



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 17, 2026 – 11:49 PM UTC

PDB ID : 5JN9 / pdb_00005jn9
Title : Crystal structure for the complex of human carbonic anhydrase IV and ethoxy-zolamide
Authors : Chen, Z.; Waheed, A.; Di Cera, E.; Sly, W.S.
Deposited on : 2016-04-29
Resolution : 2.10 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

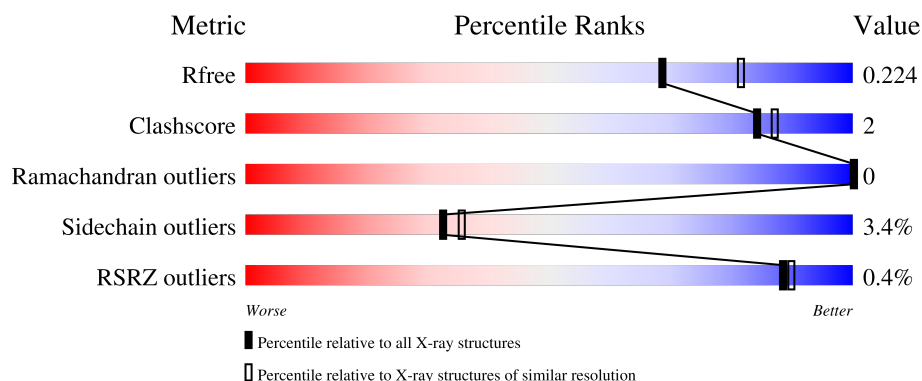
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

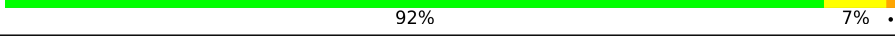
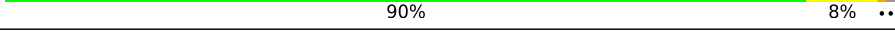
The reported resolution of this entry is 2.10 Å.

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}	180053	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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

Mol	Chain	Length	Quality of chain
1	A	266	 89% 7% ..
1	B	266	 87% 8% ..
1	C	266	 92% 7% ..
1	D	266	 90% 8% ..

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 9431 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.

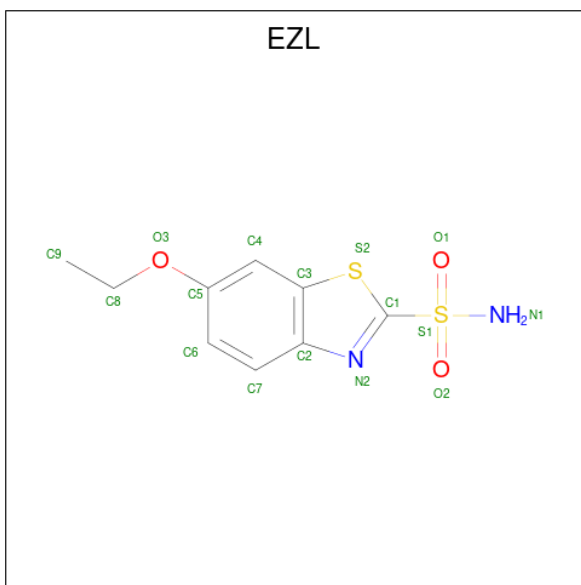
- Molecule 1 is a protein called Carbonic anhydrase 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	259	Total	C	N	O	S	0	1	0
			2084	1322	357	394	11			
1	B	255	Total	C	N	O	S	0	0	0
			2050	1303	350	386	11			
1	C	264	Total	C	N	O	S	0	0	0
			2120	1343	365	401	11			
1	D	263	Total	C	N	O	S	0	1	0
			2122	1345	367	399	11			

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

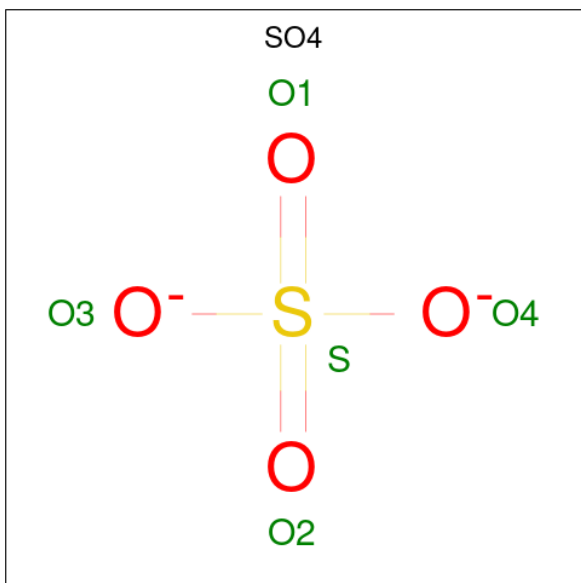
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		
2	C	1	Total	Zn	0	0
			1	1		
2	D	1	Total	Zn	0	0
			1	1		

- Molecule 3 is 6-ethoxy-1,3-benzothiazole-2-sulfonamide (CCD ID: EZL) (formula: C₉H₁₀N₂O₃S₂).



