



Full wwPDB EM Validation Report ⓘ

Jul 16, 2025 – 11:18 AM JST

PDB ID : 8JR8 / pdb_00008jr8
EMDB ID : EMD-36592
Title : MapSPARTA dimer bound with guide-target
Authors : Huang, P.P.; Li, Z.X.; Guo, L.J.; Xiao, Y.B.; Chen, M.R.
Deposited on : 2023-06-16
Resolution : 3.48 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

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>.

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

EMDB validation analysis : **FAILED**
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

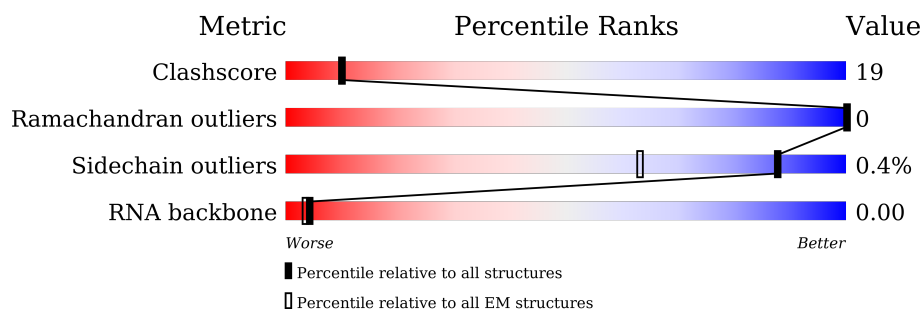
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.48 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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 ≥ 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	E	21	24% 57% 19%
1	G	21	43% 43% 14%
2	F	25	52% 28% 20%
2	H	25	24% 56% 20%
3	A	507	54% 36% 10%
3	C	507	52% 37% 10%
4	B	452	33% 23% 44%
4	D	452	31% 25% 44%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 13127 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 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
1	E	17	Total	C	N	O	P	0	0
			341	160	59	105	17		
1	G	18	Total	C	N	O	P	0	0
			360	169	61	112	18		

- Molecule 2 is a DNA chain called DNA (25-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
2	F	20	Total	C	N	O	P	3	0
			411	196	77	118	20		
2	H	20	Total	C	N	O	P	3	0
			411	196	77	118	20		

- Molecule 3 is a protein called Piwi domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	455	Total	C	N	O	S	0	0
			3674	2384	609	670	11		
3	C	455	Total	C	N	O	S	0	0
			3674	2384	609	670	11		

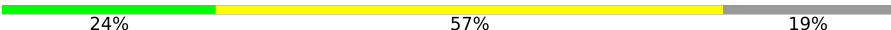
- Molecule 4 is a protein called TIR domain-containing protein.

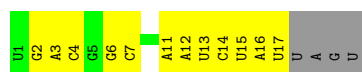
Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	252	Total	C	N	O	S	0	0
			2128	1379	355	386	8		
4	B	252	Total	C	N	O	S	0	0
			2128	1379	355	386	8		

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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.

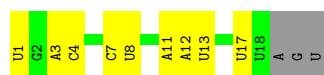
- Molecule 1: RNA (5'-R(P*UP*GP*AP*CP*GP*GP*CP*UP*CP*UP*AP*AP*UP*CP*UP*A P*UP*UP*AP*GP*U)-3')

Chain E: 



- Molecule 1: 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')

Chain G: 

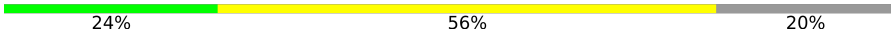


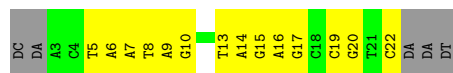
- Molecule 2: DNA (25-MER)

Chain F: 



- Molecule 2: DNA (25-MER)

Chain H: 



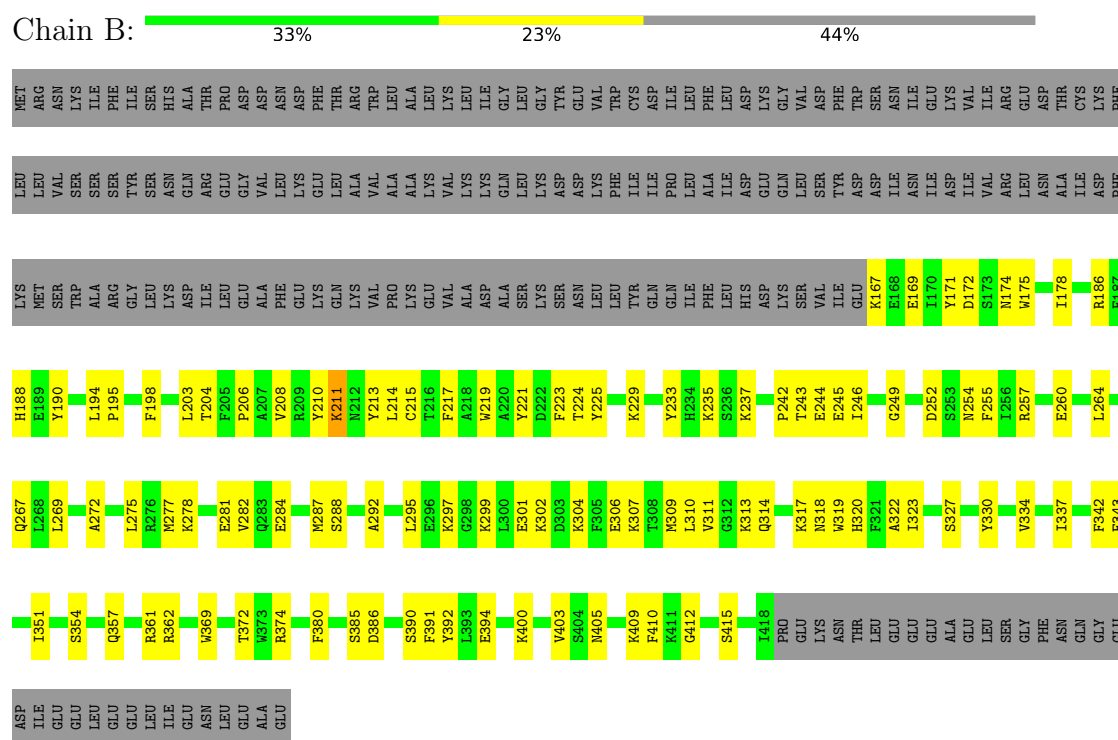
- Molecule 3: Piwi domain-containing protein

