



Full wwPDB NMR Structure Validation Report ⓘ

Mar 8, 2026 – 03:58 AM UTC

PDB ID : 2KXQ / pdb_00002kxq
Title : Solution Structure of Smurf2 WW2 and WW3 bound to Smad7 PY motif containing peptide
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Deposited on : 2010-05-11

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

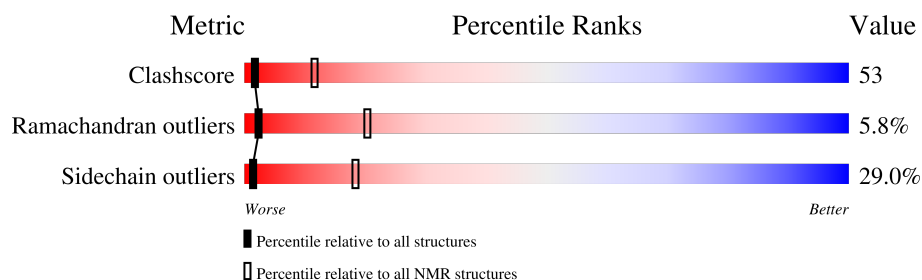
1 Overall quality at a glance

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	90	22% 50% 9% 19%
2	B	20	20% 15% 65%

2 Ensemble composition and analysis

This entry contains 10 models. Model 5 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy*.

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:255-A:285, A:290-A:331, B:206-B:212 (80)	0.45	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 2 clusters and 5 single-model clusters were found.

Cluster number	Models
1	2, 5, 6
2	3, 4
Single-model clusters	1; 7; 8; 9; 10

3 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 1683 atoms, of which 814 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called E3 ubiquitin-protein ligase SMURF2.

Mol	Chain	Residues	Atoms						Trace
1	A	90	Total	C	H	N	O	S	0
			1386	443	671	131	140	1	

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	244	GLY	-	expression tag	UNP Q9HAU4
A	245	PRO	-	expression tag	UNP Q9HAU4
A	246	LEU	-	expression tag	UNP Q9HAU4
A	247	GLY	-	expression tag	UNP Q9HAU4
A	248	GLY	-	expression tag	UNP Q9HAU4
A	249	SER	-	expression tag	UNP Q9HAU4

- Molecule 2 is a protein called Smad7 PY motif containing peptide.

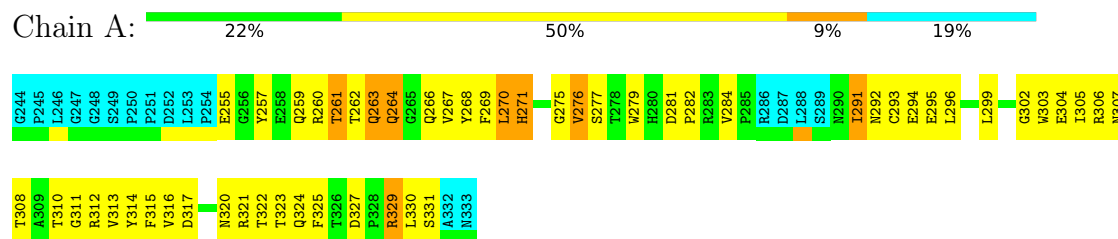
Mol	Chain	Residues	Atoms						Trace
2	B	20	Total	C	H	N	O	S	0
			297	98	143	23	32	1	

4 Residue-property plots

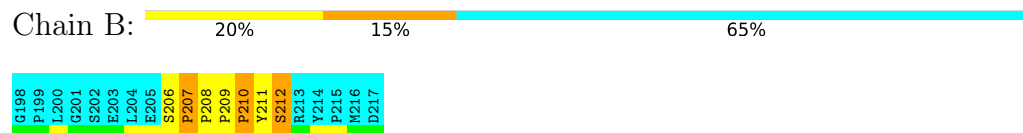
4.1 Average score per residue in the NMR ensemble

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: E3 ubiquitin-protein ligase SMURF2



- Molecule 2: Smad7 PY motif containing peptide

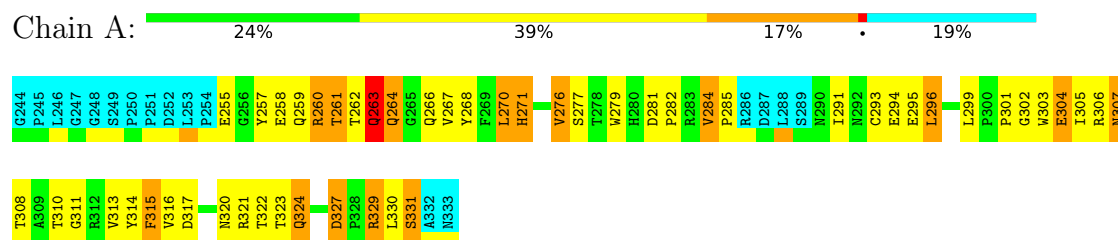


4.2 Scores per residue for each member of the ensemble

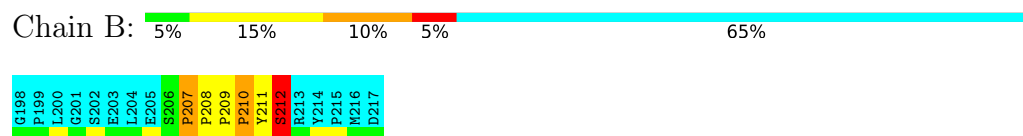
Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

