110.20
3	C	188	ILE	N-CA-C	-5.44	105.23	110.72
2	B	381	ALA	CA-C-N	-5.43	114.22	119.87
2	B	381	ALA	C-N-CA	-5.43	114.22	119.87
1	A	508	ILE	CB-CA-C	-5.41	104.84	112.14
1	A	819	ARG	CG-CD-NE	-5.27	100.42	112.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	225	GLY	CA-C-N	-5.23	112.77	120.46
1	A	225	GLY	C-N-CA	-5.23	112.77	120.46
2	B	285	GLY	N-CA-C	5.21	119.22	112.54
1	A	472	GLY	N-CA-C	5.20	117.63	110.56
2	B	162	THR	N-CA-C	-5.17	102.83	110.48
1	A	913	SER	N-CA-C	5.16	117.76	109.15
2	B	172	HIS	N-CA-C	5.07	117.20	111.11
3	C	159	ILE	CA-C-N	5.04	125.19	119.90
3	C	159	ILE	C-N-CA	5.04	125.19	119.90
1	A	474	ASP	N-CA-CB	-5.03	102.65	110.29
1	A	668	LYS	N-CA-C	-5.01	104.07	110.53

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	268	ILE	Peptide
3	C	199	VAL	Peptide

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	7229	0	7104	125	0
2	B	3079	0	3004	59	0
3	C	1433	0	1434	18	0
4	D	749	0	706	2	0
5	A	44	0	26	4	0
6	A	25	0	0	3	0
6	B	10	0	0	0	0
6	C	5	0	0	0	0
6	D	5	0	0	0	0
7	B	53	0	31	3	0
8	B	31	0	19	7	0
9	D	1	0	0	0	0
10	A	557	0	0	17	2
10	B	163	0	0	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
10	C	119	0	0	4	0
10	D	66	0	0	1	0
All	All	13569	0	12324	200	2

