



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2018 – 05:43 pm GMT

PDB ID : 1XQI  
Title : Crystal Structure Analysis of an NDP kinase from *Pyrobaculum aerophilum*  
Authors : Pedelacq, J.D.; Waldo, G.S.; Cabantous, S.; Liong, E.C.; Berendzen, J.; Terwilliger, T.C.  
Deposited on : 2004-10-12  
Resolution : 2.50 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.

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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 : 1.7.3 (157068), CSD as539be (2018)  
Xtrriage (Phenix) : 1.13  
EDS : trunk30967  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk30967

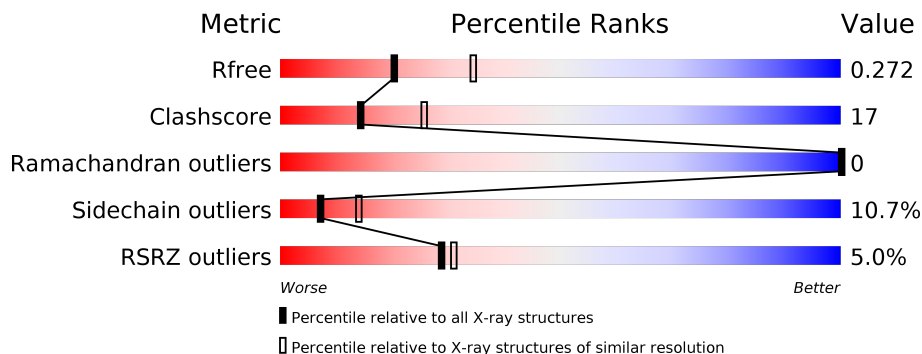
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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))
$R_{free}$	111664	4155 (2.50-2.50)
Clashscore	122126	4827 (2.50-2.50)
Ramachandran outliers	120053	4735 (2.50-2.50)
Sidechain outliers	120020	4737 (2.50-2.50)
RSRZ outliers	108989	4058 (2.50-2.50)

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	195	
1	B	195	
1	C	195	

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	PGE	A	500	-	-	X	-
3	PGE	B	600	-	-	X	-
3	PGE	C	700	-	-	X	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 4454 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 Nucleoside diphosphate kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	Se			
1	A	182	1414	900	246	265	3	0	0	0
1	B	182	1414	900	246	265	3	0	0	0
1	C	182	1414	900	246	265	3	0	0	0

There are 33 discrepancies between the modelled and reference sequences:

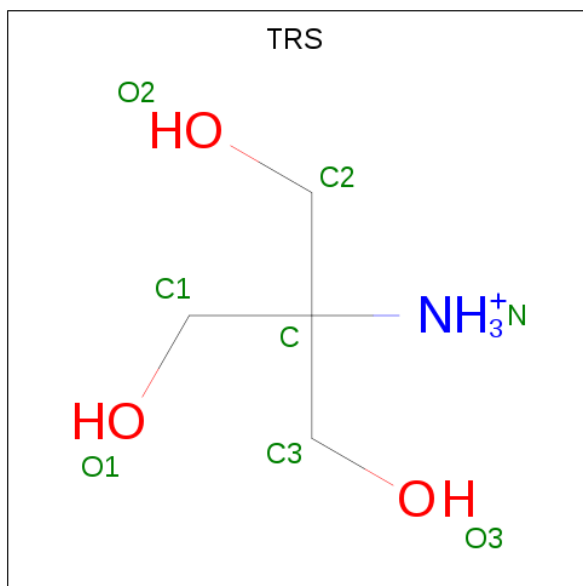
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
A	10	ASP	ALA	ENGINEERED	UNP Q8ZWY4
A	13	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
A	33	ASP	GLY	ENGINEERED	UNP Q8ZWY4
A	40	LYS	GLU	ENGINEERED	UNP Q8ZWY4
A	51	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
A	71	GLN	ARG	ENGINEERED	UNP Q8ZWY4
A	107	ASN	SER	ENGINEERED	UNP Q8ZWY4
A	112	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
A	117	ASN	ILE	ENGINEERED	UNP Q8ZWY4
A	120	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
B	1	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
B	10	ASP	ALA	ENGINEERED	UNP Q8ZWY4
B	13	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
B	33	ASP	GLY	ENGINEERED	UNP Q8ZWY4
B	40	LYS	GLU	ENGINEERED	UNP Q8ZWY4
B	51	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
B	71	GLN	ARG	ENGINEERED	UNP Q8ZWY4
B	107	ASN	SER	ENGINEERED	UNP Q8ZWY4
B	112	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
B	117	ASN	ILE	ENGINEERED	UNP Q8ZWY4
B	120	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
C	1	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4