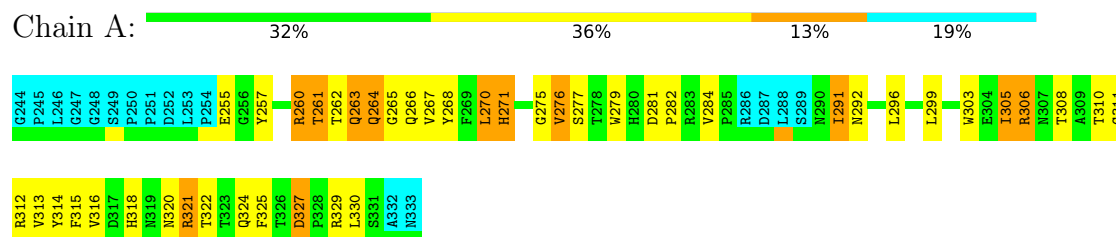


- Molecule 2: Smad7 PY motif containing peptide

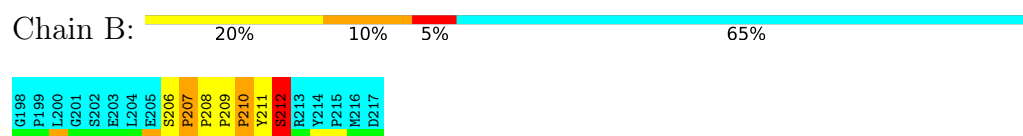


4.2.2 Score per residue for model 2

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

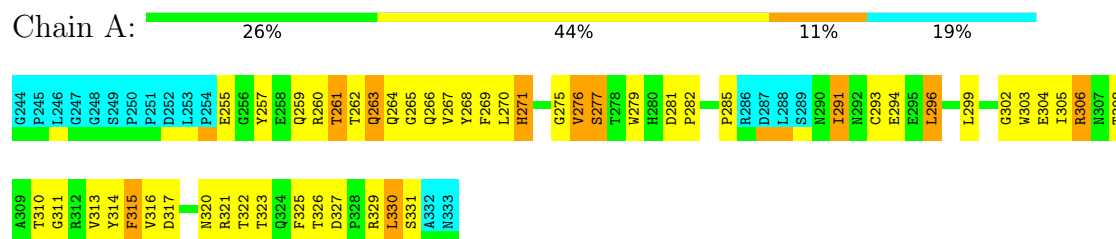


- Molecule 2: Smad7 PY motif containing peptide

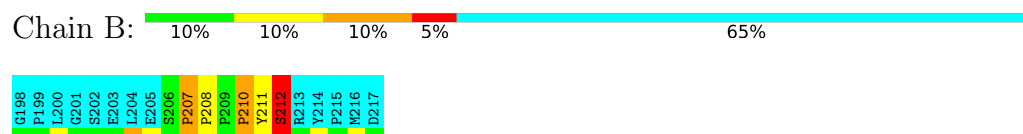


4.2.3 Score per residue for model 3

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

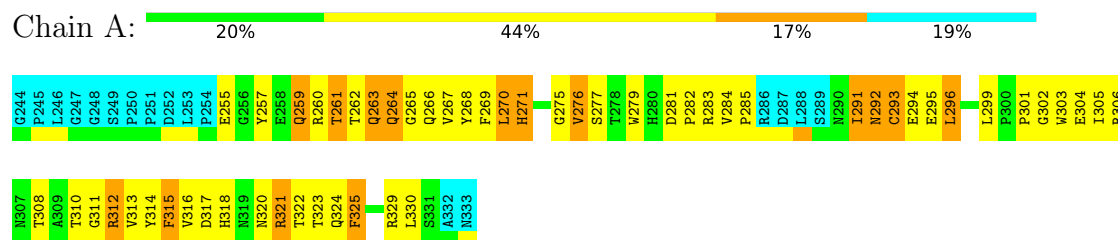


- Molecule 2: Smad7 PY motif containing peptide

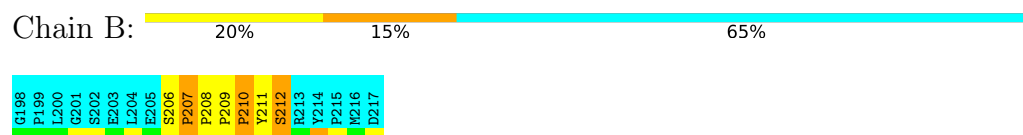


4.2.4 Score per residue for model 4

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

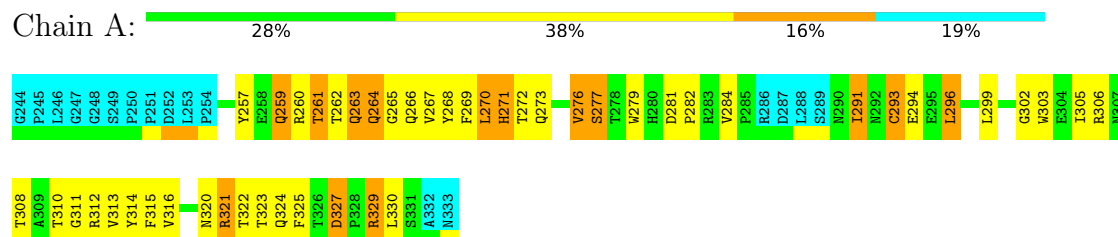


- Molecule 2: Smad7 PY motif containing peptide

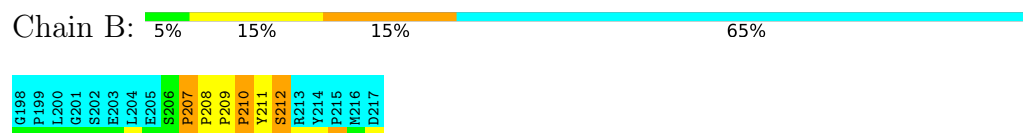


4.2.5 Score per residue for model 5 (medoid)

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

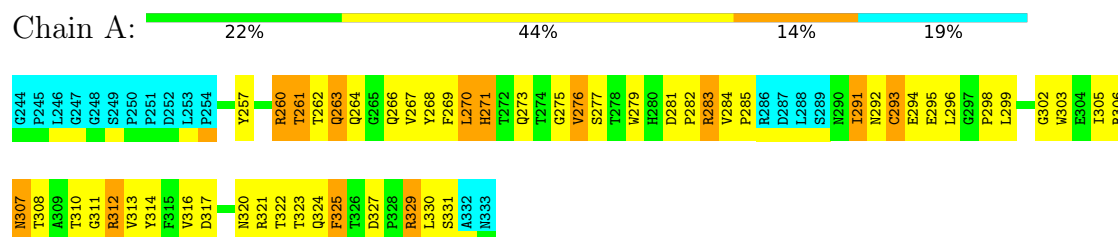


- Molecule 2: Smad7 PY motif containing peptide

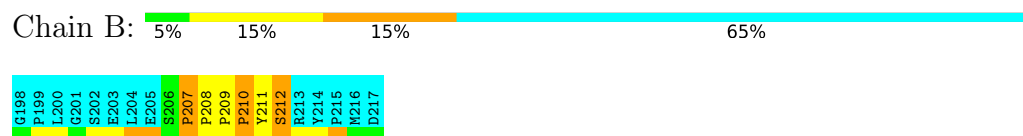


4.2.6 Score per residue for model 6

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

