



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 05:16 AM UTC

PDB ID : 1VC3 / pdb_00001vc3
Title : Crystal Structure of L-Aspartate-alpha-Decarboxylase
Authors : Nakajima, O.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2004-03-04
Resolution : 1.50 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
Mogul	:	2022.3.0, CSD as543be (2022)
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

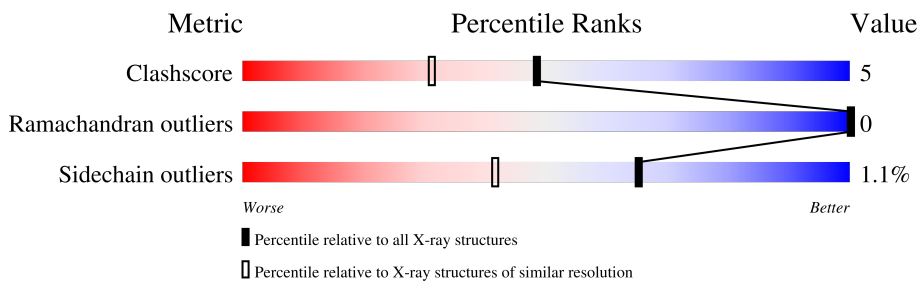
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.50 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	4235 (1.50-1.50)
Ramachandran outliers	187476	4153 (1.50-1.50)
Sidechain outliers	187428	4150 (1.50-1.50)

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	24	
2	B	96	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 1071 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 L-Aspartate-alpha-Decarboxylase light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	24	Total	C	N	O	S	0	0	0
			192	122	38	30	2			

- Molecule 2 is a protein called L-Aspartate-alpha-Decarboxylase heavy chain.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	96	Total	C	N	O	0	0	0
			721	456	123	142			

- Molecule 3 is water.

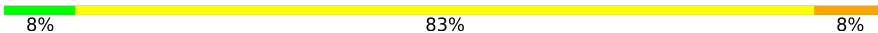
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	29	Total	O	0	0
			29	29		
3	B	129	Total	O	0	0
			129	129		

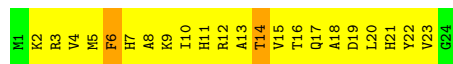
3 Residue-property plots

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.

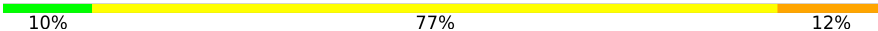
Note EDS was not executed.

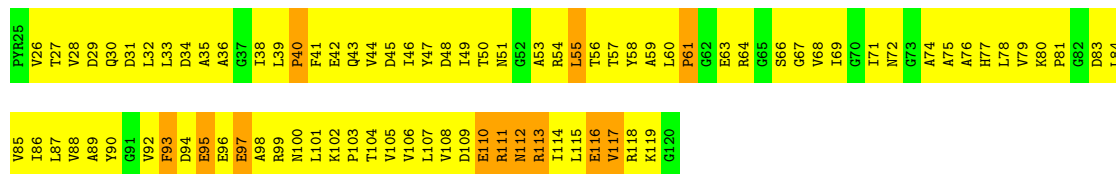
- Molecule 1: L-Aspartate-alpha-Decarboxylase light chain

Chain A: 



- Molecule 2: L-Aspartate-alpha-Decarboxylase heavy chain

Chain B: 



4 Data and refinement statistics

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

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, α , β , γ	67.53Å 67.53Å 47.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	10.00 – 1.50	Depositor
% Data completeness (in resolution range)	(Not available) (10.00-1.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.215 , 0.247	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	1071	wwPDB-VP
Average B, all atoms (Å ²)	9.0	wwPDB-VP

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PYR

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	2.57	22/196 (11.2%)	1.27	5/263 (1.9%)
2	B	2.54	84/725 (11.6%)	1.16	13/988 (1.3%)
All	All	2.55	106/921 (11.5%)	1.18	18/1251 (1.4%)