Chain A: 





- Molecule 4: TIR domain-containing protein



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	79726	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](#)

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	E	0.17	0/381	0.34	0/581
1	G	0.16	0/402	0.33	0/613
2	F	0.24	0/461	0.43	0/709
2	H	0.20	0/461	0.38	0/709
3	A	0.13	0/3768	0.34	0/5099
3	C	0.14	0/3768	0.37	0/5099
4	B	0.13	0/2188	0.38	1/2948 (0.0%)
4	D	0.12	0/2188	0.33	0/2948
All	All	0.14	0/13617	0.36	1/18706 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	211	LYS	CB-CA-C	-5.37	109.93	117.23

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	E	341	0	182	15	0
1	G	360	0	192	9	0
2	F	411	0	212	7	0
2	H	411	0	212	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	3674	0	3677	146	0
3	C	3674	0	3677	155	0
4	B	2128	0	2088	86	0
4	D	2128	0	2088	96	0
All	All	13127	0	12328	474	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 19.

All (474) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:4:LEU:HD22	3:C:411:TYR:HB2	1.60	0.84
4:B:269:LEU:HD22	4:B:327:SER:HB3	1.64	0.80
4:D:185:LEU:HD11	4:D:265:ILE:HD11	1.63	0.78
3:C:384:VAL:HG22	3:C:445:ILE:HD11	1.69	0.75
3:C:404:THR:HG22	4:D:370:ASN:HB2	1.71	0.71
3:C:417:SER:HG	4:D:330:TYR:HH	1.40	0.70
3:C:281:LEU:HB3	3:C:359:ILE:HG13	1.72	0.69
3:A:1:MET:N	4:B:409:LYS:O	2.25	0.69
3:A:295:ARG:HH11	3:A:326:GLY:HA3	1.55	0.69
3:A:24:ARG:HH11	3:A:73:PRO:HD2	1.58	0.69
3:C:66:ASN:HB3	3:C:73:PRO:HA	1.73	0.69
4:D:287:MET:HE2	4:D:292:ALA:HB2	1.74	0.69
3:C:24:ARG:HH21	3:C:251:HIS:HB2	1.58	0.69
4:D:309:MET:SD	4:D:309:MET:N	2.65	0.69
3:C:13:LEU:HB2	3:C:272:SER:HB2	1.74	0.68
3:C:276:ASN:O	3:C:355:LYS:NZ	2.27	0.68
3:C:464:LYS:NZ	3:C:472:PHE:O	2.26	0.67
3:A:205:GLN:HE21	3:A:207:HIS:HB3	1.59	0.67
1:E:16:A:H2'	4:B:210:TYR:HE2	1.60	0.67
3:A:144:PRO:HG2	3:A:147:ILE:HG13	1.77	0.67
4:B:188:HIS:HB2	4:B:214:LEU:HB3	1.76	0.67
3:A:417:SER:OG	4:B:330:TYR:OH	2.13	0.67
1:G:3:A:OP1	3:C:468:ASN:ND2	2.28	0.67
3:A:477:PRO:HG2	3:A:480:LEU:HD23	1.77	0.66
4:D:344:THR:HA	4:D:350:LEU:HA	1.76	0.66
3:C:280:TYR:HB2	3:C:304:PHE:HB2	1.77	0.65
3:A:4:LEU:HD11	4:B:410:PHE:HB3	1.79	0.65
3:A:11:LYS:HE3	3:A:19:LYS:HD2	1.79	0.65
3:C:243:ARG:H	3:C:243:ARG:HD3	1.61	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:11:A:H2'	1:G:12:A:H8	1.62	0.65
3:A:28:ALA:HB2	3:A:254:TRP:HH2	1.62	0.65
3:A:426:VAL:HG21	3:A:472:PHE:HE2	1.62	0.64
3:A:54:ARG:NH2	3:A:88:SER:OG	2.30	0.64
3:C:399:THR:HG22	4:D:374:ARG:HH22	1.62	0.64
3:C:426:VAL:HG23	3:C:429:ILE:HG12	1.80	0.63
3:A:10:PRO:HG3	3:A:460:LEU:HB3	1.80	0.63
3:C:497:LYS:HG3	3:C:498:THR:HG22	1.81	0.63
1:E:3:A:H4'	3:A:469:ALA:HB2	1.80	0.62
3:A:348:GLU:N	3:A:348:GLU:OE1	2.32	0.62
2:F:22:DC:OP2	3:A:72:ARG:NH2	2.31	0.62
3:C:24:ARG:NH1	3:C:470:CYS:O	2.32	0.62
4:D:300:LEU:HD11	4:D:305:PHE:HB2	1.81	0.62
3:A:302:GLN:HA	3:A:315:GLY:HA2	1.79	0.62
3:A:122:ILE:HA	3:A:125:ILE:HG22	1.81	0.62
4:D:168:GLU:HG2	4:D:413:ASN:HA	1.80	0.62
4:D:390:SER:OG	4:D:391:PHE:N	2.32	0.62
3:A:410:ALA:HB2	3:A:420:LEU:HD13	1.82	0.62
4:D:208:VAL:HG11	4:D:267:GLN:HG2	1.81	0.61
3:A:109:SER:OG	3:A:112:LYS:NZ	2.34	0.61
4:D:171:TYR:O	4:D:410:PHE:N	2.29	0.61
1:E:2:G:H22	3:A:251:HIS:HE1	1.45	0.61
1:E:16:A:H2'	4:B:210:TYR:CE2	2.35	0.61
