



Full wwPDB NMR Structure Validation Report ⓘ

Mar 5, 2026 – 06:33 PM UTC

PDB ID : 2KTU / pdb_00002ktu
Title : Human eRF1 C-domain, "closed" conformer
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Deposited on : 2010-02-09

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

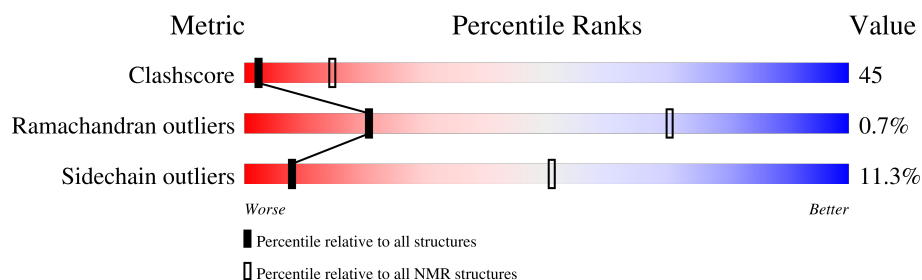
1 Overall quality at a glance

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	170	35% 30% 5% 27% .

2 Ensemble composition and analysis

This entry contains 24 models. Model 14 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *closest to the average*.

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:281-A:332, A:344-A:351, A:371-A:416 (106)	0.41	14
2	A:429-A:440 (12)	1.00	5

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 5 clusters and 2 single-model clusters were found.

Cluster number	Models
1	2, 3, 4, 5, 6, 7, 10, 13, 22, 24
2	11, 17, 18, 19, 23
3	1, 12, 15
4	8, 16
5	9, 20
Single-model clusters	14; 21

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 2626 atoms, of which 1284 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Eukaryotic peptide chain release factor subunit 1.

Mol	Chain	Residues	Atoms						Trace
1	A	164	Total	C	H	N	O	S	0
			2626	858	1284	211	267	6	

There are 8 discrepancies between the modelled and reference sequences:

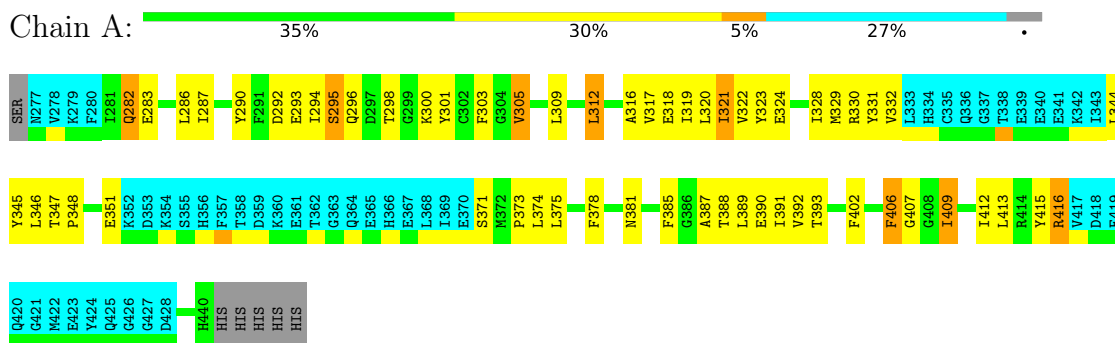
Chain	Residue	Modelled	Actual	Comment	Reference
A	438	LEU	-	expression tag	UNP P62495
A	439	GLU	-	expression tag	UNP P62495
A	440	HIS	-	expression tag	UNP P62495
A	441	HIS	-	expression tag	UNP P62495
A	442	HIS	-	expression tag	UNP P62495
A	443	HIS	-	expression tag	UNP P62495
A	444	HIS	-	expression tag	UNP P62495
A	445	HIS	-	expression tag	UNP P62495

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: Eukaryotic peptide chain release factor subunit 1

