



Full wwPDB NMR Structure Validation Report ⓘ

Apr 21, 2024 – 06:35 PM EDT

PDB ID : 1NZ8
Title : Solution Structure of the N-utilization substance G (NusG) N-terminal (NGN) domain from *Thermus thermophilus*
Authors : Reay, P.; Yamasaki, K.; Terada, T.; Kuramitsu, S.; Shirouzu, M.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2003-02-17

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 : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
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) : 2.36.2

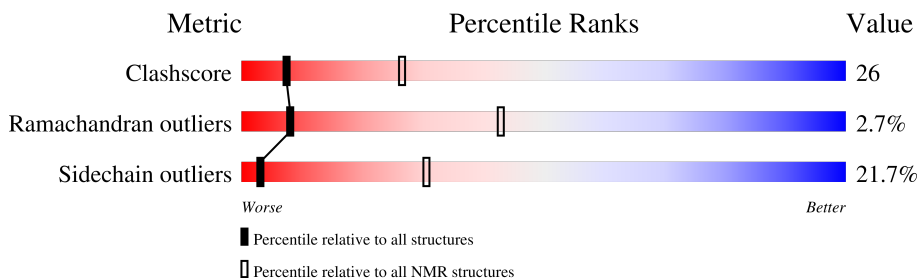
1 Overall quality at a glance

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	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

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	119	

2 Ensemble composition and analysis i

This entry contains 31 models. Model 31 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:3-A:42, A:59-A:72, A:77-A:91, A:100-A:120 (90)	0.80	31

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, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 30, 31
2	20, 27
3	3, 29
Single-model clusters	28

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1896 atoms, of which 957 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called TRANSCRIPTION ANTITERMINATION PROTEIN NUSG.

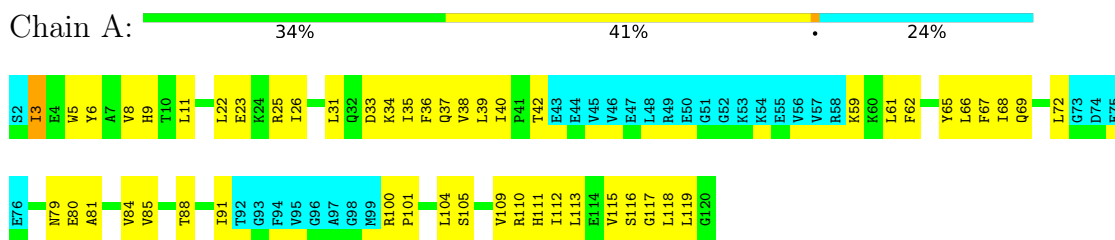
Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	119	1896	604	957	158	175	2	0

4 Residue-property plots

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: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG

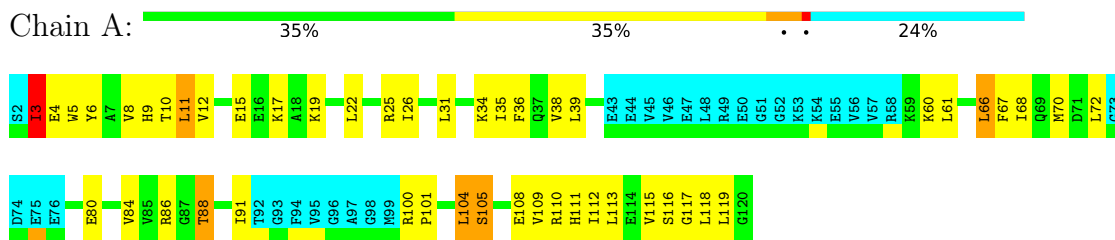


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

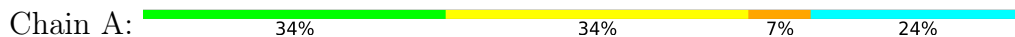
4.2.1 Score per residue for model 1

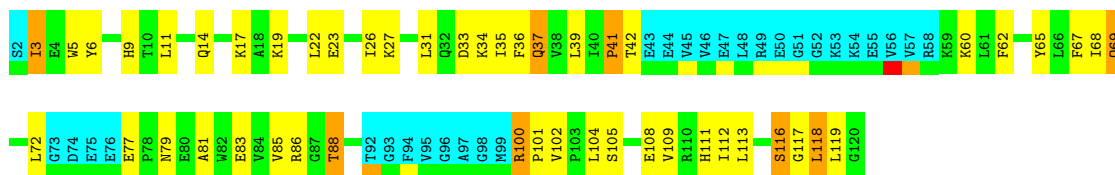
- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



4.2.2 Score per residue for model 2

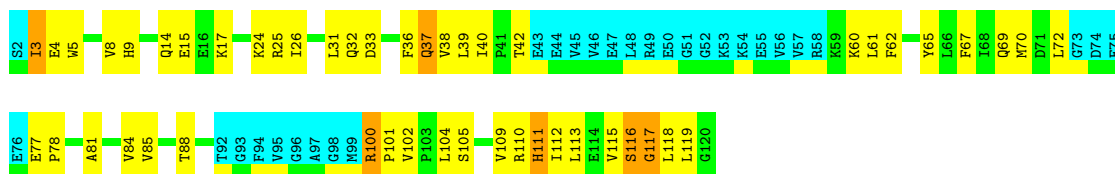
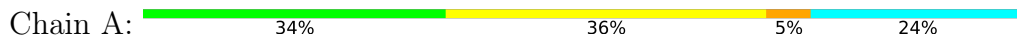
- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG





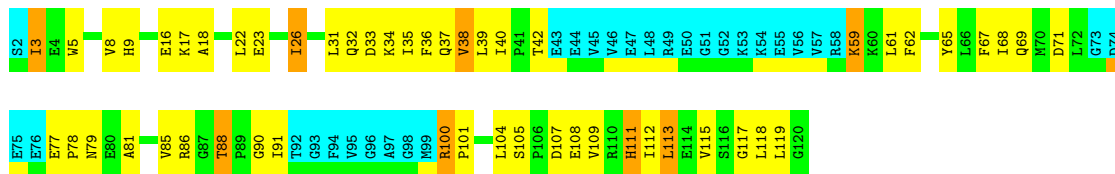
4.2.3 Score per residue for model 3

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



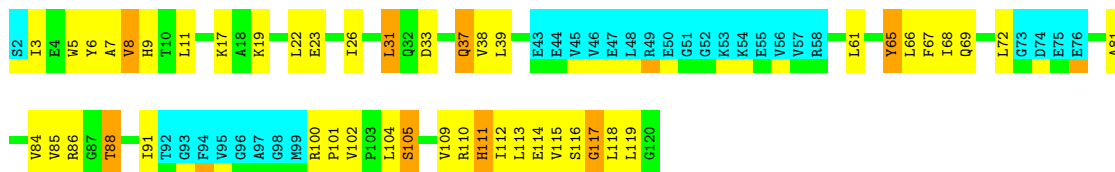
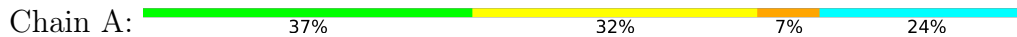
4.2.4 Score per residue for model 4

