



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 11:02 am GMT

PDB ID : 4CP9  
Title : Crystal structure OF lecA lectin complexed with a divalent galactoside at 1.65 angstrom  
Authors : Topin, J.; Varrot, A.; Imberty, A.; Wissinger, N.  
Deposited on : 2014-02-04  
Resolution : 1.65 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : trunk28620  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : recalc28949

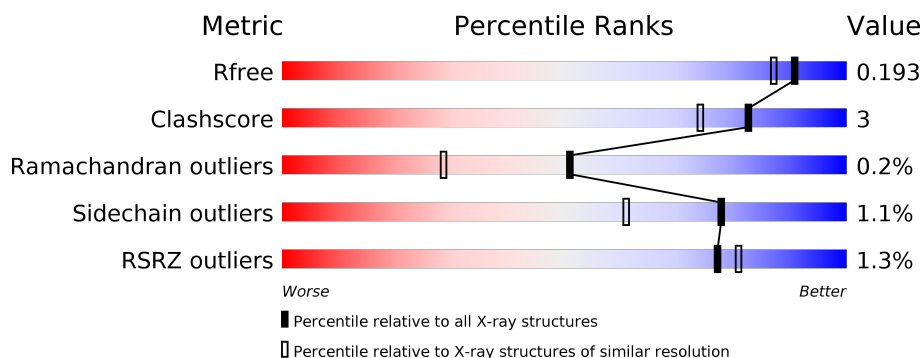
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.65 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))
$R_{free}$	100719	1368 (1.66-1.66)
Clashscore	112137	1468 (1.66-1.66)
Ramachandran outliers	110173	1438 (1.66-1.66)
Sidechain outliers	110143	1438 (1.66-1.66)
RSRZ outliers	101464	1371 (1.66-1.66)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	121	<div> <div>96%</div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div>•</div> </div>
2	B	121	<div> <div>2%</div> <div>90%</div> <div>8%</div> <div></div> </div> <div>•</div>
2	C	121	<div> <div>2%</div> <div>94%</div> <div>6%</div> <div></div> </div>
2	D	121	<div> <div>%</div> <div>95%</div> <div>5%</div> <div></div> </div>

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	CA	A	1122	-	-	-	X
5	CN8	B	1125	-	-	-	X
5	CN8	D	1125	-	-	-	X
6	1PE	A	1125	-	-	-	X
6	1PE	C	1126	-	-	-	X
6	1PE	D	1127	-	-	-	X

## 2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 4294 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 PA-I GALACTOPHILIC LECTIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	121	Total	C	N	O	S	0	3	0
			927	581	160	183	3			

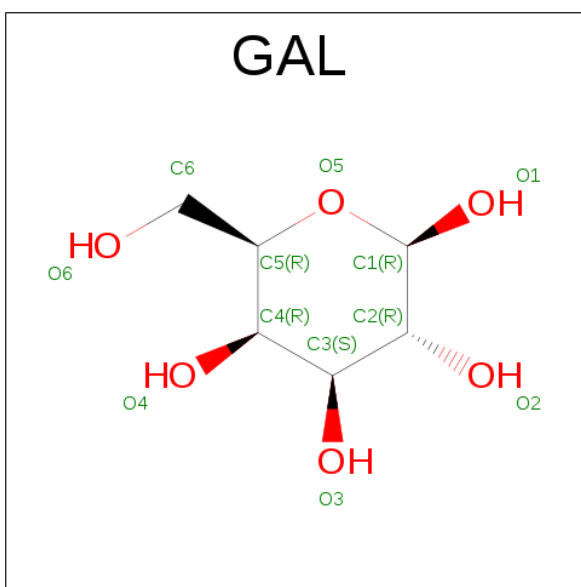
- Molecule 2 is a protein called PA-I GALACTOPHILIC LECTIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	121	Total	C	N	O	S	0	3	0
			927	581	160	183	3			
2	C	121	Total	C	N	O	S	0	0	0
			903	567	156	177	3			
2	D	121	Total	C	N	O	S	0	3	0
			925	580	160	182	3			

