



Full wwPDB NMR Structure Validation Report ⓘ

Mar 14, 2026 – 12:10 PM UTC

PDB ID : 1RIK / pdb_00001rik
Title : E6-binding zinc finger (E6apc1)
Authors : Liu, Y.; Liu, Z.; Androphy, E.; Chen, J.; Baleja, J.D.
Deposited on : 2003-11-17

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 : 4-5-2 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

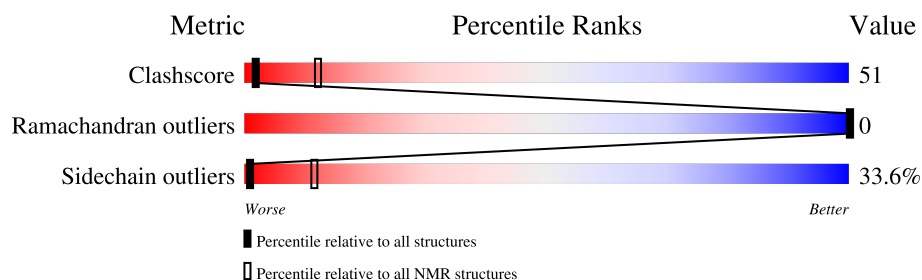
1 Overall quality at a glance

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	29	

2 Ensemble composition and analysis

This entry contains 50 models. Model 16 is the overall representative, medoid model (most similar to other models). The authors have identified model 33 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:4-A:24 (21)	0.20	16

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 8 clusters and 3 single-model clusters were found.

Cluster number	Models
1	3, 4, 6, 7, 8, 9, 12, 13, 16, 23, 33, 34, 38, 39, 44, 46, 48, 49
2	15, 18, 24, 26, 28, 35, 40
3	11, 21, 22, 41, 45, 47
4	19, 20, 30, 31, 36
5	2, 14, 17, 42
6	1, 10, 50
7	5, 37
8	32, 43
Single-model clusters	25; 27; 29

3 Entry composition [i](#)

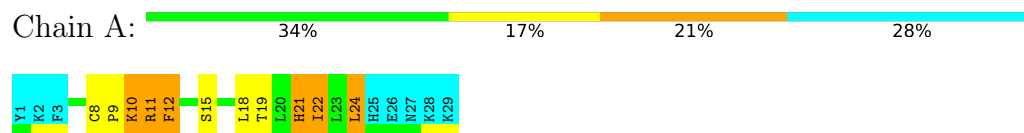
There is only 1 type of molecule in this entry. The entry contains 502 atoms, of which 254 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called E6apc1 peptide.

Mol	Chain	Residues	Atoms						Trace
1	A	29	Total	C	H	N	O	S	0
			502	160	254	46	39	3	