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



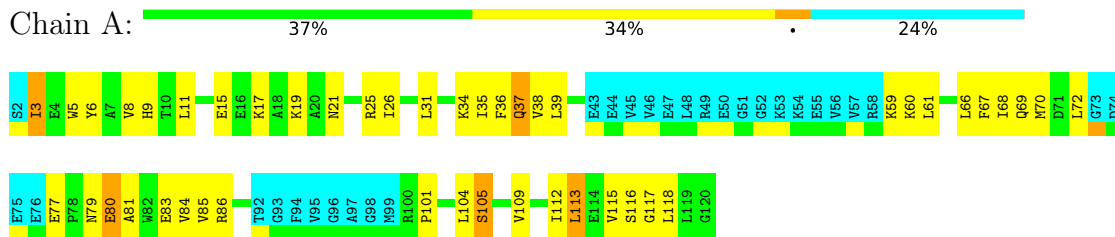
4.2.5 Score per residue for model 5

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



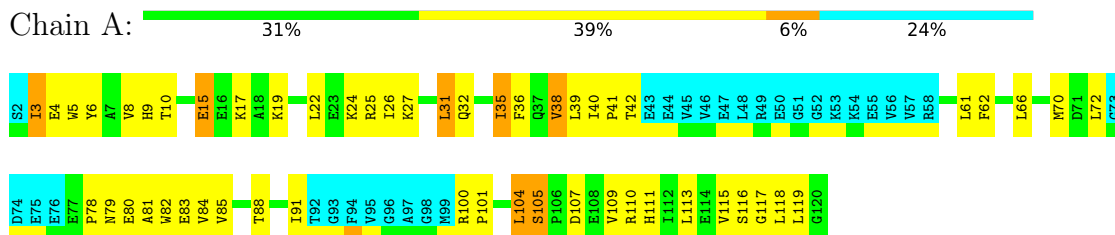
4.2.6 Score per residue for model 6

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



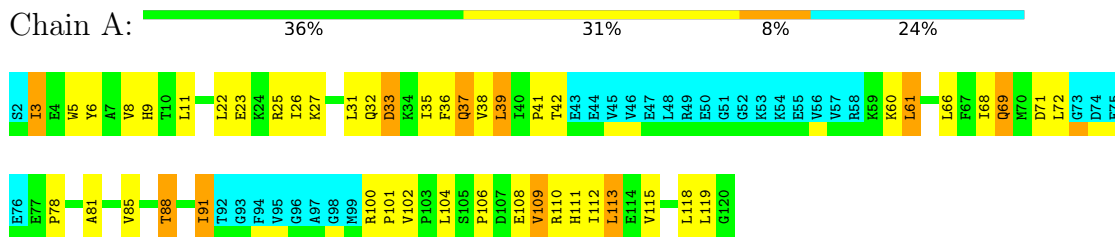
4.2.7 Score per residue for model 7

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



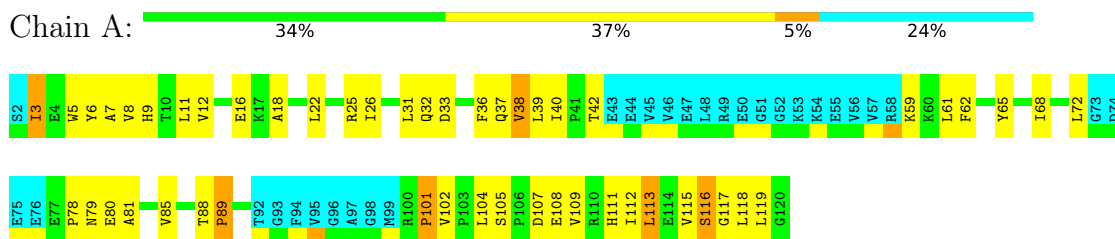
4.2.8 Score per residue for model 8

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



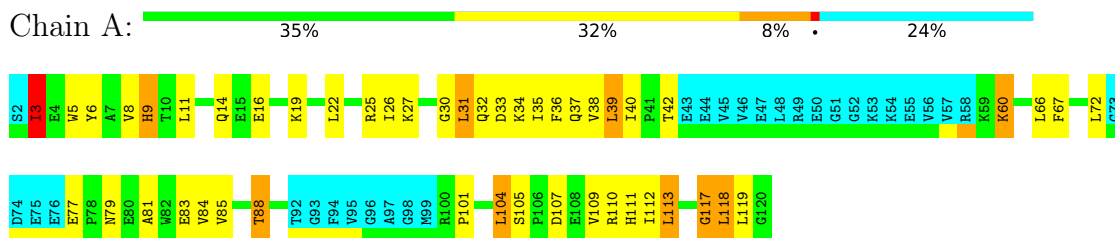
4.2.9 Score per residue for model 9

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



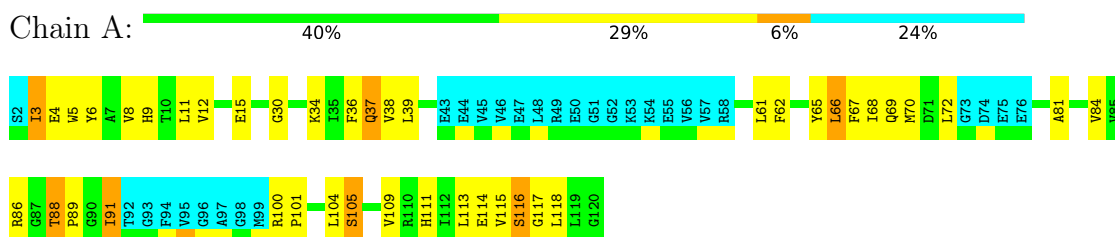
4.2.10 Score per residue for model 10

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



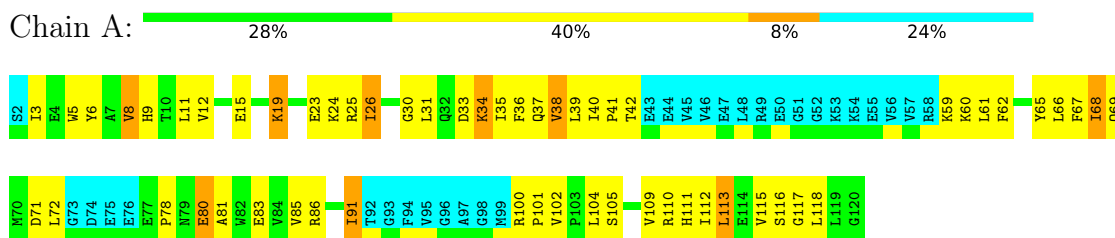
4.2.11 Score per residue for model 11

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



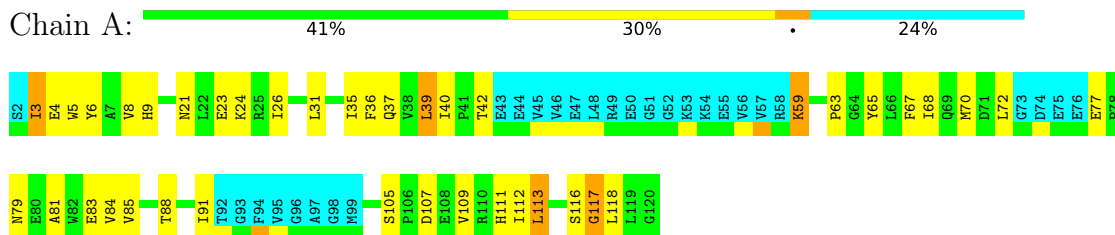
4.2.12 Score per residue for model 12

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



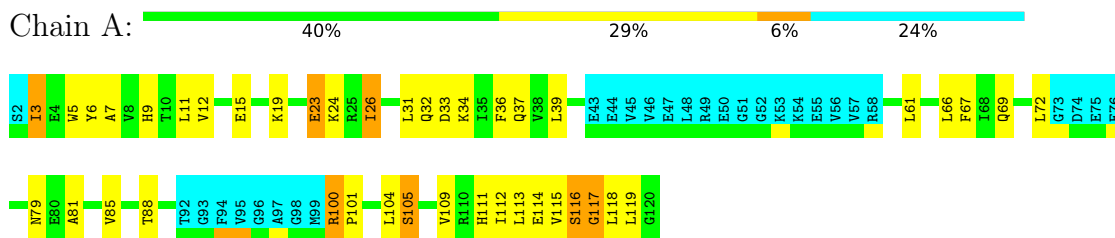
4.2.13 Score per residue for model 13

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



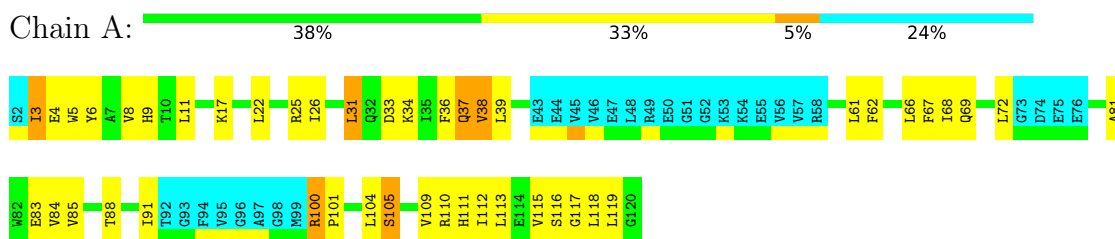
4.2.14 Score per residue for model 14

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



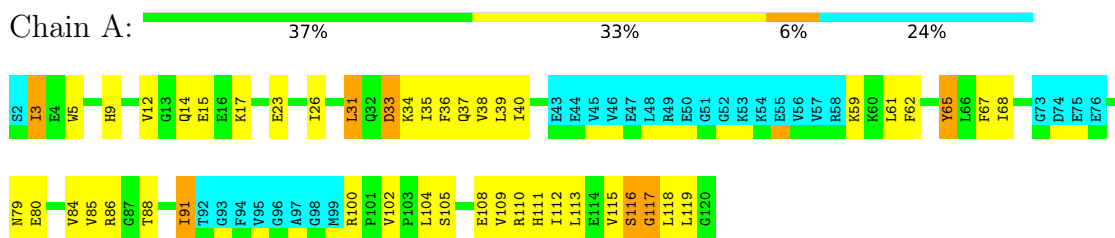
4.2.15 Score per residue for model 15

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



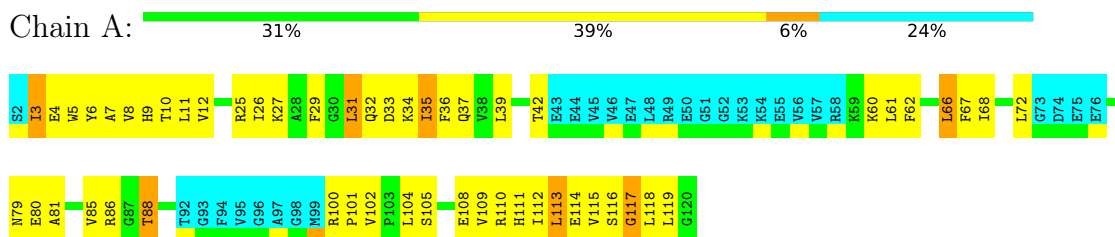
4.2.16 Score per residue for model 16

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



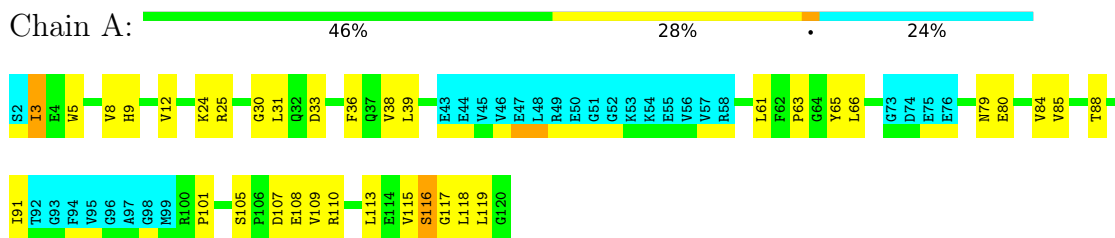
4.2.17 Score per residue for model 17

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



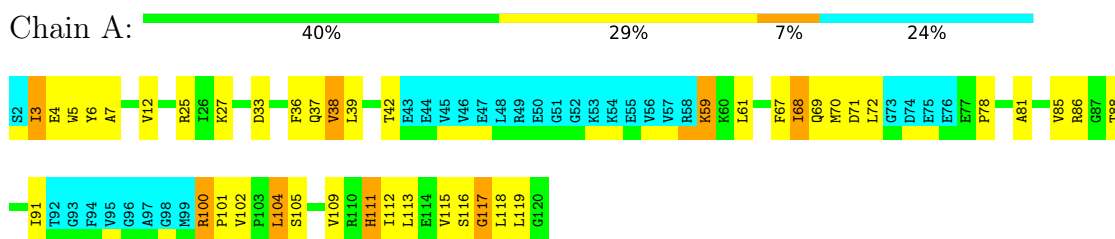
4.2.18 Score per residue for model 18

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



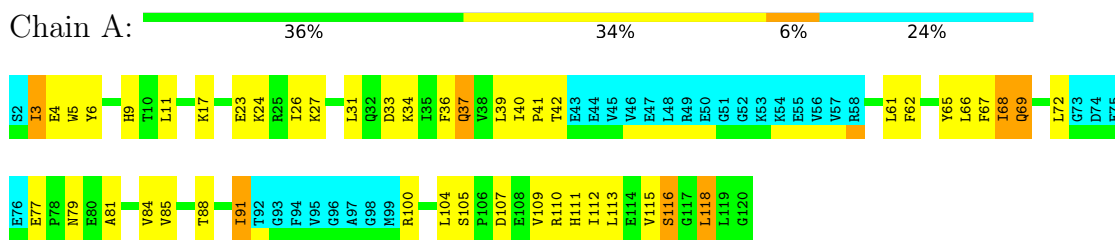
4.2.19 Score per residue for model 19

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



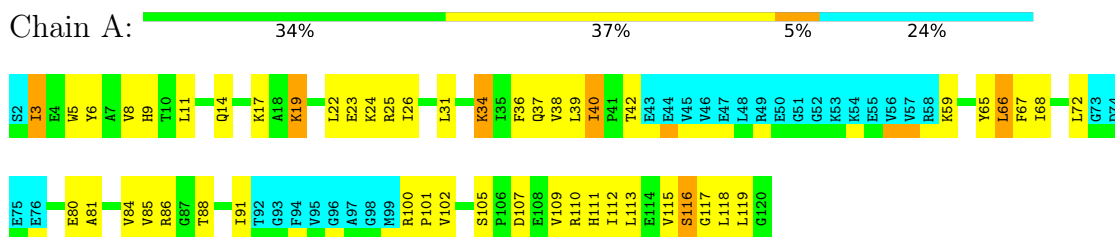
4.2.20 Score per residue for model 20

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



