



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 10, 2017 – 11:38 AM EDT

PDB ID : 5TXO
Title : STRUCTURE OF Q151M complex (A62V, V75I, F77L, F116Y, Q151M) mutant HIV-1 REVERSE TRANSCRIPTASE (RT) TERNARY COMPLEX WITH A DOUBLE STRANDED DNA AND AN INCOMING DATP
Authors : Das, K.; Martinez, S.M.; Arnold, E.
Deposited on : unknown
Resolution : 2.55 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

<http://wwpdb.org/validation/2016/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 : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20029824
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20029824

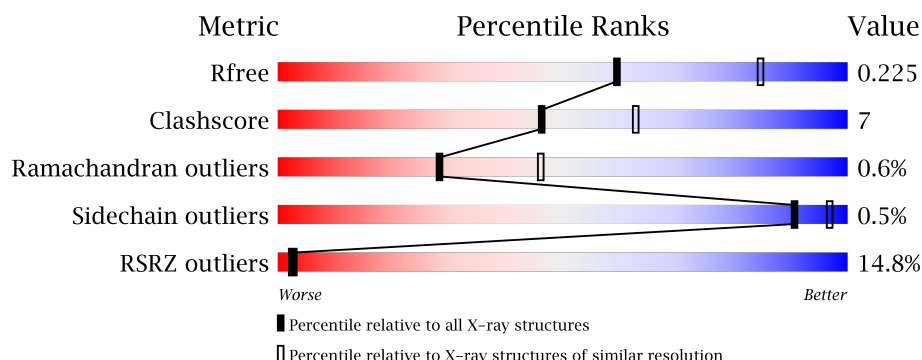
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.55 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.



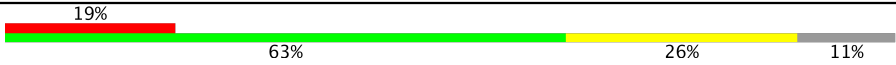


Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	100719	4993 (2.58-2.50)
Clashscore	112137	5755 (2.58-2.50)
Ramachandran outliers	110173	5652 (2.58-2.50)
Sidechain outliers	110143	5654 (2.58-2.50)
RSRZ outliers	101464	5026 (2.58-2.50)

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 ≥ 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	556	<div> <div>16%</div> <div> <div></div> <div>81%</div> <div>19%</div> </div> </div>
1	C	556	<div> <div>17%</div> <div> <div></div> <div>76%</div> <div>23%</div> <div>.</div> </div> </div>
2	B	428	<div> <div>9%</div> <div> <div></div> <div>84%</div> <div>12%</div> <div>.</div> </div> </div>
2	D	428	<div> <div>13%</div> <div> <div></div> <div>79%</div> <div>17%</div> <div>.</div> </div> </div>
3	E	27	<div> <div>19%</div> <div> <div></div> <div>44%</div> <div>44%</div> <div>11%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
3	T	27	
4	F	21	
4	P	21	

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
8	EDO	D	503	-	-	-	X
9	SO4	B	503	-	-	-	X
9	SO4	D	502	-	-	-	X

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 17928 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 HIV-1 REVERSE TRANSCRIPTASE P66 SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	556	Total	C	N	O	S	0	0	0
			4516	2923	751	833	9			
1	C	556	Total	C	N	O	S	0	0	0
			4516	2923	751	833	9			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	initiating methionine	UNP P03366
A	0	VAL	-	expression tag	UNP P03366
A	62	VAL	ALA	engineered mutation	UNP P03366
A	75	ILE	VAL	engineered mutation	UNP P03366
A	77	LEU	PHE	engineered mutation	UNP P03366
A	116	TYR	PHE	engineered mutation	UNP P03366
A	151	MET	GLN	engineered mutation	UNP P03366
A	258	CYS	GLN	engineered mutation	UNP P03366
A	280	SER	CYS	engineered mutation	UNP P03366
A	498	ASN	ASP	engineered mutation	UNP P03366
C	-1	MET	-	initiating methionine	UNP P03366
C	0	VAL	-	expression tag	UNP P03366
C	62	VAL	ALA	engineered mutation	UNP P03366
C	75	ILE	VAL	engineered mutation	UNP P03366
C	77	LEU	PHE	engineered mutation	UNP P03366
C	116	TYR	PHE	engineered mutation	UNP P03366
C	151	MET	GLN	engineered mutation	UNP P03366
C	258	CYS	GLN	engineered mutation	UNP P03366
C	280	SER	CYS	engineered mutation	UNP P03366
C	498	ASN	ASP	engineered mutation	UNP P03366

- Molecule 2 is a protein called HIV-1 REVERSE TRANSCRIPTASE P51 SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	412	Total	C	N	O	S	0	0	0
			3400	2212	563	619	6			
2	D	412	Total	C	N	O	S	0	0	0
			3397	2210	563	619	5			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	280	SER	CYS	engineered mutation	UNP P03366
D	280	SER	CYS	engineered mutation	UNP P03366

- Molecule 3 is a DNA chain called DNA (5'-D(*TP*GP*GP*TP*CP*GP*GP*CP*GP*CP*CP*GP*AP*AP*CP*AP*GP*GP*GP*AP*CP*TP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	T	24	Total	C	N	O	P	0	0	0
			494	233	97	141	23			
3	E	24	Total	C	N	O	P	0	0	0
			494	233	97	141	23			

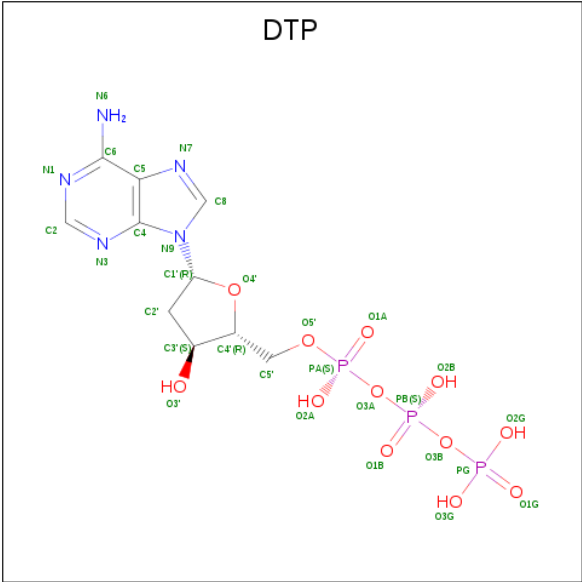
- Molecule 4 is a DNA chain called DNA (5'-D(*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MRG)P*CP*GP*CP*CP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	P	20	Total	C	N	O	P	S	0	0
			407	195	72	120	19	1		
4	F	20	Total	C	N	O	P	S	0	0
			407	195	72	120	19	1		

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

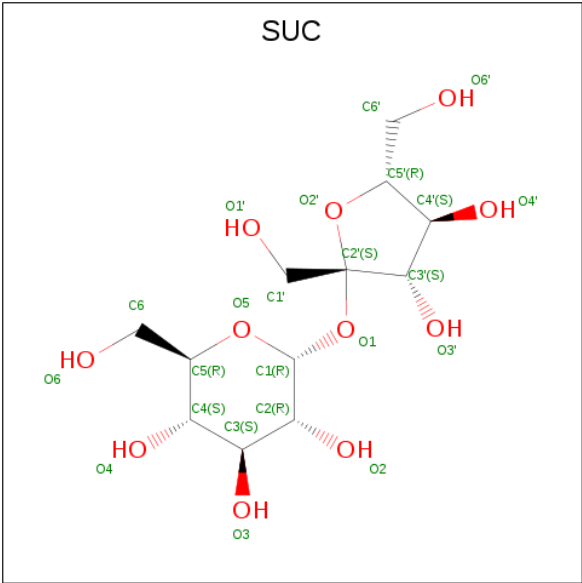
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Mg	0	0
			2	2		
5	C	2	Total	Mg	0	0
			2	2		

- Molecule 6 is 2'-DEOXYADENOSINE 5'-TRIPHOSPHATE (three-letter code: DTP) (formula: C₁₀H₁₆N₅O₁₂P₃).