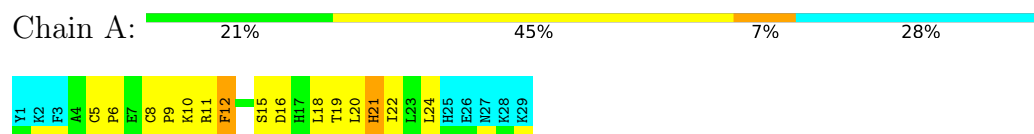
4.2.3 Score per residue for model 3

- Molecule 1: E6apc1 peptide



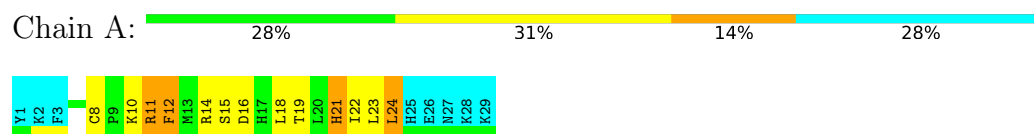
4.2.4 Score per residue for model 4

- Molecule 1: E6apc1 peptide



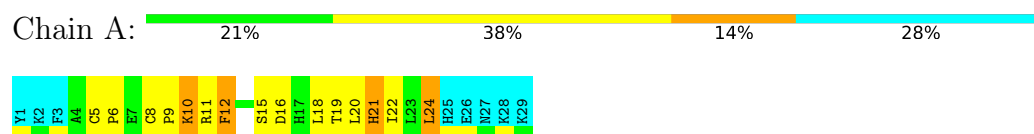
4.2.5 Score per residue for model 5

- Molecule 1: E6apc1 peptide



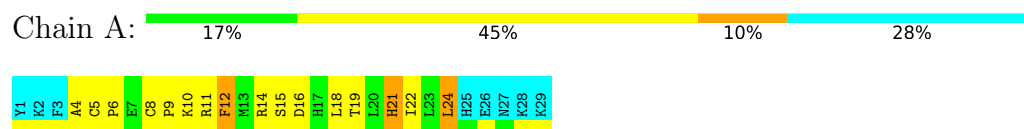
4.2.6 Score per residue for model 6

- Molecule 1: E6apc1 peptide



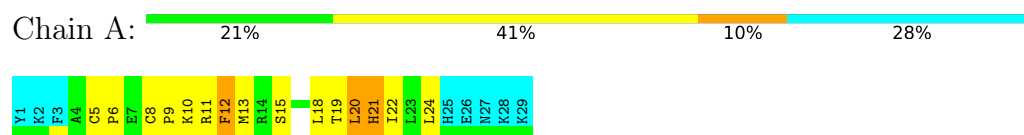
4.2.7 Score per residue for model 7

- Molecule 1: E6apc1 peptide



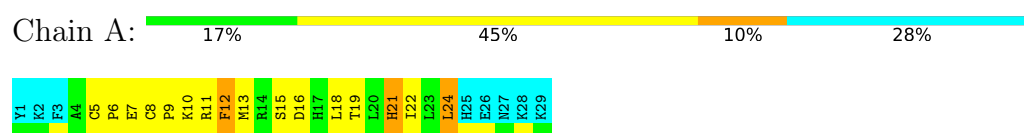
4.2.8 Score per residue for model 8

- Molecule 1: E6apc1 peptide



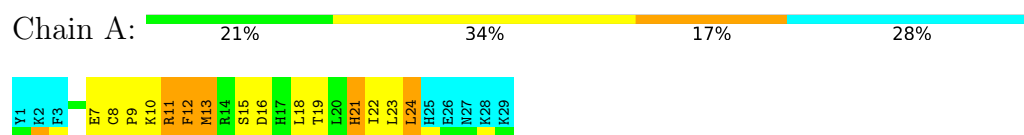
4.2.9 Score per residue for model 9

- Molecule 1: E6apc1 peptide