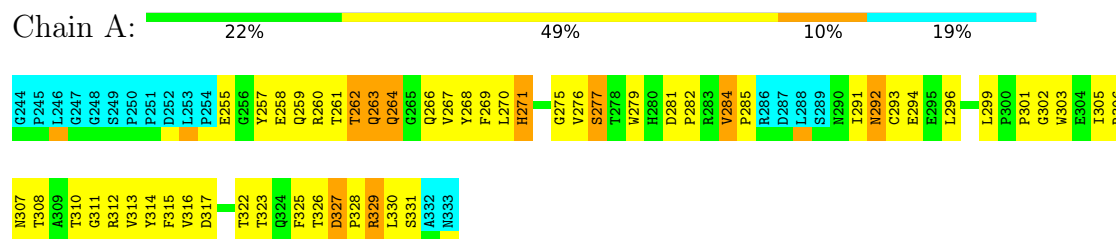


- Molecule 2: Smad7 PY motif containing peptide

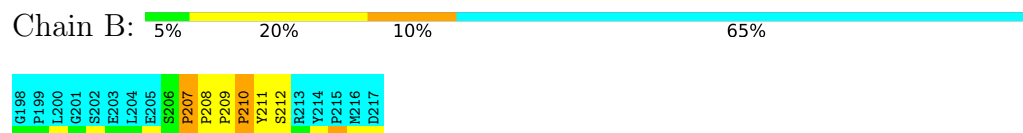


4.2.7 Score per residue for model 7

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

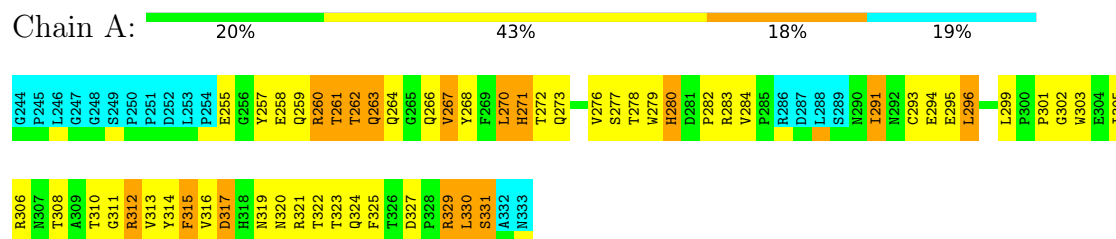


- Molecule 2: Smad7 PY motif containing peptide

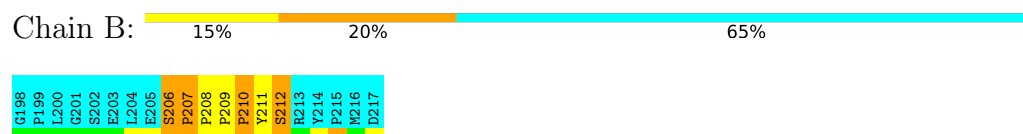


4.2.8 Score per residue for model 8

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

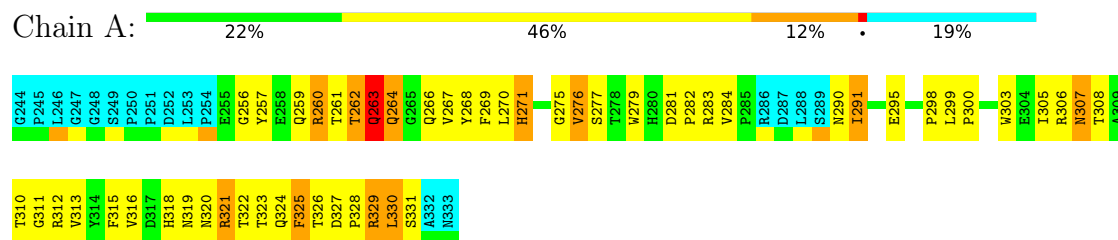


- Molecule 2: Smad7 PY motif containing peptide

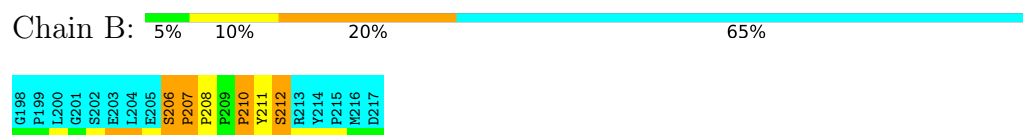


4.2.9 Score per residue for model 9

- Molecule 1: E3 ubiquitin-protein ligase SMURF2

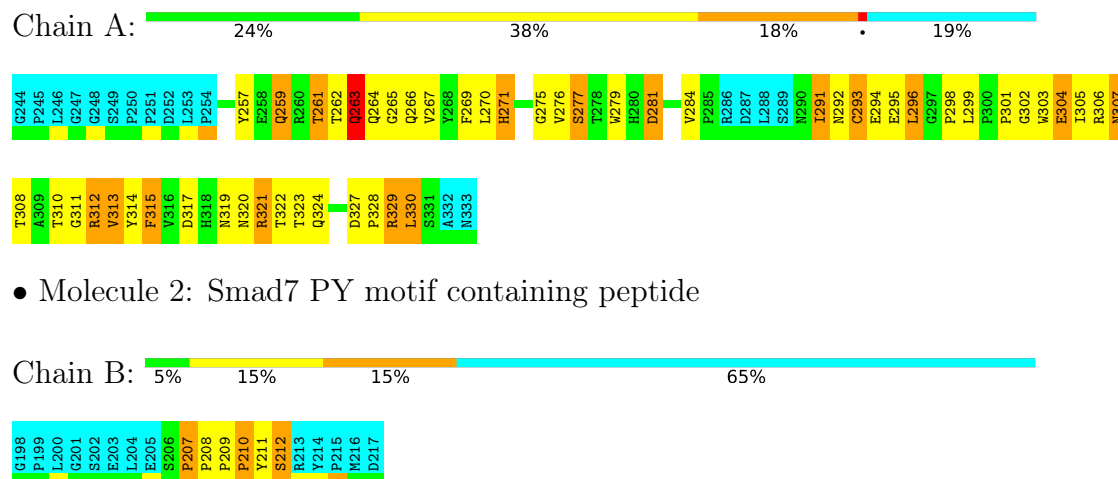


- Molecule 2: Smad7 PY motif containing peptide



4.2.10 Score per residue for model 10

- Molecule 1: E3 ubiquitin-protein ligase SMURF2



- Molecule 2: Smad7 PY motif containing peptide

5 Refinement protocol and experimental data overview

Of the 200 calculated structures, 10 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
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	598	557	554	59±6
2	B	52	47	47	20±2
All	All	6500	6040	6010	657

