



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 02:34 PM EDT

PDB ID : 4BNW  
Title : Crystal structure of 3-oxoacyl-(acyl-carrier-protein) reductase (FabG) from *Pseudomonas aeruginosa* in complex with an unknown ligand at 1.6 Å resolution  
Authors : Cukier, C.D.; Schnell, R.; Lindqvist, Y.; Schneider, G.  
Deposited on : 2013-05-17  
Resolution : 1.60 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 : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 2.36.2  
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) : 2.36.2

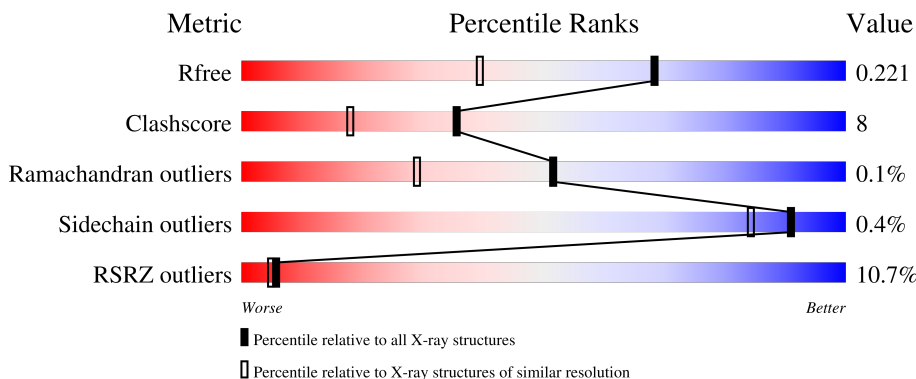
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.60 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	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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	269	 7% 81% 9% 10%
1	B	269	 11% 77% 11% 12%
1	C	269	 10% 80% 13% 7%
1	D	269	 11% 80% 11% 9%

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
3	PG4	B	1248	-	-	X	-

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 7741 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 3-OXOACYL-[ACYL-CARRIER-PROTEIN] REDUCTASE FABG.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	242	Total 1805	C 1128	N 319	O 351	S 7	0	10	0
1	B	238	Total 1764	C 1108	N 312	O 338	S 6	0	5	0
1	C	251	Total 1886	C 1177	N 338	O 363	S 8	0	8	0
1	D	246	Total 1853	C 1164	N 326	O 355	S 8	0	11	0

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	MET	-	expression tag	UNP O54438
A	-20	HIS	-	expression tag	UNP O54438
A	-19	HIS	-	expression tag	UNP O54438
A	-18	HIS	-	expression tag	UNP O54438
A	-17	HIS	-	expression tag	UNP O54438
A	-16	HIS	-	expression tag	UNP O54438
A	-15	HIS	-	expression tag	UNP O54438
A	-14	SER	-	expression tag	UNP O54438
A	-13	SER	-	expression tag	UNP O54438
A	-12	GLY	-	expression tag	UNP O54438
A	-11	VAL	-	expression tag	UNP O54438
A	-10	ASP	-	expression tag	UNP O54438
A	-9	LEU	-	expression tag	UNP O54438
A	-8	GLY	-	expression tag	UNP O54438
A	-7	THR	-	expression tag	UNP O54438
A	-6	GLU	-	expression tag	UNP O54438
A	-5	ASN	-	expression tag	UNP O54438
A	-4	LEU	-	expression tag	UNP O54438
A	-3	TYR	-	expression tag	UNP O54438
A	-2	PHE	-	expression tag	UNP O54438

