



# Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2023 – 01:20 pm BST

PDB ID : 8OQ0  
Title : Crystal structure of tailspike depolymerase (APK09\_gp48) from Acinetobacter phage APK09  
Authors : Matyuta, I.O.; Boyko, K.M.; Nikolaeva, A.Y.; Shneider, M.M.; Timoshina, O.Y.; Popova, A.V.; Miroshnikov, K.A.; Popov, V.O.  
Deposited on : 2023-04-10  
Resolution : 2.59 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

<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>.

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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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.33  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.33

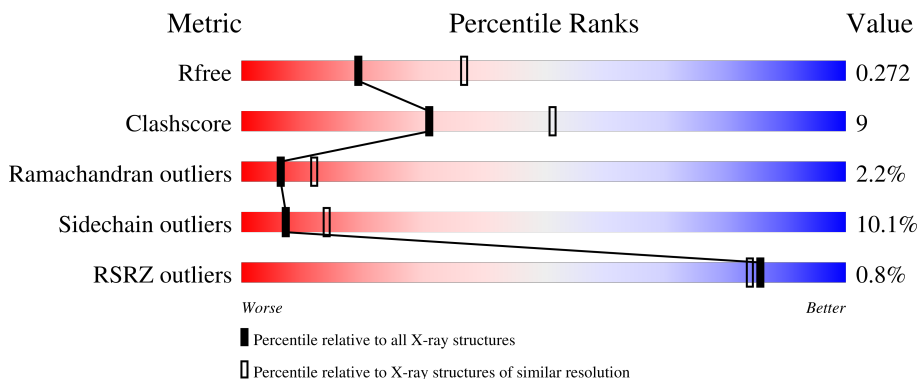
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.59 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))
$R_{free}$	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	616	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 4611 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 Tailspike protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	606	4588	2892	771	905	20	0	0	0

- Molecule 2 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
			Total	C	O		
2	A	1	7	4	3	0	0
2	A	1	7	4	3	0	0

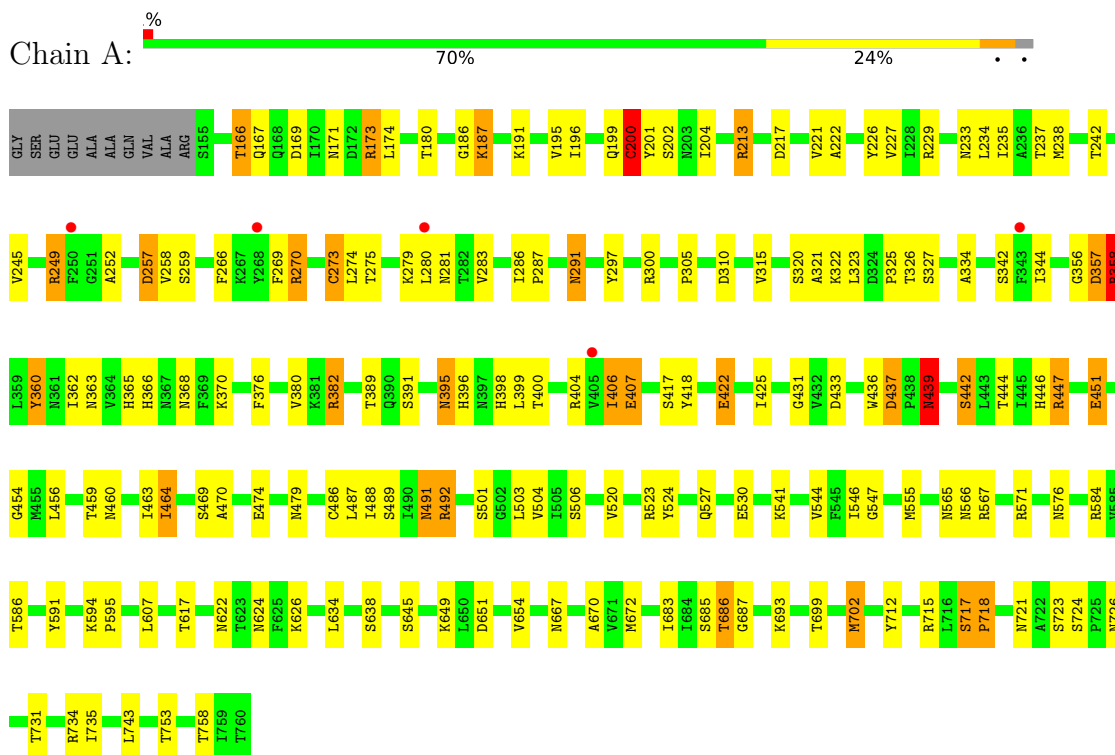
- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	9	Total 9 9	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: Tailspike protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	88.69Å 88.69Å 421.04Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	72.15 – 2.59 72.15 – 2.59	Depositor EDS
% Data completeness (in resolution range)	99.3 (72.15-2.59) 99.0 (72.15-2.59)	Depositor EDS
$R_{merge}$	0.34	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.04 (at 2.58Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.189 , 0.272 0.189 , 0.272	Depositor DCC
$R_{free}$ test set	1057 reflections (5.18%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	54.0	Xtrriage
Anisotropy	0.158	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 32.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	4611	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	58.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.72% 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: PEG

