Full wwPDB X-ray Structure Validation Report ⓘ

Nov 11, 2025 – 02:07 PM EST

PDB ID	:	9NLO / pdb_00009nlo
Title	:	Escherichia coli Signal Peptidase I Delta 2-76 P84A in complex with lipopeptide inhibitor
Authors	:	Paetzel, M.; Luo, C.
Deposited on	:	2025-03-03
Resolution	:	2.32 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:

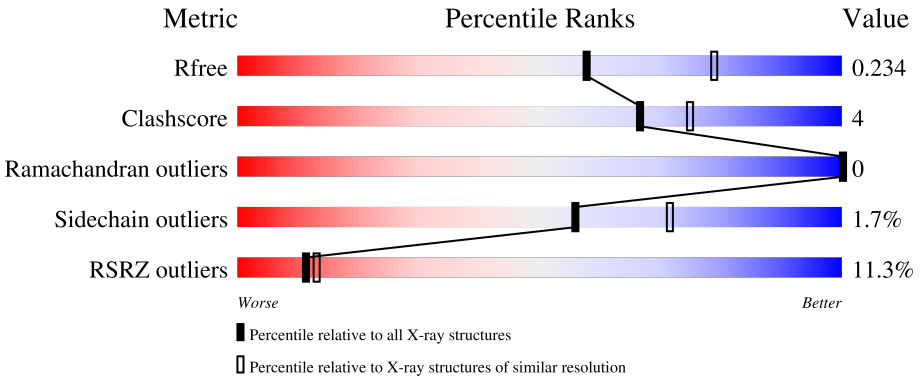
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

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 2.32 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}	164625	7250 (2.34-2.30)
Clashscore	180529	8063 (2.34-2.30)
Ramachandran outliers	177936	7993 (2.34-2.30)
Sidechain outliers	177891	7993 (2.34-2.30)
RSRZ outliers	164620	7250 (2.34-2.30)

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	249	12% 78% 12% 9%
1	B	249	8% 87% · 8%
2	C	6	33% 67%
2	D	6	33% 67%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 3726 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 Signal peptidase I.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	226	Total	C	N	O	S	0	0	0
			1719	1103	288	322	6			
1	B	229	Total	C	N	O	S	0	0	0
			1759	1129	297	328	5			

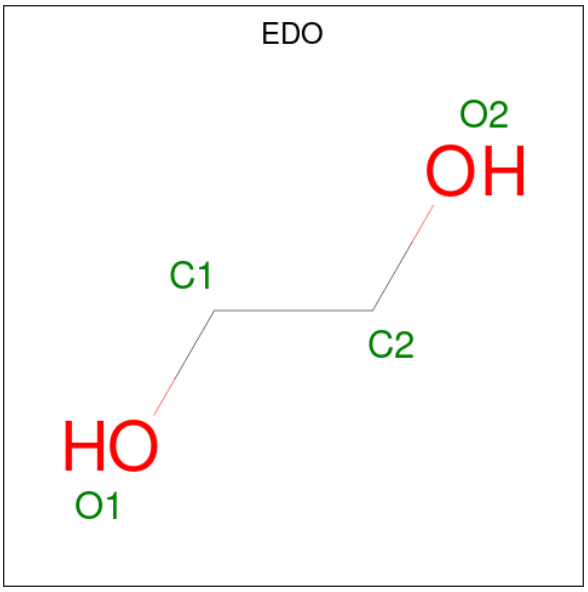
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	76	MET	-	initiating methionine	UNP P00803
A	84	ALA	PRO	engineered mutation	UNP P00803
B	76	MET	-	initiating methionine	UNP P00803
B	84	ALA	PRO	engineered mutation	UNP P00803

- Molecule 2 is a protein called ARYLOMYCIN A2.

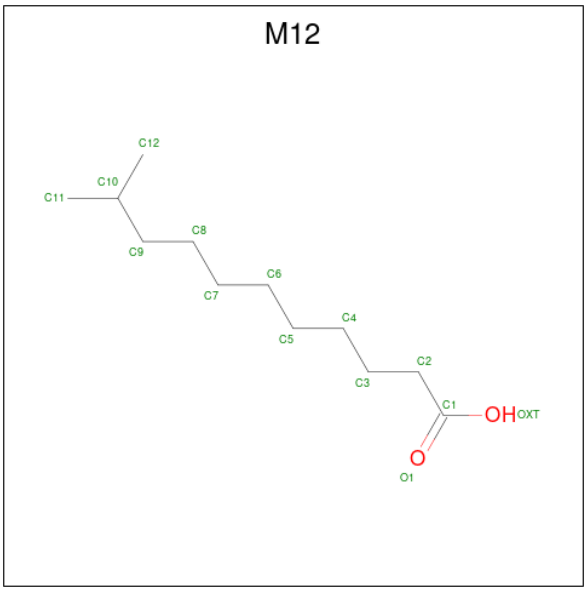
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	6	Total	C	N	O	0	0	0
			46	30	6	10			
2	D	6	Total	C	N	O	0	0	0
			46	30	6	10			