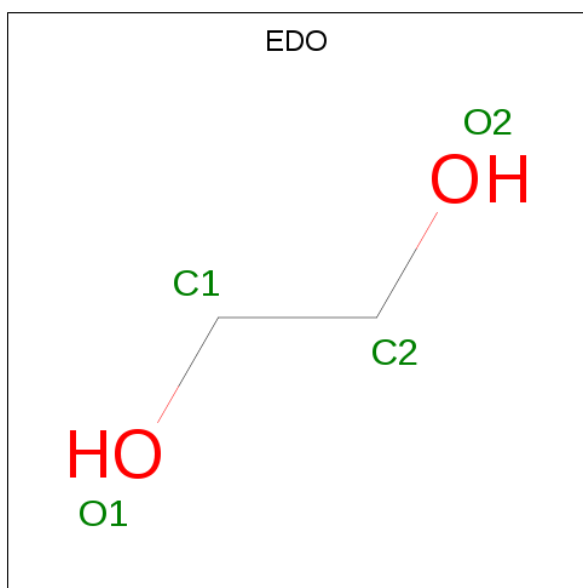
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	0	0
			30	10	5	12	3		
6	C	1	Total	C	N	O	P	0	0
			30	10	5	12	3		

- Molecule 7 is SUCROSE (three-letter code: SUC) (formula: C₁₂H₂₂O₁₁).



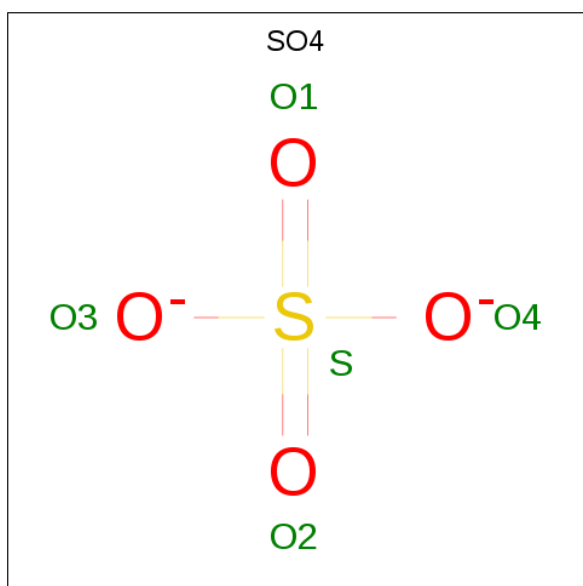
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	B	1	Total	C	O	0	0
			23	12	11		
7	D	1	Total	C	O	0	0
			23	12	11		

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	B	1	Total	C	O	0	0
			4	2	2		
8	D	1	Total	C	O	0	0
			4	2	2		

- Molecule 9 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	D	1	Total	O	S	0	0
			5	4	1		

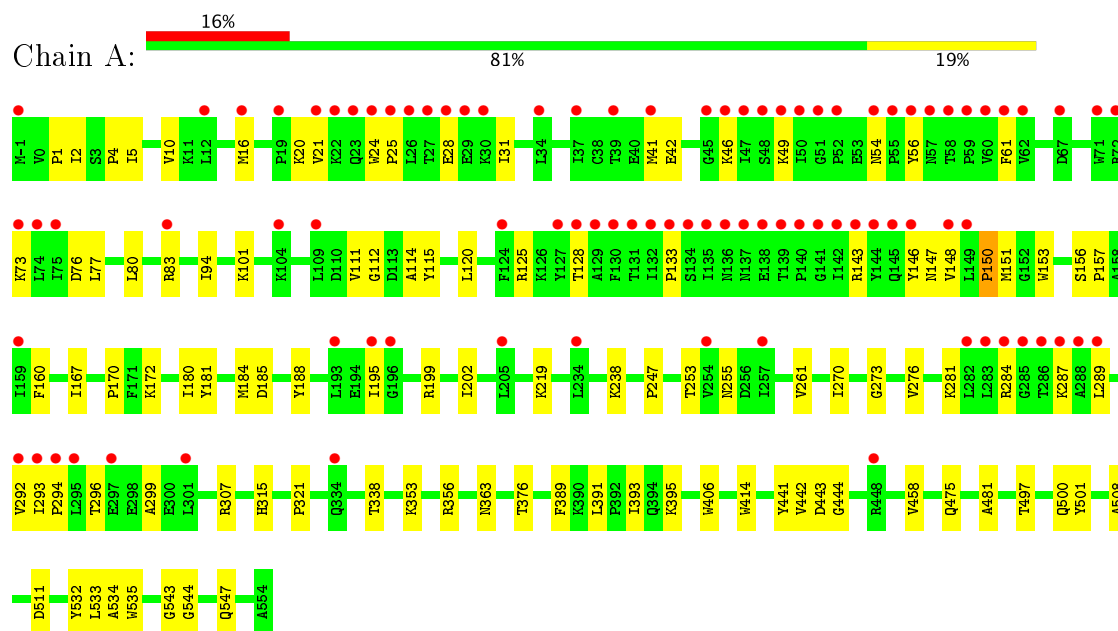
- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	45	Total	O	0	0
			45	45		
10	B	37	Total	O	0	0
			37	37		
10	T	3	Total	O	0	0
			3	3		
10	P	1	Total	O	0	0
			1	1		
10	C	51	Total	O	0	0
			51	51		
10	D	27	Total	O	0	0
			27	27		
10	E	2	Total	O	0	0
			2	2		
10	F	3	Total	O	0	0
			3	3		

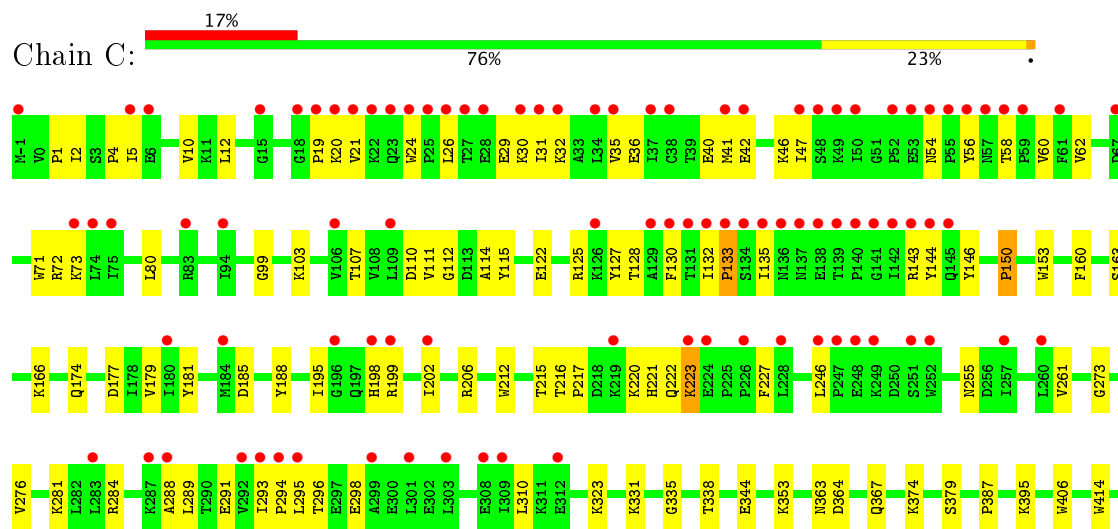
3 Residue-property plots

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: HIV-1 REVERSE TRANSCRIPTASE P66 SUBUNIT

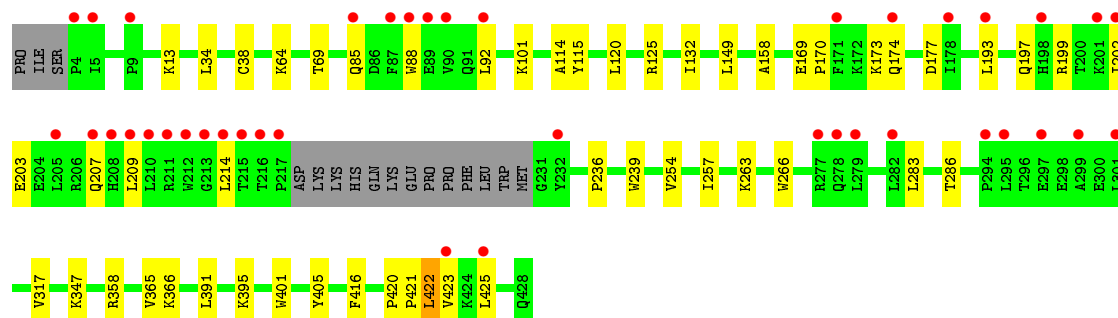
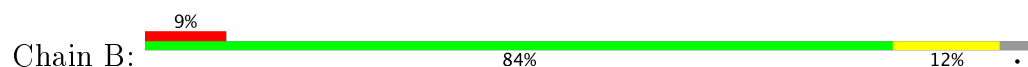


