Full wwPDB X-ray Structure Validation Report (i)

Nov 10, 2026 – 12:08 PM EST

PDB ID	:	9YUH / pdb_00009yuh
Title	:	human Siderocalin bound to 343HOPO-Er
Authors	:	Rupert, P.B.; Strong, R.K.
Deposited on	:	2025-10-22
Resolution	:	2.30 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 (i) 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 (i)) were used in the production of this report:

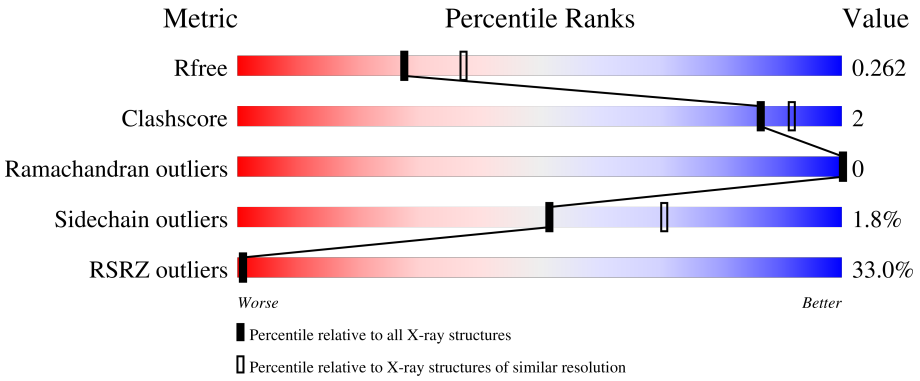
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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

Mol	Chain	Length	Quality of chain
1	A	178	10% 94%
1	B	178	80% 91% 5%
1	C	178	6% 89% 7%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	A1DER	C	201	X	-	-	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 4283 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.

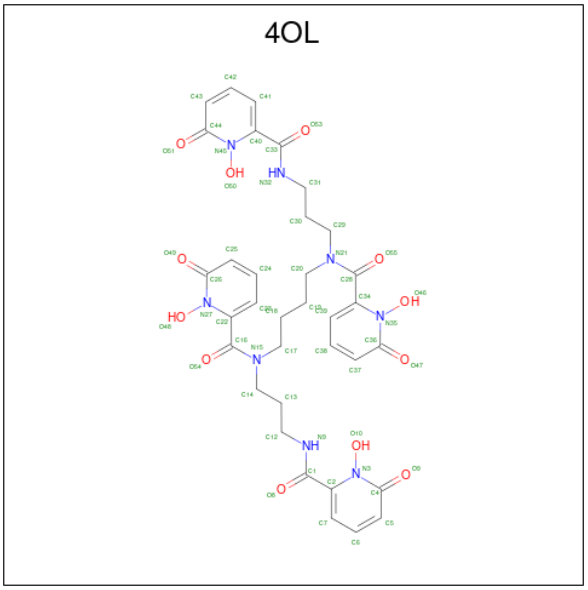
- Molecule 1 is a protein called Neutrophil gelatinase-associated lipocalin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	175	Total	C	N	O	S	0	1	0
			1399	907	230	258	4			
1	B	169	Total	C	N	O	S	0	1	0
			1321	860	220	237	4			
1	C	174	Total	C	N	O	S	0	2	0
			1389	903	228	254	4			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	87	SER	CYS	engineered mutation	UNP P80188
B	87	SER	CYS	engineered mutation	UNP P80188
C	87	SER	CYS	engineered mutation	UNP P80188

- Molecule 2 is N,N'-butane-1,4-diylbis[1-hydroxy-N-(3-{[(1-hydroxy-6-oxo-1,6-dihydropyridin-2-yl)carbonyl]amino}propyl)-6-oxo-1,6-dihydropyridine-2-carboxamide] (CCD ID: 4OL) (formula: $C_{34}H_{38}N_8O_{12}$) (labeled as "Ligand of Interest" by depositor).

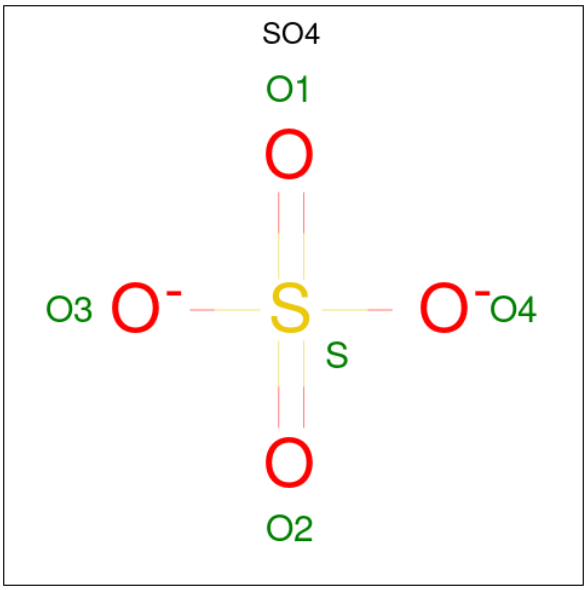


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			54	34	8	12		

- Molecule 3 is ERBIUM (III) ION (CCD ID: ER3) (formula: Er) (labeled as "Ligand of Interest" by depositor).

