



Full wwPDB NMR Structure Validation Report ⓘ

May 28, 2020 – 08:22 pm BST

PDB ID : 1QLZ
Title : Human prion protein
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Deposited on : 1999-09-20

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

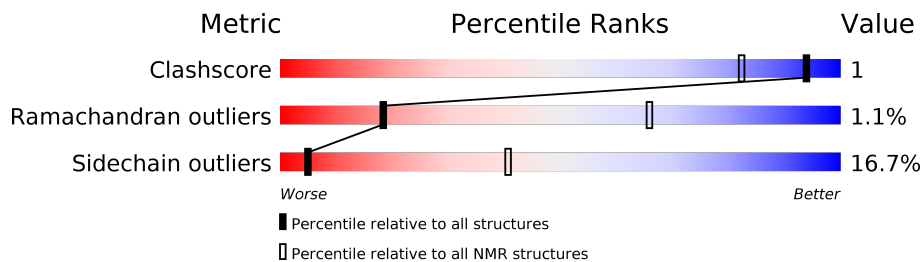
1 Overall quality at a glance

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	210	 41% 7% 50%

2 Ensemble composition and analysis i

This entry contains 20 models. Model 19 is the overall representative, medoid model (most similar to other models).

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:128-A:228 (101)	0.42	19

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

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1688 atoms, of which 811 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called PRION PROTEIN.

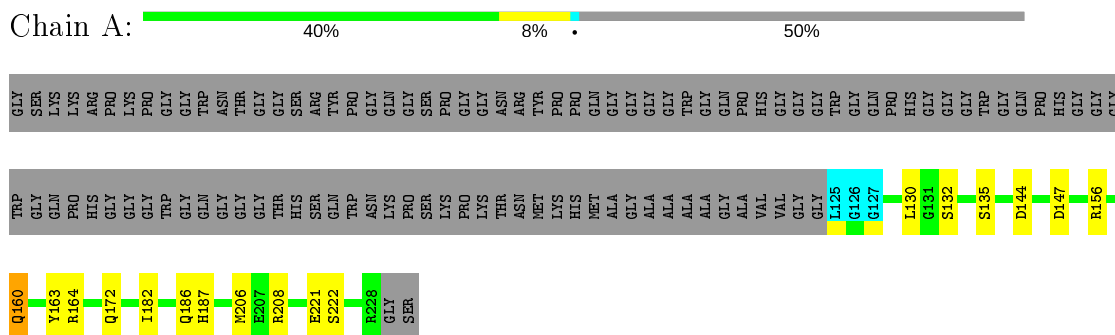
Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	104	1688	544	811	153	171	9	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	21	GLY	-	cloning artifact	UNP P04156
A	22	SER	-	cloning artifact	UNP P04156

