



## Full wwPDB EM Validation Report ⓘ

Mar 31, 2024 – 01:18 AM JST

PDB ID : 8JAY  
EMDB ID : EMD-36138  
Title : CrtSPARTA Octamer bound with guide-target  
Authors : Guo, L.J.; Huang, P.P.; Li, Z.X.; Xiao, Y.B.; Chen, M.R.  
Deposited on : 2023-05-07  
Resolution : 4.20 Å (reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : **FAILED**  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

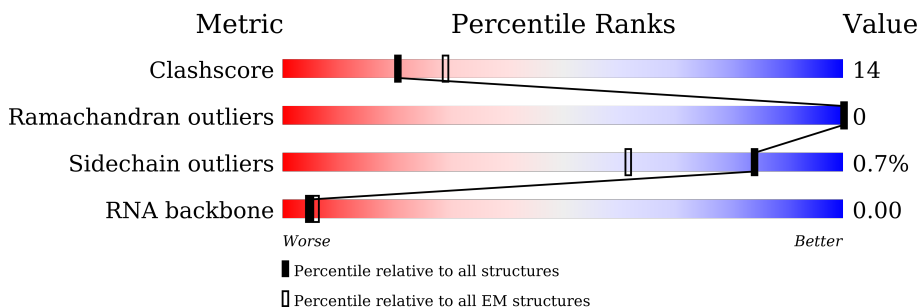
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.20 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.




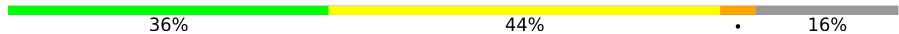
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain			
1	A	507	65%	23%	12%	
1	C	507	63%	26%	11%	
1	I	507	68%	20%	12%	
1	M	507	66%	22%	12%	•
2	B	450	61%	32%	6%	
2	D	450	60%	33%	6%	•
2	J	450	60%	33%	6%	
2	N	450	64%	29%	6%	

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Mol	Chain	Length	Quality of chain
3	E	21	
3	G	21	
3	K	21	
3	O	21	
4	F	25	
4	H	25	
4	L	25	
4	P	25	

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 31982 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Piwi domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	C	449	Total 3626	C 2352	N 604	O 659	S 11	0	0
1	A	448	Total 3618	C 2348	N 603	O 656	S 11	0	0
1	I	448	Total 3618	C 2348	N 603	O 656	S 11	0	0
1	M	448	Total 3618	C 2348	N 603	O 656	S 11	0	0

- Molecule 2 is a protein called TIR domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	422	Total 3531	C 2290	N 595	O 635	S 11	0	0
2	B	422	Total 3531	C 2290	N 595	O 635	S 11	0	0
2	J	422	Total 3531	C 2290	N 595	O 635	S 11	0	0
2	N	422	Total 3531	C 2290	N 595	O 635	S 11	0	0

- Molecule 3 is a RNA chain called RNA (5'-R(P\*UP\*GP\*AP\*CP\*GP\*GP\*CP\*UP\*CP\*UP\*AP\*AP\*UP\*CP\*UP\*AP\*UP\*UP\*AP\*GP\*U)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	E	21	Total 422	C 198	N 73	O 130	P 21	0	0
3	G	21	Total 422	C 198	N 73	O 130	P 21	0	0
3	K	21	Total 422	C 198	N 73	O 130	P 21	0	0
3	O	21	Total 422	C 198	N 73	O 130	P 21	0	0

- Molecule 4 is a DNA chain called DNA (25-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
4	F	21	Total	C	N	O	P	3	0
			432	206	82	123	21		
4	H	20	Total	C	N	O	P	3	0
			411	196	77	118	20		
4	L	21	Total	C	N	O	P	3	0
			432	206	82	123	21		
4	P	20	Total	C	N	O	P	3	0
			411	196	77	118	20		

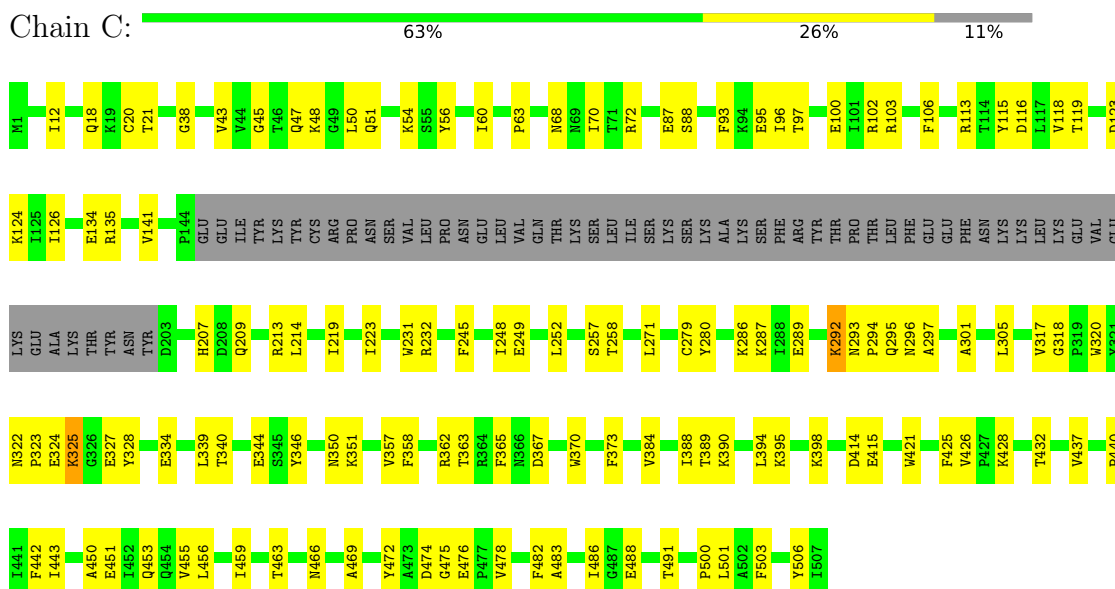
- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
5	M	1	Total	Mg	0
			1	1	
5	E	1	Total	Mg	0
			1	1	
5	G	1	Total	Mg	0
			1	1	
5	K	1	Total	Mg	0
			1	1	

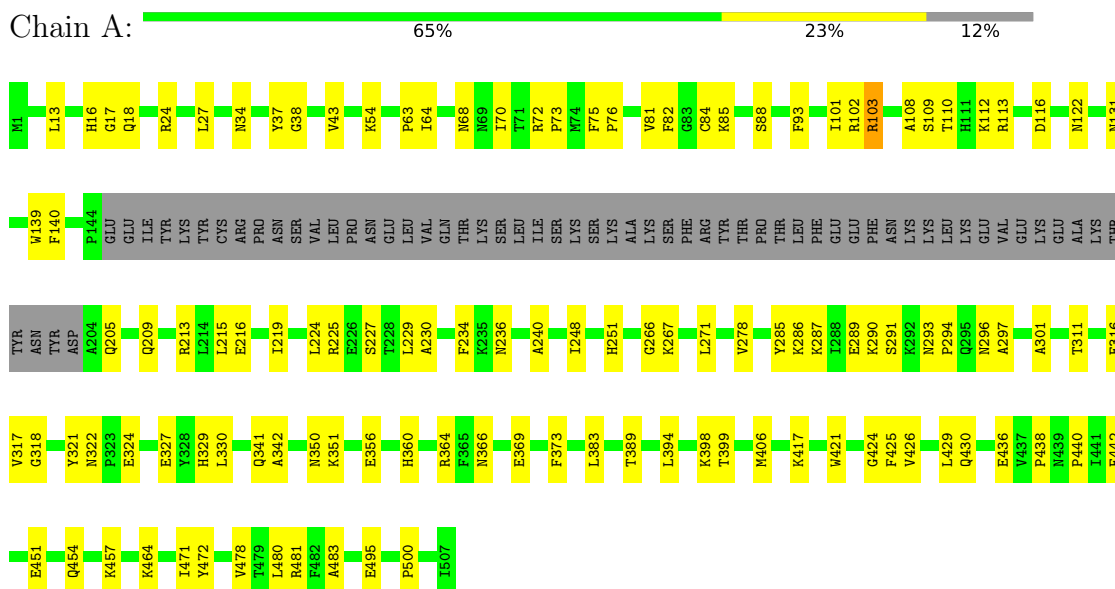
### 3 Residue-property plots [i](#)

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. 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. 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: Piwi domain-containing protein



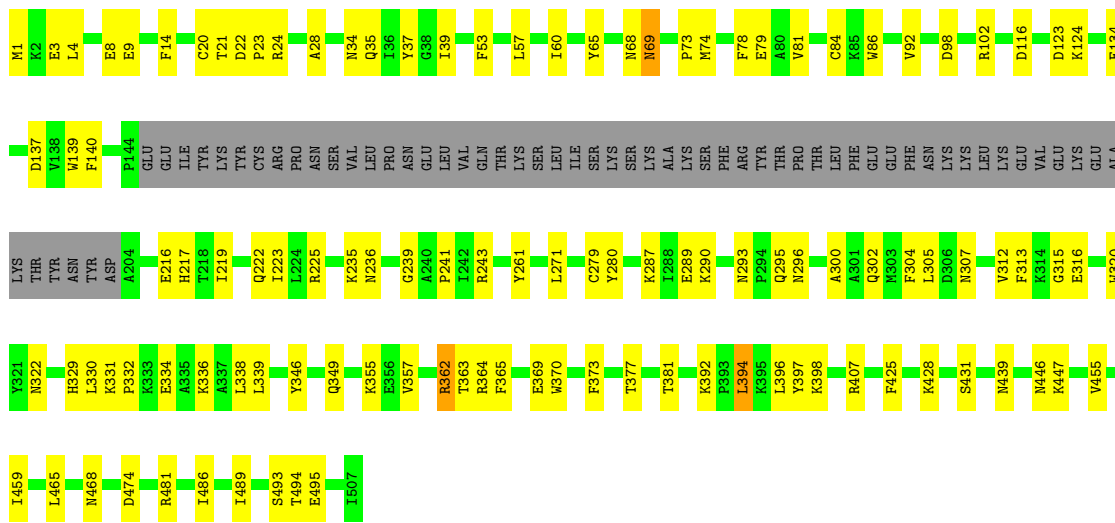
- Molecule 1: Piwi domain-containing protein



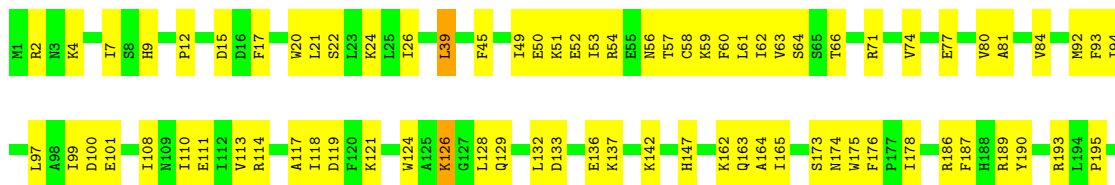
• Molecule 1: Piwi domain-containing protein

