



Full wwPDB NMR Structure Validation Report ⓘ

Feb 12, 2017 – 11:42 pm GMT

PDB ID : 2L5D
Title : Solution Structures of human PIWI-like 1 PAZ domain with ssRNA (5'-pUGACA)
Authors : Zeng, L.; Zhang, Q.; Yan, K.; Zhou, M.
Deposited on : 2010-10-29

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A user guide is available at

<http://wwpdb.org/validation/2016/NMRValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

Cyrange : Kirchner and Güntert (2011)
NmrClust : Kelley et al. (1996)
MolProbity : 4.02b-467
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
RCI : v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV : Wang et al. (2010)
ShiftChecker : trunk28760
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : recalc28949

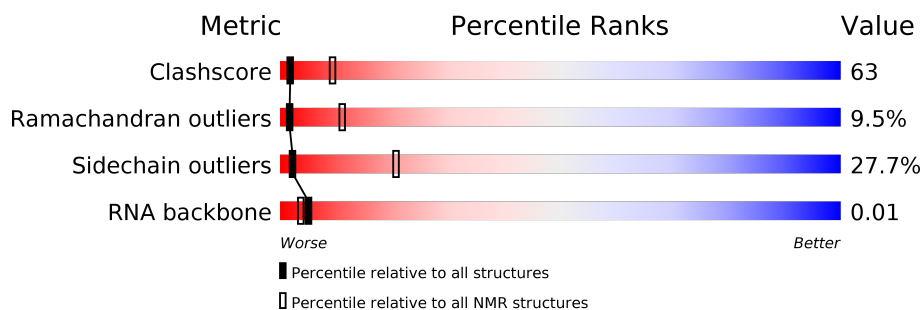
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

SOLUTION NMR

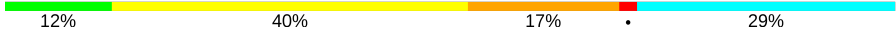
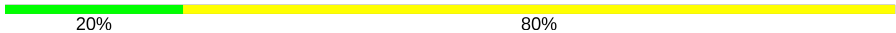
The overall completeness of chemical shifts assignment is 80%.

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)	NMR archive (#Entries)
Clashscore	125131	11601
Ramachandran outliers	121729	10391
Sidechain outliers	121581	10367
RNA backbone	3398	623

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and 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	134	
2	B	5	

2 Ensemble composition and analysis

This entry contains 20 models. Model 11 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy*.

The following residues are included in the computation of the global validation metrics.

Well-defined (core) protein residues			
Well-defined core	Residue range (total)	Backbone RMSD (Å)	Medoid model
1	A:277-A:332, A:340-A:364, A:380-A:393 (95)	0.19	11

Ill-defined regions of proteins are excluded from the global statistics.

Ligands and non-protein polymers are included in the analysis.

The models can be grouped into 3 clusters and 1 single-model cluster was found.

Cluster number	Models
1	1, 2, 3, 5, 7, 9, 10, 11, 12, 14, 16, 17, 20
2	4, 8, 15, 18
3	13, 19
Single-model clusters	6

3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 2355 atoms, of which 1149 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Piwi-like protein 1.

Mol	Chain	Residues	Atoms						Trace
1	A	134	Total	C	H	N	O	S	0
			2195	698	1093	188	211	5	

- Molecule 2 is a RNA chain called 5'-R(*UP*GP*AP*CP*A)-3'.

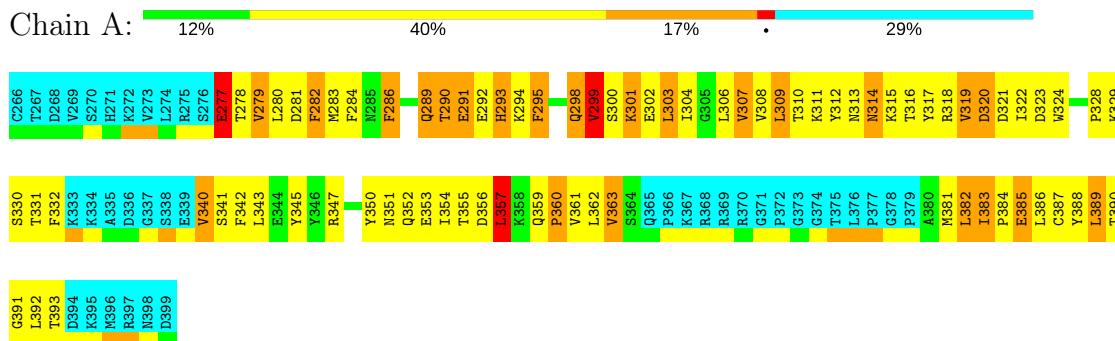
Mol	Chain	Residues	Atoms						Trace
2	B	5	Total	C	H	N	O	P	0
			160	48	56	20	32	4	

4 Residue-property plots

4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA and DNA chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-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 outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: Piwi-like protein 1



- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

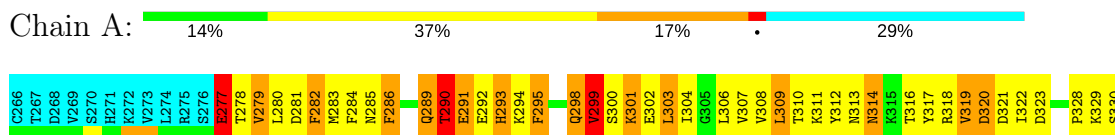


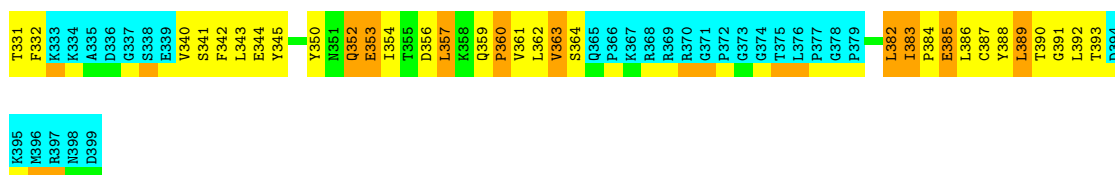
4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

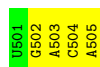
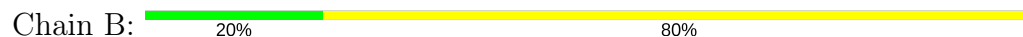
4.2.1 Score per residue for model 1

- Molecule 1: Piwi-like protein 1



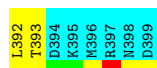
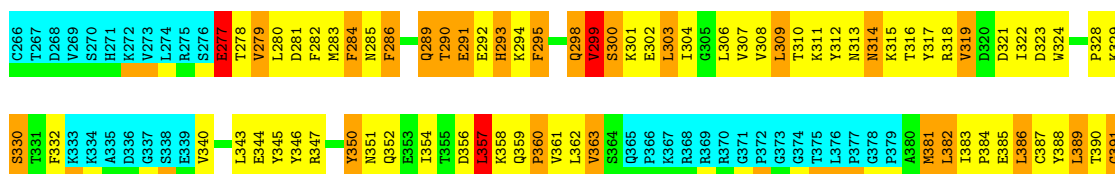


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

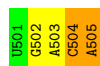
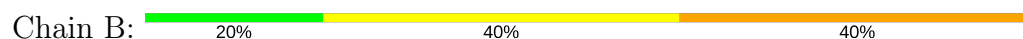


4.2.2 Score per residue for model 2

- Molecule 1: Piwi-like protein 1

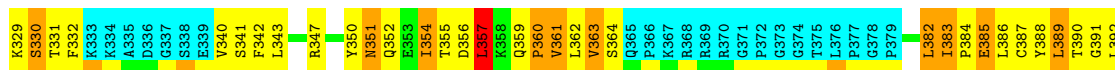
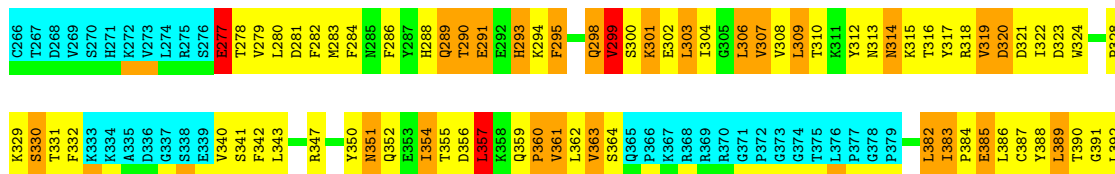


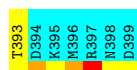
- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.3 Score per residue for model 3

- Molecule 1: Piwi-like protein 1



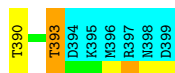
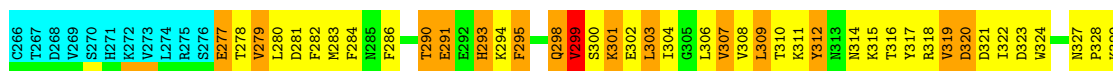
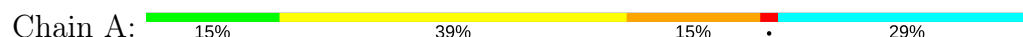