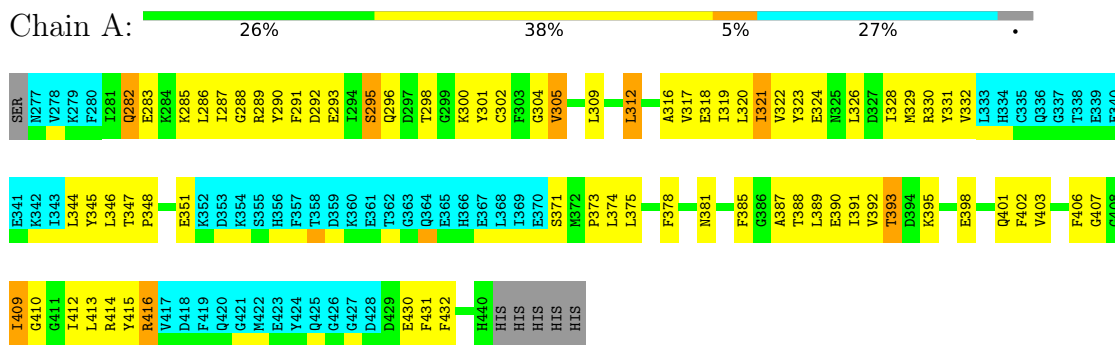


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

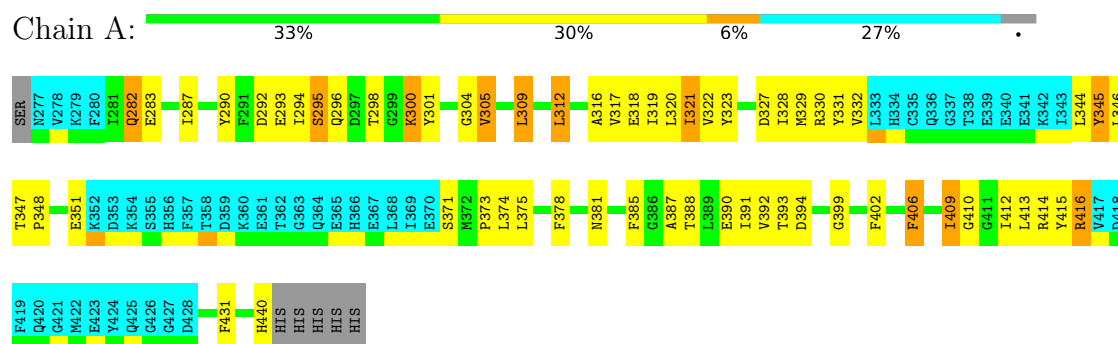
4.2.1 Score per residue for model 1

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



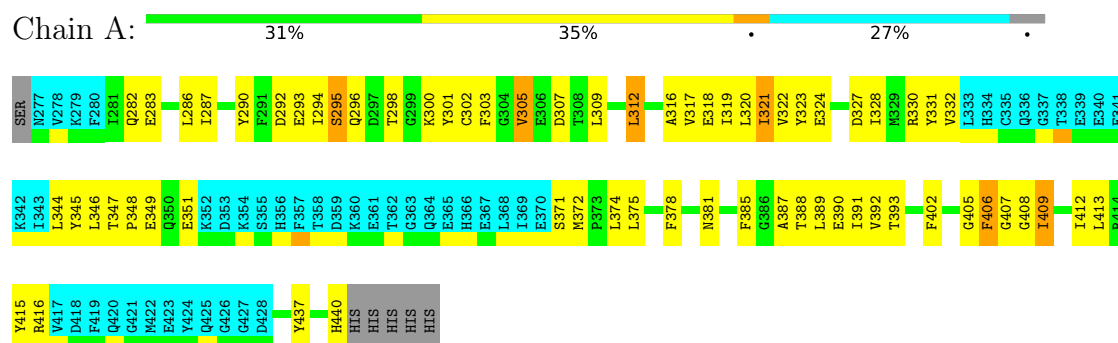
4.2.11 Score per residue for model 11

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



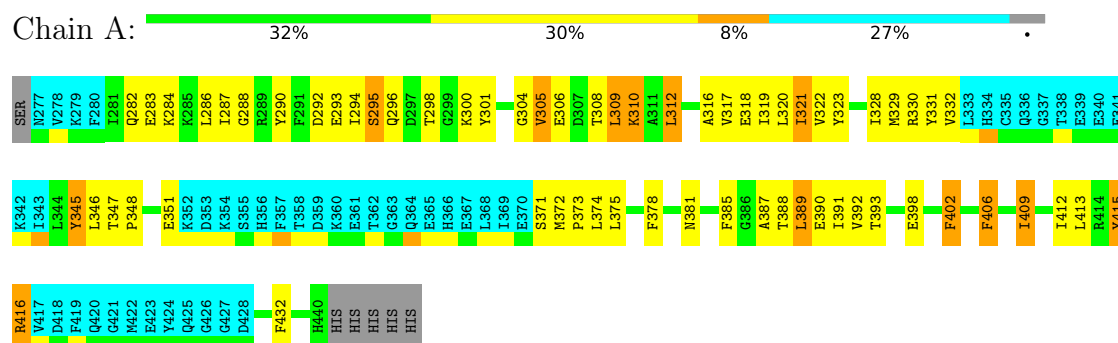
4.2.12 Score per residue for model 12

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



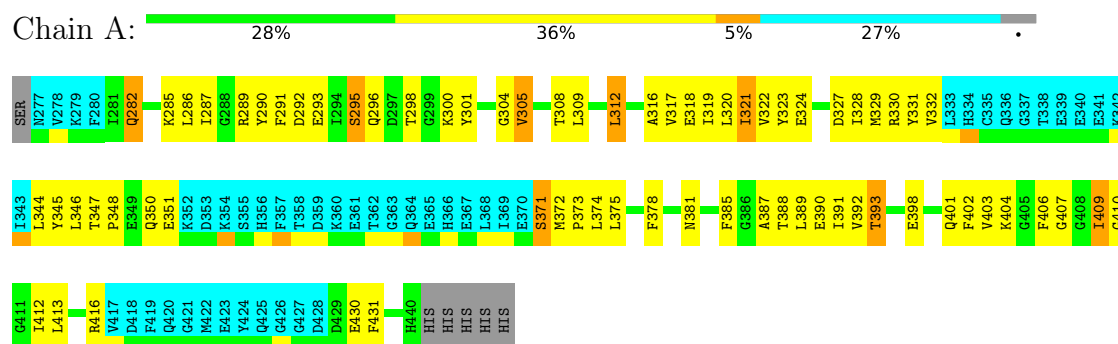
4.2.13 Score per residue for model 13

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



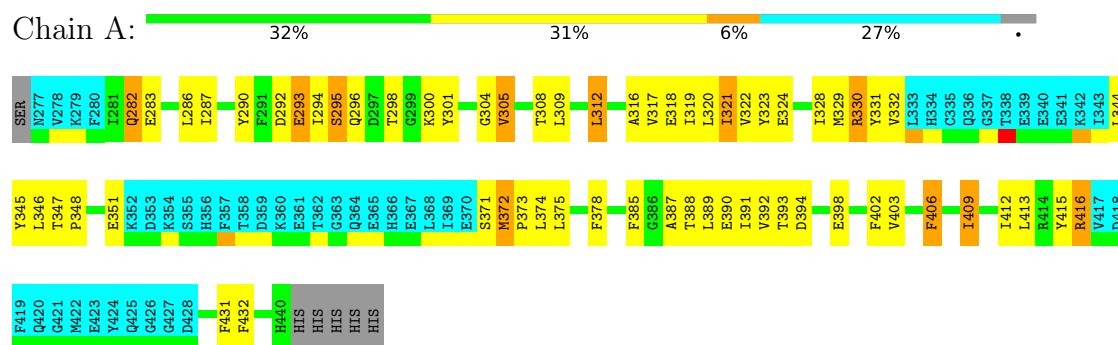
4.2.14 Score per residue for model 14 (medoid)

