



Full wwPDB NMR Structure Validation Report ⓘ

Mar 6, 2026 – 10:31 PM UTC

PDB ID : 1O9A / pdb_00001o9a
Title : Solution structure of the complex of 1F12F1 from fibronectin with B3 from FnBB from *S. dysgalactiae*
Authors : Schwarz-Linek, U.; Werner, J.M.; Pickford, A.R.; Pilka, E.S.; Gurusiddappa, S.; Briggs, J.A.G.; Hook, M.; Campbell, I.D.; Potts, J.R.
Deposited on : 2002-12-11

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

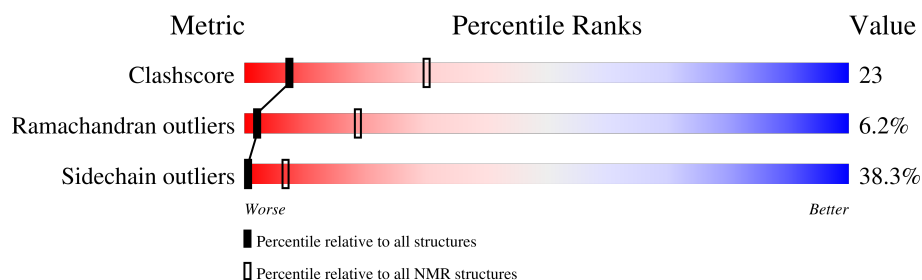
1 Overall quality at a glance

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	93	32% 53% 9% 6%
2	B	36	19% 33% • 11% 33%

2 Ensemble composition and analysis

This entry contains 15 models. Model 1 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:20-A:96, A:100-A:109, B:13-B:32 (107)	2.50	1

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 2 clusters and 1 single-model cluster was found.

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

3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 1785 atoms, of which 852 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called FIBRONECTIN.

Mol	Chain	Residues	Atoms						Trace
1	A	93	Total	C	H	N	O	S	0
			1404	447	671	132	145	9	

- Molecule 2 is a protein called FIBRONECTIN BINDING PROTEIN.

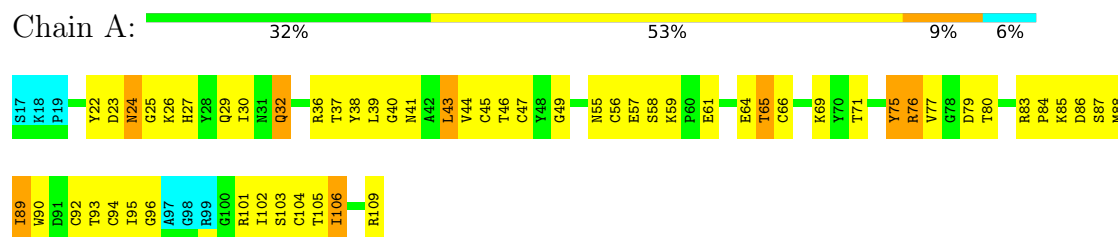
Mol	Chain	Residues	Atoms					Trace
2	B	24	Total	C	H	N	O	0
			381	124	181	31	45	

4 Residue-property plots [i](#)

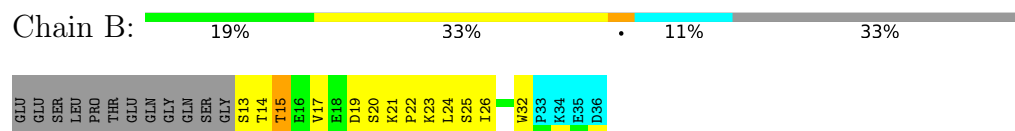
4.1 Average score per residue in the NMR ensemble

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: FIBRONECTIN



• Molecule 2: FIBRONECTIN BINDING PROTEIN

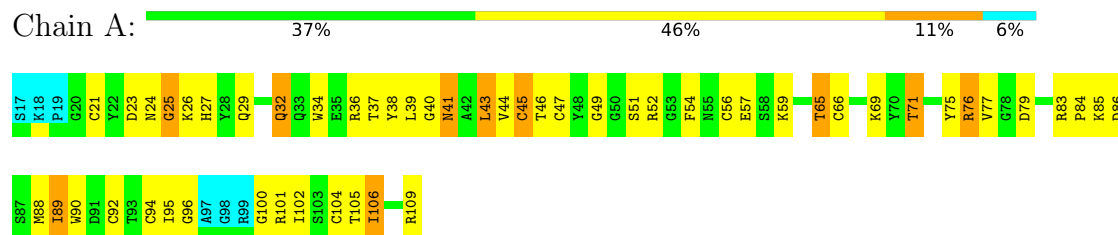


4.2 Scores per residue for each member of the ensemble

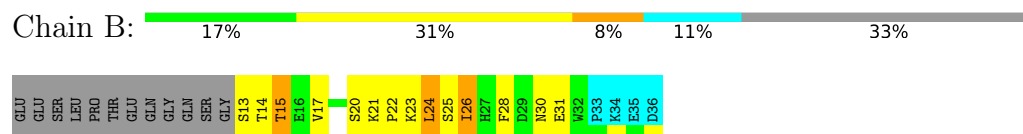
Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1 (medoid)