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 53.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:299:LEU:HD13	1:A:305:ILE:HD11	1.08	1.20	7	8
1:A:291:ILE:HG12	1:A:330:LEU:HD21	0.88	1.44	1	5
1:A:308:THR:HG23	1:A:312:ARG:O	0.85	1.72	9	6
1:A:262:THR:O	1:A:264:GLN:N	0.83	2.11	4	4
1:A:291:ILE:CG1	1:A:330:LEU:HD21	0.81	2.06	1	7
1:A:299:LEU:HD21	1:A:303:TRP:CB	0.76	2.10	7	10
1:A:303:TRP:HA	1:A:316:VAL:O	0.75	1.82	9	9
1:A:291:ILE:HG13	1:A:330:LEU:HD11	0.74	1.58	3	2
1:A:299:LEU:HD21	1:A:303:TRP:HB3	0.73	1.58	1	10
1:A:299:LEU:CD1	1:A:305:ILE:HD11	0.73	2.10	7	2
2:B:207:PRO:HB2	2:B:208:PRO:CD	0.73	2.14	2	5
2:B:207:PRO:HB2	2:B:208:PRO:HD3	0.73	1.61	1	10
1:A:279:TRP:CH2	2:B:208:PRO:HG2	0.72	2.19	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:291:ILE:HB	1:A:330:LEU:HD11	0.71	1.61	7	6
2:B:207:PRO:CB	2:B:208:PRO:HD3	0.71	2.15	1	9
1:A:284:VAL:HG12	1:A:331:SER:HA	0.71	1.63	7	3
1:A:299:LEU:HD13	1:A:305:ILE:CD1	0.70	2.10	7	7
1:A:299:LEU:HD21	1:A:303:TRP:C	0.70	2.12	7	3
1:A:316:VAL:HG22	1:A:323:THR:HG22	0.70	1.64	3	6
1:A:293:CYS:HA	1:A:296:LEU:HD12	0.69	1.64	1	6
1:A:327:ASP:CB	1:A:330:LEU:HD13	0.68	2.19	7	5
1:A:327:ASP:HB3	1:A:330:LEU:HD13	0.64	1.70	10	2
1:A:270:LEU:HD12	1:A:276:VAL:O	0.64	1.92	2	10
1:A:279:TRP:CE2	2:B:207:PRO:HD2	0.64	2.28	10	10
1:A:291:ILE:HB	1:A:330:LEU:HD21	0.63	1.70	2	1
1:A:301:PRO:O	1:A:303:TRP:CD1	0.62	2.53	8	5
1:A:327:ASP:HB2	1:A:330:LEU:HD13	0.62	1.70	2	5
1:A:322:THR:HA	2:B:211:TYR:HB2	0.62	1.71	3	6
1:A:327:ASP:HB2	1:A:330:LEU:HD22	0.62	1.71	7	4
1:A:306:ARG:O	1:A:313:VAL:HG23	0.62	1.94	2	3
2:B:207:PRO:HD2	2:B:208:PRO:HD2	0.62	1.71	8	4
1:A:267:VAL:HG23	1:A:322:THR:HB	0.61	1.69	9	8
1:A:316:VAL:HG11	2:B:211:TYR:CE1	0.61	2.30	9	1
1:A:281:ASP:HB3	1:A:284:VAL:HG22	0.60	1.71	4	7
1:A:279:TRP:CZ2	2:B:207:PRO:HD2	0.60	2.30	4	4
1:A:262:THR:HG23	1:A:266:GLN:HB3	0.59	1.73	3	5
1:A:264:GLN:HB3	2:B:210:PRO:CB	0.59	2.28	5	8
1:A:327:ASP:H	1:A:330:LEU:HD22	0.59	1.57	2	2
1:A:291:ILE:HG13	1:A:330:LEU:HD21	0.59	1.73	9	1
1:A:306:ARG:O	1:A:313:VAL:HA	0.58	1.98	2	10
1:A:299:LEU:CD2	1:A:303:TRP:CB	0.57	2.83	3	10
2:B:207:PRO:CG	2:B:208:PRO:HD3	0.57	2.29	1	5
1:A:307:ASN:HA	1:A:313:VAL:HA	0.57	1.76	10	4
1:A:264:GLN:O	2:B:211:TYR:O	0.57	2.22	8	8
1:A:280:HIS:CD2	1:A:280:HIS:N	0.57	2.70	8	1
1:A:318:HIS:CE1	2:B:211:TYR:OH	0.57	2.58	9	1
1:A:262:THR:CG2	1:A:266:GLN:HB3	0.56	2.31	2	6
1:A:301:PRO:O	1:A:303:TRP:HD1	0.55	1.83	4	5
1:A:279:TRP:CZ2	2:B:208:PRO:HD2	0.55	2.37	9	8