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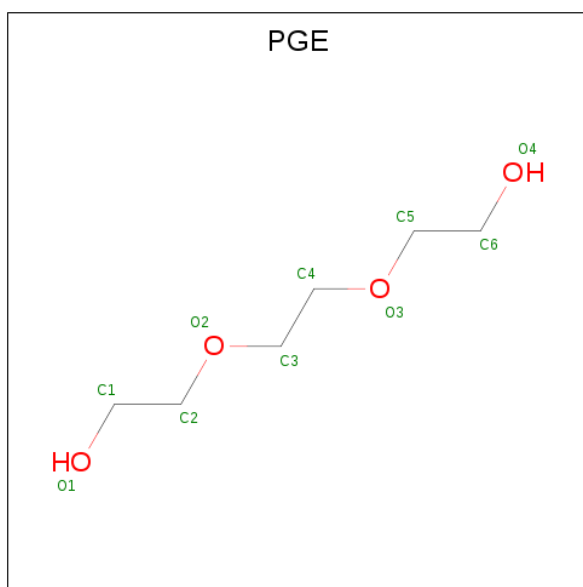
Chain	Residue	Modelled	Actual	Comment	Reference
C	10	ASP	ALA	ENGINEERED	UNP Q8ZWY4
C	13	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
C	33	ASP	GLY	ENGINEERED	UNP Q8ZWY4
C	40	LYS	GLU	ENGINEERED	UNP Q8ZWY4
C	51	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
C	71	GLN	ARG	ENGINEERED	UNP Q8ZWY4
C	107	ASN	SER	ENGINEERED	UNP Q8ZWY4
C	112	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4
C	117	ASN	ILE	ENGINEERED	UNP Q8ZWY4
C	120	MSE	MET	MODIFIED RESIDUE	UNP Q8ZWY4

- Molecule 2 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: C<sub>4</sub>H<sub>12</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			8	4	1	3		
2	B	1	Total	C	N	O	0	0
			8	4	1	3		
2	C	1	Total	C	N	O	0	0
			8	4	1	3		

- Molecule 3 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>).



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

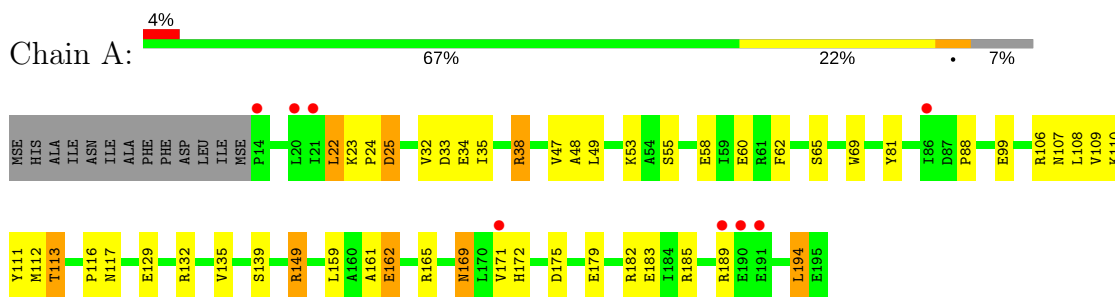
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	46	Total O 46 46	0	0
4	B	57	Total O 57 57	0	0
4	C	55	Total O 55 55	0	0

