Full wwPDB X-ray Structure Validation Report (i)

Sep 19, 2023 – 04:43 AM EDT

PDB ID	:	5BXI
Title	:	1.7 Angstrom Resolution Crystal Structure of Putative Nucleoside Diphosphate Kinase from Toxoplasma gondii with Tyrosine of Tag Bound to Active Site
Authors	:	Minasov, G.; Ruan, J.; Ngo, H.; Shuvalova, L.; Dubrovska, I.; Flores, K.; Anderson, W.F.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on	:	2015-06-09
Resolution	:	1.70 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

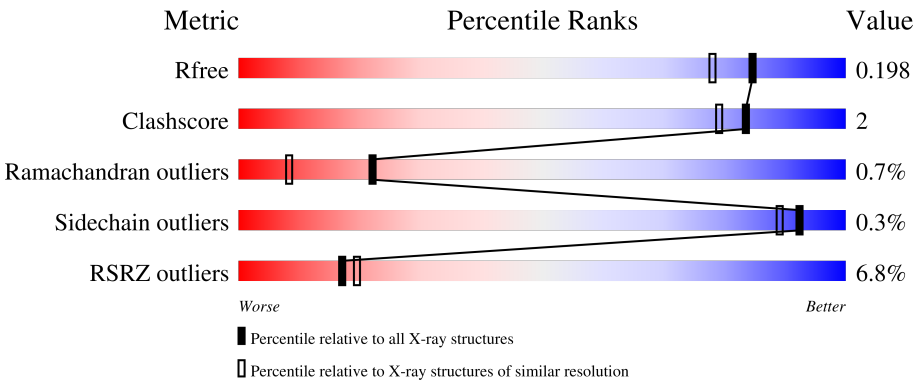
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.70 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	4298 (1.70-1.70)
Clashscore	141614	4695 (1.70-1.70)
Ramachandran outliers	138981	4610 (1.70-1.70)
Sidechain outliers	138945	4610 (1.70-1.70)
RSRZ outliers	127900	4222 (1.70-1.70)

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 >=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 <=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	160	2%, 90%, 5%, 5%
1	B	160	3%, 88%, 8%, •
1	C	160	10%, 81%, 8%, 11%
1	D	160	4%, 93%, 6%, •

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Mol	Chain	Length	Quality of chain
1	E	160	3% 93%
1	F	160	4% 89% 6%
1	G	160	11% 92% 6%
1	H	160	4% 86% 9% 5%
1	I	160	8% 91% 5%
1	J	160	8% 87% 8% 5%
1	K	160	10% 85% 10% 5%
1	L	160	11% 91% 5%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 17245 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	S			
1	A	152	1260	794	221	237	8	0	6	0
1	B	153	1308	824	232	243	9	0	10	0
1	C	143	1209	757	212	231	9	0	8	0
1	D	158	1287	812	222	245	8	0	3	0
1	E	153	1311	824	228	251	8	0	11	0
1	F	153	1295	816	228	243	8	0	9	0
1	G	158	1315	827	231	248	9	0	6	0
1	H	152	1291	813	228	242	8	0	9	0
1	I	152	1263	797	221	237	8	0	5	0
1	J	152	1276	804	228	236	8	0	6	0
1	K	152	1232	779	216	229	8	0	2	0
1	L	152	1241	784	217	232	8	0	3	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	156	GLY	-	expression tag	UNP S8FF85
A	157	GLU	-	expression tag	UNP S8FF85
A	158	ASN	-	expression tag	UNP S8FF85
A	159	LEU	-	expression tag	UNP S8FF85
A	160	TYR	-	expression tag	UNP S8FF85