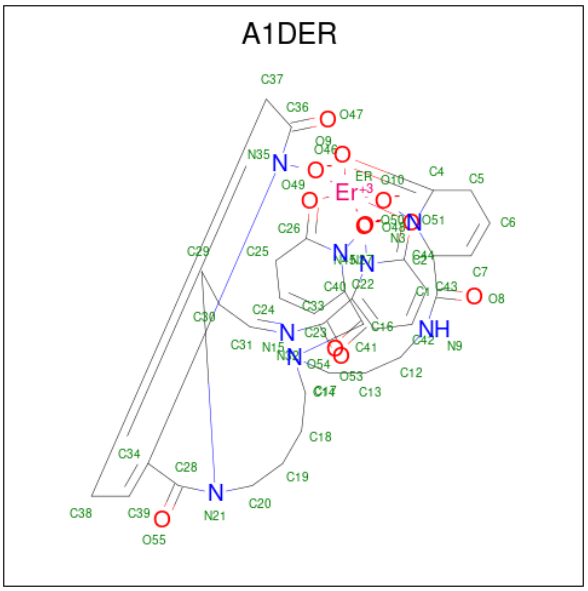
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Er	0	0
			1	1		

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



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

- Molecule 5 is [(1R)-6-[(S)-[(3E)-3-{[(1R)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,6-dihydropyridine-2-carbonyl]imino}propyl]{4-[(S)-[(1R,2S)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,2,5,6-tetrahydropyridine-2-carbonyl](3-{[(1S,2R)-1-(oxido-kappaO)-6-(oxo-kappaO)-1,2,5,6-tetrahydropyridine-2-carbonyl]amino}propyl)amino]butyl}carbamoyl]-2-oxopyridin-1(2H)-olato-kappaO]erbate(1-) (CCD ID: A1DER) (formula: $C_{34}H_{36}ErN_8O_{12}$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	C	1	Total	C	Er	N	O	0	0
			55	34	1	8	12		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	15	Total	O	0	0
			15	15		
6	B	1	Total	O	0	0
			1	1		
6	C	38	Total	O	0	0
			38	38		

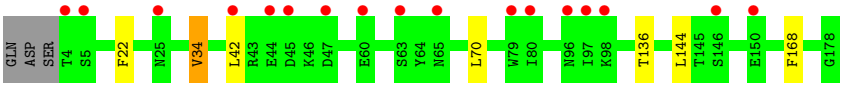
3 Residue-property plots (i)

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: Neutrophil gelatinase-associated lipocalin

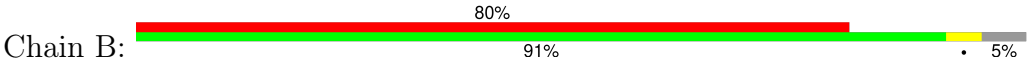
Chain A:

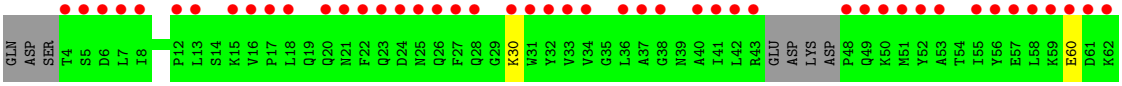


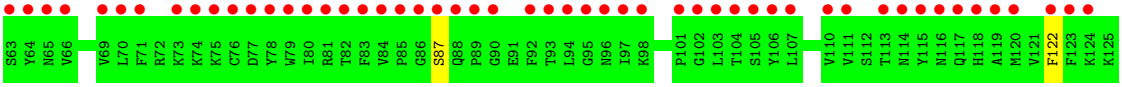


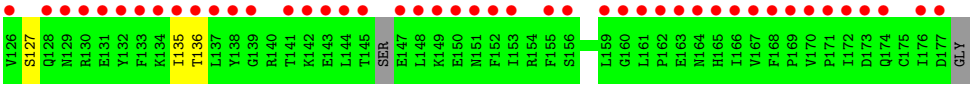
• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain B:



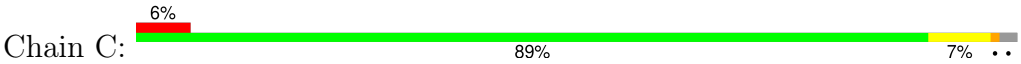


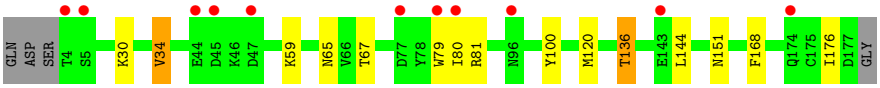




• Molecule 1: Neutrophil gelatinase-associated lipocalin

Chain C:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α, β, γ	115.04Å 115.04Å 118.97Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.06 – 2.30 48.06 – 2.30	Depositor EDS
% Data completeness (in resolution range)	98.8 (48.06-2.30) 98.8 (48.06-2.30)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	6.05 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.234 , 0.259 0.240 , 0.262	Depositor DCC
R_{free} test set	1806 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	36.9	Xtriage
Anisotropy	0.128	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 40.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.012 for -h,l,k 0.007 for -l,-k,-h	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	4283	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.36% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, ER3, A1DER, 4OL

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	0.67	0/1436	1.06	1/1950 (0.1%)
1	B	0.56	0/1354	0.95	1/1837 (0.1%)
1	C	0.74	1/1432 (0.1%)	1.12	2/1948 (0.1%)
All	All	0.66	1/4222 (0.0%)	1.05	4/5735 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	168	PHE	C-O	-5.10	1.19	1.24

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	168	PHE	CA-CB-CG	-6.25	107.55	113.80
1	C	136	THR	CA-CB-OG1	-5.77	100.94	109.60
1	A	168	PHE	CA-CB-CG	-5.69	108.11	113.80
1	B	136	THR	CA-CB-OG1	-5.31	101.63	109.60

