



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 02:49 PM UTC

PDB ID : 6Z66 / pdb_00006z66
Title : Crystal structure of apo-state neurotensin receptor 1
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Deposited on : 2020-05-27
Resolution : 3.19 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)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

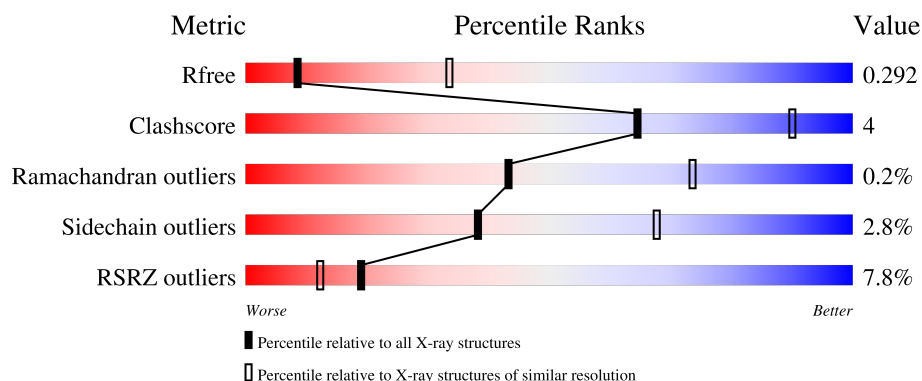
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.19 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))
R_{free}	180053	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	AAA	482	7% 87% 8% • 5%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6398 atoms, of which 3157 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 Neurotensin receptor type 1,Neurotensin receptor type 1,DARPin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	AAA	459	Total	C	H	N	O	S	225	0	0
			6398	2107	3157	536	585	13			

There are 57 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AAA	46	GLY	-	expression tag	UNP P20789
AAA	47	PRO	-	expression tag	UNP P20789
AAA	48	GLY	-	expression tag	UNP P20789
AAA	49	SER	-	expression tag	UNP P20789
AAA	83	GLY	SER	engineered mutation	UNP P20789
AAA	86	LEU	ALA	engineered mutation	UNP P20789
AAA	101	ARG	THR	engineered mutation	UNP P20789
AAA	103	ASP	HIS	engineered mutation	UNP P20789
AAA	105	TYR	HIS	engineered mutation	UNP P20789
AAA	119	PHE	LEU	engineered mutation	UNP P20789
AAA	121	LEU	MET	engineered mutation	UNP P20789
AAA	124	ASP	GLU	engineered mutation	UNP P20789
AAA	143	LYS	ARG	engineered mutation	UNP P20789
AAA	150	GLU	ASP	engineered mutation	UNP P20789
AAA	161	VAL	ALA	engineered mutation	UNP P20789
AAA	167	LEU	ARG	engineered mutation	UNP P20789
AAA	213	LEU	ARG	engineered mutation	UNP P20789
AAA	234	LEU	VAL	engineered mutation	UNP P20789
AAA	235	ARG	LYS	engineered mutation	UNP P20789
AAA	240	LEU	VAL	engineered mutation	UNP P20789
AAA	253	ALA	ILE	engineered mutation	UNP P20789
AAA	260	ALA	ILE	engineered mutation	UNP P20789
AAA	262	ARG	ASN	engineered mutation	UNP P20789
AAA	263	ARG	LYS	engineered mutation	UNP P20789
AAA	?	-	GLU	deletion	UNP P20789
AAA	?	-	GLN	deletion	UNP P20789
AAA	?	-	GLY	deletion	UNP P20789