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

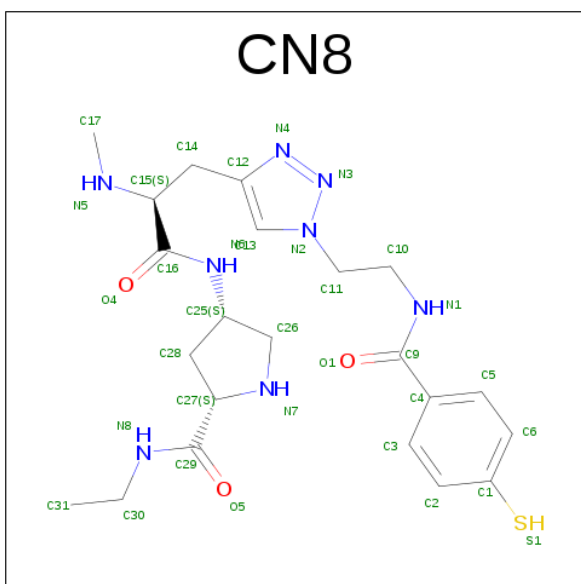
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Ca	0	0
			1	1		
3	A	1	Total	Ca	0	0
			1	1		
3	D	1	Total	Ca	0	0
			1	1		
3	C	1	Total	Ca	0	0
			1	1		

- Molecule 4 is SUGAR (BETA-D-GALACTOSE) (three-letter code: GAL) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



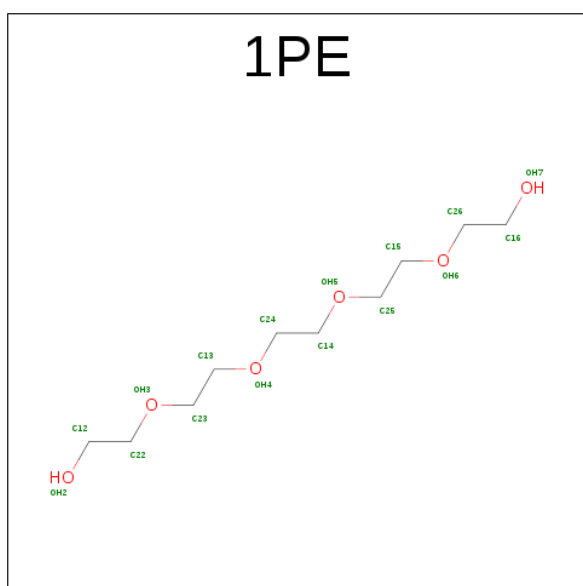
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			11	6	5		
4	B	1	Total	C	O	0	0
			11	6	5		
4	C	1	Total	C	O	0	0
			11	6	5		
4	D	1	Total	C	O	0	0
			11	6	5		

- Molecule 5 is (4S)-N-ETHYL-4-[[N-METHYL-3-(1-{2-[(4-SULFANYLBENZOYL)AMINO]ETHYL}-1H-1,2,3-TRIAZOL-4-YL)-L-ALANYL]AMINO]-L-PROLINAMIDE (three-letter code: CN8) (formula: C<sub>22</sub>H<sub>32</sub>N<sub>8</sub>O<sub>3</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	S	0	0
			18	12	4	1	1		
5	B	1	Total	C	N	O	S	0	0
			18	12	4	1	1		
5	C	1	Total	C	N	O	S	0	0
			10	7	1	1	1		
5	D	1	Total	C	N	O	S	0	0
			34	22	8	3	1		

- Molecule 6 is PENTAETHYLENE GLYCOL (three-letter code: 1PE) (formula:  $C_{10}H_{22}O_6$ ).