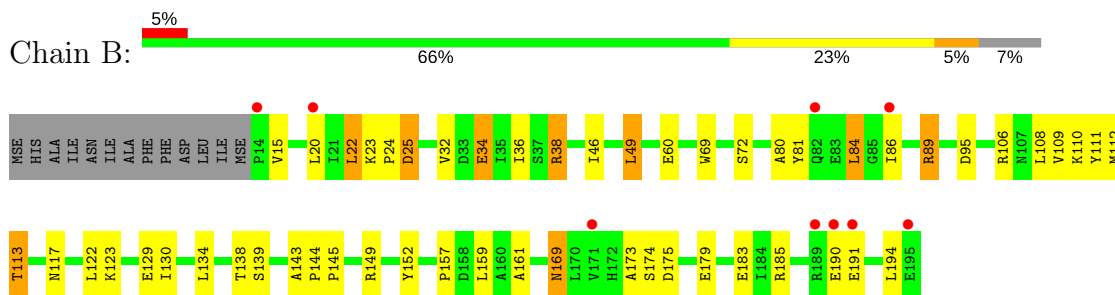
### 3 Residue-property plots [i](#)

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.

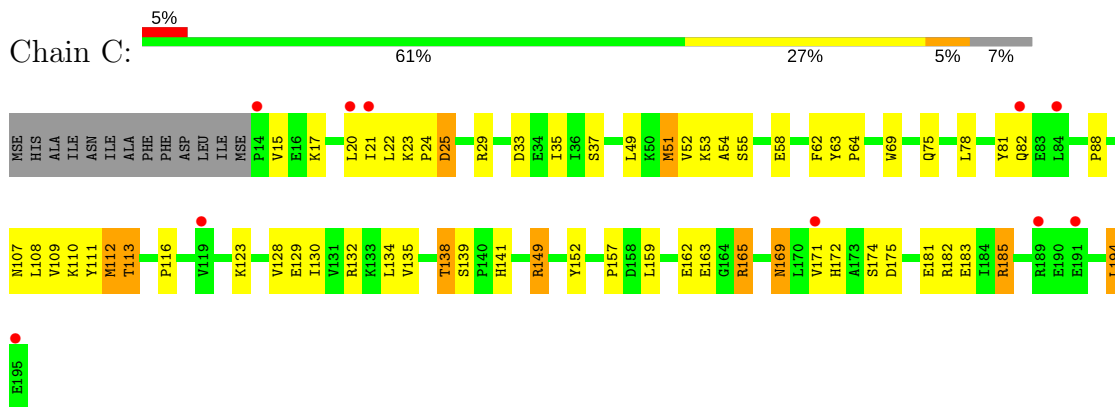
- Molecule 1: Nucleoside diphosphate kinase



- Molecule 1: Nucleoside diphosphate kinase



- Molecule 1: Nucleoside diphosphate kinase



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	125.02Å 72.04Å 104.99Å 90.00° 133.30° 90.00°	Depositor
Resolution (Å)	25.00 – 2.50 24.91 – 2.40	Depositor EDS
% Data completeness (in resolution range)	94.8 (25.00-2.50) 86.4 (24.91-2.40)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.40 (at 2.39Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.187 , 0.260 0.205 , 0.272	Depositor DCC
$R_{free}$ test set	1513 reflections (6.45%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	33.6	Xtrriage
Anisotropy	0.216	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 35.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	4454	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	36.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.58% 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: TRS, PGE

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	0.91	0/1438	0.92	5/1942 (0.3%)
1	B	0.92	1/1438 (0.1%)	0.94	5/1942 (0.3%)
1	C	0.89	1/1438 (0.1%)	0.95	5/1942 (0.3%)
All	All	0.91	2/4314 (0.0%)	0.93	15/5826 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	129	GLU	CG-CD	5.40	1.60	1.51
1	C	112	MSE	CG-SE	-5.01	1.78	1.95

