



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 11:19 AM GMT

PDB ID : 3OM4  
Title : Crystal structure of B. megaterium levansucrase mutant K373A  
Authors : Strube, C.P.; Homann, A.; Gamer, M.; Jahn, D.; Seibel, J.; Heinz, D.W.  
Deposited on : 2010-08-26  
Resolution : 1.75 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 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
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) : trunk26865

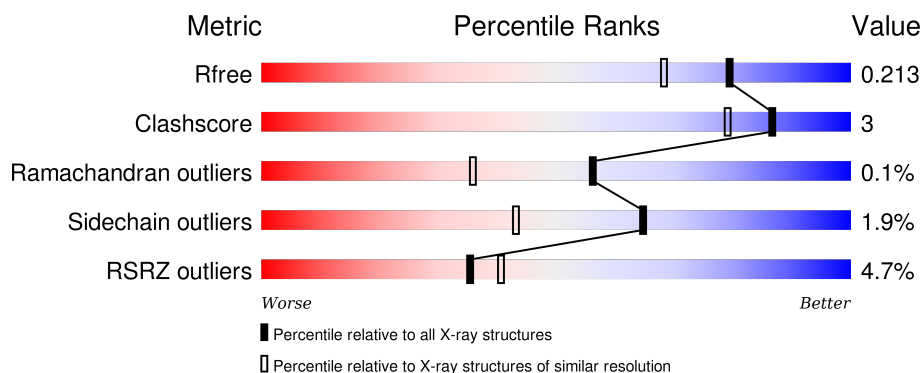
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.75 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))
$R_{free}$	91344	1609 (1.76-1.76)
Clashscore	102246	1730 (1.76-1.76)
Ramachandran outliers	100387	1711 (1.76-1.76)
Sidechain outliers	100360	1711 (1.76-1.76)
RSRZ outliers	91569	1610 (1.76-1.76)

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	456	<div> <div>4%</div> <div>91%</div> <div>7% ..</div> </div>
1	B	456	<div> <div>6%</div> <div>92%</div> <div>7% .</div> </div>
1	C	456	<div> <div>5%</div> <div>92%</div> <div>6% .</div> </div>
1	D	456	<div> <div>3%</div> <div>90%</div> <div>7% ..</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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	SO4	A	6	-	-	-	X
5	SO4	D	5	-	-	-	X

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 15821 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 Levansucrase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	448	Total	C	N	O	S	0	4	0
			3558	2237	592	722	7			
1	B	448	Total	C	N	O	S	0	3	0
			3553	2230	592	724	7			
1	C	448	Total	C	N	O	S	0	5	0
			3572	2243	596	726	7			
1	D	448	Total	C	N	O	S	0	5	0
			3577	2243	596	730	8			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	373	ALA	LYS	ENGINEERED MUTATION	UNP D5DC07
B	373	ALA	LYS	ENGINEERED MUTATION	UNP D5DC07
C	373	ALA	LYS	ENGINEERED MUTATION	UNP D5DC07
D	373	ALA	LYS	ENGINEERED MUTATION	UNP D5DC07

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			7	4	3		

- Molecule 4 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula:  $C_6H_{14}O_4$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			10	6	4		
4	B	1	Total	C	O	0	0
			10	6	4		
4	B	1	Total	C	O	0	0
			10	6	4		

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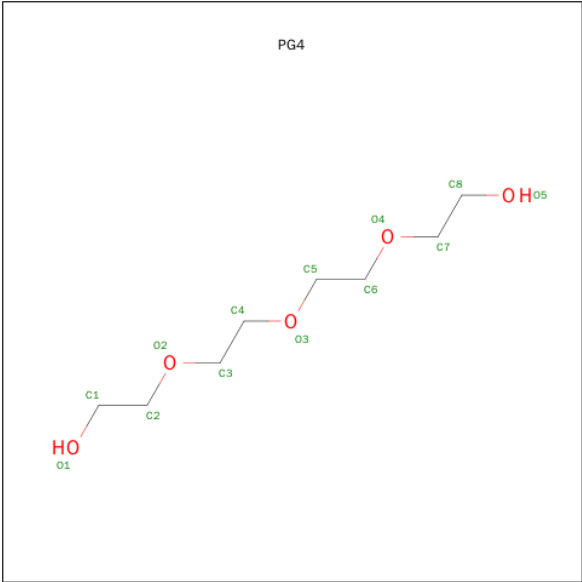
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	C	1	Total	C	O	0	0
			10	6	4		
4	D	1	Total	C	O	0	0
			10	6	4		