3:C:2:LYS:HB2	4:D:410:PHE:HD1	1.65	0.61
3:A:459:ILE:HA	3:A:462:LEU:HD23	1.82	0.61
3:C:305:LEU:HD22	3:C:346:TYR:HD2	1.66	0.61
4:D:233:TYR:OH	4:D:237:LYS:O	2.18	0.61
4:D:395:MET:SD	4:D:396:GLY:N	2.74	0.61
3:C:425:TYR:HA	3:C:432:ALA:HA	1.82	0.61
4:D:272:ALA:HB1	4:D:393:LEU:HD21	1.81	0.61
1:E:13:U:H5'	3:A:295:ARG:HH12	1.66	0.60
3:C:330:LEU:N	3:C:369:GLU:OE2	2.31	0.60
4:B:323:ILE:HB	4:B:337:ILE:HD11	1.83	0.60
3:A:11:LYS:N	3:A:273:ASP:OD2	2.35	0.60
4:B:343:PHE:H	4:B:357:GLN:HE22	1.48	0.60
4:D:206:PRO:HG3	4:D:272:ALA:HB2	1.84	0.60
4:D:344:THR:HG22	4:D:350:LEU:HG	1.84	0.59
1:G:4:C:OP1	3:C:481:ARG:NH1	2.35	0.59
3:A:362:LYS:HG3	3:A:480:LEU:HD12	1.83	0.59
4:B:311:VAL:HG22	4:B:320:HIS:HA	1.84	0.59
2:H:10[A]:DG:H1'	4:D:263:ARG:HD3	1.83	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:309:ASP:OD1	3:A:309:ASP:N	2.36	0.59
1:G:13:U:OP1	3:C:295:ARG:NH2	2.34	0.59
3:C:3:GLU:HA	4:D:411:LYS:HB2	1.85	0.58
3:C:234:PHE:HB2	3:C:243:ARG:HH22	1.68	0.58
4:B:287:MET:HE3	4:B:288:SER:H	1.67	0.58
3:C:62:LYS:NZ	3:C:63:PRO:O	2.37	0.58
4:D:203:LEU:HG	4:D:205:PHE:H	1.68	0.58
4:B:284:GLU:OE2	4:B:284:GLU:N	2.36	0.58
3:A:425:TYR:HA	3:A:432:ALA:HA	1.84	0.58
4:B:178:ILE:HG13	4:B:403:VAL:HG22	1.85	0.58
4:D:189:GLU:HB2	4:D:237:LYS:HB3	1.85	0.57
3:C:100:ASP:HA	3:C:103:LYS:HD3	1.86	0.57
3:C:282:GLY:HA2	3:C:360:HIS:HB2	1.87	0.57
4:B:211:LYS:HE2	4:B:213:TYR:HE2	1.70	0.57
2:H:5:DT:H2'	2:H:6:DA:C5	2.40	0.57
3:C:122:ILE:HB	3:C:214:LEU:HD21	1.86	0.57
3:A:119:SER:OG	3:A:213:ARG:NH2	2.34	0.57
2:H:14:DA:H2''	2:H:15:DG:H5''	1.85	0.57
3:A:436:GLU:N	3:A:436:GLU:OE1	2.36	0.57
3:C:451:ASP:HB2	3:C:454:GLN:HG2	1.86	0.57
3:C:474:ASP:OD2	3:C:481:ARG:NH1	2.38	0.57
2:H:13[A]:DT:H2''	3:C:328:TYR:HE2	1.69	0.56
4:B:297:LYS:HE2	4:B:313:LYS:HZ2	1.69	0.56
3:C:251:HIS:HA	3:C:254:TRP:HD1	1.69	0.56
3:C:44:ILE:HG21	3:C:125:ILE:HD11	1.87	0.56
3:A:66:ASN:HB2	3:A:250:GLY:HA3	1.88	0.56
4:B:190:TYR:HB3	4:B:194:LEU:HB3	1.87	0.56
3:A:100:ASP:N	3:A:100:ASP:OD1	2.37	0.56
3:C:105:LEU:HD13	3:C:147:ILE:HD13	1.87	0.56
2:H:20:DG:OP2	4:D:363:ARG:NH1	2.38	0.56
2:H:19:DC:H2'	2:H:20:DG:C8	2.40	0.56
3:C:336:LYS:HB3	3:C:376:VAL:HG11	1.87	0.56
3:C:424:GLY:O	3:C:433:LEU:N	2.39	0.55
3:C:10:PRO:HG2	3:C:464:LYS:HD3	1.87	0.55
3:A:322:ASN:ND2	3:A:334:GLU:OE2	2.39	0.55
3:C:226:GLU:OE1	3:C:226:GLU:N	2.40	0.55
3:C:205:GLN:HG3	3:C:208:ASP:H	1.72	0.55
3:C:145:ASP:HA	3:C:148:TYR:CZ	2.42	0.55
3:A:305:LEU:HG	3:A:311:THR:HG21	1.89	0.55
4:D:295:LEU:HD13	4:D:310:LEU:HD21	1.89	0.55
1:E:14:C:H2''	1:E:15:U:H5'	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:187:PHE:HB2	4:D:239:ILE:HB	1.89	0.55
4:B:275:LEU:HD23	4:B:278:LYS:HZ3	1.70	0.55
3:A:317:VAL:HG13	3:A:318:GLY:H	1.72	0.55
3:C:406:LEU:HD12	3:C:425:TYR:HB3	1.89	0.55
1:G:11:A:H2'	1:G:12:A:C8	2.42	0.55
3:C:317:VAL:HG23	3:C:318:GLY:H	1.71	0.55
4:D:372:THR:OG1	4:D:376:LYS:NZ	2.30	0.55
3:A:236:ASN:HB2	3:A:242:ILE:HG12	1.90	0.54
3:A:303:MET:HE2	3:A:305:LEU:HD22	1.87	0.54
2:F:19:DC:H2'	2:F:20:DG:C8	2.43	0.54
4:D:174:ASN:ND2	4:D:337:ILE:O	2.40	0.54
4:D:277:MET:HE1	4:D:384:LEU:HD11	1.89	0.54
3:A:140:PHE:HD1	3:A:222:GLN:HB3	1.72	0.54
3:A:87:GLU:HG2	3:A:89:THR:H	1.72	0.54
3:A:270:LYS:HD3	3:A:271:LEU:N	2.23	0.54
3:C:243:ARG:H	3:C:243:ARG:CD	2.20	0.54