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

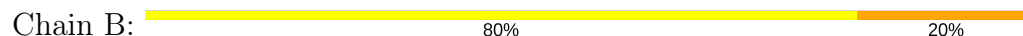


4.2.4 Score per residue for model 4

- Molecule 1: Piwi-like protein 1

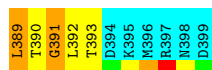
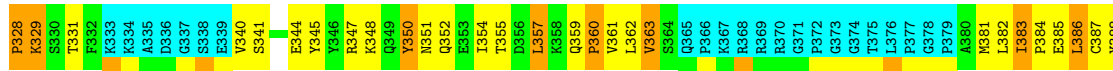
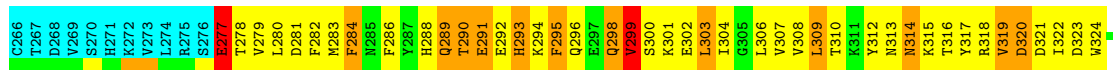
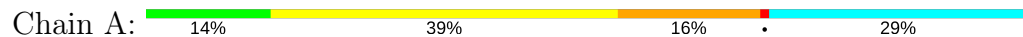


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.5 Score per residue for model 5

- Molecule 1: Piwi-like protein 1



- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

Chain B:  20% 80%

U501
G502
A503
C504
A505

4.2.6 Score per residue for model 6

- Molecule 1: Piwi-like protein 1

Chain A:  11% 37% 21% 29%

C966 T267 D268 V269 S270 H271 K272 V273 L274 R275 S276 E277 T278 V279 L280 D281 F282 M283 F284 F285 F286 Q289 T290 E291 E292 H293 K294 F295 Q296 E297 Q298 V299 S300 K301 E302 L303 L304 G305 L306 V307 V308 L309 T310 K311 Y312 N313 N314 K315 T316 Y317 R318 V319 D320 D321 I322 D323 W324 Q326

K327 F328 K329 S330 T331 F332 K333 K334 A335 D336 G337 S338 F339 V340 S341 F342 L343 K347 N351 Q352 E353 T354 T355 D356 L357 K358 Q359 P360 V361 L362 V363 S364 Q365 P366 K367 R368 R369 R370 P371 P372 G373 G374 T375 L376 G378 P377 P379 K380 K381 L382 P383 P384 E385 L386 C387 Y388 L389 T390

G391 L392 T393 D394 M395 K396 R397 N398 D399

- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

Chain B:  40% 60%

U501
G502
A503
C504
A505

4.2.7 Score per residue for model 7

- Molecule 1: Piwi-like protein 1

Chain A:  16% 37% 16% 29%

C966 T267 D268 V269 S270 H271 K272 V273 L274 R275 S276 E277 T278 V279 L280 D281 F282 M283 F284 F285 F286 Q290 E291 H293 K294 F295 Q298 V299 S300 K301 E302 L303 L304 G305 L306 V307 V308 L309 T310 K311 Y312 N313 N314 K315 T316 Y317 R318 V319 D320 D321 I322 D323 W324 Q326

T331 F332 K333 K334 A335 D336 G337 S338 F339 V340 S341 F342 L343 E344 Y346 R347 Y350 N351 Q352 E353 T354 T355 D356 L357 K358 Q359 P360 V361 L362 V363 S364 Q365 P366 K367 R368 R369 R370 P371 P372 G373 G374 T375 L376 G378 P377 P379 L382 L383 P384 E385 L386 C387 Y388 L389 T390 G391 L392

T393 D394 M395 K396 R397 N398 D399

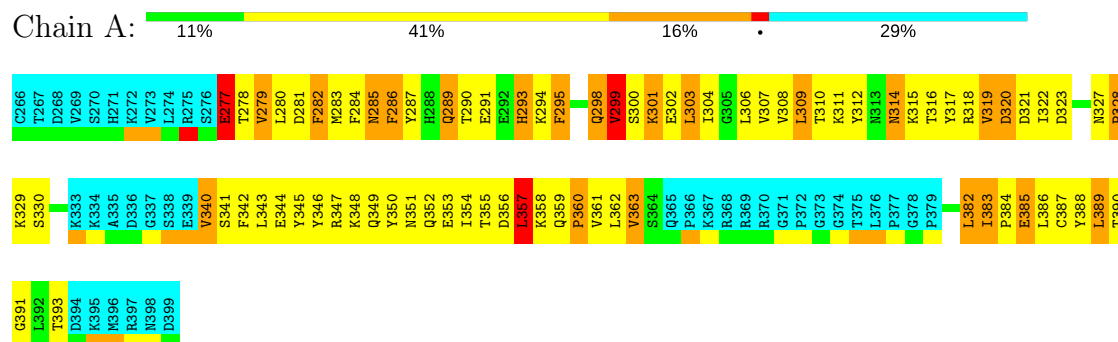
- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

Chain B:  20% 80%

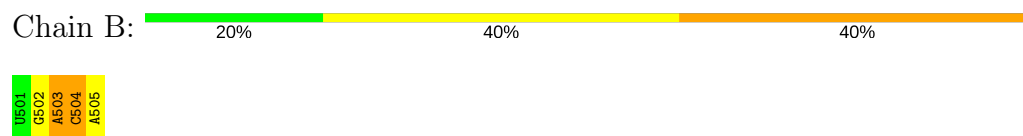
U501
G502
A503
C504
A505

4.2.8 Score per residue for model 8

- Molecule 1: Piwi-like protein 1

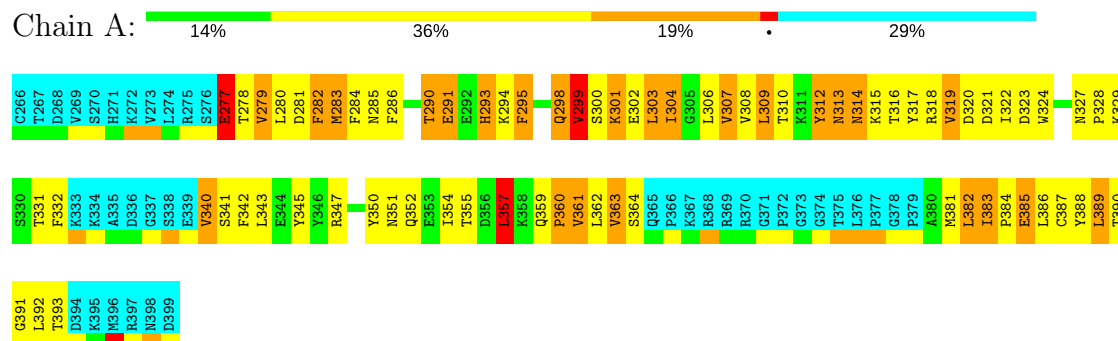


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.9 Score per residue for model 9

- Molecule 1: Piwi-like protein 1

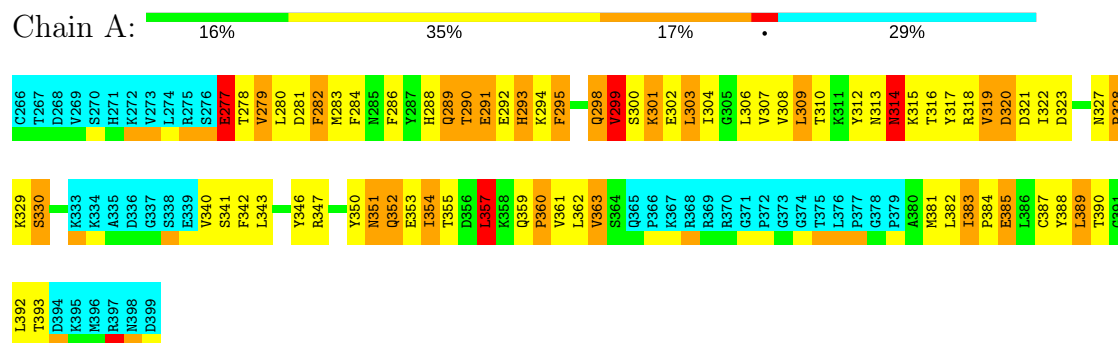


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.10 Score per residue for model 10

- Molecule 1: Piwi-like protein 1

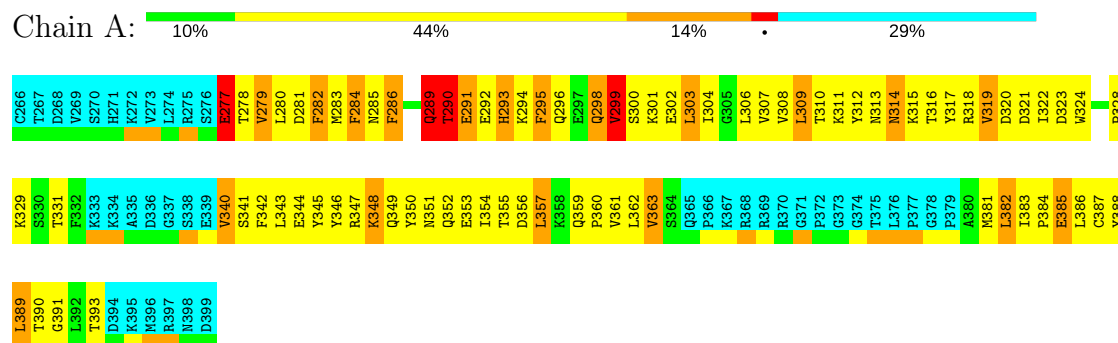


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.11 Score per residue for model 11 (medoid)