- Molecule 5 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



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

- Molecule 6 is TETRAETHYLENE GLYCOL (three-letter code: PG<sub>4</sub>) (formula: C<sub>8</sub>H<sub>18</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	C	1	Total	C	O	0	0
			13	8	5		

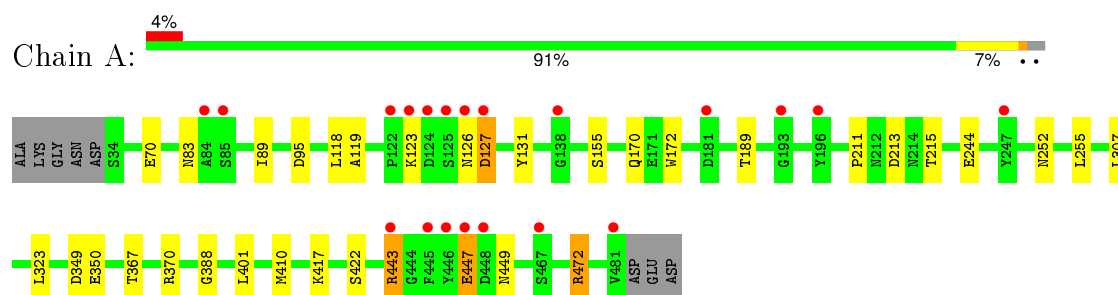
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	367	Total	O	0	0
			367	367		
7	B	370	Total	O	0	0
			370	370		
7	C	350	Total	O	0	0
			350	350		
7	D	370	Total	O	0	0
			370	370		

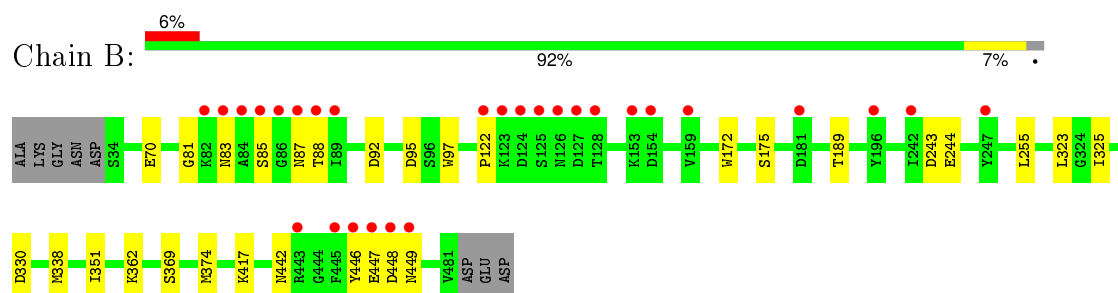
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