3:C:234:PHE:O	3:C:243:ARG:NH1	2.37	0.54
1:G:1:U:OP2	3:C:222:GLN:NE2	2.41	0.54
3:A:426:VAL:HG22	3:A:428:LYS:H	1.73	0.54
3:A:334:GLU:OE1	3:A:334:GLU:N	2.36	0.54
3:C:2:LYS:HB2	4:D:410:PHE:CD1	2.43	0.54
3:C:100:ASP:N	3:C:100:ASP:OD1	2.37	0.54
4:B:361:ARG:O	4:B:361:ARG:NH1	2.39	0.54
4:B:233:TYR:CZ	4:B:237:LYS:HG3	2.43	0.54
3:C:15:ALA:HB2	3:C:33:LEU:HA	1.89	0.53
3:C:256:ILE:HD12	3:C:256:ILE:H	1.73	0.53
4:D:188:HIS:N	4:D:214:LEU:O	2.36	0.53
3:A:420:LEU:O	3:A:441:LEU:N	2.42	0.53
3:C:396:LEU:HD23	3:C:421:TRP:HZ2	1.74	0.53
4:D:372:THR:O	4:D:376:LYS:NZ	2.40	0.53
4:D:219:TRP:HE1	4:D:398:GLU:HG2	1.73	0.53
3:C:280:TYR:HD2	3:C:462:LEU:HD21	1.72	0.53
4:D:381:ILE:O	4:D:385:SER:N	2.41	0.53
4:B:206:PRO:HG3	4:B:272:ALA:HB2	1.89	0.52
3:A:11:LYS:HE2	3:A:19:LYS:HA	1.91	0.52
3:A:11:LYS:NZ	3:A:18:GLN:O	2.30	0.52
3:C:27:LEU:HD23	3:C:254:TRP:HZ3	1.75	0.52
4:B:219:TRP:HD1	4:B:235:LYS:HZ1	1.57	0.52
3:A:152:ARG:NH1	3:A:204:ALA:O	2.43	0.52
4:D:217:PHE:HD2	4:D:395:MET:HE3	1.74	0.52
4:B:313:LYS:HD2	4:B:318:ASN:HB3	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:52:ILE:HD11	3:C:142:ILE:HG21	1.91	0.52
3:C:7:ILE:HG23	3:C:457:LYS:HG2	1.92	0.52
4:B:369:TRP:H	4:B:372:THR:HG22	1.75	0.52
3:A:405:ILE:HG12	3:A:409:ASN:HD21	1.73	0.51
3:C:141:VAL:HG21	3:C:210:PHE:CZ	2.45	0.51
4:B:208:VAL:HG11	4:B:267:GLN:HG2	1.91	0.51
4:B:252:ASP:OD1	4:B:257:ARG:NH2	2.37	0.51
3:C:87:GLU:HG2	3:C:89:THR:H	1.75	0.51
4:D:195:PRO:HD2	4:D:198:PHE:CD2	2.45	0.51
1:E:4:C:OP1	3:A:466:ASN:ND2	2.41	0.51
3:A:328:TYR:O	3:A:329:HIS:ND1	2.44	0.51
3:C:3:GLU:CD	3:C:3:GLU:H	2.19	0.51
4:B:310:LEU:HD21	4:B:380:PHE:HE1	1.75	0.51
4:B:260:GLU:HG3	4:B:264:LEU:HD23	1.91	0.51
3:A:421:TRP:CE2	3:A:440:PRO:HB3	2.45	0.51
3:C:40:LYS:O	3:C:137:ASP:N	2.38	0.51
4:D:394:GLU:HA	4:D:400:LYS:HG2	1.92	0.51
3:A:286:LYS:NZ	3:A:484:ASP:OD1	2.30	0.51
3:C:59:HIS:HE1	3:C:64:ILE:HD12	1.76	0.51
4:D:199:ASP:OD2	4:D:200:VAL:N	2.44	0.51
3:A:336:LYS:NZ	3:A:375:GLU:OE2	2.31	0.51
2:H:13[A]:DT:H2'	2:H:14:DA:C8	2.45	0.51
3:A:293:ASN:HD21	3:A:296:ASN:CG	2.19	0.51
3:C:3:GLU:OE1	3:C:3:GLU:N	2.40	0.51
3:C:254:TRP:O	3:C:258:THR:OG1	2.23	0.50
2:H:16:DA:OP1	3:C:290:LYS:NZ	2.40	0.50
3:A:39:ILE:HB	3:A:86:TRP:CD1	2.46	0.50
4:D:188:HIS:HB2	4:D:214:LEU:HB3	1.93	0.50
3:A:302:GLN:HE22	3:A:483:ALA:HB2	1.77	0.50
4:B:243:THR:HA	4:B:246:ILE:HD13	1.93	0.50
3:A:132:GLU:O	3:C:504:LYS:NZ	2.44	0.50
3:C:13:LEU:HD22	3:C:270:LYS:HE3	1.92	0.50
3:C:301:ALA:HB3	3:C:316:GLU:HB3	1.93	0.50
2:H:19:DC:H2''	4:D:362:ARG:HG2	1.93	0.50
3:C:236:ASN:HB2	3:C:242:ILE:HG12	1.94	0.50
2:H:8:DT:H2''	2:H:9:DA:C8	2.47	0.50
3:C:305:LEU:HD22	3:C:346:TYR:CD2	2.46	0.50
3:A:39:ILE:HB	3:A:86:TRP:HD1	1.77	0.50
4:D:207:ALA:HB1	4:D:214:LEU:HD11	1.93	0.50
4:D:284:GLU:O	4:D:294:TRP:NE1	2.45	0.50
3:A:231:TRP:HH2	3:A:246:SER:HB3	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:380:GLU:OE1	3:A:380:GLU:N	2.45	0.49
3:A:395:LYS:HB2	4:B:174:ASN:ND2	2.27	0.49
3:C:244:ASP:OD1	3:C:244:ASP:N	2.45	0.49
3:C:59:HIS:CE1	3:C:64:ILE:HD12	2.48	0.49
3:C:96:VAL:HG22	3:C:124:LYS:HE2	1.95	0.49
3:C:245:PHE:HB2	3:C:248:ILE:HG13	1.94	0.49
4:D:392:TYR:HB2	4:D:400:LYS:HD3	1.94	0.49
4:B:167:LYS:HG2	4:B:415:SER:HB2	1.93	0.49
4:B:171:TYR:HB2	4:B:410:PHE:HB2	1.93	0.49