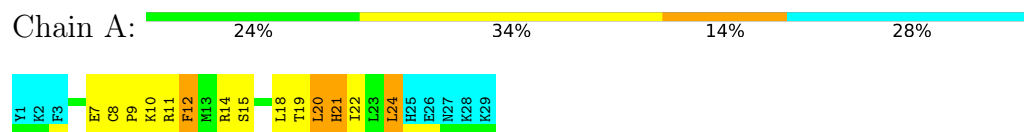
4.2.10 Score per residue for model 10

- Molecule 1: E6apc1 peptide



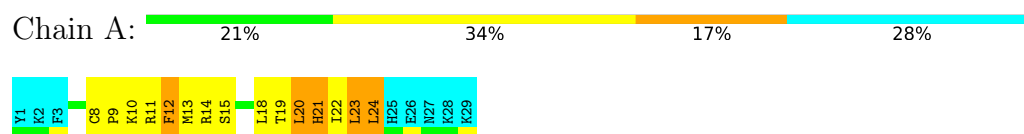
4.2.11 Score per residue for model 11

- Molecule 1: E6apc1 peptide



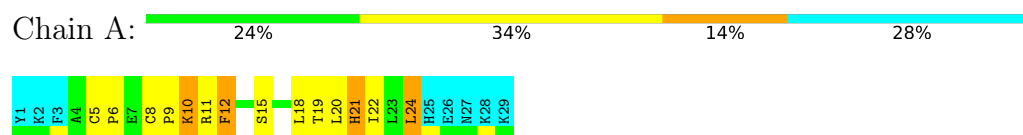
4.2.12 Score per residue for model 12

- Molecule 1: E6apc1 peptide



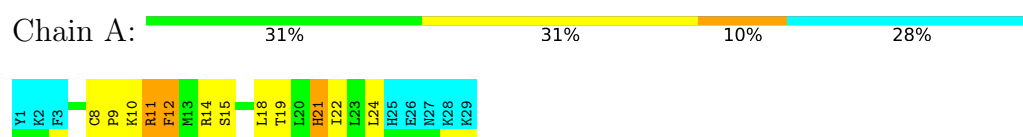
4.2.13 Score per residue for model 13

- Molecule 1: E6apc1 peptide



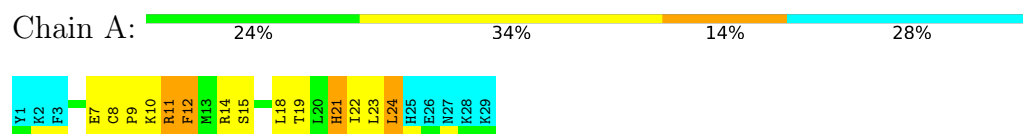
4.2.14 Score per residue for model 14

- Molecule 1: E6apc1 peptide



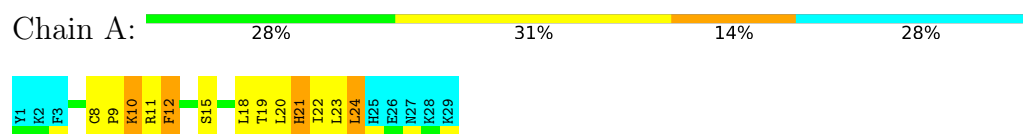
4.2.15 Score per residue for model 15

- Molecule 1: E6apc1 peptide



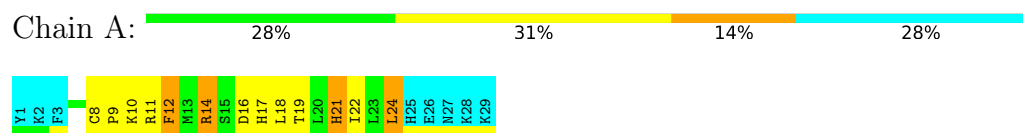
4.2.16 Score per residue for model 16 (medoid)