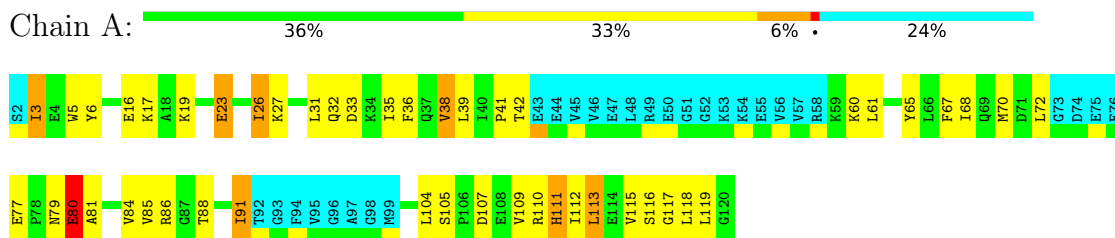
4.2.21 Score per residue for model 21

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



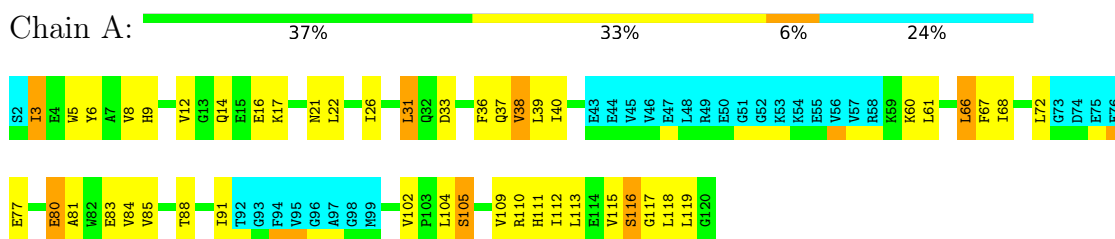
4.2.22 Score per residue for model 22

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



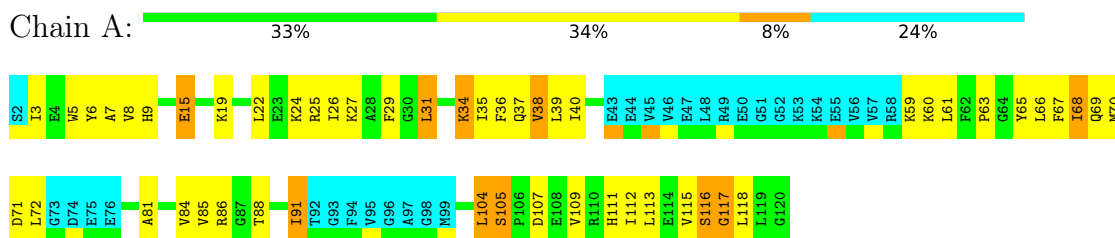
4.2.23 Score per residue for model 23

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



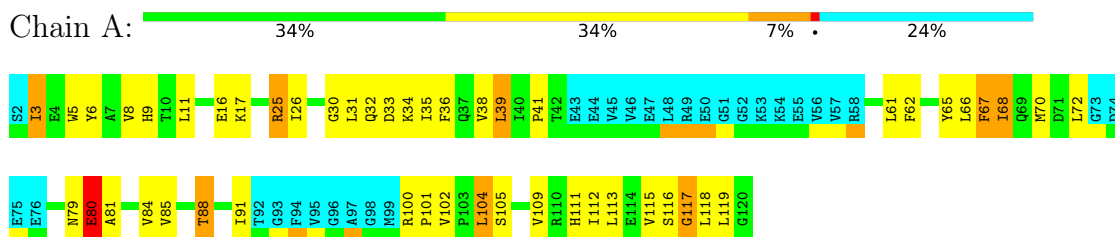
4.2.24 Score per residue for model 24

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



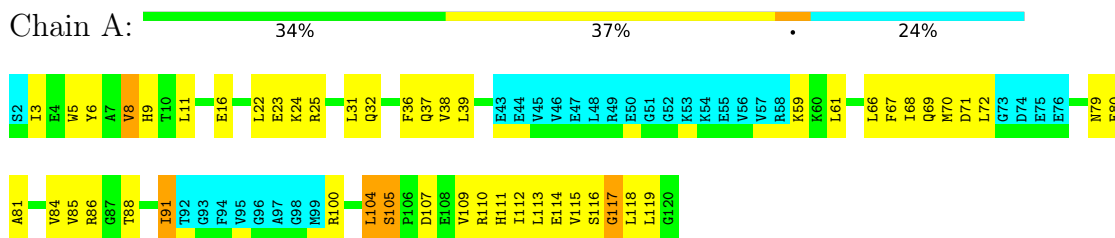
4.2.25 Score per residue for model 25

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



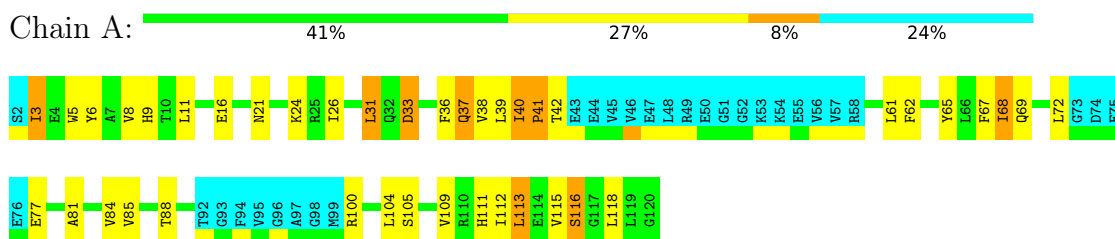
4.2.26 Score per residue for model 26

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



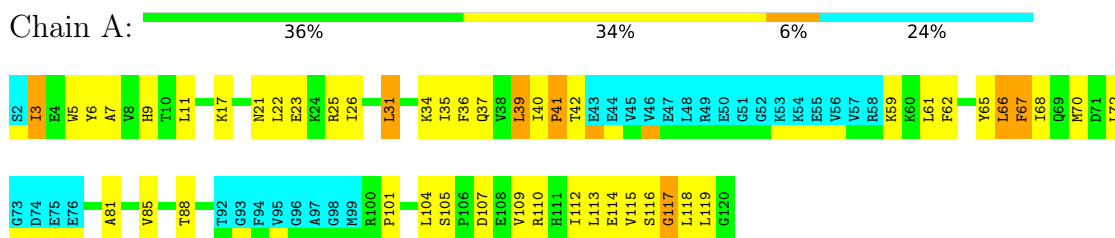
4.2.27 Score per residue for model 27

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



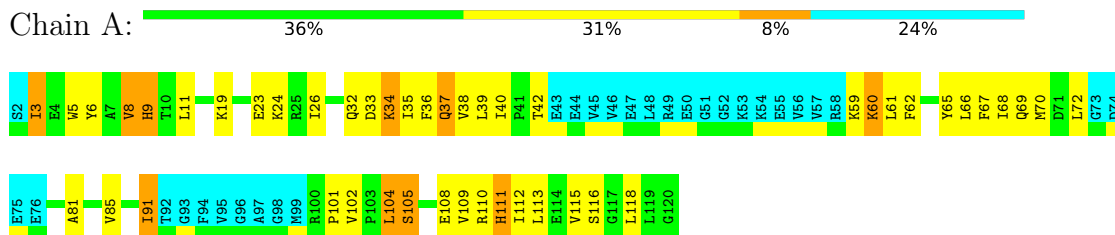
4.2.28 Score per residue for model 28

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



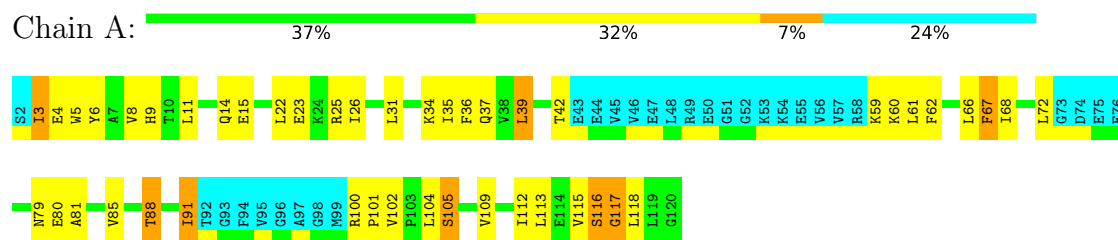
4.2.29 Score per residue for model 29

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



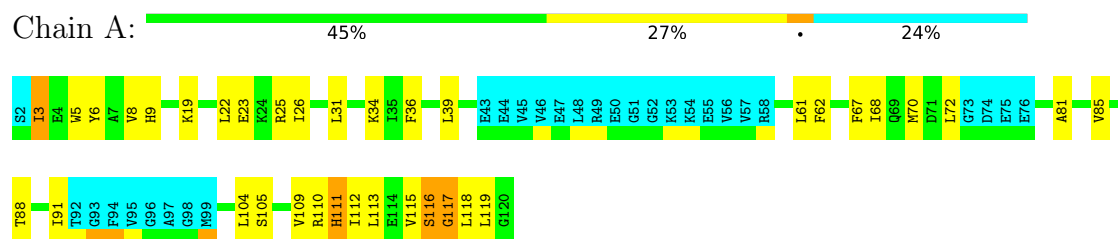
4.2.30 Score per residue for model 30

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



4.2.31 Score per residue for model 31 (medoid)

- Molecule 1: TRANSCRIPTION ANTITERMINATION PROTEIN NUSG



5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing, molecular dynamics, torsion angle dynamics*.

Of the 90 calculated structures, 31 were deposited, based on the following criterion: *structures with the lowest energy, NONE WITH DISTANCE VIOLATIONS > 0.2 ANGSTROMS, NONE WITH DIHEDRAL ANGLE RESTRAINT VIOLATIONS > 2 DEGREES*.

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

Software name	Classification	Version
CNS	structure solution	1.1
CNS	refinement	1.1

No chemical shift data was provided.

6 Model quality i

6.1 Standard geometry i

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 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	724	748	746	38±7
All	All	22444	23188	23126	1183

