



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 10:58 AM UTC

PDB ID : 1I7N / pdb_00001i7n
Title : CRYSTAL STRUCTURE ANALYSIS OF THE C DOMAIN OF SYNAPSIN
II FROM RAT BRAIN
Authors : Esser, L.; Palnitkar, M.; Deisenhofer, J.
Deposited on : 2001-03-09
Resolution : 1.90 Å(reported)

This is a Full wwPDB X-ray 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/XrayValidationReportHelp>

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
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

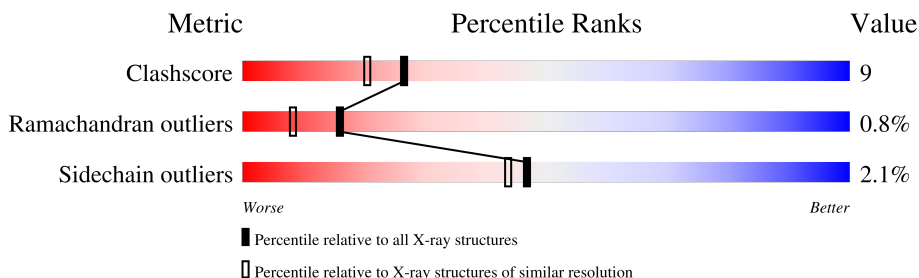
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 Å.

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)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	8410 (1.90-1.90)
Ramachandran outliers	187476	8333 (1.90-1.90)
Sidechain outliers	187428	8333 (1.90-1.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. 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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	309	 80% 18% •
1	B	309	 79% 18% •

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5192 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called SYNAPSIN II.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	308	Total	C	N	O	S	105	0	0
			2450	1569	412	451	18			
1	B	308	Total	C	N	O	S	76	0	0
			2450	1569	412	451	18			

- Molecule 2 is water.

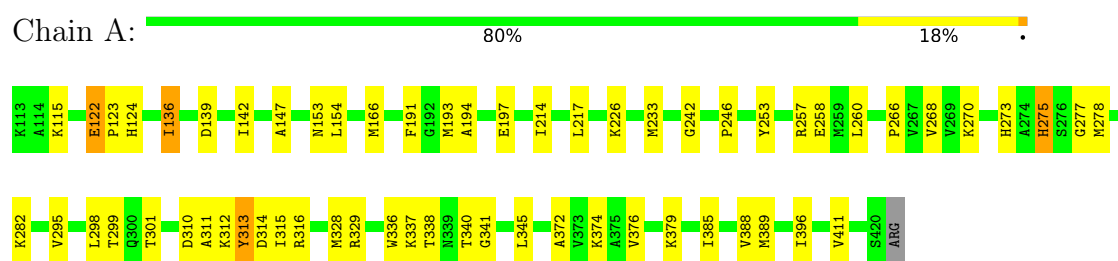
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	151	Total	O	0	0
			151	151		
2	B	141	Total	O	0	0
			141	141		

3 Residue-property plots

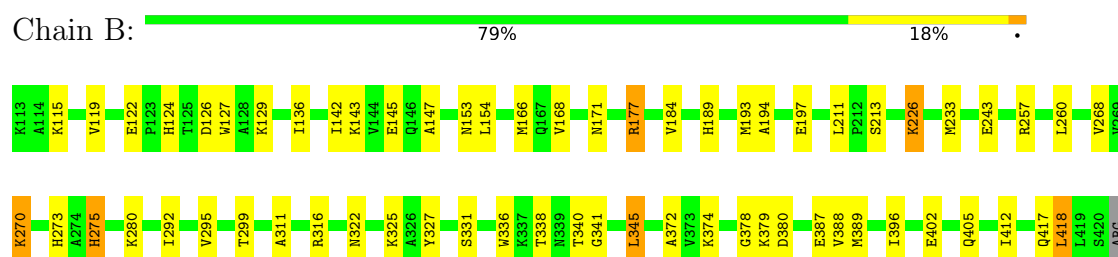
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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 outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