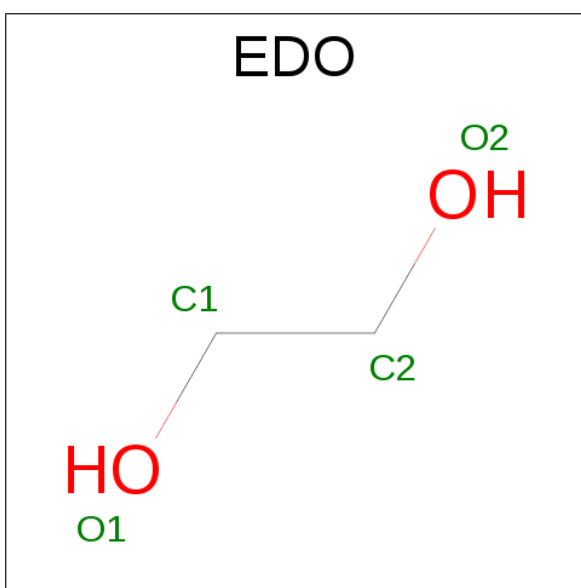
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			10	6	4		
6	B	1	Total	C	O	0	0
			15	10	5		
6	C	1	Total	C	O	0	0
			10	6	4		
6	D	1	Total	C	O	0	0
			13	8	5		

- Molecule 7 is SULFATE ION (three-letter code: SO4) (formula:  $O_4S$ ).



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

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula:  $C_2H_6O_2$ ).



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

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	131	Total 131	O 131	0	0
9	B	116	Total 116	O 116	0	0
9	C	81	Total 81	O 81	0	0
9	D	90	Total 90	O 90	0	0



### 3 Residue-property plots [i](#)

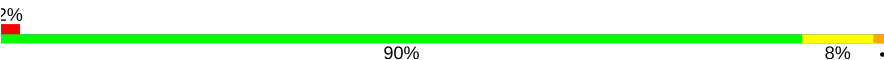
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are 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.

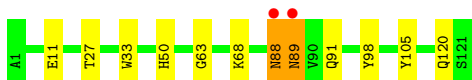
- Molecule 1: PA-I GALACTOPHILIC LECTIN

Chain A:  96% .



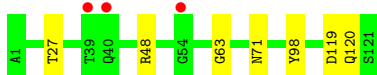
- Molecule 2: PA-I GALACTOPHILIC LECTIN

Chain B:  90% 8% .



- Molecule 2: PA-I GALACTOPHILIC LECTIN

Chain C:  94% 6% .



- Molecule 2: PA-I GALACTOPHILIC LECTIN

Chain D:  95% 5% .



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	50.88Å 66.26Å 159.43Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.47 – 1.65 48.47 – 1.65	Depositor EDS
% Data completeness (in resolution range)	99.9 (48.47-1.65) 99.9 (48.47-1.65)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.89 (at 1.65Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, $R_{free}$	0.155 , 0.184 0.168 , 0.193	Depositor DCC
$R_{free}$ test set	3334 reflections (5.34%)	DCC
Wilson B-factor (Å <sup>2</sup> )	19.1	Xtriage
Anisotropy	1.091	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 44.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	4294	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.40% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: TRO, CA, EDO, CN8, 1PE, GAL, SO4, OCS

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	0.75	0/922	0.76	0/1254
2	B	0.74	0/941	0.77	0/1282
2	C	0.68	0/917	0.72	0/1251
2	D	0.68	0/939	0.72	0/1280
All	All	0.71	0/3719	0.74	0/5067

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	927	0	883	9	0
2	B	927	0	880	12	0
2	C	903	0	859	7	0
2	D	925	0	881	4	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	11	0	8	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	11	0	8	0	0
4	C	11	0	8	0	0
4	D	11	0	8	0	0
5	A	18	0	10	0	0
5	B	18	0	10	1	0
5	C	10	0	4	0	0
5	D	34	0	31	0	0
6	A	10	0	13	0	0
6	B	15	0	19	3	0
6	C	10	0	13	0	0
6	D	13	0	17	1	0
7	A	5	0	0	0	0
7	D	5	0	0	0	0
8	B	8	0	12	0	0
9	A	131	0	0	0	0
9	B	116	0	0	1	0
9	C	81	0	0	0	0
9	D	90	0	0	0	0
All	All	4294	0	3664	22	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 3.