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	149	ARG	NE-CZ-NH2	-8.38	116.11	120.30
1	A	38	ARG	NE-CZ-NH2	-7.70	116.45	120.30
1	A	149	ARG	NE-CZ-NH1	7.50	124.05	120.30
1	C	185	ARG	NE-CZ-NH2	7.50	124.05	120.30
1	C	51	MSE	CG-SE-CE	-7.15	83.16	98.90
1	A	149	ARG	NE-CZ-NH2	-7.11	116.74	120.30
1	B	89	ARG	NE-CZ-NH2	6.91	123.75	120.30
1	A	25	ASP	CB-CG-OD1	6.58	124.22	118.30
1	C	149	ARG	NE-CZ-NH1	6.20	123.40	120.30
1	B	22	LEU	CB-CG-CD2	-6.09	100.64	111.00
1	B	25	ASP	CB-CG-OD1	5.53	123.28	118.30
1	C	165	ARG	NE-CZ-NH1	5.44	123.02	120.30
1	A	38	ARG	NE-CZ-NH1	5.42	123.01	120.30
1	B	38	ARG	NE-CZ-NH2	-5.03	117.79	120.30
1	B	49	LEU	CA-CB-CG	5.01	126.81	115.30

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	1414	0	1443	51	0
1	B	1414	0	1443	32	1
1	C	1414	0	1443	62	0
2	A	8	0	12	2	0
2	B	8	0	12	1	0
2	C	8	0	12	2	0
3	A	10	0	14	13	0
3	B	10	0	14	7	0
3	C	10	0	14	18	0
4	A	46	0	0	11	0
4	B	57	0	0	4	0
4	C	55	0	0	7	0
All	All	4454	0	4407	144	1

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 17.