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Chain	Residue	Modelled	Actual	Comment	Reference
B	156	GLY	-	expression tag	UNP S8FF85
B	157	GLU	-	expression tag	UNP S8FF85
B	158	ASN	-	expression tag	UNP S8FF85
B	159	LEU	-	expression tag	UNP S8FF85
B	160	TYR	-	expression tag	UNP S8FF85
C	156	GLY	-	expression tag	UNP S8FF85
C	157	GLU	-	expression tag	UNP S8FF85
C	158	ASN	-	expression tag	UNP S8FF85
C	159	LEU	-	expression tag	UNP S8FF85
C	160	TYR	-	expression tag	UNP S8FF85
D	156	GLY	-	expression tag	UNP S8FF85
D	157	GLU	-	expression tag	UNP S8FF85
D	158	ASN	-	expression tag	UNP S8FF85
D	159	LEU	-	expression tag	UNP S8FF85
D	160	TYR	-	expression tag	UNP S8FF85
E	156	GLY	-	expression tag	UNP S8FF85
E	157	GLU	-	expression tag	UNP S8FF85
E	158	ASN	-	expression tag	UNP S8FF85
E	159	LEU	-	expression tag	UNP S8FF85
E	160	TYR	-	expression tag	UNP S8FF85
F	156	GLY	-	expression tag	UNP S8FF85
F	157	GLU	-	expression tag	UNP S8FF85
F	158	ASN	-	expression tag	UNP S8FF85
F	159	LEU	-	expression tag	UNP S8FF85
F	160	TYR	-	expression tag	UNP S8FF85
G	156	GLY	-	expression tag	UNP S8FF85
G	157	GLU	-	expression tag	UNP S8FF85
G	158	ASN	-	expression tag	UNP S8FF85
G	159	LEU	-	expression tag	UNP S8FF85
G	160	TYR	-	expression tag	UNP S8FF85
H	156	GLY	-	expression tag	UNP S8FF85
H	157	GLU	-	expression tag	UNP S8FF85
H	158	ASN	-	expression tag	UNP S8FF85
H	159	LEU	-	expression tag	UNP S8FF85
H	160	TYR	-	expression tag	UNP S8FF85
I	156	GLY	-	expression tag	UNP S8FF85
I	157	GLU	-	expression tag	UNP S8FF85
I	158	ASN	-	expression tag	UNP S8FF85
I	159	LEU	-	expression tag	UNP S8FF85
I	160	TYR	-	expression tag	UNP S8FF85
J	156	GLY	-	expression tag	UNP S8FF85
J	157	GLU	-	expression tag	UNP S8FF85

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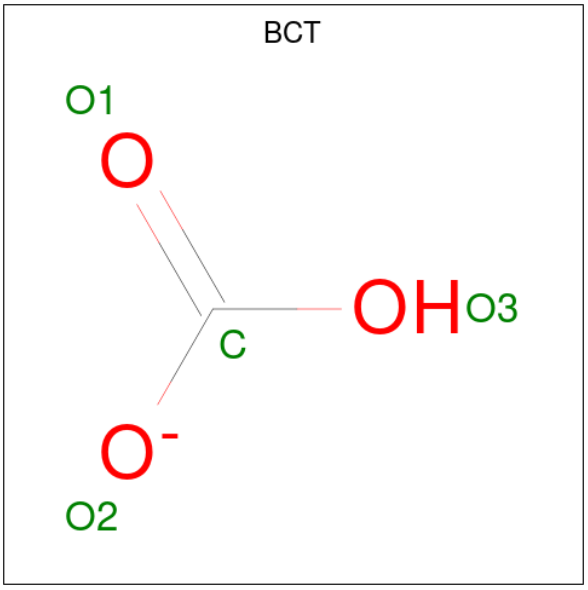
Chain	Residue	Modelled	Actual	Comment	Reference
J	158	ASN	-	expression tag	UNP S8FF85
J	159	LEU	-	expression tag	UNP S8FF85
J	160	TYR	-	expression tag	UNP S8FF85
K	156	GLY	-	expression tag	UNP S8FF85
K	157	GLU	-	expression tag	UNP S8FF85
K	158	ASN	-	expression tag	UNP S8FF85
K	159	LEU	-	expression tag	UNP S8FF85
K	160	TYR	-	expression tag	UNP S8FF85
L	156	GLY	-	expression tag	UNP S8FF85
L	157	GLU	-	expression tag	UNP S8FF85
L	158	ASN	-	expression tag	UNP S8FF85
L	159	LEU	-	expression tag	UNP S8FF85
L	160	TYR	-	expression tag	UNP S8FF85

- Molecule 2 is BICARBONATE ION (three-letter code: BCT) (formula: CHO_3).