All (106) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	57	THR	CA-C	-9.56	1.44	1.53
1	A	19	ASP	CA-C	-9.12	1.43	1.53
2	B	102	LYS	CA-C	-8.77	1.43	1.52
2	B	114	ILE	CA-C	-8.62	1.43	1.52
2	B	85	VAL	CA-C	-8.59	1.43	1.52
2	B	72	ASN	CA-C	-8.52	1.42	1.52
2	B	93	PHE	CA-C	-8.52	1.42	1.52
2	B	119	LYS	CA-C	-8.49	1.42	1.52
2	B	44	VAL	CA-C	-8.47	1.42	1.52
2	B	118	ARG	CA-C	-8.39	1.42	1.52
1	A	15	VAL	CA-C	-8.35	1.43	1.52
2	B	71	ILE	CA-C	-8.35	1.43	1.52
1	A	3	ARG	CA-C	-8.22	1.43	1.52
1	A	2	LYS	CA-C	-8.13	1.42	1.52
2	B	36	ALA	CA-C	-8.08	1.41	1.52
2	B	39	LEU	CA-C	-8.03	1.42	1.52
2	B	68	VAL	CA-C	-8.02	1.43	1.52
2	B	61	PRO	CA-C	-7.86	1.43	1.52
1	A	8	ALA	CA-C	-7.85	1.43	1.52
1	A	5	MET	CA-C	-7.83	1.43	1.52
1	A	18	ALA	CA-C	-7.75	1.43	1.52
2	B	98	ALA	CA-C	-7.69	1.42	1.52
2	B	115	LEU	CA-C	-7.68	1.42	1.52
2	B	113	ARG	CA-C	-7.64	1.43	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	23	VAL	CA-C	-7.61	1.42	1.52
2	B	38	ILE	CA-C	-7.60	1.43	1.52
2	B	104	THR	CA-C	-7.60	1.43	1.52
2	B	60	LEU	CA-C	-7.59	1.43	1.52
2	B	59	ALA	CA-C	-7.58	1.43	1.52
2	B	96	GLU	CA-C	-7.57	1.43	1.52
1	A	12	ARG	CA-C	-7.53	1.43	1.53
2	B	106	VAL	CA-C	-7.52	1.43	1.52
2	B	69	ILE	CA-C	-7.51	1.43	1.52
2	B	109	ASP	CA-C	-7.49	1.43	1.53
2	B	103	PRO	CA-C	-7.43	1.43	1.52
1	A	4	VAL	CA-C	-7.43	1.43	1.52
2	B	111	ARG	CA-C	-7.43	1.42	1.52
2	B	100	ASN	CA-C	-7.42	1.43	1.52
2	B	84	LEU	CA-C	-7.40	1.43	1.52
1	A	17	GLN	CA-C	-7.39	1.43	1.52
2	B	27	THR	CA-C	-7.38	1.43	1.52
1	A	10	ILE	CA-C	-7.37	1.43	1.52
2	B	45	ASP	CA-C	-7.36	1.43	1.52
2	B	34	ASP	CA-C	-7.33	1.43	1.52
2	B	33	LEU	CA-C	-7.33	1.43	1.52
1	A	14	THR	CA-C	-7.31	1.43	1.52
2	B	117	VAL	CA-C	-7.27	1.43	1.52
2	B	54	ARG	CA-C	-7.24	1.43	1.52
2	B	28	VAL	CA-C	-7.23	1.43	1.52
2	B	77	HIS	CA-C	-7.22	1.43	1.52
2	B	99	ARG	CA-C	-7.22	1.42	1.52
2	B	64	ARG	CA-C	-7.22	1.43	1.52
2	B	83	ASP	CA-C	-7.22	1.43	1.52
2	B	66	SER	CA-C	-7.21	1.42	1.52
2	B	89	ALA	CA-C	-7.21	1.43	1.52
2	B	48	ASP	CA-C	-7.18	1.44	1.52
1	A	13	ALA	CA-C	-7.18	1.42	1.53
1	A	22	TYR	CA-C	-7.17	1.43	1.52
2	B	116	GLU	CA-C	-7.17	1.43	1.52
2	B	108	VAL	CA-C	-7.17	1.44	1.52
2	B	95	GLU	CA-C	-7.16	1.43	1.52
2	B	94	ASP	CA-C	-7.16	1.43	1.53
2	B	35	ALA	CA-C	-7.16	1.43	1.52
1	A	9	LYS	CA-C	-7.14	1.43	1.52
2	B	78	LEU	CA-C	-7.14	1.43	1.52
2	B	87	LEU	CA-C	-7.14	1.44	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	107	LEU	CA-C	-7.07	1.44	1.52
2	B	32	LEU	CA-C	-7.07	1.43	1.52
2	B	53	ALA	CA-C	-7.06	1.43	1.52
2	B	50	THR	CA-C	-7.05	1.43	1.52
2	B	90	TYR	CA-C	-7.03	1.44	1.52
1	A	21	HIS	CA-C	-7.01	1.43	1.52
2	B	58	TYR	CA-C	-7.01	1.44	1.52
2	B	31	ASP	CA-C	-7.00	1.43	1.52
2	B	47	TYR	CA-C	-6.98	1.44	1.52
2	B	29	ASP	CA-C	-6.91	1.44	1.52
2	B	42	GLU	CA-C	-6.89	1.43	1.52
2	B	97	GLU	CA-C	-6.86	1.43	1.52
2	B	40	PRO	CA-C	-6.86	1.43	1.52
2	B	92	VAL	CA-C	-6.86	1.44	1.52
2	B	86	ILE	CA-C	-6.85	1.44	1.52
1	A	11	HIS	CA-C	-6.84	1.44	1.52
2	B	74	ALA	CA-C	-6.83	1.43	1.52
2	B	81	PRO	CA-C	-6.81	1.44	1.52
2	B	55	LEU	CA-C	-6.81	1.44	1.52
2	B	43	GLN	CA-C	-6.80	1.44	1.52
2	B	105	VAL	CA-C	-6.79	1.43	1.52
2	B	79	VAL	CA-C	-6.79	1.43	1.52
1	A	20	LEU	CA-C	-6.79	1.43	1.52
2	B	110	GLU	CA-C	-6.78	1.43	1.52
2	B	46	ILE	CA-C	-6.77	1.43	1.52
2	B	112	ASN	CA-C	-6.75	1.43	1.53
1	A	16	THR	CA-C	-6.68	1.43	1.52
2	B	56	THR	CA-C	-6.68	1.44	1.52
2	B	101	LEU	CA-C	-6.68	1.44	1.52
2	B	88	VAL	CA-C	-6.65	1.44	1.52
1	A	6	PHE	CA-C	-6.61	1.44	1.52
2	B	80	LYS	CA-C	-6.61	1.43	1.52
2	B	63	GLU	CA-C	-6.55	1.43	1.52
2	B	51	ASN	CA-C	-6.49	1.44	1.52
2	B	30	GLN	CA-C	-6.36	1.43	1.52
2	B	75	ALA	CA-C	-6.30	1.43	1.52
2	B	76	ALA	CA-C	-6.29	1.43	1.52
1	A	7	HIS	CA-C	-6.25	1.43	1.52
2	B	41	PHE	CA-C	-6.12	1.43	1.52
2	B	49	ILE	CA-C	-6.11	1.43	1.52