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0

- Molecule 4 is 10-METHYLUNDECANOIC ACID (CCD ID: M12) (formula: $C_{12}H_{24}O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total C O 12 11 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	D	1	Total C O 12 11 1	0	0

- Molecule 5 is water.

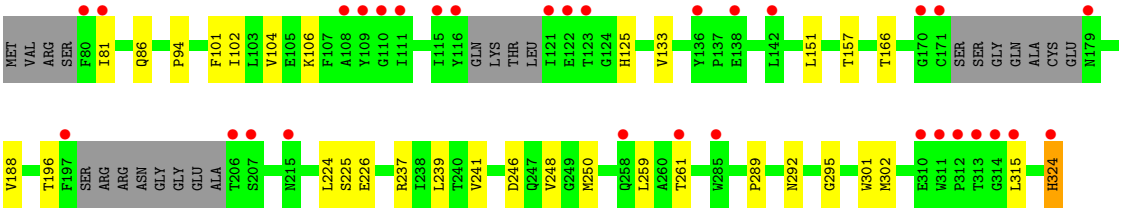
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	56	Total O 56 56	0	0
5	B	66	Total O 66 66	0	0
5	D	2	Total O 2 2	0	0

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.

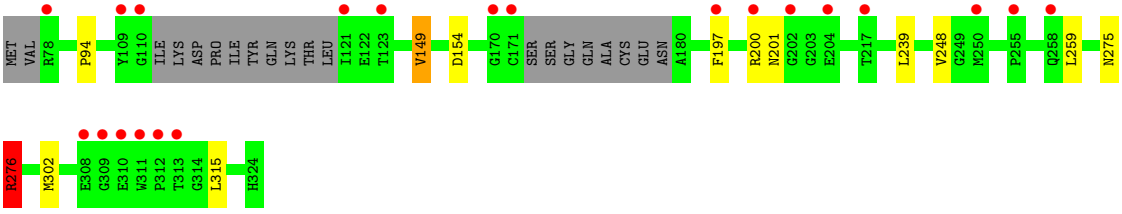
• Molecule 1: Signal peptidase I

Chain A:



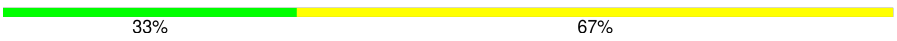
• Molecule 1: Signal peptidase I

Chain B:



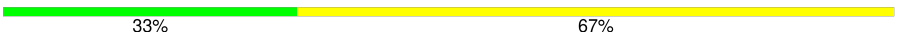
• Molecule 2: ARYLOMYCIN A2

Chain C:



• Molecule 2: ARYLOMYCIN A2

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	71.80Å 71.80Å 263.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	35.60 – 2.32 35.60 – 2.32	Depositor EDS
% Data completeness (in resolution range)	99.3 (35.60-2.32) 99.3 (35.60-2.32)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.35 (at 2.31Å)	Xtriage
Refinement program	REFMAC 5.8.0430	Depositor
R, R_{free}	0.209 , 0.234 0.213 , 0.234	Depositor DCC
R_{free} test set	1119 reflections (3.62%)	wwPDB-VP
Wilson B-factor (Å^2)	41.8	Xtriage
Anisotropy	0.177	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 36.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	3726	wwPDB-VP
Average B, all atoms (Å^2)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.74% 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: DSE, EDO, M12, 5PG, DAL

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	0.56	0/1762	0.92	1/2395 (0.0%)
1	B	0.56	0/1804	0.94	3/2448 (0.1%)
2	C	3.06	3/21 (14.3%)	1.22	0/24
2	D	3.08	3/21 (14.3%)	1.32	0/24
All	All	0.65	6/3608 (0.2%)	0.93	4/4891 (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	B	0	2