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	0.59	1/4681 (0.0%)	1.23	18/6381 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	530	GLU	CD-OE1	6.27	1.32	1.25

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	584	ARG	CG-CD-NE	8.89	130.46	111.80
1	A	492	ARG	CG-CD-NE	7.85	128.29	111.80
1	A	439	ASN	CB-CA-C	7.78	125.96	110.40
1	A	758	THR	CA-CB-OG1	-7.28	93.70	109.00
1	A	382	ARG	CG-CD-NE	-6.36	98.44	111.80
1	A	523	ARG	CG-CD-NE	-6.18	98.82	111.80
1	A	492	ARG	NE-CZ-NH1	6.11	123.35	120.30
1	A	491	ASN	CB-CA-C	5.91	122.22	110.40
1	A	718	PRO	N-CA-C	5.78	127.12	112.10
1	A	358	ARG	CB-CG-CD	5.69	126.39	111.60
1	A	437	ASP	CB-CA-C	5.58	121.56	110.40
1	A	270	ARG	CB-CA-C	5.46	121.33	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	444	THR	CA-CB-OG1	-5.39	97.67	109.00
1	A	734	ARG	NE-CZ-NH2	-5.35	117.62	120.30
1	A	360	TYR	CB-CG-CD1	5.32	124.19	121.00
1	A	571	ARG	NE-CZ-NH1	5.24	122.92	120.30
1	A	571	ARG	NE-CZ-NH2	-5.20	117.70	120.30
1	A	479	ASN	CB-CA-C	5.01	120.42	110.40

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	357	ASP	Peptide
1	A	437	ASP	Peptide
1	A	717	SER	Peptide,Mainchain
1	A	726	ASN	Peptide

## 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	4588	0	4472	83	0
2	A	14	0	20	1	0
3	A	9	0	0	0	0
All	All	4611	0	4492	83	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 9.

All (83) 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:213:ARG:HH11	1:A:213:ARG:HG2	1.14	1.04
1:A:227:VAL:HG22	1:A:237:THR:HG22	1.45	0.97
1:A:431:GLY:HA3	1:A:439:ASN:OD1	1.77	0.85
1:A:506:SER:HB3	1:A:546:ILE:HG23	1.59	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:173:ARG:HH11	1:A:173:ARG:HG3	1.43	0.82
1:A:213:ARG:HG2	1:A:213:ARG:NH1	1.93	0.78
1:A:173:ARG:HH11	1:A:173:ARG:CG	2.03	0.71
1:A:213:ARG:HH11	1:A:213:ARG:CG	2.00	0.71
1:A:173:ARG:HG3	1:A:173:ARG:NH1	2.10	0.65
1:A:281:ASN:HA	1:A:310:ASP:O	1.97	0.65
1:A:366:HIS:HA	1:A:396:HIS:O	1.97	0.64
1:A:486:CYS:SG	1:A:489:SER:HB2	2.40	0.62
1:A:672:MET:HB2	1:A:702:MET:HG2	1.83	0.61
1:A:376:PHE:HB2	1:A:406:ILE:HG12	1.81	0.61
1:A:356:GLY:HA3	1:A:389:THR:HG22	1.85	0.58
1:A:622:ASN:HB2	1:A:753:THR:HG23	1.84	0.57
1:A:395:ASN:HA	1:A:417:SER:O	2.05	0.57
1:A:463:ILE:O	1:A:464:ILE:HD13	2.04	0.56
1:A:555:MET:HE1	1:A:566:ASN:HB3	1.87	0.56
1:A:357:ASP:HB2	1:A:358:ARG:HD2	1.87	0.55
1:A:217:ASP:HB3	1:A:235:ILE:HG12	1.89	0.54
1:A:486:CYS:HA	1:A:520:VAL:O	2.08	0.54
1:A:667:ASN:HA	1:A:712:TYR:OH	2.09	0.53
1:A:229:ARG:HA	1:A:235:ILE:HG22	1.90	0.53
1:A:257:ASP:HA	1:A:279:LYS:O	2.08	0.53
1:A:221:VAL:HG12	1:A:222:ALA:H	1.73	0.53
1:A:594:LYS:NZ	1:A:607:LEU:O	2.41	0.53
1:A:436:TRP:HB3	1:A:439:ASN:HB2	1.91	0.52
1:A:280:LEU:HD13	1:A:315:VAL:HG11	1.92	0.52
1:A:245:VAL:HG11	1:A:269:PHE:CD2	2.45	0.52
1:A:213:ARG:NH1	1:A:213:ARG:CG	2.65	0.51
1:A:201:TYR:CD2	1:A:202:SER:HB2	2.46	0.51
1:A:459:THR:HG21	1:A:463:ILE:HD11	1.93	0.49
1:A:460:ASN:O	1:A:492:ARG:HA	2.13	0.48
1:A:238:MET:HG2	1:A:249:ARG:NH1	2.28	0.48
1:A:547:GLY:HA2	1:A:565:ASN:O	2.12	0.48
1:A:201:TYR:HD2	1:A:202:SER:HB2	1.78	0.48
1:A:166:THR:O	1:A:169:ASP:N	2.47	0.48
1:A:266:PHE:HA	1:A:269:PHE:O	2.14	0.47
1:A:274:LEU:O	1:A:305:PRO:HG3	2.14	0.47
1:A:683:ILE:HG21	1:A:686:THR:HG23	1.97	0.47
1:A:702:MET:HA	1:A:715:ARG:O	2.14	0.47
1:A:270:ARG:HG2	1:A:297:TYR:CE2	2.49	0.47
1:A:487:LEU:HG	1:A:488:ILE:HD12	1.97	0.47
1:A:586:THR:HB	1:A:743:LEU:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:425:ILE:O	1:A:454:GLY:HA3	2.15	0.46
1:A:576:ASN:OD1	1:A:576:ASN:N	2.48	0.46
1:A:226:TYR:O	1:A:237:THR:HA	2.16	0.46
1:A:451:GLU:OE1	2:A:801:PEG:H22	2.15	0.46
1:A:334:ALA:HA	1:A:360:TYR:O	2.16	0.45
1:A:398:HIS:O	1:A:399:LEU:HD12	2.17	0.45
1:A:651:ASP:O	1:A:670:ALA:HA	2.16	0.45
1:A:200:CYS:HB3	1:A:204:ILE:HD12	2.00	0.44
1:A:273:CYS:HB2	1:A:300:ARG:HB2	1.98	0.44
1:A:451:GLU:HA	1:A:474:GLU:O	2.18	0.44
1:A:370:LYS:HA	1:A:400:THR:O	2.18	0.44
1:A:594:LYS:HA	1:A:595:PRO:HD2	1.80	0.44
1:A:447:ARG:HA	1:A:447:ARG:HD2	1.60	0.43
1:A:342:SER:HA	1:A:368:ASN:HB3	2.00	0.43
1:A:417:SER:HA	1:A:446:HIS:O	2.18	0.43
1:A:591:TYR:HA	1:A:735:ILE:O	2.19	0.43
1:A:321:ALA:O	1:A:325:PRO:HA	2.19	0.43
1:A:524:TYR:CD2	1:A:527:GLN:HG3	2.54	0.43
1:A:252:ALA:HB1	1:A:258:VAL:HG23	2.01	0.42
1:A:400:THR:HA	1:A:422:GLU:O	2.18	0.42
1:A:634:LEU:HD23	1:A:645:SER:OG	2.20	0.42
1:A:417:SER:HB3	1:A:418:TYR:HD2	1.85	0.42
1:A:283:VAL:HG12	1:A:322:LYS:HG3	2.02	0.42
1:A:447:ARG:HD2	1:A:470:ALA:O	2.20	0.41
1:A:431:GLY:CA	1:A:439:ASN:OD1	2.60	0.41
1:A:291:ASN:OD1	1:A:291:ASN:N	2.49	0.41
1:A:406:ILE:HD13	1:A:407:GLU:N	2.35	0.41
1:A:257:ASP:OD1	1:A:259:SER:HB2	2.21	0.41
1:A:491:ASN:OD1	1:A:492:ARG:N	2.52	0.41
1:A:286:ILE:O	1:A:287:PRO:C	2.57	0.41
1:A:624:ASN:HA	1:A:654:VAL:O	2.21	0.41
1:A:365:HIS:HA	1:A:395:ASN:O	2.21	0.40
1:A:469:SER:HA	1:A:506:SER:O	2.22	0.40
1:A:404:ARG:HG3	1:A:407:GLU:HG3	2.03	0.40
1:A:199:GLN:O	1:A:200:CYS:HB3	2.22	0.40
1:A:233:ASN:O	1:A:234:LEU:HD23	2.22	0.40
1:A:546:ILE:HD13	1:A:546:ILE:HG21	1.86	0.40
1:A:638:SER:HB3	1:A:731:THR:HG21	2.04	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	604/616 (98%)	541 (90%)	50 (8%)	13 (2%)	<b>6</b> <b>12</b>

