



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2018 – 12:21 am GMT

PDB ID : 1S97
Title : DPO4 with GT mismatch
Authors : Trincao, J.; Johnson, R.E.; Wolffe, W.T.; Escalante, C.R.; Prakash, S.;
Prakash, L.; Aggarwal, A.K.
Deposited on : 2004-02-03
Resolution : 2.40 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 ⓘ symbol.

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 : trunk31020
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) : trunk31020

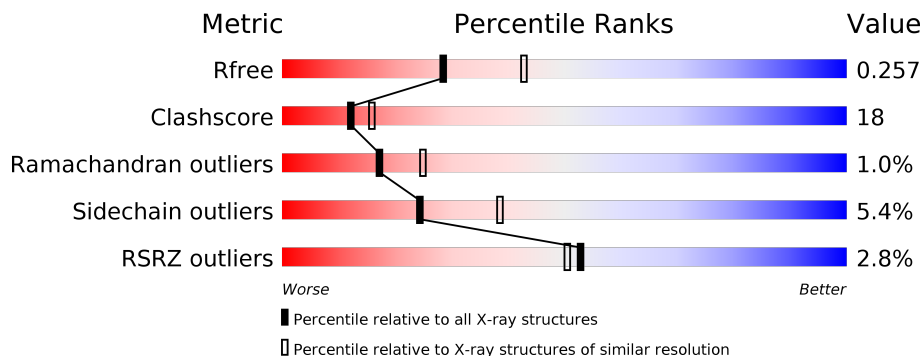
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	3481 (2.40-2.40)
Clashscore	122126	3956 (2.40-2.40)
Ramachandran outliers	120053	3897 (2.40-2.40)
Sidechain outliers	120020	3898 (2.40-2.40)
RSRZ outliers	108989	3386 (2.40-2.40)

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 ≥ 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	E	13	
1	F	13	
1	G	13	
1	H	13	
2	I	18	
2	J	18	

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Mol	Chain	Length	Quality of chain
2	K	18	
2	L	18	
3	A	352	
3	B	352	
3	C	352	
3	D	352	

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 14001 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 DNA chain called 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*T P*G)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	E	13	Total 274	C 129	N 60	O 73	P 12	0	0	0
1	F	13	Total 274	C 129	N 60	O 73	P 12	0	0	0
1	G	13	Total 274	C 129	N 60	O 73	P 12	0	0	0
1	H	13	Total 274	C 129	N 60	O 73	P 12	0	0	0

- Molecule 2 is a DNA chain called 5'-D(*T*TP*CP*AP*GP*TP*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	I	17	Total 335	C 162	N 54	O 103	P 16	0	0	0
2	J	17	Total 335	C 162	N 54	O 103	P 16	0	0	0
2	K	17	Total 335	C 162	N 54	O 103	P 16	0	0	0
2	L	17	Total 335	C 162	N 54	O 103	P 16	0	0	0

- Molecule 3 is a protein called DNA polymerase IV.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	A	341	Total 2723	C 1748	N 470	O 498	S 7	0	0	0
3	B	341	Total 2732	C 1754	N 471	O 500	S 7	0	0	0
3	C	341	Total 2729	C 1751	N 467	O 504	S 7	0	0	0

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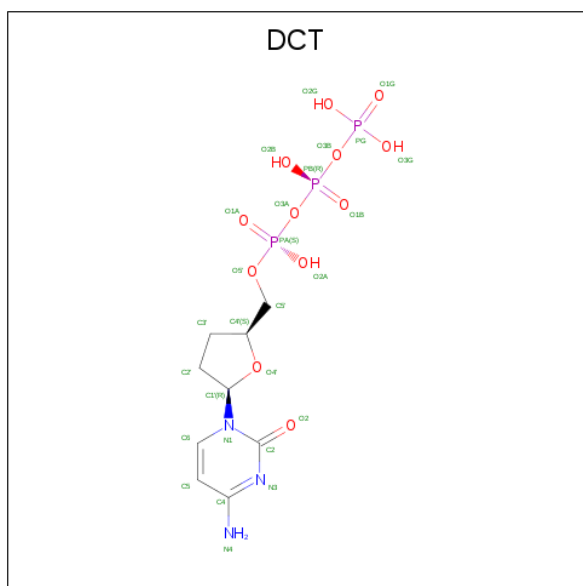
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	341	2714	1739	468	500	7	0	0	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 5 is 2',3'-DIDEOXYCYTIDINE 5'-TRIPHOSPHATE (three-letter code: DCT) (formula: C₉H₁₆N₃O₁₂P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
5	A	1	27	9	3	12	3	0	0
5	B	1	27	9	3	12	3	0	0
5	C	1	27	9	3	12	3	0	0
5	D	1	27	9	3	12	3	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	E	20	Total O 20 20	0	0
6	I	26	Total O 26 26	0	0
6	F	16	Total O 16 16	0	0
6	J	18	Total O 18 18	0	0
6	G	21	Total O 21 21	0	0
6	K	30	Total O 30 30	0	0
6	H	17	Total O 17 17	0	0
6	L	9	Total O 9 9	0	0
6	A	108	Total O 108 108	0	0
6	B	109	Total O 109 109	0	0
6	C	99	Total O 99 99	0	0
6	D	82	Total O 82 82	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.

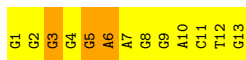
- Molecule 1: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*G)-3'

Chain E: 

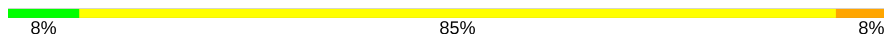


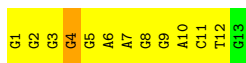
- Molecule 1: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*G)-3'

Chain F: 



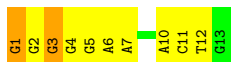
- Molecule 1: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*G)-3'

Chain G: 



- Molecule 1: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*G)-3'

Chain H: 




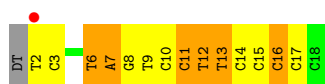
- Molecule 2: 5'-D(*T*TP*CP*AP*GP*TP*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'

Chain I: 

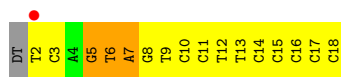
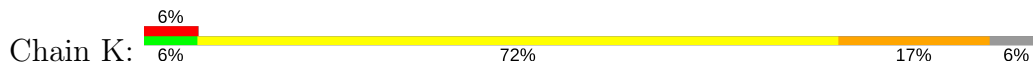


- Molecule 2: 5'-D(*T*TP*CP*AP*GP*TP*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'

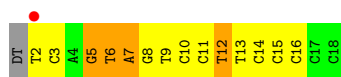
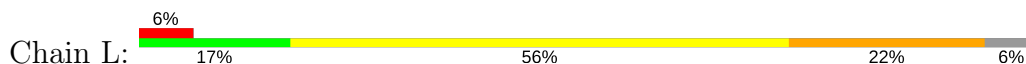
Chain J: 



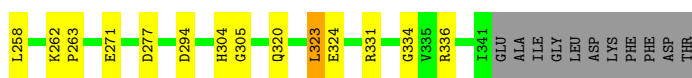
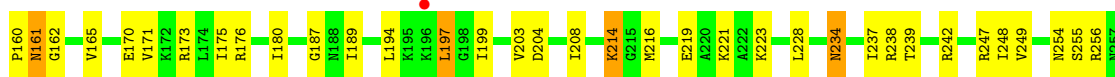
• Molecule 2: 5'-D(*T*TP*CP*AP*GP*TP*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'



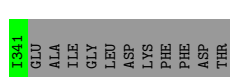
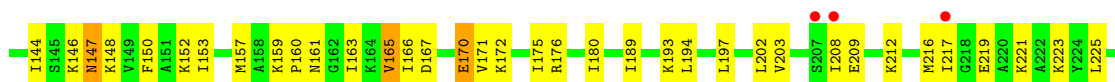
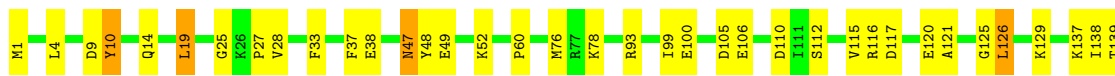
• Molecule 2: 5'-D(*T*TP*CP*AP*GP*TP*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'