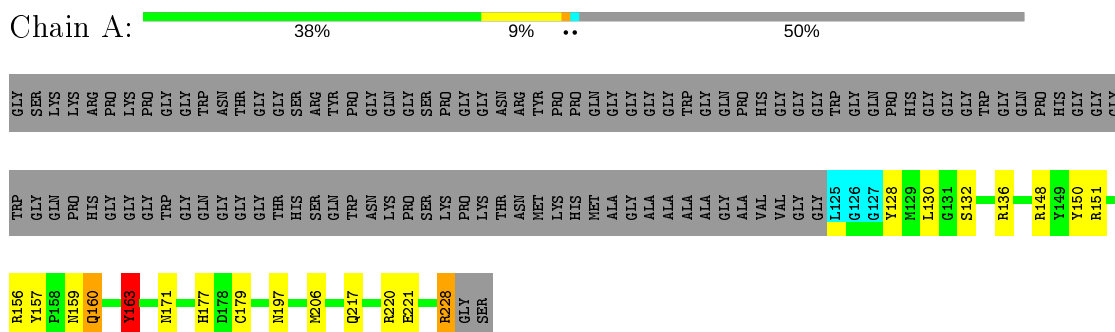
4.2.2 Score per residue for model 2

- Molecule 1: PRION PROTEIN



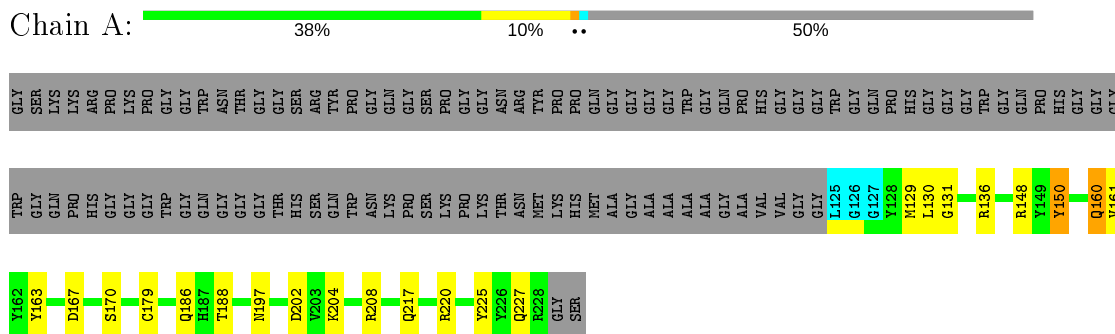
4.2.3 Score per residue for model 3

- Molecule 1: PRION PROTEIN



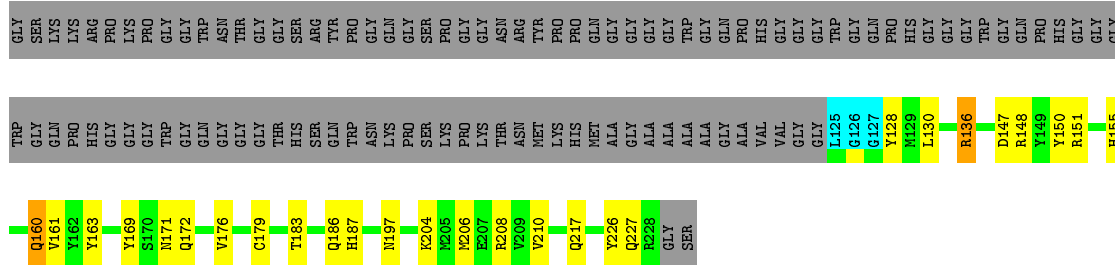
4.2.4 Score per residue for model 4

- Molecule 1: PRION PROTEIN



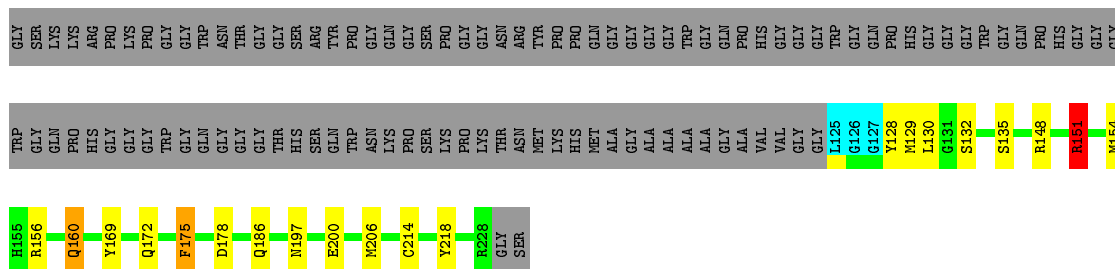
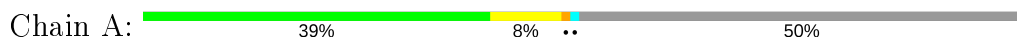
4.2.5 Score per residue for model 5

- Molecule 1: PRION PROTEIN



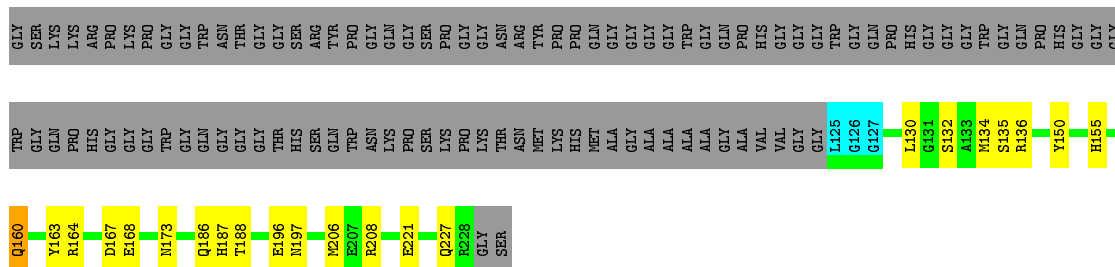
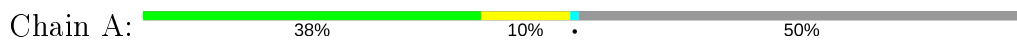
4.2.9 Score per residue for model 9

