



Full wwPDB NMR Structure Validation Report ⓘ

Mar 24, 2026 – 08:55 PM UTC

PDB ID : 2HQO / pdb_00002hqo
Title : Structure of a Atypical Orphan Response Regulator Protein Revealed a New Phosphorylation-Independent Regulatory Mechanism
Authors : Hong, E.; Lee, W.
Deposited on : 2006-07-19

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

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:

MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

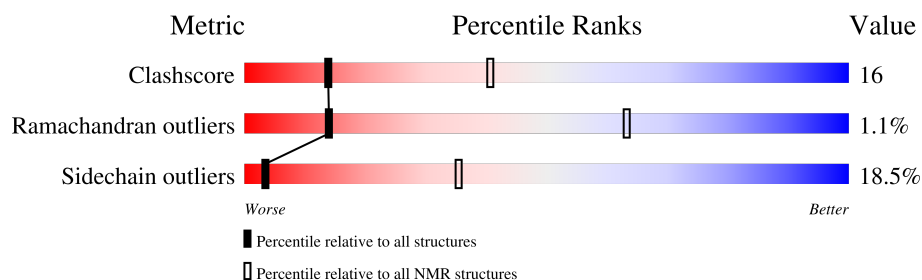
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

SOLUTION NMR

The overall completeness of chemical shifts assignment was not calculated.

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	229148	14424
Ramachandran outliers	224038	12848
Sidechain outliers	223484	12823

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	123	
1	B	123	

2 Ensemble composition and analysis

This entry contains 20 models. Model 2 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:2-A:113, B:302-B:413 (224)	0.37	2

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 2 clusters and 2 single-model clusters were found.

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

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 3762 atoms, of which 1882 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Putative TRANSCRIPTIONAL REGULATOR.

Mol	Chain	Residues	Atoms						Trace
1	A	119	Total	C	H	N	O	S	0
			1881	592	941	160	184	4	
1	B	119	Total	C	H	N	O	S	0
			1881	592	941	160	184	4	

There are 8 discrepancies between the modelled and reference sequences:

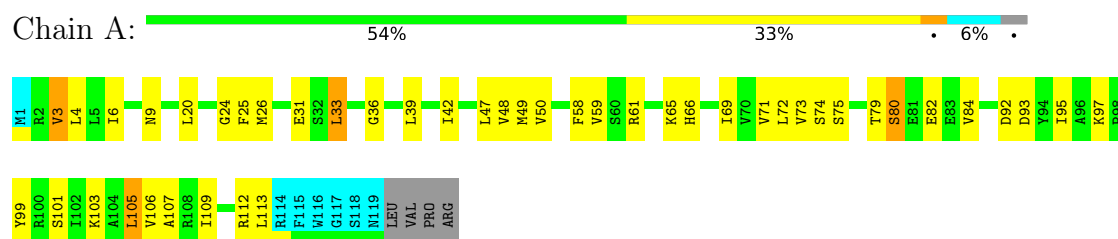
Chain	Residue	Modelled	Actual	Comment	Reference
A	120	LEU	-	cloning artifact	UNP Q9ZM42
A	121	VAL	-	cloning artifact	UNP Q9ZM42
A	122	PRO	-	cloning artifact	UNP Q9ZM42
A	123	ARG	-	cloning artifact	UNP Q9ZM42
B	420	LEU	-	cloning artifact	UNP Q9ZM42
B	421	VAL	-	cloning artifact	UNP Q9ZM42
B	422	PRO	-	cloning artifact	UNP Q9ZM42
B	423	ARG	-	cloning artifact	UNP Q9ZM42

4 Residue-property plots [i](#)

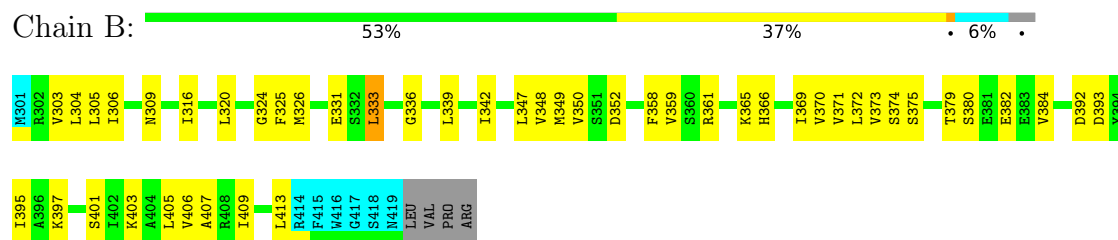
4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA, DNA and oligosaccharide 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: Putative TRANSCRIPTIONAL REGULATOR



• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

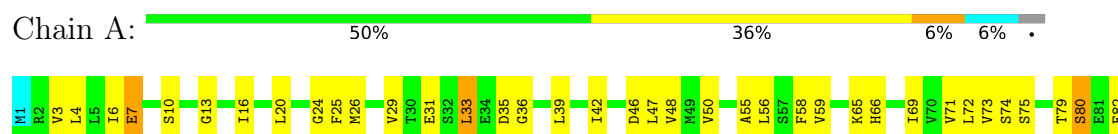


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

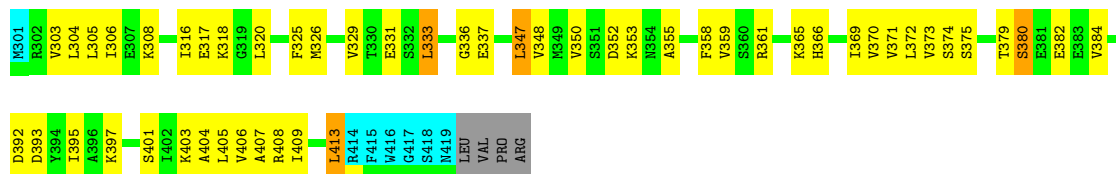
• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR





• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

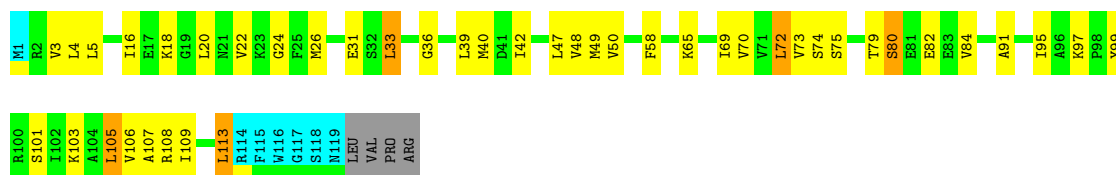
Chain B: 50% 38% 6%



4.2.2 Score per residue for model 2 (medoid)

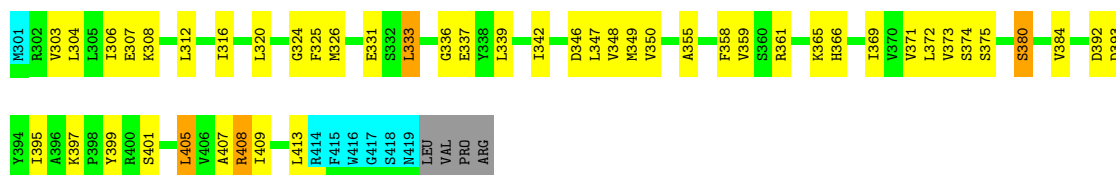
• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain A: 56% 31% 6%



• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

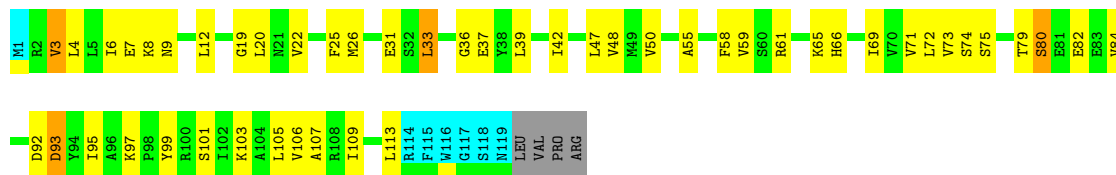
Chain B: 53% 35% 6%



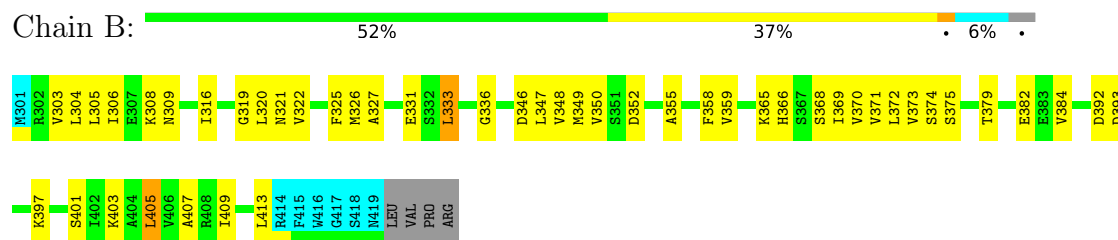
4.2.3 Score per residue for model 3

• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain A: 51% 37% 6%

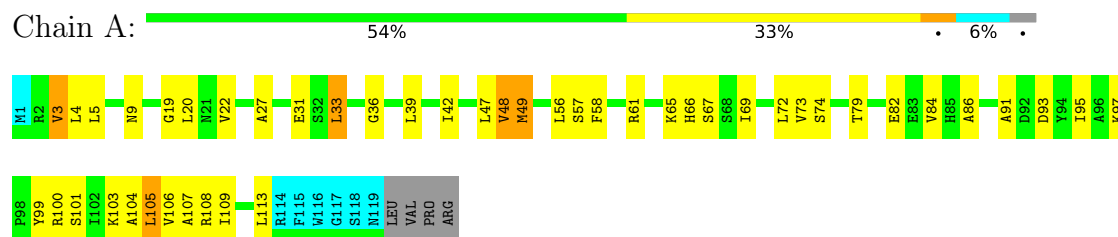


• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

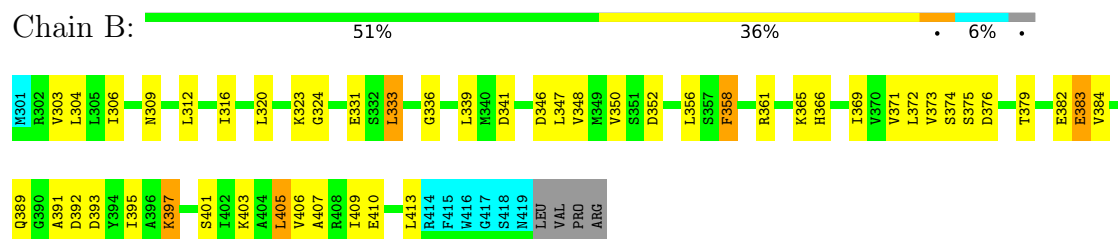


4.2.4 Score per residue for model 4

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

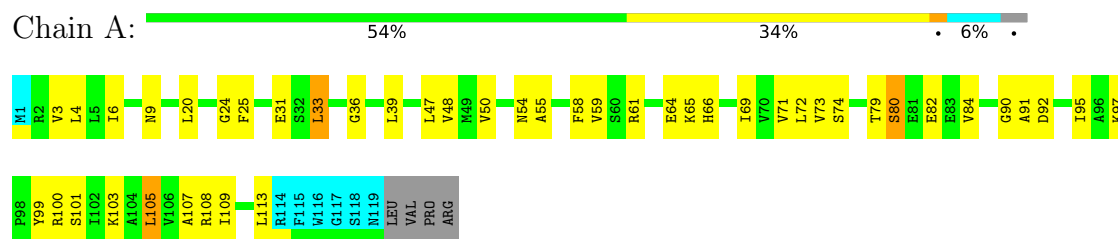


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

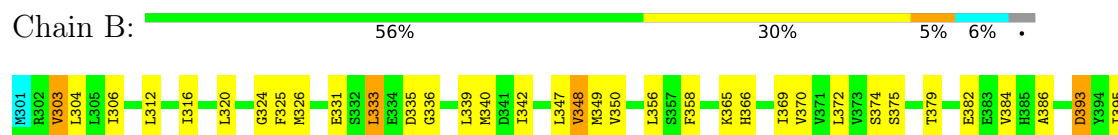


4.2.5 Score per residue for model 5

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



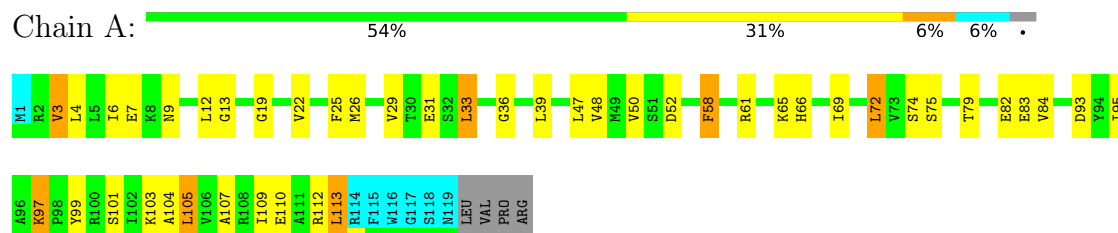
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