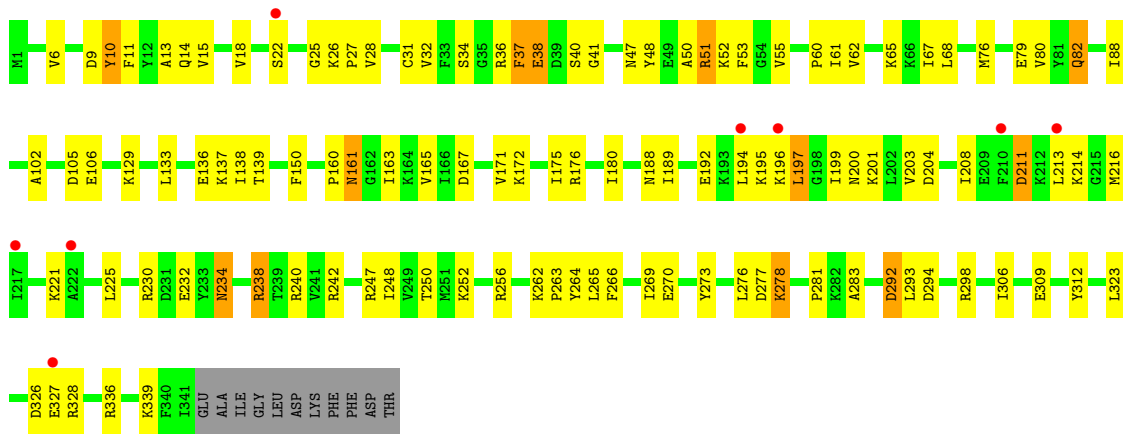
• Molecule 3: DNA polymerase IV



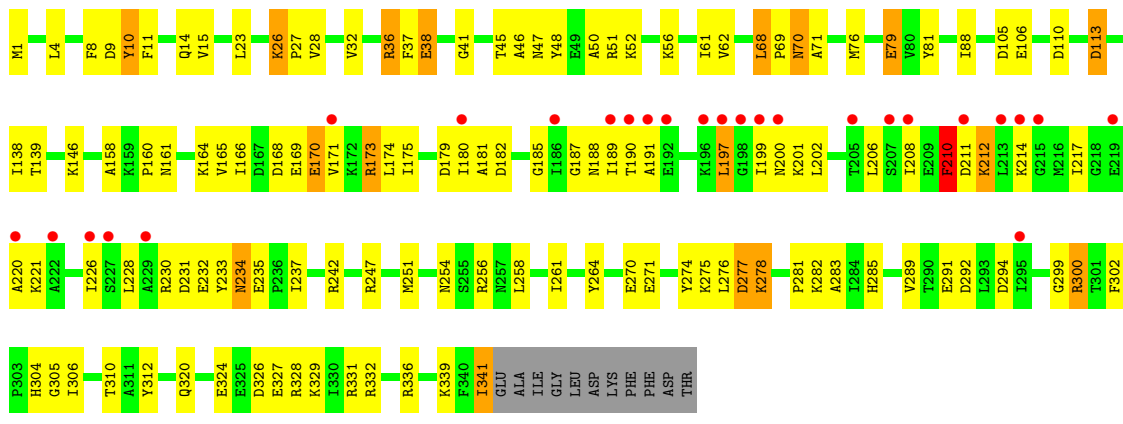
• Molecule 3: DNA polymerase IV



• Molecule 3: DNA polymerase IV



• Molecule 3: DNA polymerase IV



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	104.43Å 100.64Å 110.43Å 90.00° 94.89° 90.00°	Depositor
Resolution (Å)	29.64 – 2.40 47.01 – 2.40	Depositor EDS
% Data completeness (in resolution range)	85.9 (29.64-2.40) 95.1 (47.01-2.40)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.89 (at 2.39Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.218 , 0.269 0.207 , 0.257	Depositor DCC
R_{free} test set	3866 reflections (4.33%)	wwPDB-VP
Wilson B-factor (Å ²)	29.6	Xtrriage
Anisotropy	0.320	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 47.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	14001	wwPDB-VP
Average B, all atoms (Å ²)	32.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 61.58 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.2828e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical 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: CA, DCT

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	E	0.69	0/310	1.28	1/479 (0.2%)
1	F	0.64	0/310	1.24	0/479
1	G	0.58	0/310	1.17	0/479
1	H	0.59	0/310	1.14	0/479
2	I	0.71	0/372	1.29	2/570 (0.4%)
2	J	0.75	0/372	1.35	2/570 (0.4%)
2	K	0.64	0/372	1.22	1/570 (0.2%)
2	L	0.63	0/372	1.24	1/570 (0.2%)
3	A	0.36	0/2762	0.58	0/3713
3	B	0.36	0/2771	0.59	0/3723
3	C	0.35	0/2768	0.57	0/3721
3	D	0.39	2/2753 (0.1%)	0.68	4/3703 (0.1%)
All	All	0.44	2/13782 (0.0%)	0.79	11/19056 (0.1%)

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	E	0	4
1	F	0	5
1	G	0	4
1	H	0	2
2	I	0	6
2	J	0	5
2	K	0	3
2	L	0	3
3	D	0	1
All	All	0	33

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	212	LYS	C-N	-7.28	1.17	1.34
3	D	210	PHE	C-N	-6.37	1.19	1.34

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	210	PHE	O-C-N	-16.26	96.69	122.70
3	D	212	LYS	O-C-N	9.62	138.09	122.70
3	D	210	PHE	CA-C-N	8.43	135.74	117.20
3	D	212	LYS	CA-C-N	-7.44	100.84	117.20
2	J	7	DA	O4'-C1'-C2'	5.43	110.24	105.90
2	I	7	DA	O4'-C1'-C2'	5.42	110.24	105.90
1	E	6	DA	O4'-C1'-C2'	5.21	110.07	105.90
2	I	15	DC	O4'-C4'-C3'	-5.20	102.42	104.50
2	L	7	DA	O4'-C1'-C2'	5.19	110.05	105.90
2	K	7	DA	O4'-C1'-C2'	5.16	110.03	105.90
2	J	8	DG	O4'-C1'-C2'	5.12	110.00	105.90

There are no chirality outliers.

All (33) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	D	210	PHE	Mainchain
1	E	1	DG	Sidechain
1	E	3	DG	Sidechain
1	E	5	DG	Sidechain
1	E	6	DA	Sidechain
1	F	1	DG	Sidechain
1	F	3	DG	Sidechain
1	F	5	DG	Sidechain
1	F	6	DA	Sidechain
1	F	9	DG	Sidechain
1	G	1	DG	Sidechain
1	G	4	DG	Sidechain
1	G	6	DA	Sidechain
1	G	9	DG	Sidechain
1	H	1	DG	Sidechain
1	H	3	DG	Sidechain
2	I	11	DC	Sidechain
2	I	12	DT	Sidechain
2	I	13	DT	Sidechain

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Mol	Chain	Res	Type	Group
2	I	16	DC	Sidechain
2	I	5	DG	Sidechain
2	I	6	DT	Sidechain
2	J	11	DC	Sidechain
2	J	12	DT	Sidechain
2	J	13	DT	Sidechain
2	J	16	DC	Sidechain
2	J	6	DT	Sidechain
2	K	12	DT	Sidechain
2	K	5	DG	Sidechain
2	K	6	DT	Sidechain
2	L	12	DT	Sidechain
2	L	5	DG	Sidechain
2	L	6	DT	Sidechain

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	E	274	0	144	15	0
1	F	274	0	144	17	0
1	G	274	0	144	14	0
1	H	274	0	144	18	0
2	I	335	0	194	18	0
2	J	335	0	194	23	0
2	K	335	0	194	21	0
2	L	335	0	194	16	0
3	A	2723	0	2855	74	0
3	B	2732	0	2872	89	0
3	C	2729	0	2856	94	0
3	D	2714	0	2819	115	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	27	0	12	4	0
5	B	27	0	12	4	0
5	C	27	0	12	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	D	27	0	12	3	0
6	A	108	0	0	4	0
6	B	109	0	0	6	0
6	C	99	0	0	6	0
6	D	82	0	0	6	0
6	E	20	0	0	0	0
6	F	16	0	0	1	0
6	G	21	0	0	0	0
6	H	17	0	0	3	0
6	I	26	0	0	0	0
6	J	18	0	0	1	0
6	K	30	0	0	2	0
6	L	9	0	0	2	0
All	All	14001	0	12802	480	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 18.