3:A:325:ASN:HD22	3:A:327:GLN:HG2	1.78	0.49
4:D:201:ARG:HA	4:D:271:LYS:HE2	1.95	0.49
3:A:41:SER:HB3	3:A:86:TRP:HE1	1.78	0.49
3:C:343:LEU:HD11	3:C:377:THR:HG22	1.94	0.49
4:D:339:SER:HB3	4:D:377:LEU:HD13	1.94	0.49
3:A:259:ALA:O	3:A:263:LYS:HG2	2.13	0.49
3:C:128:ALA:O	3:C:132:GLU:HB2	2.12	0.49
3:C:141:VAL:C	3:C:142:ILE:HD13	2.37	0.49
4:B:208:VAL:HG23	4:B:215:CYS:HB3	1.95	0.49
3:C:270:LYS:HD2	3:C:310:GLY:HA2	1.94	0.49
3:A:11:LYS:HZ2	3:A:13:LEU:HD12	1.78	0.49
4:B:319:TRP:HB3	4:B:343:PHE:CE2	2.47	0.49
3:A:50:LEU:HD22	3:A:93:PHE:CG	2.48	0.49
3:A:307:ASN:N	3:A:311:THR:OG1	2.46	0.49
3:C:10:PRO:HD3	3:C:460:LEU:HB3	1.93	0.49
3:C:396:LEU:HD11	4:D:410:PHE:HD2	1.78	0.49
3:C:465:LEU:HD12	3:C:467:TYR:CZ	2.48	0.48
4:B:281:GLU:HB3	4:B:299:LYS:NZ	2.28	0.48
4:D:343:PHE:HZ	4:D:361:ARG:HA	1.78	0.48
4:B:323:ILE:HG12	4:B:380:PHE:CE2	2.48	0.48
3:A:85:LYS:HG2	3:A:87:GLU:OE1	2.14	0.48
3:A:244:ASP:OD1	3:A:244:ASP:N	2.45	0.48
3:A:281:LEU:HA	3:A:302:GLN:O	2.13	0.48
3:A:307:ASN:OD1	3:A:308:GLY:N	2.38	0.48
4:D:194:LEU:HB2	4:D:198:PHE:CD2	2.49	0.48
4:D:283:GLN:HE22	4:D:296:GLU:HB3	1.77	0.48
4:B:385:SER:HA	4:B:391:PHE:HB3	1.95	0.48
3:C:1:MET:HB3	4:D:409:LYS:HE2	1.96	0.48
4:B:392:TYR:HB2	4:B:400:LYS:HB3	1.96	0.48
3:A:11:LYS:NZ	3:A:12:ILE:O	2.45	0.48
4:D:274:GLU:HA	4:D:277:MET:HB2	1.94	0.48
3:A:10:PRO:HG2	3:A:464:LYS:HG2	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:324:SER:O	4:D:338:SER:OG	2.32	0.48
2:H:6:DA:H2''	2:H:7:DA:O5'	2.13	0.48
3:A:346:TYR:CE2	3:A:354:PRO:HB3	2.48	0.48
3:A:340:SER:O	3:A:344:GLN:N	2.34	0.48
3:C:22:ASP:OD1	3:C:23:ALA:N	2.47	0.48
3:C:396:LEU:HD11	4:D:410:PHE:CD2	2.49	0.48
3:C:113:ARG:NH2	3:C:150:TYR:O	2.46	0.47
3:A:118:VAL:HG23	3:A:210:PHE:HD1	1.79	0.47
4:D:269:LEU:HD11	4:D:401:VAL:HG11	1.96	0.47
4:D:320:HIS:N	4:D:342:PHE:O	2.44	0.47
4:B:242:PRO:HB2	4:B:244:GLU:HG3	1.95	0.47
3:A:143:VAL:HG23	3:A:147:ILE:HD12	1.96	0.47
4:B:343:PHE:O	4:B:357:GLN:NE2	2.48	0.47
3:A:426:VAL:HG21	3:A:472:PHE:CE2	2.47	0.47
3:C:297:ALA:HB3	3:C:323:PRO:HB2	1.94	0.47
3:C:407:ARG:HH22	3:C:460:LEU:HD22	1.79	0.47
4:B:299:LYS:HB3	4:B:299:LYS:HE2	1.65	0.47
4:B:310:LEU:HD23	4:B:311:VAL:HG23	1.96	0.47
1:E:2:G:OP2	3:A:225:ARG:NH1	2.47	0.47
3:A:476:GLU:HG3	3:A:477:PRO:HD2	1.95	0.47
3:C:389:SER:OG	3:C:391:THR:HG22	2.15	0.47
3:C:420:LEU:HD11	3:C:460:LEU:HG	1.96	0.47
3:C:486:ILE:HD11	3:C:503:PHE:HE1	1.80	0.47
3:C:118:VAL:HG13	3:C:213:ARG:HH11	1.79	0.47
3:C:235:LYS:HE3	3:C:235:LYS:HB3	1.84	0.47
4:B:169:GLU:HG2	4:B:415:SER:HB3	1.98	0.47
1:E:17:U:H4'	4:B:211:LYS:HG2	1.96	0.46
3:A:125:ILE:HG21	3:A:214:LEU:HD21	1.96	0.46
3:A:414:ASN:OD1	3:A:414:ASN:N	2.48	0.46
4:D:217:PHE:CD2	4:D:395:MET:HE3	2.50	0.46
3:A:320:TRP:CZ3	3:A:338:LEU:HD12	2.50	0.46
3:C:421:TRP:CE2	3:C:440:PRO:HB3	2.49	0.46
3:C:429:ILE:HG13	3:C:431:THR:H	1.80	0.46
3:C:466:ASN:HD22	3:C:469:ALA:HB3	1.80	0.46
4:D:183:GLU:HG3	4:D:184:GLU:HG3	1.97	0.46
4:D:244:GLU:H	4:D:244:GLU:CD	2.20	0.46
1:E:11:A:H2'	1:E:12:A:C8	2.50	0.46
4:B:302:LYS:NZ	4:B:304:LYS:HB2	2.30	0.46
3:A:141:VAL:HG21	3:A:210:PHE:CZ	2.50	0.46
3:A:255:THR:HG23	3:A:469:ALA:HA	1.97	0.46
3:C:398:LYS:HE3	4:D:169:GLU:HG2	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:B:306:GLU:O	4:B:307:LYS:HG3	2.15	0.46
1:E:12:A:H2'	1:E:13:U:C6	2.51	0.46