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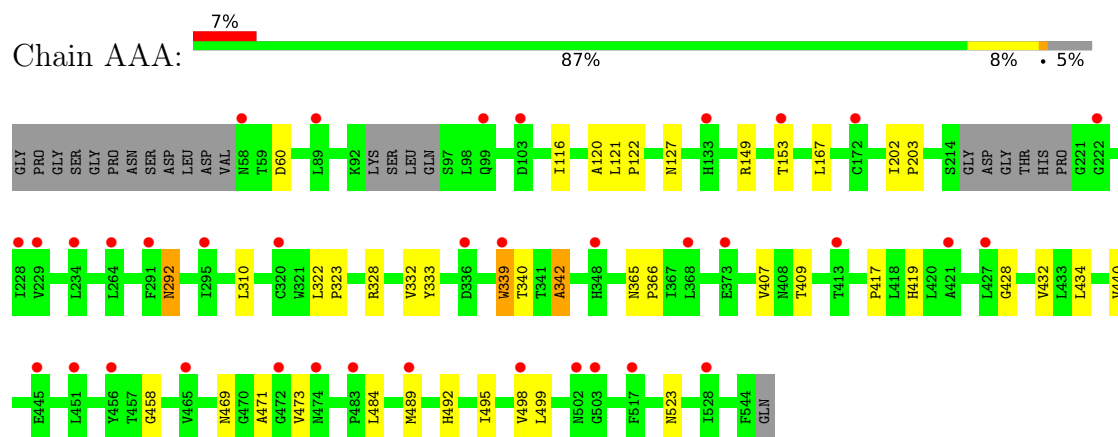
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Chain	Residue	Modelled	Actual	Comment	Reference
AAA	?	-	ARG	deletion	UNP P20789
AAA	?	-	VAL	deletion	UNP P20789
AAA	?	-	CYS	deletion	UNP P20789
AAA	?	-	THR	deletion	UNP P20789
AAA	?	-	VAL	deletion	UNP P20789
AAA	?	-	GLY	deletion	UNP P20789
AAA	?	-	THR	deletion	UNP P20789
AAA	?	-	HIS	deletion	UNP P20789
AAA	?	-	ASN	deletion	UNP P20789
AAA	?	-	GLY	deletion	UNP P20789
AAA	?	-	LEU	deletion	UNP P20789
AAA	?	-	GLU	deletion	UNP P20789
AAA	?	-	HIS	deletion	UNP P20789
AAA	?	-	SER	deletion	UNP P20789
AAA	?	-	THR	deletion	UNP P20789
AAA	305	ARG	HIS	engineered mutation	UNP P20789
AAA	332	VAL	CYS	engineered mutation	UNP P20789
AAA	342	ALA	PHE	engineered mutation	UNP P20789
AAA	354	SER	THR	engineered mutation	UNP P20789
AAA	358	VAL	PHE	engineered mutation	UNP P20789
AAA	362	ALA	SER	engineered mutation	UNP P20789
AAA	372	ALA	-	linker	UNP P20789
AAA	373	GLU	-	linker	UNP P20789
AAA	374	ASP	-	linker	UNP P20789
AAA	375	LEU	-	linker	UNP P20789
AAA	376	VAL	-	linker	UNP P20789
AAA	377	GLU	-	linker	UNP P20789
AAA	378	ASP	-	linker	UNP P20789
AAA	379	TRP	-	linker	UNP P20789
AAA	380	GLU	-	linker	UNP P20789

3 Residue-property plots [i](#)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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.

- Molecule 1: Neurotensin receptor type 1,Neurotensin receptor type 1,DARPin



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	76.19Å 212.99Å 94.64Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.46 – 3.19 29.46 – 3.19	Depositor EDS
% Data completeness (in resolution range)	81.9 (29.46-3.19) 81.9 (29.46-3.19)	Depositor EDS
R_{merge}	0.33	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.32 (at 3.18Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.286 , 0.294 0.286 , 0.292	Depositor DCC
R_{free} test set	524 reflections (4.71%)	wwPDB-VP
Wilson B-factor (Å ²)	75.4	Xtriage
Anisotropy	0.013	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 27.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	6398	wwPDB-VP
Average B, all atoms (Å ²)	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.10% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	AAA	1.05	0/3313	1.75	0/4565

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 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 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	AAA	3241	3157	2977	24	0
All	All	3241	3157	2977	24	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 4.