• Molecule 1: FIBRONECTIN

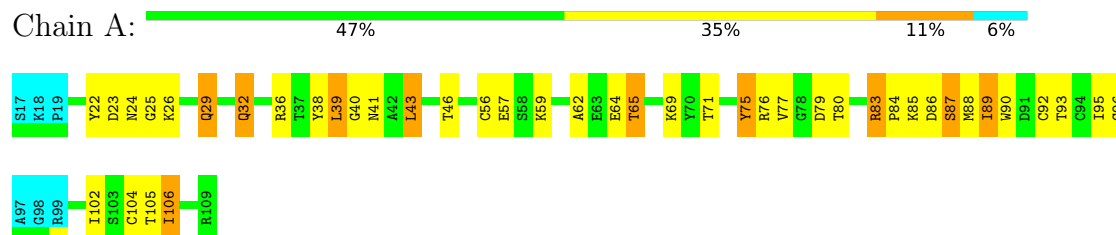


• Molecule 2: FIBRONECTIN BINDING PROTEIN

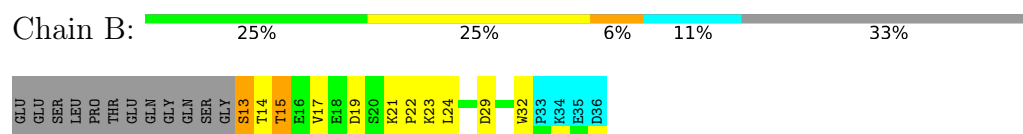


4.2.2 Score per residue for model 2

- Molecule 1: FIBRONECTIN

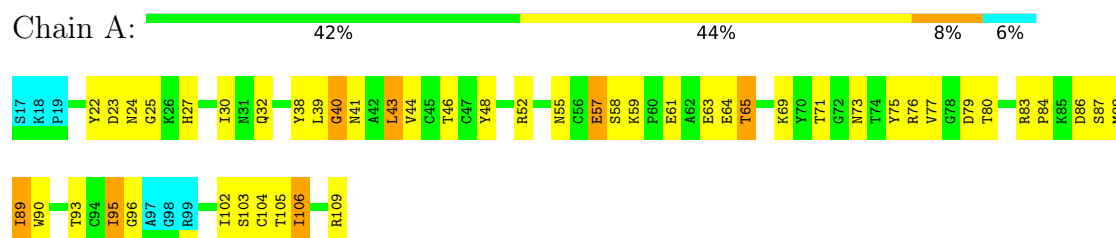


- Molecule 2: FIBRONECTIN BINDING PROTEIN

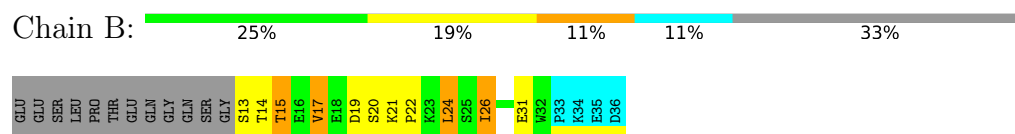


4.2.3 Score per residue for model 3

- Molecule 1: FIBRONECTIN



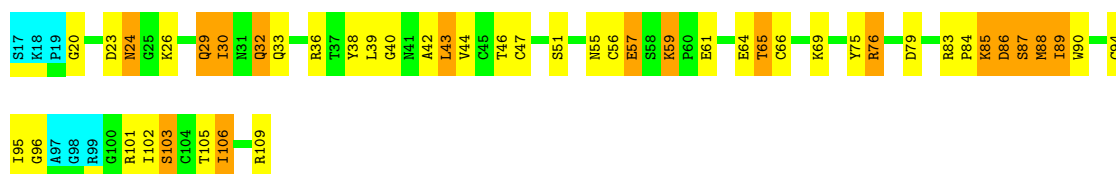
- Molecule 2: FIBRONECTIN BINDING PROTEIN



4.2.4 Score per residue for model 4

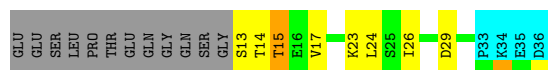
- Molecule 1: FIBRONECTIN





- Molecule 2: FIBRONECTIN BINDING PROTEIN

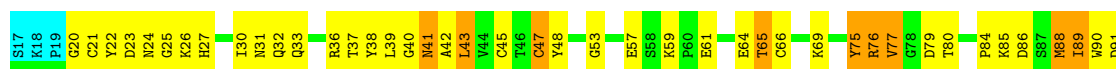
Chain B: 33% 19% 11% 33%



4.2.5 Score per residue for model 5

- Molecule 1: FIBRONECTIN

Chain A: 35% 44% 14% 6%



- Molecule 2: FIBRONECTIN BINDING PROTEIN

Chain B: 11% 33% 11% 11% 33%



4.2.6 Score per residue for model 6

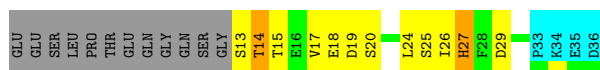
- Molecule 1: FIBRONECTIN

Chain A: 38% 37% 18% 6%



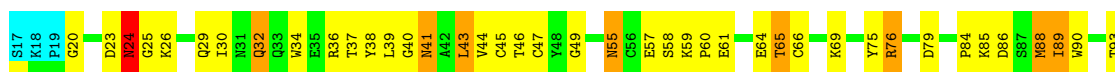
- Molecule 2: FIBRONECTIN BINDING PROTEIN