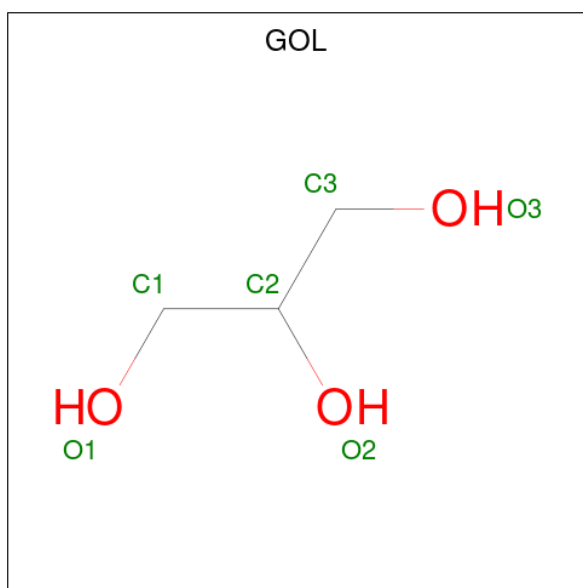
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			16	9	2	3	2		
3	B	1	Total	C	N	O	S	0	0
			16	9	2	3	2		
3	C	1	Total	C	N	O	S	0	0
			16	9	2	3	2		
3	D	1	Total	C	N	O	S	0	0
			16	9	2	3	2		

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



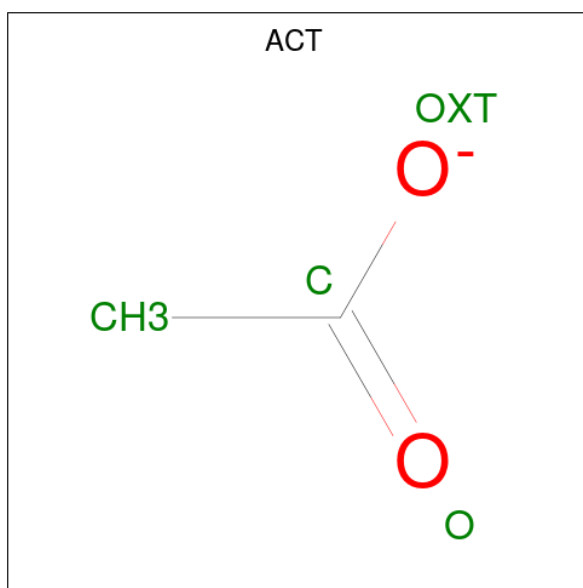
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O S 5 4 1	0	0
4	A	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	B	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	C	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 6 is ACETATE ION (CCD ID: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			4	2	2		
6	D	1	Total	C	O	0	0
			4	2	2		

- Molecule 7 is water.

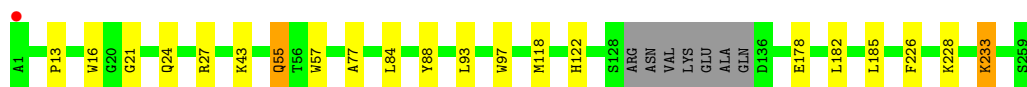
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	255	Total	O	0	0
			255	255		
7	B	210	Total	O	0	0
			210	210		
7	C	219	Total	O	0	0
			219	219		
7	D	231	Total	O	0	0
			231	231		

3 Residue-property plots [i](#)

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

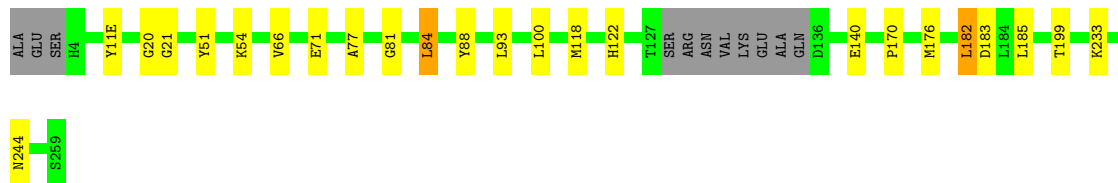
- Molecule 1: Carbonic anhydrase 4

Chain A:  89% 7% ..

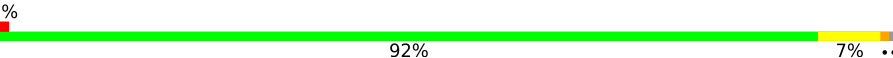


- Molecule 1: Carbonic anhydrase 4

Chain B:  87% 8% ..



- Molecule 1: Carbonic anhydrase 4

Chain C:  92% 7% ..



- Molecule 1: Carbonic anhydrase 4

Chain D:  90% 8% ..