All (480) 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)
3:B:14:GLN:HE22	3:B:139:THR:N	1.62	0.95
3:C:14:GLN:HE22	3:C:139:THR:H	0.98	0.94
3:A:14:GLN:HE22	3:A:139:THR:H	0.98	0.93
3:B:14:GLN:NE2	3:B:139:THR:H	1.66	0.93
3:D:197:LEU:HG	3:D:199:ILE:HD13	1.48	0.93
3:C:211:ASP:HA	3:C:214:LYS:HG2	1.56	0.87
3:C:256:ARG:HH21	3:C:327:GLU:HA	1.42	0.85
3:A:79:GLU:H	3:A:79:GLU:CD	1.82	0.83
2:K:2:DT:H5''	2:K:3:DC:OP1	1.78	0.82
3:A:14:GLN:NE2	3:A:139:THR:H	1.77	0.82
3:C:67:ILE:HG22	3:C:68:LEU:HD22	1.58	0.81
3:A:49:GLU:HA	3:A:52:LYS:HE2	1.61	0.80
3:D:36:ARG:HB3	3:D:36:ARG:HH11	1.47	0.79
3:C:14:GLN:HE22	3:C:139:THR:N	1.80	0.79
3:B:166:ILE:HG23	3:B:170:GLU:HB3	1.66	0.78
3:D:210:PHE:O	3:D:212:LYS:N	2.17	0.78
3:D:210:PHE:O	3:D:211:ASP:C	2.24	0.76
2:L:5:DG:H2''	3:D:32:VAL:HG11	1.67	0.74
2:L:2:DT:H2'	2:L:2:DT:O2	1.89	0.73
3:D:300:ARG:HD2	3:D:302:PHE:CE1	2.23	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:9:ASP:OD1	3:A:159:LYS:HE3	1.88	0.73
3:C:14:GLN:NE2	3:C:139:THR:H	1.81	0.73
3:A:21:PRO:O	3:A:24:LYS:HG2	1.89	0.72
3:B:147:ASN:ND2	3:B:150:PHE:H	1.87	0.71
3:C:238:ARG:NH2	3:C:238:ARG:HB3	2.05	0.71
3:B:14:GLN:HE22	3:B:139:THR:H	0.81	0.71
3:A:131:LYS:HA	3:A:131:LYS:HE3	1.73	0.71
3:D:278:LYS:HE3	3:D:278:LYS:N	2.06	0.70
1:H:11:DC:H5''	3:D:187:GLY:H	1.55	0.70
3:A:171:VAL:O	3:A:175:ILE:HG13	1.91	0.70
3:D:166:ILE:HG23	3:D:170:GLU:HB3	1.74	0.69
3:C:27:PRO:HB2	3:C:50:ALA:HB2	1.73	0.69
3:C:199:ILE:HG23	3:C:204:ASP:HB2	1.73	0.69
3:D:146:LYS:HD2	3:D:171:VAL:HG21	1.74	0.69
3:C:199:ILE:HD11	3:C:208:ILE:HD13	1.75	0.69
1:F:12:DT:N3	2:J:7:DA:C2	2.58	0.68
3:A:219:GLU:HG2	3:A:223:LYS:NZ	2.08	0.68
3:B:49:GLU:HA	3:B:52:LYS:HE2	1.75	0.68
3:B:171:VAL:O	3:B:175:ILE:HG13	1.93	0.68
3:C:188:ASN:O	3:C:192:GLU:HG2	1.94	0.68
2:I:3:DC:H1'	3:A:60:PRO:HG2	1.74	0.68
3:B:110:ASP:HB2	3:B:237:ILE:HG13	1.75	0.68
3:D:28:VAL:H	3:D:47:ASN:ND2	1.92	0.67
3:C:238:ARG:HH21	3:C:238:ARG:HB3	1.57	0.67
3:D:282:LYS:NZ	3:D:341:ILE:HG23	2.09	0.67
3:D:320:GLN:O	3:D:324:GLU:HB2	1.94	0.67
3:A:320:GLN:O	3:A:324:GLU:HG3	1.95	0.67
1:F:12:DT:H3	2:J:7:DA:H2	1.41	0.66
1:E:12:DT:N3	2:I:7:DA:C2	2.62	0.66
2:K:2:DT:H4'	2:K:3:DC:H5'	1.77	0.66
2:J:3:DC:H1'	3:B:60:PRO:HG2	1.77	0.66
2:J:2:DT:H1'	3:B:37:PHE:CE2	2.31	0.66
3:A:175:ILE:O	3:A:203:VAL:HG13	1.96	0.66
3:C:67:ILE:HG22	3:C:68:LEU:CD2	2.26	0.65
3:A:258:LEU:CD1	3:A:262:LYS:HE3	2.27	0.65
2:J:9:DT:H2'	2:J:10:DC:C6	2.32	0.65
3:D:200:ASN:O	3:D:201:LYS:HD3	1.97	0.65
2:I:9:DT:H2'	2:I:10:DC:C6	2.32	0.65
3:B:147:ASN:HD21	3:B:150:PHE:H	1.42	0.65
3:B:180:ILE:HD11	3:B:225:LEU:HD13	1.78	0.65
3:B:321:LYS:O	3:B:325:GLU:HG3	1.96	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:14:DC:H2'	2:J:15:DC:C6	2.32	0.65
3:B:193:LYS:O	3:B:197:LEU:HD13	1.97	0.64
3:D:27:PRO:HB2	3:D:50:ALA:HB2	1.78	0.64
3:B:292:ASP:OD1	3:B:294:ASP:HB2	1.96	0.64
2:K:15:DC:H2'	2:K:16:DC:C6	2.32	0.64
3:D:14:GLN:HE22	3:D:139:THR:H	1.45	0.64
3:D:256:ARG:HG2	3:D:256:ARG:HH11	1.63	0.64
2:L:15:DC:H2'	2:L:16:DC:C6	2.33	0.64
3:B:147:ASN:C	3:B:147:ASN:HD22	2.01	0.64
3:C:256:ARG:NH2	3:C:327:GLU:HA	2.12	0.64
3:C:200:ASN:O	3:C:201:LYS:HD2	1.98	0.64
2:I:16:DC:H2''	2:I:17:DC:H5'	1.78	0.64
3:D:256:ARG:NH2	3:D:327:GLU:HA	2.13	0.64
1:H:10:DA:H5''	3:D:189:ILE:HG21	1.80	0.63
2:J:15:DC:H2'	2:J:16:DC:C6	2.33	0.63
3:C:208:ILE:HD11	3:C:213:LEU:HD13	1.81	0.63
3:B:304:HIS:HD2	3:B:305:GLY:O	1.81	0.63
3:D:276:LEU:HD13	3:D:281:PRO:HD3	1.81	0.63
3:D:283:ALA:HB2	3:D:339:LYS:HD2	1.81	0.63
2:K:14:DC:H2'	2:K:15:DC:C6	2.34	0.63
3:B:256:ARG:HG3	3:B:329:LYS:HG2	1.81	0.62
3:A:199:ILE:HD11	3:A:208:ILE:HG21	1.82	0.62
3:B:194:LEU:HD21	3:B:217:ILE:HD13	1.81	0.61
2:I:5:DG:H2''	3:A:32:VAL:HG11	1.82	0.61
3:D:23:LEU:HA	3:D:26:LYS:HD3	1.80	0.61
3:D:217:ILE:HD13	3:D:221:LYS:HB2	1.82	0.61
2:K:5:DG:H2''	3:C:32:VAL:HG11	1.83	0.61
3:A:254:ASN:HD21	3:A:331:ARG:HG3	1.66	0.60
3:B:129:LYS:HB3	3:B:129:LYS:HZ2	1.67	0.60
3:D:88:ILE:HD11	3:D:138:ILE:HD12	1.83	0.60
3:A:176:ARG:HG2	3:A:203:VAL:HG11	1.83	0.60
3:C:197:LEU:HD22	3:C:216:MET:HG2	1.84	0.60
3:C:252:LYS:HG2	3:C:264:TYR:OH	2.02	0.60
2:J:2:DT:H4'	2:J:3:DC:O5'	2.01	0.60
2:I:15:DC:H2'	2:I:16:DC:C6	2.36	0.60
3:D:289:VAL:HB	3:D:332:ARG:HB2	1.84	0.60
1:E:5:DG:H2'	1:E:6:DA:C8	2.36	0.60
3:C:195:LYS:HG2	6:C:759:HOH:O	2.00	0.59
3:A:14:GLN:HE22	3:A:139:THR:N	1.83	0.59
2:L:14:DC:H2'	2:L:15:DC:C6	2.38	0.59
3:B:48:TYR:O	3:B:52:LYS:HG3	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:164:LYS:HD3	3:D:165:VAL:N	2.17	0.59
3:A:219:GLU:HG2	3:A:223:LYS:HZ3	1.68	0.59
3:B:14:GLN:NE2	3:B:139:THR:HG23	2.18	0.58
3:D:173:ARG:HH21	3:D:174:LEU:HD23	1.68	0.58
3:D:11:PHE:N	5:D:603:DCT:O3G	2.33	0.58
3:B:180:ILE:HD13	3:B:194:LEU:HD13	1.84	0.58
3:B:256:ARG:HG2	3:B:329:LYS:HA	1.86	0.58
3:C:180:ILE:HD13	3:C:194:LEU:HD13	1.85	0.58
3:D:210:PHE:CE1	3:D:214:LYS:HB2	2.38	0.58
3:C:55:VAL:CG2	3:C:68:LEU:HD23	2.33	0.58
3:C:197:LEU:HD13	3:C:216:MET:HE2	1.84	0.58
2:J:12:DT:H2'	2:J:13:DT:C6	2.39	0.58
3:D:282:LYS:HZ3	3:D:341:ILE:HG23	1.68	0.58
1:F:12:DT:C2	2:J:7:DA:H2	2.21	0.58
1:E:12:DT:O2	2:I:7:DA:H2	1.85	0.58
3:B:167:ASP:OD2	3:B:170:GLU:HB2	2.03	0.57
1:H:11:DC:H2'	1:H:12:DT:H71	1.86	0.57
