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Full wwPDB NMR Structure Validation Report ⓘ

May 28, 2020 – 09:09 pm BST

PDB ID	:	1YXE
Title	:	Structure and inter-domain interactions of domain II from the blood stage malarial protein, apical membrane antigen 1
Authors	:	Feng, Z.P.; Keizer, D.W.; Stevenson, R.A.; Yao, S.; Babon, J.J.; Murphy, V.J.; Anders, R.F.; Norton, R.S.
Deposited on	:	2005-02-21

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

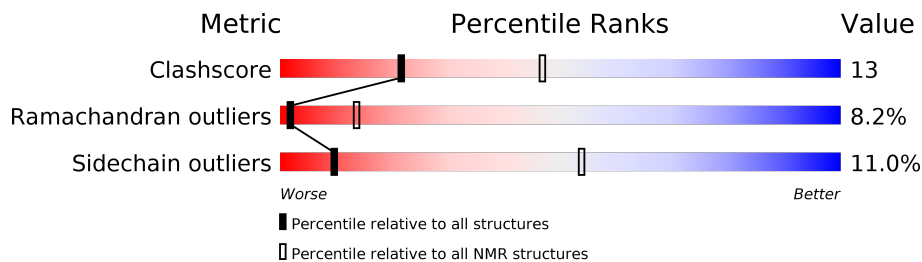|		
Cyrange	:	Kirchner and Güntert (2011)
NmrClust	:	Kelley et al. (1996)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
ShiftChecker	:	2.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

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	Percentile Ranks	Value
Clashscore		13
Ramachandran outliers		8.2%
Sidechain outliers		11.0%

Worse   *Better*

■ Percentile relative to all structures
▯ Percentile relative to all NMR structures

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	140	25% 14% 61%

2 Ensemble composition and analysis (i)

This entry contains 20 models. Model 11 is the overall representative, medoid model (most similar to other models). The authors have identified model 12 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:320-A:344, A:398-A:427 (55)	1.42	11

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

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

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

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

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 2186 atoms, of which 1060 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called apical membrane antigen 1.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	140	2186	711	1060	197	212	6	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	MET	-	EXPRESSION TAG	UNP P22621
A	-11	ARG	-	EXPRESSION TAG	UNP P22621
A	-10	GLY	-	EXPRESSION TAG	UNP P22621
A	-9	SER	-	EXPRESSION TAG	UNP P22621
A	-8	HIS	-	EXPRESSION TAG	UNP P22621
A	-7	HIS	-	EXPRESSION TAG	UNP P22621
A	-6	HIS	-	EXPRESSION TAG	UNP P22621
A	-5	HIS	-	EXPRESSION TAG	UNP P22621
A	-4	HIS	-	EXPRESSION TAG	UNP P22621
A	-3	HIS	-	EXPRESSION TAG	UNP P22621
A	-2	GLY	-	EXPRESSION TAG	UNP P22621
A	-1	SER	-	EXPRESSION TAG	UNP P22621

4   Residue-property plots ⓘ

4.1   Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA and DNA chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: apical membrane antigen 1
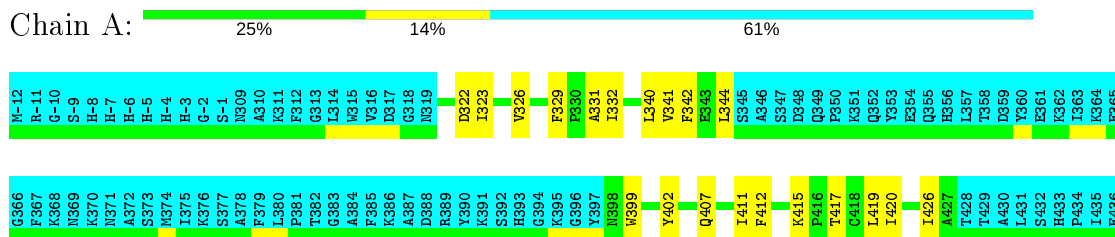
4.2   Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1   Score per residue for model 1

- Molecule 1: apical membrane antigen 1
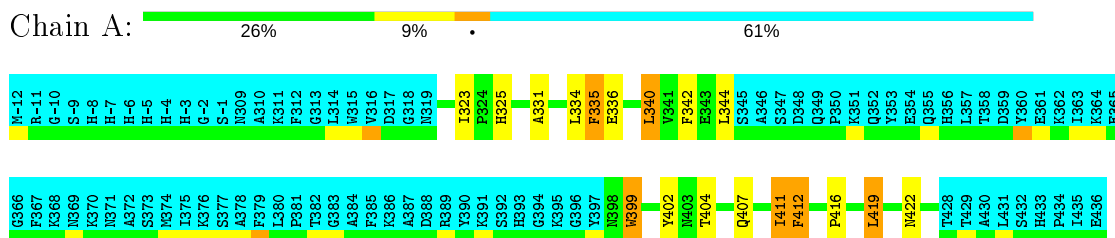
4.2.2   Score per residue for model 2