• Molecule 1: HIV-1 REVERSE TRANSCRIPTASE P66 SUBUNIT

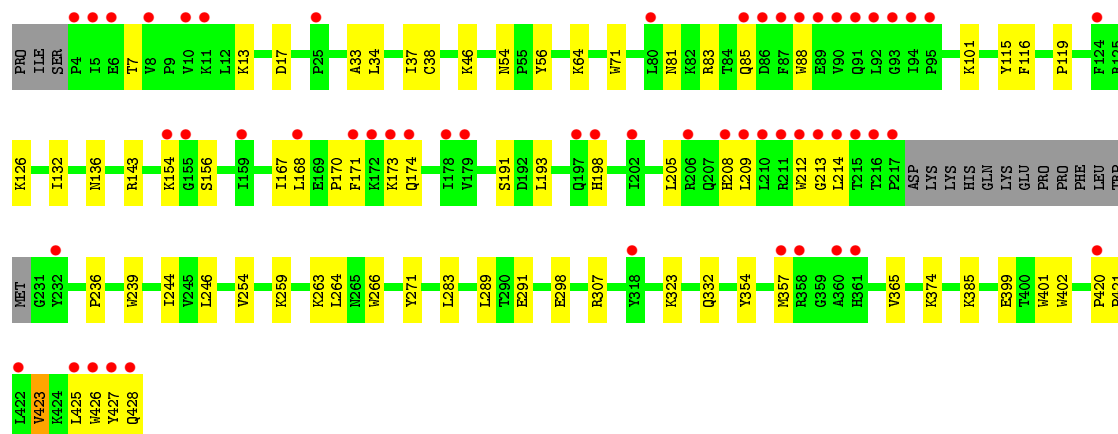




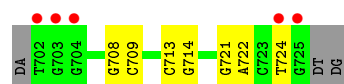
● Molecule 2: HIV-1 REVERSE TRANSCRIPTASE P51 SUBUNIT



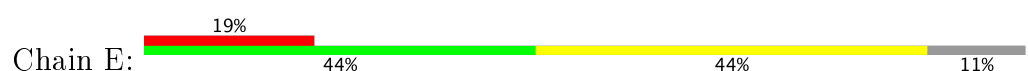
● Molecule 2: HIV-1 REVERSE TRANSCRIPTASE P51 SUBUNIT




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



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



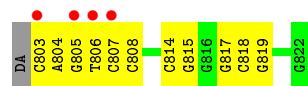
- Molecule 4: DNA (5'-D(*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MRG)P*CP*GP*CP*CP*G)-3')

Chain P: 



- Molecule 4: DNA (5'-D(*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MRG)P*CP*GP*CP*CP*G)-3')

Chain F: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	89.99Å 132.93Å 139.12Å 90.00° 97.38° 90.00°	Depositor
Resolution (Å)	45.99 – 2.55 48.00 – 2.55	Depositor EDS
% Data completeness (in resolution range)	98.8 (45.99-2.55) 98.8 (48.00-2.55)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.01 (at 2.54Å)	Xtriage
Refinement program	PHENIX (1.10_2155: ???)	Depositor
R, R_{free}	0.191 , 0.228 0.188 , 0.225	Depositor DCC
R_{free} test set	3133 reflections (2.99%)	DCC
Wilson B-factor (Å ²)	58.6	Xtriage
Anisotropy	0.292	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 75.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	17928	wwPDB-VP
Average B, all atoms (Å ²)	96.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.65% of the height of the origin peak. No significant pseudotranslation is detected.*

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: MG, MRG, SUC, EDO, SO4, DTP

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	0.28	0/4633	0.46	0/6296
1	C	0.32	0/4633	0.58	3/6296 (0.0%)
2	B	0.30	1/3497 (0.0%)	0.51	0/4751
2	D	0.29	0/3494	0.48	0/4748
3	E	0.57	0/555	0.87	0/856
3	T	0.53	0/555	0.85	1/856 (0.1%)
4	F	0.62	0/424	0.91	0/649
4	P	0.71	1/424 (0.2%)	0.97	1/649 (0.2%)
All	All	0.34	2/18215 (0.0%)	0.57	5/25101 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	P	804	DA	C4'-O4'	8.39	1.53	1.45
2	B	391	LEU	C-N	5.12	1.44	1.34

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	295	LEU	CA-CB-CG	7.59	132.76	115.30
4	P	804	DA	O4'-C4'-C3'	-7.12	101.65	104.50
1	C	132	ILE	C-N-CD	-6.05	107.29	120.60
3	T	709	DC	O4'-C4'-C3'	-5.55	102.28	104.50
1	C	223	LYS	CA-CB-CG	-5.13	102.11	113.40

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4516	0	4581	64	0
1	C	4516	0	4581	79	0
2	B	3400	0	3433	31	0
2	D	3397	0	3426	49	0
3	E	494	0	269	9	0
3	T	494	0	269	7	0
4	F	407	0	229	11	0
4	P	407	0	229	8	0
5	A	2	0	0	0	0
5	C	2	0	0	0	0
6	A	30	0	12	2	0
6	C	30	0	12	2	0
7	B	23	0	22	0	0
7	D	23	0	22	0	0
8	B	4	0	6	0	0
8	D	4	0	6	2	0
9	B	5	0	0	0	0
9	D	5	0	0	0	0
10	A	45	0	0	1	0
10	B	37	0	0	0	0
10	C	51	0	0	0	0
10	D	27	0	0	3	0
10	E	2	0	0	0	0
10	F	3	0	0	0	0
10	P	1	0	0	0	0
10	T	3	0	0	0	0
All	All	17928	0	17097	248	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 7.