• Molecule 1: SYNAPSIN II



• Molecule 1: SYNAPSIN II



4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 63 2 2	Depositor
Cell constants a, b, c, α , β , γ	120.41 Å 120.41 Å 165.46 Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	11.98 – 1.90	Depositor
% Data completeness (in resolution range)	96.4 (11.98-1.90)	Depositor
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.222 , 0.265	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5192	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.95	0/2505	1.15	13/3386 (0.4%)
1	B	0.94	1/2505 (0.0%)	1.15	11/3386 (0.3%)
All	All	0.95	1/5010 (0.0%)	1.15	24/6772 (0.4%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	226	LYS	C-O	-5.06	1.19	1.24

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	213	SER	N-CA-C	8.13	120.47	108.60
1	A	122	GLU	CA-C-N	7.74	127.79	119.28
1	A	122	GLU	C-N-CA	7.74	127.79	119.28
1	B	331	SER	CA-C-N	-7.21	114.06	122.63
1	B	331	SER	C-N-CA	-7.21	114.06	122.63
1	A	311	ALA	N-CA-C	7.13	121.46	109.76
1	A	253	TYR	CA-C-N	7.05	127.04	119.28
1	A	253	TYR	C-N-CA	7.05	127.04	119.28
1	B	338	THR	N-CA-C	-7.03	96.95	108.41
1	B	311	ALA	N-CA-C	6.95	121.36	110.32
1	B	260	LEU	N-CA-C	-6.81	104.45	112.89
1	A	312	LYS	N-CA-C	-6.63	102.50	112.04
1	B	418	LEU	N-CA-C	6.12	120.47	112.89
1	A	379	LYS	N-CA-C	-6.11	104.69	111.71
1	A	310	ASP	N-CA-C	-6.01	97.89	108.23
1	A	242	GLY	N-CA-C	6.00	121.10	113.24
1	B	379	LYS	N-CA-C	-5.87	105.82	112.87
1	A	139	ASP	N-CA-C	5.66	119.50	112.59
1	A	268	VAL	N-CA-C	-5.40	99.97	107.80
1	A	313	TYR	N-CA-C	5.38	117.25	109.07
1	A	123	PRO	N-CA-C	5.18	120.64	113.65

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	168	VAL	N-CA-C	5.13	115.36	108.17
1	B	270	LYS	CB-CG-CD	5.03	122.88	111.30
1	B	268	VAL	N-CA-C	-5.03	100.51	107.80

There are no chirality outliers.

There are no planarity outliers.

5.2 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 the 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 within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2450	0	2428	42	0
1	B	2450	0	2428	48	0
2	A	151	0	0	2	0
2	B	141	0	0	2	0
All	All	5192	0	4856	87	0

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 9.