3:C:281:LEU:HD11	3:C:301:ALA:HB1	1.97	0.46
4:D:390:SER:HA	4:D:405:ASN:H	1.79	0.46
3:A:443:ILE:HD12	3:A:443:ILE:N	2.31	0.46
4:D:171:TYR:HB3	4:D:410:PHE:HB2	1.98	0.46
4:D:180:SER:OG	4:D:402:PHE:HB2	2.16	0.46
4:B:295:LEU:HD23	4:B:380:PHE:CZ	2.50	0.46
3:C:11:LYS:CE	3:C:19:LYS:HD3	2.46	0.46
3:C:71:THR:OG1	3:C:72:ARG:HG2	2.16	0.46
3:C:54:ARG:HG3	3:C:54:ARG:HH11	1.80	0.45
4:B:171:TYR:HE2	4:B:412:GLY:HA3	1.81	0.45
4:B:385:SER:HB3	4:B:405:ASN:HD22	1.82	0.45
3:A:37:TYR:CD2	3:C:38:GLY:HA3	2.51	0.45
4:B:314:GLN:HG2	4:B:319:TRP:CD1	2.51	0.45
4:B:313:LYS:HE3	4:B:313:LYS:HB3	1.72	0.45
3:A:373:PHE:O	3:A:377:THR:OG1	2.32	0.45
3:A:372:ALA:O	3:A:375:GLU:HG3	2.17	0.45
3:C:289:GLU:OE2	3:C:290:LYS:NZ	2.41	0.45
3:C:302:GLN:HE21	3:C:483:ALA:HB2	1.80	0.45
4:B:309:MET:HE2	4:B:309:MET:HA	1.99	0.45
4:B:386:ASP:OD2	4:B:392:TYR:N	2.49	0.45
3:C:458:ASP:HA	3:C:461:SER:HB3	1.97	0.45
4:D:392:TYR:HA	4:D:402:PHE:HA	1.98	0.45
4:B:172:ASP:OD1	4:B:172:ASP:N	2.47	0.45
4:B:282:VAL:HG13	4:B:295:LEU:HD22	1.99	0.45
3:A:245:PHE:O	3:A:249:GLU:N	2.50	0.45
1:E:6:G:H2''	4:B:362:ARG:HH22	1.82	0.45
3:A:12:ILE:HD11	3:A:464:LYS:HE3	1.98	0.45
3:A:271:LEU:HD11	3:A:465:LEU:HD22	1.98	0.45
3:A:293:ASN:HD22	3:A:324:LYS:HD3	1.81	0.45
4:D:169:GLU:N	4:D:412:GLY:O	2.45	0.45
4:B:221:TYR:O	4:B:224:THR:OG1	2.32	0.45
3:A:18:GLN:HG3	3:A:30:PHE:CD1	2.52	0.44
3:C:136:VAL:HG11	3:C:139:TRP:NE1	2.33	0.44
3:C:316:GLU:OE2	3:C:341:GLN:NE2	2.50	0.44
3:C:407:ARG:HG2	3:C:407:ARG:HH11	1.82	0.44
3:C:414:ASN:OD1	3:C:414:ASN:N	2.49	0.44
1:G:17:U:H4'	4:D:211:LYS:H	1.82	0.44
3:C:72:ARG:HG3	3:C:251:HIS:ND1	2.33	0.44
4:B:292:ALA:HB3	4:B:342:PHE:HE2	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:289:GLU:HG3	3:C:290:LYS:HD3	1.98	0.44
4:B:254:ASN:OD1	4:B:255:PHE:N	2.51	0.44
4:B:354:SER:HA	4:B:357:GLN:HB2	2.00	0.44
3:A:303:MET:O	3:A:313:PHE:HB2	2.17	0.44
4:B:287:MET:HE3	4:B:288:SER:N	2.31	0.44
1:E:13:U:H5'	3:A:295:ARG:NH1	2.32	0.44
3:C:39:ILE:HB	3:C:86:TRP:HB2	1.99	0.44
3:C:138:VAL:HG13	3:C:264:ALA:HB2	1.99	0.44
4:B:390:SER:OG	4:B:391:PHE:N	2.49	0.44
3:C:12:ILE:HG22	3:C:271:LEU:HD13	1.99	0.44
4:D:195:PRO:HD2	4:D:198:PHE:HD2	1.82	0.44
3:A:353:TYR:CD2	3:A:378:PRO:HG3	2.53	0.44
3:A:464:LYS:HA	3:A:464:LYS:HD3	1.69	0.44
3:C:71:THR:HA	3:C:429:ILE:HB	2.00	0.44
3:C:269:TRP:HE1	3:C:465:LEU:HB2	1.82	0.44
3:C:365:PHE:HD1	3:C:446:ASN:HD22	1.65	0.44
4:B:175:TRP:HB3	4:B:334:VAL:HG21	2.00	0.44
3:A:119:SER:HG	3:A:213:ARG:HH22	1.63	0.44
3:A:394:LEU:HD13	4:B:175:TRP:CE2	2.52	0.44
3:C:251:HIS:O	3:C:254:TRP:HB2	2.17	0.44
4:D:285:TYR:CE1	4:D:287:MET:HG2	2.52	0.44
4:B:186:ARG:HG2	4:B:188:HIS:CE1	2.53	0.44
3:A:339:LEU:HD21	3:A:383:LEU:HD11	2.00	0.43
3:C:234:PHE:HB2	3:C:243:ARG:NH2	2.31	0.43
3:C:476:GLU:OE2	3:C:481:ARG:NE	2.46	0.43
4:D:221:TYR:HA	4:D:224:THR:OG1	2.18	0.43
3:A:114:THR:O	3:A:118:VAL:HG12	2.18	0.43
3:A:125:ILE:HD11	3:A:139:TRP:CG	2.53	0.43
3:A:366:ASN:OD1	3:A:369:GLU:N	2.50	0.43
3:C:464:LYS:HD2	3:C:464:LYS:HA	1.76	0.43
3:A:109:SER:OG	3:A:112:LYS:HG2	2.18	0.43
3:A:391:THR:O	3:A:391:THR:OG1	2.32	0.43
3:C:19:LYS:HG3	3:C:19:LYS:O	2.19	0.43
3:C:359:ILE:HG22	3:C:384:VAL:O	2.18	0.43
3:C:435:MET:HE1	4:D:366:LYS:O	2.18	0.43
4:B:277:MET:HE2	4:B:277:MET:N	2.33	0.43
4:B:351:ILE:HD11	4:B:357:GLN:HG2	2.00	0.43
