W O R L D W I D E
wwPDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jul 16, 2024 – 04:17 PM JST

PDB ID	:	8W50
Title	:	Crystal structure of DNA binding and cleavage core of human topoisomerase 2-alpha in a DNA binding-competent conformation
Authors	:	Chan, N.L.; Liu, K.T.; Chen, S.F.
Deposited on	:	2023-08-25
Resolution	:	2.67 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 2.67 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.
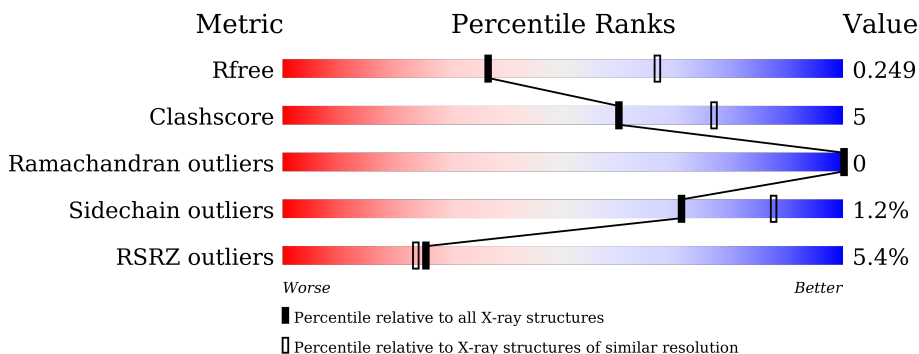
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3863 (2.70-2.66)
Clashscore	141614	4210 (2.70-2.66)
Ramachandran outliers	138981	4141 (2.70-2.66)
Sidechain outliers	138945	4141 (2.70-2.66)
RSRZ outliers	127900	3780 (2.70-2.66)

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	806	2% · 78% · 12% · 10%
1	B	806	4% · 77% · 12% · 11%
1	C	806	5% · 71% · 9% · 20%
1	D	806	7% · 72% · 10% · 19%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 20918 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 DNA topoisomerase 2-alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	729	Total 5689	C 3662	N 932	O 1068	S 27	0	1	0
1	B	716	Total 5457	C 3500	N 906	O 1028	S 23	0	0	0
1	C	644	Total 4702	C 3006	N 788	O 888	S 20	0	0	0
1	D	656	Total 4673	C 2995	N 786	O 870	S 22	0	0	0

There are 184 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	403	MET	-	expression tag	UNP P11388
A	404	ALA	-	expression tag	UNP P11388
A	405	SER	-	expression tag	UNP P11388
A	406	TRP	-	expression tag	UNP P11388
A	407	SER	-	expression tag	UNP P11388
A	408	HIS	-	expression tag	UNP P11388
A	409	PRO	-	expression tag	UNP P11388
A	410	GLN	-	expression tag	UNP P11388
A	411	PHE	-	expression tag	UNP P11388
A	412	GLU	-	expression tag	UNP P11388
A	413	LYS	-	expression tag	UNP P11388
A	414	GLY	-	expression tag	UNP P11388
A	415	ALA	-	expression tag	UNP P11388
A	416	ASP	-	expression tag	UNP P11388
A	417	ASP	-	expression tag	UNP P11388
A	418	ASP	-	expression tag	UNP P11388
A	419	ASP	-	expression tag	UNP P11388
A	420	LYS	-	expression tag	UNP P11388
A	421	VAL	-	expression tag	UNP P11388
A	422	PRO	-	expression tag	UNP P11388
A	423	ASP	-	expression tag	UNP P11388

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Chain	Residue	Modelled	Actual	Comment	Reference
A	424	PRO	-	expression tag	UNP P11388
A	425	THR	-	expression tag	UNP P11388
A	426	SER	-	expression tag	UNP P11388
A	427	VAL	-	expression tag	UNP P11388
A	428	ASP	-	expression tag	UNP P11388
A	1189	GLY	-	expression tag	UNP P11388
A	1190	ALA	-	expression tag	UNP P11388
A	1191	PRO	-	expression tag	UNP P11388
A	1192	GLY	-	expression tag	UNP P11388
A	1193	PHE	-	expression tag	UNP P11388
A	1194	SER	-	expression tag	UNP P11388
A	1195	SER	-	expression tag	UNP P11388
A	1196	ILE	-	expression tag	UNP P11388
A	1197	SER	-	expression tag	UNP P11388
A	1198	ALA	-	expression tag	UNP P11388
A	1199	HIS	-	expression tag	UNP P11388
A	1200	HIS	-	expression tag	UNP P11388
A	1201	HIS	-	expression tag	UNP P11388
A	1202	HIS	-	expression tag	UNP P11388
A	1203	HIS	-	expression tag	UNP P11388
A	1204	HIS	-	expression tag	UNP P11388
A	1205	HIS	-	expression tag	UNP P11388
A	1206	HIS	-	expression tag	UNP P11388
A	1207	HIS	-	expression tag	UNP P11388
A	1208	HIS	-	expression tag	UNP P11388
B	403	MET	-	expression tag	UNP P11388
B	404	ALA	-	expression tag	UNP P11388
B	405	SER	-	expression tag	UNP P11388
B	406	TRP	-	expression tag	UNP P11388
B	407	SER	-	expression tag	UNP P11388
B	408	HIS	-	expression tag	UNP P11388
B	409	PRO	-	expression tag	UNP P11388
B	410	GLN	-	expression tag	UNP P11388
B	411	PHE	-	expression tag	UNP P11388
B	412	GLU	-	expression tag	UNP P11388
B	413	LYS	-	expression tag	UNP P11388
B	414	GLY	-	expression tag	UNP P11388
B	415	ALA	-	expression tag	UNP P11388
B	416	ASP	-	expression tag	UNP P11388
B	417	ASP	-	expression tag	UNP P11388
B	418	ASP	-	expression tag	UNP P11388
B	419	ASP	-	expression tag	UNP P11388

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Chain	Residue	Modelled	Actual	Comment	Reference
B	420	LYS	-	expression tag	UNP P11388
B	421	VAL	-	expression tag	UNP P11388
B	422	PRO	-	expression tag	UNP P11388
B	423	ASP	-	expression tag	UNP P11388
B	424	PRO	-	expression tag	UNP P11388
B	425	THR	-	expression tag	UNP P11388
B	426	SER	-	expression tag	UNP P11388
B	427	VAL	-	expression tag	UNP P11388
B	428	ASP	-	expression tag	UNP P11388
B	1189	GLY	-	expression tag	UNP P11388
B	1190	ALA	-	expression tag	UNP P11388
B	1191	PRO	-	expression tag	UNP P11388
B	1192	GLY	-	expression tag	UNP P11388
B	1193	PHE	-	expression tag	UNP P11388
B	1194	SER	-	expression tag	UNP P11388
B	1195	SER	-	expression tag	UNP P11388
B	1196	ILE	-	expression tag	UNP P11388
B	1197	SER	-	expression tag	UNP P11388
B	1198	ALA	-	expression tag	UNP P11388
B	1199	HIS	-	expression tag	UNP P11388
B	1200	HIS	-	expression tag	UNP P11388
B	1201	HIS	-	expression tag	UNP P11388
B	1202	HIS	-	expression tag	UNP P11388
B	1203	HIS	-	expression tag	UNP P11388
B	1204	HIS	-	expression tag	UNP P11388
B	1205	HIS	-	expression tag	UNP P11388
B	1206	HIS	-	expression tag	UNP P11388
B	1207	HIS	-	expression tag	UNP P11388
B	1208	HIS	-	expression tag	UNP P11388
C	403	MET	-	expression tag	UNP P11388
C	404	ALA	-	expression tag	UNP P11388
C	405	SER	-	expression tag	UNP P11388
C	406	TRP	-	expression tag	UNP P11388
C	407	SER	-	expression tag	UNP P11388
C	408	HIS	-	expression tag	UNP P11388
C	409	PRO	-	expression tag	UNP P11388
C	410	GLN	-	expression tag	UNP P11388
C	411	PHE	-	expression tag	UNP P11388
C	412	GLU	-	expression tag	UNP P11388
C	413	LYS	-	expression tag	UNP P11388
C	414	GLY	-	expression tag	UNP P11388
C	415	ALA	-	expression tag	UNP P11388