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (200) 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:819:ARG:HH12	1:A:909:HIS:CE1	1.38	1.41
2:B:172:HIS:NE2	8:B:406:FMN:C8M	1.79	1.41
2:B:172:HIS:NE2	8:B:406:FMN:HM82	0.96	1.28
1:A:819:ARG:NH1	1:A:909:HIS:CE1	2.11	1.16
1:A:693:THR:HG22	6:A:2559:SO4:O2	1.43	1.12
1:A:102:ASN:HB2	10:A:1443:HOH:O	1.52	1.07
1:A:768:GLU:HB2	10:A:1451:HOH:O	1.64	0.97
2:B:172:HIS:CE1	8:B:406:FMN:HM82	2.00	0.96
1:A:368:ARG:HD2	10:A:1327:HOH:O	1.66	0.95
1:A:918:ARG:HH11	1:A:918:ARG:HG3	1.31	0.95
1:A:888:ALA:O	1:A:938:THR:HG23	1.67	0.94
1:A:889:LEU:HD23	1:A:925:ILE:HD11	1.48	0.94
3:C:99:ASP:HB2	10:C:714:HOH:O	1.71	0.88
2:B:172:HIS:CD2	8:B:406:FMN:HM82	2.08	0.88
1:A:693:THR:CG2	6:A:2559:SO4:O2	2.23	0.87
3:C:37:PHE:O	3:C:93:GLU:HG2	1.76	0.85
2:B:172:HIS:HD1	2:B:173:ASP:H	1.24	0.85
1:A:648:MET:HA	1:A:648:MET:HE2	1.57	0.85
1:A:102:ASN:CB	10:A:1443:HOH:O	2.18	0.82
2:B:387:ARG:HH11	2:B:387:ARG:HG3	1.44	0.81
1:A:292:ASN:HD22	1:A:294:SER:H	1.26	0.81
2:B:384:ALA:O	2:B:387:ARG:HD3	1.82	0.80
1:A:830:ASP:OD1	1:A:909:HIS:CD2	2.35	0.80
1:A:15:ARG:HD3	1:A:161:GLU:OE2	1.81	0.79
1:A:15:ARG:CD	1:A:161:GLU:OE2	2.32	0.77
2:B:287:ASP:OD1	10:B:656:HOH:O	2.04	0.75
1:A:226:PRO:HB2	10:A:1287:HOH:O	1.88	0.72
1:A:736:ARG:NH2	1:A:963:ASP:O	2.17	0.71
1:A:819:ARG:NH1	1:A:909:HIS:ND1	2.28	0.71
2:B:172:HIS:CD2	8:B:406:FMN:C8M	2.71	0.71
1:A:696:ALA:HB3	10:C:217:HOH:O	1.91	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:172:HIS:HD1	2:B:173:ASP:N	1.89	0.70
1:A:249:ALA:HB1	10:A:966:HOH:O	1.91	0.70
1:A:685:ASP:HB2	10:A:1424:HOH:O	1.92	0.69
1:A:292:ASN:ND2	1:A:294:SER:H	1.90	0.69
2:B:369:HIS:HD2	10:B:625:HOH:O	1.77	0.68
1:A:938:THR:HG22	1:A:939:PRO:HD2	1.76	0.68
1:A:243:GLN:OE1	1:A:413:HIS:HE1	1.77	0.68
2:B:172:HIS:NE2	8:B:406:FMN:HM81	2.04	0.67
1:A:248:THR:O	1:A:249:ALA:HB3	1.94	0.67
1:A:819:ARG:NH1	1:A:909:HIS:HE1	1.87	0.66
2:B:210:LYS:HD2	2:B:211:THR:H	1.61	0.66
1:A:750:ASN:ND2	1:A:773:ARG:HH12	1.93	0.66
1:A:819:ARG:CZ	1:A:909:HIS:CE1	2.80	0.65
1:A:889:LEU:HD23	1:A:925:ILE:CD1	2.27	0.64
1:A:382:PRO:HG2	1:A:404:VAL:HG12	1.81	0.63
1:A:842:MET:O	1:A:845:VAL:HG12	1.98	0.63
1:A:918:ARG:HH11	1:A:918:ARG:CG	2.08	0.62
3:C:37:PHE:O	3:C:93:GLU:CG	2.45	0.62
2:B:126:ASN:HB3	2:B:131:VAL:HG22	1.82	0.61
1:A:901:THR:CG2	10:A:1404:HOH:O	2.48	0.61
1:A:125:HIS:HD2	10:A:1346:HOH:O	1.83	0.60
2:B:387:ARG:HH11	2:B:387:ARG:CG	2.08	0.60
1:A:15:ARG:HD2	1:A:161:GLU:OE2	2.01	0.60
1:A:860:ARG:HH21	1:A:863:ASN:HD21	1.49	0.59
1:A:630:THR:O	1:A:693:THR:HB	2.03	0.59
2:B:387:ARG:HG3	2:B:387:ARG:NH1	2.16	0.59
1:A:123:HIS:CD2	1:A:238:HIS:HE1	2.19	0.59
1:A:776:PHE:CE2	1:A:819:ARG:HG3	2.39	0.58
1:A:931:ARG:O	1:A:949:VAL:CG2	2.51	0.58
1:A:114:PRO:HA	2:B:314:ILE:HG13	1.85	0.57
1:A:815:MET:HE2	1:A:816:HIS:HD2	1.69	0.57
1:A:173:GLN:C	1:A:174:ILE:HD13	2.30	0.56
10:A:1091:HOH:O	3:C:182:HIS:HD2	1.89	0.56
1:A:932:ILE:HA	1:A:949:VAL:HG23	1.88	0.55
2:B:111:HIS:HD2	2:B:156:TYR:O	1.89	0.55
10:A:1191:HOH:O	2:B:277:LYS:HE2	2.07	0.55
3:C:137:CYS:HB2	3:C:156:LEU:HD23	1.89	0.54
1:A:830:ASP:OD2	1:A:909:HIS:NE2	2.41	0.54
1:A:887:ALA:HB1	1:A:938:THR:HG21	1.88	0.54
1:A:821:GLU:OE2	1:A:913:SER:HB2	2.08	0.54
1:A:750:ASN:HD22	1:A:773:ARG:HH12	1.56	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:868:ARG:O	1:A:926:LYS:O	2.26	0.53
1:A:815:MET:HE2	1:A:816:HIS:CD2	2.43	0.53
1:A:7:SER:OG	1:A:10:GLN:HG3	2.08	0.53
1:A:742:LEU:HD21	1:A:798:VAL:HG22	1.89	0.53
2:B:7:HIS:CE1	2:B:174:HIS:CE1	2.96	0.53
2:B:69:ARG:HD2	2:B:71:ASN:OD1	2.09	0.53
1:A:511:TYR:CZ	2:B:7:HIS:HB2	2.43	0.53
2:B:202:ASP:OD1	2:B:202:ASP:C	2.52	0.53
1:A:582:HIS:CD2	1:A:601:TYR:OH	2.62	0.53
1:A:64:PHE:HB3	1:A:71:PRO:HD2	1.91	0.52
1:A:829:GLN:HG2	1:A:909:HIS:NE2	2.24	0.52
1:A:918:ARG:HG3	1:A:918:ARG:NH1	2.08	0.52
2:B:93:GLU:HG2	10:B:459:HOH:O	2.08	0.52
1:A:816:HIS:O	1:A:819:ARG:HD3	2.09	0.52
2:B:172:HIS:NE2	8:B:406:FMN:C8	2.67	0.51
2:B:333:ASP:HB2	2:B:395:ASP:HA	1.92	0.51
1:A:916:LEU:HD22	1:A:954:LEU:HD12	1.93	0.51
1:A:871:LEU:HD13	1:A:952:LEU:HD11	1.93	0.51
3:C:94:ASN:HB3	3:C:97:LEU:HD22	1.91	0.51
1:A:616:CYS:HB2	1:A:914:PRO:HG2	1.94	0.50
1:A:648:MET:HE2	1:A:648:MET:CA	2.35	0.50
2:B:110:ALA:HB1	2:B:115:ASP:HB3	1.93	0.50
3:C:11:PRO:HD2	3:C:34:GLU:OE2	2.11	0.50
1:A:901:THR:HG22	10:A:1404:HOH:O	2.10	0.50
1:A:578:MET:HG2	1:A:627:ASP:OD2	2.12	0.50
2:B:360:THR:HB	2:B:361:PRO:HD3	1.94	0.50
1:A:387:HIS:HE1	1:A:393:LYS:O	1.95	0.49
2:B:39:LEU:HD13	2:B:368:ALA:HA	1.93	0.49