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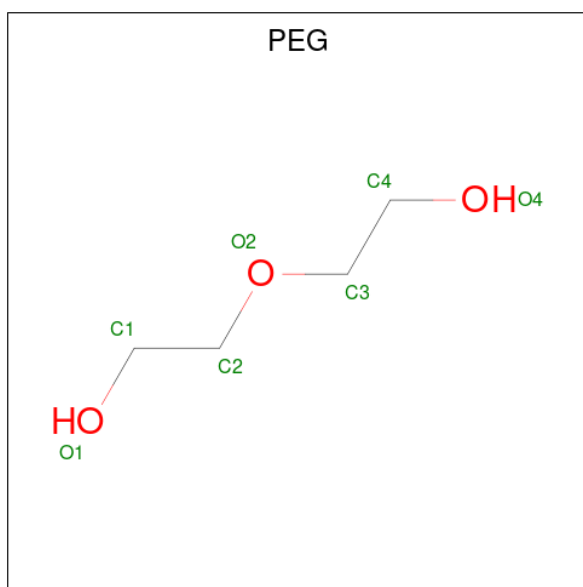
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLN	-	expression tag	UNP O54438
A	0	SER	-	expression tag	UNP O54438
B	-21	MET	-	expression tag	UNP O54438
B	-20	HIS	-	expression tag	UNP O54438
B	-19	HIS	-	expression tag	UNP O54438
B	-18	HIS	-	expression tag	UNP O54438
B	-17	HIS	-	expression tag	UNP O54438
B	-16	HIS	-	expression tag	UNP O54438
B	-15	HIS	-	expression tag	UNP O54438
B	-14	SER	-	expression tag	UNP O54438
B	-13	SER	-	expression tag	UNP O54438
B	-12	GLY	-	expression tag	UNP O54438
B	-11	VAL	-	expression tag	UNP O54438
B	-10	ASP	-	expression tag	UNP O54438
B	-9	LEU	-	expression tag	UNP O54438
B	-8	GLY	-	expression tag	UNP O54438
B	-7	THR	-	expression tag	UNP O54438
B	-6	GLU	-	expression tag	UNP O54438
B	-5	ASN	-	expression tag	UNP O54438
B	-4	LEU	-	expression tag	UNP O54438
B	-3	TYR	-	expression tag	UNP O54438
B	-2	PHE	-	expression tag	UNP O54438
B	-1	GLN	-	expression tag	UNP O54438
B	0	SER	-	expression tag	UNP O54438
C	-21	MET	-	expression tag	UNP O54438
C	-20	HIS	-	expression tag	UNP O54438
C	-19	HIS	-	expression tag	UNP O54438
C	-18	HIS	-	expression tag	UNP O54438
C	-17	HIS	-	expression tag	UNP O54438
C	-16	HIS	-	expression tag	UNP O54438
C	-15	HIS	-	expression tag	UNP O54438
C	-14	SER	-	expression tag	UNP O54438
C	-13	SER	-	expression tag	UNP O54438
C	-12	GLY	-	expression tag	UNP O54438
C	-11	VAL	-	expression tag	UNP O54438
C	-10	ASP	-	expression tag	UNP O54438
C	-9	LEU	-	expression tag	UNP O54438
C	-8	GLY	-	expression tag	UNP O54438
C	-7	THR	-	expression tag	UNP O54438
C	-6	GLU	-	expression tag	UNP O54438
C	-5	ASN	-	expression tag	UNP O54438
C	-4	LEU	-	expression tag	UNP O54438

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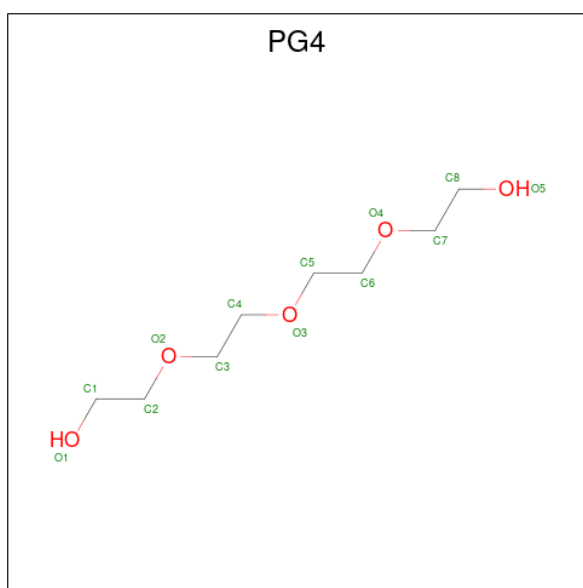
Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	TYR	-	expression tag	UNP O54438
C	-2	PHE	-	expression tag	UNP O54438
C	-1	GLN	-	expression tag	UNP O54438
C	0	SER	-	expression tag	UNP O54438
D	-21	MET	-	expression tag	UNP O54438
D	-20	HIS	-	expression tag	UNP O54438
D	-19	HIS	-	expression tag	UNP O54438
D	-18	HIS	-	expression tag	UNP O54438
D	-17	HIS	-	expression tag	UNP O54438
D	-16	HIS	-	expression tag	UNP O54438
D	-15	HIS	-	expression tag	UNP O54438
D	-14	SER	-	expression tag	UNP O54438
D	-13	SER	-	expression tag	UNP O54438
D	-12	GLY	-	expression tag	UNP O54438
D	-11	VAL	-	expression tag	UNP O54438
D	-10	ASP	-	expression tag	UNP O54438
D	-9	LEU	-	expression tag	UNP O54438
D	-8	GLY	-	expression tag	UNP O54438
D	-7	THR	-	expression tag	UNP O54438
D	-6	GLU	-	expression tag	UNP O54438
D	-5	ASN	-	expression tag	UNP O54438
D	-4	LEU	-	expression tag	UNP O54438
D	-3	TYR	-	expression tag	UNP O54438
D	-2	PHE	-	expression tag	UNP O54438
D	-1	GLN	-	expression tag	UNP O54438
D	0	SER	-	expression tag	UNP O54438