- Molecule 1: PRION PROTEIN



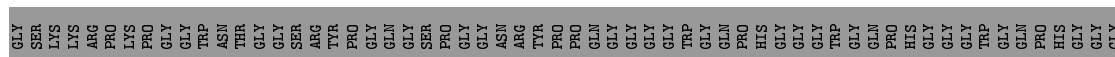
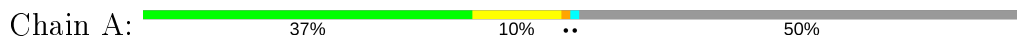
4.2.10 Score per residue for model 10

- Molecule 1: PRION PROTEIN



4.2.11 Score per residue for model 11

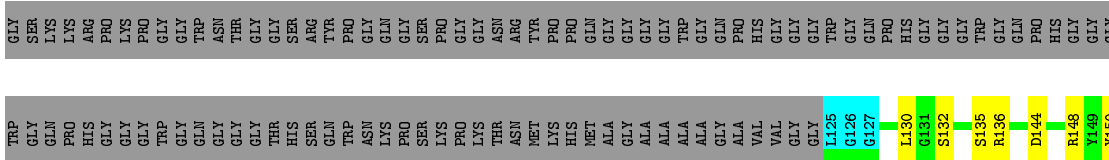
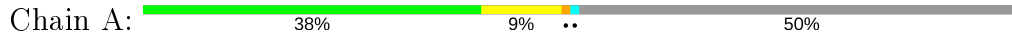
- Molecule 1: PRION PROTEIN





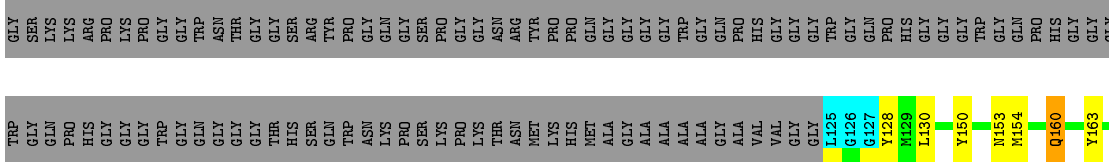
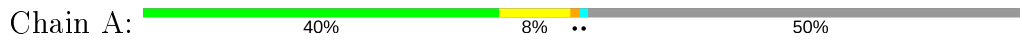
4.2.15 Score per residue for model 15

- Molecule 1: PRION PROTEIN



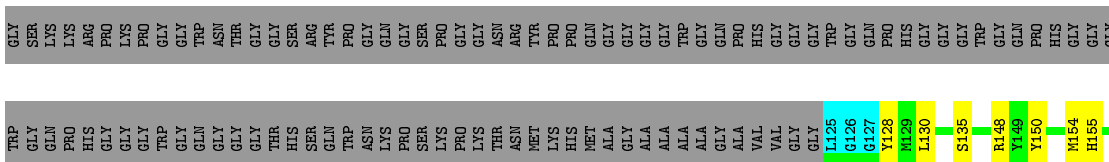
4.2.16 Score per residue for model 16

- Molecule 1: PRION PROTEIN



4.2.17 Score per residue for model 17

- Molecule 1: PRION PROTEIN



5 Refinement protocol and experimental data overview (i)

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

Of the 100 calculated structures, 20 were deposited, based on the following criterion: *LEAST RESTRAINT VIOLATION*.