- Molecule 1: E6apc1 peptide



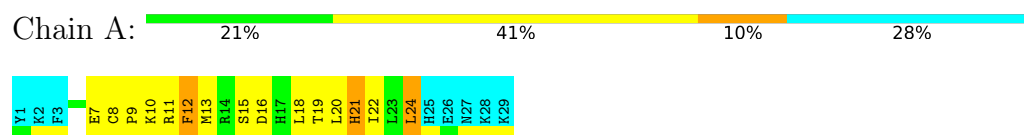
4.2.17 Score per residue for model 17

- Molecule 1: E6apc1 peptide



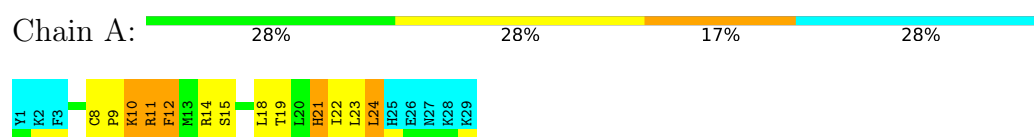
4.2.18 Score per residue for model 18

- Molecule 1: E6apc1 peptide



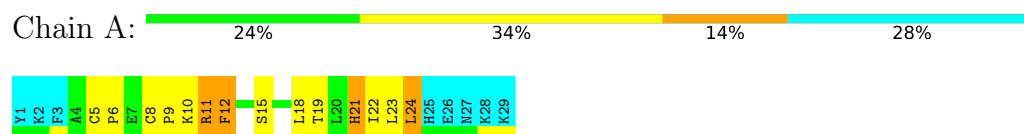
4.2.19 Score per residue for model 19

- Molecule 1: E6apc1 peptide



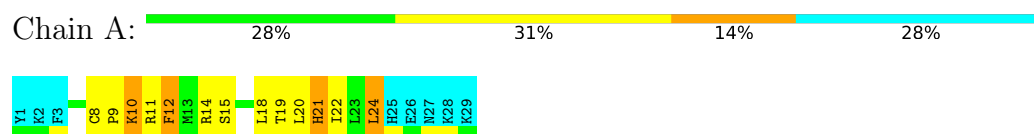
4.2.20 Score per residue for model 20

- Molecule 1: E6apc1 peptide



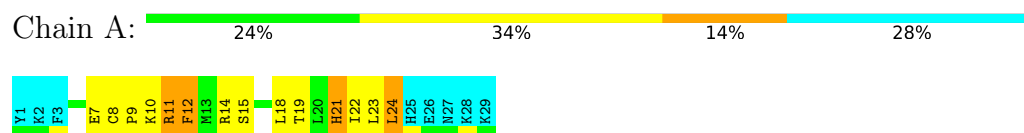
4.2.21 Score per residue for model 21

- Molecule 1: E6apc1 peptide



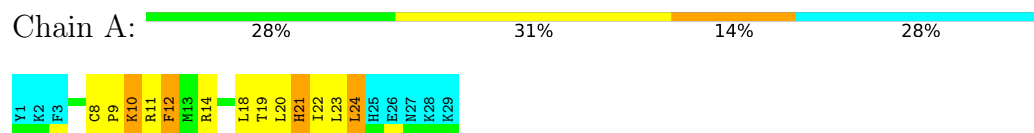
4.2.22 Score per residue for model 22

- Molecule 1: E6apc1 peptide



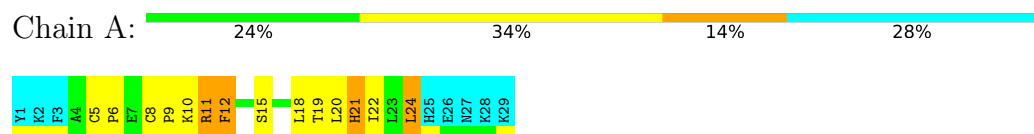
4.2.23 Score per residue for model 23

- Molecule 1: E6apc1 peptide



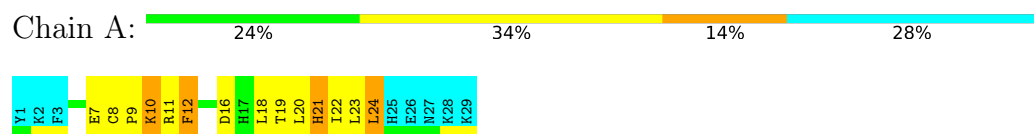
4.2.24 Score per residue for model 24

- Molecule 1: E6apc1 peptide



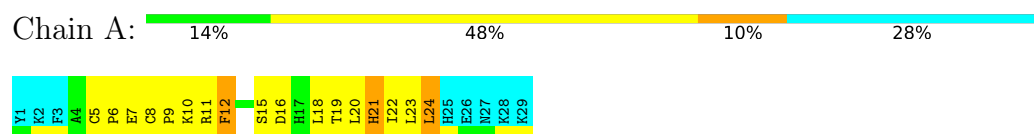
4.2.25 Score per residue for model 25

- Molecule 1: E6apc1 peptide



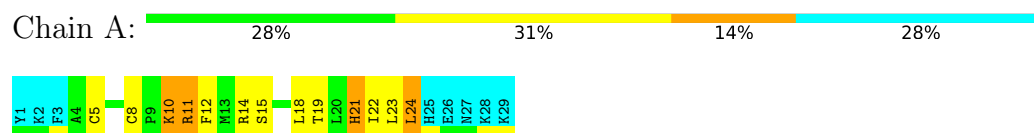
4.2.26 Score per residue for model 26

- Molecule 1: E6apc1 peptide



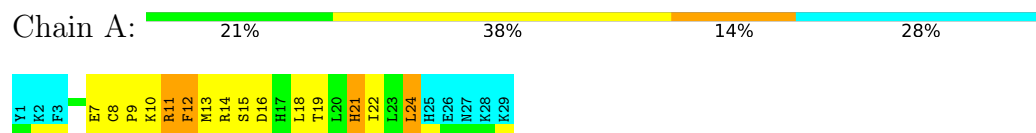
4.2.27 Score per residue for model 27