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	5	ALA	C-N	8.69	1.45	1.33
2	C	5	ALA	C-N	8.57	1.45	1.33
2	C	6	TYR	CE2-CZ	6.03	1.52	1.38
2	D	6	TYR	CE2-CZ	5.78	1.52	1.38
2	C	6	TYR	CG-CD2	5.72	1.51	1.39
2	D	6	TYR	CG-CD2	5.53	1.50	1.39

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	246	ASP	CA-CB-CG	5.92	118.52	112.60
1	B	197	PHE	CB-CA-C	5.37	119.43	109.54
1	B	154	ASP	CA-CB-CG	5.27	117.87	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	149	VAL	N-CA-CB	-5.07	101.37	110.95

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	275	ASN	Peptide
1	B	276	ARG	Sidechain

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1719	0	1617	21	0
1	B	1759	0	1678	6	0
2	C	46	0	37	0	0
2	D	46	0	37	0	0
3	A	4	0	6	0	0
3	B	4	0	6	0	0
4	C	12	0	19	0	0
4	D	12	0	19	2	0
5	A	56	0	0	0	0
5	B	66	0	0	1	0
5	D	2	0	0	0	0
All	All	3726	0	3419	25	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (25) 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:248:VAL:CG1	1:A:259:LEU:HB3	2.32	0.59
1:A:188:VAL:HG13	1:A:225:SER:HB3	1.83	0.59
1:A:302:MET:CE	1:A:315:LEU:HD22	2.32	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:157:THR:HB	1:A:166:THR:OG1	2.03	0.58
1:B:302:MET:HE1	1:B:315:LEU:HD22	1.85	0.58
1:A:301:TRP:HB2	4:D:101:M12:H113	1.86	0.56
1:A:81:ILE:HG23	1:A:106:LYS:HB2	1.89	0.54
1:A:248:VAL:HG12	1:A:259:LEU:HB3	1.90	0.53
1:A:302:MET:HE1	1:A:315:LEU:HD22	1.91	0.52
1:A:94:PRO:HD3	1:A:239:LEU:HG	1.92	0.52
1:A:104:VAL:HG21	1:A:133:VAL:HG21	1.93	0.50
1:A:86:GLN:HG2	1:A:101:PHE:CE2	2.47	0.49
1:A:102:ILE:HD12	1:A:104:VAL:HG23	1.96	0.48
1:A:226:GLU:OE1	1:A:237:ARG:HD2	2.14	0.46
1:A:289:PRO:HG2	1:A:292:ASN:OD1	2.16	0.46
1:A:104:VAL:CG1	1:A:295:GLY:HA3	2.46	0.45
1:B:94:PRO:HD3	1:B:239:LEU:HG	2.00	0.44
1:A:224:LEU:HD22	1:A:241:VAL:HG22	2.01	0.43
1:B:248:VAL:CG1	1:B:259:LEU:HB3	2.49	0.43
1:B:276:ARG:HG2	5:B:535:HOH:O	2.18	0.42
1:A:301:TRP:HB2	4:D:101:M12:C11	2.48	0.42
1:A:250:MET:HE2	1:B:200:ARG:HA	2.02	0.42
1:A:237:ARG:NH2	1:A:324:HIS:OXT	2.51	0.42
1:A:157:THR:HG23	1:A:261:THR:HG22	2.01	0.42
1:A:250:MET:CE	1:B:201:ASN:H	2.33	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	218/249 (88%)	211 (97%)	7 (3%)	0	100	100
1	B	223/249 (90%)	220 (99%)	3 (1%)	0	100	100
2	C	2/6 (33%)	2 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	2/6 (33%)	2 (100%)	0	0	100	100
All	All	445/510 (87%)	435 (98%)	10 (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	174/213 (82%)	170 (98%)	4 (2%)	45	62
1	B	178/213 (84%)	176 (99%)	2 (1%)	70	83
2	C	1/1 (100%)	1 (100%)	0	100	100
2	D	1/1 (100%)	1 (100%)	0	100	100
All	All	354/428 (83%)	348 (98%)	6 (2%)	56	71