- Molecule 1: Piwi-like protein 1

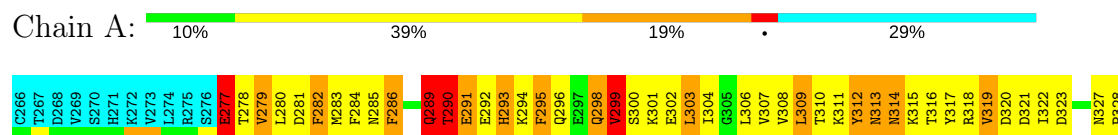


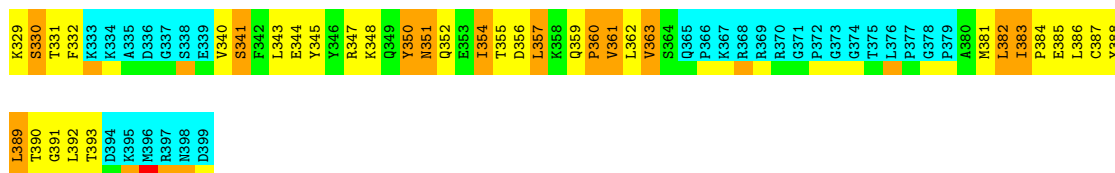
- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



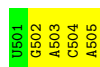
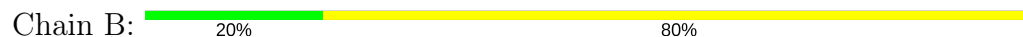
4.2.12 Score per residue for model 12

- Molecule 1: Piwi-like protein 1



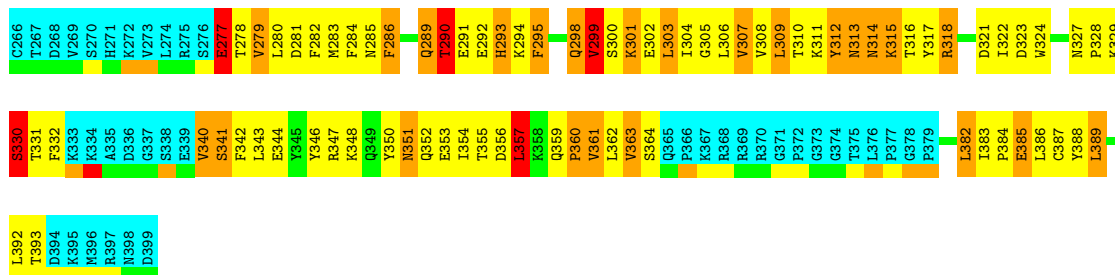


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

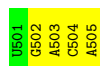


4.2.13 Score per residue for model 13

- Molecule 1: Piwi-like protein 1

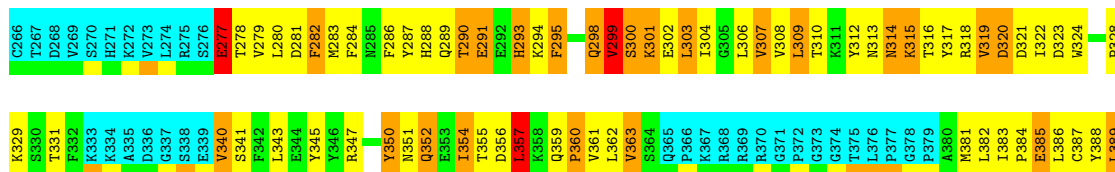


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



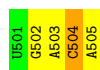
4.2.14 Score per residue for model 14

- Molecule 1: Piwi-like protein 1



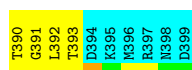


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.15 Score per residue for model 15

- Molecule 1: Piwi-like protein 1

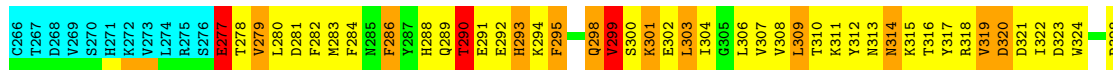
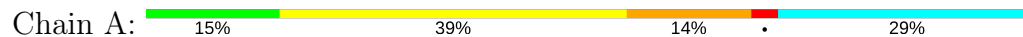


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

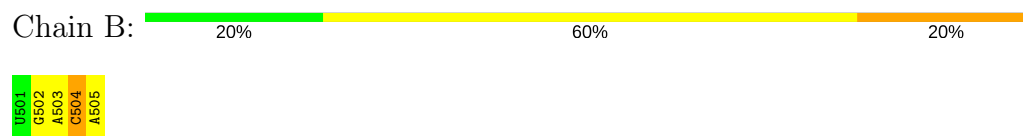


4.2.16 Score per residue for model 16

- Molecule 1: Piwi-like protein 1

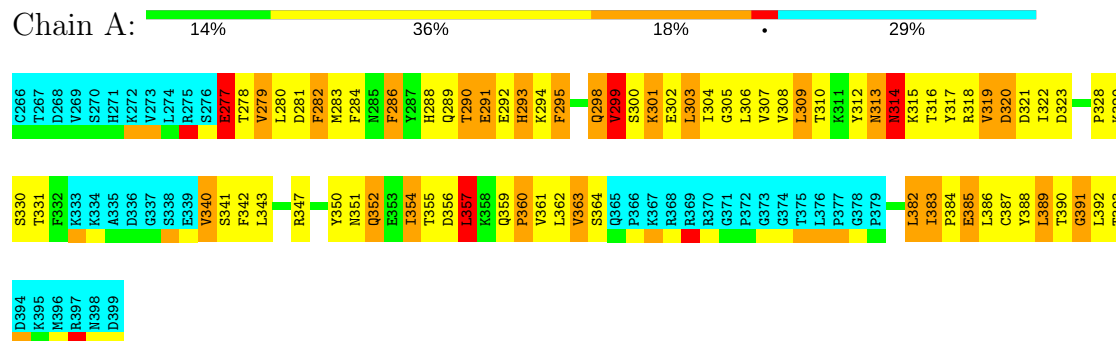


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.17 Score per residue for model 17

- Molecule 1: Piwi-like protein 1

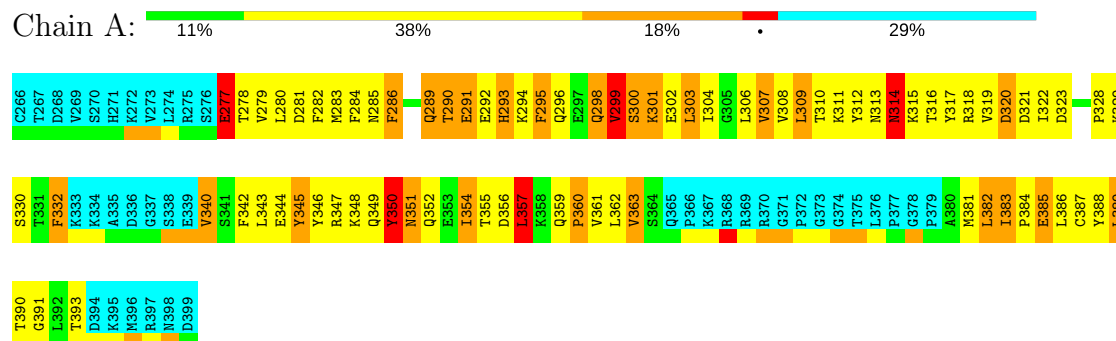


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'

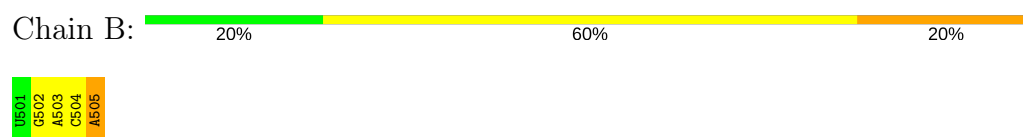


4.2.18 Score per residue for model 18

- Molecule 1: Piwi-like protein 1

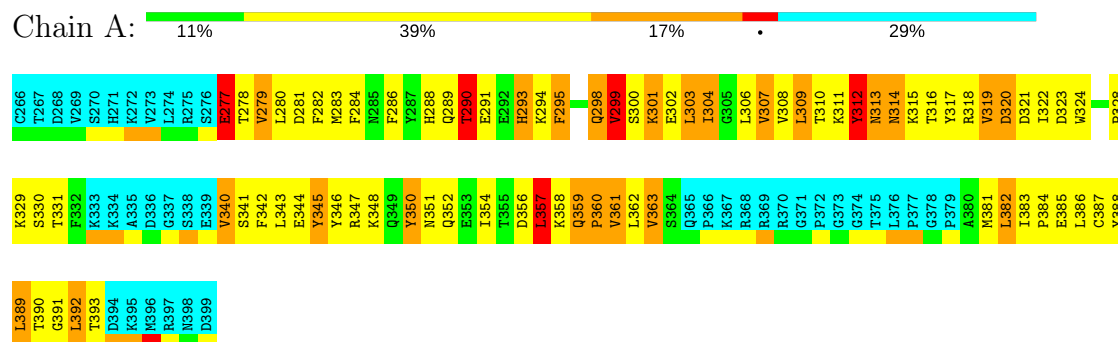


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.19 Score per residue for model 19

- Molecule 1: Piwi-like protein 1

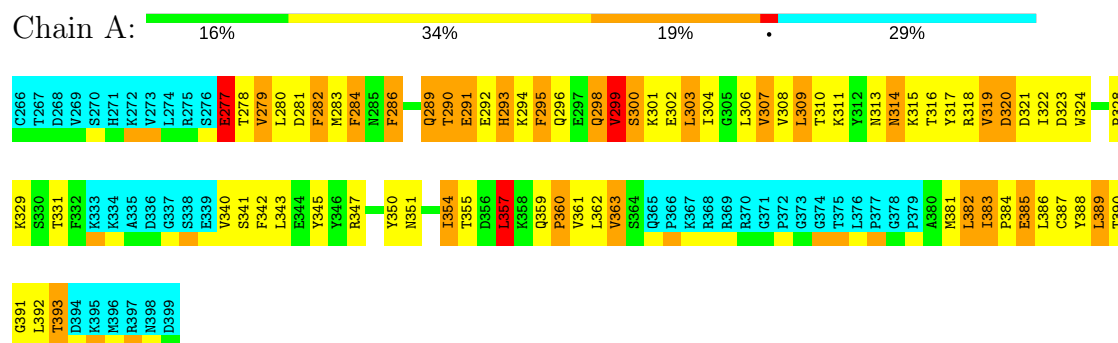


- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



4.2.20 Score per residue for model 20

- Molecule 1: Piwi-like protein 1



- Molecule 2: 5'-R(*UP*GP*AP*CP*A)-3'



5 Refinement protocol and experimental data overview

The models were refined using the following method: *DGSA-distance geometry simulated annealing, torsion angle dynamics*.