- Molecule 2 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



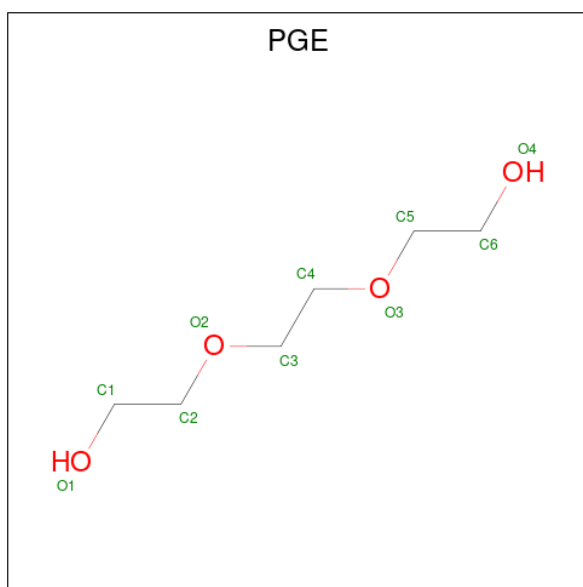
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			7	4	3		
2	C	1	Total	C	O	0	0
			7	4	3		

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula:  $C_8H_{18}O_5$ ).



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

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



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

- Molecule 5 is water.

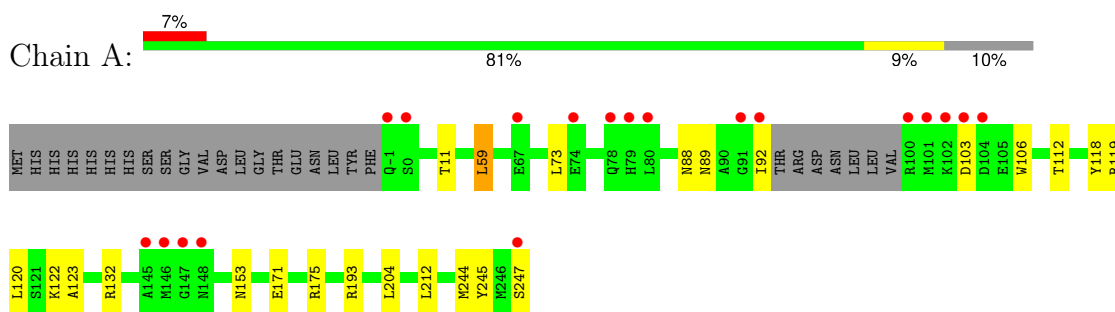
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	102	Total O 102 102	0	0
5	B	97	Total O 97 97	0	0
5	C	96	Total O 96 96	0	0
5	D	101	Total O 101 101	0	0



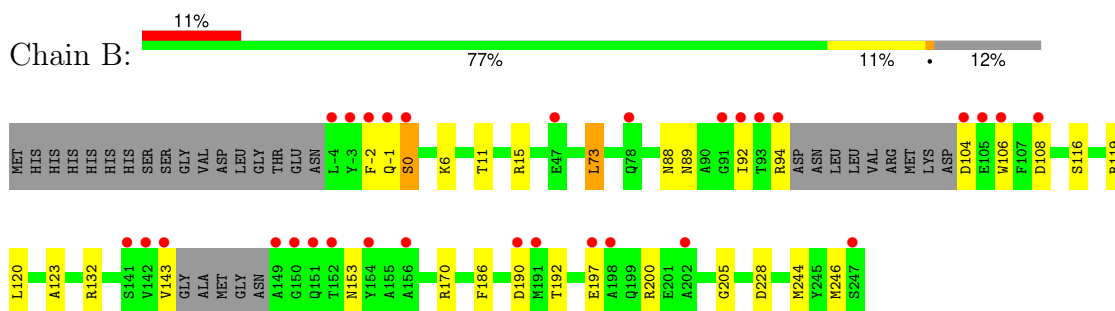
### 3 Residue-property plots [i](#)

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.