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

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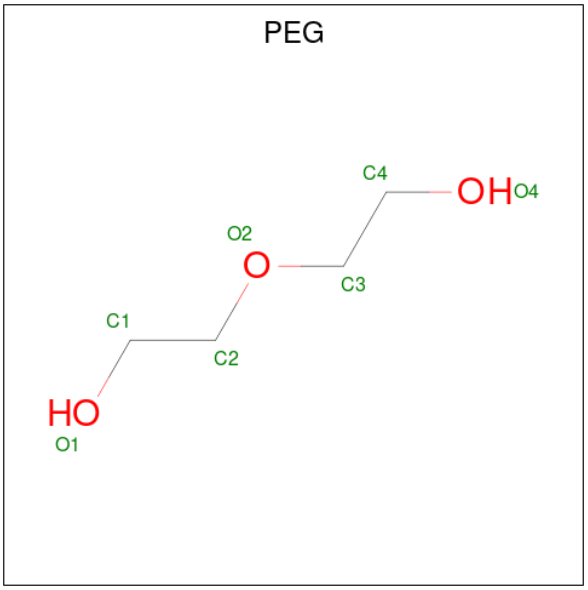
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	I	1	4	1	3	0	0

- Molecule 3 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).



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

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	A	197	202	202	0	9
4	B	193	198	198	0	9
4	C	147	152	152	0	6
4	D	191	199	199	0	9
4	E	188	199	199	0	20
4	F	189	191	191	0	6
4	G	151	159	159	0	11

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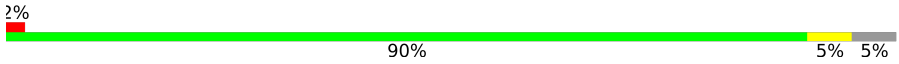
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	H	132	141	141	0	13
			Total	O		
4	I	121	124	124	0	5
			Total	O		
4	J	107	112	112	0	5
			Total	O		
4	K	123	127	127	0	4
			Total	O		
4	L	115	122	122	0	8

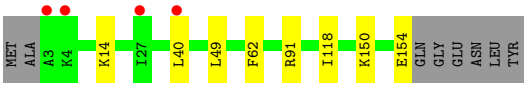
3 Residue-property plots (i)

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: Nucleoside diphosphate kinase

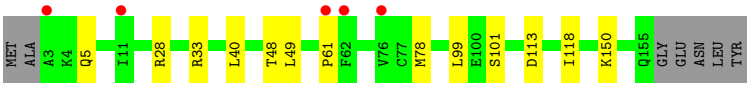
Chain A:





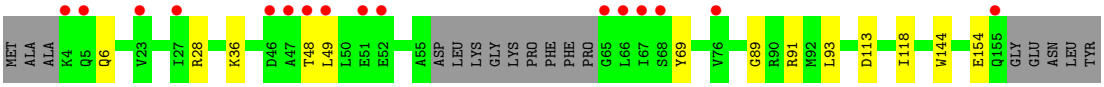
• Molecule 1: Nucleoside diphosphate kinase

Chain B:



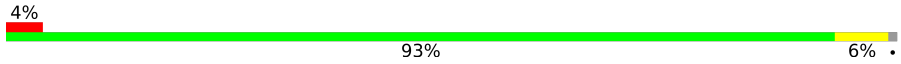
• Molecule 1: Nucleoside diphosphate kinase

Chain C:



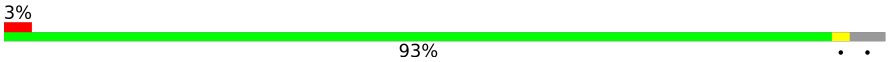
• Molecule 1: Nucleoside diphosphate kinase

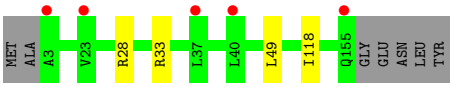
Chain D:



• Molecule 1: Nucleoside diphosphate kinase

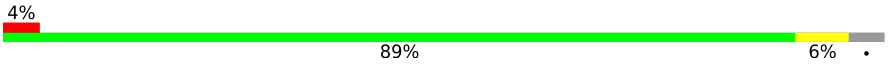
Chain E:

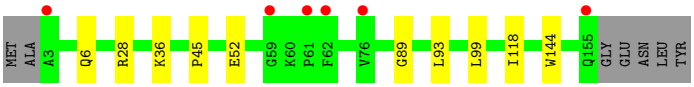




• Molecule 1: Nucleoside diphosphate kinase

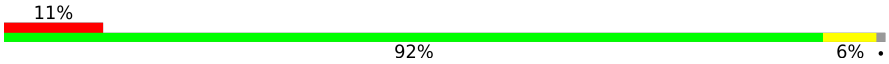
Chain F:

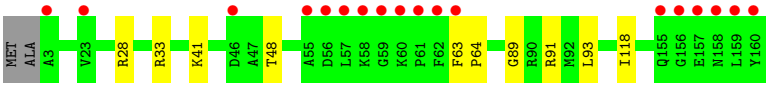




• Molecule 1: Nucleoside diphosphate kinase

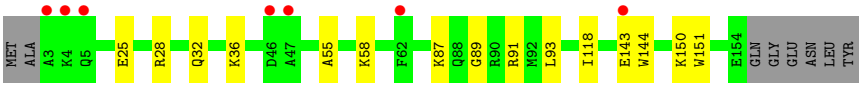
Chain G:





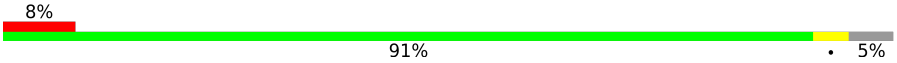
• Molecule 1: Nucleoside diphosphate kinase

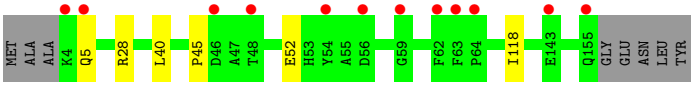
Chain H:



• Molecule 1: Nucleoside diphosphate kinase

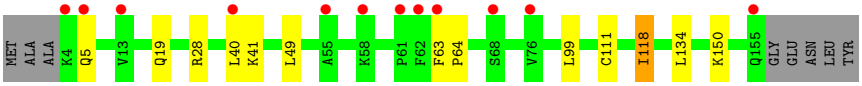
Chain I:





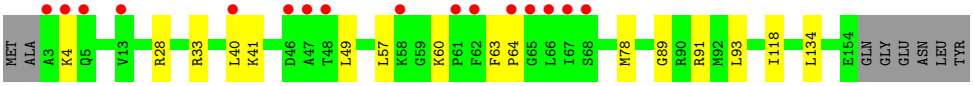
• Molecule 1: Nucleoside diphosphate kinase

Chain J:



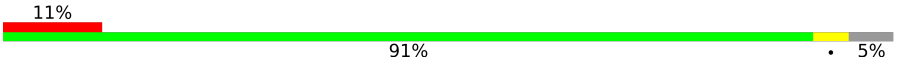
• Molecule 1: Nucleoside diphosphate kinase

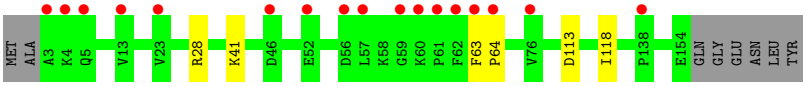
Chain K:



• Molecule 1: Nucleoside diphosphate kinase

Chain L:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	236.81Å 73.40Å 122.67Å 90.00° 116.83° 90.00°	Depositor
Resolution (Å)	29.98 – 1.70 29.83 – 1.70	Depositor EDS
% Data completeness (in resolution range)	98.2 (29.98-1.70) 98.3 (29.83-1.70)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	3.37 (at 1.70Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.154 , 0.192 0.164 , 0.198	Depositor DCC
R_{free} test set	10203 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	26.3	Xtriage
Anisotropy	0.377	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 50.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	17245	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.04% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: BCT, 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	0.61	0/1288	0.76	0/1739
1	B	0.64	0/1336	0.81	1/1801 (0.1%)
1	C	0.59	0/1232	0.72	0/1661
1	D	0.56	0/1316	0.76	0/1776
1	E	0.57	0/1339	0.71	1/1807 (0.1%)
1	F	0.56	0/1323	0.69	0/1786
1	G	0.52	0/1344	0.71	2/1812 (0.1%)
1	H	0.50	0/1319	0.68	0/1778
1	I	0.49	0/1291	0.66	0/1741
1	J	0.49	0/1304	0.68	0/1758
1	K	0.47	0/1260	0.68	1/1701 (0.1%)
1	L	0.48	0/1269	0.63	0/1713
All	All	0.54	0/15621	0.71	5/21073 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	33	ARG	NE-CZ-NH2	-5.96	117.32	120.30
1	G	33	ARG	NE-CZ-NH2	-5.53	117.54	120.30
1	E	33	ARG	NE-CZ-NH2	-5.14	117.73	120.30
1	G	33	ARG	NE-CZ-NH1	5.08	122.84	120.30
1	K	33	ARG	NE-CZ-NH1	5.01	122.80	120.30