All (22) 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)
2:D:71:ASN:HA	6:D:1127:1PE:H122	1.84	0.58
1:A:120:GLN:NE2	2:B:120:GLN:HE21	2.02	0.57
1:A:120:GLN:NE2	2:C:120:GLN:H	2.02	0.57
2:C:27:THR:HG21	2:D:27:THR:HG21	1.89	0.54
1:A:120:GLN:HE21	2:B:120:GLN:NE2	2.06	0.52
1:A:27:THR:HG21	2:B:27:THR:HG21	1.92	0.51
1:A:120:GLN:HE21	2:B:120:GLN:HE21	1.58	0.51
2:B:68:LYS:NZ	6:B:1126:1PE:H261	2.26	0.51
6:B:1126:1PE:H151	9:B:2076:HOH:O	2.12	0.48
2:B:63:GLY:HA2	2:B:98:TYR:CZ	2.49	0.47
2:C:48:ARG:HD2	2:D:33:TRP:CE3	2.50	0.47
1:A:120:GLN:HE22	2:C:119:ASP:HB3	1.81	0.46
1:A:120:GLN:HE22	2:C:120:GLN:H	1.63	0.46
2:B:11:GLU:HG2	2:B:105:TYR:CG	2.50	0.46
2:B:68:LYS:HZ3	6:B:1126:1PE:H261	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:48:ARG:HD2	2:B:33:TRP:CE3	2.52	0.45
1:A:63:GLY:HA2	1:A:98:TYR:CZ	2.55	0.42
2:B:50:HIS:HE1	5:B:1125:CN8:C1	2.33	0.42
2:B:88:ASN:O	2:B:89:ASN:HB2	2.20	0.42
2:C:63:GLY:HA2	2:C:98:TYR:CZ	2.55	0.42
2:B:120:GLN:HG2	2:C:119:ASP:HA	2.02	0.41
2:D:63:GLY:HA2	2:D:98:TYR:CZ	2.56	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	120/121 (99%)	116 (97%)	4 (3%)	0	100	100
2	B	121/121 (100%)	117 (97%)	3 (2%)	1 (1%)	22	5
2	C	118/121 (98%)	115 (98%)	3 (2%)	0	100	100
2	D	121/121 (100%)	117 (97%)	4 (3%)	0	100	100
All	All	480/484 (99%)	465 (97%)	14 (3%)	1 (0%)	51	28

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	89	ASN

### 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	95/92 (103%)	95 (100%)	0	100	100
2	B	96/93 (103%)	94 (98%)	2 (2%)	59	32
2	C	93/93 (100%)	92 (99%)	1 (1%)	78	61
2	D	96/93 (103%)	95 (99%)	1 (1%)	80	65
All	All	380/371 (102%)	376 (99%)	4 (1%)	78	61

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	88	ASN
2	B	91	GLN
2	C	71	ASN
2	D	44	PRO

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	78	ASN
1	A	120	GLN
2	B	21	ASN
2	B	78	ASN
2	B	91	GLN
2	C	78	ASN
2	D	78	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

5 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	$\# Z  > 2$
1	TRO	A	33	1	14,16,17	1.82	5 (35%)	13,22,24	1.96	5 (38%)
1	OCS	A	57	1	8,8,9	1.84	1 (12%)	7,11,13	3.92	6 (85%)
2	OCS	B	57	2	4,7,9	0.93	0	2,8,13	1.63	1 (50%)
2	OCS	C	57	2	4,7,9	0.90	0	2,8,13	2.22	1 (50%)
2	OCS	D	57	2	4,7,9	0.91	0	2,8,13	1.59	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
1	TRO	A	33	1	-	0/2/6/8	0/2/2/2
1	OCS	A	57	1	-	1/4/7/9	0/0/0/0
2	OCS	B	57	2	-	0/2/6/9	0/0/0/0
2	OCS	C	57	2	-	0/2/6/9	0/0/0/0
2	OCS	D	57	2	-	0/2/6/9	0/0/0/0