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



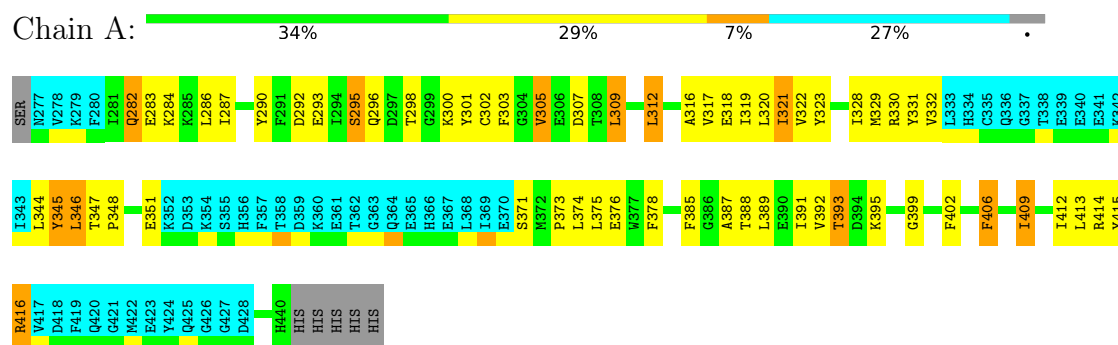
4.2.15 Score per residue for model 15

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



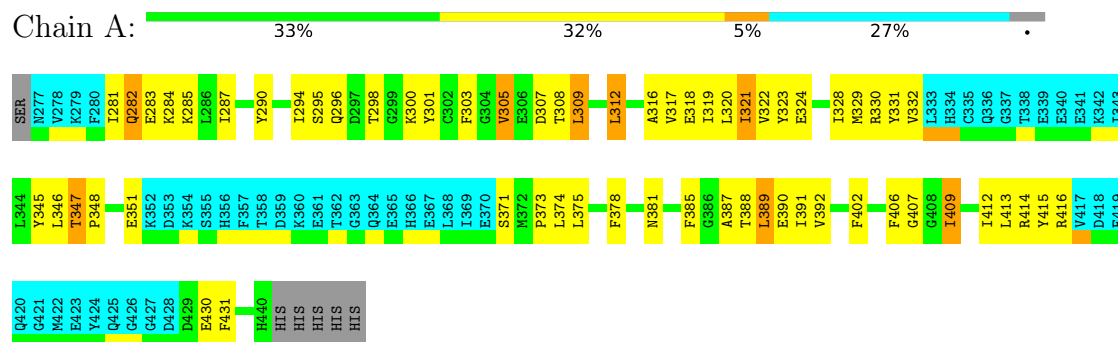
4.2.16 Score per residue for model 16

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



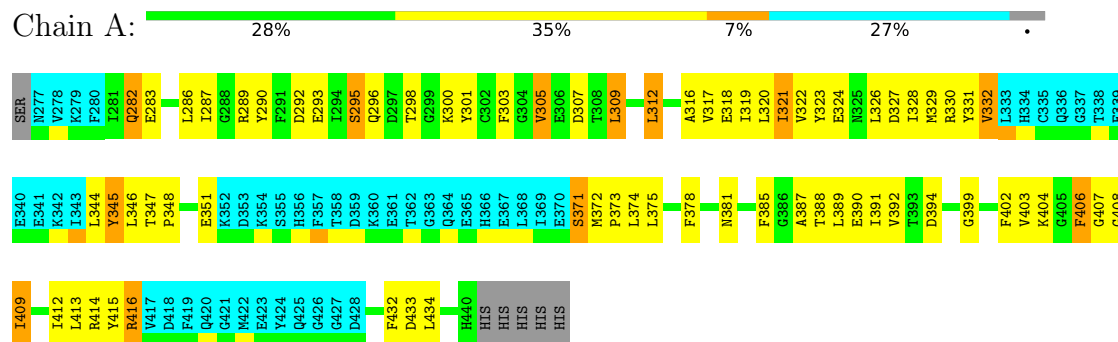
4.2.17 Score per residue for model 17

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



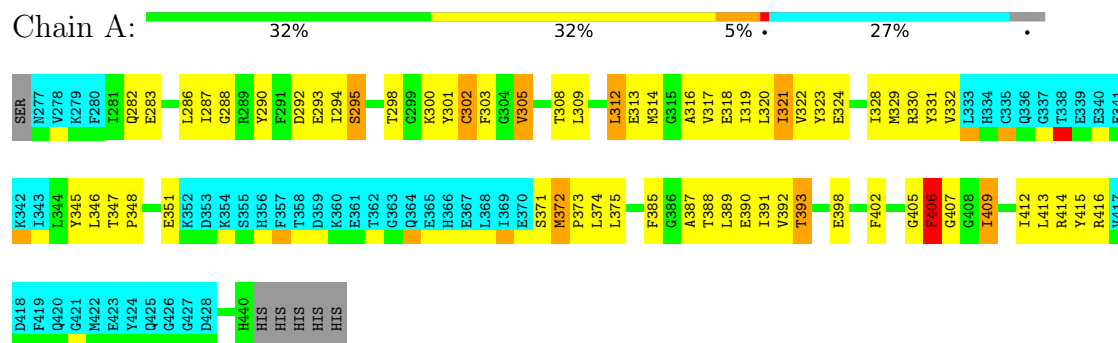
4.2.18 Score per residue for model 18

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



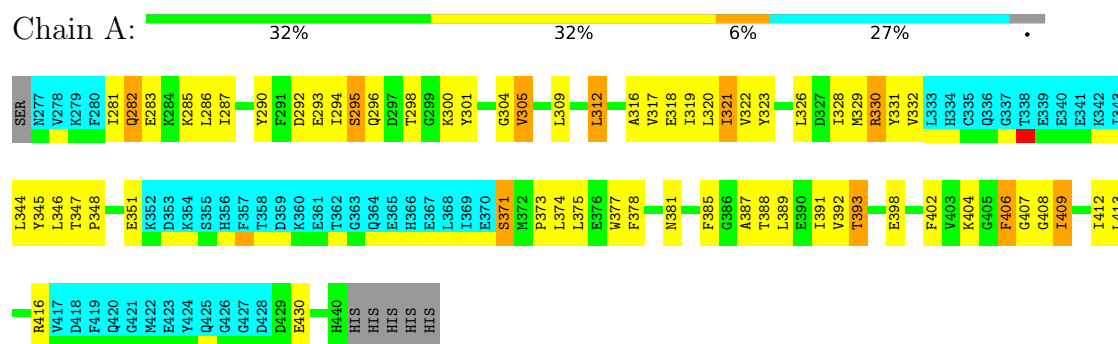
4.2.19 Score per residue for model 19

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



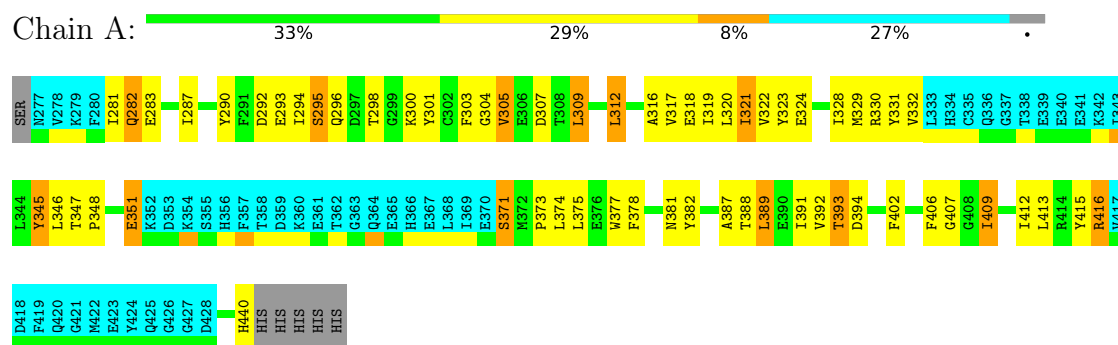
4.2.20 Score per residue for model 20

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



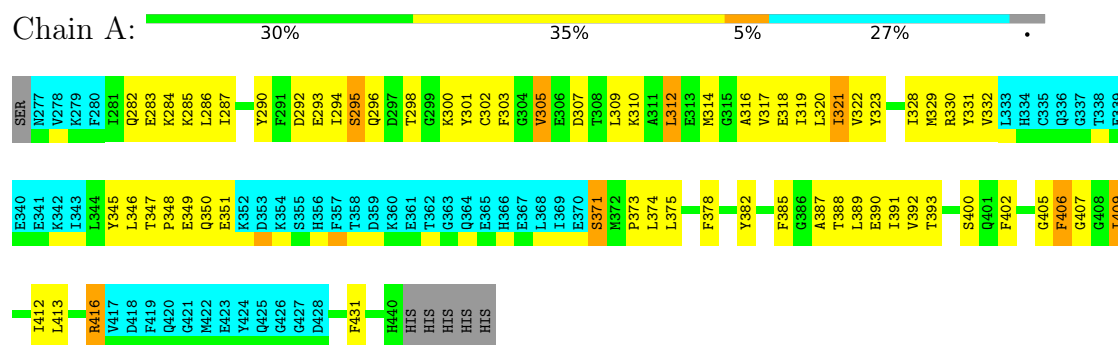
4.2.21 Score per residue for model 21

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



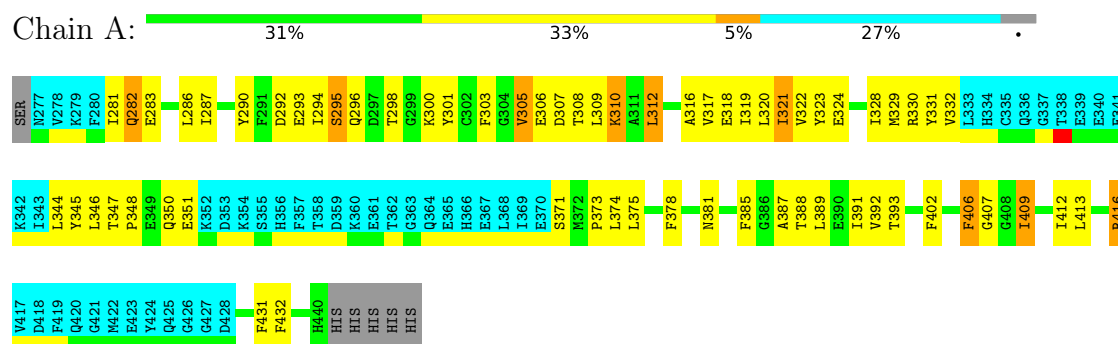
4.2.22 Score per residue for model 22

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



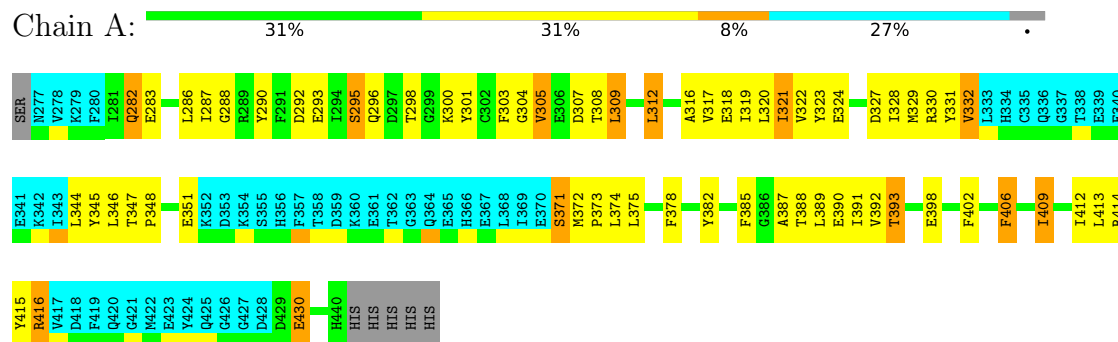
4.2.23 Score per residue for model 23

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



4.2.24 Score per residue for model 24

- Molecule 1: Eukaryotic peptide chain release factor subunit 1



5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing*.

Of the 100 calculated structures, 24 were deposited, based on the following criterion: *structures with the least restraint violations*.

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

Software name	Classification	Version
CNS 2.1	structure solution	
ARIA	refinement	
CNSSOLVE	structure solution	

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	967	940	939	86±7
All	All	23208	22560	22536	2058

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 45.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:328:ILE:HG22	1:A:374:LEU:HD12	0.97	1.36	19	24
1:A:305:VAL:HG21	1:A:328:ILE:HG21	0.94	1.35	14	24
1:A:305:VAL:HG12	1:A:309:LEU:CD1	0.92	1.94	16	24
1:A:375:LEU:HD11	1:A:391:ILE:HD12	0.90	1.44	1	24
1:A:305:VAL:HG11	1:A:374:LEU:HD13	0.89	1.43	11	24
1:A:346:LEU:HD12	1:A:350:GLN:HG2	0.87	1.43	2	4
1:A:312:LEU:CD1	1:A:317:VAL:HG21	0.86	2.01	12	24