- Molecule 1: E6apc1 peptide



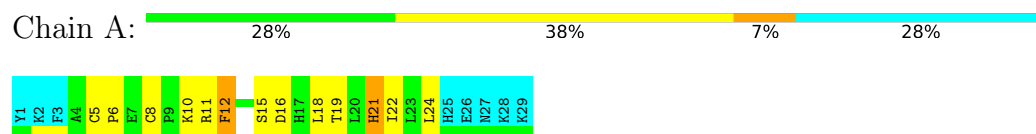
4.2.28 Score per residue for model 28

- Molecule 1: E6apc1 peptide



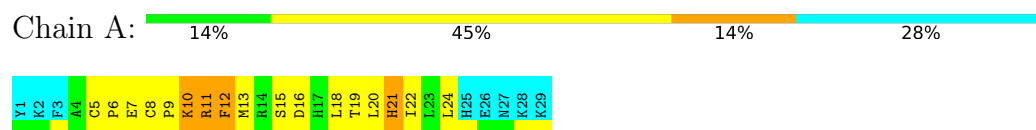
4.2.29 Score per residue for model 29

- Molecule 1: E6apc1 peptide



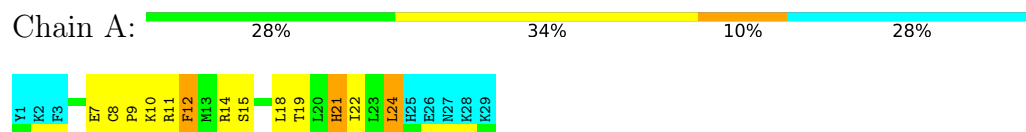
4.2.30 Score per residue for model 30

- Molecule 1: E6apc1 peptide



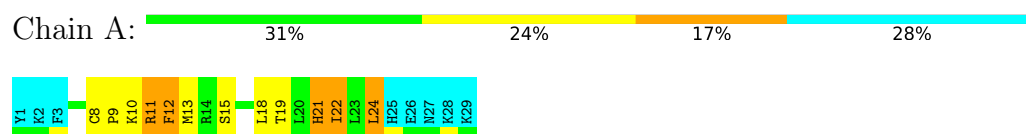
4.2.31 Score per residue for model 31

- Molecule 1: E6apc1 peptide



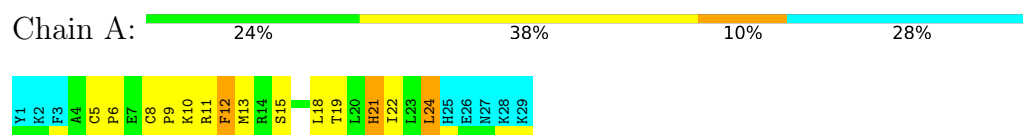
4.2.32 Score per residue for model 32

- Molecule 1: E6apc1 peptide



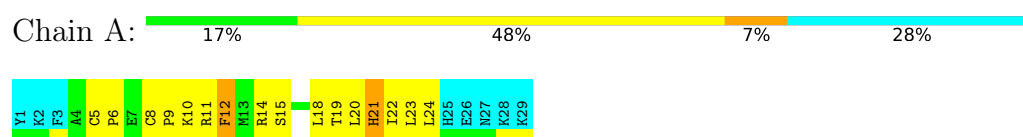
4.2.33 Score per residue for model 33

- Molecule 1: E6apc1 peptide



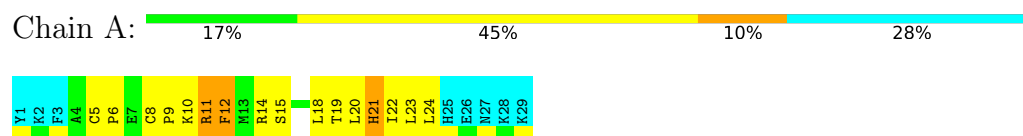
4.2.34 Score per residue for model 34

- Molecule 1: E6apc1 peptide



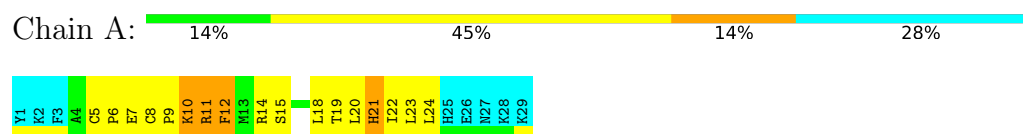
4.2.35 Score per residue for model 35

- Molecule 1: E6apc1 peptide



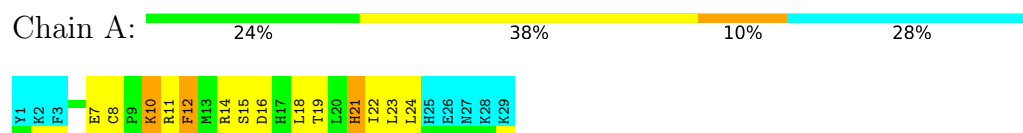
4.2.36 Score per residue for model 36

- Molecule 1: E6apc1 peptide



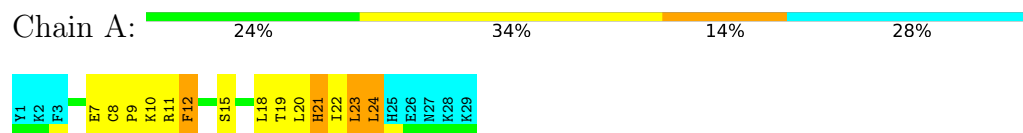
4.2.37 Score per residue for model 37

- Molecule 1: E6apc1 peptide



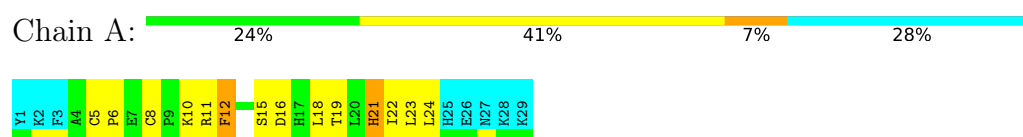
4.2.38 Score per residue for model 38

