



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 02:08 PM UTC

PDB ID : 1I1B / pdb_00001i1b
Title : CRYSTAL STRUCTURE OF RECOMBINANT HUMAN INTERLEUKIN-1BETA AT 2.0 ANGSTROMS RESOLUTION
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Deposited on : 1989-12-05
Resolution : 2.00 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

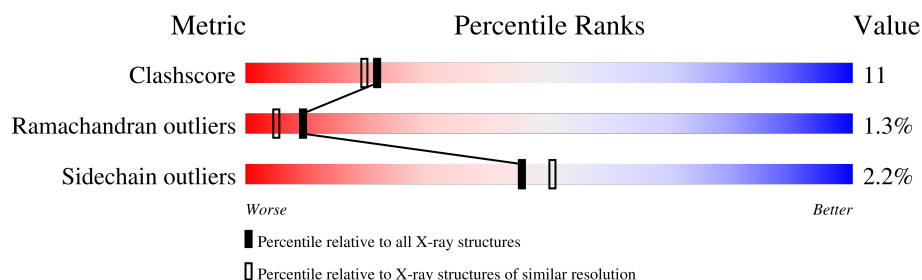
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)

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	153	 48% 38% 11% ..

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 1294 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 INTERLEUKIN-1 BETA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	151	Total	C	N	O	S	0	3	0
			1211	765	199	239	8			

- Molecule 2 is water.

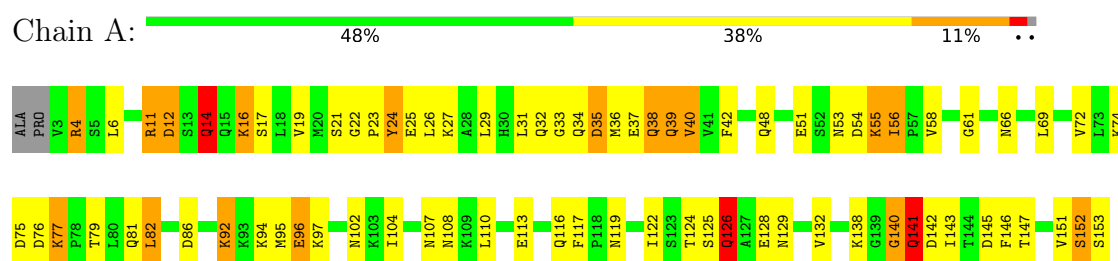
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	83	Total	O	0	0
			83	83		

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: INTERLEUKIN-1 BETA



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 43	Depositor
Cell constants a, b, c, α , β , γ	54.86 Å 54.86 Å 77.02 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.00	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-2.00)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	PROLSQ	Depositor
R, R_{free}	0.189 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	1294	wwPDB-VP
Average B, all atoms (Å ²)	27.0	wwPDB-VP

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	A	1.67	11/1248 (0.9%)	2.55	90/1677 (5.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	14	GLN	C-N	-7.19	1.23	1.33
1	A	22	GLY	N-CA	7.08	1.54	1.44
1	A	141	GLN	N-CA	7.07	1.55	1.46
1	A	61	GLY	N-CA	5.90	1.50	1.44
1	A	104	ILE	CA-CB	5.65	1.61	1.54
1	A	102	ASN	N-CA	5.49	1.52	1.46
1	A	146	PHE	CA-CB	5.33	1.63	1.54
1	A	110	LEU	C-N	-5.21	1.26	1.33
1	A	11	ARG	NE-CZ	5.12	1.38	1.33
1	A	6	LEU	N-CA	5.10	1.52	1.46
1	A	14	GLN	CA-CB	-5.07	1.45	1.53