Chain B: 22% 28% 6% 11% 33%



4.2.7 Score per residue for model 7

- Molecule 1: FIBRONECTIN

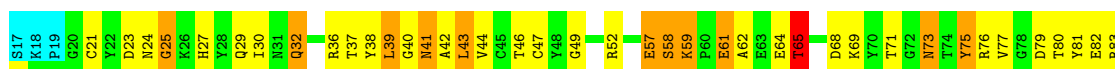


- Molecule 2: FIBRONECTIN BINDING PROTEIN

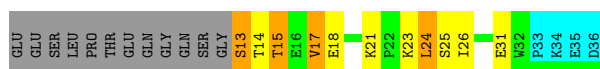


4.2.8 Score per residue for model 8

- Molecule 1: FIBRONECTIN



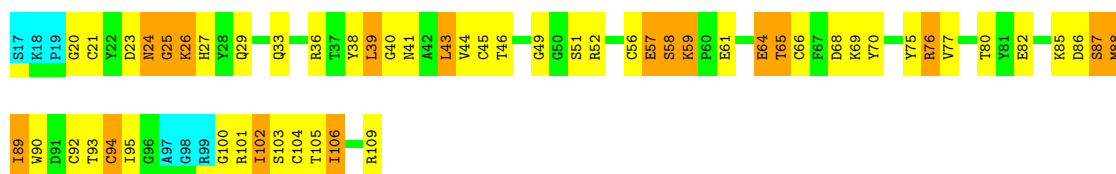
- Molecule 2: FIBRONECTIN BINDING PROTEIN



4.2.9 Score per residue for model 9

- Molecule 1: FIBRONECTIN



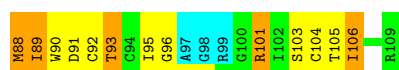
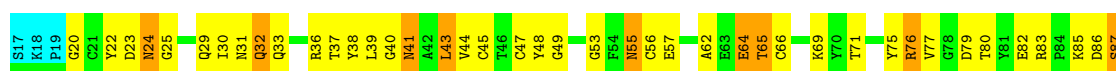


• Molecule 2: FIBRONECTIN BINDING PROTEIN



4.2.10 Score per residue for model 10

• Molecule 1: FIBRONECTIN

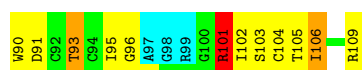
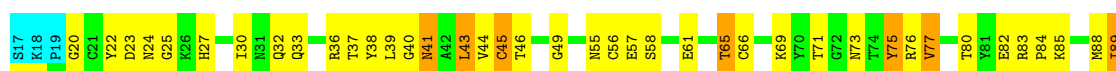


• Molecule 2: FIBRONECTIN BINDING PROTEIN



4.2.11 Score per residue for model 11

• Molecule 1: FIBRONECTIN



• Molecule 2: FIBRONECTIN BINDING PROTEIN

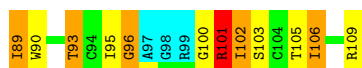
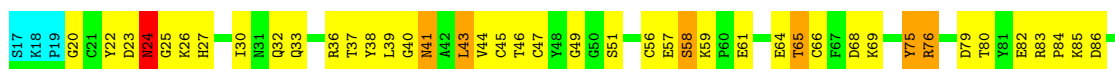