2:B:64:ASN:HA	7:B:405:FAD:C6	2.42	0.49
1:A:635:GLU:OE2	1:A:686:ARG:NH1	2.45	0.49
1:A:656:LEU:HD23	1:A:681:ARG:HB2	1.94	0.49
2:B:7:HIS:HE1	2:B:174:HIS:CE1	2.29	0.49
2:B:388:PHE:HB2	10:D:1110:HOH:O	2.12	0.49
1:A:173:GLN:O	1:A:174:ILE:HD13	2.12	0.49
2:B:111:HIS:CE1	2:B:265:SER:OG	2.66	0.49
2:B:91:LEU:HD21	2:B:179:PHE:CZ	2.48	0.49
3:C:40:GLN:HA	3:C:89:LEU:O	2.12	0.48
1:A:696:ALA:CB	10:C:217:HOH:O	2.55	0.48
4:D:18:LYS:HG3	4:D:60:SER:OG	2.14	0.48
2:B:387:ARG:CG	2:B:387:ARG:NH1	2.71	0.48
1:A:123:HIS:HE1	1:A:560:ALA:O	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:637:ARG:HG3	1:A:686:ARG:HG2	1.96	0.48
1:A:909:HIS:O	1:A:921:GLY:CA	2.61	0.48
1:A:901:THR:HG23	10:A:1404:HOH:O	2.14	0.47
6:A:2559:SO4:O1	10:A:1504:HOH:O	2.20	0.47
1:A:830:ASP:CG	1:A:909:HIS:HE2	2.23	0.47
1:A:819:ARG:NH2	1:A:909:HIS:CE1	2.83	0.47
1:A:249:ALA:HB2	5:A:965:NAD:PA	2.55	0.46
2:B:349:ASN:HB2	2:B:367:LEU:HD22	1.98	0.46
1:A:819:ARG:HH22	1:A:909:HIS:CE1	2.34	0.46
3:C:136:SER:OG	3:C:156:LEU:HD22	2.15	0.46
3:C:157:ALA:O	3:C:182:HIS:HE1	1.98	0.46
1:A:830:ASP:CG	1:A:909:HIS:NE2	2.74	0.46
1:A:904:GLU:HG3	1:A:931:ARG:HH22	1.79	0.46
1:A:152:ARG:HD3	3:C:142:HIS:CD2	2.51	0.46
1:A:931:ARG:O	1:A:949:VAL:HG21	2.16	0.46
3:C:99:ASP:CB	10:C:714:HOH:O	2.45	0.46
1:A:590:GLU:OE1	2:B:113:LEU:HD12	2.16	0.45
3:C:44:ARG:HD2	3:C:86:GLU:HG3	1.98	0.45
2:B:381:ALA:N	2:B:382:PRO:CD	2.79	0.45
1:A:385:HIS:O	1:A:389:GLN:HG3	2.16	0.45
1:A:881:LEU:HD12	10:A:1295:HOH:O	2.16	0.45
3:C:11:PRO:HG2	3:C:120:SER:HB3	1.99	0.45
1:A:421:LEU:HD13	1:A:426:SER:HB3	1.99	0.45
1:A:734:ARG:HA	1:A:734:ARG:HD3	1.68	0.45
2:B:13:ASN:ND2	2:B:184:ASN:HD21	2.15	0.45
2:B:174:HIS:CD2	10:B:673:HOH:O	2.70	0.45
1:A:625:MET:HE2	1:A:795:TRP:CE2	2.51	0.45
2:B:64:ASN:HA	7:B:405:FAD:C5X	2.48	0.44
2:B:357:PHE:HB3	7:B:405:FAD:C2	2.47	0.44
1:A:830:ASP:OD1	1:A:909:HIS:HD2	1.93	0.44
2:B:123:VAL:HG23	2:B:162:THR:HG22	2.00	0.44
3:C:192:SER:O	3:C:193:GLU:C	2.59	0.44
1:A:528:ALA:O	1:A:532:ILE:HG13	2.18	0.44
2:B:225:GLY:O	2:B:226:ALA:C	2.61	0.44
2:B:367:LEU:O	2:B:371:ILE:HG13	2.18	0.44
1:A:249:ALA:HB1	1:A:250:ALA:H	1.63	0.44
2:B:289:TYR:HA	4:D:19:TYR:CD2	2.52	0.44
1:A:931:ARG:O	1:A:949:VAL:HG22	2.18	0.43
1:A:477:HIS:NE2	10:A:1498:HOH:O	1.70	0.43
1:A:134:GLY:O	1:A:139:GLY:HA3	2.17	0.43
1:A:249:ALA:HB2	5:A:965:NAD:O3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:486:GLN:NE2	1:A:517:ALA:HB1	2.33	0.43
1:A:609:ASP:CG	1:A:882:ARG:HH22	2.26	0.43
1:A:918:ARG:CG	1:A:918:ARG:NH1	2.74	0.43
3:C:44:ARG:CD	3:C:86:GLU:HG3	2.49	0.43
1:A:249:ALA:HB2	5:A:965:NAD:C5B	2.49	0.43
1:A:901:THR:HA	1:A:902:PRO:HD3	1.86	0.43
2:B:202:ASP:HB3	2:B:207:THR:HG21	2.00	0.43
1:A:648:MET:HE1	1:A:853:VAL:HG21	2.01	0.43
2:B:270:VAL:HG22	2:B:271[B]:TYR:N	2.33	0.43
1:A:629:SER:HB3	1:A:726:ALA:HA	1.99	0.43
1:A:630:THR:C	1:A:693:THR:HB	2.43	0.43
1:A:735:SER:O	1:A:739:ILE:HG12	2.18	0.43
2:B:265:SER:O	2:B:269:HIS:HA	2.18	0.43
2:B:333:ASP:OD2	2:B:387:ARG:NH1	2.33	0.42
1:A:387:HIS:HD2	10:A:975:HOH:O	2.01	0.42
2:B:13:ASN:HD22	2:B:184:ASN:HD21	1.67	0.42
2:B:106:VAL:O	2:B:106:VAL:HG13	2.17	0.42
2:B:52:GLU:HG2	2:B:56:LEU:HA	2.02	0.42
2:B:182:LYS:HD2	2:B:182:LYS:HA	1.86	0.42
1:A:885:GLU:HG2	1:A:909:HIS:HA	2.01	0.42
3:C:22:ALA:O	3:C:23:GLU:C	2.63	0.42
1:A:227:SER:HB2	1:A:228:GLY:H	1.63	0.42
1:A:819:ARG:NH1	1:A:826:ILE:HD12	2.35	0.42
1:A:137:PRO:HD3	1:A:166:LEU:HG	2.02	0.42
2:B:91:LEU:HD21	2:B:179:PHE:HZ	1.84	0.41
1:A:248:THR:O	1:A:249:ALA:CB	2.64	0.41
1:A:909:HIS:HB3	1:A:911:TYR:CE1	2.55	0.41
2:B:111:HIS:HE1	2:B:265:SER:OG	2.03	0.41
1:A:776:PHE:CZ	1:A:819:ARG:HG3	2.55	0.41
1:A:865:ARG:HB3	1:A:867:ASP:OD1	2.21	0.41
1:A:867:ASP:OD1	1:A:867:ASP:N	2.47	0.41
2:B:122:ARG:HH11	2:B:122:ARG:HD3	1.59	0.41
1:A:840:ALA:HA	1:A:871:LEU:HB2	2.02	0.41
1:A:704:GLU:HG3	1:A:708:GLN:NE2	2.36	0.41
1:A:249:ALA:HB2	5:A:965:NAD:O2A	2.21	0.41
1:A:582:HIS:HE1	1:A:627:ASP:OD2	2.04	0.41
1:A:869:LYS:HA	1:A:925:ILE:O	2.20	0.41
3:C:12:ALA:HB3	3:C:34:GLU:CD	2.46	0.41
1:A:913:SER:HA	1:A:914:PRO:HD2	1.89	0.41
2:B:110:ALA:CB	2:B:115:ASP:HB3	2.51	0.41
1:A:883:LEU:HD11	1:A:947:VAL:HG11	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:776:PHE:O	1:A:819:ARG:HB2	2.20	0.40
1:A:794:VAL:O	1:A:798:VAL:HG23	2.19	0.40
1:A:518:ASN:ND2	1:A:518:ASN:C	2.79	0.40
1:A:223:LEU:HD12	1:A:226:PRO:HB3	2.04	0.40
2:B:102:SER:O	2:B:168:GLY:HA3	2.21	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:A:1013:HOH:O	10:A:1013:HOH:O[9_555]	1.63	0.57
10:A:1390:HOH:O	10:A:1390:HOH:O[10_665]	1.81	0.39