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	1260	0	1240	7	0
1	B	1308	0	1296	9	0
1	C	1209	0	1185	14	0
1	D	1287	0	1259	5	0
1	E	1311	0	1280	2	0
1	F	1295	0	1278	6	0
1	G	1315	0	1288	6	0
1	H	1291	0	1273	11	0
1	I	1263	0	1244	7	0
1	J	1276	0	1264	9	0
1	K	1232	0	1219	10	0
1	L	1241	0	1224	6	0
2	A	4	0	0	1	0
2	B	4	0	0	0	0
2	C	4	0	0	1	0
2	D	4	0	0	0	0
2	F	4	0	0	0	0
2	I	4	0	0	0	0
3	D	7	0	10	0	0
4	A	202	0	0	2	0
4	B	198	0	0	3	0
4	C	152	0	0	3	0
4	D	199	0	0	1	0
4	E	199	0	0	0	0
4	F	191	0	0	2	0
4	G	159	0	0	2	0
4	H	141	0	0	1	0
4	I	124	0	0	2	0
4	J	112	0	0	1	0
4	K	127	0	0	1	0
4	L	122	0	0	0	0
All	All	17245	0	15060	73	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 2.

All (73) 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:I:52[A]:GLU:OE2	1:I:52[A]:GLU:HA	1.88	0.72
1:B:5:GLN:HB3	4:B:348:HOH:O	1.88	0.71
1:H:91[B]:ARG:NH2	1:J:99:LEU:O	2.31	0.64
1:J:150:LYS:HG2	4:J:230:HOH:O	1.99	0.63
1:C:49[B]:LEU:HD23	1:C:49[B]:LEU:C	2.18	0.63
1:C:49[B]:LEU:HD23	1:C:49[B]:LEU:O	2.01	0.60
1:I:28:ARG:HE	1:L:28[A]:ARG:HH11	1.53	0.57
1:B:99:LEU:O	1:C:91[B]:ARG:NH1	2.38	0.56
1:H:150:LYS:HG2	4:H:273:HOH:O	2.05	0.56
1:A:150:LYS:HG2	4:A:411:HOH:O	2.07	0.54
1:H:25:GLU:OE2	1:H:28[B]:ARG:NH1	2.42	0.53
1:A:49:LEU:C	1:A:49:LEU:HD23	2.29	0.53
1:I:28:ARG:HH11	1:L:28[A]:ARG:HE	1.59	0.50
1:J:111:CYS:SG	1:J:118:ILE:HG12	2.53	0.49
1:J:41:LYS:HA	1:K:40:LEU:O	2.12	0.49
1:C:91[B]:ARG:NH2	4:C:301:HOH:O	2.34	0.49
1:H:55:ALA:O	1:H:58[B]:LYS:HG3	2.13	0.49
1:D:49:LEU:HD11	1:D:134:LEU:HG	1.96	0.48
1:D:101:SER:O	1:K:91[A]:ARG:NH1	2.47	0.48
1:K:57:LEU:O	1:K:60:LYS:HG2	2.14	0.48
1:C:6:GLN:NE2	4:C:304:HOH:O	2.45	0.48
1:F:52:GLU:HG2	4:F:466:HOH:O	2.13	0.48
1:H:143[B]:GLU:OE1	1:H:143[B]:GLU:C	2.52	0.47
1:B:48[A]:THR:HG23	4:B:340:HOH:O	2.14	0.47
1:J:40:LEU:O	1:K:41:LYS:HA	2.15	0.47
1:B:28:ARG:HE	1:F:28:ARG:HH11	1.62	0.47
1:A:91[B]:ARG:HG2	4:A:417[B]:HOH:O	2.15	0.47
1:C:49[B]:LEU:C	1:C:49[B]:LEU:CD2	2.83	0.46
1:D:154:GLU:HG2	1:L:113:ASP:OD2	2.16	0.46
1:G:63:PHE:HB3	1:G:64:PRO:HD3	1.97	0.46
1:B:101:SER:O	1:C:91[A]:ARG:NH1	2.49	0.45
1:G:89:GLY:O	1:G:93:LEU:HG	2.16	0.45
1:B:40:LEU:CD1	1:B:78:MET:HG2	2.46	0.45
1:K:89:GLY:O	1:K:93:LEU:HG	2.17	0.45
1:L:63:PHE:HB3	1:L:64:PRO:HD3	1.98	0.45
1:I:5:GLN:NE2	4:I:302:HOH:O	2.46	0.45