1:A:301:TYR:CE2	1:A:412:ILE:HG23	0.84	2.06	19	13
1:A:318:GLU:O	1:A:319:ILE:HD13	0.82	1.75	4	24
1:A:305:VAL:HG12	1:A:309:LEU:HD13	0.82	1.51	5	23
1:A:301:TYR:CE1	1:A:412:ILE:HG23	0.82	2.10	15	10
1:A:286:LEU:HG	1:A:321:ILE:HD13	0.81	1.52	13	9
1:A:324:GLU:OE2	1:A:391:ILE:HG21	0.81	1.76	21	2
1:A:323:TYR:CE2	1:A:392:VAL:HG23	0.80	2.12	10	7

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:331:TYR:CD2	1:A:371:SER:HB2	0.80	2.10	15	1
1:A:317:VAL:HG23	1:A:387:ALA:HB2	0.78	1.55	1	24
1:A:323:TYR:CE1	1:A:392:VAL:HG23	0.78	2.12	19	11
1:A:389:LEU:HD11	1:A:391:ILE:HD11	0.78	1.55	1	17
1:A:328:ILE:HG22	1:A:374:LEU:CD1	0.77	2.10	20	23
1:A:287:ILE:HG23	1:A:402:PHE:CD2	0.77	2.15	7	8
1:A:298:THR:O	1:A:416:ARG:HG2	0.76	1.80	2	24
1:A:312:LEU:HD12	1:A:317:VAL:HG21	0.75	1.56	12	19
1:A:303:PHE:HB2	1:A:406:PHE:CG	0.75	2.17	12	5
1:A:321:ILE:HD11	1:A:412:ILE:HD11	0.75	1.57	13	22
1:A:328:ILE:HG23	1:A:345:TYR:HB2	0.74	1.58	9	7
1:A:287:ILE:HG23	1:A:402:PHE:CE1	0.74	2.17	21	13
1:A:375:LEU:HD11	1:A:391:ILE:CD1	0.74	2.13	16	22
1:A:331:TYR:CZ	1:A:351:GLU:HG3	0.73	2.18	13	2
1:A:312:LEU:HD22	1:A:378:PHE:CE1	0.73	2.19	24	17
1:A:287:ILE:HG23	1:A:402:PHE:CE2	0.72	2.19	8	5
1:A:286:LEU:HG	1:A:321:ILE:HD12	0.72	1.61	12	1
1:A:319:ILE:HG23	1:A:388:THR:HB	0.72	1.62	18	24
1:A:305:VAL:HG12	1:A:309:LEU:HD11	0.71	1.62	23	20
1:A:287:ILE:HG23	1:A:402:PHE:CZ	0.70	2.20	8	2
1:A:296:GLN:HB2	1:A:298:THR:HG23	0.70	1.64	5	22
1:A:312:LEU:CG	1:A:317:VAL:HG21	0.70	2.17	14	24
1:A:324:GLU:CD	1:A:391:ILE:HG21	0.69	2.11	1	2
1:A:305:VAL:CG1	1:A:374:LEU:HD13	0.69	2.18	13	23
1:A:331:TYR:CD2	1:A:371:SER:HB3	0.68	2.24	11	8
1:A:312:LEU:HG	1:A:317:VAL:HG21	0.68	1.64	15	24
1:A:317:VAL:HG12	1:A:413:LEU:HD23	0.68	1.66	19	15
1:A:300:LYS:HG3	1:A:301:TYR:CE2	0.68	2.23	13	2
1:A:372:MET:HE3	1:A:373:PRO:HD2	0.67	1.66	13	5
1:A:294:ILE:HD11	1:A:301:TYR:HB2	0.67	1.66	21	13
1:A:293:GLU:OE2	1:A:298:THR:HG21	0.67	1.89	9	2
1:A:403:VAL:HA	1:A:407:GLY:CA	0.66	2.21	5	4
1:A:403:VAL:HA	1:A:407:GLY:HA2	0.66	1.66	10	4
1:A:287:ILE:HG22	1:A:398:GLU:HG3	0.65	1.68	13	1
1:A:283:GLU:O	1:A:287:ILE:HB	0.65	1.91	10	23
1:A:321:ILE:HD11	1:A:412:ILE:CD1	0.64	2.22	13	12
1:A:331:TYR:CG	1:A:371:SER:HB2	0.64	2.28	15	1
1:A:317:VAL:CG2	1:A:387:ALA:HB2	0.64	2.23	21	11
1:A:287:ILE:HD11	1:A:392:VAL:HB	0.64	1.69	7	10
1:A:328:ILE:HD12	1:A:345:TYR:CD2	0.64	2.27	8	3
1:A:317:VAL:HA	1:A:413:LEU:HA	0.63	1.70	19	21