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	961/964 (100%)	932 (97%)	25 (3%)	4 (0%)	30	39
2	B	396/404 (98%)	382 (96%)	14 (4%)	0	100	100
3	C	193/203 (95%)	186 (96%)	7 (4%)	0	100	100
4	D	89/99 (90%)	86 (97%)	3 (3%)	0	100	100
All	All	1639/1670 (98%)	1586 (97%)	49 (3%)	4 (0%)	44	55

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	227	SER
1	A	228	GLY
1	A	406	ALA
1	A	71	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	747/747 (100%)	710 (95%)	37 (5%)	20	30
2	B	318/319 (100%)	305 (96%)	13 (4%)	26	39
3	C	143/151 (95%)	133 (93%)	10 (7%)	12	17
4	D	75/81 (93%)	74 (99%)	1 (1%)	65	79
All	All	1283/1298 (99%)	1222 (95%)	61 (5%)	21	32

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

Mol	Chain	Res	Type
1	A	32	SER
1	A	68	VAL
1	A	80	ARG
1	A	124	VAL
1	A	214	LEU
1	A	327	THR
1	A	333	LEU
1	A	382	PRO
1	A	466	LEU
1	A	474	ASP
1	A	515	SER
1	A	518	ASN
1	A	535	VAL
1	A	541	PRO
1	A	578	MET
1	A	616	CYS
1	A	619	VAL
1	A	645	LEU
1	A	684	GLU
1	A	693	THR
1	A	751	ASP
1	A	761	VAL
1	A	786	ILE
1	A	792	LEU

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Mol	Chain	Res	Type
1	A	815	MET
1	A	819	ARG
1	A	848	LYS
1	A	871	LEU
1	A	874	VAL
1	A	889	LEU
1	A	890	VAL
1	A	901	THR
1	A	918	ARG
1	A	932	ILE
1	A	938	THR
1	A	949	VAL
1	A	954	LEU
2	B	39	LEU
2	B	91	LEU
2	B	131	VAL
2	B	172	HIS
2	B	211	THR
2	B	232	LEU
2	B	277	LYS
2	B	286	ILE
2	B	311	LEU
2	B	314	ILE
2	B	332	MET
2	B	387	ARG
2	B	393	LEU
3	C	6	GLN
3	C	50	THR
3	C	93	GLU
3	C	97	LEU
3	C	98	LEU
3	C	156	LEU
3	C	169	GLN
3	C	170	SER
3	C	192	SER
3	C	199	VAL
4	D	49	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	123	HIS

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Mol	Chain	Res	Type
1	A	125	HIS
1	A	200	GLN
1	A	238	HIS
1	A	292	ASN
1	A	387	HIS
1	A	412	GLN
1	A	413	HIS
1	A	452	GLN
1	A	477	HIS
1	A	486	GLN
1	A	489	GLN
1	A	518	ASN
1	A	582	HIS
1	A	750	ASN
1	A	793	GLN
1	A	816	HIS
1	A	829	GLN
1	A	863	ASN
2	B	7	HIS
2	B	13	ASN
2	B	47	ASN
2	B	111	HIS
2	B	174	HIS
2	B	267	HIS
2	B	344	GLN
2	B	369	HIS
3	C	6	GLN
3	C	111	GLN
3	C	158	ASN
3	C	182	HIS
4	D	90	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 13 ligands modelled in this entry, 1 is monoatomic - leaving 12 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
6	SO4	D	2566	-	4,4,4	0.35	0	6,6,6	0.18	0
5	NAD	A	965	-	42,48,48	2.22	7 (16%)	50,73,73	1.53	7 (14%)
8	FMN	B	406	-	33,33,33	1.62	9 (27%)	48,50,50	1.83	12 (25%)
6	SO4	B	2562	-	4,4,4	0.26	0	6,6,6	0.14	0
6	SO4	A	2560	-	4,4,4	0.48	0	6,6,6	0.49	0
6	SO4	B	2561	-	4,4,4	0.34	0	6,6,6	0.63	0
6	SO4	A	2567	-	4,4,4	0.33	0	6,6,6	0.32	0
6	SO4	C	2564	-	4,4,4	0.65	0	6,6,6	0.30	0
6	SO4	A	2559	-	4,4,4	0.27	0	6,6,6	0.31	0
7	FAD	B	405	-	54,58,58	1.65	8 (14%)	71,89,89	1.55	13 (18%)
6	SO4	A	2563	-	4,4,4	0.27	0	6,6,6	0.46	0
6	SO4	A	2565	-	4,4,4	0.28	0	6,6,6	0.20	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
8	FMN	B	406	-	-	4/18/18/18	0/3/3/3
7	FAD	B	405	-	-	4/30/50/50	0/6/6/6
5	NAD	A	965	-	-	6/26/62/62	0/5/5/5

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	965	NAD	C2N-N1N	6.85	1.42	1.35
5	A	965	NAD	O7N-C7N	6.81	1.36	1.24
5	A	965	NAD	O4B-C1B	6.11	1.48	1.40
7	B	405	FAD	C4X-N5	5.71	1.43	1.30
5	A	965	NAD	PN-O3	4.89	1.64	1.59
7	B	405	FAD	PA-O3P	-4.85	1.54	1.59
7	B	405	FAD	C10-N1	4.27	1.41	1.33
8	B	406	FMN	P-O1P	3.75	1.62	1.50
8	B	406	FMN	O5'-C5'	-2.91	1.33	1.44
5	A	965	NAD	O4D-C1D	2.90	1.44	1.40
5	A	965	NAD	C5A-N7A	-2.89	1.29	1.39
8	B	406	FMN	C5'-C4'	2.72	1.55	1.51
7	B	405	FAD	O4'-C4'	2.59	1.48	1.43
8	B	406	FMN	P-O5'	-2.54	1.52	1.60
7	B	405	FAD	C9-C8	2.44	1.42	1.39
8	B	406	FMN	C4A-N5	2.40	1.36	1.30
8	B	406	FMN	C4A-C10	-2.37	1.37	1.44
5	A	965	NAD	O4B-C4B	-2.36	1.39	1.45
8	B	406	FMN	C9A-C5A	-2.32	1.37	1.41
8	B	406	FMN	C10-N1	2.22	1.37	1.33
7	B	405	FAD	C2-N1	2.20	1.41	1.36
7	B	405	FAD	C2-N3	2.16	1.43	1.39
8	B	406	FMN	C9-C8	-2.09	1.36	1.39
7	B	405	FAD	P-O3P	2.01	1.61	1.59