All (144) 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:69:TRP:HE1	3:C:700:PGE:H6	1.26	0.99
1:A:172:HIS:CE1	3:A:500:PGE:H1	1.97	0.98
1:C:172:HIS:CE1	3:C:700:PGE:H1	2.02	0.95
2:A:200:TRS:H21	3:A:500:PGE:O4	1.67	0.94
1:B:32:VAL:HG23	4:B:647:HOH:O	1.75	0.86
1:B:69:TRP:HE1	3:B:600:PGE:H6	1.43	0.82
1:A:47:VAL:C	1:C:51:MSE:HE1	2.03	0.79
1:A:172:HIS:CE1	3:A:500:PGE:C1	2.67	0.78
1:B:149:ARG:HD3	1:B:169:ASN:O	1.85	0.75
1:B:138:THR:HG22	4:B:656:HOH:O	1.87	0.75
1:C:149:ARG:HD3	1:C:169:ASN:O	1.86	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:110:LYS:HE3	4:B:644:HOH:O	1.85	0.74
1:A:179:GLU:HG2	3:A:500:PGE:O2	1.88	0.74
1:C:172:HIS:CE1	3:C:700:PGE:C1	2.72	0.72
1:A:69:TRP:NE1	3:A:500:PGE:H52	2.06	0.70
3:C:700:PGE:C5	3:C:700:PGE:H12	2.22	0.70
1:C:109:VAL:O	1:C:113:THR:HB	1.91	0.70
1:C:53:LYS:HD2	4:C:738:HOH:O	1.92	0.69
1:C:22:LEU:HD23	1:C:171:VAL:HG12	1.75	0.69
1:B:173:ALA:O	3:B:600:PGE:H1	1.93	0.69
1:B:175:ASP:N	3:B:600:PGE:H22	2.08	0.68
1:A:194:LEU:HD22	1:C:53:LYS:HG2	1.73	0.68
1:A:172:HIS:HE1	3:A:500:PGE:C1	2.05	0.66
1:A:69:TRP:HE1	3:A:500:PGE:H52	1.60	0.65
1:C:182:ARG:HD2	4:C:734:HOH:O	1.95	0.65
1:B:109:VAL:O	1:B:113:THR:HB	1.96	0.65
1:A:53:LYS:HB2	1:C:194:LEU:HD22	1.77	0.65
1:A:23:LYS:HA	1:A:117:ASN:HD22	1.62	0.64
1:A:22:LEU:HD12	1:A:171:VAL:HG12	1.79	0.64
1:B:80:ALA:O	1:B:84:LEU:HD22	1.97	0.64
1:A:25:ASP:HB2	4:A:531:HOH:O	1.99	0.63
1:A:25:ASP:OD2	1:A:111:TYR:OH	2.16	0.62
1:C:69:TRP:NE1	3:C:700:PGE:H6	2.08	0.62
1:B:24:PRO:HG2	1:B:111:TYR:O	1.99	0.62
1:A:175:ASP:N	3:A:500:PGE:H2	2.14	0.62
1:A:23:LYS:HA	1:A:117:ASN:ND2	2.15	0.61
1:B:169:ASN:C	1:B:169:ASN:HD22	2.02	0.61
1:B:175:ASP:HB3	3:B:600:PGE:H22	1.81	0.61
1:A:194:LEU:HB2	1:C:53:LYS:HE2	1.81	0.61
1:C:149:ARG:HD2	1:C:169:ASN:HB2	1.83	0.60
1:C:175:ASP:H	3:C:700:PGE:C2	2.14	0.60
1:C:55:SER:HB2	4:C:747:HOH:O	2.02	0.59
1:A:175:ASP:H	3:A:500:PGE:H2	1.68	0.59
1:C:81:TYR:HD1	1:C:88:PRO:HB3	1.67	0.59
1:C:175:ASP:H	3:C:700:PGE:H2	1.66	0.59
1:A:106:ARG:HD3	4:A:508:HOH:O	2.01	0.59
1:A:22:LEU:HD11	1:A:35:ILE:HG21	1.84	0.59
1:B:185:ARG:HD2	4:B:646:HOH:O	2.02	0.58
1:C:175:ASP:N	3:C:700:PGE:H2	2.19	0.58
1:B:149:ARG:HD2	1:B:169:ASN:HB2	1.85	0.58
1:C:107:ASN:HA	1:C:110:LYS:HD2	1.86	0.58
1:C:75:GLN:HA	1:C:78:LEU:HD12	1.84	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:149:ARG:HD3	1:A:169:ASN:O	2.05	0.57
1:B:25:ASP:N	1:B:25:ASP:OD2	2.38	0.57
1:A:109:VAL:O	1:A:113:THR:HB	2.06	0.56
1:A:182:ARG:HG2	1:A:185:ARG:HH21	1.71	0.56
1:A:169:ASN:HD22	1:A:169:ASN:C	2.08	0.55
1:C:29:ARG:HD2	4:C:708:HOH:O	2.05	0.55
1:C:81:TYR:CD1	1:C:88:PRO:HB3	2.42	0.54
1:A:24:PRO:HD3	1:A:117:ASN:HD21	1.72	0.54
1:B:175:ASP:CB	3:B:600:PGE:H22	2.37	0.54
1:B:34:GLU:HG2	1:B:152:TYR:OH	2.08	0.53
1:A:172:HIS:HE1	3:A:500:PGE:H12	1.73	0.53
1:B:23:LYS:HZ1	1:B:169:ASN:HD21	1.57	0.53
1:C:128:VAL:O	1:C:132:ARG:HG3	2.09	0.53
1:C:15:VAL:HA	4:C:733:HOH:O	2.08	0.53
1:A:99:GLU:HG2	4:A:537:HOH:O	2.07	0.53
3:C:700:PGE:H5	3:C:700:PGE:H12	1.91	0.53
1:A:194:LEU:HD13	1:C:116:PRO:HG3	1.91	0.53
1:B:175:ASP:HB3	3:B:600:PGE:C2	2.39	0.52
1:C:149:ARG:CD	1:C:169:ASN:HB2	2.39	0.52
1:C:174:SER:HA	3:C:700:PGE:H22	1.92	0.52