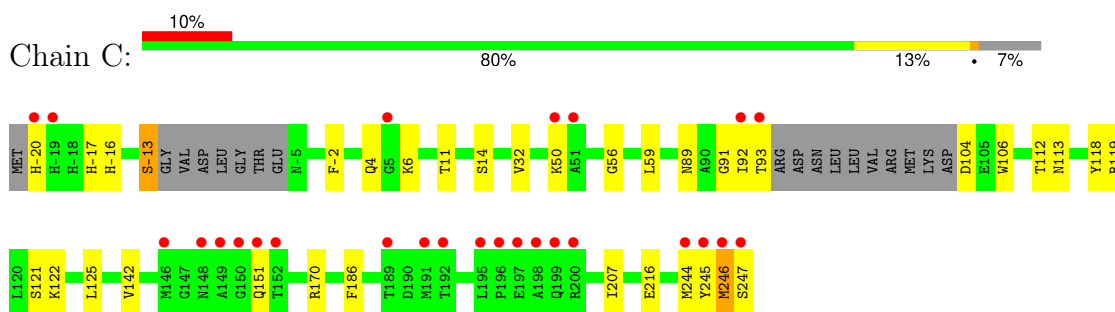
- Molecule 1: 3-OXOACYL-[ACYL-CARRIER-PROTEIN] REDUCTASE FABG



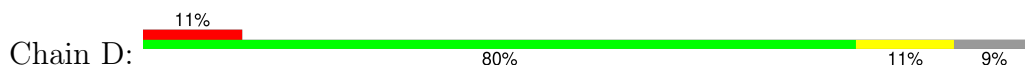
- Molecule 1: 3-OXOACYL-[ACYL-CARRIER-PROTEIN] REDUCTASE FABG

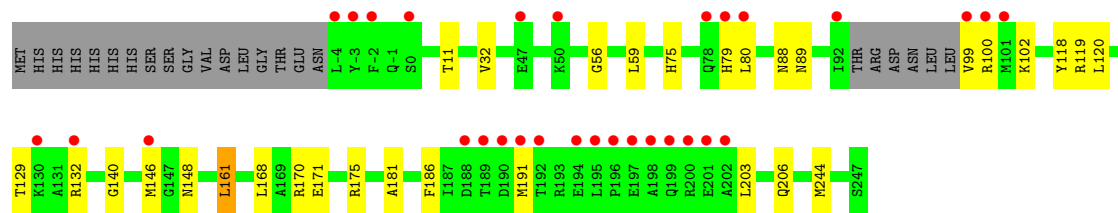


- Molecule 1: 3-OXOACYL-[ACYL-CARRIER-PROTEIN] REDUCTASE FABG



- Molecule 1: 3-OXOACYL-[ACYL-CARRIER-PROTEIN] REDUCTASE FABG





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	53.95Å 107.98Å 146.13Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.96 – 1.60 29.94 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.7 (29.96-1.60) 99.8 (29.94-1.60)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.84 (at 1.60Å)	Xtrriage
Refinement program	REFMAC 5.7.0032	Depositor
R, $R_{free}$	0.178 , 0.209 0.190 , 0.221	Depositor DCC
$R_{free}$ test set	5715 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	18.0	Xtrriage
Anisotropy	0.178	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 55.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	7741	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	25.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.75% 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: PGE, PG4, 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	0.94	0/1852	1.02	5/2502 (0.2%)
1	B	0.96	0/1797	1.02	4/2429 (0.2%)
1	C	1.05	1/1922 (0.1%)	1.04	6/2596 (0.2%)
1	D	0.96	0/1902	1.04	4/2569 (0.2%)
All	All	0.98	1/7473 (0.0%)	1.03	19/10096 (0.2%)

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	1
1	C	1	2
All	All	1	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	-13	SER	CB-OG	-5.42	1.35	1.42

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	119	ARG	NE-CZ-NH1	10.30	125.45	120.30
1	A	59[A]	LEU	CB-CG-CD2	-9.92	94.14	111.00
1	A	59[B]	LEU	CB-CG-CD2	-9.92	94.14	111.00
1	B	132	ARG	NE-CZ-NH1	8.65	124.63	120.30
1	C	119	ARG	NE-CZ-NH2	-7.07	116.77	120.30
1	A	244	MET	CG-SD-CE	-6.30	90.12	100.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	119	ARG	NE-CZ-NH2	-6.19	117.20	120.30
1	B	73[A]	LEU	CB-CG-CD1	-6.01	100.79	111.00
1	B	73[B]	LEU	CB-CG-CD1	-6.01	100.79	111.00
1	A	119	ARG	NE-CZ-NH2	-5.93	117.33	120.30
1	C	170	ARG	NE-CZ-NH1	5.85	123.22	120.30
1	D	119	ARG	NE-CZ-NH1	5.63	123.12	120.30
1	B	119	ARG	NE-CZ-NH1	5.59	123.10	120.30
1	A	119	ARG	NE-CZ-NH1	5.21	122.91	120.30
1	C	14[A]	SER	CB-CA-C	-5.18	100.26	110.10
1	C	14[B]	SER	CB-CA-C	-5.18	100.26	110.10
1	D	161[A]	LEU	CA-CB-CG	-5.14	103.47	115.30
1	D	161[B]	LEU	CA-CB-CG	-5.14	103.47	115.30
1	C	216	GLU	CG-CD-OE1	5.01	128.32	118.30