3:A:144:ILE:HB	3:A:165:VAL:HG22	1.85	0.57
2:I:6:DT:H2''	2:I:7:DA:O5'	2.02	0.57
3:B:153:ILE:O	3:B:157:MET:HG3	2.03	0.57
1:E:11:DC:H2''	1:E:12:DT:O5'	2.04	0.57
3:D:251:MET:HG2	3:D:264:TYR:CD2	2.40	0.57
3:D:217:ILE:HD13	3:D:221:LYS:CB	2.35	0.57
1:E:12:DT:C2	2:I:7:DA:H2	2.22	0.57
2:K:2:DT:H4'	2:K:3:DC:C5'	2.35	0.57
3:B:283:ALA:HB2	3:B:339:LYS:HD2	1.86	0.56
1:F:12:DT:N3	2:J:7:DA:H2	1.99	0.56
3:A:10:TYR:HA	5:A:600:DCT:PG	2.46	0.56
3:B:126:LEU:HD13	3:B:163:ILE:HD13	1.87	0.56
3:D:292:ASP:OD1	3:D:294:ASP:HB2	2.06	0.56
2:L:6:DT:H1'	6:L:233:HOH:O	2.04	0.56
3:D:226:ILE:HG23	3:D:230:ARG:HE	1.70	0.56
3:D:254:ASN:HD21	3:D:331:ARG:HG3	1.70	0.56
3:B:208:ILE:HG12	3:B:209:GLU:N	2.20	0.56
1:H:11:DC:H5''	3:D:187:GLY:N	2.20	0.56
3:D:76:MET:HG3	3:D:81:TYR:HE2	1.69	0.56
3:B:148:LYS:HD3	3:B:237:ILE:HD13	1.88	0.56
3:C:36:ARG:O	3:C:37:PHE:HB3	2.06	0.55
3:D:62:VAL:HG13	6:D:742:HOH:O	2.06	0.55
2:I:6:DT:H2'	2:I:7:DA:C8	2.41	0.55
3:C:175:ILE:HG22	3:C:203:VAL:HG13	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:13:DT:H2'	2:L:14:DC:C6	2.42	0.55
3:A:10:TYR:N	5:A:600:DCT:O3G	2.40	0.55
2:L:8:DG:H2''	2:L:9:DT:O5'	2.07	0.55
3:B:10:TYR:N	5:B:601:DCT:O3G	2.39	0.55
5:A:600:DCT:H4'	5:A:600:DCT:O1G	2.08	0.54
3:D:228:LEU:HD12	3:D:233:TYR:HB2	1.89	0.54
3:C:196:LYS:HB3	3:C:196:LYS:HZ3	1.73	0.54
1:H:5:DG:H2'	1:H:6:DA:C8	2.42	0.54
3:B:100:GLU:HG3	3:B:238:ARG:O	2.08	0.54
1:E:12:DT:H3	2:I:7:DA:H2	1.48	0.54
3:D:234:ASN:N	3:D:234:ASN:HD22	2.04	0.54
3:D:70:ASN:ND2	6:D:714:HOH:O	2.41	0.54
1:F:12:DT:O2	2:J:7:DA:H2	1.91	0.54
3:A:197:LEU:HD22	3:A:208:ILE:CD1	2.38	0.54
3:D:188:ASN:HA	3:D:191:ALA:HB3	1.88	0.53
2:K:2:DT:H1'	3:C:37:PHE:CD2	2.43	0.53
3:D:234:ASN:H	3:D:234:ASN:HD22	1.56	0.53
3:B:289:VAL:HB	3:B:332:ARG:HB2	1.89	0.53
3:D:291:GLU:OE1	3:D:329:LYS:HB2	2.07	0.53
3:A:10:TYR:HA	5:A:600:DCT:O2G	2.08	0.53
3:C:62:VAL:O	3:C:65:LYS:HB2	2.07	0.53
1:E:12:DT:N3	2:I:7:DA:H2	2.06	0.53
1:H:10:DA:H5'	6:H:14:HOH:O	2.07	0.53
2:I:16:DC:H2''	2:I:17:DC:C5'	2.39	0.53
3:A:118:TYR:HA	3:A:121:ALA:HB3	1.90	0.53
3:A:228:LEU:HA	6:A:739:HOH:O	2.07	0.53
3:D:300:ARG:HG3	3:D:300:ARG:O	2.08	0.53
3:D:47:ASN:O	3:D:51:ARG:HG3	2.08	0.53
3:D:68:LEU:HA	6:D:714:HOH:O	2.09	0.53
3:C:221:LYS:HG3	6:C:717:HOH:O	2.09	0.53
1:H:2:DG:H2'	1:H:3:DG:C8	2.44	0.53
3:A:304:HIS:HD2	3:A:305:GLY:O	1.92	0.52
3:D:79:GLU:CD	3:D:79:GLU:H	2.11	0.52
3:B:27:PRO:HA	3:B:47:ASN:HD21	1.73	0.52
1:G:10:DA:OP1	3:C:189:ILE:HD13	2.10	0.52
2:K:10:DC:H1'	6:K:113:HOH:O	2.07	0.52
3:D:206:LEU:HD22	3:D:230:ARG:NH1	2.25	0.52
3:D:36:ARG:HH21	3:D:254:ASN:ND2	2.08	0.52
3:D:306:ILE:HG23	3:D:310:THR:HB	1.92	0.52
3:B:4:LEU:HD23	3:B:4:LEU:C	2.30	0.52
3:C:34:SER:HB3	3:C:40:SER:OG	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:10:TYR:HA	5:C:602:DCT:PG	2.50	0.52
3:C:11:PHE:O	3:C:15:VAL:HG23	2.09	0.52
3:D:251:MET:CE	3:D:261:ILE:HG12	2.40	0.52
3:B:1:MET:N	6:B:722:HOH:O	2.42	0.51
3:B:299:GLY:HA2	3:B:318:LEU:HD13	1.91	0.51
3:D:258:LEU:O	3:D:258:LEU:HD23	2.10	0.51
3:C:273:TYR:HA	3:C:276:LEU:HD12	1.92	0.51
3:C:265:LEU:O	3:C:269:ILE:HG13	2.10	0.51
1:F:5:DG:H5''	6:F:106:HOH:O	2.09	0.51
3:D:326:ASP:OD1	3:D:328:ARG:HB2	2.11	0.51
3:B:10:TYR:HA	5:B:601:DCT:PG	2.50	0.51
3:A:23:LEU:O	3:A:26:LYS:HG2	2.11	0.51
3:D:28:VAL:N	3:D:47:ASN:ND2	2.59	0.51
1:E:7:DA:H2'	1:E:8:DG:C8	2.46	0.51
3:D:9:ASP:O	3:D:10:TYR:C	2.49	0.50
3:D:158:ALA:HB2	3:D:164:LYS:HB2	1.94	0.50
6:L:233:HOH:O	3:D:76:MET:HE1	2.11	0.50
3:C:281:PRO:O	3:C:306:ILE:HG13	2.10	0.50
3:C:88:ILE:HD11	3:C:138:ILE:HD13	1.92	0.50
1:G:12:DT:O2	2:K:7:DA:H2	1.93	0.50
2:K:14:DC:H2'	2:K:15:DC:H6	1.76	0.50
3:A:170:GLU:HG3	3:A:173:ARG:HH11	1.77	0.50
3:A:248:ILE:HA	3:A:334:GLY:HA3	1.94	0.50
5:B:601:DCT:H4'	5:B:601:DCT:O1G	2.11	0.50
2:K:14:DC:H1'	6:K:198:HOH:O	2.10	0.50
3:C:196:LYS:HB3	3:C:196:LYS:NZ	2.26	0.50
3:C:53:PHE:HB2	3:C:68:LEU:HD21	1.94	0.50
2:L:8:DG:OP2	3:D:336:ARG:NH2	2.44	0.50
3:B:239:THR:O	3:B:239:THR:HG23	2.12	0.50
3:C:176:ARG:O	3:C:201:LYS:HG2	2.12	0.50
2:J:14:DC:H2'	2:J:15:DC:H6	1.76	0.50
3:C:79:GLU:H	3:C:79:GLU:CD	2.14	0.50
1:E:11:DC:H5''	3:A:187:GLY:H	1.75	0.50
1:G:3:DG:H2'	1:G:4:DG:C8	2.46	0.50
3:A:49:GLU:O	3:A:52:LYS:HG2	2.12	0.50
3:C:55:VAL:HG23	3:C:68:LEU:HD23	1.93	0.50
3:D:36:ARG:CB	3:D:36:ARG:HH11	2.21	0.50
3:D:68:LEU:HD13	3:D:71:ALA:HB2	1.93	0.50
3:B:189:ILE:N	3:B:189:ILE:HD12	2.27	0.49
3:C:273:TYR:HE1	6:C:760:HOH:O	1.93	0.49
3:D:146:LYS:CD	3:D:171:VAL:HG21	2.40	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:270:GLU:HG2	3:D:312:TYR:OH	2.12	0.49
1:G:2:DG:H2'	1:G:3:DG:C8	2.47	0.49
2:J:2:DT:H5''	2:J:3:DC:OP1	2.12	0.49
2:I:13:DT:H2'	2:I:14:DC:C6	2.47	0.49
3:D:113:ASP:HB3	6:D:722:HOH:O	2.13	0.49
2:I:14:DC:H2'	2:I:15:DC:C6	2.47	0.49
2:J:13:DT:H2'	2:J:14:DC:C6	2.48	0.49
3:C:136:GLU:HB3	3:C:138:ILE:HD12	1.95	0.49
3:C:230:ARG:HB3	3:C:232:GLU:HG3	1.94	0.49
3:A:247:ARG:NH1	3:A:248:ILE:O	2.46	0.49
3:B:47:ASN:HD22	3:B:47:ASN:C	2.14	0.49
3:C:230:ARG:CB	3:C:232:GLU:HG3	2.42	0.49
2:L:3:DC:O2	2:L:3:DC:H2'	2.12	0.49
3:A:9:ASP:O	3:A:10:TYR:C	2.51	0.49
3:B:110:ASP:HB2	3:B:237:ILE:CG1	2.42	0.49
3:C:28:VAL:H	3:C:47:ASN:ND2	2.11	0.49
3:B:10:TYR:HA	5:B:601:DCT:O2G	2.12	0.49
