Full wwPDB X-ray Structure Validation Report (i)

Aug 8, 2023 – 06:02 AM EDT

PDB ID	:	1PVR
Title	:	BASIS FOR A SWITCH IN SUBSTRATE SPECIFICITY: CRYSTAL STRUCTURE OF SELECTED VARIANT OF CRE SITE-SPECIFIC RECOMBINASE, LNSGG BOUND TO THE LOXP (WILDTYPE) RECOGNITION SITE
Authors	:	Baldwin, E.P.; Martin, S.S.; Abel, J.; Gelato, K.A.; Kim, H.; Schultz, P.G.; Santoro, S.W.
Deposited on	:	2003-06-28
Resolution	:	2.65 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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

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

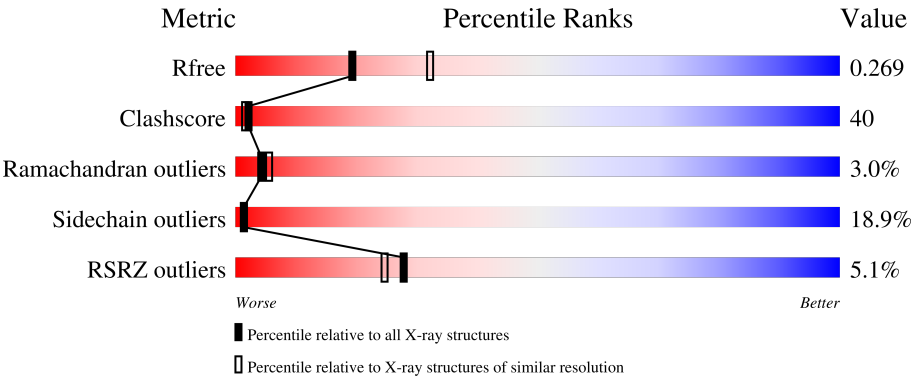
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.65 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	C	34	9% 15% 47% 35% ·
2	D	34	9% 53% 38%
3	A	349	9% 38% 40% 13% · 7%
3	B	349	% 46% 37% 8% · 8%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 6622 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 34-MER.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	33	Total	C	N	O	P	0	1	1
			677	326	121	198	32			

- Molecule 2 is a DNA chain called 34-MER.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	34	Total	C	N	O	P	0	4	0
			774	374	139	224	37			

- Molecule 3 is a protein called Recombinase CRE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	324	Total	C	N	O	S	52	0	0
			2548	1582	486	465	15			
3	B	320	Total	C	N	O	S	6	0	0
			2520	1567	482	456	15			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	MET	-	initiating methionine	UNP P06956
A	-4	HIS	-	expression tag	UNP P06956
A	-3	HIS	-	expression tag	UNP P06956
A	-2	HIS	-	expression tag	UNP P06956
A	-1	HIS	-	expression tag	UNP P06956
A	0	HIS	-	expression tag	UNP P06956
A	1	HIS	-	expression tag	UNP P06956
A	174	LEU	ILE	engineered mutation	UNP P06956
A	258	ASN	THR	engineered mutation	UNP P06956
A	259	SER	ARG	engineered mutation	UNP P06956
A	262	GLY	GLU	engineered mutation	UNP P06956
A	266	GLY	GLU	engineered mutation	UNP P06956

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-5	MET	-	initiating methionine	UNP P06956
B	-4	HIS	-	expression tag	UNP P06956
B	-3	HIS	-	expression tag	UNP P06956
B	-2	HIS	-	expression tag	UNP P06956
B	-1	HIS	-	expression tag	UNP P06956
B	0	HIS	-	expression tag	UNP P06956
B	1	HIS	-	expression tag	UNP P06956
B	174	LEU	ILE	engineered mutation	UNP P06956
B	258	ASN	THR	engineered mutation	UNP P06956
B	259	SER	ARG	engineered mutation	UNP P06956
B	262	GLY	GLU	engineered mutation	UNP P06956
B	266	GLY	GLU	engineered mutation	UNP P06956

- Molecule 4 is water.

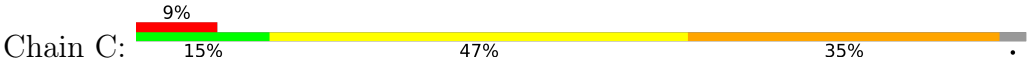
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	11	Total O 11 11	0	0
4	D	17	Total O 17 17	0	0
4	A	28	Total O 28 28	0	0
4	B	47	Total O 47 47	0	0

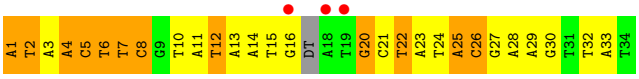
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: 34-MER

Chain C:



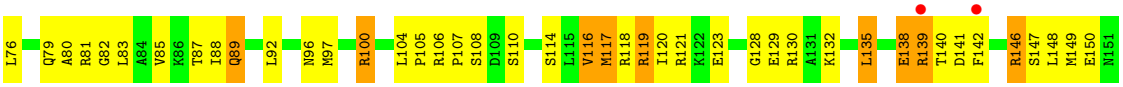


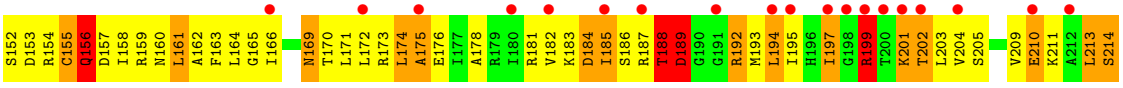
- Molecule 2: 34-MER

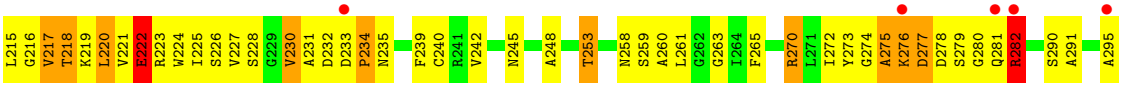
Chain D:

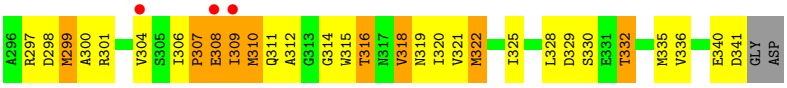
- Molecule 3: Recombinase CRE

Chain A:



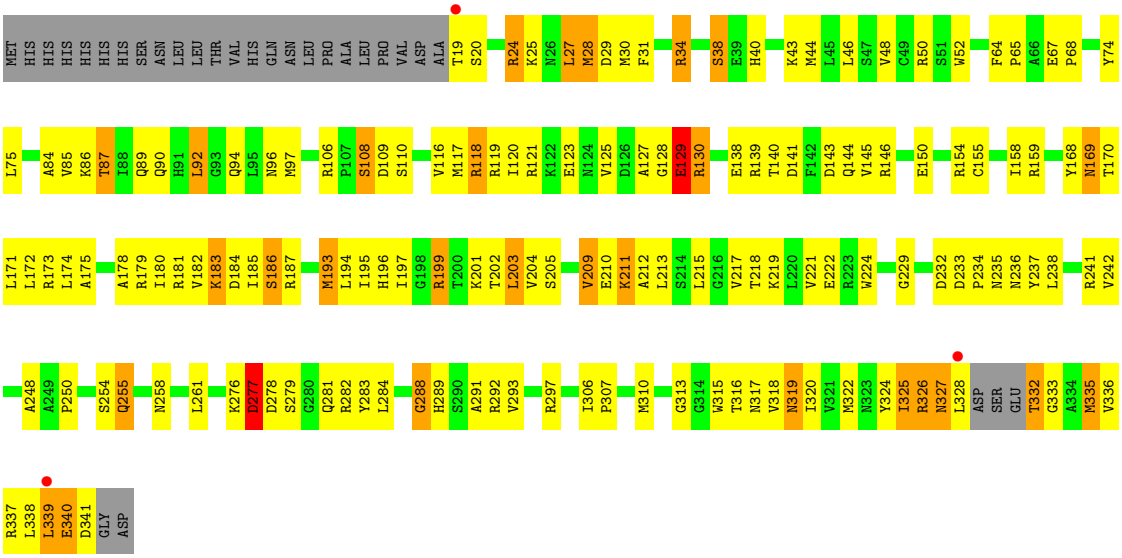






- Molecule 3: Recombinase CRE

Chain B:


MET HIS HIS HIS HIS HIS HIS SER ASN LEU LEU LEU THR VAL HIS GLN ASN LEU PRO ALA LEU PRO VAL ASP ALA T19 S20 R24 K25 N26 L27 M28 D29 M30 F31 R34 S38 E39 H40 K43 M44 L45 L46 S47 V48 C49 R50 S51 W52 F64 P65 A66 E67 P68 Y74
L75 A84 V85 K86 T87 I88 Q89 Q90 H91 L92 G93 Q94 L95 N96 M97 R106 P107 S108 D109 S110 V116 M117 R118 R119 I120 R121 K122 E123 N124 V125 D126 A127 G128 E129 R130 E138 R139 T140 D141 F142 D143 Q144 V145 R146 E150 R154 C155 I158 R159 Y168 N169 T170
L171 L172 R173 L174 A175 A178 R179 I180 R181 V182 K183 D184 I185 S186 R187 M193 L194 I195 H196 I197 G198 R199 T200 K201 T202 L203 V204 S205 V209 E210 K211 A212 L213 S214 L215 G216 V217 T218 K219 L220 V221 E222 R223 W224 G229 D232 D233 P234 N235 N236 Y237 L238 R241 V242
A248 A249 P250 S254 Q255 N258 L261 K276 D277 D278 S279 G280 Q281 R282 Y283 L284 G288 H289 S290 A291 R292 V293 R297 I306 P307 M310 G313 G314 W315 T316 N317 V318 N319 I320 V321 M322 N323 Y324 I325 R326 N327 L328 ASP SER GLU T332 G333 A334 M335 V336
R337 L338 L339 E340 D341 GLY ASP

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	107.39Å 121.57Å 179.95Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	5.00 – 2.65 89.97 – 2.65	Depositor EDS
% Data completeness (in resolution range)	97.0 (5.00-2.65) 97.0 (89.97-2.65)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.51 (at 2.65Å)	Xtriage
Refinement program	TNT	Depositor
R, R_{free}	0.212 , 0.287 0.217 , 0.269	Depositor DCC
R_{free} test set	1691 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	50.4	Xtriage
Anisotropy	0.263	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 79.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	6622	wwPDB-VP
Average B, all atoms (Å^2)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.42% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

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	C	0.84	0/757	1.69	20/1164 (1.7%)
2	D	0.85	2/868 (0.2%)	1.83	32/1337 (2.4%)
3	A	0.45	0/2589	0.81	4/3491 (0.1%)
3	B	0.42	0/2560	0.70	2/3450 (0.1%)
All	All	0.56	2/6774 (0.0%)	1.12	58/9442 (0.6%)

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
3	A	1	0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	12	DT	C5'-C4'	5.98	1.57	1.51
2	D	20	DA	C3'-O3'	-5.59	1.36	1.44

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	12	DT	P-O5'-C5'	-13.11	99.92	120.90
2	D	25	DA	O4'-C1'-N9	-9.39	101.42	108.00
1	C	12	DT	P-O3'-C3'	8.31	129.68	119.70
2	D	24	DT	O4'-C1'-C2'	-8.16	99.37	105.90
2	D	12	DT	O4'-C4'-C3'	7.91	110.75	106.00
2	D	26	DC	P-O5'-C5'	-7.83	108.38	120.90
3	A	282	ARG	NE-CZ-NH2	7.18	123.89	120.30
2	D	30	DG	P-O5'-C5'	-7.09	109.55	120.90
1	C	20	DG	C3'-C2'-C1'	-7.00	94.10	102.50
2	D	32	DT	O4'-C1'-N1	6.97	112.88	108.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	2	DT	O4'-C1'-N1	6.92	112.84	108.00
1	C	8	DC	O4'-C1'-N1	6.88	112.81	108.00
1	C	7	DT	P-O3'-C3'	6.78	127.84	119.70
2	D	24	DT	C2-N3-C4	-6.69	123.19	127.20
1	C	3	DA	P-O3'-C3'	6.64	127.67	119.70
2	D	5	DC	N1-C2-O2	-6.58	114.95	118.90
1	C	26	DC	P-O5'-C5'	-6.57	110.39	120.90
2	D	24	DT	N3-C4-O4	-6.44	116.03	119.90
3	A	234	PRO	N-CA-C	6.33	128.57	112.10
2	D	7	DT	O4'-C1'-C2'	-6.13	101.00	105.90
1	C	26	DC	P-O3'-C3'	-6.12	112.36	119.70
1	C	5	DC	O5'-P-OP1	-6.11	100.20	105.70
1	C	26	DC	C6-N1-C2	6.09	122.74	120.30
2	D	3	DA	P-O3'-C3'	6.08	127.00	119.70
1	C	4	DA	O4'-C1'-N9	6.04	112.22	108.00
3	B	335	MET	N-CA-C	6.02	127.26	111.00
2	D	18[A]	DA	O4'-C4'-C3'	-6.02	102.09	104.50
2	D	18[B]	DA	O4'-C4'-C3'	-6.02	102.09	104.50
2	D	19[A]	DC	C6-N1-C2	5.94	122.67	120.30
2	D	19[B]	DC	C6-N1-C2	5.94	122.67	120.30
2	D	32	DT	C3'-C2'-C1'	-5.93	95.38	102.50
2	D	4	DA	O4'-C1'-N9	5.88	112.12	108.00
1	C	11	DA	O4'-C1'-C2'	-5.86	101.22	105.90
1	C	20	DG	C4-N9-C1'	-5.79	118.97	126.50
2	D	19[A]	DC	O4'-C1'-N1	-5.65	104.05	108.00
2	D	19[B]	DC	O4'-C1'-N1	-5.65	104.05	108.00
1	C	4	DA	C1'-O4'-C4'	-5.59	104.51	110.10
1	C	1	DA	C8-N9-C4	-5.49	103.61	105.80
1	C	6	DT	O4'-C1'-N1	-5.42	104.21	108.00
2	D	12	DT	C5'-C4'-C3'	5.41	123.84	114.10
1	C	25	DA	P-O5'-C5'	-5.41	112.25	120.90
2	D	29	DA	P-O3'-C3'	5.34	126.11	119.70
1	C	3	DA	O4'-C1'-N9	-5.32	104.28	108.00
2	D	18[A]	DA	O4'-C1'-N9	5.29	111.70	108.00
2	D	18[B]	DA	O4'-C1'-N9	5.29	111.70	108.00
3	A	189	ASP	N-CA-C	5.28	125.26	111.00
2	D	18[A]	DA	P-O5'-C5'	-5.26	112.49	120.90
2	D	18[B]	DA	P-O5'-C5'	-5.26	112.49	120.90
2	D	12	DT	C1'-O4'-C4'	-5.25	104.85	110.10
2	D	2	DT	O4'-C1'-C2'	-5.17	101.77	105.90
2	D	24	DT	N3-C4-C5	5.16	118.30	115.20
2	D	18[A]	DA	C5-N7-C8	-5.16	101.32	103.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	18[B]	DA	C5-N7-C8	-5.16	101.32	103.90
1	C	20	DG	N9-C1'-C2'	5.13	122.34	112.60
2	D	32	DT	O4'-C1'-C2'	-5.11	101.81	105.90
3	A	318	VAL	N-CA-C	5.09	124.76	111.00
1	C	22	DT	P-O3'-C3'	-5.07	113.62	119.70
3	B	341	ASP	N-CA-CB	5.05	119.68	110.60

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	318	VAL	CA

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	677	0	379	49	0
2	D	774	0	434	96	0
3	A	2548	0	2568	226	0
3	B	2520	0	2547	183	0
4	A	28	0	0	4	0
4	B	47	0	0	1	0
4	C	11	0	0	2	0
4	D	17	0	0	2	0
All	All	6622	0	5928	486	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 40.