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	C	246[B]	MET	CA

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	0	SER	Peptide
1	C	246[B]	MET	Peptide
1	C	91	GLY	Peptide

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1805	0	1864	21	0
1	B	1764	0	1818	36	0
1	C	1886	0	1904	51	0
1	D	1853	0	1917	27	0
2	A	7	0	10	0	0
2	C	7	0	10	1	0
3	B	13	0	18	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	10	0	14	0	0
5	A	102	0	0	2	0
5	B	97	0	0	5	0
5	C	96	0	0	5	0
5	D	101	0	0	4	0
All	All	7741	0	7555	120	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 8.

All (120) 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:C:186:PHE:CD2	1:C:244[A]:MET:CE	2.15	1.29
1:C:186:PHE:HD2	1:C:244[A]:MET:CE	1.46	1.28
1:C:186:PHE:HD2	1:C:244[A]:MET:HE1	1.02	1.15
1:C:207:ILE:HG12	1:C:244[A]:MET:SD	2.00	1.02
1:B:228[A]:ASP:OD2	3:B:1248:PG4:H61	1.59	1.01
1:C:186:PHE:CD2	1:C:244[A]:MET:HE1	1.83	1.00
1:C:151:GLN:HB2	1:C:246[A]:MET:HE2	1.38	0.99
1:C:151:GLN:CB	1:C:246[A]:MET:HE2	1.91	0.99
1:C:186:PHE:CD2	1:C:244[A]:MET:HE3	1.99	0.93
1:C:151:GLN:CG	1:C:246[A]:MET:HE2	2.10	0.82
1:C:186:PHE:CD2	1:C:244[A]:MET:SD	2.74	0.81
1:C:151:GLN:HB2	1:C:246[A]:MET:CE	2.10	0.81
1:C:186:PHE:CE2	1:C:244[A]:MET:SD	2.74	0.80
1:D:206[B]:GLN:HB3	1:D:244[B]:MET:SD	2.22	0.79
1:A:204:LEU:HD21	1:A:212:LEU:HD12	1.66	0.78
5:B:2092:HOH:O	1:C:244[A]:MET:CE	2.32	0.77
1:C:186:PHE:CE2	1:C:244[A]:MET:CE	2.68	0.77
1:C:186:PHE:CE2	1:C:244[A]:MET:HE3	2.22	0.75
1:C:151:GLN:OE1	1:C:247[B]:SER:HB3	1.88	0.72
1:C:207:ILE:CG1	1:C:244[A]:MET:SD	2.77	0.72
1:A:247:SER:OG	1:C:247[A]:SER:HB2	1.91	0.71
1:B:143:VAL:HB	1:B:186:PHE:CE1	2.26	0.71
1:A:171[B]:GLU:OE2	1:B:104:ASP:N	2.24	0.70
1:D:161[B]:LEU:HD21	1:D:181:ALA:HB1	1.74	0.70
1:B:143:VAL:HG11	1:B:186:PHE:CZ	2.28	0.69
5:B:2092:HOH:O	1:C:244[A]:MET:HE1	1.92	0.68
1:C:244[B]:MET:SD	5:C:2069:HOH:O	2.51	0.68
1:B:186:PHE:CE2	1:B:244[B]:MET:SD	2.88	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:186:PHE:HD2	1:C:244[A]:MET:SD	2.17	0.65
1:B:186:PHE:HE2	1:B:244[B]:MET:SD	2.19	0.65
1:B:143:VAL:HB	1:B:186:PHE:CD1	2.32	0.65
5:B:2092:HOH:O	1:C:244[A]:MET:HE2	1.93	0.64
1:C:186:PHE:HE2	1:C:244[A]:MET:SD	2.20	0.63
1:D:161[B]:LEU:CD2	5:D:2086:HOH:O	2.49	0.61
1:B:92:ILE:HD11	1:B:116:SER:OG	2.00	0.61
1:B:6[B]:LYS:NZ	3:B:1248:PG4:O4	2.34	0.60
1:B:244[A]:MET:SD	1:B:246:MET:HG3	2.41	0.60
1:C:106:TRP:CG	1:D:171[A]:GLU:HG3	2.36	0.60
1:B:92:ILE:CD1	1:B:116:SER:OG	2.49	0.60
1:C:-13:SER:HB3	5:C:2004:HOH:O	2.02	0.59
1:D:102[B]:LYS:HG3	5:D:2052:HOH:O	2.04	0.58
1:B:116:SER:HB2	5:B:2042:HOH:O	2.04	0.57
1:C:104:ASP:CG	1:D:118:TYR:OH	2.42	0.57
1:B:228[A]:ASP:CG	3:B:1248:PG4:H61	2.23	0.56
1:A:245:TYR:HB2	1:D:170[A]:ARG:HH22	1.71	0.56
1:C:106:TRP:CD1	1:D:171[A]:GLU:HG3	2.40	0.56
1:A:193:ARG:HA	5:A:2079:HOH:O	2.05	0.55
1:C:-13:SER:O	1:C:50:LYS:HE2	2.06	0.55
1:A:247:SER:OG	1:C:247[A]:SER:CB	2.53	0.55
1:B:0:SER:HB2	3:B:1248:PG4:H71	1.88	0.54
1:B:143:VAL:CG1	1:B:186:PHE:CE1	2.90	0.54
1:C:-16:HIS:ND1	1:C:59:LEU:HD21	2.23	0.53
1:A:122:LYS:NZ	1:A:171[A]:GLU:OE2	2.40	0.53
1:C:151:GLN:OE1	1:C:247[B]:SER:CB	2.54	0.53