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:293:GLU:HB2	1:A:301:TYR:CE1	0.63	2.28	14	12
1:A:303:PHE:O	1:A:307:ASP:HB2	0.63	1.94	2	10
1:A:389:LEU:HD13	1:A:389:LEU:O	0.63	1.93	8	17
1:A:312:LEU:HD23	1:A:385:PHE:CD2	0.63	2.29	4	21
1:A:309:LEU:HD21	1:A:374:LEU:HD22	0.62	1.71	10	1
1:A:345:TYR:O	1:A:346:LEU:HD13	0.62	1.94	14	10
1:A:305:VAL:HG11	1:A:374:LEU:CD1	0.62	2.24	15	22
1:A:282:GLN:NE2	1:A:390:GLU:HB3	0.61	2.10	9	19
1:A:321:ILE:HD11	1:A:412:ILE:HG13	0.61	1.72	12	1
1:A:287:ILE:HG23	1:A:402:PHE:CD1	0.60	2.30	21	11
1:A:300:LYS:C	1:A:301:TYR:CD1	0.60	2.79	18	13
1:A:293:GLU:HB3	1:A:301:TYR:CE2	0.60	2.32	13	6
1:A:344:LEU:HD23	1:A:346:LEU:HD11	0.60	1.74	7	6
1:A:331:TYR:CE2	1:A:351:GLU:HG3	0.60	2.32	6	1
1:A:305:VAL:HG22	1:A:409:ILE:HD13	0.59	1.73	8	9
1:A:323:TYR:OH	1:A:402:PHE:HB2	0.59	1.98	1	19
1:A:330:ARG:N	1:A:374:LEU:HG	0.59	2.12	8	23
1:A:300:LYS:O	1:A:301:TYR:CG	0.58	2.57	20	23
1:A:293:GLU:HB3	1:A:301:TYR:CE1	0.58	2.33	21	1
1:A:372:MET:HE2	1:A:373:PRO:HD2	0.58	1.74	19	3
1:A:329:MET:HB2	1:A:331:TYR:CZ	0.58	2.32	6	1
1:A:318:GLU:N	1:A:412:ILE:O	0.58	2.37	7	24
1:A:346:LEU:N	1:A:346:LEU:HD22	0.58	2.14	3	19
1:A:287:ILE:HG21	1:A:398:GLU:O	0.58	1.99	7	3
1:A:303:PHE:HB2	1:A:406:PHE:HB3	0.57	1.75	8	2
1:A:409:ILE:HD12	1:A:409:ILE:N	0.57	2.14	19	20
1:A:328:ILE:HD12	1:A:345:TYR:HD2	0.57	1.59	6	1
1:A:317:VAL:HG23	1:A:317:VAL:O	0.57	1.99	4	24
1:A:287:ILE:HD11	1:A:392:VAL:CG1	0.57	2.30	20	4
1:A:287:ILE:HD11	1:A:392:VAL:HG11	0.57	1.75	20	2
1:A:320:LEU:HG	1:A:322:VAL:HG23	0.57	1.77	3	24
1:A:326:LEU:HD11	1:A:409:ILE:HD11	0.57	1.76	1	2
1:A:287:ILE:HD11	1:A:392:VAL:CB	0.57	2.30	12	9
1:A:406:PHE:CD2	1:A:409:ILE:O	0.57	2.58	8	2
1:A:327:ASP:O	1:A:347:THR:HA	0.56	2.01	3	9
1:A:346:LEU:HD12	1:A:350:GLN:CG	0.56	2.27	2	2
1:A:406:PHE:CD1	1:A:406:PHE:N	0.56	2.74	12	5
1:A:324:GLU:HB3	1:A:391:ILE:HG21	0.56	1.76	18	10
1:A:402:PHE:CG	1:A:406:PHE:CZ	0.56	2.94	8	3
1:A:312:LEU:HD11	1:A:320:LEU:HB2	0.56	1.77	2	6
1:A:317:VAL:HG12	1:A:413:LEU:CD2	0.56	2.30	19	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:282:GLN:OE1	1:A:392:VAL:HG12	0.56	2.00	3	1
1:A:286:LEU:HD11	1:A:319:ILE:HG21	0.56	1.77	7	4
1:A:290:TYR:CE2	1:A:301:TYR:HB3	0.56	2.35	5	18
1:A:331:TYR:CZ	1:A:351:GLU:HG2	0.56	2.36	15	11
1:A:286:LEU:HG	1:A:321:ILE:CD1	0.55	2.31	5	13
1:A:300:LYS:C	1:A:301:TYR:CD2	0.55	2.84	23	11
1:A:316:ALA:O	1:A:413:LEU:HA	0.55	2.02	21	24
1:A:300:LYS:C	1:A:301:TYR:CG	0.55	2.85	7	23
1:A:323:TYR:CD2	1:A:392:VAL:HG23	0.55	2.37	22	5
1:A:329:MET:HB2	1:A:331:TYR:CE1	0.55	2.36	13	1
1:A:438:LEU:C	1:A:438:LEU:HD13	0.55	2.26	3	1
1:A:323:TYR:CD1	1:A:392:VAL:HG23	0.54	2.37	19	5
1:A:346:LEU:HD12	1:A:350:GLN:NE2	0.54	2.18	8	1
1:A:290:TYR:HA	1:A:301:TYR:CE2	0.54	2.36	19	13
1:A:282:GLN:O	1:A:286:LEU:HB3	0.54	2.03	3	9
1:A:305:VAL:CG2	1:A:328:ILE:HG21	0.54	2.33	16	9
1:A:329:MET:HG2	1:A:373:PRO:HA	0.54	1.78	8	22
1:A:347:THR:HB	1:A:348:PRO:HD2	0.54	1.79	19	24
1:A:300:LYS:HB3	1:A:415:TYR:O	0.54	2.03	13	1
1:A:290:TYR:HA	1:A:301:TYR:CE1	0.53	2.38	11	10
1:A:402:PHE:O	1:A:407:GLY:N	0.53	2.42	6	6
1:A:300:LYS:O	1:A:301:TYR:CD1	0.53	2.61	3	13
1:A:309:LEU:HD21	1:A:374:LEU:CD2	0.53	2.33	10	1
1:A:318:GLU:HB2	1:A:414:ARG:HA	0.53	1.81	1	5
1:A:281:ILE:HD12	1:A:285:LYS:HD2	0.52	1.79	17	1
1:A:290:TYR:CG	1:A:402:PHE:CZ	0.52	2.96	15	7
1:A:389:LEU:HD13	1:A:389:LEU:C	0.52	2.29	12	9
1:A:331:TYR:CE1	1:A:351:GLU:HG2	0.52	2.39	15	2
1:A:294:ILE:HG12	1:A:301:TYR:CD1	0.52	2.39	7	1
1:A:328:ILE:CG2	1:A:345:TYR:HB2	0.52	2.34	7	12
1:A:331:TYR:CE2	1:A:371:SER:HB2	0.52	2.40	15	1
1:A:282:GLN:OE1	1:A:286:LEU:HD23	0.52	2.04	18	3
1:A:288:GLY:N	1:A:398:GLU:HG2	0.52	2.19	13	1
1:A:312:LEU:HD12	1:A:317:VAL:HG11	0.52	1.81	11	4
1:A:345:TYR:C	1:A:346:LEU:HD22	0.52	2.30	12	8
1:A:290:TYR:HH	1:A:302:CYS:C	0.52	2.13	22	5
1:A:331:TYR:CE2	1:A:351:GLU:CG	0.52	2.93	13	2
1:A:292:ASP:O	1:A:295:SER:HB2	0.51	2.05	13	19
1:A:287:ILE:CG2	1:A:402:PHE:CE1	0.51	2.93	23	6
1:A:389:LEU:C	1:A:389:LEU:HD13	0.51	2.30	24	3
1:A:290:TYR:CE1	1:A:402:PHE:CE1	0.51	2.99	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:290:TYR:CD1	1:A:402:PHE:CE1	0.51	2.98	15	5
1:A:290:TYR:C	1:A:290:TYR:CD1	0.51	2.88	19	6
1:A:394:ASP:HB2	1:A:403:VAL:HG21	0.51	1.82	3	3
1:A:320:LEU:HD21	1:A:378:PHE:CD1	0.51	2.41	20	1
1:A:319:ILE:HD12	1:A:388:THR:CB	0.51	2.36	20	17
1:A:322:VAL:O	1:A:391:ILE:HA	0.51	2.05	3	7
1:A:346:LEU:HB2	1:A:351:GLU:HG3	0.51	1.82	12	20
1:A:309:LEU:HD11	1:A:378:PHE:CZ	0.51	2.41	5	1
1:A:294:ILE:HG13	1:A:301:TYR:CD2	0.51	2.41	13	3
1:A:312:LEU:HG	1:A:317:VAL:CG2	0.51	2.36	15	7
1:A:291:PHE:CE2	1:A:401:GLN:CB	0.51	2.94	8	2
1:A:323:TYR:CZ	1:A:392:VAL:HG23	0.51	2.40	12	5
1:A:300:LYS:O	1:A:301:TYR:CD2	0.51	2.64	7	10
1:A:331:TYR:CE2	1:A:371:SER:HB3	0.50	2.41	3	17