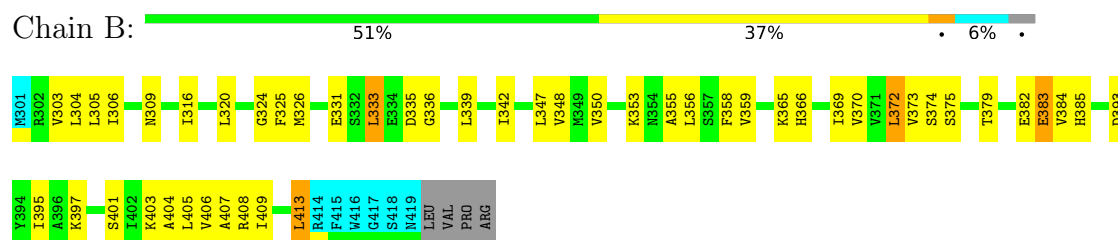


4.2.6 Score per residue for model 6

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

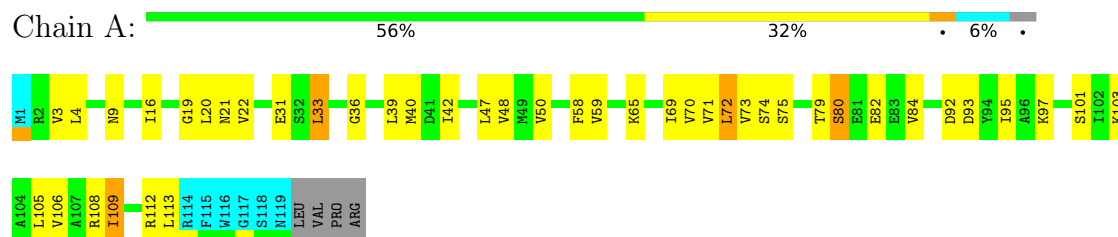


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

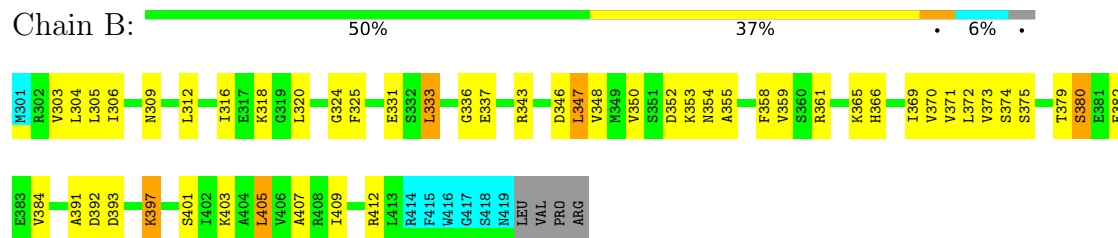


4.2.7 Score per residue for model 7

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

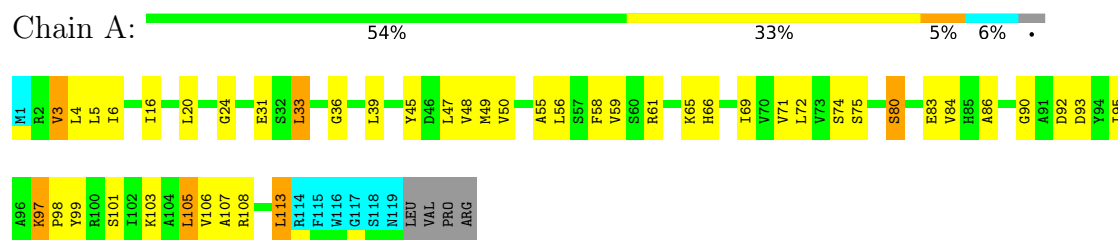


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

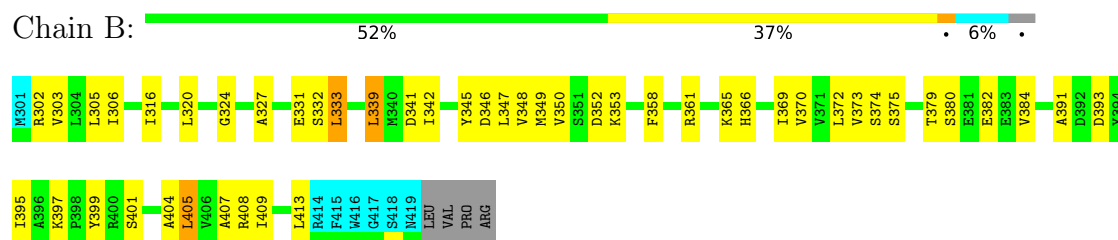


4.2.8 Score per residue for model 8

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

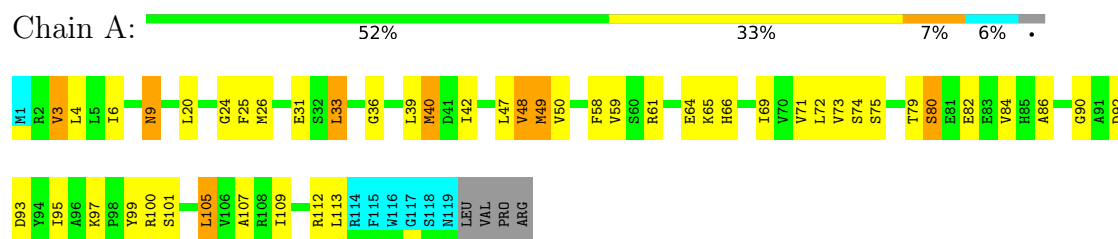


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

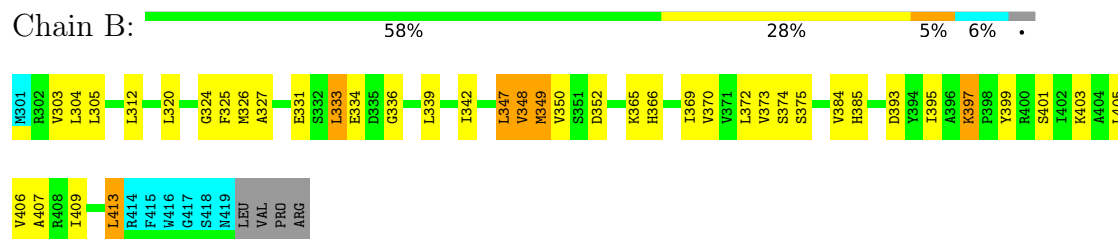


4.2.9 Score per residue for model 9

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



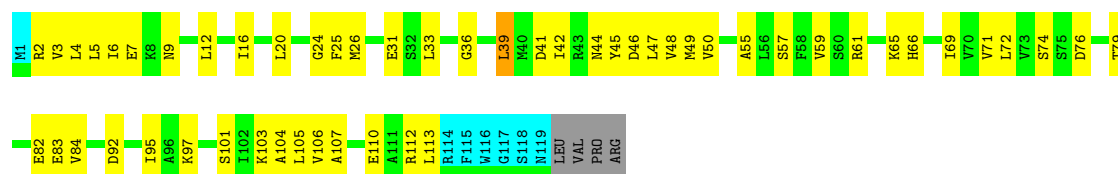
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



4.2.10 Score per residue for model 10

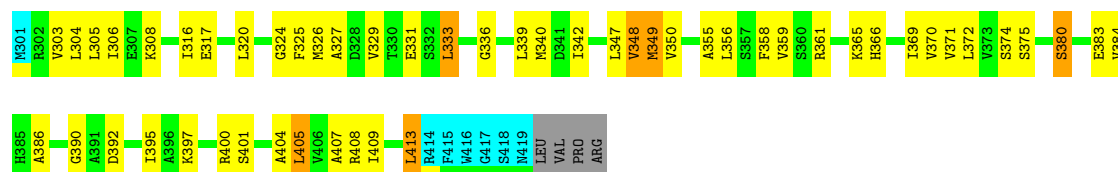
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR





• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

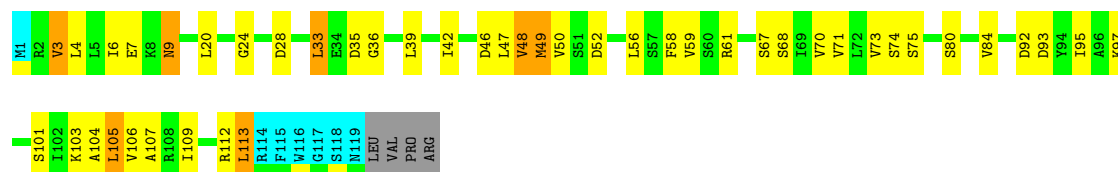
Chain B: 49% 37% 5% 6% .



4.2.11 Score per residue for model 11

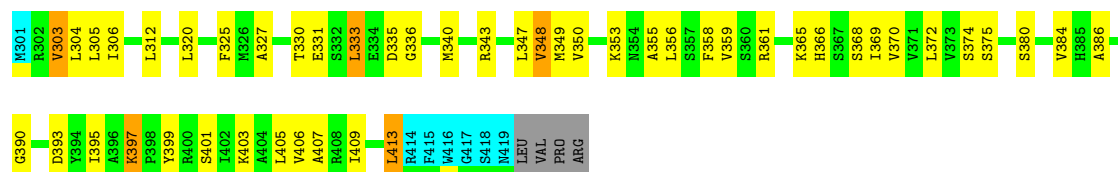
• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain A: 54% 31% 6% 6% .



• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain B: 52% 35% . 6% .



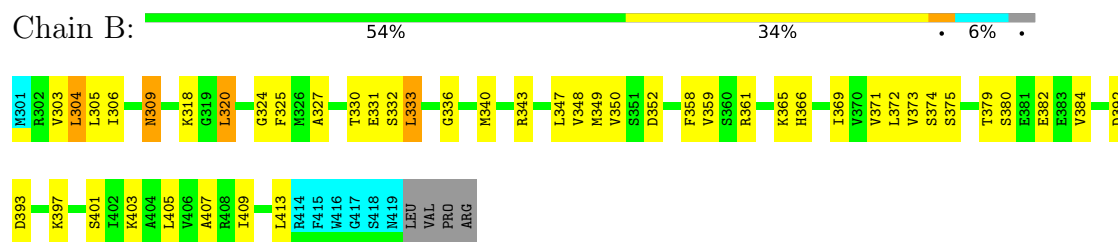
4.2.12 Score per residue for model 12

• Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain A: 58% 28% 5% 6% .