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	B	405	FAD	C4B-O4B-C1B	-6.25	104.20	109.92
5	A	965	NAD	N3A-C2A-N1A	-4.87	122.06	128.67
8	B	406	FMN	O2P-P-O5'	4.65	118.80	106.67
8	B	406	FMN	O3P-P-O5'	-4.30	95.46	106.67
5	A	965	NAD	C4A-C5A-N7A	-3.88	105.23	109.34
7	B	405	FAD	C9A-C5X-N5	-3.87	118.35	122.45
5	A	965	NAD	O4B-C1B-N9A	-3.68	103.86	108.75
7	B	405	FAD	N3A-C2A-N1A	-3.66	123.70	128.67
8	B	406	FMN	O3P-P-O1P	-3.41	97.55	110.83
8	B	406	FMN	C9A-C5A-N5	-3.38	118.86	122.45
7	B	405	FAD	C4A-C5A-N7A	-3.34	105.80	109.34
7	B	405	FAD	C4-N3-C2	-3.16	120.03	125.64
8	B	406	FMN	C4-N3-C2	-3.11	120.12	125.64
8	B	406	FMN	O2P-P-O1P	3.00	122.52	110.83
5	A	965	NAD	C5A-C6A-N6A	2.87	124.68	120.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	B	405	FAD	C10-C4X-N5	-2.78	119.13	124.81
8	B	406	FMN	C10-C4A-N5	-2.55	119.60	124.81
8	B	406	FMN	O4-C4-C4A	-2.53	119.86	126.53
5	A	965	NAD	C5B-C4B-C3B	-2.51	106.16	115.21
5	A	965	NAD	C6N-N1N-C2N	-2.37	119.86	121.88
8	B	406	FMN	O5'-C5'-C4'	-2.36	103.05	109.36
8	B	406	FMN	C5A-N5-C4A	2.32	121.84	118.09
8	B	406	FMN	C4A-C10-N10	2.28	119.75	116.48
7	B	405	FAD	C4X-C4-N3	2.28	119.06	113.25
8	B	406	FMN	C4A-C4-N3	2.25	118.99	113.25
7	B	405	FAD	C5A-C6A-N6A	2.25	123.73	120.31
7	B	405	FAD	O4-C4-C4X	-2.21	120.69	126.53
7	B	405	FAD	O3P-PA-O1A	2.21	117.35	110.70
7	B	405	FAD	C5X-N5-C4X	2.19	121.64	118.09
7	B	405	FAD	C4'-C3'-C2'	-2.17	109.96	113.57
5	A	965	NAD	C5A-C6A-N1A	-2.11	115.19	120.23
7	B	405	FAD	C4-C4X-C10	2.05	120.44	116.93

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	B	405	FAD	C5B-O5B-PA-O2A
8	B	406	FMN	C3'-C4'-C5'-O5'
8	B	406	FMN	O4'-C4'-C5'-O5'
8	B	406	FMN	C5'-O5'-P-O2P
8	B	406	FMN	C5'-O5'-P-O3P
5	A	965	NAD	C3B-C4B-C5B-O5B
5	A	965	NAD	O4D-C4D-C5D-O5D
5	A	965	NAD	C5D-O5D-PN-O1N
7	B	405	FAD	C5B-O5B-PA-O1A
7	B	405	FAD	C5'-O5'-P-O1P
7	B	405	FAD	C4'-C5'-O5'-P
5	A	965	NAD	O4D-C1D-N1N-C2N
5	A	965	NAD	O4B-C4B-C5B-O5B
5	A	965	NAD	C3D-C4D-C5D-O5D

There are no ring outliers.

4 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	965	NAD	4	0
8	B	406	FMN	7	0
6	A	2559	SO4	3	0
7	B	405	FAD	3	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 NAD A 965