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 26.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:113:LEU:HD22	1:A:118:LEU:HD12	1.12	1.18	3	14
1:A:5:TRP:CH2	1:A:39:LEU:HD22	0.99	1.92	4	2
1:A:61:LEU:HD11	1:A:115:VAL:HG11	0.92	1.40	7	17
1:A:5:TRP:CH2	1:A:39:LEU:HD12	0.91	2.01	13	3
1:A:67:PHE:CE2	1:A:112:ILE:HD12	0.88	2.04	23	16
1:A:67:PHE:CD2	1:A:112:ILE:HD12	0.86	2.06	26	16
1:A:6:TYR:CZ	1:A:72:LEU:HD12	0.86	2.05	30	15
1:A:5:TRP:CD1	1:A:109:VAL:HG11	0.85	2.06	13	26
1:A:67:PHE:CD2	1:A:112:ILE:HD13	0.85	2.06	25	4
1:A:6:TYR:CE2	1:A:72:LEU:HD12	0.85	2.06	31	13
1:A:5:TRP:CZ2	1:A:113:LEU:HD21	0.81	2.11	3	11
1:A:105:SER:O	1:A:109:VAL:HG23	0.81	1.75	2	30
1:A:88:THR:O	1:A:91:ILE:HG22	0.81	1.75	1	9
1:A:31:LEU:HD11	1:A:84:VAL:HG21	0.81	1.50	5	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:5:TRP:CZ3	1:A:39:LEU:HD12	0.80	2.10	25	4
1:A:39:LEU:HD11	1:A:118:LEU:HD21	0.80	1.53	9	6
1:A:113:LEU:CD2	1:A:118:LEU:HD12	0.79	2.07	30	11
1:A:84:VAL:O	1:A:88:THR:HG23	0.79	1.77	15	11
1:A:117:GLY:O	1:A:118:LEU:HD23	0.79	1.78	25	12
1:A:113:LEU:HD22	1:A:118:LEU:CD1	0.78	2.07	5	11
1:A:91:ILE:O	1:A:91:ILE:HD13	0.78	1.78	8	3
1:A:35:ILE:HD11	1:A:38:VAL:CG1	0.78	2.08	8	1
1:A:61:LEU:HD11	1:A:115:VAL:CG1	0.78	2.07	25	7
1:A:81:ALA:O	1:A:85:VAL:HG23	0.76	1.81	4	25
1:A:3:ILE:HG21	1:A:36:PHE:CE2	0.76	2.15	2	29
1:A:6:TYR:O	1:A:68:ILE:HD12	0.75	1.82	25	20
1:A:41:PRO:O	1:A:61:LEU:HD12	0.75	1.81	8	1
1:A:61:LEU:CD1	1:A:115:VAL:HG11	0.74	2.11	30	15
1:A:23:GLU:O	1:A:26:ILE:HG22	0.74	1.82	8	6
1:A:39:LEU:HD12	1:A:116:SER:OG	0.73	1.83	19	6
1:A:61:LEU:CD1	1:A:115:VAL:HG21	0.73	2.13	28	5
1:A:39:LEU:HD12	1:A:116:SER:HB3	0.73	1.61	22	11
1:A:40:ILE:O	1:A:42:THR:HG23	0.73	1.83	3	1
1:A:3:ILE:HD13	1:A:69:GLN:HG2	0.73	1.59	26	2
1:A:35:ILE:HD13	1:A:36:PHE:N	0.72	1.99	7	1
1:A:3:ILE:HG21	1:A:36:PHE:CE1	0.72	2.19	12	1
1:A:111:HIS:O	1:A:115:VAL:HG23	0.71	1.84	17	15
1:A:26:ILE:HG21	1:A:35:ILE:HG21	0.71	1.63	7	2
1:A:117:GLY:C	1:A:118:LEU:HD23	0.71	2.06	14	8
1:A:113:LEU:HG	1:A:118:LEU:HD12	0.71	1.62	12	12
1:A:42:THR:O	1:A:115:VAL:HG12	0.71	1.85	21	1
1:A:22:LEU:HD11	1:A:85:VAL:HG22	0.70	1.61	10	8
1:A:113:LEU:HD23	1:A:118:LEU:HD12	0.70	1.63	9	4
1:A:26:ILE:HA	1:A:31:LEU:HD12	0.69	1.63	9	12
1:A:7:ALA:HB2	1:A:104:LEU:HD11	0.69	1.64	28	4
1:A:39:LEU:HD23	1:A:112:ILE:HD12	0.69	1.64	4	1
1:A:25:ARG:HG3	1:A:88:THR:HG22	0.69	1.62	3	5
1:A:67:PHE:CE2	1:A:112:ILE:HD13	0.68	2.23	25	1
1:A:70:MET:SD	1:A:72:LEU:HD23	0.68	2.28	28	2
1:A:109:VAL:HG12	1:A:113:LEU:CD1	0.68	2.18	31	8
1:A:31:LEU:HD21	1:A:84:VAL:HG21	0.68	1.64	6	2
1:A:34:LYS:HD2	1:A:81:ALA:HB2	0.68	1.65	6	1
1:A:39:LEU:HD21	1:A:118:LEU:HD11	0.68	1.65	24	6
1:A:26:ILE:HG21	1:A:35:ILE:HD12	0.67	1.66	1	1
1:A:109:VAL:HG12	1:A:113:LEU:HD12	0.67	1.66	31	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:66:LEU:CD1	1:A:68:ILE:HD11	0.67	2.20	17	2
1:A:26:ILE:HG23	1:A:31:LEU:HB2	0.67	1.66	2	12
1:A:104:LEU:HD22	1:A:112:ILE:HD13	0.67	1.67	3	3
1:A:6:TYR:CE1	1:A:72:LEU:HD12	0.66	2.24	27	6
1:A:85:VAL:HG12	1:A:91:ILE:HG13	0.66	1.67	15	4
1:A:39:LEU:HD12	1:A:116:SER:HB2	0.66	1.65	29	2
1:A:67:PHE:CD1	1:A:104:LEU:HD11	0.66	2.26	11	5
1:A:61:LEU:HD11	1:A:115:VAL:HG21	0.66	1.65	11	1
1:A:39:LEU:O	1:A:39:LEU:HD13	0.65	1.91	28	3
1:A:113:LEU:HD22	1:A:118:LEU:HB2	0.65	1.66	25	1
1:A:26:ILE:HD12	1:A:31:LEU:HD11	0.65	1.67	27	2
1:A:38:VAL:HG12	1:A:68:ILE:HG23	0.65	1.66	22	3
1:A:62:PHE:CE1	1:A:112:ILE:HG22	0.65	2.27	20	5
1:A:3:ILE:N	1:A:3:ILE:HD13	0.65	2.07	19	3
1:A:31:LEU:O	1:A:35:ILE:HG22	0.64	1.92	7	1
1:A:40:ILE:HD12	1:A:42:THR:OG1	0.64	1.91	10	2
1:A:7:ALA:HB3	1:A:102:VAL:HG13	0.64	1.69	19	1
1:A:31:LEU:HD13	1:A:81:ALA:HA	0.64	1.69	17	1
1:A:10:THR:HG21	1:A:66:LEU:HD12	0.64	1.67	7	1
1:A:61:LEU:HD12	1:A:115:VAL:HG11	0.62	1.70	6	5
1:A:8:VAL:HG11	1:A:91:ILE:HD12	0.62	1.68	15	4
1:A:26:ILE:HG23	1:A:31:LEU:HD12	0.62	1.70	10	1
1:A:5:TRP:CZ2	1:A:39:LEU:HD22	0.62	2.29	6	2
1:A:22:LEU:HD12	1:A:88:THR:HG21	0.61	1.72	26	7
1:A:10:THR:CG2	1:A:66:LEU:HD22	0.61	2.25	17	1
1:A:61:LEU:HD13	1:A:115:VAL:HG21	0.61	1.73	27	2
1:A:35:ILE:HG23	1:A:68:ILE:CG2	0.61	2.26	28	3
1:A:15:GLU:HG2	1:A:66:LEU:HD11	0.60	1.73	1	1
1:A:26:ILE:HG21	1:A:35:ILE:HG12	0.60	1.73	10	1
1:A:31:LEU:CD1	1:A:84:VAL:HG21	0.60	2.26	15	2