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	1399	0	1363	3	0
1	B	1321	0	1269	3	0
1	C	1389	0	1349	9	0
2	A	54	0	38	1	0
3	A	1	0	0	0	0
4	A	5	0	0	1	0
4	C	5	0	0	1	0
5	C	55	0	0	1	0
6	A	15	0	0	1	0
6	B	1	0	0	0	0
6	C	38	0	0	0	0
All	All	4283	0	4019	17	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 (17) 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:B:122:PHE:HD1	1:B:135:ILE:CD1	2.03	0.70
5:C:201:A1DER:O50	5:C:201:A1DER:N32	2.22	0.70
2:A:201:4OL:O50	2:A:201:4OL:N32	2.32	0.59
1:C:30:LYS:NZ	1:C:176:ILE:O	2.31	0.56
1:A:34:VAL:HG21	1:A:144:LEU:HD12	1.87	0.56
1:C:34:VAL:HG21	1:C:144:LEU:HD12	1.90	0.54
1:B:122:PHE:CD1	1:B:135:ILE:CD1	2.88	0.52
1:C:59:LYS:HD3	1:C:65:ASN:OD1	2.09	0.52
1:C:67:THR:HG23	1:C:80:ILE:HG12	1.98	0.46
1:A:22:PHE:O	6:A:301:HOH:O	2.21	0.45
1:B:122:PHE:HD1	1:B:135:ILE:HD11	1.81	0.44
1:C:136:THR:HG21	4:C:202:SO4:O4	2.18	0.43
1:C:79:TRP:CE2	1:C:81:ARG:HD2	2.53	0.43
1:A:136:THR:HG21	4:A:203:SO4:O1	2.20	0.41
1:C:79:TRP:CH2	1:C:100:TYR:CE2	3.09	0.41
1:C:120:MET:HE1	1:C:151:ASN:OD1	2.21	0.41
1:C:79:TRP:HH2	1:C:100:TYR:CE2	2.40	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	174/178 (98%)	170 (98%)	4 (2%)	0	100	100
1	B	164/178 (92%)	160 (98%)	4 (2%)	0	100	100
1	C	174/178 (98%)	170 (98%)	4 (2%)	0	100	100
All	All	512/534 (96%)	500 (98%)	12 (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	153/163 (94%)	150 (98%)	3 (2%)	48	67
1	B	138/163 (85%)	134 (97%)	4 (3%)	37	55
1	C	151/163 (93%)	150 (99%)	1 (1%)	76	87
All	All	442/489 (90%)	434 (98%)	8 (2%)	51	70

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	34	VAL
1	A	42	LEU
1	A	70	LEU
1	B	30	LYS
1	B	60	GLU

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Mol	Chain	Res	Type
1	B	87	SER
1	B	127	SER
1	C	34	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 5 ligands modelled in this entry, 1 is monoatomic - leaving 4 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	$\#\|Z\| > 2$
5	A1DER	C	201	-	46,64,64	2.26	15 (32%)	55,106,106	3.45	15 (27%)
4	SO4	C	202	-	4,4,4	0.62	0	6,6,6	0.32	0
4	SO4	A	203	-	4,4,4	0.45	0	6,6,6	0.27	0
2	4OL	A	201	3	57,57,57	2.73	13 (22%)	64,78,78	1.98	10 (15%)

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
5	A1DER	C	201	-	7/7/13/19	13/42/129/129	-
2	4OL	A	201	3	-	27/45/45/45	0/4/4/4

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	201	4OL	C4-N3	11.75	1.43	1.39
2	A	201	4OL	C26-N27	7.94	1.41	1.39
2	A	201	4OL	C36-N35	6.33	1.41	1.39
5	C	201	A1DER	C31-N32	6.04	1.48	1.26
2	A	201	4OL	O10-N3	5.40	1.44	1.38
5	C	201	A1DER	C22-C23	-5.21	1.39	1.51
2	A	201	4OL	O48-N27	4.66	1.44	1.38
5	C	201	A1DER	C30-C31	4.59	1.53	1.49
5	C	201	A1DER	C2-C7	-4.58	1.40	1.51
2	A	201	4OL	O46-N35	4.55	1.43	1.38
2	A	201	4OL	C44-N45	4.47	1.40	1.39
5	C	201	A1DER	C25-C24	-3.86	1.39	1.49
2	A	201	4OL	O50-N45	3.73	1.42	1.38
5	C	201	A1DER	C22-C16	-3.67	1.50	1.54
2	A	201	4OL	C2-N3	3.38	1.43	1.38
5	C	201	A1DER	C25-C26	-3.33	1.40	1.51
5	C	201	A1DER	C5-C4	-3.23	1.40	1.51
2	A	201	4OL	O51-C44	3.20	1.30	1.23
5	C	201	A1DER	C5-C6	-3.15	1.40	1.49
5	C	201	A1DER	C7-C6	3.12	1.40	1.32
5	C	201	A1DER	C44-N45	3.06	1.41	1.38
5	C	201	A1DER	C36-N35	2.73	1.41	1.39
2	A	201	4OL	C43-C44	-2.72	1.37	1.43
5	C	201	A1DER	C23-C24	2.59	1.38	1.32
5	C	201	A1DER	C33-N32	-2.50	1.31	1.37
2	A	201	4OL	C34-N35	2.36	1.42	1.38
5	C	201	A1DER	C34-N35	2.20	1.41	1.37
2	A	201	4OL	C22-N27	2.00	1.41	1.38

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	201	A1DER	O48-N27-C26	13.93	125.53	116.50
5	C	201	A1DER	O51-C44-N45	13.32	126.14	117.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	201	A1DER	O51-C44-C43	-11.03	118.38	126.29
5	C	201	A1DER	O49-C26-N27	7.24	123.27	118.37
2	A	201	4OL	O50-N45-C44	6.87	121.68	116.75
2	A	201	4OL	O51-C44-N45	6.26	124.90	118.76
2	A	201	4OL	O48-N27-C26	5.48	120.68	116.75
2	A	201	4OL	C22-C16-N15	5.40	126.53	118.45
2	A	201	4OL	C41-C40-N45	4.19	121.64	118.48
2	A	201	4OL	O46-N35-C36	3.65	119.37	116.75
2	A	201	4OL	O10-N3-C4	3.48	119.25	116.75
5	C	201	A1DER	C34-C28-N21	3.14	123.15	118.45
5	C	201	A1DER	C2-C1-N9	2.94	120.68	114.86
5	C	201	A1DER	C6-C5-C4	2.73	121.23	113.20
2	A	201	4OL	O54-C16-N15	-2.60	118.56	122.67
5	C	201	A1DER	O10-N3-C4	2.55	118.15	116.50
2	A	201	4OL	C39-C34-N35	2.53	120.39	118.48
5	C	201	A1DER	O54-C16-N15	2.47	124.56	121.61
5	C	201	A1DER	O8-C1-C2	-2.43	117.51	120.96
5	C	201	A1DER	O9-C4-N3	2.40	119.99	118.37
5	C	201	A1DER	C24-C25-C26	2.36	120.14	113.20
5	C	201	A1DER	C17-N15-C14	-2.29	111.52	116.65
5	C	201	A1DER	C29-C30-C31	2.28	116.37	111.17
2	A	201	4OL	C23-C22-C16	2.27	124.14	119.51
5	C	201	A1DER	C5-C6-C7	-2.09	120.51	123.43