1:D:132:ARG:NH1	1:D:175:ARG:HG2	2.24	0.53
1:A:118:TYR:CE1	1:A:122:LYS:HE3	2.45	0.52
1:D:161[B]:LEU:HD22	5:D:2086:HOH:O	2.10	0.52
1:A:132:ARG:NH2	5:A:2050:HOH:O	2.41	0.52
1:B:197:GLU:HA	5:B:2073:HOH:O	2.08	0.52
1:C:113:ASN:CG	1:C:142:VAL:O	2.49	0.51
1:C:151:GLN:CD	1:C:246[A]:MET:HE2	2.30	0.51
1:A:92:ILE:HD13	1:A:112:THR:HG21	1.93	0.51
1:C:-17:HIS:HE1	5:C:2006:HOH:O	1.93	0.51
1:B:15:ARG:HG2	1:B:15:ARG:HH11	1.75	0.51
1:C:118:TYR:OH	1:C:122:LYS:HE2	2.12	0.50
1:B:-2:PHE:CZ	1:C:-2:PHE:CE1	2.98	0.50
1:B:88:ASN:OD1	1:B:120:LEU:HD23	2.11	0.50
1:A:11:THR:O	1:A:89:ASN:HB3	2.12	0.50
1:B:94:ARG:CG	1:B:108:ASP:HB3	2.43	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:143:VAL:CB	1:B:186:PHE:CE1	2.93	0.49
1:D:161[B]:LEU:HD23	5:D:2086:HOH:O	2.11	0.49
1:A:106:TRP:HA	1:A:153:ASN:OD1	2.12	0.49
1:B:228[A]:ASP:OD1	3:B:1248:PG4:H62	2.14	0.48
1:C:121:SER:O	1:C:125:LEU:HG	2.14	0.47
1:B:228[A]:ASP:OD1	3:B:1248:PG4:C6	2.63	0.47
1:C:11:THR:O	1:C:89:ASN:HB3	2.15	0.47
1:A:132:ARG:CZ	1:A:175:ARG:HG2	2.45	0.47
1:D:11:THR:O	1:D:89:ASN:HB3	2.15	0.46
1:B:6[B]:LYS:NZ	3:B:1248:PG4:C6	2.78	0.46
1:D:88:ASN:OD1	1:D:120:LEU:HD23	2.16	0.46
1:D:186:PHE:CE2	1:D:203:LEU:HD11	2.51	0.46
1:A:245:TYR:O	1:C:247[A]:SER:HB3	2.16	0.46
1:B:192:THR:O	1:B:200:ARG:NH2	2.44	0.46
1:B:11:THR:O	1:B:89:ASN:HB3	2.16	0.45
1:A:73[A]:LEU:HD12	1:A:123:ALA:HB1	1.98	0.45
1:B:-2:PHE:CZ	1:C:-2:PHE:HE1	2.35	0.45
1:A:73[A]:LEU:CD1	1:A:123:ALA:HB1	2.47	0.45
1:B:94:ARG:HG2	1:B:108:ASP:HB3	1.99	0.45
1:A:247:SER:CB	1:C:247[A]:SER:HB2	2.46	0.45
1:C:-16:HIS:CD2	1:C:-16:HIS:C	2.90	0.44
1:D:32:VAL:O	1:D:56:GLY:HA3	2.17	0.44
1:A:88:ASN:OD1	1:A:120:LEU:HD23	2.18	0.44
1:B:6[B]:LYS:HZ1	3:B:1248:PG4:C6	2.29	0.44
1:D:100:ARG:O	1:D:102[A]:LYS:HG2	2.17	0.44
1:B:170:ARG:NH2	1:C:245[A]:TYR:HB2	2.31	0.44
1:B:106:TRP:HB3	1:B:153:ASN:OD1	2.18	0.43
1:D:129:THR:O	1:D:132:ARG:HD2	2.19	0.43
5:C:2066:HOH:O	1:D:170[A]:ARG:NH1	2.51	0.43
1:B:-1:GLN:CG	1:B:0:SER:N	2.82	0.43
1:C:6:LYS:NZ	2:C:1248:PEG:H21	2.34	0.42
1:C:106:TRP:CZ2	1:D:168:LEU:HD13	2.54	0.42
1:A:59[A]:LEU:HA	1:A:59[A]:LEU:HD23	1.67	0.42
1:B:143:VAL:CG1	1:B:186:PHE:CZ	3.00	0.42
1:A:245:TYR:HB2	1:D:170[A]:ARG:NH2	2.34	0.42
1:B:73[A]:LEU:HD12	1:B:123:ALA:HB1	2.02	0.42
1:B:73[A]:LEU:CD1	1:B:123:ALA:HB1	2.49	0.42
1:D:170[B]:ARG:HE	1:D:170[B]:ARG:HB3	1.62	0.42
1:D:79:HIS:C	1:D:80:LEU:HD12	2.40	0.42
1:D:59:LEU:HD22	1:D:75:HIS:CE1	2.55	0.41
1:C:4:GLN:O	1:C:4:GLN:CG	2.68	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:32:VAL:O	1:C:56:GLY:HA3	2.19	0.41
1:B:205:GLY:O	1:D:148:ASN:ND2	2.52	0.41
1:D:146:MET:HG2	1:D:191:MET:HE1	2.03	0.41
1:C:104:ASP:N	5:C:2046:HOH:O	2.53	0.41
1:C:92:ILE:HG22	1:C:93:THR:N	2.35	0.40
1:C:92:ILE:HD12	1:C:112:THR:HG21	2.03	0.40
1:C:244[A]:MET:HE2	1:C:244[A]:MET:HB3	1.89	0.40
1:D:140:GLY:HA2	1:D:161[B]:LEU:HD13	2.03	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	248/269 (92%)	245 (99%)	3 (1%)	0	100	100
1	B	237/269 (88%)	231 (98%)	5 (2%)	1 (0%)	34	15
1	C	252/269 (94%)	247 (98%)	5 (2%)	0	100	100
1	D	253/269 (94%)	249 (98%)	4 (2%)	0	100	100
All	All	990/1076 (92%)	972 (98%)	17 (2%)	1 (0%)	51	29