Of the 200 calculated structures, 20 were deposited, based on the following criterion: *structures with the lowest energy*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
ARIA	refinement	2.2
CNS	structure solution	1.2

The following table shows chemical shift validation statistics as aggregates over all chemical shift files. Detailed validation can be found in section 7 of this report.

Chemical shift file(s)	BMRB entry 17273
Number of chemical shift lists	1
Total number of shifts	1472
Number of shifts mapped to atoms	1472
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	80%

No validations of the models with respect to experimental NMR restraints is performed at this time.

6 Model quality [i](#)

6.1 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 (average) 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	0.42±0.01	0±0/824 (0.0±0.0%)	0.60±0.02	0±0/1119 (0.0±0.0%)
2	B	0.22±0.04	0±0/116 (0.0±0.0%)	0.67±0.04	0±0/179 (0.0±0.0%)
All	All	0.40	0/18800 (0.0%)	0.61	2/25960 (0.0%)

There are no bond-length outliers.

All unique angle outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	350	TYR	CB-CG-CD1	8.22	125.93	121.00	18	1
1	A	350	TYR	CB-CG-CD2	-5.44	117.74	121.00	18	1

There are no chirality outliers.

There are no planarity outliers.

6.2 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 each 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 averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	804	786	784	109±6
2	B	104	56	56	1±1
All	All	18160	16840	16800	2188

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 63.

All unique clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:306:LEU:HD23	1:A:393:THR:HG22	0.82	1.50	19	20
1:A:354:ILE:HD12	1:A:383:ILE:HG21	0.82	1.51	2	9
1:A:303:LEU:HB2	1:A:322:ILE:HD11	0.81	1.52	4	20
1:A:384:PRO:HA	1:A:387:CYS:SG	0.79	2.18	11	6
1:A:352:GLN:HG3	1:A:386:LEU:HD22	0.79	1.51	8	14
1:A:350:TYR:N	1:A:350:TYR:CD1	0.78	2.51	18	1
1:A:279:VAL:HG13	1:A:387:CYS:SG	0.78	2.19	9	6
1:A:308:VAL:HB	1:A:387:CYS:HB3	0.77	1.56	19	14
1:A:279:VAL:HG23	1:A:283:MET:SD	0.74	2.23	18	18
1:A:299:VAL:O	1:A:303:LEU:HD12	0.72	1.84	4	20
1:A:361:VAL:HG12	1:A:362:LEU:H	0.72	1.45	10	10
1:A:308:VAL:HB	1:A:387:CYS:HB2	0.72	1.61	1	6
1:A:300:SER:HA	1:A:322:ILE:HD13	0.71	1.63	4	20
1:A:309:LEU:O	1:A:387:CYS:HA	0.70	1.87	16	20
1:A:291:GLU:HB2	1:A:294:LYS:HE2	0.70	1.63	6	1
1:A:279:VAL:HG22	1:A:387:CYS:SG	0.69	2.26	8	6
1:A:352:GLN:CG	1:A:386:LEU:HD22	0.69	2.18	13	9
1:A:340:VAL:HG23	1:A:344:GLU:CB	0.69	2.18	8	1
1:A:354:ILE:CD1	1:A:386:LEU:HD11	0.68	2.17	6	16
1:A:306:LEU:CD2	1:A:393:THR:HG22	0.68	2.19	3	19
1:A:308:VAL:HG13	1:A:319:VAL:CG1	0.68	2.19	17	18
1:A:309:LEU:HB3	1:A:388:TYR:HB2	0.67	1.64	9	19
1:A:391:GLY:O	1:A:393:THR:HG23	0.67	1.89	9	7
1:A:290:THR:HG23	1:A:295:PHE:HB2	0.67	1.67	6	1
1:A:323:ASP:HB3	1:A:361:VAL:HB	0.66	1.68	8	20
1:A:280:LEU:HD13	1:A:385:GLU:HG2	0.66	1.68	16	2
1:A:329:LYS:HB3	1:A:357:LEU:HD21	0.65	1.69	5	1
1:A:359:GLN:NE2	1:A:383:ILE:HG23	0.65	2.06	5	1
1:A:329:LYS:HB2	1:A:357:LEU:HD11	0.65	1.67	2	16
1:A:280:LEU:HD11	1:A:359:GLN:HB2	0.64	1.67	20	18
1:A:309:LEU:O	1:A:309:LEU:HD13	0.64	1.91	16	1
1:A:309:LEU:C	1:A:309:LEU:HD13	0.64	2.13	19	11
1:A:383:ILE:HB	1:A:386:LEU:HD12	0.64	1.69	13	14
1:A:293:HIS:HD2	1:A:294:LYS:H	0.63	1.34	14	15
1:A:352:GLN:OE1	1:A:352:GLN:N	0.63	2.31	4	1
1:A:308:VAL:HG13	1:A:319:VAL:HG11	0.63	1.69	14	11
1:A:346:TYR:HB3	1:A:352:GLN:HE21	0.63	1.52	10	1
1:A:349:GLN:HB3	1:A:350:TYR:CD1	0.63	2.28	18	1
1:A:306:LEU:HD13	1:A:307:VAL:N	0.63	2.09	14	17
1:A:350:TYR:N	1:A:350:TYR:HD1	0.63	1.89	18	2
1:A:317:TYR:CD2	1:A:382:LEU:HD21	0.63	2.29	17	16
1:A:299:VAL:O	1:A:302:GLU:HB2	0.63	1.94	4	20