All (7) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	C	201	A1DER	N45
5	C	201	A1DER	N15
5	C	201	A1DER	C22
5	C	201	A1DER	N27
5	C	201	A1DER	N3
5	C	201	A1DER	N21
5	C	201	A1DER	C2

All (40) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	4OL	O8-C1-C2-C7
2	A	201	4OL	O8-C1-C2-N3
2	A	201	4OL	O54-C16-N15-C14
2	A	201	4OL	O54-C16-N15-C17

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Mol	Chain	Res	Type	Atoms
2	A	201	4OL	C22-C16-N15-C14
2	A	201	4OL	C22-C16-N15-C17
2	A	201	4OL	N15-C16-C22-N27
2	A	201	4OL	N21-C28-C34-N35
5	C	201	A1DER	O55-C28-N21-C20
5	C	201	A1DER	O55-C28-N21-C29
5	C	201	A1DER	C34-C28-N21-C20
5	C	201	A1DER	C34-C28-N21-C29
5	C	201	A1DER	N21-C29-C30-C31
5	C	201	A1DER	C29-C30-C31-N32
2	A	201	4OL	C19-C20-N21-C29
2	A	201	4OL	C19-C20-N21-C28
5	C	201	A1DER	N15-C17-C18-C19
2	A	201	4OL	O55-C28-N21-C29
2	A	201	4OL	C12-C13-C14-N15
2	A	201	4OL	N15-C17-C18-C19
2	A	201	4OL	C13-C14-N15-C17
2	A	201	4OL	N9-C1-C2-C7
2	A	201	4OL	N9-C1-C2-N3
2	A	201	4OL	O55-C28-N21-C20
2	A	201	4OL	C34-C28-N21-C29
2	A	201	4OL	C30-C29-N21-C28
2	A	201	4OL	C17-C18-C19-C20
5	C	201	A1DER	C18-C19-C20-N21
2	A	201	4OL	C34-C28-N21-C20
2	A	201	4OL	C13-C14-N15-C16
5	C	201	A1DER	C13-C14-N15-C16
5	C	201	A1DER	O8-C1-C2-N3
5	C	201	A1DER	N15-C16-C22-N27
2	A	201	4OL	O55-C28-C34-C39
2	A	201	4OL	C30-C29-N21-C20
2	A	201	4OL	O54-C16-C22-N27
2	A	201	4OL	O55-C28-C34-N35
5	C	201	A1DER	C13-C14-N15-C17
5	C	201	A1DER	N9-C1-C2-N3
2	A	201	4OL	O54-C16-C22-C23

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	201	A1DER	1	0

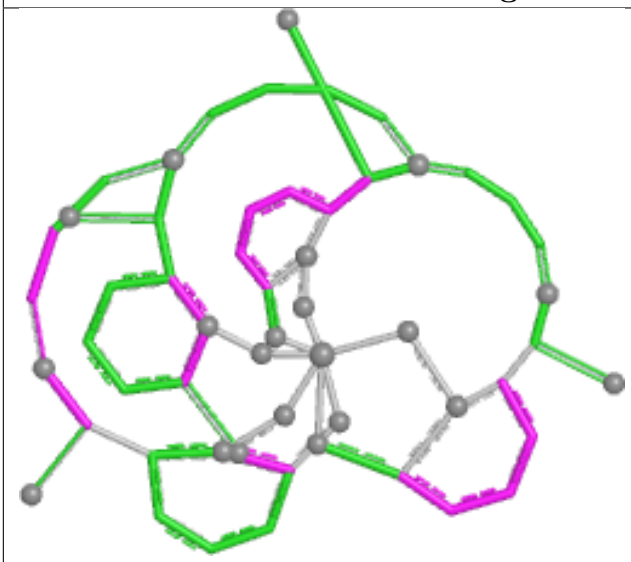
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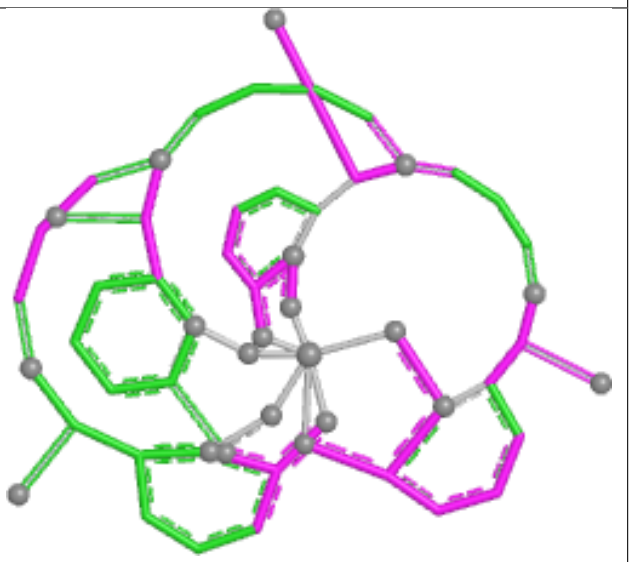
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	202	SO4	1	0
4	A	203	SO4	1	0
2	A	201	4OL	1	0

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.