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Chain	Residue	Modelled	Actual	Comment	Reference
C	416	ASP	-	expression tag	UNP P11388
C	417	ASP	-	expression tag	UNP P11388
C	418	ASP	-	expression tag	UNP P11388
C	419	ASP	-	expression tag	UNP P11388
C	420	LYS	-	expression tag	UNP P11388
C	421	VAL	-	expression tag	UNP P11388
C	422	PRO	-	expression tag	UNP P11388
C	423	ASP	-	expression tag	UNP P11388
C	424	PRO	-	expression tag	UNP P11388
C	425	THR	-	expression tag	UNP P11388
C	426	SER	-	expression tag	UNP P11388
C	427	VAL	-	expression tag	UNP P11388
C	428	ASP	-	expression tag	UNP P11388
C	1189	GLY	-	expression tag	UNP P11388
C	1190	ALA	-	expression tag	UNP P11388
C	1191	PRO	-	expression tag	UNP P11388
C	1192	GLY	-	expression tag	UNP P11388
C	1193	PHE	-	expression tag	UNP P11388
C	1194	SER	-	expression tag	UNP P11388
C	1195	SER	-	expression tag	UNP P11388
C	1196	ILE	-	expression tag	UNP P11388
C	1197	SER	-	expression tag	UNP P11388
C	1198	ALA	-	expression tag	UNP P11388
C	1199	HIS	-	expression tag	UNP P11388
C	1200	HIS	-	expression tag	UNP P11388
C	1201	HIS	-	expression tag	UNP P11388
C	1202	HIS	-	expression tag	UNP P11388
C	1203	HIS	-	expression tag	UNP P11388
C	1204	HIS	-	expression tag	UNP P11388
C	1205	HIS	-	expression tag	UNP P11388
C	1206	HIS	-	expression tag	UNP P11388
C	1207	HIS	-	expression tag	UNP P11388
C	1208	HIS	-	expression tag	UNP P11388
D	403	MET	-	expression tag	UNP P11388
D	404	ALA	-	expression tag	UNP P11388
D	405	SER	-	expression tag	UNP P11388
D	406	TRP	-	expression tag	UNP P11388
D	407	SER	-	expression tag	UNP P11388
D	408	HIS	-	expression tag	UNP P11388
D	409	PRO	-	expression tag	UNP P11388
D	410	GLN	-	expression tag	UNP P11388
D	411	PHE	-	expression tag	UNP P11388

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Chain	Residue	Modelled	Actual	Comment	Reference
D	412	GLU	-	expression tag	UNP P11388
D	413	LYS	-	expression tag	UNP P11388
D	414	GLY	-	expression tag	UNP P11388
D	415	ALA	-	expression tag	UNP P11388
D	416	ASP	-	expression tag	UNP P11388
D	417	ASP	-	expression tag	UNP P11388
D	418	ASP	-	expression tag	UNP P11388
D	419	ASP	-	expression tag	UNP P11388
D	420	LYS	-	expression tag	UNP P11388
D	421	VAL	-	expression tag	UNP P11388
D	422	PRO	-	expression tag	UNP P11388
D	423	ASP	-	expression tag	UNP P11388
D	424	PRO	-	expression tag	UNP P11388
D	425	THR	-	expression tag	UNP P11388
D	426	SER	-	expression tag	UNP P11388
D	427	VAL	-	expression tag	UNP P11388
D	428	ASP	-	expression tag	UNP P11388
D	1189	GLY	-	expression tag	UNP P11388
D	1190	ALA	-	expression tag	UNP P11388
D	1191	PRO	-	expression tag	UNP P11388
D	1192	GLY	-	expression tag	UNP P11388
D	1193	PHE	-	expression tag	UNP P11388
D	1194	SER	-	expression tag	UNP P11388
D	1195	SER	-	expression tag	UNP P11388
D	1196	ILE	-	expression tag	UNP P11388
D	1197	SER	-	expression tag	UNP P11388
D	1198	ALA	-	expression tag	UNP P11388
D	1199	HIS	-	expression tag	UNP P11388
D	1200	HIS	-	expression tag	UNP P11388
D	1201	HIS	-	expression tag	UNP P11388
D	1202	HIS	-	expression tag	UNP P11388
D	1203	HIS	-	expression tag	UNP P11388
D	1204	HIS	-	expression tag	UNP P11388
D	1205	HIS	-	expression tag	UNP P11388
D	1206	HIS	-	expression tag	UNP P11388
D	1207	HIS	-	expression tag	UNP P11388
D	1208	HIS	-	expression tag	UNP P11388

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S) (labeled as "Ligand of Interest" by depositor).

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

• Molecule 3 is water.

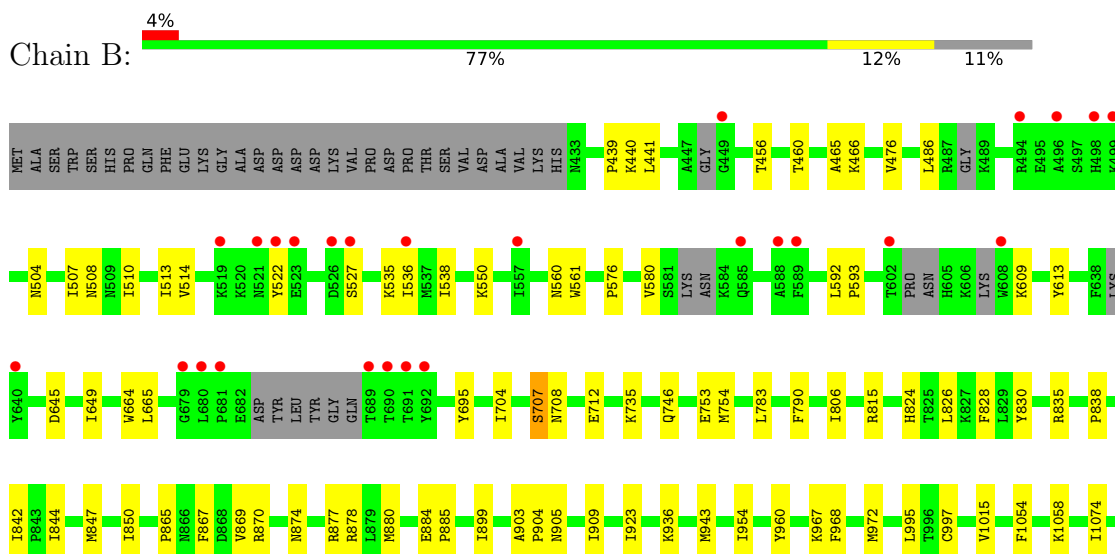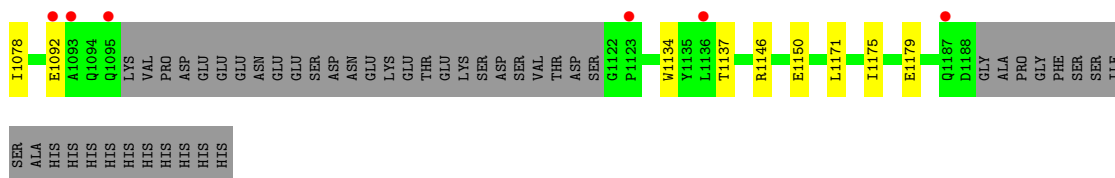| Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	201	Total O 201 201	0	0
3	B	120	Total O 120 120	0	0
3	C	54	Total O 54 54	0	0
3	D	7	Total O 7 7	0	0

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.

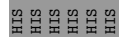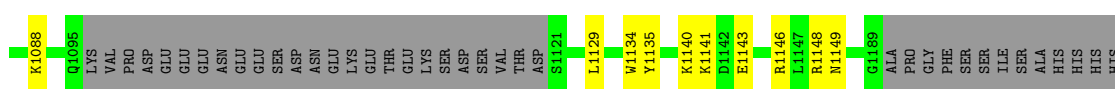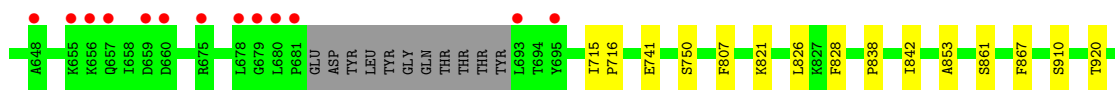• Molecule 1: DNA topoisomerase 2-alpha

Chain A:

• Molecule 1: DNA topoisomerase 2-alpha

Chain B:

I1078 E1092 A1093 Q1094 Q1095 LYS VAL PRO ASP GLU GLU GLU ASN GLU GLU SER ASP GLU LYS GLU THR GLU LYS SER ASP SER VAL THR ASP SER G1122 P1123 W1134 Y1135 L1136 T1137 R1146 E1150 L1171 I1175 E1179 Q1187 D1188 GLY ALA PRO GLY PHE SER SER ILE

SER ALA HIS HIS HIS HIS HIS HIS HIS HIS HIS HIS

• Molecule 1: DNA topoisomerase 2-alpha

Chain C:

MET ALA SER TRP SER HIS PRO GLN PHE GLU LYS GLY ALA ASP ASP ASP ASP LYS VAL PRO ASP PRO ASP THR SER VAL ASP ALA VAL LYS HIS ASN ARG ILE LYS GLY ILE ILE PRO LYS LEU ASP ALA ASP ASN ASP ALA GLY GLY ARG ASN SER THR GLU CYS THR LEU ILE LEU T460 E461 G462

ASP S464 G472 LEU GLY VAL VAL GLY ARG ASP LYS TYR GLY V483 F484 R487 R494 GLU ALA SER HIS LYS GLN ILE MET GLU N504 A505 N509 K512 I513 V514 G515 L516 Q517 TYR LYS LYS ASN TYR GLU ASP GLU ASP SER LEU LYS THR LEU ARG TYR GLY LYS ILE MET

I538 M539 Q542 H559 ASN TRP P562 L565 ARG HIS ARG PHE L570 E571 E572 F573 I574 T575 P576 S581 LYS N583 K584 Q585 E586 M587 S591 W598 P603 N604 H605 K606 K607 K611 Y612 Y613 K614 G615 K625 M631 K632 R633 I636 Y640 SER GLY PRO E644

A648 K655 K656 Q657 I658 D659 D660 R675 L678 G679 L680 P681 GLU ASP TYR TYR LEU TYR GLY GLN THR THR THR TYR L693 T694 Y695 I715 P716 E741 S750 F807 K821 L826 K827 F828 P838 I842 A853 S861 F867 S910 T920

I923 L926 E937 Q938 V939 L940 M943 E948 K949 T950 L953 Y960 D963 V966 K967 F968 K971 K976 V983 V988 S999 L1009 V1015 G1031 E1035 W1036 L1037 R1063 F1054 I1055 I1059 E1066 L1073 I1078 Q1079 R1080 D1085

K1088 Q1095 LYS VAL PRO ASP GLU GLU GLU ASN GLU GLU SER ASP ASN GLU LYS GLU THR GLU LYS SER ASP SER VAL THR ASP S1121 L1129 W1134 Y1135 K1140 K1141 D1142 E1143 R1146 L1147 R1148 N1149 G1189 ALA PRO GLY PHE SER SER ILE SER ALA HIS HIS HIS
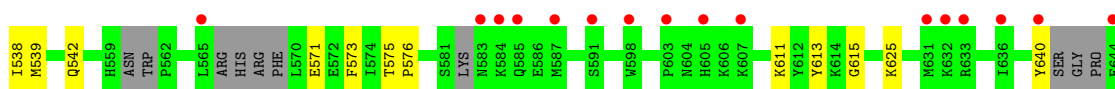
HIS HIS HIS HIS HIS

• Molecule 1: DNA topoisomerase 2-alpha

Chain D:

MET ALA SER TRP SER HIS PRO GLN PHE GLU LYS GLY ALA ASP ASP ASP ASP LYS VAL PRO ASP PRO ASP THR SER VAL ASP ALA VAL LYS HIS ASN R434 I435 K436 P439 K440 L441 G448 G449 R450 N451 S464 G474 V475 V476 A496 S497 H498 K499 Q500 E503 N504 A505

I510 I511 K512 I513 V514 D526 I536 M537 I538 M539 H648 I649 K550 G551 L552 L553 I554 H559 H567 F573 I577 V578 S581 LYS N583 K584 Q585 E586 M587 P593 E594 F595 W598 P603 N604 S641 G642 P643 E644 D645 D646 I649 F653 SER K655 K656

Q657 W664 L665 E670 D671 Q674 R675 L678 GLY LEU PRO GLU ASP TYR LEU TYR GLY GLN T689 T694 I704 S714 M718 G721 L722 Q726 L747 V751 N770 N774 F775 V776 GLY S778 N779 N782 Q785 F790 GLY T792 G797

P803 R804 Y805 I806 L810 S811 R815 L816 F828 P838 P843 I844 I845 P846 M847 I850 E854 GLY I856 G859 I864 D868 V869 I872 V873 I876 M880 D881 G882 K893 ASN F895 L902 G911 GLU VAL ALA ILE LEU ASN SER THR THR ILE

4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	266.10Å 266.10Å 172.81Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	23.19 – 2.67 23.19 – 2.67	Depositor EDS
% Data completeness (in resolution range)	99.0 (23.19-2.67) 99.0 (23.19-2.67)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.78 (at 2.67Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.222 , 0.248 0.223 , 0.249	Depositor DCC
R_{free} test set	2025 reflections (1.58%)	wwPDB-VP
Wilson B-factor (Å^2)	51.5	Xtriage
Anisotropy	0.329	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 51.9	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.010 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	20918	wwPDB-VP
Average B, all atoms (Å^2)	68.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.15% 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 $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.28	0/5810	0.48	0/7866
1	B	0.27	0/5561	0.47	0/7534
1	C	0.26	0/4786	0.44	0/6496
1	D	0.26	0/4767	0.44	0/6495
All	All	0.27	0/20924	0.46	0/28391

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5689	0	5467	54	0
1	B	5457	0	5129	53	0
1	C	4702	0	4204	41	0
1	D	4673	0	3960	46	0
2	A	10	0	0	0	0
2	B	5	0	0	0	0
3	A	201	0	0	2	0
3	B	120	0	0	1	0
3	C	54	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	7	0	0	0	0
All	All	20918	0	18760	181	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 5.