All (87) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:270:LYS:HE3	1:B:280:LYS:HE3	1.43	0.99
1:B:270:LYS:HG2	1:B:280:LYS:HG2	1.46	0.97
1:B:345:LEU:HD23	1:B:396:ILE:HD12	1.49	0.95
1:A:316:ARG:HD2	1:A:389:MET:HE1	1.60	0.83
1:B:316:ARG:HD2	1:B:389:MET:HE1	1.61	0.80
1:A:122:GLU:HB2	1:A:124:HIS:HE1	1.47	0.79
1:B:374:LYS:HE2	1:B:389:MET:SD	2.26	0.76
1:A:122:GLU:HB2	1:A:124:HIS:CE1	2.20	0.75
1:B:325:LYS:HD2	1:B:327:TYR:OH	1.86	0.75
1:B:122:GLU:HB2	1:B:124:HIS:CE1	2.22	0.75
1:B:126:ASP:OD2	1:B:129:LYS:HG3	1.89	0.73
1:B:270:LYS:CG	1:B:280:LYS:HG2	2.21	0.70
1:B:193:MET:HG3	1:B:273:HIS:O	1.92	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:226:LYS:NZ	1:B:270:LYS:HD3	2.05	0.69
1:A:329:ARG:HB2	1:A:345:LEU:HD13	1.74	0.69
1:A:299:THR:OG1	1:A:301:THR:HG22	1.94	0.68
1:B:177:ARG:HB2	1:B:177:ARG:HH11	1.60	0.67
1:B:177:ARG:HH11	1:B:177:ARG:CB	2.08	0.67
1:B:154:LEU:C	1:B:154:LEU:HD12	2.20	0.65
1:A:154:LEU:HD12	1:A:154:LEU:C	2.24	0.63
1:B:270:LYS:CE	1:B:280:LYS:HE3	2.26	0.61
1:A:313:TYR:HE2	1:A:315:ILE:HD11	1.64	0.61
1:A:193:MET:HG3	1:A:273:HIS:O	2.02	0.60
1:B:280:LYS:HE2	1:B:336:TRP:O	2.01	0.59
1:A:115:LYS:HB2	1:A:136:ILE:HD11	1.85	0.59
1:B:345:LEU:HD23	1:B:396:ILE:CD1	2.27	0.58
1:A:316:ARG:HD2	1:A:389:MET:CE	2.33	0.58
1:A:338:THR:HG22	1:A:374:LYS:HZ3	1.68	0.58
1:B:194:ALA:HB3	1:B:197:GLU:OE2	2.04	0.58
1:A:194:ALA:HB3	1:A:197:GLU:CD	2.28	0.57
1:A:295:VAL:O	1:A:299:THR:HG23	2.06	0.56
1:A:314:ASP:HB2	1:A:329:ARG:HB3	1.87	0.56
1:B:372:ALA:HB3	1:B:389:MET:HE3	1.89	0.55
1:A:313:TYR:CE2	1:A:315:ILE:HD11	2.41	0.55
1:B:122:GLU:HB2	1:B:124:HIS:NE2	2.22	0.55
1:A:147:ALA:HB2	1:A:166:MET:SD	2.47	0.54
1:A:233:MET:HE3	1:A:388:VAL:HG23	1.89	0.53
1:A:270:LYS:HB2	2:A:1122:HOH:O	2.08	0.53
1:A:122:GLU:CB	1:A:124:HIS:CE1	2.90	0.53
1:B:316:ARG:HD2	1:B:389:MET:CE	2.37	0.53
1:A:374:LYS:HE3	1:A:389:MET:SD	2.49	0.53
1:B:136:ILE:HG23	1:B:142:ILE:HD11	1.91	0.53
1:B:189:HIS:HB3	1:B:275:HIS:NE2	2.25	0.52
1:B:233:MET:HE3	1:B:388:VAL:HG23	1.92	0.52
1:B:143:LYS:HE2	1:B:145:GLU:OE2	2.11	0.51
1:A:338:THR:HG22	1:A:374:LYS:NZ	2.25	0.51
1:B:136:ILE:HG22	1:B:412:ILE:HG23	1.92	0.51
1:A:372:ALA:HB3	1:A:389:MET:HE3	1.92	0.50
1:A:345:LEU:HD21	1:A:396:ILE:HD12	1.94	0.50
1:A:257:ARG:NH1	1:B:153:ASN:HD22	2.11	0.48
1:A:214:ILE:CD1	1:A:411:VAL:HA	2.45	0.47
1:B:184:VAL:CG2	1:B:211:LEU:HD13	2.44	0.47
1:B:327:TYR:CB	1:B:345:LEU:HG	2.44	0.47
1:A:191:PHE:O	1:A:275:HIS:HE1	1.98	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:153:ASN:HD22	1:B:257:ARG:NH1	2.12	0.46
1:B:226:LYS:HE2	2:B:1205:HOH:O	2.14	0.46
1:B:136:ILE:CG2	1:B:142:ILE:HD11	2.45	0.46
1:B:327:TYR:HB2	1:B:345:LEU:HG	1.97	0.46
1:B:226:LYS:HZ3	1:B:270:LYS:HD3	1.79	0.46
1:B:295:VAL:O	1:B:299:THR:HG23	2.16	0.45
1:B:270:LYS:HE2	2:B:1273:HOH:O	2.16	0.45
1:B:194:ALA:HB3	1:B:197:GLU:CD	2.42	0.44
1:A:338:THR:CG2	1:A:374:LYS:NZ	2.81	0.44
1:A:258:GLU:HG3	1:B:154:LEU:O	2.18	0.44
1:B:154:LEU:C	1:B:154:LEU:CD1	2.91	0.44
1:A:336:TRP:CH2	1:A:337:LYS:HE3	2.52	0.43
1:A:314:ASP:O	1:A:328:MET:HA	2.18	0.43
1:A:246:PRO:HD2	1:A:385:ILE:CD1	2.49	0.43
1:B:184:VAL:HG21	1:B:211:LEU:HD13	2.01	0.42
1:B:417:GLN:HG2	1:B:418:LEU:HD23	2.01	0.42
1:B:147:ALA:HB2	1:B:166:MET:HE2	2.01	0.42
1:A:226:LYS:HE3	2:A:1087:HOH:O	2.19	0.42
1:A:328:MET:O	1:A:345:LEU:HD12	2.20	0.41
1:A:233:MET:CE	1:A:388:VAL:HG23	2.51	0.41
1:A:313:TYR:CD2	1:A:328:MET:HG3	2.56	0.41
1:B:292:ILE:HD13	1:B:292:ILE:HA	1.86	0.41
1:B:115:LYS:HG3	1:B:136:ILE:HD11	2.02	0.41
1:B:374:LYS:HE3	1:B:387:GLU:CD	2.45	0.41
1:A:277:GLY:O	1:A:278:MET:C	2.62	0.41
1:A:336:TRP:CZ2	1:A:337:LYS:HE3	2.56	0.41
1:B:402:GLU:O	1:B:405:GLN:HB3	2.21	0.40
1:A:136:ILE:HG23	1:A:142:ILE:HD11	2.03	0.40
1:A:217:LEU:HD23	1:A:217:LEU:HA	1.87	0.40
1:B:119:VAL:HG11	1:B:127:TRP:CD1	2.56	0.40
1:A:191:PHE:O	1:A:275:HIS:CE1	2.74	0.40
1:A:260:LEU:HD23	1:A:260:LEU:HA	1.80	0.40
1:B:378:GLY:C	1:B:380:ASP:N	2.78	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 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 X-ray entries followed by that with respect to entries of similar resolution.