- Molecule 1: apical membrane antigen 1

4.2.3 Score per residue for model 3

• Molecule 1: apical membrane antigen 1

4.2.4 Score per residue for model 4

• Molecule 1: apical membrane antigen 1

4.2.5 Score per residue for model 5

• Molecule 1: apical membrane antigen 1

4.2.6 Score per residue for model 6

- Molecule 1: apical membrane antigen 1

4.2.7 Score per residue for model 7

- Molecule 1: apical membrane antigen 1
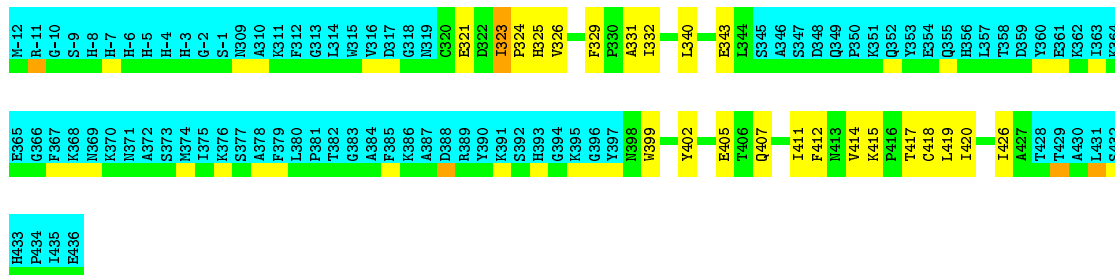

4.2.8 Score per residue for model 8

- Molecule 1: apical membrane antigen 1

4.2.9 Score per residue for model 9

- Molecule 1: apical membrane antigen 1
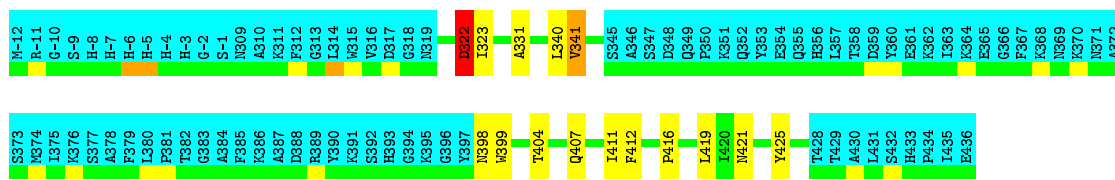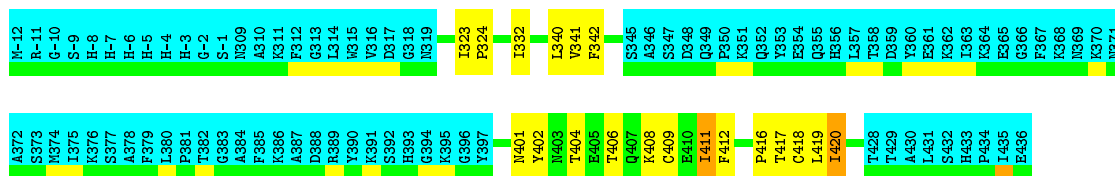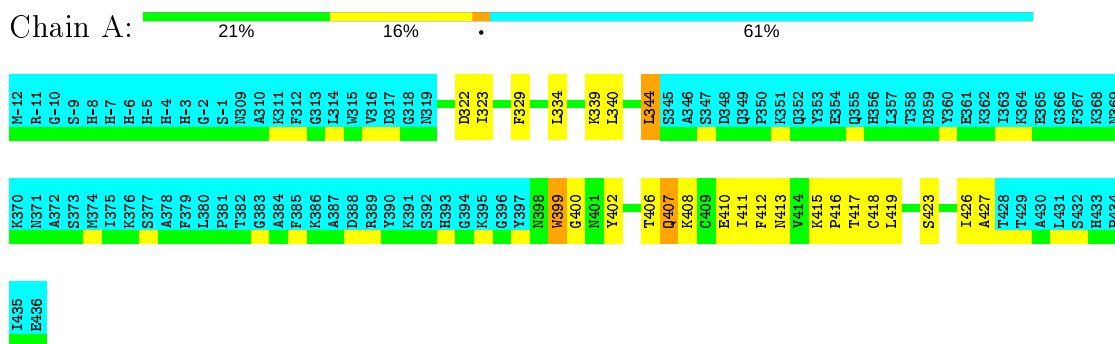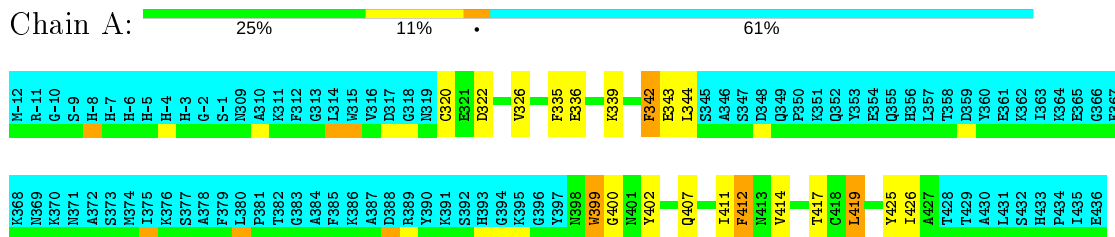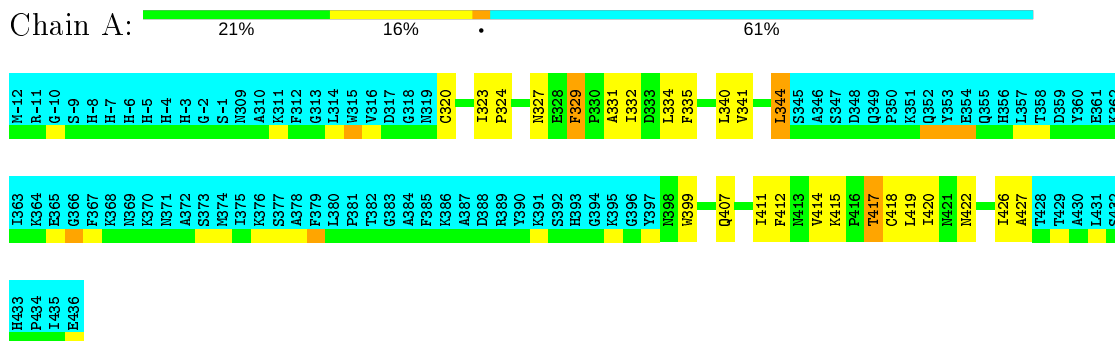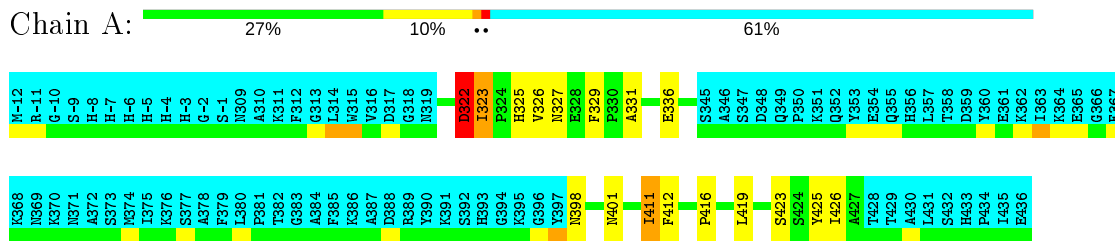
Chain A: 27% 10% •• 61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 D322 I323 P324 H325 V326 N327 E328 F329 P330 A331 E336 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366 F367