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	125	HIS
1	A	151	LEU
1	A	196	THR
1	A	324	HIS
1	B	149	VAL
1	B	276	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	86	GLN
1	B	247	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues 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	5PG	C	4	2	11,12,13	4.75	6 (54%)	10,15,17	1.21	0
2	DSE	D	1	4,2	5,6,7	0.40	0	5,6,8	1.81	2 (40%)
2	DAL	D	2	2	3,4,5	0.59	0	2,4,6	0.80	0
2	DAL	C	2	2	3,4,5	0.83	0	2,4,6	0.73	0
2	5PG	D	4	2	11,12,13	4.75	6 (54%)	10,15,17	0.98	0
2	DSE	C	1	4,2	5,6,7	0.47	0	5,6,8	1.78	1 (20%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	5PG	C	4	2	-	5/5/8/10	0/1/1/1
2	DSE	D	1	4,2	-	1/3/6/8	-
2	DAL	D	2	2	-	1/1/2/4	-
2	DAL	C	2	2	-	1/1/2/4	-
2	5PG	D	4	2	-	5/5/8/10	0/1/1/1
2	DSE	C	1	4,2	-	1/3/6/8	-

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	4	5PG	CD1-CC1	9.30	1.53	1.38
2	C	4	5PG	CD1-CC1	8.58	1.52	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	4	5PG	CC2-CB	8.41	1.52	1.39
2	D	4	5PG	CC2-CB	7.31	1.50	1.39
2	C	4	5PG	CD2-CE	6.91	1.51	1.39
2	D	4	5PG	CD2-CE	6.47	1.51	1.39
2	D	4	5PG	CD2-CC2	-5.56	1.29	1.38
2	C	4	5PG	CD2-CC2	-4.72	1.31	1.38
2	D	4	5PG	CC1-CB	-4.42	1.32	1.39
2	C	4	5PG	CD1-CE	-3.97	1.31	1.39
2	C	4	5PG	CC1-CB	-3.97	1.32	1.39
2	D	4	5PG	CD1-CE	-3.41	1.32	1.39

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	1	DSE	CN-N-CA	2.53	121.27	113.70
2	C	1	DSE	CN-N-CA	2.45	121.02	113.70
2	D	1	DSE	O-C-CA	-2.01	119.59	124.77

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	1	DSE	O-C-CA-CB
2	D	1	DSE	O-C-CA-CB
2	C	2	DAL	O-C-CA-CB
2	D	2	DAL	O-C-CA-CB
2	C	4	5PG	CB-CA-N-CN
2	C	4	5PG	N-CA-CB-CC1
2	C	4	5PG	N-CA-CB-CC2
2	C	4	5PG	C-CA-CB-CC1
2	C	4	5PG	C-CA-CB-CC2
2	D	4	5PG	CB-CA-N-CN
2	D	4	5PG	N-CA-CB-CC1
2	D	4	5PG	N-CA-CB-CC2
2	D	4	5PG	C-CA-CB-CC1
2	D	4	5PG	C-CA-CB-CC2

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

4 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	$\#\|Z\| > 2$
4	M12	C	101	2	10,11,13	0.52	0	9,10,14	0.42	0
3	EDO	B	401	-	3,3,3	0.14	0	2,2,2	0.16	0
3	EDO	A	401	-	3,3,3	0.21	0	2,2,2	0.12	0
4	M12	D	101	2	10,11,13	0.41	0	9,10,14	0.68	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
4	M12	C	101	2	-	6/9/9/11	-
3	EDO	B	401	-	-	0/1/1/1	-
3	EDO	A	401	-	-	0/1/1/1	-
4	M12	D	101	2	-	5/9/9/11	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	101	M12	C1-C2-C3-C4
4	C	101	M12	C3-C4-C5-C6

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Mol	Chain	Res	Type	Atoms
4	C	101	M12	C4-C5-C6-C7
4	D	101	M12	C6-C7-C8-C9
4	C	101	M12	C2-C3-C4-C5
4	D	101	M12	C11-C10-C9-C8
4	D	101	M12	C4-C5-C6-C7
4	C	101	M12	C11-C10-C9-C8
4	C	101	M12	C5-C6-C7-C8
4	D	101	M12	C2-C3-C4-C5
4	C	101	M12	C6-C7-C8-C9

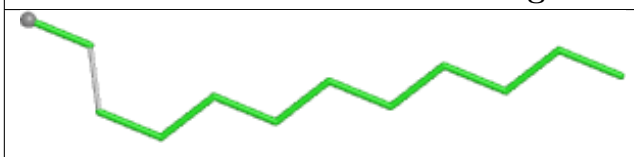
There are no ring outliers.

1 monomer is involved in 2 short contacts:

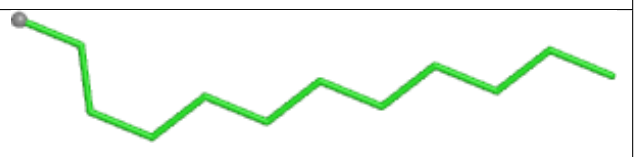
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	101	M12	2	0

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.