4.2.12 Score per residue for model 12

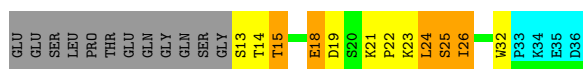
- Molecule 1: FIBRONECTIN

Chain A: 35% 44% 12% • 6%



- Molecule 2: FIBRONECTIN BINDING PROTEIN

Chain B: 22% 19% 14% 11% 33%



4.2.13 Score per residue for model 13

- Molecule 1: FIBRONECTIN

Chain A: 34% 41% 17% • 6%



- Molecule 2: FIBRONECTIN BINDING PROTEIN

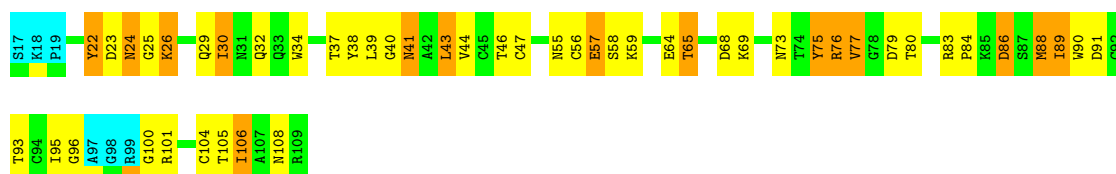
Chain B: 17% 31% 6% • 11% 33%



4.2.14 Score per residue for model 14

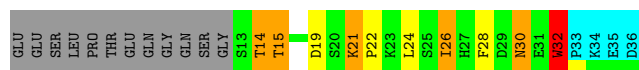
- Molecule 1: FIBRONECTIN

Chain A: 41% 37% 16% 6%



• Molecule 2: FIBRONECTIN BINDING PROTEIN

Chain B: 28% 11% 14% • 11% 33%



4.2.15 Score per residue for model 15

• Molecule 1: FIBRONECTIN

Chain A: 26% 47% 18% • 6%



• Molecule 2: FIBRONECTIN BINDING PROTEIN

Chain B: 19% 25% 6% 6% 11% 33%



5 Refinement protocol and experimental data overview ⓘ

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

Of the 100 calculated structures, 15 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
X-PLOR	refinement	
X-PLOR	structure solution	3.8

No chemical shift data was provided.

6 Model quality [i](#)

6.1 Standard geometry [i](#)

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in each chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	691	626	625	37±7
2	B	166	151	150	11±2
All	All	12855	11655	11625	567