K368 N369 K370 N371 A372 S373 M374 I375 K376 S377 M374 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 M401 I411 F412 P416 L419 S423 S424 I425 I426 A427 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.10 Score per residue for model 10

• Molecule 1: apical membrane antigen 1

Chain A: 26% 11% •• 61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 I323 P324 F329 I332 L340 V341 F342 E343 L344 S345 A346 S347 D348 Q349 P350 K351 Q352 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366 F367 K368

N369 K370 N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 E405 T406 Q407 I411 F412 C418 L419 S423 S424 Y425 I426 A427 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.11 Score per residue for model 11 (medoid)

• Molecule 1: apical membrane antigen 1

Chain A: 26% 10% • 61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 D322 I323 V326 I332 D333 L334 F335 E336 C337 V341 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366

F367 K368 N369 K370 N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 Y402 Q407 K408 C409 E410 I411 F412 N413 P416 L419 I426 A427 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.12 Score per residue for model 12

• Molecule 1: apical membrane antigen 1

Chain A: 27% 9% •• 61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 C320 E321 D322 I323 V326 F329 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366 F367 K368 N369 K370 N371 A372

S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 G400 N401 Y402 N403 T404 Q407 K408 I411 F412 C418 L419 I420 Y425 I426 A427 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.13 Score per residue for model 13

- Molecule 1: apical membrane antigen 1

Chain A: 27%   11%   •   61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 C320 E321 D322 I323 P324 F329 I332 F342 E343 L344 S345 A346 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366 F367 K368

N369 K370 N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 Q407 F412 N413 V414 K415 L419 I420 S424 Y425 I426 A427 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.14 Score per residue for model 14

- Molecule 1: apical membrane antigen 1

Chain A: 23%   14%   •   61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 C320 E321 D322 I323 V326 A331 L334 F335 K339 L340 V341 F342 E343 L344 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363

K364 E365 G366 F367 K368 N369 K370 N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 T404 Q407 F412 N413 V414 K415 P416 T417 L419 N422 S423 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.15 Score per residue for model 15

- Molecule 1: apical membrane antigen 1

Chain A: 26%   12%   •   61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 C320 E321 D322 I323 V326 F329 P330 L334 F335 E336 K339 E343 L344 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363

K364 E365 G366 F367 K368 N369 K370 N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 Y402 Q407 E410 I411 F412 L419 I420 Y425 T428 T429 A430 L431 S432 H433 P434 I435 E436

4.2.16 Score per residue for model 16

- Molecule 1: apical membrane antigen 1

Chain A: 30%   7%   ••   61%

M-12 R-11 G-10 S-9 H-8 H-7 H-6 H-5 H-4 H-3 G-2 S-1 N309 A310 K311 F312 G313 L314 W315 V316 D317 G318 N319 I323 L334 F335 K339 L340 V341 F342 S345 A346 S347 D348 Q349 P350 K351 Q352 Y353 E354 Q355 H356 L357 T358 D359 Y360 E361 K362 I363 K364 E365 G366 F367 K368 N369 K370

N371 A372 S373 M374 I375 K376 S377 A378 F379 L380 P381 T382 G383 A384 F385 K386 A387 D388 R389 Y390 K391 S392 H393 G394 K395 G396 Y397 N398 W399 Y402 K408 I411 K415 L419 I420 T428 T429 A430 L431 S432 H433 P434 I435 E436

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4.2.17 Score per residue for model 17

• Molecule 1: apical membrane antigen 1

Chain A:

4.2.18 Score per residue for model 18

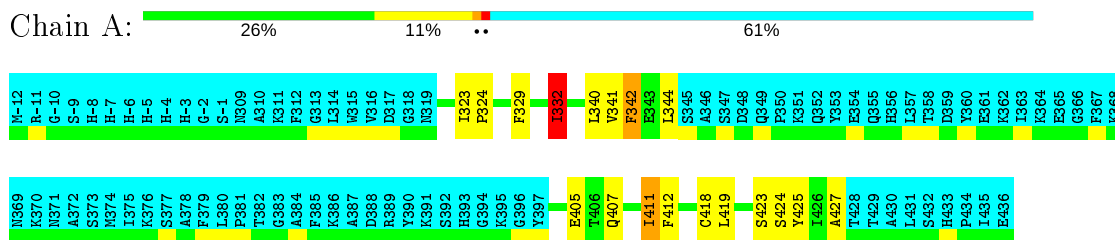• Molecule 1: apical membrane antigen 1

Chain A:

4.2.19 Score per residue for model 19
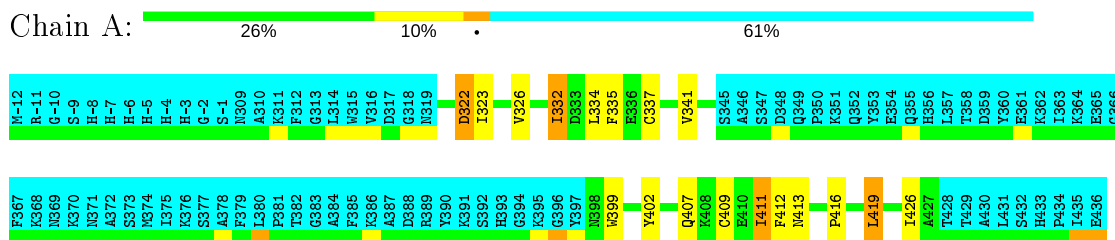
• Molecule 1: apical membrane antigen 1

Chain A:

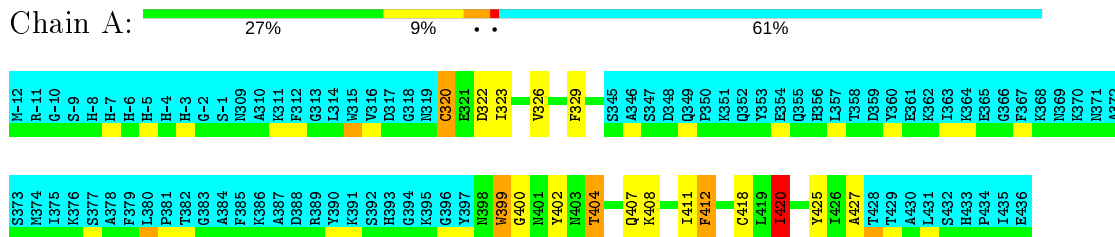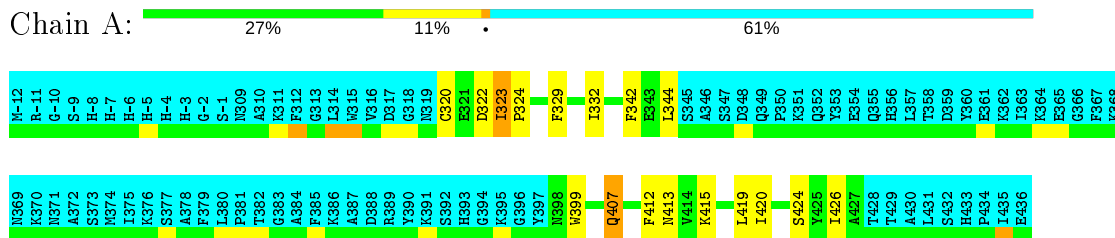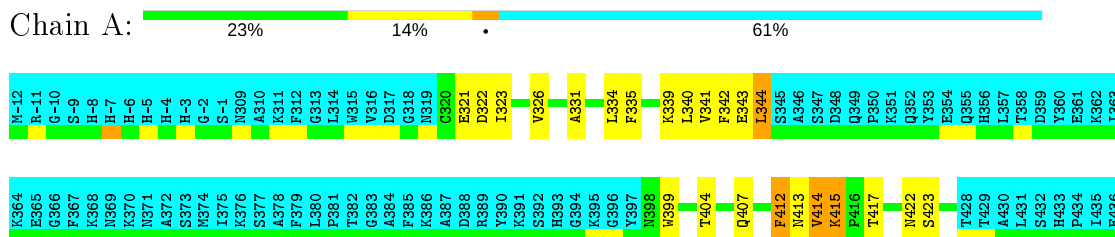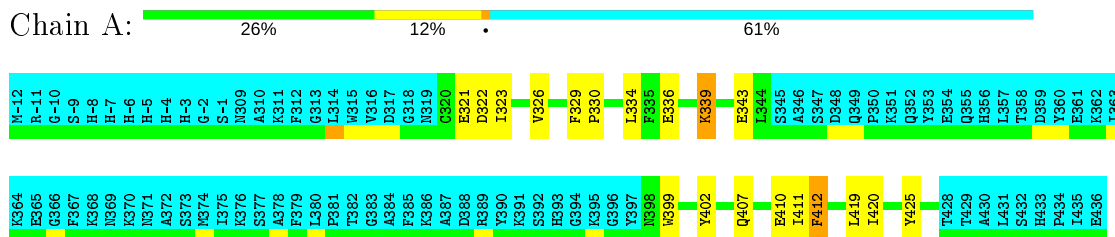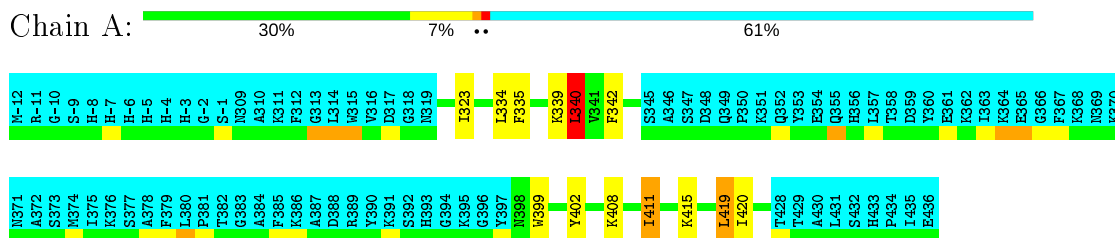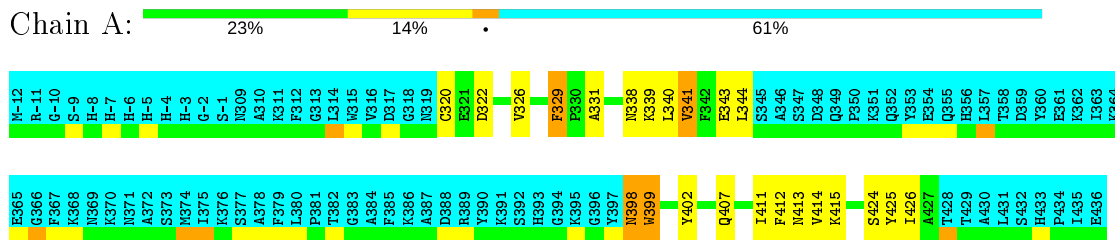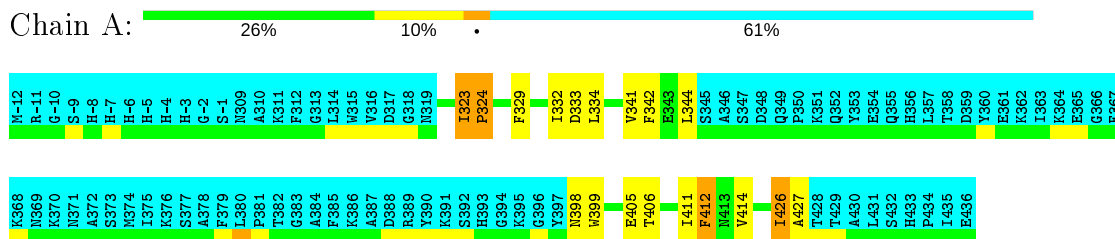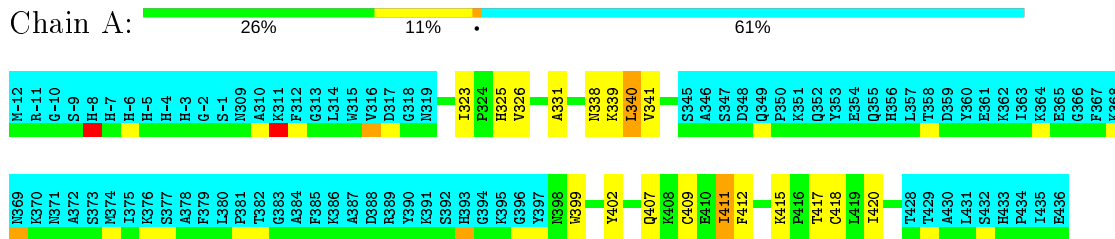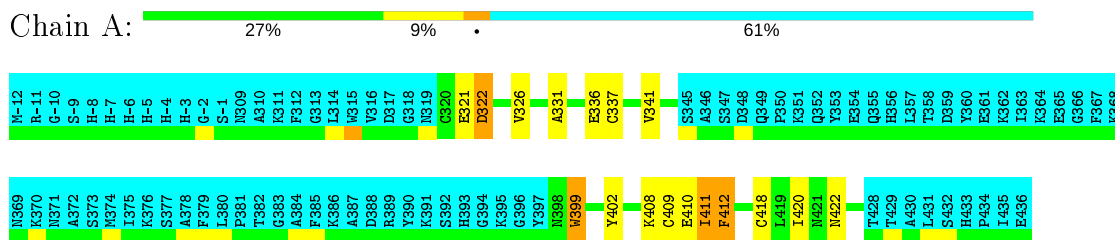### 4.2.20 Score per residue for model 20

• Molecule 1: apical membrane antigen 1

Chain A:

5 Refinement protocol and experimental data overview (i)

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

Of the 100 calculated structures, 20 were deposited, based on the following criterion: *structures with the lowest energy*.

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

Software name	Classification	Version
X-PLOR	structure solution	NIH
X-PLOR	refinement	NIH

No chemical shift data was provided. No validations of the models with respect to experimental NMR restraints is performed at this time.