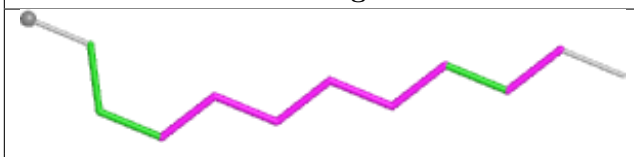
Ligand M12 C 101



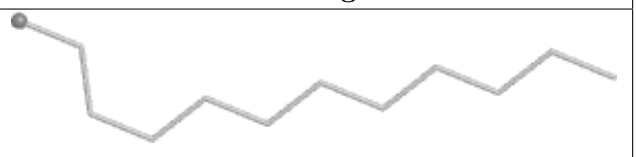
Bond lengths



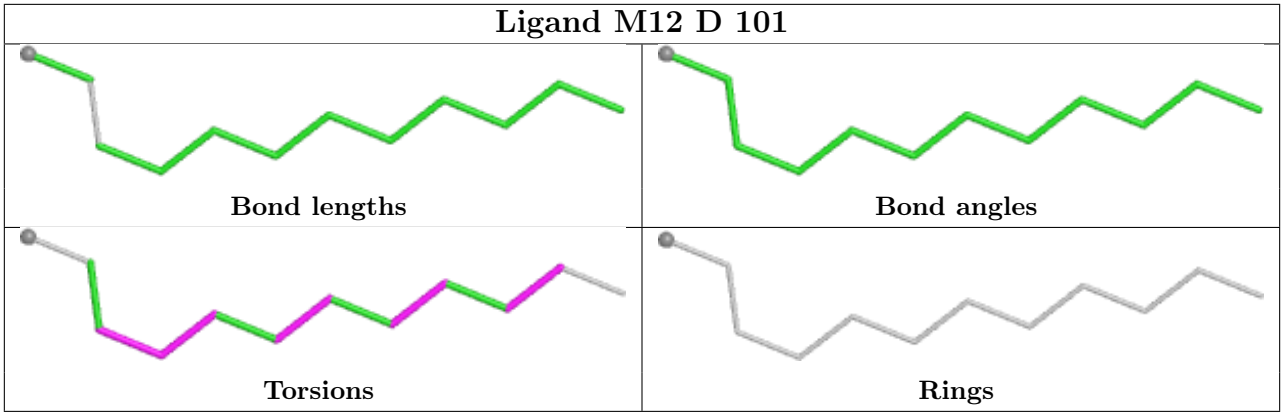
Bond angles



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, 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	226/249 (90%)	0.68	31 (13%) 8 9	26, 45, 83, 96	0
1	B	229/249 (91%)	0.35	21 (9%) 16 18	26, 42, 73, 91	0
2	C	3/6 (50%)	-0.06	0 100 100	36, 36, 42, 44	0
2	D	3/6 (50%)	0.57	0 100 100	43, 43, 47, 49	0
All	All	461/510 (90%)	0.51	52 (11%) 11 13	26, 43, 80, 96	0

All (52) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	116	TYR	11.4
1	A	197	PHE	7.1
1	B	170	GLY	6.9
1	A	179	ASN	6.3
1	A	121	ILE	5.8
1	B	171	CYS	5.5
1	A	313	THR	5.3
1	A	171	CYS	5.2
1	A	123	THR	5.0
1	B	121	ILE	4.9
1	A	111	ILE	4.7
1	A	80	PHE	4.6
1	A	311	TRP	4.5
1	A	206	THR	3.8
1	B	123	THR	3.6
1	B	110	GLY	3.4
1	A	115	ILE	3.4
1	B	200	ARG	3.4
1	B	311	TRP	3.3
1	B	313	THR	3.3
1	B	197	PHE	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	285	TRP	3.2
1	A	138	GLU	3.1
1	B	309	GLY	2.9
1	A	312	PRO	2.9
1	A	81	ILE	2.9
1	A	122	GLU	2.8
1	A	315	LEU	2.8
1	B	250	MET	2.8
1	B	255	PRO	2.7
1	B	258	GLN	2.7
1	A	258	GLN	2.7
1	A	170	GLY	2.7
1	B	310	GLU	2.6
1	A	215	ASN	2.5
1	A	108	ALA	2.5
1	A	110	GLY	2.5
1	A	310	GLU	2.4
1	A	109	TYR	2.4
1	B	78	ARG	2.3
1	A	261	THR	2.2
1	A	207	SER	2.2
1	B	109	TYR	2.2
1	B	217	THR	2.2
1	A	136	TYR	2.2
1	A	314	GLY	2.1
1	B	202	GLY	2.1
1	B	312	PRO	2.1
1	A	142	LEU	2.1
1	A	324	HIS	2.0
1	B	204	GLU	2.0
1	B	308	GLU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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	DSE	D	1	7/8	0.88	0.14	54,55,66,66	1
2	DSE	C	1	7/8	0.91	0.13	48,51,52,56	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	5PG	D	4	12/13	0.92	0.12	43,46,50,54	0
2	DAL	C	2	5/6	0.93	0.10	37,39,43,43	1
2	5PG	C	4	12/13	0.94	0.08	35,36,43,47	0
2	DAL	D	2	5/6	0.95	0.10	44,45,52,53	2