1:A:39:LEU:HD21	1:A:113:LEU:HA	0.60	1.72	13	1
1:A:5:TRP:CD1	1:A:109:VAL:HG21	0.60	2.30	8	1
1:A:104:LEU:HD13	1:A:104:LEU:N	0.60	2.11	29	3
1:A:26:ILE:HD12	1:A:35:ILE:CD1	0.60	2.26	6	1
1:A:62:PHE:CZ	1:A:112:ILE:HG22	0.60	2.31	16	6
1:A:3:ILE:HG22	1:A:71:ASP:CA	0.60	2.26	24	1
1:A:70:MET:SD	1:A:72:LEU:HD11	0.60	2.37	3	5
1:A:39:LEU:HD11	1:A:67:PHE:HD2	0.60	1.56	25	3
1:A:85:VAL:O	1:A:91:ILE:HG21	0.59	1.97	24	4
1:A:7:ALA:O	1:A:102:VAL:HG12	0.59	1.96	19	1
1:A:39:LEU:HB3	1:A:118:LEU:HD11	0.59	1.74	25	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:38:VAL:HG22	1:A:68:ILE:HG23	0.59	1.74	24	4
1:A:5:TRP:CZ2	1:A:113:LEU:HD11	0.59	2.33	14	2
1:A:31:LEU:HD12	1:A:35:ILE:HD11	0.59	1.73	22	1
1:A:38:VAL:O	1:A:39:LEU:HD22	0.59	1.97	3	3
1:A:67:PHE:CE1	1:A:104:LEU:HD11	0.59	2.33	3	2
1:A:40:ILE:O	1:A:42:THR:N	0.58	2.36	20	5
1:A:22:LEU:CD1	1:A:88:THR:HG21	0.58	2.28	23	6
1:A:19:LYS:HD2	1:A:66:LEU:HD11	0.58	1.76	12	1
1:A:39:LEU:HD23	1:A:116:SER:OG	0.58	1.97	27	2
1:A:80:GLU:O	1:A:84:VAL:HG23	0.58	1.98	6	8
1:A:39:LEU:HD23	1:A:116:SER:CB	0.58	2.28	25	4
1:A:39:LEU:CD1	1:A:113:LEU:HD12	0.58	2.29	10	1
1:A:6:TYR:CE2	1:A:72:LEU:HD11	0.58	2.34	6	1
1:A:39:LEU:HD11	1:A:67:PHE:CD2	0.58	2.34	25	3
1:A:26:ILE:CG2	1:A:35:ILE:HD12	0.57	2.28	1	1
1:A:3:ILE:HD13	1:A:69:GLN:CG	0.57	2.29	26	3
1:A:118:LEU:N	1:A:118:LEU:HD23	0.57	2.14	20	1
1:A:40:ILE:HG22	1:A:66:LEU:HG	0.57	1.75	23	1
1:A:102:VAL:HG13	1:A:102:VAL:O	0.57	1.99	8	5
1:A:8:VAL:HG13	1:A:9:HIS:N	0.57	2.14	12	2
1:A:65:TYR:O	1:A:66:LEU:HD12	0.57	1.99	28	2
1:A:19:LYS:HB3	1:A:66:LEU:HD21	0.57	1.76	21	2
1:A:3:ILE:HG22	1:A:71:ASP:HA	0.57	1.77	24	2
1:A:39:LEU:HG	1:A:118:LEU:HD11	0.57	1.76	17	2
1:A:119:LEU:HD23	1:A:119:LEU:O	0.57	2.00	9	1
1:A:39:LEU:HD21	1:A:67:PHE:CD2	0.57	2.35	25	3
1:A:5:TRP:CH2	1:A:113:LEU:HD21	0.57	2.35	5	5
1:A:5:TRP:O	1:A:104:LEU:HD12	0.57	2.00	12	6
1:A:39:LEU:CD2	1:A:118:LEU:HD11	0.57	2.29	18	8
1:A:67:PHE:CZ	1:A:112:ILE:HG21	0.56	2.35	6	1
1:A:35:ILE:HD11	1:A:38:VAL:HG23	0.56	1.77	7	1
1:A:42:THR:HG22	1:A:60:LYS:HG3	0.56	1.76	10	1
1:A:37:GLN:HB2	1:A:69:GLN:HB3	0.56	1.76	20	8
1:A:118:LEU:HD23	1:A:118:LEU:N	0.56	2.15	2	3
1:A:109:VAL:HG12	1:A:113:LEU:HD13	0.56	1.78	6	5
1:A:91:ILE:O	1:A:91:ILE:HG23	0.56	2.01	19	5
1:A:26:ILE:HG23	1:A:31:LEU:CB	0.56	2.31	6	4
1:A:10:THR:HG23	1:A:66:LEU:CD2	0.56	2.30	17	1
1:A:26:ILE:HG12	1:A:35:ILE:HD13	0.55	1.77	4	2
1:A:3:ILE:H	1:A:3:ILE:HD13	0.55	1.61	17	20
1:A:38:VAL:O	1:A:38:VAL:HG13	0.55	2.02	9	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:6:TYR:CZ	1:A:72:LEU:HD11	0.55	2.36	6	1
1:A:42:THR:HG22	1:A:60:LYS:HG2	0.55	1.77	8	2
1:A:79:ASN:OD1	1:A:81:ALA:HB3	0.55	2.01	9	1
1:A:67:PHE:CZ	1:A:104:LEU:HD11	0.55	2.36	3	1
1:A:104:LEU:HB2	1:A:109:VAL:HG22	0.55	1.79	12	8
1:A:8:VAL:HG21	1:A:91:ILE:CD1	0.55	2.32	5	1
1:A:39:LEU:HD11	1:A:113:LEU:HD12	0.55	1.76	10	3
1:A:39:LEU:HD23	1:A:116:SER:HB2	0.55	1.78	30	3
1:A:5:TRP:NE1	1:A:109:VAL:HG11	0.54	2.17	18	6
1:A:35:ILE:HD11	1:A:38:VAL:CG2	0.54	2.32	25	2
1:A:31:LEU:CD2	1:A:84:VAL:HG21	0.54	2.32	6	2
1:A:67:PHE:CE2	1:A:112:ILE:HG21	0.54	2.36	4	1
1:A:26:ILE:HA	1:A:31:LEU:HD21	0.54	1.78	27	2
1:A:37:GLN:CB	1:A:69:GLN:HB3	0.54	2.33	8	3
1:A:34:LYS:HG2	1:A:81:ALA:HB2	0.54	1.79	29	2
1:A:25:ARG:HD3	1:A:88:THR:HG22	0.54	1.78	17	2
1:A:40:ILE:HD13	1:A:40:ILE:H	0.54	1.62	21	1
1:A:35:ILE:HD12	1:A:68:ILE:HG21	0.54	1.80	29	1
1:A:3:ILE:HD13	1:A:3:ILE:H	0.54	1.62	18	3
1:A:113:LEU:HD23	1:A:118:LEU:HB2	0.53	1.78	4	1
1:A:5:TRP:CH2	1:A:39:LEU:HD23	0.53	2.39	12	7
1:A:40:ILE:HG23	1:A:40:ILE:O	0.53	2.03	9	3
1:A:3:ILE:HD13	1:A:3:ILE:N	0.53	2.19	17	17
1:A:40:ILE:O	1:A:40:ILE:HD12	0.53	2.04	23	1
1:A:70:MET:CE	1:A:72:LEU:HD21	0.53	2.33	13	3
1:A:10:THR:HG21	1:A:66:LEU:CD1	0.53	2.34	1	1
1:A:39:LEU:HD22	1:A:39:LEU:C	0.53	2.23	30	3
1:A:62:PHE:CE2	1:A:112:ILE:HG22	0.53	2.38	9	2
1:A:35:ILE:HD11	1:A:38:VAL:HG22	0.53	1.80	25	1
1:A:3:ILE:HG22	1:A:71:ASP:CB	0.52	2.34	24	2
1:A:5:TRP:CH2	1:A:39:LEU:CD2	0.52	2.83	4	2
1:A:22:LEU:HD13	1:A:88:THR:HG21	0.52	1.80	23	2
1:A:38:VAL:CG1	1:A:68:ILE:HG23	0.52	2.34	15	2
1:A:72:LEU:HD22	1:A:78:PRO:HB3	0.52	1.79	19	1
1:A:39:LEU:HD12	1:A:116:SER:CB	0.52	2.35	9	8
1:A:5:TRP:HH2	1:A:39:LEU:HD13	0.52	1.64	4	1