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 23.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:103:SER:HA	2:B:17:VAL:HB	0.82	1.49	9	4
1:A:43:LEU:HD22	1:A:43:LEU:H	0.80	1.37	9	10
1:A:80:THR:HG22	1:A:93:THR:HG22	0.76	1.55	15	11
1:A:101:ARG:HD3	1:A:102:ILE:N	0.73	1.98	12	1
1:A:43:LEU:HG	2:B:26:ILE:HD11	0.71	1.61	14	3
1:A:84:PRO:HA	1:A:89:ILE:HA	0.70	1.62	14	12
1:A:44:VAL:HG13	1:A:59:LYS:HB3	0.68	1.65	4	2
1:A:90:TRP:CE2	1:A:106:ILE:HG12	0.67	2.25	11	15
1:A:65:THR:HG22	1:A:76:ARG:HA	0.66	1.68	15	11
1:A:105:THR:HG23	2:B:15:THR:HA	0.66	1.65	14	7
1:A:43:LEU:HD22	1:A:43:LEU:N	0.65	2.06	10	10
1:A:106:ILE:HG21	2:B:14:THR:HG23	0.65	1.69	12	3
1:A:43:LEU:HB2	1:A:56:CYS:HB3	0.64	1.69	11	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:106:ILE:HG22	2:B:14:THR:N	0.64	2.07	14	15
1:A:101:ARG:HH11	1:A:101:ARG:HB2	0.64	1.53	12	1
1:A:65:THR:N	1:A:77:VAL:HG23	0.63	2.08	2	2
1:A:21:CYS:HB3	1:A:49:GLY:H	0.63	1.52	9	1
1:A:41:ASN:HD22	1:A:43:LEU:HD11	0.63	1.53	14	2
1:A:44:VAL:HG23	1:A:59:LYS:HB2	0.63	1.70	13	1
1:A:106:ILE:HB	2:B:14:THR:HB	0.62	1.71	8	5
1:A:106:ILE:HG22	2:B:13:SER:HA	0.62	1.72	12	10
1:A:95:ILE:HD11	1:A:103:SER:HB3	0.62	1.72	11	1
1:A:71:THR:HG21	1:A:83:ARG:HD2	0.61	1.72	6	5
1:A:57:GLU:HG2	2:B:25:SER:HA	0.61	1.70	15	2
1:A:67:PHE:CE2	1:A:69:LYS:HB3	0.61	2.30	6	1
2:B:24:LEU:HD12	2:B:25:SER:N	0.61	2.11	9	2
1:A:43:LEU:HD12	1:A:43:LEU:H	0.61	1.55	3	5
1:A:65:THR:HA	1:A:76:ARG:HA	0.60	1.73	8	2
1:A:88:MET:HB2	1:A:106:ILE:HD11	0.60	1.73	9	4
2:B:24:LEU:HD12	2:B:25:SER:H	0.59	1.56	9	1
1:A:43:LEU:HB3	1:A:57:GLU:C	0.59	2.22	6	10
1:A:103:SER:HB2	2:B:17:VAL:HG22	0.59	1.73	6	1
1:A:95:ILE:HG22	1:A:96:GLY:H	0.59	1.58	11	4
1:A:38:TYR:O	1:A:39:LEU:HD23	0.59	1.97	2	2
1:A:106:ILE:O	2:B:13:SER:HA	0.58	1.98	9	14
1:A:101:ARG:NE	2:B:18:GLU:H	0.58	1.96	12	1
1:A:92:CYS:HA	1:A:104:CYS:HA	0.58	1.76	9	3
1:A:86:ASP:O	1:A:88:MET:HG3	0.57	1.99	5	3
1:A:106:ILE:HG22	2:B:13:SER:CA	0.57	2.29	12	9
1:A:95:ILE:HD11	1:A:103:SER:HB2	0.57	1.77	15	2
1:A:106:ILE:HB	2:B:14:THR:OG1	0.57	2.00	9	7
1:A:90:TRP:CZ2	1:A:106:ILE:HG12	0.57	2.35	12	14
1:A:89:ILE:HG23	1:A:108:ASN:HA	0.57	1.76	5	2
1:A:95:ILE:HG12	1:A:103:SER:H	0.57	1.60	12	2
2:B:17:VAL:HG12	2:B:19:ASP:H	0.56	1.60	2	1
1:A:65:THR:HG23	1:A:76:ARG:HD3	0.56	1.75	8	3
1:A:94:CYS:SG	1:A:102:ILE:HD12	0.56	2.40	9	1
1:A:47:CYS:HA	1:A:54:PHE:HB3	0.56	1.77	13	3
1:A:58:SER:HB3	2:B:24:LEU:N	0.56	2.15	12	2
1:A:64:GLU:HG2	1:A:77:VAL:HB	0.56	1.77	8	1
1:A:75:TYR:CD1	1:A:75:TYR:N	0.56	2.74	8	2
1:A:33:GLN:HA	1:A:45:CYS:O	0.56	2.01	10	2
1:A:106:ILE:CG2	2:B:14:THR:HG23	0.56	2.30	12	2
1:A:20:GLY:HA2	1:A:30:ILE:HG13	0.55	1.79	5	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:57:GLU:HA	2:B:25:SER:HA	0.55	1.78	7	1
1:A:93:THR:N	1:A:103:SER:O	0.55	2.40	10	2
1:A:37:THR:HG23	1:A:41:ASN:C	0.55	2.25	7	8
1:A:77:VAL:HG22	1:A:96:GLY:HA3	0.55	1.77	6	1
1:A:77:VAL:HG13	1:A:95:ILE:O	0.55	2.02	6	1
1:A:38:TYR:CE1	1:A:39:LEU:HD13	0.55	2.37	9	9
1:A:38:TYR:HB3	1:A:43:LEU:HD11	0.55	1.79	6	4
1:A:58:SER:HB3	2:B:24:LEU:H	0.55	1.61	15	2
1:A:29:GLN:O	1:A:32:GLN:HB2	0.54	2.02	15	7
1:A:71:THR:HG21	1:A:83:ARG:HG2	0.54	1.79	2	1
1:A:101:ARG:HD2	1:A:101:ARG:C	0.54	2.26	11	2