Bond lengths

Bond angles

Torsions

Rings

Ligand FMN B 406

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD B 405

Bond lengths

Bond angles

Torsions

Rings
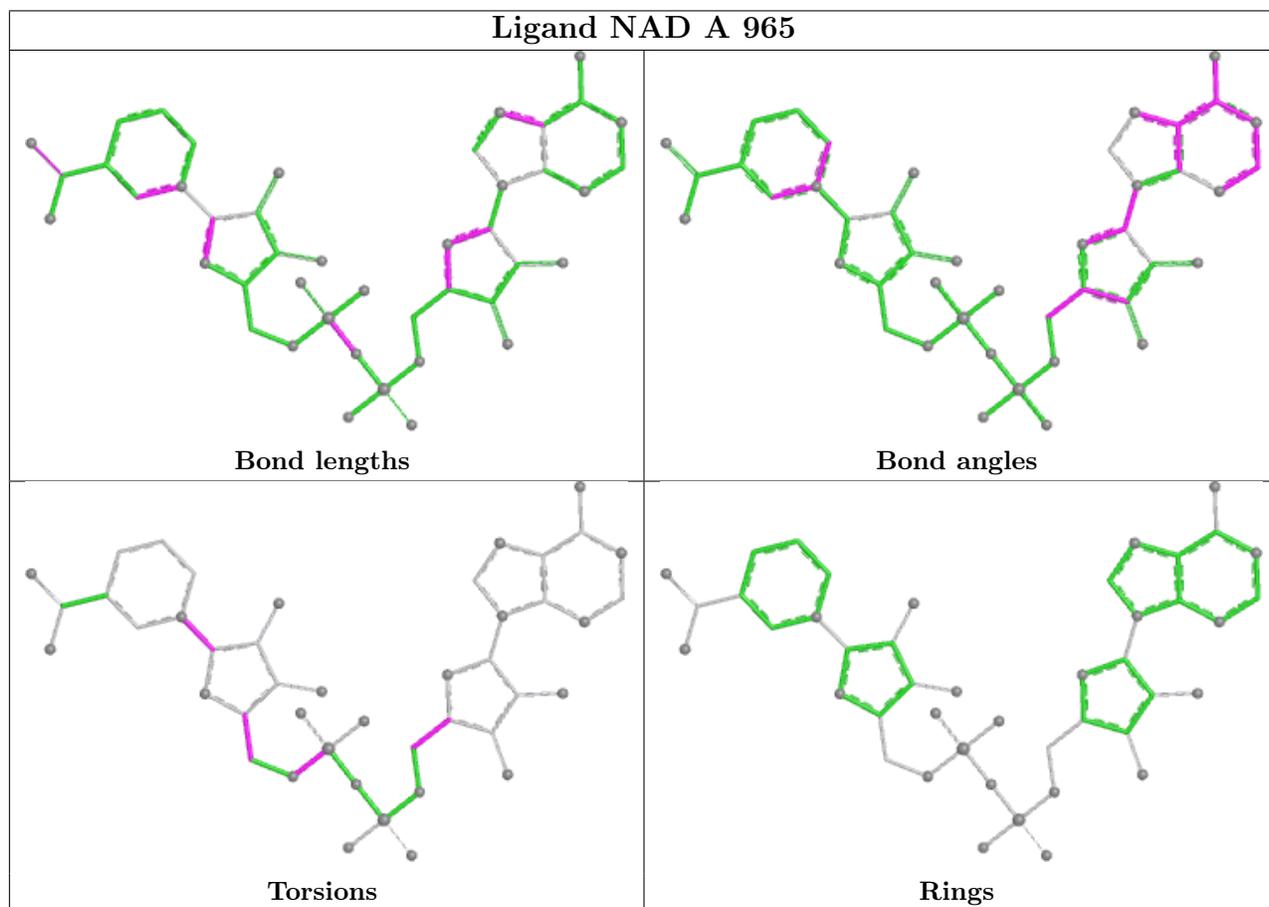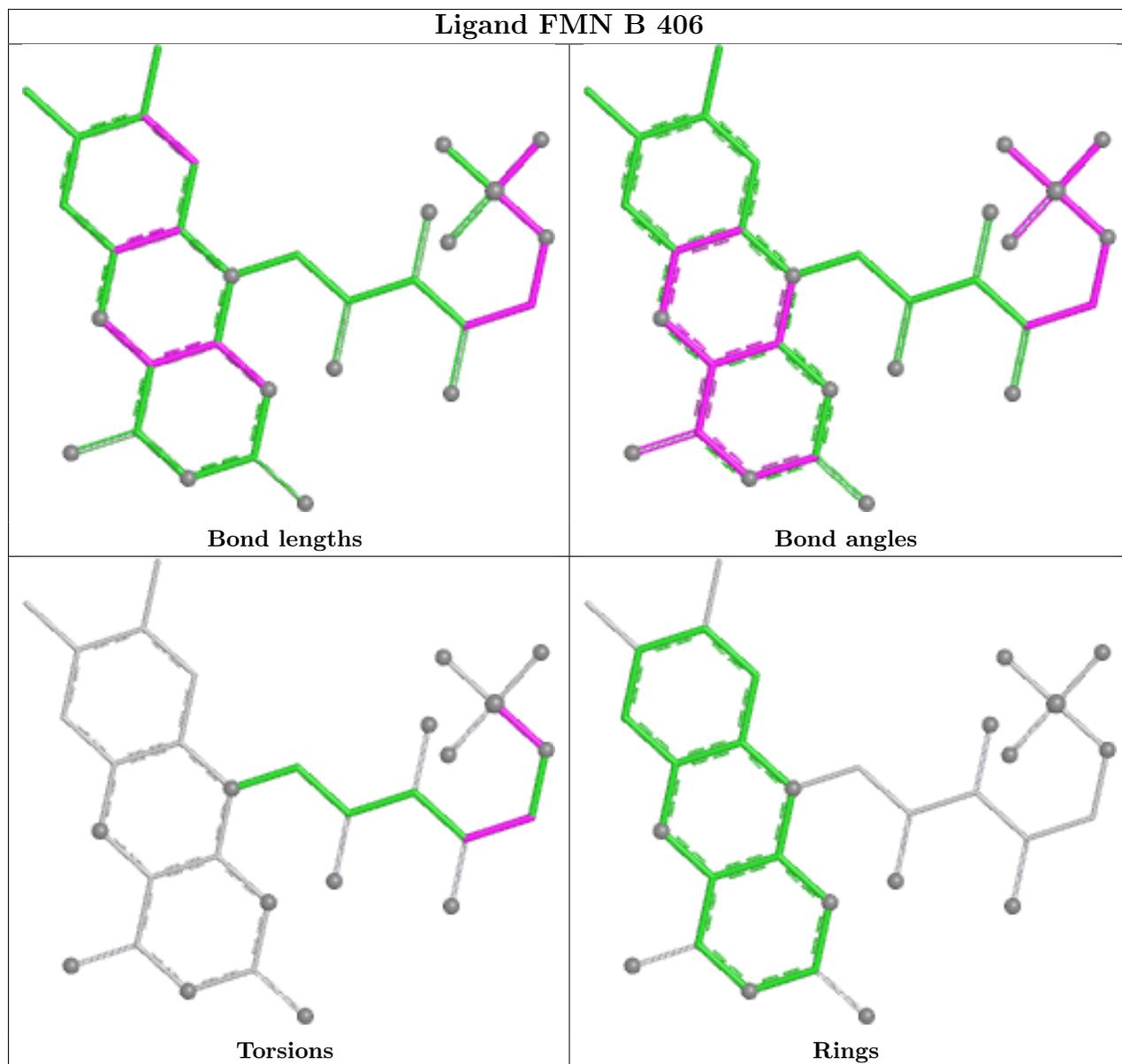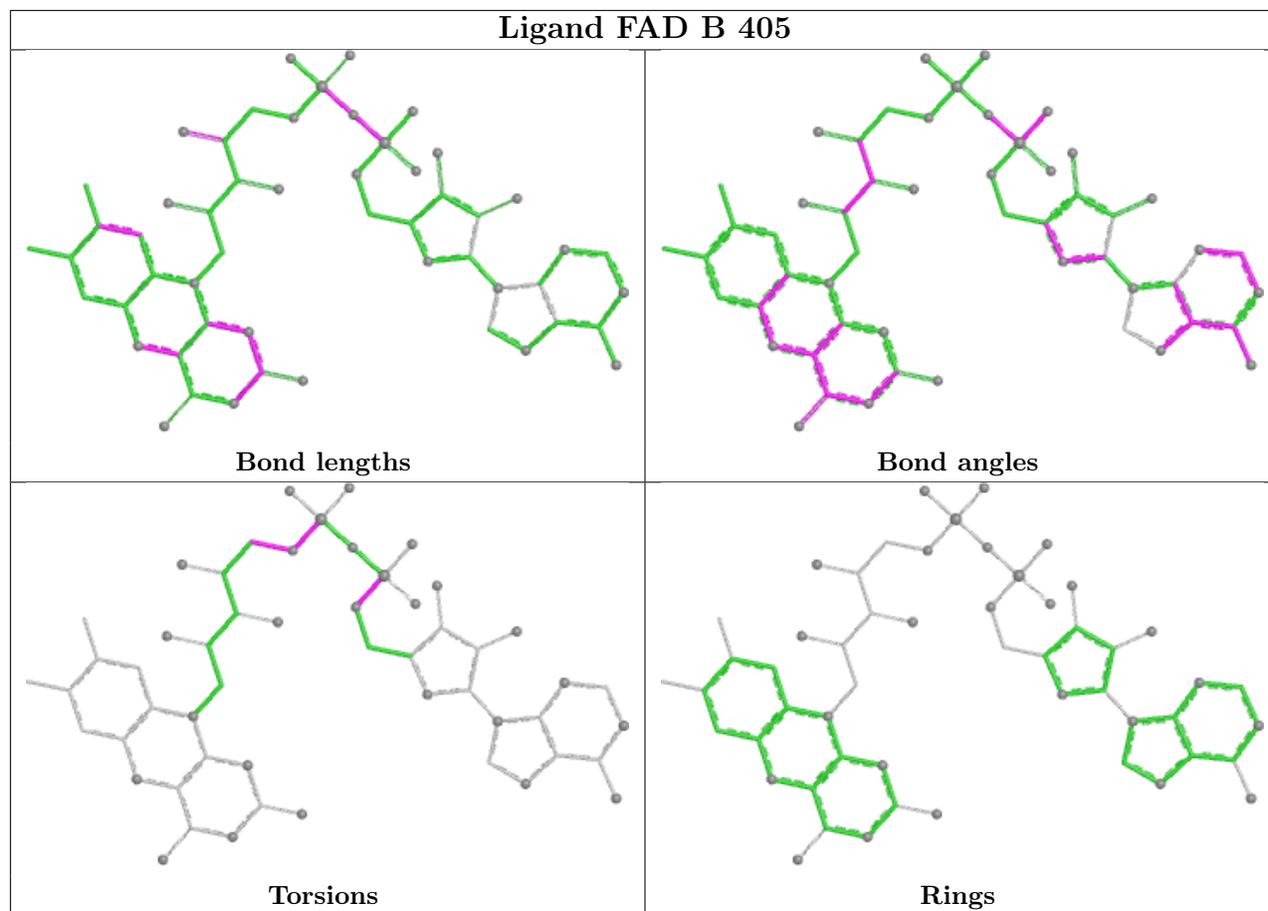
5.7 Other polymers ⓘ