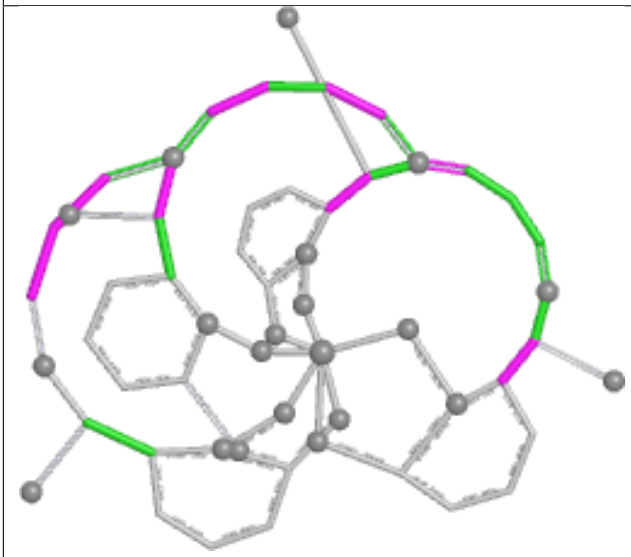
Ligand A1DER C 201



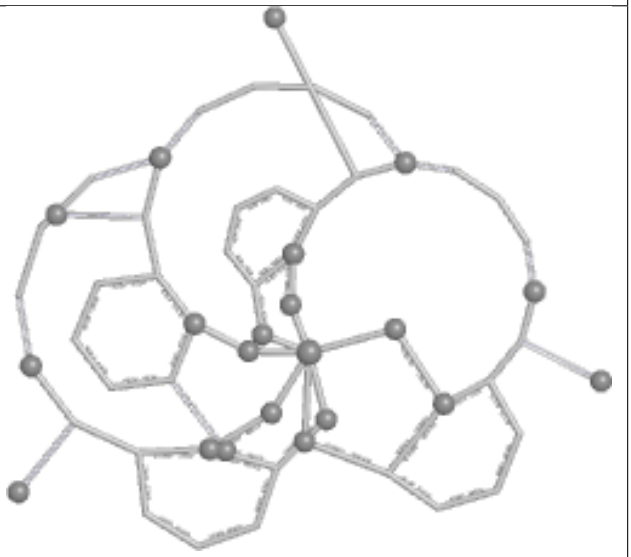
Bond lengths



Bond angles

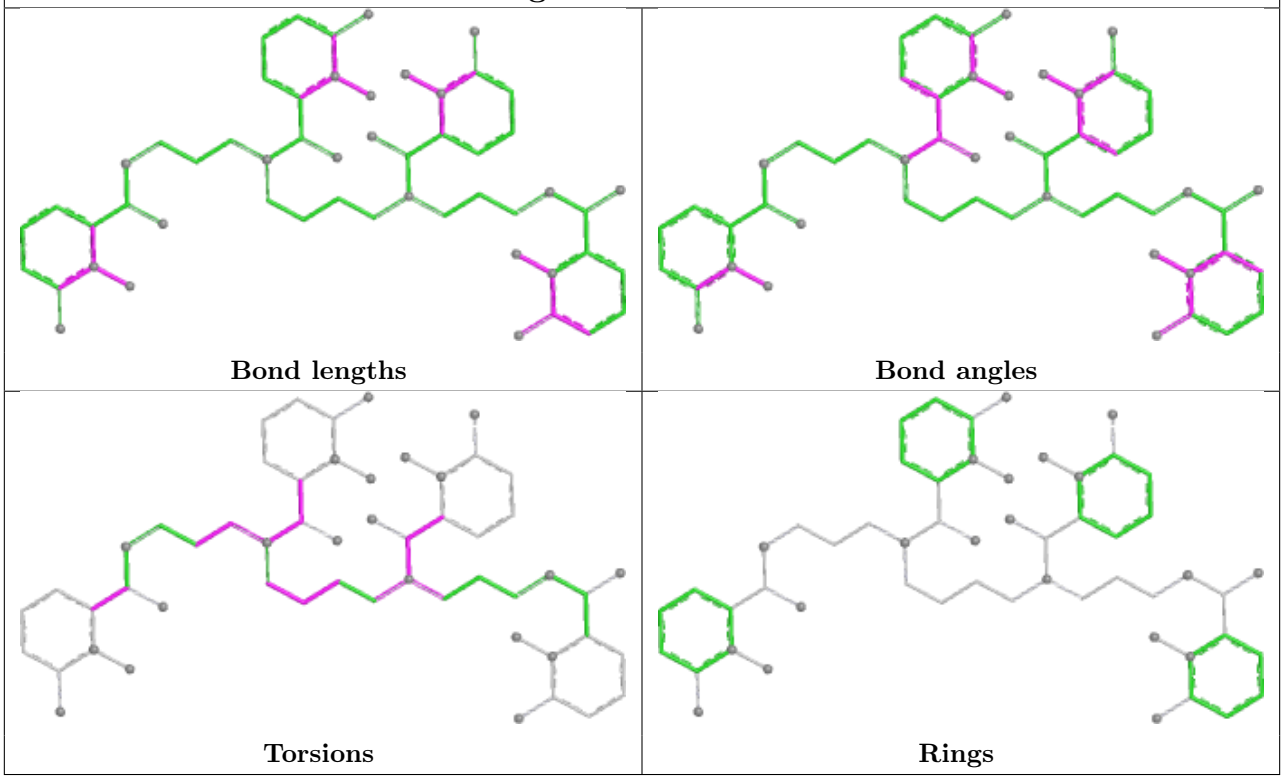


Torsions



Rings

Ligand 4OL A 201



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

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, 95^{th} 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	175/178 (98%)	0.47	17 (9%) 13 15	23, 35, 57, 81	2 (1%)
1	B	169/178 (94%)	3.44	143 (84%) 0 0	38, 80, 111, 130	1 (0%)
1	C	174/178 (97%)	0.21	11 (6%) 26 28	15, 27, 47, 74	2 (1%)
All	All	518/534 (97%)	1.35	171 (33%) 1 1	15, 39, 99, 130	5 (0%)