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	33	TRO	CZ2-CE2	-2.37	1.37	1.41
1	A	33	TRO	CB-CG	-2.13	1.49	1.51
1	A	33	TRO	CD2-CE2	2.32	1.48	1.42
1	A	33	TRO	CG-CD2	2.46	1.46	1.41
1	A	33	TRO	OD1-CD1	3.90	1.47	1.28
1	A	57	OCS	OD2-SG	4.54	1.62	1.47

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	57	OCS	OD2-SG-OD3	-4.70	100.60	111.37
1	A	33	TRO	CB-CA-C	-3.30	105.06	111.41
1	A	33	TRO	CZ3-CE3-CD2	-2.80	116.88	120.88
1	A	57	OCS	OD3-SG-OD1	-2.40	105.53	113.86
2	B	57	OCS	OD1-SG-CB	2.05	109.45	105.61
1	A	57	OCS	OD2-SG-CB	2.16	108.65	106.01

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	33	TRO	CZ3-CH2-CZ2	2.16	123.53	120.45
1	A	33	TRO	CB-CG-CD1	2.36	128.92	123.86
2	C	57	OCS	OD1-SG-CB	2.73	110.72	105.61
1	A	33	TRO	CE3-CD2-CE2	3.02	122.17	118.17
1	A	57	OCS	OD2-SG-OD1	3.04	118.34	111.37
1	A	57	OCS	OD1-SG-CB	5.04	111.14	106.83
1	A	57	OCS	OD3-SG-CB	6.17	112.10	106.83

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	57	OCS	SG-CB-CA-N

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 20 ligands modelled in this entry, 4 are monoatomic - leaving 16 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
4	GAL	A	1123	3,5	11,11,12	1.30	1 (9%)	13,15,17	1.81	6 (46%)
5	CN8	A	1124	4	18,19,36	2.10	5 (27%)	22,25,48	1.54	4 (18%)
6	1PE	A	1125	-	9,9,15	0.42	0	8,8,14	0.40	0
7	SO4	A	1126	-	4,4,4	0.89	0	6,6,6	0.99	0
4	GAL	B	1124	3,5	11,11,12	0.36	0	13,15,17	1.02	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	CN8	B	1125	4	18,19,36	2.06	4 (22%)	22,25,48	2.02	8 (36%)
6	1PE	B	1126	-	14,14,15	0.54	0	13,13,14	0.94	1 (7%)
8	EDO	B	1127	-	3,3,3	0.54	0	2,2,2	0.22	0
8	EDO	B	1128	-	3,3,3	0.59	0	2,2,2	0.38	0
4	GAL	C	1124	3,5	11,11,12	1.03	1 (9%)	13,15,17	2.77	4 (30%)
5	CN8	C	1125	4	10,10,36	1.10	0	13,13,48	1.42	2 (15%)
6	1PE	C	1126	-	9,9,15	0.42	0	8,8,14	0.69	0
4	GAL	D	1124	3,5	11,11,12	1.27	2 (18%)	13,15,17	1.61	2 (15%)
5	CN8	D	1125	4	34,36,36	1.37	4 (11%)	38,48,48	1.41	3 (7%)
7	SO4	D	1126	-	4,4,4	1.00	0	6,6,6	2.05	2 (33%)
6	1PE	D	1127	-	12,12,15	0.56	0	11,11,14	0.30	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	GAL	A	1123	3,5	-	0/2/19/22	0/1/1/1
5	CN8	A	1124	4	-	0/10/10/40	0/2/2/3
6	1PE	A	1125	-	-	0/7/7/13	0/0/0/0
7	SO4	A	1126	-	-	0/0/0/0	0/0/0/0
4	GAL	B	1124	3,5	-	0/2/19/22	0/1/1/1
5	CN8	B	1125	4	-	0/10/10/40	0/2/2/3
6	1PE	B	1126	-	-	0/12/12/13	0/0/0/0
8	EDO	B	1127	-	-	0/1/1/1	0/0/0/0
8	EDO	B	1128	-	-	0/1/1/1	0/0/0/0
4	GAL	C	1124	3,5	-	0/2/19/22	0/1/1/1
5	CN8	C	1125	4	-	0/4/4/40	0/1/1/3
6	1PE	C	1126	-	-	0/7/7/13	0/0/0/0
4	GAL	D	1124	3,5	-	0/2/19/22	0/1/1/1
5	CN8	D	1125	4	-	0/30/40/40	0/3/3/3
7	SO4	D	1126	-	-	0/0/0/0	0/0/0/0
6	1PE	D	1127	-	-	0/10/10/13	0/0/0/0