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	190	ASP

### 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	186/201 (92%)	185 (100%)	1 (0%)	88	80
1	B	180/201 (90%)	180 (100%)	0	100	100
1	C	193/201 (96%)	192 (100%)	1 (0%)	88	80
1	D	190/201 (94%)	189 (100%)	1 (0%)	88	80
All	All	749/804 (93%)	746 (100%)	3 (0%)	91	84

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	103	ASP
1	C	-20	HIS
1	D	99	VAL

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

Mol	Chain	Res	Type
1	A	111	ASN
1	A	214	GLN

### 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](#)

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	$\# Z  > 2$
3	PG4	B	1248	-	12,12,12	0.53	0	11,11,11	0.57	0
4	PGE	D	1248	-	9,9,9	0.44	0	8,8,8	0.46	0
2	PEG	C	1248	-	6,6,6	0.79	0	5,5,5	1.67	1 (20%)
2	PEG	A	1248	-	6,6,6	0.34	0	5,5,5	0.46	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	PG4	B	1248	-	-	1/10/10/10	-
4	PGE	D	1248	-	-	3/7/7/7	-
2	PEG	C	1248	-	-	0/4/4/4	-
2	PEG	A	1248	-	-	2/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	1248	PEG	O2-C2-C1	3.16	124.05	110.11

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	1248	PG4	O1-C1-C2-O2
4	D	1248	PGE	O3-C5-C6-O4
2	A	1248	PEG	C1-C2-O2-C3
4	D	1248	PGE	O2-C3-C4-O3
4	D	1248	PGE	C4-C3-O2-C2
2	A	1248	PEG	O2-C3-C4-O4

There are no ring outliers.