All (181) 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:D:577:ILE:HG23	1:D:578:VAL:HG23	1.62	0.81
1:C:542:GLN:HE21	1:C:575:THR:HG22	1.55	0.72
1:D:864:ILE:HG12	1:D:1000:MET:HG2	1.72	0.71
1:B:735:LYS:HB3	1:B:754:MET:HE1	1.73	0.70
1:C:1059:ILE:HG23	1:D:1066:GLU:HB3	1.75	0.68
1:B:850:ILE:HD12	1:B:869:VAL:HG22	1.78	0.66
1:A:821:LYS:HD3	1:A:1037:LEU:HD11	1.78	0.66
1:C:923:ILE:HB	1:C:968:PHE:HB2	1.76	0.66
1:D:645:ASP:O	1:D:649:ILE:HG13	1.97	0.65
1:C:1066:GLU:HB3	1:D:1059:ILE:HG23	1.77	0.65
1:D:641:SER:OG	1:D:645:ASP:OD2	2.11	0.64
1:A:735:LYS:HB3	1:A:754:MET:HE1	1.78	0.64
1:B:522:TYR:HA	1:B:527:SER:HB3	1.80	0.63
1:A:939:VAL:O	1:A:943:MET:HG3	1.98	0.63
1:A:1088:LYS:O	1:A:1092:GLU:HG3	1.98	0.63
1:B:1134:TRP:O	1:B:1137:THR:OG1	2.16	0.63
1:D:774:ASN:HB3	1:D:782:ASN:HD22	1.63	0.63
1:C:538:ILE:N	1:C:571:GLU:O	2.33	0.62
1:C:920:THR:HG23	1:C:971:LYS:HG2	1.81	0.62
1:A:1132:PRO:HD2	1:A:1135:TYR:CE1	2.35	0.61
1:A:1066:GLU:OE1	1:B:1058:LYS:NZ	2.32	0.60
1:A:735:LYS:HD3	1:A:754:MET:HE3	1.83	0.60
1:C:937:GLU:HG2	1:D:439:PRO:HB2	1.82	0.60
1:A:850:ILE:HD12	1:A:869:VAL:HG22	1.84	0.59
1:A:973:THR:HG22	1:A:976:LYS:H	1.68	0.59
1:A:542:GLN:HE22	1:A:575:THR:H	1.50	0.59
1:B:649:ILE:HD11	1:B:695:TYR:HB3	1.85	0.59
1:A:562:PRO:HA	1:A:565:LEU:HD13	1.83	0.58
1:A:441:LEU:HD22	1:A:513:ILE:HG12	1.84	0.58
1:A:716:PRO:HG2	1:A:853:ALA:HB1	1.85	0.58
1:B:665:LEU:HD11	1:B:707:SER:HB3	1.86	0.57
1:C:939:VAL:O	1:C:943:MET:HG3	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:685:LEU:HD22	1:A:693:LEU:HD11	1.87	0.57
1:C:828:PHE:HA	1:C:838:PRO:HA	1.87	0.56
1:D:664:TRP:CE2	1:D:704:ILE:HD13	2.41	0.56
1:B:1074:ILE:O	1:B:1078:ILE:HG13	2.05	0.56
1:D:770:ASN:O	1:D:779:ASN:ND2	2.38	0.55
1:D:1044:GLU:O	1:D:1048:LEU:HD12	2.05	0.55
1:B:1146:ARG:NH2	1:B:1150:GLU:OE1	2.39	0.55
1:D:1055:ILE:O	1:D:1059:ILE:HG13	2.07	0.55
1:B:826:LEU:HD21	1:B:842:ILE:HG22	1.88	0.55
1:B:954:ILE:HG22	1:B:972:MET:HG2	1.89	0.54
1:A:835:ARG:NE	3:A:1406:HOH:O	2.40	0.54
1:A:779:ASN:HD22	1:A:851:ASN:HB3	1.72	0.54
1:B:504:ASN:O	1:B:508:ASN:ND2	2.41	0.54
1:A:923:ILE:HB	1:A:968:PHE:HB2	1.89	0.54
1:B:708:ASN:ND2	1:B:712:GLU:OE2	2.41	0.54
1:A:680:LEU:HD21	1:C:988:VAL:HA	1.88	0.54
1:D:1070:LYS:O	1:D:1074:ILE:HG13	2.07	0.54
1:B:486:LEU:HD11	1:B:510:ILE:HD11	1.91	0.53
1:A:865:PRO:HB3	1:A:995:LEU:HD21	1.91	0.53
1:A:867:PHE:CZ	1:A:1015:VAL:HG11	2.44	0.53
1:D:1177:GLU:O	1:D:1181:VAL:HG12	2.08	0.53
1:C:826:LEU:HD21	1:C:842:ILE:HG22	1.90	0.53
1:C:1085:ASP:HB3	1:C:1088:LYS:HB3	1.90	0.53
1:A:538:ILE:HD13	1:A:553:LEU:HD22	1.90	0.52
1:D:846:PRO:HD2	1:D:872:ILE:HG21	1.91	0.52
1:C:539:MET:HG3	1:C:573:PHE:HB3	1.92	0.51
1:D:803:PRO:HA	1:D:806:ILE:HG12	1.91	0.51
1:B:865:PRO:HB3	1:B:995:LEU:HD21	1.91	0.51
1:C:472:GLY:HA2	1:C:625:LYS:HA	1.92	0.51
1:D:552:LEU:HD22	1:D:653:PHE:HE2	1.74	0.51
1:B:877:ARG:HA	1:B:880:MET:HE2	1.93	0.51
1:A:477:GLY:O	1:A:481:TYR:HB2	2.11	0.51
1:D:876:ILE:O	1:D:880:MET:HG3	2.10	0.51
1:B:441:LEU:HD22	1:B:513:ILE:HG12	1.92	0.50
1:B:824:HIS:ND1	3:B:1401:HOH:O	2.35	0.50
1:C:1055:ILE:O	1:C:1059:ILE:HG13	2.11	0.50
1:B:828:PHE:HA	1:B:838:PRO:HA	1.94	0.50
1:C:542:GLN:NE2	1:C:575:THR:H	2.09	0.50
1:B:903:ALA:HB1	1:B:904:PRO:HD2	1.94	0.49
1:A:936:LYS:HD2	1:A:959:GLU:OE2	2.12	0.49
1:C:1134:TRP:CH2	1:D:1129:LEU:HD12	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:664:TRP:CE2	1:A:704:ILE:HD12	2.48	0.49
1:D:539:MET:HG3	1:D:573:PHE:HB3	1.95	0.49
1:B:867:PHE:CZ	1:B:1015:VAL:HG11	2.47	0.49
1:B:943:MET:HB3	1:B:954:ILE:HG12	1.94	0.48
1:B:830:TYR:CZ	1:B:835:ARG:HG3	2.47	0.48
1:A:434:ARG:HH12	1:B:936:LYS:HE3	1.77	0.48
1:A:868:ASP:HB3	1:A:871:GLU:HB2	1.96	0.48
1:D:868:ASP:O	1:D:872:ILE:HD12	2.14	0.48
1:D:847:MET:HA	1:D:850:ILE:HD12	1.95	0.48
1:A:445:ASN:HB2	1:A:479:ASP:HA	1.94	0.48
1:D:828:PHE:HA	1:D:838:PRO:HA	1.95	0.48
1:A:1133:LEU:HD12	1:B:1054:PHE:HE2	1.78	0.48
1:B:664:TRP:CE2	1:B:704:ILE:HD12	2.49	0.48
1:D:844:ILE:HG13	1:D:845:ILE:HG23	1.96	0.48
1:D:1167:TRP:O	1:D:1171:LEU:HG	2.14	0.47
1:A:673:ARG:HG3	1:A:1006:VAL:HG11	1.96	0.47
1:D:785:GLN:NE2	1:D:810:LEU:O	2.47	0.47
1:B:456:THR:HG23	1:B:535:LYS:HB2	1.96	0.47
1:D:538:ILE:HG21	1:D:550:LYS:HG2	1.95	0.47
1:A:1085:ASP:HB3	1:A:1088:LYS:HB3	1.95	0.47
1:B:440:LYS:O	1:B:466:LYS:NZ	2.46	0.47
1:C:741:GLU:HG3	1:C:807:PHE:CD2	2.50	0.47
1:A:874:ASN:O	1:A:878:ARG:HG3	2.14	0.47
1:B:783:LEU:HD21	1:B:847:MET:HE2	1.96	0.47
1:D:869:VAL:O	1:D:873:VAL:HG23	2.14	0.47
1:C:953:LEU:HD12	1:C:976:LYS:HD3	1.97	0.47
1:A:435:ILE:HD11	1:A:532:ARG:CZ	2.45	0.46
1:A:1010:LYS:HD3	1:A:1012:TYR:CZ	2.50	0.46
1:D:436:LYS:O	1:D:512:LYS:NZ	2.48	0.46
1:C:963:ASP:OD1	1:C:963:ASP:N	2.47	0.46
1:A:828:PHE:HA	1:A:838:PRO:HA	1.97	0.46
1:C:867:PHE:CZ	1:C:1015:VAL:HG11	2.50	0.46
1:A:919:THR:H	1:A:977:LEU:HD23	1.80	0.46
1:B:870:ARG:NH2	1:B:1179:GLU:OE1	2.46	0.45
1:C:960:TYR:HB3	1:D:475:VAL:HG13	1.99	0.45
1:A:580:VAL:HA	1:A:609:LYS:O	2.16	0.45
1:D:665:LEU:HD23	1:D:704:ILE:HD11	1.98	0.45
1:B:580:VAL:HA	1:B:609:LYS:O	2.16	0.45
1:A:937:GLU:HG2	1:B:439:PRO:HB2	1.98	0.45
1:D:722:LEU:HD12	1:D:726:GLN:HB3	1.97	0.45
1:C:1031:GLY:O	1:C:1035:GLU:HG3	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1073:LEU:HD21	1:C:1129:LEU:HD21	1.98	0.44
1:A:565:LEU:H	1:A:565:LEU:HD12	1.82	0.44
1:B:510:ILE:O	1:B:514:VAL:HG22	2.18	0.44
1:B:538:ILE:HG21	1:B:550:LYS:HG2	1.99	0.44
1:D:747:LEU:O	1:D:751:VAL:HG23	2.18	0.44
1:B:514:VAL:HG11	1:B:536:ILE:HD11	1.99	0.44
1:B:560:ASN:HB2	1:B:561:TRP:CE3	2.53	0.44
1:B:905:ASN:HB3	1:B:997:CYS:HB2	1.99	0.44
1:C:505:ALA:O	1:C:509:ASN:N	2.48	0.44
1:C:615:GLY:HA3	1:D:805:TYR:CG	2.53	0.44
1:D:548:HIS:O	1:D:552:LEU:HD23	2.18	0.44
1:D:1012:TYR:CD1	1:D:1018:ILE:HG12	2.52	0.44
1:A:802:SER:OG	1:A:804:ARG:HG2	2.18	0.43
1:D:785:GLN:HE21	1:D:811:SER:HA	1.83	0.43
1:D:774:ASN:HB3	1:D:782:ASN:ND2	2.32	0.43
1:A:678:LEU:HD13	1:C:983:VAL:HG11	1.99	0.43
1:D:552:LEU:HD22	1:D:653:PHE:CE2	2.53	0.43
1:A:753:GLU:HG2	1:B:746:GLN:HG3	2.00	0.43
1:A:826:LEU:HD21	1:A:842:ILE:HG22	2.00	0.43
1:C:861:SER:O	1:C:999:SER:OG	2.35	0.43
1:C:960:TYR:HB2	1:C:967:LYS:HB3	2.01	0.43
1:B:560:ASN:HB2	1:B:561:TRP:CZ3	2.54	0.43
1:B:790:PHE:CZ	1:B:806:ILE:HD12	2.54	0.43
1:B:923:ILE:HB	1:B:968:PHE:HB2	2.01	0.43
1:C:715:ILE:HG21	1:C:1009:LEU:HD21	2.01	0.43
1:D:1182:GLU:HA	1:D:1185:GLU:HG3	2.01	0.43
1:B:576:PRO:O	1:B:613:TYR:HB2	2.19	0.43
1:C:1148:ARG:NH2	1:C:1149:ASN:OD1	2.44	0.42
1:A:899:ILE:HG12	1:A:909:ILE:HG12	2.01	0.42
1:B:960:TYR:HB2	1:B:967:LYS:HG2	2.00	0.42
1:C:1053:ARG:NH2	1:C:1080:ARG:O	2.44	0.42
1:D:815:ARG:HD3	1:D:815:ARG:HA	1.86	0.42
1:A:905:ASN:HB3	1:A:997:CYS:HB2	2.01	0.42
1:C:611:LYS:HB3	1:C:613:TYR:HE1	1.83	0.42
1:D:441:LEU:HD13	1:D:513:ILE:HD13	2.00	0.42
1:B:874:ASN:O	1:B:878:ARG:HG3	2.20	0.42
1:D:510:ILE:O	1:D:514:VAL:HG23	2.20	0.42
1:D:587:MET:HE1	1:D:598:TRP:NE1	2.35	0.42
1:B:1175:ILE:O	1:B:1179:GLU:HG2	2.19	0.42
1:C:1141:LYS:HB3	1:C:1141:LYS:HE3	1.82	0.42
1:C:1135:TYR:HA	1:C:1140:LYS:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:557:ILE:HG22	1:A:565:LEU:HD11	2.02	0.42
1:B:592:LEU:HB2	1:B:593:PRO:HD3	2.01	0.42
1:C:926:LEU:HG	1:C:966:VAL:HG11	2.01	0.42
1:B:790:PHE:CE2	1:B:806:ILE:HB	2.55	0.41
1:B:884:GLU:HG3	1:B:885:PRO:HD2	2.01	0.41
1:C:716:PRO:HG2	1:C:853:ALA:HB1	2.02	0.41
1:C:1143:GLU:HG3	1:C:1146:ARG:HH21	1.84	0.41
1:A:577:ILE:H	1:A:577:ILE:HG12	1.71	0.41
1:A:638:PHE:HB3	1:A:695:TYR:CE1	2.56	0.41
1:B:645:ASP:HB3	1:B:695:TYR:HB2	2.02	0.41
1:D:816:LEU:HD13	1:D:1173:THR:HG22	2.02	0.41
1:D:1181:VAL:O	1:D:1185:GLU:HG3	2.21	0.41
1:A:1175:ILE:O	1:A:1179:GLU:HG2	2.20	0.41
1:B:504:ASN:CG	1:B:507:ILE:HG12	2.41	0.41
1:C:576:PRO:O	1:C:613:TYR:HB2	2.21	0.41
1:A:610:VAL:O	1:A:833:ASN:ND2	2.47	0.41
1:B:460:THR:HB	1:B:465:ALA:HB3	2.03	0.41
1:A:472:GLY:HA2	1:A:625:LYS:HA	2.03	0.41
1:B:844:ILE:HD12	1:B:1171:LEU:HD23	2.02	0.41
1:B:899:ILE:HG12	1:B:909:ILE:HG12	2.02	0.41
1:C:1078:ILE:HD13	1:C:1078:ILE:HA	1.93	0.41
1:A:640:TYR:HD1	1:A:642:GLY:H	1.67	0.40
1:A:494:ARG:NH1	3:A:1413:HOH:O	2.48	0.40
1:A:845:ILE:HG21	1:A:873:VAL:HG22	2.04	0.40
1:A:510:ILE:O	1:A:514:VAL:HG23	2.21	0.40
1:C:821:LYS:HD3	1:C:1037:LEU:HD11	2.04	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	724/806 (90%)	711 (98%)	13 (2%)	0	100	100
1	B	698/806 (87%)	683 (98%)	15 (2%)	0	100	100
1	C	622/806 (77%)	609 (98%)	13 (2%)	0	100	100
1	D	634/806 (79%)	622 (98%)	12 (2%)	0	100	100
All	All	2678/3224 (83%)	2625 (98%)	53 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	575/724 (79%)	568 (99%)	7 (1%)	71	87
1	B	535/724 (74%)	530 (99%)	5 (1%)	78	91
1	C	420/724 (58%)	417 (99%)	3 (1%)	84	93
1	D	382/724 (53%)	374 (98%)	8 (2%)	53	78
All	All	1912/2896 (66%)	1889 (99%)	23 (1%)	71	87