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	1125	CN8	C17-N5	-2.60	1.39	1.46
4	C	1124	GAL	C4-C5	2.01	1.57	1.53
4	D	1124	GAL	O2-C2	2.01	1.47	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1125	CN8	C3-C4	2.06	1.42	1.39
4	D	1124	GAL	C4-C3	2.08	1.57	1.52
5	A	1124	CN8	C12-N4	2.36	1.37	1.33
5	D	1125	CN8	C13-C12	2.52	1.40	1.36
4	A	1123	GAL	O5-C1	2.65	1.48	1.43
5	A	1124	CN8	C2-C1	2.88	1.43	1.38
5	B	1125	CN8	N3-N2	3.08	1.40	1.34
5	D	1125	CN8	N3-N2	3.38	1.40	1.34
5	A	1124	CN8	C13-C12	3.42	1.41	1.36
5	B	1125	CN8	C13-C12	3.68	1.41	1.36
5	A	1124	CN8	N3-N2	3.74	1.41	1.34
5	D	1125	CN8	N4-N3	4.75	1.40	1.34
5	A	1124	CN8	N4-N3	5.66	1.42	1.34
5	B	1125	CN8	N4-N3	5.79	1.42	1.34

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	1125	CN8	N4-N3-N2	-4.26	104.10	107.31
4	C	1124	GAL	O4-C4-C3	-4.14	101.35	110.36
4	D	1124	GAL	O4-C4-C3	-3.63	102.46	110.36
5	B	1125	CN8	C6-C5-C4	-3.46	116.92	120.79
5	A	1124	CN8	N4-N3-N2	-3.38	104.77	107.31
5	A	1124	CN8	O1-C9-C4	-3.32	115.05	120.94
5	C	1125	CN8	O1-C9-N1	-3.16	118.09	122.58
5	B	1125	CN8	C3-C2-C1	-3.13	117.24	120.45
7	D	1126	SO4	O3-S-O2	-3.08	92.25	109.26
5	B	1125	CN8	N4-N3-N2	-2.95	105.09	107.31
5	D	1125	CN8	C10-C11-N2	-2.88	106.09	110.95
5	B	1125	CN8	O1-C9-C4	-2.78	116.00	120.94
4	A	1123	GAL	O4-C4-C3	-2.56	104.79	110.36
5	D	1125	CN8	C13-C12-N4	-2.17	108.16	111.41
4	A	1123	GAL	O2-C2-C1	-2.15	104.80	109.18
4	C	1124	GAL	O3-C3-C2	-2.05	106.29	110.02
4	A	1123	GAL	C1-O5-C5	-2.03	109.36	112.17
5	A	1124	CN8	C14-C12-N4	2.22	124.47	120.07
5	B	1125	CN8	C10-C11-N2	2.24	114.74	110.95
5	B	1125	CN8	C5-C4-C3	2.30	121.76	118.58
4	A	1123	GAL	C1-C2-C3	2.31	112.58	109.65
4	A	1123	GAL	O3-C3-C4	2.44	115.68	110.36
4	A	1123	GAL	C3-C4-C5	2.73	115.02	110.22
4	D	1124	GAL	O5-C1-C2	2.74	115.08	110.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	1126	1PE	C26-OH6-C15	2.81	123.06	112.88
5	A	1124	CN8	C4-C9-N1	3.11	123.83	117.12
4	C	1124	GAL	C1-C2-C3	3.15	113.65	109.65
7	D	1126	SO4	O4-S-O2	3.39	127.95	109.26
5	B	1125	CN8	C6-C1-C2	3.50	123.10	119.30
5	C	1125	CN8	C4-C9-N1	3.52	121.80	117.77
5	B	1125	CN8	C11-N2-C13	3.71	138.68	129.76
4	C	1124	GAL	O4-C4-C5	7.62	128.49	109.28