3:B:175:ILE:HG23	3:B:229:ALA:HA	1.94	0.49
3:D:230:ARG:HD2	3:D:232:GLU:OE2	2.12	0.49
3:B:254:ASN:HA	3:B:330:ILE:O	2.12	0.48
1:G:10:DA:H2''	1:G:11:DC:C5'	2.44	0.48
1:E:11:DC:H5''	3:A:187:GLY:N	2.28	0.48
3:D:247:ARG:NE	3:D:271:GLU:OE1	2.46	0.48
3:D:256:ARG:HG2	3:D:256:ARG:NH1	2.28	0.48
1:H:11:DC:H2'	1:H:12:DT:C6	2.49	0.48
2:I:2:DT:H4'	2:I:3:DC:O5'	2.13	0.48
3:A:48:TYR:HE1	3:A:159:LYS:HZ3	1.59	0.48
3:D:169:GLU:HG2	6:D:772:HOH:O	2.13	0.48
3:A:175:ILE:HG22	3:A:203:VAL:CG1	2.44	0.48
3:D:242:ARG:HH11	3:D:242:ARG:HG3	1.78	0.48
2:J:16:DC:H2''	2:J:17:DC:H5'	1.94	0.48
3:C:277:ASP:O	3:C:278:LYS:CB	2.61	0.48
3:D:28:VAL:N	3:D:47:ASN:HD21	2.11	0.48
1:F:7:DA:H2''	1:F:8:DG:O4'	2.14	0.48
2:L:15:DC:H2'	2:L:16:DC:H6	1.78	0.48
3:B:219:GLU:HG2	3:B:223:LYS:HE3	1.96	0.48
3:C:102:ALA:HA	3:C:240:ARG:HH21	1.78	0.48
3:D:14:GLN:NE2	3:D:139:THR:H	2.11	0.48
3:A:219:GLU:HG2	3:A:223:LYS:HZ2	1.78	0.48
3:C:10:TYR:HB3	3:C:51:ARG:HH21	1.78	0.48
3:C:283:ALA:HB2	3:C:339:LYS:HD2	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:208:ILE:N	3:D:208:ILE:HD12	2.28	0.48
2:I:12:DT:H2''	2:I:13:DT:O5'	2.13	0.48
1:H:5:DG:H1'	6:H:16:HOH:O	2.14	0.47
3:C:171:VAL:O	3:C:175:ILE:HG13	2.15	0.47
3:C:195:LYS:NZ	3:C:195:LYS:HB2	2.29	0.47
3:D:8:PHE:CE2	3:D:105:ASP:HA	2.49	0.47
3:B:105:ASP:OD1	3:B:106:GLU:HG3	2.14	0.47
3:C:270:GLU:OE1	3:C:312:TYR:OH	2.21	0.47
3:D:277:ASP:O	3:D:278:LYS:HB2	2.14	0.47
3:C:22:SER:O	3:C:26:LYS:HE3	2.14	0.47
2:L:3:DC:O2	2:L:3:DC:C2'	2.62	0.47
3:C:10:TYR:CD1	3:C:10:TYR:O	2.67	0.47
2:J:10:DC:H2'	2:J:11:DC:H6	1.80	0.47
3:A:170:GLU:HG3	3:A:173:ARG:NH1	2.30	0.47
3:C:195:LYS:HZ2	3:C:195:LYS:HB2	1.79	0.47
3:C:208:ILE:HD11	3:C:213:LEU:HB2	1.97	0.47
1:E:7:DA:H2'	1:E:8:DG:H8	1.78	0.47
3:A:203:VAL:HG23	3:A:204:ASP:N	2.30	0.47
3:C:9:ASP:O	3:C:10:TYR:C	2.53	0.47
3:C:309:GLU:HG2	3:D:69:PRO:HG2	1.96	0.47
3:C:48:TYR:HA	3:C:51:ARG:HB2	1.97	0.47
3:D:28:VAL:H	3:D:47:ASN:HD21	1.62	0.47
1:H:12:DT:O2	2:L:7:DA:H2	1.98	0.47
3:C:10:TYR:HD1	3:C:13:ALA:HB3	1.79	0.47
3:C:327:GLU:N	3:C:327:GLU:OE1	2.48	0.47
3:D:235:GLU:HA	3:D:235:GLU:OE1	2.14	0.47
3:D:173:ARG:HG3	3:D:173:ARG:HH11	1.81	0.46
3:C:247:ARG:NH1	3:C:248:ILE:O	2.48	0.46
3:D:254:ASN:ND2	3:D:331:ARG:HA	2.30	0.46
3:A:48:TYR:CE1	3:A:160:PRO:HB3	2.51	0.46
3:D:251:MET:HE1	3:D:261:ILE:HG12	1.96	0.46
3:C:195:LYS:NZ	3:C:195:LYS:CB	2.78	0.46
3:C:292:ASP:O	3:C:293:LEU:HB2	2.15	0.46
3:D:226:ILE:HG23	3:D:230:ARG:NE	2.30	0.46
1:G:10:DA:H2''	1:G:11:DC:H5'	1.98	0.46
3:A:159:LYS:HE2	3:A:160:PRO:HA	1.97	0.46
3:B:147:ASN:C	3:B:147:ASN:ND2	2.69	0.46
3:D:171:VAL:O	3:D:175:ILE:HG13	2.15	0.46
1:E:10:DA:P	3:A:189:ILE:HD13	2.55	0.46
3:A:159:LYS:HG3	6:A:794:HOH:O	2.15	0.46
3:C:262:LYS:HB3	3:C:266:PHE:CE2	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:11:DC:H2''	1:H:12:DT:O5'	2.16	0.46
3:A:4:LEU:C	3:A:4:LEU:HD23	2.35	0.46
2:L:9:DT:H2'	2:L:10:DC:C6	2.50	0.46
3:A:147:ASN:HB2	6:A:762:HOH:O	2.16	0.46
3:C:48:TYR:O	3:C:52:LYS:HG2	2.16	0.46
1:F:5:DG:C2'	1:F:6:DA:O5'	2.63	0.46
1:H:3:DG:H2'	1:H:4:DG:C8	2.51	0.46
3:B:175:ILE:O	3:B:202:LEU:HB2	2.16	0.45
1:H:6:DA:H2'	1:H:7:DA:C8	2.51	0.45
3:D:173:ARG:HH21	3:D:174:LEU:CD2	2.28	0.45
3:D:4:LEU:HD23	3:D:4:LEU:C	2.36	0.45
2:K:3:DC:H2''	3:C:60:PRO:HB3	1.99	0.45
3:C:180:ILE:HD11	3:C:225:LEU:HD13	1.98	0.45
2:K:16:DC:H2''	2:K:17:DC:H5'	1.99	0.45
3:B:221:LYS:HE2	6:B:784:HOH:O	2.17	0.45
3:A:100:GLU:HG3	3:A:238:ARG:O	2.17	0.45
3:C:167:ASP:O	3:C:171:VAL:HG23	2.17	0.45
3:A:180:ILE:HD13	3:A:194:LEU:HD13	1.97	0.45
1:F:4:DG:H2'	1:F:5:DG:C8	2.51	0.45
1:F:7:DA:H2'	1:F:8:DG:H8	1.82	0.45
2:K:10:DC:H2''	2:K:11:DC:C5'	2.47	0.45
3:B:129:LYS:HB3	3:B:129:LYS:NZ	2.30	0.45
3:A:129:LYS:HE2	3:A:162:GLY:O	2.16	0.45
3:A:336:ARG:NH1	6:A:707:HOH:O	2.47	0.45
3:C:262:LYS:HB2	3:C:263:PRO:HD3	1.98	0.45
3:D:304:HIS:HD2	3:D:305:GLY:O	2.00	0.45
1:F:10:DA:H2''	1:F:11:DC:C5'	2.47	0.45
3:B:234:ASN:HD22	3:B:234:ASN:C	2.20	0.44
1:G:7:DA:H2'	1:G:8:DG:H8	1.82	0.44
3:B:14:GLN:NE2	3:B:138:ILE:HA	2.31	0.44
3:D:45:THR:HG22	3:D:46:ALA:N	2.31	0.44
1:G:7:DA:OP2	3:C:298:ARG:HA	2.18	0.44
5:D:603:DCT:H6	5:D:603:DCT:H5''	1.98	0.44
3:B:172:LYS:HA	3:B:175:ILE:HD12	1.99	0.44
3:B:28:VAL:H	3:B:47:ASN:ND2	2.16	0.44
3:B:25:GLY:O	3:B:49:GLU:HG2	2.18	0.44
3:D:11:PHE:O	3:D:15:VAL:HG23	2.17	0.44
3:D:300:ARG:HD2	3:D:302:PHE:CZ	2.51	0.44
3:C:38:GLU:OE1	3:C:38:GLU:HA	2.18	0.44
3:C:309:GLU:HG2	3:D:69:PRO:CG	2.48	0.44
1:F:11:DC:H2''	1:F:12:DT:O5'	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:6:DT:H2''	2:J:7:DA:O5'	2.17	0.44
3:B:19:LEU:N	3:B:19:LEU:HD23	2.32	0.44
1:F:13:DG:OP2	3:B:152:LYS:NZ	2.49	0.44
1:G:4:DG:C2'	1:G:5:DG:O5'	2.66	0.44
1:G:7:DA:H2'	1:G:8:DG:C8	2.52	0.44
3:C:25:GLY:N	6:C:795:HOH:O	2.48	0.44
3:B:189:ILE:H	3:B:189:ILE:HD12	1.84	0.43
3:B:278:LYS:O	3:B:280:ILE:HD12	2.18	0.43
3:C:129:LYS:NZ	3:C:161:ASN:HD22	2.16	0.43
3:C:88:ILE:HD11	3:C:138:ILE:CD1	2.49	0.43
3:D:48:TYR:CZ	3:D:160:PRO:HB3	2.53	0.43
3:B:257:ASN:OD1	3:B:257:ASN:C	2.56	0.43
3:D:8:PHE:CD2	3:D:105:ASP:HB2	2.52	0.43
3:D:234:ASN:ND2	3:D:234:ASN:N	2.66	0.43
2:K:17:DC:H2'	2:K:18:DC:C6	2.53	0.43
3:A:48:TYR:CZ	3:A:160:PRO:HB3	2.53	0.43
3:B:208:ILE:CG1	3:B:209:GLU:N	2.82	0.43