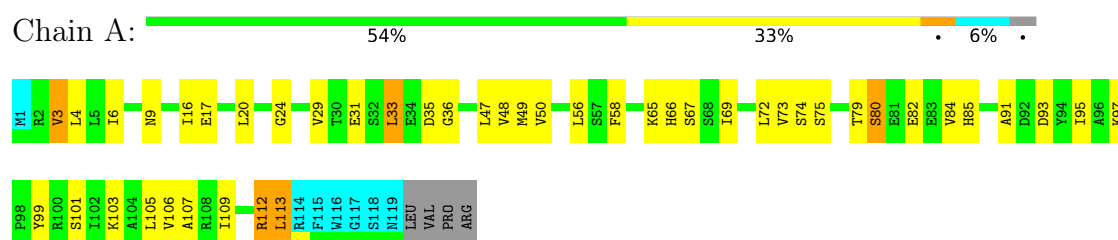


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

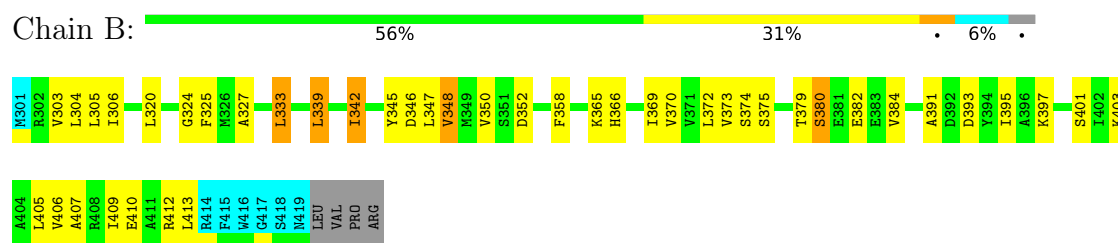


4.2.13 Score per residue for model 13

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

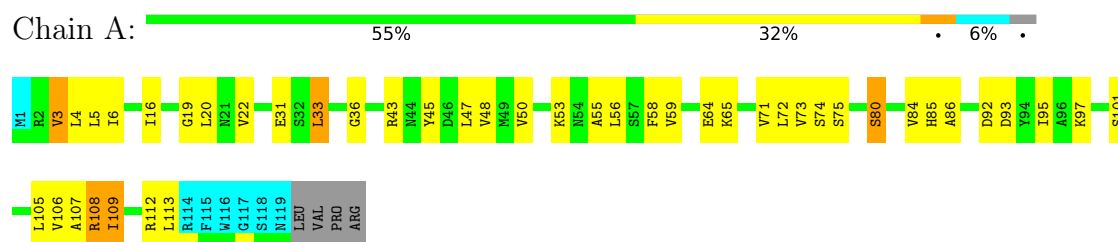


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



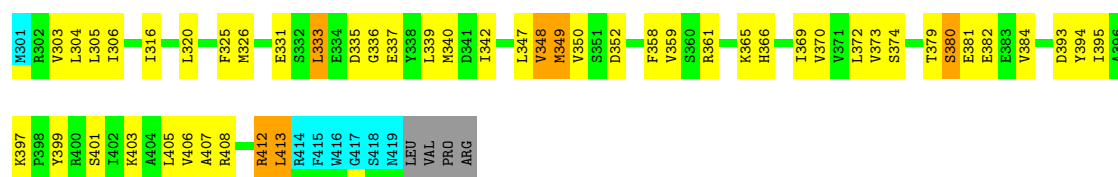
4.2.14 Score per residue for model 14

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



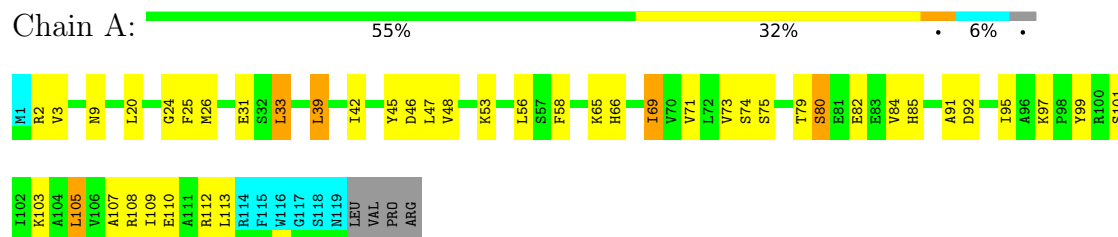
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



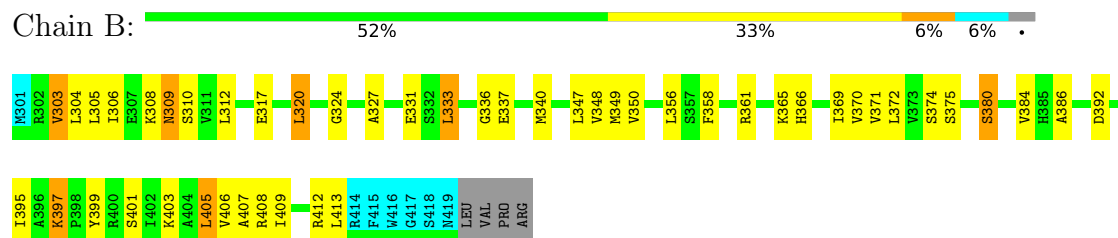


4.2.15 Score per residue for model 15

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

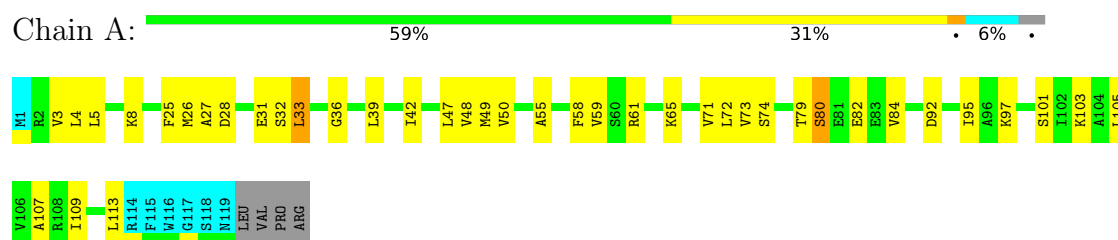


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

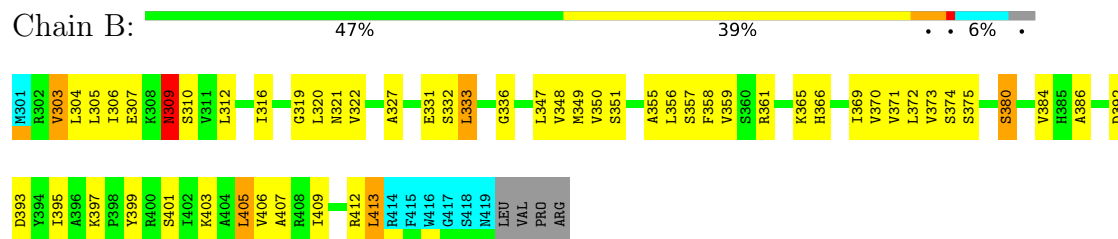


4.2.16 Score per residue for model 16

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

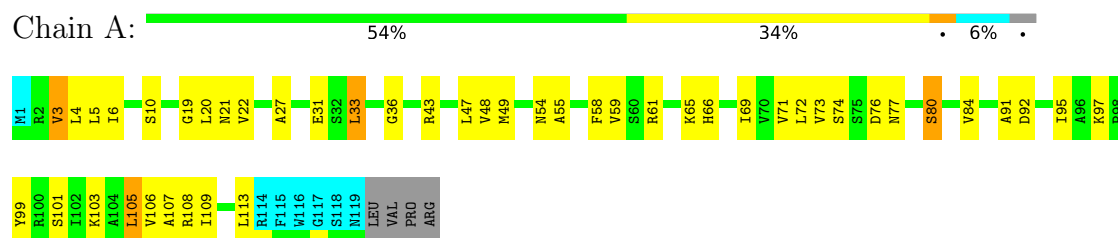


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

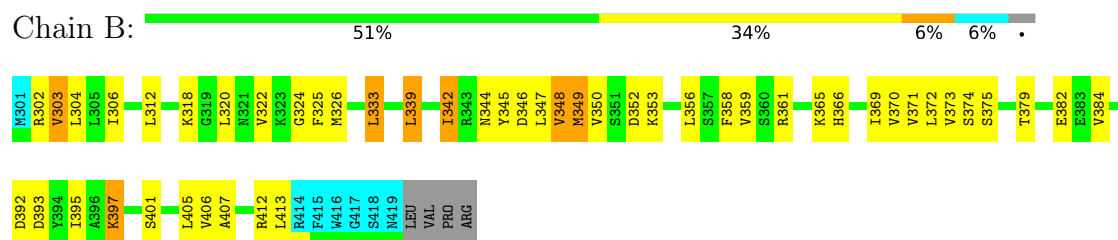


4.2.17 Score per residue for model 17

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

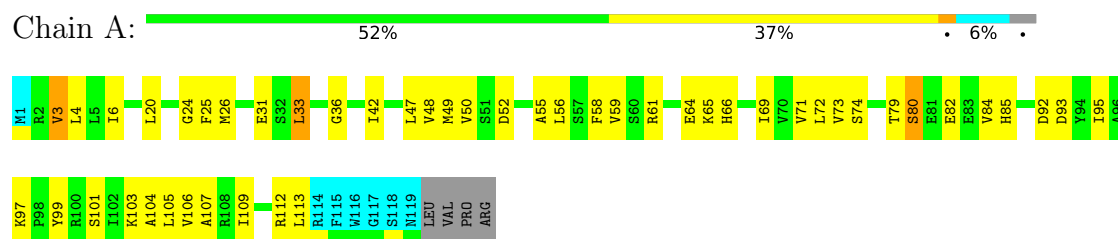


- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

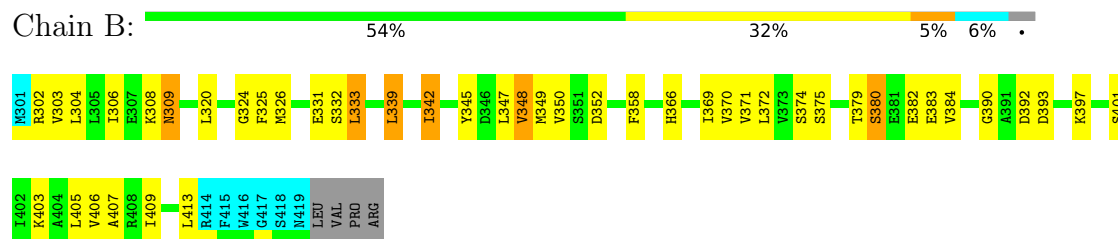


4.2.18 Score per residue for model 18

- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



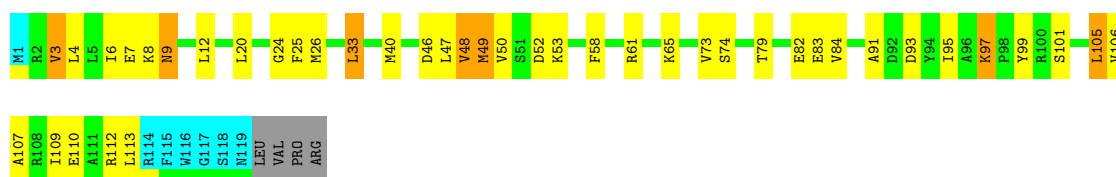
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR



4.2.19 Score per residue for model 19

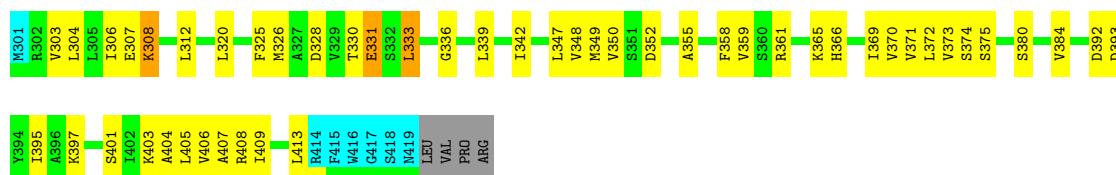
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR





- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

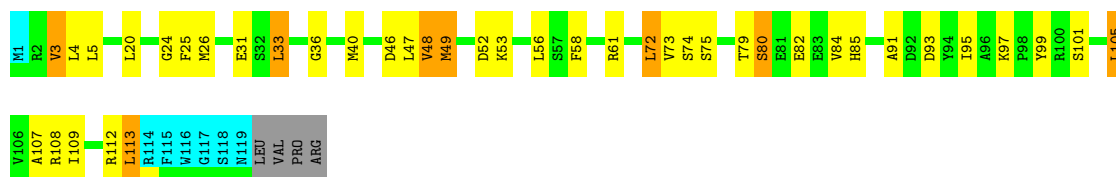
Chain B: 51% 37% 6% 6%



4.2.20 Score per residue for model 20

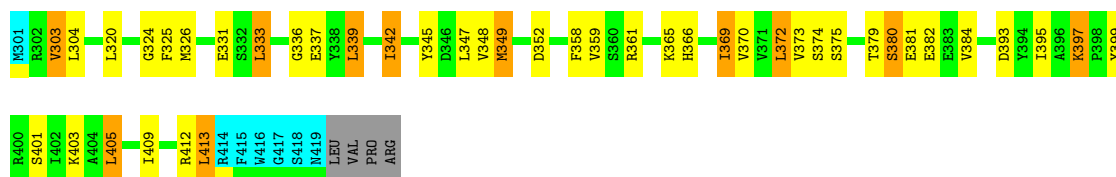
- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain A: 58% 27% 7% 6%



- Molecule 1: Putative TRANSCRIPTIONAL REGULATOR

Chain B: 56% 26% 9% 6%



5 Refinement protocol and experimental data overview ⓘ

The models were refined using the following method: *torsion angle dynamics*.

Of the 100 calculated structures, 20 were deposited, based on the following criterion: *target function*.

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

Software name	Classification	Version
CYANA	structure solution	2.1
CYANA	refinement	2.1

No chemical shift data was provided.

6 Model quality

6.1 Standard geometry

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in 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	878	886	886	29±5
1	B	878	886	886	30±4
All	All	35120	35440	35440	1112

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 16.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:347:LEU:HD23	1:B:413:LEU:HD11	0.90	1.39	15	2
1:B:303:VAL:HG13	1:B:347:LEU:HD12	0.89	1.45	8	14
1:A:3:VAL:HG13	1:A:47:LEU:HD12	0.87	1.43	5	11
1:B:347:LEU:HD11	1:B:372:LEU:HD12	0.83	1.48	19	12
1:A:49:MET:HE1	1:A:105:LEU:HD11	0.80	1.52	4	10
1:A:72:LEU:HD22	1:A:95:ILE:HD11	0.79	1.54	13	12
1:A:20:LEU:HD21	1:A:109:ILE:HD13	0.78	1.56	15	10
1:A:95:ILE:HD13	1:A:105:LEU:HD21	0.77	1.56	2	19
1:B:320:LEU:HD23	1:B:406:VAL:HG22	0.75	1.57	5	5
1:B:305:LEU:HD11	1:B:316:ILE:HG21	0.74	1.59	14	3
1:A:47:LEU:HD23	1:A:113:LEU:HD11	0.74	1.57	4	3
1:B:333:LEU:HD13	1:B:333:LEU:H	0.73	1.43	9	1
1:B:372:LEU:HD22	1:B:395:ILE:HD11	0.72	1.61	9	11

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:47:LEU:HD11	1:A:72:LEU:HD12	0.70	1.63	4	6
1:A:109:ILE:O	1:A:113:LEU:HD12	0.70	1.87	19	2
1:B:349:MET:HE1	1:B:405:LEU:HD21	0.69	1.64	16	4
1:A:4:LEU:HD23	1:A:48:VAL:HG23	0.67	1.66	5	3
1:B:395:ILE:HD13	1:B:405:LEU:HD21	0.67	1.67	20	10
1:B:347:LEU:CD2	1:B:409:ILE:HG23	0.67	2.20	20	2
1:B:320:LEU:HD21	1:B:409:ILE:HD13	0.66	1.66	2	6
1:A:47:LEU:HD23	1:A:113:LEU:HD21	0.66	1.67	20	4
1:B:304:LEU:HD21	1:B:336:GLY:HA3	0.66	1.67	14	14
1:A:84:VAL:HG12	1:B:407:ALA:CB	0.65	2.22	12	19
1:B:380:SER:O	1:B:384:VAL:HG22	0.65	1.92	18	14
1:A:107:ALA:CB	1:B:384:VAL:HG12	0.65	2.22	19	19
1:B:320:LEU:HD23	1:B:406:VAL:HG13	0.65	1.68	15	5
1:A:80:SER:O	1:A:84:VAL:HG22	0.64	1.91	12	16
1:B:366:HIS:O	1:B:369:ILE:HG22	0.64	1.93	19	20
1:A:4:LEU:HD21	1:A:36:GLY:HA3	0.64	1.68	10	13
1:A:72:LEU:HD21	1:A:108:ARG:CZ	0.64	2.23	14	1
1:A:47:LEU:HD13	1:A:48:VAL:N	0.64	2.08	10	20
1:A:104:ALA:HB1	1:B:383:GLU:CD	0.63	2.18	18	1
1:B:303:VAL:CG1	1:B:347:LEU:HD12	0.63	2.22	8	12
1:A:45:TYR:CE1	1:A:69:ILE:HD12	0.63	2.28	10	3
1:B:347:LEU:HD23	1:B:413:LEU:CD2	0.63	2.23	16	7
1:B:347:LEU:HD13	1:B:348:VAL:N	0.62	2.10	18	17
1:A:66:HIS:O	1:A:69:ILE:HG22	0.62	1.95	12	13
1:B:333:LEU:HD13	1:B:358:PHE:HB2	0.62	1.72	10	19
1:A:33:LEU:HD13	1:A:58:PHE:HB2	0.61	1.71	4	19
1:B:303:VAL:HG21	1:B:320:LEU:HD13	0.61	1.71	19	2
1:B:304:LEU:HD21	1:B:336:GLY:CA	0.61	2.26	4	8
1:B:349:MET:HE1	1:B:405:LEU:HD11	0.61	1.72	17	6
1:B:409:ILE:O	1:B:413:LEU:HD12	0.60	1.96	8	3
1:A:84:VAL:HG12	1:B:407:ALA:HB2	0.60	1.73	8	11
1:B:303:VAL:HG13	1:B:347:LEU:HB3	0.59	1.74	17	7
1:A:19:GLY:O	1:A:22:VAL:HG12	0.59	1.97	14	6
1:B:320:LEU:HD13	1:B:406:VAL:HG23	0.59	1.73	16	2
1:A:3:VAL:HG21	1:A:20:LEU:HD13	0.59	1.74	18	8
1:A:12:LEU:HD21	1:A:97:LYS:HE2	0.59	1.72	19	1
1:A:47:LEU:HD23	1:A:113:LEU:CD2	0.59	2.27	20	6
1:A:20:LEU:HD21	1:A:109:ILE:CD1	0.59	2.27	15	8
1:A:20:LEU:HG	1:A:106:VAL:HG22	0.59	1.75	14	3
1:B:312:LEU:HD21	1:B:397:LYS:HE2	0.59	1.75	5	1
1:B:345:TYR:CE1	1:B:369:ILE:HD12	0.59	2.32	8	5