1:A:279:TRP:NE1	2:B:207:PRO:CD	0.55	2.69	2	10
1:A:302:GLY:O	1:A:317:ASP:HA	0.55	2.01	4	5
1:A:323:THR:HG21	2:B:209:PRO:O	0.55	2.02	1	4
1:A:291:ILE:CB	1:A:330:LEU:HD21	0.55	2.32	2	2
1:A:305:ILE:HD13	1:A:315:PHE:CE2	0.54	2.38	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:327:ASP:CB	1:A:330:LEU:HD22	0.54	2.32	10	1
1:A:257:TYR:CD1	1:A:282:PRO:HG2	0.54	2.36	6	5
1:A:279:TRP:CZ3	2:B:208:PRO:HG2	0.54	2.38	6	10
1:A:261:THR:HG21	1:A:322:THR:CG2	0.54	2.33	1	2
1:A:267:VAL:O	1:A:279:TRP:CZ3	0.54	2.60	7	1
1:A:279:TRP:CE2	2:B:207:PRO:CD	0.54	2.91	4	4
1:A:267:VAL:HB	1:A:323:THR:O	0.54	2.03	10	6
1:A:281:ASP:CB	1:A:284:VAL:HG22	0.53	2.33	10	1
1:A:279:TRP:CH2	2:B:208:PRO:HD2	0.53	2.38	1	3
1:A:291:ILE:HG12	1:A:330:LEU:CD2	0.53	2.33	7	2
1:A:306:ARG:HB2	1:A:314:TYR:CZ	0.53	2.38	4	6
1:A:266:GLN:HG3	2:B:208:PRO:O	0.53	2.03	4	1
2:B:207:PRO:CB	2:B:208:PRO:CD	0.53	2.87	1	8
1:A:269:PHE:CE2	1:A:281:ASP:OD1	0.53	2.62	4	4
1:A:304:GLU:O	1:A:315:PHE:HA	0.52	2.05	10	2
1:A:299:LEU:CD2	1:A:303:TRP:HB2	0.52	2.35	3	9
1:A:322:THR:N	2:B:211:TYR:CD2	0.52	2.78	3	2
2:B:209:PRO:O	2:B:210:PRO:O	0.52	2.28	4	8
1:A:316:VAL:HG11	2:B:211:TYR:CZ	0.52	2.38	9	1
1:A:302:GLY:O	1:A:303:TRP:CD1	0.52	2.63	8	7
1:A:306:ARG:O	1:A:313:VAL:HB	0.52	2.04	10	1
1:A:322:THR:HA	2:B:211:TYR:CB	0.52	2.35	5	6
1:A:261:THR:HA	1:A:266:GLN:O	0.51	2.05	2	8
1:A:320:ASN:C	1:A:321:ARG:HG3	0.51	2.29	4	1
1:A:305:ILE:O	1:A:306:ARG:HG2	0.51	2.05	7	2
1:A:308:THR:O	1:A:311:GLY:N	0.51	2.38	2	10
1:A:263:GLN:HG2	1:A:264:GLN:N	0.51	2.19	5	1
1:A:262:THR:O	1:A:265:GLY:N	0.51	2.42	3	5
1:A:321:ARG:HB2	2:B:211:TYR:CE1	0.51	2.40	8	3
1:A:314:TYR:HB2	1:A:324:GLN:O	0.50	2.06	8	3
1:A:264:GLN:HB3	2:B:210:PRO:HB3	0.50	1.84	1	5
1:A:307:ASN:HD22	1:A:313:VAL:HG12	0.50	1.67	1	4
1:A:262:THR:O	1:A:263:GLN:C	0.50	2.53	10	8
1:A:321:ARG:HA	2:B:211:TYR:CZ	0.50	2.42	8	4
1:A:316:VAL:CG1	2:B:211:TYR:CE1	0.50	2.95	9	1
1:A:260:ARG:CB	1:A:268:TYR:CZ	0.50	2.95	4	4
2:B:207:PRO:HD2	2:B:208:PRO:CD	0.49	2.37	7	7
1:A:320:ASN:C	1:A:321:ARG:HG2	0.49	2.33	3	2
1:A:316:VAL:CG1	2:B:211:TYR:CZ	0.49	2.96	9	1
1:A:279:TRP:NE1	2:B:207:PRO:HD3	0.49	2.23	2	9
1:A:308:THR:HG22	2:B:209:PRO:HD3	0.49	1.83	8	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:291:ILE:CG1	1:A:330:LEU:HD11	0.49	2.33	3	1
1:A:267:VAL:HG23	1:A:322:THR:CB	0.49	2.37	6	3
1:A:270:LEU:HA	1:A:276:VAL:O	0.49	2.07	10	3
1:A:322:THR:N	2:B:211:TYR:CD1	0.48	2.81	2	1
1:A:262:THR:OG1	1:A:266:GLN:CB	0.48	2.62	2	2