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	64.78Å 123.98Å 151.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.00 – 2.10 40.00 – 2.10	Depositor EDS
% Data completeness (in resolution range)	94.4 (40.00-2.10) 94.4 (40.00-2.10)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.94 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.8.0107	Depositor
R, R_{free}	0.170 , 0.220 0.178 , 0.224	Depositor DCC
R_{free} test set	3413 reflections (4.74%)	wwPDB-VP
Wilson B-factor (Å ²)	24.1	Xtriage
Anisotropy	0.062	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 51.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	9431	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.71% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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

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	0.91	2/2137 (0.1%)	0.91	1/2888 (0.0%)
1	B	0.89	3/2100 (0.1%)	0.97	4/2839 (0.1%)
1	C	0.88	0/2171	0.91	0/2935
1	D	0.87	0/2176	0.94	1/2941 (0.0%)
All	All	0.89	5/8584 (0.1%)	0.93	6/11603 (0.1%)

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
1	A	0	1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	77	ALA	C-N	-9.99	1.20	1.33
1	B	20	GLY	C-O	-6.26	1.18	1.24
1	A	233	LYS	C-O	-5.25	1.17	1.24
1	B	77	ALA	C-N	-5.24	1.26	1.33
1	B	21	GLY	C-N	-5.06	1.26	1.33

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	21	GLY	O-C-N	-7.87	113.47	122.67
1	A	77	ALA	O-C-N	-5.52	116.95	123.25
1	B	66	VAL	N-CA-C	-5.43	100.66	108.53
1	B	244	ASN	N-CA-C	-5.08	103.61	110.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	100	LEU	CA-C-N	5.04	124.65	119.56
1	B	100	LEU	C-N-CA	5.04	124.65	119.56

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	21	GLY	Mainchain

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	2084	0	2052	10	0
1	B	2050	0	2015	10	0
1	C	2120	0	2086	7	0
1	D	2122	0	2094	11	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	16	0	9	0	0
3	B	16	0	9	1	0
3	C	16	0	9	0	0
3	D	16	0	9	0	0
4	A	10	0	0	1	0
4	B	10	0	0	0	0
4	C	10	0	0	0	0
4	D	10	0	0	0	0
5	A	6	0	8	0	0
5	B	6	0	8	0	0
5	C	12	0	15	0	0
6	B	4	0	3	0	0
6	D	4	0	3	1	0
7	A	255	0	0	3	0
7	B	210	0	0	2	0
7	C	219	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	D	231	0	0	2	0
All	All	9431	0	8320	38	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 2.

All (38) 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:27[B]:ARG:NH2	4:A:303:SO4:O3	2.21	0.70
1:D:46[B]:ARG:NH1	7:D:602:HOH:O	2.25	0.69
1:C:51:TYR:HB3	1:C:182:LEU:HD13	1.81	0.62
1:B:51:TYR:HB3	1:B:182:LEU:HD13	1.82	0.61
1:D:158:GLN:NE2	7:D:603:HOH:O	2.29	0.55
1:A:24:GLN:NE2	7:A:504:HOH:O	2.39	0.55
1:A:88:TYR:HB3	1:A:122:HIS:HB3	1.91	0.53
1:B:118:MET:HE1	1:B:185:LEU:HD23	1.93	0.51
1:B:71:GLU:HA	7:B:568:HOH:O	2.10	0.51
1:A:118:MET:HE1	1:A:185:LEU:HD23	1.93	0.50
1:A:228:LYS:NZ	7:A:508:HOH:O	2.45	0.49
1:D:67:MET:HE2	1:D:69:LEU:CD2	2.43	0.48
1:C:93:LEU:C	1:C:93:LEU:HD23	2.37	0.48
1:D:118:MET:HE1	1:D:185:LEU:CD2	2.44	0.48
1:D:118:MET:HE1	1:D:185:LEU:HD23	1.96	0.48
1:A:27[A]:ARG:NH1	7:A:509:HOH:O	2.45	0.47
1:A:55:GLN:HG3	1:A:57:TRP:CZ2	2.49	0.47
1:C:54:LYS:HB3	1:C:178:GLU:HG2	1.96	0.47
1:D:51:TYR:HB3	1:D:182:LEU:HD13	1.97	0.46
1:B:11(E):TYR:HB2	7:B:402:HOH:O	2.15	0.45
1:B:88:TYR:HB3	1:B:122:HIS:HB3	1.97	0.45
1:C:93:LEU:HD23	1:C:94:HIS:N	2.32	0.45
1:A:93:LEU:C	1:A:93:LEU:HD23	2.42	0.44
1:C:187(B):GLU:H	1:C:187(B):GLU:CD	2.25	0.44
1:D:30:PRO:HG3	1:D:106:GLU:HB3	2.00	0.44
1:D:67:MET:HE2	1:D:69:LEU:HD21	1.99	0.44
1:B:81:GLY:O	1:B:84:LEU:HB2	2.18	0.44
1:C:34:VAL:HG11	1:C:37:LYS:HD3	2.00	0.44
1:B:170:PRO:HG2	1:B:233:LYS:HG3	2.00	0.44
1:D:43:LYS:N	1:D:43:LYS:HD3	2.33	0.43
1:C:118:MET:HE1	1:C:185:LEU:HD23	1.99	0.43
1:B:199:THR:OG1	3:B:302:EZL:N1	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:97:TRP:CE2	1:A:226:PHE:HB3	2.55	0.42
1:D:224:LEU:HG	6:D:305:ACT:H3	2.01	0.42
1:B:54:LYS:NZ	1:B:183:ASP:OD2	2.52	0.42
1:A:13:PRO:HA	1:A:16:TRP:CE2	2.55	0.41
1:D:157:PHE:CG	1:D:218:LEU:HD21	2.56	0.41
1:B:93:LEU:C	1:B:93:LEU:HD23	2.46	0.41