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	171	ASN
1	A	187	LYS
1	A	718	PRO
1	A	167	GLN
1	A	242	THR
1	A	249	ARG
1	A	442	SER
1	A	200	CYS
1	A	291	ASN
1	A	687	GLY
1	A	382	ARG
1	A	257	ASP
1	A	186	GLY

### 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	507/518 (98%)	456 (90%)	51 (10%)	<b>7</b> <b>14</b>

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	166	THR
1	A	173	ARG
1	A	174	LEU
1	A	180	THR
1	A	187	LYS
1	A	191	LYS
1	A	195	VAL
1	A	196	ILE
1	A	200	CYS
1	A	213	ARG
1	A	273	CYS
1	A	275	THR
1	A	320	SER
1	A	323	LEU
1	A	326	THR
1	A	327	SER
1	A	344	ILE
1	A	358	ARG
1	A	362	ILE
1	A	363	ASN
1	A	380	VAL
1	A	391	SER
1	A	395	ASN
1	A	406	ILE
1	A	407	GLU
1	A	422	GLU
1	A	433	ASP
1	A	439	ASN
1	A	442	SER
1	A	447	ARG
1	A	451	GLU
1	A	456	LEU
1	A	464	ILE
1	A	501	SER
1	A	503	LEU
1	A	504	VAL
1	A	541	LYS
1	A	544	VAL
1	A	567	ARG
1	A	617	THR
1	A	626	LYS
1	A	649	LYS
1	A	685	SER

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Mol	Chain	Res	Type
1	A	686	THR
1	A	693	LYS
1	A	699	THR
1	A	702	MET
1	A	717	SER
1	A	721	ASN
1	A	723	SER
1	A	724	SER

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

Mol	Chain	Res	Type
1	A	171	ASN
1	A	295	ASN
1	A	361	ASN
1	A	363	ASN
1	A	395	ASN
1	A	440	ASN
1	A	642	ASN

### 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

2 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
2	PEG	A	801	-	6,6,6	1.14	0	5,5,5	0.79	0
2	PEG	A	802	-	6,6,6	0.68	0	5,5,5	0.34	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
2	PEG	A	801	-	-	2/4/4/4	-
2	PEG	A	802	-	-	1/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	802	PEG	O1-C1-C2-O2
2	A	801	PEG	O1-C1-C2-O2
2	A	801	PEG	O2-C3-C4-O4

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	PEG	1	0

## 5.7 Other polymers [i](#)

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 [i](#)

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

In the following table, the column labelled '#RSRZ > 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	606/616 (98%)	-0.07	5 (0%) 86 84	30, 56, 88, 118	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	280	LEU	2.8
1	A	343	PHE	2.7
1	A	405	VAL	2.2
1	A	250	PHE	2.1
1	A	268	TYR	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 monosaccharides 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<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	B-factors(Å <sup>2</sup> )	Q<0.9
2	PEG	A	801	7/7	0.82	0.19	47,68,89,93	0
2	PEG	A	802	7/7	0.91	0.22	45,63,74,74	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.