1:A:154:GLU:HG2	1:C:113:ASP:OD2	2.17	0.44
1:F:36:LYS:HG3	1:F:144:TRP:CZ2	2.53	0.44
1:B:49[B]:LEU:C	1:B:49[B]:LEU:HD23	2.38	0.44
1:F:99:LEU:O	1:G:91[A]:ARG:NH2	2.51	0.44
1:C:28:ARG:HH11	1:E:28:ARG:HE	1.66	0.44
1:A:14:LYS:NZ	2:A:201:BCT:O2	2.49	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:LEU:O	1:G:41:LYS:HA	2.18	0.43
1:D:89:GLY:O	1:D:93:LEU:HG	2.19	0.43
1:I:28:ARG:NH1	1:L:28[A]:ARG:HE	2.16	0.43
1:K:49:LEU:HD11	1:K:134:LEU:HG	2.00	0.43
1:K:63:PHE:HB3	1:K:64:PRO:HD3	2.00	0.43
1:F:45:PRO:HD2	4:F:320:HOH:O	2.18	0.43
1:H:36:LYS:HG3	1:H:144:TRP:CZ2	2.54	0.43
1:H:89:GLY:O	1:H:93:LEU:HG	2.19	0.43
1:J:49:LEU:HD11	1:J:134:LEU:HG	2.00	0.42
1:C:89:GLY:O	1:C:93:LEU:HG	2.19	0.42
1:G:28[B]:ARG:NH1	4:G:206:HOH:O	2.49	0.42
1:H:28[B]:ARG:NH2	1:H:32:GLN:OE1	2.52	0.42
1:A:49:LEU:HD23	1:A:49:LEU:O	2.19	0.42
1:K:4:LYS:HB2	4:K:310:HOH:O	2.19	0.42
1:K:40:LEU:CD1	1:K:78:MET:HG2	2.50	0.42
1:H:151:TRP:CE2	1:J:19:GLN:HG3	2.55	0.42
1:C:6:GLN:OE1	2:C:201:BCT:O1	2.38	0.42
1:H:87:LYS:O	1:H:91[B]:ARG:HG3	2.19	0.42
1:I:40:LEU:O	1:L:41:LYS:HA	2.19	0.42
1:J:28[B]:ARG:NH2	1:K:28:ARG:HH11	2.18	0.42
1:J:63:PHE:HB3	1:J:64:PRO:HD3	2.02	0.42
1:C:36:LYS:HG3	1:C:144:TRP:CZ2	2.55	0.41
1:E:49[B]:LEU:O	1:E:49[B]:LEU:HD23	2.20	0.41
1:C:48[A]:THR:HG23	4:C:331:HOH:O	2.20	0.41
1:B:113:ASP:OD2	1:C:154[A]:GLU:HG2	2.20	0.41
1:D:3:ALA:HB1	4:D:419:HOH:O	2.20	0.41
1:H:143[B]:GLU:OE1	1:H:144:TRP:N	2.52	0.41
1:B:150:LYS:HG2	4:B:398:HOH:O	2.20	0.41
1:F:89:GLY:O	1:F:93:LEU:HG	2.20	0.41
1:G:48:THR:HG23	4:G:314:HOH:O	2.19	0.41
1:I:45:PRO:HD2	4:I:318:HOH:O	2.21	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	156/160 (98%)	153 (98%)	2 (1%)	1 (1%)	25	11
1	B	161/160 (101%)	158 (98%)	2 (1%)	1 (1%)	25	11
1	C	147/160 (92%)	144 (98%)	2 (1%)	1 (1%)	22	8
1	D	159/160 (99%)	156 (98%)	2 (1%)	1 (1%)	25	11
1	E	162/160 (101%)	159 (98%)	2 (1%)	1 (1%)	25	11
1	F	160/160 (100%)	157 (98%)	2 (1%)	1 (1%)	25	11
1	G	162/160 (101%)	159 (98%)	2 (1%)	1 (1%)	25	11
1	H	159/160 (99%)	155 (98%)	3 (2%)	1 (1%)	25	11
1	I	155/160 (97%)	152 (98%)	2 (1%)	1 (1%)	25	11
1	J	156/160 (98%)	152 (97%)	2 (1%)	2 (1%)	12	2
1	K	152/160 (95%)	148 (97%)	3 (2%)	1 (1%)	22	8
1	L	153/160 (96%)	149 (97%)	3 (2%)	1 (1%)	22	8
All	All	1882/1920 (98%)	1842 (98%)	27 (1%)	13 (1%)	22	8