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	518	TYR
1	A	640	TYR
1	A	707	SER
1	A	709	SER
1	A	929	ARG
1	A	973	THR
1	A	1153	GLN
1	B	476	VAL
1	B	707	SER
1	B	753	GLU
1	B	815	ARG
1	B	1092	GLU
1	C	640	TYR

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Mol	Chain	Res	Type
1	C	750	SER
1	C	910	SER
1	D	464	SER
1	D	567	HIS
1	D	645	ASP
1	D	646	ASP
1	D	694	THR
1	D	718	MET
1	D	868	ASP
1	D	1017	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	542	GLN
1	A	544	GLN
1	A	746	GLN
1	A	773	GLN
1	A	779	ASN
1	A	905	ASN
1	A	906	GLN
1	B	508	ASN
1	B	770	ASN
1	B	833	ASN
1	B	933	GLN
1	C	542	GLN
1	C	700	ASN
1	C	746	GLN
1	C	905	ASN
1	D	445	ASN
1	D	451	ASN
1	D	782	ASN
1	D	785	GLN
1	D	1051	GLN
1	D	1126	ASN

5.3.3 RNA (i)

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 monosaccharides in this entry.

5.6   Ligand geometry ⓘ

3 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	SO4	B	1301	-	4,4,4	0.78	0	6,6,6	0.55	0
2	SO4	A	1302	-	4,4,4	0.80	0	6,6,6	0.55	0
2	SO4	A	1301	-	4,4,4	0.78	0	6,6,6	0.59	0

There are no bond length outliers.

There are no bond angle outliers.

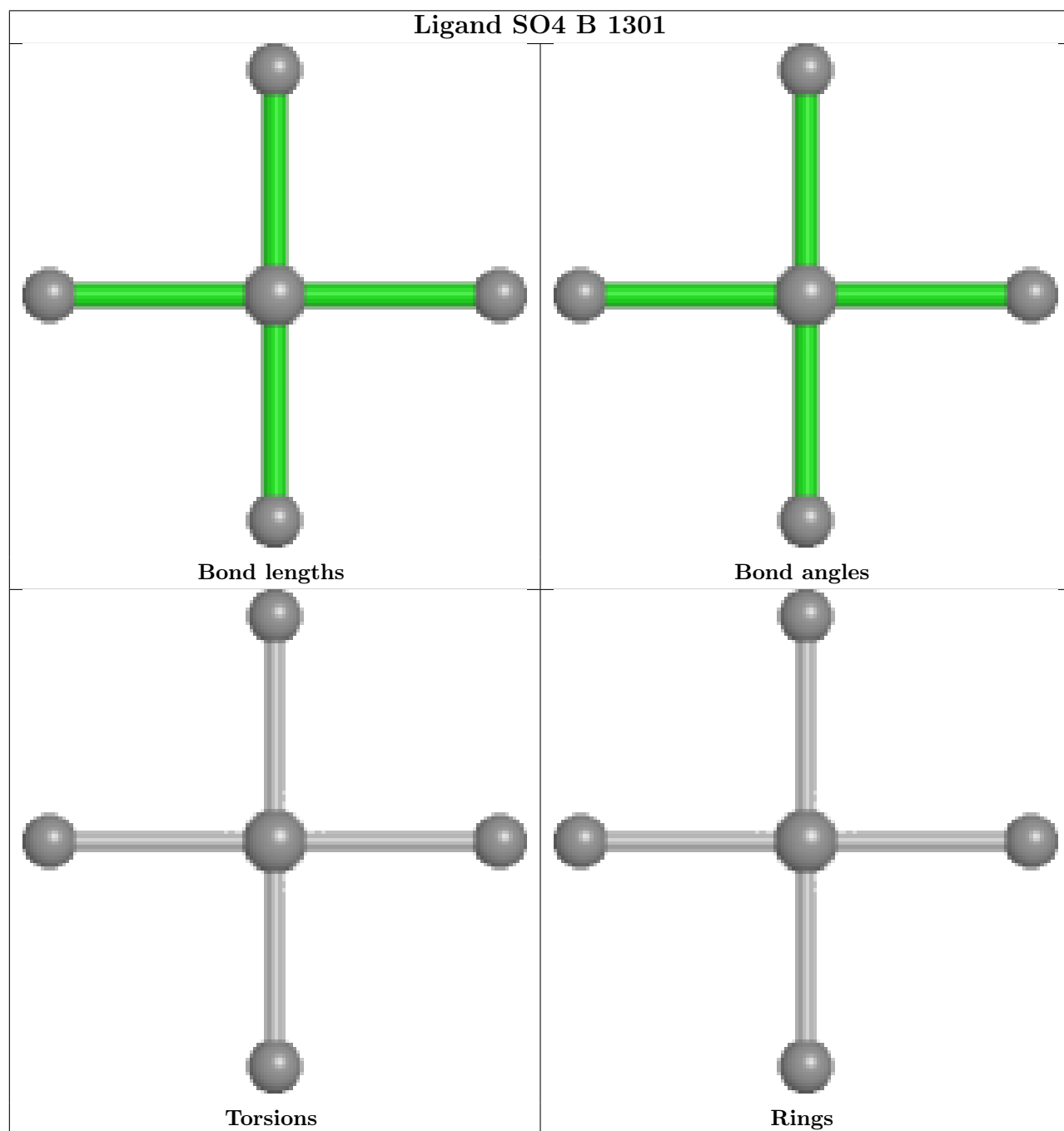There are no chirality outliers.