1:A:8:VAL:HG11	1:A:91:ILE:HD11	0.52	1.82	8	2
1:A:100:ARG:N	1:A:101:PRO:CD	0.51	2.73	2	9
1:A:70:MET:HE2	1:A:72:LEU:HD21	0.51	1.83	19	1
1:A:9:HIS:N	1:A:9:HIS:CD2	0.51	2.78	10	11
1:A:8:VAL:HG21	1:A:91:ILE:HD12	0.51	1.83	4	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:9:HIS:CE1	1:A:65:TYR:CZ	0.51	2.99	28	8
1:A:34:LYS:CE	1:A:81:ALA:HB2	0.51	2.35	15	1
1:A:67:PHE:CG	1:A:112:ILE:HD12	0.51	2.40	16	2
1:A:42:THR:HG22	1:A:60:LYS:CG	0.51	2.36	17	1
1:A:9:HIS:CE1	1:A:65:TYR:CE2	0.51	2.99	25	3
1:A:39:LEU:HD11	1:A:118:LEU:HD11	0.50	1.82	4	1
1:A:12:VAL:HG23	1:A:12:VAL:O	0.50	2.07	17	3
1:A:30:GLY:O	1:A:31:LEU:HD23	0.50	2.06	10	1
1:A:66:LEU:HD12	1:A:66:LEU:O	0.50	2.06	25	1
1:A:39:LEU:O	1:A:40:ILE:HG23	0.50	2.05	29	1
1:A:5:TRP:CD1	1:A:109:VAL:CG1	0.50	2.94	7	22
1:A:3:ILE:HG21	1:A:36:PHE:HE2	0.50	1.64	26	2
1:A:35:ILE:HD12	1:A:68:ILE:CG2	0.50	2.36	29	1
1:A:6:TYR:OH	1:A:72:LEU:HD12	0.50	2.07	17	1
1:A:10:THR:HG23	1:A:66:LEU:HD22	0.50	1.84	17	1
1:A:70:MET:CE	1:A:72:LEU:HD11	0.50	2.37	29	2
1:A:100:ARG:N	1:A:101:PRO:HD2	0.49	2.22	17	5
1:A:31:LEU:HD22	1:A:81:ALA:HA	0.49	1.83	5	1
1:A:38:VAL:C	1:A:39:LEU:HD22	0.49	2.27	3	3
1:A:5:TRP:CD1	1:A:109:VAL:CG2	0.49	2.95	8	1
1:A:26:ILE:HD12	1:A:35:ILE:HG13	0.49	1.84	24	1
1:A:104:LEU:HD22	1:A:112:ILE:CD1	0.49	2.38	30	1
1:A:5:TRP:CZ2	1:A:39:LEU:HD12	0.49	2.42	13	1
1:A:42:THR:HG22	1:A:60:LYS:HA	0.49	1.84	29	1
1:A:5:TRP:HH2	1:A:39:LEU:HD23	0.49	1.68	31	11
1:A:34:LYS:CG	1:A:81:ALA:HB2	0.49	2.38	21	1
1:A:113:LEU:HD23	1:A:118:LEU:CD1	0.48	2.38	9	1
1:A:112:ILE:C	1:A:112:ILE:HD12	0.48	2.29	25	7
1:A:39:LEU:HD11	1:A:67:PHE:HB2	0.48	1.86	25	3
1:A:8:VAL:CG2	1:A:9:HIS:N	0.48	2.77	3	8
1:A:37:GLN:O	1:A:38:VAL:HG13	0.48	2.09	15	2
1:A:26:ILE:HG23	1:A:31:LEU:HG	0.48	1.84	23	1
1:A:5:TRP:O	1:A:104:LEU:HD22	0.48	2.09	29	3
1:A:19:LYS:CG	1:A:40:ILE:HD12	0.48	2.39	12	1
1:A:6:TYR:CD2	1:A:72:LEU:HD12	0.48	2.43	20	2
1:A:104:LEU:HD13	1:A:112:ILE:CD1	0.48	2.39	1	2
1:A:39:LEU:HD13	1:A:112:ILE:CD1	0.48	2.38	8	1
1:A:40:ILE:HD12	1:A:42:THR:O	0.48	2.09	13	1
1:A:31:LEU:HD13	1:A:80:GLU:OE2	0.48	2.09	23	1
1:A:31:LEU:HD11	1:A:80:GLU:CG	0.48	2.38	26	1
1:A:26:ILE:CD1	1:A:31:LEU:HD11	0.47	2.39	27	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:62:PHE:N	1:A:62:PHE:CD1	0.47	2.82	28	5
1:A:40:ILE:HD12	1:A:66:LEU:CD2	0.47	2.40	7	1
1:A:91:ILE:HD13	1:A:91:ILE:C	0.47	2.30	20	4
1:A:113:LEU:HD23	1:A:118:LEU:CB	0.47	2.39	4	2
1:A:40:ILE:HD13	1:A:40:ILE:N	0.47	2.24	21	1
1:A:35:ILE:HD12	1:A:35:ILE:N	0.47	2.24	12	2
1:A:8:VAL:HG22	1:A:9:HIS:N	0.47	2.25	25	4
1:A:35:ILE:HD11	1:A:81:ALA:HB1	0.47	1.87	12	1
1:A:22:LEU:HD11	1:A:85:VAL:HG13	0.47	1.85	28	1
1:A:108:GLU:O	1:A:112:ILE:HG23	0.47	2.09	16	2
1:A:6:TYR:CG	1:A:72:LEU:HD12	0.47	2.44	12	1
1:A:112:ILE:HD12	1:A:113:LEU:N	0.47	2.24	9	2
1:A:5:TRP:CH2	1:A:37:GLN:CB	0.46	2.98	26	6
1:A:35:ILE:HD13	1:A:35:ILE:C	0.46	2.29	7	1
1:A:15:GLU:CD	1:A:66:LEU:HD13	0.46	2.30	24	1
1:A:31:LEU:HD11	1:A:80:GLU:HG3	0.46	1.87	12	2
1:A:3:ILE:N	1:A:3:ILE:CD1	0.46	2.77	19	3
1:A:3:ILE:CG2	1:A:36:PHE:CE2	0.46	2.99	10	5
1:A:72:LEU:HD12	1:A:72:LEU:C	0.46	2.31	8	1
1:A:61:LEU:HD11	1:A:115:VAL:CG2	0.46	2.40	11	1
1:A:101:PRO:O	1:A:102:VAL:HG13	0.46	2.10	9	1
1:A:9:HIS:CD2	1:A:9:HIS:N	0.46	2.84	11	1
1:A:42:THR:HB	1:A:59:LYS:O	0.46	2.11	30	3
1:A:15:GLU:OE2	1:A:40:ILE:HD12	0.46	2.09	16	1
1:A:67:PHE:CE2	1:A:112:ILE:CD1	0.46	2.97	3	1
1:A:61:LEU:HD11	1:A:115:VAL:HG13	0.45	1.88	8	1
1:A:67:PHE:HE2	1:A:112:ILE:HD12	0.45	1.67	10	1
1:A:9:HIS:NE2	1:A:65:TYR:CE2	0.45	2.85	20	1
1:A:102:VAL:O	1:A:102:VAL:HG23	0.45	2.11	5	2
1:A:79:ASN:O	1:A:81:ALA:N	0.45	2.49	30	3
1:A:8:VAL:HG12	1:A:9:HIS:N	0.45	2.26	11	13
1:A:29:PHE:CE2	1:A:84:VAL:HG13	0.45	2.47	24	1
1:A:72:LEU:HD22	1:A:78:PRO:HA	0.45	1.88	9	1
1:A:3:ILE:HG22	1:A:71:ASP:OD1	0.45	2.12	19	1
1:A:66:LEU:HD12	1:A:68:ILE:HD11	0.45	1.89	25	2
1:A:5:TRP:CE2	1:A:113:LEU:HD11	0.45	2.47	27	1
1:A:70:MET:HE2	1:A:72:LEU:HG	0.45	1.88	29	1
1:A:15:GLU:OE1	1:A:40:ILE:HD11	0.44	2.13	7	1
1:A:39:LEU:HD21	1:A:67:PHE:CE2	0.44	2.47	25	1
1:A:66:LEU:HD11	1:A:68:ILE:HD11	0.44	1.87	17	1
1:A:85:VAL:HG12	1:A:91:ILE:CG1	0.44	2.41	18	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:5:TRP:CH2	1:A:37:GLN:HB2	0.44	2.47	10	7
1:A:6:TYR:CE2	1:A:72:LEU:CD1	0.44	3.01	5	2