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:309:LEU:HD13	1:A:309:LEU:C	0.62	2.14	7	8
1:A:309:LEU:HD12	1:A:388:TYR:HB2	0.62	1.70	16	1
1:A:293:HIS:CD2	1:A:293:HIS:N	0.62	2.66	6	11
1:A:280:LEU:HB2	1:A:384:PRO:C	0.62	2.14	11	18
1:A:309:LEU:HD23	1:A:388:TYR:HB2	0.62	1.70	15	1
1:A:293:HIS:CD2	1:A:294:LYS:H	0.62	2.13	3	20
1:A:343:LEU:HD22	1:A:357:LEU:CD2	0.62	2.25	10	16
1:A:362:LEU:HB2	1:A:382:LEU:HB2	0.62	1.70	18	17
1:A:309:LEU:HD21	1:A:314:ASN:HA	0.61	1.70	16	1
1:A:328:PRO:HG3	1:A:359:GLN:HE21	0.61	1.54	5	1
1:A:307:VAL:HG22	1:A:390:THR:OG1	0.61	1.94	9	16
1:A:361:VAL:HG13	1:A:382:LEU:O	0.61	1.96	2	4
1:A:308:VAL:HG21	1:A:382:LEU:HD13	0.61	1.72	20	9
1:A:295:PHE:O	1:A:299:VAL:HG23	0.61	1.96	3	20
1:A:307:VAL:HG13	1:A:393:THR:H	0.61	1.55	12	19
1:A:317:TYR:CE2	1:A:382:LEU:HD21	0.61	2.31	15	1
1:A:308:VAL:O	1:A:316:THR:HA	0.61	1.95	5	20
1:A:349:GLN:HB3	1:A:350:TYR:CE1	0.61	2.30	18	1
1:A:361:VAL:HG12	1:A:362:LEU:N	0.61	2.10	17	11
1:A:321:ASP:HB2	1:A:363:VAL:HG13	0.61	1.73	3	20
1:A:353:GLU:HG3	1:A:355:THR:HG23	0.60	1.73	8	3
1:A:289:GLN:HG3	1:A:290:THR:N	0.60	2.12	13	2
1:A:279:VAL:HG11	1:A:308:VAL:HG11	0.60	1.73	15	10
1:A:280:LEU:HD12	1:A:359:GLN:CD	0.60	2.16	16	1
1:A:354:ILE:HD11	1:A:383:ILE:HG13	0.60	1.74	17	10
1:A:300:SER:O	1:A:304:ILE:HG12	0.60	1.96	8	20
1:A:340:VAL:HG23	1:A:344:GLU:HB2	0.60	1.73	8	1
1:A:294:LYS:N	1:A:294:LYS:HE3	0.60	2.12	6	1
1:A:306:LEU:HD21	1:A:391:GLY:HA2	0.59	1.74	3	7
1:A:289:GLN:HE21	1:A:290:THR:HG22	0.59	1.55	12	4
1:A:300:SER:C	1:A:304:ILE:HG12	0.59	2.18	5	20
1:A:350:TYR:CD1	1:A:350:TYR:N	0.59	2.70	19	1
1:A:329:LYS:N	1:A:357:LEU:HD11	0.59	2.13	5	6
1:A:347:ARG:O	1:A:351:ASN:HA	0.59	1.97	8	18
1:A:354:ILE:HG13	1:A:383:ILE:HG21	0.59	1.73	9	8
1:A:279:VAL:HG21	1:A:362:LEU:HD21	0.58	1.73	3	4
1:A:312:TYR:HB3	1:A:352:GLN:NE2	0.58	2.13	4	1
1:A:280:LEU:O	1:A:284:PHE:HB2	0.58	1.98	8	19
1:A:289:GLN:CG	1:A:290:THR:HG22	0.58	2.28	13	1
1:A:308:VAL:CG2	1:A:382:LEU:HD13	0.58	2.29	1	9
1:A:289:GLN:HG3	1:A:290:THR:HG22	0.58	1.75	5	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:318:ARG:N	1:A:318:ARG:HD2	0.58	2.13	19	2
1:A:310:THR:HG23	1:A:315:LYS:O	0.58	1.99	8	10
1:A:354:ILE:HD12	1:A:386:LEU:HD11	0.57	1.76	20	3
1:A:279:VAL:HA	1:A:282:PHE:HB3	0.57	1.76	9	20
1:A:291:GLU:O	1:A:295:PHE:HB2	0.57	1.99	3	19
1:A:357:LEU:HD12	1:A:357:LEU:O	0.57	2.00	3	12
1:A:294:LYS:O	1:A:298:GLN:HG2	0.57	2.00	6	20
1:A:280:LEU:HD13	1:A:385:GLU:CG	0.56	2.30	16	2
1:A:278:THR:HG21	1:A:385:GLU:O	0.56	2.00	5	20
1:A:289:GLN:O	1:A:290:THR:O	0.56	2.23	16	3
1:A:292:GLU:O	1:A:295:PHE:HB3	0.56	2.00	6	13
1:A:331:THR:HG22	1:A:341:SER:HB3	0.56	1.76	7	8
1:A:350:TYR:H	1:A:350:TYR:HD1	0.56	1.43	18	1
1:A:280:LEU:HD12	1:A:384:PRO:HG2	0.56	1.78	8	10
1:A:315:LYS:HD2	1:A:317:TYR:OH	0.56	2.01	11	9
1:A:309:LEU:HD12	1:A:388:TYR:CG	0.56	2.36	16	1
1:A:310:THR:O	1:A:314:ASN:N	0.56	2.39	3	12
1:A:359:GLN:HB3	1:A:360:PRO:HD2	0.56	1.76	9	16
1:A:329:LYS:N	1:A:357:LEU:HD21	0.55	2.16	4	3
1:A:310:THR:HG22	1:A:382:LEU:HD22	0.55	1.77	15	2
1:A:279:VAL:HG22	1:A:384:PRO:HB3	0.55	1.77	5	3
1:A:329:LYS:HD2	1:A:357:LEU:HD11	0.55	1.78	5	1
1:A:303:LEU:O	1:A:306:LEU:HB3	0.55	2.01	15	18
1:A:359:GLN:OE1	1:A:385:GLU:N	0.55	2.39	5	1
1:A:309:LEU:HD22	1:A:310:THR:N	0.55	2.16	16	1
1:A:318:ARG:HD3	1:A:318:ARG:N	0.55	2.17	2	2
1:A:294:LYS:HE3	1:A:295:PHE:H	0.55	1.61	6	1
1:A:295:PHE:O	1:A:299:VAL:CG2	0.55	2.55	7	20
1:A:356:ASP:O	1:A:358:LYS:N	0.55	2.40	8	6
1:A:364:SER:HB2	1:A:382:LEU:HD11	0.55	1.77	13	2
1:A:286:PHE:CE2	1:A:298:GLN:HB2	0.54	2.37	3	11
1:A:321:ASP:O	1:A:363:VAL:HG13	0.54	2.02	9	10
1:A:362:LEU:CB	1:A:382:LEU:HD12	0.54	2.32	6	6
1:A:290:THR:OG1	1:A:294:LYS:NZ	0.54	2.40	6	1
1:A:328:PRO:HB2	1:A:357:LEU:HD13	0.54	1.77	19	16
1:A:382:LEU:HB3	1:A:387:CYS:SG	0.54	2.43	15	13
1:A:277:GLU:O	1:A:388:TYR:HA	0.54	2.02	10	19
2:B:503:A:H4'	2:B:504:C:OP2	0.54	2.02	8	1
1:A:283:MET:HG2	1:A:299:VAL:HG12	0.54	1.80	12	18
1:A:329:LYS:O	1:A:330:SER:C	0.54	2.46	13	7
1:A:308:VAL:HG11	1:A:362:LEU:HD13	0.54	1.79	2	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:310:THR:HB	1:A:312:TYR:CE1	0.54	2.38	9	12
1:A:361:VAL:CG1	1:A:362:LEU:N	0.54	2.71	2	7
1:A:329:LYS:HD3	1:A:357:LEU:HD21	0.54	1.77	18	11
1:A:346:TYR:HA	1:A:350:TYR:CD1	0.54	2.38	18	1
1:A:361:VAL:HG11	1:A:381:MET:CE	0.54	2.32	2	1
1:A:309:LEU:CD2	1:A:314:ASN:HA	0.53	2.33	16	1
1:A:354:ILE:HD11	1:A:386:LEU:HD11	0.53	1.80	5	3
1:A:352:GLN:NE2	1:A:352:GLN:H	0.53	2.01	1	1
1:A:390:THR:HB	1:A:392:LEU:HD13	0.53	1.81	19	1
1:A:331:THR:HG22	1:A:341:SER:HB2	0.53	1.78	20	3
1:A:309:LEU:HD12	1:A:388:TYR:CB	0.53	2.33	16	1
1:A:291:GLU:N	1:A:294:LYS:NZ	0.53	2.57	6	1
1:A:278:THR:HB	1:A:384:PRO:O	0.53	2.04	14	14
1:A:317:TYR:HD2	1:A:382:LEU:HD21	0.53	1.63	13	5
1:A:390:THR:CB	1:A:392:LEU:HD22	0.53	2.33	19	1
1:A:384:PRO:O	1:A:387:CYS:SG	0.53	2.67	9	6
1:A:329:LYS:O	1:A:330:SER:O	0.53	2.27	10	4
1:A:359:GLN:N	1:A:359:GLN:HE21	0.53	2.00	16	1
1:A:364:SER:CB	1:A:382:LEU:HD11	0.53	2.33	13	1
1:A:304:ILE:CD1	1:A:321:ASP:HA	0.53	2.34	8	20
1:A:303:LEU:HA	1:A:306:LEU:HD12	0.53	1.79	19	1
1:A:280:LEU:HG	1:A:359:GLN:HG3	0.53	1.80	13	12
1:A:345:TYR:O	1:A:349:GLN:HB2	0.53	2.04	15	1
1:A:354:ILE:CG1	1:A:383:ILE:HG21	0.52	2.34	12	8
1:A:357:LEU:O	1:A:357:LEU:HD12	0.52	2.04	13	4
1:A:313:ASN:N	1:A:313:ASN:HD22	0.52	2.02	17	1
1:A:293:HIS:N	1:A:293:HIS:CD2	0.52	2.77	10	7
1:A:308:VAL:HA	1:A:390:THR:HG23	0.52	1.81	5	1
1:A:359:GLN:H	1:A:359:GLN:HE21	0.52	1.48	16	1
1:A:280:LEU:HD12	1:A:359:GLN:OE1	0.52	2.05	5	1
1:A:346:TYR:HB3	1:A:352:GLN:NE2	0.52	2.19	4	1
1:A:389:LEU:HD23	1:A:389:LEU:H	0.52	1.65	10	8
1:A:308:VAL:CB	1:A:387:CYS:HB3	0.52	2.33	2	7
1:A:303:LEU:O	1:A:306:LEU:HB2	0.52	2.04	19	2
1:A:390:THR:HB	1:A:392:LEU:HD22	0.52	1.82	19	1
1:A:313:ASN:O	1:A:314:ASN:C	0.52	2.48	16	16
1:A:329:LYS:HE3	1:A:357:LEU:HG	0.51	1.81	3	11
1:A:294:LYS:O	1:A:295:PHE:C	0.51	2.49	19	10
1:A:280:LEU:HD23	1:A:280:LEU:O	0.51	2.04	5	1
1:A:354:ILE:HG22	1:A:355:THR:N	0.51	2.18	5	11
1:A:312:TYR:CD2	1:A:386:LEU:HD13	0.51	2.40	19	10