All (90) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	77	LYS	CA-CB-CG	11.29	136.69	114.10
1	A	152	SER	N-CA-C	11.07	126.86	110.48
1	A	6	LEU	N-CA-CB	-10.88	91.73	110.99
1	A	14	GLN	OE1-CD-NE2	10.39	132.99	122.60
1	A	152	SER	CA-C-O	10.12	133.11	121.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	11	ARG	CD-NE-CZ	-9.94	110.49	124.40
1	A	76	ASP	CA-CB-CG	-9.81	102.79	112.60
1	A	37	GLU	CB-CG-CD	9.61	128.94	112.60
1	A	129	ASN	N-CA-C	8.76	123.55	112.86
1	A	142	ASP	CA-CB-CG	-8.51	104.09	112.60
1	A	97	LYS	N-CA-C	8.22	121.28	111.33
1	A	25	GLU	CA-CB-CG	7.95	130.00	114.10
1	A	77	LYS	O-C-N	7.77	129.98	122.06
1	A	38	GLN	CA-C-N	7.63	132.41	121.50
1	A	38	GLN	C-N-CA	7.63	132.41	121.50
1	A	39	GLN	OE1-CD-NE2	7.61	130.21	122.60
1	A	151	VAL	CB-CA-C	7.56	122.04	110.55
1	A	51	GLU	N-CA-CB	7.41	122.70	110.85
1	A	32	GLN	OE1-CD-NE2	-7.26	115.33	122.60
1	A	55	LYS	N-CA-CB	7.00	121.55	110.55
1	A	34	GLN	N-CA-C	-6.97	104.64	113.01
1	A	82	LEU	O-C-N	6.96	131.13	123.27
1	A	22	GLY	O-C-N	6.94	128.71	121.77
1	A	82	LEU	CA-C-O	-6.88	112.93	120.43
1	A	128	GLU	CB-CA-C	-6.81	97.01	109.54
1	A	40	VAL	CA-C-N	6.78	131.57	122.90
1	A	40	VAL	C-N-CA	6.78	131.57	122.90
1	A	92	LYS	CG-CD-CE	6.65	126.60	111.30
1	A	14	GLN	CA-CB-CG	6.64	127.37	114.10
1	A	126	GLN	CA-CB-CG	6.63	127.36	114.10
1	A	31	LEU	N-CA-CB	-6.61	99.03	111.00
1	A	54	ASP	N-CA-C	6.60	121.54	112.90
1	A	132	VAL	N-CA-C	-6.59	100.25	109.21
1	A	86	ASP	O-C-N	6.57	127.03	121.31
1	A	66	ASN	CA-C-O	-6.57	113.64	122.44
1	A	4	ARG	CB-CG-CD	-6.48	96.39	111.30
1	A	95	MET	N-CA-CB	-6.42	99.82	110.23
1	A	25	GLU	N-CA-CB	6.42	123.48	111.53
1	A	117	PHE	O-C-N	6.41	127.33	121.04
1	A	146	PHE	CA-CB-CG	-6.39	107.41	113.80
1	A	53	ASN	CA-CB-CG	6.37	118.97	112.60
1	A	56	ILE	CA-CB-CG1	-6.33	99.64	110.40
1	A	22	GLY	N-CA-C	-6.29	99.52	112.34
1	A	94	LYS	CA-C-O	6.28	128.84	121.11
1	A	108	ASN	CA-CB-CG	-6.21	106.39	112.60
1	A	92	LYS	CB-CA-C	-6.17	97.14	109.79
1	A	113	GLU	CB-CA-C	-6.07	99.28	109.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	145	ASP	N-CA-C	6.04	119.31	109.59
1	A	128	GLU	CA-C-O	-6.01	115.01	121.56
1	A	66	ASN	OD1-CG-ND2	-5.96	116.64	122.60
1	A	81	GLN	OE1-CD-NE2	5.86	128.46	122.60
1	A	124	THR	CA-CB-OG1	-5.85	100.82	109.60
1	A	147	THR	N-CA-C	-5.84	100.62	109.85
1	A	116	GLN	CB-CG-CD	5.84	122.53	112.60
1	A	53	ASN	CA-C-N	5.83	132.24	121.52
1	A	53	ASN	C-N-CA	5.83	132.24	121.52
1	A	14	GLN	O-C-N	5.78	129.13	122.25
1	A	145	ASP	N-CA-CB	5.72	119.91	110.69
1	A	82	LEU	CA-C-N	-5.72	113.69	122.62
1	A	82	LEU	C-N-CA	-5.72	113.69	122.62
1	A	51	GLU	CA-CB-CG	5.67	125.44	114.10
1	A	25	GLU	O-C-N	5.64	129.82	123.27
1	A	138	LYS	N-CA-C	-5.64	100.50	109.59
1	A	72	VAL	CA-C-O	-5.60	116.08	121.63
1	A	14	GLN	CA-C-O	-5.60	112.98	119.59
1	A	141	GLN	CB-CA-C	5.56	121.48	110.42
1	A	54	ASP	CA-C-O	-5.44	113.24	119.60
1	A	12	ASP	N-CA-CB	5.42	117.81	110.38
1	A	35	ASP	N-CA-CB	-5.40	101.42	110.39
1	A	147	THR	N-CA-CB	5.39	119.94	111.20
1	A	143	ILE	N-CA-CB	-5.37	103.15	110.56
1	A	48	GLN	OE1-CD-NE2	5.32	127.92	122.60
1	A	96	GLU	CG-CD-OE1	5.32	130.63	118.40
1	A	102	ASN	CA-C-O	-5.28	114.71	120.36
1	A	55	LYS	CB-CA-C	-5.26	101.56	110.19
1	A	108	ASN	CB-CA-C	5.25	120.86	110.42
1	A	42	PHE	CA-CB-CG	-5.25	108.55	113.80
1	A	17	SER	CA-CB-OG	-5.23	100.63	111.10
1	A	75	ASP	CA-CB-CG	5.22	117.82	112.60
1	A	16	LYS	CA-C-N	5.17	132.14	122.74
1	A	16	LYS	C-N-CA	5.17	132.14	122.74
1	A	77	LYS	CB-CA-C	-5.16	101.97	109.45
1	A	122	ILE	N-CA-C	-5.15	102.87	109.30
1	A	14	GLN	N-CA-C	-5.12	106.27	112.88
1	A	58	VAL	O-C-N	5.11	128.62	122.95
1	A	107	ASN	N-CA-C	5.07	116.84	110.91
1	A	24	TYR	N-CA-C	5.01	119.11	112.30
1	A	124	THR	N-CA-CB	5.01	119.39	111.43
1	A	56	ILE	CB-CA-C	5.01	116.08	110.52