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

Software name	Classification	Version
OPALP	refinement	
DYANA	structure solution	

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

COVALENT-GEOMETRY INFOmissingINFO

5.1 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	861	794	797	2±1
All	All	17220	15880	15940	40

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 1.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:130:LEU:HD11	1:A:160:GLN:HB2	0.62	1.72	18	20
1:A:217:GLN:HA	1:A:220:ARG:CG	0.54	2.32	15	1
1:A:200:GLU:HG2	1:A:204:LYS:HE3	0.52	1.82	13	1
1:A:175:PHE:CD2	1:A:218:TYR:CE1	0.48	3.01	9	1
1:A:183:THR:HB	1:A:210:VAL:HG11	0.48	1.84	8	1
1:A:130:LEU:HD12	1:A:161:VAL:O	0.47	2.10	4	4
1:A:161:VAL:HG12	1:A:210:VAL:HG13	0.47	1.85	8	1
1:A:191:THR:HG22	1:A:196:GLU:CG	0.45	2.42	12	1
1:A:129:MET:HE2	1:A:129:MET:H	0.44	1.72	1	1
1:A:217:GLN:HA	1:A:220:ARG:HG3	0.43	1.91	15	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:150:TYR:CZ	1:A:154:MET:SD	0.43	3.11	12	1
1:A:129:MET:HE2	1:A:129:MET:CA	0.42	2.44	1	1
1:A:200:GLU:CG	1:A:204:LYS:HE3	0.42	2.43	13	1
1:A:172:GLN:H	1:A:172:GLN:CD	0.41	2.18	14	1
1:A:129:MET:N	1:A:129:MET:HE2	0.40	2.30	1	1
1:A:176:VAL:HA	1:A:179:CYS:SG	0.40	2.56	8	1
1:A:137:PRO:HD2	1:A:209:VAL:HG13	0.40	1.94	11	1
1:A:130:LEU:HD21	1:A:160:GLN:NE2	0.40	2.32	16	1

5.2 Torsion angles [i](#)

5.2.1 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	100/210 (48%)	90±3 (90±3%)	9±2 (9±2%)	1±1 (1±1%)	18	66
All	All	2000/4200 (48%)	1793 (90%)	186 (9%)	21 (1%)	18	66

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	167	ASP	4
1	A	172	GLN	3
1	A	170	SER	2
1	A	169	TYR	2
1	A	131	GLY	2
1	A	171	ASN	2
1	A	154	MET	2
1	A	166	MET	1
1	A	196	GLU	1
1	A	132	SER	1
1	A	155	HIS	1

5.2.2 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	96/159 (60%)	80±3 (83±3%)	16±3 (17±3%)	5 41
All	All	1920/3180 (60%)	1599 (83%)	321 (17%)	5 41

All 57 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	150	TYR	16
1	A	197	ASN	16
1	A	160	GLN	15
1	A	206	MET	14
1	A	163	TYR	14
1	A	208	ARG	14
1	A	135	SER	13
1	A	187	HIS	12
1	A	132	SER	12
1	A	136	ARG	11
1	A	217	GLN	10
1	A	179	CYS	10
1	A	128	TYR	9
1	A	174	ASN	8
1	A	147	ASP	8
1	A	227	GLN	7
1	A	129	MET	7
1	A	186	GLN	7
1	A	148	ARG	6
1	A	204	LYS	6
1	A	144	ASP	6
1	A	200	GLU	5
1	A	164	ARG	5
1	A	172	GLN	5
1	A	171	ASN	5
1	A	173	ASN	5
1	A	155	HIS	4
1	A	221	GLU	4
1	A	167	ASP	4

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Mol	Chain	Res	Type	Models (Total)
1	A	177	HIS	4
1	A	168	GLU	4
1	A	214	CYS	4
1	A	169	TYR	4
1	A	154	MET	4
1	A	170	SER	3
1	A	228	ARG	3
1	A	159	ASN	3
1	A	226	TYR	3
1	A	188	THR	3
1	A	175	PHE	3
1	A	151	ARG	3
1	A	153	ASN	2
1	A	222	SER	2
1	A	191	THR	2
1	A	220	ARG	2
1	A	178	ASP	2
1	A	156	ARG	2
1	A	196	GLU	1
1	A	225	TYR	1
1	A	202	ASP	1
1	A	134	MET	1
1	A	211	GLU	1
1	A	138	ILE	1
1	A	194	LYS	1
1	A	182	ILE	1
1	A	166	MET	1
1	A	181	ASN	1

5.2.3 RNA [i](#)

There are no RNA molecules in this entry.

5.3 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.4 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.5 Ligand geometry [i](#)

There are no ligands in this entry.

5.6 Other polymers [i](#)

There are no such molecules in this entry.

5.7 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Chemical shift validation

No chemical shift data were provided