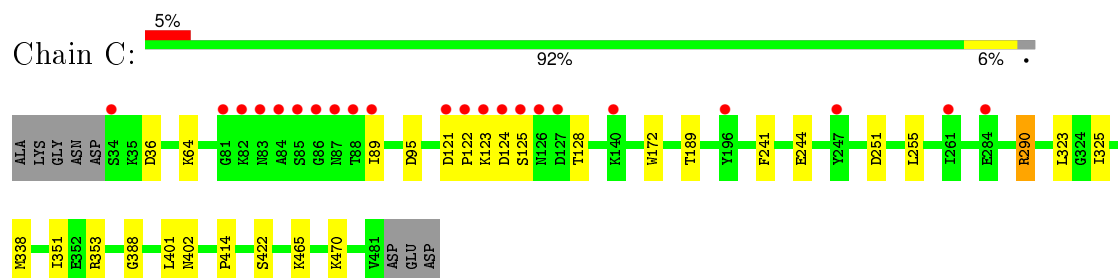
#### • Molecule 1: Levansucrase



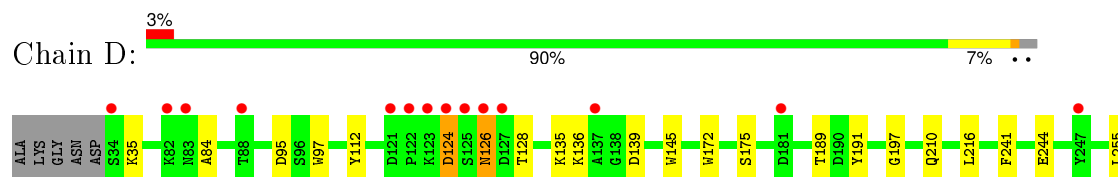
#### • Molecule 1: Levansucrase



#### • Molecule 1: Levansucrase



#### • Molecule 1: Levansucrase







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	93.58Å 100.08Å 95.54Å 90.00° 90.67° 90.00°	Depositor
Resolution (Å)	47.77 – 1.75 47.77 – 1.75	Depositor EDS
% Data completeness (in resolution range)	98.8 (47.77-1.75) 98.8 (47.77-1.75)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.41 (at 1.75Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.202 , 0.213 0.201 , 0.213	Depositor DCC
$R_{free}$ test set	8763 reflections (5.27%)	DCC
Wilson B-factor (Å <sup>2</sup> )	12.6	Xtriage
Anisotropy	0.089	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 38.6	EDS
Estimated twinning fraction	0.059 for l,k,-h 0.058 for h,-k,-l 0.053 for l,-k,h	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.26$	Xtriage
Outliers	0 of 174956 reflections	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	15821	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	13.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.66% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: PEG, CA, PGE, PG4, SO4

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.34	0/3647	0.53	0/4938
1	B	0.34	0/3636	0.53	0/4922
1	C	0.34	0/3655	0.52	0/4947
1	D	0.36	0/3654	0.53	0/4946
All	All	0.35	0/14592	0.53	0/19753