All (486) 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)
2:D:19[B]:DC:O3'	2:D:20:DA:P	0.81	1.21
2:D:21:DT:H2"	2:D:22:DT:H5'	1.27	1.12

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:15:DC:C2'	2:D:16[B]:DA:C8	2.36	1.09
2:D:19[B]:DC:HO3'	2:D:20:DA:P	0.81	1.09
3:A:139:ARG:HH22	3:B:339:LEU:HD23	1.19	1.06
2:D:15:DC:H2"	2:D:16[B]:DA:C8	1.91	1.05
3:A:139:ARG:HH12	3:B:339:LEU:HA	1.20	1.05
2:D:19[B]:DC:O3'	2:D:20:DA:OP2	1.74	1.05
2:D:33:DA:H2"	2:D:34:DT:H5"	1.35	1.03
2:D:15:DC:H2'	2:D:16[B]:DA:N7	1.79	0.97
3:A:314:GLY:HA2	3:B:326:ARG:HH22	1.26	0.97
3:A:172:LEU:HD11	3:A:197:ILE:HD12	1.46	0.96
2:D:12:DT:H5"	3:A:282:ARG:HH12	1.27	0.96
2:D:15:DC:H2'	2:D:16[B]:DA:C8	2.03	0.93
3:A:139:ARG:NH2	3:B:339:LEU:HD23	1.83	0.92
3:A:309:ILE:HG22	3:A:321:VAL:HG11	1.54	0.89
1:C:25:DA:H2"	1:C:26:DC:H5"	1.54	0.88
3:B:193:MET:HE1	3:B:221:VAL:HG11	1.53	0.88
3:A:139:ARG:NH1	3:B:339:LEU:HA	1.86	0.88
3:A:318:VAL:HG22	3:A:322:MET:HG2	1.55	0.88
3:B:310:MET:SD	3:B:318:VAL:HG22	2.14	0.87
2:D:21:DT:C2'	2:D:22:DT:H5'	2.05	0.87
3:A:203:LEU:HA	3:B:130:ARG:HD3	1.57	0.87
3:A:332:THR:HG21	3:A:336:VAL:HG11	1.58	0.86
3:A:295:ALA:HB1	3:B:335:MET:HE3	1.58	0.85
3:B:313:GLY:HA3	3:B:315:TRP:CZ3	2.12	0.84
2:D:19[B]:DC:C3'	2:D:20:DA:OP2	2.25	0.83
3:A:188:THR:HG23	3:A:189:ASP:H	1.42	0.82
1:C:26:DC:H2"	1:C:27:DG:C8	2.15	0.80
1:C:14:DA:N7	3:B:86:LYS:NZ	2.30	0.80
1:C:12:DT:OP2	3:B:87:THR:HG21	1.81	0.80
3:A:203:LEU:HA	3:B:130:ARG:CD	2.12	0.80
3:A:214:SER:O	3:A:218:THR:HB	1.81	0.80
2:D:16[B]:DA:OP2	2:D:16[B]:DA:H2'	1.81	0.80
3:A:192:ARG:HG2	3:A:213:LEU:O	1.82	0.79
2:D:11:DA:H2"	2:D:12:DT:H5'	1.64	0.78
3:A:314:GLY:HA2	3:B:326:ARG:NH2	1.97	0.78
2:D:33:DA:H2"	2:D:34:DT:C5'	2.13	0.77
3:B:154:ARG:O	3:B:158:ILE:HD12	1.83	0.77
2:D:12:DT:C5'	3:A:282:ARG:HH22	1.98	0.76
3:A:201:LYS:HA	3:A:201:LYS:HE2	1.68	0.76
3:B:85:VAL:O	3:B:89:GLN:HG3	1.85	0.76
1:C:14:DA:N3	3:B:201:LYS:NZ	2.33	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:116:VAL:O	3:B:120:ILE:HG13	1.86	0.75
2:D:18[B]:DA:C2'	2:D:19[B]:DC:H5"	2.16	0.74
1:C:16[B]:DG:H5"	3:B:316:THR:CG2	2.17	0.74
3:B:179:ARG:HG2	3:B:255:GLN:NE2	2.02	0.74
2:D:18[A]:DA:H5'	2:D:18[A]:DA:H8	1.51	0.74
3:A:104:LEU:HB3	3:A:105:PRO:HD2	1.69	0.74
3:A:81:ARG:NH1	3:A:83:LEU:HD11	2.02	0.73
3:A:188:THR:HG23	3:A:189:ASP:N	2.03	0.73
2:D:2:DT:H2"	2:D:3:DA:C8	2.24	0.73
3:A:172:LEU:HD21	3:A:197:ILE:HG21	1.68	0.73
3:A:172:LEU:HD11	3:A:197:ILE:CD1	2.18	0.72
2:D:19[B]:DC:H3'	2:D:20:DA:OP2	1.86	0.72
2:D:12:DT:C5'	3:A:282:ARG:HH12	2.02	0.72
3:B:119:ARG:O	3:B:123:GLU:HG3	1.89	0.72
3:A:216:GLY:HA3	4:A:360:HOH:O	1.89	0.72
3:A:163:PHE:CE1	3:A:261:LEU:HD22	2.24	0.71
3:B:180:ILE:HD13	3:B:195:ILE:HG21	1.70	0.71
2:D:18[A]:DA:H5'	2:D:18[A]:DA:C8	2.26	0.71
3:A:30:MET:HE3	3:A:42:TRP:HH2	1.56	0.71
3:B:139:ARG:HD2	3:B:143:ASP:OD1	1.91	0.71
3:A:139:ARG:HH12	3:B:339:LEU:CA	2.02	0.70
3:B:84:ALA:O	3:B:87:THR:HG23	1.92	0.70
2:D:23:DA:H5'	3:B:201:LYS:CG	2.21	0.70
3:B:193:MET:HE1	3:B:221:VAL:CG1	2.20	0.70
3:A:158:ILE:HG13	3:A:159:ARG:N	2.07	0.70
3:A:199:ARG:NH1	3:A:314:GLY:HA3	2.07	0.70
3:A:183:LYS:HG3	3:A:184:ASP:OD1	1.92	0.70
3:A:187:ARG:HD3	3:A:193:MET:HG2	1.72	0.69
3:A:277:ASP:OD1	3:A:277:ASP:N	2.24	0.69
3:B:130:ARG:HG2	3:B:130:ARG:HH11	1.57	0.69
3:B:84:ALA:HB3	3:B:87:THR:CG2	2.21	0.69
3:B:31:PHE:CE1	3:B:34:ARG:HD3	2.27	0.69
3:A:146:ARG:O	3:A:150:GLU:HB3	1.93	0.69
3:A:65:PRO:HG3	3:A:104:LEU:HD13	1.74	0.69
3:A:83:LEU:HD22	3:A:87:THR:HG21	1.73	0.69
3:B:27:LEU:HD12	3:B:30:MET:HE2	1.74	0.69
3:B:178:ALA:HB2	3:B:261:LEU:HD11	1.75	0.69
3:A:174:LEU:HB3	3:A:258:ASN:ND2	2.07	0.68
3:A:224:TRP:HZ2	3:A:240:CYS:HG	1.41	0.68
3:B:277:ASP:HB2	3:B:284:LEU:HD13	1.75	0.68
3:A:203:LEU:HD12	3:B:130:ARG:HA	1.75	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:201:LYS:HA	3:A:201:LYS:CE	2.24	0.68
3:A:72:ARG:HH11	3:A:72:ARG:HG2	1.58	0.68
2:D:5:DC:H2'	2:D:6:DT:C6	2.28	0.68
2:D:12:DT:H5"	3:A:282:ARG:NH1	2.05	0.67
3:A:209:VAL:HG12	3:A:210:GLU:H	1.60	0.67
3:B:319:ASN:OD1	3:B:319:ASN:N	2.27	0.67
3:B:92:LEU:HD12	3:B:117:MET:SD	2.35	0.67
3:B:128:GLY:O	3:B:130:ARG:NH1	2.27	0.67
3:B:106:ARG:O	3:B:109:ASP:HB2	1.95	0.67
3:B:194:LEU:HD23	3:B:212:ALA:HA	1.76	0.67
3:A:201:LYS:NZ	3:B:130:ARG:HH22	1.93	0.67
2:D:20:DA:OP2	3:B:106:ARG:NH1	2.28	0.66
3:A:318:VAL:CG2	3:A:322:MET:HG2	2.24	0.66
3:A:182:VAL:O	3:A:185:ILE:HG23	1.94	0.66
1:C:32:DT:H2"	1:C:33:DA:O5'	1.95	0.66
3:A:188:THR:N	3:A:192:ARG:O	2.29	0.66
3:B:185:ILE:CG2	3:B:193:MET:HG2	2.25	0.66
2:D:17[A]:DT:OP2	3:A:202:THR:HB	1.95	0.66
3:A:222:GLU:O	3:A:225:ILE:N	2.29	0.66
3:B:130:ARG:HH11	3:B:130:ARG:CG	2.09	0.66
1:C:16[B]:DG:H5"	3:B:316:THR:HG21	1.77	0.66
3:B:90:GLN:NE2	3:B:94:GLN:HE21	1.94	0.66
3:B:317:ASN:ND2	3:B:319:ASN:OD1	2.28	0.65
1:C:21:DC:H2"	1:C:22:DT:O5'	1.96	0.65
3:A:85:VAL:HG23	3:A:129:GLU:OE2	1.96	0.65
2:D:14:DG:H2"	2:D:15:DC:H6	1.62	0.65
2:D:15:DC:C2'	2:D:16[B]:DA:N7	2.47	0.65
3:B:233:ASP:O	3:B:236:ASN:HB2	1.95	0.65
2:D:21:DT:H2'	2:D:22:DT:C6	2.32	0.65
3:A:163:PHE:HE1	3:A:261:LEU:HD22	1.61	0.65
3:A:159:ARG:HB2	3:A:224:TRP:CZ3	2.32	0.64
1:C:16[A]:DG:OP1	3:B:316:THR:N	2.29	0.64
3:A:156:GLN:HG3	3:A:156:GLN:O	1.96	0.64
3:A:217:VAL:O	3:A:221:VAL:HG23	1.97	0.64
1:C:6:DT:H1'	1:C:7:DT:H5'	1.79	0.64
3:B:196:HIS:ND1	3:B:210:GLU:OE2	2.29	0.64