- Molecule 1: E6apc1 peptide



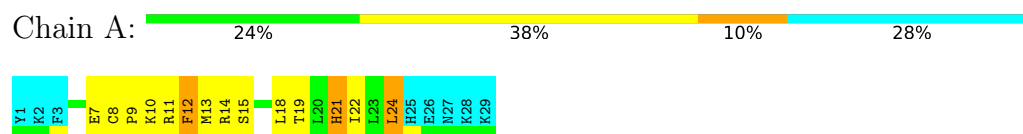
4.2.39 Score per residue for model 39

- Molecule 1: E6apc1 peptide



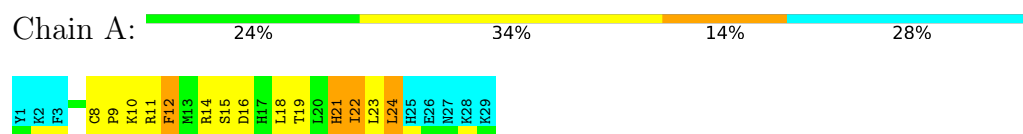
4.2.40 Score per residue for model 40

- Molecule 1: E6apc1 peptide



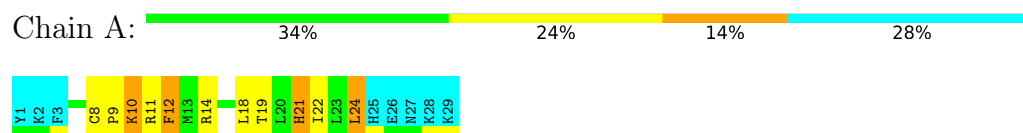
4.2.41 Score per residue for model 41

- Molecule 1: E6apc1 peptide



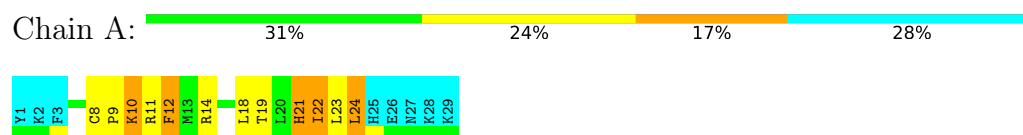
4.2.42 Score per residue for model 42

- Molecule 1: E6apc1 peptide



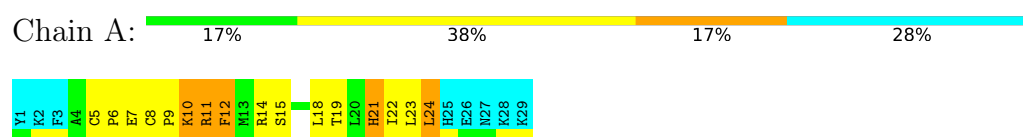
4.2.43 Score per residue for model 43

- Molecule 1: E6apc1 peptide



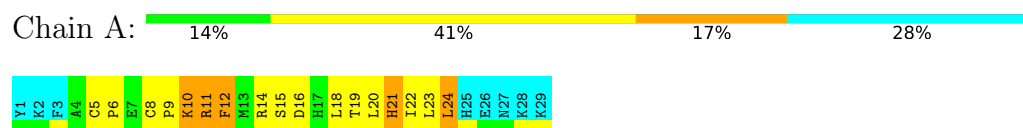
4.2.44 Score per residue for model 44

- Molecule 1: E6apc1 peptide



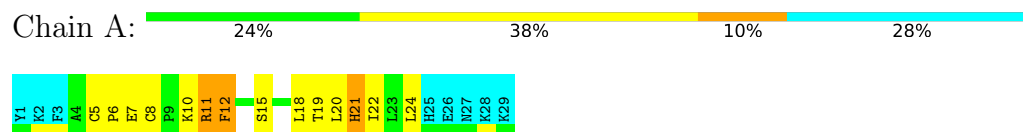
4.2.45 Score per residue for model 45

- Molecule 1: E6apc1 peptide



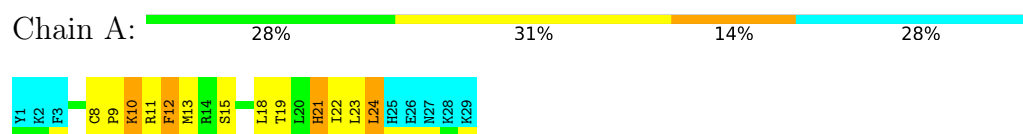
4.2.46 Score per residue for model 46

- Molecule 1: E6apc1 peptide



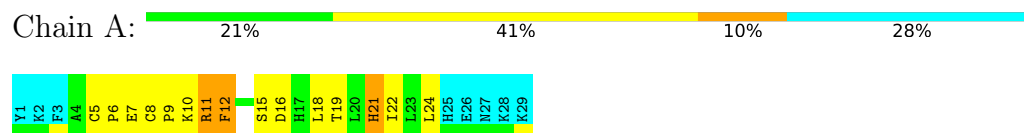
4.2.47 Score per residue for model 47

- Molecule 1: E6apc1 peptide



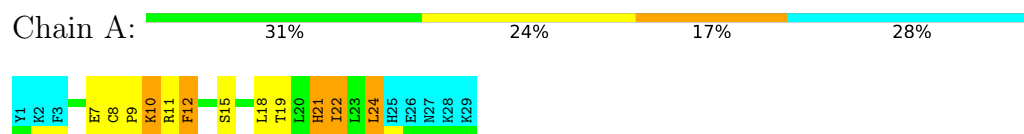
4.2.48 Score per residue for model 48

- Molecule 1: E6apc1 peptide



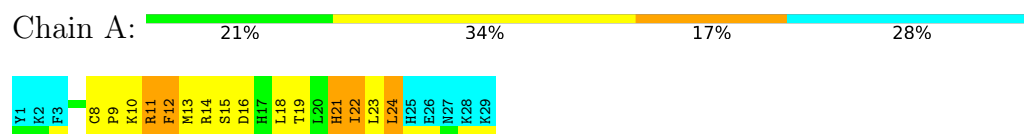
4.2.49 Score per residue for model 49