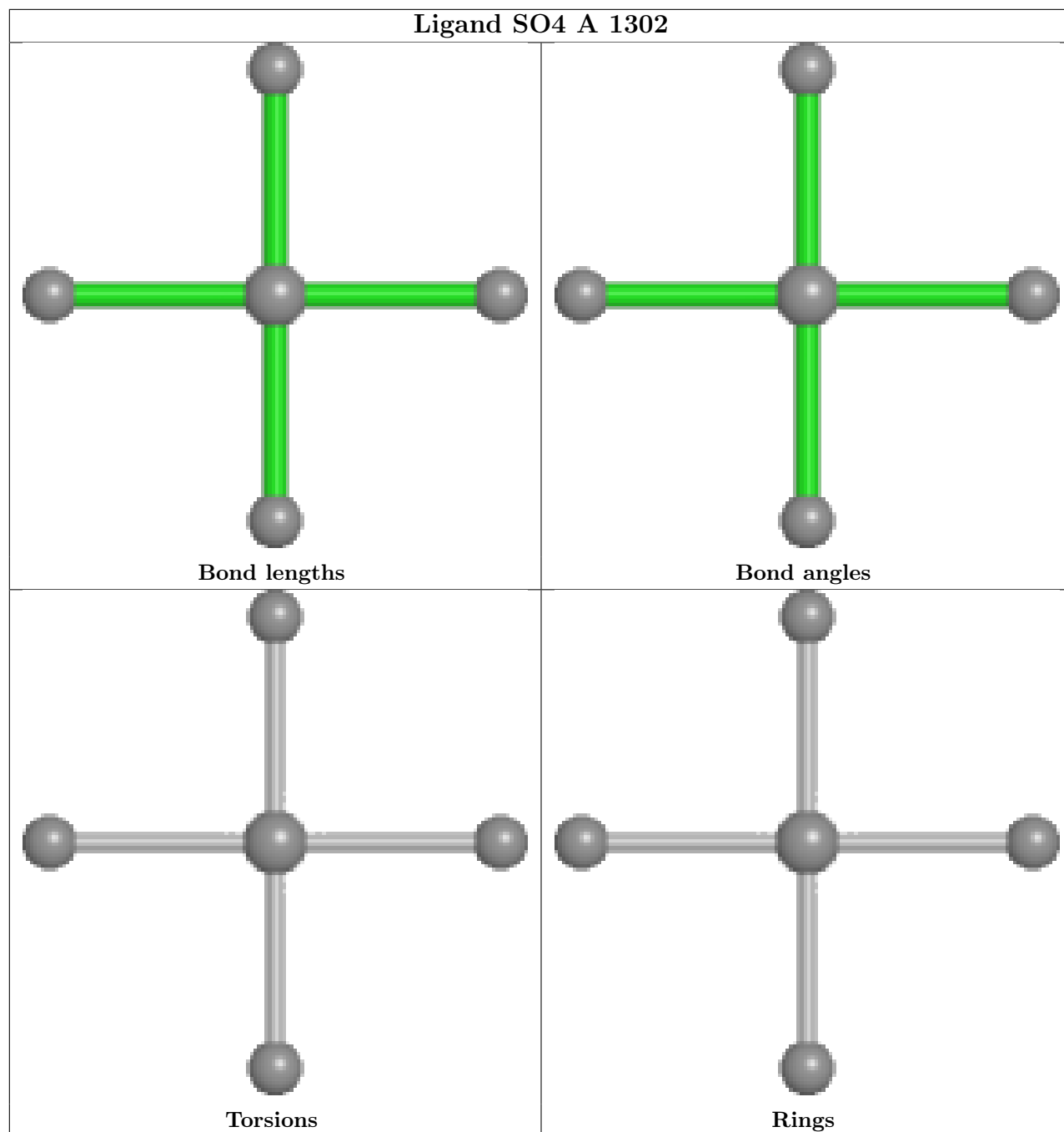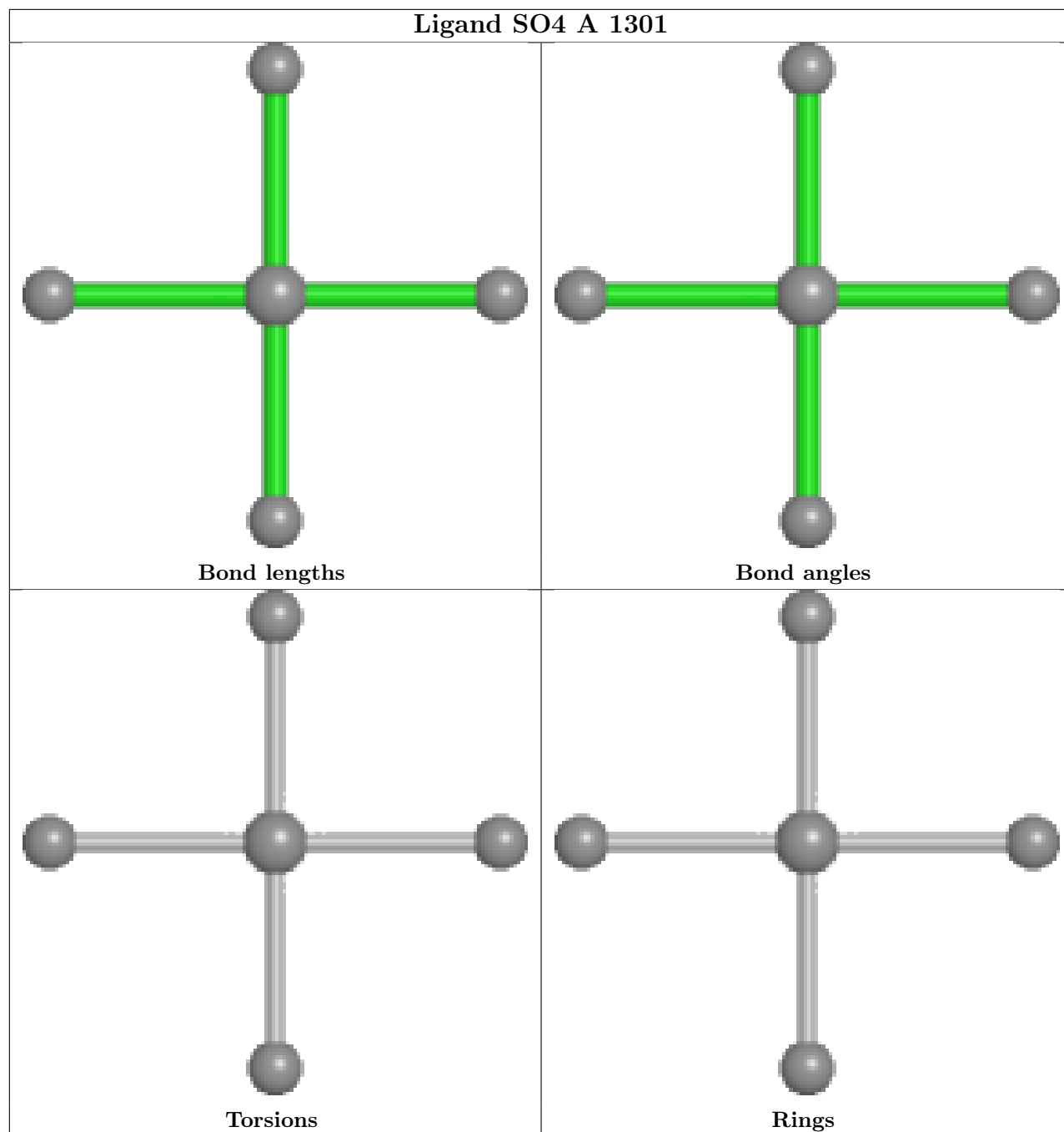There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 SO4 B 1301