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:352:GLN:HB2	1:A:386:LEU:HD22	0.51	1.80	1	1
1:A:280:LEU:O	1:A:280:LEU:HD23	0.51	2.05	16	1
2:B:504:C:H4'	2:B:505:A:H5'	0.51	1.83	2	1
1:A:305:GLY:HA2	1:A:318:ARG:NH2	0.51	2.21	13	1
1:A:352:GLN:O	1:A:353:GLU:C	0.51	2.49	4	2
1:A:317:TYR:CD2	1:A:382:LEU:HD11	0.51	2.40	15	1
1:A:361:VAL:CG1	1:A:362:LEU:H	0.50	2.18	17	4
1:A:389:LEU:N	1:A:389:LEU:HD23	0.50	2.22	2	11
1:A:306:LEU:HD22	1:A:307:VAL:H	0.50	1.66	4	10
1:A:361:VAL:HA	1:A:384:PRO:HD3	0.50	1.81	14	2
1:A:390:THR:C	1:A:392:LEU:H	0.50	2.09	3	1
1:A:329:LYS:HB2	1:A:357:LEU:CD2	0.50	2.37	15	3
1:A:315:LYS:HD3	1:A:317:TYR:OH	0.50	2.07	13	6
1:A:346:TYR:CB	1:A:352:GLN:NE2	0.50	2.75	4	1
1:A:389:LEU:HD23	1:A:389:LEU:N	0.50	2.22	17	8
1:A:389:LEU:H	1:A:389:LEU:HD23	0.50	1.67	17	11
1:A:306:LEU:HD13	1:A:307:VAL:H	0.50	1.65	14	2
1:A:350:TYR:HB2	1:A:352:GLN:HE22	0.50	1.65	10	1
1:A:346:TYR:O	1:A:352:GLN:NE2	0.50	2.45	10	1
1:A:307:VAL:CG2	1:A:392:LEU:HD12	0.49	2.37	5	9
1:A:340:VAL:CG2	1:A:345:TYR:N	0.49	2.75	8	1
1:A:309:LEU:HD23	1:A:388:TYR:CB	0.49	2.35	15	1
1:A:343:LEU:HD22	1:A:357:LEU:CD1	0.49	2.37	4	2
1:A:307:VAL:HB	1:A:318:ARG:HA	0.49	1.84	9	16
1:A:390:THR:HB	1:A:392:LEU:HG	0.49	1.84	20	3
1:A:298:GLN:O	1:A:299:VAL:C	0.49	2.51	2	20
1:A:306:LEU:HD13	1:A:307:VAL:O	0.49	2.07	12	17
1:A:312:TYR:HD2	1:A:386:LEU:HD13	0.49	1.67	2	9
1:A:300:SER:O	1:A:304:ILE:N	0.49	2.45	9	2
1:A:340:VAL:HG23	1:A:344:GLU:HB3	0.49	1.85	8	1
1:A:304:ILE:C	1:A:306:LEU:H	0.49	2.11	16	11
1:A:312:TYR:HB2	1:A:350:TYR:CD2	0.49	2.43	14	10
1:A:309:LEU:C	1:A:309:LEU:CD1	0.49	2.81	13	11
1:A:312:TYR:HA	1:A:352:GLN:NE2	0.49	2.22	6	7
1:A:350:TYR:HB2	1:A:352:GLN:NE2	0.48	2.23	10	1
1:A:331:THR:HA	1:A:341:SER:HA	0.48	1.85	11	13
1:A:280:LEU:CD1	1:A:359:GLN:HB2	0.48	2.37	15	12
1:A:312:TYR:HB3	1:A:352:GLN:CD	0.48	2.28	10	2
1:A:359:GLN:HB3	1:A:360:PRO:CD	0.48	2.38	20	10
1:A:352:GLN:N	1:A:352:GLN:CD	0.48	2.66	10	1
1:A:286:PHE:CD2	1:A:299:VAL:HG13	0.48	2.44	14	13