All (248) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:296:THR:HG23	1:A:299:ALA:H	1.51	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:13:LYS:HD2	2:B:85:GLN:HB3	1.69	0.74
1:C:163:SER:HA	1:C:166:LYS:HE2	1.70	0.73
1:A:128:THR:HG21	1:A:146:TYR:HB2	1.71	0.73
2:D:263:LYS:HE3	2:D:425:LEU:HA	1.71	0.71
1:C:261:VAL:HG13	1:C:276:VAL:HG11	1.73	0.70
1:C:323:LYS:NZ	1:C:344:GLU:OE2	2.24	0.69
1:C:54:ASN:HB3	1:C:143:ARG:HH12	1.57	0.69
3:E:722:DA:H2''	3:E:723:DC:H5''	1.74	0.69
2:D:298:GLU:OE1	10:D:601:HOH:O	2.10	0.68
1:A:253:THR:HA	1:A:292:VAL:HA	1.78	0.65
2:D:259:LYS:NZ	10:D:604:HOH:O	2.29	0.65
1:A:261:VAL:HG13	1:A:276:VAL:HG11	1.77	0.65
2:D:56:TYR:HE2	2:D:126:LYS:HE2	1.63	0.64
2:B:114:ALA:HB2	2:B:214:LEU:HD22	1.79	0.64
3:T:713:DC:H2''	3:T:714:DG:H5'	1.81	0.62
2:D:246:LEU:HD11	2:D:264:LEU:HD21	1.81	0.62
2:D:254:VAL:HG13	2:D:283:LEU:HD22	1.81	0.62
2:B:209:LEU:HD22	2:B:214:LEU:HD23	1.82	0.61
1:C:114:ALA:HB1	1:C:160:PHE:CZ	2.35	0.61
1:A:543:GLY:O	1:A:547:GLN:NE2	2.34	0.61
2:D:354:TYR:CE1	2:D:374:LYS:HD2	2.35	0.61
1:C:222:GLN:O	1:C:227:PHE:HE1	1.84	0.61
2:D:266:TRP:CE3	2:D:425:LEU:HG	2.36	0.60
1:C:19:PRO:HG3	1:C:80:LEU:HB2	1.84	0.60
1:C:122:GLU:HA	1:C:125:ARG:HD2	1.84	0.60
2:B:120:LEU:HD23	2:B:125:ARG:HG2	1.83	0.59
2:B:199:ARG:HA	2:B:202:ILE:HD12	1.83	0.59
1:C:276:VAL:HG23	1:C:353:LYS:HE2	1.83	0.59
1:A:41:MET:HE1	1:A:73:LYS:HD3	1.84	0.59
2:B:358:ARG:NH2	2:B:405:TYR:O	2.36	0.59
1:C:246:LEU:HD11	1:C:310:LEU:HD22	1.85	0.58
1:C:62:VAL:HG12	1:C:71:TRP:HE3	1.67	0.58
1:C:47:ILE:HD12	1:C:146:TYR:HA	1.83	0.58
1:A:56:TYR:O	1:A:143:ARG:NH2	2.38	0.57
2:B:203:GLU:O	2:B:207:GLN:HG2	2.04	0.57
1:A:114:ALA:HB1	1:A:160:PHE:CZ	2.40	0.57
1:C:107:THR:OG1	1:C:198:HIS:NE2	2.33	0.57
2:D:307:ARG:HH22	8:D:503:EDO:H12	1.69	0.57
4:F:804:DA:H2'	4:F:805:DG:C8	2.39	0.57
1:A:120:LEU:H	1:A:148:VAL:HA	1.69	0.57
1:A:389:PHE:HB3	1:A:391:LEU:HD13	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:543:GLY:O	1:C:547:GLN:NE2	2.37	0.57
1:C:448:ARG:O	1:C:451:LYS:NZ	2.38	0.57
2:D:332:GLN:CD	2:D:427:TYR:HB2	2.24	0.57
4:P:806:DT:H2'	4:P:807:DC:C6	2.39	0.57
1:A:112:GLY:HA2	6:A:603:DTP:O2G	2.06	0.56
2:D:213:GLY:O	2:D:214:LEU:HD23	2.05	0.56
2:D:323:LYS:O	2:D:385:LYS:NZ	2.39	0.56
2:D:64:LYS:HE3	2:D:71:TRP:CE2	2.41	0.56
3:E:720:DG:H2''	3:E:721:DG:C8	2.41	0.55
1:C:29:GLU:HG3	1:C:30:LYS:N	2.21	0.55
1:C:273:GLY:HA2	1:C:338:THR:HG21	1.89	0.55
1:C:36:GLU:O	1:C:40:GLU:HG2	2.06	0.55
2:B:365:VAL:HG11	2:B:401:TRP:HB2	1.88	0.55
1:C:110:ASP:HB3	1:C:220:LYS:HB3	1.88	0.55
1:C:195:ILE:HD11	1:C:199:ARG:HH21	1.72	0.55
2:B:266:TRP:CD1	2:B:425:LEU:HD22	2.41	0.55
1:A:16:MET:HG2	1:A:83:ARG:HD3	1.89	0.54
2:D:13:LYS:HD2	2:D:85:GLN:HB3	1.89	0.54
1:C:199:ARG:NH1	1:C:223:LYS:HD2	2.23	0.53
4:F:814:DC:H2''	4:F:815:DG:C8	2.43	0.53
2:B:92:LEU:HB3	2:B:158:ALA:HB1	1.90	0.53
1:C:32:LYS:HD2	1:C:135:ILE:HD12	1.90	0.53
1:C:111:VAL:HB	1:C:185:ASP:HB2	1.90	0.53
2:D:421:PRO:HB2	2:D:423:VAL:HG23	1.91	0.53
1:A:111:VAL:HB	1:A:185:ASP:HB2	1.89	0.53
3:E:702:DT:H3'	3:E:703:DG:H8	1.74	0.53
2:D:209:LEU:HD22	2:D:214:LEU:HD12	1.89	0.53
1:A:167:ILE:O	1:A:170:PRO:HD2	2.08	0.52
1:A:195:ILE:HD11	1:A:199:ARG:HE	1.74	0.52
1:C:353:LYS:O	1:C:374:LYS:NZ	2.42	0.52
3:T:713:DC:H2'	3:T:714:DG:C8	2.44	0.52
2:B:38:CYS:SG	2:B:132:ILE:HD11	2.50	0.52
1:A:406:TRP:CE2	2:B:420:PRO:HB3	2.44	0.52
4:F:818:DC:H2'	4:F:819:DG:C8	2.45	0.52
3:E:716:DA:H2''	3:E:717:DC:OP2	2.09	0.51
1:A:391:LEU:HB3	1:A:393:ILE:HG22	1.93	0.51
3:T:724:DT:H3	4:P:804:DA:H61	1.57	0.51
1:C:473:THR:O	1:C:477:THR:HG23	2.10	0.51
2:B:169:GLU:O	2:B:173:LYS:HG2	2.11	0.51
1:C:199:ARG:HH11	1:C:223:LYS:HD2	1.74	0.51
1:C:418:ASN:O	1:C:420:PRO:HD3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:817:MRG:H2'	4:F:818:DC:C6	2.46	0.51
4:F:806:DT:H2'	4:F:807:DC:C6	2.46	0.51
1:C:114:ALA:HB1	1:C:160:PHE:CE1	2.46	0.50
1:A:458:VAL:HG12	2:B:286:THR:HG21	1.93	0.50
1:C:56:TYR:O	1:C:143:ARG:NH2	2.45	0.50
2:D:167:ILE:HD13	2:D:214:LEU:HD11	1.94	0.50
4:P:810:DT:H2''	4:P:811:DG:H5'	1.92	0.50
2:D:54:ASN:HB3	2:D:143:ARG:HH21	1.76	0.50
1:A:20:LYS:O	1:A:21:VAL:HG23	2.12	0.50
1:A:238:LYS:HD2	1:A:315:HIS:CG	2.47	0.50
2:D:85:GLN:HA	2:D:88:TRP:CE2	2.46	0.50
2:D:170:PRO:HB2	2:D:208:HIS:CE1	2.47	0.50
1:A:24:TRP:HE3	1:A:25:PRO:HD2	1.76	0.50
1:A:77:LEU:HD13	1:A:80:LEU:HD23	1.93	0.50
2:B:101:LYS:O	2:B:236:PRO:HB2	2.12	0.50
1:C:221:HIS:CE1	1:C:223:LYS:HG3	2.47	0.50
2:D:17:ASP:O	2:D:83:ARG:HD3	2.11	0.50
2:D:81:ASN:HB3	2:D:154:LYS:HD2	1.93	0.49
2:D:168:LEU:O	2:D:171:PHE:N	2.41	0.49
4:F:818:DC:H2'	4:F:819:DG:H8	1.78	0.49
1:C:181:TYR:HB2	1:C:188:TYR:HB3	1.92	0.49
2:B:170:PRO:O	2:B:174:GLN:HG3	2.12	0.49
1:A:281:LYS:O	1:A:284:ARG:HG2	2.13	0.49
1:C:31:ILE:HD13	1:C:133:PRO:HB2	1.95	0.49
1:C:5:ILE:HG21	1:C:212:TRP:HD1	1.77	0.49
1:A:125:ARG:O	1:A:128:THR:OG1	2.25	0.48
1:A:247:PRO:O	1:A:307:ARG:NH2	2.46	0.48
2:B:64:LYS:HD3	2:B:69:THR:HA	1.96	0.48
1:C:12:LEU:HD11	1:C:127:TYR:CZ	2.48	0.48
1:A:443:ASP:OD1	1:A:444:GLY:N	2.43	0.48
1:A:181:TYR:HB2	1:A:188:TYR:HB3	1.94	0.48
1:A:114:ALA:HB1	1:A:160:PHE:CE2	2.47	0.48
4:F:805:DG:H4'	4:F:806:DT:OP1	2.14	0.48
1:A:172:LYS:HE2	1:A:180:ILE:HB	1.96	0.48
3:E:702:DT:H3'	3:E:703:DG:C8	2.49	0.48
2:D:236:PRO:HA	2:D:239:TRP:CE2	2.49	0.48
3:T:721:DG:C8	3:T:721:DG:H5'	2.49	0.48
1:C:62:VAL:HG13	1:C:72:ARG:O	2.14	0.47
1:C:288:ALA:HB3	1:C:291:GLU:HB2	1.97	0.47
2:D:167:ILE:HG23	2:D:212:TRP:CG	2.49	0.47
2:D:33:ALA:O	2:D:37:ILE:HG12	2.13	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:442:VAL:HB	1:A:481:ALA:HB1	1.95	0.47
2:D:307:ARG:HH12	8:D:503:EDO:H12	1.80	0.47
1:C:60:VAL:HG21	1:C:130:PHE:CD1	2.49	0.47