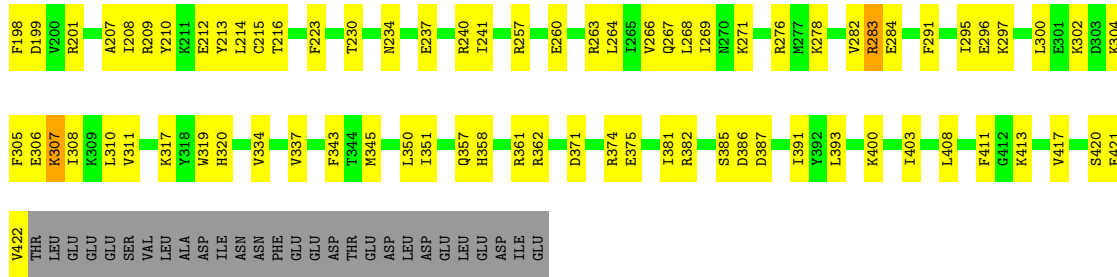


• Molecule 1: Piwi domain-containing protein

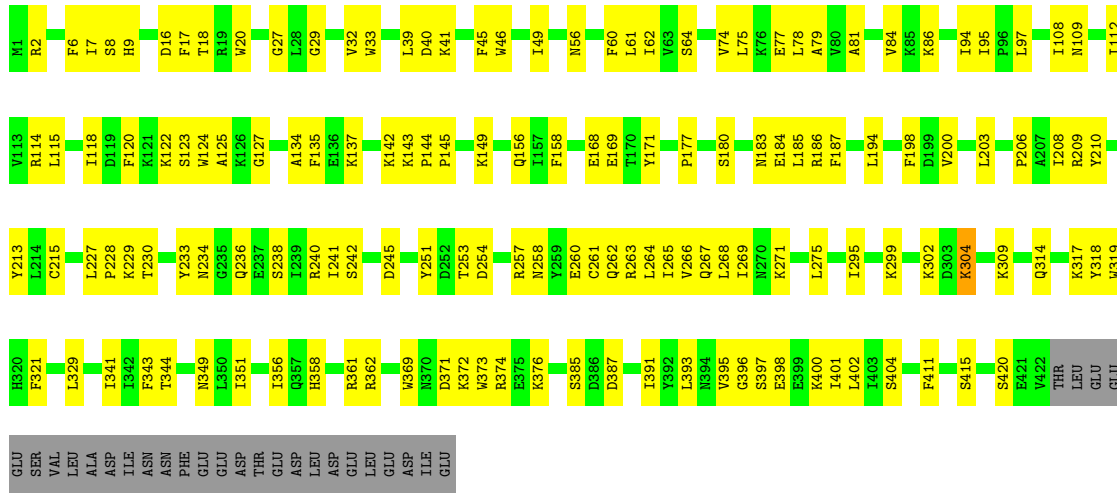


• Molecule 2: TIR domain-containing protein

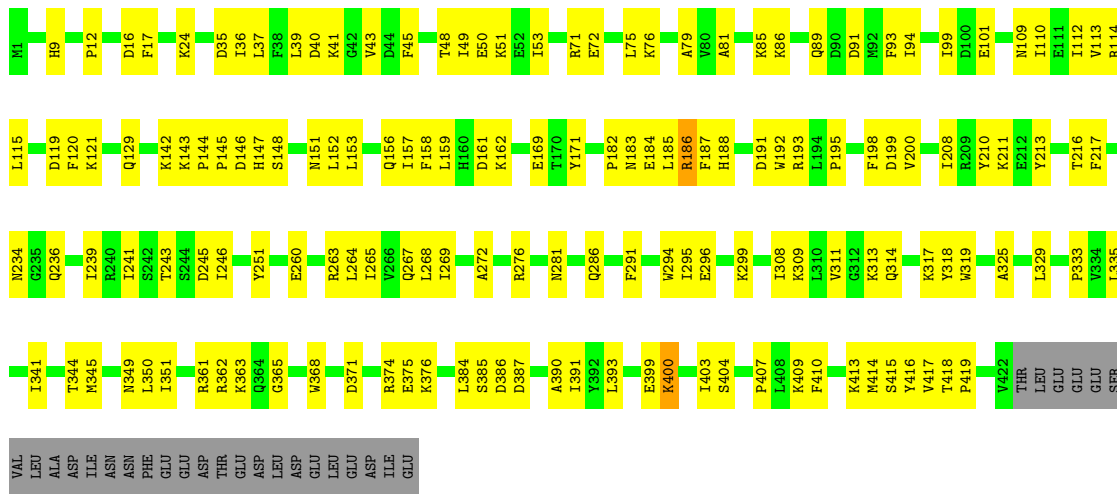




• Molecule 2: TIR domain-containing protein



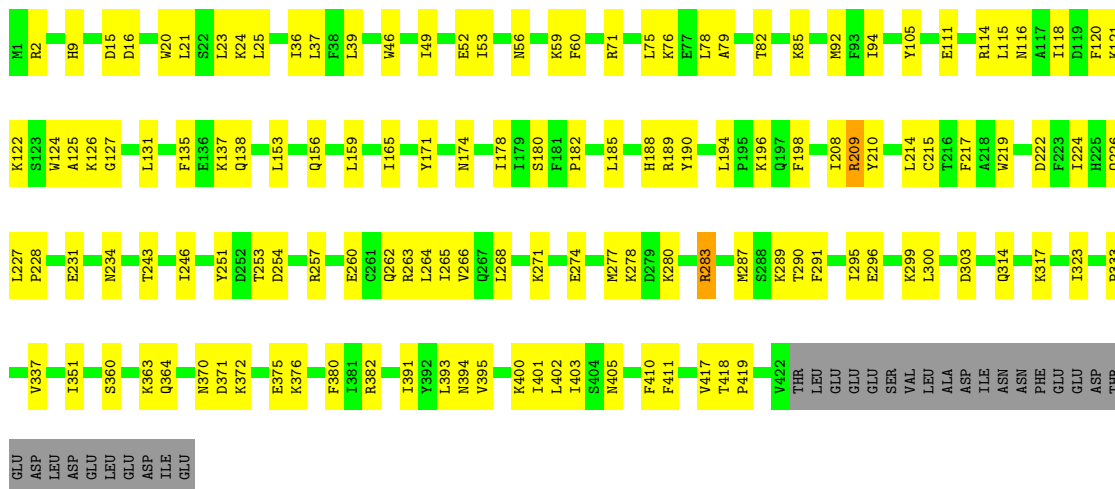
• Molecule 2: TIR domain-containing protein



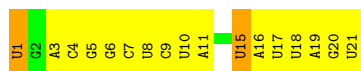
• Molecule 2: TIR domain-containing protein



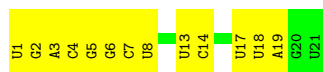




- Molecule 3: RNA (5'-R(P\*UP\*GP\*AP\*CP\*GP\*GP\*CP\*UP\*CP\*UP\*AP\*AP\*UP\*CP\*UP\*A P\*UP\*UP\*AP\*GP\*U)-3')



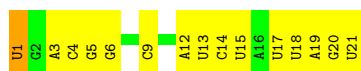
- Molecule 3: RNA (5'-R(P\*UP\*GP\*AP\*CP\*GP\*GP\*CP\*UP\*CP\*UP\*AP\*AP\*UP\*CP\*UP\*A P\*UP\*UP\*AP\*GP\*U)-3')



- Molecule 3: RNA (5'-R(P\*UP\*GP\*AP\*CP\*GP\*GP\*CP\*UP\*CP\*UP\*AP\*AP\*UP\*CP\*UP\*A P\*UP\*UP\*AP\*GP\*U)-3')



- Molecule 3: RNA (5'-R(P\*UP\*GP\*AP\*CP\*GP\*GP\*CP\*UP\*CP\*UP\*AP\*AP\*UP\*CP\*UP\*A P\*UP\*UP\*AP\*GP\*U)-3')



- Molecule 4: DNA (25-MER)

Chain F:  28% 56% 16%

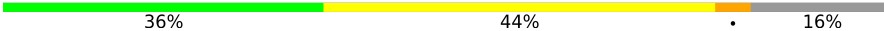


● Molecule 4: DNA (25-MER)

Chain H:  32% 48% 20%



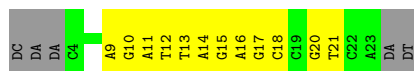
● Molecule 4: DNA (25-MER)

Chain L:  36% 44% 1% 16%



● Molecule 4: DNA (25-MER)

Chain P:  32% 48% 20%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	147489	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

## 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

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	0.25	0/3710	0.48	0/5023
1	C	0.28	0/3718	0.52	0/5034
1	I	0.25	0/3710	0.47	0/5023
1	M	0.26	0/3710	0.49	1/5023 (0.0%)
2	B	0.25	0/3620	0.51	0/4879
2	D	0.25	0/3620	0.53	1/4879 (0.0%)
2	J	0.24	0/3620	0.51	0/4879
2	N	0.25	0/3620	0.51	0/4879
3	E	0.63	1/472 (0.2%)	0.95	2/721 (0.3%)
3	G	0.61	1/472 (0.2%)	0.86	1/721 (0.1%)
3	K	0.62	1/472 (0.2%)	0.87	2/721 (0.3%)
3	O	0.61	1/472 (0.2%)	0.85	1/721 (0.1%)
4	F	0.59	0/485	0.96	0/746
4	H	0.54	0/461	0.89	0/709
4	L	0.58	0/485	0.96	1/746 (0.1%)
4	P	0.52	0/461	0.89	0/709
All	All	0.31	4/33108 (0.0%)	0.57	9/45413 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1	U	OP3-P	-10.67	1.48	1.61
3	E	1	U	OP3-P	-10.61	1.48	1.61
3	O	1	U	OP3-P	-10.60	1.48	1.61
3	K	1	U	OP3-P	-10.51	1.48	1.61

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	17	U	O4'-C1'-N1	8.91	115.33	108.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	O	17	U	O4'-C1'-N1	8.68	115.14	108.20
3	K	17	U	O4'-C1'-N1	7.62	114.29	108.20
3	E	17	U	O4'-C1'-N1	6.95	113.76	108.20
2	D	39	LEU	CA-CB-CG	5.84	128.72	115.30
3	E	15	U	O4'-C1'-N1	5.56	112.65	108.20
4	L	13[A]	DT	O4'-C1'-N1	5.29	111.70	108.00
1	M	394	LEU	CA-CB-CG	5.06	126.93	115.30
3	K	8	U	O4'-C1'-N1	5.03	112.22	108.20

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3618	0	3642	80	0
1	C	3626	0	3646	93	0
1	I	3618	0	3642	81	0
1	M	3618	0	3642	86	0
2	B	3531	0	3544	116	0
2	D	3531	0	3544	121	0
2	J	3531	0	3544	122	0
2	N	3531	0	3544	110	0
3	E	422	0	224	20	0
3	G	422	0	224	13	0
3	K	422	0	224	13	0
3	O	422	0	224	16	0
4	F	432	0	223	19	0
4	H	411	0	212	11	0
4	L	432	0	223	15	0
4	P	411	0	212	10	0
5	E	1	0	0	0	0
5	G	1	0	0	0	0
5	K	1	0	0	0	0
5	M	1	0	0	0	0
All	All	31982	0	30514	841	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 14.