All (24) 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:AAA:489:MET:C	1:AAA:523:ASN:HD21	1.98	0.70
1:AAA:434:LEU:HB3	1:AAA:469:ASN:OD1	1.97	0.65
1:AAA:458:GLY:HA3	1:AAA:492:HIS:NE2	2.17	0.59
1:AAA:332:VAL:HG23	1:AAA:333:TYR:HD1	1.67	0.59
1:AAA:121:LEU:HB3	1:AAA:122:PRO:HD3	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:AAA:292:ASN:N	1:AAA:292:ASN:HD22	2.06	0.53
1:AAA:495:ILE:O	1:AAA:498:VAL:HG22	2.09	0.53
1:AAA:116:ILE:O	1:AAA:120:ALA:HB3	2.09	0.52
1:AAA:322:LEU:HB3	1:AAA:323:PRO:HD3	1.93	0.49
1:AAA:149:ARG:O	1:AAA:153:THR:HG23	2.14	0.48
1:AAA:469:ASN:HD22	1:AAA:469:ASN:N	2.12	0.47
1:AAA:489:MET:CA	1:AAA:523:ASN:HD21	2.28	0.47
1:AAA:167:LEU:HD22	1:AAA:310:LEU:HD22	1.98	0.46
1:AAA:428:GLY:O	1:AAA:432:VAL:HG23	2.15	0.46
1:AAA:489:MET:C	1:AAA:523:ASN:ND2	2.73	0.45
1:AAA:202:ILE:N	1:AAA:203:PRO:CD	2.81	0.44
1:AAA:365:ASN:HB3	1:AAA:366:PRO:HD3	2.01	0.43
1:AAA:292:ASN:HD22	1:AAA:292:ASN:H	1.64	0.42
1:AAA:489:MET:HA	1:AAA:523:ASN:HD21	1.85	0.42
1:AAA:484:LEU:HD13	1:AAA:499:LEU:HD12	2.01	0.42
1:AAA:409:THR:O	1:AAA:417:PRO:HD3	2.21	0.41
1:AAA:440:VAL:HG22	1:AAA:471:ALA:HB2	2.02	0.41
1:AAA:340:THR:HG23	1:AAA:342:ALA:HB3	2.02	0.41
1:AAA:339:TRP:CD1	1:AAA:339:TRP:H	2.39	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	AAA	453/482 (94%)	424 (94%)	28 (6%)	1 (0%)	43 73

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	AAA	342	ALA

5.3.2 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 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	AAA	290/397 (73%)	282 (97%)	8 (3%)	38 68

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	AAA	60	ASP
1	AAA	127	ASN
1	AAA	292	ASN
1	AAA	328	ARG
1	AAA	339	TRP
1	AAA	407	VAL
1	AAA	419	HIS
1	AAA	473	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	AAA	459/482 (95%)	0.72	36 (7%) 19 12	37, 70, 95, 117	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	AAA	133	HIS	4.5
1	AAA	339	TRP	4.0
1	AAA	99	GLN	3.7
1	AAA	472	GLY	3.7
1	AAA	320	CYS	3.2
1	AAA	483	PRO	3.1
1	AAA	517	PHE	3.0
1	AAA	451	LEU	3.0
1	AAA	264	LEU	2.8
1	AAA	498	VAL	2.8
1	AAA	228	ILE	2.7
1	AAA	465	VAL	2.7
1	AAA	295	ILE	2.6
1	AAA	234	LEU	2.6
1	AAA	502	ASN	2.6
1	AAA	528	ILE	2.5
1	AAA	503	GLY	2.4
1	AAA	373	GLU	2.4
1	AAA	58	ASN	2.4
1	AAA	421	ALA	2.3
1	AAA	413	THR	2.3
1	AAA	172	CYS	2.3
1	AAA	291	PHE	2.3
1	AAA	89	LEU	2.2
1	AAA	336	ASP	2.2
1	AAA	368	LEU	2.2
1	AAA	489	MET	2.2

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Mol	Chain	Res	Type	RSRZ
1	AAA	222	GLY	2.1
1	AAA	229	VAL	2.1
1	AAA	456	TYR	2.1
1	AAA	153	THR	2.1
1	AAA	474	ASN	2.0
1	AAA	348	HIS	2.0
1	AAA	103	ASP	2.0
1	AAA	445	GLU	2.0
1	AAA	427	LEU	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.