1:A:315:PHE:CZ	1:A:327:ASP:CG	0.48	2.92	9	2
1:A:320:ASN:O	1:A:322:THR:HG23	0.48	2.09	4	4
1:A:291:ILE:N	1:A:291:ILE:HD13	0.48	2.23	5	1
1:A:317:ASP:O	2:B:211:TYR:CE2	0.48	2.66	10	1
1:A:321:ARG:CB	2:B:211:TYR:CE1	0.48	2.97	4	2
1:A:260:ARG:HB3	1:A:268:TYR:CZ	0.47	2.44	3	8
1:A:314:TYR:C	1:A:315:PHE:CG	0.47	2.93	1	4
1:A:265:GLY:HA3	2:B:211:TYR:HB3	0.47	1.86	4	2
1:A:259:GLN:CD	1:A:267:VAL:HG13	0.47	2.34	5	1
1:A:315:PHE:CE1	1:A:327:ASP:OD1	0.47	2.68	7	2
1:A:271:HIS:O	1:A:275:GLY:N	0.47	2.43	3	7
1:A:267:VAL:HG11	1:A:324:GLN:OE1	0.47	2.09	4	1
1:A:262:THR:HG23	1:A:266:GLN:O	0.47	2.10	9	4
1:A:320:ASN:O	1:A:320:ASN:ND2	0.47	2.48	6	1
1:A:257:TYR:CE1	1:A:271:HIS:CD2	0.47	3.02	3	2
1:A:327:ASP:OD1	1:A:327:ASP:N	0.47	2.48	5	2
2:B:211:TYR:CG	2:B:212:SER:N	0.46	2.83	1	2
1:A:266:GLN:NE2	2:B:208:PRO:O	0.46	2.49	2	3
1:A:260:ARG:CB	1:A:268:TYR:CE1	0.46	2.98	7	1
1:A:279:TRP:HE1	2:B:206:SER:HA	0.46	1.71	8	2
1:A:261:THR:HG21	1:A:322:THR:HG22	0.46	1.87	6	2
1:A:298:PRO:C	1:A:329:ARG:NH2	0.46	2.74	10	1
1:A:306:ARG:CB	1:A:314:TYR:CZ	0.46	2.98	6	2
1:A:262:THR:OG1	1:A:266:GLN:HB3	0.46	2.11	7	4
1:A:284:VAL:HG11	1:A:330:LEU:HG	0.46	1.86	6	1
1:A:299:LEU:HD11	1:A:303:TRP:HB3	0.46	1.87	7	1
1:A:305:ILE:C	1:A:306:ARG:HG2	0.46	2.35	2	1
1:A:293:CYS:CB	1:A:329:ARG:HD3	0.46	2.41	8	4
1:A:298:PRO:O	1:A:329:ARG:CZ	0.46	2.64	9	1
1:A:257:TYR:CZ	1:A:271:HIS:CD2	0.45	3.04	8	2
1:A:291:ILE:HG13	1:A:330:LEU:CD2	0.45	2.41	9	1
1:A:306:ARG:O	1:A:313:VAL:CA	0.45	2.64	10	1
1:A:321:ARG:CA	2:B:211:TYR:CE1	0.45	2.99	10	1
1:A:306:ARG:HB2	1:A:314:TYR:CE1	0.45	2.46	2	1
1:A:327:ASP:OD2	1:A:329:ARG:CD	0.45	2.65	10	1
1:A:259:GLN:CG	1:A:267:VAL:HG13	0.45	2.41	4	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:303:TRP:CZ2	1:A:328:PRO:HB3	0.45	2.47	10	1
1:A:270:LEU:HG	1:A:271:HIS:N	0.45	2.27	7	9
1:A:320:ASN:ND2	1:A:322:THR:CG2	0.45	2.80	1	1
1:A:260:ARG:O	1:A:267:VAL:HA	0.45	2.11	6	4
1:A:259:GLN:NE2	1:A:267:VAL:CG1	0.45	2.79	9	1
1:A:293:CYS:HB2	1:A:329:ARG:NE	0.44	2.27	7	1
1:A:321:ARG:HA	2:B:211:TYR:CE1	0.44	2.47	10	1
1:A:308:THR:OG1	1:A:312:ARG:CB	0.44	2.65	5	1
1:A:321:ARG:C	2:B:211:TYR:CD1	0.44	2.96	10	1
1:A:276:VAL:CG1	1:A:277:SER:N	0.44	2.81	8	10
1:A:308:THR:OG1	1:A:312:ARG:HB2	0.44	2.12	4	4
1:A:269:PHE:CZ	1:A:281:ASP:OD2	0.44	2.70	5	4
1:A:321:ARG:HB3	2:B:211:TYR:CE1	0.43	2.48	10	2
1:A:298:PRO:O	1:A:329:ARG:NH2	0.43	2.50	6	1
1:A:292:ASN:OD1	1:A:313:VAL:HG21	0.43	2.13	7	1
1:A:279:TRP:NE1	2:B:207:PRO:HD2	0.43	2.27	8	2