1:C:23:LYS:HD3	1:C:111:TYR:CE2	2.45	0.52
1:C:22:LEU:HD21	1:C:35:ILE:HG21	1.91	0.52
1:C:175:ASP:OD1	3:C:700:PGE:H3	2.09	0.51
1:B:179:GLU:O	1:B:183:GLU:HG3	2.10	0.51
2:B:300:TRS:H11	3:B:600:PGE:O4	2.10	0.51
1:B:60:GLU:HG3	1:B:109:VAL:HG21	1.91	0.51
1:A:116:PRO:HD2	4:A:535:HOH:O	2.11	0.51
1:A:161:ALA:O	1:A:162:GLU:C	2.48	0.51
1:C:53:LYS:CD	4:C:738:HOH:O	2.54	0.51
1:A:33:ASP:OD1	1:C:37:SER:HB2	2.11	0.51
3:C:700:PGE:C6	3:C:700:PGE:H12	2.41	0.50
1:C:163:GLU:OE1	1:C:165:ARG:NE	2.39	0.50
1:A:194:LEU:CB	1:C:53:LYS:HE2	2.42	0.50
1:B:23:LYS:NZ	1:B:169:ASN:HD21	2.09	0.50
1:C:138:THR:HG23	4:C:743:HOH:O	2.11	0.49
1:A:149:ARG:HD2	1:A:169:ASN:HB2	1.93	0.49
1:C:64:PRO:HG2	1:C:69:TRP:CD1	2.47	0.49
1:B:15:VAL:HB	1:B:123:LYS:HE3	1.94	0.49
1:B:149:ARG:CD	1:B:169:ASN:O	2.60	0.49
1:B:108:LEU:O	1:B:112:MSE:HG2	2.12	0.48
1:B:139:SER:HB2	1:B:157:PRO:HD3	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:175:ASP:CB	3:C:700:PGE:H2	2.44	0.48
1:C:169:ASN:HD22	1:C:169:ASN:C	2.16	0.48
1:C:175:ASP:N	3:C:700:PGE:C2	2.76	0.47
1:A:48:ALA:N	1:C:51:MSE:HE1	2.28	0.47
1:B:36:ILE:HG23	1:B:46:ILE:HD11	1.96	0.47
1:C:139:SER:OG	1:C:157:PRO:HD3	2.13	0.47
1:A:47:VAL:O	1:C:51:MSE:HE1	2.13	0.47
2:C:400:TRS:H11	3:C:700:PGE:O4	2.14	0.47
1:A:129:GLU:HG3	4:A:506:HOH:O	2.15	0.47
1:C:75:GLN:HB2	1:C:75:GLN:HE21	1.55	0.47
1:A:25:ASP:N	1:A:25:ASP:OD2	2.48	0.47
3:A:500:PGE:O3	3:A:500:PGE:H12	2.15	0.46
1:C:135:VAL:O	1:C:149:ARG:HG3	2.14	0.46
1:C:51:MSE:HE2	1:C:51:MSE:HB3	1.43	0.46
1:C:23:LYS:HZ2	1:C:169:ASN:HD21	1.64	0.46
1:A:179:GLU:CD	1:A:182:ARG:HH12	2.18	0.46
1:C:29:ARG:NH2	1:C:152:TYR:O	2.32	0.45
1:C:63:TYR:CD2	3:C:700:PGE:H52	2.52	0.45
1:C:54:ALA:HA	1:C:58:GLU:OE1	2.17	0.45
1:A:108:LEU:O	1:A:112:MSE:HG2	2.16	0.45
1:A:135:VAL:O	1:A:149:ARG:HG3	2.16	0.45
1:A:55:SER:OG	1:A:58:GLU:HG3	2.16	0.45
1:C:63:TYR:HD2	3:C:700:PGE:H52	1.82	0.45
1:B:23:LYS:HA	1:B:117:ASN:ND2	2.32	0.45
1:A:185:ARG:NE	4:A:540:HOH:O	2.50	0.44
1:C:21:ILE:O	1:C:171:VAL:HA	2.17	0.44
1:C:23:LYS:NZ	1:C:169:ASN:HD21	2.14	0.44
1:A:81:TYR:HD1	1:A:88:PRO:HB3	1.82	0.44
1:C:172:HIS:HE1	3:C:700:PGE:C1	2.28	0.44
1:A:32:VAL:HG23	4:A:504:HOH:O	2.17	0.44
1:C:172:HIS:ND1	2:C:400:TRS:H22	2.34	0.43
1:B:23:LYS:HA	1:B:117:ASN:HD22	1.84	0.43
1:A:107:ASN:ND2	4:A:517:HOH:O	2.37	0.43
1:A:23:LYS:NZ	1:A:169:ASN:HD21	2.17	0.42
1:A:62:PHE:HE2	1:A:183:GLU:HB3	1.83	0.42
1:C:112:MSE:HE3	1:C:112:MSE:HB3	1.93	0.42
1:C:25:ASP:OD2	1:C:25:ASP:N	2.51	0.42
1:C:17:LYS:HG2	1:C:123:LYS:HB2	2.02	0.42
1:C:181:GLU:O	1:C:185:ARG:HG3	2.19	0.42
2:A:200:TRS:H11	3:A:500:PGE:O4	2.20	0.42
1:B:81:TYR:HE1	1:B:161:ALA:HB1	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:175:ASP:CB	3:A:500:PGE:H2	2.51	0.41
1:A:185:ARG:NH2	4:A:540:HOH:O	2.52	0.41
1:A:165:ARG:HB2	4:A:523:HOH:O	2.19	0.41
1:C:62:PHE:HE2	1:C:183:GLU:HB3	1.86	0.41
1:A:162:GLU:HG3	4:A:542:HOH:O	2.20	0.41
1:B:143:ALA:HA	1:B:144:PRO:HD3	1.95	0.41
1:C:24:PRO:HG2	1:C:111:TYR:O	2.20	0.41
1:B:144:PRO:HA	1:B:145:PRO:HD3	1.98	0.41
1:C:139:SER:OG	1:C:141:HIS:ND1	2.53	0.40
1:A:110:LYS:O	1:A:113:THR:HG22	2.21	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:89:ARG:NH2	1:B:95:ASP:OD2[2_757]	2.12	0.08