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:280:LEU:HG	1:A:359:GLN:HG2	0.48	1.84	19	2
1:A:362:LEU:HB2	1:A:382:LEU:HD12	0.48	1.84	6	3
1:A:289:GLN:HG2	1:A:290:THR:HG22	0.48	1.85	10	2
1:A:293:HIS:CD2	1:A:294:LYS:N	0.48	2.81	14	4
1:A:286:PHE:O	1:A:290:THR:HG22	0.48	2.09	6	1
1:A:311:LYS:HB2	1:A:386:LEU:O	0.48	2.09	4	10
1:A:354:ILE:HD13	1:A:386:LEU:HD11	0.48	1.86	6	3
1:A:384:PRO:CA	1:A:387:CYS:SG	0.48	3.00	11	5
1:A:309:LEU:CD1	1:A:309:LEU:C	0.48	2.82	19	7
1:A:279:VAL:N	1:A:387:CYS:SG	0.47	2.88	9	4
2:B:505:A:C2'	2:B:505:A:N3	0.47	2.77	18	1
1:A:341:SER:OG	1:A:342:PHE:N	0.47	2.47	11	2
1:A:318:ARG:HD2	1:A:318:ARG:N	0.47	2.24	5	1
1:A:359:GLN:HB2	1:A:360:PRO:HD2	0.47	1.87	5	1
1:A:340:VAL:CG2	1:A:341:SER:N	0.47	2.76	8	1
1:A:317:TYR:HD2	1:A:382:LEU:HD11	0.47	1.68	15	1
1:A:343:LEU:HD22	1:A:357:LEU:HD11	0.47	1.86	15	1
1:A:346:TYR:CE2	1:A:383:ILE:HG12	0.47	2.44	19	6
1:A:311:LYS:HB3	1:A:352:GLN:NE2	0.47	2.23	11	2
1:A:280:LEU:HD13	1:A:385:GLU:CB	0.47	2.39	20	17
1:A:340:VAL:CG2	1:A:345:TYR:HB2	0.47	2.40	5	9
1:A:308:VAL:HG13	1:A:319:VAL:HG12	0.47	1.86	11	6
1:A:291:GLU:O	1:A:295:PHE:CB	0.47	2.62	6	5
1:A:291:GLU:CB	1:A:294:LYS:HE2	0.47	2.37	6	1
1:A:344:GLU:HB3	1:A:348:LYS:HE3	0.47	1.86	8	1
1:A:279:VAL:CG2	1:A:362:LEU:HD11	0.47	2.40	15	7
1:A:354:ILE:CD1	1:A:383:ILE:HG21	0.47	2.40	1	3
1:A:280:LEU:HD21	1:A:356:ASP:CG	0.47	2.28	13	9
1:A:278:THR:HA	1:A:387:CYS:O	0.47	2.09	9	5
1:A:307:VAL:CG1	1:A:393:THR:N	0.47	2.78	14	2
1:A:318:ARG:N	1:A:318:ARG:HD3	0.47	2.25	4	2
1:A:307:VAL:CG1	1:A:318:ARG:HD2	0.47	2.39	14	1
1:A:328:PRO:HB3	1:A:354:ILE:HG12	0.47	1.87	5	2
1:A:329:LYS:CB	1:A:357:LEU:HD11	0.47	2.39	19	13
1:A:347:ARG:HB3	1:A:348:LYS:HE3	0.47	1.84	11	1
1:A:280:LEU:HD23	1:A:280:LEU:C	0.47	2.31	5	1
1:A:327:ASN:C	1:A:329:LYS:H	0.47	2.13	6	7
1:A:317:TYR:OH	2:B:504:C:H5'	0.47	2.09	14	1
1:A:311:LYS:HD2	1:A:352:GLN:HE22	0.47	1.68	11	3
1:A:307:VAL:HG12	1:A:318:ARG:HD2	0.47	1.87	13	2
1:A:283:MET:CE	1:A:322:ILE:HG21	0.46	2.40	10	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:286:PHE:O	1:A:289:GLN:HG3	0.46	2.11	1	6
1:A:304:ILE:HD12	1:A:321:ASP:HA	0.46	1.87	8	4
2:B:503:A:O2'	2:B:504:C:P	0.46	2.73	8	1
1:A:279:VAL:HA	1:A:389:LEU:HD22	0.46	1.87	16	8
1:A:304:ILE:HG23	1:A:320:ASP:O	0.46	2.11	10	12
1:A:280:LEU:HD13	1:A:385:GLU:HB2	0.46	1.88	18	10
1:A:343:LEU:HD13	1:A:357:LEU:HD22	0.46	1.88	2	2
1:A:293:HIS:CD2	1:A:293:HIS:H	0.46	2.27	6	3
1:A:346:TYR:CA	1:A:352:GLN:NE2	0.46	2.79	4	1
1:A:329:LYS:HE2	1:A:357:LEU:HG	0.46	1.87	1	2
1:A:359:GLN:HG3	1:A:384:PRO:HB2	0.46	1.86	16	1
1:A:344:GLU:O	1:A:348:LYS:HG3	0.46	2.11	18	3
1:A:322:ILE:O	1:A:324:TRP:CD1	0.46	2.69	16	14
1:A:390:THR:CG2	1:A:392:LEU:HD22	0.46	2.40	19	1
1:A:294:LYS:HE3	1:A:295:PHE:N	0.46	2.25	6	1
1:A:304:ILE:HD12	1:A:320:ASP:O	0.46	2.10	3	8
1:A:311:LYS:HD2	1:A:352:GLN:NE2	0.46	2.26	13	1
1:A:295:PHE:CG	1:A:296:GLN:N	0.46	2.84	6	7
1:A:356:ASP:C	1:A:358:LYS:N	0.46	2.69	4	6
1:A:352:GLN:C	1:A:352:GLN:CD	0.46	2.74	1	1
1:A:346:TYR:O	1:A:351:ASN:N	0.46	2.49	18	2
1:A:283:MET:HE1	1:A:360:PRO:HG2	0.46	1.86	9	2
1:A:290:THR:HB	1:A:298:GLN:NE2	0.46	2.25	13	1
1:A:312:TYR:CD1	1:A:313:ASN:ND2	0.45	2.84	2	1
1:A:280:LEU:HB2	1:A:385:GLU:N	0.45	2.27	18	9
1:A:341:SER:O	1:A:342:PHE:C	0.45	2.55	8	3
1:A:383:ILE:N	2:B:505:A:N7	0.45	2.64	18	1
1:A:303:LEU:HD13	1:A:322:ILE:HG12	0.45	1.89	20	6
1:A:282:PHE:HZ	1:A:302:GLU:HB3	0.45	1.70	13	14
1:A:279:VAL:HG13	1:A:387:CYS:HB2	0.45	1.89	6	4
1:A:352:GLN:HG2	1:A:386:LEU:HD22	0.45	1.85	13	1
1:A:282:PHE:CD2	1:A:389:LEU:HD21	0.45	2.45	4	1
1:A:352:GLN:O	1:A:386:LEU:HD21	0.45	2.11	4	1
1:A:312:TYR:CD1	1:A:313:ASN:N	0.45	2.84	18	5
1:A:280:LEU:HD11	1:A:356:ASP:CG	0.45	2.32	16	1
1:A:328:PRO:HG2	1:A:357:LEU:HA	0.45	1.89	15	3
1:A:383:ILE:HB	2:B:505:A:H62	0.45	1.72	18	1
1:A:279:VAL:HG21	1:A:362:LEU:HD11	0.45	1.89	18	2
1:A:307:VAL:HG12	1:A:318:ARG:CD	0.45	2.41	13	1
1:A:389:LEU:CD2	1:A:389:LEU:H	0.45	2.24	10	8
1:A:390:THR:OG1	1:A:391:GLY:N	0.45	2.50	5	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:307:VAL:HG13	1:A:392:LEU:HB2	0.45	1.88	9	3
1:A:328:PRO:HD2	1:A:357:LEU:HD23	0.45	1.89	4	2
1:A:312:TYR:HB3	1:A:352:GLN:CG	0.45	2.41	18	1
1:A:340:VAL:HG21	1:A:345:TYR:N	0.45	2.27	8	1
1:A:354:ILE:CD1	1:A:383:ILE:HG13	0.44	2.42	17	2
1:A:309:LEU:HD21	1:A:314:ASN:CG	0.44	2.33	6	2
1:A:282:PHE:C	1:A:284:PHE:N	0.44	2.71	4	10
1:A:343:LEU:HA	1:A:354:ILE:HG13	0.44	1.90	1	1
1:A:277:GLU:HG2	1:A:389:LEU:HD11	0.44	1.89	14	7
1:A:356:ASP:C	1:A:358:LYS:H	0.44	2.15	4	5
1:A:295:PHE:CE1	1:A:299:VAL:HG21	0.44	2.48	6	13
1:A:328:PRO:O	1:A:342:PHE:HB2	0.44	2.13	18	6
1:A:363:VAL:HB	1:A:381:MET:SD	0.44	2.52	18	6
1:A:329:LYS:HB3	1:A:357:LEU:HD11	0.44	1.89	5	1
1:A:343:LEU:HA	1:A:354:ILE:HD13	0.44	1.89	17	1
1:A:381:MET:HG3	1:A:381:MET:O	0.44	2.11	2	1
1:A:347:ARG:HA	1:A:352:GLN:H	0.44	1.73	17	2
1:A:328:PRO:HD2	1:A:357:LEU:HD12	0.44	1.89	5	1
1:A:298:GLN:O	1:A:301:LYS:N	0.44	2.51	4	9
1:A:389:LEU:H	1:A:389:LEU:CD2	0.44	2.25	17	10
1:A:329:LYS:CA	1:A:357:LEU:HD21	0.44	2.43	4	3
1:A:307:VAL:HB	1:A:317:TYR:O	0.43	2.13	2	2
1:A:328:PRO:HA	1:A:383:ILE:HD11	0.43	1.90	16	3
1:A:350:TYR:HD2	1:A:352:GLN:HE22	0.43	1.53	4	1
1:A:347:ARG:O	1:A:351:ASN:N	0.43	2.52	4	2
1:A:307:VAL:CG1	1:A:393:THR:H	0.43	2.26	14	2
1:A:279:VAL:HG22	1:A:384:PRO:CB	0.43	2.44	5	1
1:A:352:GLN:HE21	1:A:352:GLN:H	0.43	1.55	1	1
1:A:312:TYR:HB3	1:A:352:GLN:HG2	0.43	1.89	18	1
1:A:279:VAL:CG1	1:A:387:CYS:SG	0.43	3.02	7	5
1:A:280:LEU:C	1:A:280:LEU:HD23	0.43	2.34	16	1
1:A:315:LYS:HB3	1:A:317:TYR:CZ	0.43	2.49	14	1
1:A:282:PHE:O	1:A:285:ASN:ND2	0.43	2.52	1	4
1:A:300:SER:O	1:A:301:LYS:C	0.43	2.57	18	6
1:A:317:TYR:OH	2:B:504:C:H5''	0.43	2.13	16	1
1:A:340:VAL:CG2	1:A:345:TYR:H	0.43	2.27	8	1
1:A:342:PHE:CD2	1:A:383:ILE:HD11	0.43	2.49	3	5
1:A:313:ASN:ND2	1:A:350:TYR:CD2	0.43	2.87	19	1
1:A:300:SER:O	1:A:303:LEU:N	0.43	2.51	13	16
1:A:305:GLY:H	1:A:320:ASP:HA	0.43	1.73	17	1
1:A:381:MET:H	2:B:505:A:H4'	0.42	1.74	20	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:390:THR:HG21	1:A:392:LEU:HD22	0.42	1.91	19	1
1:A:361:VAL:HG11	1:A:381:MET:HE2	0.42	1.89	2	1
1:A:312:TYR:HB3	1:A:352:GLN:CB	0.42	2.44	15	1
1:A:279:VAL:CG2	1:A:384:PRO:HB3	0.42	2.44	5	1
1:A:328:PRO:HA	1:A:383:ILE:CD1	0.42	2.44	6	1
1:A:347:ARG:HA	1:A:352:GLN:N	0.42	2.29	11	1
1:A:318:ARG:CD	1:A:318:ARG:N	0.42	2.79	2	1
1:A:307:VAL:CG1	1:A:392:LEU:HB2	0.42	2.43	13	1
1:A:293:HIS:H	1:A:293:HIS:CD2	0.42	2.33	5	4
1:A:310:THR:O	1:A:314:ASN:HA	0.42	2.13	19	1
1:A:381:MET:O	2:B:505:A:C1'	0.42	2.68	18	1
1:A:382:LEU:HD23	2:B:505:A:C2	0.42	2.49	18	1
1:A:357:LEU:O	1:A:358:LYS:HE2	0.42	2.14	16	2
1:A:285:ASN:O	1:A:289:GLN:HG2	0.42	2.15	8	1
1:A:328:PRO:C	1:A:357:LEU:HD21	0.42	2.35	4	1
1:A:317:TYR:HB3	1:A:364:SER:OG	0.42	2.14	17	2
1:A:348:LYS:N	1:A:348:LYS:HE3	0.42	2.29	11	1
1:A:312:TYR:HA	1:A:352:GLN:HE21	0.42	1.74	8	1
1:A:361:VAL:HG11	1:A:381:MET:HE3	0.42	1.92	20	1
1:A:307:VAL:O	1:A:390:THR:OG1	0.42	2.30	6	7
1:A:279:VAL:HA	1:A:389:LEU:CD2	0.42	2.44	1	1
1:A:362:LEU:HD11	1:A:387:CYS:SG	0.42	2.55	9	1
1:A:304:ILE:C	1:A:306:LEU:N	0.42	2.72	16	5
1:A:344:GLU:O	1:A:345:TYR:C	0.42	2.58	18	3
1:A:329:LYS:CA	1:A:357:LEU:HD11	0.42	2.45	19	4
1:A:382:LEU:HA	2:B:505:A:C5	0.42	2.50	18	1
1:A:330:SER:HB2	1:A:342:PHE:CE2	0.41	2.49	3	1
1:A:303:LEU:O	1:A:304:ILE:C	0.41	2.56	19	1
1:A:279:VAL:HB	1:A:303:LEU:CD2	0.41	2.45	9	2
1:A:328:PRO:HD2	1:A:357:LEU:O	0.41	2.15	8	1
1:A:312:TYR:HA	1:A:352:GLN:CD	0.41	2.36	12	1
1:A:315:LYS:HG2	1:A:317:TYR:CE2	0.41	2.49	15	1
1:A:299:VAL:O	1:A:303:LEU:CD1	0.41	2.66	7	3
1:A:283:MET:HE1	1:A:322:ILE:HG21	0.41	1.91	10	3
1:A:329:LYS:CE	1:A:357:LEU:HD13	0.41	2.45	15	1
1:A:345:TYR:O	1:A:349:GLN:CB	0.41	2.67	11	2
1:A:323:ASP:HB2	1:A:363:VAL:HG12	0.41	1.93	4	1
1:A:328:PRO:HG2	1:A:356:ASP:O	0.41	2.15	6	3
1:A:329:LYS:NZ	1:A:357:LEU:HD13	0.41	2.30	4	1
1:A:362:LEU:HD12	1:A:387:CYS:SG	0.41	2.55	2	1
1:A:328:PRO:HB2	1:A:357:LEU:HG	0.41	1.93	8	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:308:VAL:CG2	1:A:387:CYS:SG	0.41	3.09	15	1
1:A:279:VAL:CG2	1:A:387:CYS:SG	0.41	3.07	13	1
2:B:501:U:H4'	2:B:502:G:OP2	0.41	2.14	4	1
1:A:310:THR:CG2	1:A:382:LEU:HD22	0.41	2.46	5	1
1:A:343:LEU:HD13	1:A:357:LEU:HD12	0.41	1.92	8	2
1:A:390:THR:C	1:A:392:LEU:N	0.41	2.74	3	1
1:A:354:ILE:CG2	1:A:355:THR:N	0.41	2.84	5	3
1:A:344:GLU:HG2	1:A:348:LYS:HD3	0.41	1.93	12	2
1:A:290:THR:OG1	1:A:295:PHE:N	0.41	2.54	16	1
1:A:295:PHE:CD2	1:A:296:GLN:HG3	0.41	2.51	6	1
1:A:279:VAL:CG1	1:A:387:CYS:O	0.41	2.69	18	1
1:A:347:ARG:O	1:A:351:ASN:CA	0.41	2.69	11	1
1:A:348:LYS:H	1:A:348:LYS:HE3	0.41	1.76	11	1
1:A:331:THR:HG22	1:A:341:SER:CA	0.41	2.46	13	1
1:A:317:TYR:HB2	1:A:382:LEU:HD11	0.41	1.92	15	1
1:A:357:LEU:O	1:A:357:LEU:CD2	0.41	2.69	4	1
1:A:284:PHE:O	1:A:287:TYR:N	0.40	2.54	14	2
1:A:323:ASP:OD1	1:A:326:GLN:HG3	0.40	2.15	6	1
1:A:307:VAL:HG22	1:A:392:LEU:HD12	0.40	1.92	5	1
1:A:328:PRO:HG2	1:A:359:GLN:NE2	0.40	2.31	16	1
1:A:363:VAL:O	1:A:363:VAL:HG22	0.40	2.17	15	1
1:A:328:PRO:HB2	1:A:354:ILE:HG21	0.40	1.93	11	1
1:A:317:TYR:HB3	1:A:364:SER:HB3	0.40	1.92	15	1
1:A:318:ARG:N	1:A:318:ARG:CD	0.40	2.83	19	1
1:A:280:LEU:HD21	1:A:356:ASP:OD2	0.40	2.15	2	1
1:A:345:TYR:O	1:A:349:GLN:HB3	0.40	2.16	8	1
1:A:346:TYR:HA	1:A:352:GLN:NE2	0.40	2.31	4	1
1:A:357:LEU:O	1:A:357:LEU:HD23	0.40	2.16	4	1
1:A:388:TYR:O	1:A:390:THR:HG23	0.40	2.16	3	1
1:A:299:VAL:O	1:A:300:SER:C	0.40	2.58	16	1
1:A:291:GLU:OE2	1:A:294:LYS:HG3	0.40	2.17	14	1
1:A:359:GLN:OE1	1:A:384:PRO:HB2	0.40	2.16	5	1
1:A:279:VAL:HG13	1:A:387:CYS:O	0.40	2.16	17	1
1:A:383:ILE:HG22	1:A:385:GLU:N	0.40	2.32	1	1
1:A:290:THR:HG21	1:A:295:PHE:HA	0.40	1.94	12	1
1:A:331:THR:CG2	1:A:341:SER:OG	0.40	2.69	12	1
1:A:313:ASN:O	1:A:315:LYS:N	0.40	2.54	16	1
1:A:309:LEU:HD13	1:A:309:LEU:O	0.40	2.16	2	1