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, 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	963/964 (99%)	-0.42	13 (1%)	74	75	11, 25, 47, 67	0
2	B	397/404 (98%)	-0.41	6 (1%)	71	72	14, 28, 42, 62	1 (0%)
3	C	195/203 (96%)	-0.41	3 (1%)	71	72	14, 24, 44, 56	0
4	D	91/99 (91%)	-0.58	1 (1%)	77	78	14, 23, 43, 55	0
All	All	1646/1670 (98%)	-0.42	23 (1%)	73	74	11, 26, 46, 67	1 (0%)

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	200	ALA	5.0
2	B	397	HIS	4.7
1	A	327	THR	3.3
1	A	909	HIS	3.3
1	A	694	GLY	3.3
2	B	202	ASP	3.2
1	A	895	VAL	3.1
2	B	392	HIS	3.0
1	A	226	PRO	2.8
1	A	227	SER	2.8
1	A	896	ALA	2.6
4	D	91	LEU	2.5
2	B	118	GLU	2.4
1	A	695	GLY	2.4
2	B	203	GLY	2.3
1	A	83	ALA	2.2
3	C	6	GLN	2.2
1	A	751	ASP	2.2
1	A	225	GLY	2.1
2	B	271[A]	TYR	2.1
1	A	848	LYS	2.0

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Mol	Chain	Res	Type	RSRZ
3	C	96	ALA	2.0
1	A	897	SER	2.0