1:A:105:THR:HG23	2:B:15:THR:N	0.54	2.18	9	12
1:A:44:VAL:O	1:A:44:VAL:HG23	0.54	2.03	10	2
1:A:38:TYR:HB3	1:A:43:LEU:HD21	0.54	1.80	1	6
1:A:30:ILE:HA	1:A:47:CYS:SG	0.54	2.43	4	4
1:A:93:THR:OG1	1:A:103:SER:HB3	0.54	2.03	10	1
1:A:61:GLU:HG3	2:B:21:LYS:HE2	0.54	1.80	8	1
1:A:56:CYS:HB2	2:B:26:ILE:HG13	0.53	1.77	12	1
1:A:83:ARG:HD3	1:A:84:PRO:HD2	0.53	1.80	8	1
2:B:24:LEU:HD23	2:B:25:SER:H	0.53	1.63	12	1
1:A:106:ILE:HB	2:B:14:THR:O	0.53	2.04	14	1
1:A:29:GLN:HG2	1:A:32:GLN:HE21	0.53	1.63	6	1
1:A:106:ILE:HG22	2:B:14:THR:H	0.53	1.63	5	2
1:A:23:ASP:O	1:A:25:GLY:N	0.53	2.42	11	7
1:A:100:GLY:O	1:A:101:ARG:HB3	0.52	2.02	15	1
1:A:23:ASP:HB3	1:A:26:LYS:O	0.52	2.05	6	4
1:A:101:ARG:HA	2:B:20:SER:HB3	0.52	1.81	13	1
1:A:38:TYR:O	1:A:39:LEU:HB2	0.51	2.05	14	4
1:A:89:ILE:HG13	1:A:89:ILE:O	0.51	2.05	12	2
1:A:90:TRP:CD2	1:A:106:ILE:HG12	0.51	2.41	15	10
1:A:38:TYR:C	1:A:40:GLY:H	0.51	2.14	6	5
2:B:17:VAL:HG23	2:B:19:ASP:N	0.50	2.21	11	1
2:B:21:LYS:N	2:B:22:PRO:HD3	0.50	2.22	5	4
1:A:85:LYS:HB2	1:A:90:TRP:CD1	0.50	2.41	10	1
1:A:56:CYS:O	2:B:25:SER:HA	0.50	2.07	10	2
1:A:106:ILE:HG22	2:B:13:SER:C	0.50	2.32	10	7
1:A:22:TYR:HB3	2:B:32:TRP:CZ3	0.50	2.42	14	4
1:A:23:ASP:CG	1:A:24:ASN:N	0.50	2.70	7	9
1:A:101:ARG:HE	2:B:18:GLU:H	0.50	1.50	12	1
1:A:23:ASP:C	1:A:25:GLY:H	0.49	2.15	15	5
1:A:22:TYR:HD1	2:B:32:TRP:CE3	0.49	2.25	14	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
2:B:24:LEU:HD12	2:B:26:ILE:HG12	0.49	1.83	3	1
1:A:76:ARG:HD2	1:A:77:VAL:H	0.49	1.68	6	2
1:A:80:THR:CG2	1:A:93:THR:HG22	0.49	2.38	10	5
1:A:65:THR:H	1:A:77:VAL:HG23	0.49	1.67	2	1
1:A:105:THR:HG23	2:B:15:THR:CA	0.49	2.38	1	6
1:A:77:VAL:HG13	1:A:96:GLY:N	0.49	2.23	3	1
1:A:44:VAL:HG23	1:A:59:LYS:CB	0.49	2.36	13	1
1:A:68:ASP:HB2	1:A:75:TYR:HE1	0.49	1.68	6	4
1:A:65:THR:HG22	1:A:75:TYR:O	0.48	2.08	5	10
1:A:22:TYR:HD2	2:B:32:TRP:CE3	0.48	2.26	13	1
1:A:75:TYR:HB2	1:A:94:CYS:SG	0.48	2.48	9	3
1:A:75:TYR:HD2	1:A:94:CYS:HB2	0.48	1.67	8	1
1:A:66:CYS:HB2	1:A:102:ILE:HG12	0.48	1.84	12	1
1:A:95:ILE:HB	1:A:101:ARG:O	0.47	2.08	15	2
1:A:103:SER:OG	2:B:17:VAL:HG22	0.47	2.10	4	2
1:A:30:ILE:O	1:A:31:ASN:HB2	0.47	2.09	5	2
1:A:22:TYR:HB3	2:B:32:TRP:HZ3	0.47	1.70	5	1
1:A:20:GLY:O	1:A:49:GLY:HA2	0.47	2.09	12	4
1:A:76:ARG:O	1:A:78:GLY:N	0.47	2.47	15	1
1:A:38:TYR:CD2	2:B:26:ILE:HD12	0.47	2.44	14	1
1:A:48:TYR:HB2	1:A:53:GLY:O	0.47	2.09	5	3
1:A:20:GLY:O	1:A:21:CYS:C	0.47	2.58	9	1
1:A:69:LYS:H	1:A:69:LYS:CD	0.47	2.22	6	1
1:A:45:CYS:HA	1:A:56:CYS:HA	0.46	1.87	10	4
1:A:21:CYS:N	1:A:49:GLY:HA2	0.46	2.25	6	2
1:A:60:PRO:HB2	1:A:77:VAL:HG13	0.46	1.86	15	1
1:A:68:ASP:HB2	1:A:75:TYR:OH	0.46	2.11	8	1
1:A:85:LYS:O	1:A:86:ASP:HB3	0.46	2.11	10	2
1:A:89:ILE:O	1:A:89:ILE:HG13	0.46	2.09	14	1
1:A:43:LEU:N	1:A:43:LEU:CD2	0.46	2.77	1	6
1:A:77:VAL:HG23	1:A:95:ILE:C	0.46	2.36	5	1
1:A:91:ASP:O	1:A:92:CYS:C	0.46	2.59	15	1
1:A:37:THR:HG23	1:A:41:ASN:O	0.45	2.12	11	1
1:A:89:ILE:O	1:A:106:ILE:HD13	0.45	2.12	7	5
1:A:57:GLU:O	1:A:58:SER:C	0.45	2.60	13	4
1:A:76:ARG:HD2	1:A:77:VAL:N	0.45	2.26	11	1
1:A:29:GLN:O	1:A:32:GLN:HB3	0.45	2.12	2	1
1:A:23:ASP:N	1:A:26:LYS:O	0.45	2.49	13	2
1:A:34:TRP:CZ3	1:A:47:CYS:HB3	0.45	2.47	1	1
1:A:85:LYS:HB3	1:A:90:TRP:CD1	0.45	2.47	6	2