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	3558	0	3402	23	0
1	B	3553	0	3385	18	0
1	C	3572	0	3408	19	0
1	D	3577	0	3398	19	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	7	0	10	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	10	0	14	1	0
4	B	20	0	28	0	0
4	C	10	0	14	1	0
4	D	10	0	14	0	0
5	A	5	0	0	0	0
5	B	5	0	0	0	0
5	C	10	0	0	0	0
5	D	10	0	0	0	0
6	C	13	0	18	0	0
7	A	367	0	0	2	0
7	B	370	0	0	2	0
7	C	350	0	0	1	0
7	D	370	0	0	1	0
All	All	15821	0	13691	77	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 (77) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:353:ARG:HD2	1:D:422:SER:OG	1.67	0.94
1:A:472:ARG:HG2	1:A:472:ARG:HH11	1.36	0.90
1:D:472:ARG:HG2	1:D:472:ARG:HH11	1.40	0.87
1:C:290:ARG:HH11	1:C:290:ARG:HG2	1.48	0.79
1:C:353:ARG:HD2	1:C:422:SER:OG	1.82	0.79
1:A:127:ASP:O	1:A:127:ASP:CG	2.21	0.77
1:B:83:ASN:HB2	1:B:87:ASN:H	1.58	0.68
1:D:135:LYS:HE2	1:D:139:ASP:O	1.95	0.66
1:C:290:ARG:NH1	1:C:290:ARG:HG2	2.10	0.66
1:D:306:LYS:HD2	7:D:1405:HOH:O	1.95	0.66
1:C:64:LYS:NZ	7:C:1456:HOH:O	2.29	0.64
1:A:244:GLU:HG2	7:A:501:HOH:O	1.98	0.62
1:A:472:ARG:HG2	1:A:472:ARG:NH1	2.12	0.62
1:B:448:ASP:HB2	7:B:1442:HOH:O	2.01	0.61
1:C:36:ASP:HB3	1:C:290:ARG:HE	1.69	0.57
1:A:126:ASN:HB2	1:A:170:GLN:HE22	1.70	0.57
1:D:112:TYR:CE1	1:D:136:LYS:HD3	2.40	0.57
1:D:172:TRP:HB2	1:D:189:THR:HB	1.86	0.56
1:C:172:TRP:HB2	1:C:189:THR:HB	1.87	0.56
1:A:155:SER:HB2	1:B:85:SER:HA	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:126:ASN:HB2	1:A:170:GLN:NE2	2.21	0.55
1:A:83:ASN:HB3	1:A:89:ILE:HG12	1.89	0.55
1:B:330:ASP:HB3	7:B:1373:HOH:O	2.08	0.54
1:A:172:TRP:HB2	1:A:189:THR:HB	1.90	0.54
1:C:89:ILE:HD11	1:C:122:PRO:HA	1.92	0.52
1:C:414:PRO:HB3	4:C:486:PGE:H42	1.92	0.52
1:C:241:PHE:O	1:C:244:GLU:HG2	2.10	0.52
1:D:353:ARG:CD	1:D:422:SER:OG	2.50	0.51
1:D:472:ARG:HG2	1:D:472:ARG:NH1	2.16	0.49
1:B:172:TRP:HB2	1:B:189:THR:HB	1.95	0.49
1:A:70:GLU:HG2	1:A:417:LYS:HD3	1.95	0.49
1:B:369:SER:HB3	1:B:374:MET:CE	2.43	0.48
1:B:81:GLY:O	1:B:88:THR:HA	2.14	0.48
1:C:402:ASN:OD1	1:C:465[A]:LYS:HE2	2.13	0.48
1:C:465[A]:LYS:HE2	1:C:465[A]:LYS:HA	1.96	0.48
1:A:447:GLU:H	1:A:447:GLU:CD	2.17	0.47
1:B:83:ASN:HB2	1:B:87:ASN:N	2.27	0.46
1:B:70:GLU:CG	1:B:417:LYS:HD3	2.46	0.46
1:B:92:ASP:OD2	1:B:122:PRO:HG2	2.16	0.46
1:C:353:ARG:CD	1:C:422:SER:OG	2.60	0.46
1:B:442:ASN:O	1:B:449:ASN:HA	2.16	0.46
1:D:84:ALA:HB2	1:D:124:ASP:OD1	2.16	0.46
1:A:119:ALA:HB3	1:A:131:TYR:CD2	2.51	0.46
1:A:252:ASN:HD22	1:A:350:GLU:HG3	1.81	0.45
1:D:97:TRP:CD1	1:D:175:SER:HA	2.52	0.45
1:A:323:LEU:HD11	1:A:367:THR:HB	1.98	0.45
1:C:244:GLU:OE1	1:C:251:ASP:OD2	2.35	0.45
1:A:449:ASN:OD1	1:A:449:ASN:N	2.49	0.45
1:D:455:PRO:HA	1:D:476:GLN:HA	1.98	0.44
1:D:410:MET:HE1	1:D:419:PHE:CE1	2.51	0.44
1:B:83:ASN:N	1:B:87:ASN:O	2.45	0.44
1:C:123:LYS:O	1:C:125:SER:N	2.51	0.44
1:B:323:LEU:HG	1:B:351:ILE:HD12	2.00	0.43
1:C:290:ARG:HH11	1:C:290:ARG:CG	2.25	0.43
1:A:443:ARG:HG2	7:A:522:HOH:O	2.18	0.43
1:D:210:GLN:HG2	1:D:216:LEU:HD23	2.00	0.43
1:A:350:GLU:OE2	1:A:370:ARG:NH2	2.45	0.43
1:C:323:LEU:HG	1:C:351:ILE:HD12	2.01	0.43
1:A:252:ASN:ND2	1:A:350:GLU:HG3	2.34	0.43
1:B:325:ILE:HG23	1:B:338:MET:HB2	2.01	0.43
1:B:83:ASN:HB3	1:B:85:SER:H	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:243:ASP:HB3	1:C:470:LYS:HE2	2.01	0.42
1:D:358:LYS:HE2	1:D:361:GLY:HA2	2.01	0.42
1:C:388:GLY:HA3	1:C:401:LEU:HD12	2.02	0.42
1:D:241:PHE:O	1:D:244:GLU:HG2	2.19	0.42
1:D:191:TYR:CE1	1:D:197:GLY:HA2	2.54	0.42
1:D:350:GLU:OE2	1:D:370:ARG:NH1	2.51	0.42
1:D:135:LYS:HD3	1:D:145:TRP:CE2	2.55	0.42
1:B:97:TRP:CD1	1:B:175:SER:HA	2.55	0.42
1:D:261:ILE:HG13	1:D:262:GLU:N	2.35	0.41
1:A:118:LEU:HD12	4:A:486:PGE:H4	2.01	0.41
1:A:472:ARG:NH1	1:A:472:ARG:CG	2.82	0.41
1:B:447:GLU:HG3	1:B:449:ASN:OD1	2.20	0.41
1:A:388:GLY:HA3	1:A:401:LEU:HD12	2.02	0.41
1:A:211:PRO:HG2	1:A:215:THR:HB	2.02	0.41
1:C:325:ILE:HG23	1:C:338:MET:HB2	2.03	0.40
1:A:410:MET:HB3	1:A:410:MET:HE3	1.92	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	450/456 (99%)	436 (97%)	14 (3%)	0	100	100
1	B	449/456 (98%)	432 (96%)	17 (4%)	0	100	100
1	C	451/456 (99%)	437 (97%)	13 (3%)	1 (0%)	52	32
1	D	451/456 (99%)	439 (97%)	11 (2%)	1 (0%)	52	32
All	All	1801/1824 (99%)	1744 (97%)	55 (3%)	2 (0%)	56	36