- Molecule 1: E6apc1 peptide



4.2.50 Score per residue for model 50

- Molecule 1: E6apc1 peptide



5 Refinement protocol and experimental data overview

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

Of the 50 calculated structures, 50 were deposited, based on the following criterion: *all calculated structures submitted*.

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

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	171	178	177	18±2
All	All	8550	8900	8850	884

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 51.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:19:THR:HA	1:A:22:ILE:HD12	0.83	1.51	49	50
1:A:21:HIS:O	1:A:24:LEU:HD12	0.81	1.76	44	17
1:A:12:PHE:CD1	1:A:18:LEU:HG	0.69	2.22	26	50
1:A:18:LEU:CD2	1:A:22:ILE:HD11	0.69	2.16	50	41
1:A:21:HIS:C	1:A:21:HIS:CD2	0.68	2.71	1	50
1:A:18:LEU:HD23	1:A:22:ILE:HD11	0.66	1.67	1	35
1:A:12:PHE:HB2	1:A:18:LEU:HD12	0.63	1.70	34	35
1:A:8:CYS:SG	1:A:10:LYS:HG3	0.62	2.35	24	22
1:A:8:CYS:SG	1:A:10:LYS:HG2	0.61	2.36	27	14
1:A:11:ARG:C	1:A:12:PHE:CD1	0.58	2.82	11	50
1:A:12:PHE:CD1	1:A:12:PHE:N	0.57	2.72	42	50
1:A:12:PHE:HD1	1:A:18:LEU:HD12	0.57	1.58	2	6
1:A:10:LYS:HB3	1:A:12:PHE:CE1	0.57	2.34	28	43
1:A:21:HIS:CD2	1:A:22:ILE:N	0.56	2.72	17	45