All (841) 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:B:318:TYR:HB2	2:B:344:THR:O	1.61	1.01
1:C:279:CYS:HB3	1:C:357:VAL:HA	1.54	0.89
1:M:397:TYR:HE1	2:N:370:ASN:HB2	1.38	0.87
1:C:478:VAL:O	1:C:482:PHE:HB2	1.83	0.78
2:J:43:VAL:H	2:N:115:LEU:HA	1.48	0.78
1:I:427:PRO:HG2	2:J:162:LYS:HD3	1.67	0.77
4:H:8:DT:H2'	4:H:9:DA:H8	1.50	0.77
1:C:296:ASN:HD22	1:C:322:ASN:H	1.32	0.77
1:M:92:VAL:HG11	1:M:134:GLU:HG3	1.67	0.76
2:N:283:ARG:NH2	2:N:296:GLU:OE1	2.19	0.75
2:B:187:PHE:O	2:B:238:SER:HA	1.85	0.75
1:M:289:GLU:HA	1:M:293:ASN:HA	1.70	0.74
2:D:358:HIS:CE1	2:D:361:ARG:HH21	2.06	0.74
2:B:385:SER:HA	2:B:391:ILE:HG12	1.70	0.73
2:B:180:SER:H	2:B:402:LEU:HD21	1.53	0.73
2:N:290:THR:HG22	2:N:291:PHE:H	1.52	0.73
2:D:110:ILE:HG21	2:N:49:ILE:HG12	1.70	0.73
2:J:263:ARG:NH2	4:L:9:DA:N3	2.37	0.72
2:D:193:ARG:HH12	2:D:230:THR:HG22	1.52	0.72
2:J:184:GLU:O	2:J:186:ARG:NH1	2.22	0.72
2:B:79:ALA:HB2	2:N:114:ARG:HH21	1.55	0.72
2:B:263:ARG:NH2	4:F:9:DA:N3	2.38	0.72
1:M:302:GLN:HA	1:M:315:GLY:HA2	1.71	0.72
1:M:216:GLU:OE1	1:M:217:HIS:ND1	2.21	0.71
1:I:362:ARG:NH1	1:I:363:THR:OG1	2.24	0.71
1:A:24:ARG:HD2	1:A:73:PRO:HD2	1.73	0.70
1:C:279:CYS:SG	1:C:280:TYR:N	2.65	0.70
2:N:174:ASN:ND2	2:N:337:VAL:O	2.24	0.70
2:J:319:TRP:HB2	2:J:341:ILE:HD11	1.73	0.69
2:N:209:ARG:NH1	2:N:210:TYR:O	2.25	0.69
1:A:84:CYS:SG	1:A:85:LYS:N	2.65	0.69
2:D:9:HIS:ND1	2:D:15:ASP:OD2	2.22	0.69
2:D:66:THR:OG1	2:D:100:ASP:OD2	2.10	0.69
2:J:391:ILE:HB	2:J:403:ILE:HG13	1.74	0.69
1:A:103:ARG:HH21	1:A:109:SER:H	1.41	0.69
2:N:105:TYR:OH	2:N:116:ASN:ND2	2.25	0.69
4:H:10[A]:DG:H2'	4:H:11:DA:C8	2.28	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:114:ARG:HH12	2:J:79:ALA:HB2	1.58	0.68
1:I:1:MET:N	2:J:409:LYS:O	2.27	0.68
2:J:309:LYS:O	2:J:376:LYS:NZ	2.26	0.68
2:N:314:GLN:HG3	2:N:364:GLN:HB2	1.77	0.67
2:J:109:ASN:HB3	2:J:112:ILE:HB	1.76	0.67
4:F:19:DC:H2'	4:F:20:DG:C8	2.29	0.67
1:C:346:TYR:O	1:C:350:ASN:HB2	1.94	0.67
1:I:242:ILE:HG13	1:I:243:ARG:HG3	1.76	0.67
1:M:320:TRP:HB3	1:M:334:GLU:HB3	1.76	0.67
2:D:198:PHE:O	2:D:209:ARG:NH2	2.28	0.67
1:I:428:LYS:HB3	2:J:162:LYS:HG2	1.77	0.67
3:K:5:G:H2'	3:K:6:G:C8	2.30	0.66
1:M:305:LEU:HD13	1:M:346:TYR:HA	1.78	0.66
1:C:339:LEU:HD22	1:C:373:PHE:HD1	1.61	0.66
2:D:50:GLU:HG3	2:D:51:LYS:HD3	1.78	0.66
3:E:5:G:H2'	3:E:6:G:C8	2.31	0.66
1:C:398:LYS:O	2:D:374:ARG:NH1	2.29	0.66
2:B:234:ASN:HD21	2:B:236:GLN:HB3	1.61	0.66
2:J:362:ARG:HD2	3:K:6:G:H21	1.61	0.66
2:N:194:LEU:HB2	2:N:198:PHE:HE1	1.61	0.65
4:F:5:DT:H2'	4:F:6:DA:H8	1.61	0.65
1:C:87:GLU:OE2	1:C:87:GLU:N	2.29	0.65
1:A:316:GLU:HG3	1:A:342:ALA:HA	1.78	0.65
2:J:112:ILE:HG23	2:J:113:VAL:HG13	1.78	0.65
1:C:365:PHE:HE2	1:C:370:TRP:HB2	1.62	0.64
2:N:60:PHE:HB3	2:N:94:ILE:HA	1.80	0.64
1:C:362:ARG:NH1	1:C:363:THR:OG1	2.30	0.64
2:J:211:LYS:HA	3:K:18:U:H5'	1.79	0.64
2:J:185:LEU:HB2	2:J:241:ILE:HB	1.78	0.64
1:C:54:LYS:HD2	1:C:88:SER:HB2	1.80	0.64
2:J:40:ASP:OD2	2:N:138:GLN:NE2	2.31	0.64
1:M:271:LEU:HB2	1:M:465:LEU:HD11	1.80	0.64
1:A:16:HIS:O	1:A:18:GLN:NE2	2.31	0.63
3:G:5:G:H2'	3:G:6:G:C8	2.32	0.63
1:M:14:PHE:HZ	1:M:23:PRO:HA	1.61	0.63
1:I:57:LEU:O	1:I:61:GLN:NE2	2.32	0.63
1:I:426:VAL:HB	1:I:429:LEU:HB2	1.81	0.63
1:I:469:ALA:HB2	3:K:3:A:H4'	1.79	0.63
2:N:224:ILE:HD13	2:N:231:GLU:HG2	1.81	0.63
2:N:391:ILE:HB	2:N:403:ILE:HB	1.81	0.63
1:M:20:CYS:SG	1:M:21:THR:N	2.71	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:101:ILE:HG13	1:A:102:ARG:HD2	1.81	0.62
2:J:12:PRO:HD2	2:J:71:ARG:HH12	1.64	0.62
2:B:238:SER:O	2:B:240:ARG:NH1	2.32	0.62
1:C:425:PHE:HB3	1:C:432:THR:HA	1.80	0.62
2:D:282:VAL:HG12	2:D:295:ILE:HD13	1.79	0.62
1:M:339:LEU:HD22	1:M:373:PHE:HD1	1.65	0.62
1:C:324:GLU:HG2	1:C:327:GLU:HB2	1.79	0.62
2:D:108:ILE:HD11	2:D:113:VAL:HA	1.80	0.62
1:I:135:ARG:NH1	1:M:137:ASP:OD2	2.32	0.62
3:G:7:C:H2'	3:G:8:U:C6	2.34	0.62
1:A:103:ARG:HE	1:A:108:ALA:HB3	1.65	0.62
2:N:49:ILE:HG13	2:N:53:ILE:HD12	1.82	0.62
2:D:393:LEU:O	2:D:400:LYS:HA	2.00	0.62
2:B:341:ILE:HD11	2:B:361:ARG:HB2	1.82	0.62
3:E:10:U:H2'	3:E:11:A:C8	2.35	0.62
1:C:488:GLU:HA	1:C:491:THR:HG22	1.80	0.62
2:D:361:ARG:NH1	2:D:362:ARG:HE	1.98	0.62
1:C:287:LYS:HD2	1:C:295:GLN:HA	1.82	0.61
2:J:217:PHE:HE2	2:J:399:GLU:HB2	1.65	0.61
1:A:426:VAL:HG13	1:A:429:LEU:HB2	1.82	0.61
1:A:398:LYS:HA	2:B:171:TYR:HD1	1.65	0.61
2:D:351:ILE:O	2:D:357:GLN:NE2	2.34	0.61
2:J:365:GLY:HA2	2:J:368:TRP:HD1	1.65	0.61
2:B:120:PHE:HE1	2:B:127:GLY:HA3	1.63	0.61
2:J:363:LYS:NZ	4:L:20:DG:OP2	2.30	0.61
2:D:114:ARG:HH11	2:N:79:ALA:HB2	1.65	0.61
1:M:362:ARG:O	1:M:362:ARG:NH1	2.32	0.61
2:J:344:THR:OG1	2:J:349:ASN:O	2.13	0.61
1:C:106:PHE:O	1:C:113:ARG:NH2	2.33	0.61
1:I:34:ASN:O	1:I:261:TYR:OH	2.18	0.61
1:I:398:LYS:O	2:J:374:ARG:NH1	2.34	0.61
2:D:128:LEU:HD23	2:D:132:LEU:HD23	1.82	0.61
1:I:428:LYS:HA	2:J:161:ASP:HB3	1.81	0.61
3:K:19:A:H3'	3:K:20:G:H5''	1.82	0.61
1:I:14:PHE:HZ	1:I:23:PRO:HA	1.66	0.60
1:I:296:ASN:HA	1:I:322:ASN:H	1.66	0.60
2:D:283:ARG:NH2	2:D:296:GLU:OE1	2.32	0.60
2:B:46:TRP:O	2:B:49:ILE:HG12	1.99	0.60
2:B:183:ASN:OD1	2:B:184:GLU:N	2.34	0.60
2:B:253:THR:O	2:B:257:ARG:NH1	2.34	0.60
1:A:54:LYS:HZ2	1:A:88:SER:HG	1.49	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:371:ASP:OD1	2:B:372:LYS:NZ	2.34	0.60
4:F:19:DC:H2'	4:F:20:DG:H8	1.66	0.60
2:D:189:ARG:NH2	2:D:210:TYR:O	2.33	0.60
1:M:24:ARG:HD2	1:M:73:PRO:HD2	1.83	0.60
1:C:43:VAL:HG13	1:C:93:PHE:HD1	1.67	0.60
2:N:59:LYS:HG3	2:N:135:PHE:HE1	1.67	0.60
3:K:4:C:H2'	3:K:5:G:C8	2.36	0.60
1:A:364:ARG:HH22	4:F:12[A]:DT:H4'	1.67	0.60
2:N:257:ARG:N	2:N:260:GLU:OE2	2.29	0.60
2:B:114:ARG:HH21	2:J:75:LEU:HB2	1.67	0.60
2:B:177:PRO:HD2	2:B:404:SER:HB2	1.84	0.60
1:I:305:LEU:HB2	1:I:346:TYR:HD1	1.66	0.60
2:J:210:TYR:O	2:J:211:LYS:HG2	2.02	0.60
1:M:305:LEU:HD11	1:M:349:GLN:HB3	1.82	0.60
1:C:20:CYS:SG	1:C:21:THR:N	2.75	0.60
2:N:317:LYS:HG3	2:N:351:ILE:HD11	1.82	0.60
1:C:305:LEU:HD12	1:C:346:TYR:CD1	2.37	0.59
1:A:43:VAL:HG13	1:A:93:PHE:HD1	1.67	0.59
2:D:100:ASP:OD1	2:D:101:GLU:N	2.34	0.59
1:C:388:ILE:HD12	1:C:443:ILE:HD12	1.85	0.59
2:N:9:HIS:ND1	2:N:15:ASP:OD2	2.35	0.59
2:D:284:GLU:HB2	2:D:291:PHE:HB3	1.83	0.59
2:B:358:HIS:NE2	4:F:18:DC:O2	2.35	0.59
2:N:263:ARG:HH12	4:P:9:DA:H2	1.48	0.59
1:A:63:PRO:HB3	1:A:76:PRO:HA	1.85	0.59
2:D:71:ARG:HB2	2:D:74:VAL:HG22	1.84	0.59
2:J:390:ALA:HA	2:J:404:SER:HA	1.84	0.59
2:D:190:TYR:OH	2:D:234:ASN:O	2.18	0.59
1:A:34:ASN:HD21	1:A:267:LYS:H	1.51	0.58
2:D:60:PHE:HE2	2:D:62:ILE:HB	1.67	0.58
1:I:4:LEU:HD11	2:J:410:PHE:HB3	1.84	0.58
2:J:386:ASP:H	2:J:391:ILE:HG12	1.67	0.58
1:A:327:GLU:OE2	1:A:329:HIS:N	2.36	0.58
1:A:205:GLN:O	1:A:209:GLN:NE2	2.29	0.58
2:B:396:GLY:O	2:B:400:LYS:NZ	2.32	0.58
3:G:18:U:H2'	3:G:19:A:C8	2.39	0.58
3:K:15:U:N3	3:K:16:A:N7	2.52	0.58
2:J:265:ILE:HA	2:J:268:LEU:HG	1.86	0.58
1:M:397:TYR:CE1	2:N:370:ASN:HB2	2.30	0.58
2:B:27:GLY:O	2:B:149:LYS:NZ	2.34	0.58
2:B:60:PHE:HE2	2:B:78:LEU:HD13	1.68	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:393:LEU:HB2	2:B:401:ILE:HB	1.85	0.58
2:N:253:THR:O	2:N:257:ARG:NH1	2.36	0.58
1:C:305:LEU:HD12	1:C:346:TYR:HD1	1.68	0.58
2:B:209:ARG:HH22	3:E:18:U:H4'	1.69	0.58
2:D:174:ASN:ND2	2:D:337:VAL:O	2.36	0.57
2:J:407:PRO:O	2:J:409:LYS:NZ	2.33	0.57