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	126	ASN
1	C	124	ASP

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	393/395 (100%)	382 (97%)	11 (3%)	51	25
1	B	392/395 (99%)	387 (99%)	5 (1%)	76	60
1	C	394/395 (100%)	389 (99%)	5 (1%)	76	60
1	D	394/395 (100%)	386 (98%)	8 (2%)	63	39
All	All	1573/1580 (100%)	1544 (98%)	29 (2%)	65	46

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	95	ASP
1	A	123	LYS
1	A	127	ASP
1	A	213	ASP
1	A	255	LEU
1	A	307	LEU
1	A	349	ASP
1	A	422	SER
1	A	443	ARG
1	A	447	GLU
1	A	472	ARG
1	B	95	ASP
1	B	244	GLU
1	B	255	LEU
1	B	362	LYS
1	B	446	TYR
1	C	95	ASP
1	C	121	ASP
1	C	128	THR
1	C	255	LEU

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Mol	Chain	Res	Type
1	C	290	ARG
1	D	35	LYS
1	D	95	ASP
1	D	124	ASP
1	D	126	ASN
1	D	128	THR
1	D	255	LEU
1	D	349	ASP
1	D	472	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	126	ASN
1	A	252	ASN
1	B	83	ASN
1	B	266	HIS
1	D	59	ASN
1	D	110	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 17 ligands modelled in this entry, 4 are monoatomic - leaving 13 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	PEG	A	485	-	6,6,6	0.64	0	5,5,5	0.58	0
4	PGE	A	486	-	9,9,9	0.52	0	8,8,8	0.50	0
5	SO4	A	6	-	4,4,4	0.19	0	6,6,6	0.16	0
4	PGE	B	485	-	9,9,9	0.55	0	8,8,8	0.40	0
4	PGE	B	486	-	9,9,9	0.47	0	8,8,8	0.38	0
5	SO4	B	7	-	4,4,4	0.20	0	6,6,6	0.39	0
5	SO4	C	2	-	4,4,4	0.16	0	6,6,6	0.13	0
5	SO4	C	4	-	4,4,4	0.15	0	6,6,6	0.21	0
6	PG4	C	485	-	12,12,12	0.57	0	11,11,11	0.47	0
4	PGE	C	486	-	9,9,9	0.52	0	8,8,8	0.46	0
4	PGE	D	485	-	9,9,9	0.50	0	8,8,8	0.48	0
5	SO4	D	486	-	4,4,4	0.24	0	6,6,6	0.11	0
5	SO4	D	5	-	4,4,4	0.23	0	6,6,6	0.09	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	PEG	A	485	-	-	0/4/4/4	0/0/0/0
4	PGE	A	486	-	-	0/7/7/7	0/0/0/0
5	SO4	A	6	-	-	0/0/0/0	0/0/0/0
4	PGE	B	485	-	-	0/7/7/7	0/0/0/0
4	PGE	B	486	-	-	0/7/7/7	0/0/0/0
5	SO4	B	7	-	-	0/0/0/0	0/0/0/0
5	SO4	C	2	-	-	0/0/0/0	0/0/0/0
5	SO4	C	4	-	-	0/0/0/0	0/0/0/0
6	PG4	C	485	-	-	0/10/10/10	0/0/0/0
4	PGE	C	486	-	-	0/7/7/7	0/0/0/0
4	PGE	D	485	-	-	0/7/7/7	0/0/0/0
5	SO4	D	486	-	-	0/0/0/0	0/0/0/0
5	SO4	D	5	-	-	0/0/0/0	0/0/0/0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	486	PGE	1	0
4	C	486	PGE	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	448/456 (98%)	0.19	20 (4%)	37 43	5, 12, 22, 28	11 (2%)
1	B	448/456 (98%)	0.26	28 (6%)	23 28	6, 11, 23, 32	10 (2%)
1	C	448/456 (98%)	0.22	22 (4%)	33 38	5, 11, 22, 29	12 (2%)
1	D	448/456 (98%)	0.16	15 (3%)	50 56	5, 11, 20, 27	8 (1%)
All	All	1792/1824 (98%)	0.20	85 (4%)	35 40	5, 11, 22, 32	41 (2%)