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:8:CYS:SG	1:A:10:LYS:CG	0.55	2.95	27	44
1:A:18:LEU:C	1:A:18:LEU:HD23	0.54	2.28	19	17
1:A:21:HIS:CG	1:A:22:ILE:N	0.54	2.76	18	50
1:A:12:PHE:HB2	1:A:18:LEU:HB2	0.53	1.78	50	17
1:A:12:PHE:CD1	1:A:18:LEU:HD12	0.53	2.38	2	9
1:A:21:HIS:O	1:A:24:LEU:HG	0.52	2.05	3	33
1:A:12:PHE:CD1	1:A:18:LEU:CG	0.51	2.94	50	27
1:A:24:LEU:HD13	1:A:24:LEU:C	0.50	2.31	44	2
1:A:20:LEU:C	1:A:20:LEU:HD13	0.50	2.31	38	7
1:A:5:CYS:SG	1:A:6:PRO:HD2	0.48	2.48	46	20
1:A:18:LEU:HD23	1:A:18:LEU:C	0.48	2.33	42	17
1:A:20:LEU:HD22	1:A:23:LEU:HD12	0.47	1.84	38	1
1:A:12:PHE:CZ	1:A:21:HIS:ND1	0.46	2.84	11	36
1:A:12:PHE:CD1	1:A:18:LEU:CD1	0.46	2.99	27	6
1:A:20:LEU:HD13	1:A:20:LEU:O	0.45	2.11	26	4
1:A:13:MET:HG2	1:A:14:ARG:HD3	0.45	1.88	28	1
1:A:14:ARG:HB2	1:A:17:HIS:HB2	0.45	1.89	17	1
1:A:12:PHE:CE1	1:A:18:LEU:HG	0.45	2.47	42	4
1:A:8:CYS:HB2	1:A:9:PRO:HD2	0.45	1.89	33	44
1:A:12:PHE:CB	1:A:18:LEU:HD12	0.44	2.41	34	4
1:A:20:LEU:O	1:A:23:LEU:HD23	0.44	2.11	12	1
1:A:20:LEU:HD13	1:A:20:LEU:C	0.43	2.38	26	2
1:A:24:LEU:C	1:A:24:LEU:HD22	0.42	2.39	44	2
1:A:8:CYS:HB2	1:A:9:PRO:CD	0.42	2.44	28	23
1:A:5:CYS:SG	1:A:22:ILE:HG12	0.42	2.54	27	1
1:A:23:LEU:C	1:A:23:LEU:HD12	0.41	2.40	12	1
1:A:10:LYS:N	1:A:10:LYS:CD	0.41	2.83	19	2

6.3 Torsion angles ⓘ

6.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all 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	21/29 (72%)	19±0 (91±2%)	2±0 (9±2%)	0±0 (0±0%)	100	100
All	All	1050/1450 (72%)	954 (91%)	96 (9%)	0 (0%)	100	100

There are no Ramachandran outliers.

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	20/28 (71%)	13±1 (66±7%)	7±1 (34±7%)	1	11
All	All	1000/1400 (71%)	664 (66%)	336 (34%)	1	11

All 13 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	21	HIS	50
1	A	12	PHE	49
1	A	15	SER	43
1	A	24	LEU	38
1	A	14	ARG	24
1	A	23	LEU	24
1	A	7	GLU	21
1	A	16	ASP	20
1	A	11	ARG	20
1	A	10	LYS	18
1	A	20	LEU	11
1	A	13	MET	11
1	A	22	ILE	7

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 oligosaccharides in this entry.

6.6 Ligand geometry

There are no ligands in this entry.

6.7 Other polymers

There are no such molecules in this entry.

6.8 Polymer linkage issues

There are no chain breaks in this entry.

7 Chemical shift validation

No chemical shift data were provided