1:A:294:ILE:HD11	1:A:301:TYR:CB	0.50	2.36	10	11
1:A:294:ILE:HG12	1:A:301:TYR:CE1	0.50	2.42	7	1
1:A:282:GLN:NE2	1:A:392:VAL:HG13	0.50	2.20	23	3
1:A:331:TYR:CE2	1:A:351:GLU:CD	0.50	2.90	13	2
1:A:303:PHE:HB2	1:A:406:PHE:CD1	0.50	2.41	23	2
1:A:287:ILE:HD13	1:A:399:GLY:HA2	0.50	1.81	7	2
1:A:329:MET:HB2	1:A:331:TYR:HE1	0.50	1.66	11	2
1:A:321:ILE:HD11	1:A:412:ILE:CG1	0.50	2.36	12	1
1:A:317:VAL:HA	1:A:412:ILE:O	0.49	2.06	12	14
1:A:378:PHE:O	1:A:382:TYR:HB3	0.49	2.07	21	5
1:A:290:TYR:CE1	1:A:406:PHE:CZ	0.49	3.00	6	1
1:A:321:ILE:HG22	1:A:392:VAL:CG2	0.49	2.36	17	2
1:A:346:LEU:HB2	1:A:351:GLU:HG2	0.49	1.83	6	1
1:A:331:TYR:CZ	1:A:351:GLU:CG	0.49	2.94	13	4
1:A:282:GLN:HE22	1:A:392:VAL:HG13	0.49	1.67	2	5
1:A:294:ILE:CG1	1:A:301:TYR:CE1	0.49	2.95	7	1
1:A:283:GLU:HG3	1:A:392:VAL:HB	0.49	1.85	16	2
1:A:305:VAL:HG22	1:A:409:ILE:CD1	0.49	2.38	18	12
1:A:300:LYS:CG	1:A:301:TYR:CE2	0.49	2.96	9	2
1:A:324:GLU:HA	1:A:375:LEU:CD2	0.48	2.38	15	5
1:A:406:PHE:CE2	1:A:409:ILE:C	0.48	2.91	8	1
1:A:344:LEU:HG	1:A:345:TYR:N	0.48	2.23	4	14
1:A:389:LEU:C	1:A:389:LEU:HD22	0.48	2.33	6	2
1:A:312:LEU:HD21	1:A:320:LEU:HD22	0.48	1.85	21	2
1:A:293:GLU:CB	1:A:301:TYR:CE1	0.48	2.96	3	12
1:A:290:TYR:CE1	1:A:294:ILE:CD1	0.48	2.96	2	4
1:A:323:TYR:CD1	1:A:408:GLY:HA2	0.48	2.44	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:405:GLY:C	1:A:406:PHE:CD1	0.48	2.92	19	5
1:A:291:PHE:CE2	1:A:401:GLN:HB3	0.48	2.44	14	3
1:A:312:LEU:HD23	1:A:385:PHE:CG	0.48	2.43	16	1
1:A:287:ILE:HG21	1:A:398:GLU:C	0.48	2.34	7	2
1:A:373:PRO:HG2	1:A:376:GLU:HB2	0.47	1.86	6	2
1:A:282:GLN:O	1:A:282:GLN:OE1	0.47	2.32	1	4
1:A:294:ILE:CG1	1:A:301:TYR:CD1	0.47	2.97	7	1
1:A:303:PHE:CB	1:A:406:PHE:CD1	0.47	2.98	23	2
1:A:402:PHE:O	1:A:406:PHE:N	0.47	2.45	19	3
1:A:293:GLU:CB	1:A:301:TYR:CE2	0.47	2.98	7	4
1:A:403:VAL:HA	1:A:407:GLY:HA3	0.47	1.86	5	1
1:A:381:ASN:O	1:A:385:PHE:CD2	0.47	2.68	17	15
1:A:346:LEU:CB	1:A:351:GLU:HG3	0.47	2.40	4	6
1:A:323:TYR:CD2	1:A:392:VAL:O	0.47	2.68	17	3
1:A:290:TYR:CD1	1:A:402:PHE:CZ	0.47	3.03	7	1
1:A:432:PHE:CD2	1:A:432:PHE:O	0.47	2.67	7	7
1:A:282:GLN:NE2	1:A:392:VAL:CG1	0.47	2.78	23	3
1:A:281:ILE:CG1	1:A:282:GLN:N	0.47	2.78	6	3
1:A:320:LEU:HD12	1:A:410:GLY:O	0.47	2.10	11	1
1:A:331:TYR:CE2	1:A:371:SER:CB	0.47	2.98	11	2
1:A:402:PHE:CD2	1:A:406:PHE:CE2	0.47	3.02	18	1
1:A:309:LEU:CD1	1:A:378:PHE:CZ	0.46	2.98	10	2
1:A:331:TYR:CD2	1:A:371:SER:CB	0.46	2.98	11	1
1:A:304:GLY:HA2	1:A:406:PHE:CE2	0.46	2.45	20	2
1:A:291:PHE:HA	1:A:294:ILE:HD12	0.46	1.86	7	1
1:A:287:ILE:O	1:A:290:TYR:HB3	0.46	2.10	21	3
1:A:304:GLY:HA2	1:A:406:PHE:CE1	0.46	2.46	15	6
1:A:415:TYR:CD2	1:A:416:ARG:N	0.46	2.84	5	3
1:A:331:TYR:CE1	1:A:351:GLU:CD	0.46	2.94	10	4
1:A:331:TYR:CZ	1:A:351:GLU:CD	0.46	2.94	21	2
1:A:287:ILE:CG2	1:A:402:PHE:CD1	0.46	2.99	18	1
1:A:402:PHE:CE2	1:A:410:GLY:HA3	0.46	2.45	1	2
1:A:408:GLY:C	1:A:409:ILE:HG13	0.46	2.35	12	1
1:A:431:PHE:CD2	1:A:431:PHE:O	0.45	2.70	9	7
1:A:305:VAL:O	1:A:309:LEU:HD13	0.45	2.11	2	2
1:A:331:TYR:CZ	1:A:371:SER:CB	0.45	2.99	5	1
1:A:323:TYR:CG	1:A:392:VAL:O	0.45	2.70	9	3
1:A:331:TYR:CZ	1:A:371:SER:HB2	0.45	2.47	21	1
1:A:318:GLU:C	1:A:319:ILE:HD13	0.45	2.36	5	2
1:A:324:GLU:CG	1:A:391:ILE:CG2	0.45	2.94	17	1
1:A:323:TYR:HD2	1:A:393:THR:HA	0.45	1.70	16	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:304:GLY:CA	1:A:406:PHE:CD2	0.45	3.00	14	2
1:A:298:THR:O	1:A:416:ARG:CG	0.45	2.64	13	2
1:A:345:TYR:CD1	1:A:345:TYR:O	0.45	2.69	19	7
1:A:347:THR:HB	1:A:348:PRO:CD	0.45	2.42	16	5
1:A:319:ILE:HD12	1:A:388:THR:HB	0.45	1.87	20	8
1:A:312:LEU:O	1:A:385:PHE:CD1	0.45	2.70	10	6
1:A:323:TYR:CD2	1:A:393:THR:HA	0.45	2.47	8	8
1:A:345:TYR:O	1:A:345:TYR:CD1	0.45	2.69	23	3
1:A:414:ARG:O	1:A:415:TYR:CG	0.45	2.70	1	5
1:A:300:LYS:HA	1:A:413:LEU:HD12	0.45	1.88	9	3
1:A:382:TYR:HB3	1:A:389:LEU:HB2	0.45	1.89	4	2
1:A:321:ILE:HB	1:A:402:PHE:CE2	0.45	2.47	12	1
1:A:331:TYR:CE2	1:A:351:GLU:HG2	0.45	2.47	17	3
1:A:287:ILE:HG23	1:A:402:PHE:HD2	0.45	1.66	7	1
1:A:290:TYR:OH	1:A:302:CYS:O	0.45	2.35	19	1
1:A:402:PHE:CG	1:A:406:PHE:CE2	0.44	3.04	12	2
1:A:324:GLU:HA	1:A:375:LEU:HD21	0.44	1.89	10	2
1:A:432:PHE:O	1:A:434:LEU:HG	0.44	2.13	18	1
1:A:326:LEU:HD13	1:A:408:GLY:CA	0.44	2.42	20	3
1:A:331:TYR:CZ	1:A:371:SER:HB3	0.44	2.47	5	2
1:A:296:GLN:HB2	1:A:298:THR:CG2	0.44	2.42	7	1
1:A:301:TYR:HA	1:A:411:GLY:O	0.44	2.12	7	1
1:A:377:TRP:CD2	1:A:381:ASN:ND2	0.44	2.85	21	1
1:A:288:GLY:CA	1:A:398:GLU:HG2	0.44	2.42	13	6
1:A:309:LEU:HG	1:A:378:PHE:CZ	0.44	2.48	10	2
1:A:316:ALA:O	1:A:413:LEU:CA	0.44	2.66	17	2
1:A:316:ALA:O	1:A:413:LEU:HD22	0.44	2.13	11	1
1:A:287:ILE:HB	1:A:398:GLU:HB3	0.44	1.89	1	2
1:A:409:ILE:N	1:A:409:ILE:CD1	0.44	2.80	5	11
1:A:346:LEU:HD12	1:A:350:GLN:OE1	0.44	2.13	23	1
1:A:310:LYS:O	1:A:314:MET:HG2	0.44	2.13	2	3