3:C:31:CYS:HB3	3:C:61:ILE:HD11	2.00	0.43
1:H:1:DG:H2''	1:H:2:DG:O4'	2.19	0.43
3:B:33:PHE:HB3	6:B:714:HOH:O	2.18	0.43
3:C:150:PHE:HE2	6:C:728:HOH:O	2.00	0.43
3:D:228:LEU:HD12	3:D:233:TYR:CB	2.48	0.43
1:H:10:DA:C5'	6:H:14:HOH:O	2.64	0.43
1:H:11:DC:H2'	1:H:12:DT:H6	1.83	0.43
3:B:76:MET:HB2	6:B:762:HOH:O	2.18	0.43
2:L:8:DG:P	3:D:336:ARG:HH22	2.42	0.43
3:B:99:ILE:HG23	3:B:99:ILE:O	2.18	0.43
2:L:12:DT:H2'	2:L:13:DT:C6	2.53	0.43
3:B:235:GLU:OE1	3:B:235:GLU:HA	2.19	0.43
3:C:82:GLN:CA	3:C:82:GLN:HE21	2.31	0.43
3:D:1:MET:N	6:D:709:HOH:O	2.51	0.43
3:D:271:GLU:O	3:D:275:LYS:HG3	2.19	0.43
3:A:255:SER:OG	3:A:256:ARG:N	2.52	0.43
3:D:169:GLU:O	3:D:173:ARG:HB2	2.19	0.43
3:D:27:PRO:CB	3:D:50:ALA:HB2	2.45	0.43
2:J:10:DC:H2''	2:J:11:DC:O5'	2.19	0.43
2:J:7:DA:H8	6:J:19:HOH:O	2.01	0.43
2:K:9:DT:H2'	2:K:10:DC:C6	2.53	0.43
3:B:209:GLU:O	3:B:212:LYS:HB3	2.19	0.43
3:B:247:ARG:NH1	3:B:248:ILE:O	2.51	0.43
3:D:166:ILE:HG22	3:D:166:ILE:O	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:323:LEU:HA	3:A:323:LEU:HD12	1.91	0.42
3:A:105:ASP:OD1	3:A:106:GLU:HG3	2.20	0.42
3:B:209:GLU:HB3	3:B:212:LYS:HB3	2.01	0.42
3:B:93:ARG:NH2	6:B:716:HOH:O	2.52	0.42
3:C:80:VAL:HG23	6:C:739:HOH:O	2.18	0.42
2:K:16:DC:H2'	2:K:17:DC:O4'	2.20	0.42
3:C:242:ARG:HG2	3:C:242:ARG:HH11	1.84	0.42
3:D:285:HIS:ND1	3:D:299:GLY:HA3	2.34	0.42
3:C:256:ARG:NH2	3:C:323:LEU:O	2.50	0.42
1:H:1:DG:H2'	1:H:2:DG:C8	2.55	0.42
3:A:100:GLU:HB2	3:A:237:ILE:HG23	2.01	0.42
3:A:21:PRO:HA	3:A:24:LYS:HE3	2.02	0.42
3:B:1:MET:HA	3:B:112:SER:OG	2.19	0.42
1:E:4:DG:H2'	1:E:5:DG:C8	2.54	0.42
3:B:14:GLN:HE22	3:B:139:THR:HG23	1.85	0.42
3:B:176:ARG:HA	3:B:203:VAL:HG22	2.01	0.42
3:D:179:ASP:O	3:D:181:ALA:N	2.53	0.42
1:E:10:DA:H5''	3:A:189:ILE:HG21	2.02	0.42
1:F:2:DG:C2'	1:F:3:DG:C8	3.02	0.42
3:A:129:LYS:NZ	3:A:161:ASN:ND2	2.67	0.42
3:B:144:ILE:HB	3:B:165:VAL:HG12	2.01	0.42
3:A:160:PRO:O	3:A:161:ASN:C	2.57	0.42
3:B:189:ILE:H	3:B:189:ILE:CD1	2.32	0.42
3:B:254:ASN:HD22	3:B:254:ASN:N	2.16	0.42
1:G:11:DC:H2''	1:G:12:DT:C5'	2.50	0.42
1:G:11:DC:H2''	1:G:12:DT:O5'	2.19	0.42
2:J:16:DC:H2'	2:J:17:DC:O4'	2.19	0.42
3:C:14:GLN:O	3:C:18:VAL:HG23	2.19	0.42
3:D:105:ASP:OD1	3:D:106:GLU:HG3	2.20	0.42
3:A:175:ILE:HG22	3:A:203:VAL:HG12	2.02	0.42
3:A:258:LEU:HD11	3:A:262:LYS:HE3	1.98	0.41
3:B:116:ARG:HD2	3:B:120:GLU:OE1	2.19	0.41
3:C:41:GLY:C	3:C:61:ILE:HG13	2.40	0.41
3:D:185:GLY:O	3:D:221:LYS:HE2	2.20	0.41
1:E:8:DG:H2''	1:E:9:DG:H5'	2.02	0.41
3:A:159:LYS:CE	3:A:160:PRO:HA	2.50	0.41
3:C:133:LEU:O	3:C:137:LYS:HA	2.19	0.41
3:C:326:ASP:OD1	3:C:328:ARG:HB2	2.20	0.41
3:C:48:TYR:HA	3:C:51:ARG:CB	2.50	0.41
1:H:11:DC:P	3:D:189:ILE:HB	2.60	0.41
2:J:2:DT:H4'	2:J:3:DC:C5'	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:214:LYS:HD3	3:A:219:GLU:HB2	2.03	0.41
3:B:9:ASP:O	3:B:10:TYR:C	2.59	0.41
2:K:5:DG:C2'	2:K:6:DT:O5'	2.68	0.41
3:A:29:VAL:HG12	3:A:31:CYS:SG	2.60	0.41
3:D:41:GLY:C	3:D:61:ILE:HG13	2.41	0.41
3:A:214:LYS:HD2	3:A:214:LYS:O	2.20	0.41
3:A:5:PHE:CE2	3:A:7:ASP:HB2	2.54	0.41
3:B:115:VAL:HG21	3:B:121:ALA:HB2	2.01	0.41
3:D:36:ARG:HH21	3:D:254:ASN:HD21	1.68	0.41
2:K:13:DT:H2'	2:K:14:DC:C6	2.55	0.41
2:L:11:DC:H5''	3:D:220:ALA:HB1	2.03	0.41
3:D:110:ASP:HB2	3:D:237:ILE:HG13	2.02	0.41
1:F:2:DG:H2'	1:F:3:DG:C8	2.56	0.41
1:G:7:DA:H2''	1:G:8:DG:O4'	2.20	0.41
3:A:117:ASP:OD2	3:A:119:ARG:HB3	2.20	0.41
3:A:262:LYS:HB2	3:A:263:PRO:HD3	2.03	0.41
3:A:9:ASP:O	3:A:11:PHE:N	2.54	0.41
1:F:5:DG:H2''	1:F:6:DA:O5'	2.21	0.41
3:A:247:ARG:NH1	3:A:249:VAL:HG12	2.36	0.41
3:A:49:GLU:CA	3:A:52:LYS:HE2	2.43	0.41
3:B:242:ARG:HA	3:B:242:ARG:HH11	1.86	0.41
3:B:324:GLU:HG3	6:B:805:HOH:O	2.20	0.41
3:C:14:GLN:NE2	3:C:138:ILE:HA	2.36	0.41
3:C:34:SER:OG	3:C:250:THR:HG21	2.21	0.41
3:D:37:PHE:O	3:D:38:GLU:C	2.59	0.41
3:A:234:ASN:N	3:A:234:ASN:HD22	2.19	0.41
3:B:256:ARG:NH1	3:B:256:ARG:HB3	2.35	0.41
3:D:202:LEU:HD13	3:D:228:LEU:HB3	2.03	0.41
3:D:282:LYS:HZ2	3:D:341:ILE:HG23	1.85	0.41
2:I:12:DT:H2'	2:I:13:DT:C6	2.56	0.41
2:K:8:DG:H2''	2:K:9:DT:O5'	2.21	0.41
3:B:117:ASP:OD2	3:B:120:GLU:HG3	2.20	0.41
3:B:146:LYS:HE3	3:B:231:ASP:OD1	2.21	0.41
3:D:231:ASP:OD1	3:D:231:ASP:O	2.38	0.41
3:D:48:TYR:O	3:D:52:LYS:HG3	2.21	0.41
2:J:6:DT:H2'	2:J:7:DA:C8	2.56	0.41
3:A:247:ARG:NE	3:A:271:GLU:OE1	2.45	0.40
3:B:193:LYS:HD3	3:B:216:MET:O	2.21	0.40
3:B:216:MET:HA	3:B:216:MET:HE3	2.03	0.40
1:F:7:DA:H2'	1:F:8:DG:C8	2.56	0.40
3:B:240:ARG:HG2	3:B:241:VAL:N	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:105:ASP:OD1	3:C:106:GLU:HG3	2.20	0.40
3:C:9:ASP:O	3:C:11:PHE:N	2.54	0.40
3:A:234:ASN:HD22	3:A:234:ASN:H	1.69	0.40
3:B:277:ASP:O	3:B:278:LYS:HB2	2.22	0.40
3:D:70:ASN:ND2	3:D:70:ASN:H	2.19	0.40
1:G:12:DT:N3	2:K:7:DA:C2	2.85	0.40
3:C:234:ASN:H	3:C:234:ASN:HD22	1.70	0.40
3:D:10:TYR:HA	5:D:603:DCT:PG	2.62	0.40
3:B:4:LEU:HD11	3:B:125:GLY:HA2	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	
3	A	339/352 (96%)	317 (94%)	20 (6%)	2 (1%)	27	39
3	B	339/352 (96%)	318 (94%)	19 (6%)	2 (1%)	27	39
3	C	339/352 (96%)	320 (94%)	14 (4%)	5 (2%)	11	15
3	D	339/352 (96%)	309 (91%)	25 (7%)	5 (2%)	11	15
All	All	1356/1408 (96%)	1264 (93%)	78 (6%)	14 (1%)	17	25