1:A:62:PHE:CD1	1:A:62:PHE:N	0.44	2.86	15	4
1:A:18:ALA:HB1	1:A:90:GLY:CA	0.44	2.43	4	1
1:A:18:ALA:HB2	1:A:89:PRO:O	0.44	2.12	9	1
1:A:34:LYS:CB	1:A:81:ALA:HB2	0.44	2.42	25	1
1:A:34:LYS:HB2	1:A:81:ALA:HB2	0.43	1.90	25	1
1:A:66:LEU:HD23	1:A:68:ILE:HD11	0.43	1.88	6	1
1:A:39:LEU:CD2	1:A:112:ILE:O	0.43	2.66	10	1
1:A:12:VAL:O	1:A:12:VAL:HG13	0.43	2.13	11	4
1:A:5:TRP:CZ2	1:A:113:LEU:CD2	0.43	2.96	15	1
1:A:9:HIS:CE1	1:A:65:TYR:CE1	0.43	3.06	28	1
1:A:26:ILE:HD12	1:A:35:ILE:HD11	0.43	1.89	6	1
1:A:6:TYR:CE1	1:A:72:LEU:CD1	0.43	3.01	27	1
1:A:61:LEU:HD12	1:A:115:VAL:HG21	0.43	1.88	28	1
1:A:79:ASN:ND2	1:A:81:ALA:HB3	0.43	2.28	13	1
1:A:33:ASP:O	1:A:36:PHE:CE1	0.43	2.72	4	7
1:A:59:LYS:N	1:A:59:LYS:CD	0.43	2.81	4	1
1:A:104:LEU:HB3	1:A:109:VAL:HG22	0.43	1.89	25	1
1:A:104:LEU:HD22	1:A:104:LEU:H	0.43	1.72	7	3
1:A:5:TRP:CH2	1:A:37:GLN:HB3	0.43	2.48	8	1
1:A:15:GLU:CG	1:A:66:LEU:HD11	0.43	2.43	1	1
1:A:3:ILE:HD11	1:A:69:GLN:NE2	0.43	2.29	14	2
1:A:37:GLN:HB2	1:A:69:GLN:CB	0.43	2.43	5	1
1:A:23:GLU:OE1	1:A:38:VAL:HG11	0.43	2.14	12	1
1:A:105:SER:C	1:A:109:VAL:HG23	0.42	2.35	4	2
1:A:35:ILE:HG23	1:A:68:ILE:HG22	0.42	1.91	4	2
1:A:37:GLN:HE22	1:A:118:LEU:HD13	0.42	1.74	10	1
1:A:19:LYS:HD2	1:A:66:LEU:HD21	0.42	1.90	12	1
1:A:37:GLN:NE2	1:A:118:LEU:HD13	0.42	2.30	10	2
1:A:41:PRO:O	1:A:42:THR:HG23	0.42	2.14	2	2
1:A:40:ILE:HG22	1:A:42:THR:HG23	0.42	1.91	4	1
1:A:30:GLY:C	1:A:31:LEU:HD22	0.42	2.35	18	3
1:A:35:ILE:HG23	1:A:68:ILE:HG23	0.42	1.92	16	1
1:A:7:ALA:HA	1:A:66:LEU:O	0.42	2.15	24	1
1:A:25:ARG:NH1	1:A:29:PHE:CZ	0.42	2.88	17	1
1:A:6:TYR:HE2	1:A:72:LEU:HD12	0.42	1.67	31	1
1:A:39:LEU:CD2	1:A:116:SER:OG	0.42	2.68	14	1
1:A:39:LEU:HD21	1:A:118:LEU:HD21	0.42	1.90	22	1
1:A:67:PHE:CE1	1:A:104:LEU:HD21	0.42	2.49	22	1
1:A:6:TYR:CD1	1:A:70:MET:CG	0.42	3.02	28	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:9:HIS:CE1	1:A:65:TYR:OH	0.42	2.73	2	5
1:A:35:ILE:HD12	1:A:35:ILE:H	0.42	1.75	2	4
1:A:39:LEU:HD11	1:A:113:LEU:HA	0.42	1.89	10	1
1:A:62:PHE:CZ	1:A:112:ILE:CG2	0.42	3.02	2	1
1:A:6:TYR:CD2	1:A:101:PRO:CB	0.42	3.03	5	1
1:A:34:LYS:O	1:A:36:PHE:CD1	0.42	2.73	12	1
1:A:6:TYR:CZ	1:A:72:LEU:CD1	0.41	3.02	17	2
1:A:109:VAL:O	1:A:113:LEU:HD12	0.41	2.14	9	1
1:A:33:ASP:O	1:A:36:PHE:CZ	0.41	2.73	27	5
1:A:34:LYS:O	1:A:36:PHE:CE2	0.41	2.73	24	2
1:A:37:GLN:NE2	1:A:69:GLN:NE2	0.41	2.68	27	1
1:A:5:TRP:CZ2	1:A:69:GLN:OE1	0.41	2.73	29	1
1:A:3:ILE:HG21	1:A:36:PHE:CD2	0.41	2.49	4	1
1:A:8:VAL:HG22	1:A:9:HIS:H	0.41	1.76	12	2
1:A:36:PHE:CZ	1:A:71:ASP:OD1	0.41	2.74	8	1
1:A:106:PRO:O	1:A:109:VAL:HG12	0.41	2.14	8	1
1:A:6:TYR:N	1:A:68:ILE:O	0.41	2.54	28	1
1:A:5:TRP:CD1	1:A:69:GLN:OE1	0.41	2.73	8	2
1:A:63:PRO:O	1:A:65:TYR:CD2	0.41	2.73	24	3
1:A:100:ARG:HB3	1:A:101:PRO:HD3	0.41	1.92	14	1
1:A:6:TYR:CD1	1:A:72:LEU:HD12	0.41	2.49	27	1
1:A:11:LEU:HD13	1:A:12:VAL:N	0.41	2.30	1	1
1:A:37:GLN:CG	1:A:69:GLN:HB3	0.41	2.46	4	1
1:A:109:VAL:HG12	1:A:113:LEU:HD11	0.41	1.92	5	1
1:A:34:LYS:CD	1:A:81:ALA:HB2	0.41	2.41	6	1
1:A:12:VAL:O	1:A:12:VAL:HG23	0.41	2.16	16	1
1:A:39:LEU:HD23	1:A:116:SER:HB3	0.41	1.92	13	2
1:A:36:PHE:CE2	1:A:71:ASP:OD2	0.41	2.74	4	1
1:A:26:ILE:HD11	1:A:35:ILE:CD1	0.41	2.45	22	1
1:A:31:LEU:HD11	1:A:84:VAL:CG2	0.41	2.36	5	1
1:A:12:VAL:HG13	1:A:12:VAL:O	0.41	2.16	9	1
1:A:26:ILE:O	1:A:31:LEU:N	0.41	2.54	12	1
1:A:35:ILE:O	1:A:36:PHE:CD1	0.41	2.74	25	1
1:A:104:LEU:N	1:A:104:LEU:HD13	0.40	2.31	7	1
1:A:34:LYS:NZ	1:A:81:ALA:CB	0.40	2.85	11	1
1:A:113:LEU:CD2	1:A:118:LEU:CD1	0.40	2.98	20	1
1:A:70:MET:SD	1:A:72:LEU:HD21	0.40	2.57	22	1
1:A:8:VAL:HG11	1:A:91:ILE:CD1	0.40	2.47	25	1
1:A:6:TYR:CD1	1:A:70:MET:HG3	0.40	2.51	28	1
1:A:67:PHE:CE2	1:A:112:ILE:HB	0.40	2.52	28	1
1:A:31:LEU:O	1:A:35:ILE:HD12	0.40	2.15	4	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:26:ILE:HG21	1:A:35:ILE:CD1	0.40	2.47	17	1
1:A:41:PRO:HB3	1:A:62:PHE:HB2	0.40	1.92	27	1
1:A:5:TRP:CZ3	1:A:39:LEU:CD1	0.40	2.97	30	1
1:A:31:LEU:HD22	1:A:80:GLU:HG3	0.40	1.94	9	1
1:A:70:MET:CE	1:A:72:LEU:CD2	0.40	3.00	13	1
1:A:7:ALA:HB3	1:A:102:VAL:HG23	0.40	1.94	17	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	89/119 (75%)	78±2 (88±3%)	8±2 (9±3%)	2±1 (3±1%)	8	43
All	All	2759/3689 (75%)	2425 (88%)	260 (9%)	74 (3%)	8	43