2:D:49:ILE:HG13	2:D:53:ILE:HD12	1.85	0.57
2:N:393:LEU:HB3	2:N:401:ILE:HB	1.86	0.57
1:M:397:TYR:O	2:N:171:TYR:HB3	2.04	0.57
3:E:20:G:H1	4:F:5:DT:H73	1.70	0.57
1:C:395:LYS:HE3	1:C:437:VAL:HG21	1.87	0.57
4:P:12[A]:DT:H2''	4:P:13[A]:DT:H5''	1.86	0.57
2:D:358:HIS:O	2:D:361:ARG:HG3	2.03	0.57
1:M:279:CYS:HB3	1:M:357:VAL:HG12	1.87	0.57
2:B:118:ILE:HD11	2:B:127:GLY:HA2	1.85	0.57
2:B:351:ILE:HD12	2:B:356:ILE:HG13	1.87	0.57
4:H:10[A]:DG:H2'	4:H:11:DA:H8	1.67	0.57
1:C:38:GLY:HA2	1:A:37:TYR:HE2	1.69	0.57
1:C:289:GLU:HA	1:C:293:ASN:HA	1.87	0.56
1:A:122:ASN:HD22	1:A:213:ARG:HE	1.53	0.56
2:B:262:GLN:HB2	2:B:329:LEU:HD11	1.86	0.56
2:B:369:TRP:H	2:B:372:LYS:HE2	1.71	0.56
3:O:18:U:H2'	3:O:19:A:C8	2.40	0.56
2:N:185:LEU:HD23	2:N:243:THR:HG22	1.88	0.56
2:D:374:ARG:NE	2:D:375:GLU:OE2	2.38	0.56
4:F:7:DA:H2''	4:F:8:DT:H5'	1.88	0.56
3:G:2:G:O6	3:G:3:A:N6	2.38	0.56
3:G:5:G:H2'	3:G:6:G:H8	1.71	0.56
3:O:19:A:H2'	3:O:20:G:C8	2.40	0.56
3:O:19:A:H2'	3:O:20:G:H8	1.71	0.56
2:D:283:ARG:HH12	2:D:296:GLU:N	2.03	0.56
2:J:119:ASP:OD1	2:J:120:PHE:N	2.38	0.56
2:N:189:ARG:HE	2:N:214:LEU:HG	1.70	0.56
2:D:210:TYR:HD1	2:D:213:TYR:H	1.53	0.56
1:I:344:GLU:OE1	1:I:344:GLU:N	2.39	0.56
4:L:15:DG:H2'	4:L:16:DA:H8	1.70	0.56
1:M:222:GLN:NE2	1:M:223:ILE:O	2.39	0.56
2:D:263:ARG:NH2	2:D:267:GLN:OE1	2.31	0.55
2:D:283:ARG:HH12	2:D:296:GLU:HB2	1.71	0.55
1:I:108:ALA:O	1:I:113:ARG:NH1	2.39	0.55
2:D:208:ILE:HG13	2:D:215:CYS:HB2	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:363:THR:OG1	4:P:13[A]:DT:OP1	2.23	0.55
2:B:16:ASP:OD1	2:B:17:PHE:N	2.39	0.55
3:K:5:G:H2'	3:K:6:G:H8	1.70	0.55
1:A:286:LYS:H	1:A:297:ALA:HB2	1.71	0.55
2:J:187:PHE:HB3	2:J:239:ILE:HB	1.87	0.55
2:B:184:GLU:HG3	2:B:242:SER:HA	1.88	0.55
1:C:214:LEU:HD21	1:C:219:ILE:HB	1.88	0.55
2:J:296:GLU:HA	2:J:311:VAL:HG11	1.88	0.55
1:M:474:ASP:OD2	1:M:481:ARG:NH2	2.40	0.55
1:C:500:PRO:O	1:C:506:TYR:OH	2.16	0.55
1:A:464:LYS:NZ	1:A:472:TYR:O	2.33	0.55
1:I:87:GLU:OE2	1:I:90:ASN:ND2	2.40	0.55
1:M:236:ASN:HD22	1:M:239:GLY:HA2	1.71	0.55
1:A:278:VAL:HG23	1:A:356:GLU:HB3	1.88	0.55
4:F:16:DA:H2'	4:F:17:DG:C8	2.42	0.55
4:F:16:DA:H2'	4:F:17:DG:H8	1.70	0.55
2:J:276:ARG:HD2	2:J:393:LEU:HA	1.89	0.55
1:I:495:GLU:OE1	1:I:495:GLU:N	2.40	0.54
2:N:52:GLU:HA	2:N:56:ASN:HB2	1.88	0.54
2:J:129:GLN:OE1	2:J:156:GLN:NE2	2.39	0.54
1:M:365:PHE:HE1	1:M:370:TRP:HB2	1.72	0.54
2:N:180:SER:OG	2:N:402:LEU:N	2.28	0.54
2:B:385:SER:OG	2:B:387:ASP:O	2.25	0.54
2:J:50:GLU:HA	2:J:53:ILE:HG22	1.88	0.54
3:E:5:G:H2'	3:E:6:G:H8	1.69	0.54
1:M:79:GLU:OE2	1:M:79:GLU:N	2.34	0.54
1:M:362:ARG:NE	4:P:14:DA:OP2	2.37	0.54
1:C:463:THR:OG1	1:C:474:ASP:O	2.25	0.54
1:A:224:LEU:HD21	1:A:229:LEU:HD23	1.89	0.54
1:I:54:LYS:NZ	1:I:88:SER:O	2.41	0.54
1:M:65:TYR:HD1	1:M:74:MET:HE3	1.72	0.54
2:D:118:ILE:HG23	2:B:41:LYS:HZ2	1.73	0.54
1:I:20:CYS:SG	1:I:21:THR:N	2.79	0.54
2:J:329:LEU:HD23	2:J:333:PRO:HA	1.90	0.54
3:G:4:C:H2'	3:G:5:G:C8	2.43	0.54
2:D:110:ILE:HG22	2:N:76:LYS:HZ1	1.73	0.54
1:I:37:TYR:HB2	1:M:37:TYR:HD2	1.73	0.54
3:E:15:U:N3	3:E:16:A:N7	2.56	0.54
1:C:279:CYS:HG	1:C:346:TYR:HE2	1.53	0.53
2:D:189:ARG:HB2	2:D:214:LEU:HG	1.89	0.53
2:D:343:PHE:O	2:D:350:LEU:HD13	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:421:GLU:HG3	2:D:422:VAL:HG13	1.90	0.53
1:M:8:GLU:OE2	1:M:8:GLU:N	2.35	0.53
1:A:301:ALA:HB2	1:A:483:ALA:HB2	1.91	0.53
2:D:306:GLU:OE1	2:D:382:ARG:NH2	2.39	0.53
1:I:426:VAL:HG11	1:I:429:LEU:HD23	1.91	0.53
2:J:245:ASP:HB3	2:J:251:TYR:HB2	1.89	0.53
1:A:451:GLU:OE1	1:A:454:GLN:N	2.40	0.53
2:D:12:PRO:HD2	2:D:71:ARG:HH12	1.73	0.53
1:M:377:THR:OG1	1:M:381:THR:OG1	2.19	0.53
1:M:235:LYS:HG3	1:M:236:ASN:H	1.74	0.53
1:M:39:ILE:HB	1:M:86:TRP:CD1	2.44	0.53
1:M:364:ARG:NH1	4:P:13[A]:DT:OP1	2.41	0.53
2:N:296:GLU:HB3	2:N:299:LYS:HE2	1.88	0.53
2:D:133:ASP:HA	2:D:136:GLU:HG3	1.90	0.53
1:I:426:VAL:HG12	1:I:428:LYS:H	1.73	0.53
1:A:216:GLU:OE1	1:A:216:GLU:N	2.33	0.53
1:I:40:LYS:HG3	1:I:135:ARG:HH21	1.72	0.53
3:O:20:G:H3'	3:O:21:U:H5'	1.89	0.53
1:I:118:VAL:HG23	1:I:210:LEU:HD23	1.90	0.53
4:H:18:DC:H2''	4:H:19:DC:H5''	1.90	0.53
3:O:5:G:H2'	3:O:6:G:C8	2.44	0.53
1:C:292:LYS:NZ	1:C:323:PRO:O	2.42	0.53
1:I:378:PRO:HG2	1:I:381:THR:HG21	1.91	0.53
2:J:43:VAL:HG23	2:N:116:ASN:H	1.74	0.53
2:J:43:VAL:HG22	2:J:45:PHE:HE1	1.74	0.53
3:E:18:U:H3'	3:E:19:A:H8	1.74	0.53
3:E:20:G:H3'	3:E:21:U:H3'	1.91	0.53
2:B:187:PHE:HB3	2:B:213:TYR:CE2	2.44	0.52
1:M:397:TYR:OH	2:N:371:ASP:HA	2.10	0.52
2:N:188:HIS:NE2	2:N:190:TYR:OH	2.34	0.52
2:D:257:ARG:N	2:D:260:GLU:OE1	2.41	0.52
4:H:13[A]:DT:H2'	4:H:14:DA:H8	1.75	0.52
2:D:276:ARG:NE	2:D:276:ARG:O	2.42	0.52
1:M:3:GLU:HG3	2:N:411:PHE:HZ	1.75	0.52
1:M:78:PHE:HE1	1:M:84:CYS:HB3	1.73	0.52
1:I:245:PHE:CE2	1:I:252:LEU:HD12	2.44	0.52
2:N:182:PRO:O	2:N:243:THR:OG1	2.26	0.52
1:A:102:ARG:NE	1:A:116:ASP:HB3	2.25	0.52
1:I:339:LEU:HD23	1:I:376:VAL:HG12	1.91	0.52
1:A:64:ILE:HG22	1:A:75:PHE:HD2	1.75	0.52
2:B:261:CYS:O	2:B:265:ILE:HG23	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:317:VAL:HG22	1:C:318:GLY:H	1.75	0.52
1:A:251:HIS:HE1	1:A:471:ILE:HD13	1.74	0.52
1:A:316:GLU:HB3	1:A:341:GLN:HE21	1.73	0.52
3:E:18:U:H3'	3:E:19:A:C8	2.44	0.52
1:A:329:HIS:HB2	1:A:366:ASN:HD22	1.74	0.52
2:J:385:SER:OG	2:J:387:ASP:O	2.26	0.52
1:A:399:THR:HA	2:B:374:ARG:HH12	1.74	0.52
2:D:302:LYS:O	2:D:304:LYS:NZ	2.34	0.52
2:N:224:ILE:HD12	2:N:228:PRO:HA	1.92	0.52
3:O:13:U:H2'	3:O:14:C:C6	2.44	0.52
1:A:248:ILE:HG13	1:A:251:HIS:HB3	1.92	0.52
2:D:310:LEU:HG	2:D:311:VAL:HG23	1.91	0.52
1:M:34:ASN:O	1:M:261:TYR:OH	2.27	0.52
2:N:283:ARG:HH12	2:N:296:GLU:HB2	1.74	0.52
1:C:50:LEU:HD21	1:C:93:PHE:CZ	2.45	0.51
1:M:439:ASN:ND2	3:O:6:G:OP1	2.43	0.51
2:D:111:GLU:HB3	2:N:46:TRP:HH2	1.74	0.51
1:I:286:LYS:O	1:I:295:GLN:NE2	2.32	0.51
1:I:502:ALA:HB3	1:I:505:TYR:HE1	1.74	0.51
1:C:358:PHE:HE2	1:C:455:VAL:HG12	1.76	0.51
1:A:271:LEU:H	1:A:311:THR:HG21	1.75	0.51
2:J:43:VAL:HG23	2:N:116:ASN:N	2.25	0.51
1:M:493:SER:OG	1:M:495:GLU:OE1	2.22	0.51
2:N:120:PHE:CG	2:N:127:GLY:HA3	2.45	0.51
1:C:50:LEU:HD21	1:C:93:PHE:CE1	2.46	0.51
4:L:8:DT:H2''	4:L:9:DA:H8	1.74	0.51
2:J:16:ASP:OD1	2:J:17:PHE:N	2.44	0.51
2:J:314:GLN:N	2:J:317:LYS:O	2.43	0.51
4:H:5:DT:H2'	4:H:6:DA:H8	1.76	0.51
2:B:266:VAL:HA	2:B:269:ILE:HG12	1.93	0.51
1:M:300:ALA:HB3	1:M:316:GLU:HB2	1.91	0.51
2:D:350:LEU:HD12	2:D:351:ILE:H	1.75	0.51
2:D:385:SER:OG	2:D:387:ASP:O	2.29	0.51
2:B:194:LEU:HB3	2:B:227:LEU:HD13	1.93	0.51
1:M:68:ASN:OD1	1:M:69:ASN:N	2.44	0.51
1:M:235:LYS:HD2	1:M:241:PRO:HB3	1.92	0.51
1:I:421:TRP:CZ2	1:I:440:PRO:HG3	2.46	0.51
2:J:391:ILE:N	2:J:403:ILE:O	2.43	0.51
2:N:37:LEU:HD11	2:N:153:LEU:HD21	1.93	0.51
2:N:118:ILE:HD11	2:N:131:LEU:HD13	1.93	0.51
2:N:290:THR:HG22	2:N:291:PHE:N	2.22	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:296:ASN:HB3	1:A:322:ASN:H	1.76	0.51
1:A:478:VAL:HA	1:A:481:ARG:HB3	1.93	0.51
1:I:285:TYR:HA	1:I:297:ALA:HB1	1.92	0.51
1:C:100:GLU:O	1:C:103:ARG:NH1	2.44	0.50
2:B:61:LEU:HD12	2:B:97:LEU:HD11	1.93	0.50
1:M:9:GLU:OE1	1:M:407:ARG:NH1	2.44	0.50
2:D:20:TRP:HE1	2:D:24:LYS:HZ2	1.59	0.50
2:D:186:ARG:HH21	2:D:240:ARG:HE	1.59	0.50
2:N:182:PRO:HG3	2:N:401:ILE:HD11	1.94	0.50
1:C:301:ALA:HB2	1:C:483:ALA:HB2	1.94	0.50
2:D:39:LEU:HD12	2:D:39:LEU:O	2.11	0.50