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	118	ILE
1	B	118	ILE
1	C	118	ILE
1	D	118	ILE
1	E	118	ILE
1	F	118	ILE
1	G	118	ILE
1	H	118	ILE
1	I	118	ILE
1	J	5	GLN
1	J	118	ILE
1	K	118	ILE
1	L	118	ILE

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	139/139 (100%)	138 (99%)	1 (1%)	84	77
1	B	144/139 (104%)	143 (99%)	1 (1%)	84	77
1	C	134/139 (96%)	133 (99%)	1 (1%)	84	77
1	D	141/139 (101%)	140 (99%)	1 (1%)	84	77
1	E	145/139 (104%)	145 (100%)	0	100	100
1	F	143/139 (103%)	142 (99%)	1 (1%)	84	77
1	G	144/139 (104%)	144 (100%)	0	100	100
1	H	141/139 (101%)	141 (100%)	0	100	100
1	I	139/139 (100%)	139 (100%)	0	100	100
1	J	140/139 (101%)	140 (100%)	0	100	100
1	K	135/139 (97%)	135 (100%)	0	100	100
1	L	136/139 (98%)	136 (100%)	0	100	100
All	All	1681/1668 (101%)	1676 (100%)	5 (0%)	92	89

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62	PHE
1	B	61	PRO
1	C	69	TYR
1	D	155	GLN
1	F	6	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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)

7 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	BCT	A	201	-	2,3,3	0.80	0	2,3,3	0.95	0
2	BCT	I	201	-	2,3,3	0.69	0	2,3,3	0.56	0
2	BCT	D	201	-	2,3,3	0.68	0	2,3,3	0.35	0
2	BCT	C	201	-	2,3,3	0.73	0	2,3,3	0.64	0
3	PEG	D	202	-	6,6,6	0.57	0	5,5,5	0.25	0
2	BCT	F	201[A]	-	2,3,3	0.74	0	2,3,3	0.88	0
2	BCT	B	201	-	2,3,3	0.69	0	2,3,3	0.72	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	D	202	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	202	PEG	O2-C3-C4-O4
3	D	202	PEG	O1-C1-C2-O2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	201	BCT	1	0
2	C	201	BCT	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, 95th 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^2)	Q<0.9
1	A	152/160 (95%)	-0.28	4 (2%)	56	60	19, 24, 37, 55	0
1	B	153/160 (95%)	-0.07	5 (3%)	46	51	18, 23, 43, 59	0
1	C	143/160 (89%)	0.11	16 (11%)	5	6	20, 26, 52, 65	0
1	D	158/160 (98%)	-0.23	6 (3%)	40	45	21, 27, 42, 57	0
1	E	153/160 (95%)	-0.23	5 (3%)	46	51	21, 28, 40, 66	0
1	F	153/160 (95%)	-0.08	6 (3%)	39	44	19, 27, 48, 63	0
1	G	158/160 (98%)	0.37	18 (11%)	5	5	21, 30, 68, 103	0
1	H	152/160 (95%)	-0.05	7 (4%)	32	36	22, 32, 51, 71	0
1	I	152/160 (95%)	0.19	12 (7%)	12	14	27, 35, 56, 69	0
1	J	152/160 (95%)	0.17	12 (7%)	12	14	25, 36, 62, 82	0
1	K	152/160 (95%)	0.25	16 (10%)	6	7	25, 35, 62, 75	0
1	L	152/160 (95%)	0.30	17 (11%)	5	6	26, 36, 59, 72	0
All	All	1830/1920 (95%)	0.04	124 (6%)	17	19	18, 30, 55, 103	0

All (124) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	158	ASN	9.1
1	K	3	ALA	8.6
1	H	3	ALA	8.1
1	L	3	ALA	7.8
1	G	159	LEU	7.4
1	J	4	LYS	7.2
1	F	3	ALA	6.5
1	G	157	GLU	5.7
1	G	156	GLY	5.7
1	E	3	ALA	5.5
1	B	3	ALA	5.3