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	256/266 (96%)	246 (96%)	10 (4%)	0	100	100
1	B	251/266 (94%)	247 (98%)	4 (2%)	0	100	100
1	C	262/266 (98%)	259 (99%)	3 (1%)	0	100	100
1	D	262/266 (98%)	258 (98%)	4 (2%)	0	100	100
All	All	1031/1064 (97%)	1010 (98%)	21 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	232/237 (98%)	226 (97%)	6 (3%)	40	46
1	B	228/237 (96%)	224 (98%)	4 (2%)	51	60
1	C	236/237 (100%)	225 (95%)	11 (5%)	23	24
1	D	236/237 (100%)	225 (95%)	11 (5%)	23	24
All	All	932/948 (98%)	900 (97%)	32 (3%)	32	35

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	43	LYS
1	A	55	GLN
1	A	84	LEU
1	A	178	GLU
1	A	182	LEU
1	A	233	LYS
1	B	84	LEU
1	B	140	GLU
1	B	176	MET
1	B	182	LEU
1	C	43	LYS
1	C	55	GLN
1	C	84	LEU
1	C	126	LYS
1	C	140	GLU
1	C	157	PHE
1	C	171	GLU
1	C	178	GLU
1	C	182	LEU
1	C	220	ARG
1	C	253	GLN
1	D	4	HIS
1	D	15	LYS
1	D	43	LYS
1	D	84	LEU
1	D	140	GLU
1	D	157	PHE
1	D	182	LEU
1	D	187	LYS
1	D	187(A)	GLU
1	D	187(B)	GLU
1	D	245	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11(D)	ASN
1	A	55	GLN
1	A	190	HIS
1	B	152	GLN
1	C	60	GLN
1	C	237	GLN
1	C	250	GLN
1	D	4	HIS
1	D	237	GLN
1	D	249	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 22 ligands modelled in this entry, 4 are monoatomic - leaving 18 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$
3	EZL	B	302	2	17,17,17	3.82	5 (29%)	25,25,25	2.37	8 (32%)
3	EZL	A	302	2	17,17,17	3.91	5 (29%)	25,25,25	2.85	9 (36%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	SO4	B	304	-	4,4,4	0.50	0	6,6,6	0.62	0
4	SO4	C	303	-	4,4,4	0.52	0	6,6,6	0.28	0
4	SO4	A	304	-	4,4,4	0.43	0	6,6,6	0.38	0
4	SO4	B	303	-	4,4,4	0.47	0	6,6,6	0.48	0
5	GOL	B	306	-	5,5,5	0.58	0	5,5,5	0.44	0
5	GOL	A	305	-	5,5,5	0.52	0	5,5,5	0.76	0
6	ACT	D	305	-	3,3,3	0.88	0	3,3,3	0.85	0
4	SO4	D	304	-	4,4,4	0.49	0	6,6,6	0.26	0
3	EZL	D	302	2	17,17,17	4.35	4 (23%)	25,25,25	2.58	11 (44%)
4	SO4	C	304	-	4,4,4	0.41	0	6,6,6	0.12	0
5	GOL	C	305	-	5,5,5	0.49	0	5,5,5	2.25	1 (20%)
6	ACT	B	305	-	3,3,3	0.88	0	3,3,3	0.45	0
4	SO4	A	303	-	4,4,4	0.31	0	6,6,6	0.64	0
4	SO4	D	303	-	4,4,4	0.42	0	6,6,6	0.33	0
3	EZL	C	302	2	17,17,17	3.71	4 (23%)	25,25,25	2.26	7 (28%)
5	GOL	C	306	-	5,5,5	0.40	0	5,5,5	0.27	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
3	EZL	B	302	2	-	3/9/9/9	0/2/2/2
3	EZL	A	302	2	-	3/9/9/9	0/2/2/2
5	GOL	B	306	-	-	2/4/4/4	-
5	GOL	A	305	-	-	1/4/4/4	-
3	EZL	D	302	2	-	1/9/9/9	0/2/2/2
5	GOL	C	305	-	-	2/4/4/4	-
3	EZL	C	302	2	-	3/9/9/9	0/2/2/2
5	GOL	C	306	-	-	2/4/4/4	-

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	302	EZL	C1-S1	-16.55	1.65	1.78
3	A	302	EZL	C1-S1	-14.72	1.67	1.78
3	B	302	EZL	C1-S1	-14.15	1.67	1.78
3	C	302	EZL	C1-S1	-13.73	1.67	1.78
3	D	302	EZL	C2-C3	4.74	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	302	EZL	C2-C3	4.73	1.47	1.40
3	B	302	EZL	C2-C3	4.64	1.47	1.40
3	A	302	EZL	C2-C3	4.23	1.46	1.40
3	C	302	EZL	C1-N2	3.26	1.35	1.29
3	A	302	EZL	C1-N2	3.11	1.35	1.29
3	A	302	EZL	C3-S2	-2.95	1.68	1.74
3	B	302	EZL	C3-S2	-2.74	1.68	1.74
3	B	302	EZL	C1-N2	2.71	1.34	1.29
3	D	302	EZL	C1-N2	2.65	1.34	1.29
3	D	302	EZL	C3-S2	-2.62	1.69	1.74
3	B	302	EZL	C2-N2	-2.46	1.34	1.39
3	A	302	EZL	C2-N2	-2.24	1.35	1.39
3	C	302	EZL	C3-S2	-2.01	1.70	1.74