2:D:12:DT:H4'	3:A:282:ARG:NH1	2.13	0.64
3:A:270:ARG:O	3:A:274:GLY:N	2.29	0.64
3:B:248:ALA:O	3:B:250:PRO:HD3	1.98	0.64
1:C:25:DA:C2'	1:C:26:DC:H5"	2.28	0.64
2:D:18[B]:DA:H2'	2:D:19[B]:DC:C6	2.33	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:297:ARG:CZ	3:A:328:LEU:HD11	2.28	0.63
3:B:217:VAL:O	3:B:221:VAL:HG23	1.99	0.63
1:C:1:DA:H5"	1:C:1:DA:H8	1.63	0.63
2:D:16[A]:DA:H4'	2:D:17[A]:DT:OP1	1.99	0.63
3:B:197:ILE:HB	3:B:209:VAL:HG23	1.80	0.63
3:A:76:LEU:HD23	3:A:120:ILE:HD11	1.81	0.62
3:A:209:VAL:HG12	3:A:210:GLU:N	2.12	0.62
2:D:15:DC:C2'	2:D:16[B]:DA:H8	2.08	0.62
3:A:325:ILE:HB	3:A:328:LEU:HD22	1.80	0.62
3:B:332:THR:OG1	3:B:333:GLY:N	2.28	0.62
2:D:6:DT:H2"	2:D:7:DT:O5'	1.99	0.62
1:C:1:DA:H8	1:C:1:DA:C5'	2.13	0.61
3:B:325:ILE:O	3:B:327:ASN:ND2	2.26	0.61
3:A:202:THR:O	3:B:130:ARG:NE	2.28	0.61
3:B:325:ILE:O	3:B:327:ASN:N	2.33	0.61
3:A:159:ARG:HB2	3:A:224:TRP:CE3	2.35	0.61
3:A:172:LEU:CD2	3:A:197:ILE:HG21	2.31	0.61
3:A:215:LEU:O	3:A:219:LYS:HB2	2.01	0.61
1:C:16[A]:DG:H3'	3:B:316:THR:OG1	2.00	0.61
3:A:310:MET:O	3:A:310:MET:HG3	1.99	0.61
3:A:309:ILE:HG22	3:A:321:VAL:CG1	2.31	0.60
3:A:172:LEU:HD23	3:A:176:GLU:OE1	2.01	0.60
3:B:179:ARG:HG2	3:B:255:GLN:HE22	1.66	0.60
3:A:308:GLU:HA	3:A:308:GLU:OE1	2.01	0.60
3:A:96:ASN:OD1	3:A:107:PRO:HD2	2.02	0.60
3:A:192:ARG:NH1	3:B:340:GLU:OE1	2.35	0.60
3:A:187:ARG:O	3:A:188:THR:HB	2.02	0.60
3:A:203:LEU:O	3:B:130:ARG:HD2	2.02	0.60
2:D:8:DC:H6	2:D:8:DC:H5'	1.66	0.60
3:A:340:GLU:O	3:A:341:ASP:HB2	2.02	0.60
3:B:84:ALA:HB3	3:B:87:THR:HG22	1.83	0.60
3:A:155:CYS:O	3:A:158:ILE:HG12	2.01	0.59
3:B:178:ALA:HB2	3:B:261:LEU:CD1	2.33	0.59
3:A:214:SER:OG	3:A:215:LEU:N	2.30	0.59
2:D:23:DA:H2'	2:D:24:DT:C7	2.32	0.59
3:A:195:ILE:O	3:A:210:GLU:HA	2.03	0.59
3:A:89:GLN:OE1	3:A:121:ARG:NH1	2.36	0.59
3:A:332:THR:CG2	3:A:336:VAL:HG11	2.31	0.59
3:A:153:ASP:OD1	3:A:153:ASP:N	2.36	0.58
3:B:155:CYS:HB3	3:B:242:VAL:HG11	1.84	0.58
1:C:25:DA:C8	1:C:25:DA:H5'	2.38	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:201:LYS:HZ1	3:B:130:ARG:HH22	1.50	0.58
3:B:333:GLY:O	3:B:337:ARG:HD3	2.03	0.58
3:A:154:ARG:HB2	3:A:157:ASP:HB2	1.84	0.58
3:A:183:LYS:HG3	3:A:184:ASP:H	1.68	0.58
1:C:16[B]:DG:H5"	3:B:316:THR:HG23	1.86	0.58
2:D:12:DT:C4'	3:A:282:ARG:HH22	2.16	0.57
2:D:23:DA:H2'	2:D:24:DT:C6	2.39	0.57
3:A:318:VAL:O	3:A:319:ASN:C	2.40	0.57
3:B:336:VAL:O	3:B:340:GLU:HB2	2.05	0.57
3:B:233:ASP:OD1	3:B:234:PRO:HD2	2.05	0.57
1:C:5:DC:H2"	1:C:6:DT:H5'	1.87	0.57
3:B:183:LYS:HE3	3:B:235:ASN:OD1	2.04	0.57
3:A:197:ILE:HD11	3:A:211:LYS:HB2	1.87	0.57
3:A:308:GLU:O	3:A:312:ALA:N	2.30	0.57
3:A:119:ARG:O	3:A:123:GLU:HG3	2.05	0.57
2:D:23:DA:C4'	3:B:201:LYS:HG3	2.35	0.56
3:B:238:LEU:HD12	3:B:238:LEU:O	2.04	0.56
2:D:4:DA:H2"	2:D:5:DC:H5"	1.87	0.56
3:A:75:LEU:HD22	3:A:88:ILE:HG23	1.88	0.56
3:A:104:LEU:HB3	3:A:105:PRO:CD	2.36	0.56
3:B:170:THR:O	3:B:171:LEU:HB2	2.06	0.56
2:D:18[A]:DA:H2"	2:D:19[A]:DC:H5"	1.86	0.56
3:A:224:TRP:HZ2	3:A:240:CYS:SG	2.28	0.56
3:B:318:VAL:O	3:B:322:MET:HG2	2.05	0.56
1:C:4:DA:H2"	1:C:5:DC:H5"	1.87	0.56
3:A:39:GLU:O	3:A:43:LYS:HG2	2.05	0.55
1:C:24:DT:H2"	1:C:25:DA:OP2	2.07	0.55
3:A:318:VAL:HG21	3:A:322:MET:HE1	1.89	0.55
3:B:233:ASP:O	3:B:236:ASN:N	2.39	0.55
3:B:68:PRO:HB3	3:B:110:SER:OG	2.06	0.55
2:D:18[A]:DA:H2"	2:D:19[A]:DC:C5'	2.37	0.55
3:A:223:ARG:NH1	4:A:364:HOH:O	2.39	0.55
3:A:24:ARG:O	3:A:28:MET:HG3	2.07	0.55
3:A:314:GLY:HA2	3:B:326:ARG:HH12	1.72	0.55
3:B:128:GLY:O	3:B:129:GLU:O	2.25	0.55
2:D:8:DC:H5'	2:D:8:DC:C6	2.42	0.54
3:A:158:ILE:HD12	3:A:224:TRP:HA	1.87	0.54
2:D:2:DT:H2"	2:D:3:DA:N7	2.22	0.54
3:B:185:ILE:HG21	3:B:193:MET:HG2	1.88	0.54
2:D:16[B]:DA:H2"	2:D:17[B]:DT:OP2	2.07	0.54
3:A:75:LEU:HD22	3:A:88:ILE:CG2	2.37	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:280:GLY:O	3:A:281:GLN:HB2	2.06	0.54
3:A:314:GLY:CA	3:B:326:ARG:HH22	2.12	0.54
3:B:169:ASN:C	3:B:169:ASN:HD22	2.11	0.54
3:B:159:ARG:HB2	3:B:224:TRP:CZ3	2.43	0.54
3:A:222:GLU:O	3:A:223:ARG:C	2.45	0.54
4:A:369:HOH:O	3:B:338:LEU:HD22	2.07	0.54
1:C:1:DA:H5"	1:C:1:DA:C8	2.42	0.54
3:B:318:VAL:O	3:B:318:VAL:HG12	2.08	0.54
2:D:17[B]:DT:C6	2:D:17[B]:DT:H5"	2.42	0.54
3:A:195:ILE:N	3:A:211:LYS:O	2.41	0.54
3:B:175:ALA:HB2	3:B:258:ASN:HD21	1.72	0.53
2:D:15:DC:OP1	3:A:173:ARG:NH2	2.42	0.53
2:D:27:DG:H2"	2:D:28:DA:C8	2.43	0.53
3:B:320:ILE:HG22	3:B:324:TYR:CE2	2.44	0.53
2:D:23:DA:H4'	3:B:201:LYS:HG3	1.90	0.53
3:A:295:ALA:HB1	3:B:335:MET:CE	2.36	0.53
3:B:31:PHE:CD1	3:B:34:ARG:HD3	2.43	0.53
3:A:96:ASN:ND2	3:A:108:SER:OG	2.28	0.53
3:A:142:PHE:O	3:A:146:ARG:HB2	2.08	0.53
3:B:181:ARG:O	3:B:184:ASP:HB2	2.09	0.53
1:C:29:DA:H2"	1:C:30:DG:H8	1.73	0.53
3:A:31:PHE:CE1	3:A:34:ARG:NH1	2.76	0.53
3:A:132:LYS:HE2	3:A:282:ARG:HB3	1.90	0.53
3:A:253:THR:HG23	3:A:253:THR:O	2.08	0.53
3:A:242:VAL:HG22	3:A:248:ALA:HB2	1.92	0.53
1:C:1:DA:H2"	1:C:2:DT:H5'	1.91	0.52
1:C:23:DA:C8	1:C:24:DT:H72	2.44	0.52
3:A:154:ARG:O	3:A:157:ASP:HB2	2.09	0.52
3:B:279:SER:HB2	3:B:281:GLN:HG3	1.92	0.52
3:A:132:LYS:CE	3:A:282:ARG:HB3	2.39	0.52
3:A:138:GLU:OE1	3:A:301:ARG:NH2	2.42	0.52
3:A:183:LYS:HG3	3:A:184:ASP:N	2.24	0.52
3:B:306:ILE:N	3:B:307:PRO:HD2	2.24	0.52
3:A:193:MET:HB2	3:A:218:THR:OG1	2.10	0.52
2:D:23:DA:H5'	3:B:201:LYS:HG3	1.92	0.52
3:A:174:LEU:O	3:A:176:GLU:N	2.42	0.52