All 11 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	117	GLY	26
1	A	38	VAL	14
1	A	101	PRO	9
1	A	41	PRO	8
1	A	78	PRO	5
1	A	80	GLU	5
1	A	3	ILE	2
1	A	89	PRO	2
1	A	30	GLY	1
1	A	116	SER	1
1	A	79	ASN	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	78/100 (78%)	61±4 (78±5%)	17±4 (22±5%)	3	30
All	All	2418/3100 (78%)	1893 (78%)	525 (22%)	3	30

All 55 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	3	ILE	28
1	A	119	LEU	21
1	A	11	LEU	20
1	A	110	ARG	19
1	A	111	HIS	19
1	A	66	LEU	16
1	A	17	LYS	15
1	A	34	LYS	15
1	A	37	GLN	15
1	A	116	SER	15
1	A	86	ARG	14
1	A	88	THR	14
1	A	25	ARG	13
1	A	100	ARG	13
1	A	33	ASP	13
1	A	19	LYS	12
1	A	104	LEU	12
1	A	105	SER	12
1	A	24	LYS	12
1	A	32	GLN	12
1	A	107	ASP	12
1	A	31	LEU	12
1	A	23	GLU	11
1	A	59	LYS	11
1	A	4	GLU	10
1	A	60	LYS	10
1	A	77	GLU	10
1	A	79	ASN	10
1	A	113	LEU	10
1	A	91	ILE	10
1	A	27	LYS	9
1	A	83	GLU	8
1	A	15	GLU	8

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Mol	Chain	Res	Type	Models (Total)
1	A	16	GLU	8
1	A	14	GLN	7
1	A	108	GLU	7
1	A	80	GLU	6
1	A	114	GLU	6
1	A	39	LEU	6
1	A	68	ILE	6
1	A	21	ASN	5
1	A	26	ILE	4
1	A	8	VAL	4
1	A	61	LEU	3
1	A	69	GLN	3
1	A	118	LEU	3
1	A	65	TYR	3
1	A	67	PHE	3
1	A	35	ILE	2
1	A	9	HIS	2
1	A	40	ILE	2
1	A	70	MET	1
1	A	82	TRP	1
1	A	109	VAL	1
1	A	42	THR	1

6.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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 monosaccharides 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