All (171) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	45	ASP	8.8
1	B	148	LEU	8.1
1	B	48	PRO	7.1
1	B	170	VAL	7.1
1	B	42	LEU	7.1
1	B	145	THR	6.7
1	B	172	ILE	6.4
1	B	5	SER	6.3
1	B	171	PRO	6.3
1	B	79	TRP	6.0
1	B	147	GLU	6.0
1	B	81[A]	ARG	5.9
1	B	167	VAL	5.8
1	B	144	LEU	5.7
1	B	4	THR	5.6
1	B	164	ASN	5.6
1	B	94	LEU	5.5
1	B	166	ILE	5.4
1	B	43	ARG	5.4
1	B	80	ILE	5.3
1	B	52	TYR	5.2
1	B	74	LYS	5.2
1	B	159	LEU	5.1

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Mol	Chain	Res	Type	RSRZ
1	B	149	LYS	5.1
1	B	84	VAL	5.0
1	B	85	PRO	4.9
1	B	168	PHE	4.9
1	B	169	PRO	4.7
1	B	96	ASN	4.6
1	B	6	ASP	4.5
1	B	73	LYS	4.5
1	B	98	LYS	4.5
1	B	31	TRP	4.5
1	B	64	TYR	4.4
1	B	176	ILE	4.4
1	B	97	ILE	4.4
1	B	41	ILE	4.3
1	B	32	TYR	4.3
1	B	58	LEU	4.3
1	B	117	GLN	4.3
1	B	174	GLN	4.2
1	B	165	HIS	4.2
1	B	137	LEU	4.2
1	B	69	VAL	4.1
1	B	36	LEU	4.1
1	B	70	LEU	4.1
1	B	8	ILE	4.1
1	B	87	SER	4.1
1	B	163	GLU	4.1
1	B	25	ASN	4.1
1	B	61	ASP	4.0
1	B	95	GLY	4.0
1	C	4	THR	4.0
1	B	62	LYS	4.0
1	B	155	PHE	4.0
1	B	71	PHE	3.9
1	B	153	ILE	3.9
1	B	28	GLN	3.9
1	B	150	GLU	3.9
1	B	33	VAL	3.9
1	B	55	ILE	3.8
1	B	110	VAL	3.8
1	A	96[A]	ASN	3.8
1	B	50	LYS	3.8
1	B	18	LEU	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	132	TYR	3.7
1	A	79	TRP	3.7
1	B	89	PRO	3.7
1	B	161	LEU	3.7
1	B	27	PHE	3.7
1	B	143	GLU	3.6
1	B	34	VAL	3.6
1	B	138	TYR	3.6
1	B	78	TYR	3.6
1	B	7	LEU	3.6
1	B	126	VAL	3.5
1	B	37	ALA	3.5
1	B	49	GLN	3.5
1	B	13	LEU	3.5
1	C	79	TRP	3.5
1	B	177	ASP	3.5
1	B	141	THR	3.4
1	B	22	PHE	3.4
1	B	107	LEU	3.4
1	B	83	PHE	3.4
1	C	44	GLU	3.4
1	B	75	LYS	3.4
1	B	82	THR	3.3
1	B	122	PHE	3.3
1	B	92	PHE	3.3
1	B	119	ALA	3.3
1	B	129	ASN	3.3
1	B	63	SER	3.3
1	B	21	ASN	3.2
1	B	173	ASP	3.2
1	B	139	GLY	3.2
1	B	90	GLY	3.2
1	B	51	MET	3.2
1	B	152	PHE	3.2
1	B	102	GLY	3.2
1	B	115	TYR	3.2
1	B	86	GLY	3.1
1	B	77	ASP	3.1
1	B	66	VAL	3.1
1	B	93	THR	3.0
1	B	136	THR	3.0
1	B	151	ASN	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	38	GLY	3.0
1	B	116	ASN	3.0
1	B	23	GLN	3.0
1	C	80	ILE	3.0
1	B	114	ASN	2.9
1	B	59	LYS	2.9
1	B	30	LYS	2.9
1	A	25	ASN	2.9
1	B	162	PRO	2.9
1	B	60	GLU	2.8
1	B	101	PRO	2.8
1	B	40	ALA	2.8
1	B	16	VAL	2.7
1	B	88	GLN	2.7
1	B	65	ASN	2.7
1	B	26	GLN	2.7
1	A	98	LYS	2.7
1	B	130	ARG	2.7
1	B	120	MET	2.6
1	A	150	GLU	2.6
1	C	45	ASP	2.6
1	B	76	CYS	2.6
1	C	47	ASP	2.6
1	B	134	LYS	2.6
1	A	65	ASN	2.6
1	B	12	PRO	2.6
1	B	56	TYR	2.6
1	B	118	HIS	2.5
1	B	20	GLN	2.5
1	B	24	ASP	2.5
1	B	53	ALA	2.5
1	B	142	LYS	2.5
1	B	133	PHE	2.4
1	C	174	GLN	2.4
1	B	160	GLY	2.4
1	B	111	VAL	2.4
1	B	135	ILE	2.4
1	B	106	TYR	2.4
1	A	60	GLU	2.4
1	B	15	LYS	2.3
1	A	146	SER	2.3
1	B	105	SER	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	156	SER	2.3
1	B	104	THR	2.2
1	B	131	GLU	2.2
1	C	96	ASN	2.2
1	A	4	THR	2.2
1	C	143	GLU	2.2
1	C	5	SER	2.2
1	B	123	PHE	2.2
1	C	77	ASP	2.2
1	A	44	GLU	2.2
1	B	57	GLU	2.2
1	A	5	SER	2.2
1	B	17	PRO	2.1
1	A	42	LEU	2.1
1	B	113	THR	2.1
1	A	47	ASP	2.1
1	A	80	ILE	2.1
1	B	124	LYS	2.0
1	A	63	SER	2.0
1	A	97	ILE	2.0
1	B	128	GLN	2.0
1	B	103	LEU	2.0