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:4:LEU:HD21	1:A:36:GLY:CA	0.59	2.27	14	7
1:A:47:LEU:CD2	1:A:113:LEU:HD11	0.59	2.27	4	2
1:A:3:VAL:CG1	1:A:47:LEU:HD12	0.59	2.27	9	11
1:B:305:LEU:HD23	1:B:327:ALA:HB1	0.58	1.73	12	4
1:B:306:ILE:CG2	1:B:350:VAL:HG23	0.58	2.28	16	18
1:B:347:LEU:HD22	1:B:370:VAL:HB	0.58	1.74	7	10
1:B:319:GLY:O	1:B:322:VAL:HG12	0.58	1.97	3	2
1:B:356:LEU:HD22	1:B:386:ALA:HA	0.58	1.76	11	5
1:A:72:LEU:HD22	1:A:95:ILE:CD1	0.58	2.28	13	2
1:B:316:ILE:HG23	1:B:405:LEU:HD23	0.58	1.75	7	7
1:B:304:LEU:HD11	1:B:336:GLY:CA	0.58	2.29	12	1
1:A:83:GLU:CD	1:B:404:ALA:HB1	0.58	2.24	6	2
1:A:109:ILE:O	1:A:113:LEU:HD23	0.58	1.99	16	3
1:A:47:LEU:HD23	1:A:113:LEU:HD22	0.57	1.76	16	3
1:A:45:TYR:CD1	1:A:69:ILE:HD12	0.57	2.35	12	3
1:A:4:LEU:HD21	1:A:36:GLY:HA2	0.57	1.76	14	4
1:B:370:VAL:HG21	1:B:413:LEU:HG	0.57	1.76	19	3
1:A:56:LEU:HD22	1:A:86:ALA:HA	0.57	1.75	8	2
1:B:333:LEU:CD2	1:B:350:VAL:HG21	0.57	2.30	12	1
1:A:6:ILE:CG2	1:A:50:VAL:HG23	0.57	2.29	11	9
1:B:303:VAL:HG12	1:B:347:LEU:HB3	0.56	1.77	19	1
1:A:104:ALA:HB1	1:B:383:GLU:OE1	0.56	2.00	10	2
1:B:305:LEU:HD11	1:B:316:ILE:CG2	0.56	2.30	14	1
1:A:83:GLU:OE1	1:B:404:ALA:HB1	0.56	2.01	19	4
1:B:347:LEU:HD11	1:B:372:LEU:CD1	0.56	2.30	9	2
1:B:320:LEU:HD21	1:B:409:ILE:CD1	0.56	2.31	4	11
1:B:309:ASN:C	1:B:309:ASN:ND2	0.55	2.64	16	1
1:B:409:ILE:O	1:B:413:LEU:HD23	0.55	2.00	11	1
1:A:59:VAL:HG11	1:A:73:VAL:CG1	0.55	2.31	18	8
1:B:355:ALA:O	1:B:359:VAL:HG13	0.55	2.02	16	3
1:B:305:LEU:HD21	1:B:327:ALA:HB1	0.55	1.78	11	4
1:B:305:LEU:CD2	1:B:327:ALA:HB1	0.55	2.32	13	9
1:A:20:LEU:HD23	1:A:106:VAL:HG13	0.55	1.79	11	7
1:A:107:ALA:HB2	1:B:384:VAL:HG12	0.55	1.79	9	9
1:A:55:ALA:O	1:A:59:VAL:HG22	0.54	2.01	10	9
1:A:73:VAL:HG21	1:A:91:ALA:HB2	0.54	1.80	20	9
1:A:3:VAL:HG12	1:A:47:LEU:HB3	0.54	1.77	10	1
1:A:3:VAL:HA	1:A:47:LEU:O	0.54	2.02	10	4
1:A:105:LEU:O	1:A:109:ILE:HD12	0.54	2.02	14	1
1:B:347:LEU:HD13	1:B:370:VAL:CG1	0.54	2.32	19	2
1:A:3:VAL:HG13	1:A:47:LEU:HB3	0.54	1.80	6	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:347:LEU:CD1	1:B:372:LEU:HD12	0.54	2.29	19	2
1:A:71:VAL:HG23	1:A:92:ASP:H	0.53	1.63	1	9
1:B:317:GLU:CD	1:B:329:VAL:HG23	0.53	2.28	10	2
1:B:356:LEU:HD13	1:B:389:GLN:HG3	0.53	1.81	4	1
1:A:20:LEU:HD23	1:A:106:VAL:HG22	0.53	1.79	7	4
1:A:47:LEU:HD23	1:A:113:LEU:CD1	0.53	2.33	9	2
1:A:25:PHE:C	1:A:26:MET:HE2	0.52	2.29	15	5
1:B:320:LEU:HD21	1:B:409:ILE:HD12	0.52	1.81	1	2
1:B:304:LEU:HB3	1:B:348:VAL:HG12	0.52	1.81	17	4
1:B:347:LEU:C	1:B:347:LEU:HD13	0.52	2.30	4	3
1:B:320:LEU:CD2	1:B:406:VAL:HG22	0.52	2.34	6	3
1:A:47:LEU:HD13	1:A:47:LEU:C	0.52	2.30	15	17
1:B:339:LEU:O	1:B:339:LEU:HD12	0.52	2.03	8	7
1:B:306:ILE:HG23	1:B:331:GLU:O	0.52	2.05	19	1
1:B:372:LEU:CD2	1:B:395:ILE:HD11	0.52	2.35	20	2
1:A:71:VAL:HG23	1:A:92:ASP:N	0.52	2.19	7	12
1:A:49:MET:HE1	1:A:105:LEU:CD1	0.52	2.33	4	3
1:A:16:ILE:HG23	1:A:105:LEU:HD23	0.52	1.81	14	1
1:A:4:LEU:HB3	1:A:48:VAL:HG12	0.51	1.83	12	1
1:A:5:LEU:HD21	1:A:27:ALA:HB1	0.51	1.82	4	2
1:B:312:LEU:HD11	1:B:397:LYS:NZ	0.51	2.20	11	6
1:B:333:LEU:HD23	1:B:350:VAL:HG21	0.51	1.82	12	3
1:B:347:LEU:HD13	1:B:347:LEU:C	0.51	2.30	18	14
1:A:5:LEU:CD2	1:A:27:ALA:HB1	0.51	2.35	16	3
1:B:339:LEU:HD12	1:B:342:ILE:HG12	0.51	1.82	17	9
1:B:347:LEU:HD23	1:B:413:LEU:HD21	0.51	1.83	14	2
1:A:5:LEU:HD21	1:A:20:LEU:CD1	0.51	2.35	20	1
1:A:39:LEU:HD12	1:A:39:LEU:O	0.51	2.05	6	9
1:B:359:VAL:HG11	1:B:373:VAL:CG1	0.51	2.36	6	11
1:B:320:LEU:HD13	1:B:406:VAL:HG13	0.51	1.82	11	2
1:A:72:LEU:CD2	1:A:95:ILE:HD11	0.51	2.36	6	2
1:A:99:TYR:CE2	1:A:105:LEU:HD12	0.50	2.41	20	14
1:A:5:LEU:HD13	1:A:16:ILE:HB	0.50	1.81	2	2
1:B:304:LEU:HD22	1:B:306:ILE:CD1	0.50	2.35	12	1
1:B:347:LEU:HB2	1:B:413:LEU:HD23	0.50	1.83	20	1
1:B:325:PHE:C	1:B:326:MET:HE2	0.50	2.31	18	11
1:B:355:ALA:O	1:B:359:VAL:HG22	0.50	2.05	11	8
1:B:345:TYR:CD1	1:B:369:ILE:HD12	0.50	2.41	18	4
1:B:347:LEU:HD12	1:B:348:VAL:H	0.50	1.65	19	2
1:A:3:VAL:HB	1:A:47:LEU:HD12	0.50	1.82	4	5
1:A:16:ILE:HD13	1:A:49:MET:CE	0.50	2.37	12	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:333:LEU:HD22	1:B:333:LEU:N	0.50	2.22	9	1
1:B:312:LEU:HD21	1:B:397:LYS:NZ	0.50	2.21	15	6
1:A:18:LYS:O	1:A:22:VAL:HG23	0.50	2.07	2	1
1:A:50:VAL:HG11	1:A:58:PHE:CD2	0.50	2.42	2	3
1:B:317:GLU:OE2	1:B:329:VAL:HG23	0.49	2.07	1	2
1:B:307:GLU:HG2	1:B:312:LEU:HD23	0.49	1.84	2	1
1:B:347:LEU:HD13	1:B:370:VAL:HG12	0.49	1.83	20	1
1:A:13:GLY:HA3	1:A:29:VAL:HG11	0.49	1.84	1	2
1:A:104:ALA:HB1	1:B:383:GLU:OE2	0.49	2.07	4	3
1:B:373:VAL:HG21	1:B:391:ALA:HB2	0.49	1.84	13	2
1:B:304:LEU:HD11	1:B:330:THR:HG21	0.49	1.84	11	1
1:A:79:THR:HG23	1:A:82:GLU:H	0.49	1.68	6	15
1:B:399:TYR:CE2	1:B:405:LEU:HD12	0.49	2.43	8	6
1:B:371:VAL:HG23	1:B:392:ASP:H	0.49	1.67	1	5
1:A:6:ILE:HD13	1:A:33:LEU:HA	0.48	1.84	1	5
1:B:339:LEU:HD12	1:B:339:LEU:O	0.48	2.08	17	2
1:A:59:VAL:HG11	1:A:73:VAL:HG12	0.48	1.84	18	1
1:A:39:LEU:HD12	1:A:42:ILE:HG12	0.48	1.85	12	6
1:A:72:LEU:HD12	1:A:95:ILE:CD1	0.48	2.38	20	3
1:A:47:LEU:C	1:A:47:LEU:HD13	0.48	2.34	5	1
1:B:371:VAL:HG23	1:B:392:ASP:N	0.48	2.22	1	11
1:A:7:GLU:HG2	1:A:12:LEU:HD23	0.48	1.84	10	2
1:A:107:ALA:HB3	1:B:384:VAL:HG12	0.48	1.83	14	2
1:B:347:LEU:HD12	1:B:348:VAL:N	0.48	2.24	19	2
1:A:72:LEU:HD21	1:A:112:ARG:NH2	0.48	2.24	13	1
1:B:306:ILE:HB	1:B:350:VAL:HG23	0.48	1.86	16	2
1:A:12:LEU:HD11	1:A:97:LYS:NZ	0.47	2.24	6	1