1:A:292:ASN:O	1:A:294:GLU:N	0.43	2.51	4	1
1:A:300:PRO:CG	1:A:328:PRO:CG	0.43	2.96	9	1
1:A:321:ARG:HB3	2:B:211:TYR:CE2	0.43	2.48	2	1
1:A:315:PHE:CE2	1:A:327:ASP:OD1	0.43	2.72	10	4
1:A:320:ASN:ND2	1:A:322:THR:HG21	0.43	2.29	1	1
1:A:321:ARG:C	1:A:322:THR:CG2	0.43	2.92	5	3
1:A:299:LEU:CD2	1:A:303:TRP:HB3	0.43	2.38	1	2
1:A:302:GLY:C	1:A:303:TRP:CD1	0.43	2.97	3	3
1:A:314:TYR:CD1	1:A:314:TYR:N	0.43	2.87	10	1
1:A:260:ARG:HB2	1:A:268:TYR:CZ	0.43	2.49	7	2
1:A:291:ILE:HG12	1:A:330:LEU:HD22	0.43	1.91	6	1
1:A:308:THR:CG2	1:A:312:ARG:O	0.43	2.65	7	1
1:A:260:ARG:HB3	1:A:268:TYR:CE1	0.42	2.49	1	2
1:A:269:PHE:CE2	1:A:281:ASP:OD2	0.42	2.73	9	1
1:A:318:HIS:CE1	2:B:211:TYR:HH	0.42	2.33	9	1
1:A:259:GLN:HG3	1:A:267:VAL:HG13	0.42	1.92	4	1
1:A:284:VAL:HG12	1:A:331:SER:CA	0.42	2.41	7	1
1:A:303:TRP:CZ3	1:A:328:PRO:HG3	0.42	2.50	7	1
1:A:327:ASP:OD1	1:A:328:PRO:HD3	0.42	2.15	7	1
1:A:261:THR:HG21	1:A:322:THR:HG21	0.42	1.92	1	1
2:B:207:PRO:CD	2:B:208:PRO:CD	0.42	2.98	4	2
1:A:259:GLN:NE2	1:A:268:TYR:O	0.42	2.52	9	1
1:A:316:VAL:HG12	1:A:318:HIS:CE1	0.42	2.50	2	2
1:A:321:ARG:O	1:A:322:THR:CG2	0.42	2.67	9	2
1:A:330:LEU:O	1:A:331:SER:C	0.42	2.63	8	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:320:ASN:O	1:A:321:ARG:CG	0.42	2.68	8	3
2:B:211:TYR:CD1	2:B:212:SER:N	0.42	2.88	1	1
1:A:305:ILE:HD13	1:A:315:PHE:CD2	0.42	2.49	2	1
1:A:299:LEU:HG	1:A:303:TRP:HB2	0.42	1.90	3	1
1:A:291:ILE:CG1	1:A:330:LEU:CD2	0.42	2.98	4	2
1:A:325:PHE:CZ	2:B:207:PRO:HB2	0.42	2.50	4	1
1:A:269:PHE:CZ	1:A:281:ASP:OD1	0.42	2.73	10	1
1:A:321:ARG:HA	2:B:211:TYR:CE2	0.41	2.50	6	1
1:A:300:PRO:CG	1:A:328:PRO:HG3	0.41	2.45	9	1
1:A:264:GLN:O	2:B:211:TYR:N	0.41	2.54	8	1
1:A:256:GLY:O	1:A:271:HIS:HA	0.41	2.16	9	1
2:B:207:PRO:CD	2:B:208:PRO:HD3	0.41	2.46	7	2
1:A:281:ASP:O	1:A:284:VAL:O	0.41	2.39	7	1
1:A:281:ASP:OD1	1:A:282:PRO:HD2	0.41	2.16	4	1
1:A:314:TYR:O	1:A:315:PHE:CD1	0.41	2.74	4	1
1:A:259:GLN:NE2	1:A:267:VAL:HG22	0.41	2.31	5	1
1:A:325:PHE:CE2	2:B:208:PRO:HD3	0.41	2.51	9	2
1:A:264:GLN:HB3	2:B:210:PRO:HB2	0.40	1.92	5	1
1:A:259:GLN:NE2	1:A:267:VAL:HG13	0.40	2.31	9	2
1:A:262:THR:HG21	1:A:266:GLN:OE1	0.40	2.16	7	1
1:A:315:PHE:CD1	1:A:315:PHE:N	0.40	2.90	3	1
1:A:305:ILE:HD12	1:A:315:PHE:HD1	0.40	1.77	7	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	73/90 (81%)	65±1 (89±2%)	6±1 (9±1%)	2±1 (3±1%)	6	42
2	B	7/20 (35%)	4±0 (53±7%)	1±1 (9±9%)	3±0 (39±7%)	0	0
All	All	800/1100 (73%)	684 (86%)	70 (9%)	46 (6%)	2	20