## 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	180/195 (92%)	176 (98%)	4 (2%)	0	100	100
1	B	180/195 (92%)	173 (96%)	7 (4%)	0	100	100
1	C	180/195 (92%)	174 (97%)	6 (3%)	0	100	100
All	All	540/585 (92%)	523 (97%)	17 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 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	153/162 (94%)	139 (91%)	14 (9%)	10	19
1	B	153/162 (94%)	134 (88%)	19 (12%)	5	10
1	C	153/162 (94%)	137 (90%)	16 (10%)	7	14
All	All	459/486 (94%)	410 (89%)	49 (11%)	7	14

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	LEU
1	A	34	GLU
1	A	38	ARG
1	A	49	LEU
1	A	60	GLU
1	A	65	SER
1	A	113	THR
1	A	132	ARG
1	A	139	SER
1	A	159	LEU
1	A	162	GLU
1	A	169	ASN
1	A	189	ARG
1	A	194	LEU
1	B	20	LEU
1	B	22	LEU
1	B	34	GLU
1	B	38	ARG
1	B	49	LEU
1	B	72	SER
1	B	84	LEU
1	B	86	ILE
1	B	106	ARG
1	B	113	THR
1	B	122	LEU
1	B	130	ILE

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Mol	Chain	Res	Type
1	B	134	LEU
1	B	159	LEU
1	B	169	ASN
1	B	174	SER
1	B	190	GLU
1	B	191	GLU
1	B	194	LEU
1	C	20	LEU
1	C	25	ASP
1	C	33	ASP
1	C	49	LEU
1	C	52	VAL
1	C	82	GLN
1	C	108	LEU
1	C	113	THR
1	C	129	GLU
1	C	130	ILE
1	C	134	LEU
1	C	138	THR
1	C	159	LEU
1	C	162	GLU
1	C	169	ASN
1	C	194	LEU