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	302	EZL	O2-S1-O1	-7.91	108.96	120.27
3	B	302	EZL	O2-S1-O1	-6.29	111.28	120.27
3	A	302	EZL	O1-S1-N1	6.09	116.87	108.39
3	D	302	EZL	C2-C3-S2	5.31	117.59	109.75
3	C	302	EZL	O2-S1-O1	-5.08	113.00	120.27
3	B	302	EZL	O1-S1-C1	4.94	113.02	105.65
3	A	302	EZL	C2-C3-S2	4.74	116.75	109.75
3	D	302	EZL	O2-S1-O1	-4.67	113.59	120.27
3	C	302	EZL	O1-S1-N1	4.48	114.63	108.39
3	C	302	EZL	C8-O3-C5	4.48	128.36	117.90
3	D	302	EZL	C8-O3-C5	4.44	128.27	117.90
5	C	305	GOL	C3-C2-C1	4.20	127.21	111.80
3	D	302	EZL	C3-C2-N2	-4.05	108.14	115.20
3	B	302	EZL	O1-S1-N1	3.97	113.92	108.39
3	C	302	EZL	C2-C3-S2	3.85	115.43	109.75
3	A	302	EZL	C3-C2-N2	-3.85	108.49	115.20
3	D	302	EZL	O1-S1-N1	3.64	113.46	108.39
3	A	302	EZL	O2-S1-N1	-3.53	103.47	108.39
3	C	302	EZL	C3-C2-N2	-3.43	109.21	115.20
3	C	302	EZL	C4-C3-C2	-3.42	119.45	121.99
3	D	302	EZL	S1-C1-N2	-3.28	118.07	121.95
3	B	302	EZL	O2-S1-N1	-3.22	103.90	108.39
3	A	302	EZL	O1-S1-C1	3.20	110.42	105.65
3	D	302	EZL	C3-S2-C1	-3.14	83.89	87.50
3	D	302	EZL	O2-S1-N1	-2.99	104.22	108.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	302	EZL	O2-S1-C1	2.87	109.93	105.65
3	B	302	EZL	C4-C3-C2	-2.79	119.91	121.99
3	B	302	EZL	C3-C2-N2	-2.77	110.38	115.20
3	A	302	EZL	C4-C3-C2	-2.69	119.99	121.99
3	A	302	EZL	C8-O3-C5	2.65	124.10	117.90
3	D	302	EZL	C4-C3-C2	-2.62	120.04	121.99
3	D	302	EZL	O1-S1-C1	2.60	109.52	105.65
3	B	302	EZL	C2-C3-S2	2.50	113.44	109.75
3	D	302	EZL	C7-C2-N2	2.07	134.08	128.21
3	B	302	EZL	C8-O3-C5	2.06	122.71	117.90
3	C	302	EZL	O1-S1-C1	2.03	108.67	105.65

There are no chirality outliers.

All (17) torsion outliers are listed below:

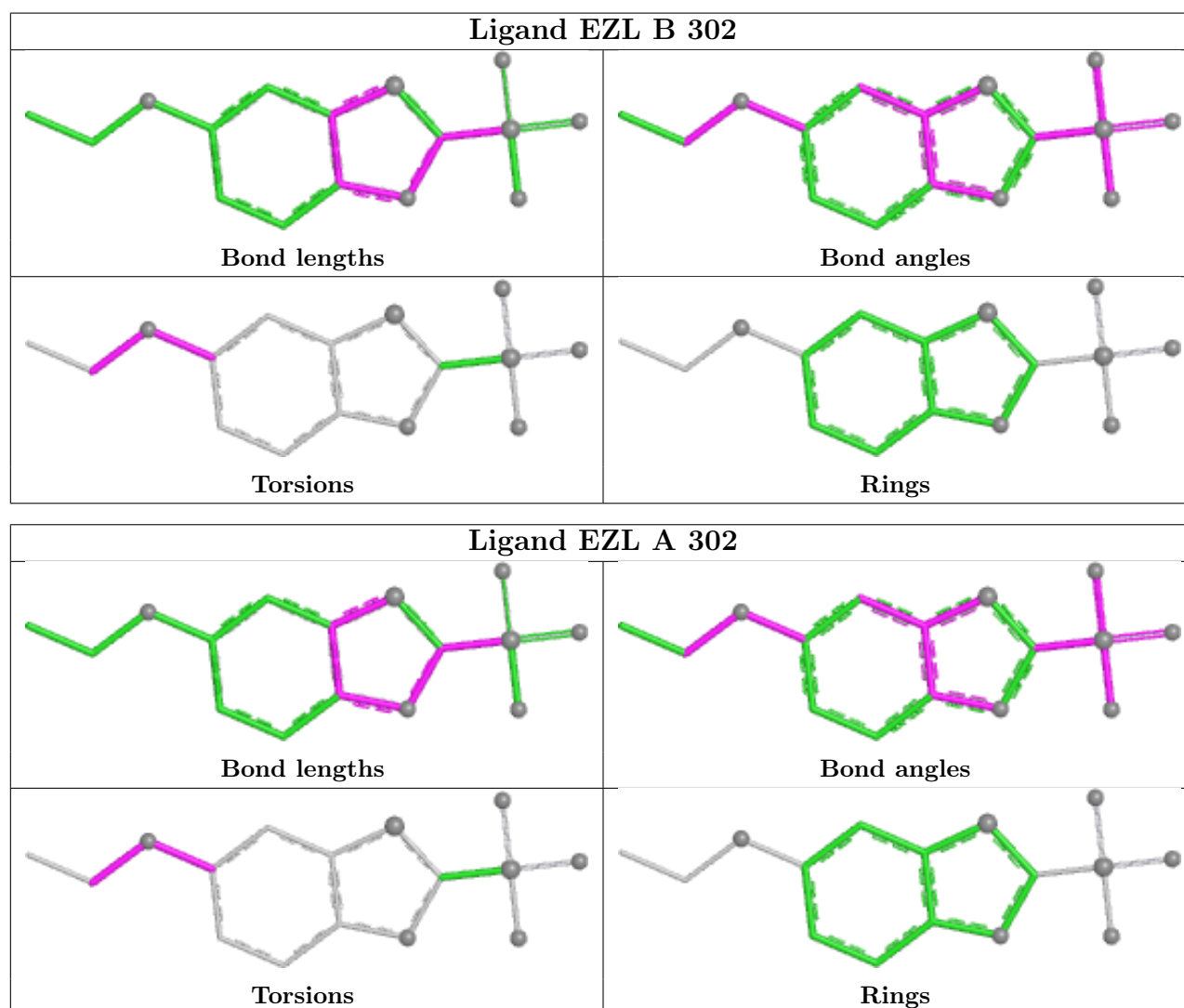
Mol	Chain	Res	Type	Atoms
5	C	305	GOL	O1-C1-C2-C3
5	C	305	GOL	C1-C2-C3-O3
3	C	302	EZL	C9-C8-O3-C5
3	D	302	EZL	C9-C8-O3-C5
3	B	302	EZL	C9-C8-O3-C5
5	B	306	GOL	O1-C1-C2-C3
5	C	306	GOL	C1-C2-C3-O3
3	A	302	EZL	C9-C8-O3-C5
5	B	306	GOL	O1-C1-C2-O2
3	B	302	EZL	C6-C5-O3-C8
3	B	302	EZL	C4-C5-O3-C8
5	C	306	GOL	O2-C2-C3-O3
3	A	302	EZL	C6-C5-O3-C8
3	A	302	EZL	C4-C5-O3-C8
3	C	302	EZL	C4-C5-O3-C8
5	A	305	GOL	O2-C2-C3-O3
3	C	302	EZL	C6-C5-O3-C8

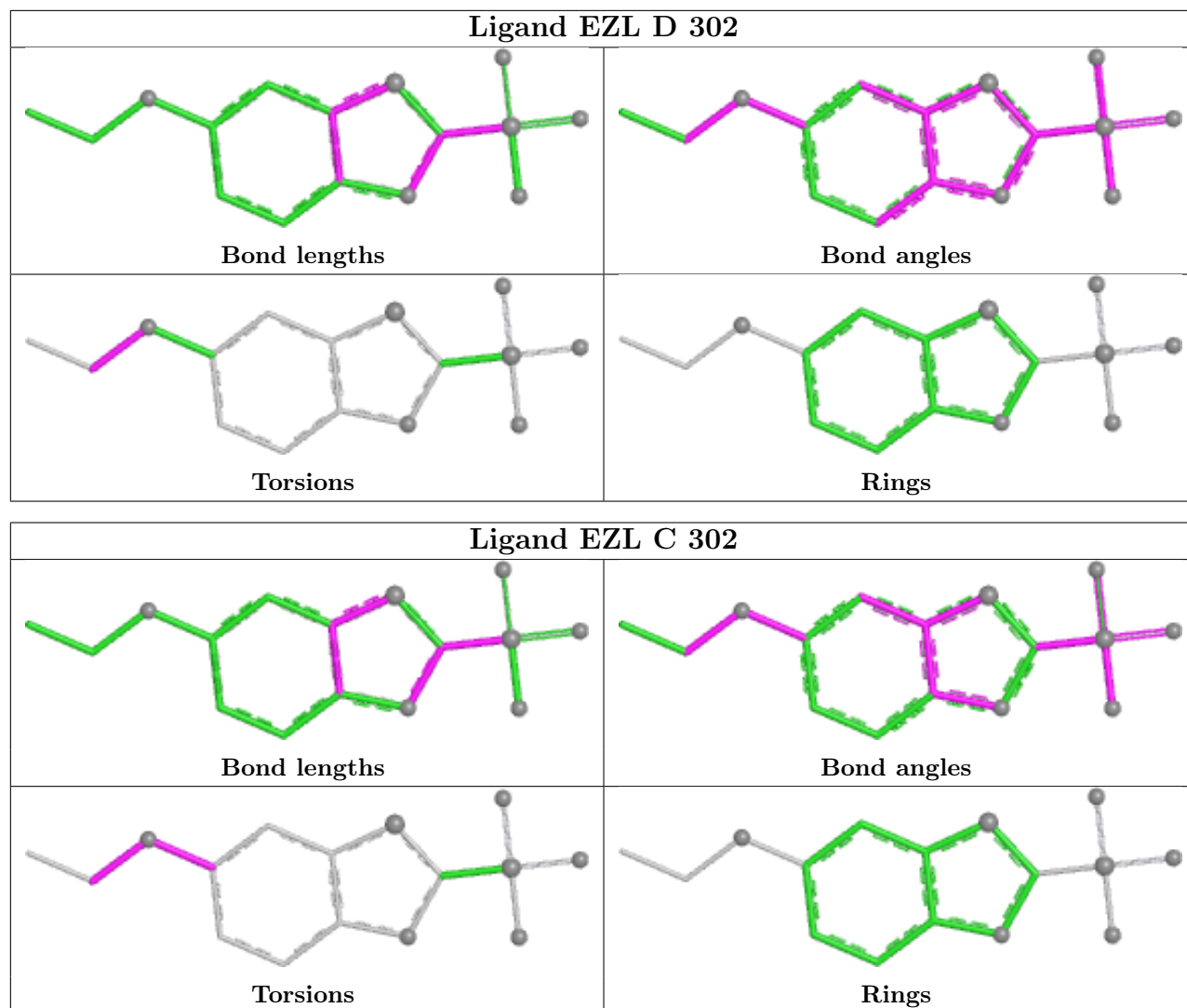
There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	302	EZL	1	0
6	D	305	ACT	1	0
4	A	303	SO4	1	0