1:A:115:TYR:HE1	1:A:184:MET:HE2	1.79	0.47
2:B:257:ILE:HB	2:B:283:LEU:HD21	1.97	0.47
1:C:406:TRP:CZ2	2:D:420:PRO:HG3	2.50	0.47
3:T:721:DG:H2''	3:T:722:DA:C8	2.50	0.47
2:B:193:LEU:HD13	2:B:197:GLN:HB3	1.97	0.47
4:P:807:DC:H4'	4:P:808:DC:OP1	2.15	0.47
1:C:103:LYS:HE3	1:C:179:VAL:HG21	1.97	0.47
1:C:216:THR:O	1:C:216:THR:OG1	2.29	0.47
1:C:47:ILE:HG12	1:C:144:TYR:HB3	1.95	0.47
2:B:254:VAL:HG13	2:B:283:LEU:HD22	1.97	0.46
1:C:128:THR:HG21	1:C:146:TYR:HB2	1.96	0.46
4:F:803:DC:H2'	4:F:804:DA:C8	2.50	0.46
4:F:807:DC:H2''	4:F:808:DC:H5''	1.97	0.46
1:A:475:GLN:HB3	1:A:501:TYR:CE2	2.50	0.46
1:C:125:ARG:O	1:C:128:THR:OG1	2.32	0.46
3:E:709:DC:H2'	3:E:710:DG:H8	1.81	0.46
1:C:20:LYS:O	1:C:21:VAL:HG23	2.16	0.46
2:D:191:SER:OG	2:D:198:HIS:ND1	2.33	0.46
2:D:38:CYS:SG	2:D:132:ILE:HD11	2.56	0.46
1:C:10:VAL:HG21	1:C:153:TRP:HH2	1.80	0.46
3:T:721:DG:H8	3:T:721:DG:H5'	1.80	0.46
1:A:276:VAL:HG23	1:A:353:LYS:HE2	1.98	0.46
1:C:441:TYR:CG	1:C:544:GLY:HA3	2.51	0.46
1:A:10:VAL:HG11	1:A:153:TRP:CZ2	2.51	0.46
1:A:61:PHE:HE2	1:A:76:ASP:HB2	1.81	0.46
2:D:173:LYS:HA	2:D:173:LYS:HD2	1.74	0.46
1:C:73:LYS:HZ1	1:C:130:PHE:HZ	1.62	0.45
4:F:807:DC:H4'	4:F:808:DC:OP1	2.15	0.45
1:A:376:THR:HG21	2:B:401:TRP:CH2	2.52	0.45
1:C:31:ILE:O	1:C:35:VAL:HG23	2.17	0.45
1:C:335:GLY:HA2	1:C:367:GLN:HE22	1.81	0.45
1:C:24:TRP:HB2	1:C:26:LEU:HG	1.98	0.45
1:C:281:LYS:O	1:C:284:ARG:HG2	2.17	0.45
2:B:263:LYS:HA	2:B:423:VAL:HG21	1.99	0.45
2:B:317:VAL:HG12	2:B:347:LYS:HB3	1.99	0.45
2:B:358:ARG:HG3	2:B:366:LYS:HD3	1.98	0.45
4:P:817:MRG:H2'	4:P:818:DC:C6	2.52	0.45
1:C:293:ILE:HG13	1:C:294:PRO:HD2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:191:SER:HB2	2:D:193:LEU:HG	1.99	0.44
1:C:112:GLY:HA2	6:C:601:DTP:O2G	2.16	0.44
1:C:255:ASN:HB2	1:C:289:LEU:HG	2.00	0.44
1:A:287:LYS:HG2	1:A:287:LYS:H	1.55	0.44
1:A:363:ASN:HA	1:A:511:ASP:OD1	2.18	0.44
1:C:42:GLU:OE2	1:C:144:TYR:OH	2.30	0.44
1:C:12:LEU:HD11	1:C:127:TYR:CE2	2.53	0.43
1:C:395:LYS:HD2	1:C:414:TRP:CH2	2.53	0.43
2:D:115:TYR:CD2	2:D:156:SER:HB3	2.52	0.43
1:A:255:ASN:HB2	1:A:289:LEU:HG	2.01	0.43
1:A:532:TYR:CE2	1:A:534:ALA:HB2	2.54	0.43
1:C:146:TYR:CD1	1:C:150:PRO:HB3	2.53	0.43
1:A:441:TYR:CG	1:A:544:GLY:HA3	2.53	0.43
1:C:442:VAL:HG12	1:C:457:TYR:HB3	2.01	0.43
4:P:807:DC:H2"	4:P:808:DC:H5"	1.99	0.43
1:C:379:SER:CB	1:C:387:PRO:HD3	2.48	0.43
1:C:99:GLY:HA3	2:D:136:ASN:ND2	2.33	0.43
1:A:94:ILE:HD11	3:T:708:DG:H21	1.83	0.43
1:A:54:ASN:HB3	1:A:143:ARG:HH12	1.84	0.43
2:B:236:PRO:HA	2:B:239:TRP:CD2	2.52	0.43
1:C:452:LEU:HD23	1:C:470:THR:HA	2.01	0.43
1:A:156:SER:HB2	1:A:157:PRO:HD3	2.01	0.43
2:B:115:TYR:O	2:B:149:LEU:HB2	2.18	0.43
1:A:219:LYS:HG3	1:A:219:LYS:H	1.48	0.43
2:D:170:PRO:O	2:D:174:GLN:HG3	2.18	0.43
2:D:365:VAL:HG11	2:D:401:TRP:HB2	2.00	0.43
4:F:805:DG:H2"	4:F:806:DT:O5'	2.18	0.43
1:C:406:TRP:CD2	2:D:420:PRO:HB3	2.54	0.43
2:B:395:LYS:HG3	2:B:416:PHE:CE2	2.54	0.42
2:D:399:GLU:HA	2:D:402:TRP:HD1	1.84	0.42
2:D:423:VAL:HG11	2:D:426:TRP:CD1	2.53	0.42
1:C:296:THR:HG22	1:C:298:GLU:H	1.83	0.42
2:D:101:LYS:O	2:D:236:PRO:HB2	2.19	0.42
1:C:395:LYS:NZ	1:C:414:TRP:O	2.52	0.42
3:E:713:DC:H2'	3:E:714:DG:C8	2.55	0.42
1:C:363:ASN:HA	1:C:511:ASP:OD1	2.19	0.42
2:D:427:TYR:O	2:D:428:GLN:HB2	2.19	0.42
1:C:202:ILE:O	1:C:206:ARG:HG3	2.19	0.42
1:A:273:GLY:HA2	1:A:338:THR:HG21	2.02	0.42
1:A:356:ARG:HD3	10:A:715:HOH:O	2.19	0.42
1:A:46:LYS:O	1:A:147:ASN:HB2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:41:MET:HG2	1:C:46:LYS:HB2	2.01	0.42
2:D:291:GLU:OE1	10:D:602:HOH:O	2.21	0.42
2:D:34:LEU:HA	2:D:34:LEU:HD23	1.83	0.42
1:A:202:ILE:HD13	1:A:202:ILE:HA	1.84	0.42
1:A:42:GLU:OE1	1:A:49:LYS:HE3	2.20	0.42
1:A:293:ILE:HG13	1:A:294:PRO:HD2	2.00	0.41
1:C:331:LYS:HE3	1:C:364:ASP:OD2	2.20	0.41
1:C:550:LYS:HE2	1:C:550:LYS:HB3	1.92	0.41
3:E:709:DC:H2'	3:E:710:DG:C8	2.54	0.41
1:A:146:TYR:CD1	1:A:150:PRO:HB3	2.55	0.41
1:C:516:GLU:O	1:C:520:GLN:HG3	2.20	0.41
4:P:813:DT:H2''	4:P:814:DC:C6	2.56	0.41
4:P:818:DC:H2'	4:P:819:DG:C8	2.55	0.41
1:A:115:TYR:CD2	1:A:151:MET:HG2	2.56	0.41
1:C:115:TYR:CD2	6:C:601:DTP:H2'1	2.55	0.41
2:D:64:LYS:HE3	2:D:71:TRP:CZ2	2.56	0.41
1:A:270:ILE:HA	1:A:270:ILE:HD12	1.93	0.41
1:A:497:THR:O	1:A:535:TRP:HA	2.20	0.41
1:C:221:HIS:HE1	1:C:223:LYS:HG3	1.86	0.41
2:B:177:ASP:OD1	2:B:177:ASP:N	2.37	0.41
2:B:85:GLN:HA	2:B:88:TRP:CE2	2.56	0.41
1:C:174:GLN:OE1	1:C:174:GLN:HA	2.21	0.41
1:C:497:THR:O	1:C:535:TRP:HA	2.20	0.41
1:A:120:LEU:N	1:A:148:VAL:HA	2.34	0.41
2:D:7:THR:HG22	2:D:119:PRO:HG2	2.02	0.41
1:A:115:TYR:CD2	6:A:603:DTP:H2'1	2.55	0.41
2:B:34:LEU:HA	2:B:34:LEU:HD23	1.85	0.41
3:E:721:DG:H2''	3:E:722:DA:C8	2.56	0.41
1:A:28:GLU:HA	1:A:31:ILE:HD12	2.03	0.40
1:A:500:GLN:HB3	2:B:422:LEU:HD21	2.03	0.40
1:C:494:ASN:HB3	2:D:289:LEU:HD12	2.03	0.40
2:D:244:ILE:HD12	2:D:271:TYR:HE2	1.86	0.40
2:D:46:LYS:HE2	2:D:116:PHE:HB3	2.03	0.40
1:A:395:LYS:HD2	1:A:414:TRP:CH2	2.57	0.40
1:A:101:LYS:HE2	1:A:321:PRO:HG3	2.03	0.40
1:A:406:TRP:HH2	1:A:508:ALA:HB2	1.86	0.40
1:A:533:LEU:HA	1:A:533:LEU:HD23	1.92	0.40
1:C:222:GLN:O	1:C:227:PHE:CE1	2.70	0.40
2:D:171:PHE:CZ	2:D:205:LEU:HB2	2.56	0.40
1:A:406:TRP:CH2	1:A:508:ALA:HB2	2.55	0.40
1:C:215:THR:O	1:C:217:PRO:HD3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:427:TYR:CE1	1:C:525:LEU:HD13	2.57	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	554/556 (100%)	535 (97%)	15 (3%)	4 (1%)	25	42
1	C	554/556 (100%)	536 (97%)	14 (2%)	4 (1%)	25	42
2	B	408/428 (95%)	396 (97%)	11 (3%)	1 (0%)	51	71
2	D	408/428 (95%)	391 (96%)	15 (4%)	2 (0%)	32	52
All	All	1924/1968 (98%)	1858 (97%)	55 (3%)	11 (1%)	28	46