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	117	ASN
1	A	169	ASN
1	B	117	ASN
1	B	169	ASN
1	C	75	GLN
1	C	117	ASN
1	C	169	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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

6 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	TRS	A	200	-	7,7,7	0.63	0	9,9,9	0.97	0
3	PGE	A	500	-	9,9,9	1.36	2 (22%)	8,8,8	1.90	3 (37%)
2	TRS	B	300	-	7,7,7	0.45	0	9,9,9	1.20	0
3	PGE	B	600	-	9,9,9	1.26	0	8,8,8	1.83	3 (37%)
2	TRS	C	400	-	7,7,7	0.55	0	9,9,9	1.20	0
3	PGE	C	700	-	9,9,9	1.37	1 (11%)	8,8,8	1.51	2 (25%)

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	TRS	A	200	-	-	0/9/9/9	0/0/0/0
3	PGE	A	500	-	-	0/7/7/7	0/0/0/0
2	TRS	B	300	-	-	0/9/9/9	0/0/0/0
3	PGE	B	600	-	-	0/7/7/7	0/0/0/0
2	TRS	C	400	-	-	0/9/9/9	0/0/0/0
3	PGE	C	700	-	-	0/7/7/7	0/0/0/0

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	500	PGE	O3-C4	2.00	1.51	1.42
3	A	500	PGE	O2-C3	2.22	1.51	1.42
3	C	700	PGE	O2-C3	2.62	1.53	1.42

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	500	PGE	C3-O2-C2	2.01	122.13	113.30
3	C	700	PGE	O3-C5-C6	2.38	120.75	110.10
3	B	600	PGE	O3-C5-C6	2.40	120.86	110.10
3	B	600	PGE	O2-C3-C4	2.65	122.59	110.37
3	C	700	PGE	O2-C2-C1	2.86	122.89	110.10
3	A	500	PGE	O3-C5-C6	3.08	123.89	110.10
3	A	500	PGE	O2-C2-C1	3.28	124.82	110.10
3	B	600	PGE	O2-C2-C1	3.41	125.40	110.10

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 39 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	200	TRS	2	0
3	A	500	PGE	13	0
2	B	300	TRS	1	0
3	B	600	PGE	7	0
2	C	400	TRS	2	0
3	C	700	PGE	18	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	179/195 (91%)	-0.01	8 (4%) 33 36	20, 33, 53, 67	0
1	B	179/195 (91%)	0.08	9 (5%) 29 31	22, 34, 65, 76	0
1	C	179/195 (91%)	0.04	10 (5%) 24 26	20, 34, 59, 70	0
All	All	537/585 (91%)	0.04	27 (5%) 29 31	20, 34, 59, 76	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	195	GLU	4.8
1	A	191	GLU	4.7
1	C	191	GLU	4.5
1	C	14	PRO	4.3
1	A	14	PRO	4.1
1	B	191	GLU	3.9
1	A	190	GLU	3.5
1	C	195	GLU	3.2
1	C	82	GLN	3.1
1	B	14	PRO	3.1
1	A	189	ARG	2.9
1	A	86	ILE	2.9
1	C	20	LEU	2.8
1	B	190	GLU	2.8
1	A	20	LEU	2.8
1	B	82	GLN	2.7
1	B	189	ARG	2.7
1	C	189	ARG	2.6
1	A	21	ILE	2.4
1	B	20	LEU	2.4
1	B	171	VAL	2.2
1	C	119	VAL	2.2
1	C	171	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	86	ILE	2.1
1	C	84	LEU	2.1
1	A	171	VAL	2.1
1	C	21	ILE	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. 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
3	PGE	B	600	10/10	0.68	0.36	72,74,78,79	0
3	PGE	C	700	10/10	0.75	0.36	62,65,70,71	0
2	TRS	A	200	8/8	0.80	0.30	46,51,54,58	0
2	TRS	C	400	8/8	0.83	0.25	52,56,58,64	0
2	TRS	B	300	8/8	0.87	0.28	53,54,59,60	0
3	PGE	A	500	10/10	0.91	0.32	47,52,55,55	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.