3:A:282:ARG:HG3	3:A:282:ARG:HH11	1.75	0.52
3:A:139:ARG:HH12	3:B:339:LEU:HG	1.75	0.52
1:C:1:DA:H2"	1:C:2:DT:C5'	2.39	0.52
1:C:10:DT:OP2	3:B:50:ARG:NH2	2.39	0.52
3:B:332:THR:O	3:B:337:ARG:NH1	2.43	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:223:ARG:O	3:A:224:TRP:C	2.49	0.51
2:D:12:DT:H5'	3:A:282:ARG:HH22	1.72	0.51
3:A:224:TRP:CE2	3:A:228:SER:HB3	2.45	0.51
2:D:28:DA:H1'	2:D:29:DA:H5'	1.91	0.51
3:B:141:ASP:O	3:B:145:VAL:HG23	2.10	0.51
3:A:31:PHE:CD1	3:A:34:ARG:NH1	2.78	0.51
3:B:40:HIS:CD2	3:B:43:LYS:NZ	2.78	0.51
3:A:100:ARG:HD3	4:A:353:HOH:O	2.10	0.51
3:A:306:ILE:O	3:A:307:PRO:O	2.29	0.51
3:B:40:HIS:HD2	3:B:43:LYS:NZ	2.08	0.51
3:B:195:ILE:HD11	3:B:213:LEU:HD11	1.91	0.51
3:B:276:LYS:O	3:B:277:ASP:O	2.28	0.50
3:B:52:TRP:HZ3	3:B:74:TYR:HB2	1.76	0.50
3:B:90:GLN:HE22	3:B:94:GLN:HE21	1.60	0.50
3:B:293:VAL:O	3:B:297:ARG:HG3	2.12	0.50
3:A:329:ASP:O	3:A:332:THR:HB	2.11	0.50
2:D:13:DA:C2	2:D:14:DG:C4	2.99	0.50
3:A:67:GLU:HG2	3:A:68:PRO:HD2	1.92	0.50
3:B:75:LEU:HD12	3:B:116:VAL:CG1	2.42	0.50
3:A:106:ARG:NH2	3:A:108:SER:HB2	2.26	0.50
3:A:169:ASN:HB2	3:A:217:VAL:HG21	1.92	0.50
3:A:281:GLN:O	3:A:282:ARG:HB2	2.11	0.50
3:A:307:PRO:O	3:A:308:GLU:C	2.49	0.50
3:B:237:TYR:CZ	3:B:255:GLN:HG2	2.47	0.50
2:D:13:DA:N6	4:D:209:HOH:O	2.43	0.50
3:A:175:ALA:N	3:A:258:ASN:HD21	2.09	0.50
2:D:12:DT:C4'	3:A:282:ARG:NH2	2.74	0.50
2:D:14:DG:C4	2:D:15:DC:C6	2.99	0.50
2:D:19[B]:DC:H2"	2:D:20:DA:O5'	2.11	0.50
3:A:189:ASP:O	3:A:192:ARG:NH2	2.45	0.50
3:B:248:ALA:C	3:B:250:PRO:HD3	2.33	0.50
2:D:17[B]:DT:H5"	2:D:17[B]:DT:H6	1.76	0.50
1:C:15:DT:H2"	1:C:16[B]:DG:C8	2.47	0.49
1:C:16[B]:DG:H5'	3:B:202:THR:HB	1.93	0.49
1:C:26:DC:H2"	1:C:27:DG:H8	1.75	0.49
2:D:16[B]:DA:N3	2:D:17[B]:DT:C6	2.80	0.49
2:D:17[A]:DT:H2"	2:D:18[A]:DA:OP2	2.12	0.49
3:A:128:GLY:O	3:A:130:ARG:HD3	2.12	0.49
3:B:64:PHE:HA	3:B:65:PRO:C	2.32	0.49
3:A:19:THR:OG1	3:A:22:GLU:OE1	2.28	0.49
3:A:325:ILE:CB	3:A:328:LEU:HD22	2.42	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:309:ILE:C	3:A:311:GLN:H	2.16	0.49
3:B:194:LEU:HD23	3:B:212:ALA:CA	2.42	0.49
3:A:72:ARG:HG2	3:A:72:ARG:NH1	2.25	0.49
3:B:125:VAL:C	3:B:127:ALA:H	2.16	0.49
2:D:14:DG:C2'	2:D:15:DC:H6	2.25	0.48
3:B:40:HIS:HD2	3:B:43:LYS:HZ3	1.60	0.48
3:B:173:ARG:O	3:B:174:LEU:C	2.50	0.48
3:A:178:ALA:HB2	3:A:261:LEU:HD11	1.95	0.48
3:A:230:VAL:C	3:A:232:ASP:H	2.16	0.48
3:A:274:GLY:O	3:A:275:ALA:O	2.31	0.48
1:C:28:DA:H2"	1:C:29:DA:C8	2.48	0.48
2:D:15:DC:H2'	2:D:16[A]:DA:N7	2.28	0.48
3:A:170:THR:O	3:A:171:LEU:HB2	2.13	0.48
3:A:213:LEU:HD13	3:A:217:VAL:HG12	1.95	0.48
2:D:18[A]:DA:C8	2:D:18[A]:DA:C5'	2.95	0.48
2:D:18[B]:DA:H2'	2:D:19[B]:DC:H5"	1.92	0.48
3:A:272:ILE:HB	3:A:273:TYR:CD1	2.49	0.48
1:C:25:DA:H5'	1:C:25:DA:H8	1.79	0.48
3:A:107:PRO:O	3:A:110:SER:OG	2.29	0.48
3:A:310:MET:HA	3:A:321:VAL:HG21	1.95	0.48
3:B:180:ILE:CD1	3:B:195:ILE:HG21	2.42	0.48
2:D:12:DT:H4'	3:A:282:ARG:CZ	2.44	0.48
2:D:15:DC:N3	2:D:16[B]:DA:N6	2.62	0.47
3:A:201:LYS:HA	3:B:130:ARG:NH2	2.29	0.47
1:C:1:DA:C5'	1:C:1:DA:C8	2.95	0.47
3:A:224:TRP:CD2	3:A:228:SER:HB3	2.49	0.47
3:A:138:GLU:HB3	3:A:298:ASP:OD2	2.14	0.47
3:B:67:GLU:HB3	4:B:368:HOH:O	2.14	0.47
3:A:194:LEU:C	3:A:195:ILE:HG13	2.35	0.47
3:A:209:VAL:CG1	3:A:210:GLU:H	2.26	0.47
3:B:293:VAL:HG22	3:B:324:TYR:CE1	2.49	0.47
3:A:332:THR:HG23	3:A:336:VAL:HG21	1.96	0.47
3:A:79:GLN:NE2	3:A:120:ILE:HG12	2.30	0.47
3:A:224:TRP:CZ2	3:A:240:CYS:SG	3.07	0.47
3:B:24:ARG:O	3:B:28:MET:HB2	2.14	0.47
3:B:44:MET:O	3:B:48:VAL:HG23	2.14	0.47
3:B:277:ASP:CB	3:B:284:LEU:HD13	2.42	0.47
3:B:306:ILE:HG22	3:B:307:PRO:HD3	1.97	0.47
2:D:12:DT:H4'	3:A:282:ARG:HH12	1.79	0.47
2:D:18[B]:DA:H2"	2:D:19[B]:DC:H5"	1.95	0.47
2:D:17[A]:DT:H2"	2:D:18[A]:DA:C8	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:106:ARG:NH2	3:A:108:SER:CB	2.78	0.47
2:D:20:DA:H2"	2:D:21:DT:O5'	2.15	0.46
3:A:314:GLY:HA2	3:B:326:ARG:NH1	2.29	0.46
3:B:187:ARG:NH1	3:B:222:GLU:OE2	2.43	0.46
3:A:169:ASN:C	3:A:169:ASN:HD22	2.18	0.46
3:B:96:ASN:HD21	3:B:108:SER:HB2	1.80	0.46
3:B:172:LEU:HD11	3:B:197:ILE:HD11	1.97	0.46
3:A:31:PHE:CE1	3:A:34:ARG:CZ	2.99	0.46
3:A:306:ILE:O	3:A:306:ILE:HG22	2.15	0.46
3:B:168:TYR:HA	3:B:291:ALA:HB1	1.98	0.46
3:B:211:LYS:HE2	3:B:211:LYS:HB3	1.67	0.46
1:C:28:DA:C2'	1:C:29:DA:C8	2.98	0.46
2:D:11:DA:C2'	2:D:12:DT:H5'	2.40	0.46
3:B:173:ARG:NH1	3:B:201:LYS:HB2	2.31	0.46
3:A:224:TRP:O	3:A:228:SER:N	2.35	0.46
3:A:310:MET:SD	3:A:318:VAL:HG12	2.55	0.46
3:A:195:ILE:O	3:A:211:LYS:N	2.46	0.46
3:A:199:ARG:NH1	3:A:314:GLY:CA	2.78	0.46
3:A:318:VAL:O	3:A:320:ILE:N	2.49	0.46
3:A:318:VAL:HG21	3:A:322:MET:CE	2.46	0.46
1:C:16[A]:DG:P	3:B:316:THR:HG1	2.32	0.46
2:D:13:DA:C2	2:D:14:DG:C5	3.04	0.46
3:A:146:ARG:HG2	3:A:161:LEU:HD21	1.98	0.46
3:B:215:LEU:O	3:B:218:THR:HB	2.16	0.46
3:B:320:ILE:CG2	3:B:324:TYR:CE2	2.99	0.46
3:A:202:THR:C	3:B:130:ARG:HE	2.15	0.45
1:C:14:DA:O5'	1:C:14:DA:H2'	2.16	0.45
3:A:297:ARG:NH2	3:A:328:LEU:HD11	2.31	0.45
3:B:19:THR:O	3:B:20:SER:C	2.52	0.45
3:B:175:ALA:O	3:B:179:ARG:HG3	2.15	0.45
3:B:194:LEU:CD2	3:B:212:ALA:HB2	2.46	0.45
3:A:185:ILE:HG13	3:A:185:ILE:O	2.17	0.45
3:A:209:VAL:CG1	3:A:210:GLU:N	2.80	0.45
3:B:237:TYR:CE2	3:B:255:GLN:HG2	2.52	0.45
3:A:135:LEU:O	3:A:290:SER:HB3	2.16	0.45
3:A:166:ILE:HD12	3:A:239:PHE:HE2	1.81	0.45