2:J:148:SER:O	2:J:151:ASN:ND2	2.44	0.50
2:J:263:ARG:HD3	2:J:267:GLN:OE1	2.11	0.50
2:J:413:LYS:HG3	2:J:414:MET:SD	2.51	0.50
4:F:12[A]:DT:H2'	4:F:13[A]:DT:H5'	1.94	0.50
1:C:428:LYS:HA	2:D:162:LYS:HG2	1.91	0.50
2:B:29:GLY:O	2:B:143:LYS:NZ	2.34	0.50
2:B:60:PHE:CZ	2:B:77:GLU:HG3	2.46	0.50
1:I:14:PHE:CZ	1:I:23:PRO:HA	2.46	0.50
1:I:454:GLN:O	1:I:458:ASP:HB2	2.12	0.50
2:J:169:GLU:OE2	2:J:171:TYR:OH	2.23	0.50
2:J:281:ASN:O	2:J:299:LYS:NZ	2.39	0.50
2:N:194:LEU:HB2	2:N:198:PHE:CE1	2.44	0.50
2:B:209:ARG:HH12	3:E:18:U:H4'	1.77	0.50
1:C:63:PRO:HG3	2:D:124:TRP:CZ2	2.47	0.50
1:I:366:ASN:ND2	1:I:369:GLU:OE2	2.44	0.50
4:F:15:DG:H2'	4:F:16:DA:C8	2.46	0.50
1:I:2:LYS:H	2:J:410:PHE:HD1	1.59	0.49
1:I:347:LYS:HG3	1:I:353:TYR:HE2	1.77	0.49
2:J:186:ARG:NE	2:J:216:THR:O	2.31	0.49
1:C:350:ASN:O	1:C:351:LYS:HG2	2.12	0.49
1:I:87:GLU:OE1	1:I:87:GLU:N	2.44	0.49
2:N:75:LEU:HD23	2:N:78:LEU:HD21	1.93	0.49
1:A:81:VAL:HG23	1:A:82:PHE:HD1	1.76	0.49
4:F:15:DG:H2'	4:F:16:DA:H8	1.77	0.49
1:C:231:TRP:NE1	1:C:249:GLU:OE2	2.45	0.49
1:C:295:GLN:NE2	1:C:328:TYR:H	2.10	0.49
1:C:414:ASP:OD1	1:C:415:GLU:N	2.45	0.49
2:B:314:GLN:HG3	2:B:319:TRP:CD1	2.46	0.49
2:J:152:LEU:HD23	2:J:152:LEU:H	1.77	0.49
2:D:20:TRP:HE1	2:D:24:LYS:NZ	2.11	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:117:ALA:HA	2:B:41:LYS:HE3	1.95	0.49
2:D:311:VAL:HA	2:D:319:TRP:O	2.13	0.49
2:B:208:ILE:HG13	2:B:215:CYS:HB3	1.94	0.49
2:J:416:TYR:HE2	2:J:419:PRO:HD3	1.77	0.49
1:M:235:LYS:NZ	1:M:243:ARG:O	2.46	0.49
1:M:287:LYS:HB3	1:M:295:GLN:HG3	1.94	0.49
1:M:398:LYS:HA	2:N:171:TYR:HD1	1.77	0.49
4:H:13[A]:DT:H2'	4:H:14:DA:C8	2.47	0.49
2:J:72:GLU:O	2:J:76:LYS:HG2	2.12	0.49
2:B:258:ASN:O	2:B:262:GLN:NE2	2.38	0.49
2:J:246:ILE:HD13	2:J:251:TYR:HD2	1.78	0.49
2:J:415:SER:OG	2:J:416:TYR:N	2.46	0.49
2:N:246:ILE:HD13	2:N:251:TYR:HD2	1.76	0.49
3:E:4:C:H2'	3:E:5:G:C8	2.48	0.49
1:C:245:PHE:HZ	3:G:2:G:C6	2.29	0.49
1:C:390:LYS:NZ	1:C:476:GLU:OE1	2.46	0.49
2:J:393:LEU:H	2:J:400:LYS:HG2	1.78	0.49
2:N:165:ILE:HG23	2:N:417:VAL:HG22	1.95	0.49
2:N:217:PHE:HB2	2:N:395:VAL:HG22	1.93	0.49
4:H:16:DA:H2''	4:H:17:DG:O5'	2.13	0.49
2:D:263:ARG:NH1	2:D:267:GLN:HB2	2.28	0.49
2:D:351:ILE:HB	2:D:357:GLN:HE21	1.77	0.49
2:B:254:ASP:N	2:B:254:ASP:OD1	2.46	0.49
1:I:271:LEU:HD12	1:I:304:PHE:HZ	1.77	0.49
4:L:15:DG:H2'	4:L:16:DA:C8	2.47	0.49
2:D:266:VAL:HA	2:D:269:ILE:HG22	1.95	0.48
1:C:394:LEU:HD23	1:C:394:LEU:O	2.14	0.48
2:D:129:GLN:O	2:D:132:LEU:HG	2.14	0.48
1:I:305:LEU:HD22	1:I:346:TYR:HA	1.94	0.48
2:N:2:ARG:HA	2:N:56:ASN:HA	1.95	0.48
2:N:208:ILE:HG21	2:N:264:LEU:HD11	1.94	0.48
2:D:17:PHE:CE2	2:D:21:LEU:HD11	2.48	0.48
2:B:122:LYS:HG3	2:B:123:SER:H	1.78	0.48
2:J:17:PHE:CZ	2:J:99:ILE:HD11	2.48	0.48
1:M:394:LEU:HD23	1:M:394:LEU:O	2.13	0.48
3:O:14:C:H2'	3:O:15:U:C6	2.48	0.48
1:C:12:ILE:HG22	1:C:271:LEU:HD13	1.94	0.48
1:C:421:TRP:CD1	1:C:440:PRO:HB3	2.47	0.48
1:A:236:ASN:N	1:A:240:ALA:O	2.38	0.48
2:D:234:ASN:ND2	2:D:237:GLU:OE1	2.47	0.48
2:D:276:ARG:HG2	2:D:393:LEU:HD23	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:102:ARG:NH1	1:C:116:ASP:HB2	2.29	0.48
1:A:290:LYS:HG3	1:A:291:SER:H	1.78	0.48
2:D:297:LYS:HB3	2:D:311:VAL:HG11	1.95	0.48
2:D:361:ARG:NH2	3:G:7:C:H1'	2.28	0.48
2:B:114:ARG:HE	2:J:75:LEU:HD13	1.79	0.48
2:J:153:LEU:O	2:J:156:GLN:HG3	2.14	0.48
2:J:272:ALA:HB1	2:J:393:LEU:HD21	1.96	0.48
2:D:223:PHE:CG	2:D:223:PHE:O	2.66	0.48
2:B:169:GLU:OE1	2:B:415:SER:OG	2.32	0.48
2:J:295:ILE:HG23	2:J:299:LYS:HD3	1.95	0.48
1:M:139:TRP:CD1	1:M:219:ILE:HD11	2.48	0.48
1:I:39:ILE:HD11	1:I:86:TRP:CG	2.49	0.48
1:I:56:TYR:OH	1:I:252:LEU:HD22	2.14	0.48
2:N:124:TRP:HD1	2:N:124:TRP:O	1.97	0.48
4:L:16:DA:H2''	4:L:17:DG:O5'	2.14	0.48
1:A:285:TYR:HD1	1:A:297:ALA:HB3	1.78	0.48
2:B:317:LYS:HD2	2:B:343:PHE:HD2	1.78	0.48
1:C:286:LYS:HB3	1:C:297:ALA:HB3	1.96	0.48
2:D:199:ASP:OD1	2:D:201:ARG:NH1	2.47	0.48
2:D:371:ASP:OD1	2:D:371:ASP:N	2.45	0.48
2:B:145:PRO:HB2	2:B:149:LYS:HB2	1.95	0.48
1:I:442:PHE:HE1	1:I:444:GLU:HB2	1.79	0.48
2:J:182:PRO:HG2	2:J:217:PHE:HZ	1.78	0.48
3:G:13:U:H2'	3:G:14:C:C6	2.49	0.48
1:A:215:LEU:HD11	1:A:500:PRO:HD2	1.96	0.47
2:D:118:ILE:HG23	2:B:41:LYS:NZ	2.29	0.47
2:B:33:TRP:CH2	2:B:49:ILE:HG22	2.49	0.47
2:N:190:TYR:OH	2:N:234:ASN:O	2.24	0.47
3:E:8:U:H2'	3:E:9:C:C6	2.49	0.47
1:C:47:GLN:HA	1:C:50:LEU:HD23	1.95	0.47
2:D:420:SER:O	2:D:422:VAL:N	2.47	0.47
2:J:43:VAL:HB	2:N:114:ARG:C	2.35	0.47
1:M:86:TRP:HZ2	1:M:140:PHE:HE2	1.61	0.47
1:A:287:LYS:NZ	1:A:289:GLU:OE2	2.47	0.47
2:J:85:LYS:NZ	2:J:91:ASP:OD1	2.43	0.47
2:B:20:TRP:CZ3	2:B:124:TRP:HB3	2.49	0.47
2:B:33:TRP:HH2	2:B:49:ILE:HG22	1.80	0.47
1:I:296:ASN:OD1	1:I:297:ALA:N	2.40	0.47
2:J:86:LYS:O	2:J:89:GLN:NE2	2.46	0.47
2:J:385:SER:HA	2:J:391:ILE:HG12	1.97	0.47
1:M:307:ASN:OD1	1:M:312:VAL:HG23	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:124:TRP:O	2:N:124:TRP:CD1	2.67	0.47
3:E:20:G:N1	4:F:5:DT:H73	2.29	0.47
1:A:324:GLU:HG2	1:A:327:GLU:HB3	1.96	0.47
2:B:245:ASP:HB2	2:B:251:TYR:HB2	1.97	0.47
1:M:331:LYS:HD2	1:M:331:LYS:HA	1.68	0.47
4:H:5:DT:H2'	4:H:6:DA:C8	2.50	0.47
4:P:15:DG:H2'	4:P:16:DA:H8	1.80	0.47
1:C:123:ASP:OD1	1:C:124:LYS:N	2.48	0.47
2:D:60:PHE:CE2	2:D:62:ILE:HB	2.48	0.47
2:D:195:PRO:HD2	2:D:198:PHE:HE1	1.80	0.47
2:D:260:GLU:OE2	2:D:260:GLU:N	2.42	0.47
2:B:228:PRO:O	2:B:229:LYS:HG2	2.14	0.47
1:I:88:SER:O	1:I:88:SER:OG	2.33	0.47
1:I:208:ASP:OD1	1:I:208:ASP:N	2.48	0.47
2:J:183:ASN:HA	2:J:243:THR:HB	1.96	0.47
1:M:53:PHE:O	1:M:57:LEU:HD23	2.14	0.47
1:M:329:HIS:CE1	1:M:365:PHE:HA	2.50	0.47
2:N:82:THR:O	2:N:85:LYS:HG2	2.14	0.47
4:L:9:DA:C2'	4:L:10[A]:DG:H5'	2.44	0.47
4:L:19:DC:H4'	4:L:20:DG:OP1	2.13	0.47
1:C:48:LYS:O	1:C:51:GLN:NE2	2.47	0.47
1:I:14:PHE:CE2	1:I:20:CYS:HB3	2.49	0.47
2:N:382:ARG:NH2	2:N:405:ASN:O	2.46	0.47
1:A:394:LEU:HD23	1:A:394:LEU:O	2.14	0.47
1:I:347:LYS:HG3	1:I:353:TYR:CE2	2.49	0.47
2:J:350:LEU:HD23	2:J:350:LEU:H	1.80	0.47
1:C:426:VAL:HG11	1:C:472:TYR:HE2	1.80	0.47
2:N:137:LYS:HE2	2:N:138:GLN:NE2	2.30	0.47
2:B:81:ALA:HA	2:B:84:VAL:HG12	1.97	0.46
2:N:16:ASP:N	2:N:16:ASP:OD1	2.48	0.46
2:N:372:LYS:O	2:N:375:GLU:HG3	2.15	0.46
2:B:271:LYS:HD2	2:B:275:LEU:HD23	1.96	0.46
4:L:9:DA:H2''	4:L:10[A]:DG:H5'	1.97	0.46
2:D:110:ILE:HG13	2:N:49:ILE:HG21	1.98	0.46
2:D:187:PHE:CD1	2:D:215:CYS:HA	2.50	0.46
1:I:295:GLN:O	1:I:322:ASN:HB3	2.15	0.46
2:N:21:LEU:O	2:N:25:LEU:HD23	2.15	0.46
2:D:7:ILE:HG13	2:D:61:LEU:HB2	1.96	0.46
1:I:289:GLU:O	1:I:289:GLU:HG2	2.15	0.46
4:P:10[A]:DG:H2'	4:P:11:DA:C8	2.50	0.46
2:J:371:ASP:OD1	2:J:371:ASP:N	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L:12[A]:DT:H2'	4:L:13[A]:DT:H5'	1.98	0.46
1:A:406:MET:HB3	1:A:425:PHE:CZ	2.51	0.46
2:B:109:ASN:HD22	2:B:112:ILE:HB	1.80	0.46
1:I:366:ASN:OD1	1:I:368:GLU:HG3	2.16	0.46
2:J:43:VAL:N	2:N:115:LEU:HA	2.26	0.46
2:J:48:THR:HA	2:J:51:LYS:HG2	1.98	0.46
2:J:199:ASP:OD1	2:J:200:VAL:N	2.49	0.46
3:K:4:C:H2'	3:K:5:G:H8	1.78	0.46
3:O:18:U:H2'	3:O:19:A:H8	1.80	0.46
2:B:209:ARG:HH12	3:E:18:U:C4'	2.28	0.46
2:J:417:VAL:HG23	2:J:418:THR:H	1.81	0.46
3:E:7:C:H2'	3:E:8:U:C6	2.50	0.46
4:P:17:DG:H2''	4:P:18:DC:H5''	1.96	0.46
1:M:332:PRO:O	1:M:336:LYS:NZ	2.41	0.46
2:D:306:GLU:HB3	2:D:382:ARG:HH22	1.81	0.46