1:A:101:ARG:HG3	2:B:19:ASP:H	0.45	1.72	15	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:77:VAL:HG22	1:A:96:GLY:HA2	0.44	1.89	15	1
2:B:26:ILE:HG21	2:B:28:PHE:CZ	0.44	2.48	5	3
1:A:43:LEU:HD12	1:A:43:LEU:N	0.44	2.27	6	4
1:A:64:GLU:O	1:A:77:VAL:HG23	0.44	2.12	6	2
1:A:34:TRP:CZ3	1:A:47:CYS:HB2	0.44	2.48	7	1
1:A:57:GLU:HA	2:B:24:LEU:O	0.44	2.12	15	1
1:A:71:THR:HG21	1:A:83:ARG:NE	0.44	2.27	3	1
1:A:68:ASP:HB2	1:A:75:TYR:HE2	0.44	1.73	9	2
1:A:42:ALA:HB3	1:A:59:LYS:HD3	0.44	1.90	15	1
1:A:104:CYS:O	2:B:16:GLU:HB2	0.44	2.12	15	1
1:A:44:VAL:HG23	1:A:59:LYS:HB3	0.44	1.89	8	1
1:A:79:ASP:CG	1:A:80:THR:N	0.44	2.76	5	2
1:A:55:ASN:HA	2:B:26:ILE:O	0.43	2.13	10	3
1:A:64:GLU:HB3	1:A:77:VAL:HG21	0.43	1.90	10	1
1:A:101:ARG:HG2	1:A:102:ILE:N	0.43	2.27	15	1
1:A:38:TYR:C	1:A:40:GLY:N	0.43	2.76	6	2
1:A:64:GLU:HB2	1:A:77:VAL:CG2	0.43	2.43	3	1
1:A:42:ALA:C	1:A:43:LEU:HD13	0.43	2.38	5	3
1:A:86:ASP:O	1:A:88:MET:HG2	0.43	2.14	7	2
1:A:105:THR:HG23	2:B:14:THR:C	0.43	2.37	8	2
1:A:43:LEU:HB3	1:A:58:SER:N	0.43	2.28	9	1
1:A:64:GLU:HB2	1:A:77:VAL:HG11	0.43	1.90	5	1
1:A:66:CYS:SG	1:A:102:ILE:HD12	0.43	2.53	11	1
1:A:64:GLU:O	1:A:76:ARG:HD3	0.43	2.14	12	1
1:A:23:ASP:C	1:A:25:GLY:N	0.43	2.77	15	2
1:A:70:TYR:CD1	1:A:70:TYR:N	0.43	2.86	9	1
2:B:19:ASP:HB3	2:B:22:PRO:HG3	0.43	1.90	2	1
1:A:66:CYS:HB2	1:A:102:ILE:HB	0.43	1.91	7	1
1:A:105:THR:HA	2:B:15:THR:HA	0.42	1.90	6	1
1:A:76:ARG:HD3	1:A:77:VAL:H	0.42	1.74	9	1
2:B:27:HIS:ND1	2:B:27:HIS:N	0.42	2.67	6	1
1:A:64:GLU:HB2	1:A:77:VAL:HG21	0.42	1.91	3	1
1:A:100:GLY:O	1:A:101:ARG:CB	0.42	2.67	12	1
1:A:96:GLY:HA2	1:A:101:ARG:N	0.42	2.28	7	1
1:A:20:GLY:C	1:A:49:GLY:HA2	0.42	2.39	12	1
1:A:43:LEU:N	1:A:43:LEU:HD13	0.42	2.29	14	4
1:A:85:LYS:O	1:A:86:ASP:HB2	0.42	2.14	6	2
1:A:36:ARG:NH1	1:A:38:TYR:HB2	0.42	2.30	6	1
1:A:93:THR:OG1	1:A:95:ILE:HD11	0.42	2.14	7	1
1:A:68:ASP:HB2	1:A:75:TYR:CE2	0.42	2.49	9	1
1:A:105:THR:OG1	2:B:15:THR:HG23	0.42	2.15	5	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:64:GLU:HB2	1:A:77:VAL:CG1	0.41	2.45	5	1
1:A:65:THR:CG2	1:A:76:ARG:HG2	0.41	2.45	6	1
1:A:96:GLY:HA2	1:A:101:ARG:H	0.41	1.76	7	1
1:A:64:GLU:O	1:A:77:VAL:HG12	0.41	2.15	14	1
1:A:65:THR:CG2	1:A:76:ARG:HD3	0.41	2.46	7	2
1:A:66:CYS:SG	1:A:75:TYR:HB2	0.41	2.55	7	1
1:A:95:ILE:HG22	1:A:96:GLY:N	0.41	2.30	12	1
1:A:102:ILE:HG13	2:B:20:SER:HB2	0.41	1.93	13	1
2:B:14:THR:O	2:B:14:THR:HG22	0.41	2.15	13	2
1:A:23:ASP:CG	1:A:34:TRP:HE1	0.41	2.23	14	1
1:A:36:ARG:O	1:A:43:LEU:HD12	0.41	2.16	13	1
1:A:85:LYS:HG2	1:A:86:ASP:N	0.41	2.31	5	1
1:A:105:THR:OG1	2:B:15:THR:HG22	0.41	2.15	6	1
1:A:73:ASN:OD1	1:A:73:ASN:N	0.41	2.54	8	1
1:A:56:CYS:HB2	2:B:26:ILE:CG1	0.41	2.46	14	1
1:A:79:ASP:CG	1:A:80:THR:H	0.41	2.24	12	1
1:A:58:SER:OG	2:B:23:LYS:HA	0.41	2.16	15	1
1:A:36:ARG:HG2	1:A:45:CYS:SG	0.40	2.56	7	1
1:A:103:SER:HA	2:B:17:VAL:CB	0.40	2.46	8	1
1:A:48:TYR:HB2	1:A:52:ARG:HB2	0.40	1.92	3	1
1:A:77:VAL:HG13	1:A:95:ILE:C	0.40	2.41	3	1
1:A:30:ILE:C	1:A:32:GLN:H	0.40	2.24	10	1
1:A:101:ARG:HD3	1:A:101:ARG:C	0.40	2.42	12	1
1:A:38:TYR:HB2	2:B:28:PHE:HZ	0.40	1.76	14	1
1:A:56:CYS:O	2:B:26:ILE:HD12	0.40	2.17	4	1
1:A:21:CYS:HB3	1:A:49:GLY:N	0.40	2.27	9	1
1:A:101:ARG:CG	1:A:102:ILE:N	0.40	2.84	15	1