1:A:305:VAL:HG13	1:A:409:ILE:HG12	0.44	1.89	10	2
1:A:283:GLU:HB3	1:A:287:ILE:HD12	0.44	1.89	16	1
1:A:392:VAL:O	1:A:393:THR:HG23	0.44	2.13	21	4
1:A:300:LYS:HA	1:A:413:LEU:HB2	0.44	1.89	7	2
1:A:430:GLU:O	1:A:432:PHE:CD1	0.44	2.71	10	1
1:A:331:TYR:HB2	1:A:346:LEU:HD23	0.44	1.90	21	1
1:A:308:THR:HG21	1:A:409:ILE:HG22	0.43	1.89	19	3
1:A:308:THR:CG2	1:A:320:LEU:CD1	0.43	2.96	6	7
1:A:324:GLU:HG3	1:A:391:ILE:HG22	0.43	1.90	17	1
1:A:293:GLU:OE1	1:A:298:THR:HG21	0.43	2.13	21	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:402:PHE:HA	1:A:406:PHE:CZ	0.43	2.48	23	1
1:A:308:THR:O	1:A:312:LEU:HB2	0.43	2.13	23	5
1:A:290:TYR:CD1	1:A:290:TYR:C	0.43	2.96	4	10
1:A:400:SER:O	1:A:404:LYS:HG2	0.43	2.13	9	1
1:A:414:ARG:O	1:A:415:TYR:CD2	0.43	2.72	11	7
1:A:306:GLU:O	1:A:310:LYS:HD3	0.43	2.13	13	3
1:A:320:LEU:HD21	1:A:378:PHE:CD2	0.43	2.48	10	1
1:A:331:TYR:CD2	1:A:351:GLU:HG2	0.43	2.49	17	1
1:A:323:TYR:CE2	1:A:392:VAL:CG2	0.43	2.98	22	2
1:A:293:GLU:HB3	1:A:301:TYR:HE2	0.43	1.74	7	2
1:A:324:GLU:HB3	1:A:391:ILE:CG2	0.43	2.44	15	4
1:A:294:ILE:HG13	1:A:301:TYR:CD1	0.43	2.48	21	1
1:A:402:PHE:CE1	1:A:410:GLY:HA3	0.43	2.49	5	2
1:A:283:GLU:O	1:A:287:ILE:HD12	0.43	2.12	20	2
1:A:320:LEU:O	1:A:388:THR:O	0.43	2.37	8	1
1:A:377:TRP:CE3	1:A:381:ASN:ND2	0.43	2.87	21	1
1:A:323:TYR:CD1	1:A:393:THR:HA	0.42	2.49	14	6
1:A:320:LEU:HD21	1:A:378:PHE:CG	0.42	2.49	6	2
1:A:414:ARG:O	1:A:415:TYR:CD1	0.42	2.72	10	2
1:A:320:LEU:CD2	1:A:378:PHE:CD1	0.42	3.02	20	2
1:A:429:ASP:O	1:A:432:PHE:CD2	0.42	2.72	3	1
1:A:283:GLU:O	1:A:287:ILE:CG1	0.42	2.67	13	1
1:A:323:TYR:OH	1:A:402:PHE:CB	0.42	2.68	3	1
1:A:345:TYR:O	1:A:345:TYR:CG	0.42	2.72	23	4
1:A:330:ARG:HG2	1:A:374:LEU:HD21	0.42	1.90	7	1
1:A:402:PHE:CD1	1:A:406:PHE:CZ	0.42	3.07	8	1
1:A:293:GLU:HB2	1:A:301:TYR:CE2	0.42	2.49	5	2
1:A:331:TYR:CE1	1:A:371:SER:CB	0.42	3.03	5	1
1:A:402:PHE:CD2	1:A:406:PHE:HE2	0.42	2.32	12	1
1:A:406:PHE:N	1:A:406:PHE:CD1	0.42	2.88	18	1
1:A:286:LEU:HD21	1:A:319:ILE:CG2	0.42	2.45	1	1
1:A:402:PHE:CB	1:A:406:PHE:CZ	0.42	3.02	8	1
1:A:288:GLY:HA2	1:A:398:GLU:HG2	0.42	1.91	13	1
1:A:431:PHE:C	1:A:432:PHE:CD1	0.42	2.98	10	1
1:A:305:VAL:O	1:A:309:LEU:HB2	0.42	2.15	9	3
1:A:332:VAL:O	1:A:332:VAL:HG23	0.42	2.15	7	1
1:A:291:PHE:CD2	1:A:401:GLN:OE1	0.42	2.73	8	1
1:A:305:VAL:HG21	1:A:345:TYR:CD2	0.41	2.50	12	1
1:A:305:VAL:O	1:A:309:LEU:CD1	0.41	2.68	7	5
1:A:301:TYR:CE2	1:A:412:ILE:CG2	0.41	2.94	19	3
1:A:309:LEU:HD23	1:A:330:ARG:NH2	0.41	2.29	5	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:293:GLU:N	1:A:293:GLU:OE1	0.41	2.53	10	2
1:A:431:PHE:O	1:A:432:PHE:CG	0.41	2.73	10	1
1:A:289:ARG:O	1:A:293:GLU:HG3	0.41	2.15	14	4
1:A:282:GLN:O	1:A:286:LEU:CB	0.41	2.68	6	1
1:A:402:PHE:CD1	1:A:406:PHE:CE1	0.41	3.08	8	1
1:A:319:ILE:HD12	1:A:388:THR:OG1	0.41	2.14	10	1
1:A:287:ILE:CG2	1:A:398:GLU:HB3	0.41	2.46	15	1
1:A:414:ARG:C	1:A:415:TYR:CD2	0.41	2.98	16	4
1:A:388:THR:HG22	1:A:390:GLU:HG2	0.41	1.92	18	2
1:A:323:TYR:HD1	1:A:393:THR:HA	0.41	1.74	15	1
1:A:415:TYR:CD2	1:A:416:ARG:O	0.41	2.74	21	1
1:A:282:GLN:OE1	1:A:282:GLN:C	0.41	2.64	3	1
1:A:394:ASP:HA	1:A:399:GLY:C	0.41	2.41	11	2
1:A:377:TRP:CE2	1:A:381:ASN:ND2	0.41	2.89	20	1
1:A:286:LEU:HD21	1:A:319:ILE:HG21	0.41	1.91	4	2
1:A:389:LEU:HD22	1:A:390:GLU:N	0.41	2.31	6	1
1:A:331:TYR:CE1	1:A:351:GLU:OE2	0.41	2.74	1	1
1:A:309:LEU:HD12	1:A:378:PHE:CZ	0.41	2.51	10	1
1:A:302:CYS:HB3	1:A:307:ASP:HB3	0.41	1.92	16	1
1:A:290:TYR:O	1:A:294:ILE:HD12	0.41	2.16	17	1
1:A:313:GLU:OE2	1:A:385:PHE:CZ	0.41	2.74	19	1
1:A:317:VAL:CA	1:A:412:ILE:O	0.41	2.68	19	1
1:A:331:TYR:OH	1:A:351:GLU:HB3	0.41	2.16	5	1
1:A:437:TYR:O	1:A:440:HIS:CE1	0.41	2.74	12	1
1:A:301:TYR:CD2	1:A:412:ILE:HG12	0.41	2.51	18	1
1:A:431:PHE:CZ	1:A:433:ASP:OD2	0.40	2.74	6	1
1:A:345:TYR:C	1:A:346:LEU:HD13	0.40	2.41	7	2
1:A:377:TRP:CD1	1:A:381:ASN:ND2	0.40	2.89	3	1
1:A:282:GLN:NE2	1:A:392:VAL:HG12	0.40	2.31	20	1
1:A:375:LEU:CD1	1:A:391:ILE:HD12	0.40	2.31	1	1
1:A:304:GLY:HA2	1:A:406:PHE:CZ	0.40	2.52	5	1
1:A:290:TYR:O	1:A:294:ILE:HG13	0.40	2.17	9	2
1:A:344:LEU:CD2	1:A:346:LEU:HD11	0.40	2.44	14	1
1:A:282:GLN:OE1	1:A:286:LEU:CD2	0.40	2.69	18	1
1:A:300:LYS:CG	1:A:413:LEU:HB2	0.40	2.47	1	1
1:A:312:LEU:CD1	1:A:320:LEU:HD13	0.40	2.46	3	1
1:A:304:GLY:HA2	1:A:406:PHE:CD2	0.40	2.52	14	1
1:A:283:GLU:HA	1:A:287:ILE:CD1	0.40	2.47	15	1
1:A:304:GLY:HA2	1:A:406:PHE:CD1	0.40	2.52	1	1
1:A:300:LYS:HE3	1:A:415:TYR:HA	0.40	1.94	7	1
1:A:301:TYR:CD1	1:A:412:ILE:HG12	0.40	2.51	17	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:314:MET:HA	1:A:314:MET:HE2	0.40	1.92	19	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	117/170 (69%)	111±1 (95±1%)	5±2 (4±1%)	1±0 (1±0%)	20	70
All	All	2808/4080 (69%)	2671 (95%)	117 (4%)	20 (1%)	20	70