2:B:265:ILE:HA	2:B:268:LEU:HG	1.97	0.46
1:I:124:LYS:HB2	1:I:124:LYS:HE2	1.80	0.46
1:M:481:ARG:NH1	3:O:4:C:OP1	2.35	0.46
1:A:122:ASN:ND2	1:A:213:ARG:HB3	2.31	0.46
1:A:350:ASN:O	1:A:351:LYS:HG2	2.16	0.46
2:D:114:ARG:NH1	2:N:79:ALA:HB2	2.31	0.46
2:D:317:LYS:HE3	2:D:345:MET:HG3	1.98	0.46
2:B:295:ILE:HG23	2:B:299:LYS:HD3	1.97	0.46
2:D:92:MET:HE1	2:B:41:LYS:O	2.16	0.45
2:B:321:PHE:HE2	2:B:376:LYS:HD3	1.81	0.45
2:B:400:LYS:O	2:B:401:ILE:HD13	2.16	0.45
2:N:188:HIS:NE2	2:N:190:TYR:CZ	2.84	0.45
1:C:503:PHE:HA	1:C:506:TYR:HD2	1.81	0.45
2:D:305:PHE:O	2:D:308:ILE:HG22	2.16	0.45
2:B:2:ARG:HD3	2:B:56:ASN:HA	1.97	0.45
2:B:75:LEU:O	2:N:114:ARG:NH2	2.50	0.45
1:I:236:ASN:OD1	1:I:239:GLY:N	2.49	0.45
2:D:190:TYR:OH	2:D:237:GLU:OE2	2.34	0.45
2:J:36:ILE:O	2:J:37:LEU:HG	2.17	0.45
2:J:43:VAL:H	2:N:116:ASN:H	1.63	0.45
2:J:365:GLY:HA2	2:J:368:TRP:CD1	2.48	0.45
1:C:384:VAL:HG21	1:C:450:ALA:HB2	1.99	0.45
2:B:263:ARG:O	2:B:266:VAL:HG12	2.16	0.45
2:J:41:LYS:HD2	2:N:92:MET:SD	2.57	0.45
2:J:264:LEU:HA	2:J:267:GLN:NE2	2.32	0.45
2:N:360:SER:HA	2:N:363:LYS:HE2	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:22:SER:O	2:D:26:ILE:HG12	2.16	0.45
2:B:194:LEU:HD12	2:B:198:PHE:HD2	1.81	0.45
2:B:371:ASP:OD1	2:B:372:LYS:N	2.50	0.45
2:J:94:ILE:HD11	2:J:115:LEU:HD13	1.98	0.45
2:J:294:TRP:CZ3	2:J:296:GLU:HB2	2.51	0.45
1:M:302:GLN:HG3	1:M:313:PHE:CE1	2.52	0.45
3:E:3:A:H2'	3:E:4:C:C6	2.51	0.45
3:O:13:U:H2'	3:O:14:C:H6	1.81	0.45
1:C:296:ASN:ND2	1:C:322:ASN:H	2.08	0.45
2:D:63:VAL:HG22	2:D:97:LEU:HD12	1.99	0.45
2:D:283:ARG:NH1	2:D:296:GLU:HB2	2.32	0.45
2:B:309:LYS:O	2:B:376:LYS:NZ	2.46	0.45
2:N:20:TRP:O	2:N:24:LYS:HG2	2.16	0.45
2:N:289:LYS:HZ1	3:O:9:C:H5	1.65	0.45
1:C:367:ASP:OD1	1:C:367:ASP:N	2.50	0.45
1:I:454:GLN:HA	1:I:457:LYS:HG2	1.99	0.45
2:J:81:ALA:HB1	2:J:93:PHE:HE2	1.81	0.45
2:J:286:GLN:HB2	2:J:291:PHE:CE2	2.52	0.45
2:N:208:ILE:HG22	2:N:215:CYS:HB2	1.98	0.45
2:N:371:ASP:N	2:N:371:ASP:OD1	2.49	0.45
4:L:16:DA:H2'	4:L:17:DG:H8	1.81	0.45
2:J:188:HIS:CD2	2:J:193:ARG:HH11	2.35	0.45
3:K:7:C:H2''	3:K:8:U:OP1	2.17	0.45
1:C:56:TYR:O	1:C:60:ILE:HG23	2.17	0.45
1:C:118:VAL:HG22	1:C:213:ARG:HD3	1.99	0.45
2:D:175:TRP:HB3	2:D:334:VAL:HB	1.97	0.45
1:I:322:ASN:ND2	1:I:327:GLU:O	2.50	0.45
2:J:85:LYS:O	2:J:89:GLN:N	2.49	0.45
2:J:313:LYS:HA	2:J:318:TYR:HA	1.99	0.45
2:N:226:GLN:O	2:N:227:LEU:HD12	2.17	0.45
1:A:317:VAL:HG12	1:A:318:GLY:N	2.32	0.45
2:B:64:SER:OG	2:B:97:LEU:O	2.32	0.45
4:L:18:DC:H5'	4:L:18:DC:H6	1.81	0.45
1:C:207:HIS:CD2	1:C:223:ILE:HG21	2.52	0.44
1:C:320:TRP:HB3	1:C:334:GLU:HG2	2.00	0.44
2:D:173:SER:HB2	2:D:408:LEU:HB2	1.98	0.44
1:I:329:HIS:HB3	1:I:369:GLU:OE2	2.16	0.44
1:M:4:LEU:HD21	1:M:396:LEU:HD11	1.98	0.44
3:K:7:C:H2'	3:K:8:U:C6	2.52	0.44
1:A:110:THR:O	1:A:113:ARG:HG2	2.18	0.44
2:N:283:ARG:H	2:N:283:ARG:HD3	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:64:ILE:HG13	1:I:75:PHE:HB3	1.99	0.44
1:M:296:ASN:HB2	1:M:322:ASN:H	1.82	0.44
1:C:456:LEU:HD12	1:C:459:ILE:HD11	1.99	0.44
1:A:389:THR:HG22	1:A:442:PHE:HB3	2.00	0.44
1:I:305:LEU:HB2	1:I:346:TYR:CD1	2.49	0.44
2:J:24:LYS:HD2	2:J:24:LYS:HA	1.77	0.44
1:M:57:LEU:O	1:M:60:ILE:HG22	2.16	0.44
1:A:230:ALA:HB3	1:A:234:PHE:CE2	2.53	0.44
2:B:74:VAL:O	2:B:78:LEU:HD23	2.18	0.44
2:B:230:THR:HA	2:B:233:TYR:CE2	2.52	0.44
2:J:317:LYS:HE2	2:J:351:ILE:HD11	2.00	0.44
1:M:446:ASN:O	1:M:447:LYS:NZ	2.46	0.44
4:F:7:DA:H2'	4:F:8:DT:H71	1.98	0.44
1:C:56:TYR:OH	1:C:252:LEU:HD22	2.17	0.44
1:C:232:ARG:HA	1:C:232:ARG:NH1	2.32	0.44
1:A:373:PHE:HB3	1:A:383:LEU:HD21	1.98	0.44
1:A:430:GLN:HE21	2:B:420:SER:HB3	1.83	0.44
2:D:49:ILE:HA	2:D:53:ILE:HB	1.99	0.44
2:B:62:ILE:HD13	2:B:78:LEU:HD11	2.00	0.44
2:B:108:ILE:HG23	2:B:109:ASN:H	1.83	0.44
1:M:225:ARG:NH2	3:O:1:U:O2	2.51	0.44
4:L:20:DG:C8	4:L:21:DT:H72	2.52	0.44
2:D:178:ILE:HG22	2:D:403:ILE:HD13	1.99	0.44
1:I:280:TYR:OH	1:I:458:ASP:OD2	2.35	0.44
1:I:493:SER:OG	1:I:495:GLU:OE1	2.29	0.44
2:J:260:GLU:O	2:J:264:LEU:HG	2.18	0.44
1:M:223:ILE:HG23	3:O:1:U:H4'	2.00	0.44
2:N:156:GLN:HA	2:N:159:LEU:HD23	2.00	0.44
4:P:16:DA:H2''	4:P:17:DG:O5'	2.18	0.44
1:A:360:HIS:HB3	1:A:480:LEU:HD11	2.00	0.44
2:B:9:HIS:CG	2:B:18:THR:HG21	2.52	0.44
2:B:125:ALA:HB3	2:B:158:PHE:HB2	2.00	0.44
2:B:185:LEU:HD23	2:B:241:ILE:O	2.18	0.44
2:B:358:HIS:HA	2:B:361:ARG:HG2	1.99	0.44
2:B:358:HIS:HA	2:B:361:ARG:NE	2.33	0.44
1:C:325:LYS:NZ	3:G:13:U:H5'	2.33	0.44
1:C:340:THR:O	1:C:344:GLU:OE1	2.36	0.44
2:B:168:GLU:OE2	2:B:411:PHE:HB2	2.17	0.44
2:B:260:GLU:O	2:B:264:LEU:HD23	2.17	0.44
1:M:28:ALA:HA	1:M:81:VAL:HG23	2.00	0.44
1:M:65:TYR:HA	1:M:74:MET:HE3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:102:ARG:NH1	1:M:116:ASP:HB3	2.33	0.44
1:M:365:PHE:HB2	1:M:369:GLU:OE2	2.18	0.44
2:N:9:HIS:HE1	2:N:36:ILE:HG13	1.83	0.44
1:C:295:GLN:CD	1:C:328:TYR:H	2.21	0.43
1:A:495:GLU:OE1	1:A:495:GLU:N	2.51	0.43
2:D:49:ILE:HG22	2:D:54:ARG:HE	1.82	0.43
2:D:93:PHE:HB3	2:D:94:ILE:HD12	2.01	0.43
2:D:176:PHE:CZ	2:D:381:ILE:HG12	2.52	0.43
2:D:264:LEU:O	2:D:268:LEU:HD23	2.17	0.43
2:J:43:VAL:HG22	2:J:45:PHE:CE1	2.52	0.43
1:C:295:GLN:HE22	1:C:327:GLU:H	1.66	0.43
2:J:39:LEU:HD23	2:J:39:LEU:H	1.82	0.43
2:J:109:ASN:OD1	2:J:110:ILE:N	2.47	0.43
2:B:2:ARG:HA	2:B:56:ASN:HA	1.99	0.43
2:B:208:ILE:HG21	2:B:264:LEU:HD12	2.00	0.43
1:M:495:GLU:OE1	1:M:495:GLU:N	2.51	0.43
1:C:295:GLN:HE22	1:C:327:GLU:N	2.16	0.43
1:A:290:LYS:HG3	1:A:291:SER:N	2.33	0.43
1:A:417:LYS:HB3	1:A:442:PHE:CE2	2.54	0.43
2:B:262:GLN:HA	2:B:265:ILE:HG12	1.99	0.43
2:N:121:LYS:HB2	2:N:122:LYS:NZ	2.33	0.43
1:I:32:PRO:HG3	1:I:82:PHE:HD1	1.82	0.43
1:M:439:ASN:OD1	1:M:439:ASN:N	2.51	0.43
1:C:118:VAL:HG13	1:C:213:ARG:NH1	2.34	0.43
1:A:424:GLY:HA2	1:A:438:PRO:HG3	2.01	0.43
2:D:207:ALA:HA	2:D:216:THR:HG22	2.00	0.43
2:B:134:ALA:HA	2:B:137:LYS:HG2	2.01	0.43
2:B:186:ARG:NH1	2:B:240:ARG:HH21	2.16	0.43
2:B:260:GLU:OE1	2:B:260:GLU:N	2.50	0.43
1:I:482:PHE:O	1:I:486:ILE:HG13	2.18	0.43
2:J:129:GLN:HG2	2:J:157:ILE:HD13	2.00	0.43
2:N:71:ARG:HA	2:N:71:ARG:HD3	1.80	0.43
2:N:189:ARG:HG2	2:N:190:TYR:N	2.34	0.43
2:N:287:MET:HB3	2:N:290:THR:O	2.19	0.43
2:D:187:PHE:HE2	2:D:241:ILE:HD12	1.84	0.43
1:I:398:LYS:HE2	2:J:171:TYR:HE1	1.83	0.43
2:J:113:VAL:HG22	2:J:114:ARG:NH1	2.33	0.43
2:J:195:PRO:HD2	2:J:198:PHE:HE1	1.84	0.43
2:J:296:GLU:HA	2:J:311:VAL:HG21	2.00	0.43
1:M:486:ILE:HA	1:M:489:ILE:HG22	2.01	0.43
3:E:7:C:H2'	3:E:8:U:H6	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:21:U:H6	3:E:21:U:H2'	1.66	0.43
4:F:4:DC:H2''	4:F:5:DT:C2	2.54	0.43
3:G:18:U:H2'	3:G:19:A:H8	1.81	0.43
1:A:406:MET:HA	1:A:425:PHE:H	1.84	0.43
2:B:7:ILE:HD13	2:B:32:VAL:HG13	2.01	0.43
2:B:39:LEU:HD12	2:B:40:ASP:H	1.84	0.43
2:B:206:PRO:HG2	2:B:395:VAL:HG23	2.00	0.43
2:B:262:GLN:O	2:B:265:ILE:HG12	2.18	0.43
2:B:302:LYS:HD3	2:B:304:LYS:HG2	2.00	0.43
2:B:361:ARG:NH1	3:E:8:U:O5'	2.51	0.43
1:I:395:LYS:HD2	1:I:437:VAL:HG23	2.01	0.43
2:J:265:ILE:O	2:J:269:ILE:HG12	2.19	0.43
1:C:68:ASN:OD1	1:C:70:ILE:HG12	2.19	0.43
1:C:119:THR:HG22	1:C:213:ARG:HH22	1.82	0.43
2:D:119:ASP:HB3	2:D:126:LYS:HZ1	1.82	0.43
2:J:43:VAL:N	2:N:116:ASN:H	2.16	0.43
1:M:35:GLN:H	1:M:35:GLN:HG3	1.72	0.43
1:M:296:ASN:CB	1:M:322:ASN:H	2.31	0.43
1:M:455:VAL:O	1:M:459:ILE:HG22	2.19	0.43