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Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	129	ASN	CA-CB-CG	-5.00	107.60	112.60

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	4	ARG	Sidechain

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	A	1211	0	1167	26	0
2	A	83	0	0	5	0
All	All	1294	0	1167	26	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 11.

All (26) 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:140:GLY:O	1:A:141:GLN:HB2	1.66	0.94
1:A:11:ARG:NE	2:A:263:HOH:O	2.15	0.68
1:A:23:PRO:HB2	1:A:24:TYR:CD1	2.30	0.66
1:A:14:GLN:OE1	1:A:126:GLN:NE2	2.29	0.66
1:A:35:ASP:O	1:A:38:GLN:HG2	1.99	0.61
1:A:152:SER:OG	1:A:153:SER:N	2.35	0.59
1:A:74:LYS:HD3	1:A:79:THR:HG21	1.86	0.57
1:A:19:VAL:HA	1:A:40:VAL:HG23	1.91	0.53
1:A:14:GLN:HG3	2:A:277:HOH:O	2.08	0.53
1:A:11:ARG:NH2	2:A:263:HOH:O	2.36	0.52
1:A:119:ASN:ND2	2:A:275:HOH:O	2.43	0.51
1:A:21:SER:HB2	1:A:27:LYS:HG3	1.92	0.50
1:A:55:LYS:C	1:A:56:ILE:HG13	2.37	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:36:MET:O	1:A:39:GLN:HB3	2.12	0.49
1:A:26:LEU:HD13	1:A:82:LEU:HD11	1.94	0.48
1:A:92:LYS:NZ	1:A:96:GLU:OE2	2.46	0.47
1:A:14:GLN:HG2	2:A:223:HOH:O	2.14	0.47
1:A:69:LEU:HD12	1:A:82:LEU:CD2	2.45	0.46
1:A:33:GLY:C	1:A:35:ASP:H	2.20	0.45
1:A:33:GLY:C	1:A:35:ASP:N	2.74	0.45
1:A:16:LYS:NZ	1:A:125:SER:O	2.42	0.45
1:A:12:ASP:C	1:A:14:GLN:H	2.26	0.42
1:A:77:LYS:HE2	1:A:77:LYS:HB3	1.70	0.42
1:A:140:GLY:O	1:A:141:GLN:CB	2.48	0.41
1:A:82:LEU:HD23	1:A:82:LEU:HA	1.89	0.41
1:A:36:MET:HB2	1:A:36:MET:HE2	1.73	0.41

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	152/153 (99%)	142 (93%)	8 (5%)	2 (1%)	9 5

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	141	GLN
1	A	140	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	140/140 (100%)	137 (98%)	3 (2%)	47 52

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLN
1	A	29	LEU
1	A	126	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	7	ASN
1	A	14	GLN
1	A	38	GLN
1	A	89	ASN
1	A	102	ASN
1	A	126	GLN
1	A	129	ASN

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 [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.