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	306/309 (99%)	290 (95%)	14 (5%)	2 (1%)	18	10
1	B	306/309 (99%)	294 (96%)	9 (3%)	3 (1%)	12	5
All	All	612/618 (99%)	584 (95%)	23 (4%)	5 (1%)	16	8

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	171	ASN
1	B	340	THR
1	B	341	GLY
1	A	340	THR
1	A	341	GLY

5.3.2 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 X-ray entries followed by that with respect to entries of similar resolution.

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	265/266 (100%)	259 (98%)	6 (2%)	44	40
1	B	265/266 (100%)	260 (98%)	5 (2%)	50	47
All	All	530/532 (100%)	519 (98%)	11 (2%)	47	44

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	136	ILE

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Mol	Chain	Res	Type
1	A	266	PRO
1	A	275	HIS
1	A	282	LYS
1	A	298	LEU
1	A	376	VAL
1	B	177	ARG
1	B	243	GLU
1	B	275	HIS
1	B	322	ASN
1	B	345	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	250	GLN
1	A	256	HIS
1	A	275	HIS
1	A	286	HIS
1	A	417	GLN
1	B	189	HIS
1	B	250	GLN
1	B	256	HIS
1	B	286	HIS
1	B	290	GLN
1	B	339	ASN
1	B	417	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.