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	259/266 (97%)	-0.50	1 (0%) 88 90	12, 26, 44, 70	1 (0%)
1	B	255/266 (95%)	-0.47	0 100 100	17, 26, 50, 65	0
1	C	264/266 (99%)	-0.40	2 (0%) 82 84	18, 27, 52, 92	0
1	D	263/266 (98%)	-0.50	1 (0%) 88 90	17, 25, 46, 90	1 (0%)
All	All	1041/1064 (97%)	-0.47	4 (0%) 88 90	12, 26, 49, 92	2 (0%)

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	11(E)	TYR	3.0
1	A	1	ALA	2.9
1	D	11(E)	TYR	2.8
1	C	11(F)	PRO	2.6

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

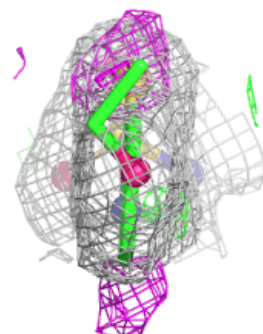
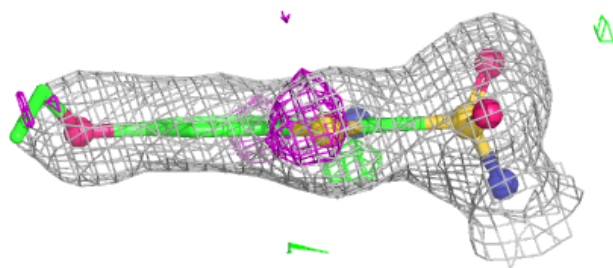
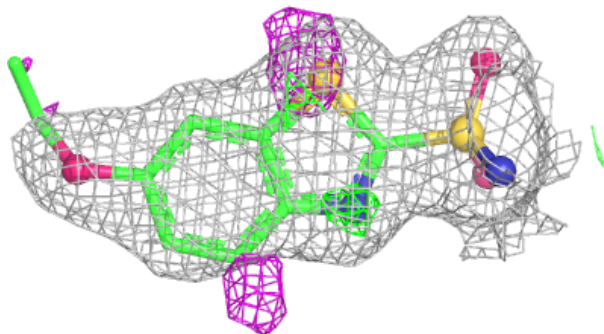
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	SO4	C	304	5/5	0.79	0.12	95,97,100,101	0
4	SO4	A	304	5/5	0.80	0.11	87,87,90,93	0
6	ACT	B	305	4/4	0.81	0.14	53,58,63,64	0
4	SO4	D	304	5/5	0.84	0.10	67,77,78,80	0
4	SO4	B	304	5/5	0.85	0.10	66,70,78,81	0
5	GOL	A	305	6/6	0.87	0.12	46,49,53,56	0
5	GOL	C	306	6/6	0.89	0.12	57,59,60,60	0
5	GOL	B	306	6/6	0.92	0.09	44,50,54,56	0
6	ACT	D	305	4/4	0.93	0.09	25,26,27,28	0
5	GOL	C	305	6/6	0.94	0.09	36,40,45,45	0
3	EZL	B	302	16/16	0.97	0.07	21,31,48,50	0
4	SO4	B	303	5/5	0.98	0.10	37,38,43,45	0
3	EZL	C	302	16/16	0.98	0.06	20,26,37,38	0
4	SO4	C	303	5/5	0.98	0.08	41,42,44,46	0
3	EZL	D	302	16/16	0.98	0.05	22,28,31,31	0
4	SO4	D	303	5/5	0.98	0.08	37,42,44,46	0
3	EZL	A	302	16/16	0.98	0.05	21,25,37,39	0
4	SO4	A	303	5/5	0.99	0.06	28,30,33,33	0
2	ZN	C	301	1/1	1.00	0.01	19,19,19,19	0
2	ZN	D	301	1/1	1.00	0.01	20,20,20,20	0
2	ZN	A	301	1/1	1.00	0.01	18,18,18,18	0
2	ZN	B	301	1/1	1.00	0.01	19,19,19,19	0