3:A:40:LYS:O	3:A:137:ASP:N	2.38	0.43
3:C:293:ASN:HD21	3:C:296:ASN:HB2	1.82	0.43
4:D:204:THR:HA	4:D:275:LEU:HD22	2.00	0.43
4:D:229:LYS:O	4:D:229:LYS:NZ	2.35	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:277:MET:HE2	4:D:277:MET:HA	2.01	0.43
2:F:9:DA:C2'	2:F:10[A]:DG:H5'	2.47	0.43
3:A:293:ASN:ND2	3:A:295:ARG:O	2.52	0.43
3:A:420:LEU:HD12	3:A:421:TRP:H	1.83	0.43
3:A:451:ASP:OD1	3:A:451:ASP:N	2.48	0.43
3:A:501:LEU:HB2	3:C:131:ASN:CG	2.43	0.43
3:C:85:LYS:HA	3:C:85:LYS:HE2	2.01	0.43
4:D:343:PHE:CZ	4:D:361:ARG:HA	2.53	0.43
3:A:441:LEU:HD23	3:A:441:LEU:HA	1.89	0.43
3:C:27:LEU:HD22	3:C:269:TRP:HZ3	1.84	0.43
4:B:245:GLU:O	4:B:249:GLY:N	2.47	0.43
3:C:293:ASN:ND2	3:C:296:ASN:HB2	2.34	0.43
3:C:366:ASN:OD1	3:C:366:ASN:N	2.52	0.43
4:D:255:PHE:CD2	4:D:256:ILE:HG22	2.53	0.43
2:H:22:DC:H2'	3:C:251:HIS:NE2	2.34	0.43
2:H:22:DC:H2''	3:C:72:ARG:HE	1.84	0.43
3:A:215:LEU:HD21	3:A:499:PRO:HA	2.01	0.43
4:D:199:ASP:OD2	4:D:201:ARG:N	2.46	0.43
4:B:203:LEU:HD21	4:B:223:PHE:CD1	2.54	0.43
1:G:8:U:O2	2:H:17:DG:N2	2.51	0.43
3:A:82:PHE:HZ	3:A:258:THR:HG22	1.83	0.43
4:B:195:PRO:HD3	4:B:229:LYS:HE2	2.01	0.43
4:B:301:GLU:N	4:B:301:GLU:OE1	2.52	0.42
3:C:5:ILE:O	3:C:5:ILE:HG13	2.18	0.42
3:C:32:PRO:HB3	3:C:261:PHE:HE2	1.84	0.42
4:D:386:ASP:H	4:D:391:PHE:HB2	1.84	0.42
3:C:377:THR:HG21	3:C:383:LEU:HD21	2.00	0.42
3:C:405:ILE:HG12	3:C:409:ASN:HD21	1.84	0.42
4:D:277:MET:HG3	4:D:293:TYR:CE2	2.54	0.42
3:A:27:LEU:HD12	3:A:27:LEU:HA	1.83	0.42
3:C:253:ALA:O	3:C:257:SER:OG	2.29	0.42
3:C:271:LEU:HD21	3:C:465:LEU:HD13	2.02	0.42
4:D:305:PHE:CD2	4:D:306:GLU:HG3	2.54	0.42
4:B:292:ALA:HB1	4:B:322:ALA:HB1	2.02	0.42
1:E:15:U:H5	2:F:9:DA:C2	2.38	0.42
3:A:286:LYS:O	3:A:298:CYS:N	2.37	0.42
2:F:9:DA:H2''	4:B:267:GLN:OE1	2.20	0.42
2:F:16:DA:H2''	2:F:17:DG:O5'	2.19	0.42
3:A:218:THR:HG22	3:A:500:PRO:HG3	2.00	0.42
3:A:360:HIS:HB3	3:A:480:LEU:HD21	2.01	0.42
4:D:380:PHE:CD2	4:D:380:PHE:C	2.98	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:9:DA:H2''	2:F:10[A]:DG:H5'	2.01	0.42
4:D:251:TYR:O	4:D:258:ASN:HB2	2.19	0.42
3:A:86:TRP:HZ2	3:A:140:PHE:CE2	2.37	0.42
3:A:268:PRO:HB2	3:A:269:TRP:CE3	2.54	0.42
3:C:109:SER:HB2	3:C:112:LYS:HE3	2.01	0.42
4:D:310:LEU:HD23	4:D:311:VAL:HG23	2.02	0.42
3:A:104:PHE:CD2	3:A:116:ASP:HB3	2.55	0.42
3:A:315:GLY:O	3:A:501:LEU:HD22	2.20	0.42
3:A:377:THR:O	3:A:379:LYS:NZ	2.51	0.42
3:C:465:LEU:HD21	3:C:478:VAL:HG21	2.01	0.42
4:D:194:LEU:HB2	4:D:198:PHE:HD2	1.83	0.42
4:D:220:ALA:H	4:D:235:LYS:NZ	2.18	0.42
4:D:244:GLU:OE2	4:D:244:GLU:N	2.28	0.41
4:D:285:TYR:HE1	4:D:287:MET:HG2	1.85	0.41
4:B:302:LYS:HZ2	4:B:304:LYS:HB2	1.85	0.41
2:H:9:DA:H1'	4:D:267:GLN:HE22	1.86	0.41
3:A:40:LYS:HD2	3:C:37:TYR:HD2	1.84	0.41
3:A:459:ILE:HA	3:A:462:LEU:CD2	2.47	0.41
3:C:396:LEU:HD13	4:D:173:SER:HA	2.02	0.41
3:C:405:ILE:HG12	4:D:171:TYR:OH	2.20	0.41
4:B:188:HIS:O	4:B:214:LEU:N	2.53	0.41
3:A:248:ILE:HG23	3:A:251:HIS:CD2	2.54	0.41
3:A:24:ARG:HH22	3:A:251:HIS:HB2	1.85	0.41
3:A:371:ASP:OD1	3:A:372:ALA:N	2.53	0.41
4:B:317:LYS:HZ1	4:B:351:ILE:HD13	1.85	0.41
1:G:7:C:OP1	3:C:395:LYS:NZ	2.50	0.41
3:A:501:LEU:HB2	3:C:131:ASN:OD1	2.21	0.41
3:C:105:LEU:HD12	3:C:151:CYS:SG	2.61	0.41
3:C:138:VAL:HG12	3:C:220:PRO:HG2	2.03	0.41
3:C:331:GLU:N	3:C:334:GLU:OE2	2.54	0.41