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	86/93 (92%)	67±2 (78±2%)	14±2 (16±2%)	5±1 (5±2%)	2	22
2	B	19/36 (53%)	10±1 (53±7%)	7±2 (37±8%)	2±2 (10±9%)	1	10

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1575/1935 (81%)	1163 (74%)	314 (20%)	98 (6%)	2 19

All 32 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	40	GLY	11
1	A	24	ASN	11
1	A	96	GLY	8
1	A	87	SER	7
1	A	25	GLY	5
1	A	100	GLY	5
2	B	20	SER	5
1	A	49	GLY	4
2	B	22	PRO	4
2	B	32	TRP	4
1	A	62	ALA	3
2	B	19	ASP	3
1	A	101	ARG	3
2	B	17	VAL	2
1	A	65	THR	2
1	A	47	CYS	2
2	B	27	HIS	2
1	A	61	GLU	2
2	B	30	ASN	2
1	A	64	GLU	1
1	A	39	LEU	1
1	A	60	PRO	1
2	B	25	SER	1
1	A	21	CYS	1
1	A	29	GLN	1
2	B	16	GLU	1
2	B	18	GLU	1
1	A	77	VAL	1
1	A	92	CYS	1
2	B	21	LYS	1
2	B	23	LYS	1
2	B	24	LEU	1

6.3.2 Protein sidechains ⓘ

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	74/78 (95%)	45±4 (61±5%)	29±4 (39±5%)	0	6
2	B	20/34 (59%)	13±1 (65±6%)	7±1 (35±6%)	1	9
All	All	1410/1680 (84%)	870 (62%)	540 (38%)	0	7

All 77 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	43	LEU	15
1	A	69	LYS	15
1	A	89	ILE	15
1	A	106	ILE	15
2	B	24	LEU	15
1	A	32	GLN	14
1	A	88	MET	14
2	B	15	THR	14
1	A	46	THR	13
1	A	59	LYS	13
1	A	65	THR	13
1	A	41	ASN	12
2	B	23	LYS	12
1	A	36	ARG	11
1	A	79	ASP	11
1	A	95	ILE	11
1	A	101	ARG	11
1	A	26	LYS	10
1	A	57	GLU	10
1	A	102	ILE	9
1	A	104	CYS	9
1	A	109	ARG	9
2	B	21	LYS	9
1	A	75	TYR	9
1	A	58	SER	9
1	A	61	GLU	9
1	A	27	HIS	8
1	A	66	CYS	8

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Mol	Chain	Res	Type	Models (Total)
1	A	76	ARG	8
1	A	85	LYS	8
1	A	86	ASP	8
2	B	26	ILE	8
1	A	24	ASN	7
1	A	55	ASN	7
2	B	17	VAL	7
2	B	19	ASP	7
1	A	64	GLU	7
1	A	44	VAL	6
2	B	31	GLU	6
1	A	22	TYR	6
1	A	83	ARG	6
1	A	87	SER	6
1	A	30	ILE	6
1	A	94	CYS	6
1	A	91	ASP	6
1	A	82	GLU	6
1	A	45	CYS	5
1	A	51	SER	5
1	A	77	VAL	5
2	B	29	ASP	5
1	A	73	ASN	5
1	A	33	GLN	5
1	A	103	SER	5
2	B	18	GLU	5
2	B	30	ASN	4
1	A	29	GLN	4
1	A	39	LEU	4
1	A	47	CYS	4
1	A	93	THR	4
1	A	21	CYS	3
1	A	52	ARG	3
1	A	92	CYS	3
1	A	56	CYS	3
2	B	13	SER	3
2	B	14	THR	3
2	B	25	SER	3
1	A	71	THR	2
2	B	20	SER	2
1	A	63	GLU	2
2	B	32	TRP	2

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Mol	Chain	Res	Type	Models (Total)
1	A	105	THR	1
1	A	31	ASN	1
2	B	27	HIS	1
1	A	81	TYR	1
1	A	23	ASP	1
1	A	54	PHE	1
1	A	108	ASN	1

6.3.3 RNA ⓘ

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.5 Carbohydrates ⓘ

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