All (85) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	247	TYR	9.0
1	B	84	ALA	8.2
1	C	124	ASP	7.8
1	B	125	SER	7.4
1	D	247	TYR	6.4
1	D	125	SER	6.3
1	A	122	PRO	6.2
1	C	247	TYR	6.1
1	B	85	SER	6.0
1	B	86	GLY	5.8
1	A	125	SER	5.6
1	B	247	TYR	5.6
1	D	126	ASN	5.3
1	C	84	ALA	5.1
1	C	121	ASP	5.1
1	A	447	GLU	5.1
1	B	126	ASN	5.1
1	C	125	SER	5.0
1	C	126	ASN	4.8
1	B	88	THR	4.8
1	B	82	LYS	4.6

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Mol	Chain	Res	Type	RSRZ
1	A	126	ASN	4.3
1	D	123	LYS	4.2
1	B	87	ASN	4.1
1	D	127	ASP	4.1
1	C	85	SER	3.9
1	D	88	THR	3.9
1	B	83	ASN	3.8
1	B	123	LYS	3.8
1	C	123	LYS	3.7
1	D	467	SER	3.4
1	C	88	THR	3.3
1	D	122	PRO	3.3
1	C	82	LYS	3.3
1	A	196	TYR	3.3
1	D	124	ASP	3.2
1	C	34	SER	3.2
1	A	127	ASP	3.1
1	A	445	PHE	3.1
1	D	82	LYS	3.1
1	C	87	ASN	3.1
1	A	124	ASP	3.0
1	A	446	TYR	3.0
1	C	196	TYR	3.0
1	C	261	ILE	2.9
1	B	449	ASN	2.9
1	C	127	ASP	2.9
1	C	86	GLY	2.8
1	A	481	VAL	2.8
1	A	123	LYS	2.8
1	B	448	ASP	2.8
1	B	446	TYR	2.7
1	B	159	VAL	2.7
1	B	127	ASP	2.6
1	B	154	ASP	2.6
1	A	467	SER	2.5
1	A	84	ALA	2.5
1	D	121	ASP	2.5
1	A	138	GLY	2.5
1	A	181	ASP	2.5
1	D	83	ASN	2.4
1	A	193	GLY	2.4
1	D	34	SER	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	443	ARG	2.4
1	A	443	ARG	2.4
1	C	83	ASN	2.4
1	B	89	ILE	2.4
1	B	447	GLU	2.3
1	A	448	ASP	2.3
1	A	85	SER	2.3
1	D	181	ASP	2.3
1	C	284	GLU	2.3
1	B	445	PHE	2.3
1	B	122	PRO	2.3
1	C	89	ILE	2.2
1	B	196	TYR	2.2
1	C	122	PRO	2.2
1	B	242	ILE	2.2
1	D	137	ALA	2.2
1	B	181	ASP	2.1
1	C	81	GLY	2.1
1	B	128	THR	2.1
1	B	153	LYS	2.1
1	C	140	LYS	2.0
1	B	124	ASP	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 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
5	SO4	D	5	5/5	0.94	0.16	3.55	31,31,32,32	0
5	SO4	A	6	5/5	0.97	0.17	2.19	32,32,32,32	0
5	SO4	B	7	5/5	0.95	0.17	1.81	30,31,31,31	0
4	PGE	C	486	10/10	0.85	0.14	1.16	22,22,23,23	0
4	PGE	B	486	10/10	0.86	0.17	1.02	22,23,23,23	0
6	PG4	C	485	13/13	0.88	0.14	0.91	27,28,29,30	0
4	PGE	D	485	10/10	0.88	0.15	0.90	22,22,23,23	0
4	PGE	A	486	10/10	0.89	0.13	0.54	22,22,22,23	0
3	PEG	A	485	7/7	0.86	0.15	0.40	30,30,30,30	0
5	SO4	C	4	5/5	0.96	0.15	0.35	31,31,31,31	0
4	PGE	B	485	10/10	0.88	0.15	0.23	21,22,22,23	0
5	SO4	C	2	5/5	0.96	0.14	0.11	29,29,29,29	0
5	SO4	D	486	5/5	0.96	0.16	-0.33	30,30,30,30	0
2	CA	B	1	1/1	1.00	0.06	-1.34	8,8,8,8	0
2	CA	C	1	1/1	1.00	0.06	-1.70	7,7,7,7	0
2	CA	D	1	1/1	1.00	0.07	-1.84	6,6,6,6	0
2	CA	A	1	1/1	1.00	0.05	-2.31	8,8,8,8	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.