1:M:494:THR:N	1:M:495:GLU:OE1	2.51	0.43
2:N:36:ILE:HA	2:N:39:LEU:HG	2.00	0.43
2:N:246:ILE:HD13	2:N:251:TYR:CD2	2.53	0.43
1:A:13:LEU:HD11	1:A:17:GLY:HA2	2.00	0.43
1:A:225:ARG:NH2	3:E:1:U:O2	2.42	0.43
2:B:358:HIS:CE1	2:B:362:ARG:HH11	2.36	0.43
2:J:210:TYR:O	2:J:213:TYR:HB2	2.18	0.43
2:N:254:ASP:OD1	2:N:254:ASP:N	2.51	0.43
1:C:483:ALA:O	1:C:486:ILE:HG22	2.19	0.42
2:D:99:ILE:HG13	2:D:100:ASP:N	2.33	0.42
1:I:414:ASP:OD1	1:I:417:LYS:N	2.51	0.42
2:N:9:HIS:CE1	2:N:36:ILE:HG13	2.54	0.42
4:F:5:DT:H2'	4:F:6:DA:C8	2.49	0.42
2:D:163:GLN:HB3	2:D:164:ALA:H	1.75	0.42
2:J:384:LEU:HD23	2:J:384:LEU:H	1.84	0.42
2:N:271:LYS:O	2:N:274:GLU:HG2	2.18	0.42
1:A:13:LEU:HD12	1:A:18:GLN:O	2.19	0.42
1:I:286:LYS:H	1:I:297:ALA:HB2	1.84	0.42
2:J:113:VAL:H	2:J:114:ARG:NH1	2.16	0.42
2:J:208:ILE:HG13	2:J:267:GLN:HE21	1.84	0.42
4:P:20:DG:H2'	4:P:21:DT:H71	2.01	0.42
1:C:141:VAL:O	1:C:223:ILE:HD12	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:339:LEU:HD22	1:C:373:PHE:CD1	2.48	0.42
2:D:296:GLU:HG3	2:D:297:LYS:N	2.35	0.42
2:D:296:GLU:HA	2:D:320:HIS:CE1	2.54	0.42
2:D:350:LEU:HD12	2:D:351:ILE:N	2.34	0.42
2:N:323:ILE:HG12	2:N:380:PHE:HE2	1.85	0.42
1:C:96:ILE:HG13	1:C:97:THR:N	2.34	0.42
1:C:292:LYS:HG3	1:C:294:PRO:HG3	2.01	0.42
2:D:49:ILE:HG23	2:D:80:VAL:HG11	2.01	0.42
1:I:50:LEU:HD21	1:I:93:PHE:CD1	2.55	0.42
1:C:257:SER:OG	1:C:258:THR:N	2.52	0.42
1:C:474:ASP:OD1	1:C:475:GLY:N	2.53	0.42
2:B:210:TYR:O	2:B:213:TYR:HB3	2.20	0.42
1:I:486:ILE:HG12	1:I:506:TYR:CE2	2.55	0.42
2:J:317:LYS:HZ1	2:J:345:MET:HB3	1.84	0.42
2:D:101:GLU:HA	2:D:121:LYS:HE3	2.00	0.42
2:D:165:ILE:HD11	2:D:417:VAL:HG22	2.01	0.42
2:D:283:ARG:H	2:D:283:ARG:HD3	1.84	0.42
2:D:300:LEU:H	2:D:300:LEU:HD23	1.83	0.42
2:B:397:SER:OG	2:B:398:GLU:OE1	2.29	0.42
1:I:110:THR:O	1:I:113:ARG:HG2	2.19	0.42
2:J:144:PRO:HA	2:J:145:PRO:HD3	1.98	0.42
2:N:125:ALA:O	2:N:126:LYS:HG2	2.20	0.42
3:K:8:U:H2'	3:K:9:C:C6	2.55	0.42
1:C:115:TYR:HD1	1:C:209:GLN:HE22	1.68	0.42
1:A:436:GLU:OE1	2:B:373:TRP:NE1	2.36	0.42
2:B:200:VAL:HA	2:B:203:LEU:HG	2.02	0.42
2:B:321:PHE:CE1	2:B:341:ILE:HG22	2.55	0.42
2:J:143:LYS:HE2	2:J:144:PRO:HD2	2.02	0.42
2:N:265:ILE:HA	2:N:268:LEU:HD12	2.02	0.42
2:N:375:GLU:OE2	2:N:376:LYS:NZ	2.45	0.42
1:C:134:GLU:OE2	1:C:134:GLU:N	2.38	0.42
1:C:317:VAL:HG22	1:C:318:GLY:N	2.34	0.42
1:C:466:ASN:ND2	3:G:4:C:OP1	2.49	0.42
2:N:125:ALA:C	2:N:127:GLY:H	2.22	0.42
2:N:178:ILE:HG12	2:N:333:PRO:HB2	2.02	0.42
2:B:144:PRO:HA	2:B:145:PRO:HD3	1.97	0.42
1:I:503:PHE:HD1	1:I:507:ILE:HD11	1.85	0.42
2:J:113:VAL:H	2:J:114:ARG:HH11	1.68	0.42
2:N:219:TRP:N	2:N:222:ASP:OD2	2.52	0.42
1:C:45:GLY:O	1:C:93:PHE:HZ	2.02	0.41
1:I:101:ILE:HD12	1:I:101:ILE:H	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:191:ASP:HB2	2:J:192:TRP:CE3	2.55	0.41
1:M:22:ASP:OD2	1:M:428:LYS:NZ	2.53	0.41
1:M:279:CYS:HB2	1:M:346:TYR:CE2	2.55	0.41
1:M:280:TYR:HB2	1:M:304:PHE:HD2	1.85	0.41
1:M:468:ASN:ND2	3:O:3:A:OP1	2.49	0.41
1:C:501:LEU:HD21	1:A:131:ASN:CG	2.40	0.41
1:A:296:ASN:CB	1:A:322:ASN:H	2.33	0.41
2:B:6:PHE:HE1	2:B:8:SER:HB2	1.84	0.41
1:I:67:HIS:ND1	1:I:247:LYS:HD2	2.35	0.41
1:M:1:MET:H2	2:N:410:PHE:HA	1.84	0.41
2:N:300:LEU:HB3	2:N:303:ASP:HA	2.01	0.41
3:K:15:U:O4	3:K:16:A:N6	2.52	0.41
1:C:389:THR:HG22	1:C:442:PHE:O	2.20	0.41
1:A:34:ASN:HD21	1:A:266:GLY:HA2	1.85	0.41
2:D:358:HIS:HE1	2:D:361:ARG:HH21	1.62	0.41
2:B:45:PHE:HB2	2:B:46:TRP:CE3	2.56	0.41
2:J:9:HIS:CE1	2:J:35:ASP:HB3	2.56	0.41
2:N:418:THR:N	2:N:419:PRO:HD2	2.35	0.41
1:A:68:ASN:OD1	1:A:70:ILE:HG22	2.20	0.41
1:A:421:TRP:CE2	1:A:440:PRO:HG3	2.56	0.41
2:D:411:PHE:HE2	2:D:413:LYS:HE2	1.84	0.41
2:B:344:THR:OG1	2:B:349:ASN:O	2.28	0.41
2:J:146:ASP:O	2:J:147:HIS:ND1	2.53	0.41
1:A:27:LEU:HD23	1:A:27:LEU:HA	1.91	0.41
2:B:86:LYS:HE2	2:B:86:LYS:HB2	1.81	0.41
2:B:94:ILE:HB	2:B:115:LEU:HD13	2.03	0.41
1:M:123:ASP:OD1	1:M:124:LYS:N	2.53	0.41
1:M:392:LYS:HA	1:M:392:LYS:HD3	1.86	0.41
1:C:93:PHE:CE2	1:C:95:GLU:HA	2.55	0.41
2:D:187:PHE:CE2	2:D:241:ILE:HD12	2.56	0.41
2:J:325:ALA:HB1	2:J:335:LEU:HD21	2.01	0.41
1:C:135:ARG:HH12	1:A:38:GLY:HA3	1.85	0.41
1:A:109:SER:HB2	1:A:112:LYS:HB3	2.02	0.41
1:A:317:VAL:HG12	1:A:318:GLY:H	1.86	0.41
2:D:308:ILE:HD12	2:D:308:ILE:HA	1.93	0.41
2:J:101:GLU:CD	2:J:121:LYS:HB2	2.41	0.41
1:M:1:MET:N	2:N:410:PHE:HA	2.36	0.41
1:M:425:PHE:HB2	1:M:431:SER:O	2.21	0.41
2:B:245:ASP:OD1	2:B:245:ASP:N	2.52	0.41
2:J:234:ASN:HD21	2:J:236:GLN:HG3	1.85	0.41
1:M:98:ASP:OD1	1:M:98:ASP:N	2.48	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:49:ILE:HD12	2:N:49:ILE:H	1.85	0.41
2:N:262:GLN:O	2:N:266:VAL:HG23	2.21	0.41
1:C:18:GLN:NE2	2:D:147:HIS:HB3	2.35	0.41
1:A:251:HIS:CE1	1:A:471:ILE:HD13	2.56	0.41
1:A:293:ASN:N	1:A:294:PRO:HD3	2.36	0.41
2:D:52:GLU:O	2:D:57:THR:OG1	2.16	0.41
2:D:58:CYS:HB3	2:D:59:LYS:HZ3	1.86	0.41
2:D:64:SER:OG	2:D:97:LEU:O	2.31	0.41
2:D:137:LYS:NZ	2:B:39:LEU:HA	2.36	0.41
2:D:189:ARG:HB3	2:D:212:GLU:O	2.20	0.41
2:D:268:LEU:HD13	2:D:271:LYS:HD3	2.03	0.41
2:D:386:ASP:OD1	2:D:391:ILE:HA	2.20	0.41
2:B:109:ASN:HB3	2:B:112:ILE:CG2	2.51	0.41
2:B:156:GLN:OE1	2:B:156:GLN:N	2.54	0.41
1:I:46:THR:HG23	1:I:49:GLY:H	1.85	0.41
1:I:452:ILE:O	1:I:456:LEU:HG	2.20	0.41
2:J:142:LYS:HA	2:J:142:LYS:HD2	1.82	0.41
1:M:320:TRP:CZ2	1:M:338:LEU:HA	2.56	0.41
2:N:92:MET:HE2	2:N:138:GLN:HG2	2.02	0.41
2:N:295:ILE:HD12	2:N:295:ILE:HA	1.95	0.41
2:N:394:ASN:HA	2:N:400:LYS:HG3	2.03	0.41
4:L:19:DC:H2''	4:L:20:DG:O5'	2.21	0.41
2:B:95:ILE:HD12	2:B:135:PHE:HE1	1.86	0.41
2:B:264:LEU:O	2:B:267:GLN:HG2	2.21	0.41
1:I:305:LEU:HG	1:I:312:VAL:HB	2.03	0.41
1:I:331:LYS:HE3	1:I:332:PRO:HD2	2.03	0.41
1:C:451:GLU:OE1	1:C:453:GLN:N	2.54	0.40
2:B:142:LYS:NZ	2:B:145:PRO:HD3	2.36	0.40
2:J:158:PHE:CE1	2:J:159:LEU:HG	2.56	0.40
1:M:69:ASN:C	1:M:69:ASN:HD22	2.25	0.40
1:M:322:ASN:HD22	1:M:330:LEU:HA	1.86	0.40
2:N:20:TRP:HA	2:N:23:LEU:HD12	2.03	0.40
1:C:469:ALA:HB2	3:G:3:A:H4'	2.03	0.40
1:A:139:TRP:NE1	1:A:219:ILE:HD11	2.36	0.40
1:A:227:SER:HA	1:A:234:PHE:CE2	2.56	0.40
2:D:45:PHE:HZ	2:D:77:GLU:HB3	1.86	0.40
2:J:152:LEU:O	2:J:156:GLN:N	2.51	0.40
1:C:482:PHE:HE2	1:C:503:PHE:CD2	2.40	0.40
1:A:296:ASN:HB3	1:A:321:TYR:HD2	1.86	0.40
1:A:417:LYS:HB3	1:A:442:PHE:CZ	2.56	0.40
2:D:4:LYS:HB2	2:D:56:ASN:O	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:81:ALA:O	2:D:84:VAL:HG12	2.22	0.40
1:I:245:PHE:HE2	1:I:252:LEU:HD12	1.83	0.40
1:I:397:TYR:CD1	2:J:374:ARG:HB2	2.56	0.40
1:I:417:LYS:HD3	1:I:442:PHE:HZ	1.86	0.40
2:J:45:PHE:O	2:J:49:ILE:HB	2.22	0.40
2:J:308:ILE:HG13	2:J:375:GLU:OE2	2.21	0.40
1:M:355:LYS:HD2	1:M:355:LYS:HA	1.88	0.40
2:N:82:THR:HG21	2:N:111:GLU:OE2	2.21	0.40
2:N:189:ARG:HG2	2:N:190:TYR:H	1.86	0.40
1:C:72:ARG:HH21	1:C:248:ILE:HD13	1.87	0.40
1:C:126:ILE:HD13	1:C:126:ILE:HA	1.89	0.40
1:A:330:LEU:HD23	1:A:369:GLU:HB2	2.02	0.40
2:J:45:PHE:HB2	2:J:49:ILE:CD1	2.51	0.40
2:N:277:MET:HA	2:N:280:LYS:HG2	2.04	0.40
1:A:24:ARG:CZ	1:A:72:ARG:HH21	2.34	0.40
1:A:43:VAL:HG23	1:A:140:PHE:O	2.21	0.40
2:D:176:PHE:O	2:D:334:VAL:HA	2.21	0.40
2:D:306:GLU:O	2:D:307:LYS:HG3	2.21	0.40
2:J:195:PRO:HD2	2:J:198:PHE:CE1	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 PDB entries followed by that with respect to all EM entries.