1:A:16:ILE:HG22	1:A:20:LEU:HD11	0.47	1.86	7	1
1:B:394:TYR:O	1:B:395:ILE:HD13	0.47	2.09	14	1
1:A:19:GLY:O	1:A:106:VAL:HG21	0.47	2.08	3	1
1:B:317:GLU:HG3	1:B:327:ALA:HB3	0.47	1.85	15	1
1:B:413:LEU:HD12	1:B:413:LEU:O	0.47	2.10	18	1
1:B:379:THR:HG23	1:B:382:GLU:H	0.47	1.69	13	13
1:A:5:LEU:HD21	1:A:16:ILE:HG22	0.47	1.86	10	1
1:B:333:LEU:HD22	1:B:358:PHE:CB	0.47	2.39	13	1
1:A:6:ILE:HB	1:A:50:VAL:HG23	0.47	1.85	19	5
1:A:25:PHE:C	1:A:26:MET:HE3	0.47	2.34	12	6
1:B:405:LEU:HD12	1:B:408:ARG:HH22	0.47	1.70	2	1
1:B:303:VAL:HG11	1:B:320:LEU:HD13	0.47	1.86	3	2
1:A:12:LEU:HD21	1:A:97:LYS:NZ	0.47	2.24	6	1
1:B:347:LEU:HD22	1:B:409:ILE:HG23	0.47	1.86	19	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:347:LEU:HD22	1:B:413:LEU:HD11	0.47	1.87	19	1
1:B:316:ILE:HD13	1:B:349:MET:HE2	0.47	1.86	8	1
1:A:47:LEU:HD23	1:A:113:LEU:HD23	0.47	1.87	13	1
1:A:20:LEU:CD2	1:A:106:VAL:HG22	0.46	2.40	7	1
1:A:4:LEU:HD12	1:A:28:ASP:HB3	0.46	1.88	11	1
1:B:303:VAL:HA	1:B:347:LEU:O	0.46	2.10	16	3
1:A:72:LEU:HD23	1:A:93:ASP:HB3	0.46	1.86	3	2
1:B:325:PHE:C	1:B:326:MET:HE3	0.46	2.36	5	1
1:B:320:LEU:HD13	1:B:406:VAL:CG2	0.46	2.39	16	2
1:A:73:VAL:HG21	1:A:86:ALA:HB1	0.46	1.87	14	2
1:A:47:LEU:HD22	1:A:70:VAL:HB	0.46	1.86	2	2
1:B:333:LEU:HD21	1:B:354:ASN:HB2	0.46	1.87	7	1
1:A:39:LEU:HD12	1:A:42:ILE:CG1	0.46	2.41	1	1
1:B:405:LEU:O	1:B:409:ILE:HD12	0.46	2.11	16	3
1:A:48:VAL:O	1:A:48:VAL:HG13	0.45	2.10	10	4
1:B:370:VAL:HG22	1:B:412:ARG:NH1	0.45	2.27	14	1
1:A:4:LEU:CD2	1:A:6:ILE:HD11	0.45	2.41	19	1
1:A:33:LEU:HD21	1:A:54:ASN:HB2	0.45	1.88	17	2
1:B:303:VAL:HG21	1:B:320:LEU:HG	0.45	1.88	18	1
1:B:312:LEU:HD11	1:B:399:TYR:CE2	0.45	2.47	2	2
1:A:47:LEU:HD21	1:A:72:LEU:HD12	0.45	1.88	10	2
1:A:47:LEU:HD11	1:A:72:LEU:CD1	0.45	2.39	4	2
1:A:39:LEU:HD21	1:A:45:TYR:OH	0.45	2.11	8	1
1:B:307:GLU:CG	1:B:309:ASN:ND2	0.45	2.79	16	1
1:A:26:MET:HE3	1:A:26:MET:N	0.45	2.27	9	6
1:B:373:VAL:CG2	1:B:391:ALA:HB2	0.45	2.42	8	2
1:A:55:ALA:O	1:A:59:VAL:HG13	0.45	2.11	3	3
1:A:95:ILE:HD13	1:A:105:LEU:CD2	0.45	2.39	19	1
1:A:40:MET:HE2	1:A:48:VAL:HG11	0.45	1.88	9	1
1:B:349:MET:HE1	1:B:397:LYS:NZ	0.45	2.27	20	1
1:A:73:VAL:CG2	1:A:91:ALA:HB2	0.45	2.42	17	4
1:B:347:LEU:HD23	1:B:413:LEU:HD22	0.45	1.87	16	2
1:A:7:GLU:OE2	1:A:16:ILE:HD12	0.44	2.12	1	1
1:B:370:VAL:HG21	1:B:413:LEU:HB3	0.44	1.88	20	4
1:B:347:LEU:HD21	1:B:372:LEU:CD1	0.44	2.43	19	1
1:B:326:MET:HE3	1:B:326:MET:N	0.44	2.27	5	1
1:B:395:ILE:HD13	1:B:405:LEU:CD2	0.44	2.41	19	1
1:A:72:LEU:HD23	1:A:93:ASP:HB2	0.44	1.90	4	1
1:A:56:LEU:HD23	1:A:85:HIS:CD2	0.44	2.48	1	6
1:A:95:ILE:CD1	1:A:105:LEU:HD21	0.43	2.36	2	3
1:B:347:LEU:HD21	1:B:372:LEU:HD12	0.43	1.88	19	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:320:LEU:CD1	1:B:406:VAL:HG23	0.43	2.43	18	2
1:B:304:LEU:CB	1:B:348:VAL:HG12	0.43	2.44	13	1
1:A:72:LEU:HD21	1:A:112:ARG:HH22	0.43	1.72	13	1
1:A:19:GLY:C	1:A:106:VAL:HG21	0.43	2.39	3	1
1:B:308:LYS:HG2	1:B:331:GLU:O	0.43	2.13	19	1
1:B:348:VAL:HG21	1:B:358:PHE:HZ	0.43	1.73	16	2
1:B:307:GLU:OE1	1:B:312:LEU:HD23	0.43	2.14	19	1
1:B:306:ILE:CB	1:B:350:VAL:HG23	0.43	2.44	16	1
1:A:83:GLU:OE2	1:B:404:ALA:HB1	0.42	2.14	1	1
1:A:39:LEU:CD1	1:A:42:ILE:HD11	0.42	2.44	16	4
1:B:318:LYS:O	1:B:322:VAL:HG23	0.42	2.15	17	1
1:B:347:LEU:HD12	1:B:370:VAL:O	0.42	2.14	20	1
1:A:6:ILE:HD12	1:A:50:VAL:HB	0.42	1.90	1	1
1:A:109:ILE:O	1:A:113:LEU:HD22	0.42	2.14	11	1
1:B:333:LEU:HD22	1:B:334:GLU:N	0.42	2.30	9	1
1:A:70:VAL:HG11	1:A:112:ARG:HH11	0.42	1.73	11	1
1:B:370:VAL:HG11	1:B:412:ARG:HG2	0.42	1.90	15	1
1:A:71:VAL:HG22	1:A:92:ASP:OD2	0.42	2.13	17	1
1:B:333:LEU:HD12	1:B:350:VAL:HG21	0.42	1.91	9	1
1:B:305:LEU:HD21	1:B:316:ILE:HG22	0.42	1.91	6	1
1:B:309:ASN:O	1:B:310:SER:CB	0.42	2.68	15	1
1:A:33:LEU:HD22	1:A:58:PHE:CB	0.42	2.44	12	1
1:B:372:LEU:HD23	1:B:393:ASP:HB3	0.42	1.91	5	1
1:B:358:PHE:CD1	1:B:358:PHE:C	0.41	2.97	4	1
1:B:373:VAL:HG11	1:B:391:ALA:HB2	0.41	1.92	4	2
1:B:356:LEU:HD23	1:B:385:HIS:CD2	0.41	2.51	6	1
1:B:359:VAL:HG11	1:B:373:VAL:HG12	0.41	1.91	14	2
1:A:104:ALA:HB2	1:B:380:SER:HB2	0.41	1.91	11	1
1:B:304:LEU:HD23	1:B:348:VAL:HG13	0.41	1.91	10	1
1:B:304:LEU:HD11	1:B:336:GLY:HA2	0.41	1.93	12	1
1:B:326:MET:HE2	1:B:326:MET:N	0.41	2.31	18	1
1:A:3:VAL:HG13	1:A:47:LEU:CD1	0.41	2.37	7	1
1:A:47:LEU:C	1:A:47:LEU:CD1	0.41	2.94	15	1
1:A:26:MET:HE2	1:A:26:MET:N	0.41	2.30	15	3
1:A:47:LEU:HD21	1:A:72:LEU:CD1	0.41	2.46	1	1
1:A:24:GLY:O	1:A:26:MET:HE3	0.41	2.15	2	1
1:B:347:LEU:HG	1:B:409:ILE:HG23	0.41	1.93	8	1
1:B:333:LEU:H	1:B:333:LEU:CD1	0.41	2.17	9	1
1:B:304:LEU:HD23	1:B:348:VAL:HG12	0.41	1.93	14	1
1:A:48:VAL:HG21	1:A:58:PHE:HZ	0.41	1.76	18	2
1:B:344:ASN:C	1:B:345:TYR:CD2	0.41	2.99	17	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:B:384:VAL:HG23	1:B:385:HIS:N	0.41	2.31	9	1
1:A:97:LYS:HA	1:A:98:PRO:C	0.40	2.40	8	1
1:B:306:ILE:CG2	1:B:331:GLU:O	0.40	2.69	19	1
1:A:17:GLU:CD	1:A:29:VAL:HG23	0.40	2.41	13	1
1:B:303:VAL:HB	1:B:347:LEU:HD12	0.40	1.91	11	1
1:A:72:LEU:HD23	1:A:93:ASP:CB	0.40	2.46	3	1
1:B:348:VAL:O	1:B:348:VAL:HG13	0.40	2.15	8	1
1:B:323:LYS:HE3	1:B:406:VAL:HG11	0.40	1.94	4	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	112/123 (91%)	102±2 (91±1%)	9±2 (8±1%)	1±1 (1±1%)	14	63
1	B	112/123 (91%)	102±1 (91±1%)	9±1 (8±1%)	1±1 (1±1%)	15	65
All	All	4480/4920 (91%)	4069 (91%)	363 (8%)	48 (1%)	14	63