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	277	ASP
3	B	277	ASP
3	D	38	GLU
3	A	10	TYR
3	B	10	TYR
3	C	10	TYR

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Mol	Chain	Res	Type
3	C	197	LEU
3	D	180	ILE
3	D	197	LEU
3	D	277	ASP
3	D	10	TYR
3	C	278	LYS
3	C	37	PHE
3	C	163	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	
3	A	295/309 (96%)	282 (96%)	13 (4%)	31	48
3	B	297/309 (96%)	280 (94%)	17 (6%)	23	36
3	C	297/309 (96%)	282 (95%)	15 (5%)	26	42
3	D	292/309 (94%)	273 (94%)	19 (6%)	19	29
All	All	1181/1236 (96%)	1117 (95%)	64 (5%)	24	38

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	56	LYS
3	A	126	LEU
3	A	159	LYS
3	A	161	ASN
3	A	197	LEU
3	A	214	LYS
3	A	216	MET
3	A	221	LYS
3	A	234	ASN
3	A	239	THR
3	A	242	ARG
3	A	294	ASP
3	A	323	LEU

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Mol	Chain	Res	Type
3	B	19	LEU
3	B	38	GLU
3	B	47	ASN
3	B	78	LYS
3	B	126	LEU
3	B	137	LYS
3	B	147	ASN
3	B	159	LYS
3	B	160	PRO
3	B	161	ASN
3	B	165	VAL
3	B	170	GLU
3	B	234	ASN
3	B	258	LEU
3	B	267	ARG
3	B	313	SER
3	B	323	LEU
3	C	6	VAL
3	C	38	GLU
3	C	51	ARG
3	C	76	MET
3	C	82	GLN
3	C	160	PRO
3	C	161	ASN
3	C	165	VAL
3	C	172	LYS
3	C	211	ASP
3	C	234	ASN
3	C	238	ARG
3	C	292	ASP
3	C	294	ASP
3	C	336	ARG
3	D	26	LYS
3	D	36	ARG
3	D	56	LYS
3	D	68	LEU
3	D	70	ASN
3	D	79	GLU
3	D	113	ASP
3	D	161	ASN
3	D	168	ASP
3	D	170	GLU