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, 95^{th} 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	4OL	A	201	54/54	0.79	0.25	32,92,126,132	0

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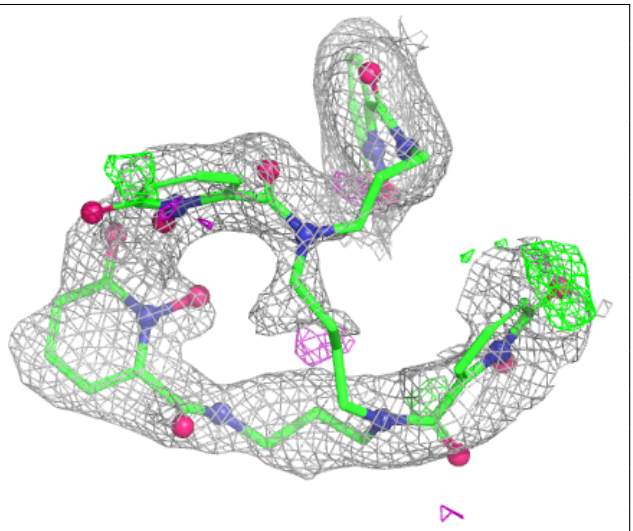
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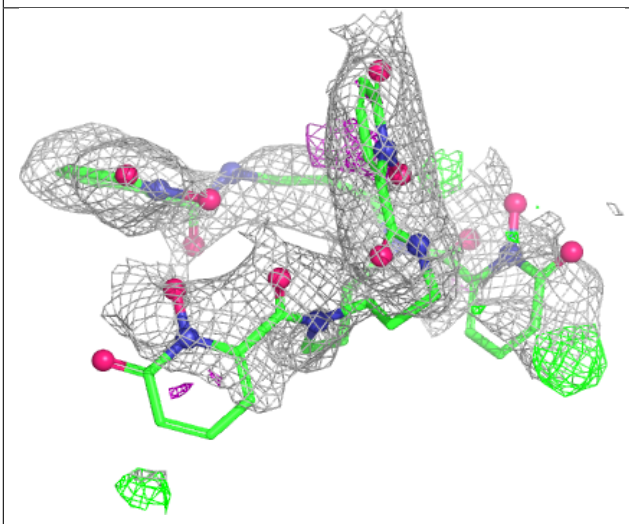
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	ER3	A	202	1/1	0.83	0.17	190,190,190,190	0
4	SO4	C	202	5/5	0.87	0.28	27,63,68,72	0
5	A1DER	C	201	55/55	0.87	0.20	27,71,117,128	0
4	SO4	A	203	5/5	0.94	0.17	30,52,58,69	0

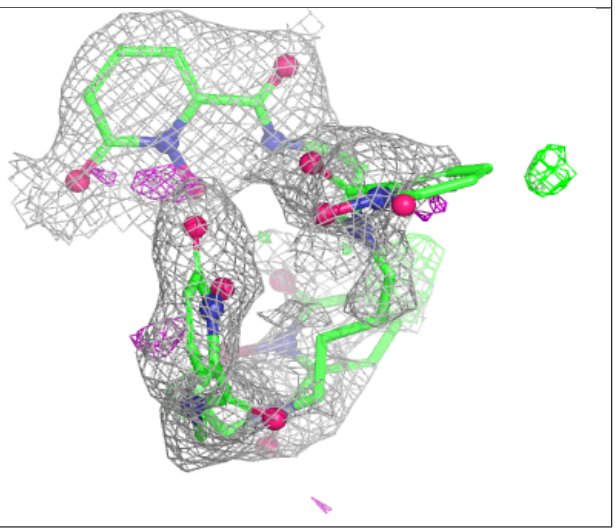
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 4OL A 201:

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

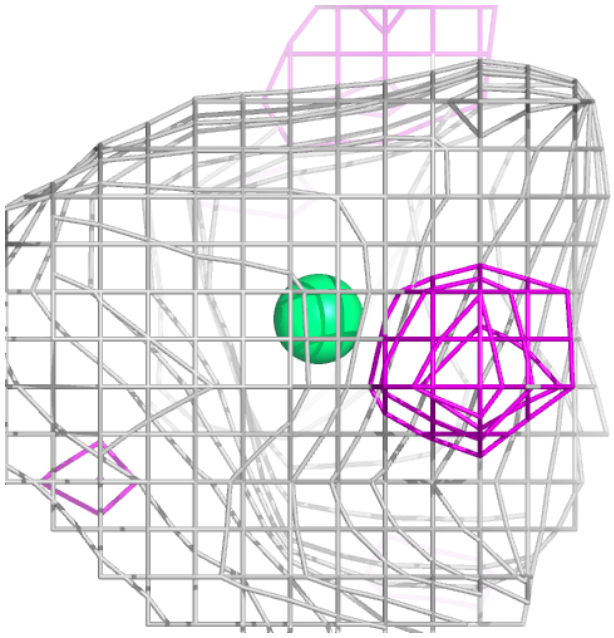


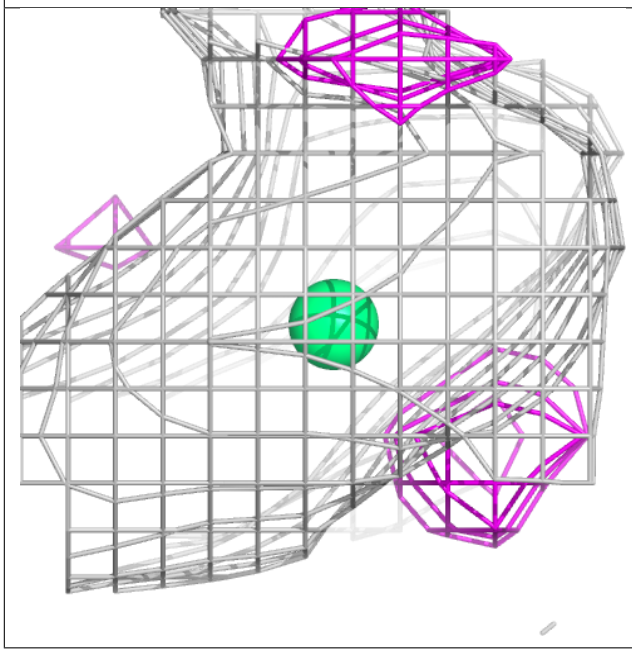


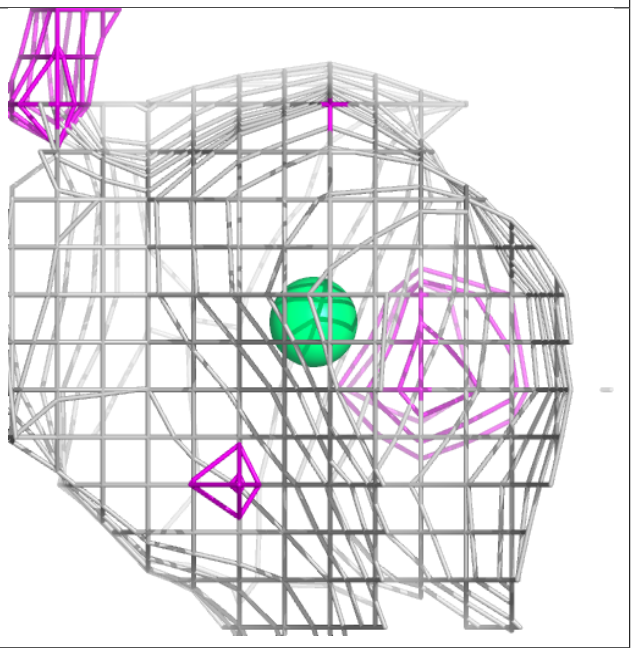


Electron density around ER3 A 202:

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

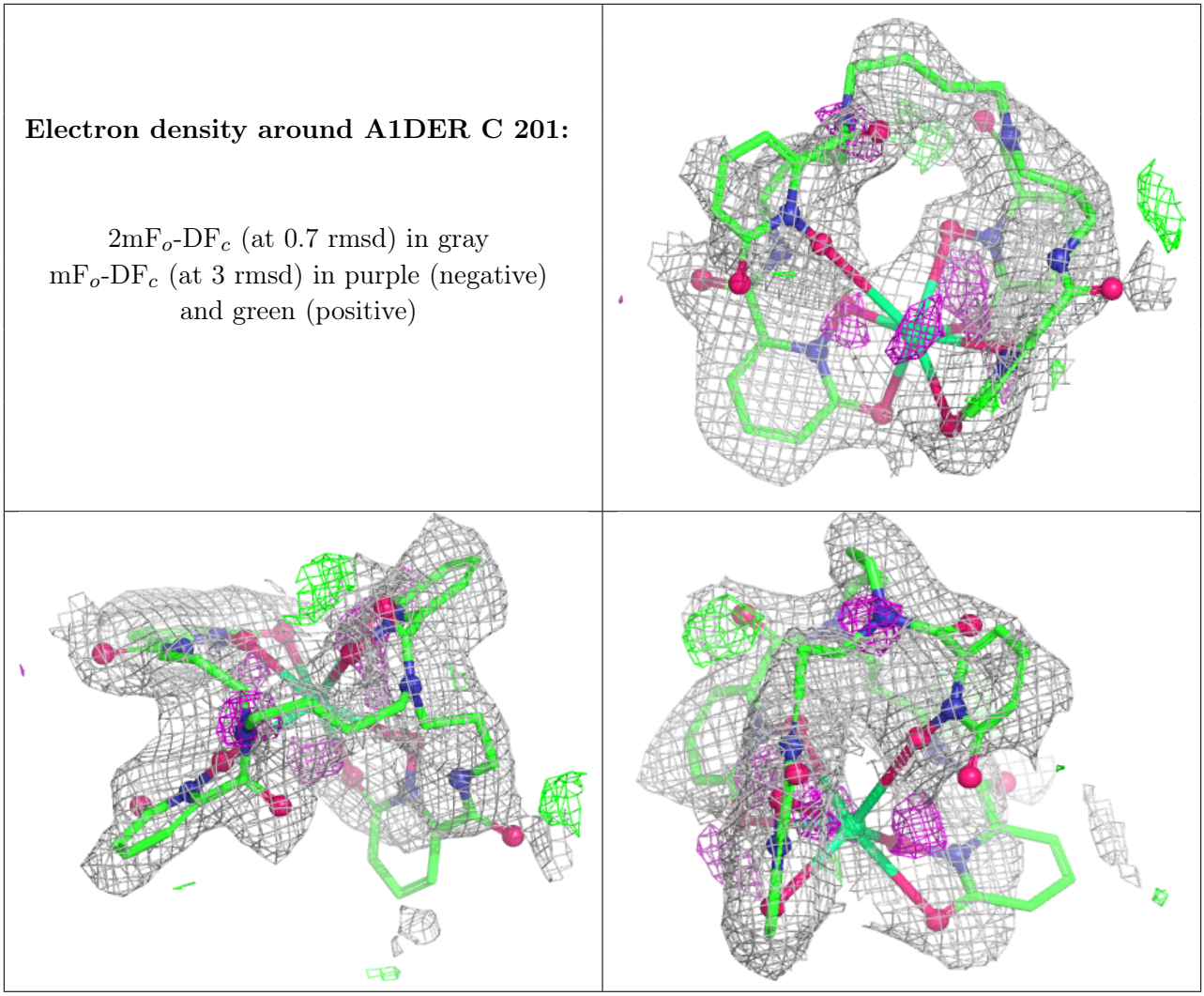






Electron density around A1DER C 201:

$2mF_o$-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.