6 Model quality (i)

6.1 Standard geometry (i)

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	447	417	417	11±4
All	All	8940	8340	8340	225

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 13.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
1:A:411:ILE:HD13	1:A:412:PHE:N	0.78	1.94	9	5
1:A:400:GLY:HA3	1:A:411:ILE:HD13	0.78	1.56	2	1
1:A:344:LEU:HD11	1:A:399:TRP:CZ3	0.75	2.16	6	1
1:A:326:VAL:HG12	1:A:412:PHE:CD1	0.73	2.18	2	3
1:A:323:ILE:HG21	1:A:420:ILE:HG21	0.72	1.60	5	1
1:A:326:VAL:HG12	1:A:412:PHE:CB	0.71	2.16	20	5
1:A:323:ILE:HD13	1:A:420:ILE:HG12	0.69	1.62	5	1
1:A:326:VAL:HG12	1:A:412:PHE:CE1	0.67	2.23	2	1
1:A:338:ASN:OD1	1:A:341:VAL:HG11	0.67	1.90	19	1
1:A:419:LEU:N	1:A:419:LEU:HD13	0.67	2.04	1	1
1:A:419:LEU:HD12	1:A:419:LEU:O	0.67	1.90	13	3
1:A:326:VAL:HG12	1:A:412:PHE:CG	0.67	2.24	15	8
1:A:425:TYR:CE2	1:A:427:ALA:HB3	0.66	2.25	12	3
1:A:344:LEU:HD11	1:A:399:TRP:CE3	0.66	2.25	6	1