All 4 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	406	PHE	13
1	A	407	GLY	5
1	A	415	TYR	1
1	A	394	ASP	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	103/150 (69%)	91±2 (89±2%)	12±2 (11±2%)	8	51
All	All	2472/3600 (69%)	2193 (89%)	279 (11%)	8	51

All 38 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	305	VAL	24
1	A	312	LEU	24
1	A	409	ILE	24
1	A	321	ILE	23
1	A	295	SER	20
1	A	282	GLN	18
1	A	416	ARG	16
1	A	393	THR	14
1	A	371	SER	14
1	A	309	LEU	10
1	A	284	LYS	8
1	A	345	TYR	8
1	A	406	PHE	7
1	A	285	LYS	6
1	A	349	GLU	6
1	A	389	LEU	5
1	A	404	LYS	5
1	A	395	LYS	4
1	A	402	PHE	4
1	A	372	MET	4
1	A	332	VAL	3
1	A	430	GLU	3
1	A	293	GLU	3
1	A	310	LYS	3
1	A	330	ARG	3
1	A	400	SER	2
1	A	303	PHE	2
1	A	351	GLU	2
1	A	346	LEU	2
1	A	347	THR	2
1	A	378	PHE	2
1	A	440	HIS	2
1	A	301	TYR	1
1	A	300	LYS	1
1	A	381	ASN	1
1	A	431	PHE	1
1	A	433	ASP	1
1	A	302	CYS	1

6.3.3 RNA ⓘ

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 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