4:D:265:ILE:HD13	4:D:265:ILE:HA	1.88	0.41
4:D:317:LYS:HB2	4:D:317:LYS:HE3	1.77	0.41
3:A:394:LEU:HB2	4:B:175:TRP:CZ2	2.56	0.41
3:A:409:ASN:OD1	3:A:409:ASN:N	2.51	0.41
3:A:486:ILE:HG13	3:A:506:TYR:CE2	2.55	0.41
3:C:254:TRP:HB3	3:C:470:CYS:SG	2.61	0.41
4:B:188:HIS:HA	4:B:233:TYR:OH	2.20	0.41
3:A:404:THR:OG1	3:A:405:ILE:N	2.52	0.41
3:C:50:LEU:HD11	3:C:93:PHE:CD2	2.56	0.41
4:D:353:SER:OG	4:D:356:VAL:HB	2.19	0.41
3:A:24:ARG:HD3	3:A:73:PRO:HG2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:372:ALA:O	3:A:376:VAL:HG22	2.21	0.41
3:C:208:ASP:HB3	3:C:492:ALA:HB2	2.03	0.41
3:C:224:PHE:CD2	3:C:229:LEU:HD21	2.56	0.41
3:C:291:SER:C	3:C:292:LYS:HD3	2.46	0.41
3:A:12:ILE:HD12	3:A:12:ILE:N	2.36	0.41
3:A:67:SER:OG	3:A:68:ASN:N	2.53	0.41
3:A:330:LEU:HD23	3:A:330:LEU:HA	1.81	0.41
3:A:399:THR:HA	4:B:374:ARG:CZ	2.51	0.41
3:C:1:MET:N	4:D:409:LYS:O	2.54	0.41
3:C:279:CYS:O	3:C:358:PHE:N	2.52	0.41
4:B:210:TYR:HB3	4:B:213:TYR:CZ	2.56	0.41
4:B:246:ILE:HD12	4:B:246:ILE:N	2.36	0.41
4:B:317:LYS:NZ	4:B:351:ILE:HD13	2.36	0.41
3:A:280:TYR:HB2	3:A:304:PHE:HB3	2.03	0.41
3:A:317:VAL:HG21	3:A:490:LEU:HD22	2.03	0.41
3:C:280:TYR:CD2	3:C:462:LEU:HD21	2.54	0.41
4:D:393:LEU:HD22	4:D:401:VAL:HB	2.03	0.41
4:B:186:ARG:NH1	4:B:217:PHE:O	2.53	0.41
4:B:394:GLU:H	4:B:394:GLU:CD	2.27	0.41
3:A:319:PRO:HB2	3:A:321:TYR:CZ	2.56	0.40
3:A:429:ILE:O	3:A:430:GLN:HG3	2.21	0.40
4:D:198:PHE:HB3	4:D:209:ARG:HH22	1.86	0.40
3:A:468:ASN:HD22	3:A:485:LYS:NZ	2.19	0.40
4:D:287:MET:HE3	4:D:290:LYS:HG2	2.03	0.40
1:E:7:C:H1'	4:B:362:ARG:HH21	1.86	0.40
3:A:97:THR:OG1	3:A:100:ASP:OD1	2.40	0.40
3:A:426:VAL:HG13	3:A:429:ILE:HG12	2.03	0.40
4:D:185:LEU:HD12	4:D:243:THR:HG22	2.03	0.40
4:D:313:LYS:HZ1	4:D:315:LYS:C	2.30	0.40
4:B:204:THR:HG23	4:B:225:TYR:OH	2.21	0.40
3:A:18:GLN:HG3	3:A:30:PHE:CG	2.56	0.40
3:A:281:LEU:HB2	3:A:359:ILE:HD13	2.03	0.40
3:C:131:ASN:O	3:C:132:GLU:HG2	2.21	0.40
3:C:320:TRP:CZ2	3:C:338:LEU:HD22	2.57	0.40
4:B:195:PRO:O	4:B:198:PHE:HB2	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	
3	A	451/507 (89%)	420 (93%)	31 (7%)	0	100	100
3	C	451/507 (89%)	424 (94%)	27 (6%)	0	100	100
4	B	250/452 (55%)	238 (95%)	12 (5%)	0	100	100
4	D	250/452 (55%)	234 (94%)	16 (6%)	0	100	100
All	All	1402/1918 (73%)	1316 (94%)	86 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	
3	A	397/446 (89%)	394 (99%)	3 (1%)	79	87
3	C	397/446 (89%)	395 (100%)	2 (0%)	86	92
4	B	233/414 (56%)	233 (100%)	0	100	100
4	D	233/414 (56%)	233 (100%)	0	100	100
All	All	1260/1720 (73%)	1255 (100%)	5 (0%)	88	94

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

Mol	Chain	Res	Type
3	A	52	ILE
3	A	227	SER

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Mol	Chain	Res	Type
3	A	430	GLN
3	C	304	PHE
3	C	317	VAL

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	61	GLN
3	A	135	ASN
3	A	205	GLN
3	A	251	HIS
3	A	293	ASN
3	A	325	ASN
3	A	468	ASN
3	C	48	GLN
3	C	59	HIS
3	C	307	ASN
3	C	409	ASN
3	C	446	ASN
4	D	191	ASN
4	D	212	ASN
4	D	417	ASN
4	B	318	ASN
4	B	320	HIS
4	B	357	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	E	0/21	-	-
1	G	0/21	-	-
All	All	0/42	-	-

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 ⓘ

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.