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

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

6.3　Carbohydrates ⓘ

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
6	SO4	B	2562	5/5	0.34	0.14	156,156,156,156	0
6	SO4	A	2565	5/5	0.74	0.16	161,161,161,162	0
6	SO4	B	2561	5/5	0.86	0.16	59,59,62,63	0
6	SO4	A	2563	5/5	0.88	0.11	76,76,77,77	0
6	SO4	A	2559	5/5	0.90	0.12	80,80,80,82	0
6	SO4	D	2566	5/5	0.90	0.08	73,73,75,75	0
6	SO4	A	2560	5/5	0.94	0.11	50,51,55,55	0
6	SO4	C	2564	5/5	0.97	0.14	33,33,37,40	0
7	FAD	B	405	53/53	0.98	0.05	15,25,31,33	0
8	FMN	B	406	31/31	0.98	0.04	9,15,20,22	0
5	NAD	A	965	44/44	0.99	0.04	5,14,18,23	0
6	SO4	A	2567	5/5	0.99	0.05	34,35,36,39	0
9	ZN	D	100	1/1	1.00	0.01	21,21,21,21	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.
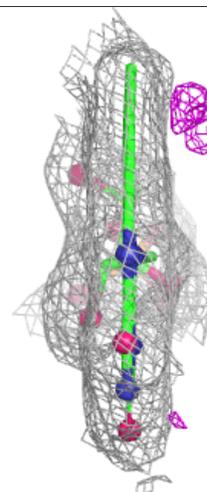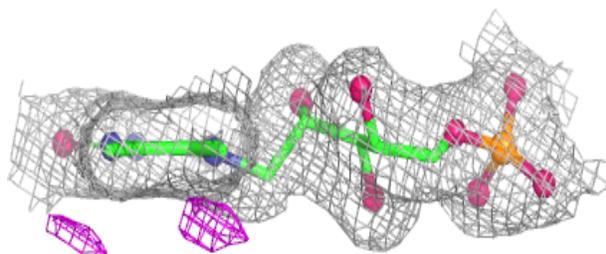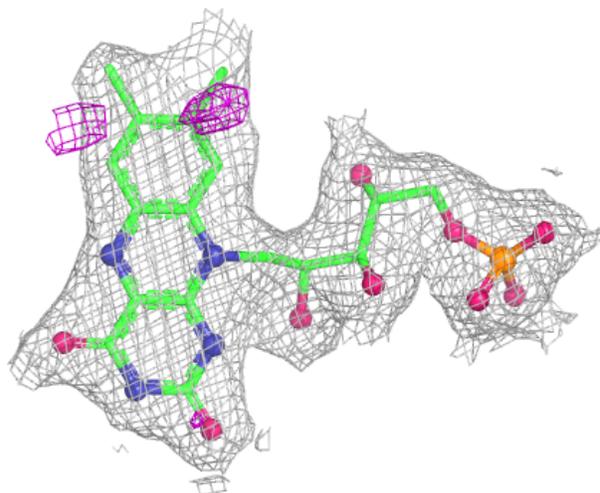
Electron density around FAD B 405:
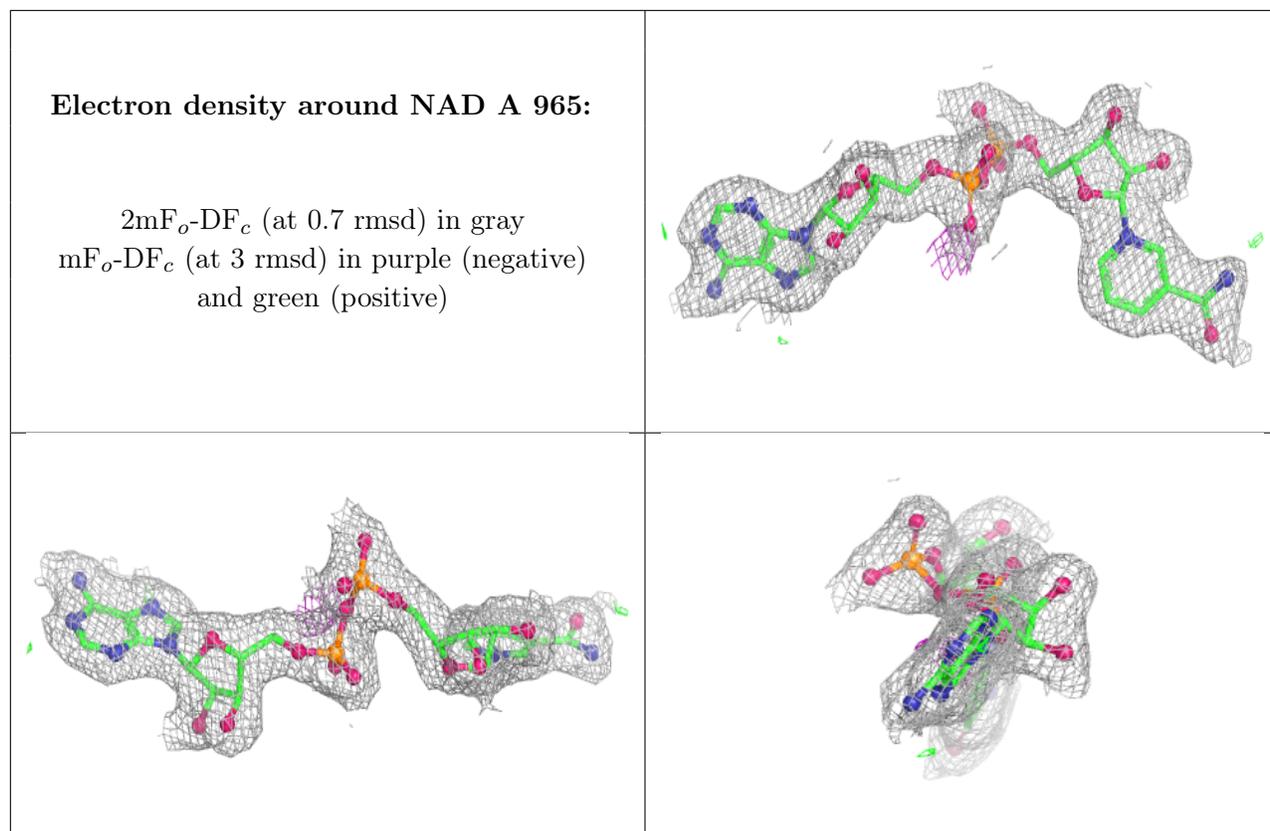
$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
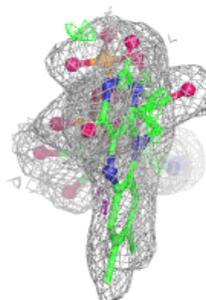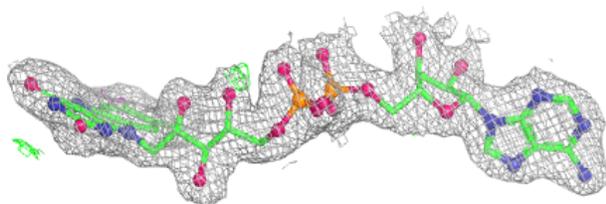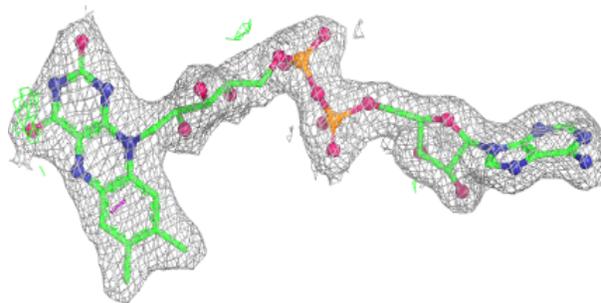
Electron density around FMN B 406:

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

Electron density around NAD A 965:

$2mF_o$-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 ⓘ

There are no such residues in this entry.