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1125	CN8	1	0
6	B	1126	1PE	3	0
6	D	1127	1PE	1	0

## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	119/121 (98%)	-0.51	0 <b>100</b> <b>100</b>	15, 22, 34, 41	0
2	B	120/121 (99%)	-0.18	2 (1%) 70 75	15, 23, 37, 66	0
2	C	120/121 (99%)	-0.06	3 (2%) 58 60	18, 29, 49, 59	0
2	D	120/121 (99%)	-0.39	1 (0%) 86 88	17, 23, 39, 51	2 (1%)
All	All	479/484 (98%)	-0.28	6 (1%) 77 81	15, 24, 44, 66	2 (0%)

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	88	ASN	4.1
2	B	89	ASN	3.3
2	C	54	GLY	2.5
2	D	89	ASN	2.3
2	C	40	GLN	2.1
2	C	39	THR	2.0

### 6.2 Non-standard residues in protein, DNA, RNA chains

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
1	TRO	A	33	15/16	0.95	0.09	-	18,27,32,40	0
2	OCS	C	57	8/10	0.94	0.10	-	36,37,46,47	0
2	OCS	D	57	8/10	0.92	0.12	-	29,32,44,45	0
1	OCS	A	57	9/10	0.92	0.14	-	22,24,37,41	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	OCS	B	57	8/10	0.94	0.09	-	25,27,38,38	0

### 6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
6	1PE	A	1125	10/16	0.91	0.11	9.82	33,38,45,53	0
6	1PE	C	1126	10/16	0.82	0.13	6.02	43,46,48,51	0
5	CN8	B	1125	18/34	0.91	0.32	4.82	24,47,55,55	0
6	1PE	D	1127	13/16	0.80	0.17	3.31	39,50,54,56	0
5	CN8	D	1125	34/34	0.93	0.20	3.12	22,47,56,59	0
3	CA	A	1122	1/1	0.99	0.07	2.28	17,17,17,17	0
5	CN8	C	1125	10/34	0.89	0.17	1.69	37,41,49,51	0
6	1PE	B	1126	15/16	0.88	0.12	1.66	32,37,50,55	0
5	CN8	A	1124	18/34	0.96	0.11	0.64	20,39,50,50	0
3	CA	D	1123	1/1	0.98	0.06	0.30	19,19,19,19	0
3	CA	B	1123	1/1	0.98	0.07	0.28	20,20,20,20	0
4	GAL	C	1124	11/12	0.87	0.11	0.13	29,34,40,41	0
7	SO4	D	1126	5/5	0.97	0.08	-0.02	22,25,29,34	0
7	SO4	A	1126	5/5	0.99	0.06	-0.33	22,23,25,26	0
4	GAL	D	1124	11/12	0.95	0.06	-0.33	18,22,23,23	0
4	GAL	A	1123	11/12	0.96	0.06	-0.57	15,18,19,19	0
4	GAL	B	1124	11/12	0.95	0.06	-0.78	23,24,27,28	0
3	CA	C	1123	1/1	0.90	0.08	-1.10	32,32,32,32	0
8	EDO	B	1128	4/4	0.66	0.16	-	50,51,51,53	0
8	EDO	B	1127	4/4	0.79	0.15	-	47,48,50,54	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.