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	PRO
1	C	4	PRO
2	D	357	MET
1	A	1	PRO
2	D	423	VAL
1	A	150	PRO
1	C	1	PRO
1	C	150	PRO
1	A	133	PRO
2	B	421	PRO
1	C	133	PRO

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	496/498 (100%)	494 (100%)	2 (0%)	93	98
1	C	496/498 (100%)	491 (99%)	5 (1%)	80	92
2	B	374/390 (96%)	373 (100%)	1 (0%)	94	98
2	D	373/390 (96%)	373 (100%)	0	100	100
All	All	1739/1776 (98%)	1731 (100%)	8 (0%)	91	97

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ILE
1	A	5	ILE
2	B	422	LEU
1	C	2	ILE
1	C	58	THR
1	C	177	ASP
1	C	474	ASN
1	C	553	SER

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

2 non-standard protein/DNA/RNA residues 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
4	MRG	F	817	1,3,4	21,28,29	3.25	10 (47%)	24,39,42	2.07	9 (37%)
4	MRG	P	817	3,4	21,28,29	3.33	10 (47%)	24,39,42	2.19	9 (37%)

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
4	MRG	F	817	1,3,4	-	0/8/26/27	0/3/3/3
4	MRG	P	817	3,4	-	0/8/26/27	0/3/3/3

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	817	MRG	O5'-C5'	-4.23	1.38	1.44
4	P	817	MRG	O5'-C5'	-4.15	1.39	1.44
4	P	817	MRG	C2'-C3'	-3.30	1.44	1.52
4	F	817	MRG	C2'-C3'	-3.28	1.44	1.52
4	P	817	MRG	O3'-C3'	-2.72	1.37	1.43
4	F	817	MRG	O4'-C4'	-2.61	1.39	1.45
4	P	817	MRG	O4'-C4'	-2.59	1.39	1.45
4	F	817	MRG	O3'-C3'	-2.52	1.37	1.43
4	P	817	MRG	C2-N1	2.59	1.43	1.34
4	F	817	MRG	C2-N1	2.60	1.43	1.34
4	F	817	MRG	C2-N3	2.93	1.44	1.34
4	P	817	MRG	C2-N3	3.00	1.44	1.34
4	P	817	MRG	C6-C5	3.95	1.48	1.41
4	F	817	MRG	C6-C5	4.20	1.49	1.41
4	P	817	MRG	C6-N1	4.94	1.42	1.33
4	F	817	MRG	C6-N1	5.02	1.42	1.33
4	F	817	MRG	C4-N3	5.82	1.45	1.35
4	P	817	MRG	C4-N3	5.93	1.45	1.35
4	F	817	MRG	C2-N2	9.02	1.48	1.34
4	P	817	MRG	C2-N2	9.50	1.49	1.34

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	P	817	MRG	N3-C2-N1	-4.83	118.93	126.23
4	F	817	MRG	N3-C2-N1	-4.25	119.80	126.23
4	F	817	MRG	C4-C5-N7	-2.63	106.87	109.41
4	P	817	MRG	C5-C6-N1	-2.51	119.91	123.48
4	F	817	MRG	C5-C6-N1	-2.44	120.01	123.48
4	F	817	MRG	C21-N2-C2	-2.28	119.53	123.68
4	P	817	MRG	C4-C5-N7	-2.07	107.41	109.41
4	F	817	MRG	C22-C21-N2	2.42	117.91	111.46
4	P	817	MRG	O5'-C5'-C4'	2.63	118.27	109.01
4	F	817	MRG	C6-N1-C2	2.65	119.93	115.18
4	F	817	MRG	O5'-C5'-C4'	2.71	118.54	109.01
4	P	817	MRG	C6-N1-C2	3.05	120.64	115.18
4	P	817	MRG	N2-C2-N3	3.06	122.78	117.19
4	P	817	MRG	O4'-C1'-N9	3.17	113.12	107.78
4	F	817	MRG	O4'-C1'-N9	3.26	113.27	107.78
4	P	817	MRG	C22-C21-N2	3.48	120.73	111.46
4	F	817	MRG	C2-N3-C4	4.69	120.47	115.11
4	P	817	MRG	C2-N3-C4	4.94	120.74	115.11

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	817	MRG	1	0
4	P	817	MRG	1	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 4 are monoatomic - leaving 8 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	$\# Z > 2$
6	DTP	A	603	5	26,32,32	1.40	6 (23%)	26,50,50	1.97	4 (15%)
7	SUC	B	501	-	24,24,24	1.54	4 (16%)	36,36,36	2.95	11 (30%)
8	EDO	B	502	-	3,3,3	0.49	0	2,2,2	0.35	0
9	SO4	B	503	-	4,4,4	0.14	0	6,6,6	0.06	0
6	DTP	C	601	5	26,32,32	1.41	6 (23%)	26,50,50	1.90	4 (15%)
7	SUC	D	501	-	24,24,24	1.49	4 (16%)	36,36,36	3.05	15 (41%)
9	SO4	D	502	-	4,4,4	0.15	0	6,6,6	0.06	0
8	EDO	D	503	-	3,3,3	0.42	0	2,2,2	0.28	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
6	DTP	A	603	5	-	0/18/34/34	0/3/3/3
7	SUC	B	501	-	-	0/12/51/51	0/2/2/2
8	EDO	B	502	-	-	0/1/1/1	0/0/0/0
9	SO4	B	503	-	-	0/0/0/0	0/0/0/0
6	DTP	C	601	5	-	0/18/34/34	0/3/3/3
7	SUC	D	501	-	-	0/12/51/51	0/2/2/2
9	SO4	D	502	-	-	0/0/0/0	0/0/0/0
8	EDO	D	503	-	-	0/1/1/1	0/0/0/0