All 7 unique Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	B	324	GLY	14
1	A	24	GLY	12
1	A	9	ASN	9
1	B	309	ASN	6
1	A	90	GLY	3
1	B	390	GLY	3
1	A	45	TYR	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	98/108 (91%)	80±2 (82±2%)	18±2 (18±2%)	4	36
1	B	98/108 (91%)	79±2 (81±2%)	19±2 (19±2%)	3	34
All	All	3920/4320 (91%)	3195 (82%)	725 (18%)	3	35

All 107 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	33	LEU	20
1	A	74	SER	20
1	A	97	LYS	20
1	A	101	SER	20
1	B	333	LEU	20
1	B	374	SER	20
1	B	397	LYS	20
1	B	401	SER	20
1	B	365	LYS	19
1	B	375	SER	19
1	A	65	LYS	18
1	B	331	GLU	18
1	B	393	ASP	18
1	A	31	GLU	17
1	A	103	LYS	16
1	B	403	LYS	16
1	A	80	SER	15
1	B	413	LEU	15
1	A	113	LEU	14
1	B	361	ARG	14
1	A	61	ARG	14
1	A	93	ASP	13
1	A	105	LEU	13
1	B	352	ASP	13
1	A	3	VAL	13
1	A	75	SER	12
1	B	380	SER	10
1	A	112	ARG	10
1	A	108	ARG	9
1	B	405	LEU	9
1	B	348	VAL	9
1	B	349	MET	9

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Mol	Chain	Res	Type	Models (Total)
1	B	408	ARG	8
1	A	46	ASP	7
1	B	308	LYS	7
1	B	342	ILE	7
1	B	346	ASP	7
1	B	337	GLU	6
1	B	353	LYS	6
1	A	49	MET	6
1	A	42	ILE	6
1	A	48	VAL	6
1	B	303	VAL	6
1	B	340	MET	6
1	B	412	ARG	6
1	A	40	MET	5
1	A	109	ILE	5
1	B	309	ASN	5
1	A	9	ASN	5
1	A	52	ASP	5
1	A	110	GLU	5
1	B	339	LEU	5
1	A	53	LYS	5
1	A	7	GLU	4
1	A	72	LEU	4
1	A	64	GLU	4
1	B	335	ASP	4
1	B	372	LEU	4
1	B	332	SER	4
1	A	35	ASP	3
1	B	318	LYS	3
1	B	347	LEU	3
1	A	69	ILE	3
1	A	8	LYS	3
1	A	67	SER	3
1	A	100	ARG	3
1	B	410	GLU	3
1	B	343	ARG	3
1	B	302	ARG	3
1	A	2	ARG	3
1	A	39	LEU	3
1	A	10	SER	2
1	B	321	ASN	2
1	B	368	SER	2

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Mol	Chain	Res	Type	Models (Total)
1	A	57	SER	2
1	B	341	ASP	2
1	B	383	GLU	2
1	A	21	ASN	2
1	A	76	ASP	2
1	B	320	LEU	2
1	B	330	THR	2
1	A	43	ARG	2
1	B	381	GLU	2
1	A	83	GLU	1
1	A	37	GLU	1
1	B	358	PHE	1
1	B	376	ASP	1
1	A	58	PHE	1
1	B	373	VAL	1
1	A	41	ASP	1
1	A	44	ASN	1
1	B	400	ARG	1
1	A	56	LEU	1
1	A	68	SER	1
1	B	304	LEU	1
1	A	5	LEU	1
1	A	28	ASP	1
1	A	32	SER	1
1	B	310	SER	1
1	B	351	SER	1
1	B	357	SER	1
1	A	77	ASN	1
1	B	356	LEU	1
1	B	328	ASP	1
1	B	371	VAL	1
1	B	392	ASP	1
1	B	369	ILE	1

6.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

6.5 Carbohydrates [i](#)

There are no oligosaccharides 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

No chemical shift data were provided