Ligand SO4 A 1302

Bond lengths

Bond angles

Torsions

Rings

Ligand SO4 A 1301

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	729/806 (90%)	-0.06	16 (2%)	62	61	27, 51, 100, 151	0
1	B	716/806 (88%)	-0.01	32 (4%)	33	31	29, 56, 113, 167	0
1	C	644/806 (79%)	0.18	43 (6%)	17	15	41, 68, 127, 158	0
1	D	656/806 (81%)	0.45	58 (8%)	10	8	54, 91, 116, 142	0
All	All	2745/3224 (85%)	0.13	149 (5%)	25	24	27, 67, 118, 167	0

All (149) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	939	VAL	4.8
1	B	681	PRO	4.7
1	C	472	GLY	4.5
1	D	655	LYS	4.4
1	C	515	GLY	4.2
1	C	680	LEU	4.1
1	C	565	LEU	3.9
1	C	693	LEU	3.9
1	C	660	ASP	3.7
1	B	692	TYR	3.6
1	D	895	PHE	3.6
1	C	598	TRP	3.5
1	C	679	GLY	3.5
1	A	583	ASN	3.5
1	C	505	ALA	3.5
1	A	434	ARG	3.4
1	B	499	LYS	3.4
1	C	657	GLN	3.4
1	D	902	LEU	3.4
1	B	1095	GLN	3.3
1	B	689	THR	3.3

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Mol	Chain	Res	Type	RSRZ
1	C	633	ARG	3.3
1	A	433	ASN	3.3
1	B	526	ASP	3.3
1	C	517	GLN	3.2
1	A	497	SER	3.2
1	D	674	GLN	3.2
1	D	475	VAL	3.1
1	C	631	MET	3.1
1	D	603	PRO	3.1
1	C	948	GLU	3.1
1	C	632	LYS	3.1
1	D	989	PHE	3.1
1	D	500	GLN	3.1
1	C	591	SER	3.0
1	C	644	GLU	3.0
1	A	1133	LEU	3.0
1	B	522	TYR	3.0
1	C	640	TYR	3.0
1	C	516	LEU	3.0
1	B	449	GLY	2.9
1	C	585	GLN	2.9
1	D	505	ALA	2.9
1	D	536	ILE	2.9
1	C	483	VAL	2.9
1	B	690	THR	2.9
1	D	882	GLY	2.9
1	D	604	ASN	2.9
1	D	526	ASP	2.8
1	C	655	LYS	2.8
1	C	656	LYS	2.8
1	D	1133	LEU	2.8
1	B	557	ILE	2.8
1	B	521	ASN	2.8
1	B	602	THR	2.8
1	C	512	LYS	2.8
1	D	499	LYS	2.8
1	D	721	GLY	2.8
1	D	595	PHE	2.7
1	D	643	PRO	2.7
1	B	536	ILE	2.7
1	A	600	SER	2.7
1	D	843	PRO	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	797	GLY	2.7
1	B	680	LEU	2.7
1	C	484	PHE	2.6
1	D	1160	ARG	2.6
1	A	641	SER	2.6
1	B	527	SER	2.6
1	B	608	TRP	2.6
1	B	496	ALA	2.6
1	D	451	ASN	2.6
1	A	554	ILE	2.6
1	C	603	PRO	2.6
1	B	494	ARG	2.6
1	A	603	PRO	2.5
1	B	691	THR	2.5
1	C	695	TYR	2.5
1	D	496	ALA	2.5
1	C	681	PRO	2.4
1	D	927	PRO	2.4
1	C	648	ALA	2.4
1	D	584	LYS	2.4
1	C	607	LYS	2.4
1	C	678	LEU	2.4
1	B	640	TYR	2.4
1	C	584	LYS	2.4
1	B	498	HIS	2.4
1	D	593	PRO	2.4
1	D	986	HIS	2.4
1	B	1187	GLN	2.4
1	D	928	VAL	2.4
1	D	503	GLU	2.4
1	B	1092	GLU	2.3
1	B	585	GLN	2.3
1	A	502	MET	2.3
1	D	935	TYR	2.3
1	D	859	GLY	2.3
1	D	657	GLN	2.3
1	D	934	THR	2.3
1	D	844	ILE	2.3
1	C	675	ARG	2.3
1	B	679	GLY	2.3
1	D	498	HIS	2.3
1	D	585	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	1093	ALA	2.3
1	D	670	GLU	2.3
1	C	583	ASN	2.2
1	C	940	LEU	2.2
1	C	487	ARG	2.2
1	B	1136	LEU	2.2
1	B	588	ALA	2.2
1	C	636	ILE	2.2
1	D	554	ILE	2.2
1	C	587	MET	2.2
1	D	675	ARG	2.2
1	A	567	HIS	2.2
1	C	950	THR	2.2
1	A	527	SER	2.2
1	B	519	LYS	2.2
1	D	567	HIS	2.2
1	B	589	PHE	2.2
1	D	476	VAL	2.1
1	D	714	SER	2.1
1	A	498	HIS	2.1
1	A	553	LEU	2.1
1	A	524	ASP	2.1
1	D	448	GLY	2.1
1	D	929	ARG	2.1
1	A	469	ALA	2.1
1	D	1094	GLN	2.1
1	D	474	GLY	2.1
1	D	1186	LYS	2.1
1	D	1183	ALA	2.1
1	D	678	LEU	2.1
1	C	605	HIS	2.1
1	D	1029	TYR	2.1
1	D	449	GLY	2.1
1	D	671	ASP	2.1
1	D	1188	ASP	2.1
1	D	1078	ILE	2.0
1	C	659	ASP	2.0
1	C	504	ASN	2.0
1	D	1011	LYS	2.0
1	B	523	GLU	2.0
1	D	1145	CYS	2.0
1	D	559	HIS	2.0