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

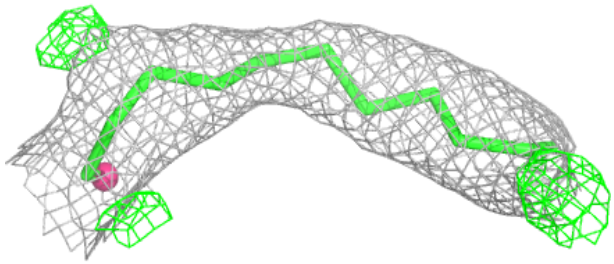
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

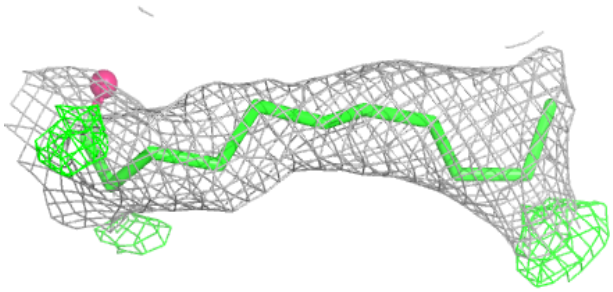
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	M12	D	101	12/14	0.82	0.19	58,64,70,70	1
4	M12	C	101	12/14	0.86	0.16	55,60,69,70	0
3	EDO	A	401	4/4	0.92	0.11	46,49,50,52	0
3	EDO	B	401	4/4	0.94	0.11	41,50,51,53	0

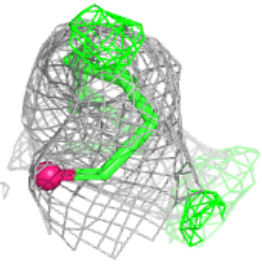
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around M12 D 101:

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

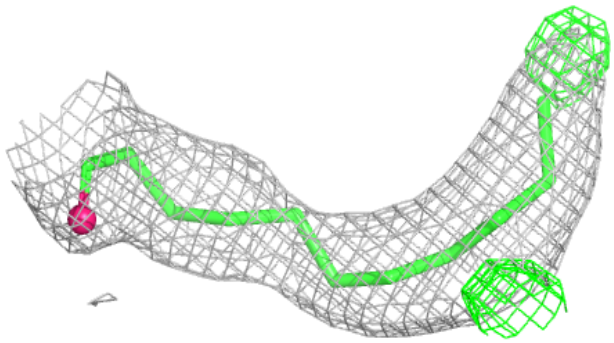


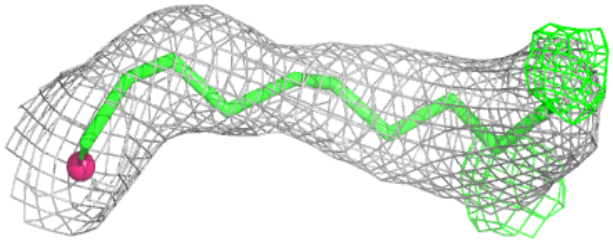


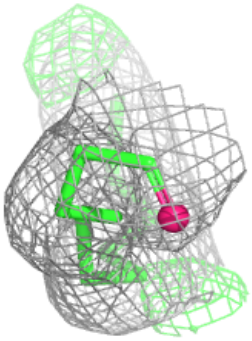


Electron density around M12 C 101:

$2mF_o$-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 (i)

There are no such residues in this entry.