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	603	DTP	C5'-C4'	-2.95	1.42	1.51
6	C	601	DTP	C5'-C4'	-2.92	1.42	1.51
6	A	603	DTP	C2'-C3'	-2.50	1.46	1.52
6	C	601	DTP	C2'-C3'	-2.46	1.46	1.52
6	A	603	DTP	O5'-C5'	-2.41	1.35	1.44
6	C	601	DTP	O5'-C5'	-2.38	1.35	1.44
7	D	501	SUC	O2'-C5'	-2.35	1.38	1.43
6	C	601	DTP	O3'-C3'	-2.20	1.38	1.43
6	A	603	DTP	O3'-C3'	-2.16	1.38	1.43
6	C	601	DTP	C3'-C4'	-2.13	1.47	1.53
6	A	603	DTP	C3'-C4'	-2.09	1.47	1.53
7	B	501	SUC	C4'-C5'	2.26	1.58	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	D	501	SUC	C4'-C5'	2.26	1.58	1.53
7	B	501	SUC	O5-C1	2.32	1.47	1.41
6	A	603	DTP	C6-N6	3.11	1.46	1.34
6	C	601	DTP	C6-N6	3.20	1.47	1.34
7	D	501	SUC	O2'-C2'	3.34	1.50	1.42
7	B	501	SUC	O3'-C3'	3.79	1.50	1.42
7	B	501	SUC	O2'-C2'	4.35	1.52	1.42
7	D	501	SUC	O3'-C3'	4.41	1.51	1.42

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	D	501	SUC	O1-C2'-O2'	-9.35	81.80	110.55
7	B	501	SUC	O1-C2'-O2'	-9.04	82.75	110.55
6	A	603	DTP	N3-C2-N1	-8.07	121.83	128.86
6	C	601	DTP	N3-C2-N1	-8.05	121.85	128.86
7	B	501	SUC	O2'-C5'-C4'	-7.33	86.48	105.50
7	D	501	SUC	O2'-C5'-C4'	-6.83	87.77	105.50
7	B	501	SUC	O2'-C2'-C3'	-3.98	96.93	105.57
7	B	501	SUC	C1'-C2'-C3'	-3.52	103.24	114.50
7	D	501	SUC	O2'-C2'-C3'	-3.29	98.43	105.57
7	D	501	SUC	C1'-C2'-C3'	-3.22	104.21	114.50
7	D	501	SUC	C6-C5-C4	-2.69	106.70	113.00
6	A	603	DTP	C4-C5-N7	-2.45	107.05	109.41
7	D	501	SUC	O5-C5-C6	-2.18	101.18	106.41
6	C	601	DTP	C4-C5-N7	-2.18	107.30	109.41
7	B	501	SUC	C6'-C5'-C4'	-2.16	109.82	115.05
7	D	501	SUC	C6'-C5'-C4'	-2.10	109.98	115.05
7	D	501	SUC	C3-C4-C5	-2.05	106.61	110.22
7	D	501	SUC	O5-C5-C4	2.02	113.38	109.66
7	D	501	SUC	O3'-C3'-C2'	2.17	120.68	113.83
6	A	603	DTP	O5'-C5'-C4'	2.51	117.91	109.00
6	C	601	DTP	O5'-C5'-C4'	2.62	118.31	109.00
7	D	501	SUC	O1-C2'-C1'	2.78	118.44	109.51
7	B	501	SUC	O1-C2'-C1'	2.88	118.76	109.51
6	C	601	DTP	O4'-C1'-N9	3.30	113.35	107.78
7	B	501	SUC	O5-C5-C6	3.40	114.56	106.41
7	B	501	SUC	O3'-C3'-C4'	3.40	125.39	113.38
7	D	501	SUC	O3'-C3'-C4'	3.45	125.55	113.38
6	A	603	DTP	O4'-C1'-N9	3.78	114.14	107.78
7	D	501	SUC	O2'-C2'-C1'	4.01	118.41	108.03
7	B	501	SUC	O2'-C2'-C1'	4.24	119.00	108.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	501	SUC	C2'-O1-C1	4.65	130.04	117.62
7	D	501	SUC	O1-C2'-C3'	6.97	131.34	108.11
7	D	501	SUC	C2'-O1-C1	7.01	136.34	117.62
7	B	501	SUC	O1-C2'-C3'	7.20	132.10	108.11

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	603	DTP	2	0
6	C	601	DTP	2	0
8	D	503	EDO	2	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, 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	556/556 (100%)	0.97	91 (16%) 2 2	38, 89, 181, 228	0
1	C	556/556 (100%)	1.08	96 (17%) 2 1	40, 96, 172, 244	0
2	B	412/428 (96%)	0.69	40 (9%) 8 8	37, 74, 137, 215	0
2	D	412/428 (96%)	0.89	56 (13%) 3 3	45, 87, 162, 206	0
3	E	24/27 (88%)	1.32	5 (20%) 1 1	84, 121, 230, 245	0
3	T	24/27 (88%)	1.09	5 (20%) 1 1	80, 110, 232, 267	0
4	F	19/21 (90%)	0.72	4 (21%) 1 1	65, 101, 194, 217	0
4	P	19/21 (90%)	0.57	3 (15%) 2 2	72, 99, 170, 215	0
All	All	2022/2064 (97%)	0.92	300 (14%) 3 2	37, 86, 171, 267	0

All (300) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	214	LEU	19.7
2	D	214	LEU	13.4
1	A	135	ILE	12.8
3	T	702	DT	10.8
2	B	4	PRO	9.5
1	C	142	ILE	9.4
2	D	88	TRP	9.1
2	D	360	ALA	9.0
1	A	142	ILE	8.7
2	D	92	LEU	8.5
1	C	26	LEU	8.2
1	C	133	PRO	8.2
1	A	133	PRO	8.0
2	B	215	THR	8.0
1	C	252	TRP	7.7
2	D	4	PRO	7.7

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Mol	Chain	Res	Type	RSRZ
1	A	141	GLY	7.6
1	C	144	TYR	7.6
1	C	24	TRP	7.5
1	C	132	ILE	7.4
1	A	144	TYR	7.3
1	A	26	LEU	7.3
1	A	73	LYS	7.3
1	A	131	THR	7.2
1	A	132	ILE	7.2
1	A	130	PHE	7.1
1	A	24	TRP	7.0
1	C	34	LEU	6.8
2	D	90	VAL	6.7
1	C	22	LYS	6.6
1	A	140	PRO	6.6
1	A	57	ASN	6.5
1	C	131	THR	6.5
1	A	30	LYS	6.5
2	D	215	THR	6.5
2	D	212	TRP	6.4
1	C	135	ILE	6.4
2	D	89	GLU	6.3
1	C	74	LEU	6.2
1	C	21	VAL	6.2
1	C	134	SER	6.2
1	A	60	VAL	6.2
2	B	5	ILE	6.2
1	C	141	GLY	6.2
1	C	61	PHE	6.1
1	A	129	ALA	6.0
2	B	90	VAL	5.9
2	D	209	LEU	5.8
1	C	54	ASN	5.7
2	B	89	GLU	5.6
1	A	134	SER	5.6
1	C	19	PRO	5.6
2	D	213	GLY	5.6
1	A	61	PHE	5.6
1	A	75	ILE	5.6
2	D	94	ILE	5.5
2	B	212	TRP	5.5
3	E	725	DG	5.4

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Mol	Chain	Res	Type	RSRZ
1	A	52	PRO	5.4
1	C	25	PRO	5.4
2	D	85	GLN	5.4
2	B	88	TRP	5.3
1	A	138	GLU	5.2
1	C	299	ALA	5.2
1	C	31	ILE	5.2
1	A	285	GLY	5.2
1	A	109	LEU	5.1
1	C	130	PHE	5.1
1	A	58	THR	5.0
1	A	288	ALA	5.0
2	D	168	LEU	5.0
1	A	56	TYR	5.0
1	C	49	LYS	5.0
1	C	27	THR	4.9
2	B	301	LEU	4.9
1	A	143	ARG	4.9
3	E	702	DT	4.9
1	C	35	VAL	4.8
1	A	50	ILE	4.8
1	A	193	LEU	4.8
2	D	361	HIS	4.8
1	A	139	THR	4.7
1	C	32	LYS	4.7
1	A	74	LEU	4.7
1	A	21	VAL	4.6
2	B	92	LEU	4.6
1	A	286	THR	4.5
1	C	52	PRO	4.5
1	C	292	VAL	4.4
1	C	293	ILE	4.4
1	C	23	GLN	4.4
1	C	246	LEU	4.4
1	C	28	GLU	4.4
2	B	205	LEU	4.4
1	C	448	ARG	4.3
1	C	138	GLU	4.3
2	B	171	PHE	4.3
1	A	136	ASN	4.3
2	D	216	THR	4.3
1	A	289	LEU	4.2