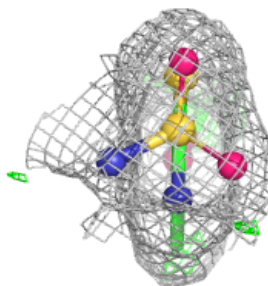
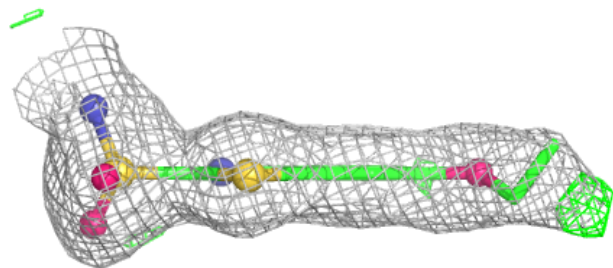
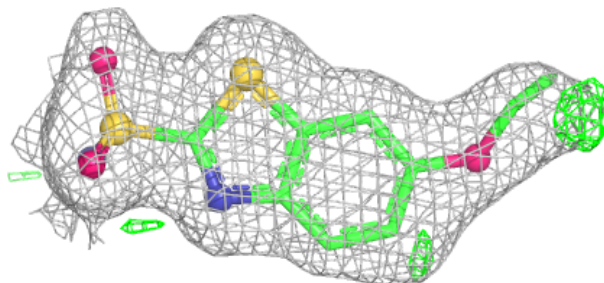
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around EZL B 302:

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

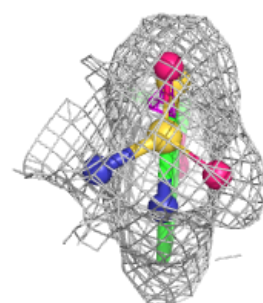
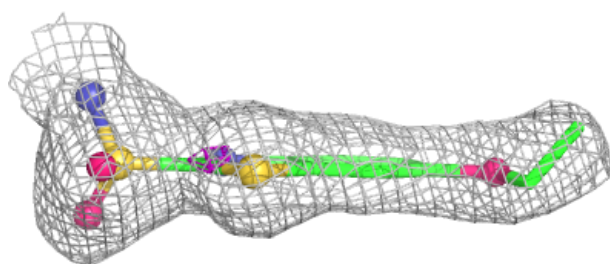
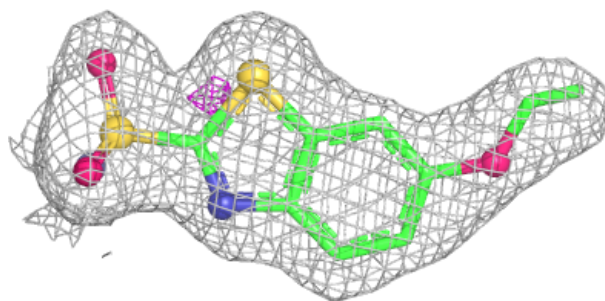
**Electron density around EZL C 302:**

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

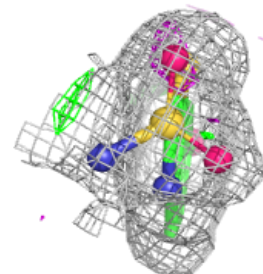
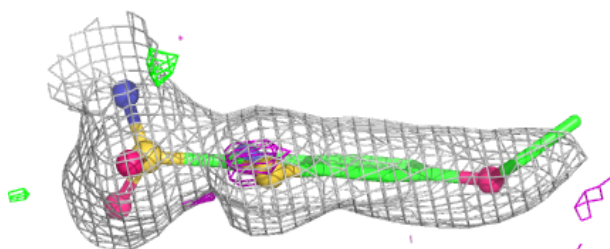
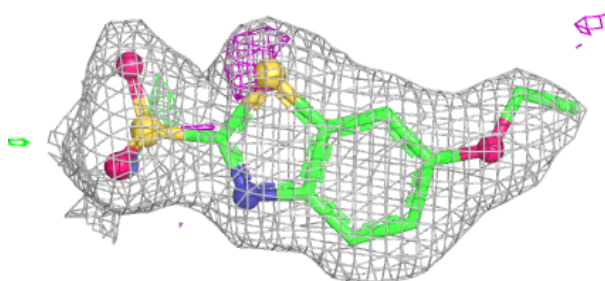


Electron density around EZL D 302:

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

**Electron density around EZL A 302:**

$2mF_o-DF_c$ (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.