2 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1248	PG4	8	0
2	C	1248	PEG	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 [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	242/269 (89%)	0.28	19 (7%) 12 11	10, 20, 54, 79	0
1	B	238/269 (88%)	0.51	30 (12%) 3 3	9, 21, 49, 76	0
1	C	251/269 (93%)	0.44	26 (10%) 6 5	9, 18, 44, 67	0
1	D	246/269 (91%)	0.50	30 (12%) 4 3	11, 21, 54, 90	0
All	All	977/1076 (90%)	0.43	105 (10%) 6 5	9, 20, 51, 90	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	92	ILE	11.8
1	B	-2	PHE	9.5
1	D	-3	TYR	6.9
1	B	93	THR	6.0
1	B	149	ALA	6.0
1	D	-2	PHE	5.9
1	D	197	GLU	5.3
1	B	-3	TYR	5.2
1	D	199	GLN	5.1
1	B	105	GLU	5.1
1	D	190	ASP	5.0
1	D	198	ALA	5.0
1	B	104	ASP	5.0
1	A	145	ALA	5.0
1	B	94	ARG	4.9
1	B	-1	GLN	4.9
1	D	195	LEU	4.9
1	D	189	THR	4.8
1	D	191	MET	4.7
1	D	-4	LEU	4.5
1	C	149	ALA	4.5

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Mol	Chain	Res	Type	RSRZ
1	C	93	THR	4.4
1	C	196	PRO	4.2
1	A	0	SER	4.0
1	D	201	GLU	4.0
1	D	0	SER	3.9
1	A	101	MET	3.9
1	B	198	ALA	3.9
1	C	244[A]	MET	3.9
1	A	-1	GLN	3.8
1	A	91	GLY	3.8
1	B	150	GLY	3.8
1	D	80	LEU	3.7
1	B	0	SER	3.7
1	B	106	TRP	3.7
1	A	104	ASP	3.6
1	B	143	VAL	3.6
1	A	79	HIS	3.5
1	C	-19	HIS	3.5
1	C	195	LEU	3.5
1	B	142	VAL	3.5
1	D	192	THR	3.5
1	A	80	LEU	3.4
1	D	100	ARG	3.4
1	D	188	ASP	3.4
1	B	78	GLN	3.4
1	A	100	ARG	3.4
1	D	99	VAL	3.3
1	D	146	MET	3.3
1	D	202	ALA	3.3
1	C	197	GLU	3.3
1	C	150	GLY	3.2
1	C	189	THR	3.2
1	C	247[A]	SER	3.2
1	C	245[A]	TYR	3.2
1	D	196	PRO	3.1
1	C	92	ILE	3.1
1	D	101	MET	3.1
1	C	51	ALA	3.1
1	B	154	TYR	3.0
1	B	47	GLU	3.0
1	A	147	GLY	3.0
1	D	92	ILE	3.0

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Mol	Chain	Res	Type	RSRZ
1	A	78	GLN	2.9
1	B	202	ALA	2.9
1	C	198	ALA	2.9
1	C	-20	HIS	2.9
1	C	152	THR	2.8
1	D	47	GLU	2.8
1	B	191	MET	2.8
1	A	103	ASP	2.8
1	B	-4	LEU	2.7
1	C	5	GLY	2.6
1	A	146	MET	2.6
1	D	200	ARG	2.6
1	B	197	GLU	2.6
1	C	191	MET	2.6
1	C	246[A]	MET	2.6
1	C	50	LYS	2.5
1	C	151	GLN	2.5
1	B	151	GLN	2.5
1	B	92	ILE	2.5
1	D	79	HIS	2.4
1	D	50	LYS	2.4
1	D	130	LYS	2.4
1	A	74	GLU	2.4
1	B	247	SER	2.4
1	D	132	ARG	2.4
1	C	146	MET	2.4
1	C	200	ARG	2.3
1	B	190	ASP	2.3
1	D	194	GLU	2.3
1	C	148	ASN	2.3
1	B	108	ASP	2.3
1	B	156	ALA	2.2
1	A	67	GLU	2.2
1	B	152	THR	2.2
1	D	78	GLN	2.1
1	C	192	THR	2.1
1	C	199	GLN	2.1
1	A	247	SER	2.1
1	A	102	LYS	2.0
1	B	141	SER	2.0
1	A	148	ASN	2.0
1	B	91	GLY	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( $\text{\AA}^2$ )	Q<0.9
2	PEG	C	1248	7/7	0.67	0.18	40,45,49,52	0
3	PG4	B	1248	13/13	0.82	0.15	38,41,44,45	0
2	PEG	A	1248	7/7	0.85	0.24	42,45,48,49	0
4	PGE	D	1248	10/10	0.86	0.16	40,48,51,53	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.