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Mol	Chain	Res	Type	RSRZ
1	J	155	GLN	5.2
1	A	3	ALA	5.2
1	L	59	GLY	5.0
1	D	159	LEU	4.8
1	G	55	ALA	4.8
1	K	64	PRO	4.4
1	C	65	GLY	4.4
1	I	59	GLY	4.2
1	G	62	PHE	4.0
1	G	59	GLY	3.9
1	B	61	PRO	3.9
1	L	62	PHE	3.9
1	L	4	LYS	3.8
1	G	61	PRO	3.8
1	G	3	ALA	3.8
1	J	5	GLN	3.8
1	H	4	LYS	3.8
1	C	4	LYS	3.7
1	I	4	LYS	3.6
1	G	57	LEU	3.5
1	K	48	THR	3.5
1	F	59	GLY	3.4
1	G	155	GLN	3.4
1	C	66	LEU	3.3
1	I	155	GLN	3.2
1	L	61	PRO	3.2
1	G	56	ASP	3.2
1	F	155	GLN	3.1
1	L	76	VAL	3.1
1	C	67	ILE	3.1
1	J	61	PRO	3.1
1	E	155	GLN	3.1
1	G	160	TYR	3.0
1	I	64	PRO	3.0
1	L	57	LEU	3.0
1	K	67	ILE	3.0
1	I	63	PHE	2.9
1	K	61	PRO	2.9
1	J	68	SER	2.9
1	J	62	PHE	2.9
1	C	68	SER	2.9
1	H	62	PHE	2.8

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Mol	Chain	Res	Type	RSRZ
1	I	62	PHE	2.8
1	K	4	LYS	2.8
1	I	5	GLN	2.8
1	G	46	ASP	2.8
1	I	46	ASP	2.8
1	C	49[A]	LEU	2.8
1	C	155	GLN	2.8
1	D	155	GLN	2.8
1	J	55	ALA	2.8
1	L	63	PHE	2.7
1	J	58[A]	LYS	2.7
1	L	56	ASP	2.7
1	B	76	VAL	2.7
1	L	64	PRO	2.7
1	G	58	LYS	2.7
1	K	62	PHE	2.7
1	L	23	VAL	2.7
1	H	47	ALA	2.6
1	K	58	LYS	2.6
1	K	68	SER	2.6
1	C	5	GLN	2.6
1	E	40	LEU	2.6
1	G	63	PHE	2.6
1	C	48[A]	THR	2.6
1	G	23	VAL	2.6
1	A	4	LYS	2.6
1	L	60	LYS	2.6
1	H	46	ASP	2.6
1	K	47	ALA	2.6
1	D	3	ALA	2.5
1	K	40	LEU	2.5
1	D	158	ASN	2.5
1	K	5	GLN	2.5
1	C	47	ALA	2.5
1	F	62	PHE	2.4
1	B	62	PHE	2.4
1	K	65	GLY	2.4
1	D	157[A]	GLU	2.4
1	L	46	ASP	2.3
1	C	27	ILE	2.3
1	L	5	GLN	2.3
1	J	76	VAL	2.3

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Mol	Chain	Res	Type	RSRZ
1	J	40	LEU	2.3
1	I	143	GLU	2.3
1	C	46	ASP	2.3
1	F	61	PRO	2.3
1	A	40	LEU	2.3
1	I	54	TYR	2.3
1	H	5	GLN	2.2
1	I	48	THR	2.2
1	F	76	VAL	2.2
1	D	156	GLY	2.2
1	H	143[A]	GLU	2.1
1	C	23	VAL	2.1
1	A	27	ILE	2.1
1	C	52[A]	GLU	2.1
1	G	60	LYS	2.1
1	L	52	GLU	2.1
1	E	23	VAL	2.1
1	J	13	VAL	2.1
1	B	11	ILE	2.1
1	C	76	VAL	2.1
1	K	13	VAL	2.1
1	E	37	LEU	2.1
1	L	13	VAL	2.1
1	J	63	PHE	2.0
1	K	66	LEU	2.0
1	I	56	ASP	2.0
1	C	51	GLU	2.0
1	K	46	ASP	2.0
1	L	138	PRO	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, 95th 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^2)	Q<0.9
3	PEG	D	202	7/7	0.78	0.23	41,55,67,75	0
2	BCT	D	201	4/4	0.81	0.17	46,46,48,57	0
2	BCT	I	201	4/4	0.86	0.18	47,55,60,71	0
2	BCT	B	201	4/4	0.89	0.25	52,59,62,64	0
2	BCT	F	201[A]	4/4	0.89	0.42	37,38,40,40	4
2	BCT	A	201	4/4	0.91	0.16	31,40,44,49	0
2	BCT	C	201	4/4	0.93	0.15	51,51,53,55	0

6.5 Other polymers (i)

There are no such residues in this entry.