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:400:GLY:CA	1:A:411:ILE:HD13	0.65	2.21	2	2
1:A:340:LEU:HD22	1:A:344:LEU:HD13	0.65	1.69	8	1
1:A:331:ALA:HB3	1:A:407:GLN:CG	0.64	2.21	19	1
1:A:340:LEU:HD22	1:A:344:LEU:CD1	0.63	2.24	8	1
1:A:340:LEU:N	1:A:340:LEU:HD13	0.63	2.08	19	1
1:A:322:ASP:HB3	1:A:323:ILE:HD13	0.63	1.68	9	1
1:A:426:ILE:HD12	1:A:427:ALA:N	0.62	2.08	18	1
1:A:400:GLY:CA	1:A:411:ILE:HG22	0.61	2.25	6	1
1:A:326:VAL:HG21	1:A:410:GLU:OE2	0.60	1.96	20	1
1:A:411:ILE:HD13	1:A:411:ILE:N	0.60	2.12	19	1
1:A:344:LEU:HD23	1:A:344:LEU:O	0.60	1.97	14	1
1:A:411:ILE:N	1:A:411:ILE:HD13	0.60	2.12	5	2
1:A:404:THR:HG21	1:A:408:LYS:CB	0.59	2.27	5	1
1:A:326:VAL:HG12	1:A:412:PHE:HB3	0.58	1.74	20	1
1:A:326:VAL:HG12	1:A:412:PHE:HB2	0.58	1.76	14	2
1:A:340:LEU:HB3	1:A:411:ILE:HG21	0.58	1.72	17	1
1:A:323:ILE:HD13	1:A:324:PRO:O	0.58	1.98	18	1
1:A:339:LYS:C	1:A:340:LEU:HD13	0.58	2.19	19	1
1:A:412:PHE:CE1	1:A:414:VAL:HG21	0.58	2.34	8	1
1:A:332:ILE:HD13	1:A:332:ILE:O	0.57	2.00	10	1
1:A:344:LEU:HD22	1:A:344:LEU:N	0.57	2.14	17	1
1:A:399:TRP:HA	1:A:426:ILE:HD13	0.57	1.75	13	1
1:A:331:ALA:HB3	1:A:407:GLN:HG3	0.56	1.75	19	1
1:A:418:CYS:SG	1:A:420:ILE:HG22	0.56	2.41	12	1
1:A:323:ILE:HG23	1:A:323:ILE:O	0.56	2.01	15	6
1:A:341:VAL:HG23	1:A:341:VAL:O	0.56	2.01	19	1
1:A:323:ILE:O	1:A:323:ILE:HG23	0.56	2.01	10	3
1:A:420:ILE:HG22	1:A:420:ILE:O	0.55	2.02	16	2
1:A:404:THR:HG23	1:A:404:THR:O	0.55	2.02	4	3
1:A:341:VAL:O	1:A:341:VAL:HG22	0.55	2.02	4	3
1:A:411:ILE:H	1:A:411:ILE:HD13	0.55	1.62	16	1
1:A:400:GLY:HA3	1:A:411:ILE:HG22	0.55	1.78	6	2
1:A:326:VAL:HG12	1:A:412:PHE:CD2	0.54	2.37	19	2
1:A:322:ASP:OD2	1:A:323:ILE:HG22	0.54	2.03	12	1
1:A:404:THR:O	1:A:404:THR:HG23	0.54	2.03	1	1
1:A:321:GLU:O	1:A:420:ILE:HD11	0.54	2.03	3	1
1:A:406:THR:O	1:A:406:THR:HG23	0.53	2.04	6	1
1:A:340:LEU:N	1:A:340:LEU:HD22	0.53	2.19	6	1
1:A:340:LEU:HD21	1:A:344:LEU:HD23	0.53	1.80	10	1
1:A:332:ILE:HD13	1:A:409:CYS:HB2	0.52	1.81	5	1
1:A:420:ILE:O	1:A:420:ILE:HG22	0.52	2.04	20	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:419:LEU:HD13	1:A:419:LEU:H	0.52	1.64	16	1
1:A:425:TYR:CZ	1:A:427:ALA:HB3	0.52	2.40	10	1
1:A:340:LEU:N	1:A:340:LEU:HD12	0.51	2.20	10	1
1:A:341:VAL:HG12	1:A:341:VAL:O	0.51	2.05	2	1
1:A:411:ILE:C	1:A:411:ILE:HD13	0.51	2.25	20	3
1:A:334:LEU:HD12	1:A:334:LEU:C	0.49	2.28	14	1
1:A:410:GLU:C	1:A:411:ILE:HD12	0.49	2.27	15	1
1:A:342:PHE:CD2	1:A:342:PHE:O	0.49	2.66	18	1
1:A:417:THR:HG23	1:A:417:THR:O	0.49	2.08	19	1
1:A:326:VAL:HG11	1:A:417:THR:HG21	0.48	1.83	2	1
1:A:411:ILE:HD13	1:A:411:ILE:C	0.48	2.26	9	2
1:A:332:ILE:HG21	1:A:407:GLN:HG3	0.48	1.85	13	1
1:A:340:LEU:CD1	1:A:344:LEU:HD23	0.48	2.38	1	1
1:A:339:LYS:O	1:A:340:LEU:HD22	0.48	2.07	2	2
1:A:411:ILE:HD12	1:A:411:ILE:N	0.48	2.23	15	3
1:A:323:ILE:HD13	1:A:323:ILE:C	0.48	2.29	18	1
1:A:340:LEU:HD12	1:A:343:GLU:CG	0.47	2.39	3	1
1:A:418:CYS:SG	1:A:420:ILE:HD12	0.47	2.49	3	1
1:A:426:ILE:C	1:A:426:ILE:HD12	0.47	2.30	18	1
1:A:402:TYR:CD1	1:A:402:TYR:N	0.47	2.83	2	6
1:A:334:LEU:HD12	1:A:335:PHE:N	0.47	2.24	14	1
1:A:419:LEU:HD13	1:A:419:LEU:N	0.47	2.24	16	1
1:A:344:LEU:HD21	1:A:399:TRP:CH2	0.47	2.45	6	1
1:A:400:GLY:HA2	1:A:411:ILE:HD13	0.47	1.86	12	1
1:A:401:ASN:ND2	1:A:412:PHE:CE2	0.47	2.83	5	1
1:A:331:ALA:HB1	1:A:336:GLU:HA	0.47	1.87	1	1
1:A:331:ALA:O	1:A:332:ILE:HD13	0.47	2.10	8	1
1:A:326:VAL:CG1	1:A:412:PHE:CE1	0.46	2.98	2	1
1:A:399:TRP:N	1:A:399:TRP:CD1	0.46	2.83	4	3
1:A:402:TYR:N	1:A:402:TYR:CD1	0.46	2.84	3	5
1:A:344:LEU:HD22	1:A:399:TRP:CH2	0.46	2.46	8	1
1:A:404:THR:HG21	1:A:408:LYS:HB2	0.46	1.87	5	2
1:A:412:PHE:CE1	1:A:414:VAL:CG2	0.45	3.00	8	1
1:A:323:ILE:CG2	1:A:420:ILE:HG21	0.45	2.37	5	1
1:A:419:LEU:CD1	1:A:419:LEU:N	0.45	2.75	1	1
1:A:341:VAL:HG23	1:A:343:GLU:H	0.45	1.70	17	1
1:A:399:TRP:CD1	1:A:399:TRP:N	0.45	2.84	3	7
1:A:323:ILE:HD13	1:A:420:ILE:CG1	0.45	2.37	5	1
1:A:411:ILE:HD13	1:A:411:ILE:H	0.45	1.71	19	1
1:A:340:LEU:N	1:A:340:LEU:HD23	0.45	2.27	16	1
1:A:402:TYR:CD2	1:A:409:CYS:CB	0.45	3.00	20	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:411:ILE:N	1:A:411:ILE:CD1	0.45	2.79	16	3
1:A:332:ILE:HD13	1:A:332:ILE:C	0.45	2.31	10	1
1:A:402:TYR:CE1	1:A:425:TYR:CE1	0.45	3.04	15	1
1:A:332:ILE:HG23	1:A:332:ILE:O	0.44	2.12	3	2
1:A:341:VAL:CG1	1:A:399:TRP:CH2	0.44	3.01	19	1
1:A:412:PHE:N	1:A:412:PHE:CD1	0.44	2.84	12	1
1:A:406:THR:O	1:A:407:GLN:C	0.44	2.56	6	1
1:A:329:PHE:CD1	1:A:331:ALA:HB3	0.44	2.47	8	1
1:A:323:ILE:CB	1:A:324:PRO:CD	0.44	2.96	3	1
1:A:417:THR:HG23	1:A:418:CYS:N	0.43	2.28	2	3
1:A:412:PHE:CD1	1:A:412:PHE:N	0.43	2.86	4	1
1:A:332:ILE:HG22	1:A:332:ILE:O	0.43	2.13	8	1
1:A:340:LEU:N	1:A:340:LEU:CD2	0.43	2.81	6	1
1:A:323:ILE:N	1:A:324:PRO:CD	0.43	2.81	2	1
1:A:399:TRP:CH2	1:A:411:ILE:HD11	0.43	2.49	11	1
1:A:326:VAL:CG1	1:A:412:PHE:CD1	0.43	2.99	2	1
1:A:327:ASN:CB	1:A:411:ILE:HD11	0.43	2.44	8	1
1:A:419:LEU:O	1:A:419:LEU:HD12	0.43	2.13	6	1
1:A:340:LEU:O	1:A:399:TRP:CZ2	0.43	2.71	17	1
1:A:412:PHE:CE1	1:A:415:LYS:O	0.43	2.71	2	1
1:A:339:LYS:N	1:A:340:LEU:HD23	0.43	2.28	16	1
1:A:426:ILE:O	1:A:426:ILE:HG22	0.43	2.14	3	2
1:A:417:THR:O	1:A:417:THR:HG23	0.43	2.14	3	1
1:A:411:ILE:N	1:A:411:ILE:HD12	0.42	2.29	3	1
1:A:325:HIS:CG	1:A:325:HIS:O	0.42	2.72	1	2
1:A:419:LEU:HD22	1:A:419:LEU:N	0.42	2.29	3	1
1:A:323:ILE:HB	1:A:324:PRO:CD	0.42	2.45	3	1
1:A:419:LEU:CD2	1:A:419:LEU:N	0.42	2.82	3	1
1:A:341:VAL:HG12	1:A:342:PHE:N	0.42	2.29	18	1
1:A:329:PHE:CE1	1:A:331:ALA:HB3	0.42	2.50	8	1
1:A:426:ILE:HG22	1:A:426:ILE:O	0.42	2.15	11	1
1:A:412:PHE:CE2	1:A:413:ASN:ND2	0.42	2.87	14	1
1:A:398:ASN:O	1:A:426:ILE:HD11	0.42	2.14	18	1
1:A:414:VAL:HG22	1:A:415:LYS:N	0.42	2.30	17	2
1:A:412:PHE:CZ	1:A:415:LYS:O	0.42	2.73	2	1
1:A:414:VAL:HG12	1:A:415:LYS:N	0.42	2.29	8	2
1:A:420:ILE:HG23	1:A:422:ASN:ND2	0.42	2.29	8	1
1:A:402:TYR:CD1	1:A:408:LYS:O	0.41	2.74	6	1
1:A:344:LEU:HD11	1:A:412:PHE:HA	0.41	1.93	18	1
1:A:341:VAL:HG13	1:A:342:PHE:N	0.41	2.30	10	1
1:A:412:PHE:CD2	1:A:413:ASN:OD1	0.41	2.74	17	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
1:A:340:LEU:CD1	1:A:340:LEU:N	0.41	2.79	19	1
1:A:414:VAL:HG12	1:A:426:ILE:HG21	0.41	1.91	7	1
1:A:420:ILE:HG23	1:A:420:ILE:O	0.41	2.16	19	1
1:A:399:TRP:CD1	1:A:399:TRP:O	0.41	2.73	12	1
1:A:399:TRP:O	1:A:399:TRP:CE3	0.41	2.74	15	2
1:A:414:VAL:HG22	1:A:427:ALA:HA	0.41	1.92	18	1
1:A:329:PHE:CD1	1:A:331:ALA:O	0.41	2.74	17	1
1:A:334:LEU:O	1:A:335:PHE:CD2	0.41	2.74	1	1
1:A:342:PHE:O	1:A:342:PHE:CD2	0.41	2.74	5	1
1:A:425:TYR:CD2	1:A:425:TYR:O	0.41	2.74	9	1
1:A:335:PHE:O	1:A:335:PHE:CD1	0.40	2.74	11	2
1:A:325:HIS:O	1:A:412:PHE:CE1	0.40	2.74	19	1
1:A:341:VAL:HG22	1:A:342:PHE:N	0.40	2.30	14	1
1:A:338:ASN:OD1	1:A:402:TYR:CE2	0.40	2.74	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	55/140 (39%)	35±3 (64±6%)	16±3 (28±5%)	5±2 (8±3%)	2	13
All	All	1100/2800 (39%)	700 (64%)	310 (28%)	90 (8%)	2	13