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Mol	Chain	Res	Type	RSRZ
1	B	1123	PRO	2.0
1	C	514	VAL	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
2	SO4	A	1301	5/5	0.84	0.17	139,139,140,144	0
2	SO4	A	1302	5/5	0.91	0.14	95,96,97,104	0
2	SO4	B	1301	5/5	0.92	0.20	115,115,119,124	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.
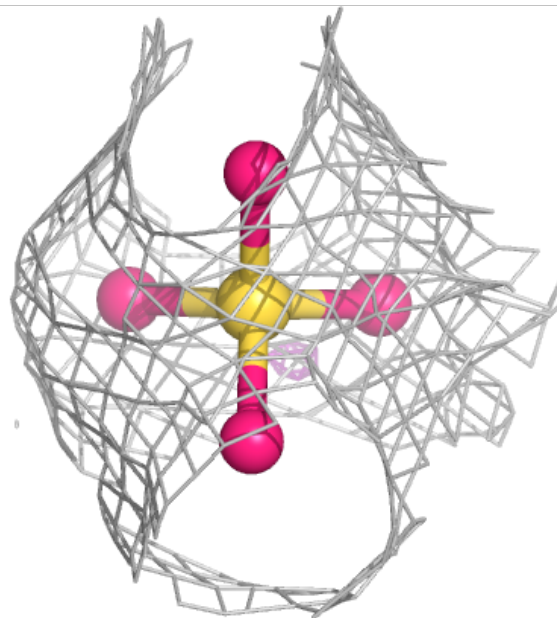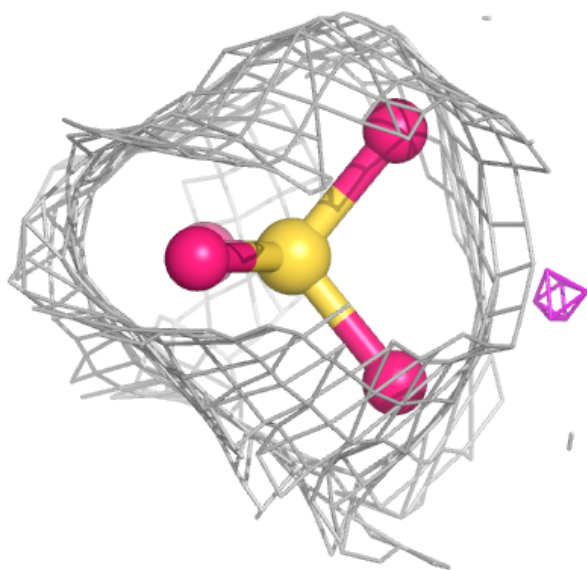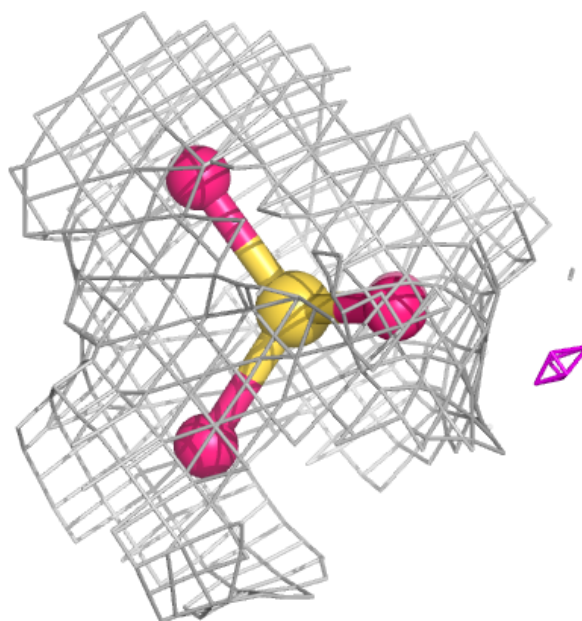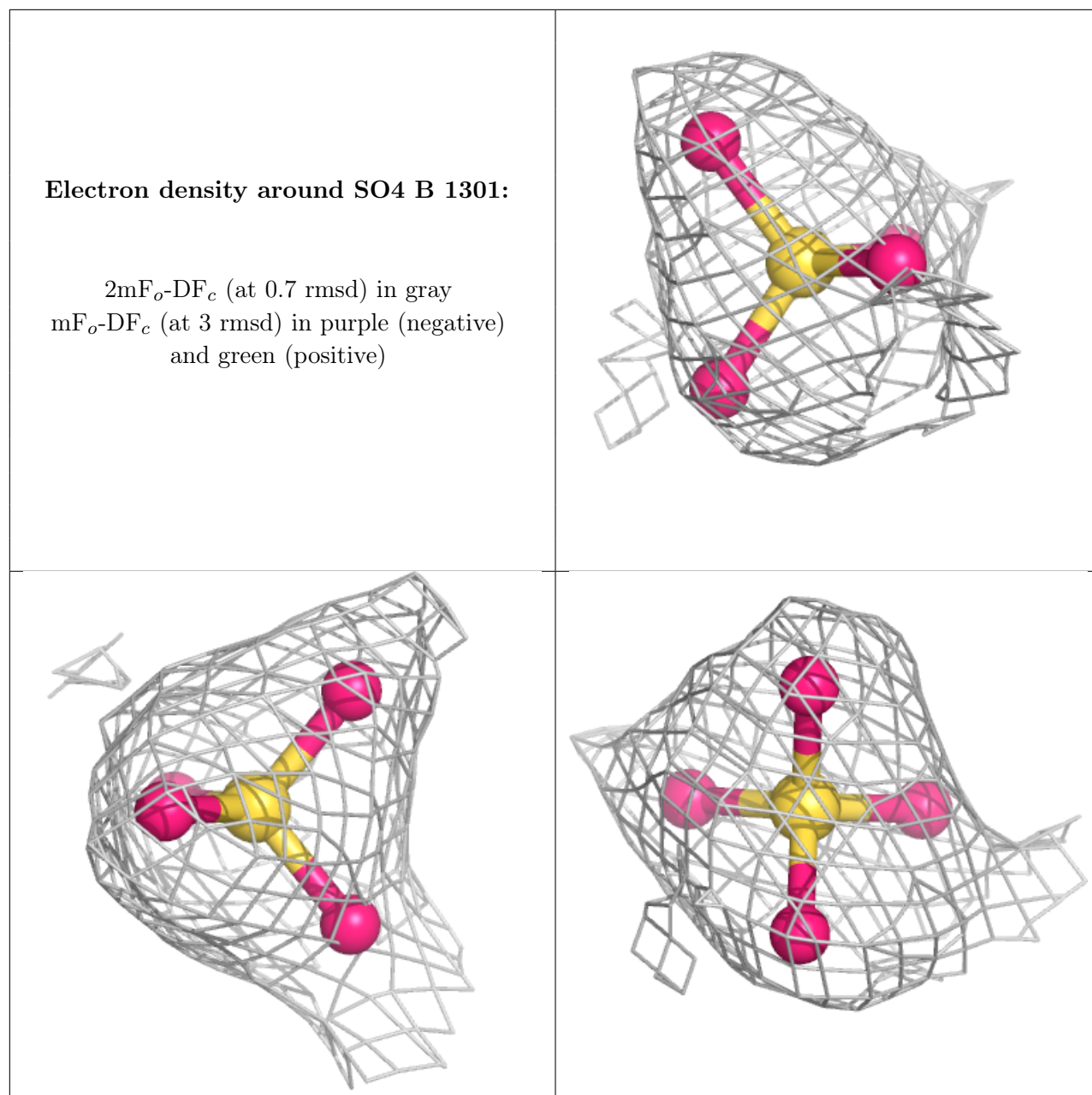
Electron density around SO4 A 1301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
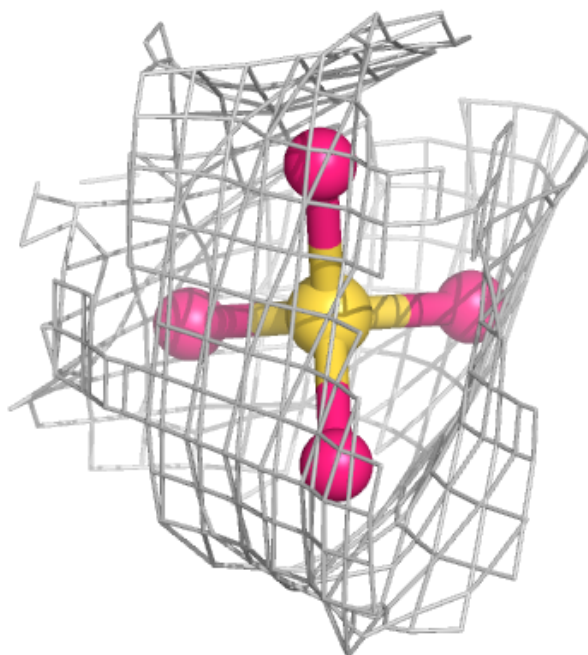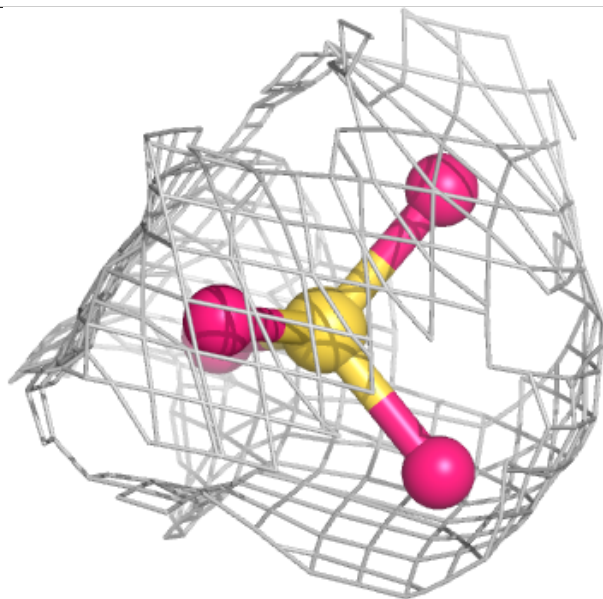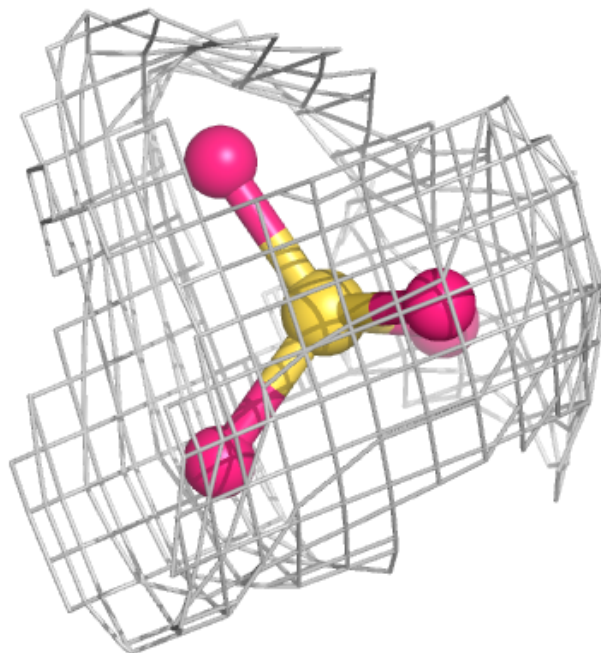
Electron density around SO4 A 1302:

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

Electron density around SO4 B 1301:

$2mF_o$-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.