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Mol	Chain	Res	Type
3	D	173	ARG
3	D	182	ASP
3	D	190	THR
3	D	210	PHE
3	D	234	ASN
3	D	274	TYR
3	D	278	LYS
3	D	300	ARG
3	D	341	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	14	GLN
3	A	70	ASN
3	A	82	GLN
3	A	83	GLN
3	A	130	ASN
3	A	161	ASN
3	A	188	ASN
3	A	234	ASN
3	A	254	ASN
3	A	304	HIS
3	B	14	GLN
3	B	47	ASN
3	B	82	GLN
3	B	83	GLN
3	B	130	ASN
3	B	147	ASN
3	B	161	ASN
3	B	188	ASN
3	B	234	ASN
3	B	254	ASN
3	B	304	HIS
3	C	14	GLN
3	C	82	GLN
3	C	83	GLN
3	C	130	ASN
3	C	161	ASN
3	C	234	ASN
3	C	254	ASN
3	D	14	GLN

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Mol	Chain	Res	Type
3	D	70	ASN
3	D	83	GLN
3	D	123	ASN
3	D	161	ASN
3	D	234	ASN
3	D	254	ASN
3	D	304	HIS
3	D	320	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	DCT	A	600	4	22,28,28	1.44	4 (18%)	23,43,43	1.46	3 (13%)
5	DCT	B	601	4	22,28,28	1.49	4 (18%)	23,43,43	1.43	4 (17%)
5	DCT	C	602	4	22,28,28	1.39	3 (13%)	23,43,43	1.32	2 (8%)
5	DCT	D	603	4	22,28,28	1.42	3 (13%)	23,43,43	1.33	2 (8%)

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
5	DCT	A	600	4	-	0/18/31/31	0/2/2/2
5	DCT	B	601	4	-	0/18/31/31	0/2/2/2
5	DCT	C	602	4	-	0/18/31/31	0/2/2/2
5	DCT	D	603	4	-	0/18/31/31	0/2/2/2

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	600	DCT	PA-O2A	-2.26	1.44	1.55
5	B	601	DCT	PA-O2A	-2.22	1.44	1.55
5	A	600	DCT	O4'-C1'	-2.22	1.37	1.42
5	C	602	DCT	O4'-C1'	-2.21	1.37	1.42
5	D	603	DCT	PA-O2A	-2.21	1.44	1.55
5	C	602	DCT	PA-O2A	-2.17	1.44	1.55
5	A	600	DCT	C2-N3	-2.10	1.34	1.38
5	B	601	DCT	C2-N3	-2.06	1.34	1.38
5	D	603	DCT	O4'-C1'	-2.05	1.37	1.42
5	B	601	DCT	PG-O3B	2.12	1.63	1.60
5	A	600	DCT	C6-N1	2.67	1.39	1.35
5	B	601	DCT	C6-N1	3.24	1.40	1.35
5	D	603	DCT	C6-N1	3.34	1.40	1.35
5	C	602	DCT	C6-N1	3.82	1.40	1.35

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	600	DCT	C6-N1-C2	-2.14	117.76	121.22
5	C	602	DCT	C6-N1-C2	-2.11	117.81	121.22
5	B	601	DCT	C6-N1-C2	-2.08	117.85	121.22
5	B	601	DCT	O4'-C1'-C2'	-2.02	104.49	106.67
5	D	603	DCT	O3G-PG-O2G	2.11	115.94	107.59
5	B	601	DCT	O4'-C4'-C5'	2.32	113.35	109.59
5	A	600	DCT	O4'-C4'-C5'	2.34	113.39	109.59
5	D	603	DCT	O4'-C1'-N1	4.03	114.57	107.78
5	C	602	DCT	O4'-C1'-N1	4.09	114.67	107.78
5	B	601	DCT	O4'-C1'-N1	4.58	115.50	107.78
5	A	600	DCT	O4'-C1'-N1	4.61	115.54	107.78

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	600	DCT	4	0
5	B	601	DCT	4	0
5	C	602	DCT	1	0
5	D	603	DCT	3	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	D	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	210:PHE	C	211:ASP	N	1.19
1	D	212:LYS	C	213:LEU	N	1.17

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	E	13/13 (100%)	-0.09	0 100 100	21, 27, 38, 44	0
1	F	13/13 (100%)	-0.19	0 100 100	19, 29, 43, 54	0
1	G	13/13 (100%)	-0.04	0 100 100	30, 37, 45, 48	0
1	H	13/13 (100%)	0.18	0 100 100	34, 45, 60, 63	0
2	I	17/18 (94%)	-0.01	1 (5%) 22 21	21, 30, 78, 101	0
2	J	17/18 (94%)	0.09	1 (5%) 22 21	18, 29, 70, 96	0
2	K	17/18 (94%)	0.22	1 (5%) 22 21	28, 38, 68, 90	0
2	L	17/18 (94%)	0.31	1 (5%) 22 21	29, 43, 70, 90	0
3	A	341/352 (96%)	-0.08	1 (0%) 93 93	10, 25, 46, 59	1 (0%)
3	B	341/352 (96%)	-0.05	3 (0%) 84 82	9, 25, 48, 68	1 (0%)
3	C	341/352 (96%)	0.03	8 (2%) 60 57	10, 30, 51, 62	1 (0%)
3	D	341/352 (96%)	0.34	26 (7%) 14 12	12, 35, 70, 80	1 (0%)
All	All	1484/1532 (96%)	0.06	42 (2%) 53 50	9, 30, 57, 101	4 (0%)

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	D	199	ILE	7.7
3	D	180	ILE	5.9
3	D	189	ILE	5.0
3	D	191	ALA	5.0
3	B	207	SER	4.6
2	K	2	DT	4.6
3	D	198	GLY	4.4
3	D	215	GLY	4.0
2	J	2	DT	3.8
3	D	214	LYS	3.6
3	D	211	ASP	3.5

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Mol	Chain	Res	Type	RSRZ
2	L	2	DT	3.4
3	D	220	ALA	3.3
3	C	194	LEU	3.3
3	D	200	ASN	3.3
3	D	190	THR	3.2
3	B	208	ILE	3.1
3	D	208	ILE	3.0
3	D	196	LYS	2.9
3	D	171	VAL	2.9
2	I	2	DT	2.8
3	D	192	GLU	2.8
3	D	226	ILE	2.8
3	C	327	GLU	2.7
3	C	222	ALA	2.6
3	C	213	LEU	2.6
3	D	219	GLU	2.6
3	D	213	LEU	2.5
3	C	210	PHE	2.5
3	D	207	SER	2.4
3	D	222	ALA	2.3
3	C	22	SER	2.3
3	D	227	SER	2.3
3	D	205	THR	2.3
3	D	229	ALA	2.3
3	C	217	ILE	2.2
3	C	196	LYS	2.2
3	A	196	LYS	2.1
3	B	217	ILE	2.1
3	D	197	LEU	2.1
3	D	186	ILE	2.0
3	D	295	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, 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
4	CA	D	704	1/1	0.82	0.17	48,48,48,48	0
5	DCT	D	603	27/27	0.82	0.29	72,74,80,80	0
5	DCT	C	602	27/27	0.83	0.23	50,64,74,75	0
4	CA	C	703	1/1	0.85	0.14	37,37,37,37	0
5	DCT	A	600	27/27	0.90	0.23	25,40,62,63	0
5	DCT	B	601	27/27	0.90	0.22	28,42,66,67	0
4	CA	B	702	1/1	0.91	0.11	34,34,34,34	0
4	CA	A	701	1/1	0.96	0.16	25,25,25,25	0

6.5 Other polymers [i](#)

There are no such residues in this entry.