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	444/507 (88%)	404 (91%)	40 (9%)	0	100	100
1	C	445/507 (88%)	416 (94%)	29 (6%)	0	100	100
1	I	444/507 (88%)	418 (94%)	26 (6%)	0	100	100
1	M	444/507 (88%)	402 (90%)	42 (10%)	0	100	100
2	B	420/450 (93%)	394 (94%)	26 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	420/450 (93%)	388 (92%)	32 (8%)	0	100	100
2	J	420/450 (93%)	385 (92%)	35 (8%)	0	100	100
2	N	420/450 (93%)	387 (92%)	33 (8%)	0	100	100
All	All	3457/3828 (90%)	3194 (92%)	263 (8%)	0	100	100

There are no Ramachandran outliers to report.

### 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 PDB entries followed by that with respect to all EM entries.

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	389/446 (87%)	387 (100%)	2 (0%)	88	93
1	C	390/446 (87%)	388 (100%)	2 (0%)	88	93
1	I	389/446 (87%)	389 (100%)	0	100	100
1	M	389/446 (87%)	386 (99%)	3 (1%)	81	89
2	B	388/415 (94%)	387 (100%)	1 (0%)	92	95
2	D	388/415 (94%)	382 (98%)	6 (2%)	65	80
2	J	388/415 (94%)	385 (99%)	3 (1%)	81	89
2	N	388/415 (94%)	384 (99%)	4 (1%)	76	86
All	All	3109/3444 (90%)	3088 (99%)	21 (1%)	84	90

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	292	LYS
1	C	325	LYS
1	A	103	ARG
1	A	457	LYS
2	D	2	ARG
2	D	126	LYS
2	D	142	LYS
2	D	278	LYS

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Mol	Chain	Res	Type
2	D	283	ARG
2	D	307	LYS
2	B	304	LYS
2	J	186	ARG
2	J	361	ARG
2	J	400	LYS
1	M	69	ASN
1	M	290	LYS
1	M	362	ARG
2	N	196	LYS
2	N	209	ARG
2	N	278	LYS
2	N	283	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	18	GLN
1	C	66	ASN
1	C	296	ASN
1	A	122	ASN
2	D	357	GLN
1	I	90	ASN
2	J	236	GLN
2	N	116	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	E	0/21	-	-
3	G	0/21	-	-
3	K	0/21	-	-
3	O	0/21	-	-
All	All	0/84	-	-

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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.