6.3 Torsion angles [i](#)

6.3.1 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 NMR 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	95/134 (71%)	64±2 (68±2%)	22±2 (23±2%)	9±1 (9±1%)	2	11
All	All	1900/2680 (71%)	1288 (68%)	432 (23%)	180 (9%)	2	11

All 18 unique Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	295	PHE	20
1	A	277	GLU	20
1	A	360	PRO	20
1	A	299	VAL	20
1	A	314	ASN	17
1	A	291	GLU	16
1	A	357	LEU	15
1	A	290	THR	14
1	A	330	SER	12
1	A	391	GLY	8
1	A	289	GLN	6
1	A	328	PRO	4
1	A	353	GLU	2
1	A	304	ILE	2
1	A	312	TYR	1
1	A	393	THR	1
1	A	351	ASN	1
1	A	347	ARG	1

6.3.2 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 NMR 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	92/125 (74%)	67±3 (72±3%)	25±3 (28±3%)	2	21
All	All	1840/2500 (74%)	1331 (72%)	509 (28%)	2	21

All 56 unique residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	277	GLU	20
1	A	357	LEU	20
1	A	363	VAL	20
1	A	281	ASP	20
1	A	298	GLN	20
1	A	301	LYS	20
1	A	293	HIS	20
1	A	299	VAL	20
1	A	303	LEU	20
1	A	389	LEU	19
1	A	319	VAL	19
1	A	290	THR	19
1	A	309	LEU	19
1	A	320	ASP	17
1	A	340	VAL	16
1	A	382	LEU	15
1	A	279	VAL	14
1	A	385	GLU	14
1	A	350	TYR	13
1	A	383	ILE	13
1	A	282	PHE	12
1	A	286	PHE	12
1	A	307	VAL	10
1	A	332	PHE	9
1	A	354	ILE	9
1	A	289	GLN	9
1	A	288	HIS	7
1	A	361	VAL	7
1	A	284	PHE	7
1	A	312	TYR	6
1	A	313	ASN	6
1	A	381	MET	5
1	A	285	ASN	5
1	A	314	ASN	5
1	A	353	GLU	4
1	A	352	GLN	4

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Mol	Chain	Res	Type	Models (Total)
1	A	300	SER	4
1	A	351	ASN	4
1	A	359	GLN	3
1	A	341	SER	3
1	A	283	MET	2
1	A	315	LYS	2
1	A	345	TYR	2
1	A	386	LEU	2
1	A	311	LYS	1
1	A	344	GLU	1
1	A	306	LEU	1
1	A	393	THR	1
1	A	392	LEU	1
1	A	329	LYS	1
1	A	330	SER	1
1	A	294	LYS	1
1	A	326	GLN	1
1	A	318	ARG	1
1	A	292	GLU	1
1	A	348	LYS	1

6.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers	Suiteness
2	B	4/5 (80%)	4±0 (95±10%)	0±0 (0±0%)	0.01±0.03
All	All	80/100 (80%)	76 (95%)	0 (0%)	0.01

The overall RNA backbone suiteness is 0.01.

All unique RNA backbone outliers are listed below:

Mol	Chain	Res	Type	Models (Total)
2	B	504	C	19
2	B	502	G	19
2	B	505	A	19
2	B	503	A	19

There are no RNA pucker outliers to report.

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

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

6.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

6.6 Ligand geometry [i](#)

There are no ligands in this entry.

6.7 Other polymers [i](#)

There are no such molecules in this entry.

6.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

7 Chemical shift validation

The completeness of assignment taking into account all chemical shift lists is 80% for the well-defined parts and 78% for the entire structure.

7.1 Chemical shift list 1

File name: BMRB entry 17273

Chemical shift list name: *assigned_chem_shift_list_1*

7.1.1 Bookkeeping

The following table shows the results of parsing the chemical shift list and reports the number of nuclei with statistically unusual chemical shifts.

Total number of shifts	1472
Number of shifts mapped to atoms	1472
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	6

7.1.2 Chemical shift referencing

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction \pm precision, ppm	Suggested action
$^{13}\text{C}_\alpha$	133	-0.02 ± 0.11	None needed (< 0.5 ppm)
$^{13}\text{C}_\beta$	125	0.19 ± 0.15	None needed (< 0.5 ppm)
$^{13}\text{C}'$	0	—	None (insufficient data)
^{15}N	124	0.57 ± 0.41	None needed (imprecise)

7.1.3 Completeness of resonance assignments

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 80%, i.e. 1066 atoms were assigned a chemical shift out of a possible 1336. 19 out of 19 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^1H	^{13}C	^{15}N
Backbone	372/469 (79%)	186/187 (99%)	95/190 (50%)	91/92 (99%)
Sidechain	562/635 (89%)	349/370 (94%)	202/240 (84%)	11/25 (44%)

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	Total	¹ H	¹³ C	¹⁵ N
Aromatic	132/138 (96%)	71/72 (99%)	60/61 (98%)	1/5 (20%)
Overall	1066/1336 (80%)	606/683 (89%)	357/525 (68%)	103/128 (80%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 78%, i.e. 1426 atoms were assigned a chemical shift out of a possible 1825. 23 out of 23 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	¹ H	¹³ C	¹⁵ N
Backbone	514/656 (78%)	257/261 (98%)	133/268 (50%)	124/127 (98%)
Sidechain	777/929 (84%)	491/547 (90%)	273/335 (81%)	13/47 (28%)
Aromatic	135/146 (92%)	73/76 (96%)	61/63 (97%)	1/7 (14%)
Overall	1426/1825 (78%)	821/938 (88%)	467/700 (67%)	138/187 (74%)

7.1.4 Statistically unusual chemical shifts ⓘ

The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

Mol	Chain	Res	Type	Atom	Shift, ppm	Expected range, ppm	Z-score
1	A	367	LYS	NZ	109.84	49.86 – 18.16	23.9
1	A	347	ARG	NE	107.59	92.63 – 76.73	14.4
1	A	296	GLN	HG3	0.23	3.75 – 0.85	-7.2
1	A	367	LYS	HZ1	3.00	10.62 – 4.22	-6.9
1	A	367	LYS	HZ2	3.00	10.62 – 4.22	-6.9
1	A	367	LYS	HZ3	3.00	10.62 – 4.22	-6.9

7.1.5 Random Coil Index (RCI) plots ⓘ

The image below reports *random coil index* values for the protein chains in the structure. The height of each bar gives a probability of a given residue to be disordered, as predicted from the available chemical shifts and the amino acid sequence. A value above 0.2 is an indication of significant predicted disorder. The colour of the bar shows whether the residue is in the well-defined core (black) or in the ill-defined residue ranges (cyan), as described in section 2 on ensemble composition.

Random coil index (RCI) for chain A:

