WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Dec 15, 2024 – 11:03 AM EST

PDB ID	:	5U0B
Title	:	Structure of full-length Zika virus NS5
Authors	:	Zhao, B.; Du, F.
Deposited on	:	2016-11-23
Resolution	:	3.00 Å(reported)

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

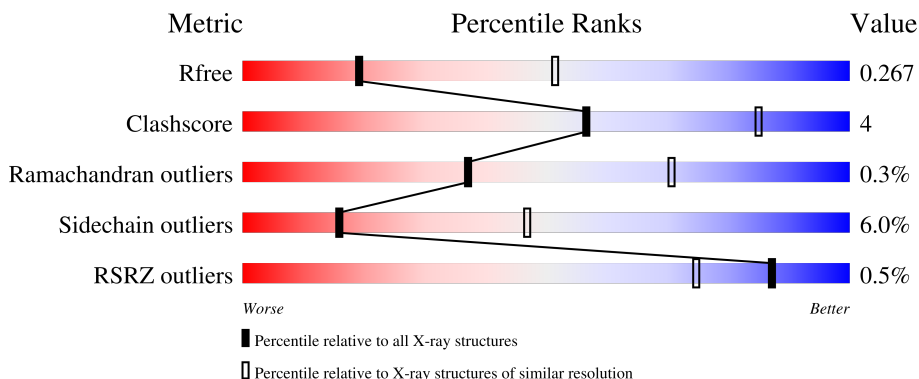|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 3.00 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		0.267
Clashscore		4
Ramachandran outliers		0.3%
Sidechain outliers		6.0%
RSRZ outliers		0.5%

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	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	903	82% 14% • •
1	B	903	82% 14% • •

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 14282 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 Genome polyprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	883	Total	C	N	O	S	0	0	0
			7098	4459	1290	1301	48			
1	B	883	Total	C	N	O	S	0	0	0
			7098	4459	1290	1301	48			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	62	LEU	ILE	engineered mutation	UNP Q32ZE1
A	212	SER	CYS	engineered mutation	UNP Q32ZE1
B	62	LEU	ILE	engineered mutation	UNP Q32ZE1
B	212	SER	CYS	engineered mutation	UNP Q32ZE1

- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula: $C_{14}H_{20}N_6O_5S$).
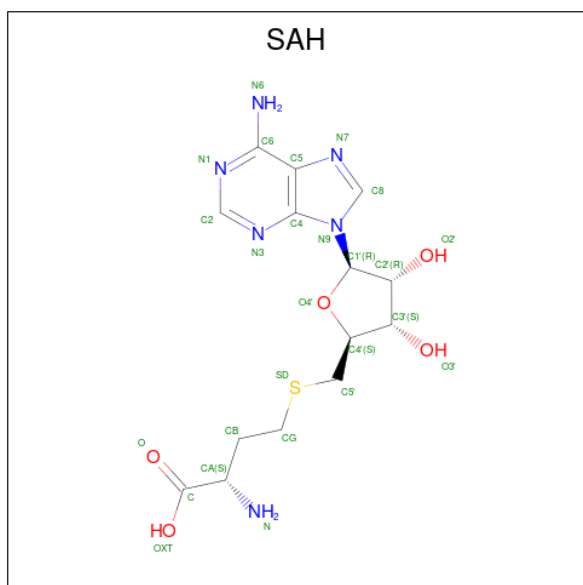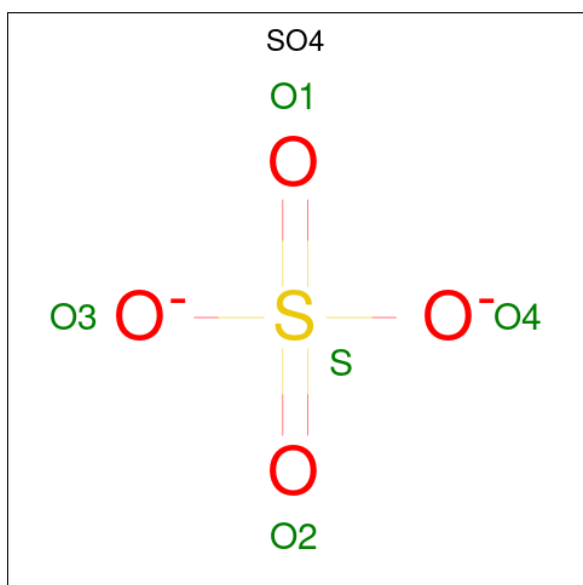
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 26	C 14	N 6	O 5	S 1	0	0
2	B	1	Total 26	C 14	N 6	O 5	S 1	0	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Zn 2	0	0
3	B	2	Total 2	Zn 2	0	0

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

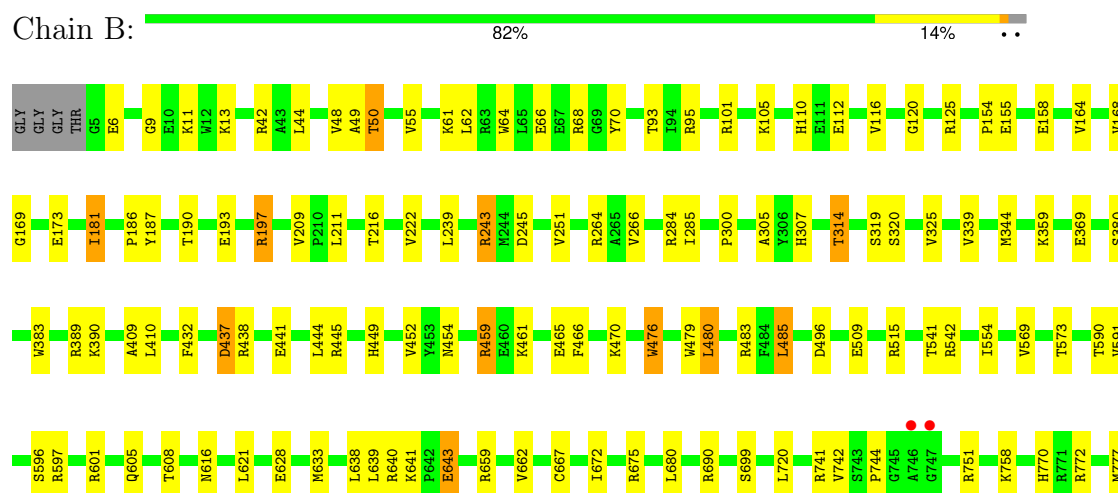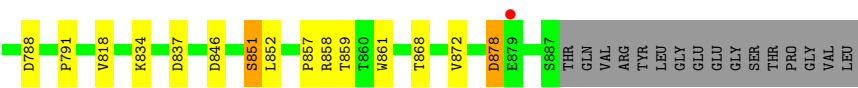| Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total 5	O 4	S 1	0	0
4	A	1	Total 5	O 4	S 1	0	0
4	A	1	Total 5	O 4	S 1	0	0
4	B	1	Total 5	O 4	S 1	0	0
4	B	1	Total 5	O 4	S 1	0	0
4	B	1	Total 5	O 4	S 1	0	0

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: Genome polyprotein

Chain A:

• Molecule 1: Genome polyprotein

Chain B:

D788 P791 V818 K834 D837 D846 S851 L852 P857 R858 T859 T860 W861 T868 V872 D878 E879 S887 THR GLN VAL ARG TYR LEU GLY GLU GLU GLY SER THR PRO GLY VAL LEU

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	136.50Å 197.00Å 95.28Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	85.78 – 3.00 85.78 – 3.00	Depositor EDS
% Data completeness (in resolution range)	96.7 (85.78-3.00) 86.0 (85.78-3.00)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.56 (at 3.01Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155)	Depositor
R, R_{free}	0.231 , 0.268 0.231 , 0.267	Depositor DCC
R_{free} test set	2610 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	37.9	Xtriage
Anisotropy	0.543	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 26.4	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	14282	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 45.98 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.2224e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: SAH, 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	0.23	0/7263	0.42	0/9812
1	B	0.23	0/7263	0.42	0/9812
All	All	0.23	0/14526	0.42	0/19624

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	7098	0	6990	64	0
1	B	7098	0	6990	63	0
2	A	26	0	19	1	0
2	B	26	0	19	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
4	A	15	0	0	0	0
4	B	15	0	0	0	0
All	All	14282	0	14018	126	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 (126) 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:99:GLU:OE2	1:A:101:ARG:NH1	2.18	0.77
1:B:9:GLY:HA3	1:B:187:TYR:HB2	1.67	0.76
1:B:70:TYR:HB3	1:B:222:VAL:HG11	1.70	0.74
1:A:551:GLU:OE2	1:A:601:ARG:NH2	2.25	0.67
1:B:465:GLU:HG3	1:B:470:LYS:HG3	1.76	0.66
1:B:168:VAL:HG21	1:B:181:ILE:HD12	1.79	0.64
1:A:787:VAL:HG11	1:A:883:MET:HB2	1.80	0.63
1:A:149:GLU:HG2	1:A:160:ARG:NH1	2.14	0.63
1:B:120:GLY:HA2	1:B:264:ARG:HB2	1.80	0.63
1:B:193:GLU:HG2	1:B:197:ARG:HH11	1.64	0.62
1:A:197:ARG:HG2	1:A:200:ARG:HH12	1.64	0.62
1:A:718:LEU:HD21	1:A:841:LEU:HD23	1.80	0.62
1:B:878:ASP:OD2	1:B:878:ASP:N	2.34	0.60
1:B:13:LYS:HG2	1:B:154:PRO:HG3	1.86	0.57
1:B:834:LYS:NZ	1:B:837:ASP:OD2	2.30	0.57
1:A:826:MET:O	1:A:829:LYS:NZ	2.37	0.56
1:A:405:ARG:HH12	1:A:794:ARG:HH12	1.51	0.56
1:A:569:VAL:O	1:A:573:THR:HB	2.05	0.56
1:B:44:LEU:HD21	1:B:55:VAL:HA	1.86	0.56
1:B:569:VAL:O	1:B:573:THR:HB	2.06	0.55
1:A:82:CYS:SG	1:A:104:THR:OG1	2.54	0.54
1:A:476:TRP:CD1	1:A:476:TRP:N	2.75	0.54
1:B:320:SER:HB2	1:B:344:MET:HB2	1.88	0.54
1:B:319:SER:O	1:B:459:ARG:NH1	2.41	0.53
1:B:476:TRP:N	1:B:476:TRP:CD1	2.77	0.53
1:A:105:LYS:HD2	1:A:110:HIS:CD2	2.44	0.53
1:B:852:LEU:O	1:B:858:ARG:HG2	2.08	0.52
1:B:193:GLU:HG2	1:B:197:ARG:NH1	2.24	0.52
1:A:168:VAL:HG11	1:A:181:ILE:HG13	1.91	0.52
1:B:788:ASP:OD1	1:B:788:ASP:N	2.42	0.52
1:A:82:CYS:HG	1:A:104:THR:HG1	1.49	0.52
1:B:50:THR:O	1:B:50:THR:OG1	2.26	0.52
1:A:730:CYS:HB2	1:A:770:HIS:HE1	1.75	0.51
1:A:29:LYS:NZ	1:A:34:GLU:OE2	2.43	0.51
1:A:193:GLU:HA	1:A:196:GLU:HB2	1.92	0.51
1:A:262:GLY:HA3	1:A:586:GLU:HG2	1.93	0.50
1:B:758:LYS:HD3	1:B:791:PRO:HG3	1.94	0.50
1:B:858:ARG:HA	1:B:861:TRP:HB3	1.93	0.49
1:B:857:PRO:O	1:B:859:THR:N	2.45	0.49
1:A:9:GLY:HA3	1:A:187:TYR:HB2	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:662:VAL:HG22	1:B:667:CYS:HB2	1.95	0.49
1:A:101:ARG:HH21	1:A:125:ARG:HB2	1.78	0.48
1:B:305:ALA:HB3	1:B:596:SER:HB3	1.95	0.48
1:A:120:GLY:HA2	1:A:264:ARG:HG2	1.94	0.48
1:B:616:ASN:HD21	1:B:667:CYS:HB3	1.79	0.48
1:A:731:ARG:HD3	1:A:736:LEU:HD21	1.95	0.48
1:A:868:THR:O	1:A:872:VAL:HG23	2.14	0.48
1:B:659:ARG:HH12	1:B:672:ILE:HA	1.78	0.48
1:B:112:GLU:OE2	1:B:466:PHE:HA	2.14	0.47
1:A:50:THR:HG21	1:A:588:GLY:HA2	1.97	0.47
1:B:307:HIS:NE2	1:B:596:SER:HB2	2.30	0.47
1:B:284:ARG:NH2	1:B:449:HIS:O	2.44	0.47
1:A:640:ARG:HH22	1:B:11:LYS:NZ	2.13	0.47
1:B:49:ALA:HB1	1:B:116:VAL:HA	1.97	0.46
1:A:245:ASP:HA	1:A:246:GLY:HA2	1.64	0.46
1:A:158:GLU:HG3	1:A:191:MET:HG2	1.98	0.46
1:A:329:LEU:HD22	1:A:780:ALA:HB1	1.98	0.46
1:A:748:TRP:HZ3	1:A:756:LEU:HD22	1.81	0.45
1:B:690:ARG:NH2	1:B:699:SER:OG	2.45	0.45
1:B:772:ARG:HB2	1:B:846:ASP:OD2	2.16	0.45
1:A:77:VAL:HG22	1:A:142:THR:HB	1.98	0.45
1:A:286:ARG:HG3	1:A:293:TRP:CE2	2.52	0.45
1:B:659:ARG:NH1	1:B:672:ILE:HG22	2.31	0.45
1:B:383:TRP:CE3	1:B:554:ILE:HD13	2.52	0.45
1:B:239:LEU:HD11	1:B:243:ARG:NH1	2.32	0.44
1:A:769:PHE:O	1:A:775:ARG:NH1	2.44	0.44
1:B:101:ARG:HA	1:B:101:ARG:HD3	1.78	0.44
1:B:390:LYS:HE3	1:B:496:ASP:O	2.17	0.44
1:A:123:ILE:HD13	1:A:264:ARG:HD3	2.00	0.44
1:B:437:ASP:O	1:B:441:GLU:HG3	2.18	0.44
1:A:197:ARG:HG2	1:A:200:ARG:NH1	2.31	0.44
1:A:636:LEU:HD11	1:A:681:ARG:HB3	1.99	0.44
1:A:352:GLN:HE22	1:A:356:PHE:HB2	1.82	0.44
1:A:660:MET:HG2	1:A:669:VAL:HG22	2.00	0.44
1:A:690:ARG:NH2	1:A:699:SER:HB3	2.33	0.44
1:A:853:ILE:H	1:A:853:ILE:HG13	1.44	0.44
1:B:454:ASN:O	1:B:476:TRP:HA	2.17	0.44
1:B:770:HIS:CD2	1:B:770:HIS:H	2.35	0.44
1:B:314:THR:HB	1:B:590:THR:HG21	2.00	0.44
1:B:441:GLU:O	1:B:445:ARG:HG3	2.17	0.44
1:A:458:LYS:HD3	1:A:460:GLU:OE2	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:383:TRP:CE3	1:A:554:ILE:HD13	2.53	0.43
1:A:157:GLU:HB3	1:A:185:CYS:HB2	2.00	0.43
1:B:359:LYS:O	1:B:541:THR:HG21	2.19	0.43
1:A:491:GLY:O	1:A:495:GLU:HG2	2.18	0.43
1:A:367:PRO:HD2	1:A:546:PHE:CD1	2.53	0.43
1:B:169:GLY:O	1:B:173:GLU:HG2	2.19	0.43
1:B:409:ALA:O	1:B:483:ARG:NH2	2.31	0.43
1:A:541:THR:HA	1:A:600:GLN:HG2	2.01	0.43
1:A:573:THR:HG22	1:A:574:TYR:CD1	2.53	0.43
1:A:454:ASN:O	1:A:476:TRP:HA	2.18	0.42
1:A:70:TYR:HB3	1:A:222:VAL:HG21	2.00	0.42
1:B:105:LYS:HD2	1:B:110:HIS:CE1	2.54	0.42
1:B:158:GLU:OE2	1:B:190:THR:HB	2.19	0.42
1:B:64:TRP:NE1	1:B:68:ARG:NH1	2.67	0.42
1:B:62:LEU:HA	1:B:62:LEU:HD23	1.77	0.42
1:B:209:VAL:HG12	1:B:211:LEU:H	1.84	0.42
1:B:628:GLU:HA	1:B:675:ARG:NH2	2.34	0.42
1:B:777:MET:HG3	1:B:861:TRP:HZ2	1.85	0.42
1:B:846:ASP:O	1:B:851:SER:HB2	2.19	0.42
1:A:146:ASP:OD2	2:A:1001:SAH:HG1	2.20	0.42
1:A:90:TYR:O	1:A:93:THR:OG1	2.36	0.42
1:B:640:ARG:HD2	1:B:641:LYS:HD3	2.02	0.42
1:B:164:VAL:O	1:B:168:VAL:HG23	2.19	0.41
1:B:432:PHE:CZ	1:B:480:LEU:HD12	2.55	0.41
1:B:485:LEU:HD12	1:B:485:LEU:HA	1.91	0.41
1:A:749:SER:OG	1:A:751:ARG:HG2	2.20	0.41
1:A:765:GLN:OE1	1:A:811:MET:HG3	2.20	0.41
1:B:643:GLU:H	1:B:643:GLU:HG3	1.67	0.41
1:A:278:ILE:O	1:A:282:ILE:HG12	2.20	0.41
1:A:436:VAL:HG11	1:A:484:PHE:CD2	2.55	0.41
1:B:344:MET:CE	1:B:461:LYS:HE2	2.51	0.41
1:B:605:GLN:HB2	1:B:608:THR:OG1	2.20	0.41
1:A:352:GLN:NE2	1:A:356:PHE:HB2	2.35	0.41
1:A:437:ASP:OD1	1:A:440:ARG:NH1	2.54	0.41
1:B:868:THR:O	1:B:872:VAL:HG23	2.20	0.41
1:A:63:ARG:O	1:A:67:GLU:HG3	2.21	0.41
1:A:455:MET:HE2	1:A:581:VAL:HG21	2.03	0.41
1:A:834:LYS:HE3	1:A:837:ASP:OD2	2.21	0.41
1:A:113:PRO:HB3	1:A:126:LEU:HD13	2.03	0.40
1:A:239:LEU:HD11	1:A:243:ARG:NH1	2.36	0.40
1:A:476:TRP:N	1:A:476:TRP:HD1	2.17	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:580:LYS:HG2	1:A:592:MET:SD	2.62	0.40
1:A:633:MET:HE2	1:A:681:ARG:NH1	2.37	0.40
1:B:285:ILE:HD11	1:B:452:VAL:HG11	2.03	0.40
1:B:61:LYS:HG2	1:B:209:VAL:HG11	2.02	0.40

There are no symmetry-related clashes.

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	881/903 (98%)	834 (95%)	44 (5%)	3 (0%)	37	70
1	B	881/903 (98%)	832 (94%)	46 (5%)	3 (0%)	37	70
All	All	1762/1806 (98%)	1666 (95%)	90 (5%)	6 (0%)	37	70

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	640	ARG
1	B	744	PRO
1	A	300	PRO
1	B	300	PRO
1	B	186	PRO
1	A	48	VAL

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	753/767 (98%)	713 (95%)	40 (5%)	19	51
1	B	753/767 (98%)	703 (93%)	50 (7%)	14	43
All	All	1506/1534 (98%)	1416 (94%)	90 (6%)	16	47

All (90) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	33	THR
1	A	35	VAL
1	A	62	LEU
1	A	101	ARG
1	A	104	THR
1	A	125	ARG
1	A	151	SER
1	A	168	VAL
1	A	181	ILE
1	A	198	LEU
1	A	229	ILE
1	A	245	ASP
1	A	302	ARG
1	A	319	SER
1	A	337	THR
1	A	444	LEU
1	A	449	HIS
1	A	476	TRP
1	A	479	TRP
1	A	483	ARG
1	A	485	LEU
1	A	559	GLU
1	A	577	LYS
1	A	591	VAL
1	A	601	ARG
1	A	621	LEU
1	A	639	LEU
1	A	681	ARG
1	A	683	LEU
1	A	742	VAL
1	A	766	LEU
1	A	775	ARG
1	A	790	VAL
1	A	792	THR

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Mol	Chain	Res	Type
1	A	812	LEU
1	A	827	GLU
1	A	846	ASP
1	A	853	ILE
1	A	871	MET
1	A	883	MET
1	B	6	GLU
1	B	42	ARG
1	B	48	VAL
1	B	50	THR
1	B	66	GLU
1	B	93	THR
1	B	95	ARG
1	B	125	ARG
1	B	155	GLU
1	B	181	ILE
1	B	197	ARG
1	B	216	THR
1	B	243	ARG
1	B	245	ASP
1	B	251	VAL
1	B	266	VAL
1	B	314	THR
1	B	325	VAL
1	B	339	VAL
1	B	369	GLU
1	B	380	SER
1	B	389	ARG
1	B	410	LEU
1	B	437	ASP
1	B	438	ARG
1	B	444	LEU
1	B	459	ARG
1	B	476	TRP
1	B	479	TRP
1	B	480	LEU
1	B	485	LEU
1	B	509	GLU
1	B	515	ARG
1	B	542	ARG
1	B	591	VAL
1	B	597	ARG

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Mol	Chain	Res	Type
1	B	601	ARG
1	B	621	LEU
1	B	633	MET
1	B	638	LEU
1	B	639	LEU
1	B	643	GLU
1	B	680	LEU
1	B	720	LEU
1	B	741	ARG
1	B	742	VAL
1	B	751	ARG
1	B	818	VAL
1	B	851	SER
1	B	878	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	110	HIS
1	A	352	GLN
1	B	287	ASN
1	B	616	ASN
1	B	762	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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	$\#|Z| > 2$
4	SO4	B	1005	-	4,4,4	0.26	0	6,6,6	0.07	0
4	SO4	A	1004	-	4,4,4	0.24	0	6,6,6	0.04	0
4	SO4	B	1004	-	4,4,4	0.23	0	6,6,6	0.09	0
4	SO4	B	1006	-	4,4,4	0.24	0	6,6,6	0.08	0
2	SAH	A	1001	-	23,28,28	1.25	3 (13%)	22,40,40	1.86	4 (18%)
4	SO4	A	1006	-	4,4,4	0.24	0	6,6,6	0.10	0
4	SO4	A	1005	-	4,4,4	0.24	0	6,6,6	0.06	0
2	SAH	B	1001	-	23,28,28	1.24	3 (13%)	22,40,40	1.86	3 (13%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	SAH	A	1001	-	-	5/11/31/31	0/3/3/3
2	SAH	B	1001	-	-	5/11/31/31	0/3/3/3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1001	SAH	C2-N3	4.09	1.38	1.32
2	B	1001	SAH	C2-N3	4.04	1.38	1.32
2	B	1001	SAH	C2-N1	2.51	1.38	1.33
2	A	1001	SAH	C2-N1	2.50	1.38	1.33
2	A	1001	SAH	OXT-C	-2.22	1.23	1.30
2	B	1001	SAH	OXT-C	-2.20	1.23	1.30

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1001	SAH	N3-C2-N1	-6.33	120.08	128.67
2	A	1001	SAH	N3-C2-N1	-6.29	120.14	128.67

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1001	SAH	C5'-SD-CG	-3.50	91.86	102.26
2	A	1001	SAH	C5'-SD-CG	-3.45	92.01	102.26
2	B	1001	SAH	OXT-C-O	-2.72	117.91	124.08
2	A	1001	SAH	OXT-C-O	-2.64	118.09	124.08
2	A	1001	SAH	O4'-C1'-N9	2.56	112.14	108.75

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1001	SAH	N-CA-CB-CG
2	B	1001	SAH	N-CA-CB-CG
2	A	1001	SAH	C-CA-CB-CG
2	B	1001	SAH	C-CA-CB-CG
2	A	1001	SAH	OXT-C-CA-CB
2	B	1001	SAH	O-C-CA-CB
2	B	1001	SAH	OXT-C-CA-CB
2	A	1001	SAH	O-C-CA-CB
2	A	1001	SAH	CB-CG-SD-C5'
2	B	1001	SAH	CB-CG-SD-C5'

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1001	SAH	1	0

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

Ligand SAH A 1001

Bond lengths

Bond angles

Torsions

Rings

Ligand SAH B 1001

Bond lengths

Bond angles

Torsions

Rings
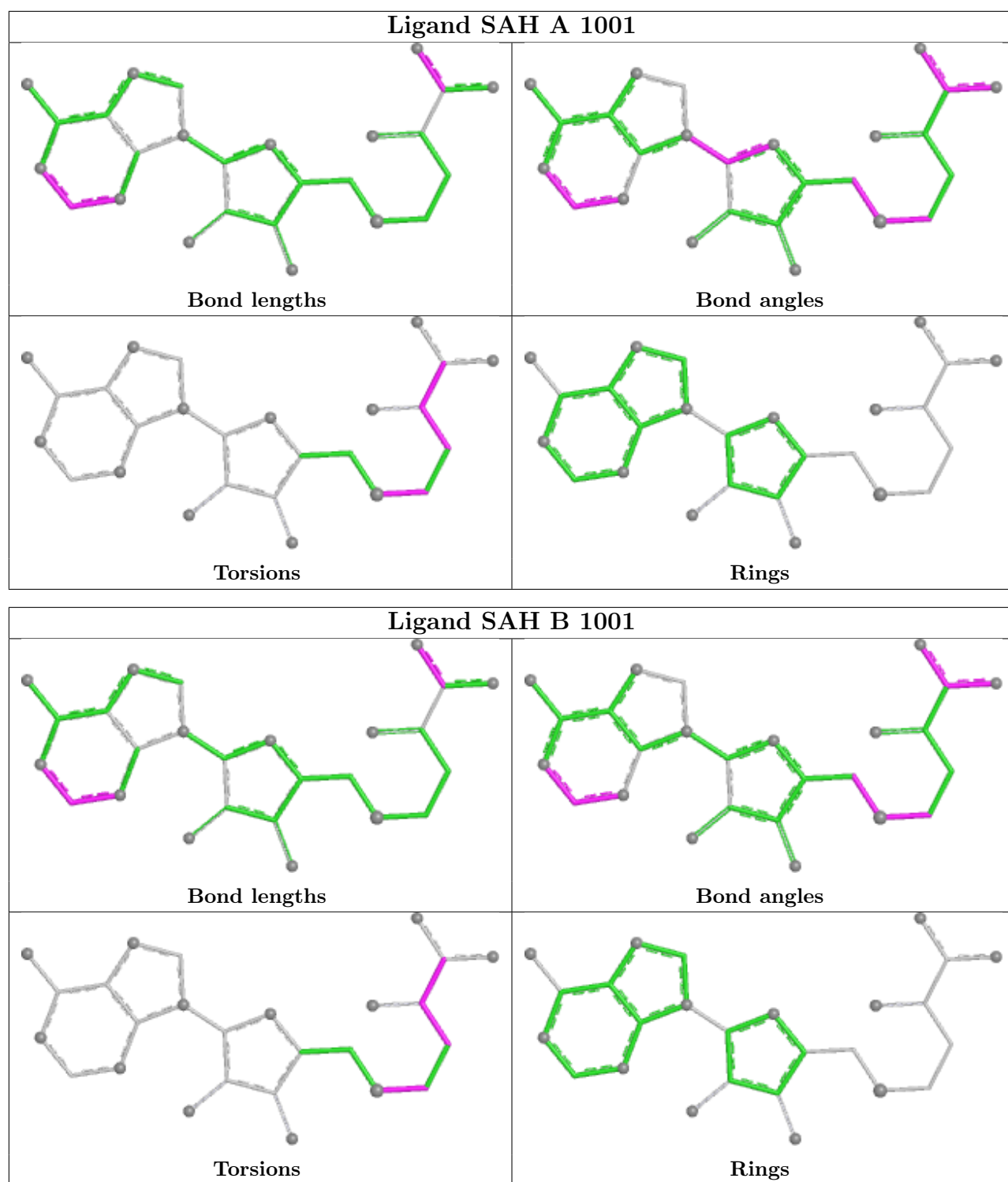
5.7 Other polymers ⓘ

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 ⓘ

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(Å²)	Q<0.9
1	A	883/903 (97%)	0.16	5 (0%)	85	71	30, 42, 56, 68	0
1	B	883/903 (97%)	0.07	3 (0%)	90	81	24, 34, 48, 60	0
All	All	1766/1806 (97%)	0.11	8 (0%)	87	75	24, 39, 53, 68	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	634	GLN	4.8
1	A	148	GLY	2.8
1	A	39	GLU	2.5
1	A	640	ARG	2.5
1	A	746	ALA	2.3
1	B	746	ALA	2.3
1	B	747	GLY	2.1
1	B	879	GLU	2.1

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,
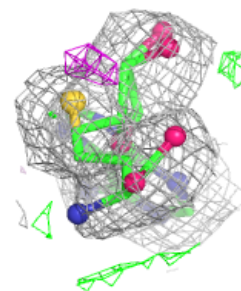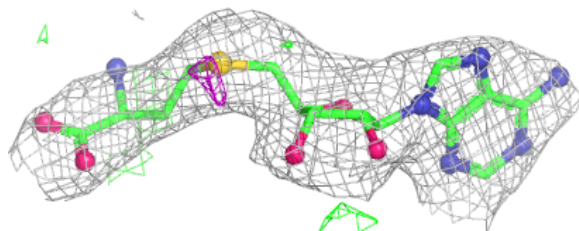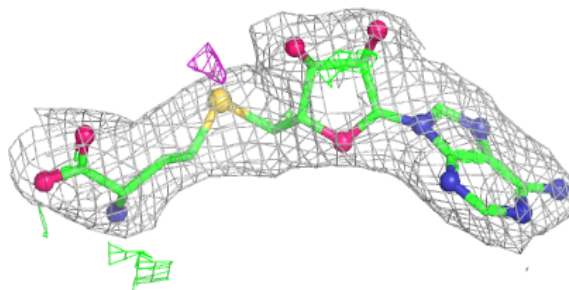
median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.
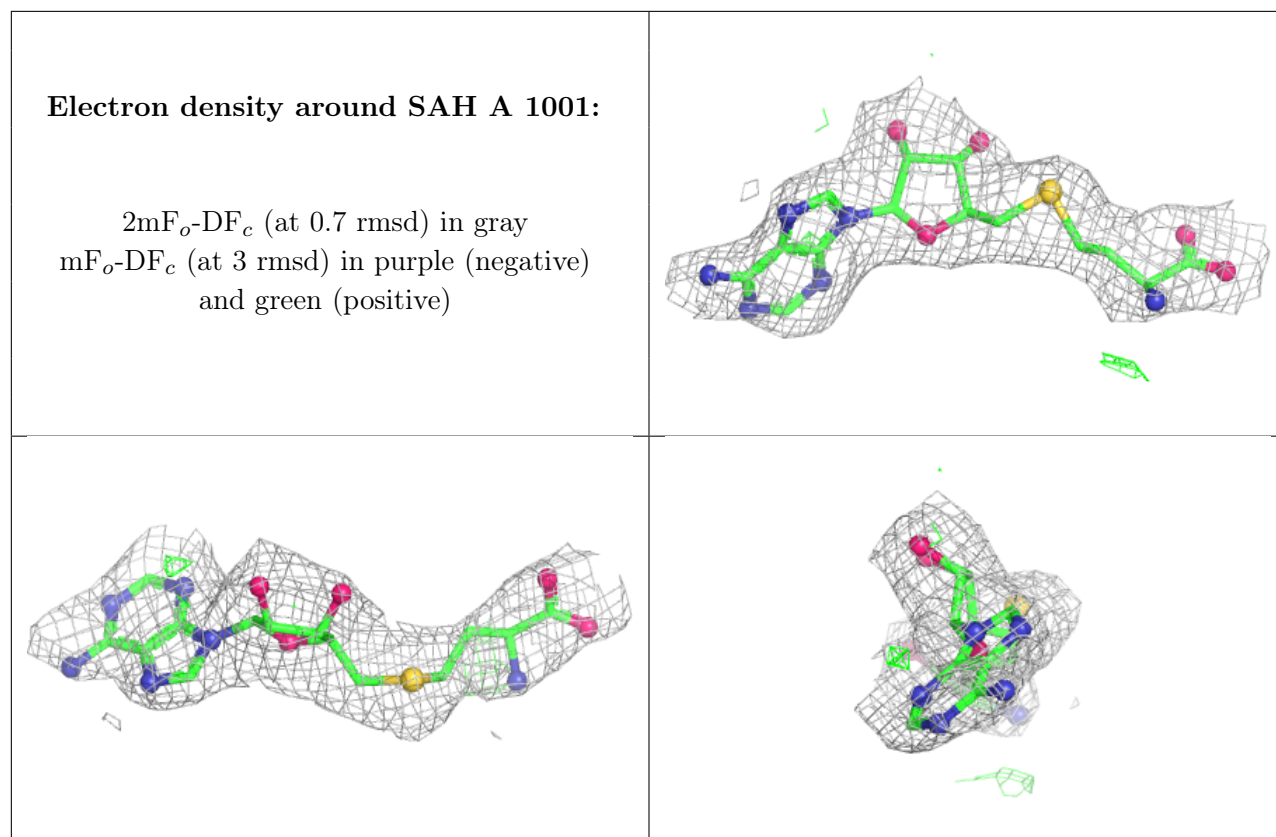
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	SO4	A	1005	5/5	0.69	0.20	49,62,68,77	0
2	SAH	B	1001	26/26	0.90	0.12	23,38,57,60	0
4	SO4	B	1005	5/5	0.90	0.14	44,48,56,65	0
4	SO4	B	1004	5/5	0.91	0.11	27,44,46,48	0
4	SO4	A	1006	5/5	0.91	0.11	45,52,56,59	0
4	SO4	B	1006	5/5	0.91	0.12	35,51,55,57	0
2	SAH	A	1001	26/26	0.93	0.12	28,43,62,65	0
4	SO4	A	1004	5/5	0.94	0.09	36,46,49,51	0
3	ZN	A	1002	1/1	0.97	0.06	30,30,30,30	0
3	ZN	A	1003	1/1	0.98	0.04	44,44,44,44	0
3	ZN	B	1002	1/1	0.99	0.03	27,27,27,27	0
3	ZN	B	1003	1/1	0.99	0.03	29,29,29,29	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 SAH B 1001:

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

Electron density around SAH A 1001:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.