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Mol	Chain	Res	Type	RSRZ
2	B	213	GLY	4.2
4	P	803	DC	4.2
1	A	59	PRO	4.2
1	A	137	ASN	4.2
1	C	288	ALA	4.1
2	D	124	PHE	4.1
2	B	209	LEU	4.0
1	A	54	ASN	4.0
1	C	47	ILE	4.0
2	D	232	TYR	4.0
2	D	358	ARG	4.0
1	A	34	LEU	4.0
1	C	139	THR	3.9
1	C	301	LEU	3.9
2	B	232	TYR	3.9
1	C	20	LYS	3.8
1	A	25	PRO	3.8
3	T	725	DG	3.8
1	A	29	GLU	3.8
3	T	703	DG	3.8
1	C	295	LEU	3.7
1	A	294	PRO	3.7
4	F	805	DG	3.7
2	D	87	PHE	3.7
1	A	37	ILE	3.7
1	A	284	ARG	3.7
1	C	137	ASN	3.6
1	C	294	PRO	3.6
1	A	71	TRP	3.6
1	C	37	ILE	3.6
2	B	9	PRO	3.6
2	D	159	ILE	3.5
3	E	703	DG	3.5
2	D	217	PRO	3.5
1	A	293	ILE	3.5
1	C	129	ALA	3.5
1	C	30	LYS	3.5
1	A	22	LYS	3.4
1	A	282	LEU	3.4
1	C	202	ILE	3.4
2	D	211	ARG	3.4
1	C	145	GLN	3.4

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Mol	Chain	Res	Type	RSRZ
1	C	143	ARG	3.4
1	C	223	LYS	3.4
1	C	55	PRO	3.3
2	B	202	ILE	3.3
2	D	5	ILE	3.3
2	D	154	LYS	3.3
1	C	57	ASN	3.3
1	C	283	LEU	3.3
2	B	174	GLN	3.3
1	A	448	ARG	3.3
1	C	-1	MET	3.3
2	D	173	LYS	3.2
1	A	127	TYR	3.2
2	B	216	THR	3.2
1	C	303	LEU	3.2
2	B	217	PRO	3.2
2	D	179	VAL	3.2
1	C	136	ASN	3.2
2	D	178	ILE	3.2
1	A	196	GLY	3.1
2	D	428	GLN	3.1
1	A	292	VAL	3.1
1	C	109	LEU	3.1
1	C	219	LYS	3.1
1	C	38	CYS	3.1
2	B	299	ALA	3.1
1	A	47	ILE	3.1
2	D	198	HIS	3.1
1	A	19	PRO	3.1
1	A	62	VAL	3.1
1	A	148	VAL	3.0
1	C	56	TYR	3.0
1	C	75	ILE	3.0
2	D	357	MET	3.0
1	A	295	LEU	3.0
1	A	149	LEU	3.0
1	A	27	THR	2.9
1	A	145	GLN	2.9
2	B	423	VAL	2.9
1	A	55	PRO	2.9
1	A	48	SER	2.9
1	C	50	ILE	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	140	PRO	2.9
1	C	247	PRO	2.9
4	F	806	DT	2.9
1	C	260	LEU	2.9
2	B	193	LEU	2.9
1	A	287	LYS	2.9
1	A	254	VAL	2.9
1	C	67	ASP	2.8
2	D	155	GLY	2.8
2	D	171	PHE	2.8
2	D	172	LYS	2.8
1	A	12	LEU	2.8
1	A	23	GLN	2.8
2	D	197	GLN	2.8
1	A	46	LYS	2.8
2	B	277	ARG	2.8
1	C	287	LYS	2.8
1	A	146	TYR	2.8
2	D	202	ILE	2.7
1	C	312	GLU	2.7
2	D	95	PRO	2.7
2	D	210	LEU	2.7
2	D	86	ASP	2.7
2	B	211	ARG	2.7
2	B	295	LEU	2.7
1	A	41	MET	2.7
1	C	58	THR	2.7
1	C	15	GLY	2.7
2	B	279	LEU	2.7
2	D	10	VAL	2.7
1	C	308	GLU	2.6
3	E	723	DC	2.6
1	C	73	LYS	2.6
1	A	195	ILE	2.6
2	D	318	TYR	2.6
3	T	724	DT	2.6
2	B	87	PHE	2.6
3	T	704	DG	2.6
1	C	48	SER	2.6
2	D	426	TRP	2.5
1	A	301	LEU	2.5
2	D	420	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	106	VAL	2.5
2	B	85	GLN	2.5
2	B	297	GLU	2.5
1	A	28	GLU	2.5
1	A	39	THR	2.4
1	A	104	LYS	2.4
1	C	257	ILE	2.4
2	D	6	GLU	2.4
1	C	5	ILE	2.4
2	B	178	ILE	2.4
4	P	804	DA	2.4
1	A	51	GLY	2.3
1	C	249	LYS	2.3
1	C	196	GLY	2.3
2	D	425	LEU	2.3
1	A	128	THR	2.3
1	C	228	LEU	2.3
2	B	425	LEU	2.3
2	D	208	HIS	2.3
1	A	257	ILE	2.3
1	A	72	ARG	2.3
1	C	42	GLU	2.3
1	A	234	LEU	2.3
2	B	198	HIS	2.3
4	P	805	DG	2.3
1	A	283	LEU	2.3
2	D	80	LEU	2.3
1	A	83	ARG	2.3
2	D	174	GLN	2.3
1	C	126	LYS	2.2
2	D	91	GLN	2.2
1	C	226	PRO	2.2
1	A	45	GLY	2.2
1	C	41	MET	2.2
2	D	8	VAL	2.2
2	B	210	LEU	2.2
2	B	282	LEU	2.2
2	D	93	GLY	2.2
4	F	807	DC	2.2
1	C	94	ILE	2.2
1	C	251	SER	2.2
1	C	6	GLU	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	18	GLY	2.2
1	A	205	LEU	2.2
2	D	422	LEU	2.2
1	C	198	HIS	2.1
2	D	206	ARG	2.1
1	C	180	ILE	2.1
2	D	11	LYS	2.1
1	C	83	ARG	2.1
1	C	199	ARG	2.1
1	A	334	GLN	2.1
2	B	294	PRO	2.1
1	A	124	PHE	2.1
1	C	184	MET	2.1
2	B	207	GLN	2.1
2	D	25	PRO	2.1
1	C	309	ILE	2.1
2	B	208	HIS	2.1
3	E	724	DT	2.1
2	B	278	GLN	2.1
2	D	427	TYR	2.1
1	A	159	ILE	2.1
1	C	224	GLU	2.1
1	A	16	MET	2.0
1	C	59	PRO	2.0
1	A	297	GLU	2.0
1	C	53	GLU	2.0
4	F	803	DC	2.0
1	A	49	LYS	2.0
1	A	67	ASP	2.0
1	C	248	GLU	2.0
2	B	201	LYS	2.0
1	A	-1	MET	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
4	MRG	P	817	26/27	0.91	0.18	-	92,114,144,154	0
4	MRG	F	817	26/27	0.90	0.18	-	117,133,165,172	0

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
9	SO4	B	503	5/5	0.67	0.84	42.69	263,263,267,280	0
8	EDO	D	503	4/4	0.93	0.34	3.48	68,75,80,80	0
9	SO4	D	502	5/5	0.83	0.26	2.13	145,146,150,153	0
7	SUC	D	501	23/23	0.83	0.25	1.50	84,122,138,150	0
8	EDO	B	502	4/4	0.95	0.19	0.85	60,68,70,77	0
7	SUC	B	501	23/23	0.86	0.22	0.48	66,108,126,130	0
6	DTP	C	601	30/30	0.94	0.17	-0.42	83,98,143,148	0
6	DTP	A	603	30/30	0.94	0.13	-0.86	66,111,146,146	0
5	MG	C	602	1/1	0.91	0.09	-1.24	116,116,116,116	0
5	MG	A	601	1/1	0.85	0.05	-3.24	129,129,129,129	0
5	MG	A	602	1/1	0.93	0.09	-3.83	143,143,143,143	0
5	MG	C	603	1/1	0.94	0.12	-	105,105,105,105	0

6.5 Other polymers [i](#)

There are no such residues in this entry.