All 26 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	407	GLN	14
1	A	412	PHE	10
1	A	322	ASP	6
1	A	416	PRO	6
1	A	331	ALA	6
1	A	324	PRO	4
1	A	417	THR	4
1	A	342	PHE	4

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Mol	Chain	Res	Type	Models (Total)
1	A	341	VAL	4
1	A	399	TRP	3
1	A	332	ILE	3
1	A	343	GLU	3
1	A	420	ILE	3
1	A	426	ILE	3
1	A	414	VAL	2
1	A	336	GLU	2
1	A	330	PRO	2
1	A	398	ASN	2
1	A	413	ASN	2
1	A	335	PHE	1
1	A	427	ALA	1
1	A	323	ILE	1
1	A	339	LYS	1
1	A	340	LEU	1
1	A	423	SER	1
1	A	422	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	52/122 (43%)	46±1 (89±3%)	6±1 (11±3%)	10	54
All	All	1040/2440 (43%)	926 (89%)	114 (11%)	10	54

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	329	PHE	10
1	A	411	ILE	9
1	A	415	LYS	6
1	A	334	LEU	6
1	A	419	LEU	5
1	A	339	LYS	5
1	A	344	LEU	5

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Mol	Chain	Res	Type	Models (Total)
1	A	340	LEU	5
1	A	322	ASP	4
1	A	321	GLU	3
1	A	418	CYS	3
1	A	399	TRP	3
1	A	405	GLU	3
1	A	336	GLU	3
1	A	424	SER	3
1	A	335	PHE	3
1	A	323	ILE	3
1	A	320	CYS	3
1	A	423	SER	3
1	A	425	TYR	3
1	A	422	ASN	3
1	A	408	LYS	2
1	A	332	ILE	2
1	A	333	ASP	2
1	A	342	PHE	2
1	A	337	CYS	2
1	A	406	THR	2
1	A	421	ASN	1
1	A	404	THR	1
1	A	325	HIS	1
1	A	410	GLU	1
1	A	398	ASN	1
1	A	343	GLU	1
1	A	420	ILE	1
1	A	401	ASN	1
1	A	409	CYS	1
1	A	327	ASN	1
1	A	413	ASN	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 carbohydrates in this entry.

6.6 Ligand geometry (i)

There are no ligands in this entry.

6.7 Other polymers (i)

There are no such molecules in this entry.

6.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

7 Chemical shift validation (i)

No chemical shift data were provided