All 7 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	263	GLN	10
2	B	207	PRO	10
2	B	210	PRO	10
2	B	212	SER	7
1	A	293	CYS	4
1	A	255	GLU	3
1	A	331	SER	2

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	66/79 (84%)	46±3 (69±4%)	20±3 (31±4%)	1	15
2	B	7/18 (39%)	6±1 (87±12%)	1±1 (13±12%)	6	47
All	All	730/970 (75%)	518 (71%)	212 (29%)	1	18

All 46 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	271	HIS	10
1	A	310	THR	10
1	A	329	ARG	10
1	A	261	THR	9
1	A	296	LEU	9
1	A	291	ILE	8
1	A	325	PHE	8
1	A	276	VAL	7
1	A	294	GLU	7
1	A	259	GLN	6
1	A	264	GLN	6
1	A	270	LEU	6
1	A	295	GLU	6
1	A	315	PHE	6
1	A	260	ARG	5
1	A	263	GLN	5
1	A	307	ASN	5
1	A	324	GLN	5

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Mol	Chain	Res	Type	Models (Total)
1	A	327	ASP	5
2	B	212	SER	5
1	A	292	ASN	5
1	A	312	ARG	5
1	A	321	ARG	5
1	A	304	GLU	4
1	A	320	ASN	4
2	B	206	SER	4
1	A	277	SER	4
1	A	330	LEU	4
1	A	283	ARG	4
1	A	255	GLU	3
1	A	258	GLU	3
1	A	331	SER	3
1	A	326	THR	3
1	A	273	GLN	3
1	A	262	THR	3
1	A	319	ASN	3
1	A	284	VAL	2
1	A	306	ARG	2
1	A	317	ASP	2
1	A	272	THR	2
1	A	305	ILE	1
1	A	267	VAL	1
1	A	278	THR	1
1	A	280	HIS	1
1	A	281	ASP	1
1	A	313	VAL	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