3:A:230:VAL:O	3:A:232:ASP:N	2.46	0.45
3:B:48:VAL:HG21	3:B:94:GLN:HB2	1.99	0.45
1:C:16[B]:DG:OP2	3:B:317:ASN:HB3	2.16	0.45
2:D:11:DA:H2"	2:D:12:DT:C5'	2.41	0.45
3:B:89:GLN:HE22	3:B:121:ARG:NH2	2.14	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:182:VAL:HG23	3:B:236:ASN:O	2.16	0.45
3:B:193:MET:HE2	3:B:221:VAL:HB	1.98	0.45
1:C:23:DA:H2'	1:C:24:DT:C7	2.46	0.45
3:A:36:ALA:O	3:B:118:ARG:NH1	2.50	0.45
3:A:31:PHE:O	3:A:34:ARG:NH1	2.38	0.45
3:B:25:LYS:O	3:B:29:ASP:N	2.45	0.45
3:B:281:GLN:HB2	3:B:284:LEU:HD21	1.99	0.45
3:B:327:ASN:N	3:B:327:ASN:HD22	2.15	0.45
2:D:15:DC:O2	2:D:16[B]:DA:C5	2.70	0.45
3:B:128:GLY:O	3:B:129:GLU:C	2.53	0.45
3:B:193:MET:CE	3:B:221:VAL:HB	2.47	0.45
3:A:197:ILE:H	3:A:197:ILE:HG12	1.50	0.44
3:A:314:GLY:HA2	3:B:326:ARG:CZ	2.45	0.44
2:D:25:DA:OP2	3:B:288:GLY:HA3	2.18	0.44
3:A:166:ILE:O	3:A:170:THR:HG23	2.17	0.44
3:B:199:ARG:HB2	3:B:204:VAL:HG22	1.99	0.44
3:A:272:ILE:CG2	3:A:273:TYR:CE1	3.00	0.44
3:A:297:ARG:HB3	3:A:328:LEU:HD21	2.00	0.44
3:B:128:GLY:O	3:B:130:ARG:HG2	2.18	0.44
3:B:306:ILE:N	3:B:307:PRO:CD	2.80	0.44
2:D:12:DT:H4'	3:A:282:ARG:NH2	2.32	0.44
3:B:146:ARG:O	3:B:150:GLU:HB2	2.18	0.44
3:B:335:MET:C	3:B:337:ARG:N	2.69	0.44
3:A:245:ASN:OD1	3:A:245:ASN:N	2.42	0.44
2:D:25:DA:H2"	2:D:26:DC:O5'	2.18	0.44
3:A:69:GLU:O	3:A:72:ARG:HB3	2.18	0.44
3:B:130:ARG:NH1	3:B:130:ARG:CG	2.76	0.44
3:A:282:ARG:NH1	3:A:282:ARG:CG	2.79	0.44
2:D:16[B]:DA:H2'	2:D:16[B]:DA:P	2.57	0.43
3:A:138:GLU:O	3:A:141:ASP:N	2.41	0.43
3:B:224:TRP:NE1	3:B:238:LEU:O	2.43	0.43
2:D:18[B]:DA:H2"	2:D:19[B]:DC:O4'	2.18	0.43
3:B:140:THR:O	3:B:144:GLN:HG3	2.17	0.43
3:A:80:ALA:C	3:A:82:GLY:H	2.21	0.43
1:C:20:DG:C8	4:C:44:HOH:O	2.71	0.43
1:C:32:DT:H2"	1:C:33:DA:C8	2.53	0.43
3:A:162:ALA:O	3:A:165:GLY:N	2.48	0.43
3:B:313:GLY:HA3	3:B:315:TRP:CE3	2.50	0.43
3:B:229:GLY:O	3:B:232:ASP:HB2	2.17	0.43
2:D:15:DC:C2'	2:D:16[A]:DA:C8	3.02	0.43
3:A:314:GLY:CA	3:B:326:ARG:HH12	2.31	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:10:DT:H2"	4:D:131:HOH:O	2.17	0.43
2:D:23:DA:C8	2:D:24:DT:H72	2.53	0.43
3:A:282:ARG:HA	3:A:282:ARG:HD3	1.74	0.43
3:A:265:PHE:HZ	3:A:291:ALA:HB2	1.83	0.43
3:B:183:LYS:HG2	3:B:234:PRO:O	2.19	0.43
3:A:277:ASP:HB2	3:A:278:ASP:H	1.18	0.43
3:B:186:SER:O	3:B:187:ARG:HG2	2.19	0.43
3:A:155:CYS:O	3:A:157:ASP:N	2.52	0.42
1:C:20:DG:N7	4:C:44:HOH:O	2.37	0.42
2:D:19[B]:DC:C2'	2:D:20:DA:C8	3.03	0.42
2:D:23:DA:OP2	3:B:38:SER:HB2	2.19	0.42
2:D:23:DA:C5'	3:B:201:LYS:HG3	2.49	0.42
3:B:121:ARG:O	3:B:125:VAL:HG13	2.19	0.42
3:B:279:SER:OG	3:B:284:LEU:HD11	2.20	0.42
3:B:335:MET:O	3:B:336:VAL:C	2.56	0.42
3:A:71:VAL:O	3:A:75:LEU:HG	2.18	0.42
3:B:279:SER:CB	3:B:281:GLN:HE21	2.33	0.42
2:D:23:DA:H5'	3:B:201:LYS:HG2	1.97	0.42
3:A:276:LYS:CD	3:A:276:LYS:H	2.32	0.42
3:A:282:ARG:HH11	3:A:282:ARG:CG	2.32	0.42
1:C:32:DT:C2'	1:C:33:DA:C8	3.02	0.42
2:D:12:DT:C4'	3:A:282:ARG:HH12	2.32	0.42
2:D:17[A]:DT:P	3:A:202:THR:HB	2.59	0.42
2:D:18[B]:DA:H2"	2:D:19[B]:DC:C5'	2.50	0.42
3:A:201:LYS:HE2	3:A:201:LYS:CA	2.36	0.42
3:B:282:ARG:O	3:B:283:TYR:HB2	2.19	0.42
3:A:160:ASN:O	3:A:164:LEU:HG	2.19	0.42
3:B:203:LEU:CD1	3:B:205:SER:HB3	2.49	0.42
3:B:180:ILE:HD13	3:B:195:ILE:CG2	2.45	0.42
2:D:3:DA:H2'	2:D:3:DA:O5'	2.19	0.42
1:C:27:DG:H2"	1:C:28:DA:OP2	2.20	0.42
3:A:116:VAL:CG1	3:A:117:MET:N	2.83	0.42
3:A:299:MET:HA	3:B:338:LEU:HD11	2.01	0.42
3:A:300:ALA:N	3:A:309:ILE:HD11	2.35	0.42
3:B:24:ARG:HH11	3:B:24:ARG:HB3	1.84	0.42
3:A:260:ALA:O	3:A:263:GLY:N	2.52	0.41
3:B:196:HIS:HB2	3:B:210:GLU:OE2	2.20	0.41
3:A:81:ARG:CZ	3:A:83:LEU:HD11	2.50	0.41
3:A:299:MET:O	3:A:304:VAL:HB	2.20	0.41
2:D:12:DT:C5'	3:A:282:ARG:NH2	2.76	0.41
2:D:16[B]:DA:OP2	2:D:16[B]:DA:H8	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:220:LEU:C	3:A:222:GLU:N	2.73	0.41
3:A:309:ILE:CG2	3:A:321:VAL:HG11	2.39	0.41
1:C:23:DA:H2"	1:C:24:DT:O5'	2.20	0.41
3:A:72:ARG:HH11	3:A:72:ARG:CG	2.30	0.41
3:A:216:GLY:O	3:A:218:THR:N	2.53	0.41
3:A:276:LYS:HB2	3:A:276:LYS:HE3	1.41	0.41
3:B:27:LEU:HD12	3:B:30:MET:CE	2.46	0.41
2:D:22:DT:O2	3:B:201:LYS:HE2	2.19	0.41
3:A:158:ILE:CD1	3:A:224:TRP:HA	2.51	0.41
3:A:183:LYS:O	3:A:185:ILE:N	2.53	0.41
3:A:184:ASP:O	3:A:195:ILE:HA	2.20	0.41
2:D:19[B]:DC:H2'	2:D:20:DA:C8	2.55	0.41
3:B:48:VAL:HG21	3:B:94:GLN:CG	2.49	0.41
1:C:8:DC:H42	2:D:27:DG:H1	1.67	0.41
1:C:10:DT:P	3:B:50:ARG:HH21	2.44	0.41
1:C:13:DA:H2"	1:C:14:DA:O5'	2.19	0.41
1:C:16[B]:DG:C5'	3:B:316:THR:HG1	2.25	0.41
3:A:96:ASN:HA	3:A:107:PRO:HD2	2.02	0.41
3:A:299:MET:C	3:A:309:ILE:HD11	2.40	0.41
3:A:26:ASN:O	3:A:29:ASP:HB2	2.21	0.41
3:A:104:LEU:CB	3:A:105:PRO:CD	2.99	0.41
3:A:318:VAL:CG2	3:A:322:MET:SD	3.09	0.41
3:B:333:GLY:C	3:B:335:MET:N	2.73	0.41
3:A:46:LEU:HD12	3:A:46:LEU:HA	1.88	0.40
3:A:316:THR:O	3:A:316:THR:HG23	2.20	0.40
3:A:174:LEU:C	3:A:176:GLU:N	2.74	0.40
3:B:27:LEU:HD12	3:B:27:LEU:HA	1.72	0.40
3:B:89:GLN:HE22	3:B:121:ARG:HH21	1.68	0.40
3:B:182:VAL:C	3:B:184:ASP:H	2.24	0.40
1:C:26:DC:H2"	1:C:27:DG:N7	2.35	0.40
3:A:272:ILE:HG21	3:A:273:TYR:CE1	2.55	0.40
1:C:28:DA:C2'	1:C:29:DA:H8	2.35	0.40
3:A:128:GLY:O	3:A:129:GLU:C	2.59	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	322/349 (92%)	268 (83%)	39 (12%)	15 (5%)	2 2
3	B	316/349 (90%)	288 (91%)	24 (8%)	4 (1%)	12 18
All	All	638/698 (91%)	556 (87%)	63 (10%)	19 (3%)	4 5