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2	LYS	CB-CA-C	7.56	122.27	109.50
2	B	53	ALA	CB-CA-C	6.26	121.05	109.54
2	B	102	LYS	CB-CA-C	6.21	122.44	111.20
1	A	13	ALA	CB-CA-C	6.21	120.69	109.83
2	B	98	ALA	CB-CA-C	6.11	121.23	110.85
2	B	89	ALA	CB-CA-C	6.06	120.95	109.37
2	B	59	ALA	CB-CA-C	6.01	119.45	109.53
2	B	114	ILE	N-CA-C	5.86	116.62	109.30
1	A	8	ALA	CB-CA-C	5.79	120.16	110.43
2	B	88	VAL	N-CA-C	5.54	116.46	108.48
1	A	18	ALA	CB-CA-C	5.51	121.67	109.94
2	B	35	ALA	CB-CA-C	5.44	121.12	110.67
2	B	94	ASP	N-CA-C	-5.34	103.34	110.55
2	B	93	PHE	N-CA-C	5.31	118.24	109.85
2	B	85	VAL	N-CA-C	5.24	116.25	108.65
2	B	74	ALA	CB-CA-C	5.19	120.53	110.46
1	A	11	HIS	N-CA-C	5.14	117.62	109.24
2	B	76	ALA	CB-CA-C	5.04	120.95	110.32

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	192	0	193	1	0
2	B	721	0	721	10	0
3	A	29	0	0	0	0
3	B	129	0	0	2	0
All	All	1071	0	914	10	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 5.

All (10) 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:A:14:THR:H	2:B:112:ASN:HD21	1.12	0.91
2:B:110:GLU:OE2	2:B:111:ARG:HG2	2.07	0.55
2:B:95:GLU:HG3	3:B:175:HOH:O	2.09	0.53
2:B:93:PHE:HD2	2:B:97:GLU:HG2	1.83	0.44
2:B:55:LEU:HD12	2:B:55:LEU:C	2.44	0.43
2:B:116:GLU:HG2	2:B:117:VAL:N	2.33	0.42
2:B:40:PRO:HB3	2:B:61:PRO:HD3	2.02	0.41
2:B:67:GLY:HA3	2:B:113:ARG:NH1	2.36	0.41
2:B:26:VAL:O	2:B:26:VAL:HG13	2.21	0.40
2:B:113:ARG:NH1	3:B:144:HOH:O	2.55	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	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
2	B	94/96 (98%)	90 (96%)	4 (4%)	0	100	100
All	All	116/120 (97%)	111 (96%)	5 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	19/20 (95%)	18 (95%)	1 (5%)	20	3
2	B	75/76 (99%)	75 (100%)	0	100	100
All	All	94/96 (98%)	93 (99%)	1 (1%)	65	41

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11	HIS
1	A	17	GLN
1	A	21	HIS
2	B	30	GLN
2	B	72	ASN
2	B	112	ASN

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 [i](#)

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 ⓘ

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.