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	189	ASP
3	A	234	PRO
3	A	275	ALA
3	A	307	PRO
3	B	129	GLU
3	B	277	ASP
3	B	326	ARG
3	A	155	CYS
3	A	175	ALA
3	A	199	ARG
3	A	231	ALA
3	B	288	GLY
3	A	184	ASP
3	A	188	THR
3	A	156	GLN
3	A	217	VAL
3	A	222	GLU
3	A	282	ARG
3	A	279	SER

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	268/291 (92%)	204 (76%)	64 (24%)	0 0
3	B	265/291 (91%)	228 (86%)	37 (14%)	3 4
All	All	533/582 (92%)	432 (81%)	101 (19%)	1 1

All (101) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	30	MET
3	A	46	LEU
3	A	61	ARG
3	A	89	GLN
3	A	92	LEU
3	A	97	MET
3	A	100	ARG
3	A	114	SER
3	A	116	VAL
3	A	117	MET
3	A	118	ARG
3	A	119	ARG
3	A	135	LEU
3	A	138	GLU
3	A	139	ARG
3	A	140	THR
3	A	146	ARG
3	A	147	SER
3	A	148	LEU
3	A	149	MET
3	A	152	SER
3	A	156	GLN
3	A	161	LEU
3	A	169	ASN
3	A	174	LEU
3	A	181	ARG
3	A	185	ILE
3	A	186	SER
3	A	188	THR
3	A	192	ARG
3	A	194	LEU
3	A	197	ILE
3	A	199	ARG

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Mol	Chain	Res	Type
3	A	201	LYS
3	A	202	THR
3	A	204	VAL
3	A	205	SER
3	A	210	GLU
3	A	213	LEU
3	A	214	SER
3	A	218	THR
3	A	220	LEU
3	A	222	GLU
3	A	226	SER
3	A	227	VAL
3	A	230	VAL
3	A	233	ASP
3	A	235	ASN
3	A	253	THR
3	A	259	SER
3	A	270	ARG
3	A	276	LYS
3	A	277	ASP
3	A	282	ARG
3	A	299	MET
3	A	308	GLU
3	A	309	ILE
3	A	310	MET
3	A	315	TRP
3	A	316	THR
3	A	322	MET
3	A	330	SER
3	A	332	THR
3	A	335	MET
3	B	24	ARG
3	B	27	LEU
3	B	28	MET
3	B	34	ARG
3	B	38	SER
3	B	46	LEU
3	B	87	THR
3	B	92	LEU
3	B	97	MET
3	B	108	SER
3	B	118	ARG

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Mol	Chain	Res	Type
3	B	129	GLU
3	B	130	ARG
3	B	138	GLU
3	B	169	ASN
3	B	183	LYS
3	B	186	SER
3	B	193	MET
3	B	199	ARG
3	B	203	LEU
3	B	209	VAL
3	B	211	LYS
3	B	219	LYS
3	B	241	ARG
3	B	254	SER
3	B	255	GLN
3	B	277	ASP
3	B	278	ASP
3	B	289	HIS
3	B	292	ARG
3	B	319	ASN
3	B	325	ILE
3	B	327	ASN
3	B	328	LEU
3	B	332	THR
3	B	339	LEU
3	B	340	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	59	ASN
3	A	79	GLN
3	A	144	GLN
3	A	156	GLN
3	A	169	ASN
3	A	235	ASN
3	A	236	ASN
3	A	258	ASN
3	B	26	ASN
3	B	40	HIS
3	B	60	ASN
3	B	89	GLN

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Mol	Chain	Res	Type
3	B	90	GLN
3	B	133	GLN
3	B	255	GLN
3	B	258	ASN
3	B	281	GLN
3	B	327	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	D	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	15:DC	O3'	16[B]:DA	P	1.78

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	19[B]:DC	O3'	20:DA	P	0.81

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	C	33/34 (97%)	-0.20	3 (9%) 9 7	27, 46, 73, 100	0
2	D	34/34 (100%)	-0.37	0 100 100	28, 45, 68, 79	0
3	A	324/349 (92%)	0.35	30 (9%) 8 7	23, 62, 95, 100	17 (5%)
3	B	320/349 (91%)	-0.06	3 (0%) 84 83	20, 39, 82, 99	3 (0%)
All	All	711/766 (92%)	0.10	36 (5%) 28 25	20, 50, 94, 100	20 (2%)

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	A	282	ARG	7.4
3	A	199	ARG	6.2
3	A	191	GLY	4.8
3	A	304	VAL	4.0
3	A	201	LYS	3.8
3	A	309	ILE	3.7
3	A	180	ILE	3.6
3	A	197	ILE	3.6
3	A	195	ILE	3.6
3	A	175	ALA	3.2
3	A	185	ILE	3.1
3	A	202	THR	3.1
3	B	339	LEU	3.1
3	A	200	THR	3.0
3	A	276	LYS	2.9
3	A	295	ALA	2.9
1	C	19	DT	2.9
1	C	16[A]	DG	2.9
3	B	19	THR	2.7
3	A	182	VAL	2.7
3	A	198	GLY	2.7

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Mol	Chain	Res	Type	RSRZ
3	B	328	LEU	2.7
3	A	166	ILE	2.7
3	A	18	ALA	2.7
3	A	308	GLU	2.5
3	A	212	ALA	2.4
3	A	194	LEU	2.3
3	A	210	GLU	2.3
3	A	142	PHE	2.3
3	A	233	ASP	2.3
3	A	187	ARG	2.2
3	A	172	LEU	2.2
3	A	139	ARG	2.2
3	A	204	VAL	2.1
3	A	281	GLN	2.1
1	C	18	DA	2.1

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.